

G-SURF365

Motherboard

ASUS®

E3497

First Edition
November 2007

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.



The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment, Mercury-containing button cell battery) should not be placed in municipal waste. Please check local regulations for disposal of electronic products.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**
This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.
- **Chapter 2: BIOS setup**
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.
- **Chapter 3: Software support**
This chapter describes the contents of the support CD/DVD that comes with the motherboard package.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**
The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.
2. **Optional documentation**
Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Instructions that you **MUST** follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Typography

Bold text

Indicates a menu or an item to select.

Italics

Used to emphasize a word or a phrase.

<Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

<Key1+Key2+Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Example: <Ctrl+Alt+D>

Command

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.

Example: At the DOS prompt, type the command line:

format A:/S

G-SURF365 specifications summary

CPU	Support AMD® Socket AM2 Athlon™ 64 FX / Athlon™ 64 X2 / Athlon™ 64 / Sempron processors AMD64 architecture enables simultaneous 32-bit and 64-bit computing Supports AMD Cool 'n' Quiet™ Technology
Chipset	NVIDIA nForce 630a
System bus	2000 / 1600 MT/s
Memory	Dual-channel memory architecture 2 x 240-pin DIMM sockets support up to 4 GB of ECC / Non-ECC unbuffered 800 / 667 / 533 MHz DDR2 memory modules
Expansion slots	1 x PCI Express™ x16 slot 2 x PCI slots
Storage	<ul style="list-style-type: none"> - 1 x Ultra DMA 133/100 interface for two PATA devices - 2 x Serial ATA 3 Gb/s hard disk drives supporting RAID 0, 1, and JBOD configuration
High Definition Audio	Realtek® ALC662 High Definition Audio 6-channel CODEC Supports S/PDIF out interface and Jack-detection
LAN	NVidia nForce built-in Gigabit MAC with external Marvell 88E1116 PHY
USB	Supports up to 6 USB 2.0 / 1.1 ports (2 ports at mid-board; 4 ports at back panel)
Manageability	WfM2.0, DMI2.0, PXE, WOR by Ring, WOL / WOR by PME
Special features	ASUS CPU Level Up ASUS MyLogo 3™ ASUS CrashFree BIOS 3 ASUS EZ Flash 2 ASUS Q-Fan

(continued on the next page)

G-SURF365 specifications summary

BIOS features	8 Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.4
Rear panel I/O	1 x PS/2 mouse port 1 x PS/2 keyboard port 1 x G-Guardian port 1 x LAN (RJ-45) port 4 x USB 2.0/1.1 ports 6-channel audio ports
Internal I/O connectors	1 x USB 2.0 connectors for 2 additional USB 2.0 ports 1 x Floppy disk drive connector 1 x IDE connector for two devices 1 x High Definition front panel audio connector 1 x CD audio-in connector 1 x S/PDIF Out connector 1 x LPT connector 1 x COM connector 1 x CPU fan connector 1 x Chassis fan connector 1 x Chassis intrusion connector 24-pin EATX power connector 4-pin x ATX 12V power connector 1 x System panel connector
Support CD contents	Drivers ASUS PC Probe II ASUS Live Update Utility Anti-virus software (OEM version)
Form Factor	ATX Form Factor, 12 in. x 9.6 in. (30.5cm x 24.5cm)

*Specifications are subject to change without notice.

This chapter describes the motherboard features and the new technologies it supports.

1 Product introduction

1.1 Welcome!

Thank you for buying an ASUS® G-SURF365 motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS G-SURF365 motherboard
Cables	1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 133/100 cable 1 x Floppy disk drive cable
Accessories	1 x G-Guardian (1 set of memory lock and 1 back I/O lock) 1 x I/O shield
Application CD	ASUS motherboard support CD ASUS SUPERB Software
Documentation	User guide



If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product highlights

Republic of Gamers



The Republic of Gamers consists only the best of the best. We offer the best hardware engineering, the fastest performance, the most innovating ideas, and we welcome the best gamers to join in. In the Republic of Gamers, mercy rules are only for the weak, and bragging rights means everything. We believe in making statements and we excel in competitions. If your character matches our trait, then join the elite club, make your presence felt, in the Republic of Gamers.



Latest processor technology

The motherboard supports AMD socket AM2 single-core Athlon 64/ Sempron and dual-core Athlon 64 X2/Athlon 64 FX processors with 2MB/1MB/512KB L2 cache, which is based on 64-bit architecture. It features 2000/1600 MT/s HyperTransport Bus, dual-channel un-buffered DDR2 800 memory support and AMD Cool 'n' Quiet Technology. See page 1-10 for details.

AMD Cool 'n' Quiet Technology



The motherboard supports the AMD Cool 'n' Quiet Technology, which monitors system operation and automatically adjusts CPU voltage and frequency for a cool and quiet operating environment. See page 2-28 for details.

Dual-Core CPU



Enjoy the extraordinary CPU power from the latest dual-core CPU. The advanced processing technology contains two physical CPU cores with individually dedicated L2 cache to satisfy the rising demand for more powerful processing capability.

64-bit CPU support



64-bit computing, the next generation technology to replace current 32-bit architecture, delivers advanced system performance, faster memory access and increased productivity. This motherboard provides excellent compatibility and flexibility by supporting either 64-bit or 32-bit architecture.

NVIDIA® nForce™ 630a

The NVIDIA® nForce™ 630a MCP delivers NVIDIA® Gigabit LAN, and NVIDIA® MediaShield storage management technology allowing easy RAID configuration (RAID 0, RAID 1 and JBOD) for Serial ATA 3Gb/s.

Dual channel DDR2 800

DDR2 800 memory provides great performance for 3D graphics and other memory demanding applications on next generation memory technology. See page 1-14 for details.

PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 1-22 for details.

Serial ATA 3Gb/s technology

The motherboard supports next-generation SATA hard drives based on the new SATA 3Gb/s storage specification. It allows RAID 0, RAID 1 and JBOD configurations for two SATA connectors. See page 1-29 or details.

Gigabit LAN technology

The on-board LAN controller is a highly integrated GbLAN controller. It is enhanced with an ACPI management function to provide efficient power management for advanced operating systems. See page 1-25 for details.

High Definition Audio

Enjoy high-quality sound system on your PC! The onboard 6-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio output, jack-sensing feature, retasking functions technology that automatically detects and identifies what types of peripherals are plugged into the audio I/O jacks and notifies users of inappropriate connection, meaning there will be no more confusion of Line-in, Line-out and Mic jacks. See pages 1-25 and 3-3 for details.

1.3.2 Innovative ASUS features

ASUS CPU Level Up



Ever wish that you could have a more expansive CPU? Upgrade your CPU at no additional cost with ROG's CPU Level Up! Simply choose a processor you want to OC to, and the motherboard will do the rest for you. See the new CPU speed and enjoy the performance instantly! Overclocking is never as easy as this. See page 2-21 for details.

ASUS G-Guardian

G-Guardian is the best protector of your memory modules and PC peripherals! With G-Guardian assembled on your motherboard, you will never worry about your keyboard, mouse, webcam, headset and memory modules being stolen. See pages 1-36 to 1-39 for details.

ASUS Q-Fan technology



ASUS Q-Fan technology intelligently adjusts CPU fan speeds according to system loading to ensure quiet, cool and efficient operation. See page 2-36 for details.

ASUS CrashFree BIOS 3



This feature allows you to restore the original BIOS data from the support CD in case when the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement BIOS chip. See page 2-7 for details.

ASUS EZ Flash 2



EZ Flash 2 is a user-friendly BIOS update utility. Simply press the predefined hotkey to launch the utility and update the BIOS without entering the OS. Update your BIOS easily without preparing a bootable diskette or using an OS-based flash utility. See pages 2-4 and 2-41 for details.

C.P.R. (CPU Parameter Recall)



The C.P.R. feature of the motherboard BIOS allows automatic re-setting to the BIOS default settings in case the system hangs due to overclocking. When the system hangs due to overclocking, C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU default setting for each parameter. See page 1-23 for details.

ASUS MyLogo 3™

This feature allows you to convert your favorite photo into a 256-color boot logo for a more colorful and vivid image on your screen. See page 2-38 for details.

Green ASUS

The motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products and packaging to safeguard consumers' health while minimizing the impact on the environment.

1.4 Before you proceed

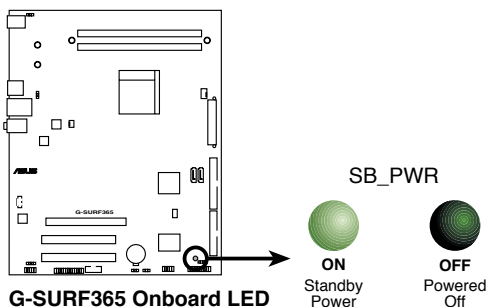
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

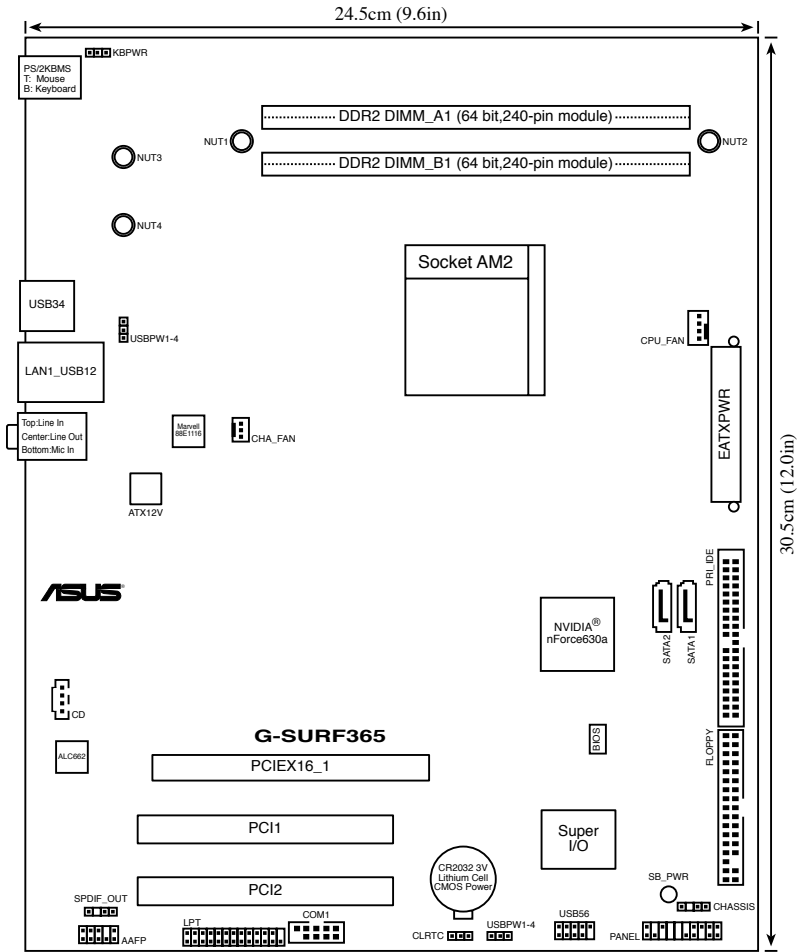
Onboard LED

The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.



1.5 Motherboard overview

1.5.1 Motherboard layout



1.5.2 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

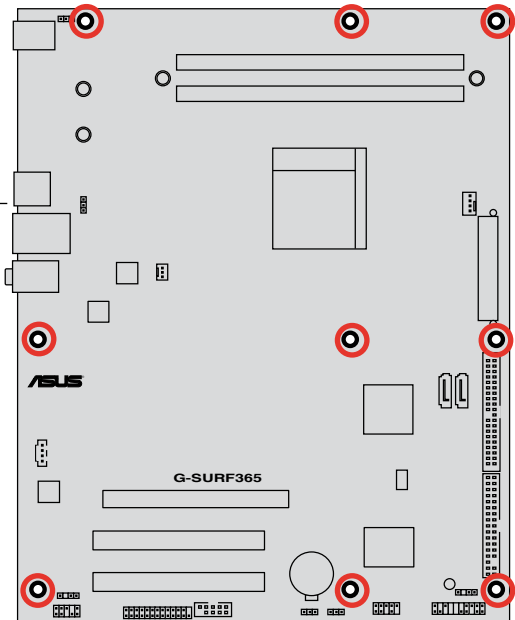
1.5.3 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.



Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards
the rear of the chassis



1.6 Central Processing Unit (CPU)

The motherboard comes with a 940-pin AM2 socket designed for the AMD Athlon™ 64 FX / Athlon™ 64 X2 / Athlon™ 64 / Sempron™ processor.

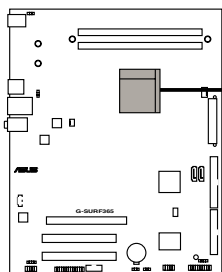


The AM2 socket has a different pinout from the 940-pin socket designed for the AMD Opteron™ processor. Make sure you use a CPU is designed for the AM2 socket. The CPU fits in only one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

1.6.1 Installing the CPU

To install a CPU.

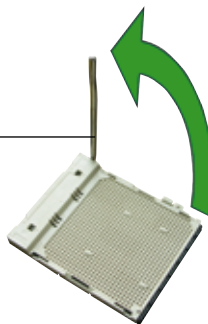
1. Locate the CPU socket on the motherboard.



G-SURF365 CPU Socket AM2

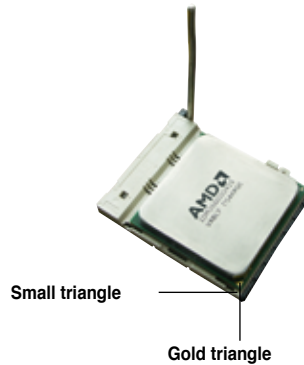
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.

Socket lever



Make sure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU does not fit in completely.

- Position the CPU above the socket such that the CPU corner with the gold triangle matches the socket corner with a small triangle.
- Carefully insert the CPU into the socket until it fits in place.

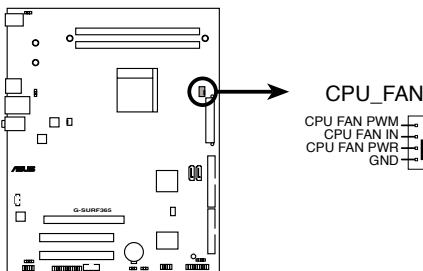


The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

- When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.
- Install a CPU heatsink and fan following the instructions that came with the heatsink package.



- Connect the CPU fan cable to the CPU_FAN connector on the motherboard.



G-SURF365 CPU fan connector



Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

1.6.2 Installing the heatsink and fan

The AMD Athlon™ 64 FX / Athlon™ 64 X2 / Athlon™ 64 / Sempron™ processor require a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



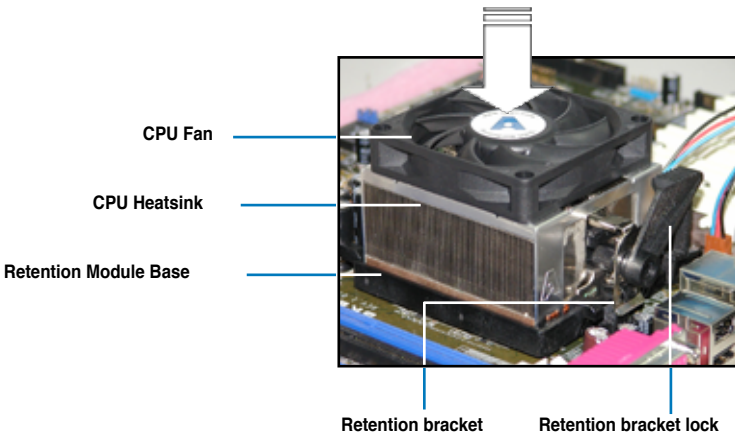
Make sure that you use only qualified heatsink and fan assembly.

Follow these steps to install the CPU heatsink and fan.

1. Place the heatsink on top of the installed CPU, making sure that the heatsink fits properly on the retention module base.

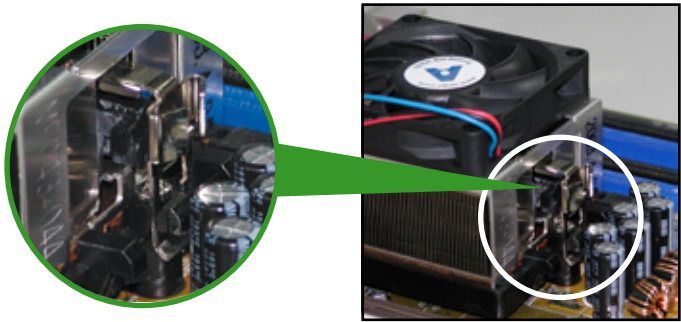


- The retention module base is already installed on the motherboard upon purchase.
 - You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
 - If you purchased a separate CPU heatsink and fan assembly, make sure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.
-



Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

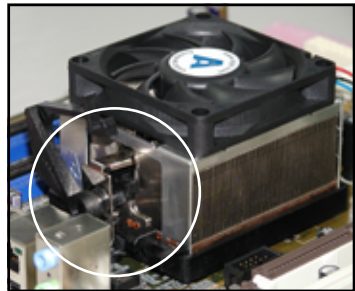
2. Attach one end of the retention bracket to the retention module base.



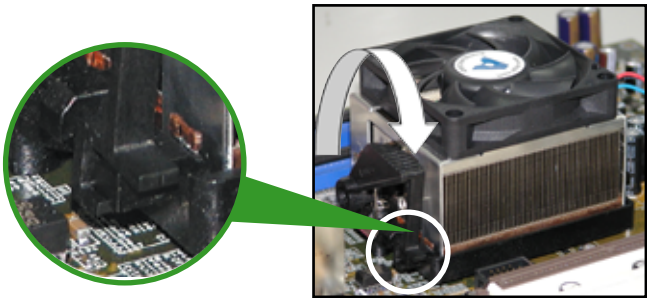
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.



Make sure that the fan and heatsink assembly perfectly fits the retention mechanism module base; otherwise, you cannot snap the retention bracket in place.



4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.



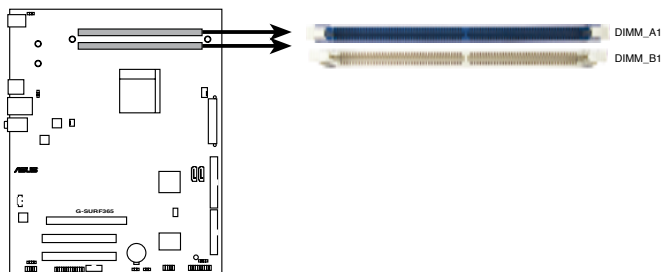
1.7 System memory

1.7.1 Overview

The motherboard comes with two Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:



G-SURF365 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

1.7.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, and 2 GB unbuffered ECC/non-ECC DDR2 DIMMs into the DIMM sockets.

Recommended memory configurations

Mode	Sockets	
	DIMM_A1	DIMM_B1
Single-Channel	–	Populated
	Populated	–
Dual-channel	Populated	Populated



Always use identical DDR2 DIMM pairs for dual channel mode. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Visit the ASUS website (www.asus.com) for the latest Qualified Vendors list.



Important notice on installing Windows® XP 32-bit version

If you install Windows® XP 32-bit version Operating System (OS), the limitation of this OS version is that it may reserve a certain amount of memory space for system devices. We recommend that you install less than 3 GB system memory if you would like to work under Windows® XP 32-bit version OS. The excess memory installation will not cause any usage problem, but it will not give users the benefit of manipulating this excess memory space.

Visit the ASUS FAQ site for further explanation:

<http://support.asus.com/faq/faq.aspx?SLanguage=en-us>

Under **General Search**, make the selections as shown, then click **Search**. Click the article titled “**4GB memory installed but less memory size detected.**”

General Search

Please Select the Product

Motherboard

Socket 939

ASUS SLI Deluxe

Search

You also may check the URLs below for third party comments on this issue:

http://dlsvr01.asus.com/pub/ASUS/mb/4GB_Rev1.pdf

<http://www.intel.com/support/motherboards/server/sb/cs-016594.htm>



This motherboard can support 4 GB physical memory on the operating systems listed below. You may install a maximum of 2 GB DIMMs on each slot.

64-bit

Windows® XP Professional x64 Edition

Windows® Vista x64 Edition

Qualified Vendors Lists (QVL) DDR2-800 MHz capability

Size	Vendor	Chip No.	SS/DS	Part No.	DIMM socket support (Optional)	
					A*	B*
512MB	KINGSTON	K4T51083QC	SS	KVR800D2N5/512	*	*
1024MB	KINGSTON	Heat-Sink Package	DS	KHX6400D2LL/1G	*	*
1024MB	KINGSTON	Heat-Sink Package	SS	KHX6400D2LLK2/1GN	*	*
1024MB	KINGSTON	V59C1512804QBF25	DS	KVR800D2N5/1G	*	*
1024MB	KINGSTON	Heat-Sink Package	SS	KHX6400D2ULK2/1G	*	*
2048MB	KINGSTON	Heat-Sink Package	DS	KHX6400D2ULK2/2G	*	*
512MB	Qimonda	HYB18T512800BF25F	SS	HYS64T64000HU-25F-B	*	*
1024MB	Qimonda	HYB18T512800BF25F	DS	HYS64T128020HU-25F-B	*	*
512MB	Hynix	HY5PS12821CFP-S5	SS	HYMP564U64CP8-S5	*	*
1024MB	Hynix	HY5PS12821CFP-S5	DS	HYMP512U64CP8-S5	*	*
512MB	MICRON	D9GKX	SS	MT8HTF6464AY-80ED4	*	*
1024MB	MICRON	D9GKX	DS	MT16HTF12864AY-80ED4	*	*
512MB	CORSAIR	Heat-Sink Package	SS	CM2X512A-6400	*	*
1024MB	CORSAIR	Heat-Sink Package	DS	CM2X1024-6400C4	*	*
1024MB	ELPIDA	E1108AB-8E-E(ECC)	SS	EBE10EE8ABFA-8E-E	*	*
2048MB	ELPIDA	E1108AB-8E-E(ECC)	DS	EBE21EE8ABFA-8E-E	*	*
512MB	Crucial	Heat-Sink Package	SS	BL6464AA804.8FD	*	*
512MB	Crucial	Heat-Sink Package	SS	BL6464AA804.8FD3	*	*
1024MB	Crucial	Heat-Sink Package	DS	BL12864AA804.16FD	*	*
1024MB	Crucial	Heat-Sink Package	DS	BL12864AL804.16FD3	*	*
1024MB	Crucial	Heat-Sink Package	DS	BL12864AA804.16FD3	*	*
512MB	Apacer	Heat-Sink Package	DS	AHU512E800C5K1C	*	*
1024MB	Apacer	Heat-Sink Package	DS	AHU01GE800C5K1C	*	*
512MB	A-DATA	AD29608A8A-25EG	SS	M2OAD6G3H3160G1E53	*	*
1024MB	A-DATA	AD26908A8A-25EG	DS	M2OAD6G3I41701E58	*	*
512MB	KINGMAX	KK8A8EIBF-HJK-25A	SS	KLDC28F-A8K15	*	*
1024MB	KINGMAX	KK8A8EIBF-HJK-25A	DS	KLDD48F-ABK15	*	*
512MB	Transcend	HY5PS12821CFP-S5	SS	TS64MLQ64V8J	*	*
1024MB	Transcend	HY5PS12821CFP-S5	DS	TS128MLQ64V8J	*	*
512MB	Super Talent	Heat-Sink Package	SS	T800UA12C4	*	*
1024MB	Super Talent	Heat-Sink Package	DS	T800UB1GC4	*	*
512MB	NANYA	NT5TU64M8BE-25C	SS	NT512T64U880BY-25C	*	*
1024MB	NANYA	NT5TU64M8BE-25C	DS	NT1GT64U8HB0BY-25C	*	*
1024MB	NANYA	NT5TU64M8CE-25D	DS	NT1GT64U8HCOBY-25D	*	*
512MB	PSC	A3R12E3HEF641B9A05	SS	AL6E8E63B8E1K	*	*
1024MB	PSC	A3R12E3HEF641B9A05	DS	AL7E8E63B-8E1K	*	*
256MB	TwinMOS	E2508AB-GE-E	SS	8G-24IK2-EBT	*	*
1024MB	Elixir	N2TU51280BE-25C	DS	M2Y1G64TU8HB0B-25C	*	*

Qualified Vendors Lists (QVL) DDR2-667 MHz capability

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM socket support (Optional)	
					A*	B*
512MB	KINGSTON	D6408TEBGGGL3U	SS	KVR667D2N5/512	*	*
256MB	KINGSTON	HYB18T256800AF3S	SS	KVR667D2N5/256	*	*
256MB	KINGSTON	6SB12D9DCG	SS	KVR667D2N5/256	*	*
2048MB	KINGSTON	E1108AB-6E-E	DS	KVR667D2N5/2G	*	*
512MB	Qimonda	HYB18T512800BF3S(ECC)	SS	HYS72T64000HU-3S-B	*	*
1024MB	Qimonda	HYB18T512800BF3S(ECC)	DS	HYS72T128020HU-3S-B	*	*
512MB	Qimonda	HYB18T512800BF3S	SS	HYS64T64000HU-3S-B	*	*
1024MB	Qimonda	HYB18T512800BF3S	DS	HYS64T128020HU-3S-B	*	*
512MB	SAMSUNG	K4T51163QE-ZCE6	DS	M378T3354EZ3-CE6	*	*
256MB	SAMSUNG	K4T51083QE	SS	M378T6553EZ3-CE6	*	*
1024MB	SAMSUNG	K4T51083QE	DS	M378T2953EZ3-CE6	*	*
256MB	Hynix	HY5PS121621CFP-Y5	SS	HYMP532U64CP6-Y5	*	*
1024MB	Hynix	HY5PS12821CFP-Y5	DS	HYMP512U64CP8-Y5	*	*
256MB	CORSAIR	M11100605	SS	VS256MB667D2	*	*
512MB	CORSAIR	64M8CFEG	SS	VS512MB667D2	*	*
1024MB	CORSAIR	64M8CFEG	DS	VS1GB667D2	*	*
256MB	ELPIDA	E2508AB-6E-E	SS	EBE25UC8ABFA-6E-E	*	*
512MB	ELPIDA	E5108AE-6E-E	SS	EBE51UD8AEFA-6E-E	*	*
512MB	A-DATA	AD29608A8A-3EG	SS	M2OAD5G3H31661C52	*	*
1024MB	A-DATA	AD29608A8A-3EG	DS	M2OAD5G3I417611C52	*	*
2048MB	A-DATA	NT5TU128M8BJ-3C	DS	M2ONY5H3J417011C5Z	*	*
512MB	crucial	Heat-Sink Package	SS	BL6464AA663.8FD	*	*
1024MB	crucial	Heat-Sink Package	DS	BL12864AA663.16FD	*	*
1024MB	crucial	Heat-Sink Package	DS	BL12864AL664.16FD	*	*
1024MB	crucial	Heat-Sink Package	DS	BL12864AA663.16FD2	*	*
512MB	Apacer	AM4B5708GQJS7E0628F	SS	AU512E667C5KBGC	*	*
1024MB	Apacer	AM4B5708GQJS7E	DS	AU01GE667C5KBGC	*	*
512MB	Transcend	K4T51083QE	SS	TS64MLQ64V6J	*	*
1024MB	Transcend	K4T51083QE	DS	TS128MLQ64V6J	*	*
256MB	Kingmax	N2TU51216AG-3C	SS	KLCB68F-36KH5	*	*
512MB	Kingmax	KKEA88B4LAUG-29DX	SS	KLCC28F-A8KB5	*	*
1024MB	Kingmax	KKEA88B4LAUG-29DX	DS	KLCD48F-A8KB5	*	*
512MB	Super Talent	Heat-Sink Package	SS	T6UA512C5	*	*
1024MB	Super Talent	Heat-Sink Package	DS	T6UB1GC5	*	*
2048MB	NANYA	NT5TU128M8BJ-3C	DS	NT2GT64U8HB0JY-3C	*	*
512MB	NANYA	NT5TU64M8BE-3C	SS	NT512T64U88B0BY-3C	*	*
512MB	PSC	A3R12E3GEF637BLC5N	SS	AL6E8E63B-6E1K	*	*
1024MB	PSC	A3R12E3GEF637BLC5N	DS	AL7E8E63B-6E1K	*	*

Qualified Vendors Lists (QVL) DDR2-667 MHz capability (continued)

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM socket support (Optional)	
					A*	B*
512MB	TwinMOS	E5108AE-GE-E	SS	8G-25JK5-EBT	*	*
512MB	TwinMOS	TMM6208G8M30C	SS	8D-23JK5M2ETP	*	*

Qualified Vendors Lists (QVL) DDR2-533 MHz capability

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM socket support (Optional)	
					A*	B*
512MB	KINGSTON	HYB18T512800AF37	SS	KVR533D2N4/512	*	*
1024MB	KINGSTON	D6408TPAGGL3U	DS	KVR533D2N4/1G	*	*
2048MB	KINGSTON	E1108AB-6E-E	DS	KVR533D2N4/2G	*	*
512MB	Qimonda	HYB18T512800BF37	SS	HYS64T64000HU-3.7-B	*	*
1024MB	Qimonda	HYB18T512800BF37	DS	HYS64T128020HU-3.7-B	*	*
256MB	Hynix	HY5PS121621CFP-C4	SS	HYMP532U64CP6-C4	*	*
1024MB	Hynix	HY5PS12821CFP-C4	DS	HYMP512U64CP8-C4	*	*
256MB	CORSAIR	32M16CEDG	SS	VS256MB533D2	*	*
512MB	CORSAIR	M110052432M8CEC	DS	VS512MB533D2	*	*
1024MB	CORSAIR	64M8CEDG	DS	VS1GB533D2	*	*
512MB	ELPIDA	E5108AB-5C-E(ECC)	SS	EBE51ED8ABFA-5C-E	*	*
512MB	ELPIDA	E5108AB-5C-E	SS	EBE51UD8ABFA-5C	*	*
512MB	ELPIDA	E5108AB-5C-E	SS	EBE51UD8ABFA-5C-E	*	*
1024MB	ELPIDA	E5108AB-5C-E	DS	EBE11UD8ABFA-5C-E	*	*
512MB	KINGMAX	E5108AE-5C-E	SS	KLBC28F-A8EB4	*	*
1024MB	KINGMAX	E5108AE-5C-E	DS	KLBD48F-A8EB4	*	*
512MB	KINGMAX	KKEA88E4AAK-37	SS	KLBC28F-A8KE4	*	*
1024MB	KINGMAX	5MB22D9DCN	DS	KLBD48F-A8ME4	*	*
512MB	Apacer	AM4B5708GQJS5D	SS	AU512E533C4KBGC	*	*
1024MB	Apacer	AM4B5708GQJS5D	DS	AU01GE533C4KBGC	*	*
512MB	Super Talent	Heat-Sink Package	SS	T5UA512C4	*	*
1024MB	Super Talent	Heat-Sink Package	DS	T5UB1G8C4	*	*
1024MB	PQI	64MX8D2-E	DS	MEAB-323LA	*	*
512MB	PQI	64MX8D2-E	SS	MEAB-423LA	*	*
512MB	TwinMOS	K4T51083QB-GCD5	SS	8D-22JB5-K2T	*	*



- A*: Supports one module inserted in any slot as Single-channel memory configuration.
- B*: Supports one pair of modules inserted into both the blue and white slots as one pair of Dual-channel memory configuration.



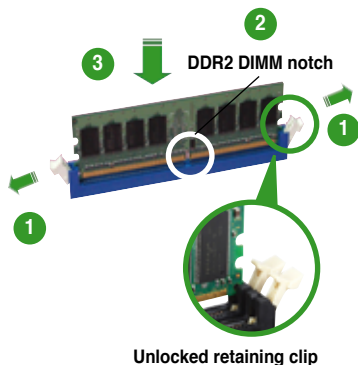
Visit the ASUS website for the latest DDR2 QVL.

1.7.3 Installing a DIMM



Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

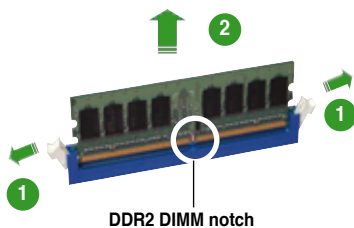


- A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
- The DDR2 DIMM sockets do not support DDR DIMMs. Do not install DDR DIMMs to the DDR2 DIMM sockets.

1.7.4 Removing a DIMM

To remove a DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

1.8 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.



Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.8.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.8.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

Interrupt assignments

IRQ	Standard function
0	High precision event timer
1	Standard 101/102-Key or Microsoft Natural PS/2 keyboard
4	Communications Port (COM1)*
6	Standard floppy disk controller
8	High precision event timer
9	Microsoft ACPI-Compliant System
10	NVIDIA nForce PCI System Management
13	Numeric data processor
20	NVIDIA Network Bus Enumerator
20	Standard Enhanced PCI to USB Host controller
21	Standard Dual Channel PCI IDE Controller
21	Standard Enhanced PCI to USB Host Controller
22	Microsoft UAA Bus Driver for High Definition Audio
23	Standard OpenHCD USB Host Controller
23	Standard OpenHCD USB Host Controller

* These IRQs are usually available for ISA or PCI devices.

IRQ assignments for this motherboard

	A	B	C	D
PCI slot 1	–	shared	–	–
PCI slot 2	–	shared	–	–
PCI Express x16 slot	–	shared	–	–



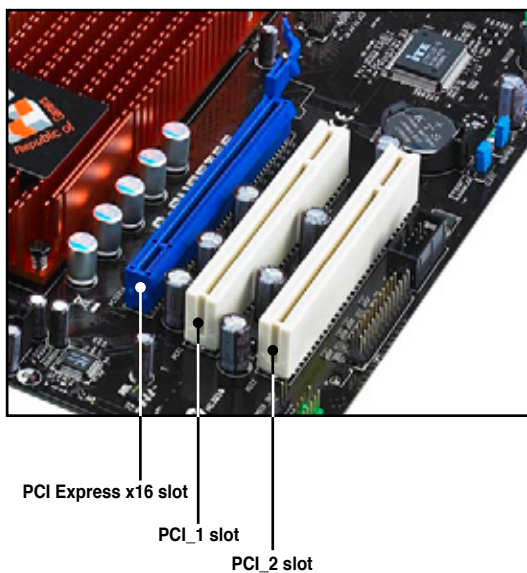
When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments; otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

1.8.3 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slots.

1.8.4 PCI Express x16 slot

This motherboard supports PCI Express x16 graphic cards that comply with PCI Express specifications. Refer to the figure below for the location of the slot.



1.9 Jumpers

1. Clear RTC RAM (CLRTC)

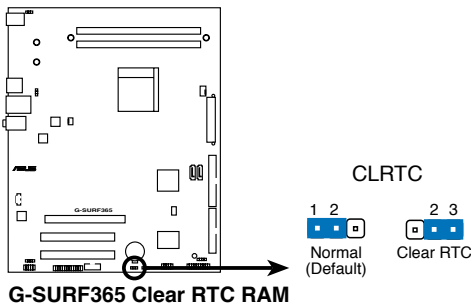
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Reinstall the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

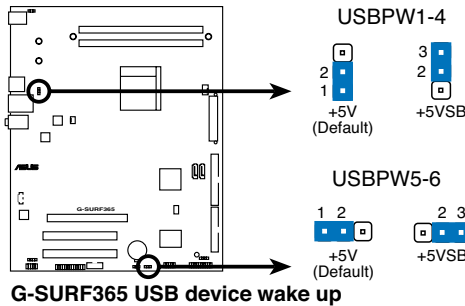


You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2. USB device wake-up (3-pin USBPW1-4, USBPW5-6)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes.

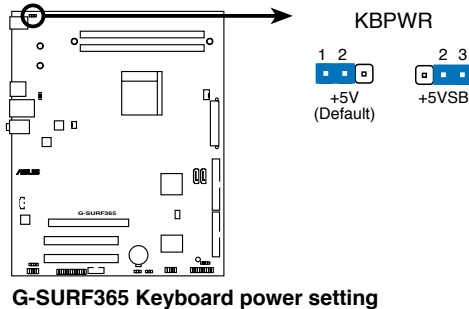
The USBPW1-4 jumpers are for the rear USB ports. The USBPW5-6 jumpers are for the internal USB connectors that you can connect to additional USB ports.



- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system will not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

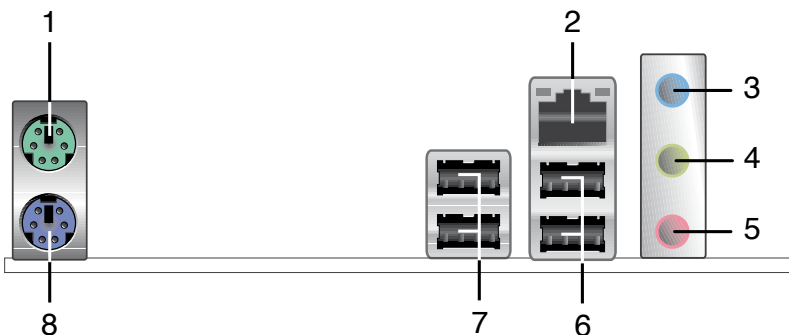
3. Keyboard power (3-pin KBPWR)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 500 mA on the +5VSB lead, and a corresponding setting in the BIOS.



1.10 Connectors

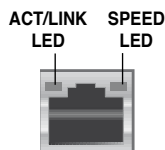
1.10.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection



LAN port

3. **Line In port (light blue).** This port connects a tape, CD, DVD player, or other audio sources.
4. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel/ 6-channel configuration, the function of this port becomes Front Speaker Out.
5. **Microphone port (pink).** This port connects a microphone.



Refer to the audio configuration table for the function of the audio ports in 2, 4, or 6,-channel configuration.

Audio 2, 4, or 6-channel configuration

Port	Headset 2-channel	4-channel	6-channel
Light Blue	Line In	Surround	Surround
Lime	Headphone/Front	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Center/Subwoofer

6. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
7. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

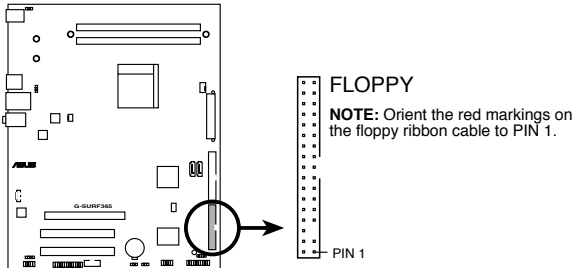
1.10.2 Internal connectors

1. Floppy disk drive connector (34-1 pin FLOPPY)

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.



Pin 5 on the connector is removed to prevent incorrect cable connection when using an FDD cable with a covered Pin 5.

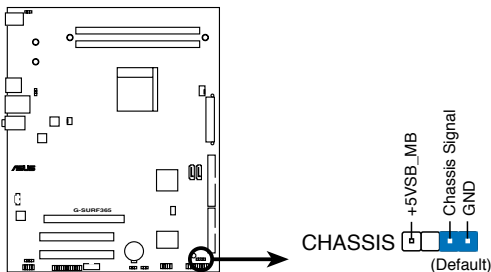


G-SURF365 Floppy disk drive connector

2. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

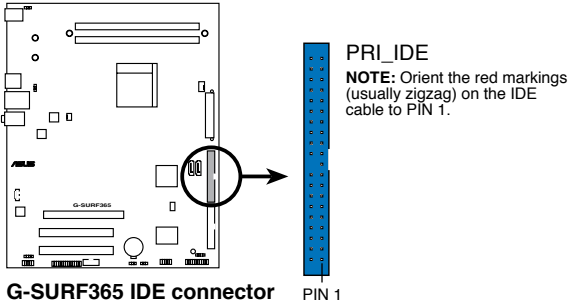
By default, the pins labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



G-SURF365 Chassis intrusion connector

3. IDE connectors (40-1 pin PRI_IDE)

The onboard IDE connector is for an Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device(s).



	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	



- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

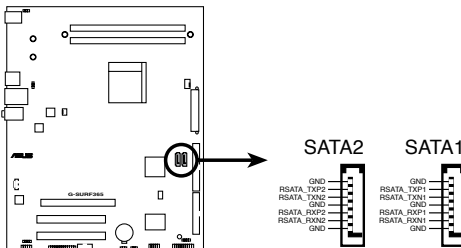


If any device jumper is set as “Cable-Select,” make sure all other device jumpers have the same setting.

4. Serial ATA connectors (7-pin SATA1, SATA2)

These connectors are for the Serial ATA signal cables for Serial ATA 3Gb/s hard disk and optical disk drives. The Serial ATA 3Gb/s is backward compatible with Serial ATA 1.5Gb/s specification. The data transfer rate of the Serial ATA 3Gb/s is faster than the standard parallel ATA with 133 MB/s (Ultra DMA133).

If you install Serial ATA hard disk drives, you can create a RAID 0, RAID 1, and JBOD configuration through the onboard controller.



G-SURF365 SATA connectors



Important note on Serial ATA

Install the Windows® XP Service Pack 1 before using Serial ATA.



- For detailed instructions on how to configure RAID 0, RAID 1 and JBOD, refer to the RAID manual in the support CD.
 - If you intend to create a Serial ATA RAID set using these connectors, set the onboard SATA Type item in the BIOS to [RAID controller]. See the page 2-16 for details.
-

5. CPU and Chassis Fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN)

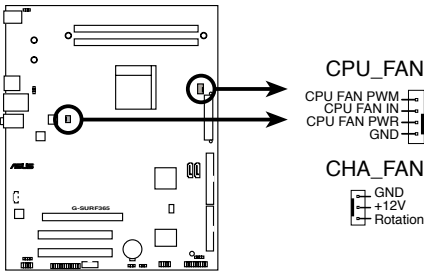
The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.



Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



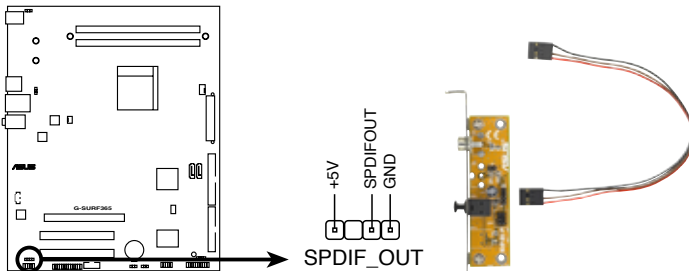
Only the CPU Fan supports Q-Fan.



G-SURF365 Fan connectors

6. Digital audio connector (4-1 pin SPDIF_OUT)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.



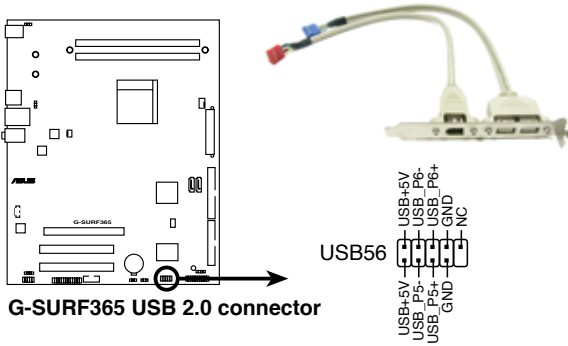
G-SURF365 Digital audio connector



The S/PDIF module is purchased separately.

7. USB connectors (10-1 pin USB56)

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



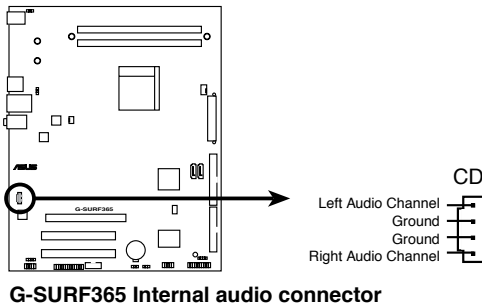
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB 2.0 module is purchased separately.

8. Optical drive audio in connector (4-pin CD)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

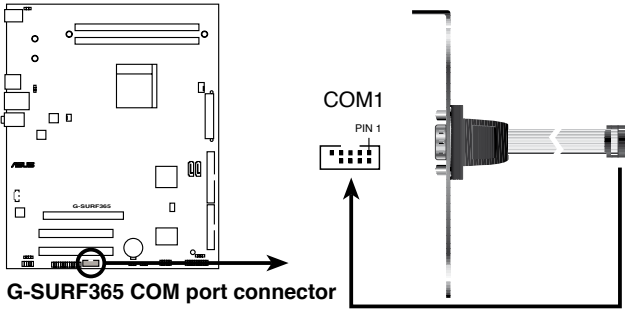


9. Serial port connectors (10-1 pin COM1)

The connector is for a serial (COM) port. Connect the serial port module cable to the connector, then install the module to a slot opening at the back of the system chassis.

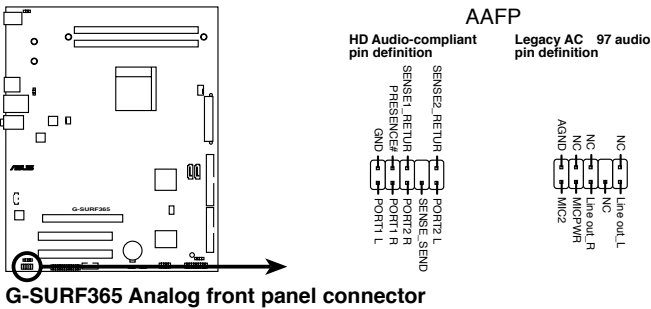


The serial port bracket (COM1) is purchased separately.



10. Front panel audio connector (10-1 pin AAFP)

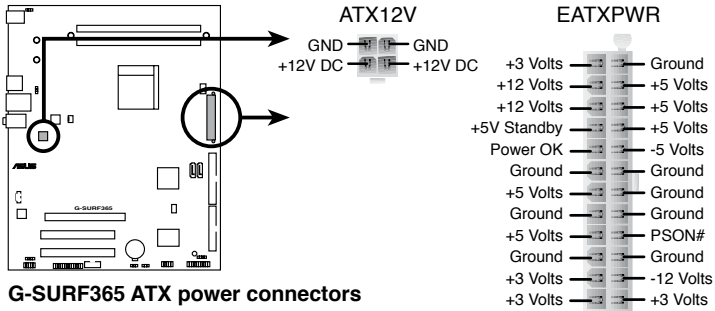
This connector is for a chassis-mounted front panel audio I/O module that supports either High Definition Audio or AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, make sure that the **Front Panel Select** item in the BIOS is set to [HD Audio]; if you want to connect an AC`97 front panel audio module to this connector, set the item to [AC97]. See page 2-29 for details.

11. ATX power connectors (24-pin ATX-PWRGD, 4-pin ATX12V)

These connectors are for an ATX power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



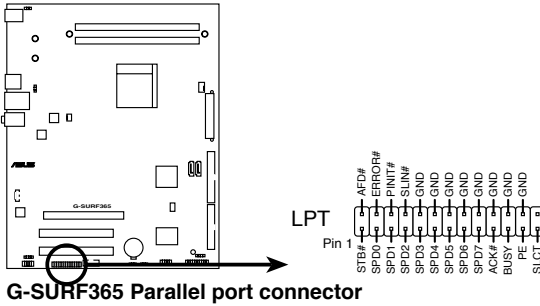
G-SURF365 ATX power connectors



- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.
- Do not forget to connect the 8-pin / 4-pin EATX12V power plug; otherwise, the system will not boot.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- If you are uncertain about the minimum power supply requirement for your system, refer to the **Recommended Power Supply Wattage Calculator** at <http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us> for details.

12. LPT connector

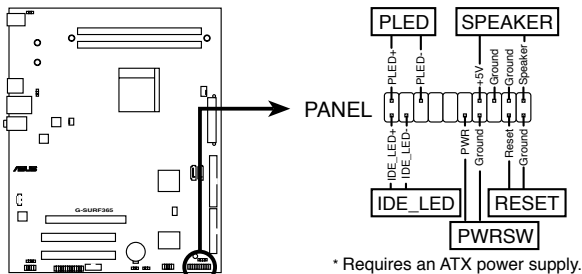
The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT standardizes as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers.



The LPT module is purchased separately.

13. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.



G-SURF365 System panel connector

- **System power LED**

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED**

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker**

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **Power/Soft-off button**

This 2-pin connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button**

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

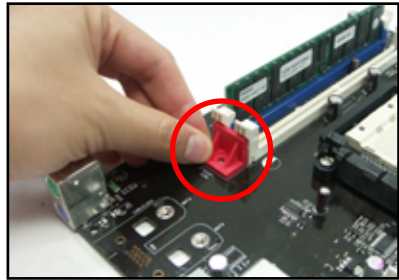
1.11 G-Guardian

1.11.1 Installing the Memory Lock

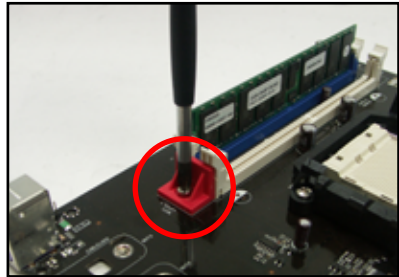
1. Locate the two (2) screw holes near the DIMM sockets.



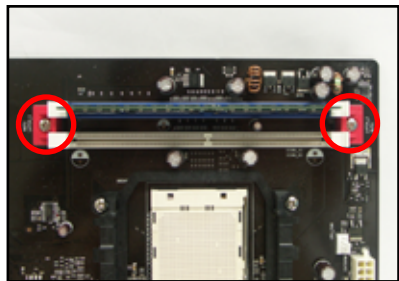
2. Select one of the two screw holes and place a memory lock module on it.



3. Secure the memory lock module with one screw.

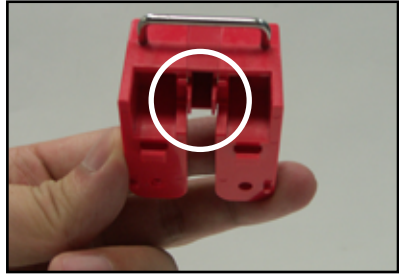


4. Repeat step 2 - 3 to attach the other memory lock module.

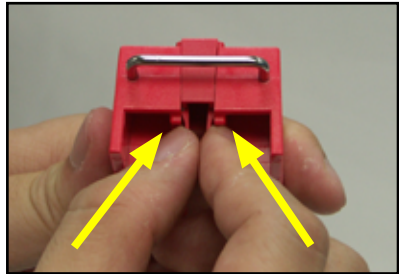


1.11.2 Installing the Back I/O Lock

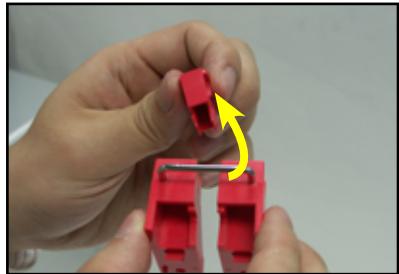
1. Locate the two latches on the bottom of the back I/O lock module.



2. Follow the direction of the arrows and carefully squeeze the latches.



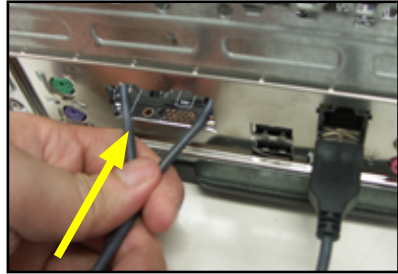
3. Push and remove the cap from the back I/O lock module.



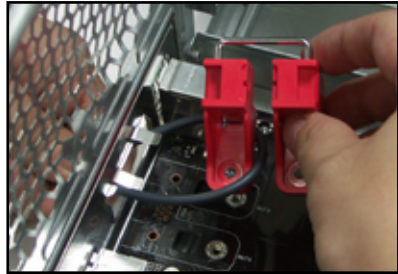
4. Attach the external device(s) to the back I/O port(s). Bend the device wire to a U-shaped curve.



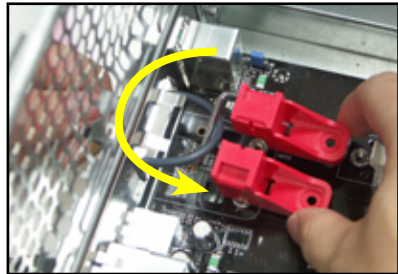
5. Insert the curved wire into the G-Guardian port on the rear panel.



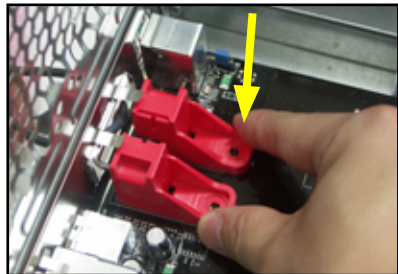
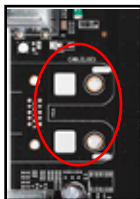
6. Inside the chassis, hook the curved wire with the back I/O lock module.



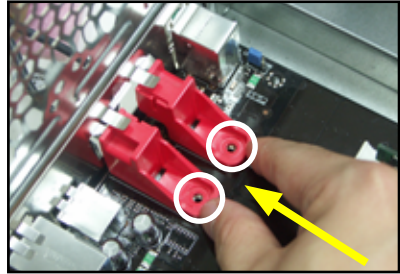
7. Rotate the back I/O lock module to prevent the hooked wire from coming off.



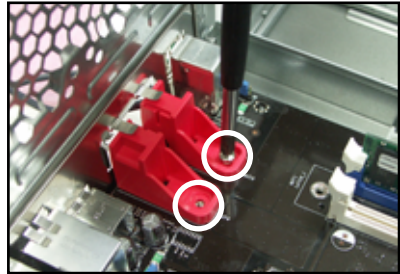
8. Follow the direction of the arrow to install the lock module to the position labelled **CABLE LOCK** on the motherboard.



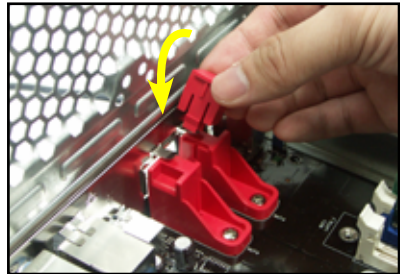
9. Follow the direction of the arrow to push the back I/O lock module forward the rear panel until you can see the two screw holes on the motherboard.



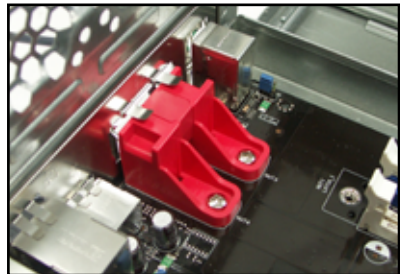
10. Secure the back I/O lock module with two (2) screws.



11. Install the cap back to the back I/O lock module.



12. The photo on the right shows the completion of the back I/O lock installation.



This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS setup **2**

2.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS EZ Flash 2** (Updates the BIOS using a floppy disk, USB Flash, or the motherboard support CD during POST.)
2. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
3. **ASUS CrashFree BIOS 3** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
4. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.



Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

2.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.


DOS environment

- a. Insert a 1.44MB floppy disk into the drive.
- b. At the DOS prompt, type **format A:/S** then press <Enter>.

Windows® XP environment

- a. Insert a 1.44 MB floppy disk to the floppy disk drive.
- b. Click **Start** from the Windows® desktop, then select **My Computer**.
- c. Select the 3 1/2 Floppy Drive icon.
- d. Click **File** from the menu, then select **Format**. A Format 3 1/2 Floppy Disk window appears.
- e. Windows® XP users: Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

Windows® Vista environment

- a. Insert a formatted, high density 1.44 MB floppy disk to the floppy disk drive.
 - b. Click  from the Windows® desktop, then select **Computer**.
 - c. Right-click **Floppy Disk Drive** then click **Format** to display the **Format 3 1/2 Floppy** dialog box .
 - d. Select the **Create an MS-DOS startup disk** check box.
 - e. Click **Start**.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

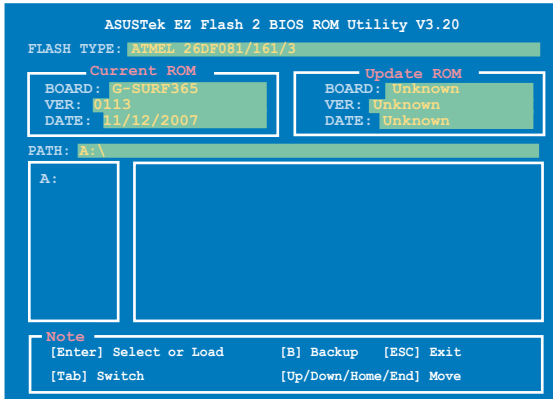
2.1.2 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash 2 utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self-Test (POST).

To update the BIOS using EZ Flash 2:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard.
2. Save the BIOS file to a floppy disk or a USB flash disk, then restart the system.
3. You can launch the EZ Flash 2 by two methods.
 - (1) Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or the USB port.

Press <Alt> + <F2> during POST to display the following.



- (2) Enter BIOS setup program. Go to the **Tools** menu to select **EZ Flash2** and press <Enter> to enable it.

You can switch between drives by pressing <Tab> before the correct file is found. Then press <Enter>.
4. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.



- This function can support devices such as USB flash disk, or floppy disk with **FAT 32/16** format only.
- Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

2.1.3 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:



- Make sure that the floppy disk is not write-protected and has at least 1024KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

```
afudos /o[filename]
```

where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

```
A:\>afudos /oOLDBIOS1.rom
```

Main filename Extension name

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
  Reading flash ..... done
  Write to file..... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.



Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (`afudos.exe`) from the motherboard support CD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:
`afudos /i[filename]`

where `[filename]` is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iG-SURF365.ROM
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iG-SURF365.ROM
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... 0x0008CC00 (9%)
```



Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iG-SURF365.ROM
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... done
Verifying flash .... done

Please restart your computer

A:\>
```

2.1.4 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.



- Prepare the motherboard support CD, or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk or the support CD to **G-SURF365.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "G-SURF365.ROM". Completed.
Start flashing...
```



DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "BURGUNDY.ROM". Completed.
Start flashing...
```

4. Restart the system after the utility completes the updating process.



The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

2.1.5 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.



ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the Utilities tab, then click **Install ASUS Update**. See page 3-4 for the **Utilities** screen menu.
3. The ASUS Update utility is copied to your system.

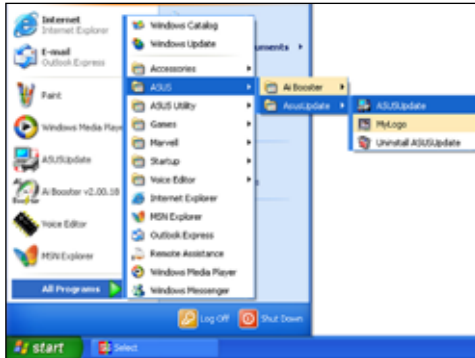


Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.



2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.



3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

- From the FTP site, select the BIOS version that you wish to download. Click **Next**.
- Follow the screen instructions to complete the update process.



The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.



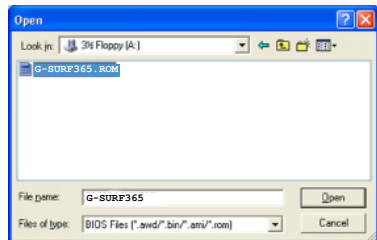
Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

- Launch the ASUS Update utility from the Windows® desktop by clicking Start > Programs > ASUS > ASUSUpdate > ASUSUpdate. The ASUS Update main window appears.
- Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.



- Locate the BIOS file from the **Open** window, then click **Open**.
- Follow the screen instructions to complete the update process.



2.2 BIOS setup program

This motherboard supports a programmable Low-Pin Count (LPC) chip that you can update using the provided utility described in section **2.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the LPC chip.

The LPC chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

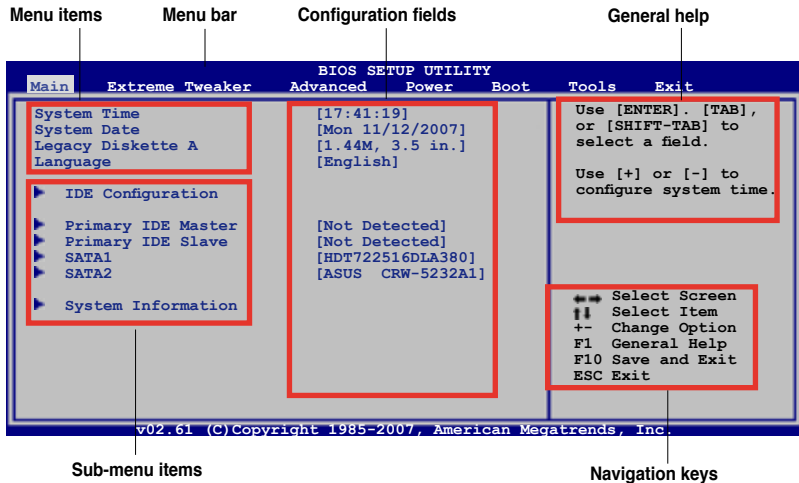
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.



-
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the Load Default Settings item under the Exit Menu. See section **2.9 Exit** menu.
 - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
 - Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.
-

2.2.1 BIOS menu screen



2.2.2 Menu bar

The menu bar on top of the screen has the following main items:

- | | |
|------------------------|--|
| Main | For changing the basic system configuration |
| Extreme Tweaker | For changing the overclocking settings |
| Advanced | For changing the advanced system settings |
| Power | For changing the advanced power management (APM) configuration |
| Boot | For changing the system boot configuration |
| Tools | For configuring options for special functions |
| Exit | For selecting the exit options and loading default settings |

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.



- The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (www.asus.com) to download the latest BIOS information.

2.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

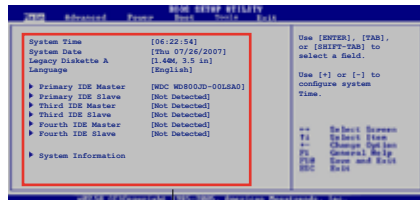


Some of the navigation keys differ from one screen to another.

2.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.



Main menu items

2.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press <Enter>.

2.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to 2.2.7 Pop-up window.

2.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

2.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.



Pop-up window

Scroll bar

2.2.9 General help

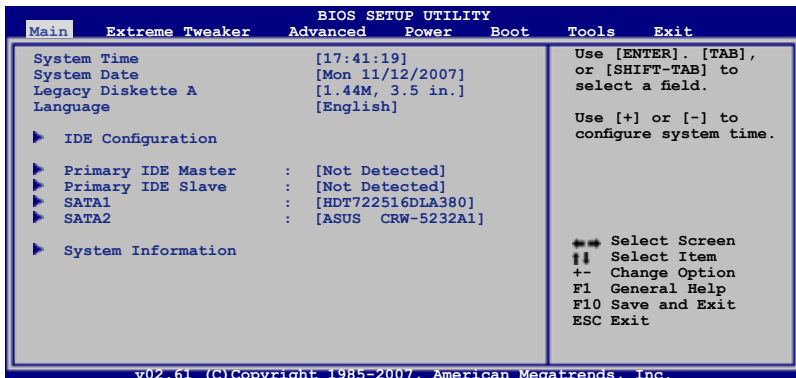
At the top right corner of the menu screen is a brief description of the selected item.

2.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.



Refer to section **2.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.



2.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

2.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

2.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed.

Configuration options: [Disabled] [720K , 3.5 in.] [1.44M, 3.5 in.]

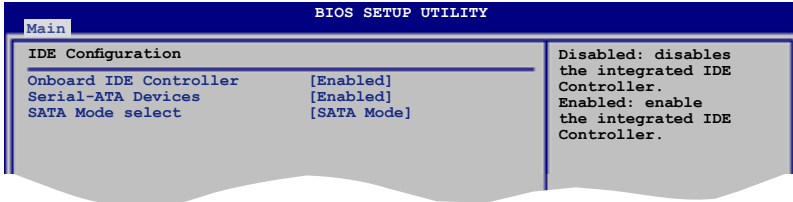
2.3.4. Language [Chinese(GB)]

Allows you to select the display language for the BIOS setup screen.

Configuration options: [Chinese(GB)] [English]

2.3.5 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



Onboard IDE Controller [Enabled]

Allows you to enable or disable the onboard IDE controller.
Configuration options: [Enabled] [Disabled]

Serial-ATA Devices [Enabled]

Allows you to disable or set the Serial-ATA devices.
Configuration options: [Enabled] [Disabled]

SATA Mode select [SATA Mode]

This item appears only when you set the **Serial-ATA Devices** item to [Enabled] and allows you to select the SATA Mode.
Configuration options: [SATA Mode] [RAID Mode] [AHCI Mode]



The following items appears only when the **SATA Mode select** item is set to [RAID Mode].

SATA Primary Master Channel [Disabled]

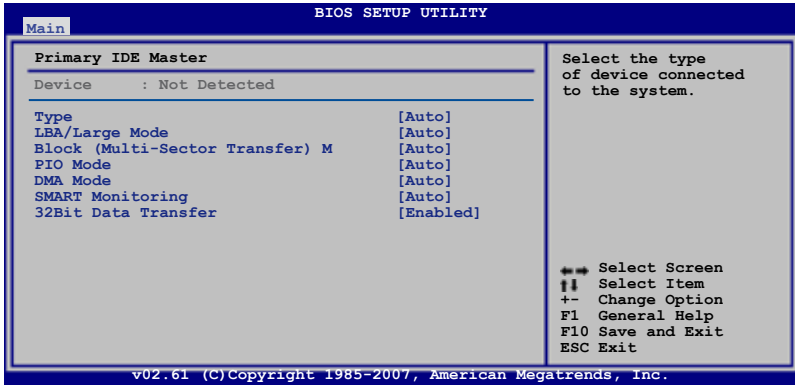
Allows you to disable or enable the Serial-ATA Primary Master Channel.
Configuration options: [Enabled] [Disabled]

SATA Secondary Master Channel [Disabled]

Allows you to disable or enable the Serial-ATA Secondary Master Channel.
Configuration options: [Enabled] [Disabled]

2.3.6 Primary IDE Master/Slave

While entering Setup, the BIOS automatically detects the presence of IDE devices. There is a separate sub-menu for each IDE device. Select a device item then press <Enter> to display the IDE device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode. Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5] [UDMA6]

SMART Monitoring [Auto]

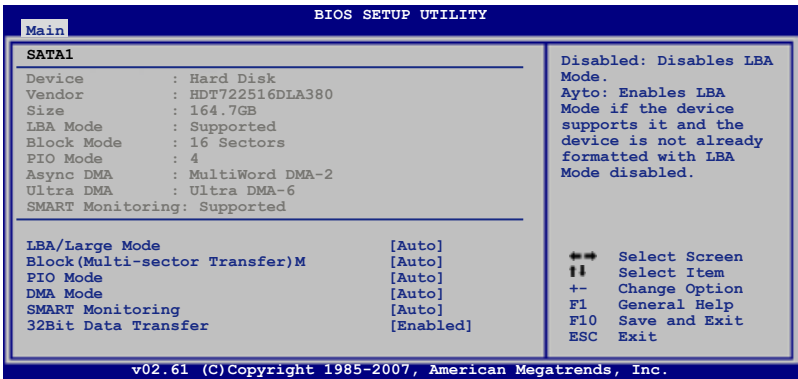
Sets the Smart Monitoring, Analysis, and Reporting Technology. Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer. Configuration options: [Disabled] [Enabled]

2.3.7 SATA1/2

While entering Setup, the BIOS automatically detects the presence of SATA devices. There is a separate sub-menu for each SATA device. Select a device item then press <Enter> to display the SATA device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode.

Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5] [UDMA6]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.

Configuration options: [Auto] [Disabled] [Enabled]

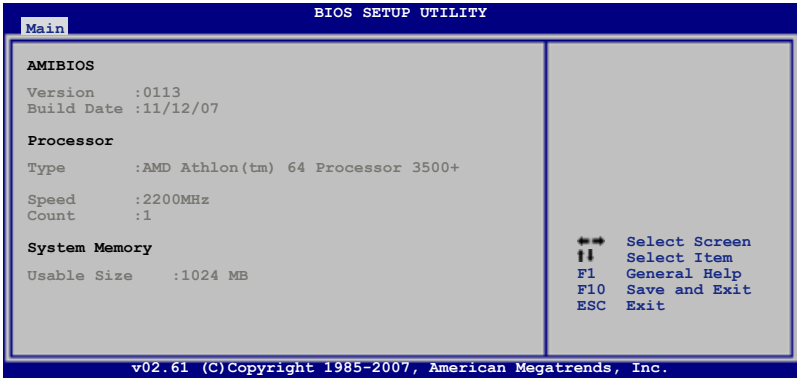
32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

2.3.8 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



AMI BIOS

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected system memory.

2.4 Extreme Tweaker menu

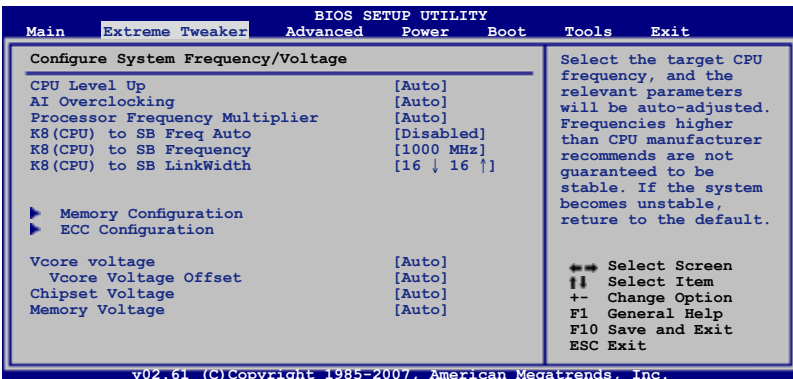
The Extreme Tweaker menu items allow you to configure overclocking-related items.



Take caution when changing the settings of the Extreme Tweaker menu items. Incorrect field values can cause the system to malfunction.



The configuration options for this chapter vary depending on the CPU and DIMM model you install on the motherboard.



2.4.1 CPU Level Up [Auto]

Allows you to select a CPU level and the related parameters will be automatically adjusted according to the selected CPU level.

Configuration options: [Auto] [Athlon64 3800+] [Athlon64 4000+] [Athlon X2 BE2350] [Athlon64X2 4200+] [Athlon64X2 4400+]



The configuration options may vary depending on your CPU type.

2.4.2 Ai Overclocking [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options:

Auto	Allows you to set overclocking parameters automatically.
Manual	Allows you to individually set overclocking parameters.
Standard	Loads the standard settings for the system.
Overclock Profile	Loads overclocking profiles with optimal parameters for stability when overclocking.
CPU Level Up	Allows you to select a CPU level, and the related parameters will be adjusted automatically.



The following items appear only when you set the **Ai Overclocking** item to [Manual].

OC From CPU Level Up [Auto]

After you select a CPU level, the **CPU Frequency(MHz)**, **Vcore Voltage Offset**, and **Memory Voltage** items will be adjusted accordingly.

Configuration options: [Auto] [Athlon64 3800+] [Athlon64 4000+]

CPU Frequency(MHz) [220.0]

Allows you to select the target CPU frequency. Use the <+> and <-> keys to adjust the PCIE frequency. Frequencies higher than CPU manufacturer recommends are not guaranteed to be stable. If the system becomes unstable, return to the default setting.

Configuration options: [200.0] [201.0] ~ [299.0] [300.0]

PCI-Express Frequency(MHz) [100]

Allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the PCIE frequency. The values range from 100 to 150.



The following item appears only when you set the **Ai Overclocking** item to [Overclock Profile].

Overclock Options [Auto]

Allows you to select from existing overclocking profiles for overall system overclocking.

Configuration options: [Auto] [Overclock 3%] [Overclock 5%] [Overclock 7%]

2.4.3 Processor Frequency Multiplier [Auto]

Allows configuration of the processor frequency. Depending on the CPU model you install, this item may not be configurable.

Configuration options: [Auto] [x5.0 1000 MHz] [x5.5 1100MHz] [x6.0 1200 MHz] [x6.5 1300 MHz] [x7.0 1400 MHz] [x7.5 1500 MHz] [x8.0 1600 MHz] [x8.5 1700 MHz] [x9.0 1800 MHz] [x9.5 1900 MHz] [x10.0 2000 MHz] [x10.5 2100 MHz] [x11.0 2200 MHz]

2.4.4 K8(CPU) to SB Freq Auto [Disabled]

Enables or disables the CPU to automatically adjust Hyper Transport frequency. When enabled, the system will automatically adjust the frequency according to CPU capability.

Configuration options: [Enabled] [Disabled]

2.4.5 K8(CPU) to SB Frequency [1000 MHz]

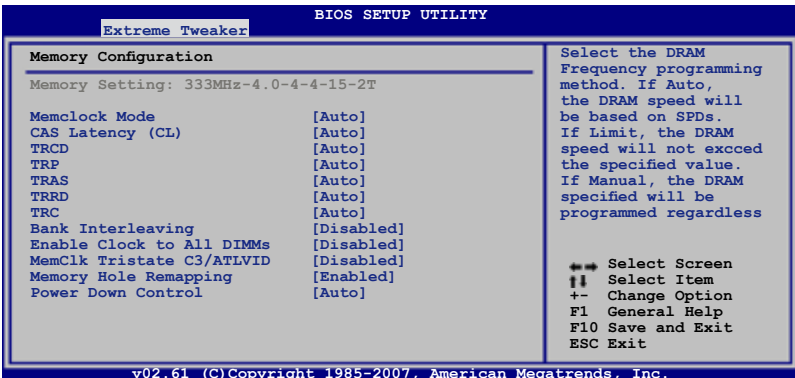
This item appears only when you set the **K8(CPU) to SB Freq Auto** item to [Disabled] and allows you to manually set the Hyper Transport frequency. Configuration options: [200 MHz] [400 MHz] [800 MHz] [1000 MHz]

2.4.6 K8(CPU) to SB LinkWidth [16 ↓ 16 ↑]

Allows you to set the Hyper Transport width. Configuration options: [4 ↓ 4 ↑] [8 ↓ 8 ↑] [16 ↓ 16 ↑]

2.4.7 Memory Configuration

The Memory Configuration menu allows you to change the advanced memory settings.



Memclock Mode [Auto]

Sets the DRAM Frequency programming method. Configuration options: [Auto] [Limit] [Manual]

Memclock Value [400 MHz]

This sub-item appears only when you set the **Memclock Mode** item to [Limit] or [Manual]. Sets the memory clock mode limit. Configuration options: [400 MHz] [533 MHz] [667 MHz] [800 MHz]

CAS Latency (CL) [Auto]

Sets the CAS Latency (CL) mode. Configuration options: [Auto] [3.0] [4.0] [5.0] [6.0]

TRCD [Auto]

Sets the TRCD mode. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

TRP [Auto]

Sets the TRP mode.

Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

TRAS [Auto]

Sets the TRAS mode.

Configuration options: [Auto] [5 CLK] [6 CLK] ~ [17 CLK] [18 CLK]

TRRD [Auto]

Sets the TRRD mode.

Configuration options: [Auto] [2T] [3T] [4T] [5T]

TRC [Auto]

Sets the TRC mode.

Configuration options: [Auto] [11T] [12T] ~ [25T] [26T]

Bank Interleaving [Disabled]

Allows you to set the bank memory interleaving mode.

Configuration options: [Disabled] [Auto]

Enable Clock to All DIMMs [Disabled]

Enable or disable the unused clocks to DIMMs even memory slots are not populated.

Configuration options: [Disabled] [Enabled]

MemClk Tristate C3/ALTVID [Disabled]

Enable or disable the MemCLK Tri-Stating during C3 and Alt VID.

Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]

Enables or disables the memory remapping around memory hole.

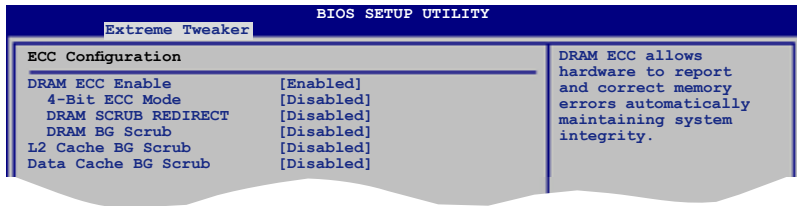
Configuration options: [Disabled] [Enabled]

Power Down Control [Auto]

Allows DIMMs to enter power down mode by deasserting the clock enable signal when DIMMs are not in use.

Configuration options: [Auto] [Disabled]

2.4.8 ECC Configuration



DRAM ECC Enable [Enabled]

Enables or disables the DRAM ECC that allows the hardware to report and correct memory errors automatically.

Configuration options: [Disabled] [Enabled]

4-Bit ECC Mode [Disabled]

Enables or disables the ECC chip kill feature.

Configuration options: [Disabled] [Enabled]

DRAM SCRUB REDIRECT [Disabled]

Enables or disables the DRAM SCRUB REDIRECT feature that allows the system to correct the DRAM ECC errors immediately when they occur.

Configuration options: [Disabled] [Enabled]

DRAM BG SCRUB [Disabled]

Disables or sets the DRAM BG Scrub.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

L2 Cache BG Scrub [Disabled]

Disables or sets the L2 Cache BG Scrub. This item allows the cache RAM to be corrected when idle.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

Data Cache BG Scrub [Disabled]

Disables or sets the Data Cache BG Scrub. This item allows the data cache BG Scrub RAM to be corrected when idle.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

2.4.9 Vcore Voltage [Auto]

Allows you to select the Processor vcore voltage or set it to auto for safe mode. The configuration options may vary depending on your CPU type.

Configuration options: [Auto] [1.125V] [1.150V] [1.175V] [1.200V] [1.225V] [1.250V] [1.275V] [1.300V] [1.325V] [1.350V]

2.4.10 Vcore Voltage Offset [Auto]

Allows you to set the vcore voltage offset or set it to auto for safe mode.

Configuration options: [Auto] [+50mV] [+100mV] [+150mV]

2.4.11 Chipset Voltage

Allows you to select the Chipset Voltage or set it to auto for safe mode. Setting a value higher than 1.450V will boost the **Memory Voltage** item accordingly when necessary.

Configuration options: [Auto] [1.250V] [1.300V] [1.350V] [1.400V] [1.450V] [1.500V] [1.550V]

2.4.12 Memory Voltage

Allows you to select the Memory Voltage or set it to auto for safe mode.

Configuration options: [Auto] [1.812V] [1.863V] [1.913V] [1.964V] [2.006V] [2.015V] [2.116V] [2.168V] [2.209V] [2.260V] [2.310V] [2.361V] [2.412V] [2.463V] [2.513V] [2.564V]

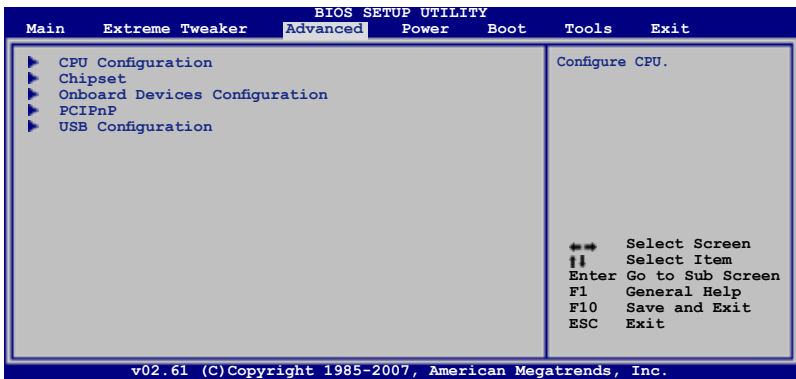


- Setting the **Vcore Voltage**, **Vcore Voltage Offset**, **Chipset Voltage** and **Memory Voltage** items to a high level may damage the chipset, memory module and CPU permanently. Proceed with caution.
- Some values of the **Vcore Voltage Offset**, **Chipset Voltage** and **Memory Voltage** items are labeled in different color, indicating the risk levels of high voltage settings. Refer to the table below for details.
- The system may need better cooling system to work stably under high voltage settings.

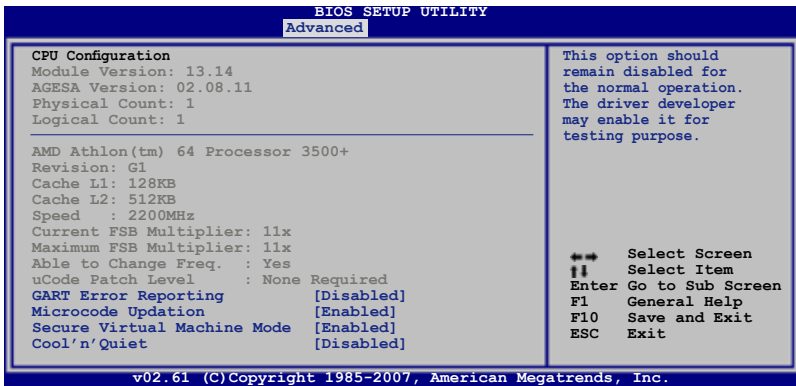
	Green	Pink	Red
Vcore Voltage Offset	+50mV	+100mV	+150mV
Chipset Voltage	1.250V ~ 1.350V	1.400V ~ 1.500V	1.550V
Memory Voltage	1.812V ~ 2.006V	2.015V ~ 2.260V	2.310V ~ 2.564V

2.5 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.



2.5.1 CPU Configuration



GART Error Reporting [Disabled]

This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose.

Configuration options: [Disabled] [Enabled]

Microcode Updation [Enabled]

Allows you to enable or disable the microcode updation.

Configuration options: [Disabled] [Enabled]

Secure Virtual Machine [Enabled]

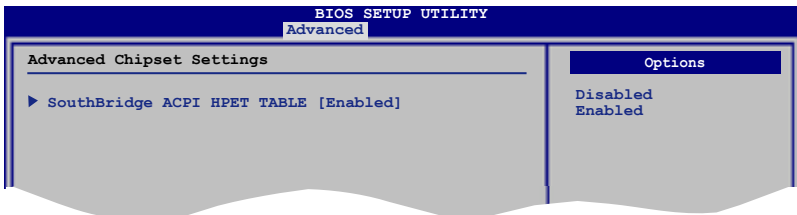
Allows you to enable or disable the AMD Secure Virtual Machine.
Configuration options: [Disabled] [Enabled]

Cool'n'Quiet [Disabled]

Enables or disables the AMD Cool'n'Quiet function.
Configuration options: [Disabled] [Enabled]

2.5.2 Chipset

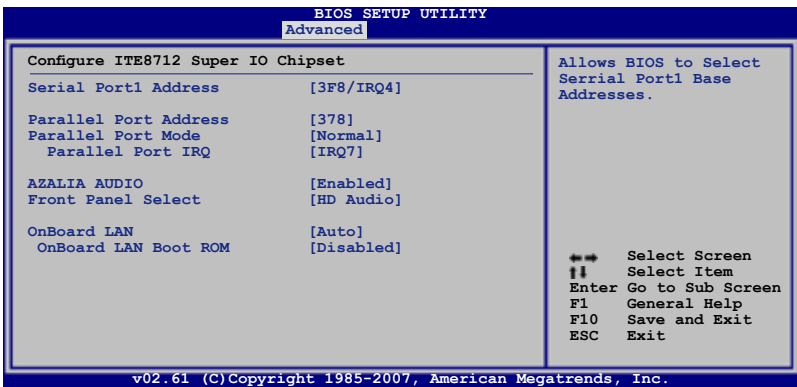
The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



SouthBridge ACPI HPET TABLE [Enabled]

Allows you to enable or disable the SouthBridge Advanced Configuration and Power Interface (ACPI) High Precision Event Timer (HPET) TABLE.
Configuration options: [Enabled] [Disabled]

2.5.3 Onboard Devices Configuration



Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

Configuration options: [Disabled] [3F8/IRQ4][2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.

Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode.

Configuration options: [Normal] [EPP] [ECP] [EPP+ECP]

EPP Version [1.9]

Appears only when the Parallel Port Mode is set to [EPP] or [EPP+ECP]. This item allows the BIOS to set the Parallel Port EPP version.

Configuration options: [1.9] [1.7]

ECP Mode DMA Channel [DMA3]

Appears only when the Parallel Port Mode is set to [ECP] or [EPP+ECP]. This item allows the BIOS to set the Parallel Port ECP DMA.

Configuration options: [DMA0] [DMA1] [DMA3]

Parallel Port IRQ [IRQ7]

Configuration options: [IRQ5] [IRQ7]

AZALIA AUDIO [Enabled]

Allows you to set or disable the onborad Realtek® ALC662 audio codec.

Configuration options: [Disabled] [Enabled]

Front Panel Select [HD Audio]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.

Configuration options: [AC97] [HD Audio]

OnBoard LAN [Auto]

Allows you to set or disable the OnBoard LAN.

Configuration options: [Auto] [Disabled]

OnBoard LAN Boot ROM [Disabled]

Allows you to enable or disable the OnBoard LAN Boot ROM.

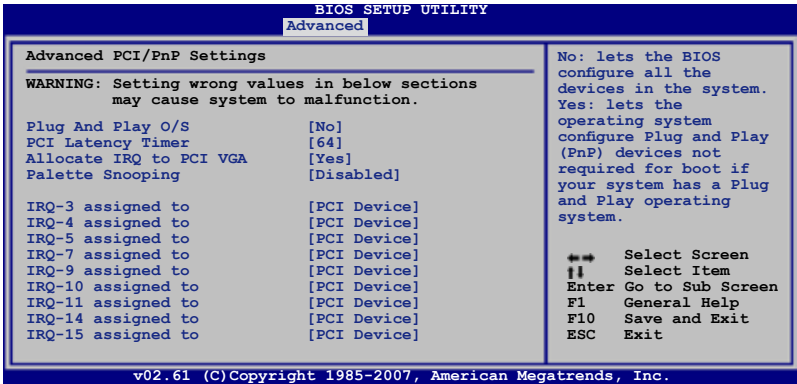
Configuration options: [Enabled] [Disabled]

2.5.4 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.



Take caution when changing the settings of the **PCI PnP** menu items. Incorrect field values can cause the system to malfunction.



Plug and Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register.

Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested.

Configuration options: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly.

Configuration options: [Disabled] [Enabled]

IRQ-xx assigned to [PCI Device]

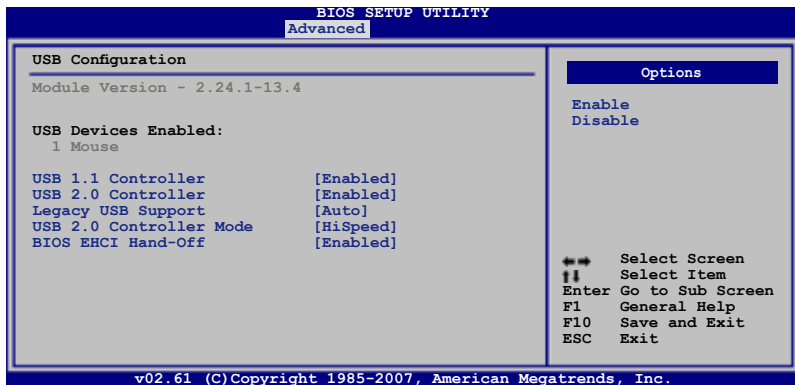
When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices.

When set to [Reserved], the IRQ is reserved for legacy ISA devices.

Configuration options: [PCI Device] [Reserved]

2.5.5 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the item shows None.

USB 1.1 Controller [Enabled]

Enables or disables the USB 1.1 Controller.

Configuration options: [Disabled] [Enabled]

USB 2.0 Controller [Enabled]

Enables or disables the USB 2.0 Controller.

Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for USB devices on legacy operating systems (OS). Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps).

Configuration options: [Full Speed] [HiSpeed]

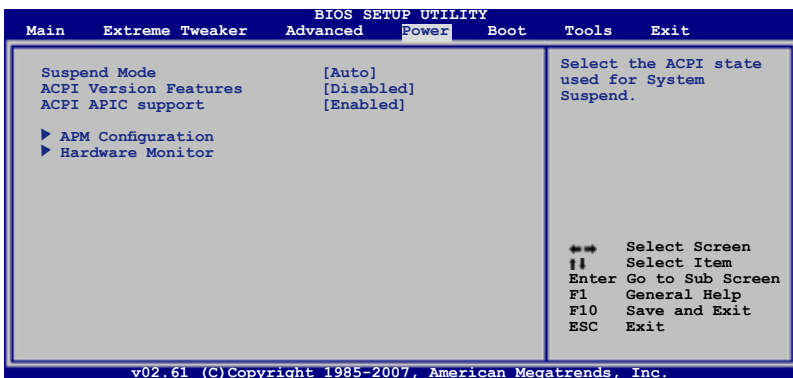
BIOS EHCI Hand-Off [Enabled]

Allows you to configure the BIOS EHCI Hand-Off.

Configuration options: [Disabled] [Enabled]

2.6 Power menu

The Power menu items allow you to change the settings for the Advanced Configuration and Power Interface (ACPI) and the Advanced Power Management (APM). Select an item then press <Enter> to display the configuration options.



2.6.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.

Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

2.6.2 ACPI Version Features [Disabled]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) features.

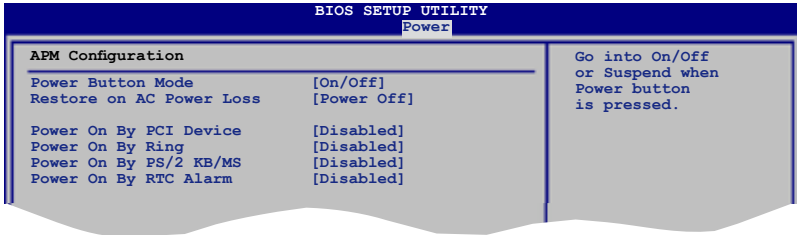
Configuration options: [Disabled] [Enabled]

2.6.3 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list.

Configuration options: [Disabled] [Enabled]

2.6.4 APM Configuration



Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed.

Configuration options: [On/Off] [Suspend]

Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss.

Configuration options: [Power Off] [Power On]

Power On By PCI Devices [Disabled]

When set to [Enabled], this parameter allows you to turn on the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Configuration options: [Disabled] [Enabled]

Power On By Ring [Disabled]

Enable or disable RI to generate a wake event.

Configuration options: [Disabled] [Enabled]

Power On By PS/2 KB/MS [Disabled]

Enable or disable PS/2 Keyboard/Mouse to generate a wake event.

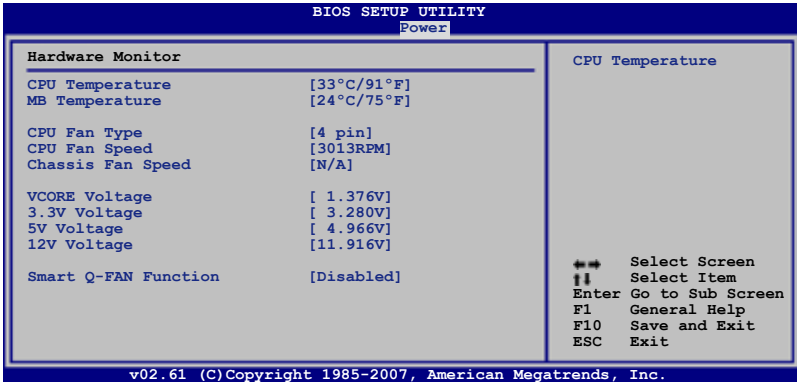
Configuration options: [Disabled] [Enabled]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the sub-items **RTC Alarm Date** and **System Time** appear with set values.

Configuration options: [Disabled] [Enabled]

2.6.5 Hardware Monitor



CPU Temperature [xxx°C/xxx°F]

MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select Ignored if you do not wish to display the detected temperatures.

CPU Fan Type [4 pin]

Allows you to select the CPU fan type you installed on the motherboard.

Configuration options: [4 pin] [3 pin]



- If you use a 4-pin fan but set this item to a 3-pin fan, the fan you installed may not work.
- If you use a 3-pin fan but set this item to a 4-pin fan, the fan control will not work and the fan you installed will always run at full speed.

CPU Fan Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select Ignored if you do not wish to display the detected speed.

Chassis Fan Speed [xxxxRPM] or [N/A] or [Ignored]

The onboard hardware monitor automatically detects and displays the chassis fan speed in rotations per minute (RPM). If the fan is not connected to the chassis, the specific field shows N/A. Select Ignored if you do not wish to display the detected speed.

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select [Ignored] if you do not want to detect this item.

Smart Q-Fan Function [Disabled]

Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation.

Configuration options: [Disabled] [Enabled]



The following items appear only if you set the **Smart Q-Fan Function** to [Enabled].

Fan Auto Mode Start Voltage [5.0V]

Sets the voltage at which the Q-Fan function starts.

Configuration options: [4.0V] [4.5V] [5.0V] [5.5V] [6.0V]

Fan Auto Mode Start Speed Temp [25°C]

Sets the temperature at which the Q-Fan function starts.

Configuration options: [25°C] [26°C] ~ [47°C] [48°C]

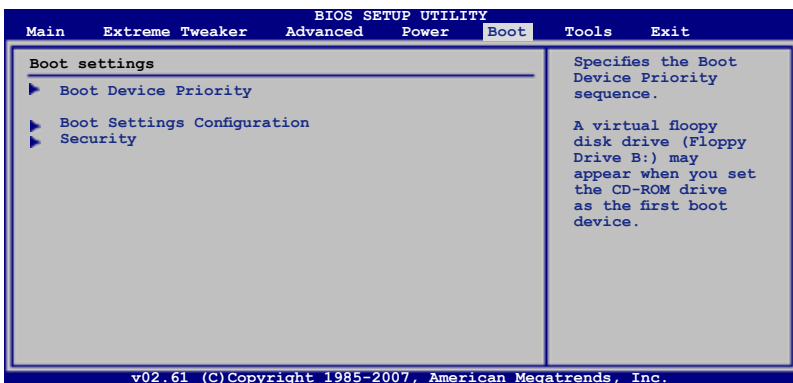
Fan Auto Mode Full Speed Temp [70°C]

Sets the temperature at which the Q-Fan rotates in full speed.

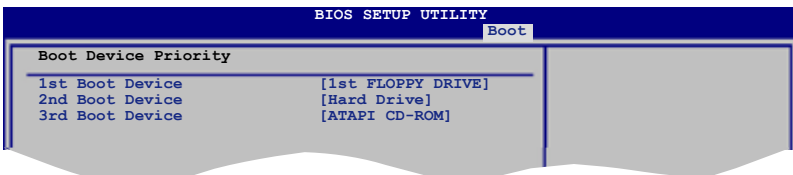
Configuration options: [67°C] [68°C] ~ [74°C] [75°C]

2.7 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



2.7.1 Boot Device Priority

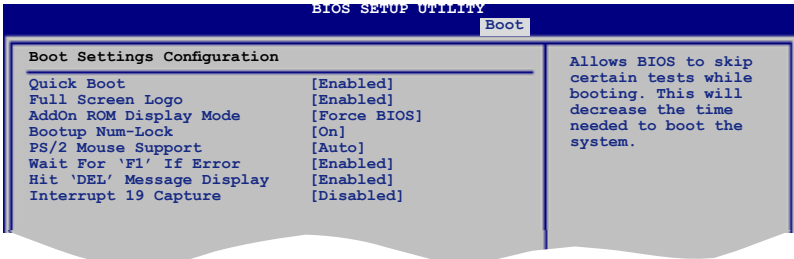


1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Configuration options: [xxth Drive] [Hard Drive] [ATAPI CD-ROM] [Disabled]

2.7.2 Boot Settings Configuration



Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]



Set this item to [Enabled] to use the ASUS MyLogo 3™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

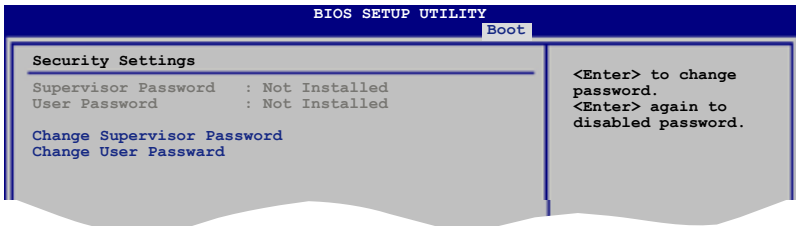
Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.

Configuration options: [Disabled] [Enabled]

2.7.3 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a Supervisor Password:

1. Select the Change Supervisor Password item and press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

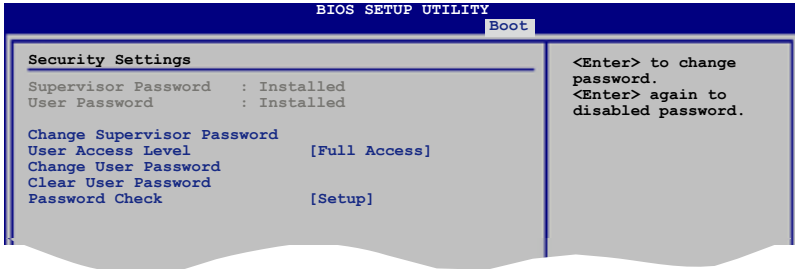
To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then press <Enter>. The message "Password Uninstalled" appears.



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section 1.9 **Jumpers** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.
Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.

Clear User Password

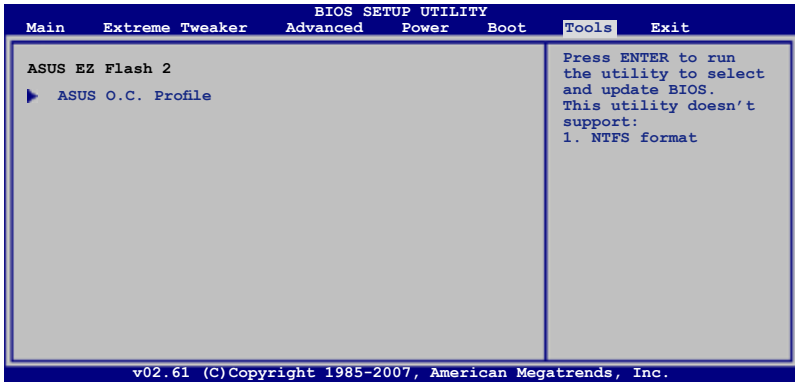
Select this item to clear the user password.

Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.

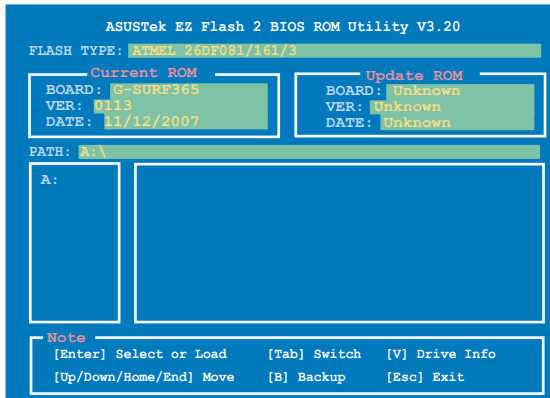
Configuration options: [Setup] [Always]

2.8 Tools menu



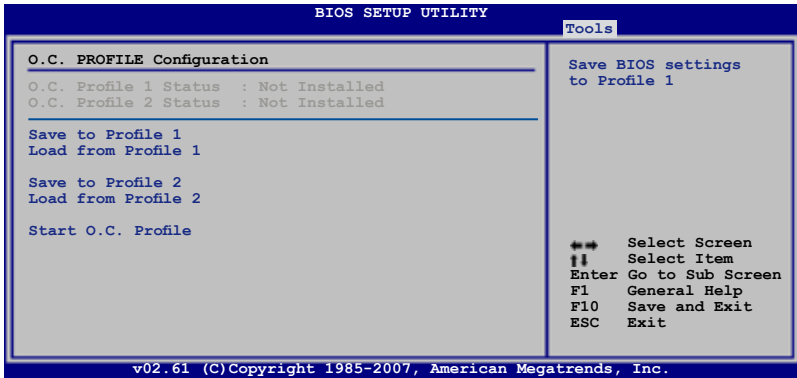
2.8.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Ok>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Ok> to confirm your choice.



2.8.2 ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.



Save to Profile 1/2

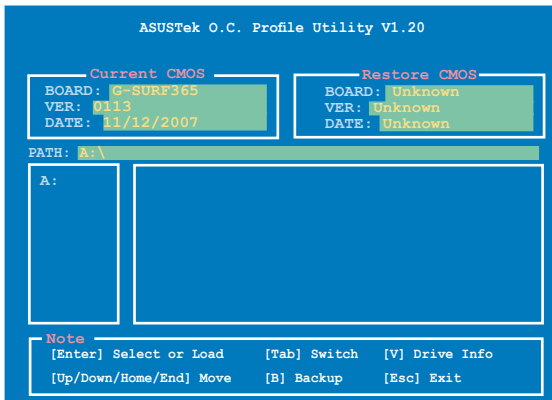
Allows you to save the current BIOS file to the BIOS Flash. Press <Enter> to save the file.

Load from Profile 1/2

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter> to load the file.

Start O.C. Profile

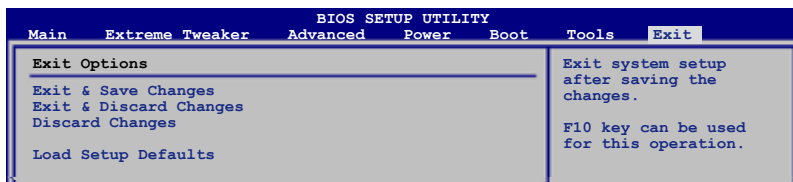
Allows you to run the utility to save and load CMOS. Press <Enter> to run the utility.



- This function can support devices such as a USB flash disk or a floppy disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!

2.9 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **OK** to save changes and exit.



If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **OK** to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **OK** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

This chapter describes the contents of the support CD that comes with the motherboard package.

3 Software support

3.1 Installing an operating system

This motherboard supports Windows® XP / Vista operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.



- Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
- Make sure that you install the Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

3.2 Support CD information

The support CD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.



The contents of the support CD are subject to change at any time without notice. Visit the ASUS website(www.asus.com) for updates.

3.2.1 Running the support CD

Place the support CD to the optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.



Click an icon to display support CD/motherboard information

Click an item to install



If Autorun is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the CD.

3.2.2 Drivers menu

The drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.



ASUS InstAll - Drivers Installation Wizard

Launches the ASUS InstallAll driver installation wizard.

AMD Cool 'n' Quiet Driver

Installs the AMD Cool 'n' Quiet driver.

Nvidia Chipset Driver Program

Installs the Nvidia chipset program driver.

Realtek Audio Driver

Installs the Realtek® ALC662 audio driver and application.

USB 2.0 Driver

Installs the USB 2.0 driver.



The screen display and drivers option may not be the same for different operating system versions.

3.2.3 Utilities menu

The Utilities menu shows the applications and other software that the motherboard supports.



ASUS InstAll - Installation Wizard for Utilities

Launches the ASUS InstallAll utilities installation wizard.

ASUS Cool 'n' Quiet Utility

This item installs the ASUS Cool 'n' Quiet utility.

ASUS Update

The ASUS Update utility allows you to update the motherboard BIOS in a Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

ASUS PC Probe II

This smart utility monitors the fan speed, CPU temperature, and system voltages, and alerts you of any detected problems. This utility helps you keep your computer in healthy operating condition.

3.2.4 Make Disk menu

The Make Disk menu allows you to make a RAID driver disk.



NVIDIA 32/64bit AHCI Driver

Allows you to create an NVIDIA AHCI driver disk for 32/64bit Windows® operating system.

NVIDIA 32/64bit SATA/RAID Driver

Allows you to create an NVIDIA Serial ATA/RAID driver disk for 32/64bit Windows® operating system.

NVIDIA Vista32/64 SATA/RAID Driver

Allows you to create an NVIDIA Serial ATA/RAID driver disk for 32/64bit Windows® Vista operating system.

3.2.5 Manual menu

The Manual menu contains a list of supplementary user manuals. Click an item to open the folder of the user manual.

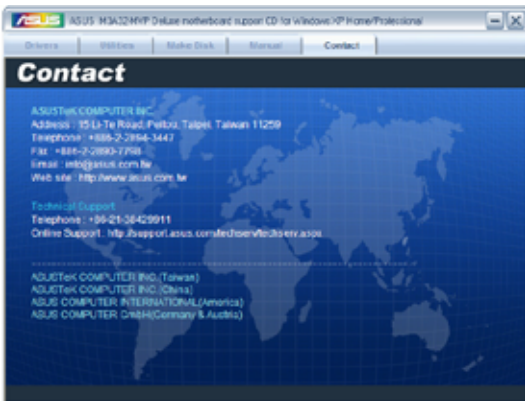


Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening a user manual file.



3.2.6 ASUS Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.



3.2.7 Other information

The icons on the top right corner of the screen give additional information on the motherboard and the contents of the support CD. Click an icon to display the specified information.

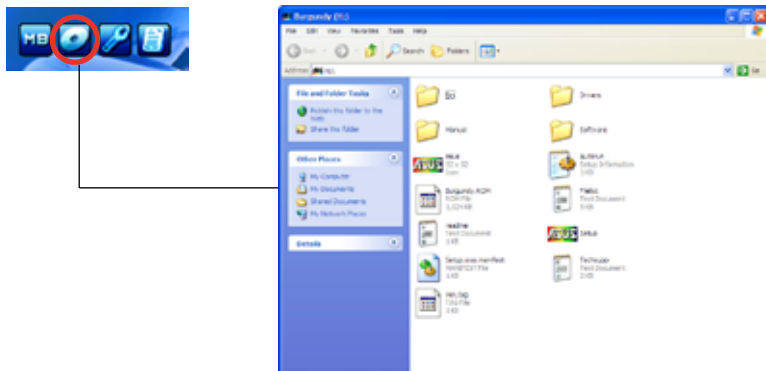
Motherboard Info

Displays the general specifications of the motherboard.



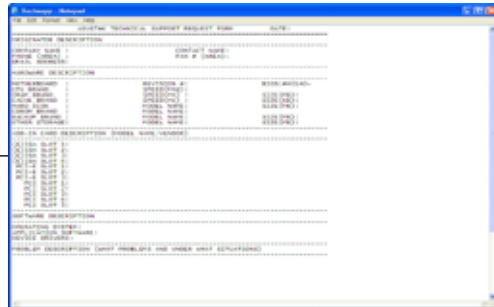
Browse this CD

Displays the support CD contents in graphical format.



Technical support Form

Displays the ASUS Technical Support Request Form that you have to fill out when requesting technical support.



Filelist

Displays the contents of the support CD and a brief description of each in text format.

