SIEMENS NIXDORF

PC

System board D824

ISA

Technical Manual

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A26361-D824-Z120-5-7619

Introduction

This description applies for the system board with ISA Bus.

Notational conventions

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

This indicates instructions which it is essential to observe. Failure to do so may endanger your health, the operational integrity and electrical safety of your PC, or the security of your 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.

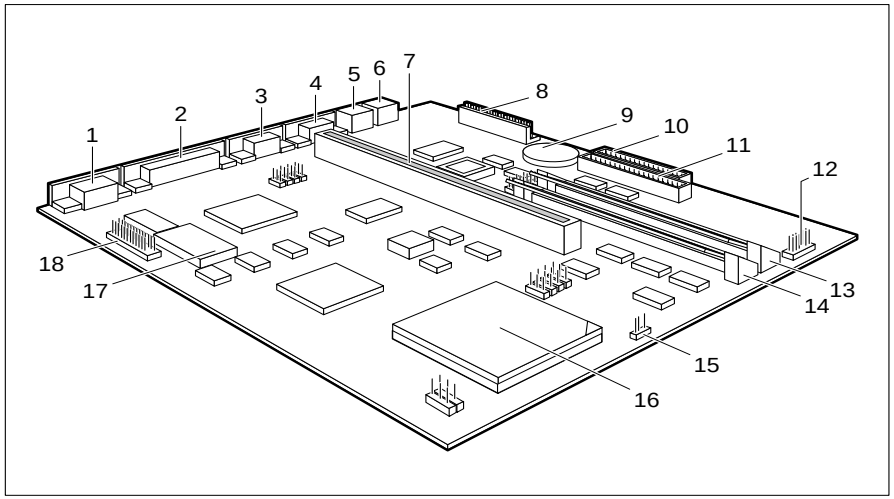
`Texts in this bold typeface` are the entries you make via the keyboard.

Texts in italics indicate commands or menu items.

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

Features

- 32-bit microprocessor i486 SX, i486 SX2, i486 DX, i486 DX2 with 8 Kbytes internal cache memory (first level cache); SL enhanced versions
- Upgrade possibility with upgrade processors ODP486 SX, ODP486 DX/33 or ODPR486 DX
- Math coprocessor: integrated in processor i486 DX and i486 DX2
- Memory configuration on system board: 4 Mbytes to 32 Mbytes RAM onboard
- 114 Bytes Setup memory in CMOS RAM
- 128 Kbytes ROM
- BIOS can be copied into RAM
- Hard disk controller for two IDE hard disk drives
- Monitor controller; graphics processor GD5428 with Windows accelerator and 512 Kbytes DRAM video memory on the system board (upgradable to 1 Mbyte)
- Floppy disk drive controller (up to 1.44 Mbyte format)
- Real-time clock/calendar with integrated battery backup
- ISA bus interface for platter
- 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
- Two serial interfaces
- Mouse interface (PS/2)
- Keyboard port (PS/2)
- 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 = Connector for power supply
9 = Lithium battery
10 = Connector for floppy disk drive
11 = Connector for IDE hard disk drive
12 = Connector for LED indicators
13 = Location bank 1 for main memory
14 = Location bank 0 for main memory
15 = Connector for external loudspeaker
16 = Socket for processor
17 = Socket for additional video memory
18 = 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 Operating Manual or Technical Manual supplied with the controller.

You can use the *WDSETUP* program (under MS-Windows) or the *SET-VGA* program (under MS-DOS) to set the screen resolution. Detailed information is provided in the MS-Windows *INFO* window or in the information file *VGA.WRI*.

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.

Screen resolution	Refresh rate (Hz)	Horizontal rate (kHz)	Max. number of colors
640x350	70	31,4	16
640x350 *)	83	39,4	16
640x350	84	37,8	16
640x480	60	31,5	256
640x480 **)	60	31,2	65536
640x480 **)	60	31,5	16777160
640x480 *)	71	39,4	256
640x480 *) **)	71	39,4	65536
640x480	75	37,5	256
640x480 **)	75	37,5	65536
720x400	70	31,5	16
720x400 *)	83	39,4	16
720x400	84	37,8	16
800x600	56	35,5	256
800x600 **)	56	35,5	65536
800x600	60	37,9	256
800x600 **)	60	37,9	65536
800x600	72	48,2	256
800x600	75	46,9	16
800x600 **)	75	46,9	256
1024x768	87 interlaced	35,5	16
1024x768 **)	87 interlaced	35,5	256
1024x768	61	48,9	16
1024x768 **)	61	48,9	256
1024x768	70	56,5	16
1024x768 **)	70	56,5	256
1024x768	75	60,3	16
1024x768 **)	75	60,3	256
1280x1024 **)	87 interlaced	49	16

*) = overscan

**) = only with 1Mbyte video memory

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.

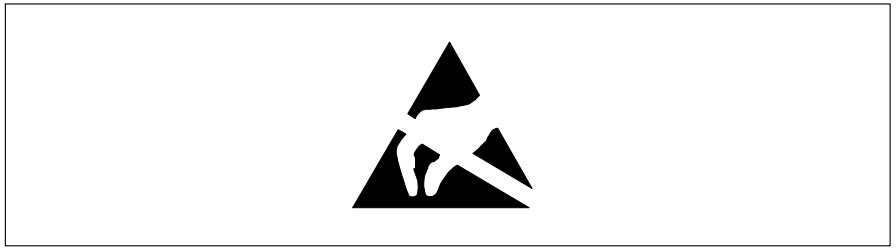
VARNING

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.

Modules with **e**lectrostatic **s**ensitive **d**evices (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 Pentium or OverDrive processor

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 switch block 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 call 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
Additional System Options

System Configuration page

```
                          CMOS Setup
                     System Configuration
-------------------------------------------------------------------------

Time (hh:mm:ss)   08:38:27               Date (mm/dd/yyyy)   01/06/1994

Diskette A:       1.4M
Diskette B:       NONE
                              Cyl    Hd   Pre    LZ   Sec   Mbyte
Hard Disk 1:      48           683   16    0      0    38     202
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 - Replacing the lithium battery").

Diskette A
Diskette B

These two fields are used to specify the type of floppy disk 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*
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:
Default for SCSI hard disk drives: *NONE*
Default for ESDI hard disk drives: *1*

1 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 and 49 are user-defined and are entered at the keyboard.

Examples of user-defined entries (IDE drives)

Size	Cyl	Hd	Pre	Lz	Sec	Mbytes
210 Mbytes:	**683**	**16**	**0**	**0**	**38**	**212**
270 Mbytes:	**917**	**12**	**0**	**0**	**48**	**270**
340 Mbytes:	**904**	**16**	**0**	**0**	**46**	**340**
520 Mbytes:	**1024**	**16**	**0**	**0**	**63**	**524**

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*: *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
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/yyyy)   01/06/1994

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: DISABLED
                                    Hard Disk Ctrlr:  ENABLED
                                    HD 1 LBA Mode:    DISABLED
                                    HD 2 LBA Mode:    DISABLED

-------------------------------------------------------------------------

<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 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

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 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.

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.

PRINTER
The port functions as an output port only.

BIDIRECTION
Data can be transferred in both directions across the port.

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*

Diskette Write

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

ENABLED
Floppy disks can be read, written or deleted, provided the jumper BLOCK1-FD_PRT on the system board is set to 1-2.

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

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

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

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)

Hard Disk Ctrlr

This fields 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.

Possible entries:

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/yyyy)   01/06/1994

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:                      ENABLED
Cache Shadow RAM::          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 F0000H - FFFFFH (64 Kbytes) is reserved for the system BIOS
The address area E0000H - EFFFFH (64 Kbytes) is available for requests via the ISA bus..

128K

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

Default entry: *64K*

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.

SYSTEM AND VIDEO BIOS

The system BIOS and the video BIOS are both copied to RAM area C0000H - C7FFFH and F0000H - FFFFFH.

SYSTEM BIOS ONLY

Only the system BIOS is copied to 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.

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).

ENABLED

The function is enabled.
The first level cache memory (in the processor) can be used.

DISABLED

The function is disabled.
The first level cache memory (in the processor) cannot be used. All cache-related settings are then without effect.

Default entry: *ENABLED*

Cache Shadow RAM

Condition: In the *Cache* field, *ENABLED* must be set and the selected BIOS must be copied to the RAM with the *Shadow BIOS ROM* function!

In the *Cache Shadow RAM* field you can select the BIOS area that is mapped in the cache memory. This enhances PC performance (speed).

Possible entries:

SYSTEM BIOS ONLY
System BIOS is mapped in the cache memory.

SYSTEM AND VIDEO BIOS
System BIOS and video BIOS are mapped in the cache memory.

VIDEO BIOS ONLY
Video BIOS is mapped in the cache memory.

DISABLED
The function is disabled.

Default entry: *VIDEO BIOS ONLY*

Cache Adaptor ROM

Condition: *Cache* must be enabled and the relevant 16-Kbyte ROM area must be copied into the RAM with the *Shadow Adaptor ROM* function.

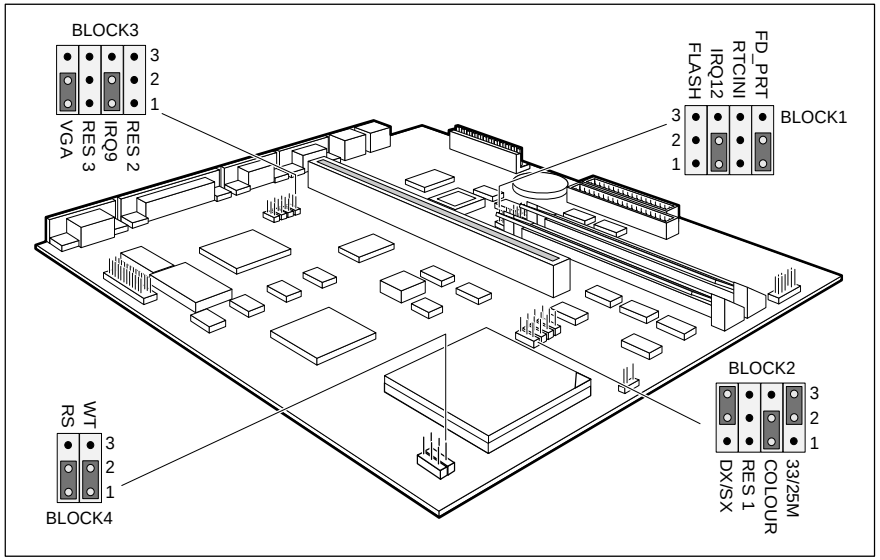
Cache Adaptor ROM allows you to specify whether the relevant 16-Kbyte ROM area should be mapped to the cache. Mapping the ROM area to RAM increases system performance.

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



BLOCK1 = Floppy disk drive write protection and Mouse interrupt IRQ12
BLOCK2 = external clock rate, primary monitor controller and processor type
BLOCK3 = VGA interrupt IRQ9 and monitor controller
BLOCK4 = First level cache

Write protection for floppy disk drive

The jumper BLOCK1-FD_PRT 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 BLOCK1-FD_PRT is set to 1-2
Read only floppy disks = jumper BLOCK1-FD_PRT is set to 2-3

Default setting:
Jumper BLOCK1-FD_PRT is set to 1-2 = read, write and delete floppy disks enabled

Mouse interrupt IRQ12

With the jumper BLOCK1-IRQ12 you can set the interrupt IRQ12.

IRQ12 used by mouse = jumper BLOCK1-IRQ12 set to 1-2
IRQ12 not used = jumper BLOCK1-IRQ12 set to 2-3

Default setting:
Jumper BLOCK1-IRQ12 set to 1-2 = IRQ12 used by mouse

VGA interrupt IRQ9

With the jumper BLOCK3-IRQ9 you can set the interrupt IRQ9.

IRQ9 not used = jumper BLOCK3-IRQ9 set to 1-2
IRQ9 used by VGA controller = jumper BLOCK3-IRQ9 set to 2-3

Default setting:
Jumper BLOCK3-IRQ9 set to 1-2 = IRQ9 not used

Processor settings

When you upgrade the processor, you must check and set the jumpers BLOCK2-33/25M and BLOCK2-DX/SX.

External clock rate

With the jumper BLOCK2-33/25M you can define the external clock rate of the processor (33 MHz or 25 MHz).

External clock rate 25 MHz = Jumper BLOCK2-33/25M set to 1-2
External clock rate 33 MHz = Jumper BLOCK2-33/25M set to 2-3

Default setting:
Depending on the built-in processor

Processor type

With the jumper BLOCK2-DX/SX you can define the processor type.

SX processor = Jumper BLOCK2-DX/SX set to 1-2

All other processor types (including SX2) = Jumper BLOCK2-DX/SX set to 2-3

Default setting:
Depending on the built-in processor

First level cache

The setting of the jumpers BLOCK4-WT and BLOCK4-RS depends on the first level cache.
If the system board is fitted with a processor with a write-back cache (e.g. Pentium OverDrive, i486DX2A), the jumpers must be set to 2-3. If it is fitted with a processor with a write-through cache (e.g, DX, DX2, etc.) the jumpers must be set to 1-2.

Write-through = jumper BLOCK4-WT and BLOCK4-RS are set to 1-2
Write-back = jumper BLOCK4-WT and BLOCK4-RS are set to 2-3

Default setting:
depends on the type of processor installed

Monitor controller settings

Primary monitor controller

With the jumper BLOCK2-COLOUR you can set the primary monitor controller.

Color monitor controller = Jumper BLOCK2-COLOUR set to 1-2
Monochrome monitor controller = Jumper BLOCK2-COLOUR set to 2-3

Default setting:
jumper BLOCK2-COLOUR set to 1-2 = Color monitor controller

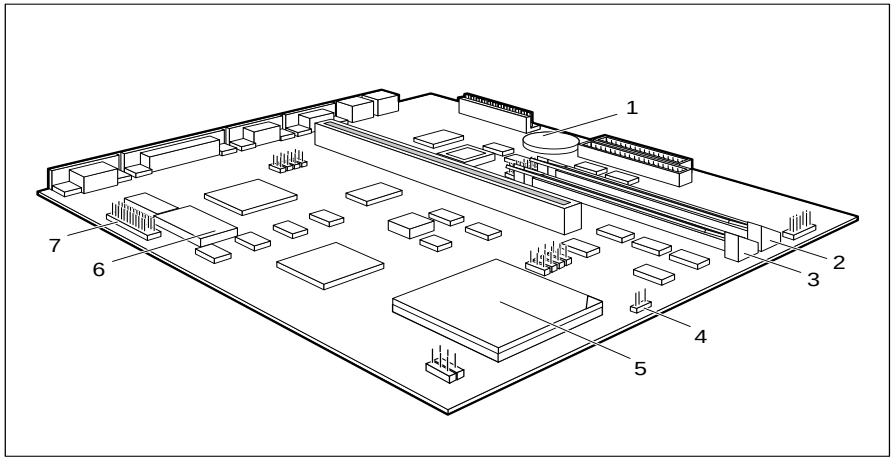
Monitor controller on the system board

With the jumper BLOCK3-VGA you can enable or disable the monitor controller on the system board.

Monitor controller enabled = Jumper BLOCK3-VGA set to 1-2
Monitor controller disabled = Jumper BLOCK3-VGA set to 2-3

Default setting:
Jumper BLOCK3-VGA set to 1-2 = Monitor controller enabled

Add-on modules



1 = Location lithium battery
2 = Location bank 1 for main memory
3 = Location bank 0 for main memory
4 = Connector for external loudspeaker
5 = Socket for processor
6 = Socket for video memory
7 = Connector for external monitor controller (VESA VGA pass through)

Upgrading main memory

Two locations (Bank 0 and Bank 1) are available on the system board for connecting memory modules.

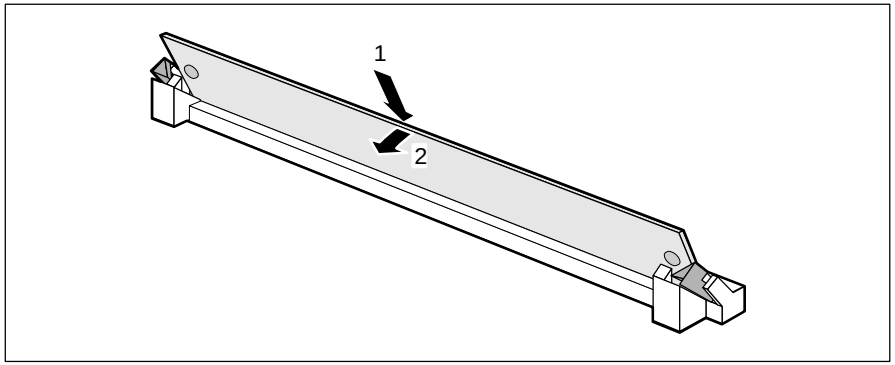
The board supports a maximum of 32 Mbytes. You may use memory modules of 4, 8, 16 or 32 Mbytes. For the memory configuration we recommend to use memory modules of the same capacity.

If you want to install or remove memory modules, you must remove the drive carrier (see Technical Manual of the PC).

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

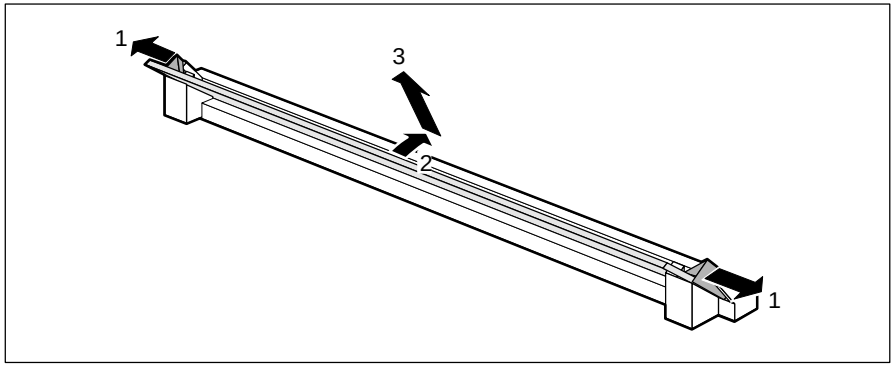
Installing memory modules

If you want to install several memory modules, plug the first memory module into the bank 0.



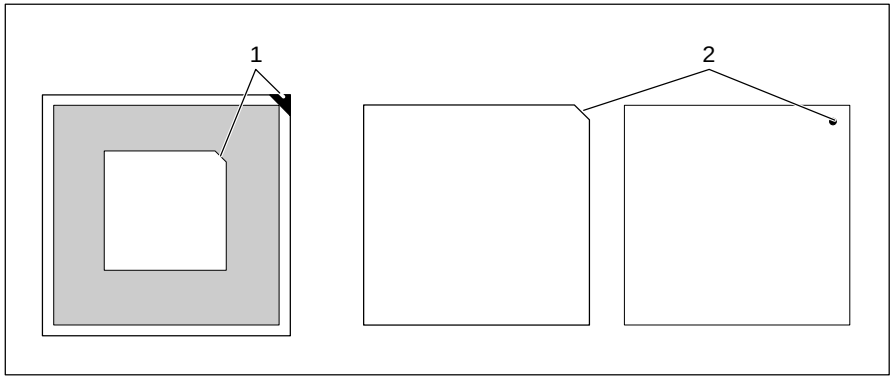
- Insert the memory module at angle into the appropriate location (1). Ensure that the key notch and the two holes are correctly aligned with the retaining pins.
- Tilt the module down until it snaps into place (2).

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).

Upgrading the processor



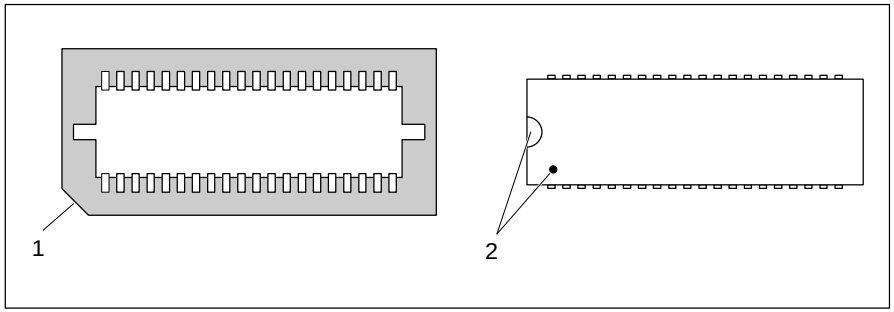
- Remove the old processor from the socket.
- Insert the new processor in the socket so that the mark on the upper side of the processor (2) matches the mark on the socket (1).
  The mark on the processor may be covered by a heat sink. In this case let yourself be guided by the marking in the rows of pins on the underside of the processor.
- Set the jumpers BLOCK2-33/25M, BLOCK2-DX/SX and BLOCK4 according to the inserted processor.

Upgrading the video memory

If your PC is supplied with a video memory configuration of 512 Kbytes, you may enlarge the video memory up to 1 Mbyte.

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

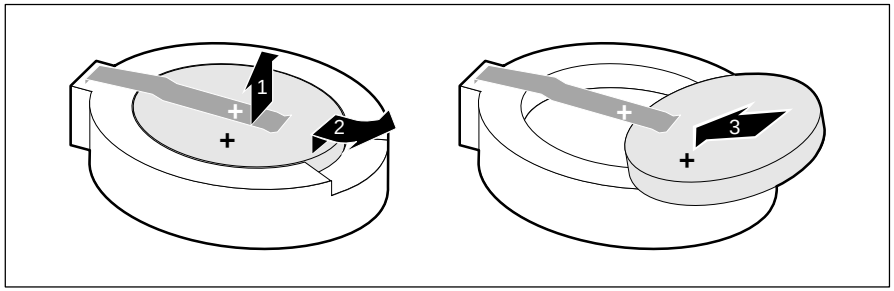
Note the location of the DRAM chip when you plug in DRAM chip!



- Insert the DRAM component in such a way that the mark on the upper side of the DRAM component (2) matches the position of the mark on the socket (1).

Replacing the lithium battery

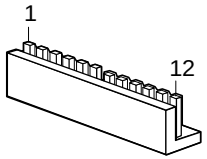
Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).
Do not throw lithium batteries into the trashcan. Your vendor or dealer or their authorized representatives will take used batteries back free of charge so that they can be recycled or disposed of in the proper manner.
Make 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).

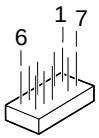
Interface pinouts and interrupts

Connector for power supply



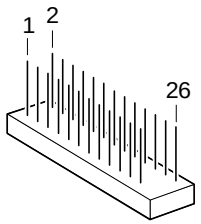
Pin	Meaning
1	Power good
2	+5 V
3	+12 V
4	-12 V
5-8	0 V
9	-5 V
10-12	+ 5 V

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 LED

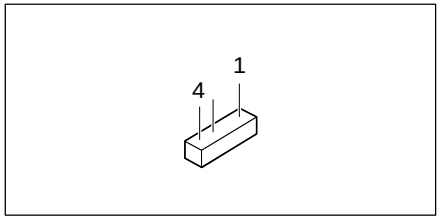
Connector for VESA VGA pass-through



Pin	Meaning
1	0 V
2	Data 0
3	0 V
4	Data 1
5	0 V
6	Data 2
7	not used
8	Data 3
9	not used
10	Data 4
11	not used
12	Data 5
13	not used

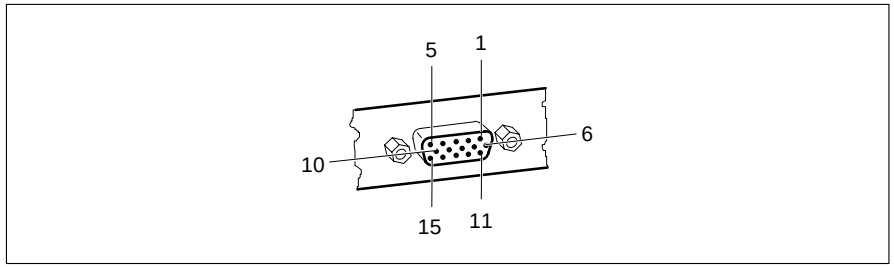
Pin	Meaning
14	Data 6
15	0 V
16	Data 7
17	0 V
18	Clock
19	0 V
20	Blanking
21	0 V
22	Horizontal Sync.
23	not used
24	Vertical Sync.
25	coded
26	0 V

Connector for external loudspeaker



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

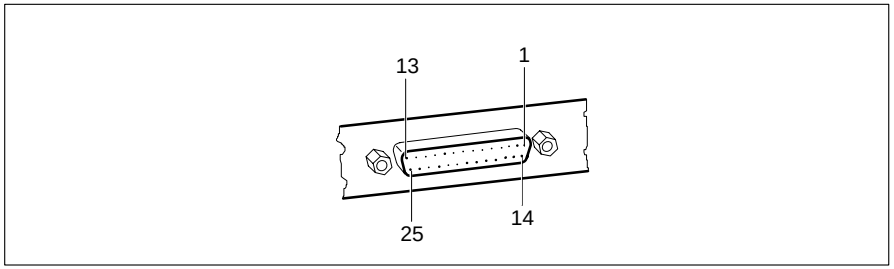
Connector for monitor



Pin	Meaning
1	Red
2	Green
3	Blue
4	Display ID bit 2
5	Ground
6	Red ground
7	Green ground
8	Blue ground

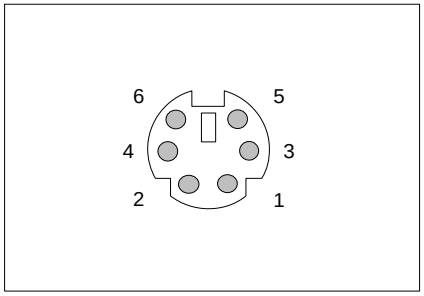
Pin	Meaning
9	coded (no pin)
10	Sync. ground
11	Monitor ID bit 0
12	Monitor ID bit 1
13	Horizontal synchronization
14	Vertical synchronization
15	Monitor ID bit 3

Parallel interface



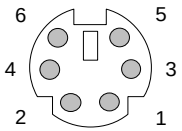
Pin	Signal name	Description
1	STROBE	Data message
2-9	Data Lines 0-7	Data lines 0-7
10	ACKNOWLEDGE	Data acknowledgement
11	BUSY	Not ready to receive
12	PE	End of paper
13	SELECT	Device selection
14	AUTO	Automatic new line
15	ERROR	Device error
16	INIT	Reset/initialize
17	SELECT IN	Printer selection
18-25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

PS/2 mouse port



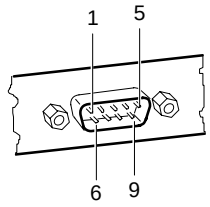
Pin	Signal
1	Data
2	not used
3	0 V
4	+5 V
5	Clock
6	not used

PS/2 keyboard port



Pin	Signal
1	Data
2	not used
3	0 V
4	+5 V
5	Clock
6	not used

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

Interrupt Request Levels and DMA channels

Interrupt Request Levels and DMA channels are listed below.

Interrupt Request Levels

IRQ0 = timer 0
IRQ1 = keyboard
IRQ2 = free or 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 = VGA controller or free
IRQ10 = free
IRQ11 = free
IRQ12 = mouse
IRQ13 = math coprocessor
IRQ14 = IDE hard disk controller
IRQ15 = free

DMA channels

DMA0 = free
DMA1 = free - normally used by LAN
DMA2 = floppy disk controller
DMA3 = IDE
DMA4 = DMA channel cascading
DMA5 = free
DMA6 = free
DMA7 = free

Error messages

This chapter contains the 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.

`MATH COPROCESSOR ADDED/REMOVED - RUN Setup`
: Call up the setup menu and confirm with the F10 and F5 keys the entry in the *COPROCESSOR INSTALLED* field.

`MEMORY PARITY ERROR AT AA:SSSS:OOOO 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:OOOO 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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