



Penryn1600SLI-110dB

User Manual

Version 1.1

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

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Chapter 1 Introduction

Thank you for purchasing ASRock **Penryn1600SLI-110dB** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>
If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

- 1 x ASRock **Penryn1600SLI-110dB** Motherboard
(ATX Form Factor: 12.0-in x 9.0-in, 30.5 cm x 22.9 cm)
- 1 x ASRock SLI Bridge
- 1 x ASRock **Penryn1600SLI-110dB** Quick Installation Guide
- 1 x ASRock **Penryn1600SLI-110dB** Support CD
- 1 x Ultra ATA 66/100/133 IDE Ribbon Cable (80-conductor)
- 1 x 3.5-in Floppy Drive Ribbon Cable
- 4 x Serial ATA (SATA) Data Cables (Optional)
- 1 x Serial ATA (SATA) HDD Power Cable (Optional)
- 1 x HDMI_SPDIF Cable (Optional)
- 1 x "ASRock WiFi_SPDIF I/O Plus" I/O Shield

1.2 Specifications

Platform	<ul style="list-style-type: none">- ATX Form Factor: 12.0-in x 9.0-in, 30.5 cm x 22.9 cm- All Solid Capacitor design
CPU	<ul style="list-style-type: none">- LGA 775 for Intel® Core™ 2 Extreme / Core™ 2 Quad / Core™ 2 Duo / Pentium® Dual Core / Celeron®, supporting Penryn Quad Core Yorkfield and Dual Core Wolfdale processors- Compatible with all FSB1600/1333/1066/800MHz CPUs (see CAUTION 1)- Supports Hyper-Threading Technology (see CAUTION 2)- Supports Untied Overclocking Technology (see CAUTION 3)- Supports EM64T CPU
Chipset	<ul style="list-style-type: none">- Northbridge: NVIDIA® 740i SLI / 650i SLI- Southbridge: NVIDIA® nForce 430
Memory	<ul style="list-style-type: none">- Dual Channel DDR2 Memory Technology (see CAUTION 4)- 4 x DDR2 DIMM slots- Support DDR2 800/667/533 non-ECC, un-buffered memory- Max. capacity of system memory: 8GB (see CAUTION 5)
Expansion Slot	<ul style="list-style-type: none">- 1 x PCI Express x16 slot (White)- 2 x PCI Express x8 slots (Yellow; for NVIDIA® SLI™ only)- 1 x PCI Express x1 slot- 3 x PCI slots- Supports NVIDIA® SLI™ (see CAUTION 6)
Audio	<ul style="list-style-type: none">- 7.1 CH Windows® Vista™ Premium Level HD Audio with Content Protection- DAC with 110dB dynamic range (ALC890 Audio Codec)
LAN	<ul style="list-style-type: none">- Gigabit LAN 10/100/1000 Mb/s- Giga PHY Realtek RTL8211B- Supports Wake-On-LAN
Rear Panel I/O	<p>ASRock WiFi_SDIF I/O Plus</p> <ul style="list-style-type: none">- 1 x PS/2 Mouse Port- 1 x PS/2 Keyboard Port- 1 x Serial Port: COM1- 1 x Parallel Port (ECP/EPP Support)- 1 x Coaxial SPDIF Out Port- 1 x Optical SPDIF Out Port- 4 x Ready-to-Use USB 2.0 Port- 1 x RJ-45 LAN Port- 2 x RJ-45 LAN Port LED (ACT/LINK LED and SPEED LED)- 1 x IEEE 1394 Port

	- HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/ Line in/Front Speaker/Microphone (see CAUTION 7)
Connector	- 4 x SATAII 3.0Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 0+1, RAID 5 and JBOD) and NCQ functions (see CAUTION 8) - 2 x ATA133 IDE connectors (support 4 x IDE devices) - 1 x Floppy connector - 1 x IR header - 1 x IR header - 1 x HDMI_SPDIF header - 1 x IEEE 1394 header - CPU/Chassis FAN connector - 24 pin ATX power connector - 8 pin 12V power connector - SLI/XFIRE power connector - CD in header - Front panel audio connector - 1 x USB 2.0 header (supports 2 USB 2.0 ports) (see CAUTION 9) - 1 x WiFi/E header (see CAUTION 10)
BIOS Feature	- 8Mb AMI BIOS - AMI Legal BIOS - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - AMBIOS 2.3.1 Support - CPU, DRAM, NB, SB, VTT Voltage Multi-adjustment
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version)
Unique Feature	- ASRock OC Tuner (see CAUTION 11) - Hybrid Booster: - CPU Frequency Stepless Control (see CAUTION 12) - ASRock U-COP (see CAUTION 13) - Boot Failure Guard (B.F.G.)
Hardware Monitor	- CPU Temperature Sensing - Chassis Temperature Sensing - CPU Fan Tachometer - Chassis Fan Tachometer - CPU Quiet Fan - Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore
OS	- Microsoft® Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit compliant
Certifications	- FCC, CE, WHQL

* For detailed product information, please visit our website: <http://www.asrock.com>

WARNING

Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

CAUTION!

1. FSB1600-CPU will operate in overclocking mode.
2. About the setting of "Hyper Threading Technology", please check page 40.
3. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 35 for details.
4. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 17 for proper installation.
5. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® XP and Windows® Vista™. For Windows® XP 64-bit and Windows® Vista™ 64-bit with 64-bit CPU, there is no such limitation.
6. This motherboard supports NVIDIA® SLI™ technology. PCIE2 and PCIE4 slots (yellow) are intended for SLI™ function. If you plan to install only one PCI Express VGA card to this motherboard, please install it to PCIE3 slot. For the information of the compatible SLI™ Mode PCI Express VGA cards, please refer to the "Supported PCI Express VGA Card List for SLI™ Mode" on page 10. For the proper installation of PCI Express VGA card, please refer to the installation guide on page 19.
7. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 12 for proper connection.
8. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 31 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
9. Power Management for USB 2.0 works fine under Microsoft® Windows® Vista™ 64-bit / Vista™ / XP 64-bit / XP SP1 or SP2 / 2000 SP4.
10. WiFi/E header supports WiFi+AP function with ASRock WiFi-802.11g or WiFi-802.11n module, an easy-to-use wireless local area network (WLAN) adapter. It allows you to create a wireless environment and enjoy the convenience of wireless network connectivity. Please visit our website for the availability of ASRock WiFi-802.11g or WiFi-802.11n module. ASRock website <http://www.asrock.com>

11. It is a user-friendly ASRock overclocking tool which allows you to surveil your system by hardware monitor function and overclock your hardware devices to get the best system performance under Windows® environment. Please visit our website for the operation procedures of ASRock OC Tuner. ASRock website: <http://www.asrock.com>
12. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
13. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.

1.3 Minimum Hardware Requirement Table for Windows® Vista™ Premium 2008 and Basic Logo

For system integrators and users who purchase this motherboard and plan to submit Windows® Vista™ Premium 2008 and Basic logo, please follow below table for minimum hardware requirements.

CPU	Celeron 420
Memory	1GB system memory (Premium)
	512MB Single Channel (Basic)
VGA	DX10.0 with WDDM Driver
	with 128bit VGA memory (Premium)
	with 64bit VGA memory (Basic)

* After June 1, 2008, all Windows® Vista™ systems are required to meet above minimum hardware requirements in order to qualify for Windows® Vista™ Premium 2008 logo.

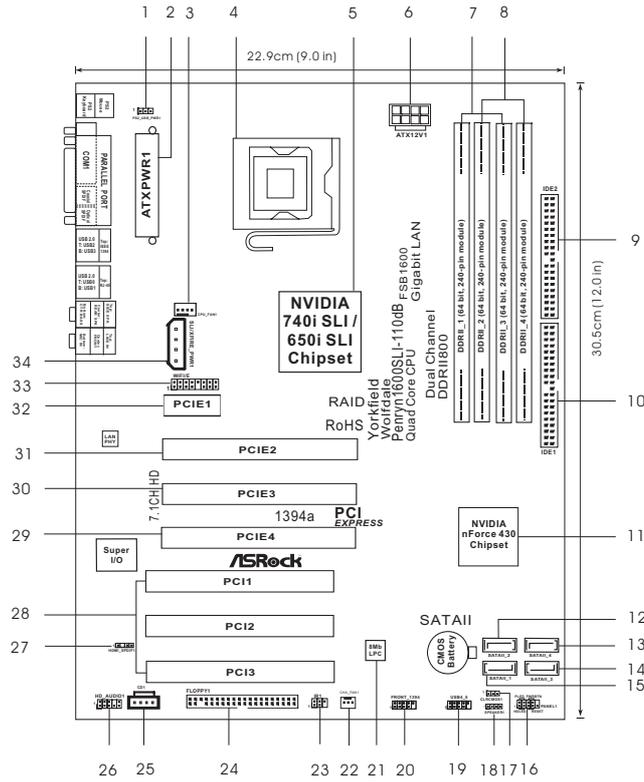
1.4 Supported PCI Express VGA Card List for SLI™ Mode

(for Windows® XP / XP 64-bit / Vista™ / Vista™ 64-bit only)

Graphics Chip Vendor	Model Name	Chipset Name
NVIDIA	ASUS EN8800GTX	GeForce 8800GTX
	ASUS EN8600GT/2DHT	GeForce 8600GT
	ASUS EN7950GX2 *	GeForce 7950GX2
	ASUS EN7900GT TOP	GeForce 7900GT
	ASUS EN7800GT	GeForce 7800GT
	ASUS EN7600GSSILENT	GeForce 7600GT
	ASUS EN7600GT/2DHT	GeForce 7600GS
	ASUS EN6800LE	GeForce 6800LE
	ASUS Extreme N6800/TD	GeForce 6800
	ALBATRON PC6600GT	GeForce 6600GT
	GIGABYTE GV-NX66256DP2	GeForce 6600
	LEADTEK PX7900GS TDH	GeForce 7900GS
	LEADTEK PX7300GS TDH *	GeForce 7300GS
	MSI 7300GT-TD256EH	GeForce 7300GT

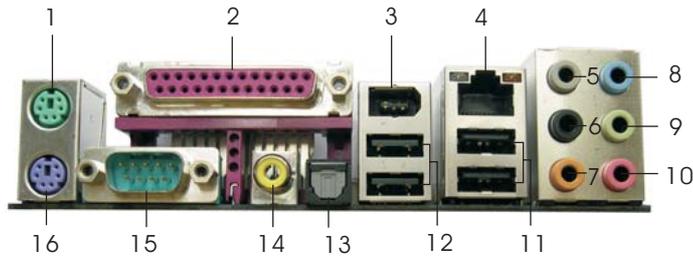
* These two cards can only work under Windows® XP / XP 64-bit OS.
For the latest updates of the supported PCI Express VGA card list for SLI™ Mode,
please visit our website for details.
ASRock website: <http://www.asrock.com/support/index.htm>

1.5 Motherboard Layout



- | | | | |
|----|--|----|---|
| 1 | PS2_USB_PW1 Jumper | 18 | Chassis Speaker Header (SPEAKER 1) |
| 2 | ATX Power Connector (ATXPWR1) | 19 | USB 2.0 Header (USB4_5, Blue) |
| 3 | CPU Fan Connector (CPU_FAN1) | 20 | Front Panel IEEE 1394 Header (FRONT_1394) |
| 4 | 775-Pin CPU Socket | 21 | LPC |
| 5 | North Bridge Controller | 22 | Chassis Fan Connector (CHA_FAN1) |
| 6 | ATX 12V Power Connector (ATX12V1) | 23 | Infrared Module Header (IR1) |
| 7 | 2 x 240-pin DDR2 DIMM Slots (Dual Channel A: DDRII_1, DDRII_3; Yellow) | 24 | Floppy Connector (FLOPPY1) |
| 8 | 2 x 240-pin DDR2 DIMM Slots (Dual Channel B: DDRII_2, DDRII_4; Orange) | 25 | Internal Audio Connector: CD1 (Black) |
| 9 | Secondary IDE Connector (IDE2, Black) | 26 | Front Panel Audio Header (HD_AUDIO1) |
| 10 | Primary IDE Connector (IDE1, Blue) | 27 | HDMI_SPDIF Header (HDMI_SPDIF1) |
| 11 | South Bridge Controller | 28 | PCI Slots (PCI1- 3) |
| 12 | Secondary SATAII Connector (SATAII_2) | 29 | PCI Express x8 Slot (PCIE4, Yellow) |
| 13 | Fourth SATAII Connector (SATAII_4) | 30 | PCI Express x16 Slot (PCIE3, White) |
| 14 | Third SATAII Connector (SATAII_3) | 31 | PCI Express x8 Slot (PCIE2, Yellow) |
| 15 | Primary SATAII Connector (SATAII_1) | 32 | PCI Express x1 Slot (PCIE1, White) |
| 16 | System Panel Header (PANEL1) | 33 | WiFi/E Header (WIFI/E) |
| 17 | Clear CMOS Jumper (CLRCMOS1) | 34 | SLI / XFIRE Power Connector |

1.6 ASRock WiFi_SPDIF I/O Plus



- | | |
|---------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | ** 9 Front Speaker (Lime) |
| 2 Parallel Port | 10 Microphone (Pink) |
| 3 IEEE 1394 Port | 11 USB 2.0 Ports (USB01) |
| * 4 LAN RJ-45 Port | 12 USB 2.0 Ports (USB23) |
| 5 Side Speaker (Gray) | 13 Optical SPDIF Out Port |
| 6 Rear Speaker (Black) | 14 Coaxial SPDIF Out Port |
| 7 Central / Bass (Orange) | 15 COM Port |
| 8 Line In (Light Blue) | 16 PS/2 Keyboard Port (Purple) |

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

LAN Port LED Indications

Activity/Link LED		SPEED LED		 LAN Port
Status	Description	Status	Description	
Off	No link	Off	10Mbps connection	
Orange	Linked	Orange	100Mbps connection	
Blinking	Data Activity	Green	1Gbps connection	

** If you use 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.

TABLE for Audio Output Connection

Audio Output Channels	Front Speaker (No. 9)	Rear Speaker (No. 6)	Central / Bass (No. 7)	Side Speaker (No. 5)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find "Mixer" tool on your system. Please select "Mixer ToolBox"  , click "Enable playback multi-streaming", and click

"ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio.

Chapter 2 Installation

This is an ATX form factor (12.0" x 9.0", 30.5 x 22.9 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

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



Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

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

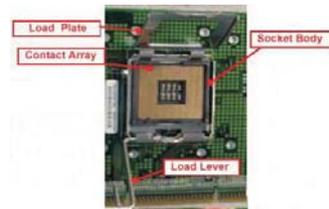
1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 CPU Installation

For the installation of Intel 775-LAND CPU, please follow the steps below.



775-Pin Socket Overview



Before you insert the 775-LAND CPU into the socket, please check if the CPU surface is unclean or if there is any bent pin on the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

Step 1. Open the socket:

Step 1-1. Disengaging the lever by depressing down and out on the hook to clear retention tab.



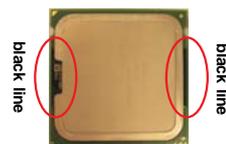
Step 1-2. Rotate the load lever to fully open position at approximately 135 degrees.

Step 1-3. Rotate the load plate to fully open position at approximately 100 degrees.

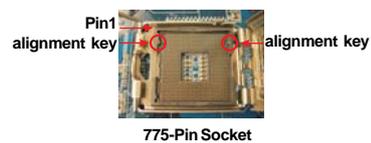
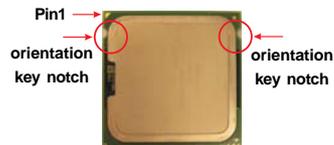


Step 2. Insert the 775-LAND CPU:

Step 2-1. Hold the CPU by the edges where are marked with black lines.



Step 2-2. Orient the CPU with IHS (Integrated Heat Sink) up. Locate Pin1 and the two orientation key notches.





For proper inserting, please ensure to match the two orientation key notches of the CPU with the two alignment keys of the socket.

Step 2-3. Carefully place the CPU into the socket by using a purely vertical motion.

Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.



Step 3. Remove PnP Cap (Pick and Place Cap):

Use your left hand index finger and thumb to support the load plate edge, engage PnP cap with right hand thumb and peel the cap from the socket while pressing on center of PnP cap to assist in removal.



1. It is recommended to use the cap tab to handle and avoid kicking off the PnP cap.
2. This cap must be placed if returning the motherboard for after service.

Step 4. Close the socket:

Step 4-1. Rotate the load plate onto the IHS.

Step 4-2. While pressing down lightly on load plate, engage the load lever.

Step 4-3. Secure load lever with load plate tab under retention tab of load lever.



2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 775-Pin socket that supports Intel 775-LAND CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 775-LAND CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector (CPU_FAN1, see page 11, No. 3).

For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.

Below is an example to illustrate the installation of the heatsink for 775-LAND CPU.

Step 1. Apply thermal interface material onto center of IHS on the socket surface.



Step 2. Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU_FAN1, see page 11, No. 3).



Step 3. Align fasteners with the motherboard throughholes.

Step 4. Rotate the fastener clockwise, then press down on fastener caps with thumb to install and lock. Repeat with remaining fasteners.



If you press down the fasteners without rotating them clockwise, the heatsink cannot be secured on the motherboard.

Step 5. Connect fan header with the CPU fan connector on the motherboard.

Step 6. Secure excess cable with tie-wrap to ensure cable does not interfere with fan operation or contact other components.

2.5 Installation of Memory Modules (DIMM)

This motherboard provides four 240-pin DDR2 (Double Data Rate 2) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install **identical** (the same brand, speed, size and chip-type) DDR2 DIMM pair in the slots of the same color. In other words, you have to install **identical** DDR2 DIMM pair in **Dual Channel A** (DDRII_1 and DDRII_3; Yellow slots; see p.11 No.7) or **identical** DDR2 DIMM pair in **Dual Channel B** (DDRII_2 and DDRII_4; Orange slots; see p.11 No.8), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDR2 DIMMs for dual channel configuration, and please install **identical** DDR2 DIMMs in all four slots. You may refer to the Dual Channel Memory Configuration Table below.

Dual Channel Memory Configurations

	DDRII_1 (Yellow Slot)	DDRII_2 (Orange Slot)	DDRII_3 (Yellow Slot)	DDRII_4 (Orange Slot)
(1)	Populated	-	Populated	-
(2)	-	Populated	-	Populated
(3)*	Populated	Populated	Populated	Populated

* For the configuration (3), please install **identical** DDR2 DIMMs in all four slots.



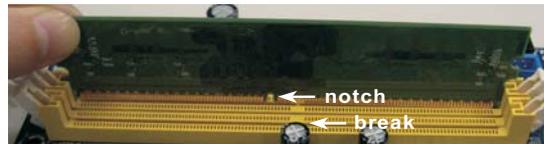
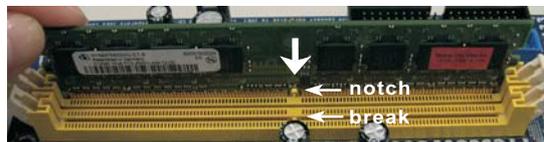
1. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of yellow slots (DDRII_1 and DDRII_3), or in the set of orange slots (DDRII_2 and DDRII_4).
2. If only one memory module or three memory modules are installed in the DDR2 DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.
3. If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDRII_1 and DDRII_2, it is unable to activate the Dual Channel Memory Technology .
4. It is not allowed to install a DDR memory module into DDR2 slot; otherwise, this motherboard and DIMM may be damaged.

Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

- Step 1. Unlock a DIMM slot by pressing the retaining clips outward.
Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.6 Expansion Slots (PCI and PCI Express Slots)

There are 3 PCI slots and 4 PCI Express slots on this motherboard.

PCI Slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIe Slots:

PCIe1 (PCIe x1 slot) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.

PCIe2 / PCIe4 (PCIe x8 slot) is used to install PCI Express expansion cards to support SLI™ function. For the information of the compatible SLI™ Mode PCI Express VGA cards, please refer to the “Supported PCI Express VGA Card List for SLI™ Mode” on page 10.

PCIe3 (PCIe x16 slot) is used for PCI Express cards with x16 lane width graphics cards.



1. This motherboard supports NVIDIA® SLI™ technology. PCIe2 and PCIe4 slots (yellow) are intended for SLI™ function only. It is not recommended to install other graphics cards on PCIe2 and PCIe4 slots, and we do not guarantee that your graphics cards can work successfully under this situation.
2. You can only choose to use either PCIe3 slot or PCIe2 / PCIe4 slot on this motherboard. If you plan to install only one PCI Express VGA card to this motherboard, please install it to PCIe3 slot.

Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

2.7 SLI™ Operation Guide

This motherboard supports NVIDIA® SLI™ (Scalable Link Interface) technology that allows you to install two identical NVIDIA® SLI™ enabled PCI Express x16 graphics cards. Currently, NVIDIA® SLI™ technology supports Windows® XP, XP 64-bit, Vista™ and Vista™ 64-bit OS. Please follow the installation procedures in this section.



SLI™ Technology Requirements

1. You should have two identical SLI™-ready graphics cards that are NVIDIA® certified.
2. Make sure that your graphics card driver supports the NVIDIA® SLI™ technology. Download the latest driver from the NVIDIA® website (www.nvidia.com).
3. Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.

Enjoy the benefit of SLI™

- Step 1. Install the identical SLI™-ready graphics cards that are NVIDIA® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE2 slot and another graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



- Step2. If required, connect an auxiliary power source to the PCI Express graphics cards.

- Step3. Align and insert the SLI Bridge to the goldfingers on each graphics card. Make sure that the SLI Bridge is firmly in place.



- Step4. Connect a VGA cable or a DVI-I cable to the monitor connector and the DVI connector of the graphics card that is inserted to PCIE2 slot.
- Step5. Connect a 4-pin ATX power cable to SLI/XFIRE power connector.



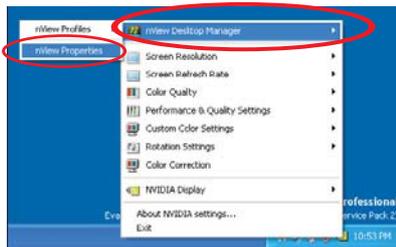
- Step6. Install the graphics card drivers to your system. After that, you can enable the Multi-Graphics Processing Unit (GPU) feature in the NVIDIA® nView system tray utility. Please follow the below procedures to enable the multi-GPU feature.

For Windows® XP / XP 64-bit OS:

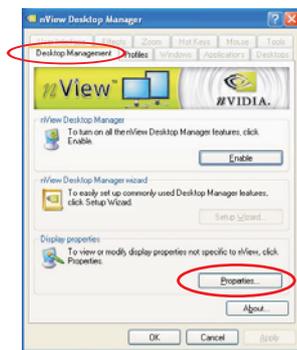
- A. Click the **NVIDIA Settings icon** on your Windows® taskbar.



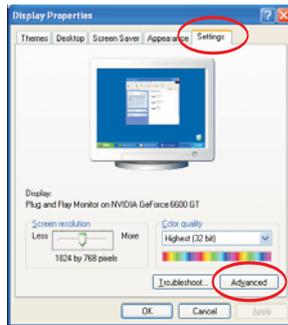
- B. From the pop-up menu, select **nView Desktop Manager**, and then click **nView Properties**.



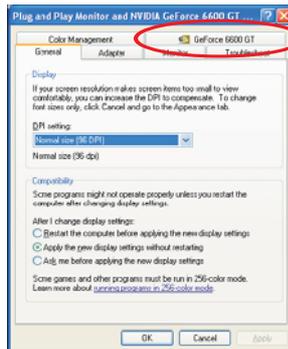
- C. From the nView Desktop Manager window, select the **Desktop Management** tab.
- D. Click **Properties** to display the Display Properties dialog box.



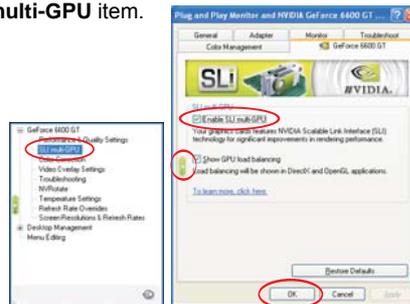
E. From the Display Properties dialog box, select the **Settings** tab then click **Advanced**.



F. Select the **NVIDIA GeForce** tab.



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

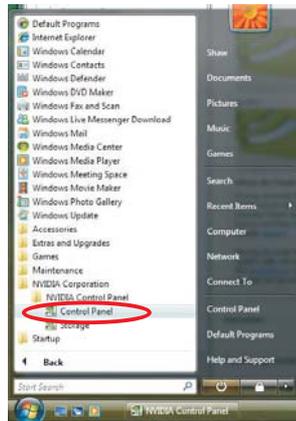


H. Click the **Enable SLI multi-GPU** check box.

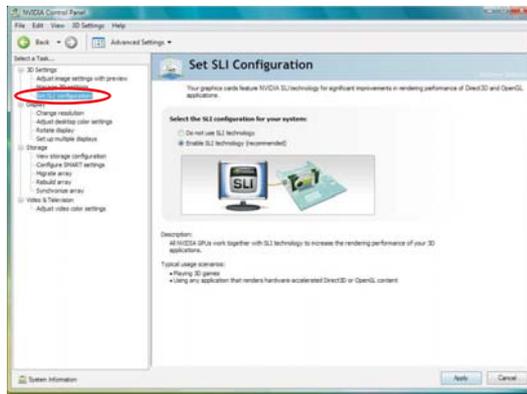
I. Click **OK** when done.

For Windows® Vista™ / Vista™ 64-bit OS:

- A. Click the **Start** icon on your Windows taskbar.
- B. From the pop-up menu, select **All Programs**, and then click **NVIDIA Corporation**.
- C. Select **NVIDIA Control Panel** tab.
- D. Select **Control Panel** tab.



- E. From the pop-up menu, select **Set SLI configuration**, and then click **Apply**.



* SLI™ appearing here is a registered trademark of NVIDIA® Technologies Inc., and is used only for identification or explanation and to the owners' benefit, without intent to infringe.

2.8 Surround Display Feature

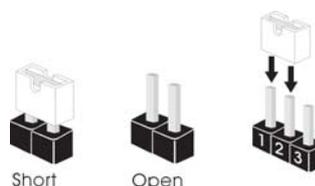
This motherboard supports Surround Display upgrade. With the external add-on PCI Express VGA card, you can easily enjoy the benefits of Surround Display feature. For the detailed instruction, please refer to the document at the following path in the Support CD:

..\ Surround Display Information

2.9 Jumpers Setup

The illustration shows how jumpers are setup.

When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



Jumper	Setting	Description
PS2_USB_PWR1 (see p.11 No. 1)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1_2</p> <p>+5V</p> </div> <div style="text-align: center;"> <p>2_3</p> <p>+5VSB</p> </div> </div>	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

Clear CMOS Jumper (CLRCMOS1) (see p.11 No. 17)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1_2</p> <p>Default</p> </div> <div style="text-align: center;"> <p>2_3</p> <p>Clear CMOS</p> </div> </div>
--	---

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

2.10 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

FDD connector
(33-pin FLOPPY1)
(see p.11 No. 24)



Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE Connector (Blue)
(39-pin IDE1, see p.11 No. 10)



Secondary IDE Connector (Black)
(39-pin IDE2, see p.11 No. 9)



connect the blue end
to the motherboard



connect the black end
to the IDE devices

80-conductor ATA 66/100/133 cable

Note: If you use only one IDE device on this motherboard, please set the IDE device as "Master". Please refer to the instruction of your IDE device vendor for the details. Besides, to optimize compatibility and performance, please connect your hard disk drive to the primary IDE connector (IDE1, blue) and CD-ROM to the secondary IDE connector (IDE2, black).

Serial ATAII Connectors

(SATAII_1: see p.11, No. 15)

(SATAII_2: see p.11, No. 12)

(SATAII_3: see p.11, No. 14)

(SATAII_4: see p.11, No. 13)



SATAII_2



SATAII_4



SATAII_1



SATAII_3

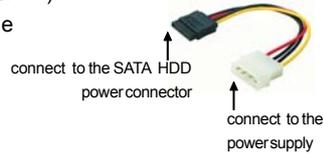
These four Serial ATAII (SATAII) connectors support SATA data cables for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

Serial ATA (SATA)
Data Cable
(Optional)



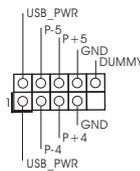
Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on this motherboard.

**Serial ATA (SATA)
Power Cable**
(Optional)



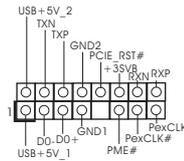
Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

USB 2.0 Header
(9-pin USB4_5)
(see p.11 No. 19)



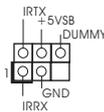
Besides four default USB 2.0 ports on the I/O panel, there is one USB 2.0 header on this motherboard. This USB 2.0 header can support two USB 2.0 ports.

WiFi/E Header
(15-pin WIFI/E)
(see p.11 No. 33)



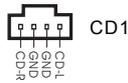
This header supports WiFi+AP function with ASRock WiFi-802.11g or WiFi-802.11n module, an easy-to-use wireless local area network (WLAN) adapter. It allows you to create a wireless environment and enjoy the convenience of wireless network connectivity.

Infrared Module Header
(5-pin IR1)
(see p.11 No. 23)



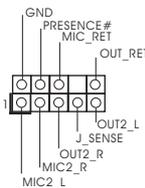
This header supports an optional wireless transmitting and receiving infrared module.

Internal Audio Connectors
(4-pin CD1)
(CD1: see p.11 No. 25)



This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.11 No. 26)



This is an interface for front panel audio cable that allows convenient connection and control of audio devices.



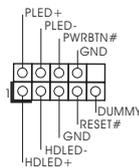
1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
 - A. Connect Mic_IN (MIC) to MIC2_L.
 - B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
 - C. Connect Ground (GND) to Ground (GND).
 - D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
 - E. Enter BIOS Setup Utility. Enter Advanced Settings, and then select Chipset Configuration. Set the Front Panel Control option from [Auto] to [Enabled].
 - F. Enter Windows system. Click the icon on the lower right hand taskbar to enter Realtek HD Audio Manager.

For Windows® 2000 / XP / XP 64-bit OS:
Click "Audio I/O", select "Connector Settings" , choose "Disable front panel jack detection", and save the change by clicking "OK".

For Windows® Vista™ / Vista™ 64-bit OS:
Click the right-top "Folder" icon , choose "Disable front panel jack detection", and save the change by clicking "OK".

System Panel Header

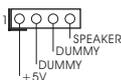
(9-pin PANEL1)
(see p.11 No. 16)



This header accommodates several system front panel functions.

Chassis Speaker Header

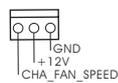
(4-pin SPEAKER 1)
(see p.11 No. 18)



Please connect the chassis speaker to this header.

Chassis Fan Connector

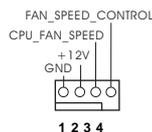
(3-pin CHA_FAN1)
(see p.11 No. 22)



Please connect a chassis fan cable to this connector and match the black wire to the ground pin.

CPU Fan Connector

(4-pin CPU_FAN1)
(see p.11 No. 3)



Please connect a CPU fan cable to this connector and match the black wire to the ground pin.



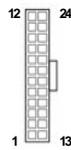
Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Pin 1-3 Connected



3-Pin Fan Installation

ATX Power Connector
(24-pin ATXPWR1)
(see p.11, No. 2)



Please connect an ATX power supply to this connector.



Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.



20-Pin ATX Power Supply Installation

ATX 12V Power Connector
(8-pin ATX12V1)
(see p.11 No. 6)



Please connect an ATX 12V power supply to this connector.



Though this motherboard provides 8-pin ATX 12V power connector, it can still work if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 5.



4-Pin ATX 12V Power Supply Installation

SLI/XFIRE Power Connector
(4-pin SLI/XFIRE_POWER1)
(see p.11 No. 34)

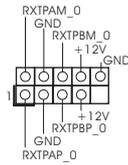


It is not necessary to use this connector, but please connect it with a hard disk power connector when two graphics cards are plugged to this motherboard at the same time.

IEEE 1394 Header

(9-pin FRONT_1394)

(see p.11 No. 20)



Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (FRONT_1394) on this motherboard. This IEEE 1394 header can support one IEEE 1394 port.

HDMI_SPDIF Header

(3-pin HDMI_SPDIF1)

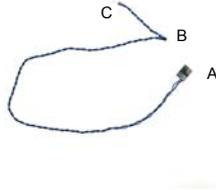
(see p.11 No. 27)



HDMI_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/ projector/LCD devices. Please connect the HDMI_SPDIF connector of HDMI VGA card to this header.

HDMI_SPDIF Cable

(Optional)

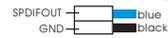


Please connect the black end (A) of HDMI_SPDIF cable to the HDMI_SPDIF header on the motherboard. Then connect the white end (B or C) of HDMI_SPDIF cable to the HDMI_SPDIF connector of HDMI VGA card.

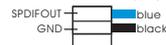
A. black end



B. white end (2-pin)



C. white end (3-pin)



2.11 HDMI_SPDIF Header Connection Guide

HDMI (High-Definition Multi-media Interface) is an all-digital audio/video specification, which provides an interface between any compatible digital audio/video source, such as a set-top box, DVD player, A/V receiver and a compatible digital audio or video monitor, such as a digital television (DTV). A complete HDMI system requires a HDMI VGA card and a HDMI ready motherboard with a HDMI_SPDIF header. This motherboard is equipped with a HDMI_SPDIF header, which provides SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. To use HDMI function on this motherboard, please carefully follow the below steps.

Step 1. Install the HDMI VGA card to the PCI Express Graphics slot on this motherboard. For the proper installation of HDMI VGA card, please refer to the installation guide on page 19.

Step 2. Connect the black end (A) of HDMI_SPDIF cable to the HDMI_SPDIF header (HDMI_SPDIF1, yellow, see page 11, No. 27) on the motherboard.



Make sure to correctly connect the HDMI_SPDIF cable to the motherboard and the HDMI VGA card according to the same pin definition. For the pin definition of HDMI_SPDIF header and HDMI_SPDIF cable connectors, please refer to page 29. For the pin definition of HDMI_SPDIF connectors on HDMI VGA card, please refer to the user manual of HDMI VGA card vendor. Incorrect connection may cause permanent damage to this motherboard and the HDMI VGA card.

Step 3. Connect the white end (B or C) of HDMI_SPDIF cable to the HDMI_SPDIF connector of HDMI VGA card. (There are two white ends (2-pin and 3-pin) on HDMI_SPDIF cable. Please choose the appropriate white end according to the HDMI_SPDIF connector of the HDMI VGA card you install.



white end
(2-pin) (B)



white end
(3-pin) (C)



Please do not connect the white end of HDMI_SPDIF cable to the wrong connector of HDMI VGA card or other VGA card. Otherwise, the motherboard and the VGA card may be damaged. For example, this picture shows the wrong example of connecting HDMI_SPDIF cable to the fan connector of PCI Express VGA card. Please refer to the VGA card user manual for connector usage in advance.



Step 4. Connect the HDMI output connector on HDMI VGA card to HDMI device, such as HDTV. Please refer to the user manual of HDTV and HDMI VGA card vendor for detailed connection procedures.

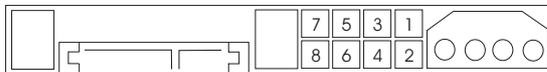


Step 5. Install HDMI VGA card driver to your system.

2.12 SATAII Hard Disk Setup Guide

Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

Western Digital



If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

SAMSUNG



If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

HITACHI

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:

<http://www.hitachigst.com/hdd/support/download.htm>



The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.

2.13 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation

This motherboard adopts NVIDIA® nForce 430 chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks and RAID functions. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

STEP 1: Install the SATA / SATAII hard disks into the drive bays of your chassis.

STEP 2: Connect the SATA power cable to the SATA / SATAII hard disk.

STEP 3: Connect one end of the SATA data cable to the motherboard's SATAII connector.

STEP 4: Connect the other end of the SATA data cable to the SATA / SATAII hard disk.



If you plan to use RAID 0, RAID 1 or JBOD function, you need to install at least 2 SATA / SATAII hard disks. If you plan to use RAID 5 function, you need to install 3 SATA / SATAII hard disks. If you plan to use RAID 0+1 function, you need to install 4 SATA / SATAII hard disks.

2.14 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

2.15 Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you just want to install Windows® 2000, Windows® XP, Windows® XP 64-bit, Windows® Vista™ or Windows® Vista™ 64-bit on your SATA / SATAII HDDs without RAID functions, you don't have to make a SATA / SATAII driver diskette. Besides, there is no need for you to change the BIOS setting. You can start to install Windows® 2000, Windows® XP, Windows® XP 64-bit, Windows® Vista™ or Windows® Vista™ 64-bit on your system directly.

2.16 Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 2000, Windows® XP, Windows® XP 64-bit, Windows® Vista™ or Windows® Vista™ 64-bit OS on your SATA / SATAII HDDs with RAID functions, please follow below procedures according to the OS you install.



Before installing Windows® 2000 to your system, your Windows® 2000 optical disk is supposed to include SP4. If there is no SP4 included in your disk, please visit the below website for proper procedures of making a SP4 disk:
http://www.microsoft.com/Windows2000/downloads/servicepacks/sp4/spdeploy.htm#the_integrated_installation_fmaj

2.16.1 Installing Windows® 2000 / XP / XP 64-bit With RAID Functions

If you want to install Windows® 2000, Windows® XP or Windows® XP 64-bit on your SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Make a SATA / SATAII Driver Diskette.

- A. Insert the ASRock Support CD into your optical drive to boot your system.
- B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
- C. When you see the message on the screen, "Generate Serial ATA driver diskette [Y/N]?", press <Y>.
- D. Then you will see these messages,
**Please insert a blank formatted diskette into floppy drive A:
press any key to start**
Please insert a floppy diskette into the floppy drive, and press any key.
- E. The system will start to format the floppy diskette and copy SATA / SATAII drivers into the floppy diskette.

STEP 2: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the "SATA Operation Mode" option to [RAID].

STEP 3: Use "RAID Installation Guide" to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide in the following path in the Support CD:

.. \ RAID Installation Guide

STEP 4: Install Windows® 2000 / Windows® XP / Windows® XP-64bit OS on your system.

After step 1, 2, 3, you can start to install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA / SATAII driver diskette containing the NVIDIA® RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the mode you choose and the OS you install.

NOTE. If you install Windows® 2000 / Windows® XP / Windows® XP 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up "SATA Operation Mode" to [RAID] in BIOS first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:
.. \ RAID Installation Guide

2.16.2 Installing Windows® Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® Vista™ or Windows® Vista™ 64-bit on your SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the "SATA Operation Mode" option to [RAID].

STEP 2: Use "RAID Installation Guide" to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

.. \ RAID Installation Guide

STEP 3: Install Windows® Vista™ / Windows® Vista™ 64-bit OS on your system.

Insert the Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive to boot your system, and follow the instruction to install Windows® Vista™ / Windows® Vista™ 64-bit OS on your system. When you see "Where do you want to install Windows?" page, please insert the ASRock Support CD into your optical drive, and click the "Load Driver" button on the left on the bottom to load the NVIDIA® RAID drivers. NVIDIA® RAID drivers are in the following path in our Support CD:

.. \ I386 \ Vista (For Windows® Vista™ OS)

.. \ AMD64 \ Vista64 (For Windows® Vista™ 64-bit OS)

After that, please insert Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive again to continue the installation.

NOTE. If you install Windows® Vista™ / Windows® Vista™ 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up "SATA Operation Mode" to [RAID] in BIOS first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:
.. \RAID Installation Guide

2.17 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter "Overclock Mode" option of BIOS setup to set the selection from [Auto] to [CPU, PCIE, Async.]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that FSB can operate under a more stable overclocking environment.



Please refer to the warning on page 8 for the possible overclocking risk before you apply Untied Overclocking Technology.

Chapter 3 BIOS SETUP UTILITY

3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The BIOS FWH chip on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

- Main** To set up the system time/date information
- Advanced** To set up the advanced BIOS features
- H/W Monitor** To display current hardware status
- Boot** To set up the default system device to locate and load the Operating System
- Security** To set up the security features
- Exit** To exit the current screen or the BIOS SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

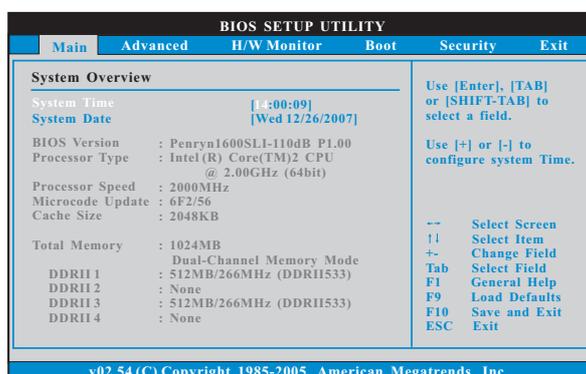
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview.



System Time [Hour:Minute:Second]

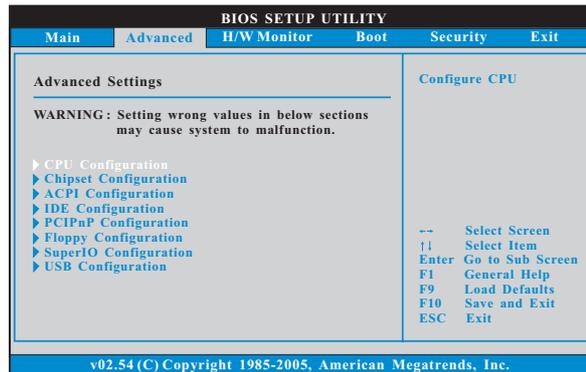
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

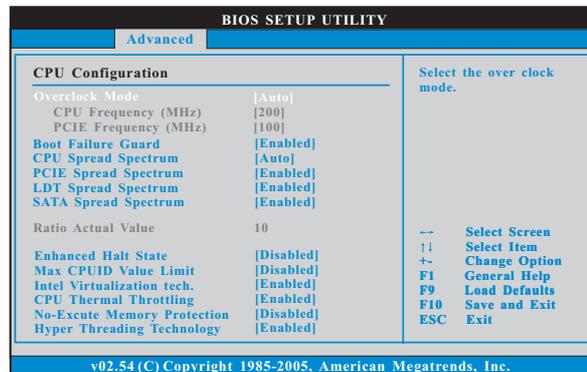
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, IDE Configuration, PCI/PnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

3.3.1 CPU Configuration



Overclock Mode

Use this to select Overclock Mode. The default value is [Auto]. Configuration options: [Auto], [CPU, PCIE, Sync.] and [CPU, PCIE, Async].

CPU Frequency (MHz)

Use this option to adjust CPU frequency.

PCIe Frequency (MHz)

Use this option to adjust PCIe frequency.

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

CPU Spread Spectrum

This feature will be set to [Auto] as default. Configuration options: [Disabled] and [Auto].

PCIe Spread Spectrum

This feature will be set to [Enabled] as default. Configuration options: [Disabled] and [Enabled].

LDT Spread Spectrum

This feature will be set to [Enabled] as default. Configuration options: [Disabled] and [Enabled].

SATA Spread Spectrum

This feature will be set to [Enabled] as default. Configuration options: [Disabled] and [Enabled].

Ratio Actual Value

This is a read-only item, which displays the ratio actual value of this motherboard.

Enhance Halt State

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

Max CPUID Value Limit

For Prescott CPU only, some OSes (ex. NT4.0) cannot handle the function with disable. This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

Intel (R) Virtualization tech.

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel (R) Virtualization Technology.

CPU Thermal Throttling

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated.

No-Execute Memory Protection

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with "No Execute (NX) Memory Protection" can prevent data pages from being used by malicious software to execute code. This option will be hidden if the current CPU does not support No-Execute Memory Protection.

Hyper Threading Technology

To enable this feature, it requires a computer system with an Intel Pentium® 4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP. Set to [Enabled] if using Microsoft® Windows® XP, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

Intel (R) SpeedStep(tm) tech.

Intel (R) SpeedStep(tm) tech. is Intel's new power saving technology. Processor can switch between multiple frequency and voltage points to enable power savings. The default value is [Auto]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® XP and select [Auto], you need to set the "Power Schemes" as "Portable/Laptop" to enable this function. If you install Windows® Vista™ and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel (R) SpeedStep(tm) tech..



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issue with some power supplies. Please set this item to [Disable] if above issue occurs.

3.3.2 Chipset Configuration

BIOS SETUP UTILITY		
Advanced		
Chipset Configuration		Options
DRAM Frequency	[Auto]	Auto:
Flexibility Option	[Disabled]	266MHz (DDR1533)
Memory Timings	[Auto]	333MHz (DDR1667)
Memory Remap Feature	[Enabled]	400MHz (DDR1800)
Primary Graphics Adapter	[PCI]	Manual
Hyper Transport Link Speed	[1000 MHZ]	
Onboard LAN	[Enabled]	-- Select Screen
OnBoard 1394	[Enabled]	11 Select Item
OnBoard HD Audio	[Auto]	+ - Change Option
Front Panel	[Auto]	F1 General Help
CPU Voltage	[Auto]	F9 Load Defaults
DRAM Voltage	[Auto]	F10 Save and Exit
Chipset Voltage	[Auto]	ESC Exit
VTT Voltage	[Auto]	

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DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may select [266MHz (DDRII533)], [333MHz (DDRII667)], [400MHz (DDRII800)] or [Manual].

Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

Memory Timings

Use this item to select the Memory Timings feature. Configuration options: [Auto] and [Manual]. If [Manual] is selected, you can adjust the following memory timings.

TCL (CAS Latency)

Use this item to adjust the means of memory accessing. Configuration options are [3], [4], [5], [6] and [Auto].

TRCD

Use this item to adjust the TRCD value. Configuration options are [1], [2], [3], [4], [5], [6], [7] and [Auto].

TRP

Use this item to adjust the TRP value. Configuration options are [1], [2], [3], [4], [5], [6], [7] and [Auto].

TRAS

Use this item to adjust the TRAS value. Configuration options are [1] to [31] and [Auto].

Command Per Clock (CMD)

Use this item to adjust the Command Per Clock (CMD) value. Configuration options are [1T], [2T] and [Auto].

TRRD

Use this item to adjust the TRRD value. Configuration options are [1] to [15] and [Auto].

TRC

Use this item to adjust the TRC value. Configuration options are [1] to [31] and [Auto].

TWR

Use this item to adjust the TWR value. Configuration options are [2], [3], [4], [5], [6] and [Auto].

TWTR

Use this item to adjust the TWTR value. Configuration options are [1] to [15] and [Auto].

Memory Remap Feature

Use this item to enable or disable memory remap feature. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

Primary Graphics Adapter

This allows you to select [PCI] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI].

Hyper Transport Link Speed

This allows you to select Hyper Transport Link Speed. Configuration options: [200 MHz], [400 MHz], [600 MHz], [800 MHz] and [1000 MHz]. The default value is [1000 MHz].

Onboard LAN

This allows you to enable or disable the "Onboard LAN" feature.

OnBoard 1394

This allows you to enable or disable the "OnBoard 1394" feature.

OnBoard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio Front Panel.

CPU Voltage

Use this to select CPU Voltage. Configuration options: [Auto] and [Manual]. The default value of this feature is [Auto].

DRAM Voltage

Use this to select DRAM Voltage. Configuration options: [Auto], [1.79V], [1.85V], [1.90V], [1.96V], [2.02V], [2.08V], [2.14V], [2.20V], [2.31V], [2.37V], [2.42V], [2.48V], [2.54V], [2.60V], [2.66V] and [2.72V]. The default value of this feature is [Auto].

Chipset Voltage

Use this to select Chipset Voltage. Configuration options: [Auto], [1.250V], [1.382V], [1.516V] and [1.648V]. The default value of this feature is [Auto].

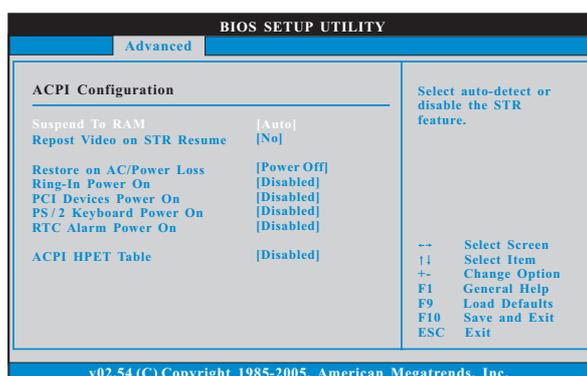
VTT Voltage

Use this to select VTT Voltage. Configuration options: [Auto], [1.24V], [1.31V], [1.375V] and [1.42V]. The default value of this feature is [Auto].

GTLREF Voltage

Use this to select GTLREF Voltage. Configuration options: [Auto], [Normal] and [High]. The default value of this feature is [Auto].

3.3.3 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it. If you set this item to [Disabled], the function "Repost Video on STR Resume" will be hidden.

Repost Video on STR Resume

This feature allows you to repost video on STR resume. (STR refers to suspend to RAM.)

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

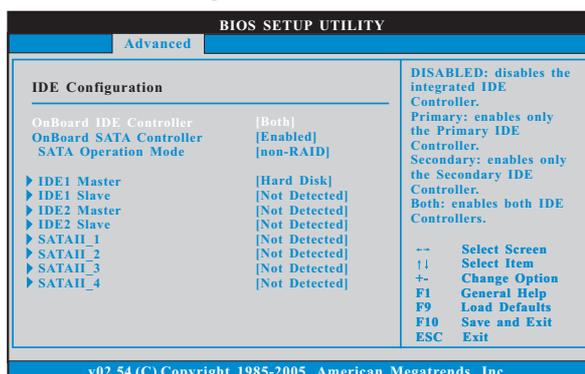
RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Disabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® Vista™ certification.

3.3.4 IDE Configuration



OnBoard IDE Controller

Use this item to enable or disable the "OnBoard IDE Controller" feature.

OnBoard SATA Controller

Use this item to enable or disable the "OnBoard SATA Controller" feature.

SATA Operation Mode

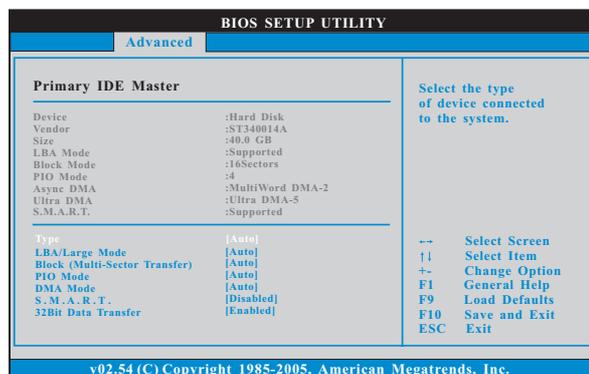
Use this item to adjust SATA Operation Mode. The default value of this option is [non-RAID]. If you want to operate RAID function on SATA / SATAII HDDs, please select [RAID].

* If you select [RAID] mode, SATA / SATAII HDDs can not be accessed until you finish configuring RAID functions in NVIDIA BIOS / Windows RAID Utility.

* If you install OS on SATA / SATAII HDDs, please do not change the setting of this item after OS installation.

IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the "IDE1 Master" as the example in the following instruction, which can be applied to the configurations of "IDE1 Slave" as well.



TYPE

Use this item to configure the type of the IDE device that you specify.

Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

[Not Installed]: Select [Not Installed] to disable the use of IDE device.

[Auto]: Select [Auto] to automatically detect the hard disk drive.



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

[CD/DVD]: This is used for IDE CD/DVD drives.

[ARMD]: This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

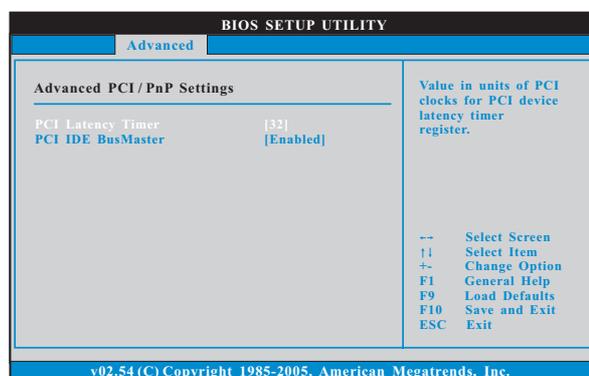
S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

3.3.5 PCI/PnP Configuration



PCI Latency Timer

The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

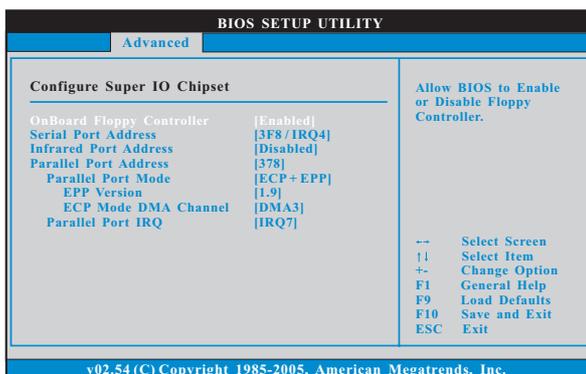
Use this item to enable or disable the PCI IDE BusMaster feature.

3.3.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.3.7 Super IO Configuration



OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

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

Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].



Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

ECP Mode DMA Channel

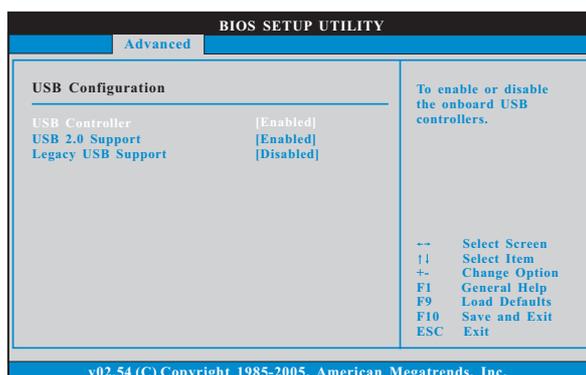
Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].



3.3.8 USB Configuration



USB Controller

Use this item to enable or disable the use of USB controller.

USB 2.0 Support

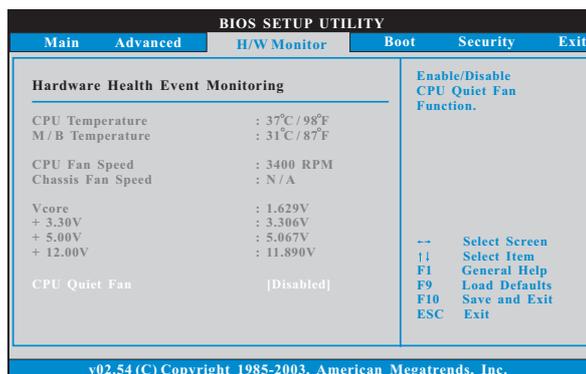
Use this item to enable or disable the USB 2.0 support.

Legacy USB Support

Use this item to enable or disable the support to emulate legacy I/O devices such as mouse, keyboard,... etc. Or you may select [Auto] so that the system will start to auto-detect; if there is no USB device connected, "Auto" option will disable the legacy USB support.

3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



CPU Quiet Fan

This item allows you to identify the temperature of CPU fan. If you set this option as [Disabled], the CPU fan will operate in full speed. If you set this option as [Enabled], you will find the items “Target CPU Temperature (°C)”, “Tolerance (°C)”, and “Minimum Fan Speed” appear to allow you adjusting them. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin CPU fan.

Target CPU Temperature (°C)

The target temperature will be between 45 °C and 65 °C. The default value is [50].

Tolerance (°C)

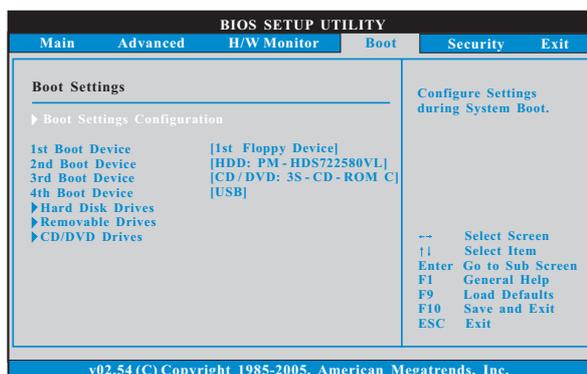
The default value of tolerance is [2], which means the error of the target CPU temperature will be within 2 °C.

Target Fan Speed

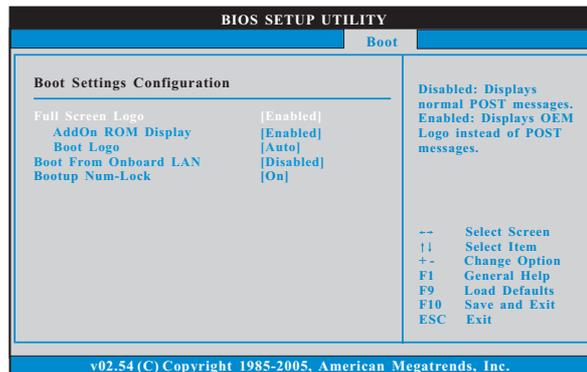
Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target CPU temperature that you choose. Configuration options: [Level 1], [Level 2], [Level 3], [Level 4], [Level 5], [Level 6], [Level 7], [Level 8] and [Level 9].

3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



3.5.1 Boot Settings Configuration



Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option "Full Screen Logo" but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

Boot Logo

Use this option to select logo in POST screen. This option only appears when you enable the option "Full Screen Logo". Configuration options: [Auto], [Aircraft], [Scenery] and [ASRock]. The default value is [Auto]. Currently, the option [Auto] is set to Aircraft.

Boot From Onboard LAN

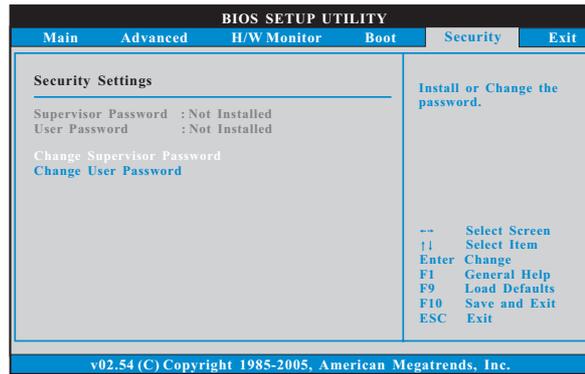
Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Up Num-Lock

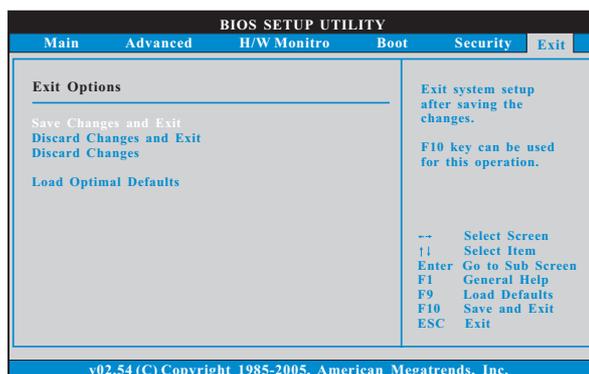
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

3.6 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



3.7 Exit Screen



Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?” Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, “Discard changes and exit setup?” Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, “Discard changes?” Select [OK] to discard all changes.

Load Optimal Defaults

When you select this option, it will pop-out the following message, “Load optimal defaults?” Select [OK] to load the default values for all the setup configurations.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available devices drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.