

**M4N82  
Deluxe**



**Motherboard**

E4461

First Edition  
February 2009

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# Notices

## Federal Communications Commission Statement

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

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

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

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



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

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## Canadian Department of Communications Statement

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

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

# 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.



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

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

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# About this guide

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

## How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**  
This chapter describes the features of the motherboard and the new technology it supports.
- **Chapter 2: Hardware information**  
This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.
- **Chapter 3: BIOS setup**  
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.
- **Chapter 4: Software support**  
This chapter describes the contents of the support DVD that comes with the motherboard package and the software.
- **Chapter 5: NVIDIA® SLI™ support**  
This chapter describes the NVIDIA® SLI™ feature and shows the graphics card installation procedures.

## 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

<b>Bold text</b>	Indicates a menu or an item to select.
<i>Italics</i>	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> + <Del>

## M4N82 Deluxe specifications summary

<b>CPU</b>	Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+/AM2) Compatible with Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 (AM3 CPU) Supports 45nm CPU AMD® Cool 'n' Quiet™ Technology
<b>Chipset</b>	NVIDIA® nForce® 980a SLI™ with NVIDIA ESA (Enthusiast System Architecture) support
<b>System bus</b>	Up to 5200 MT/s; HyperTransport™ 3.0 interface for AM3 / AM2+ CPU 2000 / 1600 MT/s for AM2 CPU
<b>Memory</b>	4 x DIMM, max. 16 GB, DDR2 1066* / 800 / 667 MHz, ECC / non-ECC, un-buffered memory Dual-channel memory architecture * Due to AMD® CPU limitation, DDR2 1066 MHz is supported by AM2+ / AM3 CPU for one DIMM per channel only. Refer to www.asus.com for the memory QVL (Qualified Vendors Lists). ** Due to OS limitation, when installing total memory of 4 GB capacity or more, Windows® 32-bit operation system may only recognize less than 3 GB. Hence, a total installed memory of less than 3 GB is recommended. *** Refer to www.asus.com or the user manual for the Memory QVL (Qualified Vendors Lists)
<b>Multi-GPU support</b>	Supports NVIDIA® 3-Way SLI™ <b>Technology</b> (Dual x16 or Triple x8)
<b>VGA</b>	Integrated NVIDIA® GeForce® 8 series GPU Hybrid SLI™ support (for Windows Vista only)
<b>Expansion slots</b>	3 x PCIe 2.0 x16 slots (Dual x16 or Triple x8) 1 X PCIe x1 slot 2 x PCI 2.2 slots
<b>Storage</b>	<b>NVIDIA® chipset</b> - 1 x Ultra DMA 133 / 100 - 5 x SATA 3Gb/s ports (Legacy IDE operation is only supported on ports 1-4) - NVIDIA® MediaShield™ RAID supports RAID 0, 1, 0+1, 5, and JBOD - 1 x eSATA 3.0 Gb/s port (SATA On-the-Go)
<b>LAN</b>	NVIDIA Gigabit MAC Realtek® 8211CL Gigabit PHY featuring AI NET 2
<b>Audio</b>	Realtek® ALC1200 8-channel High Definition Audio CODEC - Supports Jack-Detection, Multi-Streaming, and Front Panel Jack-Retasking - Coaxial / Optical S/PDIF Out ports at back I/O - ASUS Noise Filtering
<b>IEEE 1394</b>	VIA® VT6315N controller supports 2 x IEEE 1394a ports (one at midboard; one at back panel)

(continued on the next page)

# M4N82 Deluxe specifications summary

<b>USB</b>	12 x USB 2.0 ports (6 ports at midboard; 6 ports at back panel)
<b>ASUS unique features</b>	<p><b>ASUS Power Solutions:</b></p> <ul style="list-style-type: none"> <li>- 8+1 Phase Power Design</li> <li>- ASUS Anti-Surge Protection</li> </ul> <p><b>ASUS Green Design:</b></p> <ul style="list-style-type: none"> <li>- ASUS EPU (for AM2+ / AM3 CPU only)</li> <li>- ASUS AI Nap</li> </ul> <p><b>ASUS Express Gate</b></p> <p><b>ASUS Quiet Thermal Solutions:</b></p> <ul style="list-style-type: none"> <li>- ASUS Fanless Design: Heat-pipe solution</li> <li>- ASUS Optional Fan for Water-cooling or Passive-Cooling only</li> <li>- ASUS Q-Fan 2</li> </ul> <p><b>ASUS EZ DIY</b></p> <ul style="list-style-type: none"> <li>- ASUS Q-Connector</li> <li>- ASUS O.C. Profile</li> <li>- ASUS CrashFree BIOS 3</li> <li>- ASUS EZ Flash 2</li> </ul>
<b>Special features</b>	<p>100% All High-quality conductive polymer capacitors! (5000hrs VRM, over 57 years operation lifespan at 65°C)</p> <p>ASUS MyLogo 2™</p>
<b>ASUS exclusive overclocking features</b>	<p><b>Intelligent overclocking tools:</b></p> <ul style="list-style-type: none"> <li>- AI Overclocking (intelligent CPU frequency tuner)</li> <li>- ASUS TurboV</li> <li>- ASUS Turbo Key</li> </ul> <p><b>Precision Tweaker 2:</b></p> <ul style="list-style-type: none"> <li>- vCore: Adjustable CPU voltage at 0.0125V increment</li> <li>- vHT Bus: 16-step Chipset voltage control</li> <li>- vDIMM: 35-step DRAM voltage control</li> <li>- vChipset: 16-step Chipset voltage control</li> </ul> <p><b>SFS (Stepless Frequency Selection):</b></p> <ul style="list-style-type: none"> <li>- FSB tuning from 200MHz up to 600MHz at 1MHz increment</li> <li>- Memory tuning from 533MHz up to 1066MHz</li> <li>- PCIe frequency tuning from 100MHz to 200MHz at 1MHz increment</li> </ul> <p><b>Overclocking protection:</b></p> <ul style="list-style-type: none"> <li>- ASUS C.P.R. (CPU Parameter Recall)</li> </ul>
<b>Back panel I/O ports</b>	<p>1 x PS/2 keyboard port (purple)</p> <p>1 x PS/2 mouse port (green)</p> <p>1 x S/PDIF Out port (Coaxial + Optical)</p> <p>1 x External SATA port</p> <p>1 x IEEE 1394a port</p> <p>1 x LAN (RJ-45) port</p> <p>6 x USB 2.0/1.1 ports</p> <p>8-channel Audio I/O ports</p>

*(continued on the next page)*



# M4N82 Deluxe specifications summary

Internal I/O connectors	3 x USB connectors support additional 6 USB ports 1 x IDE connector 1 x COM connector 5 x SATA connectors 1 x CPU Fan connector 2 x Chassis Fan connectors 1 x Power Fan connector 1 x IEEE1394a connector Front panel audio connector 1 x S/PDIF Out header CD audio in 24-pin ATX Power connector System Panel (Q-Connector) 8-pin ATX 12V Power connector
BIOS features	8 Mb Flash ROM, AMI BIOS, PnP, DMI 2.0, WfM 2.0, SM BIOS 2.5, ACPI 2.0a
Manageability	WOL by PME, WOR by PME, WOR by Ring, PXE
Support DVD contents	Drivers Express Gate ASUS PC Probe II ASUS Update ASUS AI Suite Anti-virus software (OEM version)
Form factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.4 cm)

\*Specifications are subject to change without notice.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# Chapter 1

## 1.1 Welcome!

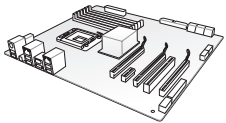
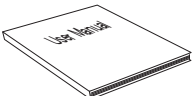

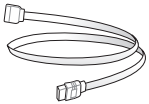

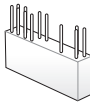
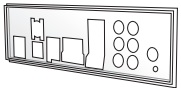
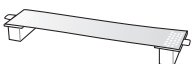
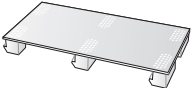
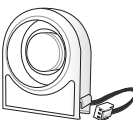
Thank you for buying an ASUS® M4N82 Deluxe motherboard!

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

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

## 1.2 Package contents

Check your motherboard package for the following items.

		
ASUS M4N82 Deluxe motherboard	User guide	Support DVD
		
Serial ATA cables	1 x Ultra DMA 133/100/66 cable	1 x ASUS 2-in-1 Q-Connector kit (USB and System panel)
		
1 x IO shield	1 x SLI bridge	1 x 3-Way SLI card
		
1 x ASUS optional fan for water-cooling or passive-cooling only		



- If any of the above items is damaged or missing, contact your retailer.
- The floppy disk drive cable is purchased separately.
- The illustrated items above are for reference only. Actual product specifications may vary with different models.

## 1.3 Special features

### 1.3.1 Product highlights

#### **AMD® Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+/AM2)**

This motherboard supports AMD® Socket AM2+ multi-core processors. It features dual-channel DDR2 1066 memory support, data transfer rate up to 5200MT/s via HyperTransport™ 3.0 based system bus, and AMD® Cool 'n' Quiet™ Technology.

#### **AMD® Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 (AM3 CPU)**

This motherboard supports AMD® AM3 multi-core processors with unique L3 cache and delivers better overclocking capabilities with less power consumption. It features dual-channel DDR2 1066 memory support and accelerates data transfer rate up to 5200MT/s via HyperTransport™ 3.0 based system bus. This motherboard also supports AMD® CPUs in the new 45nm manufacturing process.

#### **NVIDIA® nForce® 980a SLI™ chipset**

NVIDIA® nForce® 980a SLI™ media and communication processors (MCPs) power the most feature-rich, high performance motherboards for AMD AM3 CPUs.

#### **NVIDIA® Hybrid SLI™**

Hybrid SLI™ technology is a unique hybrid multi-GPU technology built upon NVIDIA. Hybrid SLI™ turbo-charges performance of NVIDIA discrete graphics cards when combined with this series motherboard GPUs.



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Hybrid SLI™ is independent on selected GeForce® GPUs. Refer to [www.nvidia.com/hybridSLI](http://www.nvidia.com/hybridSLI) for more information.

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#### **Dual channel DDR2 1066 support**

This motherboard supports DDR2 1066, which provides faster data transfer rate and more bandwidth to increase memory data transfer rate and computing efficiency. This enhances system performance in 3D graphics and other memory demanding applications.



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Due to AM2+ / AM3 CPU limitation, only one DDR2 1066 is supported per channel. When four DDR2 1066 DIMMs are installed, all DIMMs run at 800MHz frequency by default for system stability.

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### 1.3.2 ASUS unique features

#### ASUS Power Solutions

ASUS power solutions intelligently and automatically provide balanced computing power and energy consumption.

##### 8+1 Phase Power Design

To fully unleash the next-generation AM3 CPU's potential, the ASUS M4 Series motherboards have adopted a brand new 8-phase VRM power design. It delivers high power efficiency and supreme overclocking ability. Furthermore, high quality power components can effectively lower system temperature to ensure longer component lifespan. This series also features an extra 1 phase power dedicated to integrated memory/HT controller.

##### ASUS Anti-Surge Protection

This special design prevents expensive devices and the motherboard from damage caused by power surges from switching power supply (PSU).

#### ASUS Green Design

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS) to safeguard consumers' health while minimizing the impact of the environment.

##### ASUS EPU

The ASUS EPU (Energy Processing Unit) provides total system power management by detecting current PC loadings and intelligently moderating power usage for critical PC components in real-time—helping save power and money!




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ASUS EPU is supported by AM2+/AM3 CPU only.

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##### AI Nap

With AI Nap, the system can continue running at minimum power and noise when you are temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key.

#### Express Gate

Express Gate is an ASUS exclusive OS that provides you with quick access to the Internet and key applications before entering the Windows® OS.

#### ASUS Quiet Thermal Solutions

ASUS Quiet Thermal solutions make the system more stable and enhance the overclocking capability.

## Fanless Design–Heat-pipe

The Heat Pipe design effectively directs the heat generated by the chipsets to the heatsink near the back IO ports, where it can be carried away by existing airflow from CPU fan or bundled optional fan. The purpose of the innovative heat pipe design on this motherboard is that the groundbreaking fanless design does not have lifetime problems as a chipset fan does. Furthermore, it provides options for users to install side-flow fan or passive cooler. The Heat Pipe design is the most reliable fanless thermal solution to date.



---

DO NOT uninstall the heat-pipe by yourself. Doing so may bend the tubing and affect the heat dissipation performance.

---

## Q-Fan 2

ASUS Q-Fan 2 technology intelligently adjusts both CPU fan and chassis fan speeds according to system loading to ensure quiet, cool and efficient operation.

## ASUS EZ DIY

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

### ASUS Q-Connector

ASUS Q-Connector allows you to easily connect or disconnect the chassis front panel cables to the motherboard. This unique module eliminates the trouble of connecting the system panel cables one at a time and avoiding wrong cable connections.

### 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.

### ASUS EZ Flash 2

ASUS 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.

### 1.3.3 ASUS intelligent performance and overclocking features

#### **TurboV**

Feel the adrenaline rush of real-time OC—now a reality with the ASUS TurboV. This easy OC tool allows you to overclock without exiting or rebooting the OS; and its user-friendly interface makes overclock with just a few clicks away. Moreover, the ASUS OC profiles in TurboV provides the best O.C. settings in different scenarios.

#### **Turbo Key**

ASUS Turbo Key allows the user to turn the PC power button into a physical overclocking button. After the easy setup, Turbo Key can boost performances without interrupting ongoing work or games—with just one touch!

#### **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.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



# Chapter 2

## 2.1 Before you proceed

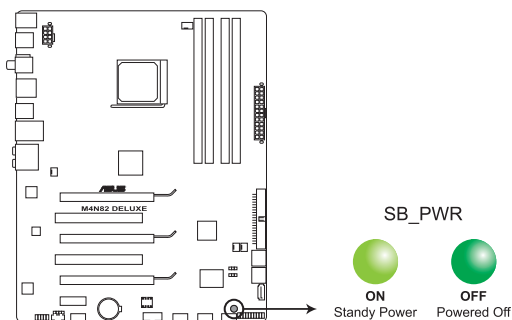
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, 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, or components.

### Onboard LED

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



**M4N82 DELUXE Onboard LED**

# Chapter 2

# Chapter 2



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

## 2.2.2 Layout contents

Connectors/Jumpers/Slots		Page
1.	ATX power connectors (24-pin EATXPWR, 4-pin EATX12V)	2-34
2.	AM2/AM2+ CPU socket	2-5
3.	CPU, chassis, and power fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1–2, 3-pin PWR_FAN)	2-33
4.	DDR2 DIMM slots	2-10
5.	Clear RTC RAM (3-pin CLRTC)	2-22
6.	IDE connector (40-1 pin PRI_IDE)	2-29
7.	Serial ATA connectors (7-pin SATA1–5)	2-30
8.	CPU overvoltage setting (3-pin OV_CPU)	2-23
9.	Standby Power LED	2-1
10.	System panel connector (20-8 pin PANEL)	2-36
11.	USB connectors (10-1 pin USB78, USB910, USB1112)	2-31
12.	Serial port connector (10-1 pin COM1)	2-32
13.	IEEE 1394a port connector (10-1 pin IE1394_2)	2-32
14.	Digital audio connector (4-1 pin SPDIF_OUT)	2-28
15.	Optical drive audio connector (4-pin CD)	2-28
16.	Front panel audio connector (10-1 pin AAFP)	2-35

## 2.2.3 Placement direction

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

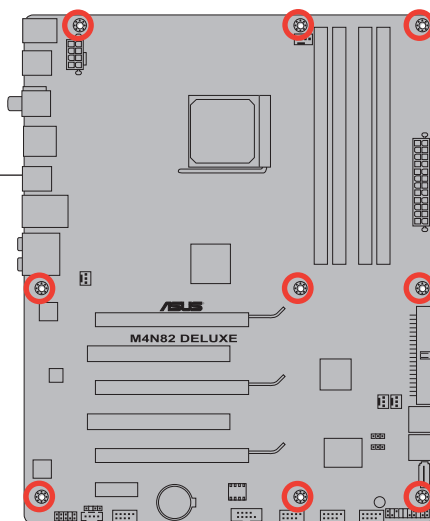
## 2.2.4 Screw holes

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



DO NOT overtighten the screws! Doing so can damage the motherboard.

Place this side towards  
the rear of the chassis



## 2.3 Central Processing Unit (CPU)

The motherboard comes with an AM2+/AM2 socket designed for Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+/AM2). It is also compatible with AMD® Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 (AM3 CPU).

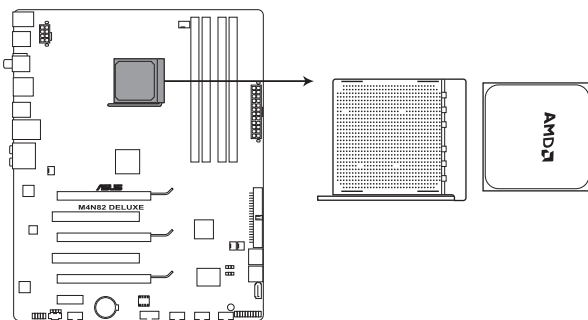


The CPU socket is not compatible with AMD® Opteron™ processors. Do not install an Opteron™ processor on this motherboard.

### 2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

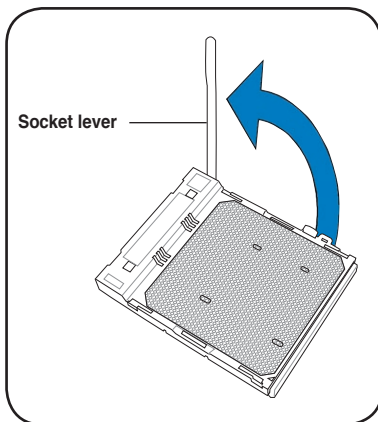


**M4N82 DELUXE CPU socket AM2**

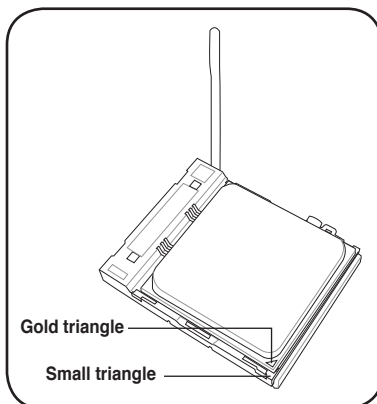
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90° angle.



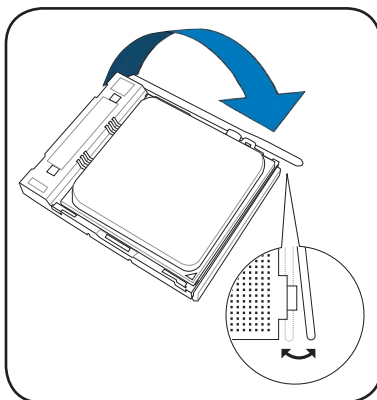
Ensure that the socket lever is lifted up to a 90° angle; otherwise, the CPU will not fit in completely.



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. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



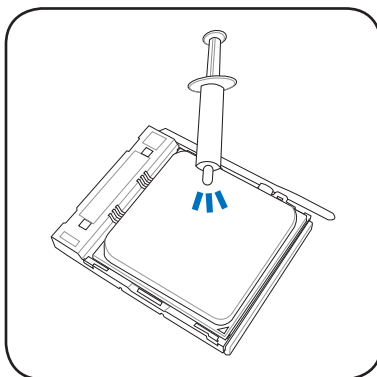
Some heatsinks come with pre-applied thermal paste. If so, skip this step.



The Thermal Interface Material is toxic and inedible. If it gets into your eyes or touches your skin, wash it off immediately, and seek professional medical help.



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



### 2.3.2 Installing the CPU heatsink and fan

The AMD® AM3/AM2+/AM2 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



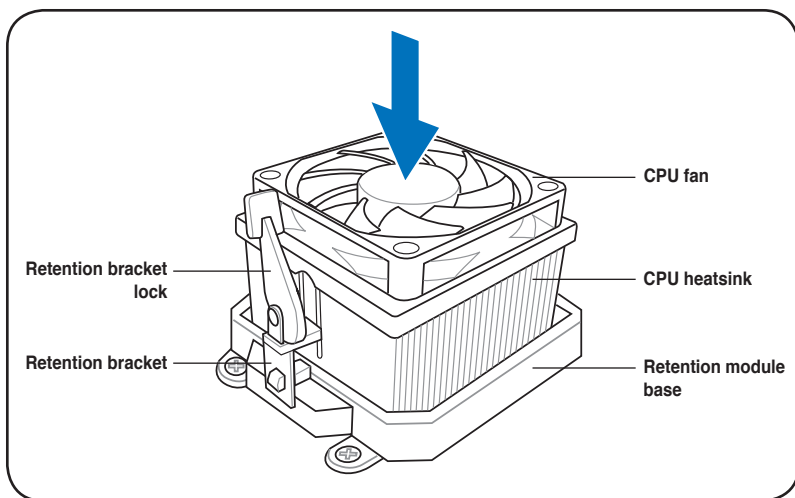
Ensure that you use only AMD-certified heatsink and fan assembly.

To install the CPU heatsink and fan:

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

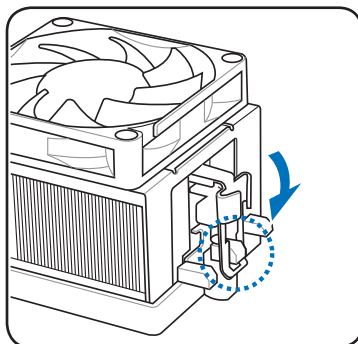


- The retention module base is already installed on the motherboard upon purchase.
- You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
- If you purchased a separate CPU heatsink and fan assembly, ensure that a Thermal Interface Material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

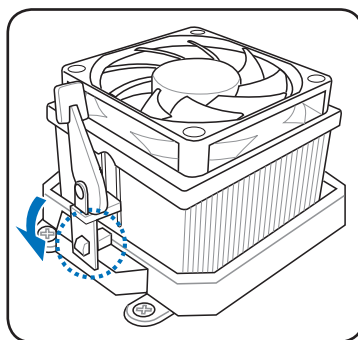
2. Attach one end of the retention bracket to the retention module base.



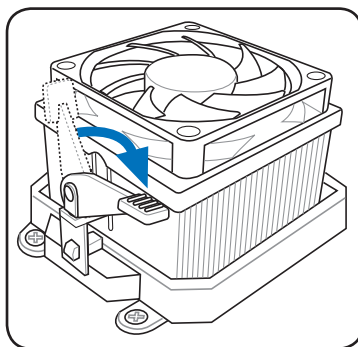
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.



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

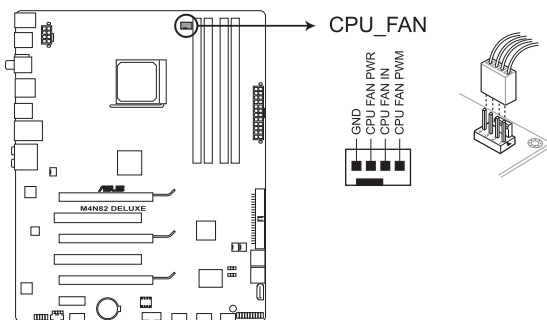


4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.





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



**M4N82 DELUXE CPU fan connector**



- 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.

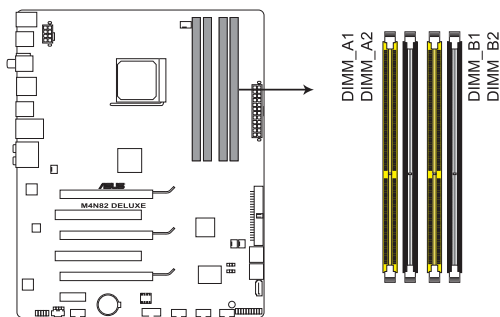
## 2.4 System memory

### 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:



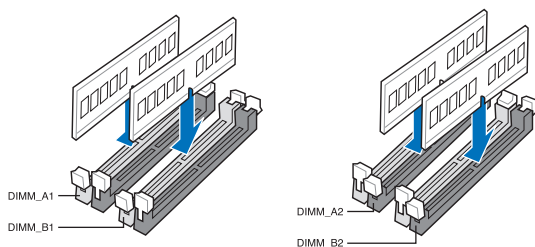
**M4N82 DELUXE 240-pin DDR2 DIMM sockets**

### Recommended memory configurations

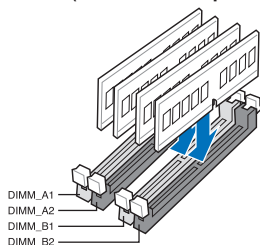
#### One DIMM:

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

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



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



## 2.4.2 Memory configurations

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



- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Due to CPU limitation, DDR2 1066 MHz is supported by AM3/AM2+ CPU for one DIMM per channel only. For system stability, when four DIMMs are installed, all DIMMs run at DDR2 800 MHz as the default setting.
- We recommend that you install the memory modules from the yellow slots for better overclocking capability.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS.
  - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard.
- This motherboard does not support DIMMs made up of 256 megabit (Mb) chips or less.



- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, see section **3.6 Advanced menu** for manual memory frequency adjustment.
- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

## M4N82 Deluxe Motherboard Qualified Vendors Lists (QVL) DDR2-1066 MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	Socket support		
								A*	B*	C*
Apacer	BoxP/N:CH.02GAF.C0KK2 (78.A0G9S.9KF)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
Apacer	BoxP/N:CH.04GAF.F0KK2 (78.AAGAL.9KF)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
CORSAIR	BoxP/N:TWIN2X4096-8500C5DF (CM2X2048-8500C5D)(EPP)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1	*	*	*
Crucial	BL12864AA106A.8F5E(EPP)	1GB	SS	N/A	Heat-Sink Package	5-5-5-15	2.0	*	*	*
Crucial	BL12864AA106S.16FD5(EPP)	1GB	DS	N/A	Heat-Sink Package	5		*	*	*
G.SKILL	F2-8500CL5S-1GBPK	1GB	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	*
G.SKILL	F2-8500CL5D-2GBPK	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	*
G.SKILL	F2-8500CL5D-4GBPK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	*
GEIL	GB22GB8500C5DC	2GB (Kit of 2)	SS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	*	*	*
GEIL	GE22GB1066C5DC	2GB (Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	*	*	*
GEIL	GE24GB1066C5QC	4GB (Kit of 4)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	*	*	*
GEIL	GB24GB8500C5DC	4GB (Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	*	*	*
GEIL	GE24GB1066C5DC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	*	*	*
GEIL	GX24GB8500C5UDC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	*	*	*
GEIL	GB24GB8500C5QC	4GB (Kit of 4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	*	*	*
Hynix	HYMP564U64FP8-G7	512MB	SS	HYNIX	HY5PS12821FFP-G7	7		*	*	*
Hynix	HYMP 512U64FP8-G7	1GB	DS	HYNIX	HY5PS12821FFP-G7	7-7-7-12		*	*	*
KINGMAX	KLEC28F-A8KI5-EGAS	512MB	SS	KINGMAX	KK48FE1BF-HJK-18E			*	*	*
KINGMAX	KLED48F-A8KI5-EPA	1GB	DS	KINGMAX	KK48FE1BF-HJK-18A			*	*	*
KINGMAX	KLEE88F-B8KB5	2GB	DS	KINGMAX	KKB8FFBFX-CFP-18A			*	*	*
KINGSTON	KHX8500D2/ 512	512MB	SS		Heat-Sink Package			*	*	*
KINGSTON	KHX8500D2K2/1G	1GB (Kit of 2)	SS	N/A	Heat-Sink Package		2.2	*	*	*
KINGSTON	KHX8500D2/1G	1GB	DS	N/A	Heat-Sink Package		2.2	*	*	*
KINGSTON	KHX8500D2K2/2G	2GB (Kit of 2)	DS	N/A	Heat-Sink Package		2.2	*	*	*
KINGSTON	KHX8500D2K2/2GN(EPP)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package		2.2	*	*	*
MICRON	MT8HTF12864AY-1GAE1	1GB	SS	MICRON	D9JKH	7		*	*	*
MICRON	MT16HTF25664AY-1GAE1	2GB	DS	MICRON	D9JKH	7		*	*	*
OCZ	OCZ2N10662GK(EPP)	2GB (Kit of 2)	DS		Heat-Sink Package			*	*	*
OCZ	OCZ2N1066SR2GK(EPP)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5	2.10	*	*	*
OCZ	OCZ2RPR10664GK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5	2.2	*	*	*
SAMSUNG	M378T2953GZ3-CF8	1GB	DS	SAMSUNG	K4T51083QG	7		*	*	*
Transcend	TX1066QLU-2GK	2GB (Kit of 2)	SS	ELPIDA	Heat-Sink Package	5		*	*	*
Transcend	TX1066QLU-4GK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5		*	*	*
Aeneon	BoxP/N:AXT760UD00-19D-K-2G (AXT760UD00-19D)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5		*	*	*
Aeneon	AXT860UD20-19E	2GB	DS	N/A	Heat-Sink Package	6		*	*	*
BUFFALO	FSX1066D2C-1G	1GB	DS	N/A	Heat-Sink Package	5-5-5-15 (800-5-5-5-15)		*	*	*
BUFFALO	FSX1066D2C-K4G	2GB	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
Elixir	M2Y1G64TU8HC4B-BD	1GB	DS	Elixir	N2TU 51280CE-BD	6		*	*	*
Kingbox	N/A	1GB	DS	MICRON	7YDI2		1.8	*	*	*
Mushkin	996535	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-4-12		*	*	*
Mushkin	996612	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1	*	*	*
Mushkin	996619	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	*	*	*
Team	BoxP/N:TXDD2048M1066HC5DC (TXDD1024M1066HC5-D)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.3	*	*	*
Team	BoxP/N:TXDD2048M1066HC5DC-D (TXDD1024M1066HC5-D)	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.3	*	*	*
Team	BoxP/N:TXDD4096M1066HC5DC-D (TXDD2048M1066HC5-D)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.3	*	*	*

M4N82 Deluxe Motherboard Qualified Vendors Lists (QVL)  
DDR2-800 MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	Socket support		
								A*	B*	C*
A-DATA	M2OAD6H3J4171Q1E52	2GB	DS	A-DATA	AD20908A8A-25EG			*	*	*
Apacer	78.91G9I.9K5	512MB	SS	APACER	AM4B5708JQJ58E	5		*	*	*
Apacer	78.01GA0.9K5	1GB	SS	APACER	AM4B5808CQJ58E	5		*	*	*
Apacer	78.A1GA0.9K4	2GB	DS	APACER	AM4B5808CQJ58E	5		*	*	*
CORSAIR	CM2X1024-6400C4	1GB	DS	N/A	Heat-Sink Package	4	1.9	*	*	*
CORSAIR	Box P/N: TWIN2X4096-6400C4DHX (CM2X2048-6400C4DHX)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.10	*	*	*
CORSAIR	Box P/N: TWIN2X4096-6400C5 (CM2X2048-6400C5)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	*	*	*
CORSAIR	Box P/N: TWIN2X4096-6400C5DHX (CM2X2048-6400C5DHX)	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	*	*	*
Crucial	BL12864AA804.16FD3	1GB	DS	N/A	Heat-Sink Package	4	2.2	*	*	*
Crucial	BL12864AA804.16FD	1GB	DS	N/A	Heat-Sink Package	4	2.2	*	*	*
Crucial	BL12864AL804.16FD3	1GB	DS	N/A	Heat-Sink Package	4	2.2	*	*	*
ELPIDA	EBE10EE8ABFA-8E-E	1GB	SS	ELPIDA	E1108AB-8E-E(ECC)	5	1.7-1.9	*	*	*
G.SKILL	F2-6400CL5D-1GBNQ	1GB (Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	1.8-2.0	*	*	*
G.SKILL	F2-6400CL4D-2GBPK	1GB	DS		Heat-Sink Package	4		*	*	*
G.SKILL	F2-6400CL5D-2GBNQ	1GB	DS		Heat-Sink Package	5		*	*	*
G.SKILL	F2-6400PHU2-2GBNR	1GB	DS		Heat-Sink Package	5		*	*	*
G.SKILL	F2-6400CL4D-4GBPK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	4	2.0-2.1	*	*	*
G.SKILL	F2-6400CL5D-4GBPQ	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5	1.8-1.9	*	*	*
G.SKILL	F2-6400CL6D-4GBMQ	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	6	1.8-1.9	*	*	*
G.SKILL	F2-6400CL6D-8GBMQ	8GB (Kit of 2)	DS	N/A	Heat-Sink Package	6-6-6-18	1.8	*	*	*
GEIL	GB22GB6400C4DC	2GB (Kit of 2)	DS	GEIL	GL2L64M088BA30EB	4-4-4-12	2.0	*	*	*
GEIL	GB22GB6400C5DC	2GB (Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5-5-5-15	1.8	*	*	*
GEIL	GE22GB800C4DC	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	*	*	*
GEIL	GE22GB800C5DC	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
GEIL	GX22GB6400DC	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
GEIL	GX22GB6400UDC	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.1	*	*	*
GEIL	GX22GB6400C4USC	2GB	DS	N/A	Heat-Sink Package			*	*	*
GEIL	GX22GB6400LX	2GB	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
GEIL	GB24GB6400C4DC	4GB (Kit of 2)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	*	*	*
GEIL	GB24GB6400C5DC	4GB (Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	*	*	*
GEIL	GB24GB6400C5QC	4GB (Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5-5-5-15	1.8	*	*	*
GEIL	GE24GB800C4DC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	*	*	*
GEIL	GE24GB800C5DC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
GEIL	GX24GB6400DC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
GEIL	GB24GB6400C4QC	4GB (Kit of 4)	DS	GEIL	GL2L64M088BA30EB	4-4-4-12	2.0	*	*	*
GEIL	GE24GB800C4QC	4GB (Kit of 4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	*	*	*
GEIL	GE24GB800C5QC	4GB (Kit of 4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
GEIL	GB28GB6400C4QC	8GB (Kit of 4)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	*	*	*
GEIL	GB28GB6400C5QC	8GB (Kit of 4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	*	*	*
GEIL	GE28GB800C4QC	8GB (Kit of 4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	*	*	*
GEIL	GE28GB800C5QC	8GB (Kit of 4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
Hynix	HYMP564U64CP8-S5	512MB	SS	HYNIX	HY5PS12821CFP-S5	5	1.8	*	*	*
Hynix	HYMP112U64CP8-S6	1GB	SS	HYNIX	HY5PS1G831CFP-S6	6		*	*	*
Hynix	HYMP 512U64CP8-S5	1GB	DS		HY5PS12821CFP-S5	5		*	*	*
KINGMAX	KLDC28F-A8KI5	512MB	SS	KINGMAX	KK48FIEBF-HJK-25A			*	*	*
KINGMAX	KLDD48F-ABKI5	1GB	DS	KINGMAX	KK48FIEBF-HJK-25A			*	*	*
KINGMAX	KLDE88F-B8KB5	2GB	DS	KINGMAX	KK88FBXF-CFA-25A			*	*	*
KINGSTON	KVR800D2N5/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	*	*	*
KINGSTON	KVR800D2N6/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	*	*	*
KINGSTON	KVR800D2N5/1G	1GB	SS	KINGSTON	D1288TPFCGL25U	800 5-5-5-15	1.8	*	*	*
KINGSTON	KHX6400D2LL/1G	1GB	DS	N/A	Heat-Sink Package	4	2.0	*	*	*
KINGSTON	KVR800D2N5/1G	1GB	DS		V59C1 512804QBF25		1.8	*	*	*
KINGSTON	KVR800D2N6/1G	1GB	DS	ELPIDA	E5108AJBG-8E-E		1.8	*	*	*
KINGSTON	KHX6400D2ULK2/2G	2GB (Kit of 2)	DS	N/A	Heat-Sink Package		2.3-2.35	*	*	*
KINGSTON	KHX6400D2/2G	2GB	DS	N/A	Heat-Sink Package		2.0	*	*	*

## M4N82 Deluxe Motherboard Qualified Vendors Lists (QVL) DDR2-800 MHz capability (continued)

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	Socket support		
								A*	B*	C*
KINGSTON	KVR800D2N5/2G	2GB	DS	ELPIDA	E1108ACBG-8E-E		1.8	*	*	*
KINGSTON	KVR800D2N6/4G	4GB	DS	ELPIDA	E2108ABSE-8G-E			*	*	*
NANYA	NT 512T64U8B0BY-25C	512MB	SS		NT5TU64M8BE-25C	5		*	*	*
NANYA	NT1GT64U8HB0BY-25C	1GB	DS		NT5TU64M8BE-25C	5		*	*	*
NANYA	NT1GT64U8HCOBY-25D	1GB	DS	NANYA	NT5TU64M8CE-25D			*	*	*
NANYA	NT2GT64U8HCOBY-AC	2GB	DS	NANYA	NT5TU128M8CE-AC	5		*	*	*
OCZ	OCZ2FX800C32GK	1GB	DS	N/A	Heat-Sink Package			*		
OCZ	OCZ2G8001G	1GB	DS	N/A	Heat-Sink Package	5	1.8	*	*	*
OCZ	OCZ2P800R22GK	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	4	1.8	*	*	*
OCZ	OCZ2PX800C32GK	2GB (Kit of 2)	DS	N/A	Heat-Sink Package	3-4-4 (800-5-5-5-15)	2.35	*		
OCZ	OCZ2P8004GK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-4-4	1.8	*	*	*
OCZ	OCZ2G8008GK	8GB (Kit of 2)	DS	N/A	Heat-Sink Package	5	1.80	*	*	*
OCZ	OCZ2VU80016GQ	8GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-6-6 (800-5-5-5-15)	1.8	*	*	*
PSC	AL8E8F73C-8E1	2GB	DS	PSC	A3R1GE3CFF734MAA0E	5		*	*	*
Qimonda	HY864T256020EU-2.5-C2	2GB	DS	Qimonda	HYB18T1G800C2F-2.5	6		*	*	*
Qimonda	HY864T256020EU-25F-C2	2GB	DS	Qimonda	HYB18T1G800C2F-25F	5		*	*	*
Qimonda	HY864T 512020EU-2.5-A	4GB	DS	Qimonda	HYB18T2G800AF-2.5	6		*	*	*
Qimonda	HY864T 512020EU-25F-A	4GB	DS	Qimonda	HYB18T2G800AF-25F	5		*	*	*
SAMSUNG	M378T6553GZS-CF7	512MB	SS	SAMSUNG	K4T51083QG	6		*	*	*
SAMSUNG	M378T2863QZS-CF7	1GB	SS	SAMSUNG	K4T1G084QQ	6		*	*	*
SAMSUNG	M391T2863QZ3-CF7	1GB	SS	SAMSUNG	K4T1G084QQ(ECC)	6		*	*	*
SAMSUNG	M378T2953GZ3-CF7	1GB	DS	SAMSUNG	K4T51083QG	6		*	*	*
SAMSUNG	M378T5663QZ3-CF7	2GB	DS	SAMSUNG	K4T1G084QQ(ECC)	6		*	*	*
SAMSUNG	M391T5663QZ3-CF7	2GB	DS	SAMSUNG	K4T1G084QQ	6		*	*	*
SAMSUNG	M378T5263AZ3-CF7	4GB	DS	SAMSUNG	K4T2G084QA-HCF7	6		*	*	*
Super Talent	T800UA12C4	512MB	SS		Heat-Sink Package			*	*	*
Super Talent	T800UB1GC4	1GB	DS		Heat-Sink Package			*	*	
Transcend	JM800QLU-1G	1GB	SS	Transcend	TQ243ECF8	5		*	*	*
Transcend	TS128MLQ64V8U	1GB	SS	ELPIDA	E1108ACBG-8E-E	5		*	*	*
Transcend	JM800QLU-2G	2GB	DS	Transcend	TQ243PCF8	5		*	*	*
Transcend	TS256MLQ64V8P	2GB	DS	ELPIDA	E1108ACBG-8E-E	6-6-6- (800-5-5-5-15)		*	*	*
Transcend	TS256MLQ64V8U	2GB	DS	ELPIDA	E1108ACBG-8E-E	5		*	*	*
Transcend	TS256MLQ72V8U	2GB	DS	ELPIDA	E1108ACBG-8E-E(ECC)	5		*		
Aeneon	AET760UD00-25DC08X	1GB	SS	AENEON	AET03R25DC	5		*	*	*
Aeneon	AET760UD00-25DB97X	1GB	DS	AENEON	AET93R25DB	5	1.8	*	*	*
Aeneon	AET860UD00-25DC08X	2GB	DS	AENEON	AET03R25DC	5		*	*	*
Asint	SLY2128M8-JGE	1GB	SS	Asint	DDR11208-GE			*	*	*
Asint	SLZ2128M8-JGE	2GB	DS	Asint	DDR11208-GE			*	*	*
CENTURY	28V2H8	512MB	SS	HYNIX	HY5PS12821BFP-S5			*	*	*
CENTURY	28VOH8	1GB	DS	HYNIX	HY5PS12821BFP-S5			*		
Elixir	M2Y1G64TU8BD4B-AC	1GB	SS	Elixir	N2TU1G80DE-AC	5		*	*	*
Elixir	M2Y1G64TU8HB0B-25C	1GB	DS	Elixir	N2TU 51280B-25C	5	1.8	*	*	*
Elixir	M2Y2G64TU8HD4B-AC	2GB	DS	Elixir	N2TU1G80DE-AC	5		*	*	*
Kingbox	N/A	2GB	DS	MICRON	D9HNL			*	*	*
Kingbox	N/A	2GB	DS	KINGBOX	EPD2128082200E-3			*	*	*
Mushkin	XP2-6400	1GB	SS		Heat-Sink Package	4		*	*	*
Oci	04701G16CZ5D2A	1GB	DS	Jnfinity	64M8PC6400	5		*	*	*
Patriot	PSD2 51280081	512MB	SS	PATRIOT	PM64M8D2BU-25EC			*	*	*
Patriot	PSD21G8002	1GB	DS	PATRIOT	PM64M8D2BU-25PAC	5		*	*	*
Patriot	PSD22G8002	2GB	DS	PATRIOT	PM128M8D2BU-25KC	5		*	*	*
Patriot	PDC24G6400LLK	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.2	*	*	*
Silicon Power	SP001GBLRU800S02	1GB	SS	S-POWER	10YR9N3	5(5-5-5-15)		*	*	*
Silicon Power	SP002GBLRU800S02	2GB	DS	S-POWER	10YR9N3	5(5-5-5-15)		*	*	*
UMAX	D48002GP1-73BEB	2GB	DS	UMAX	U2S24D30TP-8E	800-5-5-5-15		*	*	*

# M4N82 Deluxe Motherboard Qualified Vendors Lists (QVL)

## DDR2-667 MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	Socket support		
								A*	B*	C*
Apacer	78.91G92.9K5	512MB	SS	APACER	AM4B5708JQS7E	5		*	*	*
Apacer	78.01G90.9K5	1GB	SS	APACER	AM4B5808CQJS7E	5		*	*	*
Apacer	78.A1G90.9K4	2GB	DS	APACER	AM4B5808CQJS7E	5		*	*	*
CORSAIR	VS 512MB667D2	512MB	SS	N/A	64M8CFEG	N/A	N/A	*	*	*
CORSAIR	VS1GB667D2	1GB	DS	N/A	64M8CFEG	N/A	N/A	*	*	*
Crucial	BL6464AA663.8FD	512MB	SS	N/A	Heat-Sink Package	3	2.2	*	*	*
Crucial	BL12864AA663.16FD2	1GB	DS	N/A	Heat-Sink Package	3	2.2	*	*	*
Crucial	BL12864AA663.16FD	1GB	DS	N/A	Heat-Sink Package	3	2.2	*	*	*
Crucial	BL12864AL664.16FD	1GB	DS	N/A	Heat-Sink Package	3	2.2	*	*	*
ELPIDA	EBE51UD8AEFA-6E-E	512MB	SS	ELPIDA	E5108AE-6E-E	5	1.7-1.9	*	*	*
G.SKILL	F2-5400PHU2-2GBNT	2GB (Kit of 2)	DS	G.Skill	D264M8GCF	5-5-5-15	1.8	*	*	*
G.SKILL	F2-5300CL5D-4GBMQ	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8-1.9	*	*	*
GEIL	GX21GB5300SX	1GB	DS	N/A	Heat-Sink Package			*	*	*
GEIL	GX22GB5300LX	2GB	DS	N/A	Heat-Sink Package	5-5-5-15		*	*	*
GEIL	GX24GB5000LDC	4GB (Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	*	*	*
Hynix	HYMP112U64CP8-Y5	1GB	SS	HYNIX	HY5PS1G831CFP-Y5	5		*	*	*
Hynix	HYMP1512U64CP8-Y5	1GB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.8	*	*	*
KINGSTON	KVR667D2N5/ 512	512MB	SS	KINGSTON	D6408TEBGL3U	5	1.7-1.9	*	*	*
KINGSTON	KVR667D2E5/1G	1GB	DS	ELPIDA	E5108AGBG-6E-E(ECC)		1.8	*	*	*
KINGSTON	KVR667D2N5/1G	1GB	DS	KINGSTON	E5108AGBG-6E-E		1.8	*	*	*
KINGSTON	KVR667D2N5/1G	1GB	DS	ELPIDA	E5108AJBG-8E-E		1.8	*	*	*
KINGSTON	KVR667D2N5/1G	1GB	DS	HYNIX	HY5PS12821CFP-Y5		1.8	*	*	*
KINGSTON	KVR667D2E5/2G	2GB	DS	MICRON	D9HNL(ECC)		1.8	*	*	*
KINGSTON	KVR667D2N5/2G	2GB	DS	HYNIX	HY5PS1G831CFP-Y5		1.8	*	*	*
NANYA	NT 512T64U88B0BY-3C	512MB	SS	NANYA	NT5TU64M8BE-3C	5	1.8	*	*	*
NANYA	NT2GT64U88B0JY-3C	2GB	DS		NT5TU128M8BJ-3C	5		*	*	*
OCZ	OCZ26671024V	1GB	SS	Ramos	RC1GT084CA0-53EC	5	1.8	*	*	*
Qimonda	HYS64T256020EU-3S-C2	2GB	DS	Qimonda	HYB18T1GB00C2F-3S	5		*	*	*
SAMSUNG	M378T6553EZ3-CE6	512MB	SS	SAMSUNG	K4T51083QE	5		*	*	*
SAMSUNG	M378T2953EZ3-CE6	1GB	DS	SAMSUNG	K4T51083QE	5		*	*	*
SAMSUNG	M378T5263AZ3-CE6	4GB	DS	SAMSUNG	K4T2G084QA-HCE6	5		*	*	*
Super Talent	T6UA 512C5	512MB	SS	N/A	Heat-Sink Package	5	1.8	*	*	*
Super Talent	T6UB1GC5	1GB	DS	N/A	Heat-Sink Package	5	1.8	*	*	*
TwinMOS	8D-23JK5M2ETP	512MB	SS	TwinMOS	TMM6208GBM30C	5	1.8	*	*	*
Aeneon	AET760UD00-30DB97X	1GB	DS	AENEON	AET93R30DB	5	1.8	*	*	*
Aeneon	AET860UD00-30D	2GB	DS	AENEON	AET02R30DC	5		*	*	*
Aeneon	AET860UD00-30DB08X	2GB	DS	AENEON	AET03F30DB	5		*	*	*
Asint	SLX264M8-J6E	512MB	SS	Asint	DDRII6408-6E			*	*	*
Asint	SLY2128M8-J6E	1GB	SS	Asint	DDRII1208-6E			*	*	*
CENTURY	26V2H8	512MB	SS	HYNIX	HY5PS12821CFP-Y5	5	1.85	*	*	*
CENTURY	26VOH8	1GB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.85	*	*	*
Dynet	DNHMSU 512C8FE-A6	512MB	SS	Dynet	DN5HS82CFE-A6			*	*	*
Kingbox	N/A	1GB	SS	KINGBOX	EPD2128082200E-4			*	*	*
Kingbox	N/A	1GB	DS	KINGBOX	EPD264082200E-4		1.8	*	*	*
Kingbox	N/A	1GB	DS	KINGBOX	EPD264082200N-4			*	*	*
MDT	M 512-667-8	512MB	SS	MDT	18D 51280D-30648	4	1.8	*	*	*
MDT	M924-667-16	1GB	DS		18D 51280D-30646E	4		*	*	*
MDT	M924-667-16A	1GB	DS	MDT	18D 51200D-30646	4	1.8	*	*	*
Patriot	PSD2 51266781	512MB	SS	PATRIOT	PM64M8D2BU-3KC			*	*	*
Patriot	PSD21G6672	1GB	DS	PATRIOT	PM64M8D2BU-3PAC	5		*	*	*



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

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



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

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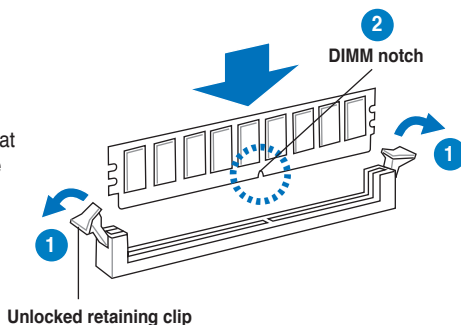
### 2.4.3 Installing a DIMM



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

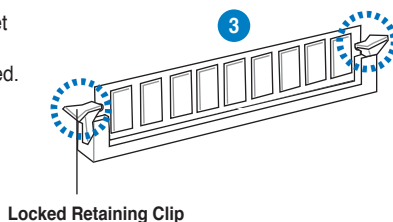
To install a DIMM:

1. Press the retaining clips outward to unlock a DIMM socket.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

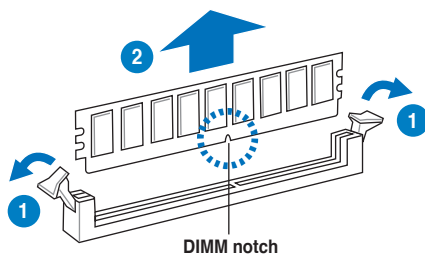
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



### 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.

## 2.5 Expansion slots

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



---

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

---

### 2.5.1 Installing an expansion card

To install an expansion card:

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

### 2.5.2 Configuring an expansion card

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

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



---

When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable. Refer to the table on the next page for details.

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## 2.5.3 Interrupt assignments

### Standard interrupt assignments

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

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

### IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIe x16_1	shared	–	–	–	–	–	–	–
PCIe x16_2	–	shared	–	–	–	–	–	–
PCIe x16_3	–	–	shared	–	–	–	–	–
USB 1.0 controller 1	–	–	–	shared	–	–	–	–
USB 1.0 controller 2	–	–	–	shared	–	–	–	–
USB 1.0 controller 3	–	–	–	shared	–	–	–	–
USB 1.0 controller 4	–	–	–	shared	–	–	–	–
USB 2.0 controller	–	–	–	shared	–	–	–	–
HD audio	shared	–	–	–	–	–	–	–
Onboard SATA	–	–	–	–	–	shared	–	–

## 2.5.4 PCI slots

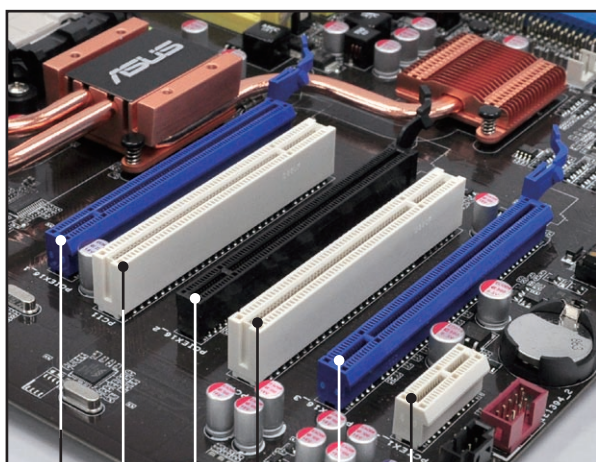
The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slots.

## 2.5.5 PCI Express x1 slot

This motherboard supports 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 slots.

## 2.5.6 PCI Express 2.0 x16 slots

This motherboard supports three NVIDIA PCI Express x16 graphics cards that comply with the PCI Express specifications. Refer to the figure below for the location of the slots.



PCI\_1 slot  
PCI\_2 slot  
PCI Express x16\_1 slot (blue, at x16 link)  
PCI Express x16\_2 slot (black, at max. x8 link)  
PCI Express x16\_3 slot (blue, at x16 link)  
PCI Express x1\_1 slot



If you install two or more graphics cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA\_FAN1/2 for better thermal environment. See page 2-33 for the connector location.



- We recommend that you install a VGA card on the primary (blue) PCI Express slots, and install any other PCI Express device on the PCI Express slot (black).
- 3-Way SLI™ / Hybrid SLI™ mode is supported only under Windows® Vista OS. For more information, visit the NVIDIA® official website at [www.nvidia.com](http://www.nvidia.com).
- Visit the NVIDIA® official website at [www.nvidia.com](http://www.nvidia.com) for the list of 3-Way SLI™ / Hybrid SLI™-supported graphics cards.
- Connect a rear chassis fan to the chassis (CHA\_FAN1/2) connector when using two (or three) graphics cards for better thermal environment. See page 2-35 for details.
- We recommend that you provide sufficient power when running NVIDIA® SLI™ mode. See page 2-34 for details.

VGA configuration	PCI Express operating mode		
	PClex16_1	PClex16_2	PClex16_3
Single VGA/PCIe card	x16	x1	x16
Dual VGA/PCIe card	x16	x1	x16
Triple VGA/PCIe card	x8	x8	x8

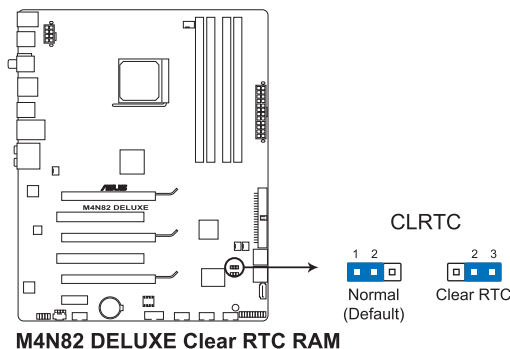


- When using one VGA card and a x4 PCIe card at the same time, install them to the blue slots.
- If you install two VGA cards to the blue slots and use other x4 PCIe cards simultaneously, the x4 PCIe cards will downgrade to x1 mode for optimum VGA performance.

## 2.6 Jumpers

### 1. 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. 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.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



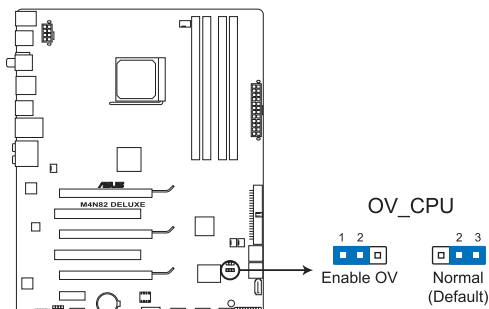
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
- 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.
- Due to the chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

## 2. CPU overvoltage setting (3-pin OV\_CPU)

This jumper allows you to enable or disable the advanced CPU overvoltage setting in BIOS. Read the following information before you change the jumper setting. Set to pins 1-2 to activate the advanced CPU overvoltage feature.



**M4N82 DELUXE CPU overvoltage setting**

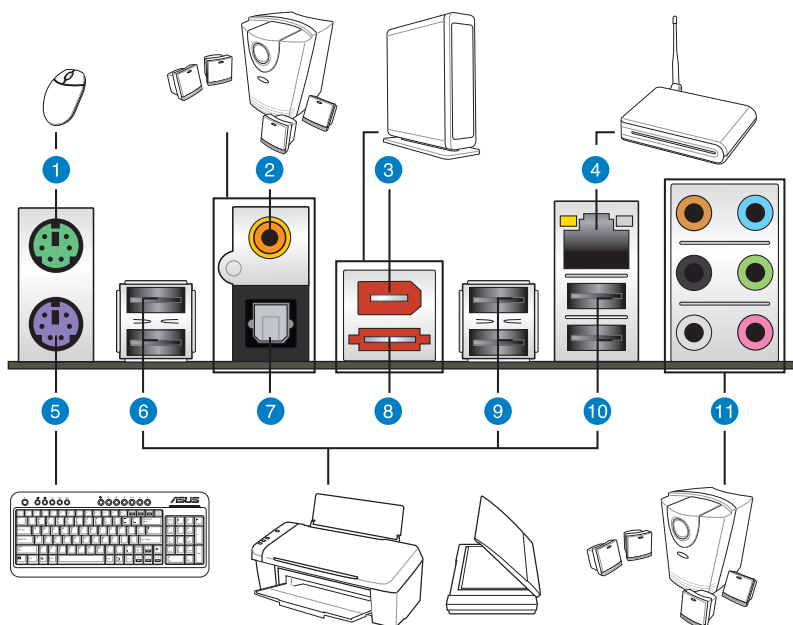
OV_CPU	
Pins 2-3 (Default)	0.80V – 1.70V
Pins 1-2 (OV Enabled)	up to 1.90V



- Before you change the jumper setting for extra-high overvoltage ability, use the BIOS items introduced in **3.5 Ai Tweaker menu** first to adjust the desired CPU performance. Ensure that your system functions well under the highest BIOS voltage setting before you change the setting of this jumper.
- Refer to **3.5 Ai Tweaker menu** for more information about the CPU overvoltage setting.
- DO NOT set the OV\_CPU jumper to pins 1-2 when you install a new CPU and have not booted for the first time. Doing so may cause the system to halt. For system failure due to the wrong setting of the OV\_CPU jumper, shut down the computer and move the cap back to pins 2-3.
- The system may need a better cooling system (for example, a water-cooling system) to work stably under high voltage settings.

## 2.7 Connectors

### 2.7.1 Rear panel connectors



#### Rear panel connectors

1.	PS/2 mouse port (green)	7.	Optical S/PDIF out port
2.	Coaxial S/PDIF out port	8.	External SATA port
3.	IEEE 1394a port	9.	USB 2.0 ports 5 and 6
4.	LAN (RJ-45) port	10.	USB 2.0 ports 1 and 2
5.	PS/2 keyboard port (purple)	11.	Audio I/O ports
6.	USB 2.0 ports 3 and 4		

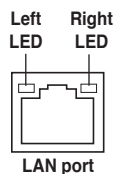


- DO NOT insert a different connector to the external SATA port.
- To enable external SATA port hot-plugging, set the **SATA Mode Select** item in the BIOS settings to [AHCI Mode], and then reboot the system. See section 3.4.2 **Storage Configuration** for details.
- Port multipliers are not supported by the external SATA port.
- The external SATA port will be disabled if you set the **SATA Mode Select** item in the BIOS settings to [SATA Mode] (or [IDE Mode], depending on the BIOS version). See section 3.4.2 **Storage Configuration** for details.



## LAN port LED indications

Status	Left LED	Right LED
OFF	OFF	OFF
10 Mbps connection	Orange (blinking during data activity)	OFF
100 Mbps connection	Orange (blinking during data activity)	Orange (blinking during data activity)
1 Gbps connection	Orange (blinking during data activity)	Green (blinking during data activity)



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

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

## 2.7.2 Audio I/O connections

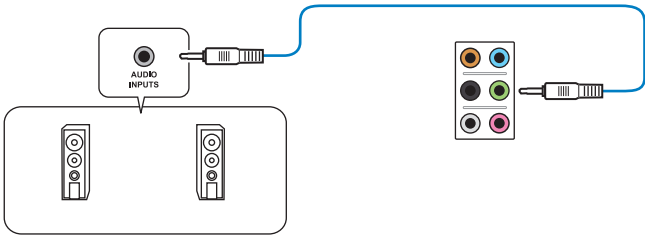
### Audio I/O ports



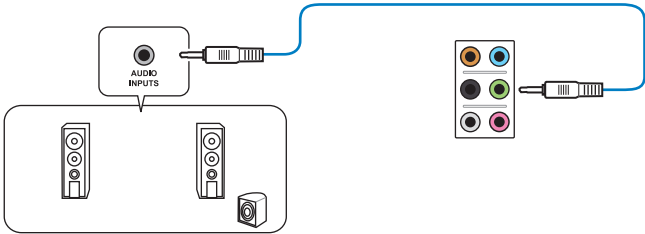
### Connect to Headphone and Mic



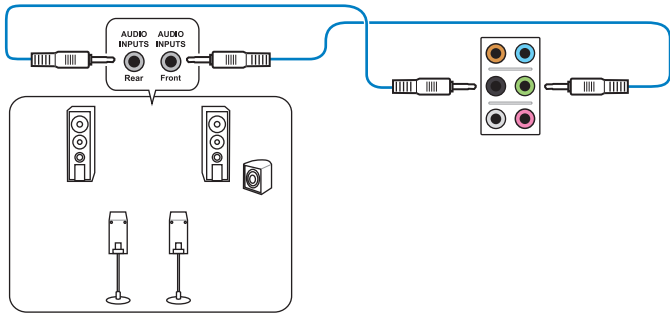
Connect to Stereo Speakers



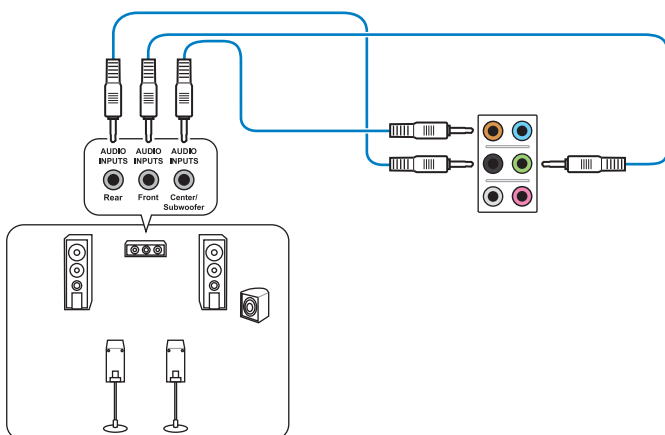
Connect to 2.1 channel Speakers



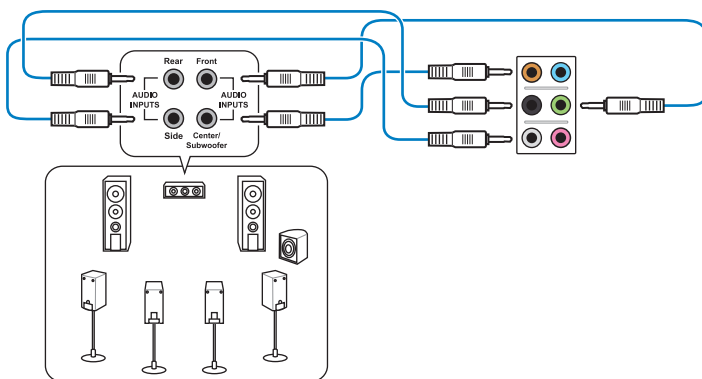
Connect to 4.1 channel Speakers



## Connect to 5.1 channel Speakers



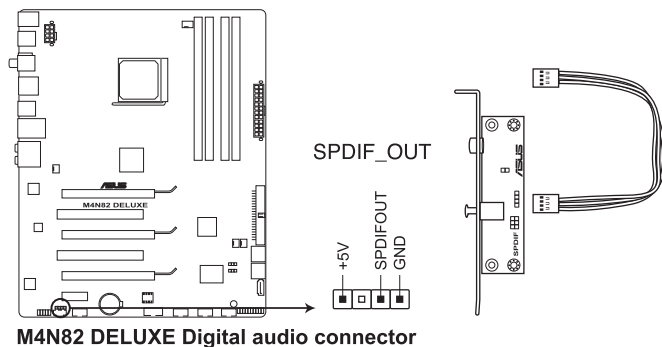
## Connect to 7.1 channel Speakers



## 2.7.3 Internal connectors

### 1. Digital audio connector (4-1 pin SPDIF\_OUT)

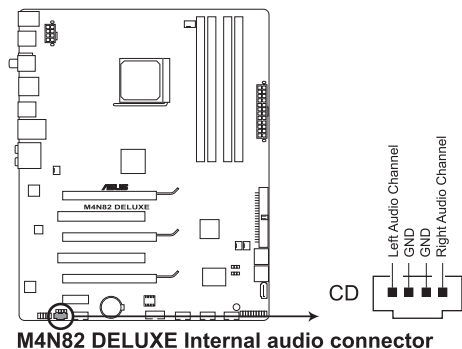
This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.



The S/PDIF module is purchased separately.

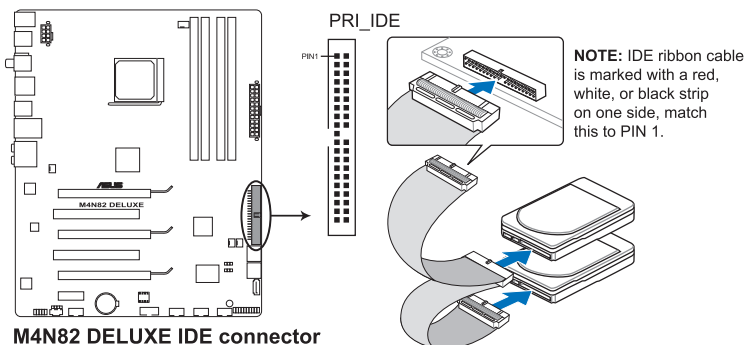
### 2. Optical drive audio connector (4-pin CD)

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



### 3. 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 133/100/66 IDE devices.



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

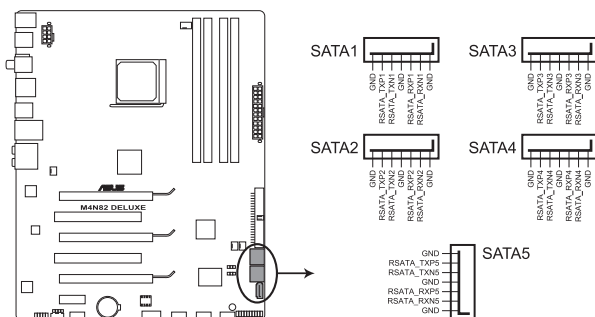
#### 4. Serial ATA connectors (7-pin SATA1–5)

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

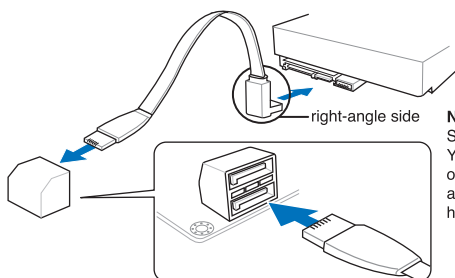
If you install SATA hard disk drives to the SATA1–5 connectors, you can create a RAID 0, 1, 0+1, or JBOD configuration through the onboard nForce® 980a SLI controller.



These connectors are set to [SATA Mode] by default. If you intend to create a Serial ATA RAID set using these connectors, set the **SATA Mode select** item in the BIOS to [RAID Mode].



**M4N82 DELUXE SATA connectors**



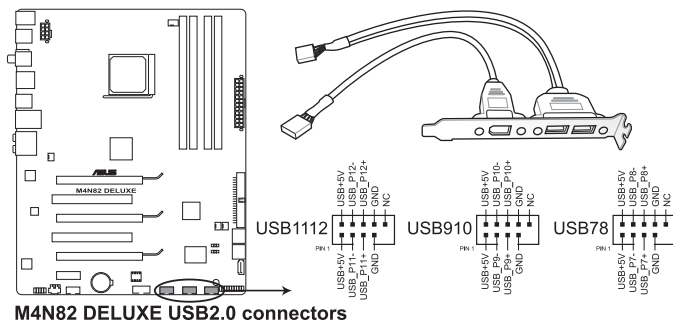
**NOTE:** Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



- The SATA 5 connector supports AHCI mode and RAID mode only. Ensure to install the AHCI driver or RAID driver in the bundled support DVD before connecting devices to the SATA 5 connector. Otherwise, the devices will not work.
- Due to chipset limitation, when you set any of the SATA ports to RAID mode, all SATA ports run at RAID mode simultaneously.
- You must install Windows® XP Service Pack 2 or later version before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP2 or later version.
- Port multipliers are not supported by the onboard SATA connectors and the external SATA port.

## 5. USB connectors (10-1 pin USB 78; USB910; USB1112)

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



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



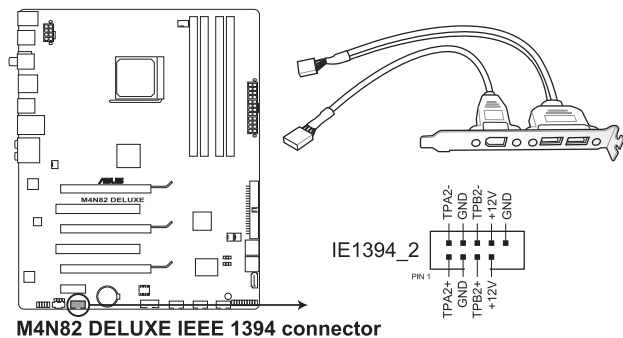
You can connect the front panel USB cable to the ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports.



The USB module is purchased separately.

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

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



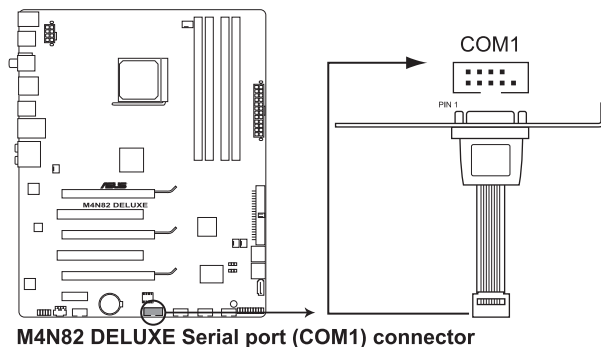
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!



The IEEE 1394a module is purchased separately.

## 7. Serial port connector (10-1 pin COM1)

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

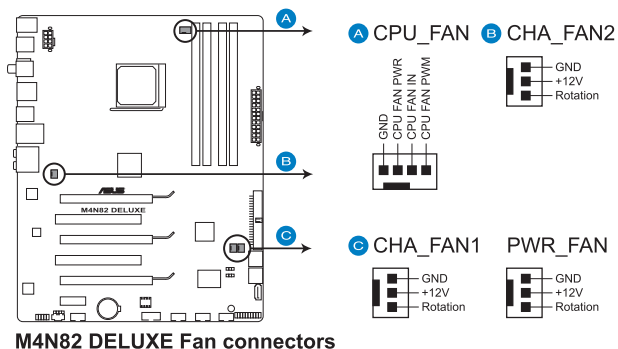


The COM module is purchased separately.



## 8. CPU, chassis, and power fan connectors (4-pin CPU\_FAN; 3-pin CHA\_FAN1-2; 3-pin PWR\_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.



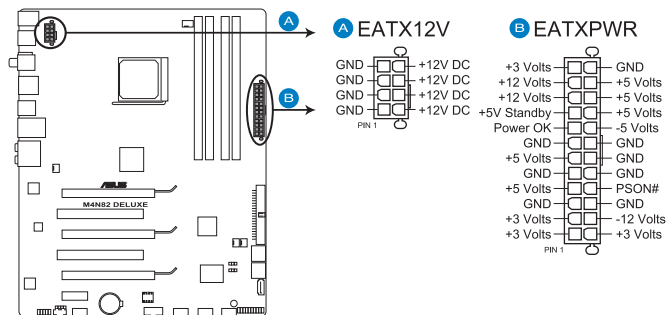
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



- Only the CPU\_FAN, CHA\_FAN 1 and CHA\_FAN 2 connectors support the ASUS Q-FAN 2 feature.
- If you install two or more 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.

## 9. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)

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



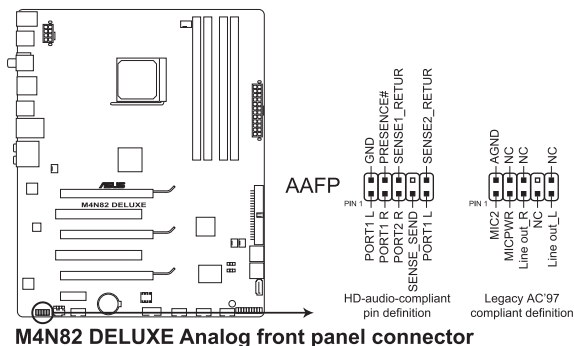
M4N82 DELUXE ATX power connectors



- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 600 W.
- Do not forget to connect the 8-pin EATX +12 V power plug. Otherwise, the system will not boot.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- If you are uncertain about the minimum power supply requirement for your system, refer to the **Recommended Power Supply Wattage Calculator** at <http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us> for details.
- The ATX 12 V Specification 2.0-compliant (1000W) PSU has been tested to support the motherboard power requirements with the following configuration:  
CPU: AMD Phenom 9950  
Memory: 1024 MB DDR2 (x4)  
Graphics card: PCI Express x16 Radeon 4870 X2 (x2)  
Serial ATA device: SATA hard disk drive (x2)  
Optical drive: DVD-RW (x1)

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

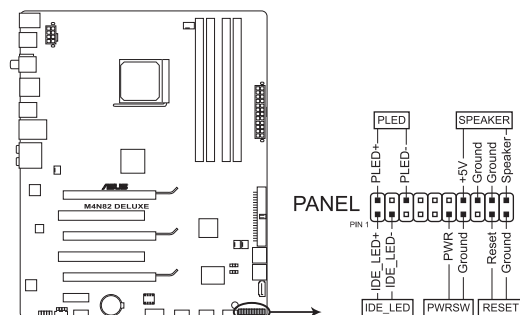
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



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

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

This connector supports several chassis-mounted functions.



**M4N82 DELUXE System panel connector**

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

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

- **Hard disk drive activity LED (2-pin IDE\_LED)**

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

- **System warning speaker (4-pin SPEAKER)**

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

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

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

- **Reset button (2-pin RESET)**

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

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

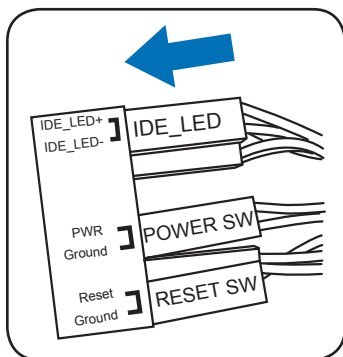
Use the ASUS Q-Connector to connect/disconnect the chassis front panel cables. Refer to the following instructions to install the ASUS Q-Connector.

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

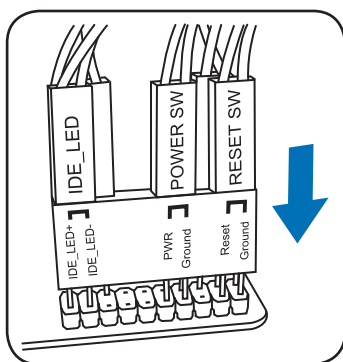
Refer to the labels on the Q-Connector to know the detailed pin definitions, and then match them to their respective front panel cable labels.



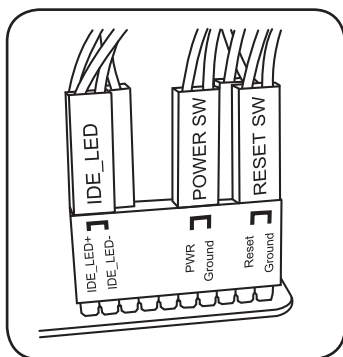
The labels on the front panel cables may vary depending on the chassis model.



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



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

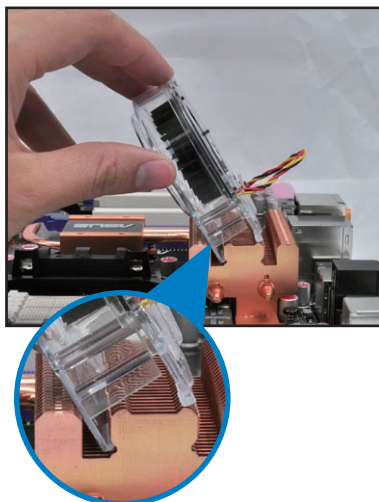
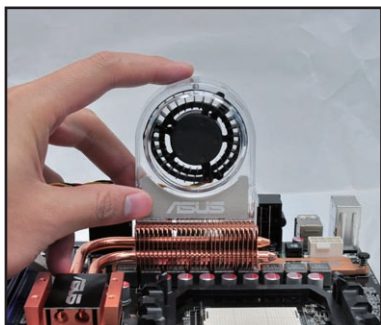


## 2.7.4 Installing the optional fan

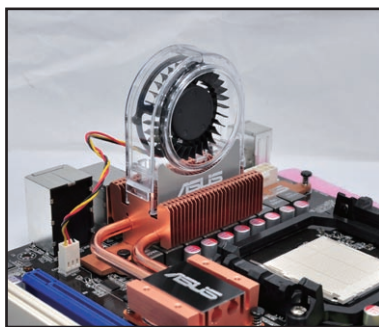
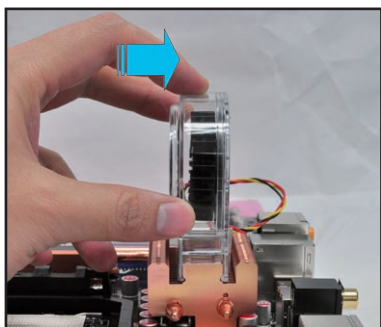


Install the optional fan only if you are using a passive cooler or a water cooler. Installing the optional fan with an active CPU cooler will interfere with the airflow and destabilize the system.

1. Position the fan above the pipe and heatsink assembly.
2. Fit the fan to the grooved edge of the heatsink.



3. Carefully push down the fan until it snugly fits the heatsink, then connect the fan cable.
4. The photo shows the fan installed on the motherboard.



- Plug the optional fan cables to the CHA\_FAN2 connector on the motherboard.
- Ensure the optional fan is installed correctly to prevent damage to the fan and motherboard components.

## 2.8 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
  - a. Monitor
  - b. External SCSI devices (starting with the last device on the chain)
  - c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to 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 the BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

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

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

## 2.9 Turning off the computer

While the system is ON, pressing the power switch for less than four seconds puts the system on sleep mode or soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section **3.7 Power Menu** in Chapter 3 for details.

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



# Chapter 3

## 3.1 Knowing BIOS

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimum performance. **We recommend that you not change the default BIOS settings** except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.
- You have installed a new system component that requires further BIOS settings or update.



---

Inappropriate settings of the BIOS may result in instability or failure to boot. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel.**

---

## 3.2 Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility, or performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, **DO NOT manually update the BIOS**. Inappropriate BIOS updating may result in the system's failure to boot. Carefully follow the instructions of this chapter to update your BIOS if necessary.



---

Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file for this motherboard.

---

The following utilities allow you to manage and update the motherboard BIOS setup program.

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

Refer to the corresponding sections for details on these utilities.



---

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

---

### 3.2.1 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
- 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.
2. From the Main menu, click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3. The ASUS Update utility is copied to your system.

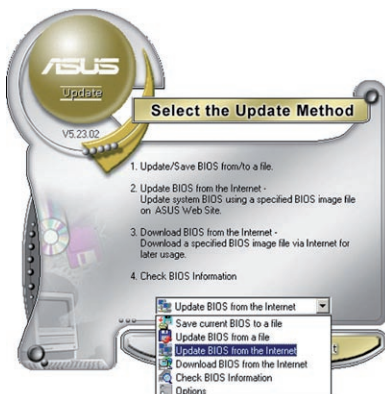
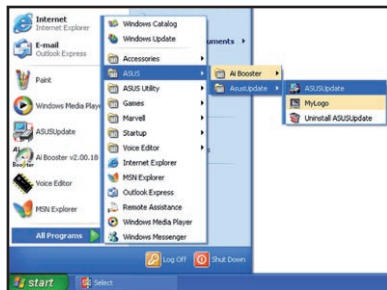


Quit all Windows® applications before you update the BIOS using this utility.

### Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. From the Windows® desktop, click **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from the Internet** from the drop-down menu, and then click **Next**.



3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.
4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.



5. Follow the onscreen instructions to complete the update process.

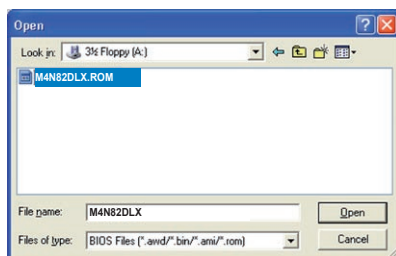
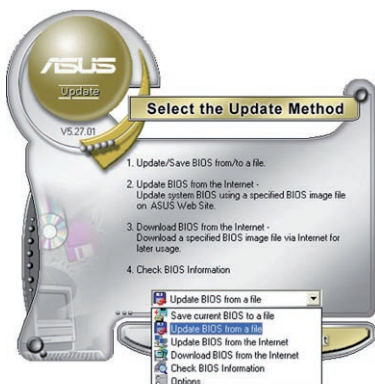


The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

## Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. From the Windows® desktop, click **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from a file** from the dropdown menu, then click **Next**.
3. Locate the BIOS file from the Open window, then click **Open**.
4. Follow the onscreen instructions to complete the update process.



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section 3.10 **Exit Menu** for details.

### 3.2.2 ASUS EZ Flash 2 utility

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

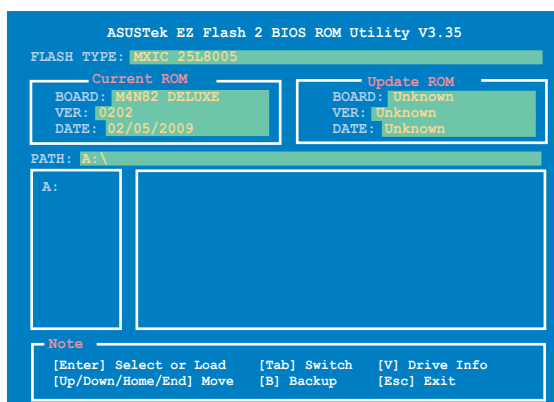


Before you start using this utility, download the latest BIOS from the ASUS website at [www.asus.com](http://www.asus.com).

To update the BIOS using EZ Flash 2:

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

Press **Tab** to switch between drives until the correct BIOS file is found.



2. 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 a USB flash drive with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit menu. See section 3.10 **Exit Menu** for details.

### 3.2.3 ASUS CrashFree BIOS 3 utility

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



---

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

---

#### Recovering the BIOS

To recover the BIOS

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



---

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


---

### 3.3 BIOS setup program

A BIOS Setup program is provided for BIOS item modification. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

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

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

- 
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
  - If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **3.10 Exit Menu** for details.
  - If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section **2.6 Jumpers** for details.

#### 3.3.1 BIOS menu screen

Menu items

Menu bar

Configuration fields

General help

Main

Ai Tweaker

Advanced

Power

Boot

Tools

Exit

System Time

System Date

Language

Primary IDE Master

Primary IDE Slave

SATA1

SATA2

SATA3

SATA4

Storage Configuration

System Information

[13:51:25]

[Fri 02/13/2009]

[English]

[Not Detected]

[Not Detected]

[HDT722516DLA380]

[Not Detected]

[ATAPI DVD DH1]

[Not Detected]

Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.

Use [+] or [-] to configure system Date.

Select Screen

Select Item

Change Field

Select Field

General Help

Save and Exit

Exit

Sub-menu items

Navigation keys

BIOS SETUP UTILITY

v02.61 (C) Copyright 1985-2009, American Megatrends, Inc.

#### 3.3.2 Menu bar

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

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

### 3.3.3 Navigation keys

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



The navigation keys may differ from one screen to another.

### 3.3.4 Menu items

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

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

### 3.3.5 Submenu items

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

### 3.3.6 Configuration fields

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

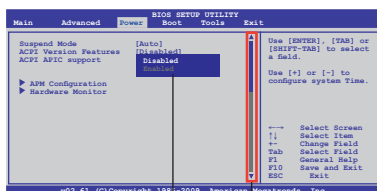
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to **3.3.7 Pop-up window**.

### 3.3.7 Pop-up window

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

### 3.3.8 Scroll bar

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



Pop-up window  
Scroll bar

### 3.3.9 General help

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

### 3.4 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information. You can set the system time and date, BIOS language, and the type of floppy drive installed.



Refer to **3.3.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

BIOS SETUP UTILITY		
Main	Ai Tweaker	Advanced Power Boot Tools Exit
System Time [13:51:25] System Date [Fri 02/13/2009] Language [English]		Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
▶ Primary IDE Master [Not Detected] ▶ Primary IDE Slave [Not Detected] ▶ SATA1 [HDT722516DLA380] ▶ SATA2 [Not Detected] ▶ SATA3 [ATAPI DVD DH1] ▶ SATA4 [Not Detected]		Use [+] or [-] to configure system Date.
▶ Storage Configuration		↔ Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
▶ System Information		
v02.61 (C)Copyright 1985-2009, American Megatrends, Inc.		

#### 3.4.1 Primary IDE Master/Slave; SATA 1–4

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

BIOS SETUP UTILITY	
Main	
<b>SATA 1</b>	
Device : Hard Disk Vendor : HDT722516DLA380 Size : 164.7GB LBA Mode : Supported Block Mode : 16Sectors PIO Mode : 4 Async DMA : MultiWord DMA-2 Ultra DMA : Ultra DMA-6 SMART Monitoring:Supported	Select the type of device connected to the system.
LBA/Large Mode [Auto] Block(Multi-sector Transfer)M [Auto] PIO Mode [Auto] DMA Mode [Auto] SMART Monitoring [Auto] 32Bit Data Transfer [Enabled]	←→ Select Screen ↑↓ Select Item +- Change Field F1 General Help F10 Save and Exit ESC Exit
v02.61 (C) Copyright 1985-2009, American Megatrends, Inc.	

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



**Type [Auto]**

Allows you to select the type of device installed.

- [Not Installed]     Select this option if no device is installed.
- [Auto]                Allows automatic selection of the appropriate device type.
- [CDROM]             Select this option if you are specifically configuring an optical disc drive.
- [ARMD]                Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.




---

This item appears in **Primary IDE Master/Slave** only.

---

**LBA/Large Mode [Auto]**

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

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

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

Enables or disables data multi-sectors transfers.

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

**PIO Mode [Auto]**

- [Auto]                Allows automatic selection of the PIO (Programmed input/output) modes, which correspond to different data transfer rates.
- [0] [1] [2] [3] [4]   Set the PIO mode to Mode 0, 1, 2, 3, or 4.

**DMA Mode [Auto]**

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

The DMA mode consists of SDMA (single-word DMA), MDMA (multi-word DMA), and UDMA (Ultra DMA). Setting to [Auto] allows automatic selection of the DMA mode.

**SMART Monitoring [Auto]**

- [Auto]                Allows automatic selection of the S.M.A.R.T (Smart Monitoring, Analysis, and Reporting Technology).
- [Enabled]            Enables the S.M.A.R.T feature.
- [Disabled]           Disables the S.M.A.R.T feature.

**32Bit Data Transfer [Enabled]**

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

**3.4.2 Storage Configuration**

The Storage Configuration menu allows you to configure your storage devices. Select an item then press <Enter> to display the submenu.

BIOS SETUP UTILITY		
Main		
Storage Configuration		
Onboard PCI IDE Controller	[Enabled]	DISABLED: disables the integrated IDE Controller. ENABLED: enables both Controllers.
OnChip S-ATA Controller	[Enabled]	
SATA Mode select	[SATA Mode]	

**Onboard PCI IDE Controller [Enabled]**

- [Enabled] Enables the onboard IDE controller.
- [Disabled] Disables the onboard IDE controller.

**OnChip S-ATA Controller [Enabled]**

- [Enabled] Enables the onboard SATA controller.
- [Disabled] Disables the onboard SATA controller.

**SATA Mode select [SATA Mode]**

This item appears only when you enabled the **OnChip S-ATA Controller** item and allows you to select the SATA mode.

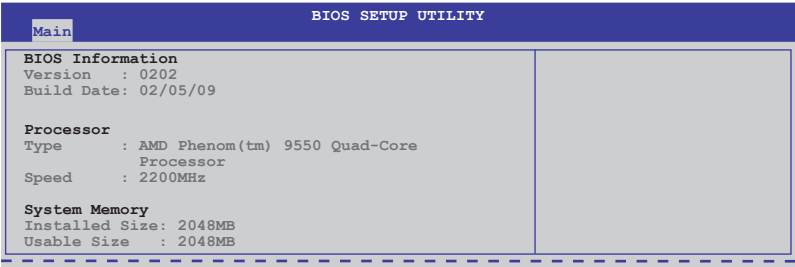
- [SATA Mode] Set to [SATA Mode] (or [IDE Mode], depending on the BIOS version) when you want to use the Serial ATA hard disk drives as Serial ATA physical storage devices.
- [RAID Mode] Set to [RAID Mode] when you want to create a RAID configuration from the SATA hard disk drives.
- [AHCI Mode] Set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



When this item is set to [AHCI], only SATA connectors 1–4 can be detected. Ensure that you’ve installed the AHCI driver, so that you could use SATA connectors 1–5 and E-SATA connector in AHCI mode under OS.

### 3.4.3 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the BIOS information, CPU specification, and system memory in this menu.



## 3.5 Ai Tweaker menu

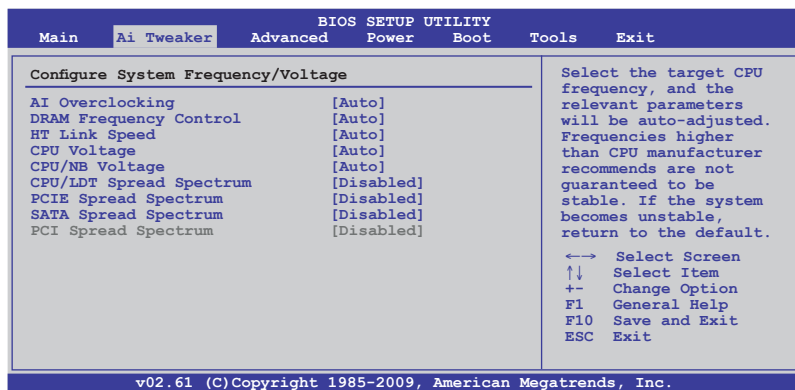
The Ai Tweaker menu items allow you to configure overclocking-related items.



Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.



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



### 3.5.1 AI Overclocking [Auto]

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options:

Manual	Allows you to individually set overclocking parameters.
Auto	Loads the optimal settings for the system.



The following three (3) items appear only when you set the **Ai Overclocking** item to [Manual].

#### CPU Ratio [Auto]

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

#### FSB Frequency [200]

Displays the frequency sent by the clock generator to the system bus and PCI bus. Use the <+> and <-> keys to adjust the FSB frequency. You can also type the desired FSB frequency using the numeric keypad. The values range from 200 to 600.

#### PCIE Frequency [100]

Use the <+> and <-> keys to adjust the PCIE frequency. You can also type the desired PCIE frequency using the numeric keypad. The values range from 100 to 150.

### 3.5.2 DRAM Frequency Control [Auto]

Allows you to select the DRAM frequency control method.

Configuration options: [Auto] [Manual]

#### DRAM Frequency [667MHz]

This item appears only when you set the **Dram Frequency Control** item to [Manual] and allows you to manually set the DRAM frequency.

Configuration options: [667MHz] [800MHz] [1066MHz]

### CPU/NB Frequency [Auto]

This item appears only when you set the **AI Overclocking** item to [Manual] and allows selection of the CPU frequency.

Configuration options: [Auto] [800MHz] [1000MHz] [1200MHz] [1400MHz] [1600MHz] [1800MHz]

### 3.5.3 HT Link Speed [Auto]

Allows you to set the CPU-Chipset HyperTransport link speed.

Configuration options: [Auto] [200 MHz] [400 MHz] [600 MHz] [800 MHz] [1 GHz] [1.2 GHz] [1.4 GHz] [1.6 GHz] [1.8 GHz]

### Memory Configuration

This item appears only when you set the **AI Overclocking** item to [Manual] and allows you to change the advanced memory settings.

BIOS SETUP UTILITY	
Ai Tweaker	
Memory Configuration	Enable Bank Memory Interleaving
Bank Interleaving	[Auto]
Channel Interleaving	[Auto]
MemClk Tristate C3/ATLVID	[Disabled]
Memory Hole Remapping	[Enabled]
DCT Unganged Mode	[Auto]
Power Down Enable	[Disabled]

#### Bank Interleaving [Auto]

Allows you to enable or disable the bank memory interleaving.

Configuration options: [Disabled] [Auto]

#### Channel Interleaving [Auto]

Allows you to set the channel interleaving mode.

Configuration options: [Disabled] [Address bits 6] [Address bits 12] [XOR of Address bits [20:16, 6] [XOR of Address bits [20:16, 9]] [Auto]

#### MemClk Tristate C3/ATLVID [Disabled]

Allows you to enable or disable MemClk Tri-Stating during C3 and Alt VID.

Configuration options: [Disabled] [Enabled]

#### Memory Hole Remapping [Enabled]

Allows you to enable or disable memory remapping around memory hole.

Configuration options: [Disabled] [Enabled]

**DCT Unganged Mode [Auto]**

Allows selection of the unganged DRAM mode.

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

**Power Down Enable [Disabled]**

Allows you to enable or disable the DDR power down mode.

Configuration options: [Disabled] [Enabled]

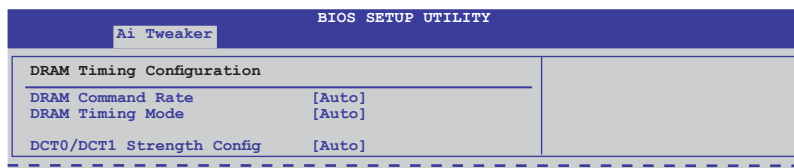
**Power Down Mode [Channel]**

Appears only when you enable the **Power Down Enable** item.

Configuration options: [Channel] [Chip Select]

## DRAM Timing Configuration

This item appears only when you set the **AI Overclocking** item to [Manual] and allows you to change the advanced DRAM timing settings.



The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

**DRAM Command Rate [Auto]**

Allows selection of the DRAM command rate.

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

**DRAM Timing Mode [Auto]**

Allows selection of the DRAM Timing Mode.

Configuration options: [Auto] [Both]



The following sub-items appear only when you set the **DRAM Timing Mode** item to [Both].

**DCT0 1st Information: 5-5-5-3(5)-15-19-5-3****TCL [Auto]**

Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK] [7 CLK DH\_Only]

**TRCD [Auto]**

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

**TRP [Auto]**

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

**TRTP [Auto]**

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

**TRAS [Auto]**

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

**TRC [Auto]**

Configuration options: [11 CLK] [12 CLK] – [25 CLK] [26 CLK] [Auto]

**TWR [Auto]**

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

**TRRD [Auto]**

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

**DCT0 2nd Information: 7-105-75****TWTR [Auto]**

Specifies the write to read delay when accessing the same DIMM.

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

**TRFC0/TRFC1 [Auto]**

Configuration options: [Auto] [75ns] [105ns] [127.5ns] [195ns] [327.5ns]

**DCT0/DCT1 Strength Config [Auto]**

Allows adjustments of the advanced DRAM strength parameters.

Configuration options: [Auto] [DCT 0] [DCT 1] [Both]



The following sub-items appear only when you set the **DCT0/DCT1 Strength Config** item to [DCT 0], [DCT 1] or [Both].

**DCT0:CKE drive strength. [Auto]****DCT1:CKE drive strength. [Auto]**

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

**DCT0:CS/ODT drive strength. [Auto]****DCT1:CS/ODT drive strength. [Auto]**

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

**DCT0:Address/Command drive strength. [Auto]****DCT1:Address/Command drive strength. [Auto]**

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

**DCT0:MEMCLK drive strength. [Auto]****DCT1:MEMCLK drive strength. [Auto]**

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

**DCT0:Data drive strength. [Auto]****DCT1:Data drive strength. [Auto]**

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

**DCT0:DQS drive strength. [Auto]****DCT1:DQS drive strength. [Auto]**

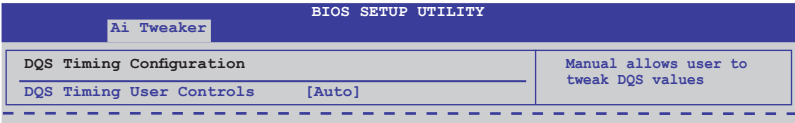
Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

**DCT0:Processor on-die termination [Auto]****DCT1:Processor on-die termination [Auto]**

Configuration options: [Auto] [300 ohms +/- 20%] [150 ohms +/- 20%] [75 ohms +/- 20%]

## DQS Timing Configuration

This item appears only when you set the **AI Overclocking** item to [Manual] and allows you to change the advanced DQS settings.



### *DQS Timing User Controls [Auto]*

Allows adjustments of the advanced DQS parameters.

Configuration options: [Auto] [DCT 0] [DCT 1] [Both]



The following sub-items appear only when you set the **DQS Timing User Controls** item to [DCT 0], [DCT 1] or [Both].

### **CKE Setup Time [Auto]**

Allows selection of the default setup time for the CKE pins versus MEMCLK.

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

### **CKE Fine Delay [00]**

Appears only when you set the **CKE Setup Time** item to [1/2 CLK] or [1 CLK]. Allows you to set how long the CKE pins are delayed from the default setup time. Type the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. The value ranges from 0 to 31.

### **CS/ODT Setup Time [Auto]**

Allows selection of the default setup time for the CS/ODT pins versus MEMCLK.

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

### **CS/ODT Fine Delay [00]**

Appears only when you set the **CS/ODT Setup Time** item to [1/2 CLK] or [1 CLK]. Allows you to set how long the CS/ODT pins are delayed from the default setup time. Type the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. The value ranges from 0 to 31.

### **Addr/Cmd Setup Time [Auto]**

Allows selection of the default setup time for the Addr/Cmd pins versus MEMCLK.

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

### **Addr/Cmd Fine Delay [00]**

Appears only when you set the **CKE Setup Time** item to [1/2 CLK] or [1 CLK]. Allows you to set how long the Addr/Cmd pins are delayed from the default setup time. Type the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. The value ranges from 0 to 31.



The following six (6) items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.



### 3.5.4 CPU Voltage [Auto]

Allows you to set the CPU voltage.



- Refer to the CPU documentation before setting the CPU Vcore voltage. Setting a high CPU voltage may damage the CPU permanently, and setting a low CPU voltage may make the system unstable.
- The value [1.90V] of the CPU Voltage item is supported only if the **OV\_CPU** jumper is enabled. Otherwise the maximum voltage supported is [1.70V]. See **2. CPU overvoltage setting** on page 2-23 for details.

### 3.5.5 CPU/NB Voltage [Auto]

Allows you to set the voltage between the CPU and Northbridge.



The following four (4) items appear only when you set the **Ai Overclocking** item to [Manual].

#### CPU VDDA Voltage [Auto]

Allows you to set the CPU VDDA voltage. The values range from 2.50V to 2.80V with a 0.10V interval.

#### DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.80V to 2.50V with a 0.02V interval.

#### HT Voltage [Auto]

Allows you to set the HyperTransport voltage. The values range from 1.20V to 1.50V with a 0.02V interval.

#### NB Voltage [Auto]

Allows you to set the NorthBridge voltage. The values range from 1.10V to 1.40V with a 0.02V interval.

#### nForce200 Voltage [Auto]

Allows you to set the nForce200 chip voltage. The values range from 1.20V to 1.50V with a 0.02V interval.

### 3.5.6 CPU/LDT Spread Spectrum [Disabled]

Set to [Disabled] to enhance CPU/LDT overclocking ability or [Enabled] for EMI control.  
Configuration options: [Disabled] [Enabled]

### 3.5.7 PCIE Spread Spectrum [Disabled]

Configuration options: [Disabled] [Linear Down]

### 3.5.8 SATA Spread Spectrum [Disabled]

Configuration options: [Disabled] [Linear Down]

### 3.5.9 PCI Spread Spectrum [Disabled]

Configuration options: [Disabled] [Linear Down]

### 3.5.10 AI Clock Skew for Channel A/B [Auto]

Adjusting these items may help enhancing DRAM overclocking ability.

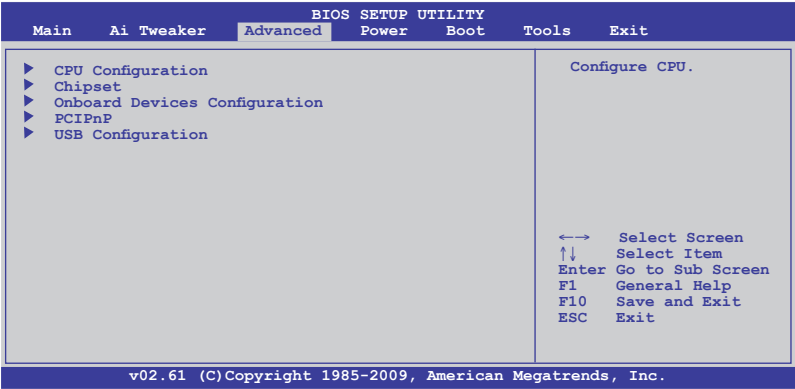
Configuration options: [Auto] [Advance 900ps] [Advance 750ps] [Advance 600ps] [Advance 450ps] [Advance 300ps] [Advance 150ps] [Normal] [Delay 150ps] [Delay 300ps] [Delay 450ps] [Delay 600ps] [Delay 750ps] [Delay 900ps]

### 3.6 Advanced menu

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



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

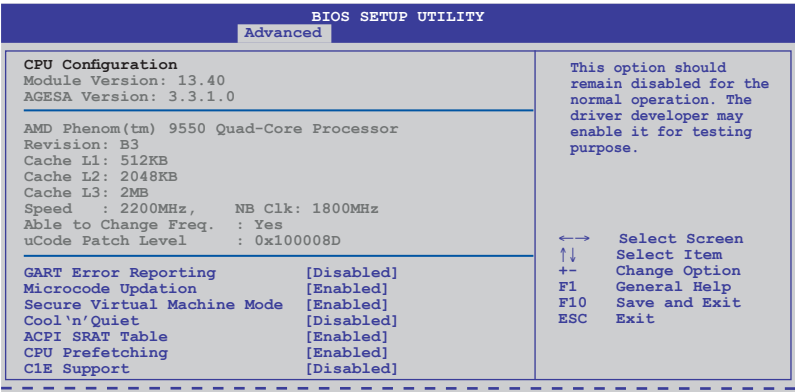


#### 3.6.1 CPU Configuration

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



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



#### GART Error Reporting [Disabled]

- [Disabled] Disables the GART Error Reporting function.
- [Enabled] Enables the GART Error Reporting function.

### Microcode Updation [Enabled]

- [Disabled] Disables the Microcode Updation function.
- [Enabled] Allows the system to update the Microcode automatically, enhancing system performance.

### Secure Virtual Machine Mode [Enabled]

- [Disabled] Disables the AMD Secure Virtual Machine mode.
- [Enabled] Enables the AMD Secure Virtual Machine mode.

### Cool'n'Quiet [Enabled]

- [Disabled] Disables the AMD Cool'n'Quiet function.
- [Enabled] Enables the AMD Cool'n'Quiet function.

### ACPI SRAT Table [Enabled]

- [Disabled] Disables the building of ACPI SRAT Table.
- [Enabled] Enables the building of ACPI SRAT Table.

### CPU Prefetching [Enabled]

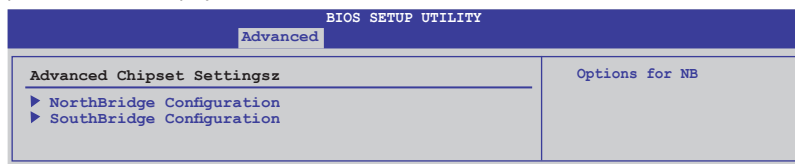
- [Disabled] Disables the CPU prefetching.
- [Enabled] Enables the CPU prefetching.

### C1E Support [Disabled]

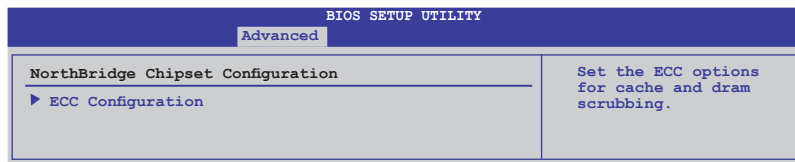
- [Disabled] Disables the the Enhanced Halt State support.
- [Enabled] Enables the the Enhanced Halt State support.

## 3.6.2 Chipset

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



### North Bridge Chipset Configuration



## ECC Configuration

BIOS SETUP UTILITY		
Advanced		
ECC Configuration		Set the level of ECC protection. Note: The 'Super' ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
ECC Mode	[Disabled]	
DRAM ECC Enable	[Disabled]	
DRAM SCRUB REDIRECT	[Disabled]	
4-Bit ECC Mode	[Disabled]	
DRAM BG Scrub	[Disabled]	
Data Cache BG Scrub	[Disabled]	
L2 Cache BG Scrub	[Disabled]	
L3 Cache BG Scrub	[Disabled]	

### ECC Mode [Disabled]

Disables or sets the DRAM ECC mode that allows the hardware to report and correct memory errors.

[Disabled] Disables the DRAM ECC mode.

[Basic] Set to [Basic] to adjust ECC mode automatically.

[Good] Set to [Good] to adjust ECC mode automatically.

[Super] Set to [Super] to adjust the **DRAM BG Scrub** sub-item manually.

[Max] Set to [Max] to adjust ECC mode automatically.

[User] Set to [User] to adjust all the subitems manually.

## SouthBridge Configuration

BIOS SETUP UTILITY		
Advanced		
Advanced Chipset Settings		1 Memory have to over 2G size 2 At least 256 MB of frame buffer size 3 External VGA must support this feature
Hybrid SLI support	[Disabled]	
Hybrid SLI Frame buffer size	[Disabled]	
Primary Graphics Adapter	[PCIe VGA Card First]	
SouthBridge ACPI HPET TABLE	[Enabled]	

### Hybrid SLI support [Disabled]

Allows you to enable or disable the NVIDIA Hybrid SLI technology.

Configuration options: [Disabled] [Auto]

### Hybrid SLI Frame buffer size [256MB]

This item becomes user-configurable when you set the **Hybrid SLI support** item to [Enabled] and allows you to set the frame buffer size for the onboard GPU.

Configuration options: [256MB] [512MB] [Disabled]

### Primary Graphics Adapter [PCIe VGA Card First]

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

Configuration options: [PCI VGA Card First] [PCIe VGA Card First]

### SouthBridge ACPI HPET TABLE [Enabled]

Configuration options: [Disabled] [Enabled]

### 3.6.3 Onboard Devices Configuration

BIOS SETUP UTILITY		
Advanced		
Onboard Devices Configuration		Options
Onboard LAN	[Enabled]	Enabled Disabled
OnBoard LAN Boot ROM	[Disabled]	
Onboard 1394	[Enabled]	
On-board AUDIO	[Enabled]	
Front Panel Select	[HD Audio]	
SPDIF Mode Setting	[SPDIF Output]	
Serial Port1 Address	[3F8/IRQ4]	

#### Onboard LAN [Enabled]

[Enabled] Enables the onboard LAN controller.

[Disabled] Disables the onboard controller.



The following item appears only when you set the **Onboard LAN** item to [Enabled].

#### Onboard LAN Boot ROM [Disabled]

[Enabled] Enables the onboard LAN Boot ROM.

[Disabled] Disables the onboard LAN Boot ROM.

#### Onboard 1394 [Enabled]

[Enabled] Enables the onboard 1394 device support.

[Disabled] Disables the onboard 1394 device support.

#### On-board AUDIO [Enabled]

[Disabled] Disables the controller.

[Enabled] Enables the High Definition Audio Controller.



The following items appear only when you set the **On-board AUDIO** item to [Enabled].

#### Front Panel Type [HD Audio]

[AC97] Sets the front panel audio connector (AAFP) mode to legacy AC'97.

[HD Audio] Sets the front panel audio connector (AAFP) mode to high definition audio.

#### SPDIF Mode Setting [SPDIF Output]

[HDMI Output] Outputs the digital audio signal through the HDMI port.

[SPDIF Output] Outputs the digital audio signal through the onboard SPDIF port.

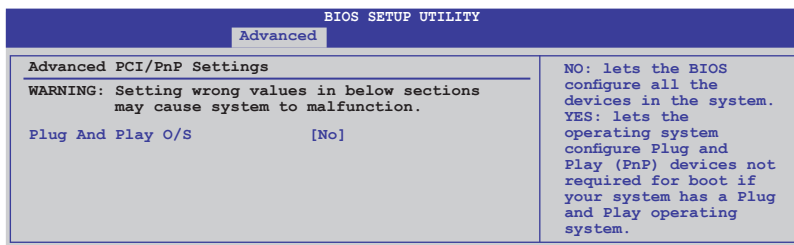
#### Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

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

### 3.6.4 PCIPnP

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



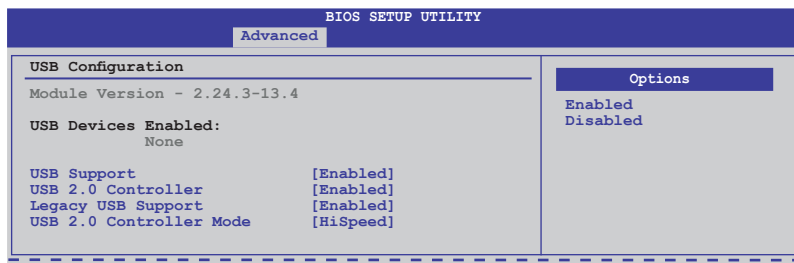
#### Plug And Play O/S [No]

[Yes] When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

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

### 3.6.5 USB Configuration

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



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

#### USB Support [Enabled]

[Enabled] Enables the USB Host Controllers.

[Disabled] Disables the controllers.



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

#### USB 2.0 Controller [Enabled]

[Enabled] Enables the USB 2.0 controller.

[Disabled] Disables the controller.

### **Legacy USB Support [Enabled]**

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

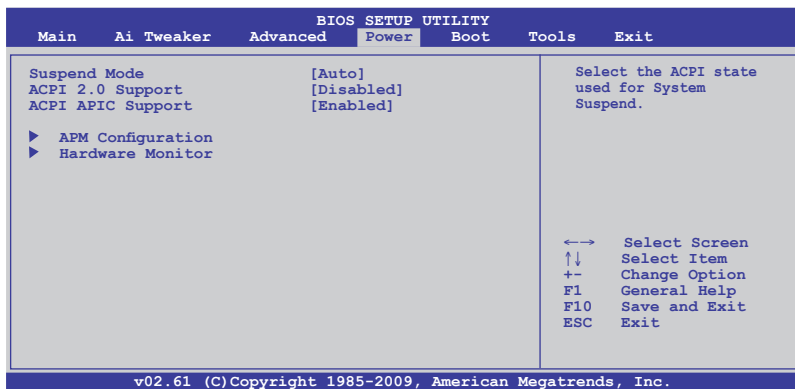
### **USB 2.0 Controller Mode [HiSpeed]**

[FullSpeed]	Sets the USB 2.0 controller mode to FullSpeed (12 Mbps).
[HiSpeed]	Sets the USB 2.0 controller mode to HiSpeed (480 Mbps).



## 3.7 Power menu

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



### 3.7.1 Suspend Mode [Auto]

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

[S1 (POS) only] Sets the APCI suspend mode to S1/POS (Power On Suspend).

[S3 only] Sets the APCI suspend mode to S3/STR (Suspend To RAM).

[Auto] The system automatically configures the ACPI suspend mode.

### 3.7.2 ACPI 2.0 Support [Disabled]

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

[Enabled] When set to [Enabled], the system adds additional tables as per ACPI 2.0 specifications.

### 3.7.3 ACPI APIC Support [Enabled]

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

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

### 3.7.4 APM Configuration

BIOS SETUP UTILITY		
Power		
APM Configuration		Options
Restore on AC Power Loss	[Power Off]	Power On Power Off Last State
Power On By PCI/PCIE Device	[Disabled]	
Power on by External modems	[Disabled]	
Power On By PS/2 Keyboard	[Disabled]	
Power On By PS/2 Mouse	[Disabled]	
Power On By RTC Alarm	[Disabled]	

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

- [Power On] The system goes into on state after an AC power loss.
- [Power Off] The system goes into off state after an AC power loss.
- [Last State] The system goes into either off or on state, whatever the system state was before the AC power loss.

#### Power On By PCI/PCIE Device [Disabled]

- [Disabled] Disallows the PCI/PCIE/onboard LAN devices to generate a wake even.
- [Enabled] Allows you to turn on the system through a PCI/PCIE/onboard LAN device. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

#### Power on by External modems [Disabled]

- [Disabled] The computer could not be powered up when the external modem receives a call while the computer is in Soft-off mode.
- [Enabled] The computer could be powered up when the external modem receives a call while the computer is in Soft-off mode.



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 PS/2 Keyboard [Disabled]

- [Disabled] Disables the Power On by a PS/2 keyboard.
- [Space Bar] Allows you to turn on the system by pressing the Space Bar key on the PS/2 keyboard. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.
- [Power Key] Allows you to turn on the system by pressing the Power key on the PS/2 keyboard. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.
- [Ctrl-Esc] Allows you to turn on the system by pressing the Ctrl key and Esc key of the PS/2 keyboard. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

#### Power On By PS/2 Mouse [Disabled]

- [Disabled] Disables the power on by PS/2 mouse function.
- [Enabled] Enables the power on by PS/2 mouse function. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

### Power On By RTC Alarm [Disabled]

- [Disabled] Disables RTC to generate a wake event.
- [Enabled] When set to [Enabled], the items **RTC Alarm Date/ RTC Alarm Time** will become user-configurable with set values.

### 3.7.5 Hardware Monitor

BIOS SETUP UTILITY		
		Power
<b>Hardware Monitor</b>		CPU Temperature
CPU Temperature	[42°C/107.5°F]	
MB Temperature	[33°C/91°F]	
CPU Fan Speed	[4856RPM]	
Chassis Fan 1 Speed	[N/A]	
Chassis Fan 2 Speed	[N/A]	
VCORE Voltage	[ 1.234V]	
3.3V Voltage	[ 3.320V]	
5V Voltage	[ 5.026V]	
12V Voltage	[11.787V]	
CPU Q-Fan Function	[Disabled]	
Chassis Q-Fan Function	[Disabled]	

#### CPU/MB Temperature [xxx°C/xxx°F]

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

#### CPU Fan /Chassis Fan 1 and 2 Speed [xxxxRPM] or [Ignored] / [N/A]

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

#### 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 Q-Fan Function [Disabled]

- [Disabled] Disables the CPU Q-Fan control feature.
- [Enabled] Enables the CPU Q-Fan control feature.



The following two items appear only when you set **CPU Q-Fan Function** to [Enabled].

#### Select Fan Type: [PWR Fan]

- [PWR Fan] Sets to [PWR Fan] when using a 4-pin CPU fan.
- [DC Fan] Sets to [DC Fan] when using a 3-pin CPU fan.

Quiet CPU Fan Mode [Silent]

[Performance]	Sets to [Performance] to achieve maximum CPU fan speed.
[Optimal]	Sets to [Optimal] to make the CPU fan automatically adjust depending on the CPU temperature.
[Silent]	Sets to [Silent] to minimize the fan speed for quiet CPU fan operation.

**Chassis Q-Fan Function [Disabled]**

[Disabled]	Disables the Chassis Q-Fan control feature.
[Enabled]	Enables the <b>Chassis Q-Fan control feature</b> .




---

The following item appears only when you set **Chassis Q-Fan Function** to [Enabled].

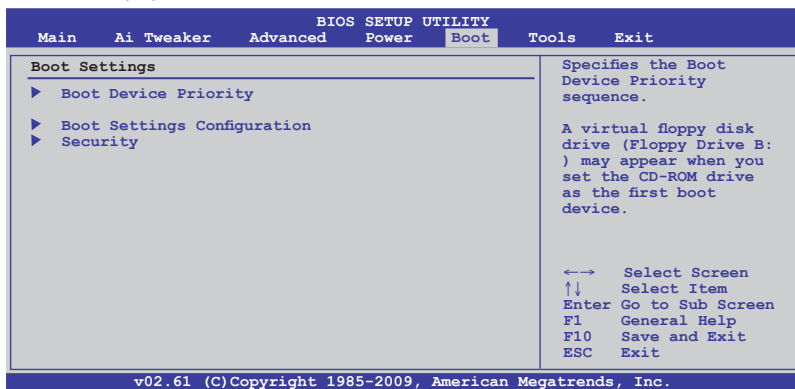
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Quiet Chassis Fan Mode [Silent]

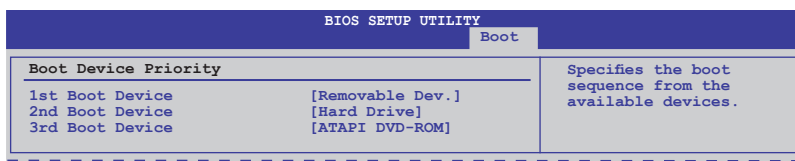
[Performance]	Sets to [Performance] to achieve maximum chassis fan speed.
[Optimal]	Sets to [Optimal] to make the chassis fan automatically adjust depending on the chassis temperature.
[Silent]	Sets to [Silent] to minimize fan speed for quiet chassis fan operation.

## 3.8 Boot menu

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



### 3.8.1 Boot Device Priority



#### 1st ~ xxth Boot Device [Removable Dev.]

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 Dev.] [Hard Drive] [ATAPI CD-ROM] [Disabled]

### 3.8.2 Boot Settings Configuration

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

#### Quick Boot [Enabled]

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

#### Full Screen Logo [Enabled]

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



Set this item to [Enabled] to use the ASUS MyLogo 2™ feature.

#### AddOn ROM Display Mode [Force BIOS]

- [Force BIOS] The third-party ROM messages will be forced to display during the boot sequence.
- [Keep Current] The third-party ROM messages will be displayed only if the third-party manufacturer had set the add-on device to do so.

#### Bootup Num-Lock [On]

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

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

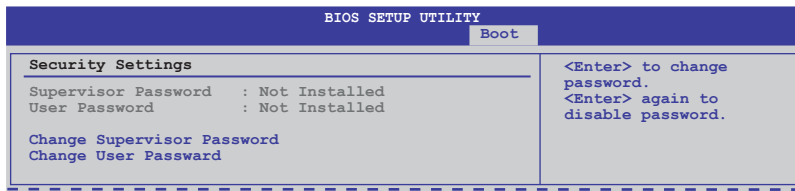
- [Disabled] Disables this function.
- [Enabled] The system waits for the <F1> key to be pressed when error occurs.

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

- [Disabled] Disables this function.
- [Enabled] The system displays the message "Press DEL to run Setup" during POST.

### 3.8.3 Security

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



#### Change Supervisor Password

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

To set a Supervisor Password:

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

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

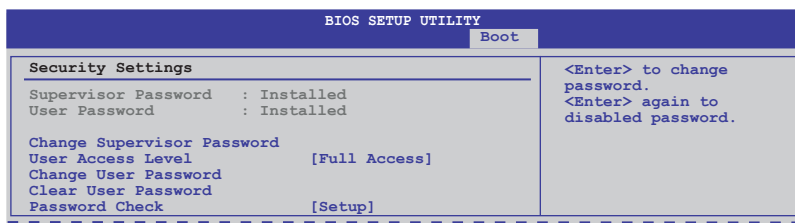
To change the supervisor password, follow the same steps as in setting a user password.

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



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **2.6 Jumpers** for information on how to erase the RTC RAM.

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



## User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.

- [No Access] Prevents user access to the Setup utility.
- [View Only] Allows access but does not allow change to any field.
- [Limited] Allows changes only to selected fields, such as Date and Time.
- [Full Access] Allows viewing and changing all the fields in the Setup utility.

## Change User Password

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

To set a User Password:

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

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

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

## Clear User Password

Select this item to clear the user password.

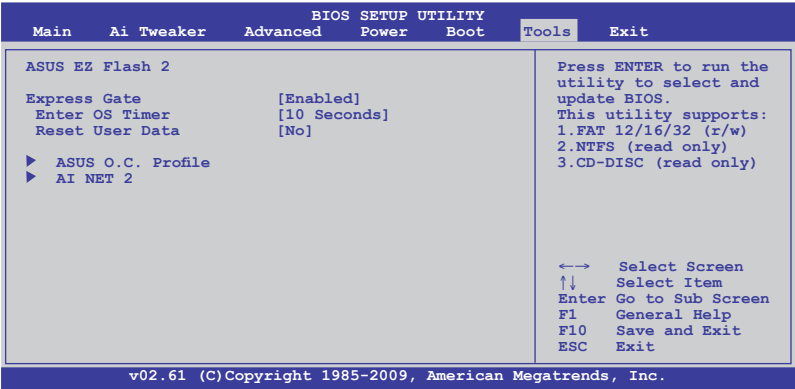
## Password Check [Setup]

- [Setup] BIOS checks for user password when accessing the Setup utility.
- [Always] BIOS checks for user password both when accessing Setup and booting the system.



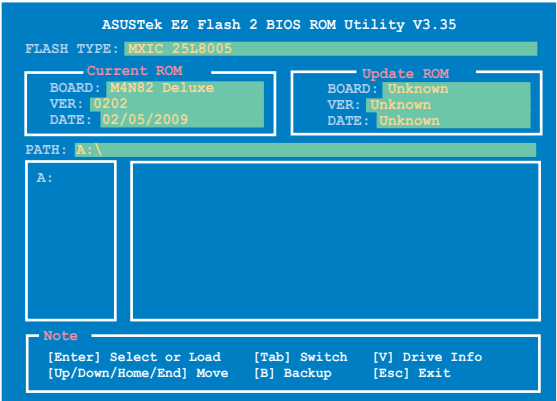
### 3.9 Tools menu

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



#### 3.9.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], and then press <Enter> to confirm your choice. See section 3.2.2 **ASUS EZ Flash 2 utility** for details.



## 3.9.2 Express Gate

Allows you to enable or disable the ASUS Express Gate feature. The ASUS Express Gate feature is a unique instant-on environment that provides quick access to the Internet browser and Skype. Configuration options: [Enabled] [Disabled]

### Enter OS Timer [10 Seconds]

Sets countdown duration that the system waits at the Express Gate's first screen before starting Windows or other installed OS. Choose [Prompt User] to stay at the first screen of Express Gate for user action.

Configuration options: [Prompt User] [1 second] [3 seconds] [5 seconds] [10 seconds] [15 seconds] [20 seconds] [30 seconds]

### Reset User Data [No]

Allows you to clear Express Gate's user data.

- |         |   |
|---------|---|
| [Reset] | When setting this item to [Reset], ensure that you save the setting to the BIOS so that the user data will be cleared the next time you enter the Express Gate. User data includes the Express Gate's settings as well as any personal information stored by the web browser such as bookmarks, cookies, browsing history. This is useful in the rare case where corrupt settings prevent the Express Gate environment from launching properly. |
| [No]    | Set to [No] to disable the Reset User Data function when entering the Express Gate.   |



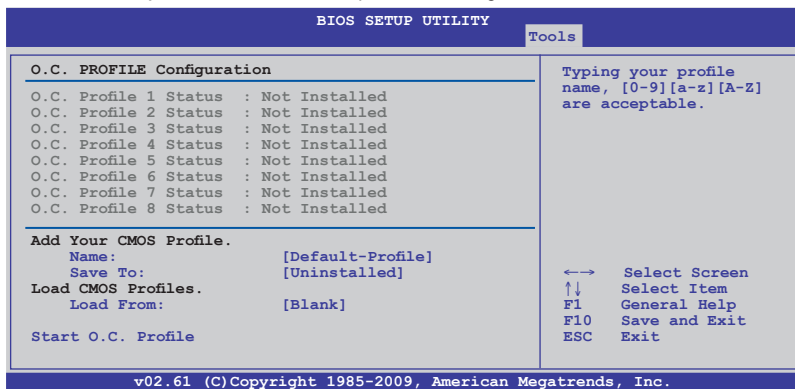
---

The first time wizard will run again when you enter the Express Gate environment after clearing its settings.

---

### 3.9.3 ASUS O.C. Profile

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



#### Add Your CMOS Profile

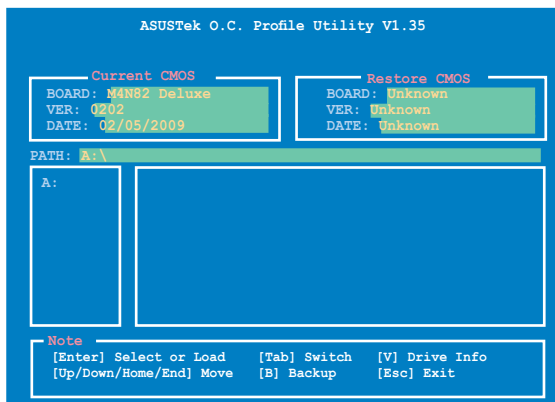
Allows you to save the current BIOS file to the BIOS Flash. In the Name sub-item, type your profile name and press <Enter>, and then choose a profile number to save your CMOS settings in the Save to sub-item.

#### Load CMOS Profiles

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

#### Start O.C. Profile

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





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

### 3.9.4 AI NET 2

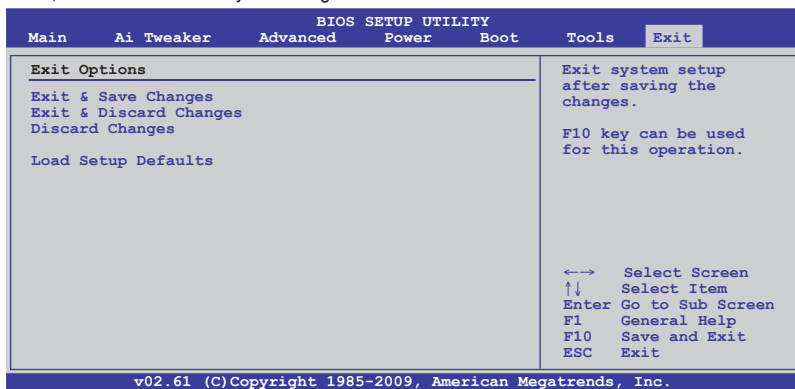
BIOS SETUP UTILITY			Tools
AI NET 2		Pair	Status Length
Check Realtek Phy LAN cable		[Disabled]	
		Check Realtek Phy LAN cable during POST.	
		It will take 3 to 10 seconds to diagnose LAN cable.	

#### Check Realtek Phy LAN Cable [Disabled]

- [Disabled] BIOS will not check the Realtek Phy LAN cable during the Power-On Self-Test (POST).
- [Enabled] BIOS checks the Realtek Phy LAN cable during the Power-On Self-Test (POST).

## 3.10 Exit menu

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



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

### Exit & Save Changes

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



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

### Exit & Discard Changes

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

### Discard Changes

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

### Load Setup Defaults

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

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# Chapter 4

## 4.1 Installing an operating system

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



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

## 4.2 Support DVD information

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



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

### 4.2.1 Running the support DVD

Place the support DVD into the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer. Click each menu tab and select the items you want to install.

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

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


The Make disk menu contains items to create the AT® RAID/AHCI driver disk.

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

Click the Contact tab to display the ASUS contact information.

Click an icon to display DVD/ motherboard information

Click an item to install



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

## 4.2.2 Obtaining the software manuals

The software manuals are included in the support DVD. Follow the instructions below to get the necessary software manuals.

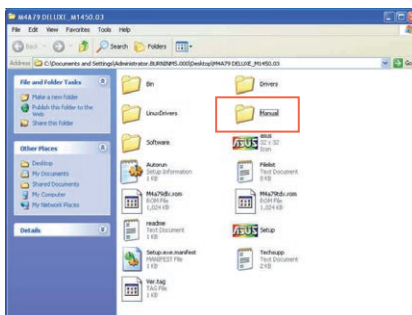


The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening the files.

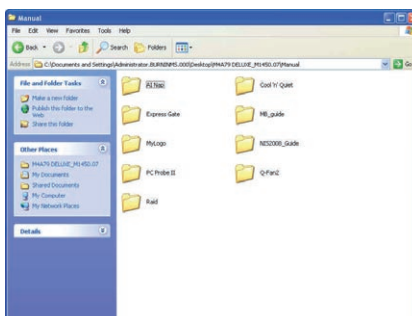
1. Click the support DVD icon.



2. The support DVD contents are displayed in graphical format. Double-click the **Manual** folder.



3. Double-click the folder of your selected manual.



The screenshots in this section are for reference only. The actual software manuals containing in the support DVD vary by models.



## 4.3 Software information

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

### 4.3.1 Cool 'n' Quiet!™ Technology

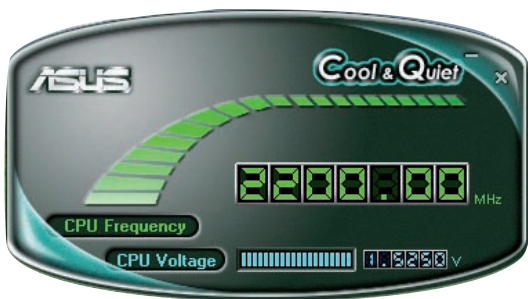
The motherboard supports the AMD Cool 'n' Quiet!™ Technology that dynamically and automatically change the CPU speed, voltage, and amount of power depending on the task the CPU performs.

#### Enabling Cool 'n' Quiet!™ Technology

1. Turn on the system and enter BIOS by pressing the <Del> key during the Power On Self-Tests (POST).
2. Go to **Advanced > CPU Configuration > Cool'n'Quiet** and set it to [Enabled]. See section 3.6 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.

#### Launching the Cool 'n' Quiet!™ software

1. Install Cool 'n' Quiet!™ software from the motherboard support DVD.
2. Click **Start > All Programs > ASUS > Cool & Quiet > Cool & Quiet**.
3. The Cool 'n' Quiet!™ technology screen appears and displays the current CPU Frequency and CPU Voltage.



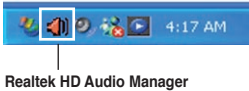
Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.

4.3.2 Audio configurations

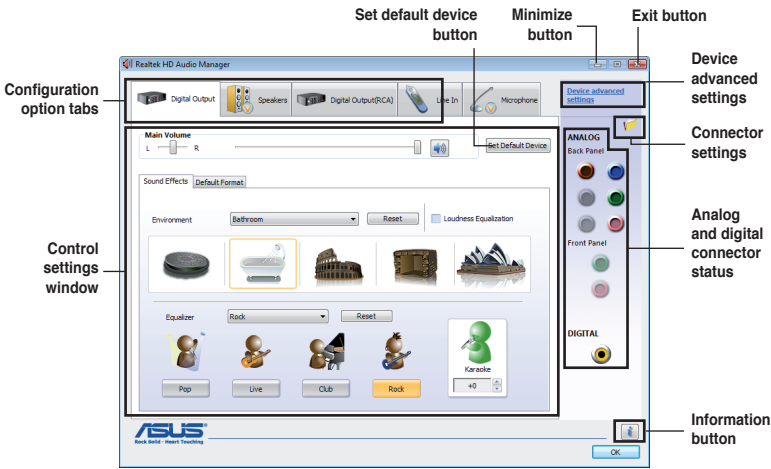
The Realtek® audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your computer. The software provides Jack-Sensing function, S/PDIF Out support, and interrupt capability. The CODEC also includes the Realtek® proprietary UAJ® (Universal Audio Jack) technology for all audio ports, eliminating cable connection errors and giving users plug and play convenience.

Follow the installation wizard to install the Realtek® Audio Driver from the support CD/DVD that came with the motherboard package.

If the Realtek audio software is correctly installed, you will find the **Realtek HD Audio Manager** icon on the taskbar. Double-click on the icon to display the Realtek HD Audio Manager.



A. Realtek HD Audio Manager for Windows® Vista™



B. Realtek HD Audio Manager for Windows XP



4.3.3      **ASUS PC Probe II**

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

**Launching PC Probe4 II**

- 1.     Install PC Probe II from the motherboard support DVD.
- 2.     Launch PC Probe II by clicking **Start > All Programs > ASUS > PC Probe II > PC Probe II v1.xx.xx**. The PC Probe II main window appears.
- 3.     The PC Probe II icon appears in the Windows® notification area. Click this icon to close or restore the application.

**PC Probe II main window**



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



Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.

### 4.3.4 ASUS Express Gate

ASUS Express Gate is an instant-on environment that gives you quick access to the Internet, Skype, and viewing your pictures. Within a few seconds of powering on your computer, you will be at the Express Gate menu where you can start the web browser, Skype, or other Express Gate applications.

#### Notices about ASUS Express Gate



- Ensure to install ASUS Express Gate from the motherboard support DVD before use.
- ASUS Express Gate supports SATA devices in IDE mode only. See chapter 3 for BIOS setup details.
- ASUS Express Gate supports SATA devices connected to **motherboard chipset-controlled onboard SATA ports** only. All onboard extended SATA ports and external SATA ports are NOT supported. See chapter 2 for the exact location of onboard SATA ports.
- ASUS Express Gate supports file uploading from ODD and USB drives and downloading to USB drives only.
- ASUS Express Gate supports installation on SATA HDDs, USB HDDs and Flash drives. When installed on USB HDDs and Flash drives, connect the drives to the motherboard USB port before turning on the computer.
- Your monitor must support the screen resolution of **1024 x 768**, or ASUS Express Gate will be skipped during the booting process, and the existing OS will be launched directly.

#### The First Screen

Express Gate's first screen appears within a few seconds after you power on the computer.




Click any of the application icons to enter Express Gate environment and launch the selected application

Turn off the computer

Continue booting to existing OS when the timer above the Exit icon counts down to zero (0); click to immediately enter existing OS




- To enter the motherboard BIOS setup program, click **Exit** on the Express Gate First Screen, and then press the <Del> key during POST.
- See the software manual in the bundled motherboard support DVD or click  in the Express Gate environment for detailed software instructions.

### 4.3.5 ASUS AI Suite

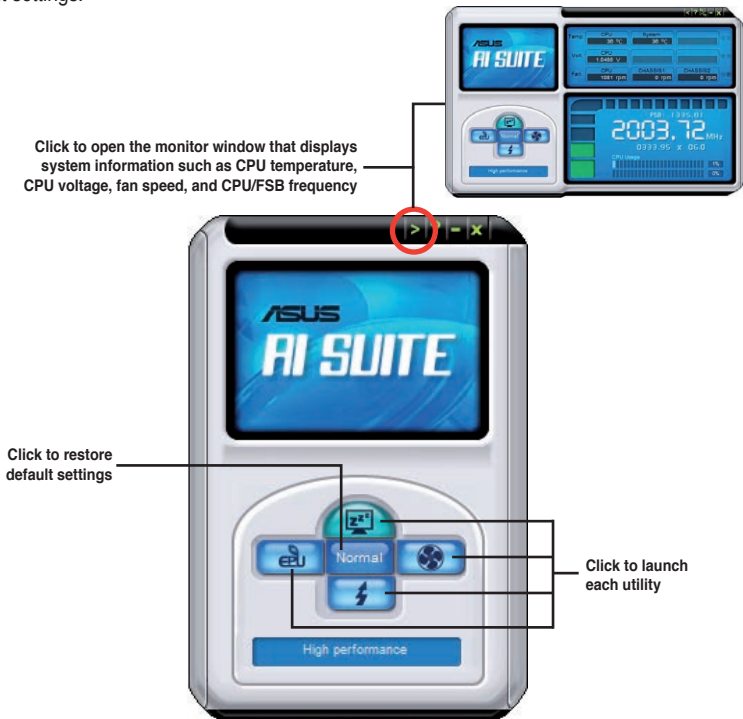
ASUS AI Suite allows you to launch several ASUS utilities easily.

#### Launching AI Suite

1. Install AI Suite from the motherboard support DVD.
2. Launch AI Suite by clicking **Start > All Programs > ASUS > AI Suite > AI Suite v1.xx**. The AI Suite main window appears.
3. The AI Suite icon  appears in the Windows® notification area. If you minimize the application main window, click this icon to restore the window.

#### Using AI Suite

Click each utility button to launch the utility, or click the **Normal** button to restore system default settings.




- The screenshots in this section are for reference only. The actual utility buttons vary by models.
- Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.

### 4.3.6 ASUS EPU

ASUS EPU is an energy-efficient tool that provides you with a total system power-saving solution. It detects the current computer loading and intelligently adjusts the power in real-time. With auto phase switching for components, the EPU automatically provides the most appropriate power usage via intelligent acceleration and overclocking

ASUS EPU provides you with these modes to choose from:

-  **Turbo Mode**
-  **High Performance Mode**
-  **Maximum Power Saving Mode**

When you select **Auto Mode** , the system shifts modes automatically according to the current system status. You can also configure advanced settings for each mode.

#### Launching EPU

After installing EPU from the motherboard support DVD, double-click the EPU tray icon to launch the program.



#### EPU main menu



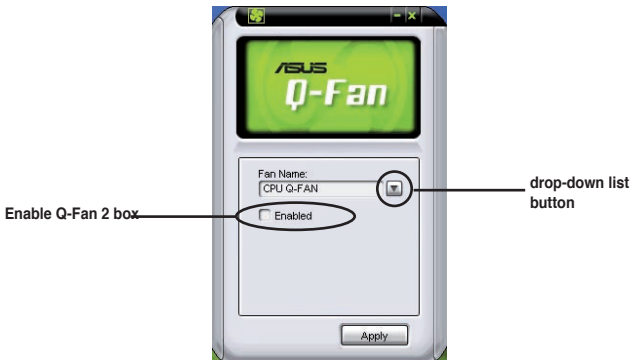
Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.

### 4.3.7 ASUS Q-Fan 2

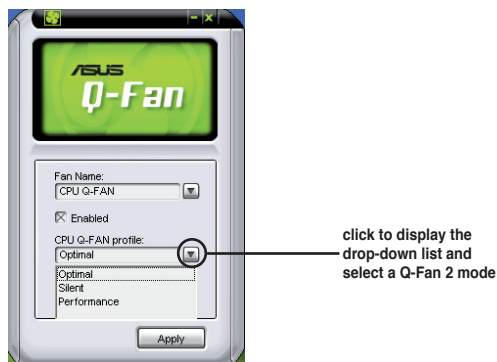
This ASUS Q-Fan 2 Control feature allows you to set the appropriate performance level of the CPU Q-Fan 2 or the Chassis Q-Fan 2 for more efficient system operation. After enabling the Q-Fan 2 function, the fans can be set to automatically adjust depending on the temperature, to decrease fan speed, or 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 2 button on the AI Suite main window.

Click the drop-down menu button and display the fan names. Select **CPU Q-Fan 2** or **CHASSIS Q-Fan 2**. Click the box of **Enable Q-Fan 2** to activate this function.



**Profile** list appears after clicking the **Enable Q-Fan 2** 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.

### 4.3.8 ASUS AI Nap

ASUS AI Nap 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.

#### Using ASUS AI Nap

1. After installing ASUS AI Suite from the motherboard support DVD, double-click the ASUS Q-Button icon in the Windows notification area to launch the Q-Button user interface.
2. Select **AI Nap**, then click **Apply** to enable AI Nap function.
3. Press the power button to enter AI Nap mode.  
Press the power button again to exit AI Nap mode.





### 4.3.9 ASUS TurboV

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



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



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

### Launching ASUS TurboV

- Install the ASUS TurboV utility from the motherboard support DVD.
- Click **Start > All Programs > ASUS > TurboV > TurboV**.

Load existing ASUS Turbo profiles. Three pre-defined profiles are provided: "Race Car", "Jet Plane", and "Rocket".

Save the current settings as a new profile

The screenshot shows the ASUS TurboV application window. It has a 'Profiles' dropdown menu and a 'Save Profile' button. The main area displays several settings with sliders and input fields:

- Target settings:** CPU Frequency (200 MHz), CPU Voltage (1.3000 V), DRAM Volt (1.90 V), CPU/NB Voltage (1.4000 V).
- Default settings:** CPU Voltage (1.3000 V), DRAM Volt (1.90 V), CPU/NB Voltage (1.4000 V).
- Click to show more settings:** More Setting button.
- Advanced CPU and chipset voltage settings:** Advance Mode and CPU Ratio tabs.
- Adjusts CPU core ratio:** CPU Ratio tab.
- Voltage Adjustment bars:** Sliders for CPU Voltage, DRAM Volt, and CPU/NB Voltage.
- Applies all changes immediately:** Apply button.
- Undoes all changes without applying:** Undo button.

Annotations with red lines point to these specific features in the screenshot.



- For advanced overclock ability, adjust first the BIOS items, and then proceed more detailed adjustments using TurboV.
- Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.



- Only AMD® Black Edition processors support the CPU Ratio function.
- Set the **CPU Ratio** item in BIOS to [Auto] before using the CPU Ratio function in TurboV. See chapter 3 for details.

### 4.3.10 ASUS Turbo Key

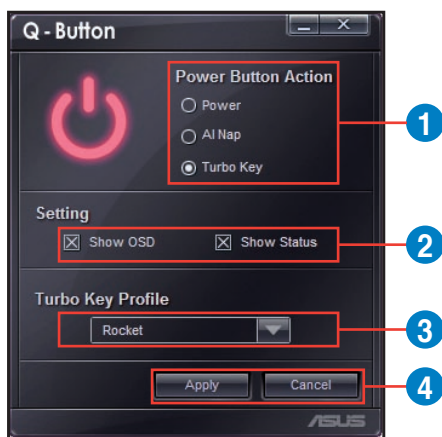
ASUS Turbo Key allows the user to turn the PC power button into a physical overclocking button. After the easy setup, Turbo Key can boost performances without interrupting ongoing work or games—with just one touch!

#### Launching ASUS Turbo Key

1. Install ASUS AI Suite from the motherboard support DVD.
2. Restart your computer. ASUS Q-Button automatically starts after Windows start-up.
3. Double-click the ASUS Q-Button icon in the Windows notification area to launch the Q-Button user interface.



#### Configuring ASUS Turbo Key



1. Select your desired power button action. Select Power to keep the power button as a common switch. Select AI Nap to enter ASUS AI Nap mode after pressing the power button. Select Turbo Key to boost system performance after pressing the power button.
2. You can choose whether to show Q-Button OSD and status by clicking the check boxes in the Setting section.
3. You can decide the performance boost level by selecting Turbo Key Profile. You can also load personal profiles saved in the ASUS TurboV utility. The default is "Rocket Mode". See your motherboard manual for ASUS TurboV configurations.
4. Click Apply for all settings to take effect.

#### Using ASUS Turbo Key

Press the power button on your computer chassis to use the Turbo Key function defined in the Q-Button user interface. Press the power button again to turn off the Turbo Key function.



Press and hold the power button for 4 seconds will turn off your computer.



Refer to the software manual in the support DVD or visit the ASUS website at [www.asus.com](http://www.asus.com) for detailed software configuration.

## 4.4 RAID configurations

The motherboard comes with the NVIDIA nForce 980a SLI chipset that allows you to configure Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations: RAID 0, RAID 1, RAID 0+1 and JBOD.

### 4.4.1 RAID definitions

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

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

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

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 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 Windows XP, If you want to boot the system from a hard disk drive included in a RAID set, first copy 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 **4.5 Creating a RAID driver disk** for details.

---

## 4.4.2 Installing Serial ATA hard disks

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

To install the SATA hard disks for a RAID configuration:

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

## 4.4.3 Setting the RAID item in BIOS

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

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



---

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

---



---

Due to chipset limitation, when set any of SATA ports to RAID mode, all SATA ports run at RAID mode together.

---

### 4.4.4 NVIDIA® MediaShield BIOS RAID configurations

To enter the NVIDIA® MediaShield BIOS RAID utility

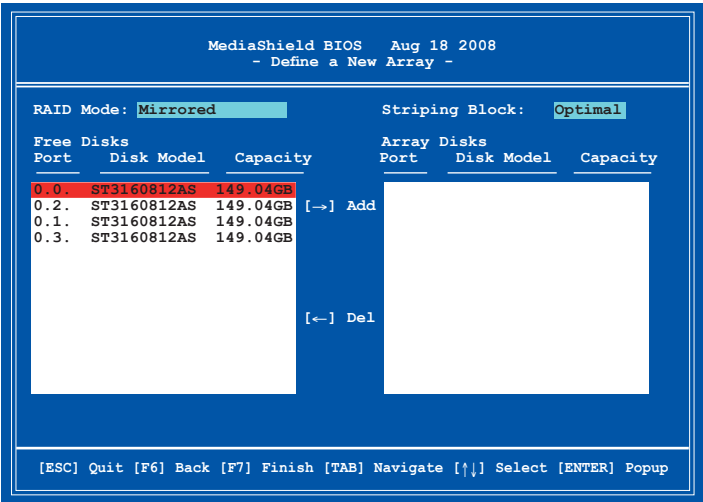
1. Boot up your computer.
2. During POST, press <F10> to display the main menu of the utility.



- The RAID BIOS setup screens shown in this section are for reference only, and may not exactly match the items on your screen.
- Ensure to re-enter your MediaShield 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 Guide” found in your motherboard support DVD.
- When using Windows® XP operating system, ensure to install the Windows® XP Service Pack 2 or later versions.



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:

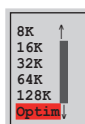
1. From the **Define a New Array** screen, use the <TAB> key to highlight the **RAID Mode** field, and then press <Enter>. The following sub-menu appears.

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



2. Press <TAB> to highlight the **Stripe Block** field, and then press <Enter>. The following sub-menu appears:

Use the up or down arrow keys to select the stripe size for your RAID array, and then press <Enter>. The available values range from 8 KB to 128 KB. The default selection is Optimal. The strip value should be chosen based on the planned drive usage.

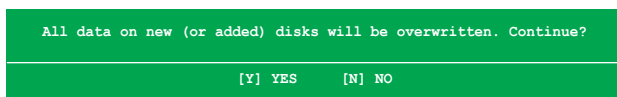


- 8 /16 KB - low disk usage
- 64 KB - typical disk usage
- 128 KB - performance disk usage



- 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.
- Stripe block size selection is not available for **Mirrored** or **Spanned** RAID arrays.

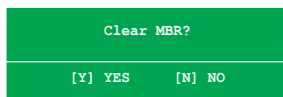
3. Press <TAB> to highlight the **Free Disks** field. Use the left or right arrow keys to assign the array disks.
4. Press <F7> to create RAID set. The following message box appears.



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!



6. Press <Y> to clear the MBR.

The Array List screen appears, where you can review the RAID arrays that you have set up.

Mediashield BIOS Aug 18 2008				
- Array List -				
Boot	Status	Vendor	Array	Size
	Healthy	NVIDIA	MIRROR	447.14G
[Ctrl+X] Exit [↑↓] Select [B] Set Bootable [N] New Array [ENTER] Detail				

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

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

## Rebuilding a RAID array

To rebuild a RAID array

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

```

Array 4 : NVIDIA MIRROR 149.04G
          - Array Detail -

```

---

```

RAID Mode: Mirrored
Striping Width: 1           Striping Block: 64K

```

Port	Index	Disk Model	Capacity
0.0	0	WDC1600AAJS-22PSA0	149.05G
0.1	1	WDC1600AAJS-22PSA0	149.05G

---

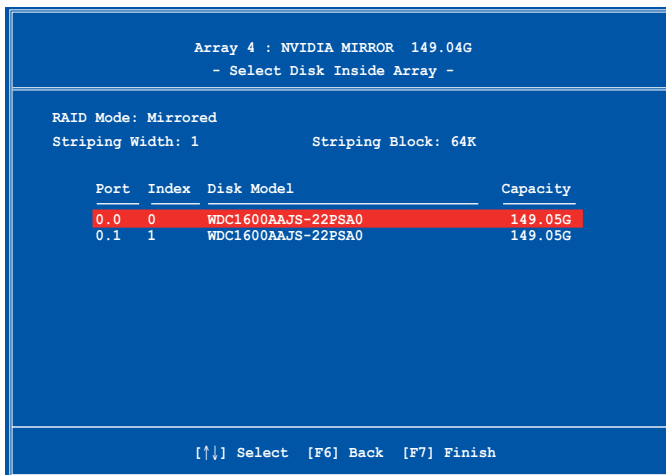
```

[R] Rebuild [D] Delete [C] Clear MBR [V] remove Vol [ENTER] Return

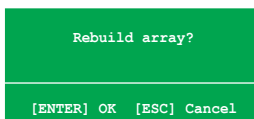
```

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.



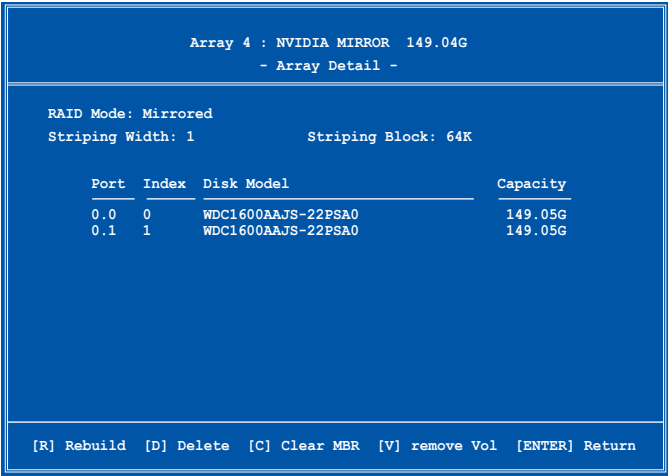
You will need to enter Window® XP/Vista and run the NVIDIA utility in order to complete the rebuild process.



Deleting a RAID array

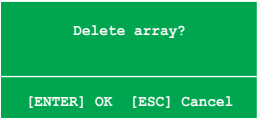
To delete a RAID array

- 1. From the **Array List** screen, use the up or down arrow keys to select a RAID array, and 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.



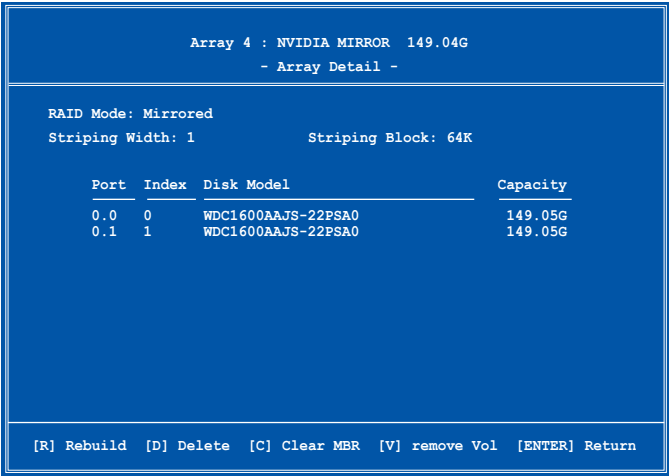
Take caution in using this option. All data on the RAID drives will be lost!

- 4. If you deleted all existing arrays, the **Define a New Array** screen appears again.

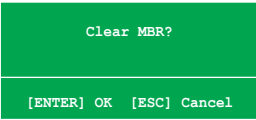
### Clearing a disk MBR

To clear disk MBR

1. From the **Array List** screen, use the up or down arrow keys to select a RAID array, and 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 MBR. The following confirmation message appears.



3. Press <Y> to clear the disk MBR or press <N> to cancel.



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

## 4.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® XP operating system on a hard disk drive that is included in a RAID set. For Windows® Vista operating system, use either a floppy disk or a USB device with the RAID driver.




---

The motherboard does not provide a floppy drive connector. You have to use a USB floppy drive when creating a SATA RAID driver disk.

---

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

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

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

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

To create a RAID driver disk in Windows®:

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




---

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

---

To install the RAID driver in Windows® XP:

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

To install the RAID driver in Windows® Vista:

1. Insert the floppy disk/USB device with RAID driver into the floppy disk drive/USB port.
2. During the OS installation, select **NVIDIA RAID Driver**.
3. Follow the succeeding screen instructions to complete the installation.

[illegible]

## 5.1 NVIDIA® SLI™ technology

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

### 5.1.1 Requirements

- In Dual SLI mode, you should have two identical SLI-ready graphics cards that are NVIDIA® certified.
- In Triple SLI mode, you should have three identical SLI-ready graphics cards that are NVIDIA® certified.
- Ensure that your graphics card driver supports the NVIDIA SLI technology. Download the latest driver from the NVIDIA website ([www.nvidia.com](http://www.nvidia.com)).
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See page 2-34 for details.



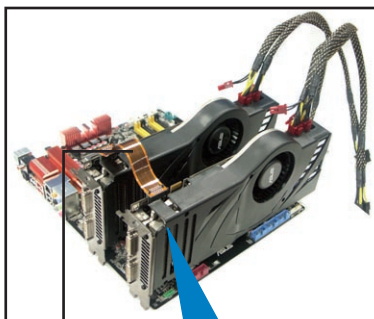
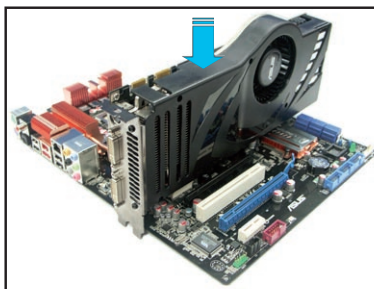
- 
- We recommend that you install additional chassis fans for better thermal environment.
  - The NVIDIA 3-Way SLI technology is supported by Windows® Vista™ operating system only.
  - Visit the NVIDIA zone website (<http://www.nzone.com>) for the latest certified graphics card and supported 3D application list.
-

## 5.1.2 Installing two SLI-ready graphics cards



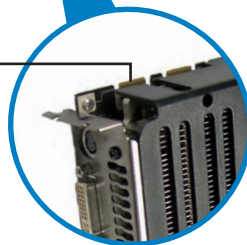
The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

1. Prepare two SLI-ready graphics cards.
2. Insert the two graphics card into the PCIEX16 slots. If your motherboard has more than two PCIEX16 slots, refer to Chapter 2 in this user manual for the locations of the PCIEX16 slots recommended for multi-graphics card installation.
3. Ensure that the cards are properly seated on the slots.
4. Align and firmly insert the SLI bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.
5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.
6. Connect a VGA or a DVI cable to the graphics card.



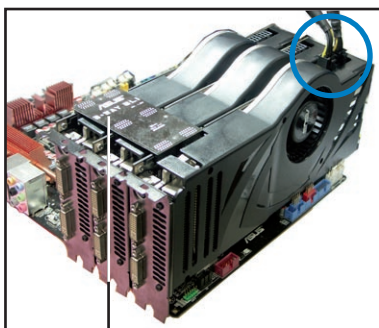
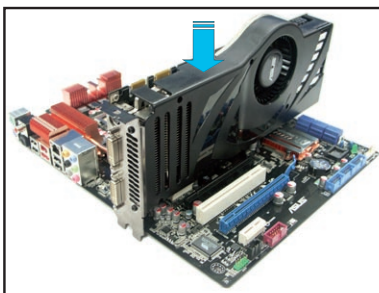
SLI bridge

Goldfingers



### 5.1.3 Installing three SLI-ready graphics cards

1. Prepare three SLI-ready graphics cards.
2. Insert the three graphics card into the PCIEX16 slots. If your motherboard has more than two PCIEX16 slots, refer to Chapter 2 in this user manual for the locations of the PCIEX16 slots recommended for multi-graphics card installation.
3. Ensure that the cards are properly seated on the slots.
4. Align and firmly insert the 3-Way SLI bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.
5. Connect three independent auxiliary power sources from the power supply to the three graphics cards separately.
6. Connect a VGA or a DVI cable to the graphics card.



3-Way SLI bridge

## 5.1.4 Installing the device drivers

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



- Ensure that your PCI Express graphics card driver supports the NVIDIA® SLI™ technology. Download the latest driver from the NVIDIA website at [www.nvidia.com](http://www.nvidia.com).
- If you are using a 3-Way SLI system, ensure to install the NVIDIA® 3-way SLI driver under Windows® Vista. The NVIDIA 3-way SLI technology is supported by Windows® Vista only.

## 5.1.5 Enabling the NVIDIA® SLI™ technology

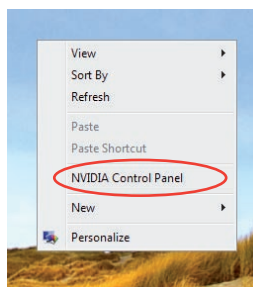
After installing your graphics cards and the device drivers, enable the SLI feature in NVIDIA® Control Panel under the Windows® Vista™ operating system.

### Launching the NVIDIA Control Panel

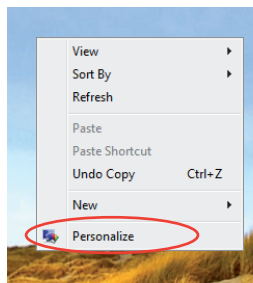
You can launch the NVIDIA Control Panel by the following two methods.

- A. Right click on the empty space of the Windows® desktop and select **NVIDIA Control Panel**.

The NVIDIA Control Panel window appears (See Step B5 on page 5-6).

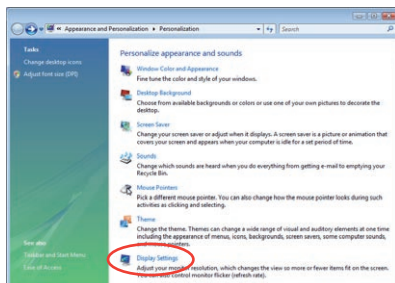


- B1. If you cannot see the NVIDIA Control Panel item in step (A), select **Personalize**.

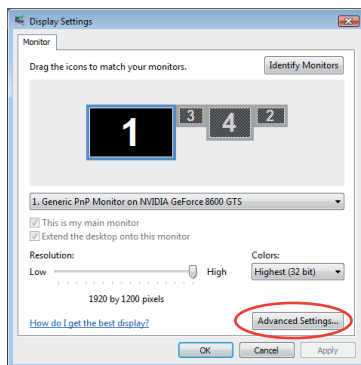




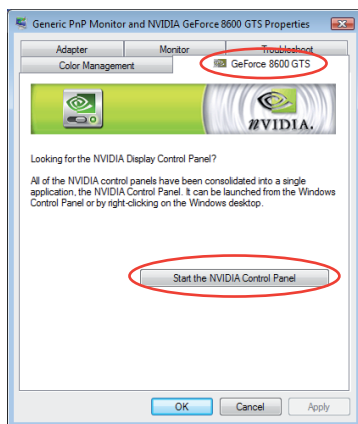
- B2. From the **Personalization** window, select **Display Settings**.



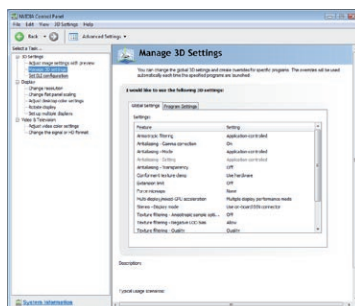
- B3. From the Display Settings dialog box, click **Advanced Settings**.



- B4. Select the NVIDIA GeForce tab, and then click **Start the NVIDIA Control Panel**.

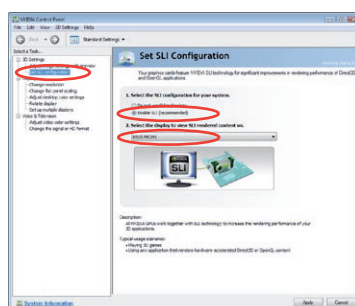


B5. The NVIDIA Control Panel window appears.



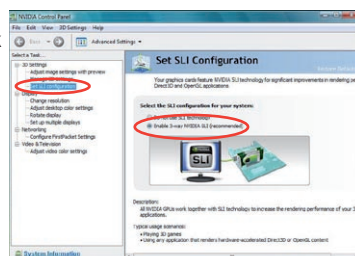
## Enabling Dual SLI settings

From the NVIDIA Control Panel window, select **Set SLI Configuration**. Click **Enable SLI** and set the display for viewing SLI rendered content. When done, click **Apply**.

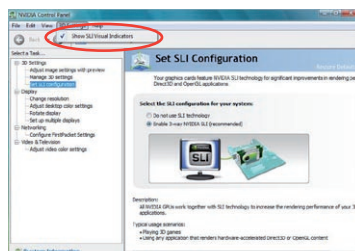


## Enabling Triple SLI settings

1. From the NVIDIA Control Panel window, select **Set SLI Configuration**, and then click **Enable 3-way NVIDIA SLI**. When done, click **Apply**.
2. Select the **3D Settings** tab and enable the **Show SLI Visual Indicators** item.



When this item is enabled, a green bar appears on the left side of the screen while 3D demonstrations are rendered, indicating the 3-way SLI status.



## 5.2 NVIDIA® Hybrid SLI® Technology

The motherboard supports the NVIDIA® Hybrid SLI® technology with GeForce® Boost. GeForce® Boost enhances the performance of NVIDIA discrete Graphics Process Units (dGPU) when they work with the onboard motherboard GPU (mGPU).



- This motherboard supports GeForce Boost only. Hybrid Power is not supported.
- Hybrid SLI technology is supported by Windows® Vista™ only.
- Hybrid SLI technology requires at least 2GB system memory to activate.
- GeForce Boost supports up to two displays simultaneously (both connected to the dGPU).
- GeForce Boost are supported by certain set of dGPUs. Go to [www.nvidia.com/hybridSLI](http://www.nvidia.com/hybridSLI) to learn the supported GPUs.

### 5.2.1 System requirements

Before using Hybrid SLI, ensure if your system meets the following requirements:

#### For best GeForce Boost performance

- AMD Phenom 9600 CPU (operating at 1800Mhz or higher)
- 2 x 1024MB of DDR2-800 DRAM
- Discrete GPU recommended for GeForce Boost
- At least 256MB of Frame Buffer carve out for the motherboard GPU

## 5.2.2 Enabling GeForce® Boost™



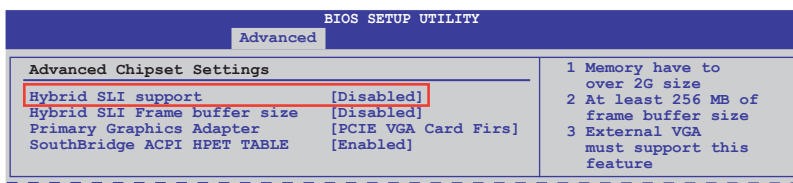
Before enabling GeForce Boost, ensure that you have installed a dGPU recommended for GeForce Boost on your motherboard.

### GeForce Boost

1. Turn on the system and press <Del> during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
2. Go to **Advanced > Chipset > SouthBridge Configuration** and set the **Hybrid SLI support** item to [Auto]. See **section 3.6.2 Chipset** for details.



The Hybrid Support item becomes user-configurable only when a dGPU is detected. Ensure that your dGPU is properly installed.



3. Save your changes and Exit Setup.
4. Place the motherboard support DVD into the optical drive, and go to the **Drivers** menu to install the **NVIDIA Chipset Driver Program**.
5. Restart the system.
6. If the driver is correctly installed, you will find the Hybrid SLI icon on the taskbar.

The Hybrid SLI icon indicates that the system is in Performance mode and that GeForce Boost is enabled. The onboard GPU will share the rendering load with the dGPU and boost the performance of the dGPU.



Visit [www.asus.com](http://www.asus.com) for the latest chipset driver.

