P4i945GC

User Manual

Version 1.0
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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"

ASRock Website: http://www.asrock.com

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock ***P4i945GC*** 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 ***P4i945GC*** Motherboard
(Micro ATX Form Factor: 9.6-in x 7.7-in, 24.4 cm x 19.6 cm)
ASRock ***P4i945GC*** Quick Installation Guide
ASRock ***P4i945GC*** Support CD
One 80-conductor Ultra ATA IDE Ribbon Cable (Optional)
One Serial ATA (SATA) Data Cable (Optional)
One I/O Panel Shield

1.2 Specifications

Platform	- Micro ATX Form Factor: 9.6-in x 7.7-in, 24.4 cm x 19.6 cm
CPU	- Socket 478 for Intel® Pentium® 4 / Celeron® D (Prescott, Northwood) processors - FSB 800/533/400 MHz (see **CAUTION 1**) - Supports Hyper-Threading Technology (see **CAUTION 2**) - Supports Untied Overclocking Technology (see **CAUTION 3**)
Chipset	- Northbridge: Intel® 945GC - Southbridge: Intel® ICH7
Memory	- 2 x DDR2 DIMM slots - Supports DDR2 667/533/400 non-ECC, un-buffered memory (see **CAUTION 4**) - Max. capacity of system memory: 4GB (see **CAUTION 5**)
Expansion Slot	- 1 x PCI Express x16 slot - 1 x PCI Express x1 slot - 2 x PCI slots
Graphics	- Intel® Graphics Media Accelerator 950 - Pixel Shader 2.0, DirectX 9.0 - Max. shared memory 224MB (see **CAUTION 6**)
Audio	- 7.1 CH Windows® Vista™ Premium Level HD Audio (Realtek ALC888 Audio Codec)
LAN	- PCIE x1 Gigabit LAN 10/100/1000 Mb/s - Realtek RTL8111DL - Supports Wake-On-LAN
Rear Panel I/O	ASRock 8CH I/O Plus - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x Serial Port: COM1 - 1 x VGA Port - 1 x Parallel Port (ECP/EPP Support) - 4 x Ready-to-Use USB 2.0 Ports - 1 x RJ-45 LAN Port - HD Audio Jack: Side Speaker / Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone (see **CAUTION 7**)
Connector	- 4 x SATAII 3.0 Gb/s connectors (No Support for RAID and "Hot Plug" functions) (see **CAUTION 8**) - 1 x ATA100 IDE connector by Intel® ICH7 (supports 2 x IDE devices) - 1 x ATA133 IDE connector by VIA® VT6415 (supports 2 x IDE devices)

	- 1 x Floppy connector - CPU/Chassis FAN connector - 24 pin ATX power connector - 4 pin 12V power connector - CD in header - Front panel audio connector - 2 x USB 2.0 headers (support 4 USB 2.0 ports) (see **CAUTION 9**)
BIOS Feature	- 4Mb AMI BIOS - AMI Legal BIOS - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - AMBIOS 2.3.1 Support - Supports Smart BIOS
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version)
Unique Feature	- Instant Boot - ASRock Instant Flash (see **CAUTION 10**) - Hybrid Booster: - CPU Frequency Stepless Control (see **CAUTION 11**) - ASRock U-COP (see **CAUTION 12**) - Boot Failure Guard (B.F.G.)
Hardware Monitor	- CPU Temperature Sensing - Chassis Temperature Sensing - CPU Fan Tachometer - Chassis Fan Tachometer - Voltage Monitoring: +12V, +5V, +3.3V, Vcore
OS	- Microsoft® Windows® 2000 / XP / Vista™ compliant
Certifications	- FCC, CE, WHQL

* 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.

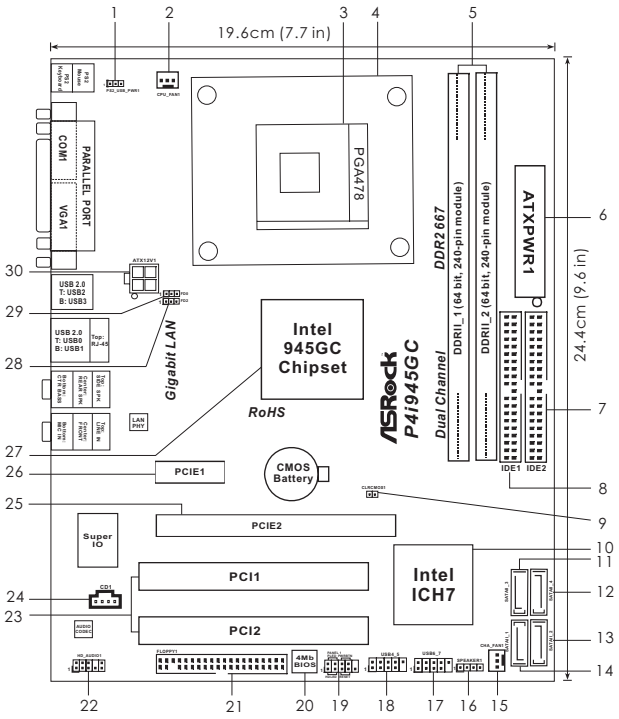
CAUTION!

1. If you adopt FSB400-CPU on this motherboard, you need to adjust the jumpers. Please refer to page 15 for proper jumper settings.
2. About the setting of "Hyper Threading Technology", please check page 26.
3. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 21 for details.
4. Please check the table below for the CPU FSB frequency and its corresponding memory support frequency.

CPU FSB Frequency	Memory Support Frequency
800	DDR2 400, DDR2 533, DDR2 667
533	DDR2 400, DDR2 533
400	DDR2 400

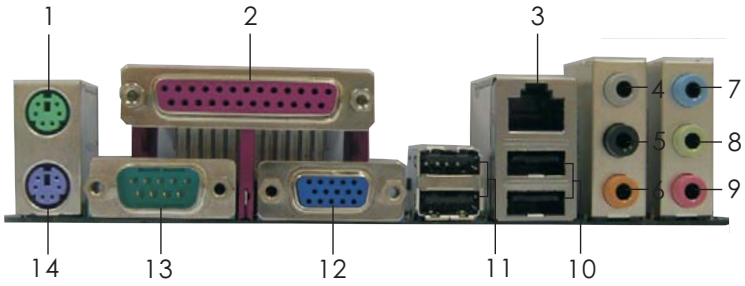
5. Due to the chipset limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® XP and Windows® Vista™.
6. The maximum shared memory size is defined by the chipset vendor and is subject to change. Please check Intel® website for the latest information.
7. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 10 for proper connection.
8. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 20 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
9. Power Management for USB 2.0 works fine under Microsoft® Windows® Vista™ / XP SP1 or SP2 / 2000 SP4.
10. 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.
11. 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.
12. 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.

1.3 Motherboard Layout



1	PS2_USB_PWR1 Jumper	16	Chassis Speaker Header (SPEAKER1, Purple)
2	CPU Fan Connector (CPU_FAN1)	17	USB 2.0 Header (USB6_7, Blue)
3	478-Pin CPU Socket	18	USB 2.0 Header (USB4_5, Blue)
4	CPU Heatsink Retention Module	19	System Panel Header (PANEL1, Orange)
5	2 x 240-pin DDR2 DIMM Slots (Dual Channel: DDRII_1, DDRII_2; Yellow)	20	BIOS SPI Chip
		21	Floppy Connector (FLOPPY1)
6	ATX Power Connector (ATXPWR1)	22	Front Panel Audio Header (HD_AUDIO1, Lime)
7	Secondary IDE Connector (IDE2, Black)		
8	Primary IDE Connector (IDE1, Blue)	23	PCI Slots (PCI1- 2)
9	Clear CMOS Jumper (CLRCMOS1)	24	Internal Audio Connector: CD1 (Black)
10	South Bridge Controller	25	PCI Express x16 Slot (PCIE2)
11	Third SATAII Connector (SATAII_3; Orange)	26	PCI Express x1 Slot (PCIE1)
12	Fourth SATAII Connector (SATAII_4; Orange)	27	North Bridge Controller
13	Secondary SATAII Connector (SATAII_2; Red)	28	FD2 Jumper
14	Primary SATAII Connector (SATAII_1; Red)	29	FD0 Jumper
15	Chassis Fan Connector (CHA_FAN1)	30	ATX 12V Connector (ATX12V1)

1.4 I/O Panel



1	PS/2 Mouse Port (Green)	* 8	Front Speaker (Lime)
2	Parallel Port	9	Microphone (Pink)
3	RJ-45 Port	10	USB 2.0 Ports (USB01)
4	Side Speaker (Gray)	11	USB 2.0 Ports (USB23)
5	Rear Speaker (Black)	12	Serial Port: COM1
6	Central / Bass (Orange)	13	VGA Port
7	Line In (Light Blue)	14	PS/2 Keyboard Port (Purple)

***** 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 “Mixer” tool on your system. Please select “Mixer ToolBox”  , click “Enable playback multi-streaming”, and click “ok”. Choose “2CH”, “4CH”, “6CH”, or “8CH” and then you are allowed to select “Realtek HDA Primary output” to use Rear Speaker, Central/Bass, and Front Speaker, or select “Realtek HDA Audio 2nd output” to use front panel audio.

Chapter 2 Installation

P4i945GC is a Micro ATX form factor (9.6-in x 7.7-in, 24.4 cm x 19.6 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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 anti-static 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.

2.1 CPU Installation

Step 1. Unlock the socket by lifting the lever up to a 90° angle.

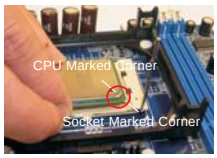
Step 2. Position the CPU directly above the socket such that its marked corner matches the base of the socket lever.

Step 3. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

STEP 1:
Lift The Socket Lever Up to 90°



STEP 2/STEP 3:
Match The CPU Marked Corner to The Socket Marked Corner

STEP 4:
Push Down And Lock The Socket Lever

2.2 Installation of CPU Fan and Heatsink

This motherboard adopts 478-pin CPU socket to support Intel® Pentium®4 CPU. It requires larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector (CPU_FAN1, see page 9, No. 2). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

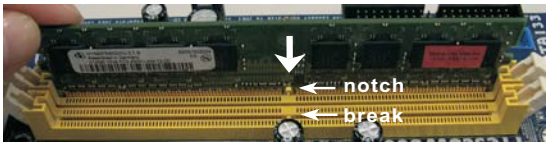
2.3 Installation of Memory Modules (DIMM)

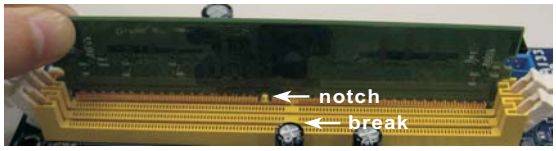
P4i945GC motherboard provides two 240-pin DDR2 (Double Data Rate 2) DIMM slots.

1. It is not allowed to install a DDR memory module into DDR2 slot; otherwise, this motherboard and DIMM may be damaged.
2. 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 Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 2 PCI Express slots on this motherboard.

PCI slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIE slots:

PCIE1 (PCIE x1 slot) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.

PCIE2 (PCIE x16 slot) is used for PCI Express cards with x16 lane width graphics cards.

If you install the add-on PCI Express VGA card to PCIE2 (PCIE x16 slot), the onboard VGA will be disabled. If you install the add-on PCI Express VGA card to PCIE2 (PCIE x16 slot) and adjust the "Internal Graphics Mode Select" BIOS option to [Enabled, 1MB] or [Enabled, 8MB], the onboard VGA will be enabled, and the primary screen will be onboard VGA.

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.

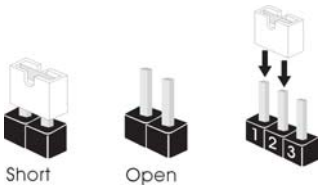
Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

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.9 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.

Clear CMOS
(CLRCMOS1, 2-pin jumper)
(see p.9 No. 9)

2-pin jumper

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short 2 pins on CLRCMOS1 for 5 seconds.

FD Jumpers
(FD0 3-pin jumper, see p.9 No. 29)
(FD2 3-pin jumper, see p.9 No. 28)

1_2
1_2 Default

Note: If you want to adopt FSB400-CPU on this motherboard, you need to adjust the jumpers. Please short pin2, pin3 for FD0 jumper and pin2, pin3 for FD2 jumper. Otherwise, the CPU may not work properly on this motherboard. Please refer to below jumper settings.

2_3
2_3

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!

FDD connector
(33-pin FLOPPY1)
(see p.9 No. 21)

Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE connector (Blue)
(39-pin IDE1, see p.9 No. 8)

Secondary IDE connector (Black)
(39-pin IDE2, see p.9 No. 7)

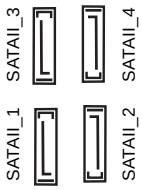
connect the blue end to the motherboard

connect the black end to the IDE devices

80-conductor ATA cable

Note: If you use only one IDE device on this motherboard, please set the IDE device as “Master”. Please refer to the instruction of your IDE device vendor for the details. Besides, to optimize compatibility and performance, please connect your hard disk drive to the primary IDE connector (IDE1, blue) and CD-ROM to the secondary IDE connector (IDE2, black).

Serial ATAII Connectors
(SATAII_1: see p.9, No. 14)
(SATAII_2: see p.9, No. 13)
(SATAII_3: see p.9, No. 11)
(SATAII_4: see p.9, No. 12)

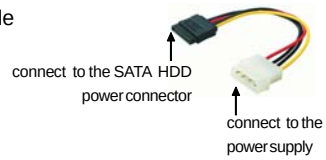


These Serial ATAII (SATAII) connectors support SATAII or SATA hard disk for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

Serial ATA (SATA) Data Cable
(Optional)

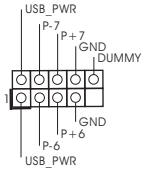
Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on the motherboard.

Serial ATA (SATA)
Power Cable
(Optional)

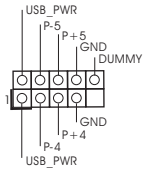


Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

USB 2.0 Headers
(9-pin USB6_7)
(see p.9 No. 17)

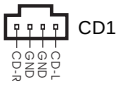


(9-pin USB4_5)
(see p.9 No. 18)



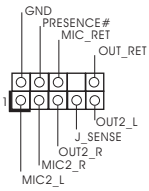
Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

Internal Audio Connector
(4-pin CD1)
(CD1: see p.9 No. 24)



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.9 No. 22)



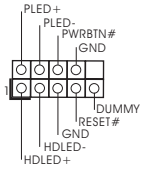
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

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].

F. Enter Windows system. Click the icon on the lower right hand taskbar to enter Realtek HD Audio Manager.
For Windows® 2000 / XP OS:
Click “Audio I/O”, select “Connector Settings”  , choose “Disable front panel jack detection”, and save the change by clicking “OK”.
For Windows® Vista™ OS:
Click the right-top “Folder” icon  , choose “Disable front panel jack detection”, and save the change by clicking “OK”.

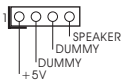
G. To activate the front mic.
For Windows® 2000 / XP OS:
Please select “Front Mic” as default record device.
If you want to hear your voice through front mic, please deselect "Mute" icon in “Front Mic” of “Playback” portion.
For Windows® Vista™ OS:
Go to the "Front Mic" Tab in the Realtek Control panel.
Click "Set Default Device" to make the Front Mic as the default record device.

System Panel Header
(9-pin PANEL1)
(see p.9 No. 19)



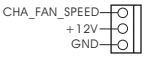
This header accommodates several system front panel functions.

Chassis Speaker Header
(4-pin SPEAKER 1)
(see p.9 No. 16)



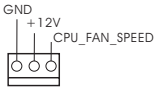
Please connect the chassis speaker to this header.

Chassis Fan Connector
(3-pin CHA_FAN1)
(see p.9 No. 15)



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

CPU Fan Connector
(3-pin CPU_FAN1)
(see p.9 No. 2)

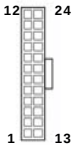


Please connect a CPU fan cable to this connector and match the black wire to the ground pin.

ATX Power Connector

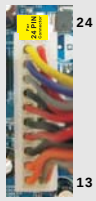
(24-pin ATXPWR1)

(see p.9, 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

ATX 12V Connector

(4-pin ATX12V1)

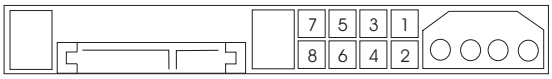
(see p.9 No. 30)

Please note that it is necessary to connect a power supply with ATX 12V plug to this connector so that it can provides sufficient power. Failing to do so will cause the failure to power up.

2.7 SATAII Hard Disk Setup Guide

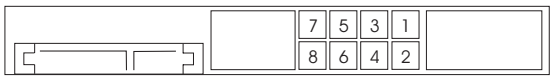
Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different 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® ICH7 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 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.

2.10 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. 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 / PCIE buses are 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
Smart	To load the BIOS according to your requirements
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.

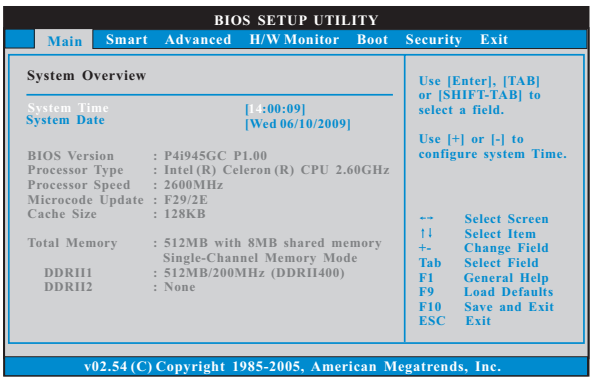
3.1.2 Navigation Keys

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



System Time [Hour:Minute:Second]

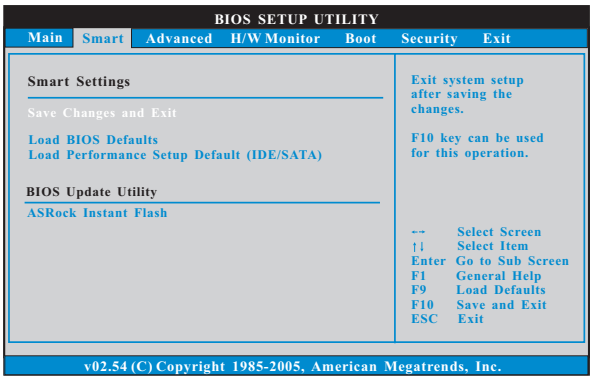
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

3.3 Smart Screen

In the Smart screen, you can load the BIOS setup according to your requirements.



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.

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)

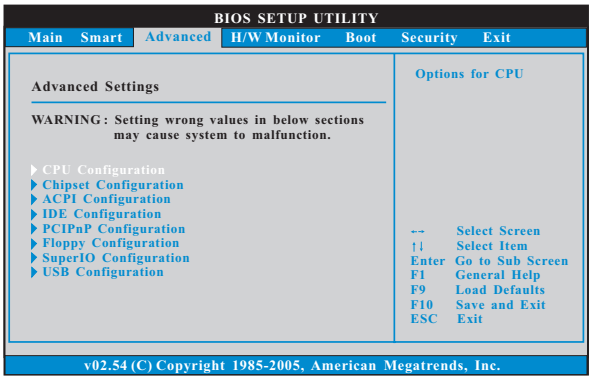
This performance setup default may not be compatible with all system configurations. If system boot failure occurs after loading, please resume optimal default settings. F5 key can be used for this operation.

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.

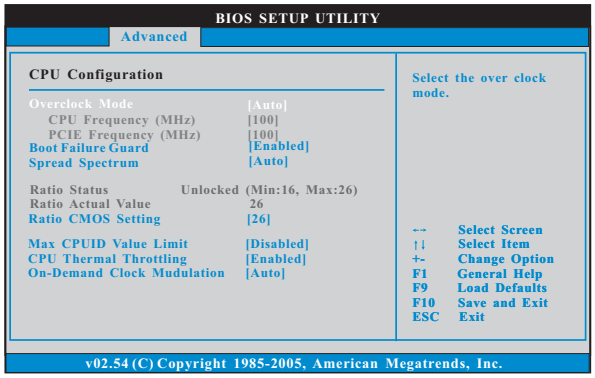
3.4 Advanced Screen

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



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

3.4.1 CPU Configuration



Overclock Mode

Use this to select Overclock Mode. The default value is [Auto]. Cnfiguration 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.

Ratio Status

This is a read-only item, which displays whether the ratio status of this motherboard is “Locked” or “Unlocked”. If it shows “Unlocked”, you will find an item **Ratio CMOS Setting** appears to allow you changing the ratio value of this motherboard.

Ratio Actual Value

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

Ratio CMOS Setting

If the ratio status is unlocked, you will find this item appear to allow you changing the ratio value of this motherboard.

Max CPUID Value Limit

For Prescott CPU only, some OSes (ex. NT4.0) cannot handle the function with disable. This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

CPU Thermal Throttling

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated. This option will be hidden if the current CPU does not support CPU Thermal Throttling.

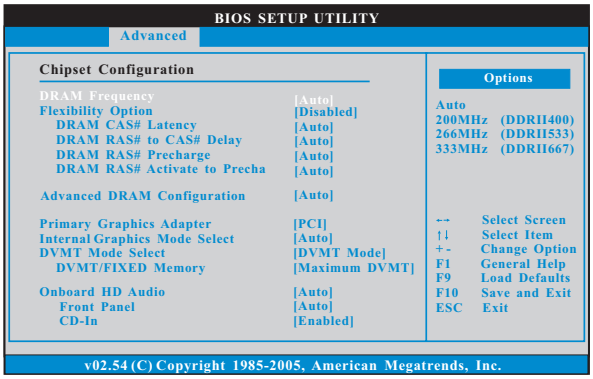
Hyper Threading Technology

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. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

On-Demand Clock Modulation

This provides the On-Demand Clock Modulation duty cycle. It indicates the clock on to clock off interval ratio. For example, if you set this option to [75.0% On], your processor will work normally 75% of the time, and spend the other 25% slacking off. Configuration options: [Auto], [Disabled], [12.5% On], [25.0% On], [37.5% On], [50.0% On], [62.5% On], [75.0% On] and [87.5% On]. The default value is [Auto].

3.4.2 Chipset Configuration



DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may also select other value as operating frequency: [200MHz (DDRII 400)], [266MHz (DDRII 533)], [333MHz (DDRII 667)]. The configuration options may change according to the corresponding FSB frequency of the CPU you adopt.

Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

DRAM CAS# Latency

Use this item to adjust the means of memory accessing. Configuration options: [Auto], [3], [4], and [5]. Please note that the configuration option [3] is available only for FSB 800 and FSB 533.

DRAM RAS# to CAS# Delay

This controls the latency between the DRAM active command and the read / write command. Configuration options: [Auto], [2 DRAM Clocks], [3 DRAM Clocks], [4 DRAM Clocks], [5 DRAM Clocks] and [6 DRAM Clocks].

DRAM RAS# Precharge

This controls the idle clocks after a precharge command is issued. Configuration options: [Auto], [2 DRAM Clocks], [3 DRAM Clocks], [4 DRAM Clocks], [5 DRAM Clocks] and [6 DRAM Clocks].

DRAM RAS# Activate to Precharge

This controls the number of DRAM clocks for TRAS. Configuration options: [Auto], [4 DRAM Clocks] to [15 DRAM Clocks].

Advanced DRAM Configuration

This item allows you to adjust advanced DRAM configuration. The default value is [Auto]. Configuration options: [Auto] and [Manual].

Primary Graphics Adapter

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

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] or [Enabled, 1MB], 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.

CD-In

Use this item to enable or disable CD-In of Onboard HD Audio. If you plan to use this motherboard to submit Windows® Vista™ logo test, please disable this option.

OnBoard Lan

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

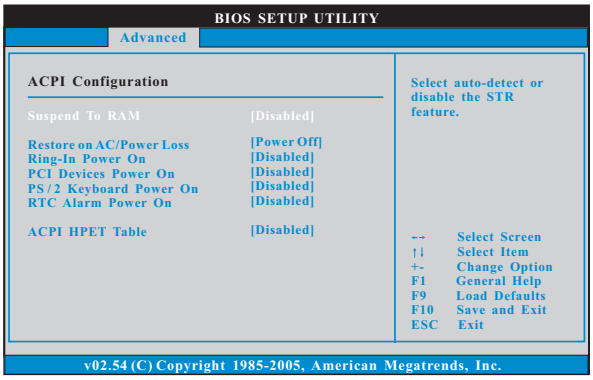
DRAM Voltage

Use this to select DRAM Voltage. Configuration options: [Auto], [1.794V], [1.851V], [1.908V], [1.965V], [2.029V], [2.086V], [2.144V] and [2.201V]. The default value of this feature is [Auto].

+1.5V Voltage

Use this to select +1.5V Voltage. Configuration options: [Auto], [Low], [Middle], [High] and [Ultra High]. The default value of this feature is [Auto].

3.4.3 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it. If you set this item to [Disabled], the function “Repost Video on STR Resume” will be hidden.

Repost Video on STR Resume

This feature allows you to repost video on STR resume. (STR refers to suspend to RAM.)

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.

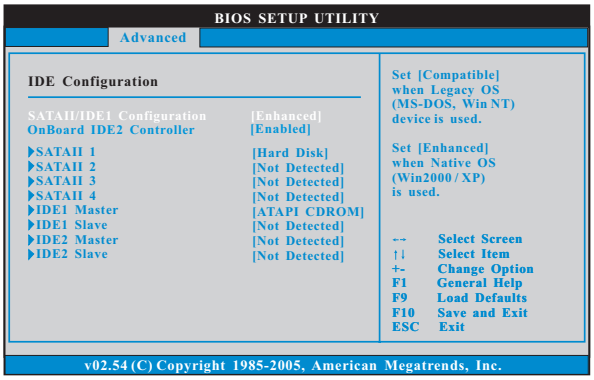
RTC Alarm Power On

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 IDE Configuration



SATAII/IDE1 Configuration

Please select [**Compatible**] when you install legacy OS (Windows® NT). If native OS (Windows® 2000 / XP) is installed, please select [**Enhanced**].

When [**Compatible**] is selected

Combined Option

It allows you to select between [**SATA 1, SATA 2, SATA 3, SATA 4**], [**SATA 1, SATA 3, IDE 1**], and [**IDE 1, SATA 2, SATA 4**]. If it is set to [SATA 1, SATA 3, IDE 1], then SATAII_2, SATAII_4 will not work. Likewise, if it is set to [IDE 1, SATA 2, SATA 4], then SATAII_1, SATAII_3 will not work.

Because Intel® ICH7 south bridge only supports four IDE devices under legacy OS (Windows® NT), you have to choose [SATA 1, SATA 2, SATA 3, SATA 4], [SATA 1, SATA 3, IDE 1], or [IDE 1, SATA 2, SATA 4] when the installed device is used with legacy OS.

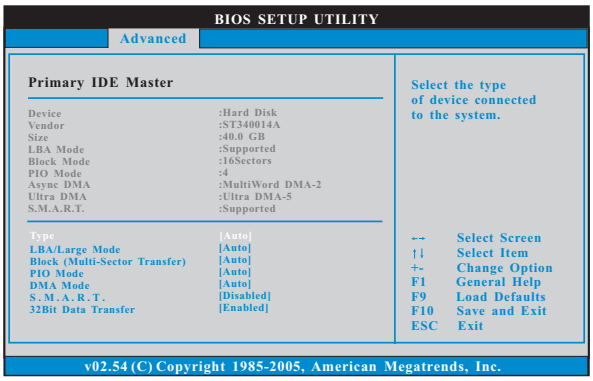
	[SATA 1, SATA 2, SATA 3, SATA 4]	[SATA 1, SATA 3, IDE 1]	[IDE 1, SATA 2, SATA 4]
Master	SATAII 1, SATAII 2	SATAII 1	SATAII 2
Slave	SATAII 3, SATAII 4	SATAII 3	SATAII 4

OnBoard IDE2 Controller

Use this item to enable or disable onboard IDE2 controller.

IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the “IDE1 Master” as the example in the following instruction, which can be applied to the configurations of “IDE1 Slave”, “IDE2 Master”, “IDE2 Slave”, “SATAII 1”, “SATAII 2”, “SATAII 3” and “SATAII 4” as well.



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.

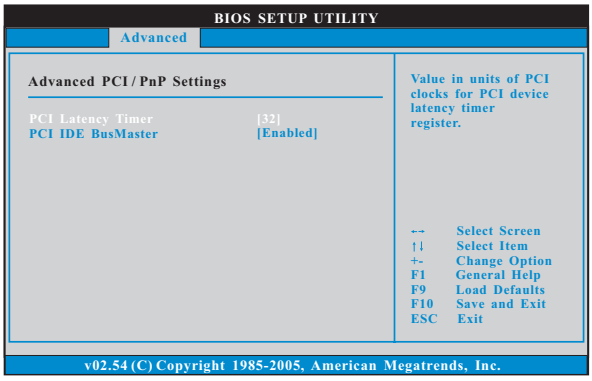
S.M.A.R.T.

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

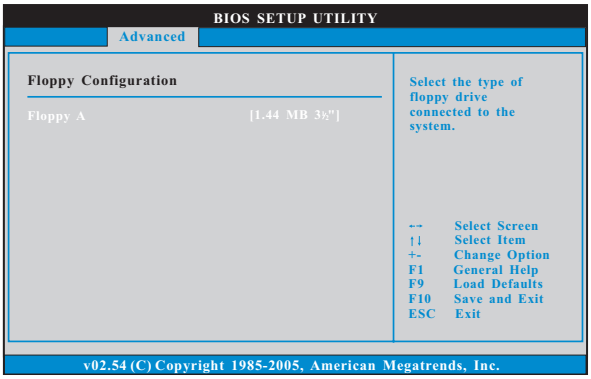
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

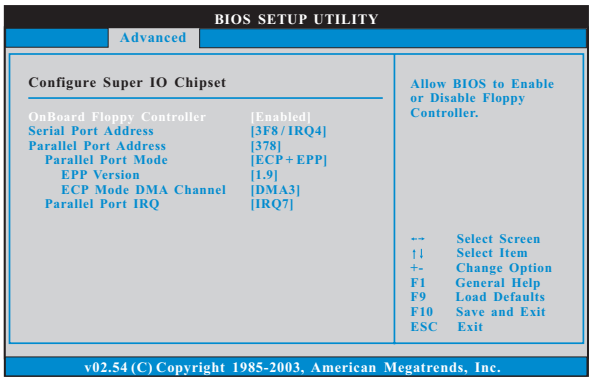
Use this item to enable or disable the PCI IDE BusMaster feature.

3.4.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.4.7 Super IO Configuration



OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

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].

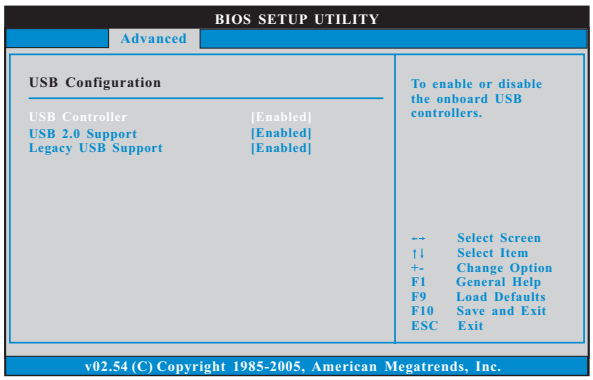
ECP Mode DMA Channel

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].

3.4.8 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:

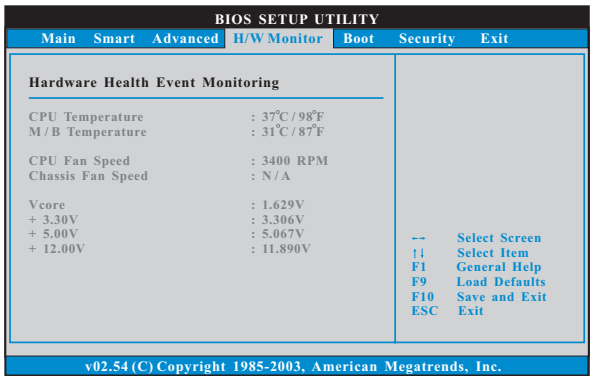
[Enabled] - Enables support for legacy USB.

[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.

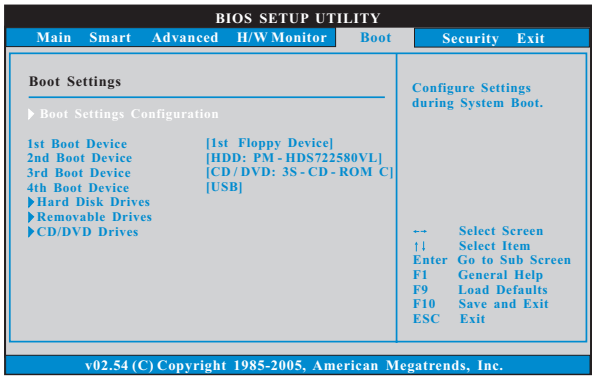
3.5 Hardware Health Event Monitoring Screen

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.

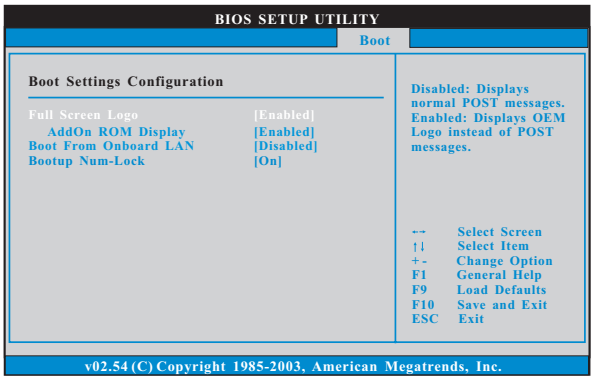


3.6 Boot Screen

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 From Onboard LAN

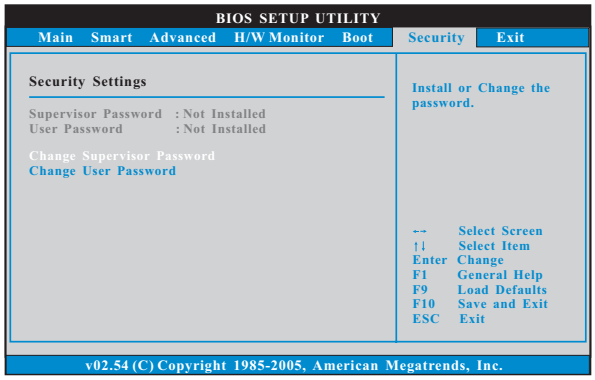
Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Up Num-Lock

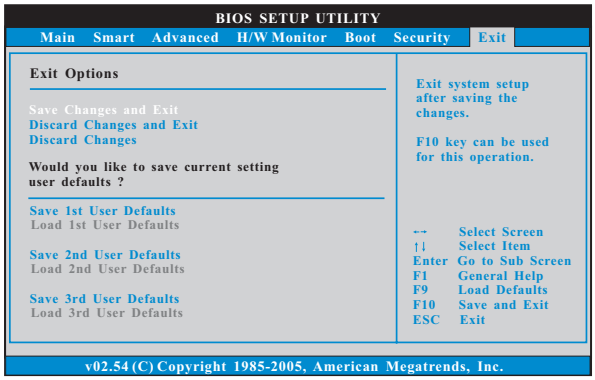
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

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.

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.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 2000 / XP / Vista™. 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.