

**Maximus II  
GENE**

**ASUS®**

**Motherboard**

E4644

First Edition

April 2009

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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.



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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.

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## 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.

## REACH

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS website at <http://green.asus.com/english/REACH.htm>.

# 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.
- Ensure 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, ensure 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.



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**DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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**DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

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# About this guide

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

## How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**  
This chapter describes the features of the motherboard and the new technology it supports.
- **Chapter 2: Hardware information**  
This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.
- **Chapter 3: 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 4: Software support**  
This chapter describes the contents of the support DVD that comes with the motherboard package and the software.
- **Chapter 5: Multiple GPU technology support**  
This chapter describes how to install and configure multiple ATI® CrossFireX™ graphics cards.
- **Appendix: Debug code table**  
The Appendix lists the debug code table for the LCD Poster.

## 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 ensure 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:

```
a.fudos /iMAIIGEN.ROM
```

## Maximus II GENE specifications summary

<b>CPU</b>	LGA775 socket for Intel® Core™2 Extreme / Core™2 Quad / Core™2 Duo / Pentium® dual-core/ Celeron® dual-core/Celeron® Processors - Support Intel® next generation 45nm Multi-Core CPU * Refer to <a href="http://www.asus.com">www.asus.com</a> for Intel CPU support list
<b>Chipset</b>	Intel® P45 / ICH10R
<b>System Bus</b>	1600/1333/1066/800 MHz
<b>Memory</b>	Dual channel memory architecture 4 x DIMM, max. 16GB, DDR2 1300/1200/1066/800/667 MHz, non-ECC, un-buffered memory modules *Refer to <a href="http://www.asus.com">www.asus.com</a> or this user manual for the Memory QVL(Qualified Vendors Lists).
<b>Expansion Slots</b>	2 x PCIe2.0 x16 slots (single max @16,dual @ x8 speed) 1 x PCIe x1 slot 1 x PCI 2.2 slot
<b>Multi-GPU Technology</b>	Support ATI CrossFireX™ Technology
<b>Storage</b>	<b>ICH10R Southbridge:</b> <ul style="list-style-type: none"> <li>- 6 x SATA 3.0 Gb/s ports</li> <li>- Intel Matrix Storage Technology supports RAID 0, 1, 5 and 10</li> </ul> <b>JMicron® 363 controller:</b> <ul style="list-style-type: none"> <li>- 1 x UltraDMA 133/100/66/33 for up to 2 PATA devices</li> <li>- 1 x SATA 3.0 Gb/s port</li> <li>- 1 x External SATA 3.0 Gb/s port (SATA On-the-Go)</li> </ul>
<b>LAN</b>	Gigabit LAN
<b>High Definition Audio</b>	SupremeFX X-Fi 8-channel High Definition Audio CODEC <ul style="list-style-type: none"> <li>- EAX® Advanced™ HD 4.0</li> <li>- X-Fi CMSS®-3D</li> <li>- X-Fi Crystalizer™</li> <li>- Creative ALchemy</li> <li>- Supports Optical S/PDIF out ports on rear</li> </ul>
<b>IEEE 1394</b>	2 x 1394a ports (1 port at back I/O, 1 port onboard)

*(continued on the next page)*

# Maximus II GENE specifications summary

<b>USB</b>	max. 12 USB 2.0 ports (6 ports onboard, 6 ports at back I/O)
<b>ROG Exclusive Overclocking Features</b>	<p><b>Keyboard-TweakIt</b></p> <p><b>Power Design</b></p> <ul style="list-style-type: none"> <li>- 8-phase CPU power</li> <li>- 2-phase DRAM power</li> <li>- 2-phase NB power</li> </ul> <p><b>CPU Level Up</b></p> <p><b>iROG</b></p> <p><b>Extreme Tweaker</b></p> <p><b>Loadline Calibration</b></p> <p><b>Intelligent overclocking tools:</b></p> <ul style="list-style-type: none"> <li>- Turbo V</li> <li>- O.C Profile</li> </ul> <p><b>Overclocking Protection:</b></p> <ul style="list-style-type: none"> <li>- COP EX (Component Overheat Protection - EX)</li> <li>- Voltminder LED</li> <li>- ASUS C.P.R. (CPU Parameter Recall)</li> </ul>
<b>Other Special Features</b>	<p>External LCD Poster</p> <p>MemOK!</p> <p>One DIMM latch</p> <p>Onboard Switches: Power / Reset / MemOK/ Clr CMOS (at rear)</p> <p>Q-Fan Plus</p> <p>ASUS EPU-6 Engine</p> <p>ASUS Q-Connector</p> <p>ASUS Fan Xpert</p> <p>ASUS EZ Flash 2</p> <p>ASUS CrashFree BIOS 3</p> <p>ASUS MyLogo3</p>
<b>BIOS Features</b>	16Mb AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.4, ACPI2.0a Multi-Language BIOS
<b>Manageability</b>	WOL by PME, WOR by PME, PXE
<b>Back Panel I/O Ports</b>	<p>1 x PS/2 Keyboard port (purple)</p> <p>1 x External SATA port</p> <p>1 x LAN (RJ45) port</p> <p>6 x USB 2.0/1.1 ports</p> <p>1 x IEEE1394a port</p> <p>1 x Clr CMOS switch</p>

(continued on the next page)

## Maximus II GENE specifications summary

<b>Internal I/O Connectors</b>	3 x USB 2.0 connectors supports additional 6 USB 2.0 ports 1 x IDE connector for two devices 7 x SATA connectors (6 in Blue, 1 in Black) 5 x Fan connectors: 1 x CPU / 2 x Chassis / 2 x Optional 2 x thermal sensor connectors 1 x IEEE1394a connector 1 x LCD Poster connector 1 x SPDIF_OUT connector 24-pin ATX Power connector 8-pin ATX 12V Power connector 1 x En/Dis-able Cir CMOS header 1 x Front panel audio connector 1 x CD audio in System panel connector
<b>Software</b>	Support DVD: - Drivers and applications Sound Blaster X-Fi Utility Futuremark® 3DMark® 06 Advanced Edition Kaspersky® Anti-Virus ASUS TurboV utility ASUS PC Probe II ASUS Update ASUS AI Suite
<b>Form Factor</b>	microATX, 9.6"x 9.6" (24.4cm x 24.4cm)

\*Specifications are subject to change without notice.

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

# 1 Product introduction

# Chapter summary



- 1.1 Welcome! ..... 1-1
- 1.2 Package contents..... 1-1
- 1.3 Special features..... 1-2

## 1.1 Welcome!

Thank you for buying an ROG Maximus II GENE 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	ROG Maximus II GENE
Cables	1 x <b>Ultra DMA 133/100/66 cable</b> 2 x Serial ATA signal cables
Accessories	1 x <b>External LCD Poster</b> 1 x 2-in-1 ASUS Q-Connector Kit 1 x I/O Shield 1 x Cable ties 1 x ROG theme label
Application DVD	ROG motherboard support DVD
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.

### Green ASUS



This 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/packaging to safeguard consumers' health while minimizing the impact on the environment.

### Intel® Core™2 Extreme / Core™ 2 Quad / Core™2 Duo Processor Support



This motherboard supports the latest Intel® Core™ 2 Extreme / Core™ 2 Quad / Core™ 2 Duo processors in the LGA775 package. It is excellent for multi-tasking, multi-media and enthusiastic gamers with 1600 / 1333 / 1066 / 800 MHz FSB. The Intel® Core™ 2 series processor is one of the most powerful CPUs in the world. This motherboard also supports Intel® CPUs in the new 45nm manufacturing process. See page 2-9 for details.

### Intel® P45 Chipset



The Intel® P45 Express Chipset is the latest chipset designed to support dual-channel DDR2 1066/800/667 architecture, 1600/1333/1066/800/FSB (Front Side Bus), PCIe 2.0, and multi-core CPUs. It especially includes Intel® Fast Memory Access technology that significantly optimizes the use of available memory bandwidth and reduces the latency of the memory accesses.

### Dual-Channel DDR2 1300 support



The motherboard supports DDR2 memory that features data transfer rates of 1300 / 1200 / 1066 / 800 / 667 MHz to meet the higher bandwidth requirements of the latest operation system, 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 20.8 GB/s.

## ATI CrossFireX Technology



ATI's CrossFireX boosts image quality along with rendering speed, eliminating the need to scale down screen resolutions to get the high image quality you want. CrossFire ignites with the higher antialiasing, anisotropic filtering, shading, and texture settings you desire. Adjust your display configurations, experiment with your advanced 3D settings, and check the effect with a real-time 3D-rendered preview within ATI's Catalyst™ Control Center to rule your CrossFireX system.



## PCIe 2.0

### Double Speed; Double Bandwidth

This motherboard supports the latest PCIe 2.0 device for double speed and bandwidth which enhances system performance. See page 2-27 for details.

## 1.3.2 ROG Intelligent Performance & Overclocking features

### iROG



#### Intelligent multiple control at hand

iROG is a special IC which enables several ROG highlighted functions that give you full disposal of the motherboard at any stage! This design allows advanced user control and management to be processed at a hardware level. iROG greatly increases fun during overclocking for PC enthusiasts and it provides system maintenance and management with more control and efficiency.

### CPU Level Up



#### A simple click for instant upgrade!

Ever wish that you could have a more expansive CPU? Upgrade your CPU at no additional cost with ROG's CPU Level Up! Simply pick the 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 3-10 and 4-25 for details.

### MemOK!



#### Any memory is A-OK!

Memory compatibility is among the top concerns when it comes to computer upgrades. Worry no more, MemOK! is the fastest memory booting solution today. This remarkable memory rescue tool requires nothing but a push of a button to patch memory issues and get you system up and running in no time. The technology is able to determine failsafe settings that can dramatically improve system booting success.

## Extreme Tweaker

### One stop performance tuning shop

Extreme Tweaker is the one stop shop to fine-tune your system to optimal performance. No matter if you are looking for frequency adjustment, over-voltage options, or memory timing settings, they are all here! See page 3-9 for details.

## Voltiminder LED

### Friendly reminder on Voltage Settings

In the pursuit of extreme performance, overvoltage adjustment is critical but risky. Acting as the “red zone” of a tachometer, the Voltiminder LED displays the voltage status for CPU, NB, SB, and Memory in a intuitive color-coded fashion. The Voltiminder LED allows quick voltage monitoring for overclockers. See page 2-2 to 2-5 for details.

## Component Overheat Protection-EX (COP EX)

### Maximum OC with confidence with burn proof protection to chipsets and GPU!

The COP EX allows overclockers to increase chipset voltages without the worries of overheating. It can also be used to monitor and save an overheating GPU. The COP EX allows more freedom and less constraint for maximum performance achievement.

## Loadline Calibration

### Optimal power boost for extreme CPU overclocking!

Maintaining ample voltage support for the CPU is critical during overclocking. The Loadline calibration ensures stable and optimal CPU voltage under heavy loading. It helps overclockers enjoy the motherboard’s ultimate OC capabilities and benchmark scores.

## 1.3.3 ROG unique features

### SupremeFX X-Fi features



### Listen with Absolute HD

### Play in extreme fidelity!

SupremeFX X-Fi delivers an excellent high definition audio experience to the gamers of ROG. SupremeFX X-Fi features unique audio innovations for gamers to spot enemies in 3D environment during game play. SupremeFX X-Fi combines the technological quality design of SupremeFX and sound effect technology from Creative Labs® to offer games exceptional game sound with absolute quality. See page 2-31 and 4-11 for details.

## External LCD Poster



### Debug and read system problems with an new external look!

The new LCD Poster now posts critical POST information in an ever friendly and flexible external display. When system malfunction occurs, the LCD Poster automatically detects device failure and translates the errors on the LCD during POST. See page 2-46 and 3-29 for details.

## Onboard Switches



### No more shorting pins or moving jumpers

With an easy press during overlocking, this exclusive onboard switch allows gamers to effortlessly fine-tune the performance without having to short the pins or moving jumpers. See page 2-44 for details.

## Q-Fan Plus



### Optimized quietness and cooling for more devices!

The Q-Fan function automatically detects temperature and adjusts fan speed accordingly to achieve quiet and efficient cooling.

## 1.3.4 ASUS special features

### ASUS Power Saving Solution

ASUS Power Saving solution intelligently and automatically provides balanced computing power and energy consumption.



### ASUS EPU-6 Engine

#### System Level Energy Saving

The new ASUS EPU—the world's first power saving engine, has been upgraded to a new 6-engine version, which provides total system power savings by detecting current PC loadings and intelligently moderating power in real-time. With auto phase switching for components (which includes the CPU, VGA card, memory, chipset, drives and system fan), the EPU automatically provides the most appropriate power usage via intelligent acceleration and overlocking—helping save power and money. See page 4-27 for details.

### ASUS EZ DIY

ASUS EZ DIY feature collection provides you easy ways to install computer components, update the BIOS or back up your favorite settings.

### ASUS Q-Connector



The ASUS Q-Connector allows you to connect or disconnect chassis front panel cables in one easy step with one complete module. This unique adapter eliminates the trouble of plugging in one cable at a time, making connection quick and accurate. See page 2-43 for details.

### ASUS O.C. Profile



The motherboard features the ASUS O.C. Profile that allows users to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving users freedom to share and distribute their favorite settings. See page 3-42 for details.

### ASUS EZ Flash 2



EZ Flash 2 is a user-friendly BIOS update utility. Simply launch this tool and update BIOS using a USB flash disk without entering the OS. You can update your BIOS in a few clicks without preparing an additional floppy diskette or using an OS-based flash utility. See page 3-4 for details.

### Kaspersky® Anti-Virus



#### The best protection from viruses and spyware

Kaspersky® Anti-Virus Personal offers premium antivirus protection for individual users and home offices. It is based on advanced antivirus technologies. The product incorporates the Kaspersky® Anti-Virus engine, which is renowned for malicious program detection rates that are among the industry's highest.

### C.P.R. (CPU Parameter Recall)



When the system hangs due to overclocking failure, there is no need to open the system chassis to clear CMOS data. Simply reboot the system, and the BIOS automatically restores the CPU default settings for each parameter.



---

Due to the chipset behavior, AC power off is required before using C.P.R. function.

---

This chapter 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.

# Hardware 2 information

2.1	Before you proceed .....	2-1
2.2	Motherboard overview.....	2-6
2.3	Central Processing Unit (CPU) .....	2-9
2.4	System memory .....	2-15
2.5	Expansion slots.....	2-25
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2.9	Turning off the computer.....	2-48

## 2.1 Before you proceed

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



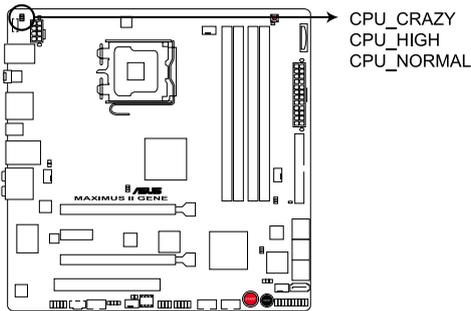
- 
- Unplug the power cord from the wall socket before touching any component.
  - Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
  - Hold components by the edges 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 LEDs

The motherboard comes with LEDs that indicate the voltage conditions of CPU, memory, northbridge, and southbridge. You may adjust the voltages in BIOS. There are also an LED for hard disk drive activity and an onboard switch for power status. For more information about voltage adjustment, refer to **3.3 Extreme Tweaker menu**.

### 1. CPU LED

The CPU LED has two voltage displays: CPU Voltage, and CPU PLL Voltage; you can select the voltage to display in BIOS. Refer to the illustration below for the location of the CPU LED and the table below for LED definition.

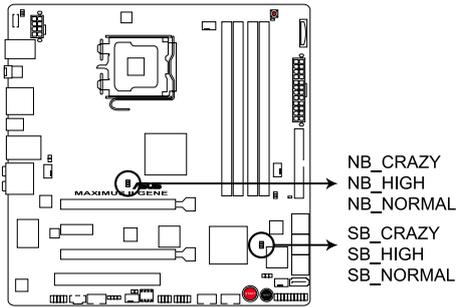


**MAXIMUS II GENE CPU LED**

	Normal (green)	High (yellow)	Crazy (red)
CPU Voltage	0.85000–1.5000	1.50625–1.69375	1.70000–2.40000
CPU PLL Voltage	1.51325–1.63250	1.64575–1.83125	1.84450–3.01050

## 2. Northbridge/Southbridge LEDs

The northbridge and southbridge LEDs each have two different voltage displays. The northbridge LED displays either the NB Voltage or the FSB VTT Voltage. The southbridge LED shows either the SB 1.1 Voltage or the SB 1.5 Voltage. You can select the voltage to display in BIOS. Refer to the illustration below for the location of the northbridge/southbridge LEDs and the table below for LED definition.

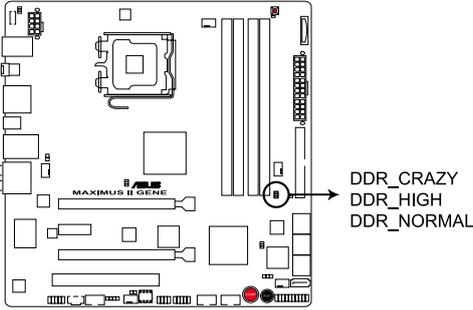


**MAXIMUS II GENE North/South Bridge LED**

	Normal (green)	High (yellow)	Crazy (red)
<b>NB Voltage</b>	1.10000–1.59025	1.60350–1.84200	1.85525–2.05400
<b>FSB VTT</b>	1.10000–1.40475	1.41800–1.60350	1.61675–2.00100
<b>SB 1.1 Voltage</b>	1.11341–1.60366	1.61691–1.85541	1.86866–2.00116
<b>SB 1.5 Voltage</b>	1.51106–1.61706	1.63031–1.81581	1.82906–2.05431

### 3. Memory LED

Refer to the illustration below for the location of the memory LED and the table below for LED definition.

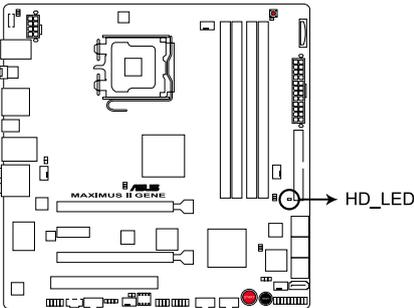


**MAXIMUS II GENE DDR LED**

	Normal (green)	High (yellow)	Crazy (red)
DRAM Bus Voltage	1.80000–1.99875	2.01200–2.60825	2.62150–3.40325

### 4. Hard Disk LED

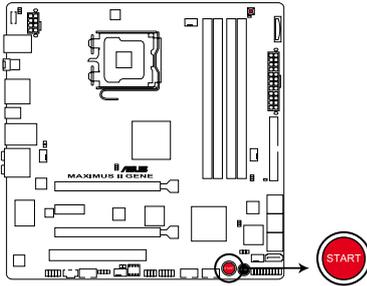
The hard disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.



**MAXIMUS II GENE Hard Disk LED**

## 5. Power LED

The motherboard comes with a power-on switch 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 power-on switch.



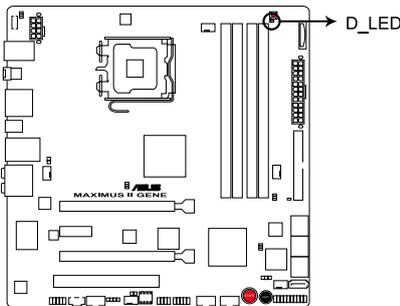
**MAXIMUS II GENE Power on switch**



When you turn on the ATX power supply, the **Power LED** flashes three times to indicate that the system is ready to boot. Wait till the flash stops before you press the power-on switch.

## 6. MemOK! LED

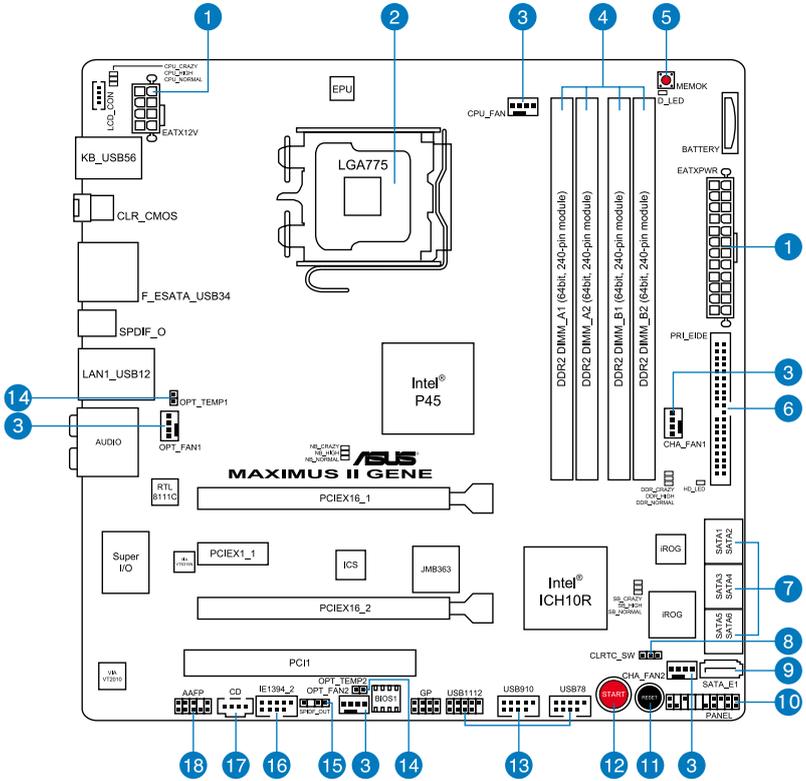
The MemOK! LED blinks while the system is loading failsafe settings for memory compatibility after pressing the MemOK! switch.



**MAXIMUS II GENE D\_LED**

## 2.2 Motherboard overview

### 2.2.1 Motherboard layout



## 2.2.2 Layout contents

Connectors/Jumpers/Switches/Slots		Page
1.	ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	2-41
2.	LGA775 CPU Socket	2-10
3.	CPU, chassis, and optional fan connectors (4-pin CPU_FAN; 3-pin CHA_FAN1-2; 3-pin OPT_FAN1-2)	2-39
4.	DDR2 DIMM slots	2-15
5.	MemOK! switch	2-45
6.	IDE connector (40-1 pin PRI_EIDE)	2-34
7.	ICH10R Serial ATA connectors (7-pin SATA1-6 [blue])	2-35
8.	Clear RTC RAM (3-pin CLRTC_SW)	2-29
9.	JMicron JMB363 <sup>®</sup> Serial ATA connector (7-pin SATA_E1 [black])	2-36
10.	System panel connector (20-8 pin PANEL)	2-42
11.	Reset switch	2-44
12.	Power-on switch	2-44
13.	USB connectors (10-1 pin USB78; USB910; USB1112)	2-36
14.	Thermal sensor cable connectors (2-pin OPT_TEMP1-2)	2-40
15.	Digital audio connector (4-1 pin SPDIF_OUT)	2-37
16.	IEEE 1394a port connector (10-1 pin IE1394_2)	2-37
17.	Optical drive audio connector (4-pin CD)	2-38
18.	Front panel audio connector (10-1 pin AAFP)	2-38



Refer to **2.7 Connectors** for more information about rear panel connectors and internal connectors.

### 2.2.3 Placement direction

When installing the motherboard, ensure 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.

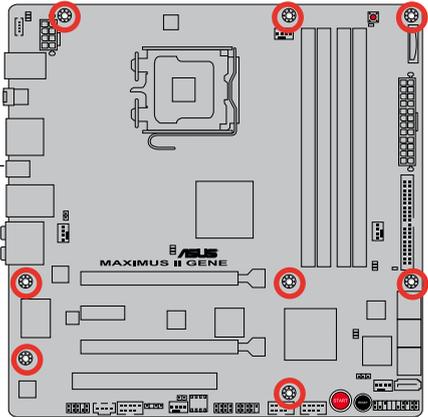
### 2.2.4 Screw holes

Place eight (8) 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



## 2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Core™ 2 Extreme / Core™ 2 Quad / Core™ 2 Duo Processor.



- 
- Ensure that all power cables are unplugged before installing the CPU.
  - Connect the chassis fan cable to the CHA\_FAN1 connector to ensure system stability.
- 

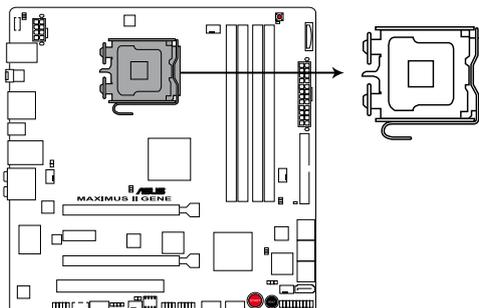


- 
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
  - Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
  - The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
-

## 2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.



**MAXIMUS II GENE CPU LGA775 Socket**

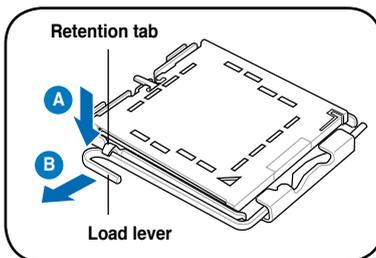


Before installing the CPU, ensure that the cam box is facing towards you and the load lever is on your left.

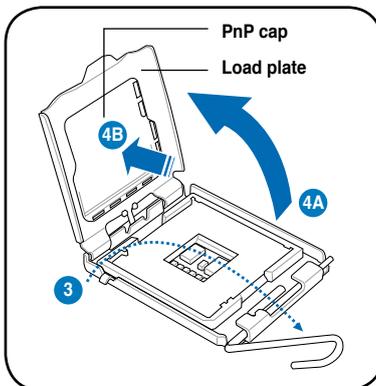
2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.



To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.



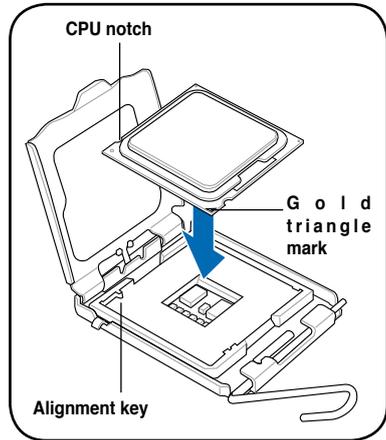
3. Lift the load lever in the direction of the arrow to a 135° angle.
4. Lift the load plate with your thumb and forefinger to a 100° angle (4A), then push the PnP cap from the load plate window to remove (4B).



5. Position the CPU over the socket, ensuring that the gold triangle is on the bottom-left corner of the socket then fit the socket alignment key into the CPU notch.



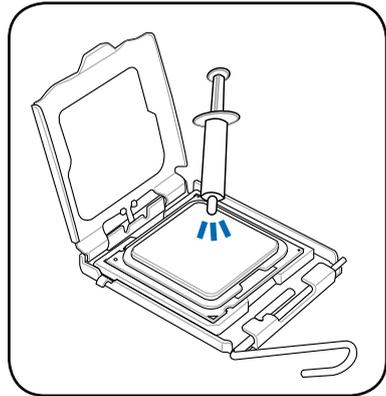
The CPU fits in only one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!



6. Apply several drops of thermal interface material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



Some heatsinks come with pre-applied thermal interface material. If so, skip this step.

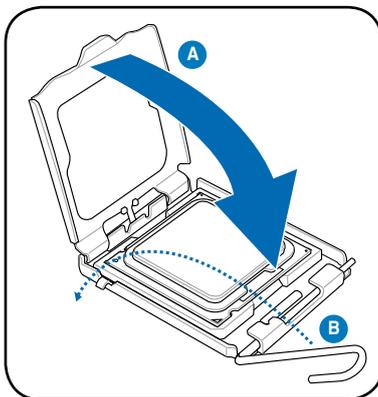


The thermal interface material is toxic and inedible. If it gets into your eyes or touches your skin, ensure to wash it off immediately, and seek professional medical help.



To prevent contaminating the paste, **DO NOT** spread the paste with your finger directly.

7. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



---

The motherboard supports Intel® LGA775 processors with the Intel® Enhanced Memory 64 Technology (EM64T), Enhanced Intel SpeedStep® Technology (EIST), and Hyper-Threading Technology. Refer to the Appendix for more information on these CPU features.

---

## 2.3.2 Installing the CPU heatsink and fan

The Intel® LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



- When you buy a boxed Intel® processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, ensure that you use only Intel®-certified multi-directional heatsink and fan.
- Your Intel® LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.



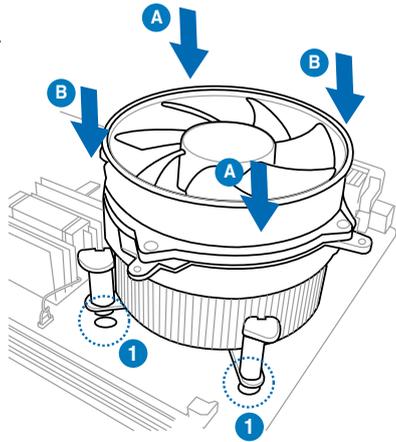
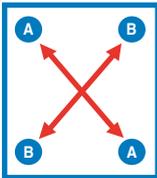
Ensure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.



If you purchased a separate CPU heatsink and fan assembly, ensure that the Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

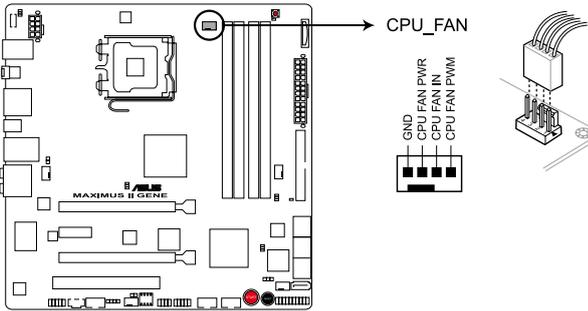
To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, ensuring that the four fasteners match the holes on the motherboard.
2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.



Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

3. Connect the CPU fan cable to the connector on the motherboard labeled CPU\_FAN.



### MAXIMUS II GENE CPU fan connector

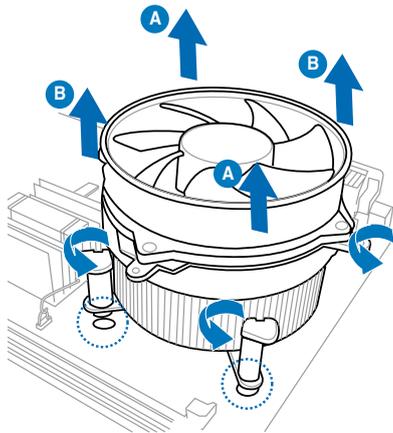
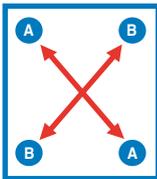


DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

## 2.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise.
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.



4. Carefully remove the heatsink and fan assembly from the motherboard.

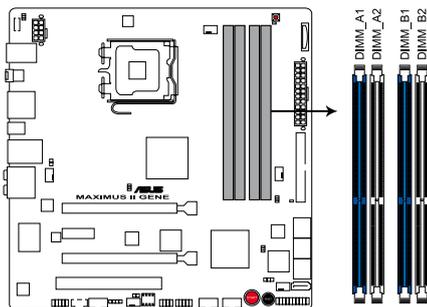
## 2.4 System memory

### 2.4.1 Overview

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

A DDR2 module has the same physical dimensions as a DDR DIMM but is notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:



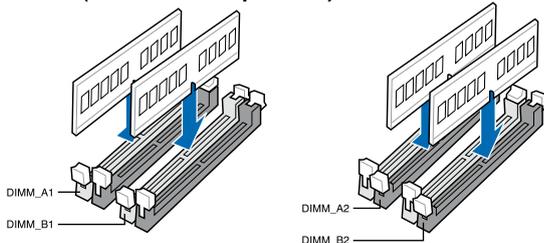
**MAXIMUS II GENE 240-pin DDR2 DIMM sockets**

### Recommended memory configurations

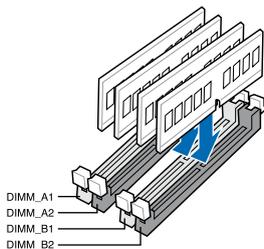
#### One DIMM:

You may install one memory module in any slot as a single-channel operation.

#### Two DIMMs (dual-channel operation):



#### Four DIMMs (dual-channel operation):



## 2.4.2 Memory configurations

You may install 512MB, 1GB, 2GB and 4GB unbuffered, non-ECC DDR2 DIMMs into the DIMM sockets.



- 
- You may install varying memory sizes in Channel A, and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
  - Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.
  - Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you install a 64-bit Windows OS when having 4GB or more memory installed on the motherboard.
  - This motherboard does not support DIMMs made up of 256 megabit (Mb) chips or less.
- 



- 
- The default memory operation frequency is dependent on its SPD. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, see section **3.3 Extreme Tweaker menu** for manual memory frequency adjustment.
  - For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.
-

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1200MHz capability

Vendor	Part No.	Size	SS/ DS	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
							A*	B*	C*
G.SKILL	F2-9600CL5D-4GBPI	4096MB (Kit of 2)	DS	Heat-Sink Package	5-5-5-15 (800-5-5-5-15)	2.1	.	.	.

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1150MHz capability

Vendor	Part No.	Size	SS/ DS	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
							A*	B*	C*
OCZ	OCZ2FX11502GK	2048MB(Kit of 2)	DS	Heat-Sink Package			.	.	
OCZ	OCZ2FXT11504GK	4096MB(Kit of 2)	DS	Heat-Sink Package	5	2.10	.	.	

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1100MHz capability

Vendor	Part No.	Size	SS/DS	Chip NO.	DIMM socket support (Optional)		
					A*	B*	C*
OCZ	OCZ2G11002GK	1024MB	DS	Heat-Sink Package	.	.	

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1066MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Apacer	Box P/N: CH.02GAF.C0KK2 (78.0AG9S.9KF)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		.	.	.
Apacer	Box P/N: CH.04GAF.F0KK2 (78.AAGAL.9KF)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		.	.	.
CORSAIR	Box P/N: TWIN2X4096- 8500C5DF (CM2X2048-8500C5D)(EPP)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1		.	
Crucial	BL12864AA106A.8FE5(EPP)	1024MB	SS	N/A	Heat-Sink Package	5-5-5-15	2.0	.	.	.
G.SKILL	F2-8500CL5S-1GBPK	1024MB	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	.	.	.
G.SKILL	F2-8500CL5D-2GBPK	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	.	.	.
GEIL	GB22GB8500C5DC	2048MB(Kit of 2)	SS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	.	.	.
GEIL	GE22GB1066C5DC	2048MB(Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	.	.	.
GEIL	GE24GB1066C5QC	4096MB(Kit of 4)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	.	.	.
GEIL	GB24GB8500C5DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	.	.	.
GEIL	GE24GB1066C5DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	.	.	.
GEIL	GX24GB8500C5UDC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	.	.	.
GEIL	GB24GB8500C5QC	4096MB(Kit of 4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	.	.	.

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1066MHz capability

Hynix	HYPM564U64FP8-G7	512MB	SS	HYNIX	HY5PS12821FFP-G7	7		*	*	*
KINGMAX	KLED48F-A8K15-EPA	1024MB	DS	KINGMAX	KKA8FEIBF-HJK-18A			*	*	
KINGSTON	KHX8500D2/ 512	512MB	SS		Heat-Sink Package			*	*	*
KINGSTON	KHX8500D2K2/1G	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package	2.2		*	*	*
KINGSTON	KHX8500D2/1G	1024MB	DS	N/A	Heat-Sink Package	2.2		*	*	
KINGSTON	KVR1066D2N7/1G	1024MB	DS	ELPIDA	E5108AJBG-1J-E	1066-5-5-5-15	1.8	*	*	
KINGSTON	KHX8500D2K2/2G	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	2.2		*	*	
KINGSTON	KHX8500D2K2/GN(EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	2.2		*	*	
MICRON	MT8HTF12864AY-1GAE1	1024MB	SS	MICRON	D9JKH	7		*	*	*
MICRON	MT16HTF25664AY-1GAE1	2048MB	DS	MICRON	D9JKH	7		*	*	*
OCZ	OCZ2N10662GK(EPP)	2048MB(Kit of 2)	DS		Heat-Sink Package			*	*	*
OCZ	OCZ2N1066SR2GK(EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	2.10	*	*	*
OCZ	OCZ2RPR10664GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	2.2	*	*	*
Transcend	TX1066QLU-2GK	2048MB(Kit of 2)	SS	ELPIDA	Heat-Sink Package	5		*		
Transcend	TX1066QLU-4GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5		*	*	*
Aeneon	BoxP/N:AXT760UD00-19D-K-2G (AXT760UD00-19D)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5		*	*	*
BUFFALO	FSX1066D2C-K4G	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		*		
Elixir	M2Y1G64TU8HC4B-BD	1024MB	DS	Elixir	N2TU 51280CE-BD	6		*	*	*
Elixir	M2Y2G64TU8HD5B-BD	2048MB	DS	Elixir	N2TU16800E-BD	6(1066-6-6-6-24)		*	*	*
Kingbox	N/A	1024MB	DS	MICRON	7YD12		1.8	*	*	*
Mushkin	996535	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-4-12		*	*	
Mushkin	996612	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1	*		
Mushkin	996619	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	*

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-1000MHz capability

Vendor	Part No.	Size	SS/DS	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
							A*	B*	C*
G.SKILL	F2-8000CL5D-4GBPQ	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	
KINGSTON	KHX8000D2/1G	1024MB	DS	Heat-Sink Package	800-5-5-5-15	2.2	*	*	*
OCZ	OCZ2P10004GK	4096MB(Kit of 2)	DS	Heat-Sink Package	5	2.10	*	*	
OCZ	OCZ2RPX10004GK	4096MB(Kit of 2)	DS	Heat-Sink Package	5		*	*	
Cell Shock	CS2221440	2048MB(Kit of 2)	DS	Heat-Sink Package	4-4-4-12 (800-5-5-5-15)	2.1-2.3	*	*	

# Maximus II GENE Motherboard

## Qualified Vendors Lists (QVL) DDR2-800MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-DATA	M2OAD6H3J4171Q1E52	2048MB	DS	A-DATA	AD20908ABA-25EG			.	.	.
Apacer	78.91G9I.9K5	512MB	SS	APACER	AM4B5708CQJS8E	5		.	.	.
Apacer	78.01GA0.9K5	1024MB	SS	APACER	AM4B5808CQJS8E	5		.	.	.
Apacer	78.A1GA0.9K4	2048MB	DS	APACER	AM4B5808CQJS8E	5		.	.	
CORSAIR	CM2X1024-6400C4	1024MB	DS	N/A	Heat-Sink Package	4	1.9	.	.	.
CORSAIR	Box P/N:TWIN2X4096-6400C4DXH (CM2X2048-6400C4DXH)Ver1.1	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.10	.		
CORSAIR	Box P/N:TWIN2X4096-6400C5 (CM2X2048-6400C5)Ver3.1	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	.		
CORSAIR	Box P/N:TWIN2X4096-6400C5DXH (CM2X2048-6400C5DXH)Ver1.1	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	.		
Crucial	BL12864AA80A.8FE5(EPP)	1024MB	SS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	.
Crucial	BL25664AA80A.16FE5(EPP)	2048MB	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	.
G.SKILL	F2-6400CL5D-1GBNQ	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	1.8-2.0	.	.	.
G.SKILL	F2-6400CL4D-2GBPK	1024MB	DS		Heat-Sink Package	4		.	.	
G.SKILL	F2-6400CL5D-2GBNQ	1024MB	DS		Heat-Sink Package	5		.	.	
G.SKILL	F2-6400PHU2-2GBNR	1024MB	DS		Heat-Sink Package	5		.	.	.
G.SKILL	F2-6400CL4D-4GBPK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4	2.0-2.1	.	.	
G.SKILL	F2-6400CL5D-4GBPQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	1.8-1.9	.	.	.
G.SKILL	F2-6400CL6D-4GBMQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	6	1.8-1.9	.	.	.
G.SKILL	F2-6400CL6D-8GBMQ	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	6-6-6-18	1.8	.		
GEIL	GB22GB6400C4DC	2048MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	4-4-4-12	2.0	.		
GEIL	GB22GB6400C5DC	2048MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5-5-5-15	1.8	.		
GEIL	GE22GB800C4DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	.
GEIL	GE22GB800C5DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.		
GEIL	GX22GB6400DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.		
GEIL	GX22GB6400UDC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.1	.		
GEIL	GX22GB6400C4USC	2048MB	DS	N/A	Heat-Sink Package			.	.	.
GEIL	GX22GB6400LX	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		.	.	.
GEIL	GB24GB6400C4DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	.	.	
GEIL	GB24GB6400C5DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	.		
GEIL	GB24GB6400C5QC	4096MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5-5-5-15	1.8	.		
GEIL	GE24GB800C4DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	
GEIL	GE24GB800C5DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.	.	.
GEIL	GX24GB6400DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.		
GEIL	GE24GB800C4QC	4096MB(Kit of 4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	
GEIL	GE24GB800C5QC	4096MB(Kit of 4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.		
GEIL	GB28GB6400C4QC	8192MB(Kit of 4)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	.		

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-800MHz capability

GEIL	GB28GB6400C5QC	8192MB(Kitof4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	.	.	.
GEIL	GE28GB800C4QC	8192MB(Kitof4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	.	.	.
GEIL	GE28GB800C5QC	8192MB(Kitof4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	.	.	.
Hynix	HYPM112U64CP8-S6	1024MB	SS	HYNIX	HY5PS1G831CFP-S6	6		.	.	.
Hynix	HYPM 512U64CP8-S5	1024MB	DS		HY5PS12821CFP-S5	5		.		
KINGMAX	KLDC28F-A8KI5	512MB	SS	KINGMAX	KK8F8FE1BF-HJK-25A			.	.	.
KINGMAX	KLDD48F-A8KI5	1024MB	DS	KINGMAX	KK8F8FE1BF-HJK-25A			.	.	.
KINGMAX	KLDE88F-B8KB5	2048MB	DS	KINGMAX	KK8F8FFBXF-CFA-25A			.	.	.
KINGSTON	KVR800D2N5/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	.	.	.
KINGSTON	KVR800D2N6/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	.	.	.
KINGSTON	KHX6400D2LLK2/1GN(EPP)	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package	4	2.0	.	.	.
KINGSTON	KVR800D2N5/1G	1024MB	SS	KINGSTON	D1288TPFCGL25U		800-5-5-5-15	1.8	.	.
KINGSTON	KHX6400D2LL/1G	1024MB	DS	N/A	Heat-Sink Package	4	2.0	.		
KINGSTON	KVR800D2N6/1G	1024MB	DS	ELPIDA	E5108AJBG-8E-E		1.8	.	.	.
KINGSTON	KHX6400D2LLK2/2GN(EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package			.		
KINGSTON	KHX6400D2/2G	2048MB	DS	N/A	Heat-Sink Package		2.0	.	.	.
KINGSTON	KVR800D2N5/2G	2048MB	DS	ELPIDA	E1108ACBG-8E-E		1.8	.	.	.
KINGSTON	KVR800D2N6/4G	4096MB	DS	ELPIDA	E2108ABSE-8G-E			.	.	.
NANYA	NT 512T64U88B0BY-25C	512MB	SS		NT5TU64M8BE-25C	5		.	.	.
NANYA	NT1GT64U8HB0BY-25C	1024MB	DS		NT5TU64M8BE-25C	5		.	.	.
NANYA	NT1GT64U8HCOBY-25D	1024MB	DS	NANYA	NT5TU64M8CE-25D			.	.	.
NANYA	NT2GT64U8HCOBY-AC	2048MB	DS	NANYA	NT5TU128M8CE-AC	5		.	.	.
OCZ	OCZ2G8001G	1024MB	DS	N/A	Heat-Sink Package	5	1.8	.	.	
OCZ	OCZ2G8002GK	1024MB	DS		Heat-Sink Package	5		.		
OCZ	OCZ2T8002GK(EPP)	1024MB	DS	N/A	Heat-Sink Package	5	1.8	.	.	.
OCZ	OCZ2P800R22GK	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4	1.8	.		
OCZ	OCZ2P8004GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-4-4	1.8	.	.	.
OCZ	OCZ2G8008GK	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	1.80	.	.	.
OCZ	OCZ2VU80016GQ	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-6-6(800-5-5-5-15)	1.8	.		
PSC	AL8E8F73C-8E1	2048MB	DS	PSC	A3R1GE3CF734MAA0E	5		.	.	.
SAMSUNG	M378T6553GZS-CF7	512MB	SS	SAMSUNG	K4T51083QG	6		.		
SAMSUNG	M378T2863QZS-CF7	1024MB	SS	SAMSUNG	K4T1G084QQ	6		.	.	.
SAMSUNG	M391T2863QZ3-CF7	1024MB	SS	SAMSUNG	K4T1G084QQ(ECC)	6		.	.	.
SAMSUNG	M378T2953GZ3-CF7	1024MB	DS	SAMSUNG	K4T51083QG	6		.	.	.
SAMSUNG	M378T5663QZ3-CF7	2048MB	DS	SAMSUNG	K4T1G084QQ(ECC)	6		.	.	.
SAMSUNG	M391T5663QZ3-CF7	2048MB	DS	SAMSUNG	K4T1G084QQ	6		.	.	.
SAMSUNG	M378T5263AZ3-CF7	4096MB	DS	SAMSUNG	K4T2G084QA-HCF7	6		.	.	.
Super Talent	T800UA12C4	512MB	SS		Heat-Sink Package			.	.	.

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-800MHz capability

Super Talent	T800UB1GC4	1024MB	DS	Heat-Sink Package			. . .
Transcend	JM800QLU-1G	1024MB	SS	Transcend TQ243ECF8	5		. . .
Transcend	TS128MLQ64V8U	1024MB	SS	ELPIDA E1108ACBG-8E-E	5		. . .
Transcend	JM800QLU-2G	2048MB	DS	Transcend TQ243PCF8	5		. .
Transcend	TS256MLQ64V8U	2048MB	DS	ELPIDA E1108ACBG-8E-E	5		. .
Transcend	TS256MLQ72V8U	2048MB	DS	ELPIDA E1108ACBG-8E-E(ECC)	5		.
Asint	SLY2128M8-JGE	1024MB	SS	Asint DDRII1208-GE			.
Asint	SLZ2128M8-JGE	2048MB	DS	Asint DDRII1208-GE			. . .
CENTURY	28V2H8	512MB	SS	HYNIX HY5PS12821BFP-S5			. . .
CENTURY	28VOH8	1024MB	DS	HYNIX HY5PS12821BFP-S5			.
Elixir	M2Y1G64TU88D4B-AC	1024MB	SS	Elixir N2TU1G80DE-AC	5		. . .
Elixir	M2Y1G64TU8HB0B-25C	1024MB	DS	Elixir N2TU 51280BE-25C	5	1.8	.
Elixir	M2Y2G64TU8HD4B-AC	2048MB	DS	Elixir N2TU1G80DE-AC	5		. .
Kingbox	N/A	2048MB	DS	Kingbox EPD2128082200E-3	800-5-5-5-15		. . .
Kingbox	N/A	2048MB	DS	MICRON D9HNL			. . .
Kingbox	N/A	2048MB	DS	KINGBOX EPD2128082200E-3			.
Mushkin	XP2-6400	1024MB	SS	Heat-Sink Package	4		. .
Oci	04701G16CZ5D2A	1024MB	DS	Jnfinity 64M8PC6400	5		.
Patriot	PSD2 51280081	512MB	SS	PATRIOT PM64M8D2BU-25EC			. . .
Patriot	PSD22GB002	2048MB	DS	PATRIOT PM128M8D2BU-25KC	5		. .
Patriot	PDC24G6400LLK	4096MB(Kit of 2)	DS	N/A Heat-Sink Package	4-4-4-12	2.2	.
Silicon Power	SP001GBLRU800S02	1024MB	SS	S-POWER 10YR9N3	5(5-5-5-15)		. . .
Silicon Power	SP002GBLRU800S02	2048MB	DS	S-POWER 10YR9N3	5(5-5-5-15)		. . .
UMAX	D48002GP1-73BEB	2048MB	DS	UMAX U2S24D30TP-8E	800-5-5-5-15		. . .

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-667MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Apacer	78.91G92.9K5	512MB	SS	APACER	AM4B5708JQJS7E	5		*	*	*
Apacer	78.01G90.9K5	1024MB	SS	APACER	AM4B5808CQJS7E	5		*	*	*
Apacer	78.A1G90.9K4	2048MB	DS	APACER	AM4B5808CQJS7E	5		*	*	*
CORSAIR	VS 512MB667D2	512MB	SS	N/A	64M8CFEG	N/A	N/A	*	*	*
CORSAIR	VS1GB667D2	1024MB	DS	N/A	64M8CFEG	N/A	N/A	*	*	*
ELPIDA	EBE51UD8AEFA-6E-E	512MB	SS	ELPIDA	E5108AE-6E-E	5	1.7-1.9	*	*	*
G.SKILL	F2-5400PHU2-2GBNT	2048MB(Kit of 2)	DS	G.Skill	D264M8GCF	5-5-5-15	1.8	*	*	*
G.SKILL	F2-5300CL5D-4GBMQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8-1.9	*	*	*
GEIL	GX21GB5300SX	1024MB	DS	N/A	Heat-Sink Package			*	*	*
GEIL	GX22GB5300LX	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
GEIL	GX24GB5300LDC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
Hynix	HYMP112U64CP8-Y5	1024MB	SS	HYNIX	HY5PS1G831CFP-Y5	5		*	*	*
Hynix	HYMP 512U64CP8-Y5	1024MB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.8	*	*	*
KINGSTON	KVR667D2N5/ 512	512MB	SS	KINGSTON	D6408TR7CGL25U	667-5-5-5-15	1.8	*	*	*
KINGSTON	KVR667D2N5/2G	2048MB	SS	SAMSUNG	K4T1G084QE	667-5-5-5-15	1.8	*	*	*
KINGSTON	KVR667/D2N5/1G	1024MB	DS	ELPIDA	E5108AJBG-6E-E	667-5-5-5-15	1.8	*	*	*
KINGSTON	KVR667D2E5/1G	1024MB	DS	ELPIDA	E5108AGBG-6E-E(ECC)		1.8	*	*	*
KINGSTON	KVR667D2E5/2G	2048MB	DS	MICRON	D9HNL(ECC)		1.8	*	*	*
KINGSTON	KVR667D2N5/2G	2048MB	DS	KINGSTON	D1288TPFCGL25U	667-5-5-5-15	1.8	*	*	*
NANYA	NT 512T64U88B0BY-3C	512MB	SS	NANYA	NT5TU64M8BE-3C	5	1.8	*	*	*
NANYA	NT2GT64UH8B0JY-3C	2048MB	DS		NT5TU128M8BJ-3C	5		*	*	*
OCZ	OCZ26671024V	1024MB	SS	Ramos	RC1GT084CA0-53EC	5	1.8	*	*	*
SAMSUNG	M378T6553EZS-CE6	512MB	SS	SAMSUNG	K4T51083QE	5		*	*	*
SAMSUNG	M378T2953EZ3-CE6	1024MB	DS	SAMSUNG	K4T51083QE	5		*	*	*
SAMSUNG	M378T5263AZ3-CE6	4096MB	DS	SAMSUNG	K4T2G084QA-HCE6	5		*	*	*
Super Talent	T6UA 512C5	512MB	SS	N/A	Heat-Sink Package	5	1.8	*	*	*
Super Talent	T6UB1GC5	1024MB	DS	N/A	Heat-Sink Package	5	1.8	*	*	*
TwinMOS	8D-23JK5M2ETP	512MB	SS	TwinMOS	TMM6208G8M30C	5	1.8	*	*	*
Asint	SLX264M8-J6E	512MB	SS	Asint	DDRII6408-6E			*	*	*
Asint	Sly2128M8-J6E	1024MB	SS	Asint	DDRII1208-6E			*	*	*
CENTURY	26V2H8	512MB	SS	HYNIX	HY5PS12821CFP-Y5	5	1.85	*	*	*
CENTURY	26VOH8	1024MB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.85	*	*	*
Dynet	DNHM5U 512C8FE-A6	512MB	SS	Dynet	DN5HS82CFE-A6			*	*	*
Kingbox	N/A	1024MB	SS	KINGBOX	EPD2128082200E-4			*	*	*
Kingbox	N/A	1024MB	DS	KINGBOX	EPD264082200E-4		1.8	*	*	*

## Maximus II GENE Motherboard Qualified Vendors Lists (QVL) DDR2-667MHz capability

Kingbox	N/A	1024MB	DS	KINGBOX	EPD264082200N-4			•	•	•
MDT	M 512-667-8	512MB	SS	MDT	18D 51280D-30648	4	1.8	•	•	•
MDT	M924-667-16	1024MB	DS		18D 51280D-30646E	4		•		
Patriot	PSD21G6672	1024MB	DS	PATRIOT	PM64M8D2BU-3PAC	5		•	•	•



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SS - Single-sided DS - Double-sided DIMM support:

- **A\***: Supports one module inserted in any slot as single-channel memory configuration.
- **B\***: Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of dual-channel memory configuration.
- **C\***: Supports four modules inserted into both the yellow and black slots as two pairs of dual-channel memory configuration.



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Visit the ASUS website at [www.asus.com](http://www.asus.com) for the latest QVL.

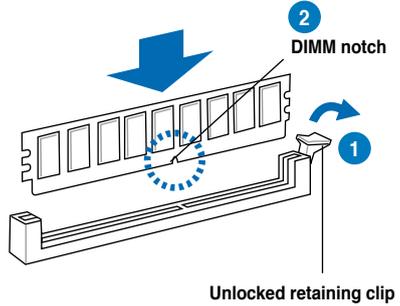
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## 2.4.3 Installing a DIMM



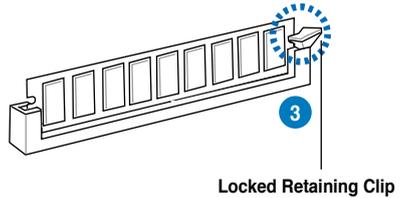
Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clip outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A 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.

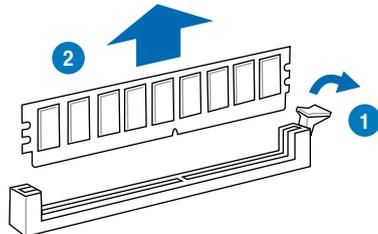
3. Firmly insert the DIMM into the socket until the retaining clip snaps back in place and the DIMM is properly seated.



## 2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Press the retaining clip 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.

## 2.5 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.



---

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

---

### 2.5.1 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.

### 2.5.2 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 3 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.



---

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. Refer to the table on the next page for details.

---

## 2.5.3 Interrupt assignments

### Standard interrupt assignments

IRQ	Priority	Standard function
0	1	System Timer
1	2	Keyboard Controller
2	–	Redirect to IRQ#9
4	12	Communications Port (COM1)*
5	13	IRQ Holder for PCI Steering*
6	14	Reserved
7	15	Reserved
8	3	System CMOS/Real Time Clock
9	4	IRQ Holder for PCI Steering*
10	5	IRQ Holder for PCI Steering*
11	6	IRQ Holder for PCI Steering*
12	7	Reserved
13	8	Numeric Data Processor
14	9	Primary IDE Channel

\* These IRQs are usually available for PCI devices.

### IRQ assignments for this motherboard

#### P45/MCH

	24	25	26	27	28	29	30	31
PCIE16_1	shared	–	–	–	–	–	–	–
PCIE16_2	–	–	–	–	–	–	shared	–

#### ICH

	A	B	C	D	E	F	G	H
PCIE1_1	shared	–	–	–	–	–	–	–
LAN	–	–	shared	–	–	–	–	–
PCI_1	shared	–	–	–	–	–	–	–
USB controller 1	–	–	–	–	–	–	–	shared
USB controller 2	–	–	–	shared	–	–	–	–
USB controller 3	–	–	shared	–	–	–	–	–
USB controller 4	shared	–	–	–	–	–	–	–
USB controller 5	–	–	–	–	–	shared	–	–
USB controller 6	–	–	–	shared	–	–	–	–
USB 2.0 controller 1	–	–	–	–	–	–	–	shared
USB 2.0 controller 2	–	–	shared	–	–	–	–	–
SATA controller 1	–	–	–	–	shared	–	–	–
SATA controller 2	–	–	–	–	shared	–	–	–
Audio Azalia	–	–	–	–	–	–	shared	–

## 2.5.4 PCI slot

The PCI slot supports 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 slot.

## 2.5.5 PCI Express x1 slot

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications.



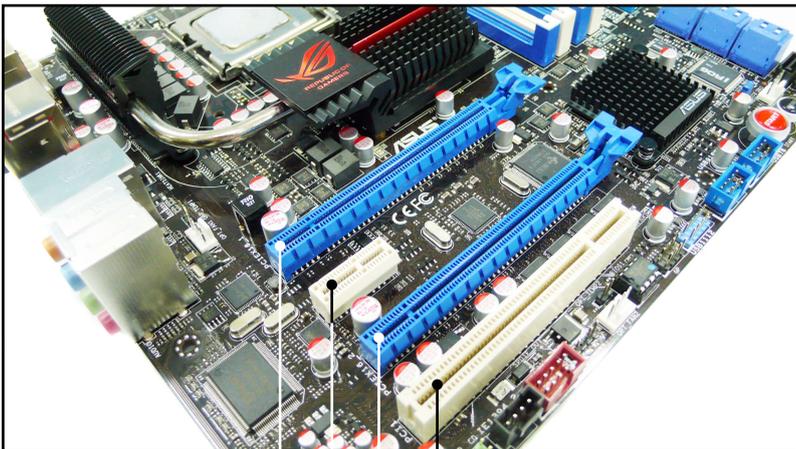
---

Install a PCIe x1 device to a PCIe x1 slot prior to a PCIe x16 slot.

---

## 2.5.6 PCI Express 2.0 x16 slots

This motherboard has two PCI Express 2.0 x16 slots that support PCI Express x16 2.0 graphic cards complying with the PCI Express specifications. Refer to the figure below for the location of the slots.



PCI slot  
PCI Express x1 slot  
PCI Express 2.0 x16\_1 slot  
PCI Express 2.0 x16\_2 slot



- 
- In single VGA card mode, use first the PCIe 2.0 x16\_1 slot for a PCI Express x16 graphics card to get better performance.
  - In CrossFireX™ mode, use the PCIe 2.0 x16\_1 and PCIe 2.0 x16\_2 (blue) slots for PCI Express x16 graphics cards to get better performance.
  - We recommend that you provide sufficient power when running CrossFireX™ mode. See page 2-41 for details.
  - Connect a chassis fan to the motherboard connector labeled CHA\_FAN1/2 when using multiple graphics cards for better thermal environment. See page 2-39 for details.
-

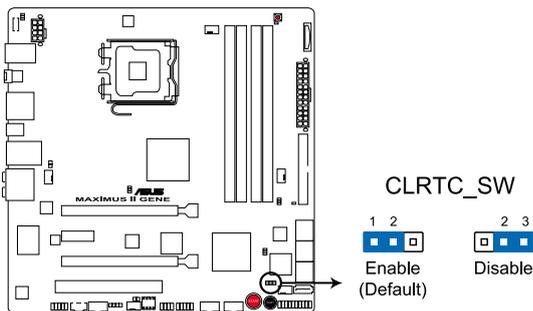
## 2.6 Jumper

### Clear RTC RAM (3-pin CLRRTC\_SW)

This jumper allows you to enable the **clr CMOS** switch on the back I/O. You can clear the CMOS memory and system setup parameters by erasing the CMOS RTC RAM data. The **clr CMOS** switch on the back I/O helps you easily clear the system setup information such as system passwords.

To erase the RTC RAM:

1. Press down the **clr CMOS** switch on the back I/O.
2. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



MAXIMUS II GENE Clear RTC RAM

### clr CMOS switch behavior

System power state	G3*	S5*	S0 (DOS mode)	S0 (OS mode)	S1	S3	S4
Clearing CMOS	•	•	•**				

\*G3: Power off without +5VSB power (AC power loss); S5: Power off with +5VSB power

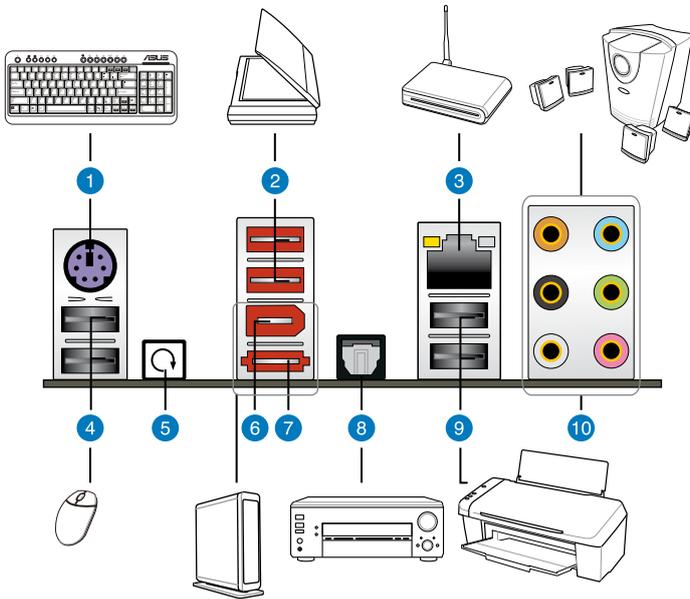
\*\*The system shuts down immediately.



- The **clr CMOS** switch will not function if the CLRRTC\_SW jumper is moved to the Disable position, but the shutdown function in S0 mode (DOS mode) still works.
- Ensure to re-enter your previous BIOS settings after you clear the CMOS.
- You do not need to clear the RTC when the system hangs due to CPU overclocking. With the C.P.R. (CPU Parameter Recall) feature, shut down and reboot the system so the BIOS can automatically reset CPU parameter settings to default values. If the system hangs due to overclocking of memory timing or chipset voltage and the power button fails to function, pressing down the **clr CMOS** switch will shut down the system and clear CMOS simultaneously.

## 2.7 Connectors

### 2.7.1 Rear panel connectors



#### Rear panel connectors

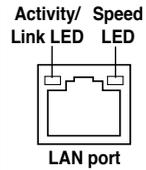
1. PS/2 keyboard port (purple)	6. IEEE 1394a port
2. USB 2.0 ports 3 and 4	7. External SATA port
3. LAN (RJ-45) port**	8. Optical S.PDIF Out port
4. USB 2.0 ports 5 and 6	9. USB 2.0 ports 1 and 2
5. Clear CMOS switch	10. Audio I/O ports***



To use hot-plug, set the **Controller Mode** in the BIOS settings to [AHCI] mode. See section 3.5.3 **Onboard Devices Configuration** for details.

## \*\* LAN port LED indications

Activity/Link	Speed LED	Description
OFF	OFF	Soft-off Mode
Yellow Blinking	OFF	During Power ON/OFF
Yellow Blinking	ORANGE	100 Mbps connection
Yellow Blinking	GREEN	1 Gbps connection

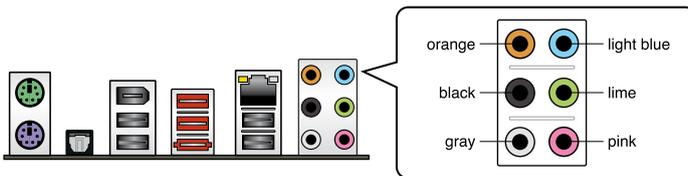


## \*\*\* Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

## 2.7.2 Audio I/O connections

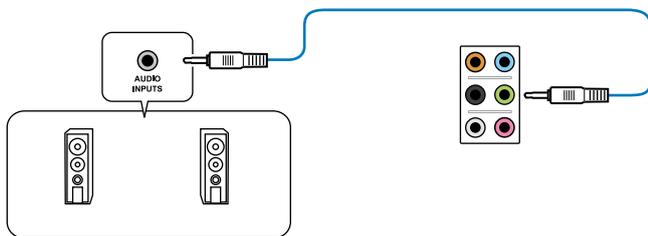
### Audio I/O ports



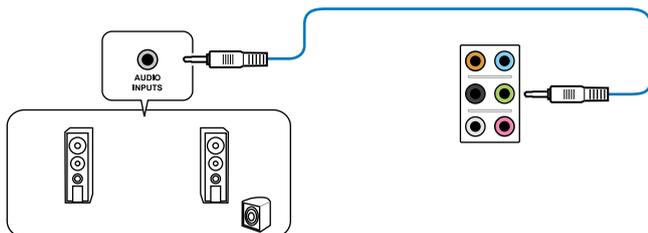
### Connect to Headphone and Mic



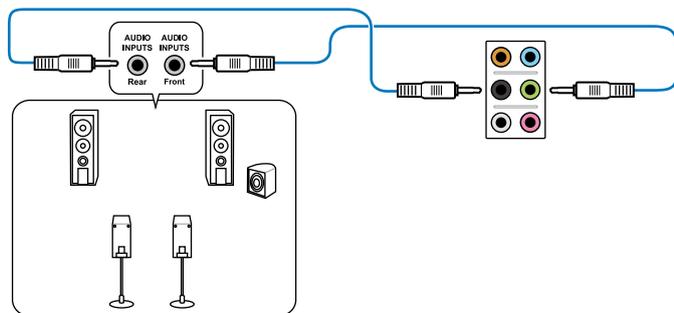
## Connect to Stereo Speakers



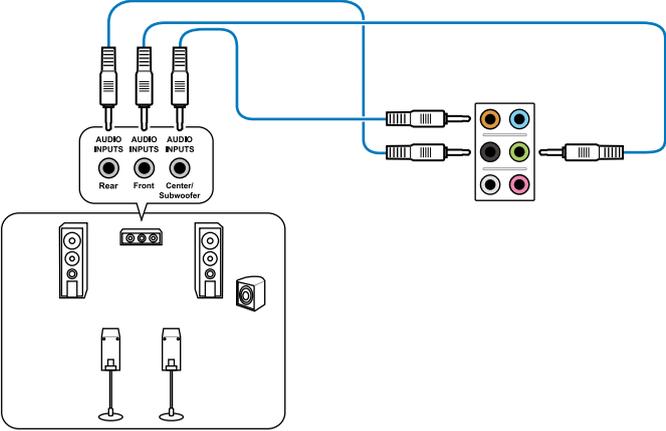
## Connect to 2.1 channel Speakers



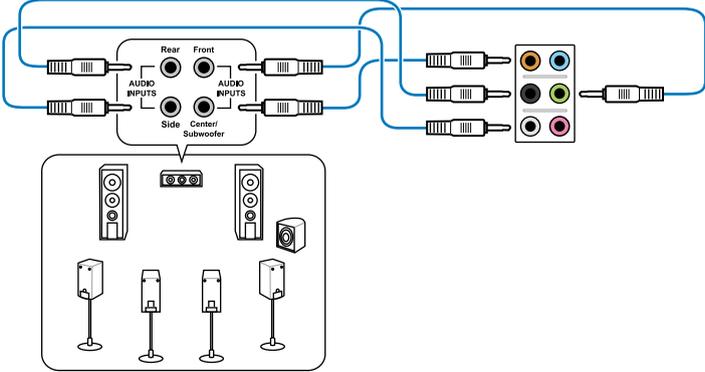
## Connect to 4.1 channel Speakers



### Connect to 5.1 channel Speakers



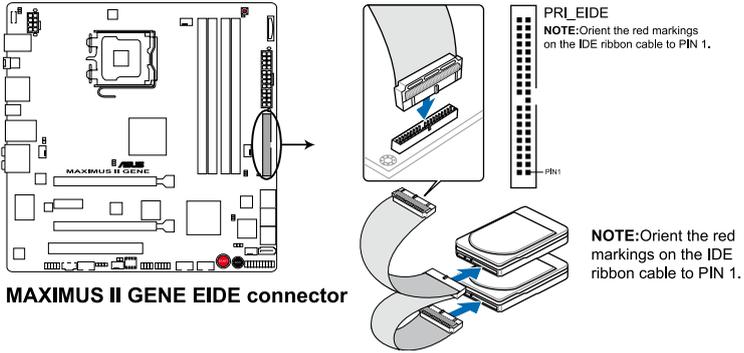
### Connect to 7.1 channel Speakers



## 2.7.2 Internal connectors

### 1. IDE connector (40-1 pin PRI\_EIDE)

The onboard IDE connector is for the 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.



	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.

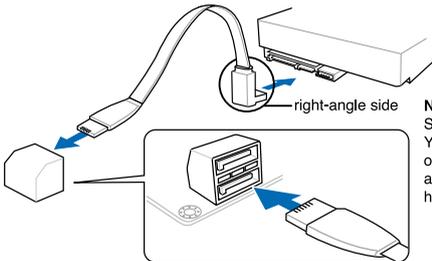
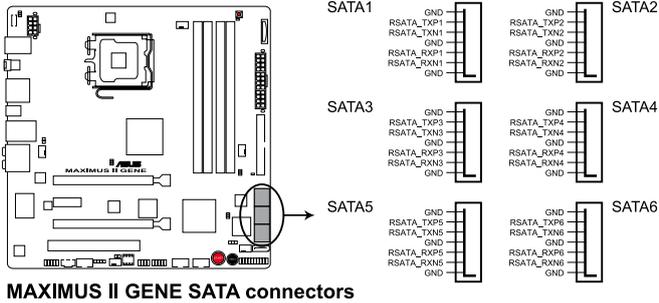


If any device jumper is set as "Cable-Select," ensure all other device jumpers have the same setting.

## 2. ICH10R Serial ATA connectors (7-pin SATA 1-6 [blue])

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives and optical disc drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Matrix Storage Technology through the onboard Intel® ICH10R RAID controllers.



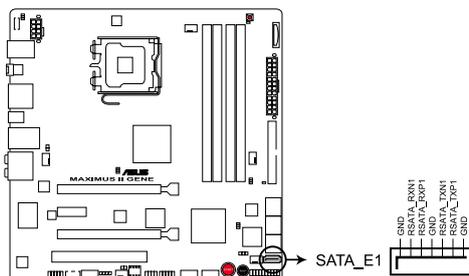
**NOTE:** Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



- These connectors are set to Standard IDE mode by default. In Standard IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section 3.4.5 **Storage Configuration** for details. Before creating a RAID set, refer to section 4.4 **RAID Configuration**.
- You must install Windows® XP Service Pack 1 or later version before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP1 or later version.
- When using hot-plug and NCQ, set the **Configure SATA as** in the BIOS to [AHCI]. See section 3.4.5 **Storage Configuration** for details.

### 3. JMicron JMB363® Serial ATA connector (7-pin SATA\_E1 [black])

This connector is for a Serial ATA signal cable for an external Serial ATA hard disk drive.



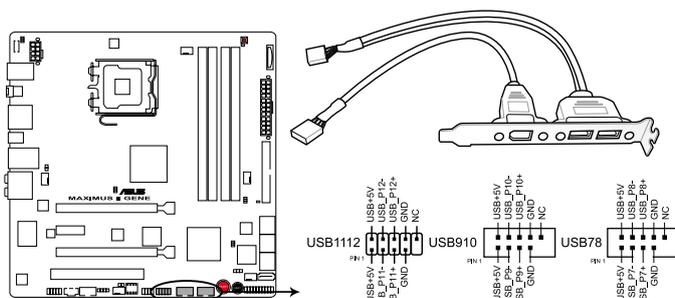
**MAXIMUS II GENE SATA connector**



To enable hot-plugging, set the **Controller Mode** item in the BIOS setting to [AHCI], and then reboot the system. See section 3.5.3 **Onboard Device Configuration** for details.

### 4. USB connectors (10-1 pin USB78; USB910; USB1112)

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.



**MAXIMUS II GENE USB2.0 connectors**



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



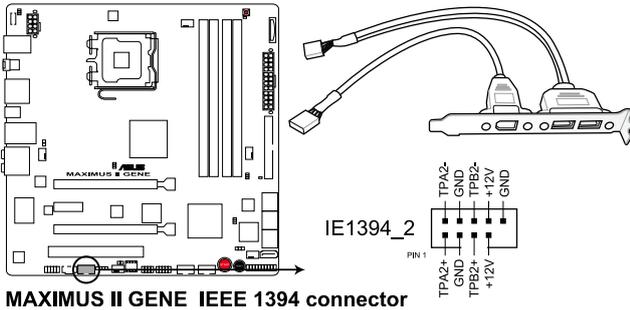
You can connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.



The USB cable is purchased separately.

## 5. IEEE 1394a port connector (10-1 pin IE1394\_2)

This connector is for an IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.



**MAXIMUS II GENE IEEE 1394 connector**



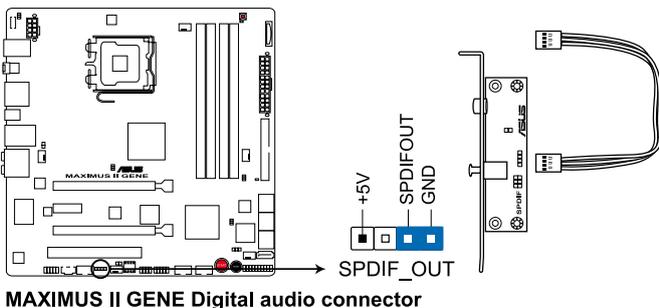
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!



The IEEE 1394a cable is purchased separately.

## 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 Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.



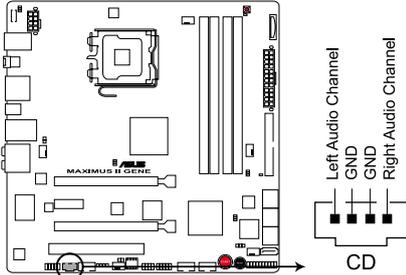
**MAXIMUS II GENE Digital audio connector**



The S/PDIF module is purchased separately.

7. **Optical drive audio connector (4-pin CD)**

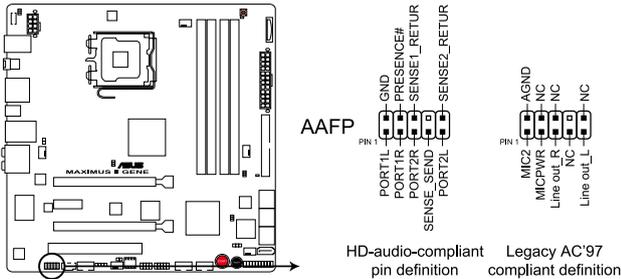
These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.



**MAXIMUS II GENE Internal audio connector**

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

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



**MAXIMUS II GENE Analog front panel connector**



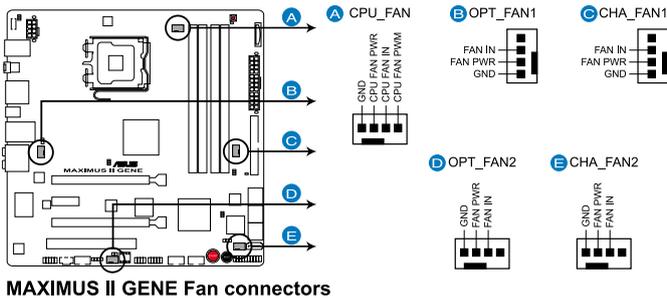
- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, set the **Front Panel Type** item in the BIOS setup to [HD Audio]; if you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. By default, this connector is set to [HD Audio].

## 9. CPU, chassis, and optional fan connectors (4-pin CPU\_FAN, 3-pin CHA\_FAN1–2, 3-pin OPT\_FAN1–2)

The fan connectors support cooling fans of 350 mA–2000 mA (24 W max.) or a total of 1 A–7 A (84 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



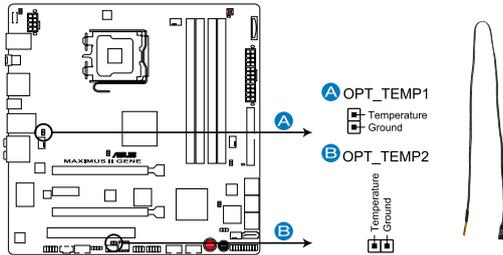
DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!



If you install two VGA cards, we recommend that you plug the chassis fan cable to the motherboard connector labeled OPT\_FAN1/2 for better thermal environment.

## 10. Thermal sensor cable connectors (2-pin OPT\_TEMP1/2)

These connectors are for temperature monitoring. Connect the thermal sensor cables to these connectors and place the other ends to the devices which you want to monitor temperature. The optional fan1/2 can work with the temperature sensors for a better cooling effect.



**MAXIMUS II GENE Thermal sensor cable connectors**



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Enable **OPT FAN1/2 overheat protection** in BIOS if you connect thermal sensor cables to these connectors. Refer to page 3-34 for details.

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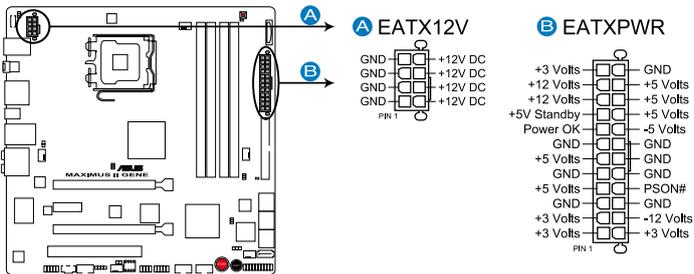
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The thermal sensor cable is purchased separately.

---

## 11. ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)

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



**MAXIMUS II GENE ATX power connectors**



- Ensure to remove the cap on the EATX12V connector before connecting an 8-pin EPS +12V power plug.
- Use only an 8-pin EPS +12V power plug for the EATX12V connector.



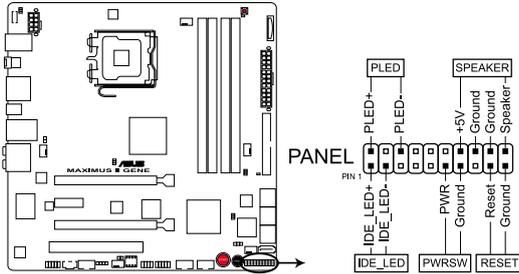
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 600 W.
- Do not forget to connect the 8-pin EATX12 V power plug; otherwise, the system will not boot.
- Use of a PSU with 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.
- If you want to use two high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.

### PSU suggested list

PSU suggested list
SilverStone ST1000
Seasonic SS-600HT
Thermaltake W0083RE
Thermaltake PUREPower-600AP
Silverstone SST-ST75ZF
EnerMAX EG701AX-VE (E)(24P)

## 12. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.



**MAXIMUS II GENE System panel connector**

- **System power LED (2-pin PLED)**

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 (2-pin IDE\_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 (4-pin SPEAKER)**

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

- **ATX power button/soft-off button (2-pin PWRSW)**

This 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 (2-pin RESET)**

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

### 13. ASUS Q-Connector (system panel)

Use the ASUS Q-Connector to connect/disconnect the chassis front panel cables.

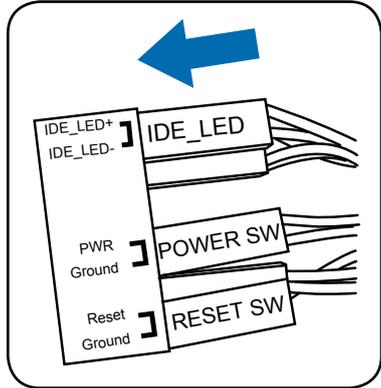
To install the ASUS Q-Connector:

1. Connect the front panel cables to the ASUS Q-Connector.

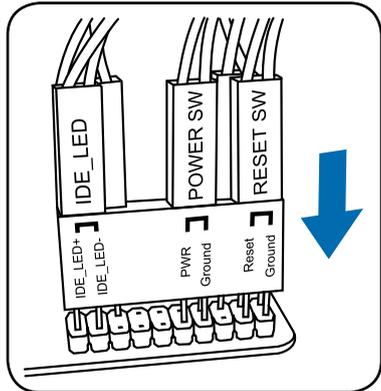
Refer to the labels on the Q-Connector to know the detailed pin definitions, and then match them to their respective front panel cable labels.



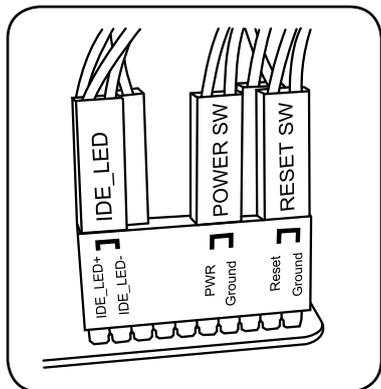
The labels on the front panel cables may vary depending on the chassis model.



2. Install the ASUS Q-Connector to the system panel connector, ensuring the orientation matches the labels on the motherboard.



3. The front panel functions are now enabled. The figure shows the Q-Connector is properly installed on the motherboard.

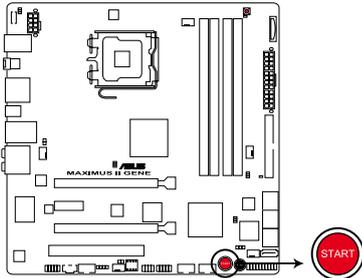


### 2.7.3 Onboard switches

Onboard switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

#### 1. Power-on switch

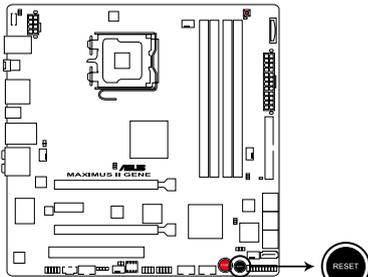
Press the power-on switch to wake/power up the system.



**MAXIMUS II GENE Power on switch**

#### 2. Reset switch

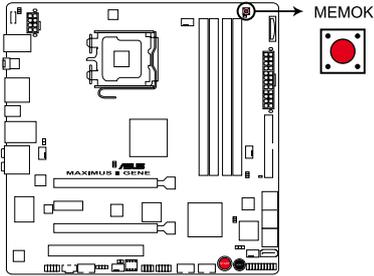
Press the reset switch to reboot the system.



**MAXIMUS II GENE Reset switch**

### 3. MemOK! switch

Press the MemOK! switch to load failsafe settings for memory compatibility and improving system boot success.



**MAXIMUS II GENE MEMOK** switch

### 2.7.4 Installing I/O shield and LCD Poster

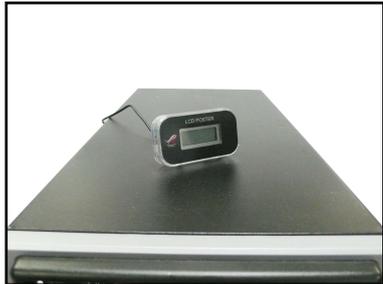
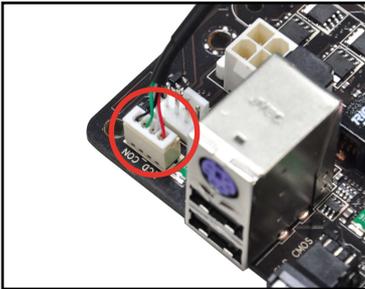
1. Install the I/O shield to the chassis by snapping it in place from inside.
2. Orient the motherboard and install it to the chassis. Ensure that the motherboard external ports fit the shield openings.



3. Thread the LCD Poster cable through the back I/O shield opening until the stopper fits the opening.



4. Locate and connect the LCD Poster cable to the **LCD\_CON** connector.
5. Place the LCD Poster on the chassis or to wherever you like.



## 2.8 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
  - a. Monitor
  - b. External SCSI devices (starting with the last device on the chain)
  - c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with “green” standards or if it has a “power standby” feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected Quick boot set to disabled No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

## 2.9 Turning off the computer

### 2.9.1 Using the OS shut down function

If you are using Windows® Vista™:

1. Click the **Start** button then select **Shut Down**.
2. The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1. Click the **Start** button then select **Turn Off Computer**.
2. Click the **Turn Off** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

### 2.9.2 Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting.

Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section 3.6 **Power Menu** in Chapter 3 for details.

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 **3**

<b>3.1</b>	<b>Managing and updating your BIOS .....</b>	<b>3-1</b>
<b>3.2</b>	<b>BIOS setup program .....</b>	<b>3-6</b>
<b>3.3</b>	<b>Extreme Tweaker menu .....</b>	<b>3-9</b>
<b>3.4</b>	<b>Main menu .....</b>	<b>3-17</b>
<b>3.5</b>	<b>Advanced menu .....</b>	<b>3-23</b>
<b>3.6</b>	<b>Power menu.....</b>	<b>3-31</b>
<b>3.7</b>	<b>Boot menu .....</b>	<b>3-37</b>
<b>3.8</b>	<b>Tools menu .....</b>	<b>3-41</b>
<b>3.9</b>	<b>Exit menu.....</b>	<b>3-45</b>

## 3.1 Managing and updating your BIOS

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

1. **ASUS Update** (Updates the BIOS in Windows® environment.)
2. **ASUS EZ Flash 2** (Updates the BIOS using a floppy disk or USB flash disk.)
3. **ASUS CrashFree BIOS 3 utility:** Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.

Refer to the corresponding sections for details on these utilities.



---

Save a copy of the original motherboard BIOS file to a USB flash drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the **ASUS Update** utility.

---

### 3.1.1 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 DVD 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 DVD in the optical drive. The Drivers menu appears.
2. Click the Utilities tab, then click Install ASUS Update VX.XX.XX.
3. The ASUS Update utility is copied to your system.

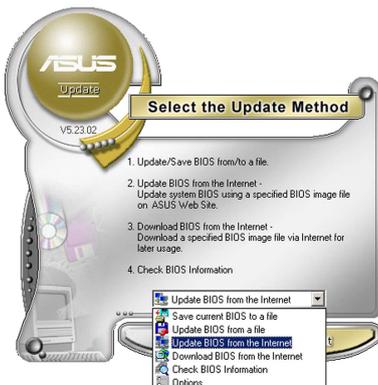
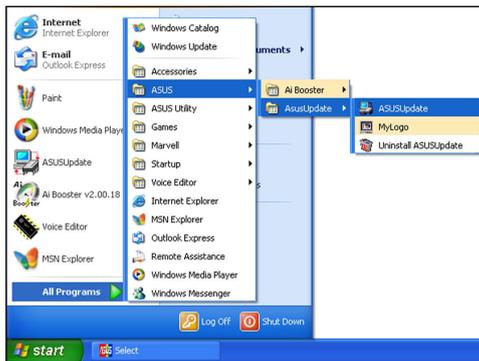


Quit all Windows® applications before you update the BIOS using this utility.

## 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**.

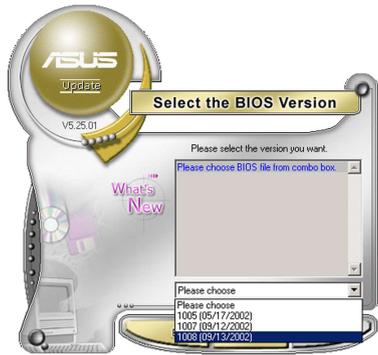


3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

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



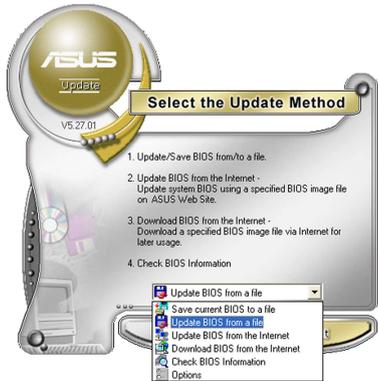
The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.



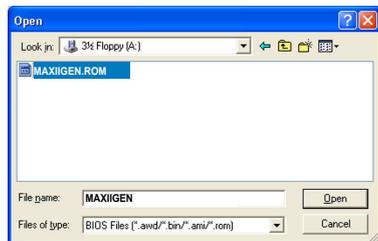
## Updating the BIOS through a BIOS file

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.



### 3.1.2 ASUS EZ Flash 2 utility

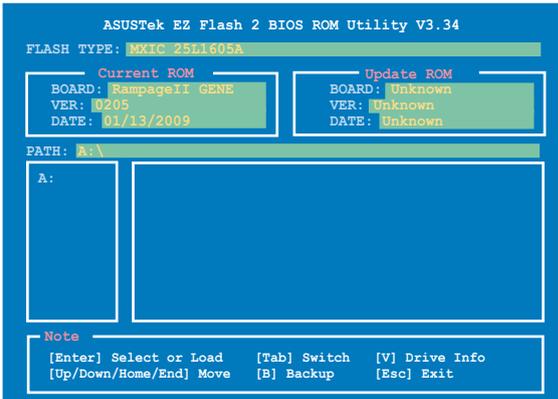
The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a DOS-based utility. The EZ Flash 2 utility is built in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).



Before you start using this utility, download the latest BIOS from the ASUS website at [www.asus.com](http://www.asus.com).

To update the BIOS using EZ Flash 2

1. Insert the USB flash disk that contains the latest BIOS file to the USB port, and then launch EZ Flash 2 in any of these two ways:
  - Press <Alt> + <F2> during POST to display the following.
  - Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press <Enter> to enable it.



2. Press <Tab> to switch between drives until the correct BIOS file is found. When found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.



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



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **3.9 Exit Menu** for details.

### 3.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility 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 restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.



---

The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at [support.asus.com](http://support.asus.com) and save it to a USB flash drive.

---

### Recovering the BIOS

To recover the BIOS

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Turn off the system after the utility completes the updating process and power on again.
5. The system requires you to enter BIOS Setup to recover BIOS setting. To ensure system compatibility and stability, we recommend that you press <F2> to load default BIOS values.



---

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

---

## 3.2 BIOS setup program

This motherboard supports two programmable firmware chips that you can update using the provided utility described in section 3.1 **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 firmware chip.

The firmware 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 <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

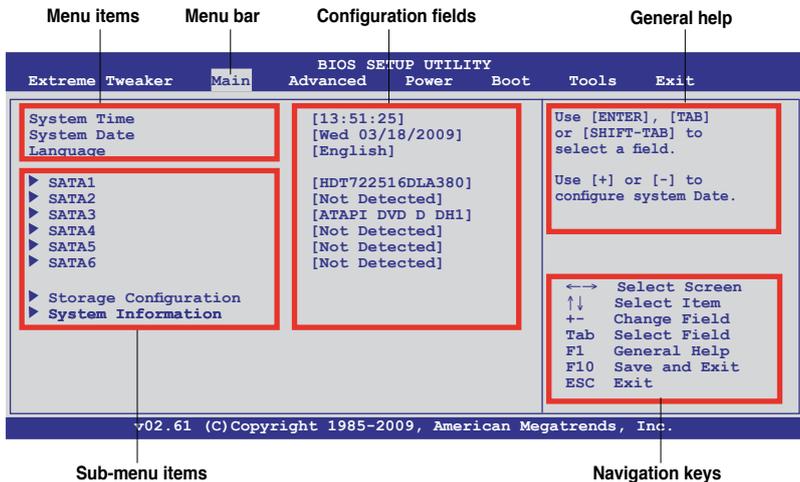
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 Setup Defaults** item under the Exit Menu. See section 3.9 **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 at [www.asus.com](http://www.asus.com) to download the latest BIOS file for this motherboard.
-

### 3.2.1 BIOS menu screen



### 3.2.2 Menu bar

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

- Extreme Tweaker** For changing the overclocking settings
- Main** For changing the basic system configuration
- 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.

### 3.2.3 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.

### 3.2.4 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.

### 3.2.5 Submenu items

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

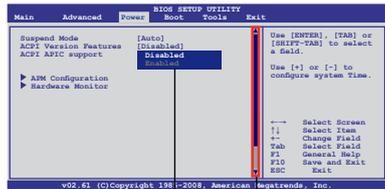
### 3.2.6 Configuration fields

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 3.2.7 Pop-up window.

### 3.2.7 Pop-up window

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



Scroll bar  
Pop-up window

### 3.2.8 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.

### 3.2.9 General help

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

### 3.3 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 default values of the following items vary depending on the CPU and memory modules you install on the motherboard.

BIOS SETUP UTILITY	
Extreme Tweaker	Main Advanced Power Boot Tools Exit
<b>Configure System Performance Settings</b>	
Tuning Mode	[Extreme OC]
CPU Level Up	[Auto]
Ai Overclock Tuner	[Auto]
CPU Ratio Setting	[Auto]
▶ CPU Configuration	
CPU Clock Skew	[Auto]
NB Clock Skew	[Auto]
FSB Strap to North Bridge	[Auto]
DRAM Frequency	[Auto]
DRAM CLK Skew on Channel A1	[Auto]
DRAM CLK Skew on Channel A2	[Auto]
DRAM CLK Skew on Channel B1	[Auto]
DRAM CLK Skew on Channel B2	[Auto]
DRAM Timing Control	[Auto]
1st Information:	5-5-5-15-3-36-5-3
2nd Information:	8-3-5-4-6-4-7
3rd Information:	13-5-1-5-5
DRAM Static Read Control	[Auto]

Tuning Mode is the BIOS menu switch for different purpose. Extreme OC offers the max tuning degree of freedom to the extreme. Gaming provides the major tuning settings for system performance boot.

←→ Select Screen  
↑↓ Select Item  
+- Change Field  
F1 General Help  
F10 Save and Exit  
ESC Exit

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Scroll down to display the following items:

DRAM Read Training	[Auto]
MEM. OC Charger	[Auto]
Ai Clock Twister	[Auto]
Ai Transaction Booster	[Auto]
C/P : A1 A2 A3 A4	
LVL : 09 09 09 09	
Load-Line Calibration	[Auto]
CPU Differential Amplitude	[Auto]
***** Please key in numbers directly! *****	
Current Voltage:	1.237V 1.535V 1.204V
CPU Temperature:	33°C/91°F
CPU Voltage	[Auto]
CPU PLL Voltage	[Auto]
FSB Termination Voltage	[Auto]
Current Voltage:	1.885V
DRAM Voltage	[Auto]
Current Voltage:	1.124V 1.124V 1.508V
NB/SB Temperature:	42°C/107.5°F 46°C/114.5°F
North Bridge 1.1 Voltage	[Auto]
South Bridge 1.1 Voltage	[Auto]
South Bridge 1.5 Voltage	[Auto]
***** Please select voltage directly! *****	
CPU GTL Reference (0)	[Auto]
CPU GTL Reference (1)	[Auto]
CPU GTL Reference (2)	[Auto]
CPU GTL Reference (3)	[Auto]
NB GTL Reference (0)	[Auto]
DDR2 ChA Reference Voltage	[Auto]
DDR2 ChB Reference Voltage	[Auto]
North Bridge DDR Reference	[Auto]
Read POST Code from LCD Poster/iROG Control Plus	
Debug Mode	[String]
Keyboard Tweakit Control	[Disabled]
CPU Spread Spectrum	[Auto]
PCIE Spread Spectrum	[Auto]

←→ Select Screen  
↑↓ Select Item  
+- Change Option  
F1 General Help  
F10 Save and Exit  
ESC Exit

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### 3.3.1 Tuning Mode [Extreme OC]

The Tuning Mode item is the Extreme Tweaker menu item switch for different purpose. The **Extreme OC** mode offers the maximum tuning degree of freedom to the extreme. The **Gaming** mode provides the major tuning settings for system performance boost. Configuration options: [Extreme OC] [Gaming]

### 3.3.2 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. If you want to manually configure the settings in detail, set Ai Overclock Tuner to [Manual] after selecting a CPU level. Configuration options: [Auto] [E6400] [E6550] [E6600] [E6700] [X6800] [E6850] [Crazy]

### 3.3.3 Ai Overclock Tuner [Auto]

Allows selection of CPU/memory overclocking options to achieve desired CPU/memory internal frequency. Select any of the preset overclocking configuration options:

<b>Manual</b>	Allows you to individually set overclocking parameters.
<b>Auto</b>	Loads the standard settings for the system.
<b>CPU Level Up</b>	Allows you to select a CPU level, and the related parameters will be adjusted automatically.

### 3.3.4 CPU Ratio Setting [Auto]

Allows you to adjust the ratio between CPU Core Clock and FSB Frequency. Use the <+> and <-> keys to adjust the value. **The valid value ranges differently** according to your CPU model.

### 3.3.5 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects. Refer to **section 3.5.1** for details.

### 3.3.6 FSB Frequency [266]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the FSB frequency. You can also type in the desired frequency using the numeric keypad. The values range from 200 to 800. This item appears only when you set **CPU Ratio Settings** to [Manual].

### 3.3.7 CPU Clock Skew [Auto]

Adjusting this item may help enhancing BCLK overclocking ability. You may need to adjust the **NB Clock Skew** item at the same time.

Configuration options: [Auto] [Normal] [Delay 100ps]–[Delay 1500ps]

### 3.3.8 NB Clock Skew [Auto]

Adjusting this item may help enhancing BCLK overclocking ability. You may need to adjust the **CPU Clock Skew** item at the same time.

Configuration options: [Auto] [Normal] [Delay 100ps]–[Delay 1500ps]

### 3.3.9 FSB Strap to North Bridge [Auto]

Selects the FSB strap frequency when the chipset switches to a different work mode. When set to [Auto], the FSB Strap will be adjusted automatically by FSB Frequency and DRAM Frequency.

Configuration options: [Auto] [200MHz] [266MHz] [333MHz] [400MHz]

### 3.3.10 DRAM Frequency [Auto]

Allows you to set the DDR2 operating frequency.

Configuration options: [Auto] [DDR2-533MHz] [DDR2-639MHz] [DDR2-667MHz] [DDR2-709MHz] [DDR2-800MHz] [DDR2-852MHz] [DDR2-887MHz] [DDR2-1066MHz]

### 3.3.11 DRAM CLK Skew on Channel A/B 1/2 [Auto]

Adjusting these items may help enhancing DRAM overclocking ability.

Configuration options: [Auto] [Advance 350ps] [Advance 300ps] [Advance 250ps] [Advance 200ps] [Advance 150ps] [Advance 100ps] [Advance 50ps] [Normal] [Delay 50ps] [Delay 100ps] [Delay 150ps] [Delay 200ps] [Delay 250ps] [Delay 300ps] [Delay 350ps]

### 3.3.12 DRAM Timing Control [Auto]

Configuration options: [Auto] [Manual]



- The following sub-items appear only when you set the **DRAM Timing Control** item to [Manual].
- The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

### 1st Information: 5-5-5-15-3-36-5-3

The values vary depending on your settings of the following sub-items:

*CAS# Latency [5 DRAM Clocks]*

Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]–[11 DRAM Clocks]

*DRAM RAS# to CAS# Delay [5 DRAM Clocks]*

Configuration options: [3 DRAM Clocks]–[18 DRAM Clocks]

*DRAM RAS# Precharge [5 DRAM Clocks]*

Configuration options: [3 DRAM Clocks]–[18 DRAM Clocks]

DRAM RAS# Activate to Precha [15 DRAM Clocks]

Configuration options: [3 DRAM Clocks]—[18 DRAM Clocks]

RAS# to RAS# Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

Row Refresh Cycle Time [Auto]

Configuration options: [Auto] [20 DRAM Clocks] [25 DRAM Clocks]—  
[65 DRAM Clocks] [70 DRAM Clocks] [80 DRAM Clocks] [85 DRAM Clocks]  
[105 DRAM Clocks] [132 DRAM Clocks]

Write Recovery Time [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

Read to Precharge Time [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

**2nd Information: 8-3-5-4-6-4-7**

The values vary depending on your settings of the following sub-items:

READ to WRITE Delay(S/D) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

Write to Read to Delay(S) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

WRITE to READ Delay(D) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

READ to READ Delay(S) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

READ to READ Delay(D) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

WRITE to WRITE Delay(S) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

WRITE to WRITE Delay(D) [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

**3rd Information: 13-5-1-5-5**

WRITE to PRE Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

READ to PRE Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

PRE to PRE Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[3 DRAM Clocks]

ALL PRE to ACT Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

ALL PRE to REF Delay [Auto]

Configuration options: [Auto] [1 DRAM Clocks]—[15 DRAM Clocks]

### 3.3.13 DRAM Static Read Control [Auto]

- [Auto] The BIOS automatically controls this function.
- [Enabled] Enhances the DRAM overclocking ability.
- [Disabled] Disables this function.

### 3.3.14 DRAM Read Training [Auto]

- [Auto] The BIOS automatically controls this function.
- [Enabled] Enables this function.
- [Disabled] Enhances the DRAM overclocking ability.

### 3.3.15 MEM. OC Charger [Auto]

- [Auto] The BIOS automatically controls this function.
- [Enabled] Enhances the DRAM overclocking ability.
- [Disabled] Disables this function.

### 3.3.16 Ai Clock Twister [Auto]

Allows you to configure the DRAM performance.

- [Auto] BIOS automatically adjusts the DRAM performance.
- [Moderate] Maintains the normal DRAM performance.
- [Light] Enhances the DRAM compatibility.
- [Lighter] Better enhances the DRAM compatibility.
- [Strong] Enhances the DRAM performance.
- [Stronger] Better enhances the DRAM performance.

### 3.3.17 Ai Transaction Booster [Auto]

Allows you to set the system performance.

- [Auto] BIOS automatically adjusts the system performance.
- [Manual] Select [Manual] to adjust the following two sub-items.



---

The following two sub-items appear only when you set the **Ai Transaction Booster** item to [Manual].

---

Common Performance Level [05]

Set this item to a higher level for better compatibility or a lower level for better performance. Use the <+> and <-> keys or the numeric keypad to enter the desired value. The values range from 1 to 31.

*Pull-In of CHA/B PH1/2/3/4 [Disabled]*

[Enabled] Applies enhancement on DRAM Channel A and B, Phase 1 to 5. The number of phases is determined by DRAM frequency and FSB strap.

[Disabled] Not allowed to adjust this function.

### 3.3.18 Load-Line Calibration [Auto]

Allows you to select the CPU Load-Line mode.

[Auto] BIOS automatically adjust the voltage.

[Disabled] Follows Intel specifications.

[Enabled] Improve CPU Vdroop directly.

### 3.3.19 CPU Differential Amplitude [Auto]

Allows you to select the CPU Amplitude. Different Amplitude might enhance FSB overclocking ability.

Configuration options: [Auto] [700mV] [800mV] [900mV] [1000mV]

### 3.3.20 PCIe Frequency [100]

Allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the PCIe frequency. You can also type in the desired value using the numeric keypad. The values range from 100 to 180. This item appears when you set **Ai Overclock Tuner** to [Manual].

### 3.3.21 CPU Voltage [Auto]

Allows you to set the CPU VCore voltage.



---

Refer to the CPU documentation before setting the CPU Vcore voltage. Setting a high VCore voltage may damage the CPU permanently, and setting a low VCore voltage may make the system unstable.

---

### 3.3.22 CPU PLL Voltage [Auto]

Allows you to set the CPU PLL voltage.

### 3.3.23 FSB Termination Voltage [Auto]

Allows you to set the front side bus termination voltage.

### 3.3.24 DRAM Voltage [Auto]

Allows you to set the DRAM voltage

### 3.3.25 North Bridge 1.1 Voltage [Auto]

Allows you to set the North Bridge 1.1 voltage.

### **3.3.26 South Bridge 1.1 Voltage [Auto]**

Allows you to set the South Bridge 1.1 voltage.

### **3.3.27 South Bridge 1.5 Voltage [Auto]**

Allows you to set the South Bridge 1.1 voltage.

### **3.3.28 CPU GTL Voltage Reference (0/2) [Auto]**

Allows you to set the CPU GTL voltage reference. Different ratio might enhance the CPU overclocking ability.

### **3.3.29 CPU GTL Voltage Reference (1/3) [Auto]**

Allows you to set the CPU GTL voltage reference. Different ratio might enhance the CPU overclocking ability.

### **3.3.30 NB GTL Reference [Auto]**

Allows you to set the Northbridge GTL reference voltage, or your can set to [Auto] for the safe mode. Different ratio might enhance CPU overclocking ability. Configuration options: [Auto] [0.67x] [0.61x]

### **3.3.31 DDR2 ChA/B Reference Voltage [Auto]**

Allows you to set the DDR2 ChA and ChB reference voltage, or your can set to [Auto] for the safe mode. Different ratio might enhance CPU overclocking ability.

### **3.3.32 North Bridge DDR Reference [Auto]**

Allows you to set the North Bridge DDR reference voltage, or your can set to [Auto] for the safe mode. Different ratio might enhance CPU overclocking ability.

### **3.3.33 Debug Mode [String]**

Allows you to select the debug mode. Configuration options: [String] [Code]

### **3.3.34 Keyboard TweakIt Control [Disabled]**

Allows you to enable or disable the keyboard TweakIt control. Configuration options: [Disabled] [Enabled]

### **3.3.35 CPU Spread Spectrum [Auto]**

[Disabled] Enhances FSB overclocking ability  
[Auto] Set to [Auto] for EMI control.

### 3.3.36 PCIE Spread Spectrum [Auto]

[Disabled] Enhances the PCIE overclocking ability

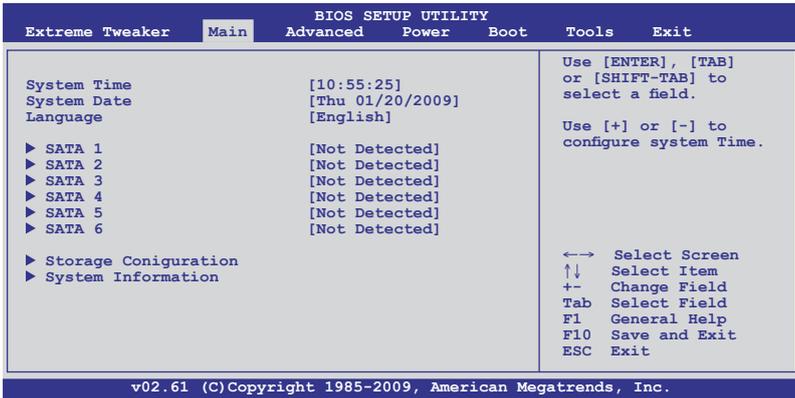
[Auto] Set to [Auto] for EMI control.

## 3.4 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 **3.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.



### 3.4.1 System Time [xx:xx:xx]

Allows you to set the system time.

### 3.4.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

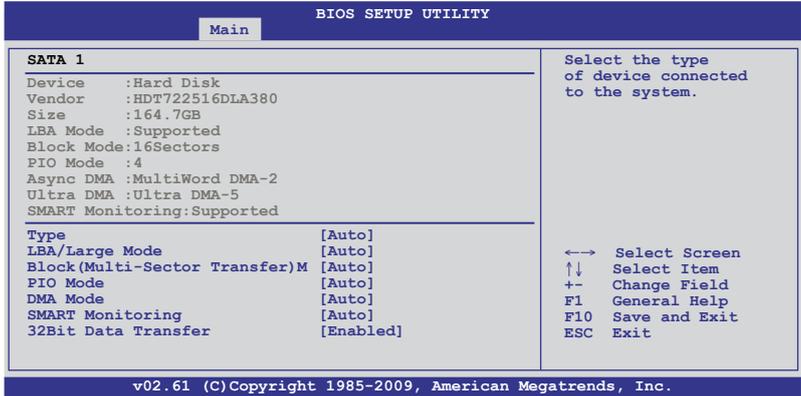
### 3.4.3 Language [English]

Allows you to choose the BIOS language version from the options.

Configuration options: [繁體中文] [簡體中文] [日本語] [Français] [Deutsch] [English]

### 3.4.4 SATA 1-6

While entering Setup, the BIOS automatically detects the presence of Serial ATA 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 [Auto] if no IDE device is installed in the system.

#### Type [Auto]

Allows you to select the type of IDE drive installed.

[Not Installed] Select this option if no IDE drive is installed.

[Auto] Allows automatic selection of the appropriate IDE device type.

[CDROM] Select this option if you are specifically configuring a CD-ROM drive.

[ARMD] Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

#### LBA/Large Mode [Auto]

Enables or disables the LBA (Logical Block Addressing) mode.

[Auto] Select [Auto] to enable the LBA mode (Logical Block Addressing mode) if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

[Disabled] Disable this function.

### **Block (Multi-Sector Transfer) M [Auto]**

Enables or disables data multi-sectors transfers.

[Auto] 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.

[Disabled] When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

### **PIO Mode [Auto]**

[Auto] Allows automatic selection of the PIO (Programmed input/output) modes, which correspond to different data transfer rates.

[0] [1] – [4] Set the PIO mode to Mode 0, 1, 2, 3, or 4.

### **DMA Mode [Auto]**

DMA (Direct Memory Access) allows your computer to transfer data to and from the hardware devices installed with much less CPU overhead.

The DMA mode consists of SDMA (single-word DMA), MDMA (multi-word DMA), and UDMA (Ultra DMA). Setting to [Auto] allows automatic selection of the DMA mode, or you can select from the following options: [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

### **SMART Monitoring [Auto]**

[Auto] Allows automatic selection of the S.M.A.R.T (Smart Monitoring, Analysis, and Reporting Technology).

[Enabled] Enable the S.M.A.R.T feature.

[Disabled] Disable the S.M.A.R.T feature.

### **32Bit Data Transfer [Enabled]**

[Enabled] Sets the IDE controller to combine two 16-bit reads from the hard disk into a single 32-bit double word transfer to the processor. This makes more efficient use of the PCI bus as fewer transactions are needed for the transfer of a particular amount of data.

[Disabled] Disable this function.

### 3.4.5 Storage Configuration

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

Main		BIOS SETUP UTILITY
<b>Storage Configuration</b>		
SATA Configuraton	[Enhanced]	Set [Compatible Mode] when Legacy OS (i.e. WIN ME, 98, NT4.0, MS DOS) is used.
Configure SATA as	[IDE]	
Hard Disk Write Protect	[Disabled]	Set [Enhanced Mode] when Native OS (i.e. WIN2000, Win XP, Vista) is used.
IDE Detect Time Out (Sec)	[35]	

#### SATA Configuration [Enhanced]

Configuration options: [Disabled] [Compatible] [Enhanced]

##### Configure SATA as [IDE]

Allows you to set the SATA configuration. This item appears only when you set the **SATA Configuration** item to [Compatible] or [Enhanced].

- [IDE] Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.
- [RAID] Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.
- [AHCI] Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

#### Hard Disk Write Protect [Disabled]

[Enabled] Enable device write protection. This function will be effective only if the device is accessed through BIOS.

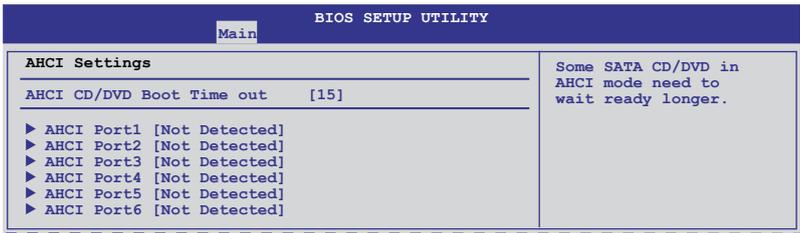
[Disabled] Disable this function.

#### SATA Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices from the following options: [0] [5] [10] [15] [20] [25] [30] [35]

### 3.4.6 AHCI Configuration

This menu is for AHCI configuration. It appears only when you set the **Configure SATA as** item under SATA Configuration to [AHCI].

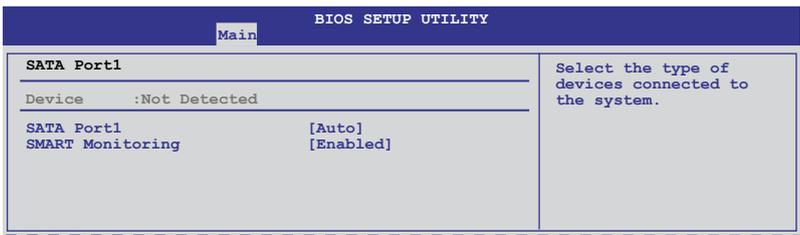


#### AHCI CD/DVD Boot Time out [15]

Selects the boot time out value for SATA CD/DVD devices in AHCI mode from the following options: [0] [5] [10] [15] [20] [25] [30] [35]

#### AHCI Port1-6 [XXXX]

Displays the status of auto-detection of SATA devices.



#### SATA Port1-6 [Auto]

[Auto] Allows automatic selection of the device type connected to the system.

[Not Installed] Select this option if no SATA devices are installed.

#### SMART Monitoring [Enabled]

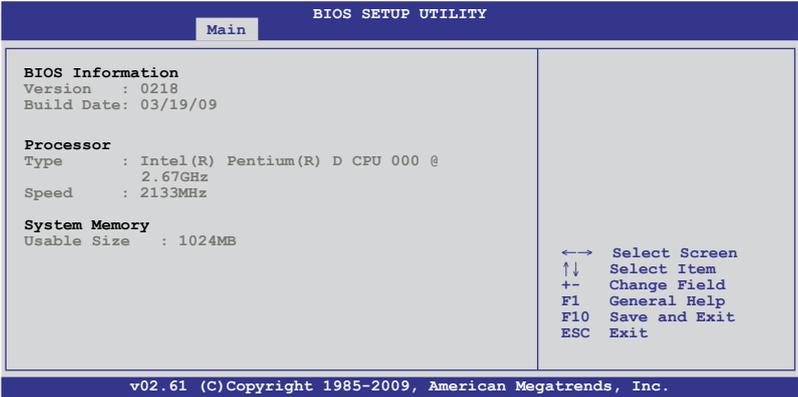
S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitor system. When read/write of your hard disk errors occur, this feature allows the hard disk to report warning messages during the POST.

[Enabled] Enable the SMART monitoring feature.

[Disabled] Disable the SMART monitoring feature.

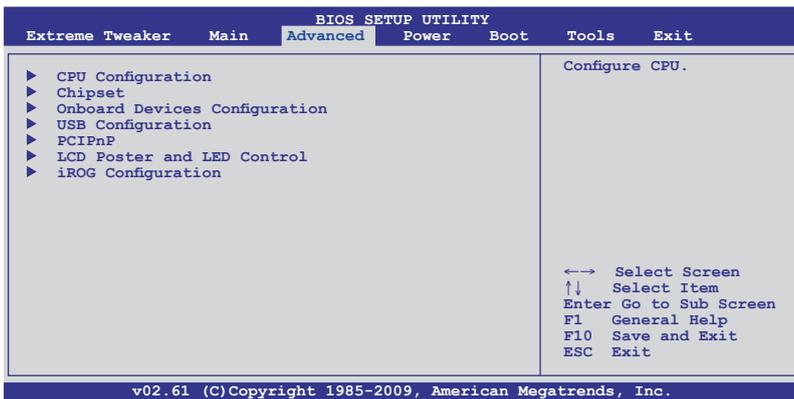
### 3.4.7 System Information

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



## 3.5 Advanced menu

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

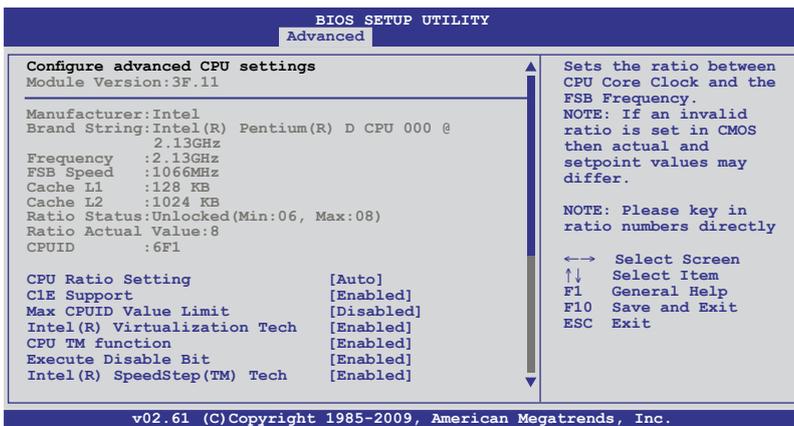


### 3.5.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.



The items shown in this screen may be different due to the CPU you installed.



### **CPU Ratio Setting [Auto]**

Allows you to set the ratio between the CPU Core Clock and the FSB Frequency. Use <+> and <-> to adjust the ratio. The valid value ranges differently according to your CPU model.

### **C1E Support [Disabled]**

[Enabled] Enables the C1E support function. This item should be enabled in order to enable the Enhanced Halt State.

[Disabled] Disables this function.

### **Max CPUID Value Limit [Disabled]**

[Enabled] Allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

[Disabled] Disables this function.

### **Intel(R) Virtualization Tech [Enabled]**

[Enabled] Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

[Disabled] Disables this function.

### **CPU TM function [Enabled]**

[Enabled] Enables the overheated CPU to throttle its clock speed to cool down.

[Disabled] Disables this function.

### **Execute Disable Bit [Enabled]**

[Enabled] Enables the No-Execution Page Protection Technology.

[Disabled] Forces the XD feature flag to always return to zero (0).

### **Intel(R) SpeedStep (TM) Tech. [Enabled]**

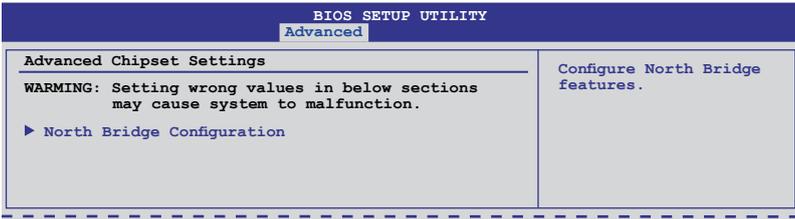
Allows you to use the Enhanced Intel SpeedStep® Technology (EIST).

[Enabled] Enables the EIST function.

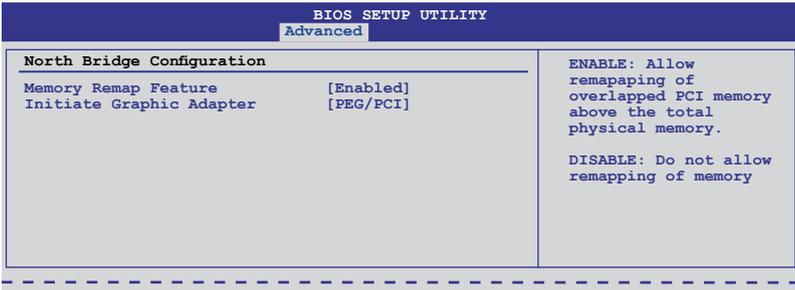
[Disabled] Disables this function.

## 3.5.2 Chipset

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



### North Bridge Configuration



#### Memory Remap Feature [Enabled]

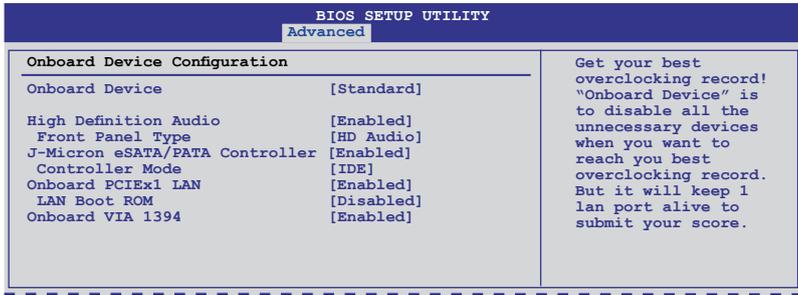
[Enabled] Enables the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system.

[Disabled] Disables this function.

#### Initiate Graphic Adapter [PEG/PCI]

Allows you to decide which graphics controller to use as the primary boot device. Configuration options: [PCI/PEG] [PEG/PCI]

### 3.5.3 Onboard Device Configuration



#### Onboard Device [Standard]

Allows you to disable all the onboard device controllers except the LAN controller.  
Configuration options: [Standard] [Disabled]

#### High Definition Audio [Enabled]

[Enabled] Enables the High Definition Audio Controller.  
[Disabled] Disables the controller.

##### Front Panel Type [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.

[AC97] Set the front panel audio connector (AAFP) mode to legacy AC'97  
[HD Audio] Set the front panel audio connector (AAFP) mode to high-definition audio.

#### J-Micron eSATA/PATA Controller [Enabled]

[Enabled] Enables the J-Micron eSATA/PATA controller.  
[Disabled] Disables the controller.

##### Controller Mode [IDE]

Allows you to set the controller mode.  
Configuration options: [IDE] [AHCI]

#### Onboard PCIe1 LAN [Enabled]

Allows you to enable or disable the onboard PCIe1 LAN controller.  
Configuration options: [Enabled] [Disabled]

##### Onboard LAN BootROM [Disabled]

This item appears only when you enable the previous item.

[Enabled] Enables the onboard LAN Boot ROM.  
[Disabled] Disables the onboard LAN Boot ROM.

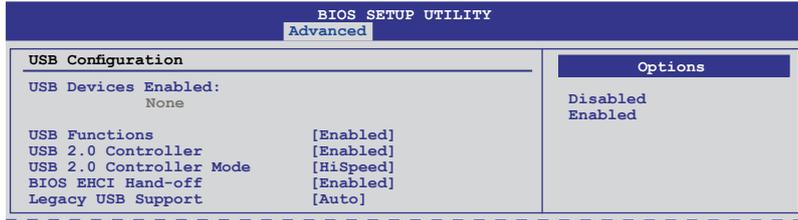
## Onboard VIA 1394 [Enabled]

[Enabled] Enables the VIA 1394 controller.

[Disabled] Disables the controller.

## 3.5.4 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 **USB Devices Enabled** item shows the auto-detected values. If no USB device is detected, the item shows None.

## USB Functions [Enabled]

[Enabled] Enables the USB Host Controllers.

[Disabled] Disables the controllers.



The following items appear only when you set **USB Functions** to [Enabled].

## USB 2.0 Controller [Enabled]

[Enabled] Enables the USB 2.0 controller.

[Disabled] Disables the controller.

## USB 2.0 Controller Mode [HiSpeed]

[FullSpeed] Set the USB 2.0 controller mode to FullSpeed (12 Mbps).

[HiSpeed] Set the USB 2.0 controller mode to HiSpeed (480 Mbps).



The **USB 2.0 Controller Mode** item appears only when you enable the **USB 2.0 Controller**.

## BIOS EHCI Hand-off [Enabled]

[Enabled] Enables the support for operating systems without an EHCI hand-off feature.

[Disabled] Disables the function.

### Legacy USB Support [Auto]

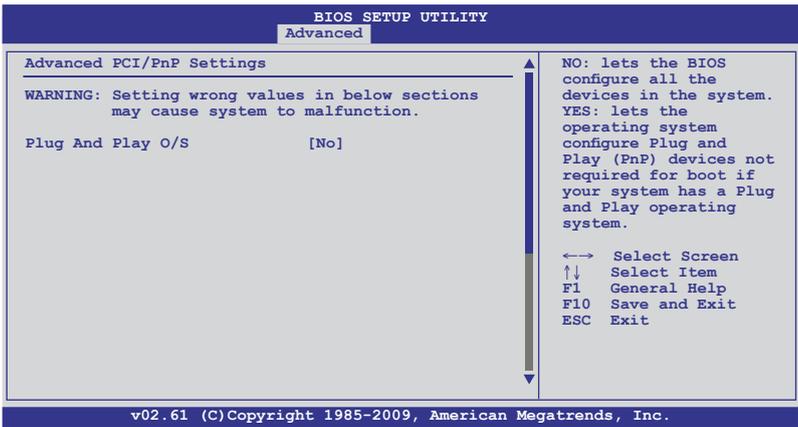
- [Auto] Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
- [Enabled] Enables the support for USB devices on legacy operating systems (OS).
- [Disabled] Disables the function.

### 3.5.5 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP 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]

- [Yes] 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.
- [No] When set to [No], BIOS configures all the devices in the system.

### 3.5.6 LCD Poster and LED Control

BIOS SETUP UTILITY	
Advanced	
LCD Poster and LED Control	
LCD Poster Backlight	[Turn Off]
LCD Poster Backlight(S5)	[Turn Off]
LCD Poster Mode	[Current Time]
All LED Control	[Enabled]
Voltiminder LED	[Enabled]
CPU LED Selection	[CPU]
NB LED Selection	[NB]
SB LED Selection	[ICH]

Turn On/Turn Off LCD Poster when system is working

#### LCD Poster Backlight [Turn Off]

Allows you to turn on/off the LCD Poster backlight when the system is working.

#### LCD Poster Backlight (S5) [Turn Off]

Allows you to turn on/off the LCD Poster backlight when the system is in soft-off state.

#### LCD Poster Mode [Current Time]

Allows the LCD Poster to display either hardware information or time.

Configuration options: [Current Time] [HWM Information]



The following item becomes configurable when you set **LCD Poster Mode** to [HWM Information].

#### HWM Select Mode

Allows you to select which hardware information to display on the LCD Poster. Configuration options: [All Voltage] [All Temperature] [All Fan Speed]

#### All LED Control [Enabled]

Allows you to enable or disable the onboard LEDs control.

Configuration options: [Enabled] [Disabled]



The following items appear only when you set **All LED Control** to [Enabled].

#### Voltiminder LED [Enabled]

Allows you to enable or disable the onboard Voltiminder LED.

Configuration options: [Enabled] [Disabled]

#### CPU LED Selection [CPU]

Allows you to switch the onboard CPU LED display between CPU voltage [CPU], CPU PLL voltage [CPU PLL] and QPI/DRAM Core voltage [QPI/DRAM Core].

Configuration options: [CPU] [CPU PLL]

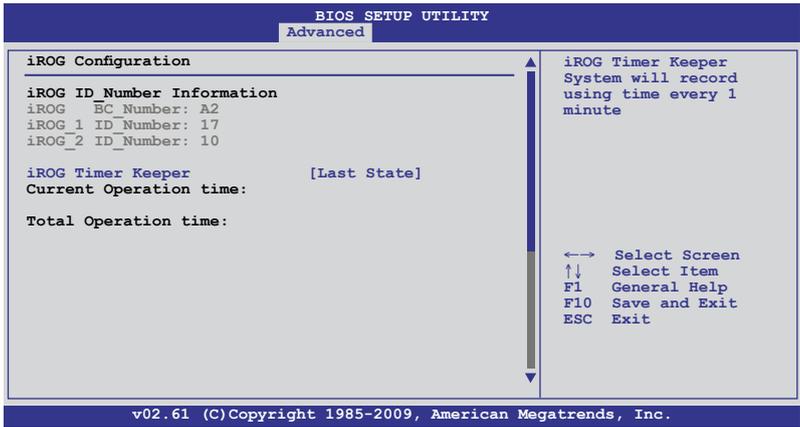
### NB LED Selection [NB]

Allows you to switch the onboard northbridge LED display.  
Configuration options: [NB] [VTT]

### SB LED Selection [ICH]

Allows you to switch the onboard southbridge LED display.  
Configuration options: [ICH] [ICH PCIE]

## 3.5.7 iROG Configuration

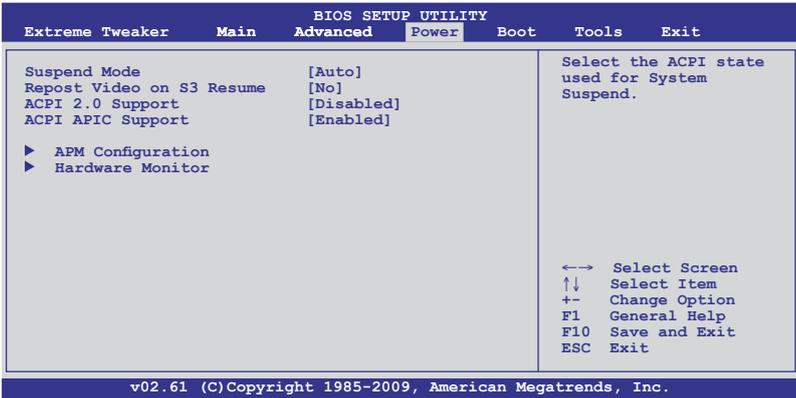


### iROG Timer Keeper [Last State]

Allows you to set the iROG Time Keeper operation mode.  
Configuration options: [Last State] [Disabled] [Enabled]

## 3.6 Power menu

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



### 3.6.1 Suspend Mode [Auto]

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

[Auto]

[S1 (POS) only] In this state, your computer is technically in standby

[S3 only]

### 3.6.2 Repost Video on S3 Resume [Disabled]

Determines whether to invoke VGA BIOS POST on S3/STR resume.

[Disabled] When set to [Disabled], the system will not invoke VGA BIOS POST on S3/STR resume.

[Enabled] When set to [Enabled], the system invokes VGA BIOS POST on S3/STR resume.

### 3.6.3 ACPI 2.0 Support [Disabled]

[Disabled] When set to [Disabled], the system will not add additional tables as per ACPI 2.0 specifications.

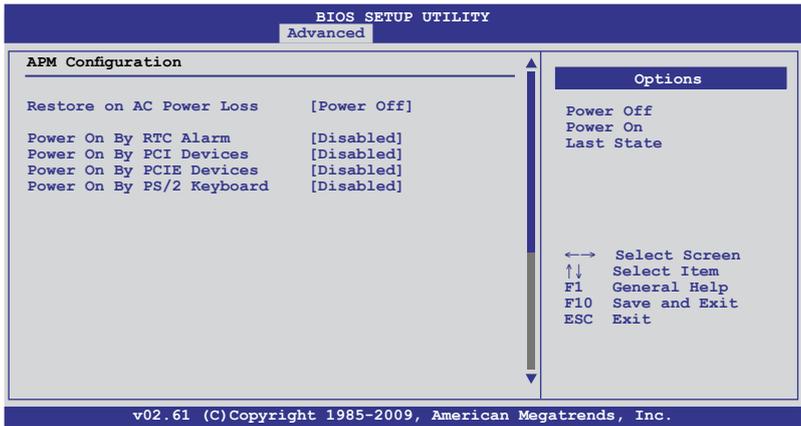
### 3.6.4 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC).

[Disabled] When set to [Disabled], the system disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC).

[Enabled] When set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list.

### 3.6.5 APM Configuration



#### Restore On AC Power Loss [Power Off]

[Power Off] The system goes into off state after an AC power loss.

[Power On] The system goes into on state after an AC power loss.

[Last State] The system goes into either off or on state, whatever the system state was before the AC power loss.

### **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 items **RTC Alarm Date/ RTC Alarm Hour/ RTC Alarm Minute/ RTC Alarm Second** will become user-configurable with set values. Configuration options: [Disabled] [Enabled]

[Disabled] Disables RTC to generate a wake event.

[Enabled] When set to [Enabled], the items **RTC Alarm Date/ RTC Alarm Hour/ RTC Alarm/ RTC Alarm Second** will become user-configurable with set values.

### **Power On By PCI Devices [Disabled]**

Allows you to enable or disable the PME to wake up from S5 by PCI devices.

[Disabled] Disables the PME to wake up from S5 by PCI devices.

[Enabled] 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.

### **Power On By PCIE Devices [Disabled]**

Allows you to enable or disable the PCIE devices to generate a wake event.

[Disabled] Disables the PCIE devices to generate a wake event.

[Enabled] Enables the PCIE devices to generate a wake event.

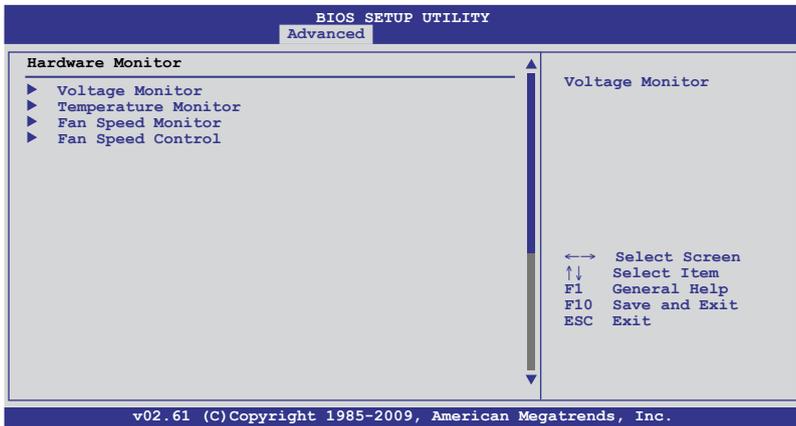
### **Power On By PS/2 Keyboard [Disabled]**

Allows you to disable or enable the Power On by PS/2 keyboard function.

[Disabled] Disables the Power On by PS/2 keyboard function.

[Enabled] **Sets specific keys on the PS/2 keyboard to turn on the system.** This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

### 3.6.6 Hardware Monitor



#### Voltage Monitor

CPU Voltage; CPU PLL Voltage; DRAM VTT Voltage; FSB Termination Voltage; North Bridge 1.1 Voltage; South Bridge 1.1 Voltage; South Bridge 1.5 Voltage; DRAM Voltage; 3.3V Voltage; 5V Voltage; 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

#### Temperature Monitor

CPU Temperature; MB Temperature; NB Temperature; SB Temperature; OPT FAN1/2 Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU, northbridge, southbridge, motherboard, power, and the assigned devices temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

NB overheat protection; SB overheat protection [100°C]

The system automatically shuts down when the northbridge or southbridge chipset is heated over the set temperature to protect it from damage. Configuration options: [Disabled] [70°C] [80°C] [90°C] [100°C]

OPT FAN1/2 overheat protection [100°C]

Allows you to set the temperature over which the system automatically shuts down when any of the thermal sensor cables connected to the motherboard detects device overheat to protect the device from damage. Configuration options: [Disabled] [70°C] [80°C] [90°C] [100°C]

## Fan Speed Monitor

*CPU Fan: Chassis Fan1/2; OPT Fan1/2 Speed [xxxxRPM] or [Ignored] / [N/A]*

The onboard hardware monitor automatically detects and displays the CPU fan, chassis fan, power fan, and optional fan speed in rotations per minute (RPM). If any of the fans is not connected to the motherboard, the field shows [N/A]. These items are not user-configurable.

## Fan Speed Control

BIOS SETUP UTILITY	
Power	
<b>Fan Speed Control</b>	
CPU Q-Fan Control	[Disabled]
Chassis Q-Fan Control	[Disabled]
OPTFan1 Control	[Disabled]
OPTFan2 Control	[Disabled]
CPU Q-Fan Control	

CPU Q-Fan Control [Disabled]

Allows you to enable or disable the CPU fan controller.

[Disabled] Disables the CPU Q-fan controller.

[Enabled] Enables the CPU Q-fan controller.



The **CPU Fan Profile** item appears when you enable the CPU Fan Control feature.

CPU Fan Profile [Standard]

Allows you to set the appropriate performance level of the ASUS Q-Fan.

[Standard] Set to [Standard] to make the CPU fan moderately adjust for quiet fan operation.

[Silent] Set to [Silent Mode] to minimize the fan speed for quiet CPU fan operation

[Turbo] Set to [Turbo] to achieve maximum CPU fan speed.

Chassis Q-Fan Control [Disabled]

Allows you to enable or disable the Chassis fan controller.

[Disabled] Disables the Chassis Q-fan controller.

[Enabled] Enables the Chassis Q-fan controller.



The **Chassis Fan Profile** item appears when you enable the Chassis Fan Control feature.

### Chassis Fan Profile [Standard]

Allows you to set the appropriate performance level of the ASUS Q-Fan.

[Standard]	Set to [Standard] to make the CPU fan moderately adjust for quiet fan operation.
[Silent]	Set to [Silent Mode] to minimize the fan speed for quiet CPU fan operation
[Turbo]	Set to [Turbo] to achieve maximum CPU fan speed.

### OPTFan1/2 Control [Disabled]

Allows you to select the optional fan control mode. When this item is set to [Duty Mode], you can configure the **OPTFan1/2 Duty** item. If you set this item to [User Mode], you are allowed to configure the **OPTFan1/2 Low Speed Temp** and **OPTFan1/2 Full Speed Temp** item.

Configuration options: [Disabled] [Duty Mode] [User Mode]



---

You need to connect the thermal sensor cables to the OPT\_TEMP1/2 connectors to enable this function.

---

### **OPTFan1/2 Duty [50%]**

Allows you to set the fan duty cycle. This item appears when the **OPTFan1/2 Control** item is set to [Duty Mode].

Configuration options: [40%] [50%] [60%] [70%] [80%] [90%]

### **OPTFan1/2 Low Speed Temp [25°C]**

Allows you to set the temperature at which the power fan rotates at low speed. This item appears when the **OPTFan1/2 Control** item is set to [User Mode].

Configuration options: [25°C] [30°C] [35°C] [40°C]

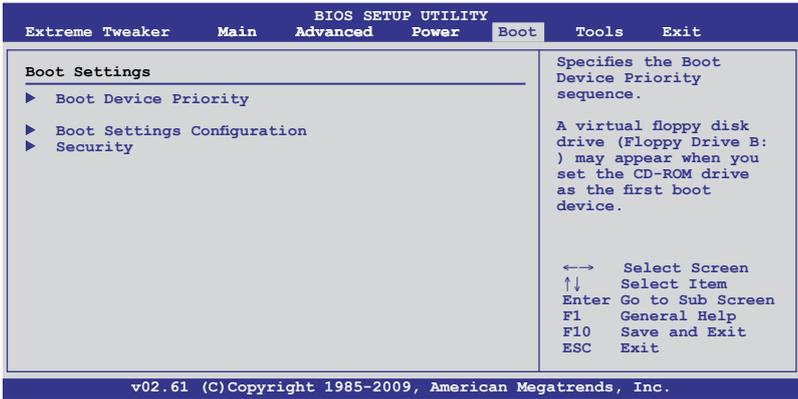
### **OPTFan1/2 Full Speed Temp [60°C]**

Allows you to set the temperature at which the power fan rotates at full speed. This item appears when the **OPTFan1/2 Control** item is set to [User Mode].

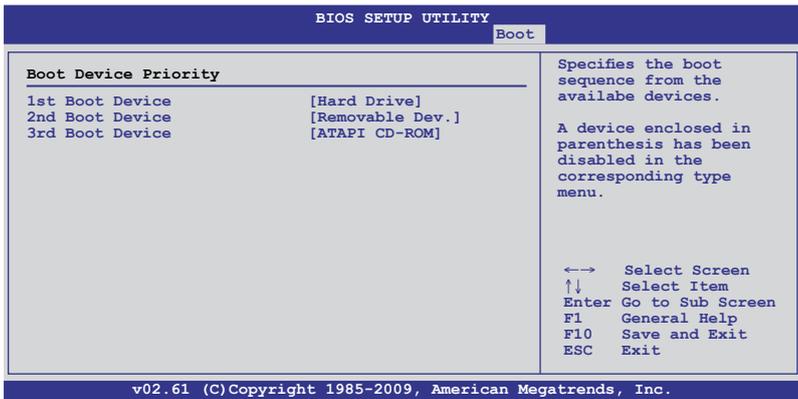
Configuration options: [60°C] [70°C] [80°C] [90°C]

## 3.7 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.



### 3.7.1 Boot Device Priority



#### 1st–xxth Boot Device [xxx 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: [xxx Drive] [Disabled]

## 3.7.2 Boot Settings Configuration

BIOS SETUP UTILITY		Boot
<b>Boot Settings Configuration</b>		
Quick Boot	[Enabled]	Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Full Screen Logo	[Enabled]	
AddOn ROM Display Mode	[Force BIOS]	
Bootup Num-Lock	[On]	
Wait for 'F1' if Error	[Enabled]	
Hit 'DEL' Message Display	[Enabled]	

### Quick Boot [Enabled]

Allows you to enable or disable the **Quick Boot** function.

- [Disabled] When set to [Disabled], BIOS performs all the POST items.
- [Enabled] When set to [Enabled], BIOS skips some power on self tests (POST) while booting to decrease the time needed to boot the system.

### Full Screen Logo [Enabled]

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

- [Enabled] Enables the full screen logo display feature.
- [Disabled] Disables the full screen logo display feature.



Set this item to [Enabled] to use the ASUS MyLogo3™ feature.

### AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

- [Force BIOS]
- [Keep Current] .

### Bootup Num-Lock [On]

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

- [On] Sets the power-on state of the NumLock to [On].
- [Off] Sets the power-on state of the NumLock to [Off].

### Wait for 'F1' If Error [Enabled]

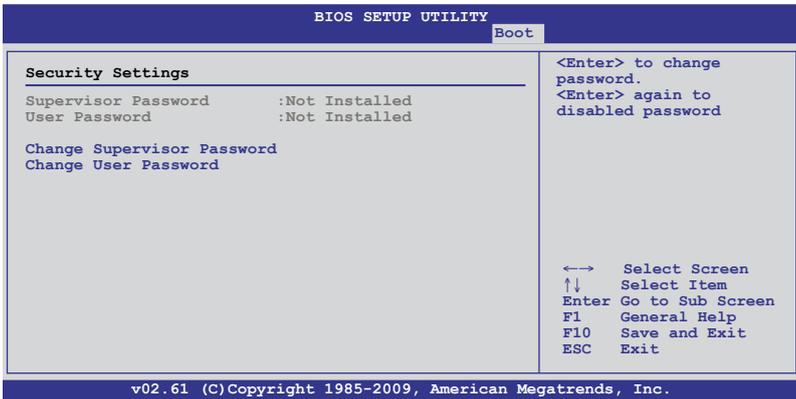
When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs.

### Hit 'DEL' Message Display [Enabled]

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

### 3.7.3 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.

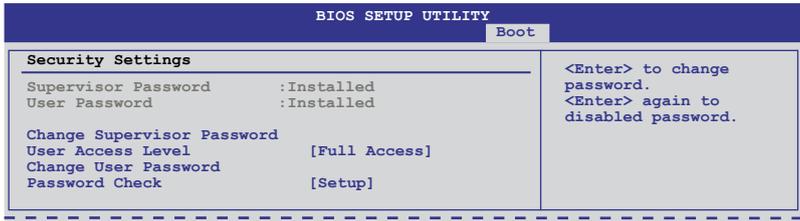
To change the supervisor password, follow the same steps as in setting a user password.

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 **2.6 Jumper** 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.

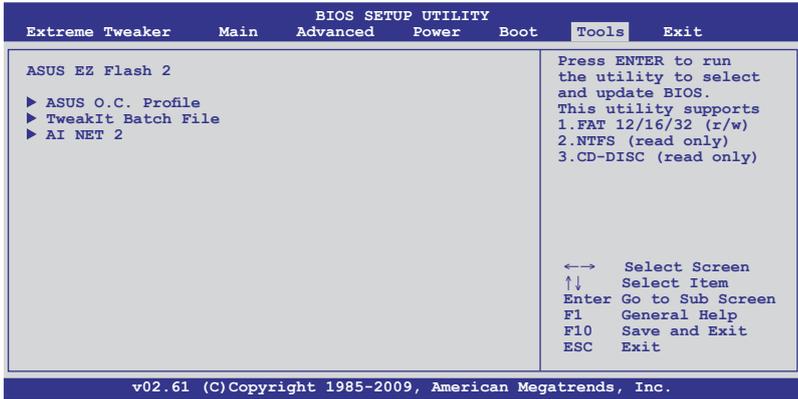
To change the user password, follow the same steps as in setting a user password.

### 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]

## 3.8 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the sub-menu.

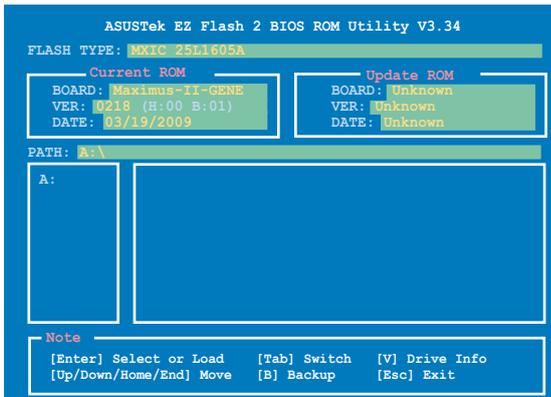


### 3.8.1 ASUS EZ Flash 2

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

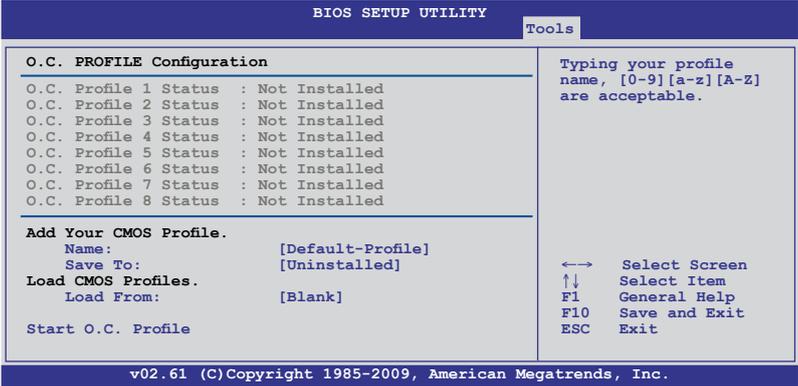


For more details, refer to [section 3.1.2 ASUS EZ Flash 2 utility](#).



### 3.8.2 ASUS O.C. Profile

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



#### Add Your CMOS Profile

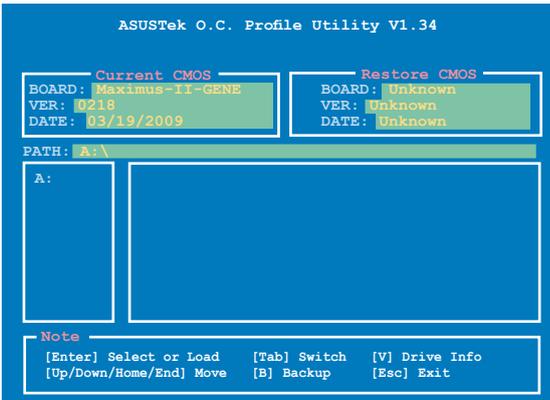
Allows you to save the current BIOS file to the BIOS Flash. In the Name sub-item, type your profile name and press <Enter>, and then choose a profile number to save your CMOS settings in the Save to sub-item.

#### Load CMOS Profiles

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter>, and choose a profile to load.

#### Start O.C. Profile

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

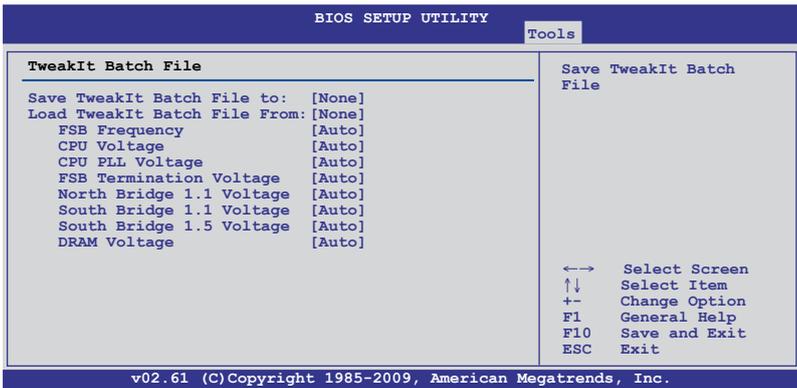




- This function supports devices such as a USB flash disk (FAT 32/16 format) or a floppy disk with single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.
- Only the CMO file can be loaded.

### 3.8.3 TweakIt Batch File

This menu allows you to set the TweakIt batch files, and load the desired TweakIt batch file.



#### Save TweakIt Batch File to:

Allows you to save the adjusted values for specific items as a TweakIt batch file.  
Configuration options: [None] [File 1] [File 2]

#### Load TweakIt Batch File to:

Allows you to load the desired TweakIt batch file.  
Configuration options: [None] [File 1] [File 2]

#### FSB Frequency; CPU Voltage; CPU PLL Voltage; FSB Termination Voltage; North Bridge 1.1 Voltage; South Bridge 1.1 Voltage; South Bridge 1.5 Voltage; DRAM Voltage

Allows you to use the <+> and <-> keys to adjust the values for each item. Refer to **3.3 Extreme Tweaker** Menu for details.

### 3.8.4 AI NET 2

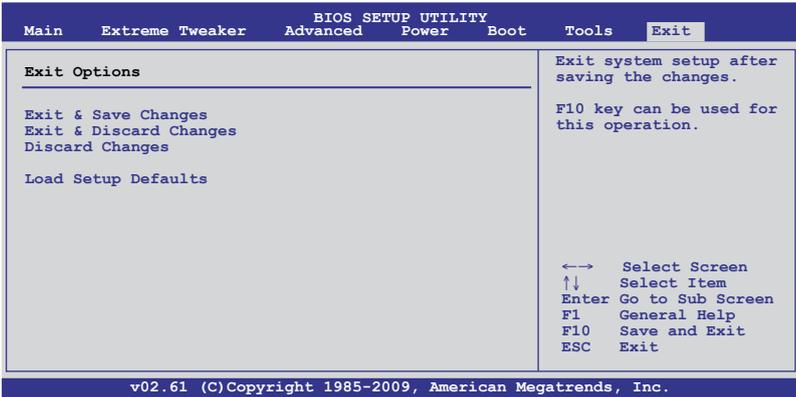
BIOS SETUP UTILITY			Tools
Ai Net 2			Check Realtek LAN cable during POST.  It will take 3 to 10 seconds to diagnose LAN cable.
Pair	Status	Length	
Check Realtek LAN cable			[Disabled]

#### Check Realtek LAN cable [Disabled]

Enables or disables checking of the LAN cable during the Power-On Self-Test (POST). Configuration options: [Disabled] [Enabled]

## 3.9 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 YES 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 YES 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 YES 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 DVD that comes with the motherboard package and the software.

# 4 Software support

4.1	Installing an operating system .....	4-1
4.2	Support DVD information .....	4-1
4.3	Software information .....	4-9
4.4	RAID configurations .....	4-32
4.5	Creating a RAID driver disk.....	4-49

## 4.1 Installing an operating system

This motherboard supports Windows® XP/64-bit 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.
- Ensure that you install Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

## 4.2 Support DVD information

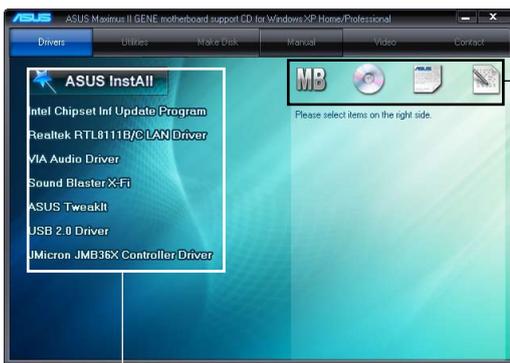
The support DVD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.



The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website at [www.asus.com](http://www.asus.com) for updates.

### 4.2.1 Running the support DVD

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



Click an icon to display support DVD/motherboard information

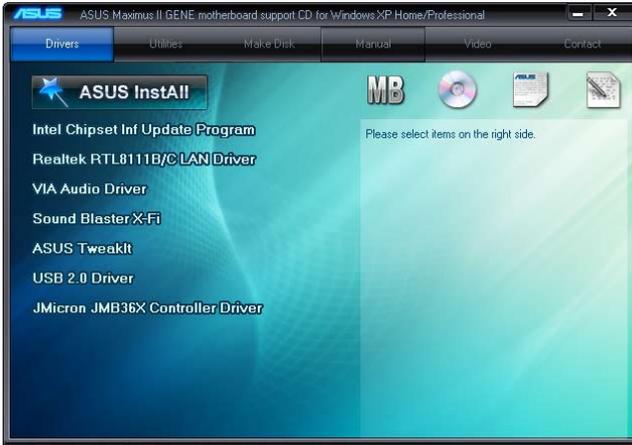
Click an item to install



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

## 4.2.2 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 InstAll driver installation wizard.

### **Intel Chipset Inf Update Program**

Installs the Intel® chipset inf update program.

### **Realtek RTL8111B/C LAN Driver**

Installs the Realtek® Gigabit Ethernet Driver.

### **VIA Audio Driver**

Installs the VIA® audio driver and application.

### **Sound Blaster X-Fi**

Installs the Sound Blaster X-Fi driver and utility.

### **ASUS TweakIt**

Installs the ASUS TweakIt driver and utility.

### **USB 2.0 Driver**

Installs the USB 2.0 driver.

### **JMicron JMB36X Controller Driver**

Installs the JMicron® JMB36X controller driver.

### 4.2.3 Utilities menu

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



#### ASUS InstAll - Installation Wizard for Utilities

Installs all of the utilities through the Installation Wizard.

#### ASUS Update

The ASUS Update utility allows you to update the motherboard BIOS in 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 voltage, and alerts you of any detected problems. This utility helps you keep your computer in healthy operating condition.

### **ASUS AI Suite**

Installs the ASUS AI Suite.

### **ASUS AI Direct Link**

The ASUS AI Direct Link provides up to 70% transferring speed improvement when compared to traditional USB 2.0 and is the easiest and fastest way for users to enjoy large-sized data exchange of files such as movies, music, etc.

### **Adobe Reader 8**

Installs the Adobe® Reader that allows you to open, view, and print documents in Portable Document Format (PDF).

### **Microsoft DirectX 9.0c**

Installs Microsoft DirectX 9.0c.

### **Anti-Virus Utility**

The anti-virus application scans, identifies, and removes computer viruses. View the online help for detailed information.

### **3DMark06 Software**

Installs the Futuremark® 3DMark06 system benchmark application.

### **Corel MediaOne Starter**

Installs the Corel MediaOne Starter application to easily manage, edit share and protect your multimedia data.

### **ASUS TurboV**

Installs ASUS TurboV, the advanced overclocking tool for extreme O.C. record.

### **Ulead Burn.Now**

Installs the Ulead Burn.Now application for Audio DVD, CD and data disc creation.

### **Ulead PhotoImpact 12 SE**

Installs the Ulead PhotoImpact 12 SE software.

### **Winzip 11**

Installs the Winzip utility for easy file-compression and protection.

### **ASUS EPU-6 Engine**

Installs the ASUS EPU-6 Engine driver and utility.

## 4.2.4 Make disk menu

The Make disk menu contains items to create the Intel ICH10R driver disk.



### Intel ICH10R 32/64 bit AHCI/RAID Driver

Allows you to create an ICH10R 32/64bit AHCI/RAID driver disk.

### JMicron JMB36X 32/64 bit RAID/AHCI Driver

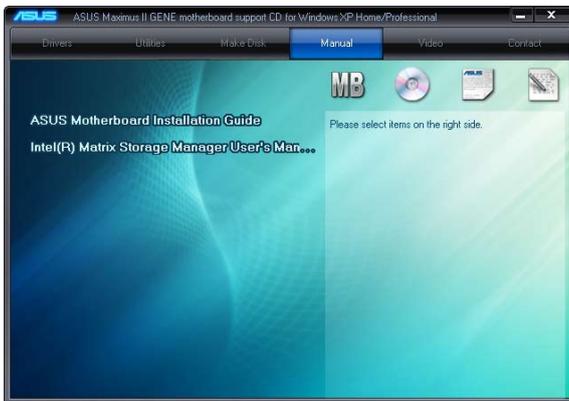
Allows you to create a JMicron® JMB36X RAID/AHCI driver disk for 32/64bit system.

## 4.2.5 Manual menu

The Manuals 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.



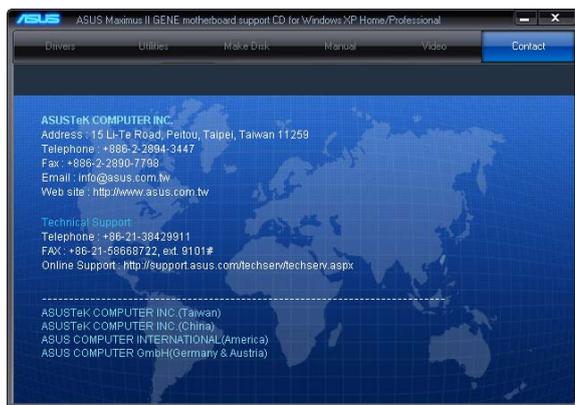
## 4.2.6 Video menu

Click the Video tab to display a list of video clips. Click the video titles to watch ROG users' outstanding performances with ROG motherboards.



## 4.2.7 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.

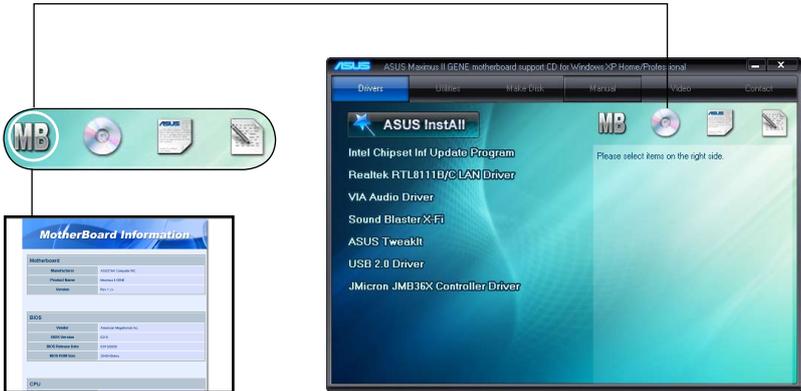


## 4.2.8 Other information

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

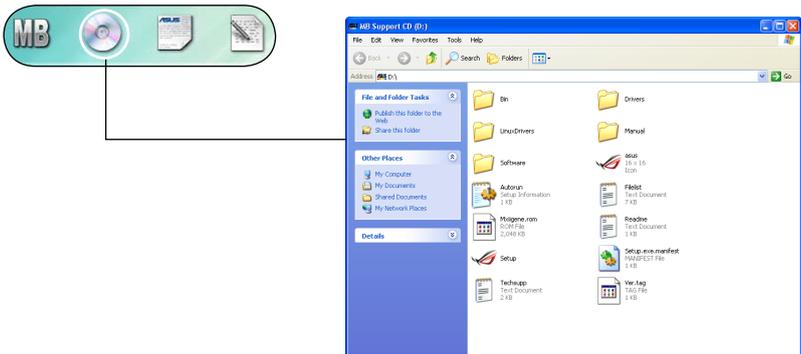
### Motherboard Info

Displays the general specifications of the motherboard.



### Browse this DVD

Displays the support DVD contents in graphical format.



## Technical support form

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



ASUSTEK TECHNICAL SUPPORT REQUEST FORM

ORIGINATOR DESCRIPTION

COMPANY NAME : CONTACT NAME :  
 PHONE (AREA) : FAX # (AREA) :  
 EMAIL ADDRESS :

HARDWARE DESCRIPTION

MOTHERBOARD : REVISION # : BIOS # (40164) :  
 CPU BRAND : SPEED (MHZ) :  
 DRAM BRAND : SPEED (NS) : SIZE (MB) :  
 CACHE BRAND : SPEED (NS) : SIZE (KB) :  
 HARD DISK : MODEL NAME : SIZE (MB) :  
 CDROM BRAND : MODEL NAME : SIZE (MB) :  
 OTHER STORAGE : MODEL NAME : SIZE (MB) :

ADD-IN CARD DESCRIPTION (MODEL NAME/VENDOR)

(E)ISA SLOT 1 :  
 (E)ISA SLOT 2 :  
 (E)ISA SLOT 3 :  
 (E)ISA SLOT 4 :  
 PCI-E SLOT 1 :  
 PCI-E SLOT 2 :  
 PCI SLOT 1 :  
 PCI SLOT 2 :  
 PCI SLOT 3 :  
 PCI SLOT 4 :  
 PCI SLOT 5 :

SOFTWARE DESCRIPTION

## Filelist

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



File list for the included support software for motherboard

```
--Drivers
-Chipset      -Intel Chipset software Installation utility v9.1.0.1007 For w
-Audio        -VIA Audio Driver v6.0.1.1600 For Windows XP/Vista & Windows 6
-LAN          -Realtek RTL8111C Ethernet Driver v5.702.806.2008 For Windows
-vista       -Realtek RTL8111C Ethernet Driver v6.210.1009.2008 For Windows
-RAID
-IMSM
  -install    -Intel(R) Matrix Storage Manager Driver v8.7.0.1007 for window
  -driver     -ICH10R AHCI/RAID driver disk for Windows XP/Vista & Windows 6
-MakeDisk    -Make ICH10R AHCI/RAID driver disk for Windows XP/Vista & Wind
-Micron       -Micron JMB36X Controller Driver v1.17.47.11 for Windows XP/V
-SB_XP1      -Sound Blaster X-Fi utility v1.0 for Windows XP/Vista & window
-TweakIt     -ASUS TweakIt v1.00.04 for Windows XP/Vista & Windows 64bit XP
-USB2        -USB2.0 Driver Installation for Windows XP.

--Manuals
-Intel-IMSM   -Intel(R) Matrix Storage Manager User's Manual.
-MB_guide     -ASUS Motherboard Installation Guide.
```

## 4.3 Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

### 4.3.1 ASUS MyLogo3™

The ASUS MyLogo3™ utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On Self-Tests (POST). The ASUS MyLogo3™ is automatically installed when you install the ASUS Update utility from the support DVD. See section 4.2.3 **Utilities menu** for details.



- Before using the ASUS MyLogo3™, use the ASUS Update utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section 3.1.1 **ASUS Update utility**.
- Ensure that the BIOS item Full Screen Logo is set to [Enabled] if you wish to use ASUS MyLogo3™. See section 3.7.2 **Boot Settings Configuration**.
- You can create your own boot logo image in GIF file formats.

To launch the ASUS MyLogo3™:

1. Launch the ASUS Update utility. Refer to section 3.1.1 **ASUS Update utility** for details.
2. Select **Options** from the drop down menu, then click **Next**.
3. Check the option **Launch MyLogo** to replace system boot logo before flashing BIOS, then click **Next**.
4. Select **Update BIOS** from a file from the drop down menu, then click **Next**.
5. When prompted, locate the new BIOS file, then click **Next**. The ASUS MyLogo window appears.
6. From the left window pane, select the folder that contains the image you intend to use as your boot logo.



- 7. When the logo images appear on the right window pane, select an image to enlarge by clicking on it.



- 8. Adjust the boot image to your desired size by selecting a value on the Ratio box.



- 9. When the screen returns to the ASUS Update utility, flash the original BIOS to load the new boot logo.
- 10. After flashing the BIOS, restart the computer to display the new boot logo during POST.

### 4.3.2 Sound Blaster X-Fi audio utility

With the SupremeFX X-Fi technology supported, you will be able to enjoy excellent audio quality and experience realistic sound effects through the audio codec and Sound Blaster X-Fi interface. Activating X-Fi's CMSS3D, Crystalizer, and EAX will deliver accurate virtual surround sound and enhanced audio dynamics, which amount to ultimate gaming experience.

To install Sound Blaster X-Fi:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.
2. Click the **Drivers** tab and click **VIA Audio Driver**.
3. Follow the screen instructions to complete installation.
4. Click the support DVD **Drivers** tab and click **Sound Blaster X-Fi**.
5. Follow the screen instructions to complete installation.



You need to install VIA Audio Driver to use Sound Blaster X-Fi audio utility.

If the Sound Blaster X-Fi audio utility is successfully installed, you will find the **Volume Panel** icon on the notification area.



Click the Volume Panel icon to display a list of Creative® media utilities that help you manage and play your media files. Click **Help** in each utility control panel to know more about them.



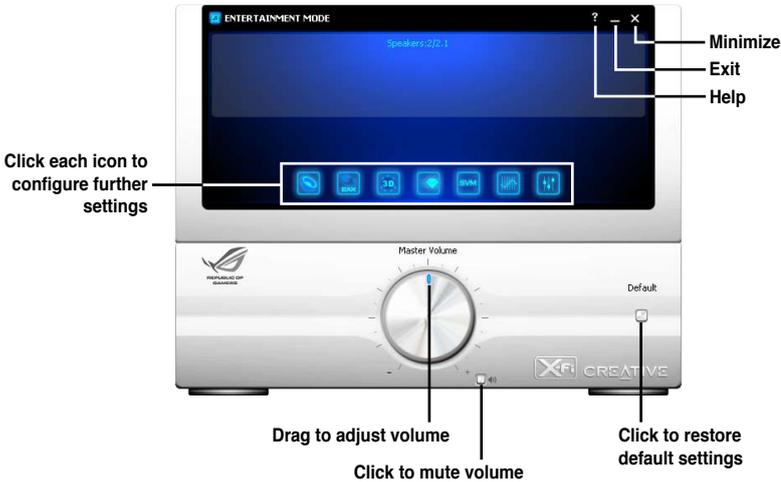
**Double-click** the Volume Panel icon to launch the Mixer control panel.

Click **Main Display**  Main Display to go to the Main Panel.



## Main Panel

The Main Panel displays all the features and functions the SupremeFX X-Fi supports. Click each icon to configure the following settings (from left to right): Speakers and Headphone, EAX Effects, X-Fi CMSS-3D, X-Fi Crystalizer, Smart Volume Management, Graphic Equalizer, and Mixer.



## Speakers and Headphone Panel

This panel allows you to configure speakers/headphone settings including bass management and speaker volume. You can also test each speaker channel.



## EAX Effects Panel

This panel contains environment effects that you can select to obtain a sense of realism during interactive 3D games.

Click to enable  
EAX Effects  
Drag to adjust  
effects amount



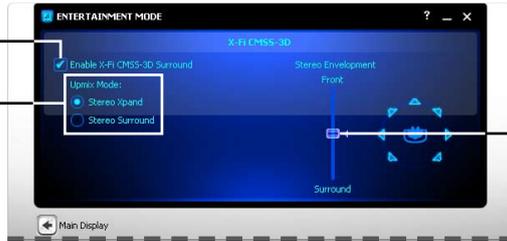
Click to select  
an environment

## X-Fi CMSS-3D Panel

This panel allows you to configure 3D virtual surround effects.

Click to enable  
X-Fi 3D Virtual  
effects

Click to select  
an upmix mode  
(appears when  
using 4/4.1/5.1/7.1  
Speakers)

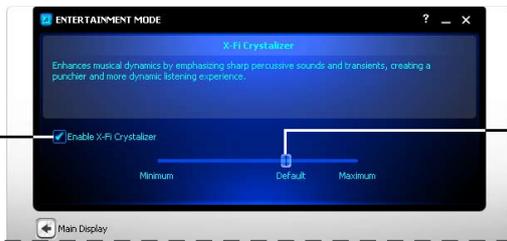


Drag to adjust  
effects

## X-Fi Crystalizer Panel

Enable X-Fi Crystalizer to obtain more audio dynamics.

Click to enable  
X-Fi Crystalizer



Drag to adjust  
effects

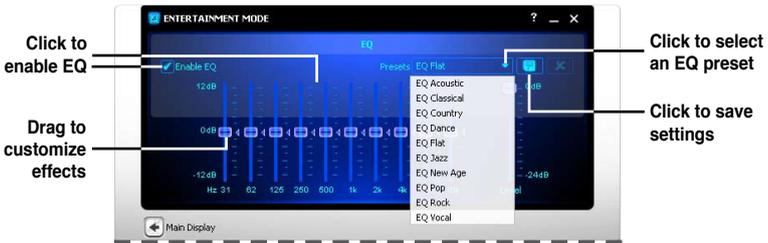
## Smart Volume Management Panel

Enable Smart Volume Management (SVM) to avoid large volume fluctuations.



## Graphic Equalizer Panel

This panel allows you to customize equalizer settings or select an EQ preset.



## Mixer Panel

This panel allows you to select a recording device and adjust recording/playback devices volume.



### 4.3.3 ASUS PC Probe II

PC Probe II is a utility that monitors the computer's vital components, and detects and alerts you of any problem with these components. PC Probe II senses fan rotations, CPU temperature, and system voltages, among others. Because PC Probe II is software-based, you can start monitoring your computer the moment you turn it on. With this utility, you are assured that your computer is always at a healthy operating condition.

#### Installing PC Probe II

To install PC Probe II on your computer:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.



If Autorun is not enabled in your computer, browse the contents of the support DVD to locate the setup.exe file from the ASUS PC Probe II folder. Double-click the **setup.exe** file to start installation.

2. Click the **Utilities** tab, then click **ASUS PC Probe II**.
3. Follow the screen instructions to complete installation.

#### Launching PC Probe II

You can launch the PC Probe II right after installation or anytime from the Windows® desktop.

To launch the PC Probe II from the Windows® desktop, click **Start > All Programs > ASUS > PC Probe II > PC Probe II v1.xx.xx**. The PC Probe II main window appears.

After launching the application, the PC Probe II icon appears in the Windows® taskbar. Click this icon to close or restore the application.

#### Using PC Probe II

##### *Main window*

The PC Probe II main window allows you to view the current status of your system and change the utility configuration. By default, the main window displays the Preference section. You can close or restore the Preference section by clicking on the triangle on the main window right handle.



Click to close the Preference panel



## Hardware monitor panels

The hardware monitor panels display the current value of a system sensor such as fan rotation, CPU temperature, and voltages.

The hardware monitor panels come in two display modes: hexagonal (large) and rectangular (small). When you check the Enable Monitoring Panel option from the Preference section, the monitor panels appear on your computer's desktop.



Large display



Small display

### Changing the monitor panels position

To change the position of the monitor panels in the desktop, click the arrow down button of the Scheme options, then select another position from the list box. Click OK when finished.



### Moving the monitor panels

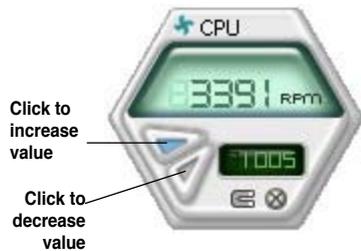
All monitor panels move together using a magnetic effect. If you want to detach a monitor panel from the group, click the horseshoe magnet icon. You can now move or reposition the panel independently.



### Adjusting the sensor threshold value

You can adjust the sensor threshold value in the monitor panel by clicking the  or  buttons. You can also adjust the threshold values using the Config window.

You cannot adjust the sensor threshold values in a small monitoring panel.



### Monitoring sensor alert

The monitor panel turns red when a component value exceeds or is lower than the threshold value. Refer to the illustrations below.



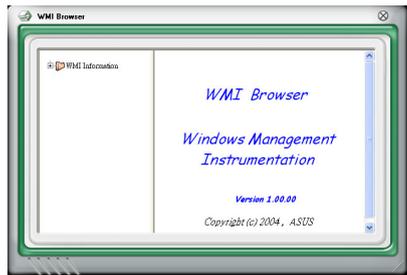
Large display



Small display

## WMI browser

Click **WMI** to display the WMI (Windows Management Instrumentation) browser. This browser displays various Windows® management information. Click an item from the left panel to display on the right panel. Click the plus sign (+) before WMI Information to display the available information.



You can enlarge or reduce the browser size by dragging the bottom right corner of the browser.

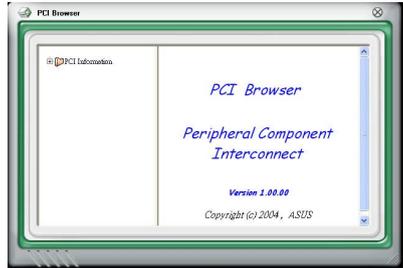
## DMI browser

Click **DMI** to display the DMI (Desktop Management Interface) browser. This browser displays various desktop and system information. Click the plus sign (+) before DMI Information to display the available information.



## PCI browser

Click **PCI** to display the PCI (Peripheral Component Interconnect) browser. This browser provides information on the PCI devices installed on your system. Click the plus sign (+) before the PCI Information item to display available information.

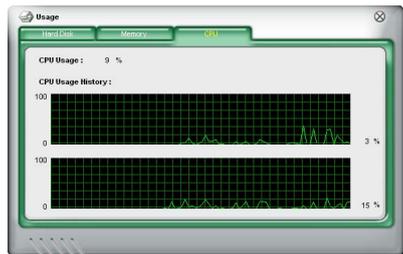


## Usage

The Usage browser displays real-time information on the CPU, hard disk drive space, and memory usage. Click **USAGE** to display the Usage browser.

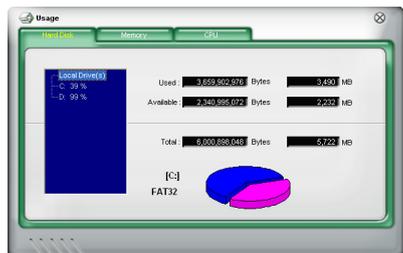
### CPU usage

The CPU tab displays real-time CPU usage in line graph representation. If the CPU has an enabled Hyper-Threading, two separate line graphs display the operation of the two logical processors.



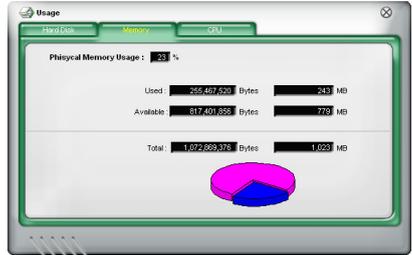
### Hard disk drive space usage

The Hard Disk tab displays the used and available hard disk drive space. The left panel of the tab lists all logical drives. Click a hard disk drive to display the information on the right panel. The pie chart at the bottom of the window represents the used (blue) and the available HDD space.



### Memory usage

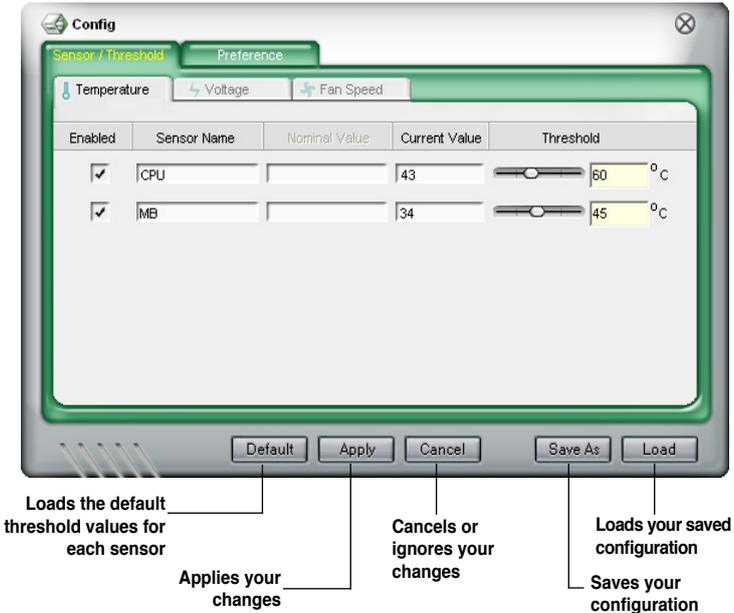
The Memory tab shows both used and available physical memory. The pie chart at the bottom of the window represents the used (blue) and the available physical memory.



### Configuring PC Probe II

Click to view and adjust the sensor threshold values.

The Config window has two tabs: Sensor/Threshold and Preference. The Sensor/Threshold tab enables you to activate the sensors or to adjust the sensor threshold values. The Preference tab allows you to customize sensor alerts, or change the temperature scale.



### 4.3.4 ASUS AI Suite

ASUS AI Suite allows you to launch EPU-6 Engine, TurboV, CPU Level Up, and Fan Xpert utilities easily.

#### Installing AI Suite

To install AI Suite on your computer:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.
2. Click the Utilities tab, then click **AI Suite**.
3. Follow the screen instructions to complete installation.

#### Launching AI Suite

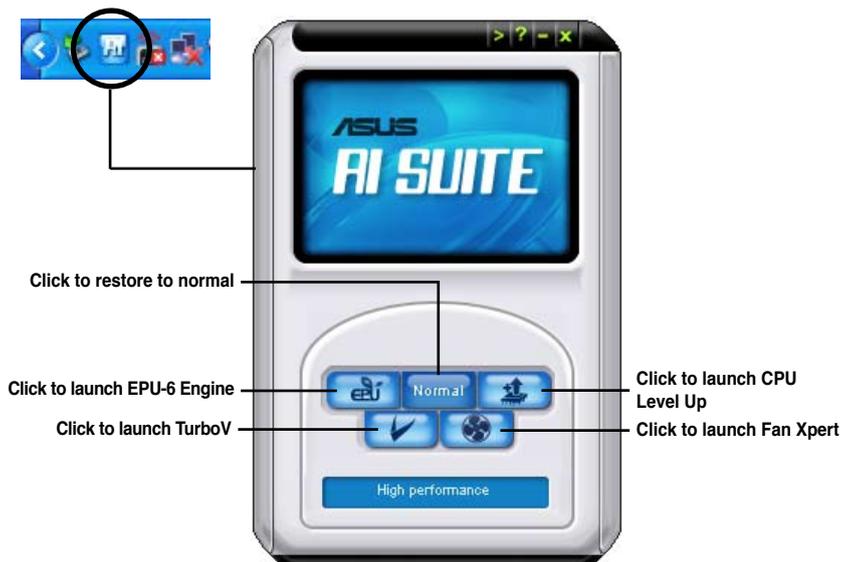
You can launch AI Suite right after installation or anytime from the Windows® desktop.

To launch AI Suite from the Windows® desktop, click **Start > All Programs > ASUS > AI Suite > AI Suite v1.xx.xx**. The AI Suite main window appears.

After launching the application, the AI Suite icon appears in the Windows® notification area. Click this icon to close or restore the application.

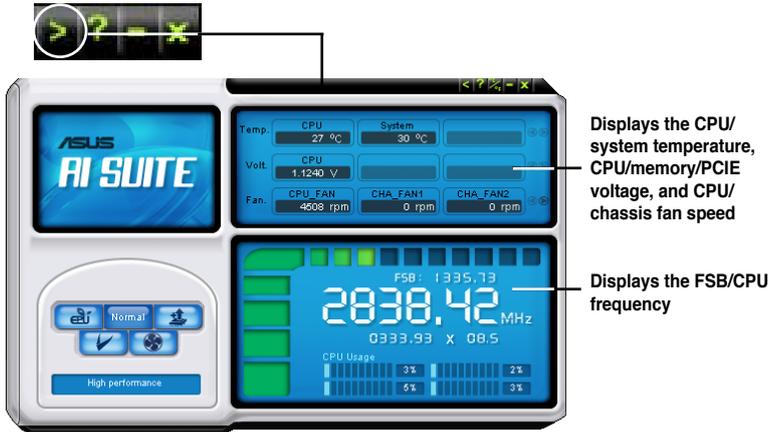
#### Using AI Suite

Click the EPU-6 Engine, TurboV, CPU Level Up, or Fan Xpert icon to launch the utility, or click the Normal icon to restore the system to normal state.



Other feature buttons

Click  on right corner of the main window to open the monitor window.



Click  on right corner of the expanded window to switch the temperature from degrees Centigrade to degrees Fahrenheit.



### 4.3.5 ASUS Fan Xpert

Asus Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's system loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

Install AI Suite from the bundled support DVD. To launch the ASUS Fan Xpert utility, double-click the **AI Suite** icon in the Windows® notification area and click the **Fan Xpert** button on the AI Suite main window.

Click the dropdown list button and display the fan types. Select **CPU Fan** or **Chassis Fan**.



## Fan profile modes

- **Disable:** Select this mode to disable the **Fan Xpert** function.
- **Standard:** This mode makes the fan adjust speed in moderate pattern.
- **Silent:** This mode minimizes fan speed for quiet fan operation.
- **Turbo:** This mode boosts the fan to achieve maximal fan speed for the best cooling effect.
- **Intelligent:** This mode automatically adjusts the CPU fan speed with the ambient temperature.
- **Stable:** This mode keeps the CPU fan at the same speed to avoid noise caused by the unsteady fan rotation. However, the fan will speed up when the temperature exceeds 70°C.
- **User:** This mode allows you to change the CPU fan profile under certain limitation.



For **Chassis Fan**, only Disable/Standard/Silent/Turbo modes could be selected.



Click to close the Calibration window

100%	N/A	rpm
90%	N/A	rpm
80%	N/A	rpm
70%	N/A	rpm
60%	N/A	rpm
50%	N/A	rpm
40%	N/A	rpm
30%	N/A	rpm
20%	N/A	rpm

Click to get the calibration between the fan rotation and fan speed ratio

### 4.3.6 CPU Level Up

The CPU Level Up allows you to overclock immediately with OC profile presets in Windows® environment without the hassle of entering BIOS.

After installing AI Suite from the bundled Support DVD, launch the utility by double-clicking the AI Suite icon in the Windows® notification area and click the CPU Level Up button on the AI Suite main window.



### 4.3.7 ASUS EPU-6 Engine

ASUS EPU-6 Engine is an energy-efficient tool that satisfies different computing needs. This utility provides four modes that you can select to enhance system performance or save power. Selecting Auto mode will have the system shift modes automatically according to current system status. You can also customize each mode by configuring settings like CPU frequency, vCore Voltage, and Fan Control.

#### Installing 6 Engine

To install 6 Engine on your computer:

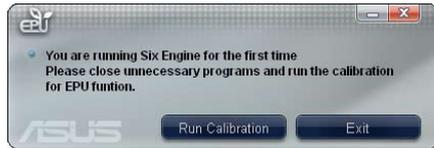
1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.
2. Click the **Drivers** tab and then click **ASUS EPU-Six Engine**.
3. Follow the screen instructions to complete installation.

#### Launching 6 Engine

Launch 6 Engine by double-clicking the 6 Engine icon in the Windows® notification area.



The first time you launch 6 Engine, the following message will appear, asking you to run Calibration first. Running calibration allows the system to detect CPU properties to optimize power management.



Click **Run Calibration** and wait for a few seconds. Then, the 6 Engine main menu appears.

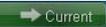
## 6 Engine main menu

The screenshot shows the ASUS 6 Engine main menu with the following callouts:

- Displays CPU Power and Total CPU Energy Saving:** Points to a small window showing 'Current CPU Power' at 2.50 and 'Total CPU Energy Saving' at 15.711141 x 10<sup>-3</sup> kWh/hr.
- Displays the following message if no VGA power saving engine is detected:** Points to a warning window: 'VGA: No VGA detected, please insert supported VGA card! VGA GPU, BIOS, driver must conform to ASUS SmartDoctor. ASUS SmartDoctor'.
- Lights up when power saving engine is activated:** Points to the 'VGA' component icon.
- Displays the amount of CO2 reduced:** Points to the 'Reduced CO2 Emission' bar showing 'mg' and 'Since 2002/1/17 03:39'.
- \*Shifts between the display of Total and Current CO2 reduced:** Points to the 'Current' button next to the CO2 bar.
- Displays current mode:** Points to the 'Mode Setting' section, which is currently set to 'High Performance'.
- Auto Mode**
- Turbo Mode**
- High Performance Mode**
- Medium Power Saving Mode**
- Max. Power Saving Mode**
- Runs calibration:** Points to the 'Calibrate' button.
- Displays the system properties of each mode:** Points to the 'Tranquility' icon and the 'Performance', 'Convenience', 'Reliability', and 'Energy Saving' buttons.
- Exits the utility:** Points to the 'Exit' button.

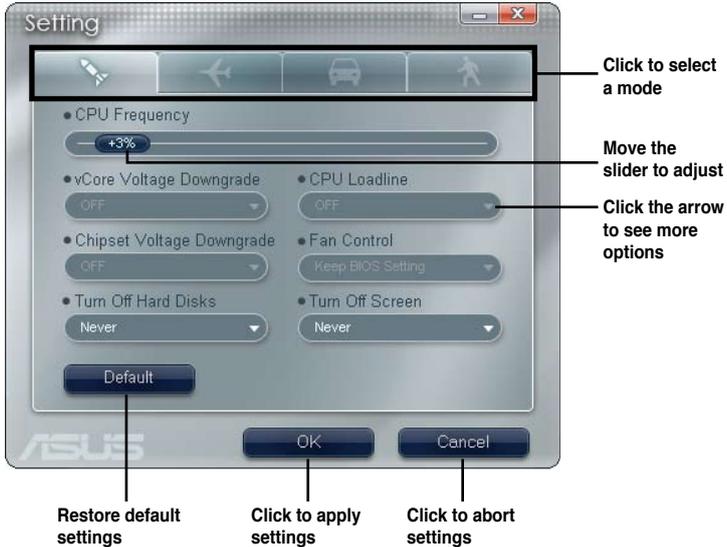
Advanced settings for each mode (refer to the next page for further information)



- \* Click **Current**  to show the CO2 that has been reduced since you click the **Renew** button .
- \* Click **Total**  to show the total CO2 that has been reduced since you launched 6 Engine.

## Advanced settings menu

Click **Setting** (  ) from the 6 Engine main menu to display configuration options in each mode. Some options in certain modes are dimmed, meaning that they are not available.



## Configuration options in Advanced settings menu

The following lists the configuration options and their definitions in Advanced settings menu.

- **CPU Frequency:** Raises or lowers CPU frequency to a certain percentage.
- **vCore Voltage Downgrade:** Lowers CPU vCore voltage.
  - **High:** Downgrades voltage to the highest level for CPU power saving.
  - **Medium:** Downgrades voltage to the medium level.
  - **Small:** Downgrades voltage to the minimum level.
- **Chipset Voltage Downgrade:** Turns on/off chipset voltage.
- **Turn Off hard disks:** Turns off hard disk drives when they are not accessed after a certain time.
- **CPU Loadline:** Sets up the CPU loadline to manage CPU power saving.
  - **Light:** Saves CPU power to the minimum level.
  - **Medium:** Saves CPU power to the medium level.
  - **Heavy:** Saves CPU power to the highest level.

- **Fan Control:** Adjusts fan speeds to reduce noise and save system power.
  - **Quiet:** Lowers CPU fan speed and shuts off two chassis fans.
  - **Slow:** Lowers CPU fan and two chassis fan speeds.

Refer to the following table for the configuration options in each mode.

Configuration options	Turbo Mode	High Performance Mode	Medium Power Saving Mode	Maximum Power Saving Mode
CPU Frequency	Overclocking +1% to +30%	N/A	Downclocking -1% to -50%	Downclocking -1% to -50%
vCore Voltage Downgrade	N/A	N/A	Small/Medium/High	Small/Medium/High
Chipset Voltage Downgrade	N/A	N/A	On/Off	On/Off
Turn Off hard disks	Never/After 3 mins–After 5 hours			
CPU Loadline	N/A	N/A	Light/Medium/Heavy	Light/Medium/Heavy
Fan Control	N/A	N/A	Keep Bios Setting/Slow	Keep Bios Setting/Quiet



The TweakIt function is disabled when 6-Engine is set to Auto Mode. To enable TweakIt function, set 6-Engine to other mode option. Or, you may click the TweakIt icon in the Windows® notification area and click **Unlock** to enable the TweakIt function.



Ensure that you've installed TweakIt driver from the bundled Support DVD.

### 4.3.9 ASUS TurboV

ASUS TurboV allows you to overclock the CPU frequency, CPU voltage, QPI/ Memory controller voltage, and DRAM voltage in Windows® environment and takes effect in real-time without exiting and rebooting the OS.



Refer to the CPU documentation before adjusting CPU voltage settings. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.



- For system stability, all changes made in ASUS TurboV will not be saved to BIOS settings and will not be kept on the next system boot. Use the **Save Profile** function to save your customized overclocking settings and manually load the profile after Windows starts.
- For system stability, set ASUS EPU 6-Engine to **High Performance Mode** while using ASUS TurboV.

To launch ASUS TurboV

1. Install the ASUS TurboV utility from the motherboard support DVD.
2. Click **start > All Programs > ASUS > TurboV > TurboV**.

Save the current settings as a profile

Shows more settings

Default settings

Target settings

Applies all changes immediately

Undoes all changes without applying

Voltage Adjustment bars



#### Overclocking tips:

- For advanced overclockability, adjust first the **Extreme Tweaker** items in BIOS, and then proceed more detailed adjustments using TurboV.
- The **CPU Frequency** setting in BIOS affects the adjustable range of CPU Frequency in TurboV.

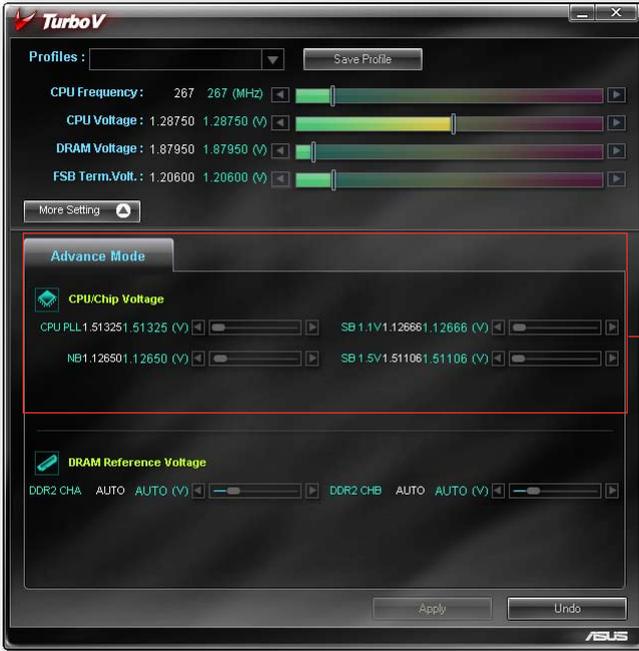
*For advanced overclocking:* Set CPU Frequency in BIOS to 200MHz or above for an adjustment range from 200MHz to 500MHz in TurboV.

*For general overclocking:* Set CPU Frequency in BIOS below 200MHz for an adjustment range from 100MHz to 250MHz in TurboV.

## Advanced settings menu

Click **More Setting** from the TurboV main screen to display detailed configuration options for CPU/chip voltage, DRAM Reference voltage, and CPU ratio.

### Advance Mode



Advanced CPU and DRAM voltage settings

## 4.4 RAID configurations

The motherboard comes with the Intel® ICH10R Southbridge controller that supports RAID 0, RAID 1, RAID 10, and RAID 5 for six independent Serial ATA channels.

### 4.4.1 RAID definitions

**RAID 0 (Data striping)** optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

**RAID 1 (Data mirroring)** copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

**RAID 5** stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10\* configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

**Intel® Matrix Storage.** The Intel® Matrix Storage technology supported by the ICH10R chip allows you to create a RAID 0, RAID 1, RAID 5, and RAID 10 function to improve both system performance and data safety. You can also combine two RAID sets to get higher performance, capacity, or fault tolerance provided by the difference RAID function. For example, RAID 0 and RAID 1 set can be created by using only two identical hard disk drives.



---

If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support DVD to a floppy disk before you install an operating system to the selected hard disk drive. Refer to section **4.5 Creating a RAID driver disk** for details.

---

## 4.4.2 Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1. Install the SATA hard disks into the drive bays.
2. Connect the SATA signal cables.
3. Connect a SATA power cable to the power connector on each drive.

## 4.4.3 Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID set(s) using SATA HDDs. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main** menu > **Storage Configuration**, and then press <Enter>.
3. Set the **Configure SATA as** item to [RAID].
4. Save your changes, and then exit the BIOS Setup.



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Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

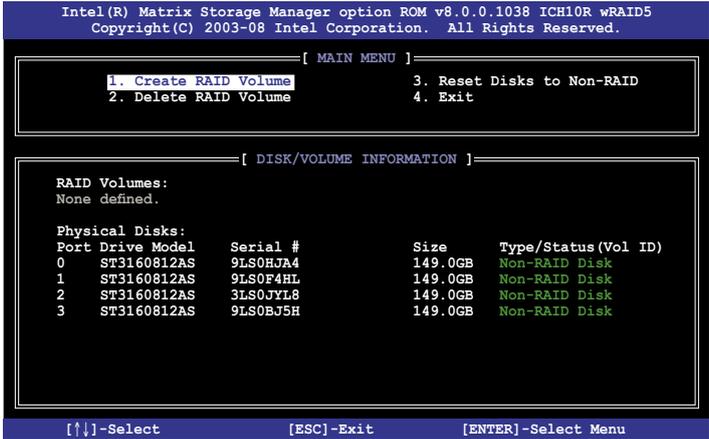
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### 4.4.4 Intel® Matrix Storage Manager option ROM utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 0+1), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Matrix Storage Manager option ROM utility:

1. Turn on the system.
2. During POST, press <Ctrl+I> to display the utility main menu.



The navigation keys at the bottom of the screen allow you to move through the menu and select the menu options.



The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

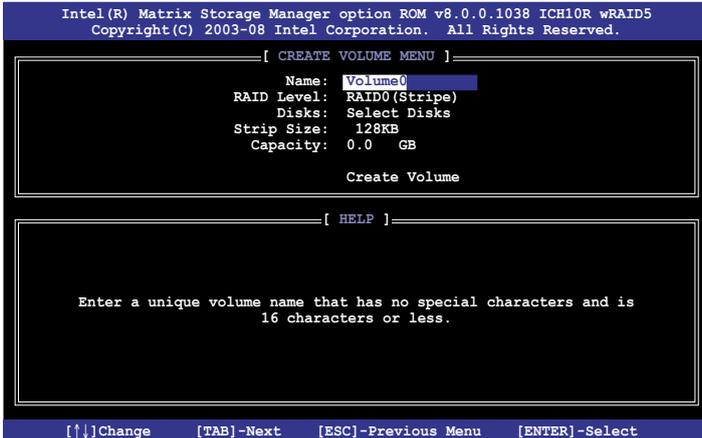


The utility supports maximum four hard disk drives for RAID configuration.

## Creating a RAID set

To create a RAID set

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears.



2. Enter a name for the RAID set and press <Enter>.
3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.
4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears.



5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection

6. Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The following are typical values:  
RAID 0: 128KB  
RAID 10: 64KB  
RAID 5: 64KB



---

We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

---

7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
8. When the **Create Volume** item is selected, press <Enter>. The following warning message appears.



9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

## Deleting a RAID set



Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears.

```
Intel(R) Matrix Storage Manager option ROM v8.0.0.1038 ICH10R wRAID5
Copyright(C) 2003-08 Intel Corporation. All Rights Reserved.

[ DELETE VOLUME MENU ]

Name      Level      Drives    Capacity  Status    Bootable
Volume0   RAID0 (Stripe)  2         298.0GB   Normal    Yes

[ HELP ]

Deleting a volume will reset the disks to non-RAID.
WARNING: ALL DISK DATA WILL BE DELETED.

[↑↓]-Select      [ESC]-Previous Menu  [DEL]-Delete Volume
```

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears.

```
[ DELETE VOLUME VERIFICATION ]

ALL DATA IN THE VOLUME WILL BE LOST!

Are you sure you want to delete volume "Volume0"? (Y/N):
```

3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

## Exiting the Intel® Matrix Storage Manager

To exit the utility

1. From the utility main menu, select **4. Exit**, and then press <Enter>. The following warning message appears.



2. Press <Y> to exit or press <N> to return to the utility main menu.

## 4.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® XP/Vista and later operating system on a hard disk drive that is included in a RAID set. For Windows Vista user, you can create a RAID driver disk with a floppy disk drive or a USB flash disk drive.

### 4.5.1 Creating a RAID driver disk without entering the OS

To create a RAID/SATA driver disk without entering the OS:

1. Boot your computer.
2. Press <Del> during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support DVD into the optical drive.
5. Save changes and exit BIOS.
6. When the **Make Disk** menu appears, press <a> or <b> to create a 32/64bit **Intel ICH10R RAID driver disk**.
7. Insert a formatted floppy disk into the floppy drive then press <Enter>.
8. Follow the succeeding screen instructions to complete the process.

### 4.5.2 Creating a RAID driver disk in Windows®

To create a RAID driver disk in Windows®:

1. Start Windows®.
2. Place the motherboard support DVD into the optical drive.
3. Go to the **Make disk** menu, and then click **Intel ICH10R 32/64 bit RAID Driver Disk** to create an Intel® ICH10R RAID driver disk.
4. Insert a floppy disk into the floppy disk drive.
5. Follow the succeeding screen instructions to complete the process.



---

Write-protect the floppy disk to avoid computer virus infection.

---

To install the RAID driver in Windows® XP:

1. During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.
2. Press <F6>, and then insert the floppy disk with RAID driver into the floppy disk drive.
3. When prompted to select the SCSI adapter to install, ensure that you select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.
4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver in Windows® Vista™:

1. Insert the floppy disk/USB device with RAID driver into the floppy disk drive/USB port.
2. During the OS installation, select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.
3. Follow the succeeding screen instructions to complete the installation.

This chapter describes how to install and configure multiple ATI® CrossFireX™ graphics cards.

# 5 Multiple GPU technology support

5.1 ATI® CrossFireX™ technology ..... 5-1

## 5.1 ATI® CrossFireX™ technology

The motherboard supports the ATI® CrossFireX™ technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

### 5.1.1 Requirements

- You should have two identical CrossFireX-ready graphics cards or one CrossFireX-ready dual-GPU graphics card that are ATI® certified.
- Ensure that your graphics card driver supports the ATI CrossFireX technology. Download the latest driver from the AMD website at [www.amd.com](http://www.amd.com).
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See page 2-41 for details.



- 
- We recommend that you install additional chassis fans for better thermal environment.
  - Visit the ATI Game website at <http://game.amd.com> for the latest certified graphics card and the supported 3D application list.
- 

### 5.1.2 Before you begin

For ATI CrossFireX to work properly, you have to uninstall all existing graphics card drivers before installing ATI CrossFireX graphics cards to your system.

To uninstall existing graphics card drivers

1. Close all current applications.
2. For Windows XP, go to **Control Panel > Add/Remove Programs**.  
For Windows Vista, go to **Control Panel > Programs and Features**.
3. Select your current graphics card driver/s.
4. For Windows XP, select **Add/Remove**.  
For Windows Vista, select **Uninstall**.
5. Turn off your computer.

### 5.1.3 Installing CrossFireX graphics cards

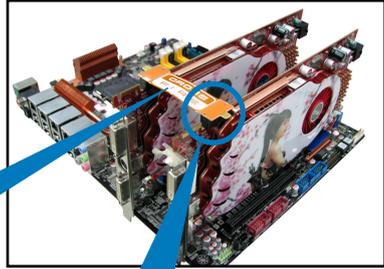


The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

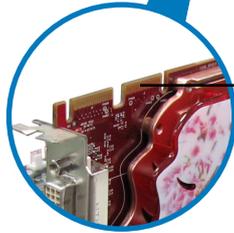
1. Prepare two CrossFireX-ready graphics cards.
2. Insert the two graphics card into the PCIEX16 slots.
3. Ensure that the cards are properly seated on the slots.



4. Align and firmly insert the CrossFireX bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

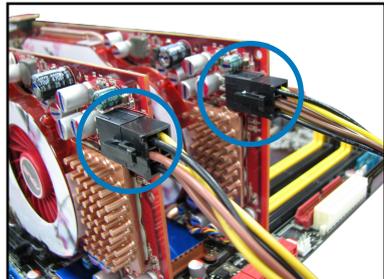


CrossFireX bridge



Goldfingers

5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.
6. Connect a VGA or a DVI cable to the graphics card.



## 5.1.4 Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.



Ensure that your PCI Express graphics card driver supports the ATI® CrossFireX™ technology. Download the latest driver from the AMD website ([www.amd.com](http://www.amd.com)).

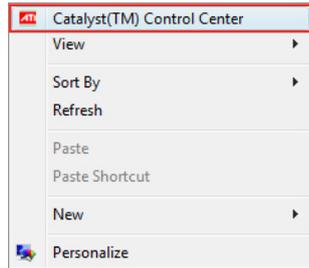
## 5.1.5 Enabling the ATI® CrossFireX™ technology

After installing your graphics cards and the device drivers, enable the CrossFireX™ feature through the ATI Catalyst™ Control Center in Windows environment.

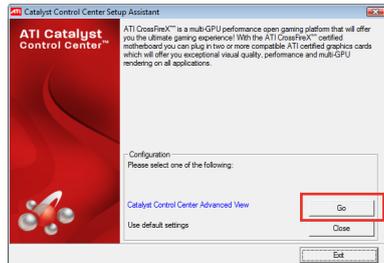
### Launching the ATI Catalyst Control Center

To launch the ATI Catalyst Control Center

1. Right-click on the Windows® desktop and select **Catalyst(TM) Control Center**. You can also right-click the ATI icon in the Windows notification area and select **Catalyst Control Center**.



2. The **Catalyst Control Center Setup Assistant** appears when the system detects the existence of multi-graphics cards. Click **Go** to continue to the **Catalyst Control Center Advanced View** window.



## Enabling CrossFireX settings

1. In the Catalyst Control Center window, click **Graphics Settings > CrossFireX > Configure**.
2. From the Graphics Adapter list, select the graphics card to act as the display GPU.
3. Select **Enable CrossFireX**.
4. Click **Apply**, and then click **OK** to exit the window.



The Appendix lists the debug code table  
for the LCD Poster.

# Debug code table



# Chapter summary



Debug code table.....A-1

## Debug code table

Code	Description
CPU INIT	CPU Initiation
DET CPU	Test CMOS R/W functionality.
CHIPINIT	Early chipset initialization: -Disable shadow RAM -Disable L2 cache -Program basic chipset registers
DET DRAM	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache
DC FCODE	Expand compressed BIOS code to DRAM
EFSHADOW	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
INIT IO	Initialize IO devices.
INIT HWM	Initialize Hardware Monitor.
CLR SCRN	1. Blank out screen 2. Clear CMOS error flag
INIT8042	1. Clear 8042 interface 2. Initialize 8042 self-test
ENABLEKB	1. Test special keyboard controller for Super I/O chips. 2. Enable keyboard interface.
DIS MS	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Super I/O chips.
R/W FSEG	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
DET FLASH	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
TESTCMOS	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
PRG CHIP	Program chipset default values into chipset.
INIT CLK	Initialize clock generator.
CHECKCPU	Detect CPU information including brand, type and CPU level (586 or 686).
INTRINIT	Initial interrupts vector table.
INITINT9	Initialize INT 09 buffer
CPUSPEED	1. Program CPU internal MTRR (Pentium class CPU) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
VGA BIOS	Initialize VGA BIOS
TESTVRAM	1. Initialize multi-language 2. Put information on screen display, including BIOS logo, CPU type, CPU speed .
RESET KB	Reset keyboard.

# Debug code table

Code	Description
8254TEST	Test 8254
8259MSK1	Test 8259 interrupt mask bits for channel 1.
8259MSK2	Test 8259 interrupt mask bits for channel 2.
8259TEST	Test 8259 functionality.
COUNTMEM	Calculate total memory by testing the last double word of each 64K page.
MP INIT	<ol style="list-style-type: none"> <li>1. Program MTRR of M1 CPU</li> <li>2. Initialize L2 cache for P6 class CPU &amp; program CPU with proper cacheable range.</li> <li>3. Initialize the APIC for P6 class CPU.</li> <li>4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.</li> </ol>
USB INIT	Initialize USB
TEST MEM	Test all memory (clear all extended memory to 0)
SHOW MP	Display number of processors (multi-processor platform)
PNP LOGO	Display PnP logo
ONBD IO	Initialize Onboard IO devices.
EN SETUP	Okay to enter Setup utility.
MSINSTAL	Initialize PS/2 Mouse
CHK ACPI	Prepare memory size information for function call: INT 15h ax=E820h
EN CACHE	Turn on L2 cache
SET CHIP	Program chipset registers according to items described in Setup & Auto-configuration table.
AUTO CFG	Assign resources to devices.
INIT FDC	<ol style="list-style-type: none"> <li>1. Initialize floppy controller</li> <li>2. Set up floppy related fields in 40:hardware.</li> </ol>
DET IDE	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM.
COM/LPT	Detect serial ports & parallel ports.
DET FPU	Detect & install co-processor
CPU CHG	New CPU installed
EZ FLASH	Execute EZ Flash
CPR FAIL	CPR error
FAN FAIL	Fan error
UCODEERR	UCODE error
FLOPYERR	Floppy error
KB ERROR	Keyboard error
HD ERR	HDD error
CMOS ERR	CMOS error
MS ERROR	Mouse error
SMARTERR	HDD smart function error
HM ERROR	Hard monitor error
AINETERR	AI NET error
CASEOPEN	Case open

## Debug code table

Code	Description
<b>PASSWORD</b>	Clear EPA or customization logo. 1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
<b>USB FINAL</b>	Initialize PnP boot devices 1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
<b>INIT ROM</b>	Initialize device option ROMs.
<b>NUM LOCK</b>	1. Program daylight saving 2. Update keyboard LED & typematic rate
<b>UPDT DMI</b>	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
<b>INT 19H</b>	Boot attempt (INT 19h)

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