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SIMATIC

Industrial PC SIMATIC HMI IPC477C / HMI IPC477C PRO

Operating Instructions

Preface 1
Security 2
Description 3
Application planning 4
Installing/Mounting 5
Connecting 6
Integration into an Automation System 7
Commissioning 8
Operation 9
Functions 10
Expansions and Configurations 11
Maintenance and servicing 12
Alarm, error and system messages 13
Troubleshooting/FAQs 14
Technical specifications 15
Dimension drawings 16
Detailed descriptions 17
Appendix A
List of abbreviations B

10/2010
A5E02368070-02

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 corresponding information is not taken into account.

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

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation for the specific task, 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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⚠ WARNING

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

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Disclaimer of Liability

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

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GERMANY

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℗ 11/2010

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Table of contents

1 Preface 9
2 Security 11
2.1 Safety information 11
2.2 General Information 13
2.3 ESD guidelines 15
3 Description 17
3.1 SIMATIC HMI IPC477C built-in devices 17
3.1.1 Design of the IPC477C with touch panel 18
3.1.2 Design of the IPC477C with key panel 19
3.1.3 Connection elements and operator controls 22
3.2 SIMATIC HMI IPC477C PRO 24
3.2.1 Design of the IPC477C PRO 24
3.2.2 Structure of the basic adapter 26
3.3 Accessories 27
3.4 Windows Embedded Standard 2009 27
3.5 Windows Embedded Standard 7 29
4 Application planning 31
4.1 Unpacking and checking the delivery 31
4.2 Device identification data 32
4.3 Affixing Labeling Strips for Function Keys and Softkeys 34
4.4 Ambient and Environmental Conditions 37
5 Installing/Mounting 39
5.1 Installing SIMATIC HMI IPC477C 39
5.1.1 Installation guidelines 39
5.1.2 Permitted mounting positions 41
5.1.3 Preparing the mounting cut-out 42
5.1.4 Fastening and installation types 43
5.1.5 Securing the Device with Clamps 44
5.1.6 Securing the Device with Screws 45
5.1.7 IPC477C for shipbuilding 47
5.2 Integrating SIMATIC HMI IPC477C PRO 48
6 Connecting 51
6.1 Connecting the 24 VDC power supply 51
6.2 connecting the PE conductor 53
6.3 Connecting peripheral equipment 55

7 Integration into an Automation System 57

7.1 Overview 57

7.2 MPI/PROFIBUS-DP network 58

7.3 Connecting an S7 automation system 58

7.4 Networking via Industrial Ethernet 59

7.5 PROFINET 59

8 Commissioning 61

8.1 Before commissioning 61

8.2 Commissioning Windows Embedded Standard 62
8.2.1 Basic commissioning - initial startup 62
8.2.2 Setting up the language selection in Windows Embedded Standard 2009 63
8.2.3 Language selection in Windows Embedded Standard 7 64

8.3 Commissioning Windows XP Professional 65
8.3.1 Basic commissioning - initial startup 65
8.3.2 Setting Up the Language Selection 66

8.4 Commissioning Windows 7 67
8.4.1 Basic commissioning - initial startup 67
8.4.2 Setting Up the Language Selection 68
8.4.3 Recovery of Windows 7 68
8.4.4 Installing drivers and software 71

8.5 Checking the Language Selection 72

8.6 Setting the panel type 73
8.6.1 First commissioning 73
8.6.2 Touch panel configuration 74
8.6.3 Key panel configuration 75
8.6.4 Automatic restart 76

8.7 Device with key panel 76
8.7.1 Activating KeyTools 76

8.8 Device with touch screen 77
8.8.1 Recalibrating the Touch Screen 77
8.8.2 Activating the Screen Keyboard 80

8.9 Controlling backlighting 81

9 Operation 83

9.1 Device with key panel 83
9.1.1 Safety 83
9.1.2 Overview 84
9.1.3 Keys 86
9.1.3.1 Control keys 86
9.1.3.2 Alphanumeric and numeric keys 87
9.1.3.3 Cursor keys 88
9.1.3.4 External keyboards 89

9.2 Device with touch screen 89
9.2.1 Overview 89
9.2.2 Using the touch screen 90

10 Functions 91

10.1 Overview of the functions 91
10.2 Temperature monitoring/display 92
10.3 Watchdog (WD) 92
10.4 Enhanced Write Filter (EWF) 93
10.5 File Based Write Filter (FBWF) 95
10.6 HAL tool 97

11 Expansions and Configurations 99

11.1 Open the device. 99
11.2 Memory expansion 102
11.2.1 Installing the memory module 102
11.3 Installing/Removing Compact Flash Cards 103
11.3.1 Installation options for Compact Flash cards 103
11.3.2 SIMATIC HMI IPC477C 105
11.3.2.1 Installing/removing the Compact Flash card in the external slot 105
11.3.2.2 Installing/removing the compact flash card in the internal slot 106
11.3.3 SIMATIC HMI IPC477C PRO 108
11.3.3.1 Installing/removing a Compact Flash card 108
11.3.3.2 Kit for distributed installation/removal 115

12 Maintenance and servicing 117

12.1 Cleaning the Device Front 117
12.2 Removing and installing hardware components 117
12.2.1 Repairs 118
12.2.2 Replace the backup battery 119
12.3 Installation/removal of SSD 121
12.3.1 Installing/removing SSD with SIMATIC HMI IPC477C 121
12.3.2 Installing/removing SSD with SIMATIC HMI IPC477C PRO 124
12.4 Reinstalling the operating system 127
12.4.1 Windows Embedded Standard 2009 or Windows Embedded Standard 7 127
12.4.1.1 General installation procedure 127
12.4.1.2 Restoring the software to delivery state using the Restore CD/DVD 128
12.4.2 Windows XP Professional 129
12.4.2.1 General installation procedure 129
12.4.2.2 Restoring the software to delivery state using the Restore CD/DVD 129
12.4.2.3 Setting up the operating system via the Recovery DVD 130
12.5 Partitioning data media 132
12.5.1 Setting up the partitions under Windows Embedded Standard 2009 132
12.5.2 Partitioning in Windows Embedded Standard 7 133
12.5.3 Setting up the partitions under Windows XP Professional 133
12.5.4 Partitioning in Windows 7 Ultimate 134
12.5.5 Adapting partitions in Windows 7 and Windows Embedded Standard 7 134
12.6 Installing updates 135
12.6.1 Updating the operating system 135
12.6.2 Installing or updating application programs and drivers 136
12.6.3 Performing a BIOS update 136

12.7 Data backup ... 136
12.8 Installing drivers and software ... 137
12.8.1 Installing drivers for Windows Embedded Standard 2009 and Windows Embedded Standard 7 ... 137
12.8.2 Installation of driver and software ... 137
12.9 CP 1616 onboard ... 138
13 Alarm, error and system messages ... 139
13.1 Boot error messages ... 139
14 Troubleshooting/FAQs ... 141
14.1 General problems ... 141
15 Technical specifications ... 143
15.1 General technical specifications SIMATIC HMI IPC477C ... 143
15.2 General technical specifications SIMATIC HMI IPC477C PRO ... 146
15.3 Power requirements of the components ... 148
15.4 Power supply ... 149
15.5 Keyboard table ... 149
16 Dimension drawings ... 157
16.1 Overview of the dimension drawings ... 157
16.2 Dimension drawing of the touch screen device, 12" display ... 158
16.3 Dimension drawing of the touch screen device, 15" display ... 159
16.4 Dimension drawing of the touch screen device, 19" display ... 160
16.5 Dimension drawing of the key panel device, 12" display ... 161
16.6 Dimension drawing of the key panel device, 15" display ... 162
16.7 Dimension drawing of the touch screen PRO device, 15" display ... 163
16.8 Dimension drawing of the touch screen PRO device, 19" display ... 164
17 Detailed descriptions ... 165
17.1 Components ... 165
17.1.1 Overview of internal components ... 165
17.1.2 Technical features of the motherboard ... 168
17.1.3 External interfaces ... 168
17.1.3.1 COM ... 168
17.1.3.2 DVI-I ... 169
17.1.3.3 Ethernet ... 170
17.1.3.4 PROFIBUS ... 171
17.1.3.5 PROFINET ... 171
17.1.3.6 USB ... 172
17.1.3.7 Compact Flash card interface ... 172

17.2 BIOS Setup 173
17.2.1 Overview 173
17.2.2 Starting BIOS Setup 174
17.2.3 BIOS Setup menus 175
17.2.4 Main menu 176
17.2.5 Advanced Menu 182
17.2.6 Security menu 185
17.2.7 Boot menu 186
17.2.8 Version menu 189
17.2.9 Exit Menu 190
17.2.10 Default BIOS Setup entries 191

17.3 System resources 193
17.3.1 Currently allocated system resources 193

17.4 I/O Address Areas 193
17.4.1 Overview of the internal module registers 193
17.4.2 SRAM address register 194
17.4.3 SRAM control register (write only, address 066h) 194
17.4.4 General Purpose Ports (GPP) output register (read/write, address 404Dh) 195

17.5 CP 1616 onboard communications processor 195
17.5.1 Introduction 195
17.5.1.1 Properties 195
17.5.1.2 Network connections 196
17.5.1.3 Typical Communication Partners 196
17.5.2 Firmware loader 197
17.5.3 Loading firmware 198
17.5.4 Further actions in STEP 7/NCM PC 200

A Appendix 201

A.1 Guidelines and Declarations 201

A.2 Certificates and Approvals 202

A.3 Service and support 203

B List of abbreviations 205

B.1 Abbreviations 205

Glossary 211

Index 223

Preface

1

Purpose of the Operating Instructions

These operating instructions contain all the information you need for commissioning and operation of the SIMATIC HMI IPC477C and SIMATIC HMI IPC477C PRO.

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

Basic knowledge required

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

Scope of the operating instructions

These operating instructions are valid for all devices with the order numbers 6AV7884-... and 6AV7883-… and describe the product package status as of October 2010.

Approbations

You can find additional information in Certificates and Approvals (Page 202) in the Appendix.

CE marking

You can find additional information in Guidelines and Declarations (Page 201) in the Appendix.

Standards

You can find additional information in the sections Application planning (Page 31) and Technical specifications (Page 143).

Position in the information landscape

The documentation for the HMI IPC includes the following sections:

- SIMATIC HMI IPC477C / SIMATIC HMI IPC477C PRO, Operating Instructions Compact
- SIMATIC HMI IPC477C / SIMATIC HMI IPC477C PRO, Operating Instructions

The documentation is supplied with the HMI IPC in German and English in electronic form as a PDF file on the "Documentation and Drivers" CD/DVD.

Conventions

In these operating instructions, the terms "SIMATIC HMI IPC477C" and "SIMATIC HMI IPC477C PRO", "control unit", and "computer unit" are uniformly referred to as the "device". "CP" is used as an abbreviation for "CP 1616 onboard".

In these operating instructions, the terms "Windows Embedded Standard 2009" and "Windows Embedded Standard 7" are also abbreviated with the term "Windows Embedded Standard". "Windows 7" is used as an abbreviation for "Windows 7 Ultimate".

Note

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

Security 2

2.1 Safety information

⚠ WARNING

Emergencies

In the event of a device fault, interrupt the power supply immediately. Inform the competent customer service personnel. Malfunctions can occur when the operator controls or power cable are damaged or when liquids or foreign objects penetrate the device.

⚠ WARNING

Following the results of a risk analysis, additional protection equipment on the machine or the system is necessary to avoid endangering persons. With this, especially the programming, configuration and wiring of the inserted I/O modules have to be executed, in accordance with the safety performance (SIL, PL or Cat.) identified by the necessary risk analysis. The intended use of the device has to be ensured.

The proper use of the device has to be verified with a function test on the system. This test can detect programming, configuration and wiring errors. The test results have to be documented and if necessary inserted into the relevant inputs.

Note

This device corresponds to the regulations of the EU low-voltage directive and the GPSG, verified by conformity with national and international standards (DIN EN, IEC) by a UL approval (cULuc). Please comply with all the information in these operating instructions when assembling the device.

Electrical connection

⚠ WARNING

Disconnect the device from the mains before every intervention.

Do not touch power lines or data transmission lines during electrical storms and do not connect any cables.

System expansions

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

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

CAUTION
Do not crimp cables Take care that no cables are crimped when closing the device.

High frequency radiation

CAUTION
Unintentional operating situations High frequency radiation, from cell phones for example, can cause unintentional operating situations under some circumstances. For additional information, see Technical specifications (Page 143) under Electromagnetic Compatibility.

Handling and disposal of lithium batteries

⚠ WARNING
Danger of explosion and the release of harmful substances! Do not throw lithium batteries into fire, do not solder onto the cell body, do not open, do not short circuit, do not reverse pole, do not heat above 100 °C, dispose of according to regulations, and protect from direct sunlight, moisture and condensation. Replace lithium batteries with the same brand or a brand recommended by the manufacturer. Dispose of used lithium batteries as hazardous waste, individually, in accordance with the local regulations.

Repairs

Only qualified technical personnel may 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.

2.2 General Information

Overview

CAUTION
The device must only be operated in closed rooms. Failure to comply nullifies the warranty

Operate the device only in accordance with the ambient conditions specified in the technical specifications. Protect the device against dust, moisture and heat. Do not place the device in direct sunlight.

Transportation

Unpack the device at the its installation location. Transport the device only in the original packaging. Do not transport the device when it is mounted.

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

CAUTION
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. However, do not expose the device to direct heat radiation. If moisture condensation occurs, wait at least 12 hours before you switch on the device. **Vibration** Optical 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 to allow the drive to stop completely.

Tools & downloads

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

Downloads are available on the Internet at After-sales information system for SIMATIC PC/PG (http://www.siemens.com/asis).

Safety-relevant applications

⚠ WARNING
Incorrect operation Do not perform safety-relevant functions of the user software with the touch screen.

Resistance to chemicals

CAUTION
Adhere to the information regarding chemical resistance of the panel front. You can find information in the Internet at After-sales information system for SIMATIC PC/PG (http://www.siemens.com/asis)

Sources of light

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

Defective pixels in the display

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

You can find additional information in the section General technical specifications SIMATIC HMI IPC477C (Page 143) and General technical specifications SIMATIC HMI IPC477C PRO (Page 146) .

Burn-in effect on TFT displays

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:

- The liquid crystals in screen savers which actuate active black when the backlighting is on, e.g. flying stars "starfield simulation," renew themselves. Pay attention to the length of time the backlighting is activated
- The following applies to screen savers that 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

2.3 ESD guidelines

What does ESD mean?

Almost all electronic modules are equipped with highly integrated components and elements in MOS technology. For technological reasons, these electronic components are very sensitive to overvoltages and, consequently, to electrostatic discharge. These components are therefore marked as follows:

- **ESD: E**lectrostatically **S**ensitive **D**evices
- **ESD:** Internationally recognized designation for electrostatic sensitive components and modules

The following symbols on switch cabinets, module carriers or packaging indicate their susceptibility to electrostatic discharge:



ESD components are destroyed by voltage and energy far below the limits of human perception. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged ESD components which were subject to such voltage are usually not recognized immediately as being defective, because the malfunction does not occur until after a longer period of operation.

Note

More information is located on the rating plate. The rating plate is described in the section "Application planning (Page 31)".

Precautions against electrostatic discharge

Most plastics can be charged easily. Therefore, keep plastics away from ESD components!

When working with electrostatically sensitive components, make sure that the person, the workstation and the packaging are properly grounded. Conduct the electrostatic charge away from your body by touching the mounting plate for the interfaces, for example.

Handling electrostatic sensitive modules

As a rule: Only touch ESD components if unavoidable due to necessary tasks.

Only touch the components when the following holds true:

- You are permanently grounded by means of an ESD armband.
- You are wearing ESD shoes or ESD shoes grounding protective strips in connection with ESD floors.

Before you touch an electronic assembly, your body must be discharged. Touch a conductive object immediately beforehand, e.g. a bare metal part of a switch cabinet or the water pipe.

Do not allow chargeable, highly insulated materials, e.g. plastic films, insulating tabletops, synthetic clothing fibers, to come into contact with ESD components.

Place ESD components only on conductive surfaces (work surfaces with ESD surface, conductive ESD foam, ESD packing bag, ESD transport container).

Do not expose ESD components to visual display units, monitors or televisions. Maintain a distance of at least 10 cm to screens.

Handle flat components only by their edges. Do not touch component connectors or conductors. This prevents charges from reaching and damaging sensitive components.

Measuring and modifying electrostatic sensitive modules

Measure the ESD component under the following conditions only:

- The measuring device is grounded with a PE conductor, for example.
- The probe on the potential-free measuring device has been discharged, e.g. by touching the bare metal of a part of the switch cabinet.
- Your body is discharged. Do so by touching grounded metallic parts.

Solder only with grounded soldering irons.

Shipping electrostatic sensitive modules

Always store or ship ESD components in conductive packaging, e.g. metalized plastic boxes or metal cans. Leave the components and parts in their packaging until installation. If the packaging is not conductive, wrap the ESD component in a conductive material, e.g. rubber foam, ESD bag, household aluminum foil, or paper, before packing. Do not wrap the ESD component in plastic bags or plastic film.

In ESD components containing installed batteries, make sure that the conductive packaging does not touch the battery connectors or short circuit. Insulate the connectors with suitable material.

Description

3

3.1 SIMATIC HMI IPC477C built-in devices

Features

The SIMATIC HMI IPC477C provides high-level industrial performance.

- Compact design
- Maintenance-free operation
- Rugged

The SIMATIC HMI IPC477C is available with a variety of control units which are distinguished by the size of the display and by a key or touch panel. It is available in 2 versions.

Key panel variants

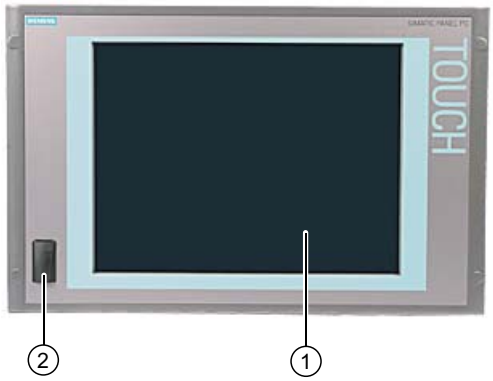
- Color display with backlighting:
  - 12" TFT technology with 800 x 600 resolution
  - 15" TFT technology with 1024 x 768 resolution
- Membrane keyboard with alphanumeric keys, numeric keys, cursor keys and control keys
- Function keys and softkeys
- Integrated mouse
- Front-mounted USB 2.0 interface for connecting external I/O devices.

Touch panel variants

- Color display with backlighting
  - 12" TFT technology; 800 x 600 resolution
  - 15" TFT technology; 1024 x 768 resolution
  - 19" TFT technology; 1024 x 1280 resolution
- Front-mounted USB 2.0 interface for connecting external I/O devices.

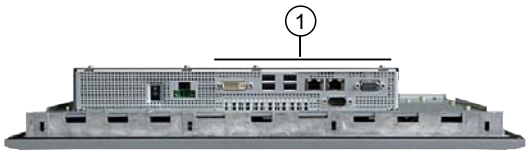
3.1.1 Design of the IPC477C with touch panel

Front view



① Display / touch screen
② USB port

Bottom view

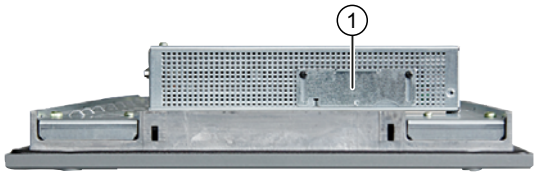


① Interfaces / Connection elements

Rear view



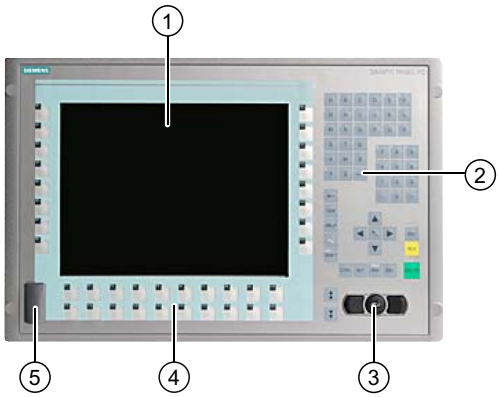
Side view



① Compact Flash slot (external slot)

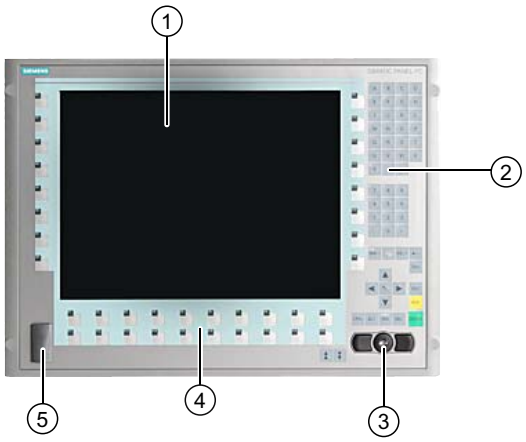
3.1.2 Design of the IPC477C with key panel

Front view 12" device



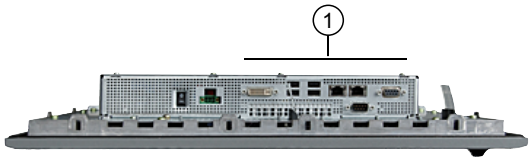
① LCD display
② Alphanumeric keys, numeric keys, cursor keys and control keys
③ Integrated mouse
④ Function keys, softkeys
⑤ USB port

Front view 15" device



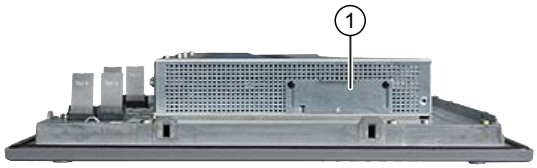
① LCD display
② Alphanumeric keys, numeric keys, cursor keys and control keys
③ Integrated mouse
④ Function keys, softkeys
⑤ USB port

Bottom view



① Interfaces / Connection elements

Side view



① Compact Flash slot (external slot)

Rear view 12" device

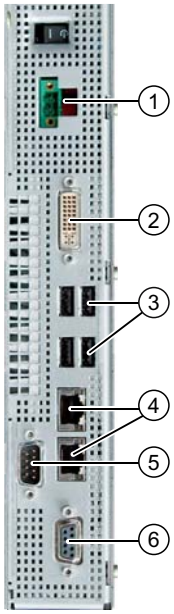


Rear view 15" device



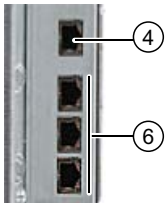
3.1.3 Connection elements and operator controls

Connection components of computer unit



①	24 VDC	Power supply connection
②	DVI	DVI-I socket
③	USB	4 USB 2.0 / 500 mA connections
④	ETHERNET	2 RJ45 Ethernet connections for 10/100/1000 Mbps
⑤	COM 1	Serial port 1 (RS232) 9-pin Cannon socket
⑥	PROFIBUS DP/MPI	PROFIBUS-DP/MPI interface (RS 485, electrically isolated), 9-pin Cannon socket

Figure 3-1 Variants with PROFIBUS



④	ETHERNET	1 RJ45 Ethernet connection for 10/100/1000 Mbps
⑥	PROFINET	CP 1616 onboard interface, three RJ45 sockets

Figure 3-2 Variants with PROFINET

Connection components of the control unit



① 1 USB 2.0 connection, high current / 500 mA below sealed cover

NOTICE
Ensuring degree of protection P65 (front) When the sealed cover over the USB port is removed in order to connect a USB component, the degree of protection for the front of the device is no longer guaranteed.

Note

Use of USB devices

- Wait at least ten seconds between removal and reconnection of USB devices. This also applies to control units with touch screen panels, especially for touch operation.
- When using standard USB peripherals, bear in mind that their EMC immunity level is frequently designed for office applications only. These devices may be used for commissioning and servicing. However, only industry-standard devices are allowed for industrial operation.
- Peripherals are developed and marketed by individual vendors. The respective manufacturers offer support for the peripherals. Moreover, the terms of liability of the individual vendors or suppliers apply here.

3.2 SIMATIC HMI IPC477C PRO

Features

The SIMATIC HMI IPC477C PRO provides high-level industrial performance.

- Compact design
- Maintenance-free operation
- Extremely rugged

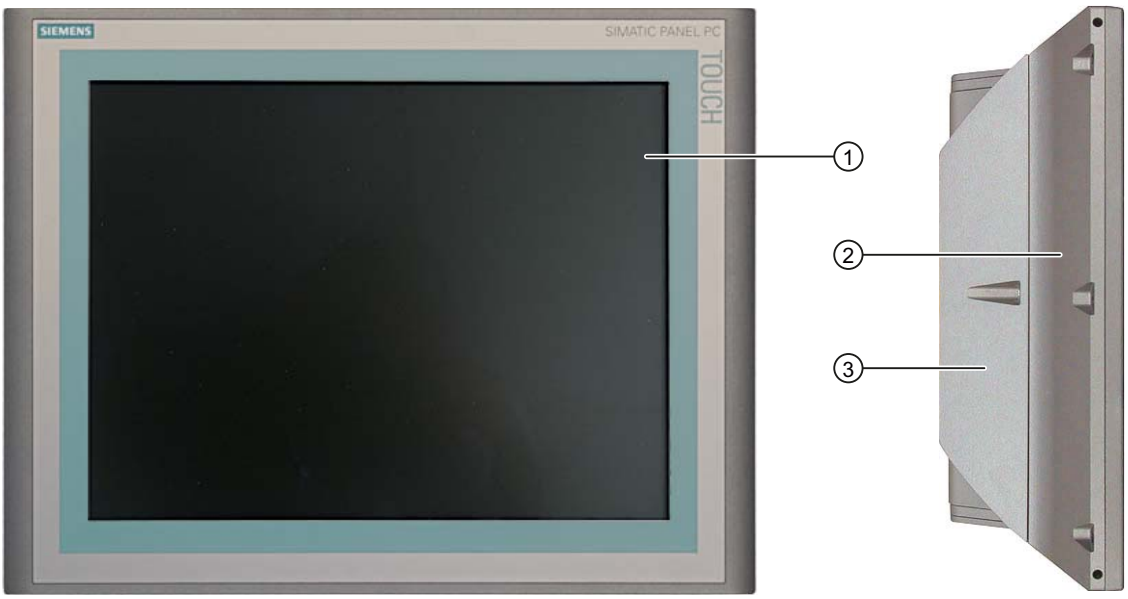
The SIMATIC HMI IPC477C PRO is available as touch panel front with 15" and 19" displays.

Touch panel variants

- Color display with backlighting
  - 15" TFT technology; 1024 x 768 resolution
  - 19" TFT technology; 1024 x 1280 resolution

3.2.1 Design of the IPC477C PRO

Front view and side view



① Display with touch screen
② Enclosure
③ Rear wall of enclosure

Bottom view



① Lower cover

Rear view



① Rear wall of enclosure
② Cover

Note

The cover is only mounted if the basic adapter for attaching the support arm is not mounted.

Mount the cover on the side other than the one intended for the support arm attachment.

The side not intended for the support arm attachment must be closed with the supplied cover.

Difference between 19" and 15" devices



① Lower cover

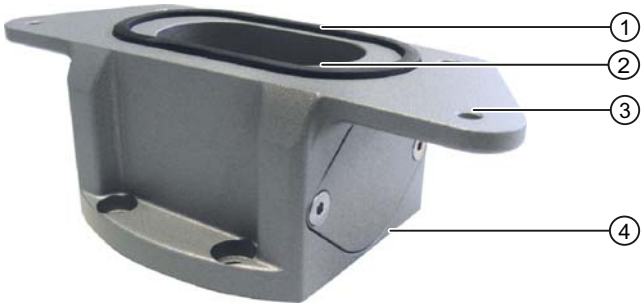
The ventilation channels (marked in red) differ on the 19" and 15" devices.

Note

Do not cover the ventilation ducts

Do not cover the ventilation ducts, otherwise the device will overheat.

3.2.2 Structure of the basic adapter



① Seal
② Cable channel
③ Mechanical interface to IPC477C PRO
④ Mechanical interface to the adapter from the adapter set

The basic adapter is included in the product package of the IPC477C PRO. An adapter set forms part of the basic adapter and can be ordered as an accessory. The basic adapter and adapter set are required in order to fit the IPC477C PRO to a support arm or on a stand.

3.3 Accessories

These accessories are not included in the product package.

Accessories	Order no.
2 GB Compact Flash card	6ES7648 - 2BF02 - 0XF0
4 GB Compact Flash card	6ES7648 - 2BF02 - 0XG0
8 GB Compact Flash card	6ES7648 - 2BF02 - 0XH0
1 GB DDR3 memory module	6ES7648 - 2AH40 - 0AH0
2 GB DDR3 memory module	6ES7648 - 2AH50 - 0AH0
4 GB DDR3 memory module	6ES7648 - 2AH60 - 0AH0
Touch pen	6AV7672 - 1JB00 - 0AA0

Note

Replace Compact Flash cards only with cards of the same product versions

Only SIMATIC PC Compact Flash cards with product version number 02 (ES 02 or higher) can be used for this device.



3.4 Windows Embedded Standard 2009

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

Function	Version HDD / SSD	CompactFlash card version
Enhanced Write Filter (EWF)	In RAM RAM(REG)	In RAM RAM(REG)
SIMATIC IPC DiagBase	Available V1.2	Available V1.2
Pagefile	Deactivated in favor of the EWF	Deactivated in favor of the EWF
System Restore Core	Deactivated in favor of the EWF	Deactivated in favor of the EWF
File based Writefilter (FBWF)	Available	Available
Registryfilter	Available	Available
Device Update Agent (DUA)	Available	Available
HORM	Available	Available

Function	Version HDD / SSD	CompactFlash card version
Telnet Server	Available	Available
Windows Backup	Available	Available
User Mode Driver Framework (UMDF)	Available	Available
MUI	GER/FRA/ITA/SPA Default language: English	GER default language: English
Administrator Account	Available	Available
User Account	Available	Available
Explorer Shell	Available	Available
Internet Explorer (IE)	Available, IE7	Available, IE7
Internet Information Server (IIS)	Available V5.1	Available V5.1
Terminal Services	Available	Available
Bluetooth	Available	Available
Wireless Network Support	Available	Available
Windows Firewall	Available	Available
Windows Security Center	Available	Available
MSN Explorer	Available	Not available
Outlook Express	Available	Available
Administrative Tools	Available	Available
SMS Advanced Client	Available	Not available
Remote Desktop	Available V6.0	Available V6.0
Remote Assistance	Available	Available
.NET Framework	Available, V3.5	Not available
ASP.NET	Available, V3.5	Not available
Windows .NET Messenger	Available V4.7	Available V4.7
Code pages/User Location/Keyboard	Available	Selection available
Disk Management Services	Available	Available
Windows Installer Service	Available V3.1	Available V3.1
Class Installer	Available	Available
CoDevice Installer	Available	Available
Windows Movie Maker	Available V 2.1	Not available
Media Player	Available, V11.0	Available, V11.0
Windows Media Player Tour	Available	Not available
DirectX	V9.0c	V9.0c
Accessories	Available	Available
Help files for all components	Available	Not available
Games	Available	Not available
Fonts	316	118
Windows XP Tour	Available	Not available
Microsoft Silverlight	Available V 1.0	Available V 1.0
NetMeeting	Available V 3.1	Available V 3.1

Note

Activation of "HORM" and creation of a "Hiber File"

When "HORM" is activated, the "Hibernate" function can be used for Windows Embedded Standard 2009:

- EWFMGR C: /activatehorm

"Hibernate" is activated following a restart. The system then always boots from this file.

3.5 Windows Embedded Standard 7

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

Function	Version HDD / SSD	Compact Flash card version
.Net Framework	Available, V3.5	Available, V3.5
Accessories	Available	Available
Aero background	Available	Available
Backup and Restore	Available	Available
Bluetooth	Available	Available
Dialog box filter	Available	Available
DirectX and Windows Device Experience	Available, V11	Available, V11
Domain services	Available	Available
Driver database	Available	Not available
Driver frameworks	Available	Available
Encrypted File System (EFS)	Available	Available
Enhanced Write Filter	Available	Available
Fax and Scan	Available	Available
File Based Write Filter (FBWF)	Available	Available
Fonts	134	48
Help and Support Engine	Available	Available
Hibernate Once Resume Many (HORM-EEF)	Available	Available
Image Mastering API V2	Available	Available
IME Base Components	Available	Available
Internet Explorer	Available, IE 8	Available, IE 8
Internet Information Server (IIS)	Available,V7.0	Available, V7.0
Language (Standard)	English [1)]	English [1)]
Mobility Center	Available	Available
Network and Sharing Center	Available	Available
Network Diagnostics	Available	Available
Pagefile	Available	Available

Function	Version HDD / SSD	Compact Flash card version
Printing Utilities and Management	Available	Available
Registry Filter	Available	Available
Remote Assistance	Available	Available
Remote Client	Available	Available
Remote Desktop	Available	Available
SIMATIC IPC DiagBase	Available, V1.4	Available, V1.4
Speech	Available	Not available
System Management Administrative Tools	Available	Available
Telnet Server	Available	Available
User Account Control	Available	Available
Windows Explorer Shell	Available	Available
Windows Firewall	Available	Available
Windows Installer	Available	Available
Windows Media Player	Available, V12	Available, V12
Windows PowerShell 2.0	Available	Available
Windows Search and Natural Language 6	Available	Available
Windows Security Center	Available	Available
Windows Update	Available	Available
Wireless Networking	Available	Available

1) Note the licensing agreements for Windows Embedded Standard 7.

Additional information on language selection is available in section Language selection in Windows Embedded Standard 7 (Page 64).

Application planning

4

4.1 Unpacking and checking the delivery

Procedure

1. Please check the packaging material for transport damage upon delivery.
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
Lie the front side on a soft surface to avoid damaging the front panel USB port.

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

NOTICE
The packaging protects the device during transport and storage. Therefore, never dispose of the original packaging material!

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 scope of delivery list.
7. Should the contents of the package be incomplete or damaged, please inform the responsible supply service immediately and fax us the enclosed form "SIMATIC IPC/PG quality control report".

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

8. Note the identification information as described in the section Device identification data (Page 32).

4.2 Device identification data

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

Enter the following data in the table below:

- Serial number: The serial number (S VP...) is found on the rating plate.

Rating plate SIMATIC HMI IPC477C

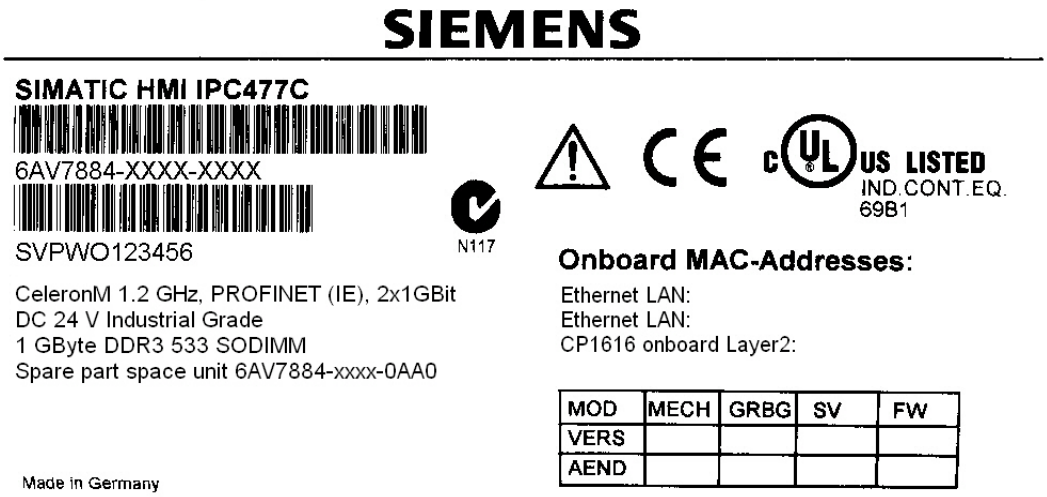
Note

Replacement device SIMATIC HMI IPC477C: Product can only be supplied without storage media

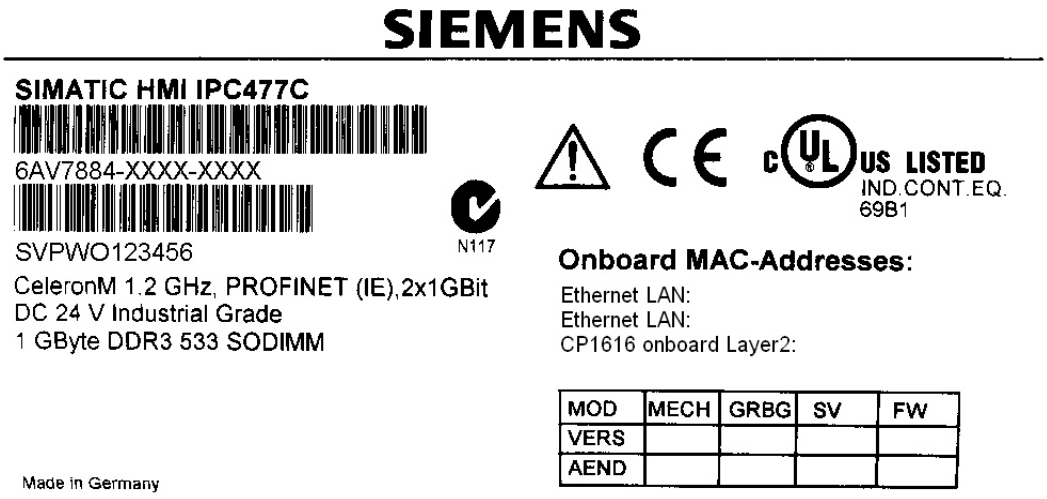
The order number of a replacement device that can be briefly loaned out from the warehouse is listed on the rating place. The replacement device is always supplied without storage media.

- If you order a replacement device with the order number ending -0AA0, remove all storage media (SSD, CompactFlash card, etc.) from your device and insert them into the replacement device.

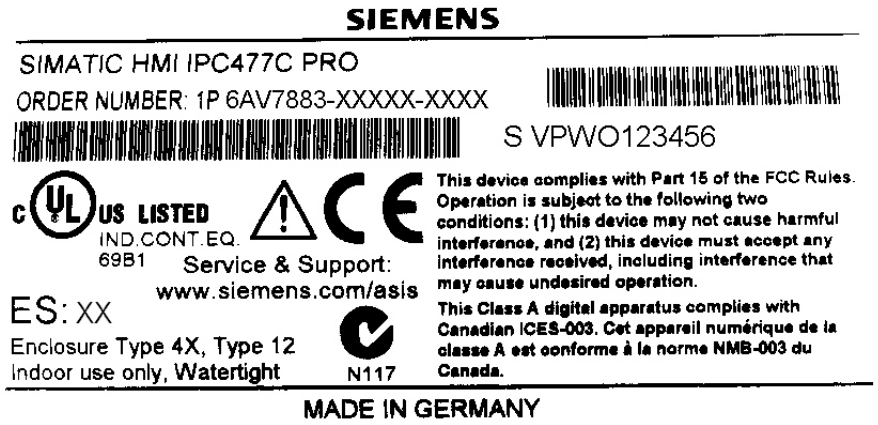
Rating plate SIMATIC 477C with replacement device



Rating plate SIMATIC 477C



Rating plate SIMATIC HMI IPC477C PRO



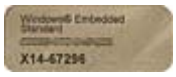
- Order number of the device
- Ethernet addresses:
  - The Ethernet addresses of the device can be viewed in the BIOS Setup (F2) under "Main > Hardware Options > Onboard Ethernet Address".
  - The Ethernet address is also printed on the combination rating / component plate.

COA label

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

The COA is only attached to the rear panel of devices with preinstalled Windows Embedded Standard 2009, Windows Embedded Standard 7, Windows 7, or XP Professional.

The Windows Embedded Standard operating system is installed on the device shown here with the COA label.



The Windows XP Pro operating system is installed on the device shown here with the COA label.



Serial number:	S VP ...
Order No.	6AV7 884-... (SIMATIC HMI IPC477C) 6AV7 883-... (SIMATIC HMI IPC477 PRO)
Microsoft Windows Product Key	
Ethernet address 1	
Ethernet address 2 (not for PROFINET versions)	
CP 1616 onboard MAC address layer 2	
CP 1616 onboard Mac address PROFINET	

4.3 Affixing Labeling Strips for Function Keys and Softkeys

Note

The following table applies only to devices with a key panel.

The control unit has two horizontal and two vertical keypads for the function keys and the softkeys. Assign user specific functions to the keys as needed. You can mark these keys with labeling strips. A4 films for creating the labeling strips are available as accessories.

Proceed as follows to affix the labeling strips:

Preparing the labeling strips

1. Label the DIN A4 film with a laser printer, for example using the printing templates provided on the Documentation and Drivers CD.

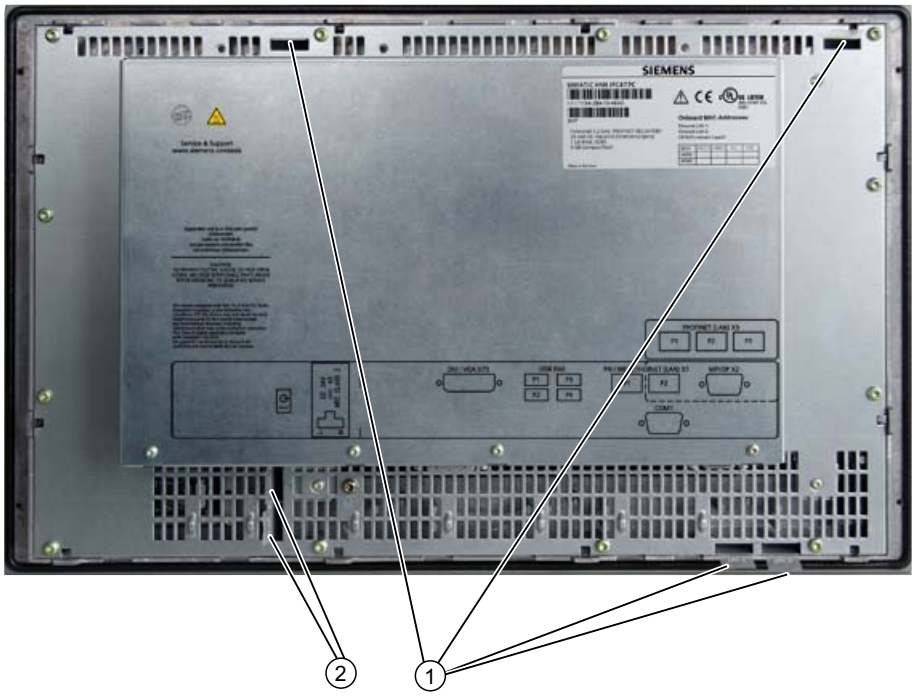
2. Cut the labeling strips along the pre-printed lines.

Note

Do not insert handwritten labeling strips until the ink has dried.

Affixing the labeling strips

Insert the labeling strips into the slots provided on the rear of the control unit.



① Insert strips, vertical key rows
② Insert strips, horizontal key rows

Figure 4-1 12" touch screen device: Device rear with labeling strips



① Insert strips, vertical key rows
② Insert strips, horizontal key rows

Figure 4-2 15" touch screen device: Device rear with labeling strips

4.4 Ambient and Environmental Conditions

When you plan your project, you should make allowances for:

IPC 477C

- The climatic and mechanical environmental conditions specified in the specifications given in your operating instructions.
- The device is approved for operation in closed rooms only.
- Avoid extreme ambient conditions. Protect the device against dust, moisture and heat.
- Do not place the device in direct sunlight.
- Always maintain a minimum clearance of 100 mm to components installed above or underneath the device, or to the walls of an enclosure.
- Do not cover the ventilation slots of the device.
- Always observe the mounting positions permitted for this device.
- The connected or built-in peripherals should not introduce a negative sequence voltage in excess of 0.5 V into the device.

IPC 477C PRO

- The climatic and mechanical environmental conditions specified in the specifications given in your operating instructions.
- The device is approved for operation in closed rooms only.
- Avoid extreme ambient conditions.
- Do not place the device in direct sunlight.
- Do not cover the ventilation slots of the device.
- Always observe the mounting positions permitted for this device.
- The connected or built-in peripherals should not introduce a negative sequence voltage in excess of 0.5 V into the device.

Installing/Mounting 5

5.1 Installing SIMATIC HMI IPC477C

5.1.1 Installation guidelines

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

⚠ WARNING
Danger, high voltage Isolate the power supply to the switchgear cabinet before opening it. Ensure that the power to the switchgear cabinet cannot be turned on accidentally.

CAUTION
The device is approved for operation in closed rooms only.

NOTICE
Adhere to the SIMATIC assembly guidelines and the relevant DIN/VDE requirements or the country-specific regulations when mounting in switching cabinets.

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

- Provide adequate volume in the switchgear cabinet for air circulation and heat transport. Keep at least 10 cm distance between the device and switchgear cabinet.
- Ensure that the maximum air intake temperature, measured 10 cm before the air intake opening, does not exceed 45° C. The maximum air intake temperature must be accounted for especially when sizing closed switchgear cabinets.
- The minimum distance between the device and the housing is 10 cm on the air output end.
- Ensure there is enough free space in the switchgear cabinet to allow the cover to be removed. You will otherwise have to remove the device from the switchgear cabinet or swivel arm when replacing memory or the battery.
- Equip the switchgear cabinet with struts for stabilizing the mounting cut-out. Install struts where necessary.
- Avoid extreme ambient conditions. Protect your device against dust, moisture and heat.

- Install the device in such a way that it poses no danger, e.g. by falling over.
- During assembly, please comply with the approved installation positions.

NOTICE

If you mount the device in an impermissible installation position or you do not observe the environmental conditions (see section Technical specifications (Page 143)), you endanger the product safety provided by the UL-approval and compliance with the low-voltage directive (via EN 60950-1). In additional, the functionality of the device is no longer guaranteed.

⚠ WARNING

Function test while installing the device in machines or execute systems

Following the results of a risk analysis, additional protection equipment on the machine or the system is necessary to avoid endangering persons. Here, the programming, configuration and wiring of the I/O used in particular must be performed in accordance with the safety performance (SIL, PL or Cat.) identified by the necessary risk analysis. The intended use of the device has to be ensured.

The proper use of the device has to be verified with a function test on the system. This test can detect programming, parameter assignment and wiring errors. The test results have to be documented and if necessary inserted into the relevant inputs.

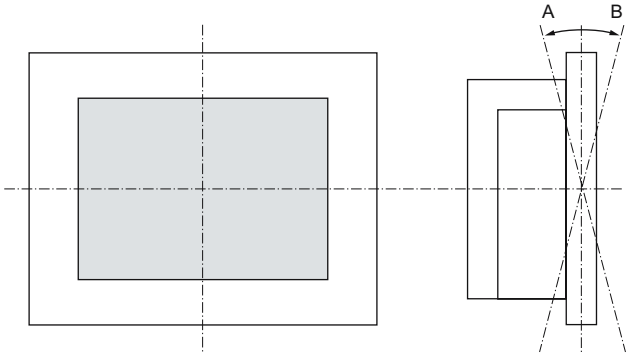
- Position the screen in an ergonomic position favorable to the user. Choose a suitable mounting height.
- Position the screen so that it is not subject to direct sunlight or other strong sources of light.

For additional information, see Dimension drawings (Page 157).

5.1.2 Permitted mounting positions

Mounting positions

Only vertical mounting at angles up to +45° and -45° are permitted for the device.



Temperature at the device		Angle A	Angle B
Rear	Front		
0° - 50° C[1)]	Max. 40°C	+45°	-45°
0° to 45°C	0° to 45°C	+45°	-45°

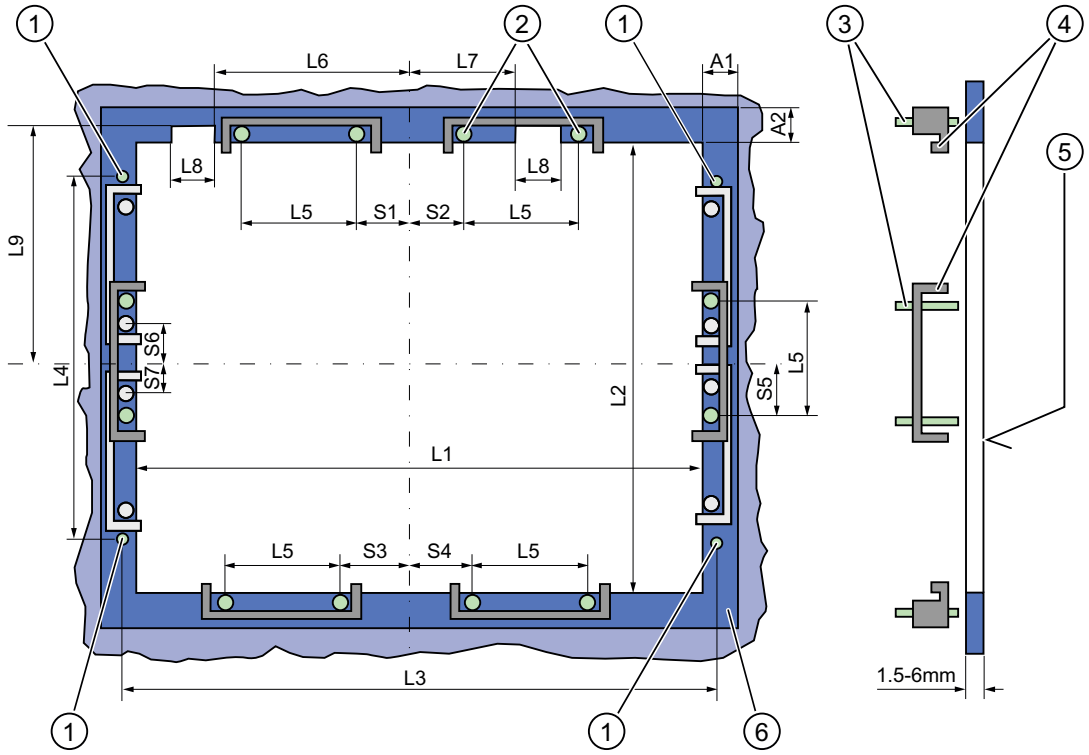
[1)] For RAL mounting only (RAL = Restricted Access Location)
(installation of device in operating facilities with restricted access - for example, a locked control cabinet)

Mechanical environmental conditions

- Vibration
  - Operation, tested in accordance with DIN IEC 60068-2-6
    10 to 58 Hz: 0.075 mm 58 to 200 Hz: 9.8 m/s²
  - Storage/transport, tested according to IEC 60068-2-27, IEC 60068-2-29
    50 m/s², 30 ms
    250 m/s², 6 ms

5.1.3 Preparing the mounting cut-out

The following illustration shows the dimensions for the mounting cut-out.



(1) Drill hole for screw attachment
(2) Pressure points for clamp
(3) Setscrews
(4) Clamp
(5) R_Z 120 in the seal area
(6) Seal area

Figure 5-1 Drill holes for the screws and pressure points for the clamp screws

Note

Mounting dimensions can be read from the dimension overview or they can be transferred to the cabinet from the mounting template supplied.

Table 5- 1 Dimensions for the mounting cut-out in mm

Control unit	L1	L2	L3 [1]	L4 [1]	L5	L6 [2]	L7 [2]	L8 [2]	L9 [2]	A1	A2	S1	S2 S3 S4	S5 [3]	S6 [3] S7 [3]
Tolerance	**±1**	**+1**	**±0,2**	**±0,2**	**±0,5**	**±0,5**	**±0,5**	**±0,5**	**+1**	**±1**	**±1**	**±1**	**±1**	**±1**	**±1**
Key panel															
12" TFT	450	290	465	235	112	—	—	—	—	16	10	78	78	56	—
15" TFT	450	321	465	279	112	186	135	25	165	16	17	51	51	56	—
Touch panel															
12" TFT	368	290	—	—	112	—	—	—	—	16	10	19	35	56	—
15" TFT	450	290	465	235	112	—	—	—	—	16	10	81	81	56	—
19" TFT	450	380	465	235	112	—	—	—	—	16	10	46	46	—	46

[1] M6 thread or drill holes with a diameter of 7 mm

[2] Cut-outs for the shafts of the insert strips are only necessary for 15" key panels.

[3] Two clamps necessary for vertically securing clamps only for 19" touch panel fronts.

Preparing the mounting cut-out

Steps for preparing the mounting cut-out	
1.	Select a location suitable for mounting, taking into account the mounting position.
2.	On the basis of the dimensions, check whether the required screw and pressure points on the rear and the seal area are easily accessible after the completion of the mounting cut-out. Otherwise the mounting cut-out is useless.
3.	Complete the mounting cut-out in accordance with the dimensions.

5.1.4 Fastening and installation types

Mounting methods

You can install the device by three methods:

- In a 19" rack
- On a swivel arm
- In a switchgear cabinet

Type of fixation

You can fasten the device by two methods:

- With clamps Clamp and grub screws are included in the contents of delivery.
- With screws

Note

You cannot use screws to secure the device variant with the 12" touch screen variant.

5.1.5 Securing the Device with Clamps

You require 6 clamps in order to mount the device. These are supplied with the device.

Required tool for fasting the clamps: Allen wrench 2.5 mm



Figure 5-2 Clamp assembly

Rack mounting

Steps for fastening the device with clamps	
1.	Follow the installation instructions.
2.	Disconnect the device from the power supply.
3.	Working from the front, insert the device into the 19" rack.
4.	Fasten the control unit in the rack from the rear using the clamps. Tighten the setscrews to a torque of 0.4-0.5 Nm.

Swivel arm mounting

Steps for fastening the device with clamps	
1.	Follow the installation instructions.
2.	Disconnect the device from the power supply.
3.	Working from the front, place the device onto the swivel arm.
4.	Fasten the control unit on the swivel arm from the rear using the clamps. Tighten the setscrews to a torque of 0.4-0.5 Nm.

Control cabinet installation

Steps for fastening the device with clamps	
1.	Follow the installation instructions.
2.	Disconnect the device from the power supply.
3.	Working from the front, insert the device into the mounting cut-out.
4.	Secure the control unit in the mounting cut-out from behind with the clamps, as shown in the mounting cut-out in the dimensions. Tighten the setscrews to a torque of 0.4-0.5 Nm.

IP65 degree of protection

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

NOTICE

Control cabinet installation: Material strength at the mounting cut-out

Please ensure that the material strength at the mounting cut-out is a maximum of 6 mm. Read the information for the dimensions in the Preparing the mounting cut-out (Page 42) section.

The degree of protection can only be guaranteed when the following requirements are met:
1. The material strength at the mounting cut-out must be at least 2 mm.
2. The deviation from the plane of the mounting cut-out in relation to the external dimensions for an installed HMI device is ≤ 0.5 mm.

5.1.6 Securing the Device with Screws

IP54 degree of protection

This degree of protection is ensured for screw mounting.

NOTICE

Control cabinet installation: Material strength at the mounting cut-out

Please ensure that the material strength at the mounting cut-out is a maximum of 6 mm. Read the information for the dimensions in the Preparing the mounting cut-out (Page 42) section.

The degree of protection can only be guaranteed when the following requirements are met:
1. The material strength at the mounting cut-out must be at least 2 mm.
2. The deviation from the plane of the mounting cut-out in relation to the external dimensions for an installed HMI device is ≤ 0.5 mm.

Note

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

Required tool for fasting with screws: 7 mm drill

NOTICE
Only use the catalog-listed mounting material (order number 6AV7672-8KE00-0AA0) for 19" devices for screw mounting.

NOTICE
Risk of damage Ensure that no metal cuttings enter the device when the holes are drilled. Cover the device with film or when drilling, use removal by suction.

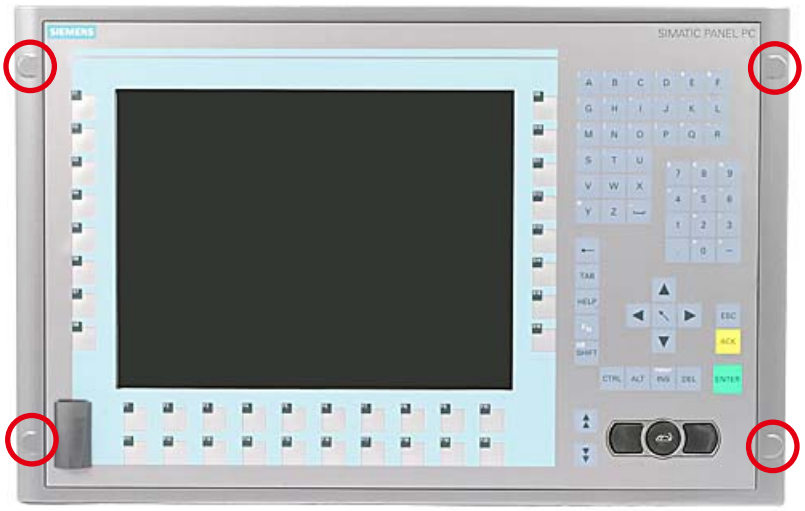


Figure 5-3 Designated location for holes on the control unit

Rack mounting

Steps for fastening the device with screws	
1.	Follow the installation instructions.
2.	Carefully drill the respective holes in the control unit at the designed location from the rear.
3.	Working from the front, insert the device into the 19" rack.
4.	Secure the control unit by inserting suitable screws through the holes and attaching nuts.

Swivel arm mounting

Steps for fastening the device with screws	
1.	Follow the installation instructions.
2.	Carefully drill the respective holes in the control unit at the designed location from the rear.
3.	Working from the front, place the device onto the swivel arm.
4.	Secure the control unit by inserting suitable screws through the holes and attaching nuts.

Control cabinet installation

Steps for fastening the device with screws	
1.	Follow the installation instructions.
2.	Drill suitable holes at the prepared installation cut-out in accordance with the specifications for L4 and L5, as shown at the dimensions in the mounting cut-out
3.	Carefully drill the respective holes in the control unit at the designed location from the rear.
4.	Working from the front, insert the device into the mounting cut-out.
5.	Secure the control unit by inserting suitable screws through the holes and attaching nuts.

5.1.7 IPC477C for shipbuilding

Assembly for shipbuilding

The IPC477C Panel PC can also be used in maritime and offshore applications. The conditions for installing/integration are the same as those for industrial application.

The following ambient conditions are permitted:

- ENV1 and ENV2

  In accordance with "Lloyd's Register's Type Approval System, Test Specification Number 1 - 2002".

Note

A B84113C type filter must be installed line-side.

If the IPC477C Panel PC is used in shipbuilding, a B84113C type filter must be installed line-side (manufactured by the EPCOS company).

Acceptance for maritime and offshore applications:

- ABS - American Bureau of Shipping (USA)
- BV - Bureau Vertias (France)
- DNV - Det Norske Veritas (Norway)
- GL - Germanische Lloyd
- LR - Lloyds Register of Shipping
- NKK - Nippon Kaiji Kyokai (Japan)

5.2 Integrating SIMATIC HMI IPC477C PRO

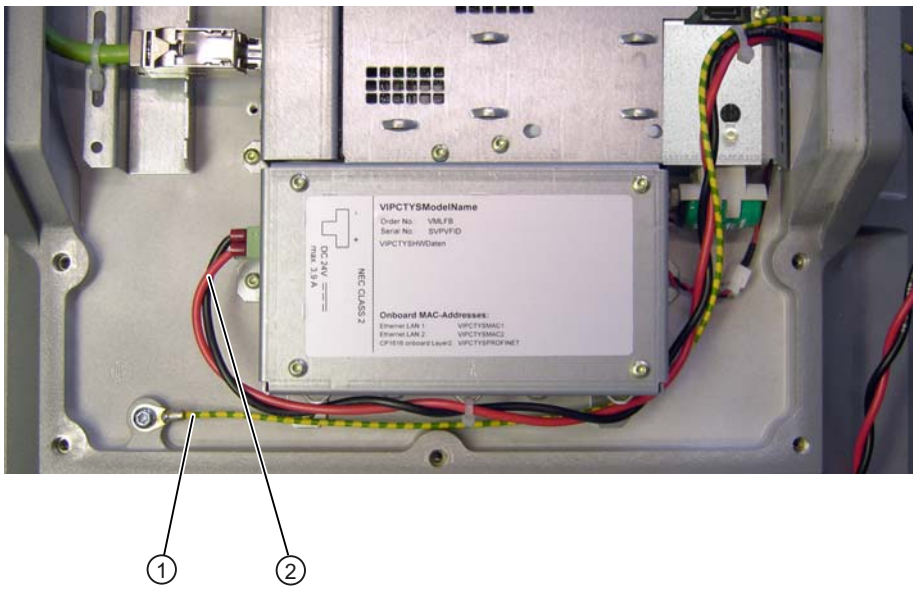
Requirement

All packaging components and protective foils should be removed from the HMI device.

To install the HMI device, you need the basic adapter and an adapter set from the accessories.

The following cables are fed through the stand or the support arm to which the HMI device will be fixed:

- Protective conductor
- Power supply cable
- Data cables, such as PROFINET, USB



① Protective conductor
② Power supply cable

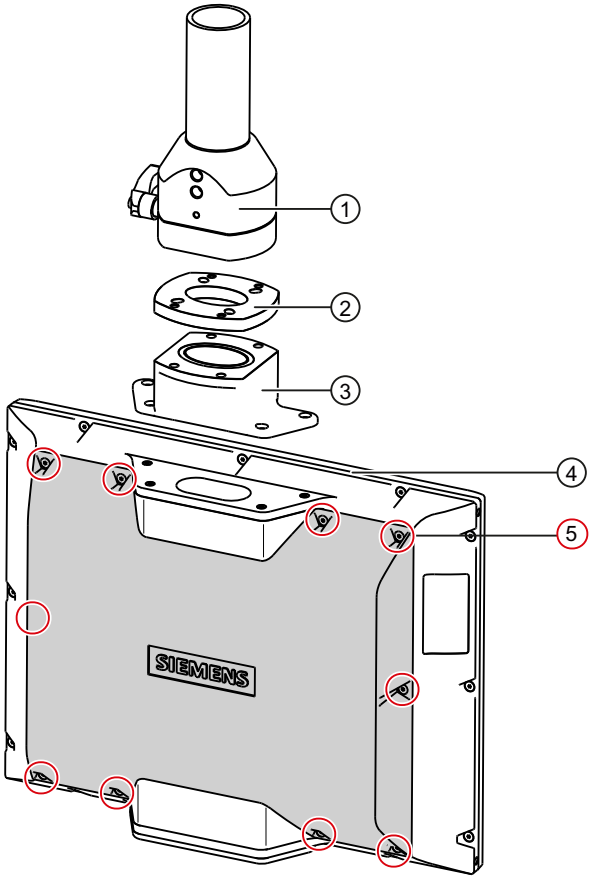
NOTICE
Warranty endangered If you install the HMI device not in accordance with the specifications given in these operating instructions, the warranty for the HMI device will become void. Always install the HMI device according to these operating instructions. **IP65 degree of protection at risk** If there are no seals on the adapters or these are damaged, then IP65 degree of protection is at risk. Check the condition and seating of the seals. If the seal on the rear panel of the housing is damaged, it can be repaired.

Note

The warranty for the IP65 degree of protection assumes that the support arm or the stand also complies with IP65.

Procedure

This section describes how to install the device on a support arm system. Installation on a stand is carried out from below in the same way.



1. Remove the 10 screws ⑤ from the rear panel.
2. Remove the rear panel and place it down safely.
3. Fasten the supporting arm head ① to the adaptor plate ② using the four M4 x 12 screws from the accessory kit of the adapter set. Ensure that the seal is properly seated.
4. Fasten the base adapter ③ to the adaptor plate ② using the four M4 x 12 screws from the accessory kit of the adapter set. Ensure that the seal is properly seated.
5. Fix the device to the basic adapter with four countersunk head screws, ensuring that all connections are fed (without damage) through the adapter into the inside of the panel.

Note

The cables can only be connected when the rear wall of the housing is opened

Note that the cable can only be connected with the rear wall of the housing open.

6. Mount the rear panel using the screws ⑤.

Result

The panel is mounted and electrically connected.

Torques for the device

NOTICE
Do not exceed the permitted torque values Excess tightening torque on the rear panel screws, or on the screws used to mount the device onto a support arm or stand, can lead to damage to the mating threads in the housing, base adapter, or support arm head. Observe the maximum torque values.

Maximum permissible torque values

5.7 Nm for the following connection:

- Adapter plate ② to support arm head ①

1.5 Nm for the following connections:

- Base adapter ③ to adapter plate ②
- Base adapter ③ to device
- Rear panel ⑤ to device

Connecting

6

6.1 Connecting the 24 VDC power supply

To be noted before you connect the device

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

⚠ WARNING

The generation of the 24 VDC supply voltage by the line-side power supply must be made as functional extra-low voltage with safe electrical isolation according to IEC 60364--4--41 or as SELV in conformity to IEC/UL/EN/DIN-EN 60950-1 and LPS / NEC Class 2.

The PE conductor on the device needs to be connected to the PE conductor which is integrated in the cabinet.

NOTICE

The 24 VDC power source must be adapted to the input data of the device (see the technical specifications in the operating instructions).

NOTICE

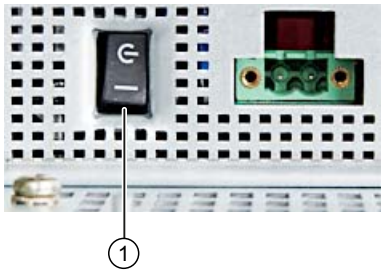
Permissible conductor cross-section for the 24 VDC connecting cable: 0.75 mm^2 to 2.5 mm^2.

NOTICE

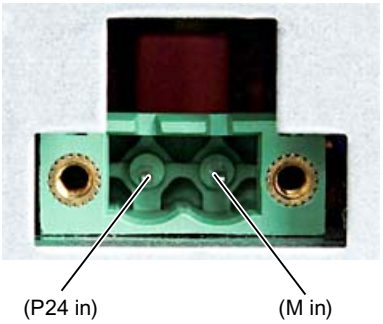
If a Compact Flash card is used in the device, make sure that the card is seated correctly before you connect it.

On-off switch

⚠ CAUTION
Power is on The On/Off switch does not isolate the device from the power supply. Always disconnect the power cord to isolate the device from the power supply.

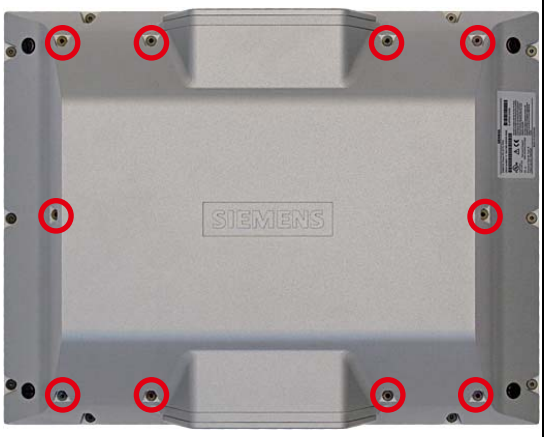
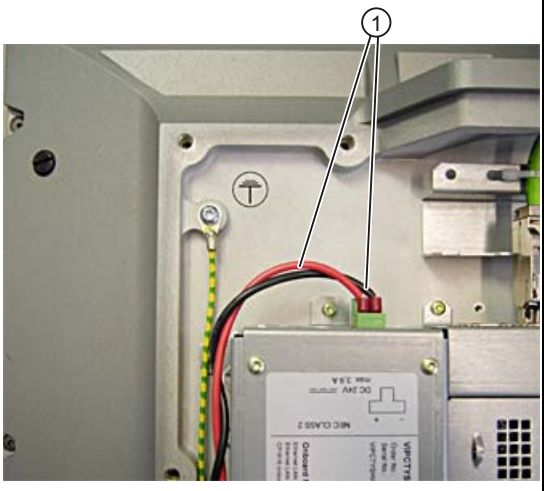
Position of the on/off switch	
The on/off switch ① turns off the output voltages of the power supply without isolating the unit from mains. Delivery condition: Power switch turned off.	

Connecting the IPC477C

Steps for connecting the IPC477C to the 24 V DC power supply		
1.	Switch off the 24 VDC power supply.	
2.	Connect the power supply using the connector (included in the scope of delivery).	
3.	Connect the PE conductor as described in section connecting the PE conductor (Page 53).	

The power consumption at 24 V amounts to 60 W maximum.

Connecting the IPC477C PRO

Steps for connecting the IPC477C PRO to the 24 V DC power supply		
1.	Remove the ten screws from the rear panel of the housing.	
2.	Lift up the rear panel slightly and then remove it.	
3.	Connect the power supply ① using the connector (included in the scope of delivery).	
4.	Connect the PE conductor as described in section connecting the PE conductor (Page 53).	

The power consumption at 24 V amounts to 60 W maximum.

See also

Technical specifications (Page 143)

6.2 connecting the PE conductor

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

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

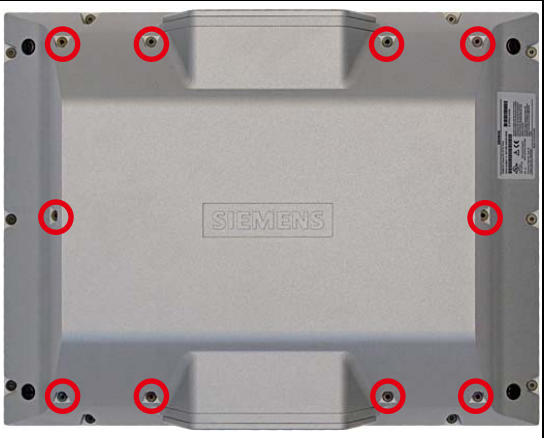
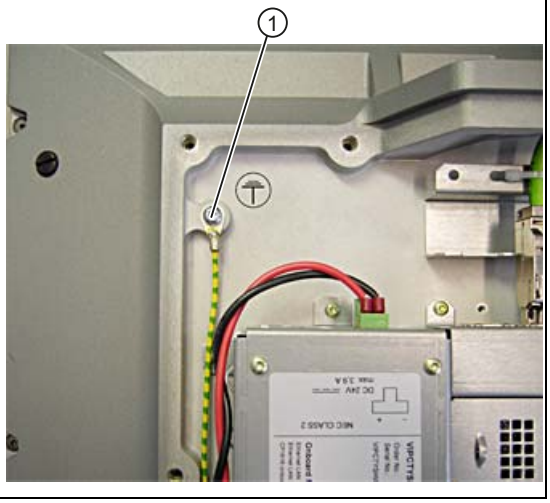
Procedure: PE conductor connection for IPC477C

Required tool: TORX T20 screwdriver.

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

Procedure: PE conductor connection for IPC477C PRO

Required tool: TORX T20 screwdriver.

Steps for connecting the PE conductor		
1.	Remove the ten screws from the rear panel of the housing.	
2.	Lift up the rear panel slightly and then remove it.	
3.	Connect the PE terminal (M4 thread) ① on the device to the PE conductor on the cabinet or system in which the PC will be installed. The minimum conductor cross-section may not be less than 5 mm².	

6.3 Connecting peripheral equipment

NOTICE
Ensure suitability for industrial applications Connect only peripheral devices approved for industrial applications according to EN 61000-6-2.

Note

Peripheral devices capable of hot-plugging (USB)

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

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

CAUTION
Strictly adhere to the specifications for peripheral equipment.

Note

Strain relief

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

Integration into an Automation System 7

7.1 Overview

Introduction

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

Ethernet

The integrated Ethernet interface can be used for communication and for data exchange with automation devices such as SIMATIC S7.

You require suitable software for this: STEP 7, WinCC, WinCC flexible, WinAC, SIMATIC NET.

PROFIBUS/MPI

The isolated PROFIBUS interface can be used to connect distributed field devices or to link with SIMATIC S7.

You require suitable software for this: STEP 7, WinCC, WinCC flexible, WinAC, SIMATIC NET.

PROFINET

PROFINET can be operated via:

- CP1616 IRT (Isochronous Real Time)
- Standard Ethernet interfaces (RT)

The CP 1616 onboard enables Panel PCs to be connected to Industrial Ethernet. Only one CP 1616 can be installed in a PC. You can find detailed information in the next section or in the section CP 1616 onboard communications processor (Page 195).

Device driver CP16xx.sys

The device driver enables the Windows network protocols to be connected to the Ethernet PROFINET controller "CP 1616 onboard" which is optional on the SIMATIC PCs. The PROFINET interface will act like a 100 Mbit Ethernet interface with a MAC address when you use this driver. The three RJ45 sockets are connected with each other via a switch.

The drivers and documentation can be found in the user manual on the supplied Documentation and Drivers CD/DVD.

PROFINET IO application

You can create, run or configure PROFINET IO applications with the "Development Kit DK-16xx PN IO". It must be installed in addition to the device driver CP 16xx.sys. You can download this kit and the documentation free of charge at DK-16xx PN IO development kit (http://www.automation.siemens.com/net/html_00/produkte/040_cp_1616_devlopkit.htm)

SIMATIC NET

You can create, run and configure the SIMATIC installation with this software package. Information on this can be found on the SIMATIC NET Manual Collection CD. The software package and the documentation are not included in the product package.

Additional information

You can find additional information in the catalog and in the Internet at Industrial Automation and Drive Technologies (http://mall.automation.siemens.com).

7.2 MPI/PROFIBUS-DP network

You can connect the device to a SIMATIC S7 automation system or a PROFIBUS DP network via the MPI/DP interface. You can connect up to 32 PC, PG, or AS devices to one network segment. The use of repeaters allows you to interconnect several MPI/PROFIBUS DP network segments. The complete MPI/PROFIBUS DP network consists of a maximum of 127 stations.

The device is physically connected to the MPI/PROFIBUS DP network via an electrically isolated RS485 interface on the PC motherboard. The potential is isolated within the safety low voltage circuit (SELV).

The transmission rate is limited to 187.5 Kbps with the 5-meter MPI cable for connecting to the SIMATIC S7-CPU. To achieve baud rates over 1.5 Mbps, you require a 12 Mbps PROFIBUS cable with the order number 6ES7901-4BD00-0XA0. In the PROFIBUS DP MPI network, you can achieve data transmission rates of 9.6 Kbps to 12 Mbps.

7.3 Connecting an S7 automation system

Coupling

The device is coupled via the MPI/DP interface as follows:

- With MPI networks S7-200, S7-300, and S7-400
- PROFIBUS DP networks with DP components

Hardware requirements

You can use the following components for coupling or networking with PROFIBUS:

- RS 485 interface, MPI/DP interface, onboard
- PROFIBUS cable

Note

Refer to the SIMATIC Net catalog IK PI for more information about SIMATIC Net expansion cards.

Procedure

1. Disconnect the device from the mains.

CAUTION
Risk of damage to the device! Neutralize the static charge of your body, the device, and the connecting cables. You can do this by briefly touching the metal housing with the cable in your hand.

2. Insert the PROFIBUS cable in the MPI/DP socket.
3. Reconnect the device to the electrical power system.

7.4 Networking via Industrial Ethernet

You can establish a network between the device and other computers via Industrial Ethernet. The on-board LAN interface is a twisted-pair (TP) interface for data transfer rates of 10/100/1000 Mbps.

NOTICE
A catagory 6 Ethernet cable is required for 1000 Mbps operation.

7.5 PROFINET

CP 1616 onboard

The basic characteristics of the CP 1616 onboard are:

- Optimized for PROFINET IO
- With Ethernet-Real-Time-ASIC ERTEC 400
- Three RJ45 sockets for connecting terminal devices or addition network components

- Integrated 3-port real-time switch
- Automatic hardware detection

Additional documentation on PROFINET

Get an overview of the information available on the topic of PROFINET.

Document designation	What is contained in this document?
This documentation is **not** included in the product package:	
Getting Started PROFINET IO Getting Started: Manual Collection	The documents use concrete examples to provide step-by-step instructions on how to commission a fully functional application.
Manual PROFINET System Description	This gives you the basic knowledge about the PROFINET IO topics: Network components, data exchange and communication, PROFINET IO, Component Based Automation, application example of PROFINET IO and Component Based Automation.
Manual From PROFIBUS DP to PROFINET IO	Read this document if you want to convert an installed PROFIBUS system to a PROFINET system.
Readme file for CP 1616/CP 1604 and DK-16xx PN IO	This provides the latest information about the SIMATIC NET products CP 1616/CP 1604, CP 1616 onboard, the developer kit.
Configuration Manual Commissioning PC Stations	This provides you with all the information necessary for commissioning and configuring a PC as a PROFINET IO Controller or IO Device.
Manual SIMATIC NET Industrial Communication with PG/PC: Volume 1 - Basics SIMATIC NET Industrial Communication with PG/PC: Volume 2 - Interfaces	This manual introduces you to industrial communication and explains the available communication protocols. It also describes the OPC interface as an alternative to the IO-based user programming interface.
S7 CPs for Industrial Ethernet Configuring and Commissioning	This provides the following support: - For commissioning S7 stations - For establishing effective communication
Manual SIMATIC NET - Twisted Pair and Fiber-Optic Networks	Configure and build your Industrial Ethernet networks based on this document.
This documentation is part of the supplied Documentation and Drivers CD:	
Operating Instructions CP 1616/CP 1604/CP 1616 onboard	This provides you with all information required for operation.
Installation guide Device Driver CP16xx.sys	Read this guide if you want to install the NDIS device driver, CP16xx.sys.

Further information

You can find the information on specific products in the Internet at the address: Product-related Information SIMATIC NET (http://www.siemens.com/simatic-net)

Commissioning 8

8.1 Before commissioning

Check list

Before starting up the device for the first time, go through the following checklist:

- Have you taken into account the proper ambient and environmental conditions for the device, as described in the specifications?
- Have you connected the protective conductor?
- Have you checked that the power supply is connected correctly and that the values are appropriate?
- Read this information in the Connecting (Page 51) section of the operating instructions. Please follow all guidelines.

CAUTION
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. Wait 12 hours before switching the device on. Allow the device to slowly adjust to room temperature before commissioning the device. Do not subject the device to direct heat radiation from devices such as heaters.

NOTICE
Windows Embedded Standard 2009 and Windows Embedded Standard 7: Read the EWF and FBWF information Two configurable write filters (Enhanced Write Filter and File Based Write Filter) are provided with Windows Embedded Standard 2009 and Windows Embedded Standard 7. Please be aware of this when activating and using the EWF/FBWF information, otherwise you may experience data loss.

Delivery state

The following operating systems are available for SIMATIC HMI IPC477C and SIMATIC HMI IPC477C PRO:

- Windows Embedded Standard 2009 pre-installed on CompactFlash card or SSD
- Windows XP Professional (32-bit) pre-installed on SSD
- Windows Embedded Standard 7 pre-installed on CompactFlash card or SSD
- Windows 7 Ultimate (32-bit) pre-installed on SSD

8.2 Commissioning Windows Embedded Standard

8.2.1 Basic commissioning - initial startup

Requirement

- The device is connected to the 24 VDC power supply.
- The ground conductor is wired.
- The cables are correctly plugged in.

Setting up the operating system

Note

Initial commissioning of Windows Embedded Standard

System startup can take longer than usual for the initial commissioning. Only a blue screen is displayed for several minutes.

The devices with touch panel require a USB mouse or USB keyboard for commissioning.

During the **initial** startup of the computer, the operating system that is preinstalled on the Compact Flash card or Solid State Drive (SSD) is set up automatically.

Proceed as follows:

1. Switch the device on using the On/Off switch. The device now performs an power-on self test. During the self-test, this message appears:

   ```
   Press <F2> to enter SETUP or <ESC> to display the Boot menu
   ```

2. Wait until this message is cleared, then follow the instructions on the screen.

NOTICE
The device may not be switched off at any time during the installation process. **Do not** change the default BIOS settings, otherwise the operating system setup may become corrupted.

3. Restart
   After you have entered all the necessary information and the operating system is configured,
   you are prompted to restart the system. Acknowledge this prompt with **Yes**.

Note

System startup can take longer than usual for the initial commissioning. The screen display "FBResseal Resealing in progress..." is shown for several minutes.

Note

Errors and warnings can be displayed in the status bar, with the first and second switch on of the initial commissioning or after a restore procedure This will have no effect on the device functions.

As of now, the operating system automatically opens its user interface on completion of the startup sequence.

Note

To prevent data loss, it is advisable to create an image of your system partition after initial commissioning.

Switching off the device

When you work with Windows Embedded Standard, always shut down the PC with the command **Start > Shut Down**.

Note

The Enhanced Write Filter should be enabled following the installation of Windows Embedded Standard on a Compact Flash card or SSD.

8.2.2 Setting up the language selection in Windows Embedded Standard 2009

Windows Embedded Standard 2009 offers the option of selecting the menu and dialog languages. You can select the German and English languages.

Setting up the language selection

Windows Embedded Standard 2009 is set up by default with English menu and dialog language and US international keyboard layout. You can change the language in the Control Panel by selecting:

Start > Settings > Control Panel >Regional and Language Options > **Languages** tab, **Language used in menus and dialogs** field.

In addition to the menu and dialog language, select **Regional and Language Options** and set the default to **non-Unicode programs** in the **Advanced** section.

8.2.3 Language selection in Windows Embedded Standard 7

Changing languages is possible using the Restore CD/DVD (forms part of the scope of delivery). The CD/DVD contains the required language packages and help for changing the system language.

Note

Note the license terms of Windows Embedded Standard 7

Please note the license terms for Windows Embedded Standard 7 and especially the extended SIEMENS AG Software terms for Windows Embedded Standard 7.

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

Change system language

To change the language for Windows Embedded Standard 7, follow these steps:

Prerequisite:

The "Legacy USB Support" option has to be set to "Enabled" in the Advanced menu of the BIOS so that the device can address a USB CD-ROM drive.

1. Connect a USB CD-ROM drive to the device.
2. Insert the Restore CD/DVD in the drive, restart the device and when the BIOS message:

   ```
   Press <F2> to enter Setup or <ESC> to show Boot menu
   ```

   appears, press the F2 key.
3. Select the Boot menu and move the entry "CD-ROM Drive" to the first position.
4. End the BIOS setup with the "Exit Saving Changes" entry.
5. Follow the on-screen instructions.
6. After selecting the menu dialog language of the Restore CD/DVD, select the menu entry "Select language packages".

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

   – Display language settings
   – Install language
   – Change language
   – Remove the "Non-system language".

Note

The "Install language or Deinstall language" process can take several minutes.

Note

The "Legacy USB Support" option has to be set to "Enabled" in the **Advanced menu** of the **BIOS** so that the device can address a USB CD-ROM drive.

See also

Advanced Menu (Page 182)

8.3 Commissioning Windows XP Professional

8.3.1 Basic commissioning - initial startup

Setting up the operating system

When the computer starts up for the **first** time, the Windows XP Professional operating system preinstalled on the HDD or SSD will be configured automatically. Proceed as follows:

1. Connect the device to the 24 VDC power supply and then turn on the power switch. The device now performs a power-on self-test. During the self-test, the following message is output:

   ```
   Press <F2> to enter SETUP or <ESC> to display the Boot menu
   ```

2. Wait until this message is cleared, then follow the instructions on the screen.

NOTICE
The device may not be switched off at any time during the installation process. **Do not** change the default BIOS settings, otherwise the operating system setup may become corrupted.

3. Automatic restart
   After you have entered all necessary information and the operating system is configured, the PC is automatically restarted and displays the user interface of the respective operating system.

Note

System startup can take longer than usual for the initial commissioning.

When you switch on the PC now, the user interface of the Windows XP Professional operating system is automatically opened when the startup routine is completed.

Note

To prevent data loss, it is advisable to create an image of your system partition once you have completed initial commissioning.

Switching off the device

When you work with Windows XP Professional, always shut down the PC with the command **Start > Turn Off Computer**.

8.3.2 Setting Up the Language Selection

The **M**ultilanguage **U**ser **I**nterface (MUI) allows you to set up the Windows XP Professional menus and dialogs for additional languages.

Setting up the language selection

The default setting on your device is Windows XP MUI with English menus and dialog boxes and a US keyboard layout. You can change the language in the Control Panel by selecting

Start > Control Panel > Regional and Language Options Languages, tab **Language used in menus and dialogs** field.

For the **Regional and Language Options** set the default as **non-Unicode programs** under **Advanced** in addition to the language for menus and dialogs.

8.4 Commissioning Windows 7

8.4.1 Basic commissioning - initial startup

Setting up the operating system

When the computer starts up for the **first** time, the Windows 7 operating system preinstalled on the HDD or SSD will be configured automatically. Proceed as follows:

1. Connect the device to the 24 VDC power supply and then turn on the power switch. The device now performs a power on self-test. During the self-test, the following message is output:

   ```
   Press <F2> to enter SETUP or <ESC> to display the Boot menu
   ```

2. Wait until this message is cleared, then follow the instructions on the screen.

NOTICE
The device may not be switched off at any time during the installation process. Do **not** change the default BIOS settings, otherwise the operating system setup may become corrupted.

3. Automatic restart
   After you have completed all necessary entries and the operating system setup, the PC automatically restarts and displays the user interface of the your operating system.

Note

System startup can take longer than usual for the initial commissioning.

As of now, the operating system automatically opens its user interface of the Windows 7 operating system on completion of the startup sequence.

Note

To prevent data loss, it is advisable to create an image of your system partition once you have completed initial commissioning.

Switching off the device

In Windows 7, always select **Start > Turn Off Computer** to shut down the PC.

8.4.2 Setting Up the Language Selection

The **M**ultilanguage **U**ser **I**nterface (MUI) supports changes of the Windows 7 menu and dialog language.

Setting up the language selection

The default setting on your device is Windows 7 MUI with English menu and dialog language and US keyboard layout. You can change the language in the Control Panel by selecting:

Start > Control Panel > Regional and Language Options Languages, tab **Language used in menus and dialogs** field.

In addition to the menu and dialog language, select **Regional and Language Options** and set the default to **non-Unicode programs** in the **Advanced** section.

8.4.3 Recovery of Windows 7

There is a full graphical user interface available for recovery of Windows 7. It may take several minutes before the first input window appears. In this window, you can set the time and currency formats and select the keyboard language.

English is the basic language and other languages can be installed later with the MUI. The MUI is on the recovery DVD.
Now follow the on-screen instructions. It may take several minutes before the next prompt for the product key is displayed.

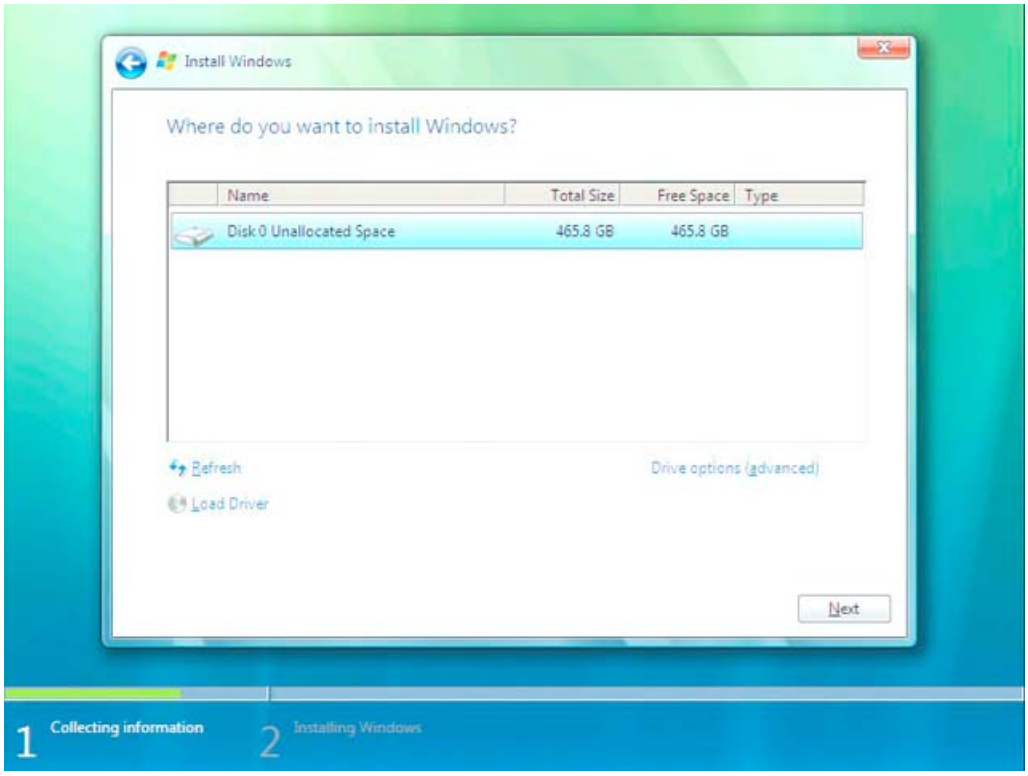
Note

Due to the previous activation, you do not need to enter the product key (COA number). This is entered automatically during the installation.

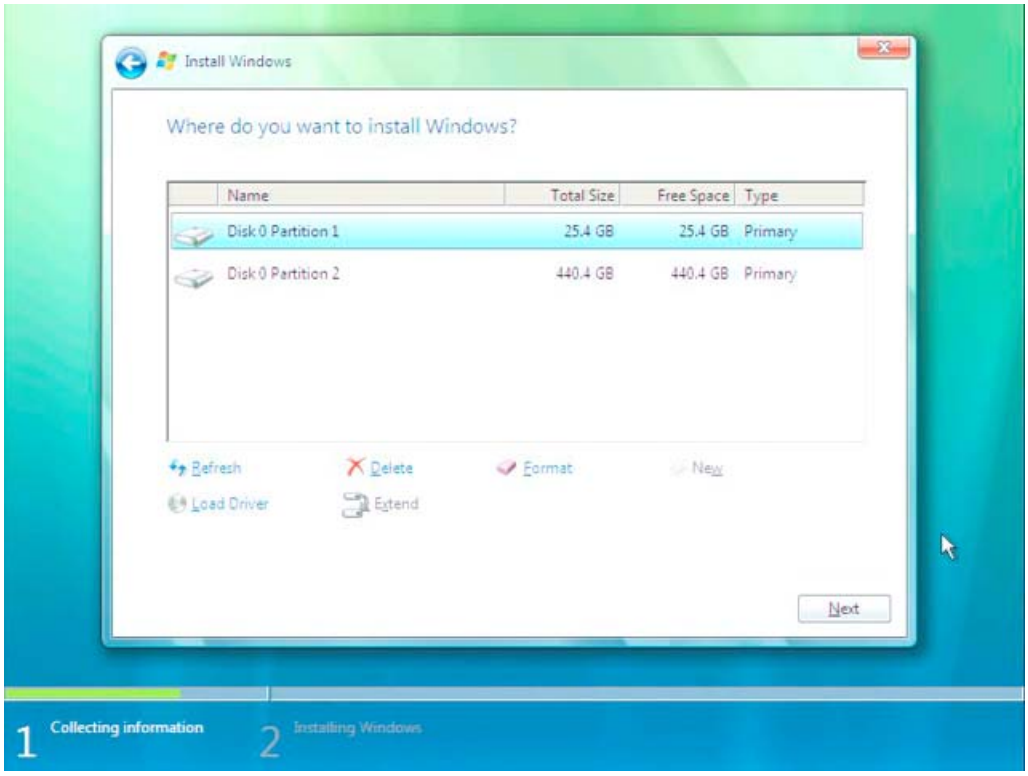
Setting up and formatting partitions

After you have installed a new HDD or SSD, or if partitions are faulty, or when you wish to change the partitioning on your HDD or SSD, you need to create or reconfigure partitions on the HDD or SSD.

In the next dialog box, you can set up the HDD or SSD according to your requirements and add controllers that are not yet known to the system.



Options	Meaning
Drive options (advanced)	Additional functions will be displayed with which you can set up the HDD or SSD.
Load Driver	To implement new drivers.



Options	Meaning
Refresh	Updating
Delete	Deleting a partition
Format	Formatting a partition
New	Creating new partitions
Load Driver	To implement new drivers
Extend	Changing the partition size
⚠	Any error messages that occur are displayed behind this icon, for example if the hard disk was not formatted in the required "NTFS" format.

The first partition should be at least 25 GByte. The operating system must be installed on this partition. You can use the rest of the HDD or SSD as a data partition. Both partitions must be installed as the NTFS file system.

When shipped, the partitions are set up as follows:

Partition	Operating system	Name	Size	File system
First	Windows 7	SYSTEM	25 GB	NTFS not compressed
Second	Windows 7	DATA	Remainder	NTFS not compressed

Following a required reboot, Windows will be installed on the HDD or SSD. This process takes at least 20 minutes.

Now follow the instructions on the screen.

Note

If you want to reinstall drivers from a USB floppy disk drive, select Floppy Drive (A:) .

Note

If you want to use Microsoft Windows as a professional user, you should have the following manuals available (not included in the scope of delivery):

- Windows 7 Technical Reference (MS Press No. 5913)

These manuals contain specific information for administrators who install, manage and integrate Windows in networks or multi-user environments.

Setting up the language selection in Windows 7

With the Multilanguage User Interface (MUI), you can set up the Windows menus and dialogs for additional languages. When shipped, Windows 7 is installed with English menus and dialogs. You can change this in the Control Panel with the "Regional and Language options" or "Time and Date" dialogs.

Here, you can change all system formats:
Start > Control Panel > Clock, Language, and Region > Change display language > Regional and Language options

Here, you can only change the date and time formats:
Start > Control Panel > Clock, Language, and Region > Change display language > Time and Date

If you want to install additional languages, you can install these later in the Control Panel, as follows. You will find the necessary files on the recovery DVD in the "Languagepacks" folder.

Start > Control Panel > Clock, Language, and Region > Change display language > Regional and Language options > Keyboards and Languages

Additional languages can be integrated through Windows Update.

8.4.4 Installing drivers and software

NOTICE
Before you install new drivers or updates for multilingual operating systems, (MUI versions), reset the regional settings for menus and dialogs and the default language to US English.

Install the drivers and software from the included "Documentation and Drivers" CD.
Procedure:

1. Insert the CD/DVD into the drive.
2. Run *START*.
3. Select *Drivers & Updates* from the index.

4. Select the operating system in *Drivers & Updates*.
5. Install the required driver.

NOTICE
For a new Windows 7 installation, always install the chipset driver before you install any other drivers.

8.5 Checking the Language Selection

You can have the languages currently set and their ID numbers displayed by using the "CheckLanguageID" tool. These include:

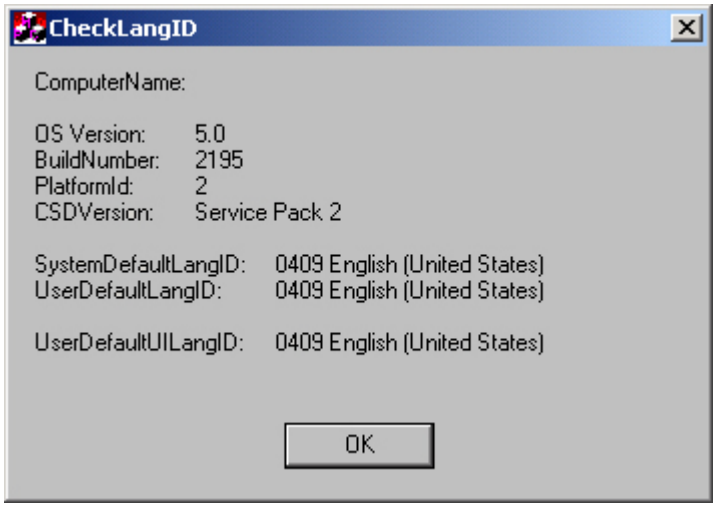
- SystemDefaultLangID: System language
- UserDefaultLangID: Standard language
- UserDefaultUILangID: User interface language

Note

This tool is only installed for the hard disk versions of devices running Windows Embedded Standard 2009, Windows Embedded Standard 7, or Windows XP Professional.

Checking the Language Selection

Call up the "CheckLanguageID" tool by using **c:\drivers\checklang\checklangid.exe**.



NOTICE
All three languages displayed should have the same ID assigned. If this is not the case, change the language selection as described in the section "Setting Up the Language Selection".

8.6 Setting the panel type

8.6.1 First commissioning

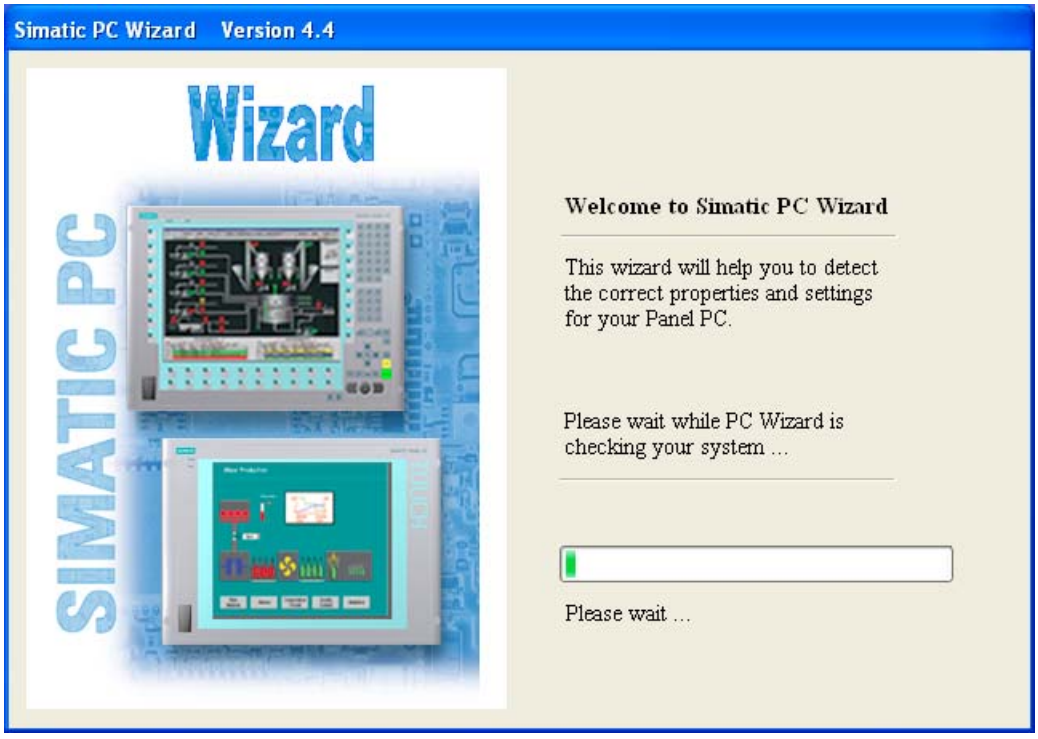
Initial commissioning

- The "SIMATIC PC Wizard" program is automatically started once during commissioning.
- The "SIMATIC PC Wizard" implements the specific settings for the SIMATIC Panel PC during the initial startup of the operating system.
- Several dialogs appear on screen during initial commissioning of the SIMATIC Panel PC.

NOTICE
Start the PC for commissioning in an unchanged delivery state and follow the dialogs until their conclusion.

Procedure

Device-specific drivers are set during the hardware detection and configuration phase.

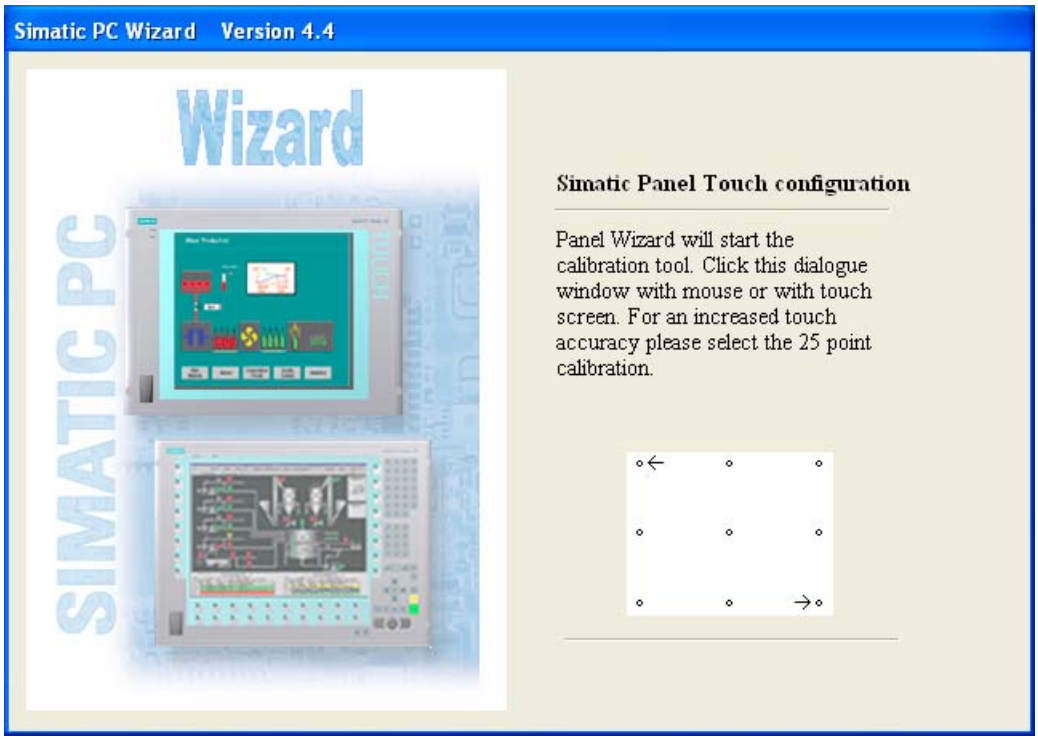


The type of SIMATIC PC is selected and detected automatically.

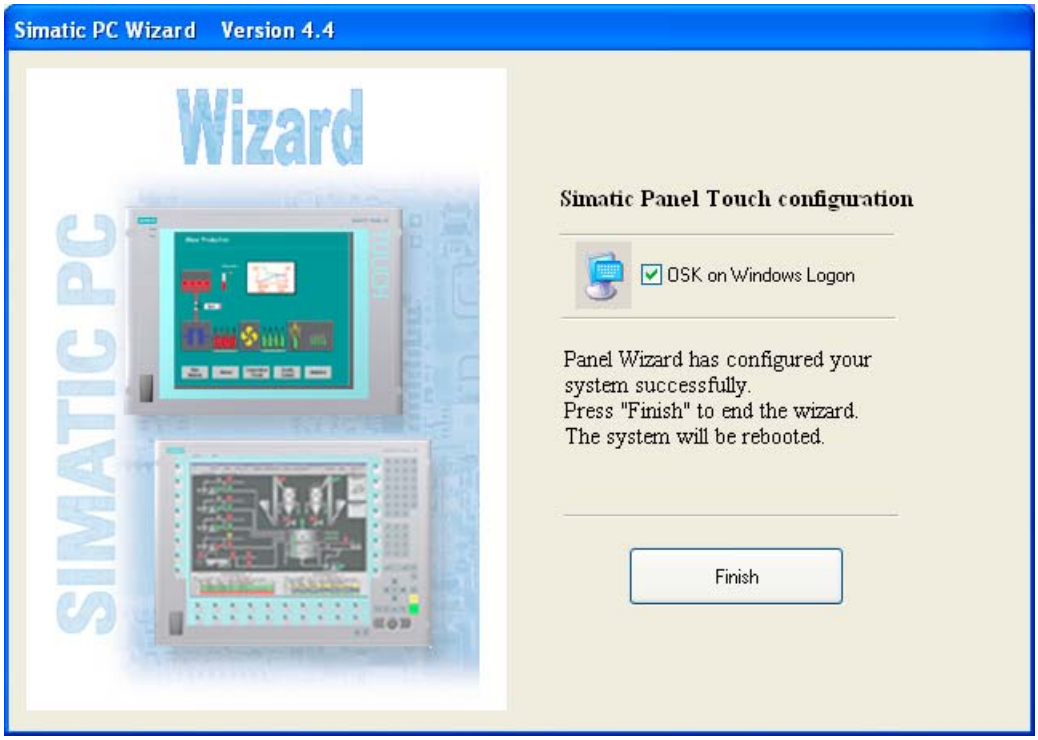
8.6.2 Touch panel configuration

Touch screen calibration

1. Calibrate the touch screen by clicking the wizard.



2. Click "Finish".



Note

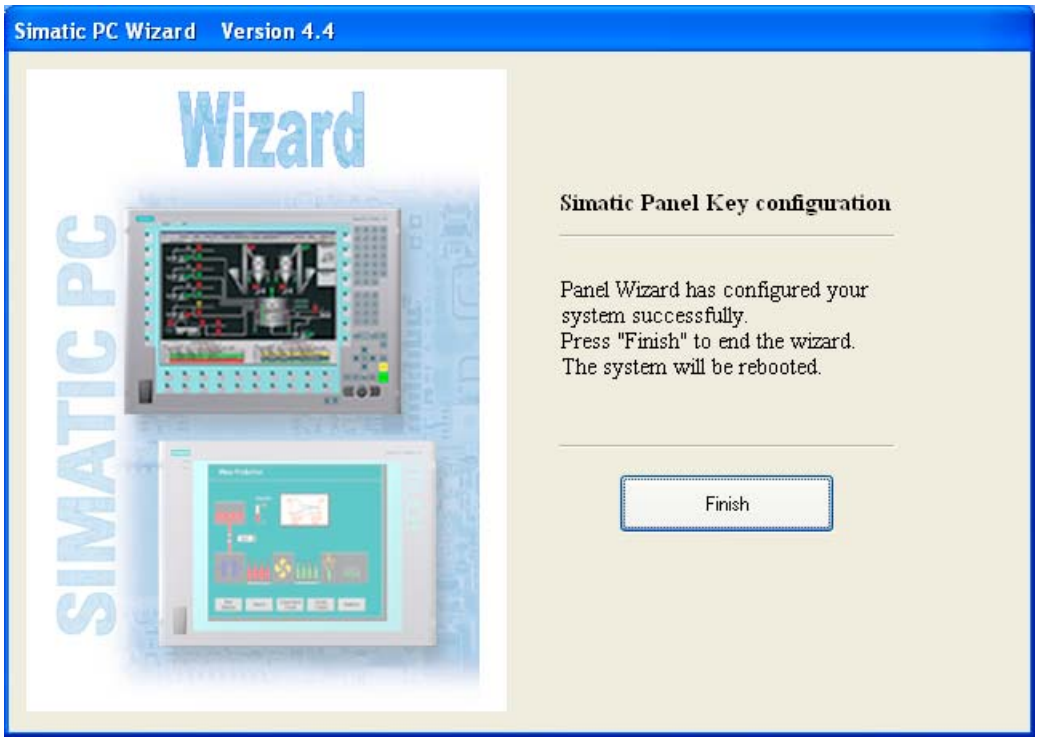
On-screen keyboard (OSK)

- If the "enable" checkbox is selected, the Windows on-screen keyboard is displayed for logon at every program start. You can use this keyboard to enter the administrator password, for example. An external keyboard is then not necessary.
- If you clear the checkbox, the on-screen keyboard is not displayed.
- In Windows 7, the on-screen keyboard is not displayed until a password is assigned to the user account.

3. Use the "Finish" button to close the wizard. The HMI device will be restarted automatically for the respective configuration.

8.6.3 Key panel configuration

1. Follow all dialogs until the end.
2. Click "Finish".



Note

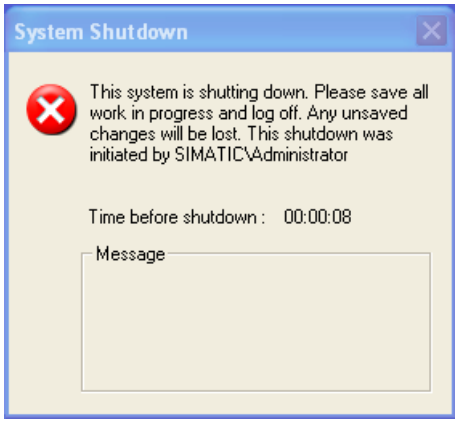
On-screen keyboard (OSK)

- If the "enable" checkbox is selected, the Windows on-screen keyboard is displayed for logon at every program start. You can use it, for example, to enter the administrator password. An external keyboard is then not necessary.
- If you clear the checkbox, the on-screen keyboard is not displayed.
- In Windows 7, the on-screen keyboard is not displayed until a password is assigned to the user account.

1. Use the "Finish" button to close the wizard. The HMI device will be restarted automatically for the respective configuration.

8.6.4 Automatic restart

An automatic restart is perfumed after every configuration.



8.7 Device with key panel

8.7.1 Activating KeyTools

SIMATIC KeyTools is one selection of the applications for SIMATIC Panel PC. These applications allow you to adapt key codes that are sent by the key panel of the control unit. SIMATIC KeyTools consists of the following applications:

- Key code table: Loading and editing of key code tables.
- WinCC hotkey function: WinCC hotkey function activation und deactivation.
- Security features: Lock function that prevents two function keys from being activated simultaneously. This prevents incorrect operations and undefined states of the application program.

Note

For a detailed description of the SIMATIC KeyTools, refer to the help menu and the application description on the Documentation & Drivers DVD.

Opening Keytools

1. Open Keytools with the command **Start > Settings > Control Panel > SIMATIC KeyTools**.
2. Select the desired application and follow the instructions on the screen.

NOTICE
Malfunctions of the user software For security reasons always use the "Security features". If you deactivate it nevertheless, serious malfunctions of the user software may occur when the additional function keys and softkeys F13 to S16 are used or if own key code tables are used.

8.8 Device with touch screen

8.8.1 Recalibrating the Touch Screen

If the touch screen does not react as expected when touched, repeat the calibration.

Procedure for standard calibration

1. Select "Start > Programs > UPDD > Settings".
   The "UPDD Console" dialog box opens.

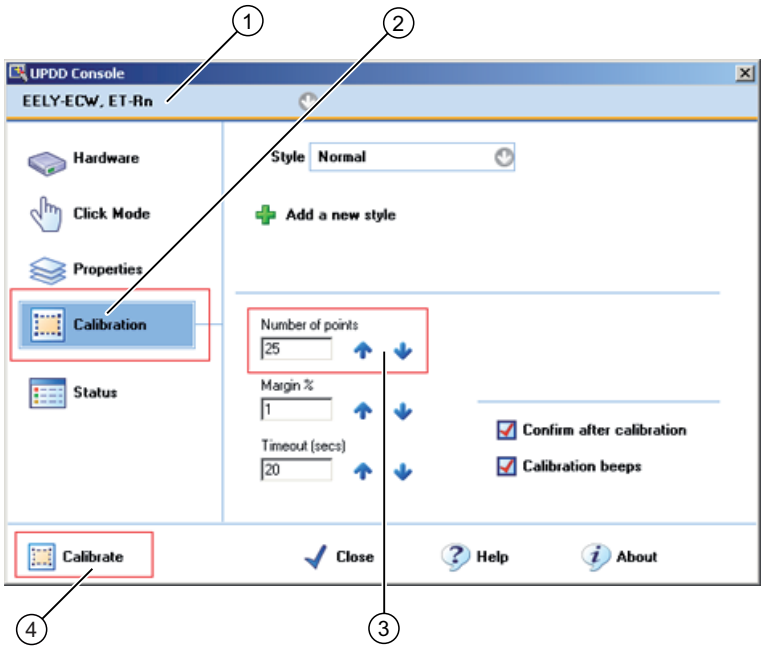


Figure 8-1 Point calibration

2. Select the controller ① you wish to calibrate.

3. Click the "Calibration" tab ②.
4. Select the "Number of points" option with the "25 point calibration" ③.
5. Click "Calibrate" ④.

   The calibration mask is output on the selected display.
6. Quickly touch the corresponding selections one after the other.

   The entry is confirmed by a check mark, the next selection is displayed.
7. Confirm all input prompts (arrows, or crosses in the center) until the complete screen has been calibrated.
8. Finally, confirm the prompt with "Confirm".

Procedure for EEPROM calibration

1. Select "Start > Programs > UPDD > Settings".

   The "UPDD Console" dialog box opens.

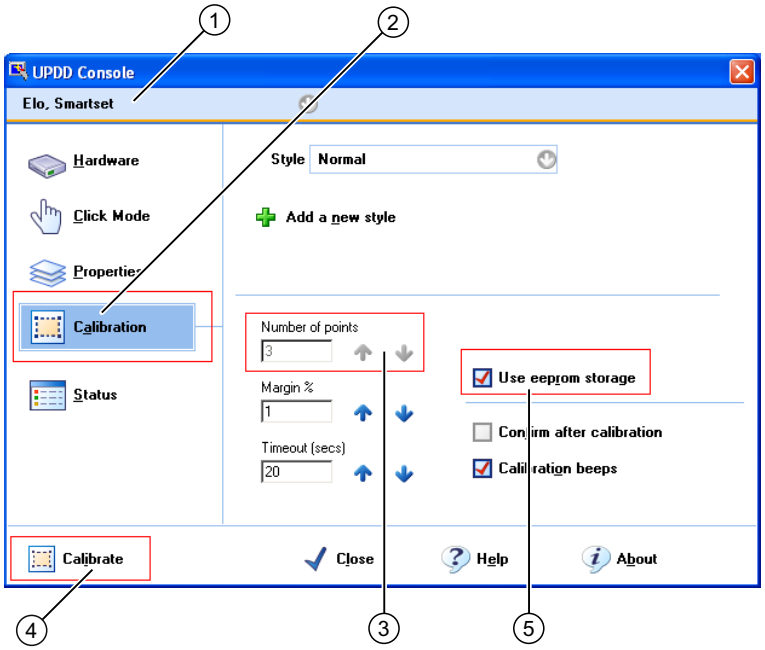


Figure 8-2 Point calibration

2. Select the controller ① you wish to calibrate.
3. Click the "Calibration" tab ②.

   The "Use eeprom storage" ⑤ option is selected by default for touch controllers with EEPROM.

   The "Number of points" option box indicates "3-point calibration" ③.
4. Click "Calibrate" ④.

   The calibration mask is output on the selected display.

5. Quickly touch the corresponding selections one after the other.

   The entry is confirmed by a check mark, the next selection is displayed.

6. Confirm all input prompts (arrows, or crosses in the center) until the complete screen has been calibrated.

Note

If the screen does not respond to touching as expected, check the specified controller (marked in black) in "UPDD Console" and repeat the calibration.

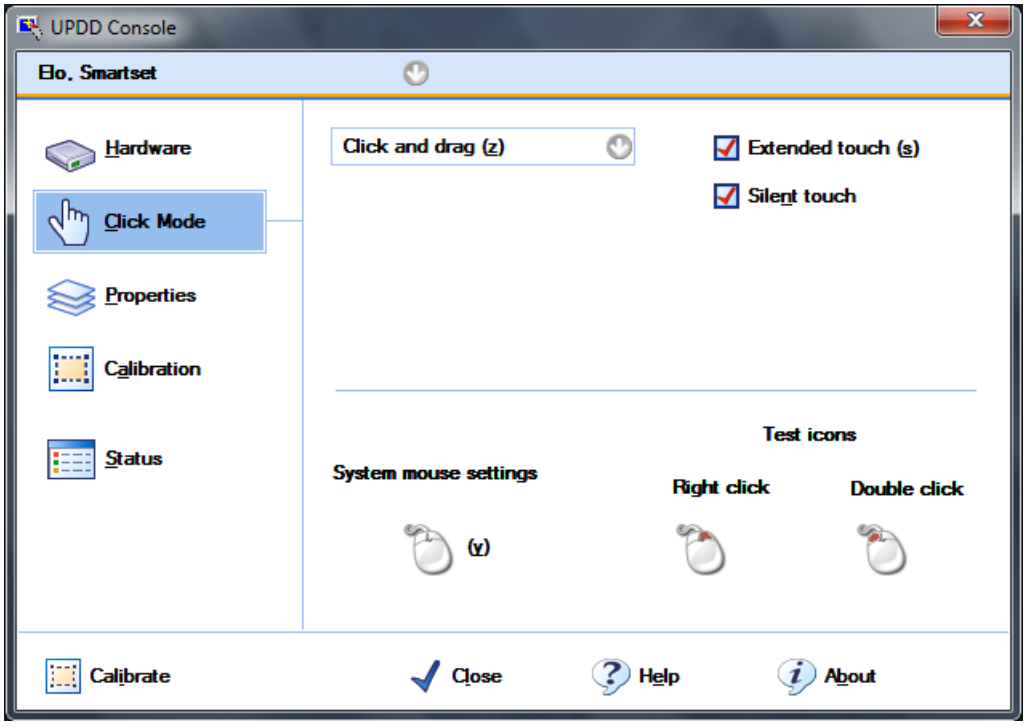
Only an active controller can be calibrated. A removed controller is marked in red.

If 3 point calibration does not suffice for the operator panel, you can clear it in the "Use eeprom storage" option box and use the standard calibration (25 point calibration).

Currently only the Touch Controller "ELO 2216 (USB)" supports EEPROM calibration.

Extended Touch touch functionality

1. Select "Start > Programs > UPDD > Settings". The "UPDD Console" dialog box opens.



2. Select the corresponding controller.

The "Extended touch" option is preset for Windows 7.

Note

The "Extended touch" functionality is only available for Windows 7 Ultimate.

If "Extended touch" is selected, the extended touch functions of Windows 7 will be available, such as "operating touch permanently", which corresponds to the right mouse button function.

Note

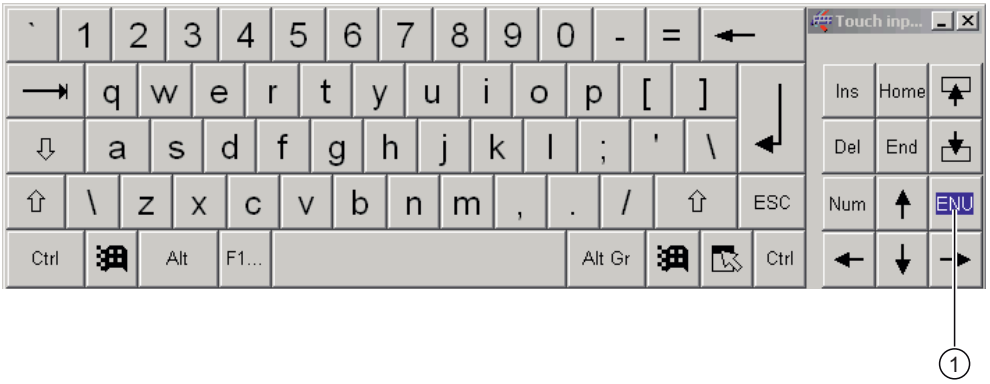
The "EventSelector" program works only with disabled "Extended touch" function.

8.8.2 Activating the Screen Keyboard

You can operate the device by means of a virtual screen keyboard. You can use it to enter the characters directly on the touch screen or with the mouse.

Starting Touch Input

Start the "Touch Input" application on the desktop. The screen keyboard is displayed.



(1) Button for language selection: German, English, Italian, Spanish, French

8.9 Controlling backlighting

The Panel PC Tool program installs two software applications:

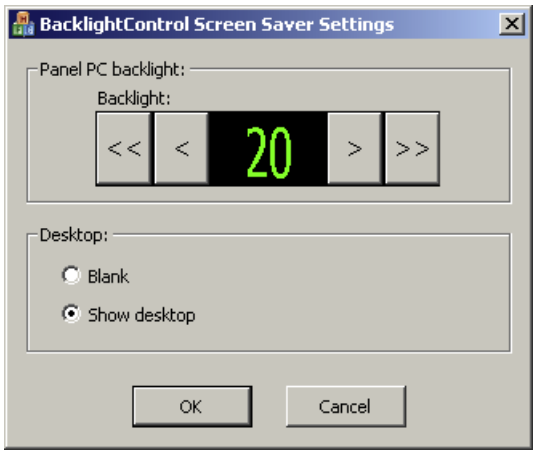
Controlling backlighting



Controls the screen brightness via the backlight function. The default is 65. To open this application, click the "Set Brightness" icon on the desktop.

Use the "<" and ">" buttons for single-step changes to the value, or "<<" and ">>" to make changes in steps of ten. "MIN" sets the brightness to 0, and "MAX" sets it to 100.

Controlling backlighting using the screen saver



Controls the screen brightness while the screensaver is active. In the "Desktop" area, select a black screen, or a translucent desktop.

Operation 9

9.1 Device with key panel

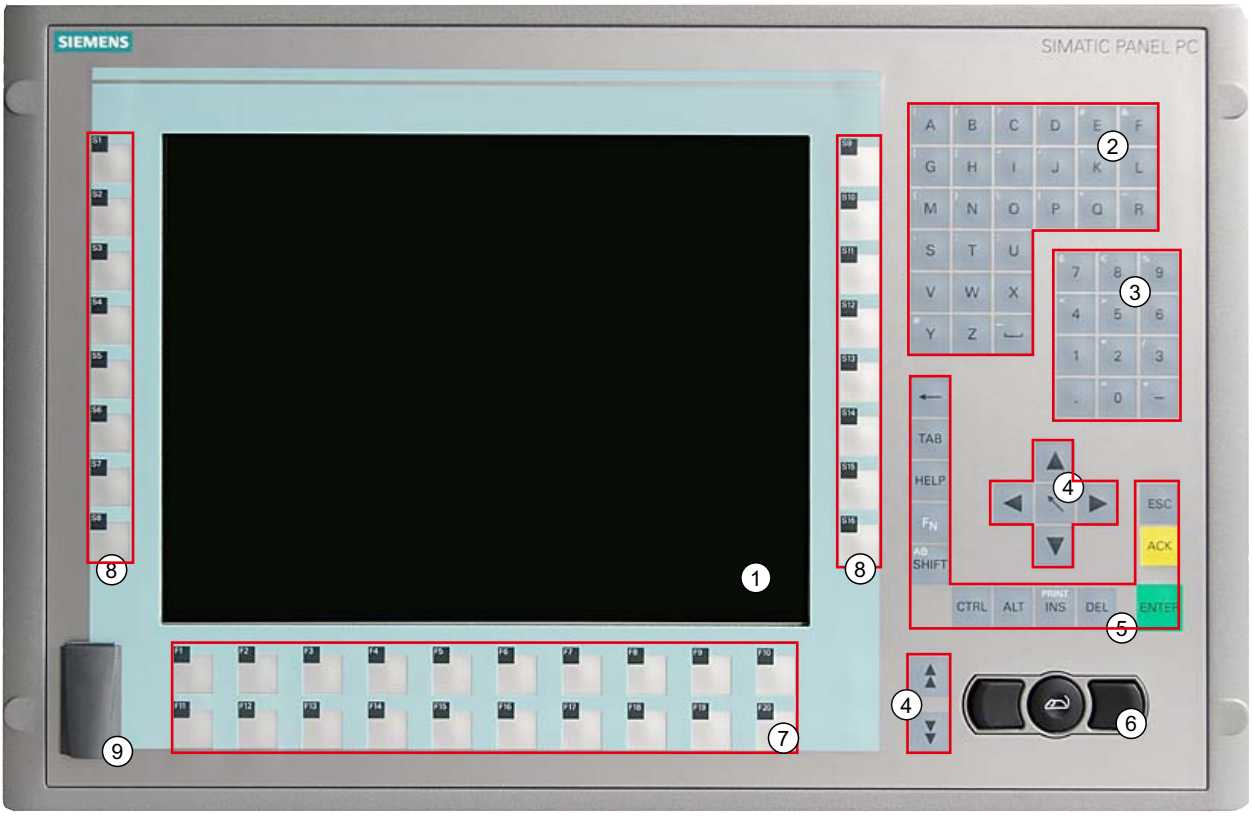
9.1.1 Safety

NOTICE
Maloperation If you activate several keys simultaneously, a malfunction on the device cannot be excluded. Activate function keys and softkeys only in sequence. **Malfunctions of the user software** For security reasons, always use "Security features" of the KeyTools. If you deactivate it nevertheless, serious malfunctions of the user software may occur when the additional function keys and softkeys F13 to S16 are used or if own key code tables are used. **Risk of damage** Activating a key using a hard or pointed object, for example a screwdriver, reduces the life of the key or can damage it.

9.1.2 Overview

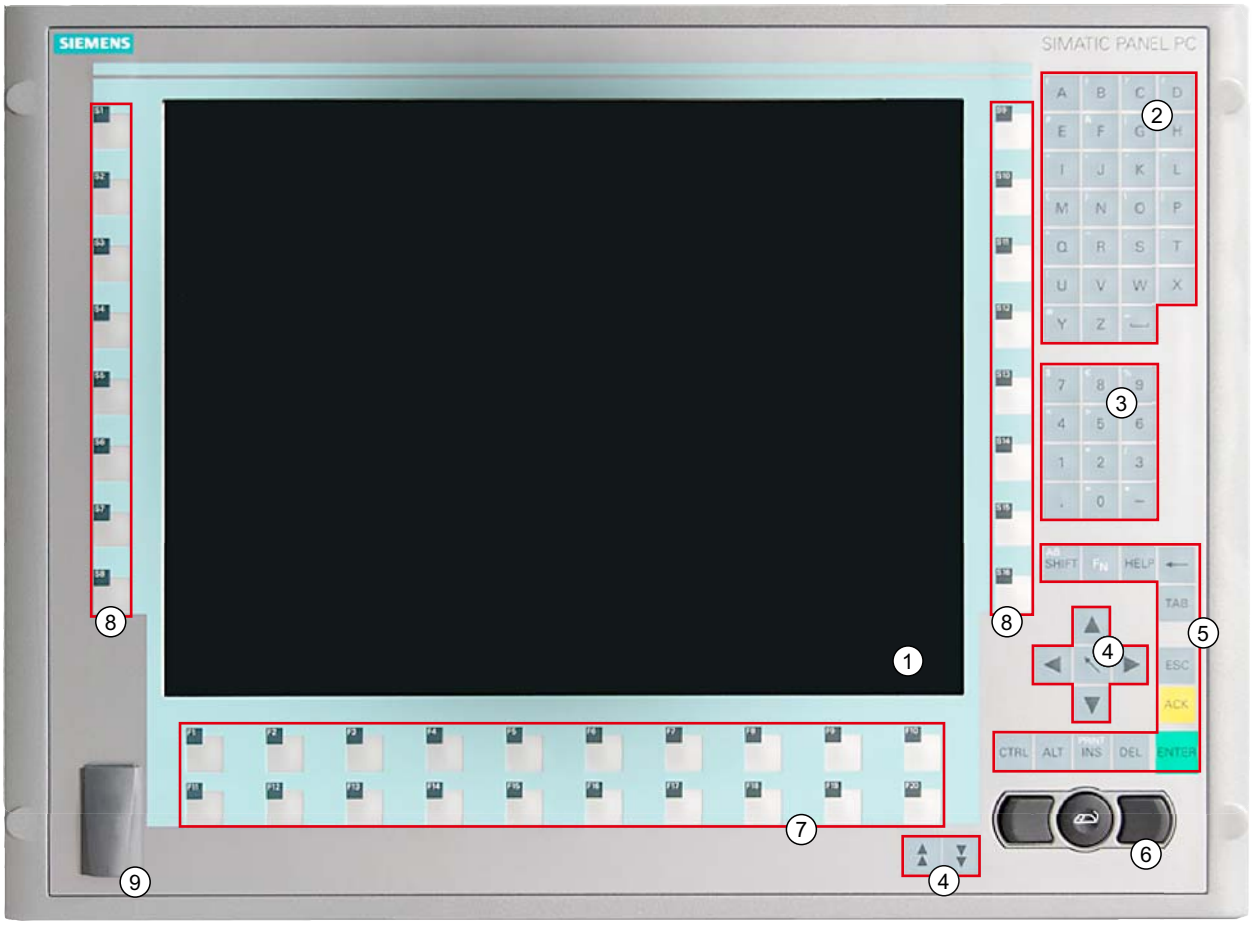
Overview

The number of keys, their labeling and function is the same on all key panels. The various panel types differ in the arrangement of the keys and in the size and type of the display.



(1) Display
(2) Alphanumeric keys
(3) Numeric keys
(4) Cursor keys
(5) Control keys
(6) Integrated mouse
(7) Function keys
(8) Softkeys
(9) USB ports (optional)

Figure 9-1 Example of a 12" key panel



(1) Display
(2) Alphanumeric keys
(3) Numeric keys
(4) Cursor keys
(5) Control keys
(6) Integrated mouse
(7) Function keys
(8) Softkeys
(9) USB ports (optional)

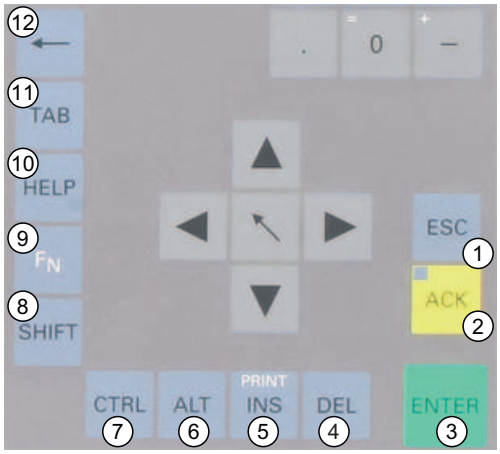
Figure 9-2 Example of a 15" key panel

9.1.3 Keys

9.1.3.1 Control keys

Control keys

The control keys activate editing functions and control functions in different applications.



(1) Cancel
(2) Acknowledge
(3) Enter
(4) Delete
(5) Insert/Print screen (in combination with F_N)
(6) Application-specific function key codes (see key code table in appendix)
(7) Application-specific function key codes (see key code table in appendix)
(8) Toggling between lower-case letters and upper-case letters
(9) Function key
(10) Call Help
(11) Tabulator
(12) Backspace

Figure 9-3 Control keys

9.1.3.2 Alphanumeric and numeric keys

Alphanumeric keys

Enter letters, special characters, blank spaces and underline using the alphanumeric keys.



(1) Underline

(2) Space character

Figure 9-4 Alphanumeric keys 2

Toggling between lower-case and upper-case letters

Enter the lower-case letters using the pre-defined assignment of the alphanumeric keys. To enter an upper-case letter, proceed as follows:

1. Hold down the <Shift> key.
2. Activate the desired alphanumeric key at the same time. The displayed upper case letter will be entered.
3. To enter lower case letters, release the <Shift> key.
4. You can, however, also activate the Caps Lock function using the <F_N> and <Shift> keys. The LED on the <Shift> key is then also lit.

Numeric keys

Enter the numerals "0" to "9" and special characters, e.g. the decimal point, using the pre-defined assignment of the numeric keys.

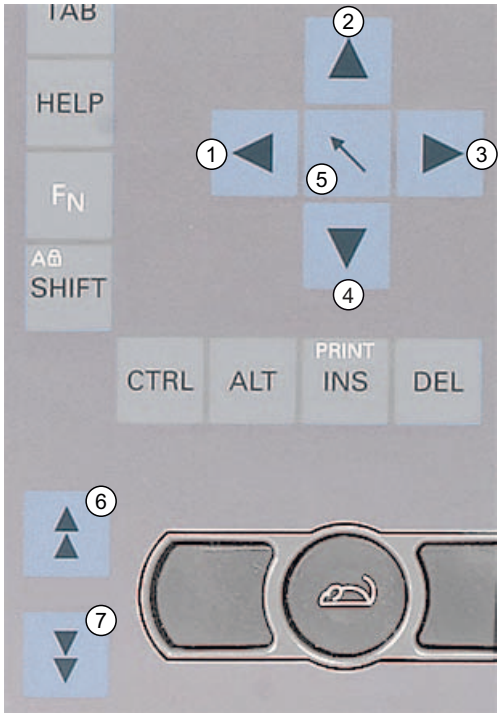
Enter special characters, arithmetic signs and signs

Special characters, arithmetic signs and signs are also assigned to most of the alphanumeric and numeric keys. These signs are indicated by white symbols on the top left of the keys. To enter such a sign, proceed as follows:

1. Hold down the <F_N> control key.
2. Activate the desired alphanumeric or numeric key at the same time. The displayed special character, arithmetic sign or signs will be entered.
3. To enter the signs of the pre-defined assignment again, release the <F_N> key.

9.1.3.3 Cursor keys

Navigate, scroll or move the writing mark using the cursor keys. The cursor keys correspond to the usual keys of the PC keyboard.



(1) <Left> key
(2) <Up> key
(3) <Right> key
(4) <Down> key
(5) Position 1 key (Home)
(6) <Page up> key
(7) <Page down> key

Figure 9-5 Cursor keys

9.1.3.4 External keyboards

The keyboard layout has been set to "English/USA international." If you use a keyboard with a layout other than the "English/USA international" layout, the key codes of the internal and external keyboards might no longer correspond.

9.2 Device with touch screen

9.2.1 Overview

The 12" variant and the 15" variant differ in their dimensions and the size of the display. The 12" and 19" variants do not have side drill hole covers.

The following figure is only an example using the front view of the 15" variant.

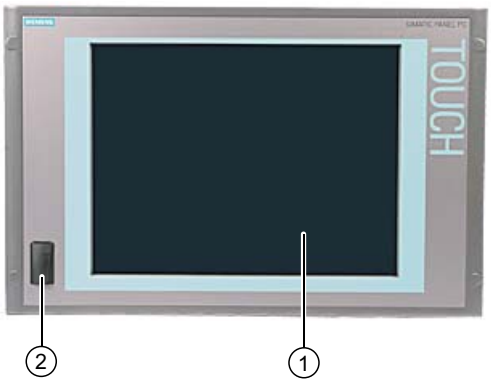


Figure 9-6 Example of a 15" touch screen front

(1) Display with touch screen
(2) USB port

9.2.2 Using the touch screen

Application-specific user interface elements, for example buttons, are shown on the display. When you tap the button with your finger, the function assigned to the button is activated.

The following types of pressure are permissible:

- Using a plastic pen with a 1 mm radius at the point: 25 g.
- Using a silicone finger with a diameter of 1.6 cm: 50 g.

CAUTION
Only touch one point on the touch screen and not several points at one time. You may otherwise trigger unintended reactions. Do not touch the screen in the following situations: • During the boot process • When plugging or unplugging USB components • While Scandisk is running

Use the touch pen

You can operate the controls on the touch screen by touching them with the touch pen.

Functions

10

10.1 Overview of the functions

Even in its basic version, the device offers optional monitoring functions. When used in combination with the appropriate software, the following functions for displaying, monitoring and controlling are available:

- Temperature monitoring (over-temperature, under-temperature or cable break at a temperature sensor)
- Monitoring of the battery voltage
- Monitoring of Compact Flash cards and SSD drives with S.M.A.R.T. functionality
- Watchdog (hardware or software reset of the computer)
- Operating hours meter (information on the cumulative run time)

SIMATIC IPC DiagBase software

With the SIMATIC IPC DiagBase software (included in the scope of delivery), you can use these functions for local monitoring. You can use the DiagBase Management Explorer application for general monitoring or DiagBase Alarm Manager for notification of individual alarms.

Additional information on the functions of the SIMATIC IPC DiagBase software is available in the online help.

SIMATIC IPC DiagMonitor software

The SIMATIC IPC DiagMonitor software is available on CD. (not included in the product package) It contains the monitoring software, the software for the stations to be monitored and a library for creating custom applications.

10.2 Temperature monitoring/display

Temperature monitoring

The temperature is recorded by two temperature sensors. One sensor monitors the processor temperature and the other monitors the temperature near the RAM module.

When the temperature exceeds one of the two defined temperature thresholds, the following error reactions are triggered:

Reaction	Option
The DiagBase or DiagMonitor software is enabled	None

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

- Acknowledging the error message
- Restart of the device

10.3 Watchdog (WD)

Function

If the user program does not respond to the watchdog within the predetermined monitoring time, the watchdog monitors the program process and informs the user about various reactions.

The watchdog is idle when the PC is switched on or after a HW RESET(cold restart), i.e., no reaction of the WD is triggered.

Watchdog reactions

If the WD is not triggered again within the set time (by application with the help of the DiagBase drive), the following reactions are triggered:

Reaction	Option
Trigger a PC reset	Configurable
DiagBase or DiagMonitor software is enabled	None

Note

If the desired device reset does not occur, set Bit 7 to the value 0 in the General Purpose Ports (GPP) output register (address 404D) .

WD monitoring times (TWD)

The monitoring times are defined as follows:

Normal mode: 94 ms, 210 ms, 340 ms, 460 ms, 590 ms, 710 ms, 840 ms and 960 ms.
Macro mode: 2 s, 4 s, 6 s, 8 s, 16 s, 32 s, 48 s and 64 s.

Note

Default mode

The macro mode is selected as the default during DiagBase operation.

Note

If the watchdog time is changed after the watchdog was enabled (i.e., while the watchdog is running), the watchdog is retriggered!

10.4 Enhanced Write Filter (EWF)

Purpose and function

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

The Enhanced Write Filter allows you to boot Windows Embedded Standard 2009 or Windows Embedded Standard 7 from write-protected media (such as CD-ROM), to write protect individual partitions, and customize file system performance (when using Compact Flash cards, for example).

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

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

Note

The Enhanced Write Filter is disabled by default for Windows Embedded Standard 2009 or Windows Embedded Standard 7. After the operating system has been set up, you should back up your date and then enable the EWF.

Set EWF

The EWFMGR.EXE program can be used to install, enable or disable the EWF. Use the command prompt to call up the program. The following functions are available:

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

Note

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

Note

The EWF command `ewfmgr c: -commitanddisable` cannot be used in combination with the `-Live` option (e.g.: `ewfmgr c: -commitanddisable -live`).

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

- In the event of a power failure, if the EWF is enabled changes made after the boot sequence on drive C: are lost.
  To prevent data loss in the event of a power failure, the use of a USV is recommended.
- You can save the files in the EWF RAM overlay to the Compact Flash card and the HDD or SSD before you shut down the device. To do so, enter the following command in the command prompt:

```
ewfmgr c: -commitanddisable
```

Then restart the system.

```
ewfmgr c: -enable
```

Then restart the system.

Note

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

The reason for this behavior is that Windows Embedded Standard 2009 or Windows Embedded Standard 7 has a registry entry that detects the conversion to daylight saving time. Since this file is also protected against modification by the EWF, the marker is lost during the boot sequence and the adjustment is made again.

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

Procedure:

1. Switch off the EWF filter (ewfmgr c: -commitanddisable) and reboot the system.
2. Deactivate automatic adjustment in the Control Panel. Select Start > Control Panel > Date and Time > Time Zone tab to clear the check mark from the "Automatically adjust clock for daylight saving changes" check box.
3. Enable EWF again (ewfmgr c: -enable) and reboot the system.

10.5 File Based Write Filter (FBWF)

Purpose and function

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

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

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

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

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

Comparison between EWF and FBWF

- You should prefer FBWF, because it is more flexible in its configuration and allows immediate writing without rebooting.
- If you use HORM or compressed NTFS, EWF is indispensable.

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

Configuring FBWF

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

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

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

You can find detailed instructions on FBWF in the Internet (http://msdn.microsoft.com/en-us/library/aa940926(WinEmbedded.5).aspx).

10.6 HAL tool

The HAL tool is used to convert a SIMATIC IPC with unicore processor from the installed Multiprocessor PC HAL to Uniprocessor PC HAL mode. The HAL tool is used in Windows Embedded Standard 2009.

Installing the HAL tool

1. Unzip the "HAL-Tool.zip" file to a folder.
2. Switching to HAL mode:

- Switching to Multiprocessor PC HAL:

  Run "HAL_Multiprocessor.bat".
- Switching to Uniprocessor PC HAL:

  Run "HAL_Uniprocessor.bat".

1. Restart the computer.
2. Once again, restart the computer when prompted in Windows.

Restoring to delivery state in Windows Embedded Standard 2009

1. Boot Windows Embedded Standard 2009.
2. Open the following folder: C:\Windows\HAL-Backup\original
3. Run the "undo.bat" batch file.
4. Restart Windows Embedded Standard 2009.

Restoring the delivery state in Windows PE

1. Boot Windows PE (e.g. from the Restore CD/DVD).
2. Open a console window.
3. Open the following folder: C:\Windows\HAL-Backup\original
4. Run the "undo.bat" batch file.
5. Restart Windows Embedded Standard 2009.

Expansions and Configurations 11

11.1 Open the device.

CAUTION
Only qualified technical personnel are permitted to carry out any work on the open device. Within the warranty time, you are only allowed to install expansions for memory and expansion card modules.

⚠ WARNING
Danger to life • Separate the device from the mains before opening it. • Use the supplied screws to close the device before commissioning.

CAUTION
The device contains electronic components which may be destroyed by electrostatic charge. You therefore need to take precautionary measures before you open the device. Refer to the ESD guidelines on handling electrostatically sensitive components under ESD guidelines (Page 15).

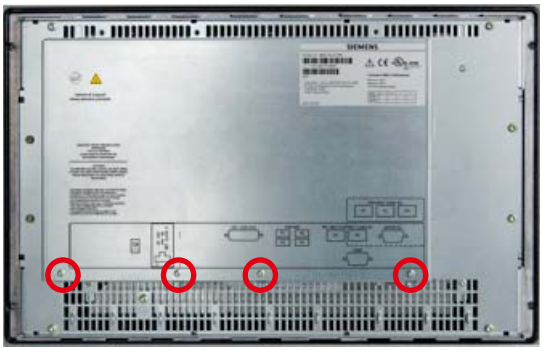
Tools

- Rear wall of device: Torx T20 (IPC477C PRO), Torx T10 (IPC477C)
- SSD mount: Torx T10
- Protective earth terminal: Torx T20

Preparation

Disconnect the device from the power supply.

Opening IPC477C

How to open the device		
1.	Remove the four screws.	
2.	Slide the cover up.	
3.	Lift up the cover and remove it.	

Closing the IPC477C

Note

To close the device, install the fan in reverse order. Make sure the cover latches into the hook.

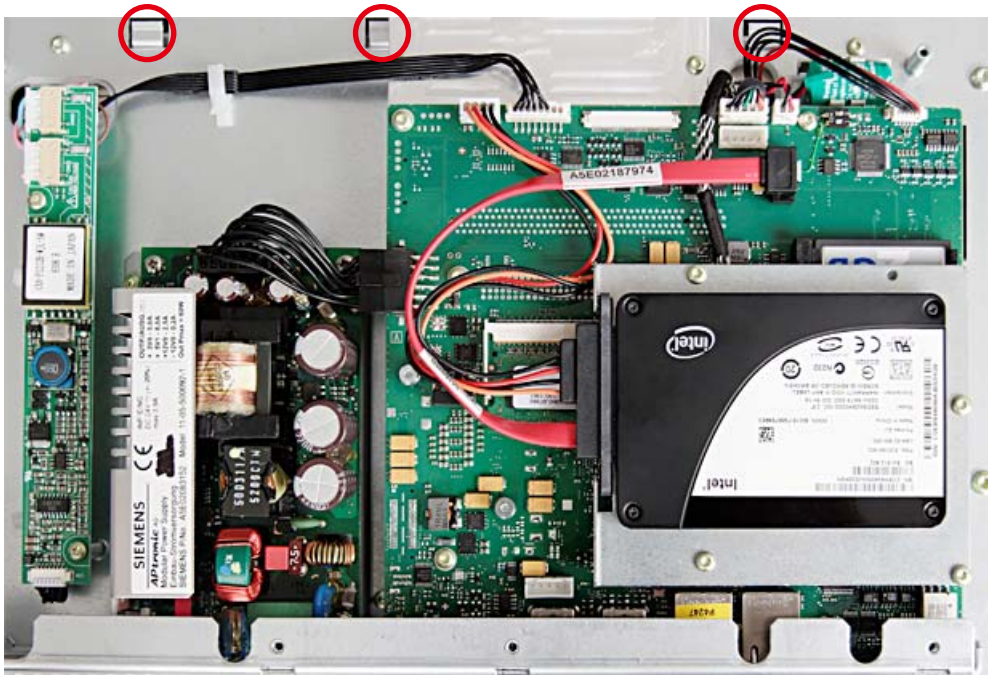
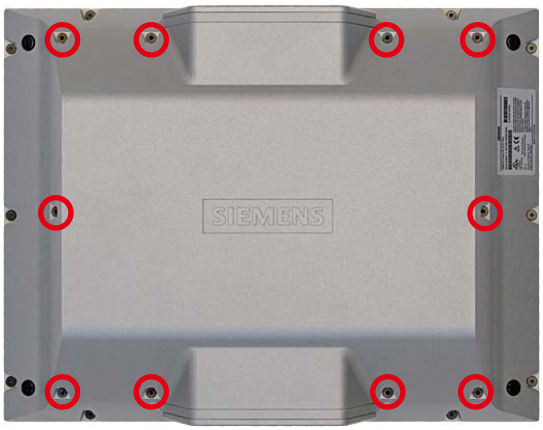


Figure 11-1 Device without cover. Marked in red: Hook for latching the cover

Opening IPC477C PRO

How to open the device		
1.	Remove the ten screws from the rear panel of the housing.	
2.	Lift up the rear wall of the housing and remove it.	

Closing the IPC477C PRO

Note

To close the device, install the fan in reverse order.

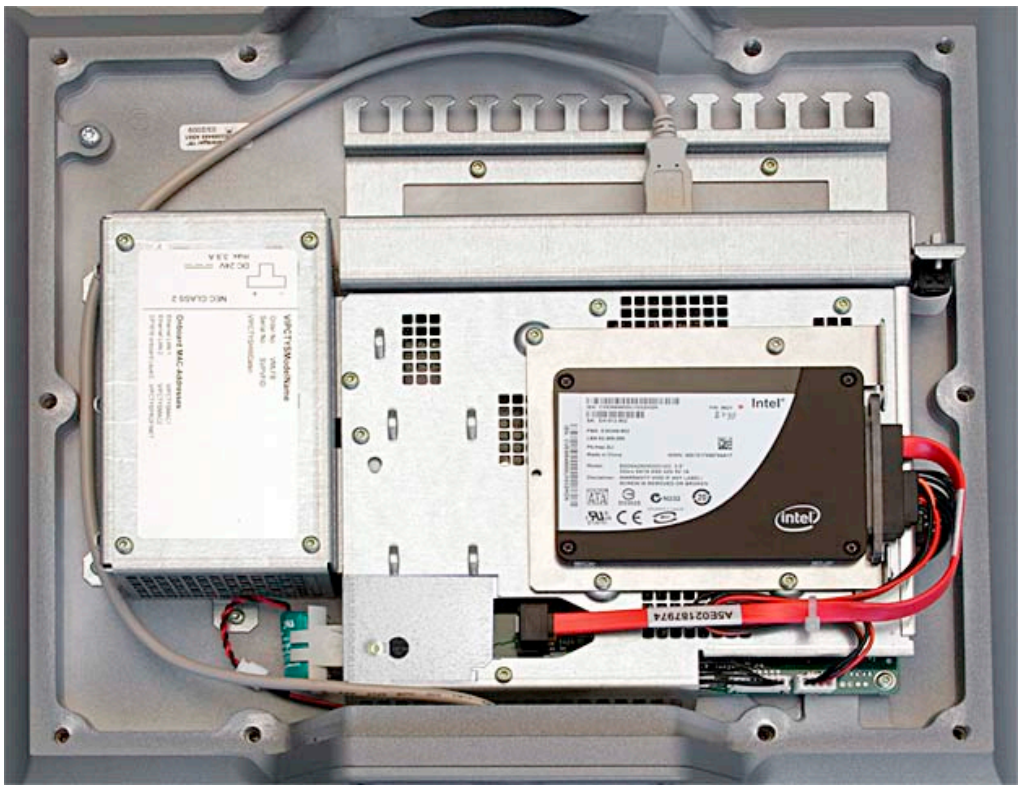


Figure 11-2 Device without cover

11.2 Memory expansion

11.2.1 Installing the memory module

Memory expansion options

The motherboard is equipped with one slot for an SO-DIMM DDR3 memory module. This lets you expand the memory capacity of your device to a maximum of 4 GB. 3.2 GB of this memory is available for the operating system and applications.

Note

We recommend using the original spare parts for memory configuration.

Preparation

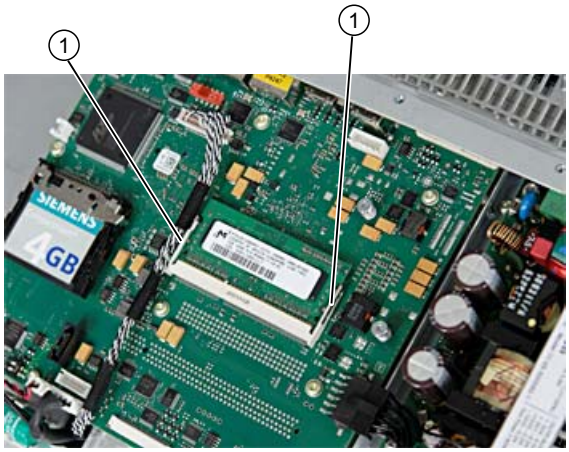
Disconnect the device from the power supply.

CAUTION
The electronic components on the PCBS are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatically sensitive components ESD guidelines (Page 15).

Note

The SSD must first be installed for devices with SSD.

Removing a Memory Module

How to remove a memory module		
1.	Remove the device cover at the rear wall of the device.	
2.	Press the latch (1) downward. Tilt the memory module forward.	
3.	Pull the memory module out of the slot.	

Installing the memory module

How to install a memory module		
1.	Place the memory module in the slot at an angle.	
2.	Lightly press the memory module down until it snaps into the latch.	
3.	Mount the expansion cover.	

Display of the current memory configuration

A new memory module is automatically detected. System RAM, Extended RAM and Cache SRAM are displayed during device startup.

11.3 Installing/Removing Compact Flash Cards

11.3.1 Installation options for Compact Flash cards

Memory expansion options

The device can be expanded with Compact Flash cards (Types I / II). The following options are available:

- Installing a Compact Flash card in the internal slot
- Installing a Compact Flash card in the external slot

Only use SIMATIC PC Compact Flash cards for industrial application.

Note

Replace Compact Flash cards only with cards of the same product versions

Only SIMATIC PC Compact Flash cards with product version number 02 (ES 02 or higher) can be used for this device.



Figure 11-3 SIMATIC PC Compact Flash®



Figure 11-4 SIMATIC PC Compact Flash 4GB - rear with product version ES 02

NOTICE

Risk of damage

The Compact Flash slots are not hot-plug capable. The Compact Flash card must be installed before the device is switched on and should only be removed when the device is switched off.

Note

The Compact Flash slots are coded against reversed insertion. Insert the Compact Flash card so that its upper side (label side) is facing right.

⚠ CAUTION

If the Compact Flash card meets resistance, flip it over. Never insert the Compact Flash card with force.

11.3.2 SIMATIC HMI IPC477C

11.3.2.1 Installing/removing the Compact Flash card in the external slot

Preparation

Disconnect the device from the power supply.

⚠ CAUTION
The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatically sensitive components ESD guidelines (Page 15).

Installing the Compact Flash card in the external module receptacle

How to install a Compact Flash card		
1.	Slide the cover of slot up.	
2.	Insert the Compact Flash card into the slot with the connector facing in until it locks into place.	
3.	Close the cover.	

Removing the Compact Flash card from the external slot

How to remove a Compact Flash card		
1.	Open the cover of the slot.	
2.	Press the eject key and remove the Compact Flash card.	
3.	Close the cover.	

11.3.2.2 Installing/removing the compact flash card in the internal slot

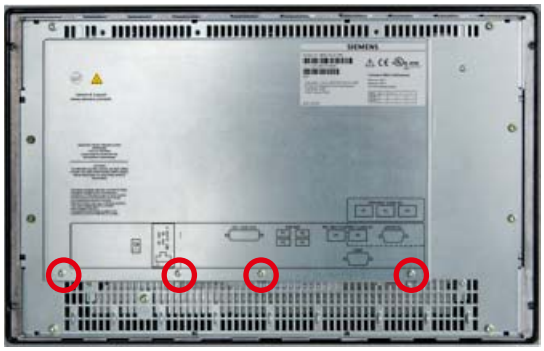
Preparatory steps

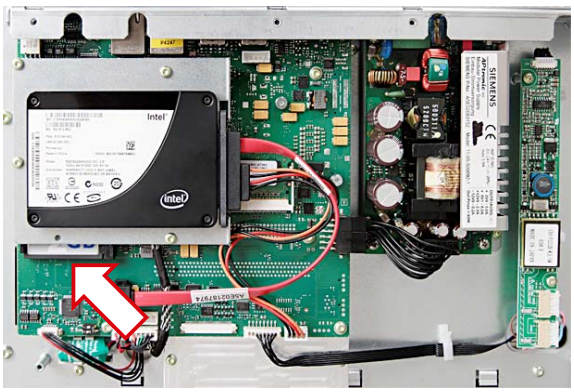
Disconnect the device from the power supply.

CAUTION

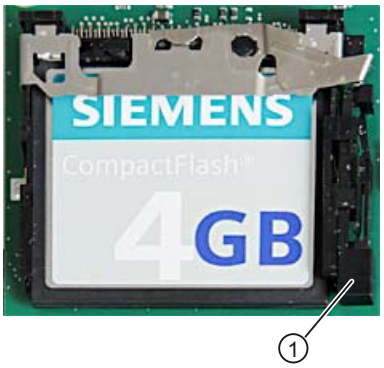
The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatically sensitive components ESD guidelines (Page 15).

Installing the Compact Flash card in the internal slot

How to install a Compact Flash card		
1.	Open the device as described in the section Open the device. (Page 99).	

How to install a Compact Flash card		
	Device with SSD: The internal slot for Compact Flash card is located under the SSD (arrow).	
	Device without SSD:	
2.	Insert the Compact Flash card ① into the slot with the connector facing in until it locks into place.	
3.	Fasten the cover.	

Removing the Compact Flash card from the internal slot

How to remove a Compact Flash card		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Press the eject key ① and remove the Compact Flash card.	
3.	Fasten the cover.	

11.3.3 SIMATIC HMI IPC477C PRO

11.3.3.1 Installing/removing a Compact Flash card

There is no external connection for a Compact Flash card on the IPC477PRO, but the device features two internal slots for Compact Flash cards:

- The upper slot is located on the motherboard.
- The lower slot is located below the motherboard.

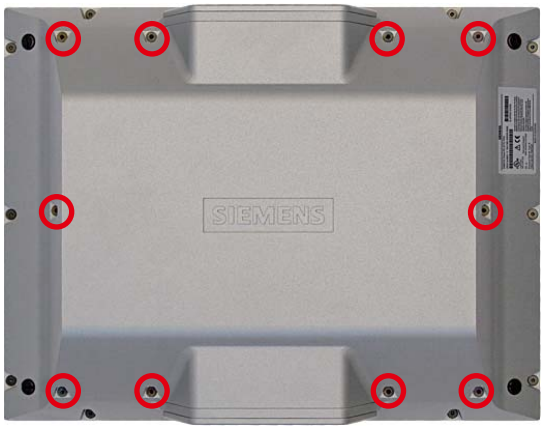
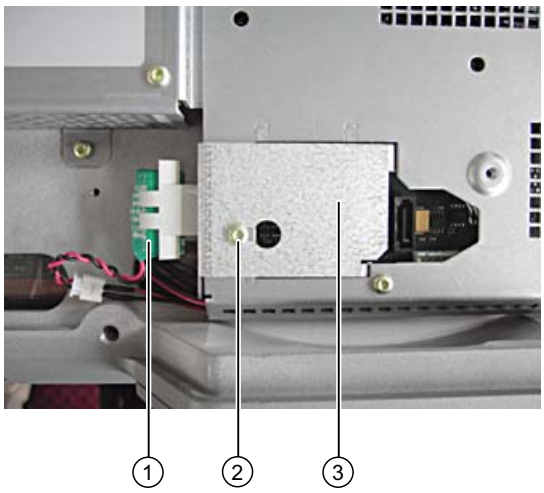
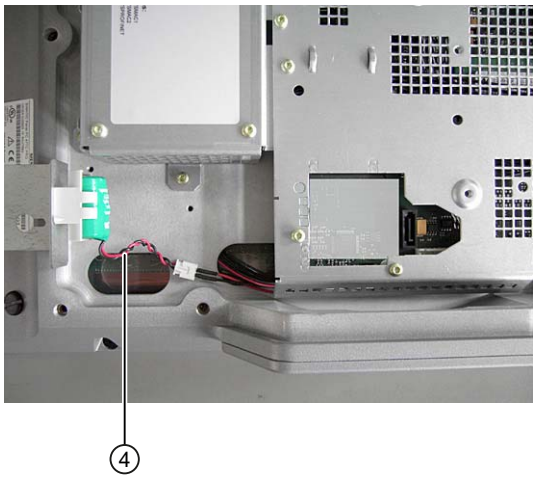
Preparation

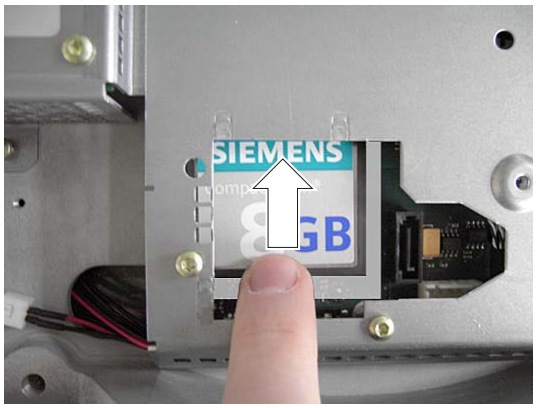
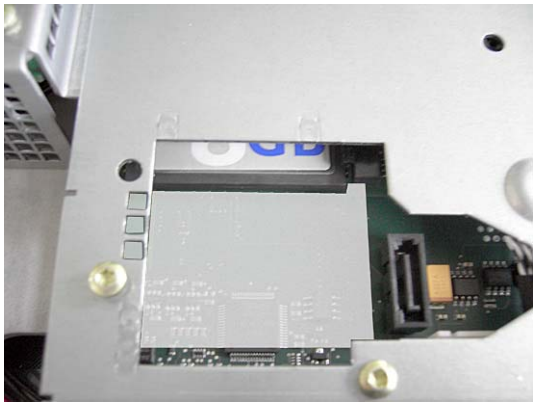
Disconnect the device from the power supply.

CAUTION

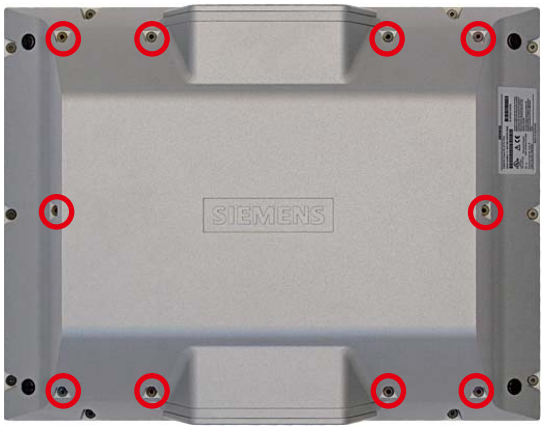
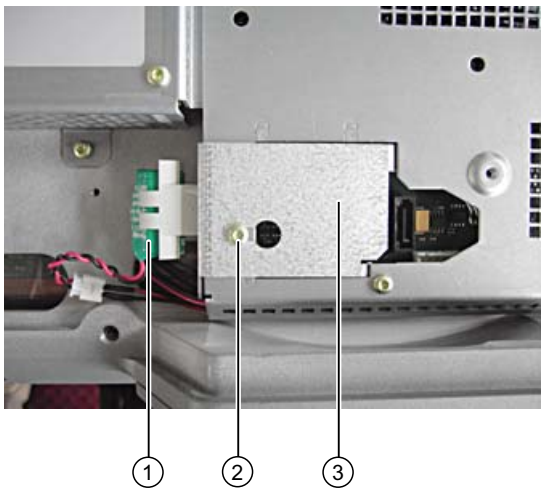
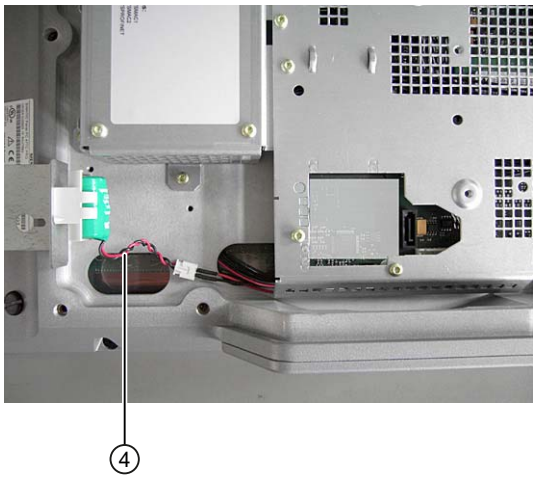
The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatically sensitive components ESD guidelines (Page 15).

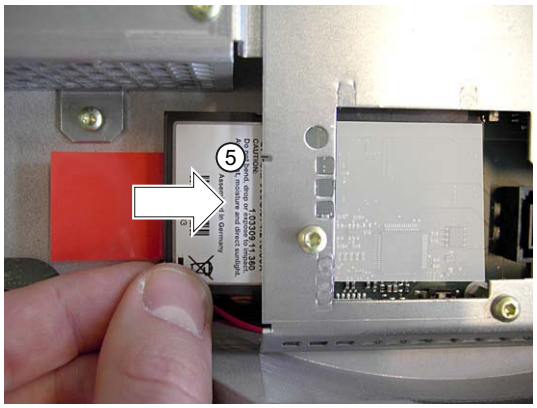
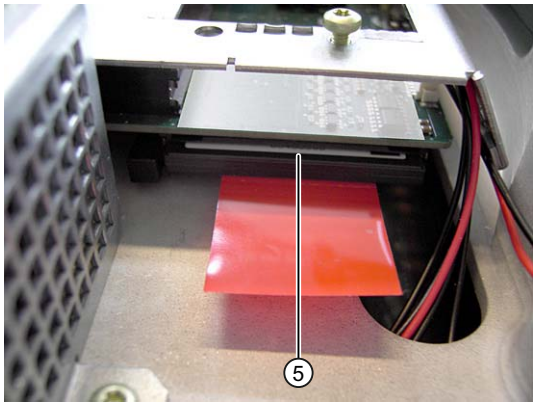
Installing the Compact Flash card in the upper slot

How to install the Compact Flash card in the upper slot		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Loosen the screws ② of the Compact Flash cover.	
3.	Slide the card protective plate ③ together with the battery ① into the position in which the card protective plate can be removed.	
4.	Remove the card protective plate. Make sure that you do not pull out the battery cable ④.	

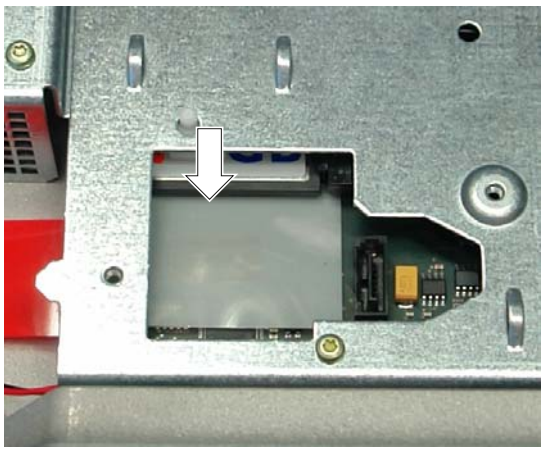
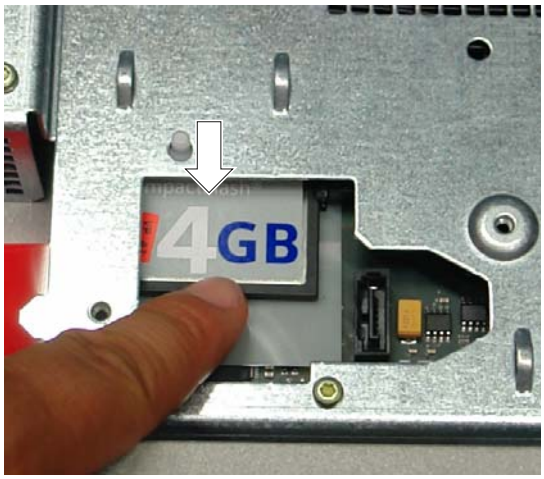
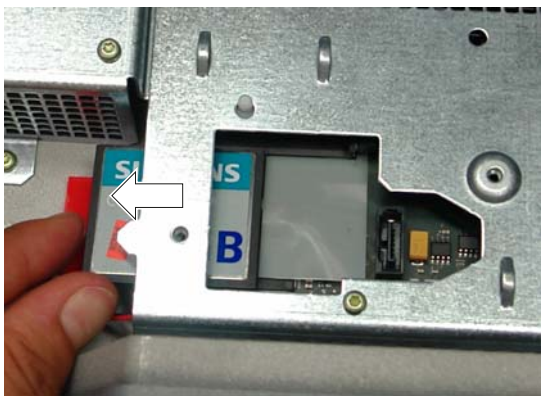
How to install the Compact Flash card in the upper slot		
5.	Insert the Compact Flash card ⑤ into the upper slot with the connector facing in until it locks into place.	  
6.	Install the Compact Flash card protective plate as described in steps 4, 3 and 2.	
7.	Fasten the cover.	

Installing the Compact Flash card in the lower slot

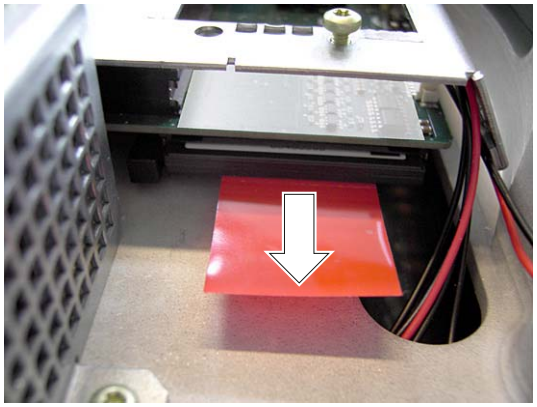
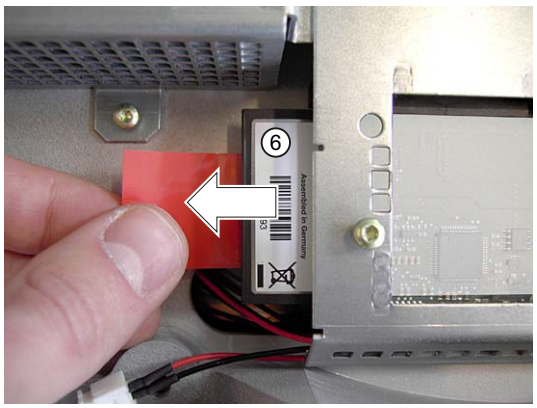
How to install the Compact Flash card in the lower slot		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Loosen the screws ② of the CompactFlash card protection.	
3.	Slide the card protective plate ③ and the battery ① into the position in which the card protective plate can be removed.	
4.	Remove the card protective plate. Make sure that you do not pull out the battery cable ④.	

How to install the Compact Flash card in the lower slot		
5.	Insert the Compact Flash card ⑤ into the lower slot with the connector facing in until it locks into place.	 
6.	Install the Compact Flash card protective plate as described in steps 4, 3 and 2.	
7.	Fasten the cover.	

Removing the Compact Flash card from the lower slot

How to remove a Compact Flash card from the upper slot		
1.	Open the device and remove the Compact Flash card protective plate as described under steps 1 to 4.	
2.	Press the eject key and remove the Compact Flash card.	 
3.	Slide the Compact Flash card to the side with your finger and take it out.	
4.	Install the Compact Flash card protective plate as described for the installation in steps 4, 3 and 2.	
5.	Fasten the cover.	

Removing the Compact Flash card from the lower slot

How to remove a Compact Flash card from the lower slot		
1.	Open the device and remove the Compact Flash card protective plate as described under steps 1 to 4.	
2.	Remove the Compact Flash card by pulling on the PE strips.	 
3.	Install the Compact Flash card protective plate as described for the installation in steps 4, 3 and 2.	
4.	Fasten the cover.	

11.3.3.2 Kit for distributed installation/removal

The Remote Kit makes it possible to separate the input device (e.g. keyboard) from the Panel and install it at a distance of up to 30 m. All properties of the Panel PC are retained.

Preparation

Disconnect the device from the power supply.

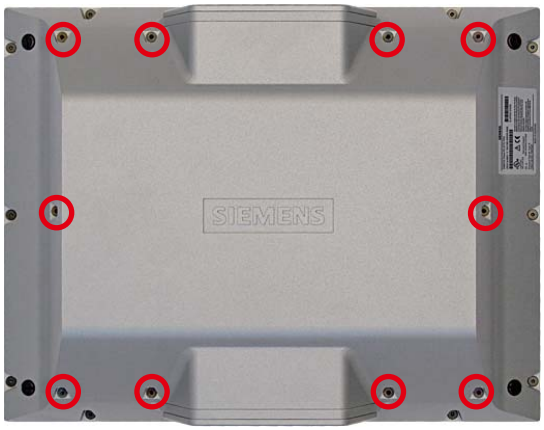
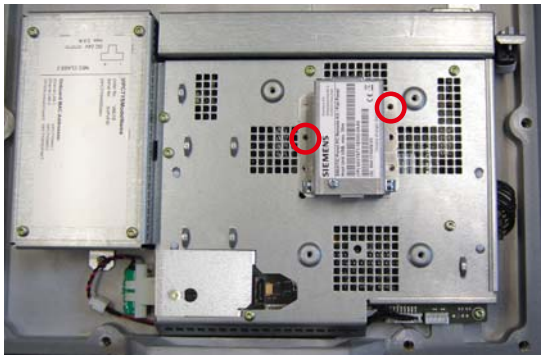
⚠ CAUTION

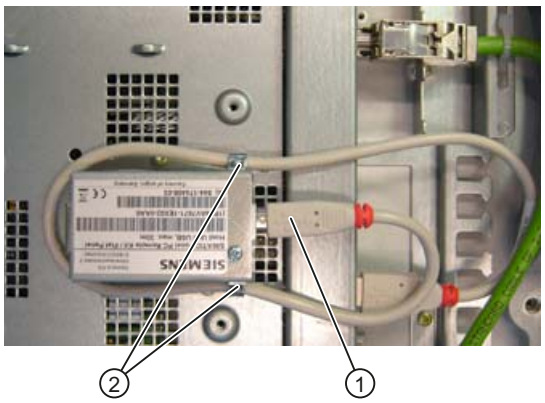
The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatically sensitive components ESD guidelines (Page 15).

Note

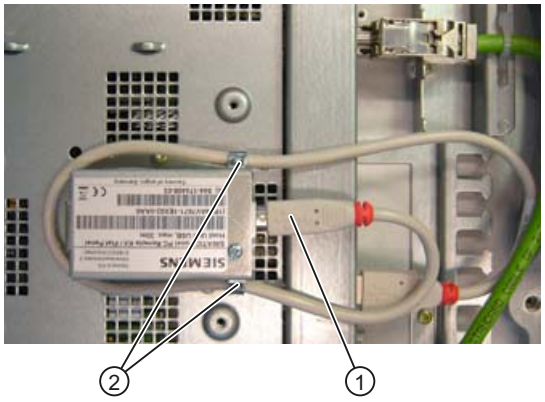
The distributed kit can only be installed as an alternative to an SSD.

Installing the distributed kit

How to install the distributed kit		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Secure the distributed kit with two screws at the position shown.	

How to install the distributed kit		
3.	Insert the cable ① into the distributed kit and secure it with the two cable clamps ②. Insert the other end of the cable into a free USB port.	
	The distributed kit is installed.	

Removing the distributed kit

How to remove the distributed kit		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Pull the cable ① from the distributed kit and remove the two cable clamps ②.	
3.	Remove the two screws.	
4.	Remove the distributed kit.	
	The distributed kit is removed.	

Maintenance and servicing 12

12.1 Cleaning the Device Front

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

Cleaning Agents

Use dish soap or foaming screen cleaner only as cleaning agents.

NOTICE
Risk of damage Do not clean the device with aggressive solvents or scrubbing agents or with pressurized air or steam cleaner.

Cleaning the Device Front

1. Switch off the device. This prevents the accidental triggering of functions when the screen and/or the membrane keyboard is touched.
2. Dampen the cleaning cloth.
3. Spray the cleaning agent on the cloth and not directly on the device.
4. Clean the device with the cleaning cloth.

12.2 Removing and installing hardware components

Replacement device SIMATIC HMI IPC477C: Product can only be supplied without storage media

Note

If a replacement device is available from stock on short-term notice, the rating plate identifies this device by its order number (ending -0AA0). The replacement device is always supplied without mass storage media (CF and/or SSD).

- If you order a replacement device, remove all storage media (SSD, Compact Flash card etc.) from your device and insert them into the replacement device.

12.2.1 Repairs

Performing repairs

Only qualified technical personnel are permitted to repair the device.

⚠ WARNING
Danger to life • Separate the device from the mains before opening it. • Use the supplied screws to close the device before commissioning.

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

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

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

NOTICE
Read the ESD guidelines (Page 15).

Liability disclaimer

All specifications and approvals are only valid when the expansion component feature the CE symbol. Observe the installation instructions for the components.

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

No liability can be accepted for impairment of functions caused by the use of third-party devices or components.

Tools

- Torx T20 (cover of device rear)
- Torx T10 (SSD mount)
- Torx T20 (equipotential bonding terminal)

12.2.2 Replace the backup battery

Note before you replace the battery

Note

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

CAUTION
Risk of damage The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer (Order no.: A5E00331143).

⚠ WARNING
Danger of explosion and the release of harmful substances For this reason, do not burn lithium batteries, do not solder on the cell body, do not open, do not short circuit, do not reverse polarity, do not heat above 100°C, dispose of correctly, and protect against direct sunlight, dampness and dew.

Disposal

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

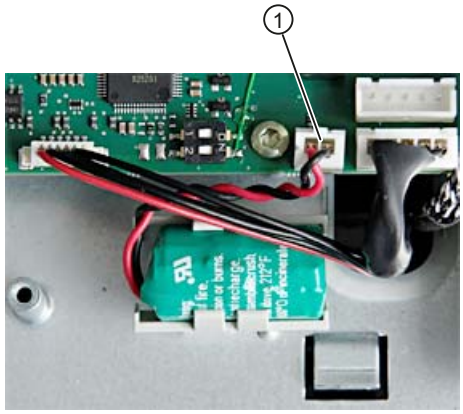
Preparatory steps

Note

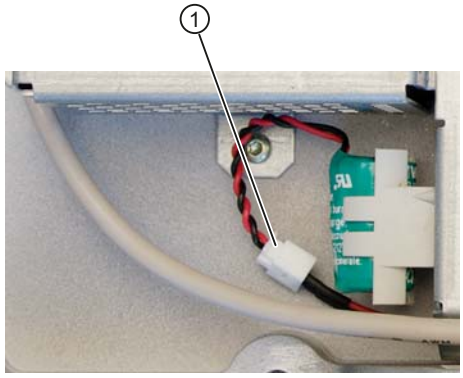
The configuration data and contents of the SRAM in the device are buffered for at least 30 seconds.

1. Note down the current settings of the BIOS setup.
   A list in which you can note down this information is found in the BIOS description.
2. Disconnect the device from the power supply.

Replacing the battery of the IPC477C

How to replace the battery		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Pull out the battery plug ①.	
3.	Remove the battery from the bay.	
4.	Insert the new battery and fasten the battery plug.	
5.	Close the device.	

Replacing the battery of the IPC477C PRO

How to replace the battery		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Pull out the battery plug ①.	
3.	Remove the battery from the bay.	
4.	Close the device.	

Reconfiguring the BIOS setup

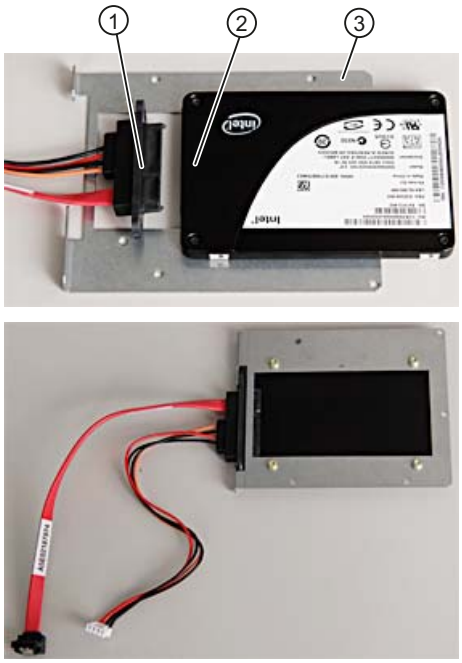
When a battery is exchanged, the configuration data of the device are lost and must be reentered in the BIOS setup.

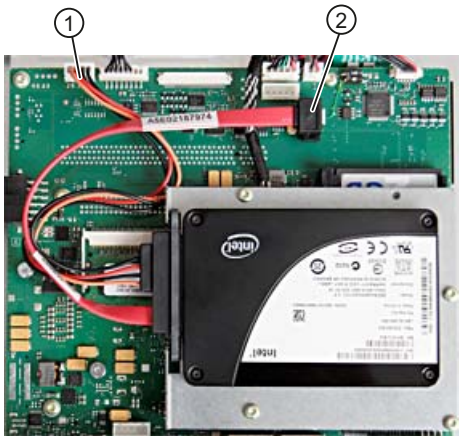
12.3 Installation/removal of SSD

NOTICE
Configuring BIOS Setup after installing the SSD The BIOS Setup needs to be configured following the installation of the SSD. (Page 173)

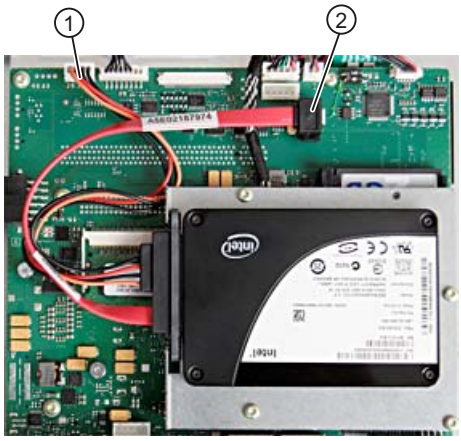
12.3.1 Installing/removing SSD with SIMATIC HMI IPC477C

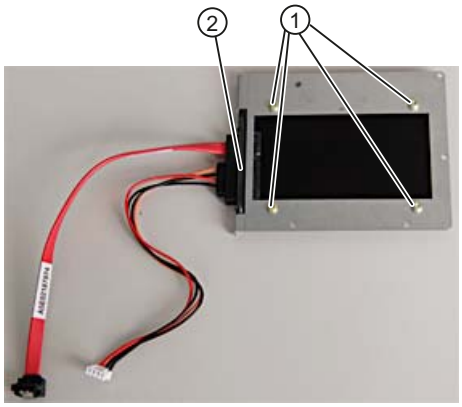
Installing SSD

How to install the SSD		
1.	Insert the plug ① into the SSD ②.	
2.	Fasten the SSD ② to the SSD mount ③ with the four screws.	
3.	Secure the SSD and SSD mount assembly to the four female-threaded hexagon bolts on the basic module specifically designed for this.	

How to install the SSD		
4.	Insert the SATA and power supply cables (② and ①) on the motherboard. The SSD is installed.	

Removing the SSD

How to remove the SSD		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Pull out the SATA and power supply cables (② and ①) from the motherboard.	
3.	Loosen the four screws ① of the SSD mount.	
4.	Remove the SSD and SSD mount assembly from the basic module.	

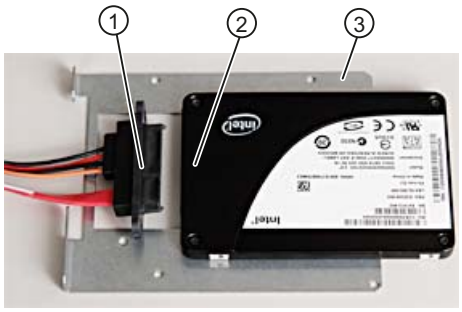
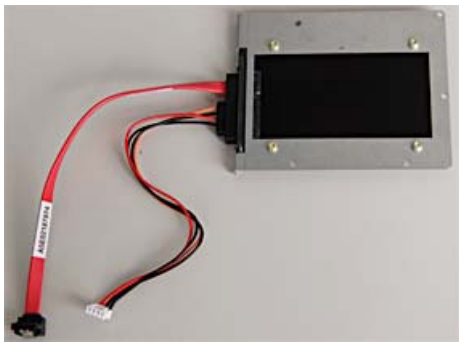
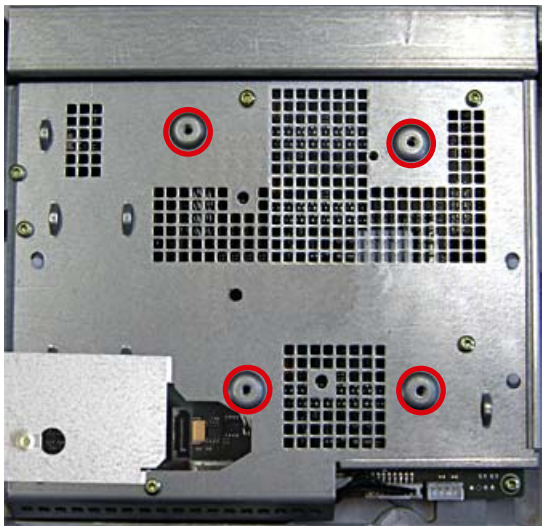
How to remove the SSD		
5.	Loosen the four screws ① of the SSD mount.	
6.	Pull out the plug ② from the SSD.	
	The SSD is removed.	

12.3.2 Installing/removing SSD with SIMATIC HMI IPC477C PRO

Location of SSD



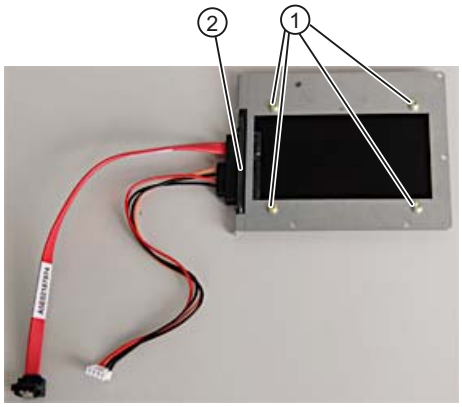
Installing SSD

How to install the SSD		
1.	Insert the plug ① into the SSD ②.	
2.	Fasten the SSD ② to the SSD mount ③ with the four screws.	
3.	Secure the SSD and SSD mount assembly to the four female-threaded bolts on the basic module specifically designed for this.	

How to install the SSD		
4.	Insert the SATA and power supply cables (② and ①) on the motherboard. The SSD is installed.	

Removing the SSD

How to remove the SSD		
1.	Open the device as described in the section Open the device. (Page 99).	
2.	Pull the SATA and power supply cables (② and ①) from the motherboard.	
3.	Loosen the four screws ① of the SSD mount.	
4.	Remove the SSD and SSD mount assembly from the basic module.	

How to remove the SSD		
5.	Loosen the four screws ① of the SSD mount.	
6.	Pull out the plug ② from the SSD.	
	The SSD is removed.	

12.4 Reinstalling the operating system

12.4.1 Windows Embedded Standard 2009 or Windows Embedded Standard 7

12.4.1.1 General installation procedure

If your software becomes corrupt for any reason, you can reinstall it from the Restore CD/DVD. The Restore CD/DVD contains an image file with the original software and is included with the product as a software package.

Note

You require a USB keyboard and a USB mouse to reinstall the operating system.

12.4.1.2 Restoring the software to delivery state using the Restore CD/DVD

You can reinstall the original factory software using the Restore CD/DVD (forms part of the scope of delivery). The CD/DVD contains the necessary images and tools for transferring the factory software to the SSD or CompactFlash card of your PC. The following options are available for restoring software:

- You can restore the entire hard disk with drive C: (system) and drive D:.
- or only drive C:. This allows you to retain any user data on drive D: on drive D:.
- Restore the entire Compact Flash card.

CAUTION
With the option "Restore system partition only", all data on drive C: (system partition) will be deleted. All data, user settings and all authorizations or license keys on drive C: are lost! All data on drive C: of your hard disk drive will be deleted. Setup formats the hard disk partition and reinstalls the original factory software. When you select the "Restore entire hard disk" option, ALL data, user settings and existing authorizations or license keys will be lost on the hard disk.

Restoring the delivery state

To restore the delivery state, proceed as follows:

1. Connect a USB CD-ROM drive to the device.
2. Insert the Restore CD/DVD in the drive and reboot the device. When the BIOS message appears

   ```
   Press <F2> to enter Setup or <ESC> to show Boot menu
   ```

   appears, press the F2 key.
3. Select the Boot menu and move the entry "CD-ROM Drive" to the first position.
4. End the BIOS setup with the "Exit Saving Changes" entry.
5. Now follow the instructions on the screen.

CAUTION
All existing **data, programs, user settings** and **authorizations or license keys will be deleted** from the hard disk and therefore lost.

For information on the functions, refer to the README.TXT file on the Restore CD/DVD.

Note

The "Legacy USB Support" option has to be set to "Enabled" in the Advanced menu of the BIOS so that the device can address a USB CD-ROM drive.

12.4.2 Windows XP Professional

12.4.2.1 General installation procedure

If your software becomes corrupt for any reason, you have two possibilities:

- **Restoring the factory state of the software by means of the Restore CD/DVD**
  The Restore CD/DVD contains an image file of the original supplied software (operating system with installed hard ware drivers) and is included in the Windows XP Professional supply variant.
- **Setting up the operating system with the Recovery DVD**
  The recovery DVD contains the tools required to set up the HDD or SSD as well as the Windows XP Professional operating system. After the required data have been copied to the HDD or/ SSD, you can run Windows XP Professional Setup to install the operating system.
  The Recovery DVD can be obtained from the Customer Support.

Note

You require a USB keyboard in order to reinstall the operating system.

12.4.2.2 Restoring the software to delivery state using the Restore CD/DVD

You can reinstall the original factory software (included in the Windows XP Professional supply variant) using the Restore CD/DVD. The CD/DVD contains the necessary images and tools for transferring the factory software to the HDD or SSD of your PC. The following options are available for restoring software: :

- You can restore the entire hard disk with drive C: (system) and drive D:.
- Only for restoring drive C:. This allows you to retain any user data on drive D:.

CAUTION

With the option "Restore system partition only", all data on drive C: (system partition) will be deleted. All data, user settings and all authorizations or license keys on drive C: are lost! All data on drive C: of your hard disk drive will be deleted. Setup formats the hard disk partition and reinstalls the original factory software.

When you select the "Restore entire hard disk" option, ALL data, user settings and existing authorizations or license keys will be lost on the hard disk.

Restoring the delivery state

To restore the delivery state, proceed as follows:

1. Connect a USB DVD-ROM drive to the device.
2. Insert the Restore CD/DVD in the drive and reboot the device. When the BIOS message appears

   ```
   Press <F2> to enter Setup or <ESC> to show Boot menu
   ```

   appears, press the F2 key.

3. Select the Boot menu and move the entry "CD-ROM Drive" to the first position.
4. End the BIOS setup with the "Exit Saving Changes" entry.
5. Now follow the instructions on the screen.

CAUTION
All existing **data, programs, user settings** and **authorizations or license keys will be deleted** from the hard disk and therefore lost.

For information on the functions, refer to the README.TXT file on the Restore CD/DVD.

Note

The "Legacy USB Support" option has to be set to "Enabled" in the Advanced menu of the BIOS so that the device can address a USB DVD-ROM drive.

Setting up the language selection for Windows XP Professional

The **M**ultilanguage **U**ser **I**nterface (MUI) allows you to set up the Windows XP Professional menus and dialogs for additional languages.

Default language of your Windows XP MUI installation is English and a US keyboard layout. You can change the language in the Control Panel by selecting

Start > Control Panel > Regional and Language Options Languages,
tab **Language used in menus and dialogs** field.

For the **Regional and Language Options** set the default as **non-Unicode programs** under **Advanced** in addition to the language for menus and dialogs.

12.4.2.3 Setting up the operating system via the Recovery DVD

Use the Recovery DVD to install Windows to suit your particular requirements. You also need the included Documentation and Drivers CD/DVD.

Note

Prerequisite is that you connect a USB CD-ROM drive to the device and have set the "Legacy USB Support" option to "Enabled" in the BIOS setup.

Booting with the Recovery DVD

1. Insert the Recovery CD in your drive, restart the device and press the ESC key when the BIOS message
   `Press <F2> to enter Setup or <ESC> to show Boot Menu`
   appears. The "Boot Menu" is displayed when initialization is completed.
2. Follow the on-screen instructions until the "Windows XP Professional Setup" window opens.

Partition setup

After you have installed a new hard disk or SSD, or if partitions are faulty, or when you wish to change the partitioning on your hard disk, you need to create or reconfigure partitions on the hard disk.

CAUTION
When you delete or create partitions or logical DOS partitions, you lose all data on the hard disk. All drives on the hard disk or SSD will be deleted.

With Windows XP operating systems, the factory state features two partitions with an NTFS file system on the hard disk. To restore the partitions to factory state, follow the on-screen instructions:

- To install the selected partition, select "ENTER"
- To create a new partition in an unpartitioned area, press C.
- To delete the selected partition, press D.

Note

The on-screen instructions are in English.

Installation of the operating system.

Follow the on-screen instructions when the "Windows XP Professional Setup" window appears.

Note

Note that there must still be free space on the drive after the selected recovery data has been transferred:
1500 MB for Windows XP

Note

If you want to use Windows XP as a professional you should have the following manual (not included in the product package) available:
Microsoft Windows XP Professional, the technical reference" (MSPress Nr 934).

This manual contains information specifically for administrators involved in installing, managing and integrating Windows in networks or multi-user environments.

12.5 Partitioning data media

12.5.1 Setting up the partitions under Windows Embedded Standard 2009

You need to set up the partitions on the CompactFlash card after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning the Compact Flash card

In delivery state, the following default partitions are set up on CompactFlash card for Windows Embedded Standard 2009:

Partition	Name	Size of the card			File system
		2 GB	4 GB	8 GB	
1. Partition	SYSTEM	1536 MB	2560 MB	5120 MB	NTFS (compressed)
2. Partition	DATA	Remainder *	Remainder *	Remainder *	NTFS (compressed)

* Due to partitioning/formatting, the actual Compact Flash capacity does not correspond to the memory size specified on the Compact Flash.

Partitioning the SSD

The following partitions are configured in the delivery state of the SSD with Windows Embedded Standard 2009:

Partition	Name	Size	File system
1. Partition	system	15 GB	NTFS (not compressed)
2. Partition	DATA	Remainder	NTFS (not compressed)

To restore the original partition to its delivery state, it is recommended to use the software tool **SIMATIC IPC Image & Partition Creator.** Detailed information about using this tool is available in the manufacturer documentation.

12.5.2 Partitioning in Windows Embedded Standard 7

You need to set up the partitions on the CompactFlash card after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning the Compact Flash card

In delivery state, the following default partitions are set up on CompactFlash card for Windows Embedded Standard 7:

Partition	Name	Size of the card		File system
		4 GB	8 GB	
1. Partition	SYSTEM	3690 MB	6150 MB	NTFS (compressed)
2. Partition	DATA	Remainder *	Remainder *	NTFS (compressed)

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

Partitioning the SSD

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

Partition	Name	Size	File system
1. Partition	SYSTEM	25 GByte	NTFS (not compressed)
2. Partition	DATA	Remainder	NTFS (not compressed)

To restore the original partition to its delivery state, it is recommended to use the software tool **SIMATIC IPC Image & Partition Creator.** Detailed information about using this tool is available in the manufacturer documentation.

12.5.3 Setting up the partitions under Windows XP Professional

You need to set up the partitions on the CompactFlash card after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning the SSD

The following partitions are configured in the delivery state of the SSD with Windows XP Professional:

Partition	Name	Size	File system
1. Partition	SYSTEM	15 GB	NTFS (not compressed)
2. Partition	DATA	Remainder	NTFS (not compressed)

To restore the original partition to its delivery state, it is recommended to use the software tool **SIMATIC IPC Image & Partition Creator**. Detailed information about using this tool is available in the manufacturer documentation.

12.5.4 Partitioning in Windows 7 Ultimate

You need to set up the partitions on the CompactFlash card after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning the SSD

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

Partition	Name	Size	File system
1. Partition	SYSTEM	25 GByte	NTFS (not compressed)
2. Partition	DATA	Remainder	NTFS (not compressed)

To restore the original partition to its delivery state, it is recommended to use the software tool **SIMATIC IPC Image & Partition Creator.** Detailed information about using this tool is available in the manufacturer documentation.

12.5.5 Adapting partitions in Windows 7 and Windows Embedded Standard 7

You can adapt the partitioning of your CF, SSD or HDD with the partition manager.

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

NOTICE
Data lost in the case of deleting a partition! If you delete a partition, all the data on this partition is lost. Back up your data before you change partitions.

Requirements

You are logged on as an administrator.

Reduce partition

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

Increase partition

Note

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

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

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

12.6 Installing updates

12.6.1 Updating the operating system

Windows Embedded Standard 2009 and Windows Embedded Standard 7

An update of the operating systems is only possible with a new version of the Restore CD/DVD. Please contact customer support for more information about its availability.

Windows XP Professional / Windows 7

Monthly updates for the Windows XP Professional and Windows 7 operating systems are available fro download from the Internet at Microsoft Side Guide (http://www.microsoft.com) .

NOTICE
Before you install new drivers or operating system updates at Windows XP Professional and Windows 7 MUI versions, the regional settings for menus and dialogs and the default language have to be reset to US English.

Other operating systems

Please contact the corresponding manufacturer.

12.6.2 Installing or updating application programs and drivers

To install software for Windows Embedded Standard / Windows XP Professional / Windows 7 from a CD and/or floppy disk, you must connect a corresponding external USB drive to your computer.

Drivers for USB floppy drives and CD-ROM drives are included in Windows Embedded Standard / Windows XP Professional / Windows 7 and do not have to be installed from other sources.

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

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

NOTICE
Before you install new drivers or operating system updates at Windows XP Professional MUI versions, the regional settings for menus and dialogs and the default language have to be reset to US English.

12.6.3 Performing a BIOS update

Download from BIOS update

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

You can find the downloads in the Internet (http://www.siemens.com/asis) in the "Support" tab under "Tools & Downloads"´. Using the global search function, you can then also search for any downloads you require.

12.7 Data backup

Data backup in Windows Embedded Standard / Windows XP Professional / Windows 7

To backup data in Windows Embedded Standard, Windows XP Professional and Windows 7, we recommend you use the "SIMATIC IPC Image & Partition Creator" software tool. This tool provides convenient and efficient functions for backing up and restoring the full content of drives and individual partitions (images).

The software can be ordered from the Siemens A&D online ordering system. For more information about "SIMATIC IPC Image & Partition Creator", refer to the corresponding product documentation.

12.8 Installing drivers and software

12.8.1 Installing drivers for Windows Embedded Standard 2009 and Windows Embedded Standard 7

Install the drivers for Windows Embedded Standard 2009 or Windows Embedded Standard 7 as for Windows XP Professional or Windows 7. Observe the Setup instructions of the driver manufacturer.

During driver installation in Windows Embedded Standard 2009, Setup may prompt you to insert the Windows XP Installation CD or SP2 CD.

In this case, insert the Restore DVD. The required files are in the \Drivers_XPE folder.

12.8.2 Installation of driver and software

NOTICE
Before you install new drivers or updates for multilingual operating systems, (MUI versions), reset the regional settings for menus and dialogs and the default language to US English.

Install the drivers and software from the included "Documentation and Drivers" CD.
Procedure:

1. Insert the CD/DVD into the drive.
2. Start the program with "START".
3. Select "Drivers & Updates" from the index.
4. Select the operating system in "Drivers & Updates".
5. Install the required driver.

Note

During driver installation in Windows Embedded Standard 2009, Setup may prompt you to insert the "Windows XP Installation CD", or SP2 CD. You will find the necessary drivers on the recovery DVD in the \Drivers_XPE folder.

NOTICE
For new Windows XP / Windows 7 installations, you must always install the chipset driver before you install any other drivers.

12.9 CP 1616 onboard

NDIS device driver

Read the information in the description Installation_CP16xx.pdf document on the supplied Documentation and Drivers CD.

PROFINET IO

Please observe the information on the SIMATIC devices and SIMATIC NET documentation listed in the chapter "Integration".

Alarm, error and system messages 13

13.1 Boot error messages

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

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

The following lists the error messages from the system BIOS. For information on error messages output by the operating system or programs, refer to the corresponding manuals.

On-screen error messages

On-screen error message	Meaning / suggestions
Address conflict	Plug-and-Play problem. Contact your technical support team.
Combination not supported	Plug-and-Play problem. Contact your technical support team.
IO device IRQ conflict	Plug-and-Play problem. Contact your technical support team.
Invalid system configuration data	Plug-and-Play problem • Set the RESET CONFIGURATION DATA option in the "Advanced" menu of Setup. • Contact your technical support team.
Allocation Error for ...	Plug-and-Play problem • Please undo the last hardware change. • Contact your technical support team.
System battery is dead. Replace and run SETUP	The battery on the CPU module is defective or dead. Contact your technical support team.
System CMOS checksum bad Run SETUP	Call up SETUP, adjust settings and save. If this message appears during each startup, contact your technical support team.
Failure Fixed Disk	Error accessing the hard drive. Check the SETUP settings. Contact your technical support team.
System RAM Failed at offset:	Memory error. Contact your technical support team.
Shadow RAM Failed at offset:	Memory error. Contact your technical support team.
Extended RAM Failed at offset:	Memory error. Contact your technical support team.
Failing Bits:	Memory error. Contact your technical support team.

On-screen error message	Meaning / suggestions
Operating system not found	Possible causes: • No operating system present • Incorrect active boot partition • Wrong boot drive settings in SETUP
Previous boot incomplete Default configuration used	Abort of the previous BOOT procedure, for example, due to a power failure. Adjust the settings in SETUP.
System time-out	Hardware error. Contact your technical support team.
Real-time clock error	Clock chip error. Contact your technical support team.
Keyboard controller error	Controller error. Contact your technical support team.

Troubleshooting/FAQs

14

14.1 General problems

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

Problem	Possible cause	Remedy
The device is not operational.	There is no power supply to the device.	Check the power supply.
The display remains dark	The display is in "powersave" mode.	Press any key on the keyboard.
	The power cord is not connected.	Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet.
		If the display still remains dark after you have performed these checks, contact your technical support team.
The mouse pointer does not appear on the display.	The mouse driver is not loaded.	Check whether the mouse driver is properly installed and present when you start the application program. For more detailed information, refer to the manuals for the mouse or application programs.
	The mouse is not connected.	Check whether the mouse cord is properly connected to the system unit. If you use an adapter or extension on the mouse cable, also check the connectors.
		If the mouse pointer still does not appear on the display after you have performed these checks and measures, contact your technical support team.
Wrong time and/or date on the PC.		1. Press <F2> within the boot sequence to open the BIOS Setup. 2. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and data are still wrong.	The backup battery is dead.	In this case, please contact your technical support team.
USB device not responding.	Operating system does not support the USB port.	No remedy
	The operating system does not have a suitable driver for the USB device.	Install a suitable driver; the correct driver can often be downloaded from the homepage of the device's manufacturer. The EWF for Windows Embedded Standard 2009 and Windows Embedded Standard 7 must first be disabled for this purpose.

Technical specifications

15

15.1 General technical specifications SIMATIC HMI IPC477C

General technical specifications	
Order numbers	See the order documents
Dimensions	Device with touch screen, 12" display 400x310x60 (WxHxD in mm) Device with touch screen, 15" display: 483x310x64 (WxHxD in mm) Device with touch screen, 19" display: 483x400x71 (WxHxD in mm) Device with key panel, 12" display 483x310x60 (WxHxD in mm) Device with key panel, 15" display 483x355x59 (WxHxD in mm)
Weight	Device with touch screen, 12" display 6.1 kg Device with touch screen, 15" display: 7.0 kg Device with touch screen, 19" display: 9.5 kg Device with key panel, 12" display 6.6 kg Device with key panel, 15" display 7.2 kg
Supply voltage	24 VDC [1] (19.2 to 28.8 V)
Brief power failure according to Namur	Min. 15 ms (DC) Max. 10 events per hour; min. 1 s recovery time
Max. power consumption (DC): 12", 15" or 19" devices	Max. continuous current 3.9 A (starting current 4.5 A / 15 ms)
Degree of protection	IP 20 to IEC 60529

[1] The generation of the 24 VDC supply voltage by the line-side power supply must be made as functional extra-low voltage with safe electrical isolation according to IEC 60364--4--41 or as SELV in conformity to IEC/UL/EN/DIN-EN 60950-1 and LPS / NEC Class 2.

General technical specifications	
Security	
Protection class	Protection class I to IEC 61140
Safety regulations	EN60950-1, UL 508; CSA C22.2 No. 142
Electromagnetic compatibility (EMC)	
Emitted interference	EN 61000-6-4; CISPR 22:2004 Class A; FCC Class A
Noise immunity on signal lines	± 1 kV; (to IEC 61000-4-4, burst, length < 30 m) ± 2 kV; (to IEC 61000-4-4, surge symmetrical, length > 30 m) ± 2 kV (to IEC 61000-4-5, surge symmetrical, length > 30 m)

General technical specifications	
Immunity to conducted interference on the supply lines	± 2 kV (to IEC 61000-4-4, burst) ± 1 kV (to IEC 61000-4-5, surge symmetrical) ± 2 kV (to IEC 61000-4-5, surge asymmetrical)
Immunity to electrostatic discharge	± 6 kV, contact discharge (to IEC 61000-4-2) ± 8 kV, air discharge (to IEC 61000-4-2)
Immunity to RF interference	10 V/m, 80 - 1000 MHz, 80% AM; (to IEC 61000-4-3) 10 V/m, 1.4 - 2 GHz 1 V/m, 2 - 2.7 GHz 10 V, 9 kHz - 80 MHz; (to IEC 61000-4-6)
Immunity to magnetic fields	100A/m, 50/60 Hz; (to IEC 61000-4-8)
Climatic conditions	
Temperature - in operation Vertical mounting position with ± 45° angle Gradient - Storage/transport Gradient	tested to IEC 60068-2-1, IEC 60068-2-2 0 - 45°C (front and rear of device) with full configuration 0 - 50°C (rear), 40°C (front) max. 10° C/h, no condensation -20 °C to +60°C max. 20° C/h, no condensation
Relative humidity - Operation - Storage/transport	tested to IEC 60068-2-78, IEC 60068-2-30 5% to 85% at 30° C (no condensation) 5% to 95% at 25° C (no condensation)
Air pressure - Operation - Storage/transport	Tested to IEC 60068-2-13 1080 to 795 hPa (corresponds to an altitude of -1000 m to 2000 m) 1080 to 660 hPa (corresponds to an altitude of -1000 m to 3500 m)
Mech. Ambient conditions	
Vibration - in operation - Storage/transport	Tested to IEC 60068-2-6 10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2 5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Resistance to shock - in operation - Storage/transport	Tested to IEC 60068-2-27 50 m/s^2, 30 ms 250 m/s^2, 6 ms
Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Intel Celeron M 1.2 GHz, 800 MHz FSB or Intel Pentium Core 2 Solo 1.2 GHz, 800 MHz FSB, 3 MB SLC or Intel Pentium Core 2 Duo 1.2 GHz, 800 MHz FSB, 3 MB SLC
Main memory	SO-DIMM module; 1024/2048/4096 MB DDR3-SDRAM
Backup memory	2 MB SRAM (128 KB of this can be backed up in the buffer time of the power supply)

General technical specifications	
Drives / storage media	
Compact Flash card	2048/4096/8192 MB
SSD	≥32 GByte; 2.5" SATA-SSD optional
Graphics	
Display	12" screen diagonal with background illumination, resolution 800x600 pixels 15" screen diagonal with background illumination, resolution 1024x768 pixels 19" screen diagonal with background illumination, resolution 1280x1024 pixels
Touch controller (only touch screen devices)	Resistive Semtech controller ELO CTR-2216SU-AT-CHP-00 Touchscreen analog resistive Touch force (with test pen of 2 mm diameter): 5N
Graphic connector	DVI connection with external VGA output
Resolutions / controller	From 640x480 to 1600x1200
Interfaces	
COM1	RS232, max. 115 Kbps., 9-pin SUB D, male
DVI	VGA integrated in the DVI-I
Keyboard	USB support
Mouse	USB support
USB	1x USB 2.0 / 500 mA (device front) 4x USB 2.0 / 500 mA (device rear)
PROFIBUS / MPI interface, isolated	9-pin SUB D socket, 2-row
- Transmission speed - Operating modes	9.6 Kbps to 12 Mbps DP master: DP-V0, DP-V1 with SOFTNET-DP DP slave: DP-V0, DP-V1 with SOFTNET-DP slave (only for devices with PROFIBUS feature)
Ethernet	2x Ethernet ports (RJ45) Intel Tekoa 82573L 10/100/1000 Mbps, isolated Teaming-capable
PROFINET	3x PROFINET via 100 Mbps Ethernet (only for devices with PROFINET feature) - Transmission rate 10/100 Mbps - Half/full duplex - Autocrossover, Autonegotiation - Autopolarity for 10 Mbit - LED functions for link and activity

15.2 General technical specifications SIMATIC HMI IPC477C PRO

General technical specifications	
Order numbers	See the order documents
Dimensions	Device with touch screen, 15" display: 400x350x105 (WxHxD in mm) Device with touch screen, 19" display: 483x400x119 (WxHxD in mm)
Weight	Device with touch screen, 15" display: 7.4 kg Device with touch screen, 19" display: 11.0 kg
Supply voltage	24 VDC [1] (19.2 to 28.8 V)
Brief power failure according to Namur	Min. 15 ms (DC) Max. 10 events per hour; min. 1 s recovery time
Maximum power consumption 15" and 19" devices	Continuous current 3.9 A (starting current 4.5 A / 15 ms)
Degree of protection	IP65

[1] The generation of the 24 VDC supply voltage by the line-side power supply must be made as functional extra-low voltage with safe electrical isolation according to IEC 60364--4--41 or as SELV in conformity to IEC/UL/EN/DIN-EN 60950-1 and LPS / NEC Class 2.

General technical specifications	
Security	
Protection class	Protection class I to IEC 61140
Safety regulations	EN60950-1, UL 508; CSA C22.2 No. 142
Electromagnetic compatibility (EMC)	
Emitted interference	EN 61000-6-4; CISPR 22:2004 Class A; FCC Class A
Noise immunity on signal lines	± 1 kV; (to IEC 61000-4-4, burst, length < 30 m) ± 2 kV; (to IEC 61000-4-4, burst symmetrical, length > 30 m) ± 2 kV (to IEC 61000-4-5, surge symmetrical, length > 30 m)
Immunity to conducted interference on the supply lines	± 2 kV (to IEC 61000-4-4, burst) ± 1 kV (to IEC 61000-4-5, surge symmetrical) ± 2 kV (to IEC 61000-4-5, surge asymmetrical)
Immunity to electrostatic discharge	± 6 kV, contact discharge (to IEC 61000-4-2) ± 8 kV, air discharge (to IEC 61000-4-2)
Immunity to RF interference	10 V/m, 80 - 1000 MHz, 80% AM; (to IEC 61000-4-3) 10 V/m, 1.4 - 2 GHz 1 V/m, 2 - 2.7 GHz 10 V, 9 kHz - 80 MHz; (to IEC 61000-4-6)
Immunity to magnetic fields	100A/m, 50/60 Hz; (to IEC 61000-4-8)

General technical specifications	
Climatic conditions	
Temperature	Tested to IEC 60068-2-1, IEC 60068-2-2
- in operation	
Vertical mounting position with ± 45° angle	15" device: 0 to 45°C
	19" device: 0 to 40°C
Gradient	max. 10° C/h, no condensation
- Storage/transport	-20 °C to +60°C
Gradient	max. 20° C/h, no condensation
Relative humidity	tested to IEC 60068-2-78, IEC 60068-2-30
- in operation	5% to 85% at 30° C (no condensation)
- Storage/transport	5% to 95% at 25°C (no condensation)
Air pressure	
- Operation	1080 to 795 hPa
	(corresponds to an altitude of -1000 m to 2000 m)
- Storage/transport	1080 to 660 hPa
	(corresponds to an altitude of -1000 m to 3500 m)
Mech. Ambient conditions	
Vibration	Tested to IEC 60068-2-6
- in operation	10 to 58 Hz: 0.0375 mm, 58 to 500 Hz: 4.9 m/s^2
- Storage/transport	(with basic adapter, 9.8m/s^2 on support arm)
	5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Resistance to shock	Tested to IEC 60068-2-27
- In operation	50 m/s^2, 30 ms
- Storage/transport	250 m/s^2 , 6 ms
Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Intel Celeron M 1.2 GHz, 800 MHz FSB or
	Intel Pentium Core 2 Solo 1.2 GHz, 800 MHz FSB, 3 MB SLC or
	Intel Pentium Core 2 Duo 1.2 GHz, 800 MHz FSB, 3 MB SLC
Main memory	SO-DIMM module; 1024/2048/4096 MB DDR3-SDRAM
Backup memory	2 MB SRAM (128 KB of this can be backed up in the buffer time of the power supply)
Drives / storage media	
Compact Flash card	2048/4096/8192 MB
SSD	≥32 GByte; 2.5" SATA-SSD optional
Graphics	
Display	15" screen diagonal with background illumination, resolution 1024x768 pixels
	19" screen diagonal with background illumination, resolution 1280x1024 pixels
Touch controller	Resistive Semtech controller ELO CTR-2216SU-AT-CHP-00 Touchscreen analog resistive Touch force (with test pen of 2 mm diameter): 5N

General technical specifications	
Graphic connector	DVI connection with external VGA output
Resolutions / controller	From 640x480 to 1600x1200
Interfaces	
COM1	RS232, max. 115 Kbps., 9-pin SUB D, male
DVI	VGA integrated in the DVI-I
Keyboard	USB support
Mouse	USB support
USB	4 x USB 2.0 / 500 mA (device rear)
PROFIBUS / MPI interface, isolated	9-pin SUB D socket, 2-row
- Transmission speed - Operating modes	9.6 Kbps to 12 Mbps DP master: DP-V0, DP-V1 with SOFTNET-DP DP slave: DP-V0, DP-V1 with SOFTNET-DP slave (only for devices with PROFIBUS feature)
Ethernet	2x Ethernet ports (RJ45) Intel Tekoa 82573L 10/100/1000 Mbps, isolated Teaming-capable
PROFINET	3x PROFINET via 100 Mbps Ethernet (only for devices with PROFINET feature) - Transmission rate 10/100 Mbps - Half/full duplex - Autocrossover, Autonegotiation - Autopolarity for 10 Mbit - LED functions for link and activity

15.3 Power requirements of the components

Maximum power consumption of the auxiliary components

Auxiliary components		Maximum permitted power consumption				Max. total power
		+5 V	+3.3 V	+12 V	-12 V	
USB device	High current	500 mA	--	--	--	6 W (for all USB devices)
	Low current	100 mA	--	--	--	

15.4 Power supply

Technical specifications

Input Voltage	24 VDC (19.2 to 28.8 VDC)
Power consumption 1)	Max. 72 W
Power failure buffering	Hold-up time > 15 ms (after > 5 ms DC_FAIL becomes active)
Maximum continuous output power 1)	60 W
Degree of protection	IP20
Protection class	Safety class I (A protective conductor must be connected to the device)

1) The performance specifications apply to the power supply components and the IPC477C device.

Note

Inrush current

A minimum of 4.5 A inrush current for 15 ms is required for starting the IPC477C.

The peak value of the startup current depends on the input voltage and the impedance of the 24V source: Peak values of more than 4.5 A are possible. This will not inhibit the operation of the IPC477C.

15.5 Keyboard table

Key codes

The following table applies only to control units with key panels. It contains all characters that can be entered in SIMATIC KeyTools in the "Key code table" area and under "User specific". The character that is triggered by pressing a specific key is listed in the "Display/function" column. You can find additional information in the documentation for SIMATIC KeyTools on the "Documentation and Drivers" CD.

Name	Code (Hex) 0x	Check-box	Display/function
a A	4	—	a
		L Shift/R Shift	A
		R Alt	á
		R Alt+L Shift/R Shift	Á
b B	5	—	b
		L Shift/R Shift	B

Name	Code (Hex) 0x	Check-box	Display/function
c C	6	—	c
		L Shift/R Shift	C
		R Alt	©
		R Alt+L Shift/R Shift	¢
		L Ctrl/R Ctrl	Copy
d D	7	—	d
		L Shift/R Shift	D
		R Alt	ð
		R Alt+L Shift/R Shift	Ð
e E	8	—	e
		L Shift/R Shift	E
		R Alt	é
		L Shift/R Shift	É
		L Gui/R Gui	Start Windows Explorer
f F	9	—	f
		L Shift/R Shift	F
		L Gui/R Gui	Find folder and file
g G	0A	—	g
		L Shift/R Shift	G
h H	0B	—	h
		L Shift/R Shift	H
i I	0C	—	i
		L Shift/R Shift	I
		R Alt	í
		R Alt+L Shift/R Shift	Í
j J	0D	—	j
		L Shift/R Shift	J
k K	0E	—	k
		L Shift/R Shift	K
l L	0F	—	l
		L Shift/R Shift	L
		R Alt	ø
		R Alt+L Shift/R Shift	Ø
m M	10	—	m
		L Shift/R Shift	M
		R Alt	µ
		L Gui/R Gui	Minimize all windows

Name	Code (Hex) 0x	Check-box	Display/function
n N	11	—	n
		L Shift/R Shift	N
		R Alt	ñ
		R Alt+L Shift/R Shift	Ñ
o O	12	—	o
		L Shift/R Shift	O
		R Alt	ó
		R Alt+L Shift/R Shift	Ó
		L Ctrl/R Ctrl	Open
p P	13	—	p
		L Shift/R Shift	P
		R Alt	ö
		R Alt+L Shift/R Shift	Ö
		L Ctrl/R Ctrl	Printing
q Q	14	—	q
		L Shift/R Shift	Q
		R Alt	ä
		R Alt+L Shift/R Shift	Ä
r R	15	—	r
		L Shift/R Shift	R
		R Alt	®
		L Gui/R Gui	Display "Run" dialog
s S	16	—	s
		L Shift/R Shift	S
		R Alt	ß
		R Alt+L Shift/R Shift	§
		L Ctrl/R Ctrl	Save
t T	17	—	t
		L Shift/R Shift	T
		R Alt	þ
		R Alt+L Shift/R Shift	Þ
u U	18	—	u
		L Shift/R Shift	U
		R Alt	ú
		R Alt+L Shift/R Shift	Ú

Name	Code (Hex) 0x	Check-box	Display/function
v V	19	—	v
		L Shift/R Shift	V
		L Ctrl/R Ctrl	Paste
w W	1A	—	w
		L Shift/R Shift	W
		R Alt	å
		R Alt+L Shift/R Shift	Å
x X	1B	—	x
		L Shift/R Shift	X
		L Ctrl/R Ctrl	Cut
y Y	1C	—	y
		L Shift/R Shift	Y
		R Alt	ü
		R Alt+L Shift/R Shift	Ü
z Z	1D	—	z
		L Shift/R Shift	Z
		R Alt	æ
		R Alt+L Shift/R Shift	Æ
		L Ctrl/R Ctrl	
1 !	1E	—	1
		L Shift/R Shift	!
		R Alt	¡
		R Alt+L Shift/R Shift	¹
2 @	1F	—	2
		L Shift/R Shift	@
		R Alt	²
3 #	20	—	3
		L Shift/R Shift	#
		R Alt	³
4 $	21	—	4
		L Shift/R Shift	$
		R Alt	¤
		R Alt+L Shift/R Shift	£
5 %	22	—	5
		L Shift/R Shift	%
		R Alt	€

Name	Code (Hex) 0x	Check-box	Display/function
6 ^	23	—	6
		L Shift/R Shift	^
		R Alt	¼
7 &	24	—	7
		L Shift/R Shift	&
		R Alt	½
8 *	25	—	8
		L Shift/R Shift	*
		R Alt	¾
9 (	26	—	9
		L Shift/R Shift	(
		R Alt	'
0)	27	—	0
		L Shift/R Shift	)
		R Alt	'
Return	28	—	Return
Escape	29	—	Escape
Backspace	2A	—	Backspace
Tab	2B	—	Tab
Space	2C	—	Space
- _	2D	—	-
		L Shift/R Shift	_
		R Alt	¥
= +	2E	—	=
		L Shift/R Shift	+
		R Alt	×
		R Alt+L Shift/R Shift	÷
[{	2F	—	[
		L Shift/R Shift	{
		R Alt	«
] }	30	—	]
		L Shift/R Shift	}
		R Alt	»
\ |	31	—	\
		L Shift/R Shift	|
		R Alt	¬
		R Alt+L Shift/R Shift	¦

Name	Code (Hex) 0x	Check-box	Display/function
Europe 1	32	—	Europe 1
; :	33	—	;
		L Shift/R Shift	:
		R Alt	¶
		R Alt+L Shift/R Shift	°
’ "	34	—	
		L Shift/R Shift	"
		R Alt	´
		R Alt+L Shift/R Shift	¨
‘ ~	35	—	‘
		L Shift/R Shift	~
, <	36	—	,
		L Shift/R Shift	<
		R Alt	ç
		R Alt+L Shift/R Shift	Ç
. >	37	—	.
		L Shift/R Shift	>
/ ?	38	—	/
		L Shift/R Shift	?
		R Alt	¿
Caps Lock	39	—	Caps Lock
F1	3A	—	F1
		L Shift/R Shift	F13
		L Ctrl/R Ctrl	S5
F2	3B	—	F2
		L Shift/R Shift	F14
		L Ctrl/R Ctrl	S6
F3	3C	—	F3
		L Shift/R Shift	F15
		L Ctrl/R Ctrl	S7
F4	3D	—	F4
		L Shift/R Shift	F16
		L Ctrl/R Ctrl	S8
F5	3E	—	F5
		L Shift/R Shift	F17
		L Ctrl/R Ctrl	S9
F6	3F	—	F6
		L Shift/R Shift	F18
		L Ctrl/R Ctrl	S10

Name	Code (Hex) 0x	Check-box	Display/function
F7	40	—	F7
		L Shift/R Shift	F19
		L Ctrl/R Ctrl	S11
F8	41	—	F8
		L Shift/R Shift	F20
		L Ctrl/R Ctrl	S12
F9	42	—	F9
		L Shift/R Shift	S1
		L Ctrl/R Ctrl	S13
F10	43	—	F10
		L Shift/R Shift	S2
		L Ctrl/R Ctrl	S14
F11	44	—	F11
		L Shift/R Shift	S3
		L Ctrl/R Ctrl	S15
F12	45	—	F12
		L Shift/R Shift	S4
		L Ctrl/R Ctrl	S16
Print Screen, F_N+INS	46	—	Print Screen, F_N+INS
Scroll Lock	47	—	Scroll Lock
Break, Ctrl+Pause	48	—	Break, Ctrl+Pause
Pause	48	—	Pause
Insert	49	—	Insert
Home	4A	—	Home
Page Up	4B	—	Page Up
Delete	4C	—	Delete
End	4D	—	End
Page Down	4E	—	Page Down
Right Arrow	4F	—	Right Arrow
Left Arrow	50	—	Left Arrow
Down Arrow	51	—	Down Arrow
Up Arrow	52	—	Up Arrow
Num Lock	53	—	Num Lock
Keypad /	54	—	Keypad /
Keypad *	55	—	Keypad *
Keypad -	56	—	Keypad -
Keypad +	57	—	Keypad +
Keypad Enter	58	—	Keypad Enter
Keypad 1 End	59	—	Keypad 1 End
Keypad 2 Down	5A	—	Keypad 2 Down
Keypad 3 PageDn	5B	—	Keypad 3 PageDn
Keypad 4 Left	5C	—	Keypad 4 Left

Name	Code (Hex) 0x	Check-box	Display/function
Keypad 5	5D	—	Keypad 5
Keypad 6 Right	5E	—	Keypad 6 Right
Keypad 7 Home	5F	—	Keypad 7 Home
Keypad 8 Up	60	—	Keypad 8 Up
Keypad 9 PageDn	61	—	Keypad 9 PageDn
Keypad 0 Insert	62	—	Keypad 0 Insert
Keypad . Delete	63	—	Keypad . Delete
Europe 2	64	—	Europe 2
App	65	—	App
Keyboard Power	66	—	Keyboard Power
Keypad =	67	—	Keypad =
F13	68	—	F13
F14	69	—	F14
F15	6A	—	F15
F16	6B	—	F16
F17	6C	—	F17
F18	6D	—	F18
F19	6E	—	F19
F20	6F	—	F20
F21	70	—	F21
F22	71	—	F22
F23	72	—	F23
F24	73	—	F24
Left Control	E0	—	Left Control
Left Shift	E1	—	Left Shift
Left Alt	E2	—	Left Alt
Left GUI	E3	—	Left GUI
Right Control	E4	—	Right Control
Right Shift	E5	—	Right Shift
Right Alt	E6	—	Right Alt
Right GUI	E7	—	Right GUI

Dimension drawings

16

16.1 Overview of the dimension drawings

This section contains the following dimension drawings:

- Dimension drawing of the touch screen device, 12" display
- Dimension drawing of the touch screen device, 15" display
- Dimension drawing of the touch screen device, 19" display
- Dimension drawing of the key panel device, 12" display
- Dimension drawing of the key panel device, 15" display
- Dimension drawing of the touch screen PRO device, 15" display
- Dimension drawing of the touch screen PRO device, 19" display

Note

The dimensions are always given in in mm and inch (above: Millimeter, below: Inch).

16.2 Dimension drawing of the touch screen device, 12" display

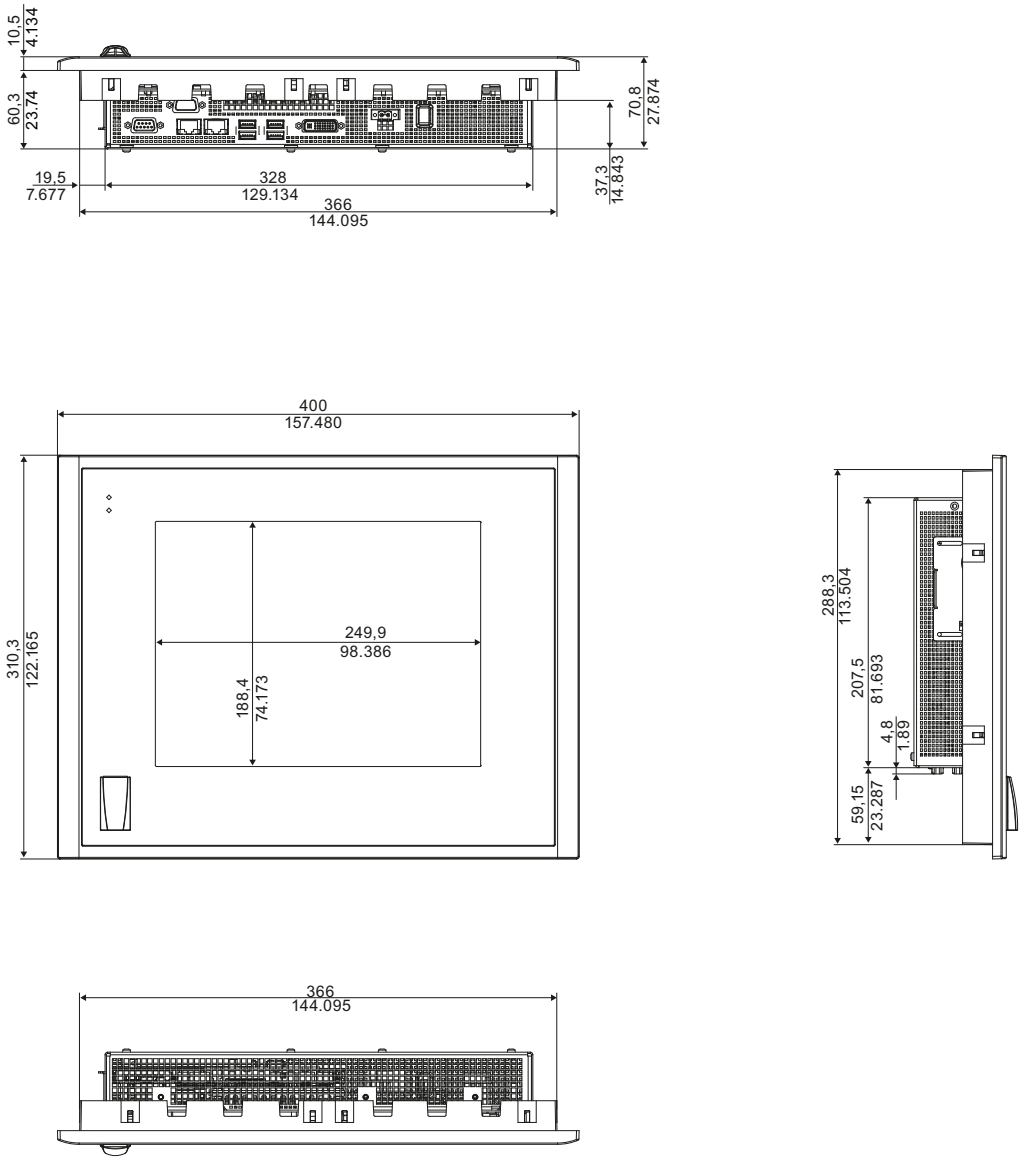


Figure 16-1 Dimension drawing of the touch screen device with 12" display

16.3 Dimension drawing of the touch screen device, 15" display

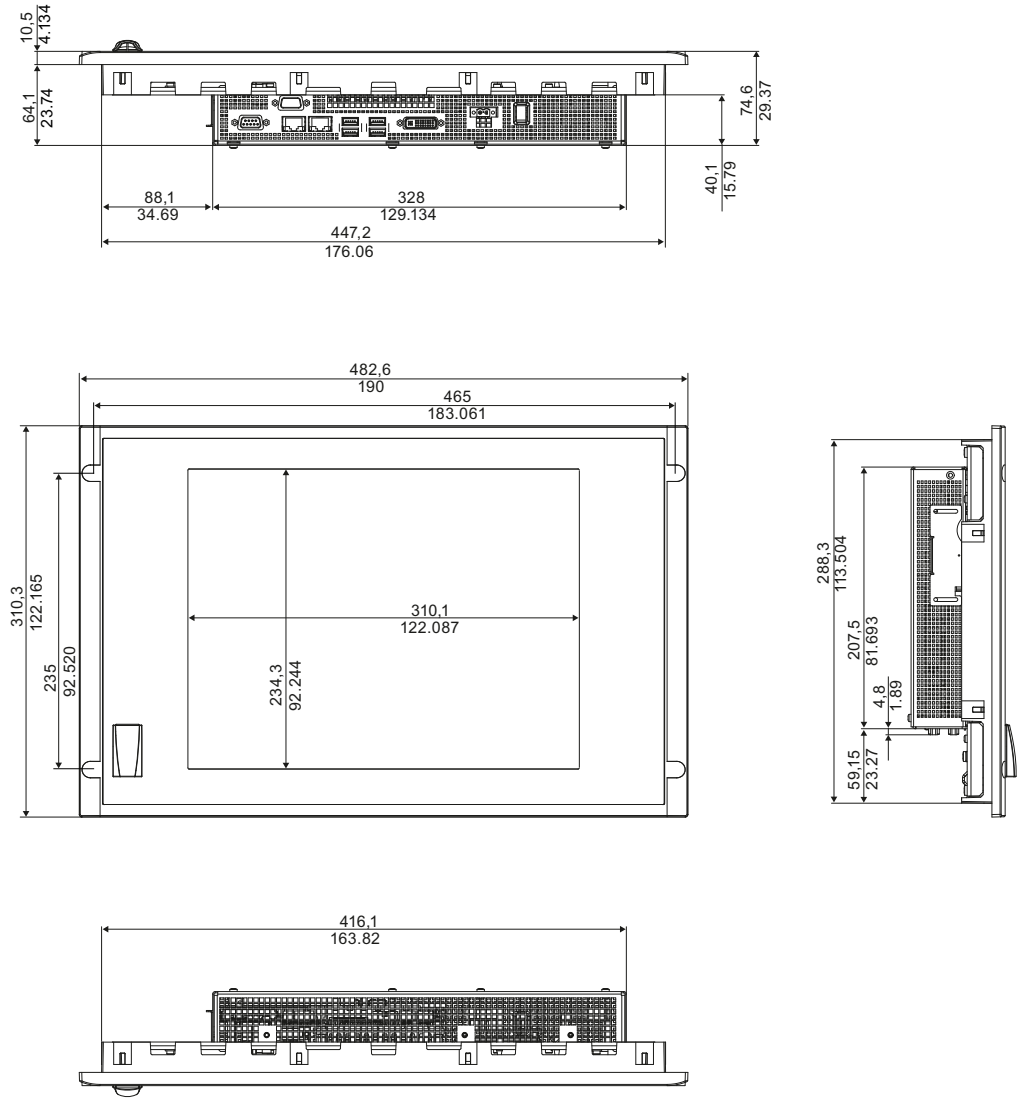


Figure 16-2 Dimension drawing of the touch screen device with 15" display

16.4 Dimension drawing of the touch screen device, 19" display

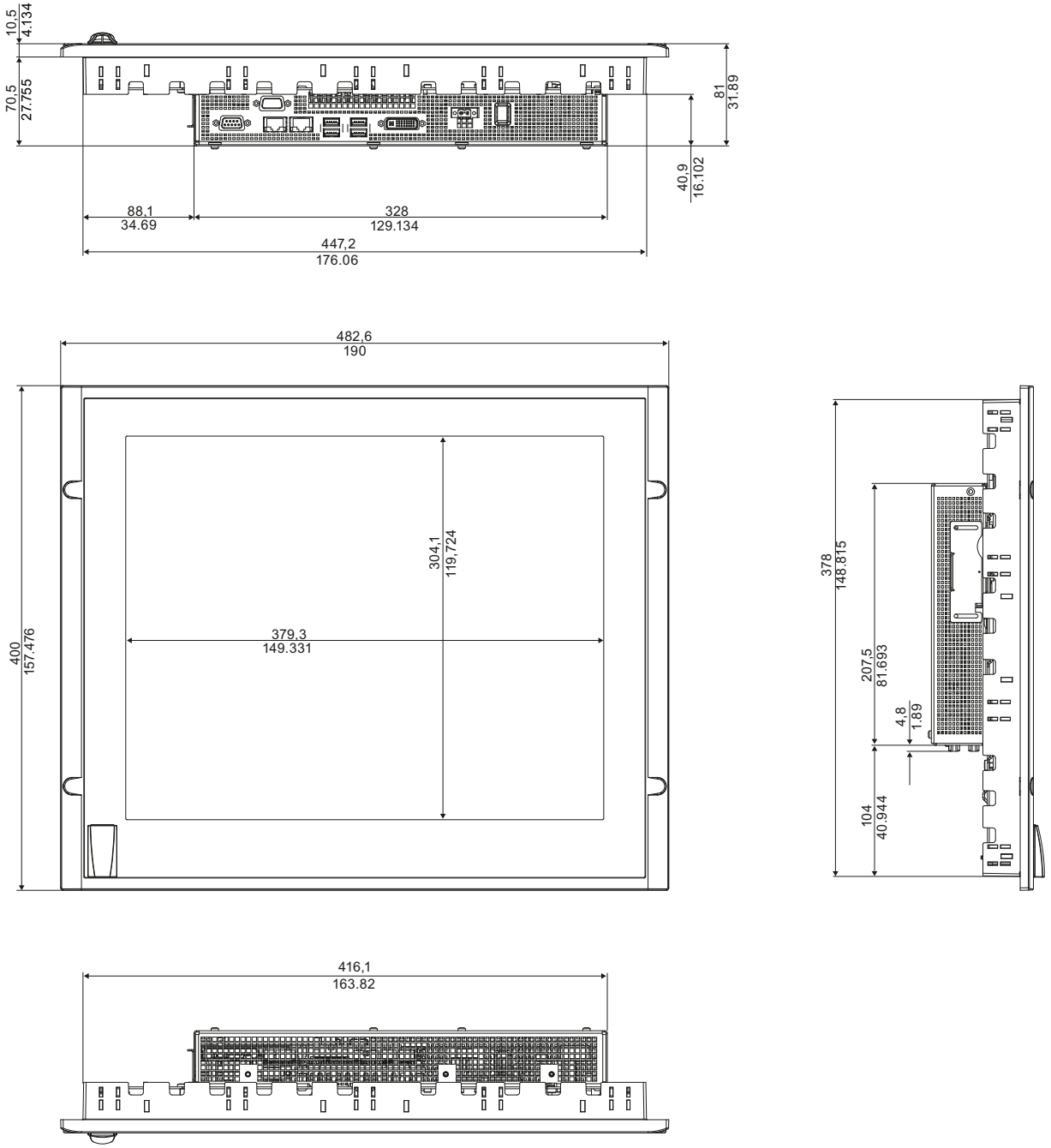


Figure 16-3 Dimension drawing of the touch screen device with 19" display

16.5 Dimension drawing of the key panel device, 12" display

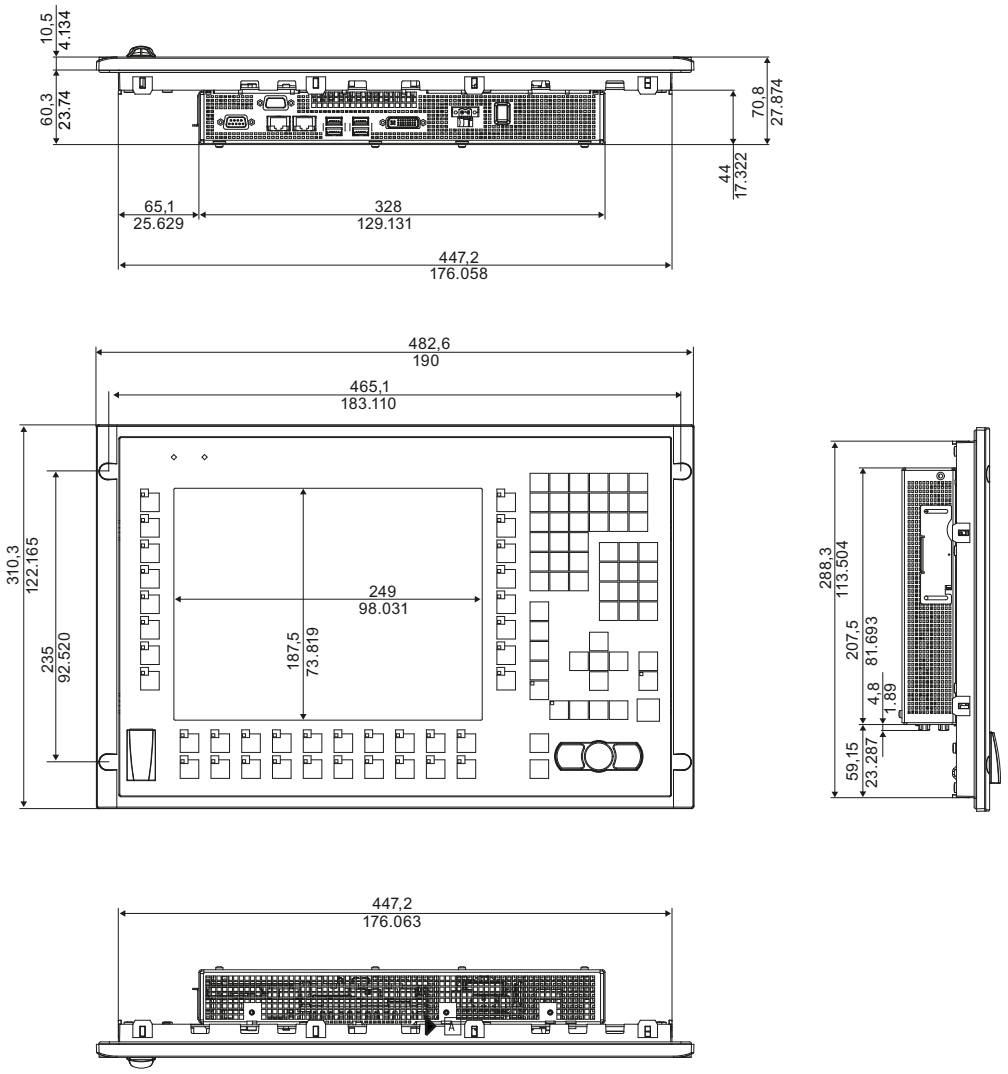


Figure 16-4 Dimension drawing of the key panel device with 12" display

16.6 Dimension drawing of the key panel device, 15" display

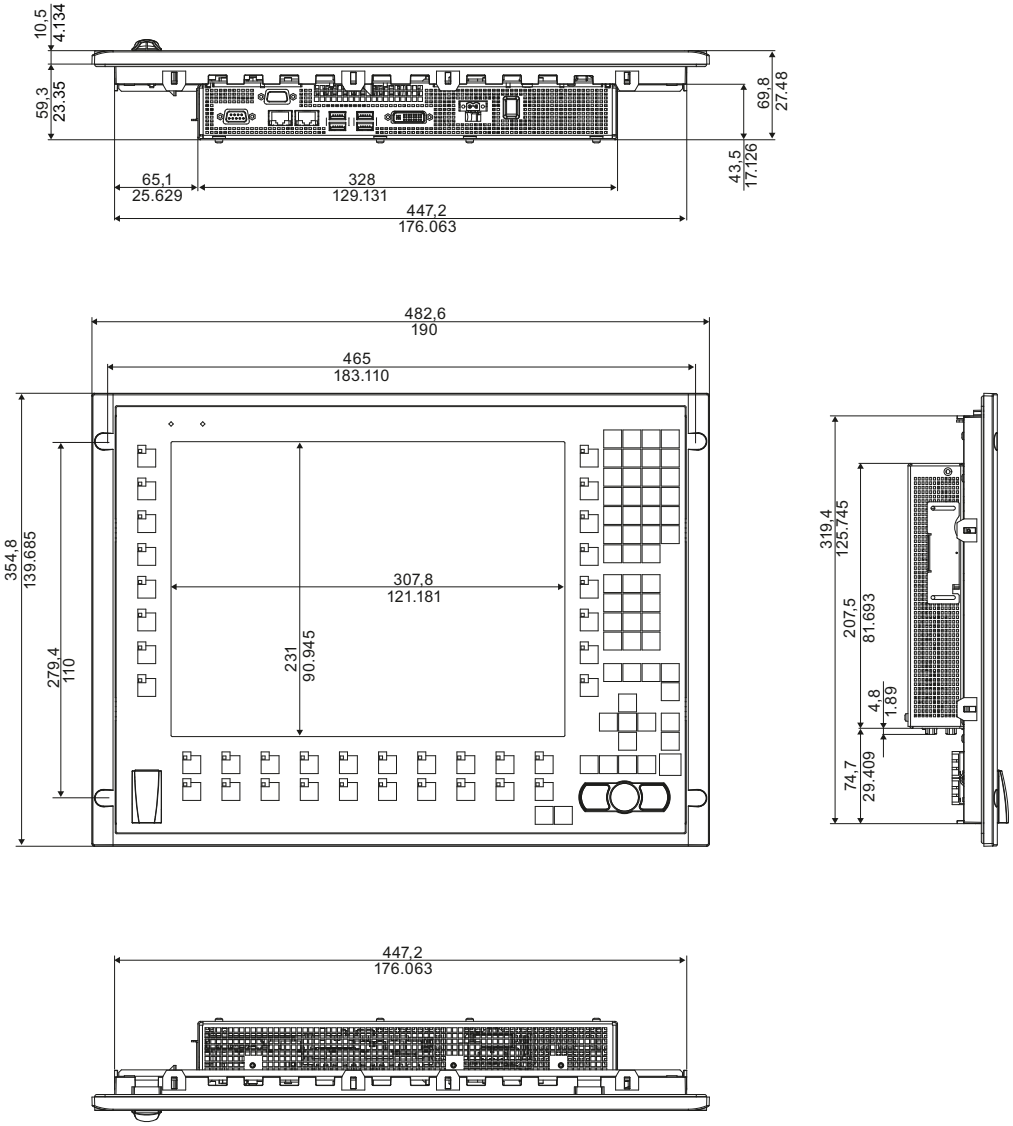
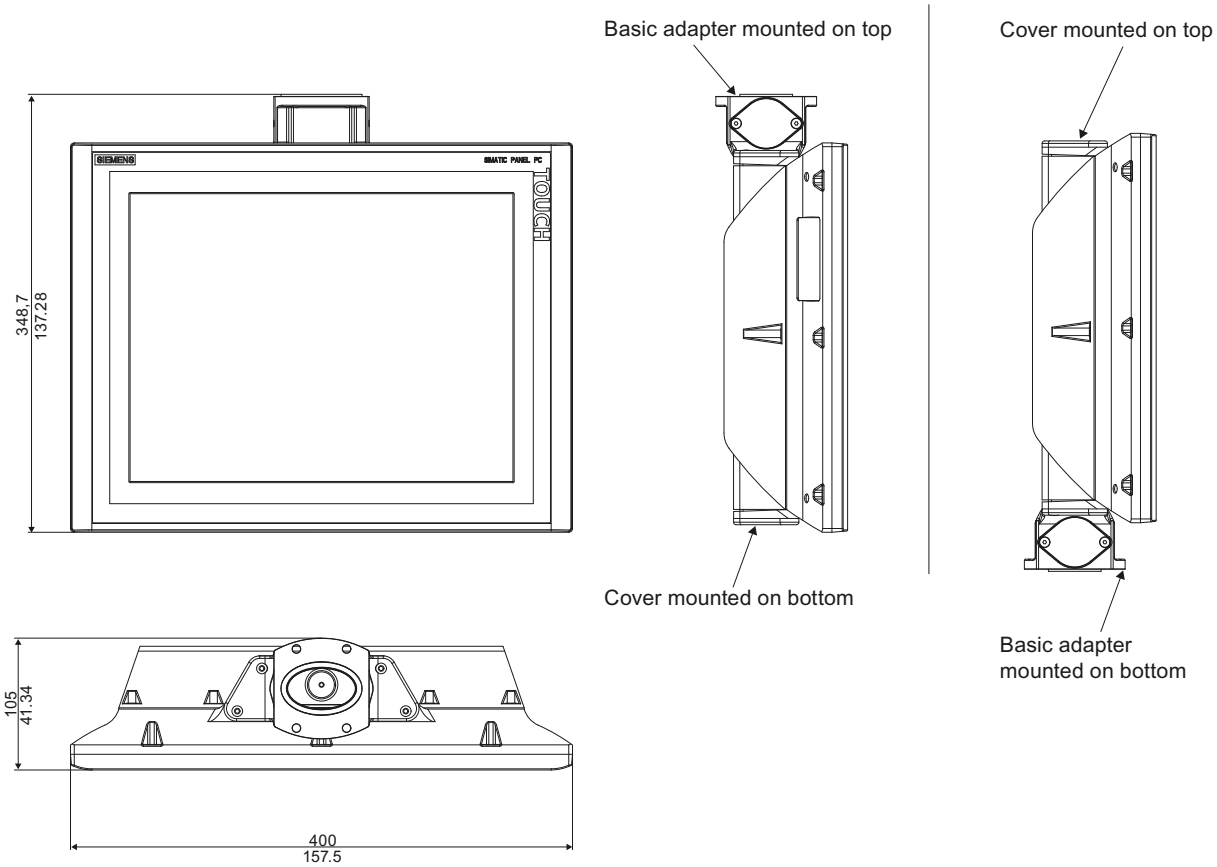


Figure 16-5 Dimension drawing of the key panel device with 15" display

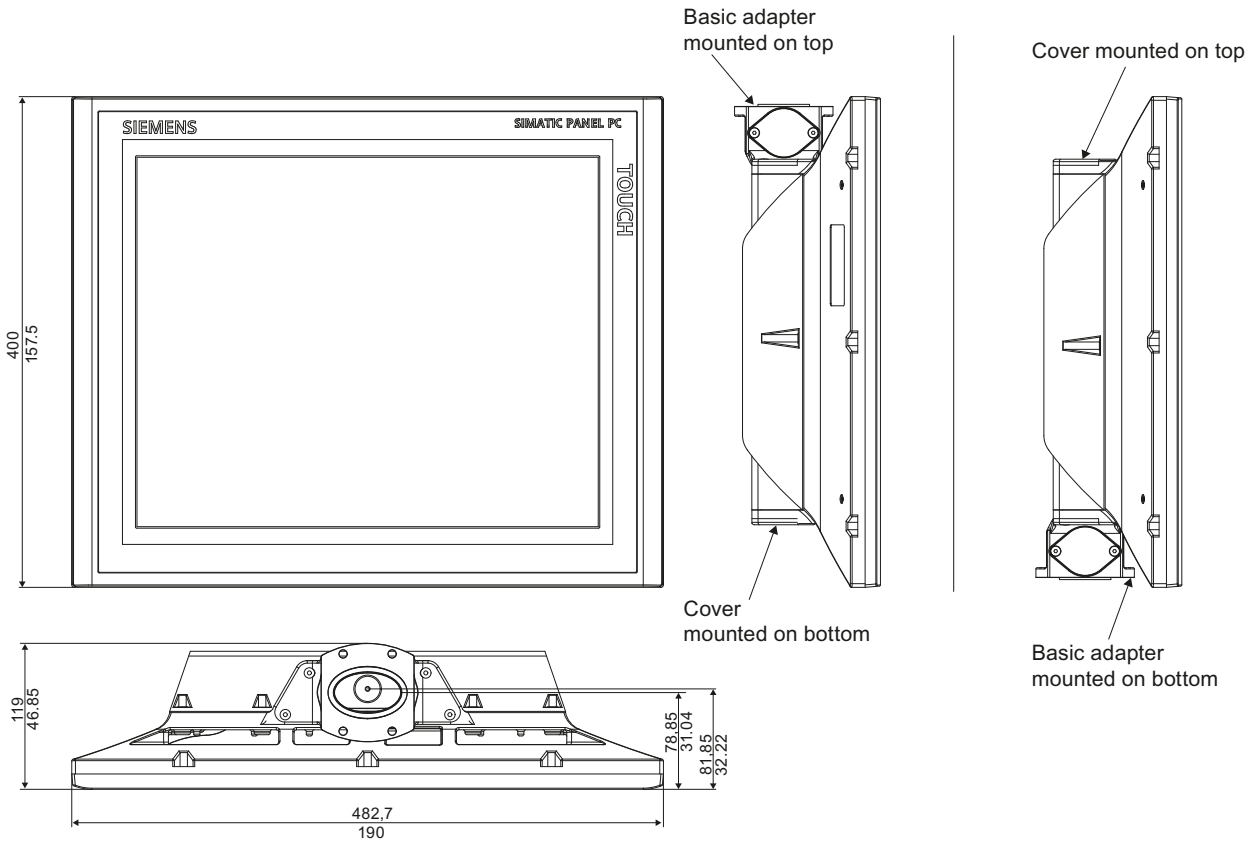
16.7 Dimension drawing of the touch screen PRO device, 15" display

Preliminary dimension drawing



16.8 Dimension drawing of the touch screen PRO device, 19" display

Preliminary dimension drawing



Detailed descriptions 17

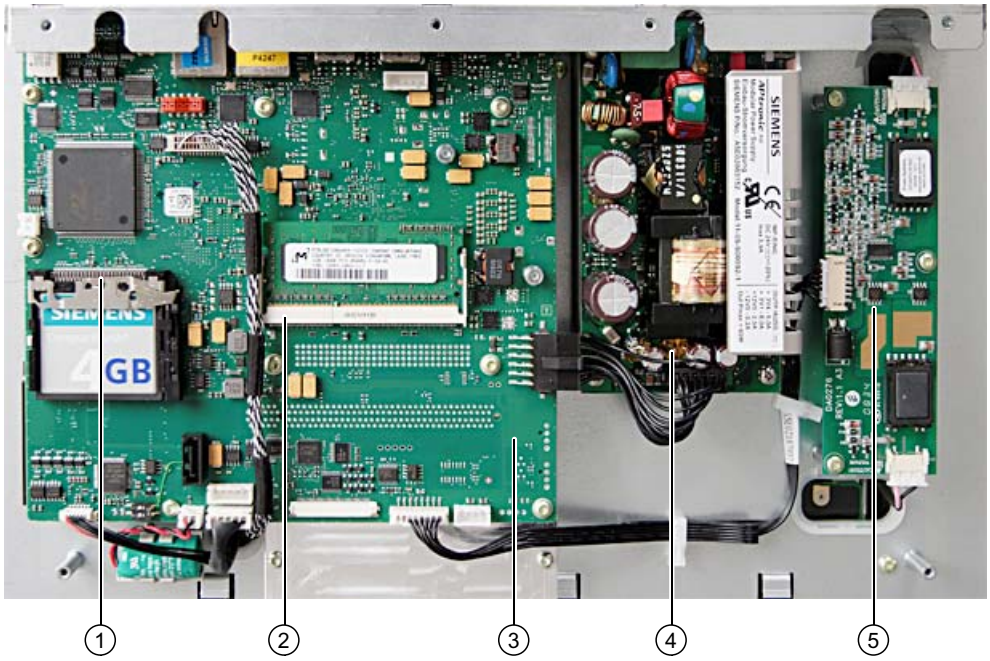
17.1 Components

17.1.1 Overview of internal components

The basic components of the device are

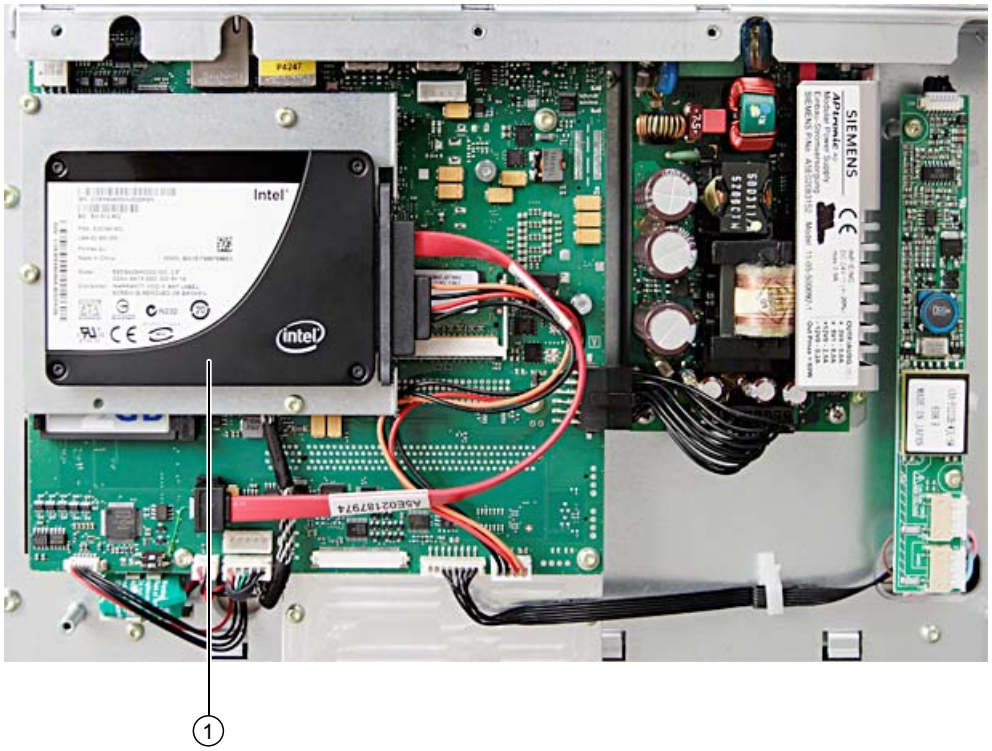
- the motherboard with processor, the chipset, one slot for a RAM module, internal and external interfaces, the Flash BIOS and
- a DC/DC converter for the power supply of the device.

IPC477C



① Slot for Compact Flash card
② Slot for a memory module
③ Motherboard
④ DC power supply
⑤ Inverter

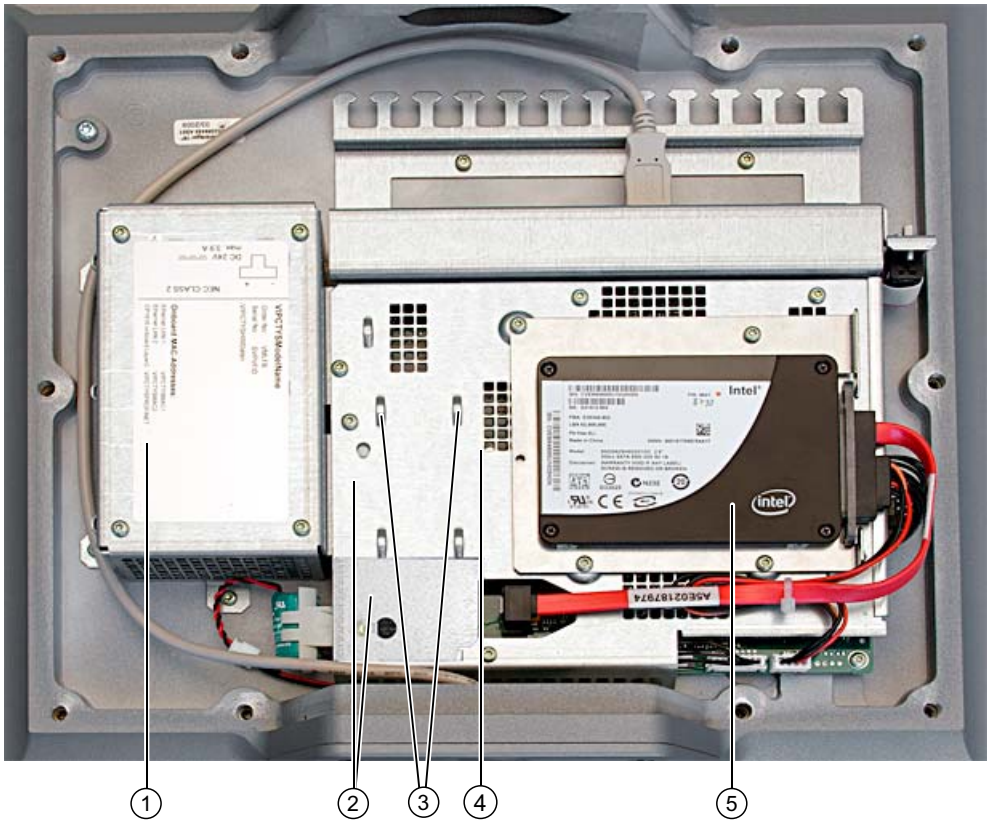
Figure 17-1 Internal design of the device without SSD:



① SSD

Figure 17-2 Internal design of the device with SSD:

IPC477C PRO



① 24 VDC power supply

② • Slot 1: Above the printed circuit board
• Slot 2: Below the printed circuit board

For Compact Flash cards (both slots covered with slot brackets)

③ Planned mounting place for cable clamp in the device:
For securing cable with cable ties

④ Motherboard (below blanking cover of motherboard, not visible)

⑤ Solid-state drive (SSD)

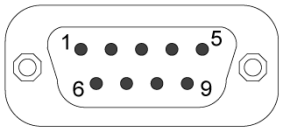
Figure 17-3 Internal design of the device with SSD

17.1.2 Technical features of the motherboard

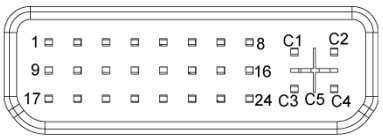
Component / interface	Description	Parameters
Chipset	Intel GM45+ICH-9m	
BIOS	Insyde H20...	
CPU	Intel Celeron M Inter Pentium Core 2 Solo Intel Pentium Core 2 Duo	1.2 GHz, 1 MB SLC 1.2 GHz, 3 MB SLC 1.2 GHz, 3 MB SLC
Memory	DDR 3 SO-DIMM module	1024 MB / 2048 MB / 4096 MB
Graphics	Intel GMA4500	8 - 512 MB graphics memory taken dynamic from RAM

17.1.3 External interfaces

17.1.3.1 COM

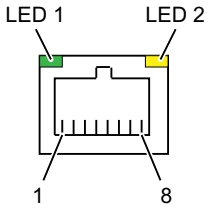
Serial port COM1, 9-pin (plug)		
		
Pin no.	**Short designation**	**Meaning**
1	DCD	Data carrier detect (I)
2	RxD	Received data (I)
3	TxD	Transmitted data (O)
4	DTR	Data terminal ready (O)
5	GND	
6	DSR	Data set ready (I)
7	RTS	Request to send (O)
8	CTS	Clear to send (I)
9	RI	Incoming call (I)

17.1.3.2 DVI-I

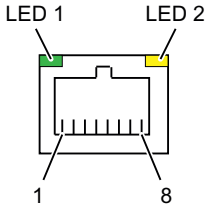
DV-I interface, standard socket		
		
Pin no.	**Short designation**	**Meaning**
1	TMDS Data2-	DVI data channel (O)
2	TMDS Data2+	DVI data channel (O)
3	TMDS Data2/4 shield	Cable shield
4	NC*	
5	NC	
6	DDC clock (SCL)	Display data channel – clock (I/O)
7	DDC data (SDA)	Display data channel – data (I/O)
8	Analog vertical sync (VSYNC)	Analog vertical sync signal (O)
9	TMDS Data1-	DVI data channel (O)
10	TMDS Data1+	DVI data channel (O)
11	TMDS Data1/3 shield	Cable shield
12	NC	
13	NC	
14	+5V power (VCC)	+5V power for DCC (O)
15	Ground (return for +5V, Hsync and Vsync) (GND)	Analog ground
16	Hot Plug Detect	
17	TMDS data 0-	DVI data channel (O)
18	TMDS data 0+	DVI data channel (O)
19	TMDS Data0/5 shield	Cable shield
20	NC	
21	NC	
22	TMDS clock shield	Cable shield
23	TMDS clock+	DVI clock channel (O)
24	TMDS clock-	DVI clock channel (O)
C1	Analog red (R)	Analog red signal (O)
C2	Analog green (G)	Analog green signal (O)
C3	Analog blue (B)	Analog blue signal (O)
C4	Analog horizontal sync (HSYNC)	Analog horizontal sync signal (O)
C5	Analog ground (analog R, G, & return) (GND)	Analog ground

17.1.3.3 Ethernet

Pin assignment of interface with 1 Gbps operating mode

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

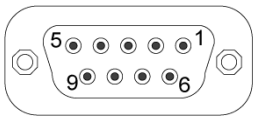
Pin assignment of interface with 100 Mbps operating mode

Ethernet RJ45 connection			
			
Pinno.	**Short designation**	**Meaning**	**Input / output**
1	Rx+	Receive +	Input
2	RX-	Receive -	Input
3	TX+	Transmit +	Output
4			–

Ethernet RJ45 connection			
5			–
6	TX-	Transmit -	Output
7			–
8			–
S		Shield	–
	LED 1	Off: 10 Mbps Lit in green: 100 Mbps	–
	LED 2	Lit: Active connection (to a hub, for example) Flashing: Activity	–

17.1.3.4 PROFIBUS

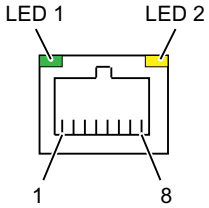
PROFIBUS interface, 9-pin (socket)



Pin no.	Short designation	Meaning
1-2	NC	Not connected
3	LTG_B	Data line (I/O)
4	RTS_AS	Turn on PLC transmitter (O)
5	GND	Ground isolated
6	P5V_dp_fused	+5 V (fused) isolated
7	NC	Not connected
8	LTG_A	Data line (I/O)
9	RTS_PG	PG Request to send (O)

17.1.3.5 PROFINET

Ethernet RJ45 connection

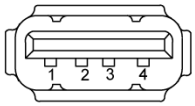


Pinno.	Short designation	Meaning	Input / output
1	Rx+	Receive +	Input

Ethernet RJ45 connection			
2	RX-	Receive -	Input
3	TX+	Transmit +	Output
4			–
5			–
6	TX-	Transmit -	Output
7			–
8			–
S		Shield	–
	LED 1	Off: 10 Mbps Lit in green: 100 Mbps	–
	LED 2	Lit: Active connection (to a hub, for example) Flashing: Activity	–

17.1.3.6 USB

USB interface, 4 channels (2* low current, 2* high current)



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

17.1.3.7 Compact Flash card interface

Compact Flash card interface, X3		
Pin no.	Short description	Description
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

Compact Flash card interface, X3		
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	+ 5V power

17.2 BIOS Setup

17.2.1 Overview

BIOS Setup program

BIOS Setup program is stored in ROM BIOS. System configuration data are stored in battery-backed RAM of the device.

SETUP can be used to define the hardware configuration (for example, the hard disk type) and system properties. SETUP is also used to set the time and date of the realtime clock.

Changing the device configuration

Your device configuration is preset for operating with the included software. You should only change the default values if you have modified the technical configuration your device, or if a fault occurs when the unit is powered up.

17.2.2 Starting BIOS Setup

Starting BIOS Setup

Start the setup program as follows:

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

   In the figures shown, the default settings differ based on the device versions. With the default setting of your device, the display shown below appears following power-on, **for example**:



Figure 17-4 Diagnostic screen of the HMI IPC477C

On completion of the POST, the BIOS gives you the opportunity of starting the SETUP program. The following message appears on the screen:

```
PRESS F2 go to Setup Utility or
Press ESC go to Boot Manager
```

2. Press F2 key as long as BIOS prompt appears on screen.

NOTICE
Different text on the diagnostic screen of the IPC477 PRO
The text on the diagnostic screen of the Panel IPC477 PRO differs from that on the IPC477C.

17.2.3 BIOS Setup menus

The various menus and submenus are listed on the next pages. You can obtain information on the selected SETUP item from the "Item-specific help" part of the respective menu.

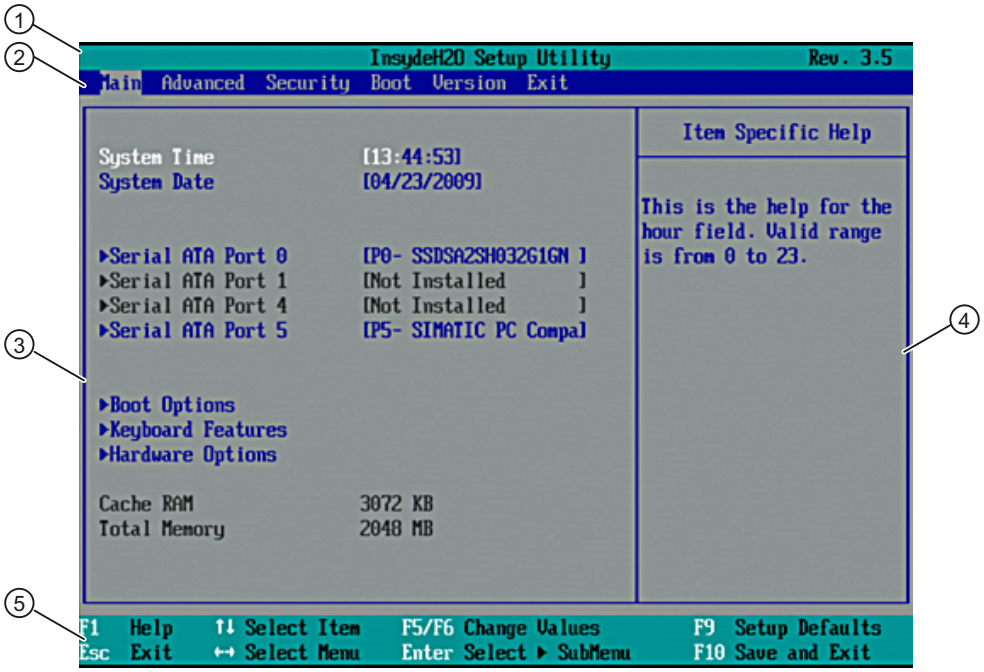


Figure 17-5 BIOS SETUP menu (example)

① Header	④ Help window
② Menu bar	⑤ Command line
③ Selectable submenu	

Menu layout

The screen is divided into four sections. In the top section ②, you can select the submenus [Main] [Advanced] [Security] [Boot] [Version] [Exit]. You can select various settings or submenus in the left middle section ③. Short help texts are displayed on the right ④ for currently selected menu entries; the bottom section ⑤ contains information for operator input.

The following figures represent examples of specific device configurations. The screen content may deviate slightly depending on the equipment actually supplied.

You can move between the menu forms using the cursor keys [←] left and [→] right.

Menu	Description
Main	System functions are set here
Advanced	An extended system configuration can be set here
Security	Security functions are set here, for example, a password.

Menu	Description
Boot	This is where the boot priority is specified.
Version	Information about the programming device (for example, release status) can be found here.
Exit	Used for terminating and saving.

17.2.4 Main menu

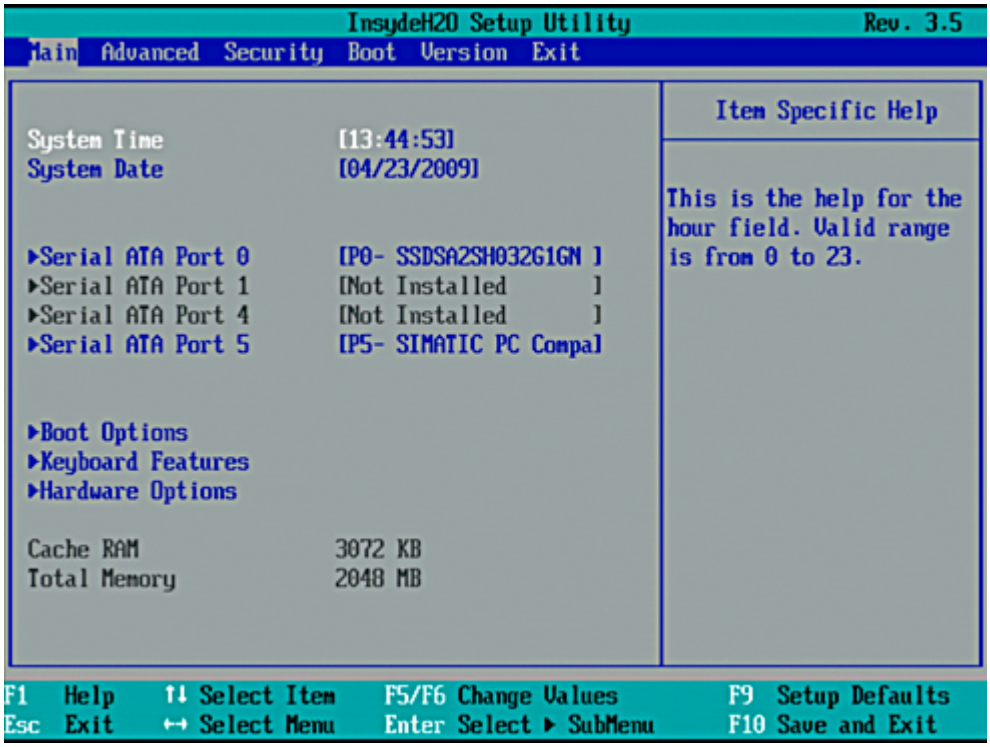


Figure 17-6 Main menu

Settings in the main menu

In the main menu, you can move up and down to select the following system configuration boxes by means of the [↑] up and [↓] down cursor keys:

Field	Meaning
System Time	For viewing and setting the current time
System Date	For viewing and setting the current date
by submenus	
Serial ATA Port 0	Type of installed drives
Serial ATA Port 1	Type of installed drives
Boot options	Used for setting the boot options
Keyboard Features	Used for setting the keyboard interface (Numlock)
Hardware Options	Used for setting the hardware options

System time and date

System Time and System Date indicate the current values. Once you have selected the appropriate option, you can use the [+] and [-] keys to modify the time setting

Hour: Minute: Second

and for the date

Month/Day/Year

You can navigate through the entries within the date and time fields (for example, from hour to minute) using the Enter key.

Serial ATA Port 0, Serial ATA Port 1

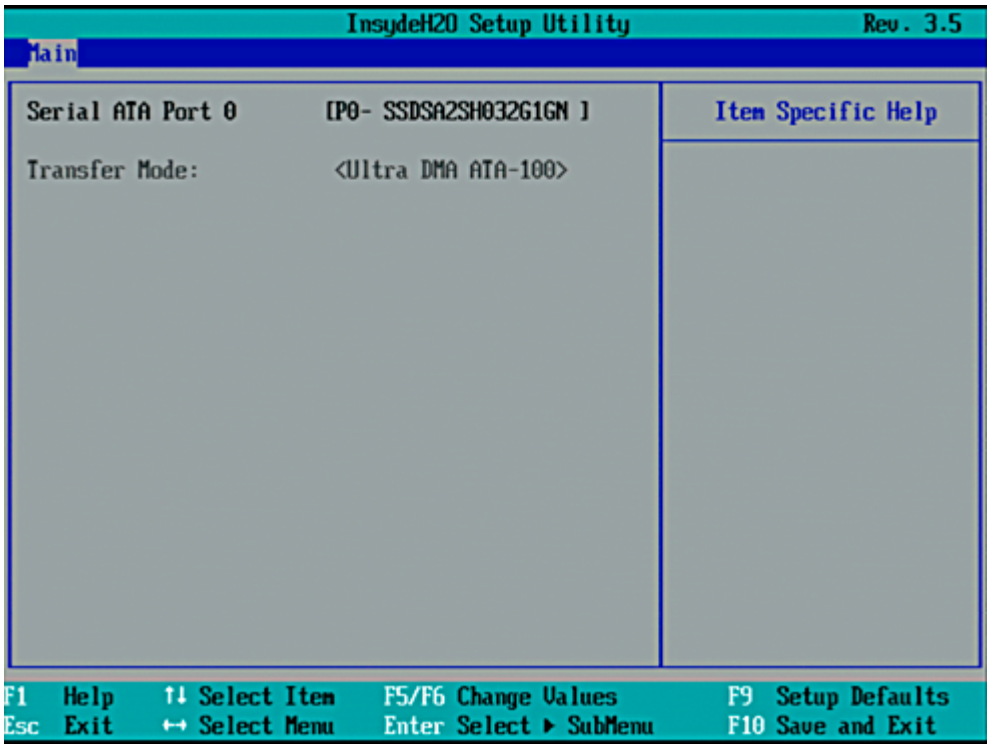


Figure 17-7 "Serial ATA Port 0" submenu (example)

Transfer Mode	Fast PIO	This field shows the transmission speed of the interface. The displayed value depends on the type of drive connected. Exit the submenu by pressing ESC.
	Ultra DMA ATA-33	
	Ultra DMA ATA-66	
	Ultra DMA ATA-100	

"Boot Options" submenu

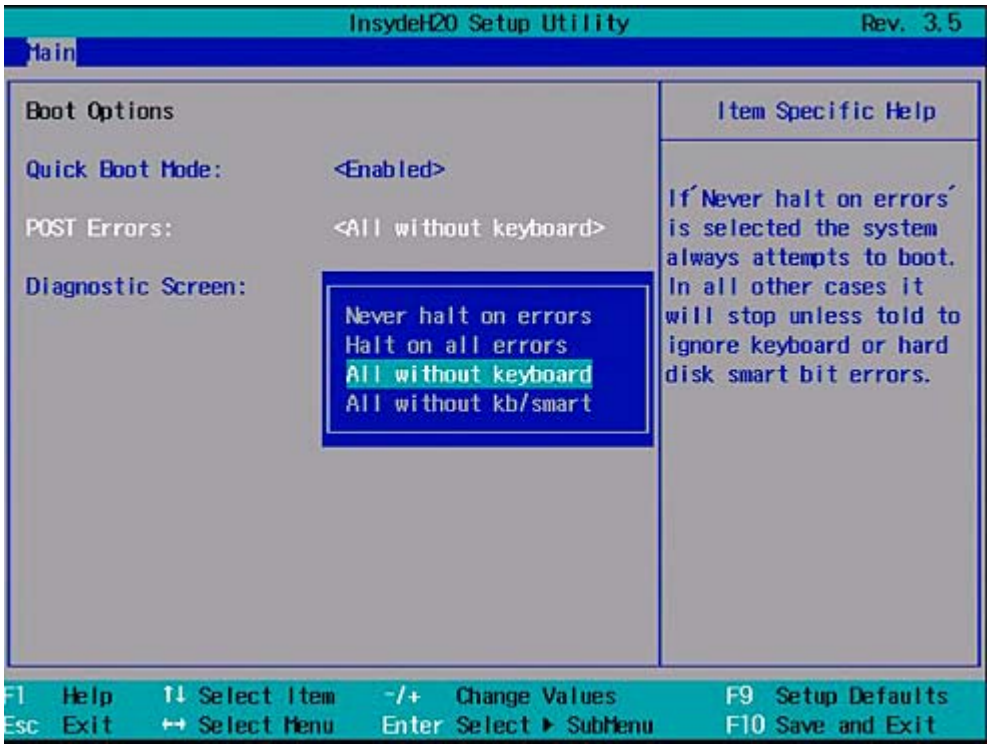


Figure 17-8 "Boot Options" submenu

Quick Boot Mode	Some hardware tests are skipped to speed up the boot sequence.	
POST errors	The boot sequence is stopped if an error is detected during booting; you must press F1 to acknowledge.	
	Never halt on errors	Booting continues if errors occur
	Halt on all errors	Booting is stopped if an error is detected
	All without keyboard	Booting is stopped if any error except a keyboard error occurs
	All without kb/smart	Stop at any error, but not with a keyboard or S.M.A.R.T storage media error.
Diagnostic screen	Shows the diagnostics messages on the monitor during booting.	

"Keyboard Features" submenu

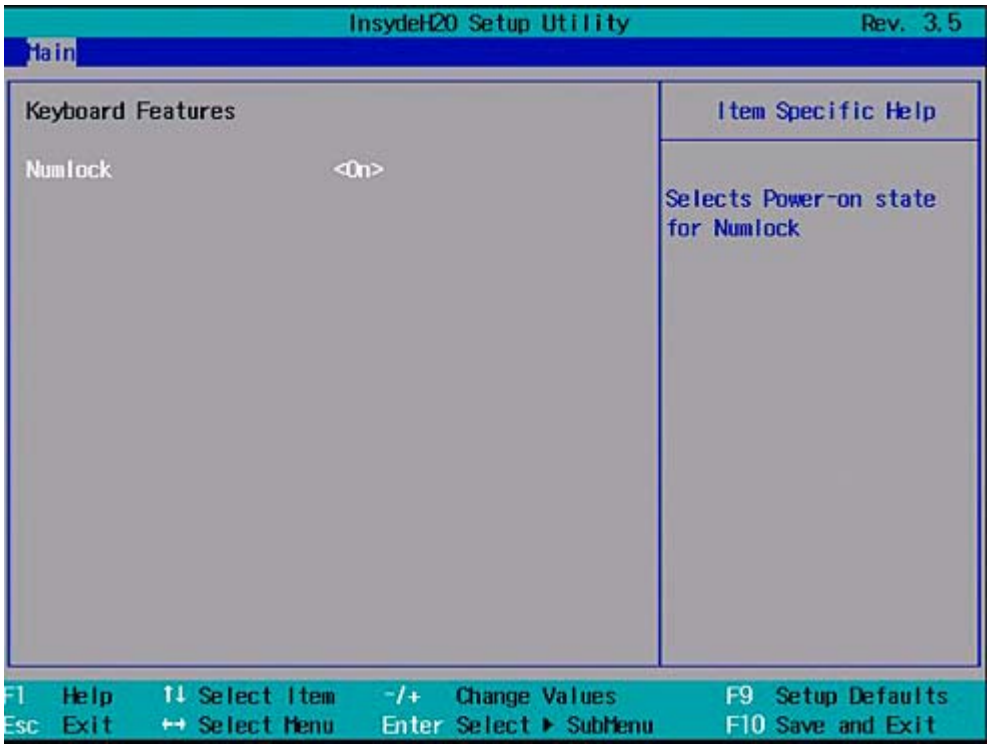


Figure 17-9 "Keyboard Features" submenu

Numlock	On	Switches Numlock on or off following power on.
	Off	

"Hardware Options" submenu

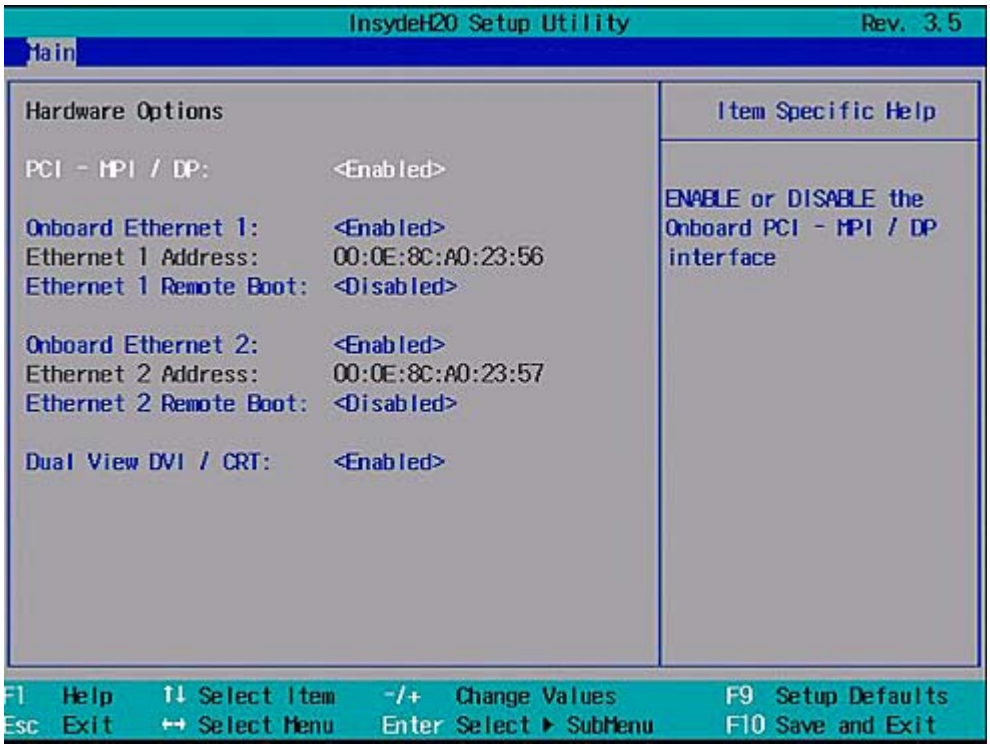


Figure 17-10 "Hardware Options" field

The parameters of the interfaces present on the motherboard are set here.

Entry	Meaning	
PCI - MPI / DP	Enabled	Sharing the MPI/DP interface. The resources are managed by the BIOS PCI Plug and Play mechanism.
	Disabled	The MPI/DP interface is disabled.
Onboard Ethernet 1/2	Enabled	The Ethernet port on the motherboard is enabled.
	Disabled	The Ethernet port on the motherboard is disabled.
Ethernet 1/2 Address	Shows the individual Ethernet address.	
Ethernet 1/2 Remote Boot	Enabled	Booting via a connected LAN is possible.
	Disabled	Booting via LAN is not possible.
Dual view DVI/CRT	Enabled	Dual view DVI/CRT is available via the DVI-I socket (not relevant for Panel PC).
	Disabled	Only one monitor can be enabled via the DVI-I socket (not relevant for Panel PC).

Note

The second Ethernet interface support is OS dependent. For DOS based applications, use the first Ethernet interface and disable the second Ethernet interface in BIOS Setup. This is practical because some programs use the second Ethernet interface because it is the first one found on the PCI bus.

17.2.5 Advanced Menu

Menu layout

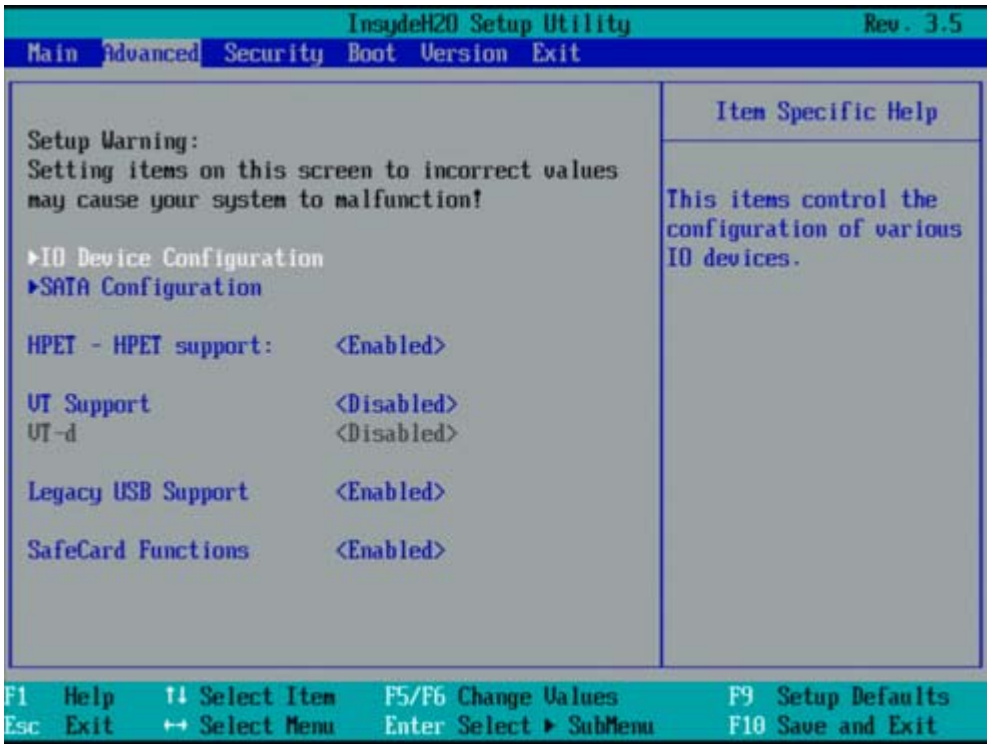


Figure 17-11 Advanced Menu

Settings in the Advanced Menu

HPET - HPET support	Disabled	High Precision Event Timer is disabled
	Enabled	High Precision Event Timer is enabled
Legacy USB support	Disabled	Disables Legacy Universal Serial Bus support Booting via USB media is not possible: but USB keyboard and USB mouse work.
	Enabled	Enables Legacy Universal Serial Bus support Booting via USB media is possible and the USB keyboard and USB mouse work. The USB Boot function must be enabled to allow booting from a USB device, or if the system is to be operated without USB support with a USB keyboard or mouse.
SafeCard functions	Enabled	Watchdog reset is enabled.
	Disabled	Watchdog reset is disabled.
	The relevant driver and the application must be started for operation of the monitoring functions.	

"IO Device Configuration" submenu

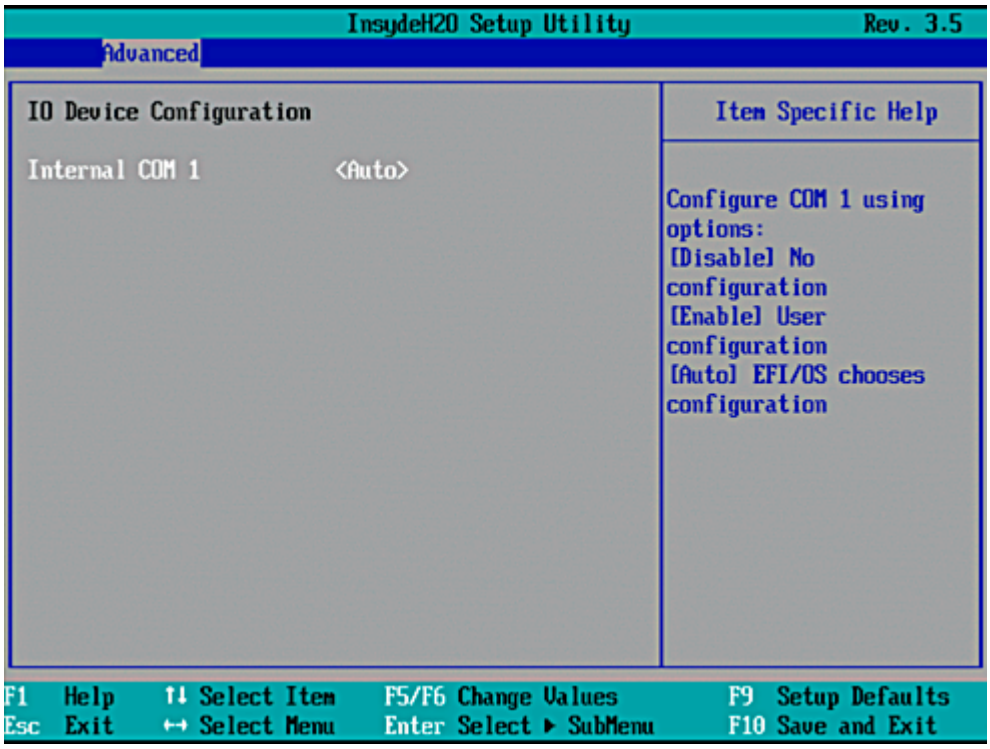


Figure 17-12 "IO Device Configuration" submenu

Internal COM 1	Disabled	COM 1 is always disabled.
	Auto	BIOS switches on the COM. Resources are assigned in the OS per reconfiguration.
	Enabled	COM 1 is always enabled. BIOS assigns resources to COM.

"SATA Configuration" submenu

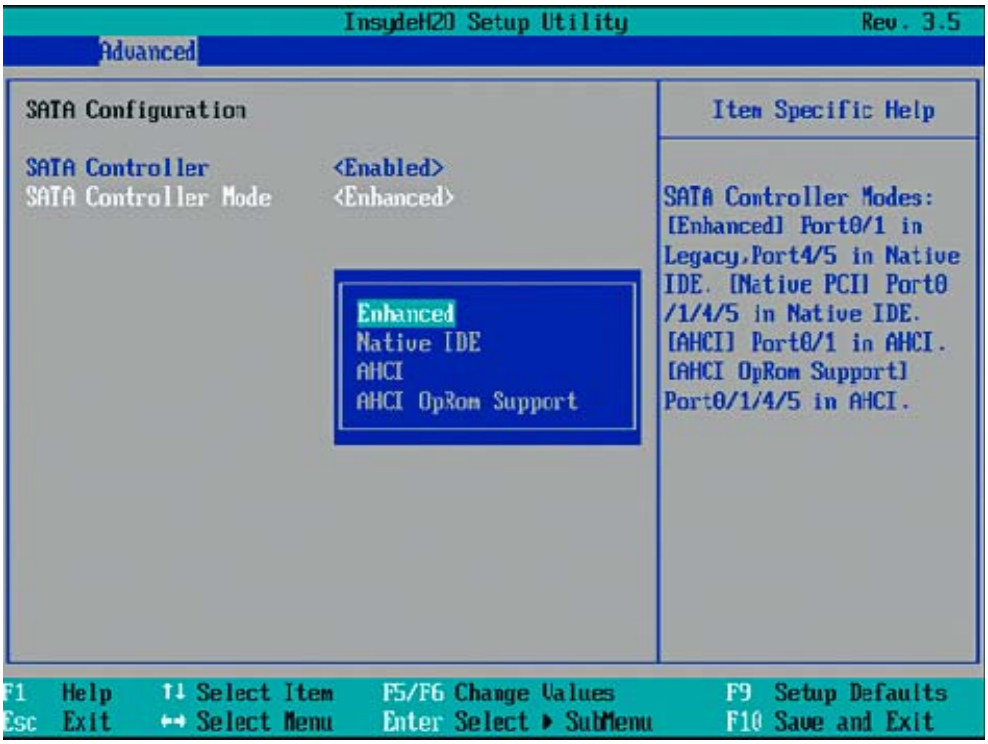


Figure 17-13 "SATA Configuration" submenu

SATA Controller	[Enabled] [Disabled]	Disables or enables the SATA controller
SATA Controller mode	[Enhanced]	Serial ATA Ports 0/1 work in Legacy Mode. Serial ATA Ports 4/5 work in Native IDE Mode.
	Native PCI	Serial ATA Ports 0/1/4/5 work in Native IDE Mode.
	AHCI	Serial ATA Ports 0/1 work in AHCI Mode (not relevant for IPC477C/ IPC477 PRO).
	AHCI OpRom Support	Serial ATA Ports 0/1/4/5 work in AHCI Mode with the ROM support option (setting for Panel PC).

17.2.6 Security menu

You can only edit the fields enclosed in square brackets. Two passwords can be assigned to protect your PC from unauthorized use. The Supervisor password can be used to restrict access to the hard disks.

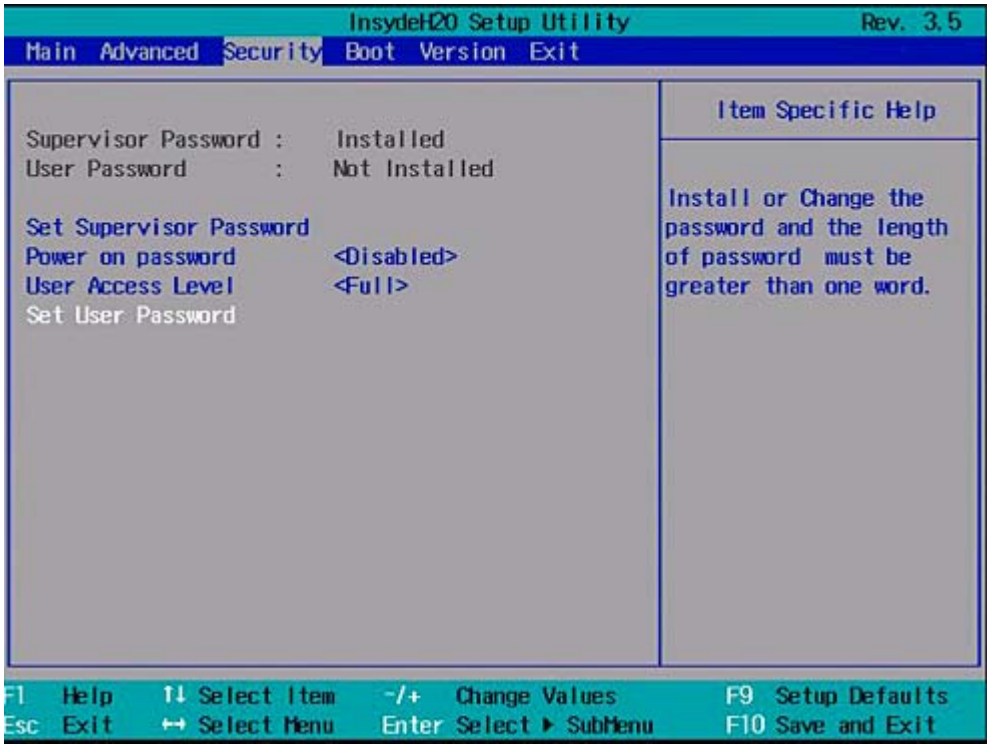


Figure 17-14 "Security" menu (example)

Supervisor Password	Installed	Certain Setup fields are configurable by the user, including the user password.
	Not installed	The password is disabled.
User password	Installed	Certain setup fields can be changed by the user, including the user password.
	Not installed	The password is disabled.
Set Supervisor Password	This field opens the password input dialog. Authorized logged on users can change the supervisor password, or delete and deactivate it by pressing "Return."	
Power on password	Enabled	Password must be entered to boot.
	Disabled	Password must be entered to access BIOS Setup.
User Access Level	View only	Setup is accessible, but fields cannot be changed.
	Limited	Some setup entries can be changed.
	Full	All setup entries can be changed, except for the supervisor password.
Set User Password	This field opens the password input dialog. Logged on users can change the password, or clear and deactivate it by pressing "Return."	

17.2.7 Boot menu

This menu allows you to assign a priority for the boot devices.

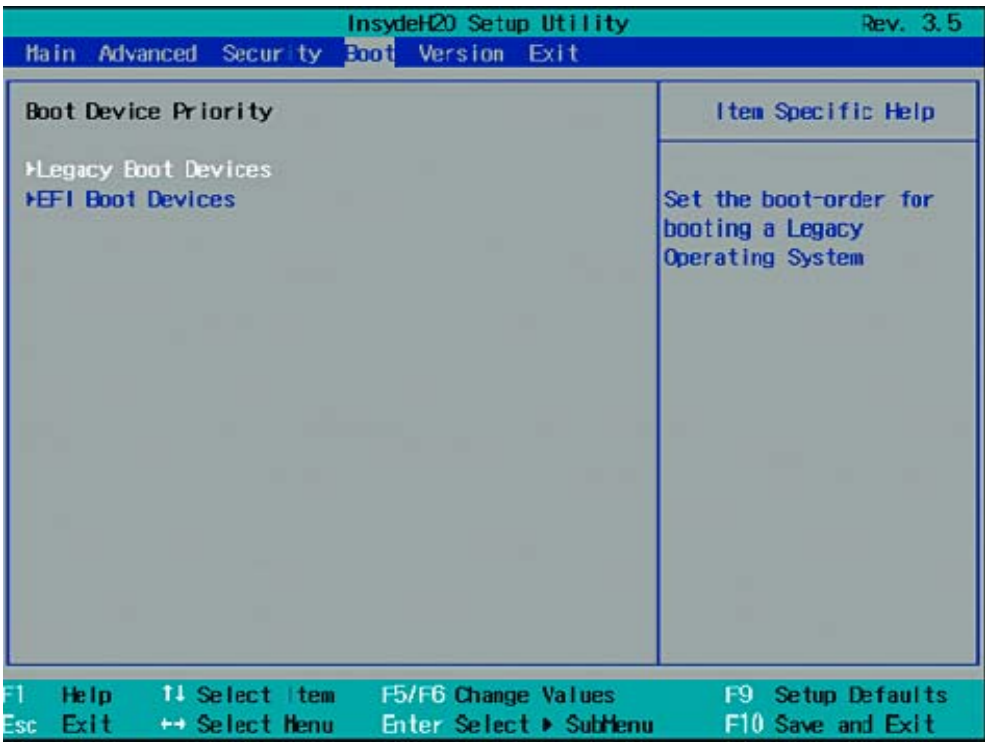


Figure 17-15 "Boot" menu

Legacy Boot Device	
EFI Extensible Firmware Interface	Extensible Firmware Interface

Legacy

Specifies the boot sequence for boot devices with Legacy operating systems.

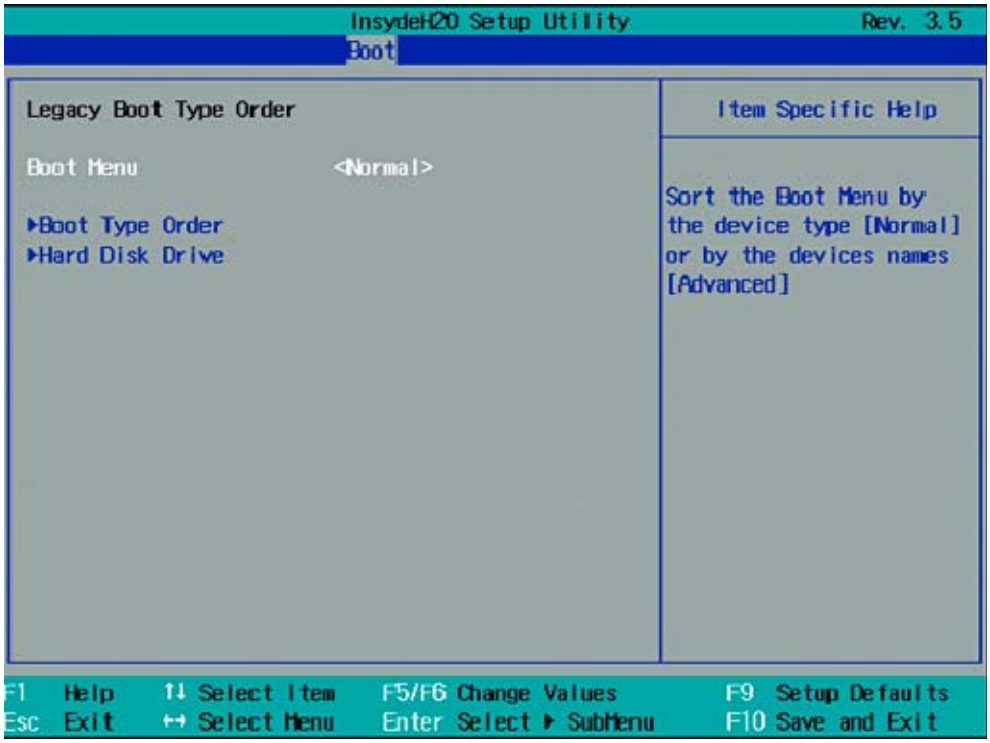


Figure 17-16 "Legacy" submenu

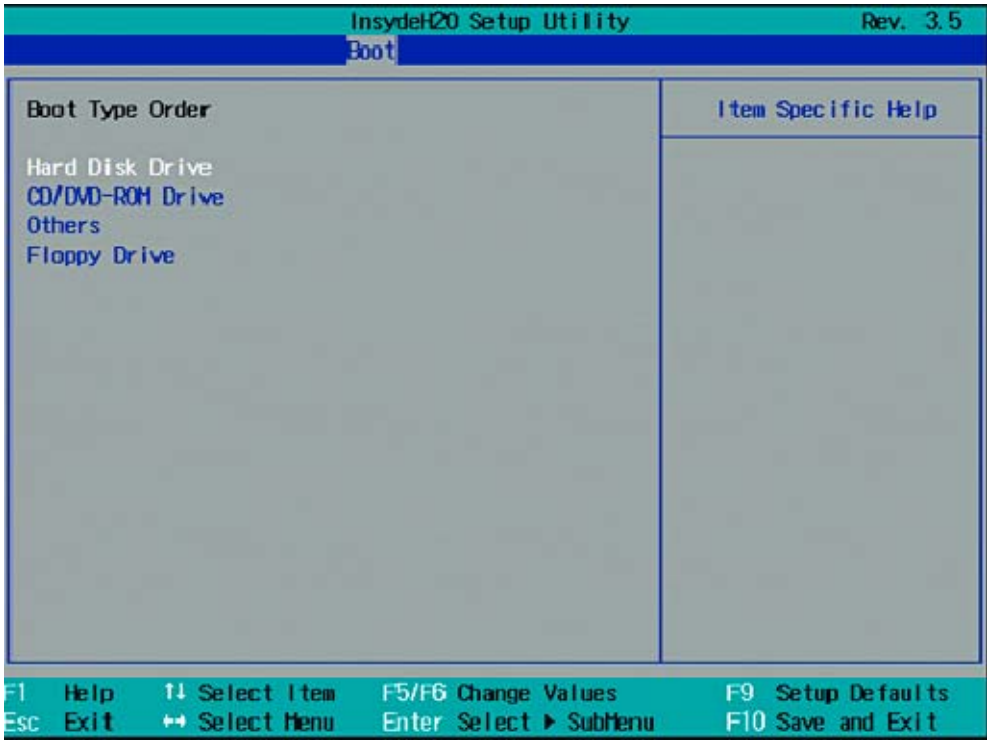


Figure 17-17 "Boot Type Order" field

This screen shows all possible legacy boot types. The boot type with highest boot priority is shown at the top. To change the sequence:

Select the boot source with the ↑ ↓ keys, move to the desired position with + or -.

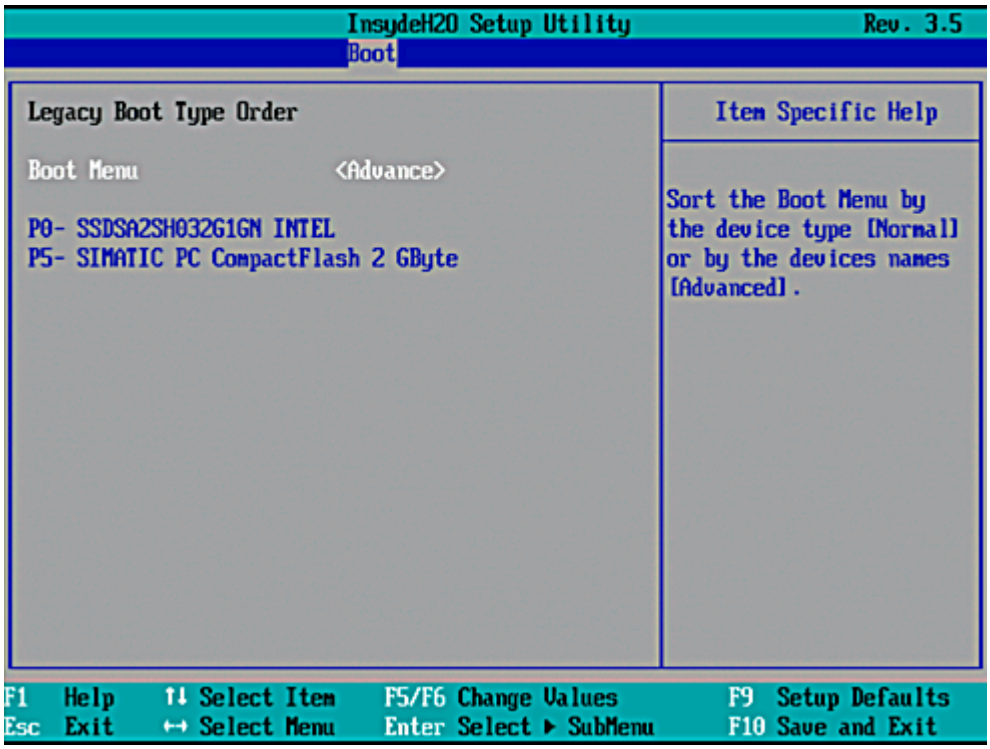


Figure 17-18 Boot Type Order

Note

You can open the Boot menu and select the boot volume by pressing the ESC key during system startup.

17.2.8 Version menu

Keep this information at hand if customer support has technical questions about your system.

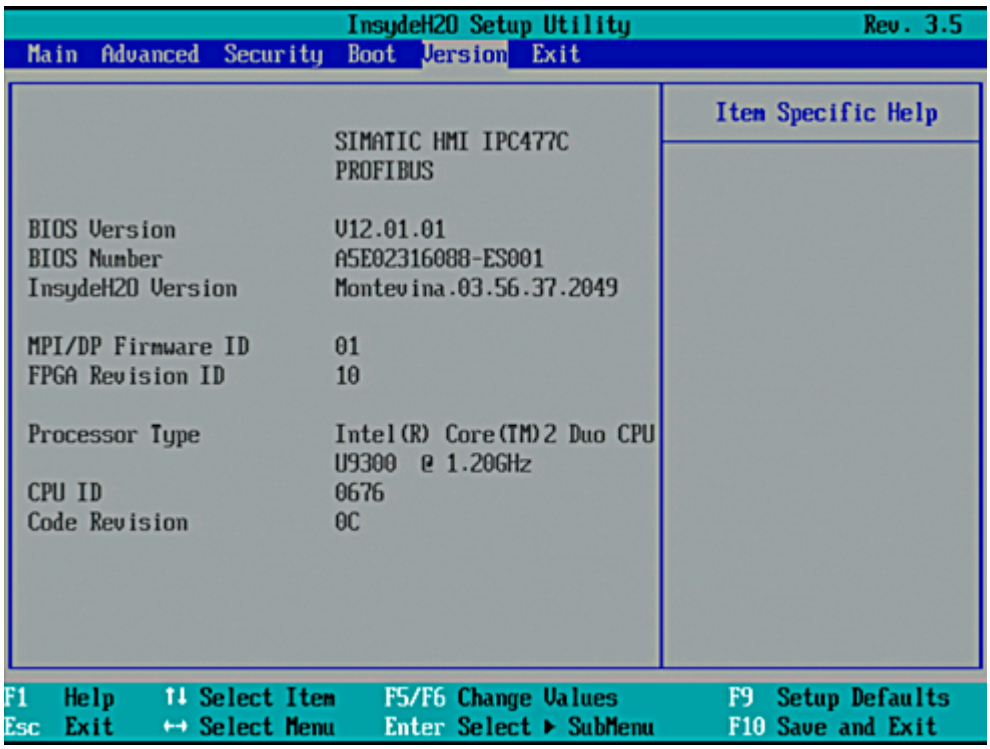


Figure 17-19 Version menu (example)

17.2.9 Exit Menu

You always exit BIOS Setup in this menu.

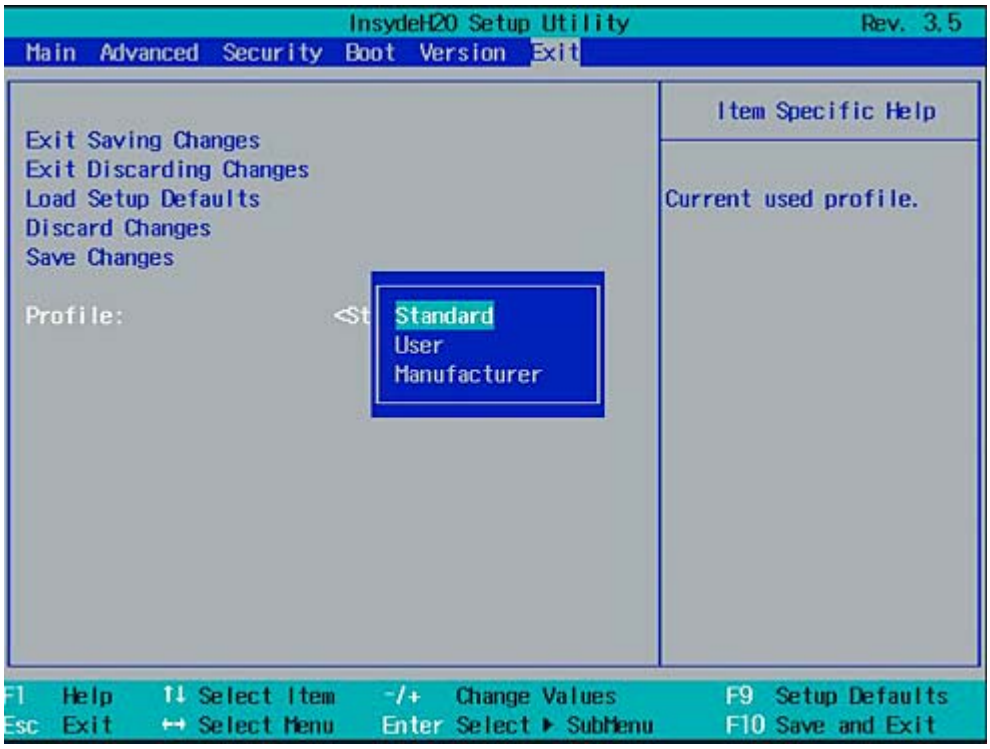


Figure 17-20 Exit menu

Exit Saving Changes	All changes are saved and the system is restarted with the new parameters.	
Exit Discarding Changes	All changes are discarded and the system is restarted with the old parameters.	
Load Setup Defaults	The default values are loaded.	
Discard Changes	All changes are discarded.	
Save Changes	All changes are saved.	
Profiles	Standard	The BIOS settings are backed up to buffered CMOS
	User	The BIOS settings are saved in the non-volatile FLASH memory.
	Manufacturer	This setting is only used for production purposes. Do not use.

17.2.10 Default BIOS Setup entries

Documenting your device configuration

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

Note

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

BIOS Setup default settings

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

Serial ATA Port 0, Serial ATA Port 1		
Type		
32-bit I/O		
Block Mode		
Transfer Mode		
Security Mode		

Boot options		
Quick Boot Mode	Enabled	
POST errors	All without keyboard	
Diagnostic screen	Enabled	

Keyboard Features		
Numlock	On	

Hardware Options		
PCI - MPI/DP [1)]	Enabled	
On-board Ethernet 1	Enabled	
Ethernet 1 Address	00.0E.8C.xxxxxx	
Ethernet 1 Remote Boot	Disabled	
On-board Ethernet 2	Enabled	
Ethernet 2 Address	00.0E.8C.xxxxxx	

Hardware Options		
Ethernet 2 Remote Boot	Disabled	
Dual view DVI/CRT	Disabled	

1)Only for variants with PROFIBUS

Advanced		
HPET - HPET support	Enabled	
Legacy USB support	Enabled	
SafeCard functions	Enabled	

IO device configuration		
Internal COM 1	Auto	

SATA Configuration		
SATA Controller	Enabled	
SATA Controller mode	Enhanced	

Security		
Supervisor Password	Not installed	
User password	Not installed	
Set Supervisor Password		
Power on password		
User Access Level		
Set User Password		

Boot		
Legacy Boot Devices		
EFI Boot Devices		

Legacy Boot Type Order		
Boot menu	Standard	

Version		
SIMATIC PC	IPC477C/ IPC477 PRO PROFIBUS	
BIOS Version	V12.01.xx	
BIOS Number	A5E02316088-ES0xx	
InsideH20 Version	Montevina.03.56.37.20xx	
MPI / DP Firmware ID	xx	

Version		
FPGA Revision ID	xx	
Processor Type		
CPU ID		
Code Revision		

17.3 System resources

17.3.1 Currently allocated system resources

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

Windows Embedded Standard 2009	Select **Start** > **Run** > **Open** , enter *msinfo32* > confirm with **OK**
Windows XP Pro	Select **Start** > **Run** > **Open** , enter *msinfo32* > confirm with **OK**
Windows Embedded Standard 7	Select **Start > Search** , enter *cmd* > enter*msinfo32* in the **input box** > confirm with **OK**
Windows 7 Ultimate	Select **Start > Search** , enter *cmd* > enter*msinfo32* in the **input box** > confirm with **OK**

17.4 I/O Address Areas

17.4.1 Overview of the internal module registers

Overview of the internal module registers

The following addresses are used for the internal registers:

Addresses	Input/output unit
I/O 062h	Watchdog enable register / 066h select register
I/O 066h	Watchdog trigger register (Watchdog enable register bit 2=0)
I/O 118Fh	Battery status register (read-only)

17.4.2 SRAM address register

The battery-buffered SRAM uses a 2 MB memory address area, which can be read via the PCI register.

Meaning of the bits

SRAM address register		
PCI register address: SRAM base address register	PCI register content: SRAM memory address (default)	Length of the memory area
8010 2010h	9040 0000h Address is assigned dynamically (depending on device)	20 0000h

17.4.3 SRAM control register (write only, address 066h)

The length and enable of the SRAM address range is made through the SRAM control register (write only, address 066h).

Note

The SRAM control register shares its I/O address with other registers. The watchdog enable register therefore must be selected before access.

Meaning of the bits[1]

SRAM control register (write only, address 066h, address register selection 1)								
Bit								Length in KB
7	6	5	4	3	2	1	0	
0	0	0						Disabled
0	0	1						4
0	1	0						8
0	1	1						16
1	0	0						32
1	0	1						64
1	1	0						128 [2]
1	1	1						Disabled
			0	0	0	0	0	Reserved (write 0 0 0 0 0 0)

[1] It is possible that selection is limited by default in the BIOS Setup.
[2] This setting is only practical when memory is activated.

17.4.4 General Purpose Ports (GPP) output register (read/write, address 404Dh)

Meaning of the bits

General Purpose Ports output register (read/write, address 404Dh)								
Bits								Meaning
7	6	5	4	3	2	1	0	
					1			Write protection for BIOS Flash Memory is active (default)
					0			Write protection for BIOS Flash Memory is inactive
	1							SW reset for PROFIBUS ASIC ASPC2 is inactive (default)
	0							SW reset for PROFIBUS ASIC ASPC2 is active
1								Watchdog interlocking is inactive (default)
0								Watchdog interlocking is inactive
		1	1	1				Reserved (read/write)

NOTICE
Data loss If SIMATIC products are installed on your device, the ASPC2 may not be reset by a user program under any circumstances.

17.5 CP 1616 onboard communications processor

17.5.1 Introduction

17.5.1.1 Properties

The CP 1616 onboard allows the connection of industrial PCs to Industrial Ethernet.

The basic characteristics of the PCS 1616 onboard are:

- Optimized for PROFINET IO
- Enhanced Real Time Ethernet Controller 400 = ERTEC 400
- Three RJ45 sockets for connecting terminal devices or addition network components
- Integrated 3-port real-time switch
- Automatic hardware detection

17.5.1.2 Network connections

Ethernet

The CP 1616 is designed for operation in Ethernet networks. Additional features are:

- The connectors are designed for 10BaseT and 100BaseTX.
- Data transfer rates of 10 and 100 Mbps in full/half duplex mode are supported.
- The handshake is performed automatically (auto negotiation).
- A 3-port realtime switch is located in the module.
- Autocrossing

Three RJ45 connectors

The CP 1616 is connected to the LAN (Local Area Network) via one of the three RJ45 sockets of the PC.

These three sockets lead to the integrated realtime switch.

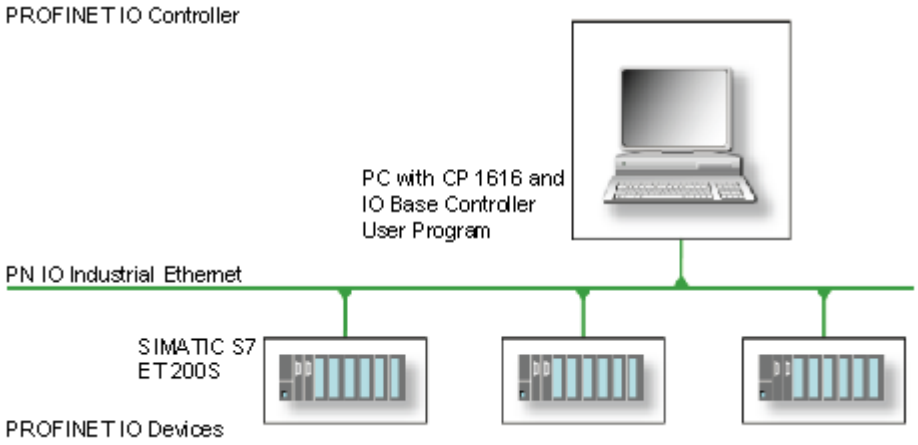
17.5.1.3 Typical Communication Partners

CP 1616 onboard as an IO controller

The following diagram shows a typical application: CP 1616 onboard as PROFINET IO controller on the IO controller layer.

The IO base controller user program runs on the PC. This program accesses the functions of the IO base user program interface.

Data traffic is routed via the communication processor to several SIMATIC S7 PROFINET IO devices, ET 200S over Industrial Ethernet.

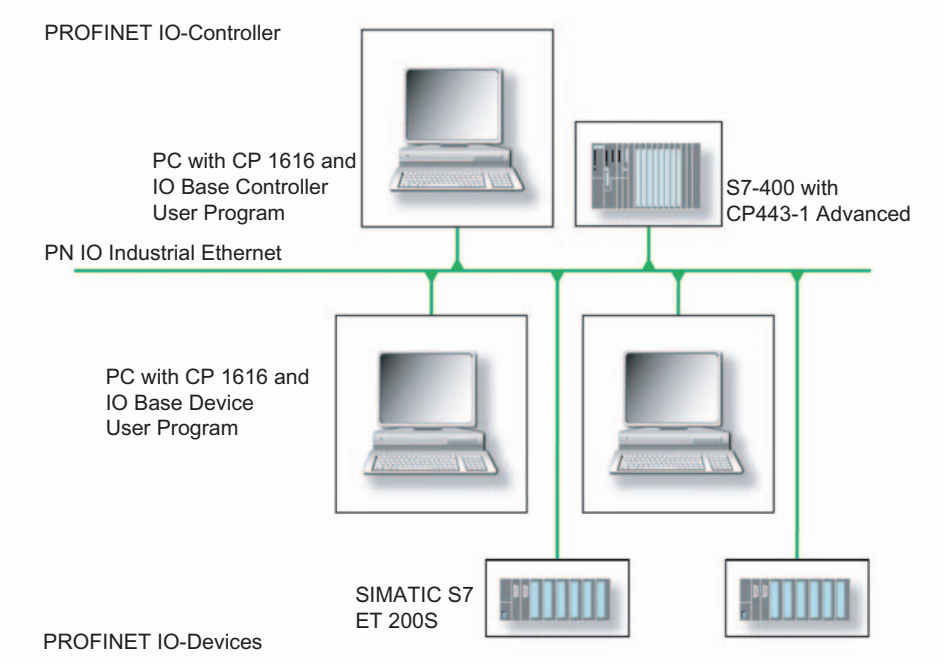


CP 1616 onboard as IO device

The following diagram shows a typical application: Two PCs each with a CP as a PROFINET IO device on the IO device layer.

A PC with a CP as PROFINET IO controller, a SIMATIC S7-400 with a CP 443-1 as PROFINET IO controller and two SIMATIC S7 ET 200S PROFINET IO devices are also connected in the network.

The IO base device user program runs on the IO device PC. This program accesses the functions of the IO base user program interface. Data traffic is routed via the CP 1616 onboard communication processor to a PC as PROFINET IO controller, or to an S7-400 automation system with CP 443-1 over Industrial Ethernet.



17.5.2 Firmware loader

Scenario for using the firmware loader

The CP 1616 onboard is supplied with the latest version of the firmware. If new functions become available due to product development, you can make them available by performing a firmware download.

Description

This section will familiarize you with the application area and use of the firmware loader. You can find additional, detailed information about the individual loader variants in the integrated help of the program.

Firmware

This refers to the system program in the SIMATIC NET modules.

Application area for the firmware loader

The firmware loader enables you to reload new firmware releases to SIMATIC NET modules. It is used for:

- PROFIBUS modules
- Industrial Ethernet modules
- Modules for gateways, for example IE/PB link

Installation

The firmware loader is available on your PG/PC under Windows following the installation of STEP 7/NCM PC.

Loader files

The firmware loader supports the following file types:

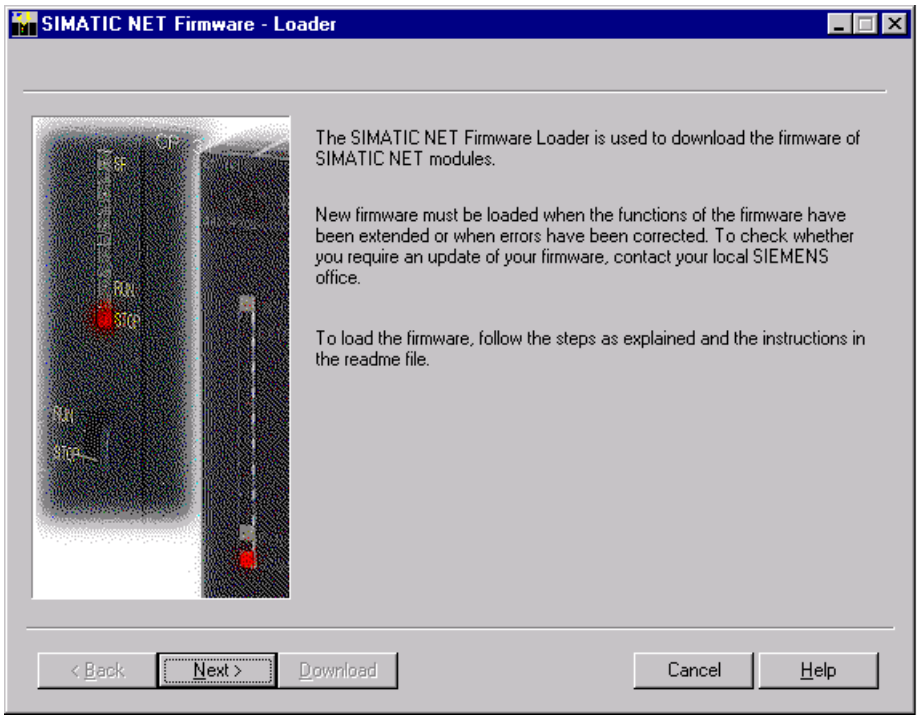
- <file>.FWL
  A file form that contains further information, which is displayed by the firmware loader. The firmware loader can use this information to check if the firmware is compatible to the device.

Read the information provided along with the loader file, for example, in the readme file. This information is also displayed in the firmware loader when the FWL file is loaded.

17.5.3 Loading firmware

Start downloading procedure

1. In the Windows Start menu, select the menu command SIMATIC > STEP 7 > NCM S7 > Firmware Loader.



2. Click "Next" and follow the instructions in the dialog fields that follow. A help function is integrated in the software as support.

CAUTION
Ensure that the loader file you are using for the update is suitable for the version of firmware on your module. If you have any doubts, contact your local Siemens consultant.

CAUTION
Be aware that aborting the loading process may result in an inconsistent state in your module.

You can find additional, detailed information about the individual loader variants in the integrated help.

NOTICE
When loading the firmware or commissioning the module, be aware that the CP 1616 onboard takes five MAC addresses (always in direct sequence). The first two are shown in the BIOS.

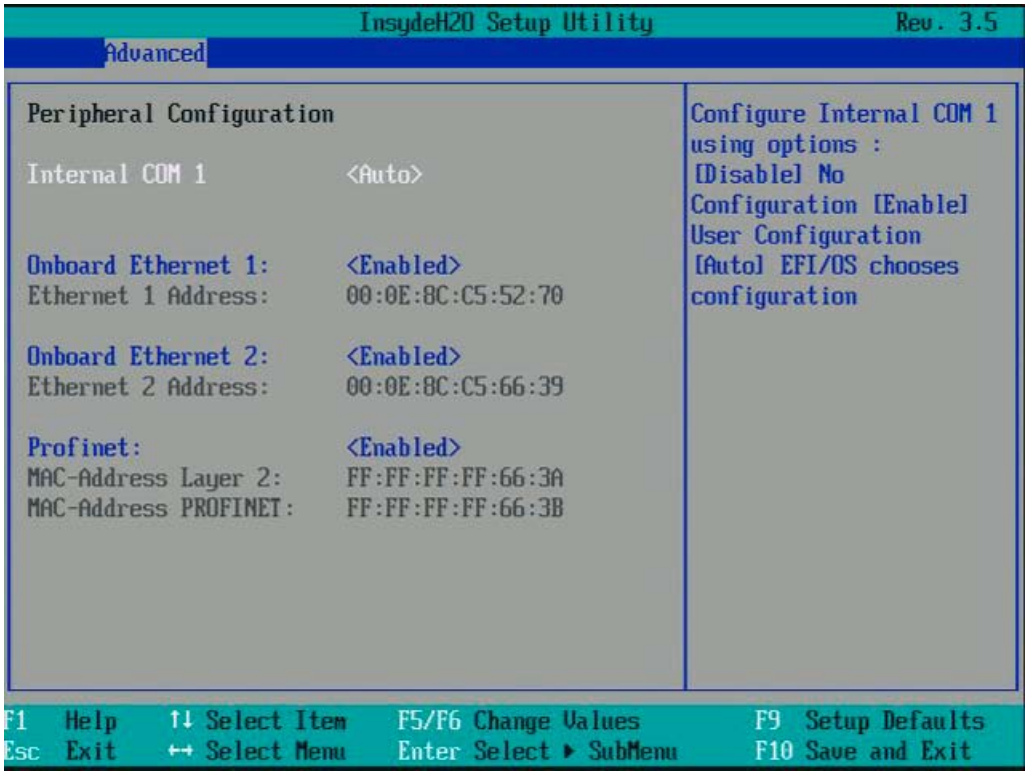


Figure 17-21 Advanced menu Peripheral Configuration

Example

The lower MAC address at "Profinet" is provided for Layer 2 communication, while the second one is used for Ethernet/PROFINET communication.

17.5.4 Further actions in STEP 7/NCM PC

Configuring

Your PC is now ready, although you still have to configure the SIMATIC NET communication software. The rest of the procedure is described in the "Commissioning PC Stations" manual (on the Windows PC that also contains STEP 7/NCM PC: Start > Simatic > Documentation > English > Commissioning PC Stations).

Appendix A

A.1 Guidelines and Declarations

Notes on the CE marking

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

EMC directive

The devices fulfill the requirements for the EC directive "2004/108/EEC Electromagnetic Compatibility", and the following area of application applies according to this CE marking:

Area of application	**Requirements**	
	Emitted interference	Interference immunity
Industry	EN 61000-6-4: 2007	EN 61000-6-2: 2005

Declaration of conformity

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

Note the installation guidelines

The installation guidelines and safety instructions given in this documentation have to be noted during commissioning and operation.

Connecting peripherals

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

A.2 Certificates and Approvals

DIN ISO 9001 certificate

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

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

EQ Net Certificate No.: DE-001108 QM

Software license agreement

The device can be supplied with or without preinstalled software. For devices with preinstalled software, please note the relevant license agreements.

Approvals for USA and Canada

Product safety

The following approval is available for the device:	
C UL US	Underwriters Laboratories (UL) according to standard UL508 and C22.2 No. 142 or C 22.2 No. 14-05 (IND.CONT.EQ)

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.
Modifications	Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
Conditions of operations	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

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

A.3 Service and support

Local information

Contain your Siemens representative (http://www.siemens.com/automation/partner) if you have questions about the products described here.

Technical documentation for SIMATIC products

You can find additional documentation for SIMATIC products and systems in the Internet:
SIMATIC Guide manuals (http://www.siemens.com/simatic-tech-doku-portal)

Easy shopping at the mall

You can find the online catalog and order system under:
Industrial Automation and Drive Technologies (http://mall.automation.siemens.com)

Training center

All the training options are listed at:
SITRAIN homepage (http://www.sitrain.com)

Technical support

You can contact technical support for all Industry Automation and Drive Technologies products by:

- E-mail: support.automation@siemens.com
- Internet: Online support request form: (http://www.siemens.com/automation/support-request)

When you contact the customer support, please have the following information for the technician on hand:

- BIOS version
- Order No. (MLFB) of the device
- Installed additional software
- Installed additional hardware

Online Service & Support

Information about the product, Support and Service, right through to the Technical Forum, can be found at: Industry Automation and Drive Technologies - Homepage (http://www.siemens.com/automation/service&support)

After-sales information system for SIMATIC PC / PG

Information about contacts, drivers, and BIOS updates, FAQs and Customer Support can be found at: After-sales information system for SIMATIC PC/PG (http://www.siemens.com/asis)

List of abbreviations

B

B.1 Abbreviations

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

Abbreviation	Term	Meaning
CPU	Central Processing Unit	CPU
CRT	Cathode Ray Tube	
CSA	Canadian Standards Association	Canadian organization for tests and certifications according to own or binational standards (with UL / USA) standards
CTS	Clear To Send	Clear to send
DRAM	Dynamic Random Access Memory	
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without GUI
DP	Display Port	New powerful digital monitor port
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DDRAM	Double Data Random Access Memory	Memory chip with high-speed interface
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVD	Digital Versatile Disk	Digital versatile disk
DVI	Digital Visual Interface	Digital display interface
DVI-I	Digital Visual Interface	Digital display interface with digital and VGA signals
ECC	Error checking and correction	Error correction code
ECP	Extended capability port	Extended parallel port
EFI	Extensible Firmware Interface	
EGA	Enhanced Graphics Adapter	PC to monitor interface
ESD	Components sensitive to electrostatic charge	
DM	Electronic Manual	
EIDE	Enhanced Integrated Drive Electronics	An enhancement of the IDE standard
EISA	Extended Industry Standard Architecture	Extended ISA standard
EMM	Expanded Memory Manager	Manages memory expansions
EM64T	Extended Memory 64 technology	
EN	European standard	
EPROM / EEPROM	Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory	Plug-in submodules with EPROM/EEPROM chips
EPP	Enhanced Parallel Port	Bi-directional Centronics interface
ESC	Escape character	Control character
EWF	Enhanced Write Filter	
FAQ	Frequently Asked Questions	FAQs
FAT 32	File Allocation Table 32-bit	32-bit file allocation table
FBWF	File-Based Write Filter	
FD	Floppy disk	Disk drive, 3.5"
FSB	Front Side Bus	

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

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

Abbreviation	Term	Meaning
SLC	Second Level Cache	
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym for parallel port
SRAM	Static Random Access Memory	Static RAM
SSD	Solid State Drive	
SVGA	Super Video Graphics Array	Enhanced VGA standard with at least 256 colors
SVP	Serial number of the device	
SW	Software	
TCO	**T**otal **C**ost of **O**wnership	
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TTY	Tele Type	Asynchronous data transfer
TxD	Transmit Data	Data transfer signal
TXT	Trusted Execution Technology	Hardware implementation
TWD	Watchdog Time	Watchdog monitoring time
UEFI	Unified Extensible Firmware Interface	
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards
UMA	Unified Memory Architecture	Video memory
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1600x1200 pixels.
V.24		ITU-T standardized recommendation for data transfer via serial ports
VCC		Positive supply voltage of integrated circuits
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Intel technology with which a virtually closed environment can be made available.
VT-D	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device.
W2k	Windows 2000	
WAN	Wide Area Network	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming.

Abbreviation	Term	Meaning
WLAN	Wireless LAN	LWireless local area network
WoL	Wake on Local Area Network	
WWW	World Wide Web	
XD	Execute Disable Capability	Hardware implementation
XGA	Extended Graphics Array	Graphic standard, maximum resolution 1024x768 pixels.

Glossary

AHCI mode

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

APIC mode

Advanced peripheral interrupt controller. 24 interrupt lines are available.

ATAPI CD-ROM Drive

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

Automation system (AS)

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

Backup

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

Baud

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

Boot disk

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

Cache

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

CE marking

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

Chipset

Located on the motherboard, connects the processor with the RAM, the graphics controller, the PCI bus, and the external interfaces.

Cold restart

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

COM interface

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

Compact Flash cards (CF)

Compact Flash is a digital storage medium in card format and without moving parts. The CF card contains the non-volatile memory and the controller. The interface of the CF card corresponds with the IDE interface. CF cards can be operated without additional electronics on PCMCIA or IDE hard disk controllers using a plug and socket adapter. There are two design forms: CF-I (42.6 x 36.4 x 3.3 mm) and CF-II (42.8 x 36.4 x 5 mm).

Configuration files

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

Configuration software

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

Controller

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

Device configuration

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

Disc-at-once

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

DP

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

Drivers

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

Dual Core CPU

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

ECC

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

EMC directive

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

Energy management

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

Energy options

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

Enhanced Write Filter (EWF)

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

ESD directive

Directive for using electrostatic sensitive components.

Ethernet

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

Execute Disable Capability

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

Extensible Firmware Interface (EFI)

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

File Based Write Filter (FBWF)

Configurable write filter to protect individual files from write access.

Formatting

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

Gender changer

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

HORM

Hibernate once, resume many is a method for fast booting from a single Hibernate file that only needs to be created once. HORM ensures restoration of a uniform, saved system state when booting. This reduces the writing to a CompactFlash medium to a minimum, for example, when starting up and shutting down Windows Embedded Standard 2009.

Hot plug

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

Hub

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

Hyper Threading

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

IGD

Integrated Graphics Device. Graphics interface integrated in the chipset.

Image

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

Intel Active Management Technology

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

Intel VT

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

Interface

See Interface

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

Interface, multi-point

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

LAN

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

Legacy Boot Device

Conventional drives can be used as USB devices.

Legacy USB support

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

License key

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

License key disk

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

Low-voltage directive

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

LPT interface

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

Memory card

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

Module

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

Motherboard

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

NEC Class 2

The "NEC", National Electrical Code, is the USA collection of regulations that generally correspond to German VDE 0100 standards. All USA standards governing the safety of electrical equipment and corresponding "deviations" in IEC standards are based on NEC in terms of their country-specific requirements.

NEC Class 2 specifies higher safety requirements for protection against electric shock and National Fire Protection Association (NFPA) requirements for fire protection. Power supplies operating within the range from 20 VDC to 30 VDC must be equipped with an internal current limiting circuit which safely prevents output power higher than 100 VA.

Operating system

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

Packet writing

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

PATA

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

PC card

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

PC/104 / PC/104-Plus

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

PCMCIA

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

PEG interface

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

PIC mode

Peripheral interrupt controller. 15 interrupt lines are available.

Pixel

PixElement (picture point). The pixel represents the smallest element that can be reproduced on-screen or on a printer.

Plug&Play

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

POST

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

PROFIBUS/MPI

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

PROFINET

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

Programmable controller (PLC)

The programmable controllers (PLC) of the SIMATIC S5 system consist of a central controller, one or more CPUs, and various other modules (e.g. I/O modules).

PXE server

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

RAID

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

RAL

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

Recovery CD

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

Reset

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

Restart

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

Restore DVD

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

ROM

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

S.M.A.R.T

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

SATA

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

SCSI interface

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

Session at once

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

SETUP (BIOS Setup)

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

SSD (Solid State Drive)

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

STEP 7

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

Track-at-once

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

Troubleshooting

Error cause, cause analysis, remedy

Trusted Execution Technology

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

Turbo Mode

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

V.24 interface

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

Wake on LAN (WoL)

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

Warm restart

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

WLAN

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

Index

2

24 VDC power supply
  Connecting, 51

A

Abbreviations, 205, 210
Adapting
  Partitioning, 134
Ambient and environmental conditions, 37
Approbation, 9
Approvals, 202

B

Backlighting, 17, 24
Battery replacement, 119
BIOS Setup, 173
  Advanced Menu, 182
  Defaults, 191
  Exit menu, 190
  Main menu, 177
  Menu layout, 175
  Version menu, 189
Boot options, 179
Boot sequence, 139
Bottom view, 25

C

CAN
  Base address register, 194
CE marking, 9, 201
Certificates, 202
Check list
  Commissioning, 61
Checking the package contents, 31
Clamp, 44
Cleaning Agents, 117
COA label, 34
COM interface, 168
Commissioning, 61
  Device, 61
Compact Flash card
  Installation/removal, 106, 109
  Interface, 173
  Partitioning, 104
Condensation, 13, 61
Connecting
  24 VDC power supply, 51
  Couple device via MPI/PROFIBUS, 58
  Device, 58
  Electrical connection, 11
  Peripheral equipment, 55
  Peripherals, 201
  Power supply, 55
  S7 automation system, 58
Control cabinet installation, 47
Control cabinet Installation, 45
Control unit, 17
couple, 58
  Device, 58
Coupling with SIMATIC S7, 57

D

Data backup, 136
Data exchange, 57
Date
  BIOS Setup, 177
DC supply voltage, 149
Declaration of conformity, 201
Degree of protection
  IP54, 45
  IP65, 45
Delivery state, 128
  Operating Systems, 61
Device, 61
  Commissioning, 61
  Connecting, 58
  couple, 58
  Opening, 99, 118
Device configuration, 191
Device driver CP16xx.sys, 57
Diagnostics
  Error Messages, 139
  Troubleshooting, 141
Dimensional drawings
  Device, 157
Display, 14, 15, 17, 24
  TFT-LC display, 15
Distributed, 57

Distributed kit
Installation/removal, 115
Download, 14
Driver installation, 137
DVI-I interface, 169

E

EEPROM calibration, 78
Electrostatic charge, 16
Protective measures, 16
EMC directive, 201, 202
Enhanced Write Filter, 93
Error messages
Troubleshooting, 141
Error Messages
on the screen, 139
ESD, 15
Guideline, 15
Handling, 16
Measurement, 16
modify., 16
Shipping, 16
Ethernet, 57
Ethernet RJ45 port, 170
EWF, 93

F

FAQs, 141
FBWF, 95
Field devices, 57
File Based Write Filter, 95

G

Guidelines, 201

H

HAL tool, 97
Hardware Options, 181
HMI device
Installing, 49
Hotfix, 14

I

Identification data, 32
Image
Creating, 136
Initial commissioning
for Windows XP Professional, 65
SIMATIC PC Wizard, 73
Windows Embedded Standard, 62
with Windows 7, 67
Installation guidelines, 39
Installation information, 39
Installing
HMI device, 49
Integration
Ethernet, 57
PROFIBUS, 57
PROFINET, 57
Interfaces
COM, 168
DVI-I, 169
PROFIBUS, 171
PROFINET, 172
RJ45 Ethernet, 170
USB, 172
IPC477 15 PRO
Bottom view, 25
IT communication, 57

K

Key code, 149
Key panel, 84
Keyboard Features, 180
Keyboard table, 149

L

Labeling strips, 17, 35
Language selection
Setting up, 66, 68
Setup in Windows Embedded Standard 2009, 63
Windows 7, 71
LED 1/2
Output register, 195
Liability disclaimer, 118
License key, 128, 129
Lithium battery, 119

M

Marine
Assembly for shipbuilding, 47
Measurement
ESD, 16

Membrane keyboard, 17
Memory Hole, 194
Modify
ESD, 16
Monitoring
Watchdog, 92
Motherboard
Layout and function, 165
Mounting, 44
Mounting methods, 43
Mounting positions, 41
Mouse, 17
MPI network, 58
MPI/PROFIBUS
Couple device via MPI/PROFIBUS, 58

N

Note, 39
General Information, 13
Installation guidelines, 39
Numeric keys, 88

O

On-board Ethernet, 181
On-off switch
Position of on/off switch, 52
Operating system
Setting up Windows 7, 67
Setting up Windows Embedded Standard, 62
Setting up Windows XP Professional, 65
Windows 7, 68
Operating Systems, 61
Operation
Touch screen, 90
Output register LED 1 / 2, 195

P

Panel Wizard
starting, 73
Partitioning, 134
Adapting, 134
Compact Flash card, 132, 133
SSD, 132, 133, 134
Windows 7 Ultimate, 134
Windows Embedded Standard 2009l, 132
Windows Embedded Standard 7, 133
Windows XP Professional, 133
PE conductor
SIMATIC IPC477C, 54
Peripheral equipment, 55
Peripherals
Connecting, 201
Pixel, 14
Defective pixel, 14
Ports
MPI/DP interface, 58
Power consumption
SIMATIC IPC 477C, 52
SIMATIC IPC 477C PRO, 53
Power supply
DC supply voltage, 149
Power requirements of the components, 148
PROFIBUS, 58
Integration, 57
PROFIBUS interface, 171
PROFIBUS-DP network, 58
PROFINET, 57
PROFINET interface, 172
PROFINET IO application, 58
Protective conductor
Protective conductor at stand or support arm, 48
SIMATIC IPC477C PRO, 54

R

Rack mounting, 44, 46
radiation
High frequency radiation, 12
Ramp-up, 139
Rating plate, 32
Recovery
Windows 7, 68
Recovery DVD, 130
Repairs, 13, 118
Replacement device
SIMATIC HMI IPC477C, 32, 117
Restart, 66, 67
Restore CD/DVD
for Windows XP Professional, 129
Restore CD/DVD, 128
Restoring the delivery state
for Windows XP Professional, 129

S

S7 automation system
Connecting, 58
Safety note, 11
SATA/PATA Configuration, 184

Scope, 9
Screen keyboard
calling, 80
Shipping
ESD, 16
SIMATIC HMI IPC477C
Replacement device, 32, 117
SIMATIC KeyTools, 76
SIMATIC NET, 58
SIMATIC PC Wizard
Initial commissioning, 73
SIMATIC S7, 57
Integration, 57
SRAM
Control register, 194
SSD
Installing/removing:SIMATIC IPC477C, 121
Installing/removing:SIMATIC IPC477C PRO, 125
Partitioning, 132, 133, 134
Standard, 62
Standard calibration, 77
Swivel arm mounting, 44, 47
System Date, 177
System partition, 128, 129
System resources, 193
Currently allocated system resources, 193
System Time, 177

T

Temperature monitoring, 92
TFT technology, 17
Time
BIOS Setup, 177
Touch input
Calling the screen keyboard, 80
Touch screen
Operation, 90
Transportation, 13
Troubleshooting/FAQs, 141
Type of fixation, 44

U

Updates, 14
User programs and drives, 135, 136
USB interface, 172
USB port, 17
User password, 185

V

Ventilation ducts, 26
Ventilation slots, 37

W

Warranty, 12
Watchdog
Monitoring function, 92
Monitoring times, 93
Windows 7
Data backup, 136
Recovery, 68
Setting up the operating system, 67
Windows 7 Ultimate
Partitioning the hard disk, 134
Windows Embedded Standard
Data backup, 136
Setting up the operating system, 62
Windows Embedded Standard 2009l
Partitioning the hard disk, 132
Windows Embedded Standard 7
Partitioning the hard disk, 133
Windows XP Embedded Standard 7
Reinstalling the operating system, 127
Windows XP Professional
Data backup, 136
Partitioning the hard disk, 133
Reinstalling the operating system, 129
Setting up the operating system, 65
Updates, 135

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