User's Manual

Sapphire Pure Black P67 Hydra

PB-CI7S42P67

Intel P67/LGA1155 Series Mainboard

TRADEMARK

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These specifications are subject to change without notice.

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Federal Communications Commission (FCC) Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the product into 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.

Note1: Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception

Note2: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

Note3: To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables

CE: Radiation of EN 55022 & Immunity of EN 55024

Waste Electrical and Electronic Equipment (WEEE) Statement

To protect the global environment, this product must be sent to separate collection facilities for recovery and recycling.

DISPOSAL

Do not dispose of this product as unsorted municipal waste. Collect such waste separately for special treatment.

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Chapter 1 Introduction

1-1 Mainboard Specifications

CPU

- Supports Intel® Core i7/i5/i3 processor in the LGA1155 package

Chipset

- Intel® P67 Singe chipset
- Lucid Hydra LT24102 chipset

System Memory

- Four 240-pin DDR3 SDRAM DIMM sockets
- Supports 1.5v DDR3-800/1066/1333 DIMMs with dual channel architecture
- Supports x16 and x8 DIMMs, non-ECC, unbuffered DIMMs
- Supports up to 16GB system memory

USB Ports

- Twelve USB 2.0 ports (eight at rear panel, four onboard by header), supporting transfer speeds up to 480Mbps
- Two USB 3.0 ports (at rear panel) backwardly compatible with USB 2.0 supporting transfer speeds up to 4.8Gbps
- Supports wake-up from S1 mode in all USB ports, S3 mode only supported on USB 2.0 ports

SATA Ports

- Four SATAII ports including one eSATA port, with 3Gb/s data transfer rate, supporting RAID 0, RAID 1, RAID 10 and RAID 5 from Intel® P67 chipset
- Four SATAIII ports with 6Gb/s data transfer rate, supporting RAID 0 and RAID 1, two from Intel® P67 chipset, other two from Marvell® 88SE9128

Onboard LAN

- One Gigabit Ethernet from Marvell 88E8057 Gigabit controller

Bluetooth

- Atheros AR3011 is a highly integrated, all-CMOS, single chip with Bluetooth® 2.1 + EDR supported

Onboard IEEE1394a (Firewire)

- Two IEEE1394a ports (one at rear panel, one by header) with 400 Mbps transfer rate by Ti® TSB43AB22A

Onboard Audio

- Supports 8-channel High-Definition audio
- Supports rear panel Optical and Coaxial S/PDIF output
- Supports Jack-detection function

Expansion Slots

- Four PCI-Express 2.0 x16 connectors
- Two PCI slots
- Supports ATI®CrossFireX™ Technology and Lucid Hydra Modes either

BIOS

- 32Mb SPI Flash with AMI EFI BIOS
- Supports ACPI (Advanced Configuration and Power Interface)
- Supports dual BIOS switch

Form Factor

- ATX form factor of 305mm x 245mm

Operating systems

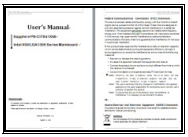
- Windows Vista and Windows 7

Special Features

- Onboard diagnostics 7-Segment LED with CPU temperature display
- Onboard buttons include Clear CMOS, RESET and POWER
- Supports CPU Power Vcore Load-line adjust function
- Supports Windows base OC utility “Trixx” and Win7 HW monitor gadget tool

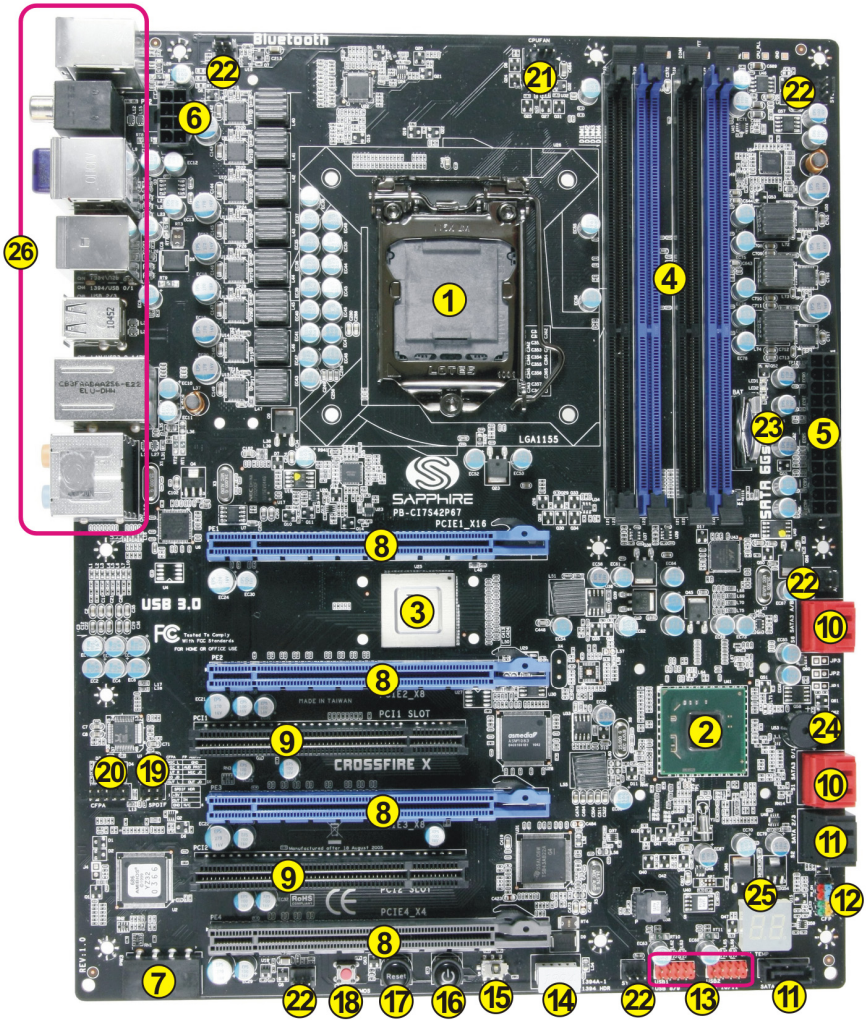
1-2 Package Contents

Your Sapphire Pure Black P67 Hydra mainboard comes with the following accessories.

1. Mainboard	
2. Quick Installation Guide	**3. Driver CD**
	
4. I/O Shield	**5. SATA Data Cable *6**

1-3 Mainboard Layout

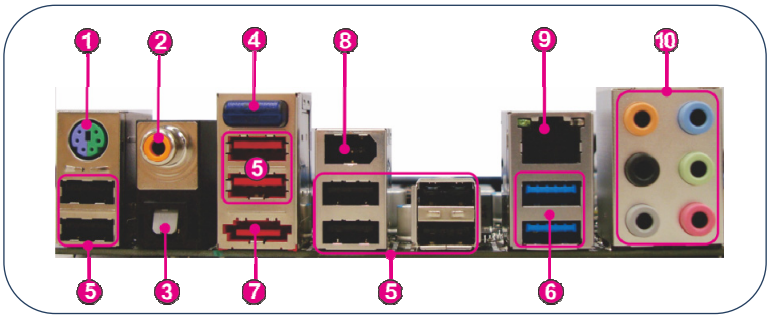
The following figure shows the location of components on the mainboard. See Page 5 for the Key



Item	Component description
1	CPU Socket 1155
2	Intel P67 Single Chip
3	Lucid LT24102 Chip
4	DDR3 DIMM Slots 1-4
5	24-Pin ATX Power Connector
6	8-pin ATX_12V Power Connector
7	4-pin Molex Power Connector
8	PCI-E x16 Slots 1-4
9	PCI Slots 1-2
10	SATAIII Connectors *4
11	SATAII Connectors *3
12	Front Panel Header
13	USB2.0 Header *4
14	IEEE1394a Header
15	Dual BIOS Switch
16	Power Button
17	Reset Button
18	Clear CMOS Button
19	S/PDIF Header
20	Front Panel Audio Header
21	CPU Fan Header
22	3-pin Fan Header *5
23	Mainboard Battery
24	PC Speaker
25	Debug LED Display
26	Back Panel Connectors (see next page for detail)

I/O Back Panel

The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.



1. PS/2 Keyboard/Mouse Port
   This connector is used for a keyboard or mouse. You can plug a PS/2 keyboard or mouse directly into this connector.

2. Coaxial S/PDIF-Out
   This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through a coaxial cable.

3. Optical S/PDIF-Out
   This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through an optical fiber cable.

4. Bluetooth
   Bluetooth wireless technology is an interface intended for wireless control/data communication

5. USB 2.0 Ports (Eight)
   The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as a keyboard, mouse or other USB-compatible devices. Supports data transfer rates up to 480Mb/s.

6. USB 3.0 ports (two)
   USB 3.0 ports are backwardly compatible with USB 2.0 devices. Supports data transfer rates up to 4.8Gb/s (SuperSpeed).

7. ESATA Port
   The ESATA (External SATA) port provides connection to ESATA hard drives.

8. IEE1394a (Firewire) Port
   The IEEE 1394 port provides connection to IEEE 1394 devices.

9. LAN Ports with LEDs
   The mainboard provides one standard RJ-45 jack for connecting to a Local Area Network (LAN). Two LEDs are built into the RJ-45 LAN connector. These LEDs indicate the status of the LAN.

LED	LED Color	LED state	Indicates
A	Green	Off	LAN link is not established
		On	LAN link is established
		Blinking	LAN activity is occurring
B	N/A	Off	10 Mb/s data rate
	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

10. Audio Ports
    This mainboard provides 2, 6, or 8channel audio. It is easy to differentiate between the audio functions by referring to the color of the jacks.

Ports	2 channel	6 channel	8 channel
Blue	Line-In	Line-In	Line-In
Lime	Line-Out	Front Stereo-Out	Front Stereo-Out
Pink	Min-In	Min-In	Min-In
Orange	--	Center/Subwoofer	Center/Subwoofer
Black	--	Rear Stereo-Out	Rear Stereo-Out
Gray	--	--	Side Stereo-Out

Chapter 2 Installation

2-1 Before You Begin

Please take note of all precautions before you install anything on to the mainboard or change any of the mainboard settings.
Turn off the power to your system and discharge your body's static electric charge by touching a grounded surface—for example, the metal surface of the power supply—before performing any hardware procedure.
The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of any components by unauthorized service personnel. If you do not feel comfortable performing the installation, consult a qualified computer technician.
Damage to system components, the mainboard, and injury to you may result if power is applied during installation.

2-2 Installing the I/O Shield

The mainboard comes complete with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the mainboard in the chassis. Place the shield inside the chassis. Press the shield into place so that it fits tightly and securely. If the shield does not fit, obtain a properly sized shield from the chassis supplier.

2-3 Securing to the Chassis

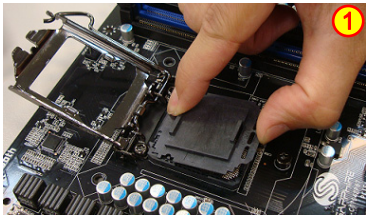
When installing the mainboard, you have to secure the mainboard into the chassis by fastening with nine screws. Please refer to your chassis manual for instructions on installing.

2-4 Installing the CPU and Fan Heatsink

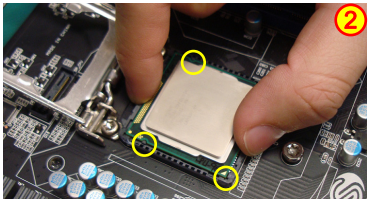
To install the CPU:

1. Open the socket lever by pushing the lever down and away from the socket. Remove the protective socket cover from the socket. Do not touch the socket contacts.

   Note: Do not discard the protective socket cover. Be sure to always replace the cover unless the CPU is installed.



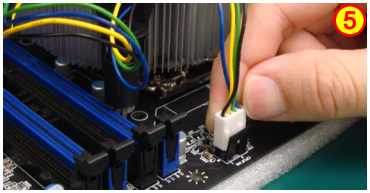
2. Align the CPU notches to the socket protrusions. Place CPU straight down without tilting or sliding it.



3. Close the load plate and engage the socket lever.

4. To install fan heatsink, align the holes on the mainboard. Press the four hooks down to fasten the cooler. You will hear a "click" upon full engagement. Gently rotate the cap clockwise 1/4 turn to fasten the heatsink onto the mainboard

5. Connect the 4-wire fan cable to the 4-pin CPUFAN header on the mainboard.



2-5 Installing System Memory

This mainboard has four 240-pin DIMM sockets for DDR3 memory. These slots support 1GB, 2GB and 4GB DDR3 DIMMs.

Make sure that you install memory modules of the same type and density in different channel DIMM slots for Dual-Channel mode.

There must be at least one memory bank populated to ensure normal operation and always inset the memory module into the DIMM slot 2 first.

Memory configurations:

Use the following the recommendations for installing memory.

1 DIMM (Single-Channel): install into DIMM slot 2.

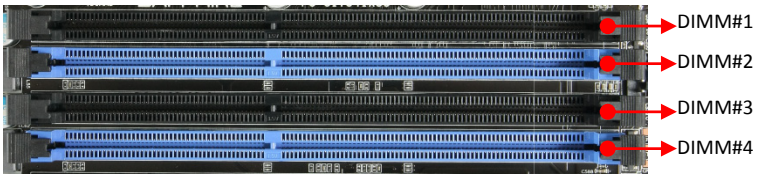
2 DIMMs (Dual-Channel): install into DIMM slots 2 and 4.

3 DIMMs (Dual -Channel): install into DIMM slots 1, 2 and 4.

4 DIMMs (Dual -Channel): install into all DIMM slots.

DIMM Quantity / Location	1 DIMM (Single Channel)	2 DIMMs (Dual Channel)	3 DIMMs (Dual Channel)	4 DIMMs (Dual Channel)
DIMM#1 (Black)	--	--	V	V
DIMM#2 (Blue)	V	V	V	V
DIMM#3 (Black)	--	--	--	V
DIMM#4 (Blue)	--	V	V	V

(" V" = Memory installed, "--" = No memory installed)



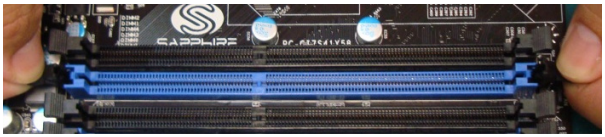
Memory Installation:

DDR3 and DDR2 memory modules are physically different. Please only install DDR3 DIMMs in this mainboard.

To make sure you have the correct DIMM, check that all the notches line up with the DDR3 DIMM slot.

To install the DIMM, follow these steps:

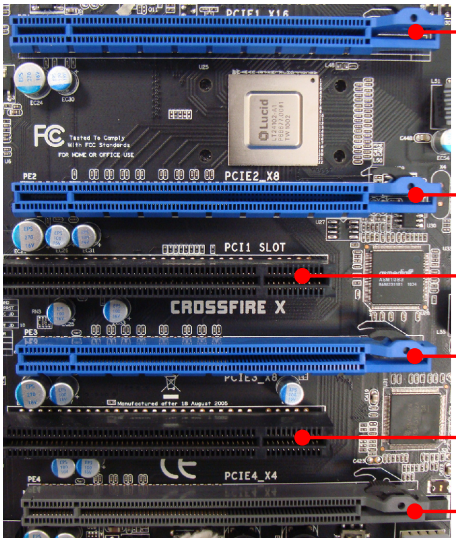
1. Pull both clips on either side of the slot outwards. Align the DIMM module with the slot.



2. Press straight down until the plastic clips close and the module fits tightly into the DIMM slot.

2-6 Installing Expansion Cards

The mainboard provides four PCI Express 2.0 x16 slots and two PCI slots.



PCIE1_X16
PCI-E2.0 x16 slot (with x16 link, Blue)

PCIE2_X8
PCI-E2.0 x16 slot (with x8 link, Blue)

PCI1 slot (Black)

PCIE3_X8
PCI-E2.0 x16 slot (with x8 link, Blue)

PCI2 slot (Black)

PCIE4_X4
PCI-E2.0 x16 slot (with x4 link, Gray)

PCI-E Slots

The design of this motherboard supports multiple graphic card technology. Supports ATI CrossFireX™ or Lucid Hydra modes either. Please refer to the location of slots and recommended configuration table for PCI-E operating mode to get the best performance possible.

Recommended configuration table			
Slot location / VGA card	PCIE1_x16 (Blue)	PCIE2_x8 (Blue)	PCIE3_x8 (Blue)
1 VGA card	x16		
2 VGA cards	x16	x8	
3 VGA cards	x16	x8	x8

Note: For more details about the Lucid Hydra installation, Please refer to Lucid Hydra documentation on the bundle driver CD.

To install a PCI Express card:

1. Place the card in an available PCI Express slot and press down on the card until it is completely seated in the slot. If the card is not seated properly, it could cause a short across the pins.
2. Secure the card's metal bracket to the chassis back panel with a screw.

PCI Slots

The two PCI slots provided supports a variety of expansion cards such as a LAN card, USB card, SCSI card and other cards that comply with PCI specifications. When installing a card into the PCI slot, be sure that it is fully seated. Secure the card's metal bracket to the chassis back panel.

2-7 Connecting Cables

This section takes you through all the necessary connections on the mainboard.

Connecting Power Supply Cables

- 24-pin ATX Power

PW1 is the main power supply connector. Make sure that the power supply cable and pins are properly aligned with the connector on the mainboard. Firmly plug the power supply cable into the connector and make sure it is secure.

Note: If you'd like to use the 20-pin ATX power supply, please plug in your power supply cable aligned with pins 1 & 13. The 24-pin main power connector is backwardly compatible with ATX power supplies with 20-pin connectors.

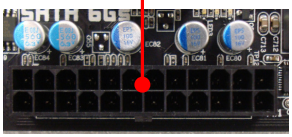
- 8-pin ATX 12V Power

PW2, the 8-pin ATX 12V power connector, is used to provide power to the CPU. Align the power plug to the connector and press firmly until seated.

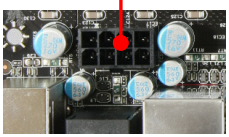
- 4-pin Molex Power

PW3, the 4-pin power connector, is used to provide extra 12V / 5V power to your system. When installing multiple graphic cards, you can connect your power supply here to ensure sufficient power supply to the PCI-E slots.

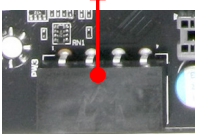
24-pin ATX Power connector



8-pin ATX Power connector



4-pin Molex Power connector

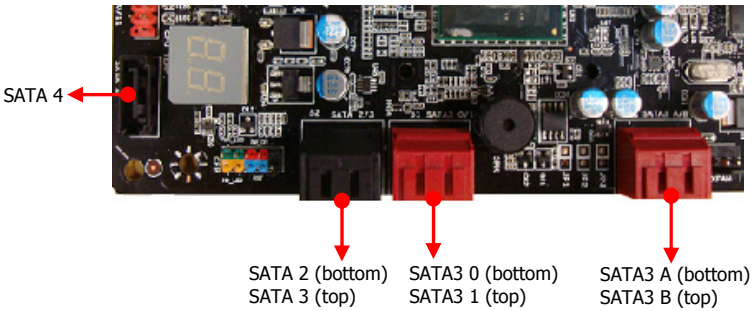


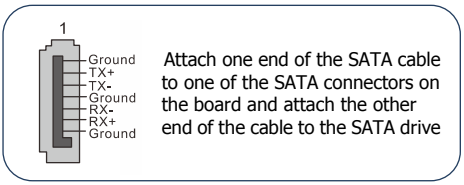
Connecting Serial ATA (SATA) Cables

SATA cables support the Serial ATA protocol. Each cable can be used to connect one internal SATA drive to mainboard.

The black coloured connectors (SATA2,3 and 4) are controlled by the AMD South Bridge and operate at speeds up to 3 Gb/s.

The red coloured connectors (SATA3 0 and SATA3 1 controlled by the AMD South Bridge and SATA3 A and SATA3 B controlled by the Marvell 9128 chip) are SATA3 compliant and work at speeds of up to 6 Gb/s.





Connecting to the Internal Headers and Connectors

Front Panel Header

The front panel header on this motherboard is one connector used to connect the front panel switches and LEDs.

▶PWR_LED

Attach the front panel power LED cable to these two pins of the connector. The Power LED indicates the system's status.

System Status	Power LED indicates
On	The LED is on
Off	The LED is off
S1	The LED is on
S3	The LED will blink
S4	The LED is off

▶PW_ON

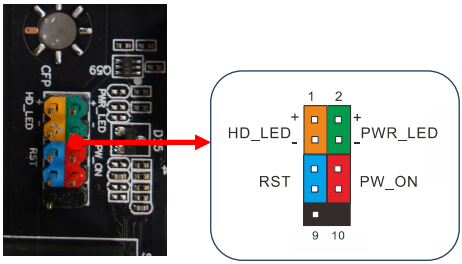
Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard button.

▶HD_LED

Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

▶RESET

Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the RESET switch is pressed.



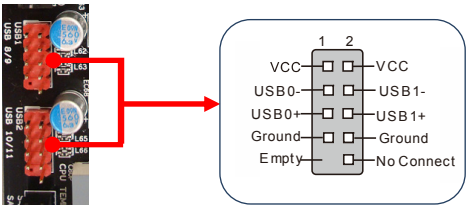
Header	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED+
	4	PWR LED-
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

USB Header

This mainboard contains eight (8) USB 2.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains two 10-pin internal header connectors onboard that can be used to connect an optional external bracket containing four (4) USB 2.0 ports.

Refer to the following steps:

1. Secure the bracket to either the front or rear panel of your chassis (not all chassis are equipped with the front panel option).
2. Connect the cable(s) to the USB 2.0 header on the mainboard.



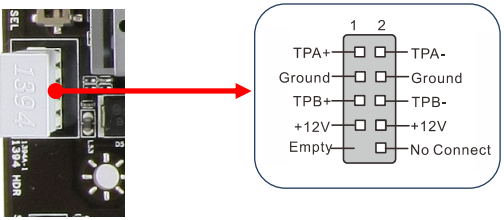
Note: Please do not connect a 1394 cable to USB connector, which will cause damage to the mainboard.

1394 Header

This header is used for IEEE1394 devices. There is a header cap on the 1394 header to prevent confusion with the USB header. If you do not require the additional external 1394 connections, you do not need to install them.

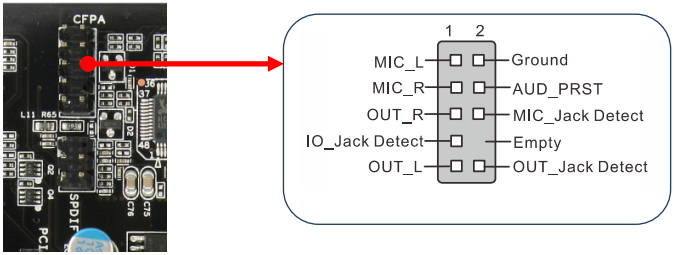
Refer to following steps:

1. Secure the bracket to either the front or rear panel of the system case (not all system cases are equipped with the front panel option).
2. Remove the header cap of 1394
3. Connect the end of the cable to the IEEE1394a header on the mainboard.



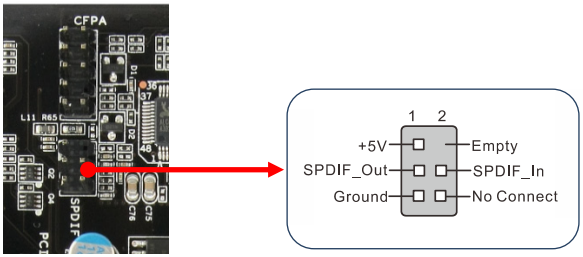
CFPA Header

This header allows you to connect the front panel audio. The audio connector supports HD audio standard.



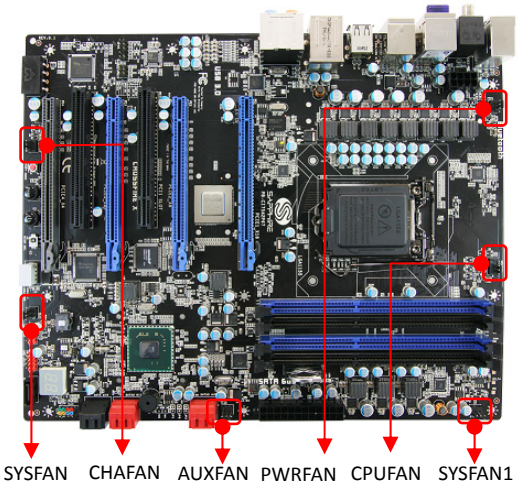
S/PDIF Header

This header is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



Fan Header

There are six fan headers (CPUFAN, SYSFAN, SYSFAN1, PWRFAN, CHAFAN, AUXFAN) on the motherboard. Three of these fans (CPUFAN, PWRFAN, CHAFAN) can be speed detected/controlled and displayed in the Hardware Health Configuration section of the CMOS Setup. The fans are automatically turned off after the system enters S3, S4 or S5 mode.



CPUFAN

Note:
The CPU fan cable can be either a 3-pin or a 4-pin connector. Connect a 3-pin connector to pins 1, 2, and 3on the mainboard connector.

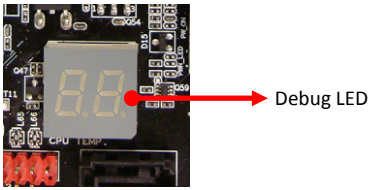
SYSFAN, SYSFAN1, AUXFAN

CHAFAN, PWRFAN

2-8 Diagnostics LED

This mainboard provides a two-digit POST code to show why the system may be failing to boot. It is useful during a troubleshooting situation. This Debug LED will also display the current CPU temperature after the system has fully booted into the operating system.

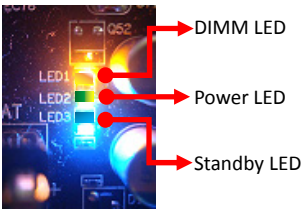
Please find a list of debug codes in the full manual found on your installation CD.



2-9 LED Status Indicators

This mainboard provides three LEDs to indicate the system's status.

- DIMM LED (LED1, Yellow): When the Memory slot is functional: This LED is on.
- POWER LED (LED2, Green): When the System is powered on: This LED is on.
- STANDBY LED (LED3, Blue): When the System is in Standby Mode: This LED is on. This LED will remain on as long as the motherboard is receiving constant power.



2-10 Onboard Buttons

These onboard buttons include Clear CMOS, RESET and POWER, which allow you to easily clear the CMOS, reset the system and turn on/off the system.

Clear CMOS Button

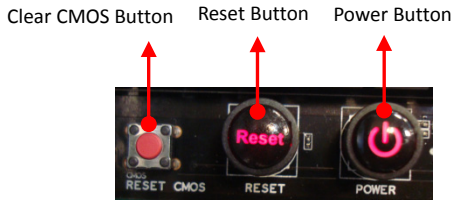
The mainboard uses the CMOS RAM to store some of the system configuration. The CMOS can be cleared by pressing the Clear CMOS button.

Reset and Power Button

These onboard buttons allow you to easily turn on/off the system and allow for easy debugging and testing of the system during troubleshooting situations.

The Reset button with LED indicates the activity status of the hard disk drives and will blink accordingly.

The Power button with LED indicates the system's status. When the system is powered on, the LED blinks red.

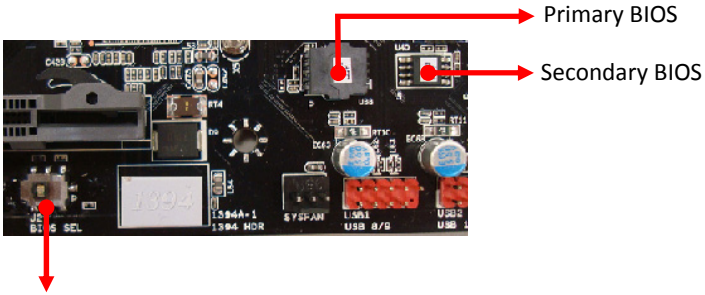


2-11 Dual BIOS Switch

This mainboard includes dual onboard BIOS, (Primary and Secondary BIOS), When the primary BIOS is corrupted or has failed, you can use the secondary BIOS to take over on the next system boot to ensure normal system operation.

To enable the secondary BIOS, please refer to the following steps:

1. Turn off the system power.
2. Change the BIOS Select jumper from "P" to "S" position.
3. Turn on the system power.



BIOS Select Switch
(When the Secondary BIOS is in operation, the LED indicator is on.)

Chapter 3 Configuring the BIOS

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

3-1 Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.

Use the following procedure to change BIOS settings.

1. Power on the computer.
2. Press the **Del** key when the following message briefly shows upon the bottom of the display during Power On Self Test (POST).

   Press F1 to continue, DEL to enter Setup.

Pressing Del takes you to the BIOS Aptio Setup Utility.

Note1: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.

Note2: The BIOS options in this manual are for reference only. BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version from our official website

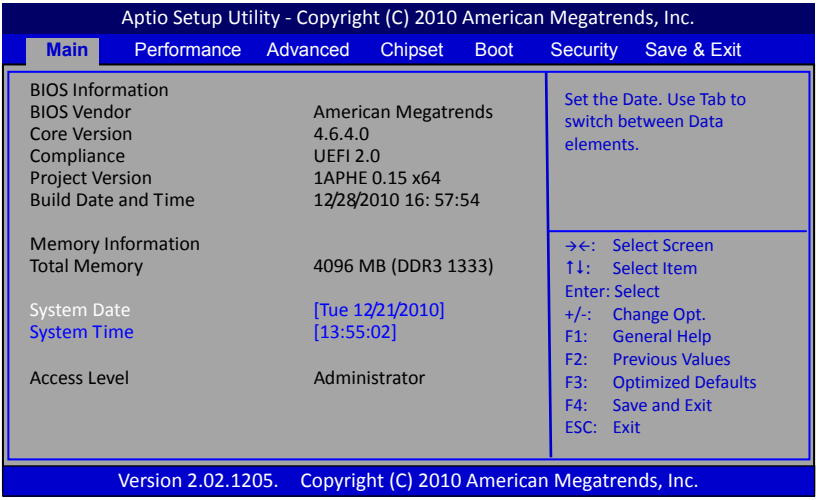
ControlKeys

Please check the following table for the function description of each Controlkey.

Control 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
<F2>	To load previous values for all the settings
<F3>	To load optimal default values for all the settings
<F4>	To save changes and exit the SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3-2 Main Menu

When entering the Aptio Setup Utility, the main menu screen appears. This main menu includes the system overview and displays the basic system configuration, such as BIOS information, memory size and system date/time.



BIOS Information

This field displays the current BIOS version, build date and ID information etc..

Memory Information

Displays current system memory size.

System Date

Allows you to set the system date.The format is <Day><Month><Date><Year>.

[Day] Weekday from Sun. to Sat., this is automatically displayed by BIOS.
[Month] The month from 1 to 12.
[Date] The date from 1 to 31 can be keyed by numeric function keys.
[Year] The year can be adjusted by users.

System Time

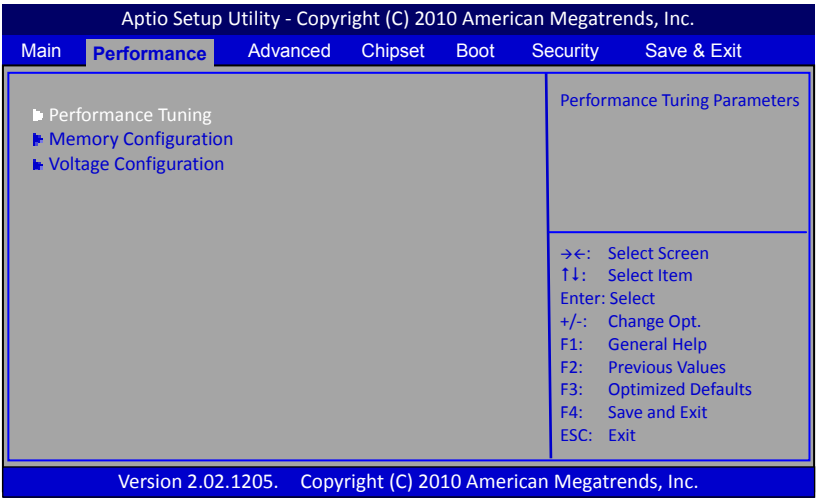
Allows you to set the system time. The time format is <hour>:<minute>:<second>.

Access Level

This item is used to limit the user access level.

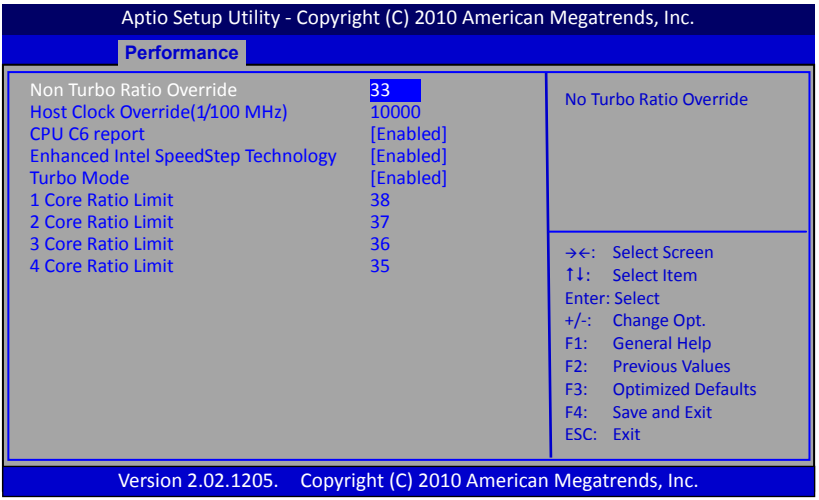
3-3 Performance Menu

The Performance menu allows you to specify your settings for CPU, memory, voltage control and overclocking. Press <Enter> to display the configuration options.



In Performance Tuning item, includes two sub-menu for CPU and memory configuration, press <Enter> to enter the sub-menu.

- **CPU Configuration**



Non Turbo Ratio Override

This is used to select the Ratio or Multiplier of the CPU, this varies depending on what CPU you have.

Host Clock Override(1/100 MHz)

Selects the value for Host Clock Override. The value range is 100MHz ~300MHz. The 1000 means 100MHz.

CPU C6 report

Enable/Disable CPU C6(ACPI C3) report to OS
Options: Enabled, Disabled.

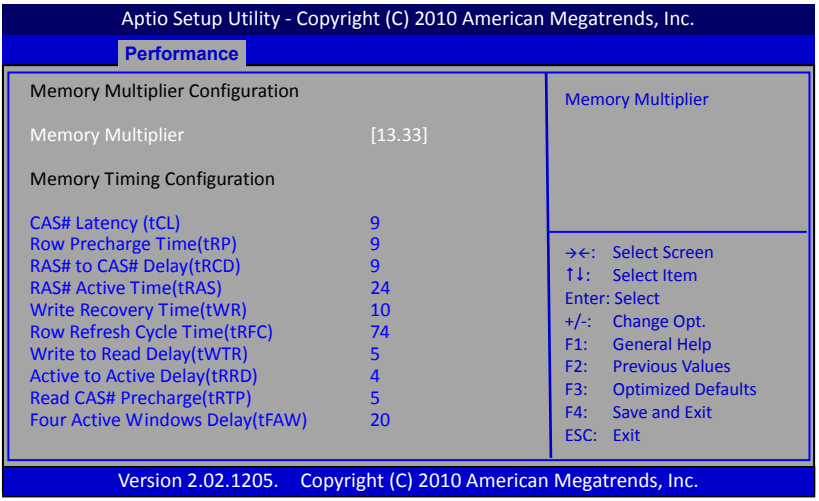
Enhanced Intel SpeedStep Technology

Enables the Intel®SpeedStep technology (EIST).
Options: Enabled, Disabled.

Turbo Mode

Enables the processor cores to run faster than marked frequency in specification condition.
Options: Enabled, Disabled.

▶ Memory Configuration



Memory Multiplier
Allows you to select the memory multiplier.
Options: Auto, 10.67, 13.33, 16, 18.67, 21.33.

CAS# Latency (tCL)
Set the CAS latency time.
Options: 3 ~ 15.

Row Precharge Time(tRP)
Set the Row Precharge time. This is the Precharge-to-Active or Auto-to-Refresh of the same bank.
Options: 3 ~ 15.

RAS# to CAS# Delay(tRCD)
Set the RAS to CAS Delay time for Read/Write commands to the same bank.
Options: 3 ~ 15.

RAS# Active Time(tRAS)
Set the minimum RAS# active time.
Options: 9 ~ 63.

Write Recovery Time(tWR)
Set the internal Write to Read recovery time.
Options: 3 ~ 31.

Row Refresh Cycle Time(tRFC)
Set the minimum refresh recovery time.
Options: 15 ~ 255.

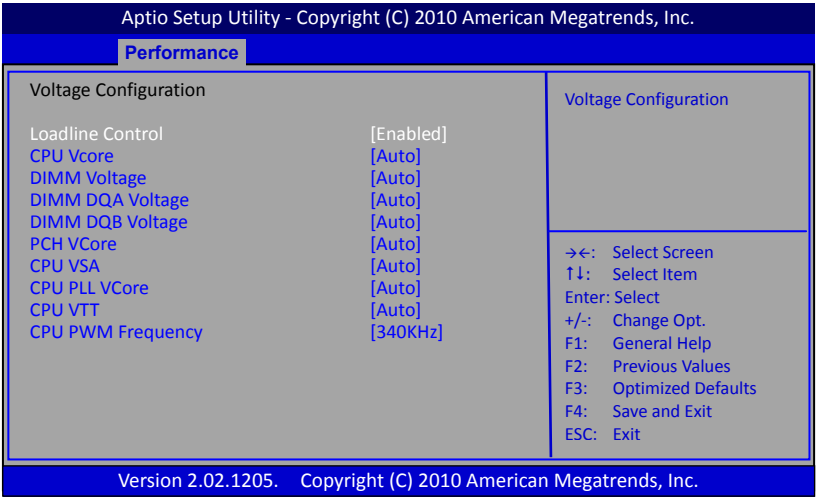
Write to Read Delay(tWTR)
Set the internal Write to Read command delay.
Options: 3 ~ 31.

Active to Active Delay(tRRD)
Set the Row Active to Row Active delay.
Options: 4 ~ 15.

Read CAS# Precharge(tRTP)
Set the Read to Precharge delay.
Options: 4 ~ 15.

Four Active Windows Delay(tFAW)
Set the Four Active Windows Delay.
Options: 4 ~ 63.

Voltage Configuration



Loadline Control
Loadline Control function is a safety measure to protect the CPU.
Options: 75%, 62% , 50% , 37%, 25% ,12%, Disable.

CPU Vcore
Allows you to adjust the CPU Vcore voltage.
Options: Auto, +00mV ~+1270mV in 10mV increments. We recommend that you select [Auto] as the default value.

DIMM Voltage
Allows you to adjust the DIMM Slot voltage.
Options: Auto, 1.10V ~2.50V in 0.05V increments.

DIMM DQA Voltage
Allows you to adjust the DQA Voltage of DIMM Slot voltage.
Options: Auto, 0.75V ~1.38V in 0.01V increments.

DIMM DQB Voltage
Allows you to adjust the DIMM DQB of DIMM Slot voltage.
Options: Auto, 0.75V ~1.38V in 0.01V increments.

PCH VCore
Allows you to adjust the Intel PCH VCore Voltage.
Options: Auto, 1.050V ~2.625 in 0.025V increments.

CPU VSA
Allows you to adjust the CPU VSA Voltage.
Options: Auto, 0.925V ~2.5 in 0.025V increments.

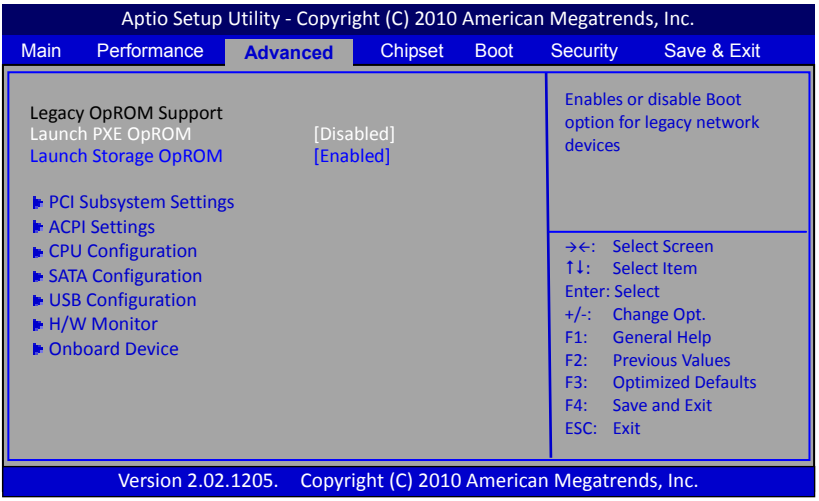
CPU PLL VCore
Allows you to adjust the CPU PLL VCore Voltage .
Options: 1.050V ~1.675V in 0.125V increments and 1.800V ~2.680V in 0.025V increments.

CPU VTT
Allows you to adjust the CPU VTT Voltage.
Options: 1.100V ~2.500V in 0.025V increment

CPU PWM Frequency
Allows you to adjust the CPU PWM Frequency.
Options: 340KHz, 380KHz, 430KHz, 480KHz

3-4 Advanced Menu

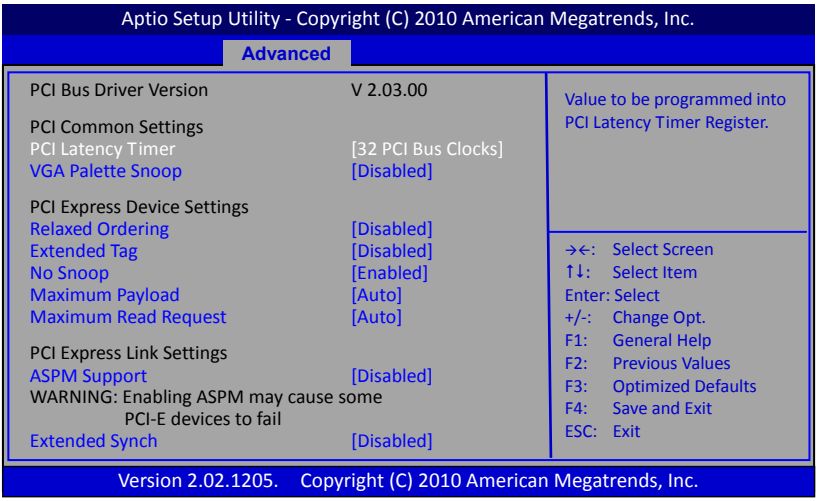
The Advanced menu items allow you to change the settings for the CPU, USB and other system devices. Press <Enter> to display the configuration options.



Launch PXE OpROM
Enables the Boot option for legacy network devices.
Options: Enabled, Disabled.

Launch Storage OpROM
Enables the Boot option for mass storage devices with option ROM.
Options: Enabled, Disabled.

▶ PCI Subsystem Settings



PCI Latency Timer
Allows you to select the value in units of PCI clocks for PCI device latency timer.
Options: 32/64/96/128/160/192/224/248 PCI Bus Clocks

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

Relaxed Ordering
Enables the PCI Express device Relaxed Ordering.
Options: Enabled, Disabled.

Extended Tag
Allows device to use 8-bit TAG field as a requester.
Options: Enabled, Disabled

No Snoop
Enables the No Snoop function of PCI Express device.
Options: Enabled, Disabled.

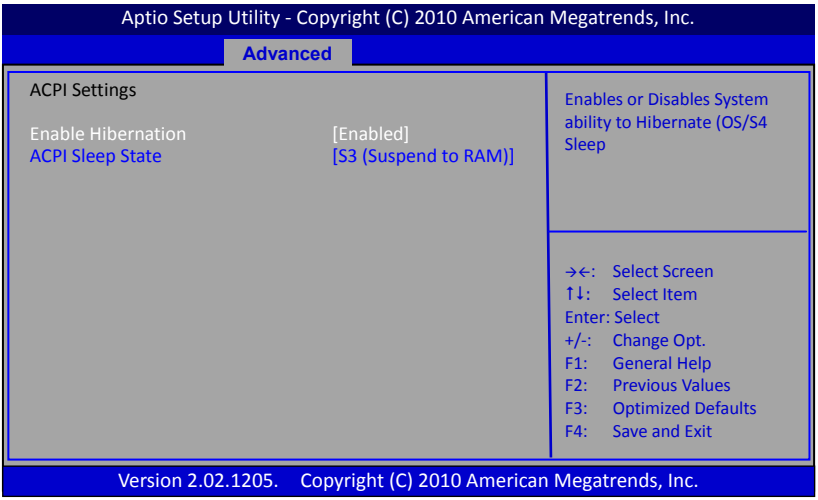
Maximum Payload
Sets the Maximum Payload size of PCI Express Device or allows the system BIOS to select the value.
Options: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

Maximum Read Request
Sets the Maximum Read Request of PCI Express Device or allows the System BIOS to select the value.
Options: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

ASPM Support
Sets the ASPM level, select "Force L0" can force all links to L0 state.
Options: Disabled, Auto, Force L0.

Extended Synch
If select "Enabled", allows generation of Extended Synchronization patterns.
Options: Enabled, Disabled.

▶ ACPI Settings

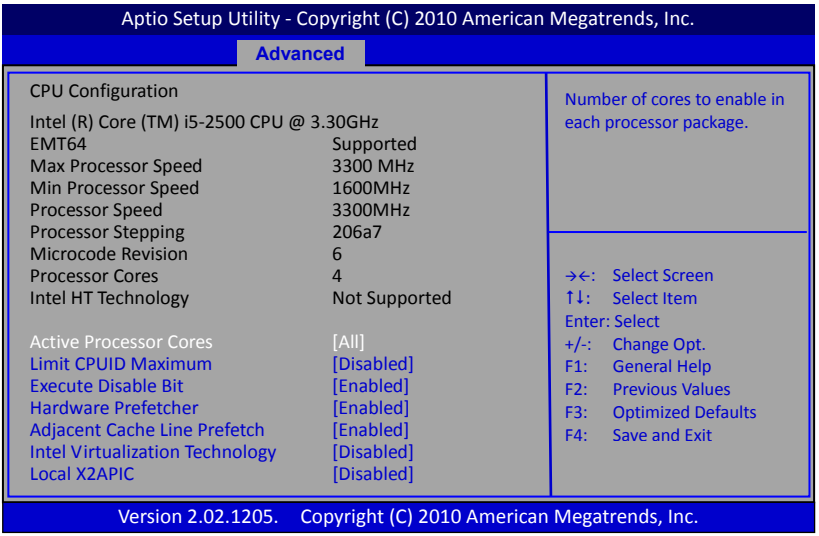


Enable Hibernation
Enables system ability to Hibernate (OS/S4 Sleep Sate). This option may be not effective with some OS.
Options: Enabled, Disabled.

ACPI Sleep State

Selects the power saving modes for ACPI function.
Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM).

▶ CPU Configuration



Active Processor Cores

Use this item to select the number of cores to enable in each processor package.
Options: All, 1, 2, 3.

Limit CPUID Maximum

We recommend leaving it disabled, unless you are using a very old OS or experiencing problems related to CPU identification/compatibility.
Options: Enabled, Disabled.

Execute Disable Bit

When this function is disabled, it forces the XD feature flag to always return to zero (0).
Options: Enabled, Disabled.

Hardware Prefetcher

This item enables L2 Cache (Mid Level Cache) stream prefetcher for tuning performance of the specific application.
Options: Enabled, Disabled.

Adjacent Cache Line Prefetch

This item enables Adjacent Cache Line Prefetch function.

Options: Enabled, Disabled.

Intel Virtualization Technology

When this function is enabled, it allows a VMM to utilize the additional hardware capabilities provided by Intel Virtualization Technology.

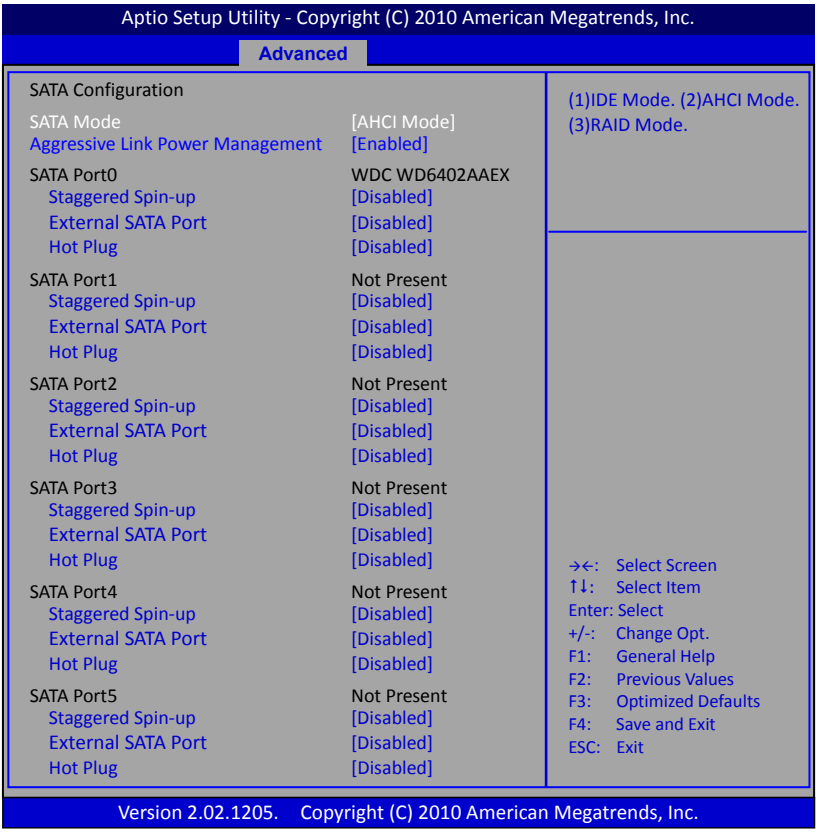
Options: Enabled, Disabled.

Local X2APIC

This item enables Local X2APIC function. Some OSes do not support this.

Options: Enabled, Disabled.

▶ SATA Configuration



SATA Mode

Allows you to set the onboard Serial SATA mode.

- IDE Mode: Use the SATA hard disk drivers as Parallel ATA storage devices.
- RAID Mode: Create a RAID 0, 1, 10, 5 configuration
- AHCI Mode: Use the AHCI (Advanced Host Controller Interface) to enable advanced SATA features for improved performance with NCQ and Hot-plug features

Aggressive Link Power Management

This item enables Aggressive Link Power Management support. For Cougar Point B0 stepping onwards.
Options: Enabled, Disabled.

Staggered Spin-up

Enables the AHCI supports Staggered Spin-up function.
Options: Enabled, Disabled.

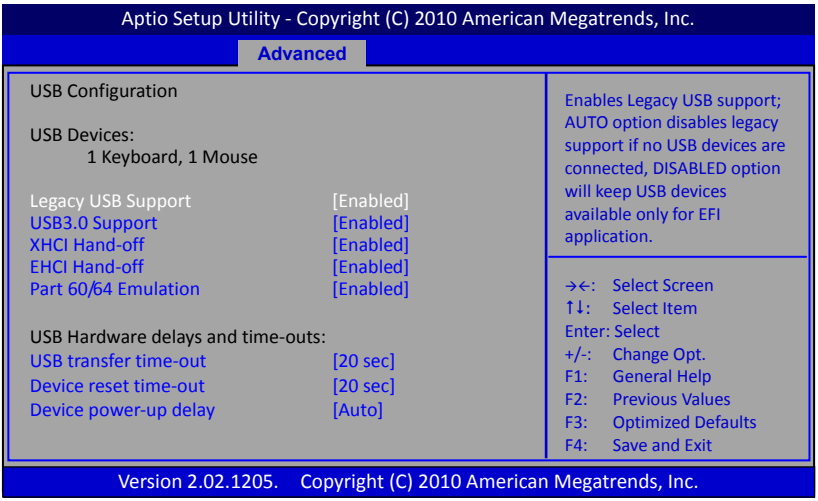
External SATA Port

Enables the external SATA port support.
Options: Enabled, Disabled.

Hot Plug

Enables the SATA port hot plug support.
Options: Enabled, Disabled.

▶ USB Configuration



Legacy USB Support
Allows you select legacy support for USB devices.
Enabled: Enables Legacy USB support.
Disabled: Keep USB devices available only for EFI application.
Auto: Disables legacy support if no USB devices are connected.

USB3.0 Support
Enables USB3,0 (XHCI) controller support.
Options: Enabled, Disabled.

XHCI Hand-off
This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
Options: Enabled, Disabled.

EHCI Hand-off
This is a workaround for OSes without EHCI hand-off support. The XHCI ownership change should be claimed by EHCI driver.
Options: Enabled, Disabled.

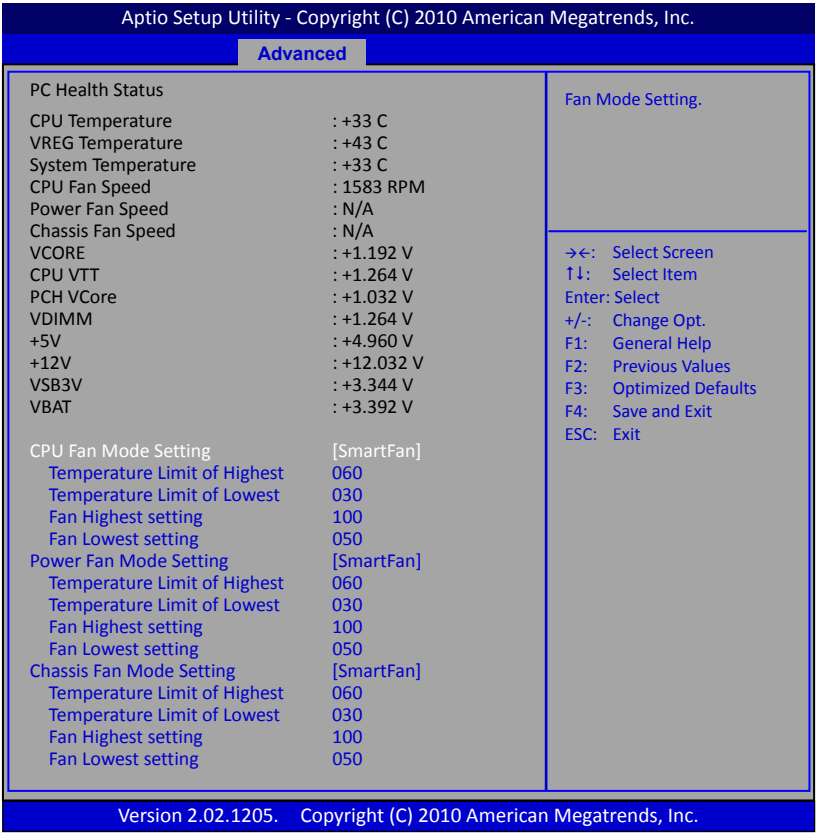
Part 60/64 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
Options: Enabled, Disabled.

USB transfer time-out
The time-out value for control, bulk, and interrupt transfers.
Options: 1 sec, 5 sec, 10 sec, 20 sec.

Device reset time-out
Sets USB mass storage devices start unit command time-out.
Options: 10 sec, 20 sec, 30 sec, 40 sec.

Device power-up delay
Maximum time the device will take before it properly reports itself to the Host controller. 'Auto' uses default values; for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Options: Auto, Manual.

H/W Monitor



CPU / VREG / System

Displays the current CPU, onboard regulator and system temperature.

CPU /Power /Chassis Fan Speed

Displays the current CPU, Power and Chassis Fan Speed

VCore/VDimm/VTT/NB/+5V/+12V/VCC3/VBAT

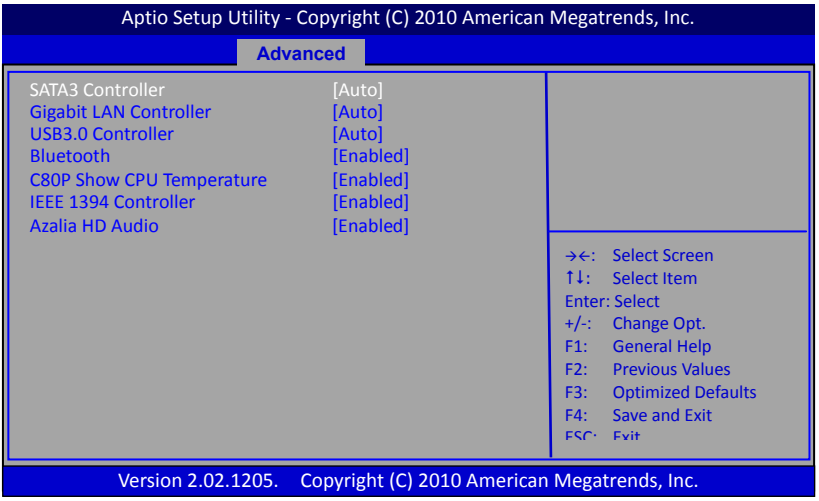
The current voltages are automatically detected and displayed by the system.

CPU Fan Mode Setting

This item controls the speed of the various fans on the motherboard. Choose [SmartFan] when you want the speed of the fans automatically controlled based on temperature. To set the fan speed to a constant rate, select [Manual Mode] and then enter the speed from 0% to 100%.

Set the desired speed for the Power and Chassis fans from 0% to 100%. The system defaults to 100%.

▶ Onboard Device



SATA3 Controller
Enables the onboard SATA3 Controller.
Options: Auto, Enabled, Disabled.

Gigabit LAN Controller
Enables the onboard Giga Lan function for LAN.
Options: Auto, Enabled, Disabled

USB3.0 Controller
Enables the onboard USB 3.0 controller.
Options: Auto, Enabled, Disabled.

Bluetooth
Enables Bluetooth function.
Options: Enabled, Disabled.

C80P Show CPU Temperature
Enables the onboard POST Port LED to display CPU temperature.
Options: Enabled, Disabled.

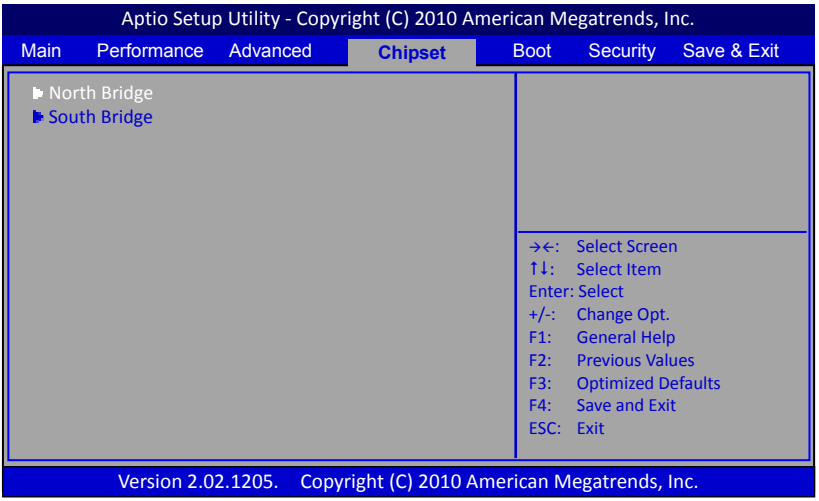
IEEE 1394 Controller
Enables the onboard IEEE1394 controller.
Options: Enabled, Disabled.

Azalia HD Audio

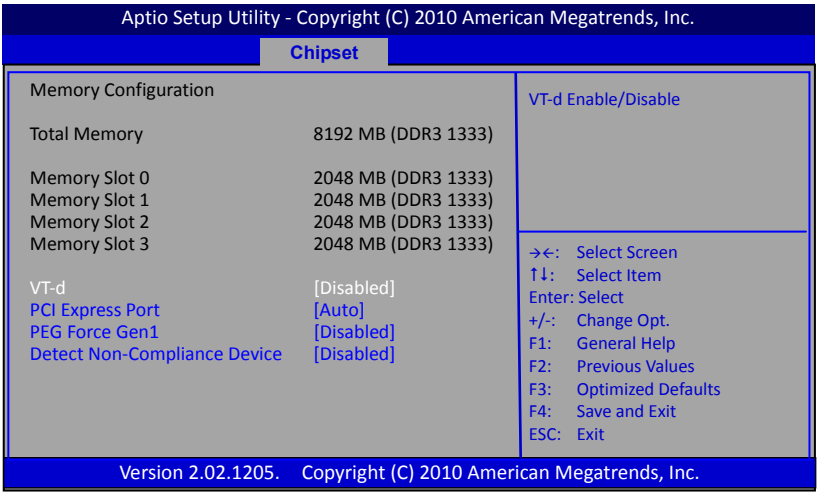
Enables the onboard High Definition Audio controller.
Options: Enabled, Disabled.

3-5 Chipset Menu

The chipset menu items allow you to change the advanced chipset settings.
Press <Enter> to display the sub-menu.



▶ North Bridge



Total Memory
Displays current system total memory size.

Memory Slot 0/1/2/3/4
Displays the memory size of each individual slot

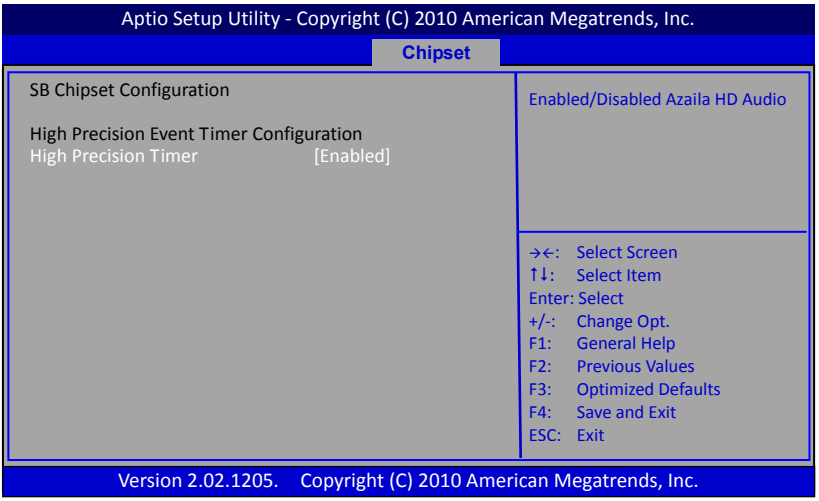
VT-d
Allows you enable the chipset VT-d technology.
Options: Enabled, Disabled.

PCI Express Port
This item enables the PCI Express Port.
Options: Auto, Enabled, Disabled.

PEG Force Gen1
When enabled, the PCI-E x16 slot will be forced to run in the PCI-E x1 mode.
Options: Enabled, Disabled.

Detect Non-Compliance Device
This item enables detect non-compliance device in PCI Express Port.
Options: Enabled, Disabled.

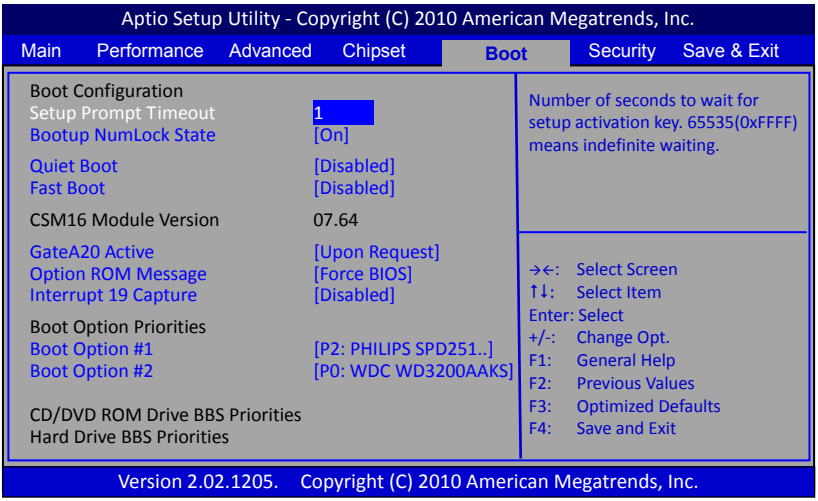
▶ South Bridge



High Precision Timer
Allows you to enable or disable the High Precision Event Timer.
Options: Enabled, Disabled.

3-6 Boot Menu

The Boot menu is used to configure the boot settings and the boot priority.



Setup Prompt Timeout

This is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

Bootup NumLock State

Selects the state of the keyboard's numlock function after POST.

Options: On, Off.

Quiet Boot

Displays normal POST message. Select disable to display Logo instead of POST message.

Options: Enabled, Disabled.

Fast Boot
This item makes your computer skip some of the POST, if your computer doesn't have any problems (bad memory chips, etc.), you can enable it.
Options: Enabled, Disabled.

GateA20 Active
This feature determines how Gate A20 is used to address memory above 1MB.
Upon Request: GA20 can be disabled using BIOS services.
Always: Do not allow disabling GA20.

Option ROM Message
Sets display mode for Option ROM.
Force BIOS: To force to a BIOS-compatible output. This will show the option ROM messages.
Keep Current: To keep the current video mode. This will suppress option ROM messages. Option ROMs requiring interactive inputs may not work properly in this mode.

Interrupt 19 Capture
Allows specify if legacy PCI option ROMs are allowed to capture software interrupt 19h.
Options: Enabled, Disabled.

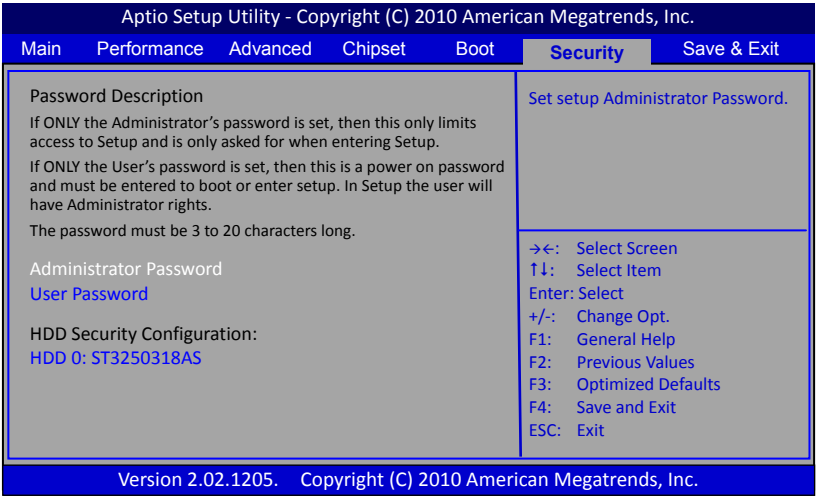
Boot Option #1/#2
These options are used to form the boot order and are dynamically generated.

CD/DVD ROM Drive BBS Priorities
Allows configure the boot order for a specific CD/DVD ROM device class.

Hard Drive BBS Priorities
Allows configure the boot order for a specific Hard Drive device class.

3-7 Security Menu

The Security menu allows you to change the system security settings.



Administrator Password

This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

User Password

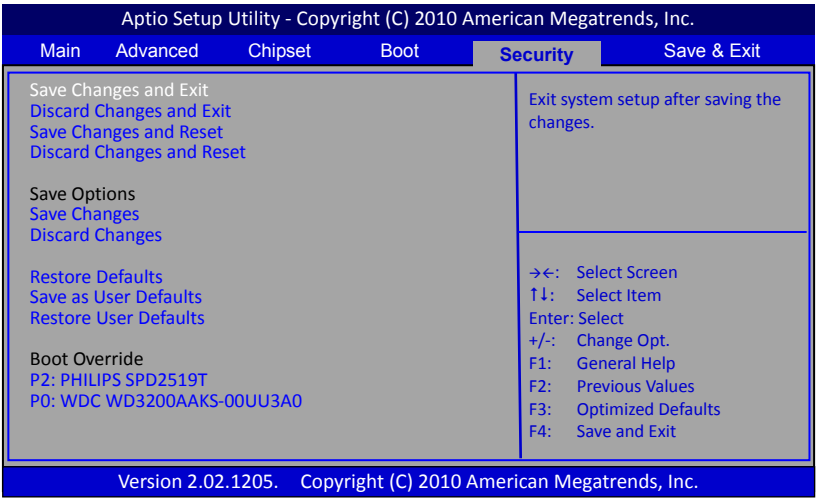
This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

HDD Security Configuration

Allows you to set password for hard drive security configuration

3-8 Save & Exit Menu

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



Save Changes and Exit

This saves the changes to the CMOS RAM and exits the BIOS Setup program.

Discard Changes and Exit

This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS.

Save Changes and Reset

This resets system after saving the changes.

Discard Changes and Reset

This resets system without saving the changes.

Save Option

Allows you to save the options you made to the CMOS RAM.

Save Change

Allows you to save the changes you made to the CMOS RAM.

Discard Changes

Allows you to discard the selections you made.

Restore Defaults

The restore defaults are the factory settings of this motherboard.

Save as User Defaults

This is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Restore User Defaults

This is used to restore all tokens to settings previously stored by Save as User Defaults.

Boot Override

This group of functions includes a list, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

Chapter 4 Driver Installation

After the operating system has been installed, you need to install drivers for this mainboard.

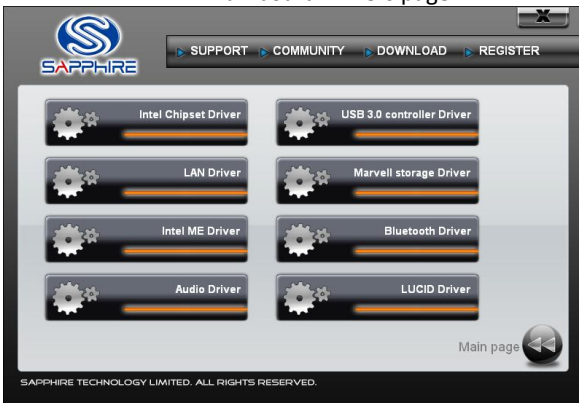
The support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

Insert the bundled driver CD into your optical drive and the main menu will be displayed on your PC screen. Click each item button and select the item you want to install.

<Main Page>

The Mainboard Drivers item shows the available device drivers. Install the necessary drivers to use the devices.

<Mainboard Drivers page>



Note: If Autorun function is not enabled in your computer, browse the contents of the support CD to locate the file autorun.exe, and click this file to run the CD.

Chapter 5 POST Code

This chapter provides the Aptio POST Codes List for the mainboard during the BIOS pre-boot process.

The POST Codes are displayed on the Debug LED readout located directly onboard the mainboard.

Please refer to following "boot phases", which may apply to various status code & checkpoint descriptions:

- ♦ Security (SEC) – initial low-level initialization
- ♦ Pre-EFI Initialization (PEI) – memory initialization
- ♦ Driver Execution Environment (DXE) – main hardware initialization
- ♦ Boot Device Selection (BDS) – system setup, pre-OS user interface & selecting a bootable device (CD/DVD, HDD, USB, Network, Shell,..)

Checkpoint Ranges

Status Code Range	Description
01 – 0B	SEC execution
0C – 0F	SEC errors
10 – 2F	PEI execution up to and including memory detection
30 – 4F	PEI execution after memory detection
50 – 5F	PEI errors
60 – 8F	DXE execution up to BDS
90 – CF	BDS execution
D0 – DF	DXE errors
E0 – E8	S3 Resume (PEI)
E9 – EF	S3 Resume errors (PEI)
F0 – F8	Recovery (PEI)
F9 – FF	Recovery errors (PEI)

Standard Checkpoints

♦ SEC Phase

Status Code	Description
00	Not used
Progress Codes	
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	North Bridge initialization before microcode loading
04	South Bridge initialization before microcode loading

05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	North Bridge initialization after microcode loading
09	South Bridge initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
SEC Error Codes	
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded

♦ PEI Phase

Status Code	Description
Progress Codes	
10	PEI Core is started
11	Pre-memory CPU initialization is started
12– 14	Pre-memory CPU initialization (CPU module specific)
15	Pre-memory North Bridge initialization is started
16	Pre-Memory North Bridge initialization (North Bridge module specific)
17	Pre-Memory North Bridge initialization (North Bridge module specific)
18	Pre-Memory North Bridge initialization (North Bridge module specific)
19	Pre-memory South Bridge initialization is started
1A	Pre-memory South Bridge initialization (South Bridge module specific)
1B	Pre-memory South Bridge initialization (South Bridge module specific)
1C	Pre-memory South Bridge initialization (South Bridge module specific)
1D – 2A	OEM pre-memory initialization codes
2B	Memory initialization. Serial Presence Detect (SPD) data reading
2C	Memory initialization. Memory presence detection
2D	Memory initialization. Programming memory timing information
2E	Memory initialization. Configuring memory
2F	Memory initialization (other).
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32	CPU post-memory initialization is started
33	CPU post-memory initialization. Cache initialization
34	CPU post-memory initialization. Application Processor(s) (AP) initialization
35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
36	CPU post-memory initialization. System Management Mode (SMM) initialization
37	Post-Memory North Bridge initialization is started
38	Post-Memory North Bridge initialization (North Bridge module specific)
39	Post-Memory North Bridge initialization (North Bridge module specific)
3A	Post-Memory North Bridge initialization (North Bridge module specific)

3B	Post-Memory South Bridge initialization is started
3C	Post-Memory South Bridge initialization (South Bridge module specific)
3D	Post-Memory South Bridge initialization (South Bridge module specific)
3E	Post-Memory South Bridge initialization (South Bridge module specific)
3F-4E	OEM post memory initialization codes
4F	DXE IPL is started
PEI Error Codes	
50	Memory initialization error. Invalid memory type or incompatible memory speed
51	Memory initialization error. SPD reading has failed
52	Memory initialization error. Invalid memory size or memory modules do not match.
53	Memory initialization error. No usable memory detected
54	Unspecified memory initialization error.
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	reset PPI is not available
5C-5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4-E7	Reserved for future AMI progress codes
S3 Resume Error Codes	
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC-EF	Reserved for future AMI error codes
Recovery Progress Codes	
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress codes
Recovery Error Codes	
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes

♦ DXE Phase

Status Code	Description
60	DXE Core is started
61	NVRAM initialization
62	Installation of the South Bridge Runtime Services
63	CPU DXE initialization is started
64	CPU DXE initialization (CPU module specific)
65	CPU DXE initialization (CPU module specific)
66	CPU DXE initialization (CPU module specific)
67	CPU DXE initialization (CPU module specific)
68	PCI host bridge initialization
69	North Bridge DXE initialization is started
6A	North Bridge DXE SMM initialization is started
6B	North Bridge DXE initialization (North Bridge module specific)
6C	North Bridge DXE initialization (North Bridge module specific)
6D	North Bridge DXE initialization (North Bridge module specific)
6E	North Bridge DXE initialization (North Bridge module specific)
6F	North Bridge DXE initialization (North Bridge module specific)
70	South Bridge DXE initialization is started
71	South Bridge DXE SMM initialization is started
72	South Bridge devices initialization
73	South Bridge DXE Initialization (South Bridge module specific)
74	South Bridge DXE Initialization (South Bridge module specific)
75	South Bridge DXE Initialization (South Bridge module specific)
76	South Bridge DXE Initialization (South Bridge module specific)
77	South Bridge DXE Initialization (South Bridge module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes
80 – 8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes

A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8 – BF	Reserved for future AMI codes
C0 – CF	OEM BDS initialization codes
DXE Error Codes	
D0	CPU initialization error
D1	North Bridge initialization error
D2	South Bridge initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (Load Image returned error)
DA	Boot Option is failed (Start Image returned error)
DB	Flash update is failed
DC	Reset protocol is not available