P4S8X-MX

ASUS®

Motherboard

E1997

First Edition V1
April 2005

Contents

Chapter 1: Product introduction

Contents

Contents

Notices

Federal Communications Commission Statement

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

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

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

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

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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

P4S8X-MX specifications summary

CPU	Socket 478 for Intel® Pentium® 4 / Celeron processors Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: SiS 661GX Southbridge: SiS 964
Front Side Bus	800*/533 MHz
Memory	2 x 184-pin DIMM sockets support up to 2 GB of unbufferred non-ECC 400**/333 MHz DDR SDRAM memory modules
Expansion slots	1 x AGP 8X slot (1.5 V only) 3 x PCI slots
Graphics	SiS Real 256E Graphics

Storage	SiS 964 Southbridge supports:
	   - 4 x Ultra DMA 133/100/66/33 hard disk drives
	   - 2 x Serial ATA drives with RAID 0, RAID 1, and JBOD configuration

Audio	Realtek® ALC655 6-channel CODEC Coaxial S/PDIF out port
LAN	Realtek® RTL8201CL 10/100 Mbps LAN PHY
Overclocking	Stepless Frequency Selection (SFS) from 100 MHz up to 200 MHz at 1 MHz increment AGP/PCI Asynchronous Mode with FSB ASUS C.P.R. (CPU Parameter Recall)
USB	Supports up to 8 USB 2.0 ports
Special features	ASUS CrashFree BIOS 2 ASUS EZ Flash ASUS MyLogo2™

(continued on the next page)

*   The motherboard runs at FSB800 when in overclock mode.

**   1.   When using an FSB800 CPU with 400 MHz DDR memory, the motherboard runs at 333 MHz by default.

      2.   When using an FSB533 CPU with 400 MHz DDR memory, the motherboard runs at 400 MHz.

P4S8X-MX specifications summary

BIOS features	4 Mb Flash ROM, AMI BIOS, Green, PnP, DMI2.0, SM BIOS 2.3, WfM2.0, ACPI 2.0
Rear panel	1 x Parallel port 1 x LAN (RJ-45) port 4 x USB 2.0 ports 1 x VGA port 1 x Serial port (COM) 1 x PS/2 keyboard port 1 x PS/2 mouse port 6-channel audio ports
Internal connectors	1 x Floppy disk drive connector 1 x Primary IDE connector 1 x Secondary IDE connector 2 x Serial ATA connectors 1 x CPU fan connector 1 x Chassis fan connector 2 x USB 2.0 connectors for four additional USB 2.0 ports 1 x Optical drive audio connector 1 x AUX connector 20-pin ATX power connector 4-pin x ATX 12V power connector 1 x GAME/MIDI connector 1 x S/PDIF Out connector 1 x Front panel audio connector System panel connector
Power Requirement	ATX power supply (with 20-pin and 4-pin 12 V plugs) ATX 12 V 2.0 compliant
Form Factor	ATX form factor: 9.6 in x 9.6 in (24.5 cm x 24.5 cm)
Support CD contents	Device drivers ASUS PC Probe ASUS Live Update utility ASUS Screensaver Adobe Acrobat Reader Anti-virus software (OEM version)

*Specifications are subject to change without notice.

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

Product introduction

1

1.1 Welcome!

Thank you for buying an ASUS® P4S8X-MX motherboard!

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

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

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS P4S8X-MX motherboard
Cables	1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 133/100/66 cable Floppy disk drive cable
Accessories	I/O shield
Application CDs	ASUS motherboard support CD
Documentation	User guide

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

1.3 Special features

SiS661GX/964 chipset

Embedded in this motherboard is the SiS661GX/964 chipset that integrates various SiS-developed technologies to ensure an efficient and reliable computing performance.

The SiS661GX chipset provides a high performance host interface for the Intel® Pentium® 4 processor, and supports AGP 8X and DDR400. The SiS661GX features the SiS HyperStreaming™ Engine that smartly manages data streams between peripherals, core logic chipsets, front side bus, memory and graphic interfaces. This technology dramatically optimizes and improves the entire computer system performance.

Providing I/O and peripheral support is the SiS964 Southbridge, which integrates various I/O functions including dual-channel ATA133 bus master IDE, USB 2.0/1.1, Ethernet, and audio controllers. The SiS964 provides

LPC and AC'97 interfaces, and complies with the Advanced Power Management (APM) 1.2 specification. The SiS964 interconnects with the Northbridge at up to 1GB/s using the SiS proprietary MuTIOL® bus interface.

Real256E integrated graphics

Embedded in the Northbridge is the SiS Real256E integrated graphics with a 256-bit 3D engine and 2D graphics accelerator with a maximum 64MB shared display memory. The Real256E integrated graphics engine incorporates the UltraAGPII™ technology to provide a faster link between the built-in graphic engine and the northbridge memory controller. This technology boosts VGA throughput to up to 3.2 GB/s to bring clearer and sharper images for your multimedia and graphic-intensive applications. The Real256E integrated graphics achieves a maximum resolution of 2048x1536 at 32 bpp. See page 1-24.

Serial ATA technology

The motherboard supports the Serial ATA technology through the Serial ATA interfaces and the Intel® ICH6. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 150 MB/s data transfer rate. See page 1-27 for details.

Integrated 10/100 Mbps LAN controller

Onboard is the Realtek® LAN PHY that interconnects with the SiS964 southbridge LAN controller to fully support 10BASE-T/ 100BASE-TX Ethernet networking. See page 1-23.

6-Channel Audio solution

The motherboard uses an onboard audio CODEC that lets you enjoy high-quality 6-channel audio without having to buy advanced sound cards. See page 1-23.

DDR400 Support

The motherboard supports up to 2 GB system memory using DDR400/ 333/266 non-ECC DDR DIMMs to deliver up to 3.2 GB/s data transfer rate for the latest 3D graphics, multimedia, and Internet applications. See page 1-15 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See pages 1-24 and 1-29 for details.

ASUS CrashFree BIOS 2

This feature allows you to restore the original BIOS data from the support CD in case when the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement ROM chip. See page 2-6 for details.

ASUS EZ Flash BIOS

With the ASUS EZ Flash, you can easily update the system BIOS even before loading the operating system. No need to use a DOS-based utility or boot from a floppy disk. See page 2-3 for details.

ASUS MyLogo2™

This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos. See page 2-33 for details.

C.P.R. (CPU Parameter Recall)

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

1.4 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.

- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

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

Onboard LED

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

SB_PWR

ON
Standby
Power

OFF
Powered
Off

P4S8X-MX Onboard LED
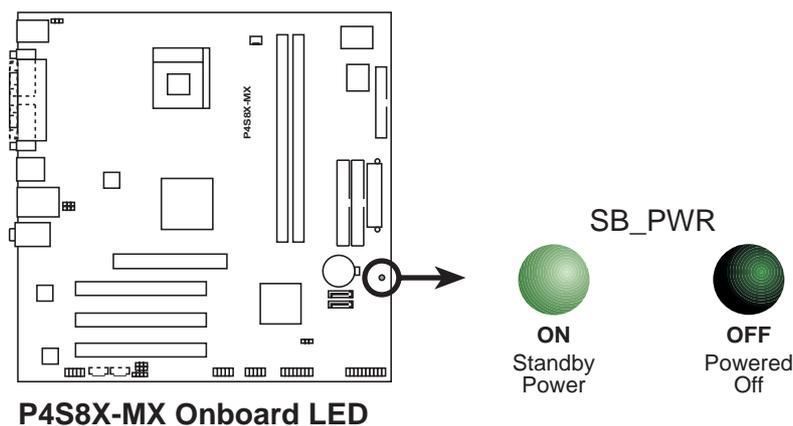
1.5   Motherboard overview

1.5.1   Motherboard layout
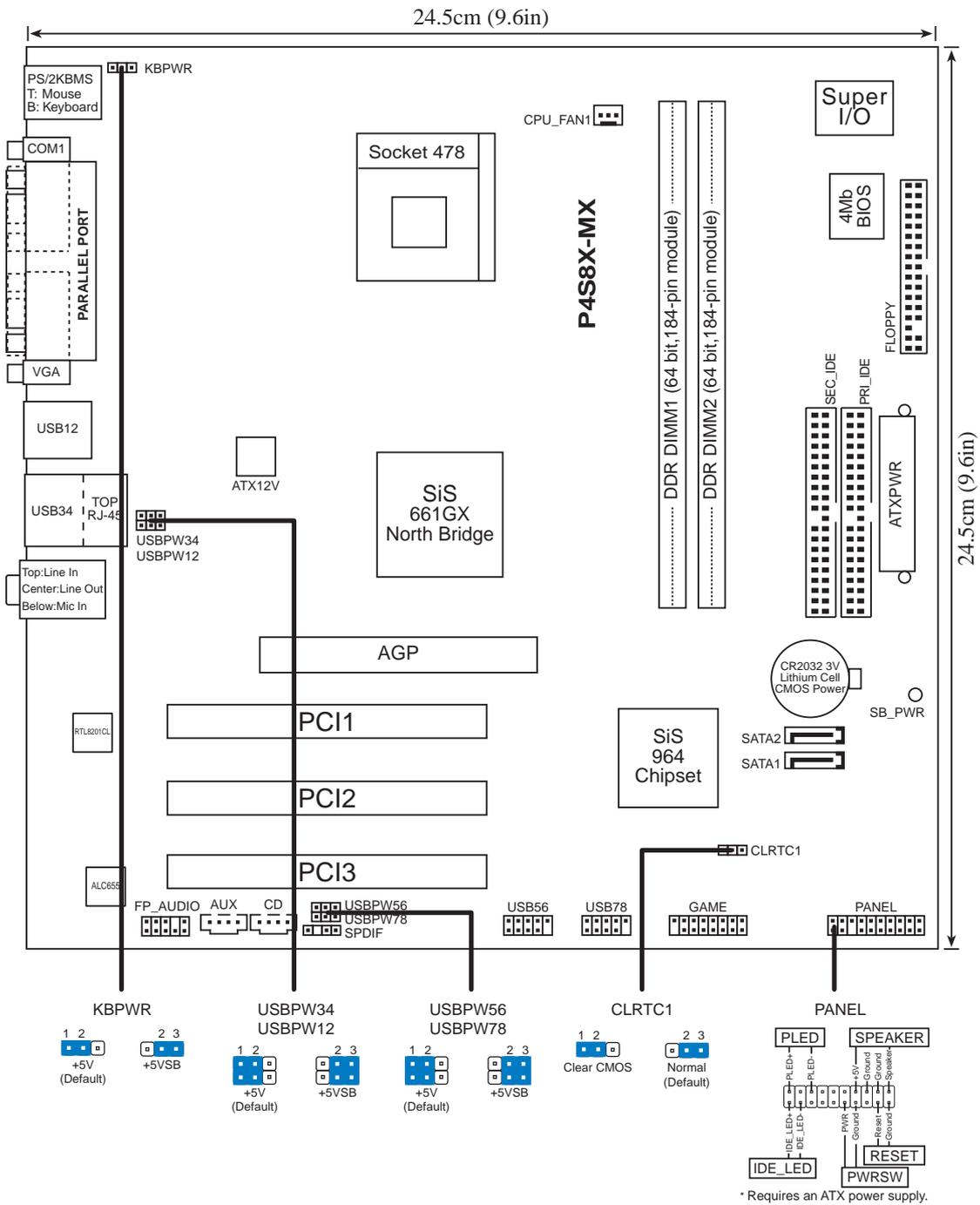
1.5.2 Placement direction

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

1.5.3 Screw holes

Place eight (8) screws into the holes indicated by circles to secure the motherboard to the chassis.

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

Place this side towards the rear of the chassis
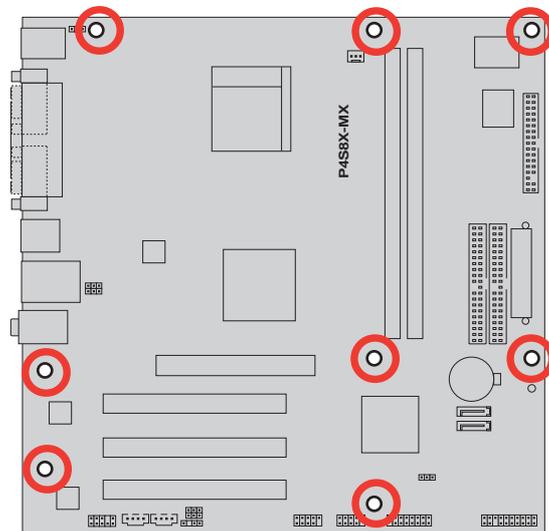
1.6   Central Processing Unit (CPU)

1.6.1   Overview

The motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket designed for the Intel® Pentium® 4 Processor.

Take note of the marked corner (with gold triangle) on the CPU. This mark should match a specific corner on the socket to ensure correct installation.

Gold mark
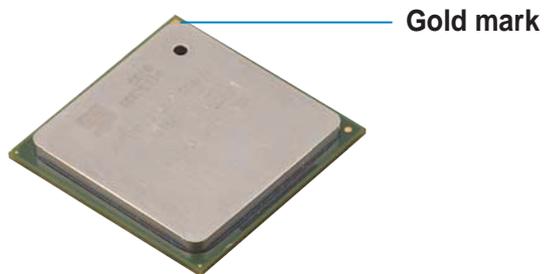
Your boxed Intel® Pentium® 4 processor package should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

Incorrect installation of the CPU into the socket can bend the pins and severely damage the CPU!

1.6.2   Installing the CPU

Follow these steps to install a CPU.

1.   Locate the 478-pin ZIF socket on the motherboard.

Gold Arrow

P4S8X-MX CPU Socket 478
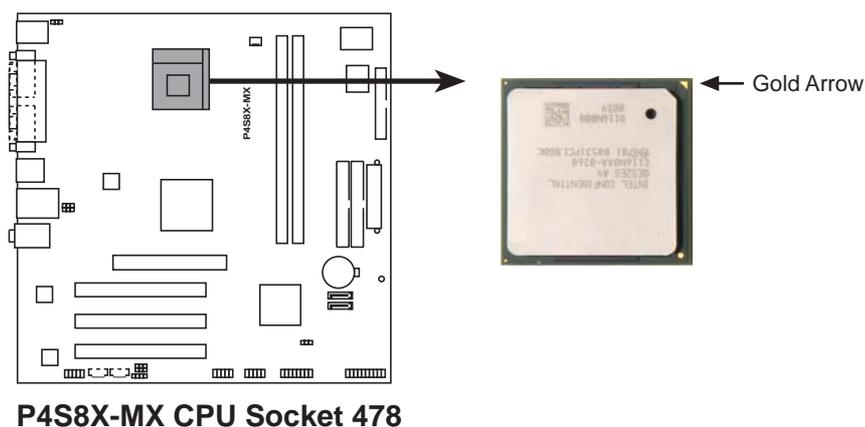
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.

90°-100° angle
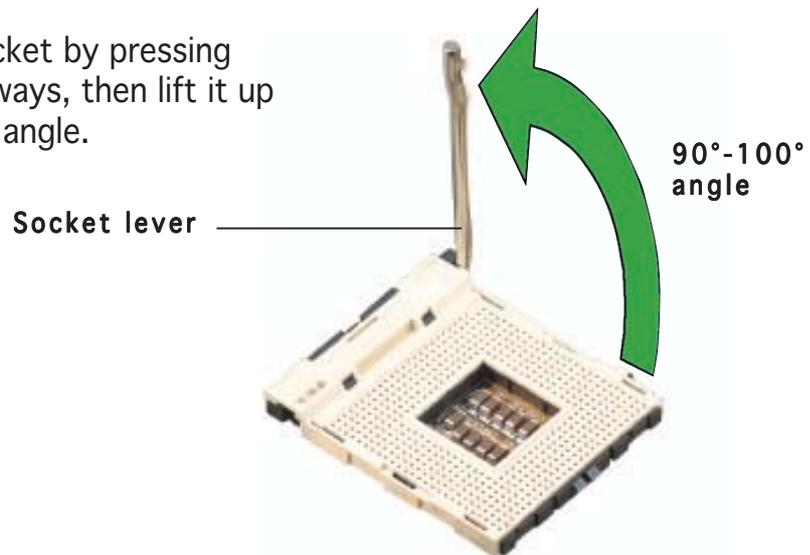
Socket lever

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

3. Position the CPU above the socket such that its marked corner matches the base of the socket lever.

4. Carefully insert the CPU into the socket until it fits in place.

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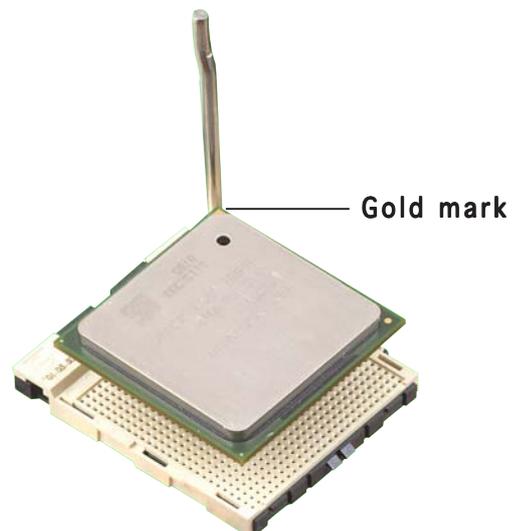
> The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

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.
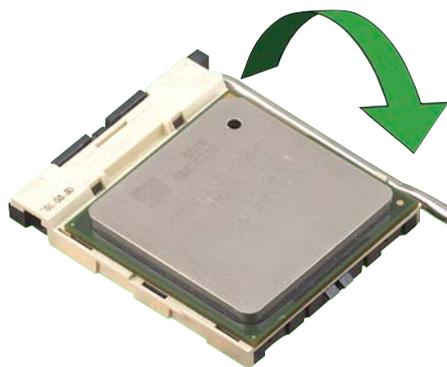
> After installation, make sure to plug the 4-pin ATX power cable to the motherboard.

Notes on Intel® Hyper-Threading Technology

> • This motherboard supports Intel® Pentium® 4 CPUs with Hyper-Threading Technology.
>
> • Hyper-Threading Technology is supported under Windows® XP/2003 Server and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in BIOS to ensure system stability and performance.
>
> • We recommend that you install Windows® XP Service Pack 1.
>
> • Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
>
> • For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

To use the Hyper-Threading Technology on this motherboard:

1. Install an Intel® Pentium® 4 CPU that supports Hyper-Threading Technology.
2. Power up the system and enter BIOS Setup (see Chapter 2: BIOS setup). Under the Advanced Menu, make sure that the item **Hyper-Threading Technology** is set to Enabled. The item appears only if you installed a CPU that supports Hyper-Threading Technology.
3. Reboot the computer.

1.6.3 Installing the heatsink and fan

The Intel® Pentium® 4 Processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

> • When you buy a boxed Intel® Pentium® 4 processor, the package includes the heatsink, fan, and retention mechanism.
>
> • If you buy a CPU separately, make sure that you use only Intel®-certified heatsink and fan.

> If you purchased a separate CPU heatsink and fan assembly, make sure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before installing the heatsink and fan assembly.

To install the CPU heatsink and fan:

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

> • The retention module base is already installed on the motherboard upon purchase.
>
> • You do not have to remove the retention module base when installing the CPU or installing other motherboard components.

CPU heatsink

Retention module base
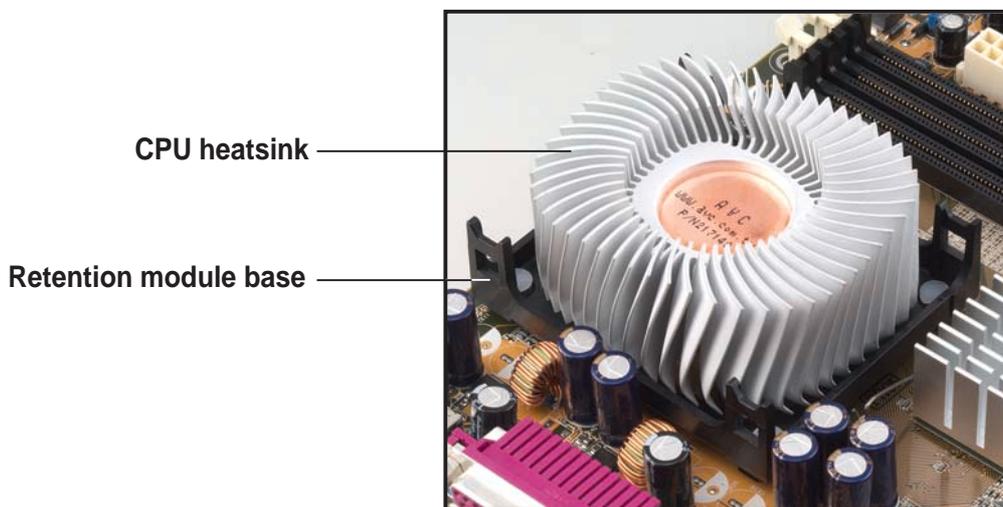
2. Position the fan with the retention mechanism on top of the heatsink. Align and snap the four hooks of the retention mechanism to the holes on each corner of the module base.

Make sure that the fan and retention mechanism assembly perfectly fits the heatsink and module base; otherwise, you cannot snap the hooks into the holes.

Retention lock

Retention hole

Retention hook snapped to the retention hole
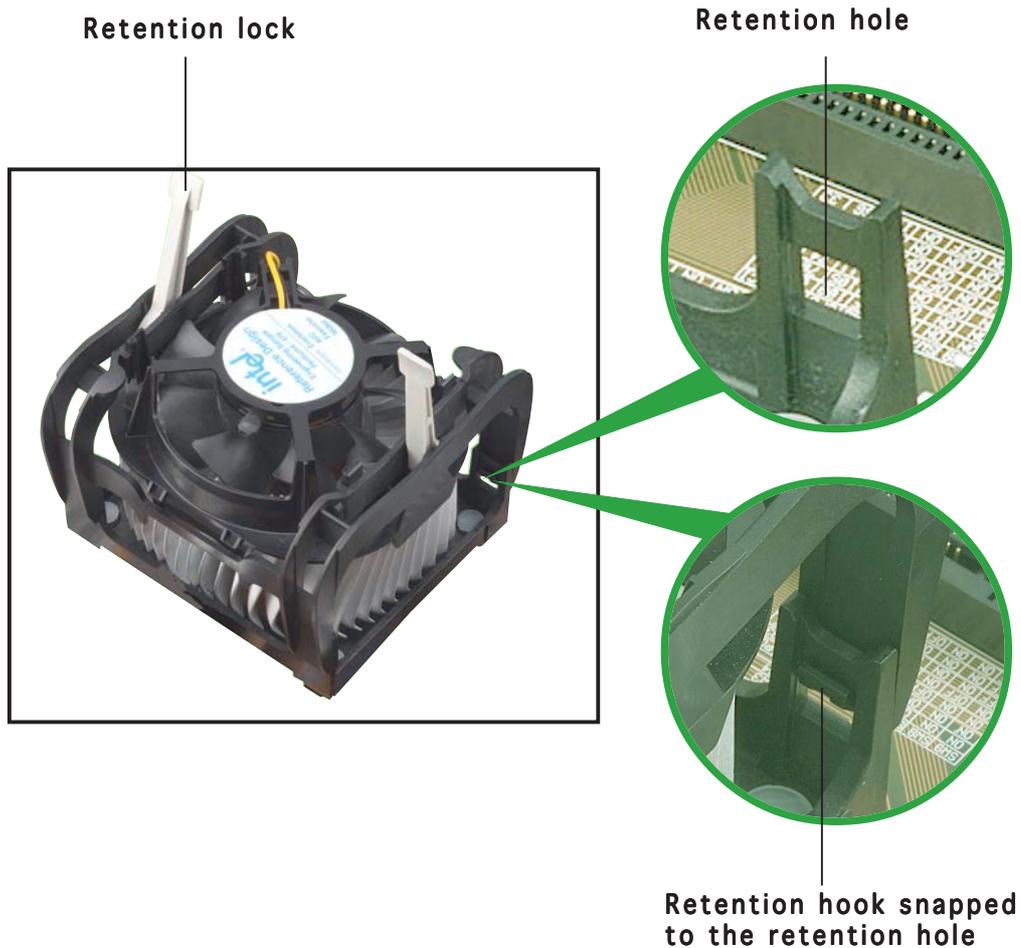
Keep the retention locks lifted upward while fitting the retention mechanism to the module base.

3. Push down the locks on the retention mechanism to secure the heatsink and fan to the module base.

When secure, the retention locks should point to opposite directions.

4. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN1.

CPU_FAN1

GND
+12V
Rotation
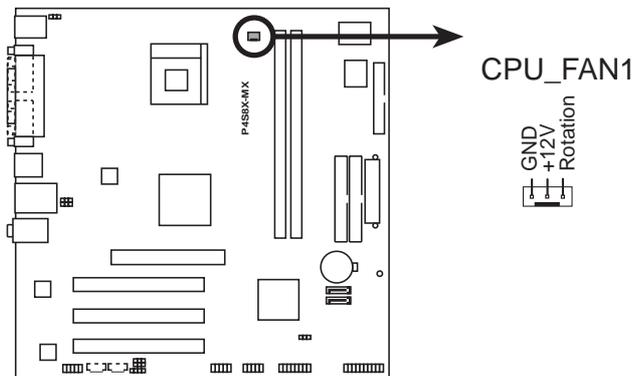
P4S8X-MX CPU fan connector

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

1.7   System memory

1.7.1   Overview

The motherboard comes with four 184-pin Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets.

The following figure illustrates the location of the sockets:

P4S8X-MX 184-pin DDR DIMM sockets
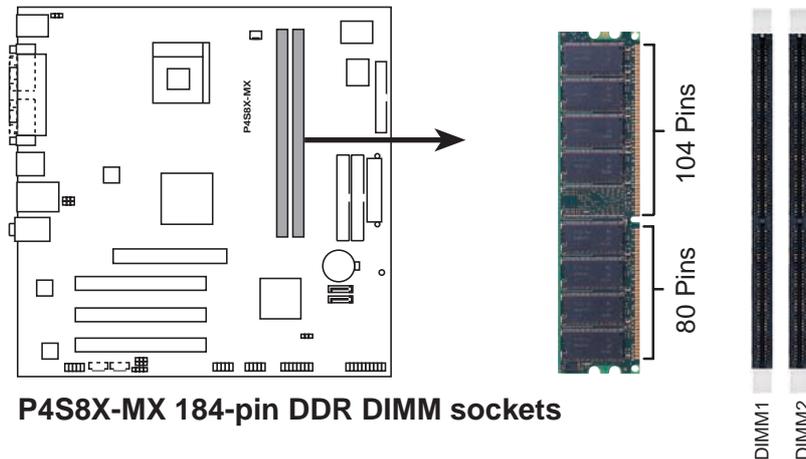
1.7.2   Memory configurations

You may install 128 MB, 256 MB, 512 MB, and 1 GB unbuffered non-ECC DDR DIMMs into the DIMM sockets using the memory configurations in this section.

- Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure.

- Visit the ASUS website (www.asus.com) for the latest DDR Qualified Vendors List (QVL).

DDR400* Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	CL	A	B
					DIMM support			
256 MB	CORSAIR	CMX256A-3200LL DDR400	–	SS	Heat-Sink Package	2	•	•
256 MB	CORSAIR	VS256MB400	Value Select	SS	VS32M8-5 2B0409	3		•
512 MB	CORSAIR	VS512MB400	Value Select	DS	VS32M8-5	3	•	
256 MB	CORSAIR	CMX256A-3200C2PT	WINBOND	SS	W942508BH-5	2		•
512 MB	CORSAIR	CMX512-3200LL DDR400	–	DS	Heat-Sink Package	2	•	•
1 G	CORSAIR	TWINX2048-3200C2 DDR400 1024MB	–	DS	Heat-Sink Package	2	•	•
256 MB	GEIL	GE2563200B	GEIL	SS	GL3LC32G88TG-5A	2	•	•
256 MB	HYNIX	HYMD232646B8J-D43	HYNIX	SS	HY5DU56822BT-D43	3	•	•
256 MB	HYNIX	HYMD232646D8J-D43 AA	HYNIX	SS	HY5DU56822DT-D43	3	•	•
512 MB	HYNIX	HYMD264646D8J-D43 DDR400 512MB	HYNIX	DS	HY5DU56822DT-D43	3	•	•
512 MB	KINGMAX	MPXC22D-38KT3R	KINGMAX	DS	KDL388P4LA-50	2.5		•
256 MB	KINGMAX	N/A	Mosel	SS	V58C2556804SAT5B	3	•	•
256 MB	KINGSTON	VALUE RAM KVR400X64C3A/256	INFINEON	SS	HYB25D256800BT-5B	3	•	•
512 MB	KINGSTON	VALUE RAM KVR400X64C3A/512	INFINEON	DS	HYB25D256800BT-5B	3	•	
512 MB	KINGSTON	VALUE RAM KVR400X64C3A/512	INFINEON	DS	HYB25D256800BT-6B	3	•	•
512 MB	KINGSTON	KHX3200A/512 DDR400 512MB	–	DS	–	3	•	•
1G	KINGSTON	KHX3200ULK2/1G DDR400 1024MB	–	DS	–	3	•	•
256 MB	KINGSTON	VALUE RAM KVR400X64C3A/256	KINGSTON	SS	D3208DH1T-5	3	•	
512 MB	KINGSTON	VALUE RAM KVR400X64C3A/512	KINGSTON	DS	D3208DH1T-5	3	•	
512 MB	KINGSTON	VALUE RAM KVR400X72C3A/512 DDR	Mosel	DS	V58C2256804SAT5	3	•	•
256 MB	KINGSTON	VALUE RAM KVR400X64C3A/256 DDR	HYNIX	SS	HY5DU56822BT-D43	3	•	
512 MB	KINGSTON	VALUE RAM KVR400X64C3A/512 DDR	HYNIX	DS	HY5DU56822BT-D43	3	•	•
512 MB	MICRON	MT16VDDT6464AG-40BC4	MICRON	DS	MT46V32M8TG-5BC	3	•	•
512 MB	MICRON	MT16VDDT6464AG-40BGB	MICRON	DS	MT46V32M8TG-5BG	3		•
256 MB	PROMOS	V826632K24SCTG-D0	–	SS	V58C2256804SCT5B	2.5	•	•
256 MB	MICRON	MT8VDDT3264AG-40BGB	MICRON	SS	MT46V32M8TG-5BG	3	•	•
256 MB	SAMSUNG	M368L3223FTN-CCC	SAMSUNG	SS	K4H560838F-TCCC	3	•	•
512 MB	SAMSUNG	M368L6423FTN-CCC	SAMSUNG	DS	K4H560838F-TCCC	3		•
512 MB	SAMSUNG	M368L6523BTM-CCC	SAMSUNG	SS	K4H560838F-TCCC	3	•	•
256 MB	Infineon	HYS64D32301HU-5-C	INFINEON	SS	HYB25D512160CE-5C	3	•	
512 MB	Infineon	HYS64D64320HU-5-C	INFINEON	DS	HYB25D256800CE-5C	3	•	•
512 MB	Infineon	HYS64D64300HU-5-C	INFINEON	DS	HYB25D256800CE-6C	3	•	•
256 MB	APACER	77.10636.11G	INFINEON	SS	HYB25D256800BT-5B	3	•	•
256 MB	TRAMSCEND	TS32MLD64V4F3	Mosel	SS	V58C2256804SAT5	3	•	•
256 MB	WINBOND	U24512ADWBG6H20	WINBOND	DS	W942508CH-5	–	•	•
256 MB	BRAIN POWER	B6U808-256M-SAM-400	SAMSUNG	SS	K4H560838D-TCC4	3	•	•
512 MB	NANYA	NT512D64S8HB1G-5T	NANYA	DS	NT5DS3232M8BT-5T	3	•	•

Legend:

SS - Single Sided

DS - Double Sided

CL - CAS Latency

A - supports one module inserted into either slot, in a Single-channel memory configuration.

B - supports one pair of modules inserted into both slots as one pair of Dual-channel memory configuration.

> * 1. When using an FSB800 CPU with 400 MHz DDR memory, the motherboard runs at 333 MHz by default.
>
> 2. When using an FSB533 CPU with 400 MHz DDR memory, the motherboard runs at 400 MHz.

1.7.3 Installing a DIMM

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

1. Unlock a DIMM socket by pressing the retaining clips outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

DDR DIMM notch

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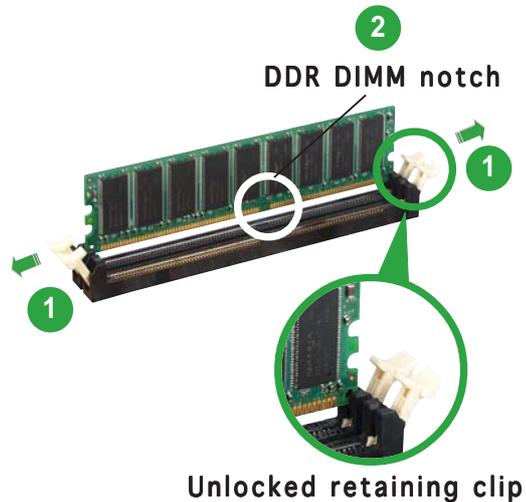
A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

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

Locked retaining clip
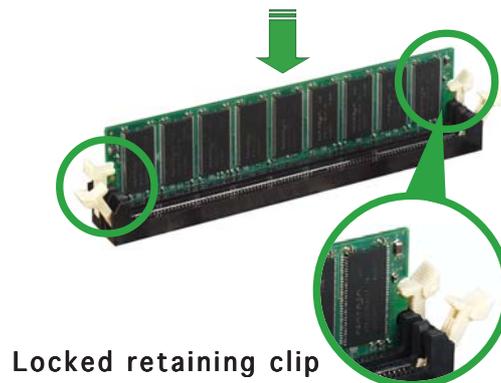
1.7.4 Removing a DIMM

To remove a DIMM:

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

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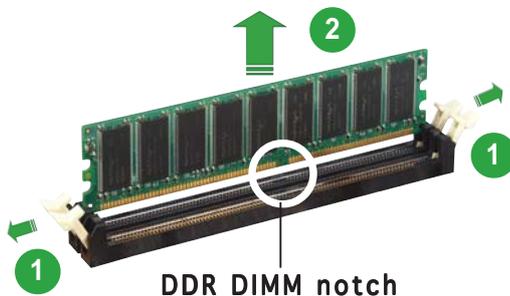
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

1.8   Expansion slots

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

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

1.8.1   Installing an expansion card

To install an expansion card:

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

1.8.2   Configuring an expansion card

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

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

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	–	Programmable Interrupt
4*	12	Communications Port (COM1)
5*	13	IRQ holder for PCI steering
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	IRQ holder for PCI steering
10*	5	Advance AC'97 CODEC
11*	6	Standard PCI Graphics Adapter (VGA)
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	shared	—	—	—	—	—
PCI slot 2	—	—	—	shared	—	—	—	—
PCI slot 3	—	used	—	—	—	—	—	—
AGP slot	shared	—	—	—	—	—	—	—
Onboard USB controller 1	—	—	—	—	used	—	—	—
Onboard USB controller 2	—	—	—	—	—	used	—	—
Onboard USB controller 3	—	—	—	—	—	—	used	—
Onboard USB 2.0 controller	—	—	—	—	—	—	—	used
Onboard LAN	—	—	—	shared	—	—	—	—
Onboard audio	—	—	shared	—	—	—	—	—
Onboard VGA	shared	—	—	—	—	—	—	—

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

1.8.3 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows a LAN card installed on a PCI slot.
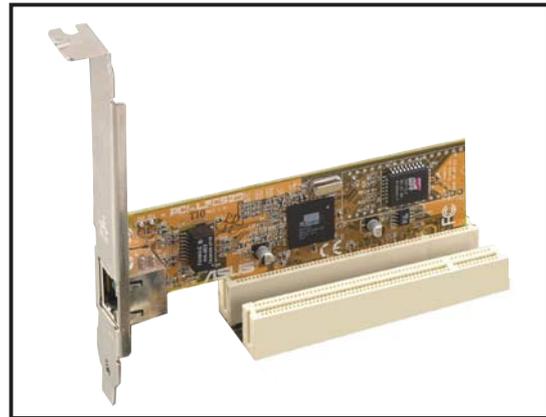
1.8.4 AGP slot

The Accelerated Graphics Port (AGP) slot that supports AGP 8X/4X (+1.5V) cards. When you buy an AGP card, make sure that you ask for one with +1.5V specification.

Note the notches on the card golden fingers to ensure that they fit the AGP slot on the motherboard.

This motherboard does not support 3.3V AGP cards. Install only +1.5V AGP cards.

Keyed for 1.5v
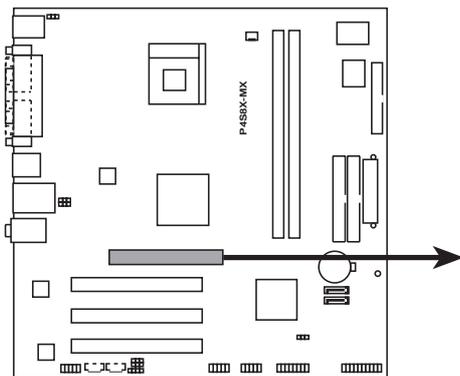
P4S8X-MX Accelerated Graphics Port (AGP)

1.9   Jumpers

1.   Clear RTC RAM (CLRTC)

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

To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.

2.   Remove the onboard battery.

3.   Move the jumper cap from pins 2-3 (default) to pins 1-2. Keep the cap on pins 1-2 for about 5~10 seconds, then move the cap back to pins 2-3.

4.   Re-install the battery.

5.   Plug the power cord and turn ON the computer.

6.   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!

P4S8X-MX Clear RTC RAM

CLRTC1

1 2   Clear CMOS

2 3   Normal (Default)
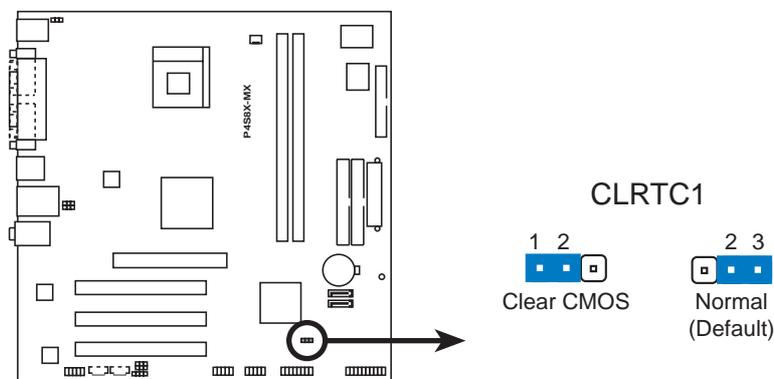
You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

---

2. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56, USBPW78)

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

The USBPW12 and USBPW34 jumpers are for the rear USB ports. The USBPW56 and USBPW78 jumper is for the internal USB connectors that you can connect to additional USB ports.

USBPW34
USBPW12

1 2   2 3

+5V   +5VSB
(Default)

USBPW56
USBPW78

1 2   2 3

+5V   +5VSB
(Default)

P4S8X-MX USB device wake up
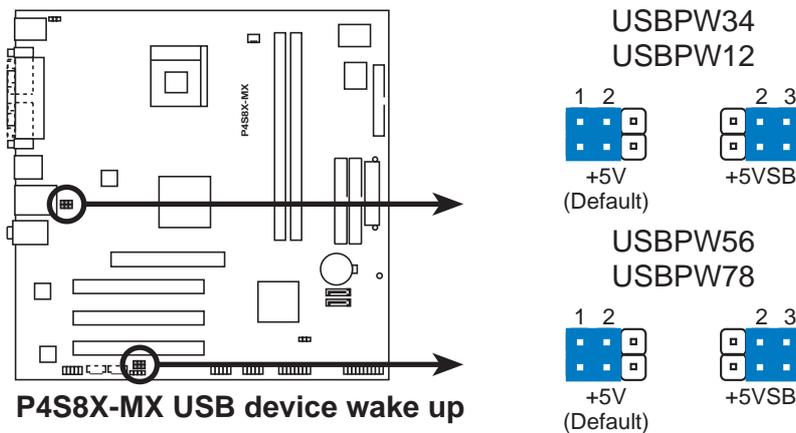
- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

3. Keyboard power (3-pin KBPWR)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 500 mA on the +5VSB lead, and a corresponding setting in the BIOS.
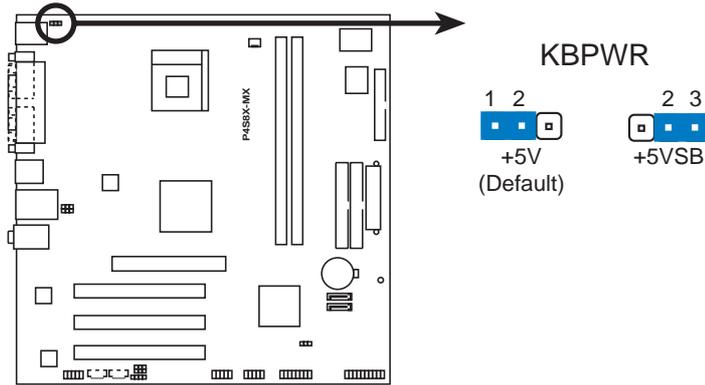
P4S8X-MX Keyboard power setting

1.10 Connectors

1.10.1 Rear panel connectors
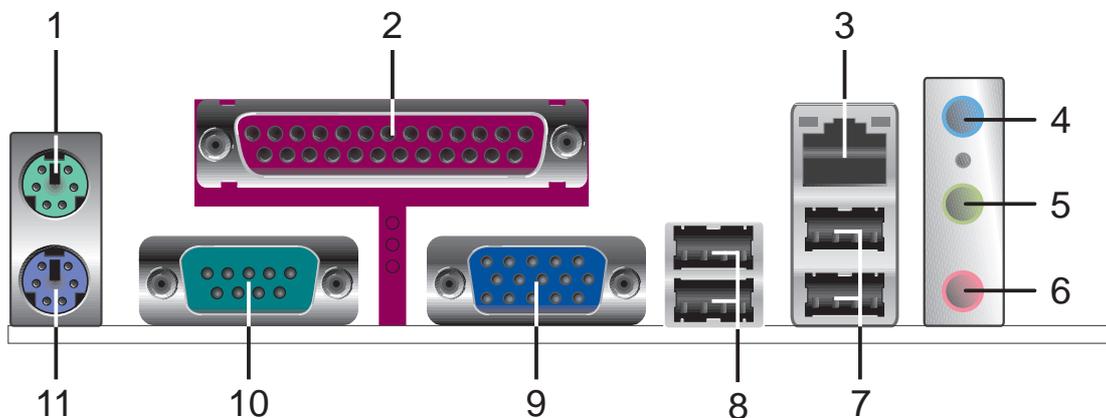
1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **LAN (RJ-45) port.** This port allows connection to a Local Area Network (LAN) through a network hub.
4. **Line In port (light blue).** This port connects a tape, CD, DVD player, or other audio sources.
5. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel and 6-channel configuration, the function of this port becomes Front Speaker Out.
6. **Microphone port (pink).** This port connects a microphone.

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

Audio 2, 4, or 6-channel configuration

Port	Headset 2-channel	4-channel	6-channel
Light Blue	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center Speaker

7. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

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

9. **Video Graphics Adapter port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.

10. **Serial connector.** This 9-pin COM1 port is for serial devices.

11. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

1.10.2 Internal connectors

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

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

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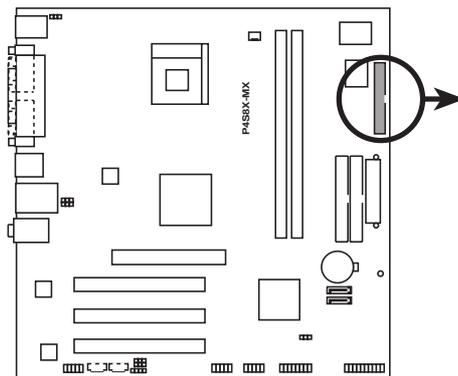
FLOPPY

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

PIN 1

P4S8X-MX Floppy disk drive connector

2. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

These connectors are for Ultra DMA 100/66 signal cables. The Ultra DMA 100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.

- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.

- Support for Ultra ATA/133 is available only when using Windows® XP with Service Pack 2.
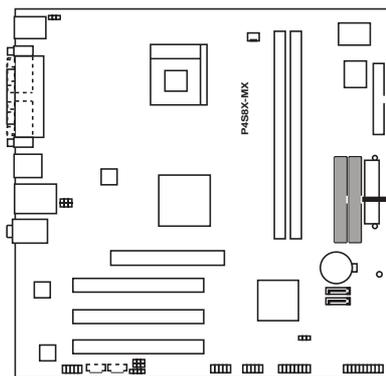
P4S8X-MX IDE connectors
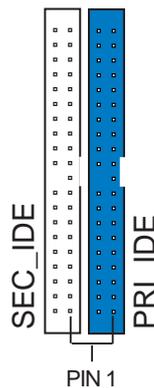
PIN 1

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

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

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives. The current Serial ATA interface allows up to 150 MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra DMA/133)
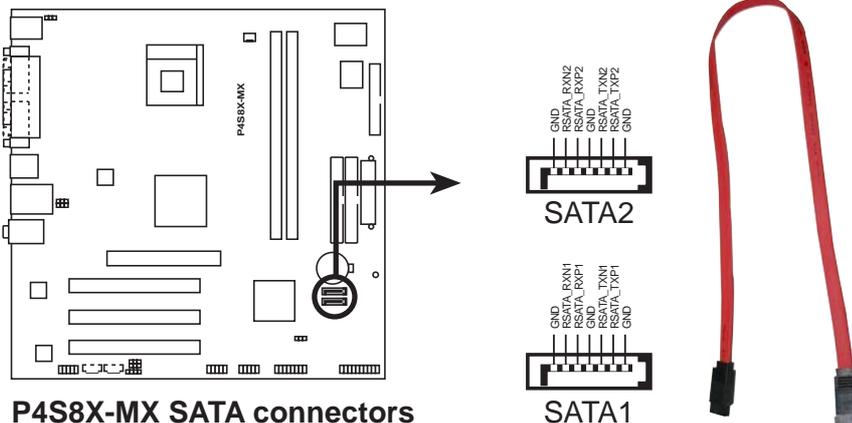
P4S8X-MX SATA connectors   SATA2   SATA1

If you install SATA hard disk drives, you can create a RAID 0, RAID 1, or JBOD configuration with the SIS964 RAID controller. Refer to page 2-16 for the BIOS setting and page 3-18 for creating a RAID driver disk.

- Install Windows® 2000 Service Pack 4, Windows® XP Service Pack 1 or later versions before using the Serial ATA feature.

- The Serial ATA RAID feature (RAID 0, RAID 1, JBOD) is available only if you're using Windows® 2000/XP or Windows® 2003 Server operating systems.

- Hot plug support for the Serial ATA drive and connectors are not available in this motherboard.

- Make sure to install the SIS RAID drivers before using the Serial ATA connectors.

Serial ATA Master/Slave connectors

Connector	Setting	Use
SATA1	Master	Boot disk
SATA2	Slave	Data disk

4. CPU fan connector (3-pin CPU_FAN1)

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

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

P4S8X-MX CPU fan connector

CPU_FAN1

GND
+12V
Rotation
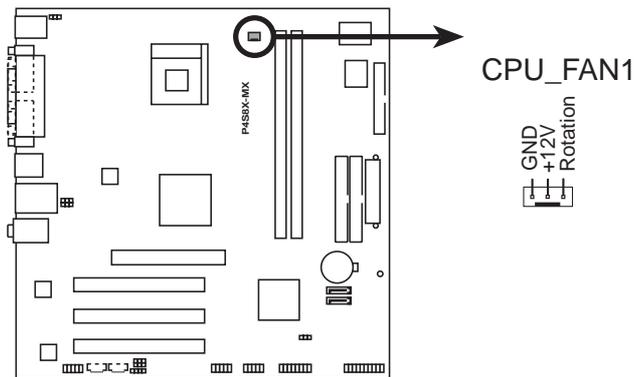
5. GAME/MIDI connector (16-1 pin GAME1)

This connector supports a GAME/MIDI module. Connect the GAME/MIDI cable with yellow connector to the yellow header onboard. The GAME/MIDI port on the module connects a joystick or a game pad for playing games, and MIDI devices for playing or editing audio files.

P4S8X-MX Game connector

GAME

+5V
J1B2
J1CY
GND
GND
J1CX
J1B1
+5V

MIDI_IN
J2B2
J2CY
MIDI_OUT
J2CX
J2B1
+5V
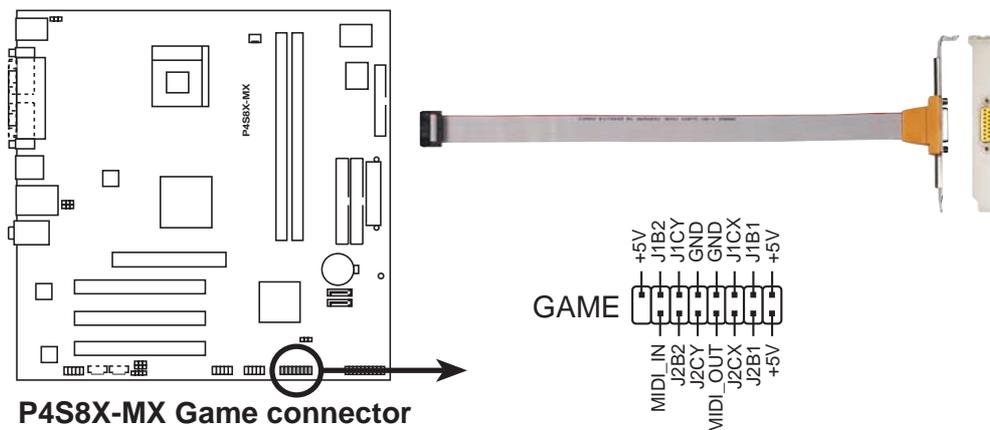
> The GAME module is purchased separately.

6. USB connectors (10-1 pin USB56, USB78)

These connectors are for USB 2.0 ports. Connect the USB/GAME 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.
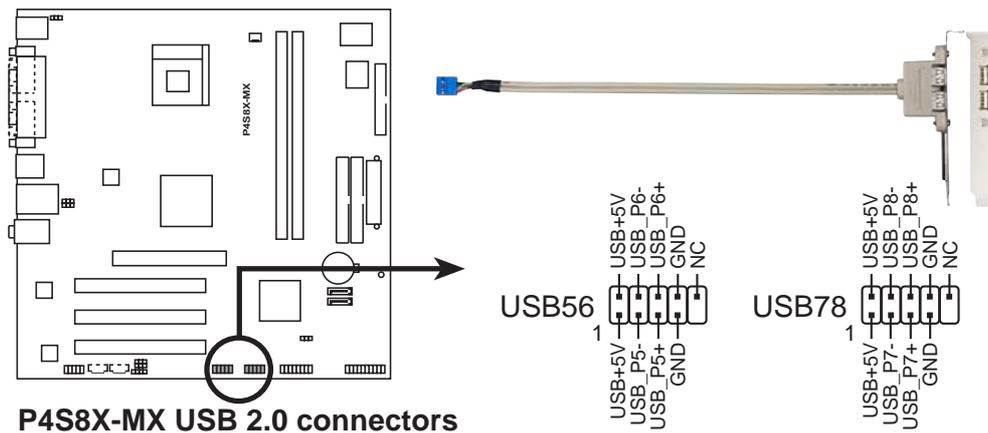
P4S8X-MX USB 2.0 connectors

USB56

USB78

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

The USB 2.0 module is purchased separately.

7. Internal audio connectors (4-pin CD, AUX)

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

AUX (White)   CD (Black)
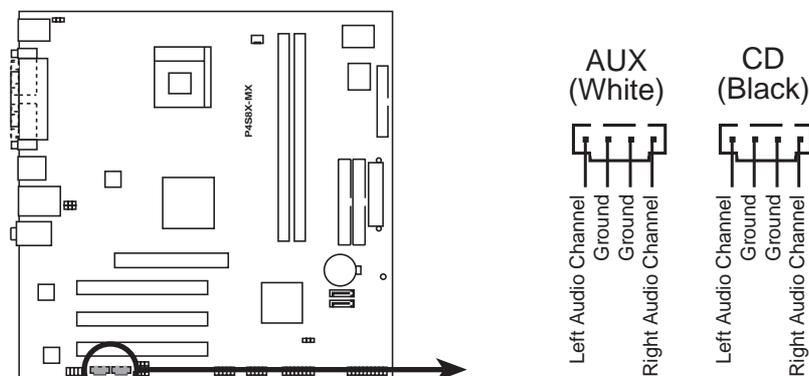
P4S8X-MX Internal audio connectors

8. ATX power connectors (20-pin ATXPWR, 4-pin ATX12V)

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

ATX12V

GND — GND
+12V DC — +12V DC

ATXPWR

+12.0VDC — +5.0VDC
+5VSB — +5.0VDC
PWR_OK — -5.0VDC
COM — GND
+5.0VDC — COM
COM — COM
+5.0VDC — PS_ON#
COM — COM
+3.3VDC — -12.0VDC
+3.3VDC — +3.3VDC

P4S8X-MX ATX power connectors
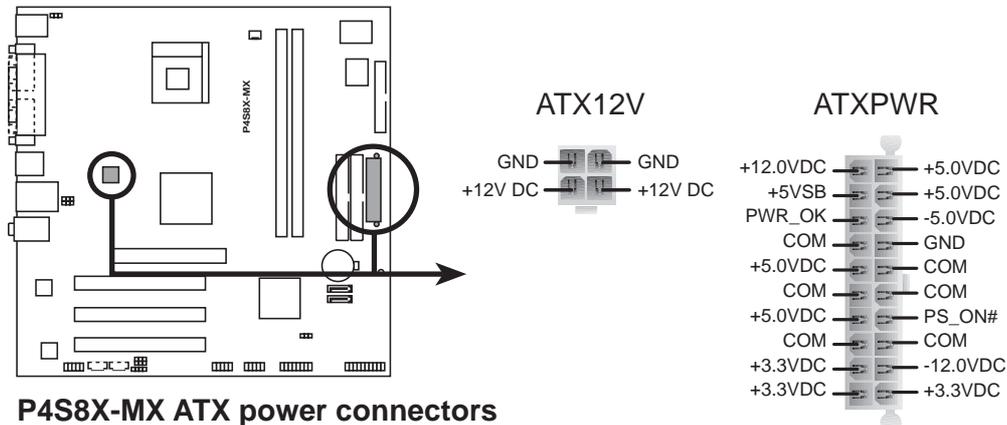
Make sure that your ATX 12 V power supply can provide 8 A on the +12 V lead and at least 1 A on the +5-volt standby lead (+5 VSB). The minimum recommended wattage is 230 W, or 300 W for a fully configured system. The system may become unstable and may experience diffculty powering up if the power supply is inadequate.

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

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

FP_AUDIO1

AGND
+5VA
BLINE_OUT_R
BLINE_OUT_L

MIC2
MICPWR
Line out_R
NC
Line out_L

P4S8X-MX Front panel audio connector
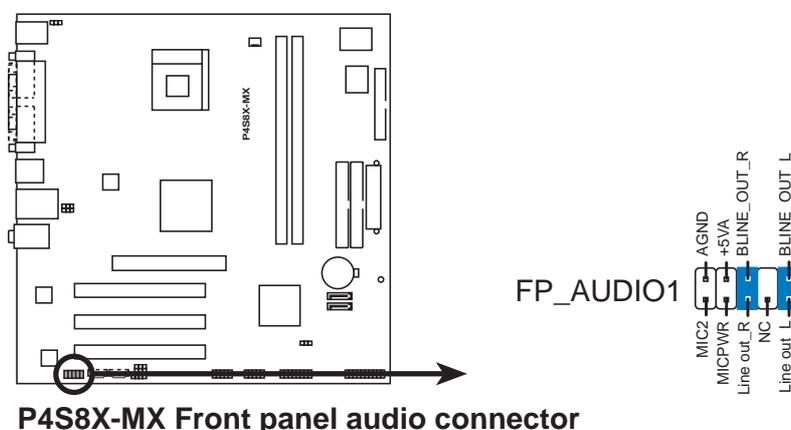
10. Digital audio connector (4-1 pin SPDIF)

An onboard S/PDIF Out connector is available for an optional S/PDIF audio module. Connect one end of the S/PDIF audio cable this connector and the other end to the S/PDIF module.

P4S8X-MX Digital Audio Connector
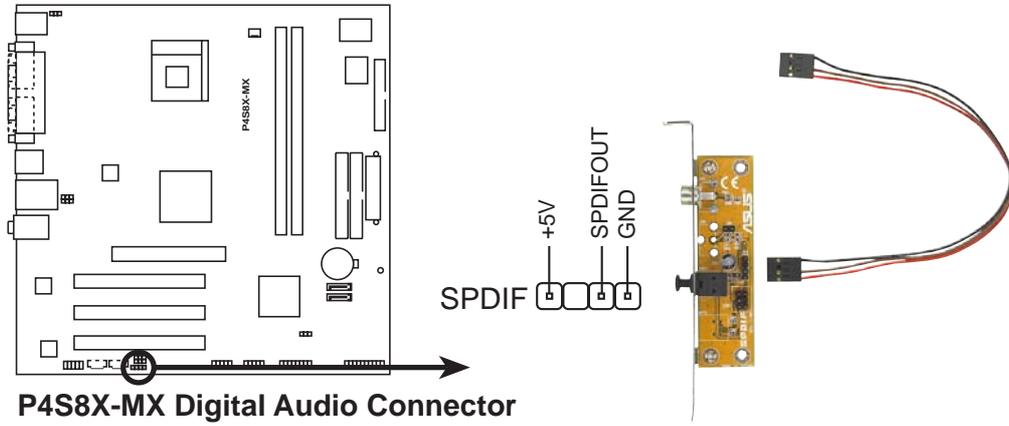
The S/PDIF module is purchased separately.

13. System panel connector (20-pin PANEL)

This connector supports several chassis-mounted functions.

P4S8X-MX System panel connector

* Requires an ATX power supply.
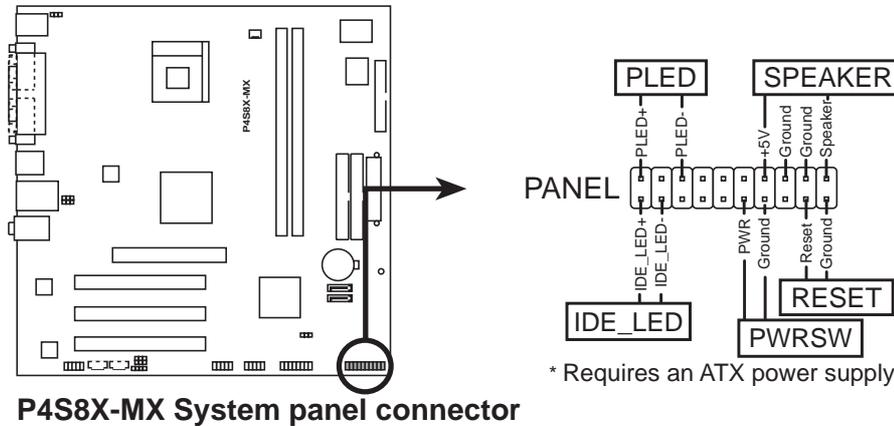
The sytem panel connector is color-coded for easy connection. Refer to the connector description below for details.

- **System power LED (Green 3-pin PLED)**
  This 3-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 (Red 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 (Orange 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.

- **Power/Soft-off button (Yellow 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 (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

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

BIOS setup 2

2.1 Managing and updating your BIOS

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

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

Refer to the corresponding sections for details on these utilities.

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

2.1.1 Creating a bootable floppy disk

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

   DOS environment

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

   Windows® XP environment

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

   Windows® 2000 environment

   To create a set of boot disks for Windows® 2000:
   a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
   b. Insert the Windows® 2000 CD to the optical drive.
   c. Click **Start**, then select **Run**.

d. From the Open field, type

    D:\bootdisk\makeboot a:

    assuming that D: is your optical drive.

e. Press <Enter>, then follow screen instructions to continue.

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

2.1.2 ASUS EZ Flash utility

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

To update the BIOS using EZ Flash:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard and rename the same to **P4S8XMX.ROM**.

2. Save the BIOS file to a floppy disk, then restart the system.

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

```
EZFlash starting BIOS update
Checking for floppy...
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.

```
EZFlash starting BIOS update
Checking for floppy...
Floppy found!
Reading file "P4S8XMX.ROM". Completed.
Start erasing.......|
Start programming...|
Flashed successfully. Rebooting.
```

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

- A "Floppy not found!" error message appears if there is no floppy disk in the drive. A "P4S8XMX.ROM not found!" error message appears if the correct BIOS file is not found in the floppy disk. Make sure that you rename the BIOS file to P4S8XMX.ROM.

2.1.3 AFUDOS utility

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

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

> • Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
>
> • The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be exactly the same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.

2. Boot the system in DOS mode, then at the prompt type:

    afudos /o[filename]

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

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

    Main filename   Extension name

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

    ```
    A:\>afudos /oOLDBIOS1.ROM
    AMI Firmware Update Utility - Version 1.10
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
       Reading flash ..... done
    A:\>
    ```

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

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

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

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

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support
    CD to the bootable floppy disk you created earlier.

3. Boot the system in DOS mode, then at the prompt type:

    afudos /i[filename]

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

```
A:\>afudos /iP4S8XMX.ROM
```

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

```
A:\>afudos /iP4S8XMX.ROM
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
    Reading file ..... done
    Erasing flash .... done
    Writing flash .... 0x0008CC00 (9%)
```

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

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

```
A:\>afudos /iP4S8XMX.ROM
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
    Reading file ..... done
    Erasing flash .... done
    Writing flash .... 0x0008CC00 (9%)
    Verifying flash .. done
A:\>
```

2.1.4　ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.

> • Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
>
> • Make sure that you rename the original or updated BIOS file in the floppy disk to **P4S8XMX.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.

2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.

3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "P4S8XMX.ROM". Completed.
Start flashing...
```

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

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

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.

2. Insert the support CD to the optical drive.

3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "P4S8XMX.ROM". Completed.
Start flashing...
```

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

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

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

2.1.5 ASUS Update utility

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

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

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

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

Installing ASUS Update

To install ASUS Update:

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

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

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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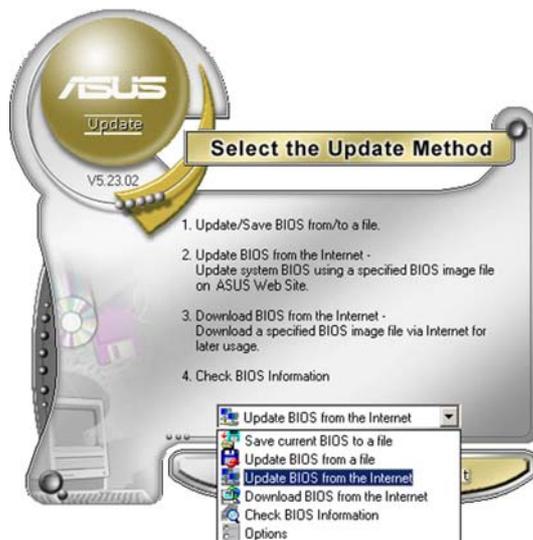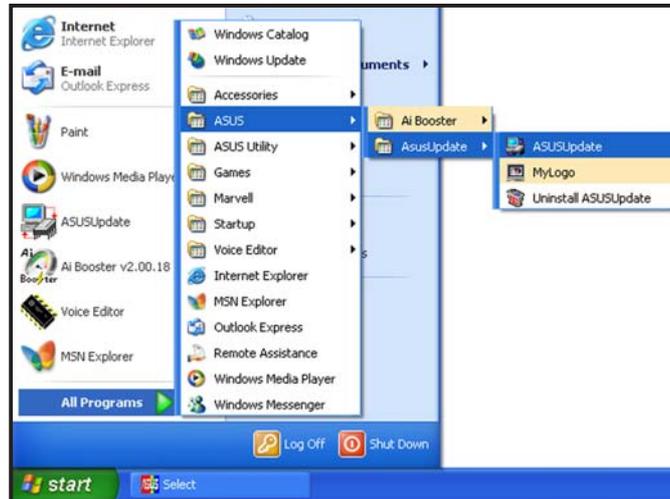
2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

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

4. From the FTP site, select the BIOS version that you wish to download. Click Next.

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

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

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

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

2. Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.
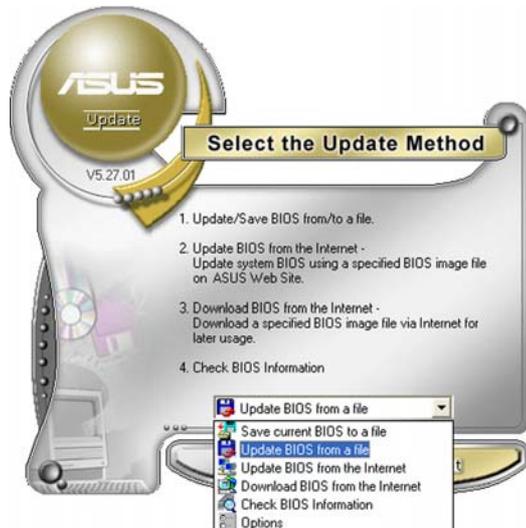
3. Locate the BIOS file from the **Open** window, then click **Save**.

4. Follow the screen instructions to complete the update process.

2.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "2.1 Managing and updating your BIOS."

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

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

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

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

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

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section "2.7 Exit Menu."

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard and .

2.2.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                    BIOS SETUP UTILITY
 Main    Advanced    Power    Boot    Exit

    System Time              [10:55:25]          Use [ENTER], [TAB] or
    System Date              [Mon 03/14/2005]    [SHIFT-TAB] to select
    Legacy Diskette A        [1.44M, 3.5 in]     a field.

  ▶ Primary IDE Master       [ST320410A]         Use [+] or [-] to
  ▶ Primary IDE Slave        [ASUS CD-S520/A]    configure the System
  ▶ Secondary IDE Master     [Not Detected]      Time.
  ▶ Secondary IDE Slave      [Not Detected]
    OnChip SATA Controller   [RAID Mode]

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

         v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

Sub-menu items   Navigation keys

2.2.2 Menu bar

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

Main   For changing the basic system configuration

Advanced   For changing the advanced system settings

Power   For changing the advanced power management (APM)
                  configuration

Boot   For changing the system boot configuration

Exit   For selecting the exit options and loading default
                  settings

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

2.2.3 Navigation keys

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

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

2.2.4 Menu items

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

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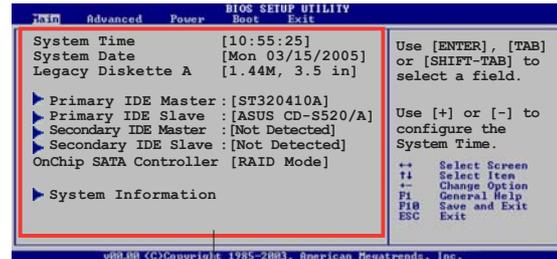
Main menu items

2.2.5 Sub-menu items

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

2.2.6 Configuration fields

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

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

2.2.7 Pop-up window

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

2.2.8 Scroll bar

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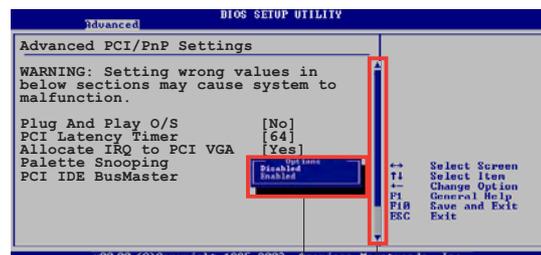
Pop-up window

Scroll bar

2.2.9 General help

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

2.3   Main menu

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

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

```
                              BIOS SETUP UTILITY
    Main      Advanced      Power      Boot     Exit

    System Time               [10:55:25]              Use [ENTER], [TAB] or
    System Date               [Mon 03/15/2005]        [SHIFT-TAB] to select
    Legacy Diskette A         [1.44M, 3.5 in]         a field.

    ▶ Primary IDE Master      [ST320410A]             Use [+] or [-] to
    ▶ Primary IDE Slave       [ASUS CD-S520/A]        configure the System
    ▶ Secondary IDE Master    [Not Detected]          Time.
    ▶ Secondary IDE Slave     [Not Detected]
    OnChip SATA Controller    [RAID Mode]

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

              v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

2.3.1   System Time [xx:xx:xx]

Allows you to set the system time.

2.3.2   System Date [Day xx/xx/xxxx]

Allows you to set the system date.

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

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

2.3.4   Primary and Secondary IDE Master/Slave

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

```
                          BIOS SETUP UTILITY
 Main

  Primary IDE Master

  Device        : Hard Disk
  Vendor        : ST320410A
  Size          : 20.0GB
  LBA Mode      : Supported
  Block Mode    : 16 Sectors
  PIO Mode      : Supported
  Async DMA     : MultiWord DMA-2
  Ultra DMA     : Ultra DMA-2
  SMART Monitoring: Supported
                                              ←→    Select Screen
  Type                        [Auto]          ↑↓    Select Item
  LBA/Large Mode              [Auto]          +-    Change Option
  Block(Multi-sector Transfer) M [Auto]       F1    General Help
  PIO Mode                    [Auto]          F10   Save and Exit
  DMA Mode                    [Auto]          ESC   Exit
  Smart Monitoring            [Auto]
  32Bit Data Transfer         [Disabled]

        v00.00 (C)Copyright 1985-2003, 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]

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

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

Block (Multi-sector Transfer) M [Auto]

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

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

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

SMART Monitoring [Auto]

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

32Bit Data Transfer [Disabled]

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

2.3.5   OnChip SATA Controller [RAID Mode]

Allows you to disable or set the onchip Serial ATA controller mode. Set to
[Native Mode] when using generic IDE devices or [Raid Mode] to enable the
RAID function. Configuration options: [Disabled] [Native Mode] [Raid Mode]

2.3.6   System Information

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

```
                           BIOS SETUP UTILITY
  Main


     AMIBIOS
     Version    : 0106
     Build Date : 03/10/05

     Processor
     Type       : Genuine Intel(R) CPU 2.04GHz
     Speed      : 2400 MHz
     Count      : 1

     System Memory
     Size       : 224MB                          ↔    Select Screen
                                                  ↑↓   Select Item
```
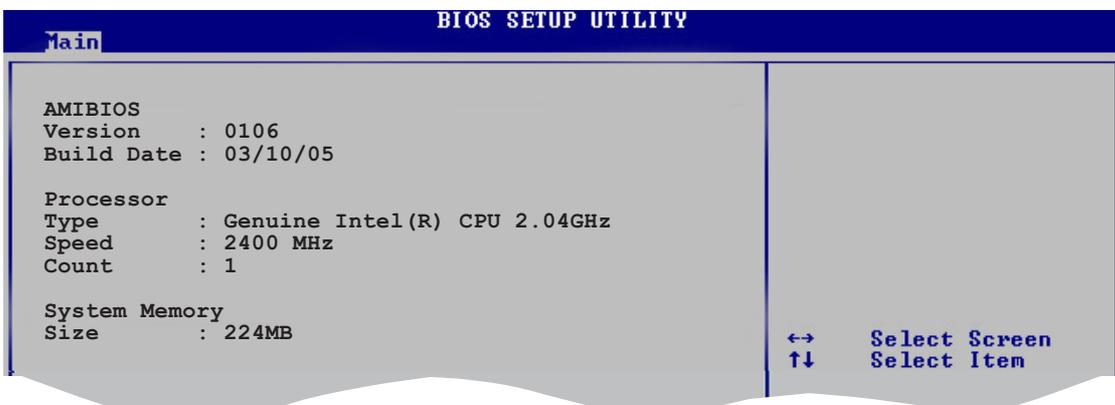
AMI BIOS

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected system memory.

2.4 Advanced menu

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

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

```
                          BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

 ┌──────────────────────────────────────┬─────────────────────────────┐
 │                                       │  Adjust system              │
 │ ▶ JumperFree Configuration            │  frequency/voltage.         │
 │ ▶ CPU Configuration                   │                             │
 │ ▶ Chipset                             │                             │
 │ ▶ Onboard Devices Configuration       │                             │
 │ ▶ PCI PnP                             │                             │
 │ ▶ USB Configuration                   │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │  ↔     Select Screen        │
 │                                       │  ↑↓    Select Item          │
 │                                       │  Enter Go to Sub Screen     │
 │                                       │  F1    General Help         │
 │                                       │  F10   Save and Exit        │
 │                                       │  ESC   Exit                 │
 │                                       │                             │
 └──────────────────────────────────────┴─────────────────────────────┘
           v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

2.4.1 JumperFree Configuration

```
                        BIOS SETUP UTILITY
    Advanced

Configure System Frequency                      Select the target CPU
                                                frequency, and the
AI Overclock Tuner         [Manual]             relevant parameters
CPU Frequency              [133]                will be auto-adjusted.
AGP/PCI Frequency          [Auto]               Frequencies higher
Spread Spectrum            [Enabled]            than CPU manufacturer
DRAM Frequency             [Auto]               recommends are not
                                                guaranteed to be
                                                stable. If the system
                                                becomes unstable,
                                                return to the default.
                                                ↔      Select Screen
                                                ↑↓     Select Item
                                                +-     Change Option
                                                F1     General Help
                                                F10    Save and Exit
                                                ESC    Exit

        v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

AI Overclock Tuner [Standard]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking options. Configuration options: [Manual] [Standard]

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

> ✎ If you are using an unlocked CPU, the item **CPU Ratio** appears under the AI Overclock Tuner item. You may select your desired ratio from the available options.

CPU Frequency (value is auto-detected)

Indicates the frequency sent by the clock generator to the system bus and PCI bus. The bus frequency (external frequency) multiplied by the bus multiple equals the CPU speed. The value of this item is auto-detected by BIOS and ranges from 100 to 200.

> ✎ The **CPU Frequency** item appears only when you set the **AI Overclocking Tuner** item to [Manual].

AGP/PCI Frequency [Auto]

Allows you to set the AGP/PCI operating frequency.
Configuration options: [Auto][66.6/33.3] [75.0/37.5] [85.7/42.8]

Spread Spectrum [Enabled]

Enables or disables the clock generator spread spectrum.
Configuration options: [Disabled] [Enabled]

DRAM Frequency [Auto]

Allows you to set the DDR operating frequency.
Configuration options: [266 MHz] [333 MHz] [400 MHz] [Auto]

2.4.2 CPU Configuration

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

```
                          BIOS SETUP UTILITY
      Advanced

   Configure Advanced CPU settings                 Sets the ratio between
                                                   CPU Core Clock and the
   Manufacturer: Intel                             FSB Frequency.
   Brand String: Genuine Intel (R) CPU 2.40 GHz    NOTE: If an invalid
   Frequency   : 2400 MHz                          ratio is set in CMOS
   FSB Speed   : 533 MHz                           then actual and
                                                   setpoint values may
   Cache L1    : 16 KB                             differ.
   Cache L2    : 1024 KB
   Cache L3    : 0 KB

   Ratio Status: Unlocked (Max: 28, Min:14)
   Ratio Actual Value : 18                         ←→      Select Screen
     Ratio CMOS Setting:          [ 18]            ↑↓      Select Item
   Max CPUID Value Limit:         [Disabled]       +-      Change Option
   Enhanced C1 Control            [Auto]           F1      General Help
   CPU Internal Thermal Control   [Auto]           F10     Save and Exit
                                                   ESC     Exit


            v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

Ratio CMOS Setting [18]

Sets the ratio between the CPU Core Clock and the Front Side Bus frequency. The default value of this item is auto-detected by BIOS. Use the <+> or <-> keys to adjust the values.

Max CPUID Value Limit [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Enhanced C1 Control [Auto]

When set to [Auto], the BIOS will automatically check the CPU's capability to enable the C1E support. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Auto] [Disabled]

CPU Internal Thermal Control [Auto]

Disables or sets the CPU internal thermal control.
Configuration options: [Auto] [Disabled]

2.4.3 Chipset

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

```
                        BIOS SETUP UTILITY
         Advanced

   ▶  NorthBridge SIS661GX Configuration
   ▶  SouthBridge SIS964 Configuration
```

NorthBridge SiS661GX Configuration

```
                        BIOS SETUP UTILITY
         Advanced

   Primary Graphics Adapter        [PCI]
   MA 1T/2T Select                 [Auto]
   DRAM CAS# Latency               [By SPD]
   DRAM Precharge Delay            [Auto]
   DRAM RAS# to CAS# Delay         [Auto]
   DRAM RAS# Precharge             [Auto]
   Graphic Win Size                [ 64MB]
   AGP Fast Write Control          [Disabled]

   Share Memory Size               [ 32MB]

                                            ↔    Select Screen
                                            ↑↓   Select Item
```
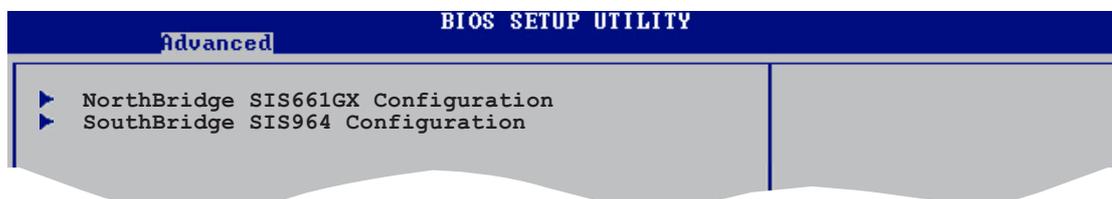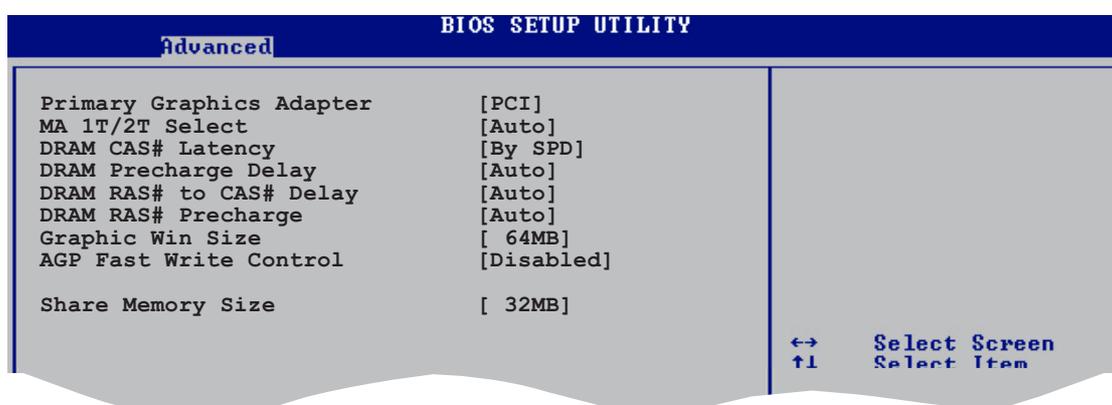
Primary Graphics Adapter [PCI]
Allows selection of the graphics controller to use as primary boot device. Configuration options: [PCI] [AGP] [Onboard AGP]

MA 1T/2T Select [Auto]
Allows you to set the Channel MA 1T or 2T setting.
Configuration options: [Auto] [MA 2T] [MA 1T]

DRAM CAS# Latency [By SPD]
Controls the latency between the SDRAM read command and the time the data actually becomes available. Configuration options: [By SPD] [2T] [2.5T] [3T]

DRAM Precharge Delay [Auto]
Sets the DRAM Precharge Delay. Configuration options: [Auto] [6T] [7T] [5T] [4T] [8T] [9T]

DRAM RAS# to CAS# Delay [Auto]
Controls the latency between the DDR SDRAM active command and the read/write command. Configuration options: [Auto] [3T] [2T] [4T] [5T]

DRAM RAS# Precharge [Auto]

Controls the idle clocks after issuing a precharge command to the DDR
SDRAM. Configuration options: [Auto] [3T] [2T] [4T] [5T]

Graphics Win Size [64MB]

Allows you to select the size of mapped memory for AGP graphic
data. Configuration options: [32MB] [64MB] [128MB]

AGP Fast Write Control [Disabled]

Enables or disables the AGP Fast Write Control feature.
Configuration options: [Disabled] [Enabled]

Share Memory Size [32MB]

Sets the share memory size. Configuration options: [16MB] [32MB]
[64MB] [128MB] [Disabled]

SouthBridge SiS964 Configuration


```
                         BIOS SETUP UTILITY
      Advanced

  Onboard AC97 Audio Device      [Enabled]
  Onboard SIS900 LAN Device      [Enabled]
  Onboard LAN Boot ROM           [Disabled]
```

Onboard AC97 Audio Device [Enabled]

This item enables or disables the onboard AC'97 audio CODEC device.
Configuration options: [Disabled] [Enabled]

OnBoard SiS900 LAN Device [Enabled]

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

OnBoard LAN Boot ROM [Disabled]

Allows you to enable or disable the option ROM in the onboard LAN
controller. This item appears only when the Onboard LAN item is set
to Enabled. Configuration options: [Disabled] [Enabled]

2.4.4 Onboard Devices Configuration

```
                         BIOS SETUP UTILITY
       Advanced

    Configure Onboard Device                      Allows BIOS to
                                                   select Serial Port1
    Serial Port1 Address          [3F8/IRQ4]       Base addresses.
    Parallel Port Address         [378]
    Parallel Port Mode            [ECP]
    ECP Mode DMA Channel          [DMA3]
    Parallel Port IRQ             [IRQ7]
    Onboard Game/MIDI Port        [Disabled]
```

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4]
[2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [ECP]

Allows you to select the Parallel Port mode. When the item **Parallel Port Address** is set to **3BC**, the Parallel Port Mode options are only Normal, Bi-directional, and ECP. Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

> *EPP Version [1.9]*
> Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**.
> Configuration options: [1.9] [1.7]

ECP Mode DMA Channel [DMA3]

Allows selection of the Parallel Port ECP DMA channel.
Configuration options: [DMA0] [DMA1] [DMA3]

Parallel Port IRQ [IRQ7]

Allows you to select the Parallel Port IRQ.
Configuration options: [IRQ5] [IRQ7]

Onboard Game/MIDI Port [Disabled]

Allows you to select the Game Port address or to disable the port.
Configuration options: [Disabled] [200/300] [200/330] [208/300]
[208/330]

2.4.5 PCI PnP

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

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

```
                        BIOS SETUP UTILITY
      Advanced

Advanced PCI/PnP Settings                            NO: Lets the BIOS
                                                     configure all the
WARNING: Setting wrong values in below sections      devices in the system.
         may cause system to malfunction.            YES: Lets the
                                                     operating system
Plug And Play O/S              [No]                   configure Plug and
PCI Lantency Timer            [64]                    Play (PnP) devices not
Allocate IRQ to PCI VGA       [Yes]                   required for boot if
Palette Snooping              [Disabled]             your system has a Plug
                                                     and Play operating
IRQ3                          [PCI Device]           system.
IRQ4                          [PCI Device]
IRQ5                          [PCI Device]          ←→    Select Screen
IRQ7                          [PCI Device]          ↑↓    Select Item
IRQ9                          [PCI Device]          +−    Change Option
IRQ10                         [PCI Device]          F1    General Help
IRQ11                         [PCI Device]          F10   Save and Exit
IRQ14                         [PCI Device]          ESC   Exit
IRQ15                         [PCI Device]

        v00.00 (C)Copyright 1985-2002, American Megatrends, Inc.
```

Plug and Play O/S [No]

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

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

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

Pallete Snooping [Disabled]

When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Setting to [Disabled] deactivates this feature. Configuration options: [Disabled] [Enabled]

2.4.6　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.

```
                          BIOS SETUP UTILITY
         Advanced

    OnBoard SiS USB1.1 Device        [Enabled]
    OnBoard SiS USB2.0 Device        [Enabled]

    USB Configuration

    Module Version - 2.23.2-10.4

    USB Devices Enabled: None

    Legacy USB Support               [Auto]
    USB 2.0 Controller Mode          [HiSpeed]
                                                   ↔    Select Screen
```
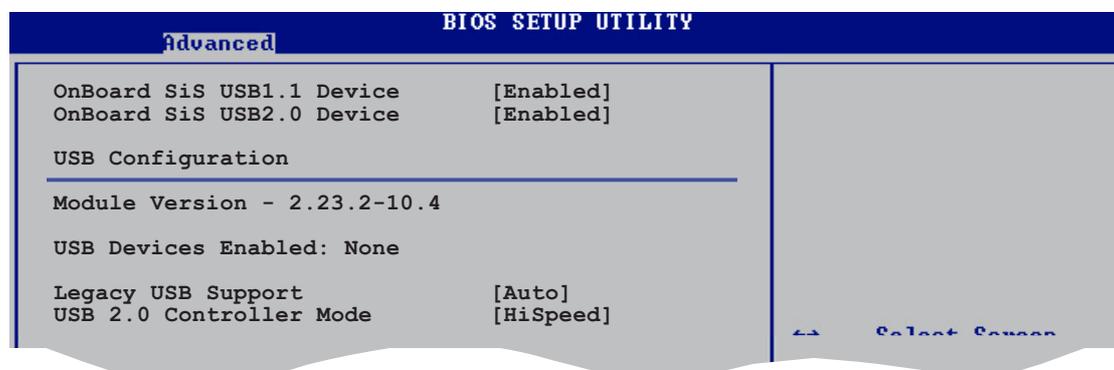
OnBoard SiS USB 1.1 Device [Enabled]

Allows you to enable or disable the onboard SiS USB 1.1 device.
Configuration options: [Disabled] [Enabled]

OnBoard SiS USB 2.0 Device [Enabled]

Allows you to enable or disable the onboard SiS USB 2.0 device.
Configuration options: [Disabled] [Enabled]

> • The Module Version and USB Devices Enabled items show the auto-detected values. If no USB device is detected, the item shows None.
>
> • Set this item to Disable when using Windows® 98 SE or Windows® Me OS.

Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps). Configuration options: [HiSpeed] [Full Speed]

2.5 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.

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

                                                Select the ACPI state
  Suspend Mode              [Auto]              used for System
  ACPI 2.0 Support          [No]               Suspend.
  ACPI APIC Support         [Enabled]

 ▶  APM Configuration
 ▶  Hardware Monitor
```
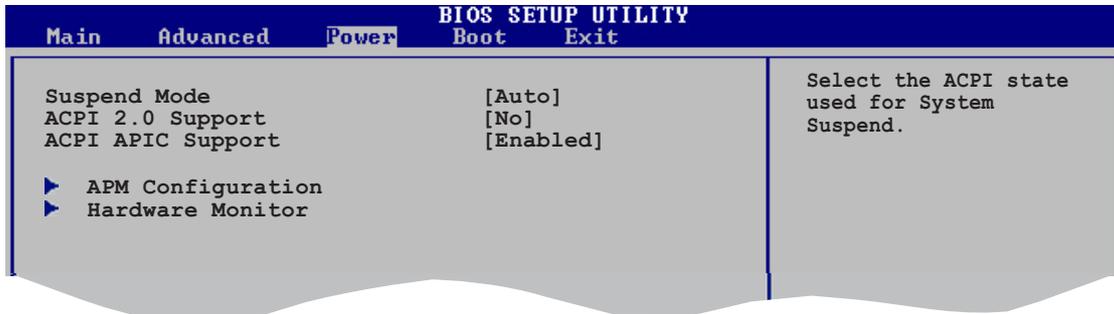
2.5.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.
Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

2.5.2 ACPI 2.0 Support [No]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [No] [Yes]

2.5.3 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

2.5.4 APM Configuration

```
                            BIOS SETUP UTILITY
                    Power

 APM Configuration                                     <Enter> to select
                                                       whether or not to
 Power Button Mode              [On/Off]               restart the system
                                                       after AC power loss.
 Restore on AC Power Loss       [Always OFF]
 Power On By PS2 Keyboard        [Disabled]
 Power On By PS2 Mouse           [Disabled]
 Power On By Internal MAC LAN    [Disabled]
 Power On By PCI Devices         [Disabled]
 Power On By External Modems     [Disabled]
 Power On By RTC Alarm           [Disabled]
```

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Suspend]

Restore on AC Power Loss [Always OFF]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state whatever was the system state before the AC power loss. Configuration options: [Always Off] [Always On] [Keep Previous State]

Power On By PS/2 Keyboard [Disabled]

This parameter allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Space Bar] [Ctrl-Esc] [Power key]

Power On By PS/2 Mouse [Disabled]

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

If the **Power On By PS/2 Keyboard** is enabled, the **Power On by PS/2 Mouse** function is disabled.

Power On By Internal MAC LAN [Disabled]

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

Power On By PCI Devices [Disabled]

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

Power On By External Modem [Disabled]

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

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

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

2.5.5 Hardware Monitor

```
                      BIOS SETUP UTILITY
              Power
 Hardware Monitor                                 CPU Temperature

 CPU Temperature              [65.5°C/148°F]
 MB Temperature               [36°C/96.5°F]

 CPU Fan Speed                [3260RPM]
 Chassis Fan Speed            [N/A]

 VCORE Voltage                [ 1.504V]
 3.3V Voltage                 [ 3.360V]
 5V Voltage                   [ 5.160V]
 12V Voltage                  [11.328V]        ←→    Select Screen
                                               ↑↓    Select Item
```
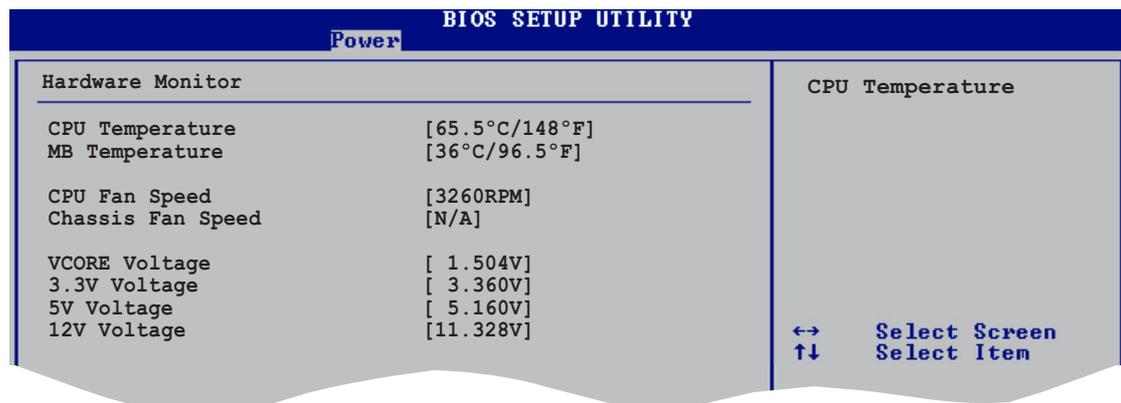
CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

CPU Fan Speed [xxxxRPM] or [N/A]
## Chassis Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU
and chassis fan speeds in rotations per minute (RPM). If any of the fans is
not connected to the motherboard, the specific field shows N/A.

## VCORE Voltage, +3.3V Voltage, +5V Voltage, +12V Voltage

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

2.6 Boot menu

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

```
                         BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit
 ┌────────────────────────────────────────────┬──────────────────────────┐
 │ Boot Settings                              │                          │
 │                                            │                          │
 │  ▶ Boot Device Priority                    │                          │
 │                                            │                          │
 │  ▶ Boot Settings Configuration             │                          │
 │  ▶ Security                                │                          │
 │                                            │                          │
 │                                            │                          │
 │                                            │  ↔    Select Screen      │
 │                                            │  ↑↓   Select Item        │
 │                                            │  +-   Change Option      │
 │                                            │  F1   General Help       │
 │                                            │  F10  Save and Exit      │
 │                                            │  ESC  Exit               │
 │                                            │                          │
 └────────────────────────────────────────────┴──────────────────────────┘
         v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

2.6.1 Boot Device Priority

```
                         BIOS SETUP UTILITY
                              Boot
 ┌────────────────────────────────────────────┬──────────────────────────┐
 │ Boot Device Priority                        │  Specifies the boot      │
 │                                             │  sequence from the       │
 │  1st Boot Device       [1st FLOPPY DRIVE]   │  available devices.      │
 │  2nd Boot Device       [PM-ST330620A]       │                          │
 │  3rd Boot Device       [PS-ASUS CD-S360]    │                          │
```

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

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

2.6.2 Removable Drives

This item appears only when there are removable drives (like a USB flash disk) plugged in the system.

```
                    BIOS SETUP UTILITY
                         Boot

Removable Drives                               Specifies the boot
                                               sequence from the
 1st Boot Device        [1st FLOPPY DRIVE]     available devices.
 2nd Boot Device        [ASUS USB Flash Disk]
 3rd Boot Device        [ASUS USB Flash Disk]
```

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

These items specify the removable boot device priority sequence from the available removable boot devices. Configuration options: [xxxxx Drive] [Disabled]

2.6.3 Boot Settings Configuration

```
                    BIOS SETUP UTILITY
                         Boot

Boot Settings Configuration                    Allows BIOS to skip
                                               certain tests while
 Quick Boot                 [Enabled]          booting. This will
 Full Screen Logo           [Enabled]          decrease the time
 AddOn ROM Display Mode      [Force BIOS]      needed to boot the
 Bootup Num-Lock            [On]               system.
 PS/2 Mouse Support         [Auto]
 Wait For 'F1' If Error     [Enabled]
 Hit 'DEL' Message Display  [Enabled]
 Interrupt 19 Capture       [Disabled]
```

Quick Boot [Enabled]

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

Full Screen Logo [Enabled]

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

Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

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

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

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

Hit 'DEL' Message Display [Enabled]

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

Interrupt 19 Capture [Disabled]

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

2.6.4 Security

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

```
                         BIOS SETUP UTILITY
                              Boot

 Security Settings                              <Enter> to change
                                                password.
 Supervisor Password   : Not Installed          <Enter> again to
 User Password         : Not Installed          disabled password.

 Change Supervisor Password
```
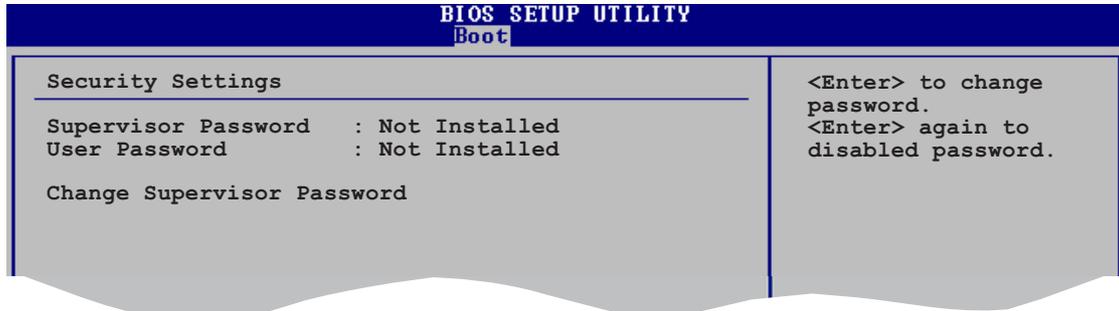
Change Supervisor Password

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

To set a Supervisor Password:

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

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

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

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

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

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

```
              BIOS SETUP UTILITY
                    Boot

 Security Settings

 Supervisor Password   : Not Installed
 User Password         : Not Installed

 Change Supervisor Password
 User Access Level              [Full Access]
 Change User Password
 Clear User Password
 Password Check                 [Setup]

                                        ←→     Select Screen
                                        ↑↓     Select Item
```

User Access Level (Full Access]

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

No Access prevents user access to the Setup utility.

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

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

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

Change User Password

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

To set a User Password:

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

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

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

Clear User Password

Select this item to clear the user password.

Password Check [Setup]

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

2.7   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.

```
                    BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

   Exit Options

   Exit & Save Changes
   Exit & Discard Changes
   Discard Changes

   Load Setup Defaults



                                          ←→      Select Screen
                                          ↑↓      Select Item
                                          Enter Go to Sub Screen
                                          F1      General Help
                                          F10     Save and Exit
                                          ESC     Exit

        v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```
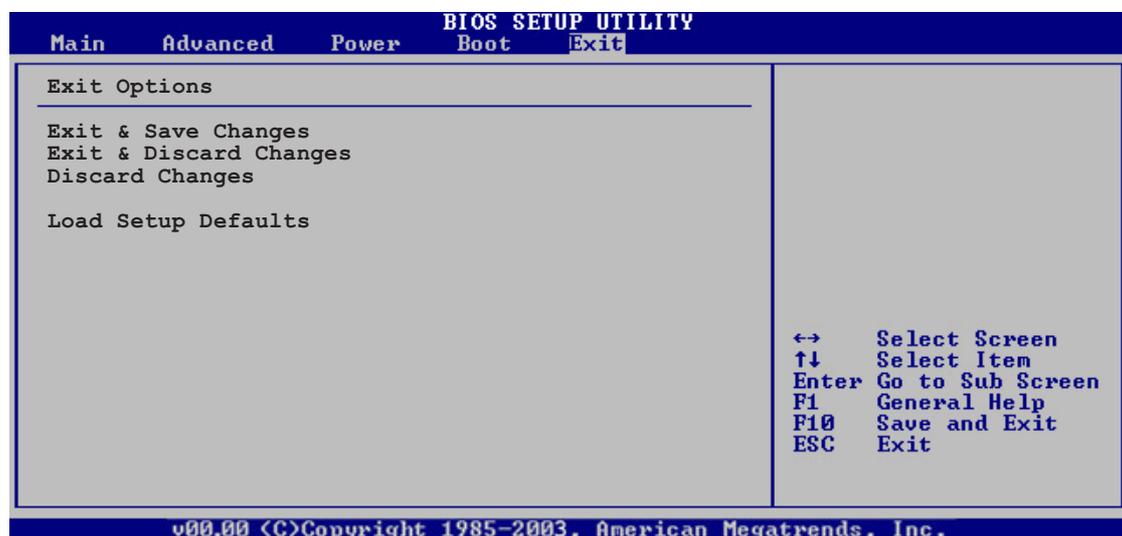
Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

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

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

Exit & Discard Changes

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

Discard Changes

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

Load Setup Defaults

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

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

Software support

3

3.1 Installing an operating system

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

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Make sure that you install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 or later versions before installing the drivers for better compatibility and system stability.

3.2 Support CD information

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

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

3.2.1 Running the support CD

Place the support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.
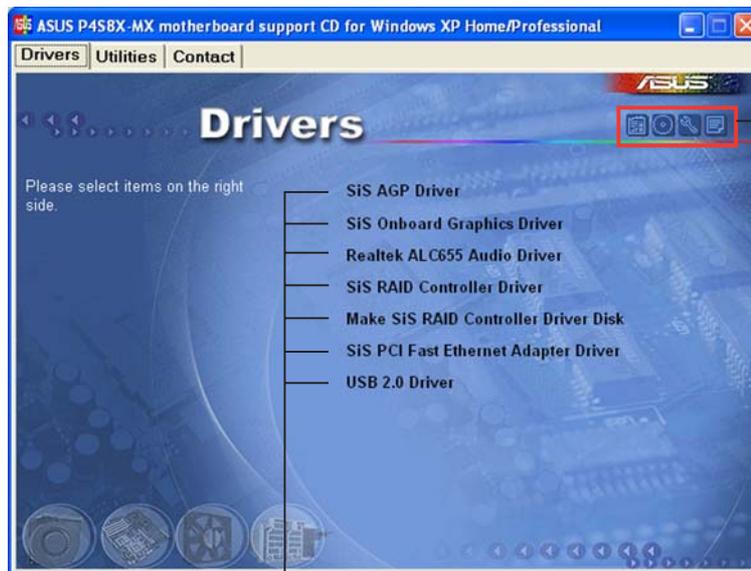
Click an icon to display support CD/motherboard information

Click an item to install

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

3.2.2 Drivers menu

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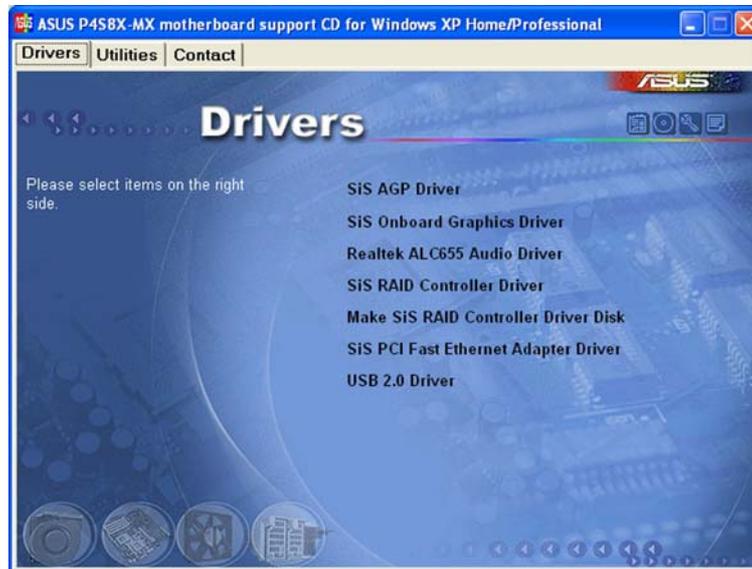
SiS AGP Driver

Installs SiS AGP display driver.

SiS Onboard Graphics Driver

Installs SiS graphics driver for the onboard graphics controller.

> Make sure you uninstall the SiS onboard graphics driver before installing a PCI VGA card.

Realtek ALC655 Audio Driver

Installs the Realtek® ALC655 audio driver and application.

SIS RAID Controller Driver

Installs the SIS RAID driver.

Make SiS RAID Controller Driver Disk

Creates a SIS RAID driver disk.

SiS PCI Fast Ethernet Adapter Driver

Installs the driver for the onboard SiS PCI LAN controller.

USB 2.0 Driver

Installs the USB 2.0 driver.

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

3.2.3   Utilities menu

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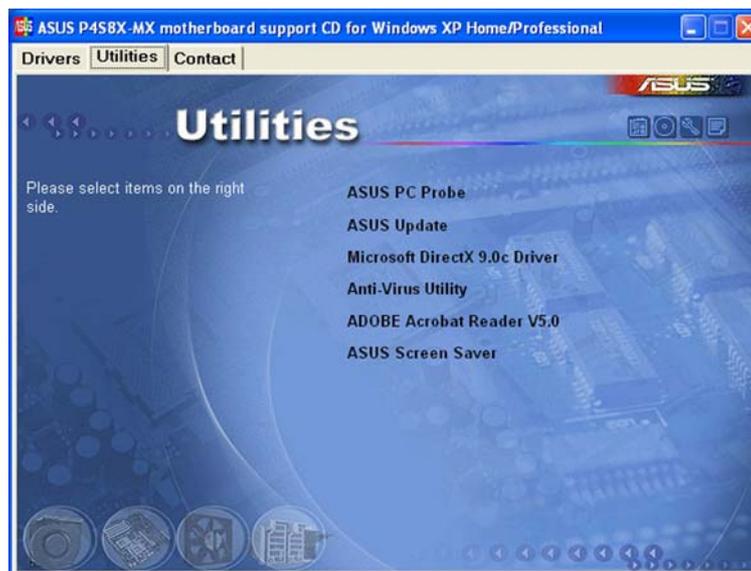
ASUS PC Probe

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

ASUS Update

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

Microsoft DirectX 9.0c

The Microsoft® DirectX® 9.0c is a multimedia technology that enhances computer graphics and sounds. DirectX® improves the multimedia features of your computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer.

Anti-virus utility

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

ADOBE Acrobat Reader

The Adobe® Acrobat® Reader V5.0 is for opening, viewing, and printing documents in Portable Document Format (PDF).

ASUS Screen Saver

Installs the ASUS screen saver.

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

3.2.4   ASUS Contact information

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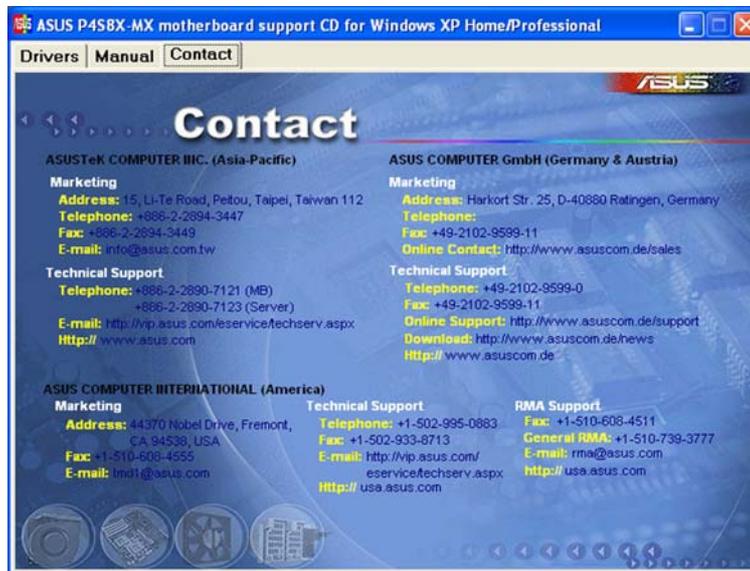
3.2.5   Other information

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

### Motherboard Info

Displays the general specifications of the motherboard.
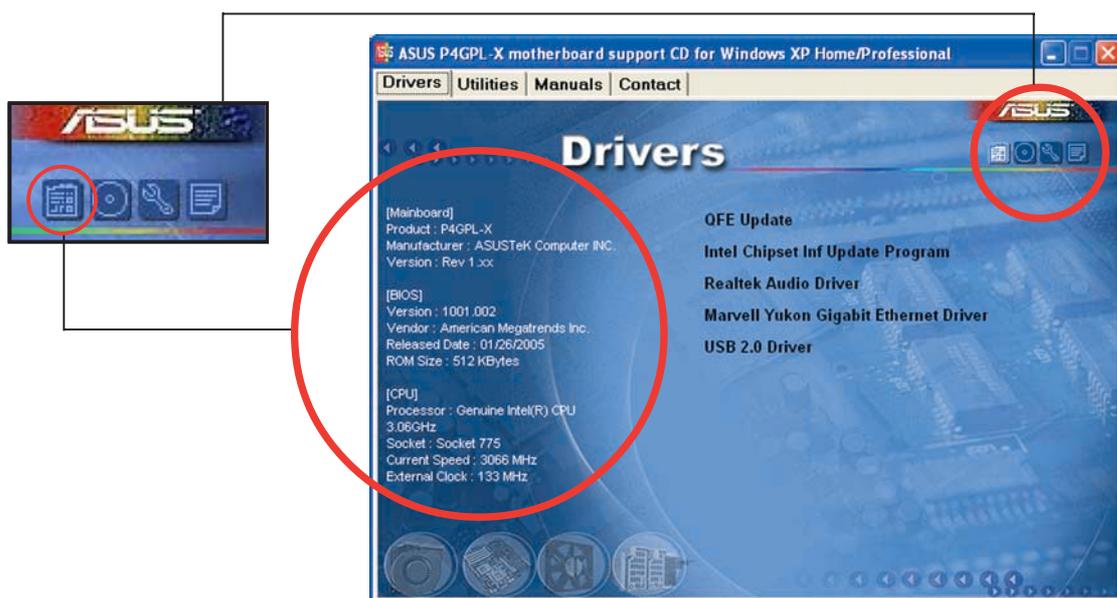
Browse this CD

Displays the support CD contents in graphical format.
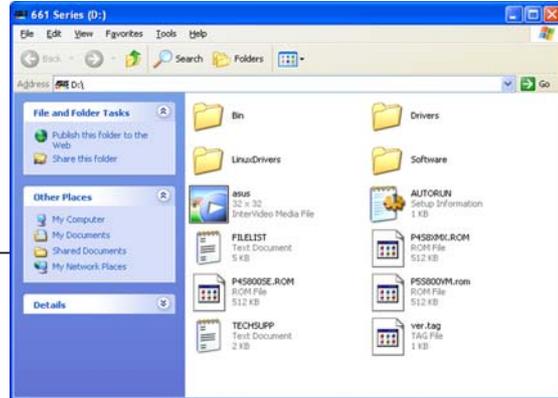
Technical support Form

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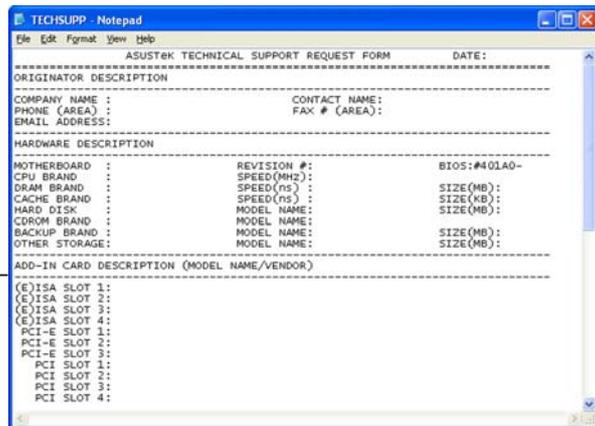
Filelist

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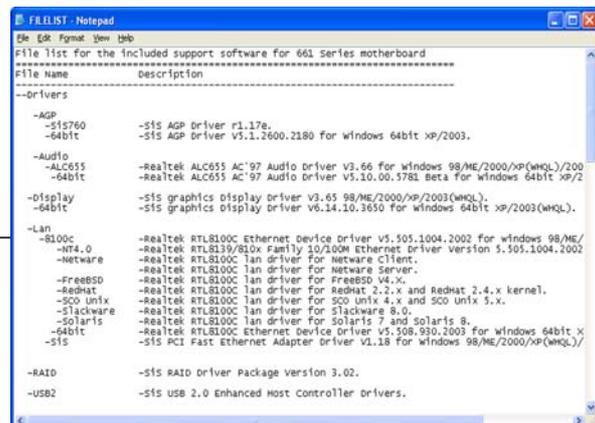
3.3   RAID configurations

The SIS 964 southbridge comes with a RAID controller that allows you to configure Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations.

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

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

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

> If you want to boot the system from a hard disk drive included in a RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to a selected hard disk drive. Refer to section "3.4 Creating a RAID driver disk" for details.

3.3.1 Installing hard disks

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

Installing Serial ATA (SATA) hard disks

To install the SATA hard disks for a RAID configuration:

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

3.3.2 SIS RAID configurations

The motherboard includes a high performance Serial ATA RAID controller integrated in the SIS 964 Southbridge chipset. It supports RAID 0 and RAID 1 with two independent Serial ATA channels.

Entering the SIS RAID BIOS utility

1. Boot your computer.

2. During POST, press <Ctrl> + <S> to enter the SIS RAID configuration utility. The following menu options appear.
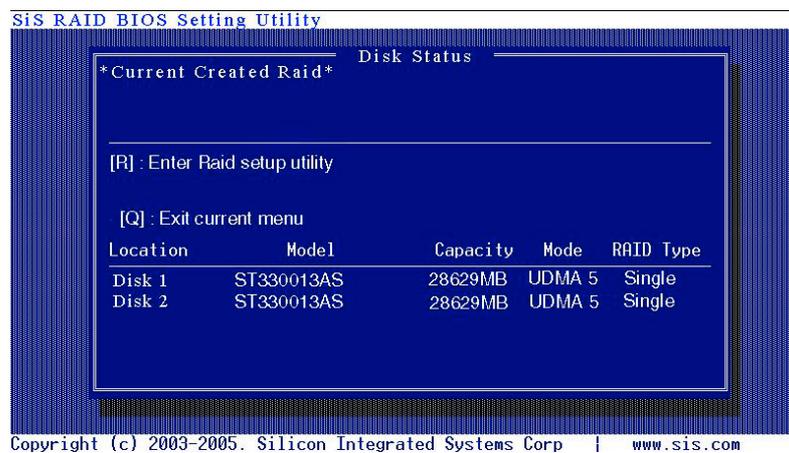
3. Press **<R>** to display the RAID setup menu.

Create an Array

1. From the SIS RAID BIOS utility main menu, press **<A>** to create an array.
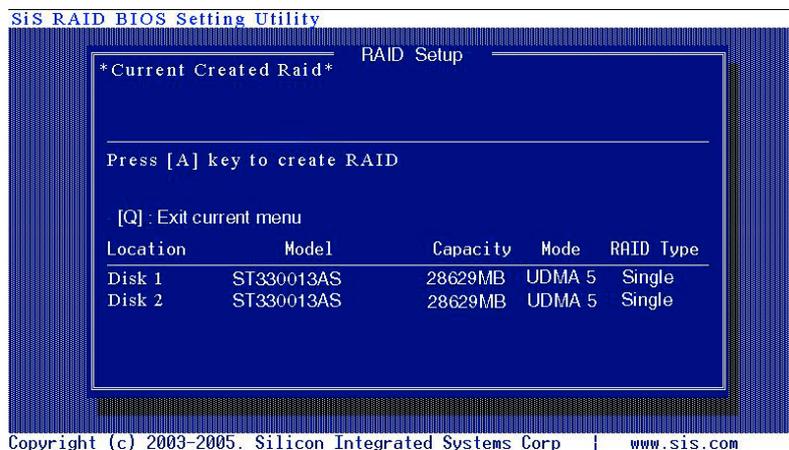
Creating JBOD

1. From the RAID Setup, press **<1>** then **<Enter>** to select JBOD (Spanning)
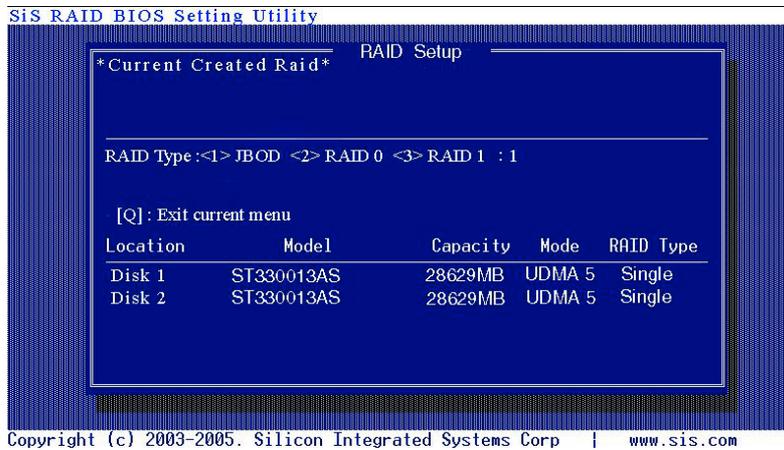
2. Select **<1>** to auto-create a RAID array or press **<2>** to manually configure array then press **<Enter>**.
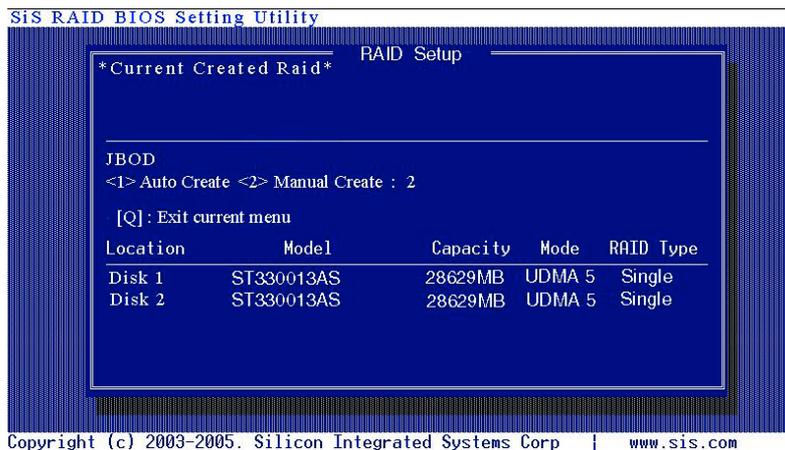
3. If you selected **1** proceed to step 5.

4. Use the **up/down** arrow keys to move the selection bar, then press **<Enter>** to select a disk drive.

5.	The current RAID set is displayed on the upper side of the screen.


```
SiS RAID BIOS Setting Utility

┌──────────────────────────────  RAID  Setup  ──────────────────────────┐
│  *Current Created Raid*
│   JBOD   : Disk 1   Disk 2
│
│
│   Press [D] key to delete RAID
│
│    [Q] : Exit current menu
│   Location          Model          Capacity   Mode   RAID Type
│
│   Disk 1        ST330013AS         28629MB   UDMA 5  JBOD
│   Disk 2        ST330013AS         28629MB   UDMA 5  JBOD
│
│
└────────────────────────────────────────────────────────────────────┘

Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |  www.sis.com
```
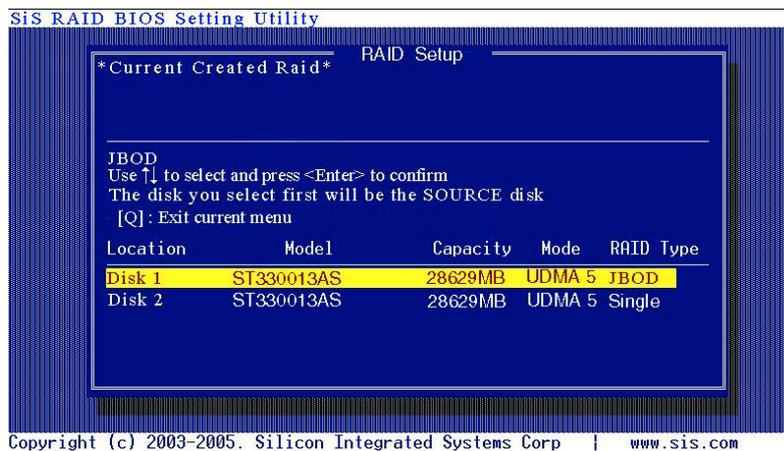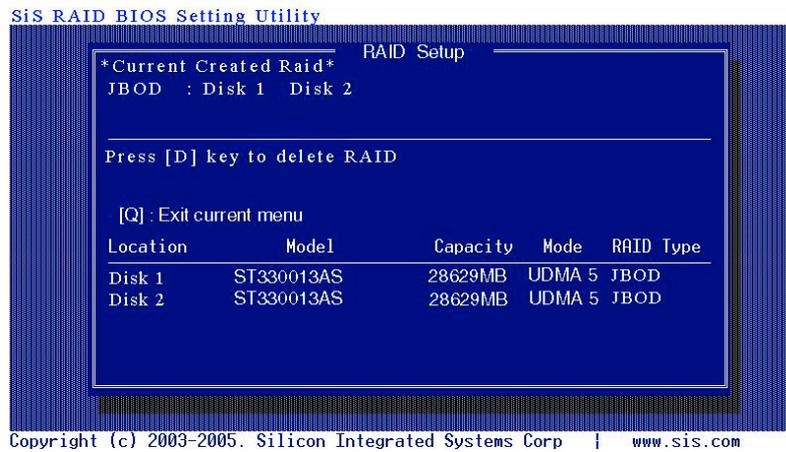
6.	Press **<Q>** to exit the RAID setup.
7.	Press **<Y>** then **<Enter>** to save changes.


```
SiS RAID BIOS Setting Utility

┌──────────────────────────────  RAID  Setup  ──────────────────────────┐
│  *Current Created Raid*
│   JBOD   : Disk 1   Disk 2
│
│
│   [R] :   ┌────────────────────────────────────┐
│          │    Do You Want to Save changes?Y    │
│   [Q] :   └────────────────────────────────────┘
│   Location          Model          Capacity   Mode   RAID Type
│
│   Disk 1        ST330013AS         28629MB   UDMA 5  JBOD
│   Disk 2        ST330013AS         28629MB   UDMA 5  JBOD
│
│
└────────────────────────────────────────────────────────────────────┘

Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |  www.sis.com
```
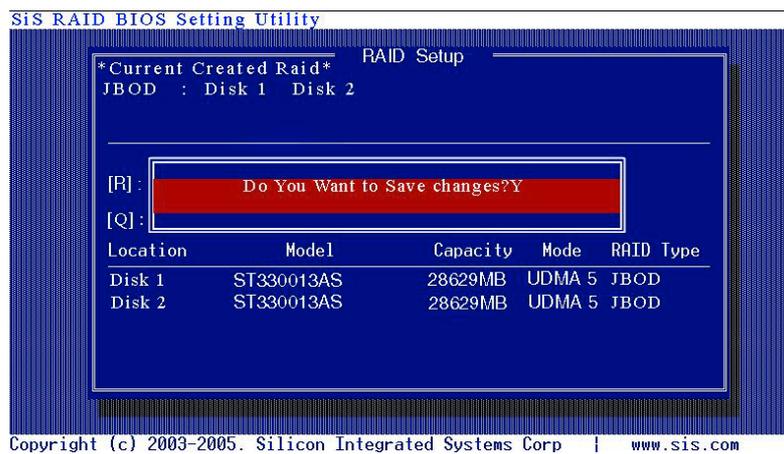
8.	After the setup is complete, you can partition and format your hard disk as a single hard drive.

Creating RAID 0 for performance

1. From the RAID Setup, press **<2>** then **<Enter>** to select RAID 0 (Striping).

```
SiS RAID BIOS Setting Utility
                              ____ RAID  Setup ____
 *Current Created Raid*


 RAID Type :<1> JBOD  <2> RAID 0  <3> RAID 1  :  2

   [Q] : Exit current menu
 Location          Model          Capacity    Mode    RAID Type
 Disk 1         ST330013AS         28629MB    UDMA 5    Single
 Disk 2         ST330013AS         28629MB    UDMA 5    Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |   www.sis.com
```

2. Select **<1>** to auto-create a RAID array or press **<2>** to manually configure array then press **<Enter>**.

```
SiS RAID BIOS Setting Utility
                              ____ RAID  Setup ____
 *Current Created Raid*



 RAID 0
 <1> Auto Create  <2> Manual Create :2
   [Q] : Exit current menu
 Location          Model          Capacity    Mode    RAID Type
 Disk 1         ST330013AS         28629MB    UDMA 5    Single
 Disk 2         ST330013AS         28629MB    UDMA 5    Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |   www.sis.com
```

3. If you selected **1** proceed to step 7.

4. If you selected **2**, select the array block size by pressing the corresponding number beside the available block sizes then press **<Enter>**.
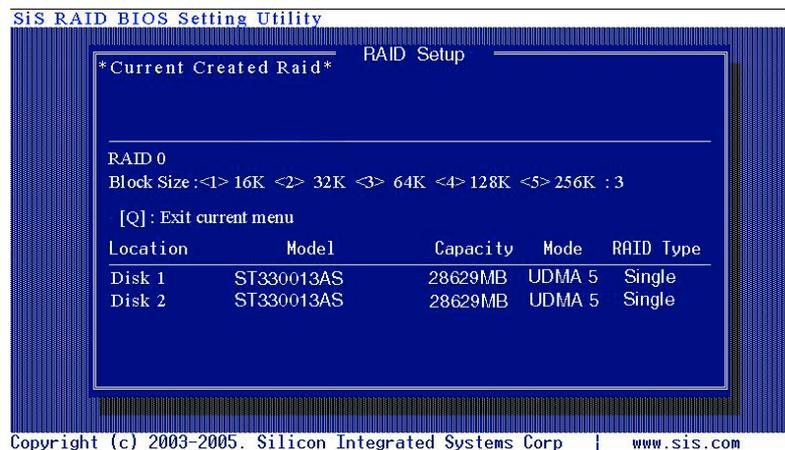
```
SiS RAID BIOS Setting Utility
                              ____ RAID  Setup ____
 *Current Created Raid*



 RAID 0
 Block Size :<1> 16K  <2>  32K  <3>  64K  <4> 128K  <5> 256K  : 3
   [Q] : Exit current menu
 Location          Model          Capacity    Mode    RAID Type
 Disk 1         ST330013AS         28629MB    UDMA 5    Single
 Disk 2         ST330013AS         28629MB    UDMA 5    Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |   www.sis.com
```

5. Use the **up/down** arrow keys to move the selection bar, then press **<Enter>** to select a disk drive.
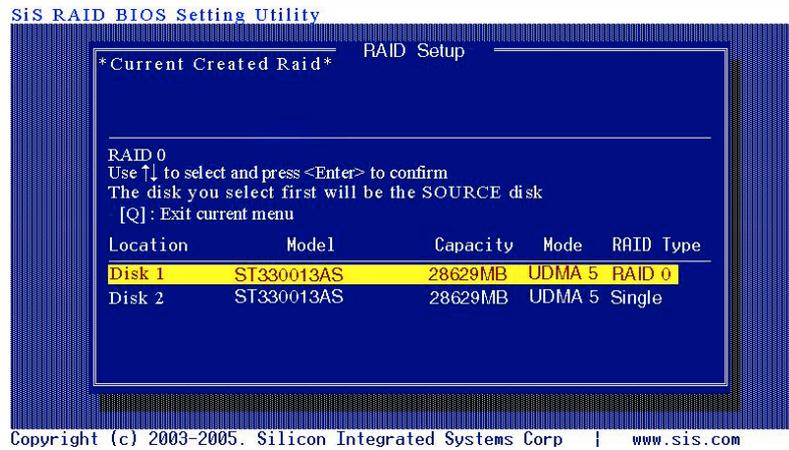
6. After selecting the drives, press **<Q>** to return to previous menu.

7. Press **<N>** then **<Enter>** to create a Stripe only configuration. Press **<Y>** if you wish to split the data on the source disk to other disks.
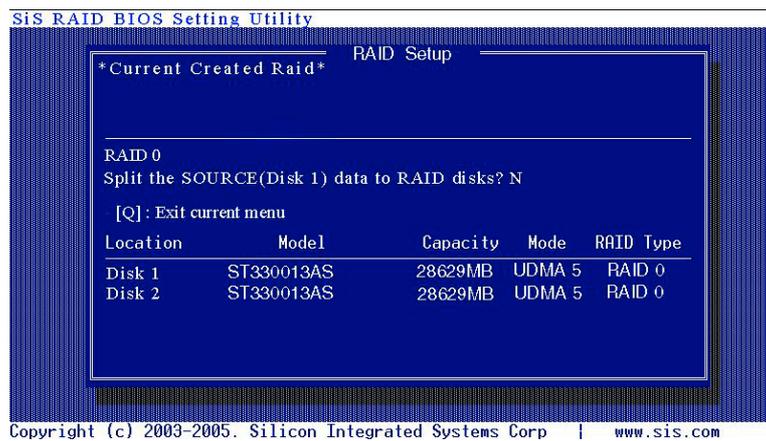
8. If you selected Y, the following screen appears.
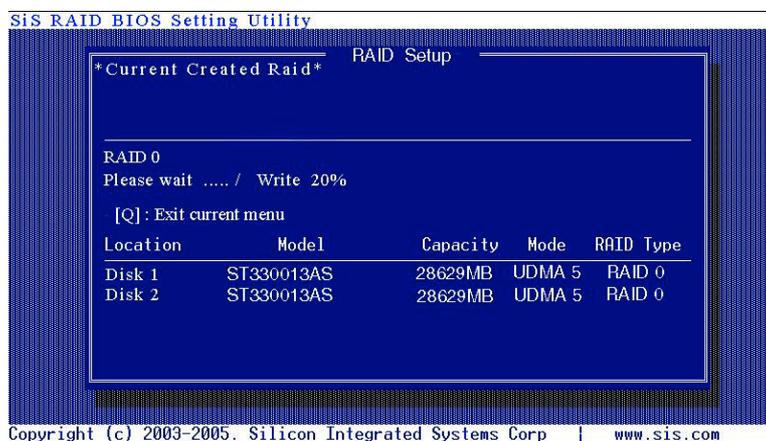
9. When finished, press **<Q>** to return to previous menu.

10. The current RAID setup is displayed on the upper side of the screen. Press **<Q>** to exit the RAID setup menu.
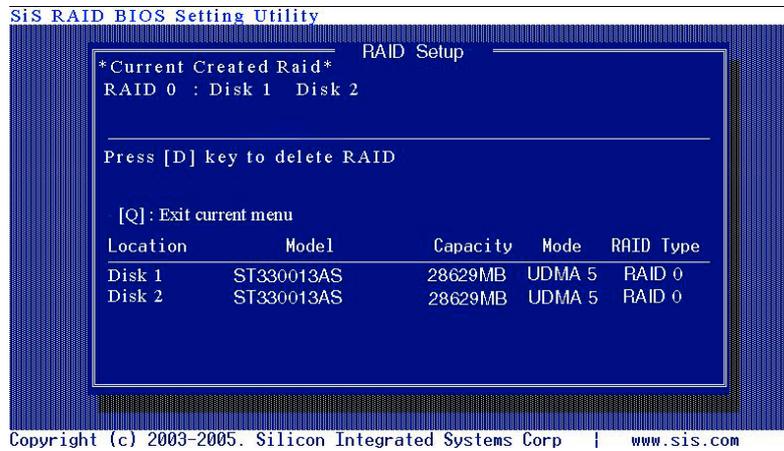
11. Press **<Y>** then **<Enter>** to save changes.
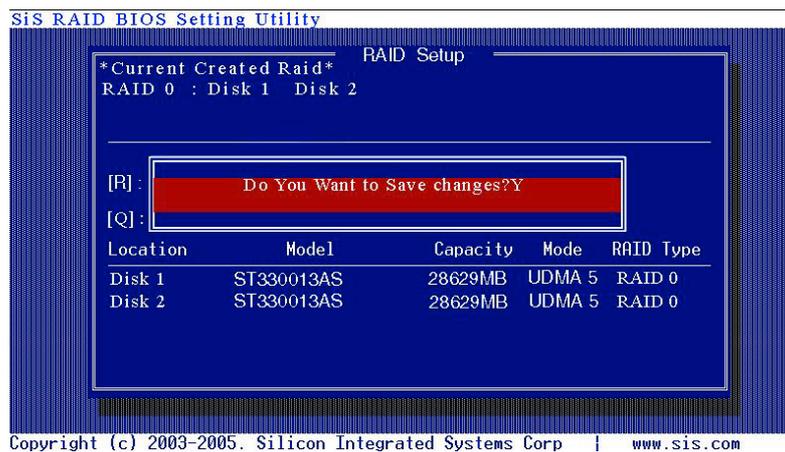
12. When finished, you can partition and format the array as a single hard drive.

Creating RAID 1 for capacity

1. From the RAID Setup, press **<3>** then **<Enter>** to select RAID 1 (Mirroring).

```
SiS RAID BIOS Setting Utility

                              RAID Setup
  *Current Created Raid*



  RAID Type :<1> JBOD  <2> RAID 0  <3> RAID 1  : 3


   [Q] : Exit current menu
  Location         Model          Capacity   Mode    RAID Type

  Disk 1        ST330013AS         28629MB   UDMA 5   Single
  Disk 2        ST330013AS         28629MB   UDMA 5   Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |  www.sis.com
```

2. Select **<1>** to auto-create a RAID array or press **<2>** to manually configure array then press **<Enter>**.

```
SiS RAID BIOS Setting Utility

                              RAID Setup
  *Current Created Raid*



  RAID 1

  <1> Auto Create  <2> Manual Create :2

   [Q] : Exit current menu
  Location         Model          Capacity   Mode    RAID Type

  Disk 1        ST330013AS         28629MB   UDMA 5   Single
  Disk 2        ST330013AS         28629MB   UDMA 5   Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |  www.sis.com
```

3. If you selected **1** proceed to step 5.

4. Use the **up/down** arrow keys to move the selection bar, then press **<Enter>** to select a disk drive.

```
SiS RAID BIOS Setting Utility

                              RAID Setup
  *Current Created Raid*



  RAID 1
  Use ↑↓ to select and press <Enter> to confirm
  The disk you select first will be the SOURCE disk
   [Q] : Exit current menu
  Location         Model          Capacity   Mode    RAID Type

  Disk 1        ST330013AS         28629MB   UDMA 5   RAID 1
  Disk 2        ST330013AS         28629MB   UDMA 5   Single




Copyright (c) 2003-2005. Silicon Integrated Systems Corp  |  www.sis.com
```

5. Press **<N>** then **<Enter>** to create a mirrored set. Press **<Y>** if you wish to duplicate the source disk (DISK 1) data to the RAID disks.
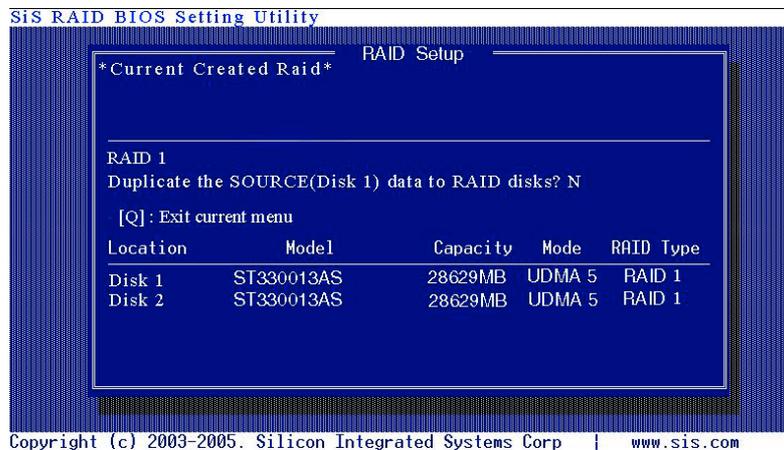
6. If you selected Y, the following screen appears.
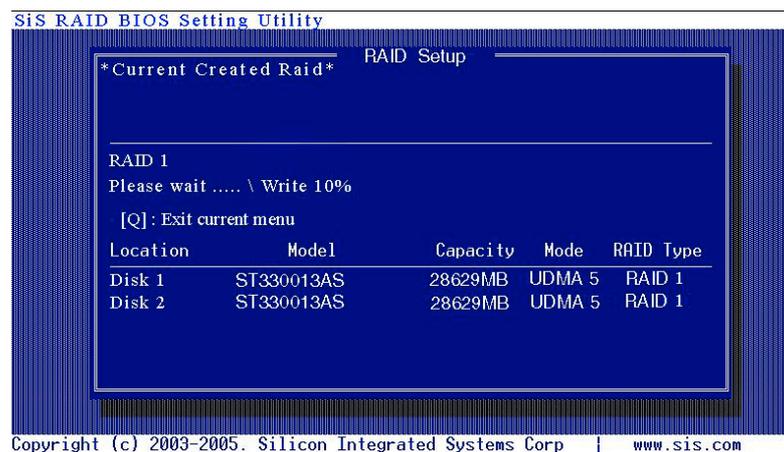
7. When finished, press **<Q>** to return to previous menu. The current RAID set is displayed on the upper side of the screen.
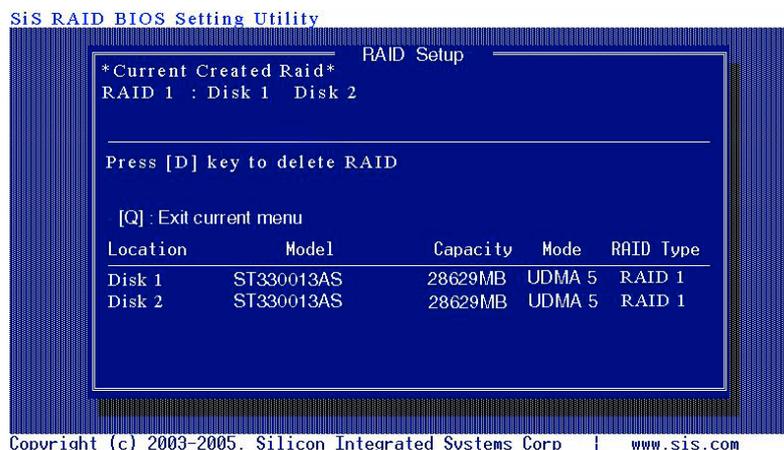
8. Press **<Q>** to exit the RAID setup.

9. Press **<Y>** then **<Enter>** to save changes.

```
SiS RAID BIOS Setting Utility

┌──────────────────────── RAID Setup ────────────────────────┐
│ *Current Created Raid*                                      │
│ RAID 1 : Disk 1   Disk 2                                    │
│                                                             │
│ _____ │
│                                                             │
│ [R]: ┌───────────────────────────────────────────────────┐ │
│      │         Do You Want to Save changes?Y              │ │
│ [Q]: └───────────────────────────────────────────────────┘ │
│                                                             │
│ Location        Model          Capacity    Mode   RAID Type│
│                                                             │
│ Disk 1         ST330013AS      28629MB     UDMA 5  RAID 1   │
│ Disk 2         ST330013AS      28629MB     UDMA 5  RAID 1   │
│                                                             │
└─────────────────────────────────────────────────────────────┘

Copyright (c) 2003-2005. Silicon Integrated Systems Corp   |   www.sis.com
```
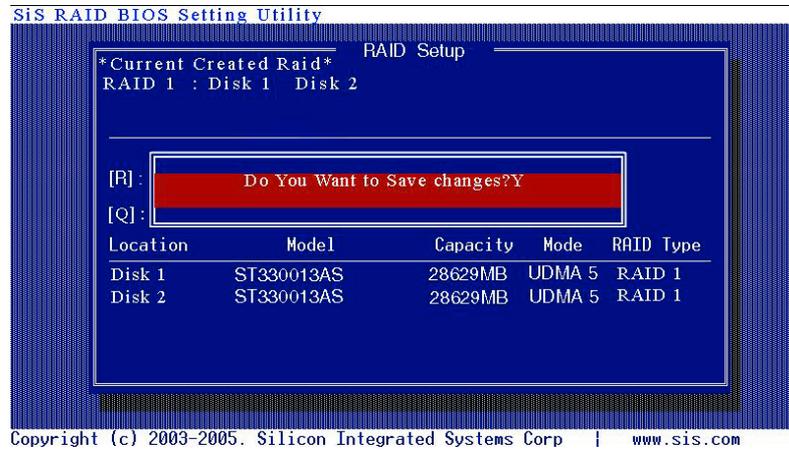
10. After the setup is complete, you can partition and format the array as a single hard drive.

3.4   Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows®
2000/XP operating system on a hard disk drive that is included in a RAID
set. Use the support CD that came with the motherboard package to
create a RAID driver disk.

To use the support CD:

1.   Boot your computer and insert the support CD into the optical drive.

2.   Make sure that the optical drive is the primary boot device. If not, set
      the optical drive as the primary boot device in the BIOS.

3.   Press the any key when the prompts "Press any key to boot from the
      optical drive." The following menu appears:

```
1) Make SIS RAID Driver Disk
2) Format Floppy Disk
3) FreeDOS command prompt
Please choose 1 ~ 3:_
```

4.   Press <1> to create a RAID driver disk.

5.   Insert a formatted floppy disk into the floppy drive then press
      <Enter>.

6.   Follow the succeeding screen instructions to complete the process.

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

To install the RAID driver:

1.   During the OS installation, the system prompts you to press the <F6>
      key to install third-party SCSI or RAID driver.

2.   Press <F6> then insert the floppy disk with RAID driver into the floppy
      disk drive.

3.   Follow the succeeding screen instructions to complete the installation.