SIEMENS

SIMATIC

PC BI45/FI45 PII

Technical Description

Contents

07/99
C79000-G7076-C794
Release 03

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:

Danger

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

Warning

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

Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken.

Note

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

Qualified Personnel

The device/system may only be set up and operated in conjunction with this manual.

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage

Note the following:

Warning

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

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

Trademarks

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Disclaimer of Liability

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

Contents

System Unit

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Chapter Overview

1.1 Technical Specifications

General Information						
Dimensions SIMATIC PC BI45	(W x H x D in mm) 385 x 295 164 mm					
Dimensions SIMATIC PC FI45	(W x H x D in mm) 483 (19") x 310 (7HE) x 184 mm					
Weight of SIMATIC BI45	approx. 11 kg					
Weight of SIMATIC FI45	approx. 11 kg					
Line voltage (U_N)	120 VAC (93 to 132 VAC), or 240 VAC (187 to 264 VAC)					
Line voltage frequency	50/60 Hz (47 to 63 Hz)					
Brief voltage interruption acc. to NAMUR	max. 20 ms at o.85 U_N (max. 10 events per hour; recovery time at least 1 second)					
Max. power consumption	220 W					
Max. current delivery (DC) *1	+5 V 20 A	+3.3 V 10 A	+12 V 8 A	-12 V 0.5 A	-5 V 0.5 A	aux. 5 V 0.05 A
Noise emission	< 50 dB (A) to DIN 45635					
Degree of protection for SIMATIC PC BI45	IP20					
Degree of protection for SIMATIC PC FI45	IP65, front (with drive cover closed)					
Safety						
Protection class	Protection class I to VDE 0106 T1: 1982 (IEC 536)					
Safety requirements	IEC 950/09.91 corr. to EN 60950					
Electromagnetic Compatibility (EMC)						
Emitted interference	EN 55022 Class B					
Noise immunity: Line-fed interference on supply lines	+- 2 kV (to IEC 1000-4-4:1995; burst) +- 1 kV (to IEC 1000-4-5:1995; surge symm) +- 2 kV (to IEC 1000-4-5:1995; surge unsymm)					
Noise immunity on process, measuring, and control lines	+- 1 kV (to IEC 1000-4-4:1995; burst; length < 3m) +- 2 kV (to IEC 1000-4-4:1995; burst; length > 3m) +- 1 kV (to IEC 1000-4-4:1995; surge symm; length > 3m) +- 2 kV (to IEC 1000-4-4:1995; surge unsymm; length > 3m)					
Noise immunity to discharges of static electricity	+- 6 kV contact discharge (to IEC 1000-4-2:1995) +- 8 kV air discharge (to IEC 1000-4-2:1995)					
Noise immunity to high-frequency radiation	10 V/m 80-1000 Mhz, 80% AM (to ENV 50140:1993) 10 V/m 900 Mhz, 50% ED (to ENV 50204:1995) 10 V 9 KHz-80 MHz					
Magnetic field	30 A/m 50 Hz					
Ambient Conditions						
Temperature - operation - storage/transport - gradient	Tested to DIN EN 60068-2-2:1994, DIN IEC 68-2-1, DIN IEC 68-2-14, + 5°C to +45°C -20°C to +60°C Max. 10 degrees C/h (no condensation)					
Relative humidity - operation - storage/transport	Tested to DIN IEC 68-2-3, DIN IEC 68-2-30, DIN IEC 68-2-56 5 % to 85 % at 25°C (no condensation) 5 % to 95 % at 25°C (no condensation)					

Mechanical Specifications	
Vibration	Tested to DIN IEC 68-2-6
- operation	10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2
- CD-ROM operation	10 to 38 Hz: 0.0375 mm, 38 to 500 Hz: 2 m/s^2
- transport	5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Shock	Tested to DIN IEC 68-2-29
- operation	50 m/s^2, 30 ms
- CD-ROM operation	50 m/s^2, 11 ms
- transport	250 m/s^2, 6 ms
Special Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Pentium II 1st level cache 16 Kbytes data memory, 16 Kbytes command memory 2nd level cache 512 Kbytes
Internal processor cache	2 x 16 Kbytes first level, 512 Kbytes second level
Main memory	BI45: 32Mbytes FI45: 64Mbytes Max. 384 Mbytes
Second level cache	512 Kbytes integrated
Free expansion slots	1 ISA long, 1 ISA short (max. 165 mm) 2 PCI short (max. 165 mm), 1 x shared ISA/PCI long
– Max. admissible power consumption per ISA slot	5V 2A, 12V 0.3A, -12 V 0.05A, -5V 0.05A
– Max. admissible power consumption per PCI slot	5V 2A, 12V 0.5A, –12V 0.1A, -5V 0.05A
– In total (all slots):	5V 10A, 12V 3A, –12V 0.5A, -5V 0.1A must not be exceeded
Drives	
Floppy disk drive	3.5” (1.44 Mbytes)
Hard disk drive	3.5” EIDE, ATA 33
CD-ROM drive	20x EIDE, 650 Mbytes, overall height 12.7 mm
Interfaces	EIDE (primary and secondary, ATA 33)
Graphics	
Graphics chip	XGA-LCD-Controller Chips and Technologies with Windows accelerator on the PCI bus.
Graphics memory	2 Mbytes DRAM EDO 60 ns
Resolutions/frequencies/colors	CRT: to 1280 x 1024 / 75 Hz / 65535 colors
LC Display (only for FI45)	
Display type	active TFT, color
Display size	270 x 203 mm (13.3”)
Picture resolution	1024 x 768 (XGA)
Colors	65536 (from 162.144)
Contrast	100:1
Brightness	150 cd/m^2
Response time	30/50 ms (t_{rise}/t_{fall})
Permitted fault locations	high/low level: < 12/25 spots green high level: < 5 spots

Interfaces	
COM1	Serial port 1 (V.24 / TTY), 25-pin sub D socket connector
COM2	Serial port 2 (V.24), 9-pin sub D socket connector
LPT1	Parallel port (standard and EPP mode) Interface for printer with parallel port
VGA	VGA interface, for external monitor
Keyboard	PS/2 keyboard interface BI45: on the box FI45: on the box and at the front
Mouse	PS/2 mouse port
MPI/DP Interface, optically isolated *2	9-pin sub D socket connector, screw-type locking For SIMATIC MPI or PROFIBUS DP networks (CP 5611 compatible)
Data signalling rate	9.6 Kbps to 1.5 Mbps, software-selectable
Operating mode	Isolated*: Data lines A, B Control lines RTS_AS, RTS_PG 5V supply voltage (max. 90 mA) Ground connection: MPI/DP connector cable shield
Physical interface	RS485, optically isolated
Memory address area	Resources are assigned via PCI-PNP
Interrupts	Resources are assigned via PCI-PNP
Relay interface, only in conjunction with SafeCard	Connection of a signaling device to a SafeCard monitoring module (see SafeCard description in the section on “Monitoring Module”).
Function Displays	
BI45	Floppy disk access (floppy disk drive on the side of the box) CD access (CD drive on the side of the box)
FI45	POWER Floppy drive MPI/DP RUN (in conjunction with SafeCard) TEMP (in conjunction with SafeCard) Floppy disk access (floppy disk drive behind the drive cover) CD access (CD drive behind the drive cover)

*1 Maximum of 150 W in total, with +5V and +3.3V the sum of 100W must not be exceeded. +12V can be loaded with 11A for a maximum of 10 seconds.

*2 Optically isolated within the safety extra-low voltage circuit (SELV)

1.2 Maximum Dimensions of Expansion Modules

Information on Modules

The SIMATIC PC BI45/FI45 is designed for modules according to AT/PCI specifications. The size of the modules should not exceed the dimensions indicated. If the given height is exceeded, this may cause contacting problems, functional disorders, or difficulties with installation. The figures below illustrate two cards with full AT/PCI overall length. Individual slots may require different card dimensions.

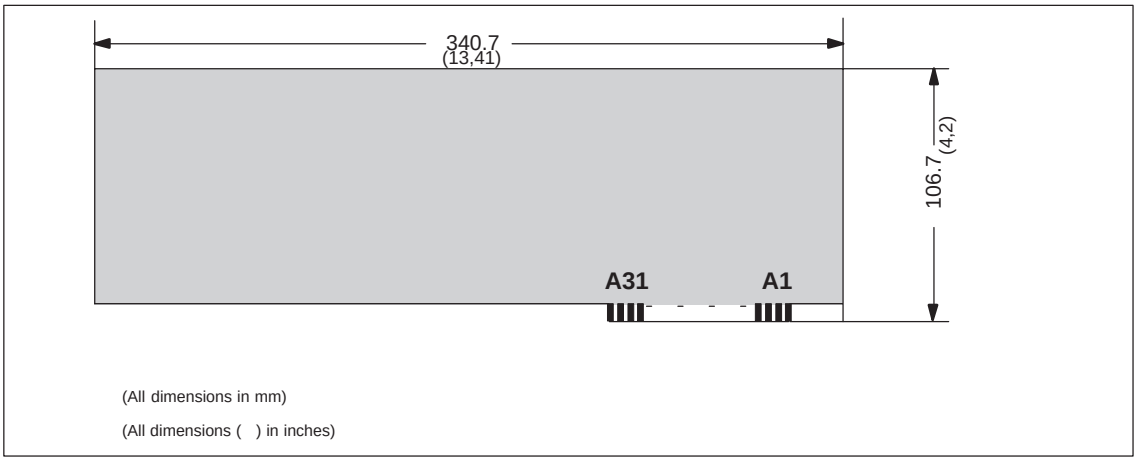

Figure 1-1 XT Module

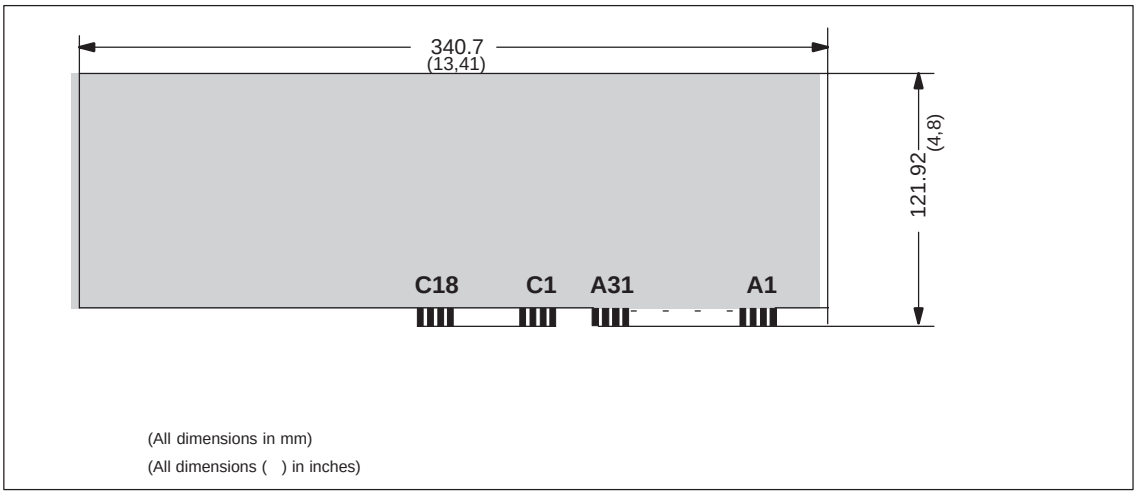

Figure 1-2 AT Module

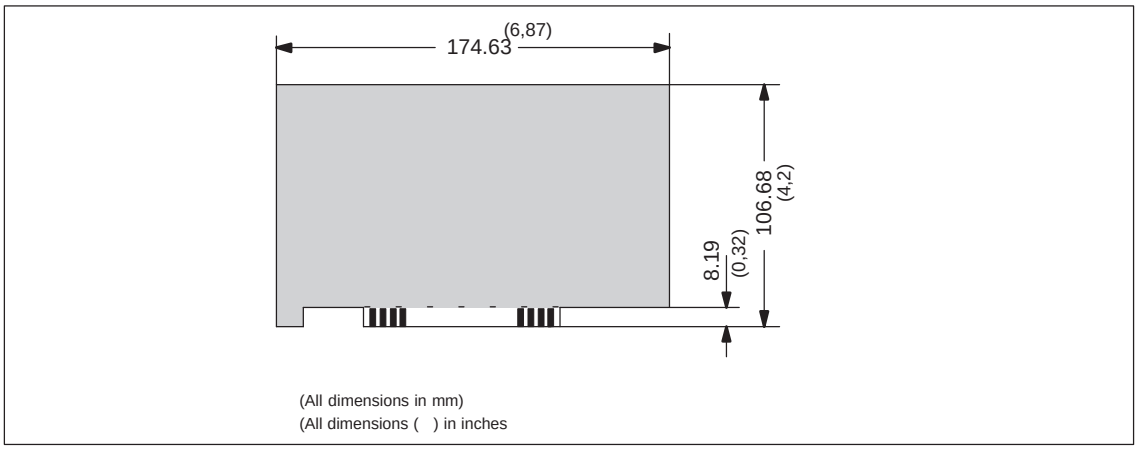

Figure 1-3 Small PCI Module (5 V)

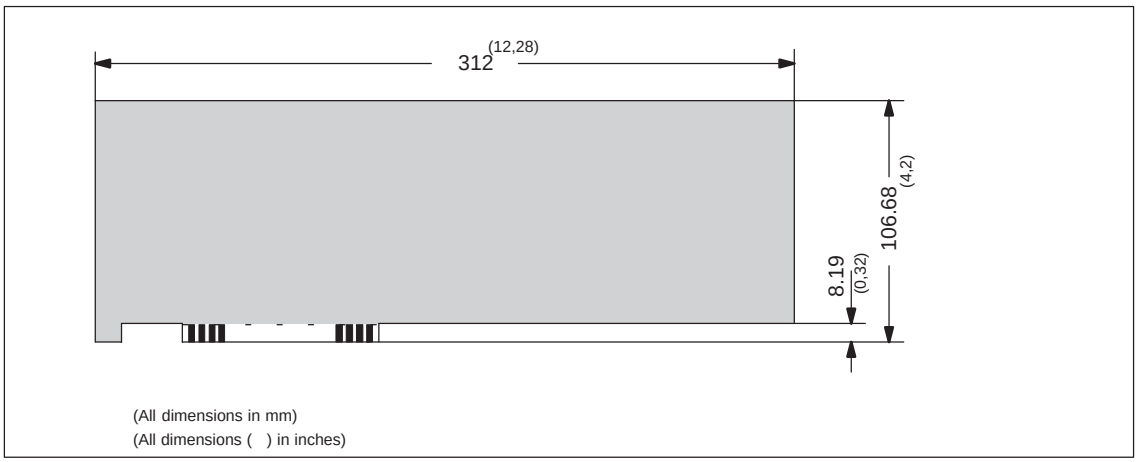

Figure 1-4 Large PCI Module (5 V)

Information on Large PCI Modules

Large PCI modules have to be equipped with a so-called extender (usually included with large PCI modules) which serves to guide them along the rails of the ventilator case. The extender guides large PCI modules along the rails of ISA modules.

1.3 Power Requirements of the Components (Maximum Values)

Basic System

Component	Voltage					
	+5V	**+3.3V**	**+12V**	**–5V**	**–12V**	**AUX5V**
Pentium II motherboard	7 A	1.5 A	0.1 A	0.01 A	0.02 A	0.05 A
Floppy disk drive	0.45 A					
Hard disk	0.6 A		0.66 A			
CD-ROM drive	0.7 A					
Fan			0.3 A			
Sum BI45 (basic configuration)	**8.75 A**	**1.5 A**	**1.06 A**	**0.01 A**	**0.02 A**	**0.05 A**
Keyboard controller (only with FI45)	0.15 A					
Touch pad (only with FI45)	0.05 A					
TFT display (only with FI45)		0.7 A				
Inverter (incl. backlight, only with FI45)			0.5 A			
Sum BI45 (max. for basic configuration)	**8.95 A**	**2.2 A**	**1.56 A**	**0.01 A**	**0.02 A**	**0.05 A**
ISA slots (sum for 3 slots)	5 A		2 A	0.3 A	0.3 A	
PCI slots (sum for 3 slots)	5 A		2 A	0.2 A	0.2 A	
Sum (max. for maximum configuration)	**20 A**	**10 A**	**8 A**	**0.5 A**	**0.5 A**	**0.05 A**

Options

Component	Voltage					
	+5V	**+3.3V**	**+12V**	**–5V**	**–2V**	**AUX5V**
WinAC FI Station Pro (SlotPLC)	0.35 A		1.3A			
Direct key module	0.5 A					
'SafeCard' monitoring module	0.35A		0.05 A			

Restrictions on Power Supply

Due to thermal stress, the maximum capacity of the power supply is restricted to:

Power supply	Restriction
Standard power supply (220 W)	maximum load 150 W

1.4 Removing and Installing Components

Prerequisites

The system unit is designed to enable any necessary maintenance work to be carried out quickly and at low cost.

Warning

Please read the warnings at the front of the User's Guide before you open the housing of the system unit.

- Do not open the housing unless you need to install or remove components, or to replace the battery.
- Write down your configuration parameters before starting the procedure.

Caution

Risk of damage to the unit!

Note that only qualified personnel should be allowed to work on the open unit, so the warranty on the device is not affected. Authorized SIEMENS maintenance and repair centers offer you a specialist maintenance service. The User's Guide contains the addresses.

Caution

The electronic components of the printed boards are extremely sensitive to electrostatic discharge. When handling the boards, you must take appropriate safety precautions. These are set out in the guidelines for electrostatically sensitive components (ESD guidelines) at the end of this manual.

Limitation of Liability

All technical specifications and licenses apply only to expansion functions approved by SIEMENS. No liability can be assumed for functional constraints caused by the use of devices and components of other manufacturers.

The following sign warns that electrostatically sensitive modules are present. Please read the ESD guidelines.

Before Opening the Unit

Before opening the unit, you should read the following rules carefully:

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by touching metallic parts, such as screws, on the rear panel of the PG.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist strap if you are handling components.
- Leave components and modules in their packaging until you are ready to install them.
- Disconnect the PC from its power supply before plugging in or removing any modules or components.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and printed conductors.
- Do not operate the PC with the cover open.

Tools

Use a suitable crosstip or TORX screwdriver to remove or install components.

1.4.1 Opening and Closing the System Unit of the BI45

- Close the application you are using.
- Remove the diskette or CD-ROM from the drive.
- Pull out the power supply connector.
- Remove the PC from its support.
- Release the seven screws on the cover of the unit.

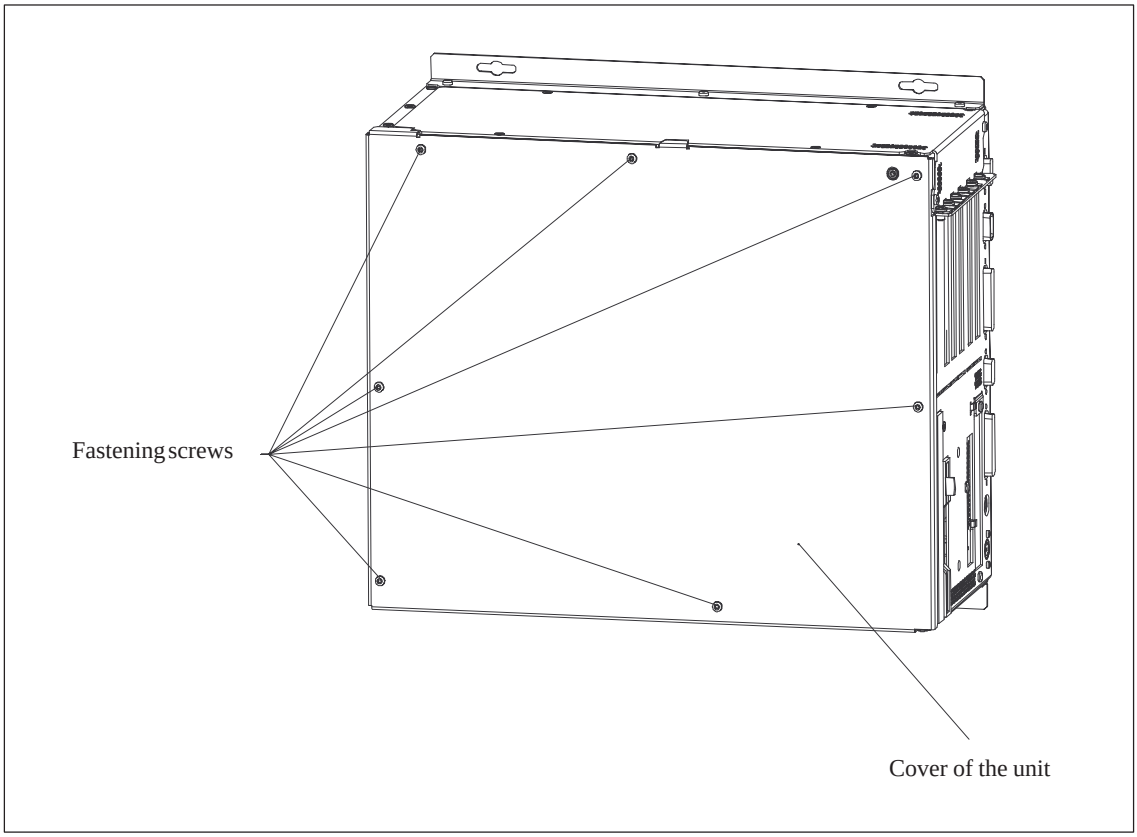

Figure 1-5 Opening the System Unit of the BI45

When the cover of the unit is removed, you see the following components/function units:

- Power supply
- Floppy disk drive and CD-ROM drive
- Motherboard
- Bus board
- Fan
- Processor
- RAM memory module(s)

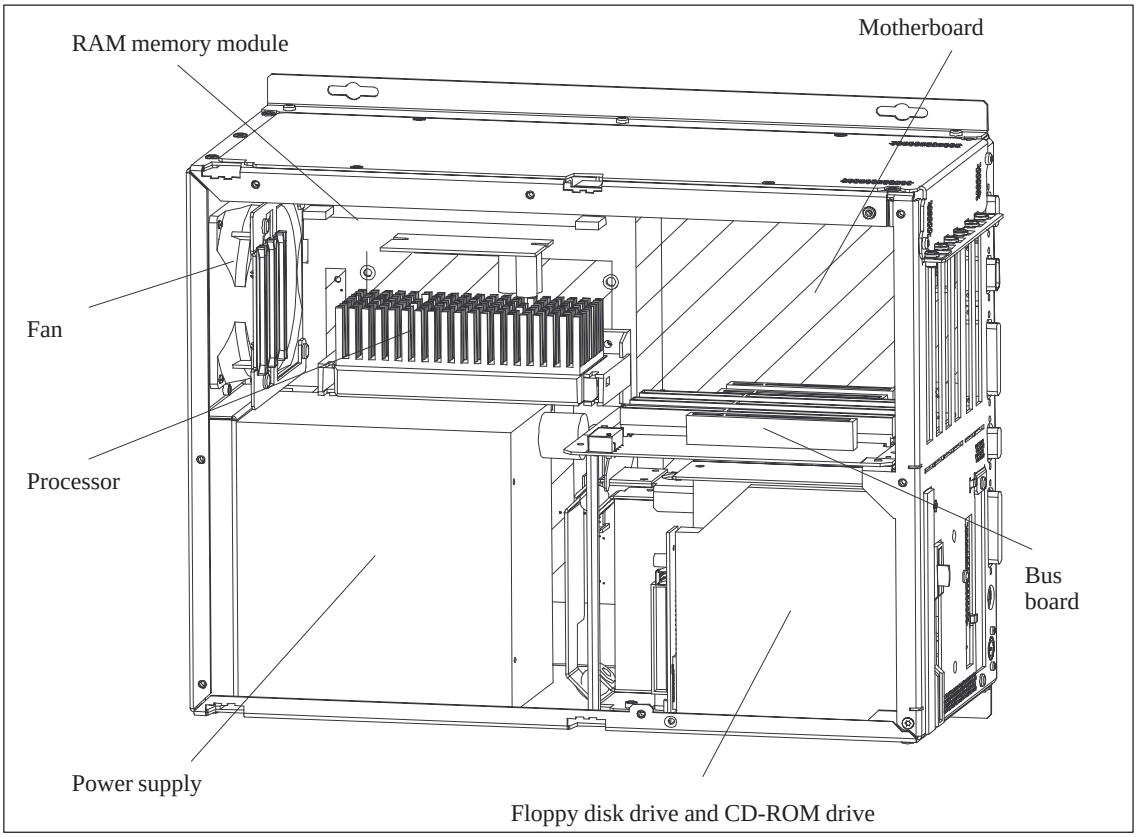

Figure 1-6 Function Units when the BI45 is Opened

1.4.2 Lowering the FI45 System Box Away from the Front Panel

- Close the application you are using.
- Remove the diskette or CD-ROM from the drive.
- Pull out the power supply connector.
- Release the six screws used to fasten the cover to the front of the unit.
- Tilt the system box about 5° towards you and then pull it away from the front panel until it reaches the latched position of the hinge.
- Now lower the system box down completely. A wire holds the system box in place at a 90° angle.

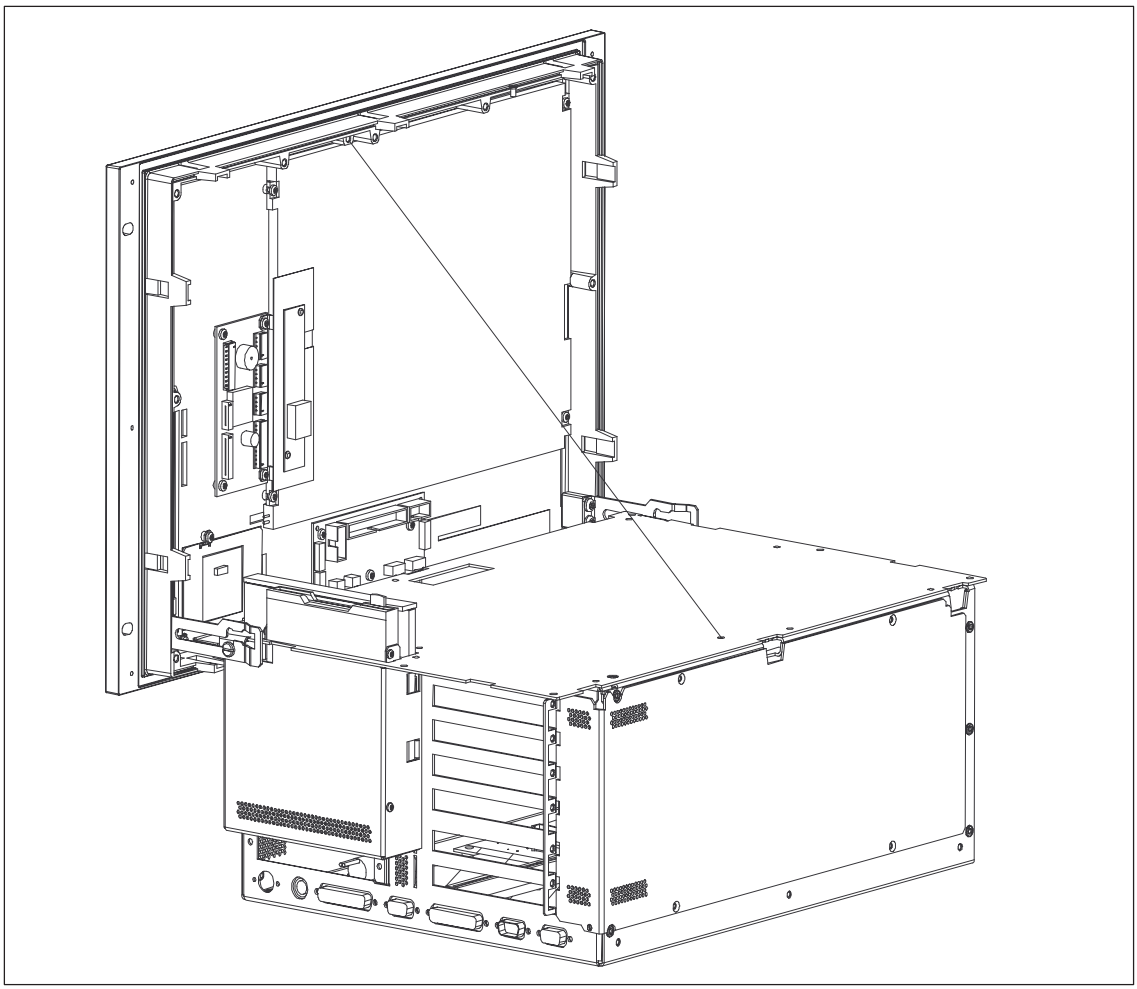

Figure 1-7 Lowering the System Unit of the FI45

When the system box has been lowered, you will see the following components/function units in the front panel:

- LC display
- Inverter module
- Keyboard controller
- Front adapter module
- Touch pad controller module

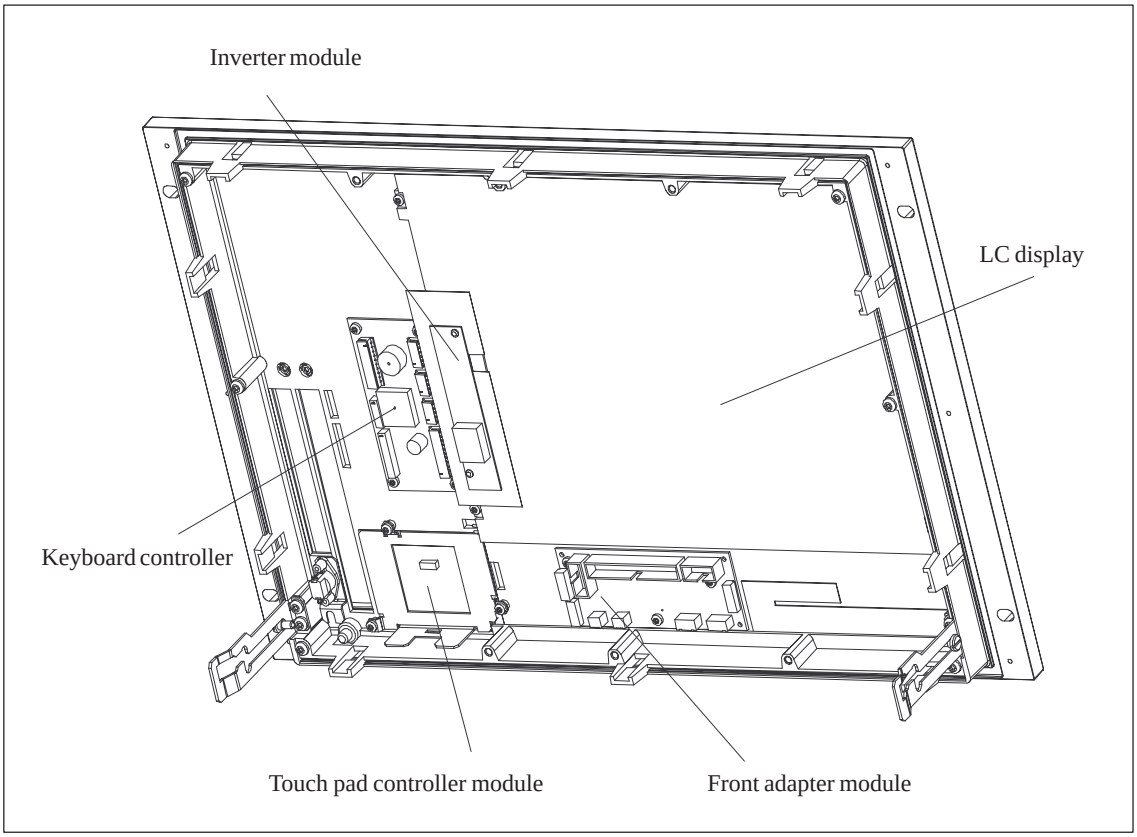

Figure 1-8 Function Units in the Front Panel of the FI45

1.4.3 Removing the System Box of the FI45 from the Front Panel

- Lower the system box of the FI45 away from the front panel as described in Section 1.4.2.
- Disconnect the mains supply to the LC display by pulling the connector carefully towards the front frame.
- Disconnect the ribbon cable from the front adapter module.
- Unhook the safety wire from the system box.
- Lift the system box upwards and out so that the hinge is released from its latched position; then pull the system unit further away from the front.
- The system unit is now isolated from the front unit.

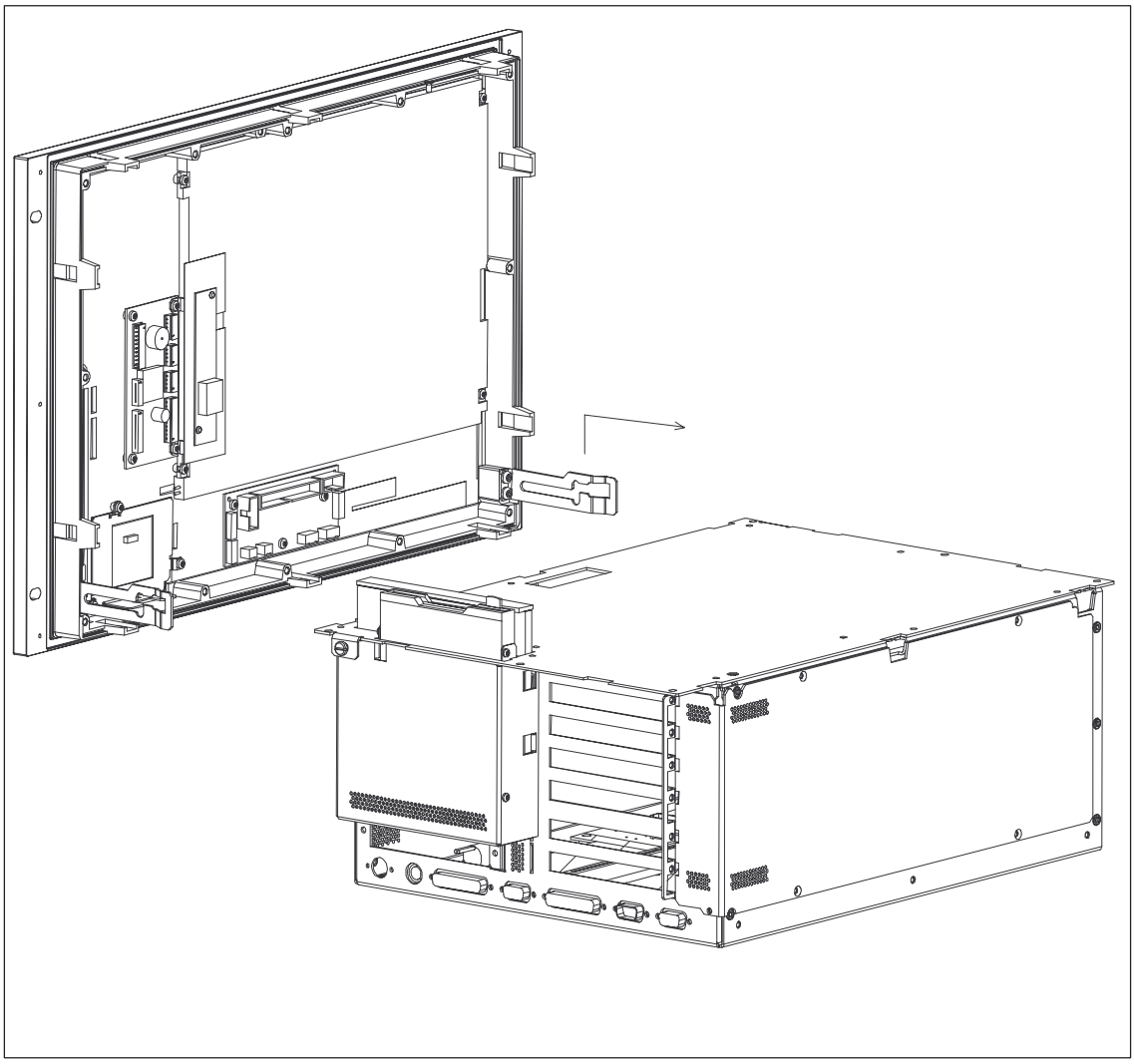

Figure 1-9 Removing the System Unit of the FI45

1.4.4 Opening and Closing the System Unit of the FI45

- Remove the system box from the front panel as described in Section 1.4.3.
- Release the seven screws on the cover of the unit.

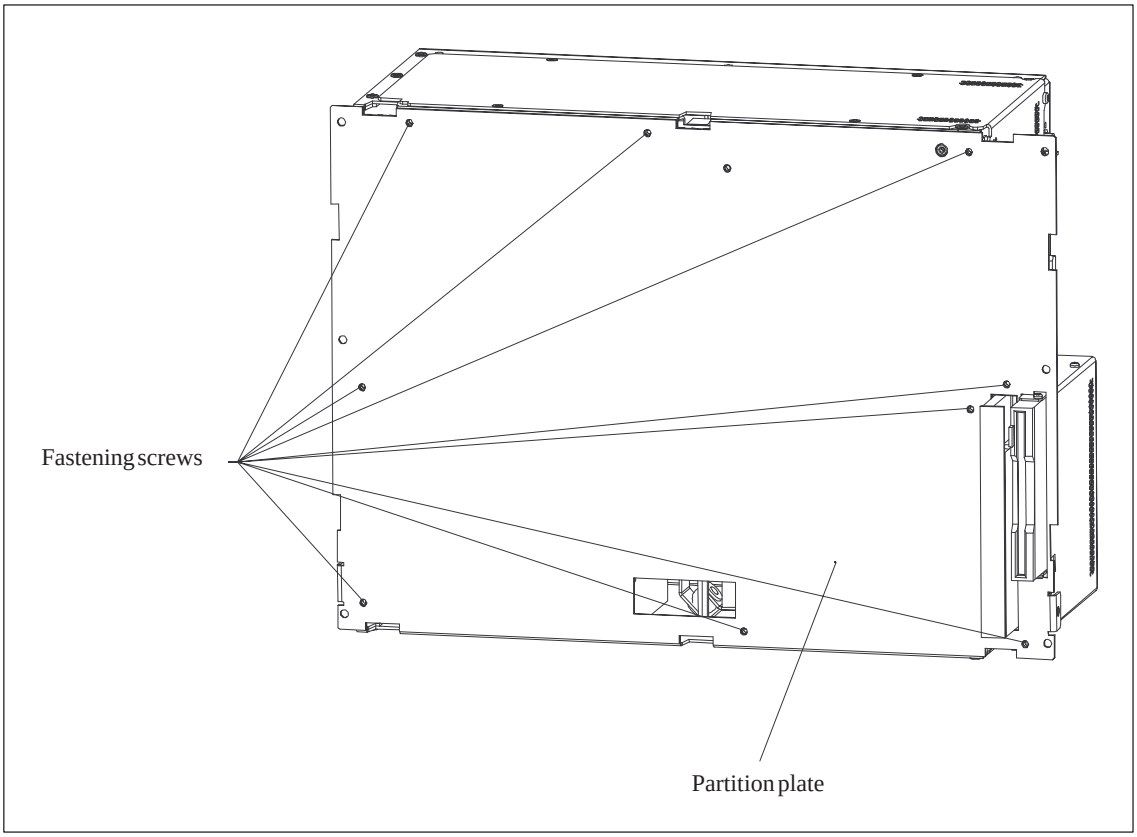

Figure 1-10 Opening the System Unit of the FI45

When the cover of the unit is removed, you see the following components/ function units:

- Power supply
- Floppy disk drive and CD-ROM drive
- Motherboard
- Bus board
- Fan
- Processor
- RAM memory module(s)

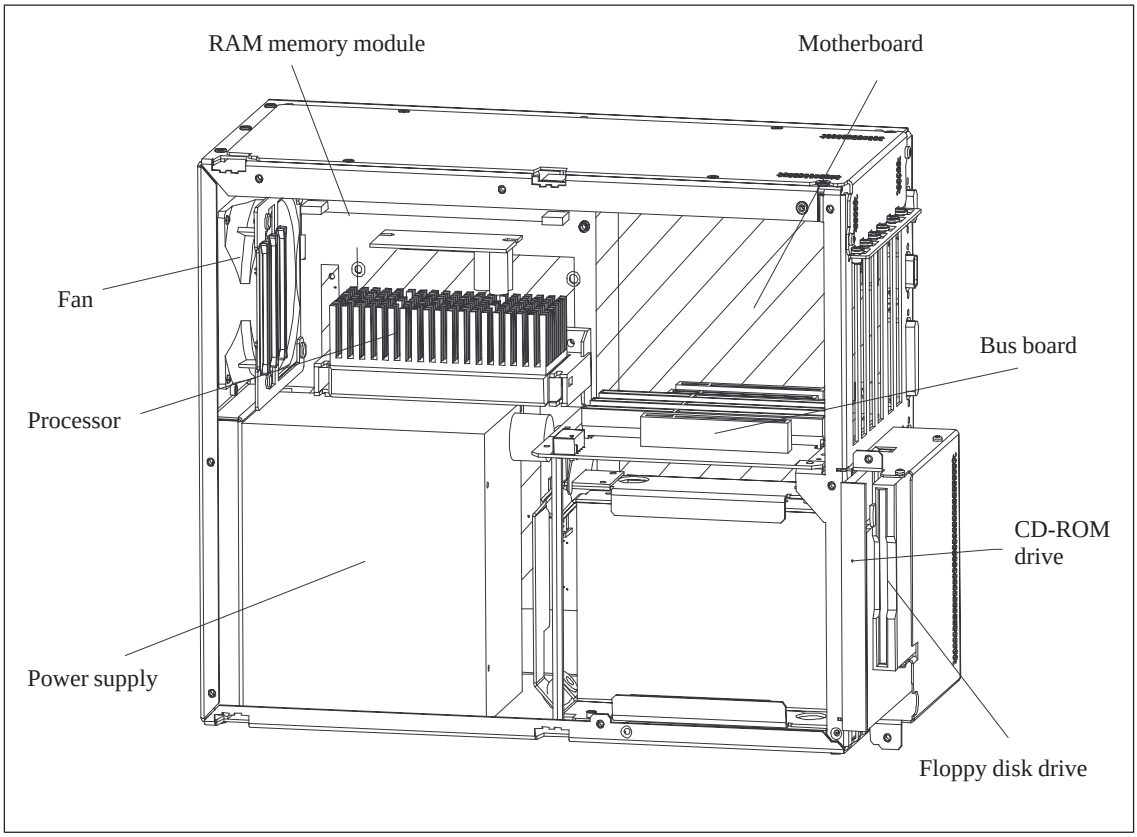

Figure 1-11 Function Units when the FI45 is Opened

1.4.5 Removing and Installing Expansion Modules

- Close the application you are using.
- Remove the diskette or CD-ROM from the drive.
- Pull out the power supply connector.
- Release the 6 screws on the cover of the unit. (If necessary, remove the BI45 from its support or lower the system box away from the front panel as described in Section 1.4.2).

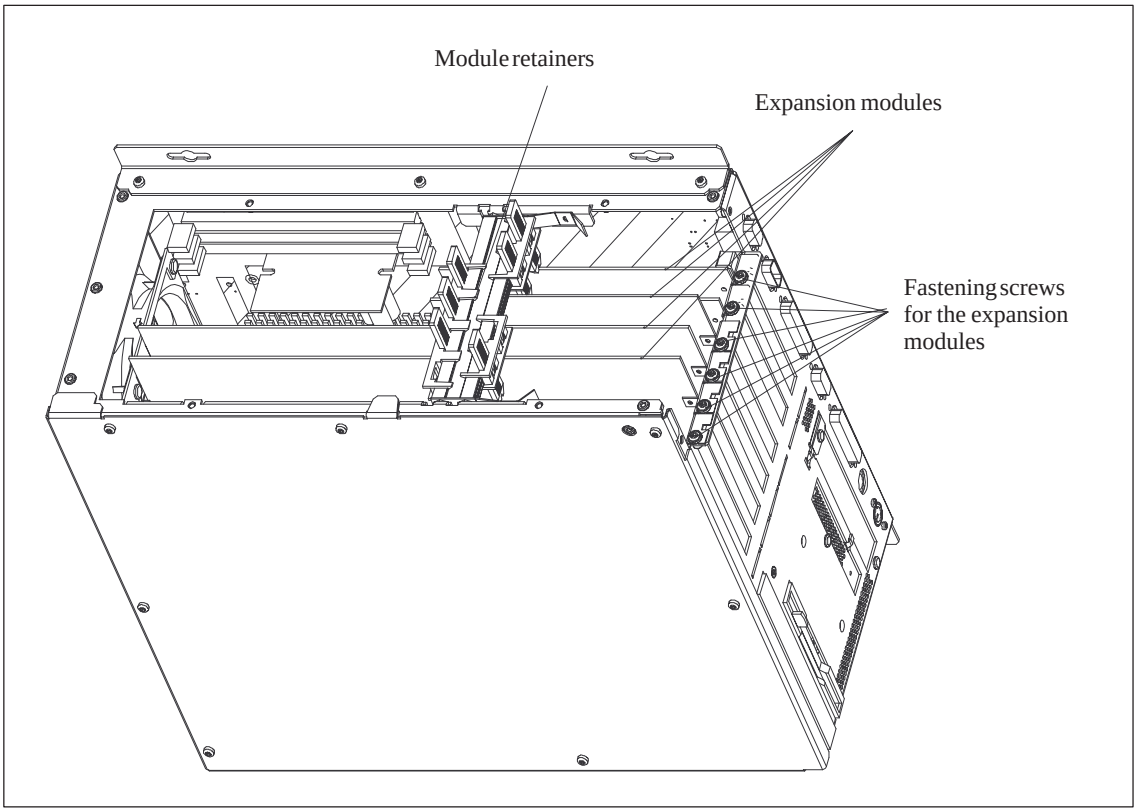

Figure 1-12 Opening the Cover of the Unit

First you must remove the crossbeam on which the modules are mounted.

- When you bend the notched spring clips inwards a little, the snap-in lockings can be released.
- Grip the crossbeam, push it approximately 1cm to the left, and then lift it out with the the module retainers.

To install the retainers, proceed in reverse order.

- Disconnect all mains connections to the module.
- Undo the screw which fastens the expansion module to the side of the system box.
- Pull the module carefully out of the slot – without tilting it.
- Set the DIP switches and jumpers of the new module according to the old module (providing that the release levels of the two modules correspond, if the release levels are not the same, you must consult the relevant module documentation).

To install the new module, proceed in reverse order. After installing/exchanging an expansion module, the retainers may need to be readjusted. To do this, proceed as follows:

- Insert the sliding element at the top and push it down until it covers the module. Then guide the module into the notch.

Caution

Do not exert pressure on the module. This means that you should *not* push down or force the retainers in any way.

- Detach the part of the sliding element which juts out by scratching a notch in the top of the sliding element with a knife and then bending it over to break it off.

1.4.6 Removing and Installing the Power Supply Unit

- Open the system unit as described in Section 1.4.1 (BI45) or Section 1.4.4 (FI45).
- Release the three screws with which the bent clips of the power supply support are fastened to the system unit.
- Pull the power supply unit and its support right out of the system unit.
- Disconnect the cables from the motherboard, the hard disk, and the bus expansion unit, and write down their previous connections.
- Release the four screws with which the power supply support is attached to the power supply unit.

To install the power supply unit, proceed in reverse order.

Changing the Supply Voltage

The standard power supply for the SIMATIC PC is set for 115/230V networks. The voltage selection switch is located at the rear of the system unit below the ventilation slots.

You must ensure that the supply voltage set at the voltage selection switch corresponds to the local supply voltage.

Selecting the Supply Voltage

If the voltage specified at the selection switch does not match the local supply voltage, you must change the voltage selection switch so that you can read the voltage value set below the green triangle on the right. Use a small, flat screwdriver to lever out the part with the voltage values and reinsert it in the appropriate position.

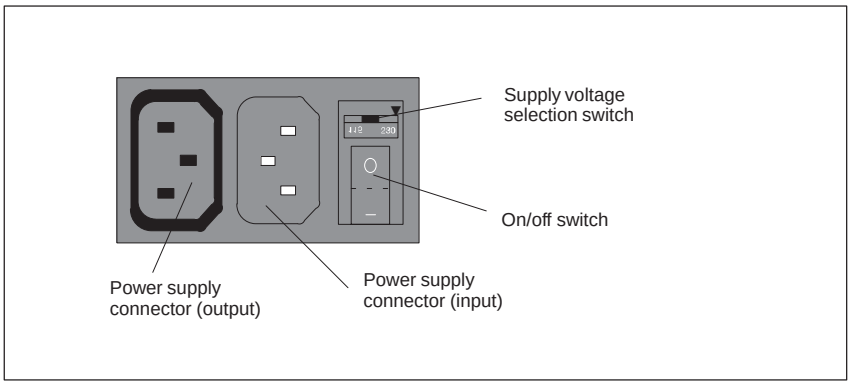

Figure 1-13 Connecting the Supply Voltage

Caution

Damage may be caused to the device!

Operating the PC with the wrong supply voltage setting may damage the device. The same voltage is applied to the supply voltage output as to the supply voltage input.

Please observe the specifications made by the monitor manufacturer when operating the monitor.

The following table lists the permissible input currents for the monitor:

Input voltage	120 V / 240 V ± 10%
Input current	8A / 4A
Output voltage	Equal to input voltage
Max. output current	3A / 1.5A

Caution

You must remove the power supply connector before changing the supply voltage.

Operating a power supply unit set to 115V in conjunction with a 230V network may cause serious damage to the PC.

1.4.7 Removing and Installing the Bus Board

- First remove all expansion modules as described in Section 1.4.5.
- Open the system unit as described in Section 1.4.1 (BI45) or Section 1.4.4 (FI45).
- Remove the power supply connection from the bus board.
- Release the two screws on the bus board.
- Lift the bus board out of the connector to the motherboard.

To install the bus board, proceed in reverse order.

1.4.8 Removing and Installing the Fan

- First remove all expansion modules as described in Section 1.4.5.
- Remove the power supply connection for the fan from the motherboard (or the SafeCard module, if present).
- The fan is fastened to the system unit with four plastic rivets. Remove the plastic rivets by pressing the pin out from behind.
- Take out the fan and the metal plate to which the guide rails are attached.
- Detach the plate with the guide rails by releasing the four plastic rivets.

To install the fan, proceed in reverse order.

1.4.9 Removing and Installing a Floppy Disk Drive or CD-ROM Drive for the BI45

- Open the system unit as described in Section 1.4.1.
- Lay the system unit face up on a flat surface.
- The floppy disk drive and the CD-ROM drive are fitted in a single support in the system unit.
- Release the three screws with which the support is fastened to the system unit.
- Remove the connection cables and lift the support carefully out of the system unit.

Caution

Before you remove the flexible cable from the floppy disk drive, you must first release the interlock on the port.

- The floppy disk drive is fastened to the support with three screws. Release these screws and pull the drive out of the support.
- The CD-ROM drive is fastened to the support with three screws. Release the screws and pull the drive out of the support.

To install the drives, proceed in reverse order.

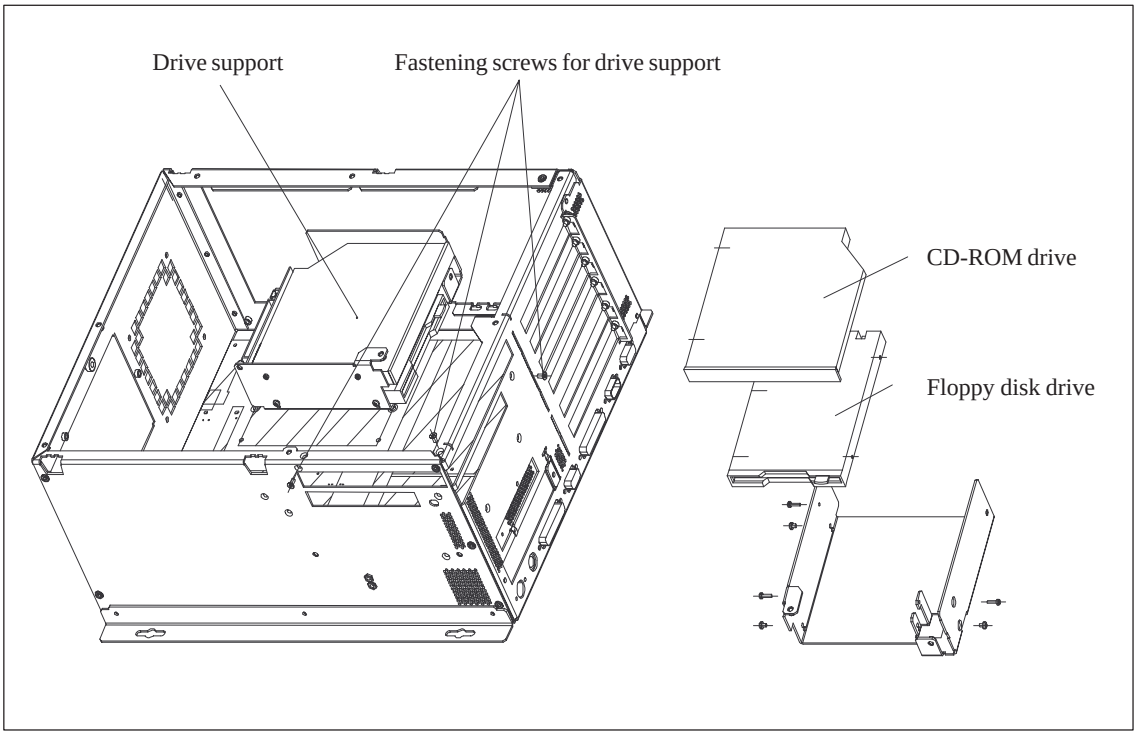

Figure 1-14 Floppy Disk/CD-ROM Drive Support on the BI45

Note

The floppy disk/CD support can also be installed in the system unit at a 90° angle. This is necessary if the unit is installed with the network connection at the top. The floppy disk drive may not be operated with the opening for the diskettes face up or face down.

1.4.10 Removing and Installing a Floppy Disk Drive or CD-ROM Drive for the FI45

- Open the system unit as described in Section 1.4.4.
- Lay the system unit on a flat surface with the opening face up.
- The floppy disk drive and the CD-ROM drive are fitted in a single support in the system housing.
- Raise the support approximately 1cm and lower it to one side of the system unit.
- Remove the connecting cables.

Caution

Before you remove the flexible cable from the floppy disk drive, you must first release the interlock on the port.

- The floppy disk drive is fastened to the support with three screws. Release the screws and pull the drive out of the support.
- The CD-ROM drive is fastened to the support with two screws. Release the screws and pull the drive out of the support.

To install the drives, proceed in reverse order.

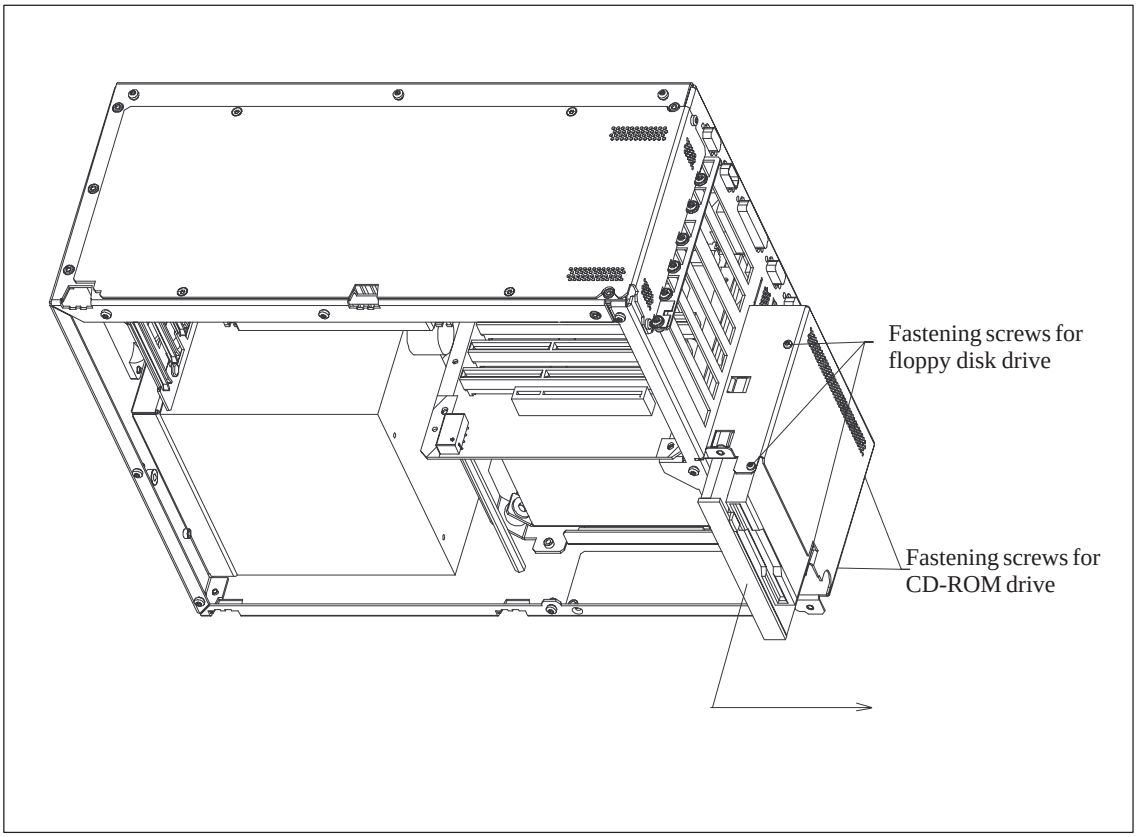

Figure 1-15 Floppy Disk/CD-ROM Drive Support for the FI45

1.4.11 Removing and Installing the Hard Disk of the BI45/FI45

- If you are using the BI45, remove the floppy disk/CD-ROM drive support as described in Section 1.4.9.
- If you are using the FI45, lower the floppy disk/CD-ROM drive support to one side of the system unit as described in Section 1.4.10.
- Release the four screws with which the hard disk support is fastened to the system unit.
- Remove the connecting cables and lift the support carefully out of the system unit.
- Release the four screws with which the hard disk is fastened to the vibration-damped part of the support.
- Take the hard disk out out of the support.

To install the drive, proceed in reverse order.

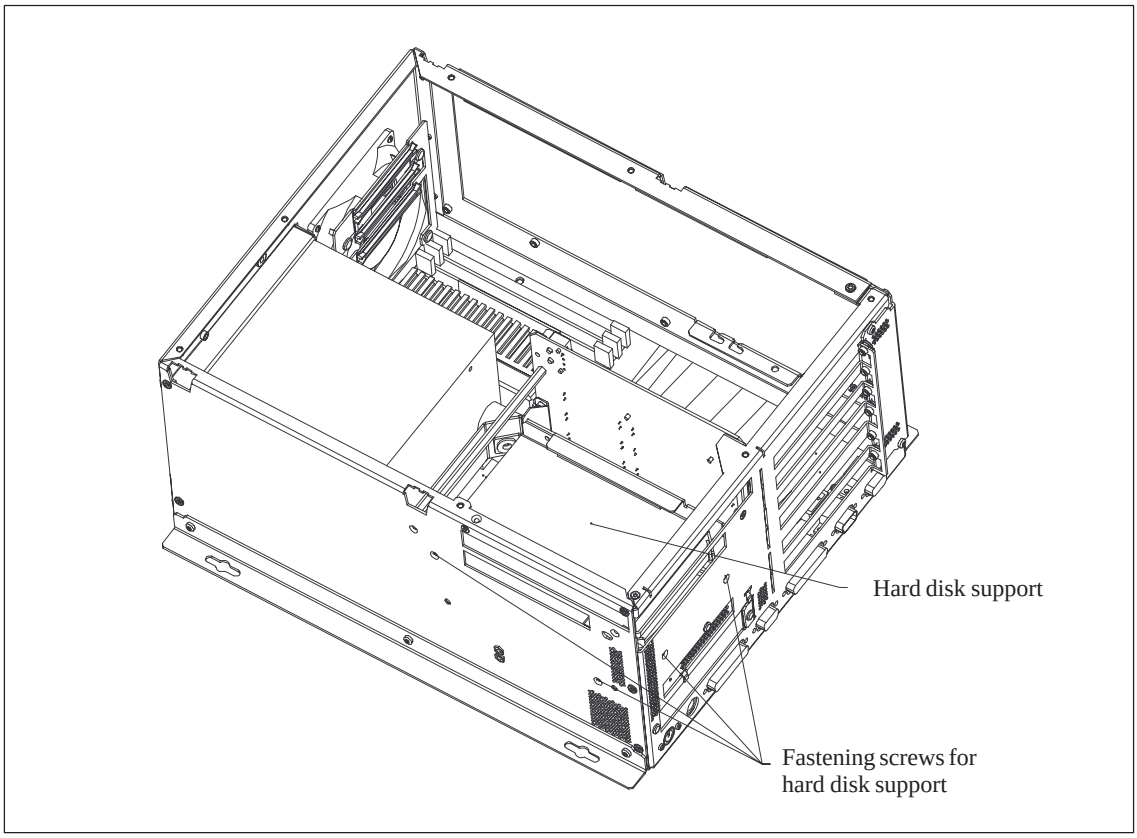

Figure 1-16 Removing the Hard Disk Support

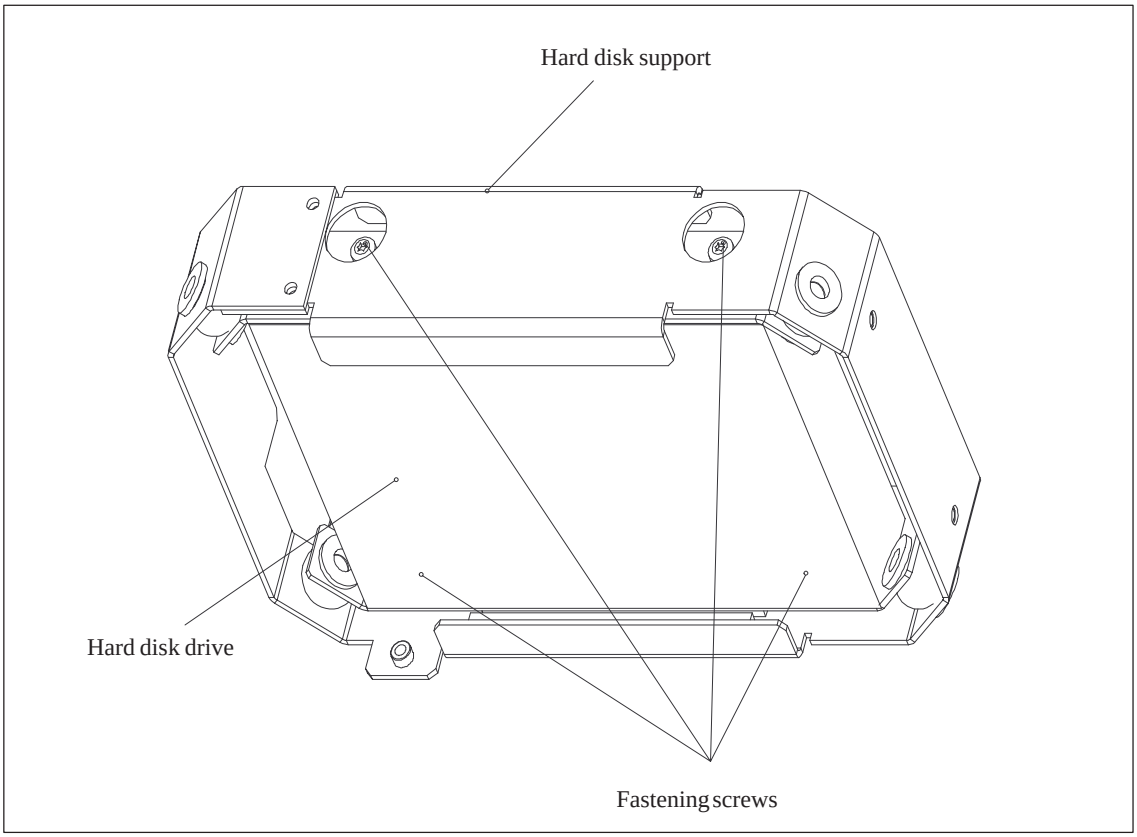

Figure 1-17 Removing the Hard Disk Drive from the Support

1.4.12 Removing and Installing the Motherboard

- Open the system unit as described in Section 1.4.1 (BI45) or Section 1.4.4 (FI45).
- Remove the power supply as described in Section 1.4.6.
- Remove the bus board as described in Section 1.4.7.
- Remove the fan as described in Section 1.4.8.
- Remove the support for the floppy disk drive and the CD-ROM drive as described in Section 1.4.9 (BI45) or Section 1.4.10 (FI45).
- Remove the hard disk support as described in Section 1.4.11.
- The motherboard is fastened to the system unit with seven screws. Release these screws.
- The motherboard is fastened to the side of the system unit with 10 hexagonal socket screws. Undo these socket screws and remove the motherboard.

To install the motherboard, proceed in reverse order.

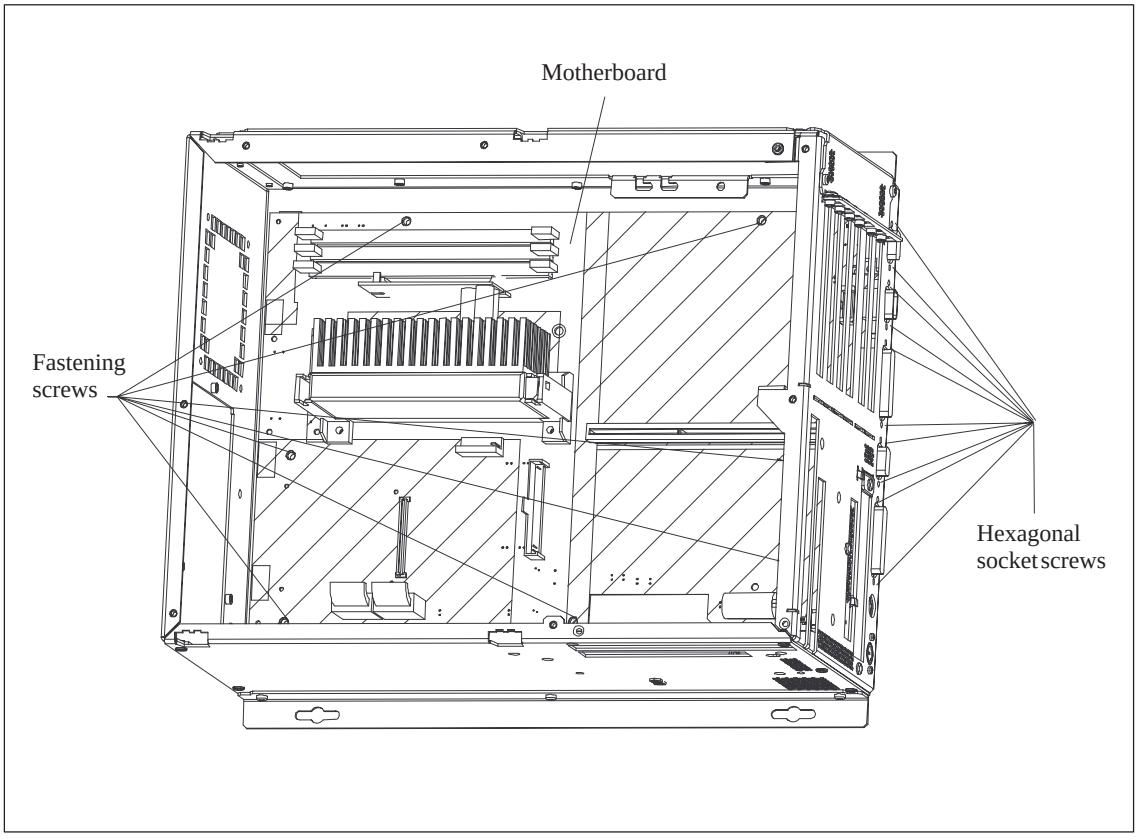

Figure 1-18 Removing the Motherboard

1.4.13 Removing and Installing the Membrane Keyboard or Front Components of the FI45

After the device has been installed, the membrane keyboard or front components can be exchanged from the front. Proceed as follows:

- Close the application you are using.
- Open the cover of the disk drive and remove the diskette or CD-ROM.
- Pull out the mains connector.
- Release the 10 screws with which the membrane keyboard is fastened to the front frame.
- Grip the cover of the disk drive carefully and pull the membrane keyboard forwards and off.

Caution

There is nothing to prevent the keyboard from falling.

- Unplug the 40-pin connector from the front adapter module and disconnect the interface cable carefully from the display.
- Remove the membrane keyboard and the front components mounted on it.

To install the membrane keyboard, proceed in reverse order.

1.4.14 Removing and Installing the Keyboard Controller for the FI45

- Lower the system box of the FI45 away from the front as described in Section 1.4.2 or remove the membrane keyboard as described in Section 1.4.13.
- Loosen the two screws and then remove the support with the inverter module.
- Remove the two connection cables for the membrane keyboard.

Caution

Before you remove the connecting cables, release the interlocks on the ports so that the contacts of the connecting cables are not damaged.

- Before you unplug all the other connectors, write down their previous connections.
- Undo the two remaining screws; you can then lift out the keyboard controller board.

To install the keyboard controller, proceed in reverse order.

1.4.15 Removing and Installing the Inverter Module for the FI45

- Lower the system box of the FI45 away from the front panel as described in Section 1.4.2 or remove the membrane keyboard as described in Section 1.4.13.
- Before you unplug all the connectors, write down their previous connections.
- Undo the two screws and remove the support with the inverter module.
- The inverter module is fastened to the support with two plastic rivets. Remove the rivets, by pressing the pin out from behind.

To install the inverter module, proceed in reverse order.

Caution

When installing the module, do not forget to place the insulating foil between the inverter module and the metal plate.

1.4.16 Removing and Installing the Display for the FI45

- Lower the system box of the FI45 away from the front panel as described in Section 1.4.2 or remove the membrane keyboard as described in Section 1.4.13.
- Release the two screws with which the support for the inverter module is mounted.
- Before you unplug all the connectors, write down their previous connections.
- Release the four screws with which the display is secured and then remove the display.

To install the display, proceed in reverse order.

1.4.17 Removing and Installing the Touch Pad for the FI45

- Remove the membrane keyboard as described in Section 1.4.13.
- Release the three screws on the installation plate with which the touch pad module is fastened to the membrane keyboard.
- Remove the installation plate and the copper-colored sheet-metal spring underneath.
- Take out the touch pad module and detach the flexible cord (contact side faces module).

To install the touch pad, proceed in reverse order.

1.4.18 Removing and Installing the Front Adapter Module for the FI45

- Lower the system box of the FI45 away from the front panel as described in Section 1.4.2, or remove the membrane keyboard as described in Section 1.4.13.
- Remove the two connection cables for the membrane keyboard and the flexible cord which leads to the touch pad module.

Caution

Before you remove the connecting cables, release the interlocks on the ports so that the contacts of the connecting cables are not damaged.

- Before you unplug all the other connectors, write down their previous connections.
- Release the three screws; then you can remove the front adapter module.

To install the front adapter module, proceed in reverse order.

1.5 Connecting the MPI/DP Interface

Connecting a PROFIBUS-DP Network via MPI/DP Interface

You can connect your IPC to PROFIBUS-DP networks via the optically isolated *) MPI/DP interface. The connection is established via SINEC L2 components for stationary links or via an MPI connecting cable with a length of 5 meters for non-stationary links (order no.: 6ES7001-0BF00-0AA0). SINEC L2 components and MPI connecting cables are not included with the IPC and have to be ordered separately. The MPI connecting cable (5m) can only be employed for data transfer rates up to 187.5 Kbps.

To connect your IPC to a PROFIBUS-DP network, proceed as follows:

1. Switch off your IPC.
2. Plug the connecting cable (of the SINEC L2 components or the MPI connecting cable) into the MPI/DP socket connector of your IPC and tighten the connector by means of screw-type locking.
3. Switch on your IPC.

Caution

Risk of damage to the unit!

Before plugging in the connecting cables, you must discharge the electrostatic charge of the cables and of your body by briefly touching a grounded object (ESD guideline).

PROFIBUS-DP Network

You can network up to 32 devices (PC, PG, PLC or DP components) via the MPI/DP interface in one segment. The interconnection to the PROFIBUS-DP segments is established via an optically isolated *) RS 458 port, which is part of the interface.

Interconnect several PROFIBUS-DP segments via a repeater.

The entire PROFIBUS-DP network has a maximum capacity of 127 stations. The data transfer rate of the MPI network is 187.5 Kbps. The data transfer rate that can be achieved via MPI/DP interface in the PROFIBUS-DP network ranges from 9.6 Kbps up to 1.5 Mbps.

Note

For further information on configuring a PROFIBUS-DP network please refer to the “S7-300 Hardware Manual,” order no.: 6ES7030-0AA00-8AA0.

*) Optically isolated within SELV circuit

1.6 Point-to-Point Connections

Point-to-Point Connection

In this section, you will learn how to connect your device to a programming device or programmable controller using a point-to-point connection.

You can establish a point-to-point connection by connecting the SIMATIC PC to a programming device or a programmable controller via:

- A V.24 connection.
- A TTY connection.

Suggestions for Configuring TTY (20 mA) Interfaces

Reliable data transfer depends on several factors. The data transfer rate you can achieve depends on the distance, the type of cable, the type of interface and any interference present.

Rules

You can reduce interference by choosing the right transmission cable and connecting it properly, and observing the following guidelines:

- Use a shielded cable with a low surge impedance (< 130 Ω / km) and low capacitance (< 90 pF/m). Twisted-pair cables enhance noise immunity due to inductance. A low surge impedance results in reduced voltage excursions and shorter charge reversal times. The larger the conductor cross-section, the lower the surge impedance for the same length of cable.
- The shorter the transmission link, the higher the maximum possible data transfer rate.
- If there is an active sender and an active receiver at the same end of the transmission link, the sequence of access priority to the transmission circuit must be taken into account in order to achieve the longest possible transmission link.
- Signal lines and power lines must not be run together. Signal lines must be installed as far away as possible from strong interference sources (for example, 400 V three-phase power cables).
- The active TTY interface with 12 V no-load voltage has been tested on a 1000 m (3300 ft.) long cable at a transmission rate of 9600 bps in a normal noisy environment (field strength < 3 V/m or 1 V/ft.). If a shielded LiYCY 5x1x0.14 is used, reliable transmission is possible over a distance of up to 1000 m (3300 ft.). The AS511 protocol (only one transmitter at a time) was used for testing.

Note

The contaminating field of the interference source decreases exponentially with the distance.

Connecting the BIxx/FIxx to S5 Programmable Controllers

You can connect the BIxx/FIxx to a SIMATIC S5 programmable controller via the COM1/TTY interface port.

Connect your BIxx/FIxx to a SIMATIC S5 programmable controller as follows:

1. Switch off the BIxx/FIxx.
2. Plug the cable into the COM1/V.24 PLC interface port.

Caution

Risk of damage to the BIxx/FIxx!

The interface port may be damaged if you confuse the connections or use the wrong connecting cables. Make sure the TTY cable of the BIxx/FIxx is plugged into the COM1/TTY port and not into the LPT1 port.

Before plugging in the cables, you must discharge your body's electrostatic charge by briefly touching a grounded object (ESD guideline).

Use only the original cables to establish the connection to the programmable controller.

The BIxx/FIxx and the programmable controller must be operated at the same protective ground potential.

Connecting the BIxx/FIxx via an Adapter

An adapter is available for connecting the programmable controller using older standard cables.

Interface	Link	Connecting Cable	Adapter
TTY interface (COM1)	BIxx/FIxx to SIMATIC S5 programmable controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

Higher Data Transfer Rates at Distances of up to 1000 m (3300 ft.)

In order to maintain a data transfer rate of 9600 bps up to a distance of over 1000 m (3300 ft), the receiving diode is connected to ground (reference) via the connecting cable. Cables of various lengths are available under the Order No. 6ES5 734-2xxx0 (xxx stands for the length in meters).

1.7 Error Diagnostics

Error	Cause	Remedy
Power-ON LED does not light up	• PC is switched off • Power supply is not properly connected	• Check power supply connections, power cable and power plug
The "Invalid configuration information... Press the F1 key for continue, F2 to run Setup utility" appears on the screen	• Incorrect configuration data • Buffer battery is low or damaged	• Press "F2" key, check the configuration data in SETUP, enter any default values, and check error messages in the first SETUP menu
The "No boot device available" appears on the screen	• There is no boot diskette in the drive • Wrong hard disk drive set in SETUP	• Use the "Fixed disk function" in SETUP
"Keyboard stuck key failure" message appears	• A key has become blocked during the system keyboard self-test	• Check the keyboard • Restart the system
Booting of the PC aborted after several beeps	• An error has occured during the system self-test	• Check the hardware
Every time a key is pressed, a beep is heard and no characters appear	• Keyboard buffer overflow	• <CTRL> <PAUSE>
Not-ready message when trying to write to a diskette	• No diskette has been inserted • Diskette has not been formatted	• Insert diskette • Format diskette
Write-protect error when trying to write to a diskette	• Diskette write-protect activated • Write-protect hole open on 3.5" diskette	• Cancel write protection
"EPROM TSR Interface disabled, check Power Management" message	• "Programming Interface" has been disabled in SETUP	• Enable "Programming Interface" in SETUP under submenu "FI Hardware options"
COM1,COM2, LPT1 or MPI/DP do not respond	• Ports have been disabled in SETUP	• Enable COM1,COM2, LPT1 or MPI/DP in SETUP under submenu "FI Hardware Options."
<\> key labeling missing	• No original keyboard	• German keyboard: <ALTGr > < ß >, or <ALT> <9> <2> • International keyboard: <ALT> <9> <2>
<\> key is not displayed	• Wrong keyboard driver is being used	• Load correct keyboard driver • <ALT> <9> <2>
Mouse not working	• Trackball does not rotate • No or wrong mouse driver is used	• Clean trackball and housing • Load correct mouse driver
Mouse pointer cannot be moved	• PS/2 port has been disabled in SETUP	• Check SETUP settings
Mouse pointer moving erratically	• Trackball dirty	• Clean trackball and housing
Drive cover cannot be opened	• Filter cap not properly fixed	• Push filter cap in proper position