

mATX AIMB-542 Series

Intel® Pentium® D / Pentium® 4 / Celeron® mATX
Main Board

User's Manual



Ver. 1.00

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Notices

Federal Communications Commission Statement

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

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

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

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



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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.



The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- Chapter 1: Product introduction
This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.
- Chapter 2: BIOS setup
This chapter tells how to change system settings through the BIOS Setup menu. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. Advantech websites
The Advantech website provides updated information on Advantech hardware and software products. Refer to the Advantech contact information.
2. Optional documentation
Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Instructions that you **MUST** follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Typography

Bold text

Indicates a menu or an item to select

Italics

Used to emphasize a word or a phrase

<Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key

Example: <Enter> means that you must press the Enter or Return key

<Key1>+<Key2>+<Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+)

Example: <Ctrl>+<Alt>+<D>

Command

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets

Example: At the DOS prompt, type the command line:

afudos /i [filename]

afudos /iP5P800VM.ROM

AIMB-542 specifications summary

| | |
|---------------------|--|
| CPU | LGA775 socket for Intel® Pentium® D / Pentium® 4 / Celeron processor Compatible with the Intel® 05B/05A and 04B/04A processors Supports Intel® 65 nm Dual-Core CPU Supports Intel® Hyper-Threading Technology |
| Chipset | Northbridge: Intel® 865G Southbridge: Intel® ICH5 |
| Front Side Bus | 800/533 MHz |
| Memory | Dual-channel memory architecture 4 x 184-pin DIMM sockets support up to 4GB of unbuffered non-ECC 400/333/266 MHz DDR DIMMs |
| Integrated Graphics | Intel® 865G chipset with integrated Intel® Extreme Graphics 2 Technology Max. UMA share memory size: 96MB Max. Resolution: 2048 x 1536(@75Hz) Max. Refresh Rate: 85Hz(@1800 x 1440) |
| Expansion slots | 3 x PCI slots 1 x AGP 8X |
| Storage | 2 x Ultra DMA100/66/33 2 x Serial ATA |
| Audio | Realtek® ALC655 6-channel CODEC S/PDIF out interface support |
| LAN | Realtek® 10/100 LAN controller |
| USB | Supports up to 8 USB 2.0 ports |
| Rear panel | 1 x Parallel port 1 x LAN (RJ-45) port 4 x USB 2.0 ports 1 x Serial port (COM) 1 x VGA port 1 x PS/2 keyboard port 1 x PS/2 mouse port Audio I/O ports |

(continued on the next page)

AIMB-542 specifications summary

| | |
|---------------------|--|
| BIOS features | 4 Mb Flash ROM, AMI BIOS, PnP, WfM2.0, DMI2.0, SM BIOS 2.3 |
| Industry standard | PCI 2.2, USB 2.0 |
| Manageability | WfM 2.0, DMI 2.0, WOL by PME, WOR by PME, Chassis Intrusion |
| Internal connectors | 2 x USB 2.0 connectors for 4 additional USB 2.0 ports 1 x CPU fan connector 1 x Chassis fan connector 1 x 20-pin ATX power connector 1 x 4-pin ATX 12 V power connector 1 x CD connector 1 x Front panel audio connector 1 x S/PDIF out connector 1 x 20-pin Panel connector |
| Power Requirement | ATX power supply (with 20-pin and 4-pin 12 V plugs) |
| Form Factor | Micro-ATX form factor: 9.6 in x 9.6 in |
| Support CD contents | Device drivers |

**Specifications are subject to change without notice.*

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

1 Product introduction

1.1 Welcome!

Thank you for buying an Advantech® AIMB-542 motherboard!

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

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

1.2 Package contents

Check your motherboard package for the following items.

| | |
|----------------|--|
| Motherboard | Advantech AIMB-542 motherboard |
| Cables | 1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 100/66 cable 1 x Floppy disk drive cable |
| Accessory | I/O shield |
| Application CD | Advantech motherboard support CD |



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

1.3 Special features

1.3.1 Product highlights

Latest processor technology

The motherboard comes with a 775-pin surface mount Land Grid Array (LGA) socket designed for the Intel® Pentium® 4 processor in the 775-land package. The motherboard supports the Intel® Pentium 4, Intel® Pentium D, Intel® Celeron and Intel® Dual-Core processors featuring 800/533 MHz Front Side Bus (FSB), dedicated L2 cache, and a core speed of up to 3.8GHz.

The motherboard also supports the Intel Hyper-Threading Technology, the Intel® Extended Memory 64 Technology (EM64T) that allows 64-bit computing, and the Enhanced Intel Speedstep® Technology (EIST) that intelligently adjusts the CPU voltage and frequency depending on the CPU loading, system speed or power requirement. See page 1-9 for details.

Intel® 65 nanaometer process technology support

The motherboard supports Intel® processors built on the 65 nanaometer (nm) process technology with copper interconnect. Intel's 65 nm process is the most advanced chip manufacturing technology, delivering breakthrough performance, enhanced media experience, and low power consumption. The Intel® 65 nm Dual-Core processors utilize this package technology for a thinner, lighter design without compromising performance. See page 1-9 for details.

Integrated Intel® Extreme Graphics 2

The Intel® 865G chipset on the motherboard integrates the Intel® Extreme Graphics 2 architecture to deliver realistic 3D/2D graphics with sharp images, fast rendering, smooth motion, and clearly defined details. This unique architecture balances the memory usage between graphics and the system for optimal performance with a maximum UMA share memory size of 96MB, a maximum resolution of 2048 x 1536(@75Hz) and a maximum refresh rate of 85Hz(@1800 x 1440). See page 1-27 for details.

Dual-channel DDR400 memory support

Employing the Double Data Rate (DDR) memory technology, the motherboard supports up to 4GB of system memory using DDR400/333/266 DIMMs. The ultra-fast 400MHz memory bus delivers the required bandwidth for the latest 3D graphics, multimedia, and Internet applications. See 1-16 to 1-19 for details.

Serial ATA technology

The motherboard supports the Serial ATA technology through the Serial ATA interfaces and the Intel® ICH5 chipset. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 150 MB/s data transfer rate. See page 1-29 for details.

AI Audio

The motherboard comes with the Realtek® ALC655 audio CODEC that lets you enjoy high-quality 6-channel audio without having to buy advanced sound cards. It also features intelligent detection of plugged peripherals into the audio ports and identifies any incompatible devices. See page 1-27 for details.

10/100 Mbps LAN support

Easy connectivity to your network or broadband connection with the onboard LAN port. Allows you to play online games without buying expensive additional LAN cards. See page 1-26 for details.

AGP 8X support

The AGP 8X (AGP 3.0) VGA interface specification enhances graphics performance with high bandwidth speeds up to 2.12 GB/s.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See page 1-27 and page 1-32 for details.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (integrated in the Winbond Super I/O) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely xure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components. See page 2-28 for details.

1.4 Before you proceed

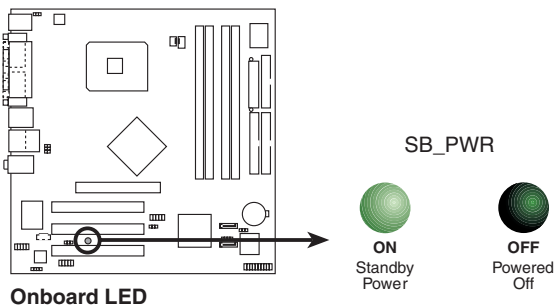
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

Onboard LED

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



1.5 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

1.5.1 Placement direction

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

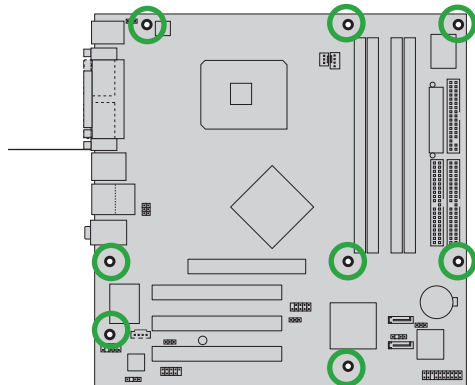
1.5.2 Screw holes

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

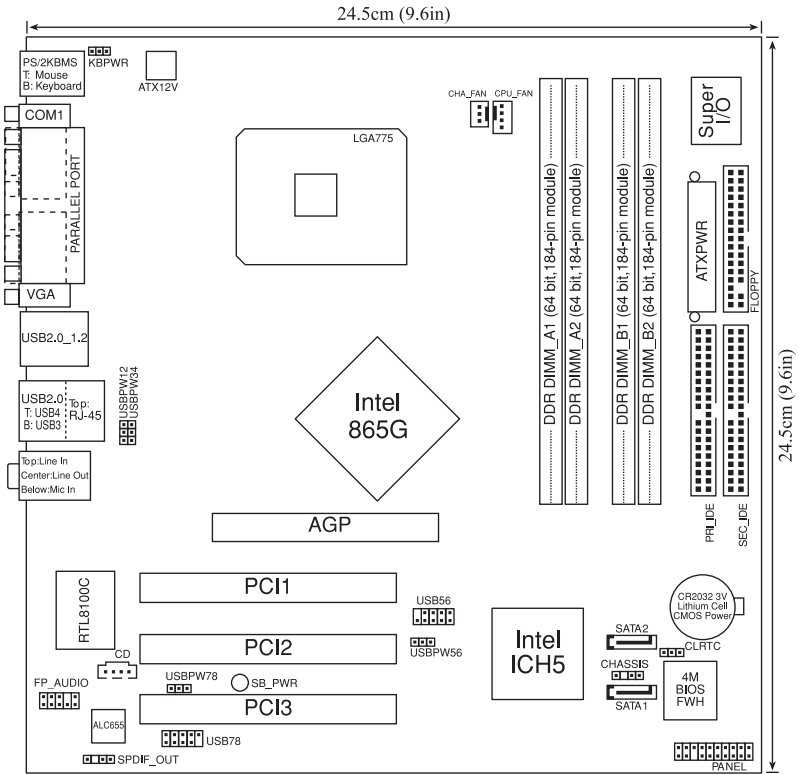


Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards
the rear of the chassis



1.5.3 Motherboard layout



1.6 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Pentium® 4 processor in the 775-land package.

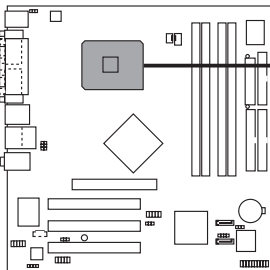


- Your boxed Intel® Pentium® 4 LGA775 processor package should come with installation instructions for the CPU, fan and heatsink assembly. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/motherboard components. Advantech will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. Advantech will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
- The product warranty does not cover damage to the socket pins resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

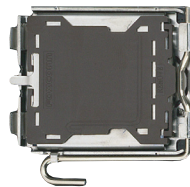
1.6.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

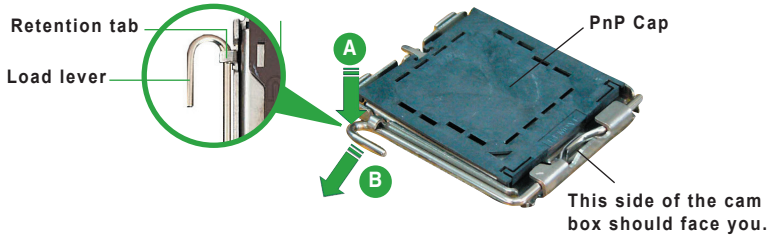


CPU Socket 775



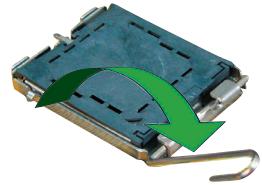
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

2. Press the load lever with your thumb (A) and move it to the left (B) until it is released from the retention tab.

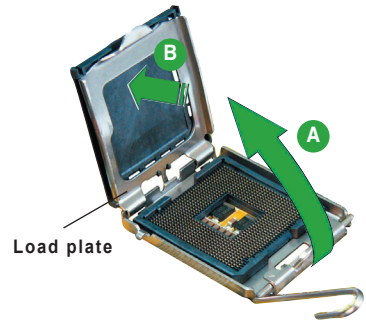


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

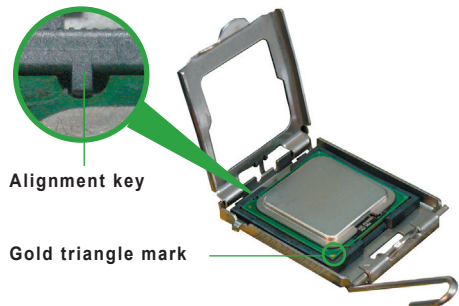
3. Lift the load lever in the direction of the arrow to a 135° angle.



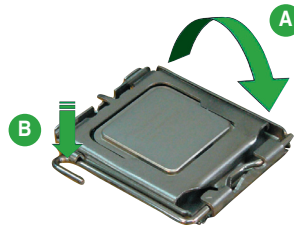
4. Lift the load plate with your thumb and forefinger to a 100° angle (A), then push the PnP cap from the load plate window to remove (B).



5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket. The socket alignment key should fit into the CPU notch.



6. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

Notes on Intel® Hyper-Threading Technology



- This motherboard supports Intel® Pentium® 4 CPUs in the 775-land package with Hyper-Threading Technology.
 - Hyper-Threading Technology is supported under Windows® XP/2003 Server and Linux 1.7.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in the BIOS to ensure system stability and performance.
 - Installing Windows® XP Service Pack 1 or later is recommended.
 - Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
 - For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.
-

To use the Hyper-Threading Technology on this motherboard:

1. Install an Intel® Pentium® 4 CPU in the 775-land package that supports Hyper-Threading Technology.
2. Power up the system and enter the BIOS Setup (see Chapter 2: BIOS setup). Under the Advanced Menu, make sure that the item Hyper-Threading Technology is set to Enabled. The item appears only if you installed a CPU that supports Hyper-Threading Technology.
3. Reboot the computer.

1.6.2 Installing the CPU heatsink and fan

The Intel® Pentium® 4 LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



- When you buy a boxed Intel® Pentium® 4 processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel®-certified multi-directional heatsink and fan.
- Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.
- If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.



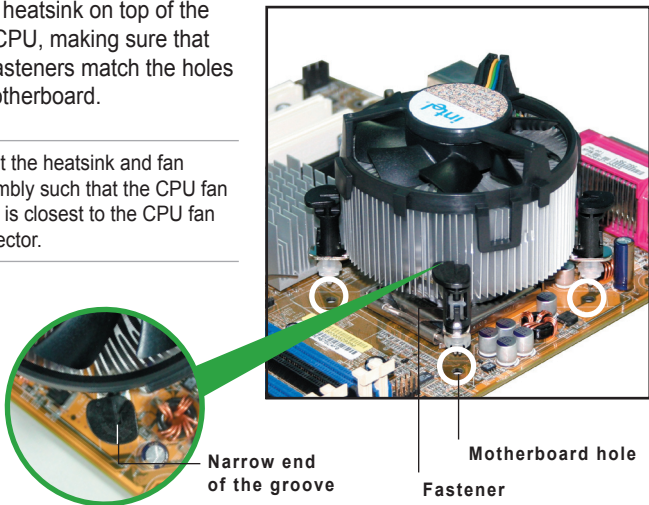
Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

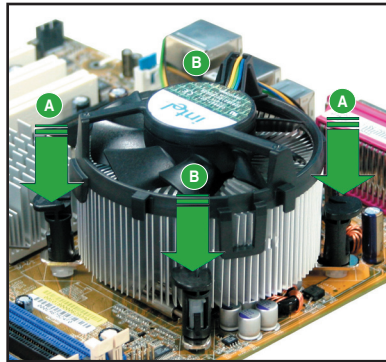
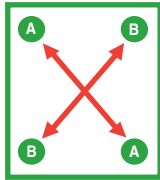


Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

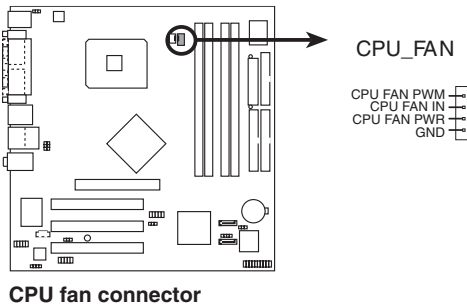


Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.



3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

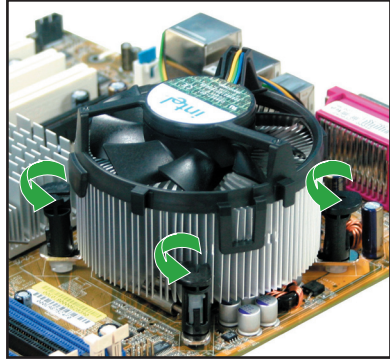


Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

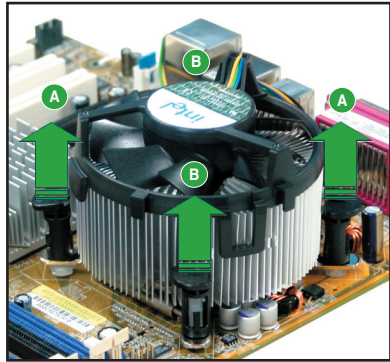
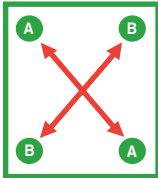
1.6.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

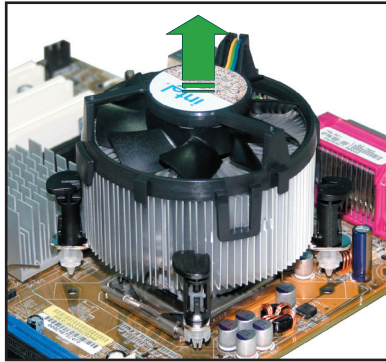
1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise.



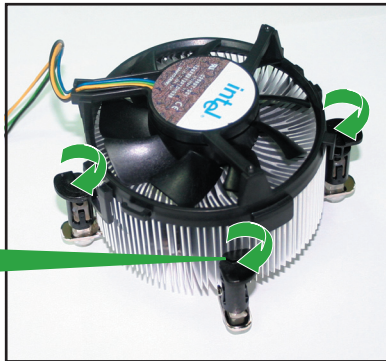
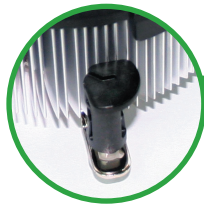
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.



- Carefully remove the heatsink and fan assembly from the motherboard.



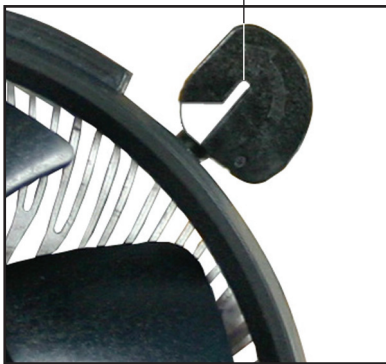
- Rotate each fastener clockwise to ensure correct orientation when reinstalling.



Narrow end of the groove



The narrow end of the groove should point outward after resetting. (The photo shows the groove shaded for emphasis.)

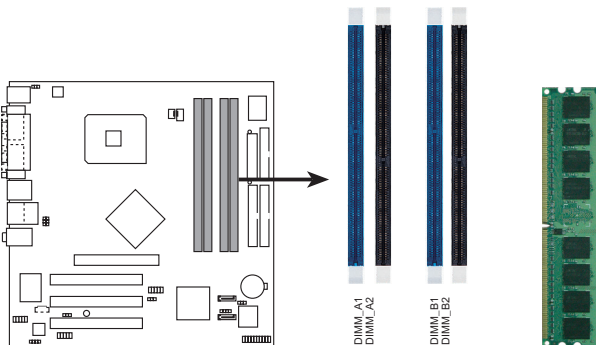


1.7 System memory

1.7.1 Overview

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

The following figure illustrates the location of the sockets:



184-pin DDR DIMM sockets

1.7.2 Memory configurations

You may install 64MB, 128 MB, 256 MB, 512 MB, and 1 GB DDR DIMMs into the DIMM sockets using the memory configuration in this section.



- If you installed four 1 GB memory modules, the system may detect less than 3 GB of total memory because of address space allocation for other critical functions. This limitation applies to Windows® XP 32-bit version operating system since it does not support Physical Address Extension(PAE)
- Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations in Table 1.
- In dual-channel configurations, install only identical (the same type and size) DDR DIMM pairs for each channel.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- DIMMs installed into any three sockets will function in single-channel mode.

Table 1 Recommended memory configurations

| Mode | Sockets | | | |
|----------------|-------------------|--------------------|-------------------|--------------------|
| | DIMM_A1 (Blue) | DIMM_A2 (Black) | DIMM_B1 (Blue) | DIMM_B2 (Black) |
| Single-channel | (1) | populated | — | — |
| | (2) | — | populated | — |
| | (3) | — | — | populated |
| | (4) | — | — | populated |
| Dual-channel | (1) | Populated | — | Populated |
| | (2) | — | Populated | — |
| | (3)* | populated | populated | populated |

* For dual-channel configuration (3), you may:

- install identical DIMMs in all four sockets, or
- install an identical DIMM pair in DIMM_A1 and DIMM_B1 (blue sockets) and the other identical DIMM pair in DIMM_A2 and DIMM_B2 (black sockets)

1.7.3 DDR Qualified Vendors List

The following table lists the memory modules that have been tested and qualified for use with this motherboard. Visit the Advantech website (www.Advantech.com) for the latest DDR DIMM modules for this motherboard.

Table 1 DDR Qualified Vendors List

| Size | Vendor | Model | Brand | Side(s) | Component | DIMM support | | |
|-------|----------|-------------------|--------------|---------|-------------------|--------------|---|---|
| | | | | | | A | B | C |
| 256MB | Kingston | KVR333X64C25/256 | Kingston | SS | D3208DH1T-6 | V | V | V |
| 256MB | Kingston | KVR333X64C25/256 | Hynix | DS | HY5DU56822BT-D43 | V | V | V |
| 512MB | Kingston | KVR333X64C25/512 | Kingston | DS | D3208DH1T-6 | V | V | V |
| 512MB | Kingston | KVR400X64C3A/512 | Hynix | DS | HY5DU56822BT-D43 | V | V | V |
| 512MB | Kingston | KVR400X64C3A/512 | Kingston | DS | D3208DH1T-5 | V | V | V |
| 512MB | Kingston | KVR400X64C3A/512 | Kingston | SS | HY5DU12822BT-D43 | V | V | V |
| 256MB | Kingston | KVR400X64C3A/256 | Hynix | SS | HY5DU56822BT-D43 | V | V | V |
| 256MB | Kingston | KVR400X64C3A/256 | Kingston | SS | D3208DL3T-5A | V | V | V |
| 256MB | Kingston | KVR400X64C3A/256 | PSC | SS | A2S56030BTIP | V | V | V |
| 1G | Kingston | KVR400X64C3A/1G | Infineon | DS | HYB25D512800BE-5B | V | V | V |
| 256MB | Infineon | HY564D32300GU-5-C | Infineon | SS | HYB25D256800CE-5C | V | V | V |
| 512MB | Infineon | HY564D64320GU-5-C | Infineon | SS | HYB25D512800BE-5B | V | V | V |
| 512MB | Infineon | HY564D64320GU-5-C | Infineon | DS | HYB25D256800CE-5C | V | V | V |
| 256MB | Infineon | HY564D32300GU-5-C | Infineon | SS | HYB25D256800CE-6C | V | V | V |
| 512MB | Infineon | HY564D64320GU-6-C | Infineon | DS | HYB25D256800CE-6C | V | V | V |
| 256MB | HY | HYMD232646D8J-D43 | Hynix | SS | HY5DU56822BT-D43 | V | V | V |
| 512MB | HY | HYMD264646D8J-D43 | Hynix | DS | HY5DU56822BT-D43 | V | V | V |
| 256MB | HY | HYMD232646B8J-J | Hynix | SS | HY5DU56822BT-J | V | V | V |
| 512MB | HY | HYMD264646B8J-J | Hynix | DS | HY5DU56822BT-J | V | V | V |
| 256MB | Corsair | VS256MB400 | Value select | SS | VS32M8-5 2B0409 | V | V | V |
| 256MB | Corsair | XMS3202v3.1 | Infineon | DS | HYB25D256807BT-5B | V | V | V |

(continued on the next page)

Table 1 DDR Qualified Vendors List

| Size | Vendor | Model | Brand | Side(s) | Component | DIMM support | | |
|-------|-----------|----------------------|--------------|---------|-------------------|--------------|---|---|
| | | | | | | A | B | C |
| 512MB | Corsair | V5S12MB400 | Value select | DS | V532M8-5 2B0402 | V | V | |
| 256MB | Corsair | V5256MB333 | Samsung | SS | K4H560838D-TCB3 | V | V | V |
| 512MB | Corsair | XMS2702v3.1 | Mosel | DS | V58C2256804SAT6 | V | V | V |
| 512MB | Micron | MT16VDDT6464AG-335GB | Micron | DS | MT46V32M8TG-6TG | V | V | V |
| 256MB | Micron | MT8VDDT3264AG-335GB | Micron | SS | MT46V32M8TG-6TG | V | V | V |
| 256MB | Micron | MT8VDDT3264AG-40BGB | Micron | SS | MT46V32M8TG-5BG | V | V | V |
| 512MB | Micron | MT16VDDT6464AG-40BCB | Micron | DS | MT46V32M8TG-5BC | V | V | V |
| 256MB | Samsung | M368L3223FTN-CCC | Samsung | SS | K4H560838F-TCCC | V | V | V |
| 512MB | Samsung | M368L6423FTN-CCC | Samsung | DS | K4H560838F-TCCC | V | V | V |
| 256MB | Samsung | M368L3223FTN-CB3 | Samsung | SS | K4H560838F-TCB3 | V | V | V |
| 512MB | Samsung | M368L6423FTN-CB3 | Samsung | DS | K4H560838F-TCB3 | V | V | V |
| 256MB | Elpida | U24256ADEPG6H20 | Elpida | SS | DD2508AKTA-5C | V | V | V |
| 512MB | Elpida | U24512ADEPG6H20 | Elpida | DS | DD2508AMTA | V | V | V |
| 512MB | Apacer | 77.90728.U1G | Apacer | DS | AM3A56AJT-6B | V | V | V |
| 256MB | Apacer | 77.10636.46G | Samsung | SS | K4H560838E-TCCC | V | V | V |
| 256MB | Apacer | 77.10636.56G | Mosel | SS | V58C2256804SAT5B | V | V | V |
| 512MB | Apacer | 77.10736.11G | Infineon | DS | HYB25D256800BT-5B | V | V | V |
| 256MB | Transcend | DDR400-256 | Samsung | SS | K4H560838F-TCCC | V | V | V |
| 256MB | Transcend | DDR400-256 | Mosel | SS | V58C2256804SAT5B | V | V | V |
| 512MB | Transcend | 102709-0001 | PSC | DS | A2S56D3OATP | V | V | V |
| 512MB | Transcend | DDR400-512 | Mosel | DS | V58C2256804SAT5B | V | V | V |
| 512MB | Transcend | DDR400-512 | Samsung | DS | K4H560838F-TCCC | V | V | V |
| 256MB | Transcend | 111448-0214 | PSC | SS | A2S56D30BTP | V | V | V |
| 512MB | Transcend | DDR333-512 | Hynix | DS | HY5DU56822CT-J | V | V | V |
| 256MB | Kingmax | MPMB62D-38LT3R | Mosel | SS | V58C2256804SAT6 | V | V | V |
| 512MB | Kingmax | MPMC22D-38HT3R | Hynix | DS | HY5DU56822BT-J | V | V | V |
| 256MB | Kingmax | MPXB62D-38KT3R | Kingmax | SS | KDL388P4LA-50 | V | V | V |
| 512MB | Kingmax | MPXC22D-38KT3R | Kingmax | DS | KDL388P4EA-50 | V | V | V |
| 256MB | Vdata | MDV06F4G2680B1E0H | Vdata | SS | VDR9616A8A-5C | V | V | V |

Side(s): SS- Single-side DS-Double-sided

DIMM support:

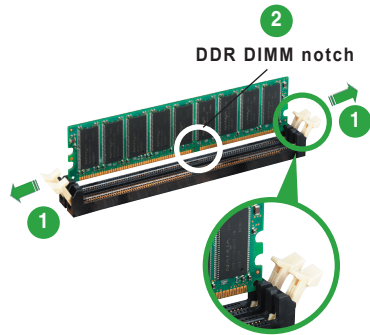
- A - supports one module inserted into any slot, in a single-channel memory configuration.
- B - supports one pair of modules inserted into either blue or black slots as one pair of dual-channel memory configuration.
- C - supports two pairs of modules inserted into the blue and black slots as two pairs of dual-channel memory configuration.

1.7.4 Installing a DIMM



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

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

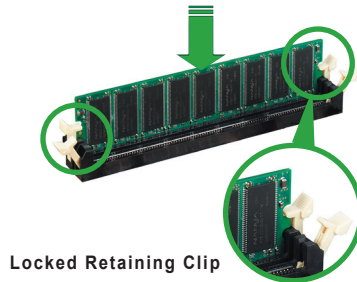


Unlocked retaining clip



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

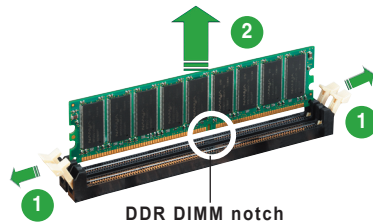
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



1.7.5 Removing a DIMM

Follow these steps to remove a DIMM.

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



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

2. Remove the DIMM from the socket.

1.8 Expansion slots

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



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

1.8.1 Installing an expansion card

To install an expansion card:

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

1.8.2 Configuring an expansion card

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

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

1.8.3 Interrupt assignments

Standard interrupt assignments

| IRQ | Priority | Standard Function |
|-----|----------|------------------------------|
| 0 | 1 | System Timer |
| 1 | 2 | Keyboard Controller |
| 2 | N/A | Re-direct to IRQ#9 |
| 3 | 11 | Communications Port (COM2)* |
| 4 | 12 | Communications Port (COM1)* |
| 5 | 13 | IRQ holder for PCI steering* |
| 6 | 14 | Floppy Disk Controller |
| 7 | 15 | Printer Port (LPT1)* |
| 8 | 3 | System CMOS/Real Time Clock |
| 9 | 4 | IRQ holder for PCI steering* |
| 10 | 5 | IRQ holder for PCI steering* |
| 11 | 6 | IRQ holder for PCI steering* |
| 12 | 7 | PS/2 Compatible Mouse Port* |
| 13 | 8 | Numeric Data Processor |
| 14 | 9 | Primary IDE Channel |
| 15 | 10 | Secondary IDE Channel |

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

IRQ assignments for this motherboard

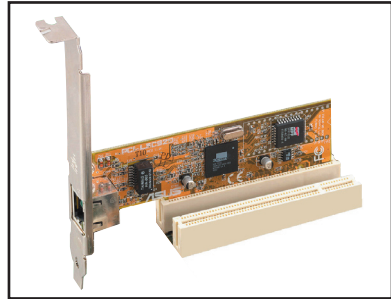
| | A | B | C | D | E | F | G | H |
|----------------------------|--------|--------|------|------|---|------|------|--------|
| PCI slot 1 | — | — | — | — | — | — | used | — |
| PCI slot 2 | — | — | — | — | — | used | — | — |
| PCI slot 3 | — | shared | — | — | — | — | — | — |
| Onboard USB controller 1 | shared | — | — | — | — | — | — | — |
| Onboard USB controller 2 | — | — | — | used | — | — | — | — |
| Onboard USB controller 3 | — | — | used | — | — | — | — | — |
| Onboard USB controller 4 | shared | — | — | — | — | — | — | — |
| Onboard USB 2.0 controller | — | — | — | — | — | — | — | shared |
| Onboard LAN | — | — | — | — | — | — | — | shared |
| Onboard audio | — | shared | — | — | — | — | — | — |
| Onboard VGA | shared | — | — | — | — | — | — | — |



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

1.8.4 PCI slots

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

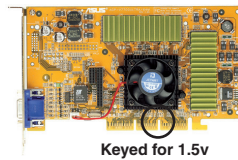
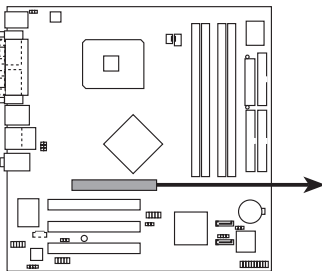


1.8.5 AGP slot

The Accelerated Graphics Port (AGP) slot that supports AGP8X/4X cards. When you buy an AGP card, make sure that you ask for one with +1.5V specification. Note the notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.



Install only 1.5V or 0.8V AGP cards on this motherboard! This motherboard does not support 3.3V AGP cards.



Keyed for 1.5v

Accelerated Graphics Port (AGP)

1.9 Jumpers

1. Clear RTC RAM (3-pin CLRTC)

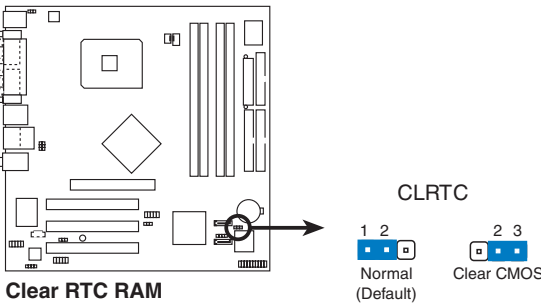
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

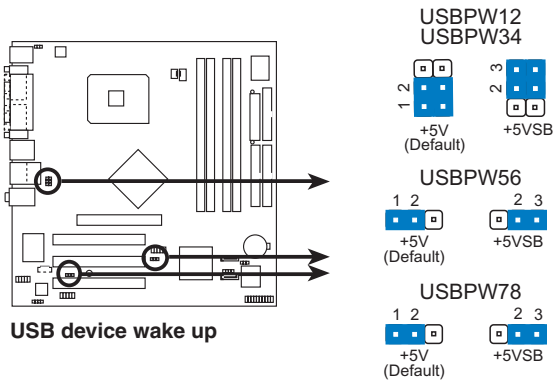


You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

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

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

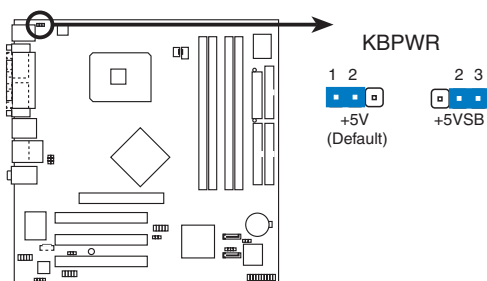
The USBPWR12 and USBPWR34 jumpers are for the rear USB ports. The USBPWR56 and USBPWR78 jumper is for the internal USB connectors that you can connect to additional USB ports.



- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

3. Keyboard power (3-pin KBPWR)

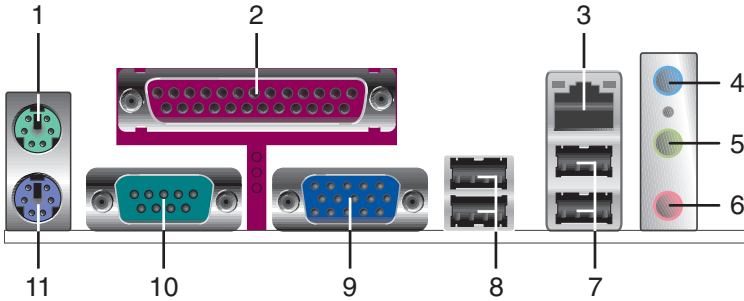
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



Keyboard power setting

1.10 Connectors

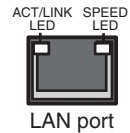
1.10.1 Rear panel connectors



1. PS/2 mouse port (green). This port is for a PS/2 mouse.
2. Parallel port. This 25-pin port connects a parallel printer, a scanner, or other devices.
3. LAN (RJ-45) port. This port allows 10/100Mb connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

| ACT/LINK LED | | SPEED LED | |
|--------------|---------------|-----------|---------------------|
| Status | Description | Status | Description |
| OFF | No link | OFF | 10 Mbps connection |
| ORANGE | Linked | GREEN | 100 Mbps connection |
| BLINKING | Data activity | | |



4. Line In port (light blue). This port connects a tape, CD, DVD player, or other audio sources. In 4-channel and 6-channel configuration, the function of this port becomes Front Speaker Out.
5. Line Out port (lime). This port connects a headphone or a speaker. In 4-channel and 6-channel configuration, the function of this port becomes Rear Speaker Out.
6. Microphone port (pink). This port connects a microphone. In a 6-channel configuration, the function of this port becomes Center/Subwoofer.



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

Audio 2, 4, or 6-channel configuration

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

7. USB 2.0 ports 3 and 4. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8. USB 2.0 ports 1 and 2. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
9. VGA port. This 15-pin VGA port connects to a VGA monitor.
10. Serial connector. This 9-pin COM1 port is for serial devices.
11. PS/2 keyboard port (purple). This port is for a PS/2 keyboard.

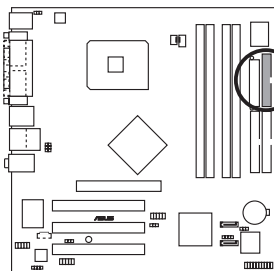
1.10.2 Internal connectors

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

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



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



Floppy disk drive connector

FLOPPY

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

PIN 1

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

These connectors are for Ultra DMA 100/66 signal cables. There are three interfaces on each Ultra DMA 100/66 signal cables: blue, black, and gray. Connect the blue interface into the motherboard's IDE connector, then select the following modes to configure your hard disk drive(s).

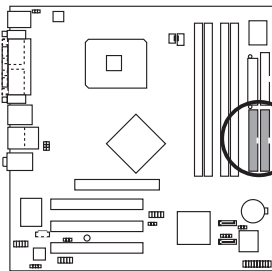
| | Drive Jumper Setting | Mode of Devices | Cable Connector |
|---------------|------------------------|-----------------|-----------------|
| Single device | Cable-select or Master | - | Black |
| Two devices | Cable-select | Master Slave | Black Gray |
| | Master Slave | Master Slave | Black or gray |



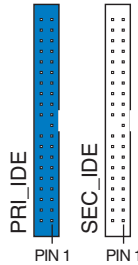
- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66/33 IDE devices.



If any device jumper is set to "Cable-select", make sure all other device jumpers have the same setting.



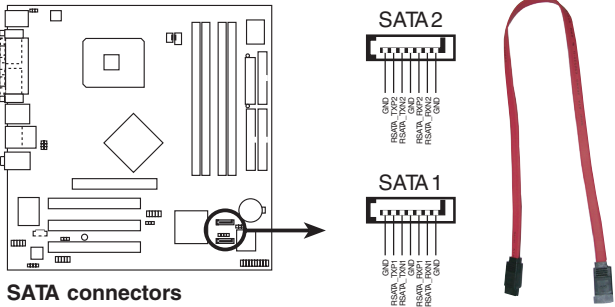
IDE connectors



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

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

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.



SATA connectors



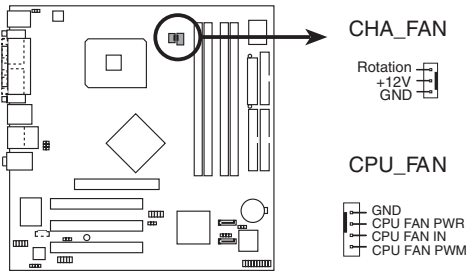
Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 or later before using Serial ATA.

4. CPU and Chassis fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN)

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



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

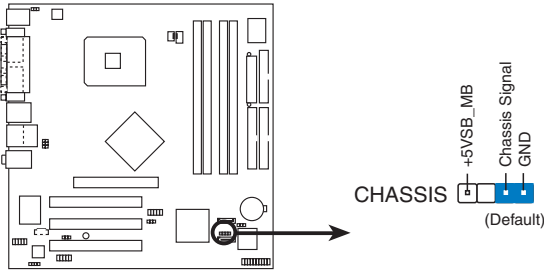


Fan connectors

5. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

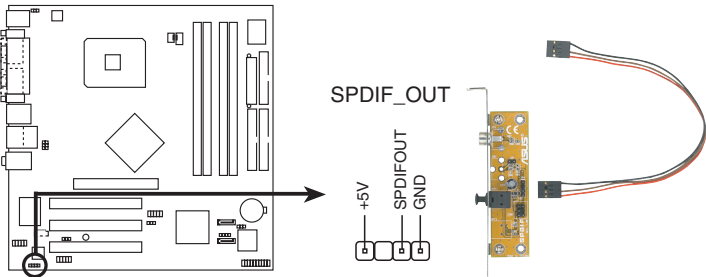
By default, the pins labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



Chassis Intrusion Connector

6. Digital Audio connector (4-1 pin SPDIF_OUT)

This connector is for the S/PDIF audio module to allow digital sound output. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.



Digital audio connector



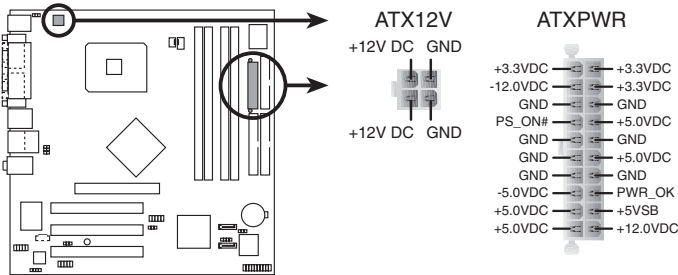
The S/PDIF out module is purchased separately.

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

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



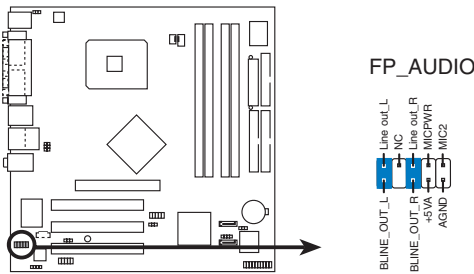
- Do not forget to connect the 4-pin ATX +12 V power plug; otherwise, the system will not boot up.
- Use a PSU with a minimum power rating of 300 W on this motherboard. Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.



ATX power connector

8. Front panel audio connector (10-1 pin FP_AUDIO)

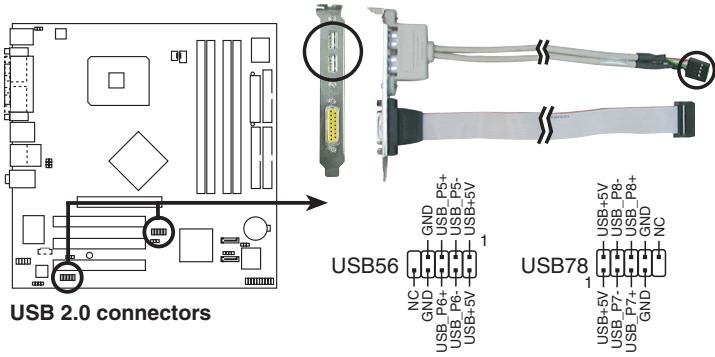
This connector is for a chassis-mounted front panel audio I/O module that supports legacy AC '97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



Front panel audio connector

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

These connectors are for USB 2.0 ports. Connect the optional USB/GAME module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



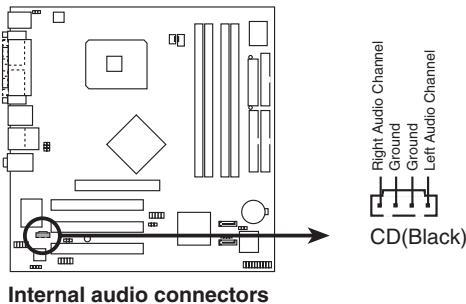
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB/GAME module is purchased separately.

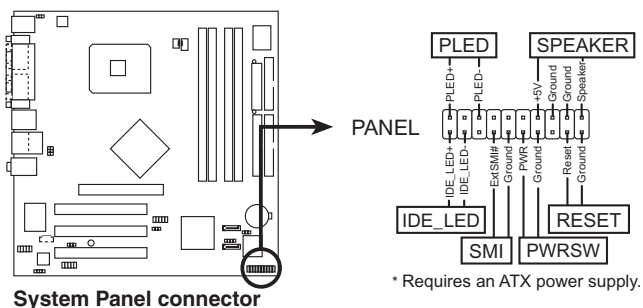
10. Internal audio connectors (4-pin CD)

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



11. System panel connector (20-1 pin PANEL)

This connector supports several chassis-mounted functions.



System Panel connector



The system panel connector is color-coded for easy connection. Refer to the connector description below for details.

- **System power LED (2-pin PLED)**
This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **System warning speaker (4-pin SPEAKER)**
This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- **Hard disk drive activity (2-pin IDE_LED)**
This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
- **System Management Interrupt Lead (2-pin SMI)**
This 2-pin connector allows you to manually place the system into a suspended mode, or “green” mode, where system activity is instantly decreased to save power and to expand the life of certain system components. Attach the chassis-mounted suspend switch to this connector.
- **Power/Soft-off button (2-pin PWRSW)**
This connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (2-pin RESET)**
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

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

BIOS setup **2**

2.1 Managing and updating your BIOS

2.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.
DOS environment
 - a. Insert a 1.44MB floppy disk into the drive.
 - b. At the DOS prompt, type `format A:/S` then press <Enter>.*Windows® XP environment*
 - a. Insert a 1.44 MB floppy disk to the floppy disk drive.
 - b. Click **Start** from the Windows® desktop, then select **My Computer**.
 - c. Select the 3 1/2 Floppy Drive icon.
 - d. Click **File** from the menu, then select **Format. A Format 3 1/2 Floppy Disk** window appears.
 - e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.*Windows® 2000 environment*

To create a set of boot disks for Windows® 2000:

 - a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
 - b. Insert the Windows® 2000 CD to the optical drive.
 - c. Click **Start**, then select **Run.d**. From the Open field, type
`D:\bootdisk\makeboot a:`
assuming that D: is your optical drive.
 - e. Press <Enter>, then follow screen instructions to continue.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

2.2 BIOS setup program

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

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

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

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

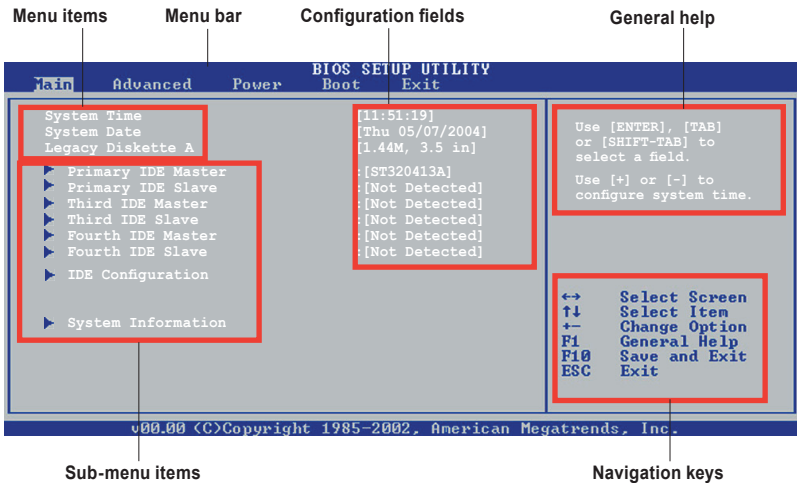
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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



-
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section “2.7 Exit Menu.”
 - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
 - Visit the Advantech website to download the latest BIOS file for this motherboard.
-

2.2.1 BIOS menu screen



2.2.2 Menu bar

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

- Main** For changing the basic system configuration
- Advanced** For changing the advanced system settings
- Power** For changing the advanced power management (APM) configuration
- Boot** For changing the system boot configuration
- Exit** For selecting the exit options and loading default settings

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

2.2.3 Navigation keys

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

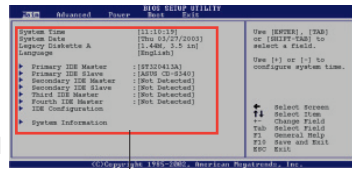


Some of the navigation keys differ from one screen to another.

2.2.4 Menu items

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

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



Main menu items

2.2.5 Sub-menu items

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

2.2.6 Configuration fields

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

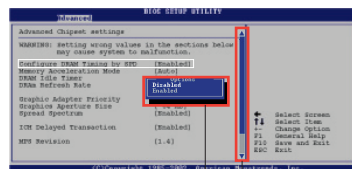
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to “2.2.7 Pop-up window.”

2.2.7 Pop-up window

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

2.2.8 Scroll bar

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



Pop-up window

Scroll bar

2.2.9 General help

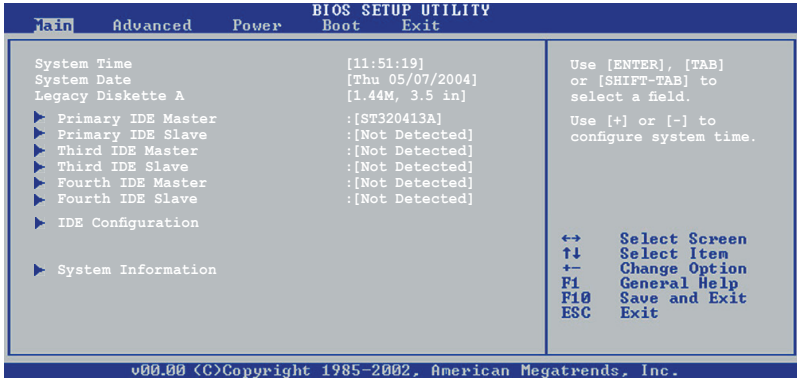
At the top right corner of the menu screen is a brief description of the selected item.

2.3 Main menu

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



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



2.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

2.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

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

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

2.3.4 Primary, Third and Fourth IDE Master/Slave

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



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

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

LBA/Large Mode [Auto]

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

Block (Multi-sector Transfer) [Auto]

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

PIO Mode [Auto]

Selects the PIO mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

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

SMART Monitoring [Auto]

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

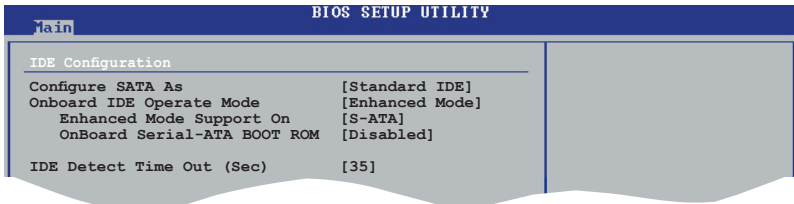
32Bit Data Transfer [Disabled]

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

2.3.5 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



Configure SATA As [Standard IDE]

Sets the Serial ATA configuration.

If you want to use your Serial ATA like a Parallel ATA physical storage interface, select the Standard IDE option.

Configuration options: [Standard IDE]

Onboard IDE Operate Mode [Enhanced Mode]

Disables or allows selection of the IDE operation mode depending on the operating system (OS) that you installed. Set to Enhanced Mode if you are using native OS, such as Windows® 2000/XP/2003 Server.

Configuration options: [Disabled] [Compatible Mode] [Enhanced Mode]

Enhanced Mode Support On [S-ATA]

The default setting S-ATA allows you to use native OS on Serial ATA and Parallel ATA ports. We recommend that you do not change the default setting for better OS compatibility. In this setting, you may use legacy OS on the Parallel ATA ports **only if** you did not install any Serial ATA device.

The P-ATA+S-ATA and P-ATA options are for advanced users only. If you set to any of these options and encounter problems, revert to the default setting **S-ATA**. Configuration options: [P-ATA+S-ATA] [S-ATA] [P-ATA]

Onboard SATA Boot Rom [Disabled]

Allows you to enable or disable the onboard Serial ATA Boot ROM. Set this item to [Enabled] to configure Serial ATA RAID.

Configuration option: [Disabled] [Enabled]

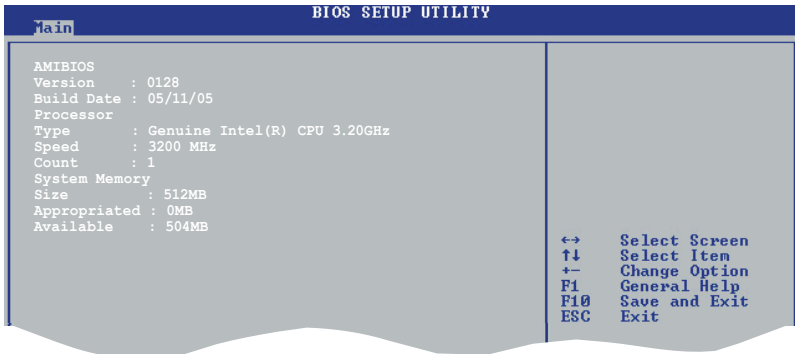
IDE Detect Time Out [35]

Selects the time out value for detecting ATA/ATAPI devices.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

2.3.6 System Information

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



AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

System Memory

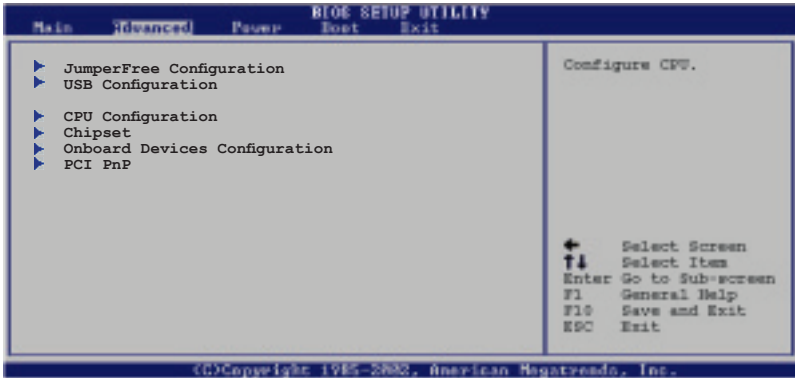
Displays the auto-detected system memory

2.4 Advanced menu

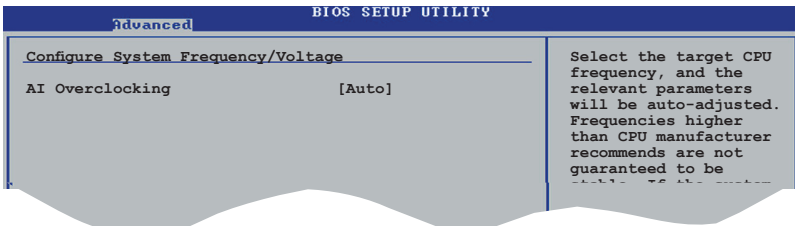
The Advanced menu items allow you to change the settings for the CPU and other system devices.



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



2.4.1 JumperFree Configuration



AI Overclocking [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options:

Manual - allows you to individually set overclocking parameters.

Auto - loads the optimal settings for the system.

Standard - loads the standard settings for the system.

Overclock Profile - loads overclocking profiles with optimal parameters for stability when overclocking.



The following item appears only when you set the **AI Overclocking** item to [Manual].

CPU Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the CPU frequency. You can also type the desired CPU frequency using the numeric keypad. The values range from 100 to 400. Refer to the table below for the correct Front Side Bus and CPU External Frequency settings.

FSB/CPU External Frequency Synchronization

| Front Side Bus | CPU External Frequency |
|----------------|------------------------|
| FSB 1066 | 266 MHz |
| FSB 800 | 200 MHz |
| FSB 533 | 133 MHz |

DRAM Frequency [Auto]

Allows you to set the DDR2 operating frequency.

Configuration options: [Auto] [DDR2-400MHz] [DDR2-533MHz] [DDR-667MHz]



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

PCI Express Frequency [Auto]

Allows you to set the PCI Express frequency. This item is set to [Auto] by default.

Configuration options: [Auto] [90]...[150]

PCI Clock Synchronization Mode [To PCI Express]

Allows you to synchronize the PCI frequency with the PCI Express or CPU frequency.

Configuration options: [To PCI Express] [Fixed 33.3MHz]

[Fixed 36.3MHz] [Fixed 40.0MHz]

Memory Voltage [Auto]

Allows you to select the DDR2 reference voltage.

Configuration options: [Auto] [1.812V] [1.904V]



Refer to the DDR2 documentation before adjusting the memory voltage. Setting a very high memory voltage may damage the memory module(s)!

MCH Chipset Voltage [Auto]

Allows you to select the memory controller hub (MCH) voltage.

Configuration options: [Auto] [1.50V] [1.60V] [1.70V]

CPU VCore Voltage [Auto]

Sets the operating VCore voltage. Configuration options: [Auto]

[1.7000V] [1.6875V] [1.6750V] [1.6625V] [1.6500V] [1.6375V] [1.6250V] [1.6125V]
[1.6000V] [1.5875V] [1.5750V] [1.5625V] [1.5500V] [1.5375V] [1.5250V] [1.5125V]
[1.5000V] [1.4875V] [1.4750V] [1.4625V] [1.4500V] [1.4375V] [1.4250V] [1.4125V]
[1.4000V] [1.3875V] [1.3750V] [1.3625V] [1.3500V] [1.3375V] [1.3250V] [1.3125V]
[1.3000V] [1.2875V]



-
- Setting to a very high CPU VCore voltage can damage the CPU or may cause the system to become unstable. If this happens, revert to default settings.
 - The following item appears only when the **AI Overclocking** item is set to [Overclock Profile].
-

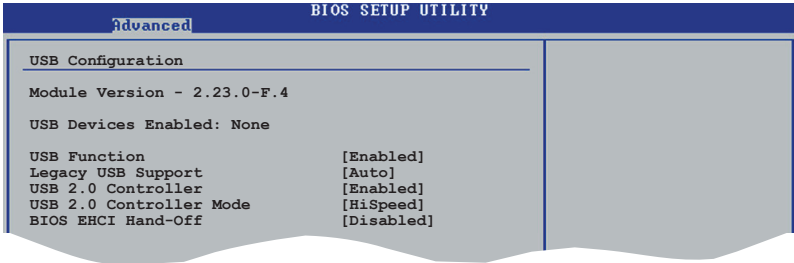
Overclock Options [Overclock 5%]

Allows you to overclock the CPU speed through the available preset values.

Configuration options: [Overclock 5%] [Overclock 10%] [Overclock 15%]
[Overclock 20%] [Overclock 30%]

2.4.2 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The Module Version and USB Devices Enabled items show the auto-detected values. If no USB device is detected, the item shows None.

USB Function [Enabled]

Allows you to enable or disable the USB function.

Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

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

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.

Configuration options: [Disabled] [Enabled]

USB 2.0 Controller Mode [HiSpeed]

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

BIOS EHCI Hand-off [Disabled]

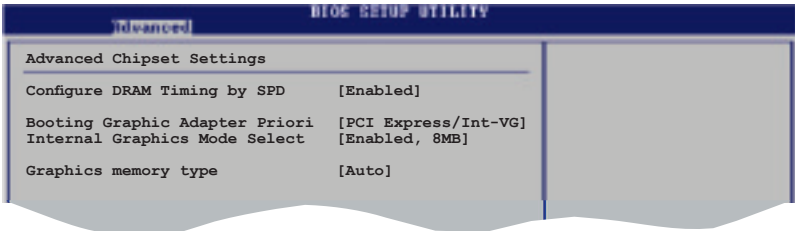
Allows you to enable support for operating systems without an EHCI hand-off feature. Configuration options: [Enabled] [Disabled]



Do not disable the BIOS EHCI Hand-Off option if you are running a Windows® operating system with USB device.

2.4.3 Chipset

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



Advanced Chipset Settings

Booting Graphic Adapter Priority [PCI Express/Int-VGA]

Allows selection of the graphics controller to use as primary boot device.

Configuration options: [Internal VGA] [PCI Express/Int-VGA]

[PCI Express/PCI] [PCI/PCI Express] [PCI/Int-VGA]

Internal Graphics Mode Select [Enabled, 8MB]

Sets the internal graphics mode.

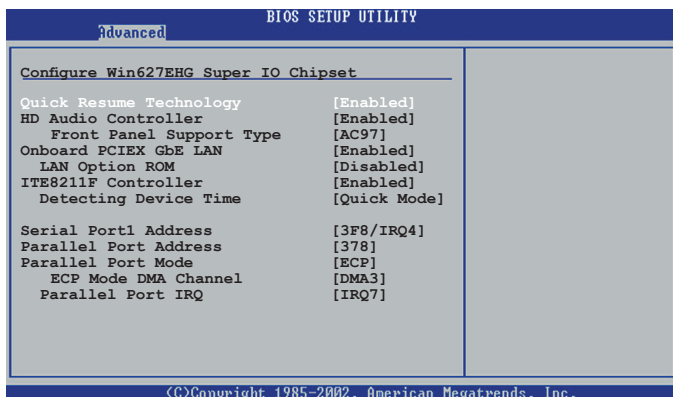
Configuration options: [Disabled] [Enabled, 1MB] [Enabled, 8MB]

Graphics memory type [Auto]

Sets the graphics memory type. Configuration options: [Auto] [DVMT] [FIX]

[DVMT+FIX]

2.4.4 Onboard Devices Configuration



HD Audio Controller [Enabled]

Enables or disables the Azalia/AC'97 CODEC.

Configuration options: [Enabled] [Disabled]

OnBoard PCIEX GbE LAN [Enabled]

Allows you to enable or disable the onboard PCI Express Gigabit LAN controller.

Configuration options: [Disabled] [Enabled]

LAN Option ROM [Disabled]

Allows you to enable or disable the option ROM in the onboard LAN controller. This item appears only when the Onboard LAN item is set to Enabled. Configuration options: [Disabled] [Enabled] ITE8211F Controller [Enabled]

Enables or disables the onboard ITE[®] 8211F IDE controller.

Configuration options: [Enabled] [Disabled]

Detecting Device Time [Quick Mode]

Sets the ITE8211F detecting device time. If the devices installed on the ITE IDE connector cannot be detected, set this item to Standard Mode to enable complete detecting process. This item appears only when the ITE8211F Controller is Enabled.

Configuration options: [Standard Mode] [Quick Mode]

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

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

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.

Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [ECP]

Allows you to select the Parallel Port mode.

Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

ECP Mode DMA Channel [DMA3]

Appears only when the Parallel Port Mode is set to [ECP]. This item allows you to set the Parallel Port ECP DMA.

Configuration options: [DMA0] [DMA1] [DMA3]

EPP Version [1.9]

Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**.

Configuration options: [1.9] [1.7]

Parallel Port IRQ [IRQ7]

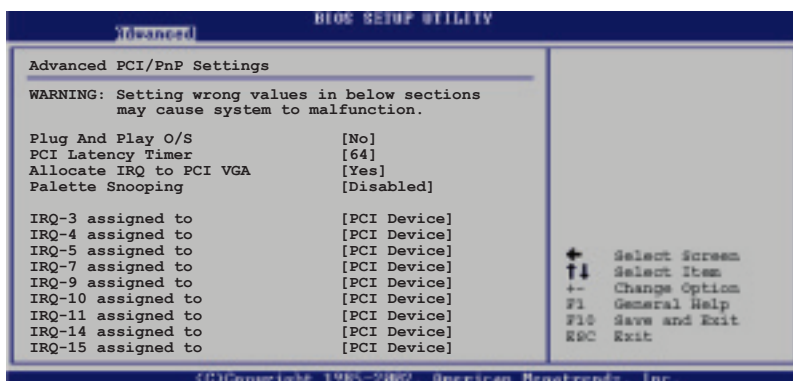
Configuration options: [IRQ5] [IRQ7]

2.4.5 PCI PnP

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



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



Plug and Play O/S [No]

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

Configuration options: [No] [Yes]

PCI Latency Timer [64]

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

Allocate IRQ to PCI VGA [Yes]

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

Palette Snooping [Disabled]

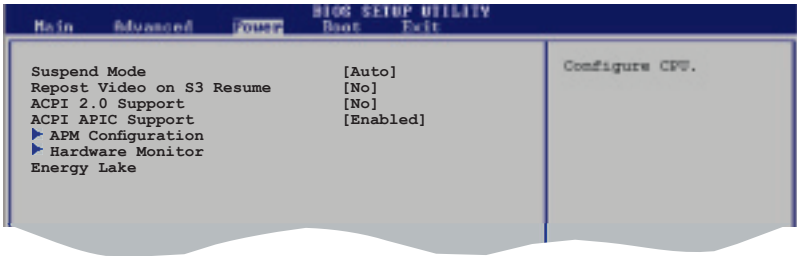
When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

2.5 Power menu

The Power menu items allow you to change the settings for the Advanced Configuration and Power Interface (ACPI) and the Advanced Power Management (APM). Select an item then press <Enter> to display the configuration options.



2.5.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.

Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

2.5.2 Repost Video on S3 Resume [No]

Determines whether to invoke VGA BIOS POST on S3/STR resume.

Configuration options: [No] [Yes]

2.5.3 ACPI 2.0 Support [No]

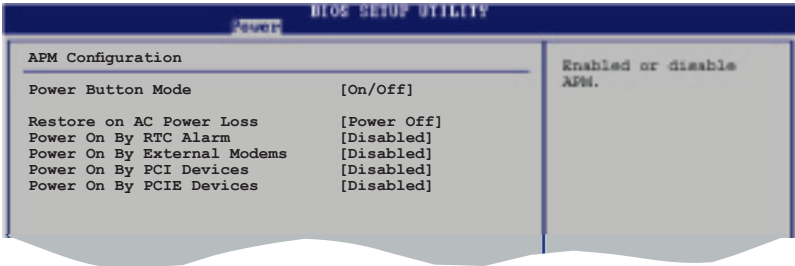
Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [No] [Yes]

2.5.4 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list.

Configuration options: [Disabled] [Enabled]

2.5.5 APM Configuration



Power Button Mode [On/Off]

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

Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss.

Configuration options: [Power Off] [Power On] [Last State]

Power On By RTC Alarm [Disabled]

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

Power On By External Modems [Disabled]

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

Configuration options: [Disabled] [Enabled]



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

Power On By PCI Devices [Disabled]

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

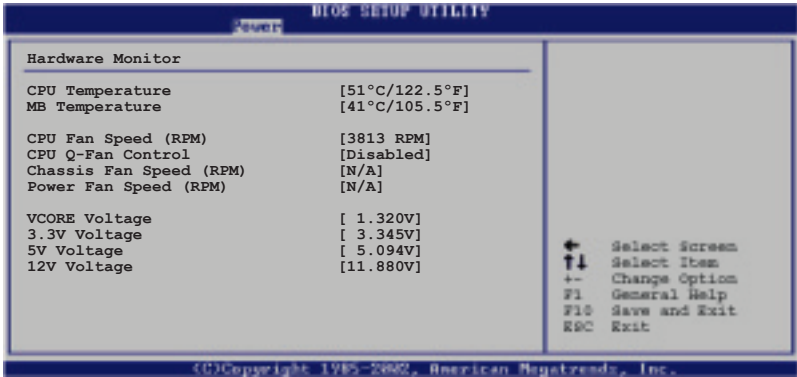
Configuration options: [Disabled] [Enabled]

Power On By PCIE Devices [Disabled]

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

Configuration options: [Disabled] [Enabled]

2.5.6 Hardware Monitor



CPU Temperature [xxxC/xxxF]

MB Temperature [xxxC/xxxF]

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

Configuration options: [Ignored] [xxxC/xxxF]

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

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

Configuration options: [Ignored] [xxxRPM] CPU FAN PROFILE MODE [Optimal]

Sets the CPU fan profile mode.

Configuration options: [Optimal] [Silent Mode] [Performance Mode] Chassis Fan Speed [xxxxRPM] or [N/A]

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

Configuration options: [Ignored] [xxxRPM] or [N/A]

Power Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the power fan speed in rotations per minute (RPM). If the fan is not connected to the power fan connector, the specific field shows N/A.

Configuration options: [Ignored] [xxxRPM] or [N/A]

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

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

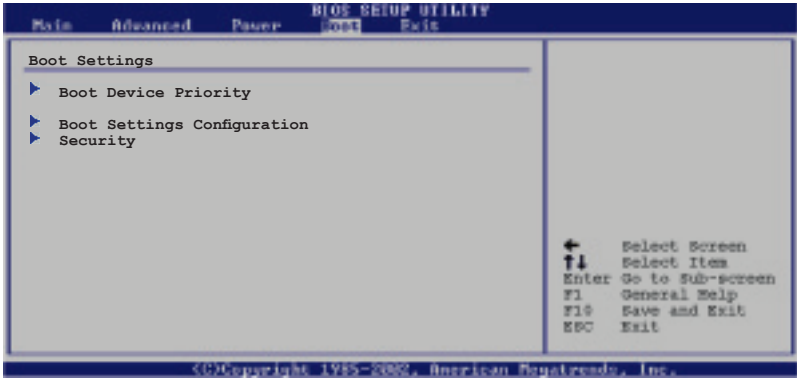
2.5.7 Energy Lake Feature [Enabled]

Allows you to enable or disable the Energy Lake technology feature.

Configuration options: [Enabled] [Disabled]

2.6 Boot menu

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



2.6.1 Boot Device Priority

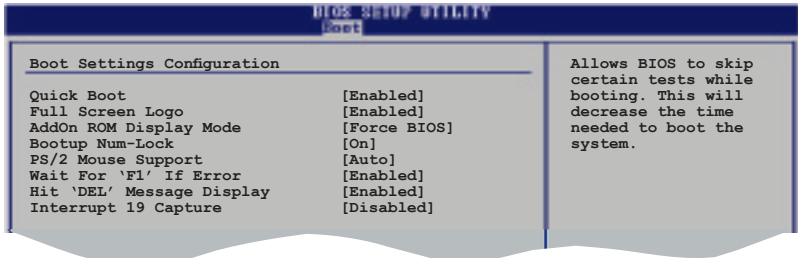


1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Configuration options: [xxxxx Drive] [Disabled]

2.6.2 Boot Settings Configuration



Quick Boot [Enabled]

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

Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]



Set this item to [Enabled] to use the Advantech MyLogo™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

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

Hit 'DEL' Message Display [Enabled]

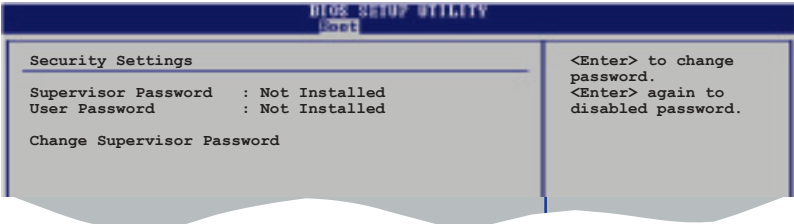
When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

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

2.6.3 Security

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



Change Supervisor Password

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

To set a Supervisor Password:

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

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

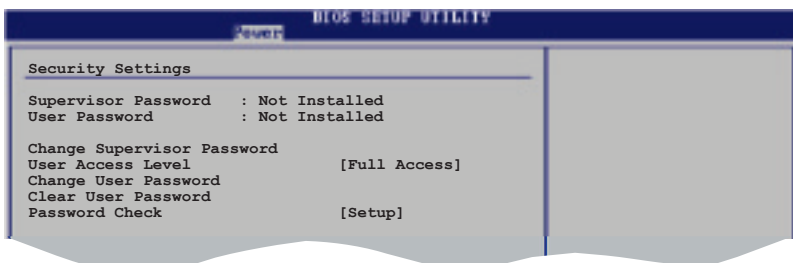
To change the supervisor password, follow the same steps as in setting a user password.

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



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section "2.6 Jumpers" for information on how to erase the RTC RAM.

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



User Access Level (Full Access)

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

No Access prevents user access to the Setup utility.

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

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

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

Change User Password

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

To set a User Password:

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

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

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

Clear User Password

Select this item to clear the user password.

Password Check [Setup]

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

Configuration options: [Setup] [Always]

2.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

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



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

Exit & Discard Changes

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

Discard Changes

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

Load Setup Defaults

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