

BIOS manual D3498/D3598



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BIOS manual D3498/D3598

Manual

Introduction	9
Navigating BIOS Setup	11
Main Menu – System functions	14
Advanced Menu – Advanced system configuration	16
Security Menu – Security Functions	44
Power Menu – Energy saving functions	54
Event Logs – Configuration and Display of the Event Log	57
Boot Menu – System boot	59
Save & Exit Menu – Finish BIOS Setup	62
BIOS Update	64
Index	66

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Contents

Introduction	9
Notational conventions	10
Navigating BIOS Setup	11
Open BIOS Setup	11
If you want to open the Boot Menu immediately	12
If you wish to boot immediately from LAN	12
Navigating BIOS Setup	13
Exiting BIOS Setup	13
Main Menu – System functions	14
System Information	14
Open source software license information	14
System Language	14
System Date / System Time	15
Keyboard Layout	15
Access Level	15
Advanced Menu – Advanced system configuration	16
Erase Disk	17
Onboard Device Configuration	19
LAN n Controller	19
Audio Configuration	19
Card Reader Settings	19
Auto BIOS Update	20
Terms of Use	20
Automatic BIOS update	20
Update Server address	21
Silent update	21
Manually check for update	21
PCI Subsystem Settings	21
PERR# Generation	21
SERR# Generation	22
Slot n Link Speed	22
Slot n Non-Compliance	22
Above 4G Decoding	22
CPU Configuration	23
Hyper-threading	23
Active Processor Cores	23
Hardware Prefetcher	23
Adjacent Cache Line Prefetcher	24
DCU (Data Cache Unit) Streamer Prefetcher	24
DCU Ip (Instruction pointer-based) Prefetcher	24
Intel Virtualization Technology	25
VT-d	25
Intel TXT Support	25
HWPM Support	26
Enhanced SpeedStep	26
Turbo Mode	26
Override OS Energy Performance	26
Energy Performance	27

- CPU C1E Support 27
- Autonomous C-state Support 27
- CPU C6 Report 27
- Package C State limit 28
- LLC Dead Line Alloc 28
- State AtoS 28
- Runtime Error Logging 28
 - ECC Memory Error Logging 28
 - PCI Error Logging 29
- Memory Configuration 29
 - NUMA 29
 - DDR Performance 29
 - IMC Interleaving 30
 - Sub NUMA Clustering 30
- VMD Configuration 30
 - CPU n - root port m 30
- Drive Configuration 30
 - OnBoard SATA Configuration 30
- SMART Settings 32
 - SMART Self Test 32
- CSM Configuration 32
 - Launch CSM 32
 - Boot Option Filter 32
 - Launch PXE OpROM Policy 32
 - Launch Storage OpROM Policy 33
 - Launch Video OpROM Policy 33
 - Other PCI Device ROM Priority 33
- TPM (Trusted Platform Module) Computing 33
 - TPM Support 33
 - Pending TPM operation 33
 - Current TPM Status Information 34
- USB Configuration 34
 - USB Devices 34
 - Legacy USB Support 34
 - PS/2 Emulation 34
 - Mass Storage Devices 35
 - USB Port Security 35
- System Management 37
 - Fan Startup Check 37
 - Fan Control 37
 - Watchdog Timeout 37
- Super IO Configuration 38
- Serial Port 1 Configuration 38
 - Serial Port 38
 - Device Settings 38
 - Change Settings 38
- Serial Port Console Redirection 38
- Console Redirection Settings 39
 - Terminal Type 39
 - Bits per Second 39
 - Data Bits 39
 - Parity 39
 - Stop Bits 40

Flow Control	40
VT-UTF8 Combo Key Support	40
Recorder Mode	40
Resolution 100x31	40
Legacy OS Redirection Resolution	40
Putty KeyPad	41
Redirection After BIOS RESET	41
AMT Configuration	42
ME Version	42
Intel AMT	42
USB Provisioning	42
Unconfigure AMT/ME	42
MEBx Mode	42
Network Stack Configuration	43
Network Stack	43
Ipv4 PXE Support	43
Ipv6 PXE Support	43
Option ROM Configuration	43
Launch Slot n OpROM	43
Driver Health	43
Security Menu – Security Functions	44
Password Description	45
Administrator Password	45
User Password	45
Password Severity	46
Password on Boot	46
Housing Monitoring	46
Skip Password on automatic Wakeup	46
System Firmware Update	47
System Firmware Rollback	47
Easy PC Protection	47
HDD Security Configuration	48
HDD Password on Boot	48
HDD n / HDD-ID	48
HDD Password Description	48
HDD Password Configuration	48
Security Supported	48
Security Enabled	48
Security Locked	48
Security Frozen	48
HDD User Password Status	49
HDD Master Password Status	49
Set User Password	49
Set Master Password	49
Secure Boot Configuration	49
Platform Mode	49
Secure Boot	50
Vendor Keys	50
Secure Boot Control	50
Secure Boot Mode	50
Key Management	51
Factory Default Key Provisioning	51

Enrol All Factory Default Keys	51
Export Secure Boot Variables	51
Platform Key	51
Key Exchange Keys	52
Authorized Signatures	52
Forbidden Signatures	52
Authorized TimeStamps	53
OsRecovery Signatures	53
Power Menu – Energy saving functions	54
Power Settings	54
Power Failure Recovery – System status after a power failure	54
USB Power	55
USB Type-C Connector Power Limit	55
Wake-Up Resources	55
LAN	55
Wake On LAN Boot	55
USB Keyboard	56
Wake Up Timer	56
Hour	56
Minute	56
Second	56
Wake Up Mode	56
Wake Up Day	56
Event Logs – Configuration and Display of the Event Log	57
Change SMBIOS event log settings	57
SMBIOS Event Log	57
Erase Event Log	57
When Log is full	58
View SMBIOS Event Log	58
Boot Menu – System boot	59
Boot Configuration	59
Bootup NumLock State	59
Quiet Boot	60
Check Controller Health Status	60
Boot Error Handling	60
Keyboard Error Reporting	60
Primary Display	60
New Boot Option Policy	60
Boot Menu	61
Boot Removable Media	61
Boot option priorities	61
Save & Exit Menu – Finish BIOS Setup	62
Save Changes and Reset	62
Discard Changes and Reset	62
Save Changes and Power Off	62
Restore Defaults	63
Boot Override	63
Diagnostic Program	63
BIOS Update	64

Auto BIOS Update 64
Flash BIOS update under Windows 64
Flash BIOS update with a USB stick 65
BIOS Recovery Update 65
Index **66**

Introduction

BIOS Setup provides settings for system functions and the hardware configuration for the system. Any changes you make to the settings take effect as soon as you save the settings and quit *BIOS Setup*.

The individual menus in *BIOS Setup* provide settings for the following areas:







<i>Main:</i>	System functions
<i>Advanced:</i>	Advanced system configuration
<i>Security:</i>	Security functions
<i>Power:</i>	Energy saving functions
<i>Event Logs:</i>	Configuration and display of the event log
<i>Boot:</i>	Configuration of the start-up sequence
<i>Save & Exit:</i>	Save and quit



The setting options depend on the hardware configuration of your system.

Some menus and certain settings may therefore not be available in *BIOS Setup* on your system, or the menus may be in a different place, depending on the *BIOS revision*.

Notational conventions

	Pay particular attention to texts marked with this symbol. Failure to observe this warning endangers your health, destroys the system, or may lead to loss of data. The warranty will be invalidated if the system becomes defective through failure to take notice of this warning.
	Indicates important information which is required to use the system properly.
	Indicates an activity that must be performed.
	Indicates a result.
This font	Indicates data entered using the keyboard in a program dialogue or command line, e.g. your password ((Name123) or a command used to start a program (start.exe).
This font	Indicates information that is displayed on the screen by a program, e.g.: Installation is complete!.
<i>This font</i>	Indicates <ul style="list-style-type: none"> • terms and texts used in a software interface, e.g.: Click on <i>Save</i>. • names of programs or files, e.g. <i>Windows</i> or <i>setup.exe</i>.
"This font"	Indicates <ul style="list-style-type: none"> • cross-references to another section, e.g. "Safety information" • cross-references to an external source, e.g. a web address: For more information, go to "http://www.fujitsu.com/fts/" • names of CDs, DVDs and titles or designations for other materials, e.g.: "CD/DVD Drivers & Utilities" or "Safety" manual.
	Indicates a key on the keyboard, e.g:  .

Navigating BIOS Setup



Open BIOS Setup

- ▶ Switch the system on using the ON/OFF button and keep the button pressed for 2 seconds.
- ↳ The BIOS pauses during the POST and the message appears:
Press <F2> to enter Setup or any other key to continue
- ▶ Press function key **[F2]**.
- ▶ If the system is password protected, you must now enter the password and confirm with the **[Enter]** key. You will find details on password assignment under ["Password Description", Page 45](#).
- ↳ The BIOS Setup Main menu will be displayed on the screen.
- ▶ To display system-specific information, select *System Information* and press the **[Enter]** key.
- ↳ The BIOS release information will be displayed:
 - The revision of the BIOS (e.g. R1.3.0)
Under "Board" you will find the system board number (e.g. D3062-A11)
With the aid of the system board number you can locate the correct technical manual for the system board on the "Drivers & Utilities" CD/DVD. Alternatively you can also use it to download the corresponding BIOS update file from the Internet (see ["BIOS Update", Page 64](#)).

If you want to open the Boot Menu immediately





You can use this function if you do not wish to boot your system from the drive which is given as the first setting under *Boot Option Priorities* in the *Boot* menu.

- ▶ Start the system and wait until screen output appears.
- ▶ Press the function key **[F12]**.
- ↳ On the screen, the boot options are shown as a popup window. You can now select the drive from which you wish to boot the operating system. The selection options are the same as the possible settings given under *Boot Option Priorities* in the *Boot* submenu.
- ▶ Use the  and  cursor keys to select which drive you want to boot the operating system from now and confirm your choice with the **[Enter]** key.















Your selection is only valid for the current system boot. At the next system boot, the settings in the *Boot* menu are valid again.

- ▶ If you want to start the BIOS Setup, use the cursor keys  or  to select the *Enter Setup* entry and confirm your selection with the **[Enter]** key.

If you wish to boot immediately from LAN

- ▶ Press the function key **[F11]** if you wish to boot directly via LAN and not from the drive which is given as the first position under *Boot Option Priorities* in the *Boot* menu.

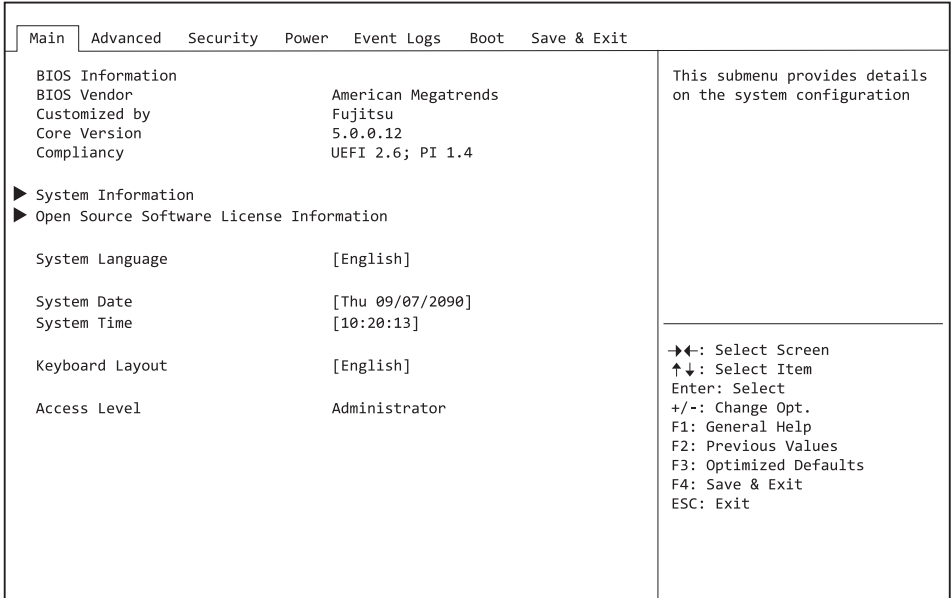
Navigating BIOS Setup

 or  cursor keys	Select menu from menu bar
 or  cursor keys	Select field - selected field is highlighted
 or 	Open submenu (marked by ►)  and leave 
 or  keys (numeric keypad)	Change entry for field
	Set default entries for all menus
	Reset entries that were in use when <i>BIOS Setup</i> was opened.

Exiting BIOS Setup

- ▶ Select the *Save & Exit* menu from the menu bar to end *BIOS Setup*.
- ↳ You can then decide whether you want to save the changed settings.
- ▶ Select the required option.
- ▶ Press the Enter key.

Main Menu – System functions



Example showing the *Main* menu

The *Main Menu* is entered, to determine the basic system configuration and to provide an overview. Some of the parameters are only available under certain conditions.

System Information

The *System Information* submenu gives you an overview of the system configuration. This includes information about the CPU, memory and LAN configuration.

Open source software license information

This submenu provides the licence information for the open source software that is used in this system board.

System Language

Specifies the language used in the *BIOS Setup*.

System Date / System Time

Shows the currently set date / the currently set time of the system. The date has the format "Day of the week, month/day/year". The time has the format "hours/minutes/seconds". If you wish to change the currently set date / the currently set time, enter the new date in the field *System Date* and the new time in the field *System Time*. Use the tab key to switch the cursor between the *System Time* and *System Date* fields.



If the system date & time fields are often set incorrectly when starting the computer, the lithium battery is possibly discharged and must be changed. The procedure for changing the lithium battery is described in the system board manual.

Keyboard Layout

Specifies the keyboard layout used in the BIOS Setup.

This menu option can only be selected if no password has been configured, in order to prevent problems when entering a password.

Access Level

Shows the current access level in *BIOS Setup*. If the system is not protected by a password, or an administrator password has been allocated, the access level is Administrator. If administrator and user passwords are allocated, the access level depends on the password entered.

Advanced Menu – Advanced system configuration

The advanced functions which are available to the system are configured in this menu for the advanced system configuration.



Only change the default settings if required for a special purpose. Incorrect settings can cause malfunctions.

Main	Advanced	Security	Power	Event Logs	Boot	Save & Exit
Advanced		Onboard Devices Configuration				
▶ Onboard Device Configuration						
▶ Auto BIOS Update						
▶ PCI Subsystem Settings						
▶ CPU Configuration						
▶ Runtime Error Logging						
▶ Memory Configuration						
▶ UMD Configuration						
▶ Drive Configuration						
▶ SMART Settings						
▶ CSM Configuration						
▶ Trusted Computing						
▶ USB Configuration						
▶ System Management						
▶ Serial Port Console Redirection						
▶ AMT Configuration						
▶ Network Stack Configuration						
▶ Option ROM Configuration						
▶ Intel (R) Virtual RAID on CPU						
▶ Driver Health						
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit				

Example showing the *Advanced* menu

Erase Disk

Erase Disk is a solution that is integrated into the firmware of the Fujitsu Computer (*UEFI: Unified Extensible Firmware Interface*), to delete all the data from a hard disk or solid state drive (SSD).

This function can be used to delete all data from internal or external hard disks or SSDs connected via the eSATA port, before the hard disks are discarded or the complete computer system is disposed of. The function can also be used if hard disks need to be completely deleted, for example before installing a new operating system.



The application can only be selected and run if an administrator/supervisor password has been assigned (*BIOS Setup -> Security Menu*).



To delete hard disks in a system, the mode of the controller must be changed, for instance to *AHCI mode* in the *SATA configuration* sub-menu of the *Advanced* menu.

To erase data from hard disks or SSDs, proceed as follows:

- ▶ Call up the *BIOS Setup* with the administrator/supervisor password.
- ▶ To start the application, select *Erase Disk* (*BIOS Setup -> Advanced* or *BIOS Setup -> Security*) and set *Start after Reboot*.
- ▶ Then select *Save Changes and Exit* in the menu *Save & Exit / Exit* to initiate a reboot and start *Erase Disk*.



As a result of the reboot, the *Erase Disk* menu is started. You have the option of interrupting the process during the user selection.

- ▶ After the application starts, the administrator/supervisor password must be entered for security reasons.
- ↳ A dialogue field appears in which a particular, several or all the hard disks can be selected for deletion - this depends on the number of hard disks in your system.
- ▶ Select the hard disk(s) to be deleted.
- ↳ The selected hard disk(s) will be deleted one-by-one.



Erase Disk offers four deletion options for hard disks, from "fast" (with one deletion pass) to "very secure" (with 35 deletion passes). Depending on the algorithm chosen, the process can take between ~10 seconds and ~10 minutes per GB:

- *Zero Pattern* (1 pass)
- *German BSI/VSITR* (7 passes)
- *DoD 5220.22-M ECE* (7 passes)
- *Guttmann* (35 passes)



You can find further information on the deletion algorithms here:

- ["https://www.bsi.bund.de/clin_174/DE/Publikationen/publikationen_node.html"](https://www.bsi.bund.de/clin_174/DE/Publikationen/publikationen_node.html)
- ["http://www.usaid.gov/policy/ads/500/d522022m.pdf"](http://www.usaid.gov/policy/ads/500/d522022m.pdf)
- ["http://www.cs.auckland.ac.nz/~pgut001/pubs/secure_del.html"](http://www.cs.auckland.ac.nz/~pgut001/pubs/secure_del.html)



SSD drives are securely erased with the "Enhanced Secure Erase" ATA command integrated in the firmware.

- ▶ Select the desired deletion algorithm for the selected hard disks.



The complete deletion process can be recorded as an audit-compliant log and copied to an external USB stick, which must be formatted as FAT32. Please connect only one external USB stick.

- ▶ Select whether a status report should be written to the USB stick.



The user can select the following tasks which are run by the system after the deletion process:

- *Reset administrator and user password*
- *Load BIOS setup defaults*
- *Shutdown the computer*
- *Exit Erase Disk with no additional options upon completion*

- ▶ Select the function which you require.

↳ The deletion process starts.

Disabled Erase Disk will NOT be started after the next reboot.

Start after Reboot Erase Disk will be started after the next reboot.

Onboard Device Configuration

Opens the submenu to configure devices on the system board. Some of them are only available under certain conditions.

LAN n Controller

Specifies whether the corresponding onboard LAN controller is available. If several onboard LAN controllers are available, these can be individually enabled or disabled.

Disabled The LAN Controller on the system board is not available.

Enabled The LAN controller on the system board is available.

Audio Configuration

Azalia HD Audio

Allows the onboard Azalia HD (High Definition) audio controller to be enabled.

Enabled The onboard audio controller is enabled.

Disabled The onboard audio controller is disabled.

ASMedia USB

Allows Onboard ASMedia USB 3.1 Gen2 controllers to be enabled.

Disabled The Onboard ASMedia USB controller is disabled.

Enabled The Onboard ASMedia USB controller is enabled.

Card Reader Settings

PCIe card reader

Allows enabling of a PCIe card reader.

Disabled The PCIe card reader is disabled.

Enabled The PCIe card reader is enabled.

SD 4.0 Support

Makes it possible to enable a transmission speed supported by SD 4.0.

Disabled The card uses the highest compatible UHS-I or SD speed.

Enabled The speed of the SD 4.0 card reader is set to Ultra High Speed Phase II (UHS-II).

Auto BIOS Update

With Auto BIOS Update it is possible to check a Fujitsu server automatically to see if there is a new BIOS version for the system. For the update, no operating system or external storage medium is required.

To be able to use this function, the computer must have access to the Internet over a network. Access to the Internet must take place via a gateway and a DHCP server must be present in the network for the allocation of IP addresses.



Please also note the terms of use, which are included as an Annex to the BIOS manual or can be found on the Internet at ["tou.ts.fujitsu.com"](http://tou.ts.fujitsu.com).

Terms of Use

In order to be able to use the *Auto BIOS Update* function, you must accept the terms of use, which are included as an Annex to the BIOS manual or can be found on the Internet at ["tou.ts.fujitsu.com"](http://tou.ts.fujitsu.com).

<i>Decline</i>	The Terms of Use were not accepted. The <i>Auto BIOS Update</i> function cannot be used.
<i>Accept</i>	The Terms of Use were accepted. The <i>Auto BIOS Update</i> function can be used.



FLASH Write Support or the System Firmware Update must be enabled before the *Auto BIOS Update* function can be used.

Automatic BIOS update

Defines how frequently BIOS updates are searched for on the Fujitsu server. If the automatic BIOS update function is *disabled*, it is possible under *Manually check for update* to search for BIOS updates at the next system boot.

<i>Disabled</i>	BIOS updates are not automatically searched for.
<i>Daily</i>	BIOS updates are searched for daily.
<i>Weekly</i>	BIOS updates are searched for once per week.
<i>Monthly</i>	BIOS updates are searched for once per month.
<i>Quarterly</i>	BIOS updates are searched for once every three months.

Update Server address

Shows the address of the TFTP server on which BIOS updates are searched for.

The preset Fujitsu Update Server can be reached at the address "webdownloads.ts.fujitsu.com". With the fee-based advanced version of *Auto BIOS Update*, there is the option to use one's own TFTP server. Either a domain name or a direct IPv4 address of the desired update server can be entered.



The name resolution of a domain name occurs at first via the DNS server configured through DHCP. If no DNS server is configured or the DNS server cannot be reached, name resolution is attempted through the Google DNS server via IP address 8.8.8.8. The Neustar DNS service at IP address 156.154.70.1 is used as a second fallback.

Silent update

Defines if the BIOS update, if a new BIOS version is available, is executed automatically without an input request and only a notification is displayed.

<i>Disabled</i>	It is possible to execute the BIOS update immediately, to skip it with this system boot or to ignore the new BIOS version.
<i>Enabled</i>	The BIOS update is executed automatically without an input request.

Manually check for update

Defines if a BIOS update is searched for during the next system reboot.



This function is automatically reset to *disabled* after a search has been performed.

<i>Disabled</i>	No BIOS update is searched for at the next system reboot.
<i>Enabled</i>	A BIOS update is searched for at the next system reboot.

PCI Subsystem Settings

PERR# Generation

Specifies whether PERR# (PCI parity errors) are created.

<i>Disabled</i>	PCI parity errors will not be created.
<i>Enabled</i>	PCI parity errors will be created.

SERR# Generation

Specifies whether SERR# (PCI system errors) will be created.

<i>Disabled</i>	PCI system errors will not be created.
<i>Enabled</i>	PCI system errors will be created.

Slot n Link Speed

Allows the maximum possible link speed to be limited for individual PCIe slots.

<i>Auto</i>	The card in the slot is operated at the maximum possible link speed.
<i>GEN1</i>	The maximum possible link speed will be limited to GEN1 (2,5 GT/s).
<i>GEN2</i>	The maximum possible link speed will be limited to GEN2 (5 GT/s).
<i>GEN3</i>	If supported by the slot. The maximum possible link speed is limited to GEN3 (8 GT/s).

Slot n Non-Compliance

Improves the identification of non-compliant PCI-Express cards. If enabled, this function increases the boot time of the system.

<i>Disable</i>	The identification of non-compliant PCIe cards is disabled.
<i>Enable</i>	The identification of non-compliant PCIe cards is enabled.

Above 4G Decoding

Defines whether memory resources can be assigned to PCI devices above the 4GB address limit. The selection depends on the operating system and the adapter cards.

<i>Disabled</i>	Only memory resources below the 4GB address limit are assigned to the PCI devices. This selection must be made for 32-bit operating systems, but is also supported by 64-bit operating systems.
<i>Enabled</i>	Memory resources above the 4GB address limit can be assigned to PCI devices if they have 64-bit address decoding. This option is only supported by 64-bit operating systems. This selection can be necessary if the integrated PCI Express devices (e.g. co-processor adapter cards) have a large memory requirement that cannot fit into the address space below 4 GB.



PCI address decoding is limited to the 4GB address limit for 32-bit operating systems, even if the available PCI devices support 64-bit address decoding.

CPU Configuration

Opens the *CPU Configuration* submenu. Some of the parameters are only available under certain conditions.

Hyper-threading

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 leads to an increase in 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 without ACPI support.

- Disabled* An ACPI operating system can only use the first logical processor of the physical processor. This setting should therefore only be chosen if the operating system does not support hyper-threading technology.
- Enabled* An ACPI operating system can use all the logical processors of the physical processor.

Active Processor Cores

On processors which contain multiple processor cores, the number of active processor cores can be limited. Inactive processor cores will not be used and are hidden from the operating system.

- All* All available processor cores are active and can be used.
- 1..n* Only the selected number of processor cores is active. The other processor cores are disabled.



The choice made here allows possible problems with certain software packages or system licences to be solved.

Hardware Prefetcher

If this function is enabled, an automatic prefetch of the memory content anticipated to be needed occurs when the memory bus is inactive. If the content is loaded from cache and not from memory, the latency is reduced. This particularly applies to applications with linear data access.



With this parameter you can make performance settings for non-standard applications. For standard applications, we recommend that the default settings are maintained.

- Auto* Activates the hardware prefetcher of the CPU.
- Disabled* Deactivates the hardware prefetcher of the CPU.

Adjacent Cache Line Prefetcher

Available if the processor offers a mechanism by which an adjacent 64-byte cache line can also be loaded during each cache request. The number of hits in the cache increases as a result in the case of applications with high spatial locality.



With this parameter you can make performance settings for non-standard applications. For standard applications, we recommend that the default settings are maintained.

Disabled

The processor loads the requested cache line.

Enabled

The processor loads the requested cache line and the adjacent cache line.

DCU (Data Cache Unit) Streamer Prefetcher

With this option, data content which will probably be needed is automatically pre-loaded into the L1 data cache when the memory bus is inactive. Because content is called from cache instead of from memory, the latency is reduced, especially for applications with linear data access.



You can use this parameter to change the performance settings for non-standard applications. We recommend that the default settings are kept for standard applications.

Enabled

Enables the DCU Streamer Prefetcher function of the CPU.

Disabled

Disables the DCU Streamer Prefetcher function of the CPU.

DCU Ip (Instruction pointer-based) Prefetcher

Performance increases can be expected if code is used sequentially and in contiguous storage.



You can use this parameter to change the performance settings for non-standard applications. We recommend that the default settings are kept for standard applications.

Enabled

Enables the *DCU Streamer Prefetcher* function of the CPU.

Disabled

Disables the *DCU Streamer Prefetcher* function of the CPU.

Intel Virtualization Technology

Used to support the visualisation of platform hardware and multiple software environments. Based on Virtual Machine Extensions (VMX), to support the application of multiple software environments under the use of virtual computers. The virtualisation technology enhances the processor support for virtualisation purposes on the over 16 bit and 32 bit protected modes and on the Intel® Extended Memory 64 Technology (EM64T) mode.



In active mode, a Virtual Machine Monitor (VMM) can use the additional performance features of the Vanderpool Technology Hardware.

Disabled

A Virtual Machine Monitor (VMM) cannot use the additional performance features of the hardware.

Enabled

A VMM can use the additional performance features of the hardware.

VT-d

VT-d (Intel Virtualization Technology for Directed I/O) is a hardware support for the common use of I/O devices by several virtual machines. VMM systems (Virtual Machine Monitor) can use VT-d to manage various virtual machines which access the same physical I/O device.

Disabled

VT-d is disabled and is not available for the VMMs.

Enabled

VT-d is available for the VMMs.

Intel TXT Support

Enables Trusted Execution Technology (TXT) support. Intel® TXT is available if the CPU in use supports Secure Mode Extensions (SMX), and both Intel® Virtualization Technology (VT) and VT-d are enabled in the CPU submenu.

Intel® TXT is only available if TPM (Trusted Platform Module) is enabled. The TPM function is located under the *Advanced* menu in the *Trusted Computing* sub-menu.



Intel TXT Support must be disabled before BIOS Update of the system is started.

Disabled

TXT is disabled.

Enabled

TXT is enabled.

HWPM Support

Hardware Power Management (HWPM) is a flexible processor interface for the management of power and energy efficiency. The frequency control functions that were previously part of the operating system (OS) are now embedded in the CPU firmware.

Disabled The HWPM functionality is not available. P-states are controlled in the same way as by processors of the previous generations.

Native Mode HWPM works together with the operating system via a software interface. The operating system can dynamically allocate additional controls and instructions.

OOB Mode The CPU autonomously controls the frequency without further OS controls and instructions, based on the guideline settings for energy efficiency of the operating system.

Enhanced SpeedStep

Specifies the voltage and frequency of the processor. EIST (Enhanced Intel SpeedStep® Technology) is an energy-saving function.



The processor voltage is adapted to the particular system requirements which are needed at any one time. A reduction in the clock frequency causes the system to require less energy.

Disabled Enhanced SpeedStep functionality is disabled.

Enabled Enhanced SpeedStep functionality is enabled.

Turbo Mode

The processor may work faster than the specified frequency when the operating system requires the maximum performance state (P0). This function is also known as Intel® Turbo Boost Technology.

Disabled Turbo Mode is disabled.

Enabled Turbo Mode is enabled.

Override OS Energy Performance

Prevents the OS overwriting the energy efficiency settings from Setup.

Disabled Override OS Energy Performance is disabled.

Enabled Override OS Energy Performance is enabled.

Energy Performance

Energy efficiency specifications for the processor on non-legacy operating systems. The processor receives the instruction to adapt energy consumption and performance.

<i>Performance</i>	Optimisation with respect to performance, where required at the cost of energy efficiency.
<i>Balanced Performance</i>	Optimisation with respect to performance, with good energy efficiency.
<i>Balanced Energy</i>	Optimisation with respect to energy efficiency, with good performance.
<i>Energy Efficient</i>	Optimisation with respect to energy efficiency, where required at the cost of performance.



Depending on the selected energy options, where required the operating system selects a mode other than that selected in the Setup.

CPU C1E Support

If this is supported by the operating system, the processor will be stopped if possible, to save power.

<i>Disabled</i>	The C1E power state function is not available.
<i>Enabled</i>	The C1E power state function is available.

Autonomous C-state Support

Enables the autonomous C-state clock control of the processor.

<i>Disabled</i>	C-states are controlled by the operating system with the aid of the available ACPI objects.
<i>Enabled</i>	C-states are controlled by the processor hardware without the use of ACPI. CPU HLT instructions are handled as MWAIT instructions. Based on internal statistics, the hardware demotes the C-state requests to a C-state with lower latency.

CPU C6 Report

Passes the processor C6 state as ACPI-C3 state to the OSPM, to enable Processor Deep Power Down Technology.

<i>Disabled</i>	CPU C6 is not passed as ACPI-C3 status to the OSPM.
<i>Enabled</i>	CPU C6 is passed as ACPI-C3 status to the OSPM.

Package C State limit

Allows the C state limit of the processor to be configured.

<i>C0</i>	The C state limit is C0.
<i>C2</i>	The C state limit is C2.
<i>C6</i>	The C state limit is C6.
<i>C6 Retention</i>	The C state limit is C6 Retention.
<i>No limit</i>	The C state limit is C7.
<i>Auto</i>	The C state limit is C6.

LLC Dead Line Alloc

Specifies the handling of dead lines in the LLC (Last Level Cache). This has an effect on the system performance.

<i>Disabled</i>	Never fill dead lines in the LLC.
<i>Enabled</i>	Fill dead lines in the LLC when necessary.

Stale AtoS

Specifies the directory optimisation of older data by the caching agent. This has an effect on the system performance.

<i>Disabled</i>	Directory optimisation is disabled.
<i>Enabled</i>	Directory optimisation is enabled.

Runtime Error Logging

ECC Memory Error Logging

Specifies whether ECC memory errors will be recognised and entered in the event log.

<i>Enabled</i>	Both single-bit memory errors and multi-bit memory errors will be entered in the event log.
<i>Multi-bit Errors Only</i>	Only multi-bit memory errors will be entered in the event log.
<i>Disabled</i>	No memory errors will be entered in the event log.

PCI Error Logging

Specifies whether PCI errors will be entered in the event log.



To be able to recognise PCI errors, the creation of PERR# (PCI parity errors) or SERR# (PCI system errors) must be enabled in advance in the menu *PCI Subsystem Settings*.

Disabled

No PCI errors will be entered in the event log.

Enabled

PCI errors will be entered in the event log.

Memory Configuration

Opens the *Memory configuration* submenu.

NUMA

NUMA (Non-Uniform Memory Access) is a memory architecture for multiprocessor systems. Each processor has its own local memory, but can also access the local memory of other processors (shared memory). Access to the local memory is faster than the access to the shared memories.

Disabled

The whole system memory is divided into many small, interleaved areas of local and shared memory. Use this option if the operating system does not support NUMA.

Enabled

The whole system memory is divided into fewer, larger, non-interleaved areas of local and shared memory. On an ACPI operating system which supports NUMA, this will achieve the best results with respect to performance.

DDR Performance

The memory modules can operate at various speeds (frequencies).

The performance increases with higher speeds, on the other hand the energy-saving increases with lower speeds. The possible memory speeds are determined by the particular memory module configuration.

Energy optimized

Lowest possible speed, to save energy.

Performance optimized

Highest possible speed, for the best performance.

IMC Interleaving

States the interleaving of the integrated memory controller (IMC).

This option can be used to improve the system performance, depending on the memory configuration,

1-Way 1-way interleaving is selected.

2-Way 2-way interleaving is selected.

Sub NUMA Clustering

Sub NUMA Clustering (SNC) is a feature for opening the LLC (Last Level Cache) into non-contiguous clusters based on the address region. The function improves the average latency from the LLC to local memory.

Disabled Sub NUMA Clustering is disabled.

Enabled Full Sub NUMA Clustering, i.e. 2 clusters with 1-way interleaving is enabled.

Auto Depending on the IMC interleaving choice, 1-cluster or 2-clusters is supported. If IMC interleaving is also set to *Auto*, 1-cluster with 2-way interleaving is supported.

VMD Configuration

CPU n - root port m

Specifies whether the Volume Management Device (VMD) of this PCI Express root port can take over control of its PCI hierarchy, to allow grouping together of devices such as PCI Express SSD into a RAID array.

Disabled The PCI Express devices connected to this root port are still accessible in the standard PCI hierarchy.

Enabled The PCI Express devices concerned, that are connected to the root port, are only accessible via the VMD device and are no longer visible in the standard PCI hierarchy. A VMD device driver is required to control the downstream PCI Express mass storage devices and to create a RAID array.

Drive Configuration

Opens the drive configuration submenu.

OnBoard SATA Configuration

SATA Controller

Specifies whether the SATA controller is available.

Disabled The SATA controller is not available.

Enabled The SATA controller is available.

SATA Mode

Specifies in which mode the SATA ports will be operated.

<i>AHCI</i>	The SATA port is operated in AHCI Mode.
<i>RST (if available)</i>	The SATA port is operated in Intel® RST mode.



Depending on the chip set and the CPU, one of the following functions may be available:

- Intel RST Premium with Intel Optane System Acceleration
- Intel RST with Intel Optane System Acceleration
- Intel RST Premium (no Optane)
- Intel RST (no Optane)

Depending on the chip set, a RAID can be established via Intel Rapid Storage Technology (RST) option ROM.

Port n

Specifies whether the SATA port is available.

<i>Disabled</i>	The SATA port n is not available
<i>Enabled</i>	The SATA port is available.

Staggered Spin-up

Reduces the electrical load during boot up of systems with multiple SATA devices. The SATA devices run one after the other at the request of the HOST controller.

<i>Disabled</i>	Staggered Spin-up is disabled.
<i>Enabled</i>	Staggered Spin-up is enabled.

External SATA Port

Specifies whether the port will be operated internally as SATA or externally as eSATA.

<i>Disabled</i>	The port will be used internally as SATA.
<i>Enabled</i>	The port will be used as external SATA (eSATA).

Hot Plug

Specifies whether hot plug support of the port is enabled.

<i>Disabled</i>	The hot plug support of the port is disabled.
<i>Enabled</i>	The hot plug support of the port is enabled.

SMART Settings

Opens the submenu for enabling the hard disk self test.

SMART Self Test

Specifies whether the SMART (Self Monitoring, Analysis and Reporting Technology, S.M.A.R.T.) self test is enabled for all hard disks during the POST.

- Enabled* The SMART self test is enabled during the POST.
- Disabled* The SMART self test is disabled during the POST.

CSM Configuration

Opens the submenu for configuring the Compatibility Support Module (CSM).



This submenu is only available if *Secure Boot Control* is disabled under *Setup* → *Security* → *Secure Boot Configuration*.

Launch CSM

Specifies whether the Compatibility Support Module (CSM) is executed. A legacy operating system can only be booted if the CSM has been loaded.

- Disabled* The CSM is not executed so that a only a UEFI operating system can be booted.
- Enabled* The CSM is executed so that a legacy or UEFI operating system can be booted.

Boot Option Filter

Specifies the drives from which booting can be carried out.

- UEFI and Legacy* Booting is possible both from drives with UEFI OS and from drives with Legacy OS.
- Legacy only* Booting is only possible from drives with Legacy OS.
- UEFI only* Booting is only possible from drives with UEFI OS.

Launch PXE OpROM Policy

Specifies which PXE option ROM is booted. For the PXE boot, both the normal (Legacy) PXE boot and a UEFI PXE boot are available.

- Do not launch* No option ROMs are booted.
- UEFI only* Only UEFI option ROMs are booted.
- Legacy only* Only Legacy option ROMs are booted.

Launch Storage OpROM Policy

Specifies which Storage option ROM is booted.

<i>Do not launch</i>	No Storage option ROMs are booted.
<i>UEFI only</i>	Only UEFI Storage option ROMs are booted.
<i>Legacy only</i>	Only Legacy Storage option ROMs are booted.

Launch Video OpROM Policy

Specifies which Video option ROM is booted.

<i>UEFI only</i>	Only UEFI Video option ROMs are booted.
<i>Legacy only</i>	Only Legacy Video option ROMs are booted.

Other PCI Device ROM Priority

Specifies which option ROM is booted for devices other than the network, mass memory or video.

<i>UEFI only</i>	Only UEFI option ROMs are booted.
<i>Legacy only</i>	Only Legacy option ROMs are booted.

TPM (Trusted Platform Module) Computing

Opens the submenu for enabling TPM and changing the TPM settings. If this setup menu is available, the system board contains a security and encryption chip (TPM - Trusted Platform Module) which complies with TCG specification 2.0. This chip allows security-related data (passwords, etc.) to be stored securely. The use of TPM is standardised and is specified by the Trusted Computing Group (TCG).

TPM Support

Specifies whether the TPM (Trusted Platform Module) hardware is available. If the TPM is disabled, the system behaves like any other system without TPM hardware.

<i>Disabled</i>	Trusted Platform Module is not available.
<i>Enabled</i>	Trusted Platform Module is available.

Pending TPM operation

Specifies a TPM operation which will be performed during the next boot process.

<i>None</i>	No TPM operation will be performed.
<i>TPM Clear</i>	TPM is reset to the factory setting. All keys in the TPM will be deleted.

Current TPM Status Information

Shows the current TPM (Trusted Platform Module) status.

USB Configuration

USB Devices

Shows the number of available USB devices, USB keyboards, USB mice and USB hubs.

Legacy USB Support

Specifies whether legacy USB support is available. This function should always be enabled or set to *Auto* so that the operating system can be booted from a USB device if required.

<i>Disabled</i>	Legacy USB support is not available. A USB keyboard or USB mouse can only be used if this is supported by the operating system. Booting the operating system from a USB device is not possible.
<i>Enabled</i>	Legacy USB support is available. A USB keyboard or USB mouse can also be used if the operating system does not support USB. Booting the operating system from a USB device is possible.
<i>Auto</i>	Legacy USB support will be disabled if no USB devices are connected.



Legacy USB support should be disabled if the operating system supports USB and you do not want to boot the operating system from USB devices.

PS/2 Emulation

Enables the use of USB keyboards and mice under operating systems such as Windows 7, which do not support XHCI.

<i>Disabled</i>	PS/2 Emulation is not available. A USB keyboard or USB mouse can only be used if it is supported by the operating system.
<i>Enabled</i>	PS/2 Emulation is available. A USB keyboard or USB mouse can be used even if the operating system does not support USB.

Mass Storage Devices

List of USB Mass Storage Device(s)

Allows the user to force a particular device emulation. When set to *Auto*, the devices are emulated according to their media format. Optical drives are emulated as "CD ROM" and drives without data media according to the drive type.

<i>Auto</i>	Emulation is chosen depending on the USB device.
<i>Floppy</i>	Force USB floppy emulation.
<i>Hard Disk</i>	Force USB hard disk emulation.
<i>CD-ROM</i>	Force USB CD ROM emulation.

USB Port Security

Opens the *USB Port Security* submenu in order to configure the USB interfaces present on the mainboard.

USB Port Control

Configures the use of the USB ports. Disabled USB ports are only available during the POST, but are no longer available under the operating system.



During POST, a USB mouse and a USB keyboard are also available if the corresponding USB port is disabled.

<i>Enable all ports</i>	All USB ports are enabled.
<i>Disable all ports</i>	All USB ports are disabled.
<i>Enable front and internal ports</i>	All USB ports on the rear of the device are disabled.
<i>Enable rear and internal ports</i>	All USB ports on the front of the device are disabled.
<i>Enable internal ports only</i>	All external USB ports are disabled.
<i>Enable used ports</i>	All unused USB ports are disabled.

USB Device Control

For the *Enable front and internal ports*, *Enable rear and internal ports* and *Enable used ports* settings, which were made under *USB Port Control*, there are additional options available here.

Enable all devices Those settings made under *USB Port Control* will be used without any limitation.

Enable Keyboard and Mouse only Only USB keyboards and USB mice can be operated at the USB ports enabled under *USB Port Control*. Any ports to which no USB keyboards or USB mice are connected are disabled. Keyboards with an integrated hub result in deactivation of the port.

Enable all devices except mass storage devices/Hubs USB ports on which USB storage devices or USB hubs are connected will be disabled.

System Management

Temperatures, fan speeds and electrical voltages may also be shown on this page, depending on the system board.

Fan Startup Check

Allows you to check the start-up of fans at system boot. This can prolong the duration of the system boot by a few seconds.

<i>Disabled</i>	The system does not wait for the fans to start up. A fan startup check is not executed.
<i>Enabled</i>	The system waits for the fans to start up. The fan startup check is executed.

Fan Control

Controls the speed of the fan. The preset mode can be changed depending on the system configuration and the applications used.

<i>Enhanced (if available)</i>	The fan speed will be increased automatically so that the maximum CPU performance is achieved.
<i>Auto</i>	The fan speed is adjusted automatically. A compromise between system temperature and CPU performance.
<i>Full</i>	All fans are operated at maximum speed.

Watchdog Timeout

Determines the time after which a restart of the system takes place.

The permitted values are: 0 to 225

<i>0</i>	The Watchdog is deactivated. This setting is recommended to prevent an unintended restart of the system.
<i>1...255</i>	After expiry of the time set (in minutes), a restart of the system takes place if the Watchdog was not stopped in this timeframe by a tool in the OS or was continuously reset.

Super IO Configuration

Serial Port 1 Configuration

Opens the submenu for configuration of the serial port 1 (COMA).

Serial Port

Specifies whether the serial port is available.

<i>Disabled</i>	The serial port is not available.
<i>Enabled</i>	The serial port is available.

Device Settings

Shows the base I/O address and the interrupt used for access to the serial port.

Change Settings

Specifies which base I/O addresses and which interrupts can be used for the particular serial port by the BIOS or the operating system.

<i>Auto</i>	The base I/O address and the interrupt are automatically assigned.
<i>IO=3F8h; IRQ=4;</i>	The base I/O address 3F8h and the interrupt 4 are permanently assigned.
<i>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</i>	The base I/O address is permanently assigned.
<i>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</i>	
<i>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</i>	
<i>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</i>	

The values given in the list are available for the interrupt for automatic selection by the BIOS or the operating system.



If conflicts with other devices occur, this option should be converted to *Auto*.

Serial Port Console Redirection

The parameters for terminal communication via Serial Port Console Redirection can be shown and set in this submenu. Some parameters are only available under certain conditions.

<i>Disabled</i>	Serial Port Console Redirection is not available.
<i>Enabled</i>	Serial Port Console Redirection is available.

Console Redirection Settings

Specifies the data exchange process of the host and remote system via the COM0 and COM4 ports (iAMT/SOL (Serial overLAN)).



Both systems require identical or compatible settings.

Terminal Type

Specifies the type of terminal.

Permitted values: VT100, VT100+, VT-UTF8, ANSI



The terminal type allocated will be used to transfer data to the host.

Bits per Second

Specifies the transfer rate for communication with the host.

Permitted values: 9600, 19200, 38400, 57600, 115200



The data will be transferred to the host at the transfer rate set.

Data Bits

Shows the number of data bits used for communication with the host.

- | | |
|---|-------------------------------------------------|
| 7 | Seven data bits are used for the communication. |
| 8 | Eight data bits are used for the communication. |

Parity

Specifies the use of parity bits for communication with the host. Parity bits are used for error detection.

- | | |
|--------------|--------------------------------------------------------------------------|
| <i>None</i> | No parity bits are used. Error detection is not possible. |
| <i>Even</i> | Parity bit is 0 if the number of ones in the data bit is an even number. |
| <i>Odd</i> | Parity bit is 0 if the number of ones in the data bit is an odd number. |
| <i>Mark</i> | Parity bit is always 1. |
| <i>Space</i> | Parity bit is always 0. |

Stop Bits

Shows the number of stop bits used to indicate the end of a serial data packet.

- 1* One stop bit is used.
- 2* Two stop bits are used.

Flow Control

This setting determines the transfer control over the interface.

- None* The interface is operated without transfer control.
- Hardware CTS/RTS* The transfer control is undertaken by the hardware. This mode must also be supported by the cable.

VT-UTF8 Combo Key Support

Specifies whether VT-UTF8 combination key support for ANSI/VT100 terminals is available.

- Disabled* VT-UTF8 combination key support is not available.
- Enabled* The VT-UTF8 combination key support is available.

Recorder Mode

Specifies whether only text will be sent. This is used to capture terminal data.

- Disabled* Recorder mode is not available.
- Enabled* Recorder mode is available.

Resolution 100x31

Indicates whether enhanced terminal resolution is available.

- Disabled* Enhanced terminal resolution is not available.
- Enabled* Enhanced terminal resolution is available.

Legacy OS Redirection Resolution

Specifies the number of lines and columns for the legacy OS redirection.

- 80x24* Resolution 80x24 is used.
- 80x25* Resolution 80x25 is used.

Putty KeyPad

Sets FunctionKey and KeyPad to Putty.

<i>VT100</i>	Selects VT100.
<i>LINUX</i>	Selects LINUX.
<i>XTERMR6</i>	Selects XTERMR6.
<i>SCO</i>	Selects SCO.
<i>ESN</i>	Selects ESN.
<i>VT400</i>	Selects VT400.

Redirection After BIOS RESET

<i>BootLoader</i>	Legacy Console Redirection is disabled before Legacy OS is started.
<i>Always Enable</i>	Legacy Console Redirection is enabled for Legacy OS.

AMT Configuration

Opens the submenu to configure Intel® Active Management Technology.

ME Version

Shows the current AMT/ME version.

Intel AMT

Enables/disables Intel® Active Management Technology BIOS Extension (MEBx).



iAMT H/W is always enabled. This option simply controls the execution of the BIOS Extension.

- Disabled* Intel® AMT BIOS Extension (MEBx) is disabled.
- Enabled* Intel® AMT BIOS Extension (MEBx) is enabled.

USB Provisioning

If this option is enabled, the settings of the AMT/ME configuration can be changed using a USB stick without starting the Intel® Active Management Technology BIOS Extension (MEBx).

- Disabled* USB Provisioning from USB stick is disabled.
- Enabled* USB Provisioning from USB stick is enabled.

Unconfigure AMT/ME

If this option is enabled, an MBEx (Management Engine BIOS eXtension) query occurs at the next reboot to establish whether the AMT/ME configuration should be reset to the default values.

- Disabled* Do not change the AMT/ME configuration.
- Enabled* Start the reset of the AMT/ME configuration. The option is then automatically reset to *Disabled*.

MEBx Mode

Configure how the MEBx (Management Engine BIOS eXtension) behaves during the reboot.

- Normal* MEBx Setup can be called by pressing the Ctrl + P key combination during POST.
- Enter MEBx Setup* The MEBx Setup will be automatically called during the next POST.

Network Stack Configuration

Network Stack

Specifies whether the UEFI Network Stack is available for network access under UEFI. If the UEFI Network Stack is disabled, UEFI installation via PXE is not possible, for example.

<i>Disabled</i>	The UEFI Network Stack is not available.
<i>Enabled</i>	The UEFI Network Stack is available.

Ipv4 PXE Support

Specifies whether PXE UEFI Boot via Ipv4 is available for installation of operating systems in UEFI mode.

<i>Disabled</i>	PXE UEFI Boot via Ipv4 is not available.
<i>Enabled</i>	PXE UEFI Boot via Ipv4 is available.

Ipv6 PXE Support

Specifies whether PXE UEFI Boot via Ipv6 is available for installation of operating systems in UEFI mode.

<i>Disabled</i>	PXE UEFI Boot via Ipv6 is not available.
<i>Enabled</i>	PXE UEFI Boot via Ipv6 is available.

Option ROM Configuration

Calls the *Option ROM Configuration* submenu.

Launch Slot n OpROM

Specifies whether Option ROMs for expansion cards which are plugged into this slot should be started.

<i>Disabled</i>	Do not start any Option ROMs for expansion cards in this slot.
<i>Enabled</i>	Start Option ROMs for expansion cards in this slot.

Driver Health

If a UEFI driver of a PCI express device supports the Driver Health protocol, the UEFI firmware can query the status of the devices with the UEFI drivers which they manage. The status of the UEFI drivers which support Driver Health are shown in this menu.

Security Menu – Security Functions

The *Security* menu offers various options for protecting your system and personal data from unauthorised access. Using a sensible combination of these options will help you achieve maximum protection for your system.

The following security settings can be made in this menu. Some of them are only available under certain conditions.

Main Advanced Security Power Event Logs Boot Save & Exit					
<p>Password Description</p> <p>If the Administrator's password is set, then this limits access to Setup and is asked during boot or when entering Setup. If the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have USER rights. The password length must be in the following range:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Minimum length</td> <td style="text-align: right;">3</td> </tr> <tr> <td>Maximum length</td> <td style="text-align: right;">32</td> </tr> </table> <p>Administrator Password User Password Password Severity [Standard] Password on Boot [Disabled] Skip Password on automatic Wakeup [Disabled] System Firmware Update [Enabled]</p> <p>▶ Secure Boot Configuration ▶ Easy PC Protection</p>	Minimum length	3	Maximum length	32	<p style="text-align: center;">Set Administrator Password</p> <hr/> <p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
Minimum length	3				
Maximum length	32				

Password Description

Neither an administrator password nor a user password has been allocated

Opening the BIOS Setup and booting the system are possible without restriction.

Only the administrator password was allocated

If ONLY an administrator password was allocated, only the BIOS Setup is protected. Booting the system can be performed without restriction. When you access the BIOS Setup with an administrator password, Administrator access level is assigned to you and you have unrestricted access to the BIOS Setup.

Administrator AND user passwords were allocated

If administrator and user passwords were allocated, the authorisation level in the BIOS Setup depends on the password entered. If you access the BIOS Setup with the administrator password, unlimited access to the BIOS Setup is possible, entry of the user password results in limited access. Booting the system is possible both with the administrator and also with the user password.



If the administrator password is deleted, the user password will also be deleted.

The system will stop after an incorrect password has been entered three times. If this happens, switch off the system and then back on again, and enter the correct password.

Administrator Password

If you press the enter key, a window will open in which you can assign the administrator password. Enter a character string to define the password. If you confirm an empty password field, the password will be deleted.



To call up the complete BIOS Setup, you need the administrator level of access. If an administrator password is allocated, the user password only allows very limited access to the BIOS Setup.

User Password

If you press the enter key, a window will open in which you can assign the user password. Enter a character string to define the password. With the user password, you can prevent unauthorised access to your system.



In order to be able to assign a user password, an administrator password must already have been assigned.

Password Severity

Defines ways to access the system if the password has been forgotten.

<i>Standard</i>	A forgotten password can be deleted using the Password skip jumper.
<i>Strong</i>	It is not possible to use the Password skip jumper. If a password has been forgotten, only the certified, technical support team can enable it.

Password on Boot

Specifies whether a password must be entered before the boot process.

<i>On Every Boot</i>	Entry of a password is required before every boot process.
<i>On First Boot</i>	Entry of a password is required during every cold start boot process.
<i>Disabled</i>	The system boots, without requiring a password to be entered.

Housing Monitoring

Specifies whether opening of the casing should be monitored.



This menu item is only visible if a switch for cover monitoring is present.
This menu item is greyed out if no administrator password has been assigned.

<i>Disabled</i>	The system continues to operate normally, even if the casing was opened.
<i>Enabled</i>	If the casing has been opened, then the boot process is suspended until BIOS Setup is called. If the BIOS Setup is protected with a password, then this must be entered. An SMBIOS event log entry will be generated.

Skip Password on automatic Wakeup

Specifies whether the request for a password is skipped or is prompted when the system is started automatically.

<i>Disabled</i>	The password is not requested during automatic start processes.
<i>Enabled</i>	The password is requested.

System Firmware Update

Defines how the system firmware (BIOS) update is carried out.

<i>Disabled</i>	The system firmware (BIOS) cannot be written. A flash BIOS update is not possible.
<i>Restricted</i>	The system firmware (BIOS) can only be updated via FUJITSU Tools, automatic update via Windows Update (WU) is prevented.
<i>Enabled</i>	The system firmware (BIOS) can be updated both via FUJITSU Tools and automatically via Windows Update (WU).

System Firmware Rollback

Specifies whether a Flash BIOS update to an older version of the system firmware (BIOS) is possible.

<i>Disabled</i>	The system firmware (BIOS) cannot be flashed back to an older version.
<i>Enabled</i>	The system firmware (BIOS) can be flashed back to an older version.

Easy PC Protection

Easy PC Protection bypasses the start password, if the start permission confirmation is issued via the local network (LAN).

If the system is connected to the corporate LAN, the start configuration will be read from the TFTP server. All required data (name of start configuration file, IP address of TFTP server, name of system) is saved in the *System Data* area.



To set the *Easy PC Protection* function to *Enabled*, the *Network Stack* function must first be set to *Enabled*.

<i>Disabled</i>	Easy PC Protection is not available.
<i>Enabled</i>	Easy PC Protection is available.

Effective configuration settings:

- Server IP address, e.g. 192.168.1.1
The TFTP server IP address provides the boot grant configuration data
- Schedule, e.g. Development_Department
System identification name
- Configuration file name, e.g. Dev_Dep.csv
CSV file name with the boot grant configuration, provided by the TFTP server

HDD Security Configuration

HDD Password on Boot

Specifies whether a hard disk user password must be entered during every boot process.

<i>Disabled</i>	It is not necessary to enter a hard disk user password during the boot process.
<i>Enabled</i>	Entry of a hard disk user password is required during every boot process.

HDD n / HDD-ID

Opens a submenu with information on the hard disk user password.

HDD Password Description

Allows the hard disk user and master passwords to be set, changed and deleted. The hard disk user password must be set up before the Enabled Security setting can be carried out. The hard disk master password can only be changed if you have successfully unlocked it in POST with the hard disk master password.

HDD Password Configuration

Shows the current security status of the hard disk.

Security Supported

Yes is shown here if the device supports use of a hard disk user password. In this case it is possible to assign a password to the hard drive.

Security Enabled

Yes is shown here if either a hard disk user password or a hard disk master password has been assigned to the hard disk.

Security Locked

The hard disk is locked if it was not unlocked with the valid password.

Security Frozen

If *Yes* is displayed, then a hard disk user password cannot be set up, changed or deleted. To change the security frozen status to *No*, the system must have been shut down before the BIOS Setup is called. Only then can a hard disk user password be set up, changed or deleted.

HDD User Password Status

Shows whether a hard disk user password was allocated or not.

HDD Master Password Status

Shows whether a hard disk master password was allocated or not.

Set User Password

The hard disk user password protects the hard disk(s) from unauthorised access. Booting the operating system from the hard disk or accessing the data on the hard disk can only be carried out by those people who know the hard disk user password. The hard disk user password can be up to 32 characters long. The settings become effective immediately and also remain so, regardless of how you later end the BIOS Setup. The hard disk user password is requested during the POST.



If you press the Enter key, a window will open in which you can assign the hard disk user password. Enter a character string to define the password. If you confirm an empty password field, the password will be deleted.

Set Master Password

If a hard disk user password has been forgotten, it can be deleted using the hard disk master password. This option is only available if an incorrect hard disk user password has been entered three times when the system is booting during POST. The hard disk master password for your hard disk can be obtained from the certificated technical support service, but only if the particular HDD-ID is provided together with a valid proof of purchase.

Secure Boot Configuration

Opens the submenu for configuring Secure Boot.

An authentication process for the firmware version is defined with *Secure Boot Configuration*.

Secure Boot defines the industry standard method by which platform firmware certificates are managed, firmware is authenticated and in which the operating system is integrated in this process.

Secure Boot Configuration is based on the PKI process (Public Key Infrastructure), to authenticate modules before they are allowed to be executed.

Platform Mode

Shows whether the system is in user mode or setup mode.

<i>User</i>	In user mode, the Platform Key (PK) is installed. Secure Boot can be enabled or disabled via the <i>Secure Boot Control</i> menu option.
<i>Setup</i>	In setup mode, the Platform Key (PK) is not installed. Secure Boot is disabled and cannot be enabled via the <i>Secure Boot Control</i> menu option.

Secure Boot

Indicates whether the Secure Boot function is active.

<i>Not active</i>	Secure Boot is not active.
<i>Active</i>	Secure Boot is active.

Vendor Keys

Shows whether the Vendor Keys have been modified.

<i>Modified</i>	The Vendor Keys were modified.
<i>Not Modified</i>	The Vendor Keys were not modified.

Secure Boot Control

Specifies whether booting of unsigned boot loaders/UEFI OpROMs is permitted.



The associated signatures are saved in the BIOS or can be reloaded in the *Key Management* submenu.

<i>Disabled</i>	All boot loaders / OpROMs (Legacy / UEFI) can be executed.
<i>Enabled</i>	Only booting of signed boot loaders/UEFI OpROMs is permitted.

Secure Boot Mode

Specifies whether the Key Management submenu is available.

<i>Default</i>	The <i>Key Management</i> submenu is not available.
<i>Custom</i>	The <i>Key Management</i> submenu is available.

Key Management

Submenu for deleting, changing and adding the key and signature databases required for Secure Boot.



Without the installed Platform Key (PK), the system is in setup mode (Secure Boot is disabled). As soon as the PK is installed, the system switches to user mode (Secure Boot can be enabled).

Factory Default Key Provisioning

If the system is in setup mode (no Public Key is installed), it is possible to install the default Secure Boot key and signature databases.

Disabled

The available Secure Boot key and signature databases remain unchanged.

Enabled

If the PK, KEK, DB, DBT, DBX signature databases are not available, the default Secure Boot key and signature databases will be installed after rebooting the system.

Enrol All Factory Default Keys

All keys and signature databases (PK, KEK, DB, DBT, DBX) in the system are reset to the default values.



This menu item is only available if *Factory Default Key Provisioning* is set to *Enabled*.

Export Secure Boot Variables

Stores all secure boot variables in the root directory on the selected drive.

Platform Key

Shows the current status of the Platform Key (PK).

Details

Shows details of the Platform Key (PK).

Save To File

Backs up the Platform Key (PK) in a file on the selected drive.

Set New Key

Sets the Platform Key (PK). After selecting the drive, the corresponding file must be selected in the browser.

Delete Key

Deletes the Platform Key (PK), which puts the system in setup mode and disables Secure Boot.

Key Exchange Keys

Shows the current status of the Key Exchange Keys Database (KEK).

<i>Details</i>	Shows the details of the Key Exchange Keys Database (KEK).
<i>Save To File</i>	Backs up the Key Exchange Keys Database (KEK) in a file on the selected drive.
<i>Set New Key</i>	Sets the Key Exchange Keys Database (KEK) After selecting the drive, the corresponding file must be selected in the browser.
<i>Append Key</i>	Adds an entry to the Key Exchange Keys Database (KEK). After selecting the drive, the corresponding file must be selected in the browser.
<i>Delete Key</i>	Deletes the Key Exchange Keys Database (KEK)



The system has high security standards. Various keys and signatures are present in the system to ensure maximum security. These functions are reserved for experts and administrators.

Detailed descriptions of the security standards can be found on the Internet, e.g.: UEFI Specification Version 2.6.

Authorized Signatures

<i>Details</i>	Shows the details of the Authorized Signatures Database (DB).
<i>Save To File</i>	Backs up the Authorized Signatures Database (DB) in a file on the selected drive.
<i>Set New Key</i>	Sets the Authorized Signatures Database (DB). After selecting the drive, the corresponding file must be selected in the browser.
<i>Append Key</i>	Adds an entry to the Authorized Signatures Database (DB). After selecting the drive, the corresponding file must be selected in the browser.
<i>Delete Key</i>	Deletes the Authorized Signatures Database (DB).

Forbidden Signatures

Shows the current status of the Forbidden Signatures Database (DBX).

<i>Details</i>	Shows the details of the Forbidden Signatures Database (DBX).
<i>Save To File</i>	Backs up the Forbidden Signatures Database (DBX) in a file on the selected drive.
<i>Set New Key</i>	Sets the Forbidden Signatures Database (DBX). After selecting the drive, the corresponding file must be selected in the browser.
<i>Append Key</i>	Adds an entry to the Forbidden Signatures Database (DBX). After selecting the drive, the corresponding file must be selected in the browser.
<i>Delete Key</i>	Deletes the Forbidden Signatures Database (DBX).

Authorized TimeStamps

Shows the current status of the Authorized TimeStamps Database (DBT).

- | | |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Set New Key</i> | Sets the Authorized TimeStamps Database (DBT). After selecting the drive, the corresponding file must be selected in the browser. |
| <i>Append Key</i> | Adds an entry to the Authorized TimeStamps Database (DBT). After selecting the drive, the corresponding file must be selected in the browser. |

OsRecovery Signatures

Shows the current status of the OsRecovery Signatures Database.

- | | |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <i>Set New Key</i> | Sets the OsRecovery Signatures Database. After selecting the drive, the corresponding file must be selected in the browser. |
| <i>Append Key</i> | Adds an entry to the OsRecovery Signatures Database. After selecting the drive, the corresponding file must be selected in the browser. |

Power Menu – Energy saving functions

Main	Advanced	Security	Power	Event Logs	Boot	Save & Exit
Power Settings				After recovery from power failure:		
Power Failure Recovery				[Disabled]		
USB Power				Remain Off.		
				[Always Off]		
Wake-Up Resources				Switch Off.		
				[Always On]		
				Switch On.		
LAN				[Enabled]		
Wake on LAN boot				[Boot Sequence]		
USB Keyboard				[Disabled]		
Wake Up Timer				[Disabled]		
				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		

Example showing the *Power* menu.

Power Settings

Power Failure Recovery – System status after a power failure

Specifies how the system behaves during a reboot following a power failure.

- Always Off* The system switches itself on briefly (initialisation by the wake sources)
- Always On* The system switches on.
- Previous State* The system switches on briefly, performs a status check, and then returns the mode it was in before the power failure occurred (ON or OFF).
- Disabled* The system does not switch on.

USB Power

Enables and disables the power supply to the USB ports when the system is switched off.

Always off The USB ports are no longer supplied with power after the system is shut down.

Always on The USB ports continue to be supplied with power after the system is shut down.

USB Type-C Connector Power Limit

Limits the maximum power that will be provided via the USB Type-C port. Limiting the maximum power can improve system stability if many USB devices are used.

max. 3A / 1.5W Limits the output power at the USB Type-C port to max. 3A

max. 1.5A / 7.5W Limits the output power at the USB Type-C port to max. 1.5A

max. 900mA / 4.5W Limits the output power at the USB Type-C port to max. 900mA

OFF (no power supply) The power supply at the USB Type-C port is switched off and as a result the port cannot be used.

Wake-Up Resources

LAN

Determines whether the system can be switched on via a LAN controller (on the system board or expansion card).

Enabled The system can be switched on via a LAN controller.

Disabled The system cannot be switched on via a LAN controller.

Wake On LAN Boot

Specifies the system behaviour when switched on by means of network signals.

Boot Sequence After being switched on via the LAN, the system boots up according to the device sequence specified in the boot menu.

Force LAN Boot After being switched on via the LAN, the system is booted remotely via the LAN.

USB Keyboard

Specifies whether the system can be switched on via a USB keyboard (power button or any desired button).

With ordinary keyboards, the system can be switched on using any key. With keyboards that have a special power button, the system can only be switched on using this button.



It is only possible to switch the system on via a USB keyboard if *USB Power* is set to *Always On* and the keyboard is directly connected to the system.

Disabled

A USB keyboard cannot switch the system on.

Enabled

The system can be switched on using a USB keyboard.

Wake Up Timer

The time at which the system should be switched on can be specified here.

Disabled

Wake Up Timer is not enabled.

Enabled

Wake Up Timer is enabled. The system is switched on at the time specified.

Hour

Specifies the hour of the switch-on time.

Minute

Specifies the minute of the switch-on time.

Second

Specifies the second of the switch-on time.

Wake Up Mode

Specifies whether the system should be switched on daily, on selected week days or only once a month at the specified time.

Daily

The system will be switched on daily at the time specified.

Weekly

The system is switched on at the specified time on the selected week days.

Monthly

The system will be switched on once a month at the time specified.

Wake Up Day

Specifies the day of the month on which the system is to be switched on. Permitted values are 1..31.

Event Logs – Configuration and Display of the Event Log



Example showing the *Event Logs*.

Change SMBIOS event log settings

SMBIOS Event Log

Specifies whether the SMBIOS event log is enabled.

Disabled The SMBIOS event log is disabled.

Enabled The SMBIOS event log is enabled.

Erase Event Log

Specifies whether the SMBIOS event log should be deleted.

No The SMBIOS event log will not be deleted.

Yes, next reset The SMBIOS event Log is deleted once during the next system boot up. Afterwards, this option is automatically reset to *No*.

Yes, every reset The SMBIOS event log is deleted every time the system is booted.

When Log is full

Specifies the course of action to be taken when the SMBIOS event log is full.

Do Nothing When the SMBIOS event log is full, no further entries are added. The SMBIOS event log must first be deleted before new entries can be added.

Erase Immediately When the SMBIOS event log is full, it will be erased immediately. All existing entries will be deleted!

View SMBIOS Event Log

Opens the submenu to show all SMBIOS event log entries present.



An explanation can be shown in the top right window for each log entry. To do this, select the entry using the cursor keys.

Boot Menu – System boot

Main	Advanced	Security	Power	Event Logs	Boot	Save & Exit
<p>Boot Configuration</p> <p> Bootup NumLock State [On] Quiet Boot [Enabled] Check controllers health status [Enabled] Boot error handling [Pause and wait for key] Keyboard Error Reporting [Enabled] Primary Display [Auto] </p> <p> New Boot Option Policy [Place First] Boot Menu [Enabled] Boot Removable Media [Enabled] </p> <p> Boot Option Priorities Boot Option #1 [IBA GE Slot 0300 v1584] Boot Option #2 [IBA CL Slot 00FE v0112] Boot Option #3 [UEFI: USB DISK 3.0 PMAP, Partition 1] Boot Option #4 [USB DISK 3.0 PMAP] </p>						<p>Select the keyboard NumLock state</p> <hr/> <p> →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>

The sequence of the drives from which booting is to occur can be specified here.

Up to eight drives (can include USB ports, for example) can be listed here.

Boot Configuration

Bootup NumLock State

The setting of the NumLock function after a system boot is provided here. NumLock controls the functionality of the numeric keypad.

On NumLock is enabled, the numeric keypad can be used.

Off NumLock is disabled, the numeric keypad keys can be used to control the cursor.



The Num indicator light on your keyboard shows the current boot up NumLock state. The **Num** key on the keyboard can be used to toggle between ON and OFF.

Quiet Boot

The boot logo is shown on the screen instead of the POST boot up information.

- | | |
|-----------------|------------------------------------------------------|
| <i>Disabled</i> | The POST boot up information is shown on the screen. |
| <i>Enabled</i> | The boot logo is displayed. |

Check Controller Health Status

If a UEFI driver option ROM of a PCI Express device supports Controller Health, the UEFI firmware can query the UEFI driver option ROM regarding the status of the devices that it manages.

- | | |
|-----------------|-------------------------------------------------------------|
| <i>Disabled</i> | The Controller Health Status is not queried by the UEFI FW. |
| <i>Enabled</i> | The UEFI FW queries the Controller Health Status. |

Boot Error Handling

Specifies whether the system boot process is interrupted and the system stopped when an error is detected.

- | | |
|-------------------------------|----------------------------------------------------------------------------------------------|
| <i>Continue</i> | The system boot is not aborted. The error will be ignored, as far as this is possible. |
| <i>Pause and wait for key</i> | If an error is detected during POST, the boot process is interrupted and the system stopped. |

Keyboard Error Reporting

Specifies whether a keyboard error message is displayed and entered in the event log.

- | | |
|-----------------|------------------------------------------------------------------------|
| <i>Disabled</i> | No keyboard error message is displayed nor entered in the event log. |
| <i>Enabled</i> | A keyboard error message is displayed and is entered in the event log. |

Primary Display

Specifies which plug-in graphics card is used as image source during the Power-On Self-Test (POST).

- | | |
|---------------|------------------------------------------------------------------------------------------------|
| <i>Slot n</i> | Select the slot of the plug-in graphics card which should be used as image source during POST. |
|---------------|------------------------------------------------------------------------------------------------|

New Boot Option Policy

Configures the placement rule for new boot options in the boot options priorities list.

- | | |
|--------------------|---------------------------------------------------|
| <i>Default</i> | No placement rule is applied to new boot options. |
| <i>Place First</i> | New boot options are placed at the beginning. |
| <i>Place Last</i> | New boot options are placed at the end. |

Boot Menu

Specifies whether the Boot menu can be called up by pressing the **F12** key during the POST process.

Enabled The *Boot* menu can be called up during the POST.

Disabled The *Boot* menu cannot be called up during the POST.

Boot Removable Media



Specifies whether booting via a removable data storage device such as a USB stick is supported.

Disabled Booting via a removable data storage device is disabled.

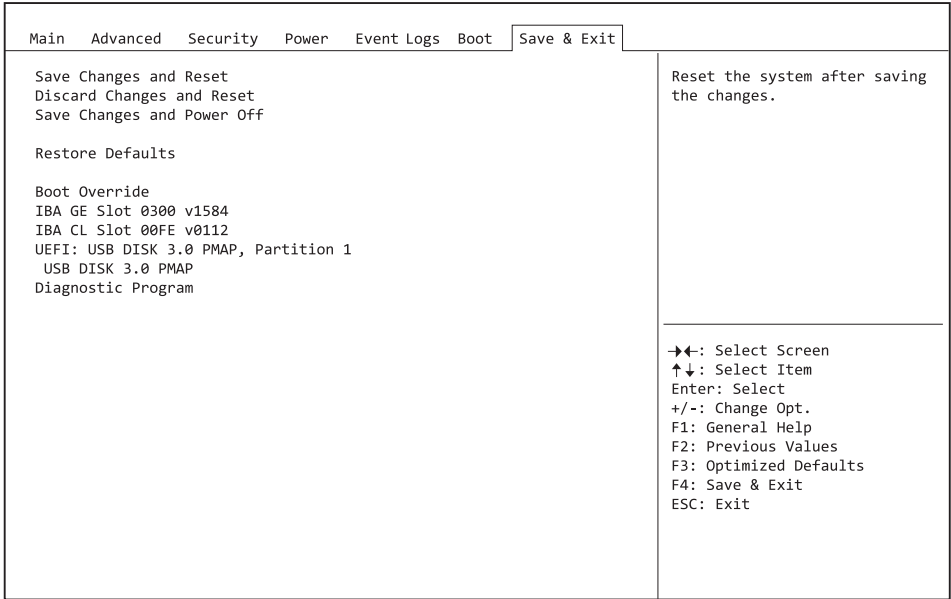
Enabled Booting via a removable data storage device is enabled.

Boot option priorities

Displays the current boot sequence.

- ▶ Use the cursor keys  or  to select the device whose boot sequence you would like to change.
- ▶ To increase the priority for the selected device, press the **+** key. To decrease the priority, press the **-** key.
- ▶ To remove the selected device from the boot sequence, press the **Enter** key and select *Disabled*.

Save & Exit Menu – Finish BIOS Setup



The *Exit* menu provides options for saving settings and exiting *BIOS Setup*.

Save Changes and Reset

To save the current entries in the menus and exit BIOS Setup, select *Save Changes and Reset* and *Yes*. The system reboots and the new settings take effect.

Discard Changes and Reset

To discard changes made since calling the BIOS Setup, select *Discard Changes and Reset* and *Yes*. BIOS Setup is closed and the system reboots.



Save Changes and Power Off

To save the current entries in the menus and then shut down the system, select *Save Changes and Power Off* and *Yes*.

Restore Defaults

To reset all the menus of the BIOS setup to the default values, select *Restore Defaults* and *Yes*. If you wish to leave the BIOS Setup with these settings, select *Save Changes and Exit* and *Yes*.


Boot Override

Use the cursor keys  and  to select the drive from which the operating system should be booted. Press the Enter key to start the boot process from the selected drive.

Diagnostic Program

- ▶ To perform a basic test of the CPU, working memory and hard disks, select *Diagnostic Program* and press the Enter key.
- ↳ If a problem occurs during the test, the relevant Error Code and a brief explanation (Diagnostic Result) will be displayed. In addition, the Error Code is entered in the Smbios Event Log.



Diagnostic Program can also be called up directly in the Boot Menu by pressing the  key in the POST.

BIOS Update

To carry out a *Flash BIOS Update*, you can use the *Auto BIOS Update* function ("[Auto BIOS Update](#)", [Page 20](#)) or must first download the necessary files from the Internet.



The BIOS is installed on a flash memory module. If an error occurs during the flash BIOS update procedure, the BIOS image may be destroyed. You can then only recover the BIOS using *BIOS Recovery Update*, see "[BIOS Recovery Update](#)", [Page 65](#). If this is not possible, the Flash memory module must be replaced. If this is the case, please contact the Service Desk of Customer Services.

- ▶ On the Internet, go to "<http://www.fujitsu.com/de/support/index.html>".
- ▶ Use *MANUAL PRODUCT SELECTION* to select your device or look for your device under *SELECT PRODUCT USING SERIAL/IDENT NO.* using the serial/ident. no. or the product name.
- ▶ Click on *Drivers & Downloads* and select your operating system.
- ▶ Select *Flash BIOS*.
- ▶ Flash BIOS Update – Desk Flash Instant: For "Flash-BIOS Update under Windows", download the file *Flash-BIOS Update – Desk Flash Instant*.
- ▶ Admin package – Compressed Flash Files: If you cannot find the operating system which you are using in the selection, select an operating system of your choice and download the file *Admin package – Compressed Flash Files* to "Flash-BIOS Update using a USB stick".
- ▶ For safety reasons, make a note of the settings in the BIOS Setup before you perform the Flash-BIOS update. Normally, a Flash-BIOS update does not damage the BIOS Setup.

Auto BIOS Update

With *Auto BIOS Update* it is possible to check a Fujitsu server automatically to see if there is a new BIOS version for the system. For the update, no operating system or external storage medium is required. For details on the *Auto BIOS Update* function, see the manual, "[Auto BIOS Update](#)", [Page 20](#).

Flash BIOS update under Windows

- ▶ Start your system and boot Windows.
- ▶ Open Windows Explorer, then under *Flash-BIOS Update – Desk Flash Instant* select the file which was downloaded and start the Flash-BIOS update with a double-click. Follow the instructions on the screen.



Administrator rights are necessary to run "Desk Flash Instant".

- ↳ After the Flash-BIOS Update has terminated successfully, the system will restart automatically and boot up with the new version of BIOS.

Flash BIOS update with a USB stick



- ▶ Have a boot-capable USB stick ready.



If your USB stick is not boot-capable, you will find the necessary files for it under *Admin package – Compressed Flash Files* under the item *Installation description* then selecting the item *Further information*. Follow the instructions.



When a boot-capable USB stick is created, all the files on the stick are irretrievably deleted. Please therefore make certain that all files from the USB stick are backed up elsewhere beforehand.

- ▶ Unzip the ZIP files which were downloaded under *Admin package – Compressed Flash Files* and copy the files and directories into the root directory of your boot-capable USB stick.
- ▶ Restart your system and wait until screen output appears. Press the function key F12 and use the cursor keys  or  to select the boot-capable USB stick.
- ▶ Use *cd DOS* to change directory, launch Flash BIOS Update with the command *DosFlash* and follow the further instructions.
- ↳ After the Flash-BIOS Update has terminated successfully, the system will restart automatically and boot up with the new version of BIOS.

BIOS Recovery Update

- ▶ Prepare a boot-capable USB stick as described under "Flash BIOS update with a USB stick".
- ▶ Switch off the system and unplug it from the mains supply.
- ▶ Open the casing and enable *Recovery* using the jumper / DIP switch on the system board. You will find details on this in the technical manual for the system board.
- ▶ Connect the prepared USB stick and remove all other bootable USB devices.



If the Admin package on the prepared USB stick does not match the BIOS version of the system (e.g. Admin package for BIOS R1.2.0, but BIOS R1.3.0 is enabled on the system), no screen outputs will be possible in recovery mode. The Recovery Update will be carried out automatically in this case.

During the Recovery Update, a recurring short signal tone will sound. Recovery of the system has succeeded if you hear the repeated signal sequence "short-short-long-long" after a long signal tone. The Recovery process can take a few minutes.

- ▶ After the recovery process has finished, switch off the system and disconnect it from the mains supply.
- ▶ Remove the USB stick.
- ▶ For all jumpers / DIP switches which were changed, return them to their original positions and close the casing.
- ▶ Connect the system to the mains supply again and switch it on.
- ↳ The system will now boot up with the new version of BIOS.
- ▶ Check the settings in the BIOS Setup. If necessary, configure the settings once again.

Index

- A**
 - Access 15
 - Access Level 15
 - Active Processor Cores 23
 - Adjacent Cache Line Prefetcher 24
 - Advanced menu 16
 - AMT Configuration 42
 - ASMedia 19
 - Audio Configuration 19
 - Authorized Signatures Database (DB) 52
 - Authorized TimeStamps Database (DBT) 53
 - Automatic BIOS Update 20
- B**
 - BIOS Recovery Update 65
 - BIOS Setup 11
 - navigating 13
 - settings 9
 - System configuration 14
 - System settings 16
 - BIOS Setup,
 - security functions 44
 - BIOS update
 - under Windows 64
 - with a USB stick 65
 - BIOS Update 64
 - BIOS-Setup
 - opening 11
 - Boot menu 12
 - system boot 59
 - Boot Menu
 - Calling the 12
 - Boot Option Filter 32
- C**
 - C-state 27
 - Card reader settings 19
 - COM0 39
 - COM4 39
 - CPU C1E Support 27
 - CPU C6 Report 27
 - CSM 32–33
- D**
 - Data Cache Unit 24
 - Date 15
 - DDR Performance 29
 - Decoding
 - 4G 22
 - Details
 - Keyboard 15
- E**
 - Easy PC Protection 47
 - Energy Performance 27
 - Enhanced SpeedStep 26
 - Erase Disk 17
 - Erase SATA hard disk 17
 - Error Logging 28
 - Event Log 57
 - Exit Menu 62
 - External SATA Port 31
- F**
 - F12, function key 12
 - Finish
 - BIOS Setup 62
 - Forbidden Signatures Database (DBX) 52
 - frequency 29
- H**
 - Hardware Power Management Support 26
 - Hardware Prefetcher 23
 - Hot Plug 31
 - HWPM 26
 - Hyper Threading 23
- I**
 - IMC Interleaving 30
 - Intel Virtualization Technology 25
- K**
 - Key Exchange Keys (KEK) 52
 - Key Management 51–53
- L**
 - LAN 12
 - LAN controller 19
 - Launch CSM 32
 - Launch PXE OpROM Policy 32
 - Launch Storage OpROM Policy 33
 - Launch Video OpROM Policy 33
 - Legacy USB Support 34
 - Link Speed 22

- M**
- Main Menu 14
 - Mass Storage Devices 35
 - Memory Configuration 29
 - Memory Error 28
- N**
- Network Stack 43
 - Non-Compliance 22
 - NUMA 29–30
 - NumLock 59
- O**
- Onboard Device Configuration 19
 - Open source software license information 14
 - OsRecovery Signatures 53
 - Other PCI Device ROM Priority 33
 - Override OS Energy Performance 26
- P**
- Package C State limit 28
 - Password 45
 - Administrator Password 45
 - automatic Wakeup 46
 - Hard Disk Master Password 49
 - Hard Disk User Password 48–49
 - Housing Monitoring 46
 - Password on Boot 46
 - Password Severity 46
 - User Password 45
 - PCI
 - PCI parity errors 21
 - PCI system errors 22
 - PCIe 22
 - Platform Key 51
 - Platform Mode 49
 - Power failure, system reaction 54
 - Primary Display 60
 - PS/2 Emulation 34
 - Putty KeyPad 41
- R**
- Recovery Update 65
 - Redirection After BIOS RESET 41
 - Rollback
 - System Firmware 47
- S**
- SATA
 - Drive Configuration 30
 - SATA Controller 30
 - SATA Port n 31
 - SATA ports 31
 - SD 4.0 19
 - Secure Boot 49–51
 - Secure Boot Control 50
 - Secure Boot Mode 50
 - Secure Boot Variables 51
 - Security Menu 44
 - Serial interface 38
 - Server address 21
 - Setup,
 - see BIOS Setup 11
 - speed 29
 - Staggered Spin-up 31
 - Switch on system
 - network 55
 - System boot 61
 - System Date / System Time 15
 - System Information 14
 - System Language 14
 - System power-on
 - LAN controller 55
- T**
- Terms of Use 20
 - Time 15
 - Trusted Computing 33
 - Trusted Platform Module 33
 - Pending TPM operation 33
 - TPM Status Information 34
 - TPM Support 33
 - Turbo Mode 26
- U**
- Update 20–21, 64
 - System Firmware 47
 - USB 34, 36
 - USB keyboard 56
 - USB ports 35
 - USB 3.1 Gen2 19
- V**
- Vendor Keys 50
 - VMD 30
 - Volume Management Device 30
 - VT-d 25
- W**
- Wake Up Mode 56
 - Wake Up Timer 56