

AX4BR-U

Online Manual

DOC. NO.: AX4BRU-OL-E0209B

What's in this manual

AX4BR-U	1
<i>What's in this manual</i>	<i>2</i>
<i>You Must Notice</i>	<i>8</i>
<i>Before You Start</i>	<i>9</i>
<i>Overview</i>	<i>10</i>
<i>Feature Highlight</i>	<i>11</i>
<i>Quick Installation Procedure</i>	<i>14</i>
<i>Motherboard Map</i>	<i>15</i>
<i>Block Diagram</i>	<i>16</i>
Hardware Installation.....	17
<i>About "User Upgrade Optional" and "Manufacture Upgrade Optional"</i>	<i>18</i>
<i>JP14 Clear CMOS Data</i>	<i>19</i>
<i>CPU Installation</i>	<i>20</i>
<i>CPU Jumper-less Design</i>	<i>23</i>
<i>CPU and System Fan Connector (with H/W Monitoring)</i>	<i>24</i>
<i>DIMM Sockets</i>	<i>25</i>
<i>Front Panel Connector</i>	<i>27</i>



ATX Power Connector 28

AC Power Auto Recovery 29

STBY LED 30

IDE and Floppy Connector 31

WOL (Wake on LAN) 33

Support 10/100 Mbps LAN onboard 35

PC99 Color Coded Back Panel 36

Support 2nd USB Port 37

Connecting COM2 Connector 38

Over-current Protection 39

3300µF Low ESR Capacitor 40

Layout (Frequency Isolation Wall) 41

Enlarged Aluminum Heatsink 42

Driver and Utility 43

 Installing Intel® Chipset Software Installation Utility 44

 Installing Intel IAA Driver 45

 ACPI Suspend to Hard Drive 46

BIOS Setup Utility 47

 Enter Setup 48



System Information 49

Product Information..... 53

Disk Drives..... 55

Onboard Peripherals..... 60

Power Management 67

Boot Options 71

Date and Time..... 75

System Security 77

Health Monitor..... 80

Load Default Settings..... 86

Abort Settings Change 87

Exit Setup 88

Overclocking **89**

VGA Card & Hard Disk 90

Glossary **91**

AC97..... 91

ACPI (Advanced Configuration & Power Interface) 91

AGP (Accelerated Graphic Port) 91

AMR (Audio/Modem Riser)..... 92



AOpen Bonus Pack CD 92

APM (Advanced Power Management) 92

ATA (AT Attachment) 92

ATA/66 92

ATA/100 93

BIOS (Basic Input/Output System) 93

Bus Master IDE (DMA mode) 93

CNR (Communication and Networking Riser)..... 94

CODEC (Coding and Decoding)..... 94

DDR (Double Data Rated) SDRAM 94

DIMM (Dual In Line Memory Module)..... 94

DMA (Direct Memory Access)..... 95

ECC (Error Checking and Correction) 95

EDO (Extended Data Output) Memory 95

EEPROM (Electronic Erasable Programmable ROM)..... 95

EPROM (Erasable Programmable ROM) 96

EV6 Bus 96

FCC DoC (Declaration of Conformity) 96

FC-PGA (Flip Chip-Pin Grid Array)..... 96



Flash ROM 97

FSB (Front Side Bus) Clock 97

I²C Bus 97

IEEE 1394 98

Parity Bit 98

PBSRAM (Pipelined Burst SRAM) 98

PC-100 DIMM 99

PC-133 DIMM 99

PC-1600 or PC-2100 DDR DRAM 99

PCI (Peripheral Component Interface) Bus 99

PDF Format 99

PnP (Plug and Play) 100

POST (Power-On Self Test) 100

RDRAM (Rambus DRAM) 100

RIMM (Rambus Inline Memory Module) 100

SDRAM (Synchronous DRAM) 101

Shadow E²PROM 101

SIMM (Single In Line Memory Module) 101

SMBus (System Management Bus) 101



SPD (Serial Presence Detect) 102

Ultra DMA 102

USB (Universal Serial Bus) 102

VCM (Virtual Channel Memory)..... 103

ZIP file..... 103

Troubleshooting..... **104**

Technical Support **108**

Product Registration **111**

How to Contact Us **112**

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 and Pentium 4 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.

This documentation is protected by copyright law. All rights are reserved.

No part of this document may be used or reproduced in any form or by any means, or stored in a database or retrieval system without prior written permission from AOpen Corporation.

Copyright[®] 1996-2002, AOpen Inc. All Rights Reserved.

Before You Start



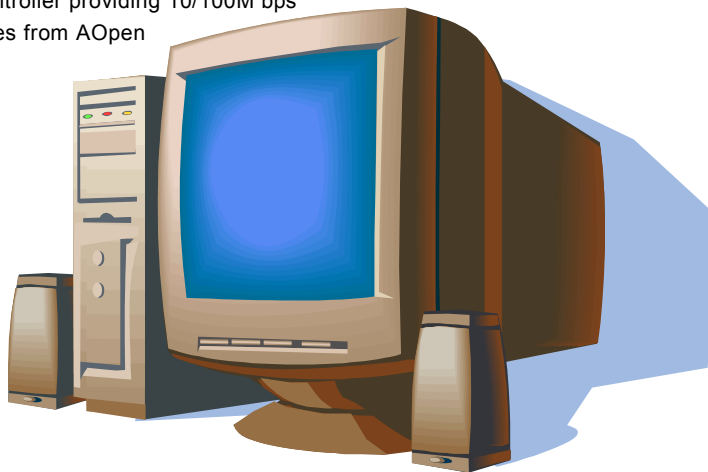
This Online Manual will introduce to the user how this product is installed. All useful information will be described in later chapters. Please keep this manual carefully for future upgrades or system configuration changes. This Online Manual is saved in [PDF format](#), we recommend using Adobe Acrobat Reader 4.0 for online viewing, it is included in [Bonus CD](#) 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 AX4BR-U motherboard. The AX4BR-U is Intel® Socket 478 motherboard (M/B) based on the ATX form factor featuring the [Intel® 845E \(Brookdale\) chipset](#). As high performance chipset built in the M/B, the AX4BR-U motherboard can support Intel® Socket 478 Pentium® 4 (Brookdale) and 533MHz [Front Side Bus \(FSB\)](#) clock. According to different customer's requirements, the Intel 845E chipset memory interface supports DDR200/266 SDRAM devices with densities of 128, 256, 512 and 1024Mb DDR SDRAM DIMM modules and the maximum memory size can be up to 2GB. The onboard IDE controller supports [Ultra DMA](#) 33/66/100 mode and the transfer rate up to 100MB/s. Besides, the AX4BR-U has a 8M ATI Rage XL VGA onboard and equips with Intel LAN controller providing 10/100M bps Ethernet for office and home use. Now, let's enjoy all features from AOpen AX4BR-U motherboard.



Feature Highlight

CPU

Supports Intel® Socket 478 Pentium® 4 (Brookdale) 1.4GHz~2.8GHz+ with 533MHz [Front Side Bus \(FSB\)](#) designed for Socket 478 technology.

Chipset

With Intel® 845E (Brookdale) chipset is designed for use with the Intel Pentium 4 processor and Northwood processor in the 478-pin package. The Intel 845E chipset Memory Controller Hub (MCH) component provides the processor interface, DRAM interface, AGP interface, and Hub Interface in an Intel 845E desktop platform. It is optimized for the Intel Pentium 4 processor and Northwood processor, supporting a single channel of DDR 200/266. Besides, it also supports the second generation I/O Controller Hub (Intel ICH4) to provide the features required by a desktop platform.

Expansion Slots

Including five 32-bit/33MHz PCI. The [PCI](#) local bus throughput can be up to 132MB/s. Of five PCI slots provided, all of them are master PCI slots with arbitration and decoding for all integrated functions and LPC bus.

Memory

Provides two 184-pin DDR [SDRAM](#) DIMM sockets that support up to 2GB of [PC-200/266](#) compliant DDR SDRAM (Synchronous Dynamic Random Access Memory). You may install 128, 256, 512 and 1024Mb DDR SDRAM DIMM modules into each socket.

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.

Intel® 82540EM GbE and Intel® 82551 LAN controllers

Another cost-effective feature for network solution is the integration of Intel 82540EM GbE and Intel 82551 10/100 Mbps Fast Ethernet controllers. The Intel 82540EM GbE integrates Intel's fourth-generation Gigabit MAC design with fully integrated, physical-layer circuitry to provide a standard IEEE 802.3 Ethernet interface for 1000BASE-T and 100BASE-TX applications. Moreover, on the strength of Intel 82551 LAN controller on board, which is a highly integrated Platform LAN Connect device, it provides 10/100 Mbps Ethernet.

Four USB Connectors

Provides two ports on the back panel and one [USB](#) connector for USB interface devices, such as mouse, keyboard, modem, scanner, etc.

Power Management/Plug and Play

Supports the power management function that conforms 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 (RAS)

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

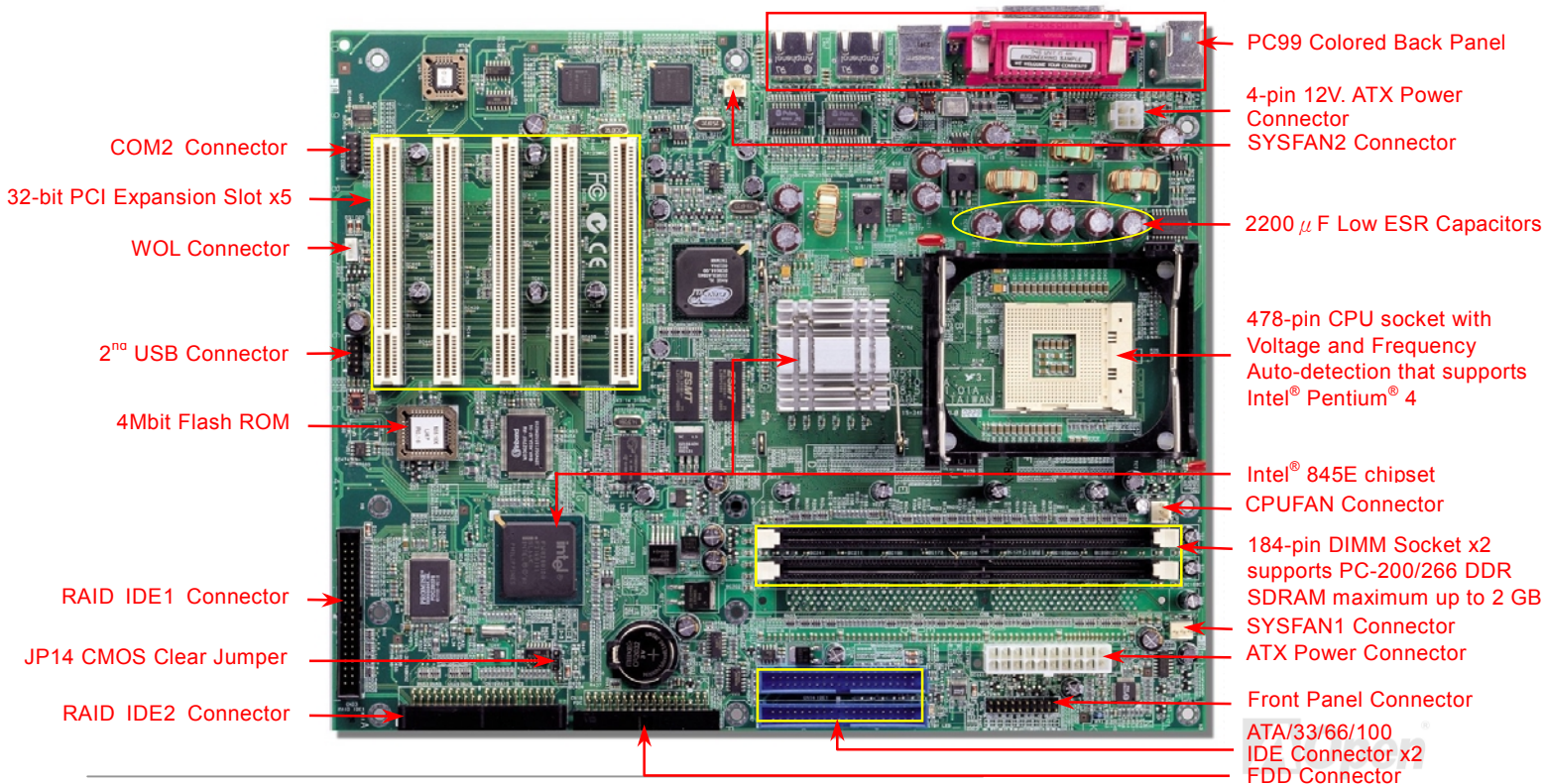
Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities. UART can also be directed from COM1 to the Infrared Module for the wireless connections.

Quick Installation Procedure

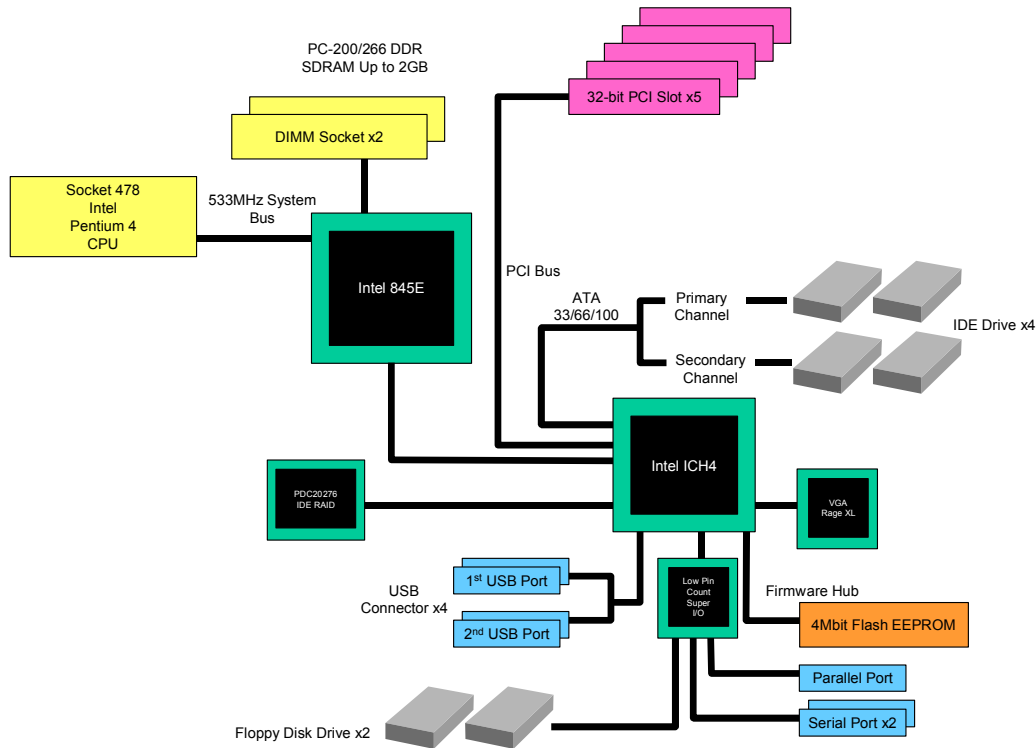
This page gives you a quick procedure on how to install your system. Follow each step accordingly.

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



Block Diagram



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.*

About “User Upgrade Optional” and “Manufacture Upgrade Optional”...

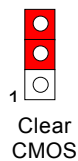
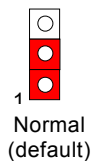
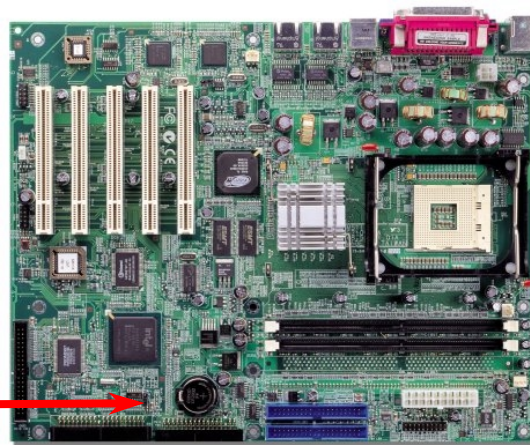
When you read this online manual and start to assemble your computer system, you may notice that some of the functions are marked as “User Upgrade Optional” or “Manufacture Upgrade Optional”. Although all of AOpen’s motherboards have included many amazing and powerful features, sometimes not every user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



JP14 Clear CMOS Data

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

1. Turn off the system and unplug the AC power.
2. Remove ATX power cable from connector PWR2.
3. Locate JP14 and short pins 2-3 for a few seconds.
4. Return JP14 to its normal setting by shorting pin1 & pin2.
5. Connect ATX power cable back to connector PWR2.



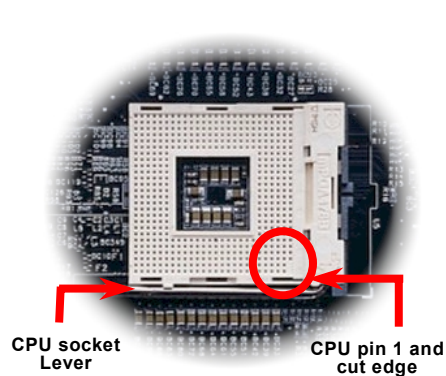
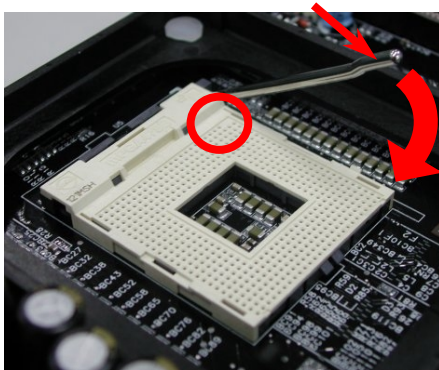
Tip: When should I Clear CMOS?

1. Boot fail because of overclocking...
2. Forget password...
3. Troubleshooting...

CPU Installation

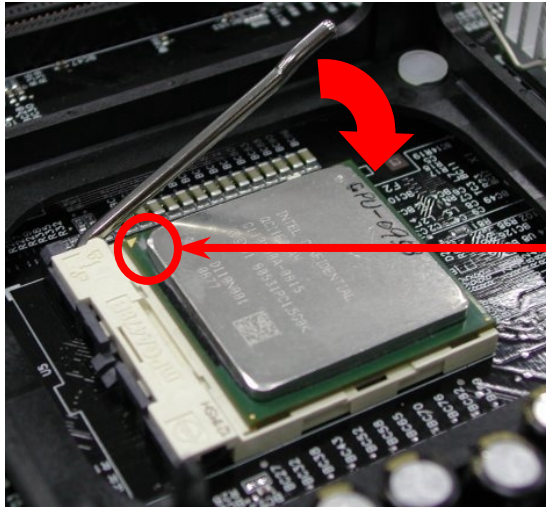
This motherboard supports Intel® Pentium 4 Socket 478 series CPU (Brookdale). Be careful of CPU orientation when you plug it into CPU socket.

1. Pull up the CPU socket lever and up to 90-degree angle.
2. Locate Pin 1 in the socket and look for a cut edge on the CPU upper interface. Match Pin 1 and cut edge, then insert the CPU into the socket.



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.

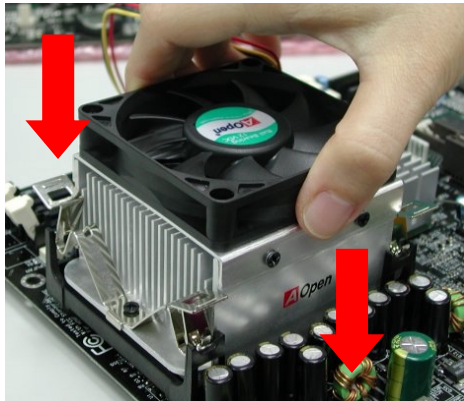
Note: This socket supports Micro-FC-PGA2 package CPU, which is the latest CPU package developed by Intel. Other forms of CPU package are impossible to be fitted in.

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

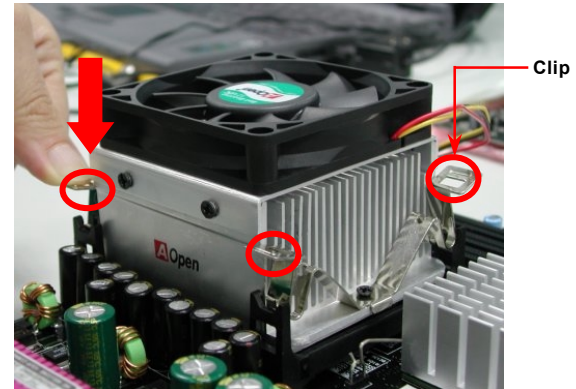
CPU Fan Installation

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

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

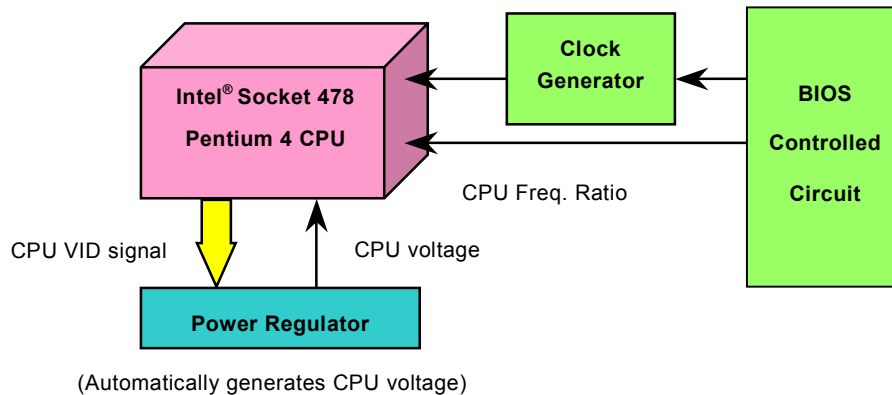


2. Pressing down the four clips with force one by one on the retention module.



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.



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

Plug in the CPU fan cable to the 3-pin **CPUFAN** connector. If you have chassis fan, you can also plug it on **SYSFAN1** or **SYSFAN2** connector.



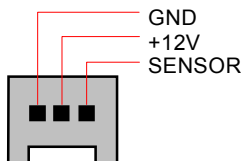
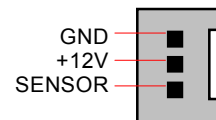
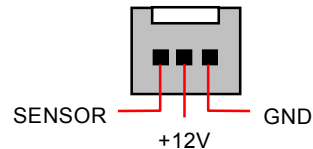
SYSFAN2 Connector



CPUFAN Connector



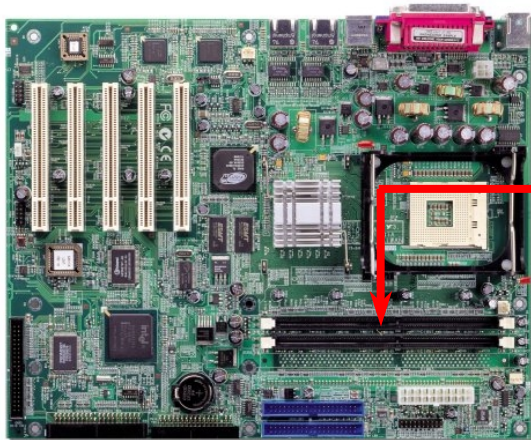
SYSFAN1 Connector



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

DIMM Sockets

This motherboard has two 184-pin DDR [DIMM](#) sockets that allow you to install [DDR200](#) or [DDR266](#) memory up 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.

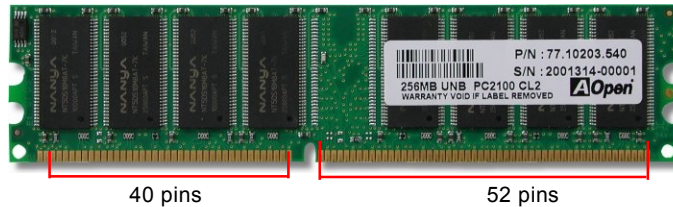


DIMM1
DIMM2

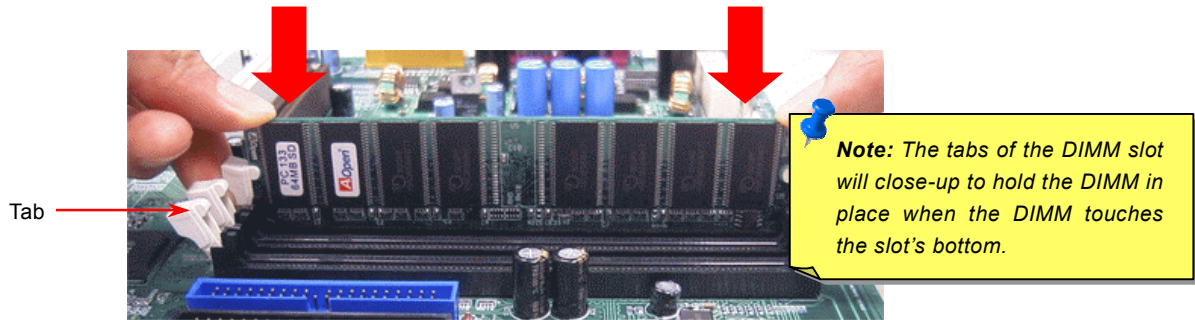
How to Install Memory Modules

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.

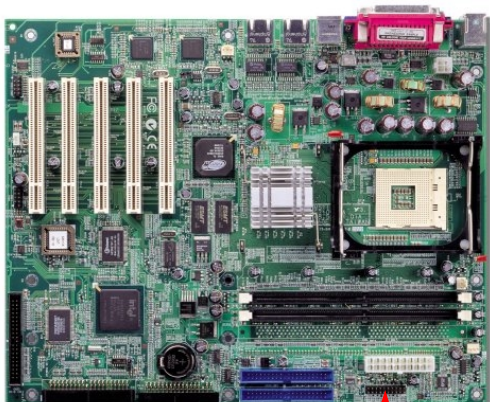


2. Insert the module straight down to the DIMM slot with both hands and press down firmly until the DIMM module is securely in place.



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

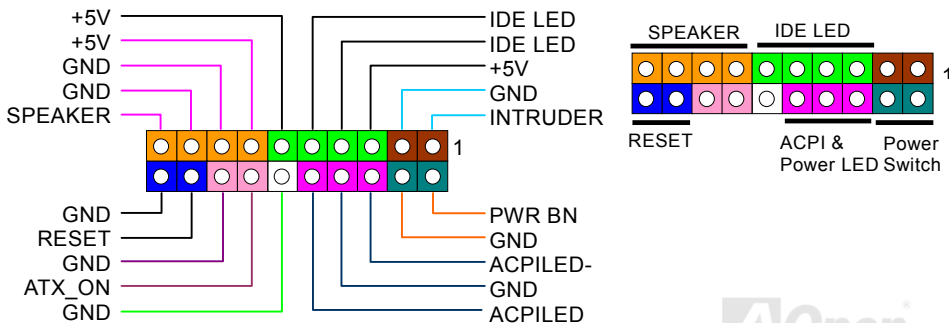
Front Panel Connector



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.

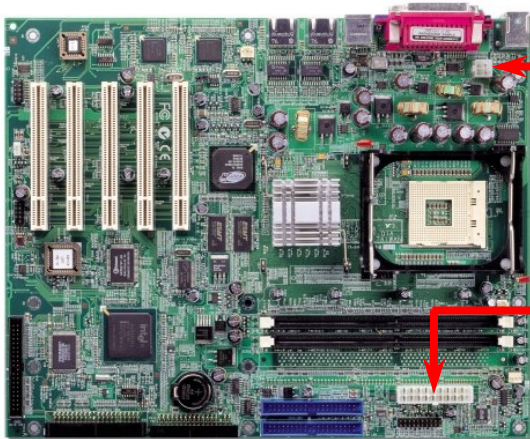
Locate the power switch cable from your ATX housing. It is 2-pin female connector from the housing front panel. Plug this connector to the soft-power switch connector marked **SPWR**.

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

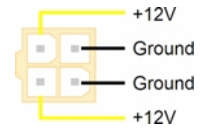


ATX Power Connector

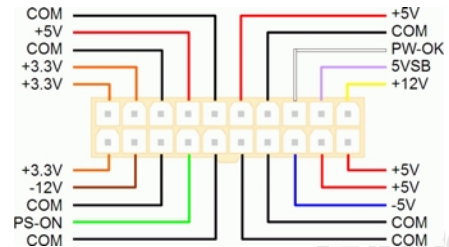
This motherboard comes with a 20-pin and 4-pin ATX power connector. Make sure you plug in the right direction. We strongly recommend you to connect the 4-pin 12V ATX connector before connecting the 20-pin ATX power connector and use standard power supply specially designed for Pentium 4 system.



4-Pin 12V ATX Power Connector



20-Pin Power Connector



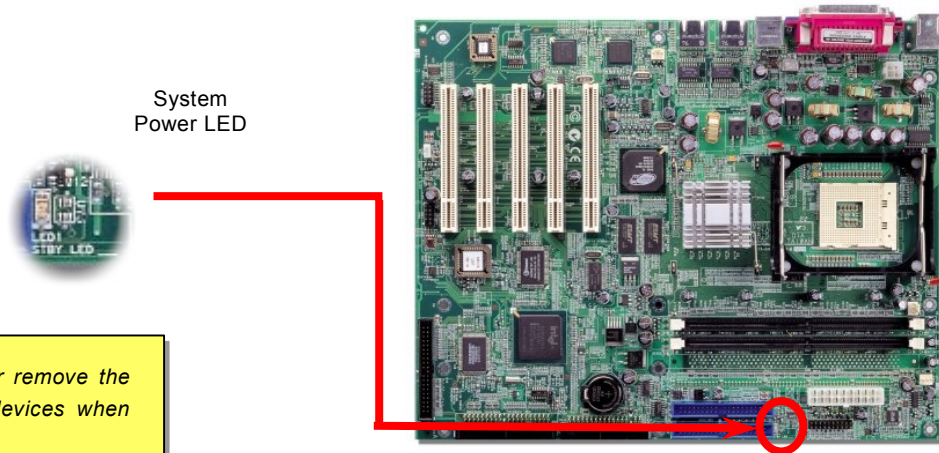
AC Power Auto Recovery

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.



STBY LED

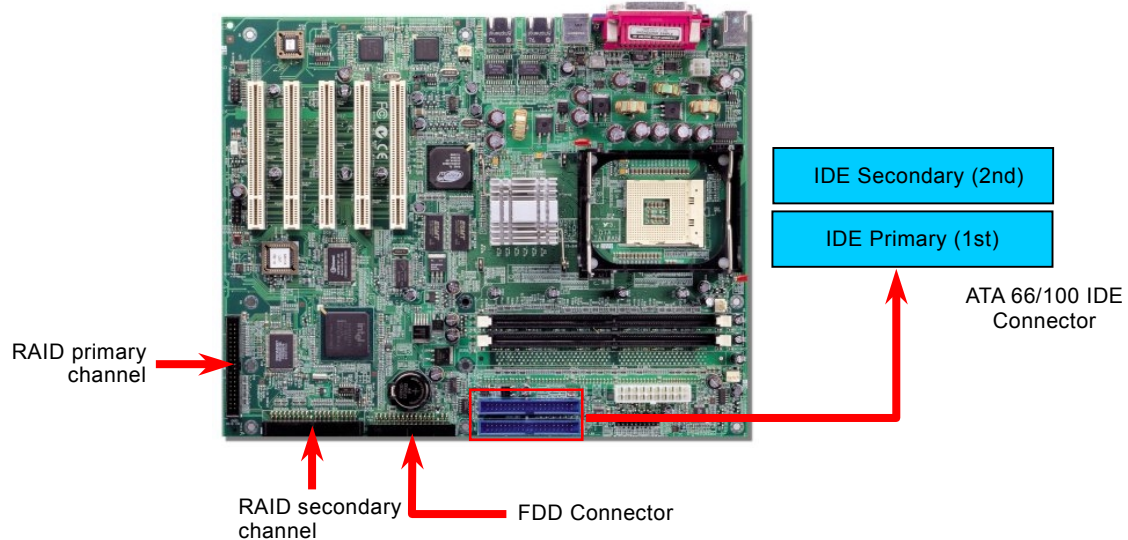
STBY LED is AOpen's considerate design that we aim at providing you friendly system information. The STBY LED will light up when power is provided to the motherboard. This is a convenient indication for you to check the system power status in many circumstances such as power on/off, stand-by mode and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



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

IDE and Floppy Connector

Connect 34-pin floppy cable and 40-pin IDE cable to floppy connector FDC and IDE connector. Pin1 of cable is normally marked with red color. Addition to IDE connectors, we also provide two RAID IDE connectors for you to connect RAID. Be careful of the pin1 orientation. Wrong orientation may cause system damage.



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	$(1/600\text{ns}) \times 2\text{byte} = 3.3\text{MB/s}$
PIO mode 1	30ns	13	383ns	$(1/383\text{ns}) \times 2\text{byte} = 5.2\text{MB/s}$
PIO mode 2	30ns	8	240ns	$(1/240\text{ns}) \times 2\text{byte} = 8.3\text{MB/s}$
PIO mode 3	30ns	6	180ns	$(1/180\text{ns}) \times 2\text{byte} = 11.1\text{MB/s}$
PIO mode 4	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
DMA mode 0	30ns	16	480ns	$(1/480\text{ns}) \times 2\text{byte} = 4.16\text{MB/s}$
DMA mode 1	30ns	5	150ns	$(1/150\text{ns}) \times 2\text{byte} = 13.3\text{MB/s}$
DMA mode 2	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
ATA 33	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} \times 2 = 33\text{MB/s}$
ATA 66	30ns	2	60ns	$(1/60\text{ns}) \times 2\text{byte} \times 2 = 66\text{MB/s}$
ATA100	20ns	2	40ns	$(1/40\text{ns}) \times 2\text{byte} \times 2 = 100\text{MB/s}$

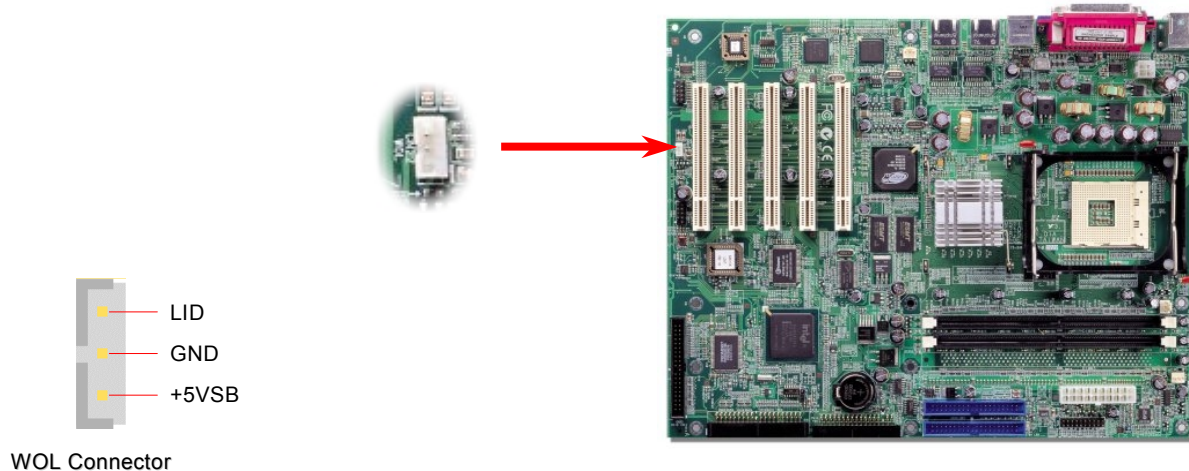
Warning: The specification of the IDE cable is a maximum of 46cm (18 inches); make sure your cable does not exceed this length.

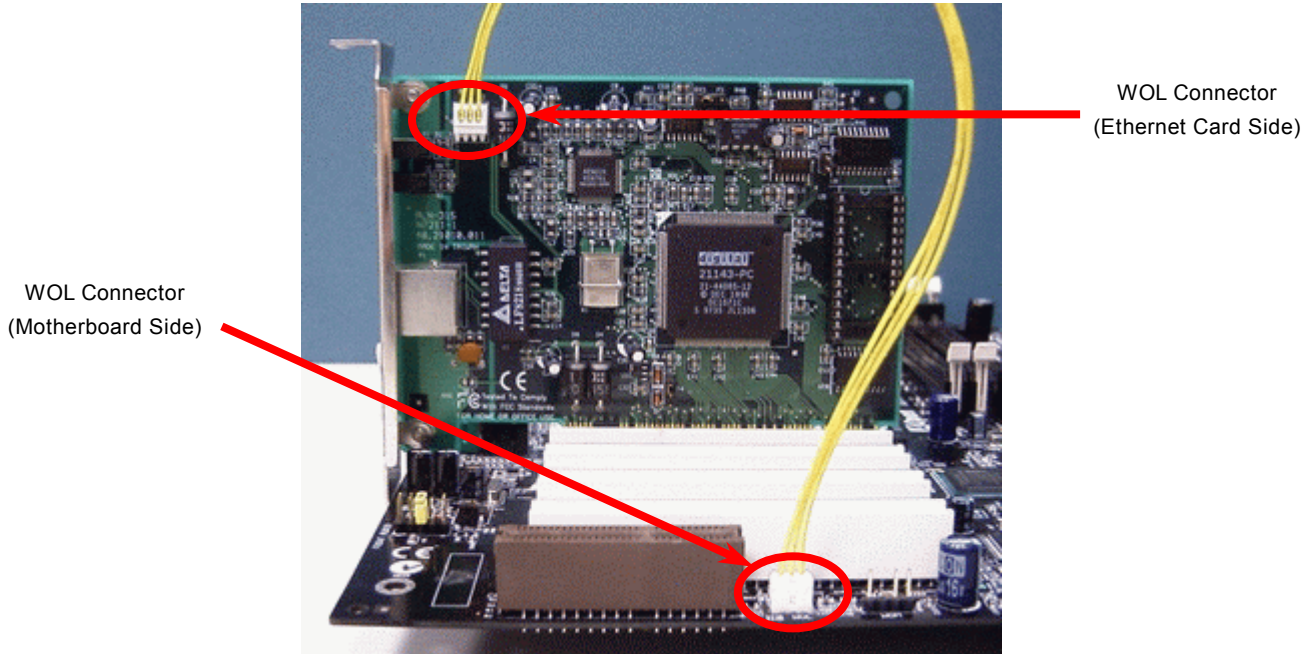
Tip:

- 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
- 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.

WOL (Wake on LAN)

This feature is very similar as [Wake On Modem](#), but it goes through local area network. 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.

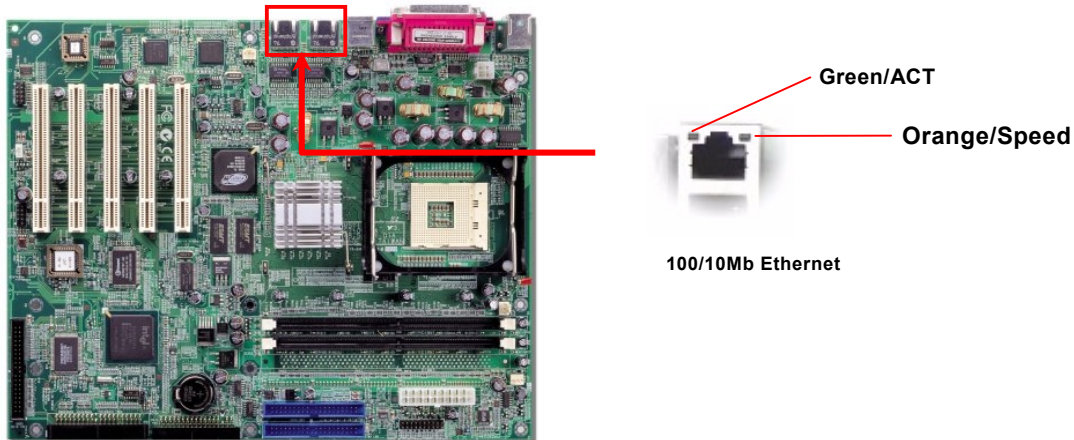




Note: This picture is for example only, it may not exactly be the same motherboard.

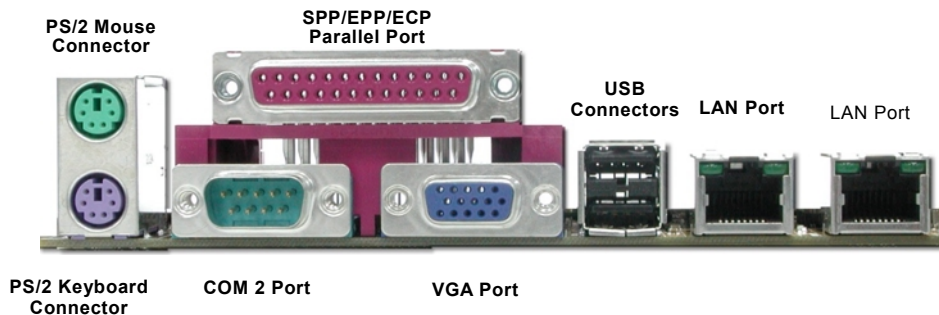
Support 10/100 Mbps LAN onboard

The Intel 82551QM includes a fast Ethernet controller on chip. On the strength of this LAN controller on board, which is a highly-integrated Platform LAN Connect device, it provides 10/100M bps Ethernet for office and home use, the Ethernet RJ45 connector is located on top of USB connectors. The green LED indicates the link mode, it lights when linking to network and blinking when transferring data. The orange LED indicates the transfer mode, and it lights when data is transferring in 100Mbps mode. To enable or disable this function, you may simply adjust it through BIOS.



PC99 Color Coded Back Panel

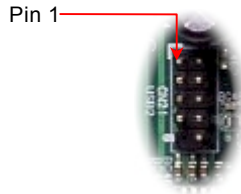
The onboard I/O devices are PS/2 Keyboard, PS/2 Mouse, COM1, VGA port, Printer, [USB](#), and LAN ports. The view angle of drawing shown here is from the back panel of the housing.



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.

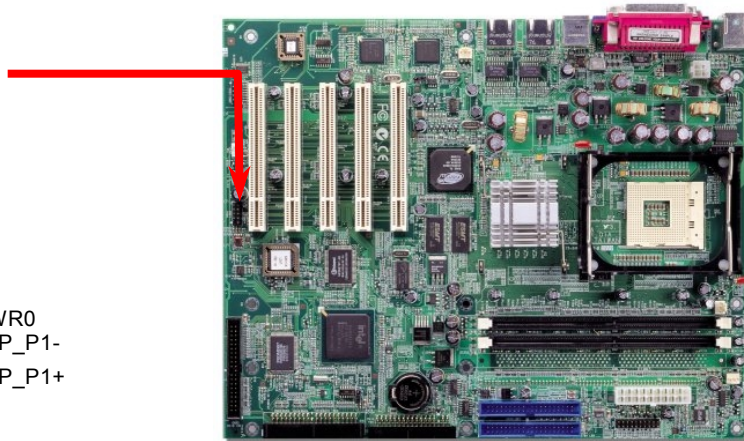
Support 2nd USB Port

This motherboard provides four [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 the other USB connector to the back panel or front panel of chassis.



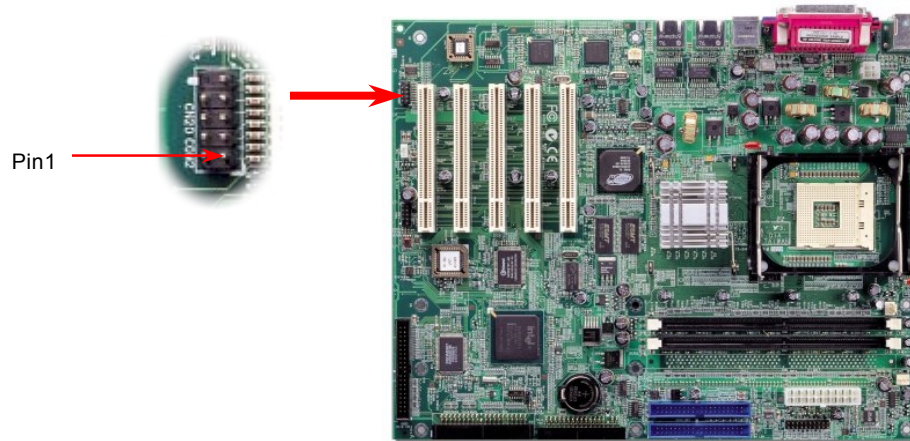
USB2 Connector

	1	2	
USBPWR0			USBPWR0
USB_FP_P0-			USB_FP_P1-
USB_FP_P0+			USB_FP_P1+
GND			GND
KEY			NC



Connecting COM2 Connector

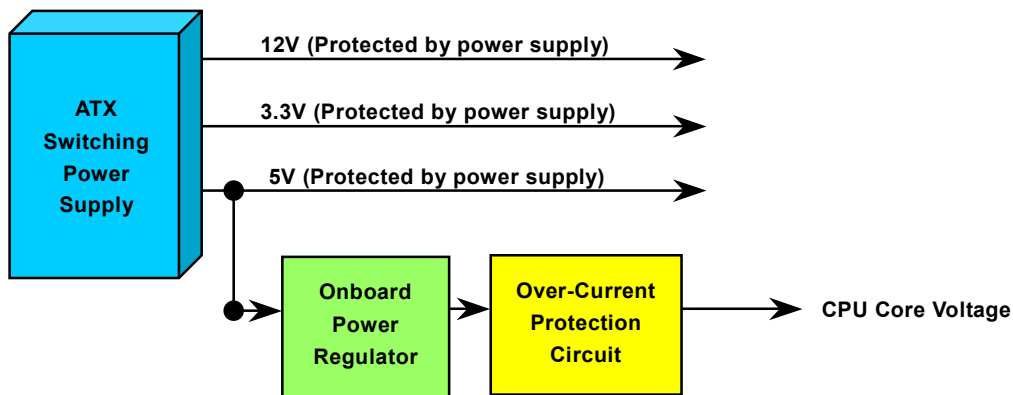
This motherboard comes with a COM1 connector on the back panel. However, we provide an extra COM2 connector for your convenience. Once you need to connect a device via COM2, just connect a suitable cable on it.



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

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.

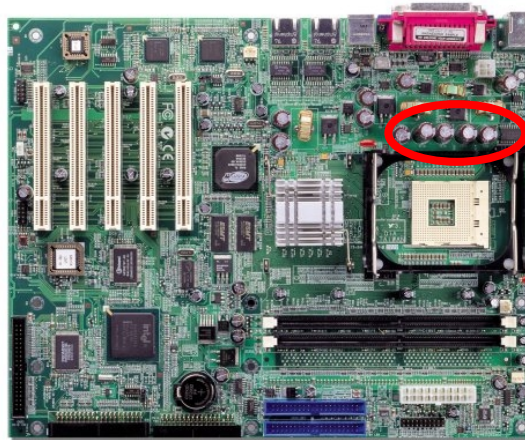


Note: Although we have implemented protection circuit try to prevent any human operating mistake, there is still certain risk that CPU, memory, HDD, add-on cards installed on this motherboard may be damaged because of component failure, human operating error or unknown nature reason. AOpen cannot guaranty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

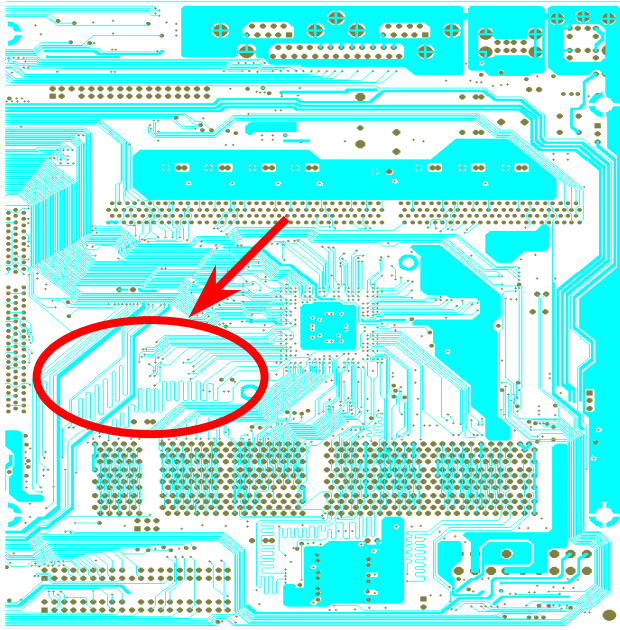
3300 μF Low ESR Capacitor

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, AX4BR-U implements 3300 μF capacitors, which is much larger than normal capacitor (1000 and 1500 μF) and it provides better stability for CPU power.



Layout (Frequency Isolation Wall)

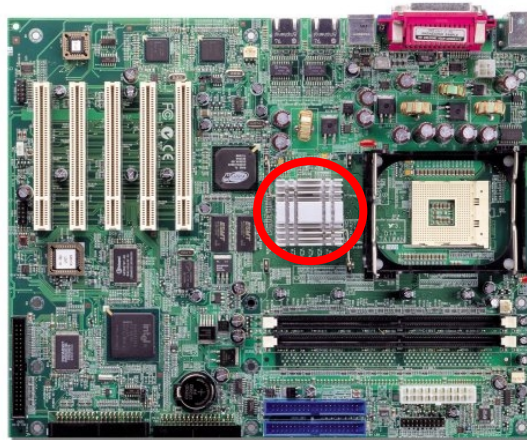


For high frequency operation, especially overclocking, layout is the most important factor to make sure chipset and CPU working in stable condition. The layout of this motherboard implements AOpen's unique design called " Frequency Isolation Wall". Separating each critical portion of motherboard into 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.

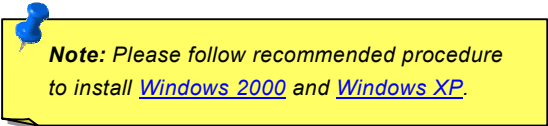
Enlarged Aluminum Heatsink

Cool down CPU and Chipset is important for system reliability. Enlarged aluminum heat sink provides better heat consumption especially when you are trying to over clocking the CPU.



Driver and Utility

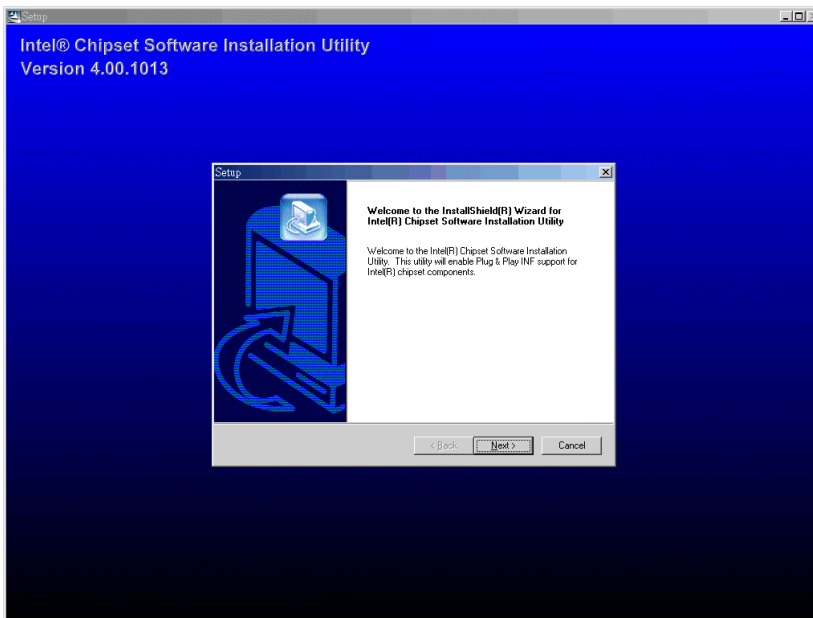
There are motherboard drivers and utilities included in [AOpen Bonus CD](#). You don't need to install all of them in order to boot your system. But after you finish the hardware installation, you have to install your operation system first (such as Windows 2000) before you can install any drivers or utilities. Please refer to your operation system's installation guide.



Note: Please follow recommended procedure to install [Windows 2000](#) and [Windows XP](#).

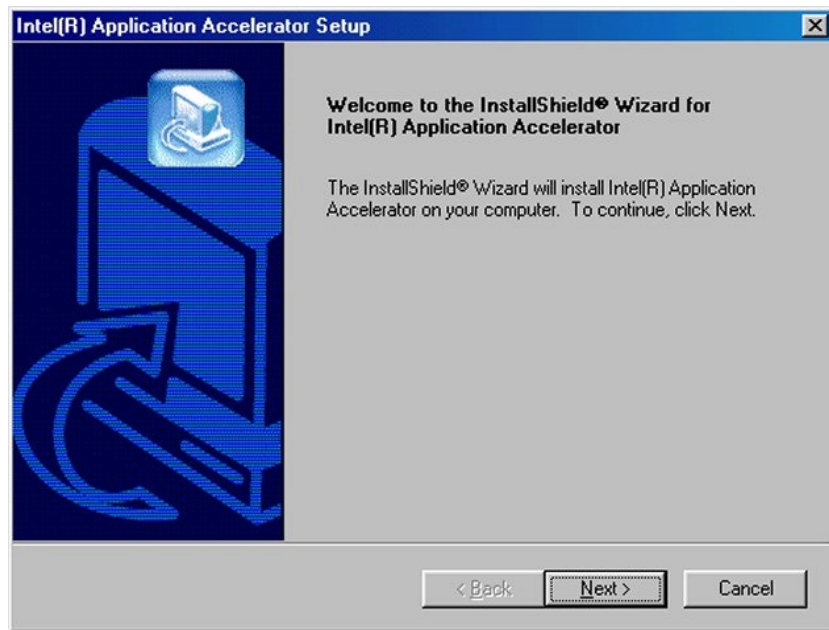
Installing Intel® Chipset Software Installation Utility

Windows 95/98 cannot recognize this chipset, because it was released before the Intel 845E chipset. You can install the Intel INF Update Utility from the Bonus Pack CD auto-run menu to eliminate the “?” marks.



Installing Intel IAA Driver

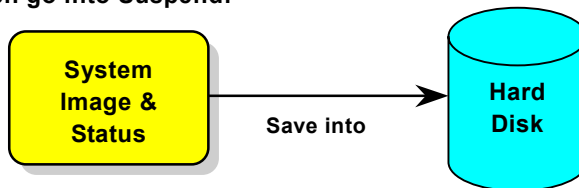
You can install Intel IAA Driver to increase the performance of software applications and reduce PC boot times. You can find it in the [AOpen Bonus Pack](#) CD.



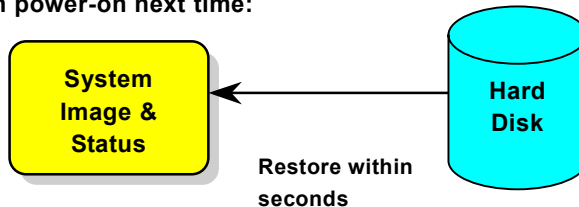
ACPI Suspend to Hard Drive

[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:



When power-on next time:



BIOS Setup Utility

Most of system had already configured by the manufacturer or the dealer. There is no need to run BIOS setup program when starting the computer unless you get a run setup program message.

The setup program loads configuration values into the battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM.

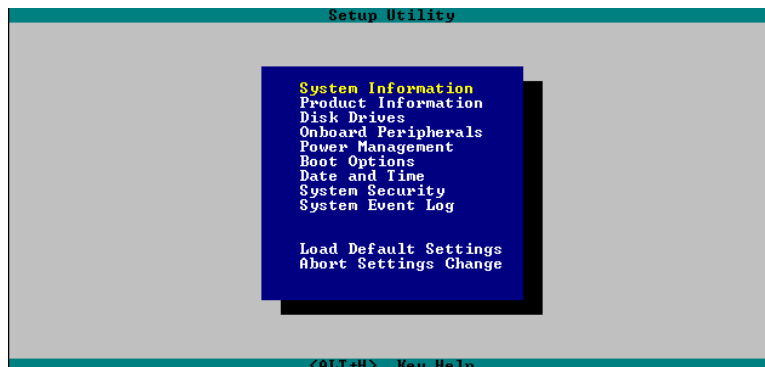
Enter Setup



To enter Setup, press the DELETE key.




**You must press DELETE while the system is booting.
This key does not work during any other time.**

The Setup Utility Main Menu appears:



Use the arrow keys  and  to move around the Setup Utility screen.

Use  to move to the next page or  to return to the previous page if the setup screen has more than one page available.

Use , , “+” or “-” to select the options if they are available.

Press  to return to the Main menu.

System Information

The following screen appears if you select System Information from the Main menu:

System Information	
Processor	..Intel (R) Pentium (R) 4 CPU 2.26GHz
Processor Speed.....	2.26GHz
Bus Frequency.....	133/533 MHz
Level 1 Cache.....	32 KB, Enabled
Level 2 Cache.....	512 KB, Enabled
Floppy Drive A.....	1 .44 MB 3.5-inch
IDE Primary Channel Master.....	Hard Disk, 20020 M.B.
IDE Primary Channel Slave.....	None
IDE Secondary Channel Master.....	None
IDE Secondary Channel Slave.....	None
Total Memory.....	256M
1st DIMM.....	None
2nd DIMM.....	DDR RAM, 256 MB
Serial Port 1	3F8h,IRQ4
Serial Port 2	2F8h,IRQ3
Parallel Port	378h,IRQ7
PS/2 Mouse.....	Installed

The System Information menu shows the current basic configuration of your system.

The sections below explain the parameters.

Processor

The Processor parameter specifies the type of processor currently installed in your system. The system supports Intel Pentium® 4 up to 2.8GHz.

Processor Speed

The Processor Speed parameter specifies the speed of the processor currently installed in your system.

CPU/SDRAM BUS Frequency

This parameter specifies the currently FSB (Front Side Bus) frequency of the CPU/SDRAM.

Level 1 Cache

This parameter specifies the first-level or the internal fast accessed memory (i.e., the memory integrated into the CPU) size, and whether it is enabled or disabled.

Level 2 Cache

This parameter specifies the second-level cache memory size that comes with the CPU. The available cache size is 256/512 KB.

Diskette Drive A

This parameter specifies the system's current diskette drive A settings.

IDE Primary Channel

This parameter specifies the current configuration of the IDE device connected to the master and slave ports of the primary IDE channel.

IDE Secondary Channel

This parameter specifies the current configuration of the IDE device connected to the master and slave ports of the secondary IDE channel.

Total Memory

This parameter specifies the total amount of onboard memory. The memory size is automatically detected by BIOS during the POST. If you install additional memory, the system automatically adjusts this parameter to display the new memory size.

1st Bank/2nd Bank/3rd Bank/4th Bank

The 1st Bank, 2nd Bank, 3rd Bank, and 4th Bank parameters indicate the type and size of DRAM installed in DIMM sockets 1 and 2 respectively. The **"None"** setting indicates that there is no DRAM installed.

Serial Port 1

This parameter shows the serial port 1 address and IRQ setting.

Serial Port 2

This parameter shows the serial port 2 address and IRQ setting.

Parallel Port

This parameter shows the parallel port address and IRQ setting.

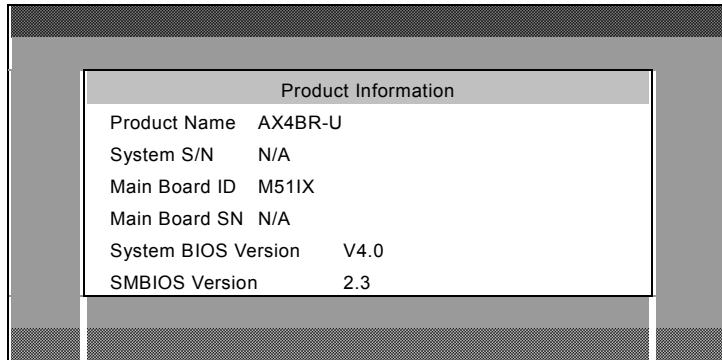
PS/2 Mouse

The BIOS utility automatically detects if there is a pointing device connected to your system. If there is, this parameter displays the “**Installed**” setting. Otherwise, this is set to “**None**”.

Product Information

The Product Information contains the general data about the system, such as the product name, serial number, BIOS version, etc. This information is necessary for troubleshooting (may be required when asking for technical support).

The following shows how the Product Information screen appears:



The screenshot shows a window titled "Product Information" with a list of system parameters. The parameters are listed in a table format with two columns: the parameter name and its value.

Product Information	
Product Name	AX4BR-U
System S/N	N/A
Main Board ID	M511X
Main Board SN	N/A
System BIOS Version	V4.0
SMBIOS Version	2.3

Product Name

This parameter specifies the official name of the system.

System S/N

This parameter specifies the system's serial number.

Main Board ID

This parameter specifies the motherboard's identification number.

Main Board S/N

This parameter specifies the motherboard's serial number.

System BIOS Version

This parameter specifies the version of the BIOS utility.

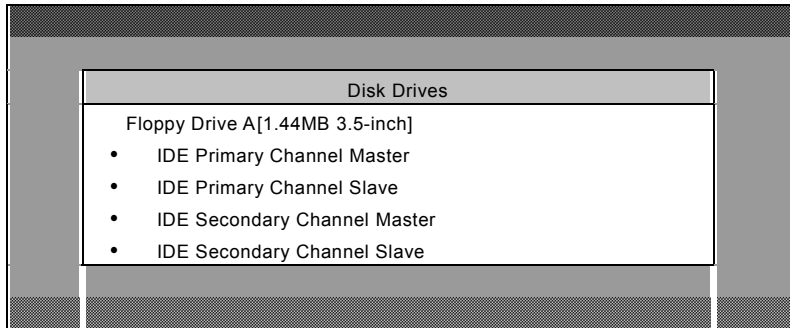
SMBIOS Version

This parameter specifies the version of the SMBIOS version.

Disk Drives

Select Disk Drives to input configuration values for disk drives.

The following screen shows the Disk Drives menu:



Floppy Drives

To enter the configuration value for the first floppy drive, highlight the Floppy Drive A parameter. Press **PGUP** or **PGDN** key to view the options and select the appropriate value.

Drive A

None
360KB 5.25"
1.2MB 5.25"
720KB 3.5"
1.44MB 3.5"
2.88MB 3.5"

These items select the floppy drive type. The available settings and types supported by the motherboard are listed to the left.

IDE Drives

To configure the IDE drives connected to your system, select the parameter that represents the channel and port where the desired hard disk to configure is connected. The options are:

IDE Primary Channel Master

This option lets you configure the hard disk drive connected to the master port of IDE channel 1.

IDE Primary Channel Slave

This option lets you configure the hard disk drive connected to the slave port of IDE channel 1.

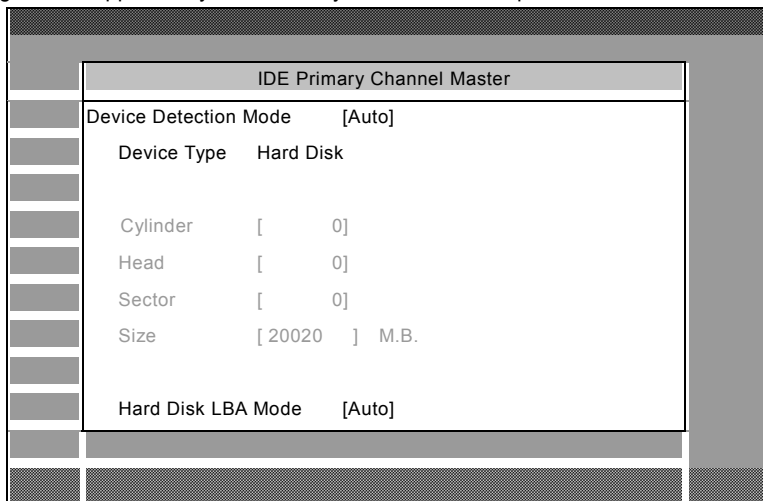
IDE Secondary Channel Master

This option lets you configure the hard disk drive connected to the master port of IDE channel 2.

IDE Secondary Channel Slave

This option lets you configure the hard disk drive connected to the slave port of IDE channel 2.

The following screen appears if you select any of the IDE Drive parameters:



The screenshot shows a configuration window titled "IDE Primary Channel Master". The window contains the following settings:

Device Detection Mode	[Auto]
Device Type	Hard Disk
Cylinder	[0]
Head	[0]
Sector	[0]
Size	[20020] M.B.
Hard Disk LBA Mode	[Auto]

Device Detection Mode

<u>Device Detection Mode</u>

Auto (Default)

User

None

If you select "Manual", you need to fill in all remaining field, such as Cylinder, Head, and Sector on this selected item. If the item "Auto" is selected, the items will remain "0". And when the system boot up, system will detect the hard disk and configure it automatically. "None" means there is no device in the channel.

Device Type

This parameter shows which type of IDE drive currently used.

Cylinder

This parameter specifies the number of cylinders of your hard disk, and is automatically set depending on your Type parameter setting.

Head

This parameter specifies the number of heads of your hard disk, and is automatically set depending on your Type parameter setting.

Sector

This parameter specifies the number of sectors of your hard disk, and is automatically set depending on your Type parameter setting.

Size

This parameter specifies the size of your hard disk, in MB.

Hard Disk LBA Mode

<u>Hard Disk Block Mode</u>
--

Auto (Default)

Disabled

This function enhances disk performance depending on the hard disk in use. If you set this parameter to “**Auto**”, the BIOS utility automatically detects if the installed hard disk drive supports the Block Mode function. If supported, it allows data transfer in blocks (multiple sectors) at a rate of 256 bytes per cycle. To disregard the feature, change the setting to “**Disable**”.

Onboard Peripherals

The Onboard Peripherals Configuration allows you to configure the onboard communication ports and the onboard devices. Selecting this option displays the following screen:

Onboard Peripherals	
Serial Port 1	[Enabled]
Base Address	[3F8h]
IRQ	[4]
Serial Port 2	[Enabled]
Base Address	[2F8h]
IRQ	[3]
Parallel Port	[Enabled]
Base Address	[378h]
IRQ	[7]
Operation Mode	[Standard]
ECP DMA Channel	[--]
Floppy Disk Controller	[Enabled]
IDE Controller	[Both]
PS/2 Mouse Controller	[Enabled]
USB Host Controller	[Enabled]
USB Legacy Mode	[Disabled]
Onboard IDE RAID	[Enabled]
Onboard 10/100 Ethernet Chip	[Enabled]
Onboard Gigabit Ethernet Chip	[Enabled]

Serial Ports 1 and 2

Serial Port 1 & 2

Enabled (Default)

Disabled

These parameters allow you to enable or disable serial ports 1 and 2.

Base Address

Base Address

Serial Port 1:

3F8h (Default)

3E8h

2E8h

Serial Port 2:

2F8h (Default)

2E8h

3E8h

This item allows you to assign address and interrupt for the board serial port.

IRQ

IRQ

Serial Port 1:

4 (Default), 11

Serial Port 2:

3 (Default), 10

This function lets you assign an interrupt for serial ports 1 and 2. The options for serial ports 1 are IRQ 4 and 11. The options for serial port 2 are IRQ 3 and 10.



The Base Address and IRQ parameters for each port are configurable only if the port is enabled.

Parallel Port

Parallel Port

Enabled (Default)
Disabled

This parameter allows you to enable or disable the parallel port.

Base Address

Base Address

378h (Default)
3BCh
278h

This item allows you to assign address and interrupt for the board serial port.

IRQ

IRQ

7 (Default), 5

This function lets you assign an interrupt for the parallel port. The options are IRQ 5 and 7.



The Base Address and IRQ parameters are configurable only if Parallel Port is enabled.

If you install an add-on card that has a parallel port whose address conflicts with the onboard parallel port, a warning appears on the screen.

Check the parallel port address of the add-on card and change the address to one that does not conflict.

Operation Mode

Operation Mode

EPP (Default)
Bi-Directional
Standard
ECP

This item lets you set the parallel port mode. The mode options are Standard, Bi-directional, EPP (Enhanced Parallel Port) and ECP (Extended Parallel Port).

Setting	Function
Standard Parallel Port (Standard)	Allows normal speed one-way operation
Bi-directional Parallel Port (Bi-directional)	Allows normal speed operation in a two-way mode
Enhanced Parallel Port (EPP)	Allows bi-directional parallel port operation at maximum speed
Extended Capabilities Port (ECP)	Allows parallel port to operate in bi-directional mode and at a speed higher than the maximum data transfer rate

ECP DMA Channel**ECP Mode Use DMA**

3

1 (Default)

This item becomes active only if you select Extended Capabilities Port (ECP) as the operation mode. It allows you to assign DMA channel 1 or DMA channel 3 for the ECP parallel port function (as required in Windows 95).

Floppy Disk Controller**Floppy Disk
Controller**

Enabled (Default)

Disabled

This parameter lets you enable or disable the onboard floppy disk controller.

IDE Controller**IDE Controller**

Both (Default)

Primary

Disabled

Set this parameter to "**Primary**" to enable only the primary IDE controller; "**Both**" to enable both primary and secondary IDE controllers; or "**Disabled**" to disable all IDE controllers.

PS/2 Mouse Controller**PS/2 Mouse
Controller**

Enabled (Default)

Disabled

This parameter enables or disables the onboard PS/2 mouse controller.

USB Host Controller**USB Host
Controller**

Enabled (Default)
Disabled

This parameter lets you enable or disable the USB controller on board. When enabled, it activates the USB function of the system. When disabled, it deactivates the function.

USB Legacy Mode**USB Legacy
Mode**

Enabled
Disabled (Default)

This parameter lets you enable or disable the USB controller on board. When enabled, it activates the USB function of the system. When disabled, it deactivates the function.

On-board IDE RAID**On-board IDE
RAID**

Enabled (Default)
Disabled

This parameter lets you enable or disable the IDE RAID controller on board. When enabled, it activates the RAID function of the system. When disabled, it also deactivates the function.

Onboard 10/100 Ethernet Chip**On-board 10/100
Ethernet Chip**

Enabled (Default)
Disabled

This parameter allows you to enable or disable the onboard network feature.

Onboard Ethernet Chip**On-board
Ethernet Chip**

Enabled (Default)
Disabled

This parameter allows you to enable or disable the onboard network feature.

Power Management

The Power Management menu allows you to configure the system power-management feature. The following screen shows the Power Management parameters and their default settings:

Power Management	
Power Management Mode	[Enabled]
IDE Hard Disk Standby Timer	[OFF]
System Sleep Timer	[OFF]
Sleep Mode	[-----]
Power Switch < 4 sec	[Power Off]
System wake-up event	
Modem Ring Indicator	[Enabled]
PCI Power Management	[Enabled]
RTC Alarm	[Disabled]
Resume Day	[--]
Resume Time	[--:--:--]
Restart on AC/Power Failure	[Disabled]

Power Management Mode

Power Management Mode

Enabled (Default)
Disabled

This parameter allows you to reduce power consumption. When this parameter is set to **“Enabled”**, you can configure the IDE hard disk and system timers. Setting it to **“Disabled”** deactivates the power-management feature and its timers.

IDE Hard Disk Standby Timer

IDE Hard Disk Standby Timer

Off (Default)
1 to 15min

This parameter allows the hard disk to enter standby mode after inactivity of **1 to 15** minutes, depending on your setting. When you access the hard disk again, allow 3 to 5 seconds (depending on the hard disk) for the disk to return to normal speed. Set this parameter to **“Off”** if your hard disk does not support this function.

System Sleep Timer

System Sleep Timer

Off (Default)
120, 110,
100...20, 15, 10,
5, 2min

This parameter sets the system to the lowest power-saving mode after a specified period of inactivity. Any keyboard or mouse action or any activity detected from the IRQ channels resumes system operation.

Sleep Mode

Sleep Mode

Standby
Suspend (Default)

This parameter lets you specify the power-saving mode that the system will enter after a specified period of inactivity. The options are "**Standby**" and "**Suspend**" modes. This parameter becomes configurable only if the System Sleep Timer is enabled. Any keyboard or mouse action, or any enabled monitored activities occurring through the IRQ channels resume system operation.

Power Switch < 4 sec.

Power Switch < 4

Sec.
Suspend
Power Off
(Default)

When set to "**Power Off**", the system automatically turns off when the power switch is pressed for less than 4 seconds. When set to "**Suspend**", the system enters the suspend mode when pressed for less than 4 seconds.

System Wake-up Event

The system wake-up event allows the system to resume operation when the modem ring indicator is enabled.

Modem Ring Indicator

**Modem Ring
Indicator**

Enabled
Disabled (Default)

When "**Enabled**" any fax/modem activity wakes up the system from suspend mode. The default setting is "**Disabled**".

PCI Power Management**PCI Power Management**

Enabled (Default)
Disabled

This item allows you to enable or disable the PCI power management function.

RTC Alarm**RTC Alarm**

Enabled
Disabled (Default)

This item allows you to set a certain time on a certain day to wake-up the system from suspend mode.

Resume Day**Resume Day**

1 to 31

This item is displayed when you enable the “**RTC Timer**” option. Here you can specify what date you want to wake up the system. For example, setting to 15, the system will wake up on the 15th day of every month.

Resume Time**Resume Time**

Hh:mm:ss

This item is displayed when you enable the RTC Wake Up Timer option. Here you can specify what time you want to wake up the system.

Restart On AC/Power Failure

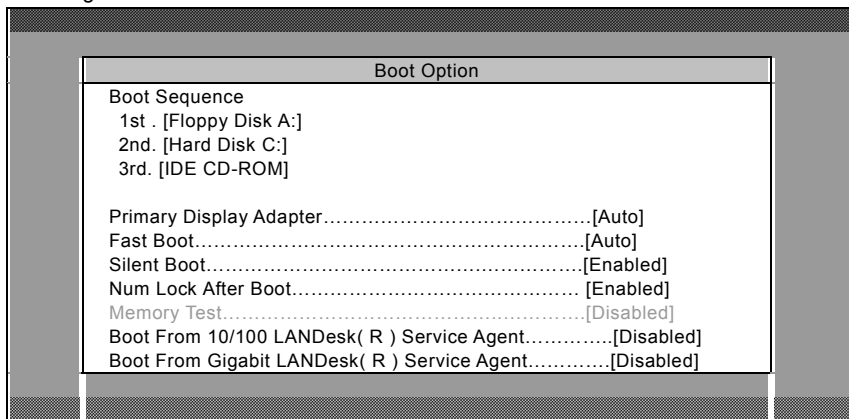
**Restart On
AC/Power Failure**

Enabled
Disabled (Default)
Pre-State

When “**Enabled**”, the system automatically turns on when the power comes back. When “**Disabled**” the system turns off and does not turn on when the power comes back. When set to “**Pre-State**”, the system maintains the last power state when the power comes back.

Boot Options

This option allows you to specify your preferred setting for boot up. The following screen appears if you select Boot Options from the Basic Configuration menu:



Boot Sequence

This parameter allows you to specify the boot search sequence during POST.

- 1st. The system checks this drive first.
- 2nd. The system then checks this drive if it can not boot from the 1st specified drive.
- 3rd. If the 1st and 2nd searches fail then it boots from this drive.

BIOS will display an error message if the drive(s) specified is not bootable.

Primary Display Adapter

Primary Display Adapter

Auto
Onboard (Default)

This parameter lets you activate the onboard video controller as your primary display adapter, or automatically disable it once BIOS detects that there is a video card installed in your system.

Fast Boot

Fast Boot

Auto (Default)
Disabled

This parameter allows the system to boot faster by skipping some POST routines.

Silent Boot

Silent Boot

Enabled (Default)

Disabled

This parameter enables or disables the Silent Boot function. When set to "**Enabled**", BIOS is in graphical mode and displays only an identification logo during POST and while booting. After booting the screen displays the operating system prompt (such as DOS) or logo (such as Windows 95). If any error occurs while booting, the system automatically switches to the text mode.

Even if your setting is "**Enabled**", you may also switch to the text mode while booting by pressing when you see the "**Press DELETE key to enter setup**" message on the screen.

When set to "**Disabled**", BIOS is in the conventional text mode where you see the system initialization details on the screen.

Num Lock After Boot

Num Lock After

Boot

Enabled (Default)

Disabled

This parameter allows you to activate the Num Lock function upon booting.

Memory Test

Memory Test

Enabled

Disabled (Default)

When set to "**Enabled**", this parameter allows the system to perform a RAM test during the POST routine. When set to "**Disabled**", the system detects only the memory size and bypasses the test routine.

Boot from 10/100 LANDesk(R) Service Agent

Boot from 10/100**LANDesk(R)****Service Agent**

Enabled

Disabled (Default)

When set to “**Enabled**”, this parameter allows system to boot from the LAN card.

Boot from Gigabit LANDesk(R) Service Agent

Boot from 10/100**LANDesk(R)****Service Agent**

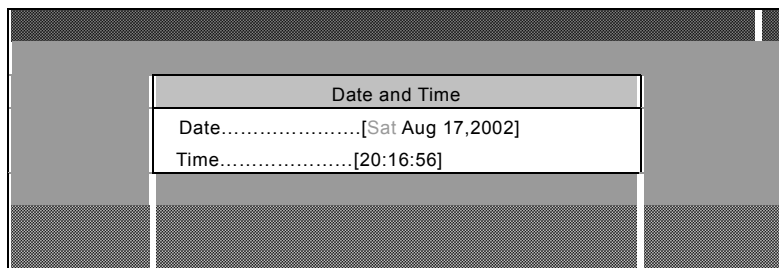
Enabled

Disabled (Default)

When set to “**Enabled**”, this parameter allows system to boot from the LAN card.

Date and Time

The real-time clock keeps the system date and time. After setting the date and time, you do not need to enter them every time you turn on the system. As long as the internal battery remains good (approximately seven years) and connected, the clock continues to keep the date and time accurately even when the power is off.



Date

Date

ww:mm:dd:yy

Highlight the items on the Date parameter and press **PGUP** or **PGDN** to set the date following the weekday-month-day-year format.

Valid values for weekday, month, day, and year are:

- Weekday: Sun, Mon, Tue, Wed, Thu, Fri, Sat
- Month: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

- Day: 1 to 31
- Year: 1980 to 2079

Time

Time
hh:mm:ss

Highlight the items on the Time parameter and press **PGUP** or **PGDN** to set the time following the hour-minute-second format.

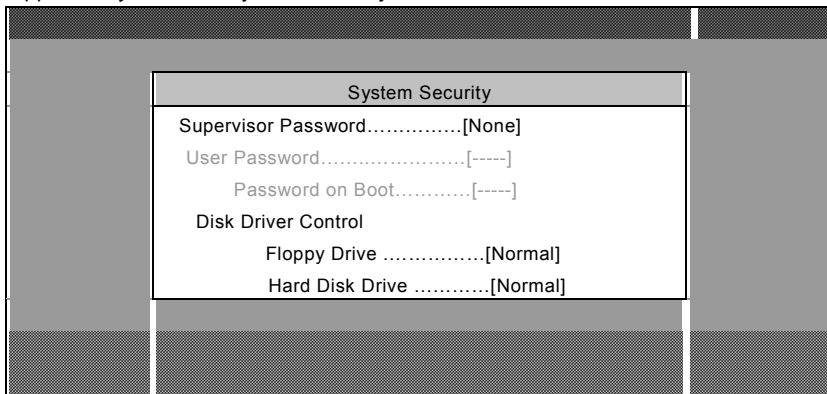
Valid values for hour, minute, and second are:

- Hour 00 to 23
- Minute 00 to 59
- Second 00 to 59

System Security

The Setup program has a number of security features to prevent unauthorized access to the system and its data.

The following screen appears if you select System Security from the Main menu:

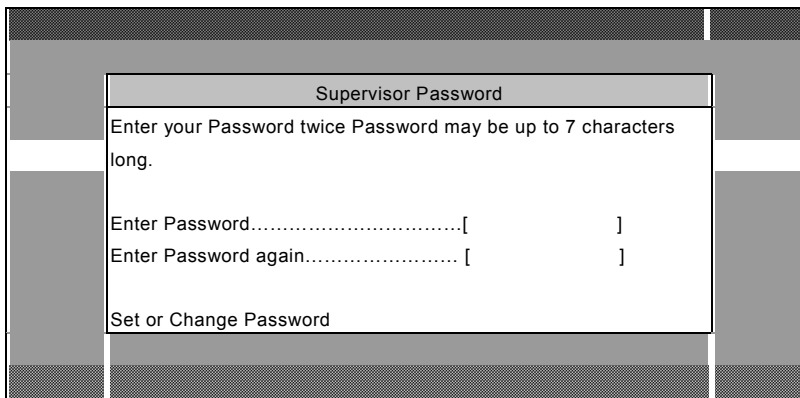


Supervisor Password

Supervisor
Password

None (Default)
Present

This item can prevent unauthorized access to the BIOS utility. The "**Present**" setting allows you to set a setup password.



Supervisor Password

Enter your Password twice Password may be up to 7 characters long.

Enter Password.....[]

Enter Password again..... []

Set or Change Password

1. Enable the Supervisor Password parameter in the System Security menu by pressing the ENTER key. The Supervisor Password windows will appear as shown above.
2. Type a password. The password may consist of up to seven characters.



Be very careful when typing your password because the actual characters do not appear on the screen.

3. Press the ENTER key. Re-type the password to verify your first entry then press ENTER key again.
4. Highlight the **“Set or change password”** option and press ENTER key.
5. Press the ESC key to return the System Security screen.

6. Press the ESC key to exit setup. The Exit Setup screen will appear.
7. Choose “**Yes**” to save your setting and exit Setup. Your password will be saved to CMOS.
8. If you want to remove the password, please select “**Disabled**” to disable this function.

User Password

User Password

None (Default)

Present

This item can secure your system against unauthorized use. Once you set this password, you have to type it before you access to normal operation on the system. This item is available only when Supervisor Password is set.

Password on Boot

Password on**Boot**

None (Default)

Present

If you set this password, the system will request you the password while booting. This password is available only when user password is set.

Disk Drive Control

The disk drive control features allow you to control the floppy drive or the hard disk drive boot function to prevent loading operating systems or other programs from a certain drive while the other drives are operational (under DOS mode only).

The table below lists the drive control settings and their corresponding functions.

Floppy Drive	
Setting	Description
Normal	Floppy drive functions normally
Write Protect All Sectors	Disables the write function on all sectors
Write Protect Boot Sector	Disables the write function only on the boot sector
Hard Disk Drive	
Setting	Description
Normal	Hard disk drive functions normally
Write Protect All Sectors	Disables the write function on all sectors
Write Protect Boot Sector	Disables the write function only on the boot sector

Health Monitor

The system event log enables you to record and monitor events that occur in your system like system temperature, fan stops, and others. This feature allows you to specify the appropriate settings for your system's event handling. Selecting the option displays the following screen:



Health Monitor	
Event Logging	
Event Logging.....	[Enabled]
Clear Event Logs.....	[Disabled]
Total Number of Event Logs	12
Remain of Event Log Area	93%
. View Event Logs	
Hardware Monitor	
. Health Monitor Status	
Temperature/Voltage/Fan.....	[Disabled]
CPU Fan.....	[-----]
1st System Fan.....	[-----]
2nd System Fan.....	[-----]
Memory ECC.....	[Enabled]
Threshold Setting	
CPU Temperature.....	[70] °C [158] °F
CPU Core Voltage.....	1.50 V
CPU Voltage.....	[±0.2] V
+3.3 V.....	[±0.4]V
+3.3 V Standby.....	[±0.7] V
+5 V.....	[±0.6] V
+5 V Standby.....	[±0.6] V
+12 V.....	[±0.7] V
Vbat.....	[±0.3] V
Cpu Fan.....	[2000] RPM
System Fan.....	[2000] RPM
POST Event Action	
Power off if Fan Fail.....	[Disabled]
Poewr off if CPU Temperature too High...	[Disabled]
Alert Beep When Log an Event.....	[Disabled]



Event Logging

This option allows you to record monitored events that occur during the operation of your system.

Event Logging

Event Logging

Enabled (Default)

Disabled

This item allows you to enable or disable the system event logging function.

Clear Event Logs

Clear Event Logs

Enabled

Disabled (Default)

This item allows you to enable or disable the system event logs clearing function. Please enable it if you want to clear the event log whenever the event log area is full.

Total Number of Event Logs

**Total Number of
Event Logs**

The currently number of events located in the event log area.

Remain of Event Log Area

**Available Space
for Event Logs**

The percentage of space that is still available for logging system events.

View Event Logs

View Event Logs

Opens the system event log file for viewing.

Hardware Monitor

This parameter monitors the hardware status such as fan and memory information.

Health Monitor Status

Health Monitor
Status

Represents the system information.

Health Monitor Status	
CPU Temperature.....	[0038]
CPU Core Voltage.....	1.50 V
CPU Voltage.....	[1.50] V
CPU Fan.....	[N/A] RPM
+3.3 V.....	[3.37] V
+3.3 V standby	[3.42] V
+5 V.....	[5.08] V
+5 V Standby.....	[5.10] V
+12 V.....	[12.22] V
Vbat.....	[3.28] V
System Temperature.....	[0040] °C
1st System Fan.....	[N/A]
2nd System Fan.....	[0000] RPM



Temperature/Voltage/Fan**Temperature/Voltage/Fan**

Enabled (Default)

Disabled

Enable or disable the monitoring of the system's temperature, voltage, and CPU fan.

Memory ECC**ECC**

Enabled (Default)

Disabled

ECC or Error-Correcting Code tests the accuracy of data as it passes in and out of memory. This parameter enables or disables the monitoring of this function.

Threshold

Setting **Threshold****Setting**

This parameter allows you to set CPU temperature, core voltage and fan threshold values.

POST Event Action**Power off if Fan Fail****Power off if Fan****Fail**

This parameter allows you to enable or disable the automatic power off when fan fails working.

Power off if Fan Fail

Power off if CPU
Temperature too
High

This parameter allows you to enable or disable the automatic power off when CPU temperature is too high.

Alert Beep When Log an Event

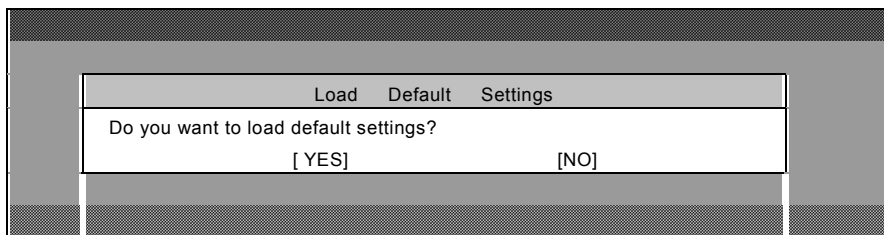
Alert Beep When
Log an Event

This parameter allows you to enable or disable an alert beep when a log is produced.

Load Default Settings

Use this option to load the default settings for the optimized system configuration. When you load the default settings, some of the parameters are grayed-out with their fixed settings. These grayed parameters are not user-configurable.

The following dialog box appears when you select Load Default Settings from the main menu:



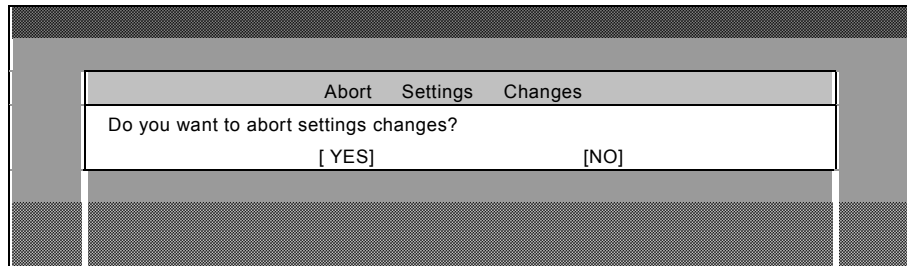
Select "**Yes**" to load the default settings.

Select "**No**" to ignore the message and return to the BIOS utility.

Abort Settings Change

Use this option to disregard your changes to the BIOS and reload your previous settings.

The following dialog box appears when you select Abort Settings Change from the main menu:

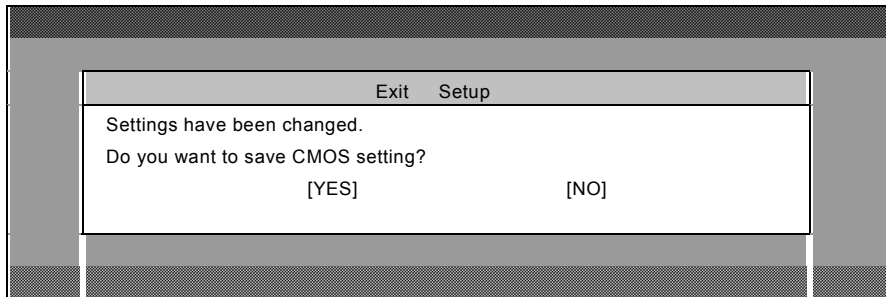


Select "**Yes**" to disregard your changes and reload your previous settings. After reload, the main menu appears on screen.

Select "**No**" to ignore the message and return to the BIOS utility.

Exit Setup

Use this option to exit the BIOS utility.



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 **533MHz** CPU bus clock. But it comes with clock generator of **248MHz** when we design it to accommodate with future CPU bus clock. Our lab test results showed that **120MHz** is achievable when proper setting and qualified components were presented. Not only that, the CPU clock ratio can be up to 24x that supports almost all of Pentium® 4 CPUs in the future and provides flexibility for overclockers. For your reference, the configuration we feel appropriate for this motherboard is **120MHz** bus clock.

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.*

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 $66\text{MHz} \times 4\text{byte} \times 2 = 528\text{MB/s}$. AGP is now moving to 4X mode, $66\text{MHz} \times 4\text{byte} \times 4 = 1056\text{MB/s}$. AOpen is the first company to support 4X AGP motherboards by both AX6C (Intel 820) and MX64/AX64 (VIA 694x), started from Oct 1999.

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 [ATA/66](#) but clock cycle time is reduced to 40ns. The data transfer rate is $(1/40\text{ns}) \times 2 \text{ bytes} \times 2 = 100\text{MB/s}$. 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 [EPROM](#) or [Flash ROM](#). BIOS controls Input/output devices and other hardware devices of motherboard. In general, to provide hardware independent portability, operation system and drivers is required to access BIOS without directly access hardware devices.

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 E²PROM. 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.

FSB (Front Side Bus) Clock

FSB Clock means CPU external bus clock.

CPU internal clock = CPU FSB Clock x CPU Clock Ratio

I²C 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, $4 \times 16 = 64$ 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 $200 \times 64 / 8 = 1600 \text{MB/s}$, and $266 \times 64 / 8 = 2100 \text{MB/s}$. 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 E²PROM

A memory space in Flash-ROM to simulate E²PROM operation, AOpen motherboard uses Shadow E²PROM 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.

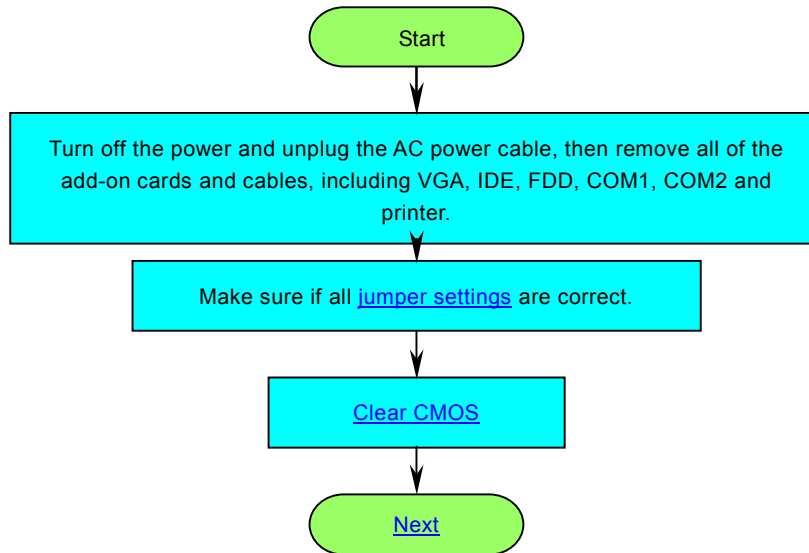
ZIP file

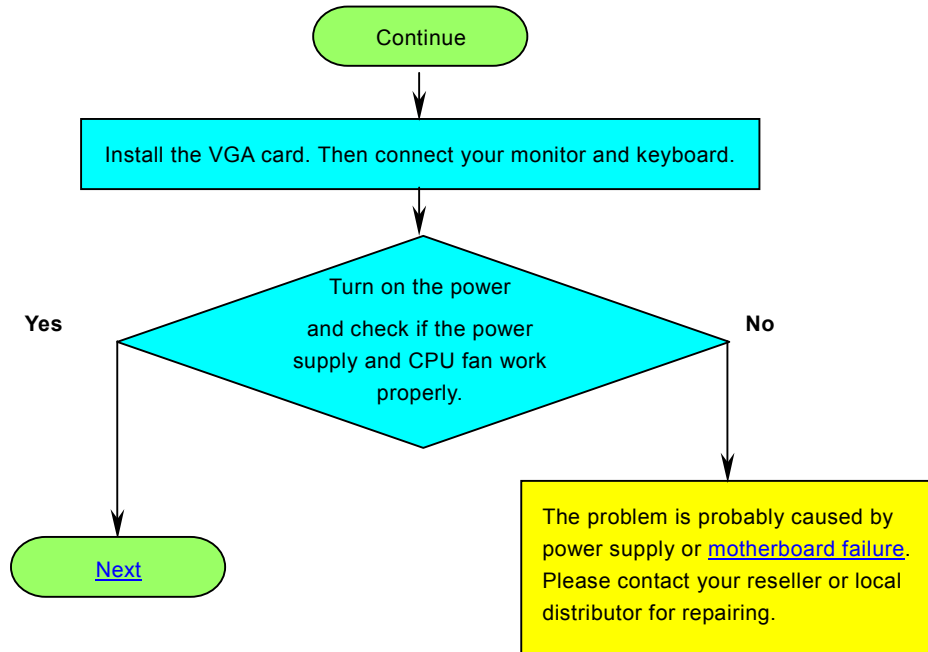
A compressed file format to reduce file size. To unzip file, run shareware PKUNZIP (<http://www.pkware.com/>) for DOS and other operating system or WINZIP (<http://www.winzip.com/>) for windows environment.

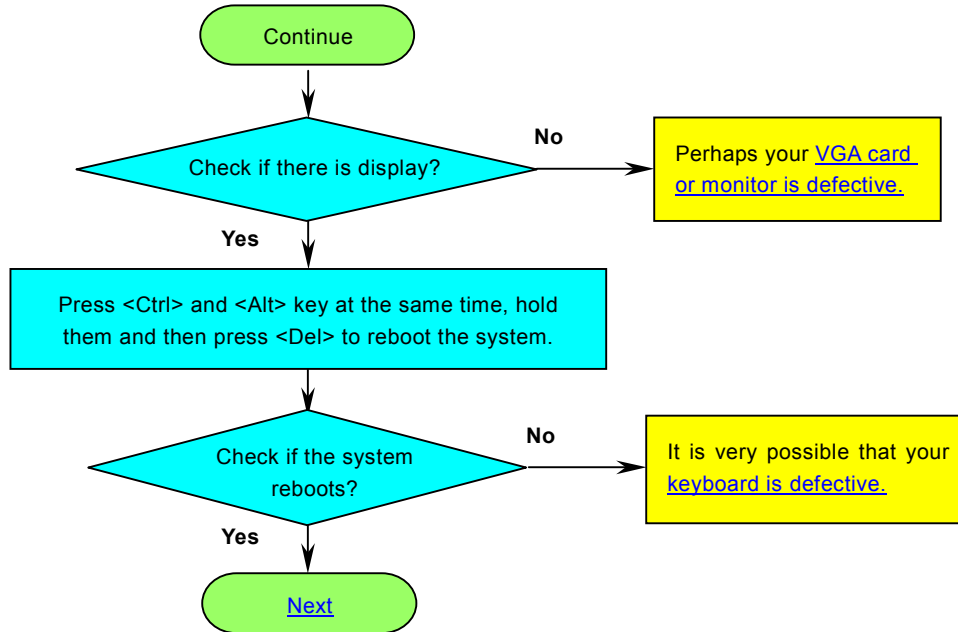


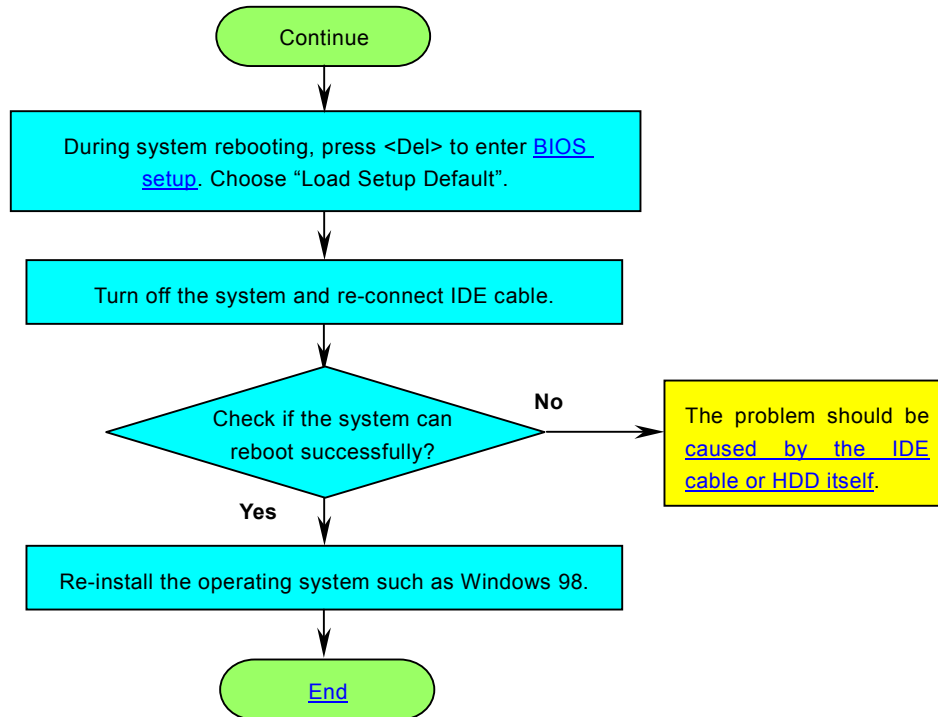
Troubleshooting

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











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://english.aopen.com.tw/tech/download/manual/default.htm>

2

Test Report: We recommend choosing board/card/device from the compatibility test reports for assembling your PC.

<http://english.aopen.com.tw/tech/report/default.htm>

3

FAQ: The latest FAQ (Frequently Asked Questions) may contain a solution to your problem.

<http://english.aopen.com.tw/tech/faq/default.htm>

4

Download Software: Check out this table to get the latest updated BIOS/utility and drivers.

<http://english.aopen.com.tw/tech/download/default.htm>

5

News Group: Your problem probably had been answered by our support engineer or professional users on the news group.

<http://english.aopen.com.tw/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 more efficiently than us. After all, their attitude of service is an 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 or on component side of PCB. For example:



Part No.

Serial No.



Part No.

Serial No.

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

Model name and BIOS version

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



AX4BR-U is model name of motherboard; **R1.20** is BIOS version.



Product Registration

Club AOpen

Welcome to AOpen Inc.



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: 1-510-489-8928

Fax: 1-510-489-1998

China

艾爾鵬國際貿易(上海)有限公司

Tel: 86-21-6225-8622

Fax: 86-21-6225-7926

Germany

AOpen Computer GmbH.

Tel: 49-1805-559191

Fax: 49-2102-157799

Japan

AOpen Japan Inc.

Tel: 81-048-290-1800

Fax: 81-048-290-1820

Web Site: <http://www.aopen.com.tw>

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

English <http://english.aopen.com.tw/tech/default.htm>

Japanese <http://www.aopen.co.jp/tech/default.htm>

Chinese <http://www.aopen.com.tw/tech/default.htm>

German <http://www.aopencom.de/tech/default.htm>

Simplified Chinese <http://www.aopen.com.cn/tech/default.htm>