# AD510PV / AD410PV

# User Manual

Version 1.0
Published March 2010

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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# Chapter 1 Introduction

Thank you for purchasing ASRock ***AD510PV / AD410PV*** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website http://www.asrock.com
If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

## 1.1 Package Contents

ASRock ***AD510PV / AD410PV*** Motherboard
(Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm)
One Bundled Intel® Dual-Core Atom™ Processor D510 (AD510PV)
One Bundled Intel® Atom™ Processor D410 (AD410PV)
ASRock ***AD510PV / AD410PV*** Quick Installation Guide
ASRock ***AD510PV / AD410PV*** Support CD
Two Serial ATA (SATA) Data Cables (Optional)
One I/O Panel Shield

## 1.2 Specifications

| | |
|---|---|
| **Platform** | - Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm<br>- Solid Capacitor for CPU power |
| **CPU** | - Intel® Dual-Core Atom™ Processor D510 (AD510PV)<br>- Intel® Atom™ Processor D410 (AD410PV)<br>- Supports Hyper-Threading Technology (see **CAUTION 1**)<br>- Supports Untied Overclocking Technology (see **CAUTION 2**)<br>- Supports EM64T CPU |
| **Chipset** | - Southbridge: Intel® NM10 Express |
| **Memory** | - 2 x DDR2 DIMM slots<br>- Supports DDR2 800/667 non-ECC, un-buffered memory<br>- Max. capacity of system memory: 8GB (see **CAUTION 3**) |
| **Expansion Slot** | - 1 x PCI slot |
| **Graphics** | - Intel® Graphics Media Accelerator 3150<br>- Pixel Shader 2.0, DirectX 9.0<br>- Max. shared memory 384MB (see **CAUTION 4**)<br>- Supports D-Sub with max. resolution up to 2048x1536 @ 60Hz |
| **Audio** | - 5.1 CH HD Audio (VIA® VT1705 Audio Codec) |
| **LAN** | - PCIE x1 Gigabit LAN 10/100/1000 Mb/s<br>- Realtek RTL8111DL<br>- Supports Wake-On-LAN |
| **Rear Panel I/O** | I/O Panel<br>- 1 x PS/2 Mouse Port<br>- 1 x PS/2 Keyboard Port<br>- 1 x Parallel Port (ECP/EPP Support)<br>- 1 x Serial Port: COM1<br>- 1 x VGA Port<br>- 4 x Ready-to-Use USB 2.0 Ports<br>- 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED)<br>- HD Audio Jack: Line in / Front Speaker / Microphone |
| **Connector** | - 2 x SATAII 3.0 Gb/s connectors, support NCQ, AHCI and Hot Plug functions (see **CAUTION 5**)<br>- CPU/Chassis FAN connector<br>- 24 pin ATX power connector<br>- CD in header<br>- Front panel audio connector<br>- 2 x USB 2.0 headers (support 4 USB 2.0 ports) (see **CAUTION 6**) |

| | |
|---|---|
| **BIOS Feature** | - 4Mb AMI BIOS<br>- AMI Legal BIOS<br>- Supports “Plug and Play”<br>- ACPI 1.1 Compliance Wake Up Events<br>- Supports jumperfree<br>- AMBIOS 2.3.1 Support<br>- VCCM, SB Voltage Multi-adjustment<br>- Supports Smart BIOS |
| **Support CD** | - Drivers, Utilities, AntiVirus Software (Trial Version), ASRock Software Suite (CyberLink DVD Suite and Creative Sound Blaster X-Fi MB) (OEM and Trial Version) |
| **Unique Feature** | - ASRock OC Tuner (see **CAUTION 7**)<br>- Instant Boot<br>- ASRock Instant Flash (see **CAUTION 8**)<br>- ASRock OC DNA (see **CAUTION 9**)<br>- Hybrid Booster:<br>- CPU Frequency Stepless Control (see **CAUTION 10**)<br>- ASRock U-COP (see **CAUTION 11**)<br>- Boot Failure Guard (B.F.G.) |
| **Hardware Monitor** | - CPU Temperature Sensing<br>- Chassis Temperature Sensing<br>- CPU Fan Tachometer<br>- Chassis Fan Tachometer<br>- CPU Quiet Fan<br>- Voltage Monitoring: +12V, +5V, +3.3V, Vcore |
| **OS** | - Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit compliant |
| **Certifications** | - FCC, CE, WHQL<br>- ErP/EuP Ready (ErP/EuP ready power supply is required) (see **CAUTION 12**) |

* For detailed product information, please visit our website: http://www.asrock.com

**WARNING**

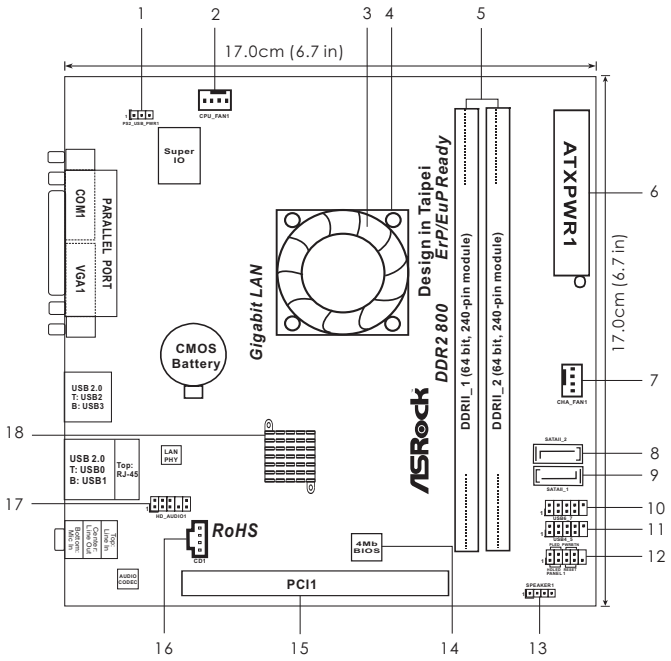
Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

## *CAUTION!*

1. About the setting of "Hyper Threading Technology", please check page 33.
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 25 for details.
3. Due to the chipset limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® OS.
4. The maximum shared memory size is defined by the chipset vendor and is subject to change. Please check Intel® website for the latest information.
5. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 19 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
6. Power Management for USB 2.0 works fine under Microsoft® Windows® 7 64-bit / 7 / Vista™ 64-bit / Vista™ / XP 64-bit / XP SP1 or SP2.
7. It is a user-friendly ASRock overclocking tool which allows you to surveil your system by hardware monitor function and overclock your hardware devices to get the best system performance under Windows® environment. Please visit our website for the operation procedures of ASRock OC Tuner. ASRock website: http://www.asrock.com
8. ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.
9. The software name itself – OC DNA literally tells you what it is capable of. OC DNA, an exclusive utility developed by ASRock, provides a convenient way for the user to record the OC settings and share with others. It helps you to save your overclocking record under the operating system and simplifies the complicated recording process of overclocking settings. With OC DNA, you can save your OC settings as a profile and share with your friends! Your friends then can load the OC profile to their own system to get the same OC settings as yours! Please be noticed that the OC profile can only be shared and worked on the same motherboard.
10. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.

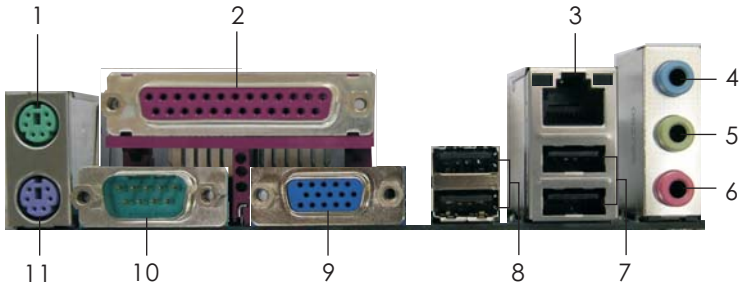
11. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
12. EuP, stands for Energy Using Product, was a provision regulated by European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.00W in off mode condition. To meet EuP standard, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v standby power efficiency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details.

## 1.3 Motherboard Layout




| | | | |
|---|---|---|---|
| 1 | PS2_USB_PWR1 Jumper | 10 | USB 2.0 Header (USB6_7, Blue) |
| 2 | CPU Fan Connector (CPU_FAN1) | 11 | USB 2.0 Header (USB4_5, Blue) |
| 3 | CPU Fan | 12 | System Panel Header (PANEL1, White) |
| 4 | CPU Heatsink | 13 | Chassis Speaker Header (SPEAKER 1, White) |
| 5 | 2 x 240-pin DDR2 DIMM Slots (Dual Channel: DDRII_1, DDRII_2; Yellow) | 14 | BIOS SPI Chip |
| | | 15 | PCI Slot (PCI1) |
| 6 | ATX Power Connector (ATXPWR1) | 16 | Internal Audio Connector: CD1 (Black) |
| 7 | Chassis Fan Connector (CHA_FAN1) | 17 | Front Panel Audio Header (HD_AUDIO1, White) |
| 8 | Secondary SATAII Connector (SATAII_2; Blue) | | |
| 9 | Primary SATAII Connector (SATAII_1; Blue) | 18 | South Bridge Controller |

## 1.4 I/O Panel




| | | | |
|---|---|---|---|
| 1 | PS/2 Mouse Port (Green) | 7 | USB 2.0 Ports (USB01) |
| 2 | Parallel Port | 8 | USB 2.0 Ports (USB23) |
| 3 | RJ-45 Port | 9 | VGA Port |
| 4 | Line In (Light Blue) | 10 | COM Port |
| 5 | Line Out (Lime) | 11 | PS/2 Keyboard Port (Purple) |
| 6 | Microphone (Pink) | | |

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

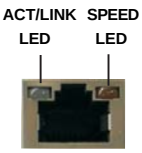
**LAN Port LED Indications**

**Activity/Link LED**

| Status | Description |
|---|---|
| Off | No Activity |
| Blinking | Data Activity |

**SPEED LED**

| Status | Description |
|---|---|
| Off | 10Mbps connection |
| Orange | 100Mbps connection |
| Green | 1Gbps connection |




**LAN Port**

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find “VIA HD Audio Deck” tool on your system. Please follow below instructions according to the OS you install.

**For Windows® XP / XP 64-bit OS:**

Please click “VIA HD Audio Deck” icon  , and click “Speaker”. Then you are allowed to select “2 Channel” or “4 Channel”. Click “Power” to save your change.

**For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:**

Please click “VIA HD Audio Deck” icon  , and click “Advanced Options” on the left side on the bottom. In “Advanced Options” screen, select “Independent Headphone”, and click “OK” to save your change.

# Chapter 2 Installation

***AD510PV / AD410PV*** is a Mini-ITX form factor (6.7" x 6.7", 17.0 x 17.0 cm) motherboard. 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 may cause physical injuries to you and damages to motherboard components.

## 2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not over-tighten the screws! Doing so may damage the motherboard.

## 2.2 Pre-installation Precautions

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

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.

Before you install or remove any component, ensure that the power 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.

## 2.3 Installation of Memory Modules (DIMM)

***AD510PV / AD410PV*** motherboard provides two 240-pin DDR2 (Double Data Rate 2) DIMM slots.

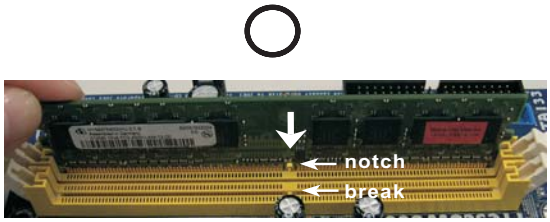
It is not allowed to install a DDR memory module into DDR2 slot;otherwise, this motherboard and DIMM may be damaged.

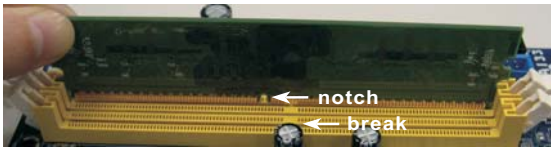
### Installing a DIMM

Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

Step 1. Unlock a DIMM slot by pressing the retaining clips outward.

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




The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

## 2.4 Expansion Slot (PCI Slot)

There is 1 PCI slot on this motherboard.

**PCI slot:** PCI slot is used to install expansion cards that have the 32-bit PCI interface.

### Installing an expansion card

Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

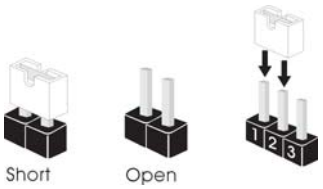
Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 4. Fasten the card to the chassis with screws.

## 2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short”. If no jumper cap is placed on pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.




| Jumper | Setting | Description |
|---|---|---|
| PS2_USB_PWR1 (see p.10 No. 1) | 1_2 +5V  2_3 +5VSB  | Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events. |

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

## 2.6 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

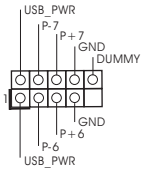
**Serial ATAII Connectors**
(SATAII_1: see p.10, No. 9)
(SATAII_2: see p.10, No. 8)


These Serial ATAII (SATAII) connectors support SATAII or SATA hard disk for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

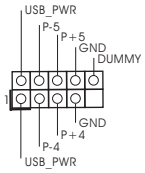
**Serial ATA (SATA) Data Cable**
(Optional)

Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on the motherboard.

**USB 2.0 Headers**
(9-pin USB6_7)
(see p.10 No. 10)




(9-pin USB4_5)
(see p.10 No. 11)



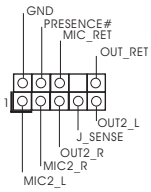

Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

**Internal Audio Connector**
(4-pin CD1)
(CD1: see p.10 No. 16)

CD1

This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

**Front Panel Audio Header**
(9-pin HD_AUDIO1)
(see p.10 No. 17)



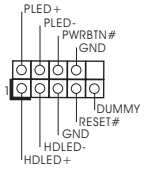

This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
   E. Enter BIOS Setup Utility. Enter Advanced Settings, and then select Chipset Configuration. Set the Front Panel Control option from [Auto] to [Enabled].

### System Panel Header

(9-pin PANEL1)

(see p.10 No. 12)

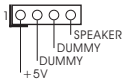



This header accommodates several system front panel functions.

### Chassis Speaker Header

(4-pin SPEAKER 1)

(see p.10 No. 13)

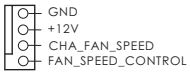



Please connect the chassis speaker to this header.

### Chassis Fan Connector

(4-pin CHA_FAN1)

(see p.10 No. 7)

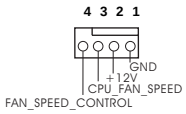



Please connect a chassis fan cable to this connector and match the black wire to the ground pin.

### CPU Fan Connector

(4-pin CPU_FAN1)

(see p.10 No. 2)




Please connect a CPU fan cable to this connector and match the black wire to the ground pin.

Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

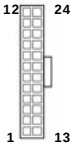
**Pin 1-3 Connected**

3-Pin Fan Installation

ATX Power Connector

(24-pin ATXPWR1)

(see p.10, No. 6)




Please connect an ATX power supply to this connector.

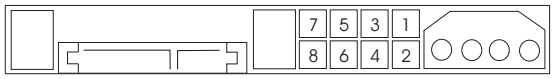
Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.


20-Pin ATX Power Supply Installation

## 2.7 SATAII Hard Disk Setup Guide

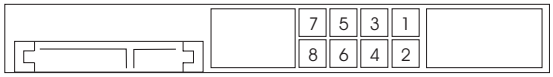
Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

**Western Digital**




If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

**SAMSUNG**




If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

**HITACHI**

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:
http://www.hitachigst.com/hdd/support/download.htm

The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.

## 2.8 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation

This motherboard adopts Intel® NM10 Express south bridge chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

STEP 1: Install the SATA / SATAII hard disks into the drive bays of your chassis.
STEP 2: Connect the SATA power cable to the SATA / SATAII hard disk.
STEP 3: Connect one end of the SATA data cable to the motherboard's SATAII connector.
STEP 4: Connect the other end of the SATA data cable to the SATA / SATAII hard disk.

## 2.9 Hot Plug Function for SATA / SATAII HDDs

This motherboard supports Hot Plug function for SATA / SATAII Devices in AHCI mode. Intel® NM10 Express south bridge chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed thru a joint industry effort. AHCI also provides usability enhancements such as Hot Plug.

**NOTE**

**What is Hot Plug Function?**

If the SATA / SATAII HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA / SATAII HDDs while the system is still power-on and in working condition.
However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA / SATAII HDD.

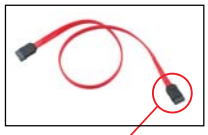
## 2.10 SATA / SATAII HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA / SATAII HDD in AHCI mode. Please read below operation guide of SATA / SATAII HDD Hot Plug feature carefully. Before you process the SATA / SATAII HDD Hot Plug, please check below cable accessories from the motherboard gift box pack.

A. 7-pin SATA data cable

B. SATA power cable with SATA 15-pin power connector interface

A. SATA data cable (Red)



SATA 7-pin connector

B. SATA power cable

The SATA 15-pin power connector (Black) connect to SATA / SATAII HDD

1x4-pin conventional power connector (White) connect to power supply

### Caution

1. Without SATA 15-pin power connector interface, the SATA / SATAII Hot Plug cannot be processed.
2. Even some SATA / SATAII HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is definitely not able to support Hot Plug and will cause the HDD damage and data loss.

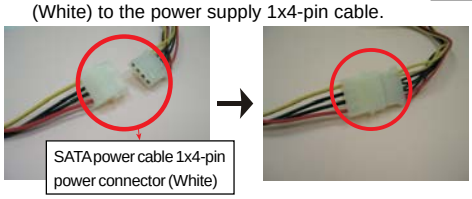
### Points of attention, before you process the Hot Plug:

1. Below operation procedure is designed only for our motherboard, which supports SATA / SATAII HDD Hot Plug.
   * The SATA / SATAII Hot Plug feature might not be supported by the chipset because of its limitation, the SATA / SATAII Hot Plug support information of our motherboard is indicated in the product spec on our website: www.asrock.com
2. Make sure your SATA / SATAII HDD can support Hot Plug function from your dealer or HDD user manual. The SATA / SATAII HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATAII driver is installed into system properly. The latest SATA / SATAII driver is available on our support website: www.asrock.com
4. Make sure to use the SATA power cable & data cable, which are from our motherboard package.
5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss.

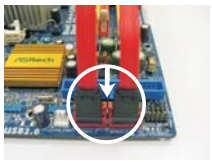
## How to Hot Plug a SATA / SATAII HDD:

Points of attention, before you process the Hot Plug:
Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA / SATAII HDD damage and data loss.

Step *1* Please connect SATA power cable 1x4-pin end (White) to the power supply 1x4-pin cable.




Step *2* Connect SATA data cable to the motherboard's SATAII connector.



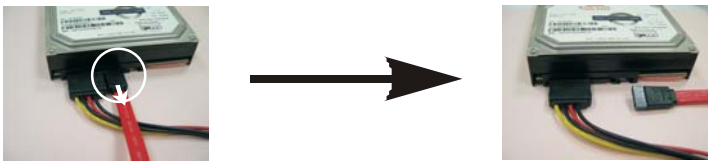
Step *3* Connect SATA 15-pin power cable connector (Black) end to SATA / SATAII HDD.

Step *4* Connect SATA data cable to the SATA / SATAII HDD.

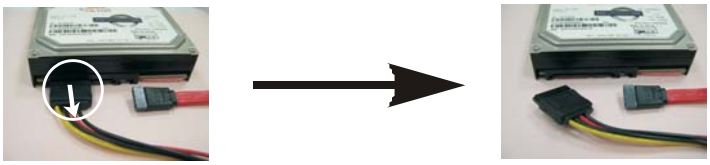
## How to Hot Unplug a SATA / SATAII HDD:

Points of attention, before you process the Hot Unplug:
Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA / SATAII HDD damage and data loss.

Step *1* Unplug SATA data cable from SATA / SATAII HDD side.



Step *2* Unplug SATA 15-pin power cable connector (Black) from SATA / SATAII HDD side.



## 2.11 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

## 2.12 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit OS on your SATA / SATAII HDDs without RAID functions, please follow below procedures according to the OS you install.

### 2.12.1 Installing Windows® XP / XP 64-bit Without RAID Functions

If you want to install Windows® XP / XP 64-bit OS on your SATA / SATAII HDDs without RAID functions, please follow below steps.

AHCI mode is not supported under Windows® XP / XP 64-bit OS.

**Using SATA / SATAII HDDs without NCQ function**

**STEP 1: Set up BIOS.**

A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the option “SATA Operation Mode” to [IDE].

**STEP 2: Install Windows® XP / XP 64-bit OS on your system.**

### 2.12.2 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your SATA / SATAII HDDs without RAID functions, please follow below steps.

**Using SATA / SATAII HDDs with NCQ function**

**STEP 1: Set Up BIOS.**

A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the option "SATA Operation Mode" to [AHCI].

**STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.**

**Using SATA / SATAII HDDs without NCQ function**

**STEP 1: Set up BIOS.**

A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the option "SATA Operation Mode" to [IDE].

**STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.**

## 2.13 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI bus. Before you enable Untied Overclocking function, please enter “Overclock Mode” option of BIOS setup to set the selection from [Auto] to [CPU, PCIE, Async.]. Therefore, CPU FSB is untied during overclocking, but PCI buse is in the fixed mode so that FSB can operate under a more stable overclocking environment.

Please refer to the warning on page 7 for the possible overclocking risk before you apply Untied Overclocking Technology.

# Chapter 3 BIOS SETUP UTILITY

## 3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The BIOS FWH chip on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

### 3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

| | |
|---|---|
| **Main** | To set up the system time/date information |
| **OC Tweaker** | To set up overclocking features |
| **Advanced** | To set up the advanced BIOS features |
| **PCIPnP** | To set up the PCI features |
| **Boot** | To set up the default system device to locate and load the Operating System |
| **Security** | To set up the security features |
| **Chipset** | To set up the chipset features |
| **Exit** | To exit the current screen or the BIOS SETUP UTILITY |

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

### 3.1.2 Navigation Keys

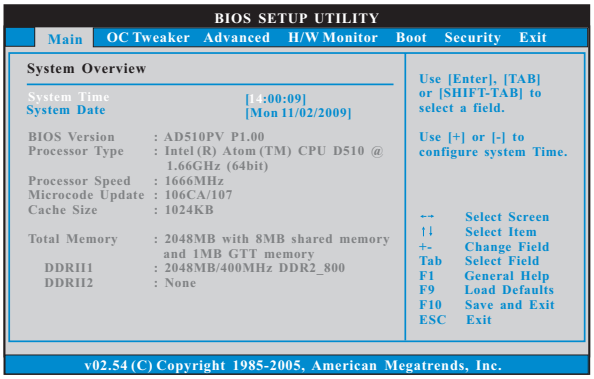
Please check the following table for the function description of each navigation key.

| Navigation Key(s) | Function Description |
|---|---|
| ← / → | Moves cursor left or right to select Screens |
| ↑ / ↓ | Moves cursor up or down to select items |
| + / - | To change option for the selected items |
| <Enter> | To bring up the selected screen |
| <F1> | To display the General Help Screen |
| <F9> | To load optimal default values for all the settings |
| <F10> | To save changes and exit the BIOS SETUP UTILITY |
| <ESC> | To jump to the Exit Screen or exit the current screen |

## 3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview.

**AD510PV**



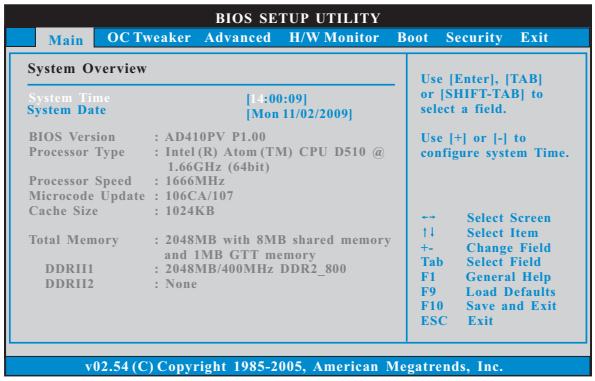

**System Time [Hour:Minute:Second]**

Use this item to specify the system time.

**System Date [Day Month/Date/Year]**

Use this item to specify the system date.

**AD410PV**




**System Time [Hour:Minute:Second]**

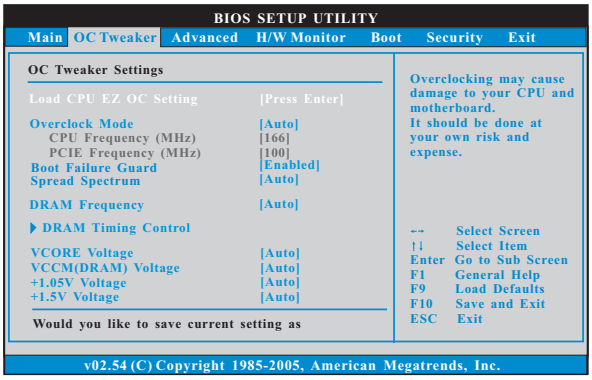
Use this item to specify the system time.

**System Date [Day Month/Date/Year]**

Use this item to specify the system date.

## 3.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.




**Load CPU EZ OC Setting**

You can use this option to load CPU EZ overclocking setting. Configuration options: [Press Enter], [1.80 GHz], [1.90 GHz] and [2.00 GHz]. Please note that overclocing may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

**Overclock Mode**

Use this to select Overclock Mode. The default value is [Auto]. Configuration options: [Auto], [CPU, PCIE, Sync.], [CPU, PCIE, Async.] and [Optimized].

**CPU Frequency (MHz)**

Use this option to adjust CPU frequency.

**PCIE Frequency (MHz)**

Use this option to adjust PCIE frequency.

**Boot Failure Guard**

Enable or disable the feature of Boot Failure Guard.

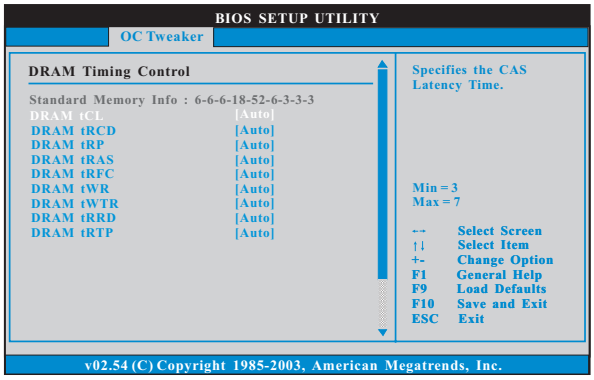
**Spread Spectrum**

This item should always be [Auto] for better system stability.

**DRAM Frequency**

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may select [Auto], [333MHz DDR2_667] and [400MHz DDR2_800].

### DRAM Timing Control




**DRAM tCL**

This controls the number of DRAM clocks for TCL. Min: 3. Max: 7. The default value is [Auto].

**DRAM tRCD**

This controls the number of DRAM clocks for TRCD. Min: 3. Max: 10. The default value is [Auto].

**DRAM tRP**

This controls the number of DRAM clocks for TRP. Min: 3. Max: 10. The default value is [Auto].

**DRAM tRAS**

This controls the number of DRAM clocks for TRAS. Min: 9. Max: 24. The default value is [Auto].

**DRAM tRFC**

This controls the number of DRAM clocks for TRFC. Min: 15. Max: 78. The default value is [Auto].

**DRAM tWR**

This controls the number of DRAM clocks for TWR. Min: 3. Max: 15. The default value is [Auto].

**DRAM tWTR**

This controls the number of DRAM clocks for TWTR. Min: 2. Max: 15. The default value is [Auto].

**DRAM tRRD**

This controls the number of DRAM clocks for TRRD. Min: 2. Max: 15. The default value is [Auto].

**DRAM tRTP**

This controls the number of DRAM clocks for TRTP. Min: 2. Max: 13. The default value is [Auto].

**VCORE Voltage**

Use this to select VCORE Voltage. Configuration options: [Auto], [1.107V] to [1.252V]. The default value of this feature is [Auto].

**VCCM(DRAM) Voltage**

Use this to select VCCM(DRAM) Voltage. Configuration options: [Auto], [1.794V] to [2.201V]. The default value of this feature is [Auto].

**+1.05V Voltage**

Use this to select +1.05V Voltage. Configuration options: [Auto], [1.050V] to [1.200V]. The default value of this feature is [Auto].

**+1.5V Voltage**

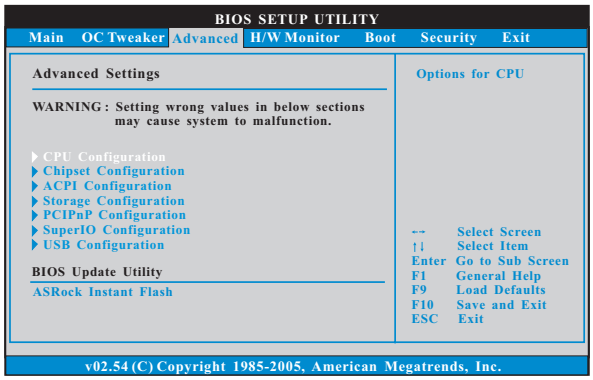
Use this to select +1.5V Voltage. Configuration options: [Auto], [1.509V] to [1.645V]. The default value of this feature is [Auto].

**Would you like to save current setting user defaults?**

In this option, you are allowed to load and save three user defaults according to your own requirements.

## 3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, Storage Configuration, PCIPnP Configuration, SuperIO Configuration, and USB Configuration.

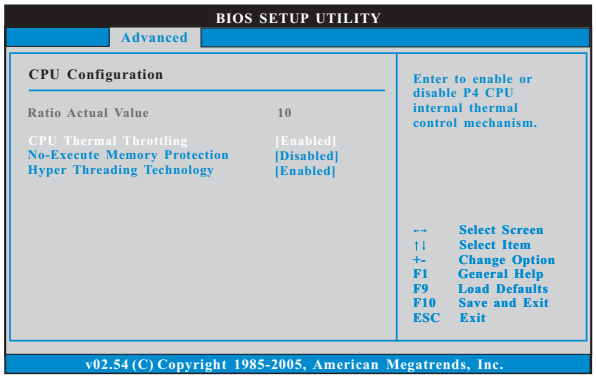



Setting wrong values in this section may cause the system to malfunction.

**ASRock Instant Flash**

ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute ASRock Instant Flash utility, the utility will show the BIOS files and their respective information. Select the proper BIOS file to update your BIOS, and reboot your system after BIOS update process completes.

## 3.4.1 CPU Configuration




**Ratio Actual Value**

This is a read-only item, which displays the ratio actual value of this motherboard.

**CPU Thermal Throttling**

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated.

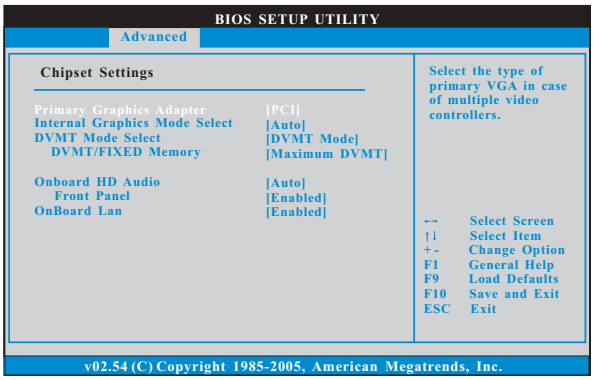
**No-Excute Memory Protection**

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with “No Execute (NX) Memory Protection” can prevent data pages from being used by malicious software to execute code.

**Hyper Threading Technology**

To enable this feature, it requires a computer system with an Intel Pentium® 4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP. Set to [Enabled] if using Microsoft® Windows® XP, or Linux kernel version 2.4.18 or higher.

## 3.4.2 Chipset Configuration




**Primary Graphics Adapter**

This item shows the primary graphics adapter. The default value is [PCI]. Configuration options: [Onboard] and [PCI].

**Internal Graphics Mode Select**

If you select [Auto], the onboard VGA will be automatically disabled when you install VGA card; the onboard VGA will be enabled without the installation of any add-on VGA card. If you select [Enabled, 8MB], the onboard VGA will be enabled.

**DVMT Mode Select**

Use this option to adjust DVMT mode. Configuration options: [Fixed Mode], [DVMT Mode] and [Fixed+DVMT Mode]. The default value is [DVMT Mode]. DVMT (Dynamic Video Memory Technology) is an architecture that offers breakthrough performance for the motherboard through efficient memory utilization. In Fixed mode, a fixed-size fragment of the system memory is allocated to the graphics core. In DVMT mode, the graphics driver allocates memory as needed for running graphics applications and is cooperatively using this memory with other system components. In Fixed+DVMT mode, the graphics processor gets a fixed-size chunk of 64MB of memory and up to 64MB of dynamically-allotted memory. This mode guarantees that at least 64MB of memory is available to the graphics core, with a possibility to increase this amount to 128MB, if necessary. This item will not be used under Windows® Vista™ OS because the driver will intelligently detect physical memory available and allocate necessary video memory.

**DVMT/FIXED Memory**

You are allowed to adjust the shared memory size in this item if you set DVMT Mode Select as [DVMT Mode]. Configuration options: [64MB], [128MB] and [Maximum DVMT].

**Onboard HD Audio**

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

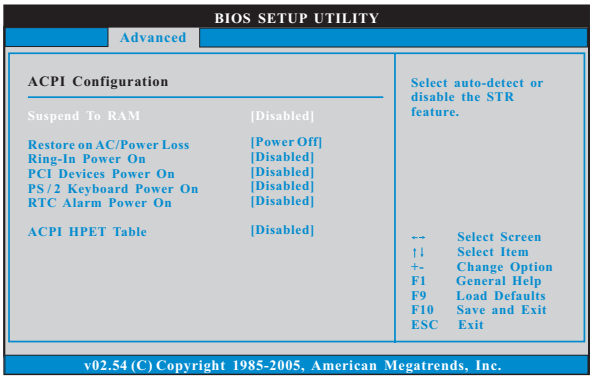
**Front Panel**

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio Front Panel.

**OnBoard Lan**

This allows you to enable or disable the “OnBoard Lan” feature.

## 3.4.3 ACPI Configuration




**Suspend to RAM**

This field allows you to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the system supports it.

**Check Ready Bit**

Use this item to enable or disable the feature Check Ready Bit.

**Restore on AC/Power Loss**

This allows you to set the power state after an unexpected AC/Power loss. If [Power Off] is selected, the AC/Power remains off when the power recovers. If [Power On] is selected, the AC/Power resumes and the system starts to boot up when the power recovers.

**Ring-In Power On**

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

**PCI Devices Power On**

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

**PS/2 Keyboard Power On**

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

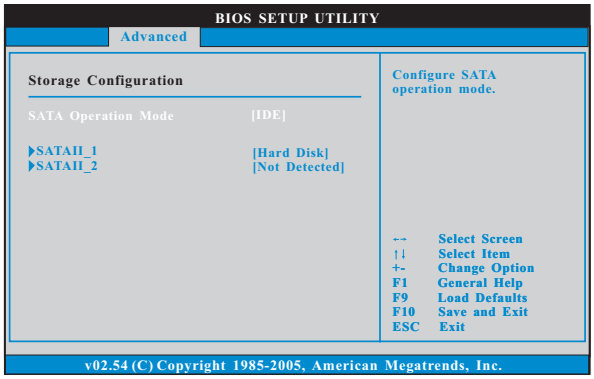
**RTC Alarm Power On**

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

**ACPI HPET Table**

Use this item to enable or disable ACPI HPET Table. The default value is [Disabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® Vista™ certification.

## 3.4.4 Storage Configuration



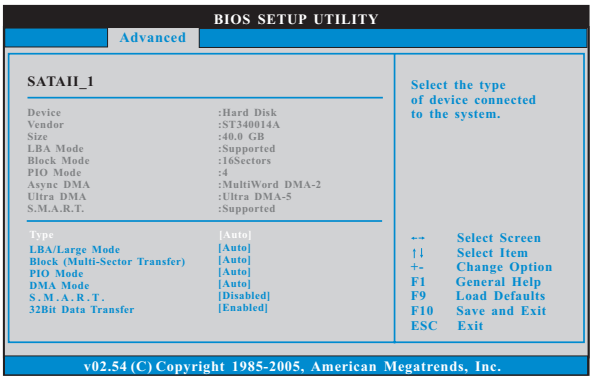

### SATA Operation Mode

Use this to select SATA operation mode. Configuration options: [IDE], [AHCI] and [Disabled]. The default value is [IDE].

AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

### IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the “SATAII_1” as the example in the following instruction.




### TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

**[Not Installed]:** Select [Not Installed] to disable the use of IDE device.

**[Auto]:** Select [Auto] to automatically detect the hard disk drive.

After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

**[CD/DVD]:** This is used for IDE CD/DVD drives.

**[ARMD]:** This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

**LBA/Large Mode**

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

**Block (Multi-Sector Transfer)**

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

**PIO Mode**

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

**DMA Mode**

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

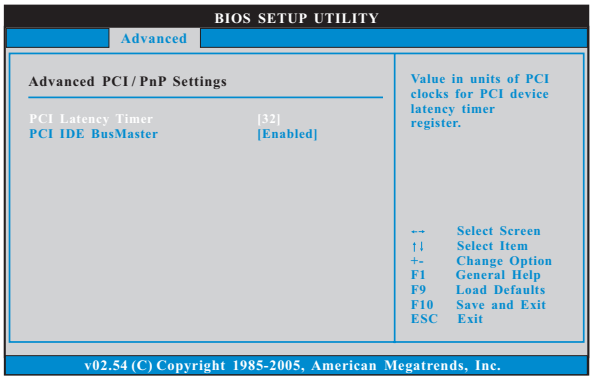
**S.M.A.R.T.**

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

**32-Bit Data Transfer**

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

## 3.4.5 PCIPnP Configuration



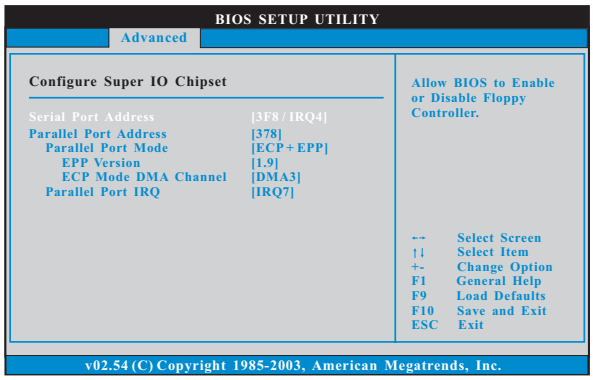

**PCI Latency Timer**

The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

**PCI IDE BusMaster**

Use this item to enable or disable the PCI IDE BusMaster feature.

## 3.4.6 Super IO Configuration




**Serial Port Address**

Use this item to set the address for the onboard serial port or disable it. Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

**Parallel Port Address**

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

**Parallel Port Mode**

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, “EPP Version”. Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

**EPP Version**

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

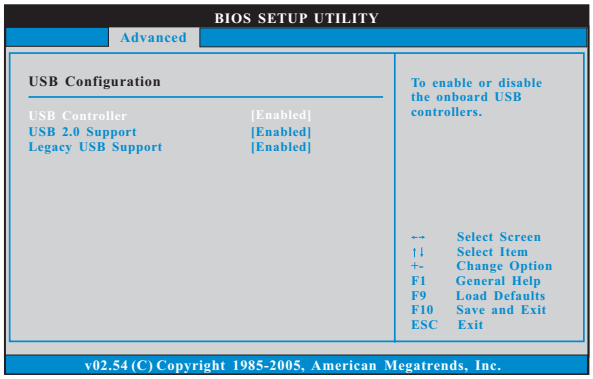
**ECP Mode DMA Channel**

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

**Parallel Port IRQ**

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

## 3.4.7 USB Configuration




**USB Controller**

Use this item to enable or disable the use of USB controller.

**USB 2.0 Support**

Use this item to enable or disable the USB 2.0 support.

**Legacy USB Support**

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [BIOS Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

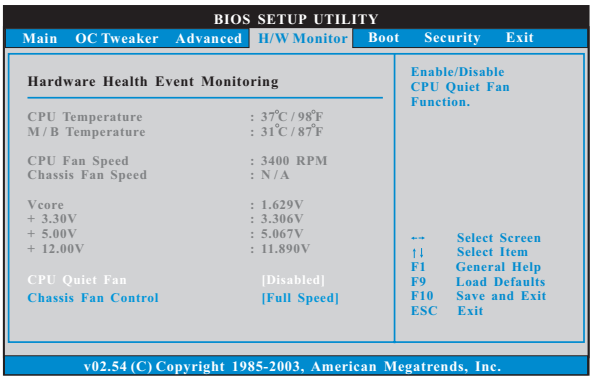
[Auto] - Enables legacy support if USB devices are connected.

[Disabled] - USB devices are not allowed to use under legacy OS and BIOS setup when [Disabled] is selected. If you have USB compatibility issue, it is recommended to select [Disabled] to enter OS.

[BIOS Setup Only] - USB devices are allowed to use only under BIOS setup and Windows / Linux OS.

## 3.5 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.




**CPU Quiet Fan**

This item allows you to identify the temperature of CPU fan. If you set this option as [Disabled], the CPU fan will operate in full speed. If you set this option as [Enabled], you will find the items “Target CPU Temperature” and “Target Fan Speed” appear to allow you adjusting them. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin CPU fan.

**Target CPU Temperature**

The target temperature will be between 45° C/113° F and 65° C/149° F. The default value is [50° C/122° F].

**Target Fan Speed**

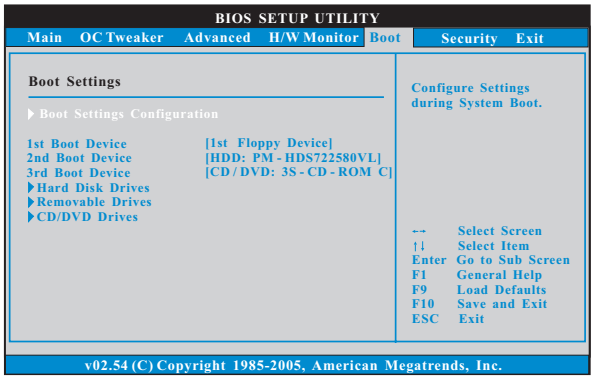
Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target CPU temperature that you choose. Configuration options: [Level 1], [Level 2], [Level 3], [Level 4], [Level 5], [Level 6] [Level 7], [Level 8] and [Level 9].

**Chassis Fan Control**

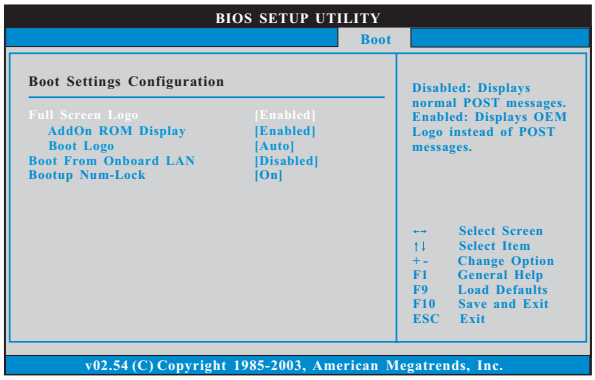
This item allows you to control the speed of chassis fan. Configuration options: [Full Speed], [Level 1], [Level 2], [Level 3], [Level 4], [Level 5], [Level 6] [Level 7], [Level 8] and [Level 9].

## 3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.




### 3.6.1 Boot Settings Configuration




**Full Screen Logo**

Use this item to enable or disable OEM Logo. The default value is [Enabled].

**AddOn ROM Display**

Use this option to adjust AddOn ROM Display. If you enable the option "Full Screen Logo" but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

**Boot Logo**

Use this option to select logo in POST screen. This option only appears when you enable the option "Full Screen Logo". Configuration options: [Auto], [EuP], [Scenery] and [ASRock]. The default value is [Auto].

**Boot From Onboard LAN**

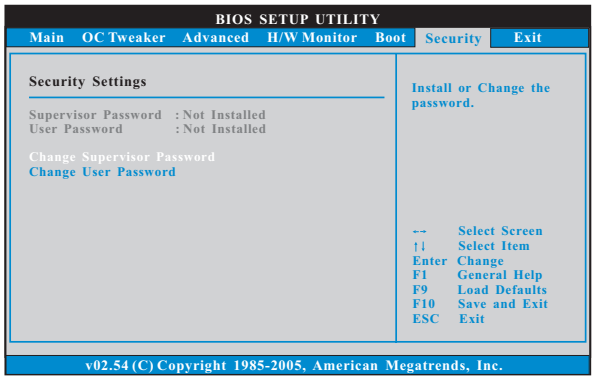
Use this item to enable or disable the Boot From Onboard LAN feature.

**Boot Up Num-Lock**

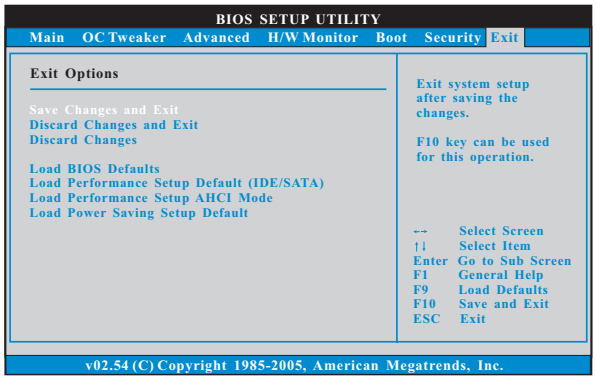
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

## 3.7 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



## 3.8 Exit Screen




**Save Changes and Exit**

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

**Discard Changes and Exit**

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

**Discard Changes**

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

**Load BIOS Defaults**

Load BIOS default values for all the setup questions. F9 key can be used for this operation.

**Load Performance Setup Default (IDE/SATA)**

This performance setup default may not be compatible with all system configurations. If system boot failure occurs after loading, please resume optimal default settings. F5 key can be used for this operation.

**Load Performance Setup AHCI Mode**

This performance setup AHCI mode may not be compatible with all system configurations. If system boot failure occurs after loading, please resume optimal default settings. F3 key can be used for this operation.

**Load Power Saving Setup Default**

Load power saving setup default. F6 key can be used for this operation.

# Chapter 4 Software Support

## 4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

## 4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

### 4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

### 4.2.2 Drivers Menu

The Drivers Menu shows the available devices drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

### 4.2.3 Utilities Menu

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

### 4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information.