BIOS-Setup V4.06 / FirstBIOS Desktop Pro V5.0 / TrustedCore™ V6.0

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BIOS-Setup V4.06 / FirstBIOS Desktop Pro V5.0 / TrustedCoreTM V6.0

REFERENCE MANUAL

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Introduction

In *BIOS Setup* you can set the system functions and the hardware configuration of the device.

Any changes you make take effect as soon as you save the settings and quit the *BIOS Setup*.

In the individual menus of the *BIOS Setup* you can select the following settings:

Main	- System functions
Advanced	- Advanced system configuration
Security	- Security functions
Server	- Server management
Power	- Energy saving functions
Exit	- Save and quit

> **i** The individual menus and setting options are described in alphabetical order in the next chapters.
>
> The setting options depend on the hardware configuration of your device.
>
> Menus or certain setting options may therefore not be available in your device's *BIOS setup*, or the menus may be in a different place, depending on the BIOS revision.

Notational conventions

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.

> **i** Supplementary information, remarks, and tips follow this symbol.

► Text which follows this symbol describes activities that must be performed in the order shown.

␣ This symbol indicates that you must enter a blank space (press the Space Bar) at this point.

↵ This symbol indicates that you must press the Enter key.

`Text in this typeface` indicates screen outputs.

`Text in this bold typeface` indicates the entries you make via the keyboard.

Text in italics indicates commands or menu items.

"Quotation marks" indicate names of chapters or terms.

Using the BIOS Setup

Calling BIOS Setup

► Restart the device by switching power Off/On or pressing `Ctrl` + `Alt` + `Del` (warm boot).

If *Quiet Boot* is set to *Enabled*, a manufacturer's logo appears at the upper edge of the screen and the following message is displayed at the lower edge of the screen:

```
Press F3 for POST Screen
```

► Press the function key `F3` to read the other messages.

If *Quiet Boot* is set to *Disabled* at the factory, a message appears at the upper edge of the screen, e.g.:

```
Phoenix BIOS™ Version 4.06 Rev.1.03.1567
```

or

```
Phoenix cME FirstBIOS Desktop Pro
Version 5.00 R2.01B.1567.01
```

First, the version number of *BIOS Setup*, Version 4.06 or Version 5.00, is displayed, then the revision number of *BIOS Setup*, e.g. Rev. 1.03.1567. The last three or four digits indicate the mainboard number. Based on the mainboard number you can locate the respective technical manual for the mainboard on the "Drivers & Utilities" or "ServerStart" CD.

One of the following messages will be displayed at the bottom of the screen:

```
Press <F2> to enter SETUP
Press <F1> to resume, <F2> to SETUP
Press <F2> BIOS Setup /<F12> Boot Menu
```

> **i** The message and the available functions depend on the hardware of your device.
> Therefore it could happen that `F1` or `F12` are not offered by your device.

If you want to call the "BIOS-Setup":

► Press function key `F2`.

► If you have assigned a setup password, you must now enter this password and confirm it with the Enter key.

The *Main* menu of *BIOS Setup* is displayed on the screen.

If you have installed the Phoenix cME FirstWare on your hard disk and want to open the Console:

► Press function key **F4** .

The *Phoenix cME Console* appears on the screen.

> **i** You can use this function when you have installed the Phoenix cME FirstWare on your hard disk.

► Double-click on the *System Setup* symbol. The *BIOS-Setup* will be started.

If you want to call the "Boot Menu" immediately:

> **i** You may use this function if you do not want to boot the system from the drive specified as first device in the entry *Boot Sequence* in the submenu *Boot Options*.

► Press function key **F12** .

On the screen, the *Boot Menu* appears as popup window. You can now select, from which drive you want to boot the operating system. The selection options are the same as those listed in the entry *Boot Sequence* in the submenu *Boot Options*.

Your selection is only valid for the current system boot. At the next system start, the options selected in the entry *Boot Sequence* in the submenu *Boot Options* are valid again.

► Use the arrow keys **↑** or **↓** to select from which drive you want to boot the system now and press the enter key.

► If you want to call the *BIOS-Setup*, use the arrow keys **↑** or **↓** to select the *Setup* and press the enter key.

> **i** You cannot choose a drive marked with "!" for booting.
>
> You can check in *BIOS Setup* why that drive is not available for booting (in the *Boot Options* submenu).

BIOS Setup with incorrect settings

i
If an incorrect setting in *BIOS Setup* prevents system start and if the system cannot be started three times in a row, the following system start will automatically reset the *BIOS-Setup* default settings once. The following error message appears:

```
Previous boot incomplete - Default configuration used
```

By pressing function key F2 you can check and correct the settings in *BIOS Setup* (see "Error messages" chapter).

If an incorrect setting in *BIOS Setup* prevents system start, this setting can now be corrected. This re-enables error free system start.

```
                Phoenix BIOS Setup Utility
1 ─────    Main      Advanced     Security     Power      Exit

           System Time:          [07:42:19]
           System Date:          [08/01/2000]                  Item Specific Help
2 ─────
           Diskette A:           [1.4M]
           Diskette B:           [None]

           ▶ Standard IDE        Type xxx-(PM)
                                                                                    3
           ▶Boot Options


           Base Memory:               640K
           Extended Memory:           31M

           F1  Info     ↑↓ Select Item     -/+  Change Values     F9 Setup Defaults
4 ─────    ESC Exit     ←→ Select Menu     Enter Select▶  Sub-Menu  F7 Previous Values
```
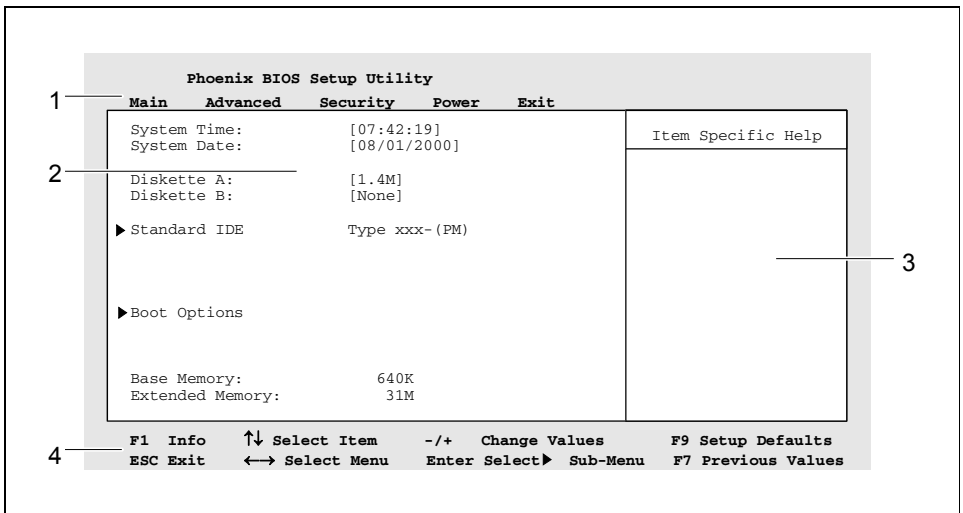
Example of the *Main* menu of the *BIOS Setup*

1 = Menu bar   3 = Help area
2 = Working area   4 = Operations bar

The *BIOS Setup* screen is divided into the following areas:

- Menu bar (1)
  In the menu bar, you can select the different *BIOS Setup* menus.

- Working area (2)
  The working area displays the setting options (fields) of the selected menus. You can set the entries in the displayed fields according to your requirements.

  Ê indicates fields which open further submenus. You can change entries in these submenus.
  * indicates configuration conflicts that must be resolved to ensure that the device functions correctly.

- Help area (3)
  Brief information on the selected field is displayed in the help area.

- Operations bar (4)
  The operations bar indicates which keys you can use to operate *BIOS Setup*.

i	You can display additional information (e.g. BIOS version) by pressing the function key **F1**.

Operating BIOS Setup

Cursor keys **←** or **→**	Select menu from menu bar
Cursor keys **↑** or **↓**	Select field - selected field is shown highlighted.
Enter or **ESC**	Open (marked with Ê) **Enter** and exit **ESC** submenu
Keys **+** or **-** (numeric keypad)	Change entry for field
F9 function key	Set default entries for all menus
F7 function key	Set entries valid when *BIOS Setup* was called.

Exiting BIOS Setup

To exit *BIOS Setup*, select the *Exit* menu from the menu bar. You can then decide whether you want to save the changed settings. Mark the required option and activate it with the Enter key.

Main menu - system functions

```
 Main

                                                  Item Specific Help

   System Time:          [07:42:19]
   System Date:          [08/01/2000]

   Diskette A:           [1.4M]

 Ê Standard IDE          [Type xxxx-(PM)]
 È Standard IDE          [Type xxxx-(SM)]


 Ê Boot Options


   Base Memory:              640K
   Extended Memory:          256M

   F1 Info ...
```
Example for *Main* menu

Base Memory / System Memory

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

BIOS version

indicates the BIOS version.

BMC F/W Version

indicates the BMC version (BMC = Baseboard Management Controller).

Boot options

calls the submenu in which you can select the settings for system start-up.

Boot Menu - System boot

specifies whether the *Boot Menu* can be called (*Enabled*) or not (*Disabled*) during the POST with the
F12 key.

Enabled   The *Boot* menu can be invoked.

Disabled   The *Boot* menu cannot be invoked.

Boot sequence

specifies the sequence of drives or system components which the *BIOS* searches for system files during the boot process to start the operating system. This sequence can be changed with the cursor. Position the cursor on the entry for the drive you want to move forward (+ key) or back (- key).

The number of listed drives depends on the number of drives connected. To boot from a USB floppy disk drive, set the menu item *USB Legacy Support* in the *Advanced* menu to *Enabled*.

Possible entries (Example):

> *CD ROM drive*
> +*floppy disk*
> +*hard drive*
> *Legacy LAN card*
> *PXE*

You also have the following options for operation:

- Drives marked with "+" provide a submenu for individual drives available. Place the cursor on a drive marked with "+" and press the Enter key. The possible drives are displayed (e.g. USB drives, USB memory such as *MemoryBird*).
- Drives marked with "!" cannot be chosen for booting, e.g. because a drive is not connected any longer. You can delete drives marked with "!" using "*" (numerical keypad).
- You can allow/disallow a drive to boot using the space bar.

i Each time you modify the configuration of the drives, you must check that the correct drive is still set for system boot. If not, readjust the entry.

Fast Boot

can reduce the extent of the self-test and thus accelerate the system start-up.

Enabled   When the device is switched on, the quick self-test is carried out, in which the floppy disk drives are not checked.

Disabled   After the device is switched on, the complete self-test is carried out.

Hard Drive - hard disk for system boot

All available boot drives / drive controllers in the system are displayed. Only the first hard disk in the list will be searched for system files for booting the operating system. All hard disks / controllers with the BIOS boot specification are listed individually. All other hard disks / controllers are grouped under *Alternate Device*.

In order to place a hard disk or a drive controller in first position, you must point the cursor at the name of the drive that you want to move forwards (+ key) or backwards (- key).

Alternate Device

Single entry for all hard disks and drive controllers in the system that do **not** fulfil the BIOS boot specification. The BIOS system cannot influence which hard disk drive is used to boot the system. The boot sequence can be modified by altering the setup of the drive controller or by changing the order of the drive controllers in the slots (scan sequence). It is not possible to tell how many drives are grouped under *Alternate Device*.

If *Alternate Device* is in first position on the list, but contains no hard disks / controllers, this entry is ignored.

<Device name>

List entry of a hard disk drive or a drive controller that fulfils the BIOS boot specification. The number of hard disks / controllers listed depends on the drive controllers (e.g. SCSI controller, IDE controller) and drives used. For *Device name*, either the drive controller name or the hard disk name is displayed. If the drive controller name is displayed, you must set the boot sequence in the drive controller setup.

i Each time you modify the configuration of the drive controller (SCSI, IDE), you must check that the correct hard disk drive is still set for system boot. If not, readjust the entry.

Memory test

specifies whether (*Enabled*) or not (*Disabled*) a memory test is to be run through during the boot routine.

Enabled   The memory test is carried out during the boot routine of the BIOS.

Disabled   The memory test is not carried out during the boot routine of the BIOS.

MultiBoot for HDs

defines whether *Hard Drive* is used or not.

Enabled The menu item *Hard Drive* specifies the boot sequence.

Disabled The menu item *Hard Drive* does not influence the boot sequence. The operating system is started from the drive that is found first by the BIOS, i.e. the selection of the PCI slot has an influence on the boot sequence.

> **i** If you are using *ServerShield*, turn off *MultiBoot for HDs*.

POST Errors - Aborting system start-up

defines whether the system start-up is to be aborted and the system halted when an error is detected.

Halt On All Errors or *Enabled*
  If the self-test detects an error, system start-up is aborted after the self-test, and the system is halted.

No Halt On Any Errors or *Disabled*
  The system start-up is not aborted. The error is ignored as far as possible.

Keyboard Check

specifies whether keyboard checks are carried out. This setting is useful for systems which are operated without a keyboard.

Enabled Keyboard checks are carried out. If there are keyboard faults, the system behaves as defined in the setting in the POST Errors menu item.

Disabled No keyboard checks are carried out. Possible keyboard faults are not detected.

Switching the NumLock button on/off

Determines how the NumLock key will be set when your system is started up.

Auto The status of the NumLock key will not be changed.

On The NumLock key will be enabled.

Off The NumLock key will be disabled.

Primary display

If multiple monitor controllers are built in, this determines the sequence the BIOS uses to search for the monitor controller.

AGP VGA The search sequence is ISA VGA, AGP VGA, PCI VGA.

PCI VGA The search sequence is ISA VGA, PCI VGA, AGP VGA.

Quiet Boot - boot logo

Instead of a POST information a logo is displayed on the screen.

Enabled   The logo is displayed on the screen. A switch to the POST information is made if you press the **F3** or the **Esc** key or if errors occur.

Disabled   The POST information is displayed on the screen.

Removable devices

The operating system assigns drive letters to the removable devices (e.g. LS-120, Zip drive) in the order displayed. To change the position of the removable device, position the cursor on the entry of the drive you want to more forward (**+** key) or back (**-** key).

The number of removable devices listed depends on the number of drives connected.

Setup Prompt

This field specifies whether the message `Press F2 to enter SETUP` is displayed when the PC is rebooted.

Enabled   The message `Press F2 to enter SETUP` is displayed when the system is started.

Disabled   The message is not displayed.

SM Error Halt - Error Handling for System Monitoring

configures the system behaviour during the self-test in case of a system monitoring error reported by the BMC (e.g. fan monitoring, temperature monitoring).

This setting is only effective when the setting *Halt On All Errors* has been selected for *Post Errors* in the *Boot Options* menu.

Enabled   If an error is reported to the BIOS by the BMC, the system start-up is cancelled and the system stopped following the self-test.

Disabled   The system start is not cancelled when an error is reported to the BIOS by the BMC. Error message is displayed only.

Diskette A - floppy disk drive

This field is used to specify the type of floppy disk drive installed.

360K, 720K, 1.2M, 1.4M
                     The entry depends on the floppy disk drive installed.
                     (Default entry Diskette A : *1.4M*).

None   No diskette drive installed or diskette drive is accessed via *IDE Drive* or USB.

Extended Memory

indicates the size of the memory above 1 Mbyte.

Auto   The memory capacity is determined by the memory modules on the system board.

DOS   The memory is limited to 1 GB during the next booting process.

| **i** | The *DOS* setting only applies to the next booting process and is automatically reset to *Auto* each time |

Standard/native IDE/ATA drive

calls the submenu to make corresponding settings of the IDE/ATA hard disk drive. The manufacturer's designation of the IDE/ATA drive is given beside each submenu. The BIOS supports a maximum of eight IDE/ATA drives which, for example, can be connected to two IDE connections and to four serial ATA connections. The IDE connections are divided into the primary, secondary, tertiary and quaternary IDE connection, whereby each connection can manage up to two drives.

Older systems and operating systems only support primary and secondary IDE interfaces. Current standards also define the tertiary and quaternary IDE interfaces. To be able to use the tertiary and quaternary IDE interfaces, the operating system and BIOS must support these.

The following description of the settings applies to all ready-to-operate IDE/ATA drives. Depending on which IDE/ATA connector the drive is connected to, it is shown with the following designation:

- -(PM) = Primary Master
- -(SM) = Secondary Master
- -(TM) = Tertiary Master
- -(QM) = Quaternary Master

- -(PS) = Primary Slave
- -(SS) = Secondary Slave
- -(TS) = Tertiary Slave
- -(QS) = Quaternary Slave

Example: the mainboard has two standard IDE interfaces and four serial ATA interfaces. If a IDE/ATA drive is connected to each connection, the drives will be shown with the following designation.

IDE interface 2/3	-(PM) = Primary Master / -(PS) = Primary Slave
IDE interface 2/3	-(SM) = Secondary Master / -(SS) = Secondary Slave
Serial ATA interface 1	-(TM) = Tertiary Master
Serial ATA interface 2	-(TS) = Tertiary Slave
Serial ATA interface 3	-(QM) = Quaternary Master
Serial ATA interface 4	-(QS) = Quaternary Slave

Change Password - establish or change hard disk password

allows you to set or change a password for the hard disk. You are prompted to enter a password for the hard disk before the operating system is started. If the hard disk password matches the system password, the hard disk is automatically unlocked on entering the system password. If different hard disks are used in a system, you can assign a separate password for each hard disk.

Mark the field and press the Enter key. You can then enter and confirm the hard disk password. A detailed description of how to establish or change the hard disk password is contained in the chapter "Setting hard disk password".

Maximum Capacity - hard disk capacity

shows the capacity of the IDE/ATA hard disk as an LBA value. The LBA value is the capacity calculated by BIOS on the basis of the maximum possible sectors reported by the hard disk. IDE and BIOS restrict the formatting of hard disks in cylinders, heads and sectors through maximum permissible values. IDE/ATA permits more cylinders but fewer heads than BIOS. A combination of IDE and BIOS restrictions yields a maximum addressable storage area of 528 Mbyte.

The following table lists the maximum permissible values and the resulting maximum usable memory capacities.

	BIOS	IDE	Combination BIOS/IDE
Max. sectors per head (at 512 Byte)	63	255	63
Max. heads per cylinder	256	16	16
Max. cylinders	1024	65535	1024
Capacity	8.4 GB	136.9 GB	528 MB

LBA Translation converts the physical formatting of hard disks in cylinders, heads and sectors so that the logical values generated lie within the above BIOS limitations. This means that a hard disk capacity of over 528 Mbyte can be used. Operating system and application programmes work with these logical hard disk values.
IDE/ATA hard disks of over 528 Mbyte are configured and operated using LBA mode. If the IDE/ATA hard disk supports the LBA mode, then the full memory capacity of the hard disk can be used.

The BIOS also supports 48-bit addressing for hard disks. This industry standard specifies hard disk capacities up to 144 Pbyte (Petabyte) - approximately 120,000 times the 137 Gbyte limit.

HD-ID

shows the identification number of the hard disk installed. This ID is required to generate the master password for a hard disk. Only the service (help desk) can generate the master password.

Master Password - unlocking hard disk if password is forgotten

enables you to unlock the hard disk with the master password if you forget your hard disk password. You can only generate the master password with the identification number of the hard disk (HD-ID) via Service (Help Desk). If you do not allow (*disabled*) the master password for security reasons, then the hard disk can only be enabled with the password you have specified.

> ⚠️ If the master password setting is *Disabled* and you forget your password, then you cannot access the hard disk and the data contained on it.

Enabled   Master password is possible

Disabled   Master password is not possible

Passwort Status - display status of hard disk password

indicates, in which security state the hard disk is at the moment.

Not Supported   The hard disk does not support a password. You cannot assign a password to this hard disk.

Not Installed   No password has been assigned to this hard disk.

Installed   A password has been just assigned to the hard disk.

Locked   The hard disk is protected and a password has to be entered for access.

Frozen until Power off
                  To change the security state of the hard disk, switch the system off and on again. Call the *BIOS Setup* during system start-up and make the desired settings.

PIO Mode - Transfer rate

The PIO (Programmed Input Output) mode indicates the transfer rate of the IDE/ATA hard disk drive. This means BIOS will determine automatically the best possible transfer rate for the hard drive.

Opaque   0,8 Mbyte/s to 2 Mbyte/s
PIO 1   0,8 Mbyte/s to 2 Mbyte/s
PIO 2   4 Mbyte/s to 5 Mbyte/s
PIO 3   5 Mbyte/s to 10 Mbyte/s
PIO 4   10 Mbyte/s to 16 Mbyte/s

Ultra DMA Mode - Transmission Speed

(Direct Memory Access Mode) indicates the fast Ultra-DMA transfer speed of the IDE hard disk. If the hard disk supports DMA, then the BIOS automatically determines the best possible transfer speed for the hard disk.

UDMA 0	up to 16 Mbyte/s
UDMA 1	up to 25 Mbyte/s
UDMA 2	up to 33 Mbyte/s
UDMA 3	up to 44 Mbyte/s
UDMA 4	up to 66 Mbyte/s
UDMA 5	up to 100 Mbyte/s
UDMA 6	up to 133 Mbyte/s

Silent Mode - noise level of hard disks and optical drive

Specifies the noise level of hard disk or optical drive. To lower the noise level of the drive, the rotating speed is reduced. The drive must support this function.

Disabled   The drive operates at its highest rotating speed.

Medium   Depending on the drive, the rotating speed is reduced to a medium value. Thel drive produces less noise during operation and the performance is slightly reduced.

Silent   Depending on the drive, the rotating speed is reduced to its lowest value. The optical drive produces less noise during operating and the performance is reduced.

Serial ATA Configuration

calls up the sub-menu in which you can make changes for the serial ATA interfaces.

S-ATA Interface

activates (*Enabled*) or deactivates (*Disabled*) all serial ATA interfaces on the mainboard.

S-ATA Mode

specifies which operating mode the serial ATA interfaces are used in.

Some operating systems only support primary and secondary IDE interfaces. Here you can select whether the serial ATA drives are to be assigned to the primary/secondary IDE interfaces

Compatible   The serial ATA drives are assigned to the primary/secondary IDE interfaces. Further settings you make under *S-ATA Drive Mapping*.

Native   Condition: The operating system must support this function. The serial ATA drives are assigned to the tertiary/quaternary IDE interfaces.

RAID   Condition: The mainboard must support this function. The serial ATA interfaces are used as a RAID system. Two identical serial ATA hard disk drives must be connected. Additional settings are made in the *RAID Configuration Utility*. This utility can be started when booting the system with a key combination. A message to this effect appears on screen.

AHCI   Condition: The operating system must support this function. The serial ATA interface is operated in the AHCI mode.

i	The setting options may differ depending on the mainboard.

S-ATA Drive Mapping

specifies how the serial ATA interfaces are assigned to the default IDE interfaces.

S-ATA 1/2 Only Only the serial ATA interfaces are used. Both IDE interfaces (primary and secondary) are assigned to the serial ATA interfaces. Drives on the IDE interfaces are not detected by the BIOS.

S-ATA 1/2 + P-ATA 3/4
    The serial ATA interfaces and the secondary IDE interface are used. The primary IDE interface is assigned to the serial ATA interfaces. Drives on the primary IDE interface are not detected by the BIOS.

P-ATA 1/2 + S-ATA 1/2
    The serial ATA interfaces and the primary IDE interface are used. The secondary IDE interface is assigned to the serial ATA interfaces. Drives on the secondary IDE interface are not detected by the BIOS.

i	The setting options may differ depending on the mainboard.

System time / System date

indicates the date / the time of the device. The date is shown in the format "mm/dd/yyyy". The time is shown in the format "hours:minutes:seconds". If you want to change the current date set / the current time set, enter the new date in the *System Date* field / the new time in the *System Time* field. You can move the cursor between the *System Time* and *System Date* fields using the tabulator key.

⚠️ If the settings in the *System Time* and *System Date* fields are frequently wrong when you power up the computer, the lithium battery is dead. Replace the battery.

VGA Memory Size

Everything shown on the screen is contained in the VGA memory.
When higher screen resolutions and greater colour depths are set (e.g. under Windows), more memory is required by the VGA card.

32 Mbyte, 64 Mbyte

Advanced Menu - advanced system configuration

⚠️ Change the default settings only for special applications. Incorrect settings can cause malfunctions.

```
┌─────────────────────────────────────────────────────────┬──────────────────────────┐
│  Advanced ...                                             │                          │
├─────────────────────────────────────────────────────────┼──────────────────────────┤
│                                                           │   Item Specific Help     │
│             Setup Warning!                                │                          │
│ Setting items on this menu to incorrect values           │                          │
│ may cause your system to malfunction.                     │                          │
│                                                           │                          │
│ Ê Peripheral Configuration                                │                          │
│ Ê PCI Configuration                                       │                          │
│ Ê Advanced System Configuration                           │                          │
│ Ê System Management                                       │                          │
│ Ê IPMI                                                    │                          │
│                                                           │                          │
│   Reset Configuration Data:      [No]                     │                          │
│   Lock Setup Configuration:      [No]                     │                          │
│                                                           │                          │
│   ATAPI UDMA Auto Detect:        [Standard]               │                          │
│                                                           │                          │
│   Multiprocessor Specification: [1.4]                     │                          │
├─────────────────────────────────────────────────────────┴──────────────────────────┤
│   F1 Info ...                                                                        │
└──────────────────────────────────────────────────────────────────────────────────────┘
```

Example for the *Advanced* menu

Advanced system configuration

calls the submenu in which you can make additional settings.

ACPI Save To RAM - energy-saving mode

specifies the functionality of the energy-saving mode.

Enabled   The ACPI system state "S3" is possible. With the exception of the main memory (RAM), all components of the mainboard are switched off. This reduces the power consumption to a minimum. The system is reactivated with the On/Off switch and is available again after approx. 5 sec.

Disabled   Only the ACPI system state "S1" is permitted. The power consumption is reduced in this state. The system can be reactivated with the On/Off switch, the mouse or the keyboard and is available again after approx. 1 sec.

APIC - Multiprocessor Interrupt Controller

defines the functionality of the APIC (Advanced Interrupt Controller) in the processor.

Enabled   The second processor (if present) can be used by multiprocessor operating systems to enhance performance.

Disabled   The second processor cannot be used by the operating system.

 An operating system must always be operated with the settings as installed.
Novell NetWare 3.12 can be operated only with the setting *Disabled*.

APIC Mode - interrupt allocation

allows the configuration of a better interrupt allocation under operating systems with APIC (Advanced Interrupt Controller) support.

Enabled   The operating system can use APIC.

Disabled   The operating system does not use APIC.

ASR&R (only for certain server types)

ASR&R (Automatic Server Reconfiguration & Restart) defines the amount of time the server waits after a disconnection on faults (e.g. due to overtemperature) before it reboots.

Enabled   *ASR&R* is enabled.

Disabled   *ASR&R* is disabled.

BIOS Work Space Location

specifies where the data area for extended BIOS functions is located.

Expansion ROM Area
           The data area is located within the area of the BIOS expansions.

Top of Base Memory
           The data area lies in the working memory directly below the 640 Kbyte limit. This setting should only be used when not all BIOS extensions, e.g. SCSI, can be loaded from the system BIOS.

cME Video Mode - display of FirstWare Console

specifies which screen resolution the FirstWare Console is started with.

640x480, 800x600, 1024x768, 1280x1024
           The entry is dependent on the monitor.

CPU Frequency (GHz) - processor frequency

For some Intel processors it is possible to set the frequency of all processors. All processors then operate with the same frequency. The BIOS ensures that only frequencies permissible for all processors are set.

Automatic   The maximum possible frequency jointly supported by all processors in the system is set for all processors.

2.80, 3.00, 3.20 GHz,...
                All processors operate with the set frequency.

i	This entry is only visible when the processor supports a frequency selection.

CPU HLT Detection/CPU Halt Mode (C1E) - reduce processor power consumption

enables reduction of power consumption, if the processor is in idle mode. The system performance can be somewhat decreased.

Enhanced   The processor in idle mode is recognised and power consumption is reduced. Thus system performance can be affected.

Opaque   The processor operates in the standard mode. Power consumption in idle mode is not reduced.

CPU Mismatch Detection - Checking the processor data

Checking of the processor data (processor type and speed) can be switched on (*Enabled*) or switched off (*Disabled*) here.

The check ascertains whether the processor data has changed between two system starts. In multiprocessor systems a check is also made to ascertain whether the processor data of all processors is identical.

An error message is displayed if the processor data differs.

CPU MC Status Clear – Intel Machine Check Architecture

When a processor detects an error, the cause is marked in a status register. Some errors can be dealt with immediately, others can lead to a system failure. Now the processor can retain the MCA status until switch-off. Following a reset the BIOS can deal with these CPU MC status markings during the POST phase and log detected run-time errors.

Disabled   The CPU MCA status registers are never cleared by the BIOS.

Enabled   The CPU MCA status registers are cleared by the BIOS during the next booting process.

Next Boot   The CPU MCA status registers are cleared once by the BIOS during the next booting process.

CPU Timeout Counter

The internal time monitoring of the processor can switched on (*Enabled*) or switched off (*Disabled*) here.

With the internal time monitoring activated, the processor detects both internal time-outs and time-outs on the CPU bus. The process signals this with an external signal. In this case the system is restarted.

If time monitoring is deactivated, the system may "freeze-up" and be inoperable.

Enabled   Internal processor time monitoring is activated.

Disabled   Internal processor time monitoring is deactivated.

CPU Clock Throttling Delay - Delay time of processor frequency adjustment

The activation of the processor frequency adjustment can be delayed here.

The frequency adjustment reduces the processor speed if the processor becomes too hot. This can lead to problems during the boot phase of some operating systems. With operating systems of this kind the processor frequency adjustment may not be activated until a complete system boot is carried out.

None   The processor frequency adjustment is always active.

1 min .. 60 min   The processor frequency adjustment is not activated until after the set time. The time measurement begins when the operating system is booted.

CPU Fast String Operations

This is an adjustment option of the CPU to effect optimised string operations. Cache procedures are optimised and interrupts are only admitted on cacheline boundaries.

i   On the Internet under *www.intel.com* in the document "IA-32 Intel Architecture Software Developers Manual Vol 1-3" under the keyword "Out-of-Order Stores for String Operations" you will find more information.

Enabled   Activates the fast string operation function of the CPU.

Disabled   Deactivates the fast string operation function of the CPU.

CPU Compatible FPU Code

i   On the Internet under *www.intel.com* in the document "IA-32 Intel Architecture Software Developers Manual Vol 1-3" under the keyword ""Guidelines for writing x87 FPU Exception Handlers" you will find more information.

Enabled   Activates P6 the compatible FPU opcode register model.

Disabled   Deactivates P6 the compatible FPU opcode register model.

CPU Split Lock Operation

This feature describes, whether during a transaction which splittes a acheline or a page (split-lock transaction) an allignment check exception is activated.

Enabled   Activates the split lock feature of the CPU.

Disabled   Deactivates the split lock feature of the CPU.

CPU Adjacent Sector Prefetch

enables a prefetch to adjacent sectors.

Enabled   The CPU only reads whole cachelines.

Disabled   Only the sector of a cacheline ,which contains the required data, is read.

i   With this option you can make performance settings for exceeding applications vornehmen.
Fujitsu Siemens Computers recommends for standart applications not to deviate from the default settings.

CPU Hardware Prefetch

enables a prefetch to the hardware.

Enabled   Activates the hardware prefetcher of the CPU.

Disabled   Deactivates the hardware prefetcher of the CPU.

i   With this option you can make performance settings for exceeding applications vornehmen.
Fujitsu Siemens Computers recommends for standart applications not to deviate from the default settings.

CPU Echo TPR

Enabled   If the TPR register of a local APICs is written, a xTPR message is sent to the central agent.

Disabled   No xTPR messages are sent.

i   With this option you can make performance settings for exceeding applications vornehmen.
Fujitsu Siemens Computers recommends for standart applications not to deviate from the default settings.

Limit CPUID Functions

This function enables the user to reduce the CPU functions (CPUID). Some operating systems cannot process new CPUID commands which support more than three functions. This option should be activated for these operating systems.

Enabled   Only a reduced number of CPUID functions is supported by the processor for OS compatibility reasons.

Disabled   The entire range of CPUID functions is supported.

CPU Thermal Management

Protects the processor from overheating. If the processor becomes too hot for some reason (e.g. fan failure etc.), it automatically reduces its performance.

Opaque   The CPU uses the standard method for thermal management (clock throttling).

Enhanced   The Enhanced Thermal Management mode is activated in the CPU. The processor automatically reduces the working frequency and operating voltage to maintain balanced thermal conditions.

Discard Timer Mode - setting burst transfer for PCI cards

enables the delay time to be decreased for resuming a burst transfer previously cancelled.

1024 clocks   Standard delay.

128 clocks   Very short delay.

> **i** Only select this setting if you are having problems transferring larger quantities of data. Fujitsu Siemens Computers recommends for standart applications not to deviate from the default settings.

ECC Memory Checking - Error correction for main memory

permits data error recognition and correction using the appropriately equipped memory modules.

Enabled   Error Correction Code (ECC) is enabled when all memory modules support ECC.

Disabled   Error Correction Code (ECC) is disabled.

Enhanced SpeedStep

Enhanced SpeedStep is a new energy-saving mode of the CPU.
In time phases in which the CPU's capacity is not fully utilised, the clock frequency and the supply voltage level of the CPU can be reduced here. This leads to a lower power consumption of the CPU, and therefore also to reduced heat development of the system.

To fully support this mode, an interaction between the BIOS and the operating system is necessary.

Enabled   Enhanced SpeedStep function is active.

Disabled   Enhanced SpeedStep function is deactivated.

FAN Speed

controls the speed of the processor fan.

Auto   The speed is adjusted automatically.

Full   Maximum speed.

Graphics Aperture - set the size of the graphics aperture

sets the size of the graphics aperture when an AGP screen controller is installed. This function expands the available video memory.

4M, 8M, 16M, 32M, 64M, 128M, 256M
> The size of the graphics aperture is set to the selected value.

Remap System Memory - Recovery of the address space which ist required for CPU configuration

Enabled For main memories larger than 3 Gbytes, the main memory above 4 Gbytes covered by the PCI devices is displayed again. This setting decreases performance, however may considerably increase the available main memory. When the maximum main memory is installed, this option has no effect.

Disabled For main memories larger than 3 Gbytes, the main memory covered by the PCI devices is not used. This enhances performance.

Hot Spare Memory Feature - Reserve memory bank

Switches the function *Hot Spare Memory Feature* on (*Enabled*) or off (*Disabled*).

The BIOS uses a memory bank as a reserve for the case that too many correctable errors occur in another memory bank. Before any uncorrectable errors occur, the memory content of this memory bank is rerouted into the "spare bank". The potentially defective memory bank is not used further. This procedure takes place during operation. At the same time, the memory error is signalled to the administrator. The potentially defective memory module can then be exchanged during the next scheduled maintenance.

Memory Redundancy/Reserve Memory Mode

Here it is possible to reserve memory capacity for possible error treatment.

Disabled Deactivates the function

Sparing The BIOS uses a memory bank as a reserve for the case that too many correctable errors occur in another memory bank. Before some uncorrectable error occurs, the content of this memory bank is routed back into the "sparing bank". The potentially defective memory bank is not used anymore. This procedure is carried out while working. At the same time, the memory error is reported to the administrator. The potentially defective memory module can be replaced during the next planned maintenance work.

Mirroring The BIOS divides the system memory in half and retains two copies of all data in the memory. It prevents a system crash when uncorrectable errors occur.
In seldom cases in which uncorrectable errors occur, the data cannot be collected from the first copy. The data are immediately called from the second copy. At the same time, the memory error is reported to the administrator. The potentially defective memory module can be replaced during the next planned maintenance work.

NX Memory Protection – protection of executable memory areas

This option enables protection of executable memory areas (virus protection). The function is only effective if it is also supported by the operating system.

Enabled   Enables the operating system to activate the *Execute Disable* feature of the processor.

Disabled   Prevents the operating system from being able to activate the *Execute Disable* feature of the processor.

Hyper-Threading - Use of logical processors

Hyper-threading technology allows a single physical processor to appear as several logical processors. With this technology the operating system can better utilise the internal processor resources, which in turn leads to increased performance. The advantages of this technology can only be used by an operating system that supports ACPI. This setting has no effect on operating systems that do not support ACPI.

Enabled   An ACPI operating system can use all logical processor within a physical processor.

Disabled   An ACPI operating system can only use the 1st logical processor of the physical processor. This setting should only be used if hyper-threading technology has not been correctly implemented in the ACPI operating system.

Parity Mode - DRAM Parity Check

Determines whether a parity check is carried out in the case of DRAM modules. If the system BIOS detects that at least one DRAM module does not have a parity bit, the parity check is generally disabled.

Disabled   No parity check is performed.

Parity   The parity check is set in parity mode. A one-bit corruption is recognised and an error message is issued.

ECC   A one-bit corruption is corrected (no error message). An error message is issued for two or more bit corruptions.

PCI Bus Parity Checking

Switches the parity checking function on (*Enabled*) or off (*Disabled*).

If you use PCI boards which do not behave in accordance with PCI bus guidelines, you can deactivate *PCI Bus Parity Checking*.

Remap PCI Memory Gap - Reassignment of PCI memory area

The memory addresses directly below 4 Gbyte are used for accessing PCI devices. The size of this area is dependent on the number of PCI devices and the devices themselves. This address area is called a "PCI Memory Gap". If the system is equipped with 4 Gbytes or more of main memory, it is not possible to access the part of the main memory with addresses reserved for accessing PCI devices that lie in the "PCI Memory Gap". If the "Remap PCI Memory Gap" flag is set to *Enabled*, this (otherwise unusable) memory area is assigned addresses above 4 Gbytes and it can be used.

Enabled   The PCI memory area is made usable.

Disabled   The PCI memory area is not used.

> **i** Not all operating systems support memory addresses above the 4 Gbyte limit. Special boot parameters may also be necessary for the operating system to make main memory above 4 Gbytes usable.

SMART Device Monitoring - hard disk self-monitoring analysis and report technology

switches the self-monitoring (SMART function) of the hard disk on or off.

Enabled   Function is activated

Disabled   The finction is deactivated.

During the self-analysis the hard disk automatically observes and logs the calibration, performance and other critical parameters. The SMART functions determine a prediction on the next possible hard disk error from the logged data. These data can be made available to the operating system and evaluated by a suitable application (e.g. *DeskView*). The user is warned when there is a possible risk of data loss. It is then possible to take corresponding countermeasures prior to hard disk failures.

USB host controller

specifies whether the USB controller is switched on (*Enabled*) or switched off (*Disabled*). If this function is switched off, the USB controller will not be recognised by any operating system. As a result, no USB devices can be operated.

USB 2.0 host controller - USB port

switches the USB 2.0 host controller (Universal Serial Bus) of the mainboard on or off.

Enabled   The system BIOS determines which system resources (interrupts, addresses) are occupied.

Disabled   The USB controller is disabled.

USB Legacy Support

specifies whether the USB keyboard emulation is still active after starting the operating system. If a USB keyboard is used, the emulation for the *BIOS setup* is always switched on. This function is also required when the operating system is to be booted from a USB device.

Enabled The function is enabled. The USB keyboard or USB mouse can also be used under operating systems that do not support USB. The operating system can be booted from a USB device if the operating system also supports it.

Disabled The function is disabled. To operate a USB keyboard or USB mouse, it must be supported by the operating system. The operating system cannot be loaded from a USB device.

i	This function, *USB Legacy Support*, should be switched off (*Disabled*) if the operating system supports USB and you do not want to boot the operating system from USB devices.

USB Enabled Ports

determines which USB ports may be used. If you enable only the internal USB ports, you cannot use a USB mouse or a USB keyboard.

None All USB ports are disabled and cannot be used.

internal Only the internal USB ports may be used. The external ports are disabled.

All All USB ports are enabled and may be used.

USB BIOS Supported Devices

determines which USB devices are supported by the BIOS. You can hence determine whether a USB device may be used for booting and whether USB devices may also be used for operating systems/software without USB support (e.g. DOS, Recover Pro).

Auto All USB devices that are connected when the system starts are supported.

None No USB devices are supported, except the USB keyboard for BIOS setup.

Keyboard/Mouse
　　　　　USB keyboard and USB mouse are supported

All All USB devices are supported.

SB Boot Delay

some USB boot devices require a few seconds before they are ready to boot. Here you can select the time taken for the BIOS to activate the USB device for booting (or for the BIOS to expect the USB device boot). Possible intervals: *0 s, 3 s, 6 s, 9 s*

USB At Power-off

determines what the USB ports do when the system is shut down.

Always Off All USB ports are disabled when the system is shut down.

Always On All USB ports remain enabled when the system is shut down.

ATAPI UDMA Auto Detect - UDMA mode

allows to disable the UDMA mode for CD ROM- or DVD drives. When returning from energy-saving mode (Standby), the operating system can get problems with handling drives with UDMA mode appropriately.

Opaque UDMA mode is recognised automatically and enabled, if the CD-ROM or DVD drive supports UDMA mode.

Disabled UDMA mode is disabled for all CD-ROM and DVD drives in the system.

IPMI

opens the submenu with the IPMI (Intelligent Platform Management Interface) settings. The behaviour of the BMC (Baseboard Management Controller) is specified and information displayed here.

BMC Time Sync

specifies whether the internal time of the BMC is calibrated with the system time during each system start-up. The system clock and the clock in the BMC operate independently of each other. This makes a time calibration at regular intervals necessary. In addition, the clocks must be calibrated again on leap days and when changing over to/from summer time. This task is normally carried out by the *ServerView* program.

Disabled *Disabled* The summer time and the internal time of the BMC are not calibrated during system start-up (exception: the click in the BMC reports an invalid time).

Enabled The BMC assumes the system time during each system start-up.

Clear System Event Log

specifies whether the System Event Log file is to be cleared during the next system start-up. All system events and errors are saved in this file.

Disabled The System Event Log is not cleared.

Enabled The System Event Log is cleared during the next system start-up.

Event Log Full Mode

specifies whether or not the System Event Log can be overwritten.

Maintain If the System Event Log file is full, no further events are entered. The System Event Log file must be cleared first before additional events can be entered.
Older events have greater importance than newer ones in this case.

Overwrite If the System Event Log is full, additional events overwrite the oldest entries of the System Event Log.
Newer events have greater importance than the older ones in this case.

LAN Settings

opens the submenu for the BMC LAN settings. If *RomPilot* is present on the system, its parameters of the same name are linked to the following ones.

DHCP

specifies whether the DHCP support for the BMC is switched on (*Enabled*) or switched off (*Disabled*). The BMC can automatically have itself assigned an IP address from a DHCP server in the network via the DHCP (Dynamic Host Configuration Protocol) network protocol. A manual entry under *Local IP Address* is then no longer possible.

Gateway address

► Enter the gateway address of the system LAN board here. Use the same gateway address as in the operating system.
Only numeric characters are permitted.

Local IP address

► Enter the IP address of the system LAN board here. Use the same IP address as in the operating system.
Only numeric characters are permitted.

Server Name

► Determine the server name to identify the system here.

We recommend to use the same name for the server that will be used later in the operating system. You can use a maximum of 16 ASCII characters. Special characters are permitted.

Subnet Mask

► Enter the *subnet mask* of the system LAN board here. Use the same *subnet mask* as in the operating system.
Only numeric characters are permitted.

SDRR Browser

opens the submenu of the Sensor Data Record browser.

Entity ID

shows the module to which the current sensor belongs.

Entity Inst

shows the number of the current sensor within its module.

SDR Record ID

shows the identification number of the current sensor.

Further switching to the previous/next sensor is carried out with the [-] or [+] key of the number block.

SDR ID

shows the type of the current sensor.

Sensor No

shows the consecutive number of the current sensor.

Sensor Type[Units]

shows the type and unit of measure of the current sensor.

Sensor Value

shows the currently measured value of the current sensor.

Sensor Value(max)

shows the maximum permissible value of the current sensor.

Sensor Value(min)

shows the minimum permissible value of the current sensor.

SEL Load - Filling level of the System Event Log file

shows the filling level of the System Event Log file in percent.

System Event Log

opens the submenu of the System Event Log Browser. All events and errors that occur in the system are saved in the System Event Log file.

Entry Number

shows the number of the current SEL entry.

Further switching to the previous/next sensor is carried out with the $\boxed{-}$ or $\boxed{+}$ key of the number block.

Event Data

shows the data for the current event as a numeric code.

Event Type

shows the type of the current event.

Sensor

shows the sensor that has triggered the current event.

Sensor Event

shows the current event in plain text. The data from *Event Data* are evaluated for this purpose.

Sensor Type

shows the sensor type that has triggered the current event.

Timestamp

shows the data and time at which the current event occurred.

Local Bus IDE adapter

This field allows you to enable and disable the onboard IDE controller.

Enabled The onboard IDE controller is used for the IDE hard disk with the *RemoteView* diagnostic software or for another drive which is connected to the IDE connector e.g. an ATAPI-CD-ROM.

Disabled If no IDE hard disk with the *RemoteView* diagnostic software has been installed nor another drive, the IDE controller can be disabled. This means that the interrupt reserved for the IDE controller is free for other applications.

or

> **i** Please note when making settings that the settings in the menus *Primary Master*, *Primary Slave*, *Secondary Master* and *Secondary Slave* must match with the following settings.

Disabled If no IDE hard disk with the *RemoteView* diagnostic software has been installed or another drive, the IDE controller has to be disabled. This means that the interrupt reserved for the IDE controller is free for other applications.

Primary If no SCSI hard disk is installed, but instead IDE hard disk drives are connected to the first IDE connector on the mainboard, then the IDE controller must be set to *Primary*. This means that the interrupt reserved for the IDE controller is not free for other applications.

Secondary If ATAPI CD-ROM drives, IDE hard disk drives or LS-120 drives are connected to the second IDE connector on the mainboard, then the IDE controller must be set to *Secondary*. This means that the interrupt reserved for the IDE controller is not free for other applications.

Both If drives are connected to both IDE connectors on the mainboard, then both IDE controllers must be switched on with the setting *Both.* This means that the interrupts reserved for the IDE controllers are not free for other applications.

Lock Setup Configuration

specifies whether (*Yes*) or not (*No*) the Setup settings can be changed by a Plug&Play-capable operating system.

PCI Configuration

invokes the submenu where you can make settings for the PCI devices (PCI slots and PCI components on the mainboard). The submenu may have a scroll bar depending on the number of PCI devices.

Latency Timer

The field specifies the additional number of clock cycles in which a burst can be transferred beyond the specification on the PCI bus.

20h, 40h, 60h, 80h, A0h, C0h, E0h, Default (40h)
Number of clock cycles

Ethernet on Board: Device

specifies whether the LAN controller on the mainboard is used (*Enabled*) or switched off (*Disabled*).

Ethernet on Board: Enable Master

specifies whether the LAN controller on the mainboard acts as a master controller (*Enabled*) or as a slave controller (*Disabled*).

Ethernet on Board: Latency Timer

The field defines the additional number of clock cycles in which a burst can be transferred on the PCI bus over and above what is specified. *n* stands for the number of the PCI slot.

20h, 40h, 60h, 80h, A0h, C0h, E0h, Default (40h)

Embedded SCSI BIOS

The SCSI BIOS of the SCSI controller on the mainboard is masked into the BIOS. You can choose whether you want to use the masked-in SCSI BIOS (*Enabled*) or the SCSI BIOS of an external SCSI controller (*Disabled*) that has the same SCSI chip (Symbios).

Embedded SCSI BIOS Scan Order

Defines the order in which boot devices are scanned with reference to the onboard SCSI controller. This parameter is intended, e.g. for use in ServerShield applications. The embedded SCSI BIOS parameter must be enabled.

First   The onboard SCSI controller is scanned first.

Last   The onboard SCSI controller is scanned last.

Auto   The onboard SCSI controller is scanned as if it is a plug-in controller.

PCI device, Slot #n: Default Latency Timer

specifies the additional number of clock cycles in which a PCI master board can be active on the PCI bus over and above what is specified. *n* stands for the number of the PCI slot.

Yes   The value predefined by the PCI board is accepted. The entry in the corresponding field for *PCI Device, Slot #n: Latency Timer* is ignored.

No   The value predefined by the PCI board is ignored. The value set in the relevant field of *PCI Device, Slot #n: Latency Timer* determines the number of clock cycles.

PCI Device, Slot #n: Latency Timer

Requirement: The relevant field of *PCI Device, Slot #n: Default Latency Timer* must be set to *No*.

The field defines the additional number of clock cycles in which a burst can be transferred on the PCI bus over and above what is specified. *n* stands for the number of the PCI slot.

0000h to *0280h*

PCI Interrupt Mapping INTx# - Assignment of the PCI interrupts

defines which PCI interrupt is switched to which ISA interrupt.

A mono-functional PCI board uses an interrupt designated *PCI Slot INTA*. Depending on the slot used, this interrupt is assigned to various *PCI INTx#*.

A multifunctional PCI board can use all PCI interrupts, if need be.

	Slot 1 INT				Slot 2 INT				Slot 3 INT				Slot 4 INT			
PCI Interrupt Mapping	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
INTA#	v							z			y			x		
INTB#		x			v							z			y	
INTC#			y			x			v							z
INTD#				z			y			x			v			

v = for mono-functional boards
v x [y [z]] = for multi-functional boards

Example: For slot 3 the PCI slot INTA of the board is assigned to the PCI INTC#.

If you use a setting other than *Auto*, the Plug&Play functionality of the system BIOS for PCI boards is deactivated.

Auto   The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled   No PCI interrupt is used for the PCI board in the assigned PCI slot.

IRQ03, IRQ04, IRQ05, IRQ06, IRQ07, IRQ09, IRQ10, IRQ11, IRQ12, IRQ14, IRQ15
        The PCI interrupt is switched to the selected ISA interrupt. You may not select an ISA interrupt that is used by a component on the mainboard (e.g. controller) or an ISA board.

PCI IRQ line x / device - Assignment of the PCI interrupts

Establishes which ISA interrupts will be used for the individual PCI slots and which controller (device) of the mainboard shares this PCI interrupt with the PCI slots (e.g. USB, SCSI).

Multifunctional PCI boards or boards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Monofunctional PCI boards (default) only use one PCI interrupt (INTA#) per PCI slot.

The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for every PCI slot.

The detailed assignment of the PCI interrupts you can find in the relevant technical manual for the mainboard.

With monofunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# of each PCI slot.

Example:

PCI slot	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
PCI IRQ Line for INTA#	1	2	3	5	6	7

With multifunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# to INTD# of each PCI slot.

Example:

PCI slot	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
PCI IRQ Line for INTA#	1	2	3	5	6	7
PCI IRQ Line for INTB#	2	3	4	6	7	8
PCI IRQ Line for INTC#	3	4	1	7	8	5
PCI IRQ Line for INTD#	4	1	2	8	5	6

The same interrupt can be assigned simultaneously to several PCI boards. You should avoid this condition due to reduced performance.

If you use a setting other than *Auto*, the Plug&Play functionality of the system BIOS for the corresponding PCI boards is deactivated.

Auto — The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled — No ISA interrupt is assigned to the PCI interrupt.

IRQ3, IRQ4, IRQ5, IRQ6, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, IRQ15
The PCI interrupt is switched to the selected ISA interrupt. You may not select an ISA interrupt that is used by an ISA component on the mainboard (e.g. controller) or an ISA board.

PCI IRQ line x - Assignment of the PCI interrupts (at PRIMERGY)

Defines which ISA interrupts are used for the separate PCI slots.
Multifunctional PCI boards or boards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Monofunctional PCI boards (default) only use one PCI interrupt (INTA#) per PCI slot.
The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for every PCI slot.
The detailed assignment of the PCI interrupts you can find in the relevant technical manual for the mainboard.
With monofunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# of each PCI slot:

D1111 or U41090-J-Z156 and D1998												
PCI slot	1	2	3	4	5	6	7	8	9	10*	**10****	11	12
PCI IRQ Line for INTA#	9	12	11	10	5	8	7	6	1	4	**3**	13	16

*: This assignment of PCI slot 10 applies to the following boards: Traffic Number (TN) 74217.00.1.15 and traffic number (TN) 00528.00.2.15.
**: This assignment of PCI slot 10 applies to the following boards: Traffic Number (TN) 00576.00.3.15 and traffic number (TN) 00689.00.6.15.

D1173													
PCI slot	1	2	3	4	5	6	7	8	9*	10*	11*	12*	13*
PCI IRQ Line for INTA#	11	9	5	7	13	14	15	16	9	10	11	12	9

*: The assignment of the PCI slots 9-13 is only valid for K400 system with installed extension board.

With multifunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# to INTD# of each PCI slot:

D1111 or U41090-J-Z156 and D1998												
PCI slot	1	2	3	4	5	6	7	8	9	10*	**10****	11	12
PCI IRQ Line for INTA#	9	12	11	10	5	8	7	6	1	4	**3**	13	16
PCI IRQ Line for INTB#	10	9	12	11	6	5	8	7	2	1	**4**	14	13
PCI IRQ Line for INTC#	11	10	9	12	7	6	5	8	3	2	**1**	15	14
PCI IRQ Line for INTD#	12	11	10	9	8	7	6	5	4	3	**2**	16	15

*: This assignment of PCI slot 10 applies to the following boards: Traffic Number (TN) 74217.00.1.15 and traffic number (TN) 00528.00.2.15.
**: This assignment of PCI slot 10 applies to the following boards: Traffic Number (TN) 00576.00.3.15 and traffic number (TN) 00689.00.6.15.

D1173													
PCI slot	1	2	3	4	5	6	7	8	9*	10*	11*	12*	13*
PCI IRQ Line for INTA#	11	9	5	7	13	14	15	16	9	10	11	12	9
PCI IRQ Line for INTB#	12	10	6	8	14	15	16	13	10	11	12	9	10
PCI IRQ Line for INTC#	9	11	7	5	15	16	13	14	11	12	9	10	11
PCI IRQ Line for INTD#	10	12	8	6	16	13	14	15	12	9	10	11	12

*: The assignment of the PCI slots 9-13 is only valid for K400 system with installed extension board.

PCI devices on the mainboard use the following *PCI IRQ Line*:

D1111 or U41090-J-Z156				
PCI Device	USB	I960	Ethernet	SCSI 1	SCSI 2
PCI IRQ Line	4	13	14	15	16

D1173				
PCI Device	USB	Ethernet	Copernicus	SCSI A	SCSI B
PCI IRQ Line	-	1	2	3	4

The same interrupt can be assigned simultaneously to several PCI boards. You should avoid this condition due to reduced performance.

If you use a setting other than *Auto*, the Plug&Play functionality of the system BIOS for the corresponding PCI boards is deactivated.

Auto   The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled   No ISA interrupt is assigned to the PCI interrupt.

3, 4, 5, 7, 10, 11, 12, 14, 15
                  The selected ISA interrupt is assigned to the PCI interrupt. You may not select an ISA interrupt that is used by a component on the mainboard (e.g. controller) or an ISA board.

> **i** With the *Auto* setting, you can use the *ICU* (*ISA Configuration Utility*) utility to check how the interrupts are assigned.

PCI Parity Checking

determines whether a parity check is carried out on PCI bus.

Enabled   Each time the PCI data or PCI address bus is accessed, a parity check is performed. If a corrupted bit is detected, an error message is issued.

Disabled   PCI bus parity checking is disabled.

SCSI A / SCSI B: Device

specifies whether the SCSI controller on the mainboard is used (*Enabled*) or switched off (*Disabled*).

SCSI A / SCSI B: Enable Master

specifies whether the SCSI controller on the mainboard acts as a master controller (*Enabled*) or as a slave controller (*Disabled*).

SCSI A / SCSI B: Latency Timer

The field defines the additional number of clock cycles in which a burst can be transferred on the PCI bus over and above what is specified. n stands for the number of the PCI slot.

20h, 40h, 60h, 80h, A0h, C0h, E0h, Default (40h)

Service Processor on Board: Latency Timer

The field defines the additional number of clock cycles in which a burst can be transferred on the PCI bus over and above what is specified. n stands for the number of the PCI slot.

0h, 40h, 60h, 80h, A0h, C0h, E0h, Default (40h)

PCI IRQ Configuration

calls the submenu in which you can make the settings for the PCI interrupts. The submenu may have a scroll bar depending on the number of PCI interrupts. This submenu is described in the "PCI IRQ line x / device - Assignment of the PCI interrupts" section.

PCI SLOTS Configuration

calls the submenu in which you can make the settings for the PCI slots. The submenu may have a scroll bar depending on the number of PCI slots.

Bus Master

specifies whether the PCI slot acts as a busmaster (*Enabled*) or not (*Disabled*).

Option ROM Scan

specifies whether the BIOS of the adapter in this PCI slot is started by the system BIOS.

To load an operating system from an adapter (e.g. SCSI, LAN), the related adapter must be controlled by a BIOS.

Enabled   If the adapter in the PCI slot is equipped with a BIOS, this will be started during initialisation by the system BIOS.

Disabled   The BIOS of the adapter is not started.

Peripheral configuration - ports and controllers

calls the submenu in which you can set the ports and controllers.

Audio controller

If the audio controller is configured on the mainboard, it can be enabled or disabled.

Auto   The system BIOS automatically configures the audio devices. If, in addition to the onboard audio controller, an audio board is also installed, the onboard audio controller will be deactivated.

Enabled   All audio controllers are enabled. The system BIOS determines which system resources (interrupts, addresses, DMAs) are occupied.

Disabled   The onboard audio controller is disabled.

Diskette controller

Switches the floppy-disk drive controller of the mainboard on (*Enabled* - IRQ6 is assigned) or off (*Disabled* - IRQ6 is available).

Floppy Type

Specifies which floppy disk drive controller is to be used.

It is possible to choose from the local (default) controller and the controller for remote access. The default controller permits access to the floppy disk drive installed in the system. On the other hand, the controller for remote access permits access to a floppy disk drive of another system or to a floppy-disk image file stored on another system. The data are routed via the network in this case.

Local   The default floppy-disk drive controller of the system is used.

Remote   The floppy-disk drive controller for remote access is used.

Remote Once   The floppy-disk drive controller for remote access is used for the subsequent system start-up. Then the system automatically switches over to *Local*.

LAN controller

If the LAN controller is configured on the mainboard, it can be enabled or disabled.

Enabled   The system BIOS determines which system resources are occupied.

Disabled   The LAN controller is disabled.

LAN Remote Boot - loading operating system via LAN

enables the operating system to be loaded from a server. This function is used particularly when neither floppy disk nor hard disk drives are installed, or they have been switched off. Here there are two different boot protocols:

BootP   The *BootP* LAN-BIOS is activated and enables the operating system to be loaded from a server via a local network connection with *BootP*.

PXE   The PXE-BIOS is activated and enables the operating system to be loaded from a server via a local network connection with *PXE*.

> **i**
>
> If the PXE-BIOS is active, you can configure the start sequence in the *Boot Options* menu after restarting.
>
> In addition, you can call the Setup integrated in the PXE-BIOS.
>
> ► After enabling the computer, press the [**F3**] function key in order to switch to the *POST Screen*.
>
> ► Then press both shift keys until the PXE Setup appears.

or

LSA   The *LSA* LAN-BIOS is activated and enables the operating system to be loaded from a server via a local network connection with *LSA*.

Disabled   LAN boot not possible. The LAN-BIOS is not activated.

Mouse controller

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

Auto Detect   The connected mouse is automatically detected and activated. Operating systems that support Plug&Play automatically configure the mouse.

Enabled   The mouse controller is enabled - IRQ 12 is used.

Disabled   The mouse controller is disabled - IRQ 12 is free.

Parallel - parallel port

This field selects the address and the interrupt used to access the parallel port.

Enabled   The parallel port is set to the shown address and interrupt. If you set *Enabled*, additional lines are displayed for setting the configuration.

Auto   The parallel port is automatically set to the next available combination (address, interrupt).

Disabled   The parallel port is disabled.

PnP OS or *OS Controlled*
      The operating system configures the ports.

Parallel Address - Base I/O address and IRQ

determines the base I/O address and the interrupt for the parallel port.

378h, IRQ 7; 278h, IRQ 5; 3BCh, IRQ 7
      The parallel port uses the selected address and the selected interrupt.

Parallel Port: Base I/O address

determines the base I/O address for the parallel port.

378h, 278h   The parallel interface uses the selected address.

Parallel Port: DMA Channel

Specifies the DMA channel for the parallel port.

DMA1, DMA3   The parallel port uses the selected DMA channel.

Parallel Port: Interrupt

defines the interrupt for the parallel port.

IRQ7, IRQ5   The parallel port uses the selected interrupt.

Parallel Mode - Parallel data transfer

This field is used to specify whether the parallel port is to be used as a bi-directional input/output port or just as an output port. *ECP* and *EPP* transfer modes allow faster transfer rates of 2 and 2.4 Mbytes/s. These modes will only work with peripheral devices which support them. In addition, at *EPP* the field *Parallel* must be set to *378h* or *278h*.

Parallel mode is not displayed if you selected *Disabled* under parallel.

Printer	The port functions as an output port only.
Bidirection	Data can be transferred in both directions across the port.
EPP	Fast transfer mode (up to 2 Mbytes/s), can output and receive data. The mode requires a peripheral device which supports the EPP (Enhanced Parallel Port) transfer mode.
ECP	Fast transfer mode (up to 2.4 Mbytes/s), can output and receive data. The mode requires a peripheral device which supports the ECP (Enhanced Capability Port) transfer mode. The DMA channel required is determined by the system in accordance with Plug&Play.

SCSI controller

Enables/disables the SCSI controller (Small Computer System Interface) on the mainboard. The SCSI controller occupies an assigned ISA interrupt, even when the controller is switched off. This allows the SCSI controller to be enabled automatically if required. If you want to use this ISA interrupt for other purposes, you must disable it in the *PCI Configuration* menu.

Enabled	The SCSI controller is enabled. The ISA interrupt in the *PCI Configuration* menu must not be set to *Disabled*.
Disabled	The SCSI controller is disabled.

SCSI Controller (at PRIMERGY)

Enables/disables the SCSI controller (Small Computer System Interface) on the mainboard. The ISA interrupt assigned under *SCSI IRQ Line* is still occupied if the SCSI controller is disabled. This allows the SCSI controller to be enabled automatically if required. If you want to use the ISA interrupt for other purposes, you must disable it in the *SCSI IRQ Line* field.

Enabled	The onboard SCSI controller is enabled. *SCSI IRQ Line* must not be *Disabled*.
Disabled	The onboard SCSI controller is disabled.

SCSI Option ROM Scan - SCSI ROM expansion

The SCSI BIOS is started by the system BIOS.

To be able to load an operating system from an SCSI controller, the related SCSI controller must be controlled by an SCSI BIOS.

Enabled	During the initialisation of the SCSI controller on the mainboard, the SCSI BIOS is started by the system BIOS.
Disabled	During the initialisation of the SCSI controller on the mainboard, the SCSI BIOS is not started by the system BIOS.

Serial 1/Serial 2 - serial ports

This field selects the address and the interrupt used to access the relevant serial port.

Enabled The serial port is set to the shown address and interrupt. If you set *Enabled*, additional lines are displayed for setting the configuration.

Auto The serial port is automatically set to the next available combination (address, interrupt).

Disabled The serial port is disabled.

PnP OS or *OS Controlled*
  The operating system configures the ports.

Serial Multiplexer

specifies whether the serial interface can be used by the system or the BMC.

System The serial interface can be used by the system or the operating system.

BMC The serial interface can be used by the BMC. The operating system cannot use the serial interface.

Serial 1 / 2 Address: Base I/O address and IRQ

defines the base I/O address and the interrupt for the serial interface.

3F8h, IRQ4, *2F8h, IRQ3*, *3E8h, IRQ4*, *2E8h, IRQ3*,
  The serial port is set to the shown address and interrupt.

Reset Configuration Data

This field specifies whether the configuration data is reset and reinitialised when the system is started.

Yes After the system is started, the configuration data is reset, and the entry in this field is set to *No*. The new configuration data is determined by means of the Plug&Play functionality. The mounted boards and drives are then initialised with this data. Non-Plug&Play components must be entered manually (e.g. Windows, ICU).

No After the system is started, the Plug&Play functionality ascertains the current configuration data and uses this data to initialise the installed boards and drives. The configuration data of non-Plug&Play components are not reset.

System Management

calls up the submenu where fan and temperature sensors can be set and monitored.

Alert On LAN

Switches *Alert On LAN* on (*Enabled*) or off (*Disabled*). If the *Alert On LAN* function has also been enabled and configured in the operating system, the LAN hardware automatically sends predefined messages approximately every 30 seconds.

Battery State

indicates whether the voltage of the CMOS battery is sufficient. When *Fail* is displayed, the CMOS battery should be replaced.

OK	The voltage of the CMOS battery is sufficient.
Fail	The CMOS battery should be replaced.

Fan Control - fan rotational speed

controls the speed of the fan.
Depending on the system configuration and applications used, you can change the preset mode. If the system is fully configured, silent mode is not recommended.

Enhanced Cooling	The fans turn with a high rotational speed.
Auto	The fan rotational speed is adjusted automatically.
Silent	Temperature dependent regulation of processor speed enables reduced fan rotational speed which means less noise.

Fan State

Indicates if the fans for the processor (*CPU*), *Power Supply*, *System* and *Auxiliary* are rotating or not. The fans must support this function. If *OK* is displayed, the fan supports the function and is operating properly. If *None* is displayed, the fan is not recognised by BIOS. If *Fail* is displayed, BIOS found a faulty fan or the fan was removed. When leaving *BIOS Setup* status *Fail* is reset.

!\ If the fan does not support the function, *None* is displayed, even if the fan is operating.

CPU	Possible display: *None / OK / Fail*
Power Supply	Possible display: *None / OK / Fail*
System	Possible display: *None / OK / Fail*
Auxiliary	Possible display: *None / OK / Fail*

SM Error Halt - Error Handling for System Monitoring

Configures the procedures in the event of a fan / temperature sensor error.

Enabled   If a fan/temperature sensor error is detected or a fan/temperature sensor is removed, system start is terminated after self test and the system stops.

Disabled   The system startup is not aborted. Error message is displayed only.

Thermal Sensor State

Indicates if the temperature sensors for the processor (*CPU*), the *System* and the *Auxiliary* temperature sensor are functioning properly or not. The temperature sensors must support this function. If *OK* is displayed, the temperature sensor supports the function and is operating properly. If *None* is displayed, the temperature sensor is not recognised by BIOS. If *Fail* is displayed, BIOS found a faulty temperature sensor or the temperature sensor was removed. When leaving *BIOS Setup* status *Fail* is reset.

> ⚠ If the temperature sensor does not support the function, *None* is displayed, if the temperature sensor is operating.

CPU   Possible display: *None / OK / Fail*

System   Possible display: *None / OK / Fail*

Auxiliary   Possible display: *None / OK / Fail*

Use Multiprocessor Specification

specifies which version of the multiprocessor table is used. The multiprocessor table is needed by multiprocessor operating systems to recognise the multiprocessor characteristics of the system.

1.4   The newer version of the multiprocessor table is used.

1.1   The older version of the multiprocessor table is used. You should use this setting only if the operating system has problems with the multiprocessor configuration.

Security Menu - security features

The *Security* menu offers you various options for protecting your system and personal data from unauthorised access. By sensibly combining these options, you can achieve maximum protection for your system.

```
   Security ...

                                              Item Specific Help
                                            ──────────────────────
   Setup Password          Not Installed
   System Password         Not Installed    ─

   Set Setup Password:     [Enter]
   Setup Password Lock:    [Standard]
   Set System Password:    [Enter]
   System Password Mode:   [System]
   System Password Lock:   [Standard]

   cME Authentication Level:  [High]
   System Load:            [Standard]
   Setup Prompt:           [Enabled]
   Virus Warning:          [Disabled]

   Diskette Write:         [Enabled]
   Flash Write:            [Enabled]

   MemoryBird SystemLock:  [Disabled]
   SmartCard SystemLock:   [Disabled]
     SmartCard and PIN:    [Always required]
     Unblock Own SmartCard [Disabled]

   Cabinet Monitoring:     [Disabled]
   TPM Configuration:      [Disabled]

     Clear Security Chip:  [Disabled]


   F1 Info ...
```

Example for *Security* menu

Possible security features

Preventing unauthorised BIOS Setup entry

You can activate this protection by setting a setup password in the *Security* menu. In addition, you can suppress the `Press F2 to enter SETUP` message in the *Security* menu. This message is then no longer displayed while the start-up phase of the device is in progress.

Preventing unauthorised system access

You can activate this protection by setting a system password in the *Security* menu or by activating .*MemoryBird SystemLock*.

Preventing unauthorised access to the settings of boards with their own BIOS

You can activate this protection by selecting the value *Extended* for the *Setup Password Lock* field in the *Security* menu.

Preventing impermissible starting of non-certified FirstWare applications

To activate this protection, select the value *High* for the *cME Authentication Level* field in the *Security* menu.

Preventing system booting from the diskette drive

You can activate this protection by selecting the value *Diskette/CD-ROM-Lock* for the *System Load* field in the *Security* menu.

Activating virus warnings

You can have a warning output if the boot sector has been modified. To activate this warning, select the value *Enabled* for the *Virus Warning* field in the *Security* menu.

Preventing unauthorised writing of diskettes

To activate this protection, select the value *Disabled* for the *Diskette Write* field in the *Security* menu.

Protecting BIOS from being overwritten

To activate this protection, select the value *Disabled* for the *Flash Write* field in the *Security* menu.

Protecting the device from being switched on by an external device

To activate this protection make the required settings in the *Power On/Off* sub menu.

Preventing unauthorised access to the hard disk drives

You activate this protection when you make the desired settings in the submenu of the hard disk drives.

Switching on Trusted Platform module

You activate this protection when you select the entry *Enabled* for *TPM Configuration*.

Assigning and cancelling passwords

Setting the Setup/System password

The Setup password prevents unauthorised calling of *BIOS Setup*. Only those who know the Setup password can call *BIOS Setup* .

The system password prevents unauthorised access to your device. With the system password you can prevent booting of the operating system. Only those who know the system password can access the system.

You must also set a Setup password to make the system password effective.

i	The password must be four to eight characters in length. All alphanumerical characters can be used; no differentiation is made between upper-case and lower-case.
	Passwords are not displayed as they are entered.
	If you have forgotten your passwords, please contact our technical customer service.

► To set or change the setup/system password, proceed as follows:

► Call *BIOS Setup* and select the *Security* menu.

► Mark the *Set Setup Password* or *Set System Password* field and press the Enter key.

When a password has been set, you will be asked to enter it:

```
Enter Current Password
```

You are asked to enter the new password:
```
Enter New Password
```

► Enter the password and press the Enter key.

You are asked to confirm the password:
```
Confirm New Password
```

► Enter the password again and press the Enter key.

The new password is saved.
```
Changes have been saved [Continue]
```

For the setup password:

You can now choose whether you want the Setup password to prevent calling of the *BIOS Setup* only or in addition lock the settings of installed boards with their own BIOS.

► To prevent calling of the *BIOS Setup* only, mark the *Setup Password Lock* field and select the value *Standard*.

► To lock the settings of installed boards with their own BIOS in addition to preventing calling of the *BIOS-Setup*, mark the *Setup Password Lock* field and select the value *Extended*.

For the system password:

► To prevent booting of the operating system, mark the *System Password Mode* field and select the value *System*.

> ⚠ To lock the keyboard and the mouse, use the security functions of your operating system instead of the *Keyboard* entry.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The device is rebooted and the new setup/system password is effective.

Cancelling the setup/system password

> ℹ If you cancel the Setup password, you automatically deactivate the system password.

To cancel the setup/system password without setting a new password:

► Call *BIOS Setup* and select the *Security* menu.

► Mark the *Set Setup Password* or *Set System Password* field and press the Enter key.

You are asked to enter the current password:
`Current Password`

► Enter the password and press the Enter key.

► Press the Enter key twice.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The device is rebooted and the new setup/system password is cancelled.

Setting MemoryBird SystemLock

MemoryBird SystemLock is an alternative to password protection. *MemoryBird SystemLock* can replace both the setup and system passwords at the same time. This means that if *MemoryBird SystemLock* is enabled, you must first connect your MemoryBird when you want to start your system or open *BIOS Setup*.

You also have the option of setting up password protection for *BIOS Setup* (or leaving it unchanged as previously) and using *MemoryBird SystemLock* only as a substitute for the system password.

In both cases you must authenticate your MemoryBird before enabling *SystemLock* for the first time. This ensures that your system and your *BIOS Setup* can be started only with your MemoryBird.

► Call *BIOS Setup* and select the *Security* menu.

► If you want to use *MemoryBird SystemLock* as system protection only, enter a setup password as described in "Setting the Setup/System password".

► Set the *MemoryBird SystemLock* field to *Enabled*.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The device restarts.

> **i** SystemLock is not yet enabled! You must authenticate your MemoryBird before you can enable it.

Authenticating MemoryBird

When you first restart your system after setting *MemoryBird SystemLock* to *Enabled*, you are shown a window with the prompt:

```
Insert a MemoryBird for authentication
```

► Click on *OK* and connect your MemoryBird. This determines which MemoryBird you can use in the future to access your system.

MemoryBird SystemLock is now enabled.

> **i** If you select *Skip* instead, you can access your system and your *BIOS Setup* as previously. The *MemoryBird SystemLock* is not activated.

MemoryBird as system protection

At every future system start you are prompted to connect your MemoryBird (if it is not already connected). Only then can you access your system.

MemoryBird as setup and system protection

If you have not defined a password for *BIOS Setup* but have enabled *MemoryBird SystemLock*, you are prompted to connect your MemoryBird when you start your system and when you invoke *BIOS Setup*.

> ⚠ If you lose the authenticated MemoryBird and *MemoryBird SystemLock* is enabled, you can no longer access your system and you may no longer be able to access your *BIOS Setup*.
>
> In this instance, please contact our help desk. Cancellation of *MemoryBird SystemLock* is not a warranty case and is therefore subject to charge.

Cancelling MemoryBird SystemLock

► Call *BIOS Setup* and select the *Security* menu.

► Set the *MemoryBird SystemLock* field to *Disabled*.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The device restarts. *MemoryBird SystemLock* is no longer enabled.

Setting hard disk password

The hard disk password enable you to prevent unauthorised access to your hard disk drives. Only the person who knows the hard disk password, can boot the operating system from the hard disk or access data on the hard disk.

i	The password must be four to eight characters in length. All alphanumerical characters can be used; no differentiation is made between upper-case and lower-case.

Passwords are not displayed as they are entered.

If you have forgotten your passwords, please contact our help desk (see "Safety and Ergonomics" and "Warranty" manuals).

To set or change the hard disk password, proceed as follows:

► Run the *BIOS Setup* and select the hard disk in the *Main* menu.

► Mark the *Change Password* field and press the Enter key.

When a password has been set, you will be asked to enter it:

```
Enter HD Password
```

You are asked to enter the new password:
```
Enter New Password
```

► Enter the password and press the Enter key.

You are asked to confirm the password:
```
Confirm New Password
```

► Enter the password again and press the Enter key.

The new password is saved.

```
Password Status: Installed
```

!	The settings become effective immediately and remain effective, regardless of how you end the *BIOS Setup* later.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The notebook is rebooted and the hard disk password is effective.

Cancelling hard disk password

To cancel the hard disk password (without setting a new password):

► Run the *BIOS Setup* and select the hard disk in the *Main* menu.

► Mark the *Change Password* field and press the Enter key.

You are asked to enter the current password:

```
Enter HD Password
```

► Enter the password and press the Enter key.

► Press the Enter key twice.

The old password is deleted. The following message appears:

`Password Status: Not Installed`

 The settings become effective immediately and remain effective, regardless of how you end the *BIOS Setup* later.

► Select the option *Save Changes & Exit* in the *Exit* menu.

The notebook is rebooted and the hard disk password is cancelled.

Cabinet Monitoring

defines whether the device continues working after the casing has been opened (*Disabled*) or only after the setup password has been input (*Enabled*).

Clear Security Chip - deleting Trusted Platform Module (TPM)

When the Trusted Platform Module (TPM) is switched on, you can enable an additional setting option with the key combination **Alt** + **S** .

Enabled   All secret keys (e.g. SRK - Storage Root Keys, AIK - Attestation Identity Keys etc.) of the TPM generated by applications are deleted.

Disabled   The content of the TPM is retained

 If you delete the secret keys in the TPM, it will no longer be possible to decypher any data signed or encrypted with these keys. The security profile of your system is then lost forever

cME Authentication Level

specifies which security level FirstWare applications are to run with.

High   high security level

Medium   medium security level

Low   low security level

Diskette Write

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

Enabled   Diskettes can be read, written to or deleted if the *x* option (see manual for the mainboard) is set accordingly.

Disabled   Diskettes can only be read.

Embedded Security Chip - Trusted Platform Module (TPM) (optional)

specifies whether the Trusted Platform module can be used (*Enabled*) or is switched off (*Disabled*). The Trusted Platform module is available as a secure memory for secret keys. For example, data can be generated which can only be read or run on this system. The support of security protocols, such as SSL (Secure Socket Layer) for Internet connections, IPSec (LAN encryption), S-MIME (e-mail encryption, WLAN encryption and others) is also possible.

Enabled   Trusted Platform Module function is activated.

Disabled   Trusted Platform Module function is deactivated.

TPM Configuration (optional)

specifies whether the Trusted Platform module can be used (*Enabled*) or is switched off (*Disabled*). The Trusted Platform module is available as a secure memory for secret keys. For example, data can be generated which can only be read or run on this system. The support of security protocols, such as SSL (Secure Socket Layer) for Internet connections, IPSec (LAN encryption), S-MIME (e-mail encryption, WLAN encryption and others) is also possible.

Enabled   Trusted Platform Module function is activated.

Disabled   Trusted Platform Module function is deactivated.

```
  Security ...

  TPM Configuration                          Item Specific Help
                                            ──────────────────────
                                            Enable Trusted Platform
  Current TPM State        Enabled and      Module support
                           Activated

  TPM Support:             [Enabled]
  TPM State:               [No Change]
```

TPM State

No Change	The changes made are not saved.
Enable & Activate	Trusted Platform Module function is activated.
Deactivate & Disable	Trusted Platform Module function is deactivated.
Clear	Deletes data saved in the TPM.
	Warning!: If you delete the secret keys in the TPM, it will no longer be possible to decypher any data signed or encrypted with these keys. The security profile of your system is then lost forever

Physical Presence operations

This Setup page cannot be accessed via the normal *BIOS Setup*. It is automatically displayed during the *BIOS POST*, if there is meant to be a TPM configuration change. It can be initiated either by the *BIOS Setup* or via an operating system with TPM support. The Trusted Computing Group (TCG) security provisions stipulate that configuration changes are subject to a further individual confirmation (Physical Presence operations).

```
 Physical Presence operations

 TPM Configuration change was requested to    Item Specific Help
 State:              Enable and Activate
                                              Reject Physical
 Note:                                        Presence operations
                                              and exit
 This action will switch on the TPM


 Reject
 Execute
```

TPM Configuration change was requested to State:

Enable & Activate	Trusted Platform Module function is activated.
Deactivate & Disable	Trusted Platform Module function is deactivated.
	Warning!: Activating the TPM may affect other security applications.
Clear	Deletes data saved in the TPM.
	Warning!: If you delete the secret keys in the TPM, it will no longer be possible to decypher any data signed or encrypted with these keys. The security profile of your system is then lost forever

Flash Write

This field can assign write protection to the System BIOS.

Enabled	The BIOS system can be written to or deleted if the *x* option (see manual for the mainboard) is set accordingly. Flash-BIOS update from floppy disk is possible
Disabled	The System BIOS can neither be written to nor deleted. Flash-BIOS update from floppy disk is not possible.

MemoryBird SystemLock

MemoryBird SystemLock is an alternative to password protection. *MemoryBird SystemLock* can replace both the setup and system passwords at the same time. You also have the option of setting up password protection for *BIOS Setup* (or leaving it unchanged) and using *MemoryBird SystemLock* only as a substitute for the system password. How you enable *MemoryBird SystemLock* is described in "Setting MemoryBird SystemLock" chapter.

Enabled	Your authenticated MemoryBird must be connected when you invoke *BIOS Setup* and, if necessary, when you start your system.
Disabled	Your MemoryBird need not be connected. If necessary, you are prompted to enter your password.

Set Setup Password

This field enables you to install the Setup password. The setup password prevents unauthorised callup of the *BIOS setup*.
Mark the field and press the Enter key. You can then enter and confirm the setup password (see also "Assigning and cancelling passwords").

Set System Password

Requirement: The setup password is installed.

This field enables you to install the system password. The system password prevents unauthorised access to your system.
Mark the field and press the Enter key. You can then enter and confirm the system password (see also "Assigning and cancelling passwords").

Setup Password / System Password

indicates whether or not the respective password is installed (see also "Assigning and cancelling passwords").

Setup Password Lock

Requirement: The setup password is installed.

This field establishes the effect of the setup password (see also "Assigning and cancelling passwords").

Opaque   The setup password prevents unauthorised callup of the *BIOS setup*.

Extended   The Setup password prevents unauthorised calls of the *BIOS Setup* and locks the keyboard when the device is initialised. This prevents unauthorised access to settings for installed boards with a BIOS of their own.
The BIOS of the board can be accessed only if the setup password is entered during initialisation of the board. You must conclude password entry with the enter key. No request for a password is issued on the screen.

Setup Prompt - Setup message

This field specifies whether the setup prompt `Press F2 to enter SETUP` is displayed when the system is started (*Enabled*) or not (*Disabled*).

SmartCard SystemLock - Installing SystemLock

Please refer to "Installing SystemLock" section for a description of installing SystemLock.

SmartCard and PIN

defines whether the PC may be started using Wake On LAN without SmartCard and PIN input.

Always required
        The PC can be started only with SmartCard and PIN.

Ignore on WOL
        The PC can be started using Wake On LAN without SmartCard and PIN.

Unblock Own SmartCard

specifies whether a user can unlock his/her own User SmartCard (*Enabled*), or whether only the administrator can unlock the User SmartCard (*Disabled*). Additional information can be found in "Installing SystemLock" chapter.

Monitoring

Hard disk self-monitoring analysis and report technology

Enabled   Function is activated

Disabled   The finction is deactivated.

System Load

specifies whether the system can be loaded from floppy disk/CD-ROM.

Opaque   The operating system can be loaded from floppy disk/CD-ROM.

Diskette/CD-ROM-Lock
                 The operating system cannot be loaded from floppy disk/CD-ROM.

i	For security reasons, *System Load* is linked to *Setup Password*. This ensures that the operating system cannot be loaded from floppy disk or CD-ROM. *System Load* can only be activated when a setup password has been assigned.

System Password Lock

Establishes whether the system password is bypassed or must be entered when booting with *Wake On LAN*.

WOL Skip   The system password is deactivated when booting with *Wake On LAN*.

Opaque   The system password must be entered via the keyboard when booting the operating system.

System Password Mode

Requirement: Setup and system password are installed.

This field establishes the effect of the system password (see also "Assigning and cancelling passwords").

System   When the system is started, the system password enables the operating system to be booted.

Keyboard   When the system is started, the operating system is booted and the keyboard and mouse are locked. The system password unlocks the keyboard and mouse. No request for a password is issued on the screen.

i	The setting *Keyboard* is not available with USB keyboards, as opposed to PS/2 keyboards. Therefore, select the setting *System* with USB keyboards.

Virus Warning

This field checks the boot sectors of the hard disk drive to see if any changes have been made since the previous system start-up. If the boot sectors have been changed and the reason for this is unknown, a programme for finding computer viruses should be loaded.

Enabled   If the boot sector has been changed since the previous system start-up (e.g. new operating system or virus attack), a warning is displayed. The warning stays on the screen until you acknowledge the changes with *Confirm* or deactivate the function (*Disabled*).

Confirm   This entry confirms a required change in a boot sector (e.g. new operating system).

Disabled   The boot sectors are not checked.

Server Menu - server management

```
  Server

                                                  Item Specific Help

    O/S Boot Timeout:        [Disabled]
    Action:                  [Reset]
    Timeout Value:           [0]
    ASR&R Boot Delay:        [3 min]
    Boot Retry Counter:      [3]
    Diagnostic System:       [Disabled]
    Next Boot uses           [Boot Option]

    Temperature Monitoring   [Disabled]
    Memory Scrubbing         [Enabled]
    BIOS Runtime Logging     [Enabled]
  Ê CPU Status:
  Ë Memory Status

  Ê Console Redirection
  Ë RomPilot
  Ë Pager Configuration
  Ë VT100 Configuration

  Ê Storage Extension

    F1 Info ...
```

Example for *Server* menu

Action – action when time monitoring expires

Determines the action carried out after the boot watchdog expires.

Continue   The system continues to run

Reset   The system restarts.

Power Cycle   The system switches off and then on again (also see the section "Power Cycle Delay" in the Server menu).

ASR&R Boot delay

Specifies the boot delay after shutdown due to a fault (e.g. excessively high temperature). The system is rebooted after the set wait period has expired.

Possible values are: *1 min* to *30 min*.

BIOS Runtime Logging

establishes whether processor, memory or PCI errors are recorded in the error log. Only a certain number of error reports can be stored in the error log. The next error report overwrites the oldest error report in the error log. If a component is sending constant error reports, they constantly overwrite the error log. Older PCI components can sometimes send constant error reports even though they are performing their functions without errors.

Enabled   Runtime Logging is enabled. Processor, memory and PCI error reports are entered in the error log.

Disabled   Runtime Logging is disabled. Processor, memory and PCI error reports are not entered in the error log.

Boot retry counter

specifies the maximum number of attempts to boot the operating system. After the time set in *O/S Boot Timeout* has expired, each failed retry is followed by a system reboot. Other critical system errors also result in system reboot and in counter decrementing. After the last retry the system is definitively shut down or a diagnostic system started (if still possible and *Enabled*).

0 to *7*   Number of possible retries.

Clear Screen Delay (sec)

The last screen with BIOS messages remains visible for the set time before the operating system is started.

0 to *32*   The last screen with BIOS messages remains visible for the set time (seconds) before the operating system is started.

Console Redirection - Terminal functions

calls the submenu in which you make the settings for operating a terminal on the system. The terminal can be connected to the server system via a direct serial connection (zero modem cable). Screen outputs are directed in parallel to the terminal and the system monitor. Keyboard input at the terminal is likewise sent to the system and treated like input at the attached server keyboard. The *BIOS Setup* of the system, for example, can be called up and modified at the terminal.

Enabled   The function is activated.

Disabled   This function is deactivated.

⚠ It is not possible to enter a system password in *Keyboard Mode* at the terminal.

Baud Rate

Condition: *Disabled* may not be entered in the *Port* field.

Specifies the baud rate for communication with the terminal.
This setting must be identical on both the terminal and the server.

300, 1200, 2400, 9600, 19.2K, 38.4K, 57.6K, 115.2K
Data communication with the terminal is performed at the rate set.

Console Type

shows the set console. This setting must be identical on both the terminal and the server.

VT 100, VT100, 8bit/PC-ANSI, 7bit/ PC ANSI, VT100+,VT-UTF8
Data transfer to the terminal takes place with the set console.

Continue C. R. after POST (C. R. = Console Redirection)

specifies whether or not the *Console Redirection* function is run after the Power-On Self-Test (POST).

On   The *Console Redirection* function continues to be run after the POST.

Off   The *Console Redirection* function does not continue to be run after the POST.

Flow Control - Port settings

Condition: *Disabled* may not be entered in the *Port* field.

This setting determines how the transfer via the port is controlled.
The setting must be the same on both the terminal and the server.

None   The port is operated without transfer control.

XON/XOFF   The port transfer control is carried out by software.

CTS/RTS   The port transfer control is carried out by hardware. This mode must be supported by the cable.

Media Type

specifies which transfer medium is used for the terminal connection.

Serial   The terminal connection is established via the serial interface.

LAN   The terminal connection is established via the LAN interface of the BMC.

Serial + LAN   The terminal connection is established both via the serial interface and via the LAN interface of the BMC.

Mode - Console redirection mode

Condition: *Disabled* may not be entered in the *Port* field.

Specifies how long the terminal connection is available.

Opaque   The terminal operating mode is only available during the boot process.

Enhanced   The terminal operating mode (e.g. under MS-DOS) remains available after the boot process.

Port - Terminal port

specifies the transfer rate for communication with the terminal.

Disabled, Serial 1, Serial 2
                 The specified port is used for communication with the terminal. The setting *Disabled* switches off the terminal functions.

Protocol - Port settings

specifies the transfer protocol for communication with the terminal.
This setting should be identical on both the terminal and the server.

VT100, VT100 8 Bit, PC-ANSI 7 Bit, PC-ANSI, VT100+
                 The specified transfer protocol is used for communication with the terminal.
                 The protocols differ in the key sequences and character sets supported, and in whether they can display colour or only black-and-white.

CPU Status

Requirement: Two processors must be installed.
determines whether or not the processor can be used. Switch a processor off only if it has reported an internal malfunction. The malfunction is recorded in the error log, which you can view with the *SCU* (*Server Configuration Utility*), with the *RemoteView* or the *ServerView* programme.

CPU x Status

Enabled   The processor can be used by the operating system.

Disabled   The processor cannot be used by the operating system.

Failed   The processor cannot be used by the operating system. As long as the status is Failed, an entry is generated in the System Event Log file during each system start-up.

i	All status displays always appear for all possible processors (*CPU 0 Status, CPU 1 Status*) even if only one processor is installed. Even if *Disabled* is entered for all processors, one processor is used for booting.

If the processor is mounted but disabled, the system may have deactivated it because a processor error has occurred.

Diagnostic System

Specifies what is to happen after the number of system reboots defined in *Boot Retry Counter*.

Enabled   The test and diagnostic system is started from the first IDE hard disk drive.

Disabled   The test and diagnostic system is not started although an IDE hard disk drive with the test and diagnostic system is installed on the system.

Disk Not installed
                   An IDE hard disk drive with the test and diagnostic system is not installed on the system.

Remote Image Disk
                   The test and diagnostic process is started by a disk image that is linked via the diagnostic processor.

Memory Scrubbing

specifies whether memory will be screened and one-bit errors recovered. This involves the reading and restoration of the constant memory. This process recovers one-bit memory errors and prevents most multibit memory errors, since the latter are due to an accumulation of one-bit memory errors.

⚠️ The cause of one-bit memory errors may be inappropriate or incorrect system environment specifications.

Disabled   One-bit errors are not corrected. System performance is enhanced.

Enabled   One-bit memory errors are corrected.

Memory Status

calls the submenu in which memory modules can be marked as faulty. Faulty memory modules are no longer used when the system is rebooted provided at least one errorfree bank is available. The memory capacity is reduced accordingly. After the defective memory modules have been replaced, you must reset the relevant entries to *Enabled*.

Memory Modules n - Status of the Memory Modules

shows the current status of the memory modules.

Enabled   If the bank is equipped, the memory module is used by the system.

Disabled   The memory module is not used by the system.

Failed   The memory module is not used by the system. If you have replaced a defective memory module, you must reset the entry to *Enabled*. As long as the module status is Failed, an entry is generated in the System Event Log file during each system start-up.

Next Boot uses - Test with Diagnosis System (RemoteView)

Requirement: One IDE hard disk must be installed in the system with the *RemoteView* diagnostics software and *Enabled* must be set in the *Diagnostic System* field.

The *Diagnostic System* entry starts the IDE hard disk with *RemoteView* (diagnostics system) at the next system boot.

Boot option　　　The first drive listed under *Boot Option* (*Main* Menu) is used to boot the system.

Diagnostic System
　　　　　　　The system is booted by the *RemoteView* IDE hard disk.

O/S Boot timeout

Requirement: Operating system with server management agents (e.g. Novell NetWare or Windows 2000, OS/2, programme *ServerView*).
O/S Boot Timeout specifies whether a system reboot is performed when the operating system is not able to establish a connection with the server management BIOS within a defined period after system booting. The server management BIOS assumes that there is a boot error and initiates a reboot.

⚠ If the operating system does not have a server management process, you must select the setting *Disabled* so that the server management BIOS does not erroneously initiate a reboot. The server management process (agent) is installed using the *ServerView* programme.

Once the time specified in *ServerView* has elapsed, and if no connection has been established with a server management process, a reboot is initiated.

Enabled　　　　Time monitoring is enabled.

Disabled　　　No time monitoring takes place.

Power Cycle Delay

specifies the minimum time that must pass until the system can be switched on again after being switched off.

0 - 15　　　　Within the set time (in seconds), the system cannot be switched on again after being switched off.

Timeout value - time set for O/S boot timeout

specifies the time after which a system restart is performed if enabled by means of *O/S Boot Timeout*.

0　　　　　　The time monitoring is disabled.

1 - 120　　　The system is restarted after the set time (minutes) has elapsed.

RomPilot

Call up the submenu for the settings to *RomPilot* with *RomPilot*. *RomPilot* is part of *RemoteView* and *ServerView*. *RomPilot* provides access from a remote console via LAN to the system start phase (POST) and MS-DOS. *ServerView* or *RemoteView/Lan* under Windows are available as remote consoles. From the remote console, via the LAN connection, the *BIOS Setup* can be called up and changed or a BIOS-Flash can be carried out. A LAN board and the respective driver are prerequisites for the operation of *RomPilot*. The respective driver for *RomPilot* is included in the delivery unit *RemoteView*. Start the server with the setup or configuration disk for *RomPilot*. For more information about *RomPilot*, consult the *RemoteView* manual.

Requirements: *RomPilot* must be installed with *RemoteView* and the system must contain a LAN board for the operation of *RomPilot*.

Activates or deactivates the function *RomPilot*. At system start, the LAN driver for *RomPilot* operation will be loaded first if *RomPilot* is activated. Then, the system attempts to set up the LAN connection for the selected remote console. If no connection can be made with the selected remote console, the operating system will start. If a connection was made with the remote console, all messages of following system start phase are displayed there in the *RemoteView/LAN* window. Keyboard entries in the *RemoteView/LAN* window are sent to the system and are treated like entries of the connected system keyboard.

Enabled   *RomPilot* is activated.

Disabled   *RomPilot* is deactivated.

i	If the connection with the remote console is made, you receive the message `New session xxx`, where xxx is the IP address of the remote console.
	When the operating system starts the *RomPilot* connection is terminated.

Connect timeout

Here you specify the waiting time that may pass while a connection is established from the system to the remote console. Should no connection have been established after this waiting time expires, then the system is started without the *RemoteView* functions.

The time required to establish a connection depends on the quality of the network connection (e.g. intranet or internet) and the number of remote consoles used.

Extend the waiting time if you experience problems when establishing connections.

Low   Low waiting time

Medium   Medium waiting time

High   Long waiting time

Front End x IP

You enter the IP address of the remote console here.

Front End x Mode

Up to three remote consoles (front-end consoles) can be entered. The system attempts to set up the LAN connection with one of the entered remote consoles in sequence. With the field *Front End x Mode* it can be set if a remote console should be enabled or not.

Enabled   The remote console is used.

Disabled   The remote console is not used.

Gateway address

Enter the gateway address of the system LAN board here. Use the same gateway address as in the operating system. Only numeric characters are permitted.

Local IP address

Enter the IP address of the system LAN board here. Use the same IP address as in the operating system. Only numeric characters are permitted.

NIC Slot no.

The slot number where the LAN board for *RomPilot* is located can be found here. This field cannot be changed. It is set during *RomPilot* installation with *RemoteView*. It can only be changed with a new installation of *RomPilot*.

Reset on lost connection

If *RomPilot* determines that the connection to the remote-console was lost for a number of seconds a server reset is done.

Enabled   *Reset on lost connection* is active.

Disabled   *Reset on lost connection* is deactivated.

Server Name

Determine the server name to identify the system here. We recommend to use the same name for the server that will be used later in the operating system. You can use a maximum of 16 ASCII characters. Special characters are permitted.

Subnet mask

Enter the *subnet mask* of the system LAN board here. Use the same *subnet mask* as in the operating system. Only numeric characters are permitted.

Storage Extension

⚠️ The following submenu does not apply for the PCD-SE storage extension!

Storage Extensions calls the submenu in which you can make the settings for group configuration and for the communication bus. A number of servers and storage extensions (SEs) can be combined into a group (functional unit, family). Within this group each unit (server/SE) is given it's own device ID via which it can be addressed for purposes of communication over the communication bus (CAN bus). These devices can be combined into a maximum of ten groups. A group may comprise a maximum of five servers and 16 SEs.

Group number

specifies the group number for SE and server. Communication between SEs and servers is possible only within a group.

0 to 9   Group number.

ℹ️ The group number of the SE is set using the rotary switches on the control board in the SE (see SE operating manual).

Local Server ID

specifies the device ID of the server within the group. Within a group each device must have it's own device ID.

0 to *99/127*   Device ID of the server.

Use a device ID from 0 to 9 for the server.

Number of connected SE

specifies the number of SEs connected at the server. At system start a check is made whether all SEs of the group are present.

0 to *16*   Number of SEs.

SE Communication

permits communication between server and SE via the communication bus (CAN-BUS). If *SE Communication* is *Enabled*, a check is made at system start whether all SEs are present. For this purpose, the number of SEs attached to the server is specified in *Number of connected SE*. In addition, when the server is switched on, all SEs within the group are enabled via the communication bus.

Enabled   Communication via the communication bus is enabled.

Disabled   Communication with the SE via the communication bus is not possible. The SEs are not enabled with the server.

Server Type

This entry defines the server type (for high-availability configurations).

Primary   The server is of the type primary server.

Secondary   The server is of the type secondary server.

Temperature Monitoring

This field specifies whether the system is switched off if the ambient temperature or the temperature of a processor exceeds the critical value. This protects against damage to the system or data. If the operating has an active server management process, this takes over the temperature monitoring function and executes a shutdown if critical temperatures occur.
Depending on the *Boot Retry Counter*, the system switches itself on again after the period specified under *ASR&R Boot Delay*. In this period the system should have cooled down again.

Enabled   The system switches itself off if the temperature exceeds the critical value.

Disabled   The system does not switch itself off if the temperature exceeds the critical value.

Power Menu - energy saving functions

Programmes for power management (e.g. *POWER.EXE*) can change the settings for the energy saving functions.

```
  Power ...

                                              Item Specific Help

  APM Interface:          [Enabled]
    APM Power Saving:      [Customized]
      Standby Timeout:     [15 min]
      Suspend Timeout:     [Disabled]
      Hard Disk Timeout:   [15 min]
    APM Resume Timer:      [Disabled]
      APM Resume Time:     [00:00:00]

    ACPI Save To RAM:      [Enabled]

  Ê Power On/Off



  F1 Info ...
```

Example for menu *Power*

Power On/Off – Configuring the On/Off switch behavior

calls the submenu in which you can specify how the system can be powered on and off. These settings cause the system to be switched on and off in the same way as using the power switch on the system. The power switch is always operable and cannot be disabled.

⚠️ If you have assigned a system password in *System Password Mode*, the boot procedure is suspended during remote power on of the system (using *Remote Power On* or *Timer On*) as the system waits for entry of the system password. For this reason you should not assign a system password in *System Mode* if you want to use remote power-on but select the setting *Keyboard* in *System Password Mode*.

Wake On LAN

allows the system to be switched on by means of network signals. The LAN controller on the mainboard can switch on the system (*Enabled*) or not (*Disabled*).

ℹ️ If the function *LAN Remote Boot* is enabled, set *Wake On LAN* to *Enabled*.

LAN wake-up mode: Switching monitor on/off

Condition: *Wake On LAN* or *Power On Source: LAN* is set to *Enabled*.

If the system is switched on via the LAN controller on the mainboard, the monitor can also be switched on (*On*) or not (*Off*).

Power Failure Recovery - system status after a power failure

specifies the system status after recovering from power failure.

Always Off   The system switches on, performs a status check, and switches off.

> **i** During the short initialisation all wake up sources are configured again. The system can be reveilled by LAN etc. When *Disabled* is set the system can only be reveilled by power on button.

Always On   The system switches on.

Previous State The system switches on, performs a status check, and enters the status it had before the power failure occurred (ON or OFF).

Disabled   The system cannot be switched on.

Power Off Source: Keyboard

specifies whether the system can be switched off using a special on/off button on the keyboard (*Enabled*) or not (*Disabled*).

Power Off Source: Power Button - switch-off with the On/Off switch

specifies whether the system can be switched off with the On/Off switch on the front of the unit when the ACPI function is not active.

Enabled   The system can be switched off with the On/Off switch on the front of the unit.

Disabled   The system cannot be switched off with the On/Off switch on the front of the unit.

> ⚠ If the On/Off switch on the front of the unit is pressed for longer than 4 seconds, the system always switches off.

Power Off Source: Software

specifies whether the system can be switched off with a program (*DeskOff, SWOFF*) or an operating system e.g. one of the Windows operating system versions (*Enabled*) or not (*Disabled*).

Enabled   The system can be switched off with a programme.

Disabled   The system cannot be switched off with a programme.

Power On Source: LAN

determines whether the system can be switched on by means of an LAN controller (on the mainboard or additional board) (*Enabled*) or not (*Disabled*).

Enabled   The system can be switched on by means of an LAN controller.

Disabled   The system cannot be switched on by means of an LAN controller.

Power-on Source: Wake Up Timer – switching on via time

specifies whether the system can be timed to switch on at a particular time or after a particular period of time (*Enabled*) or not (*Disabled*).
The switch-on time cannot be specified in *BIOS Setup*. You require a suitable programme for setting this switch-on time.

Enabled   The system can be switched on at set times.

Disabled   The system cannot be switched on under timer control.

⚠ Rebooting after a critical system error (*ASR&R Boot Delay* field in the *Server* menu) is not affected by this setting.

Power On Source: Management of switch-on sources

specifies whether the switch-on sources for ACPI operating systems are managed by the BIOS or the operating system.

BIOS Controlled
                The switch-on sources are managed by the BIOS. Switching on via the LAN or Timer is permitted.

ACPI Controlled
                The switch-on sources are managed by the ACPI operating system. Switching on is only possible with the power switch.

Power-on Source: Wake Up Time - switching on via time

Specifies the exact point in time at which the system is to be switched on.
00:00:00

Power On Source: Wake Up Day

Specifies the exact day of the month on which the system is to be switched on

1, ...31

Power On Source: Wake Up Mode

Specifies the switch-on period.

Daily   The system is switched on daily.

Monthly   The system is switched on monthly.

ACPI Save To RAM

allows you to switch on (*Enabled*) or off(*Disabled*) the Save-to-RAM mode (ACPI S3) if the operating system supports the ACPI S3 functionality.

Enabled   The operating system can activate the Save-to-RAM (ACPI S3) mode.

Disabled   The operating system cannot activate the Save-to-RAM (ACPI S3) mode.

ACPI Save To RAM - energy-saving mode

specifies the functionality of the energy-saving mode.

Enabled   The ACPI system state "S3" is possible. With the exception of the main memory (RAM), all components of the mainboard are switched off. This reduces the power consumption to a minimum. The system is reactivated with the On/Off switch and is available again after approx. 5 sec.

Disabled   Only the ACPI system state "S1" is permitted. The power consumption is reduced in this state. The system can be reactivated with the On/Off switch, the mouse or the keyboard and is available again after approx. 1 sec.

After Power Failure

specifies whether or not the server is to be rebooted after a power failure.

Stay Off   After a power failure the server remains switched off.

Last State   The server restores the last state before the power failure. If the server was switched off, it remains switched off, and if it was switched on, then it switches on again.

Power on   The server is rebooted after a power failure.

Safe Standby

In case of a power failure, this function helps you to automatically recover data stored in the main memory during standby. In this case, the content of the main memory is secured on the hard disk. In order to activate the Safe Standby function, you need the Safe Standby tool, which you can find on the "Drivers&Utility" CD.

Enabled   The content of the main memory is secured on the hard disk.

Disabled   Data in the main memory are not secured against power failure during standby (ACPI S3)

APM Interface - Enabling the APM Interface

Determines whether an operation system can change the power management settings in the system BIOS (*Enabled*) or not (*Disabled*).

CPU HLT Detection/CPU Halt Mode (C1E) - reduce processor power consumption

enables reduction of power consumption, if the processor is in idle mode. This is a processor-integrated function that works independently of the operating system.

Enabled The processor in idle mode is recognised and power consumption is reduced.

Disabled The processor operates in the standard mode. Power consumption in idle mode is not reduced.

CPU Thermal Management

Protects the processor from overheating. If the processor becomes too hot for some reason (e.g. fan failure etc.), it automatically reduces its performance.

Opaque The processor continues running with an unchanged clock frequency and is temporarily stopped in order to reduce lost heat (Thermal Management 1).

Enhanced The Enhanced Thermal Management mode is activated in the processor. The processor automatically reduces the working frequency and operating voltage to maintain balanced thermal conditions (Thermal Management 2).

Enhanced SpeedStep

Enhanced SpeedStep is an energy-saving mode exclusively reserved for processors with Enhanced SpeedStep technology. When the processor is not working at full capacity, the clock frequency and the supply voltage level of the processor may be reduced. This leads to a lower power consumption of the processor, and therefore also to reduced heat development of the system.
To fully support this mode, an interaction between the BIOS and the operating system is necessary

Enabled The power-saving function can be activated via the operating system

SilentSpeed

describes a power-saving function for Pentium 4 and Celereon D processors. Processor power consumption is reduced by means of a processor pin. The processor pin is activated by Windows during periods of processor inactivity. The requirements for SilentSpeed functionality are a processor with Thermal Monitoring 2 support and the corresponding setting in the operating system.
Enabled The power-saving function can be activated via the operating system

Disabled Control of this power-saving function is not possible with windows

System Mode Configuration

 This function enables fixed predefined settings for noise and power consumption as well as further individual system settings.

This function enables fixed predefined settings for noise and power consumption as well as further individual system settings.

Auto   Ideal configuration of maximum performance and minimum noise level (recommended)

Performance   Optimum system settings for maximum performance

Silent   Optimum system settings for silent operation

Custom   User-configurable settings

SM Fan Control

The noise level is reduced by the temperature-dependent control of the processor speed and the fan speed. Three different operating modes are available and can be configured in BIOS Setup.

Enhanced Cooling Greater air flow and maximum processor performance

Auto   Optimum temperature control and processor performance

Silent   Minimum fan noise, may reduce processor performance

Hard disk timeout

Requirement: The *Power Management Mode* must be set to *Customized*.
This field defines the amount of time without system activity before the motor of the hard disk drive is switched off. As soon as there is a hard disk access, the motor is switched back on. In the case of newer hard disks, it may happen that in order to increase the life, the hard disk only switches off after several minutes even though a shorter time is set.

i	The energy saving is minimal in the case of newer hard disks.

2 min, *5 min*, *10 min*, *15 min*
                  Default entry = *10 min.*

Disabled   The PC does not switch off the hard disk drive.

APM Power Saving - Extent of energy saving functions

This field defines the extent of the energy saving functions.

Customized   The functions set in the fields *Standby Timeout*, *Suspend Timeout* and *Hard Disk Timeout* are effective in power management.

Maximum Power Saving, MinimumPower Saving
                  These entries call predefined settings, thus determining the extent of energy saving.

Disabled   None of the energy saving functions is effective.

APM Resume Timer/APM Resume Time

permits (*On*) or prevents (*Off*) the system from being switched on at a time set under *Resume Time*.

| i | This does not apply if *Save To Disk* was selected under *Suspend Mode*.

APM Resume Time

Prerequisite: *Resume Timer* is set to *On*.

Resume time for the function *Resume Timer*.

Standby timeout

Requirement: The *Power Management Mode* must be set to *Customized*.
This field defines the amount of time without system activity the system is to wait before switching to standby mode. In standby mode, the screen is dark.
The next *Wakeup Event* terminates standby mode again.

2 min, *5 min*, *10 min*, *15 min*, *30 min*   Default entry = *15 min.*

Disabled   The PC does not switch to standby mode

Suspend Timeout - Suspend mode

Requirement: The *Power Management Mode* must be set to *Customized*.
This field defines the amount of time without system activity the system is to wait before switching to standby mode. In standby mode, the screen is dark and the processor is switched off.
The next *Wakeup Event* terminates suspend mode again.

| i | In a network environment *Suspend Timeout* must be disabled, otherwise data transfer will be aborted.
| | If Windows NT is used as the operating system, *Suspend Timeout* should also be switched off, as Windows NT does not support access to the power management settings (*Advanced Power Management,* see "After Power Failure").

2 min, *15 min*, *30 min*, *1 h*, *2 h*   Default entry = *15 min*.

Disabled   The PC does not switch to suspend mode

Boot

Special menu for some servers (e.g. BX300). The menu items shown here are described in the chapter *Main*.

Exit Menu - exiting BIOS Setup

In the *Exit* menu, you can save your settings and exit *BIOS Setup*.

Exit	
	Item Specific Help
Save Changes & Exit Discard Changes & Exit Get Default Values Load Previous Values	
F1 Info ...	

Example for menu *Exit*

Discard Changes & Exit

Select *Discard Changes & Exit* and *Yes* to discard the changes you have made. The settings which were in force when *BIOS Setup* was called remain effective. *BIOS Setup* is terminated and the device is rebooted.

Get Default Values

To revert all the menus of *BIOS Setup* to the default entries, select *Get Default Values* and *Yes*.

If you want to exit *BIOS Setup* with these settings, select *Save Changes & Exit* and *Yes*.

Load Previous Values

To load the values of all the menus of *BIOS Setup* that were in effect when *BIOS Setup* was called, select *Load Previous Values* and *Yes*. If you want to exit *BIOS Setup* with these settings, select *Save Changes & Exit* and *Yes*.

Save Changes & Exit

Select *Save Changes & Exit* and *Yes* to save the current settings and exit the *BIOS Setup*. The device is rebooted and the new settings come into effect.

SystemLock

With *SystemLock*, the PC can only be started with an initialised SmartCard (SICRYPT, CardOS or Fujitsu) and personal identification number (PIN). SmartCard and PIN are already checked during system booting in the *BIOS Setup*, i.e. before the operating system is booted.

> **i** All new SmartCards have a preset PIN (Personal Identification Number) and PUK (Personal Unblocking Key).
>
> On SICRYPT and CardOS SmartCards PIN and PUK are preset to *12345678*. At Fujitsu the PIN is preset to *0000* and the PUK to *administrator*.
>
> For reasons of security, we recommend that you change both PIN and PUK.

So that it is also checked during operation, whether the proper SmartCard has been inserted, you require additional software such as *Smarty*.

If you do not have the entry *SmartCard SystemLock* in the *BIOS Setup* in the *Security* menu, then your system does not support *SystemLock*. You can update your system BIOS with the flash BIOS update (see "Flash BIOS update" chapter).

> **i** After you have initialised the first SmartCard, the entry *SmartCard SystemLock* cannot be deactivated (*Disabled*) in the *BIOS-Setup*. How to deinstall *SystemLock* is described at "Deinstalling SystemLock".

Access rights of the SmartCard

New SmartCards have only a preset PIN and PUK. Access rights and an individual PIN and PUK are not assigned until the SmartCard is initialised. The SmartCard type depends on the access rights assigned to the card as described below:

- User-SmartCard - system start-up, changing PIN
- Super User SmartCard - system start-up, changes in *BIOS Setup,* changing PIN
- Service SmartCard - changes in *BIOS Setup*.
- Admin SmartCard - system start-up, changes in *BIOS Setup*, changing PIN, deinstalling *SystemLock*, initialising SmartCards, activating SmartCards

The following table shows an overview of the rights associated with each SmartCard type when a PIN or PUK is entered:

	User SmartCard		Super User SmartCard		Service SmartCard		Admin SmartCard	
	PIN	PUK	PIN	PUK	PIN	PUK	PIN	PUK
System start-up	x		x				x	
Calling BIOS Setup			x		x		x	
Changing own PIN	x		x		x		x	x
Unblocking own blocked SmartCard		x [1)]		x [1)]		x [1)]		x
Unblocking all blocked SmartCards								x
Generating user cards								x
Deinstalling *SystemLock*								x

1 = Set in *BIOS Setup* (*Unblock own SmartCard*)

Usually there are always an admin SmartCard and at least one User or Super User SmartCard, to operate a system.

SmartCard user groups

User groups can be set up using *SystemLock*. This enables several systems to be started with a SmartCard. A user group consists of at least two systems. Each user who is allowed to start the systems is provided with a SmartCard. The user can start any of the systems using the SmartCard.

Basic information on setting up user groups

When installing SystemLock the first PC of the user group is set up as a "single PC". The Admin SmartCard generated in doing so is used to set up the user group. SystemLock sets up each additional PC as a "group PC" during installation. The existing Admin SmartCard is inserted, information is read in and the PC is added to the user group. The Admin SmartCard determines, which user group the PC belongs to.

If you use FSC-CardOS SmartCards, SystemLock can be managed via the Windows program "SystemLock Admin". With "SystemLock Admin", you can now conveniently manage SystemLock on the operating system level, create SystemLock Organisation Units and Groups, generate SmartCards for these Organisation Units or Groups, assign access authorisations on various levels for user cards and restore access authorisations with remote access. You can change your SmartCard's PIN or PUK or that of other users, and also reactivate blocked cards. For a detailed description, see the Help manual for "SystemLock Admin".
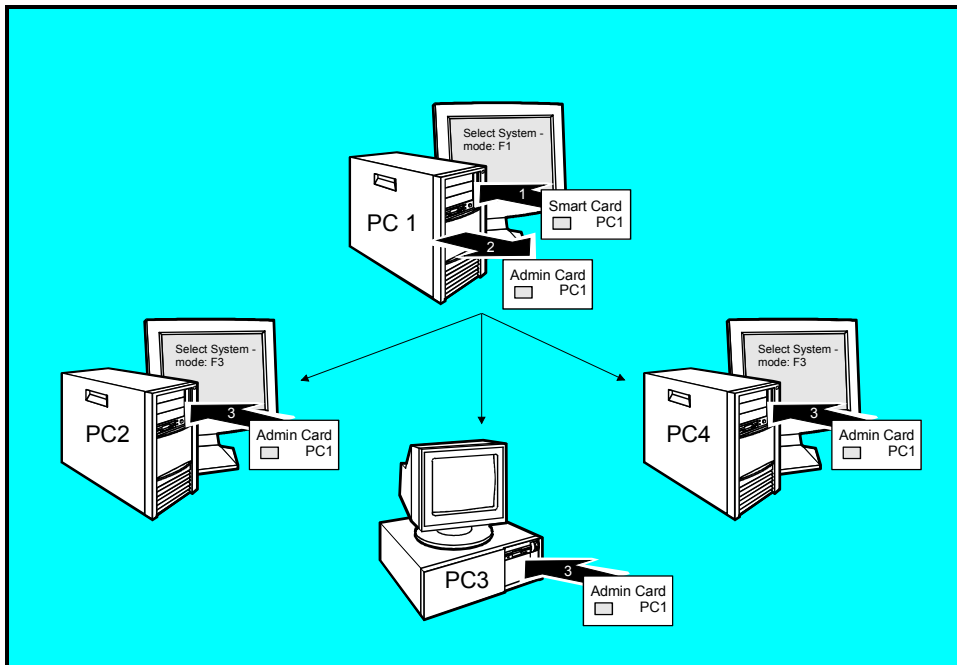
An example for generating a user group

User SmartCards or Super User SmartCards have to be generated using SystemLock so that the users can access the systems within the user group. Using a User SmartCard or Super User SmartCard a user can log on to each system within the user group.

Installing SystemLock

During initial installation, the first SmartCard becomes the Admin SmartCard. Together with the PUK, it has all access rights, and should therefore be kept in a safe place. It can only be used by the authorised user (administrator), e.g. to initialise user cards.

You need an Admin SmartCard if you want to set up a user group. You use the Admin SmartCard to add further systems to the user group.

How you set up the first PC of a user group or an individual system is described in "Setting up the first system of a user group or an individual system". How you add further systems to a user group is described in "Adding systems to a user group".

Setting up the first system of a user group or an individual system

Requirement: The *SmartCard SystemLock* function of the system BIOS is activated (*Enabled*) and the SmartCard reader must be ready-to-operate.

► Start the PC.

The following message appears:

```
SmartCard security installation
Select SystemLock mode:  F1=Single PC, F3=Group PC, ESC=Abort
```

► Press function key `F1`.

The following message appears:

```
Installing SystemLock ...
Insert a SmartCard.
```

► Insert a new SmartCard.

> **i** If you want to re-initialise a previously initialised SmartCard, the message *Enter PUK* appears.
> ► Ê Enter the PUK.
>
> The following appears:
> - *PUK OK* = The PUK was entered correctly.
> - *ACCESS DENIED* = you have entered the wrong administrator PUK. After six failed attempts, the SmartCard is blocked, and can no longer be used.

► At the following message, enter the new administrator PUK.

```
Enter the new PUK:
```

> **i** For the new PUK, 4 to 8-digit numbers are acceptable. For security reasons, we recommend that you change the PUK for every SmartCard, and use an 8-digit number each time.

```
Confirm the new PUK:
```

► Enter the new PUK again for confirmation.

The following appears:
- *NEW PUK OK* = the PUK was entered correctly.
- *NEW PUK FAILED* = you have confirmed the administrator PUK wrongly. You are then requested to enter and confirm the new PUK again.

► At the following message, enter the new user PUK.

```
Enter your new PIN:
```

> **i** For the new PIN, 4 to 8-digit numbers are acceptable.
> For security reasons, we recommend that you change the PIN for every SmartCard, and use an 8-digit number each time.

```
Confirm your new PIN:
```

► Enter the new PIN again for confirmation.

The following appears:
- *NEW PIN OK* = The PIN was entered correctly.
- *NEW PIN FAILED* = you have confirmed the PIN wrongly. You are then requested to enter and confirm the new PIN again.

The following message appears:

```
Initialize another SmartCard or press ESC to abort.
F5=User, F6=SuperUser, F7=Admin, F8=Service, F9=Unblock SmartCard,
F10=Uninstall
```

Instructions on how to initialise additional SmartCards are contained in the section "Carrying out administrator functions".

► If you do not want to initialise further SmartCards, press Esc and remove the Admin SmartCard. Never note the PIN or PUK on the SmartCard!

⚠️ Keep SmartCard and PIN/PUK in a safe place and protect it from unauthorised access.

Adding systems to a user group

Requirement: The *SmartCard SystemLock* function of the system BIOS is activated (*Enabled*) and the SmartCard reader must be ready-to-operate and you own an Admin SmartCard of the user group.

► Start the PC.

The following message appears:

```
SmartCard security installation

Select SystemLock mode:  F1=Single PC, F3=Group PC, ESC=Abort
```

► Press function key F3 .

The following message appears:

```
Installing SystemLock ...
Insert a SmartCard.
```

► Insert the Admin SmartCard of the user group.

```
Enter your PIN:
```

► Enter the PIN.

The following appears:
- *NEW PIN OK* = The PIN was entered correctly.
- *NEW PIN FAILED* = you have confirmed the PIN wrongly. You are then requested to enter and confirm the new PIN again.

The following message appears:

```
Enter your PUK:
```

► Enter the PUK.

The following appears:
- *PUK OK* = The PUK was entered correctly.
- *ACCESS DENIED* = you have entered the wrong administrator PUK. After six failed attempts, the SmartCard is blocked, and can no longer be used.

The following message appears:

```
Initialize another SmartCard or press ESC to abort?
F5=User, F6=SuperUser, F7=Admin, F8=Service, F9=Unblock SmartCard,
F10=Uninstall
```

Generate a user card for the PC as described in "Carrying out administrator functions".

► If you do not want to initialise further SmartCards, press **Esc** and remove the Admin SmartCard.

Switching on the PC with SystemLock

If you have an internal SmartCard reader, then you can switch on the PC by inserting the SmartCard. If you switch on the PC with an On/Off switch then the following message appears:

```
Insert a SmartCard.
```

► Insert your SmartCard.

```
Enter your PIN:
```

► Enter your PIN.

The following appears:
- *PIN OK* = the PIN was entered correctly.
- *ACCESS DENIED* = you have entered the wrong PIN. After three failed attempts, the SmartCard is blocked, and can only be enabled again by entering the PUK.

Depending on the rights of your SmartCard, you can select the following functions when this message is displayed on the screen:
```
F2=Setup, F3=Change PIN, F4=Administration
```

If your SmartCard has the relevant rights, you can

F2 - start the *BIOS Setup*.
F3 - change your PIN.
F4 - carry out administrator functions.
If you do not select a function, the system starts.

Start BIOS Setup - F2

A SmartCard with the appropriate rights must be inserted (SuperUser, Service or Admin).

Change PIN - F3

Possible with every initialised SmartCard.

Carry out administrator functions - F4

The Admin SmartCard must be inserted.

Changing PIN

► Press function key **F3** .

► Enter the old PIN.

► Enter the new PIN.

i	For the new PIN, 4 to 8-digit numbers are acceptable. For security reasons, we recommend that you change the PIN for every SmartCard, and use an 8-digit number each time.

► Confirm the new PIN.

Carrying out administrator functions

If you have an internal SmartCard reader, then you can switch on the PC by inserting the SmartCard. If you switch on the PC with an On/Off switch then the following message appears:

```
SystemLock
Insert a SmartCard.
```

► Insert the next Admin SmartCard. You receive the following message:

Enter your PIN:

Now you can make your choice:

```
F2=Setup, F3=Change PIN, F4=Administration
```

► Press function key **F4** . You receive the following message:

```
Enter the PUK:
```

► You receive the following message if you have entered the PUK correctly:

```
PUK OK.
Initialize another SmartCard or press ESC to abort?
F5=User, F6=SuperUser, F7=Admin, F8=Service, F9=Unblock SmartCard,
F10=Uninstall
```

F5 - Normal user SmartCard (access right "System"):
Allows system start-up only, but forbids changes in *BIOS Setup*.

F6 - Extended user SmartCard (access right "System and Setup"):
Allows system start-up and changes in *BIOS Setup*.

F7 - Admin SmartCard (access right "Admin"):
Allows generation of further Admin SmartCards.

F8 - Service SmartCard (access right "Service"):
Allows changes in *BIOS Setup* only.

F9 - Re-activate a blocked user SmartCard.
Enables a new user PIN entry.

F10 - Deinstalls *SystemLock*.
The further SmartCards should be produced either as normal user SmartCards ("System") or as extended user SmartCards ("System and Setup"). These then have restricted access to the PC.

► Press the appropriate function key. You receive the following message:

`Remove the SmartCard.`

► Remove the Admin SmartCard.

i	Keep the Admin SmartCard in a safe place and protect it from unauthorised access.

`Insert a SmartCard.`

► Insert the next SmartCard. It is initialised as required.

i	Always change the PIN and PUK for all further SmartCards. The PUK is used to re-activate a blocked SmartCard.

You receive the following message:

`Remove the SmartCard.`

► Remove the user SmartCard and label it e.g. with the user's name. Never note the PIN on the SmartCard!

Deinstalling SystemLock

► Start the PC.
► Follow the instructions as described in section "Carrying out administrator functions". Select **F10** for deinstalling *SystemLock*. You can now use the PC again with the need for a SmartCard.

Flash BIOS update

To perform a Flash BIOS update you must first load the relevant file from the Internet.

Under *http://www.fujitsu-siemens.com* you select the desired language (English or German) and then the *Drivers/Manuals* section. Then click *BIOS updates* to go to the Web page where you can see whether a flash BIOS update is available for your computer.

You need a DOS Boot diskette on which the BIOS update file will be saved. This diskette is then called the *Flash-BIOS-Diskette*.

> ⚠ The BIOS is stored in the flash memory. If an error occurs during Flash BIOS updating, the *BIOS Setup* in the flash memory is destroyed. You can then only restore the *BIOS Setup* using "Flash Memory Recovery Mode".
> If it is no longer possible to do so, replace the Flash Memory or contact customer service centre.
>
> ► Note down the settings in the *BIOS Setup*.
>
> A Flash BIOS update does not normally affect the settings in the *BIOS Setup*. However, if you want to modify some settings after a Flash-BIOS update you must reconfigure them.

► Boot the system with the inserted *Flash BIOS floppy disk*.

The FLASHBIO.EXE utility first reads in the BIOS Update file.

Once the Flash Memory type has automatically been recognised, programming begins. The old *BIOS Setup* is deleted and overwritten with the contents of the BIOS Update file.

> ⚠ The system must not be switched off or reset while programming is in progress.
>
> ► Do not press the RESET button or the key combination **Ctrl** + **Alt** + **Del** during this operation.
>
> ► Do not switch off the computer.
>
> These actions would interrupt the Flash BIOS update and destroy the *BIOS Setup*.

Screen messages during programming may look like this:

```
   WARNING:
   SYSTEM MUST NOT BE SWITCHED OFF OR RESET WHILE FLASH PROGRAMMING
   IS IN PROCESS. OTHERWISE THE SYSTEM BIOS WILL BE DESTROYED.

Flash memory: AMD 29F002T

Erasing 1.BLOCK (64K) /
Erasing 2.BLOCK (64K) /
Erasing 3.BLOCK (64K) /
Erasing 4.BLOCK (32K) /
Erasing 5.BLOCK (8K) /

Programming 1.BLOCK (64K) /
Programming 2.BLOCK (64K) /
Programming 3.BLOCK (64K) /
Programming 4.BLOCK (32K) /
Programming 5.BLOCK (8K) /

CMOS Configuration updated.

Flash memory programmed.
```

When the Flash BIOS update is completed, the following message appears on the screen:

```
Flash memory programmed.

Turn off the system and remove flash diskette from drive!
```

► Switch off the PC and remove the *flash update diskette* from drive A:.

The next time the PC is switched on, it is booted with the new BIOS version.

► Check the *BIOS Setup* and the settings. If necessary, configure the settings again.

Error message after a Flash BIOS update

If this error message is displayed at the next system boot, proceed as described below: If the message

```
BIOS update for installed CPU failed
```

appears the microcode required for the processor inserted must still be loaded.

► Boot the system with the inserted *Flash BIOS floppy disk*.

► Abort the normal Flash BIOS update by answering the question about whether you want to perform the update with

n ↵

► To carry out the Flash BIOS update for the processor, enter:

flashbio↵/p6 or **bioflash↵/p6** ↵

Flash Memory Recovery Mode

⚠️ The BIOS is stored in the flash memory. If an error occurs during Flash BIOS updating, the *BIOS Setup* in the flash memory is destroyed. You can restore the *BIOS Setup* using "Flash Memory Recovery Mode". If it is no longer possible to do so, replace the Flash Memory or contact customer service centre.

► Switch off the system and unplug the power plug.

► Open the casing and switch on "Recovery Mode" (RCV) using the DIP switch (refer to the manual about the mainboard or the relevant manual in PDF format on the "Drivers & Utilities" CD).

► Boot the system with the inserted *Flash BIOS floppy disk*.

⚠️ Normally no screen outputs are possible in Recovery mode.

Note the signals issued from the loudspeaker.

You have successfully restored the system if you hear the signal sequence "short-short-long-long-long" and the diskette access indicator is dark. The recovery update may take several minutes.

Only if a separate VGA board is mounted you can follow the Recovery Update on screen.

ℹ️ On some systems you must also switch on the "Skip" (SKP) switch to see the outputs on screen (refer to the manual for the mainboard or the relevant manual in PDF format on the "Drivers & Utilities" CD).

Then the following message appears:

    RECOVERY MODE

► Switch off the system and unplug the power plug.

► Remove the diskette from drive A: and change the setting of the DIP switch (RCV).

► Return all switches which have been changed (e.g. "Skip") to the initial position.

► Switch the device on again.

The PC is booted with the new BIOS version.

► Check the *BIOS Setup* and the settings. If necessary, configure the settings again.

DeskFlash

ℹ️ With some mianboards a Flash BIOS update can be performed directly under Windows using the *DeskFlash* utility contained on the "Drivers & Utilities" CD.

In the *Readme* file in the subfolder *DeskFlash* you will find the installation instructions for *DeskFlash*.

Further information on *DeskFlash* is provided in the file *\...\DeskView.PDF* and in the *DeskView* online help.

Error messages

This chapter contains error messages generated by the mainboard.

```
Available CPUs do not support the same bus frequency - System halted!
Memory type mixing detected
Non Fujitsu Siemens Memory Module detected - Warranty void
There are more than 32 32 RDRAM devices in the system
```

   Check whether the system configuration has changed. If necessary, correct the settings.

```
BIOS update for installed CPU failed
```

   This message appears if the microcode update required for the connected processor is not contained in the system BIOS.

► Boot the system with the inserted *Flash BIOS floppy disk*.

► Abort the normal Flash BIOS update by answering the question about whether you want to perform the update with

   n ⏎

► To carry out the Flash BIOS update for the processor, enter:

   flashbio₊₊/p6 ⏎

```
Check date and time settings
```

   The system date and time are invalid. Set the current date and time in the *Main* menu of the *BIOS Setup*.

```
CPU ID 0x failed
```

   Switch the server off and on again. If the message is still displayed, go into the *BIOS setup* and set the corresponding processor to *Disabled* in the *Server - CPU Status* menu; please contact your sales outlet or customer service centre.

```
CPU mismatch detected
```

   You have replaced the processor or changed the frequency setting. As a result, the characteristic data of the processor have changed. Confirm this change by running the *BIOS Setup* and exiting it again.

```
Diskette drive A error
Diskette drive B error
```

   Check the entry for the diskette drive in the *Main* menu of the *BIOS Setup*. Check the connections to the diskette drive.

```
DMA test failed
EISA CMOS not writable
Extended RAM Failed at offset: nnnn
Extended RAM Failed at address line: nnnn
Failing Bits: nnnn
Fail-Safe Timer NMI failed
Multiple-bit ECC error occurred
Memory decreased in size
Memory size found by POST differed from EISA CMOS
Single-bit ECC error occurred
Software NMI failed
System memory exceeds the CPU's caching limit
System RAM Failed at offset: nnnn
Shadow RAM Failed at offset: nnnn
```

> Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Failure Fixed Disk 0
Failure Fixed Disk 1
Fixed Disk Controller Failure
```

> Check the entry for the hard disk drive in the *Main* menu and the entry for the IDE drive controller in the *Advanced - Peripheral Configuration* menu of the *BIOS Setup*. Check the hard disk drive's connections and jumpers.

```
Incorrect Drive A - run SETUP
Incorrect Drive B - run SETUP
```

> Correct the entry for the diskette drive in the *Main* menu of the *BIOS Setu*p.

```
Invalid NVRAM media type
```

> Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Invalid System Configuration Data
```

> In the *Advanced* menu of the *BIOS Setup* set the entry *Reset Configuration Data* to *Yes*.

```
Invalid System Configuration Data - run configuration utility
Press F1 to resume, F2 to Setup
```

> This error message may be displayed if the machine was switched off during system start-up.

> Call *BIOS Setup* and switch to the *Advanced* menu. Select the menu item *Reset Configuration Data* and change the setting to *Yes*. Save the change and terminate *BIOS Setup*. Reboot the device.

```
Hot Spare Memory Feature could not be enabled
```

> The reserve memory bank could not be configured, as either only one memory bank is available to the system or the existing memory banks have different memory sizes. Check whether at least two memory banks of equal size are present in the system and check the status of the memory modules in the submenu *Memory Status* in the *Server* menu in the *BIOS Setup*.

```
Keyboard controller error
```

> Connect another keyboard or another mouse. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Keyboard error
```

Check that the keyboard is connected properly.

```
Keyboard error nn
nn Stuck Key
```

Release the key on the keyboard (*nn* is the hexadecimal code for the key).

```
Missing or invalid NVRAM token
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Monitor type does not match CMOS - RUN SETUP
```

Correct the entry for the monitor type in the *Main* menu of the *BIOS Setup*.

```
On Board PCI VGA not configured for Bus Master
```

In the *BIOS Setup*, in the *Advanced* menu, submenu *PCI Configuration*, set the *Shared PCI Master Assignment* entry to *VGA*.

```
One or more RDRAM devices are not used
One or more RDRAM devices have bad architecture/timing
One or more RDRAM devices are disabled
```

Contact your system administrator or contact our customer service centre.

```
Operating system not found
```

Check the entries for the hard disk drive and the floppy disk drive in the *Main* menu and the entries for *Boot Sequence* submenu of the *BIOS Setup*.

```
Parity Check 1
Parity Check 2
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Previous boot incomplete - Default configuration used
```

By pressing function key **F2** you can check and correct the settings in *BIOS Setup*. By pressing function key **F1** the system starts with incomplete system configuration. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Real time clock error
```

Call the *BIOS Setup* and enter the correct time in the *Main* menu. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Service Processor not properly installed
```

The server management controller has not been correctly installed. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Storage Extension Group = xy
Configuration error, x Storage Extensions(s) found, configured are y
SE(s).
Device List: k1, k2 ...
```

The specified number of storage expansion units (SEs) in the *BIOS Setup* menu *Server - Storage Extensions - Number of connected SE* is incorrect. Check how many SEs within the group are connected at the server and change the setting in *BIOS Setup*. Check whether you have assigned the same device ID twice.

xy = Group number
x = Number of SEs found on the communication bus
y = Number of SEs entered in *Number of connected SE*
k1, k2 ... = Device ID of the storage extensions found

```
System battery is dead - Replace and run SETUP
```

Replace the lithium battery on the mainboard and redo the settings in the *BIOS Setup*.

```
System Cache Error - Cache disabled
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
System CMOS checksum bad - - Default configuration used
```

Call the *BIOS Setup* and correct the previously made entries or set the default entries.

```
System Management Configuration changed or Problem occurred
```

A system fan or system sensor has failed. Check the hardware operation.

```
System timer error
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Uncorrectable ECC DRAM error
DRAM Parity error
Unknown PCI error
```

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

```
Verify CPU frequency selection in Setup
```

The frequency setting for the processor is invalid. Correct the *BIOS Setup* and the setting.

DOS error messages

This chapter contains the error messages that occur while DOS is running.

If a uncorrectable error occurs while DOS is running, then the following error text is output on the screen:

`Critical error logged to server management processor - system halted`

If the NMI button of the control panel is pressed, then the following error text is output on the screen:

`Frontpanel NMI activated - system halted`

SystemLock - error messages

This chapter contains error messages generated by the SmartCard reader (chipcard reader).

`Boot access denied`

> The SmartCard has no access rights to the system.

`Check your SmartCard`

> The SmartCard is either inserted incorrectly or it is not a suitable SystemLock SmartCard.

`SmartCard reader FAIL`

> An error has occurred on the serial port to the SmartCard reader (chipcard reader). If this error occurs always or often, the connection between the SmartCard reader and the mainboard must be checked, or the SmartCard reader must be replaced. While the error is present, access to the system is blocked.

`Non authorized SmartCard`

> The SmartCard cannot be used on this PC. The SmartCard has been configured for a different PC.

`SystemLock installation FAIL:`

> An error occurred while installing SystemLock. Do not switch off the PC, but insert the "BIOS Flash diskette", and try the installation again.

`The SmartCard is blocked.`
`Enter the PUK:`

> You have exceeded the maximum number of failed attempts to enter the PIN. The SmartCard is blocked.
> Enter the administrator PUK to re-activate the SmartCard. You must then enter a new User PIN to restart the system.

RomPilot - error messages

The following error messages can occur with *RomPilot*:

```
Dummy LAN driver installed, please replace with correct driver
```

The wrong LAN driver was installed for the LAN board for *RomPilot* operation. Install the correct LAN driver with the *RomPilot* setup or configuration disk. The disk is part of *RemoteView*.

```
xx RomPilot error code
```

xx is the error number. In the following you will find the error code and the respective error description.

If you receive a *RomPilot* error message, proceed as follows:

► Install or configure *RomPilot* again with *RemoteView*.

► Please test all set parameters on the server.

► Test all set parameters on the remote console.

If the message is still displayed, please contact your sales outlet or customer service centre.

	Error codes from real-mode kernel initialization
00	Unable to find Phoenix Dispatch manager/Post Memory manager entry points.
01	Failed to allocate real-mode memory.
02	Failed to load protected-mode kernel module.
03	Failed to load bundle/module (bundle/module is probably corrupt).
04	Protected-mode module is missing kernel signature.

	Error codes from protected-mode kernel initialization
05	Failed to initialize memory manager/system objects.
06	Failed to initialize kernel interrupt tables.
07	Failed to allocate descriptor table usage list.
08	Failed to create event object for BIOS messages.
09	Failed to create objects for BIOS slice.
0A	Failed to load all modules (module is probably corrupt).
0B	Kernel initialized successfully.

	Error codes from bundle loader module (INIT.PLM)
10	Unable to allocate memory below 1MB.
11	Unable to allocate memory above 1MB.
12	Phoenix Dispatch Manager call to size/load module failed.
13	No bundle file found in BIOS image.
14	No ODI driver found in BIOS image.
15	Too many bundles found in BIOS image.
16	Bundle failed to load (bundle is probably corrupt).

	Error codes from connection manager (CONMNGR.PLM)
18	Failed to register interface with RPC.
19	Protocol stack not bound to ODI driver.
1A	Unable to create thread.
1B	RomPilot shutdown for transition to DOS.
1C	RomPilot forced to shutdown by BIOS.

	Error codes from export of NV install data (EXPVARS.PLM)
20	Unable to allocate memory below 1MB.
21	Phoenix Dispatch Manager call to read NV install data failed.
22	Unable to allocate memory above 1MB.
23	Failed to export symbol.
24	Version mismatch between RomPilot and NV install data.
25	NV install data is marked as incomplete.
26	NV install data is missing RomPilot signature.
27	NV install data failed checksum.

	Error codes from link support layer (LSL.PLM)
28	LSL initialization failed.

	Error codes from media support module (MSM.PLM)
30	Unable to register shutdown function.
31	Network card not initialized.
32	Appropriate board not found.

	Error codes from protocol stack (PSTACK.PLM)
38	IP address is already in use.

Annex

POST (Power-On Self Test)

When the system is switched on or reset, the BIOS first carries out a number of routines. The routines test and initialise the hardware and load the operating system from the hard disk. These routines are called POST (Power–On Self-Test). At the beginning of each POST routine the BIOS writes the POST code to the I/O address 80h.

If an error occurs during the POST routines before the monitor is initialised, an acoustic signal (beep code) sounds. The POST routines are then stopped. The POST Watchdog causes a reboot of the system after the waiting time

> **i** If the system stops during the test, the POST code of the last routine carried out is saved under the I/O address 80h.
>
> If the mainboard is equipped with an 8-segment LED display, then these LEDs show the current value of the I/O address 80h.

Programmers and technicians use the screen messages, beep codes and LED displays during troubleshooting to determine where the system stopped and which routine was carried out last.

POST routines

The following list shows the POST codes, the beep codes, the LED display and the POST routine.

> **i** The routines are sorted according to their POST code. The routines do not run in this order.

LED indicator: □ = LED off, ■ = LED on

Code	Beep	LED indicator	POST routine
02h		□□□□□□■□	Verify real mode
03h		□□□□□□■■	Disable non–maskable interrupt (NMI)
04h		□□□□□■□□	Get CPU type
06h		□□□□□■■□	Initialize system hardware
08h		□□□□■□□□	Initialize chipset with initial POST values
09h		□□□□■□□■	Set IN POST flag
0Ah		□□□□■□■□	Initialize CPU registers
0Bh		□□□□■□■■	Enable CPU cache
0Ch		□□□□■■□□	Initialize caches to initial POST values
0Eh		□□□□■■■□	Initialize I/O component
0Fh		□□□□■■■■	Initialize the local bus IDE
10h		□□□■□□□□	Initialize power management

Code	Beep	LED indicator	POST routine
11h		□□□■□□□■	Load alternate registers with initial POST values
12h		□□□■□□■□	Restore CPU control word during warm boot
13h		□□□■□□■■	Initialize PCI bus mastering devices
14h		□□□■□■□□	Initialize keyboard controller
16h	1–2–2–3	□□□■□■■□	BIOS ROM checksum
17h		□□□■□■■■	Initialize cache before memory autosize
18h		□□□■■□□□	8254 timer initialization
1Ah		□□□■■□■□	8237 DMA controller initialization
1Ch		□□□■■■□□	Reset programmable interrupt controller
20h	1–3–1–1	□□■□□□□□	Test DRAM refresh
22h	1–3–1–3	□□■□□□■□	Test 8742 keyboard controller
24h		□□■□□■□□	Set ES segment register to 4 GB
26h		□□■□□■■□	Enable A20 line
28h		□□■□■□□□	Autosize DRAM
29h		□□■□■□□■	Initialize POST memory manager
2Ah		□□■□■□■□	Clear 512 KB base RAM
2Ch	1–3–4–1	□□■□■■□□	RAM failure on address line *xxxx**
2Eh	1–3–4–3	□□■□■■■□	RAM failure on data bits *xxxx** of low byte of memory bus
2Fh		□□■□■■■■	Enable cache before system BIOS shadow
30h	1–4–1–1	□□■■□□□□	RAM failure on data bits *xxxx** of high byte of memory bus
32h		□□■■□□■□	Test CPU bus clock frequency
33h		□□■■□□■■	Initialize Phoenix dispatch manager
36h		□□■■□■■□	Warm start shut down
38h		□□■■■□□□	Shadow system BIOS ROM
3Ah		□□■■■□■□	Autosize cache
3Ch		□□■■■■□□	Advanced configuration of chipset registers
3Dh		□□■■■■□■	Load alternate registers with CMOS values
42h		□■□□□□■□	Initialize interrupt vectors
45h		□■□□□□■■	POST device initialization
46h	2–1–2–3	□■□□□■■□	Check ROM copyright notice
48h		□■□□■□□□	Check video configuration against CMOS
49h		□■□□■□□■	Initialize PCI bus and devices
4Ah		□■□□■□■□	Initialize all video adapters in system
4Bh		□■□□■□■■	Quiet-Boot start (optional)

Code	Beep	LED indicator	POST routine
4Ch		□■□□■■□□	Shadow video BIOS ROM
4Eh		□■□□■■■□	Display BIOS copyright notice
50h		□■□■□□□□	Display CPU type and speed
51h		□■□■□□□■	Initialize EISA board
52h		□■□■□□■□	Test keyboard
54h		□■□■□■□□	Set key click if enabled
58h	2−2−3−1	□■□■■□□□	Test for unexpected interrupts
59h		□■□■■□□■	Initialize POST display service
5Ah		□■□■■□■□	Display prompt "Press F2 to enter SETUP"
5Bh		□■□■■□■■	Disable CPU cache
5Ch		□■□■■■□□	Test RAM between 512 and 640 KB
60h		□■■□□□□□	Test extended memory
62h		□■■□□□■□	Test extended memory address lines
64h		□■■□□■□□	Jump to UserPatch1
66h		□■■□□■■□	Configure advanced cache registers
67h		□■■□□■■■	Initialize Multi Processor APIC
68h		□■■□■□□□	Enable external and CPU caches
69h		□■■□■□□■	Setup system management mode (SMM) area
6Ah		□■■□■□■□	Display external L2 cache size
6Bh		□■■□■□■■	Load custom defaults (optional)
6Ch		□■■□■■□□	Display shadow−area message
6Eh		□■■□■■■□	Display possible high address for UMB recovery
70h		□■■■□□□□	Display error messages
72h		□■■■□□■□	Check for configuration errors
76h		□■■■□■□□	Check for keyboard errors
7Ch		□■■■■■□□	Set up hardware interrupt vectors
7Eh		□■■■■■■□	Initialize coprocessor if present
80h		■□□□□□□□	Disable onboard super I/O ports and IRQs
81h		■□□□□□□■	Late POST device initialization
82h		■□□□□□■□	Detect and install external RS232 ports
83h		■□□□□□■■	Configure non−MCD IDE controllers
84h		■□□□□■□□	Detect and install external parallel ports
85h		■□□□□■□■	Initialize PC−compatible PnP ISA devices
86h		■□□□□■■□	Re−initialize onboard I/O ports.
87h		■□□□□■■■	Configure motherboard configurable devices (optional)

Code	Beep	LED indicator	POST routine
88h		■□□□■□□□	Initialize BIOS data area
89h		■□□□■□□■	Enable non‑maskable interrupts (NMIs)
8Ah		■□□□■□■□	Initialize extended BIOS data area
8Bh		■□□□■□■■	Test and initialize PS/2 mouse
8Ch		■□□□■■□□	Initialize floppy controller
8Fh		■□□□■■■■	Determine number of ATA drives (optional)
90h		■□□■□□□□	Initialize hard disk controllers
91h		■□□■□□□■	Initialize local bus hard disk controllers
92h		■□□■□□■□	Jump to UserPatch2
93h		■□□■□□■■	Build MPTABLE for multi‑processor boards
95h		■□□■□■□■	Install CD ROM for boot
96h		■□□■□■■□	Clear huge ES segment register
97h		■□□■□■■■	Fixup multi-processor table
98h	1‑2	■□□■■□□□	Search for option ROMs. One long, two short beeps on checksum failure
99h		■□□■■□□■	Check for SMART drive (optional)
9Ah		■□□■■□■□	Shadow option ROMs
9Ch		■□□■■■□□	Set up power management
9Dh		■□□■■■□■	Initialize security engine (optional)
9Eh		■□□■■■■□	Enable hardware interrupts
9Fh		■□□■■■■■	Determine number of ATA and SCSI drives
A0h		■□■□□□□□	Set time of day
A2h		■□■□□□■□	Check key lock
A4h		■□■□□■□□	Initialize Keyboard typematic rate
A8h		■□■□■□□□	Erase F2 prompt
AAh		■□■□■□■□	Scan for F2 key stroke
ACh		■□■□■■□□	Enter SETUP
AEh		■□■□■■■□	Clear Boot flag
B0h		■□■■□□□□	Check for errors
B2h		■□■■□□■□	POST done – prepare to boot operating system
B4h	1	■□■■□■□□	One short beep before boot
B5h		■□■■□■□■	Terminate Quiet-Boot (optional)
B6h		■□■■□■■□	Check password (optional)
B9h		■□■■■□□■	Prepare boot
BAh		■□■■■□■□	Initialize DMI parameters
BBh		■□■■■□■■	Initialize PnP option ROMs

Code	Beep	LED indicator	POST routine
BCh		■□■■■■□□	Clear parity checkers
BDh		■□■■■■□■	Display Multi-Boot menu
BEh		■□■■■■■□	Clear screen (optional)
BFh		■□■■■■■■	Check virus and backup reminders
C0h		■■□□□□□□	Try to boot with INT 19
C1h		■■□□□□□■	Initialize POST Error Manager (PEM)
C2h		■■□□□□■□	Initialize error logging
C3h		■■□□□□■■	Initialize error display function
C4h		■■□□□■□□	Initialize system error handler
C5h		■■□□□■□■	PnPnd dual CMOS (optional)
C6h		■■□□□■■□	Initialize notebook docking (optional)
C7h		■■□□□■■■	Initialize notebook docking late
C8h		■■□□■□□□	Force check (optional)
C9h		■■□□■□□■	Extended checksum (optional)
D2h		■■□■□□□□	Unknown interrupt

*   If the BIOS discovers the error 2C, 2E or 30 (base 512K RAM error), an additional word bitmap (*xxxx*) appears on the screen which indicates the address line or bits which are defective.

Example:

"2C 0002" means address line 1 (bit 1 set) is defective

"2E 1020" means data bits 12 and 5 (bits 12 and 5 set) were defective in the low-value 16 bits.

The BIOS also sends this bitmap to the LED indicator of the I/O address 80h. First the POST code is displayed, then a pause, then the high-value byte, another pause, then the low-value byte of the error. The sequence is continually repeated.

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