



System board D800

ISA/PCI

Technical Manual



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System board D800

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Technical Manual

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Introduction

This Technical Manual applies for the system board with PCI bus (Peripheral Component Interconnect).

Explanation of symbols

The meanings of the symbols and fonts used in this manual are as follows:



Pay particular attention to texts marked with this symbol. Failure to observe this warning endangers your life, destroys the system, or may lead to loss of data.



This symbol is followed by supplementary information, remarks and tips.

► Texts which follow this symbol describe activities that must be performed in the order shown.

□ This symbol means that you must enter a blank space at this point.

⏏ This symbol means that you must press the Enter key.

Texts in this typeface are screen outputs from the PC.

Texts in this bold typeface are the entries you make via the keyboard.

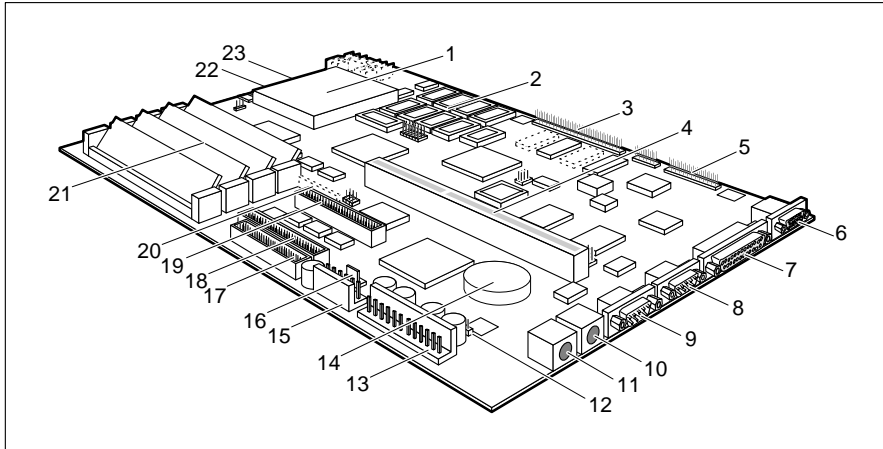
Texts in italics indicate commands or menu items.

"Quotation marks" indicate highlighted text and names of chapters.

Introduction

Features

- 32-bit microprocessor i486 SX, i486 SX2, i486 DX or i486 DX2 with 8 Kbyte internal cache (first-level cache), i486 DX4 with 16 Kbyte internal cache or Pentium OverDrive processor
- Math coprocessor: integrated in i486 DX, i486 DX2, i486 DX4 and Pentium OverDrive processor
- Memory configuration on system board: 8 Mbyte to 128 Mbyte RAM onboard
- Second-level cache memory on the system board: 0 Kbytes, 128 Kbytes or 256 Kbytes
- PCI bus for 25 MHz and 33 MHz
- Integrated PCI-bus hard disk controller for up to four IDE drives (e.g. FAST IDE hard disk drive, IDE CD ROM drive)
- Integrated PCI-bus graphics controller; Tseng W32P Windows accelerator with 1 Mbyte of DRAM video memory
- Real-time clock/calendar with integrated battery backup
- 128-Kbyte flash-upgradable BIOS
- Floppy disk controller (up to 2.88 Mbyte format)
- Bus interface
- Connector for external loudspeaker
- Imageport connector
- Connector for external display controller (VESA VGA pass-through)
- Parallel interface (ECP- and EPP-compatible)
- Two serial interfaces
- PS/2 mouse interface
- PS/2 keyboard interface
- Monitor interface



- 1 = Processor socket
- 2 = Second-level cache
- 3 = Imageport connector
- 4 = PCI bus interface
- 5 = Connector for external display controller (VESA VGA pass-through)
- 6 = Monitor connector
- 7 = Parallel interface
- 8 = Serial interface 2
- 9 = Serial interface 1
- 10 = PS/2 mouse interface
- 11 = PS/2 keyboard interface
- 12 = Connector for REMOTEON (option)
- 13 = Connector for 5 V power supply
- 14 = Lithium battery
- 15 = Connector for 3.3 V power supply
- 16 = Connector for soft-off power supply (option)
- 17 = Floppy disk drive connector
- 18 = Connector for IDE drives 1 and 2
- 19 = Connector for IDE drives 3 and 4
- 20 = Floppy disk drive connector (optional)
- 21 = Locations for memory modules
- 22 = Connector for external loudspeaker
- 23 = Connector for LEDs



Possible screen resolution

The screen resolutions in the following table refer to the VGA controller on the system board.

If you are using an external display controller, you will find details of supported screen resolutions in the user's guide or technical reference guide supplied with the controller.

Screen resolution	Refresh rate (Hz)	Horizontal rate (kHz)	Max. number of colors
640x350	70	31.5	16
640x350	84	38	16
640x480	60	31.5	16777216
640x480	75	38	65536
640x480	90	48	65536
720x400	70	31.5	16
720x400	84	38	16
800x600	56	35	65536
800x600	60	38	65536
800x600	75	47	256
800x600	90	60	256
1024x768	87 interlaced	36	256
1024x768	60	49	256
1024x768	70	57	256
1024x768	75	60	256
1280x1024	87 interlaced	49	16



You may set only those resolutions and refresh rates specified in the "Technical data" section of the monitor description. Otherwise you may damage your monitor. If you are in any doubt, contact your sales office or customer service.

You can use the WSETUP program (under Microsoft Windows) or the SET-VGA program (under MS-DOS) to set the screen resolution. Detailed information is provided under Microsoft Windows in About or in the file VGA.WRI.

Important notes



Be sure to read this page carefully and note the information before you open the PC.

Please note the information provided in the chapter "Safety" in the Operating Manual of the PC.

Incorrect replacement of the lithium battery may lead to a risk of explosion. It is therefore essential to observe the instructions in the section "Replacing the lithium battery".

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the trashcan. Your vendor or dealer or their authorized representatives will take used batteries back free of charge so that they can be recycled or disposed of in the proper manner.

ADVARSEL



Lithiumbatteri - Eksplosionsfare ved feilagtig håndtering. Udsiktning må kun ske med batteri af samme fabrikat og type. Lever det brugte batteri tilbage til leverandøren.

ADVARSEL



Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

WARNING



Eksplosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkarenfabrikanten. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

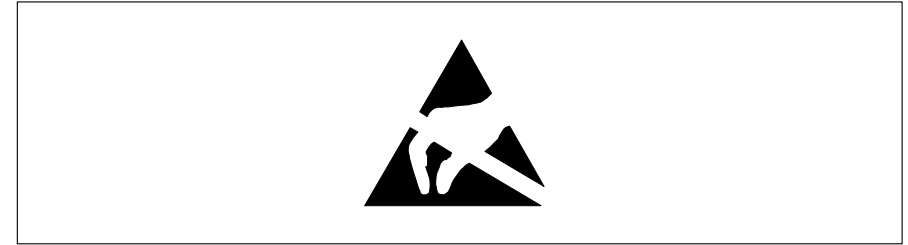


Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.



Important notes

Modules with **electrostatic sensitive devices (ESD)** may be identified by labels.



When you handle modules fitted with ESDs, you must observe the following points under all circumstances:

- When you handle modules fitted with ESDs, you must always discharge yourself (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Pull out the power plug before inserting or pulling out modules containing ESDs.
- Always hold modules with ESDs by their edges.
- Never touch pins or conductors on modules fitted with ESDs.

Notes on software

Program with time loops

Problems can occur with programs in which time loops have been implemented through software loops. This applies in particular to older programs which were written for 8 MHz processors.

SCO-UNIX on devices with processor i486 DX2, i486 DX4 or OverDrive

The Adaptec-SCSI controller AHA 1740 cannot be addressed under SCO-UNIX 3.2.4 and ODT 2.0.

To solve this problem, you can order **from SCO** a set of **SLS (Support Level Supplement) floppies** (consisting of 3 floppy disks) under the number **uod361**, free of charge, or contact one of our IT Service Shops.

The problem no longer exists in the new releases of SCO-UNIX 3.2.4.2 and ODT 2.1.

There will be no support for older versions (SCO-UNIX versions lower than 3.2.4 and ODT versions lower than 2.0).

Settings

You can make settings in the setup menu or using the jumpers on the system board.

Setup menu

The setup menu displays settings and technical information on the PC's configuration. The Operating Manual describes how to invoke the setup menu and change menu entries. Pressing the function key **F1** provides help information on each entry field.

The setup menu has the following different pages:

System Configuration

System Security Options

Additional System Options

PCI Device Configuration

Additional Hard Disk Options

Power Management Configuration



Settings

System Configuration page

CMOS Setup System Configuration							
Time (hh:mm:ss)	08:38:27	Date (mm/dd/yy)	08/13/1993				
Diskette A:	1.4M						
Diskette B:	NONE						
		Cyl	Hd	Pre	LZ	Sec	Mbyte
Hard Disk 1:	NONE						
Hard Disk 2:	NONE						
Hard Disk 3:	NONE						
Hard Disk 4:	NONE						
Base Memory:	640K	Video Display:	EGA/VGA				
Extended Memory:	15360K	Speed Select:	HIGH				
Error Halt:	HALT ON ALL ERRORS						

<F1> Help	<F8> System info	<F10> Store CMOS	<Esc> Exit	Page			
<...> Edit field	<↑↓↔> Next field	<PgUp> Next page	<Ctrl> ...	01			

Example of the *System Configuration* page

Time

Date

The *Time* field and the *Date* field show the time and date respectively according to the PC. The time is shown in the format *hh:mm:ss* (hours:minutes:seconds) and the date is shown in the format *mm/dd/yy* (month/day/year).



If the settings in the *Time* and *Date* fields are frequently wrong when you power up the computer, the lithium battery is dead. Change the battery as described in "Add-on modules - Changing the lithium battery").

Diskette A

Diskette B

These two fields are used to specify the type of floppy drive installed. The possible settings are: *360K*, *1.2M*, *720K*, *1.4M*, *2.8M* or *NONE*.

Default entry for *Diskette A*:

3 1/2-inch floppy drive *1.4M*

5 1/4-inch floppy drive *1.2M*

Default entry for *Diskette B*: *NONE*

Hard Disk 1
 Hard Disk 2
 Hard Disk 3
 Hard Disk 4

These fields are used to indicate the types of hard disks installed. The entries here may possibly not match the information printed on the hard disk drive by the manufacturer.

The maximum transfer rate of two IDE drives connected to the same connector is determined by the slower of the two. Fast hard disks should therefore be connected to the first IDE connector and identified as *Hard Disk 1* or *Hard Disk 2*; slower hard disks should be connected to the second IDE connector and identified as *Hard Disk 3* or *Hard Disk 4*.

Possible settings: 1 through 43, *AUTO* or *NONE*.

i If the wrong hard disk type is specified, the system will not boot correctly.

Special entries for the hard disk type:
 Entry for SCSI hard disks: *NONE*
 Entry for ESDI hard disks: 1

1 through 39

The hard disk parameters (cylinders, heads, etc.) for types 1 through 39 are preset.

40 through 43

The hard disk parameters (cylinders, heads, etc.) for types 40 through 43 are user-defined and are entered at the keyboard.

Examples of user-defined entries (IDE drives). In LBA mode different values may be displayed here.

Size	Cyl	Hd	Pre*	Lz*	Sec	Mbyte
120 Mbytes:	762	8	NONE	762	39	121
170 Mbytes:	904	8	NONE	904	46	170
210 Mbytes:	683	16	NONE	683	38	212
340 Mbytes:	904	16	NONE	904	46	340
540 Mbytes:	1048	16	NONE	1048	63	542
1 Gbyte:	2079	16	NONE	2079	63	1080

* These values are preset and cannot be modified.

AUTO

If the hard disk supports this mode, the setup menu reads the hard disk parameters from the disk itself and sets them automatically. You do not need to select the parameters yourself.

NONE

The computer either has no hard disk or is fitted with a SCSI hard disk.

Default entry for *Hard Disk 1*:

depends on the type of hard disk installed

Default entry for *Hard Disk 2, 3, 4*: *NONE*

Base Memory

This field indicates the size of the available base memory below 1 Mbyte.

512K

A module needs the memory between 512 and 640 Kbyte.

640K

The memory is used by the system board.

Default entry: *640K*

Extended Memory

This field indicates the size of the memory above 1 Mbyte. You can reduce the size of extended memory if necessary.

Video Display

This field is used to specify the type of monitor connected.

Possible entries are: *EGA/VGA*, *COLOR 40*, *COLOR 80*, *MONO*.

Default entry: *EGA/VGA*

Speed Select

This field is used to specify the system speed set at system startup. You might, for example, need to select a slower speed for certain software programs that use programmed time loops.

HIGH

Full system speed

LOW

Reduced system speed.

Default entry: *HIGH*

Error Halt

This field is used to specify which errors the self-test should not report. The default setting should only be changed if required by special applications.

HALT ON ALL ERRORS

The self-test reports all errors it encounters.

NO KEYBOARD ERROR HALT

The self-test ignores keyboard errors.

NO DISK ERROR HALT

The self-test ignores floppy disk and hard disk errors.

NO KEYBOARD OR DISK HALT

The self-test ignores keyboard, floppy disk and hard disk errors.

NO HALT ON ANY ERRORS

The self-test ignores all errors.

Default entry: *HALT ON ALL ERRORS*

The System Security Options page

```

          CMOS Setup
        System Security Options
-----
Time (hh:mm:ss)  08:38:27          Date (mm/dd/yy)  08/13/1993

System Load:      STANDARD
Security Features:  DISABLED

Serial 1:         COM1 (3F8h)      Diskette Write:  ENABLED
Serial 2:         COM2 (2F8h)      Diskette Ctrlr:  ENABLED

Parallel:        LPT1 (378h)      Setup Prompt:    ENABLED
Par Mode:        PRINTER          Quick Load:      DISABLED
Mouse Ctrlr:     ENABLED          Virus Warning:    DISABLED
Flash Write:     ENABLED

-----
<F1> Help      <F8> System info  <F10> Store CMOS  <Esc> Exit  Page
<+ -> Select item <↓←→> Next field  <PgUp> Next page  <Ctrl> ...  02

```

Example of the *System Security Options* page

Time / Date

The *Time* field shows the current time and the *Date* field shows the current

date according to the PC.

System Load

This field allows you to disable booting from floppy disk or swap the drive letters assigned to the floppy disk drives.

STANDARD

The operating system can be loaded from floppy disk or hard disk.

NONSTANDARD

System start-up is controlled by the operating system (terminal emulation).

DISKETTE LOCK

The operating system can only be loaded from hard disk.

DISKETTE SWAP

Drives A and B are switched.

Default entry: *STANDARD*

Security Features

This field allows you to define a password to prevent access to the data in your PC.

DISABLED

No passwords are in effect.

SYSTEM AND SETUP LOCK

The setup menu and the operating system are protected by passwords.

SETUP LOCK

The setup menu is protected by a password.

KEYBOARD AND SETUP LOCK

The setup menu is protected and the keyboard and the mouse are locked by passwords.

CHANGE PASSWORD

This option is only displayed if a password has already been defined. It enables you to alter the password.

Default entry: *DISABLED*

Serial 1

The address and the interrupt used to access serial interface 1 are selected here.

COM1 (3F8h)

Serial interface 1 is set to the address 3F8h and IRQ4 (edge-triggered).

COM3 (3E8h)

Serial interface 1 is set to the address 3E8h and IRQ4 (edge-triggered).

DISABLED

Serial interface 1 is disabled.

Default entry: *COM1 (3F8h)*

Serial 2

The address and the interrupt used to access serial interface 2 are selected here.

COM2 (2F8h)

Serial interface 2 is set to the address 2F8h and IRQ3 (edge-triggered).

COM4 (2E8h)

Serial interface 2 is set to the address 2E8h and IRQ3 (edge-triggered).

DISABLED

Serial interface 2 is disabled.

Default entry: *COM2 (2F8h)*

Parallel

The address and the interrupt used to access the parallel interface are selected here.

LPT1 (378h)

The parallel interface is set to the address 378h and IRQ7.

LPT2 (278h)

The parallel interface is set to the address 278h and IRQ5.

LPT3 (3BCh)

The parallel interface is set to the address 3BCh and IRQ7.

DISABLED

The parallel interface is disabled.

Default entry: *LPT1 (378h)*

Par Mode

This field is used to specify whether the parallel interface is to be used as a bidirectional input/output port or just as an output port.

In addition, LPT1 and LPT2 can be configured for *ECP*, *EPP*, and *ECP and EPP* transfer modes, which allow transfer rates of 2 and 2.4 Mbyte/s. These modes will only work with peripheral devices which also support them.

PRINTER

The port functions as an output port only.

BIDIRECTION

Data can be transferred in both directions across the port.

EPP

Enhanced Parallel Port transfer mode.

ECP

Enhanced Capability Port transfer mode.

ECP AND EPP

Enhanced Capability and Enhanced Parallel Port transfer mode.

Default entry: *PRINTER*

Mouse Ctrlr

This field is used to enable and disable the built-in mouse controller on the system board.

ENABLED

The mouse controller is enabled.

DISABLED

The mouse controller is disabled.

Default entry: *ENABLED*

Flash Write

This field is used to write-protect the flash BIOS.

ENABLED

The flash BIOS can be written or deleted, provided jumper J6-FLP on the system board is open.

DISABLED

The flash BIOS cannot be written. The BIOS cannot be flash-upgraded from floppy disk.

Default entry: *ENABLED*

Diskette Write

This field is used to enable and disable floppy disk write-protection.

ENABLED

Floppy disks can be read, written or deleted, provided jumper J6-FDP on the system board is open.

DISABLED

Floppy disks can only be read.

Default entry: *ENABLED*

Diskette Ctrlr

This field is used to enable and disable the built-in floppy disk controller on the system board.

ENABLED

The floppy disk controller is enabled.

DISABLED

The floppy disk controller is disabled.

Default entry: *ENABLED*

Setup Prompt

This field specifies whether the *PRESS F2 FOR SETUP* prompt is displayed when the PC is started.

ENABLED

The *PRESS F2 FOR SETUP* prompt is displayed when the system is started.

DISABLED

The prompt is not displayed.

Default entry: *ENABLED*

Quick Load

This field allows you to shorten the duration of the self-test and speed up system start-up. If you choose the quick self-test option, only a minimum memory test is carried out.

ENABLED

The quick self-test is enabled.

DISABLED

The normal self-test is carried out.

Default entry: *DISABLED*

Virus Warning

This field enables and disables a check of the boot sector on the bootable hard disk for changes since the last system start-up. If changes are detected and the cause is unknown, you should run an appropriate virus checker to check for a virus.

ENABLED

If the boot sector has been modified since the system last booted (e.g., a new operating system version has been installed or the hard disk has been infected by a virus), an on-screen warning appears.

```
!!! HARD DISK WARNING !!!
```

```
Boot sector has been modified.
```

```
Confirm the new boot sector in SETUP,  
and run a virus scan program.
```

This warning is re-displayed each time you restart the system until you acknowledge the message with CONFIRM or you disable the function by setting this field to DISABLED.

CONFIRM

By selecting this option, you indicate to the system that the modification to the boot sector was intentional (e.g., you have installed a new operating system version).

DISABLED

Boot sectors are not checked.

Default entry: *DISABLED*

Additional System Options page

```

          CMOS Setup
    Additional System Options
-----
Time (hh:mm:ss)  08:38:27          Date (mm/dd/yy)  08/13/1993

System BIOS:      128K
Shadow BIOS ROM:  SYSTEM AND VIDEO BIOS
                  C800  CC00  D000  D400  D800  DC00
Shadow Adaptor ROM: NO    NO    NO    NO    NO    NO

Cache:           INTERN AND EXTERN
Cache Mode:      WRITE BACK
Cache BIOS ROM:  VIDEO BIOS ONLY
                  C800  CC00  D000  D400  D800  DC00
Cache Adaptor ROM: NO    NO    NO    NO    NO    NO

-----
<F1> Help      <F8> System info  <F10> Store CMOS  <Esc> Exit  Page
<+ -> Select item <↑↓←→> Next field  <PgUp> Next page  <Ctrl> ...  03
    
```

Example of the *Additional System Options* page

Time / Date

The *Time* field shows the current time and the *Date* field shows the current date according to the PC.

System BIOS

In this field you can make available a ROM address area of 32 Kbytes for requests via the ISA/PCI bus (e.g., SCSI BIOS).

Entry	Memory area / location
96K	E8000H - FFFFFH / system board
128K	E0000H - FFFFFH / system board

96K

A 96-Kbyte area is reserved for the system BIOS.
A 32-Kbyte are (E0000H - E7FFFH) is available for requests via the ISA/PCI bus.

128K

A 128-Kbyte area is reserved for the system BIOS.

Default entry: 128K

Shadow BIOS ROM

This field allows you to copy the video BIOS to fast RAM in addition to the system BIOS at system start-up. Copying the BIOS to RAM increases CPU performance.

SHADOW BIOS ROM memory areas:

Entry	RAM area used
<i>SYSTEM BIOS ONLY</i>	E8000H - FFFFFH
<i>SYSTEM AND VIDEO BIOS</i>	C0000H - C7FFFH/F0000H - FFFFFH

SYSTEM AND VIDEO BIOS

The system BIOS and the video BIOS are both copied to RAM.

SYSTEM BIOS ONLY

Only the system BIOS is copied to RAM.

Default entry: *SYSTEM AND VIDEO BIOS*

Shadow Adaptor ROM

This field allows you to copy 16-Kbyte adaptor ROMs to RAM. If ROM code executes from RAM it increases your PC's performance. The ROM of PCI adaptors is always copied to RAM, regardless of the setting in this field.

NO

The relevant ROM area is not copied to RAM.

YES

The relevant ROM area is copied to RAM.

Default entry: *NO*

Cache

This field is used to specify which cache memory the CPU should use. Cache memory greatly increases performance. If the system runs too fast for certain older software, you can slow it down by disabling the cache (DISABLED).

INTERN ONLY

Only the internal cache is enabled.

INTERN AND EXTERN

The internal cache and the second-level cache are enabled.

DISABLED

Both the internal cache and the second-level cache are disabled. All cache-related settings are then without effect.

Default entry: *INTERN AND EXTERN*

Cache Mode

Condition: *Cache* must be enabled.

Cache Mode sets the mode in which the CPU uses the cache; write operations to the cache are carried out either in write-back mode or write-through mode. In write-back mode the CPU writes information to the cache and the information is only written to main memory if necessary. Memory and cache contents are not identical. In write-through mode the processor writes the information to the cache and to main memory. The contents of memory and cache are identical.

WRITE BACK

The cache works in write-back mode.

WRITE THROUGH

The cache works in write-through mode.

Default entry: *WRITE BACK*

Cache BIOS ROM

Condition: *Cache* must be enabled.

Cache BIOS ROM lets you specify BIOS ROM areas that should also be mapped to the cache in addition to main memory.

SYSTEM BIOS ONLY

The system BIOS is mapped to the cache.

VIDEO BIOS ONLY

The video BIOS is mapped to the cache.

SYSTEM AND VIDEO BIOS

The system BIOS and the video BIOS are mapped to the cache.

DISABLED

BIOS ROM areas are not mapped to the cache.

Default entry: *SYSTEM AND VIDEO BIOS*

Cache Adaptor ROM

Condition: *Cache* must be enabled.

Cache Adaptor ROM allows you to specify whether the relevant 16-Kbyte ROM area should be mapped to the cache. Mapping the ROM area to RAM increases system performance.

NO

The relevant ROM area is not mapped to the cache.

YES

The relevant ROM area is mapped to the cache.

Default entry: *NO*

PCI Device Configuration page

```

          CMOS Setup
        PCI Device Configuration
-----
Time (hh:mm:ss)  08:38:27          Date (mm/dd/yy)  08/13/1993
Memory Base Address:  44000000h  Color Palette Snoop:  DISABLED
I/O Base Address:    D000h       Parity Checking:      ENABLED

PCI Interrupt Mapping:  INTA#      INTB#      INTC#      INTD#
                       AUTO       AUTO       AUTO       AUTO

-----
<F1> Help          <F8> System info  <F10> Store CMOS  <Esc> Exit  Page
<...> Select item <↓←→> Next field  <PgUp> Next page  <Ctrl> ...   04

```

Example of the *PCI Device Configuration* page

Time / Date

The *Time* field shows the current time and the *Date* field shows the current date according to the PC.

Memory Base Address

This field shows the base address used to map memory areas of PCI boards.

I/O Base Address

This field shows the base address for PCI adapter input/output operations.

Color Palette Snoop

This field is used to specify whether setting of the color palette is to be available on the ISA bus.

ENABLED

Setting of the color palette is available simultaneously on the PCI bus and the ISA bus. This setting can be of relevance when operating video or multimedia boards on the ISA bus.

DISABLED

Setting of the color palette is only available on the PCI bus.

Default entry: *DISABLED*

Parity Checking

Here you specify whether the PCI bus is to be parity-checked.

ENABLED

A parity check is performed on the PCI bus.

DISABLED

No parity check is performed on the PCI bus.

Default entry: *ENABLED*

PCI Interrupt Mapping

Here you specify which PCI interrupt is to be mapped to which ISA interrupt.

With multifunctional PCI adaptor boards you may use all PCI interrupts.

The PCI interrupts INTA# and INTB# are normally assigned as follows:

Slot 1 = INTA#, slot 2 = INTB#

Possible entries: *NONE, AUTO, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15*

Default entry: INTA# *AUTO*
 INTB# *AUTO*
 INTC# *AUTO*
 INTD# *AUTO*

Additional Hard Disk Options page

CMOS Setup Additional Hard Disk Options			
Time (hh:mm:ss)	08:38:27	Date (mm/dd/yy)	08/13/1993
Hard Disk Ctrlr:	ENABLED		
	Transfer Mode	LBA Translation	Power Down
Hard Disk 1:	STANDARD	DISABLED	DISABLED
Hard Disk 2:	STANDARD	DISABLED	DISABLED
Hard Disk 3:	STANDARD	DISABLED	DISABLED
Hard Disk 4:	STANDARD	DISABLED	DISABLED

<F1> Help	<F8> System info	<F10> Store CMOS	<Esc> Exit Page
<+ -> Select item	<↓↔> Next field	<PgUp> Next page	<Ctrl> ... 05

Example of the *Additional Hard Disk Options* page

Time / Date

The *Time* field shows the current time and the *Date* field shows the current date according to the PC.

Hard Disk Ctrlr

This field allows you to enable and disable the built-in IDE hard disk controller. The associated interrupt will only be available if no hard disk is physically connected.

ENABLED

The IDE hard disk controller is enabled.

DISABLED

The IDE hard disk controller is disabled.

Default entry: *ENABLED*

Hard Disk 1: Transfer Mode

Hard Disk 2: Transfer Mode

Hard Disk 3: Transfer Mode

Hard Disk 4: Transfer Mode

Here you specify the transfer rate for the IDE hard disks.

STANDARD

The system transfers 512 bytes per interrupt

AUTO SELECT

If fast hard disks are installed, the highest possible transfer rate is selected. If the hard disk supports this mode, the setup menu prompts for the maximum number of blocks to be transferred per interrupt. The maximum is 32 blocks of 512 bytes each. In addition, the hard disk's PIO modes 0 through 4 (Processor Input Output modes) are used.

8K BLOCK XFER

Eight Kbytes are transferred per interrupt.

Default entry: *STANDARD*

Hard Disk 1: LBA Translation

Hard Disk 2: LBA Translation

Hard Disk 3: LBA Translation

Hard Disk 4: LBA Translation

This field enables and disables the LBA (Logical Block Addressing) mode. LBA mode allows you to install and use hard disks with a capacity of more than 528 Mbytes. If a hard disk supports LBA mode, you can use its full capacity.

You may only change the default setting when installing a new hard disk.



You may only use IDE drives in the LBA mode selected when they were set up. In other words, if you set up a hard disk with LBA mode *DISABLED*, you may only operate the hard disk with LBA mode disabled.

DISABLED

The BIOS uses the hard disk parameters and supports a maximum capacity of 528 Mbytes.

AUTO SELECT

If the hard disk supports LBA and it has a capacity of more than 528 Mbytes, the BIOS translates the hard disk parameters, allowing the disk's full capacity to be used.

If the hard disk does not support LBA, its parameters are not translated.

Default entry: depends on the type of hard disk installed

Hard Disk 1: Power Down

Hard Disk 2: Power Down

Hard Disk 3: Power Down

Hard Disk 4: Power Down

Here you specify the period of hard disk inactivity after which the hard disk's motor is power down. The next hard disk read or write operation powers up the hard disk again automatically.

The hard disk requires roughly 15 seconds to run up.

Possible entries: *DISABLED, 5 min, 10 min, 15 min*

Default entry: *DISABLED* (the hard disk does not power down)

Power Management Configuration page

```

                                CMOS Setup
                                Power Management Configuration
-----
Time (hh:mm:ss)  08:38:27                Date (mm/dd/yy)  08/13/1993

Standby Timeout:  DISABLED                Wakeup Timer:    00:00:00

      Standby Function                    Wakeup Event
Video:      ENABLED                      System Tic:     DISABLED
Hard Disk:  ENABLED                      Mouse:          ENABLED
CPU Speed:  LOW                          IRQ09:          DISABLED
Hard Disk 4: STANDARD                    IRQ10:          DISABLED
                                           IRQ11:          DISABLED
-----

<F1> Help      <F8> System info  <F10> Store CMOS  <Esc> Exit  Page
<+ -> Select item <↑↓> Next field  <PgUp> Next page  <Ctrl> ...  06

```

Example of the *Power Management Configuration* page

Time / Date

The *Time* field shows the current time and the *Date* field shows the current date according to the PC.

Standby Timeout

Here you specify the period of inactivity after which the system switches to standby mode.

Possible entries: *DISABLED, 1 min, 2 min, 5 min, 10 min, 15 min, 30 min, 60 min*

Default entry: *DISABLED* (the system does not switch to standby mode)

Wakeup Timer

Here you specify the time at which the system returns to its normal operating mode from standby mode.

Default entry: *00:00:00* (the function is disabled)

Standby Function

Video

This field allows you to enable and disable the video controller's standby function. You should only enable this function if both video controller and display support the power-saving function.

DISABLED

The monitor remain switched on.

ENABLED

The monitor is switched off.

Default entry: *ENABLED*

Hard Disk

This field allows you to enable and disable the hard disk controller's standby mode.

DISABLED

The hard disk controller remains on.

ENABLED

The hard disk controller shuts itself down.

Default entry: *ENABLED*

CPU Speed

This field allows you to specify the CPU speed in standby mode.

HIGH

The CPU runs at the highest clock speed.

REDUCED

The CPU runs at a reduced clock speed.

LOW

The CPU runs at the lowest clock speed.

STOPPED

The CPU stops. This mode saves the most power. However, any programs running are also placed in standby mode.

Default entry: *LOW*

Wakeup Event

This field defines the source of the wakeup event that switches the system back into its normal operating mode from standby mode.



Certain wakeup events only return the system board to its normal operating mode, but not the display.

System Tic

You should only use this option in connection with special applications. The System Tic-Modus generates an interrupt every 55 ms and would normally cause the system to return instantly to its normal operating mode.

DISABLED

The System Tic is ignored.

ENABLED

The System Tic switches the system board back to its normal operating mode.

Default entry: *DISABLED*

Mouse

Condition:

The mouse must be connected to the PS/2 mouse port.

DISABLED

Mouse movement is ignored.

ENABLED

Moving the mouse switches the system back into its normal operating mode.

Default entry: *ENABLED*

IRQ09
IRQ10
IRQ11

All hardware interrupts not included here always switch the system board back to its normal operating mode. The hardware interrupts IRQ1 (keyboard), IRQ3 and IRQ4 also reactivate the display.

DISABLED

The relevant hardware interrupt is ignored.

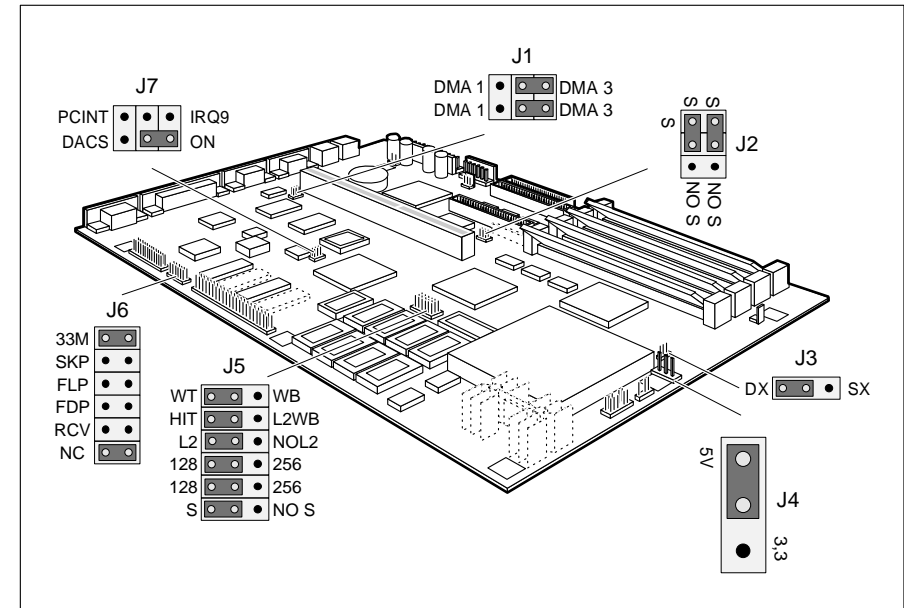
ENABLED

The relevant hardware interrupt switches the system board back to its normal operating mode.

Default entry: *DISABLED*



Jumper settings



J1 = DMA channel for parallel interface
J2 = CPU technology
J3 = CPU type
J4 = CPU operating voltage 3.3 V or 5 V

J5 = Cache and CPU technology
J6 = External clock rate
J7 = VGA interrupt

Jumper J6-SKP is for use by customer service. Jumper J7-DACS has not function.

DMA channel of parallel interface in ECP mode

Jumper J1 selects the DMA channel used by the parallel interface.

DMA channel 1 = both J1 jumpers are set to DMA 1

DMA channel 3 = both J1 jumpers are set to DMA 3

No DMA channel = both jumpers are open

Default setting:

Jumper 1 is set to DMA 3 = DMA channel 3

CPU settings

If you upgrade the processor, you must change and check a number of jumper settings.

CPU technology

Jumpers J2 and J5-S/NO S are used to specify "SL Enhanced" CPU technology.

SL Enhanced = jumpers J2 and J5-S/NO S are set to S
 other = jumpers J2 and J5-S/NO S are set to NO S

Default setting:

Jumpers J2 and J5-S/NO S are set to S = SL Enhanced

CPU type

Jumper J3 is used to specify the CPU type.

SX processor = J3 jumpers are set to SX
 all other processor (incl. SX2) = J3 jumpers are set to DX

Default setting:

depends on the type of CPU installed

5 V or 3.3 V operating voltage

Jumper J4 is used to set the operating voltage for the CPU. The 5 V setting is for 5 V CPUs. The 3.3 V setting supports the i486 DX4 if 3.3 V or 3.45 V (according to the Intel spec sheet) is supplied across the 3.3 V power supply connector.



Never run a 3.3 V CPU at 5 V.

5 V supply = jumper J4 is set to 5 V
 3.3 V supply (e.g. for the DX4) = jumper J4 is set to 3.3

Default setting:

depends on the type of CPU installed

External clock

Jumper J6-33M is used to set the external clock rate for the CPU (33 MHz or 25 MHz).

External clock rate 25 MHz = jumper J6-33M open
 External clock rate 33 MHz = jumper J6-33M closed

Default setting:

depends on the type of CPU installed

Cache settings

The setting of jumper J5-HIT/L2WB depends on the first-level cache and whether a second-level cache is present on the system board.

If the system board is fitted with second-level cache and a processor with a write-back cache (e.g. Pentium OverDrive or DX2DA), jumper J5-HIT/L2WB must be set to L2WB.

If the system board is not fitted with second-level cache or is fitted with a processor with a write-through cache (e.g. SX, SX2, DX, DX2, DX4), jumper J5-HIT/L2WB must be set to HIT.

Write-through = jumper J5-HIT/L2WB is set to HIT

Write-back + second-level cache = jumper J5-HIT/L2WB is set to L2WB

Default setting:

depends on the type of processor installed and the presence of second-level cache

First-level cache

If the system board is fitted with a processor with a write-back cache (e.g., a Pentium OverDrive), jumper J5-WT/WB must be set to WB.

If it is fitted with a processor with a write-through cache (e.g. a DX or DX2, etc.), jumper J5-WT/WB must be set to WT.

Write-through = jumper J5-WT/WB is set to WT

Write-back = jumper J5-WT/WB is set to WB

Default setting:

depends on the type of processor installed

Second-level cache

Jumper J5-L2/NOL2 is used to indicate to the system whether a second-level cache (consisting of SRAM chips) is present on the system board.

Second-level cache present = jumper J5-L2/NOL2 is set to L2
No second-level cache = jumper J5-L2/NOL2 is set to NOL2

Default setting:
depends on the presence of a second-level cache

Jumpers J5-128/256 define the size of the second-level cache.

No second-level cache = jumper settings for J5-128/256 not important
128-Kbyte second-level cache = jumpers J5-128/256 set to 128
256-Kbyte second-level cache = jumpers J5-128/256 set to 256

Default setting:
depends on the size of the second-level cache

BIOS update



If you wish to update your system BIOS, please consult customer service.

Jumper J6-FLP enables and disables BIOS updating. In addition, when updating the BIOS you must ensure that *Flash Write* is set to *ENABLED* in the *System Security Options* setup menu.

BIOS updating disabled = jumper J6-FLP closed
BIOS updating enabled = jumper J6-FLP is open

Default setting:
Jumper J6-FLP open = BIOS updating enabled

BIOS recovery

Jumper J6-RCV enables recovery of the old BIOS after an attempt to update it has failed. To restore the old BIOS you need a recovery disk (call customer service).

If BIOS recovery is possible, the BIOS executes from floppy drive A: and restores the flash BIOS.

BIOS recovery = jumper J6-RCV closed
Normal operation = jumper J6-RCV open

Default setting:
Jumper J6-RCV open = normal operation

Floppy disk write-protection

Jumper J6-FDP is used to specify whether the floppy disk drive is able to write floppy disks and delete them. In addition, the *Diskette Write* option in the *System Security Options* setup menu has to be configured correctly.

Read, write and delete floppy disks = jumper J6-FDP is closed
Read floppy disks only = jumper J6-FDP is open

Default setting:
Jumper J6-FDP is closed = floppy disks can be read, written and deleted

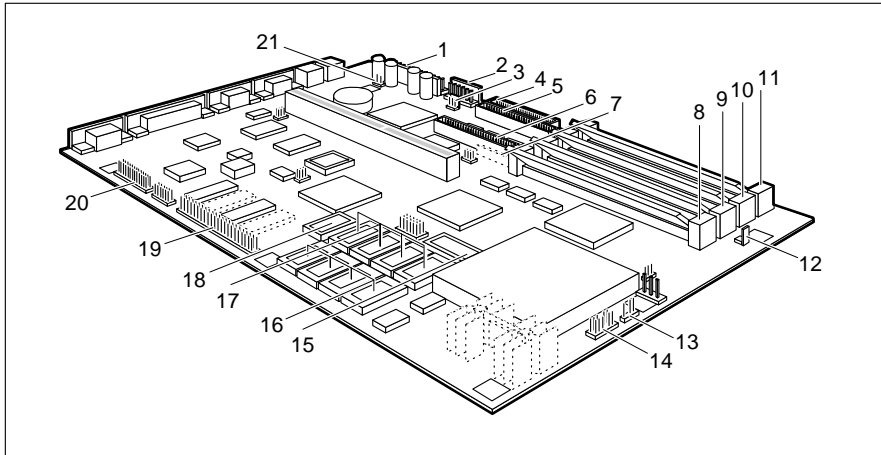
VGA interrupt

Jumper J7-PCINT/IRQ9 assigns IRQ9 to the ISA bus or to INTD on the PCI bus, or disables it.

VGA interrupt disabled (IRQ9 free) = jumper J7-PCINT/IRQ9 open
VGA interrupt is set to IRQ9 on the ISA BUS = jumper is set to IRQ9
VGA interrupt is set to INTD on the PCI BUS = jumper is set to PCINT

Default setting:
Jumper J7-PCINT/IRQ9 is open = VGA interrupt is disabled (IRQ9 is free)

Add-on modules



- | | |
|--|--|
| 1 = Connector for 5 V power supply | 12 = Connector for soft-off switch |
| 2 = Connector for 3.3 V power supply | 13 = Connector for external loudspeaker |
| 3 = Connector for soft-off power supply | 14 = Connector for LEDs |
| 4 = Connector for floppy disk drive | 15 = Socket for tag SRAM 12 ns |
| 5 = Connector for IDE hard disks 1 and 2 | 16 = Sockets for first 128 Kbytes of second-level cache, 20 ns |
| 6 = Connector for IDE hard disks 3 and 4 | 17 = Sockets for 128 Kbytes of second-level cache, 20 ns (expansion to 256 Kbytes) |
| 7 = Optional connector for floppy disk drive | 18 = Socket for dirty SRAM, 20 ns |
| 8 = Location for main memory, bank 0 | 19 = Connector for Imageport |
| 9 = Location for main memory, bank 1 | 20 = Connector for VESA VGA pass-through |
| 10 = Location for main memory, bank 2 | 21 = Connector for REMOTEON |
| 11 = Location for main memory, bank 3 | |



Add-on modules

Main memory

Four locations (Bank 0 through Bank 3) area available on the system board for installing memory modules. The board supports a maximum of 128 Mbytes. If you wish to add or remove memory modules, you may have to remove the disk-drive mount (see your PC's technical manual).



You may only use fast memory modules (access time = 70ns or less).

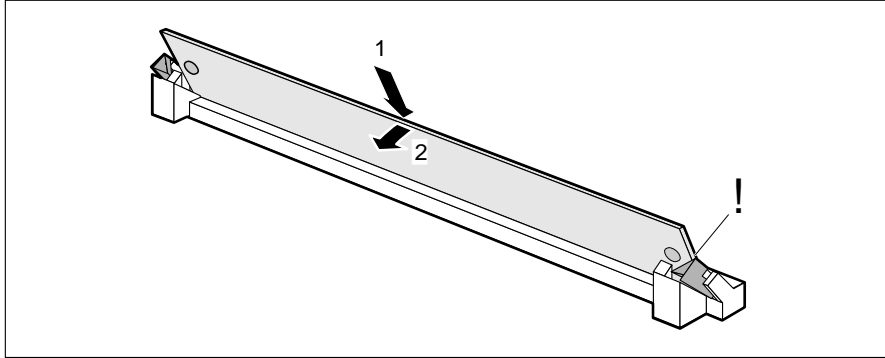
You must always add memory modules in pairs. In other words, you fit the first pair to Bank 0 and Bank 1, and the second pair to Bank 2 and Bank 3. Pairs of memory modules must have the same capacity and the same access time.

The table below shows recommended upgrades and use of memory locations (subject to change).

Memory configuration	Memory modules in Bank 0 and Bank 1	Memory modules in Bank 2 and Bank 3
4 Mbytes	2 x 2 Mbytes	empty
8 Mbytes	2 x 4 Mbytes	empty
16 Mbytes	2 x 8 Mbytes	empty
32 Mbytes	2 x 16 Mbytes	empty
64 Mbytes	2 x 16 Mbytes	2 x 16 Mbytes
64 Mbytes	2 x 32 Mbytes	empty
128 Mbytes	2 x 32 Mbytes	2 x 32 Mbytes

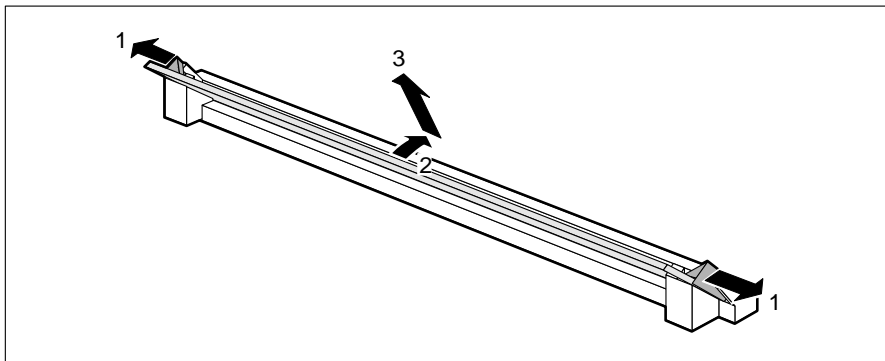
Installing memory modules

When installing more than one memory module, start by installing the first in Bank 0.



- ▶ Insert the memory module at angle into the appropriate location (1). Ensure that the key notch and the two holes are correctly aligned with the retaining pins.
- ▶ Tilt the module down until it snaps into place (2).

Removing a memory module



- ▶ Carefully push the retaining clips at each end of the module outwards (1).
- ▶ Tilt the module upwards (2) and pull it at an angle out of the location (3).

Second-level cache

The system board will work with 0 Kbytes, 128 Kbytes or 256 Kbytes of second-level cache. The board has ten sockets for the necessary SRAM chips.

To ensure optimum benefit from the second-level cache, make the following settings in the setup menu:

- *Speed Select:* *HIGH*
- *Shadow BIOS ROM:* *SYSTEM AND VIDEO BIOS*
- *Cache:* *INTERN AND EXTERN*
- *Cache BIOS ROM:* *SYSTEM AND VIDEO BIOS*

Adding second-level cache memory



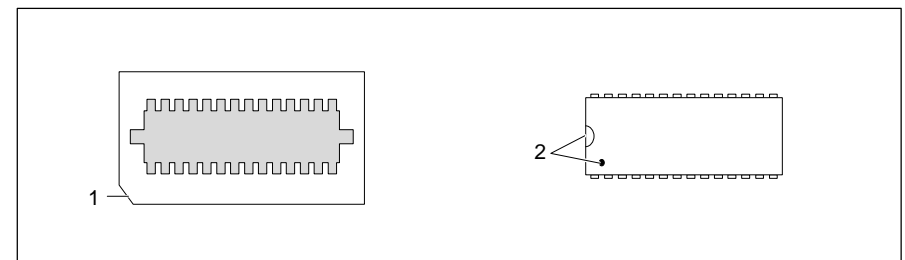
For information on the type of SRAM chips (32Kbit*9) to use, consult your sales office or customer service.

Socket 15 should be populated with one 12ns 32-pin SRAM chip. Socket 18 should be populated with one 20ns 24-pin SRAM chip.

For 128 Kbytes of second-level cache, populate socket 16 with 20ns 28-pin SRAM chips.

For 256 Kbytes of second-level cache, populate sockets 16 and 17 with 20ns 28-pin SRAM chips.

Make sure that the SRAM chips are the right way round when you insert them.

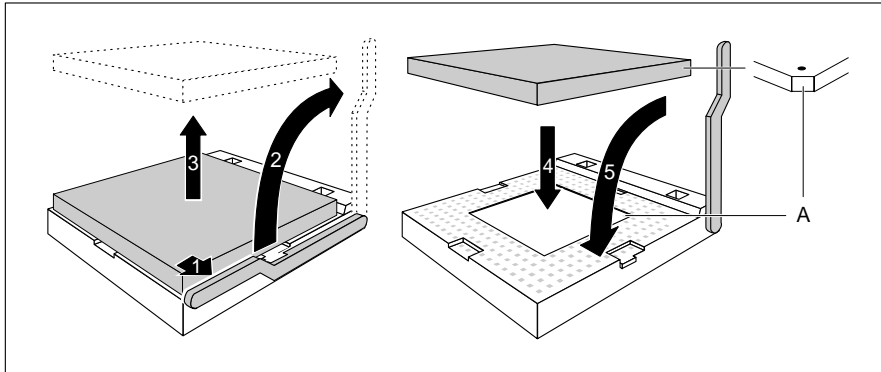


- 1 = Marking on socket
- 2 = Marking on upper side of SRAM chip

- ▶ Insert the SRAM chip so that the marking on it matches the marking on the socket.

- ▶ Set jumpers J5-L2/NOL2 and J5-128/256 on the system board (see the "Cache settings" section).
- ▶ Makes the recommended changes in the setup menu.

Upgrading the processor



- ▶ Push the lever in the direction of the arrow (1) and lift it as far as it will go (2).
- ▶ Remove the old processor from the socket (3).
- ▶ Insert the new processor in the socket so that the mark on the upper side of the processor matches the mark (A) on the socket (4).



The mark on the processor may be covered by a heat sink.

- ▶ Push the lever back down so that it snaps into place (5).
- ▶ Set jumpers J2, J3, J4, J5-S/NO S and J6-33 on the system board (see the "CPU settings" section).

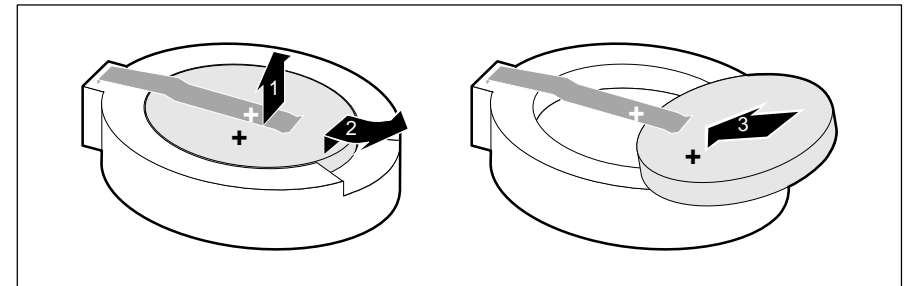
Replacing the lithium battery



Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the trashcan. Your vendor or dealer or their authorized representatives will take used batteries back free of charge so that they can be recycled or disposed of in the proper manner.

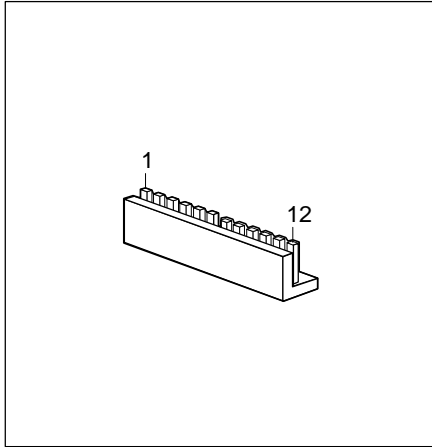
Makes sure that you insert the battery the right way round. The plus pole must be on the top.



- ▶ Lift the contact (1) a few millimeters and remove the battery from its socket (2).
- ▶ Insert a new lithium battery of the same type in the socket (3).

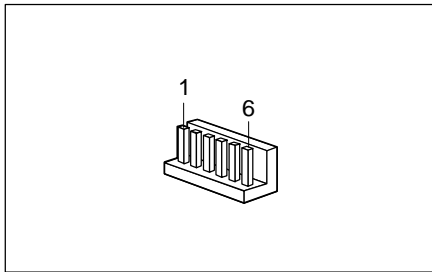
Interface pinouts and interrupts

Connector for 5 V power supply



Pin	Meaning
1	Power good
2	+5 V
3	+12 V
4	-12 V
5	0 V
6	0 V
7	0 V
8	0 V
9	-5 V
10	+5 V
11	+5 V
12	+5 V

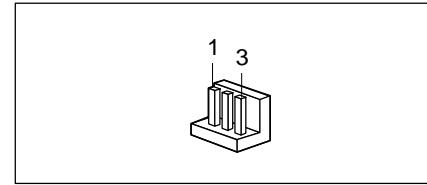
Connector for 3.3 V power supply



Pin	Meaning
1	0 V
2	0 V
3	0 V
4	+3.3 V
5	+3.3 V
6	+3.3 V

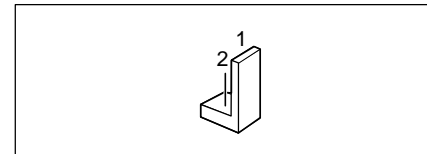
Interface pinouts and interrupts

Connector for soft-off power supply



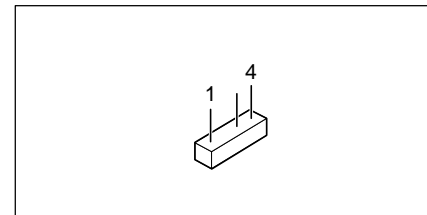
Pin	Meaning
1	+5 V (auxiliary voltage)
2	Power Supply ON
3	0 V

Connector for soft-off pushbutton



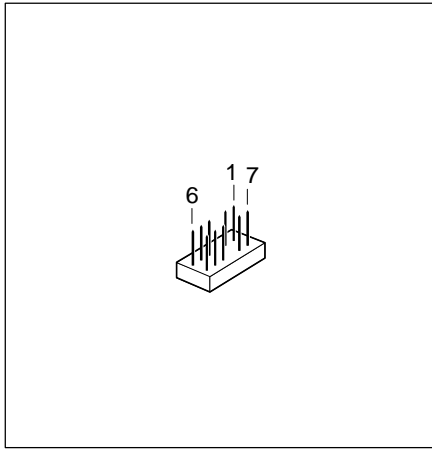
Pin	Meaning
1	+5 V (auxiliary voltage)
2	Pushbutton input

Connector for external loudspeaker



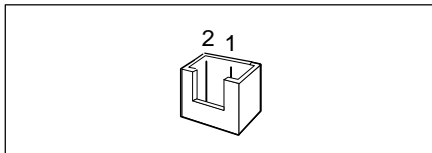
Pin	Meaning
1	Loudspeaker signal
2	keyed
3	0 V
4	+5 V

Connector for LEDs



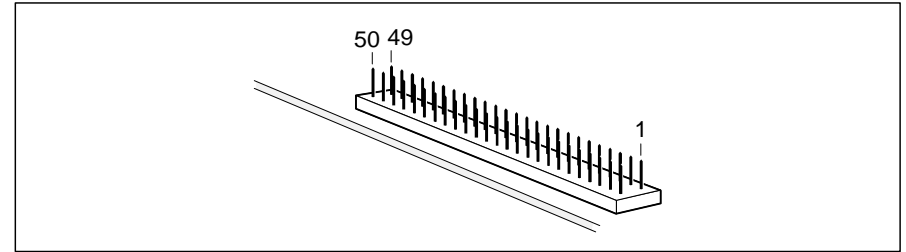
Pin	Meaning
1	System unit ON
2	free
3	keyed
4	free
5	Reset switch
6	+5 V
7	0 V
8	0 V
9	keyed
10	0 V
11	0 V
12	Hard disk drive

Connector for REMOTEON



Pin	Meaning
1	free
2	REMOTEON

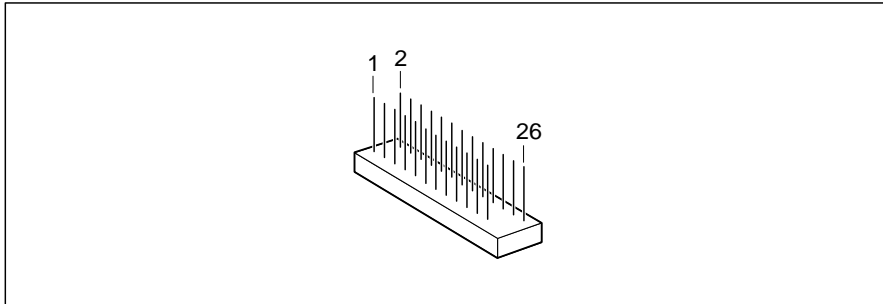
Connector for Imageport



Pin	Meaning
1	+5 V
2	+5 V
3	0 V
4	0 V
5	+12 V
6	0 V
7	Write Request
8	0 V
9	Image Data Mask0
10	free
11	Image Data 0
12	0 V
13	Image Data 1
14	Image Frame Sync
15	Image Data 2
16	Image Line Sync
17	Image Data 3
18	0 V
19	Image Data 4
20	Image Data Ready
21	Image Data 5
22	0 V
23	Image Data 6
24	Odd Image Data
25	Image Data 7

Pin	Meaning
26	free
27	Host Data 0
28	0 V
29	Host Data 1
30	Ext. Command
31	Image Write Strobe
32	0 V
33	Reset
34	0 V
35	Host Data 2
36	Host Data 3
37	Host Data 4
38	Host Data 5
39	Host Data 6
40	Host Data 7
41	free
42	free
43	free
44	free
45	free
46	free
47	free
48	free
49	0 V
50	0 V

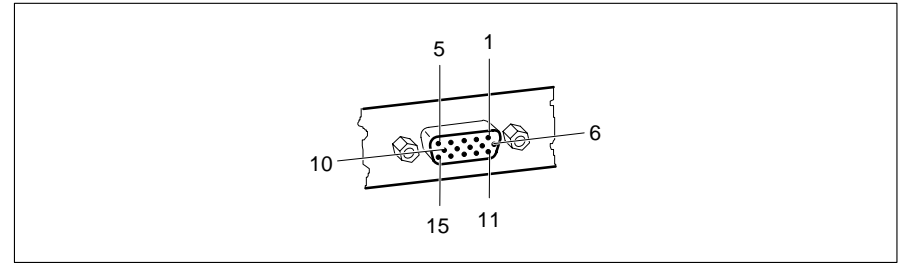
Connector for VESA VGA pass-through



Pin	Meaning	Pin	Meaning
1	0 V	14	Data 6
2	Data 0	15	0 V
3	0 V	16	Data 7
4	Data 1	17	0 V
5	0 V	18	Clock
6	Data 2	19	0 V
7	free	20	Blanking
8	Data 3	21	0 V
9	free	22	Horizontal Sync.
10	Data 4	23	free
11	free	24	Vertical Sync.
12	Data 5	25	keyed
13	free	26	0 V

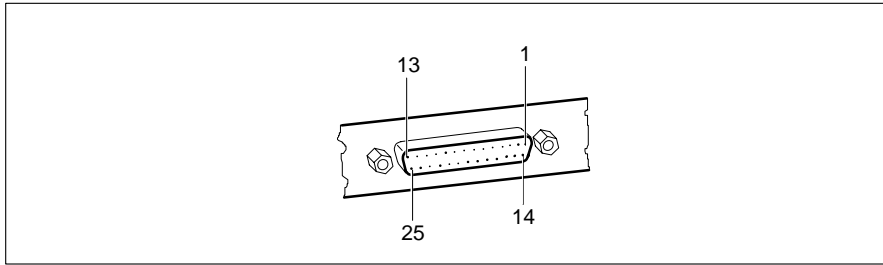


Connector for monitor



Pin	Meaning	Pin	Meaning
1	Red	9	keyed (no pin)
2	Green	10	Sync. ground
3	Blue	11	Monitor ID bit 0
4	Display ID bit 2	12	Monitor ID bit 1
5	Ground	13	Horizontal synchronization
6	Red ground	14	Vertical synchronization
7	Green ground	15	Monitor ID bit 3
8	Blue ground		

Parallel interface



The parallel interface supports three transfer modes: SPP, EPP and ECP. SPP mode (standard parallel port) is the mode traditionally used to drive a printer. The EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) modes are transfer modes that allow transfer rates of 2 and 2.4Mbytes/s. These modes will only work in connection with peripheral devices which specifically support them. The new transfer modes are used among other things for connecting to SCSI or IDE peripherals. The pinouts are different in all three modes.

Pinout in SPP mode

Pin	Signal name	Description
1	STROBE	Data message
2-9	Data Lines 0-7	Data lines 0-7
10	ACKNOWLEDGE	Data acknowledgement
11	BUSY	Not ready to receive
12	PE	End of paper
13	SELECT	Device selection
14	AUTO	Automatic new line
15	ERROR	Device error
16	INIT	Reset/initialize
17	SELECT IN	Printer selection
18-25	GROUND	Ground

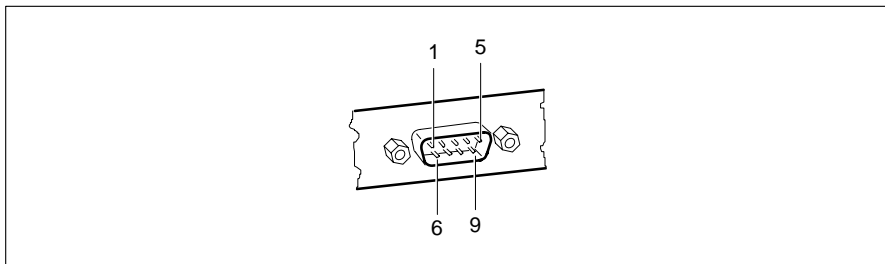
Pinout in EPP mode

Pin	Signal	Signal direction
1	Write	Output
2-9	Data Lines 0-7	Input/output
10	Intr	Input
11	Wait	Input
12	not used	---
13	not used	Input
14	DStrb	Output
15	not used	---
16	not used	---
17	AStrb	Output
18-25	Ground	

Pinout in ECP mode

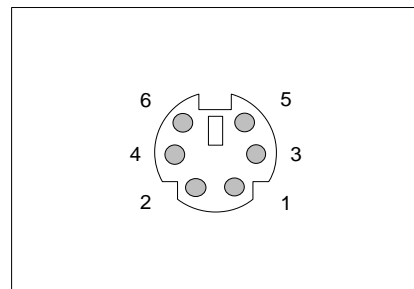
Pin	Signal	Signal direction
1	HostClk	Output
2-9	Data Lines 0-7	Input/output
10	PeriphClk	Input
11	PeriphAck	Input
12	AckReverse	Input
13	Xflag	Input
14	HostAck	Output
15	PeriphRequest	Input
16	ReverseRequest	Output
17	ECP-Mode	Output
18-25	Ground	

Serial interface



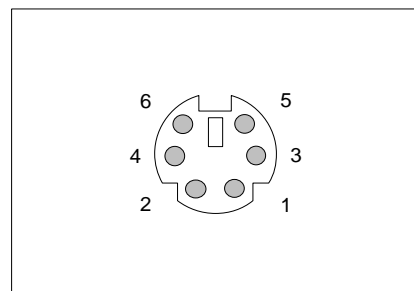
Pin	Signal	Meaning
1	DCD	Data Carrier Detect
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	Signal Ground	Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	Ri	Ring Indicator

PS/2 mouse port



Pin	Signal
1	Data
2	free
3	0 V
4	+5 V
5	Clock
6	free

PS/2 keyboard port



Pin	Signal
1	Data
2	free
3	0 V
4	+5 V
5	Clock
6	free



Interrupt Request Levels and DMA channels

Interrupt Request Levels and DMA channels are listed below.

Interrupt Request Levels

IRQ0 = timer 0
IRQ1 = keyboard
IRQ2 = IRQ9
IRQ3 = serial interface 2 (COM2/COM4)
IRQ4 = serial interface 1 (COM1/COM3)
IRQ5 = free or parallel interface (LPT2)
IRQ6 = floppy disk controller
IRQ7 = parallel interface (LPT1/LPT3)
IRQ8 = real-time clock interrupt
IRQ9 = free, or VGA controller
IRQ10 = free
IRQ11 = free
IRQ12 = free or mouse
IRQ13 = math coprocessor
IRQ14 = IDE hard disk controller (first connector)
IRQ15 = IDE hard disk controller (second connector)



DMA channels

DMA0 = free
DMA1 = free/ECP mode (jumper J1)
DMA2 = floppy disk controller
DMA3 = free/ECP mode (jumper J1)
DMA4 = DMA channel cascading
DMA5 = free
DMA6 = free
DMA7 = free

Error messages

This chapter contains error messages generated by the system board.

Access Denied - System Halted

You have entered an illegal password three times. Restart the PC.

Access Denied - Press Any Key to Continue

You have entered an illegal password three times. Press any key. The PC reboots.

Diskette drive failure

Diskette drive 0 failure

Diskette drive 1 failure

Check the entry defining the drive type in the *Diskette* field in the setup menu. Check the floppy disk drive's connecting cables.

Fixed disk configuration error

Fixed disk controller failure

Fixed disk 0 failure

Fixed disk 1 failure

Check the entries defining the hard disk type in the *Hard Disk Ctrlr*, *Hard Disk 1*, *Hard Disk 2*, *Hard Disk 3*, *Hard Disk 4* in the setup menu. Check the drive's connecting cables and jumper settings.

Incorrect Password

You have entered an illegal password. Enter the password again and press the Enter key.

Invalid configuration information

Check all the entries in the setup menu. If this error occurs each time you power up the PC, contact your sales office or customer service.

I/O Expansion board NMI

I/O Expansion board NMI, Slot x

Restart your PC. If the error persists, contact your sales office or customer service.

Error messages

!!! HARD DISK WARNING !!!

Boot sector has been modified.

Confirm the new boot sector in SETUP, and run a virus scan program.

The boot sector of your bootable hard disk drive has been modified since the last boot-up (e.g., a new operating system has been installed on the system has been infected by a virus). If the change to the boot sector was intentional (e.g., you have installed a new operating system), then acknowledge the Virus Warning function in the *System Security Options* page of the setup menu by selecting *CONFIRM*.

If you are not sure what modified the boot sector, you should check your computer for virus infection with the aid of an appropriate virus scanner program.

Keyboard is locked - unlock

Unlock the PC and restart the system.

Keyboard failure

Keyboard stuck key failure

Check whether a key is sticking and whether the keyboard is connected correctly.

Memory parity error at ...

Unresolved memory parity error

Restart your PC. If the system reports this error each time you switch it on, contact your sales office or customer service.

Memory failure at xxx read xxxx expecting xxxx

Restart your PC. If the system reports this error each time you switch it on, contact your sales office or customer service.

Not a boot diskette -

No boot device available -

No boot sector on hard disk -

Diskette read failure -

Hard disk read failure -

Insert the operating system floppy disk in the floppy disk drive and press Enter.

Check the entries for the floppy disk and hard disk types in the setup menu.

Error messages

No timer tick interrupt

Timer 2 failure

Shutdown failure

Gate A20 failure

Unexpected interrupt in protected mode

Restart your PC. If the system reports this error each time you switch it on, contact your sales office or customer service.

Passwords entered do not match

The password you entered in confirmation was different from the first password. Enter the password again and press the Enter key.

Pointing device failure

Check whether the mouse is properly connected.

Real time clock failure

Time-of-day not set - run SETUP program



Access the setup menu and enter the correct time in the *Time* field. If the system reports this error each time you switch it on, contact your sales office or customer service.

Security Features Not Changed - Press Any Key to Continue

You have failed three times in succession to correctly confirm the password. The password has not been set. Press any key. The PC will reboot.



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