



# System board D819

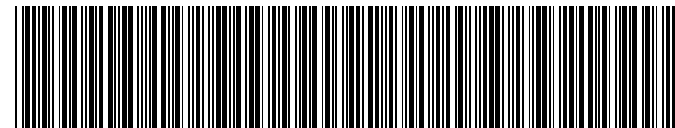
ISA / VL

Technical Manual

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## System board D819

ISA/PCI

Technical Manual

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# Introduction

This description applies for the system board with VESA Local Bus (Video Electronics Standard Association), also referred to as VL Bus.

## 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.

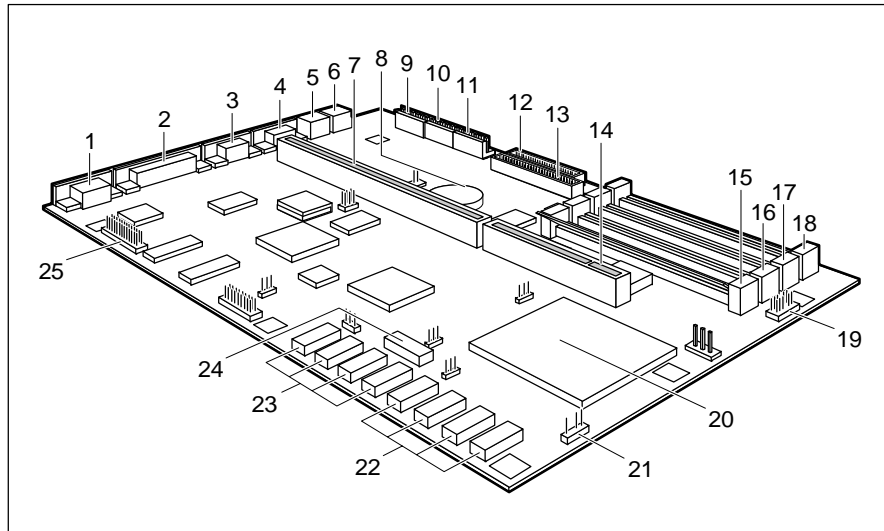
"Quotation marks" indicate highlighted text and names of chapters.

---

# Introduction

## Features

- 32-bit microprocessor
- Socket for upgrade with OverDrive processor
- VESA Local Bus for 25 MHz and 33 MHz
- Memory configuration on system board: 4 Mbyte to 64 Mbyte RAM onboard
- Second level cache memory on the system board:  
0 Kbytes, 128 Kbytes or 256 Kbytes
- 114 Byte Setup memory in CMOS RAM
- 128 Kbyte ROM
- Adaptor BIOS can be copied into Shadow RAM
- Parts of the main memory can be copied into cache memory
- Hard disk controller connected to VESA local bus for two fast IDE hard disk drives
- Monitor controller connected to VESA local bus; graphics processor S3 86C805 with Windows accelerator and 1 Mbyte DRAM video memory
- Floppy disk controller (up to 2.88 Mbyte format)
- Real-time clock/calendar with integrated battery backup
- ISA and VESA bus interface
- Connector for IDE hard disk drive
- Connector for floppy disk drive
- Connector for external loudspeaker
- Connector for external monitor 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 = Monitor interface
- 2 = Parallel interface
- 3 = Serial interface (Ser 2)
- 4 = Serial interface (Ser 1)
- 5 = Mouse interface(PS/2)
- 6 = Keyboard port(PS/2)
- 7 = ISA bus interface
- 8 = Lithium battery with connector
- 9 = Connector X250 for power supply
- 10 = Connector X251 for power supply
- 11 = Connector X253 for power supply
- 12 = Connector for floppy disk drive
- 13 = Connector for IDE hard disk drive
- 14 = VESA bus interface
- 15 = Location B0 for main memory
- 16 = Location B1 for main memory
- 17 = Location B2 for main memory
- 18 = Location B3 for main memory
- 19 = Connector for LED indicators
- 20 = Socket for processor
- 21 = Connector for external loudspeaker
- 22 = Sockets for first 128 Kbyte second level cache
- 23 = Sockets for 128 Kbyte second level cache (expansion to 256 Kbyte)
- 24 = Socket for TAG RAM (second level cache)
- 25 = Connector for external monitor controller (VESA VGA Pass-Through)


**Possible screen resolution**

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

If you are using an external monitor 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	31,4	16
640x350	84	37,8	16
640x480	60	31,5	16777216
640x480	73	38	65536
640x480	90	48	65536
720x400	70	31,4	16
720x400	84	37,8	16
800x600	56	35,4	256
800x600	57	36,1	65536
800x600	60	37,8	256
800x600	60	39	65536
800x600	72	48	256
800x600	75	49,5	256
800x600	90	60,3	256
1024x768	87 interlaced	35,5	256
1024x768	60	49	256
1024x768	70	56,6	256
1024x768	75	60,1	256
1280x1024	87 interlaced	49	16

The screen resolution depends on the connected monitor.

 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 WDSETUP 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 fejlagtig håndtering. Udskiftning 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



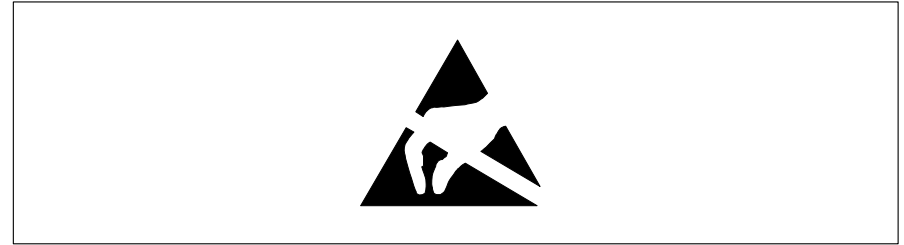
Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.



---

## 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 DX2 or OverDrive

If you upgrade the system board by adding a processor mentioned above, please note the following:

If you use the processor mentioned above, the Adaptec-SCSI controller 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 consists of the following screen pages:

*System Configuration*, *System Security Options* and *Additional System Options*.



## Settings

### System Configuration page

CMOS Setup System Configuration									
Time (hh:mm:ss)	08:38:27							Date (mm/dd/yy)	07/26/1993
Diskette A:	1.4M								
Diskette B:	NONE								
		Cyl	Hd	Pre	LZ	Sec	Mbyte		
Hard Disk 1:	48	904	8	NONE	904	46	162		
Hard Disk 2:	NONE								
Base Memory:	640K							Video Display:	EGA/VGA
Extended Memory:	3072K							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

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.



If the wrong hard disk type is entered, the system cannot be loaded. An error message like the following appears: `No operating system.`

Special entries for the hard disk type:

Entry for SCSI hard disks: *NONE*

Entry for ESDI hard disks: *I*

*I* through *47*

The hard disk parameters (cylinders, heads, etc.) for types 1 through 47 are preset.

*48* and *49*

The hard disk parameters (cylinders, heads, etc.) for types 48 und 49 are user-defined and are entered at the keyboard.

Examples of user-defined entries (IDE drives)

Size	Cyl	Hd	Pre*	Lz*	Sec	Mbyte
120 Mbyte:	762	8	NONE	0	39	116
170 Mbyte:	904	8	NONE	0	46	162
210 Mbyte:	683	16	NONE	0	38	202
340 Mbyte:	904	16	NONE	0	46	324
520 Mbyte:	1024	16	NONE	0	63	504

*NONE*

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

Default entry for *Hard Disk 1*: depends on hard disk installed

Default entry for *Hard Disk 2*: *NONE*

## Base Memory

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

## Extended Memory

This field indicates the size of the memory above 1 Mbyte.

## 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

The entry in this field has no effect.

## 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*

This means that command execution is interrupted each time an error is detected during the self-test.

*NO HALT ON ANY ERRORS*

Command execution is not interrupted.

*NO KEYBOARD ERROR HALT*

Command execution is not interrupted in the event of a keyboard error.

*NO DISK ERROR HALT*

Command execution is not interrupted in the event of floppy or hard disk errors.

*NO KEYBOARD OR DISK HALT*

Command execution is not interrupted in the event of keyboard, floppy disk or hard disk 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)  07/26/1993

System Load:      STANDARD
Security Features:  DISABLED

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

Parallel:        LPT1 (378h)             HD Ctrlr Mode:  STANDARD
Par Mode:        PRINTER                  HD Power Down:  DISABLED
Virus Warning:   ENABLED                  Hard Disk Ctrlr: ENABLED
Soft Power Off:  DISABLED                 HD1 LBA Mode:   ENABLED
Flash Write:     DISABLED                 HD2 LBA Mode:   ENABLED

-----
<F1> Help      <F8> System info  <F10> Store CMOS  <Esc> Exit  Page
<...> Edit field  <↑↓←→> 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 entry enables you to inhibit loading of the operating system from floppy disk.

*STANDARD*

The operating system is loaded from floppy disk and from hard disk.

*DISKETTE LOCK*

The operating system can only be loaded from the hard disk.

*NONSTANDARD*

This entry has the same effect as the entry *STANDARD*.

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

Default entry: *DISABLED*

## Serial 1

The serial interface SER1 can be set here.

*COM1 (3F8h)*

The serial interface SER1 is set to addresses 3F8h and IRQ4.

*COM3 (3E8h)*

The serial interface SER1 is set to addresses 3E8h and IRQ4.

*DISABLED*

The serial interface SER1 is off.

Default entry: *COM1 (3F8h)*

## Serial 2

The serial interface SER2 can be set here.

*COM2 (2F8h)*

The serial interface SER2 is set to address 2F8h and IRQ3.

*COM4 (2E8h)*

The serial interface SER2 is set to address 2E8h and IRQ3.

*DISABLED*

The serial interface SER2 is off.

Default entry: *COM2 (2F8h)*

## Parallel

The parallel interface PAR can be set here.

*LPT1 (378h)*

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

*LPT3 (3BCh)*

The parallel interface PAR is set to address 3BCh and IRQ7. If you use this setting, the entry in the field *Par Mode* must be set to *PRINTER*.

*DISABLED*

The parallel interface PAR is off.

Default entry: *LPT1 (378h)*

## Par Mode

You can define here the transmission mode of the parallel interface.

*PRINTER*

The parallel interface PAR can only send.

*BIDIRECTION*

Additional software enables the parallel interface PAR to send and receive.

*EPP*

Enhanced Parallel Port. The enhanced parallel transmission according to EPP is supported.

*ECP*

Extended Capabilities Port. The fast parallel transmission according to ECP is supported.

*EPP AND ECP*

The transmission according to EPP and ECP is supported.

Default entry: *PRINTER*

## 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*

## Soft Power off

In this field you can specify if it is possible to power off the PC with the *SWOFF* program. The input field is effective only if the system board supports PC power off by means of the *SWOFF* program.

*DISABLED*

The system unit can be powered off only with the ON/OFF switch.

*ENABLED*

The system unit can be powered off either with the *SWOFF* program or with the ON/OFF switch.

Default entry: *DISABLED*

Flash Write

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

*ENABLED*

The flash BIOS can be written or deleted, provided jumper J8-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: *DISABLED*

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 J8-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*

HD Ctrlr Mode

With this input field, you can set the transmission speed of the IDE hard disk.

*STANDARD*

The system transfers 512 bytes per interrupt

*4K BLOCK XFER*

4 Kbytes are transferred per interrupt. This setting is supported by most hard disks with a disk buffer of 4 Kbytes or more.

Default entry: *STANDARD*

HD Power Down

In this input field you can set the time after which the motor of the IDE hard disk drive powers down if no access operations are performed. You can save energy by powering down the motor.

The hard disk drive needs env. 15 s to start-up

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

Default entry: *DISABLED*

Hard Disk Ctrlr

This field allows you to disable the hard disk controller on the system board.

*ENABLED*

The IDE hard disk controller on the system board is on.

*DISABLED*

The IDE hard disk controller on the system board is off.

Default entry: *ENABLED*

HD 1: LBA Mode

HD 2: LBA Mode

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 entry 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.

*ENABLED*

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: depending on built-in hard disk drive

## Additional System Options page

```

          CMOS Setup
    Additional System Options
-----
Time (hh:mm:ss)  08:38:27          Date (mm/dd/yy)  07/26/1993
System BIOS:          64K
Shadow BIOS ROM:     SYSTEM AND VIDEO BIOS
                   C800 CC00 D000 D400 D800 DC00
Shadow Adaptor ROM:  NO   NO   NO   NO   NO   NO

Cache:
Cache Shadow RAM::  INTERN AND EXTERN
                   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
<...> Edit field  <↑↓←→> 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 input field you can make available a ROM address area of 64 Kbytes for requests via the ISA bus (e. g. SCSI-BIOS).

Possible entries:

*64K*

The address area E0000H - EFFFFH (64 Kbytes) is available for requests via the ISA bus.

The address area F0000H - FFFFFH (64 Kbytes) is reserved for the system BIOS.

*128K*

The address area E0000H - FFFFFH (128 Kbytes) is reserved for the system BIOS.

Default entry: *64K*

## Shadow BIOS ROM

The entry in this field enables you to copy the system BIOS or video BIOS to the fast RAM after powering up. This shortens the runtimes of these program sections and enhances PC performance (speed).

*SYSTEM AND VIDEO BIOS*

System BIOS and video BIOS are copied in RAM area C0000H - C7FFFH and F0000H - FFFFFH.

*SYSTEM BIOS ONLY*

System BIOS is copied in RAM area E8000H - FFFFFH.

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 AND EXTERN*

The internal cache and the second level cache are enabled.

*INTERN ONLY*

Only the internal cache is enabled.

*DISABLED*

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

Default entry: *INTERN ONLY* or *INTERN AND EXTERN*

Cache Shadow RAM

With this input field, you can map the system BIOS and the video BIOS in the cache memory. This enhances PC performance (speed).

Condition:

In the *Cache* field, *INTERN AND EXTERN* or *INTERN ONLY* must be set and the selected BIOS must be copied to the RAM with the *Shadow BIOS ROM* function!

Possible entries:

*SYSTEM BIOS ONLY*

System BIOS is mapped in the cache memory.

*VIDEO BIOS ONLY*

Video BIOS is mapped in the cache memory.

*SYSTEM AND VIDEO BIOS*

System BIOS and video BIOS are mapped in the cache memory.

*DISABLED*

The function is disabled.

Default entry: *VIDEO BIOS ONLY*

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.

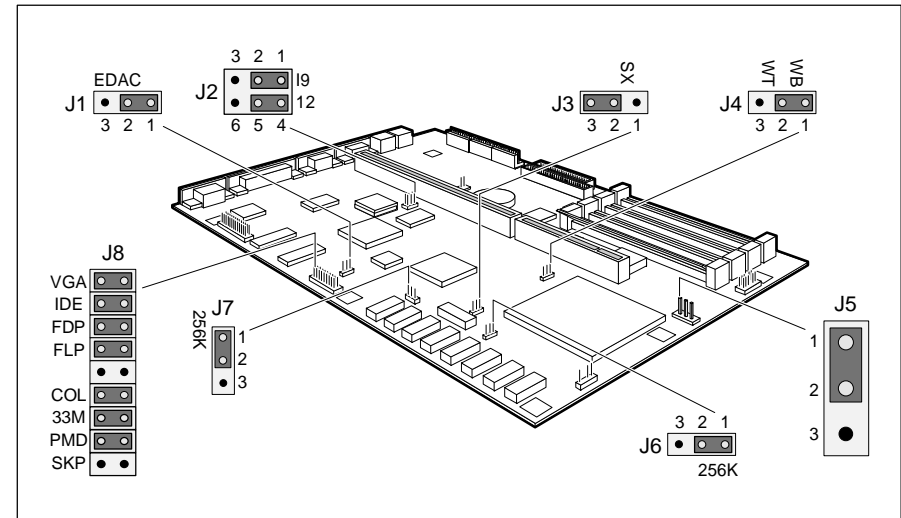
*YES*

The relevant ROM area is mapped to the cache.

Default entry: *NO*



Jumper settings



- J1 = jumper for external monitor controller (VESA-VGA-Pass-Through)
- J2 = VGA interrupt IRQ9 and interrupt IRQ12
- J3 = processor type
- J4 = cache memory access for 586 OverDrive
- J5 = voltage supply for processor
- J6 = Second level cache
- J7 = Second level cache
- J8 = monitor and hard disk controller, floppy disk drive and clock rate

VGA interrupt IRQ9 and mouse interrupt IRQ12

With the jumper J2 you can set the VGA interrupt IRQ9 and mouse interrupt IRQ12.

IRQ9 used by VGA controller = jumper J2 set to 1-2

IRQ9 not used = jumper J2 set to 2-3

IRQ12 used by mouse = jumper J2 set to 4-5

IRQ12 not used = jumper J2 set to 5-6

Default setting:

Jumper J2 set to 1-2 = IRQ9 used by VGA controller

Jumper J2 set to 4-5 = IRQ12 used by mouse

**Processor settings**

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

**Processor type**

Jumper J3 is used to specify the processor type.

SX processor = J3 jumper is set to 1-2

all other processor (incl. SX2) = J3 jumper is set to 2-3

Default setting:

depends on the type of processor installed

**Cache memory access for 586 OverDrive**

Jumper J4 is used to specify the cache memory access for 586 OverDrive. Write back allows a quicker access to the cache memory than write through.

Write back = jumper J4 is set to 1-2

Write through = jumper J4 is set to 2-3

Default setting:

jumper J4 is set to 1-2 = Write back

**Operating voltage for the processor**

Jumper J5 is used to set the operating voltage for the CPU. The 5 V setting is for 5 V CPUs.



Never run a 3.3 V CPU at 5 V.

5 V supply = jumper J5 is set to 1-2

3.3 V supply (e.g. for the DX4) = jumper J5 is set to 2-3

Default setting:

depends on the type of CPU installed

**External clock rate**

Jumper J8-33M is used to set the external clock rate for the processor (33 MHz or 25 MHz).

External clock rate 25 MHz = jumper J8-33M open

External clock rate 33 MHz = jumper J8-33M inserted

Default setting:

depends on the type of processor installed

**Size of the second level cache**

Jumpers J6 and J7 define the size of the second level cache.

256-Kbyte second level cache = jumpers J6 and J7 set to 1-2

0 or 128-Kbyte second level cache = jumpers J6 and J7 set to 2-3

Default setting:

depends on the size of the second level cache

**Monitor controller settings****Connector for external monitor controller**

Jumper J1 is used to set the connector for the external monitor controller (VESA-VGA-Pass-Through).

Connector not used = jumper J1 set to 1-2  
Connector is used = jumper J1 set to 2-3

Default setting:  
Jumper J1 set to 1-2 = connector not used

**Monitor controller on system board**

Jumper J8-VGA is used to enable or disable the monitor controller on the system board.

Monitor controller enabled = jumper J8-VGA inserted  
Monitor controller disabled = jumper J8-VGA open

Default setting:  
Jumper J8-VGA inserted = monitor controller enabled

**Primary monitor controller**

Jumper J8-COL is used to set the primary monitor controller.

Color monitor controller = jumper J8-COL inserted  
Monochrome monitor controller = jumper J8-COL open

Default setting:  
Jumper J8-COL inserted = color monitor controller

**IDE hard disk controller**

Jumper J8-IDE is used to enable or disable the IDE hard disk controller on the system board.

IDE hard disk controller enabled = jumper J8-IDE inserted  
IDE hard disk controller disabled jumper J8-IDE open

Default setting:  
Jumper J8-IDE inserted = IDE hard disk controller enabled


**Write protection for floppy disk drive**

Jumper J8-FDP is used to define whether floppy disks can be written or deleted in the floppy disk drive. To write and delete floppy disks, the field *Diskette Write* must be set to *ENABLED* in the *System Security Options* setup menu.

Read, write and delete floppy disks = jumper J8-FDP inserted  
Read only floppy disks = jumper J8-FDP open

Default setting:  
Jumper J8-FDP inserted = read, write and delete floppy disks enabled

**BIOS update**

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

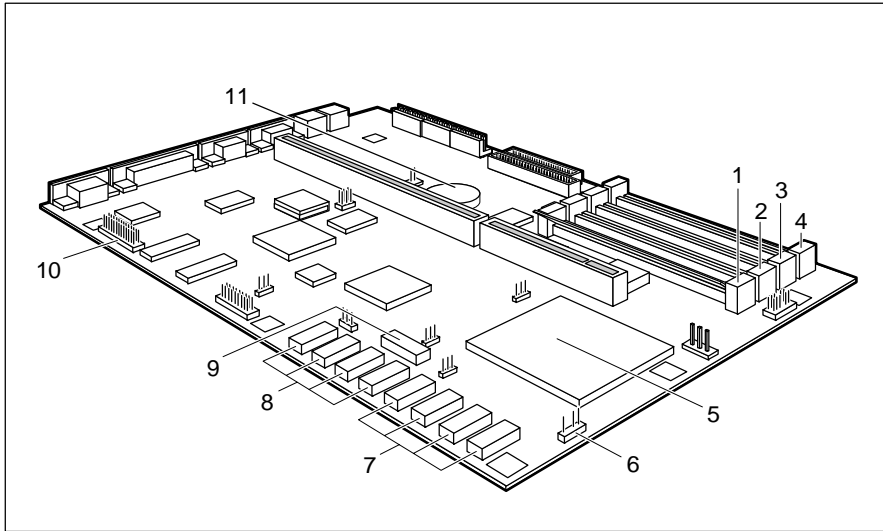
Jumper J8-FLP enables and disables BIOS updating. In addition, when updating the BIOS you must ensure that *Flash Write* is set to *ENABLED* in the *System Security Options* setup menu.

BIOS updating disabled = jumper J8-FLP closed  
BIOS updating enabled = jumper J8-FLP is open

Default setting:  
Jumper J8-FLP open = BIOS updating enabled



## Add-on modules



- 1 = Location B0 for main memory
- 2 = Location B1 for main memory
- 3 = Location B2 for main memory
- 4 = Location B3 for main memory
- 5 = Socket for processor
- 6 = Connector for external loudspeaker
- 7 = Sockets bank 0 for first 128 Kbytes of second level cache

- 8 = Sockets bank 0 for 128 Kbytes of second level cache (expansion to 256 Kbytes)
- 9 = Socket for TAG RAM (second level cache)
- 10 = Connector for VESA VGA pass through
- 11 = Lithium battery

## Upgrading main memory

Four locations (B 0 through B 3) are available on the system board for installing memory modules. The board supports a maximum of 64 Mbytes. You may use memory modules of 4, 8, 16 or 32 Mbyte. You may add memory modules of different capacity in the locations.



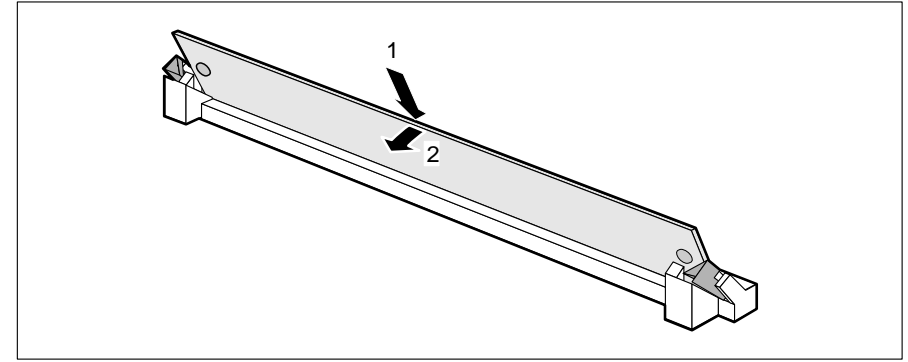
You may only use fast memory modules (access time = 70ns or less).

You may use a maximum of three memory modules of 8 Mbytes that are equipped with memory chips on both sides.

## Add-on modules

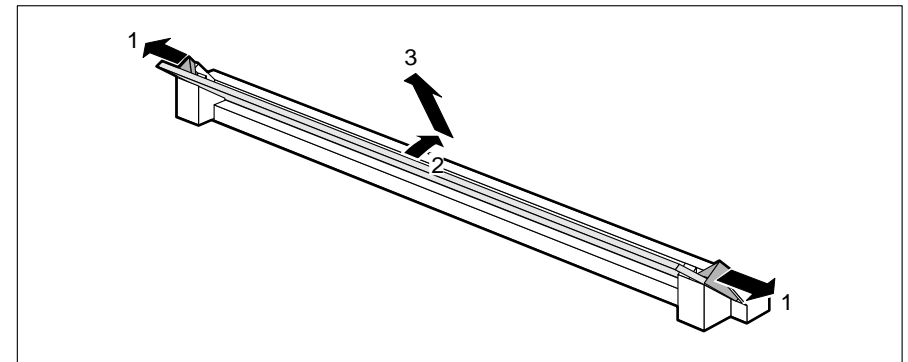
### Installing memory modules

When installing more than one memory module, start by installing the first in B0.



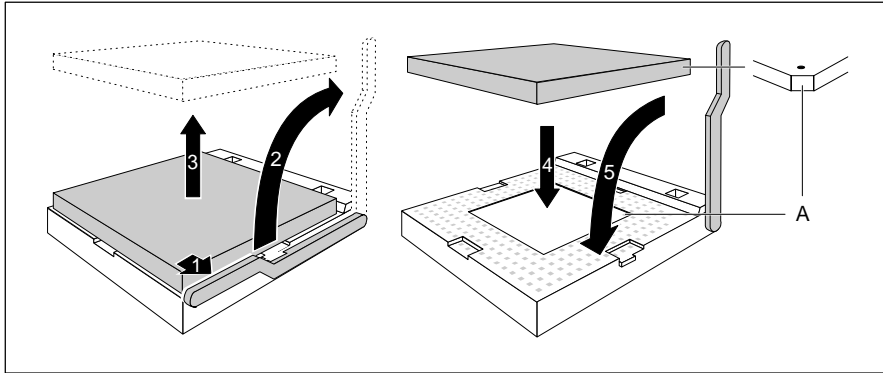
- ▶ Insert the memory module at angle into the appropriate location (1). Ensure that the key notch and the two holes are correctly aligned with the retaining pins.
- ▶ Tilt the module down until it snaps into place (2).

### 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).

## 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 J3, J4, J5 and J8-33M on the system board according to the inserted processor.



If you install a 586 OverDrive processor, you must note the following:

The air circulation of the processor fan must not be obstructed by cables or other objects.

No full-length board must be fitted in the bottom board slot. There must be a gap of at least 15 mm between the board and the processor base.

## Adding second level cache memory

The system board will work with 0 Kbytes, 128 Kbytes or 256 Kbytes of second level cache. The board has nine sockets (bank 0, bank 1, TAG) for the necessary SRAM chips.

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

- *Shadow BIOS ROM:*     *SYSTEM AND VIDEO BIOS*
- *Cache:*                 *INTERN AND EXTERN*
- *Cache Shadow RAM:*   *VIDEO BIOS ONLY*

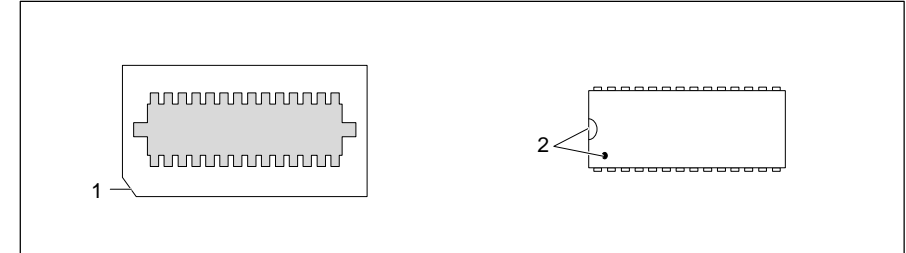


Information on which SRAM components you can use is available from your sales office or the customer service.

The TAG RAM socket should be populated with one 15ns 32-pin SRAM chip (32Kbit\*9).

The second level cache sockets should be populated with with 20ns 28-pin SRAM chips (32Kbit\*8).

Note the location of the SRAM chip when you plug in SRAM chip!

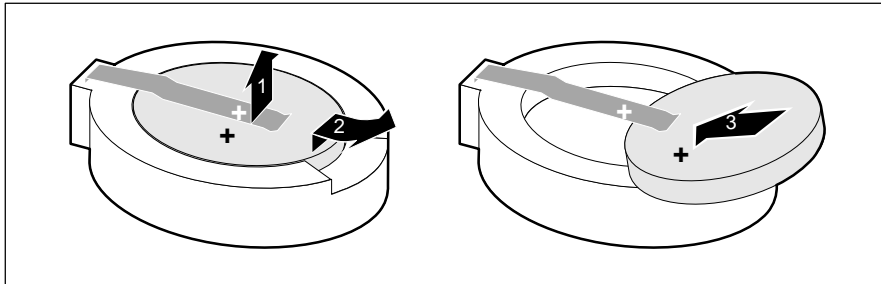


- ▶ Insert the SRAM chip so that the marking on it (2) matches the marking on the socket (1).
- ▶ Set jumpers J6 and J7 on the system board according to the cache memory size.
- ▶ Makes the recommended changes in the setup menu.

## 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.

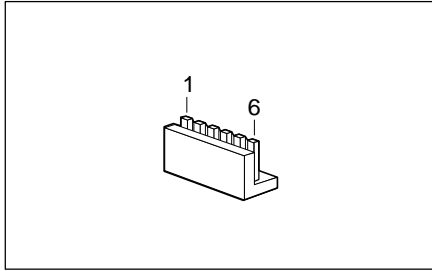


- ▶ Lift the contact (1) a few millimeters and remove the battery from its socket (2).
- ▶ Insert a new lithium battery of the same type in the socket (3).



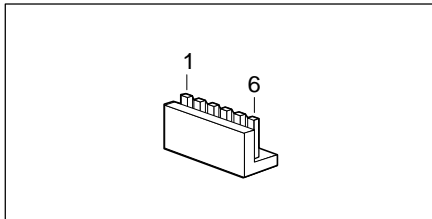
## Interface pinouts and interrupts

### Connector X250 for power supply



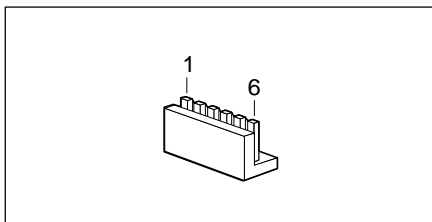
Pin	Meaning
1	Power Good
2	+5V
3	+12 V
4	-12 V
5	0 V
6	0 V

### Connector X251 for power supply



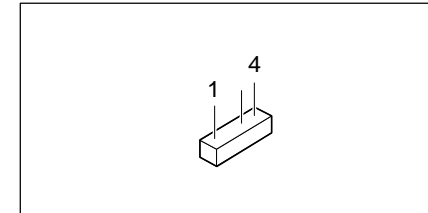
Pin	Meaning
1	0 V
2	0 V
3	-5 V
4-6	+ 5 V

### Connector X253 for power supply



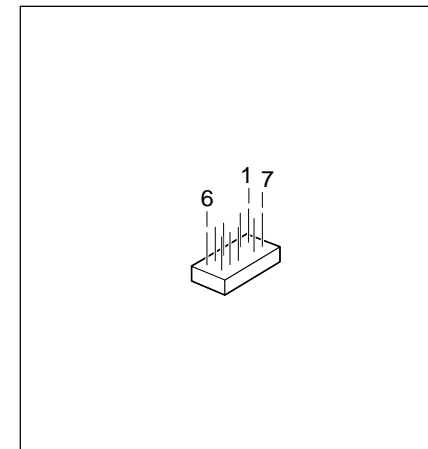
Pin	Meaning
1	0 V
2	0 V
3	0 V
4-6	+ 3.3 V

### Connector for external loudspeaker



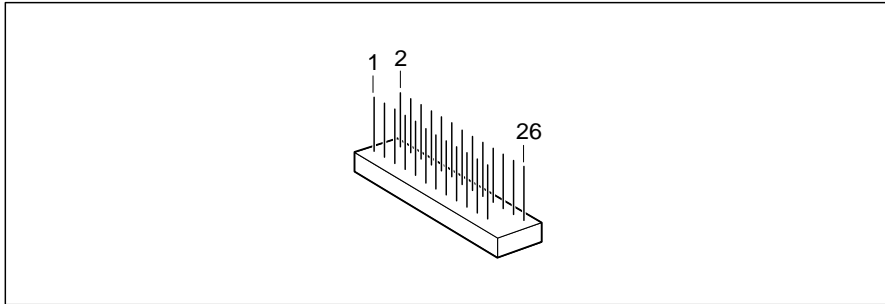
Pin	Meaning
1	loudspeaker coded
2	0 V
3	0 V
4	+5 V

### Connector for LED indicators



Pin	Signal name
1	System unit ON
2	not used
3	coded
4	not used
5	Reset switch
6	+5 V
7	0 V
8	0 V
9	coded
10	0 V
11	0 V
12	Hard disk drive

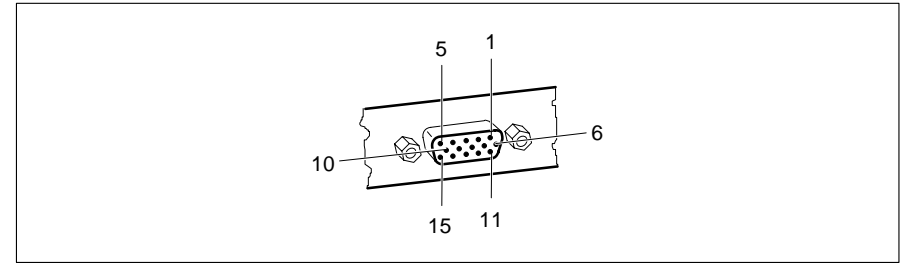
### Connector for external monitor controller (VESA VGA pass-through)



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

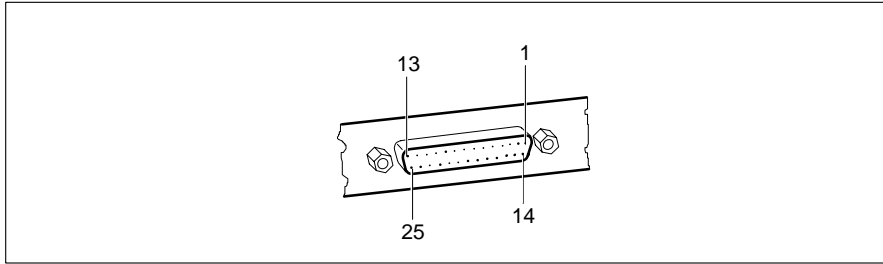


### Connector for monitor



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

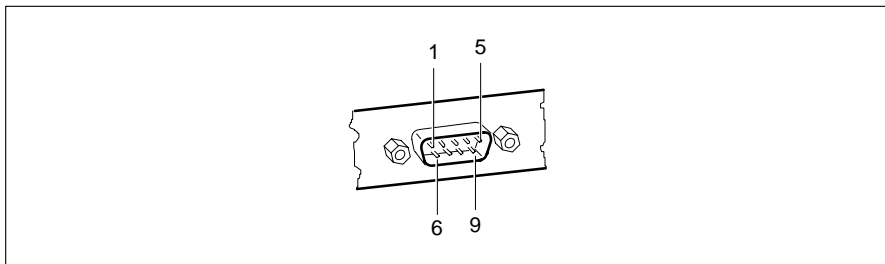
#### Pinout in EPP mode

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

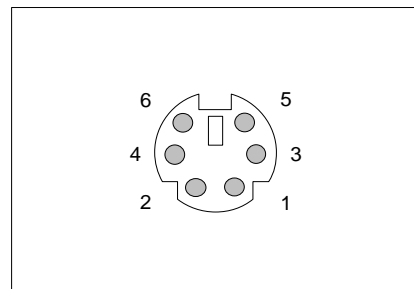
Pin	Signal	Signal direction
1	HostClk	Output
2-9	Data Lines 0-7	Input/output
10	PeriphClk	Input
11	PeriphAck	Input
12	AckReverse	Input
13	Xflag	Input
14	HostAck	Output
15	PeriphRequest	Input
16	ReverseRequest	Output
17	ECP-Mode	Output
18-25	Ground	

### Serial interface



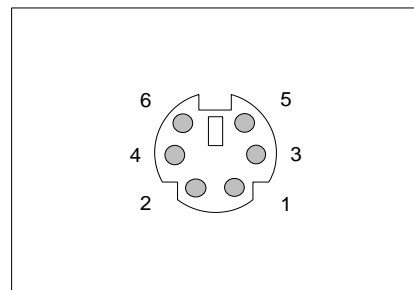
Pin	Signal	Meaning
1	DCD	Data Carrier Detect
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	Signal Ground	Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	Ri	Ring Indicator

### 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  
IRQ6 = floppy disk controller  
IRQ7 = parallel interface (LPT1/LPT3)  
IRQ8 = real-time clock interrupt  
IRQ9 = free, or VGA controller  
IRQ10 = free  
IRQ11 = free  
IRQ12 = 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 3 times. Restart the PC.

### Access to Setup Denied - Press Any Key to Continue

You have entered an illegal password 3 times. Press any key.

### CMOS RAM ERROR, CHECK BATTERY/RUN SETUP

Check all the entries in the setup menu. If this error occurs each time the PC is powered up, contact your customer field service.

### DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

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

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

### DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Check the drive type entered in the *Diskette* field of the setup menu and also the connections for the floppy disk drive.

### ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Check the hard disk type entered in the *Hard Disk 1* and *Hard Disk 2* fields of the setup menu and also the connections and jumpers on the hard disk drive.

### ERROR INITIALIZING HARD DISK CONTROLLER

Contact your customer field service.

### FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Check the entry in the *Diskette* field of the setup menu and also the connections and jumpers on the floppy disk drive.

### Incorrect Password

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

### IO PARITY ERROR - SYSTEM HALTED

Restart your PC. Should the error recur, contact your customer field service.

### KEYBOARD ERROR OR NO KEYBOARD PRESENT

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

---

## Error messages

MEMORY PARITY ERROR AT AA:SSSS:0000 FOUND FFFF EXPECTED EEEE  
Restart your PC.

### MEMORY SIZE ERROR - RUN SETUP

Call up the setup menu and confirm with the **F10** and **F5** keys the entries in the *Base Memory* and *Extended Memory* fields.

MEMORY VERIFY ERROR AT AA:SSSS:0000 FOUND FFFF EXPECTED EEEE  
Restart your PC.

### Passwords entered do Not Match

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

RAM PARITY ERROR. CHECKING FOR SEGMENT ADDRESS ...  
OFFENDING SEGMENT: SSSS

Restart your PC.

RAM PARITY ERROR. CHECKING FOR SEGMENT ADDRESS ...  
OFFENDING ADDRESS NOT FOUND

Restart your PC.

### REAL TIME CLOCK ERROR - RUN SETUP

Call up the setup menu and enter the correct time in the *Time* field.

### REFRESH TIMING ERROR

Contact your customer field service.



### Security Features Not Changed - Press Any Key to Continue

You have confirmed an illegal password 3 times. No password is assigned. Press any key.

### VIDEO EQUIPMENT CONFIGURATION ERROR - RUN SETUP

The entry in the *Video Display* field of the setup menu is incorrect. Correct the entry or the jumper for the primary monitor.

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