

3L Small Form Factor

945GCD-3L

Supports Intel® Atom™ CPU



Certificate HK07/01191.00

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Preface

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Version 1.0

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

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

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Preface

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

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

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

About the Manual

The manual consists of the following:

Chapter 1 Introducing the 3L Small Form Factor	Describes features of the 3L Small Form Factor. Go to ➞ page 1
Chapter 2 Installing the Motherboard	Describes installation of motherboard components. Go to ➞ page 7
Chapter 3 Using BIOS	Provides information on using the BIOS Setup Utility. Go to ➞ page 19
Chapter 4 Using the Motherboard Software	Describes the motherboard software Go to ➞ page 33

Preface

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Chapter 1

Introducing the 3L Small Form Factor

Introducing the 3L Small Form Factor

Thank you for choosing 3L Small Form Factor of great performance and with stylish and flexible design.

With Intel® Atom™ processors inside and a dimension of 270mm (H)* 200mm (D)* 60mm (W) (3 Liter), 3L Small Form Factor provides the features of low power consumption (working with a 65Watt power adaptor), low noise (28dB) and space saving (Up to 87% Power Saving than desktop PC). It incorporates the 945GC Northbridge (NB) and ICH7 Southbridge (SB) chipsets, supporting up to 1 GB or 2 GB of system memory with DDR2 memory SODIMM frequencies of 400/533 MHz, 3.5" SATA II HDD, Slim DVD Supermulti Tray type/12.7mm Tray-load Slim type ODD, and Build in GMA950/945GC Graphics.

3L Small Form Factor is equipped with two USB 2.0 ports, two audio ports in the front panel and advanced full set of I/O ports in the rear panel, including J1, PS/2 mouse and keyboard connectors, COM1, one VGA port, four USB ports, one LAN port and audio jacks for microphone, line-in and line-out.



Introducing the 3L Small Form Factor

Feature of the motherboard

Processor

This motherboard uses onboard Intel® Atom™ CPU that carries the following features:

- Onboard Intel® Atom™ single core, 1.60GHz CPU speed with 512KB cache
- Supports a system bus (FSB) of 533 MHz
- Supports “Hyper-Threading” technology CPU

“Hyper-Threading” technology enables the operating system into thinking it’s hooked up to two processors, allowing two threads to be run in parallel, both on separate “logical” processors within the same physical processor.

Chipset

The 945GC Northbridge (NB) and ICH7 Southbridge (SB) chipsets are based on an innovative and scalable architecture with proven reliability and performance.

- | | |
|-------------------|--|
| 945GC (NB) | <ul style="list-style-type: none"> • Supports 32-bit host bus addressing • 2 GB/s point-to-point Direct Media Interface (DMI) to ICH7 (1 Gb/s each direction) • Supports 256-Mb, 512-Mb and 1-Gb DDR2 technologies for x8 and x16 devices • Supports high quality 3D setup, Render Engine and high-quality texture engine |
| ICH7 (SB) | <ul style="list-style-type: none"> • Enhanced DMA Controller, interrupt controller, and timer functions • Compliant with PCI Express Base Specification, Revision 1.0a • Compliant with PCI v2.3 specification • Integrated SATA 3.0 Gb/s Host Controller • Integrated USB 2.0 Host Controller supporting up to eight USB 2.0 ports • Integrated IDE controller supports Ultra ATA 100/66/33 |

Memory

- Supports DDR2 400/533 DDR2 SDRAM
- Accommodates one or two unbuffered SO-DIMM(s)
- Up to 1 GB per DIMM with maximum memory size up to 1 GB or 2 GB

Audio

The onboard Audio provides the following features:

- 5.1 Channel High Definition Audio Codec
- Exceeds Microsoft Windows Logo Program (WLP) Requirements
- ADCs support 44.1k/48k/96k/192kHz sample rate
- Power Support: Digital: 3.3V; Analog: 5.0V

Introducing the 3L Small Form Factor

Onboard LAN

The onboard LAN controller provides either of the following features:

- Integrated 10BASE-T/100BASE-TX Transceiver
- Integrated IEEE802.3z compliant
- IEEE802.3u Auto-Negotiation

Expansion Options

The motherboard comes with the following expansion options:

- One SCN1 slot (MINI PCI Express slot)
- One SATA_HDD1 and one SATA_ODD1 connectors

The motherboard supports UDMA bus mastering with transfer rates of 100/66/33 Mb/s.

Integrated I/O

The motherboard has a full set of I/O ports and connectors:

- One serial port
- One VGA port
- Two PS/2 ports for mouse and keyboard
- Four USB ports
- One LAN port
- One J1 port (DC Jack)
- Audio jacks for microphone, line-in and line-out

BIOS Firmware

This motherboard uses AMI BIOS that enables users to configure many system features including the following:

- Power management
- Wake-up alarms
- CPU parameters
- CPU and memory timing

The firmware can also be used to set parameters for different processor clock speeds.



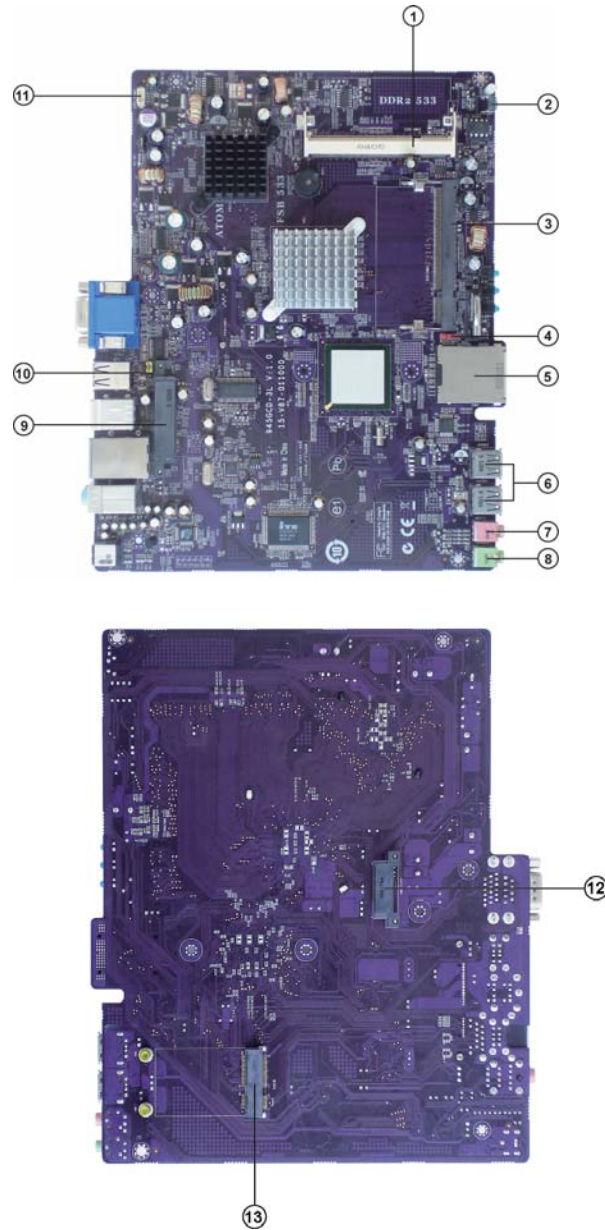
1. Some hardware specifications and software items are subject to change without prior notice.

2. Due to chipset limitation, we recommend that motherboard be operated in the ambience between 0 and 50 °C.

3. To achieve better performance and air flow, we suggest that you use a system fan on this motherboard.

Introducing the 3L Small Form Factor

Motherboard Components



Introducing the 3L Small Form Factor

Table of Motherboard Components

LABEL	COMPONENTS
1. SODIMM2*	One 200-pin DDR2 SDRAM SODIMM
2. CN3	Power switch
3. SODIMM1	One 200-pin DDR2 SDRAM SODIMM
4. CLR_CMOS	Clear CMOS jumper
5. CN2*	Reader Card
6. JUSB1~2	Front panel USB ports
7. JMIC1	Front audio line-out
8. JPHONE1	Front audio microphone
9. SATA_HDD1	Serial ATA HDD connector
10. USBPWR_R	Rear panel USB PS/2 power select jumper
11. CPU_FAN1	CPU cooling fan connector
12. SATA_ODD1	Serial ATA ODD connector
13. SCN1	MINI PCI Express slot

* stands for optional components.

This concludes Chapter 1. The next chapter explains how to install the motherboard.

Introducing the 3L Small Form Factor

Memo

Introducing the 3L Small Form Factor

Chapter 2

Installing the Motherboard

Safety Precautions

- Follow these safety precautions when installing the motherboard
- Wear a grounding strap attached to a grounded device to avoid damage from static electricity
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard
- Leave components in the static-proof bags they came in
- Hold all circuit boards by the edges. Do not bend circuit boards

Choosing a Computer Case

There are many types of computer cases on the market. The motherboard complies with the specifications for the Mini system case. First, some features on the motherboard are implemented by cabling connectors on the motherboard to indicators and switches on the system case. Make sure that your case supports all the features required. Secondly, this motherboard supports two enhanced IDE drives. Make sure that your case has sufficient power and space for all drives that you intend to install.

Most cases have a choice of I/O templates in the rear panel. Make sure that the I/O template in the case matches the I/O ports installed on the rear edge of the motherboard.

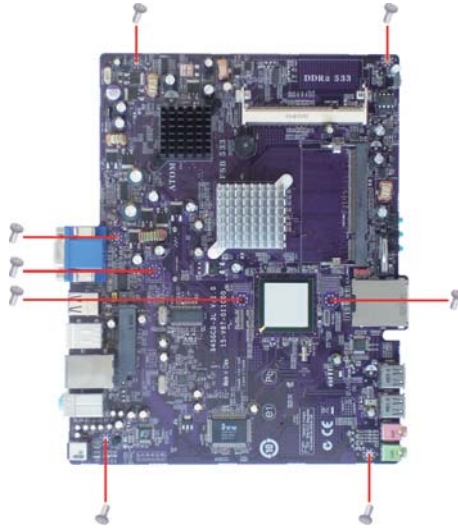
This motherboard carries a Mini form factor of 236 x 195 mm. Choose a case that accommodates this form factor.

Installing the Motherboard in a Case

Refer to the following illustration and instructions for installing the motherboard in a case.

Most system cases have mounting brackets installed in the case, which correspond the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.

Ensure that your case has an I/O template that supports the I/O ports and expansion slots on your motherboard.



Do not over-tighten the screws as this can stress the motherboard.

Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

Setting Jumpers

Use the motherboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

The illustrations show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is **SHORT**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **OPEN**.

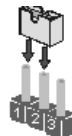


SHORT



OPEN

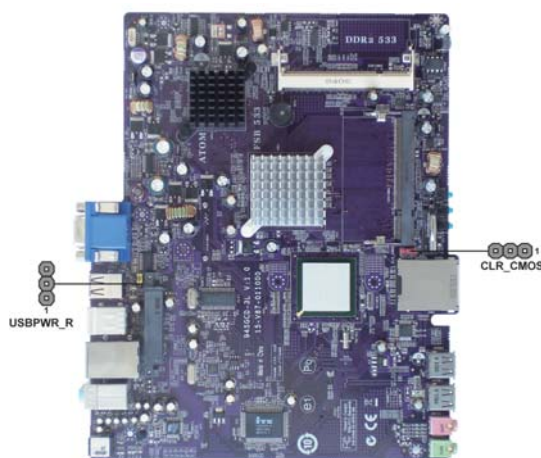
This illustration shows a 3-pin jumper. Pins 1 and 2 are **SHORT**.





Installing the Motherboard

Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.



Jumper Settings

Jumper	Type	Description	Setting (default)	
CLR_CMOS	3-pin	CLEAR CMOS	1-2: NORMAL 2-3: CLEAR CMOS Before clearing the CMOS, make sure to turn the system off.	 CLR_CMOS
USBPWR_R	3-pin	Rear Panel USB/PS2 Power Select Jumper	1-2: VCC5 2-3: 5VSB	 USBPWR_R



1. To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to “Load Default Settings” and then “Save & Exit Setup”.
2. Make sure the power supply provides enough 5VSB voltage before selecting the 5VSB function.
3. It is required that users place the USBPWR_R cap onto 2-3 pin rather than 1-2 pin as default if you want to wake up the computer by USB/PS2 KB/Mouse.

Installing the Motherboard

Installing Hardware

Installing Memory Modules

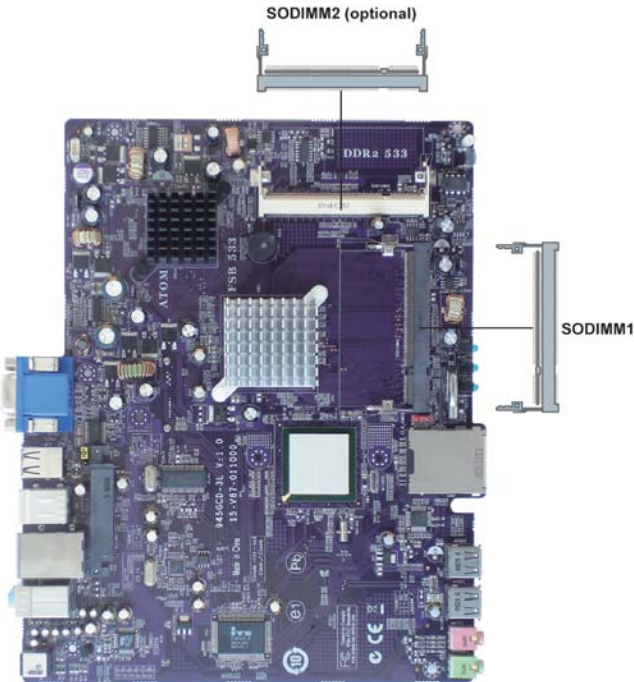
This motherboard accommodates one or two memory modules. It can support one or two 200-pin DDR2 400/533. The total memory capacity is 1 GB or 2 GB.

DDR2 SDRAM memory module table

Memory module	Memory Bus
DDR2 533	266 MHz



Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.



Installing the Motherboard

Installation Procedure

These modules can be installed with up to 2 GB system memory. Refer to the following to install the memory module.

1. Align the memory module with the DIMM slot. There is a notch on the DIMM slot that you can install the DIMM module in the correct direction. Match the cutout on the DIMM module with the notch on the DIMM socket.
2. Insert the memory module to the slot and press it down until it seats correctly.
3. Make sure the slot latches cling to the edge of the DIMM module.



Installing the Motherboard

Table A: DDR2 (memory module) QVL (Qualified Vendor List)

The following DDR2 800/667/533 memory modules have been tested and qualified for use with this motherboard.

Type	Size	Vendor	Module Name
DDR2 533	256 MB	Nanya	NT5TU32M16AG-37B
DDR2 667	512 MB	Micron	MT4HTF6464HY-667E1
		Ramaxel	7HD22 D9GMH
	1 GB	Apacer	Apacer AM4B5808CQJS7E 0815F
		Kingston	KVR667D2SS/1G
		Qimonda	HY S64T128021EDL-3S-B2
		Winchip	NEJA2450.A8ECW
DDR2 800	512 MB	Winchip	NEK51250.A8N8W
	1 GB	Elxir	M2N1G64TUH8D4F-AC
		Infinity	14701G16CZ5D2A
		Kingston	Nanya NT5TU64M8BE-25D
		PNY	PNY AEE648WM-20
		PSC	AS7E8F63J-8E
		Qimonda	HY S64T128021EDL-2.5B2
		Samsung	K4T1G164QQ-HCF7
	2 GB	QI	MECER521PA0101-08A12



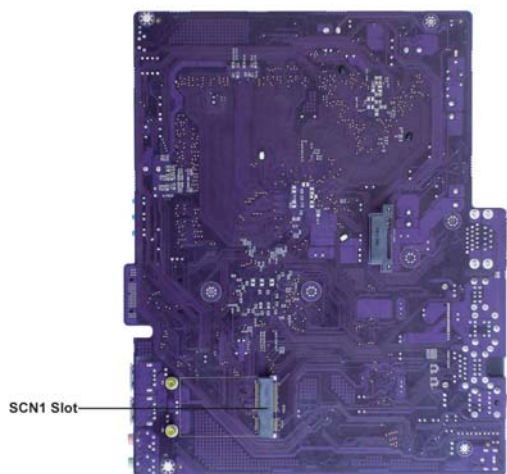
Due to the motherboard limitation, the memory controller only supports DDR2 memory DIMM frequency of 533 MHz.

Installing the Motherboard

Expansion Slots

Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.



SCN1 Slot

The SCN1 slot is used to install an external PCI Express graphics card.



Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

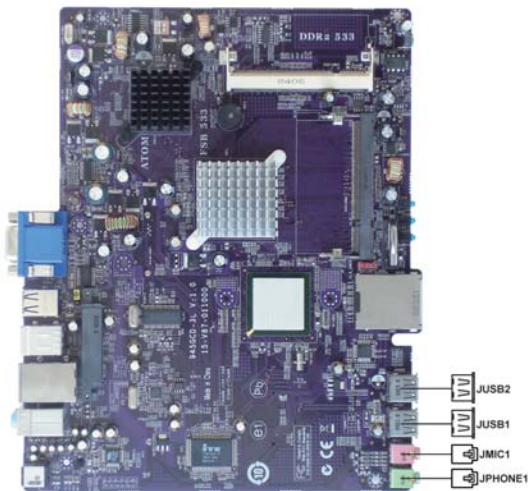
Table B: Supported Wireless LAN Card List for SCN1 Slot

Vender	Model Name
Billinton	GMEWLGR-L-2
VIA	VNT6656GEV00-U(802.11 b/G MINI PCIE)
	VNT6656GEV00
Foxconn	Albatron 256MB7600GT 256M
	ASUS EN7600GS 512MB

Installing the Motherboard

Connecting Optional Devices

Refer to the following for information on connecting the motherboard's optional devices:



JUSB1~2: Front Panel USB Ports

The motherboard has four USB ports installed on the rear edge I/O port array. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector to connect the front-mounted ports to the motherboard.

Pin	Signal Name	Pin	Signal Name
1	USBVCC	2	USBP4-(DATA-)
3	USBP4+(DATA+)	4	GND
5	GND	6	GND

JPHONE1: Front Audio Line-out Jack

Pin	Signal Name	Pin	Signal Name
1	GND	2	LINE2_L
3	LINE2_R	4	LINE2_JD
5	GND	6	N/C

JMIC1: Front Audio Microphone Jack

Pin	Signal Name	Pin	Signal Name
1	GND	2	MIC2_L
3	MIC2_R	4	MIC2_JD
5	GND	6	N/C

Installing the Motherboard

Installing SATA_HDD

About SATA_HDD1 Connector

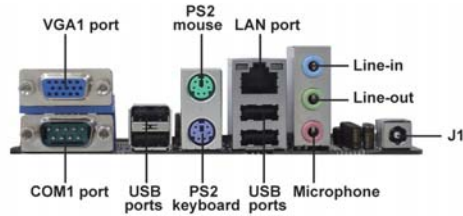
This motherboard features one SATA HDD1 connector supporting one drive, and you can connect a hard disk drive to the SATA_HDD1 port.



Installing the Motherboard

Connecting I/O Devices

The backplane of the motherboard has the following I/O ports:



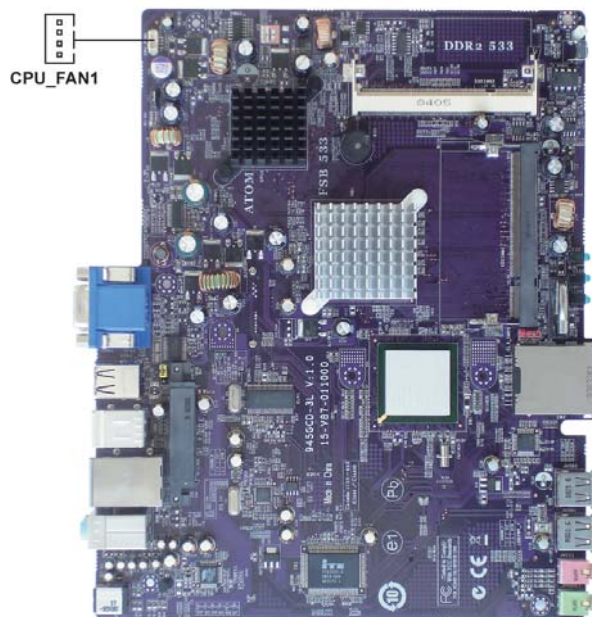
VGA1 Port	Connect your monitor to the VGA1 port.
Serial Port (COM1)	Use the COM1 port to connect serial devices such as mouse or fax/modems.
USB Ports	Use the USB ports to connect USB devices.
PS2 Mouse	Use the upper PS/2 port to connect a PS/2 pointing device.
PS2 Keyboard	Use the lower PS/2 port to connect a PS/2 keyboard.
LAN Port	Connect an RJ-45 jack to the LAN port to connect your computer to the Network.
J1	Connect a DC-in jack to J1.
Audio Ports	Use the three audio ports to connect audio devices. The first jack is for stereo line-in signal. The second jack is for stereo line-out signal. The third jack is for microphone.

Installing the Motherboard

Connecting Case Components

After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:

- 1 Connect the CPU cooling fan connector to **CPU_FAN1**.



CPU_FAN1: FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor
4	PWM	CPU FAN control



Users please note that the fan connector supports the CPU cooling fan of 1.1A~2.2A (26.4W max.) at +12V.

Installing the Motherboard

LED1~4**LED1 (System Power LED)**

The system power LED can be used to indicate system power status. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

System Status	LED
S0	On
S1/S3	Blinking
S4/S5	Off

LED2 (HDD LED)

The LED2 can be used to indicate HDD status. The LED keeps blinking when the system is in Active state.

System Status	LED
Active	Blinking

LED3 (LAN LED)

The LED3 can be used to indicate LAN status. The LED keeps blinking when the system is in Active state.

System Status	LED
Active	Blinking

LED4 (Reader Card LED)

The LED4 can be used to indicate Reader Card status. The LED keeps blinking when the system is in Active state.

System Status	LED
Active	Blinking

This concludes Chapter 2. The next chapter covers the BIOS.

Installing the Motherboard

Chapter 3

Using BIOS

About the Setup Utility

The computer uses the latest “American Megatrends Inc.” BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system’s configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Using BIOS

Press DEL to enter SETUP

Press the DEL key to access the BIOS Setup Utility.

CMOS Setup Utility -- Copyright (C) 1985-2005, American Megatrends, Inc.

▶ Standard CMOS Setup ▶ Advanced Setup ▶ Advanced Chipset Setup ▶ Integrated Peripherals ▶ Power Management Setup ▶ PC Health Status	▶ Frequency/Voltage Control Load Default Settings ▶ Supervisor Password ▶ User Password Save & Exit Setup Exit Without Saving
↑↓ → ← Move Enter : Select +/- : Value F10: Save ESC: Exit F1: General Help F9: Optimized Defaults	
v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.	

BIOS Navigation Keys

The BIOS navigation keys are listed below:

KEY	FUNCTION
ESC	Exits the current menu
↑↓ → ←	Scrolls through the items on a menu
+/-/PU/PD	Modifies the selected field's values
Enter	Select
F9	Loads an optimized setting for better performance
F10	Saves the current configuration and exits setup
F1	Displays a screen that describes all key functions

Using BIOS

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Web site. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

- 1 Create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)
- 2 Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the system diskette you created in Step 1.
- 3 Turn off your computer and insert the system diskette in your computer's diskette drive.
- 4 At the X:\ (working disk) prompt, type the Flash Utility program name and the file name of the new bios and then press <Enter>. Example: AMINF340.EXE 040706.ROM
- 5 The computer will restart automatically. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten.

Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ►) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ►.

Using BIOS

Standard CMOS Setup

This option displays basic information about your system.

CMOS Setup Utility -- Copyright (C) 1985-2005, American Megatrends, Inc.
Standard CMOS Setup

Date	Mon 01/01/2007	Help Item
Time	00 : 01 : 05	
► SATA 1	Not Detected	Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
► SATA 2	Not Detected	
IDE BusMaster	Enabled	Use [+] or [-] to configure system Date.

↑↓ → ← : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

► SATA 1~2

This motherboard supports two SATA channels and each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.

CMOS SETUP UTILITY -- Copyright (C) 1985-2005, American Megatrends, Inc.
SATA1

SATA1		Help Item
Device	: Hard Disk	Select the type of device connected to the system.
Vendor	: Hitachi HDS721680PLA380	
Size	: 82.3GB	
LBA Mode	: Supported	
Block Mode	: 16Sectors	
PIO Mode	: 4	
Async DMA	: MultiWord DMA-2	
Ultra DMA	: Ultra DMA-6	
S.M.A.R.T	: Supported	
Type	: Auto	
LBA/Large Mode	: Auto	
Block (Multi-Sector Transfer)	: Auto	
PIO Mode	: Auto	
DMA Mode	: Auto	
S.M.A.R.T	: Auto	
32Bit Data Transfer	: Enabled	

↑↓ → ← : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Using BIOS

Type

Use this item to configure the type of the IDE device that you specify. If the feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer

LBA/Large Mode

Use this item to set the LAB/Large mode to enhance hard disk performance by optimizing the area the hard disk is visited each time.

Block (Multi-Sector Transfer)

If the 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 user to improve the transfer-speed and data-integrity for compatible IDE devices.

S.M.A.R.T.

The S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. software resides on both the disk drive and the host computer.

32Bit Data Transfer

Use this item to enable or disable 32Bit Data Transer.

Press <Esc> to return to the Standard CMOS Setup page.

IDE BusMaster

This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

Press <Esc> to return to the main menu setting page.

Advanced Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Advanced Setup

Thermal Management	Enabled	Help Item
TM Status	TM1	
Limit CPUID MaxVal	Disabled	
Intel XD Bit	Disabled	
Hyper-Threading Technology	Enabled	
Quick Power on Self Test	Enabled	
Boot Up Numlock Status	On	
APIC Mode	Enabled	
1st Boot Device	Hard Drive	
2nd Boot Device	CD/DVD	
3rd Boot Device	Removable Dev.	
Boot Other Device	Yes	

↑↓ → ←: Move Enter: Select +/-: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Thermal Management

This item displays CPU' temperature and enables you to set a safe temperature to Prescott CPU.

TM Status

This item displays CPU Monitor status.

Limit CPUID MaxVal

Use this item to enable or disable the Max CPU ID value limit.

Intel XD Bit

This item enables or disables the Intel XD Bit technology.

Hyper-Threading Technology

This item is only available when the chipset supports Hyper-Threading and you are using a Hyper-Threading CPU.

Quick Power on Self Test

Enable this item to shorten the power on testing (POST) and have your system start up faster. You might like to enable this item after you are confident that your system hardware is operating smoothly.

Boot Up Numlock Status

This item defines if the keyboard Num Lock key is active when your system is started.

APIC Mode

This item allows you to enable or disable the APCI (Advanced Programmable Interrupt Controller) mode. APIC provides symmetric multi-processing (SMP) for systems, allowing support for up to 60 processors.

Using BIOS

1st/2nd/3rd Boot Device

Use this item to determine the device order the computer used to look for an operating system to load at start-up time. The devices showed here will be different depending on the exact devices installed on your motherboard.

Boot Other Device

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the First, Second and Third boot devices.

Press <Esc> to return to the main menu setting page.

Advanced Chipset Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Advanced Chipset Setup

DRAM Frequency	Auto	Help Item
Configure DRAM Timing by SPD	Enabled	
DVMT Mode Select	DVMT Mode	Options
DVMT/FIXED Memory	128MB	
HPET	Enabled	Auto
		400 MHz
		533 MHz

↑↓ → ←: Move Enter: Select +/-: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

DRAM Frequency

This item enables users to adjust the DRAM frequency. The default setting is auto and we recommend users leave the setting unchanged. Modify it at will may cause the system to be unstable.

Configure DRAM Timing by SPD

When this item is set to enable, the DDR timing is configured using SPD. SPD (Serial Presence Detect) is located on the memory modules, BIOS reads information coded in SPD during system boot up.

DVMT Mode Select

DVMT is Dynamic Video Memory Technology. This item helps you select video mode.

DVMT/FIXED Memory

When set to Fixed Mode, the graphics driver will reserve a fixed portion of the system memory as graphics memory. When set to DVMT Mode, the graphics chip will dynamically allocate system memory as graphics memory, according to system and graphics requirements.

HPET

This item enables or disables HPET (High Precision Event Timer) support

Press <Esc> to return to the main menu setting page.

Integrated Peripherals

This page sets up some parameters for peripheral devices connected to the system.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Integrated Peripherals

Onboard SATA Mode	Enhanced	Help Item
Onboard AUDIO Function	Enabled	
Onboard LAN Function	Enabled	
Onboard LAN BOOT ROM	Disabled	
Serial Port1 Address	3F8/IRQ4	
USB Functions	Enabled	
Legacy USB Support	Enabled	
		Options
		Disabled
		Compatible
		Enhanced

↑↓ → ←: Move Enter: Select +/-: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Onboard SATA Mode

Use this item to select the mode of the Serial ATA.

Onboard AUDIO Function

Use this item to enable or disable the onboard audio controller.

Onboard LAN Function

Use this item to enable or disable the onboard LAN function.

Onboard LAN BOOT ROM

Use this item to enable or disable the booting from the onboard LAN or a network add-in card with a remote boot ROM installed.

Serial Port1 Address

Use this item to enable or disable the onboard COM1 serial port, and to assign a port address.

USB Functions

Use this item to enable or disable the USB function.

Legacy USB Support

Use this item to enable or disable support for legacy USB devices.

Press <Esc> to return to the main menu setting page.

Using BIOS

Power Management Setup

This page sets up some parameters for system power management operation.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Power Management Setup

		Help Item
ACPI Suspend Type	S3 (STR)	Select the ACPI state used for System Suspend.
Soft-off by PWR-BTTN	Instant Off	
PWRON After PWR-Fail	Power Off	
Power On by Ring	Disabled	
Resume By Lan PME	Disabled	
Resume By USB (S3)	Disabled	
Resume By PS2 KB (S3)	Disabled	
Resume on RTC Alarm	Disabled	

↑ ↓ → ← : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

ACPI Suspend Type

Use this item to define how your system suspends. In the default, S3, the suspend mode is a suspend to RAM, i.e, the system shuts down with the exception of a refresh current to the system memory.

Soft-Off By PWR-BTTN

Under ACPI (Advanced Configuration and Power management Interface) you can create a software power down. In a software power down, the system can be resumed by Wake Up Alarms. This item lets you install a software power down that is controlled by the power button on your system. If the item is set to Instant-Off, then the power button causes a software power down. If the item is set to Delay 4 Sec, then you have to hold the power button down for four seconds to cause a software power down.

PWRON After PWR-Fail

This item enables your computer to automatically restart or return to its operating status.

Power On by Ring

This system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the Modem. You must use an ATX power supply in order to use this feature.

Resume By Lan PME

This item specifies whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

Resume By USB (S3)

This item allows users to enable or disable the USB device wakeup function from S3/S4 mode.

Resume By PS2 KB (S3)

This item enable or disable you to allow mouse activity to awaken the system from power saving mode.

Using BIOS

Resume on RTC Alarm

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

Press <Esc> to return to the main menu setting page.

PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
PC Health Status

-- System Hardware Monitor --		Help Item
► Smart Fan Function	Press Enter	
Shutdown Temperature	Disabled	
FAN Speed	: 6308 RPM	
CPU Temperature	: 31°C/87°F	
CPU Core	: 1.136V	
VDIMM	: 1.920V	

↑↓ → ← : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

► Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Smart Fan Function

		Help Item
SMART Fan Control	Enabled	
SMART Fan start PWM value	60	
SMART Fan start TEMP. (°C)	30	
CPU DeltaT	+3	
SMART Fan Slope PWM value	3 PWM value/°C	
CPU FAN Full Limit Temp	52°C	
		Options
		Disabled
		Enabled

↑↓ ↔ : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Load Default settings

Using BIOS

SMART FAN Control

This item allow you to enable or disable the control of the system fan speed by changing the fan voltage.

SMART FAN start PWM value

This item is use to set the start PWM value of the smart fan.

SMART FAN start TEMP. (°C)

This item is use to set the start temperature of the smart fan.

CPU DeltaT

This item specifies the range that controls CPU temperature and keeps it from going so high or so low when smart fan works.

SMART Fan Slope PWM value

This item is used to set the Slope Select PWM of the smart fan.

CPU FAN Full Limit Temp

This item is use to set the limit temperature of the smart fan.

Press <Esc> to return to the PC Health Status page.

Shutdown Temperature

Enable you to set the maximum temperature the system can reach before powering down.

System Component Characteristics

These items display the monitoring of the overall inboard hardware health events, such as System & CPU temperature, CPU & DIMM voltage, CPU & system fan speed,...etc.

- Fan Speed
- CPU Temperature
- CPU Core
- VDIMM

Press <Esc> to return to the main menu setting page.

Frequency/Voltage Control

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Frequency/Voltage Control

Manufacturer : Intel		Help item
Ratio Actual Value : 12		
CPU Over-clocking Func. :	Disabled	Options
Auto Detect DIMM/PCI Clk	Enabled	
Spread Spectrum	Enabled	Disabled
		Enabled

↑↓ → ← : Move Enter : Select +/- : Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Manufacturer: Intel

This item displays the information of current manufacturer of the CPU installed in your computer.

Ratio Actual Value: 12

This item shows the actual ratio of the CPU installed in your system.

CPU Over-clocking Func.

This item decides the CPU over-clocking function installed in your system. If the over-clocking fails, please turn off the system power. And then, hold the PageUp key (similar to the Clear CMOS function) and turn on the power, the BIOS will recover the safe default.

Auto Detect DIMM/PCI Clk

When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

Spread Spectrum

If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

Press <Esc> to return to the main menu setting page.

Load Default Settings

This option opens a dialog box that lets you install stability-oriented defaults for all appropriate items in the Setup Utility. Select [OK] and then press <Enter> to install the defaults. Select [Cancel] and then press <Enter> to not install the defaults.

Supervisor Password

This page helps you install or change a password.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Supervisor Password

Supervisor Password : Disabled		Help Item
Change Supervisor Password	Press Enter	Install or Change the password.

↑↓ → ← : Move Enter : Select +/-: Value F10: Save ESC: Exit
 F1: General Help F9: Optimized Defaults

Supervisor Password

This item indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

Change Supervisor Password

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

Press <Esc> to return to the main menu setting page.

User Password

This page helps you install or change a password.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
User Password

User Password : Disabled	Help Item
Change User Password Press Enter	Install or Change the password.

↑↓ → ← : Move Enter: Select +/-: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

User	Password
------	----------

This item indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

Change User Password

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password. This item will show if the Supervisor Password is set.

Press <Esc> to return to the main menu setting page.

Save & Exit Setup

Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility and exit the Setup Utility. When the Save and Exit dialog box appears, select [OK] to save and exit, or select [Cancel] to return to the main menu.

Exit Without Saving

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility. When the Exit Without Saving dialog box appears, select [OK] to discard changes and exit, or select [Cancel] to return to the main menu.



If you have made settings that you do not want to save, use the “Exit Without Saving” item and select [OK] to discard any changes you have made.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Chapter 4

Using the Motherboard Software

About the Software CD-ROM

The support software CD-ROM that is included in the motherboard package contains all the drivers and utility programs needed to properly run the bundled products. Below you can find a brief description of each software program, and the location for your motherboard version. More information on some programs is available in a README file, located in the same directory as the software. Before installing any software, always inspect the folder for files named README.TXT, INSTALL.TXT, or something similar. These files may contain important information that is not included in this manual.



1. *Never try to install all software from folder that is not specified for use with your motherboard.*

2. *The notice of Intel HD audio installation (optional): The Intel High Definition audio functionality unexpectedly quits working in Windows Server 2003 Service Pack 1 or Windows XP Professional x64 Edition. Users need to download and install the update packages from the Microsoft Download Center “before” installing HD audio driver bundled in the Driver CD. Please log on to <http://support.microsoft.com/default.aspx?scid=kb;en-us;901105#appliesto> for more information.*

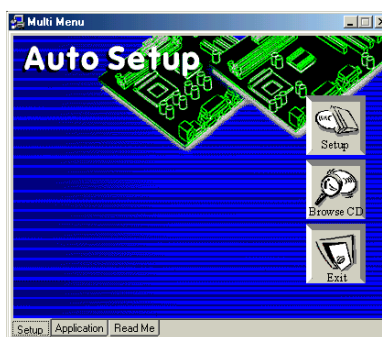
Auto-installing under Windows Vista

The Auto-install CD-ROM makes it easy for you to install the drivers and software for your motherboard.



If the Auto-install CD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Refer to the Utility Folder Installation Notes later in this chapter.

The support software CD-ROM disc loads automatically under Windows Vista. When you insert the CD-ROM disc in the CD-ROM drive, the autorun feature will automatically bring up the install screen. The screen has three buttons on it, Setup, Browse CD and Exit.



If the opening screen does not appear; double-click the file “setup.exe” in the root directory.

Using the Motherboard Software

Setup Tab

Setup	Click the Setup button to run the software installation program. Select from the menu which software you want to install.
Browse CD	<p>The Browse CD button is the standard Windows command that allows you to open Windows Explorer and show the contents of the support CD.</p> <p>Before installing the software from Windows Explorer, look for a file named README.TXT, INSTALL.TXT or something similar. This file may contain important information to help you install the software correctly.</p> <p>Some software is installed in separate folders for different operating systems, such as Windows Vista. Always go to the correct folder for the kind of OS you are using.</p> <p>In install the software, execute a file named SETUP.EXE or INSTALL.EXE by double-clicking the file and then following the instructions on the screen.</p>
Exit	The EXIT button closes the Auto Setup window.

Application Tab

Lists the software utilities that are available on the CD.

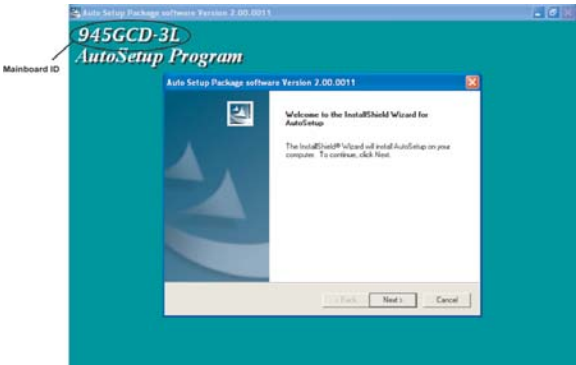
Read Me Tab

Displays the path for all software and drivers available on the CD.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

1. Click **Setup**. The installation program begins:

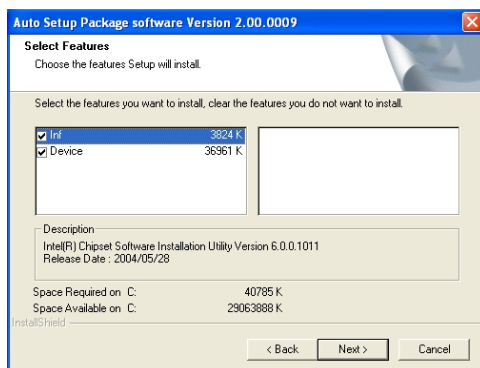


The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

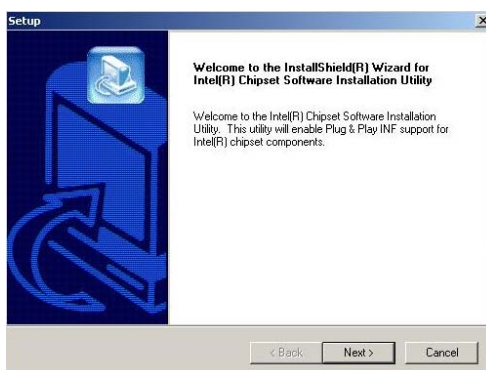
The motherboard identification is located in the upper left-hand corner.

Using the Motherboard Software

2. Click **Next**. The following screen appears:



3. Check the box next to the items you want to install. The default options are recommended.
4. Click **Next** run the Installation Wizard. An item installation screen appears:



5. Follow the instructions on the screen to install the items.

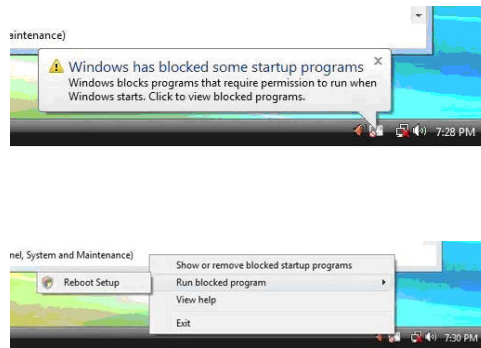


1. Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to restart a few times to complete the installation.
2. During the Windows Vista Driver Auto Setup Procedure, users should use one of the following two methods to install the driver after the system restart.

Using the Motherboard Software

Method 1. Run Reboot Setup

Windows Vista will block startup programs by default when installing drivers after the system restart. You must select taskbar icon **Run Blocked Program** and run **Reboot Setup** to install the next driver, until you finish all drivers installation.



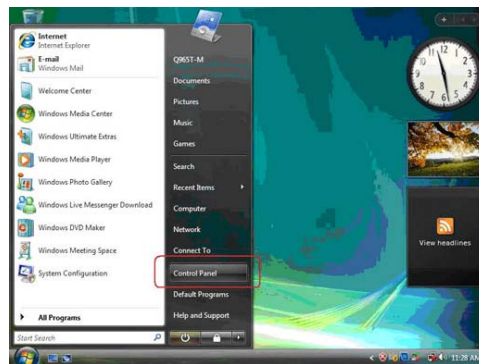
Method 2. Disable UAC (User Account Control)

* For administrator account only. Standard user account can only use Method 1.

Disable Vista UAC function before installing drivers, then use CD driver to install drivers, it will continue to install drivers after system restart without running blocked programs.

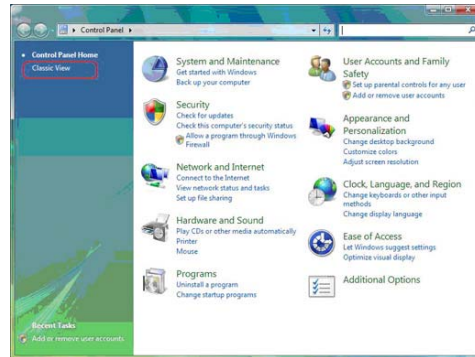
Follow these instructions to Disable Vista UAC function:

1. Go to **Control Panel**.

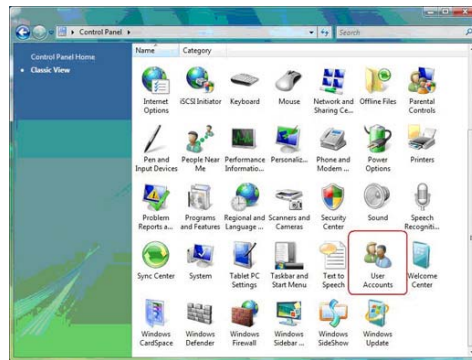


Using the Motherboard Software

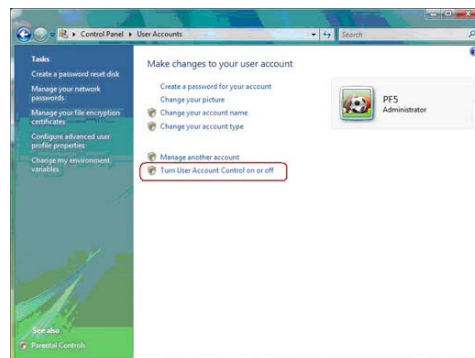
2. Select **Classic View**.



3. Set **User Account**.

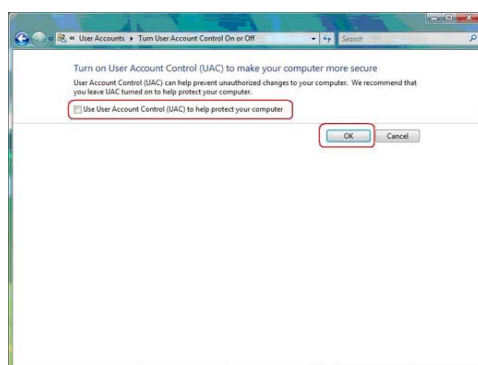


4. Select **Turn User Account Control on or off** and press **Continue**.



Using the Motherboard Software

5. Disable **User Account Control (UAC)** to help protect your computer item and press **OK**, then press **Restart Now**. Then you can restart your computer and continue to install drivers without running blocked programs.



Manual Installation

Insert the CD in the CD-ROM drive and locate the PATH.DOC file in the root directory. This file contains the information needed to locate the drivers for your motherboard.

Look for the chipset and motherboard model; then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.



These software(s) are subject to change at anytime without prior notice. Please refer to the support CD for available software.

This concludes Chapter 4.

Using the Motherboard Software