

Industrial PC

IPC / IPC300 Connectivity Manual



Edition

104



BOSCH
Automation

Industrial PC

IPC / IPC300 Connectivity Manual

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1 Safety Instructions

Before you start working with the Bosch Rexroth IPC / IPC300 Industrial PC, we recommend that you thoroughly familiarize yourself with the contents of this manual. Keep this manual in a place where it is always accessible to all users.

1.1 Standard operation

This manual contains information required for the proper use of this product. However, for reasons of structural clarity, the manual cannot provide exhaustive details regarding all available combinations of functional options. Similarly, it is not feasible to consider every conceivable integration or operating scenario within the confines of this manual.


The described industrial PCs serve as **operating and visualization units** for Bosch Rexroth proprietary application software running on Microsoft Windows NT 4.0 operating systems. They are intended as control platforms for testing, adjustment and assembly station applications.

While it is possible in principle to operate other proprietary operating systems or application software on the industrial PCs, the occurrence of unexpected effects, even with Bosch Rexroth applications, cannot be entirely ruled out. With this type of nonstandard operation, Bosch Rexroth shall not assume any liability for either hardware and/or software.

The products described hereunder

- were developed, manufactured, tested and documented in accordance with the relevant safety standards. In standard operation, and provided that the specifications and safety instructions relating to the project phase, installation and correct operation of the product are followed, there should arise no risk of danger to personnel or property.
- are certified to be in full compliance with the requirements of the
 - COUNCIL DIRECTIVE 89/336/EEC of May 3rd 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility, 93/68/EEC (amendments of Directives), and 93/44/EEC (relating to machinery)
 - COUNCIL DIRECTIVE 73/23/EEC (electrical equipment designed for use within certain voltage limits)
 - Harmonized standards EN 50081-2 and EN 50082-2
- are designed for operation in an industrial environment (Class A emissions). The following restrictions apply:
 - Direct connection to the public low-voltage power supply is prohibited.
 - Connection to the medium and/or high-voltage system must be provided via transformer.

The operation of Class A devices in private residences, in business or small-industry settings is permitted only if their operation does not produce undue interference with other devices.

 **This is a Class A device. In a residential area, this device may cause radio interference. In such case, the user may be required to introduce suitable countermeasures, and to bear the cost of the same.**

The prerequisites for trouble-free service and safe operation of the described products are proper transport, handling and storage, placement, installation, plus careful operation of the equipment.

1.2 Qualified personnel

This instruction manual is designed for specially trained personnel. The relevant requirements are based on the job specifications as outlined by the ZVEI and VDMA professional associations in Germany. Please refer to the following German-Language publication:

Weiterbildung in der Automatisierungstechnik
Publishers: ZVEI and VDMA Maschinenbau Verlag
Postfach 71 08 64
60498 Frankfurt/Germany

This instruction manual is designed specifically for system planners and PC specialists. They require special knowledge of configuration and start-up of electrical equipment.

Interventions in the hardware and software of our products not described in this instruction manual may only be performed by our skilled personnel.

Unqualified interventions in the hardware or software or non-compliance with the warnings listed in this instruction manual or indicated on the product may result in serious personal injury or damage to property.

Installation and maintenance of the products described hereunder are the exclusive domain of trained electricians as per IEV 826-09-01 (modified) who are familiar with the contents of this manual.

Trained electricians are persons of whom the following is true:

- They are capable, due to their professional training, skills and expertise, and based upon their knowledge of and familiarity with applicable technical standards, of assessing the work to be carried out, and of recognizing possible hazards.
- They possess, subsequent to several years' experience in a comparable field of endeavour, a level of knowledge and skills that may be deemed commensurate with that attainable in the course of a formal professional education.

With regard to the foregoing, please read the information about our comprehensive training program.

You find the latest information on training courses, teachware and training systems on our website <http://www.boschrexroth.de>. The professional staff at our Didactic Center Erbach will be pleased to provide detailed information. You may contact the center by telephone at (+49) 6062 78-600.

1.3 Safety markings on components



DANGER! High voltage!



DANGER! Corrosive battery acid!



CAUTION! Electrostatically sensitive devices (ESD)!



Disconnect mains power before opening!



Lug for connecting PE conductor only!



Screened conductor only!

1.4 Safety instructions in this manual



DANGEROUS ELECTRICAL VOLTAGE

This symbol warns of the presence of a **dangerous electrical voltage**. Insufficient or lacking compliance with this warning can result in **personal injury**.




DANGER

This symbol is used wherever insufficient or lacking observance of this instruction can result in **personal injury**.



CAUTION

This symbol is used wherever insufficient or lacking observance of instructions can result in **damage to equipment or data files**.

 This symbol is used to alert the user to an item of special interest.

★ This asterisk symbol indicates that the manual is describing an activity which the user will be required to perform.

1.5 Safety instructions concerning the described product

**DANGER**

Fatal injury hazard through ineffective Emergency-STOP devices! Emergency-STOP safety devices must remain effective and accessible during all operating modes of the system. The release of functional locks imposed by Emergency-STOP devices must never be allowed to cause an uncontrolled system restart!

Before restoring power to the system, test the Emergency-STOP sequence!

**DANGER**

Retrofits or modifications may interfere with the safety of the products described hereunder!

The consequences may be severe personal injury or damage to equipment or the environment. Therefore, any system retrofitting or modification utilizing equipment components from other manufacturers shall require express approval by Bosch Rexroth.

**DANGEROUS ELECTRICAL VOLTAGE**

Unless described otherwise, maintenance procedures must always be carried out only while the system is isolated from the power supply. During this process, the system must be blocked to prevent an unauthorized or inadvertent restart.

If measuring or testing procedures must be performed on active systems, these must be carried out by trained electricians.

**CAUTION**

Only Bosch Rexroth-approved spare parts may be used!

**CAUTION**

Danger to the module!

All ESD protection measures must be observed when using the module! Prevent electrostatic discharges!

Observe the following protective measures for electrostatically sensitive devices (ESD)!


- The personnel responsible for storage, transport and handling must be trained in ESD protection.
- ESDs must be stored and transported in dedicated protective packaging.
- Out of principle, ESDs may be handled only at special ESD work stations equipped for this particular purpose.
- Personnel, work surfaces and all devices and tools that could come into contact with ESDs must be on the same potential (e.g., earthed).
- An approved earthing wrist strap must be worn. It must be connected to the work surface via a cable with integrated 1 M Ω resistor.
- ESDs may under no circumstances come into contact with objects susceptible to accumulating an electrostatic charge. Most items made of plastic belong to this category.
- When installing ESDs in or removing them from an electronic device, the power supply of the device must be switched OFF.

1.6 Documentation, software release and trademarks

Documentation

The present manual provides the user with comprehensive information about operation and configuration of the IPC / IPC300 Industrial PC.

Overview of available documentation	Part no.	
	German	English
IPC, IPC300 Connectivity Manual	1070 073 812	1070 073 822
BF2xxT / BF3xxT Control Panel Connectivity Manual	1070 073 814	1070 073 824

 **In this manual the floppy disk drive always uses drive letter A:, and the hard disk drive always uses drive letter C:.**

Special keys or key combinations are shown enclosed in pointed brackets:

- Named keys: e.g., <Enter>, <PgUp>,
- Key combinations (pressed simultaneously): e.g., <Ctrl> + <PgUp>

Release

Information on the software version for Windows95 or WindowsNT can be obtained by:

1. Clicking with the right mouse button on the "My Computer" icon ("Workplace") on the desktop
2. Select "Properties" menu option

Trademarks

All trademarks referring to software that is installed on Bosch Rexroth products when shipped from the factory represent the property of their respective owners.

At the time of shipment from the factory, all installed software is protected by copyright. Software may therefore be duplicated only with the prior permission of the respective manufacturer or copyright owner.

MS-DOS® and Windows™ are registered trademarks of Microsoft Corporation.

PROFIBUS® is a registered trademark of the PROFIBUS Nutzerorganisation e.V. (user organization).

Notes:

2 IPC System Overview

The Bosch IPC and IPC300 each comprise a powerful industrial PC with **additional components** (e.g., UPS, temperature monitoring unit, safe shut-down of the operating system, up to 6 expansion cards with PCI and ISA slot), all of which exceed the standard of an industrial PC.

The physical construction is very compact and service-friendly, providing the suitability for industrial applications:

- **High degree of failure resistance** (e.g., shock and vibration-proof cushioned hard disk, UPS uninterruptible power supply), and
- **Simple maintenance**

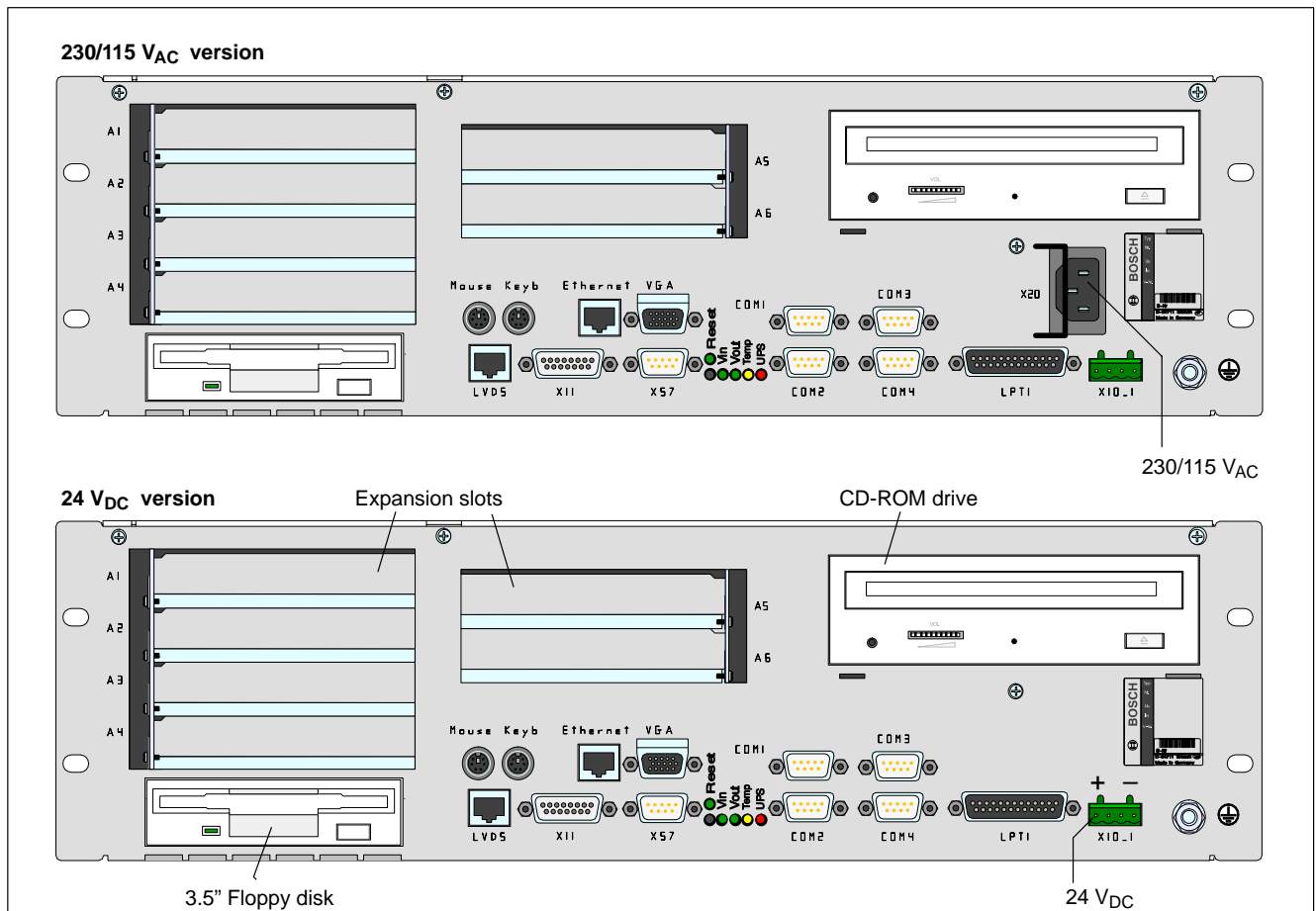
In accordance with requirements, the IPC / IPC300 is supplied with installed Microsoft Windows 95B or Windows NT4.0 operating system and appropriate Bosch Rexroth application software (refer to Section 9.3).

2.1 Versions

The IPC and IPC300 are available in two equipment versions accommodating different power supplies:

- **230/115 V_{AC}** version
- **24 V_{DC}** version


☞ **The 230/115 V_{AC} version also has a 24 V_{DC} input (X10_1) which is not functional, however.**



2.2 Specifications

PC feature	IPC	IPC300
Interl Pentium processor or compatible CPU (socket 7) with Intel MMX™ technology	≥ 200 MHz or ≥ 266 MHz*	≥ 266 MHz optional 400 MHz Pentium™ III
Second level cache	512 kB	512 kB
RAM	MIN 64 MB MAX 128 MB or 256 MB*	min 64 MB max. 256 MB
Hard disk	> 2.1 GB IDE (spring-cushion mount, w/ Autopark function)	> 2.1 GB IDE (federnd gelagert, mit Autopark-Funktionalität)
CD-ROM drive	32 X (or higher)	32-fach (min.)
Floppy Disk	High-density 3.5 in./1.44 MB	High-density 3.5 in./1.44 MB
Free expansion slots	4x PCI / 2x ISA or 3x PCI / 3x ISA	4x PCI / 2x ISA or 3x PCI / 3x ISA
Power supply (2 versions)	230/115 V _{AC} (at 50/60 Hz) or 24 VDC	230/115 V _{AC} (at 50/60 Hz) or 24 VDC
UPS (Uninterruptible Power Supply)	Via internal battery	Via internal battery
Temperature monitoring unit	With warning function & safe shutdown	With warning function & safe shutdown
4 LEDs	Display of essential operating statuses	Display of essential operating statuses
Standard interfaces	4x serial (RS-232, of which 1x optional RS-485/422), 1x parallel, PS/2 keyboard, PS/2 mouse, VGA	4x serial (RS-232, of which 1x optional RS-485/422), 1x parallel, PS/2 keyboard, PS/2 mouse, VGA
Enhanced interfaces	Ethernet, LVDS video transmission (touch screen signals via COM2), power supply for control panel.	Ethernet, Gigabit video transmission including touch screen signals, power supply for control panel.
Weight	Approx. 8 kg	Approx. 8 kg
IPC dimensions	19 in. housing: 448 x 132 x 256 mm (19 in. x 3U x 256 mm)	19"-Gehäuse: 448 x 132 x 256 mm (19 in. x 3U x 256 mm)
Operating system	Microsoft Windows 95B / Windows NT4.0	Microsoft Windows NT 4.0

* Due to processor phase-out, the IPC subject to concurrent modification to 266 MHz / MAX 256 MB.

 **All specifications are subject to change as a result of technological developments. This also means that components providing higher than the specified performance (e.g., a faster processor) may be integrated in the devices without explicit reference in this documentation.**

2.3 Expansion slots

Six expansion slots are provided for expansion cards:

- 3 PCI bus slots
- 2 ISA bus slots
- 1 PCI or ISA bus slot (combination slot)



CAUTION

Possible damage to or application software PC through the use of non-approved expansion cards.

Use only approved expansion cards which have been installed by authorized specialists.

For more information on installing expansion cards, refer to Section 8.3.

2.4 Rechargeable battery pack

The IPC and IPC300 feature an integrated rechargeable battery pack (2 series-connected 6V batteries).

In the presence of a power failure, the battery pack facilitates a controlled and safe shutdown of the PC operating system, as described in Section 3.2, “**UPS Functions**”. Loss of data held in PC RAM is thus prevented.

The rechargeable battery pack must be replaced if it no longer accumulates a sufficient charge.

Refer also to Section 8.2.3.

2.5 Operating conditions

The IPC and IPC300 are designed for continuous (24 hours/day) operation. The display backlight can be switched off. Unless stated otherwise in specific sections, these specifications apply:

Temperature

Storage temperature

- -20°C to $+60^{\circ}\text{C}$

Ambient temperature

- $+5^{\circ}\text{C}$ to $+45^{\circ}\text{C}$

Ambient temperatures apply to installation described in Section 4. Temperature fluctuations of up to 3°C per minute are permitted.



CAUTION

Excessive operating temperature!

Do not expose the PC to direct sunlight or other sources of heat radiation!

Relative humidity

Climate class 3K3, as per EN 60529; condensation not permitted.

Atmospheric pressure

To DIN 60204, when operating at altitudes up to 2000 m above sea level.

Protection Category ratings

IP00

Control cabinets and installation compartments for the control panels must conform to IP 54 rating (dust filters upstream of air intake and exhaust):



CAUTION

Conditions hazardous to the product!

The ambient air must be free of electrically conductive pollutants (e.g., acids, alkali, corrosives, salts, metallic vapours, etc.).

Air intake and exhaust filters must be serviced at regular intervals.

Vibration resistance, operating

Frequency range: 10 to 150 Hz
 Amplitude: 0.075 mm at 10 to 57 Hz
 Acceleration: 1 g at 57 to 150 Hz
 to EN 60068-2-6


Impact resistance

15 g as per DIN IEC 68-2-27, no functional impediment.

2.6 Standards compatibility

The IPC and IPC300 system components are certified to comply with the following standards:

- EN 60 204-1 Electrical systems on machines
- EN 50 081-2 Basic specification for interference emission (industrial environment)
- EN 50 082-2 Basic technical standard, interference resistance (industrial environment)
- EN 60 742 Transformer for 24 V power supply, protective separation
- EN 60 950 Overvoltage category II
- EN 61 131 Requirements w/ respect to 24 V outputs
- EN 61 131-2 Requirements w/ respect to 24 V power supply
- EN 418 Machine safety, Emergency-STOP devices
- EN 60 529 Protection categories (incl. housings and installation compartments)
- EN 60 068-2-6 Vibration test
- EN 60 068-2-27 Impact test
- .IS.114 "X-ray Radiation" Directive, as per Official Federal Gazette

 **The CE licensing requirements have been fulfilled for all IPC and IPC300 shipped from the factory. However, the subsequent insertion of additional expansion cards will necessitate a supplementary CE certification.**

Notes:

3 Security Functions

Each PC is equipped with a temperature monitoring function and an uninterruptible power supply (UPS). The UPS only works in conjunction with a battery pack.

3.1 Temperature monitoring function

The ambient air of the IPC must not exceed +45°C (see Section 2.5). To ensure operational reliability, a temperature monitoring function measures the internal housing temperature.

A temperature warning, occurring at internal housing temperatures **exceeding 50°C**, manifests itself as follows:

- via the flashing "Temp" LED at the front panel of the housing.
- via a message window displayed by the operating system.
This message must also be interpreted by all PC applications, and by I/O processes in particular. Bosch Rexroth application programs are in full compliance with this requirement.

The described temperature monitor can be disabled by means of the following program:

- UPS_{plus} for Windows 95
- UPS_{NT} for Windows NT 4.0

See also Section 3.3.

If temperatures in the housing **exceed 65°C**, the IPC **will be shut down and switched off** via the UPS logic circuit (see Section 3.2).



DANGER

Inadvertent machine movements.

Always ensure that temperatures remain within the noncritical range. In the case of application-sensitive procedures, ensure that machine movements are terminated in a controlled fashion in the event that the temperature monitoring function disables the operator terminal.

3.2 Uninterruptible power supply (UPS)

In the event of a power failure exceeding 800 ms in duration, or of an internal housing temperature in excess of 65°C (refer to Section 3.1, above), the UPS logic integrated in the power supply is activated, effecting a safe operating system shutdown procedure backed up by the internal rechargeable battery ("battery pack").

Power interruptions of shorter durations are bridged by the battery pack. For an IPC300 running with the Windows NT operating system, power interruptions of up to 5 seconds in length may be permitted before the USP logic circuit activates.

Please note:

- To allow the rechargeable battery pack to attain its full charge capacity, the IPC must remain powered up for a minimum of 5 hours subsequent to initial start-up. Sufficient USP protection cannot be ensured during this charging period.
- **IPC only:**
Frequent On/Off cycling of power tends to cause rapid discharge of the battery pack. You should never cycle the power more often than 4 times in succession. The battery pack must again be fully recharged thereafter.
- The UPS logic function requires hard disk capacity for intermediate data storage. Ensure that the hard disk never fills up completely.
- Check and verify whether or not the preset **Delay Time** of 30 seconds selected in the UPS Dialog window will allow the safe shutdown of all application programs, or whether the interval must be increased.



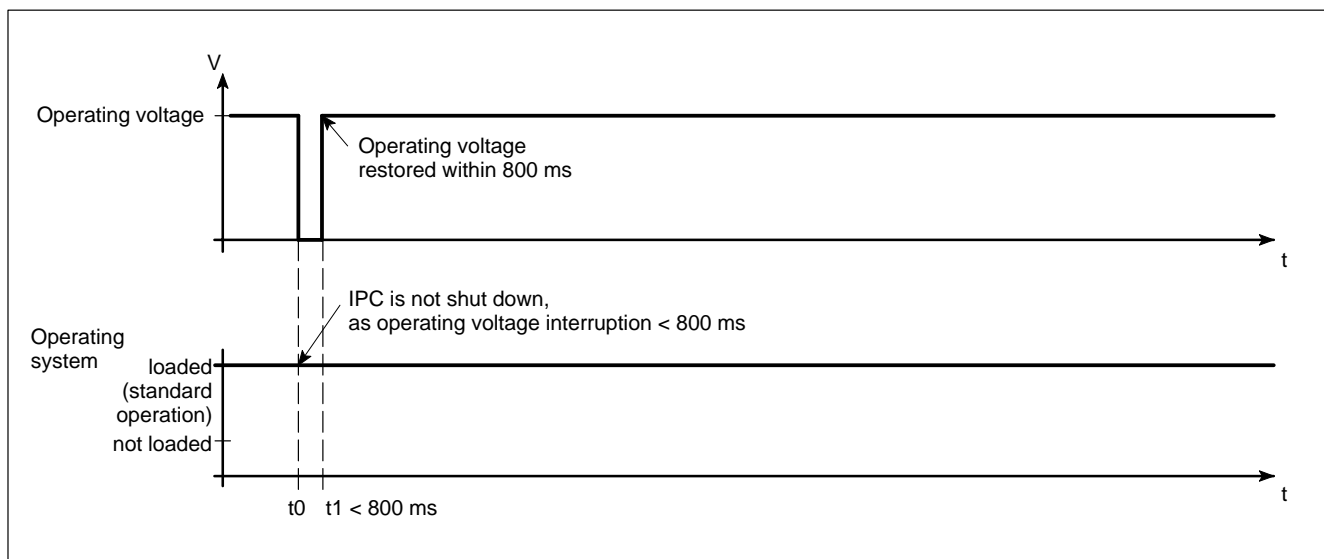
DANGER

If there are no batteries in the unit, or if the batteries are defective or discharged, the IPC will RESET without warning after a voltage dip in excess of 20 ms! Possible consequences are uncontrolled machine movements or loss of data.

Each time the PC is booted up, observe UPS program messages indicating that the battery pack may be discharged. This test is run during each PC boot phase.

Voltage drops below 800 ms duration

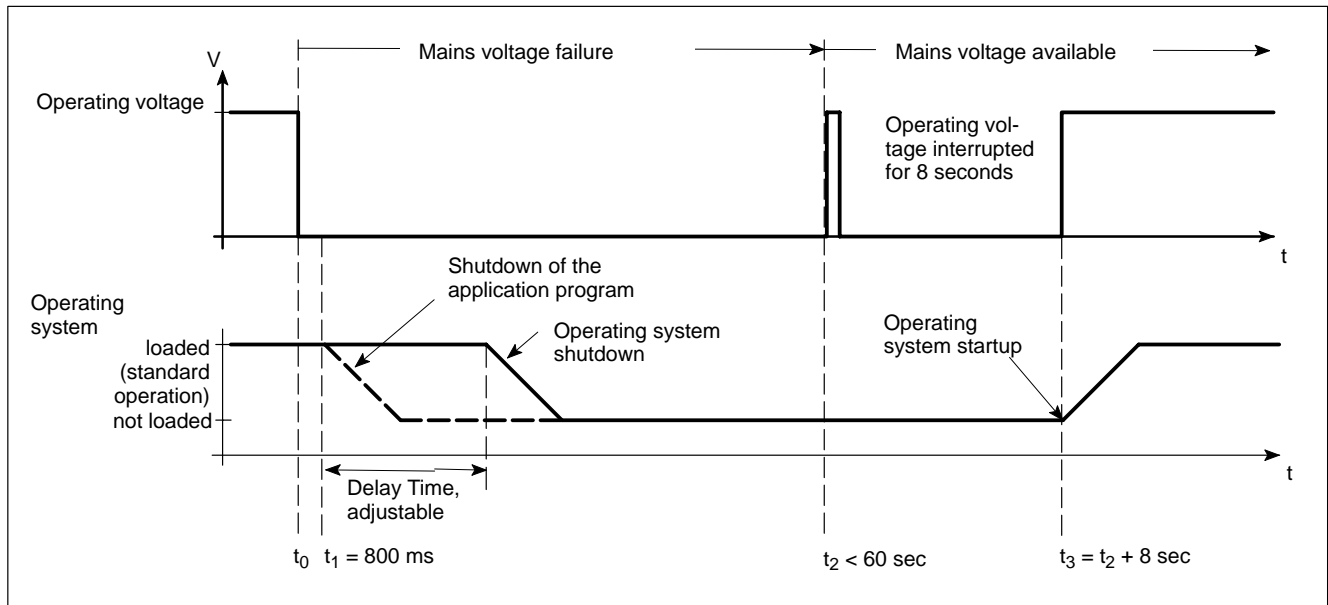
Voltage drops below 800 ms duration are bridged by the battery pack, and do not trigger the UPS logic circuit.



Voltage drops between 800 ms and 60 s duration

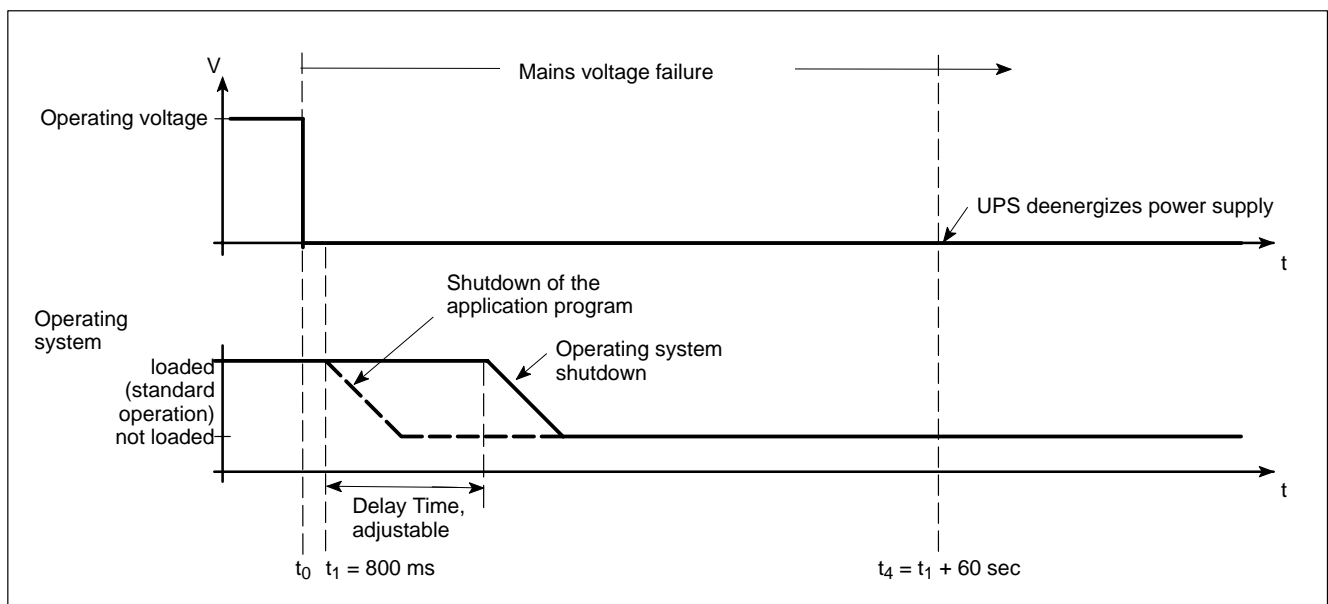
In the event of a voltage drop in excess of 800 ms, the operating system will initiate a safe shutdown of the operating system after a preselected delay time.


- If the mains power is restored within a 5-second interval (short break), the USP will remain disabled (**IPC300** only with appropriate settings).
- If the mains power is restored within the next 60 seconds, the USP will interrupt the operating voltage for another 8 seconds (up to t_3), and then again restart the operating system.



Voltage interruption in excess of 60 seconds

After approx. 60 sec the UPS internally switches off the power supply.



 **For the procedures required to adjust the Delay Time with the “UPS_{plus}” supplementary software, see page LEERER MERKER. See also “UPS_{NT} for IPC” (page 3–10), or “UPS_{NT} for IPC300” (page 3–13).**

3.3 UPS program

3.3.1 Functions

The “UPS_{plus}” or “UPS_{NT}” uninterruptible power supply program controls and monitors the integrated uninterruptible power supply (UPS). The program also checks the function of the battery pack, and controls temperature monitoring of the system.

In the case of the IPC300, the program also monitors fan functions and internal operating voltages.

Depending on the type of IPC and its operating system, one of the following is installed:

- **UPS_{plus} for IPC** with Windows 95
- **UPS_{NT} for IPC** with Windows NT
- **UPS_{NT} for IPC300** with Windows NT

The UPS program is always connected to the UPS via the COM4 serial port.

The occurrence of a voltage drop/interruption causes the UPS program to respond as follows:

- By sending, within a preselected interval (Delay Time = max. 50 seconds), a signal to all active applications, facilitating their safe shutdown by the user / operator or via special application routines.
- By following the expiration of the Delay Time by shutting down the operating system.
Once the UPS power monitoring function has been triggered, aborting the system shutdown routine is no longer possible.

Closing all active applications prevents data loss in the event of a sudden voltage interruption.

If the mains voltage has not been restored, the UPS switches off the IPC power supply after a maximum 60 seconds (see disconnect conditions in Section 3.2).



CAUTION

Loss of data through manual restart!

Note that the USP switches off the operator terminal in any case. For this reason, once the operating system has been shut down, the “Restart” dialog button must not be selected.

In the case of voltage interruptions below 60 seconds, the operating system is restarted automatically.

The operator cannot access the UPS_{plus} or UPS_{NT} program during standard operation. **Operation** and **settings** are not possible without special access rights (as User or Administrator), and not until the operating system has been restarted.

Parameter values set in UPS_{plus} or UPS_{NT} may not be changed without prior consultation with Bosch Rexroth AG.

3.3.2 Operating and configuring UPS_{plus} (Windows95)



☞ The full complement of the procedural steps described below is available only during the initial installation, or in the event that the program was started by a user with special access privileges.

Start / Stop

Select the **UPS** menu option in the main window, and double-click **Start**.



Subsequent to the initial installation or after a **Stop** command, the program is again started with this command. Once the start has been successful, the main window disappears after approx. 2 seconds, and a symbol is added to the task bar.

The USP program is exited by selecting the **Stop** menu command.

Hide

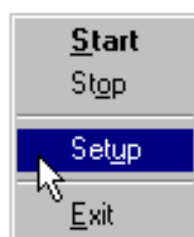
Hides the main window of the program, and adds a symbol to the task bar. The command is not available while the program is stopped.

Exit

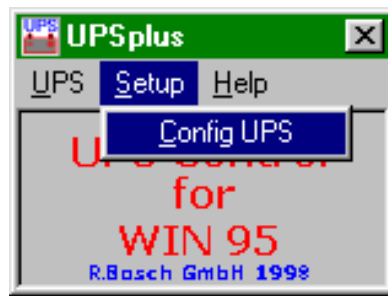
Exits the entire program, and terminates an ongoing monitoring event.

Simple operating menu

Click the **right** mouse button to open a simple operating menu listing the important functions of the program.

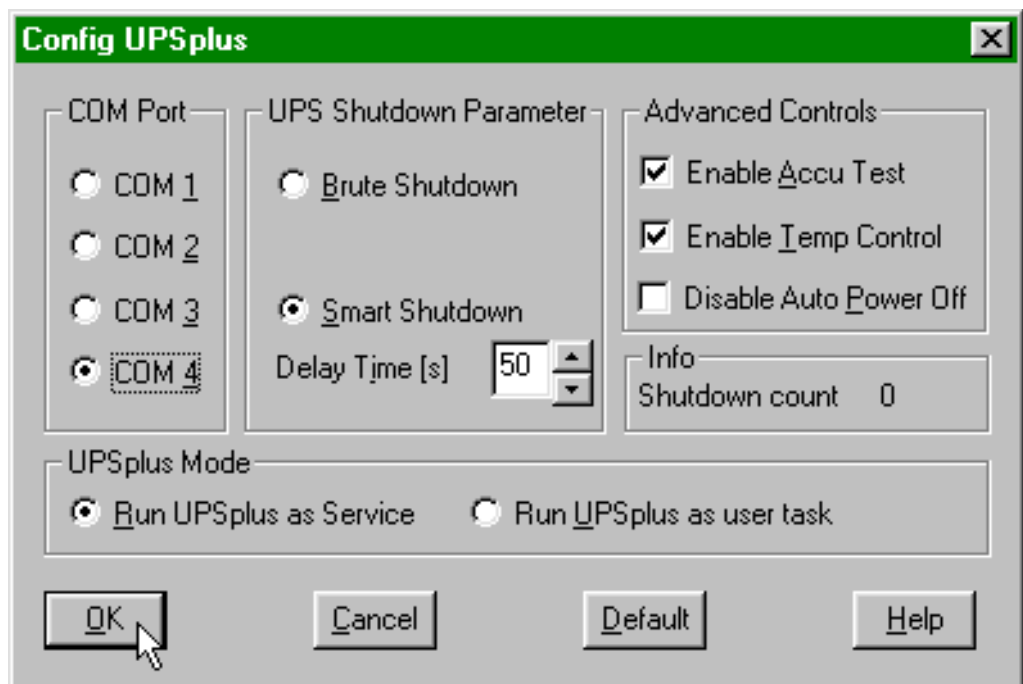


Configuration



This dialogue defines the start and runtime characteristics of UPS monitoring.

To allow possible changes to take effect, the UPS program must be stopped and restarted.



COM Port

The UPS program is always connected to the UPS via the COM4 serial port.

UPS Shutdown Parameter

Brute Shutdown

Upon receipt of the shutdown signal from the UPS, the shutdown command for the Windows operating system is issued without delay. This causes the immediate termination of all active applications, followed by the shutdown of Windows.

Smart Shutdown

Upon receipt of the shutdown signal from the UPS, the preset Delay Time starts to elapse.

Delay Time

This interval is defined as a value between 0 and 50 seconds, **by which the shutdown of Windows will be delayed**. The intervening period is used to dispatch a Request To Close message to all active windows. The user can avail himself of this time for the purpose of saving his data. Upon expiry of the Delay Time, all application programs will be terminated without prior security query!

When setting the Delay Time, observe that there must be sufficient time to effect a safe shutdown of the operating system (closing and backing up Windows system files), i.e., between the end of the Delay Time and the expiry of the 60 seconds after the shutdown signal. If the interval is too short, the shutdown process will be interrupted because the UPS disrupts the mains power. This may cause loss of data in some circumstances.



CAUTION

Upon expiry of the Delay Time, the operating system is shut down without prior security query. Unsecured data belonging to open applications will be lost.

Advanced Controls

Enable Accu Test

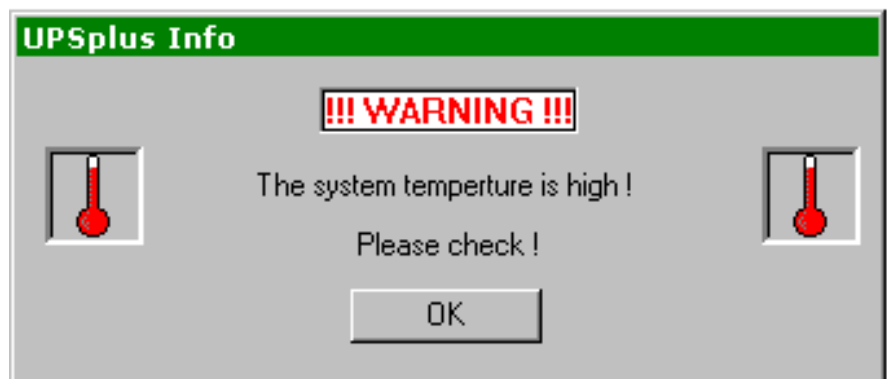
When this check box is checked, the system performs a test of the battery pack during each restart.

In the case of a faulty battery pack (e.g., defective battery pack, cable break, plug not connected), battery monitoring is disabled. The UPS program continues only with its temperature monitoring function.

If temperature monitoring has not been enabled, the UPS program will be terminated.

Enable Temp Control

When this checkbox is checked, the ambient temperature is monitored on a continuous basis. Excessive temperatures will produce the following warning message:



Subsequent to a temperature warning, the UPS program is again enabled. During the reactivation interval of approx. 2 seconds, no power monitoring takes place although the battery pack is fully functional.

Disable Auto Power Off

This option disables both the USP monitoring function and the power-off delay for the power supply:

- A voltage interruption will cause the PC to shut down immediately.
- After a normal shutdown, the wait interval of approx. 60 seconds prior to the shutdown of the power supply is omitted.

Although this function reduces the wait times during startups and software installations, it must always be disabled during standard operation!

**CAUTION****Loss of data!**

Activation of this checkbox no longer makes a safe shutdown possible in the event of a power failure. The device switches off instantly!

Info**Shutdown Count**

The displayed value shows how often the system was shut down by UPS, i.e. how many charging cycles the battery has been subjected to. More details regarding after how many charging cycles it is necessary to replace the rechargeable batteries is contained in section 8.2.3.

UPS_{plus} Mode

There are two operating modes for the **UPS_{plus}** program:

Run as Service

The program is started as part of the Windows 95 startup, and remains active until Windows 95 is again terminated. Changing user logins have no influence on the program's characteristics.

The user is unable to stop the program or terminate monitoring. Although he would be able to access the active program via the Setup dialog and change parameter values, these changes would not take effect until Windows 95 has been restarted.

Run as User Task

The program is started as part of a user login routine, and is terminated upon logout. The user has full control over all UPS program functions.

Default button

Selecting this button returns all settings to their **default values**.

These are:

- COM port: COM4
- Smart Shutdown, Delay Time: 50 sec
- Enable Accu Test: enabled
- Enable Temp Control: enabled
- Disable Auto Power Off: disabled
- Run UPS_{plus} as Service: enabled

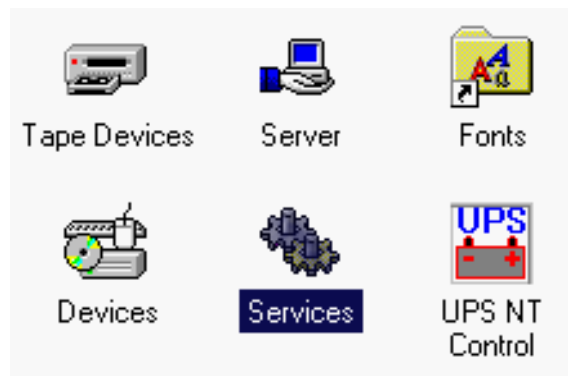
3.3.3 Operating and configuring UPS_{NT} (WindowsNT)

 **Operation requires Administrator privileges!**

Start / Stop

The UPS_{NT} program is automatically started with WindowsNT.

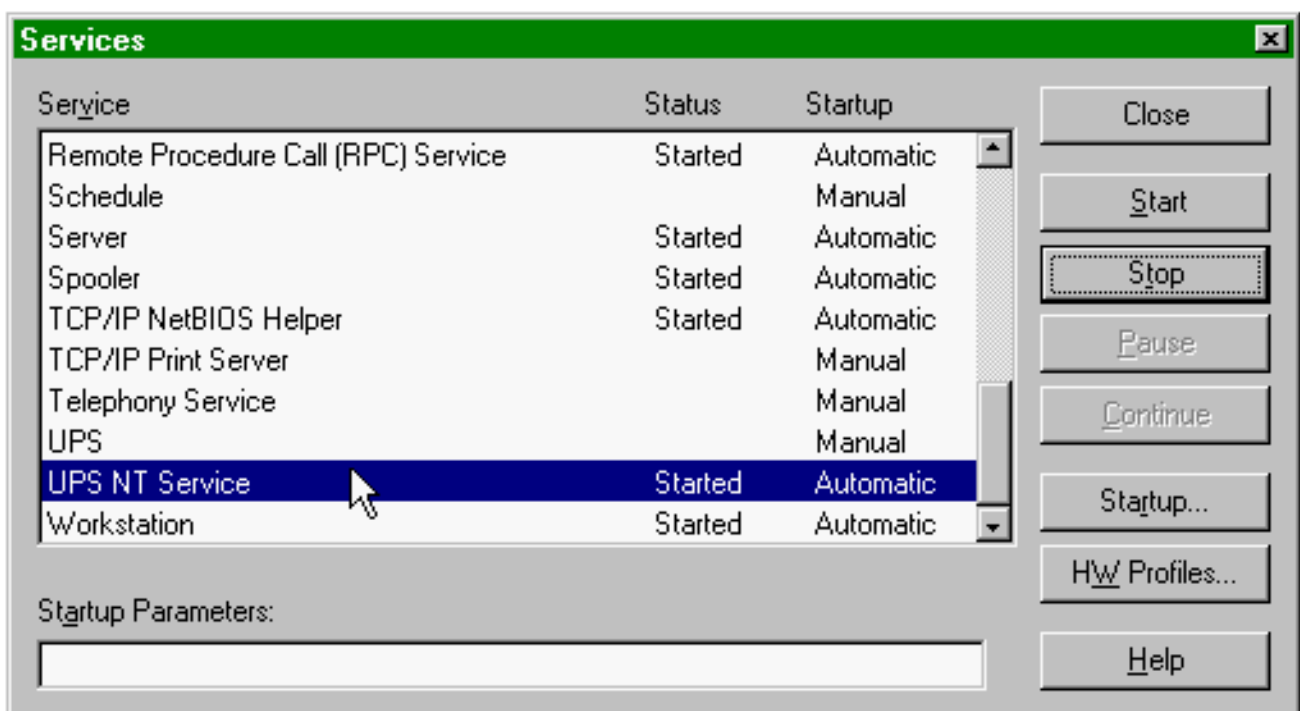
If the service is to be stopped, ended or restarted (e.g., during a reinstallation or update procedure), select **Services Manager** in the system control (see icon below, to the left of UPS_{NT} Control).



The status of the UPS_{NT} service is displayed in the Services Manager of WindowsNT:

- UPS_{NT} stopped: No entry in Status column
- UPS_{NT} started: **Started** entry in Status column

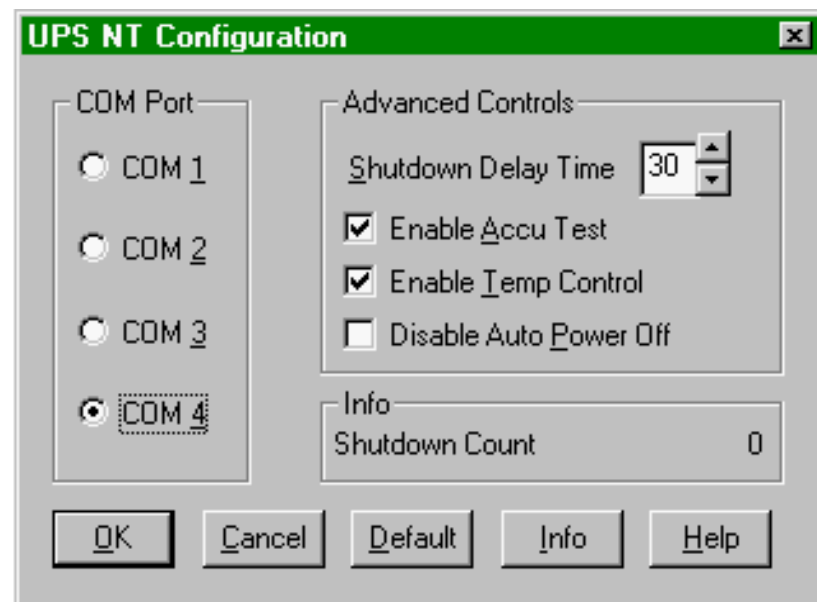
The marked entry of the UPS_{NT} service is started and stopped via the Start and Stop buttons, respectively.



Configuration – UPS_{NT} for IPC

To configure the UPS_{NT} program, select **UPS NT Control** in the control panel (see illustration below).

- ☞ **The UPS_{NT} program always runs as a Windows NT service. Changing user logins have no influence on this characteristic. A user without Administrator privileges is neither able to terminate the program nor stop the monitoring function.**



- ☞ **To allow new parameter values to take effect subsequent to their modification, the UPS program must be stopped and restarted. This may be accomplished by restarting the computer, or with the aid of the Services Manager.**

COM Port

The UPS program is always connected to the UPS via the COM4 serial port.

Advanced Controls

Shutdown Delay Time

This interval is defined as a value between 0 and 45 seconds, **by which the shutdown of Windows will be delayed**. The intervening period is used to dispatch a Request To Close message to all active windows. The user can avail himself of this time for the purpose of saving his data. Upon expiry of the Delay Time, all application programs will be terminated without prior security query!

When setting the Delay Time, observe that there must be sufficient time to effect a safe shutdown of the operating system (closing and backing up Windows system files), i.e., between the end of the Delay Time and the expiry of the 60 seconds after the shutdown signal. If the interval is too short, the shutdown process will be interrupted because the UPS disrupts the mains power. This may cause loss of data in some circumstances.



CAUTION

Upon expiry of the Delay Time, the operating system is shut down without prior security query. Unsecured data belonging to open applications will be lost.

Enable Accu Test

When this check box is checked, the system performs a test of the battery pack during each restart.

In the case of a faulty battery pack (e.g., defective battery pack, cable break, plug not connected), battery monitoring is disabled. The UPS program continues only with its temperature monitoring function.

If temperature monitoring has not been enabled, the UPS program will be terminated.

Enable Temp Control

When this checkbox is checked, the ambient temperature is monitored on a continuous basis. Excessive temperatures will produce a temperature warning message.

Subsequent to a temperature warning, the UPS program is again enabled. During the reactivation interval of approx. 2 seconds, no power monitoring takes place although the battery pack is fully functional.

Disable Auto Power Off

This option disables both the USP monitoring function and the power-off delay for the power supply:

- A voltage interruption will cause the PC to shut down immediately.
- After a normal shutdown, the wait interval of approx. 60 seconds prior to the shutdown of the power supply is omitted.

Although this function reduces the wait times during startups and software installations, it must always be disabled during standard operation!



CAUTION

Loss of data!

Activation of this checkbox no longer makes a safe shutdown possible in the event of a power failure. The device switches off instantly!

Info

Shutdown Count

The displayed value shows how often the system was shut down by UPS, i.e. how many charging cycles the battery has been subjected to. More details regarding after how many charging cycles it is necessary to replace the rechargeable batteries is contained in section 8.2.3.

Default button


Selecting this button returns all settings to their **default values**.

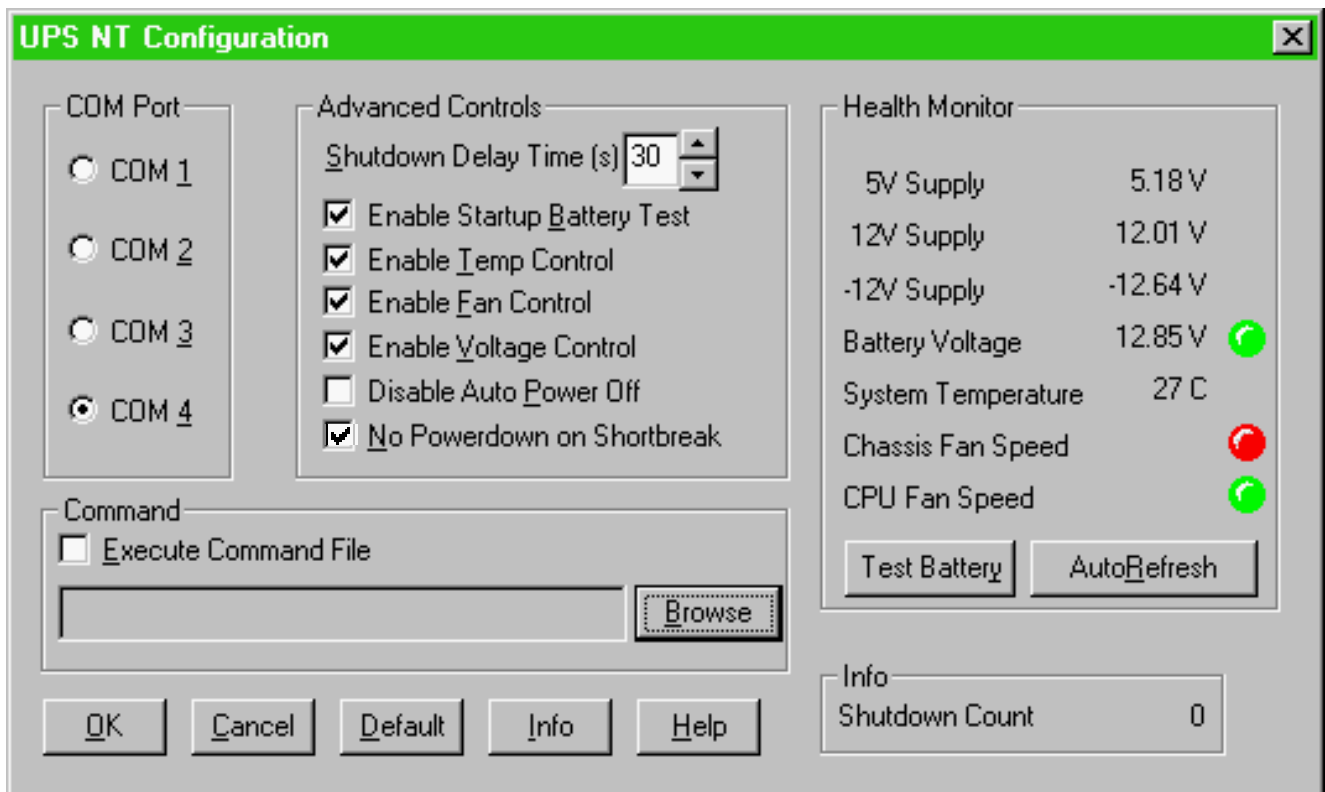
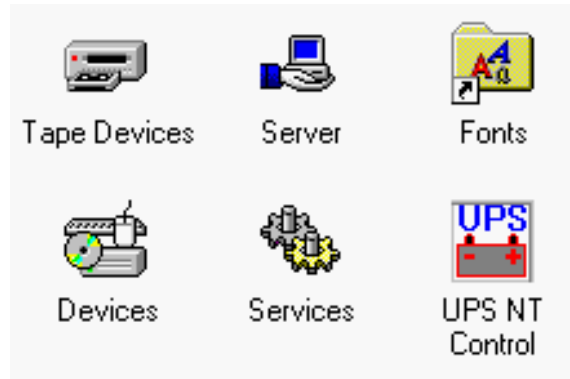
These are:


- COM port: COM4
- Shutdown Delay Time: 30 sek
- Enable Accu Test: enabled
- Enable Temp Control: enabled
- Disable Auto Power Off: disabled

Configuration – UPS_{NT} for IPC300

To configure the UPS_{NT} program, select **UPS NT Control** in the control panel (see illustration below).

 **The UPS_{NT} program always runs as a Windows NT service. Changing user logins have no influence on this characteristic. A user without Administrator privileges is neither able to terminate the program nor stop the monitoring function.**



 **To allow new parameter values to take effect subsequent to their modification, the UPS is automatically stopped and restarted. No monitoring function is enabled during this interval (5 to 10 sec).**

COM Port

The UPS program is always connected to the UPS via the COM4 serial port.

Advanced Controls

Shutdown Delay Time

This interval is defined as a value between 0 and 45 seconds, **by which the shutdown of Windows will be delayed**. The intervening period is used to dispatch a Request To Close message to all active windows. The user can avail himself of this time for the purpose of saving his data. Upon expiry of the Delay Time, all application programs will be terminated without prior security query!

When setting the Delay Time, observe that there must be sufficient time to effect a safe shutdown of the operating system (closing and backing up Windows system files), i.e., between the end of the Delay Time and the expiry of the 60 seconds after the shutdown signal. If the interval is too short, the shutdown process will be interrupted because the UPS disrupts the mains power. This may cause loss of data in some circumstances.



CAUTION

Upon expiry of the Delay Time, the operating system is shut down without prior security query. Unsecured data belonging to open applications will be lost.

Enable Startup Battery Test

When this check box is checked, the system performs a test of the battery pack during each restart. Upon detection of an error, the red LED "UPS" flashes and an error message is generated ("Accu Test failed! The Accu is not installed or empty!") and distributed throughout the system. The UPS program continues to operate.

The battery test is automatically repeated after 12 hours:

- If no error is found, automatic test repetition in 12-hour intervals ensues.
- Upon detection of an error, the red LED "UPS" flashes and an error message is generated and distributed throughout the system, and no further battery test is performed.

Error messages from the battery test are also stored in the Windows NT Application Event Log.

Enable Temp Control

When this checkbox is checked, the ambient temperature is monitored on a continuous basis. Excessive temperatures will produce the temperature warning message "Board Temperature high! Check System!".

The power monitoring function is retained even after a temperature warning. Upon detection of an error, the red LED "Temp" flashes.

Temperature warning messages are also stored in the Windows NT Application Event Log.

Enable Fan Control

When this checkbox is activated, the integrated housing fans are monitored in the IPC300 with Pentium I (266 MHz) and the housing and processor fans are monitored in the IPC300 with Pentium III (400 MHz). In the event of an error, the red LED "Temp" flashes and the following message is generated and distributed throughout the system: "FAN failure! Check System!"

Enable Voltage Control

When this checkbox is activated, internal supply voltages are monitored. In the event of an error, the green LED "Vout" extinguishes and the following message is generated and distributed throughout the system: "Board Voltage failure! Check System!".

Disable Auto Power Off



CAUTION

Loss of data!

Activation of this checkbox no longer makes a safe shutdown possible in the event of a power failure. The device switches off instantly!

This option disables both the USP monitoring function and the power-off delay for the power supply:

- A voltage interruption will cause the PC to shut down immediately.
- After a normal shutdown, the wait interval of approx. 60 seconds prior to the shutdown of the power supply is omitted.

Although this function reduces the wait times during startups and software installations, it must always be disabled during standard operation!

No Powerdown on Shortbreak

When this checkbox has been activated, interruptions in the power supply of up to 5 seconds are permitted without affecting ongoing operations. Only in the case of power interruptions lasting in excess of 5 seconds will the UPS logic be started and the safe shutdown of the system initiated.

Command

This dialog box provides for the linking and activation of an executable program (*.exe; *.bat) which is to be started and executed after the initialization of the shutdown. This is helpful in situations where applications failing to respond to the systemwide messages must be backed up and terminated. To this end, appropriate housekeeping and termination programs can be entered and activated in this dialog. If there are several programs, or if the programs require transfer parameters, they must be combined in a batch file and then entered.



The entry itself may not contain any invocation parameters, and the declared program itself must not initiate a shutdown!

Default button

Selecting this button returns all settings to their **default values**.

These are:


- COM port: COM4
- Shutdown Delay Time: 30 sec
- Enable Startup Battery Test: enabled
- Enable Temp Control: enabled
- Enable Fan Control: enabled
- Enable Voltage Control: enabled
- Disable Auto Power Off: disabled
- No Powerdown on Shortbreak: enabled
- Execute Command File: disabled

Health Monitor

This dialog section indicates the current readings for internal voltages, battery voltage, system temperature and fan functions.

The **Battery Voltage** reading is updated only after a battery test. The battery test occurs automatically after a system start, and in 12-hour intervals thereafter; it can also be initiated by pressing the **Test Battery** button.

- The LED illuminates red when the voltage reading of the battery voltage measured under load is low.
- The LED illuminated green when the battery pack is fully functional.

 **Excessive repetitions of the battery test will discharge the battery pack. Never perform more than 5 battery tests within a 24-hour period.**

The following applies to **Fan Speed monitoring**:

- Red LED: Fan at standstill, or fan speed is too low or too high.
- Green LED: Fan is working properly.

Pressing the **StopAutoRefresh** button disables the automatic updating of measured readings, and the legend on the button changes to **AutoRefresh**. Pressing the **AutoRefresh** button again enables automatic measurement updating, again changing the legend on the button to **StopAutoRefresh**.

Info

Shutdown Count

The displayed value shows how often the system was shut down by UPS, i.e. how many charging cycles the battery has been subjected to. More details regarding after how many charging cycles it is necessary to replace the rechargeable batteries is contained in section 8.2.3.

 **Windows NT stores all important events under the following: VERWALTUNG ► EREIGNISANZEIGE ► PROTOKOLL/ANWENDUNG**

4 Installation

When installing the Bosch IPC / IPC300, refer to the information on standards compatibility and operating conditions in Sections 2.6 and 2.5.



CAUTION

Conditions hazardous to the product!

The ambient air must be free of electrically conductive pollutants (e.g., acids, alkali, corrosives, salts, metallic vapours, etc.).

Air intake and exhaust filters must be serviced in regular intervals.



DANGER

The operational reliability of components designed to be installed in housings or control cabinets will be severely impeded if they are used or operated without having first been installed.

Therefore, do not use or operate the IPC until it has been installed.

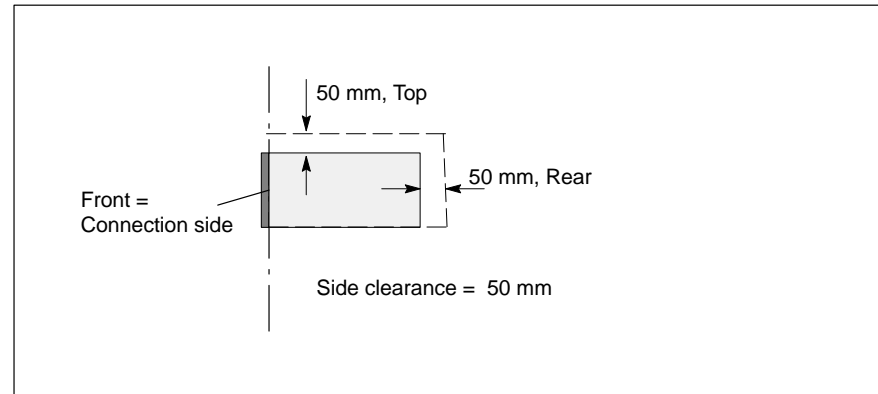
Note

- The use of silicon-based sealing compounds, adhesives and insulating agents is prohibited.
- Ensure that the installation is maintenance-friendly, i.e., that it provides unrestricted access to connections, cables and fuses.
- Precede all installation procedures by writing down the information on equipment rating plates. In the event that rating plates are hidden from view as a result of the installation, you will still have quick access to this information whenever required.

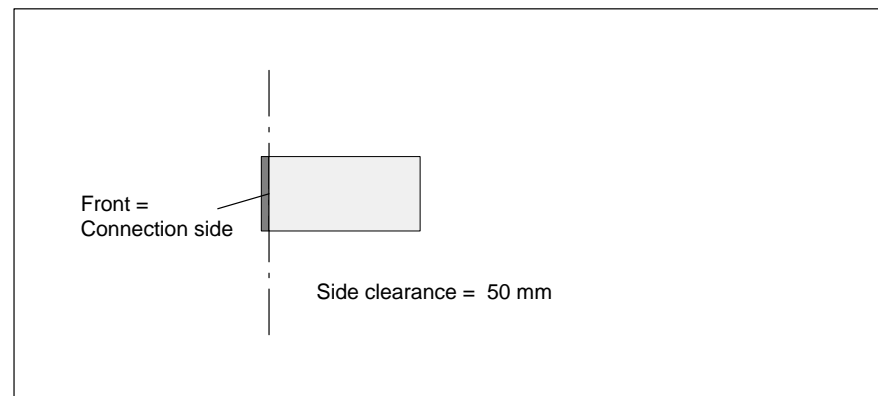
4.1 Installed positions and clearances

Housing:	19 in. rack module, protection category IP00 (EN 60529)
Weight:	Approx. 8 kg (w/o expansion cards)
Installed pos.:	Horizontal
Installation type:	Installation premises to provide a min. of IP54 rating.

IPC installation clearances



IPC300 installation clearances

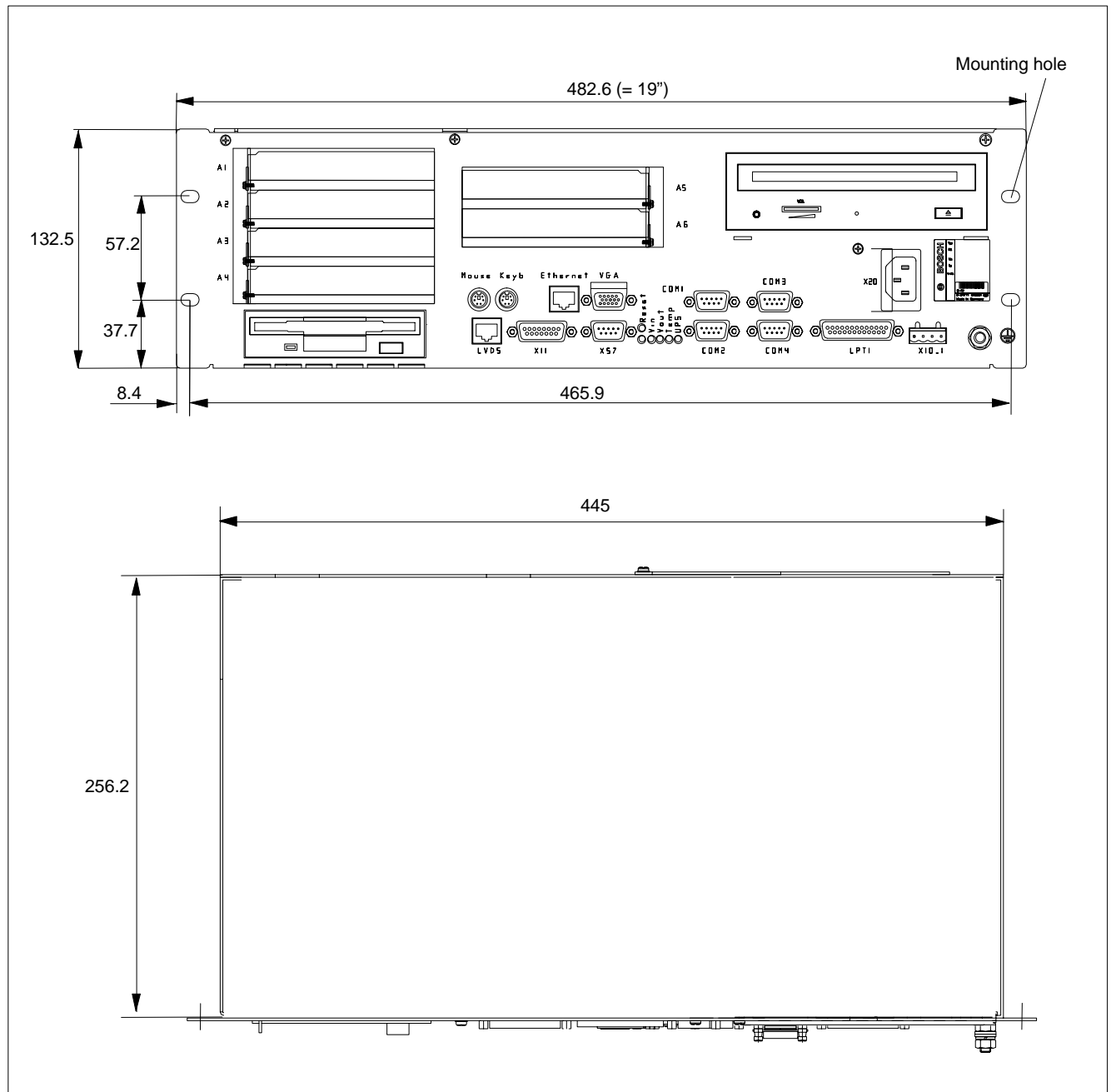


☞ Please note that the integrated CD-ROM drive may be operated in a horizontal position only. For this reason the IPC must be installed in a horizontal position.

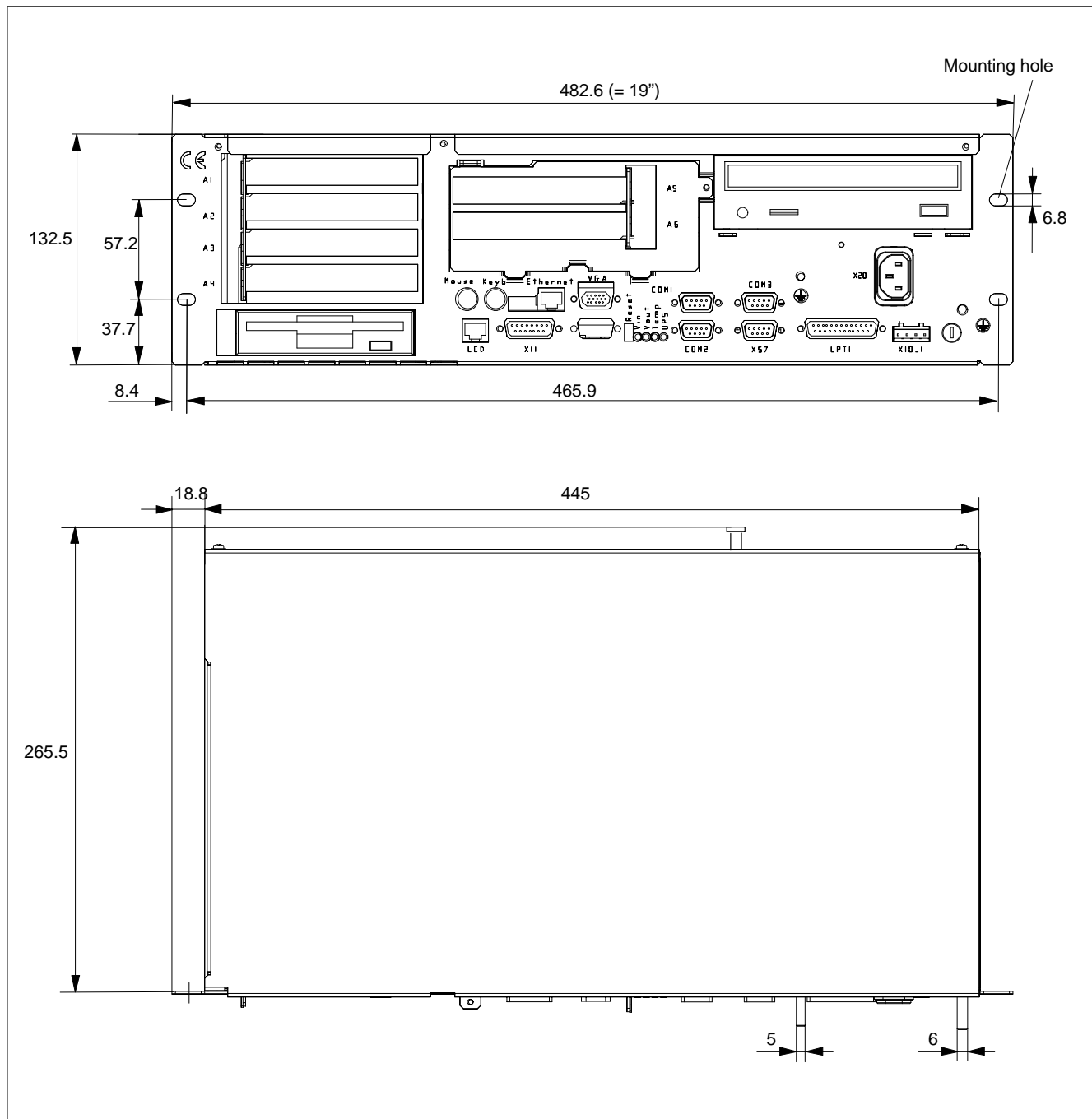
- When installing the IPC / IPC300, ensure that the connection side of the respective unit remains easily accessible.
- Because it must be possible to verify the operating status of the unit at any time, the LED displays must not be concealed in any way.
- Provide adequate ventilation, and ensure that cables are routed with a minimum clearance of 50 mm (top, bottom and rear).
- Allow for connecting loops in all cable routings; provide strain relief for all cables.
- Maintain suitably large distances from sources of interference.

4.2 IPC / IPC300 dimensioned drawings

IPC



IPC300



4.3 Installing IPC / IPC300 in mounting frame

- ★ Construct a 19 in. mounting frame with fasteners for the 4 holes in the front panel of the IPC or IPC300.
- ★ Insert the IPC or IPC300 into the mounting frame from the front.
- ★ Using 4 suitable mounting screws, attach the unit to the mounting frame.

5 Electrical Connections

Please note that, with respect to all electrical connections, the terminal connection plans and work instructions provided by the machine manufacturer shall always be binding!

The system planner is also charged with providing and planning for the integration and implementation of required components, such as Emergency-STOP circuits, mains switches, etc., in accordance with the current state of the art and at the highest level of safety attainable.



CAUTION

Risk of damage to system components through by insertion or removal of plug connectors on energized circuits!
Connections must be made only while the system is switched off.

Observe the following to prevent functional failures:

- Provide for isolated 24 VDC and 0 V terminal bars inside the control cabinet. With regard to cable routing, maintain a minimum distance of 10 cm (4 in.) from all power cables.
- Design the overall system power circuits in a manner ensuring the simultaneous startup of operating terminals and other industrial components, such as CNC and PLC.

5.1 Protective Earth conductor (PE) & screening information

**DANGER**

Dangerous conditions, functional failures and equipment damage on machine plant caused by substandard potential equalization or screening properties between system components!

Potential equalization currents may not flow across the screening of interface cables.

- ★ The protective earthing conductors (earthing connections) of the system must be arranged in a tightly meshed grid. All components, control cabinet housings and doors, including the mounting plate, must be earthed.
 - ★ The potential equalization lines / PE lines of all system components shall be kept as short as possible, thus providing low-resistance connections.
 - ★ Install the PE lines, preferably electroconductively, on the mounting plate in the control cabinet. Both sides of the insulated installed PE rails must be connected to the mounting plate with max. 20 cm long, adequately dimensioned copper bands.
Position the PE lines so that the length of the outgoing protective earth conductor connections to the individual modules in the control cabinet does not exceed 1 m.
 - ★ When specifying the PE wiring, ensure sufficiently dimensioned cross-section. In this regard, also observe EN 60204, Part 1 (max. electrical resistance and testing PE wiring installations).
 - ★ If at all possible, apply screening connections on both ends of a cable.
 - ★ Ensure that equipotential equalization currents do not flow across the interface signal lines via the shielded conductors. Therefore, before switching on the IPC for the first time, ensure that the potential equalization between devices which are to be connected is correct. Do not forget the interfaces which connect devices to each other at different locations (irrespective of distance or power supply).
-

**DANGER**

**Dangerous shock currents due to poor PE connections!
The effectiveness of PE connections must not be impeded by mechanical, chemical or electrochemical influences.
Connections must be permanent and tight.**

5.2 Interference suppression information

When designing the machine plant, observe and comply with governing regulations and statutory law with regard to interference suppression on individual components. This will increase the operational safety of the entire system.



DANGER

Dangerous conditions, functional failures and equipment damage on the machine plant caused by substandard EMC measures or line transient interference!

Install signal voltage cables only at a sufficient distance from high-voltage cables (e.g., motor power cables). If this is not possible, separate metallic cable channels must be used.

The following sections are designed to provide you with a brief overview of possible interference suppression measures in the control cabinet. Among these are, for example:

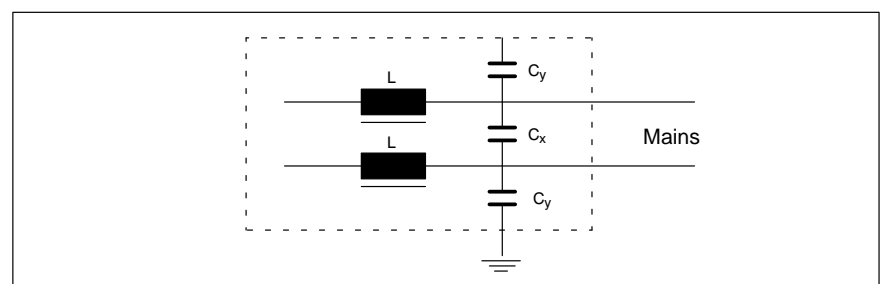
- Filters
- Spark quenching circuits
- Damping of inductive switching peaks
- Limitation of switching voltage of high-speed semiconductors
- Screening

To ensure optimum suppress interference, **all of these** components should be taken into consideration because they are most effective when working in combination. In principle, interference suppression should be implemented as follows:

- Apply suppression measures as close to the source of interference as possible.
- Use only components that are identified as interference suppressors.
- Limit leakage currents in accordance with safety regulations.
- Provide touch guards.
- Prevent vibration fatigue breakage by providing secure mechanical support for interference suppressors.

To ensure that interference suppression measures are successful, electrical symmetry or asymmetry must also be taken into consideration. Besides symmetrical interference voltage components which occur between mains connection cables, there are also asymmetrical interference voltages caused, for example, by capacitive coupling of the source of interference to the mains.

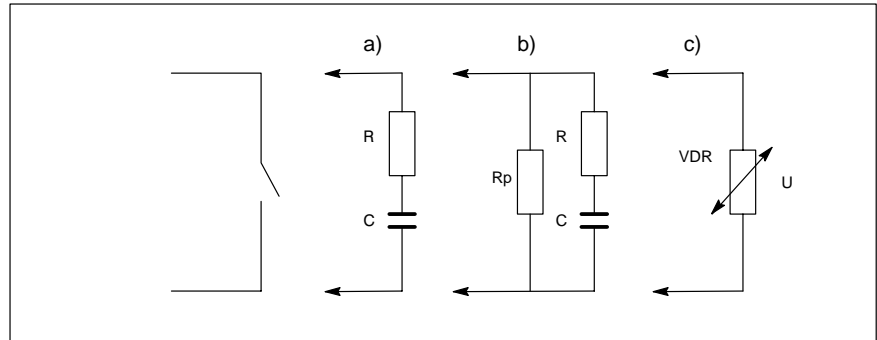
The following diagram shows a standard interference suppression circuit. The asymmetrical interference voltages are discharged to the housing via C_y . C_x damps the symmetrical interference.



Interference suppression examples

Suppression of contacts:

(Alternating current, direct current, offset DC current)

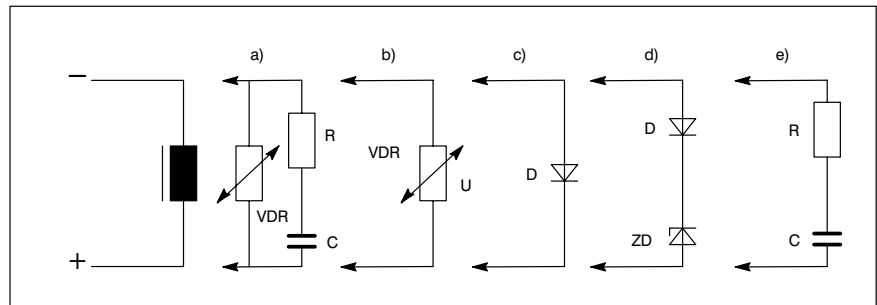


to b) For sensitive contacts, residual current when contact open!

to c) Voltage-dependent resistance, residual current when contact open!

Suppression of an inductive load:

(Motors, solenoid, relay and contactor coils)

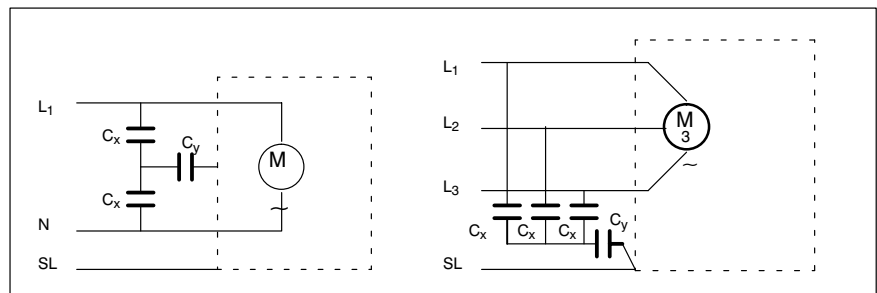


to c) For relay, drop-off delay.

to d) For relay, defined drop-off delay.

to e) Must be optimized for inductance!

Suppression example – mains input:



5.3 Power supplies

5.3.1 24V_{DC} power supply

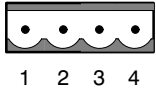
X10_1 24 VDC power connection (w/ integrated 24 VDC power supply)

Alternative to 230/115 VAC power connection. All internally required voltages are provided by a DC/DC converter.

Weidmüller push-lock terminal, MSTB 1.5, 4-pin

Max. conductor cross-sect.: 1.5 mm² (see next page)

X10_1		Pin	Signal
+	+	1	24V
-	-	2	24V
		3	0V
		4	0V



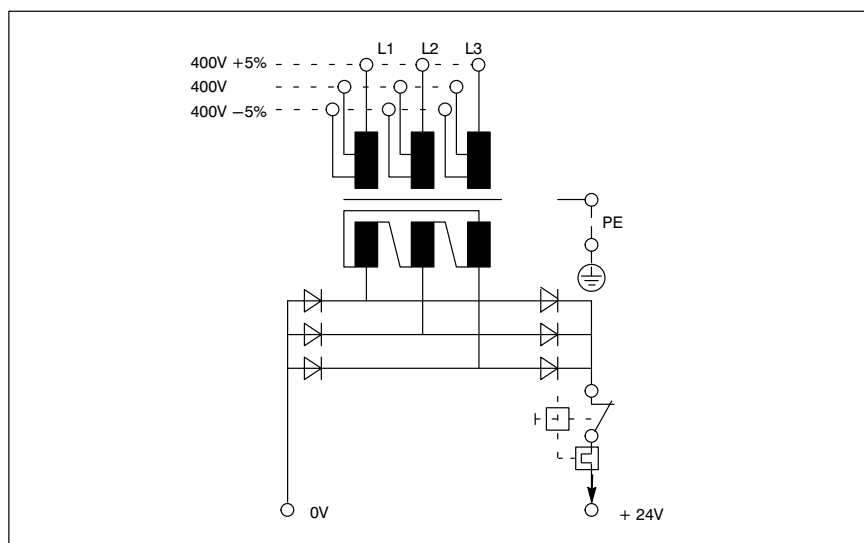
- Rated voltage U_N : 24 VDC ; +20%, -15%
- Residual ripple at U_N : See diagram below
- Interference / surge immunity: $U_{max} = 35$ V (at $t < 100$ ms)
- Current draw at U_N : max. 5 A
- Input fuse: 6.3 A (5x20) medium time-lag
- Reverse polarity protection: Via decoupling diode. Polarity reversal will blow input fuse.



DANGEROUS ELECTRICAL VOLTAGE

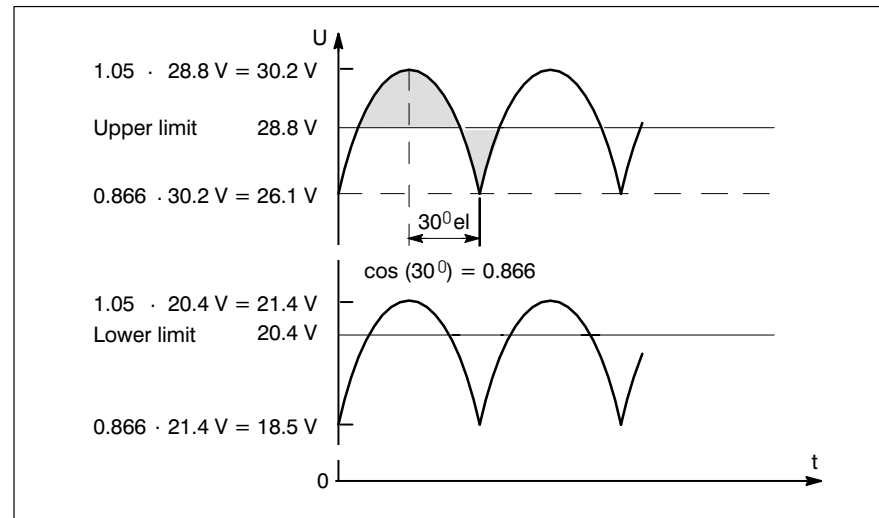
The 24 VDC input voltage must satisfy the requirements of "protective separation"!

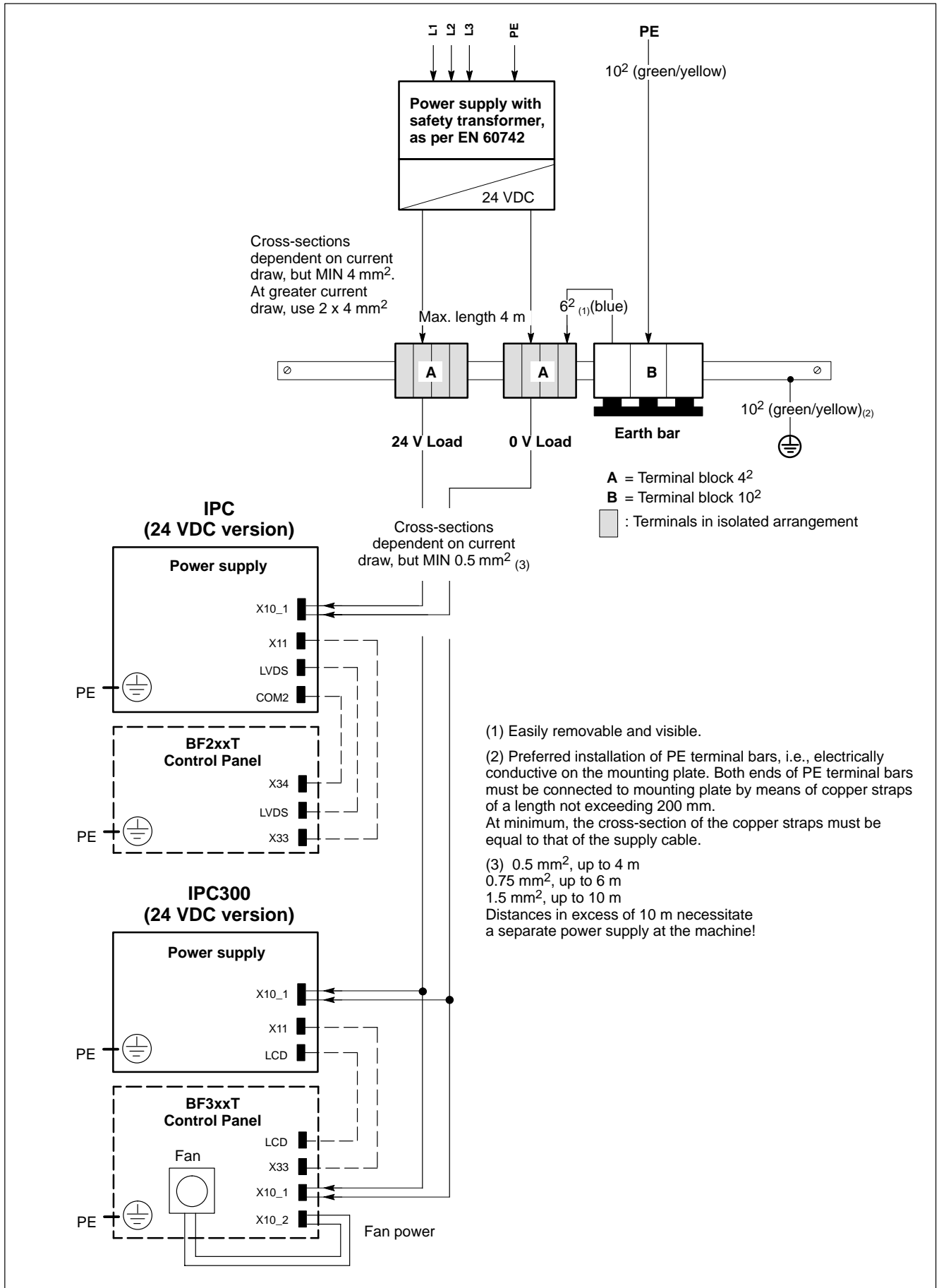
Safety transformer, as per EN 60742



Offset AC components of the type produced by an unregulated rotary current bridge circuit without smoothing, with a ripple factor of 5% (refer to DIN 40110/10.75, Section 1.2), are permissible.

As an upper voltage limit, this produces a maximum absolute value of 30.2 V and, as a minimum voltage limit, the minimum absolute value of 18.5 V.





5.3.2 230/115 VAC power supply

X20 230/115 VAC power connection (w/ integrated AC power supply)

Alternative to 24 VDC power connection.

All internally required voltages are produced by the integrated power supply.



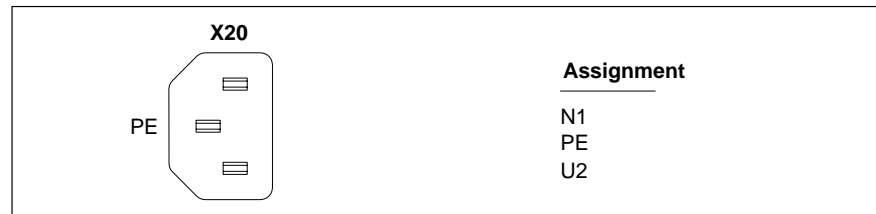
CAUTION

The supply voltage must satisfy the requirements of Overvoltage Category II. Otherwise, the integrated power supply may be destroyed.

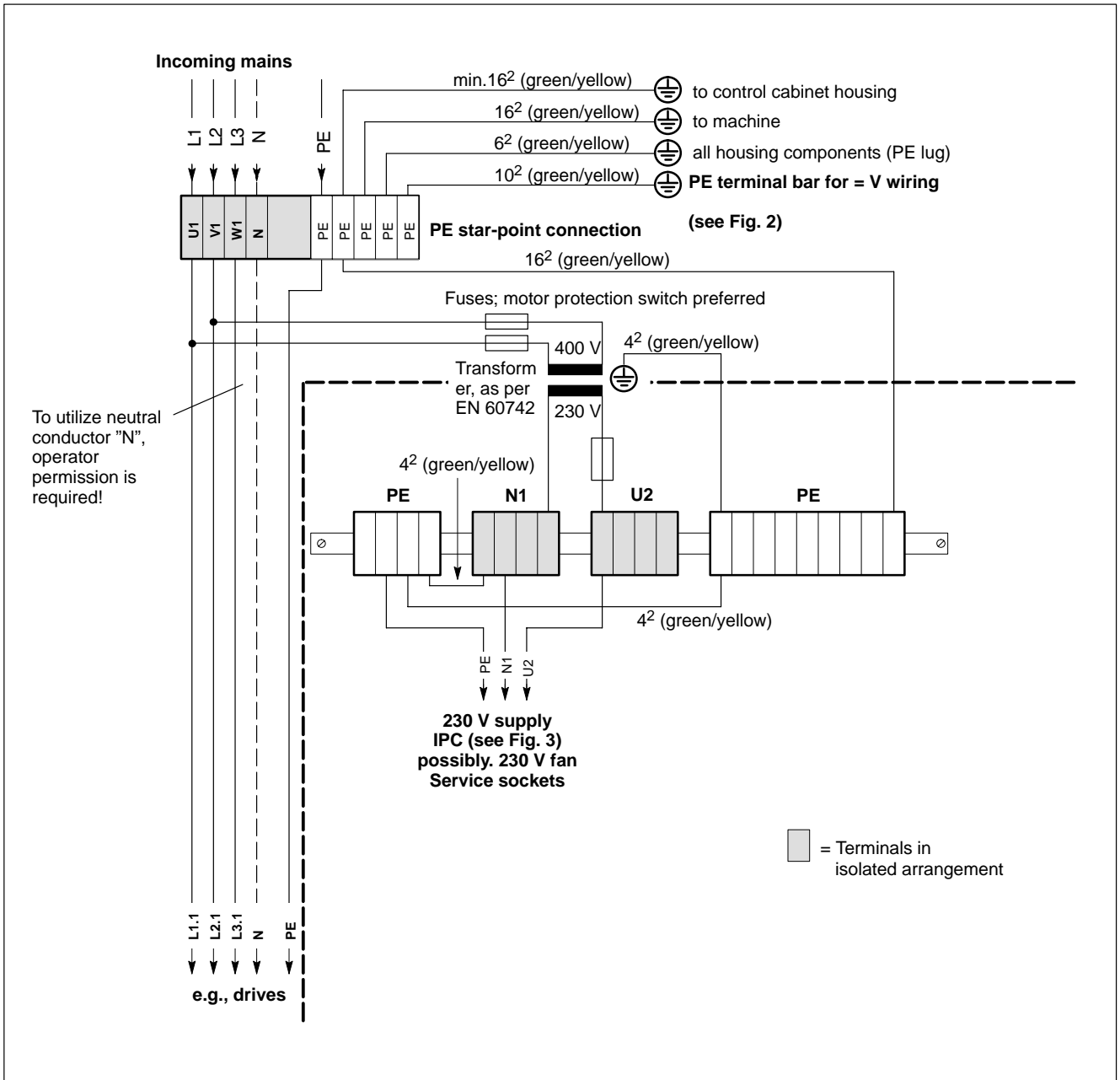
Use a separation transformer to generate the 230/115 VAC (refer to next page).

Coupler for non-heating apparatus, 3-pin

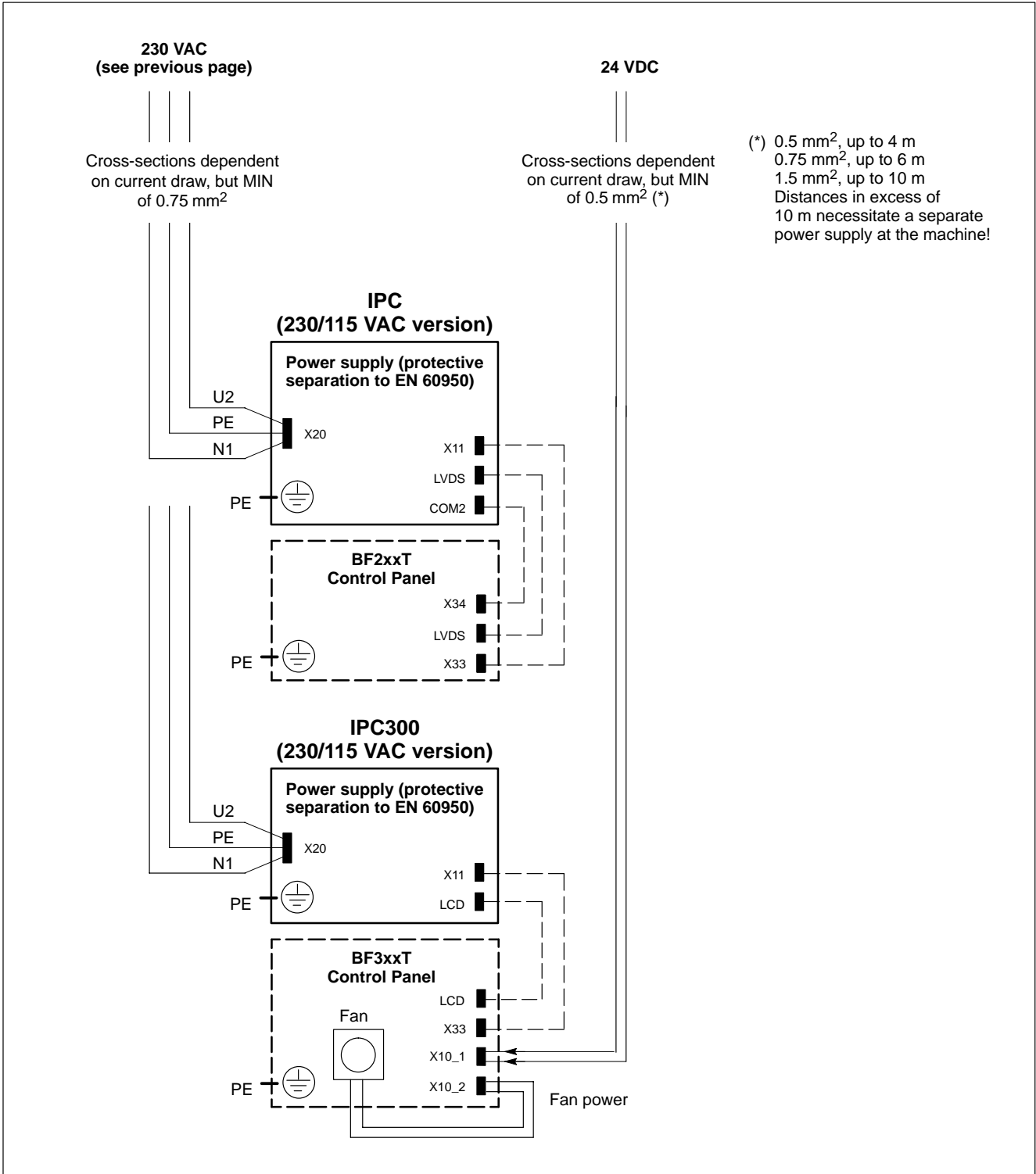
Max. conductor cross-section: 1.5 mm²



Rated voltage:	85VAC to 264VAC; Extended-range input
Current draw at $U_N = 230$ VAC:	0.6 A
Current draw at $U_N = 115$ VAC:	1.2 A
Inrush current at 230 VAC:	30 A, cold start 25°C
at 115 VAC:	15 A, cold start, 25°C
Input fuse:	1.25 A (5x20) medium time-lag



230 VAC power connection via separation transformer



6 Interfaces, Ports & Connectors

6.1 Overview

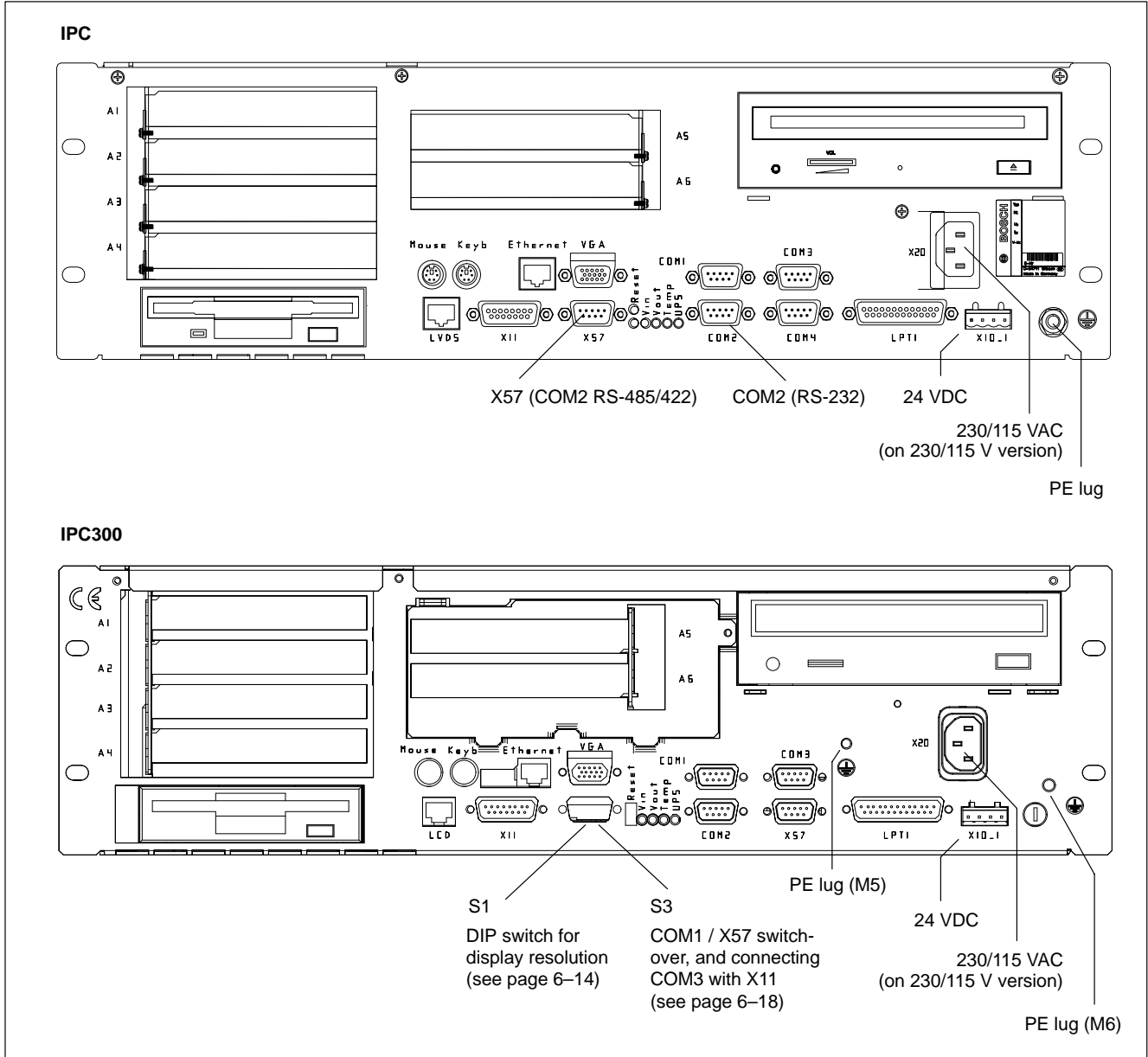
The following table specifies the installed IPC connector types, as well as their mating connectors.

Label on housing		Interface service	Physical connector	Mating connector or cable
IPC	IPC300			
COM1		Serial port: RS-232, IPC: free assignment IPC300: alternative, X57	Male DB-9 connector	Female DB-9 connector
COM2		Serial port: RS-232 for touch screen. Without touch screen: IPC: alternative to X57 IPC300: free assignment	Male DB-9 connector	Female DB-9 connector
X57		Serial port: RS-485/422: IPC: alternative, COM2 IPC300: alternative to COM1	Male DB-9 connector	Female DB-9 connector
COM3		Serial port: RS-232, free assignment	Male DB-9 connector	Female DB-9 connector
COM4	–	Serial port: RS-232 for UPS logic	Male DB-9 connector	Female DB-9 connector
LPT1		Parallel port: Supports SPP, EPP, ECO mode	Female DB-25 connector	Male DB-25 connector (e.g., printer cable)
Ethernet		Ethernet 10 Base T Network connection	Female RJ45, 8-pin	Male RJ45 connector, 8-conductor, twisted prs.
USB		USB interface	Female USB connector, 4-pin	Male USB, 4-conductor
LVDS	–	for BF2xxT: Video transmission	Female RJ45, 8-pin	Male RJ45 connector, 8-conductor, twisted prs.
–	LCD	Gigabit for BF3xxT: Video transmission and RS-422 for touch screen controller (COM2)	Female RJ45, 8-pin	Male RJ45 connector, 8-conductor, twisted prs., CAT7
VGA		VGA connection for external CRT monitor	Female VGA HD connector, 15-pin	Monitor cable w/ male VGA HD connect., 15-pin
X11		BF2xxT, BF3xxT: Power supply, mouse & keyboard	Female DB-15 connector	Male DB-15 connector
Keyb		PS/2 mini DIN keyboard	Female PS/2 mini DIN, 6-pin	Keyboard cable w/ male PS/2 mini DIN, 6-pin
Mouse		PS/2 mini DIN mouse	Female PS/2 mini DIN, 6-pin	Male PS/2 mini DIN, 6-pin
As described in Section 5.3:				
X20		PC power supply: 230/115 VAC, alternative to X10_1	Non-heating appliance connector, male	Power cord w/ female non-heating appliance connector
X10_1		PC power supply: 24 VDC, alternative to X20	Male Weidmüller push-lock terminal, MSTB 1.5, 4-pin	Female Weidmüller push-lock terminal, MSTB 1.5, 4-pin

☞ **Mouse and keyboard may be connected only if there is neither mouse nor keyboard connected to the BF2xxT/BF3xxT control panel.**

Port and connector layout

All externally accessed connectors are located on the front panel. All connectors are clearly labelled. In addition, in the IPC300 DIP switches S1 and S3 provide external access.



6.2 COM1 through COM4 serial ports

6.2.1 Pin assignments



CAUTION

Functional failures caused by poor screening!

Use only metallic or conductive connector/coupling shells providing large-area screen contact.

**COM1 Serial port, freely assignable
IPC300: alternative to X57**

Male DB-9 connector

Type:

RS-232

IPC300: COM1 is also applied to X57 as an RS-422/485. Parallel operation is not possible.

Cable length:

Max. 15 m

Cable type:

Screened, min. cross-section 0.14 mm²

Transmission rate:

Max. 115200 bps

Handshake:

Hardware and software handshake (XON, XOFF)

Interrupt (IRQ):

4

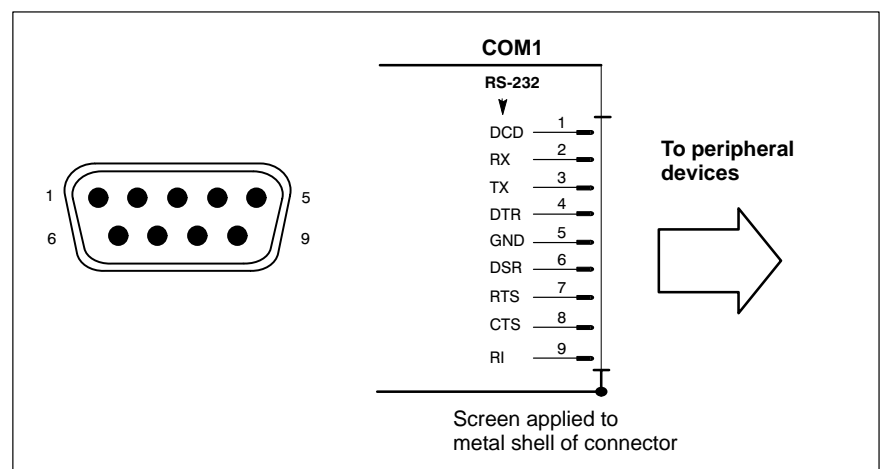
I/O address:

3F8H or AUTO (recommended)

BIOS preset:

IPC: Onboard Serial Port1: Auto

IPC300: Serial Port A: Enabled



Assignment as an RS-232:

- DCD Data Carrier Detect. RCV channel used, for example, by a connected modem to inform the PC that it is receiving a carrier signal (active connection).
- RX Receive Data. Line on which data is received.
- TX Transmit Data. Line on which data is transmitted to a peripheral device.
- DTR Data Terminal Ready. XMIT channel used by the PC to signal to a connected peripheral device that its interface is switched on and initialized.
- DSR Data Set Ready. RCV channel used by the connected peripheral device to inform the PC that it is switched on and initialized.
- GND Signal Ground

RTS	Request to Send. RCV channel used by the connected peripheral device to signal to the PC that it wishes to transmit data.
CTS	Clear to Send. XMIT channel used by the PC to signal to the connected peripheral device that it is permitted to transmit data.
RI	Ring Indicator. Receive line on which a connected modem informs the PC of the presence of an active call.
Screen	Contact with housing frame via metallic shell of the D-Sub connector.

COM2 Serial port, assigned to touch screen

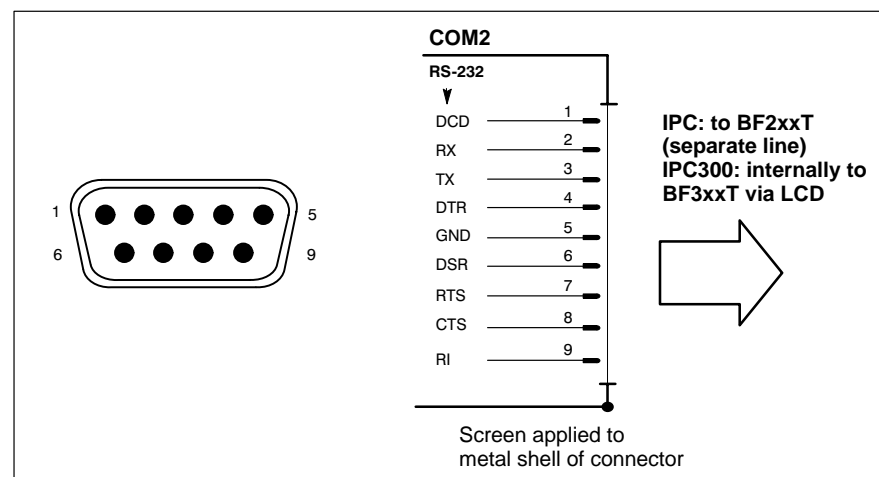
On the IPC, the COM2 port must be connected to the touch screen. On the IPC300, the COM2 is transmitted via the Gigabit bus, making a special data line unnecessary.

In exceptional cases the IPC also permits the use of the COM1 or COM3 port for the touch screen, provided that the BIOS settings are changed to suit.

On the IPC the COM2 is also applied to X57 to provide RS-422/485 service. Parallel operation is not possible, however.

Male DB-9 connector

Type:	RS-232
Cable length:	Max. 15 m
Cable type:	Screened, min. cross-section 0.14 mm ²
Transmission rate:	Max. 115200 bps
Handshake:	Hardware and software handshake (XON, XOFF)
Interrupt (IRQ):	3
I/O address:	2F8H or AUTO (recommended)
BIOS preset:	IPC: Onboard Serial Port2: Auto IPC300: Serial Port B: Enabled



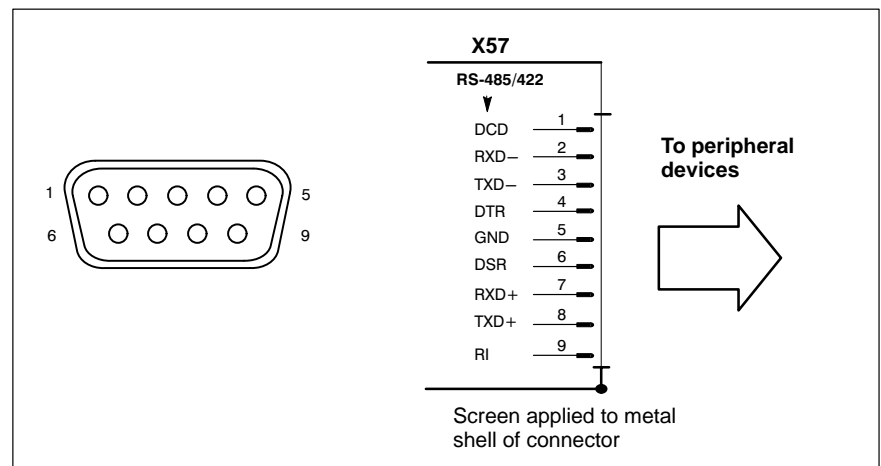
Refer to page 6-3 for explanations on pin assignments.

**X57 Serial port used as an RS-485/422, IPC: alternative to COM2
IPC300: alternative to COM1**

This port can be assigned only in the event that the COM2 port (IPC) or COM1 port (IPC300) is not used. Parallel operation is not possible. The X57 interface is not suitable as a connection for the touch screen controller of a connected control panel.

Male DB-9 connector

Type:	RS-485/422
Cable length:	Max. 15 m
Cable type:	Screened, min. cross-section 0.14 mm ²
Transmission rate:	Max. 115200 bps
Handshake:	Hardware and software handshake (X _{ON} , X _{OFF})
Interrupt (IRQ):	3 (IPC), 4 (IPC300)
I/O address:	2F8H (IPC), 3F8H (IPC300), AUTO (recommended)
BIOS preset:	IPC: Onboard Serial Port 2: AUTO IPC300: Serial Port A: Enabled



Assignment as an RS-485/422:

(For more information on pin assignment, see Page 6-3)

DCD	as for RS-232
RXD-, RXD+	Receive Data. Line on which data is received.
TXD-, TXD+	Transmit Data. Line on which data is transmitted to peripheral.
DTR	as for RS-232
DSR	as for RS-232
GND	as for RS-232
RI	as for RS-232
Screen	as for RS-232

Settings

The S3 DIP switch can be used to configure the X57 interface as an RS-485 or RS-422:

- **X57 = RS-485** Switch 3 set to **ON** = TXD is controlled via RTS. Also, for 2-wire operation, **TXD+** must be bridged with **RXD+**, and **TXD-** with **RXD-**.
- **X57 = RS-422** Switch 3 set to **OFF** = TXD always enabled.

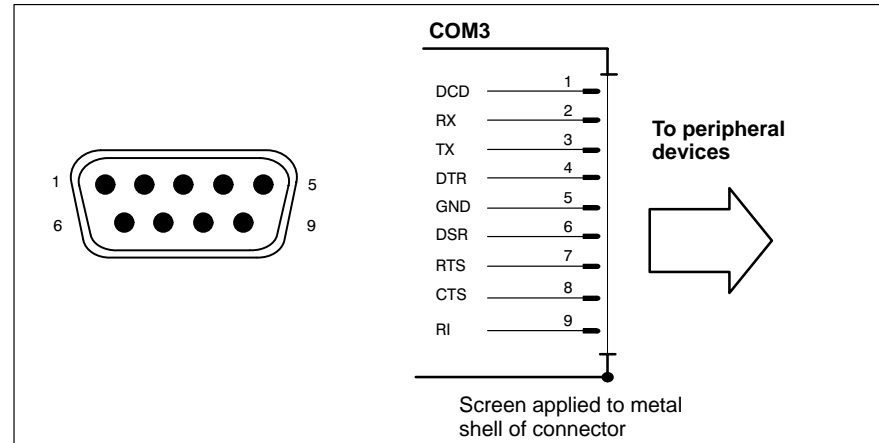


Location of S3: IPC300 = externally accessed, see diagram on page 6-2
IPC = see diagram on page 6-12.

COM3 Serial port, freely assignable

Male DB-9 connector

Type:	RS-232
Cable length:	Max. 15 m
Cable type:	Screened, min. cross-section 0.14 mm ²
Transmission rate:	Max. 115200 bps
Handshake:	Hardware and software handshake (XON, XOFF)
Interrupt (IRQ):	10
I/O address:	3E8H
BIOS preset:	IPC: Onboard Serial Port3: 3E8h IPC300: Serial Port C: Enabled



Refer to page 6-3 for explanations on pin assignments.

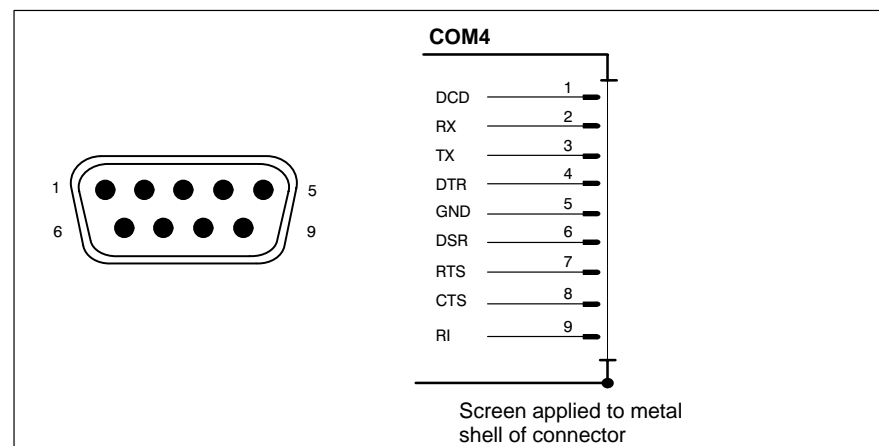
COM4 Serial port, assigned to UPS logic

(refer to Section 3.2)

COM4 is internally assigned to the uninterruptible power supply (UPS). On the IPC, COM4 can be used for external applications if the UPS ios not required. On the IPC300, the COM4 is not externally accessible.

Male DB-9 connector

Type:	RS-232
Cable length:	Max. 15 m
Cable type:	Screened, min. cross-section 0.14 mm ²
Transmission rate:	Max. 115200 bps
Handshake:	Hardware and software handshake (XON, XOFF)
Interrupt (IRQ):	11
I/O address:	2E8H (if equipped for free assignment)
BIOS preset:	IPC: Onboard Serial Port4: 2E8h IPC300: Serial Port D: Enabled

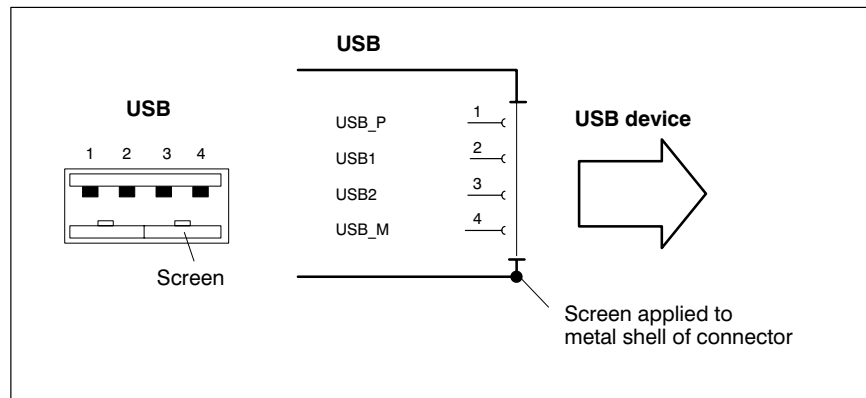


Refer to page 6-3 for explanations on pin assignments.

USB Serial interface (Universal Serial Bus), currently not supported

The USB interface provides for the connection of up to 128 devices equipped with USB functions.

USB socket, 4-pin



PIN	Signal
1	USB power supply (max. 500 mA)
2	Data -
3	Data +
4	USB Ground

6.2.2 COM1 through COM4 settings

Control Panel

For information about setting the communication parameters for serial interfaces, refer to the manual supplied with the installed operating system.
Windows 95/NT: Go to **Start / Settings / Control Panel**, etc.

BIOS

The factory-shipped BIOS settings for COM1 through COM4 have been set to **Present**.



CAUTION

Interrupt (IRQ) and I/O address must correspond to BIOS settings.

In the case of address conflicts regarding COM3/4, e.g., if IRQ 10 or 11 are already in use by other PC expansion cards, free IRQs must be used instead.

6.3 LPT1 parallel port

LPT1 Parallel port for printer, scanner, etc.

Male DB-25 connector

Type:

SPP (ex works), EPP, ECP

Cable length:

Max. 3 m

Cable type:

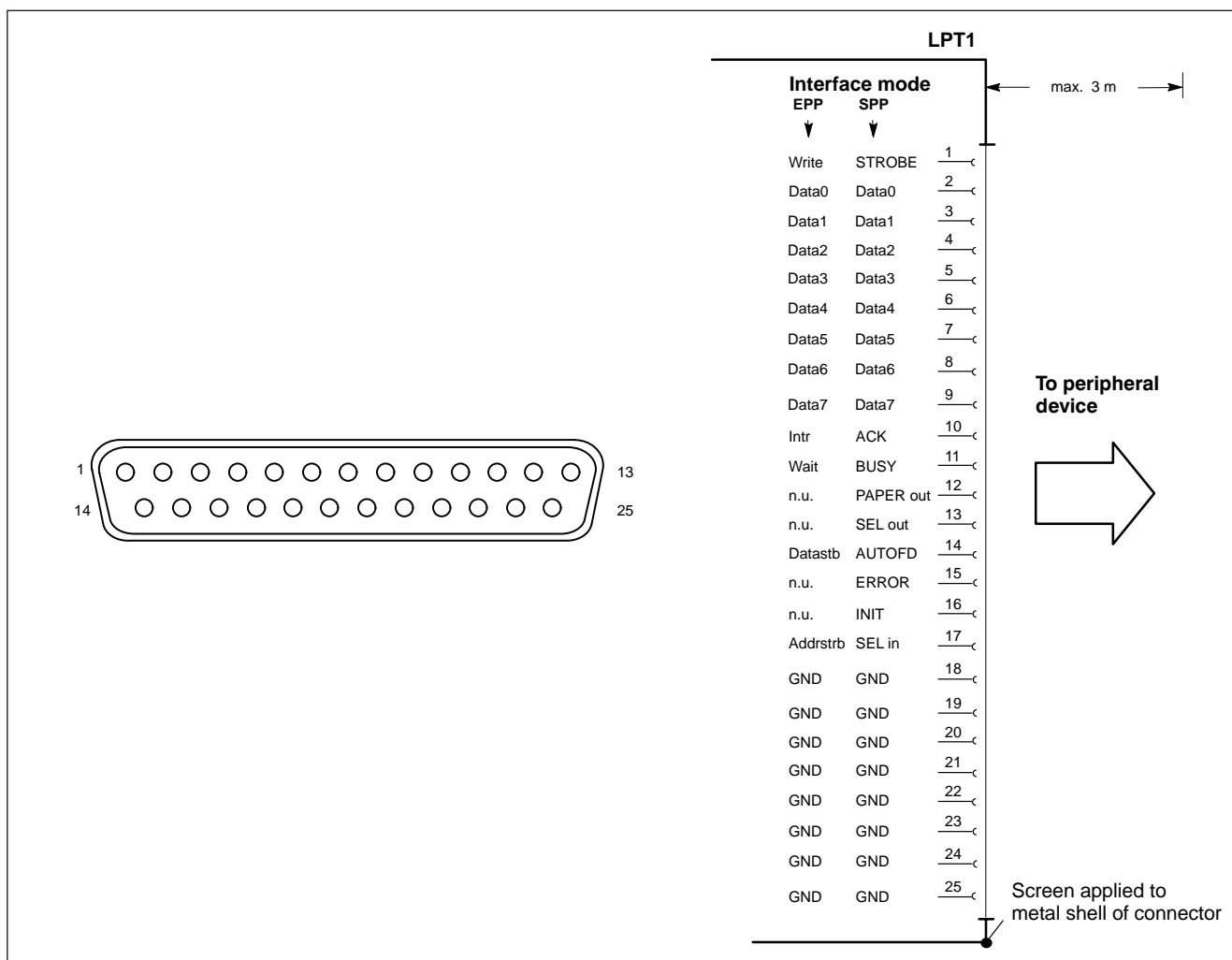
Screened, min. cross-section 0.14 mm²

Interrupt (IRQ):

7

I/O address:

AUTO or 378H (recommended)



The parallel port normally runs in the default SPP mode. Provided that suitable peripheral devices are present, it can also be operated in EPP (Enhanced Parallel Port) or ECP (Extended Capabilities Port) mode. The mode is changed in the BIOS settings.



CAUTION

Functional failures caused by poor screening!

Use only metallic or conductive connector/coupling shells providing large-area screen contact.

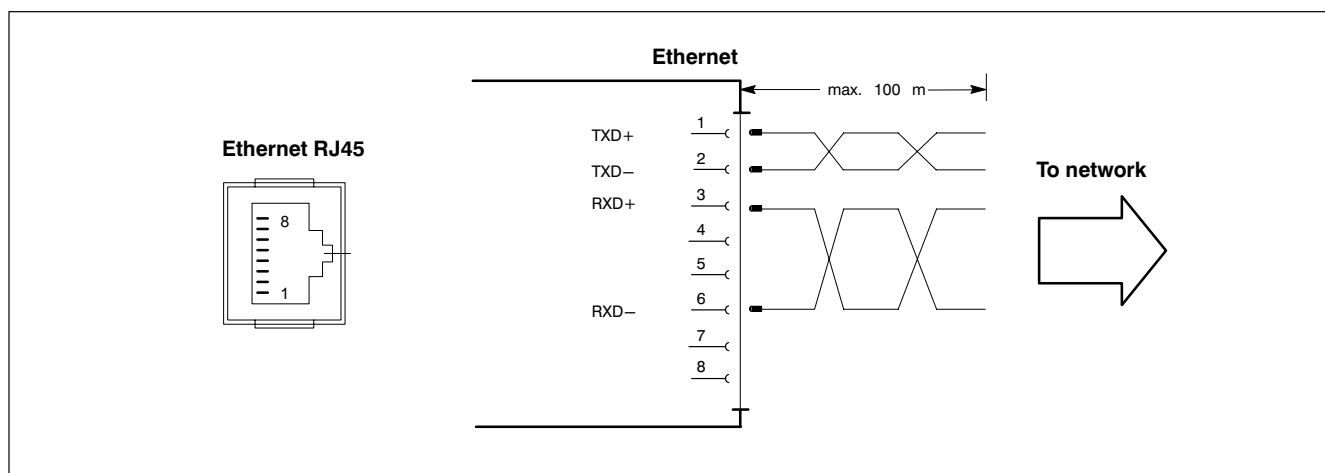
6.4 Ethernet connection

Ethernet Network connection

The Ethernet connection allows the PC to communicate on an Ethernet network. To facilitate data communications, the required network protocols (e.g., TCP/IP) must be recognized by the operating system and the network application programs running on the PC.

Female RJ45, 8-pin

Type:	IPC: Ethernet 10-Base-T IPC300: Ethernet 10/100BaseTX
Cable length:	Max. 100 m
Cable type:	Screened, twisted pair
Transmission rate:	10 Mbit/s and/or 100 Mbit/s
Interrupt (IRQ):	5
I/O address:	340H



The driver configuration functions for the network connection can be accessed in the task bar or in the **Control Panel** under the **Network Card** symbol. A dialog box provides selections of data transmission speed, e.g., 10 Mbit/s or 100 Mbit/s.

 **Note that the network card of the remote communication partner must be able to handle the same data transfer rate.**

6.5 Display interfaces

6.5.1 BF2xxT for IPC

LVDS Video transmission

The video signals are transmitted via the LVDS port. The port has been specifically designed for longer transmission routes and interference-free transmission, and can only be connected to the LVDS port of the BF200T and BF212T control panels.

Female RJ45, 8-pin

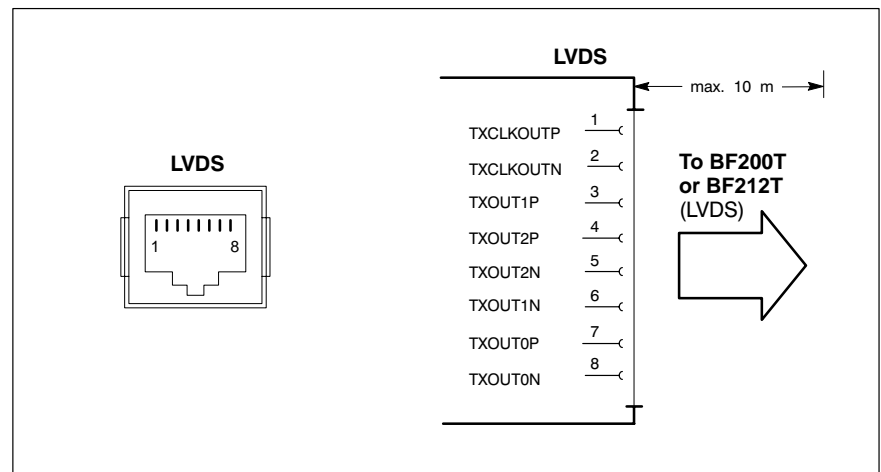
Cable length:

Max. 10 m

Cable type:

Twisted pair, 8-conductor, screened

Refer to information on premanufactured connecting cables in Section 10.2.

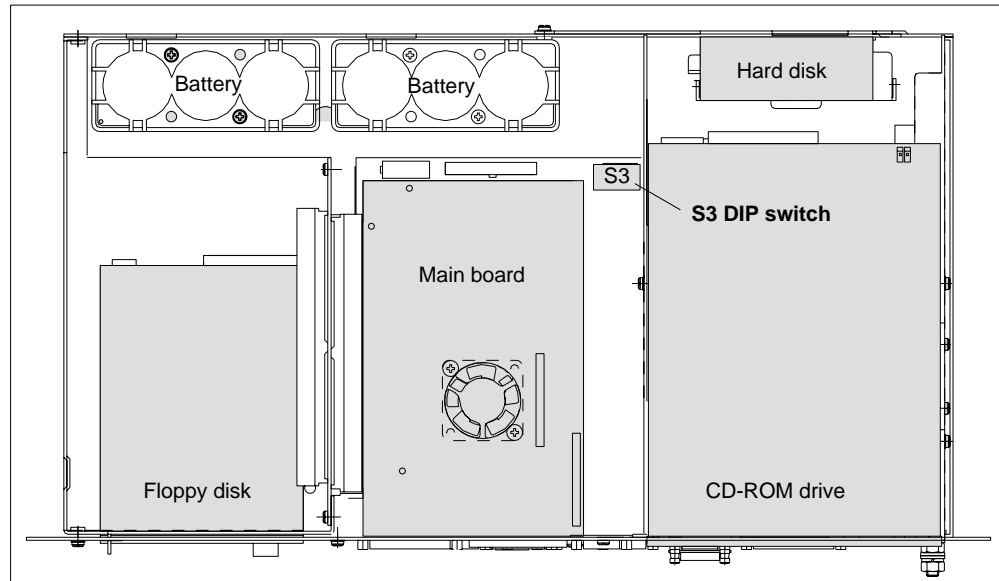


Selecting the display resolution

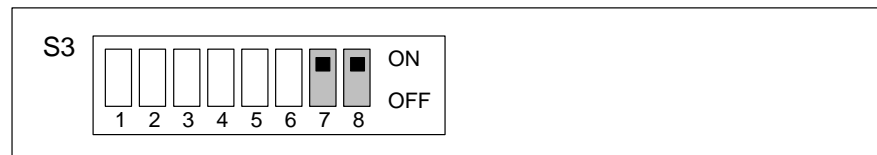
The display resolutions must be selected in the connected IPC or rho4 via the S3 DIP switch (see diagram below):

- BF200T (10.4 in. colour display): 640 x 480 pixels, 256000 colours
- BF212T (12.1 in. colour display): 800 x 600 pixels, 256000 colours
(factory setting)

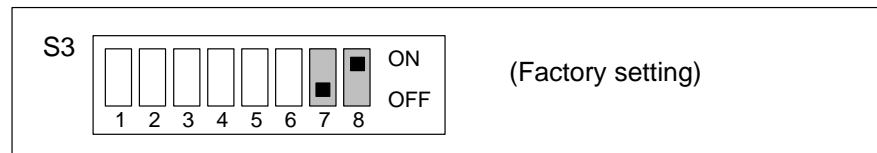
To change the factory setting, the mousing cover of the IPC is removed (4 mounting screws), and the settings of segments 7 and 8 on the S3 DIP switch are changed (see diagram below).



- 640 x 480 pixels Switches 7,8: **ON**



- 800 x 600 pixels Switch 7 : **OFF**
Switch 8 : **ON**



6.5.2 BF3xxT for IPC300

LCD Gigabit interface (video transmission and RS-422 for touch screen controller)

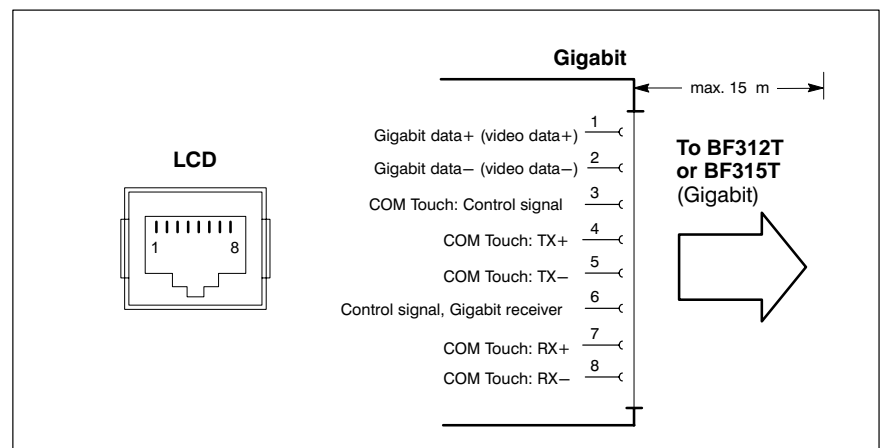
The Gigabit interface simultaneously handles the transfer of video signals and control communications for the touch screen controller (RS-422). On the IPC300 the controller signals are internally connected to COM2. The Gigabit interface has been specifically designed for longer transmission routes and interference-free transmission, and can only be connected to the Gigabit interface on the BF312T and B315T control panel.

Female RJ45, 8-pin

Cable length: Max. 15 m, max. 75 m with repeaters

Cable type: Twisted pair, 8-pin, screened

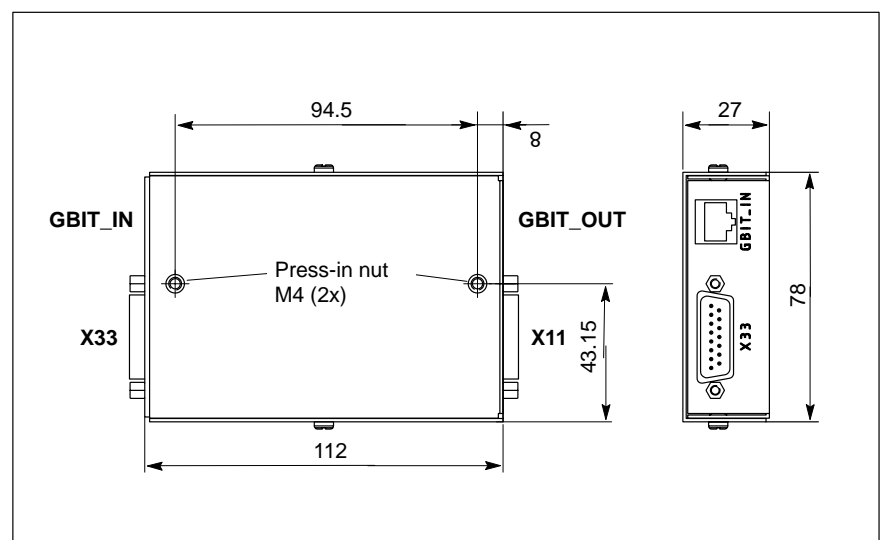
Refer to information on premanufactured connecting cables in Section 10.2.



GBIT repeater

The use of the Gigabit repeater extends the reach of required connections between the IPC300 and BF3xxT (LCD and X33) by 15 metres per repeater, to a maximum of 75 metres achieved with 4 repeaters. Installs via M4 press-in nuts. Using standard mounting clamps, snap-on installation on a standard DIN rail is also possible. Information on screen resolution settings can be found on page 6-15.

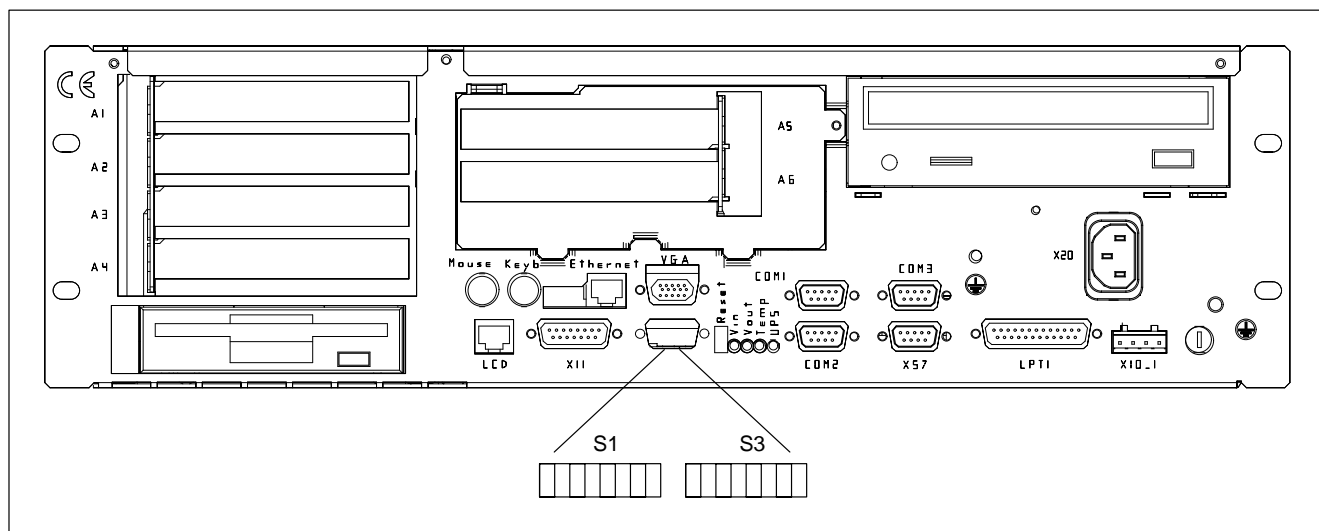
Refer to ordering information in Section 10.2.



Setting screen resolution

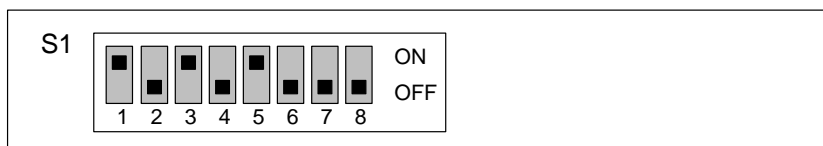
The display resolution must be selected on the S1 DIP switch (refer to diagram below):

- BF312T (12.1 in. colour display): 800 x 600 pixels
- BF315T (15 in. colour display): 1024 x 768 pixels
(factory presets)

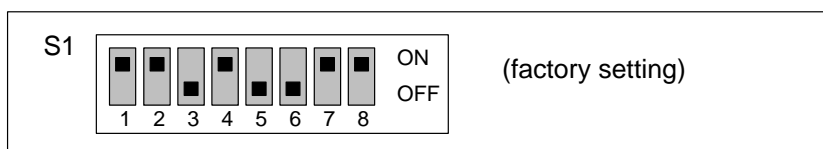


Changes are made on the externally accessible switch segments 1 through 8 of the S1 DIP switch:

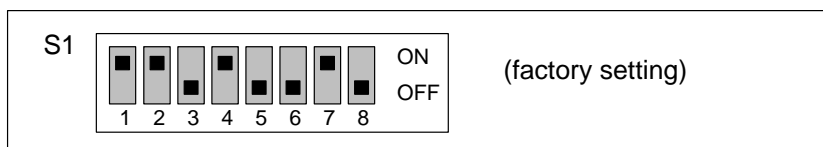
- 800 x 600 pixels



- 1024 x 768 pixels
(IPC300 with Pentium I / 266 MHz)

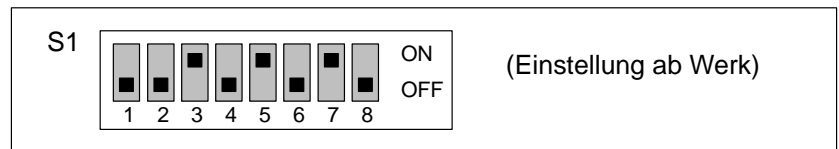


- 1024 x 768 pixels
(IPC300 with Pentium III / 400 MHz)

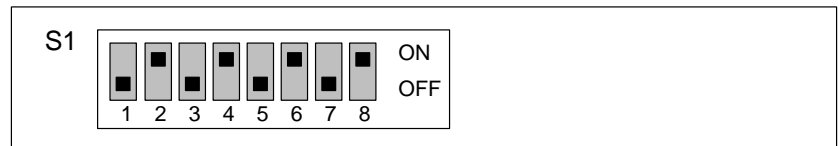


If a **Gigabit Repeater** is used, the DIP switch has to be configured as follows depending on the connected control panels:

- 800 x 600 Pixel (BF312T)



- 1024 x 768 Pixel (BF315T)



6.5.3 External CRT monitor for IPC / IPC300

VGA External monitor port

The VGA port accepts an external monitor (CRT) for operation via the built-in video adapter. The external monitor can be operated in parallel with the operator panel.

- Video RAM: 2 MB

Note that the external monitor must already be connected at the time the control terminal is booted up. If this is not the case, the VGA port will not be initialized by the BIOS.

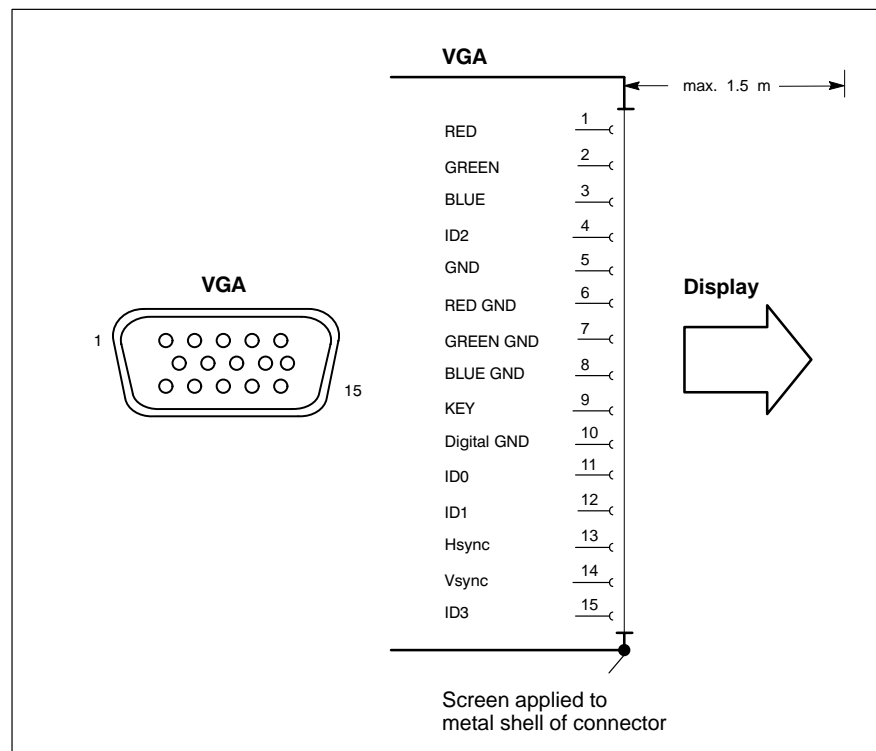
Inserting a graphics card will disable the integrated video adapter. Also, on the IPC300, the BIOS setting must be changed.

Female VGA HD, 15-pin

Cable length: Max. 1.5 m

Cable type: Screened, min. cross-section 0.14 mm²

Max. resolution: 1280 x 1024 pixels, max. 16 million colours



CRT monitor resolution

After a system restart, the screen resolution of the VGA port always corresponds to the setting of the LVDS or LCD interface. Refer to page 6-11 (LVDS) or page 6-14 (LCD).

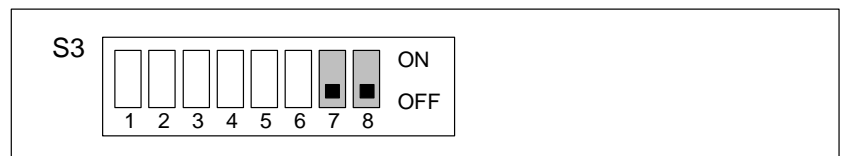
It should be noted that it is technically possible to bypass the stated resolution and colour settings by changing them in the Control Panel while the IPC or IPC300 is running. However, such changes would again be overwritten during a subsequent system start:

- VGA mode: 640 x 480 pixels, 72 Hz, 24 bit colours
- SVGA mode: 800 x 600 pixels, 72 Hz, 24 bit colours
- XGA mode: 1024 x 768 pixels, 72 Hz, 16 bit colours
- SXGA: 1280 x 1024 pixels, 72 Hz, 8 bit colours

If the VGA port must be permanently set to a resolution which fails to correspond to the selections possible on the LVDS or LCD interface, the connection between LVDS and/or LCD and VGA must be interrupted:

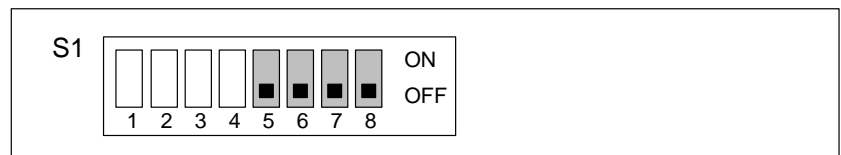
- **IPC** with S3 DIP switch:

VGA resolution	Segment 7 :	“OFF”
as per BIOS:	Segment 8 :	“OFF”



- **IPC300** with S1 DIP switch:

VGA resolution	Segment 5 :	OFF
as per BIOS:	Segment 6 :	OFF
	Segment 7 :	OFF
	Segment 8 :	OFF



☞ **With these settings, connecting a control panel is no longer possible!**



CAUTION

Setting incorrect resolutions and colours can destroy your monitor! Observe the specifications applying to your CRT or LCD monitor, and adapt the operating system parameters accordingly.

Recommended monitors for external use are low-radiation models to TCO95. In addition, you should achieve the desired display resolution at a refresh rate of no less than 72 Hz.

6.6 X11 power supply connection


X11 Power supply, backlight power, mouse and keyboard signals from control panel

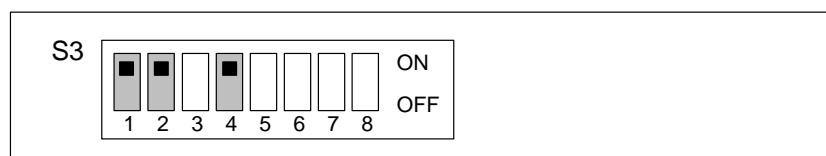
The X11 power supply connection ensures **reliable service** of the control panel and other components even **over extended physical distances**. For distances below 1.5 m, mouse and keyboard can also be directly connected to the PC.

The X11 connection provides the following services:

- Operating power to the control panel. IPC: 12 VDC
IPC300: 24 VDC
- Power required for backlight source.
- Communication of mouse and keyboard signals (refer also to Sections 6.7 and 6.8)
- Connection between COM3 and control panel as required. The connection is configured with the use of the S3 DIP switch and is identical for IPC and IPC300.

COM3 interconnected with X11: S3 switch segments 1 and 2: **ON**

 **IPC300 with Pentium III / 400 MHz only:**
Always make sure that segment 4 of the DIP switch S3 is closed (ON) in order to activate the backlight "sleep" function of the BF3xx.



Female DB-15 connector

Cable length:

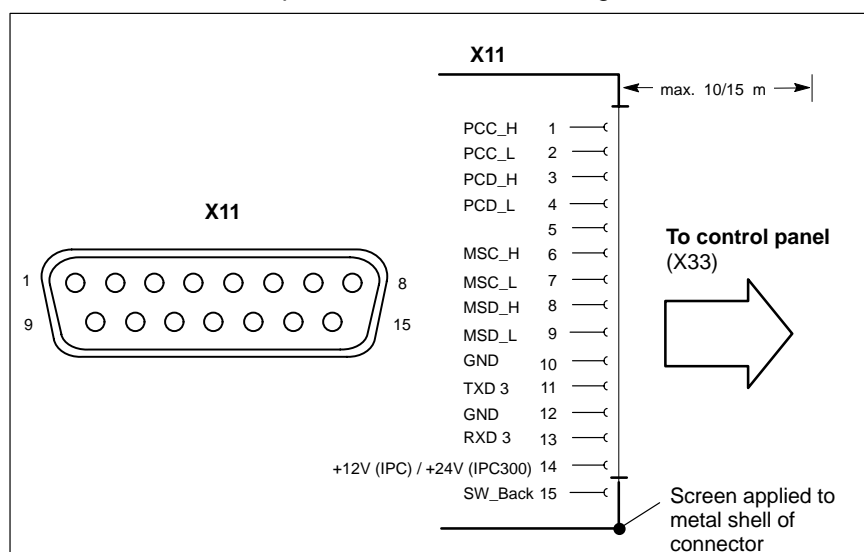
IPC: Max. 10 m

IPC300: Max. 15 m, can be extended to 75 m via repeaters in conjunction with Gigabit interface (refer to page 6-13)

Cable type:


Screened, min. cross-section 0.14 mm²

Refer to information on premanufactured connecting cables in Section 10.2.



6.7 Keyboard connector

Keyb PS/2 mini DIN keyboard connector

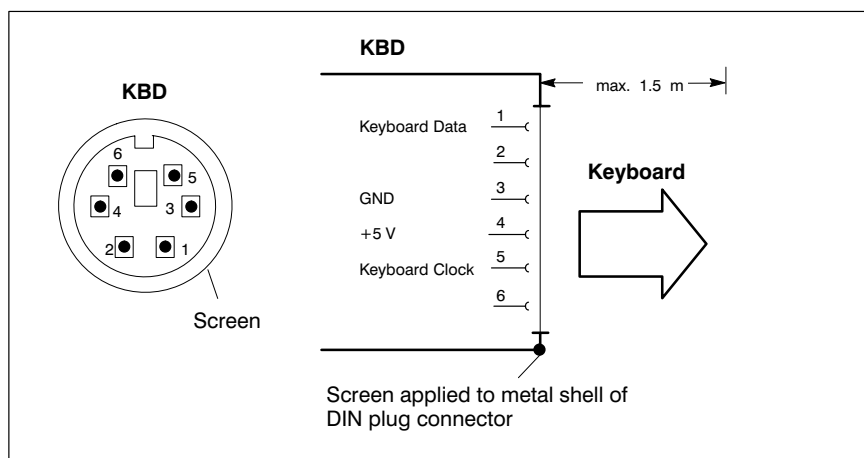
 **Use this connection only if no keyboard is connected to the “KBD” port of the control panel. Otherwise, faulty keyboard operation may occur.**

Female PS/2 mini DIN, 6-pin

Cable length: Max. 1.5 m

Cable type: Screened, min. cross-section 0.14 mm²

BIOS preset: System Keyboard: Present (IPC only)
(for “Keyb” or “KBD”)

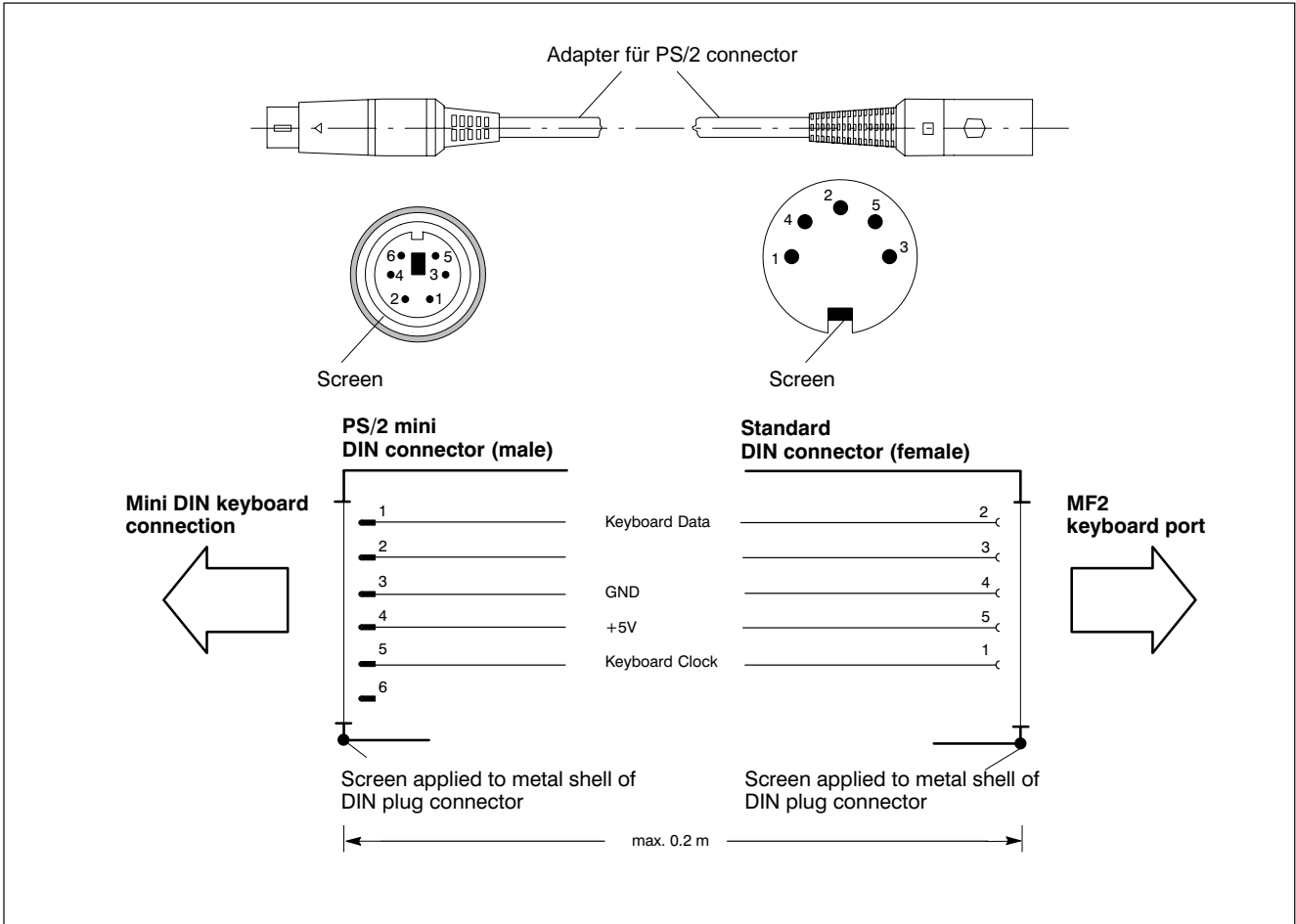


If the system fails to recognize the keyboard, the interface in the BIOS may have been set to “Absent”, i.e., “Not Connected”. Change the BIOS setting to “Present” (IPC only).

Keyboard adapter

In the event that the MF2 keyboard is equipped with a standard 5-pin DIN plug, you will require a keyboard plug adapter to a female PS/2 Mini DIN connector.

A suitable adapter is approx. 20 cm in length with a DIN connector and a mini DIN coupling on the ends. Connector assignment as per diagram below. These premanufactured adapters are available from computer stores.



6.8 Mouse port

Mouse PS/2 mouse port

- ☞ **Use this connection only if no mouse is connected to the “Mouse” port of the IPC.
Otherwise, faulty mouse operation may occur.**

Female PS/2 mini DIN, 6-pin

Cable length:

Max. 1.5 m

Cable type:

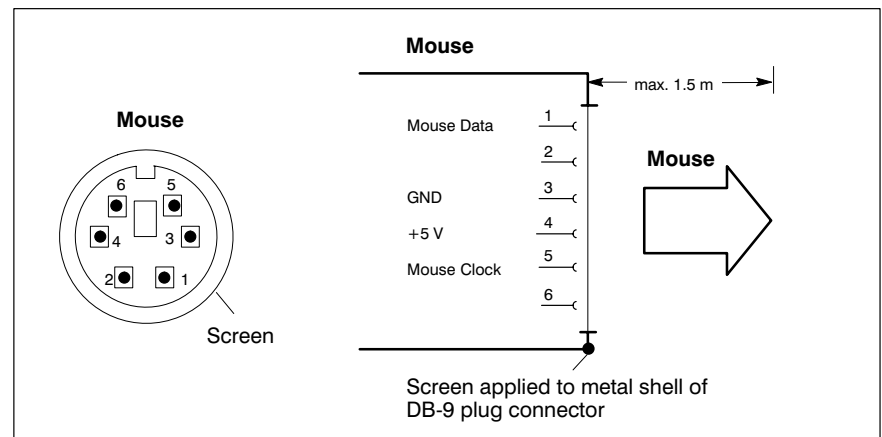
Screened, min. cross-section 0.14 mm²

Interrupt (IRQ):

12

BIOS preset:

IPC: PS/2 Mouse Support: Enabled



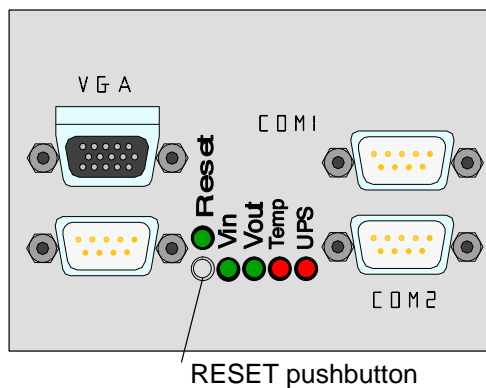
If the system fails to recognize the PS/2 mouse, the interface in the BIOS may have set to “Disabled”, i.e., “Not Available”. Change the BIOS setting to “Enabled” (IPC only).

The operating system will not recognize the insertion of an external mouse after completed startup because the mouse initialization occurs during the boot phase.

- ☞ **The connected mouse must be PS/2-compatible.
The BIOS normally reserves IRQ12 for the PS/2 mouse.
If there are address conflicts, e.g., if IRQ 12 has already been occupied by another PC expansion card, you should change the IRQ of the expansion card to one that is still free.**

Notes:

7 LED Display



A RESET pushbutton and a horizontal array of 5 LEDs are located on the backside. They have the following functions:

LED	Display	Meaning	Remedial measure
V _{in}	LED green	Standard operation	–
	LED off	No 230/115V _{AC} mains power or 24 V _{DC} is present at power supply	Check IPC power supply for power.
V _{Out}	LED green	Standard operation	–
	LED off	Internal +5 V and +12 V voltages are not present	Check IPC power supply for power.
Temp	LED off	Standard operation	–
	LED flashes red	Internal housing temp. above 50 °C, shutdown will occur if temperature continues to rise	Reduce internal IPC housing temperature. Check/verify fan functions.
UPS	LED off	Standard operation	–
	LED red	IPC currently in battery mode, i.e., no mains power present!	Restore mains power to IPC. Initiate controlled IPC restart.
	LED flashes red	Battery pack discharged, defective or not connected	Check battery charge. Maintain 5-hour charging cycle!

	Control/Display	Meaning	Remedial measure
RESET	pushbutton	Initiates reboot of the PC	–
	LED red	RESET pushbutton has been pressed	–

Notes:

8 Maintenance and Replacement

The IPC and IPC300 are maintenance-free. However, some components are subject to wear and must be replaced.

Maintenance schedule

Include the following tasks in your maintenance schedule:

- At least once a year check that all plug-and-socket and terminal connections of the components are correctly seated and not damaged. Check that cables are not broken or crushed. Replace damaged parts immediately.
- Check fan and fan filter mats at least once a year. Clogged and contaminated filter mats reduce the air volumes required for proper ventilation and cooling. Therefore, wash dirty filter mats in soapy water or replace with new mats. Allow washed filter mats to dry thoroughly before reinstalling.



DANGER

Risk of injury through rotating fan impeller!

Keep hands and fingers clear, and do not insert any items into the fan impeller.

-
- Ensure that the rechargeable batteries (battery pack) are fully functional. To ensure that the battery pack is tested during each system startup (and afterwards in 12-hour intervals), enable the Battery Test option of the UPS control program.



CAUTION

Loss of data!

Back up the data from the hard disk at regular intervals .

-
- Depending on temperature, vibration and daily operating hours, the service life of the hard disk may last anywhere between 2.5 and 10 years. To safeguard application data, and to avoid the necessity of time-intensive new installation of operating system (OS) and application programs following a hard disk replacement, the functional program and OS data on the hard disk should be backed up at regular intervals with the use of the Bosch-supplied "Backup Package for Industrial PC". This process writes an image of the hard disk to the medium in the Iomega "Jaz" drive supplied with the package; if a hard disk replacement is required, this image must simply be copied back to the newly installed hard disk. Refer to Section 10.3 for ordering information.

8.1 Fuse protection

The IPC and IPC300 are equipped with a replaceable power supply fuse:

- 6.3 A (5x20), medium time-lag for 24 VDC power supply
- 1.25 A (5x20), medium time-lag for 230 VAC power
- IPC: accessible after removal of the CD-ROM drive. (refer to procedures in Section 8.2.1)
- IPC300: accessible externally at the front panel.

Refer to fuse ordering information in Section 10.3.

 **In the event that the power supply remains faulty after replacing the power supply fuse, please contact Bosch Rexroth Service: Telephone: (+49) (0 60 62) 78-888.**

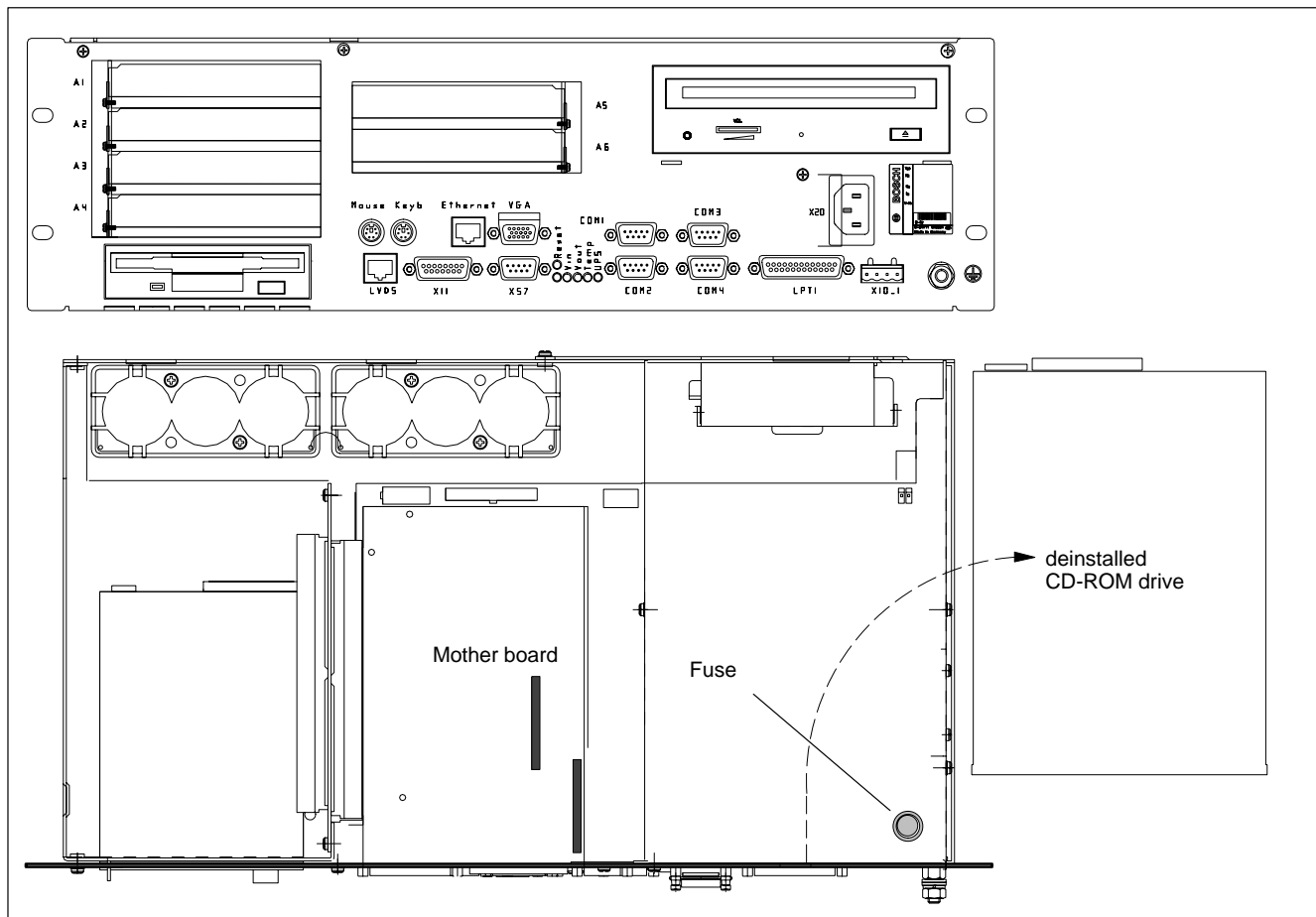


CAUTION

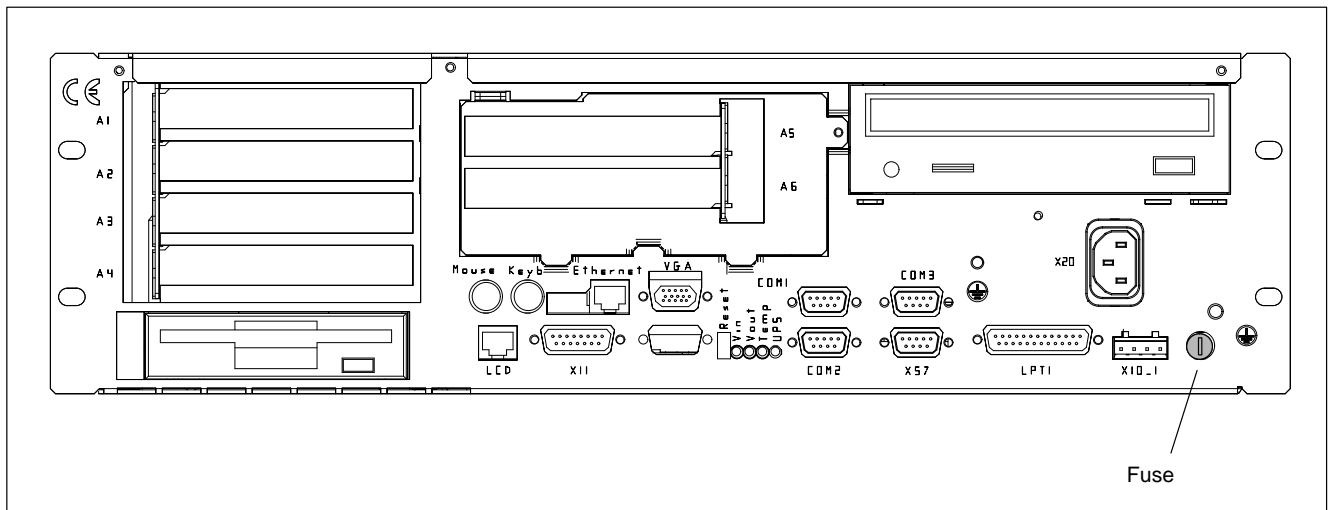
Loss of data!

Service repairs of devices returned by customers do not entail back-ups of user data. Repaired units are returned with formatted hard disk and newly installed software.

IPC



IPC300



8.2 Replacing the hard disk

The hard disk is replaced complete with installation frame.

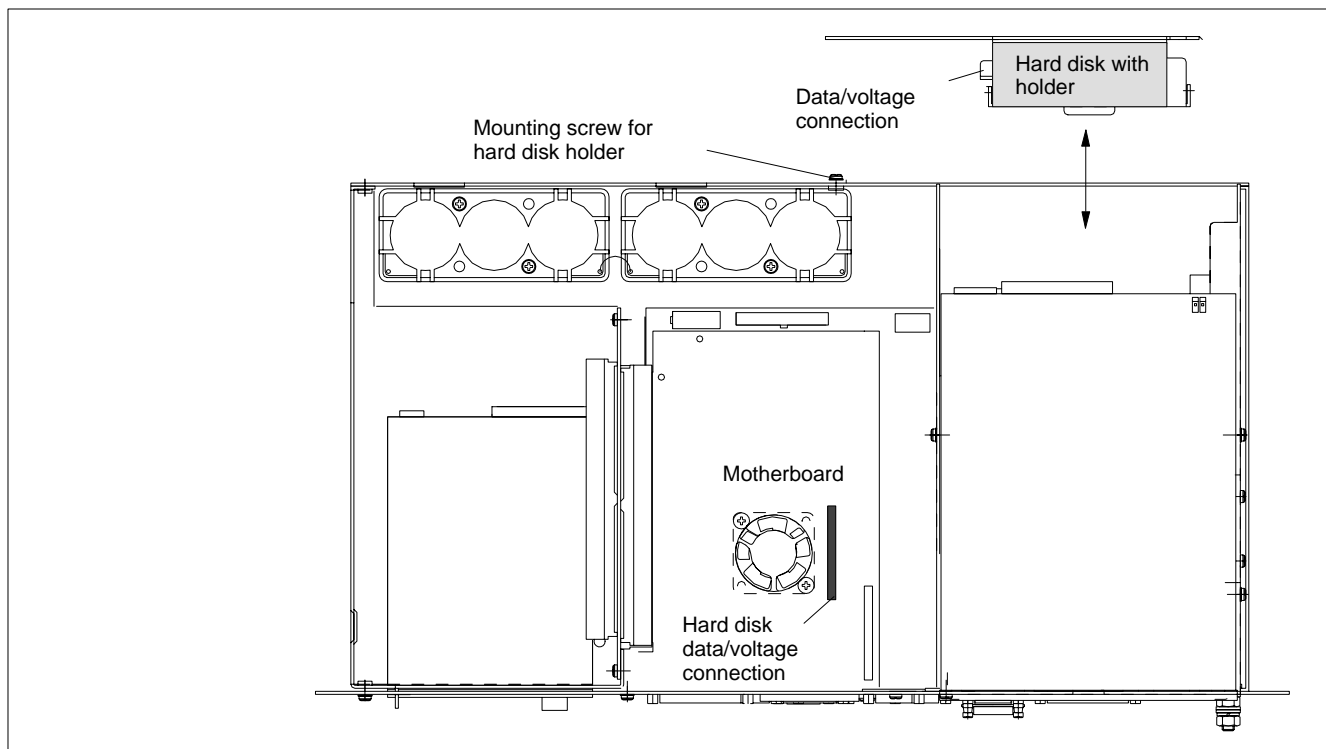


CAUTION


Loss of data!

Back up all required application data and operating system settings to an external storage medium!

- ☞ To safeguard application data, and to avoid the necessity of time-intensive new installation of operating system (OS) and application programs following a hard disk replacement, the functional program and OS data on the hard disk should be backed up at regular intervals with the use of the Bosch-supplied "Backup Package for Industrial PC". This process writes an image of the hard disk to the medium in the Iomega "Jaz" drive supplied with the package; if a hard disk replacement is required, this image must simply be copied back to the newly installed hard disk. Please refer to Section 10.3 for ordering information.



1. Switch off the power supply to the unit. If required, unplug all connectors from the unit.
2. Wait until the UPS has switched off the power supply (the **UPS LED** on the front illuminates **red** until the UPS switches off the IPC power supply).
3. Open the housing.
4. The ribbon cable is secured by a spot of hot glue which must be broken (cut) for deinstallation. Disconnect the IDE ribbon cable **from the hard disk**. Unless this cable is defective, disconnecting it from the mainboard will not be required. On the IPC300, this ribbon cable also connects the CD-ROM drive.

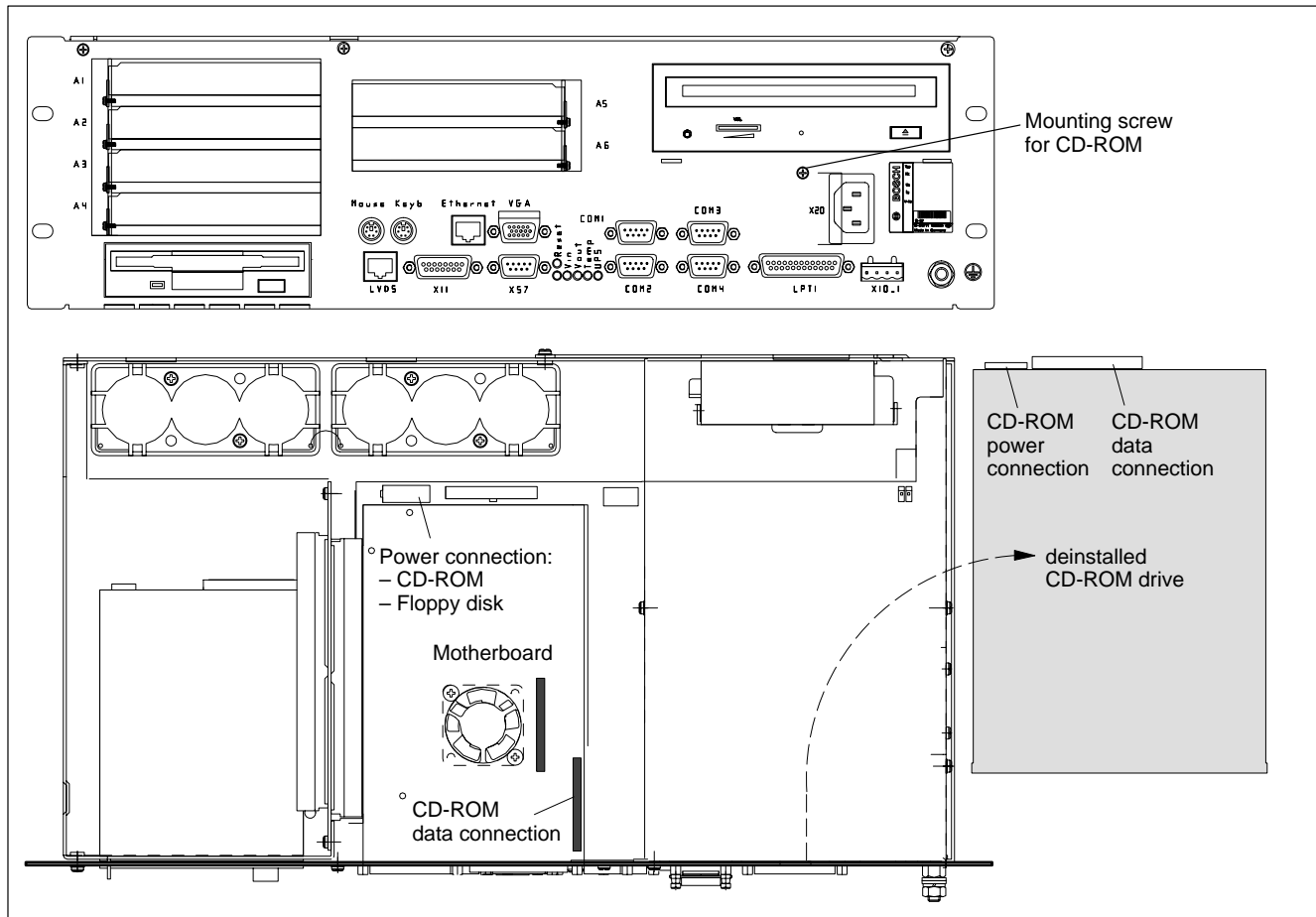
5. Loosen the mounting screw on the rear of the housing and remove the hard disk holder complete with hard disk.
 6. The new hard disk is always installed with installation frame, and in reverse sequence to that described above.
-  **Again, secure the hard disk connector by applying a spot of “hot glue”.**
7. The new hard disk must be declared to the BIOS of the PC. To access the BIOS menu, press the following keys while the system is booting up:
 - IPC: Press .
 - IPC300: Press the <F2> function key.

IPC: Select the **Auto-Detect Hard Disks** menu option so that the new hard disk parameters can be recognized by the system. In the **Standard-CMOS-Setup** menu select **PIO-Mode 3** for the hard disk. Exit the BIOS via the **Save Settings and Exit** option (save hard disk parameters).
To do this, press the <Y> button (= Yes).

IPC300: To enable recognition of the new hard disk parameters by the system, go to the main menu, select the **Primary Master** menu option, followed by the **Type = AUTO** option. Select **Exit Saving Changes** (saving new parameter settings) to exit the BIOS menu.

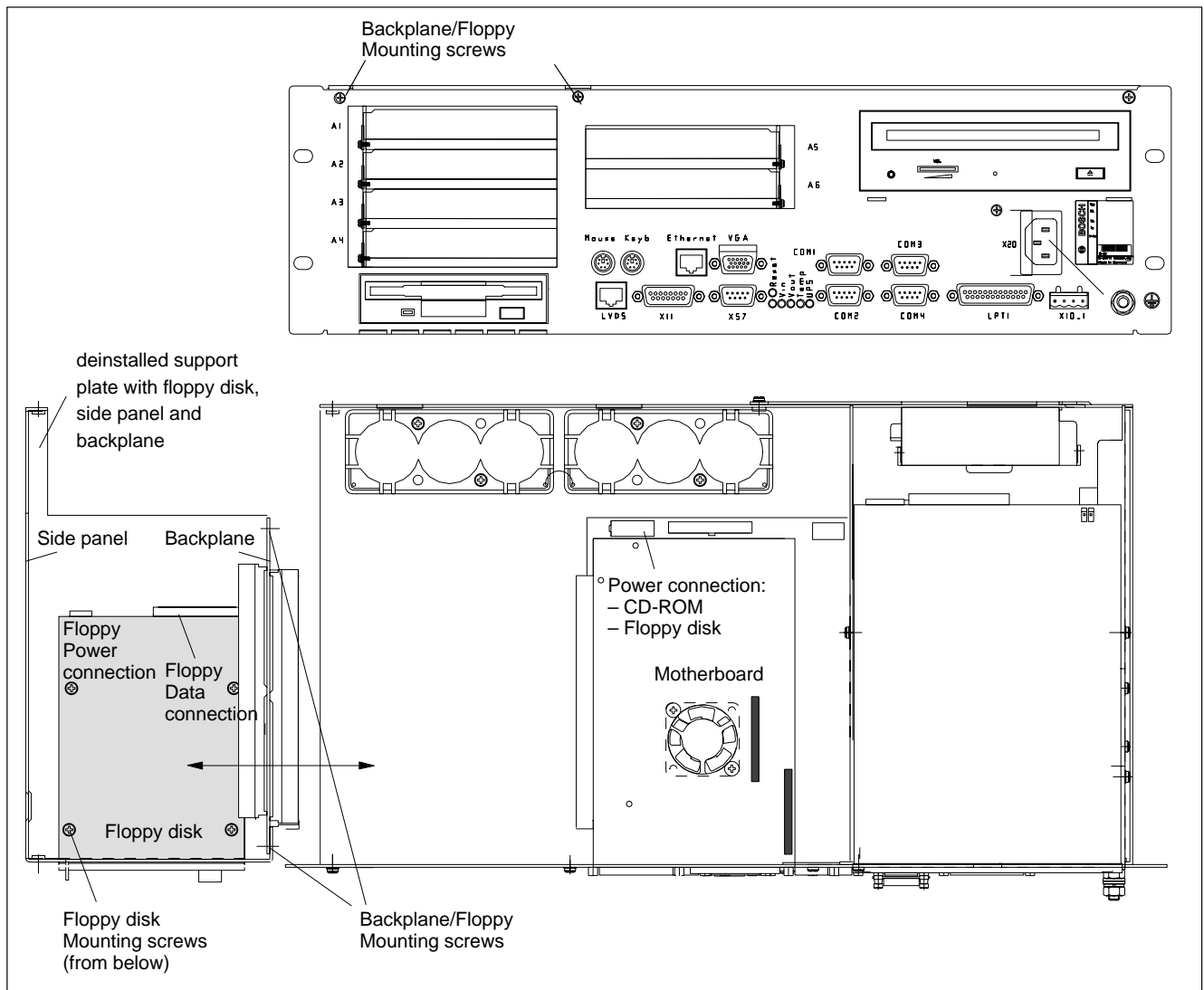
Restart the operating system, and again access the BIOS menu. In the **Primary Master** option, set the **Type** option to **User**, and the **Transfer Mode** option to **Fast PIO 3**.
Select **Exit Saving Changes** (saving new parameter settings) to exit the BIOS menu.
 8. If the IPC operating system fails to start up, interrupt the power supply again for min.10 seconds, and then restart the operating system.
 9. If the system still does not start up, check for:
 - Proper connection between controller cable and hard disk.
 - Proper connection of all port connectors and cables.
 - Presence of operating power.
 10. Once the PC has started up properly, the user data and operating system settings for standard operation must be restored.

8.2.1 Replacing the CD-ROM drive



1. Switch off the supply voltage to the unit. If required, unplug all connectors.
2. Wait until the UPS has switched off the power supply (the **UPS LED** on the front illuminates **red** until the UPS switches off the IPC power supply).
3. Open the housing.
4. Unplug the female connector together with the controller ribbon cable and the female connector for the power supply from the CD-ROM drive. Only a defective cable must be disconnected from the motherboard.
5. Loosen the mounting screw on the front panel.
6. Remove the CD-ROM drive including the carrier plate.
7. Loosen the mounting screws and replace the drive.
8. Installation is in reverse sequence to that described above.
9. When the IPC has started, the CD-ROM drive should be recognized again by the operating system if the drive is of the same type. If another type is installed, the relevant driver software should also be installed. In this case follow the installation instructions of the CD-ROM manufacturer and the Windows95 or WindowsNT 4.0 installation routine.
10. If the CD-ROM drive still cannot be accessed, check for:
 - Proper connection between controller cable and CD-ROM drive.
 - Proper seating of all cables and connectors.
 - Presence of operating power.

8.2.2 Replacing the 3.5" floppy disk



1. Switch off the supply voltage to the unit. If required, unplug all connectors.
2. Wait until the UPS has switched off the power supply (the **UPS LED** on the front illuminates **red** until the UPS switches off the IPC power supply).
3. Open the housing.
4. If applicable, remove all expansion cards and all cables connected to these cards.
5. Unplug the female connector together with the controller ribbon cable and the female connector for the power supply from the floppy disk. Only a defective cable must be disconnected from the motherboard.
6. Loosen the two mounting screws on the front panel. Loosen the 4 mounting screws on the backplane and remove the floppy disk together with the side panel, backplane and holder from the side of the housing (as the motherboard is plugged into one of the backplane slots, the backplane must be moved carefully in order to loosen this connection).
7. Loosen the 4 mounting screws on the underside of the floppy disk holder and insert a new drive.
8. Installation is in reverse sequence to that described above.

9. If you have installed another type (e.g. 3.5" HD 2.88 MB), this must be declared to the IPC BIOS. To access the BIOS menu, press the following keys while the system is booting up::

- IPC: Press .
- IPC300: Press the <F2> function key.

IPC: Go to the **Standard SETUP** menu option, and select the new floppy disk type. Exit the BIOS via the **Save Settings and Exit** option (save hard disk parameters).

To do this, press the <Y> button (= Yes).

IPC300: Go to the main menu, and select **Diskette 1**. Select the new floppy disk type. Select **Exit Saving Changes** (saving new parameter settings) to exit the BIOS menu.

10. If the floppy disk drive cannot be accessed, check for:

- Proper connection between controller cable and flopps disk drive.
- Proper seating of all cables and connectors.
- Presence of operating power.

8.2.3 Replacing the battery pack

The rechargeable battery pack must be replaced in the following cases:

- The battery test has failed.
- The total number of charging cycles is above the value which depends on the ambient temperature shown below (refer to the **Shutdown Count** option in UPS program, Sections 3.3.2 and 3.3.3).
- The red “USV” LED on the front panel is flashing for more than 8 hours (refer to page 7-1).

Different prerequisites must be met by the IPC and IPC300 to start the charge cycle. That is, whether or not the respective power supply is backed by the rechargeable battery pack after Power-Off.


- IPC: Always after Power-Off
- IPC300: After Power-Off only if a controlled shutdown of still-active software is required.

A harmful deep-discharge of the battery pack is prevented as long as the IPC or IPC300 is not connected to mains power.

The number of charging cycles that the rechargeable battery pack can withstand and therefore its useful life, depends on the ambient temperature in which the battery pack is used. Ambient temperature here is defined as the one in which the operating terminal is situated, e.g. the temperature in the control cabinet or in the operating housing.

The following table can be used as a guideline:

Ambient temperature	Charging cycles	Maintenance interval
+ 25 °C	4000 cycles	6 years
+ 35 °C	2000 cycles	3 years
+ 45 °C	1000 cycles	1.5 years

 **The battery packs used in the IPC/IPC300 are recyclable, and can be returned to Bosch Rexroth upon replacement. They must not be disposed of in standard residential refuse.**

X19 Battery terminal

Battery connection terminal. The connection may be removed only for the purpose of replacing the battery packs.

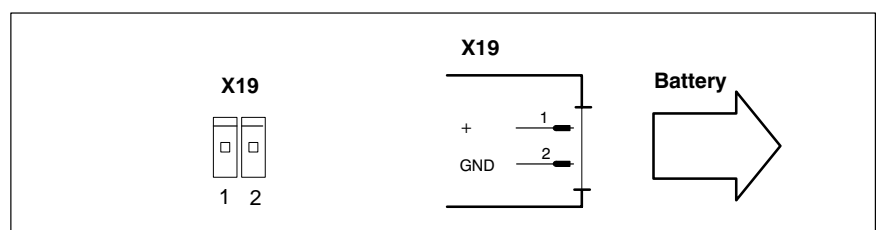
Terminal strip, 2-pin

Cable length:

Max. 0.5 m

Cable type:

Unscreened, min. cross-section 1.5 mm²



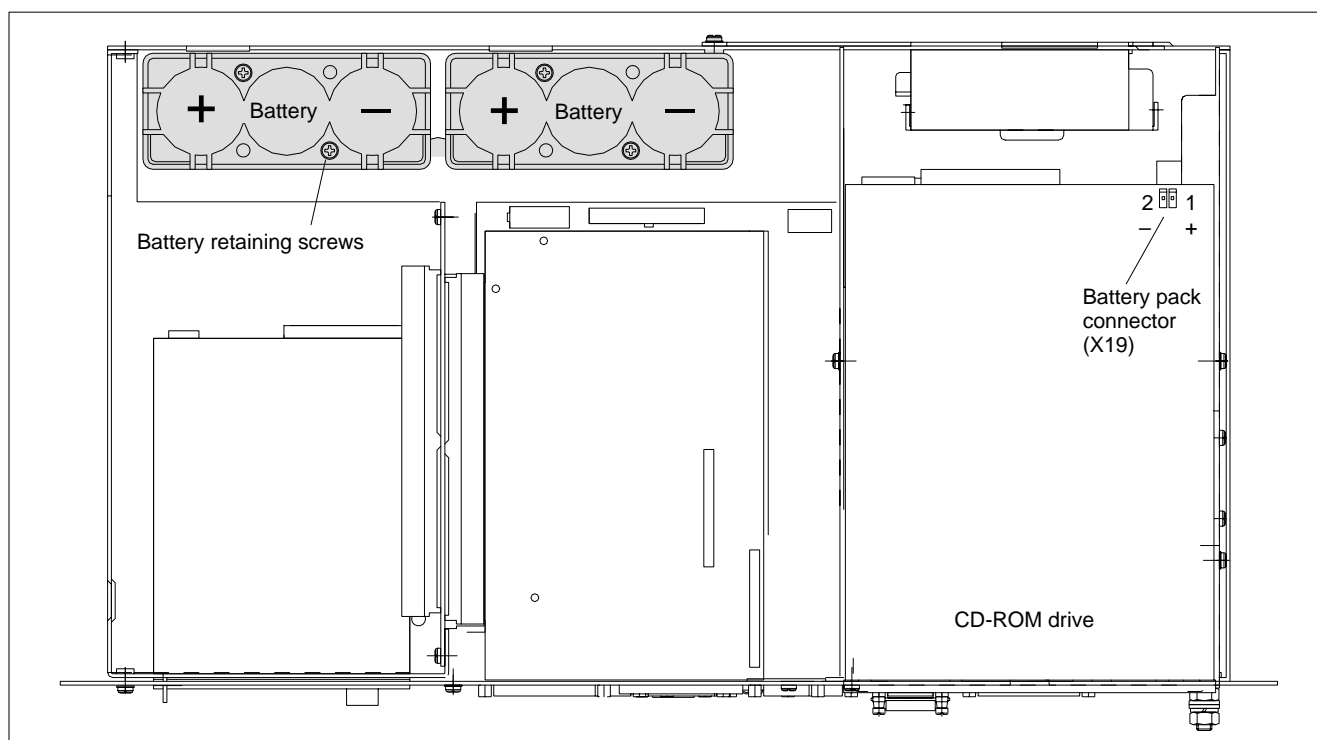
Replacing the batteries

**WARNING**

Before replacing the battery, back up important data because during the battery replacement procedure, power supply is removed.

1. Before replacing the batteries, switch off the PC and remove the mains plug (230/115 VAC and 24 VDC plug).
2. Open the housing cover
3. Remove the connector with the bipolar cable from battery terminal X19 below the CD-ROM.
4. The battery packs can be replaced when the 4 mounting screws have been removed (cf. figure below).

Insert the two new battery packs as shown in the figure below. Please also observe the installation instructions delivered together with the packs.



5. Plug the connector with the bipolar cable back onto terminal X19. Ensure correct polarity of the batteries.

**DANGER**

Polarity reversal of the rechargeable battery packs will result in an F10A (5x20) fuse being triggered on the power supply module. Further damages might occur. The UPS operating cycle will then no longer be possible.


6. Close the housing cover.

7. Restore power to the system.

Observe the "UPS" LED display on the front panel:

- Battery pack already charged: UPS LED **Off**
- Battery pack discharged: UPS LED **flashes red**

Wait approx. 5 hours until the battery pack is fully charged, and the UPS LED **extinguishes**.

 **If the new rechargeable battery pack has not been charged, there will not be sufficient UPS protection to effect a controlled shutdown of the PC. Therefore, install fully charged batteries if at all possible.**

8.3 Expansion cards

The unit provides 6 slots for PCI bus and ISA bus expansion cards :

- 3 PCI bus slots (max. length 180 mm)
- 2 ISA bus slots (max. length 175 mm)
- 1 combination slot (PCI or ISA bus) (max. length 180 mm)



CAUTION

Damage to PC or application software through unauthorized expansion cards.

Use only approved expansion cards, and have them installed by a specialist.

8.3.1 Installing an expansion card

1. Switch off the supply voltage. If required, unplug all connectors.
2. Wait until the UPS has switched off the power supply (the **UPS LED** on the front illuminates **red** until the UPS switches off the IPC power supply).
3. Open the housing.
4. Remove the mounting screw holding the slot cover.
5. Insert the expansion card, and secure it with the mounting screw.

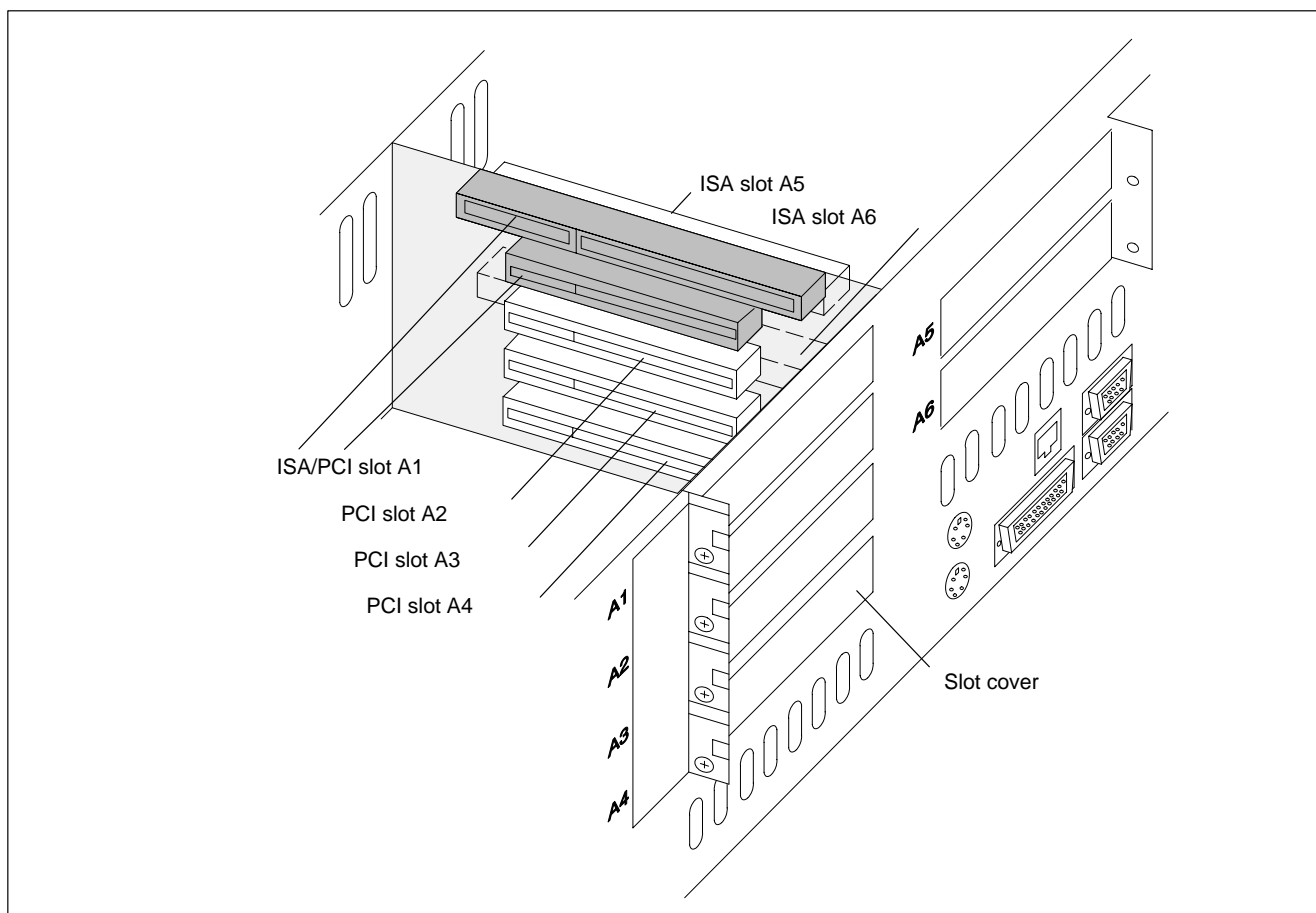


CAUTION

Destruction of expansion card or main board

The ISA/PCI combination slot must never be populated with an ISA card and PCI card at the same time!

Arrangement of expansion slots in the housing



If the card is Plug-and-Play (PnP) compatible, it is automatically recognized and integrated in the system, provided this creates no hardware conflicts (IRQ, etc.) with other expansion cards or connected devices.

In the event that subsequent to a system reboot the functions based on the newly added card are not available, there may be several reasons for this:

- The card is not properly seated in the PCI or ISA slot contacts.
- The software driver for the card has **not** been installed or its installation is **faulty**.
- IRQ (interrupt) conflict with other PC hardware components.
- The software for the card has not been installed.



CAUTION

Destruction of main board or ISA cards through address conflicts (IRQ, memory access, I/O address)!

Observe the information provided by the card manufacturer. You may have to try out new configuration settings in both BIOS and operating system.

8.3.2 BIOS settings for IPC

 **IRQ 3, 4, 5, 7, 10, 11, 14 are already occupied, and are therefore no longer available for PCI and ISA expansion cards!**

PCI slot

In the **PCI/Plug and Play Setup** BIOS menu you can assign an IRQ address to each PCI expansion slot. The number of the IRQ address also defines the priority.

If only PnP cards are used, the **AUTO** setting must be selected.

BIOS selection: PCI Slot1 IRQ Priority, PCI Slot2 IRQ Priority, PCI Slot3 IRQ Priority, PCI Slot4 IRQ Priority: AUTO, 3, 4, 5, 7, 9, 10, 11, 12

Default: AUTO

ISA slot (IRQ)

The IRQ address for non-PnP compatible ISA bus cards (so-called legacy ISA cards) must be **permanently** set in the **PCI/Plug and Play Setup** BIOS menu.

BIOS selection: IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ14, IRQ15: PCI/PnP, ISA/EISA


Default: PCI/PnP

ISA slot (DMA)

The **PCI/Plug and Play Setup** BIOS menu provides for the **permanent** selection of a DMA channel for Legacy ISA cards.

BIOS selection: DMA Channel 0, DMA Channel 1, DMA Channel 2, DMA Channel 3, DMA Channel 4, DMA Channel 5, DMA Channel 6, DMA Channel 7: PnP, ISA/EISA

Default: PnP

 **When using the PCL Software PLC, the use of DMA channels may prevent real-time generation.**

8.3.3 BIOS settings for IPC300

 **IRQ 3, 4, 5, 7, 10, 11, 14 are already occupied, and are therefore no longer available for PCI and ISA expansion cards!**

PCI slot

You can use the **The Advanced Menu / PCI Configuration sub menu** BIOS submenu to assign an IRQ address to each PCI slot. At the same time, the number of the IRQ also defines a priority.

If only PnP cards are used, the **AUTO** setting must be selected.

BIOS select.: PCI IRQ line 1, PCI IRQ line 2, PCI IRQ line 3, PCI IRQ line 4

Option: Disabled, Auto, IRQ: 3, 4, 5, 7, 9, 10, 11, 12, 14, 15,

Default: AUTO

ISA slot (IRQ)

In the **The Advanced Menu / PCI Configuration sub menu / PCI/PNP ISA IRQ Resource Exclusion / IRQx** BIOS menu the IRQ address for for non-PnP compatible ISA bus cards (so-called legacy ISA cards) must be **permanently** set.

BIOS selection: IRQ:3, 4, 5, 7, 9, 10, 11, 15

Option: Available, Reserved

Default: Available

ISA slot (UMB)

You can use the **The Advanced Menu / PCI Configuration sub menu / PCI/PNP ISA UMB Region Exclusion** BIOS submenu to reserve a specific block in upper memory for ISA legacy cards.

BIOS selection: C800 - CBFF, CC00 - CFFF, D000 - D3FF, D400 - D7FF, D800 - DBFF, DC00 - DFFF

Option: Available, Reserved

Default: Available

Notes:

9 Software

The IPC / IPC300 features a CD-ROM drive, a 3.5" floppy disk drive and an Ethernet network connection for software installation and backup. Please refer to the documentation of the particular operating system for restoring backup files.

Depending on the intended application, a variety of software programs are installed on the IPC as shipped from the factory:

- BIOS
- Operating system
- Utility programs
- Application software

9.1 BIOS software

The IPC requires the BIOS software for its initial boot process to enable it to find and start an operating system which provides a more user-friendly and comfortable platform for running the application software.

The PCs are equipped with the following licensed BIOS software:

- IPC (200 MHz): AMIBIOS by American Megatrends, version LEU1R129 (or higher)
- IPC (266 MHz): PhoenixBios by Phoenix
- IPC300: PhoenixBios by Phoenix

9.2 Operating system and utilities

	Software	
	IPC	IPC300
Operating system	Microsoft Windows 95B or Microsoft Windows NT4.0	Microsoft Windows NT4.0
UPS utility program	UPS _{plus} (for Windows 95) or UPS _{NT} (for Windows NT)	UPS _{NTC4}

9.3 Application software

The following Bosch application software options are available:

Application		IPC	IPC300
PCL	Software PLC	●	●
rho4	Robot controller software	●	●
Typ3 osa	CNC operating software	●	●
MADAP Studio	Systems operating and diagnostic software	●	●
WinSPS	PLC programming software	●	●
WinDP	Field bus parameterization for PROFIBUS-DP	●	●
WinCan	Field bus parameterization for CAN bus	●	●
TSWIN	Programming interface for operating terminals	●	●

● = provided

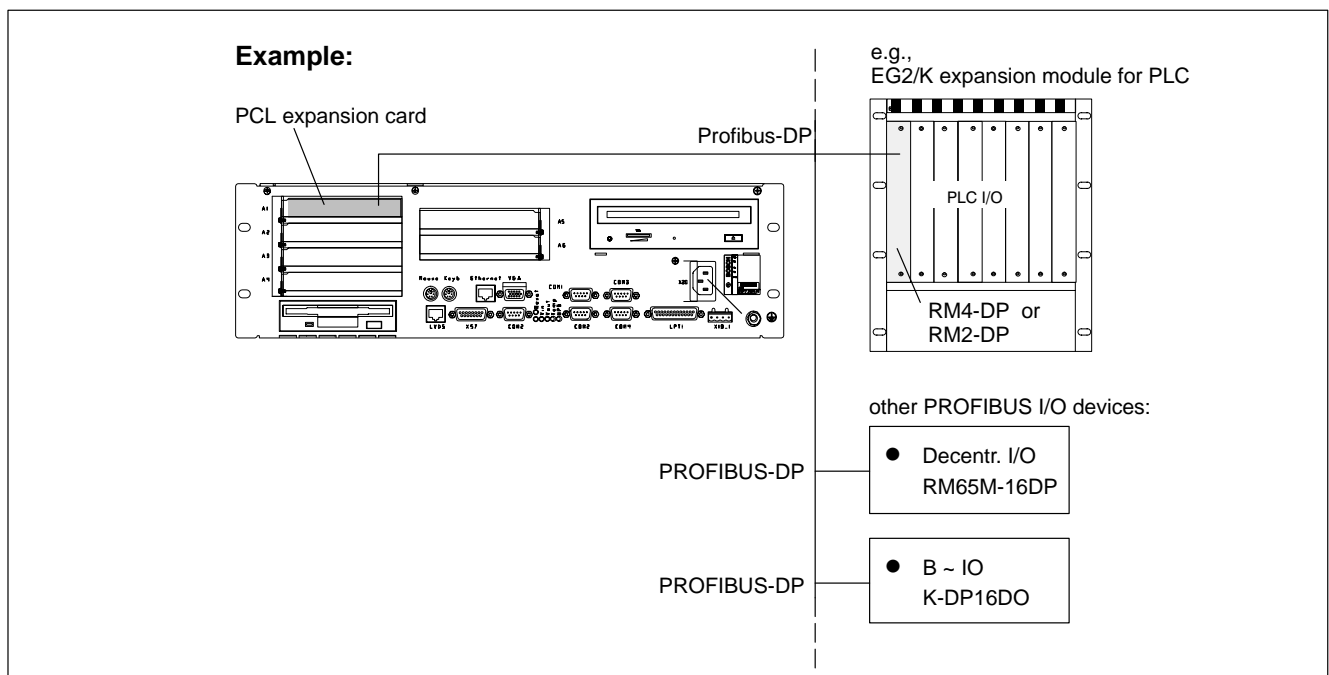
9.3.1 Bosch PCL (software PLC)

The installation of the Bosch PCL Software PLC adds the capabilities of a programmable logic controller to the IPC / IPC300. The Bosch PCL Software PLC encompasses the following components:

- PCL expansion card for PCI bus
- Installation diskette with PCL application program

Interconnection

When connected to other PLC components (e.g., I/O rack) via a field bus (PROFIBUS-DP, CAN, InterBus-S), the control panel/IPC becomes a full-featured PLC controller.

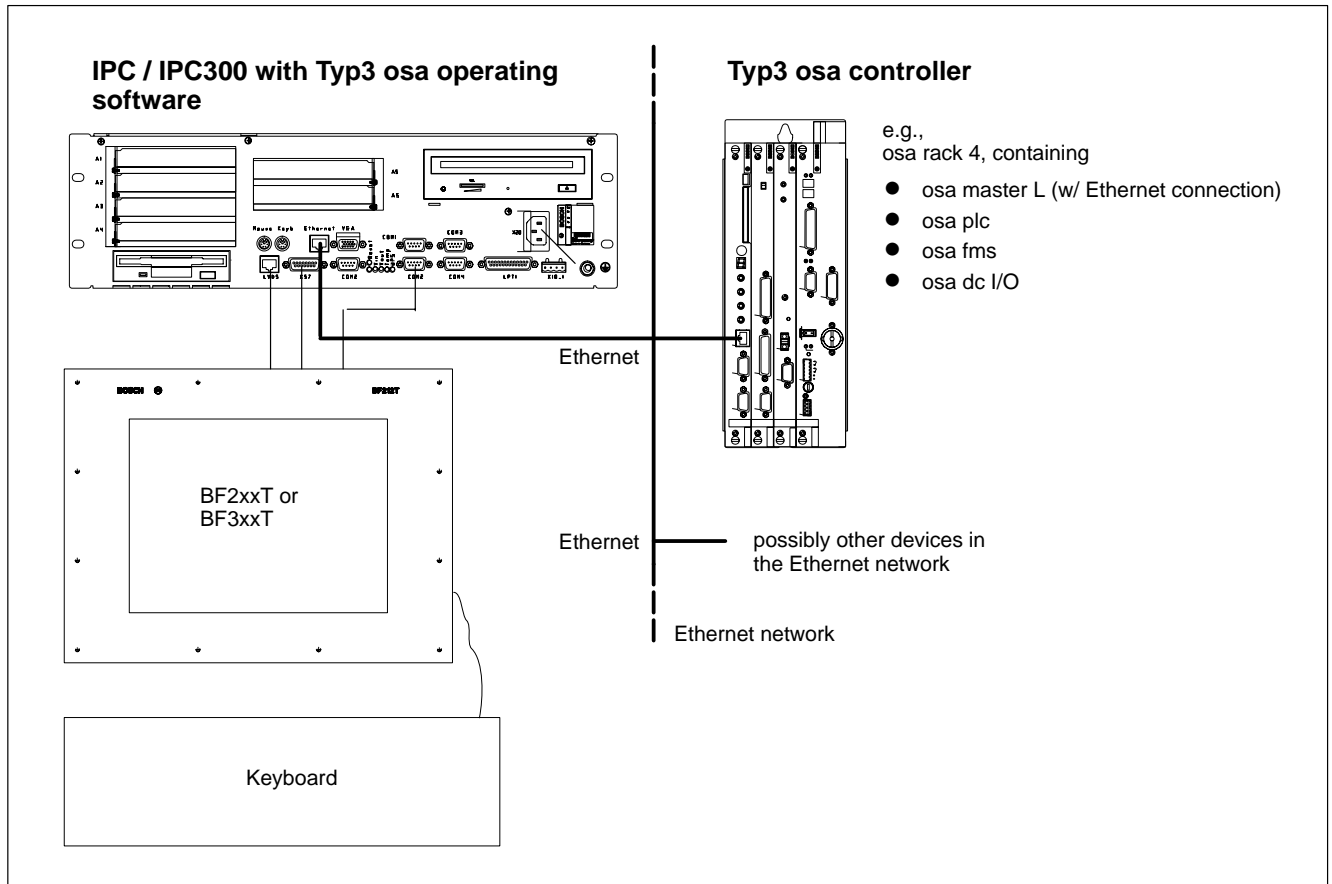


9.3.2 Typ3 osa (CNC operating software)

The IPC / IPC300 can be used in conjunction with Bosch BF2xxT, BF3xxT control panels as an operating terminal computer for the Bosch Typ3 osa controller series.

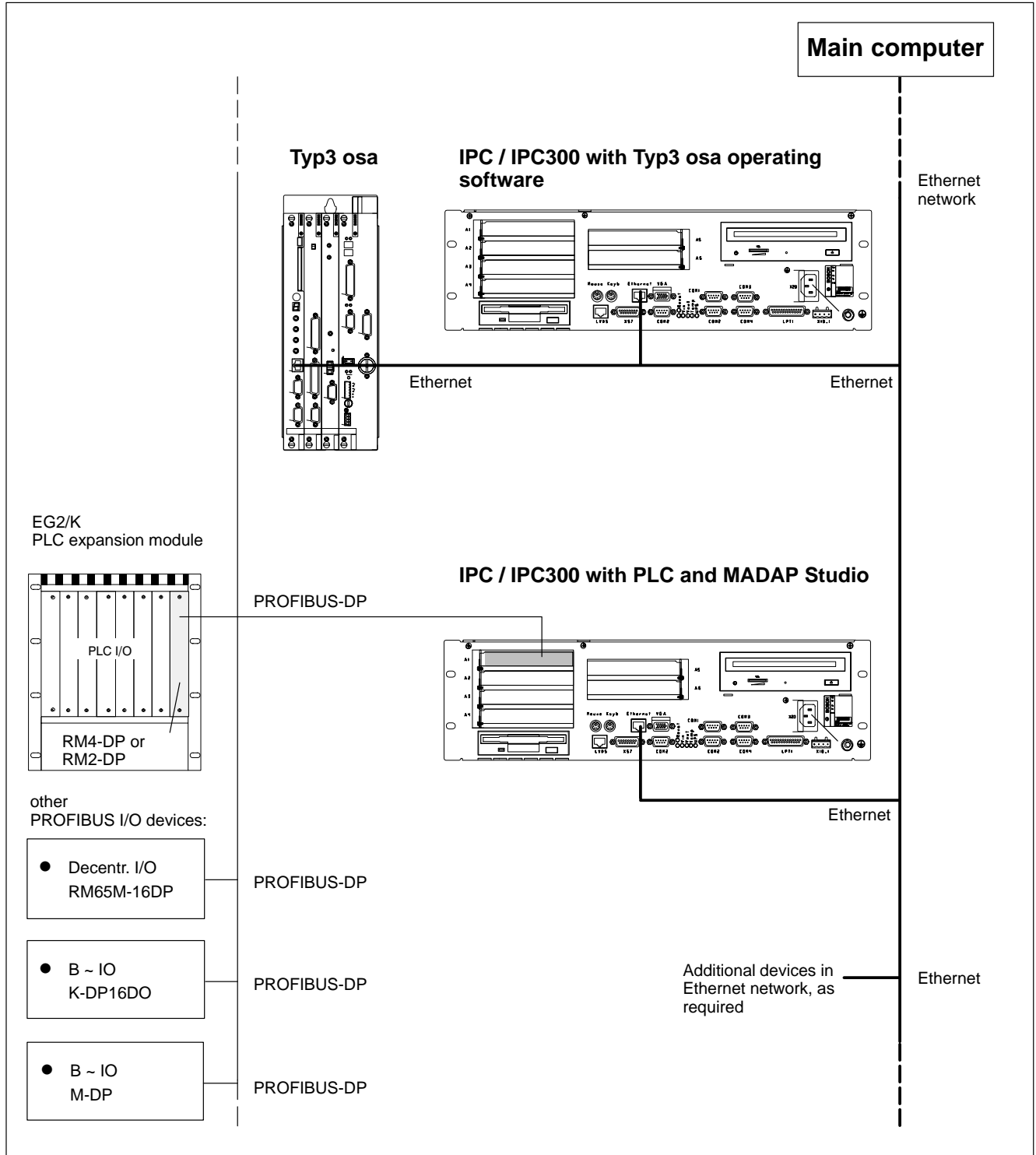
Interconnection

Communications between the operator interface and the Typ3 osa controller utilize the TCP/IP protocol via the Ethernet connection between the IPC / IPC300 and the osa master module of the controller.



9.3.3 MADAP Studio (automatic system diagnostics)

The IPC / IPC300 is also used as a visual display terminal for automatic system diagnostics. From any operator station, the system operator can thus receive statistical information (MDA/PDA) about the entire system.



10 Order numbers

10.1 IPC / IPC300

For order numbers with extensions for basic unit, operating system and additional components, refer to the "Control Technology Price List":

- 1070 072 134 (English)

10.2 Accessories

Designation		Order no.	
Connecting cables IPC	COM2 (touch screen controller), length 2.5 m	1070 083 117	
	5 m	1070 083 116	
	10 m	1070 080 771	
	LVDS, length 2.5 m	1070 918 793	
	5 m	1070 919 258	
	10 m	1070 918 794	
	LVDS, hi-flex cable length 2.5 m	1070 920 456	
	5 m	1070 920 457	
	10 m	1070 920 271	
	X11, length 2.5 m	1070 083 120	
	5 m	1070 083 119	
	10 m	1070 080 744	
	Connecting cables IPC300 with Pentium I to BF312T	LCD, rigid cable length 2,5 m	1070 920 456
		5 m	1070 921 385
		10 m	1070 921 384
15 m		1070 921 070	
X11, length 2,5 m		1070 083 120	
5 m		1070 083 119	
10 m		1070 080 744	
15 m		1070 079 383	
Connecting cables IPC300 with Pentium I to BF315T TA		LCD, rigid cable length 2,5 m	1070 920 456
	5 m	1070 921 385	
	10 m	1070 921 384	
	X11, length 2,5 m	1070 083 120	
	5 m	1070 083 119	
	10 m	1070 080 744	

Designation		Order no.
Connecting cables IPC300 with Pentium III to – BF315T P3 – BF315T P3 TA – BF315T P3 OTA	LCD, rigid cable length 2,5 m	1070 920 456
	5 m	1070 921 385
	10 m	1070 921 384
	LCD, hi-flex cable length 2,5 m	1070 922 022
	5 m	1070 922 021
	10 m	1070 921 891
	X11, length 2,5 m	1070 083 120
	5 m	1070 083 119
	10 m	1070 080 744
	Repeater for IPC300	Cable extension 15 m, for LCD and X11
Backup Package for Industrial PC	with 2 GB Iomega "Jaz" drive	1070 084 267

10.3 Spare Parts

Designation		Order no.	
Fuses	6.3 A (5x20), medium time-lag, for 24 VDC power	1070 900 850	
	1.25 A (5x20), medium time-lag, for 230 VAC power	1070 900 839	
	10 A (5x20), quick-blow, for battery pack	1070 904 575	
Battery pack	for USP	in preparation	
	Connecting cable for battery pack	1070 080 517	
Hard disk	6,4 GB, w/ spring suspension	1070 920 880	
CD-ROM drive		1070 919 420	
3,5" Floppy disk drive		1070 920 192	
Power supply	for 220 VAC power	1070 080 219	
	for 24 VDC power	1070 080 220	
RAM modules	IPC:	16 MB	1070 918 970
		32 MB	1070 919 081
		64 MB	1070 920 267
	IPC300:	128 MB	1070 920 459

A Appendix

A.1 Abbreviations

BIOS	Basic Initial Operations System
CD-ROM	Optical storage medium
COM x	Serial port x
CRT	Monitor w/ cathode ray tube
EPP	Enhanced Parallel Port (bidirectional)
FD	Floppy Disk
GB	Gigabyte
HD	Hard Disk
IDE	Interface for Hard Disk Drive, CD-ROM Drive, etc.
ISA	"Industrial Standard Architecture" , bus system for PCs
KBD	Keyboard
LCD	Liquid Crystal Display
LPT	Line Printer
MB	Megabyte
MTB	Machine control panel
PCI	Peripheral Component Interconnect, bus system for PCs
RAM	Random Access Memory
SPP	Standard Parallel Port
TFT	Thin-Film Transistor
UPS	Uninterruptible Power Supply
VGA	Video Graphics Array (graphics standard)

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