

M2N32-SLI
Premium
Vista Edition

ASUS[®]

Motherboard

E2982

First Edition V1

January 2007

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Notices

Federal Communications Commission Statement

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

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

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

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



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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

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

Operation safety

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



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.

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: Powering up**
This chapter describes the power up sequence and ways of shutting down the system.
- **Chapter 4: 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 5: Software support**
This chapter describes the contents of the support DVD that comes with the motherboard package.
- **Chapter 6: NVIDIA® SLI™ technology support**
This chapter tells how to install SLI-ready PCI Express graphics cards.

Where to find more information

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

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

Conventions used in this guide

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



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



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



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



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

Typography

Bold text

Indicates a menu or an item to select.

Italics

Used to emphasize a word or a phrase.

<Key>

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

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

<Key1+Key2+Key3>

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

Example: <Ctrl+Alt+D>

Command

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

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

```
awdflash M2N32SLI .bin
```

M2N32-SLI Premium Vista Edition

specifications summary

CPU	Socket AM2 for AMD Athlon™ 64 X2 / Athlon™ 64 / Athlon™ 64 FX / Sempron™ processor Supports AMD Cool 'n' Quiet™ Technology AMD64 architecture enables simultaneous 32-bit and 64-bit computing AMD LIVE!™ Ready
Chipset	NVIDIA® nForce® 590 SLI™ MCP NVIDIA® LinkBoost™ Technology
System bus	2000 / 1600 MT/s
Memory	Dual-channel memory architecture <ul style="list-style-type: none"> - 4 x 240-pin DIMM sockets support unbuffered ECC/non-ECC DDR2 800/667/533 MHz memory modules - Supports up to 8 GB system memory
Expansion slots	2 x PCI Express™ x16 slots with NVIDIA® SLI™ support at full x16, x16 speed 1 x PCI Express™ x4 slot (supports PCI Express™ x4 or x1 card) 1 x PCI Express™ x1 slot 2 x PCI 2.2 slots
Scalable Link Interface (SLI™)	Supports two identical NVIDIA® SLI™-ready graphics cards, both at x16 mode ASUS two-slot thermal design
Storage	NVIDIA® nForce® 590 SLI™ MCP supports: <ul style="list-style-type: none"> - 1 x IDE connector for up to two Ultra DMA 133/100/66/33 devices - 6 x Serial ATA 3.0 Gb/s connectors support six Serial ATA devices - RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configurations spanning across Serial ATA drives via the onboard NVIDIA® MediaShield™ RAID controller Silicon Image® 3132 Serial ATA controller supports: <ul style="list-style-type: none"> - 1 x Internal Serial ATA 3.0 Gb/s - 1 x External Serial ATA 3.0 Gb/s on the rear panel (SATA-On-The-Go) - RAID 0, RAID 1, and JBOD configuration
LAN	Dual Gigabit LAN controllers support NVIDIA® DualNet technology NVIDIA® nForce® 590 SLI™ MCP built-in dual Gigabit MAC with external Marvell® PHY <ul style="list-style-type: none"> - Supports Teaming and Fail-Over functions - Supports TCP/IP Acceleration

(continued on the next page)

M2N32-SLI Premium Vista Edition

specifications summary

High Definition Audio	SoundMAX® ADI AD1988B 8-channel CODEC Supports Jack-Sensing, Enumeration, Multi-Streaming, and Jack-Retasking Technology Optical and Coaxial S/PDIF Out back I/O ports
IEEE 1394	TI 1394 controller supports: - 2 x IEEE 1394a connectors (1 at mid-board; 1 on the rear panel)
USB	8 x USB 2.0 ports (4 at mid-board; 4 on the rear panel)
ASUS AI Lifestyle features	<p>ASUS AI Lifestyle Vista Edition features:</p> <ul style="list-style-type: none"> - ScreenDUO - AI Remote - ASAP (ASUS Accelerated Propeller) - TPM Support (the module is purchased separately) - AP Trigger <p>*ASUS ScreenDUO, AI Remote, and TPM can run both Windows® Vista and XP</p> <p>ASUS Quiet Thermal Solution:</p> <ul style="list-style-type: none"> - ASUS AI Gear - ASUS AI Nap - ASUS 8-Phase Power Design - ASUS Fanless Design: Heat-pipe solution & Stack Cool 2 - ASUS Q-Fan 2 - ASUS optional fan for water-cooling or passive cooling only <p>ASUS Crystal Sound</p> <ul style="list-style-type: none"> - ASUS Array Microphone - Noise Filer <p>ASUS EZ DIY</p> <ul style="list-style-type: none"> - ASUS Q-Connector - ASUS CrashFree BIOS 3 - ASUS EZ Flash 2
Other features	ASUS MyLogo3

(continued on the next page)

M2N32-SLI Premium Vista Edition

specifications summary

ASUS Exclusive Overclocking features	<p>Intelligent overclocking tools:</p> <ul style="list-style-type: none">- AI NOS™ (Non-delay Overclocking System)- AI Overclocking (intelligent CPU frequency tuner)- AI Clock Skew- ASUS O.C. Profile: overclocking configuration-sharing tool <p>Precision Tweaker:</p> <ul style="list-style-type: none">- vDIMM: 25-step DRAM voltage control- vCore: Adjustable CPU voltage at 0.0125V increment- Stepless Frequency Selection (SFS) allows FSB tuning from 200 MHz up to 400 MHz at 1 MHz increment- PCI Express x16 frequency allows PCI Express x16 frequency tuning from 100 MHz to 200 MHz at 1 MHz increment <p>Overclocking protection:</p> <ul style="list-style-type: none">- ASUS C.P.R. (CPU Parameter Recall) <p>ASUS AI Booster Utility Adjustable FSB/DDR2 ratio; fixed PCI/PCIe frequencies</p>
Rear panel I/O ports	<ul style="list-style-type: none">1 x PS/2 keyboard port (purple)1 x PS/2 mouse port (green)1 x Serial (COM1) port1 x IEEE 1394a port1 x Optical + 1 x Coaxial S/PDIF Out port1 x External SATA port2 x LAN (RJ-45) ports4 x USB 2.0/1.1 ports8-channel audio ports

(continued on the next page)

M2N32-SLI Premium Vista Edition

specifications summary

Internal connectors	<p>2 x USB 2.0 connectors support four additional USB 2.0 ports</p> <p>1 x Floppy disk drive connector</p> <p>1 x IDE connector for two devices</p> <p>7 x Serial ATA connectors</p> <p>1 x CPU / 4 x Chassis / 1 x Chipset / 1 x Power fan connectors</p> <p>1 x IEEE 1394a connector</p> <p>1 x Parallel connector</p> <p>1 x S/PDIF Out connector</p> <p>1 x TPM connector</p> <p>Chassis intrusion connector</p> <p>Front panel audio connector</p> <p>CD audio in connector</p> <p>24-pin ATX power connector</p> <p>4-pin ATX 12 V power connector</p> <p>System panel connector</p>
BIOS features	8 Mb AWARD BIOS, PnP, DMI 2.0, WfM2.0, SM BIOS 2.3
Manageability	WOL by PME, WOR by PME, Chassis intrusion, PXE
Accessories	<p>1 x SLI bridge</p> <p>1 x ASUS Array Mic</p> <p>1 x ASUS optional fan</p> <p>1 x ASUS Q-Connector kit (USB, 1394, system panel; Retail version only)</p> <p>1 x UltraDMA 133/100/66 cable</p> <p>1 x Floppy disk drive cable</p> <p>6 x SATA cables</p> <p>3 x SATA power cables for 6 devices</p> <p>1 x 2-port USB 2.0 module</p> <p>1 x IEEE 1394a module</p> <p>1 x I/O shield</p> <p>ScreenDUO (Retail version only)</p> <p>AI Remote (Retail version only)</p> <p>User's manual</p>
Support CD contents	<p>Drivers</p> <p>ASUS AI Suite</p> <p>ASUS PC Probe II</p> <p>ASUS Update</p> <p>NVIDIA® MediaShield™ RAID</p> <p>Anti-virus Utility (OEM version)</p>
Form factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.5 cm)

*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

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

1.1 Welcome!

Thank you for buying an **ASUS® M2N32-SLI Premium Vista Edition motherboard!**

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

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

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS M2N32-SLI Premium Vista Edition
I/O modules	IEEE 1394a module 1 x 2-port USB 2.0 module
Cables	6 x Serial ATA cables 3 x Serial ATA power cables for six devices 1 x Ultra DMA 133/100/66 cable 1 x Floppy disk drive cable
Accessories	I/O shield ASUS SLI™ Bridge ASUS Array Mic ASUS Optional Fan ASUS Q-Connector Kit (USB, 1394, system panel; Retail version only) ScreenDUO Kit (ScreenDUO, user guide, support CD, USB cable; Retail version only) AI Remote (Retail version only)
Application DVD	ASUS 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

Latest processor technology



The motherboard comes with a 940-pin AM2 socket that supports AMD Athlon™ 64 X2/Athlon™ 64/Athlon™ 64 FX/Sempron™ processor. With an integrated low-latency high-bandwidth memory controller and a highly scalable HyperTransport™ technology-based system bus, the motherboard provides a powerful platform for your diverse computing needs, increased office productivity, and enhanced digital media experience. See page 2-7 for details.

NVIDIA® Scalable Link Interface (SLI™)



The NVIDIA® Scalable Link Interface (SLI™) technology allows two graphics processing units (GPUs) in a single system. This technology takes advantage of the PCI Express™ bus architecture and features intelligent hardware and software solutions that allows multiple GPUs to work together and achieve exceptional graphics performance.

NVIDIA nForce® 590 SLI™ (NVIDIA LinkBoost™ certified)



NVIDIA nForce® 590 SLI™ media and communication processors (MCPs) deliver the tools and performance PC enthusiasts demand. When combined with selected NVIDIA GeForce graphics cards and other system components, you get automatic access to faster bus speeds. Ready for system overclocking and greater data throughput.

Dual-Core CPU



The advanced processing technology contains two physical CPU cores with individually dedicated L2 caches to satisfy the rising demand for more powerful processing capability.

Dual-Channel DDR2 800



DDR2 is the next generation memory technology that replaces the current DDR. With the highest speed up to 800 MHz, DDR2 memory provides great performance for 3D graphics and other memory demanding applications. See page 2-13 and 2-14 for details.

PCI Express™ interface



The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 2-21 for details.

Serial ATA 3.0 Gb/s technology and SATA-On-The-Go



The motherboard fully supports the Serial ATA 3.0 Gb/s technology through the Serial ATA interfaces and the NVIDIA® nForce® 590 SLI™ chipset. The Serial ATA 3 Gb/s specification provides twice the bandwidth of the current Serial ATA products with a host of new features, including Native Command Queuing (NCQ), and Power Management (PM) Implementation Algorithm. Serial ATA allows for thinner, more flexible cables with lower pin count and reduced voltage required. Leveraging these Serial ATA 3.0 Gb/s features is the SATA-On-The-Go. Supported by the Silicon Image Sil3132 Serial ATA controller, two Serial ATA 3.0 Gb/s connectors (one at mid-board and one on the rear panel) provide smart setup, and hot-plug function. See page 2-24, 2-27, and 2-28 for details.

Dual RAID solution



Onboard RAID controllers provide the motherboard with dual-RAID functionality that allows you to select the best RAID solution using Serial ATA devices.

The NVIDIA® nForce® 590 SLI™ chipset allows RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configuration for six SATA 3.0 Gb/s connector. See pages 2-24.

The Silicon Image® Sil3132 controller supports two additional Serial ATA 3.0 Gb/s connectors (one at mid-board and one on the rear panel) and allows RAID 0, RAID 1, and JBOD configurations on these ports. See pages 2-28 for details.

IEEE 1394a support



The IEEE 1394a interface provides high-speed and flexible PC connectivity to a wide range of peripherals and devices compliant to the IEEE 1394a standard. The IEEE 1394a interface allows up to 400 Mbps transfer rates through simple, low-cost, high-bandwidth asynchronous (real-time) data interfacing between computers, peripherals, and consumer electronic devices such as camcorders, VCRs, printers, TVs, and digital cameras. See page 2-23 and 2-29 for details.

High Definition Audio



Enjoy high-end sound quality on your PC! The onboard 8-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio output, jack-sensing feature, retasking functions and multi-streaming technology that simultaneously sends different audio streams to different destinations. You can now talk to your partners on the headphone while playing multi-channel network games. See page 2-23 and 2-24 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See page 2-24 and 2-29 for details.



Dual Gigabit LAN solution

The motherboard comes with dual Gigabit LAN controllers to provide the total solution for your networking needs. These network controllers provide faster data bandwidth for your wired or wireless Internet, LAN, and file sharing requirements. See page 2-23 for details.

AMD Cool 'n' Quiet Technology



The motherboard supports the AMD Cool 'n' Quiet Technology, which monitors system operation and automatically adjusts CPU voltage and frequency for a cool and quiet operating environment. See page 4-27 for details.

1.3.2 ASUS AI Lifestyle features



AI Remote



The revolutionary AI Remote gives you unprecedented control from the comfort of your couch. With just a touch of the button, you can quickly do your usual computer activities such as turn ON/OFF your PC, launch your favorite applications by enabling AP Trigger function, or control AI Gear and AI Nap. The AI Remote also gives you the comfort of a traditional remote on media player. Have an AI Remote in your hand and do more with your PC from a distance! See page 5-31 for details.

ASAP (ASUS Accelerated Propeller)



ASAP gets you to your destination ASAP. ASAP supports the Windows® ReadyBoost™ technology which improves system performance under Windows® Vista. Enjoy greater efficiency and get more productivity out of your system. See page 5-39 for details.

AP Trigger

The AP Trigger allows you to quickly boot or resume directly into media or into your favorite applications. With just a touch of the button on the AI Remote controller, you can quickly turn on your PC and launch predefined applications simultaneously!

ScreenDUO

The ScreenDUO provides a second display panel to enable you to conveniently view important information without having to start up your PC. The ScreenDUO synchronizes information from the PC or websites, displays RSS messages, meeting schedules and other important information. This saves you the time and the hassle to turn on your PC each time you want to view vital information.

TPM Support

This motherboard supports the Trusted Platform Module (TPM), which provides you with enhanced data protection via high-level encryption/decryption and ensures platform integrity. The TPM meets the Windows® Vista BitLocker™ Drive Encryption hardware requirement for a more secure working environment. See page 2-34 and 4-42 for details.



The TPM module is purchased separately. Use the ASUS TPM module ONLY.

AI Gear

AI Gear allows users to choose from four modes to adjust CPU and Vcore voltage, minimizing noise and power consumption. Users can choose the mode that best suits their needs. See page 5-27 for details.

AI Nap

With AI Nap, the system can continue running at minimum power and noise when the user is temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key. See page 5-28 for details.

ASUS Crystal Sound

This feature can enhance speech-centric applications like Skype, online game, video conference and recording.

ASUS Array Mic



The Bundled Superbeam Array Microphone receives only the sound coming from the reception cone and ignores the sounds coming from other directions. This mechanism eliminates a large number of interferences, including neighboring speakers and reverberations. It also uses advanced de-reverberation techniques to reduce echo and minimize its effect on the speech engine. This feature can enhance speech-centric applications like Skype, online game, video conference, and recording. See page 5-17 for details.

Noise Filter



This feature detects repetitive and stationary noises (non-voice signals) like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording. See page 5-17 for details.

Advanced Thermal Design

ASUS Stack Cool 2



ASUS Stack Cool 2 is a fan-less and zero-noise cooling solution that lowers the temperature of critical heat generating components. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat that critical components generate. See page 2-3 for details.

8-Phase Power Design



The ASUS 8-Phase Power Design prolongs CPU lifespan and keeps the system stable by preventing high power stress to the CPU and power supply module. The design ensures high efficiency operation to generate less heat compared with conventional power solutions, thus achieving cool system environment and making this motherboard ideal for overclocking.

Fanless Design and Heat-pipe



The ASUS fanless design allows multi-directional heat flow from major thermal sources in the motherboard to lower overall system temperature, resulting in quieter operation and longer system life. ASUS has devoted special efforts to addressing the thermal issues across the motherboard, and most notably in the following areas: CPU, power, VGA, Northbridge and Southbridge. The heat pipe, heatsink, and strategic board layout were tailor made to dissipate heat in the most efficient manner.

1.3.3 ASUS special features

ASUS CrashFree BIOS 3

The ASUS CrashFree BIOS 3 allows users to restore corrupted BIOS data from a USB flash disk containing the BIOS file. This utility saves users the cost and hassle of buying a replacement BIOS chip. See page 4-9 for details.

ASUS EZ Flash 2

EZ Flash 2 is a user-friendly BIOS update utility. Simply press the predefined hotkey to launch the utility and update the BIOS without entering the OS. Update your BIOS easily without preparing a bootable diskette or using an OS-based flash utility. See page 4-5 for details.

ASUS MyLogo 3

ASUS My Logo 3 is the new feature present in the motherboard that allows you to personalize and add style to your system with customizable and animated boot logos. See page 5-9 for details.

ASUS Q-Connector

You can use ASUS Q-Connector to connect / disconnect chassis from panel cables by only a few easy steps. See page 2-36 for details.

C.P.R. (CPU Parameter Recall)

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

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.

1.3.4 ASUS Intelligent Overclocking features

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 4-43 for details.

AI NOS™ (Non-Delay Overclocking System)



Applications such as 3D games and video editing demand a huge chunk of system resource. Inject “nitrous oxide” into your CPU! The patented AI NOS™ (Non-delay Overclocking System) technology intelligently detects system load and automatically boosts performance for the most demanding tasks. Unlike other dynamic overclocking techniques, AI NOS™ reacts much faster to satisfy your unending need for speeds. See page 4-20 for details.

AI Clock Skew



AI Clock Skew automatically skews the memory clock signal timing and improves memory overclocking capability by 10 to 15%, depending on the memory features when users overclock memory frequency. Users can enjoy better memory overclocking without strenuously fine-tuning the clock signal timing. For professional users, they can still adjust each memory channel’s clock signal separately to reach the highest memory frequency.

Precision Tweaker



It offers ways to raise system performance inch-by-inch and step-by-step to achieve maximum performance! This is about getting the most out of your machine and taking pride in your customized computer.

vDIMM takes control of how much power is going into the memory modules. ASUS gives you 25-step voltage control to the DIMM

vCore finds out “exactly” how much power your CPU needs. Fine-tune it with 0.0125 volts at a time!

SFS (Stepless Frequency Selection) allows

- FSB tuning from 200MHz up to 400MHz at 1MHz increment
- PCI Express frequency tuning from 100MHz up to 200MHz at 1MHz increment

1.3.5 ASUS features and the supporting OS

Refer to the following table for the OS that supports ASUS features.

	Win 2000	XP 32bit	XP 64bit	Vista 32bit	Vista 64bit
ScreenDUO		v	v	v	v
AI Remote		v	v	v	v
AP Trigger		v	v	v	v
ASAP	Function as USB Flash only			v	v
AI NOS	v	v	v	v	v
AI Gear	v	v	v	v	v
AI Nap	v	v	v	v	v
AI Booster	v	v	v	v	v
Array Mic	v	v	v	v	v
Noise Filter	v	v	v	v	v
SoundMAX	v	v	v	□	□
PC Probe II	v	v	v	v	v



Features with □ mark will be available later. You may download the utility and the driver from the ASUS website (support.asus.com).

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 information

A large, light gray, stylized number '2' is positioned behind the word 'Hardware' in the title.

2.1	Before you proceed	2-1
2.2	Motherboard overview.....	2-2
2.3	Central Processing Unit (CPU)	2-7
2.4	System memory	2-13
2.5	Expansion slots.....	2-19
2.6	Jumper	2-22
2.7	Connectors	2-23

2.1 Before you proceed

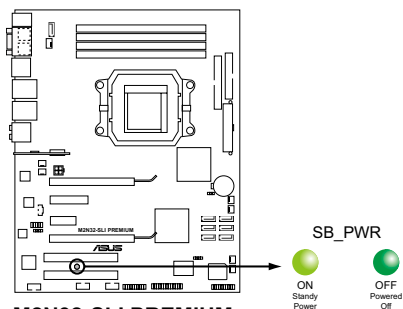
Take note of the following precautions before you install motherboard components or change any motherboard settings.



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

Onboard LED

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



M2N32-SLI PREMIUM
Onboard LED connector

2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

2.2.1 Placement direction

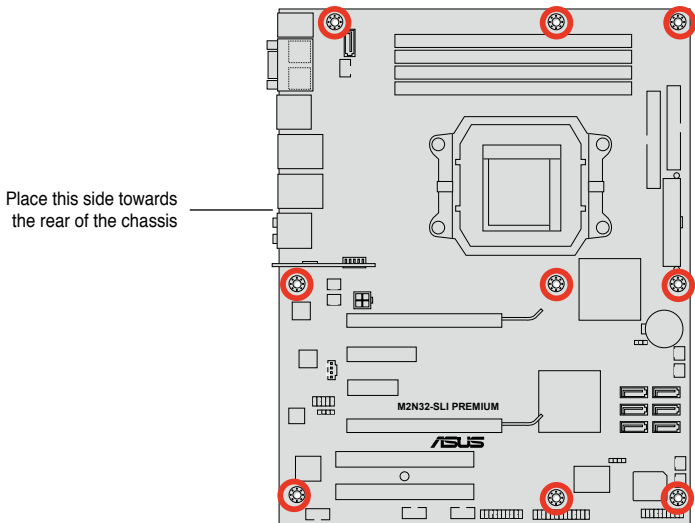
When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

2.2.2 Screw holes

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



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

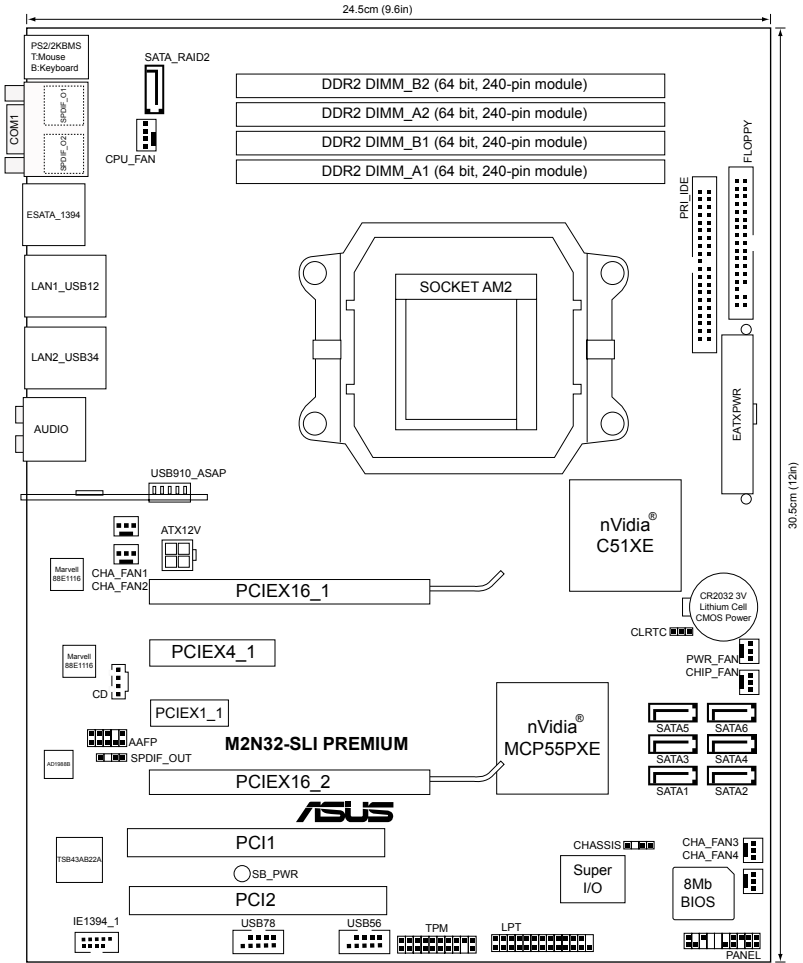


2.2.3 ASUS Stack Cool 2

The motherboard comes with the ASUS Stack Cool 2 cooling solution that lowers the temperature of critical heat generating components by 20°C. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat that critical components generate.



2.2.4 Motherboard layout



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

2.2.5 Layout contents

Slots		Page
1.	DDR2 DIMM slots	2-13
2.	PCI slots	2-21
3.	PCI Express x 4 slot	2-21
4.	PCI Express x 1 slot	2-21
5.	PCI Express x16 slots	2-21

Jumper		Page
1.	Clear RTC RAM (3-pin CLRTC)	2-22

Rear panel connectors		Page
1.	PS/2 mouse port (green)	2-23
2.	Serial (COM) port	2-23
3.	IEEE 1394a port	2-23
4.	LAN 1/2 (RJ-45) port.	2-23
5.	Center/Subwoofer port (orange)	2-23
6.	Rear Speaker Out port (black)	2-23
7.	Line In port (light blue)	2-23
8.	Line Out port (lime)	2-23
9.	Microphone port (pink)	2-24
10.	Side Speaker Out port (gray)	2-24
11.	USB 2.0 ports 1 and 2, 3 and 4	2-24
12.	External SATA port	2-24
13.	Optical S/PDIF Out port	2-25
14.	Coaxial S/PDIF Out port	2-25
15.	PS/2 keyboard port (purple)	2-25

Internal connectors		Page
1.	Floppy disk drive connector (34-1 pin FLOPPY)	2-26
2.	IDE connector (40-1 pin PRI_IDE)	2-26
3.	NVIDIA® nForce® 590 SLI Southbridge Serial ATA connectors (7-pin SATA1 [red], SATA2 [red], SATA3 [red], SATA4 [red], SATA5 [red], SATA6 [red])	2-27
4.	Silicon Image® Serial ATA RAID connector (7-pin SATA_RAID2)	2-28
5.	USB connectors (10-1 pin USB56, USB78, USB910_ASAP)	2-29
6.	IEEE 1394a port connector (10-1 pin IE1394_1)	2-29
7.	CPU, chassis, power, and chipset fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1, 3-pin CHA_FAN2, 3-pin CHA_FAN3, 3-pin CHA_FAN4, 3-pin PWR_FAN, 3-pin CHIP_FAN)	2-30
8.	Chassis intrusion connector (4-1 pin CHASSIS)	2-31
9.	ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	2-31
10.	Front panel audio connector (10-1 pin AAFP)	2-32
11.	Optical drive audio connector (4-pin CD)	2-33
12.	Parallel port connector (26-1 pin LPT)	2-33
13.	Digital audio connector (4-1 pin SPDIF)	2-34
14.	TPM connectoe (20-1 pin TPM)	2-34
15.	System panel connector (20-8-pin PANEL) <ul style="list-style-type: none"> • System power LED (2-pin PLED) • Hard disk drive activity LED (2-pin IDE_LED) • System warning speaker (4-pin SPEAKER) • ATX power button/soft-off button (2-pin PWRSW) • Reset button (2-pin RESET) 	2-35

2.3 Central Processing Unit (CPU)

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

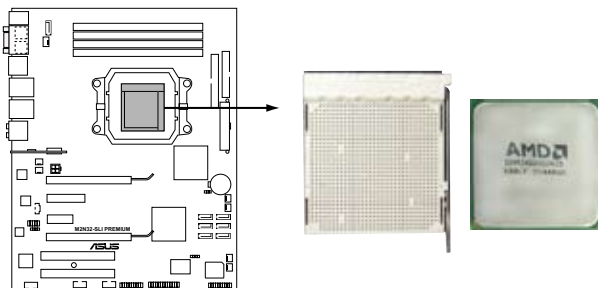


The AM2 socket has a different pinout from the 940-pin socket designed for the AMD Opteron processor. Make sure you use a CPU designed for the AM2 socket. The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the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

2.3.1 Installing the CPU

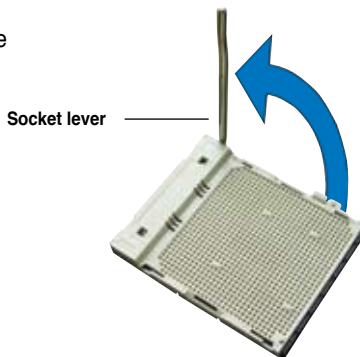
To install a CPU:

1. Locate the CPU socket on the motherboard.



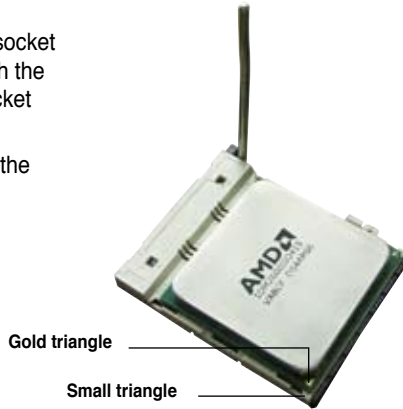
**M2N32-SLI PREMIUM
CPU Socket AM2**

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



Make sure that the socket lever is lifted up to a 90° angle; otherwise, the CPU will not fit in completely.

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



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



2.3.2 Installing the heatsink and fan

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



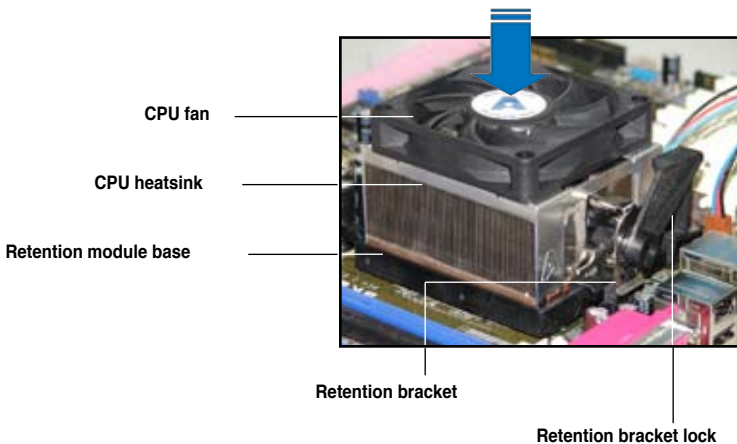
Make sure that you use only AMD-certified heatsink and fan assembly.

To install the CPU heatsink and fan:

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

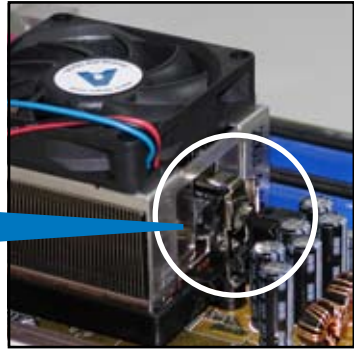


-
- The retention module base is already installed on the motherboard upon purchase.
 - You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
 - If you purchased a separate CPU heatsink and fan assembly, make sure that a Thermal Interface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



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

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



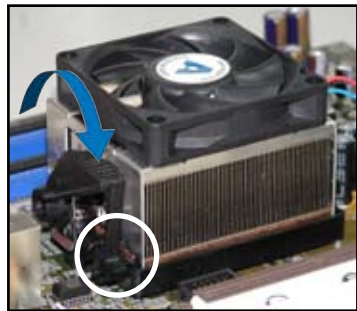
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.



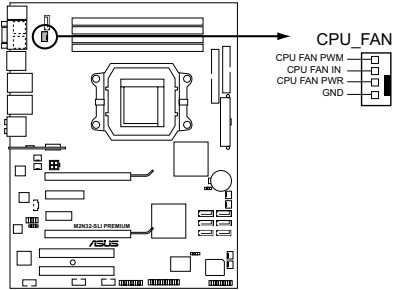
Make sure that the fan and heatsink assembly perfectly fits the retention mechanism module base, otherwise you cannot snap the retention bracket in place.



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



5. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.



M2N32-SLI PREMIUM CPU Fan connectors



- Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.
- This connector is backward compatible with old 3-pin CPU fan.

2.3.3 Installing the optional fan



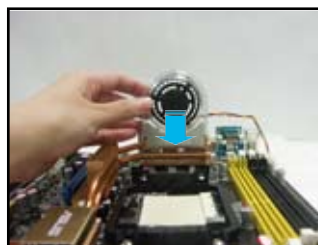
Install the optional fan only if you are using a passive cooler or a water cooler. Installing the optional fan with an active CPU cooler will interfere with the airflow and destabilize the system.



1. Position the fan above the pipe and heatsink assembly.



2. Fit the grooved edge to the heatsink.



3. Carefully push down the fan until it snugly fits the heatsink, then connect the fan cables.



4. The above photo shows the fan installed on the motherboard.



- Plug the optional fan cable to any of the CHA FAN1~4 connectors on the motherboard.
- Make sure the optional fan is installed correctly to prevent damage to the fan and motherboard components.

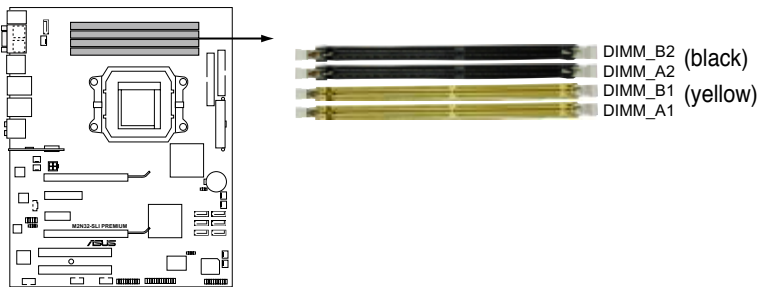
2.4 System memory

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 has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:



M2N32-SLI PREMIUM
240-pin DDR2 DIMM Sockets

Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

2.4.2 Memory configurations

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

Recommended Memory Configurations

Mode	Sockets			
	DIMM_A1	DIMM_B1	DIMM_A2	DIMM_B2
Single-Channel	-	Populated	-	-
	Populated	-	-	-
Dual-channel (1)	Populated	Populated	-	-
Dual-channel (2)	Populated	Populated	Populated	Populated



- When using only one memory module, start installing the DDR2 DIMMs from slot DIMM_A1 or DIMM_B1 for better overclocking capability.
- For dual-channel configuration (2), you may:
 - install identical DIMMs in all four sockets OR
 - install identical DIMM pair in DIMM_A1 and DIMM_B1 (yellow sockets) and another identical DIMM pair in DIMM_A2 and DIMM_B2 (black sockets)
- Always use identical DDR2 DIMM pairs for dual channel mode. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Visit the ASUS website (www.asus.com) for the latest Qualified Vendors list.



Important notice on installing Windows® XP 32-bit version

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

Visit the ASUS FAQ site for further explanation:

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

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



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

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

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



This motherboard can support 8 GB physical memory on the operating systems listed below. You may install a maximum of 2 GB DIMMs on each slot.

32-bit	64-bit
Windows® 2000 Advanced Server	Windows® Server 2003 Standard x64 Edition
Windows® Server 2003 Enterprise Edition	Windows® XP Professional x64 Edition
	Windows® Server 2003 Enterprise x64 Edition
	Windows® Vista x64 Edition

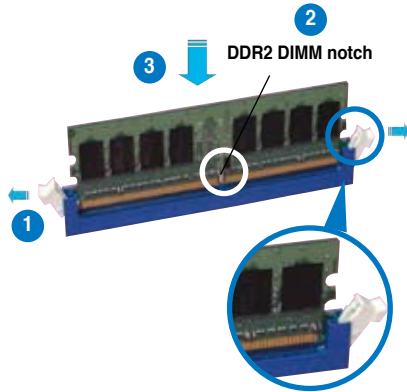
2.4.3 Installing a DIMM



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

To install a DIMM:

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



Unlocked retaining clip



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

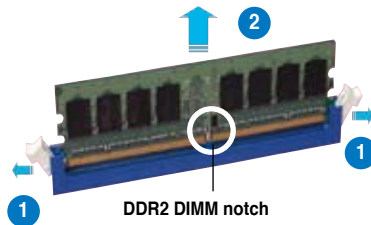
2.4.4 Removing a DIMM

To remove a DIMM:

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



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



2. Remove the DIMM from the socket.

M2N32-SLI Premium Vista Edition Motherboard Qualified Vendors Lists (QVL)

DDR2-800 MHz capability

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM support		
					A*	B*	C*
512MB	KINGSTON	Het-Sink Package	SS	KHX6400D2/512	•	•	
512MB	KINGSTON	K4T51083QC	SS	KVR800D2N5/512	•	•	•
1024MB	KINGSTON	K4T51083QC	DS	KVR800D2N5/1G	•	•	•
1024MB	KINGSTON	Heat-Sink Package	DS	KHX6400D2LL/1G	•	•	•
1024MB	KINGSTON	Heat-Sink Package	SS	KHX6400D2LLK2/1GN	•	•	•
256MB	SAMSUNG	K4T56083QF-ZCE7	SS	M378T3253FZ3-CE7	•	•	•
256MB	SAMSUNG	K4T56083QF-ZCE7(ECC)	SS	M391T3253FZ3-CE7	•	•	•
512MB	SAMSUNG	EDD339XX	SS	M378T6553CZ0-CE7	•	•	•
512MB	Infineon	HYB18T256800AF25	DS	HYS64T64520HU-2.5-A	•	•	•
512MB	Infineon	HYB18T256800AF25F	DS	HYS64T64020HU-25F-A	•	•	•
512MB	Hynix	HY5PS12821AFP-S6	SS	HYMP564U64AP8-S6	•	•	•
1024MB	Hynix	HY5PS12821AFP-S6	DS	HYMP512U64AP8-S6	•	•	•
512MB	MICRON	5JAIIZ9DQQ	SS	MT8HTF6464AY-80EA3	•	•	•
1024MB	MICRON	5JAIIZ9DQQ	DS	MT16HTF12864AY-80EA3	•	•	•
512MB	MICRON	5ZD22D9GKX	SS	MT8HTF6464AY-80ED4	•	•	•
1024MB	MICRON	5ZD22D9GKX	DS	MT16HTF12864AY-80ED4	•	•	•
512MB	MICRON	6CD22D9GKX	SS	MT8HTF6464AY-80ED4	•	•	•
1024MB	MICRON	6CD22D9GKX	DS	MT16HTF12864AY-80ED4	•	•	•
512MB	CORSAIR	Heat-Sink Package	SS	CM2X512A-6400	•	•	•
1024MB	CORSAIR	Heat-Sink Package	DS	CM2X1024-6400PRO	•	•	•
1024MB	CORSAIR	Heat-Sink Package	DS	CM2X1024-6400C4	•	•	•
256MB	A-DATA	E2508AB-GE-E	SS	M2OEL6F3G3160A1D0Z	•	•	•
256MB	A-DATA	E2508AB-GE-E	SS	M2OEL6F3G3170A1D0Z	•	•	•
512MB	A-DATA	E2508AB-GE-E	DS	M2OEL6F3H4170A1D0Z	•	•	•
512MB	A-DATA	N/A	SS	M2OAD6G3H3160J1E52	•	•	•
512MB	A-DATA	AD29608A8A-25EG	SS	M2OAD6G3H3160J1E5E	•	•	•
512MB	Apacer	E2508AB-GE-E	DS	78.91091.420	•	•	•
256MB	TwinMOS	E2508AB-GE-E	SS	8G-24IK2-EBT	•	•	•
512MB	Elixir	N2TU51280AE-25C	SS	M2Y51264U88A2B-25C	•	•	•
512MB	NANYA	NT5TU64M8AE-25C	SS	NT512T64U88A1BY-25C	•	•	•
512MB	NANYA	NT5TU64M8BE-25C	SS	NT512T64U88B0BY-25C	•	•	•
1024MB	NANYA	NT5TU64M8BE-25C	DS	NT1G164U88B0BY-25C	•	•	•
512MB	Crucial	Heat-Sink Package	SS	BL6464AA804.8FA	•	•	•
1024MB	Crucial	Heat-Sink Package	DS	BL12864AA804.16FA	•	•	•
512MB	Crucial	Heat-Sink Package	SS	BL6464AA804.8FD	•	•	•
1024MB	Crucial	Heat-Sink Package	DS	BL12864AA804.16FD	•	•	•
512MB	OCZ	Heat-Sink Package	SS	OCZ28001024EBDCPE-K	•	•	•
1024MB	OCZ	Heat-Sink Package		OCZ2G8002GK	•	•	•
512MB	GEIL	Heat-Sink Package	SS	GX21GB6400DC	•	•	•
512MB	GEIL	Heat-Sink Package	SS	GX21GB6400UDC	•	•	•

DDR2-667 MHz capability

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM support		
					A*	B*	C*
512MB	ADATA	E5108AE-6E-E	SS	M20EL5G3H3160B1C0Z	*	*	
512MB	ADATA	AD29608A88-3EG	SS	M20AD5Q3H3163J1C5Z	*	*	*
512MB	AENEON	AET93F30DA	SS	AET660UD00-30DA98Z	*	*	*
512MB	ELIXIR	N2TU51280AF-3C	SS	M2U51264TU88A0F-3C	*	*	
1024MB	ELIXIR	N2TU51280AF-3C	DS	M2U1G64TU8HA2F-3C	*	*	*
256MB	GEIL	GL2L32M168BA30F	SS	GX25125300DC	*	*	
512MB	GEIL	GL2L64G088BA30T	SS	GX21GB5300DC	*	*	*
512MB	GEIL	Heat-Sink Package	SS	GX21GB5300SDC	*	*	*
256MB	HYNIX	HY5PS121621AFP-Y5	SS	HYMP532U64AP6-Y5 AA	*	*	*
512MB	HYNIX	HY5PS12821AFP-Y4	DS	HYMP564U64AP8-Y4 AA	*	*	*
256MB	HYNIX	HY5PS12821AFP-Y5	SS	HYMP532U64AP6-Y5 AA	*	*	
512MB	HYNIX	HY5PS121621AFP-Y5	SS	HYMP564U64AP6-Y5 AA	*	*	*
512MB	HYNIX	HY5PS12821AFP-Y4	SS	HYMP564U64AP8-Y4 AA	*	*	*
512MB	HYNIX	HY5PS12821AFP-Y5	SS	HYMP564U64AP8-Y5 AA	*	*	*
1024MB	HYNIX	HY5PS12821AFP-Y4	DS	HYMP512U64AP8-Y4 AB	*	*	
1024MB	HYNIX	HY5PS12821AFP-Y5	DS	HYMP512U64AP8-Y5 AB	*	*	*
256MB	INFINEON	HYB18T512160AF-3S	SS	HYS64T32000HU-3S-A	*	*	
256MB	INFINEON	HYB18T512160BF-3S	SS	HYS64T32000HU-3S-B	*	*	*
512MB	INFINEON	HYB18T512800AF3S	SS	HYS64T64000HU-3S-A	*	*	
512MB	INFINEON	HYB18T512800BF3S	SS	HYS64T64000HU-3S-B	*	*	*
1024MB	INFINEON	HYB18T512800BF3S	SS	HYS64T128020HU-3S-B	*	*	
512MB	KINGBOX	E544H8G0WPAK	SS	N/A	*	*	*
1024MB	KINGBOX	E544H8G0WP91	DS	N/A	*	*	
512MB	KINGSTON	E5108AE-6E-E	SS	KVR667D2N5/512	*	*	*
1024MB	KINGSTON	E5108AE-6E-E	DS	KVR667D2N5/1G	*	*	*
256MB	KINGSTON	HYB18T256800AF3	SS	KVR667D2N5/256	*	*	*
512MB	KINGMAX	KKEA88E4AAK-37	SS	KLBC28F-A8KE4	*	*	
512MB	MICRON	4VB41D9CZM	DS	MT16HTF6464AY-667B4	*	*	
512MB	MICRON	4VB41D9CZM	DS	MT16HTF6464AY-667B4	*	*	
512MB	NANYA	NT5TU64M8AE-3C	SS	NT512T64U88A0BY-3C	*	*	*
512MB	NANYA	NT5TU64M88E-3B	SS	NT512T64U88B0BY-3C	*	*	*
256MB	NANYA	NT5TU32M16AG-3C	SS	NT256T64HU4A0FY-3C	*	*	
512MB	NANYA	NT5TU64M88E-3B	SS	NT512T64U88B0BY-3C	*	*	*
1024MB	PQI	E5108AE-5C-E	DS	0104-05A1	*	*	
512MB	SAMSUNG	K4T51083QC	SS	M378T6553CZ0-CE6	*	*	
1024MB	SAMSUNG	K4T51083QC	DS	M378T2953CZ0-CE6	*	*	
512MB	SAMSUNG	K4T51083QC	SS	M378T6553CZ0-CE6	*	*	*
1GB	SAMSUNG	K4T51083QC	DS	M378T2953CZ0-CE6	*	*	*
512MB	SAMSUNG	K4T56083QF-ZCE6	DS	M378T6453FZ0-CE6	*	*	*
512MB	TRANSCEND	E5108AE-6E-E	SS	TS64MLQ64V6J	*	*	
512MB	CRUCIAL	Heat-Sink Package	DS	BL6464AA664.16FB	*	*	*
1024MB	CRUCIAL	Heat-Sink Package	DS	BL12864AA663.16FA	*	*	*
512MB	CRUCIAL	Heat-Sink Package	DS	CM64M6416U26AD2F-3VXADJFI-AW	*	*	*
1024MB	CRUCIAL	Heat-Sink Package	DS	CM128M6416U27AD2F-3VXCDHZZ	*	*	*
512MB	ELPIDA	E5108AE-6E-E	SS	EBEB1UD8AEFA-6E-E	*	*	*
1024MB	WINTEC	4WA1ID9CWX	DS	39137282	*	*	
512MB	WINTEC	4UA12D9CRZ	SS	39127282W24965R	*	*	*
512MB	MDT	18D51280D-3	SS	M512-667-8	*	*	*
1024MB	MDT	18D51280D-3	DS	M924-667-16	*	*	*
1024MB	OCZ	Heat-Sink Package		OCZ26672048EBDCPE-K	*	*	*

DDR2-533 MHz capability

Size	Vendor	Chip No.	SS/ DS	Part No.	DIMM support		
					A*	B*	C*
512MB	Hynix	HY5PS12821F-C4	SS	HYMP564U648-C4	•	•	•
1GB	Hynix	HY5PS12821F-C4	DS	HYMP512U728-C4 AA	•	•	
512MB	Hynix	HY5PS12821AFP-C3	SS	HYMP564U64AP8-C3	•	•	
1024MB	Hynix	HY5PS12821AFP-C3	DS	HYMP512U64AP8-C3	•		
512MB	INFINEON	HYB18T512	SS	HYS64T64000GU-3.7-A	•	•	
512MB	INFINEON	HYB18T512	SS	HYS64T64000HU-3.7-A	•	•	
512MB	MICRON	4EB11D9BQM	DS	MT16HTF6464AG-53EB2	•	•	•
256MB	SAMSUNG	K4T56083QF-GCD5	SS	M378T3253FG0-CD5	•	•	•
512MB	SAMSUNG	K4T151083QB-GCD5	SS	M378T6553BG0-CD5	•	•	
1GB	SAMSUNG	K4T15083QB-GCD5	DS	M391T2953BG0-CD5	•	•	
512MB	SAMSUNG	K4T51083QB-GCD5	SS	M391T6553BG0-CD5	•		
512MB	ELPIDA	E5108AB-5C-E	SS	EBE51ED8ABFA-5C-E	•	•	
512MB	ELPIDA	E5108AB-5C-E	SS	EBE51UD8ABFA-5C-E	•	•	
256MB	CENTURY	K4T56083QF-GCD5	SS	25V6S8SSD5F4-K43	•	•	
512MB	CENTURY	E5108AB-5C-E	SS	25V2H8EL5CB4-J43	•	•	•
512MB	Aeneon	AET93F370AG0513	SS	AET660UD00-370A98X	•	•	•
256MB	Aeneon	AET94F370A	SS	AET560UD00-370A98X	•	•	•
256MB	Aeneon	AET94F370A	SS	AET560UD00-370A98X	•	•	•
512MB	Aeneon	AET93F370	SS	AET660UD00-370A98X	•	•	•
1024MB	Aeneon	AET93F370A	DS	AET760UD00-370A98X	•	•	•
512MB	Aeneon	AET82F370A	DS	AET660UD00-370A88S	•	•	
1024MB	Aeneon	AET93F370A	DS	AET760UD00-370A98X	•	•	
512MB	Aeneon	AET82F370A	DS	AET660UD00-370A88S	•	•	
512MB	Veritech	VTD264M8PC6G	SS	GTP512HLTm46DG	•	•	
256MB	KINGSTON	E5116AF-5C-E	SS	KVR533D2N4/256	•	•	•
512MB	KINGSTON	HYB18T512800AF37	SS	KVR533D2N4/512	•	•	•
1024MB	KINGSTON	5YD1ID9GCT	DS	KVR533D2N4/1G	•	•	•
512MB	Qimonda	HYB18T512800AC37	SS	HYS64T64000GU-3.7-A	•	•	•
256MB	Qimonda	HYB18T512160AF-3.7	SS	HYS64T32000HU-3.7-A	•	•	•
512MB	Qimonda	HYB18T512800AF37	SS	HYS64T64000HU-3.7-A	•	•	•
1024MB	Qimonda	HYB18T512800AF37	DS	HYS64T128020HU-3.7-A	•		•
256MB	Qimonda	HYB18T512160BF-3.7	SS	HYS64T32000HU-3.7-B	•	•	



- 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 4 modules inserted into both the yellow and black slots as two pairs of Dual-channel memory configuration.



Visit the ASUS website for the latest DDR2-800/667/533 MHz QVL.

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.



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

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 the it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 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.

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	Floppy Disk Controller
7	15	Printer Port (LPT1)*
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	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	–	shared	–	–	–	–	–	–
PCI slot 2	–	–	shared	–	–	–	–	–
Onboard 1394	shared	–	–	–	–	–	–	–
PCIe x16_1	shared	–	–	–	–	–	–	–
PCIe x16_2	–	–	–	–	–	shared	–	–
PCIe x 4	–	–	–	–	–	–	shared	–
PCIe x 1	–	–	–	–	shared	–	–	–

2.5.4 PCI slots

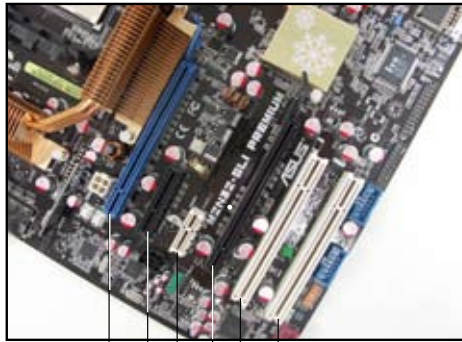
The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slots.

2.5.5 PCI Express x4 slot & PCI Express x1 slot

This motherboard supports PCI Express x4 and PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. Refer to the figure below for the location of the slot.

2.5.6 PCI Express x16 slots

This motherboard supports two NVIDIA® SLI™-ready PCI Express x16 graphic cards that comply with PCI Express specifications. Refer to the figure below for the location of the slots.



PCI Express x16_1 slot (blue)
PCI Express x4 slot
PCI Express x1 slot
PCI slot
PCI slot
PCI Express x16_2 slot (black)



- Connect a rear chassis fan to the chassis (CHA_FAN1 or CHA_FAN2) connector when using two graphics cards for better thermal environment. See page 2-30 for details.
- In single card mode, you may use either the blue or black slot for PCI Express x16 cards.
- In NVIDIA® SLI™ mode, the PCI Express x16 slots work at the full bandwidth of PCI Express x16 for a combined bandwidth of x32.
- We recommend that you provide sufficient power when running NVIDIA® SLI™ mode. See page 2-31 and 2-32 for details.
- See chapter 6 for details on the NVIDIA SLI™ technology feature.

2.6 Jumper

Clear RTC RAM (3-pin CLRTC)

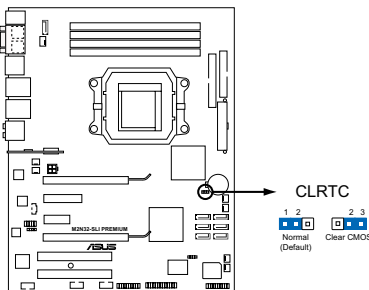
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

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



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



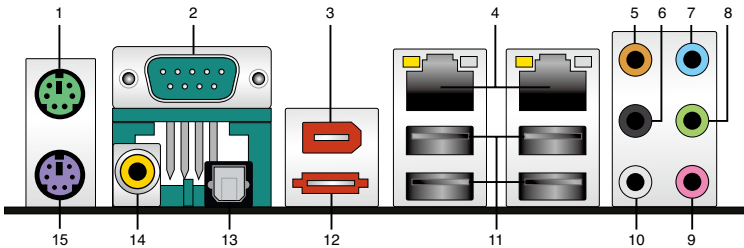
M2N32-SLI PREMIUM Clear RTC RAM



- Make sure 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 overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
-

2.7 Connectors

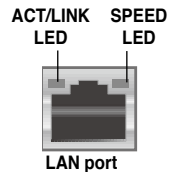
2.7.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **Serial (COM) port.** This 9-pin COM1 port is for pointing devices and other serial devices.
3. **IEEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.
4. **LAN 1/2 (RJ-45) port.** Supported by Marvell® 88E1116 Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

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



5. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.
6. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4-channel, 6-channel, or 8-channel audio configuration.
7. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
8. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.

- 9. **Microphone port (pink).** This port connects a microphone.
- 10. **Side Speaker Out port (gray).** This port connects the side speakers in an 8-channel audio configuration.

Refer to the audio configuration table below for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

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 Ou	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

- 11. **USB 2.0 ports 1 and 2, 3 and 4.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.



Connect the IR receiver ONLY to USB port 3 and 4, which support remote control function. Plugging any other USB devices to these two ports will turn on the computer.

- 12. **External SATA port.** This port connects to an external SATA box or a Serial ATA port multiplier. This port supports a Serial ATA hard disk drive that you can combine with an external Serial ATA 3.0 Gb/s device to configure a RAID 0, RAID 1, or JBOD set through the onboard Silicon Image® SATA RAID controller.



The external SATA port supports external Serial ATA 3.0 Gb/s devices. Longer cables support higher power requirements to deliver signal up to two meters away, and enables improved hot-swap function.





-
- Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cable and installed Serial ATA hard disk drives; otherwise, you cannot enter the Silicon Image RAID utility and SATA BIOS setup during POST.
 - If you intend to create a RAID configuration using this connector, set the Silicon 3132 Controller item in the BIOS to [RAID Mode]. See section **4.4.6 Onboard Device Configuration** for details.
 - Use these ports and an external Serial ATA box connected to the external SATA port, if you want to configure a RAID 0, 1 or JBOD set.
 - The Serial ATA port multiplier and external Serial ATA box are purchased separately.
-



-
- DO NOT insert a different connector to this port.
 - DO NOT unplug the external Serial ATA box when a RAID 0 or JBOD is configured.
-

- 13. Optical S/PDIF Out port.** This port connects an external audio output device via an optical S/PDIF cable.
- 14. Coaxial S/PDIF Out port.** This port connects an external audio output device via a coaxial S/PDIF cable.
- 15. PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

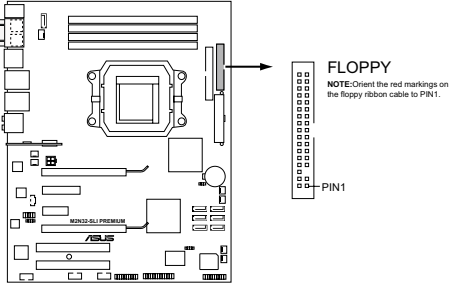
2.7.2 Internal connectors

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

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



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



M2N32-SLI PREMIUM
Floppy disk drive connector

2. IDE connector (40-1 pin PRI_IDE)

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.

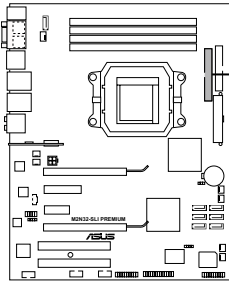
	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	–	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	



- 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 100/66 IDE devices.



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



PRI_IDE

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN1.

PIN1



**M2N32-SLI PREMIUM
IDE connector**

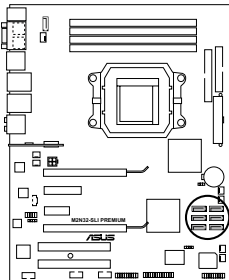
3. NVIDIA® nForce® 590 SLI Southbridge Serial ATA connectors (7-pin SATA1 [red], SATA2 [red], SATA3 [red], SATA4 [red], SATA5 [red], SATA6 [red])

These connectors are for the Serial ATA signal cables for Serial ATA 3.0 Gb/s hard disk and optical disk drives. The Serial ATA 3.0 Gb/s is backward compatible with Serial ATA 1.5 Gb/s specification.

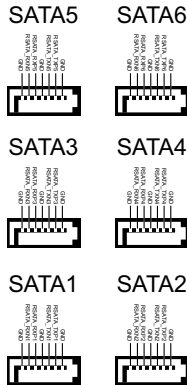
If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 0+1, RAID 5, or JBOD configuration through the onboard NVIDIA® MediaShield™ controller.



The RAID function of these connectors is set to [Disabled] by default. If you intend to create a Serial ATA RAID set using these connectors, enable the **RAID Enabled** item in the SATA Configuration sub-menu in the BIOS. See section **4.4.6 Onboard Device Configuration** for details.



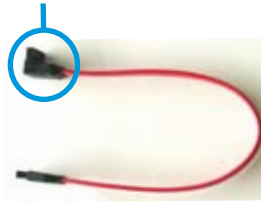
**M2N32-SLI PREMIUM
SATA connectors**





Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

right angle side

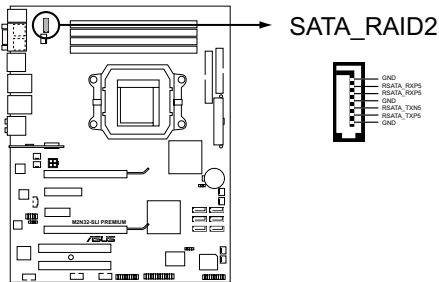


4. Silicon Image® Serial ATA RAID connector (7-pin SATA_RAID2)

This connector is for a Serial ATA signal cable. This connector supports a Serial ATA hard disk drive that you can configure for RAID through the onboard Serial ATA RAID controller.



The Silicon 3132 Controller item in the BIOS is set to [SATA Mode] by default, allowing you to enable the hot-plug function for the external device. Set to [RAID Mode] to use the connectors to build a RAID set. See section 4.4.6 **Onboard Device Configuration** for details.



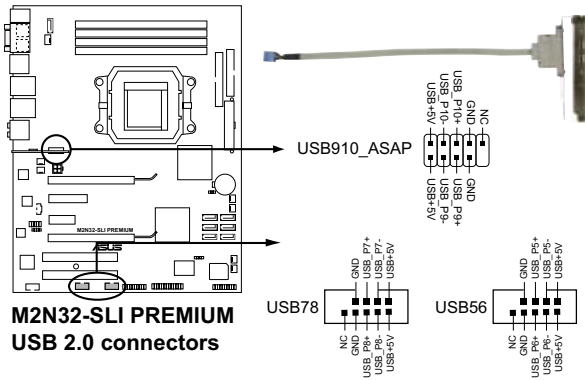
**M2N32-SLI PREMIUM
SATA RAID connector**



Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cables and installed Serial ATA hard disk drives; otherwise, you cannot enter the Silicon Image® RAID utility and SATA BIOS setup during POST.

5. USB connectors (10-1 pin USB56, USB 78, USB910_ASAP)

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



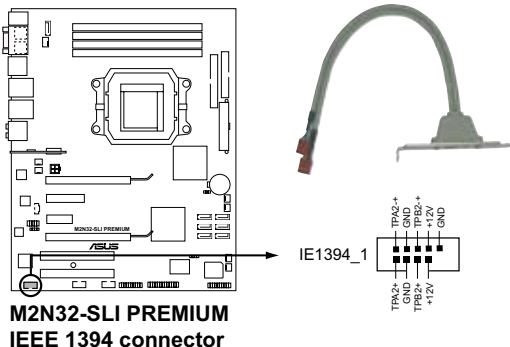
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



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.

6. IEEE 1394a port connector (10-1 pin IE1394_1)

This connector is for a 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.





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



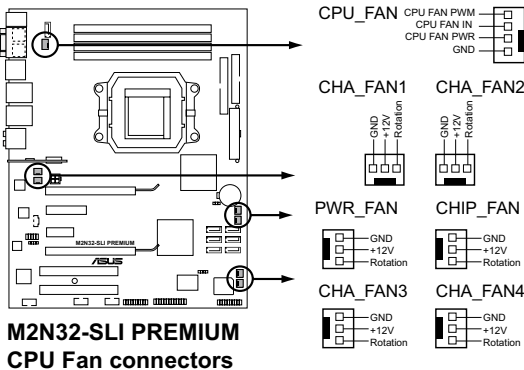
You can connect the 1394 cable to ASUS Q-Connector (1394, red) first, and then install the Q-Connector (1394) to the 1394 connector onboard.

7. CPU, chassis, power, and chipset fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1, 3-pin CHA_FAN2, 3-pin CHA_FAN3, 3-pin CHA_FAN4, 3-pin PWR_FAN, 3-pin CHIP_FAN)

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, making sure that the black wire of each cable matches the ground pin of the connector.



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

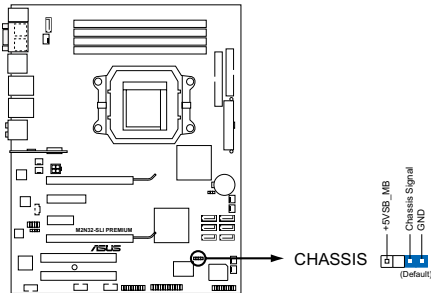


- Only the CPU-FAN and CHA-FAN 1-4 connectors support the ASUS Q FAN2 feature.
- If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1 or CHA_FAN2 for better thermal environment.

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

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

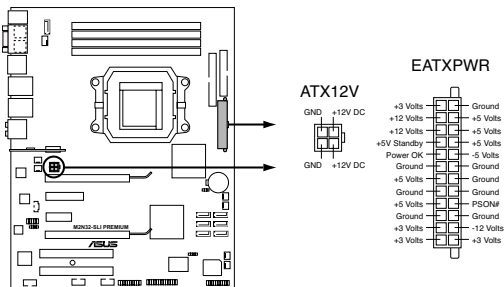
By default, the pin labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



M2N32-SLI PREMIUM
Chassis intrusion connector

9. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

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.



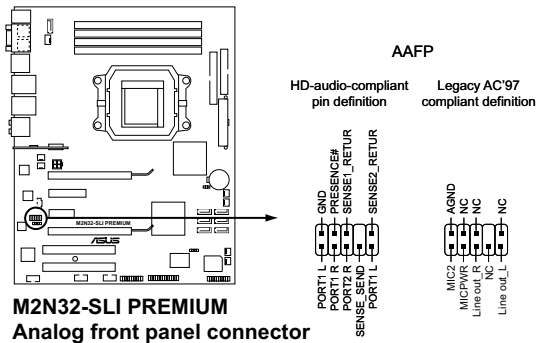
M2N32-SLI PREMIUM
ATX power connector



- 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 4-pin ATX +12 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.
- The ATX 12 V Specification 2.0-compliant (500W) PSU has been tested to support the motherboard power requirements with the following configuration:
CPU: AMD FX-62
Memory 1024 MB DDR2-800 (x4)
Graphics card: PCI Express x16 NVIDIA 7900GTX
Serial ATA device: SATA hard disk drive (x2)
Optical drives: DVD-RW
- If you want to use two EN7950GX2 graphics cards, visit the NVIDIA website(www.nvidia.com) for the qualified PSU vendor list.

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

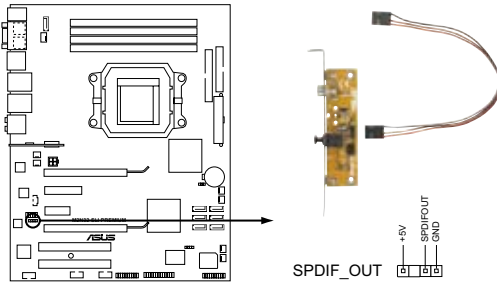
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- By default, this connector is set to [AC`97]. If you want to connect a **High Definition** front panel audio module to this connector, set the **Front Panel Support Type** item in the BIOS setup to [HD Audio]. See section **4.4.6 Onboard Device Configuration** for details.

13. 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.



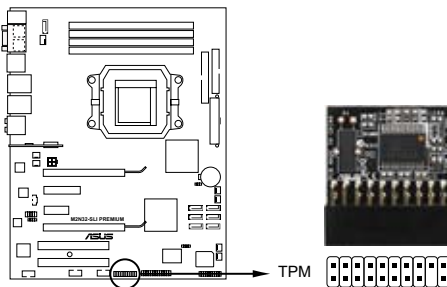
M2N32-SLI PREMIUM
Digital audio connector



The S/PDIF module is purchased separately.

14. TPM connector (20-1 pin TPM)

This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity. See section “4.6.6 Security” for details.



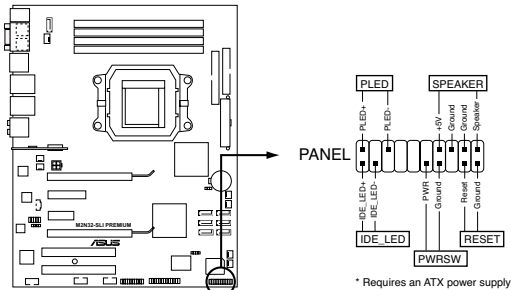
M2N32-SLI PREMIUM
TPM connector



The TPM module is purchased separately. Use the ASUS TPM module ONLY.

15. System panel connector (20-pin PANEL)

This connector supports several chassis-mounted functions.



M2N32-SLI PREMIUM
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 PWRSR)**

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)**

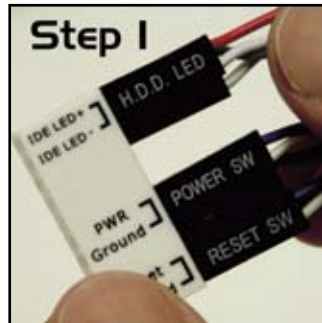
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

ASUS Q-Connector (system panel)

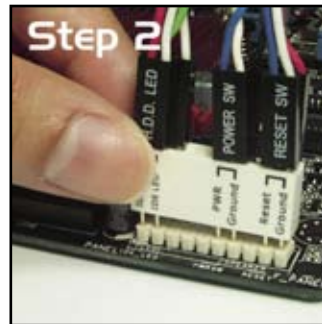
You can use the ASUS Q-Connector to connect/disconnect chassis front panel cables in a few steps. Refer to the instructions below to install the ASUS Q-Connector.

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

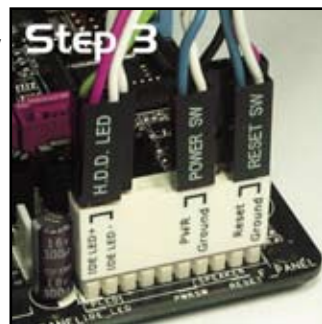
Refer to the labels on the Q-Connector to know the detailed pin definitions, then match them to the respective front panel cable labels.



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



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



This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

Powering up **3**

3.1	Starting up for the first time.....	3-1
3.2	Turning off the computer.....	3-2

3.1 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.
7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

3.2 Turning off the computer

3.2.1 Using the OS shut down function

If you are using Windows® 2000:

1. Click the Start button then click Shut Down.
2. Make sure that the Shut Down option button is selected, then click the OK button to shut down the computer.
3. 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.

If you are using Windows® Vista:

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

3.2.2 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 “4.5 Power Menu” in Chapter 4 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 4

4.1	Managing and updating your BIOS	4-1
4.2	BIOS setup program	4-10
4.3	Main menu	4-14
4.4	Advanced menu	4-19
4.5	Power menu.....	4-33
4.6	Boot menu	4-38
4.7	Tools menu	4-43
4.8	Exit menu	4-47

4.1 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 in DOS using a floppy disk / USB flash disk, or the motherboard support DVD.)
3. **Award BIOS Flash Utility** (Updates the BIOS using a bootable floppy disk / USB flash disk or a CD ROM.)
4. **ASUS CrashFree BIOS 3** (Updates the BIOS using a bootable floppy disk / USB flash disk or the motherboard support DVD 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 bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or Award BIOS Flash utilities.

4.1.1 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. See page 5-3 for the Utilities screen menu.
3. The ASUS Update utility is copied to your system.

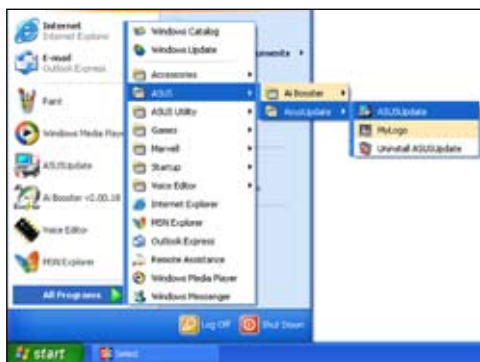


Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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



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



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

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



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



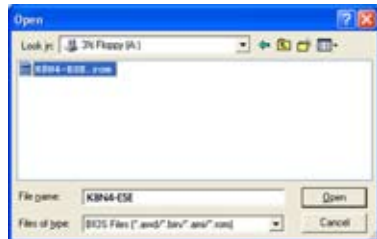
Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

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



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



4.1.2 Creating a bootable floppy disk

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

DOS environment

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

Windows® XP environment

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

Windows® 2000 environment

To create a set of boot disks for Windows® 2000:

- a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
- b. Insert the Windows® 2000 CD to the optical drive.
- c. Click **Start**, then select **Run**.
- d. From the Open field, type
`D:\bootdisk\makeboot a:`
assuming that D: is your optical drive.
- e. Press <Enter>, then follow screen instructions to continue.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

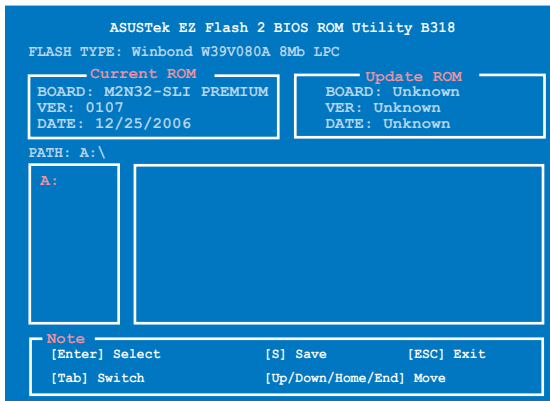
4.1.3 ASUS EZ Flash 2 utility

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

To update the BIOS using EZ Flash 2:

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

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



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

You can switch between drives by pressing <Tab> before the correct file is found. Then press <Enter>.

4. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.



- This function can support devices such as USB flash disk, hard disk, or floppy disk **with FAT 32/16/12 format only**.
- Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

4.1.4 Updating the BIOS

The Basic Input/Output System (BIOS) can be updated using the AwardBIOS Flash Utility. Follow these instructions to update the BIOS using this utility.

1. Download the latest BIOS file from the ASUS web site. Rename the file to M2N32SLI.BIN and save it to a floppy disk, CD ROM or a USB flash disk in **FAT 16/12 format**.



Save only the updated BIOS file in the disk to avoid loading the wrong BIOS file.

2. Copy the AwardBIOS Flash Utility (awdf flash.exe) from the Software folder of the support DVD to the floppy disk, CD ROM or a USB flash disk with the latest BIOS file.
3. Boot the system in DOS mode using the bootable floppy disk, CD ROM or a USB flash disk you created earlier.
4. Under the DOS mode, use <X:> (X stands for the name of the disk assignment) to switch to the folder of floppy disk, CD ROM or USB flash disk you saved the BIOS file and AwardBIOS Flash Utility.
5. At the prompt, type awdf flash then press <Enter>. The Award BIOS Flash Utility screen appears.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: 

Message: Please input File Name!
```

6. Type the BIOS file name in the File Name to Program field, then press <Enter>.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: M2N32SLI.bin

Message: Do You Want To Save Bios (Y/N)
```

7. Press <N> when the utility prompts you to save the current BIOS file. The following screen appears.
8. The utility verifies the BIOS file in the floppy disk, CD ROM or a USB flash disk and starts flashing the BIOS file.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: M2N32SLI.bin

Programming Flash Memory - OFE00 OK

Write OK      No Update      Write Fail

Warning: Don't Turn Off Power Or Reset System!
```



Do not turn off or reset the system during the flashing process!

9. The utility displays a Flashing Complete message indicating that you have successfully flashed the BIOS file. Remove the disk then press <F1> to restart the system.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: M2N32SLI.bin

Flashing Complete
Press <F1> to Continue

Write OK      No Update      Write Fail

F1 Reset
```

4.1.5 Saving the current BIOS file

You can use the AwardBIOS Flash Utility to save the current BIOS file. You can load the current BIOS file when the BIOS file gets corrupted during the flashing process.



Make sure that the floppy disk, CD ROM or a USB flash disk has enough disk space to save the file.

To save the current BIOS file using the AwardBIOS Flash Utility:

1. Follow steps 1 to 6 of the previous section.
2. Press <Y> when the utility prompts you to save the current BIOS file. The following screen appears.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: 0112.bin
Save current BIOS as:

Message:
```

3. Type a filename for the current BIOS file in the Save current BIOS as field, then press <Enter>.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: 0112.bin
Checksum: 810DH
Save current BIOS as: 0113.bin

Message: Please Wait!
```

4. The utility saves the current BIOS file to the disk, then returns to the BIOS flashing process.

```
AwardBIOS Flash Utility for ASUS V1.14
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF590-SLI-M2N32-SLI-PREMIUM    DATE:03/30/2006
Flash Type - PMC Pm49FL004T LPC/FWH

File Name to Program: 0113.bin
Now Backup System BIOS to
File!

Message: Please Wait!
```

4.1.6 ASUS CrashFree BIOS 3 utility

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



Prepare the motherboard support DVD, the floppy disk or the USB flash disk containing the updated motherboard BIOS before using this utility.

Recovering the BIOS from the support DVD

To recover the BIOS from the support DVD:

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive.
3. The utility displays the following message and automatically checks the DVD for the BIOS file.

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
```

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

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
Found CDRom, try to Boot from it... Pass
```

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

Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Restart the system after the utility completes the updating process.



- Only the USB flash disk with FAT 32/16/12 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.
 - DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!
-

4.2 BIOS setup program

This motherboard supports a programmable Low-Pin Count (LPC) chip that you can update using the provided utility described in section “4.1 Managing and updating your BIOS.”

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

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

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

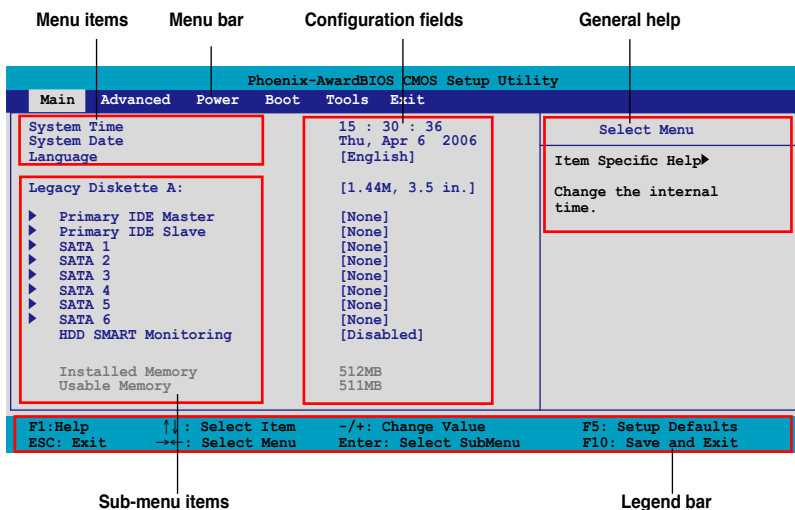
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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



-
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section **4.8 Exit Menu**.
 - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
 - Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.
-

4.2.1 BIOS menu screen



4.2.2 Menu bar

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

- 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.



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

4.2.3 Legend bar

At the bottom of the Setup screen is a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding functions.

Navigation Key	Function
<F1>	Displays the General Help screen
<F5>	Loads setup default values
<Esc>	Exits the BIOS setup or returns to the main menu from a sub-menu
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	Moves the highlight up or down between fields
Page Down or – (minus)	Scrolls backward through the values for the highlighted field
Page Up or + (plus)	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<F10>	Saves changes and exit

4.2.4 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.

4.2.5 Sub-menu items

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

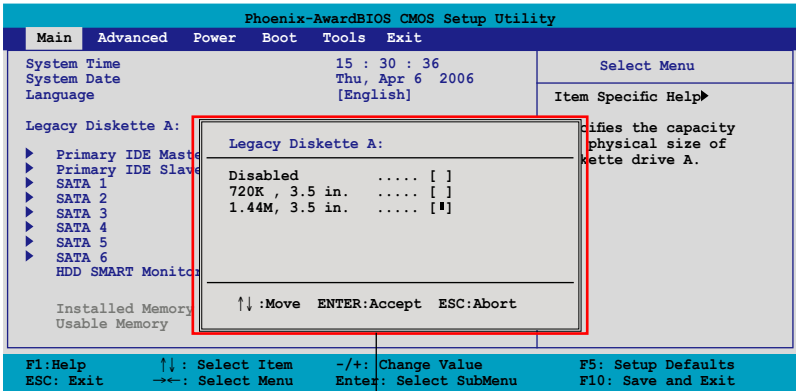
4.2.6 Configuration fields

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 “4.2.7 Pop-up window.”

4.2.7 Pop-up window

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



Pop-up menu

4.2.8 General help

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

4.3 Main menu

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



Refer to section **4.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

Phoenix-AwardBIOS CMOS Setup Utility			
Main	Advanced	Power	Boot Tools Exit
System Time			15 : 30 : 36
System Date			Thu, Apr 6 2006
Language			[English]
Legacy Diskette A:			[1.44M, 3.5 in.]
▶ Primary IDE Master			[None]
▶ Primary IDE Slave			[None]
▶ SATA 1			[None]
▶ SATA 2			[None]
▶ SATA 3			[None]
▶ SATA 4			[None]
▶ SATA 5			[None]
▶ SATA 6			[None]
HDD SMART Monitoring			[Disabled]
Installed Memory			256MB
Usable Memory			255MB

Select Menu

Item Specific Help▶

Change the internal time.

F1: Help	↑↓: Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	→←: Select Menu	Enter: Select SubMenu	F10: Save and Exit

4.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

4.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

4.3.3 Language [English]

Allows you to choose the BIOS language version from the options.
Configuration options: [English] [French] [Deutsch] [Chinese (Trad.)]
[Chinese (Simp.)] [Japanese]

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

Sets the type of floppy drive installed.
Configuration options: [Disabled] [720K , 3.5 in.] [1.44M, 3.5 in.]

4.3.5 Primary IDE Master/Slave

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

Phoenix-AwardBIOS CMOS Setup Utility			
Main			
Primary IDE Master		Select Menu	
PIO Mode	[Auto]	Item Specific Help▶▶ Set a PIO mode for IDE device. Mode0 through 4 for successive increase in performance.	
UDMA Mode	[Auto]		
Primary IDE Master	[Auto]		
Access Mode	[Auto]		
Capacity	0 GB		
Cylinder	0		
Head	0		
Sector	0		
Transfer Mode	None		
F1: Help	↑↓: Select Item		
ESC: Exit	→←: Select Menu	Enter: Select SubMenu	F10: Save and Exit

The BIOS automatically detects the values opposite the dimmed items (Capacity, Cylinder, Head, Sector and Transfer Mode). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

PIO Mode [Auto]

Sets the PIO mode for the IDE device.

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

UDMA Mode [Auto]

Disables or sets the UDMA mode. Configuration options: [Disable] [Auto]

Primary IDE Master/Slave [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the BIOS automatically fills in the correct values for the remaining fields on this sub-menu. If the hard disk was already formatted on a previous system, the setup BIOS may detect incorrect parameters. Select [Manual] to manually enter the IDE hard disk drive parameters. If no drive is installed select [None]. Configuration options: [None] [Auto] [Manual]

Access Mode [Auto]

The default [Auto] allows automatic detection of an IDE hard disk drive. Select [CHS] for this item if you set the IDE Primary Master/Slave to [Manual]. Configuration options: [CHS] [LBA] [Large] [Auto]



Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

Capacity

Displays the auto-detected hard disk capacity. This item is not configurable.

Cylinder

Shows the number of the hard disk cylinders. This item is not configurable.

Head

Shows the number of the hard disk read/write heads. This item is not configurable.

Sector

Shows the number of sectors per track. This item is not configurable.

Transfer Mode

Shows the Transfer mode. This item is not configurable.



After entering the IDE hard disk drive information into BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

4.3.6 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.

Phoenix-AwardBIOS CMOS Setup Utility		
Main		
SATA 1		Select Menu
Extended IDE Drive	[Auto]	Item Specific Help▶▶ Selects the type of fixed disk connected to the system.
Access Mode	[Auto]	
Capacity	0 MB	
Cylinder	0	
Head	0	
Landing Zone	0	
Sector	0	
F1:Help ↑↓: Select Item -/+ : Change Value F5: Setup Defaults ESC: Exit →←: Select Menu Enter: Select SubMenu F10: Save and Exit		

The BIOS automatically detects the values opposite the dimmed items (Capacity, Cylinder, Head, Landing Zone and Sector). These values are not user-configurable. These items show 0 if no SATA device is installed in the system.

Extended IDE Drive [Auto]

Selects the type of fixed disk connected to the system.

Configuration options: [None] [Auto]

Access Mode [Auto]

Sets the sector addressing mode. Configuration options: [Large] [Auto]



Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

Capacity

Displays the auto-detected hard disk capacity. This item is not configurable.

Cylinder

Shows the number of the hard disk cylinders. This item is not configurable.

Head

Shows the number of the hard disk read/write heads. This item is not configurable.

Landing Zone

Shows the number of landing zone per track. This item is not configurable.

Sector

Shows the number of sectors per track. This item is not configurable.



After entering the IDE hard disk drive information into BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

4.3.7 HDD SMART Monitoring [Disabled]

Allows you to enable or disable the HDD Self-Monitoring Analysis and Reporting Technology (SMART) feature. Configuration options: [Disabled] [Enabled]

4.3.8 Installed Memory [xxx MB]

Shows the size of installed memory.

4.3.9 Usable Memory [XXX MB]

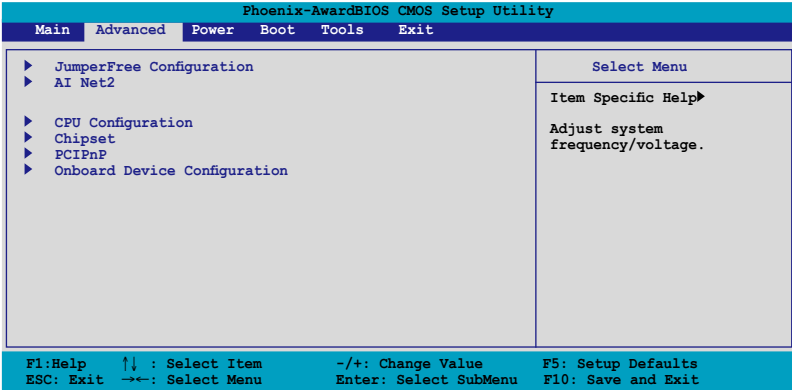
Shows the size of usable memory.

4.4 Advanced menu

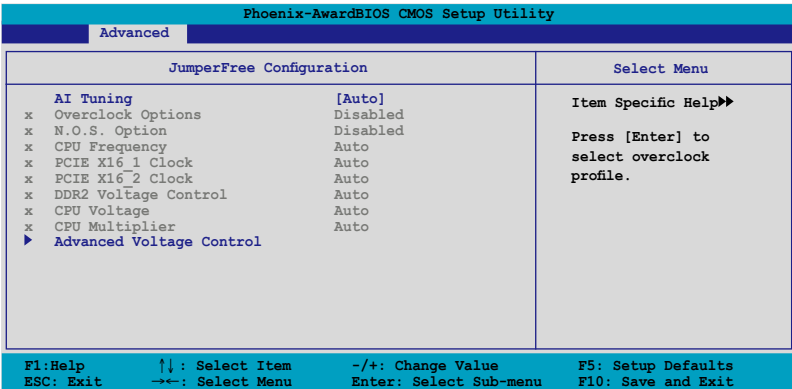
The Advanced menu items allow you to change the settings for the CPU and other system devices.



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



4.4.1 JumperFree Configuration



AI Tuning [Auto]

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

Manual Allows you to individually set overclocking parameters.

Auto Loads the optimal settings for the system.

Standard	Loads the standard settings for the system.
AI Overclock	Loads overclocking profiles with optimal parameters for stability when overclocking.
AI N.O.S.	The ASUS Non-delay Overclocking System feature intelligently determines the system load and automatically boosts the performance for the most demanding tasks.



The following item becomes user-configurable when you set **AI Tuning** to [AI Overclock].

Overclock Options [Disabled]

Allows you to set the overclocking options.

Configuration options: [Disabled] [Overclock 3%] [Overclock 5%] [Overclock 8%] [Overclock 10%]



The following item becomes user-configurable when you set **AI Tuning** to [AI N.O.S.]

N.O.S. Option [Disabled]

Allows you to set the Non-delay Overclocking System mode.

Configuration options: [Disabled] [Overclock 3%] [Overclock 5%] [Overclock 8%] [Overclock 10%]



The following items will become user-configurable when you set **AI Tuning** to [Manual]

CPU Frequency [XXX] (value is auto-detected)

Indicates the frequency sent by the clock generator to the system bus and PCI bus. The bus frequency (external frequency) multiplied by the bus multiple equals the CPU speed. The BIOS auto-detects the value of this item. The values range from 200.0 to 425.0.



Setting a very high CPU frequency may cause the system to become unstable. If this happens, revert to the default setting.

PCIEX16_1 Clock [Auto]

Allows you to set the clock of the PCI Express_1.

Configuration options: [Auto] [100MHz]~[200MHz]

PCIEX16_2 Clock [Auto]

Allows you to set the clock of the PCI Express_2.

Configuration options: [Auto] [100MHz]~[200MHz]

DDR2 Voltage Control [Auto]

Allows you to set the operating DDR2 voltage.

Configuration options: [Auto] [1.800V] [1.825V] [1.850V]~[2.500V]

CPU Voltage [Auto]

Allows you to set the operating CPU voltage. The configuration options may vary depending on the type of CPU installed. Configuration options: [Auto] [1.5625V] [1.5500V] [1.5375V] [1.5250V] [1.5125V] [1.5000V]~[0.8875V] [0.8750V] [0.8625V] [0.8500V] [0.8375V] [0.8250V] [0.8125V] [0.8000V]



Please refer to CPU documentation before setting the CPU Vcore voltage. Setting a high Vcore voltage may damage the CPU.

CPU Multiplier [Auto]

Allows you to set the operating CPU multiplier. The configuration options may vary depending on the type of CPU installed.

Configuration options: [Auto] [5x] [6x]~[25x]

Advanced Voltage Control

Phoenix-AwardBIOS CMOS Setup Utility			
Advanced			
Advanced Voltage Control		Select Menu	
CPU Vcore Offset Voltage	[Disabled]	Item Specific Help▶▶▶	
DDR2 Termination Voltage	[0.5 x DDR2 Voltage]	When select enabled in this item, CPU Vcore voltage will offset 200mV.	
CPU to NB HT Voltage	[Auto]		
NB to SB HT Voltage	[Auto]		
NB Core/PCI-E Voltage	[Auto]		
SB Core/PCI-E Voltage	[Auto]		
SB Standby Core Voltage	[+1.50V]		

F1: Help ↑↓ : Select Item -/+ : Change Value F5: Setup Defaults
ESC: Exit →← : Select Menu Enter: Select Sub-menu F10: Save and Exit

CPU Vcore Offset Voltage [Disabled]

Enables or disables the CPU Vcore offset voltage. When this item is set to [Enabled], the CPU Vcore voltage will offset 200mV.

Configuration options: [Disabled] [Enabled]

DDR2 Termination Voltage [0.5 x DDR2 Voltage]

Allows you to set the DDR2 termination voltage.

Configuration options: [0.5 x DDR2 Voltage] [0.6 x DDR2 Voltage]

CPU to NB HT Voltage [Auto]

Allows you to set the CPU to Northbridge HT voltage.

Configuration options: [Auto] [1.200V] [1.225V] [1.250V]~[1.500V]

NB to SB HT Voltage [Auto]

Allows you to set the NB to SB HT voltage.

Configuration options: [Auto] [+1.300V] [+1.325V] [+1.350V]~[+1.500V]

NB Core/PCI-E Voltage [Auto]

Allows you to set the NB Core/PCI-E voltage.

Configuration options: [Auto] [+1.200V] [+1.250V] [+1.300V] [+1.350V] [+1.400V]

SB Core/PCI-E Voltage [Auto]

Allows you to set the Southbridge core/PCI Express voltage.

Configuration options: [Auto] [+1.500V] [+1.525V] [+1.550V]~[+1.700V] [+1.750V]

SB Standby Core Voltage [+1.50V]

Allows you to set the Southbridge +1.5V standby voltage.

Configuration options: [+1.50V] [+1.60V] [+1.70V]

4.4.2 AI NET2

Phoenix-AwardBIOS CMOS Setup Utility				
Advanced				
AI Net2			Select Menu	
POST Check LAN Cable	[Disabled]		Item Specific Help▶▶	
POST Check LAN2 Cable	[Disabled]			
Pair	Status	Length	Enable or Disable LAN cable check during POST.	
LAN1 (1-2)	Open	N/A		
LAN1 (3-6)	Open	N/A		
LAN1 (4-5)	Open	N/A		
LAN1 (7-8)	Open	N/A		
LAN2 (1-2)	Open	N/A		
LAN2 (3-6)	Open	N/A		
LAN2 (4-5)	Open	N/A		
LAN2 (7-8)	Open	N/A		
F1: Help ↑↓: Select Item -/+ : Change Value F5: Setup Defaults ESC: Exit ←→: Select Menu Enter: Select Sub-menu F10: Save and Exit				

POST Check LAN Cable [Disabled]

POST Check LAN2 Cable [Disabled]

Enables or disables checking of the LAN/LAN2 cable during the Power-On Self-Test (POST). Configuration options: [Disabled] [Enabled]

4.4.3 CPU Configuration

Phoenix-AwardBIOS CMOS Setup Utility	
Advanced	
CPU Configuration	Select Menu
CPU Type AMD Sempron(tm) Processor 3000+	Item Specific Help▶▶
CPU Speed 1600 MHz	DRAM timing and control.
Cache RAM 256K	
▶ DRAM Configuration	
AMD Live! [Disabled]	
AMD Cool 'n' Quiet Function [Disabled]	

DRAM Configuration

The items in the sub-menu show the DRAM-related information auto-detected by the BIOS.

Phoenix-AwardBIOS CMOS Setup Utility	
Advanced	
DRAM Configuration	Select Menu
Memory Clock Frequency [Auto]	Item Specific Help▶▶
Tcl [Auto]	Setting platform
Trcd [Auto]	Memclock or limit
Trp [Auto]	value.
Tras [Auto]	
1T/2T Memory Timing [Auto]	
DRAM ECC Enable [Auto]	
AI Clock Skew [Auto]	
x channel A Clock Skew Advance 150ps	
x channel B Clock Skew Advance 150ps	
▶ Advance Memory Settings	
▶ DRAM Timing Control	
▶ Output Driver Control	
Current DRAM Timing 667MHz-5-5-5-13-2T	
F1: Help ↑↓ : Select Item -/+ : Change Value F5: Setup Defaults	
ESC: Exit ←→ : Select Menu Enter: Select Sub-menu F10: Save and Exit	

Memory Clock Frequency [Auto]

Sets the memory clock frequency.

Configuration options: [Auto] [DDR2 400] [DDR2 533] [DDR2 667] [DDR2 800]

Tcl [Auto]

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

Trcd [Auto]

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

Trp [Auto]

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

Tras [Auto]

Configuration options: [Auto] [5] [6] [7]~[18]

1T/2T Memory Timing [Auto]

Sets the memory timing. Configuration options: [Auto] [1T] [2T]

DRAM ECC Enable [Disabled]

Enables or disables the DRAM ECC function.

Configuration options: [Disabled] [Enabled]



This item appears only when you install DRAM modules that support ECC function.

AI Clock Skew [Auto]

Allows you to adjust the DRAM clock skew for Channel A and B. The following two items become user-configurable when you set the AI Clock Skew item to [Manual]. Configuration options: [Auto] [Manual]

Channel A Clock Skew [Normal]

[Advance 900ps] [Advance 750ps] [Advance 600ps] [Advance 450ps]
[Advance 300ps] [Advance 150ps] [Normal] [Delay 150ps] [Delay 300ps]
[Delay 450ps] [Delay 600ps] [Delay 750ps] [Delay 900ps]

Channel B Clock Skew [Normal]

[Advance 900ps] [Advance 750ps] [Advance 600ps] [Advance 450ps]
[Advance 300ps] [Advance 150ps] [Normal] [Delay 150ps] [Delay 300ps]
[Delay 450ps] [Delay 600ps] [Delay 750ps] [Delay 900ps]

Advance Memory Settings

CPU On-die Termination [Auto]

Configuration options: [Auto] [300ohm] [150ohm] [75ohm]

Trc [Auto]

Configuration options: [Auto] [11] [12] [13]~[25] [26]

Twr [Auto]

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

Trrd [Auto]

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

Trwt [Auto]

Configuration options: [Auto] [2] [3] [4] [5] [6] [7] [8] [9]

Twtr [Auto]

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

Trtp [Auto]

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

Twrrd [Auto]

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

Twrrwr [Auto]

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

Trdrd [Auto]

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

Tref [Auto]

Configuration options: [Auto] [7.8 us] [3.9 us]

Trfc [Auto]

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

DRAM Termination [Auto]

Configuration options: [Auto] [Disabled] [75 ohms] [150 ohms] [50 ohms]

Max Async Latency [Auto]

Configuration options: [Auto] [0 ns] [1 ns] [2 ns] [3 ns]~[14 ns] [15 ns]

R/W Queue Bypass [Auto]

Configuration options: [Auto] [2x] [4x] [8x] [16x]

Dynamic Idle Cycle Counter [Auto]

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

Idle Cycle Limit [Auto]

Configuration options: [Auto] [0 cycles] [4 cycles] [8 cycles] [16 cycles] [32 cycles] [64 cycles] [128 cycles] [256 cycles]

DCQ Bypass Maximum [Auto]

Configuration options: [Auto] [0x] [1x] [2x] [3x]~[14x] [15x]

DRAM Burst Length [Auto]

Configuration options: [Auto] [64-byte] [32-byte]

RdPadRcvFIFO Delay [Auto]

Configuration options: [Auto] [1.5] [2] [2.5] [3] [3.5]

Disable Jitter [Auto]

Configuration options: [Auto] [OFF] [ON]

DRAM Bank Interleaving [Enabled]

Configuration options: [Disabled] [Enabled]

Bank Swizzle Mode [Enabled]

Configuration options: [Disabled] [Enabled]

DRAM Timing Control**CKE Fine Delay [Auto]**

Configuration options: [Auto] [No delay] [1/64 MEMCLK delay] [2/64 MEMCLK delay] [3/64 MEMCLK delay] [4/64 MEMCLK delay] [5/64 MEMCLK delay]~[30/64 MEMCLK delay] [31/64 MEMCLK delay]

CKE Setup Time [Auto]

Configuration options: [Auto] [1/2 MEMCLK] [1 MEMCLK]

CS/ODT Fine Delay [Auto]

Configuration options: [Auto] [No delay] [1/64 MEMCLK delay] [2/64 MEMCLK delay] [3/64 MEMCLK delay] [4/64 MEMCLK delay] [5/64 MEMCLK delay]~[30/64 MEMCLK delay] [31/64 MEMCLK delay]

CS/ODT Setup Time [Auto]

Configuration options: [Auto] [1/2 MEMCLK] [1 MEMCLK]

Address/Command Fine Delay [Auto]

Configuration options: [Auto] [No delay] [1/64 MEMCLK delay] [2/64 MEMCLK delay] [3/64 MEMCLK delay] [4/64 MEMCLK delay] [5/64 MEMCLK delay]~[30/64 MEMCLK delay] [31/64 MEMCLK delay]

Address/Command Setup Time [Auto]

Configuration options: [Auto] [1/2 MEMCLK] [1 MEMCLK]

Read DQS Timing Control [Auto]

Configuration options: [Auto] [no delay] [1/96 MEMCLK delay] [2/96 MEMCLK delay] [3/96 MEMCLK delay] [4/96 MEMCLK delay] [5/96 MEMCLK delay]~[46/96 MEMCLK delay] [47/96 MEMCLK delay]

Write Data Timing Control [Auto]

Configuration options: [Auto] [no delay] [1/96 MEMCLK delay] [2/96 MEMCLK delay] [3/96 MEMCLK delay] [4/96 MEMCLK delay] [5/96 MEMCLK delay]~[46/96 MEMCLK delay] [47/96 MEMCLK delay]

DQS Receiver Enable Timing [Auto]

Configuration options: [Auto] [0 ps] [50 ps] [100 ps] [150 ps] [200 ps] [250 ps] [300 ps] [350 ps] [400 ps]~[8550 ps] [8600 ps] [8650 ps] [8700 ps]

Output Driver Control**CKE Drive Strength [Auto]**

Configuration options: [Auto] [1.00x] [1.25x] [1.50x] [2.00x]

CS/ODT Drive Strength [Auto]

Configuration options: [Auto] [1.00x] [1.25x] [1.50x] [2.00x]

Add/CMD Drive Strength [Auto]

Configuration options: [Auto] [1.00x] [1.25x] [1.50x] [2.00x]

MEMCLK Drive Strength [Auto]

Configuration options: [Auto] [0.75x] [1.00x] [1.25x] [1.50x]

Data Drive Strength [Auto]

Configuration options: [Auto] [0.75x] [1.00x] [1.25x] [1.50x]

DQS Drive Strength [Auto]

Configuration options: [Auto] [0.75x] [1.00x] [1.25x] [1.50x]

DRAM Drivers Weak Mode [Auto]

Configuration options: [Auto] [Normal] [Weak]

AMD Live! [Disabled]

Enables or disables the AMD Live! technology.
Configuration options: [Disabled] [Enabled]

AMD Cool 'n' Quiet Function [Disabled]

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

4.4.4 Chipset

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
Chipset		Select Menu
NB to SB HT Frequency	[Auto]	Item Specific Help▶▶▶
CPU<->NB HT Speed	[Auto]	
NB-->SB HT Speed	[5xNB to SB HT Frequency]	
SB-->NB HT Speed	[5xSB to NB HT Frequency]	
CPU<->NB HT Width	[16 16]	
NB<->SB HT Width	[16 16]	
NVIDIA GPU Ex	[Disabled]	
F1: Help ↑↓ : Select Item -/+ : Change Value F5: Setup Defaults		
ESC: Exit →← : Select Menu Enter: Select Sub-menu F10: Save and Exit		

NB to SB HT Frequency [Auto]

Allows you to set the Northbridge to Southbridge HT frequency.
Configuration options: [200.0]~[400.0]

CPU<->NB HT Speed [Auto]

Allows you to set the CPU to Northbridge HT Speed.
Configuration options: [1xCPU Frequency] [2xCPU Frequency] [3xCPU Frequency] [4xCPU Frequency] [5xCPU Frequency]

NB-->SB HT Speed [5xNB to SB HT Frequency]

Allows you to set the Northbridge to Southbridge HT Speed.
Configuration options: [1xNB to SB HT Frequency] [2xNB to SB HT Frequency] [3xNB to SB HT Frequency] [4xNB to SB HT Frequency] [5xNB to SB HT Frequency]

SB-->NB HT Speed [5xSB to NB HT Frequency]

Allows you to set the Southbridge to Northbridge HT Speed.

Configuration options: [1xSB to NB HT Frequency] [2xSB to NB HT Frequency]
[3xSB to NB HT Frequency] [4xSB to NB HT Frequency]
[5xSB to NB HT Frequency]

CPU<->NB HT Width [↓16 ↑16]

Allows you to set the CPU to Northbridge HT width.

Configuration options: [↓8 ↑8] [↓16 ↑16]

NB<->SB HT Width [↓16 ↑16]

Allows you to set the Northbridge to Southbridge HT width.

Configuration options: [↓4 ↑4] [↓8 ↑8] [↓16 ↑16]

NVIDIA GPU Ex [Disabled]

Allows you to enable the optimized Nvidia® Ex graphics driver.

Configuration options: [Auto] [Disabled]

4.4.5 PCIPnP

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
PCIPnP		Select Menu
Plug & Play O/S	[No]	Item Specific Help▶▶▶
Resources Controlled By	[Auto]	Select Yes if you are using a Plug and Play capable operating system. Select No if you need the BIOS to configure non-boot devices.
x IRQ Resources		

Plug & Play O/S [No]

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

Configuration options: [No] [Yes]

Resources Controlled By [Auto]

When set to [Auto], the BIOS automatically configures all the boot and Plug and Play compatible devices. Set to [Manual] if you want to assign the IRQ DMA and memory base address fields. Configuration options: [Auto] [Manual]



The item **IRQ Resources** becomes user-configurable when you set **Resources Controlled By** to [Manual].

IRQ Resources

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
IRQ Resources		Select Menu
IRQ-5 assigned to	[PCI Device]	Item Specific Help▶▶▶ Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
IRQ-7 assigned to	[PCI Device]	
IRQ-9 assigned to	[PCI Device]	
IRQ-10 assigned to	[PCI Device]	
IRQ-11 assigned to	[PCI Device]	
IRQ-14 assigned to	[PCI Device]	
IRQ-15 assigned to	[PCI Device]	

IRQ-xx assigned to

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

Configuration options: [PCI Device] [Reserved]

4.4.6 Onboard Device Configuration

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
Onboard Device Configuration	Select Menu	
<ul style="list-style-type: none"> ▶ IDE Function Setup ▶ Serial-ATA Configuration ▶ USB Configuration Onboard I394 Controller [Enabled] Onboard 1st nVidia LAN [Enabled] Onboard 2nd nVidia LAN [Enabled] Onboard LAN Boot ROM [Disabled] Primary Display Adapter [PCI-E slot] HD Audio [Auto] Front Panel Support Type [AC97] Silicon SATAII Controller [SATA Mode] ASUS ASAP [Disabled] Serial Port1 Address [3F8/IRQ4] Parallel Port Address [378/IRQ7] Parallel Port Mode [EPP] x ECP Mode Use DMA [3] 	Item Specific Help▶▶▶	
F1: Help ↑↓: Select Item -/+ : Change Value F5: Setup Defaults ESC: Exit →←: Select Menu Enter: Select Sub-menu F10: Save and Exit		

IDE Function Setup

This sub-menu contains IDE function-related items. Select an item then press <Enter> to edit.

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
IDE Function Setup	Select Menu	
OnChip IDE Channel0 [Enabled] IDE DMA transfer access [Enabled] IDE Prefetch Mode [Enabled]	Item Specific Help▶▶▶	

OnChip IDE Channel0 [Enabled]

Allows you to enable or disable the onchip IDE channel 0 controller.

Configuration options: [Disabled] [Enabled]

IDE DMA transfer access [Enabled]

Allows you to enable or disable the IDE DMA transfer access.

Configuration options: [Disabled] [Enabled]

IDE Prefetch Mode [Enabled]

Allows you to enable or disable the IDE PIO read prefetch mode.

Configuration options: [Disabled] [Enabled]

Serial-ATA Configuration

This sub-menu allows you to change Serial ATA settings. Select an item then press <Enter> to edit.

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
Serial-ATA Configuration		Select Menu
Serial-ATA Controller	[Enabled]	Item Specific Help▶▶▶ Press [Enter] to control onchip SATA controller
RAID Enabled	[Disabled]	
x SATA 1	RAID Disabled	
x SATA 2	RAID Disabled	
x SATA 3	RAID Disabled	
x SATA 4	RAID Disabled	
x SATA 5	RAID Disabled	
x SATA 6	RAID Disabled	

Serial-ATA Controller [Enabled]

Configuration options: [Disabled] [Enabled]

RAID Enabled [Disabled]

Enables or disables the onboard RAID controller. When set to [Enabled], the succeeding items become user-configurable.

Configuration options: [Disabled] [Enabled]

SATA1~6 RAID [Disabled]

Enables or disables the RAID function of the SATA 1~6 drive.

Configuration options: [Disabled] [Enabled]

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.

Phoenix-AwardBIOS CMOS Setup Utility		
Advanced		
USB Configuration		Select Menu
USB Controller	[Enabled]	Item Specific Help▶▶▶ Enable or Disable USB 1.1 and 2.0 Controller.
USB2.0 Controller	[Enabled]	
USB Legacy support	[Enabled]	

USB Controller [Enabled]

Allows you to enable or disable the onchip USB controller.

Configuration options: [Disabled] [Enabled]

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.

Configuration options: [Disabled] [Enabled]

USB Legacy Support [Enabled]

Allows you to enable or disable support for USB devices on legacy operating systems (OS). Configuration options: [Disabled] [Enabled]

Onboard 1394 Controller [Enabled]

Allows you to disable or enable the onboard 1394 device support.

Configuration options: [Disabled] [Enabled]

Onboard 1st/2nd nVidia LAN [Enabled]

Enables or disables the onboard NVIDIA® LAN controller.

Configuration options: [Disabled] [Enabled]

OnBoard LAN Boot ROM [Disabled]

Allows you to enable or disable the onboard LAN boot ROM.

Configuration options: [Enabled] [Disabled]

Primary Display Adapter [PCI-E Slot]

Allows you to select the graphics controller to use as the primary boot device.

Configuration options: [PCI Slot] [PCI-E slot]

HD Audio [Auto]

Allows you to disable or set the High-Definition audio function.

Configuration options: [Auto] [Disabled]

Front Panel Support Type [AC97]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports. Configuration options: [AC97] [HD Audio]

Silicon SATAII Controller [SATA Mode]

Allows you to disable or set the function of the extended SATA II controller.

Configuration options: [Disabled] [SATA Mode] [RAID Mode]

ASUS ASAP [Disabled]

Allows you to enable or disable the onboard USB flash module for the ASUS ASAP feature that supports Windows® Vista ReadyBoost™ function.

Configuration options: [Disabled] [Enabled]

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

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

Parallel Port Address [378/IRQ7]

Allows you to select the Parallel Port address.

Configuration options: [Disabled] [378/IRQ7] [278/IRQ5] [3BC/IRQ7]

Parallel Port Mode [EPP]

Allows you to select the Parallel Port mode.

Configuration options: [Normal] [EPP] [ECP] [Bi-Directional]



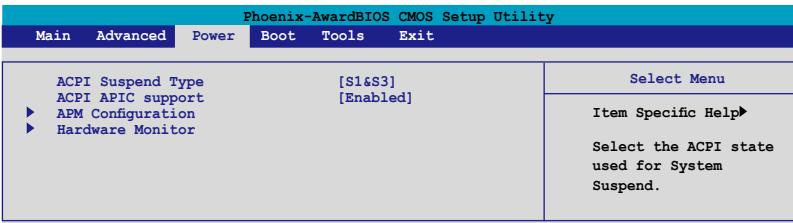
The **ECP Mode Use DMA** item becomes user-configurable when the **Parallel Port Mode** item is set to [ECP] or [Bi-Directional]

ECP Mode Use DMA [3]

Allows selection of ECP Mode. Configuration options: [1] [3]

4.5 Power menu

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



4.5.1 ACPI Suspend Type [S1&S3]

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

Configuration options: [S1(POS)] [S3(STR)] [S1&S3]

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

Configuration options: [Disabled] [Enabled]

4.5.3 APM Configuration

Phoenix-AwardBIOS CMOS Setup Utility		
Power		
APM Configuration		Select Menu
Restore on AC Power Loss	[Power-Off]	Item Specific Help▶ Press [Enter] to select whether or not to restart the system after AC power loss.
PWR Button < 4 secs	[Instant-Off]	
Power Up On PCI/PCIE Devices	[Disabled]	
Power On By External Modems	[Disabled]	
Power On by RTC Alarm	[Disabled]	
x Date (of Month) Alarm	0	
x Alarm Time (hh:mm:ss)	0 : 0 : 0	
HPET Support	[Enabled]	
Power Up By PS/2 Mouse	[Disabled]	
Power Up By PS/2 Keyboard	[Disabled]	
F1: Help ↑↓: Select Item -/+ : Change Value F5: Setup Defaults ESC: Exit →←: Select Menu Enter: Select SubMenu F10: Save and Exit		

Restore on AC Power Loss [Power-Off]

Allows you to enable or disable the Restore on AC Power Loss function. Configuration options: [Power-Off] [Power-On]

PWR Button < 4 secs [Instant-Off]

Allows you to set the event after the power button is pressed for more than 4 seconds. Configuration options: [Suspend] [Instant-Off]

Power Up On PCI/PCIE Devices [Disabled]

Allows you to enable or disable the PME to wake up from S5 by PCI/PCIE devices & NV Onboard LAN. Configuration options: [Disabled] [Enabled]

Power On By External Modems [Disabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the external modem receives a call while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]



The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system power on.

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 “Date (of Month) Alarm” and “Alarm Time (hh:mm:ss)” become user-configurable with set values. Configuration options: [Disabled] [Enabled]

Date (of Month) Alarm [xx]

To set the date of alarm, highlight this item then press <+> or <-> to make the selection (Min=0; Max=31).

Alarm Time (hh:mm:ss) [xx:xx:xx]

To set the time of alarm, use <Tab> or <-> / <-> to select a field, then press <+> or <-> to make the selection (Min=0, Max=23 for the hour field; Min=0, Max=59 for the minutes/seconds field).

HPET Support [Enabled]

Configuration options: [Disabled] [Enabled]

Power Up By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power Up By PS/2 Keyboard [Disabled]

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

Configuration options: [Disabled] [Space Bar] [Ctrl-ESC] [Power Key]

4.5.4 Hardware Monitor

The items in this sub-menu displays the hardware monitor values automatically detected by the BIOS. It also allows you to change CPU Q-Fan feature-related parameters. Select an item then press <Enter> to display the configuration options.

Phoenix-AwardBIOS CMOS Setup Utility		
Power		
Hardware Monitor		Select Menu
CPU Q-Fan Control	[Disabled]	Item Specific Help▶▶
x CPU Q-Fan Profile	Performance	
Chassis Q-Fan Control	[Disabled]	Press [Enter] to enable or disable.
x Chassis Q-Fan Profile	Performance	
Vcore Voltage	[1.39V]	
3.3V Voltage	[2.76V]	
5V Voltage	[4.48V]	
12V Voltage	[11.32V]	
CPU Temperature	42°C	
M/B Temperature	41°C	
CPU FAN Speed	3068 RPM	
CHA_FAN1 Speed	0 RPM	
CHA_FAN2 Speed	0 RPM	
CHA_FAN3 Speed	0 RPM	
CHA_FAN4 Speed	0 RPM	
PWR_FAN Speed	0 RPM	
CHIP_FAN Speed	0 RPM	
CPU Fan Speed warning	[800 RPM]	

F1: Help	↑↓: Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	←→: Select Menu	Enter: Select SubMenu	F10: Save and Exit

CPU Q-Fan Control [Disabled]

Allows you to enable or disable the CPU Q-Fan controller.

Configuration options: [Disabled] [Enabled]



The **CPU Q-Fan Profile** item becomes use-configurable when you enable the **CPU Q-Fan Control** item.

CPU Q-Fan Profile [Performance]

Allows you to set the appropriate performance level of the CPU Q-Fan. When set to [Optimal], the CPU fan automatically adjusts depending on the CPU temperature. Set this item to [Silent] to minimize fan speed for quiet CPU fan operation, or [Performance] to achieve maximum CPU fan speed.

Configuration options: [Performance] [Optimal] [Silent]

Chassis Q-Fan Control [Disabled]

Allows you to enable or disable the chassis Q-Fan controller.

Configuration options: [Disabled] [Enabled]



The succeeding item becomes user-configurable when you set the **Chassis Q-Fan Control** item to [Enabled].

Chassis Q-Fan Profile [Performance]

Allows you to set the appropriate performance level of the chassis Q-Fan. When set to [Optimal], the chassis fan automatically adjusts depending on the chassis temperature. Set this item to [Silent] to minimize fan speed for quiet chassis fan operation, or [Performance] to achieve maximum chassis fan speed.

Configuration options: [Performance] [Optimal] [Silent]

Vcore Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

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

CPU Temperature, M/B Temperature

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. These items are not user-configurable.

CPU Fan Speed

CHA_FAN1/2/3/4 Speed

PWR_FAN Speed

CHIP_FAN Speed

The onboard hardware monitor automatically detects and displays the CPU, Chassis, power, and chipset fan speeds in rotations per minute (RPM). If any of the fans is not connected to the motherboard, the field shows 0. These items are not user-configurable.

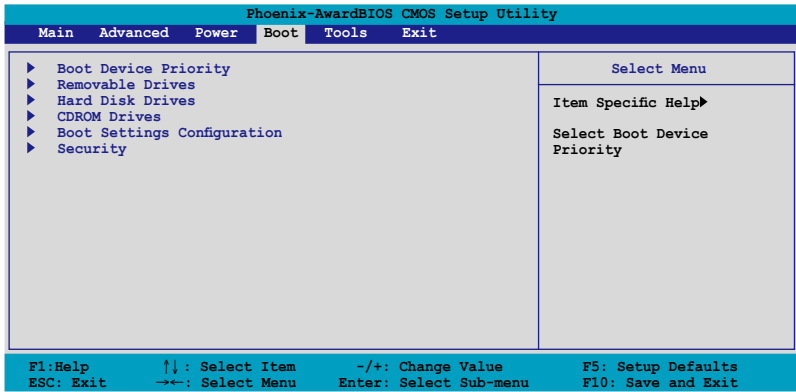
CPU Fan Speed warning [800 RPM]

Allows you to disable or set the CPU fan warning speed.

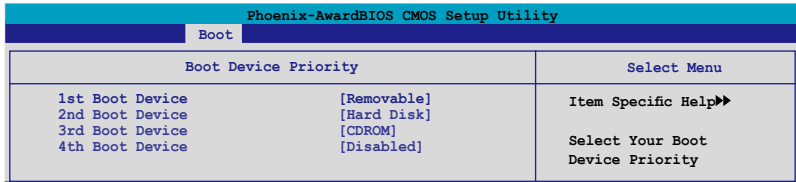
Configuration options: [Disabled] [800 RPM] [1200 RPM] [1600 RPM]

4.6 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.



4.6.1 Boot Device Priority



1st ~ 4th Boot Device [Removable]

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: [Removable] [Hard Disk] [CDROM] [Disabled]

4.6.2 Removable Drives

Phoenix-Award BIOS CMOS Setup Utility	
Boot	
Removable Drives	Select Menu
1. Floppy Disks	Item Specific Help▶▶

1. Floppy Disks

Allows you to assign a removable drive attached to the system.

4.6.3 Hard Disk Drives

Phoenix-Award BIOS CMOS Setup Utility	
Boot	
Hard Disk Drives	Select Menu
1. SATA1: XXXXXXXXX	Item Specific Help▶▶

1. SATA1: XXXXXXXXX

Allows you to assign hard disk drives attached to the system.

4.6.4 CDROM Drives

Phoenix-Award BIOS CMOS Setup Utility	
Boot	
CDROM Drives	Select Menu
1. 1st Slave: XXXXXXXXX	Item Specific Help▶▶

1. 1st Slave: XXXXXXXXX

Allows you to assign optical drives attached to the system.

4.6.5 Boot Settings Configuration

Phoenix-AwardBIOS CMOS Setup Utility			
Boot			
Boot Settings Configuration		Select Menu	
Case Open Warning	[Enabled]	Item Specific Help▶▶ Press [Enter] to enable or disable.	
Quick Boot	[Enabled]		
Boot Up Floppy Seek	[Disabled]		
Bootup Num-Lock	[On]		
Typematic Rate Setting	[Disabled]		
x Typematic Rate (Chars/Sec)	6		
x Typematic Delay (Msec)	250		
OS Select For DRAM > 64MB	[Non-OS2]		
Full Screen LOGO	[Enabled]		
Halt On	[All Errors]		
F1: Help	↑↓: Select Item	-/+ : Change Value	F5: Setup Defaults
ESC: Exit	→←: Select Menu	Enter: Select Sub-menu	F10: Save and Exit

Case Open Warning [Enabled]

Enables or disables the chassis open status feature. Setting to [Enabled] clears the chassis open status. Refer to section “2.7.2 Internal connectors” for details. Configuration options: [Disabled] [Enabled]

Quick Boot [Enabled]

Allows you to enable or disable the system quick boot feature. When set to [Enabled], the system skips certain tests while booting. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Disabled]

Enables or disables the floppy seek feature while booting. Configuration options: [Disabled] [Enabled]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock. Configuration options: [Off] [On]

Typematic Rate Setting [Disabled]

Allows you to set the keystroke rate. Enable this item to configure the Typematic Rate (Chars/Sec) and the Typematic Delay (Msec). Configuration options: [Disabled] [Enabled]



The items **Typematic Rate (Chars/Sec)** and **Typematic Delay (Msec)** become user-configurable when the item **Typematic Rate Setting** is enabled.

Typematic Rate (Chars/Sec) [6]

Allows you to select the rate at which a character repeats when you hold a key.
Configuration options: [6] [8] [10] [12] [15] [20] [24] [30]

Typematic Delay (Msec) [250]

Allows you to set the delay before keystrokes begin to repeat.
Configuration options: [250] [500] [750] [1000]

OS Select for DRAM > 64MB [Non-OS2]

Set this item to OS2 only when you are running on an OS/2 operating system with an installed RAM of greater than 64 KB. Configuration options: [Non-OS2] [OS2]

Full Screen LOGO [Enabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]



Make sure that the above item is set to [Enabled] if you want to use the ASUS MyLogo3™ feature.

Halt On [All Errors]

Allows you to error report type.
Configuration options: [All Errors] [No Errors] [All, But Keyboard] [All, But Diskette] [All, But Disk/Key]

4.6.6 Security

Phoenix-AwardBIOS CMOS Setup Utility		
Boot		
Security		Select Menu
Supervisor Password	Clear	Item Specific Help▶▶
User Password	Clear	
Password Check	[Setup]	Supervisor password controls full access,
Security Chip	[Disabled]	<Enter> to change password.

Supervisor Password

User Password

These fields allow you to set passwords:

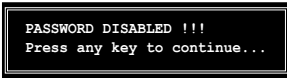
To set a password:

1. Select an item then press <Enter>.
2. Type in a password using a combination of a maximum of eight (8) alphanumeric characters, then press <Enter>.

- When prompted, confirm the password by typing the exact characters again, then press <Enter>. The password field setting is changed to Set.

To clear the password:

- Select the password field and press <Enter> twice. The following message appears:



- Press any key to continue. The password field setting is changed to Clear.

A note about passwords

The Supervisor password is required to enter the BIOS Setup program preventing unauthorized access. The User password is required to boot the system preventing unauthorized use.

Forgot your password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, refer to section “2.6 Jumper” for instructions.

Password Check

This field requires you to enter the password before entering the BIOS setup or the system. Select [Setup] to require the password before entering the BIOS Setup. Select [System] to require the password before entering the system. Configuration options: [Setup] [System]

Security Chip [Disabled]

Allows you to enable or disable the TPM security chip. Configuration options: [Disabled] [Enabled]



The succeeding item appears when you enable the **Security Chip** item.

Clear TPM Security Chip [Enter]

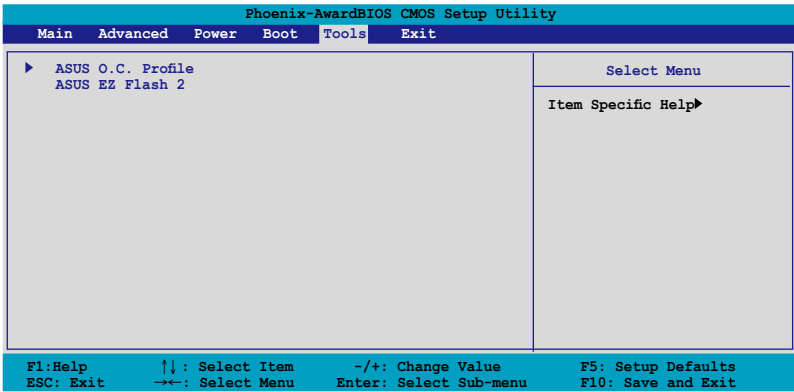
Allows you to clear the user information saved in the TPM security chip. When you press <Enter>, a warning message appears to ask if you want to clear the user information in the security chip. Use the left/right arrow key to select between [YES] and [NO], then press <Enter> to confirm your choice.



After you select [YES] to execute the **Clear TPM Security Chip** function, the data saved in the TPM security chip will be cleared and can never be restored.

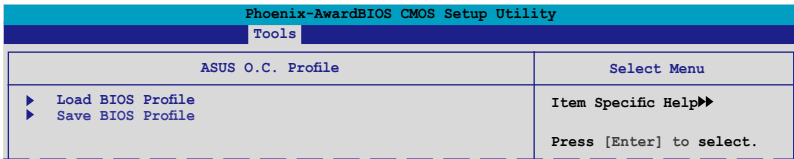
4.7 Tools menu

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

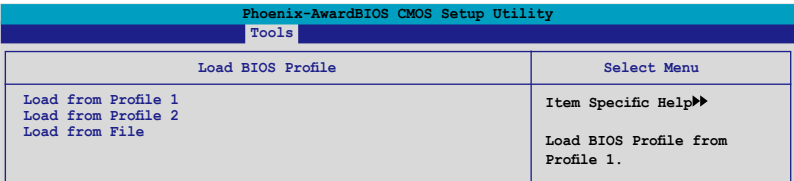


4.7.1 ASUS O.C. Profile

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



Load BIOS Profile



Load from Profile 1/2

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

Load from File

Allows you to load the previous BIOS file saved in the hard disk/floppy disk/USB flash disk with the FAT32/16/12 format. Follow the instructions below to load the BIOS file.

1. Insert the storage devices that contains the “xxx.CMO” file.
2. Turn on the system.
3. Enter BIOS setup program. Go to the “Tools” menu to select “Load from File.” Press <Enter> then the setup screen will appear.
4. Press <Tab> to switch between drives before the correct “xxx.CMO” file is found. Then press <Enter> to load the file.
5. A pop-up message will inform you when the loading process finishes.



- Suggest only to update the BIOS file coming from the same memory/CPU configuration and BIOS version.
- Only the “xxx.CMO” file can be loaded.

Phoenix-AwardBIOS CMOS Setup Utility	
Tools	
Load BIOS Profile	Select Menu
Load from Profile 1 Load from Profile 2 Load from File	Item Specific Help▶▶ Load BIOS Profile from Profile 1.

Save BIOS Profile

Phoenix-AwardBIOS CMOS Setup Utility	
Tools	
Save BIOS Profile	Select Menu
Save to Profile 1 Save to Profile 2 Save to File	Item 0 Help▶▶ Save current BIOS Profile to Profile 1.

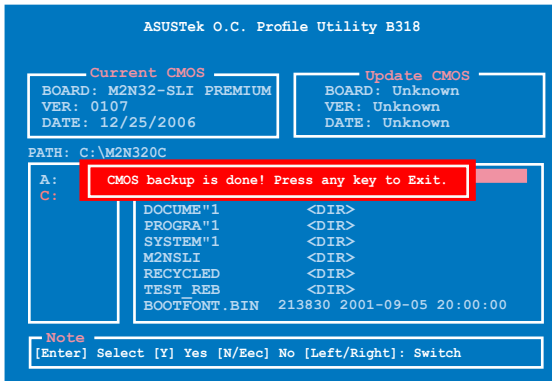
Save to Profile 1/2

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

Save to File

Allows you to save the current BIOS file to the hard disk/floppy disk/USB flash disk with FAT32/16/12 format. Follow the instructions below to save the BIOS file.

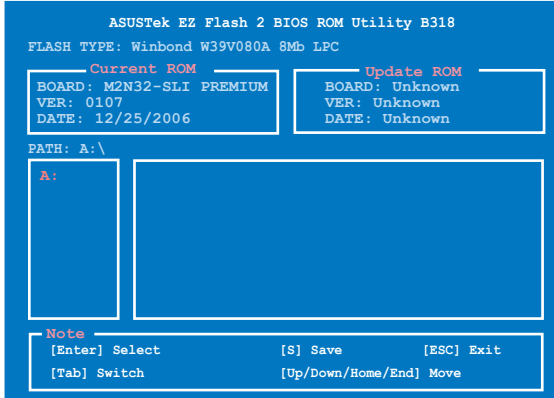
1. Insert the storage devices with enough space.
2. Turn on the system.
3. Enter the BIOS setup program. Go to the “Tools” menu to select “Save to File.” Press <Enter> then the setup screen will appear.
4. Press <Tab> to switch between the drives. Press hot-key <S> to save the file.
5. Key in the file name. Then press <Enter>.
6. A pop-up message will inform you when the saving process finishes.



The BIOS file will be saved as “xxx.CMO”.

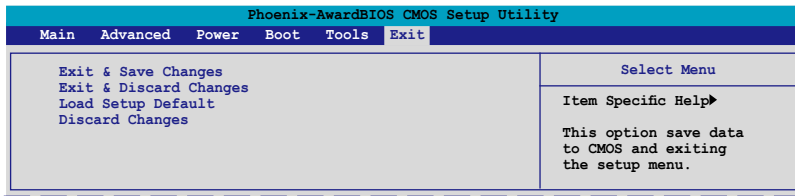
4.7.2 ASUS EZ Flash 2

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. Please see page 4-5, section 4.1.3 for details.



4.8 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.

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.

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.

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

5 Software support

5.1	Installing an operating system	5-1
5.2	Support DVD information	5-1
5.3	Software informtion	5-9
5.4	Windows® Vista feature	5-39
5.5	RAID configurations	5-40
5.6	Creating a RAID driver disk.....	5-56

5.1 Installing an operating system

This motherboard supports Windows® 2000/2003 Server/XP/64-bit XP/Vista/64-bit Vista operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.



- Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
- Make sure that you install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

5.2 Support DVD information

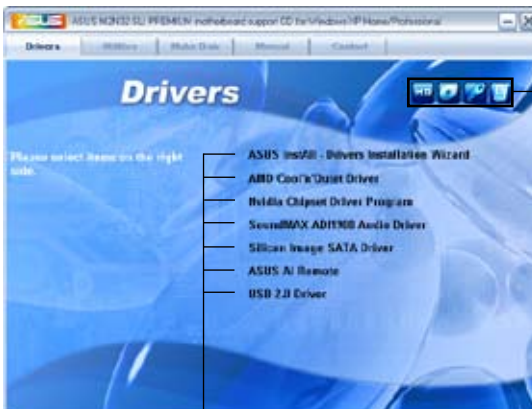
The support DVD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.



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

5.2.1 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.

5.2.2 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

Installs all of the drivers through the installation wizard.

AMD Cool 'n' Quiet Driver

Installs the AMD Cool 'n' Quiet™ technology driver.

Nvidia Chipset Driver Program

Installs the NVIDIA® Chipset drivers for the NVIDIA® nForce™ 590 SLI chipset.

SoundMAX ADI1988 Audio Driver

Installs the SoundMAX® ADI1988 audio driver and application.

Silicon Image SATA Driver

Installs the Silicon Image® Serial ATA RAID driver.

USB 2.0 Driver

Installs the Universal Serial Bus 2.0 (USB 2.0) driver.

5.2.3 Utilities menu

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



Click to display the next screen



Click to display the previous screen

ASUS InstAll - Installation Wizard for Utilities

Installs all of the utilities through the installation wizard.

ASUS Cool 'n' Quiet Utility

Installs the AMD Cool 'n' Quiet™ software.

ASUS PC Probe II

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

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).



Before using the ASUS Update, make sure that you have an Internet connection so that you can connect to the ASUS website.

ASUS AI Suite

Installs the ASUS AI Suite.

ASUS Accelerated Propeller

Installs the ASUS Accelerated Propeller (ASAP).

Adobe Reader V7.0

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

Microsoft DirectX 9.0c

Installs the Microsoft® DirectX 9.0c driver. The Microsoft DirectX® 9.0c is a multimedia technology that enhances computer graphics and sound. DirectX® improves the multimedia features of your computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website (www.microsoft.com) for updates.

Anti-Virus Utility

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

InterVideo MediaOne Gallery

Installs the InterVideo MediaOne Gallery software.

WinDVD Copy5 Trial

Installs the WinDVD Copy5 Trial version.

Ulead PhotoImpact 12 SE

Installs the Ulead PhotoImpact 12 SE software.

CyberLink PowerBackup

Installs the CyberLink PowerBackup software.

Corel Snapfire Plus SE

Installs the Corel Snapfire Plus SE software.

5.2.4 Make Disk menu

The Make Disk menu contains items to create the NVIDIA® nForce™ 590-SLI or Silicon Image SATA/RAID driver disk.



Make NV SATA/RAID 32bit Driver

Allows you to create an NVIDIA® Serial ATA RAID driver disk for a 32-bit system.

Silicon Image 32/64bit RAID/SATA Driver

Allows you to create a Silicon Image® Serial ATA/RAID driver disk for a 32/64-bit system

5.2.5 Manual menu

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

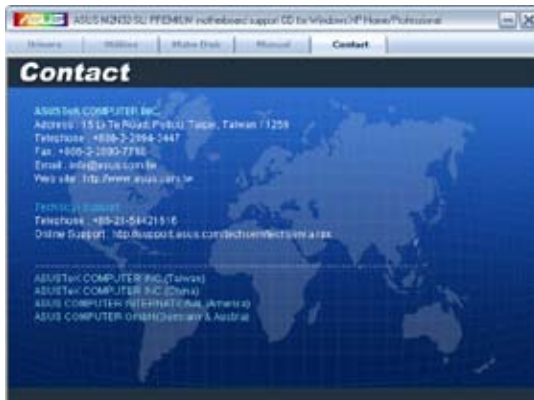


Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening a user manual file.



5.2.6 ASUS Contact information

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

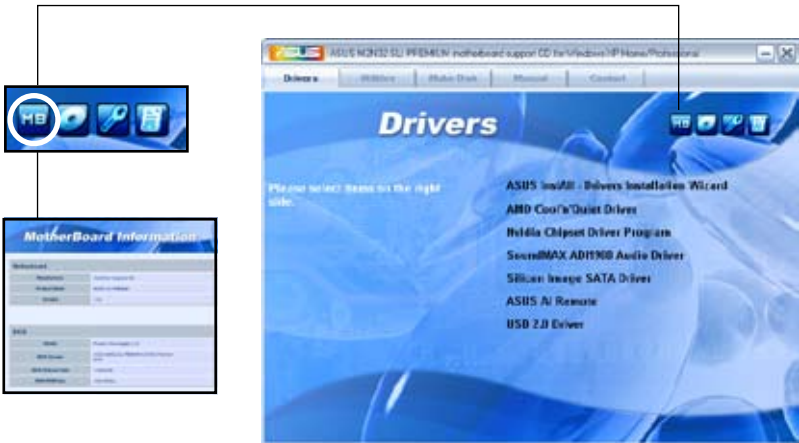


5.2.7 Other information

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

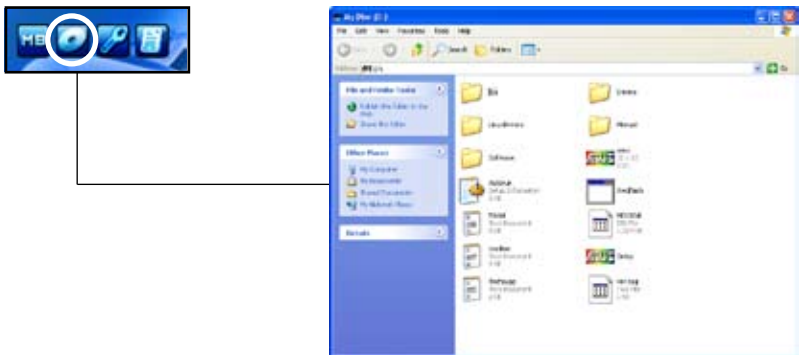
Motherboard Info

Displays the general specifications of the motherboard.



Browse this DVD

Displays the support DVD contents in graphical format.



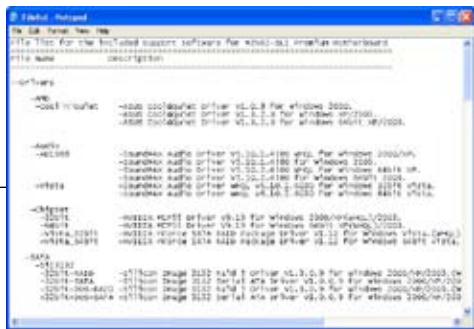
Technical support Form

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



Filelist

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



5.3 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.

5.3.1 ASUS MyLogo3™

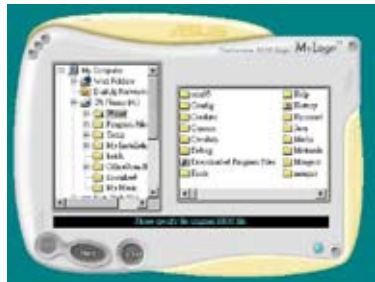
The ASUS MyLogo3™ utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On Self-Tests (POST). The ASUS MyLogo3™ is automatically installed when you install the ASUS Update utility from the support DVD. See section “5.2.3 Utilities menu” for details.



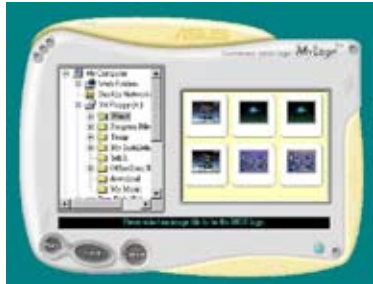
- Before using the ASUS MyLogo3™, use the Award BIOS Flash utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section 4.1.4 **Updating the BIOS**.
- Make sure that the BIOS item Full Screen Logo is set to [Enabled] if you wish to use ASUS MyLogo3. See section 4.6.5 **Boot Settings Configuration**.
- You can create your own boot logo image in GIF, or BMP file formats.
- The file size should be smaller than 150 K.

To launch the ASUS MyLogo3™:

1. Launch the ASUS Update utility. Refer to section “4.1.1 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.



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



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



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

5.3.2 Cool 'n' Quiet!™ Technology

The motherboard supports the AMD Cool 'n' Quiet!™ Technology that dynamically and automatically change the CPU speed, voltage, and amount of power depending on the task the CPU performs.

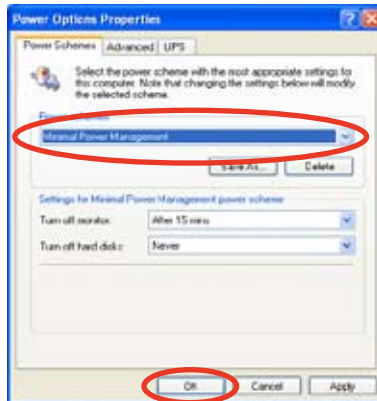
Enabling Cool 'n' Quiet!™ Technology

To enable Cool 'n' Quiet!™ Technology:

1. Turn on the system and enter BIOS by pressing the key during the Power On Self-Tests (POST).
2. Go to **Advanced > CPU Configuration > AMD Cool 'n'Quiet function** and set it to [Enabled]. See section “4.4 Advanced Menu.”
3. Save your changes and exit BIOS Setup.
4. Reboot your computer and set your Power Option Properties depending on your operating system.

Windows® 2000/XP

1. From the Windows® 2000/XP operating system, click **Start**. Select **Settings > Control Panel**.
2. Make sure the Control Panel is set to Classic View.
3. Double-click the **Display** icon in the Control Panel then select the Screen Saver tab.
4. Click the **Power** button. The following dialogue box appears.
5. From the Power schemes combo list box, select **Minimal Power Management**.
6. Click **OK** to effect settings.





- Make sure to install the AMD Cool 'n' Quiet!™ driver and application before using this feature.
- The AMD Cool 'n' Quiet!™ technology feature works only with the AMD heatsink and fan assembly with monitor chip
- If you purchased a separate heatsink and fan package, use the ASUS Q-Fan technology feature to automatically adjust the CPU fan speed according to your system loading.

Launching the Cool 'n' Quiet!™ software

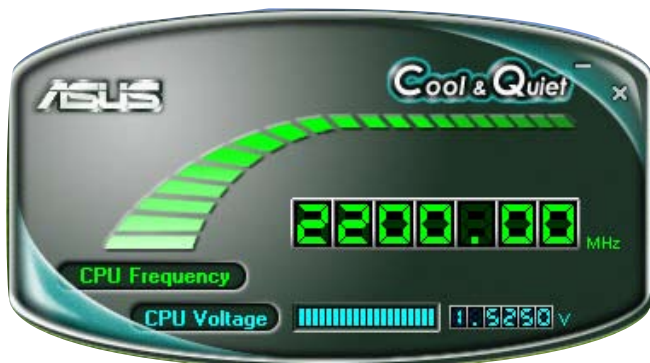
The motherboard support DVD includes the Cool 'n' Quiet!™ software that enables you to view your system's real-time CPU Frequency and voltage.



Make sure to install the Cool 'n' Quiet!™ software from the motherboard support DVD. Refer to section **5.2.3 Utilities menu** for details.

To launch the Cool 'n' Quiet!™ program:

1. If you are using Windows® 2000, click the Start button. Select **Programs > ASUS > Cool & Quiet > Cool & Quiet**.
2. If you are using Windows® XP, click the Start button. Select **All Programs > ASUS > Cool & Quiet > Cool & Quiet**.
3. The Cool 'n' Quiet!™ technology screen appears and displays the current CPU Frequency and CPU Voltage.



5.3.3 SoundMAX® High Definition Audio utility

The ADI AD1988B High Definition Audio CODEC provides 8-channel audio capability through the SoundMAX® audio utility with AudioESP™ software to deliver the ultimate audio experience on your PC. The software implements high quality audio synthesis/rendering, 3D sound positioning, and advanced voice-input technologies.

Follow the installation wizard to install the ADI AD1988B Audio Driver from the support DVD that came with the motherboard package to activate the SoundMAX® audio utility.

-
- You must use 4-channel, 6-channel or 8-channel speakers for this setup.
 - Refer to page 1-9 for the OS that supports SoundMAX®.
 - Jack Retasking function works on High Definition front panel audio ports only.
-


If the SoundMAX® audio utility is correctly installed, you will find the SoundMAX® icon on the taskbar.



From the taskbar, double-click on the SoundMAX® icon to display the SoundMAX® Control Panel.



Audio Setup Wizard

By clicking the  icon from the SoundMAX® control panel, you can easily configure your audio settings. Simply follow succeeding screen instructions and begin enjoying High Definition Audio.



Jack configuration

This screen helps you configure your computer's audio ports, depending on the audio devices you have installed.



Adjust speaker volume

This screen helps you adjust speaker volume. Click the **Test** button to hear the changes you have made.




Adjust microphone volume

This screen helps you adjust microphone volume. You will be asked to read pre-written text to allow the AudioWizard to adjust the volume as you speak.



Audio preferences



Click the  icon to go to the Preferences page. This page allows you to change various audio settings.

General options

Click the General tab to choose your playback and recording devices, enable/disable the AudioESP™ feature, and enable/disable digital output.



Listening options

Click the Listening Environment tab to optimize your speaker output settings.



Microphone options

Click the Microphone tab to optimize your microphone input settings.



Enhanced Microphone features

Noise Filtering

Enables Noise Filter function. Detects repetitive and stationary noises like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording. You can enable it for a better recording quality.

Directional Array

Receives only the sound coming from the reception cone and eliminates interferences including neighboring speakers and reverberations. You can enable it to transit clearer sound during on-line games, MSN, or Skype.

Speaker Phone

Advanced de-reverberation techniques can help to reduce echo and minimize its effect on the speech engine. You can enable it when you have conference call to reduce echoes in the other side.



- The directional Array and Speaker Phone function only when working with the ASUS Array Mic.
- If you are using Windows® Vista, you have to manually enable the directional Array and Speaker Phone function. Go to **Control panel > Sound**. Click the **Recording** tab on the top and select **Microphone**. Click the **Microphone Enhancement** tab and check **Array Mic**.



5.3.4 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. Refer to page 1-9 for the OS that supports this utility.

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

Button	Function
	Opens the Configuration window
	Opens the Report window
	Opens the Desktop Management Interface window
	Opens the Peripheral Component Interconnect window
	Opens the Windows Management Instrumentation window
	Opens the hard disk drive, memory, CPU usage window
	Shows/Hides the Preference section
	Minimizes the application
	Closes the application

Sensor alert

When a system sensor detects a problem, the main window right handle turns red, as the illustrations below show.



When displayed, the monitor panel for that sensor also turns red. Refer to the Monitor panels section for details.

Preferences

You can customize the application using the Preference section in the main window. Click the box before each preference to activate or deactivate.



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

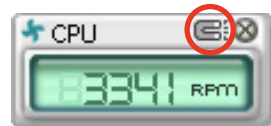
Changing the monitor panels position

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.

Click to increase value

Click to decrease value



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.

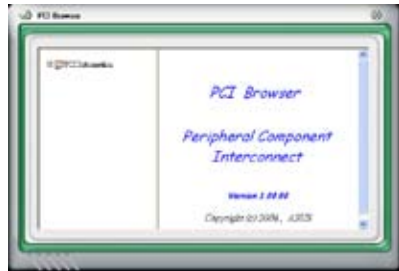
DMI browser

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.

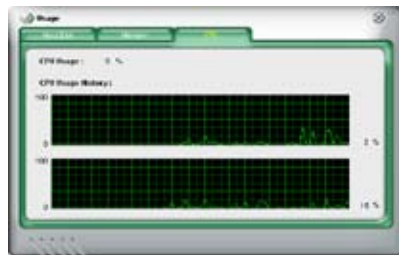


Usage

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



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 **CONFIG** 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.



Loads the default threshold values for each sensor

Applies your changes

Cancels or ignores your changes

Loads your saved configuration
 Saves your configuration

5.3.5 ASUS AI Suite

ASUS AI Suite allows you to launch AI Gear, AI N.O.S., AI Booster, AI Nap, and Q-Fan 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

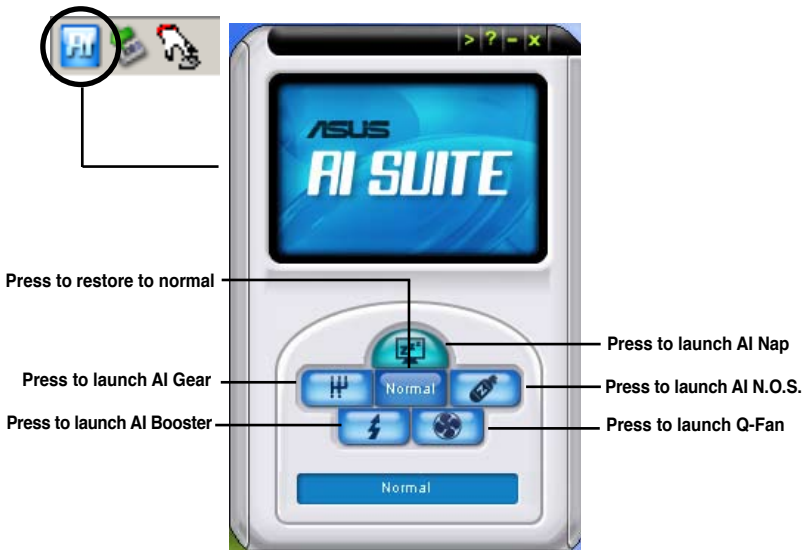
You can launch the AI Suite right after installation or anytime from the Windows® desktop.

To launch the 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® taskbar. Click this icon to close or restore the application.

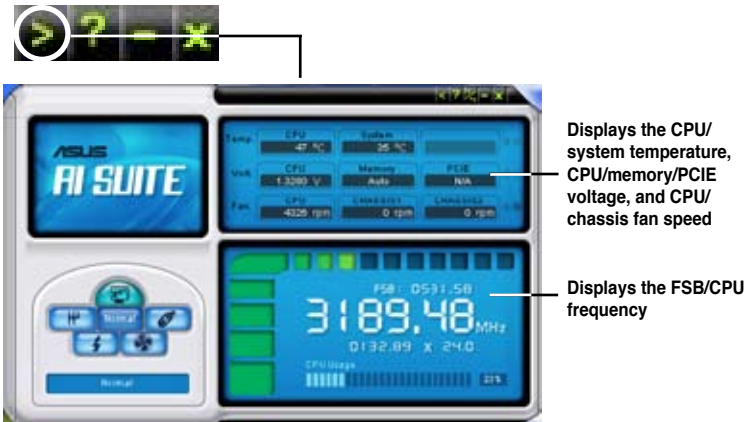
Using AI Suite


Click the AI N.O.S., AI Gear, AI Nap, AI Booster, or Q-Fan 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.



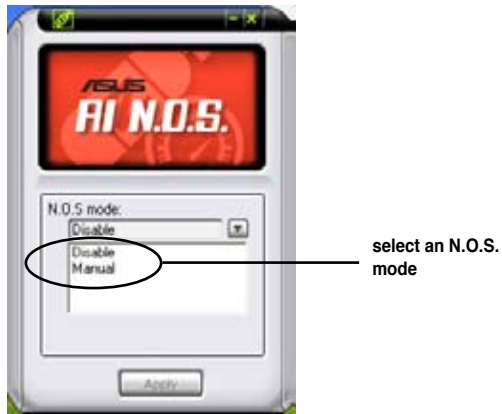
5.3.6 ASUS AI N.O.S.

This ASUS Non-delay Overclocking System feature intelligently determines the system load and automatically boosts the performance for the most demanding tasks.

After installing AI Suite from the bundled support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows OS taskbar and click the AI N.O.S. button on the AI Suite main window.



Click the drop-down menu button and select **Disable** or **Manual**.



Click **Apply** at the bottom to save the configuration.



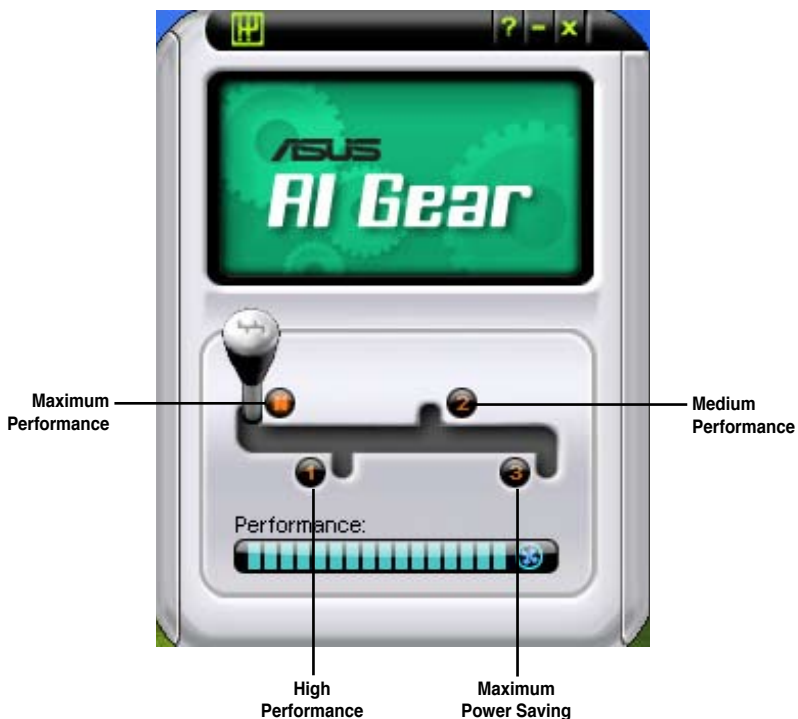
Refer to page 1-9 for the OS that supports this utility.

5.3.7 ASUS AI Gear

ASUS AI Gear provides four system performance options that allows you to select the best performance setting for your computing needs. This easy-to-use utility adjusts the processor frequency and vCore voltage to minimize system noise and power consumption.

After installing AI Suite from the bundled support DVD, you can launch AI Gear by double-clicking the AI Suite icon on your Windows OS taskbar and then click the AI Gear button on the AI Suite main window.

Shift the gear to the performance setting that you like.



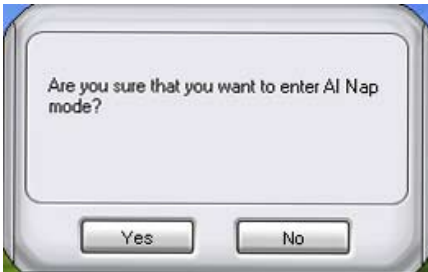
Refer to page 1-9 for the OS that supports this utility.

5.3.8 ASUS AI Nap

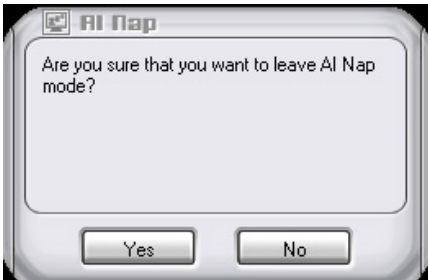
This feature allows you to minimize the power consumption of your computer whenever you are away. Enable this feature for minimum power consumption and a more quiet system operation.

After installing AI Suite from the bundled support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows OS taskbar and click the AI Nap button on the AI Suite main window.

Click **Yes** on the confirmation screen.



To exit AI Nap mode, press the system power or mouse button then click **Yes** on the confirmation screen.

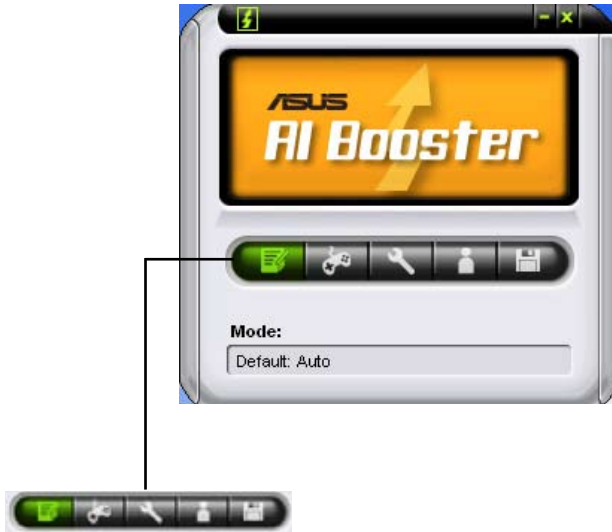


-
- To switch the power button functions from AI Nap to shutting down, just right click the **AI Suite** icon on the OS taskbar, select **AI Nap** and click **Use power button**. Unclick the item to switch the function back.
 - Refer to page 1-9 for the OS that supports this utility.
-

5.3.9 ASUS AI Booster

The ASUS AI Booster application allows you to overclock the CPU speed in Windows® environment without the hassle of booting the BIOS.

After installing AI Suite from the bundled support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows® OS taskbar and click the AI Booster button on the AI Suite main window.



The options on the taskbar allow you to use the default settings, adjust CPU/ Memory/PCI-E frequency manually, or create and apply your personal overclocking configurations.



Refer to page 1-9 for the OS that supports this utility.

5.3.10 ASUS Q-Fan

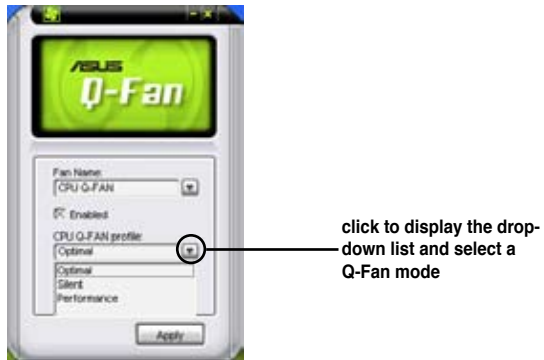
This ASUS Q-Fan Control feature allows you to set the appropriate performance level of the CPU Q-Fan or the Chassis Q-Fan for more efficient system operation. After enabling the Q-Fan function, the fans can be set to automatically adjust depending on the temperature, to decrease fan speed, or to achieve the maximum fan speed.

After installing AI Suite from the bundled support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows® OS taskbar and click the Q-Fan button on the AI Suite mAIIn window.

Click the drop-down menu button and display the fan names. Select **CPU Q-FAN** or **CHASSIS Q-FAN**. Click the box of **Enable Q-Fan** to activate this function.



Profile list appears after clicking the **Enable Q-Fan** box. Click the drop-down list button and select a profile. **Optimal** mode makes the fans adjust speed with the temperature; **Silent** mode minimizes fan speed for quiet fan operation; **Performance** mode boosts the fan to achieve maximal fan speed for the best cooling effect.

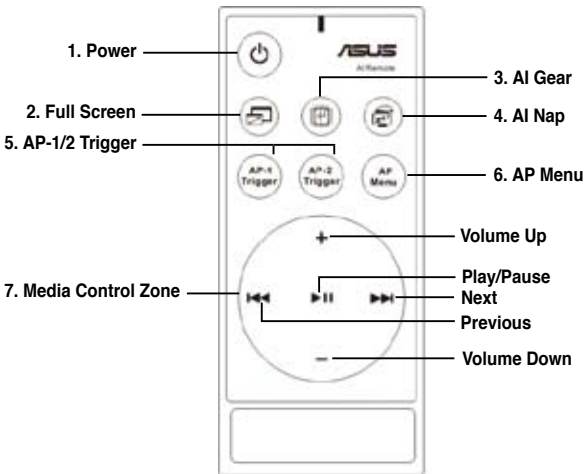


Click **Apply** at the bottom to save the setup.

5.3.11 AI Remote

With the ASUS AI Remote, you can play, pause, or adjust the volume on any songs desired without leaving your sofa. Have AI Remote in your hand and do more with your PC at a distance away.

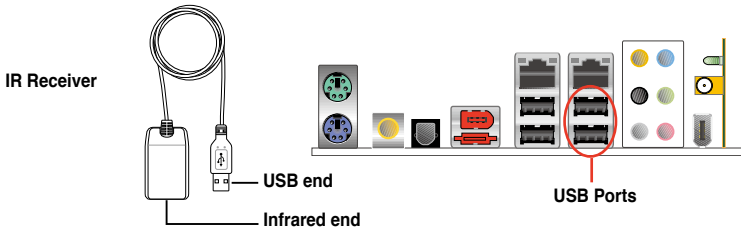
Overview of the ASUS AI Remote



- 1. Power:** Turns the computer on/off.
- 2. Full Screen:** Puts the media application into full screen.
- 3. AI Gear:** Changes modes for optimizing performance and quietness.
- 4. AI Nap:** Snoozing system without terminating tasks into quietest state.
- 5. AP-1/2 Trigger:** Initiates the pre-defined applications.
- 6. AP Menu:** Displays the application menu.
- 7. Media Control Zone:** Controls the media application.

USB IR Receiver

Your motherboard will come bundled with a IR Receiver, simply connect the USB end to your PC USB ports under the LAN2 port and place the IR receiver end at a suitable place without hindrance.



- The valid IR function distance is 6m depending on the environment. Suggest you to aim at the IR receiver when using the ASUS AI Remote to ensure a smooth and successful operation.
- These two USB ports support USB wake-up capability. So when the computer is not turned on, removing USB devices such as the ASUS IR receiver from these two ports will start up the PC.
- Back I/O differs depending on the motherboards.
- Refer to page 1-9 for the OS that supports the ASUS AI Remote.

Software Installation

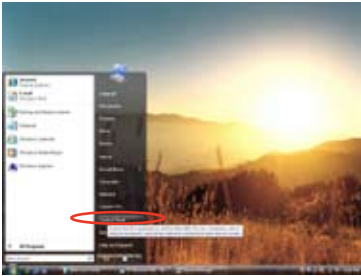
Before enjoying the convenience the ASUS AI Remote brings you, you need to install the software after the infrared receiver installation. Simply click and install the file ASUS AI Remote from the Drivers menu of the Motherboard Support DVD package for the first time, and it will launch automatically everytime you start up your PC.



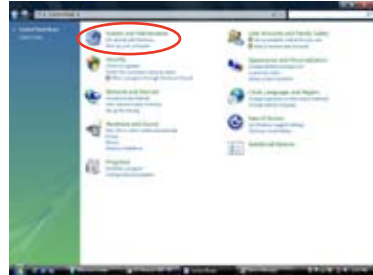
ASUS AI Remote

Activating HID-Compliant Devices

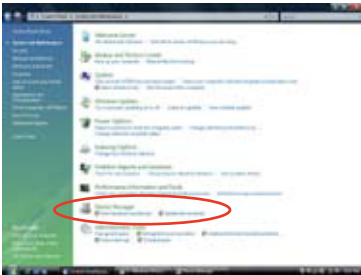
Due to the limitation of the operating system, if you remove the IR receiver from the previous port and have it reinstall into the other USB port, the IR receiver will not function. To activate the HID-compliant devices again, go to **Device Manager/Power Manager** and check the box of **Allow this device to bring the computer out of standby**.



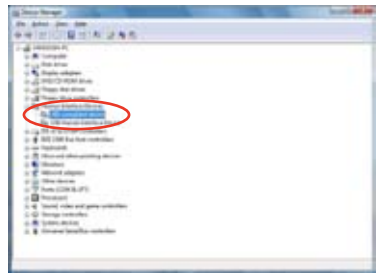
1. Click **Windows** icon and choose **Control Panel**.



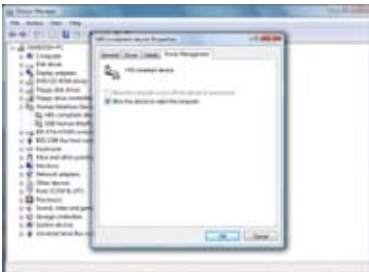
2. Double click **System and Maintenance**.



3. Click **Device Manager**.



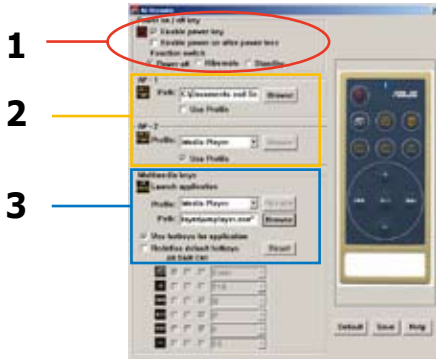
4. Select **HID-compliant device**.



5. Check the box of **Allow this device to wake the computer**.

ASUS AI Remote Settings

After the installation of the ASUS AI Remote software, the utility screen will show up and allows you to configure the ASUS AI Remote settings. Set up the function keys following the instructions below.



1. Power On / Off Key

Enable power key

Click this box to enable this power button.

Enable power on after power loss

Click this box to restart the system after the AC power loss. Whenever the power cord of your PC is removed from the outlet or there is a power failure, your PC will auto-boot and shut down around few seconds to enable the Power On function of AI Remote after the power supply is back.

Function switch

You can customize the **Power key** by switching the mode from **Power off** to **Hibernate** or **Standby** based on your preference. Setting this item to **Hibernate** allows you to lead your PC to the Windows S4 mode, which enables your PC to enter Hibernate faster and return to full power much more quickly.



- Power On/Off button does not support MS-DOS Mode.
- You have to check the box of **Enable Power Key** before using the ASUS AI Remote to turn on and off your PC or to have it hibernate or standby. Visit www.microsoft.com for details about Hibernate and Standby.

2. AP-1/2

You are allowed to configure two sets of applications for AP-1 Trigger and AP-2 Trigger buttons. After the setup, you can easily launch the pre-defined application by pressing the designated button.

- (1) Click the box before **Use Profile**, and you are able to select a default application from the drop-down menu.
- (2) To launch a non-default application, unclick the box before **Use Profile**.
- (3) Click the **Browse** button and locate the executable (.exe) file of the application you want to launch by pressing the AP-1 button.
- (4) Follow the same instructions to configure the **AP-2** button.
- (5) Click **Save** to save the configuration.

3. Multimedia Keys

Profile

There are nine default applications in the **Profile** drop-down menu and five sets of **User Define**.



Default applications are Media Player, iTunes, PowerDVD, WinDVD, QuickTime, Real Player, DivX Player, WinAmp and Power Point. (Default applications in the ASUS AI Remote software may change without notice.)

Path

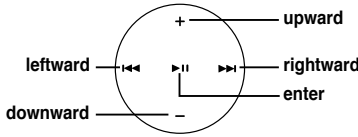
The software will help locate the executable (.exe) file of the nine default applications. If the .exe file is not located, click **Browse** to direct the correct path. The .exe files of the **User Define** applications need to be located manually before you using the ASUS AI Remote.




-
- Save after the .exe file path is directed.
 - If the executable file is relocated or the application is re-installed, you have to redirect the file path for a correct ASUS AI Remote operation.
-

AP Menu Button and Application menu

Navigate with the media control zone.



Select Application Profile

After you press  (AP Menu) on the remote control, an application profile will be displayed on the screen. Use the remote control to navigate and initiate a desired application.






Select Application Path

If the software fails to locate the executable file of the application at the first-time use, the **Select Application Path** screen will appear. Specify the correct path on screen.




Select File

After selecting the correct path, you should select the correct executable file (.exe) of the application for launching the application.

If the executable file is located by the software successfully or you have already set up correctly in advance, this screen will show up directly when the application is chosen. After selecting a desired file, folder or CD-ROM, use   to choose **Back/OK/Cancel** and then press  to confirm.



- For music listening, making playlists beforehand is suggested.
- Press  again to close the application and again to re-launch the profile menu.

Define Hotkeys for Application

If you want to use the Media Control Zone to control non-default applications, such as ACDSee, you can select **User Define** from the drop-down menu and rename it by pressing **Rename**. The ASUS AI Remote software has correctly set up nine popular applications and defined the function buttons for your convenient operation.


User Define

After clicking the box before **Use** **Hotkeys for Application**, you are free to define the hotkeys of the User Define applications.



Select **User Define 1~5** from the **Profile** drop-down menu for hotkeys definition. Press **Save** to save the new setup or press the **Default** button to clear ALL personalized setups and restore to the original definitions.



- The remote control buttons will function only when the definitions of the application hotkeys are correct.
- The hotkey definitions may vary with different software versions. Click the box of **Redefine default hotkeys** to give new correct definitions if needed. Press **Save** button to save the redefinitions or press **Reset** button to restore to the default hotkeys definition.
- After the initial setup, you will find an ASUS AI Remote icon  on the Windows OS taskbar. Click the icon and select **Settings** to launch the utility screen.

The Function Buttons and AP Profile

The ASUS AI Remote software helps you set up the correspondence between the function buttons on the remote to the function hotkeys of nine popular applications in advance and leaves five sets for User Define.

	Media Player	iTunes	PowerDVD	WinDVD	QuickTime
Full Screen	v	v	v	v	v
▶	v	v	v/x	v	v
+	v	v	v	v	v
-	v	v	v	v	v
▶▶	v	v	v	v	x
◀◀	v	v	v	v	x
*NOTE			only play, no pause		

	Real Player	DivX Player	WinAmp	Power Point	User Define
Full Screen	v	v	x	v	
▶	v	v	v/x	Full Screen	
+	v	x	v	B	
-	v	x	v	ESC	
▶▶	v	x	v	Page Down	
◀◀	v	x	v	Page Up	
*NOTE			only play, no pause		



If you find the 9 default applications insufficient and would like to add different applications, you are able to rename the 5 sets User Define and create your preferred applications and favorable setups.

5.4 Windows® Vista feature

5.4.1 ASAP (ASUS Accelerated Propeller)

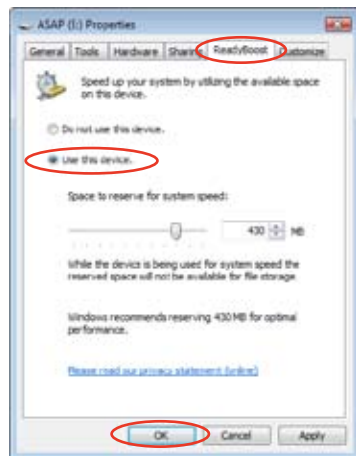
This motherboard is equipped with the ASUS Accelerated Propeller (ASAP) feature. ASAP supports the Windows® ReadyBoost™ technology that improves system performance under Windows® Vista. Refer to page 1-9 for the OS that supports ASAP.



Before activating ASAP, install the ASAP utility from the bundled support DVD.

To activate ASAP:

1. From the Windows® Vista desktop, click **Start > Computer**.
2. Right-click on the USB Removable Storage device (ASAP), and select **Properties**.
3. Click the **ReadyBoost** tab. A dialog box appears.
4. Check **Use this device**, and then move the slider to determine the amount of space reserved for ReadyBoost™ cache.
5. Click **OK** to effect the settings.



- When you see the existing partition for ASAP, we advise you not to delete this partition that supports the ReadyBoost™ function. If you delete this partition by accident, you may recreate it by:

Clicking **Start** from the Windows® Vista desktop. Right-click on **Computer** and select **Manage**. Click **Disk Management** and right-click on the ASAP drive. Select **Format > OK**. OR

Going to **Start > Control Panel > System and Maintenance > Administrative Tools > Computer Management > Disk Management**. Right-click on the ASAP drive, and select **Format > OK**.

- If you accidentally remove the ASAP device from Windows® Vista, you may re-activate it by rebooting your computer.
- If you want to reinstall an operating system, uninstall the ASAP utility first.

5.5 RAID configurations

The motherboard comes with the Silicon Image Sil3132 and the NVIDIA® nForce™ 590 SLI Southbridge RAID controllers that allow you to configure Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations.

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 0+1 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 0+1 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. (For NF-590 SLI only)

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. (For NF-590 SLI only)

JBOD (Spanning) stands for Just a Bunch of Disks and refers to hard disk drives that are not yet configured as a RAID set. This configuration stores the same data redundantly on multiple disks that appear as a single disk on the operating system. Spanning does not deliver any advantage over using separate disks independently and does not provide fault tolerance or other RAID performance benefits.



If you want to boot the system from a hard disk drive included in a RAID set, copy first the RAID driver from the support DVD to a floppy disk before you install an operating system to a selected hard disk drive. Refer to section **5.6 Creating a RAID driver disk** for details.

5.5.1 Installing 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.

Installing Serial ATA (SATA) hard disks

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.



Refer to the RAID controllers user manual in the motherboard support DVD for detailed information on RAID configurations. See section **5.2.5 Manual menu**.

5.5.2 NVIDIA® MediaShield RAID configurations

The motherboard includes a high performance RAID controller integrated in the NVIDIA® nForce™ 590 SLI southbridge chipset. It supports RAID 0, RAID 1, RAID 0+1, RAID 5 and JBOD for six independent Serial ATA channels.

Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

1. Boot the system and press during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
2. From the Main > Serial ATA Configuration menu item in the BIOS set the nVidia RAID Function item to Enabled.
3. Select and enable the SATA drive(s) that you want to configure as RAID. See section “4.4.7 Onboard Device Configuration” for details.
4. Save your changes and Exit Setup.



Make sure to re-enter your NVRAID settings after the CMOS is cleared; otherwise, the system will not recognize your RAID setup.



- For detailed descriptions on the NVIDIA® RAID configuration, refer to the “NVIDIA® RAID User’s Guide” found in your motherboard support DVD.
 - When using Windows 2000 operating system, make sure to install the Windows 2000 Service Pack 4 or later versions.
-

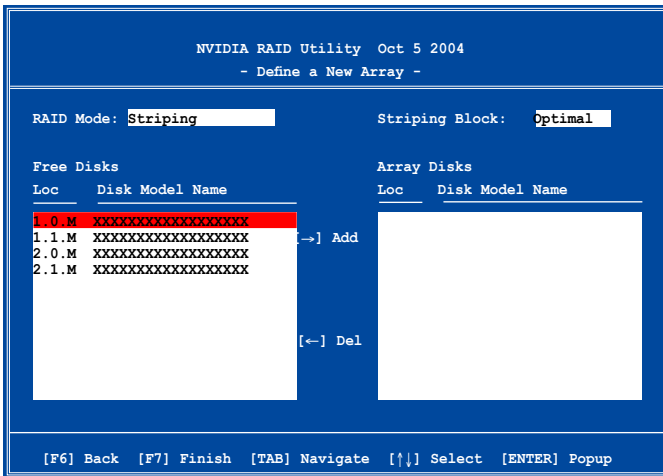
Entering the NVIDIA® MeidaShield RAID utility

To enter the NVIDIA® RAID utility:

1. Boot up your computer.
2. During POST, press <F10> to display the main menu of the utility.



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



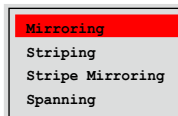
At the bottom of the screen are the navigation keys. These keys allow you to move through and select menu options.

Creating a RAID Volume

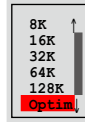
To create a RAID volume:

1. From the NVIDIA® RAID utility Define a New Array menu, select RAID Mode then press <Enter>. The following submenu appears.

Use the up or down arrow keys to select a RAID mode then press <Enter>.



2. Press <TAB> select the Striping Block then press <Enter>. The following submenu appears:



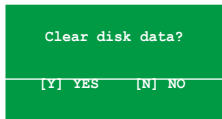
If you selected Striping or Stripe Mirroring, use the up or down arrow keys to select the stripe size for your RAID 0 array then press <Enter>. The available values range from 8 KB to 128 KB. The default selection is 128 KB. The stripe value should be chosen based on the planned drive usage.

- 8 /16 KB - low disk usage
- 64 KB - typical disk usage
- 128 KB - performance disk usage



TIP: For server systems, we recommend using a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

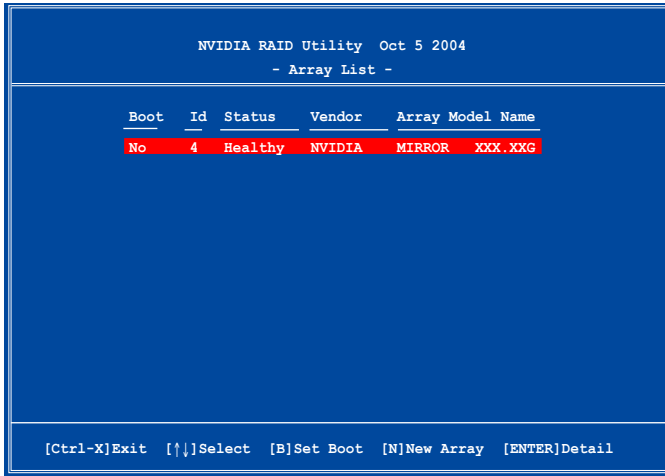
3. Press <TAB> to select the Free Disks area. Use the left or right arrow keys to assign the array disks.
4. Press <F7> to create RAID set. The following message box appears.



5. Press <Y> to clear the selected disks or <N> to proceed without clearing the disks. The following screen appears.



Take caution in using this option. All data on the RAID drives will be lost!



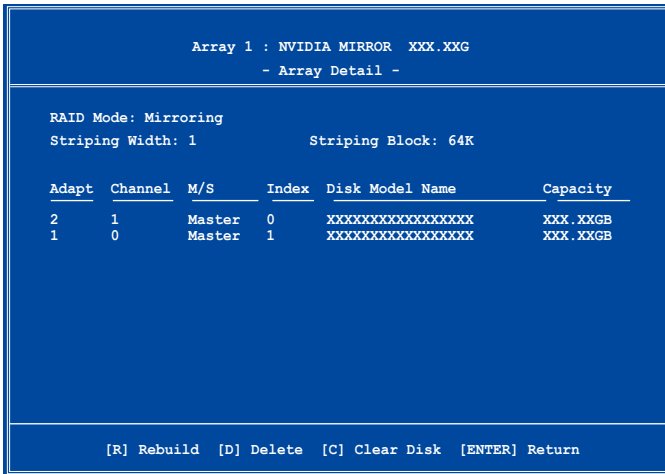
A new set of navigation keys is displayed on the bottom of the screen.

6. Press <Ctrl+X> to save settings and exit.

Rebuilding a RAID array

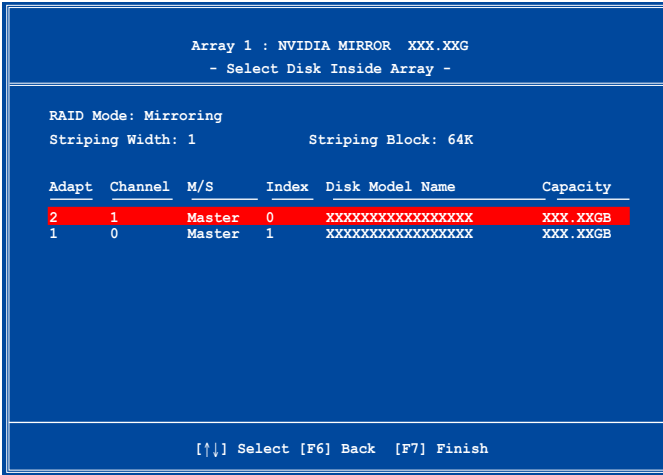
To rebuild a RAID array:

1. From the Array List menu, use the up or down arrow keys to select a RAID array then press <Enter>. The RAID Array details appear.

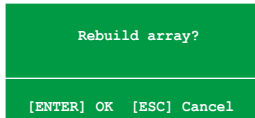


A new set of navigation keys is displayed on the bottom of the screen.

2. Press <R> to rebuild a RAID array. The following screen appears.



3. Use the up or down arrow keys to select a RAID array to rebuild, then press <F7>. The following confirmation message appears.

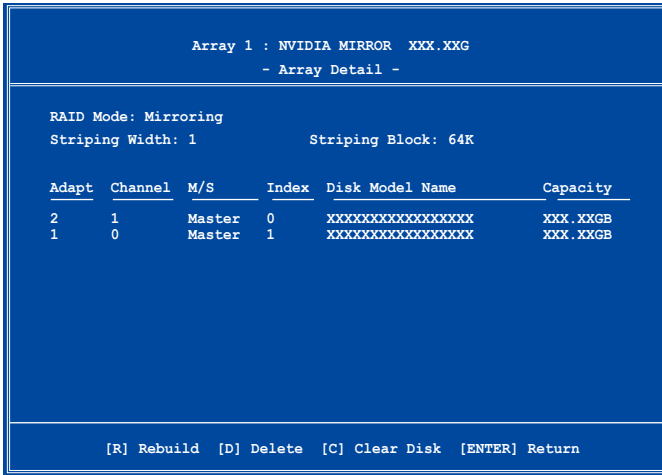


4. Press <Enter> to start rebuilding array or press <Esc> to cancel.
5. After the rebuild process, the Array list menu appears.

Deleting a RAID array

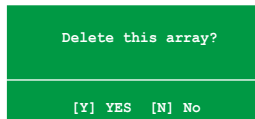
To delete a RAID array:

1. From the Array List menu, use the up or down arrow keys to select a RAID array then press <Enter>. The RAID Array details appear.



A new set of navigation keys is displayed on the bottom of the screen.

2. Press <D> to delete a RAID array. The following confirmation message appears.



3. Press <Y> to delete array or press <N> to cancel.



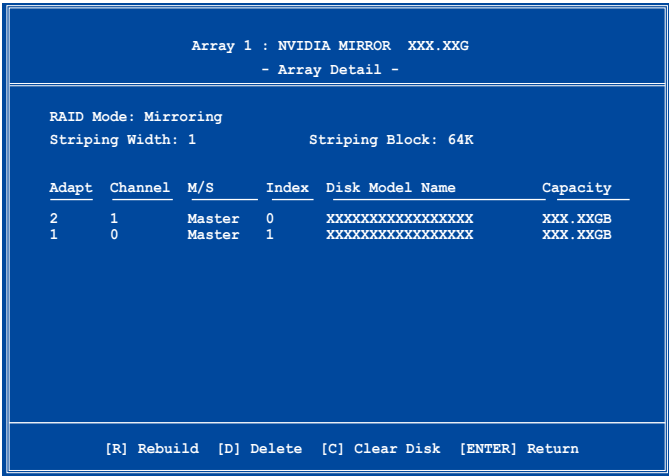
Take caution in using this option. All data on the RAID drives will be lost!

4. If you selected Yes, the Define a New Array menu appears.

Clearing a disk data

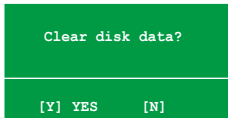
To clear disk data:

1. From the Array List menu, use the up or down arrow keys to select a RAID array then press <Enter>. The RAID Array details appear.



A new set of navigation keys is displayed on the bottom of the screen.

2. Press <C> to clear disk. The following confirmation message appears.



5. Press <Y> to clear the disk data or press <N> to cancel.



Take caution in using this option. All data on the RAID drives will be lost!

5.5.3 Silicon Image RAID configurations

The Silicon Image RAID controller supports RAID 0, RAID 1 and JBOD configurations. Use the Silicon Image RAID utility to configure a disk array.

Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

1. Boot the system and press during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
2. From the Advanced > Onboard Devices Configuration menu item in the BIOS set the Silicon Image Controller item to RAID Mode. See section "4.4.6 Onboard Devices Configuration" for details.
3. Save your changes and Exit Setup.

Launching the Silicon Image Array Management Software

Launch the Silicon Image Array Management software from Windows® XP by clicking the Start button and selecting All Programs > Silicon Image > Sam



For details on the Silicon Image SATAraid™ RAID configuration, refer to the "Sil3132 User Guide" in your motherboard support DVD.

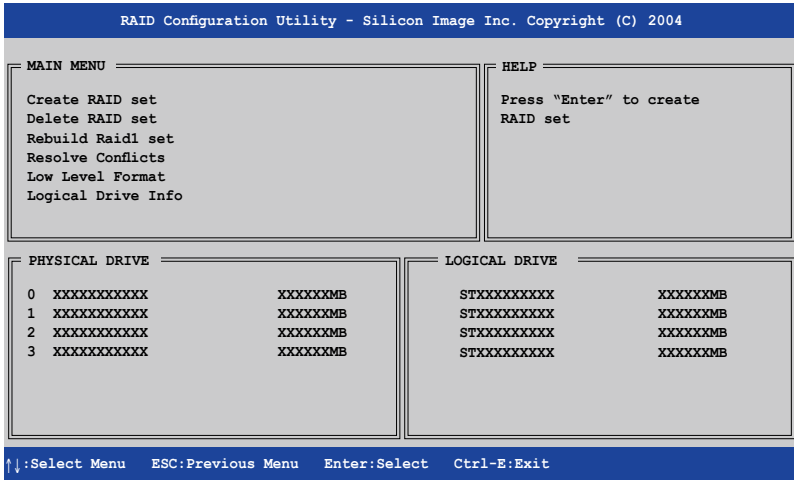
Entering the Silicon Image BIOS RAID Configuration Utility

To enter the Silicon Image BIOS RAID configuration utility:

1. Boot up your computer.
2. During POST, press <Ctrl+S> or <F4>.



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



The Main Menu on the upper left corner allows you to select an operation to be performed. The Main Menu options include the following:

Create RAID set - creates a new legacy RAID set or allocates spare drives.

Delete RAID set - deletes a RAID set or deallocates a spare drive.

Rebuild RAID1 set - rebuilds a RAID 1 set (e.g., swapped drives).

Resolve Conflicts - automatically restores disrupted drives on a RAID set.

Low Level Format - creates a pattern of reference marks on a drive. Formatting the disks erases all data previously stored in the drive.

Logical Drive Info - shows the current configuration of each RAID set.

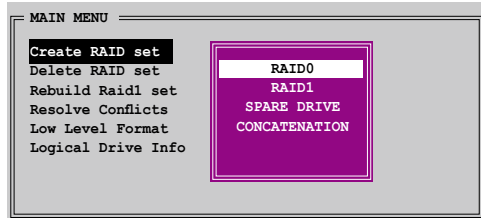
On the upper right corner of the screen is the Help message box. The message describes the function of each menu item. At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options. The following lists the keys found in the legend box and their corresponding functions.

- ↑, ↓ : Select/Move to the next item
- ESC** : Previous Menu
- Enter** : Select
- Ctrl-E** : Exit

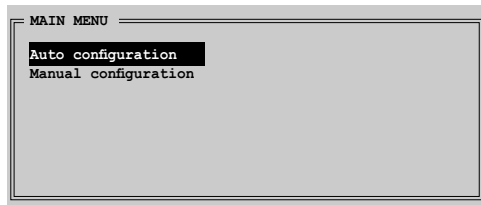
Creating a RAID 0 set (Striped)

To create a RAID set:

1. From the Silicon Image configuration utility main menu, select Create RAID set then press <Enter> to display an option menu.



2. Select RAID 0 then press <Enter> to display the following.



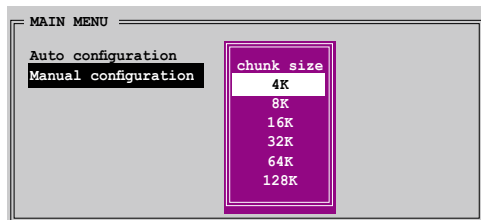
3. Select your desired method of configuration.
Auto configuration
 - a. Select Auto Configuration then press <Enter>.
 - b. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.
 - c. Press <Y> to confirm or <N> to return to the Main Menu.



By default, Auto configuration sets the stripe size to 64K and sets the logical drives based on the physical drives installed.

Manual configuration

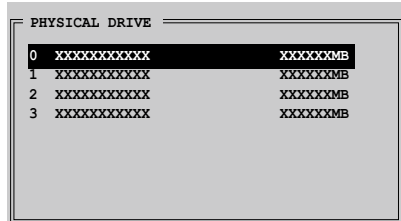
- a. Select Manual configuration and press <Enter>. The following pop-up menu appears.
- b. Use the up or down arrow keys to select a chunk size appropriate to your drive usage then press <Enter>.





TIP: For server systems, we recommend using a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

- c. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set the first drive of the RAID set.

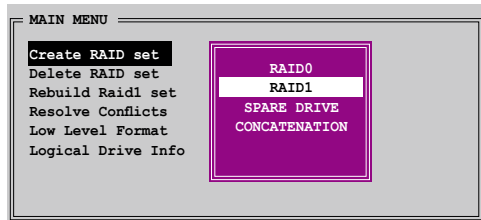


- d. Repeat step c to set the second, third, and fourth drive. The number of available drives depend on the installed and enabled physical drives in the system.
- e. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.
- f. Press <Y> to confirm or <N> to return to the Main Menu.

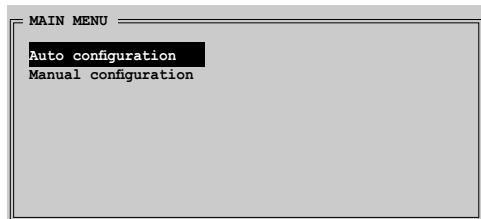
Creating a RAID 1 set (Mirrored)

To create a RAID 1 set:

1. From the Silicon Image configuration utility main menu, select Create RAID set then press <Enter>. The following sub-menu appears.



2. Select RAID 1 then press <Enter> to display the following.



3. Select your desired method of configuration.

Auto configuration

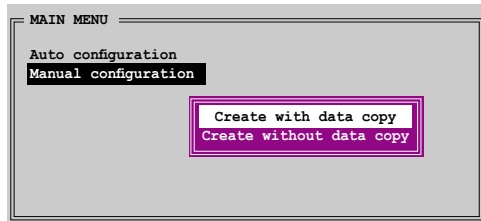
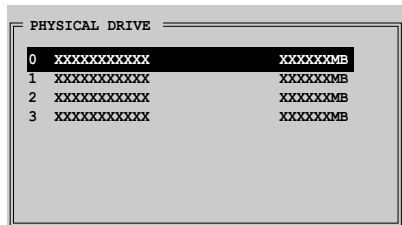
- Select Auto Configuration then press <Enter>.
- The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.
- Press <Y> to confirm or <N> to return to the Main Menu.



- Auto-configuration creates a RAID 1 set without a backup copy of the current source disk data.
- When migrating a single hard disk drive to a RAID 1 set, use of the Manual configuration is recommended.

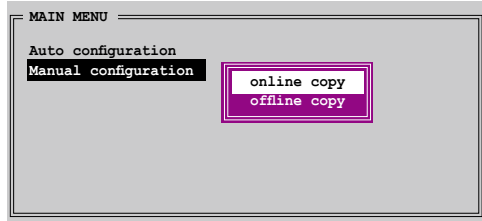
Manual configuration

- Select Manual configuration and press <Enter>. The selection bar moves to the Physical Drives menu.
- Using the up or down arrow keys, select the source drive and press <Enter>.
- Repeat step b to select the target drive.
- After selecting the source and target drives, the following pop-up menu appears.



- The Create with data copy option allows you to copy the current data from the source drive to the mirror drive.
- Select Create with data copy if you have important data in your source drive.
- The Create without data copy option disables the disk copy function of the Mirrored set.
- If you selected Create without data copy, the RAID 1 set must be repartitioned and reformatted to guarantee the consistency of its contents.

- e. If you selected Create with data copy, the following pop-up menu appears.



The online copy option automatically copies the data to the target drives on the background while writing to the source drives. The offline copy option allows you to copy the contents of the source drive to the target drives now.

- f. Use the up or down arrow keys to select desired copy method, then press <Enter>.
- g. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.
- h. Press <Y> to confirm or <N> to return to the Main Menu.

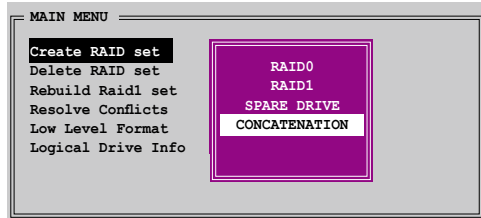


A copy progress appears if you previously selected offline copy.

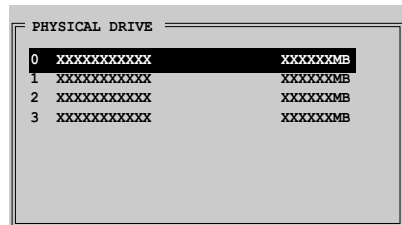
Creating a CONCATENATION set

To create a CONCATENATION set:

1. From the Silicon Image configuration utility main menu, select Create RAID then press <Enter>.
2. From the sub-menu Select CONCATENATION then press <Enter>.



3. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set a drive for the RAID set.
4. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.
5. Press <Y> to confirm or <N> to return to the Main Menu.



Configure a CONCATENATION set when using a single Serial ATA drive; otherwise, the system will not recognize the drive.

5.6 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® 2000/XP/ Vista operating system on a hard disk drive that is included in a RAID set.

To create a RAID driver disk:

1. Place the motherboard support DVD into the DVD-ROM drive.
2. Select Make Disk tab.
3. From the Make Disk menu, select the RAID driver disk you want to create or browse the contents of the support DVD to locate the driver disk utility.



Refer to section **5.2.4 Make Disk menu** for details.

4. Insert floppy disk to floppy disk drive.
5. Follow succeeding screen information to complete process.
6. Write-protect the floppy disk to avoid computer virus infection.

To install the RAID driver:

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> then insert the floppy disk with RAID driver into the floppy disk drive.
3. Follow the succeeding screen instructions to complete the installation.



Due to chipset limitation, the Serial ATA ports supported by the NVIDIA chipset doesn't support Serial Optical Disk Drives (Serial ODD) under DOS.

This chapter tells how to install SLI-ready
PCI Express graphics cards.

NVIDIA® SLI™ **technology support**

Chapter summary

6.1	Overview	6-1
6.2	Dual graphics cards setup	6-2

6.1 Overview

The motherboard supports the NVIDIA® SLI™ (Scalable Link Interface)-Intel® Edition technology that allows you to install two identical PCI Express™ x16 graphics cards. Follow the installation procedures in this section.

Requirements

- You should have two identical SLI-ready graphics cards that are NVIDIA® certified.
- Make sure that your graphics card driver supports the NVIDIA® SLI™ technology. Download the latest driver from the NVIDIA website (www.nvidia.com).
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See “9. ATX power connectors” on page 2-31 for details.



-
- The NVIDIA® SLI™ technology supports Windows® XP™ 32-bit/64bit operating system. Visit the NVIDIA website (www.nvidia.com) for the NVIDIA® SLI™ technology under Windows® Vista™
 - Visit the NVIDIA zone website (<http://www.nzone.com>) for the latest certified graphics card and supported 3D application list.
-

6.2 Dual graphics card setup

6.2.1 Installing SLI-ready graphics cards



Install only identical SLI-ready graphics cards that are NVIDIA®-certified. Different types of graphics cards will not work together properly.

To install the graphics cards:

1. Prepare two graphics cards. Each graphics card should have goldfingers for the SLI connector.



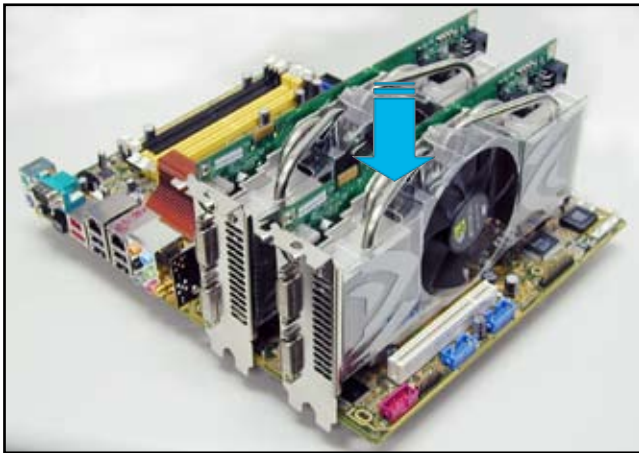
Goldfingers

2. Remove the metal bracket covers opposite the two PCI Express x16 slots.

3. Insert one graphics card into either the blue or black slot. Make sure that the card is properly seated on the slot.

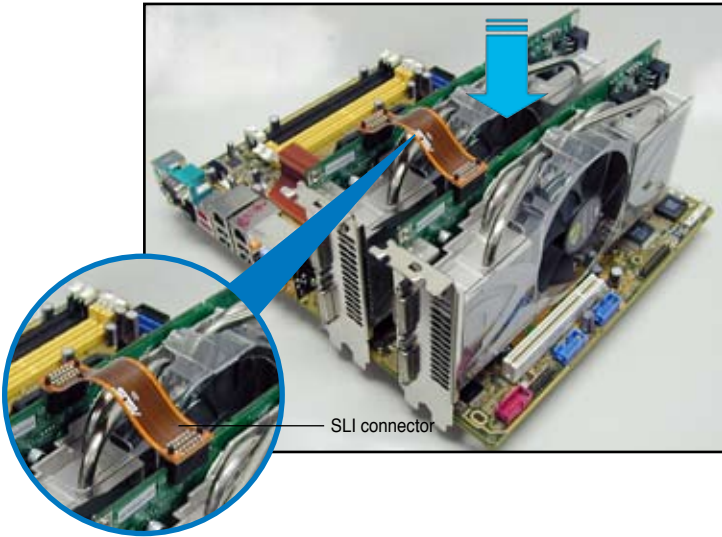


4. Insert the second graphics card into the other slot. Make sure that the card is properly seated on the slot.



If required, connect an auxiliary power source to the PCI Express graphics cards.

5. Align and insert the SLI connector to the goldfingers on each graphics card. Make sure that the connector is firmly in place.



6. When installing two VGA cards using a 20-pin ATX PSU with sufficient+12v capability, we recommend that you connect the auxillary power source from the power supply to the graphics card. Refer to the PSU documentation for dual VGA power requirements.
7. Connect a VGA cable or a DVI-I cable to the graphics card/s.



We recommend to install an additional chassis fan for better thermal environment.

6.2.2 Installing the device drivers

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



Make sure that your PCI Express graphics card driver supports the NVIDIA SLI technology. Download the latest driver from the NVIDIA website (www.nvidia.com).

6.2.3 Enabling the multi-GPU feature in Windows®

After installing your graphics cards and the device drivers, enable the Multi-Graphics Processing Unit (GPU) feature in the NVIDIA nView properties.

To enable the multi-GPU feature:

1. Click the NVIDIA Settings icon on your Windows taskbar.



NVIDIA Settings icon

2. From the pop-up menu, select nView Desktop Manager then click **nView Properties**.



3. From the nView Desktop Manager window, select the Desktop Management tab.
4. Click **Properties** to display the Display Properties dialog box.



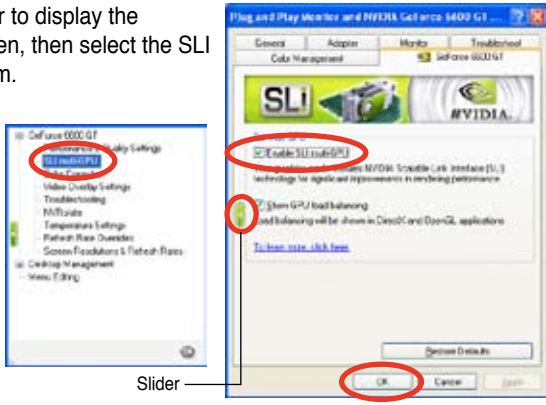
- From the Display Properties dialog box, select the Settings tab then click **Advanced**.



- Select the NVIDIA GeForce tab.



- Click the slider to display the following screen, then select the SLI multi-GPU item.



- Click the **Enable SLI multi-GPU** check box.
- Click **OK** when done.