SIEMENS

SIMATIC

Rack PC IL 40

Intel Pentium 4 Platform

Manual

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Safety Guidelines

This manual contains notices intended to ensure personal safety, as well as to protect the products and connected equipment against damage. These notices are highlighted by the symbols shown below and graded according to severity by the following texts:



Danger
indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.



Warning
indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.



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

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

Notice
draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

Repair, maintenance and servicing of device only to be carried out by qualified personnel.Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage

Note the following:



Warning
This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

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Disclaimer of Liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Preface

Purpose of the Manual

This manual contains all the information you need for commissioning and using the SIMATIC Rack PC Industrial Lite (abbreviated in the manual as Rack PC IL).

It is intended both for programming and testing/debugging personnel who commission the device itself as well as for service and maintenance personnel who install expansions or carry out fault/error analyses.

Validity of the Manual

This manual is valid for all supplied variations of the Rack PC IL and describes the state of delivery as of March 2003.

Certifications, Standards and Approvals

Certifications

The device fulfils the following guidelines and certifications:

- EN 60950 (Security)
- EN 61000-6-2 (Noise Immunity)
- Norm EN 50081-1 (Emitted Interference)
- Underwriters Laboratories (UL) to Standard UL 1950
- Canadian Standard Association (CSA) to Standard C22.2 No. 950

Standards and Approvals

The device fulfils the requirements for the CE approval.

Further information on the approvals, certificates, and licenses for your device is provided in Chapter 1.

Further Support

If you have any technical questions, please get in touch with your Siemens representative or agent responsible.

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

Training Centers

Siemens offers a number of training courses to familiarize you with the SIMATIC S7 automation system. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

A&D Technical Support

Worldwide, available 24 hours a day:



Worldwide (Nuernberg) **Technical Support** 24 hours a day, 365 days a year Phone: +49 (0) 180 5050-222 Fax: +49 (0) 180 5050-223 E-Mail: adsupport@ siemens.com GMT: +1:00		
Europe / Africa (Nuernberg) **Authorization** Local time: Mon.-Fri. 8:00 to 17:00 Phone: +49 (0) 180 5050-222 Fax: +49 (0) 180 5050-223 E-Mail: adsupport@ siemens.com GMT: +1:00	**United States** (Johnson City) **Technical Support and Authorization** Local time: Mon.-Fri. 8:00 to 17:00 Phone: +1 (0) 423 262 2522 Fax: +1 (0) 423 262 2289 E-Mail: simatic.hotline@ sea.siemens.com GMT: -5:00	**Asia / Australia** (Beijing) **Technical Support and Authorization** Local time: Mon.-Fri. 8:00 to 17:00 Phone: +86 10 64 75 75 75 Fax: +86 10 64 74 74 74 E-Mail: adsupport.asia@ siemens.com GMT: +8:00
The languages of the SIMATIC Hotlines and the authorization hotline are generally German and English.		

Service & Support on the Internet

In addition to our documentation, we offer our Know-how online on the internet at:

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

where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on your products.
- The right documents via our Search function in Service & Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Automation & Drives via our representatives database.
- Information on field service, repairs, spare parts and more under "Services".

1 Important Information

1.1 Safety Instructions

Caution

The safety instructions given on the reverse of the title page of this manual must be observed. Before expanding your Rack PC IL refer to Chapter 5 and read the relevant safety instructions.

This device corresponds to the relevant safety measures according to IEC, EN, VDE, UL, and CSA. If you have questions about the permissibility of the installation in the designated environment, please contact our service representative.

Installation Notes

Condensation can occur if the device is transported from a cold environment into the operating area. Wait until the device has adapted to the room temperature and is completely dry before operating it. Please observe the notes on ambient conditions in Chapter 6 Technical Specifications and the installation notes in Section 2.2 of this manual when installing and operating the device. The device is to be installed so that there is no danger of it falling or of causing damage to itself or others.

Be sure the fan ventilation slots are open so that a sufficient amount of air can be drawn in to cool the housing interior.



Warning

Take note of the permissible fitting positions without fail when installing the systems (see Section 2.2).

If the systems are installed in a non-permissible fitting position, the approvals pursuant to UL 1950 and EN60950 are no longer valid!

Power Connection

Install the cables so that no one can step on them or trip over them. When you connect the device, adhere to the relevant instructions in Section 2.3 of this manual.

Do not connect or disconnect power supply cables and data transmission lines during thunderstorms.

In emergency situations (for example, damaged housing, damaged operator elements, a damaged power supply cable, ingress of liquids or foreign particles), switch off the device. Disconnect the power plug and inform the responsible service personnel.

The Rack PC IL must be switched off when you connect or disconnect peripheral devices (keyboard, mouse, printer, etc.). You can damage the PC if you do not adhere to these instructions.

Notes for Devices with AC Power Supply

The device is intended for service in grounded electricity supply systems (TN systems to VDE 0100, part 300, or IEC 364-3).

Service in non-grounded or impedance-grounded supply systems (IT systems) is not intended.

The power cord should meet the respective local safety requirements.

Check whether the device's set supply voltage is the same as the local supply voltage.

This device is equipped with a safety-tested power supply cable. You may connect this device only to a grounding outlet with a grounding contact.

Make certain that the socket outlet on the device or the grounding contact for the building wiring system is freely accessible and as near to the device as possible.

To establish a complete power separation, you must disconnect the power plug (inlet connector on the back of the device). This location must be accessible. A central isolating switch must be present for cabinet mounting.

Country-Specific Information

For the United States and Canada:

In the United States and Canada USA, a CSA or UL-listed power supply cable must be used.

The male plug is a 5-15 style.

For operation with 120 V:

Use a UL Listed, CSA Labelles Cord Set, consisting of a min. 18 AWG. Type SVT or STJ three conductor flexible cord, max. 4.5 m (15 feet) in length and a parallel blade grounding type attachment plug rated 15 A, min 125 V.

For operation with 240 V:

Use a UL Listed, CSA Labeled Cord Set, consisting a min. 18 AWG. Type SVT or SJT three conductor flexible cord, max. 4.5 m (15 feet) in length and a tandem blade grounding type attachment plug, rated 15 A, 250 V.

For operation with 230 V (outside of USA and Canada)

Use a Cord Set consisting of a min 18 AWG cord and grounding type attachment plug rated 15 A, 250 V. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed and marked

Repairs

Only authorized personnel are permitted to repair the Rack PC IL. Unauthorized opening and improper repairs on the device can result in significant danger to the user.

Before you open the device, first switch it off and then disconnect the power plug.

Install only system expansion devices provided for this computer. If you install other expansion devices, you can damage the system or violate the safety requirements and regulations for radio interference suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.



Caution

There are fast-running fans in Rack PC IL 40 which may cause injury when touched.

Note

There is a filter mat behind the front panel, check it regularly for dirt and change it if necessary.

Battery

There is a battery in this device below the device fan. Batteries may only be exchanged by technical personnel.

Observe the local regulations on disposal of special waste when disposing of dead batteries.



Caution

There is the danger of an explosion, if the battery is not exchanged as directed. Replace only with the same type or an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the manufacturer's instructions.

Notes on Inserting and Removing Modules (ESG Guidelines)

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



Please observe and carefully follow the guidelines mentioned below when handling modules equipped with electrostatically sensitive devices:

- Always discharge your body before handling modules equipped with ESDs (for example, by touching a grounded object).
- Devices and tools must be free of static electricity.
- Always pull the power plug and disconnect the battery before connecting or disconnecting modules (containing ESDs).
- Touch modules fitted with ESDs by their edges only.
- Never touch wiring posts or printed conductors on modules containing ESDs.

For more information on electronic charging and safety measures, refer to Appendix A.

1.2 Certificates, Directives and Declarations

Notes on the CE Symbol

CE

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

EMC Directive

This product fulfils the requirements for the EC directive 89/336/EEC on „electromagnetic compatibility" and the following fields of application apply according to this CE symbol:

Field of Application	Requirement For	
	Emitted Interference	**Noise Immunity**
Residential and commercial areas and small businesses.	EN 50081-1: 1992	EN 61000-6-2
Industry	EN 50081-2: 1992	EN 61000-6-2

In addition, the EN 61000-3-2 (harmonic currents) and EN 61000-3-3 (voltage fluctuation and flicker) have been fulfilled.

Low Voltage Directive

This product fulfils the requirements for the EC directive 73/23/EEC on „low voltage" and was tested to EN60950.

Declaration of Conformity

The EC declarations of conformity and the documentation relating to this are available to the authorities concerned, according to the above EC directive, from:

Siemens AG
Bereich Automation and Drives
A&D AS RD 4
Postfach 1963
D-92209 Amberg

Tel.: +49 (9621) 80-3283
Fax: +49 (9621) 80-3278

Observing the Setup Guidelines

The setup guidelines and safety instructions given in this electronic manual must be observed on startup and during operation.

Connecting Peripherals

The requirements regarding noise immunity (EN61000-6-2) are met when you connect a peripheral suitable for an industrial environment. Peripherals should only be connected via shielded cables.

Software License Agreement

The SIMATIC Rack PC IL is shipped with the operating system on the Restore CD. Please observe the relevant license agreements.

1.3 Certification for the USA, Canada and Australia

Security

One of the following markings on a device is indicative of the corresponding approval:

	Underwriters Laboratories (UL) to the UL 1950 Standard (I.T.E) or to the UL508 (IND.CONT.EQ)
C 	Underwriters Laboratories (UL) to the Canadian Standard C22.2 No. 950 (I.T.E) or to the C22.2 No. 142 (IND.CONT.EQ)
C  US	Underwriters Laboratories (UL) to Standard UL 1950, Report E11 5352 and to the Canadian Standard C 22.2 No.950 (I.T.E) or to the UL508 and C22.2 No. 142 (IND.CONT.EQ)
	UL-Recognition-Mark
	Canadian Standard Association (CSA) to standard C22.2. No. 950 (LR 81690) or to C22.2 No. 142 (LR 63533)
 NRTL	Canadian Standard Association (CSA) to the American Standard UL 1950 (LR 81690)

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.

1.4 Transport

Transporting

Despite the fact that the Rack PC IL is of rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect the PC from severe mechanical stress when transporting it.
Use the original **packing material** if you have to ship the Rack PC IL from one location to another.



Caution

Risk of damage!

When transporting the PC in cold weather, when it may be submitted to extreme variations in temperature, make sure that there is no moisture (condensation) on or in the PC.

The PC must be allowed to reach room temperature slowly before you switch it on.

2 Commissioning

2.1 Unpacking the SIMATIC Rack PC IL

Unpack your Rack PC IL as follows:

1. Remove the packing.
2. Do not throw the original packing away. Keep it in case you have to transport the unit again sometime in the future.
3. Please keep the documentation in a safe place. It is required during the initial start up and is part of the device.
4. Check the packing and its contents for any shipping or transport damage
5. Check with the delivery note to make sure no components are missing. Also check the accessory parts, which you can order separately.
6. Please inform your local dealer of any shipping or transport damages and of outstanding items indicated on the delivery note.

Recording the Serial Number and the Ethernet address

7. Enter the serial number and the Ethernet address of your PC in the table below. You can find the serial number on the type label attached to the rear of the device. The Ethernet address can be found in the BIOS setup under **Info** (key F1) **> LAN Address**.

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

Enter the Microsoft Windows “Product Key" from the “Certificate of Authenticity"

8. Enter the Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA) in the table. The product key is on the back of the device.

F-No.	
Order No.	
Microsoft Windows Product Key	
Ethernet Address	

2.2 Installing the SIMATIC Rack PC IL

The Rack PC is suitable for vertical and horizontal fitting in consoles, switch boards and 19" rack systems.

Notice
In the event of a vertical installation, make sure the right side of the device faces up.

The Rack PC IL meets the requirements for a fire enclosure to EN 60950. It can therefore be fitted without an additional fire enclosure.

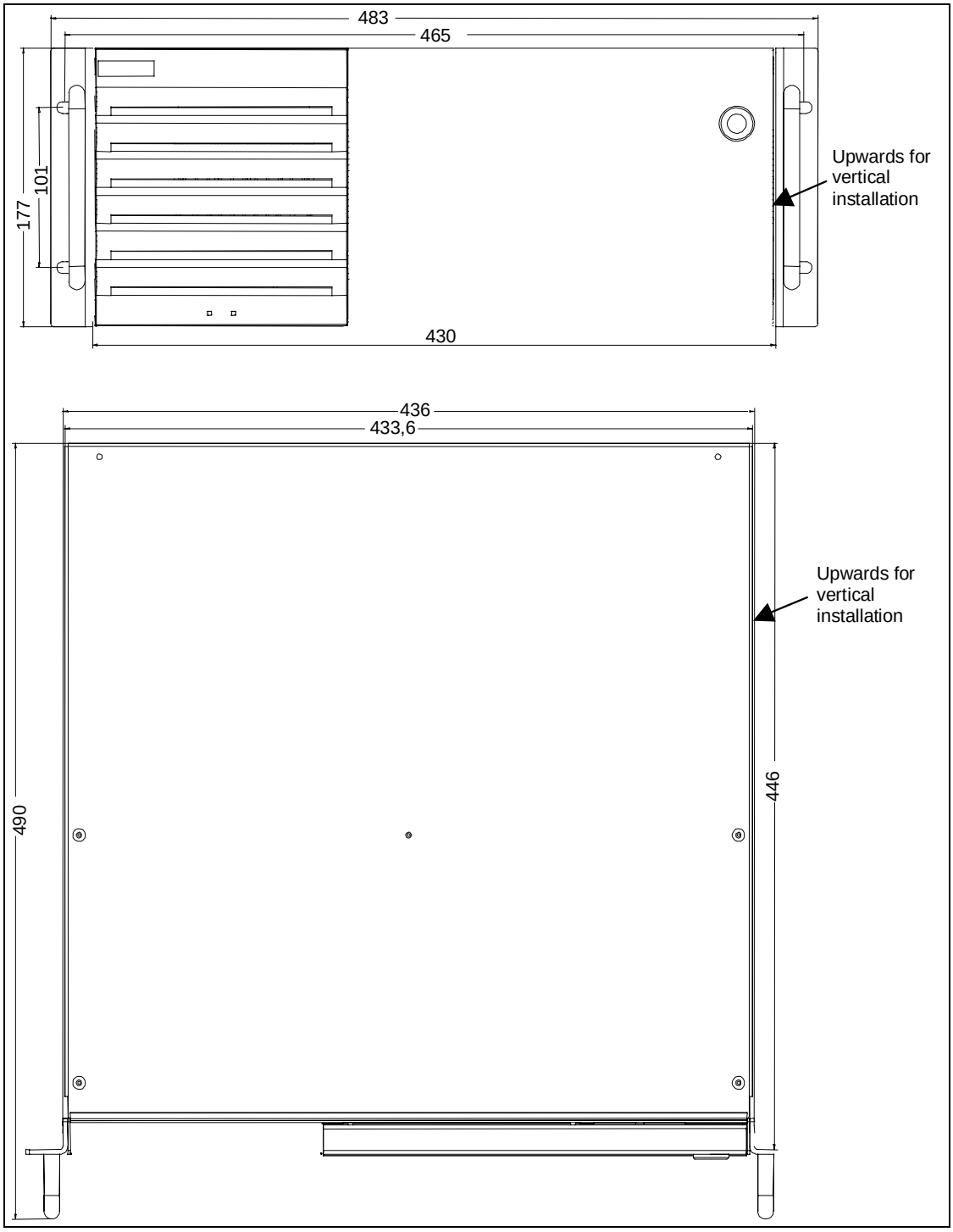
Please note the following points when installing the PC:

- Avoid extreme ambient conditions as far as possible. Protect your PC from dust, moisture, and heat.
- Keep the PC out of direct sunlight.
- Mount the PC as safely as possible to prevent any danger (for example, by falling over).
- The clearance near the ventilation slots must be at least 50 mm, so that the PC is sufficiently ventilated.
- Make certain that the ventilation slots for the housing are not covered.
- Make certain that the sliding door in front of the drives is closed during operation.
- The Rack PC IL can be mounted on telescopic rails or on cabinet brackets. It is not permitted to mount it at the 19" front supports only.
- Use the respective manufacturer's cabinet or rack slide rails or L-sections. Contact your cabinet supplier directly regarding cabinet or rack installation.
- The use of the telescopic rails makes it possible to completely pull the Rack PC out of the cabinet or rack.

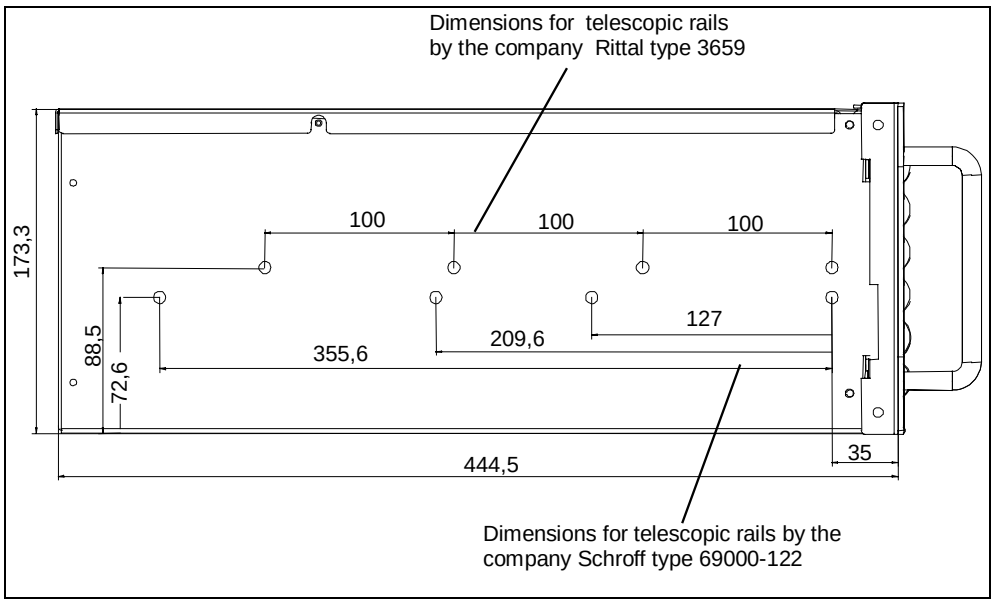
Notice

If the systems are installed without keeping to the conditions mentioned above, the approvals pursuant to UL 1950 and EN60950 are no longer valid!

Dimensioned Drawing for installation in cabinet 19"



Dimensioned Drawing for using telescopic rails



Technical Specifications of the Telescopic Rails

Load per pair	minimum 30 kg
Pull-out length for complete pull-out	minimum 470 mm
Rail thickness	maximum 9,7 mm
Fixing screws	M5 x 6mm

The fixing screw of the telescopic rail should not go beyond a maximum of 5 mm into the housing.

2.3 Preparing for Operation

Connection to the Power Supply Unit

The AC power supply unit of the Rack PC IL is designed for 115/230V systems. Voltage selection is carried out automatically.

1. Plug the supplied power cable into the appliance connector.
2. Connect the unit to a socket outlet with a grounded protective conductor.
3. Fasten the power plug using power plug clamp supplied.



Warning

The Rack PC IL is equipped with a safety-tested mains cable and may only be connected to a grounded grounding outlet.

Make sure that the socket on the device or the grounding outlet of the building installation is easily accessible and as near as possible to the device.
The mains plug must be pulled out for complete mains separation. This point must be easily accessible. If the PC is installed in a cabinet, there must be a central mains disconnector.

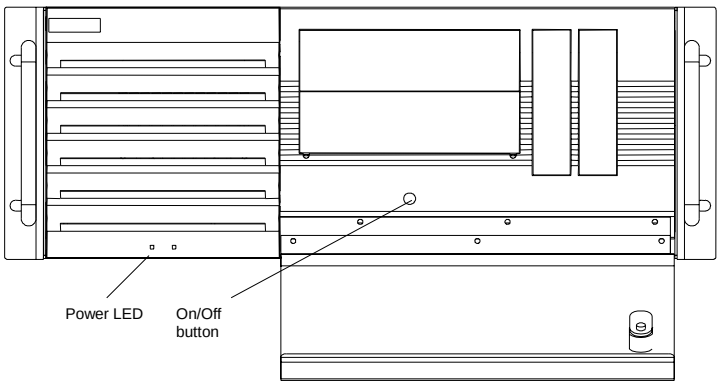
Notice

Rack IL 40 starts to run as soon as it is connected to the power supply. Press the ON/OFF button to switch it off again.

Connecting the Peripheral Units and Switching on the Rack PC IL

Before you connect the Rack PC IL to the mains, the peripheral units mouse, keyboard and monitor must be connected.

1. Insert the connector cable of the peripheral units into the corresponding sockets on the port side of the Rack PC IL (see Section 2.6.)
2. Press the On/Off button behind the front door, the PC is in operation. The Power LED lights green.



2.4 Initial Startup

The Rack PC IL is delivered without any operating system installed. The operating system is contained on the supplied Restore CD ROM.

The Rack PC IL is currently approved for the following operating systems:

- Windows NT 4.0; German, English
- Windows 2000 Professional MUI;
  German, English, French, Italian, Spanish
- Windows XP Professional MUI;
  German, English, French, Italian, Spanish

During the installation, the partitions `c:\prog` with 4 Gbytes (or 10 Gbytes for Windows XP) and `d:\data` with the remaining memory capacity are created on the hard disk drive.

Note

You require the corresponding LAN boot support in the BIOS if you want to boot the device from the network. PXE support is implemented in the BIOS during delivery. If you require BOOTP support, you have to install it first. You will find the tool for it in the "Rack PC IL 40 Documentation and Drivers" CD supplied.

Installing the Operating System from Restore CD

After switching on, the Rack PC IL will perform a self test. During the self test, the message `<F2> BIOS Setup, <F12> Boot Menu` appears briefly.

Notice

The keys F2 and F12 can be used to recall the displayed menus while the message is displayed. Only press the keys if you are familiarized with the menus to be recalled.

The Rack PC IL is booted. The message `Operating system not found` appears on the screen to indicate that no operating system has been installed yet.

1. Insert the supplied Restore CD into the CD ROM drive and close it.

Notice

If two CD drives are installed, the CD in has to be placed in the first drive (master).

2. Press twice the On/Off button behind the front door. The Rack PC IL is rebooted and the recovery menu appears.

3. If you select "Full Recovery", the hard disk will be overwritten completely. If you select "Partial Recovery", the data on "D" (Partition DATA) will be retained. Always select "Full Recovery" for the first commissioning.

   "Partial Recovery" can only be used for reinstallation if the partition name and, if applicable, the partition size are not changed.

4. Remove the CD-ROM from the drive after installation.
5. Restart your PC.

Initial Startup

Note

The procedure below describes, as an example, the first commissioning of a Rack PC IL with the operating system Windows 2000, German.

The start-up window of the operating system appears.

In case of new hardware, the dialog for hardware installation appears. Confirm the hardware installation.

The start-up window of the operating system reappears. Select and confirm your system settings. The Rack PC IL is booted.

After restart

- the time zone must be set and
- the license contract must be confirmed.

Confirm your settings – the system settings are updated now.

Then, the date/time dialog is opened. Enter the correct date/time, if necessary, and confirm your settings.

Close Windows and restart the Rack PC to fully integrate the upgraded.

2.5 Normal Operation

Once the Rack PC's operating system is set up, the user interface of the operating system is displayed following system startup every time you switch on or reset the PC.

Initial Start

To switch on the Rack PC IL press the On/Off button twice. After switching on, the Rack PC IL will perform a self test. During the self test, the message <F2> BIOS Setup, <F12> Boot Menu appears briefly.

At the conclusion of the self test, the operating system will be loaded and the desktop be displayed.

Special Features, Windows 2000

Auto-Logon is not activated in the state of delivery:

In order to activate Auto-Logon, perform the following settings:

1. Select **Start** > **Settings** > **Control Panel** > **Users and Passwords:**
2. Deactivate the check box "Users and enter user name and password for the computer".
3. Apply the settings and enter the password.

Special Features, Windows XP Professional

Auto-Logon is activated in the state of delivery.

You will find the tool for switching Auto-Logon On/Off under "Driver&Updates" on the "Rack PC IL 40 Documentation and Drivers" CD supplied.

Special Features, Windows NT4

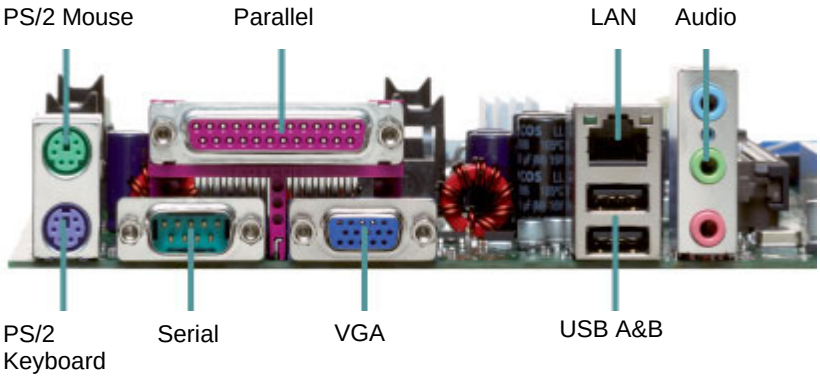
The DHCP service is installed during the installation of Windows NT. The DHCP service is deactivated by default.

Activate the DHCP service as follows if you want to use it:

1. Select **Start > Settings > Control Panel > Services**. The *services* dialog box opens.
2. Select DHCP Client service. A double-click opens the *Services* window.
3. Select *Automatically* and confirm your selection with *OK.*
4. Close the opened window.

Bear in mind that the ramp-up time of the computer increases considerably when the DHCP service is activated, however if the Rack IL is not connected to a corresponding network.

2.6 Connecting Peripheral Units



Notice

When connecting peripheral units, ensure that the components have industrial capability according to EN 50082-2.

Connecting a PS/2 Keyboard

A PS/2 keyboard of your choice can be connected to the Rack PC IL.

1. Separate the PC from the mains.
2. Insert the plug of the PS/2 keyboard.
3. Reconnect the PC to the mains.

Caution

It is recommended that a keyboard with straight keyboard connector is used, so that the connector does not obscure adjacent ports.

Connecting a USB Keyboard

You can find out how to connect a USB keyboard in **Connecting USB devices**.

Using a Mouse

You can connect a PS/2 mouse as well as a USB mouse to the Rack PC IL. The USB port is only supported by Windows 2000 and Windows XP.

Connecting a PS/2 Mouse

You can connect an external PS/2 mouse or another external pointing device to an additional PS/2-compatible mouse connector.

1. Separate the PC from the mains.
2. Plug the cable of the PS/2 mouse or another external pointing device into the mouse connector "PS/2 mouse".
3. Reconnect the PC to the mains.

Connecting a Serial Mouse

You can connect a serial mouse to the serial port. To operate a serial mouse, the appropriate mouse driver must be initialized and assigned parameters. You will find the information you need to do this in the description for your mouse or in the description for the operating system.

1. Separate the PC from the mains.
2. Plug the serial mouse into the "Serial" port.
3. Secure the connector with the screws.
4. Reconnect the PC to the mains.

Connecting a USB Mouse

You can find out how to connect a USB mouse in **Connecting USB devices**.

Connecting Monitors

You connect external multisynchronous monitors using the standard VGA connector on the right-hand panel side of the unit. We recommend that you use a Siemens monitor.

You must switch the PC off before connecting the monitor cable.

1. Separate the PC from the mains and switch the monitor off.
2. Insert the monitor lead in the VGA socket.
3. Screw down the plug.
4. Connect the monitor cable to the monitor.
5. Reconnect the PC to the mains and switch the monitor on.

Caution

If you want to set higher clock frequencies and resolutions, first make sure that the monitor you are using is suitable for a higher clock frequency and resolution.

If the clock frequency is too high, this can cause damage to the monitor.

Connecting the Printer to the Parallel Port

1. Separate the PC from the mains and switch off the printer.
2. Plug the printer cable into the parallel port.
3. Connect the printer cable to the printer.
4. Screw the connector tight at the interface port.
5. Reconnect the PC to the mains and switch the printer on.

Note

You can configure the parallel interface in the BIOS setup. The ECP mode is set by default in the delivery condition.

Caution

Switch the unit off before connecting the parallel printer to the "Parallel" port (the printer should also be switched off).

Make sure that you use the correct port. If you use the wrong port or wrong connecting cables, the port may be damaged.

Before plugging in the cables, the electrostatic charge of your body, the unit, and the cables must be equalized. To do this, touch the mounting plate for the ports on the left-hand side of the unit. Only use original connecting cables.

Connecting the Printer to a USB Port

You can find out how to connect a USB printer in **Connecting USB devices**.

Connecting USB Devices

Single as well as several USB devices (mouse, keyboard or printer) can be connected to a USB port.

- Insert the plug of the USB device into the USB port.

The device is recognized by the Plug and Play operating system and is then available.

A USB keyboard can be used to manipulate the BIOS setup. To do this, the "USB Legacy Support“ in the BIOS Setup has to be activated.

Notice

Operating systems which do not support Plug and Play (e.g. Windows NT) generally do not allow the use of USB devices.

2.7 Ethernet (RJ45 Ethernet Port)

Networking the Rack PC via the RJ45 Ethernet Port

The RJ45 Ethernet port is a Twisted Pair (TP) port with a data transfer rate of 10/100 Mbps. The onboard port is compatible with the Intel 82562 adapter.

The port is Plug and Play capable and is automatically recognized in Windows. The log settings are carried out in the Windows control panel.

Notice

A class 5 Ethernet cable is required to operate their 100 Mbps.

Note

The Rack IL 40 LAN Controller supports AlertOnLAN and WakeOnLAN.

2.8 Connection under Windows

Windows supports point-to-point connections via the LPT or COM port. The required connecting cables are standard, commercially available products. More information is available in the online Help system under "Connection to Another Computer".

3 Operating

3.1 Switch on the PC

1. Switch on the monitor (refer to the operating instructions of the screen).
2. Press the On/Off button behind the front door. The Power LED lights green, the PC is in operation.

Notice

If you have assigned the system password, you must enter this when requested to do so in order to start the operating system.

3.2 Switch off the PC

If you are working with Windows, always use **Start > Shut down** in the task bar for switching off your PC.

If the PC's operating system does not shut down automatically, switch it off on the prompt to do so with the on-off switch at the back of the front door. The power LED is not lit.

Caution

To disconnect the device from the power supply, turn off the power switch in the control cabinet/control panel or pull out the power switch on Rack PC IL.

Placing a PC (with soft power off function) in a ready-to-operate-state by means of software.

After quitting the operating system, the PC automatically shuts down using the soft power off function (ready to run).

Notice

This function is not available under Windows NT.

3.3 Operating modes

PC is switched off

The power switch in the control cabinet/control panel is off or the mains plug is removed, the power LED is not lit, and the On/Off button is disabled.

PC is ready-to-operate

The power switch in the control cabinet/control panel is on or the mains plug is inserted, the power LED is not lit. You can switch the PC on with the On/Off button. The "ready-to-operate" status corresponds to the "standby" status of a TV set. The description of the power-on indicator can be found in section 3.5.

PC switched on

The On/Off button has been actuated, the power LED lights green.

3.4 Reset via On/Off button

If you press the On/Off button briefly once the operating system will shut down and Rack PC IL is switched off.

Notice

With Windows NT the PC switched off immediately since the system cannot be shut down.

If you press the On/Off button once for more than four seconds, the Rack PC IL will be switched off, without shutting down the operation system (Reset). Briefly pressing the On/Off button again will restart the operating system.

3.5 LEDs at the PC

The LEDs are located at the front side of the housing.

Hard Disk Drive

The LED lights up when hard disk drive is being accessed.

Power

The LED lights orange	The PC is in operation.
The LED is not lit	The PC is switched off or ready for operation.

CD ROM

The LED lights up when CD ROM drive is being accessed. You may only remove the CD when the LED is unlit.

Floppy Disk

The LED lights up when floppy disk drive is being accessed. You may only remove the floppy disk when the LED is unlit.

3.6 Monitoring Functions

The following monitoring functions are implemented:

- Temperature monitoring
- Watchdog
- Fan monitoring

For this functions you will find the software "System Guard" and "Desk View on the supplied CD "Rack PC IL 40 Documentation and Drivers“.

Notice

The Software "System Guard" and "Desk View" are not to be installed simultaneously. Since both of them access the same interface, parallel installation or operation might cause errors.

You will find a comprehensive description of the monitoring functions in the technical manual on system modules on the supplied CD "Rack PC IL 40 Documentation and Drivers".

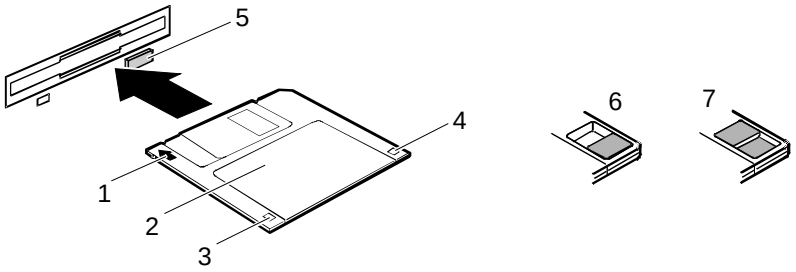
3.7 Floppy Disk Drive

Caution

Risk of Data loss!

You must not press while the eject button the drive's green access LED is lit.

Do not use the disk drive when the Rack PC IL is exposed to vibrations and shock.



1 = Insertion direction
2 = Label area
3 = Write protection tab for a 1.44 Mbyte floppy disk
4 = Identification of a 1.44 MB floppy disk or write protect switch on a 120 MB floppy disk
5 = Eject button for inserted floppy disks
6 = Disk is write-protected
7 = Disk is not write-protected

3.8 CD R/RW Drive

Depending on the device configuration, it can come with a CD R or a CD RW drive. For example, you can read the electronic manual of the supplied CD with this drive.

Caution
CD drives are sensitive to vibrations and shock. Any vibrations occurring during operation can lead to damage to the drive or storage medium.
Do not use the disk drive when the Rack PC IL is exposed to vibrations and shock.

Burner Software

To be attain the full functionality of the CD RW drive, burner software is necessary. You can find it on the CD included in the delivery of the device. To install the software place the CD in the drive and follow the instructions on the screen.

The burning operation is only permissible in an untroubled environment and under an ambient temperature not exceeding 35°C.

Caution

Risk of data error when burning a CD-RW!

The quality of recordable CDs vary considerably, data error can therefore not be completey ruled out when writing a CD, even when no error message is displayed. Correctly written data can only be guaranteed by an additional comparison with the source data. To ensure an error-free copying process do a data comparison after every burning session.

3.9 BIOS-Settings

You can set up the system functions and the hardware configurations of your PC in the BIOS.

Before delivery, the BIOS of the Rack PC IL is set differing from the standard BIOS settings as follows:

Register	Option	Settings
Main	**Boot Options → Post Errors:**	**No Halt On Any Errors**
Advanced	**Power On/Off → Power Failure Recovery:**	**Always On**
	System Management → Fan Control	**Enhanced**
Power	**APM:**	**Disabled**
	Power Management Mode:	**Disabled**
	ACPI S3:	**Disabled**

The technical manual on system modules or the manual "BIOS Setup" shows you how to call and operate the BIOS Setup. The manual also contains detailed descriptions of the menus and setting options offered by the BIOS Setup.

Notice

Updating BIOS or calling the "Default settings" function changes the BIOS settings. Reset the BIOS according to the specifications on the table.

Pay special attention to making the settings in the index *Power* correctly.

All menu items are disabled by default.

The operating system's functions "Save to RAM" (standby) and "Save to Disk" (hibernate) are not enabled functions for Rack PC IL.

3.10 Property and data protection

Software functions and mechanical locking offer a broad range of functions for protecting your PC and your personal data from unauthorized access. You can also combine these functions.

3.10.1 Mechanical housing lock

Your PC will be supplied with a housing lock; you can lock its front door with it to deny access to unauthorized persons.

3.10.2 Access protection under Windows

Under Windows you can activate a screen saver and protect it with a password. Only those users who know the password can deactivate the screen saver and access any open files. Detailed information on screen savers is provided by the associated help function.

3.10.3 BIOS Setup security functions

The **Security** menu in BIOS Setup offers you various options for protecting your personal data against unauthorized access, e.g.:

- Preventing unauthorized BIOS Setup entry
- Preventing unauthorized system access
- Preventing unauthorized access to the settings of boards with their own BIOS
- Preventing system booting from the diskette drive
- Activating virus warnings
- Preventing unauthorized writing of diskettes
- Protecting BIOS from being overwritten
- Protecting the PC from being switched on by an external device

You can also combine these functions.

You will find a detailed description of the **Security** menus and how to assign passwords in the technical manual for the system board or in the "BIOS Setup" manual.

4 Troubleshooting and tips

If a fault occurs, try to correct it as described in the following places:

- in this chapter
- in the documentation of the connected devices
- in the help systems of the software used
- in the documentation of your operating system

If you fail to correct the problem, proceed as follows:

- Switch off the Rack PC IL.
- Make a note of the steps and the circumstances that led to the fault.
- Make a note of any error messages displayed.
- Note the ID number of your device.
  This number can be found on the type label on the rear of the device.
- Contact your sales outlet or our customer service center.

4.1 Installing new software

When installing programs or drivers, important files may be overwritten and modified. To be able to access the original data in the event of any problems following installation, you should backup your hard disk prior to installation.

4.2 Power LED remains unlit after you have switched on your device

This may be due to the following:

The mains voltage supply is faulty

- Check whether the power cable is properly plugged into the Rack PC IL and grounded mains outlet.
- Switch the Rack PCIL on at the On/Off button.

Internal power supply overloaded

- Remove the PCs power plug from the grounded mains outlet.
- Wait for minimum 10 seconds.
- Plug the power plug into the grounded mains outlet again.
- Switch the Rack PC IL on at the On/Off button.

4.3 The screen stays blank

If your screen remains blank this may be due to the following:

Monitor is switched off

- Switch your monitor on.

Power saving has been activated (screen is blank)

- Press any key on the keyboard.

or

- Deactivate the screen saver. Enter the appropriate password.

Brightness control is set too dark

- Adjust the brightness control. For detailed information, please refer to the operating manual supplied with your monitor.

Power cable not connected

- Switch off the monitor.
- Check that the monitor power cable is properly connected to the monitor and, depending on the connector to a grounded mains outlet.
- Check that the PC power cable is properly plugged into the Rack PC IL and grounded mains outlet.
- Switch on the monitor.

Monitor cable not connected

- Switch off the monitor.
- Check that the monitor cable is properly connected to the Rack PC IL and monitor.
- Switch on the monitor.

Wrong monitor has been set under Windows NT

- Restart the PC in standard VGA mode.
- Set the desired resolution under **Start > Settings > Control Panel > Display**, and adjust the monitor display as described in the operating manual for the monitor.

Wrong monitor has been set under Windows 2000

- Restart the Rack PC IL.
- If the message “Starting Windows 2000” appears, press function key [F8]**.**

The “Windows 2000 Advanced Options Menu” appears.

- Select “Safe Mode” or “Safe Mode with Network”.
- Set the correct values for the attached monitor as described in the operating manual of the monitor by selecting **Start > Settings > Control Panel > Display > Settings**.

The wrong RAM modules have been inserted

See the technical manual for the system board for information on which memory modules can be used.

4.4 No mouse pointer displayed on the screen

- Shut down the operating system properly.
- Switch the PC off.
- Check that the mouse cable is properly connected to the system unit.
  If you use an adapter or extension lead with the mouse cable, check the connections.
- Make sure that only one mouse is connected.
- Switch the PC on.

The mouse controller must be enabled if you use a PS/2 mouse on the PS/2 mouse port .

- Check in the BIOS Setup that the mouse controller is Enabled.
- Check that the mouse driver is properly installed and is present when the application program is started. Detailed information can be found in the user guide for the mouse and application program.

4.5 The floppy disk cannot be read or written

- Check that the write protection of the floppy disk or the floppy disk drive is activated (refer also to the Technical Manual of the system board or to the "BIOS Setup" manual).
- Check the relevant entries for Diskette A*:* or B: in the Main menu of the BIOS Setup.
- Check that the floppy disk drive controller is enabled (refer also to the Technical Manual of the system board or in the manual "BIOS Setup").
- Check that the cables of the floppy disk drive are properly connected.

4.6 Time and/or date is not

You can set the time and date in the BIOS Setup or in the operating system.

- Set the time and date.

Notice

If the time and date are repeatedly wrong when you switch on your PC, the on-board battery is flat. Change the lithium battery as described in the Technical Manual of the system board.

4.7 Error messages on the screen

Error messages and their explanation are contained:

- in the technical manual for the system board
- in the "BIOS Setup" manual
- in the documentation for the programs used.

4.8 Restoring the hard disk

Instructions for this purpose can be found in Section 2.4.

4.9 Tips

The Rack PC IL cannot be switched off with the power button

Cause: The Rack PC IL was not switched on with the power button.

- Press the power button again.

Cause: System crash

- Press and hold the power button for at least four seconds until the device switches off.

Out of system resources

If you have too many applications running at once, you may experience problems due to a lack of system resources. In this case you should:

- close unnecessary applications

or

- run the applications in a different order.

Other manuals

Other manuals are contained on the CD “Rack PC IL 40 Documentation and Drivers”.

5 System expansions

You can enhance the performance of your Rack PC IL by adding an additional main memory, drives and expansion modules. Please observe the relevant safety guidelines.

5.1 Opening the Rack PC IL

5.1.1 Prerequisites

The Rack PC IL is designed for easy maintenance so that any work that is necessary can be done quickly and at low cost.

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices (ESD) in Appendix A.

Limitation of Liability

All technical specifications and licenses apply only to expansion functions approved by SIEMENS and Fujitsu Siemens Computers.

No liability can be accepted for impairment of functions caused by the use of devices and components of other manufacturers.

All the modules and components in the Rack PC IL are electrostatically sensitive. Please read the ESD guidelines at the end of this book carefully. The following symbol warns that electrostatically-sensitive modules are present.



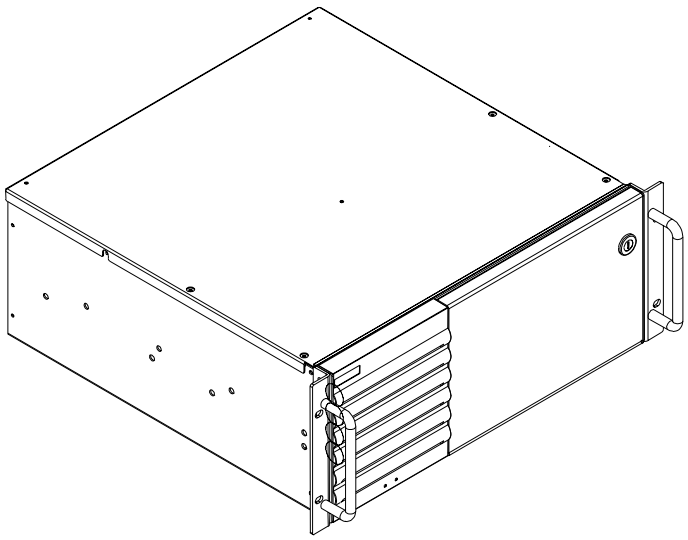
Before Opening the Rack PC IL

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by quickly touching the power supply unit.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist-strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Disconnect the Rack PC IL from its power supply by pulling out the mains plug before plugging in or removing any modules.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and printed conductors.
- Never operate the Rack PC IL with the cover open.

5.1.2 Opening the Rack PCIL

To open the Rack PC IL, proceed as follows:

1. Switch off the Rack PC IL and pull out the power supply connector.
2. If necessary, remove all cable connectors and connecting cables from the Rack PC IL.
3. If necessary, take the Rack PC IL out of its support/cabinet.
4. Undo the seven screws used in fastening the housing cover.
5. Then you can remove the housing cover.

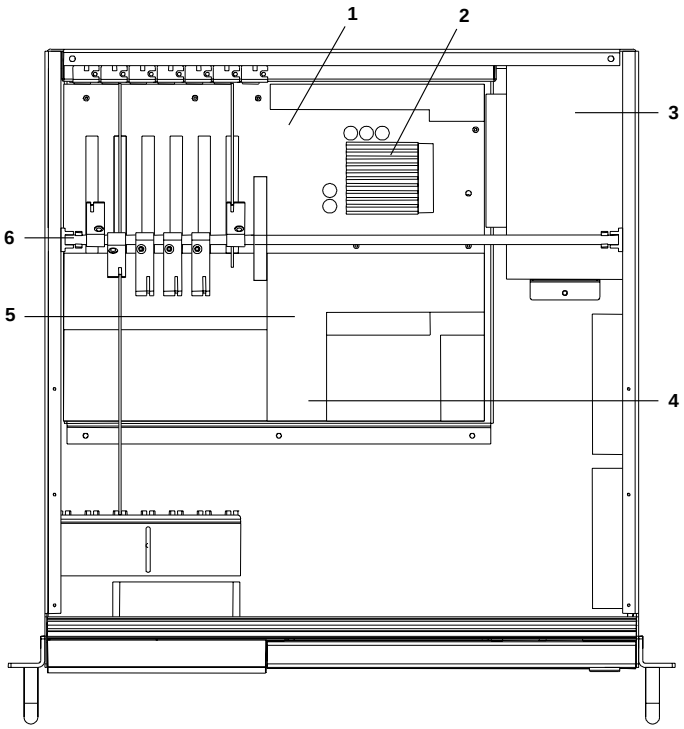


5.1.3 Components Visible after Opening the Unit

Components

Once you have removed the housing cover of your unit, the components are visible:

- Motherboard **(1)**
- Processor **(2)**
- Power supply **(3)**
- Backup battery **(4)**
- Memory expansion **(5)**
- Device for holding down the modules **(6)**



5.1.4 The Motherboard

The motherboard is the heart of the Rack PC. Here, data is processed and stored, and interfaces and device I/Os are controlled and managed. You will find detailed description of the Motherboard in the technical manual on system modules on the CD "Rack PC IL 40 Documentation and Drivers“ provided.

5.2 Installing Memory Expansion Submodules

The motherboard has 2 slots for memory submodules and one of them has a submodule inserted on it. This allows you to expand the memory capacity of your Rack PC IL. You will detailed information on the possible ways of doing this in the technical manual on system modules on the CD "Rack PC IL 40 Documentation and Drivers“ provided.

Caution

The electronic components of the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices (ESD) in Appendix A.

Installing the Memory Cards

To plug in expansion submodules, proceed as follows:

1. Open the Rack PC IL as described in Section 5.1.2.
2. Plug the cards into the slots. Note the safety recess on the connector side of the RAM card.
3. Push the card down applying light pressure until it locks into place.
4. Close the Rack PC IL.

Caution

Make sure that the cards sit securely in the slots, otherwise they can fall out and be damaged.

Installation

The memory configuration is detected automatically. When you switch on the unit, the distribution of base and extended memory is displayed on the screen.

5.3 Replacing the Backup Battery

A backup battery powers the real-time clock even after the Rack PC IL is switched off. In addition to the time of day, all the information about the Rack PC IL (device configuration) is stored. If the backup battery fails or is removed, all these data are lost.

You will find the position of the backup battery on the mother board and the procedure of changing it in the technical manual on system modules on the CD "Rack PC IL 40 Documentation and Drivers“ provided.

Caution

Risk of damage!

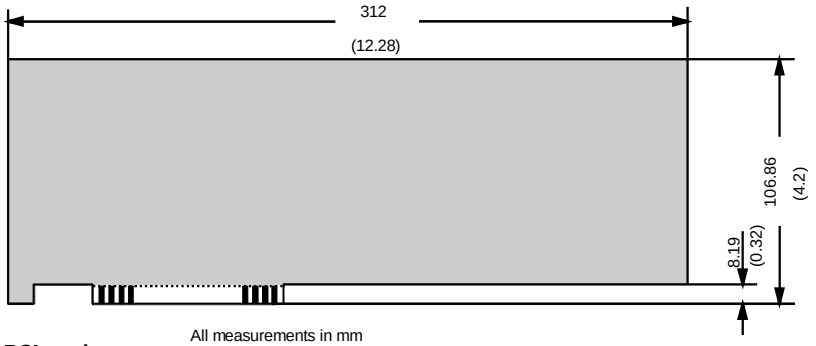
Only replace the lithium battery with an identical battery or with a type recommended by the manufacturer (Order No.: W79084-E1003-B1).

Dispose of used batteries in keeping with local regulations..

5.4 Installation of Expansion Cards

Notes about the Cards

The Rack PC IL is designed for the use with cards as per the AT/PCI specification. The dimensions of the cards may not exceed the stated dimensions. If the height is exceeded, contact problems, malfunctions and difficulties with the assembly cannot be excluded. The illustration show a card with full PCI overall length. Depending on the slot, there may be restrictions on the overall length.



PCI card

All measurements in mm

All measurements ( ) in inches

Note about Long PCI Cards

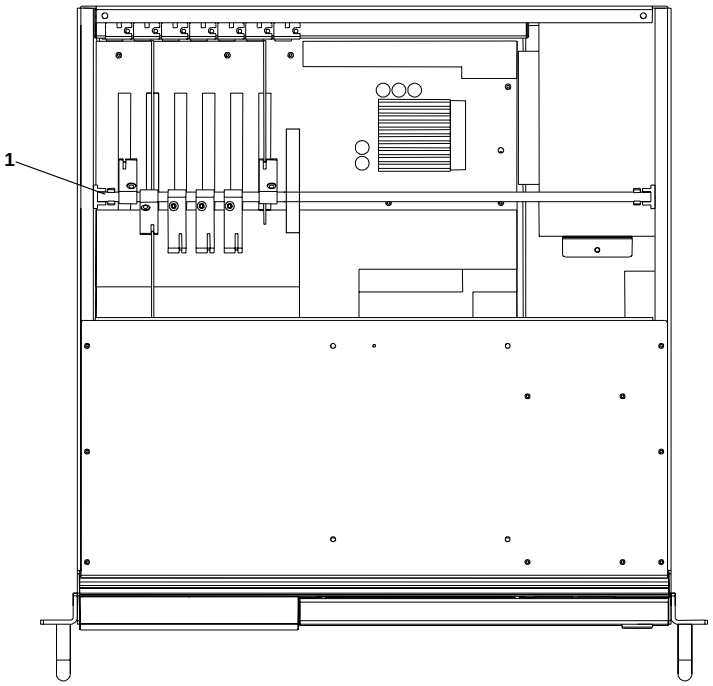
Before long PCI cards can be inserted into the guides of the fan trough, they must be fitted with a so-called extender (this should form part of the scope of supply of long PCI boards). Long PCI cards can be inserted into the guides of ISA modules by means of this extender

5.4.1 Removal and Installation of the Device for Holding Down the Modules

The device for holding down the modules is inserted in two holders. Eleven down holders are fitted on the device for holding down the modules. These down holders are fully adjustable to the modules.

Proceed as follows:

1. Open the housing as described in Section 5.1.2.
2. Pull the device for holding down the modules **(1)** out of the holders.
3. Fit the expansion modules as described in Section 5.4.2.
4. Reinsert the device for holding down the modules into the holders.
5. Align the down holders.



Note

The device for holding down the modules is intended for up to 6 PCI cards. AGP graphics cards can be interlocked mechanically using a slide on the AGP connector.

Aligning the Holding-Down Device

Proceed as follows to install the holding-down device.

- Remove the binding screw and push the down holder until it is resting firmly on the module. The module must now be introduced into the notch.

Caution

No pressure may be exerted on the module!

5.4.2 Removal and Installation of an Expansion Module

Proceed as follows:

1. Open the housing as described in Section 5.1.2.
2. Remove the device for holding down the modules as described in Section 5.4.1.
3. Select a free slot, undo and remove the screw on the slot cover.
4. Insert the expansion module gently into the slot.
5. Check whether the expansion module sits well and tighten it with a screw.
6. Plug all the necessary connectors into the expansion module.
7. Install the device for holding down the modules as described in Section 5.4.1.
8. Proceed in the reverse order to install the new expansion module.

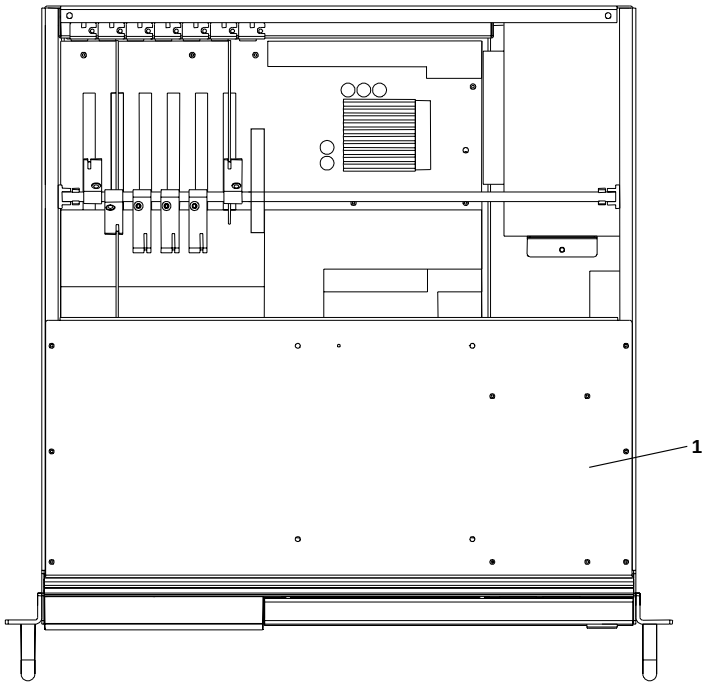
5.5 Removal and Installation of Drives

5.5.1 Removal and Installation of the Hard Disk Drive

Removal and Installation of the Front Drive Holder

Depending on variant supplied, a CD-ROM or CD-RW and floppy disk drive can be installed in the front drive holder.

1. Open the Rack PC IL as described in Section 5.1.2.
2. Take the drive holder **(1)** out of the housing.
3. Note down the cable assignment and remove the cables.
4. Proceed in reverse order when installing the drive holder.



Notice

Make sure the cable is not caught or damaged when installing the drive holder. Do not lay the cable loosely around the processor fan.

5.6 Removal and Installation of the Internal Drive Holder

The internal drive holder is fixed with 9 screws on the outside (right side).

1. Open the Rack PC IL as described in Section 5.1.2.
2. Remove the front drive holder as described in Section 5.5.1.
3. Note down the cable assignment and remove the cables.
4. Undo the screws on the sides and take the holder out of the housing.
5. Remove the power supply cables and note down their assignment.
6. Proceed in the reverse order when installing the internal drive holder.

5.6.1 Removal and Installation of the Floppy/CD Drive

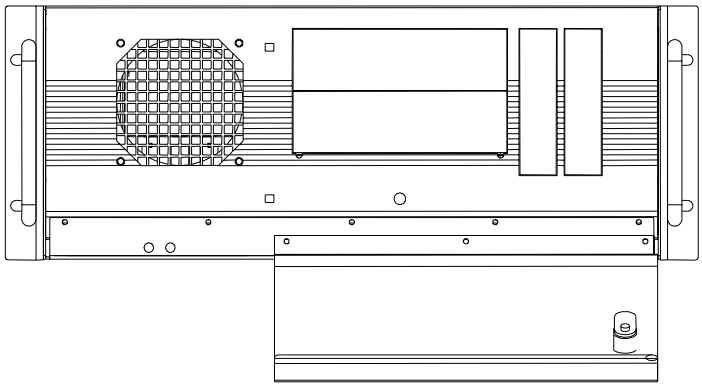
1. Open the Rack PC IL as described in Section 5.1.2
2. Remove the front drive holder as described in Section 5.5.1.
3. Undo the data and power supply cables on the drive.
4. Remove the 3.5“ drive holder by undoing the four screws holding it and thus making the screws of the drive accessible.
5. Undo the four screws on the drive and push it forward out of holder.
6. Proceed in the reverse order when installing the new drive.

5.7 Removal and Installation of the Front Fan

The Rack PC is ventilated by a fan which blow fresh air into the housing (pressurization).

Caution

There is a fast-running fan in Rack PC IL 40 which can cause injury when touched



1. Turn off the Rack PC IL.
2. Open the Rack PC IL as described in Section 5.1.2.
3. Remove the drive holder as described in chapter 5.6.
4. Remove the fan connector.
5. Unfasten the fan.
6. Proceed in reverse order for assembly.

Notice

Only a fan of the same type may be fitted!

Caution

To ensure that the device is adequately cooled, take care that the running direction of the fan is correct when installing.

Ensure that the arrow on the fan points away from the fan holder.

Only qualified personnel is authorized to change the fan.

6 Technical Specifications

General	
Structure	19“ Rack, 4 HE, industrial housing for mounting rack
Dimensions (mm)	w430xh177(4HE)xd444
Degree of protection(Front/Housing)	min. IP20 / IP20
19“ mounting bracket	removable from the outside
Cover	1 x in front of the fan / dust filter 1 x in front of the drives and control elements and lockable.
Control elements behind the front cover	On/Off button (with reset function) behind the front cover
Status LEDs	beneath the fan area • Power • HDD
Ventilation	excess pressure
Fan	Speed Control and Monitoring
Dust filter	behind the cover, replaceable from the front without a tool.
Drives behind the front cover in front	2 x 5.25 2 x 3.5
Internal drive	Max. 2x 3.5“ HD can be installed
Card retainer	yes
Telescopic rails	Prepared for telescopic rails (holes) from Rittal or Schroff
Power supply	
Power Supply AC	PFC, 300W, 100-125V/200-240V autorange
External on-off switch	yes
Frequency of supply voltage	50/60 Hz
Fan speed controller	yes

Motherboard	
Design	ATX
BIOS	• ACPI compatible, upgradable • Remote Boot • Wake on LAN
Processor	Intel Pentium4 2.0 GHz / Celeron 1,7 GHz
Main memory	Min. 128 MB, DDR266 SDRAM (without ECC), 2 GB expandable
I/O controller	UDMA 66/100 on board for 2x2 drives
Graphics	
Graphics processor	Intel 845G
Graphics memory	Intel Shared memory
Resolution / colors / frequencies	Min. UXGA / 64 k colors / 85Hz
Interfaces	
Serial	COM1:1x (9-Pin, 16 Byte FIFO, 16550 compatible) COM2: 1x (9-Pin, 16 Byte FIFO, 16550 compatible) → inside the motherboard
Parallel	LPT: 1x (25-Pin, EPP and ECP)
Keyboard	1x (PS/2)
Mouse	1x (PS/2)
USB (Universal Serial Bus)	2x USB 2.0
Monitor	1 x VGA
LAN	1x Ethernet Intel 82562 10/100 Mbit (RJ45)
Monitoring functions on board	
Temperature monitoring	Yes (incl. Fan controller)
Watchdog	Yes (function via System Guard)
Driver support for	Windows NT4/ 2000 / XP Professional
Monitoring software	System Guard or Desk View
Free slots	
PCI	6x (32-bit) long (complies with PCI specification)
AGP 4x	1x
Drives	
Floppy disk drive	1x 3.5" (1,44MB)
CD ROM drive	1x
CD ROM burner (CD R/RW)	1x optional incl. recording software
Hard disk drive	40 GByte, ATA 100; 3,5"
Security	
Approval	cULus
Standards	IEC 60950, EN 60950, UL 1950, CSA22.2 No. 950
CE symbol	• Use in industrial environment • Use in residential, commercial and light industry
Protection class	Protection class acc. to VDE 0106 T1: 1982 (IEC 536)

Ambient conditions	
Temperature	
• operation	• +5°C to +35°C with full configuration
• storage/transport	• -20°C to +60°C
gradient	max.10°C/h no condensation
Relative humidity	
• operation	• 5% to 80% at 25°C (no condensation)
• storage/transport	• 5% to 95% at 25°C (no condensation)
Vibration	
• operation *)	• 20Hz-200Hz, 0.2g (The screw points of the telescopic rails are the reference point for initializing the max. excitation of 0.2g)
• storage/transport	• 1g
Shock load	
• operation *)	• 1g shock, 20ms
• storage/transport	• 25 g
Electromagnetic Compatibility (EMC)	
Emitted interference:	EN50081-1
• Radio interference suppression	EN55022 cl. B
• Harmonic current emissions	EN 61000-3-2 see Norm
• Current fluctuations	EN 61000-3-3 see Norm
Noise immunity	EN61000-6-2 Industrial
• ESD	• IEC 61000-4-2: 4KV (Contact)/8KV (Air)
• HF radiation	• IEC 61000-4-3: 80-1000MHz:10 V/m; ENV50204:900MHz u. 1,8GHz:10V/m,50%ED
• Line-fed (Burst; l < 10m)	• IEC 61000-4-4: 2KV (Supply) ,1KV (Data)
• Line-fed (Surge)	• IEC 61000-4-5: 1KV (line to line), 2 KV (line to ground)
• HF current	• IEC 61000-4-6: 9kHz - 80MHz: 10V
• Magnetic field	• IEC 61000-4-8: 50Hz; 30A/m, 60Hz; 30A/m
• Voltage dip	• IEC 61000-4-11: 30%/10ms; 60%/100ms; 60%/1000ms
• Voltage interruption	IEC 61000-4-11:>95%/5ms
Compatibility	
Software compatibility	The computer is designed according to the PC99 System Design Guide.
Operation systems	
On the supplied Restore CD	Microsoft Windows NT German/English Microsoft Windows 2000 Professional MUI Microsoft Windows XP Professional MUI MUI (Multi Language User Interface), German, English, French, Spanish, Italian

*) only applies for horizontal installation

A Guidelines for Handling Electrostatically-Sensitive Devices (ESD)

A.1 What is ESD?

Definition

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

These Electrostatically-Sensitive Devices are commonly referred to by the abbreviation ESD.

Electrostatically-sensitive devices are labeled with the following symbol:



Caution

Electrostatically-sensitive devices are subject to voltages that are far below the voltage values that can still be perceived by human beings. These voltages are present if you touch a component or the electrical connections of a module without previously being electrostatically discharged. In most cases, the damage caused by an overvoltage is not immediately noticeable and results in total damage only after a prolonged period of operation.

A.2 Electrostatic Charging of Persons

Charging

Every person with a non-conductive connection to the electrical potential of its surroundings can be charged electrostatically.

Figure 7-1 shows you the maximum values for electrostatic voltages which can build up on a person coming into contact with the materials indicated in the figure. These values are in conformity with the specifications of IEC 801-2.

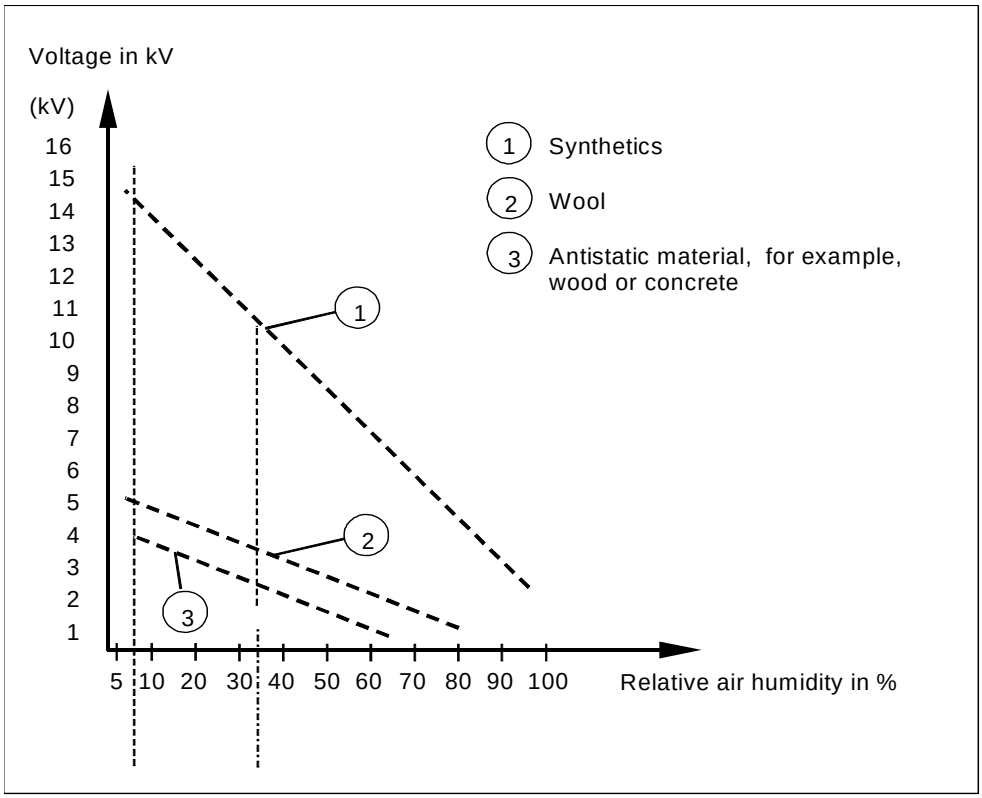


Figure 7-1 Electrostatic Voltages which can Build up on a Person

A.3 General Protective Measures Against Electrostatic Discharge Damage

Ensure Sufficient Grounding

Make sure that the personnel, working surfaces, and packaging are sufficiently grounded when handling electrostatically-sensitive devices. You thus avoid electrostatic charging.

Avoid Direct Contact

You should touch electrostatically-sensitive devices only if it is unavoidable (for example, during maintenance work). Hold modules without touching the pins of components or printed conductors. In this way, the discharged energy cannot affect the sensitive devices.

If you have to carry out measurements on a module, you must discharge your body's electrostatic charge before you start the measurement by touching grounded metallic parts. Use grounded measuring devices only.

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