AK75 Pro
Online Manual

DOC. NO.: AK75P-OL-E0202A

AOpen

Overview

Hardware Installation

Drivers & Utilities

AWARD BIOS Setup

Glossary

Troubleshooting & Technical Support

What's in this manual

AOpen

AOpen

You Must Notice

Adobe, the Adobe logo, Acrobat is trademarks of Adobe Systems Incorporated.

AMD, the AMD logo, Athlon and Duron are trademarks of Advanced Micro Devices, Inc.

Intel, the Intel logo, Intel Celeron, Pentium II, Pentium III are trademarks of Intel Corporation.

Microsoft, Windows, and Windows logo are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

All product and brand names used on this manual are used for identification purposes only and may be the registered trademarks of their respective owners.

All of the specifications and information contained in this manual are subject to change without notice. AOpen reserves the right to revise this publication and to make reasonable changes. AOpen assumes no responsibility for any errors or inaccuracies that may appear in this manual, including the products and software described in it.

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 4.0 for online viewing, it is included in Bonus CD disc 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 AK75 Pro motherboard. The AK75 Pro is AMD® Socket 462 motherboard (M/B) based on the ATX form factor featuring the SIS 745 chipset. As high performance chipset built in the M/B, the AK75 Pro motherboard can support AMD® Socket 462 series Athlon™ XP & Athlon™ & Duron™ processor with 200/266MHz EV6 system bus. In the AGP performance, it has one AGP slot and supports AGP 1X/2X/4X mode and pipelined spilt-transaction long burst transfer up to 1056MB/sec. With high bandwidth 200/266MB/s 8-bit Multi-threaded I/O Link Host Controller, DDR266(PC2100) and DDR333(PC2700) DDR SDRAM can be applied to the AK75 Pro and the maximum memory size can be up to 3GB. The onboard IDE controller supports Ultra DMA 33/66/100 mode and the transfer rate up to 100MB/s. Further flexibility can be achieved by taking advantage of the Communication and Network Riser (CNR) card option that allows audio, modem, and/or LAN configuration on a single baseboard design. Besides, the AK75 Pro has an AC97 CODEC chipset onboard providing high performance and magic surround stereo sound to let people enjoy working with it. More than that, this motherboard has an IEEE 1394a controller and three IEEE 1394 connectors onboard, which provides data transfer rate up to 400Mb/s. Now, let's enjoy all features from AOpen AK75 Pro motherboard.
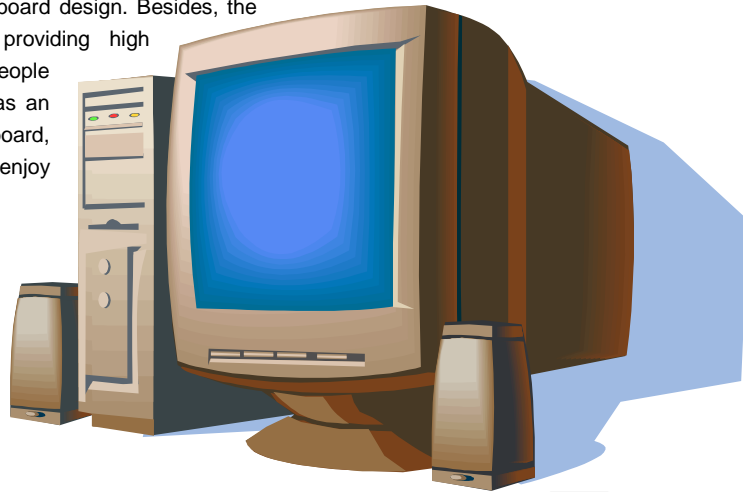
Feature Highlight

CPU

Supports AMD® Socket 462 series CPU with both 200MHz and 266MHz EV6 Bus designed for Socket 462 technology.

Athlon: 600MHz~1.4GHz

Duron: 600MHz~1.2GHz

AthlonXP: 1500+(1.3GHz)~2000+(1.667GHz)

Chipset

The motherboard is equipped with SIS 745 chipset. SIS 745 chipset consists of host interface Controller and integrated high performance DDR SDRAM Host system controller, which provide Dedicated High-Speed Data Paths connecting North-Bridge and Each South-Bridge Masters Including IDE, USB, Audio, and Modem Controllers, which can strongly enhance the system performance.

Expansion Slots

Including six 32-bit/33MHz PCI, one CNR and one AGP 1x/2x/4X slots. The PCI local bus throughput can be up to 132MB/s. The Communication & Nectworking Riser (CNR) slot provided from AK75 Pro can support CNR interface for a Modem/Audio 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 1056MB/s. AK75 Pro motherboard includes one AGP expansion slot for a bus mastering AGP graphic card. For AD and SBA signaling, AK75 Pro motherboard can support 1X/2X/4X mode. Of six PCI slots provided, AK75 Pro supports all six master PCI slots with arbitration and decoding for all integrated functions and LPC bus.

Memory

With SIS 745 chipset, the AK75 Pro can support Double-Data-Rate (DDR) SDRAM. The DDR SDRAM interface allows zero wait state bursting between the SDRAM and the data buffers at 33/66/100MHz. The six banks of DDR SDRAM can be composed of an arbitrary mixture of 16M/64M/128M/256M/512Mx1GB DDR SDRAM and maximum up to 3 GB.

Ultra DMA 33/66/100 Bus Master IDE

Comes with an on-board PCI Bus Master IDE controller with two connectors that supports 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.

On-board AC'97 Sound

AK75 Pro uses the onboard AC'97 CODEC sound chip. This on-board audio includes a complete audio recording and playback system.

S/PDIF Connectors

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

Six USB Connectors

Provides three ports, six USB connectors for USB interface devices, such as mouse, keyboard, modem, scanner, etc.

AOpen

Die-Hard BIOS with external controller (Upgrade Optional)

The Die-Hard BIOS technology is an effective hardware protection method without any software or BIOS coding involved. Therefore, it is 100% virus free.

Dr. LED (Upgrade Optional)

The Dr. LED has 8 LED lights on this motherboard to easily show the problems you may encounter.

1MHz Stepping Frequency Adjustment

Provides "1MHz Stepping Frequency Adjustment" function in the BIOS. This magic function allows you adjust CPU FSB frequency from 100~200 by 1MHz stepping, and lets your system can get maximum performance.

Dr. Voice

The Dr. Voice provides 4 language versions (English, Chinese, Japanese and German) that can easily tell you the problem you may encounter.

IEEE 1394a Connector

This motherboard has an IEEE 1394a controller and three IEEE 1394 connectors onboard. The IEEE 1394a provides data transfer rate up to 400Mb/s, while USB is just 12Mb/s. Hence, the IEEE 1394 interface can connect with the devices that needs high data transferring performance, such as digital camera, scanner or others IEEE 1394a devices. Please use the proper cable to connect to devices.

Watch Dog Timer

Includes AOpen "Watch Dog Timer" function that can auto-reset default setting in 4.8 seconds when you fail to system overclocking.

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 series compatibility, and supports Soft-Off, STR (Suspend to RAM, S3), STD (Suspend to Disk, S4) features.

Super Multi-I/O

Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities. UART can also be directed from COM1 to the Infrared Module for the wireless connections.

AOpen

Quick Installation Procedure

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

1. Installing CPU and Fan
2. Installing System Memory (DIMM)
3. Connecting Front Panel Cable
4. Connecting IDE and Floppy Cable
5. Connecting ATX Power Cable
6. Connecting Back Panel Cable
7. Power-on and Load BIOS Setup Default
8. Setting CPU Frequency
9. Reboot
10. Installing Operating System (such as Windows 98)
11. Installing Driver and Utility

Motherboard Map

Front Audio Connector

CD-IN

AC'97 CODEC

S/PDIF Connector

MODEM-CN

AUX-IN

32-bit PCI Expansion Slot x6

CNR Expansion Slot

WOL (Wake on LAN) Connector

WOM (Wake on Modem) Connector

IrDA Connector

supports 2nd & 3rd USB Connector

IEEE 1394a Connector

rd BIOS with 100% Virus Protection (Upgrade Optional)

JP14 CMOS Clear Jumper

30 Die Hard BIOS Select Jumper

Case Open Connector

2Mbit Programmable Flash ROM

JP1 Jumper (Buzzer)

Front Panel Connector

ATA/33/66/100 IDE Connector x2

LED Connector (Upgrade Optional)

FAN3 Connector

JP15 & 16 Dr. Voice Language Select Jumper

JP2 Jumper (speaker)

PC99 Colored Back Panel

Resettable Fuse

JP28 Wakeup on Keyboard/Mouse

ATX Power Connector

FAN2 Connector

2200 μ F Low ESR Capacitors

AGP 4x Expansion Slot

462-pin CPU Socket with Voltage and Frequency Auto-Detection that supports AMD Athlon^{TM} / Duron^{TM} / and Athlon^{TM}XP

SW1 CPU Ratio Select Switch

SIS 745 Chipset

CPU FAN connector

184-pin DIMM supports DDR SDRAM

DDR333 (DIMMx2 Max. to 2GB)

DDR266 (DIMMx3 Max. to 3GB)

JP21 FSB Select Jumper

FDD Connector

Block Diagram

DDR333 (DIMMx2,
Max. to 2GB)

DDR266 (DIMMx3,
Max. to 3GB)

32-bit PCI Slot x6

DIMM Socket x3

Socket 462
AMD
AthlonXP/Athlon/Duron
CPU

200/266MHz
System Bus

PCI Bus

ATA
33/66100

SIS 745

Primary
Channel

Secondary
Channel

IDE Drive x4

AGP 1X/2X/4X Slot

2Mbit
Flash EEPROM

RealTek
ALC202A
AC97
CODEC

1st USB Port

1st IEEE 1394a

PHY

2nd USB Port

2nd IEEE 1394a

3rd IEEE 1394a

3rd USB Port

Winbond
W83697

AC Link

CNR Slot

IEEE 1394a

Connector x3

USB
Connector x6

Parallel Port

Serial Port x2

Floppy Disk Drive x2

AOpen

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.*

AOpen

About "Optional" and "Upgrade Optional"…

When you read this online manual and start to assemble your computer system, you may find some of functions are called "Optional", and some are called "Upgrade Optional". Though all AOpen motherboards include many amazing and powerful features, in some situations, these powerful features are not used to every user. Hence, we changed some key features as "Optional" for you to choose. Some optional functions that can be upgraded by users, we call them "Upgrade Optional". As for those optional functions that can't be upgraded by ourselves, we call them "Optional". If needed, you can contact our local distributors or resellers for purchasing "Upgrade Optional" components, and again you can visit AOpen official web site: www.aopen.com for more detail information.

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 pin 1 & pin 2.

5.   Connect ATX power cable back to connector PWR2.

Pin 1

1 Normal Operation
(default)
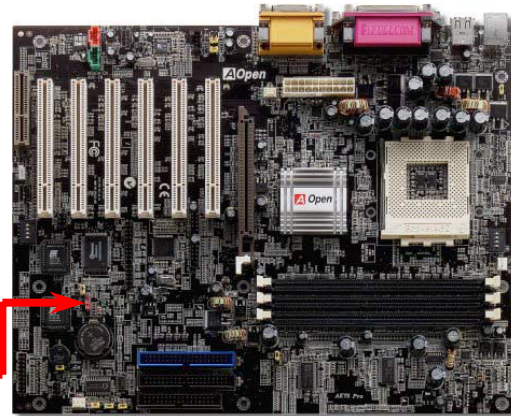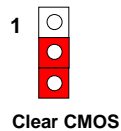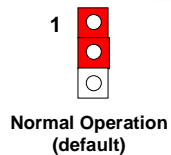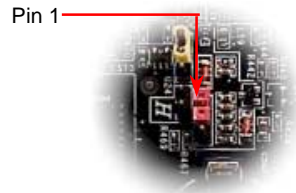
1 Clear CMOS

Tip: When should I Clear CMOS?

1. Boot fail because of overclocking…

2. Forget password…

3. Troubleshooting…

CPU Installation

This motherboard supports AMD® Athlon and Duron Socket 462 series CPU. 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 a black dot or cut edge 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
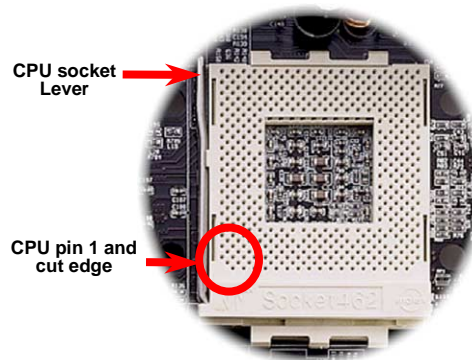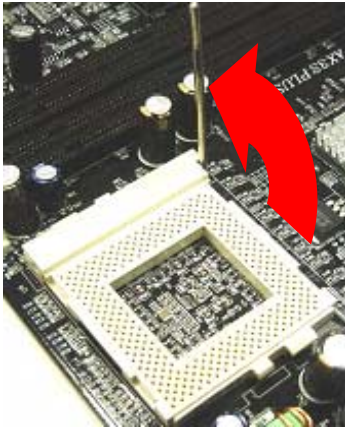
Black dot and cut edge
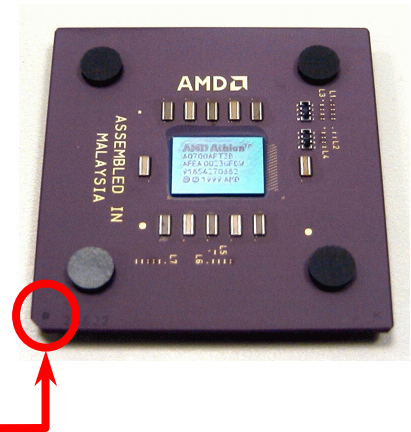
Note: These pictures are for example only, it may not exactly be the same motherboard.

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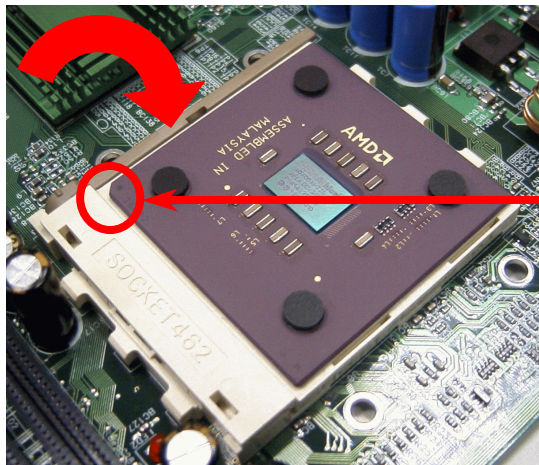
CPU cut edge

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

Note: This picture is for example only, it may not exactly be the same motherboard.

JP21 FSB/PCI Clock Ratio

This jumper is used to specify FSB clock. Generally speaking, if you are not overclockers, we recommend you to set it to the default setting. Additionally, this motherboard also provides "**1MHz Stepping Adjustment**" feature for overclockers to adjust CPU FSB frequency via BIOS setup program. Based on the CPU type, the adjustment range has two levels: 100~123 (FSB=100, such as Athlon 800), 124~200 (FSB=133, such as Athlon 1000) MHz for your choosing. You may also choose a specific FSB frequency ranging from 100~124 (say, 105, 110, 115 for example) and 133~166 with reference to a frequency table in BIOS setup program. If you fix the CPU FSB frequency by JP21, the "1MHz Stepping Adjustment" range will be changed and following your JP21 setting. To adjust CPU clock ratio, you may just adjust the select switch as table shows.

SW1 CPU Ratio Select Switch
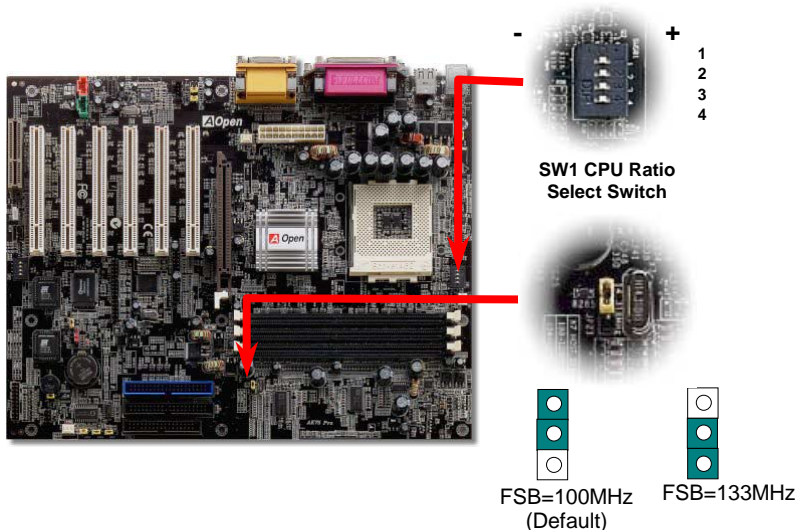
CPU Ratio	SW1-1	SW1-2	SW1-3	SW1-4
5	−	−	+	−
5.5	+	−	+	−
6	−	+	+	−
6.5	+	+	+	−
7	−	−	−	+
7.5	+	−	−	+
8	−	+	−	+
8.5	+	+	−	+
9	−	−	+	+
9.5	+	−	+	+
10	−	+	+	+
10.5	+	+	+	+
11	−	−	−	−
11.5	+	−	−	−
12	−	+	−	−
12.5	+	+	−	−
CPU Default	0	0	0	0

FSB=100MHz (Default)   FSB=133MHz

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.

(Automatically generates CPU voltage)

.
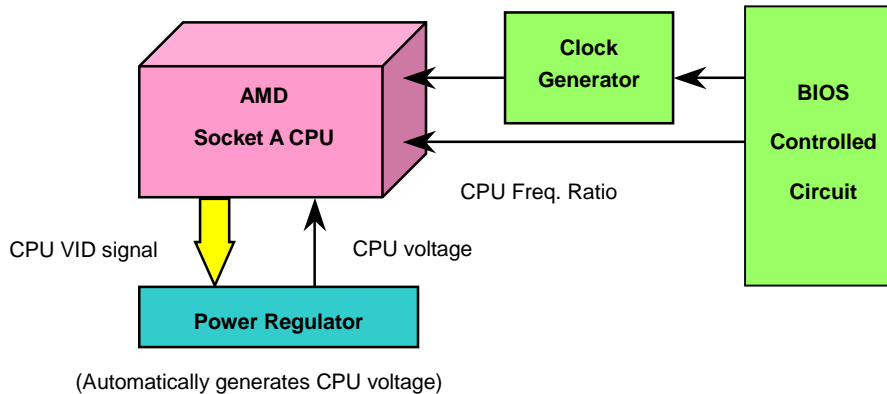
Setting CPU Core Voltage

This motherboard supports CPU VID function. The CPU core voltage will be automatically detected.

Setting CPU Frequency

BIOS Setup > Frequency/Voltage Control > CPU Clock Setting

This motherboard is CPU jumper-less design, you can set CPU frequency through the BIOS setup, and no jumpers or switches are needed.

*Core Frequency = CPU FSB Clock * CPU Ratio*

PCI Clock = CPU FSB Clock / Clock Ratio

AGP Clock = PCI Clock x 2

CPU Ratio	From 5.0x to 12.5x step 0.5x
CPU FSB (By BIOS table)	100, 103, 107, 110, 112, 124, 133, 137, 143, 147, and 166MHz.
CPU FSB (By manual Adjustment)	FSB=100, 100~123 by 1MHz stepping adjustment technology FSB=133, 124~200 by 1MHz stepping adjustment technology

AOpen

CPU	CPU Core Frequency	EV6 Bus Clock	Ratio
Athlon 1G	1GHz	200MHz	10.0x
Athlon 1.1G	1.1GHz	200MHz	11.0x
Athlon 1.2G	1.2GHz	200MHz	12.0x
Athlon 1.3G	1.3GHz	200MHz	13.0x
Athlon 1G	1GHz	266MHz	7.5x
Athlon 1.13G	1.13GHz	266MHz	8.5x
Athlon 1.2G	1.2GHz	266MHz	9.0x
Athlon 1.33G	1.33GHz	266MHz	10.0x
Athlon 1.4G	1.4GHz	266MHz	10.5x
AthlonXP 1500+	1.3GHz	266MHz	10.0x
AthlonXP 1600+	1.4GHz	266MHz	10.5x
AthlonXP 1700+	1.46GHz	266MHz	11.0x
AthlonXP 1800+	1.53GHz	266MHz	11.5x
AthlonXP 1900+	1.6GHz	266MHz	12.0x
AthlonXP 2000+	2GHz	266MHz	12.5x
Duron 800	800MHz	200MHz	8.0x
Duron 850	850MHz	200MHz	8.5x
Duron 900	900MHz	200MHz	9.0x
Duron 950	950MHz	200MHz	9.5x
Duron 1G	1GHz	200MHz	10.0x
Duron 1.1G	1.1GHz	200MHz	11.0x

Warning: SIS 745 Chipset supports maximum 266MHz (EV6) system bus and 66MHz AGP clock; higher clock setting may cause serious system damage.

AOpen

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

Plug in the CPU fan cable to the 3-pin **CPU FAN** connector. If you have chassis fan, you can also plug it on **System FAN** (FAN2) or **AUX FAN** (FAN3) connector.

FAN2 Connector

GND
+12V
SENSOR

CPU Fan Connector

GND
+12V
SENSOR
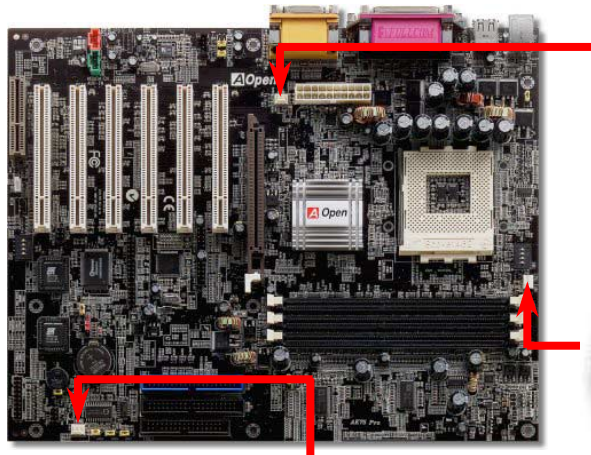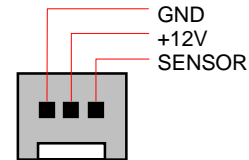
GND
+12V
SENSOR
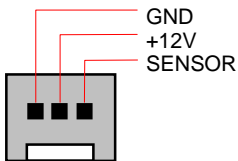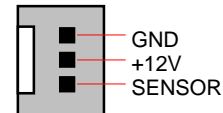
FAN3 Connector

Note: Some CPU fans do not have sensor pin, so that cannot support hardware monitoring function.

JP28 Keyboard/Mouse Wake-up Enable/Disable Jumper

This motherboard provides 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.
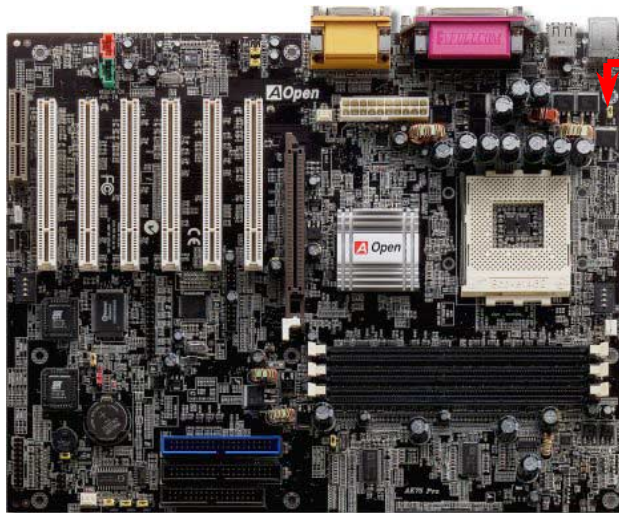
JP28

KB/Mouse Wake-up

Pin 1

Disable

(Default)

Enable

AOpen

DIMM Sockets

This motherboard has three 184-pin DDR DIMM sockets that allow you to install PC2100 (DIMMx3, Max. to 3GB) or PC2700   (DIMMx2, Max. to 2GB). Both ECC and Non-ECC DDR SDRAM are supported, but you can't install them both on DIMM. Otherwise, it will cause serious damage on memory sockets or SDRAM module.
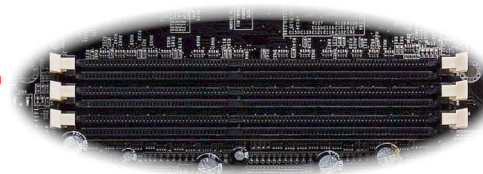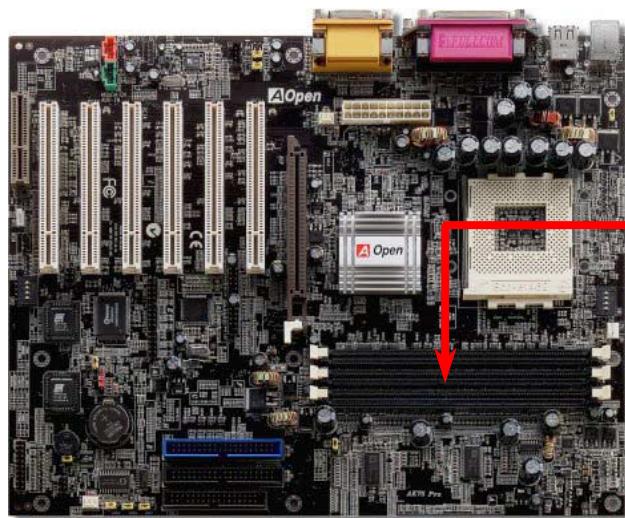
DIMM1
DIMM2
DIMM3

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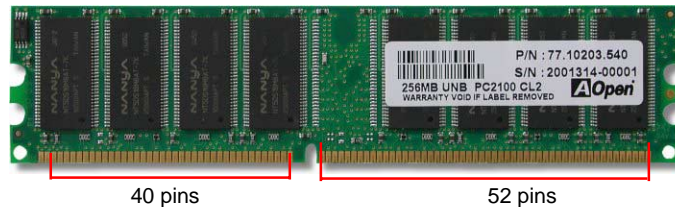
2. Insert the module straight down to the DIMM slot with both hands and press down firmly until the DIMM module is securely in place.

Tab ———→

Note: The tabs of the DIMM slot will close-up to hold the DIMM in place when the DIMM touches the slot's bottom.
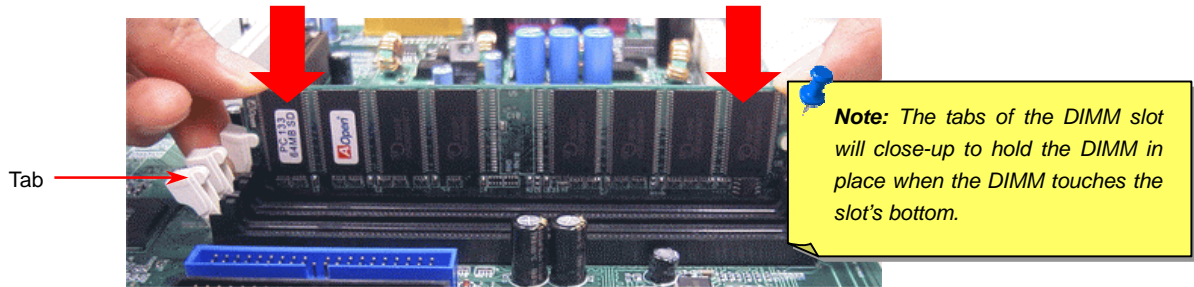
3. Repeat step 2 to finish additional DIMM modules installation.

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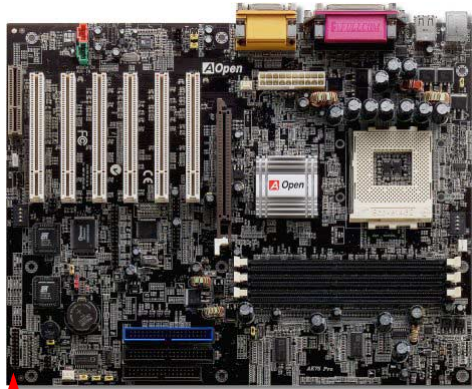
Attach the power LED, Keylock, speaker, power and reset switch connectors to the corresponding pins. If you enable "Suspend Mode" item in BIOS Setup, the ACPI & Power LED will keep flashing while the system is in suspend mode.

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 (S2) or Suspend to RAM (S3)	Flashing for every second
Suspend to Disk (S4)	The LED will be turned off

Pin 1

1

SPWR

IDE LED

ACPI & PWR LED

Speaker

Reset

1

NC		SPWR
NC		GND
+5V		ACPI LED-
IDE LED		GND
IDE LED		ACPILED
+5V		NC
+5V		NC
GND		GND
NC		RESET
SPEAKER		GND
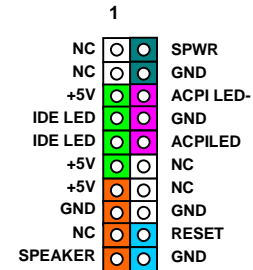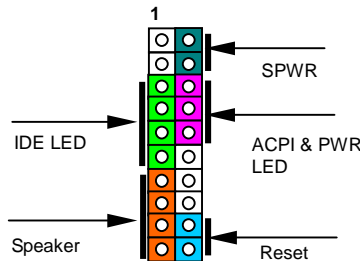
ATX Power Connector

This motherboard comes with a 20-pin ATX power connector as shown below. Make sure you plug in the right direction.


```
COM ──────────────                    ────────────── COM
COM ──────────────                    ────────────── PS-ON
-5V ──────────────                    ────────────── COM
+5V ──────────────                    ────────────── -12V
+5V ──────────────                    ────────────── +3.3V

+12V ─────────────                    ────────────── +3.3V
5VSB ─────────────                    ────────────── +3.3V
PO-OK ────────────                    ────────────── COM
COM ──────────────                    ────────────── +5V
+5V ──────────────                    ────────────── COM
```
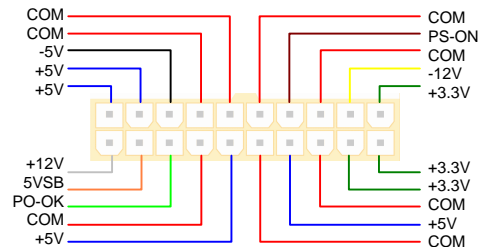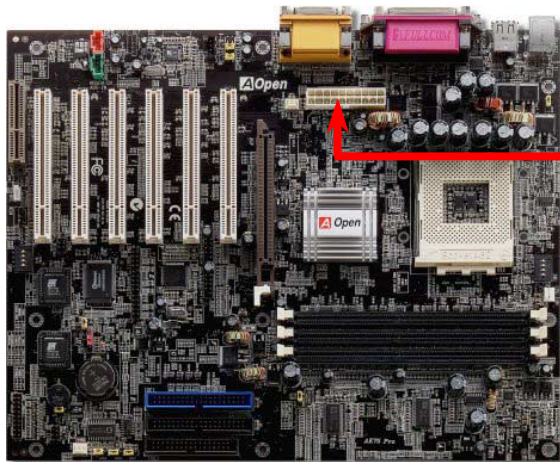
AC Power Auto Recovery

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 FDC and IDE connector. The blue connector is IDE1 for clear identification. Be careful of the pin1 orientation. Wrong orientation may cause system damage.

Primary Slave (2nd)

Primary Master (1st)

IDE 1 (Primary)

IDE 2 (Secondary)

Pin 1

Secondary Slave (4th)

Secondary Master (3rd)

ATA 33/66/100
IDE Connector

FDD Connector

Pin 1
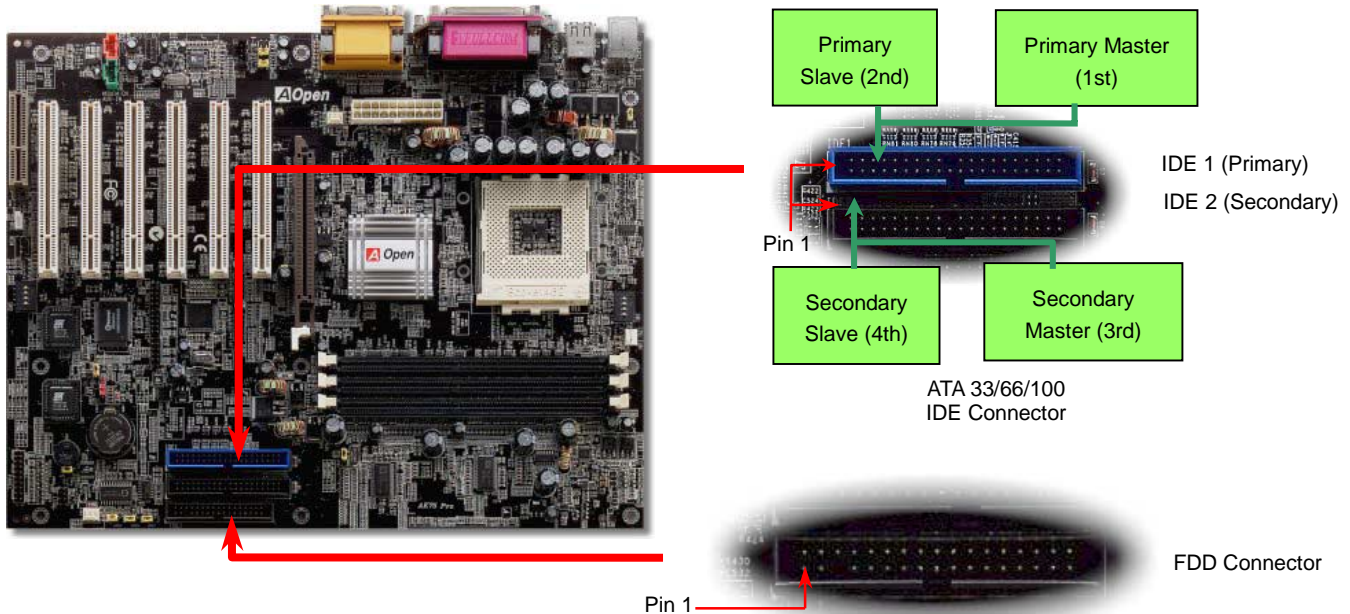
IDE1 is also known as the primary channel and IDE2 as the secondary channel. Each channel supports two IDE devices that make a total of four devices. In order to work together, the two devices on each channel must be set differently to **Master** and **Slave** mode. Either one can be the hard disk or 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.

This motherboard supports ATA33, ATA66 or ATA100 IDE devices. Following table lists the transfer rate of IDE PIO and DMA modes. The IDE bus is 16-bit, which means every transfer is two bytes.

Mode	Clock Period	Clock Count	Cycle Time	Data Transfer Rate
PIO mode 0	30ns	20	600ns	(1/600ns) x 2byte = 3.3MB/s
PIO mode 1	30ns	13	383ns	(1/383ns) x 2byte = 5.2MB/s
PIO mode 2	30ns	8	240ns	(1/240ns) x 2byte = 8.3MB/s
PIO mode 3	30ns	6	180ns	(1/180ns) x 2byte = 11.1MB/s
PIO mode 4	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
DMA mode 0	30ns	16	480ns	(1/480ns) x 2byte = 4.16MB/s
DMA mode 1	30ns	5	150ns	(1/150ns) x 2byte = 13.3MB/s
DMA mode 2	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
UDMA 33	30ns	4	120ns	(1/120ns) x 2byte x2 = 33MB/s
UDMA 66	30ns	2	60ns	(1/60ns) x 2byte x2 = 66MB/s
UDMA100	20ns	2	40ns	(1/40ns) x 2byte x2 = 100MB/s

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

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.*

S/PDIF (Sony/Philips Digital Interface) Connector

S/PDIF (Sony/Philips Digital Interface) is a newest audio transfer file format, which provides impressive quality through optical fiber and allows you to enjoy digital audio instead of analog audio. 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 better audio quality. Through a specific audio cable, you can connect the S/PDIF connector to other end of the S/PDIF audio module, which bears S/PDIF digital output. However, you must have a S/PDIF supported speaker with S/PDIF digital input to connect to the S/PDIF digital output to make the most out of this function.

Connecting to
RCA Cable

Audio cable

Connecting to
Optical Cable

Pin 1

S/PDIF Connector

S/PDIF Module
(Optional)

1 +5VSB
   NC
   S/PDIFOUT
   GND
   S/PDIFIN
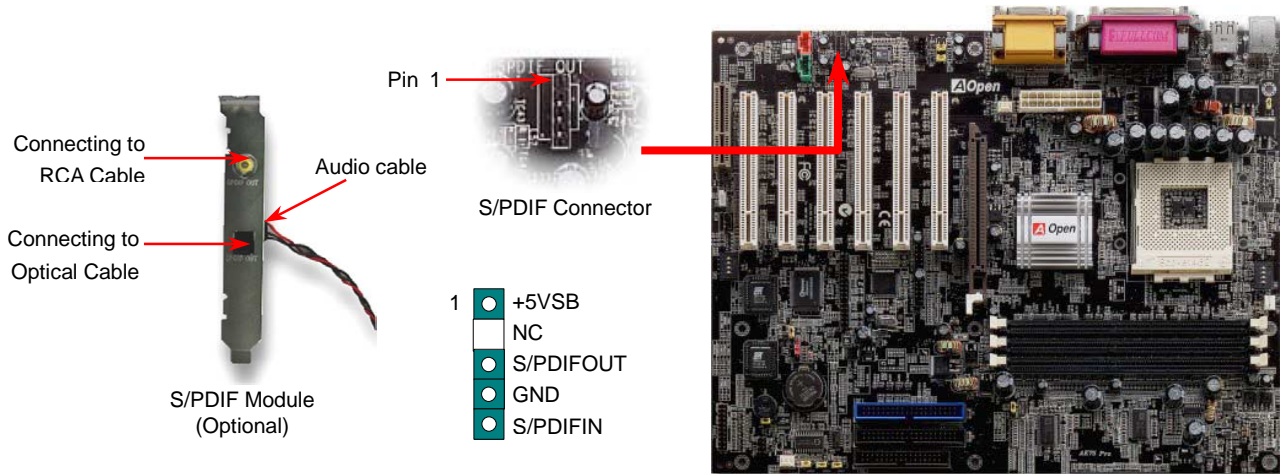
IrDA Connector

The IrDA connector can be configured to support wireless infrared module, with this module and application software such as Laplink or Windows 95 Direct Cable Connection, the 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, make sure to have the correct orientation when you plug in the IrDA connector.

Pin 1

1

NC	KEY
+5V	GND
IR_TX	IR_RX

IrDA Connector
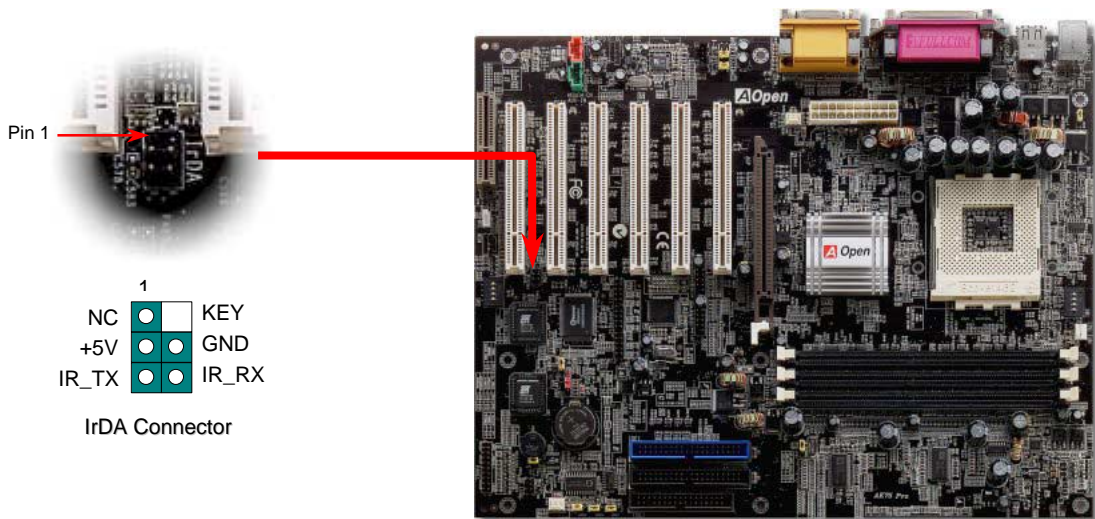
AGP (Accelerated Graphic Port) Expansion Slot

The AK75 Pro provides an AGP 1x/2x/4x slot. The AGP 4x is a bus interface targeted for high-performance 3D graphics. AGP supports only memory read/write operation and single-master single-slave one-to-one only. AGP uses both rising and falling edge of the 66MHz clock, for 2X AGP, the data transfer rate is 66MHz x 4bytes x 2 = 528MB/s. AGP is now moving to AGP 4x mode, 66MHz x 4bytes x 4 = 1056MB/s.
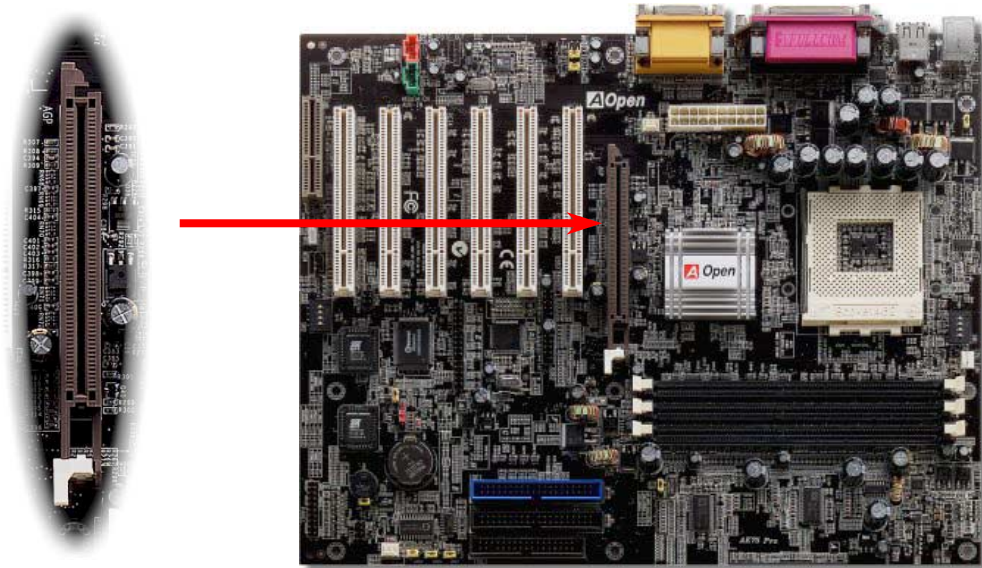
WOM (Zero Voltage Wake on Modem) Connector

This motherboard implements special circuit to support Wake On Modem, both Internal modem card and external box modem are supported. Since Internal modem card consumes no power when system power is off, it is recommended to use an internal modem. To use internal modem, connect 4-pin cable from RING connector of modem card to the WOM connector on the motherboard.

Pin 1 ——

WOM Connector

1
+5VSB
NC
RI-
GND

WOM Connector
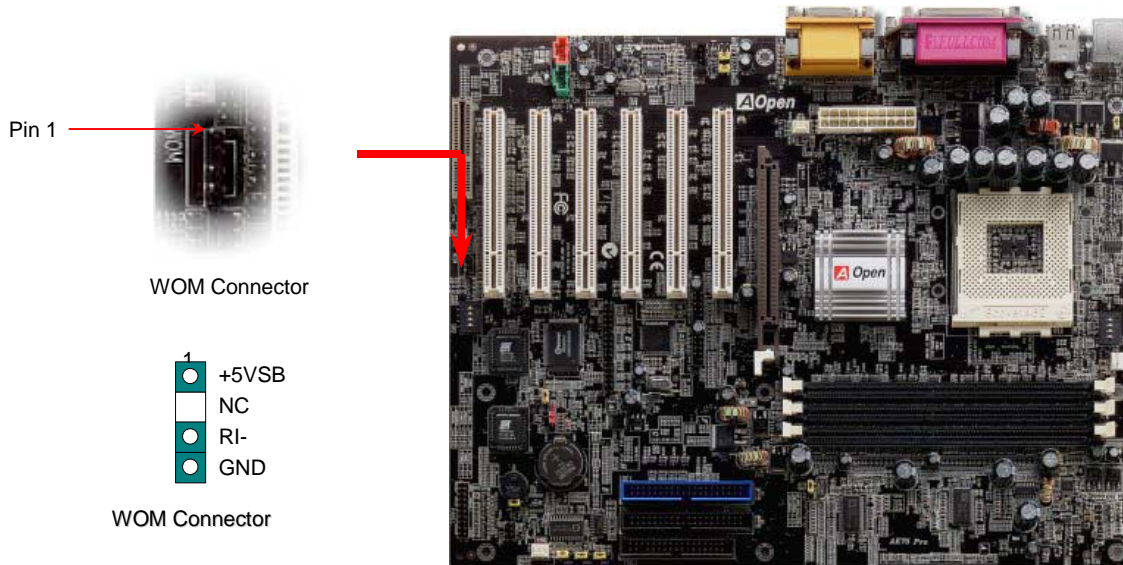
WOM by External BOX Modem

Traditional Green PC suspend mode does not really turn off the system power supply, it uses external box modem to trigger MB COM port and resume back to active.
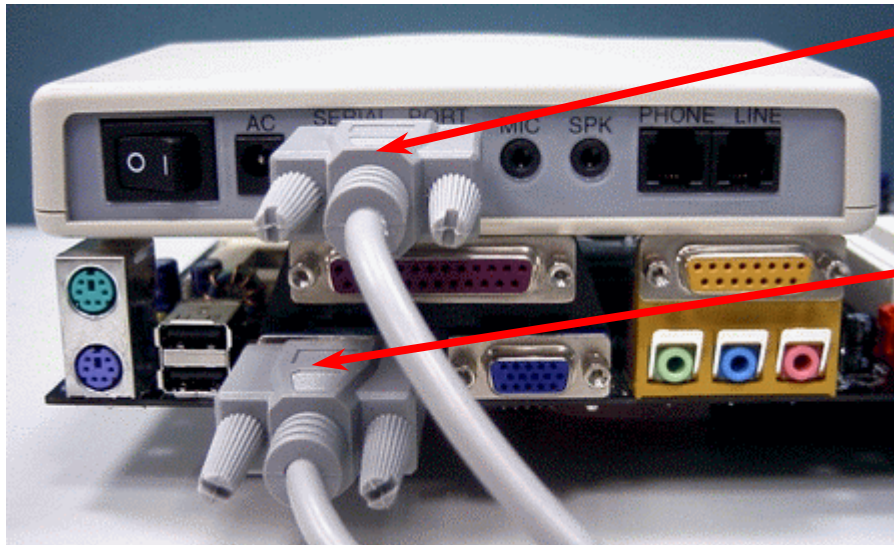
Serial Port (Modem Side)

Serial Port (Motherboard Side)

Note: This picture is for example only, it may not exactly be the same motherboard.

WOM by Internal Modem Card

With the help of the ATX soft power On/Off, it is possible to have a system totally power off, and wakeup to automatically answer a phone call as an answering machine or to send/receive a fax. You may identify whether or not your system is in true power off mode by checking to see if the fan of your power supply is off. Both an external box modem and an internal modem card can be used to support Modem Wake Up, but if you use an external modem, you have to leave your box modem on.
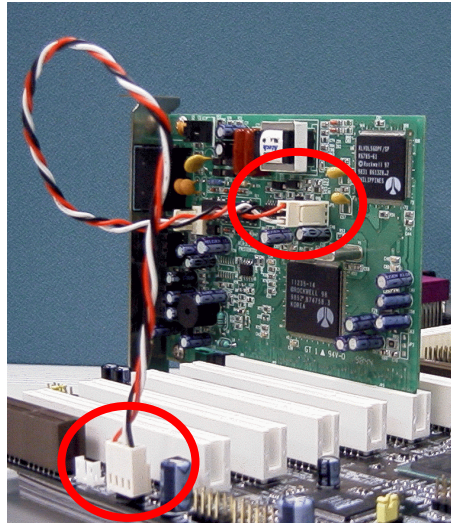
Note: This picture is for example only, it may not exactly be the same motherboard.

WOL (Wake on LAN)

To use Wake On LAN function, you must have a network card with chipset that supports this feature, and connect a cable from LAN card to motherboard WOL connector. The system identification information (probably IP address) is stored on network card and because there is a lot of traffic on the Ethernet, you need to install network management software, such as ADM, for the checking of how to wake up the system. Note that, at least 600mA ATX standby current is required to support the LAN card for this function.

LID
GND
+5VSB

WOL connector

WOL Connector
(Ethernet Card Side)

WOL Connector
(Motherboard Side)
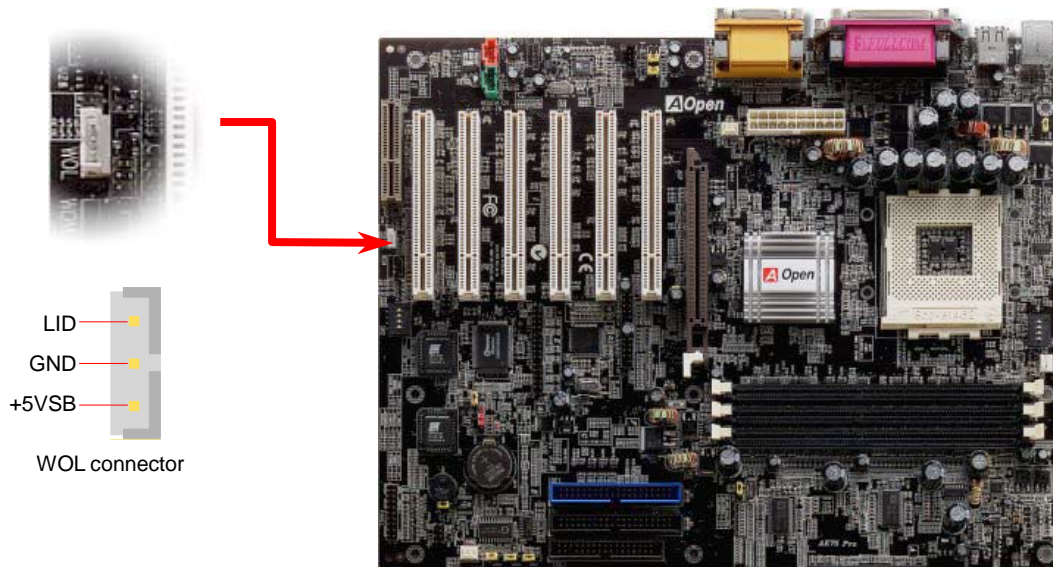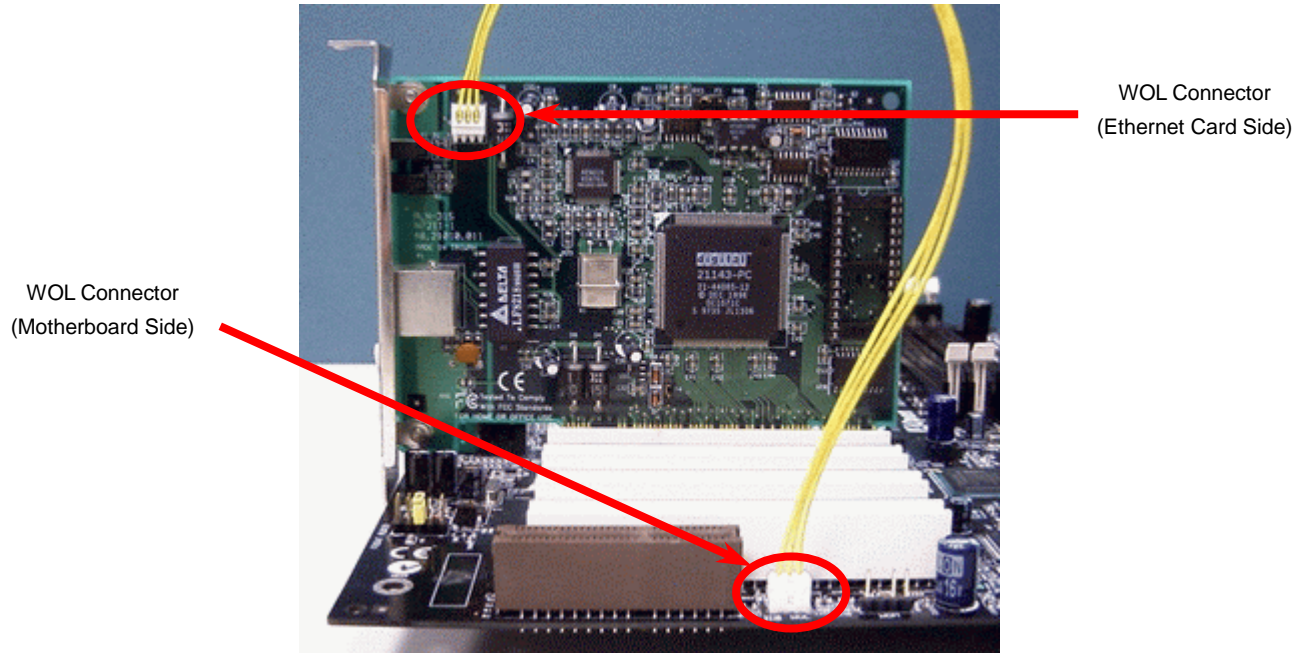
Note: This picture is for example only, it may not exactly be the same motherboard.

CNR (Communication and Network Riser) Expansion Slot

CNR is a riser card specification to replace the AMR (Audio/Modem Riser) that supports V.90 analog modem, multi-channel audio, and phone-line based networking. Owing to CPU computing power getting stronger, the digital processing job can be implemented in main chipset and share CPU power. The analogy conversion (CODEC) circuit requires a different and separate circuit design, which is put on CNR card. This motherboard implements sound CODEC on board, but reserve CNR slot for the option of modem function. Note that you can still use PCI modem card.
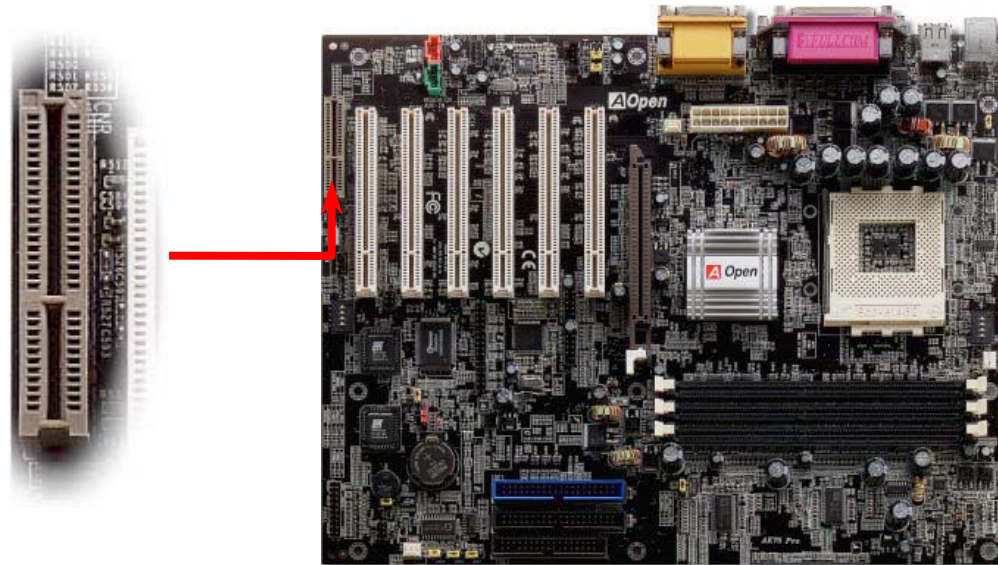
PC99 Color Coded Back Panel

The onboard I/O devices are PS/2 Keyboard, PS/2 Mouse, COM1 and COM2, Printer, USB, AC97 sound and game ports. The view angle of drawing shown here is from the back panel of the housing.
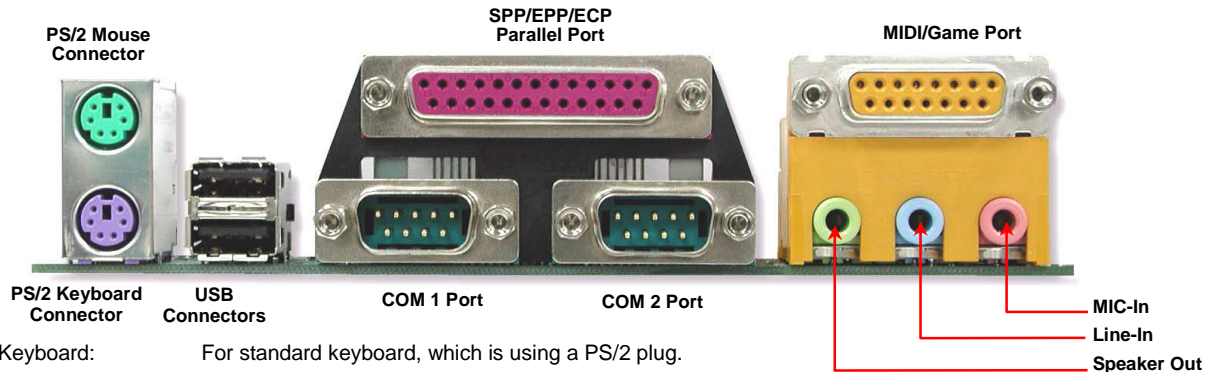
PS/2 Keyboard: For standard keyboard, which is using a PS/2 plug.
PS/2 Mouse: For PC-Mouse, which is using a PS/2 plug.
USB Port: Available for connecting USB devices.
Parallel Port: To connect with SPP/ECP/EPP printer.
COM1/COM2 Port: To connect with pointing devices, modem or others serial devices.
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.
MIDI/Game Port: For 15-pin PC joystick, game pad or MIDI devices.

AOpen

Support Six USB Connectors

This motherboard provides six USB connectors to connect USB devices, such as mouse, keyboard, modem, printer, etc. There are two connectors on the PC99 back panel. You can use proper cable to connect other USB connectors to the back panel or front panel of chassis.

Pin 1

USB3 Connector

USB2 Connector

```
          1    2
USBPWR0  [o]  [o]  USBPWR0
USB_FP_P0- [o] [o]  USB_FP_P1-
USB_FP_P0+ [o] [o]  USB_FP_P1+
    GND  [o]  [o]  GND
    KEY       [o]  USB_FP_OC0
```
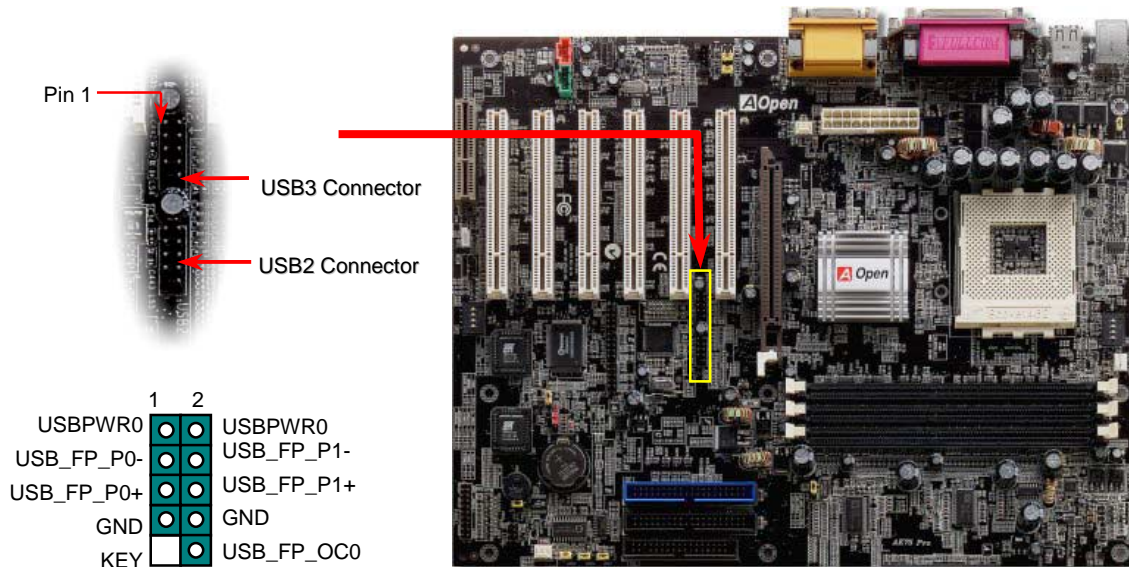
Onboard IEEE 1394a Connector

This motherboard has an IEEE 1394a controller and three IEEE 1394 connectors onboard. The IEEE 1394a provides data transfer rate up to 400Mb/s, while USB is just 12Mb/s. Hence, the IEEE 1394 interface can connect with the devices that needs high data transferring performance, such as digital camera, scanner or others IEEE 1394a devices. Please use the proper cable to connect to devices.

IEEE 1394
Connector 1

Connector 2

Connector 3

Pin 1

	10	9	
SHIED GND	●		KEY
+12V(Fused)	●	●	+12V(Fused)TP
TPB-	●	●	B+
GND	●	●	GND
TPA-	●	●	TPA+

AOpen
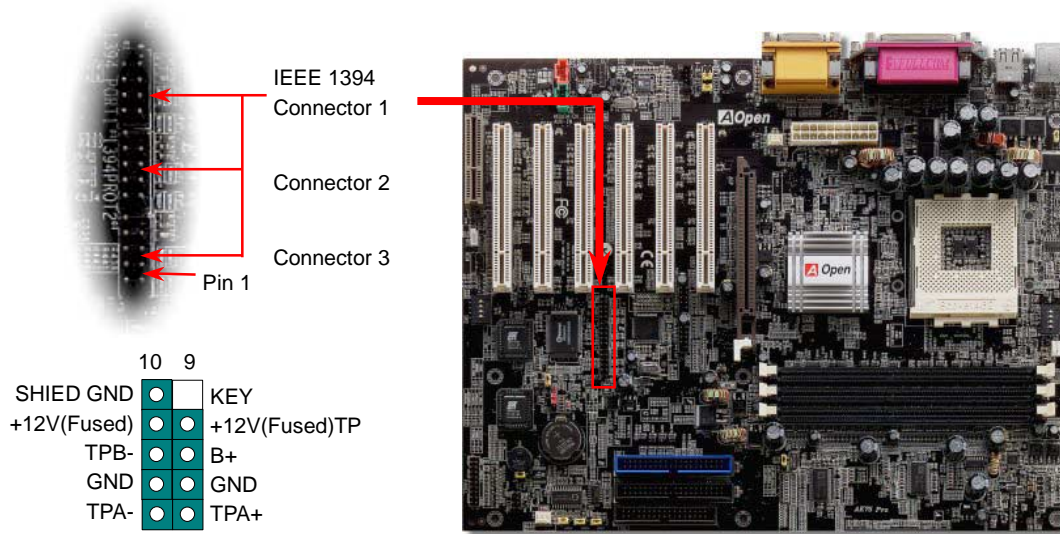
Dr. Voice

The **Dr. Voice** is a great feature of this motherboard, which can identifies what kind of problems had occurred in the operating system. It can even clearly "**tell**" whether there is a component issue or an installed issue, such as CPU, memory module, VGA, PCI add-on card, FDD, HDD or keyboard by voice. The Dr. Voice provides four kinds of language versions, **English**, **German**, **Japanese** and **Chinese** for your choosing. You can select preferred language version by **JP15** & **JP16** jumpers. However, if you want to disable this function, you may also set JP1 and JP2 to pin 2-3 to disable to buzzer and speaker from making out voices respectively.
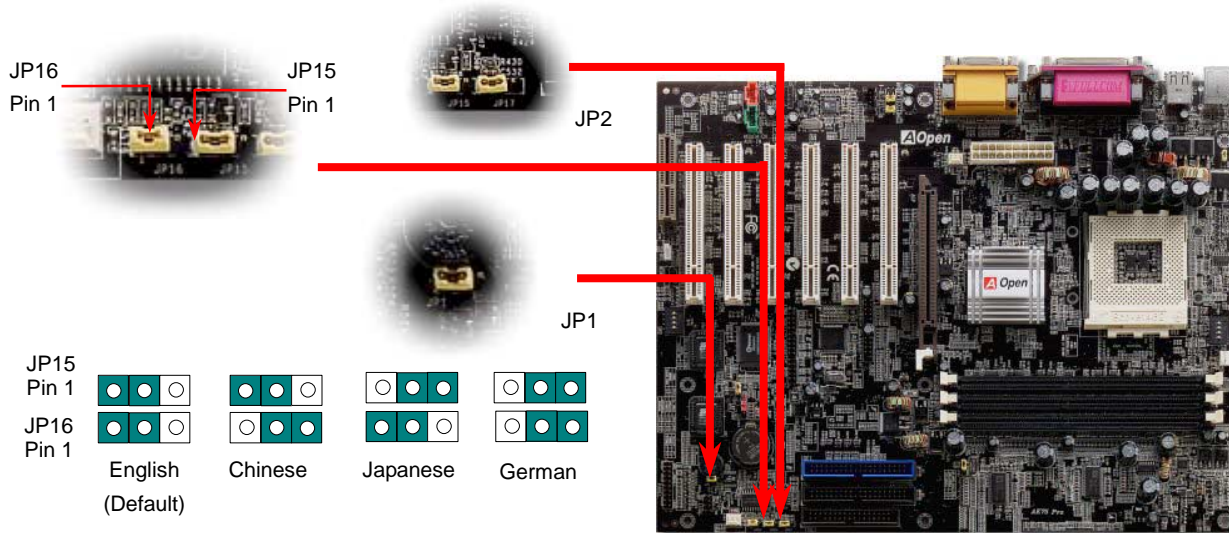
Chassis Intrusion Connector

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 the opening of the chassis, the system will send out beep sound 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.
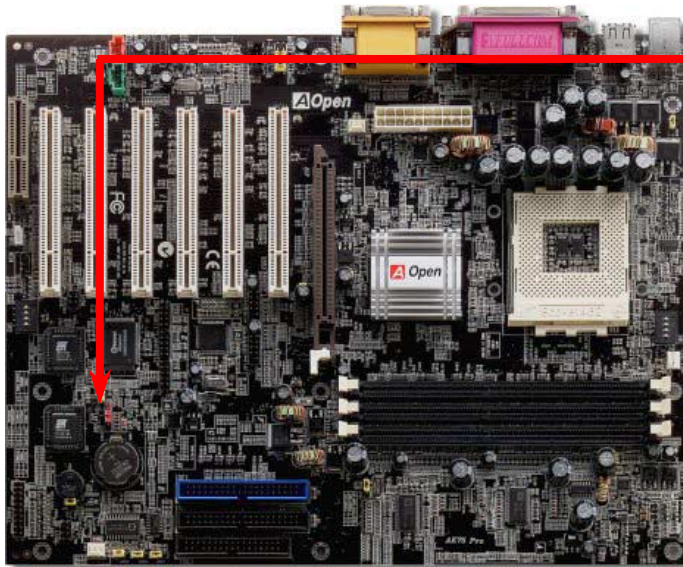
SENSOR

1   GND

Chassis Intrusion
Connector

CD Audio Connector

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

R

GND

GND

L
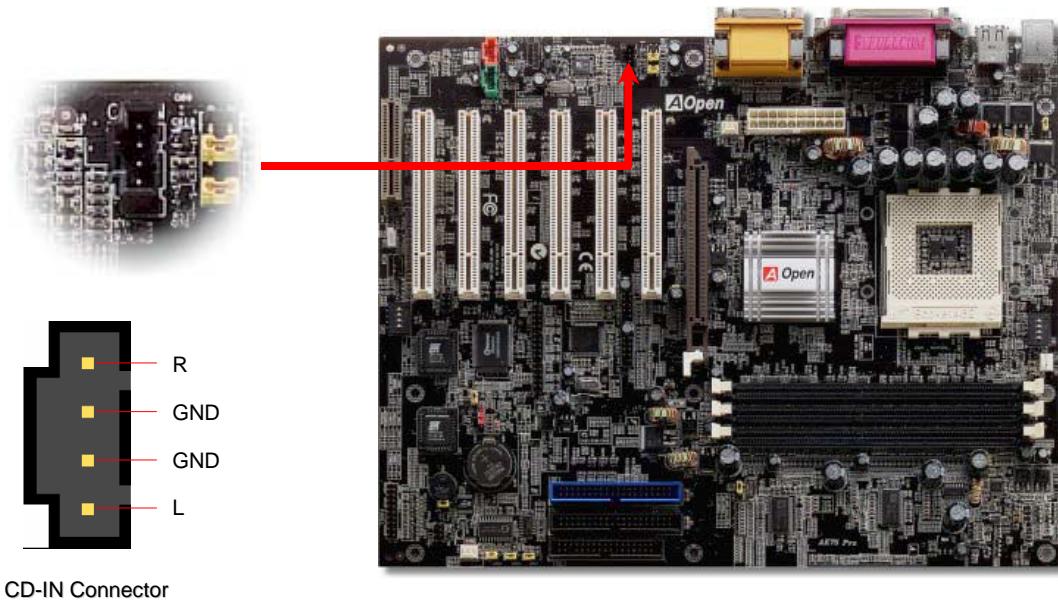
CD-IN Connector

Modem Audio Connector

This connector is used to connect Mono In/MIC Out cable from internal modem card to onboard sound circuit. The pin 1-2 is Mono In, and the pin 3-4 is MIC Out. Please note that there is no standard for this kind of connector yet, only some internal modem cards implement this connector.

MONO IN

GND

GND

MIC OUT
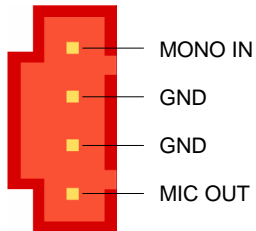
MODEM-CN Connector
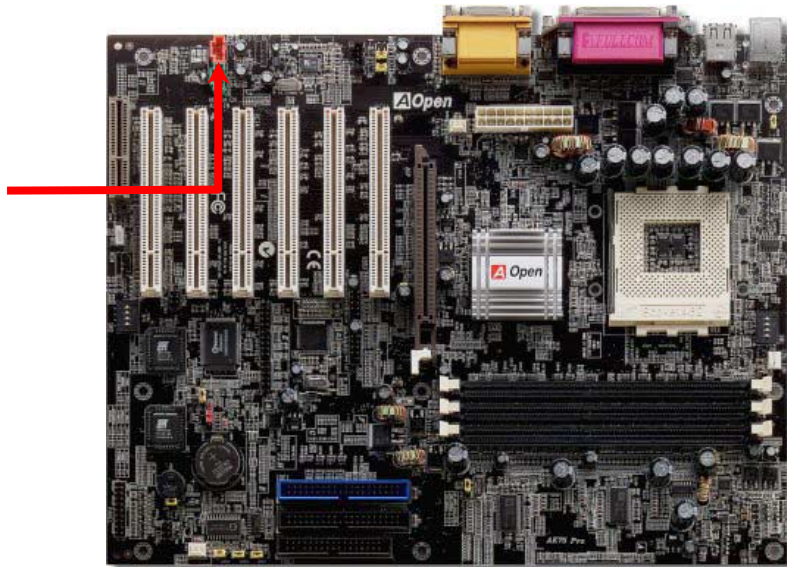
AUX-IN Connector

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

L

GND

GND

R

AUX-IN Connector
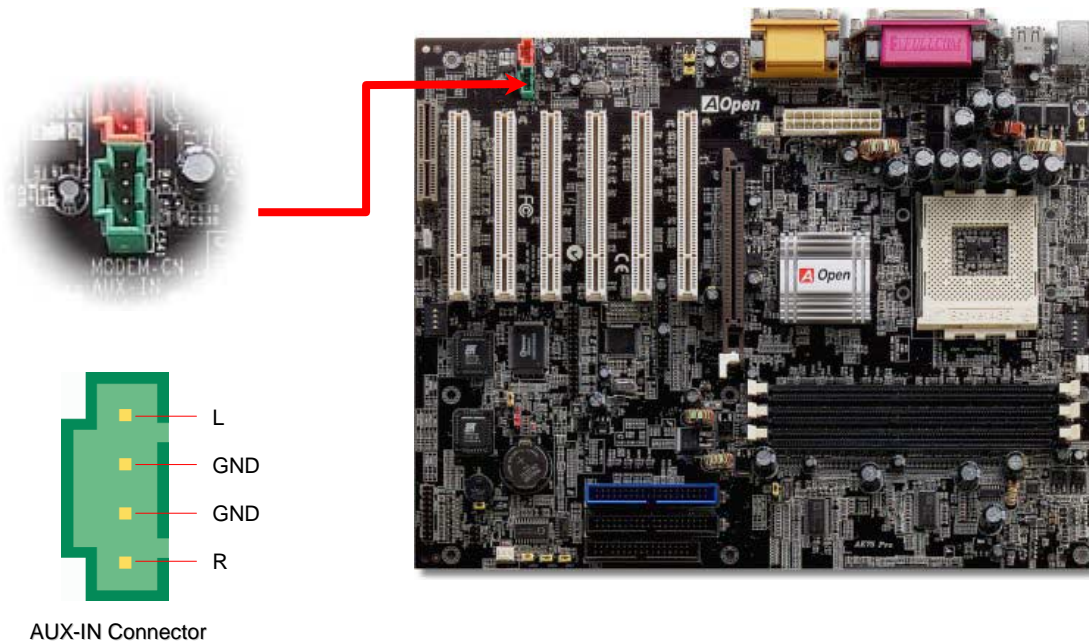
Front Audio Connector

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 5-6 and 9-10 jumper caps from the Front Audio Connector before connecting the cable. Please do not remove these 5-6 and 9-10 yellow jumper caps if there's no audio port on the front panel.

Pin 1

	1 2	
AUD_MIC	○ ○	AUD_GND
AUD_MIC_BIAS	○ ○	AUD_VCC
AUD_FPOUT_R	○ ○	AUD_RET_R
NC	○	KEY
AUD_FROUT_L	○ ○	AUD_RET_L
	9 10	
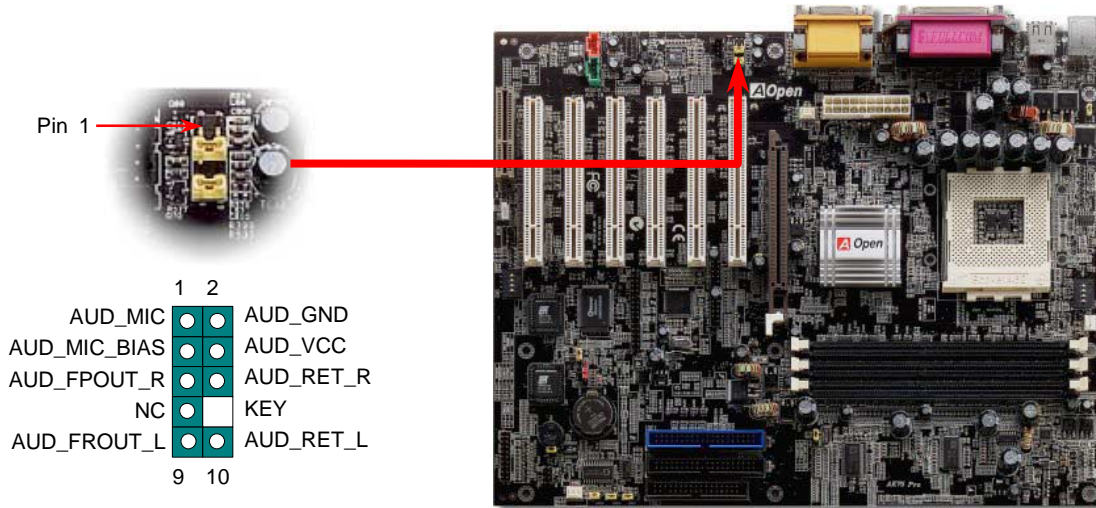
Note: Please remove the jumper cap from the Front Panel Audio Connector before you connect the cable. Do not remove this yellow jumper cap if housing without an audio port on the front panel.

Die-Hard BIOS (100% Virus Protection, Upgrade Optional)

Recently, many viruses have been found that they may destroy bios code and data area. Therefore, this motherboard implements a very effective hardware protection method that does not involve any software or BIOS coding, hence it is 100% virus free. You may restore the originally mounted BIOS with 2nd BIOS ROM by setting JP30 to pin 2-3 if it fails to act normally. This motherboard comes with one BIOS ROM, you may contact our local distributor or reseller for purchasing the extra BIOS ROM. Please visit our website: www.aopen.com for details.

Rescue ROM

JP30
Pin 1

BIOS ROM

Normal   Rescue

AOpen
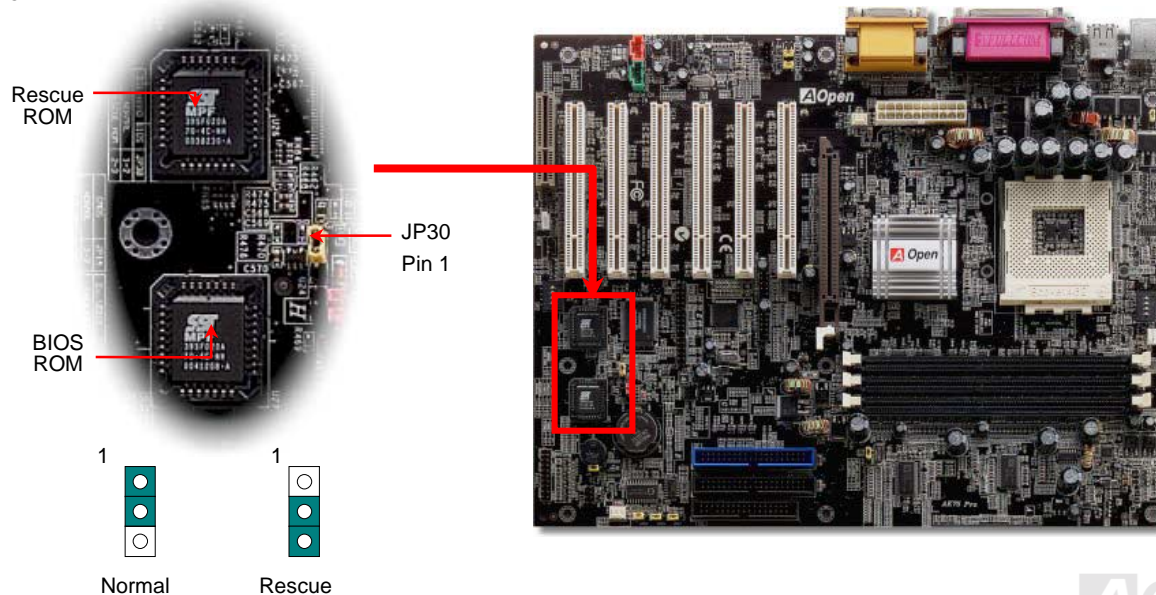
External Controller for DIE-HARD BIOS (Upgrade Optional)

External Controller provides you a better and convenience way to switch the BIOS status between "**Rescue**" and "**Normal**" without opening the case of your computer. You have to plug the jumper cable to the connector pin (**JP30**) on the motherboard. Be careful of the orientation when you connect, the red wire should correspond to Pin1.

To / Form CPU

Manual Switch

Read Only

Read/Write

Normal Flash ROM

Rescue ROM

AOpen
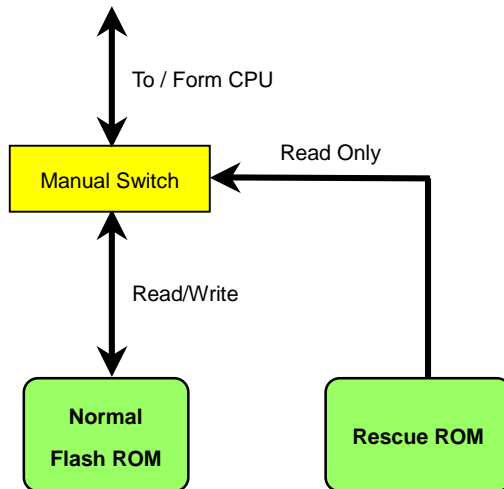
Dr. LED Connector (Upgrade Optional)

In conjunction with Dr. LED (Upgrade Optional), which can easily show what kind of problem you may incur on your system during assembly. It can clearly indicate whether there is a component issue or an installed issue by the 8 LEDs on the front panel of Dr. LED. This helps you quickly self-diagnostic your system status.

Pin 1
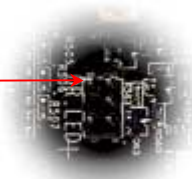
Dr. LED Connector

	1	2	
3.3V	●	●	GPO12
NC	●	●	GPO14
GND	●	●	GPO14-
	5	6	
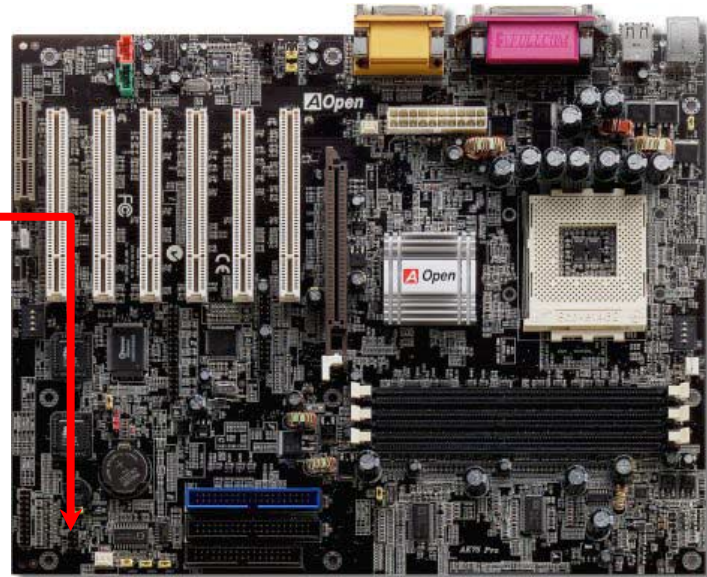
Dr. LED is a CD disc storage box with 8 LEDs on its front panel, the size of Dr. LED is exactly the same as 5.25 in floppy drive, so that it can be mount into normal 5.25 in drive bay of any housing.

7	6	5	4	3	2	1	0
○	○	○	○	○	○	○	○
Boot O.K.	KB	HDD	Floppy	PCI	Video	Memory	CPU
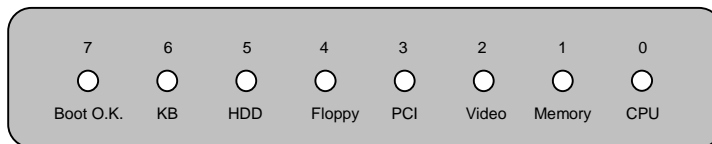
The total 8 LEDs light up alternatively if the system fails in one of eight stages. Once the LED7 (latest LED) is lit, this indicates that the system has completed its boot-up procedure.

The 8 LEDs indicate the following messages when lit:

LED 0 - Indicates that the CPU may have been installed incorrectly or is damaged.
LED 1 - Indicates that the memory may have been installed incorrectly or is damaged.
LED 2 - Indicates that the AGP may have been installed incorrectly or is damaged.
LED 3 - Indicates that the PCI card may have been installed incorrectly or is damaged.
LED 4 - Indicates that the floppy disk drive may have been installed incorrectly or is damaged.
LED 5 - Indicates that the HDD may have been installed incorrectly or is damaged.
LED 6 - Indicates that the keyboard may have been installed incorrectly or is damaged.
LED 7 - Indicates that the system is OK.

> *Note: During POST (Power On Self Test) procedure, the Debug LED will light on sequentially from LED0 to LED7 until the system boot O.K*

AOpen

Battery-less and Long Life Design

This Motherboard implements Flash ROM and a special circuit that allows you to save your current CPU and CMOS Setup configurations without the need of a battery. 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 switching 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
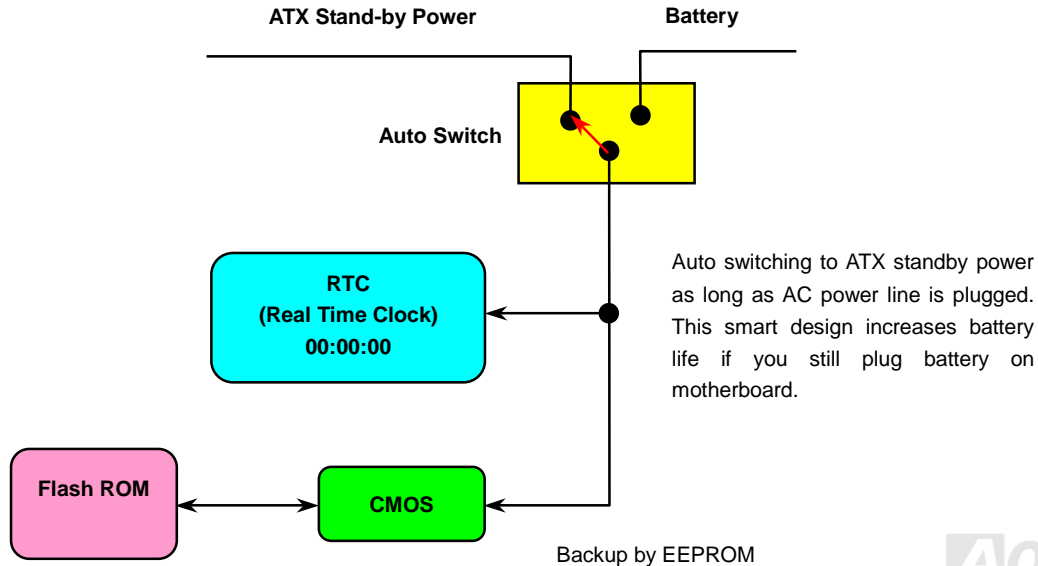
Over-current Protection

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

12V (Protected by power supply)

3.3V (Protected by power supply)

5V (Protected by power supply)

ATX Switching Power Supply

Onboard Power Regulator

Over-Current Protection Circuit

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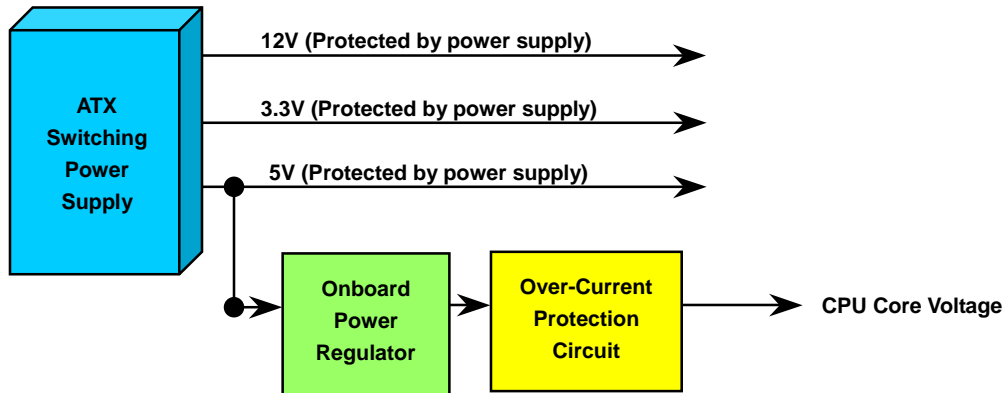
*Note: Although we have implemented protection circuit try to prevent any human operating mistake, there is still certain risk that CPU, memory, IDE, add-on cards installed on this motherboard may be damaged because of component failure, human operating error or unknown nature reason. **AOpen cannot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

AOpen

Hardware Monitoring

This motherboard implements a hardware monitoring system. As you turn on your system, this smart design will continue to monitor your system's working voltage, fan status and CPU temperature. If any of these systems' status goes wrong, there will be an alarm through the chassis external speaker or buzzer of motherboard (if existed) to warn the user.

Fan — Fan Speed →

CPU — CPU Temperature, CPU Voltage →

Power — System Voltage →

Detection Circuit → **AOpen H/W Monitoring Utility**

AOpen
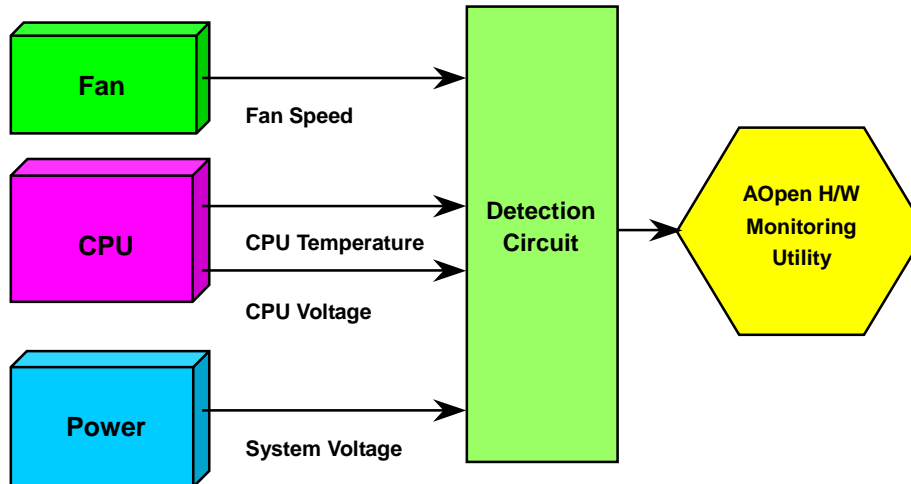
Resettable Fuse

Traditional motherboard has fuse for Keyboard and USB port to prevent over-current or shortage. These fuses are soldered onboard that when it is broken (function as protecting the motherboard), user still cannot replace it and the motherboard is still malfunctioning.

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

Resettable
Fuse
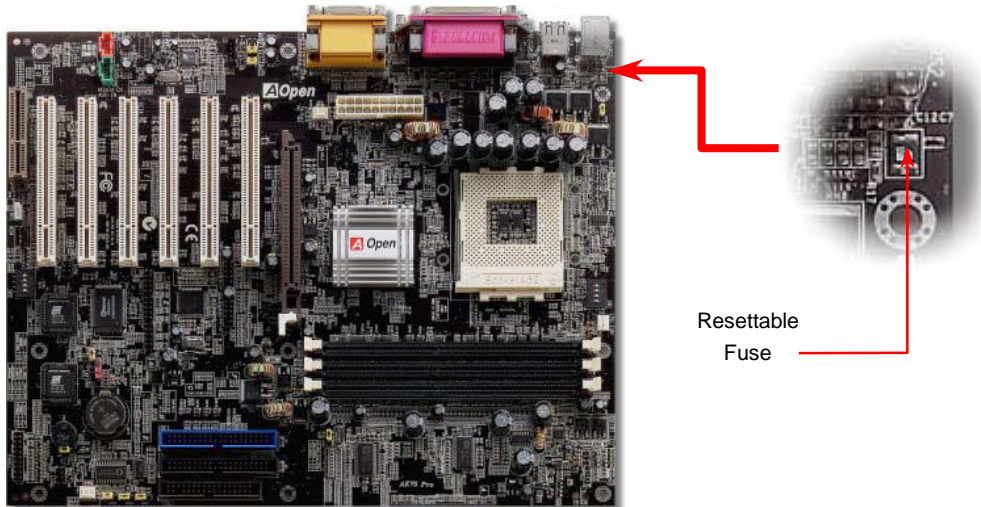
2200μ F Low ESR Capacitor

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, AK75 Pro implements 2200μ F capacitors, which is much larger than normal capacitor (1000 & 1500μ f) and it provides better stability for CPU power.
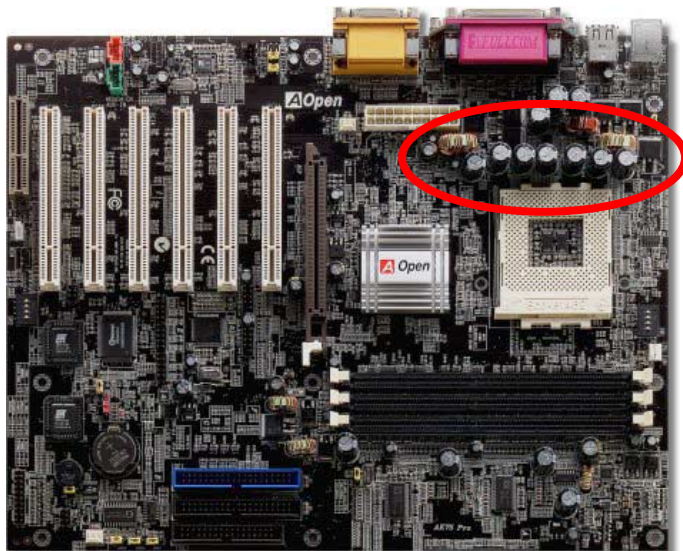
Layout (Frequency Isolation Wall)
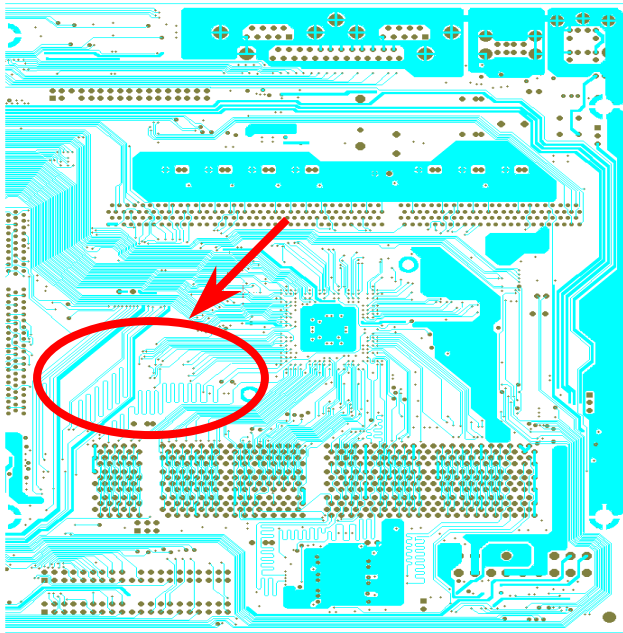
For high frequency operation, especially overclocking, layout is the most important factor to make sure chipset and CPU working in stable condition. The layout of this motherboard implements AOpen's unique design called " Frequency Isolation Wall". Separating each critical portion of motherboard into regions where each region operates in a same or similar frequency range to avoid cross talk and frequency interference between each region's operations and condition. The trace length and route must be calculated carefully. For example, the clock trace must be equal length (not necessarily as short as possible) so that clock skew will be controlled within few a pico second ($1/10^{12}$ Sec)

Note: This diagram for example only, it may not be exactly the same as this motherboard.

Pure Aluminum Heatsink
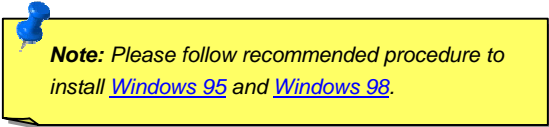
Cool down CPU and Chipset is important for system reliability. Aluminum heat sink provides better heat consumption especially when you are trying to over clocking the CPU.
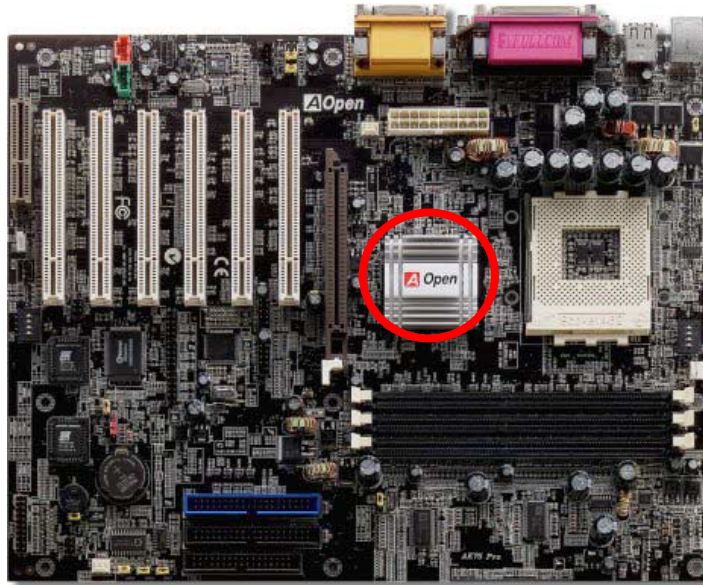
Driver and Utility

There are motherboard drivers and utilities included in AOpen Bonus CD disc. You don't need to install all of them in order to boot your system. But after you finish the hardware installation, you have to install your operation system first (such as Windows 98) before you can install any drivers or utilities. Please refer to your operation system's installation guide.

> **Note:** *Please follow recommended procedure to install Windows 95 and Windows 98.*

Auto-run Menu from Bonus CD Disc

You can use the auto-run menu of Bonus CD disc. Choose the utility and driver and select model name.
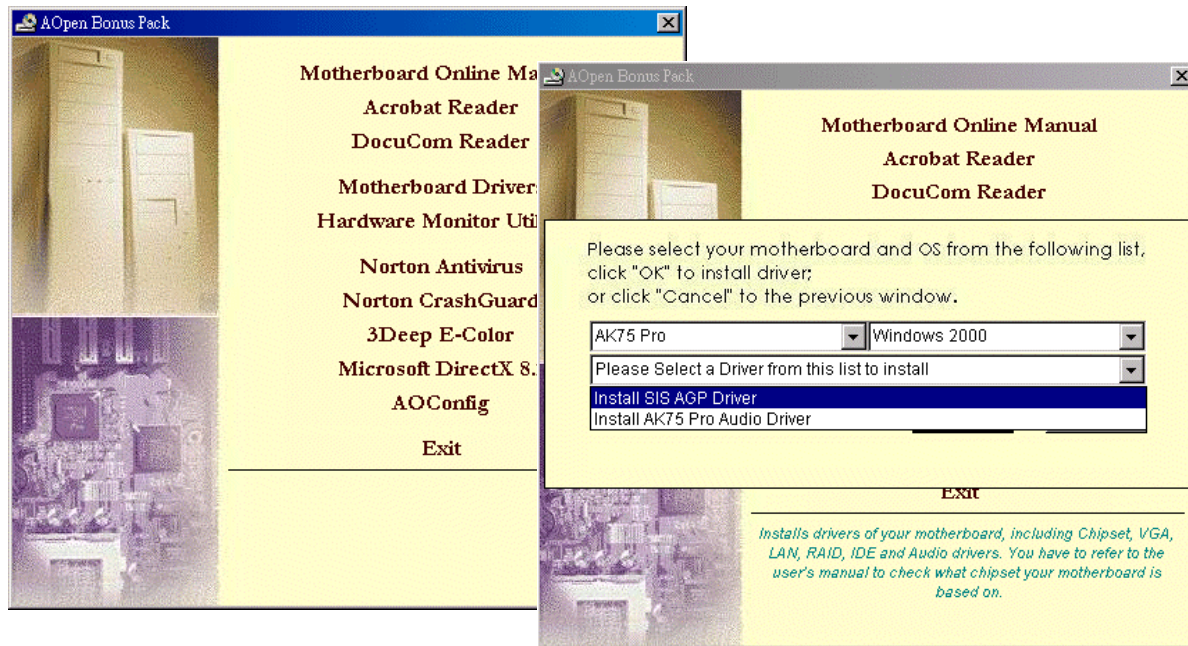
Installing Onboard Sound Driver

This motherboard comes with an AC97 CODEC. You can find the audio driver from the Bonus Pack CD disc auto-run menu.
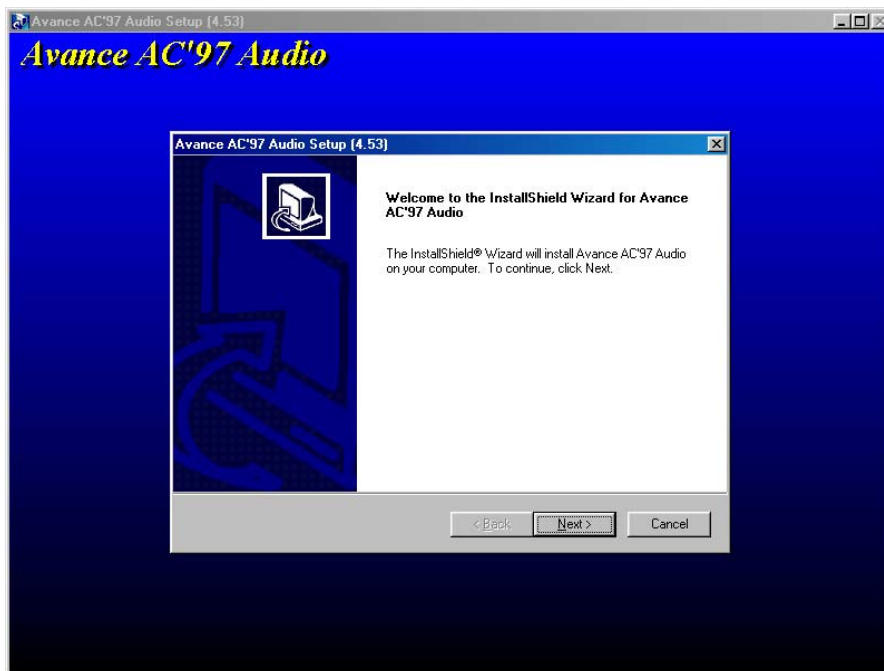
Installing SiS AGP Driver

This motherboard comes with an AGP driver. You can find the audio driver from the Bonus Pack CD disc auto-run menu.
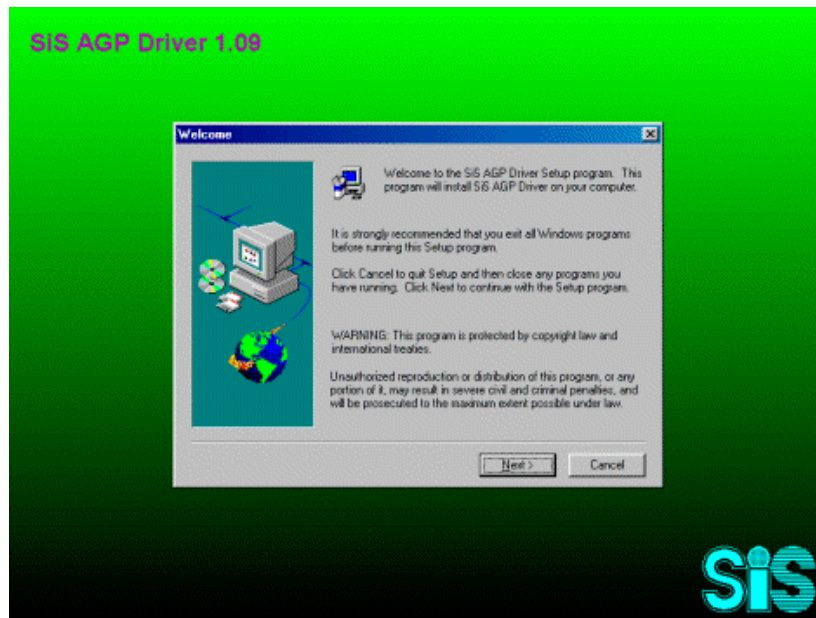
Installing Hardware Monitoring Utility

You can install Hardware Monitoring Utility to monitor CPU temperature, fans and system voltage. The hardware monitoring function is automatically implemented by the BIOS and utility software. No hardware installation is needed.
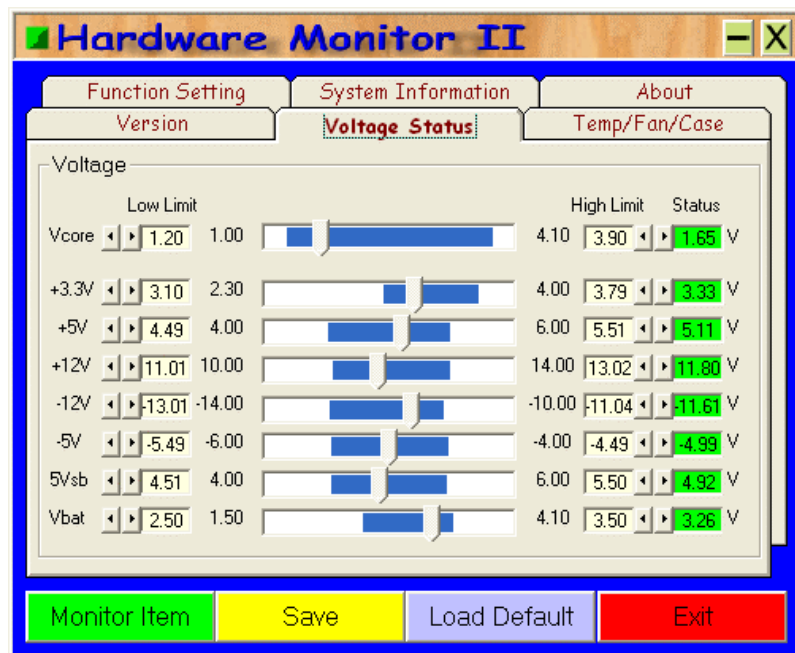
ACPI Suspend to Hard Drive

ACPI Suspend to Hard Drive is basically controlled by Windows operation system. It saves your current work (system status, memory and screen image) into hard disk, and then the system can be totally power off. Next time, when power is on, you can resume your original work directly from hard disk within few seconds without go through the Windows booting process and run your application again. If your memory is 64MB, normally, you need to reserve at least 64MB HDD space to save your memory image.

When go into Suspend:

| System Image & Status | → Save into → | Hard Disk |

When power-on next time:

| System Image & Status | ← Restore within seconds | Hard Disk |

AOpen®
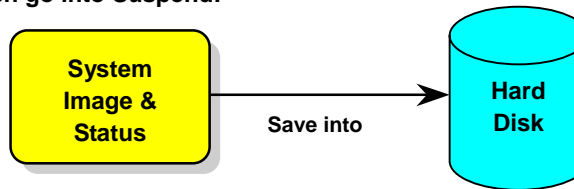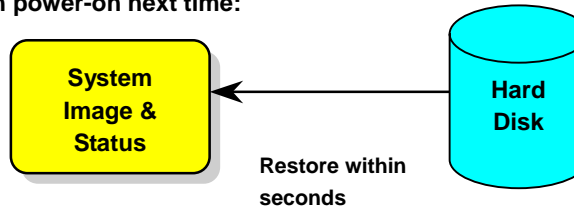
System Requirement

1.   **AOZVHDD.EXE 1.30b** or later.

2.   Delete **config.sys** and **autoexec.bat**.

Fresh installation of Windows 98 on a new system

1. Execute "**Setup.exe /p j**" to install Windows 98

2. After Windows 98's installation is complete, go to the Control Panel > Power Management.

    a. Set Power Schemes > System Standby to "Never".

    b. Click on "Hibernate" and select "Enable Hibernate Support" then "Apply".

    c. Click on the "Advanced" tab, you'll see "Hibernate" on "Power Buttons". Note that this option will only be seen after step b mentioned above has been completed; otherwise only "Standby" and "Shutdown" will be shown. Select "Hibernate" and "Apply".

3. Clean boot into DOS and run AOZVHDD utility.

    a. If you assign the whole disk to your Win 98 system (FAT 16 or FAT 32), please run "**aozvhdd /c /file**". Please remember sufficient free space has to be reserved in the disk, e.g. if you have 64 MB DRAM and 16 MB VGA card installed, the system needs at least 80 MB free space. The utility will locate the space automatically.

    b. If you assign an individual partition for Win 98, please run "**aozvhdd /c /partition**". Of course, the system needs to provide unformatted an empty partition.

4. Reboot system.

5. You've already implemented ACPI Suspend to-Hard Drive. Click "Start > Shut Down > Standby" then the screen will go off immediately. And 1 minute or so will be taken for the system to save what's in the memory to the hard drive; the larger the memory size the longer this process will take.

AOpen

Changing from APM to ACPI (Windows 98 only)

1. Run "**Regedit.exe**"

    a. Go through the following path

        HKEY_LOCAL_MACHINE

            SOFTWARE

                MICROSOFT

                    WINDOWS

                        CURRENT VERSION

                        DETECT

    b. Select "ADD Binary" and name it as "**ACPIOPTION**".

    c. Right click and select Modify, add "01" after "0000" to make it "0000 01".

    d. Save changes.

2. Select "Add New Hardware" under Control Panel. Allow Windows 98 to detect new hardware. (It will find "**ACPI BIOS**" and remove "**Plug and Play BIOS**")

3. Reboot system.

4. Clean boot into DOS and run "AOZVHDD.EXE /C /File"

Changing from ACPI to APM

1. Run "**Regedit.exe**"

    a. Go through the following path

HKEY_LOCAL_MACHINE

   SOFTWARE

      MICROSOFT
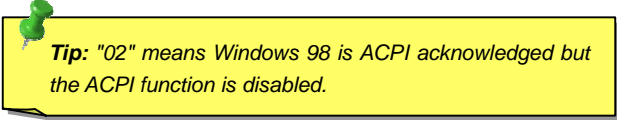
         WINDOWS

            CURRENT VERSION

               DETECT

                  ACPI OPTION
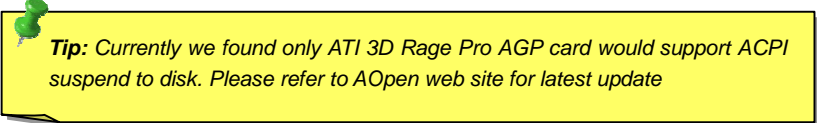
b. Right click and select "Modify, change "01" to "02" to make it "0000 02".

> ***Tip:*** *"02" means Windows 98 is ACPI acknowledged but the ACPI function is disabled.*

c. Save changes.

2. Select "Add New Hardware" under Control Panel. Allow Windows 98 to detect new hardware. (It will find "**Plug and Play BIOS**" and **remove "ACPI BIOS**")

3. Reboot system.

4. Run "Add New Hardware" again and it will find "Advanced Power Management Resource".

5. Click "OK".

> ***Tip:*** *Currently we found only ATI 3D Rage Pro AGP card would support ACPI suspend to disk. Please refer to AOpen web site for latest update*

AOpen

ACPI Suspend to RAM (STR)

This motherboard supports ACPI Suspend to RAM function. With this function, you can resume your original work directly from DRAM without going through the Windows 98 booting process and run your application again. Suspend to DRAM saves your current work in the system memory, it is faster than Suspend to Hard Drive but requires power supplied to DRAM, while Suspend to Hard Drive requires no power.

When go into Suspend:

System Image & Status in the DRAM		Other System Devices

Backup by 3.3V Power

Power loss

When power-on next time:

System Image & Status in the DRAM		Other System Devices

Power back to work

Power back to work
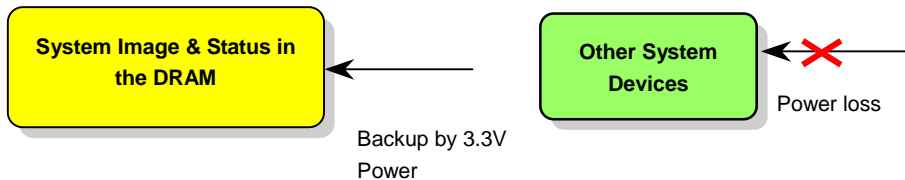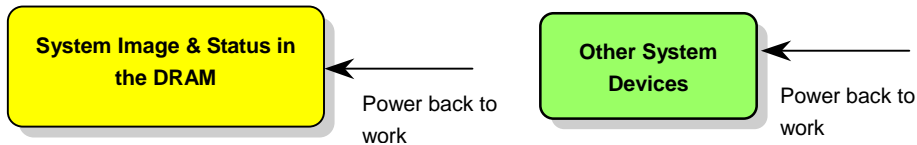
To implement ACPI Suspend to DRAM, please follow the procedures as below:

System Requirement

An ACPI OS is required. Currently, Currently, except Windows 95 and Windows NT, all other Windows Systems support ACPI.

Procedures

1.   Changed the following BIOS settings.

      BIOS Setup > Power Management Setup > ACPI Function: Enabled

      BIOS Setup > Power Management Setup > ACPI Suspend Type: S3.

2.   Go to Control Panel > Power Management. Set "Power Buttons" to "Standby".

3.   Press power button or standby button to wake up the system.
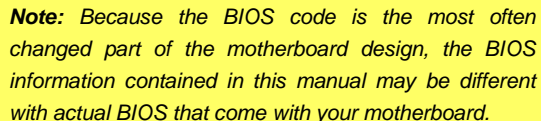
AWARD BIOS

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).

The AwardBIOS™ that 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 setting of AK75 Pro had optimized by AOpen's R&D engineering team. But, the default setting of BIOS still can't fine-tune the chipset controlling entire system. Hence, the rest of this chapter is intended to guide you through the process of configuring your system using 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.*

About BIOS Function Description…

AOpen always dedicates to give users a more friendly computer system. Now, we include all function descriptions of BIOS setup program into the BIOS Flash ROM. When you select one function of BIOS setup program, the function description will appeared at right side of screen. Hence, you don't need read this manual while you changing the BIOS setting.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                            Advanced BIOS Features
       Virus Warning                Disabled    ▲           Item Help
       CPU Internal Cache           Enabled
       External Cache               Enabled            Menu Level    ▶
       CPU L2 Cache ECC Checking    Enabled
       Quick Power On Self Test     Disabled           Allows you to choose
       First Boot Device            Floppy             the VIRUS warning
       Second Boot Device           HDD-0              feature for IDE Hard
       Third Boot Device            LS120              Disk boot sector
       Boot Other Device            Enabled            protection. If this
       Swap Floppy Drive            Disabled           function is enabled
       Boot Up Floppy Seek          Enabled            and someone attempt to
       Boot Up NumLock Status       On                 write data into this
       Gate A20 Option              Fast               area ,  BIOS will show
       Typematic Rate Setting       Disabled           a warning message on
     x Typematic Rate (Chars/Sec)   6                  screen and alarm beep
     x Typematic Delay (Msec)       250
       Security Option              Setup
       OS Select For DRAM > 64MB    Non-OS2
       Video BIOS Shadow            Enabled    ▼

   ↑↓→←:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help
        F5:Previous Values      F6:Fail-Safe Defaults    F7:Optimized Defaults
```

Menu Items Select Window   Item Function Description Window

AOpen

How To Use Award™ BIOS Setup Program

Generally, you can use the 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 value. You also can press <F1> key for help and press <Esc> key to quit Award™ BIOS setup program. The following table provides details about how to use keyboard in the Award™ BIOS setup program. By the way, all products of AOpen also provides a special function in the BIOS setup, you can press <F3> key selecting preferred menu language to display.

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.
F1	Get menu or item help description.
F3	Changing menu language.
F5	Load previous setting value from CMOS.

Key	Description
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 the setting of jumpers and connect correct cables. Power on and enter the BIOS Setup, press <Del> during POST (Power-On Self Test). Choose "Load Setup Defaults" for recommended optimal performance.

```
          CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
    ┌──────────────────────────────────────────────────────────────────────┐
    │  ► 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 Configura ┌─────────────────────────────┐ faults           │
    │                      │  Load Setup Defaults (Y/N)? Y │                 │
    │  ► PC Health Status  └─────────────────────────────┘ faults           │
    │                                                                        │
    │  ► Frequency/Voltage                                                    │
    ├──────────────────────────────────────────────────────────────────────┤
    │  Esc : Quit                       ↑ ↓ → ←  : Select Item               │
    │  F10 : Save & Exit Setup          (Shift)F3 : Change Language          │
    ├──────────────────────────────────────────────────────────────────────┤
    │                   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

BIOS Upgrade under Windows environment *NEW!*

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 even the latest 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.
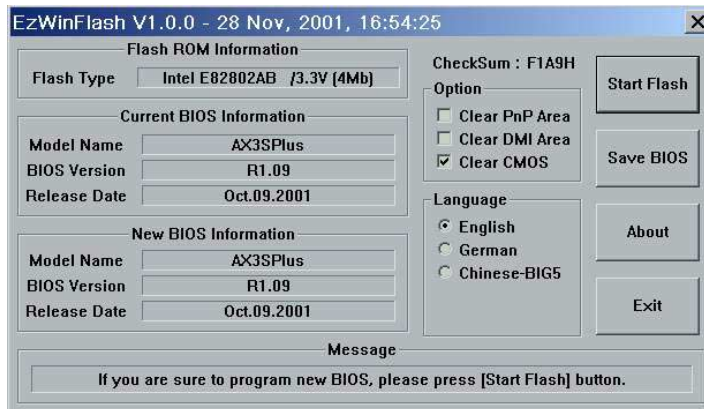
Caution: By updating your motherboard, you are taking a risk of BIOS flash failure. If your motherboard is working stable, and there are no major bugs that had been fixed by a latter BIOS revision, we recommend that you DO NOT try to upgrade your BIOS.
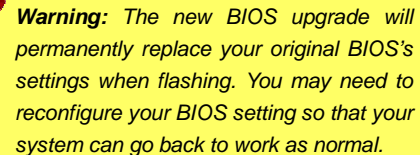
If you intent on upgrading, PLEASE BE SURE to get the right BIOS revision for the right motherboard model to avoid any possibility failure.

Note: The model name on this BIOS picture is for reference only. It may not be the exact model name.

You may accomplish BIOS upgrade procedure with EZWinFlash by the following steps, and it's STRONGLY RECOMMMANDED 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: WAK75P102.ZIP) with WinZip (http://www.winzip.com) in Windows environment.

3. Save the unzipped files into a folder, for example, WAK75P102.EXE & WAK75P102.BIN.

4. Double click on the WAK75P102.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

Overclocking

As a leading manufacturer in motherboard industry, AOpen always listens to what customers want and develop products to fit different user's requirements. Reliability, compatibility, leading technology and friendly features are our basic goals when designing motherboards. Other than above mentioned design criteria, there are power users who are always seeking to push the limitation of the system performance by overclocking which we call them "Overclocker".

This section is dedicated to overclockers.

This high performance motherboard is designed for maximum **200MHz** CPU bus clock. Some lab tests results showed that **133MHz** is achievable when proper setting and qualified components were presented. Not only that, the CPU clock ratio can be up to 12.5x that supports almost all of AMD CPUs in the future and provides flexibility for overclockers.

But not guaranty. ☺

> *Tip: Note that overclocking may also cause thermal problem. Please make sure that the cooling fan and the heatsink were adequate to dissipate excessive heat that's generated by overclocking the CPU.*

> *Warning: The design of this product follows CPU and chipset vendor's design guideline. Any attempts to push beyond product specification are not recommended and you are taking your own risk to damage your system or important data. Before doing overclocking, you must make sure your components are able to tolerate such abnormal setting, especially CPU, DRAMs, hard disks, and AGP VGA cards.*

AOpen

VGA Card & Hard Disk

VGA and HDD is key components for overclocking, for your reference, the following list are what have been successful overclocked in our lab. Please note that AOpen can not guaranty they can be successful overclocked again. Please check the **Available Vendor List (AVL)** by link to our official website.

VGA: http://www.aopen.com.tw/tech/report/overclk/mb/vga-oc.htm

HDD: http://www.aopen.com.tw/tech/report/overclk/mb/hdd-oc.htm

Glossary

AC97

Basically, AC97 specification separates sound/modem circuit to two parts, digital processor and a CODEC for analogy I/O they are linked by AC97 link bus. Since digital processor can be put into motherboard main chipset, the cost of sound/modem onboard solution can be reduced.

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.

AGP (Accelerated Graphic Port)

AGP is a bus interface targeted for high-performance 3D graphic. AGP supports only memory read/write operation and single-master single-slave one-to-one only. AGP uses both rising and falling edge of the 66MHz clock, for 2X AGP, the data transfer rate is 66MHz x 4byte x 2 = 528MB/s. AGP is now moving to 4X mode, 66MHz x 4byte x 4 = 1056MB/s. AOpen is the first company to support 4X AGP motherboards by both AX6C (Intel 820) and MX64/AX64 (VIA 694x), started from Oct 1999.

AOpen

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.

AOpen Bonus Pack CD

A disc bundled with AOpen motherboard product; there are motherboard drivers, Acrobat Reader for PDF online manual and other useful utilities.

APM (Advanced Power Management)

Unlike ACPI, BIOS controls most APM power management functions. AOpen Suspend to Hard Drive is a good example of APM power management.

ATA (AT Attachment)

ATA is the specification of diskette interface. In 80's, many software and hardware manufacturers instituted the ATA specification together. The AT is meaning International Business Machines Corporation (IBM) personal computer/AT's bus structure.

ATA/66

ATA/66 uses both rising edge and falling edge but doubles UDMA/33 transfer rate. The data transfer rate is 4 times of the PIO mode 4 or DMA mode 2, 16.6MB/s x4 = 66MB/s. To use ATA/66, you need special ATA/66 IDE cable.

ATA/100

ATA/100 is a new IDE specification under developing. ATA/100 uses both rising edge and falling edge as <u>ATA/66</u> but clock cycle time is reduced to 40ns. The data transfer rate is (1/40ns) x 2 bytes x 2 = 100MB/s. To use ATA/100, you need special 80-wire IDE cable, the same as ATA/66.

BIOS (Basic Input/Output System)

BIOS is a set of assembly routine/program that reside in <u>EPROM</u> or <u>Flash ROM</u>. 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.

Bus Master IDE (DMA mode)

The traditional PIO (Programmable I/O) IDE requires the CPU to involve in all the activities of the IDE access including waiting for the mechanical events. To reduce the workload of the CPU, the bus master IDE device transfers data from/to memory without interrupting CPU, and releases CPU to operate concurrently while data is transferring between memory and IDE device. You need the bus master IDE driver and the bus master IDE HDD to support bus master IDE mode.

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.

CODEC (Coding and Decoding)

Normally, CODEC means a circuit that can do digital to analog conversion and also the analog to digital conversion. It is part of AC97 sound/modem solution.

DDR (Double Data Rated) SDRAM

DDR SDRAM utilizes the existing DRAM infrastructure and technology while doubling the nominal bandwidth available to systems in an easy to design and simple to adopt way. Initially a perfect solution for memory intensive server and workstation applications, DDR low cost and low voltage will ultimately make it an ideal solution for all segments of the PC market, high performance desktop and mobile PCs, Value PCs and even Internet Appliances and mobile devices.

DIMM (Dual In Line Memory Module)

DIMM socket has total 168-pin and supports 64-bit data. It can be single or double side, the golden finger signals on each side of PCB are different, and that is why it was called Dual In Line. Almost all DIMMs are made by SDRAM, which operate at 3.3V. Note that some old DIMMs are made by FPM/EDO and only operate at 5V. Do not confuse them with SDRAM DIMM.

DMA (Direct Memory Access)

Channel for communications between the memory and surrounding devices.

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.

EDO (Extended Data Output) Memory

The EDO DRAM technology is actually very similar to FPM (Fast Page Mode). Unlike traditional FPM that tri-states the memory output data to start the pre-charge activity, EDO DRAM holds the memory data valid until the next memory access cycle, that is similar to pipeline effect and reduces one clock state.

EEPROM (Electronic Erasable Programmable ROM)

Also known as E^2PROM. 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 in the technology of Alpha processor from Digital Equipment Corporation. EV6 bus uses both rising and falling clock edge to transfer data, similar as DDR SDRAM or ATA/66 IDE bus.

EV6 Bus Speed = CPU external bus clock x 2.

For example, 200 MHz EV6 bus is actually using 100 MHz external bus clock, but the equivalent speed is 200 MHz.

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 new package of Intel for Pentium III CPU. It can plug into SKT370 socket, but require motherboard to add some signals on socket 370. That is, the motherboard needs to be redesigned. Intel is going to ship FC-PGA 370 CPU and phase out slot1 CPU.

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 256KB (2M bit). AOpen AX5T is the first board to implement 256KB (2Mbit) Flash ROM. Now flash ROM size is moving to 4M bit on AX6C (Intel 820) and MX3W (Intel 810) motherboard. , AOpen motherboard uses EEPROM for jumper-less and battery-less design.

AOpen

FSB (Front Side Bus) Clock

FSB Clock means CPU external bus clock.

CPU internal clock = CPU FSB Clock x CPU Clock Ratio

I^2C Bus

See SMBus.

IEEE 1394

IEEE 1394 is a low-cost digital interface originated by Apple Computer as a desktop LAN and developed by the IEEE 1394 working group. The IEEE 1394 can transport data at 100, 200 or 400 Mbps. One of the solutions to connect digital television devices together at 200 Mbps. Serial Bus Management provides overall configuration control of the serial bus in the form of optimizing arbitration timing, guarantee of adequate electrical power for all devices on the bus, assignment of isochronous channel ID, and notification of errors. There are two type of IEEE 1394 data transfer: asynchronous and isochronous. Asynchronous transport is the traditional computer memory-mapped, load and store interface. Data requests are sent to a specific address and an acknowledgment is returned. In addition to an architecture that scales with silicon technology, IEEE 1394 features a unique isochronous data channel interface. Isochronous data channels provide guaranteed data transport at a pre-determined rate. This is especially important for time-critical multimedia data where just-in-time delivery eliminates the need for costly buffering.

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.

PBSRAM (Pipelined Burst SRAM)

For Socket 7 CPU, one burst data read requires four QWord (Quad-word, 4x16 = 64 bits). PBSRAM only needs one address decoding time and automatically sends the remaining QWords to CPU according to a predefined sequence. Normally, it is 3-1-1-1, total 6 clocks, which is faster than asynchronous SRAM. PBSRAM is often used on L2 (level 2) cache of Socket 7 CPU. Slot 1 and Socket 370 CPU do not need PBSRAM.

PC-100 DIMM

SDRAM DIMM that supports 100MHz CPU FSB bus clock.

PC-133 DIMM

SDRAM DIMM that supports 133MHz CPU FSB bus clock.

PC-1600 or PC-2100 DDR DRAM

Based on FSB frequency, the DDR DRAM has 200MHz and 266MHz two type of working frequency. Because of DDR DRAM data bus is 64-bit, it provides data transfer bandwidth up to 200x64/8=1600MB/s, and 266x64/8=2100MB/s. Hence, the PC-1600 DDR DRAM is working with 100MHz and PC-2100 DDR DRAM is working with 133MHz FSB frequency.

PCI (Peripheral Component Interface) Bus

Bus for the internal connection of peripheral devices, high-speed data channel between the computer and expansion card.

PDF Format

A file format for electronic document, PDF format is independent from platform, you can read PDF file under Windows, Unix, Linux, Mac … with different PDF reader. You can also read PDF file by web browser such as IE and Netscape, note that you need to install PDF plug-in first (Included in Acrobat Reader).

PnP (Plug and Play)

The PnP specification suggests a standard register interface for both BIOS and operating system (such as Windows 95). These registers are used by BIOS and operating system to configure system resource and prevent any conflicts. PnP BIOS or operating system will automatically allocate the IRQ/DMA/Memory. Currently, almost all the PCI cards and most ISA cards are already PnP compliant.

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.

RDRAM (Rambus DRAM)

Rambus is a memory technology that uses large burst mode data transfer. Theoretically, the data transfer should be high than SDRAM. RDRAM is cascaded in channel operation. For Intel 820, only one RDRAM channel is supported, 16-bit data per channel, and this channel may have maximum 32 RDRAM devices, no matter how many RIMM sockets.

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. AOpen is the first company to support dual-SDRAM DIMMs onboard (AP5V), from Q1 1996

Shadow E^{2}PROM

A memory space in Flash-ROM to simulate E^{2}PROM operation, AOpen motherboard uses Shadow E^{2}PROM for jumper-less and battery-less design

SIMM (Single In Line Memory Module)

SIMM socket is only 72-pin, and is only single side. The golden finger signals on each side of PCB are identical. That is why it was called Single In Line. SIMM is made by FPM or EDO DRAM and supports 32-bit data. SIMM had been phased out on current motherboard design.

SMBus (System Management Bus)

SMBus is also called I2C 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.

Ultra DMA

Ultra DMA (or, more accurately, Ultra DMA/33) is a protocol for transferring data between a hard disk drive through the computer's data path (or bus) to the computer's random access memory (RAM). The Ultra DMA/33 protocol transfers data in burst mode at a rate of 33.3MB/s, twice as fast as the previous Direct Access Memory (DMA) interface. Ultra DMA was developed as a proposed industry standard by the Quantum corporation, makes of hard disk drives, and Intel, makes of chipset that support computer bus technology. Ultra DMA support in your computer means that it will boot (start) and open new applications more quickly. It will help users of graphic-intensive and applications that require large amounts of access to data on the hard disk drive. Ultra DMA uses Cyclical Redundancy Checking (CRC), offering a new level of data protection. Ultra DMA uses the same 40-pin IDE interface cable as PIO and DMA.

16.6MB/s x2 = 33MB/s

16.6MB/s x4 = 66MB/s

16.6MB/s x6 = 100MB/s

USB (Universal Serial Bus)

USB is a 4-pin serial peripheral bus that is capable of cascading low/medium speed peripherals (less than 10Mbit/s) such as keyboard, mouse, joystick, scanner, printer and modem. With USB, the traditional complex cables from back panel of your PC can be eliminated.

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.

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
>
> Next

Continue

Install the VGA card. Then connect your monitor and keyboard.

Turn on the power and check if the power supply and CPU fan work properly.

Yes

No

Next

The problem is probably caused by power supply or motherboard failure. Please contact your reseller or local distributor for repairing.

AOpen

Continue

Check if there is display?

No

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.

Check if the system reboots?

No

It is very possible that your keyboard is defective.

Yes

Next

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 98.

End

AOpen

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:** Please check the manual carefully and make sure the jumper settings and installation procedure are correct.
http://www.aopen.com/tech/download/manual/default.htm

2   **Test Report:** We recommend choosing board/card/device from the compatibility test reports for assembling your PC.
http://www.aopen.com/tech/report/default.htm

3   **FAQ:** The latest FAQ (Frequently Asked Questions) may contain a solution to your problem.
http://www.aopen.com/tech/faq/default.htm

4   **Download Software:** Check out this table to get the latest updated BIOS/utility and drivers.
http://www.aopen.com/tech/download/default.htm

5
> **News Group:** News posted by computer experts, you are welcome to join any discussion and learning from it.http://www.aopen.com/tech/newsgrp/default.htm

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 if next time you want to buy something else from them.

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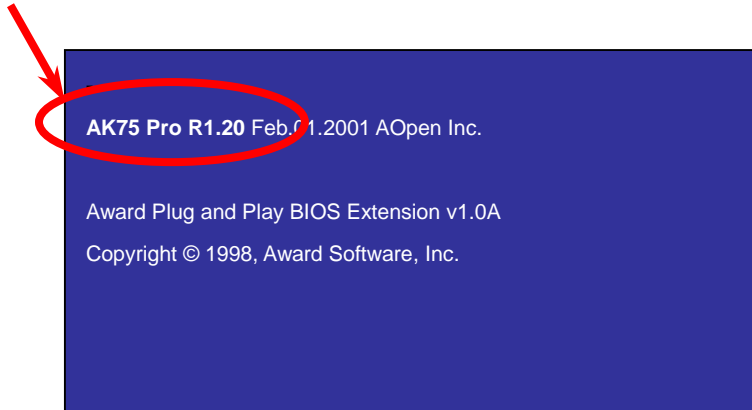
The Part Number and Serial number are printed on bar code label. You can find this bar code label on the outside packing, on ISA/CPU slot or on component side of PCB. For example:

P/N:91.88110.201   S/N:91949378KN73

Part No.   Serial No.

918811020191949378KN73

Part No.   Serial No.

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

AOpen

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:

AK75 Pro R1.20 Feb.01.2001 AOpen Inc.

Award Plug and Play BIOS Extension v1.0A

Copyright © 1998, Award Software, Inc.

AK75 Pro is model name of motherboard; **R1.20** is BIOS version.

Product Registration

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:

- Have opportunities to play online slot machine and win a prize from AOpen by accumulating your bonuses for later prize exchange.

- Be upgraded to gold membership of Club AOpen program.

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

- Receive email notification about latest product's announcements.

- Be able to personalize your AOpen web pages.

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

- Have opportunities to participate special product promotional programs.

- Enjoy higher service priority to receive technical assistance provided by AOpen specialists worldwide.

- Be able to join the discussions of web-based news groups.

AOpen makes sure that the information you provide is encrypted, so that it cannot be read or intercepted by other people or companies. Further, AOpen will not disclose any of information you submitted under any conditions. Please consult our online privacy policy for further information on our company policy.

> **Note:** *If registering products purchased from different dealers/retails and/or purchased on different dates, please submit a separate form for each product.*

How to Contact Us

Please do not hesitate contact us if you have any problem about our products. Any opinion will be appreciated.

Pacific Rim AOpen Inc. Tel: 886-2-3789-5888 Fax: 886-2-3789-5899	Europe AOpen Computer b.v. Tel: 31-73-645-9516 Fax: 31-73-645-9604	America AOpen America Inc. Tel: 1-510-498-8928 Fax: 1-408-922-2935
China 艾尔鹏国际上海(股)有限公司 Tel: 86-21-6225-8622 Fax: 86-21-6225-7926	Germany AOpen Computer GmbH. Tel: 49-2102-157700 Fax: 49-2102-157799	Japan AOpen Japan Inc. Tel: 81-048-290-1800 Fax: 81-048-290-1820

Web Site: *http://www.aopen.com*

E-mail: Send us email by going through the contact form below.

English	*http://www.aopen.com/tech/contact/techusa.htm*
Japanese	*http://www.aopen.co.jp/tech/contact/techjp.htm*
Chinese	*http://www.aopen.com.tw/tech/contact/techtw.htm*
German	*http://www.aopencom.de/tech/contact/techde.htm*
French	*http:/france.aopen.com/tech/contact/techfr.htm*
Simplified Chinese	*http://www.aopen.com.cn/tech/contact/techcn.htm*