AX4SG-GN
Online Manual

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What's in this manual

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Before You Start

This Online Manual will introduce to the user how this product is installed. All useful information will be described in later chapters. Please keep this manual carefully for future upgrades or system configuration changes. This Online Manual is saved in PDF format, we recommend using Adobe Acrobat Reader 5.0 for online viewing, it is included in Bonus CD or you can get free download from Adobe web site.

Although this Online Manual is optimized for screen viewing, it is still capable for hardcopy printing, you can print it by A4 paper size and set 2 pages per A4 sheet on your printer. To do so, choose **File > Page Setup** and follow the instruction of your printer driver.

Thanks for the help of saving our earth.

Overview

Thank you for choosing AOpen AX4SG-GN motherboard. AX4SG-GN is Intel® Socket 478 motherboard (M/B) based on the ATX form factor featuring the Intel 865G chipsets. As high performance chipset built in the M/B, AX4SG-GN motherboard supports Intel® Socket 478 Pentium® 4 1.6GHz~3.06GHz. It supports 400/533/800MHz Front Side Bus (FSB) clock and Hyper-Threading Technology that brings additional intelligence to systems. In the AGP performance, it has one AGP slot to support AGP 8X/4X mode and pipelined spilt-transaction long burst transfer up to 2112MB/sec. The slot also support ADD card. According to different customer's requirements, this motherboard supports DDR266, DDR333 and DDR400 SDRAM up to 2GB maximum. The onboard IDE controller supports Ultra DMA 33/66/100 mode and Serial ATA. There are 5 PCI slots provided on this board. A total of 6 USB 2.0 ports on the back panel and one connector on the board give you the best use of all USB devices with the fancy speed up to 480Mbps. More than that, on the strength of integrated Realtek LAN controller on board, which is a highly integrated Platform LAN Connect device, it provides 10/100Mbps Ethernet for office and home use. Besides, AX4SG-GN has S/PDIF connector and an AC97 CODEC Realtek chipset onboard, providing high performance and magic surround stereo sound to let people enjoy working with it. Now, let's enjoy all features from AOpen AX4SG-GN motherboard.
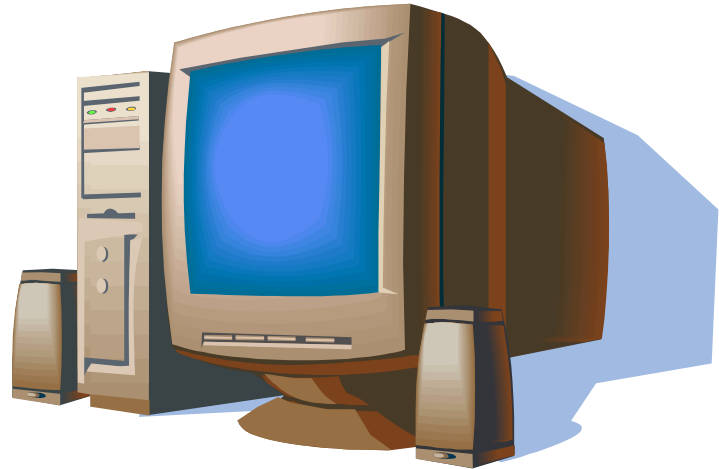
Feature Highlight

CPU

Supports Intel® Socket 478 Pentium® 4 (Northwood) 1.6GHz~3.06GHz+ with 400/533/800MHz Front Side Bus (FSB) designed for Socket 478 technology.

Chipset

Intel 865G is a Graphics Memory Controller Hub (GMCH) designed for use with the Pentium 4 processor with 512-KB L2 cache on 0.13 micron processor. It provides CPU, DDR, AGP, Hub, CSA Interfaces and integrated graphics with display interfaces. The CPU interface supports Pentium 4 processor subset of the Extended Mode of the Scalable Bus Protocol. The GMCH memory interface supports one up to two channels of DDR, and the AGP interface supports 0.8/1.5V signaling with 8X/4X data transfers and 8X/4X AGP Fast Writes. The integrated graphics controller provides 3D, 2D, and display capabilities while using a portion of system memory for graphics memory (UMA) to provide a cost effective, high performance graphics solution. The Springdale platform supports the fifth generation I/O Controller Hub (ICH5).

The ICH5 integrates an Ultra ATA 100 controller, two Serial ATA host controllers, one EHCI host controller and four UHCI host controllers supporting eight external USB2.0 ports, LPC interface controller, flash BIOS interface controller, PCI interface controller, AC'97 digital controller, integrated LAN controller, an ASF controller and a hub interface for communication with the Springdale GMCH.

Hyper-Threading Technology

Support Hyper-Threading Technology that brings additional intelligence to systems so that multiple tasks received from the processor can be managed and prioritized more effectively.

Memory

With Intel 865G chipset, this motherboard can support dual channel Double-Data-Rate (DDR) RAM. The dual channel mode allows chipsets to get data in 128 bit and zero wait state bursting between the RAM. The data transfer at 266/333/400MHz. The two slots of DDR RAM can be composed of an arbitrary mixture of 64, 128, 256, 512 MB or 1GB DDR RAM and maximum up to 2GB.

Expansion Slots

Including five 32-bit/33MHz PCI and one AGP 8X/4X slots. The PCI local bus throughput can be up to 132MB/s. Of five PCI slots provided, all of them are master PCI slots with arbitration and decoding for all integrated functions and LPC bus. AX4SG-GN motherboard includes one AGP expansion slot for a bus mastering AGP graphic card. The Accelerated Graphics Port (AGP) specification provides a new level of video display sophistication and speed. The AGP video cards support data transfer rate up to 2112MB/s. Or you may have ADD card cabled to this AGP slot to provide high-speed digital connection for digital displays.

AGP Protection Technology

With AGP Protection Technology implemented, this motherboard will automatically detect the voltage of AGP card and prevent your chipsets from being burnt out.

Watch Dog ABS

Includes AOpen "Watch Dog ABS" function that can auto-reset system in few seconds when you fail the system overclocking.

1MHz Stepping CPU Frequency Adjustment

Provides "1MHz Stepping CPU Frequency Adjustment" function in the BIOS. This magic function allows you to adjust CPU FSB frequency from 100~400MHz by 1MHz stepping adjustment, and helps your system get maximum performance.

LAN Port

On the strength of Realtek LAN, a fourth-generation dual-speed 10/100 base-T Ethernet LAN Controller solution for high-performance network applications, this motherboard provides 10/100 Mbps Ethernet for office and home use.

Ultra DMA 33/66/100 Bus IDE

Comes with an on-board PCI Bus Master IDE controller with two connectors that support four IDE devices in two channels, supports Ultra DMA 33/66/100, PIO Modes 3 and 4 and Bus Master IDE DMA Mode 5, and supports Enhanced IDE devices.

Serial ATA

Integrated in ICH5 that contains independent DMA operation on two ports, the SATA controllers are completely software transparent with the IDE interface, while providing a lower pin count and higher performance. The ICH5 SATA interface supports data transfer rates up to 150MB/s.

On-board AC'97 Sound

AX4SG-GN uses Realtek AC97 CODEC Realtek ALC202A sound chip. This on-board audio includes a complete audio recording and playback system.

Eight USB 2.0 Ports

Provides six ports on the back panel and one USB 2.0 connector on the board, providing a total of eight USB 2.0 interface to connect devices such as mouse, keyboard, modem, scanner, etc.

S/PDIF Connector

S/PDIF (Sony/Philips Digital Interface) is the newest audio transfer file format, which provides impressive quality through optical fiber and allows you to enjoy digital audio instead of analog audio.

Power Management/Plug and Play

Supports the power management function that confirms to the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program. It also offers Plug-and-Play, which helps save users from configuration problems, thus making the system much user-friendlier.

Hardware Monitoring Management

Supports CPU or system fans status, temperature and voltage monitoring and alert, through the on-board hardware monitor module.

Enhanced ACPI

Fully implement the ACPI standard for Windows® 98/ME/2000/XP series compatibility, and supports Soft-Off, STR (Suspend to RAM, S3), STD (Suspend to Disk, S4) and S5 features.

Quick Installation Procedure

This page gives you a quick procedure on how to install your system. Follow each step accordingly.

1. Installing <u>CPU</u> and <u>Fan</u>

2. <u>Installing System Memory (DIMM</u>)

3. <u>Connecting Front Panel Cable</u>

4. <u>Connecting IDE and Floppy Cable</u>

5. <u>Connecting ATX Power Cable</u>

6. <u>Connecting Back Panel Cable</u>

7. <u>Power-on and Load BIOS Setup Default</u>

8. <u>Setting CPU Frequency</u>

9. Reboot

10. Installing Operating System (such as Windows XP)

11. <u>Installing Driver and Utility</u>

Motherboard Map

AC'97 CODEC

AUX-IN Connector

COM2 Connector

S/PDIF Connector

Game Port Connector

Resetable Fuse

IrDA Connector

Front Audio Connector

CD-IN Connector

32-bit PCI Expansion Slot x5

FDD Connector

SATA Port x 2

USB 2.0 Connector

SYSFAN3 Connector

JP14 CMOS Clear Jumper

Front Panel Connector

Case Open Connector

ATA66/100 IDE Connector x2

Colored Back Panel

JP28 Keyboard/Mouse
Wakeup Jumper

SYSFAN2 Connector

4-pin 12V. ATX Power Connector

Low ESR Capacitors

ATX Power Connector

AGP 8x Expansion Slot
supports ADD card

478-pin CPU socket (Northwood)
with Voltage and Frequency
Auto-detection that supports Intel®
Pentium® 4 1.6~3.06GHz+ CPU

Intel 865G Chipsets that
support 533/800MHz FSB

CPUFAN1 connector

184-pin DIMMx2 support
DDR400/333/266 SDRAM
maximum up to 2GB

Block Diagram

Dual Channel DDR400/333/266
SDRAM Up to 2GB

32-bit PCI Slot x5

PCI Bus

DIMM Socket x2

2 Serial ATA Ports
150MB/s

SATA 1

Socket 478
Intel Pentium 4
CPU

533/800MHz
System Bus

Intel
865G

SATA 2

AGP bus

ATA 66/100

Primary
Channel

IDE Drive x4

AGP 8X Slot

Secondary
Channel

ICH5

Realtek
AC97
CODEC

VGA onboard

LAN connect Component

Realtek
LAN

USB Port

USB Port

4Mbit Flash EEPROM

USB Port x8

USB Port

Parallel Port

USB Port

Serial Port x2

Floppy Disk Drive x2

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Hardware Installation

This chapter describes jumpers, connectors and hardware devices of this motherboard.

Note: Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.

1. *Do not remove a component from its protective packaging until you are ready to install it.*

2. *Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.*

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About "User Upgrade Optional" and "Manufacture Upgrade Optional"…

When you read this online manual, you may notice that some of the functions are marked as "User Upgrade Optional" or "Manufacture Upgrade Optional". Although all of AOpen's motherboards have included many amazing and powerful features, sometimes not every user is familiar with these powerful features. As a result of this we define features that can be upgraded by users as "User Upgrade Optional". You can upgrade these functions by purchasing additional devices. As for functions that cannot be upgraded by users, we define them as "Manufacture Upgrade Optional". If needed, you can contact our local distributors or resellers to purchase "Manufacture Upgrade Optional" components, and again you are also welcome to visit our official website at english.aopen.com.tw for detail information.

CPU Installation

This motherboard supports Intel® Pentium 4 Socket 478 series CPU (Northwood). Be careful of CPU orientation when you plug it into CPU socket.

1. Pull up the CPU socket lever and up to 90-degree angle.

2. Locate Pin 1 in the socket and look for mark on the CPU upper interface. Match Pin 1 and cut edge, then insert the CPU into the socket.

CPU socket Lever

CPU pin 1 and cut edge
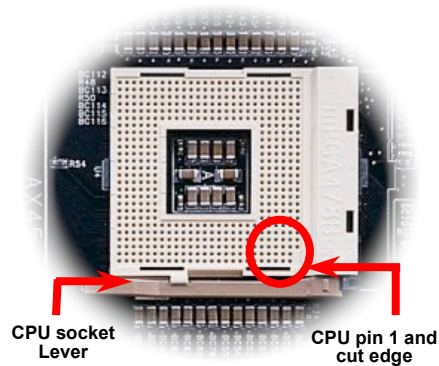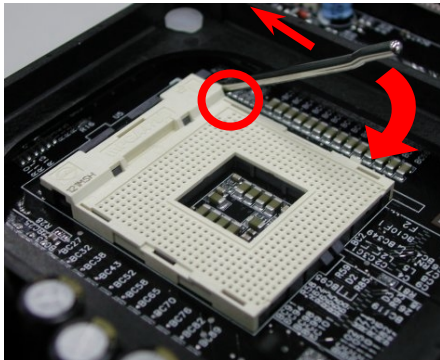
CPU cut edge

Note: Those pictures are for example only; they may not look the same with the motherboard you purchased.

3. Press down the CPU socket lever and finish CPU
   installation.
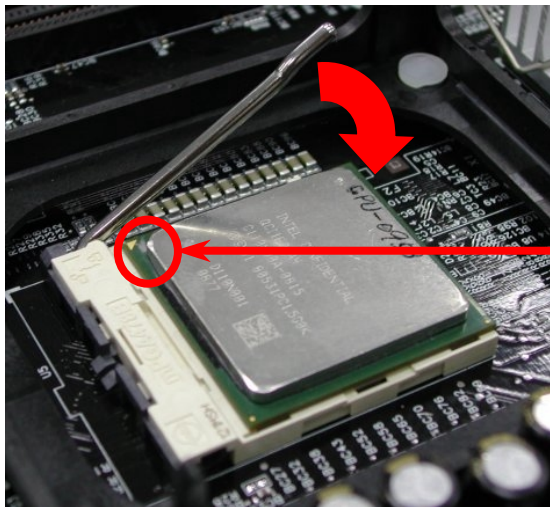
CPU cut edge

> **Note:** If you do not match the CPU
> socket Pin 1 and CPU cut edge well, you
> may damage the CPU.

> **Note:** This socket supports FC-PGA2
> package CPU, which is the latest CPU
> package developed by Intel. Other
> forms of CPU package are impossible to
> be fitted in.

Note: This picture is for example only; it may not look the same with the motherboard you purchased.

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Hyper Threading Technology

NEW!

What is Hyper-Threading?

Hyper-Threading Hyper-Threading technology is an innovative design from Intel that enables multi-threaded software applications to process threads in parallel within each processor resulting in increased utilization of processor execution resources. As a result, an average improvement of ~40% in CPU resource utilization yields higher processing throughput.

How Hyper-Threading Works

A form of simultaneous multi-threading technology (SMT), Hyper-Threading technology allows multiple threads of software applications to
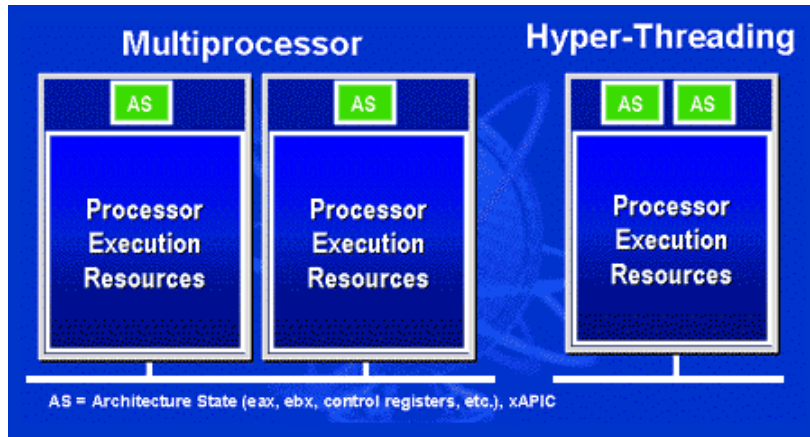
be run simultaneously on one processor by duplicating the architectural state on each processor while the same processor execution resources is shared. The figure below represents how a Hyper-Threading based processor differentiates a traditional multiprocessor. The left-hand configuration shows a traditional multiprocessor system with two physical processors. Each processor has its own independent execution resources and architectural state. The right-hand configuration represents an Intel Hyper-Threading technology based processor. You can see that the architectural state for each processor is duplicated, while the execution resources is shared.

For multiprocessor-capable software applications, the Hyper-Threading based processor is considered two separate logical processors on which the software applications can run without modification. Also, each logical processor responds to interrupts independently. The first logical processor can track one software thread, while the second logical processor tracks another software thread simultaneously. Because the two threads share the same execution resources, the second thread can use resources that would be otherwise idle if only one thread was executing. This results in an increased utilization of the execution resources within each physical processor.
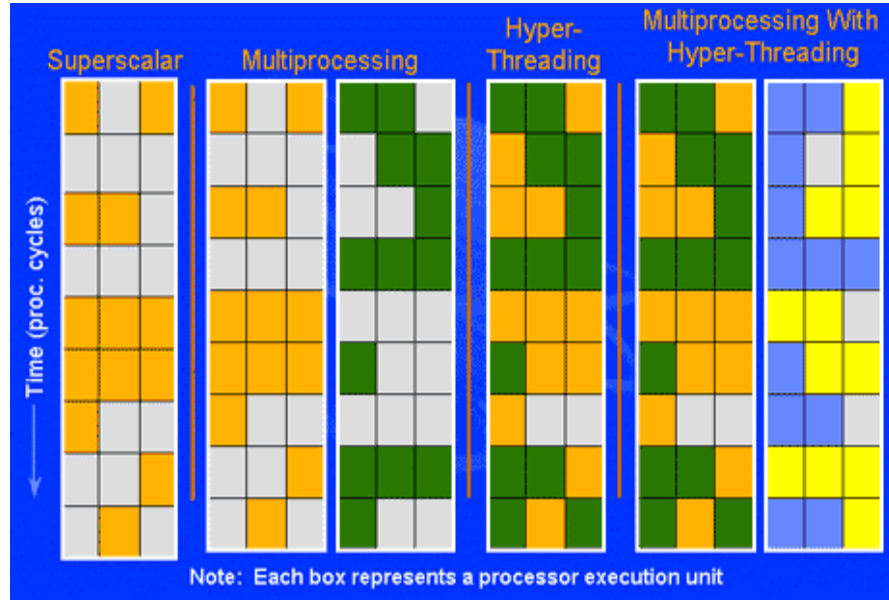
The figure below represents how Hyper-Threading saves time when it works. With two logical processors available on every single physical processor, multi-threaded applications can now take advantage of thread-level parallelism on each physical processor for additional performance. As software applications continue to be optimized to take greater advantage of processor parallelism, Hyper-Threading technology provides an additional boost for newer capabilities and the growing needs of today's users.

CPU Fan Installation

This motherboard comes with a retention module attached on the CPU socket when shipped, we strongly recommend you to install AOpen special designed CPU Fan as shown below on the retention module for better heat dissipation. Please install the CPU Fan correctly as the following pictures shown.

1. Gently put the CPU Fan down on the retention module with clips aligning correctly to the four corners.

2. Pressing down the four clips with force one by one on the retention module.
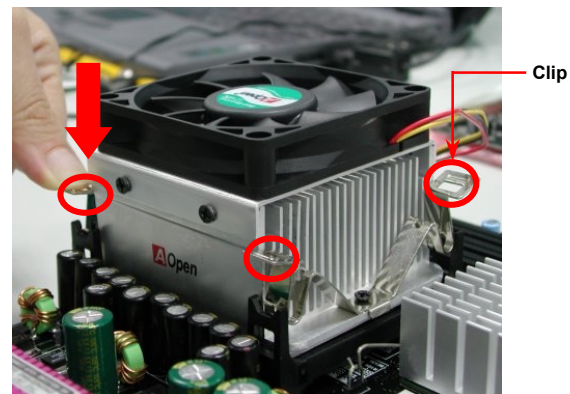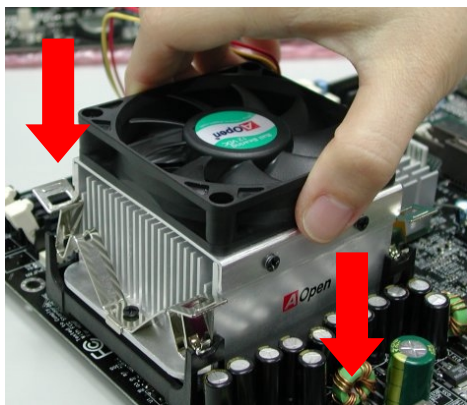
Note: The picture above may look different from the product you purchased.

CPU Jumper-less Design

CPU VID signal and SMbus clock generator provide CPU voltage auto-detection and allows the user to set the CPU frequency through the BIOS setup, therefore no jumpers or switches are used. The disadvantages of the Pentium based jumper-less designs are eliminated. There will be no worry of wrong CPU voltage detection.

Intel® Socket 478

Pentium 4

Clock Generator

BIOS Controlled Circuit

CPU Freq. Ratio

CPU VID signal   CPU voltage

Power Regulator

(Automatically generates CPU voltage)
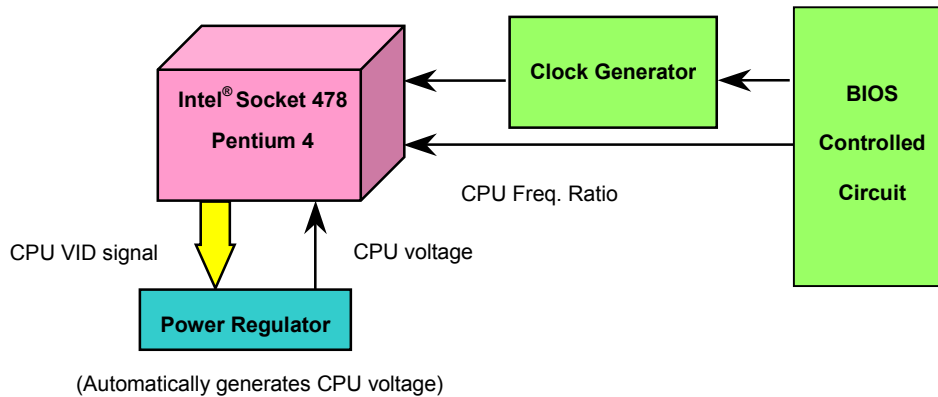
CPU Over-current Protection

The Over Current Protection is a popular implementation on ATX 3.3V/5V/12V switching power supply. However, the new generation CPU uses different voltage with a regulator to transfer 12V to CPU voltage (for example, 2.0V), and thus makes 5V over current protection useless. This motherboard is with switching regulator onboard supporting CPU over-current protection; in conjunction with 3.3V/5V/12V power supply provide the full line over-current protection.

ATX Switching Power Supply

5V (Protected by power supply)

3.3V (Protected by power supply)

12V (Protected by power supply)

Onboard Power Regulator
(Over-Current Protection)

CPU Core Voltage
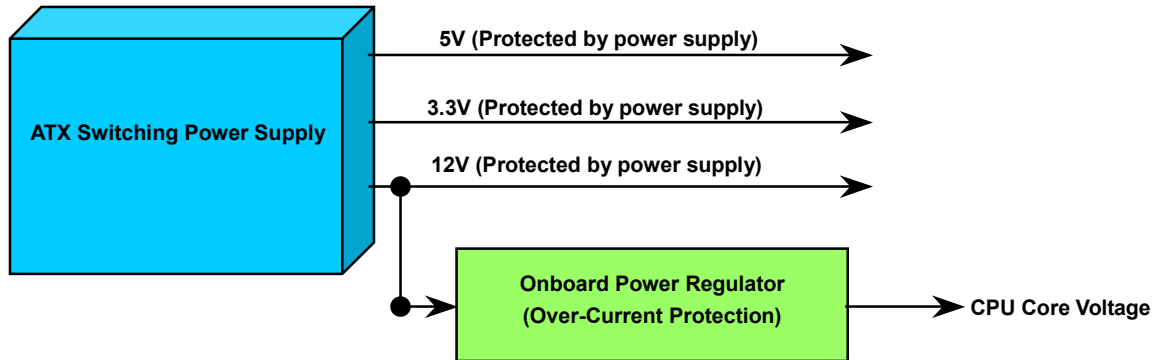
Note: Although we have implemented protection circuit try to prevent any human operating mistake, there is still certain risk that CPU, memory, HDD, add-on cards installed on this motherboard may be damaged because of component failure, human operating error or unknown nature reason. AOpen cannot guarantee the protection circuit will always work perfectly.

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CPU and System Fan Connector (with H/W Monitoring)

Plug in the CPU fan cable to the 3-pin **CPUFAN1** connector. If you have chassis fan, you can also plug it on **SYSFAN2** or **SYSFAN3** connector.

GND
+12V
SENSOR

SYSFAN2 Connector

GND
+12V
SENSOR

CPUFAN1 Connector

GND
+12V
SENSOR
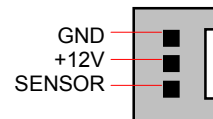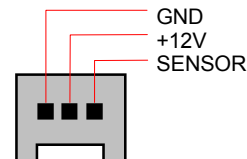
SYSFAN3 Connector
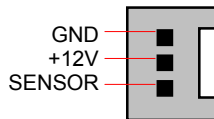
Note: Some CPU fans do not have sensor pin, so that they cannot support hardware monitoring function.

Full-range Adjustable CPU Core Voltage

This motherboard supports CPU VID function. The CPU core voltage will be automatically detected and the range is from 0.8375V to 1.6V. It is not necessary to set CPU Core Voltage.

Setting CPU Frequency

BIOS Setup > Frequency/Voltage Control > CPU Bus Frequency

This motherboard is CPU jumper-less design, you can set CPU frequency in BIOS; no jumpers or switches are needed. The default setting is "table select mode". You can adjust the FSB from "CPU Host/RAM/PCI Clock" for overclocking.

Core Frequency = CPU FSB Clock * CPU Ratio

PCI Clock = CPU FSB Clock / Clock Ratio

AGP Clock = PCI Clock x 2

CPU Ratio	8x, 10x… 24x, 25x, 26x
CPU FSB (By BIOS table)	100-400MHz

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Northwood CPU	CPU Core Frequency	FSB Clock	System Bus	Ratio
Pentium 4 1.6G	1600MHz	100MHz	400MHz	16x
Pentium 4 1.6G	1600MHz	133MHz	533MHz	12x
Pentium 4 1.7G	1700MHz	133MHz	533MHz	13x
Pentium 4 1.8G	1800MHz	100MHz	400MHz	18x
Pentium 4 2.0G	2000MHz	100MHz	400MHz	20x
Pentium 4 2.2G	2200MHz	100MHz	400MHz	22x
Pentium 4 2.2G	2200MHz	133MHz	533MHz	16x
Pentium 4 2.26G	2260MHz	133MHz	533MHz	17x
Pentium 4 2.4G	2400MHz	100MHz	400MHz	24x
Pentium 4 2.4G	2400MHz	133MHz	533MHz	18x
Pentium 4 2.53G	2530MHz	133MHz	533MHz	19x
Pentium 4 2.6G	2600MHz	200MHz	800MHz	13x
Pentium 4 2.66G	2660MHz	133MHz	533MHz	20x
Pentium 4 2.8G	2800MHz	133MHz	533MHz	21x
Pentium 4 2.8G	2800MHz	200MHz	800MHz	14x
Pentium 4 3.0G	3000MHz	200MHz	800MHz	15x
Pentium 4 3.06G	3060MHz	133MHz	533MHz	23x

Note: Intel 865G chipset doesn't support Willamette or Celeron processors. Northwood processor can detect the clock ratio automatically; you may not be able to adjust the clock ratio in BIOS manually.

*Warning: Intel 865G chipset supports maximum 800MHz (200MHz*4) system bus and 66MHz AGP clock; higher clock setting may cause serious system damage.*

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DIMM Sockets

This motherboard has two 184-pin DDR DIMM sockets that allow you to install 128-bit dual channel DDR400, DDR333 or DDR266 memory up to 2GB. Only non-ECC DDR RAM is supported. Please install suitable modules; otherwise serious damage may occur on memory sockets or you RAM modules. *Please note that when you install DDR333 memory module and have your CPU FSB set at 800MHz, the memory can only run with the speed of DDR320. It is limitation of Intel.* For other limitation of CPU types, please see the table below.

Item	DDR266	DDR333	DDR400
CPU FSB 400MHz	V	X	X
CPU FSB 533MHz	V	V	X
CPU FSB 800MHz	V	⊙	V

DIMM1

DIMM2

Warning: This motherboard supports DDR RAM. Please do not install the SDRAM on the DDR RAM sockets; otherwise it will cause serious damage on memory sockets or SDRAM module.

Note: To run dual channel speed, you have to use the same type memory modules installed on two DIMMs. If you install two different sized modules, the system can only run single channel mode and with the speed of that lower memory module.

How to Install Memory Modules

Please follow the procedure as shown below to finish memory installation.

1. Make sure the DIMM module's pin face down and match the socket's size as depicted below.

40 pins   52 pins
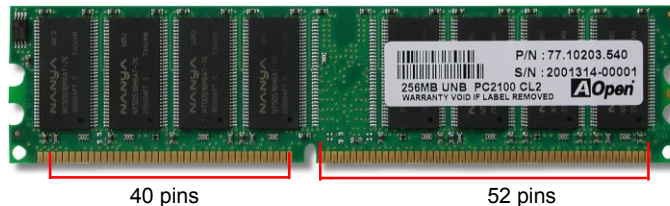
2. Insert the module straight down to the DIMM slot with both hands and press down firmly until the DIMM module is securely in place.

Tab

Key

Note: The tabs of the DIMM slot will close-up to hold the DIMM in place when the DIMM touches the slot's bottom.

Pin 1
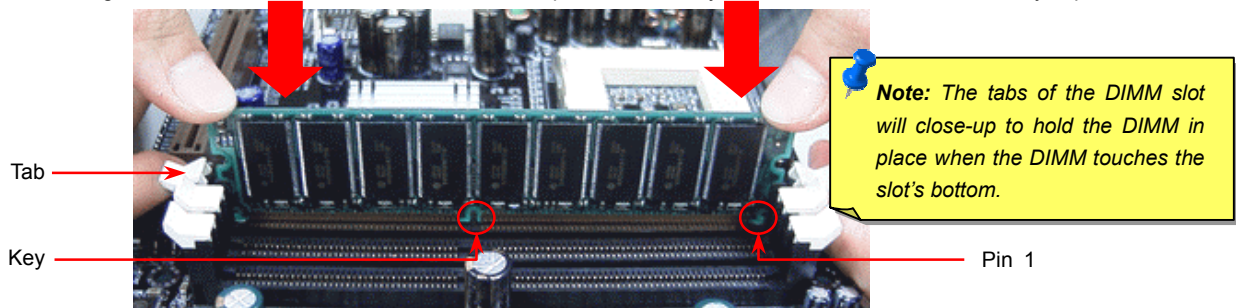
3. Repeat step 2 to finish additional DIMM modules installation.

Note: These images are for example only; they may not be exactly the same as the motherboard you purchased.

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ATX Power Connector

This motherboard comes with a 20-pin and 4-pin ATX power connector. Make sure you plug in the right direction. We strongly recommend you to connect the 4-pin 12V ATX connector before connecting the 20-pin ATX power connector and use standard power supply specially designed for Pentium 4 system.
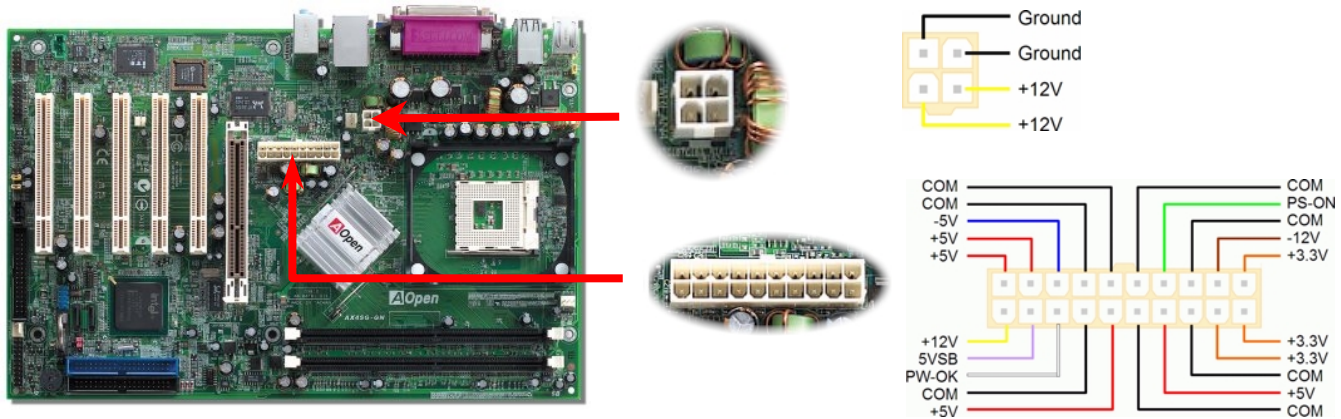
AC Power Auto Recovery

A traditional ATX system should remain at power off stage when AC power resumes from power failure. This design is inconvenient for a network server or workstation, without an UPS, that needs to keep power-on. This motherboard implements an AC Power Auto Recovery function to solve this problem.

IDE and Floppy Connector

Connect 34-pin floppy cable and 40-pin IDE cable to floppy connector FDD and IDE connector. Be careful of the pin1 orientation. Wrong orientation may cause system damage.

Primary Master (1st)

Primary Slave (2nd)

IDE 1 (Primary)

IDE 2 (Secondary)

Pin 1

Secondary Master (3rd)

Secondary Slave (4th)

ATA 66/100 IDE Connector
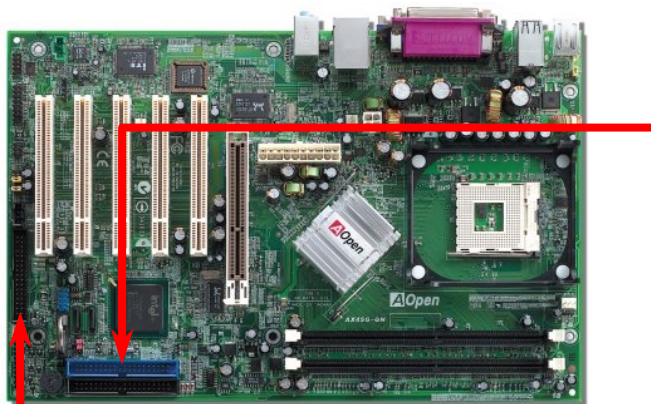
Pin 1
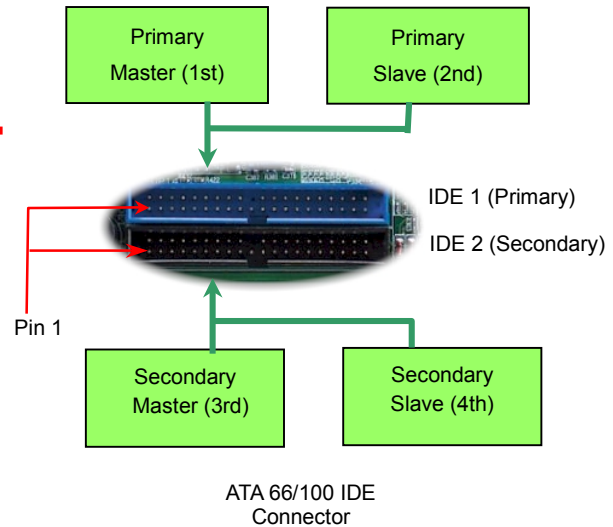
FDD Connector

IDE1 is also known as the primary channel and IDE2 as the secondary channel. Each channel supports two IDE devices that make a total of four devices. In order to work together, the two devices on each channel must be set differently to **Master** and **Slave** mode. Either one can be the hard disk or the CDROM. The setting as master or slave mode depends on the jumper on your IDE device, so please refer to your hard disk and CDROM manual accordingly.

> *Tip:*
>
> 1. *For better signal quality, it is recommended to set the far end side device to master mode and follow the suggested sequence to install your new device. Please refer to above diagram*
>
> 2. *To achieve the best performance of Ultra DMA 66/100 hard disks, a special 80-wires IDE cable for Ultra DMA 66/100 is required.*

> *Warning: The specification of the IDE cable is a maximum of 46cm (18 inches); make sure your cable does not exceed this length.*

Serial ATA Supported NEW!

The traditional parallel ATA specification has defined the standard storage interface for PCs with its original speed of just 3 Mbytes/second since the protocol was introduced in the 1980s. And the latest generation of the interface, Ultra ATA-133, has been developed further with a burst data transfer rate of 133 Mbytes/second. However, while ATA has enjoyed an illustrious track record, the specification is now showing its age and imposes some serious design issues on today's developers, including a 5-volt signaling requirement, high pin count, and serious cabling headaches.

The Serial ATA specification is designed to overcome these design limitations while enabling the storage interface to scale with the growing media rate demands of PC platforms. Serial ATA is to replace parallel ATA with the compatibility with existing operating systems and drivers, adding performance headroom for years to come. It reduces voltage and pins count requirements and can be implemented with thin and easy to route cables.
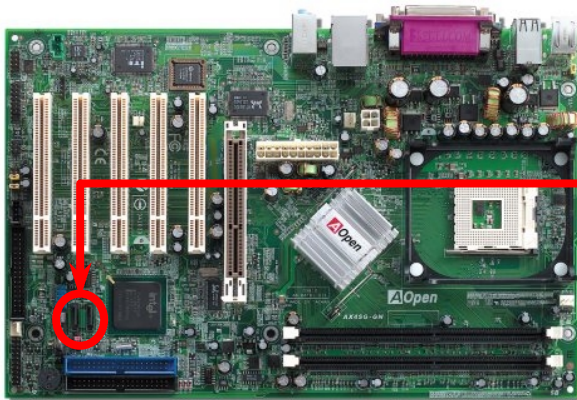
SATA port 2
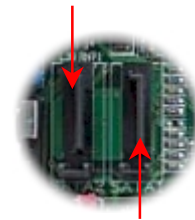
Serial ATA Port 1

Connecting Serial ATA Disk

To connect a Serial ATA disk, you have to have a 7-pin serial ATA cable. Connect two ends of the serial ATA cable to the serial ATA header on the motherboard and the disk. Like every other traditional disk, you also have to connect a power cable.   Please be noted that it is a jumper free implement; you don't need to set jumpers to define a master or slave disk. When serial ATA hard disks are installed on serial ATA ports, the one connected on Port 0(SATA 1) will be set as the first boot device automatically. Please be noted that it doesn't support Hot-Plug in function.
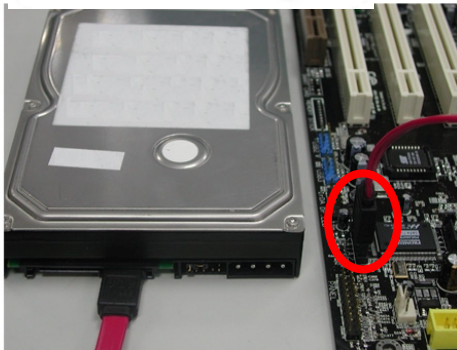
| Item	Parallel ATA	Serial ATA
Bandwidth	100/133 MB/Sec	150/300/600 MB/Sec
Volts	5V	250mV
Pins	40	7
Length Limitation	18 inch (45.72cm)	1 meter (100cm)
Cable	Wide	Thin
Ventilation	Bad	Good
Peer-to-Peer	No	Yes

Comparison between Parallel ATA and Serial ATA

Note: These images are for example only; they may not be exactly the same as the motherboard you purchased.

AOpen

Adjusting Your Hard Disk

Except its original 2 sets of parallel IDE, this motherboard does come with the support for the latest Serial ATA hard disk. If you are unable to find your newly installed Serial ATA hard disks on your operating system after you have had installed them on, the problem mainly lies in the BIOS setting. You may simply adjust BIOS settings to have them work properly.

After having properly installed your hard disks, you may directly get into the BIOS setting screen for adjustment. You may simply press "Integrated Peripherals → On-Chip IDE Device → On-Chip Serial ATA" to choose your preferable mode. If you have no intention of changing its setting, the default would be Auto.
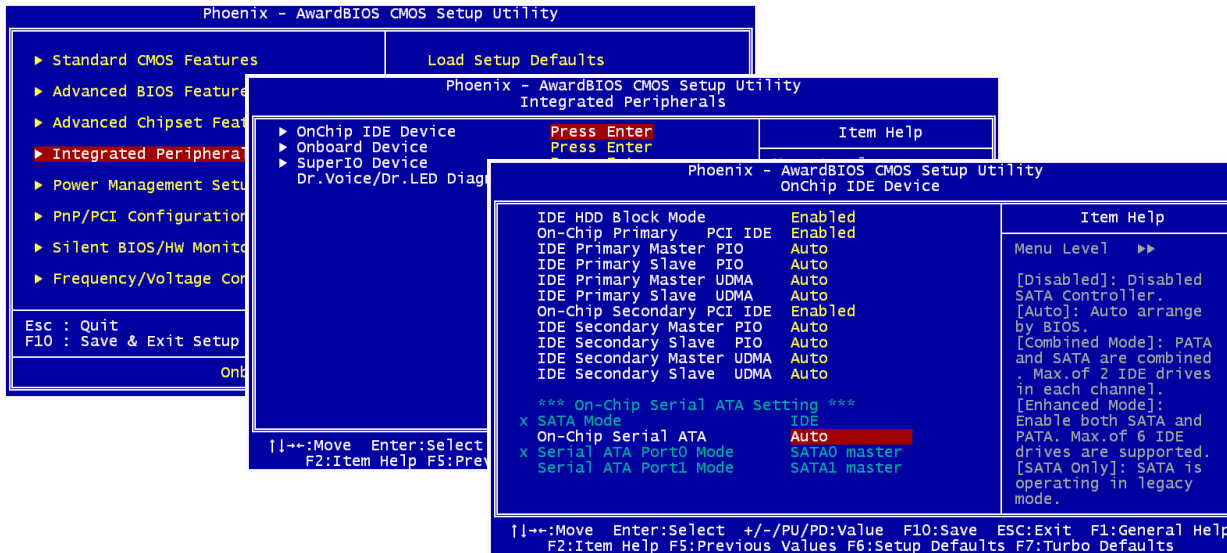
If you intend to change the default setting, simply press **Enter** for a list of selection:

```
On-Chip Serial ATA

Disabled      ..... [ ]
Auto          ..... [■]
Combined Mode ..... [ ]
Enhanced Mode ..... [ ]
SATA Only     ..... [ ]



 ↑↓:Move ENTER:Accept ESC:Abort
```
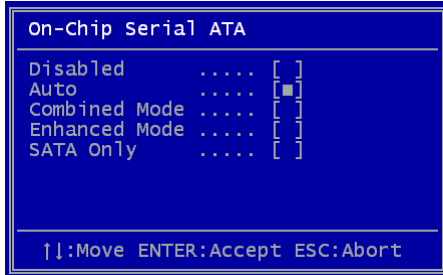
1. **Disabled**: You may choose this item if you're sure that only traditional IDE hard disks had been installed on your system. Disabling this item may also cancel the detection to Serial ATA hard disk during POST, which theoretically, could speed up your boot-up timing for a little bit; however, please remember to re-adjust the settings here if you intend to use Serial ATA hard disk later.

2. **Auto**: This is the default setting upon receipt of the motherboard. Basically, if your system functions properly, it's not necessary to change it. The system will automatically recognize the first hard disk on IDE1 as the first boot device.

Note: Please be informed that when you are using Windows98/ME with six hard disks fully installed, Auto mode is not able to function properly, it's just because Windows98/Me is not able to energize Enhanced Mode to detect all hard disks.

3. **Combined Mode:** If you have had installed traditional IDE hard disks and Serial ATA hard disks at the same time, then you may choose this Combined Mode. Under this mode, you may randomly choose either IDE hard disks or Serial ATA had disk as your first boot device. But please be aware that Serial ATA will exist with IDE in a mapping way, which also means it will occupy one of the IDE Channel and left you with one IDE Channel only.

4. **Enhanced Mode:** If you are using the latest operating system (say, Windows XP, Windows.NET Server), it is highly recommended to select Enhanced Mode. The system would be able to detect all six devices (traditional IDE x4, Serial ATA x 2) completely and functions perfectly under this mode. But please be noted that it is defaulted with using traditional IDE as the first boot device.
Note: From our practical lab tests, we found no obvious problem or mistakes happened under Windows2000 operating system, but, however, it is not within the regulation recommended by Intel.

5. **SATA Only:** You may select this SATA Only mode if you have had installed Serial ATA hard disks only. It also allows you to select booting sequence from Port0 (SerialATA1) or Port1 (SerialATA2).

Front Panel Connector

Attach the power LED, Keylock, speaker, power and reset switch connectors to the corresponding pins. If you enable "Suspend Mode" item in BIOS Setup, the ACPI & Power LED will keep flashing while the system is in suspend mode.

Locate the power switch cable from your ATX housing. It is 2-pin female connector from the housing front panel. Plug this connector to the soft-power switch connector marked **SPWR**.

Suspend Type	ACPI LED
Power on Suspend (S1) or Suspend to RAM (S3)	Flashing for every second
Suspend to Disk (S4)	The LED will be turned off

Pin1

1

NC		5VSB
NC		SPWR
+5V		ACPI LED-
IDE LED		GND
IDE LED		ACPILED
+5V		NC
+5V		NC
GND		GND
NC		RESET
SPEAKER		GND

1

SPWR

IDE LED   ACPI & POWER
                       LED

Speaker   Reset

AOpen
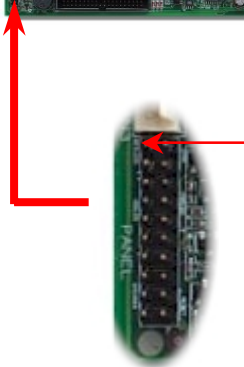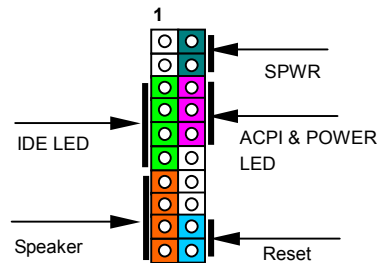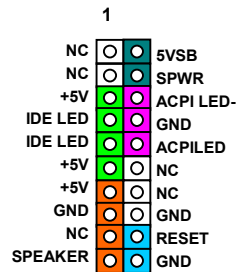
AGP (Accelerated Graphic Port) 8X Expansion Slot

AX4SG-GN provides an AGP 8x slot. The AGP 8X is a bus interface targeted for high-performance 3D graphic. AGP uses both rising and falling edge of the 66MHz clock, for 4X AGP, the data transfer rate is 66MHz x 4bytes x 4 = 1056MB/s. AGP is now moving to AGP 8x mode, which is 66MHz x 4bytes x 8 =2.1GB/s. This AGP slot could automatically become an AGP slot or a Multiplexed Intel DVO Output depending on what kind of cards inserted, like AGP, or ADD (AGP Digital Display) cards. With ADD card cabled to this slot, Multiplexed Intel DVO output could provide high-speed digital connection for digital displays or TV-OUT functionality.

Warning: It is strongly recommended not to adjust voltage/clock of AGP/PCI when connecting any SATA service. It is because when the voltage/clock for AGP/PCI is adjusted, the clock for SATA couldn't keep 100MHz, and the system will be unstable.
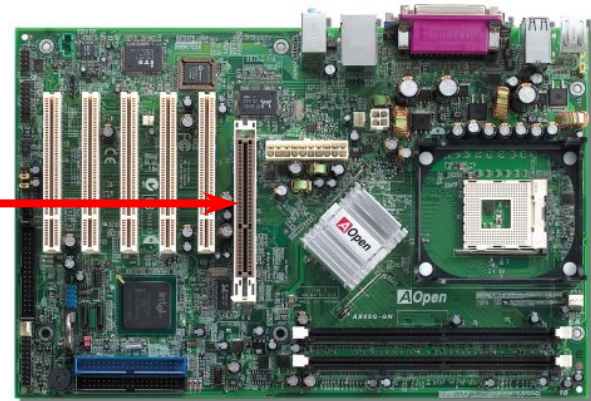
Support USB 2.0 Ports

This motherboard provides eight USB 2.0 ports to connect USB devices such as mouse, keyboard, modem, printer, etc. There is one USB connector on the board for you to connect two USB devices and six other ports on the back panel. You can use proper cables to connect USB devices from back panel or connect the front USB connector to the front panel of chassis.

Compared to traditional USB 1.0/1.1 with the speed of 12Mbps, USB 2.0 has a fancy speed up to 480Mbps which is 40 times faster than the traditional one. Except for the speed increase, USB 2.0 supports old USB 1.0/1.1 software and peripherals, offering impressive and even better compatibility to customers. On this motherboard, all eight ports support USB 2.0 function.

```
           1
    +5V  ○ ○  +5V
  SBD6-  ○ ○  SBD7-
  SBD6+  ○ ○  SBD7+
   GND   ○ ○  GND
   KEY     ○  NC
```

USB 2.0 Connector

Pin 1 ⟶

Note: Please note that if you would like to use USB devices (Example: keyboard, mouse etc.) under DOS environment, you must install driver that comes with the devices to make it work.

Color Coded Back Panel

The onboard I/O devices are PS/2 Keyboard, PS/2 Mouse, RJ-45 LAN Connector, COM1, VGA port, Printer, USB, AC97 sound and game ports. The view angle of drawing shown here is from the back panel of the housing.

PS/2 Mouse Connector	**USB 2.0 Ports**	**SPP/EPP/ECP Parallel Port**	**RJ-45 LAN Connector**

Line-In

Speaker Out

MIC-In

PS/2 Keyboard Connector	**COM 1 Port**	**VGA Port**	**USB 2.0 Ports**
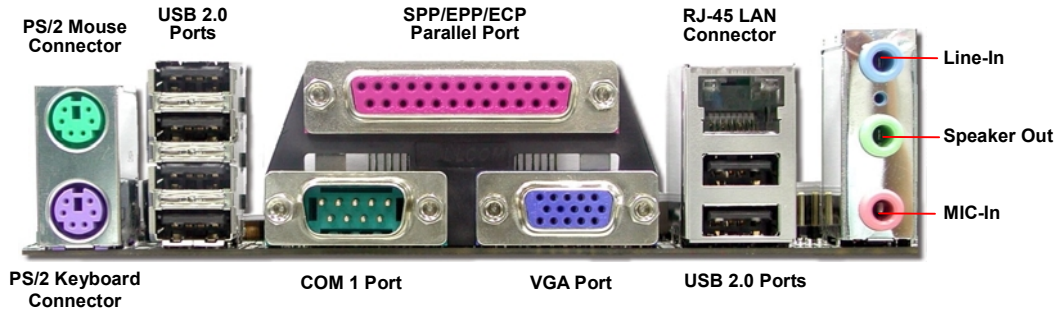
PS/2 Keyboard:	For standard keyboard, which use a PS/2 plug.
PS/2 Mouse:	For PC-Mouse, which use a PS/2 plug.
USB Port:	Available for connecting USB devices.
Parallel Port:	To connect with SPP/ECP/EPP printer.
COM1 Port:	To connect with pointing devices, modem or others serial devices.
RJ-45 LAN connector	To connect Ethernet for home or office use.
VGA Connector:	To connect with PC monitor.
Speaker Out:	To External Speaker, Earphone or Amplifier.
Line-In:	Comes from the signal sources, such as CD/Tape player.
MIC-In:	From Microphone.

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Front Audio Connector

If the housing has been designed with an audio port on the front panel, you'll be able to connect onboard audio to front panel through this connector. By the way, please remove the jumper cap from the Front Audio Connector before you connect the cable. Do not remove this yellow jumper cap if your housing doesn't have an audio port on the front panel.

Pin 1

Front Audio Connector

```
              1
AUD_MIC       ○ ○    AUD_GND
AUD_MIC_BIAS  ○ ○    AUD_VCC
AUD_FPOUT_R   ○ ○    AUD_RET_R
NC            ○      KEY
AUD_FPOUT_L   ○ ○    AUD_RET_L
```
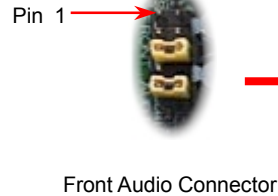
Note: Please remove the jumper cap from the front audio connector before you connect the cable. Do not remove this yellow jumper cap if your housing doesn't have an audio port on the front panel.

Support 10/100Mbps LAN Onboard

On the strength of Realtek LAN, which is a highly integrated platform LAN connect device, it provides 10/100Mbps Ethernet for office and home use. The Ethernet RJ45 connector is located on top of USB connectors. The right hand side LED indicates link mode, it lights in yellow whenever linking to network. The left hand side LED indicates transfer mode and it lights in green when data is transferring in 100Mbps (no light while in 10Mbps). To enable or disable this function, you may simply adjust it through BIOS.
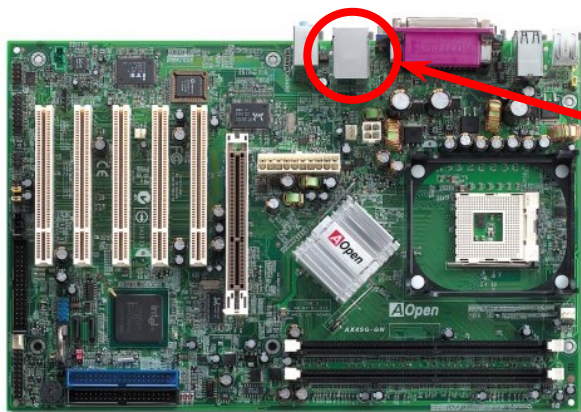
Right: Linking (Yellow)

Left: Transferring
10Mbps (No light)
100Mbps (Green)

S/PDIF (Sony/Philips Digital Interface) Connector

S/PDIF (Sony/Philips Digital Interface) is a latest audio transfer file format that provides impressive quality through optical fiber and allows you to enjoy digital audio instead of analog. Normally there are two S/PDIF outputs as shown, one for RCA connector, the most common one used for consumer audio products, and the other for optical connector with a even better audio quality. Through a specific audio cable, you can connect the S/PDIF connector to a S/PDIF audio module bearing S/PDIF digital output. However, you must have a S/PDIF supported speaker with S/PDIF digital input to make the most of this function.

Connecting to
RCA Cable

Connecting to
Optical Cable
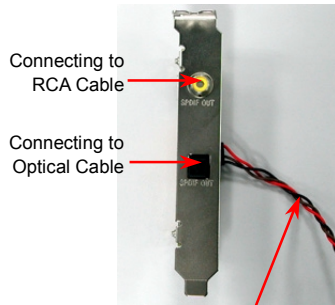
Audio cable

S/PDIF Module
(User Upgrade Optional)

Pin 1 →

S/PDIF Connector

1 ○ +5V
  □ NC
  ○ SPDIFOUT
  ○ GND
5 ○ SPDIFIN

Note: Please note that this model doesn't support S/PDIF IN function.

IrDA Connector

The IrDA connector can be configured to support wireless infrared module. With this module and application software such as Laplink or Windows 98 Direct Cable Connection, user can transfer files to or from laptops, notebooks, PDA devices and printers. This connector supports HPSIR (115.2Kbps, 2 meters) and ASK-IR (56Kbps).

Install the infrared module onto the **IrDA** connector and enable the infrared function from BIOS Setup, UART Mode. Please make sure you have the correct orientation when plugging the IrDA connector.
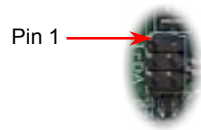
Pin 1 ⟶

IrDA Connector

1	
NC	KEY
+5V	GND
IR_TX	IR_RX
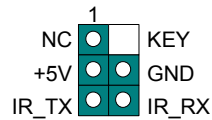
COM2 Connector

This motherboard provides two serial ports. One of them is on back panel connector, and the other is on the upper left of board. With proper cable, you can connect it to the back panel of chassis.

Pin 1
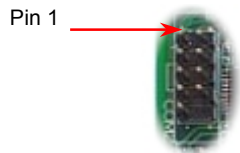
	1	2	
DCD#	○	○	SIN
SOUT	○	○	DTR#
GND	○	○	DSR#
RI#	○	○	CTS#
RTS#	○		

COM2 Connector

Game Port Bracket Supported

This motherboard comes with a game port (Joystick-Midi) for you to connect any midi devices or joysticks. To use this function you have to have a joystick module and connect it with a game port cable to this port on the motherboard.

Joystick Module
(User Upgrade Optional)

Pin1 →
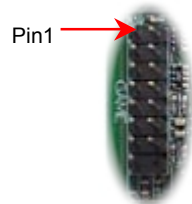
Game Port Connector

	1		
+5V	⬚ ⬚	+5V
JAB1	⬚ ⬚	JBB1
JACX	⬚ ⬚	JBCX
GND	⬚ ⬚	MIDI_TXD
GND	⬚ ⬚	JBCY
JACY	⬚ ⬚	JBB2
JAB2	⬚ ⬚	MIDI_RXD
+5V	⬚	KEY

Note: This picture is for example only; it may not exactly look the same with the motherboard you purchased.

CD Audio Connector

This connector is used to connect CD Audio cable from CDROM or DVD drive to onboard sound.

L

GND

GND

R
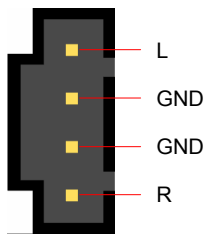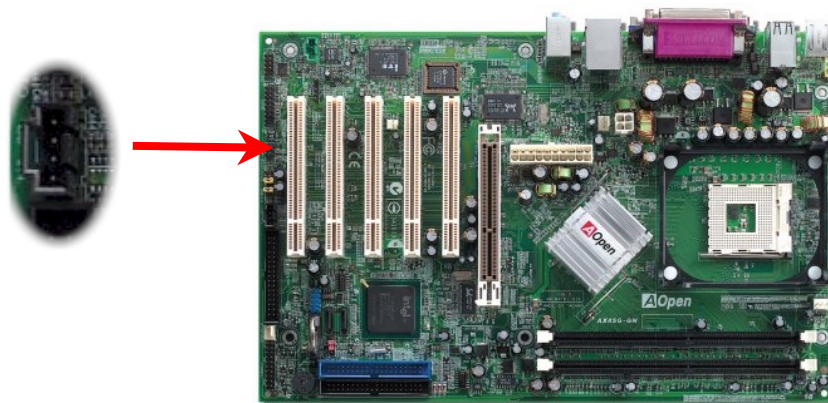
CD-IN Connector

*Note: Though some of the latest versions of Windows support "Digital Audio" through IDE bus. However, in order to use Open Jukebox player, which is driven under BIOS, it is a **MUST** to connect audio cable to CD-IN connector on the motherboard.*

AUX-IN Connector

This connector is used to connect MPEG Audio cable from MPEG card to onboard sound.

L

GND

GND

R
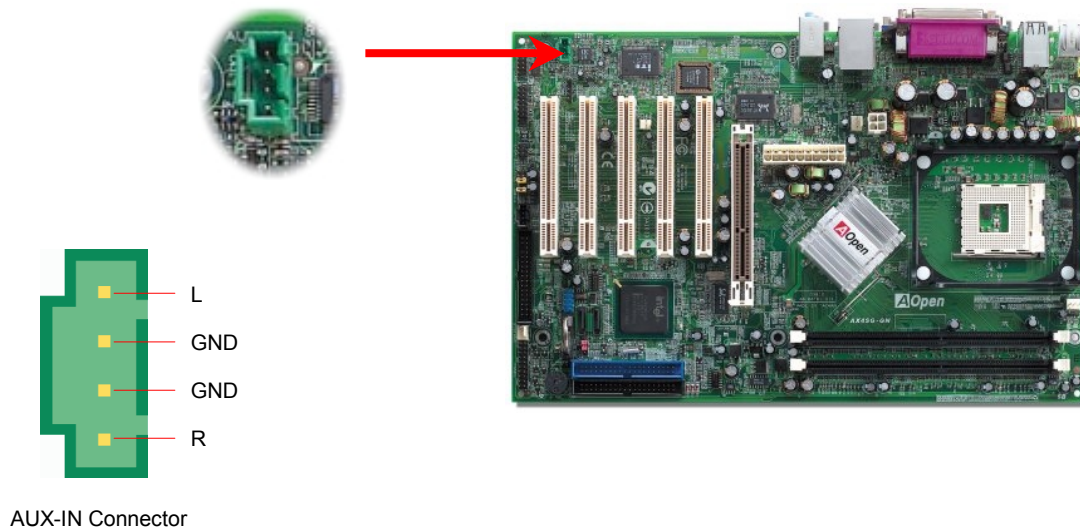
AUX-IN Connector

Case Open Connector

The "CASE OPEN" header provides chassis intrusion-monitoring function. To make this function works, you have to enable it in the system BIOS, connect this header to a sensor somewhere on the chassis. So, whenever the sensor is triggered by lights or by the opening of the chassis, the system will beep to inform you. Please be informed that this useful function only applies to advanced chassis, you may purchase an extra sensor, attach it on your chassis, and make a good use of this function.

Sensor

GND

1
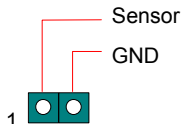
Pin 1

Case Open Connector

JP14 Clear CMOS Data

You can clear CMOS to restore system default setting. To clear the CMOS, follow the procedure below.

1. Turn off the system and unplug the AC power.

2. Remove ATX power cable from connector PWR2.

3. Locate JP14 and short pins 2-3 for a few seconds.

4. Return JP14 to its normal setting by shorting pin1 & pin2.

5. Connect ATX power cable back to connector PWR2.

Pin 1
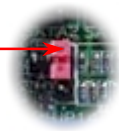
Normal
(default)

Clear CMOS

Tip: When should I Clear CMOS?

1. Boot fails because of overclocking…

2. Forget password…

3. Troubleshooting…

JP28 Keyboard/Mouse Wake-up Jumper

This motherboard provides PS2 keyboard / mouse wake-up function. You can use JP28 to enable or disable this function, which could resume your system from suspend mode with keyboard or mouse. The factory default setting is set to "Disable" (1-2), and you may enable this function by setting the jumper to 2-3.

Pin 1

1
Disable
(Default)

1
Enable

AOpen "Watch Dog ABS"

AOpen provides a special and useful feature on this motherboard for overclockers. When you power-on the system, the BIOS will check last system POST status. If it succeeded, the BIOS will enable "Watch Dog ABS" function immediately, and set the CPU FSB frequency according to user's settings stored in the BIOS. If system failed in BIOS POST, the "Watch Dog ABS" will reset the system to reboot in five seconds. Then, BIOS will detect the CPU's default frequency and POST again. With this special feature, you can easily overclock your system to get a higher system performance without removing the system housing and save the hassle from setting the jumper to clear CMOS data when system hangs.

Enable/Disable Signal from
BIOS

BIOS

**AOpen
Watch Dog ABS**

Reset Signal

Clock Generator

CPU ID Signal

Countdown about
5 seconds if fails
in POST

CPU
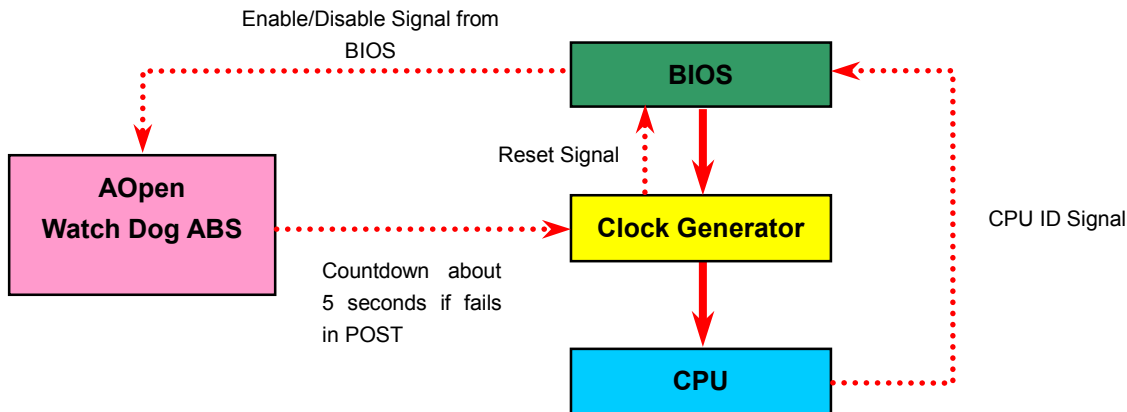
STBY LED and BOOT LED

Both STBY LED and BOOT LED are AOpen's considerate designs that aim at providing you friendly system information. The STBY LED will light up when power is provided to the motherboard. This is a convenient indication for you to check the system power status in many circumstances such as power on/off, stand-by mode and RAM power status during Suspend to RAM mode.

BOOT LED will keep blinking when you power the system on and when your system is under POST (Power-On Self Test). After POST diagnoses everything alright and finishes the booting, the LED will stay on otherwise it will remain flashing to warn you that mistakes have occurred during POST.
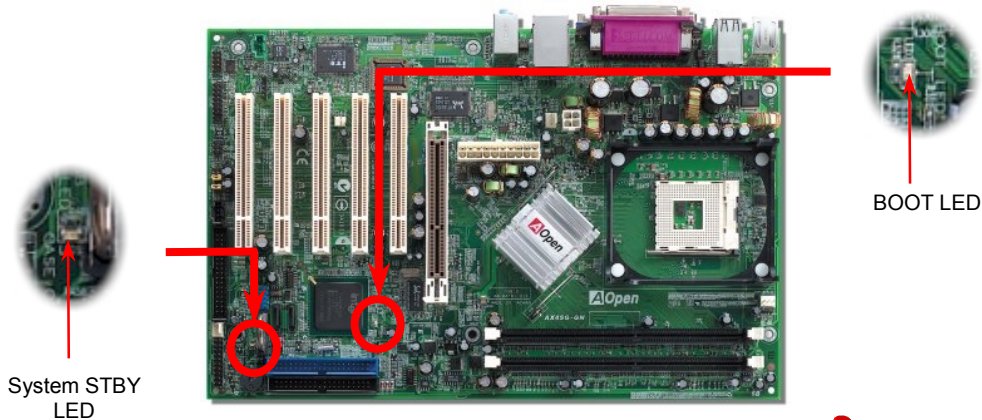
BOOT LED

System STBY
LED

Warning: *Do not install or remove the DIMM module or others devices when the STBY LED lights on.*

AGP Protection Technology and AGP LED

With the outstanding R&D ability of AOpen and its specially developed circuit, this motherboard implements a blend new technology to protect your motherboard from being damaged by over-voltaging of AGP card. When AGP Protection Technology is implemented, this motherboard will automatically detect the voltage of AGP card and prevent your chipsets from being burnt out. Please note that if you install a AGP card with 3.3V, which is not supported by Intel Springdale chipset, the AGP LED on the motherboard will light up to warn you the possible damage of the exceeding voltage. You may contact your AGP card vendor for further support.
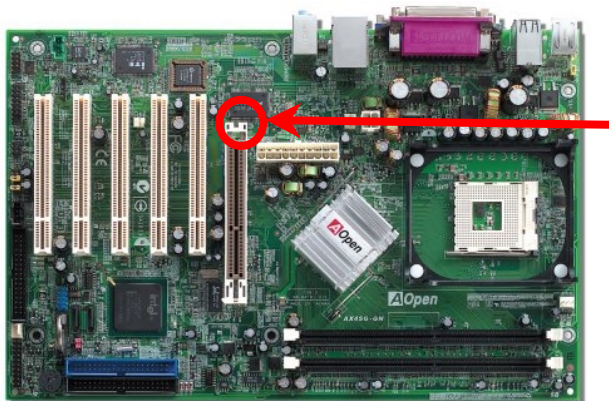
AGP LED

> *Warning:* *It is strongly recommended not to install a 3.3V AGP card, which is not supported by Intel 865SG. When you do so, the AGP LED on the motherboard will light up to warn you the possible damage.*

Battery-less and Long Life Design

This Motherboard implements a Flash ROM and a special circuit that provide you no batter power consumption of current CPU and CMOS Setup configurations. The RTC (real time clock) can also keep running as long as the power cord is plugged. If you lose your CMOS data by accident, you can just reload the CMOS configurations from Flash ROM and the system will recover as usual.

ATX Stand-by Power   **Battery**

Auto Switch

**RTC
(Real Time Clock)
00:00:00**

Auto switch to ATX standby power as long as AC power line is plugged. This smart design increases battery life if you still plug battery on motherboard.

Flash ROM   **CMOS**

Backup by EEPROM

AOpen
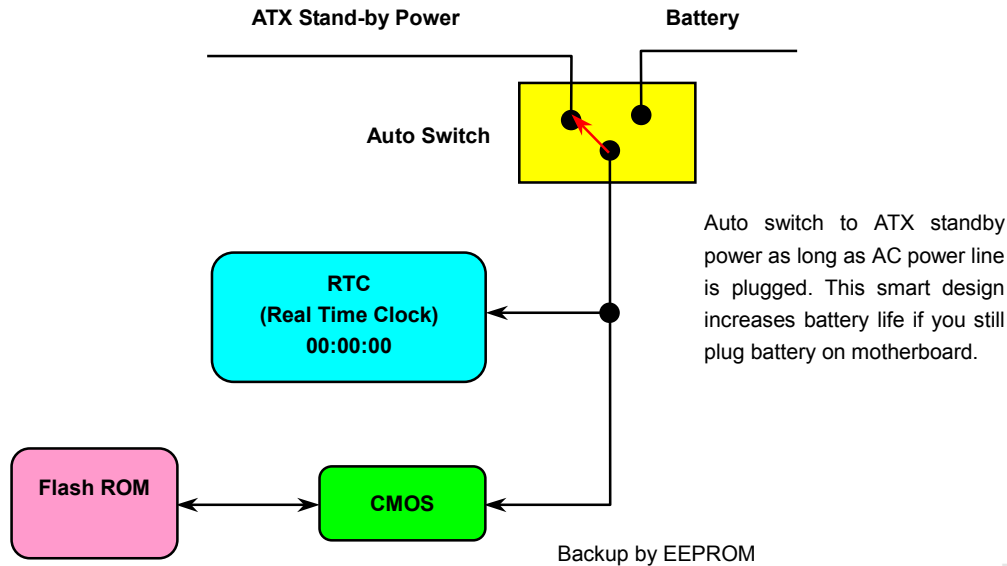
Resetable Fuse

Traditional motherboard uses fuses to prevent Keyboard and USB port from over-current or shortage. These fuses are soldered onboard that when it is broken (function to protect motherboard), user cannot replace them and result in malfunction of motherboard.

With expensive Resetable Fuse, the motherboard can be resumed back to normal function even after the fuse had done its protection job.

Resetable Fuse
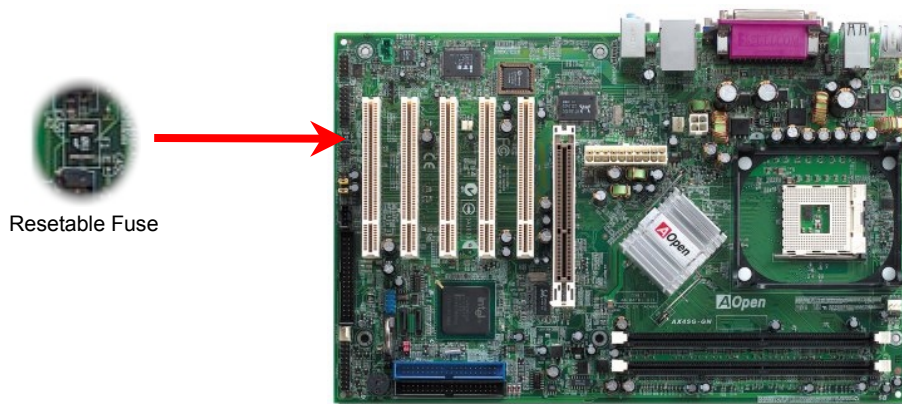
Enlarged Aluminum Heatsink

Cool down CPU and Chipset are important for system reliability. Enlarged aluminum heat sink provides better heat consumption especially when you are trying to over-clock the CPU.
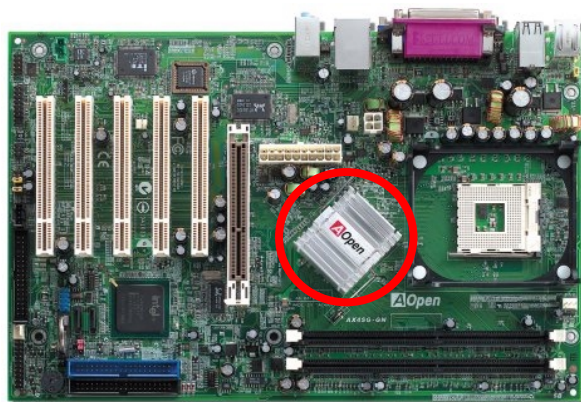
Low ESR Capacitor

The quality of low ESR capacitor (Low Equivalent Series Resistance) during high frequency operation is very important for the stability of CPU power. The idea of where to put these capacitors is another know-how that requires experience and detail calculation.

Not only that, AX4SG-GN implements 3300 μF capacitors, which is much larger than normal capacitor (1000 & 1500 μF) and it provides better stability for CPU power.
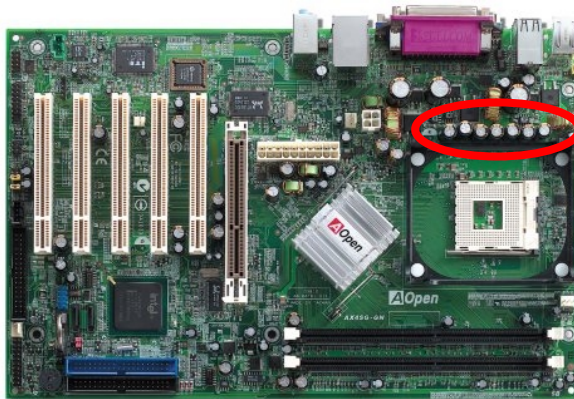
EzClock

Have you ever thought how great it would be if you can adjust the frequency setting on your motherboard under Windows environment and be a real master of your system? Everybody knows that the ratio and frequency setting are key factors to influence the system performance, however, it's absolutely not an easy task for an amateur to adjust the setting value. On most traditional motherboards, you have to get into BIOS screen for the frequency and reboot the system again and again. But from now on, you don't have to surfer the boring stuffs anymore.

With brand-new and user-friendly EzClock that AOpen specially designs for his users, you can adjust those important values as you please and think of suitable. This tailor-made EzClock allows you to set the voltage and frequency of CPU, VGA, PCI and memory under Windows environment as well as in BIOS setting page; even better, those settings will be displayed realtime. Having this handy EzClock, you can monitor the system when you're fine-tuning the performance of your system. It provides you detailed and necessary information. Now let's take a look how it works on utility, BIOS and POST.

How You Adjust the Settings in EzClock Utility

In EzClock utility, you can adjust CPU Front Side Bus (FSB), the voltage and frequency of VGA, AGP, PCI and DRAM. Besides, the CPU related information such as CPU voltage, temperature and CPUFAN rotation speed will also be displayed on this utility.

CPU Color Bars:
The color bar will light on and show different colors as values change. On default values, it will show green.

On the left circle area shows Ratio, FSB and frequency information about CPU. When the values are set to factory default, the light on the top and bottom of the circle will show green and it will vary as you change these CPU settings.

CPU Ratio, FSB and frequency displaying area:
You can adjust CPU FSB here by entering preferred value.

On the right part of the panel is the section that you adjust the settings of VGA, AGP, PCI and memory. To adjust the voltage and clock frequency of those installments, you can press "-" or "+" on corresponding items. The color parts represent the situation of values. The higher value you set, the light on the color bar goes to right and turns red. After finishing those value settings, you can press "S" button on the upper right hand corner to save changes to CMOS.

VGA, AGP, PCI and DRAM Voltage / Clock Area:
Pressing "_" and "+" buttons, you can adjust the voltage and clock frequency values of onboard VGA, AGP, PCI and DRAM.
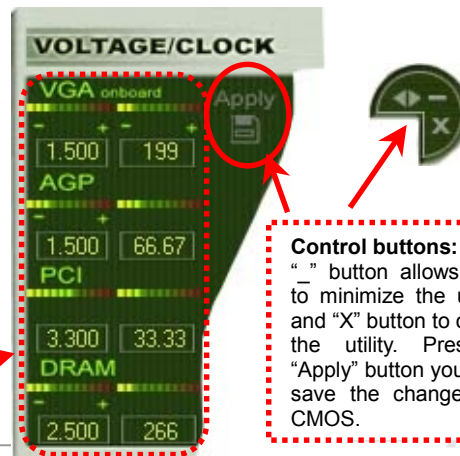
Control buttons:
"_" button allows you to minimize the utility and "X" button to close the utility. Pressing "Apply" button you can save the changes to CMOS.

On the bottom rectangular panel represents CPU fan speed, CPU voltage and CPU temperature. The three color bars on the right hand side will light on according to operation temperature. Please refer to the picture shown above.

CPU Color Bars:
The color bars will light on according to CPU operation temperature.

CPU Fan, Voltage and Temperature:
representing CPU fan speed, CPU voltage and CPU temperature in Celsius and Fahrenheit degrees.

How You Adjust the Settings in BIOS

Apart from EzClock utility, the voltage and frequency values of CPU, PCI and memory can also be adjusted on BIOS page. By pressing "+", "-", "PgUp" or "PgDn" keys, you can adjust the frequency values of CPU Bus, PCI Bus and DRAM.
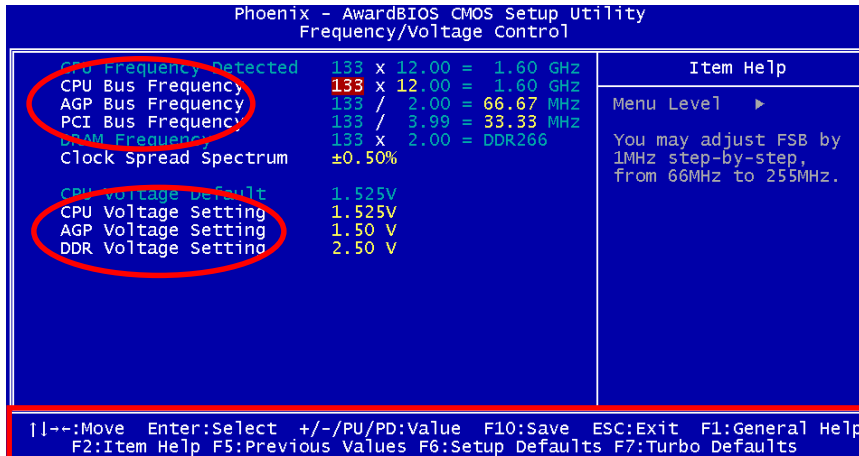
Also, the same keys help you adjust the voltage of CPU and DDR settings. Some values may change while you adjust the settings. You can press "F10" to save the changes you've made.

Function Keys Description

How Your Boot Screen Looks Like

After you finish setting BIOS, these setting values will be displayed on the boot screen like the shown picture here.

Every time you boot your system, both default and current settings will pop up on the screen. Your personal settings that had been adjusted earlier will be highlighted; thus, you can have clear idea how your system functions and monitor your system more easily.

Current values of your system
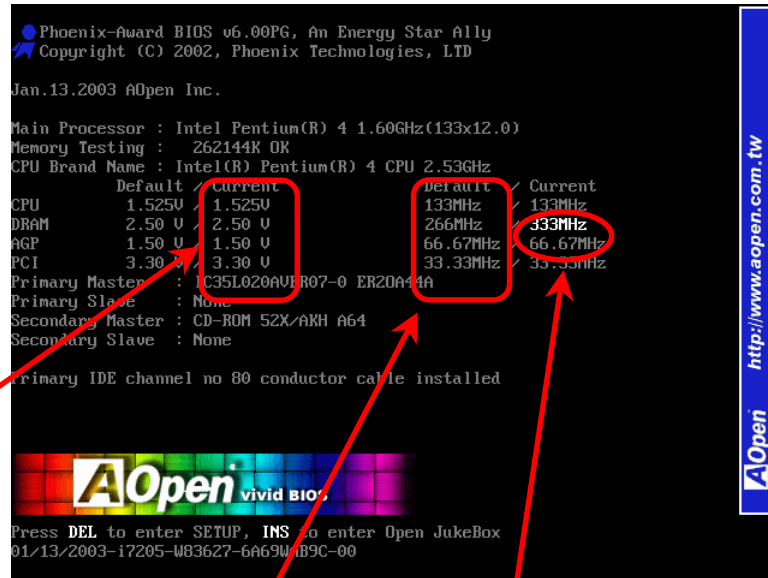
Default settings of this motherboard

The highlighted setting value you manually adjust

AOConfig Utility NEW!

AOpen always dedicated to provide users a much friendly computer environment. We now bring you a comprehensive system detection utility. AOConfig is a Windows based utility with user-friendly interface that allows users to obtain information of the operation system and hardware such as motherboard, CPU, memory, PCI devices and IDE devices. The powerful utility also displays the version of BIOS and firmware for your convenience of maintenance.

Moreover, AOConfig allows users to save information in *.BMP or *.TXT format which users may collect the system information in detail and send them to AOpen directly for technical support or for further diagnose of system problems.
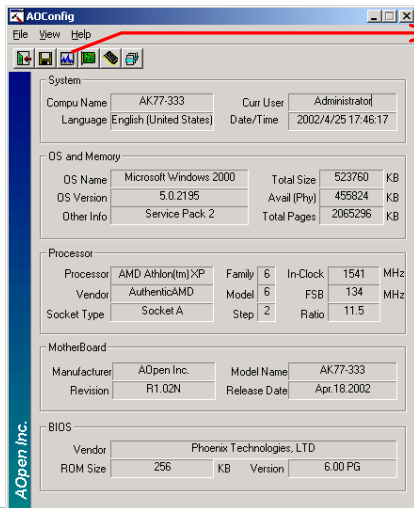
1. The system page shows the detailed information of the motherboard, operating system, processor, and BIOS version.

2. The PCI device page shows the configurations of all PCI devices installed in your motherboard.
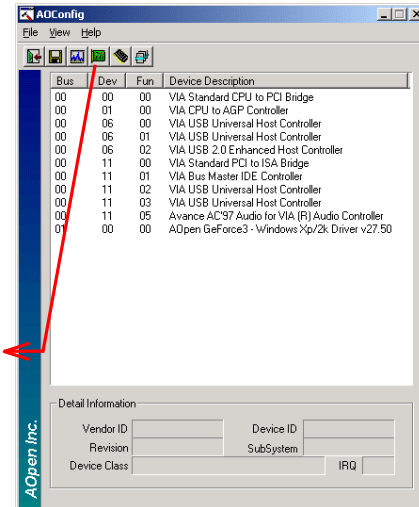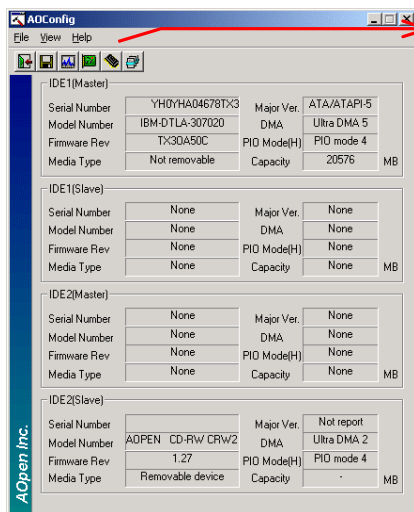
3. This page presents the IDE device information, such as serial number, manufacturer, firmware version, and capacity.

4. From this page, users can obtain the technical support information of AOpen. Moreover, detailed information could be saved in .bmp or .txt format.
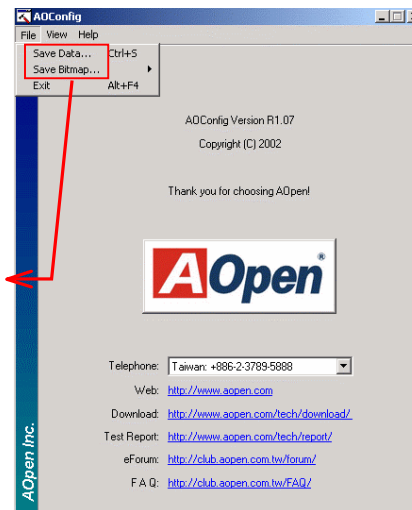
NOTE:

AOConfig can be used under Windows 98SE/ME, NT4.0/2000, or Windows XP. Please also note that AOConfig can only be operated in a system equipped with an AOpen motherboard. Before running AOConfig, all applications must be closed.
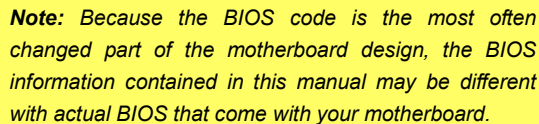
Phoenix-AWARD BIOS

System parameters can be modified by going into BIOS Setup menu, this menu allows you to configure the system parameters and save the configuration into the 128 bytes CMOS area, (normally in the RTC chip or in the main chipset).

Phoenix-Award BIOS™ installed in the Flash ROM of the motherboard is a custom version of an industry standard BIOS. The BIOS provides critical low-level support for standard devices such as hard disk drives, serial and parallel ports.

Most BIOS settings of AX4SG-GN have been optimized by AOpen's R&D engineering team. But, the default setting of BIOS still can't fine-tune the chipset controlling entire system. Therefore, the rest of this chapter intends to guide you the process of configuring your system setup.

To enter to BIOS setup menu, press <Del> when POST (Power-On Self Test) screen is shown on your monitor.

> *Note: Because the BIOS code is the most often changed part of the motherboard design, the BIOS information contained in this manual may be different with actual BIOS that come with your motherboard.*

AOpen

How To Use Phoenix-Award™ BIOS Setup Program

Generally, you can use arrow keys to highlight items that you want to choose, then press <Enter> key to select, and use the <Page Up> and <Page Down> key to change setting values. You can press <Esc> key to quit Phoenix-Award™ BIOS setup program. The following table provides details about how to use keyboard in the Phoenix-Award™ BIOS setup program. Alternatively, it's strongly recommended to install AOpen's newest WinBIOS Utility to get more detailed description, further powerful functions and advanced setting of BIOS.

Key	Description
Page Up or +	Changing setting to next value or increase the value.
Page Down or -	Changing setting to previous value or decrease value.
Enter	Select the item.
Esc	1. In main menu: Quit and don't save any change. 2. In sub menu: Exit current menu to main menu.
Up Arrow	Highlight previous item.
Down Arrow	Highlight next item.
Left Arrow	Move the light bar to left side of menu.
Right Arrow	Move the light bar to right side of menu.
F6	Load fail-save setting value from CMOS.
F7	Load turbo setting value from CMOS.
F10	Save changed setting and exit setup program.

AOpen

How To Enter BIOS Setup

After you finish jumper settings and connect correct cables, power on and enter the BIOS Setup. Press <Del> during POST (Power-On Self Test) and choose "Load Setup Defaults" for recommended optimal performance.

```
          Phoenix - AwardBIOS CMOS Setup Utility
┌─────────────────────────────────────────────────────────────┐
│  ► Standard CMOS Features          Load Setup Defaults        │
│                                                               │
│  ► Advanced BIOS Features          Load Turbo Defaults        │
│                                                               │
│  ► Advanced Chipset Features       Set Password               │
│                                                               │
│  ► Integrated Peripherals          Save & Exit Setup          │
│                                                               │
│  ► Power Management Setup           Exit Without Saving        │
│                                                               │
│  ► PnP/PCI Configurations          Load EEPROM Defaults       │
│                                                               │
│  ► Silent BIOS/HW Monitor          Save EEPROM Defaults       │
│                                                               │
│  ► Frequency/Voltage Control     ► Credits                    │
├─────────────────────────────────────────────────────────────┤
│  Esc : Quit                  ↑ ↓ → ←   : Select Item          │
│  F10 : Save & Exit Setup                                      │
├─────────────────────────────────────────────────────────────┤
│                  Load Setup Defaults                          │
└─────────────────────────────────────────────────────────────┘
```

Del

Warning: *Please avoid of using "Load Turbo Defaults", unless you are sure your system components (CPU, DRAM, HDD, etc.) are good enough for turbo setting.*

AOpen

WinBIOS Utility

NEW!

In the past, users have to keep punching the DEL key at a good timing during POST (Power-On-Self-Test) screen to get into the BIOS, which is inconvenient and clumsy. From now on, AOpen provides an easier way to configure your BIOS. WinBIOS is a customized utility for running exclusively on AOpen motherboards, which allows you to setup your BIOS under Windows environment. Designed with traditional-BIOS-alike interface, you may adjust BIOS parameter with clear descriptions for each item.

WinBIOS is natively designed with multi-language support. There are various widely-use languages provided on our website for your downloading, which also helps to prevent wrong settings caused by misunderstanding of the languages. The only thing you have to do is to visit our official website and download your respective language pack (of few KB size), then double-click on it to activate the support with your chosen language.

Moreover, with high scalability, either for newly bought motherboard or the latest BIOS version with new function, you don't have to re-install the whole program again and again. All you have to do is to grab the latest profile from our website, simply double-click on it as well to support the latest version of your BIOS. You don't have to spend any extra effort to have your motherboard supported by WinBIOS.
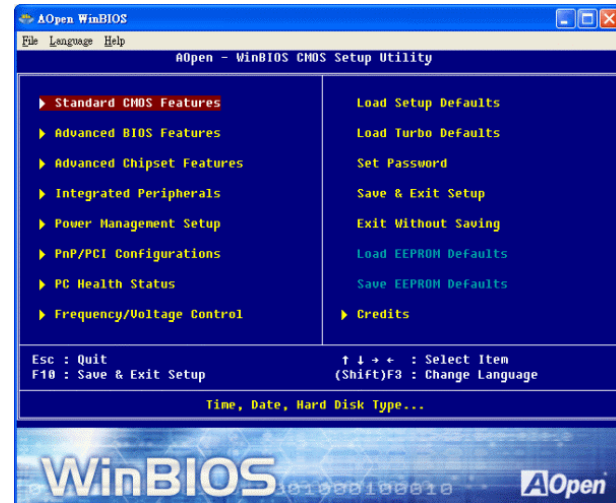
Function keys:

It's definitely easy to handle WinBIOS as if you're using traditional BIOS setting. Users can use the arrow keys such as ↑ ↓ ← → to move around the items in WinBIOS screen. And use PGUP PGDN, "+" or "-" to change the setting value if they are available. Press ESC to get back to the previous screen. Furthermore, the hotkeys shown in the table may help you and save your time. Some settings may not come into effect until you reboot your system.

Hotkey	Function Description
F1	Get help description.
F2	Item Help
F3	Changing menu language.
F5	Load previous setting
F6	Load setup default setting
F7	Load turbo setting
F10	Save changed setting and exit setup program.
F12	Full Screen / Normal Mode

Caution: **After updating your BIOS, please remember to update WinBIOS profile as well. If the upgraded BIOS version is newer than WinBIOS profile, WinBIOS will not be able to launch and a dialog box with error message will pop up. This verification is designed on purpose to protect your BIOS from damaged by wrong profile version.**

For the latest WinBIOS profile and language pack modules, you may find them from AOpen official web site as shown below:

(http://english.aopen.com.tw/tech/download/WinBIOS/default.htm)

Error

Sorry! WinBIOS cannot support this version of BIOS.(049)

確定

Note: Due to BIOS versions are updated in an extremely fast speed, it's strongly recommended to download the latest BIOS version and WinBIOS profile from our website upon receipt of the motherboard.

BIOS Upgrade under Windows environment

With outstanding R&D ability of AOpen, we now bring you a whole new BIOS Flash wizard ---- EzWinFlash. With an eye to users convenience, EzWinFlash combines the BIOS binary code and flash module together, so the only thing you have to do is just clicking on the utility you downloaded from web and let it helps you complete the flash process automatically. EzWinFlash detects your motherboard and checks the BIOS version cleverly to prevent your system from any possible failure. Moreover, EzWinFlash has been taken into consideration to go with any windows platform you might be using, no matter if you're using Windows 95/98, 98SE/ME, NT4.0/2000, or Windows XP.

In the meanwhile, in order to provide a much more user-friendly operating environment, AOpen EzWinFlash is natively designed to have multi-language function to provide easier way for users' usage in changing BIOS setting.
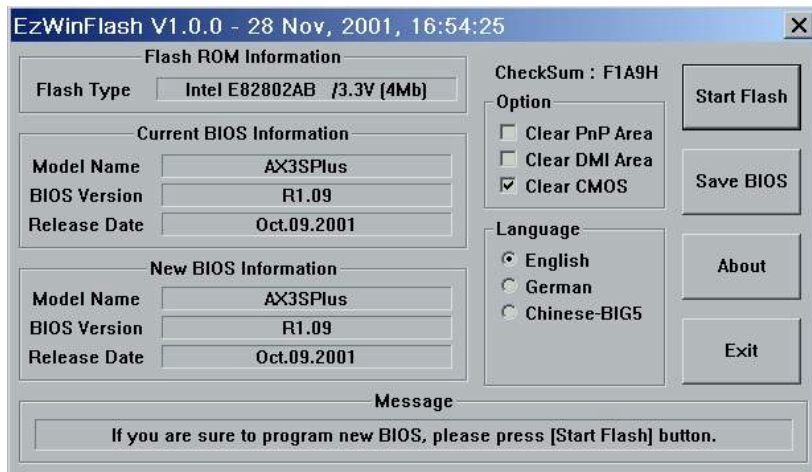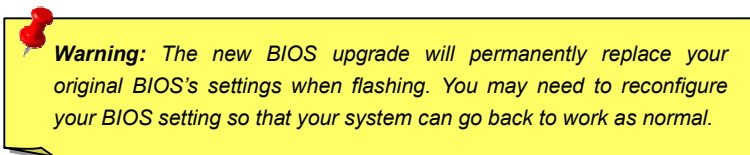
Caution: By updating your motherboard, you are taking a risk of BIOS flash failure. If your motherboard is working stable, and there are no major bugs that had been fixed by a latter BIOS revision, we recommend that you DO NOT try to upgrade your BIOS.

If you intent on upgrading, PLEASE BE SURE to get the right BIOS revision for the right motherboard model to avoid any possibility failure.

You may accomplish BIOS upgrade procedure with EzWinFlash by the following steps, and it's STRONGLY RECOMMENDED to close all the applications before you start the upgrading.

1. Download the new version of BIOS package zip file from AOpen official web site. (ex: http://www.aopen.com)

2. Unzip the download BIOS package (ex: WAX4SGGN102.ZIP) with WinZip (http://www.winzip.com) in Windows environment.

3. Save the unzipped files into a folder, for example, WAX4SGGN102.EXE & WAX4SGGN102.BIN.

4. Double click on the WAX4SGGN102.EXE; EzWinFlash will detect the model name and BIOS version of your motherboard. If you had got the wrong BIOS, you will not be allowed to proceed with the flash steps.

5. You may select preferred language in the main menu, then click [Start Flash] to start the BIOS upgrade procedure.

6. EzWinFlash will complete all the process automatically, and a dialogue box will pop up to ask you to restart Windows. You may click [YES] to reboot Windows.

7. Press <Del> at POST to enter BIOS setup; choose "Load Setup Defaults", then "Save & Exit Setup". Done!

It is strongly recommended NOT to turn off the power or run any application during FLASH PROCESS.

> *Warning:* *The new BIOS upgrade will permanently replace your original BIOS's settings when flashing. You may need to reconfigure your BIOS setting so that your system can go back to work as normal.*

AOpen

Vivid BIOS technology

Have you been fed up with the conservative and immutable POST screen? Let's rule out the tradition idea that POST screen are stiff and frigid, and let AOpen show you the newly developed VividBIOS to experience the lively vivid colourful POST screen!

Unlike earlier graphic POST screen which could occupy the whole screen and mask text information during POST, AOpen VividBIOS deals with graphics and texts separately, and makes them running simultaneously during POST. With this innovative design, VividBIOS now brings you a beautiful and sleek 256 colours screen without missing any important information shown on POST screen.

In addition, the limited space of BIOS ROM is another big issue. When all of the traditional BIOS can only show space-consuming and uncompressed Bitmap, AOpen has considerably tuned the BIOS to next generation, to recognize the smaller-sized GIF format and even dynamic-showing GIF animation.

Vivid BIOS shares the same fundamental technology with Open JukeBox CD Player, you may use the same EzSkin utility to change your

Vivid BIOS screen or to download your favourite Open JukeBox skin. If you see this little logo shown beside your model name on the BIOS download page, http://download.aopen.com.tw/downloads, it is assured that your motherboard supports this innovative feature!

Driver and Utility

There are motherboard drivers and utilities in AOpen Bonus CD. You don't need to install all of them to boot your system. But after you finish the hardware installation, you have to install your operation system first (such as Windows XP) before you install any drivers or utilities. Please refer to your operation system's installation guide.

Auto-run Menu from Bonus CD

You can use the auto-run menu of Bonus CD. Choose the utility and driver and select model name.
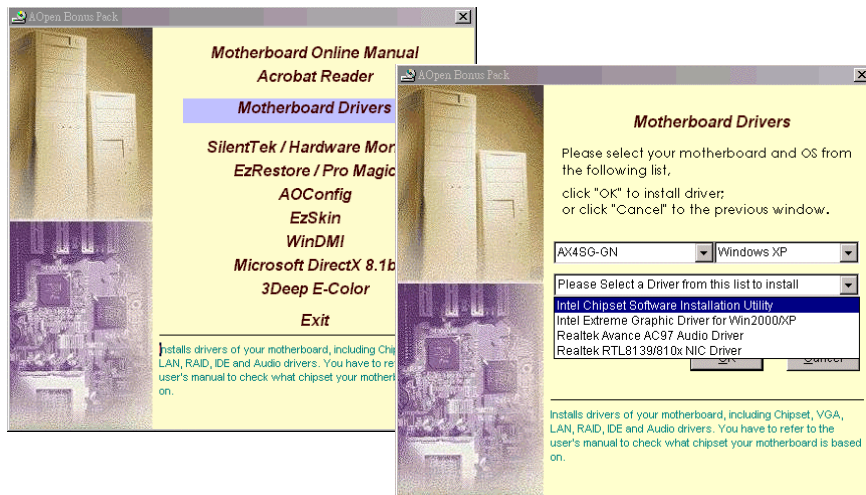
Installing Intel® Chipset Software Installation Utility

The Intel® Chipset Software Installation Utility should be installed onto the target system and the Windows * INF files outline the operating system how the chipset components will be configured. It is recommended that the Intel® Chipset Software Installation utility be installed onto the target system prior to the installation of other drivers.
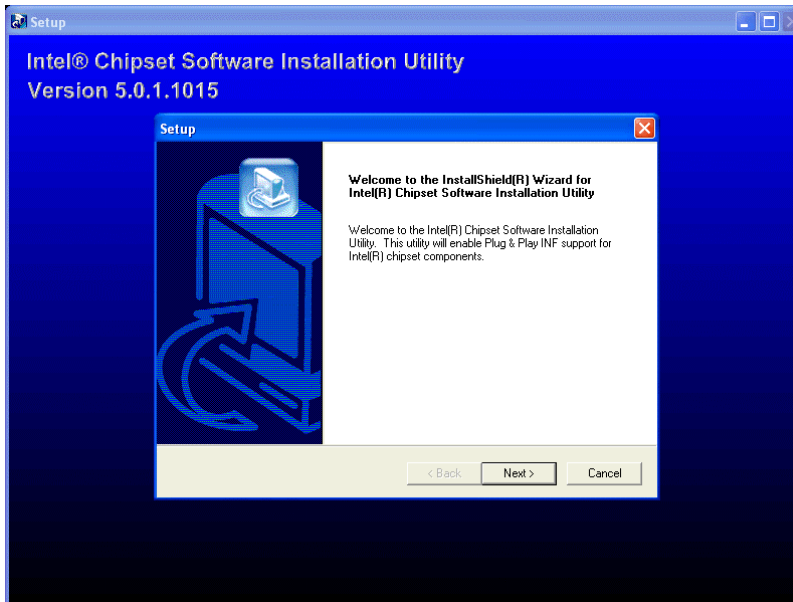
Installing Intel Extreme Graphic Driver

You can install Intel Extreme graphic driver to get the best graphics function of the chipset. You can find it in the Bonus Pack CD.
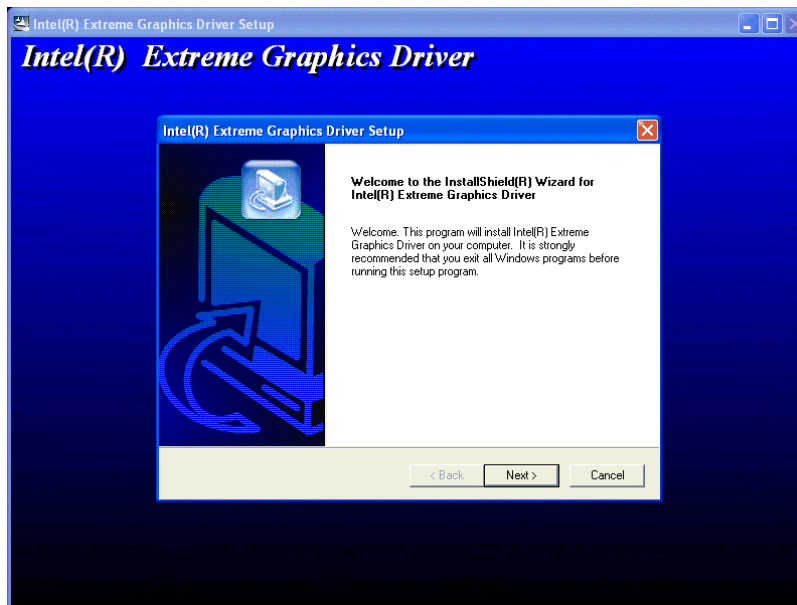
Installing Onboard Sound Driver

This motherboard comes with AC97 CODEC. This audio driver supports Windows 98SE and upper Windows OS; you can find the audio driver from the Bonus Pack CD auto-run menu.
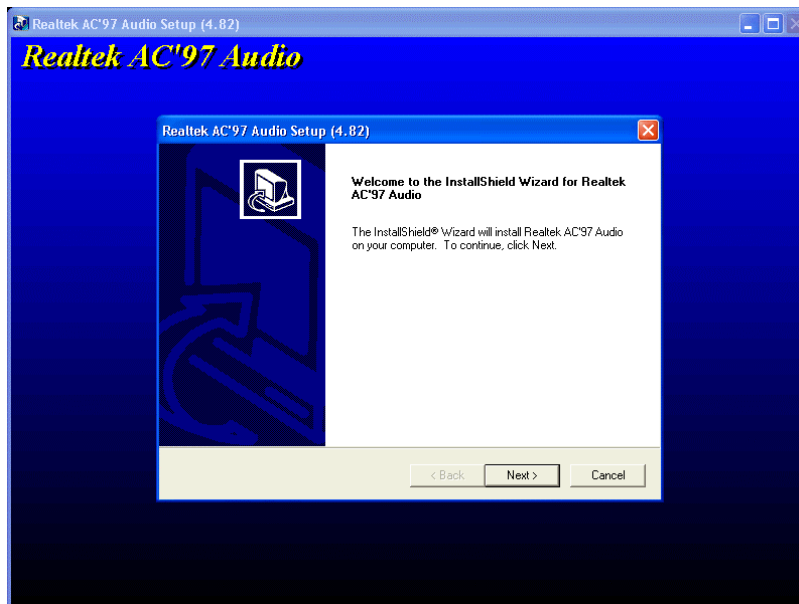
Installing LAN Driver in Windows 98/ME/2000/XP

This motherboard integrates Realtek Ethernet Chip. You can find this driver from the Bonus Pack CD auto-run menu.

Realtek Fast Ethernet NIC Driver Setup -- RTLSetup ver.A

Welcome to the InstallShield Wizard for Realtek RTL8139/810x Fast Ethernet NIC Driver Setup

The InstallShield® Wizard will install Realtek RTL8139/810x Fast Ethernet NIC Driver Setup on your computer. To continue, click Next.

< Back | Next > | Cancel

AOpen
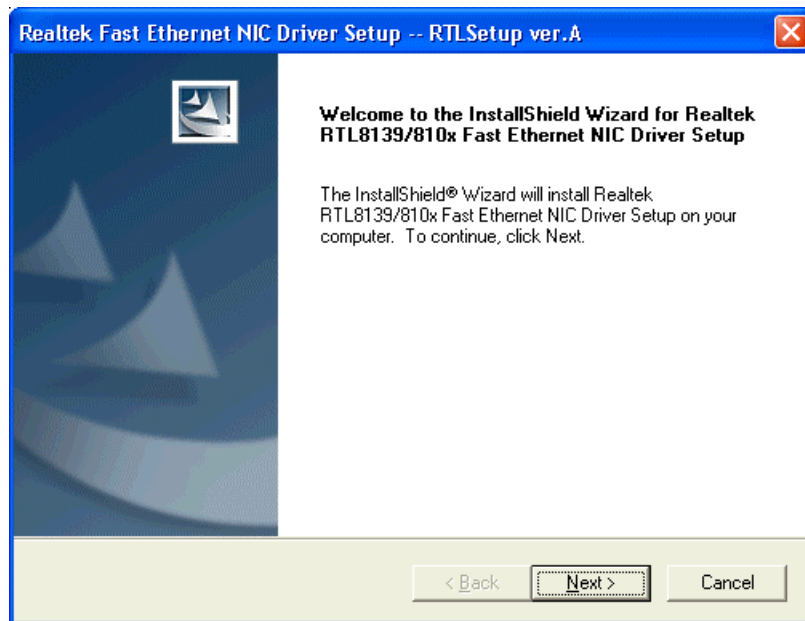
Install LAN Driver in Windows 95

Introduction:

This document describes the procedure to install Windows 95 (Golden version), Win95A, OSR2, Windows NT v4.0 driver for Realtek RTL8139 PCI Fast Ethernet adapter.

[Windows 95 (Golden version), Win95A and OSR2]

Installing driver procedure on Microsoft Windows 95 :

----

1. Ask you to select which driver you want to install, select "Driver from disk provided by hardware manufacturer".

2. Specify the setup file pathname

[CD-ROM]:\Driver\LAN\RTL8100\Windows\95\WIN95A (for Windows 95 and Win95A) or

[CD-ROM]:\Driver\LAN\RTL8100\Windows\95\W95OSR2 (for Windows 95 OSR2).

3. Windows 95 will appear some messages to insert Windows 95 system disk to complete setup step.

4. Windows 95 will finish the other installation procedure automatically, then you restart the system.

[Windows NT 3.5, 3.51 & 4.0]

Installing driver procedure on Microsoft Windows NT :

When you are in Windows NT :

1. In the Main group of NT, select the "Control Panel" icon.

2. In the Control Panel window, choose the "Network" icon.

3. In the Network Settings dialog box, choose the "Add Adapter" button. The Add Network Adapter dialog box appears.

4. In the list of network cards, select "<other> Requires disk from manufacturer", and then press <Enter> button.

5. Enter drive and pathname

[CD-ROM]:\Driver\LAN\RTL8100\Windows\NT (for NT 4.0) which is the path where the setup file OEMSETUP.INF is located, and then choose the OK button.

6. The screen will appear "Select Line Speed" dialog box which is provided by RTL8139.SYS driver. The default value is "auto" so that the RTL8139 PCI Fast Ethernet adapter and its driver RTL8139.SYS will auto-detect the line speed, 10 Mb or 100Mb, while the RTL8139.SYS is loading. The other values, "10" or "100", are only used when you want to forced RTL8139 PCI Fast Ethernet adapter to 10Mb or 100Mb.

7. The screen will appear "Input EthernetID" dialog box which is provided by RTL8139.SYS driver. This option is only required when you have more than one Realtek RTL8139 PCI Fast Ethernet adapters on this computer. Select "SKIP" if only one adapter is installed on this computer.

8. "Bus Location" display in next screen. Your machine contains more than one hardware bus, please select the Bus Type and Bus number on which your network adapter card is installed.

9. NT will then perform the binding process. If any additional network software options were installed, you may be prompted for specific information for these packages.

10. Restarting your system you will acquire network service.

NOTES:

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* Installing Multiple LAN Adapters:

Enter Windows NT and follow above setup procedure step 2,in the "Network Settings" dialog box, choose the "Configure.." button. The "Input Ethernet ID" dialog box appears and input adapter's Ethernet ID. Last step to select OK and close NETWORK SETUP. Select SKIP if only one adapter is installed on this computer.

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Installing USB 2.0 Driver in Windows 98/SE

This motherboard supports USB2.0. You can find this driver from the Bonus Pack CD auto-run menu.
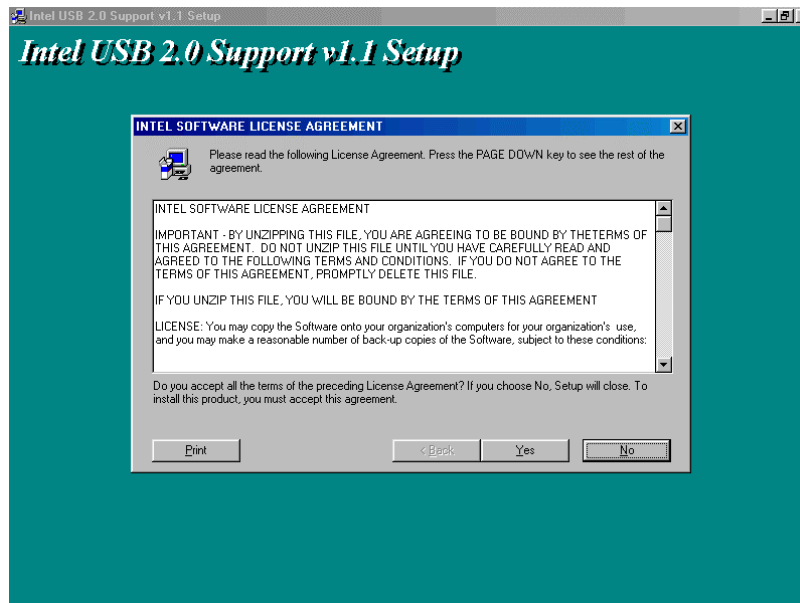
Windows 2000 Installation Guide

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Installing Drivers During Windows 2000 Installation
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The following details the installation of the USB 2.0 driver while installing Windows 2000 (with the USB 2.0 controller is enabled already).

1. After enabling the USB 2.0 controller, install Windows 2000 normally.
2. After installation, go the "Start" menu and choose "Settings."
3. From the "Settings" menu, choose "Control Panel."
4. In the "Control Panel" window, double-click on the "System" icon.
5. In the "System" window, choose the "Hardware" tab.
6. Press the "Device Manager..." button in the "Hardware" window.
7. In the hierarchical display under "Other Devices" is a listing for "Universal Serial Bus (USB) Controller". Choose it and then press the mouse right button and click "Properties".
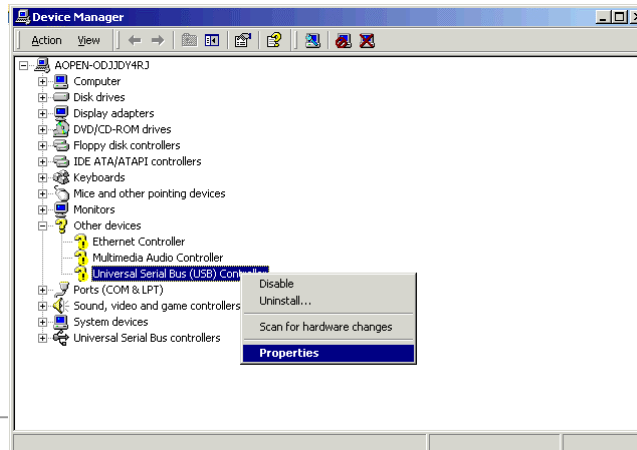
8. Choose the "Driver" tab in the "Properties" window, choose "Update Driver," and then press "Next."

9. Choose "Search for a suitable driver for my device (Recommended)". from the list, and then press "Enter".

10. Choose "Specify a location." and then press "Next"

11. Insert the Bonus CD in CD-ROM.

12. Type "[CD-ROM]:\Driver\Intel\USB2.0\Win2000" in the text box that appears. Press " OK ".
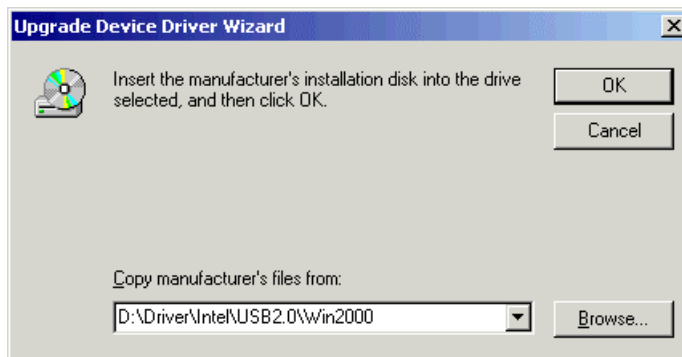
13. Click on "Next." A message informing you that Windows has found "Intel PCI to USB Enhanced Host Controller - ICH5" should appear.

14. Click on "Next," and then on "Finish."

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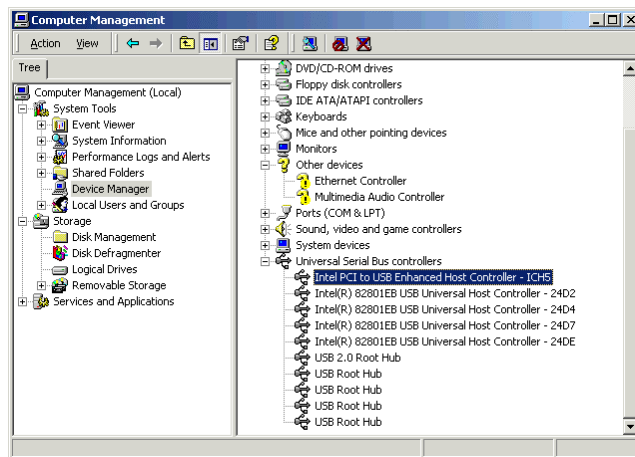
Installing Driver in Existing Windows 2000 System

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After enabling the USB 2.0 controller and rebooting your system, Windows 2000 setup will show a "New Hardware Found" dialog box. Under Windows 2000, "Universal Serial Bus (USB) Controller" will be displayed.

1. Choose "Search for a suitable driver for my device (Recommended)". from the list, and then press "Enter".
2. Choose "Specify a location." and then press "Next"
3. Insert the Bonus CD in CD-ROM.
4. Type "[CD-ROM]:\Driver\Intel\USB2.0\Win2000" in the text box that appears. Press " OK ".
5. Click on "Next." A message informing you that Windows has found "Intel PCI to USB Enhanced Host Controller - ICH5" should appear.
6. Click on "Next," and then on "Finish."

****

Confirming Windows 2000 Installation

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1. From Windows 2000, open the Control Panel from "My Computer" followed by the System icon.
2. Choose the "Hardware" tab, and then click the "Device Manager" tab.
3. Click the "+" in front of "Universal Serial Bus controllers". "Intel PCI to USB Enhanced Host Controller - ICH5" should appear.

Glossary

AC97 CODEC

Basically, AC97 CODEC is the standard structure of PCI sound card. As we know, computer is digital-based, but music is based on analog-based. Therefore, there must be a process to turn digital into analog during the last stage processing of sound in computer. Hence, the component on sound card that play this important task is what we called CODEC.

Audio CODEC 97 (briefly called AC97) is the specification regulated by Intel, and it's about the structure of audio conversion. The special place about CODEC is that it is separated from sound card (CODEC is an independent chipset). Therefore, PCI sound card could possess with 90db and do other application process as well. We called CODEC that meets this structure AC97 CODEC.

ACPI (Advanced Configuration & Power Interface)

ACPI is the power management specification of PC97 (1997). It intends to save more power by taking full control of power management to operating system and bypass BIOS. The chipset or super I/O chip needs to provide standard register interface to operating system (such as Windows 98). This is a bit similar as the PnP register interface. ACPI defines ATX momentary soft power switch to control the power state transition.

ACR (Advanced Communication Riser)

Building on the PC motherboard riser architecture, ACR slot is backward compatible with AMR but beyond the limitation of it. The ACR specification is designed to support modem, audio, Local Area Network (LAN) and Digital Subscriber Line (DSL).

AGP (Accelerated Graphic Port)

The main function of AGP simply put is to tell monitor what screen information had to be shown, a visual transmission device actually. With the rapid developing of AGP card, we can see that it had been developed from single colorful AGP card to 2D and 3D graphic. AGP supports only memory read/write operation and single-master single-slave one-to-one only. Though AGP and PCI share the same algorithm of 32-bit, its frequencies are 66MHz and 33MHz respectively.   AGP interface had been developed from 2X to 8x.

1X AGP, data transfer rate is 66MHz x 4byte x 1 = 264MB/s

2X AGP, data transfer rate is 66MHz x 4byte x 2 = 528MB/s

4X AGP, data transfer rate is 66MHz x 4byte x 4 = 1056MB/s.

8X AGP, data transfer rate is 66MHz x 4byte x 8 = 2112MB/s.

AMR (Audio/Modem Riser)

The CODEC circuit of AC97 sound/modem solution can be put on motherboard or put on a riser card (AMR card) that connects to motherboard through AMR connector.

ATA (AT Attachment)

Before talking about ATA (AT Attachment), we must understand **DMA** (Direct Memory Access), which allows devices to skip the CPU devices and access memory directly. DMA specification could not only eliminate the workload of CPU, but also accelerate the transmission of data. DMA begins with a data transfer rate of 16.6MB/Sec, but afterward developed to new data rate of 33.3MB/Sec, which is twice the data rate and we called it **Ultra DMA**.   **ATA** details power and data signals between the drive and integrated drive controller and the computer's motherboard. Two drives (master and slave) are supported. The ATA specification allows the drive to connect directly to the ISA bus on the computer. ATA transfer rate then had been developed to 133MHz/Sec and would come out with fastest rate later (please refer to Serial ATA).

DMA, data transfer rate is 16.6MHz/s

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Ultra DMA, data transfer rate is 16.6MHz x 2 = 33MB/s.

ATA/66, data transfer rate is 16.6MHz x 4 = 66MB/s.

ATA/100, data transfer rate is 16.6MHz x 6 = 100MB/s.

ATA/133, data transfer rate is 16.6MHz x 8 = 133MB/s.

(ATA/133 uses both rising edge and falling edge as ATA/66 but clock cycle time is reduced to 30ns.)

BIOS (Basic Input/Output System)

BIOS, is a set of assembly routine/program that reside in EPROM or Flash ROM. BIOS controls Input/output devices and other hardware devices of motherboard. In general, to provide hardware independent portability, operation system and drivers is required to access BIOS without directly access hardware devices.

Bluetooth

Bluetooth is a wireless transferring technology that enables short-range wireless connections between desktop and laptop computers, personal digital assistants (PDAs), cellular phones, printers, scanners, digital cameras and even home appliances. The principle of Bluetooth (a chipset) is to transfer information and voices at the frequency of ISM Band. Every Bluetooth technology devices do come with a standard address for you to connect one-to-one or one-to-seven (to form a Pico-net), with transferring range up to 10 meters (100 meters to follow), using low power radio. Bluetooth do not only possess high transfer rate of 1MB/s, it also could be encrypted with pin code. With hopping rate of 1600 hops per second, it's difficult to be intercepted and are less interrupted by electromagnetic wave.

CNR (Communication and Networking Riser)

The CNR specification provides the PC industry the opportunity to deliver a flexible and cost reduced method of implementing LAN, home networking, DSL, USB, wireless, audio and modem subsystems widely used in today's "connected PCs". The CNR specification is an open industry specification and is supported by OEMs, IHV card manufacturers, silicon supplier and Microsoft.

DDR (Double Data Rate) RAM

DDR RAM utilizes the existing SDRAM (For ex, PC-100, PC-133) infrastructure and technology while doubling the nominal bandwidth available to systems in an easy to design and simple to adopt way. Based on FSB frequency, DDR RAM on the market are DDR200, DDR266 and DDR333 with more coming around soon.
DDR200, transfer bandwidth up to 200x64/8=1600MB/s (PC1600)
DDR266, transfer bandwidth up to 266x64/8=2100MB/s (PC2100)
DDR333, transfer bandwidth up to 333x64/8=2700MB/s (PC2700)
DDR400, transfer bandwidth up to 400x64/8=3200MB/s (PC3200)

ECC (Error Checking and Correction)

The ECC mode needs 8 ECC bits for 64-bit data. Each time memory is accessed; ECC bits are updated and checked by a special algorithm. The ECC algorithm has the ability to detect double-bit error and automatically correct single-bit error while parity mode can only detect single-bit error.

EEPROM (Electronic Erasable Programmable ROM)

Also known as E^{2}PROM. Both EEPROM and Flash ROM can be re-programmed by electronic signals, but the interface technology is different. Size of EEPROM is much smaller than flash ROM.

EPROM (Erasable Programmable ROM)

Traditional motherboard stores BIOS code in EPROM. EPROM can only be erased by ultra-violet (UV) light. If BIOS has to be upgraded, you need to remove EPROM from motherboard, clear by UV light, re-program, and then insert back.

EV6 Bus

EV6 Bus is the technology of Alpha processor from Digital Equipment Corporation. EV6 bus uses both rising and falling clock edge to transfer data, similar as DDR RAM or ATA/66 IDE bus.
EV6 Bus Speed = CPU external bus clock x 2.
200 MHz EV6 bus, 200MHz = 100 MHz external bus clock x 2

FCC DoC (Declaration of Conformity)

The DoC is component certification standard of FCC EMI regulations. This standard allows DIY component (such as motherboard) to apply DoC label separately without a shielding of housing.

FC-PGA (Flip Chip-Pin Grid Array)

FC means Flip Chip, FC-PGA is a package of Intel for Pentium III for 0.18μm process CPU, which can be plugged into SKT370 socket.

FC-PGA2 (Flip Chip-Pin Grid Array)

After FC-PGA, FC-PGA2 is the package for 0.13μm process CPU developed by Intel, which can be plugged into SKT423/478 socket as well.

Flash ROM

Flash ROM can be re-programmed by electronic signals. It is easier for BIOS to upgrade by a flash utility, but it is also easier to be infected by virus. Because of increase of new functions, BIOS size is increased from 64KB to 512KB (4M bit).

Hyper Threading

Hyper-Threading technology is an innovative design from Intel that enables multi-threaded software applications to process threads in parallel within each processor resulting in increased utilization of processor execution resources. As a result, an average improvement of ~40% in CPU resource utilization yields higher processing throughput.

IEEE 1394

IEEE 1394, which also called Firewire, is a serial data transfer protocol and interconnection system. The main feature of the Firewire that assures its adoption for the digital video and audio (A/V) consumer application is its low cost. Fire wire interface is capable of supporting various high-end digital A/V applications, such as consumer A/V device control and signal routing, Digital Video (DV) editing, home networking, and more than 32 channels of digital mixing. Gone are those days of expensive video capture cards. Firewire allows for video capture from both newer DV camcorders with Firewire ports and older analog equipment using A/V to Firewire converters.

The advantages of the IEEE1394:

High data transfer rate – Start from 400 Mbps, (with 800/1600/3200 Mbps coming soon), which is about 30 times faster than USB 1.1.

Supports up to 63 devices (16 - daisy chained) with cable length up to about 4.5 m (14 feet).

Hot-pluggable (like USB). No need to turn of your device to connect or disconnect, and you don't need to reboot your PC. Also, it is a plug-and-play bus.

IEEE1394 is very easy to connect (Like USB1.1/2/0).

Parity Bit

The parity mode uses 1 parity bit for each byte, normally it is even parity mode, that is, each time the memory data is updated, parity bit will be adjusted to have even count "1" for each byte. When next time, if memory is read with odd number of "1", the parity error is occurred and this is called single bit error detection.

PCI (Peripheral Component Interface) Bus

Developed by Intel, Peripheral Component Interconnect (PCI) is a local bus standard. A bus is a channel used to transfer data to (input) and from (output) a computer and to or from a peripheral device. Most PCs have a PCI bus usually implemented at 32-bits providing a 33 MHz clock speed with a throughput rate of 133 MBps.

PDF Format

With PDF file, it is easy to do universal document exchange. Virtually any document may be converted in Portable Document Format (PDF). Contents in PDF documents are exactly the same as the original file, including fonts and graphics, and they can be distributed by e-mail or stored on the World Wide Web, an intranet, a file system, or a CD-ROM for other users to view on any platforms. You may download Acrobat Reader in order to read PDF file from its website (www.adobe.com).

PnP (Plug and Play)

Oversimplified, Plug-and-Play automatically tells the software (device drivers) where to find various pieces of hardware (devices) such as modems, network cards, sound cards, etc. Plug-and-Play's task is to match up physical devices with the software (device drivers) that operates them and to establish channels of communication between each physical device and its driver.

POST (Power-On Self Test)

The BIOS self-test procedure after power-on, sometimes, it is the first or the second screen shown on your monitor during system boot.

PSB (Processor System Bus) Clock

PSB Clock means the external bus clock of CPU.
CPU internal clock = CPU PSB Clock x CPU Clock Ratio

RDRAM (Rambus Dynamic Random Access Memory)

A DRAM technology developed by Rambus Corporation*, to achieve high speed of memory through the use of multiple channels in parallel by 16-bits. Basically, RDRAM uses new structure of Multibank, which is quite different from FPM, EDO, SDRAM. Using different memory module as well, RDRAM uses "RIMM" with transfer rate of 600/700/800MHz, providing bandwidth as high to 1.6GB.

RIMM (Rambus Inline Memory Module)

184-pin memory module that supports RDRAM memory technology. A RIMM memory module may contain up to maximum of 16 RDRAM devices.

SDRAM (Synchronous DRAM)

SDRAM is one of the DRAM technologies that allow DRAM to use the same clock as the CPU host bus (EDO and FPM are asynchronous and do not have clock signal). It is similar as PBSRAM to use burst mode transfer. SDRAM comes in 64-bit 168-pin DIMM and operates at 3.3V, and have been gradually replaced by DDR RAM.

SATA (Serial ATA)

The Serial ATA specification is designed to overcome speed limitations while enabling the storage interface to scale with the growing media rate demands of PC platforms. Serial ATA is to replace parallel ATA with the compatibility with existing operating systems and drivers, adding performance headroom for years to come. It is developed with data transfer rate of 150 Mbytes/second, and 300M/bs, 600M/bs to come. It reduces voltage and pins count requirements and can be implemented with thin and easy to route cables.

SMBus (System Management Bus)

SMBus is also called I^2C bus. It is a two-wire bus developed for component communication (especially for semiconductor IC). For example, set clock of clock generator for jumper-less motherboard. The data transfer rate of SMBus is only 100Kbit/s, it allows one host to communicate with CPU and many masters and slaves to send/receive message.

SPD (Serial Presence Detect)

SPD is a small ROM or EEPROM device resided on the DIMM or RIMM. SPD stores memory module information such as DRAM timing and chip parameters. SPD can be used by BIOS to decide best timing for this DIMM or RIMM.

USB 2.0 (Universal Serial Bus)

A Universal Serial Bus (USB) is an external bus (an interconnect) standard that supports data transfer rates of 12 Mbps. A single USB port can be used to connect up to 127 peripheral devices, such as mouse, modems and keyboards. Introduced in 1996, USB has completed replaced serial and parallel ports. It also supports plug-and-play installations and hot plugging Plug-and-play is the ability to add and remove devices to a computer while the computer is running and have the operating system automatically recognize the change. USB 2.0, which supports data transfer rates of 480 Mbps, has been widely used in motherboard these days.

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VCM (Virtual Channel Memory)

NEC's Virtual Channel Memory (VCM) is a new DRAM core architecture that dramatically improves the memory system's ability to service multimedia requirements. VCM increases memory bus efficiency and performance of any DRAM technology by providing a set of fast static registers between the memory core and I/O pins. Using VCM technology results in reduced data access latency and reduced power consumption.

Wireless LAN – 802.11b

802.11 is a specification developed by IEEE and Wireless LAN technology, which is an interface between a wireless client and a base station or between two wireless clients.

802.11 families include the following specifications and with more coming:

802.11 = 1 or 2 Mbps transmission in the 2.4 GHz band, using either frequency hopping spread spectrum (FHSS) or direct sequence spread spectrum (DSSS)).

802.11a = 54 Mbps in the 5GHz band, using orthogonal frequency division multiplexing)

802.11b (11 Mbps transmission in the 2.4 GHz band, using direct sequence spread spectrum (DSSS).

ZIP file

A compressed file format to reduce file size. To unzip file, run shareware PKUNZIP (http://www.pkware.com/) for DOS and other operating system or WINZIP (http://www.winzip.com/) for windows environment.

Troubleshooting

If you encounter any trouble to boot you system, follow the procedures accordingly to resolve the problem.

```
                              ┌─────────────┐
                              │    Start    │
                              └─────────────┘
                                     │
                                     ▼
     ┌──────────────────────────────────────────────────────────────────┐
     │  Turn off the power and unplug the AC power cable, then remove all │
     │  of the add-on cards and cables, including VGA, IDE, FDD, COM1,    │
     │  COM2 and printer.                                                 │
     └──────────────────────────────────────────────────────────────────┘
                                     │
                                     ▼
          ┌───────────────────────────────────────────────────┐
          │     Make sure if all jumper settings are correct.   │
          └───────────────────────────────────────────────────┘
                                     │
                                     ▼
          ┌───────────────────────────────────────────────────┐
          │    Clear CMOS, then plug the ATX power cord correctly│
          │    (For P4 system, please also plug the 4pin(+12V) cord)│
          └───────────────────────────────────────────────────┘
                                     │
                                     ▼
                              ┌─────────────┐
                              │    Next     │
                              └─────────────┘
```

```
                              ┌─────────────────┐
                              │    Continue     │
                              └────────┬────────┘
                                       │
                                       ▼
        ┌──────────────────────────────────────────────────────────┐
        │  Install the VGA card. Then connect your monitor and      │
        │  keyboard.                                                 │
        └──────────────────────────┬───────────────────────────────┘
                                    │
                                    ▼
                          ╱─────────────────╲
                         ╱   Turn on the     ╲
   Yes                  ╱      power          ╲                No
  ◀────────────────────   and check if the power  ───────────────────▶
                         ╲  supply and CPU fan    ╱
                          ╲   work properly.     ╱
                           ╲──────────────────╱
                                                             │
                                                             ▼
                                          ┌──────────────────────────────┐
                                          │ The problem is probably caused│
    ┌─────────────────┐                   │ by power supply or motherboard│
    │      Next       │                   │ failure. Please contact your  │
    └─────────────────┘                   │ reseller or local distributor │
                                          │ for repairing.                │
                                          └──────────────────────────────┘
```

AOpen

```
                              ╭──────────────╮
                              │   Continue    │
                              ╰──────┬───────╯
                                     │
                                     ▼
                          ◇─────────────────────◇          No        ┌──────────────────────────┐
                          │ Check if there is display? │──────────────▶│ Perhaps your VGA card    │
                          ◇─────────────────────◇                      │ or monitor is defective. │
                                     │ Yes                             └──────────────────────────┘
                                     ▼
        ┌─────────────────────────────────────────────────────┐
        │ Press <Ctrl> and <Alt> key at the same time, hold them │
        │    and then press <Del> to reboot the system.         │
        └─────────────────────────────────────────────────────┘
                                     │
                                     ▼
                          ◇─────────────────────◇          No        ┌──────────────────────────┐
                          │  Check if the system  │──────────────▶│ It is very possible that your │
                          │       reboots?        │                 │ keyboard is defective.       │
                          ◇─────────────────────◇                   └──────────────────────────┘
                                     │ Yes
                                     ▼
                              ╭──────────────╮
                              │     Next      │
                              ╰──────────────╯
```

AOpen

```
                              ┌──────────────┐
                              │   Continue   │
                              └──────┬───────┘
                                     │
                                     ▼
        ┌────────────────────────────────────────────────────┐
        │  During system rebooting, press <Del> to enter BIOS setup. │
        │          Choose "Load Setup Default".              │
        └────────────────────────────┬───────────────────────┘
                                     │
                                     ▼
        ┌────────────────────────────────────────────────────┐
        │      Turn off the system and re-connect IDE cable. │
        └────────────────────────────┬───────────────────────┘
                                     │
                                     ▼
```

Check if the system can reboot successfully?

No → The problem should be caused by the IDE cable or HDD itself.

Yes

Re-install the operating system such as Windows XP.

End

✚ Technical Support

Dear Customer,

Thanks for choosing AOpen products. To provide the best and fastest service to our customer is our first priority. However, we receive numerous emails and phone-calls worldwide everyday, it is very hard for us to serve everyone on time. We recommend you follow the procedures below and seek help before contact us. With your help, we can then continue to provide the best quality service to more customers.

Thanks very much for your understanding!

AOpen Technical Supporting Team

1

Online Manual: To download manual, please log on and then select your preferred language. Under "Type" directory, choose "Manuals" to go to our manual database. You can also find the manual and EIG in AOpen Bonus Pack.
http://download.aopen.com.tw/downloads

2

Test Report: We recommend you to choose board/card/device from the compatibility test reports for assembling your PC. It may prevent incompatibility problems.
http://english.aopen.com.tw/tech/report/default.htm

3

FAQ: Here we list problems that users often encounter and FAQ (Frequently Asked Questions). You may select your preferred language after log on and find a solution to your problem.
http://club.aopen.com.tw/faq/

4

Download Software: After log on and having language selected, you may get the latest updated BIOS/utility and drivers you need under "Type" directory. In most case, newer versions of drivers and BIOS have solved earlier bugs or compatibility problems.
http://download.aopen.com.tw/downloads

5

eForum: We welcome you to join AOpen eForum to discuss our products with other users. Your problem probably had been discussed before or will be answered by other power users here.
http://club.aopen.com.tw/forum/

6

Contact Distributors/Resellers: We sell our products through resellers and integrators. They should know your system configuration very well and should be able to solve your problem efficiently and provide important reference for you.

7

Contact Us: Please prepare detail system configuration and error symptom before contacting us. The **part number**, **serial number** and **BIOS version** are also very helpful.

Part Number and Serial Number

The Part Number and Serial number are printed on bar code label. You can find this bar code label on the outside packing, or on component side of PCB. For example:

P/N:91.88110.201   S/N:91949378KN73

Part No.

Serial No.

9188110201 91949378KN73

P/N: 91.88110.201 is part number, **S/N: 91949378KN73** is serial number.

Model name and BIOS version

Model name and BIOS version can be found on upper left corner of first boot screen (POST screen). For example:

AX4SG-GN R1.00 Jun. 1. 2003 AOpen Inc.

Phoenix-Award Plug and Play BIOS Extension v1.0A

Copyright © 2003, Award Software, Inc.

AX4SG-GN is model name of motherboard, **R1.00** is BIOS version.

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Thank you for choosing AOpen product. AOpen encourages you to spend few minutes in completing the following product registration. To register your product will ensure the high quality of services from AOpen. After the registration, you will:

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- Receive email notification about product safety alerts. Its purpose is to alert consumers quickly and conveniently when products contain technical issues.

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- Receive e-mail notification about latest BIOS/Driver/Software release information.

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