Maximus IV Extreme-Z

Motherboard

E6715

Second Edition
July 2011

Contents

Contents

Contents

Contents

Notices

Federal Communications Commission Statement

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

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

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

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

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

FCC Radio Frequency (RF) Exposure Caution Statement

> Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. "The manufacture declares that this device is limited to Channels 1 through 11 in the 2.4GHz frequency by specified firmware controlled in the USA."

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with FCC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting. End users must follow the specific operating instructions for satisfying RF exposure compliance.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Declaration of Conformity (R&TTE directive 1999/5/EC)

The following items were completed and are considered relevant and sufficient:

- Essential requirements as in [Article 3]
- Protection requirements for health and safety as in [Article 3.1a]
- Testing for electric safety according to [EN 60950]
- Protection requirements for electromagnetic compatibility in [Article 3.1b]
- Testing for electromagnetic compatibility in [EN 301 489-1] & [EN 301 489-17]
- Effective use of the radio spectrum as in [Article 3.2]
- Radio test suites according to [EN 300 328-2]

CE Marking

C E

CE marking for devices without wireless LAN/Bluetooth

The shipped version of this device complies with the requirements of the EEC directives 2004/108/EC "Electromagnetic compatibility" and 2006/95/EC "Low voltage directive".

C E ①

CE marking for devices with wireless LAN/ Bluetooth

This equipment complies with the requirements of Directive 1999/5/EC of the European Parliament and Commission from 9 March, 1999 governing Radio and Telecommunications Equipment and mutual recognition of conformity.

Wireless Operation Channel for Different Domains

N. America 2.412-2.462 GHz Ch01 through CH11

Japan 2.412-2.484 GHz Ch01 through Ch14

Europe ETSI 2.412-2.472 GHz Ch01 through Ch13

France Restricted Wireless Frequency Bands

Some areas of France have a restricted frequency band. The worst case maximum authorized power indoors are:

- 10mW for the entire 2.4 GHz band (2400 MHz–2483.5 MHz)
- 100mW for frequencies between 2446.5 MHz and 2483.5 MHz

> Channels 10 through 13 inclusive operate in the band 2446.6 MHz to 2483.5 MHz.

There are few possibilities for outdoor use: On private property or on the private property of public persons, use is subject to a preliminary authorization procedure by the Ministry of Defense, with maximum authorized power of 100mW in the 2446.5–2483.5 MHz band. Use outdoors on public property is not permitted.

In the departments listed below, for the entire 2.4 GHz band:

- Maximum authorized power indoors is 100mW
- Maximum authorized power outdoors is 10mW

Departments in which the use of the 2400–2483.5 MHz band is permitted with an EIRP of less than 100mW indoors and less than 10mW outdoors:

01 Ain	02 Aisne	03 Allier	05 Hautes Alpes
08 Ardennes	09 Ariège	11 Aude	12 Aveyron
16 Charente	24 Dordogne	25 Doubs	26 Drôme
32 Gers	36 Indre	37 Indre et Loire	41 Loir et Cher
45 Loiret	50 Manche	55 Meuse	58 Nièvre
59 Nord	60 Oise	61 Orne	63 Puy du Dôme
64 Pyrénées Atlantique		66 Pyrénées Orientales	
67 Bas Rhin	68 Haut Rhin	70 Haute Saône	71 Saône et Loire
75 Paris	82 Tarn et Garonne		84 Vaucluse
88 Vosges	89 Yonne	90 Territoire de Belfort	
94 Val de Marne			

This requirement is likely to change over time, allowing you to use your wireless LAN card in more areas within France. Please check with ART for the latest information (www.arcep.fr)

> Your WLAN Card transmits less than 100mW, but more than 10mW.

Canadian Department of Communications Statement

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

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

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

IC Radiation Exposure Statement for Canada

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with IC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Operation is subject to the following two conditions:

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

To prevent radio interference to the licensed service (i.e. co-channel Mobile Satellite systems) this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

> The user is cautioned that this device should be used only as specified within this manual to meet RF exposure requirements. Use of this device in a manner inconsistent with this manual could lead to excessive RF exposure conditions.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/CANADA.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.
- The optical S/PDIF is an optional component (may or may not be included in your motherboard) and is defined as a CLASS 1 LASER PRODUCT.

INVISIBLE LASER RADIATION, AVOID EXPOSURE TO BEAM.

- Never dispose of the battery in fire. It could explode and release harmful substances into the environment.
- Never dispose of the battery with your regular household waste. Take it to a hazardous material collection point.
- Never replace the battery with an incorrect battery type.

- RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
- DISPOSE OF USED BATTERIES ACCORDING TO THE ABOVE BATTERY-RELATED INSTRUCTIONS.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

⚠️ This motherboard should only be used in environments with ambient temperatures between 5ºC (41ºF) and 40ºC (104ºF).

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

REACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at http://csr.asus.com/english/REACH.htm.

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

About this guide

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

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: BIOS setup**

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

- **Chapter 4: Software support**

  This chapter describes the contents of the support DVD that comes with the motherboard package and the software.

- **Chapter 5: Multiple GPU technology support**

  This chapter describes how to install and configure multiple ATI® CrossFireX™ and NVIDIA® SLI™ graphics cards.

Where to find more information

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

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

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

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

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

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

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

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl+Alt+D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.
	Example: At the DOS prompt, type the command line:
	afudos /iM4E.ROM

Maximus IV Extreme-Z specifications summary

CPU	LGA1155 socket for Intel® 2nd Generation Core™ i7 / Core™ i5 / Core™ i3 **Processors** Supports 32nm CPU Supports Intel® Turbo Boost Technology 2.0 * The Intel® Turbo Boost Technology 2.0 support depends on the CPU types. ** Refer to www.asus.com for Intel CPU support list
Chipset	Intel® Z68 Express Chipset
Memory	4 x DIMM, max. 32GB*, DDR3 2200(O.C.)/ 2133(O.C.)/ 1866(O.C.)/ 1600/ 1333/ 1066 MHz, non-ECC, un-buffered memory Dual channel memory architecture Supports Intel® Extreme Memory Profile (XMP) * The max. 32GB memory capacity can be supported with DIMMs of 8GB (or above). ASUS will update QVL once the DIMMs are available on the market. ** Hyper DIMM support is subject to the physical characteristics of individual CPUs. Some hyper DIMMs only support one DIMM per channel. Please refer to Memory QVL for details. *** Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors Lists)
Expansion Slots	4 x PCIe2.0 x16 slots (single @x16, dual @x8, triple @x8, x16, x16) 1 x PCIe2.0 x4 1 x PCIe2.0 x1
Multi-GPU Technology	Support NVIDIA® 3-way SLI™ with NF200 / ATI CrossFireX™ Technology Support LucidLogix® Virtu™ Technology* (d-mode) * LucidLogix® Virtu™ supports Windows® 7 operating systems.
Storage	**Intel® Z68 Express Chipset built-in:** - 2 x SATA 6Gb/s ports (Red) - 4 x SATA 3Gb/s ports (Gray) - Intel® Rapid Storage Technology supports SATA RAID 0, 1, 5, and 10 - Supports Intel® Smart Response Technology* on 2nd generation Intel® Core™ processor family * Intel® Smart Response Technology supports Windows® 7/ Vista operating systems. **Marvell® 9182 controller:** - 2 x SATA 6Gb/s ports (Red) **JMicron® 362 controller:** - 2 x External SATA 3Gb/s ports at rear (SATA On-the-Go) * These SATA ports are for hard drivers only. ATAPI devices are not supported.

Maximus IV Extreme-Z specifications summary

LAN	2 x Intel® Gigabit LAN

High Definition Audio	RealteK ALC889 8-channel High Definition Audio CODEC
	  - Blu-ray audio layer Content Protection
	  - Supports Jack-Detection, Multi-streaming, Front Panel Jack-Retasking
	  - Supports 1 x Optical S/PDIF out port at back I/O

Bluetooth Module Accessory Card	Bluetooth V2.0/V2.1+EDR RC Bluetooth On/Off Switch

USB	**1 x NEC USB3.0 Controller with 2 x VIA SuperSpeed USB hub controllers:**
	  - 6 x USB 3.0 ports at rear
	  - 2 x USB 3.0 ports at mid-board for front panel support
	1 x NEC USB3.0 Controller:
	  - 2 x USB 3.0 ports at rear
	Intel® Z68 Express Chipset:
	  - 9 x USB 2.0 ports (8 ports at mid-board, 1 port at rear is also for ROG connect)

ROG Exclusive Overclocking Features	ROG Connect
	RC Bluetooth
	ROG iDirect
	Mem TweakIt
	ROG Extreme Engine Digi+
	  - 8-phase CPU power + 4-phase iGPU Power
	  - 3-phase Memory power
	  - ML Cap on CPU only
	USB BIOS Flashback
	BIOS Flashback with onboard switch button
	ProbeIt
	Extreme Tweaker
	iROG
	Loadline Calibration
	ROG OC Kit
	  - LN2 Mode
	  - PCIe x16 Lane Switch
	  - Debug LED
	  - Q_Reset
	EFI BIOS features
	  - ROG BIOS Print
	  - GPU DIMM Post
	  - CPU Socket Monitor
	Intelligent overclocking tools:
	  - ASUS TurboV Evo
	  - O.C Profile
	Overclocking Protection:
	  - COP EX (Component Overheat Protection - EX)
	  - Voltiminder LED
	  - ASUS C.P.R.(CPU Parameter Recall)

Maximus IV Extreme-Z specifications summary

Other Special Features	CPU Level Up MemOK! Onboard Switches: Power / Reset / Clr CMOS (at rear) Q-Fan Plus ASUS Fan Xpert ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) ASUS Q-Connector ASUS Q-Shield ASUS Q-Slot ASUS Q-DIMM ASUS EZ Flash 2 ASUS CrashFree BIOS 3 ASUS MyLogo 2
Back Panel I/O Ports	1 x PS/2 Keyboard/Mouse port 2 x External SATA ports 2 x LAN (RJ45) ports 8 x USB 3.0/2.0 ports 1 x USB 2.0/1.1 ports (also for ROG Connect) 1 x S/PDIF Out (Optical) 8-channel Audio I/O 1 x ROG Connect On/Off switch 1 x RC Bluetooth switch 1 x Clr CMOS switch
Internal I/O Connectors	1 x USB 3.0 connector(Red) supports additional 2 USB 3.0 ports 4 x USB 2.0 connectors support additional 8 USB 2.0 ports 8 x SATA connectors: 4 x SATA 6Gb/s connectors (Red) & 4 x SATA 3Gb/s connectors (Gray) 8 x Fan connectors: 1 x CPU / 1 x PWR / 3 x Chassis / 3 x Optional 8 x ProbeIt measurement points 3 x Thermal sensor connectors 1 x SPDIF_out connector 1 x En/Dis-able Clr CMOS header 1 x 24-pin ATX power connector 1 x 8-pin ATX 12V power connector 2 x EZ Plug connectors (4-pin Molex Power connectors) 1 x RC Bluetooth header 1 x LN2 Mode switch 1 x Q_Reset switch 1 x Power on switch 1 x Reset switch 1 x Go Button 1 x BIOS switch button 1 x ROG light connector 1 x Audio front panel connector System panel connector

Maximus IV Extreme-Z specifications summary

BIOS Features	64Mb Flash ROM, EFI AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.5, ACPI2.0a Multi-Language BIOS
Manageability	WfM2.0, DMI2.0, WOL by PME, WOR by PME, PXE
Software	**Support DVD:** - Drivers and applications * ASUS AI Suite II * ROG CPU-Z * 3DMark Vantage * ROG Mem TweakIt Utility * DAEMON Tools Pro Standard * Kaspersky® Anti-Virus 1-year license
Form Factor	Extended ATX Form Factor, 12"x 10.6" (30.5cm x 26.9cm)

*Specifications are subject to change without notice.

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

Product introduction

Chapter summary

1

1.1   Welcome!

Thank you for buying an ROG Maximus IV Extreme-Z motherboard!

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

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

1.2   Package contents

Check your motherboard package for the following items.

Motherboard	ROG Maximus IV Extreme-Z
Cables	**1 x ROG Connect cable** 1 x ProbeIt cable set 1 x CrossFire Cable 1 x SLI Cable 1 x 2-port USB 2.0 module 2 x 2-in-1 SATA 3Gb/s signal cables 2 x 2-in-1 SATA 6Gb/s signal cables
Accessories	**1 x 2 in 1 ASUS Q-Connector Kit** 1 x 3-Way SLI bridge 1 x I/O Shield 1 x Thermal Sensor Cable Pack 1 x Cable Ties Pack 1 x ROG Theme Label 1 x 12-in-1 ROG Cable Label 1 x RC Bluetooth card
Application DVD	ROG motherboard support DVD
Documentation	User guide ROG exclusive feature guide

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

1.3   Special features

1.3.1   Product highlights

Republic of Gamers

The Republic of Gamers consists only the best of the best. We offer the best hardware engineering, the fastest performance, the most innovating ideas, and we welcome the best gamers to join in. In the Republic of Gamers, mercy rules are only for the weak, and bragging rights means everything. We believe in making statements and we excel in competitions. If your character matches our trait, then join the elite club, make your presence felt, in the Republic of Gamers.

Green ASUS

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products/packaging to safeguard consumers' health while minimizing the impact on the environment.

LGA1155 socket for Intel® Second Generation Core™ i7 / Core™ i5 / Core™ i3 Processors

This motherboard supports the Intel® second generation Core™ i7 / Core™ i5 / Core™ i3 processors in LGA1155 package with memory and PCI Express controllers integrated to support 2-channel (4 DIMMs) DDR3 memory and 16 PCI Express 2.0 lanes. This provides great graphics performance. Intel® second generation Core™ i7 / Core™ i5 / Core™ i3 processors are among the most powerful and energy efficient CPUs in the world.

Intel® Z68 Express Chipset

The Intel® Z68 Express Chipset is a single-chipset design to support socket 1155 Intel® second generation Core™ i7/Core™ i5/Core™ i3 processors. It provides improved performance by utilizing serial point-to-point links, allowing increased bandwidth and stability. Additionally, Z68 chipset provides 2 SATA 6Gb/s and 4 SATA 3Gb/s ports for faster data retrieval at double the bandwidth of current bus systems. Moreover, Intel® Z68 Express Chipset also supports iGPU function, letting users enjoy the latest Intel integrated graphic performance.

Intel® Smart Response Technology

Faster Access, Bigger Storage

Intel® Smart Response Technology boosts overall system performance. It uses an installed fast SSD (min 18.6GB available) as a cache for frequently accessed operations, speeding up hard drive/main memory interaction. Key benefits are expedited hard drive speeds, reduced load and wait times and maximized storage utilization. Power consumption also goes down by reducing unnecessary hard drive spin, an important part of Green ASUS eco-friendly computing.

LucidLogix® Virtu™

Enjoy both onboard graphics and discrete GPU performance with LucidLogix® Virtu™!

LucidLogix® Virtu™ is a next generation GPU virtualization software that blurs the line between embedded graphics and discrete GPU for increased graphics performance. When you plug a video connector directly to the discrete GPU, LucidLogix® Virtu™ enables utilization of both the discrete and integreted onboard GPU for improved performance. Users with 2nd Intel® Core™ processor featuring Intel® Quick Sync are able to enjoy an all-inclusive media platformfor better video transcoding while also enjoying high-end DirectX® 11 3D, anti-aliasing and performance features from their discrete graphics card to experience the best in game visuals.

Dual-Channel DDR3 2200(O.C.) / 2133(O.C.) / 1866(O.C.) / 1600 / 1333 / 1066 Support

The motherboard supports DDR3 memory that features data transfer rates of 2200(O.C.) / 2133(O.C.) / 1866(O.C.) / 1600 / 1333 / 1066 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR3 architecture enlarges the bandwidth of your system memory to boost system performance. Refer to page 2-5 for details.

* Due to CPU behavior, DDR3 2200/2000/1800 MHz memory module will run at DDR3 2133/2133/1866/1600 MHz frequency as default.

PCIe 2.0

Double Speed; Double Bandwidth
This motherboard supports the latest PCIe 2.0 devices for double speed and bandwidth which enhances system performance.

SLI/CrossFireX On-Demand

Why choose when you can have both?

SLI or CrossFireX? Fret no longer because with the ROG Maximus IV Extreme-Z, you'll be able to run both multi-GPU setups. The board features SLI/CrossFireX on Demand technology, supporting SLI or CrossFireX configuration. Whichever path you take, you can be assured of jaw-dropping graphics at a level previously unseen.

1.3.2   ROG Intelligent Performance & Overclocking features

Mem TweakIt

Dynamic timing adjustments, DRAM efficiency gauge

When changing DRAM settings in BIOS, it always takes time for the system to reboot. Worry no more! With Mem TweakIt, you can do DRAM tuning in real-time, view your DRAM efficiency score, and upload and share your ranking online.

ROG Connect

Plug and Overclock - Tweak it the hardcore way!

Monitor the status of your desktop PC and tweak its parameters in real-time via a notebook—just like a race car engineer—with ROG Connect. ROG Connect links your main system to a notebook through a USB cable, allowing you to view real-time POST code and hardware status readouts on your notebook, as well as make on-the-fly parameter adjustments at a purely hardware level. Diagram, power, reset button, flash BIOS through notebook.

ROG iDirect

Tune our PC from your iPhone or iPad now!

Still overclocking your PC the old-fashioned way? Let ROG iDirect bring you a whole new tweaking experience right on your iPhone or iPad! Thanks to the Bluetooth card that comes with select ASUS ROG motherboards, you can monitor your PC and tweak parameters such voltages and frequencies in real time wirelessly from your iPhone or iPad!

RC Bluetooth

Smashes all the barriers of conventional overclocking

Still overclocking in old-fashioned way? Let RC Bluetooth bring you the whole new idea of how to do! Just simply push the button from the Back IO on the RC Bluetooth card, overclockers can real-time monitor the desktop PC system status & tweak its parameters - such as voltages and frequency on the fly. When users want to use oridinary bluetooth functions, just simply push the button once again & enjoy all the wireless convenience brought from RC Bluetooth.

USB BIOS FlashBack

Refresh the BIOS can never be that easy

USB BIOS Flashback must be the most convenient way to flash BIOS ever! It allows overclockers to try their BIOS with the simplist way one can imagine. No need to enter the BIOS or the operating system, just plug the thumb drive into the ROG Connect port & push the ROG Connect button for 2 seconds, BIOS would be automatically flashed under standby power. It's no doubt that USB BIOS Flashback gives overclockers the ultimate convenience!

BIOS Flashback

Two BIOS ROM. Two BIOS settings. Twice the overclocking flexibility.

Overclocker's prayer to have BIOS flexibility is answered! With the new BIOS Flashback, PC enthusiasts can overclock with even more confidence. BIOS Flashback gives overclockers the ability to save two versions of the BIOS simultaneously. Very much like the "SaveGame" function, one BIOS can be used for the overclocking adventure, while the other BIOS is to be stored with any previous version. BIOS Flashback brings the ultimate convenience to overclockers! By pushing BIOS button, overclockers can easily choose which BIOS ROM they want to save & boot from.

iROG

Intelligent multiple control at hand

The iROG is a special IC which enables several ROG highlighted functions that gives users full disposal of the motherboard at any stage! This design allows advanced user control and management to be processed purely at a hardware level. iROG greatly increases fun during overclocking for PC enthusiasts and it offers system maintenance and management with more control and efficiency.

Probelt

Get all hands-on with hardware-based overclocking

Probelt takes the guesswork out of locating the motherboard's measurement points, identifying them clearly in the form of 8 sets of detection points so you'll know exactly where to get quick yet accurate readings using a multitester.

Extreme Tweaker

One stop performance tuning shop

Extreme Tweakers is the one stop shop to fine-tune your system to optimal performance. No matter if you're looking for frequency adjustment, over-voltage options, or memory timing settings, they're all here!

Loadline Calibration

Optimal power boost for extreme CPU overclocking!

Maintaining ample voltage support for the CPU is critical during overclocking. The Loadline Calibration ensures stable and optimal CPU voltage under heavy loading. It helps overclockers enjoy the motherboard's ultimate OC capabilities and benchmark scores.

Voltiminder LED

Friendly reminder on Voltage Settings

In the pursuit of extreme performance, overvoltage adjustment is critical but risky. Acting as the "red zone" of a tachometer, the Voltiminder LED displays the voltage status for CPU, PCH, and Memory in a intuitive color-coded fashion. The voltiminder LED allows quick voltage monitoring for overclockers.

ROG CPU-Z

Whole new design of CPU-Z

ROG CPU-Z is a customized ROG version authorized by CPUID. It has the same functionality and credibility as the original version, with a unique design. Use the whole new look of ROG CPU-Z to truly report your CPU related information and your uniqueness.

BIOS Print

One click, easily share your BIOS settings
ROG offers a whole new EFT BIOS feature to handle the demands of an overclocking experience. Maximus IV Extreme-Z features ROG BIOS Print which allows users to easily share their BIOS settings to others with the press of a button. The days of using a camera to take BIOS screenshot are over.

GPU.DIMM Post

Easily check, just enter the BIOS!
Never want your graphics or DRAM card to not be detected? Just enter the BIOS to find out. This helps you quickly analyze the problem in order to easily fix before attempting an overclock. Remove your doubts and have control over all components. Overclcoking has never been this easy.

1.3.3 ROG unique features

CPU Level Up

A simple click for instant upgrade!
Ever wish that you could have a more expansive CPU? Upgrade your CPU at no additional cost with ROG's CPU Level Up! Simply pick the processor you wanted to OC to, and the motherboard will do the rest! See the new CPU speed and enjoy that performance instantly. Overclocking is never as easy as this.

MemOK!

Any memory is A-OK!

Memory compatibility is among the top concerns when it comes to computer upgrades. Worry no more, MemOK! is the fastest memory booting solution today. This remarkable memory rescue tool requires nothing but a push of a button to patch memory issues and get your system up and running in no time. The technology is able to determine failsafe settings that can dramatically improve system booting success.

Q-Fan Plus

Optimized quietness and cooling for more devices

The Q-Fan function automatically detects temperature and adjusts fan speed accordingly to achieve quiet and efficient cooling. With Q-Fan Plus, special temperature sensor cable is provided to detect temperature on any device. When used with a optional fans, you may activate Q-Fan function on up to 3 additional devices of your choice!

COP EX

Maximum OC with confidence with burn proof protection to chipsets and CPU!
The COP EX allows overclockers to increase chipset voltage without the worries of overheating. It can also be used to monitor and save an overheating CPU. The COP EX allows more freedom and less constraint for maximum performance achievement.

Onboard Switches

No more shorting pins or moving jumpers
With an easy press during overclock, this exclusive onboard switch allows gamer to effortlessly fine-tune the performance without having to short the pins or moving jumpers!

ASUS Q-Connector

Make connections quick and accurate

The Q-Connector allows you to connect or disconnect chassis front panel cables in one easy step with one complete module. This unique adapter eliminates the trouble of plugging in one cable at a time, making connection quick and accurate.

1.3.4   ASUS special features

ASUS TurboV EVO
The Ultimate O.C. Processor

The ultimate O.C. processor satisfies every level of overclockers—from die-hard enthusiasts to beginners. Auto tuning intelligently pushes the system to the fastest clock speeds while maintaining stability. Turbo Key boosts performance with just one touch; while TurboV offers more options to advanced overclockers to achieve world O.C. record. Moreover, upgrade your CPU at no additional cost with CPU Level UP!

USB 3.0 Support
10X Faster Date Rates!

Experience ultra-fast data transfers at 4.8Gbps with USB 3.0—the latest connectivity standard. Built to connect easily with next generation components and peripherals, USB 3.0 transfers data 10X faster and is also backward compatible with USB 2.0 components.

SATA 6Gb/s Support
Experience the Future of Storage!

Supporting next-generation Serial ATA (SATA) storage interface, this motherboard delivers up to 6.0Gb/s data transfer rates. Additionally, get enhanced scalability, faster data retrieval, double the bandwidth of current bus systems.

O.C. Profile
Conveniently store or load multiple BIOS settings

Freely share and distribute favorite overclocking settings The motherboard features the ASUS O.C. Profile that allows users to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving users freedom to share and distribute their favorite overclocking settings.

Q-Shield

Easy and Comfortable Installations

The specially designed ASUS Q-Shield does without the usual ""fingers"" - making it convenient and easy to install. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electronic Magnetic Interference (EMI).

EZ Flash2

Simply update BIOS from a USB flash disk before entering the OS

EZ Flash 2 is a user-friendly BIOS update utility. Simply launch this tool and update BIOS from a USB flash disk before entering the OS. You can update your BIOS only in a few clicks without preparing an additional floppy diskette or using an OS-based flash utility.

SATA on the Go

The motherboard supports the next-generation hard drives based on the Serial ATA (SATA) 3Gb/s storage specification, delivering enhanced scalability and doubling the bus bandwidth for high-speed data retrieval and saves. The external SATA port located at the back I/O provides smart setup and hot-plug functions. Easily backup photos, videos and other entertainment contents on external devices.

3DMark® Vantage Advanced Edition

The Gamers' Benchmark

3DMarkVantage is the new industry standard PC gaming performance benchmark from Futuremark, newly designed for Windows Vista and DirectX10. It includes two new graphics tests, two new CPU tests, several new feature tests, and support for the latest hardware. 3DMark® Vantage is based on a completely new rendering engine, developed specifically to take full advantage of DirectX10, the new graphics API from Microsoft

Kaspersky® Anti-Virus

The best protection from viruses and spyware

Kaspersky® Anti-Virus Personal offers premium antivirus protection for individual users and home offices. It is based on advanced antivirus technologies. The product incorporates the Kaspersky® Anti-Virus engine, which is renowned for malicious program detection rates that are among the industry's highest.

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

Hardware information

2

Chapter summary

2

2.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.

- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

2.2 Motherboard overview

2.2.1 Motherboard layout
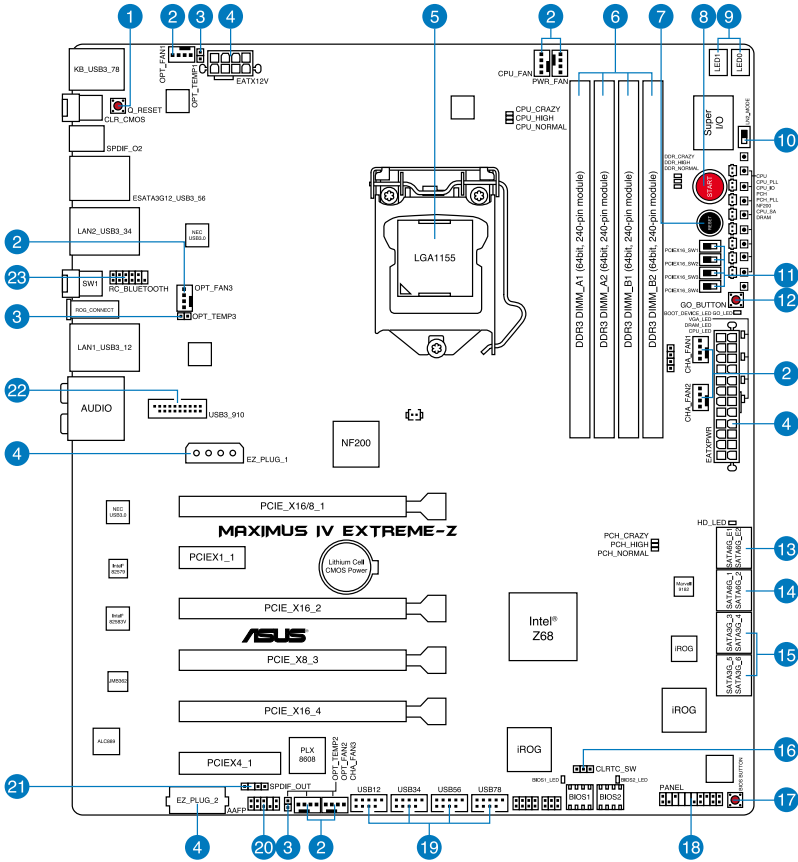
Refer to **2.3.10 Connectors** for more information about rear panel connectors and internal connectors.

2.2.2   Layout contents

Connectors/Jumpers/Switches/Slots	Page
1.	Q-Reset Switch	2-19
2.	CPU, chassis, and power fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN1-3, 4-pin PWR_FAN)	2-35
3.	Thermal sensor cable connectors (2-pin OPT_TEMP1–3)	2-36
4.	Power connectors (24-pin EATXPWR, 8-pin EATX12V, 4-pin EZ_PLUG)	2-38
5.	LGA1155 CPU Socket	2-4
6.	DDR3 DIMM slots	2-5
7.	Reset Switch	2-16
8.	Start Switch	2-16
9.	Debug LEDs	2-24
10.	LN2 switch	2-18
11.	PCIe x16 Lane switch	2-18
12.	GO button	2-17
13.	Marvell® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_E1/E2 [red])	2-32
14.	Intel® Z68 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1/2 [red])	2-30
15.	Intel® Z68 Serial ATA 3.0 Gb/s connectors (7-pin SATA3G_3–6 [gray])	2-31
16.	Clear RTC RAM (3-pin CLRTC_SW)	2-29
17.	BIOS switch	2-17
18.	System panel connector (20-8 pin PANEL)	2-39
19.	USB 2.0 connectors (10-1 pin USB12; USB34; USB56; USB78)	2-33
20.	Front panel audio connector (10-1 pin AAFP)	2-37
21.	Digital audio connector (4-1 pin SPDIF_OUT)	2-34
22.	USB 3.0 connector (USB3_910)	2-34
23.	RC Bluetooth connector (RC_BLUETOOTH)	2-52

2.2.3   Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1155 socket designed for the Intel® 2nd Generation Core™ i7 / Core™ i5 / Core™ i3 Processors.
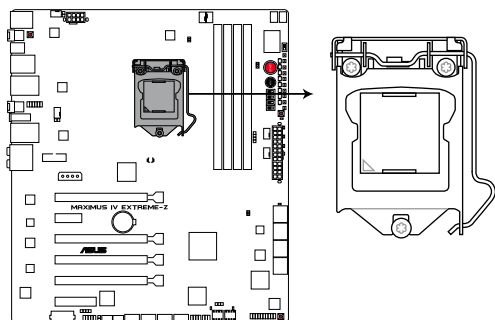
MAXIMUS IV EXTREME-Z CPU LGA1155

Ensure that all power cables are unplugged before installing the CPU.

- The LGA1156 CPU is incompatible with the LGA1155 socket. DO NOT install a LGA1156 CPU on the LGA1155 socket.

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.

- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1155 socket.

- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/ incorrect removal of the PnP cap.

2.2.4 System memory

The motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) slots.

A DDR3 module is notched differently from a DDR or DDR2 module. DO NOT install a DDR or DDR2 memory module to the DDR3 slot.
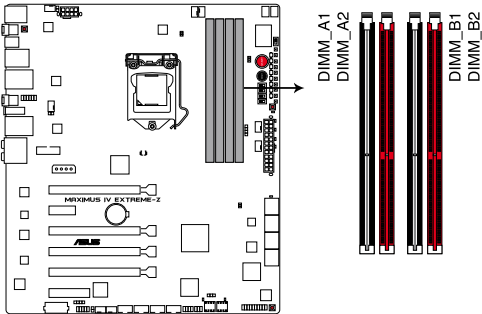
MAXIMUS IV EXTREME-Z 240-pin DDR3 DIMM sockets

Recommended memory configurations
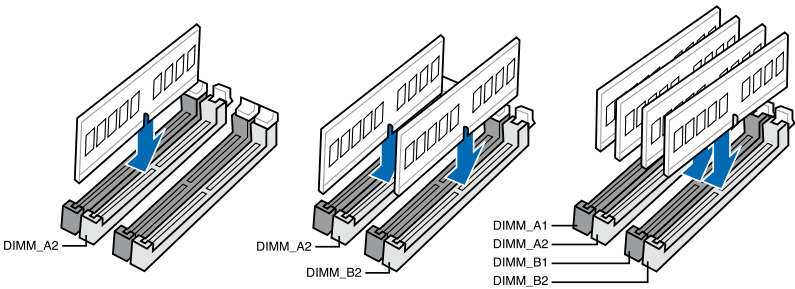
Memory configurations

You may install 1GB, 2GB and 4GB unbuffered and non-ECC DDR3 DIMMs into the DIMM sockets.

- • You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- • Due to CPU behavior, DDR3 2333/2250/2200/2000/1800 MHz memory module will run at DDR3 2133/2133/2133/1866/1600 MHz frequency as default.

- • The max. 32GB memory capacity can be supported with DIMMs of 8GB (or above). ASUS will update QVL once the DIMMs are available on the market.

- • According to Intel CPU spec, DIMM voltage below 1.65V is recommended to protect the CPU.

- • Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.

- • Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS.
  - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard.
    For more details, refer to the Microsoft® support site at http://support.microsoft.com/kb/929605/en-us.

- • This motherboard does not support DIMMs made up of 512Mb (64MB) chips or less (Memory chip capacity counts in Megabit, 8 Megabit/Mb = 1 Megabyte/MB).

- • The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, refer to section **3.4 Ai Tweaker menu** for manual memory frequency adjustment.

- • For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-2333MHz capability

Vendors	Part No.	Size	SS/DS	Voltage	DIMM socket support (Optional)		
					1 DIMM	2 DIMM	4 DIMM
KINGSTON	KHX2333C9D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	1.65	•	•	

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-2250MHz capability

Vendors	Part No.	Size	SS/DS	Voltage	DIMM socket support (Optional)		
					1 DIMM	2 DIMM	4 DIMM
KINGSTON	KHX2250C9D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	1.65	•	•	

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-2200MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Timing	Voltage	DIMM socket support (Optional)		
							1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-17600CL7D-4GBFLS(XMP)	4G (2x 2G)	DS	-	7-10-10-28	1.65	•	•	
G.SKILL	F3-17600CL8D-4GBPS(XMP)	4GB(2 x 2GB)	DS	-	8-8-8-24	1.65	•		
G.SKILL	F3-17600CL9D-4GBTDS(XMP)	4GB(2 x 2GB)	DS	-	9-9-9-24	1.65	•		
KINGMAX	FLKE85F-B8KJAA-FEIS(XMP)	4GB (2x 2GB)	DS	Kingmax	-	-	•		

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-2133MHz capability

Vendors	Part No.	Size	SS/DS	Timing	Voltage	DIMM socket support (Optional)		
						1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-17066CL9D-4GBTDS(XMP)	4GB (2x 2GB)	DS	-	1.65	•		
G.SKILL	F3-17066CL8D-4GBPS(XMP)	4GB(2 x 2GB)	DS	8-8-8-24	1.65	•		
G.SKILL	F3-17066CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	9-9-9-24	1.65	•		
G.SKILL	F3-17066CL9T-6GB-T	6GB(3 x 2GB)	DS	9-9-9-24	1.65	•	•	
GEIL	GU34GB2133C9DC(XMP)	4GB(2 x 2GB)	DS	9-9-9-28	1.65	•		
KINGSTON	KHX2133C9AD3W1K2/4GX(XMP)	4GB (2x 2GB)	DS	9	1.65	•		
KINGSTON	KHX2133C8D3T1K2/4GX(XMP)	4GB(2 x 2GB)	DS	8	1.65	•		
Patriot	PVV34G2133C9K(XMP)	4GB (2x 2GB)	DS	9-11-9-27	1.66	•		

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-2000MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
A-DATA	AX3U2000GB2G9-2G(XMP)	2GB	DS	-	-	9-9-9-24	1.55~1.65	•	•	•
Apacer	78.AAGD5.9KD(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-27	-	•	•	•
Crucial	BL12864BE2009.8SFB3(EPP)	1GB	SS	-	-	9-9-9-28	2	•		
G.SKILL	F3-16000CL9D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
G.SKILL	F3-16000CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
G.SKILL	F3-16000CL7T-6GBPS(XMP)	6GB(3 x 2GB)	DS	-	-	7-8-7-20	1.65	•	•	
G.SKILL	F3-16000CL9T-6GBPS(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
G.SKILL	F3-16000CL9T-6GBTD(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.6	•	•	•
G.SKILL	F3-16000CL7Q-8GBFLS(XMP)	8GB(4 x 2GB)	DS	-	-	7-9-7-24	1.65	•	•	
GEIL	GE38GB2000C9QC(XMP)	8GB(4 x 2GB)	DS	-	-	9-9-9-28	1.65	•	•	•
KINGSTON	KHX2000C9AD3T1K3/3GX(XMP)	3GB (3x 1GB)	SS	-	-	-	1.65	•	•	•
KINGSTON	KHX2000C9AD3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•	•
KINGSTON	KHX2000C9AD3W1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•	•
KINGSTON	KHX2000C9D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
KINGSTON	KHX2000C9AD3T1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•	•
KINGSTON	KHX2000C9AD3T1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	-	1.65	•	•	•
KINGSTON	KHX2000C9AD3W1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•	•
OCZ	OCZ3B2000LV6GK	6GB(3 x 2GB)	DS	-	-	7-8-7	1.65	•	•	
OCZ	OCZ3B2000LV6GK	6GB(3 x 2GB)	DS	-	-	7-8-7	1.65	•	•	
Gingle	9CAASS37AZZ01D1	2GB	DS	-	-	9-9-9-24	-	•	•	•
Patriot	PVT36G2000LLK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
Silicon Power	SP002GBLYU200S02(XMP)	2GB	DS	-	-	-	-	•	•	•
Team	TXD32048M2000C9(XMP)	2GB	DS	Team	T3D1288RT-20	9-9-9-24	1.5	•	•	•
Team	TXD32048M2000C9-L(XMP)	2GB	DS	Team	T3D1288LT-20	9-9-9-24	1.5	•	•	•
Team	TXD32048M2000C9-L(XMP)	2GB	DS	Team	T3D1288RT-20	9-9-9-24	1.6	•	•	•

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-1866MHz capability

Vendors	Part No.	Size	SS/DS	Timing	Voltage	DIMM socket support (Optional)		
						1 DIMM	2 DIMM	4 DIMM
A-DATA	AX3U1866PB2G8-DP2(XMP)	2GB	DS	8-8-8-24	1.55~1.75	•	•	
CORSAIR	TR3X6G1866C9DVer4.1(XMP)	6GB(3 x 2GB)	DS	9-9-9-24	1.65		•	
G.SKILL	F3-15000CL9D-4GBRH (XMP)	4GB(2 x 2GB)	DS	9-9-9-24	1.65	•	•	•
G.SKILL	F3-15000CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	9-9-9-24	1.65	•	•	•
KINGSTON	KHX1866C9D3T1K3/6GX(XMP)	6GB(3 x 2GB)	DS	9	1.65	•	•	•
OCZ	OCZ3G1866LV4GK	4GB (2x 2GB)	DS	10-10-10	1.65	•	•	
OCZ	OCZ3P1866C9LV6GK	6GB(3 x 2GB)	DS	9-9-9	1.65	•		•
Super Talent	W1866UX2G8(XMP)	2GB(2 x 1GB)	SS	8-8-8-24	-	•	•	

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-1800MHz capability

Vendors	Part No.	Size	SS/DS	Timing	Voltage	DIMM socket support (Optional)		
						1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-14400CL6D-4GBFLS(XMP)	4GB(2 x 2GB)	DS	6-8-6-24	1.65	•	•	•
G.SKILL	F3-14400CL9D-4GBRL(XMP)	4GB(2 x 2GB)	DS	9-9-9-24	1.6	•	•	•
KINGSTON	KHX1800C9D3T1K3/6GX(XMP)	6GB(3 x 2GB)	DS	-	1.65	•	•	•

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-1600MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1DIMM	2DIMM	4DIMM
A-DATA	AX3U1600GC4G9-2G	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.55~1.75	•	•	
CORSAIR	TR3X3G1600C8DVer2.1(XMP)	3GB(3 x 1GB)	SS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	HX3X12G1600C9(XMP)	12GB (6x 2GB)	DS	-	-	9-9-9-24	1.6	•	•	•
CORSAIR	CMG4GX3M2A1600C6	4GB (2x 2GB)	DS	-	-	6-6-6-18	1.65	•	•	•
CORSAIR	CMD4GX3M2B1600C8	4GB(2x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	•
CORSAIR	CMG4GX3M2A1600C6	4GB(2x 2GB)	DS	-	-	6-6-6-18	1.65	•	•	•
CORSAIR	CMX4GX3M2A1600C8(XMP)	4GB(2x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	CMD4GX3M2A1600C8(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	CMG4GX3M2A1600C7(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.65	•	•	
CORSAIR	CMX4GX3M2A1600C9(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
CORSAIR	CMP6GX3M3A1600C8(XMP)	6GB (3x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	•
CORSAIR	TR3X6G1600C8D	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	TR3X6G1600C9Ver2.1(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
CORSAIR	CMX8GX3M4A1600C9(XMP)	8GB(4 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
Crucial	BL12864BN1608.8FF(XMP)	2GB(2x 1GB)	SS	-	-	8-8-8-24	1.65	•	•	•
Crucial	BL25664BN1608.16FF(XMP)	2GB	DS	-	-	8-8-8-24	1.65	•	•	•
G.SKILL	F3-12800CL9D-4GBNG	4GB(2x 2GB)	SS	-	-	-	1.6	•	•	
G.SKILL	F3-12800CL9D-4GBRL	4GB(2 x 2GB)	SS	-	-	-	1.6	•	•	
G.SKILL	F3-12800CL7D-8GBRH(XMP)	4GB (2x 2GB)	DS	-	-	7-8-7-24	1.6	•	•	•
G.SKILL	F3-12800CL8D-8GBECO(XMP)	4GB (2x 2GB)	DS	-	-	8-8-8-24	1.35	•	•	•
G.SKILL	F3-12800CL9D-8GBRL(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•	•	•
G.SKILL	F3-12800CL7D-4GBECO(XMP)	4GB(2 x 2GB)	DS	-	-	7-8-7-24	-	•	•	•
G.SKILL	F3-12800CL7D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-24	1.65	•	•	•
G.SKILL	F3-12800CL8D-4GBRM(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.6	•	•	•
G.SKILL	F3-12800CL9D-4GBECO(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.35	•	•	•
G.SKILL	F3-12800CL8T-6GBPI(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-21	1.6~1.65	•	•	
G.SKILL	F3-12800CL9T-6GBNQ	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.5-1.6	•	•	
GEIL	GET316GB1600C9QC(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-28	1.6	•	•	•

GEIL	GE34GB1600C9DC(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-28	1.6	•	•	
GEIL	GV34GB1600C8DC(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-28	1.6	•	•	
KINGMAX	FLGD45F-B8MF7(XMP)	1GB	SS	-	-	-	-	•	•	
KINGSTON	KHX1600C7D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
KINGSTON	KHX1600C8D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	8	1.65	•		
KINGSTON	KHX1600C9D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
Kingston	KHX1600C9D3LK2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
KINGSTON	KHX1600C9D3T1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	-	1.65	•	•	
OCZ	OCZ3P1600LV3GK	3GB(3 x 1GB)	SS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3G16004GK	4GB (2x 2GB)	DS	-	-	8-8-8	1.7	•	•	
OCZ	OCZ3BE1600C8LV4GK	4GB(2x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3BE1600C8LV4GK	4GB(2x 2GB)	DS	-	-	8-8-8	1.65	•	•	•
OCZ	OCZ3P1600LV4GK	4GB(2 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3X1600LV4GK(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3FXE1600C7LV6GK	6GB (3x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3FXE1600C7LV6GK	6GB(3 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3X1600LV6GK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8	1.65	•	•	•
Super Talent	WP160UX4G8(XMP)	4GB(2 x 2GB)	DS	-	-	8	-	•	•	
Super Talent	WB160UX6G8(XMP)	6GB(3 x 2GB)	DS	-	-	-	-	•	•	
Asint	SLZ3128M8-EGJ1D(XMP)	2GB	DS	Asint	3128M8-GJ1D	-	-	•	•	•
EK Memory	EKM324L28BP8-I16(XMP)	4GB(2 x 2GB)	DS	-	-	9	-	•	•	•
GoodRam	GR1600D364L9/2G	2GB	DS	GoodRam	GF1008KC-JN	-	-	•	•	
Mushkin	996805(XMP)	4GB (2x 2GB)	DS	-	-	6-8-6-24	1.65	•	•	
Patriot	PGS34G1600LLKA2	4GB (2x 2GB)	DS	-	-	8-8-8-24	1.7	•	•	•
Patriot	PGS34G1600LLKA	4GB(2x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	•
PATRIOT	PGS34G1600LLKA	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	•
Patriot	PVT36G1600LLK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
Team	TXD31024M1600C8-D(XMP)	1GB	SS	Team	T3D1288RT-16	8-8-8-24	1.65	•	•	•
Team	TXD32048M1600C7-L(XMP)	2GB	DS	Team	T3D1288LT-16	7-7-7-24	1.65	•		
Team	TXD32048M1600C8-D(XMP)	2GB	DS	Team	T3D1288RT-16	8-8-8-24	1.65	•	•	•
Team	TXD32048M1600HC8-D(XMP)	2GB	DS	Team	T3D1288RT-16	8-8-8-24	1.65	•	•	•

Maximus IV Extreme-Z Motherboard
Qualified Vendors Lists (QVL) DDR3-1333MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1DIMM	2DIMM	4DIMM
A-DATA	SU3U1333B1G9-B	1GB	SS	Hynix	H5TQ1G83TFR	-	-	•	•	•
A-DATA	SU3U1333B2G9-B	2GB	DS	Hynix	H5TQ1G83TFR	-	-	•	•	•
A-DATA	SU3U1333C4G9-B	4GB	DS	Hynix	H5TQ2G83AFR	-	-	•	•	•
Apacer	78.01GC6.9L0	1GB	SS	Apacer	AM5D5808DEJSBG	9	-	•	•	•
Apacer	78.A1GC6.9L1	2GB	DS	Apacer	AM5D5808FEQSBG	9	-	•	•	•
CORSAIR	CMX8GX3M4A1333C9	8GB(4 x 2GB)	DS	-	-	9-9-9-24	1.5	•	•	•
Crucial	CT12864BA1339.8FF	1GB	SS	MICRON	D9KPT	9	-	•	•	•
Crucial	BL25664BN1337.16FF(XMP)	2GB	DS	-	-	7-7-7-24	1.65	•	•	•
Crucial	CT25664BA1339.16FF	2GB	DS	MICRON	D9KPT	9	-	•	•	•
Crucial	CT25672BA1339.18FF	2GB	DS	MICRON	D9KPT(ECC)	9	-	•	•	•
ELPIDA	EBJ10UE8BDF0-DJ-F	1GB	SS	ELPIDA	J1108BDSE-DJ-F	-	-	•	•	•
ELPIDA	EBJ10UE8EDF0-DJ-F	1GB	SS	ELPIDA	J1108EDSE-DJ-F	-	-	•	•	•
ELPIDA	EBJ21UE8BDF0-DJ-F	2GB	DS	ELPIDA	J1108BDSE-DJ-F	-	-	•	•	•
G.SKILL	F3-10666CL7D-8GBRH(XMP)	4GB (2x 2GB)	DS	-	-	7-7-7-21	1.5	•	•	•
G.SKILL	F3-10666CL9D-8GBRL	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•		
G.SKILL	F3-10666CL7D-4GBPI(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-21	1.5	•	•	•
G.SKILL	F3-10666CL7D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-21	1.5	•	•	•
G.SKILL	F3-10666CL8D-4GBECO(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.35	•	•	
GEIL	GET316GB1333C9QC	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.5	•	•	•
GEIL	GG34GB1333C9DC	4GB (2x 2GB)	DS	GEIL	GL1L128M88BA115FW	9-9-9-24	1.3	•	•	•
GEIL	GB34GB1333C7DC	4GB(2 x 2GB)	DS	GEIL	GL1L128M88BA15FW	7-7-7-24	1.5	•	•	•
GEIL	GG34GB1333C9DC	4GB(2 x 2GB)	DS	GEIL	GL1L128M88BA12N	9-9-9-24	1.3	•	•	•
Hynix	HMT112U6TFR8A-H9	1GB	SS	Hynix	H5TC1G83TFR	-	-	•	•	•
Hynix	HMT325U6BFR8C-H9	2GB	SS	Hynix	H5TQ2G83BFR	-	-	•	•	•
Hynix	HMT125U6BFR8C-H9	2GB	DS	Hynix	H5TQ1G83BFRH9C	9	-	•	•	•
Hynix	HMT125U6TFR8A-H9	2GB	DS	Hynix	H5TC1G83TFR	-	-	•	•	•
Hynix	HMT351U6BFR8C-H9	4GB	DS	Hynix	H5TQ2G83BFR	-	-	•	•	•
KINGMAX	FLFE85F-C8KM9	2GB	SS	Kingmax	KFC8FNMXF-BXX-15A	-	-	•	•	•
KINGMAX	FLFE85F-B8KL9	2GB	DS	KINGMAX	KFB8FNLXL-BNF-15A	-	-	•	•	•
KINGMAX	FLFF65F-C8KM9	4GB	DS	Kingmax	KFC8FNMXF-BXX-15A	-	-	•	•	•
Kingston	KVR1333D3N9/1G	1GB	SS	Elpida	J1108BDSE-DJ-F	9	1.5	•	•	•
Kingston	KVR1333D3N9/2G	2GB	DS	Kingston	D1288JPNDPLD9U	9	1.5	•	•	•
MICRON	MT4JTF12864AZ-1G4D1	1GB	SS	Micron	D9LGQ	-	-	•	•	•
MICRON	MT8JTF12864AZ-1G4F1	1GB	SS	MICRON	D9KPT	9	-	•	•	•
MICRON	MT8JTF25664AZ-1G4D1	2GB	SS	Micron	D9LGK	-	-	•	•	•
MICRON	MT16JF25664AZ-1G4F1	2GB	DS	MICRON	D9KPT	9	-	•	•	•
MICRON	MT16JTF51264AZ-1G4D1	4GB	DS	Micron	D9LGK	-	-	•	•	•

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage			
OCZ	OCZ3G1333LV3GK	3GB(3 x 1GB)	SS	-	-	9-9-9	1.65	•		
OCZ	OCZ3P1333LV3GK	3GB(3 x 1GB)	SS	-	-	7-7-7	1.65	•	•	•
OCZ	OCZ3G1333ULV4GK	4GB (2x 2GB)	DS	-	-	8-8-8	1.35	•		
OCZ	OCZ3P1333LV4GK	4GB (2x 2GB)	DS	-	-	-	1.65	•		
OCZ	OCZ3RPR13334GK	4GB (2x 2GB)	DS	-	-	6-6-6	1.75	•	•	
OCZ	OCZ3G1333ULV4GK	4GB(2 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3P1333LV4GK	4GB(2 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZX1333LV6GK(XMP)	6GB(3 x 2GB)	DS	NA	-	8-8-8	1.6	•	•	•
OCZ	OCZ3G1333LV8GK	8GB (2x 4GB)	DS	-	-	9-9-9	1.65	•	•	
OCZ	OCZ3RPR1333C9LV8GK	8GB (2x 4GB)	DS	-	-	9-9-9	1.65	•	•	
PSC	AL8F8G73D-DG1	2GB	DS	PSC	A3P1GF3DGF	-	-	•	•	•
SAMSUNG	M378B2873EH1-CH9	1GB	SS	SAMSUNG	K4B1G0846E	-	-	•	•	•
SAMSUNG	M378B2873FHS-CH9	1GB	SS	SAMSUNG	K4B1G0846F	-	-	•	•	•
SAMSUNG	M378B5773DH0-CH9	2GB	SS	Samsung	K4B2G08460	-	-	•	•	•
SAMSUNG	M378B5673FH0-CH9	2GB	DS	SAMSUNG	K4B1G0846F	-	-	•	•	•
SAMSUNG	M378B5273BH1-CH9	4GB	DS	SAMSUNG	K4B2G0846B-HCH9	9	-	•	•	•
SAMSUNG	M378B5273CH0-CH9	4GB	DS	SAMSUNG	K4B2G0846C	K4B2G0846C	-	•	•	•
SAMSUNG	M378B5273DH0-CH9	4GB	DS	Samsung	K4B2G08460	-	-	•	•	•
ACTICA	ACT1GHU64B8F1333S	1GB	SS	Samsung	K4B1G0846F	-	-	•	•	•
ACTICA	ACT1GHU72C8G1333S	1GB	SS	Samsung	K4B1G0846F(ECC)	-	-	•	•	•
ACTICA	ACT2GHU64B8G1333M	2GB	DS	Micron	D9KPT	-	-	•	•	•
ACTICA	ACT2GHU64B8G1333S	2GB	DS	Samsung	K4B1G0846F	-	-	•	•	•
ACTICA	ACT2GHU72D8G1333M	2GB	DS	Micron	D9KPT(ECC)	-	-	•	•	•
ACTICA	ACT2GHU72D8G1333S	2GB	DS	Samsung	K4B1G0846F(ECC)	-	-	•	•	•
ACTICA	ACT4GHU64B8H1333H	4GB	DS	Hynix	H5TQ2G83AFR	-	-	•	•	•
ACTICA	ACT4GHU72D8H1333H	4GB	DS	Hynix	H5TQ2G83AFR(ECC)	-	-	•	•	•
ATP	AQ56M64B8BJH9S	2GB	DS	SAMSUNG	K4B1G0846D	-	-	•	•	•
ATP	AQ56M72E8BJH9S	2GB	DS	SAMSUNG	K4B1G0846D(ECC)	-	-	•	•	•
ATP	AQ12M72E8BKH9S	4GB	DS	SAMSUNG	K4B2G0846B-HCH9(ECC)	-	-	•	•	•
BUFFALO	FSH1333D3G-T3G(XMP)	3GB(3 x 1GB)	SS	-	-	7-7-7-20	-	•	•	•
EK Memory	EKM324L28BP8-I13	4GB(2x 2GB)	DS	-	-	9	-	•	•	•
Elixir	M2F2G64CB88B7N-CG	2GB	SS	Elixir	N2CB2G808N-CG	-	-	•	•	•
Elixir	M2Y2G64CB8HA9N-CG	2GB	DS	-	-	-	-	•	•	•
Elixir	M2Y2G64CB8HC9N-CG	2GB	DS	-	-	-	-	•	•	•
Elixir	M2F4G64CB8HB5N-CG	4GB	DS	Elixir	N2CB2G808N-CG	-	-	•	•	•
GoodRam	GR1333D364L9/2G	2GB	DS	Qimonda	IDSH1G-03A1F1C-13H	-	-	•	•	•
KINGTIGER	F10DA2T1680	2GB	DS	KINGTIGER	KTG1333PS1208NST-C9	-	-	•	•	•
KINGTIGER	KTG2G1333PG3	2GB	DS	-	-	-	-	•	•	•
Patriot	PGS34G1333LLKA	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	•
Patriot	PVS34G1333ELK	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.5	•	•	•
Patriot	PVS34G1333LLK	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	•
PQI	N/A	2GB	DS	PQI	PQC32808E15R	-	-	•	•	•

Silicon Power	SP001GBLTU1333S01	1GB	SS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•
Silicon Power	SP002GBLTU133S02	2GB	DS	S-POWER	I0YT3E0	9	-	•	•	•
Silicon Power	SP001GBLTE133S01	1GB	SS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•
Silicon Power	SP002GBLTE133S01	2GB	DS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•
Team	TXD31024M1333C7(XMP)	1GB	SS	Team	T3D1288LT-13	7-7-7-21	1.75	•	•	•
Team	TXD31048M1333C7-D(XMP)	1GB	SS	Team	T3D1288LT-13	7-7-7-21	1.75	•	•	•
Team	TXD32048M1333C7-D(XMP)	2GB	DS	Team	T3D1288LT-13	7-7-7-21	1.5-1.6	•	•	
Team	TXD32048M1333C7-D(XMP)	2GB	DS	Team	T3D1288LT-13	7-7-7-21	1.5-1.6	•	•	•

- 4 DIMM slots:
  1 DIMM: Supports one module inserted in any slot as single-channel memory configuration.
  2 DIMMs: Support one pair of modules inserted into either the red slots or the gray slots as one pair of dual-channel memory configuration.
  4 DIMMs: Support 4 modules inserted into both the red and gray slots as two pairs of dual-channel memory configuration.

- When installing total memory of 4GB capacity or more, Windows 32-bit operating system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended.

- It is recommended to install the memory modules from the red slots for better overclocking capacity.

- Due to CPU behavior, DDR3 2333/2250/2200/2000/1800 MHz memory module will run at DDR3 2133/2133/2133/1866/1600 MHz frequency as default.

2.2.5   Expansion slots

⚠️ Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.
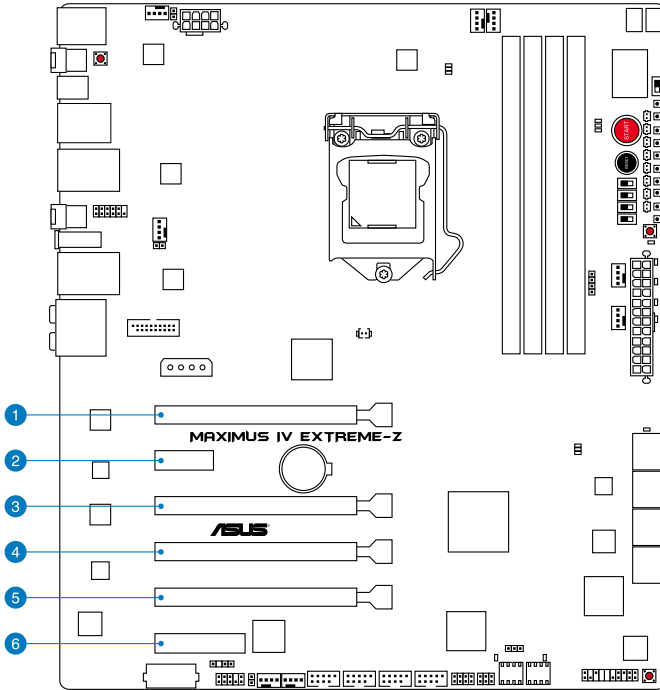
Slot No.	Slot Description
1	PCIe 2.0 x16/8_1 slot
2	PCIe 2.0 x1_1 slot
3	PCIe 2.0 x16_2 slot
4	PCIe 2.0 x8_3 slot (PCIe 2.0 x16 slot with x8 bandwidth)
5	PCIe 2.0 x16_4 slot
6	PCIe 2.0 x4_1 slot

	Single VGA	Dual VGA	Triple VGA
PCIE_X16/8_1	x16 (Native)	x8 (Native)	x8 (Native)
PCIE_X16_2	–	–	x16 (via NF200)
PCIE_X8_3	–	x8 (Native)	–
PCIE_X16_4	–	–	x16 (via NF200)

- In single VGA card mode, use the PCIE_X16/X8_1 slot for a PCI Express x16 graphics card to get better performance.
- In CrossFireX™ or SLI™ mode, use the PCIE_X16/8_1 and PCIEX8_3 slots for PCI Express x16 graphics cards to get better performance.
- In 3-way SLI mode, use the PCIE_X16/8_1, PCIE_X16_2 and PCIE_X16_4 slots for PCI Express x16 graphics cards to get better performance.
- Connect a chassis fan to the motherboard connector labeled CHA_FAN1/2/3 when using multiple graphics cards for better thermal environment.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIEx16/8_1	shared	–	–	–	–	–	–	–
PCIEx16_2	–	shared	–	–	–	–	–	–
PCIEx8_3	–	shared	–	–	–	–	–	–
PCIEx16_4	–	shared	–	–	–	–	–	–
EHCI#0 (USB2.0)	–	–	–	–	–	–	–	shared
EHCI#1 (USB2.0)	–	–	–	–	–	–	–	shared
High Definition Audio	–	–	–	–	–	–	shared	–
SATA #0	–	–	–	–	shared	–	–	–
SATA #1	–	–	–	–	shared	–	–	–
NEC USB3.0#0	–	shared	–	–	–	–	–	–
NEC USB3.0#1	–	shared	–	–	–	–	–	–
JMB362	–	–	–	shared	–	–	–	–
Marvell9182	shared	–	–	–	–	–	–	–
Intel 82583	–	–	shared	–	–	–	–	–
Intel 82579	–	–	–	shared	–	–	–	–
PCIEx4	shared	–	–	–	–	–	–	–
PCIEx1	shared	–	–	–	–	–	–	–

2.2.6 Onboard switches

Onboard switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1.   Power-on switch

Press the power-on switch to wake/power up the system.
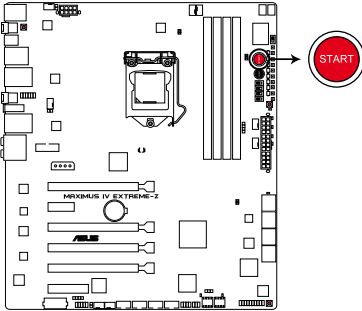
MAXIMUS IV EXTREME-Z Power on switch

2.   Reset switch

Press the reset switch to reboot the system.
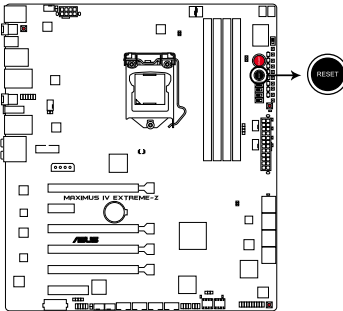
MAXIMUS IV EXTREME-Z Reset switch

3. GO button

Press the GO button before POST to enable MemOK! or press it to quickly load the preset profile (GO_Button file) for temporary overclocking when in OS.
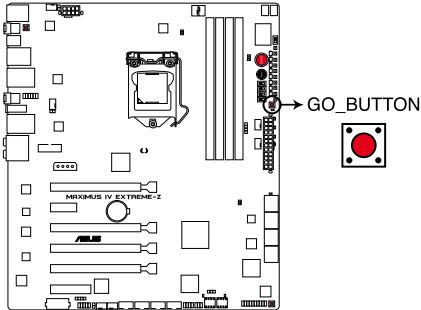
GO_BUTTON

MAXIMUS IV EXTREME-Z GO_BUTTON

4. BIOS button

The motherboard comes with two BIOS. Press the BIOS button to switch BIOS and load different BIOS settings. The nearby BIOS LEDs indicate the BIOS you are using.

BIOS_SWITCH
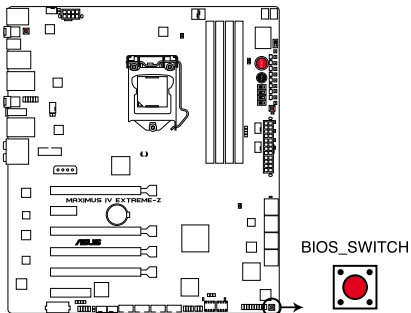
MAXIMUS IV EXTREME-Z BIOS_BUTTON

5.   PCIe x16 Lane switch

These slide switches allows you to enable and disable the corresponding PCIe x16 slots. When one of the installed PCIe x16 cards is out of order, you can use the slide switch to find out the faulty one without removing the cards.

PCIEX16_SW1   Enable (Default)   Disable

PCIEX16_SW2   Enable (Default)   Disable

PCIEX16_SW3   Enable (Default)   Disable

PCIEX16_SW4   Enable (Default)   Disable
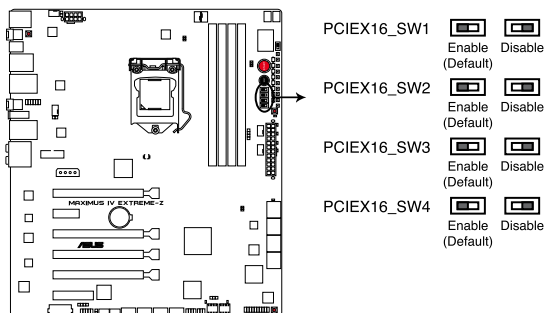
MAXIMUS IV EXTREME-Z PCIe x16 Lane switch

6.   LN2 Mode switch

With LN2 mode activated, the ROG motherboard is optimized to remedy the cold-boot bug during POST at an extremely low temperature and help the system boot successfully.

LN2_MODE

Enable (Default)   Disable
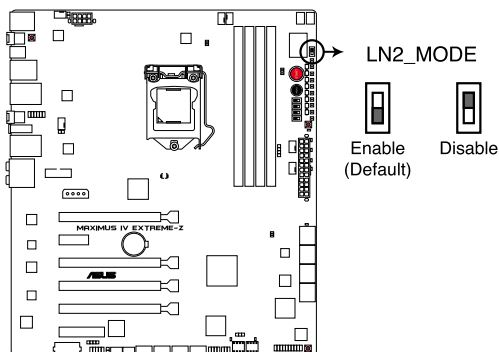
MAXIMUS IV EXTREME-Z LN2_MODE

7. Q reset button

When the LN2_Mode switch does not work and your CPU cannot resume function, press the Q reset button to temporarily stop the power supply to the CPU and help the CPU recover from a frozen condition.
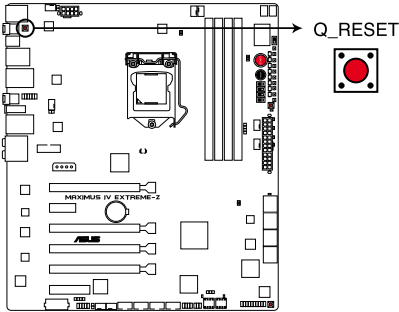
MAXIMUS IV EXTREME-Z Q_RESET BUTTON

2.2.7   Onboard LEDs

The motherboard comes with a set of LEDs that indicate the voltage conditions of CPU, memory, northbridge and southbridge. You may adjust the voltages in BIOS. There are also an LED for hard disk drive activity and an onboard switch for power status. For more information about voltage adjustment, refer to **3.3 Extreme Tweaker menu**.

1.   **CPU LED**

       The CPU LED has four voltage displays: CPU Voltage, VCCSA, VCCIO, and CPU PLL Voltage; you can select the voltage to display in BIOS. Refer to the illustration below for the location of the CPU LED and the table below for LED definition.

2.   **Memory LED**

       The Memory LED has one voltage display: DRAM Voltage. Refer to the illustration below for the location of the memory LED and the table below for LED definition.

3.   **PCH LED**
       PCH LED has two different voltage displays: PCH Voltage and PCH PLL Voltage. Refer to the illustration below for the location of the PCH LED and the table below for LED definition.
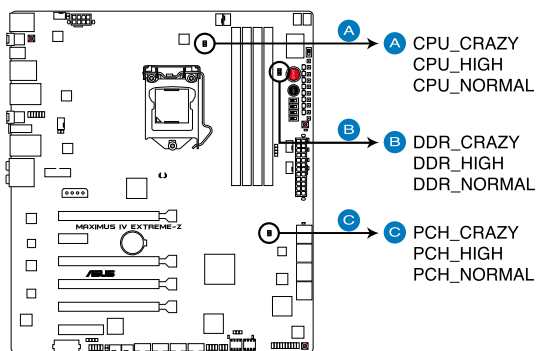
MAXIMUS IV EXTREME-Z CPU/ DDR/ PCH LED

	Normal (blue)	High (yellow)	Crazy (red)
CPU Voltage (default)	0.8–1.4	1.40500–1.55	1.55500–by CPU
VCCSA Voltage	0.8–1.1	1.10625–1.2	1.20625–by CPU
VCCIO Voltage	0.8–1.15	1.15625–1.25	1.25625–by CPU
CPU PLL Voltage	1.2–2.0	2.00625–2.1	2.10625–by CPU

	Normal (blue)	High (yellow)	Crazy (red)
DRAM Voltage	1.2–1.6	1.60625–1.8	1.80625–by CPU

	Normal (blue)	High (yellow)	Crazy (red)
PCH Voltage	0.80825–1.15275	1.166–1.20575	1.219–by CPU
PCH PLL Voltage	0.80825–1.15275	1.166–1.20575	1.219–by CPU

4. **Hard Disk LED**

   The hard disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.
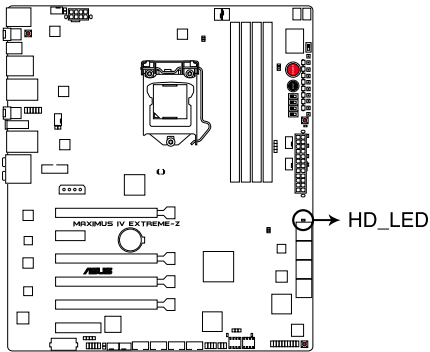
MAXIMUS IV EXTREME-Z Hard Disk LED

5. **BIOS LED**

    The BIOS LEDs help indicate the BIOS activity. Press the BIOS button
    to switch between BIOS1 and BIOS2 and the LED lights up when the
    corresponding BIOS is in use.

    BIOS1_LED   BIOS2_LED

    BIOS1   BIOS2

    MAXIMUS IV EXTREME-Z BIOS_LED
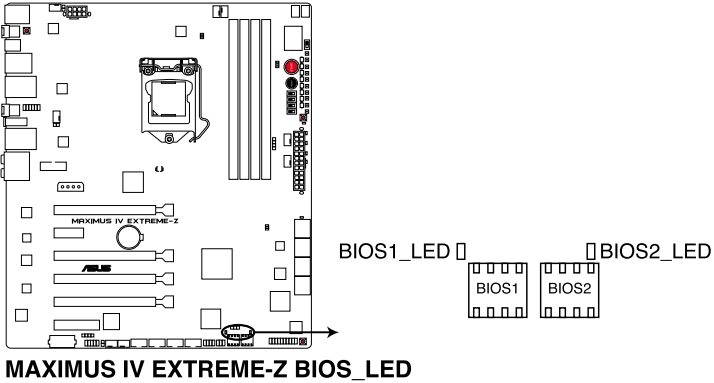
6. **GO LED**

    Blinking: Indicates that MemOK! is enabled before POST.

    Lighting: Indicates that the system loads the preset profile (GO_Button file)
    for temporary overclocking when in OS.

    GO_LED

    MAXIMUS IV EXTREME-Z GO_LED
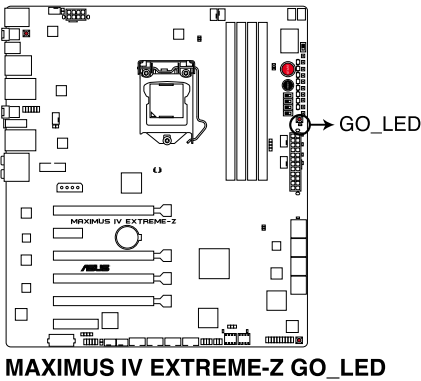
7. **Q LED**

   Q LEDs check key components (CPU, DRAM, VGA card, and booting devices) in sequence during motherboard booting process. If an error is found , the corresponding LED will continue lighting until the problem is solved. This user-friendly design provides an intuitional way to locate the root problem within a second.

BOOT_DEVICE_LED

VGA_LED

DRAM_LED

CPU_LED
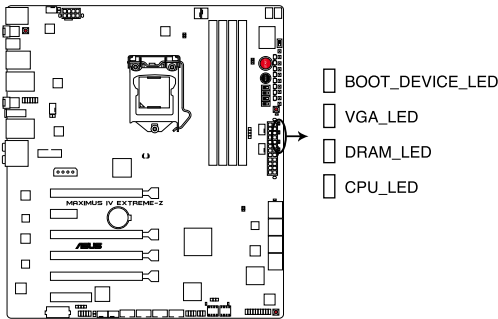
MAXIMUS IV EXTREME-Z CPU/ DRAM/ VGA/ BOOT_DEVICE LED

8. **Power LED**

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

START
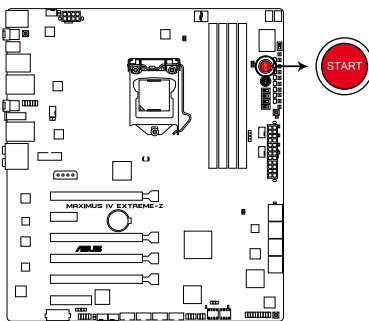
MAXIMUS IV EXTREME-Z Power on switch

9. **Debug LEDs**

   The Debug LED design provides you the 2-digit display, allowing you to know the system status. Refer to the Debug table below for details.
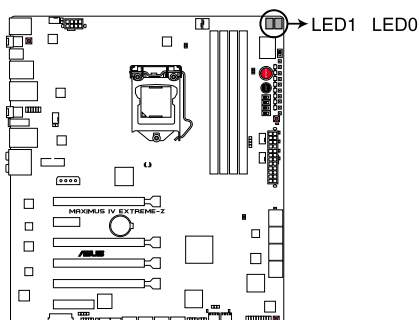
MAXIMUS IV EXTREME-Z Q-Code LED

Debug table

Code	Description
00	Not used
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	System Agent initialization before microcode loading
04	PCH initialization before microcode loading
05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started

Debug table (continued)

Code	Description
1D – 2A	OEM pre-memory initialization codes
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
3F – 4E	OEM post memory initialization codes
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
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
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
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
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)

Debug table (continued)

Code	Description
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress 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
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH 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

Code	Description
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

Debug table (continued)

Code	Description
C0– CF	OEM BDS initialization codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH 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 (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

*ASL Status Codes

Status Code	Description
01	System is entering S1 sleep state
02	System is entering S2 sleep state
03	System is entering S3 sleep state
04	System is entering S4 sleep state
05	System is entering S5 sleep state
10	System is waking up from the S1 sleep state
20	System is waking up from the S2 sleep state
30	System is waking up from the S3 sleep state
40	System is waking up from the S4 sleep state
AC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode
AA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode

2.2.8 Jumper

1. Clear RTC RAM (3-pin CLRTC)

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

To erase the RTC RAM

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

CLRTC_SW

Enable (Default)   Disable

MAXIMUS IV EXTREME-Z Clear RTC RAM
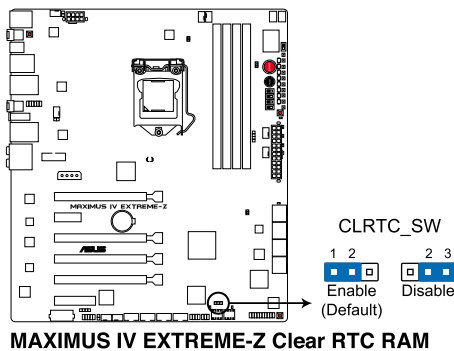
> Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

> • If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
>
> • You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
>
> • Due to the chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

2.2.9   Internal connectors

1.   Intel® Z68 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1/2 [red])

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® P67 chipset.
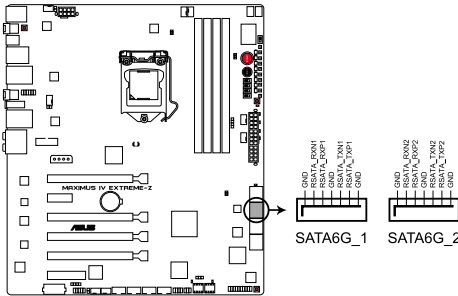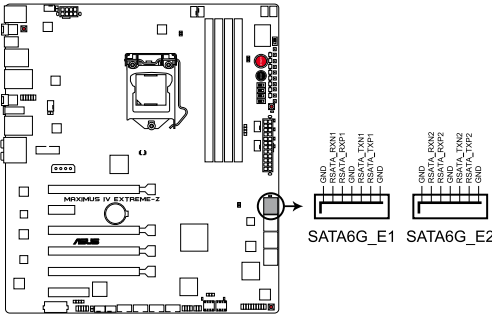
MAXIMUS IV EXTREME-Z Intel® SATA 6.0 Gb/s connectors
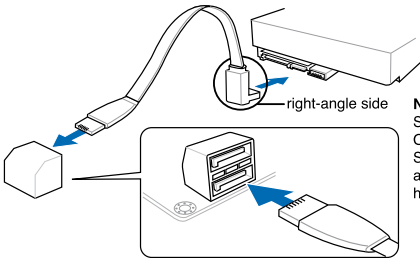
right-angle side

NOTE: Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

- These connectors are set to [AHCI Mode] by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to [RAID Mode]. Refer to section **3.5.4 SATA Configuration** for details.

- Before creating a RAID set, refer to section **4.4 RAID configurations** or the manual bundled in the motherboard support DVD.

- When using hot-plug and NCQ, set the SATA Mode in the BIOS to [AHCI Mode]. Refer to section **3.5.4 SATA Configuration** for details.

- You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 or later versions.

2. **Intel® Z68 Serial ATA 3.0 Gb/s connectors
    (7-pin SATA3G_3–6 [gray])**

    These connectors connect to Serial ATA 3.0 Gb/s hard disk drives and optical
    disc drives via Serial ATA 3.0 Gb/s signal cables.

    If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5,
    and 10 configuration with the Intel® Rapid Storage Technology through the
    onboard Intel® Z68 chipset.
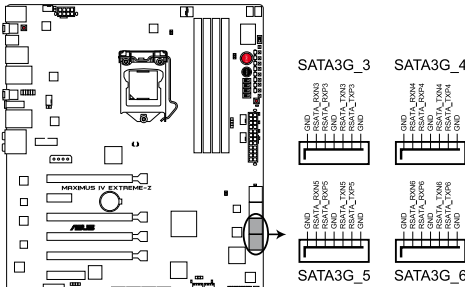
    MAXIMUS IV EXTREME-Z Intel® SATA 3.0 Gb/s connectors

    • These connectors are set to [IDE Mode] by default. If you intend to create
      a Serial ATA RAID set using these connectors, set the SATA Mode item in
      the BIOS to [RAID Mode]. Refer to section **3.5.4 SATA Configuration** for
      details.

    • Before creating a RAID set, refer to section **4.4 RAID configurations** or
      the manual bundled in the motherboard support DVD.

    • When using hot-plug and NCQ, set the SATA Mode in the BIOS to [AHCI
      Mode]. Refer to section **3.5.4 SATA Configuration** for details.

    • You must install Windows® XP Service Pack 3 or later versions before using
      Serial ATA hard disk drives. The Serial ATA RAID feature is available only if
      you are using Windows® XP SP3 or later versions.

3. **Marvell® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_E1/E2 [red])**

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.

MAXIMUS IV EXTREME-Z Marvell® SATA 6.0 Gb/s connectors

✎

- The SATA6G_E1/E2 (red) connectors are for data drives only.

- You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives.

- When using hot-plug and NCQ, set the Marvell Controller item in the BIOS to [AHCI Mode]. Refer to section **3.5.6 Onboard Devices Configuration** for details.

- Press <Ctrl> + <M> during POST to enter the Marvell RAID utility to create or delete a RAID configuration.

- If you want to install a Windows operating system to a RAID configuration created using the Marvell SATA controller, you have to create a RAID driver disk using the motherboard support DVD and load the driver during OS installation. For 32/64bit Windows XP OS, load first the **Marvell shared library** driver, and then load **Marvell 91xx SATA Controller Driver**. For Windows Vista / Windows 7 OS, load only the **Marvell 91xx SATA Controller Driver**.

4. **USB 2.0 connectors (10-1 pin USB12; USB34; USB56; USB78)**

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

MAXIMUS IV EXTREME-Z USB2.0 connector
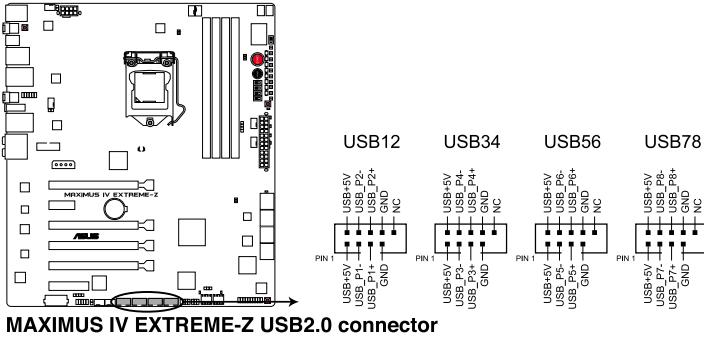
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

You can connect the front panel USB cable to the ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports.

5. USB 3.0 connector (20-1 pin USB3_910)

This connector is for the additional USB 3.0 ports, and complies with the USB 3.0 specificaton that supports up to 480 MBps connection speed. If the USB 3.0 front panel cable is available from your system chassis, with this USB 3.0 connector, you can have a front panel USB 3.0 solution.
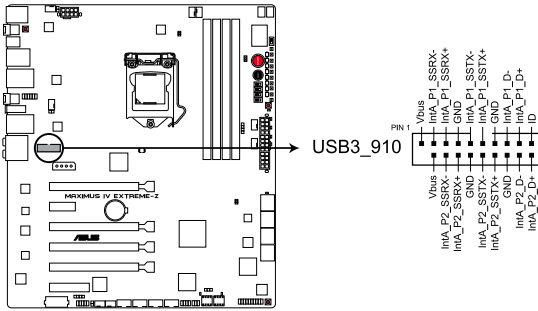
MAXIMUS IV EXTREME-Z USB3.0 connector

> You can connect the ASUS front panel USB 3.0 box to this connector to obtain the front panel USB 3.0 solution.

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

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.
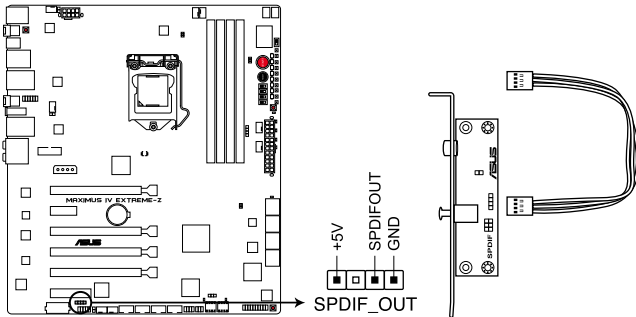
MAXIMUS IV EXTREME-Z Digital audio connector

> The S/PDIF module is purchased separately.

7. **CPU, chassis, and power fan connectors (4-pin CPU_FAN; 4-pin CHA_FAN1/2/3; 4-pin PWR_FAN; 4-pin OPT_FAN1/2/3)**

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

A CPU_FAN

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

B PWR_FAN

GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

C OPT_FAN1

OPT FAN PWM
OPT FAN IN
OPT FAN PWR
GND

D OPT_FAN3

OPT FAN PWM
OPT FAN IN
OPT FAN PWR
GND

E CHA_FAN1

CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

F CHA_FAN2

CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

G OPT_FAN2

GND
OPT FAN PWR
OPT FAN IN
OPT FAN PWM

H CHA_FAN3

GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

MAXIMUS IV EXTREME-Z Fan connectors

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

> • The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.
>
> • If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1, CHA_FAN2, CHA_FAN3 for better thermal environment.

8. **Thermal sensor cable connectors (2-pin OPT_TEMP1/2/3)**

   These connectors are for temperature monitoring. Connect the thermal sensor cables to these connectors and place the other ends to the devices which you want to monitor temperature. The optional fan1/2/3 can work with the temperature sensors for a better cooling effect.
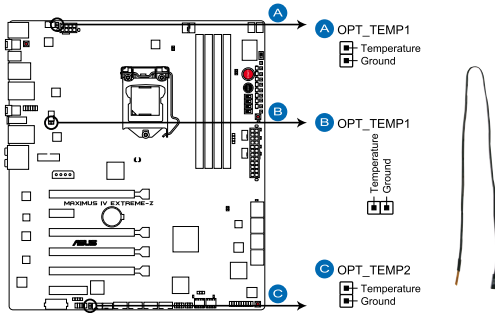
MAXIMUS IV EXTREME-Z Thermal sensor cable connectors

Enable **OPT FAN1/2/3 overheat protection** in BIOS if you connect thermal sensor cables to these connectors.

9. Front panel audio connector (10-1 pin AAFP)

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

MAXIMUS IV EXTREME-Z Analog front panel connector
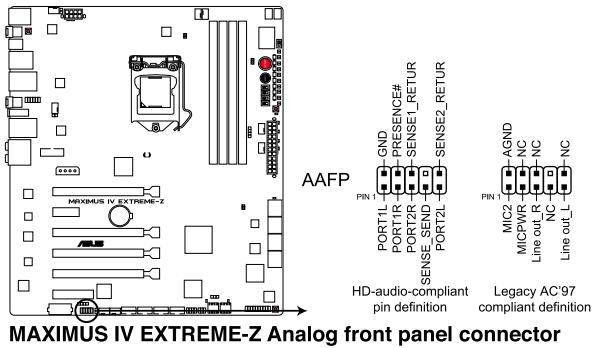
> • We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
>
> • If you want to connect a high-definition front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to [HD]; if you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. By default, this connector is set to [HD].

10. ATX power connectors
(24-pin EATXPWR; 8-pin EATX12V; 4-pin EZ_PLUG)

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

MAXIMUS IV EXTREME-Z ATX power connectors
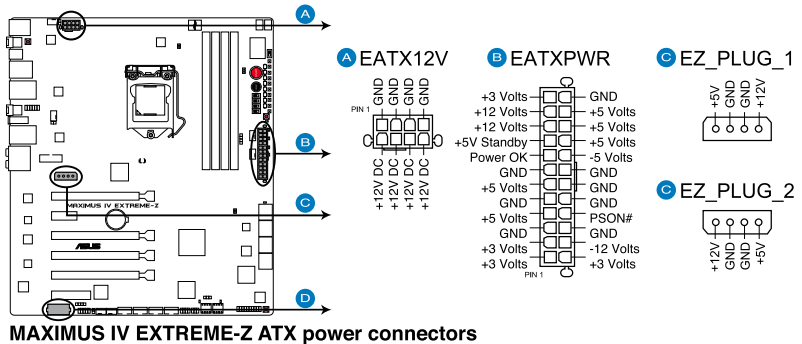
• For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.

• Do not forget to connect the 8-pin EATX12 V power plug; otherwise, the system will not boot.

• Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

• If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at **http://support.asus.com/PowerSupplyCalculator/PSCalculator. aspx?SLanguage=en-us** for details.

• If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.

11. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.
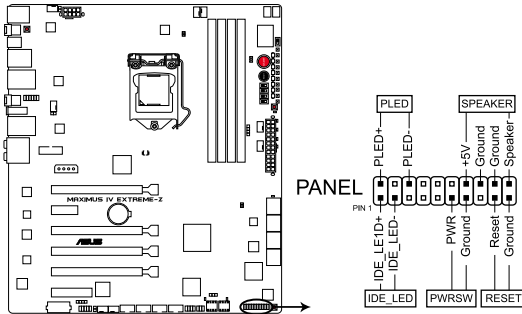
MAXIMUS IV EXTREME-Z System panel connector

- **System power LED (2-pin PLED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin IDE_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**

  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **ATX power button/soft-off button (2-pin PWRSW)**
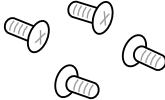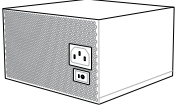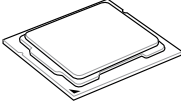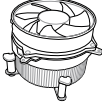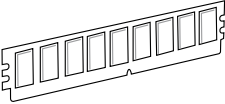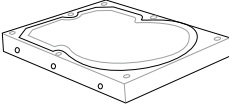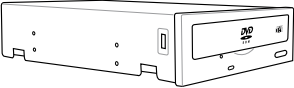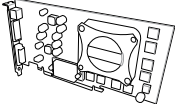
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

2.3 Building your computer system

2.3.1 Additional tools and components to build a PC system
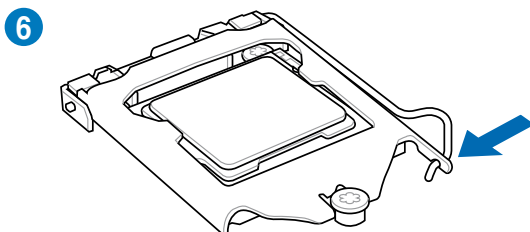
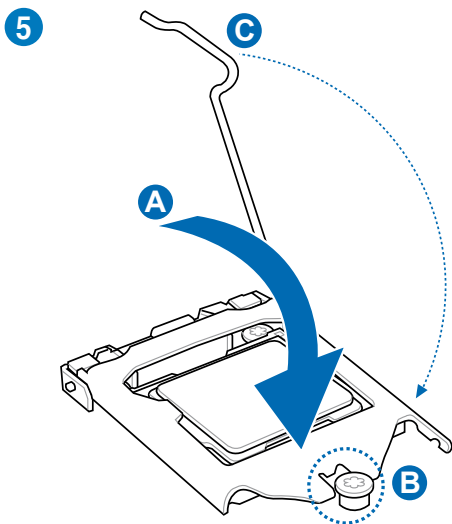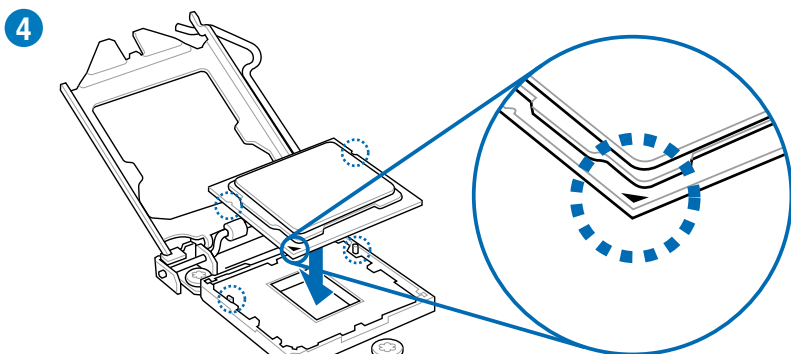|	
1 bag of screws	**Philips (cross) screwdriver**
PC chassis	**Power supply unit**
Intel LGA 1155 CPU	**Intel LGA 1155 compatible CPU Fan**
DIMM	**SATA hard disk drive**
SATA optical disc drive (optional)	**Graphics card (optional)**

The tools and components in the table above are not included in the motherboard package.

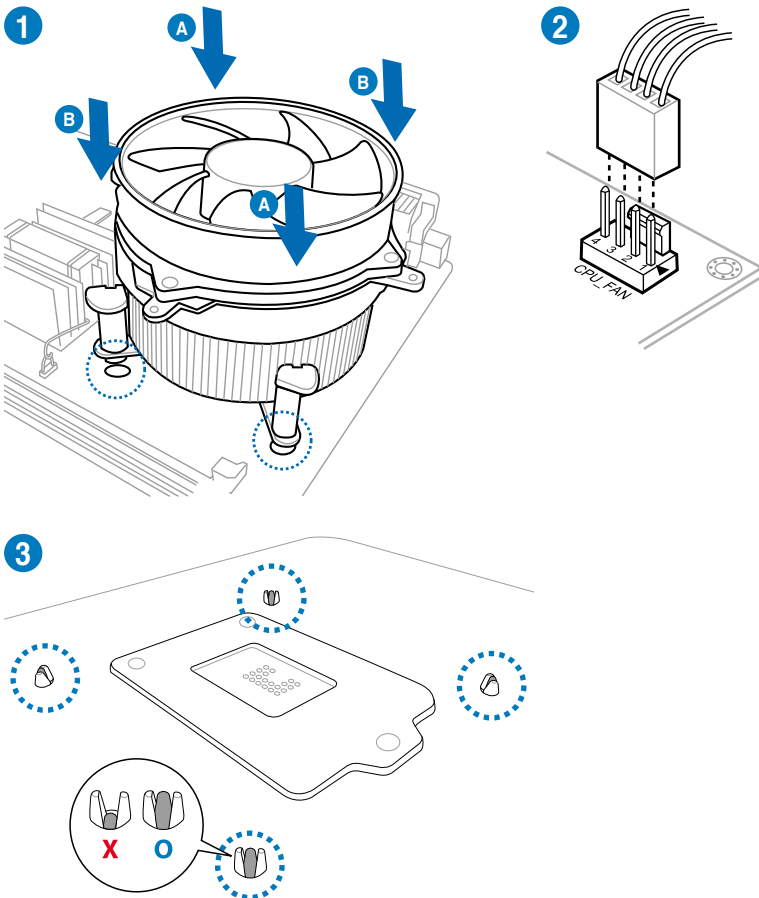## 2.3.2 CPU installation
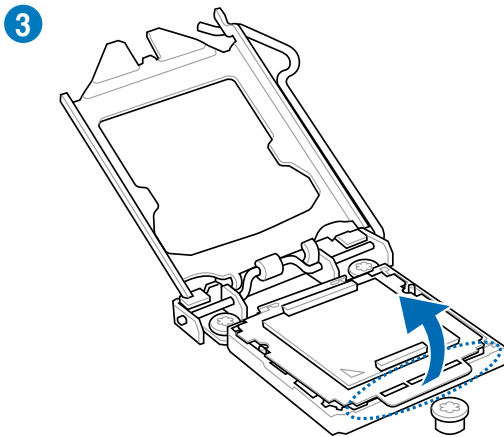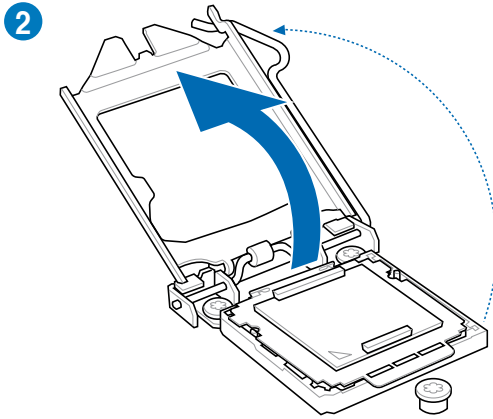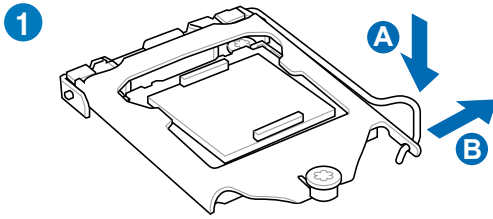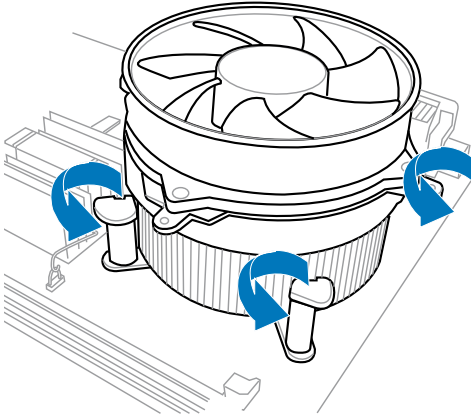
2.3.3   CPU heatsink and fan assembly installation
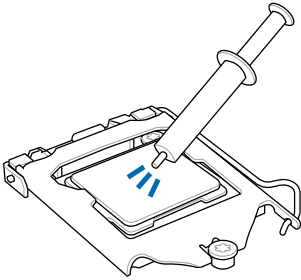
> ⚠ Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.
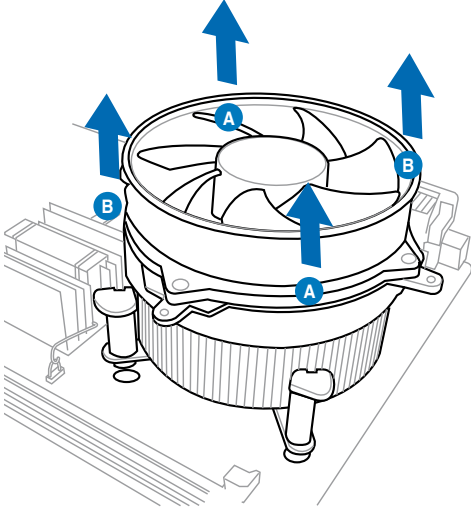
To install the CPU heatsink and fan assembly
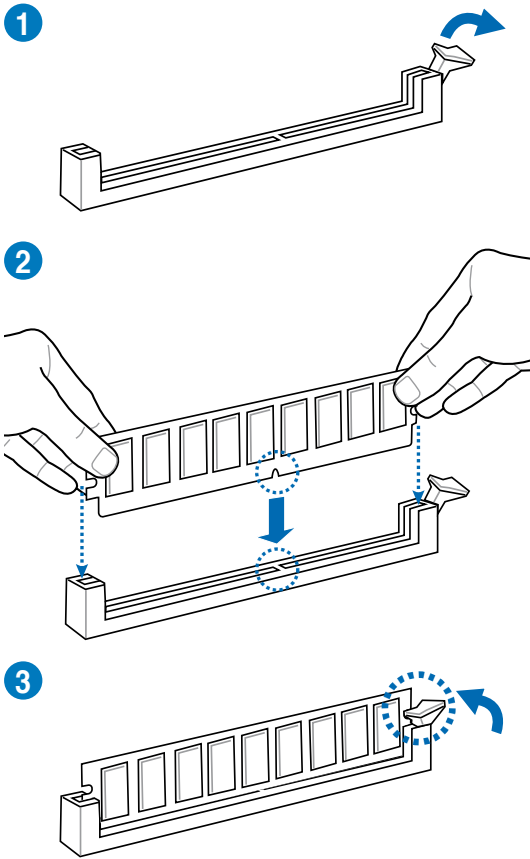
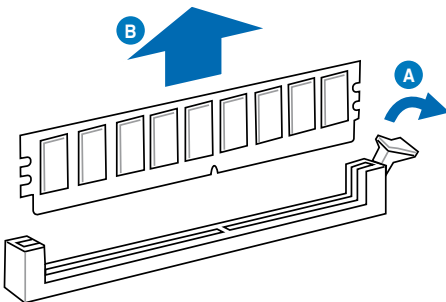**To uninstall the CPU heatsink and fan assembly**

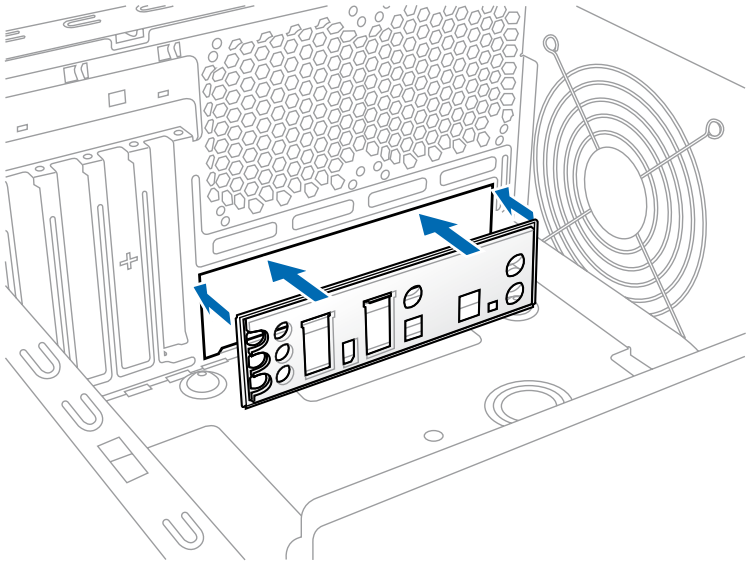## 2.3.4   DIMM installation

To remove a DIMM
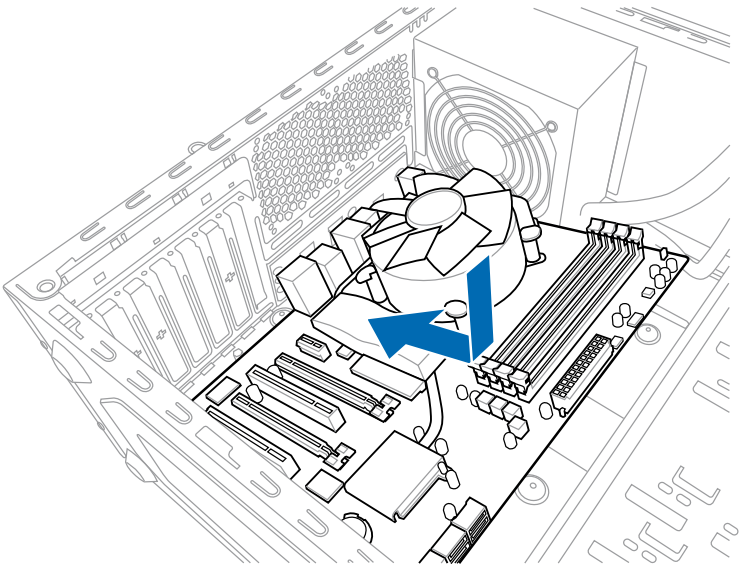
2.3.5   Motherboard installation

The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps remain the same.
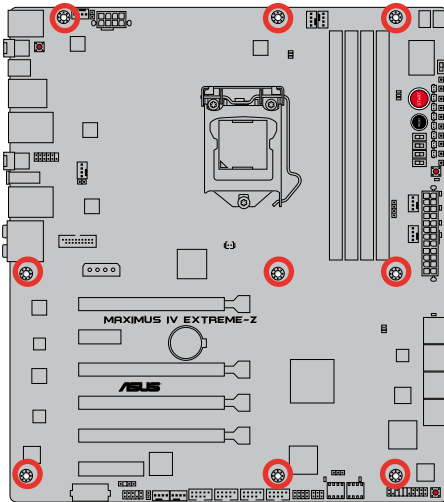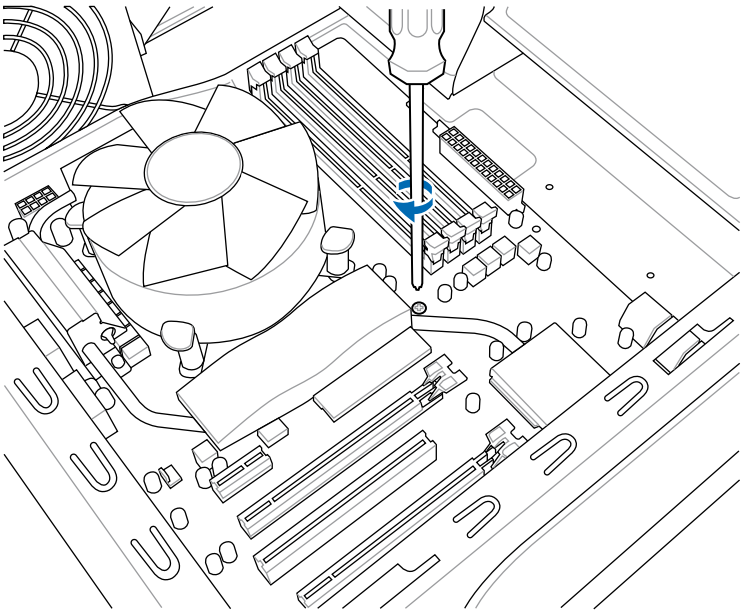
DO NOT overtighten the screws! Doing so can damage the motherboard.

2.3.6   ATX Power connection

OR   OR
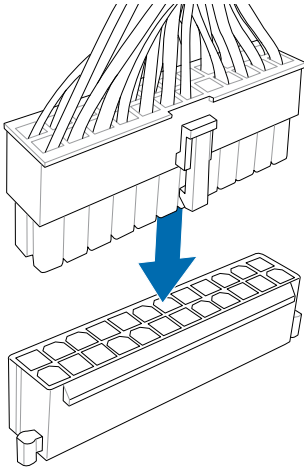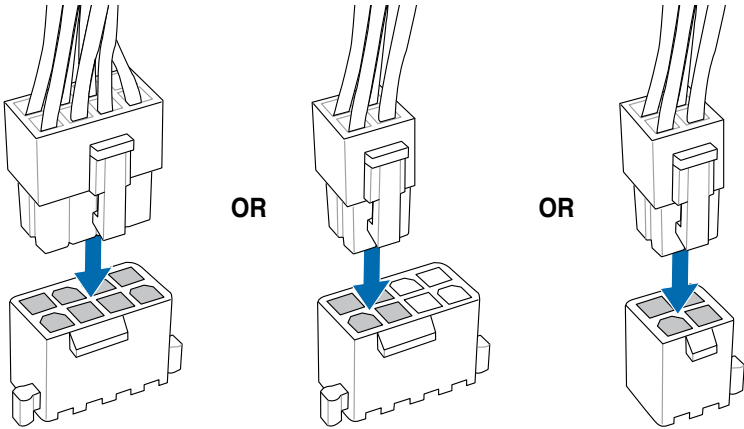
2.3.7 SATA device connection

OR

OR
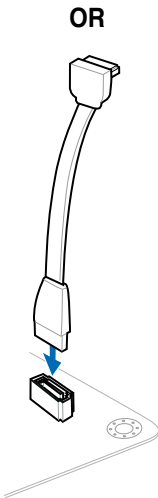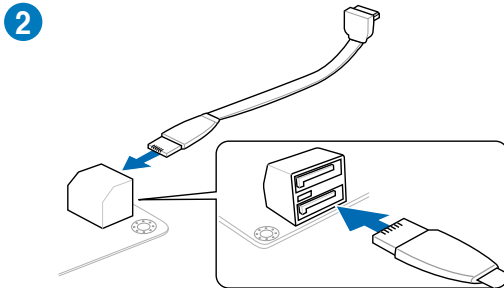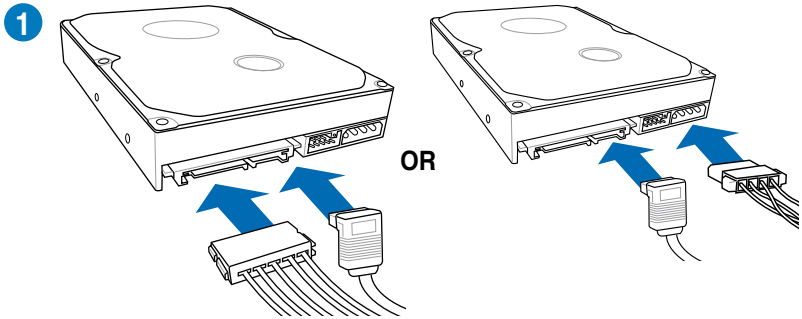
2.3.8 Front I/O Connector

To install ASUS Q-Connector
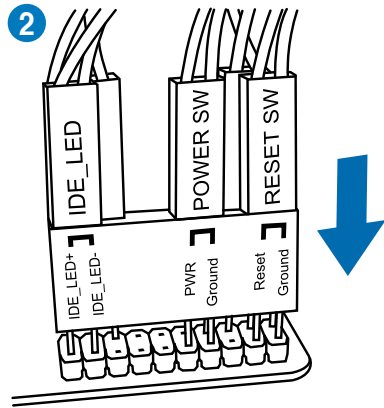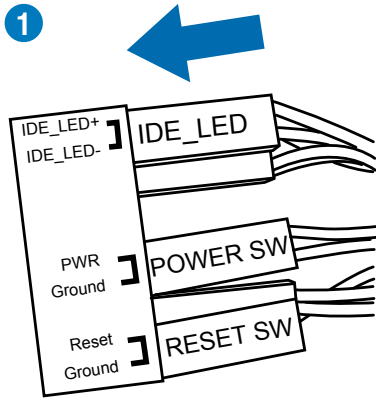
To install USB Connector

USB
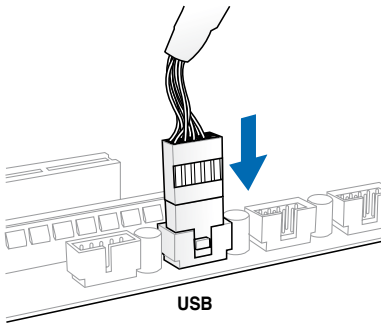
To install front panel audio connector

AAFP
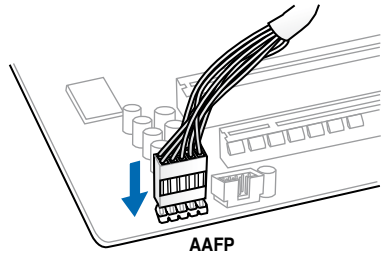
2.3.9   Expension Card installation

To install PCIe x16 cards
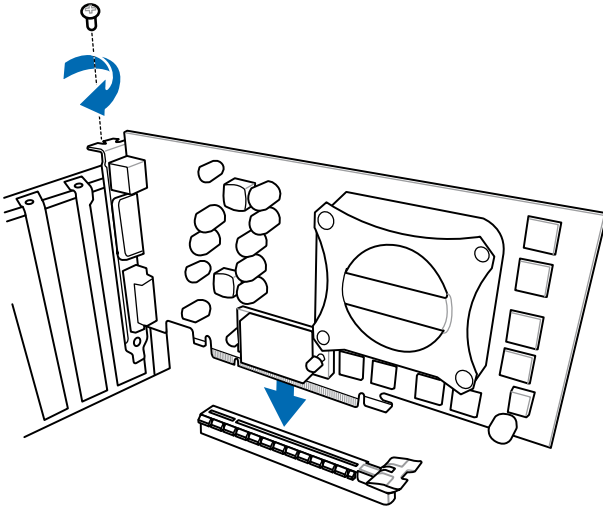
To install PCIe x1 cards
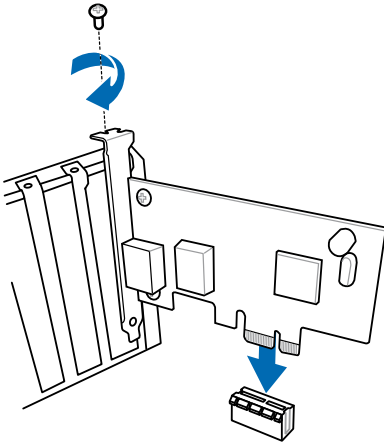
To install PCI cards
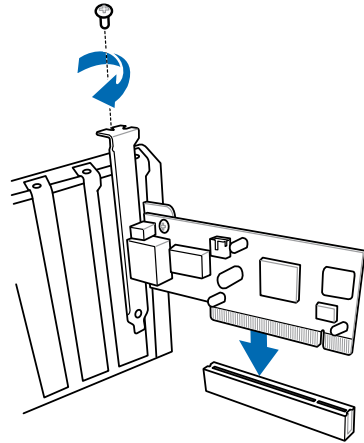
2.3.10 Rear panel connection
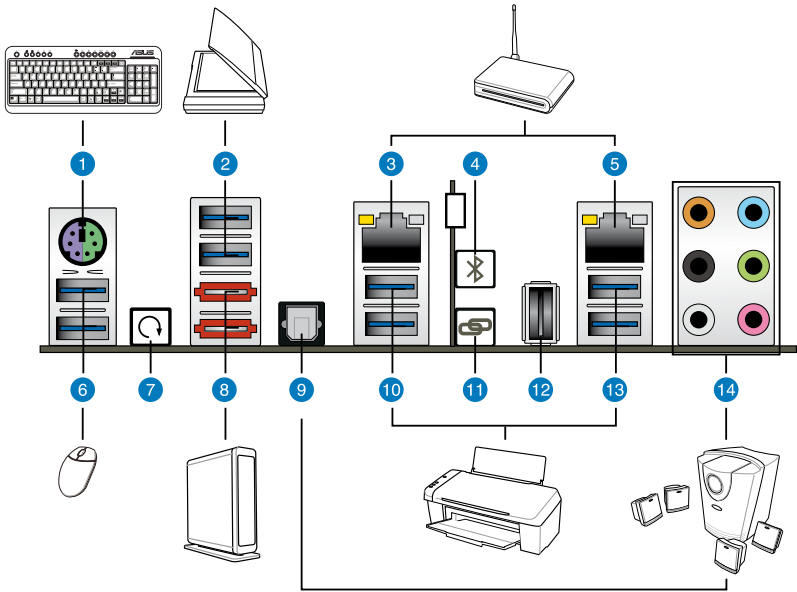
Rear panel connectors	
1. PS/2 mouse and keyboard port	8. External SATA ports 1 and 2
2. USB 3.0 ports 5 and 6	9. Optical S/PDIF Out port
3. LAN (RJ-45) port 2*	10. USB 3.0 ports 3 and 4
4. RC Bluetooth switch	11. ROG Connect switch
5. LAN (RJ-45) port 1*	12. ROG Connect port
6. USB 3.0 ports 7 and 8	13. USB 3.0 ports 1 and 2
7. Clear CMOS switch	14. Audio I/O ports**

*and **: Refer to the tables on the next page for LAN port and audio port definitions.

- Due to USB 3.0 controller limitation, USB 3.0 devices can only be used under Windows® OS environment and after the USB 3.0 driver installation.

- USB 3.0 devices can only be used as data storage only.

- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance for your USB 3.0 devices.

* LAN port LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

ACT/LINK   SPEED
LED   LED

LAN port
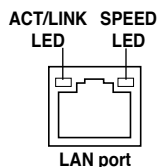
**Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

2.3.11   Audio I/O connections

Audio I/O ports

orange — light blue
black — lime
gray — pink
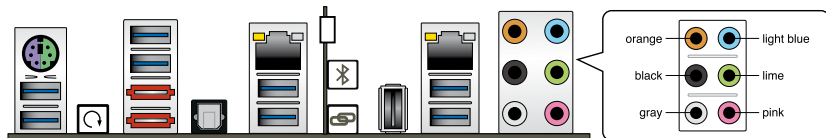
Connect to Headphone and Mic
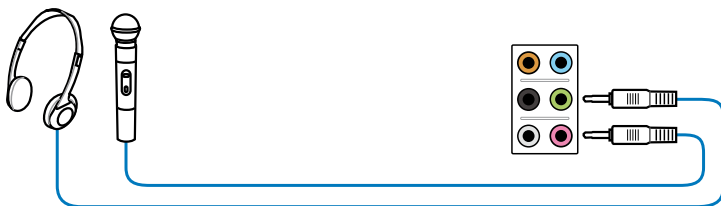
Connect to Stereo Speakers
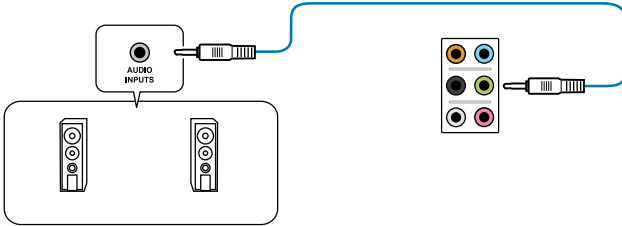
Connect to 2.1 channel Speakers
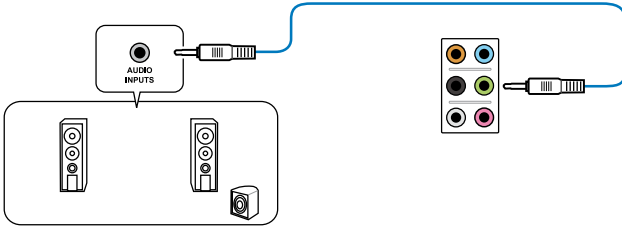
Connect to 4.1 channel Speakers
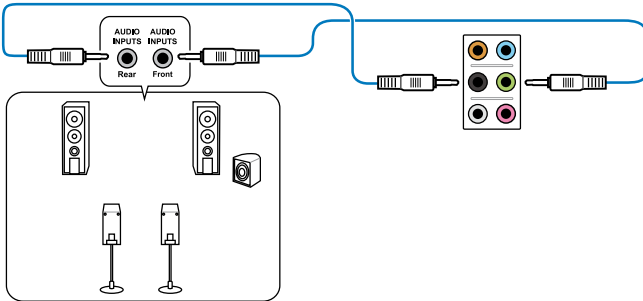
Connect to 5.1 channel Speakers
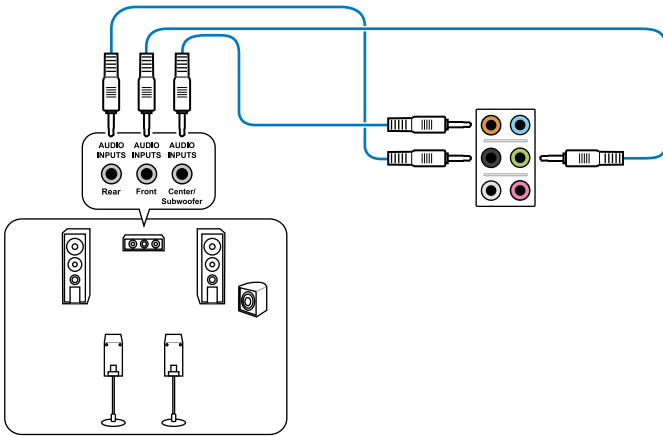
Connect to 7.1 channel Speakers
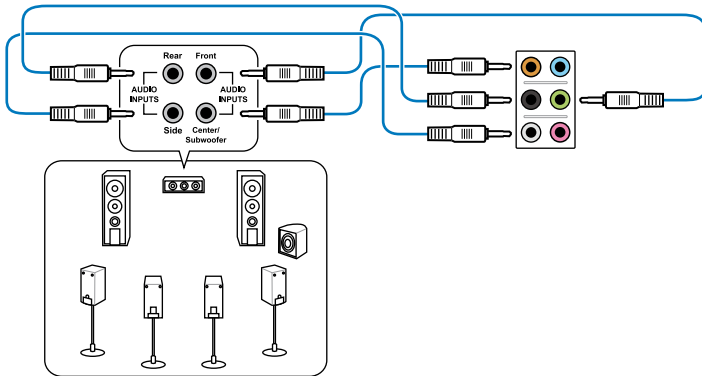
2.4   Starting up for the first time

1.   After making all the connections, replace the system case cover.

2.   Be sure that all switches are off.

3.   Connect the power cord to the power connector at the back of the system chassis.

4.   Connect the power cord to a power outlet that is equipped with a surge protector.

5.   Turn on the devices in the following order:

    a.   Monitor

    b.   External SCSI devices (starting with the last device on the chain)

    c.   System power

6.   After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on.

    The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (refer to the BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected Quick boot set to disabled No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7.   At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

2.5   Turning off the computer

While the system is ON, pressing the power switch for less than four seconds puts the system on sleep mode or soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting.

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

BIOS setup

3

Chapter summary

3

3.1 Knowing BIOS

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimum performance. **We recommend that you not change the default BIOS settings** except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.
- You have installed a new system component that requires further BIOS settings or update.

⚠ Inappropriate settings of the BIOS may result to instability or failure to boot. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel**.

3.2 BIOS setup program

A BIOS setup program is provided for BIOS item modification. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

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

✎ • The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

 • Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.

 • If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu. See section **3.9 Exit Menu** for details.

 • If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section **2.7.1 Rear panel connectors** for information on how to erase the RTC RAM.

The BIOS setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various submenus and select from the available options using a keyboard or a USB mouse.

The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from the **Exit** menu or from the **Exit/Advanced Mode** button in the **EZ Mode**/**Advanced Mode** screen.

3.2.1 Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the Advanced Mode. Refer to the following sections for the detailed configurations.

> To access the EZ Mode, click **Exit**, then select **ASUS EZ Mode**.

Menu items   **Menu bar**   **Configuration fields**   **General help**

Submenu item   **Pop-up window**   **Scroll bar**   **Navigation keys**

Menu bar

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

Extreme Tweaker	For changing the overclocking settings
Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings.
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

3.2.2 EZ Mode

The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance mode and boot device priority. To access the Advanced Mode, click **Exit/Advanced Mode**, then select **Advanced Mode**.

> The default screen for entering the BIOS setup program can be changed. Refer to the **Setup Mode** item in section **3.7 Boot memu** for details.

Selects the display language of the BIOS setup program

Clicks to display all fan speeds if available

Displays the CPU/motherboard temperature, CPU/5V/3.3V/12V voltage output, CPU/chassis/power fan speed

Exits the BIOS setup program without saving the changes, saves the changes and resets the system, or enters the Advanced Mode

Selects the boot device priority

Power Saving mode

Loads optimized default

Displays the system properties of the selected mode on the right hand side

Normal mode

ASUS Optimal mode

> • The boot device options vary depending on the devices you installed to the system.
>
> • The **Boot Menu(F8)** button is available only when the boot device is installed to the system.

Menu items

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

The other items (Ai Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

Back button

This button appears when entering a submenu. Press <Esc> or use the USB mouse to click this button to return to the previous menu screen.

Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Pop-up window

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

Scroll bar

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

Navigation keys

At the bottom right corner of the menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

General help

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

Configuration fields

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

A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

3.3 Extreme Tweaker menu

The Extreme Tweaker menu items allow you to configure overclocking-related items.

⚠️ Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

✎ The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard.
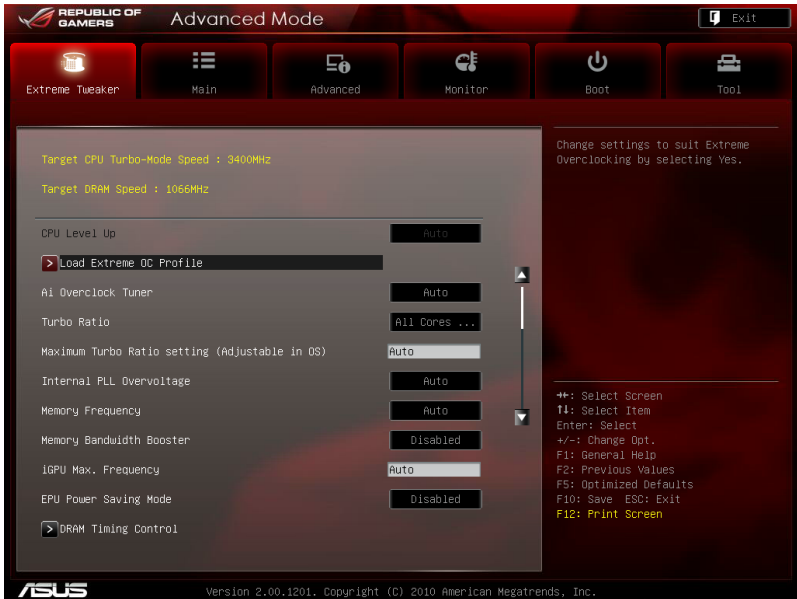
Scroll down to display the following items:
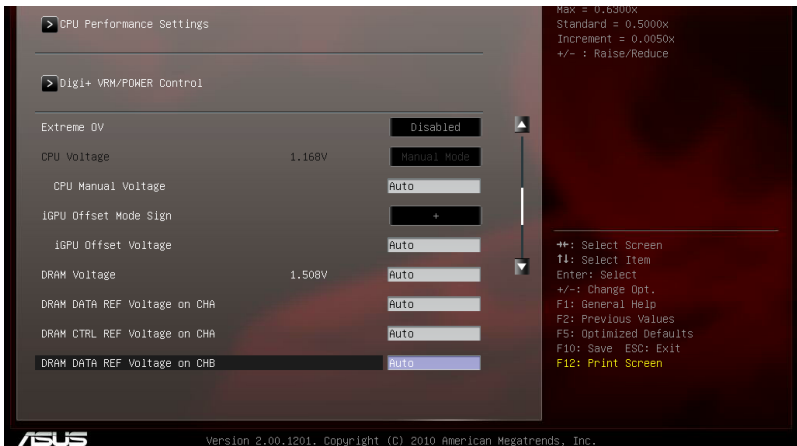
Scroll down to display the following items:
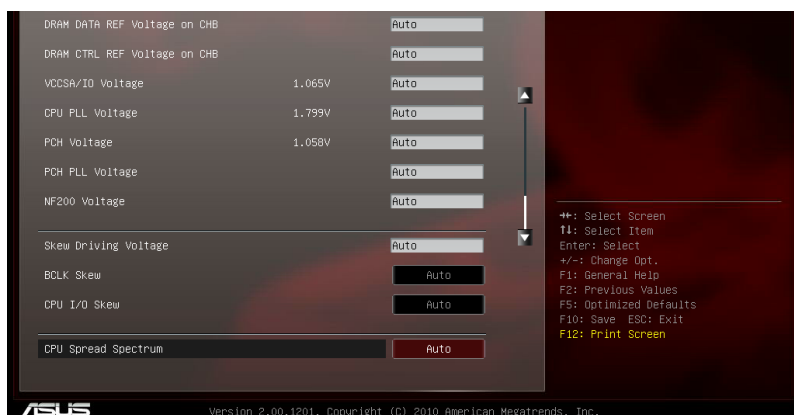
Load Extreme OC Profile

Press <Enter> and select Yes to load the extreme OC profile to suit extreme overclocking.

Ai Overclock Tuner [Auto]

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options:

[Auto]   Loads the optimal settings for the system.

[Manual]   Allows you to individually set overclocking parameters.

BCLK/PEG Frequency [XXX]

Allows you to adjust the CPU and VGA frequency to enhance the system performance. This item only appears when you set **Ai Overclock Tuner** to [Manual]. Use the <+> and <-> keys to adjust the value. You can also key in the desired value using the numeric keypad. The values range from 80.0MHz to 300.0MHz.

Turbo Ratio [Auto]

Allows you to manually adjust the Turbo CPU ratio.

[Auto]   All Turbo ratio are set by Intel CPU default settings

[All Cores mode (Adjustabale in OS)]

All numbers of active cores will be set to one single Turbo ratio in OS

[By number of active cores mode (Unadjustable in OS)]

All numbers of active cores can be set to an individual Turbo ratio in BIOS.

Maximum Turbo Ratio setting (Adjustable in OS) [Auto]

This item only appears when you set **Turbo Ratio** to [All Cores mode (Adjustable in OS)].

Internal PLL Overvoltage [Auto]

Enable Internal PLL Overvoltage for K-SKU CPUs to get extreme overclocking capability.
Configuration options: [Auto] [Enabled] [Disabled]

Memory Frequency [Auto]

Allows you to set the memory operating frequency. The configuration options vary with the **BCLK/PEG Frequency** item settings.

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

Memory Bandwidth Booster [Disabled]

Memory Bandwidth Booster.
Configuration options: [Disabled] [Enabled]

iGPU Max. Frequency [Auto]

This item allows you to adjust the iGPU Max. Frequency. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key. The values range from 1100Mhz to 3000Mhz with a 50Mhz interval.

EPU Power Saving Mode [Disabled]

Allows you to enable or disable the EPU power saving function.
Configuration options: [Disabled] [Enabled]

DRAM Timing Control

The sub-items in this menu allow you to set the DRAM timing control features. Use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

> ⚠ Changing the values in this menu may cause the system to become unstable! If this happens, revert to the default settings.

GPU.DIMM Post

The sub-items in this menu display the status of the installed VGA cards and memory. The field shows N/A if there's no device installed on that slot.

CPU Performance Settings

The sub-items in this menu allow you to set the CPU ratio and features.

CPU Ratio [Auto]
Allows you to manually adjust the maximum non-turbo CPU ratio. Use <+> and <-> keys to adjust the value. The valid value ranges vary according to your CPU model.

Enhanced Intel SpeedStep Technology [Enabled]
Allows you to enable or disable the Enhanced Intel® SpeedStep Technology.

[Disabled] Disables this function.

[Enabled] The operating system dynamically adjusts the processor voltage and core frequency which may result in decreased average consumption and decreased average heat production.

Turbo Mode [Enabled]
This item appears only when you set the **Enhanced Intel SpeedStep Technology** item to [Enabled].

[Disabled] Disables this function.

[Enabled] Allows processor cores to run faster than marked frequency in specific condition.

Maximum Power [Disabled]
[Disabled] Disables this function.

[Enabled] Allows you to set maximum values for maximum overclocking.

The following four items appear only when you set the **Enhanced Intel SpeedStep Technology** and **Turbo Mode** items to [Enabled] and **Maximum Power** set to [Disabled].

Long Duration Power Limit [Auto]
Use the <+> and <-> keys to adjust the value.

Long Duration Maintained [Auto]
Use the <+> and <-> keys to adjust the value.

Short Duration Power Limit [Auto]
Use the <+> and <-> keys to adjust the value.

Additional Turbo Voltage [Auto]
Use the <+> and <-> keys to adjust the value.

CPU Core Current Limit [Auto]
Use the <+> and <-> keys to adjust the value.

CPU I/O Current Limit [Auto]
Use the <+> and <-> keys to adjust the value.

Digi+ VRM/POWER Control

The sub-items in this menu allow you to set the Digi+ VRM settings and Power control.

VCore PWM mode [T.Probe]
[T.Probe]   Maintains the VRM thermal balance.

[Extreme] Maintains the VRM current balance.

VCore MOS volt. Control [Auto]
Use the <+> and <-> keys to adjust the value.
Configuration options: [Auto] [6V] [6.5V] [7V] [7.5V] [8V] [8.5V] [9V] [9.5V]
[10V] [10.5V]

VCore Load-Line Calibration [Auto]
Load-line is defined by Intel VRM spec and affects CPU voltage. The CPU working voltage will decrease proportionally to CPU loading. Higher load-line calibration would get higher voltage and better overclocking performance, but increase the CPU and VRM thermal. From the Regular to Extreme mode allows you to adjust the voltage range from 0% to 100% to boost the system performance.
Configuration options: [Auto] [0%] [25% (Suitable for 3.6G-4.2G)] [High]
[50% (Suitable for 4.2G-4.8G)] [75% (Suitable for 4.8G-5.2G)]
[100% (Suitable for 5.2G-6.0G)]

The actual performance boost may vary depending on your CPU specification.

VCore Switching Freq [Auto]
Switching frequency will affect the VRM transient response and component thermal. Setting a higher frequency gets faster transient response.

[Auto]   Allows you to enable or disable the Spread Spectrum item.

[Manual]   Allows you to manually set the frequency with a 10KHz interval.

VRM Fixed Frequency Mode [xxx]
This item appears only when you set the **VCore Switching Freq** item to [Manual] and allows you to set a fixed VRM frequency. Use the <+> and <-> keys to adjust the value. The values range from 250KHz to 1100KHz with a 50KHz interval.

VCore Phase Control [Optimized]

Phase number is the number of working VRM phase. Increasing phase number under heavy system loading to get more transient and better thermal performance. Reducing phase number under light system loading to increase VRM efficiency

[Standard]   Proceeds phase control depending on the CPU loading.

[Optimized]   Loads the ASUS optimized phase tuning profile.

[Extreme]   Proceeds the full phase mode.

[Manual Adjustment]   Allows manual adjustment.

When this item is set to [Extreme], the CPU Voltage is set to [Manual] and the voltage is set to [1.2V] automatically.

Manual Adjustment [Medium]

This item appears only when you set the **Phase Control** item to [Manual Adjustment]. Configuration options: [Ultra Fast] [Fast] [Medium] [Regular]

VCore Over-Current Protection [100%]

This item provides wider total power range for overclocking. A higher value brings a wider total power range and extends the overclocking frequency range simultaneously. Configuration options: [100%] [110%] [120%] [130%] [140%] [150%] [160%] [170%] [180%]

iGPU Load-line Calibration [Auto]

Load-line is defined by Intel VRM spec and affects iGPU voltage. The iGPU working voltage will decrease proportionally to integrated graphics loading. Higher value could get higher iGPU voltage and good performance but increase the CPU and VRM thermal. Configuration options: [Auto] [Regular] [High] [Extreme]

iGPU Current Capability [100%]

A higher value brings a wider total iGPU power range and extends the overclocking frequency range simultaneously to enhance iGPU performance. Configuration options: [100%] [110%] [120%] [130%] [140%] [150%]

VCore EMI Reduction [Disabled]

This item appears only when you set the **VCore Switching Freq** item to [Auto] and the **Vcore Phase Control** is NOT set to [Extreme]. It allows you to enable the spread spectrum to reduce EMI.
Configuration options: [Disabled] [Enabled]

VRM Over Temperature Protection [Enabled]
This item appears only when the **Vcore Phase Control** item is set to
[Extreme] and allows you to enable or disable the VRM over temperature
protection. Configuration options: [Disabled] [Enabled]

VDRAM
The sub-items in this menu allow you to set the VDRAM settings.

VDRAM Switching Freq [Auto]
Allows you to switch the VDRAM frequency
Configuration options: [Auto] [1x] [1.4X]

VDRAM Full Phase Control [Auto]
Allows you to enable or disable the VDRAM Full Phase Control.
Configuration options: [Auto] [Disabled] [Enabled]

VDRAM Over-Current Protection [Disabled]
Allows you to enable or disable the VDRAM Over-Current Protection.
Configuration options: [Disabled] [Enabled]

VCCSA/IO
The sub-items in this menu allow you to set the VCCSA settings.

VCCSA/IO Switching Freq [Auto]
Allows you to switch the VDRAM frequency
Configuration options: [Auto] [1x] [1.65X]

VCCSA/IO Full Phase Control [Auto]
Allows you to enable or disable the VDRAM Full Phase Control.
Configuration options: [Auto] [Disabled] [Enabled]

VCCSA/IO Over-Current Protection [Disabled]
Allows you to enable or disable the VCCSA Over-Current Protection.
Configuration options: [Disabled] [Enabled]

Extreme OV [Disable]
This item is set to [Disabled] by default to protect the CPU from being overheated.
Set this item to [Enabled] to choose a higher voltage to overclock, but doing so
might decrease CPU life. Configuration options: [Disabled] [Enabled]

CPU Voltage [Offset Mode]
[Manual Mode] Allows you to set a fixed CPU voltage.
[Offset Mode]   Allows you to set the Offset voltage.

Some of the following items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

CPU Manual Voltage [Auto]
This item appears only when you set the **CPU Voltage** item to [Manual Mode] and allows you to set a fixed CPU voltage. The values range from 0.800V to 2.155V with a 0.005V interval. The 2.155V voltage is available only when the **Extreme OV** item is set to [Enabled].

Refer to the CPU documentation before setting the CPU voltage. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.

iGPU Offset Mode Sign [+]

This item allows you to set iGPU offset settings.

[+]   To offset the voltage by a positive value.

[–]   To offset the voltage by a negative value.

iGPU Offset Voltage [Auto]
This item allows you to set the iGPU Offset voltage. The values range from 0.005V to 0.635V with a 0.005V interval.

DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.20V to 2.20V with a 0.00625V interval. The 2.20V voltage is available only when the Extreme OV item is set to [Enabled].

According to Intel CPU spec, DIMMs with voltage requirement over 1.65V may damage the CPU permanently. We recommend you install the DIMMs with the voltage requirement below 1.65V.

DRAM DATA REF Voltage on CHA/B [Auto]

Allows you to set the DRAM DATA Reference Voltage on Channel A/B. The values range from 0.395x to 0.630x with a 0.005x interval. Different ratio might enhance DRAM overclocking ability.

DRAM CTRL REF Voltage on CHA/B [Auto]

Allows you to set the DRAM Control Reference Voltage on Channel A/B. The values range from 0.395x to 0.630x with a 0.005x interval. Different ratio might enhance DRAM overclocking ability.

VCCSA/IO Voltage [Auto]

Allows you to set the VCCSA voltage. The values range from 0.80V to 1.70V with a 0.00625V interval.

CPU PLL Voltage [Auto]

Allows you to set the CPU PLL voltage. The values range from 1.20V to 2.20V with a 0.00625V interval.

PCH Voltage [Auto]

Allows you to set the Platform Controller Hub voltage. The values range from 0.80825V to 1.70925V with a 0.01325V interval.

PCH PLL Voltage [Auto]

Allows you to set the PCH PLL votage. The values range from 0.80825V to 1.70925V with a 0.01325V interval.

NF200 Voltage [Auto]

Allows you to set the NF200 voltage. The values range from 1.19250V to 1.51050V with a 0.01325V interval.

- The values of the **CPU Manual Voltage**, **CPU Offset Voltage**, **DRAM Voltage**, **VCCSA Voltage**, **VCCIO Voltage**, **CPU PLL Voltage**, **PCH Voltage**, and **NF200 Voltage** items are labelled in different color, indicating the risk levels of high voltage settings.

- The system may need better cooling system to work stably under high voltage settings.

Skew Driving Voltage [Auto]

Allows you to set the Skew Driving Voltage. The values range from 0.41075V to 1.80200V with a 0.01325V interval.

BCLK Skew [Auto]

Reduce to increase BCLK and increase to reduce BCLK.
Configuration options: [Auto] [-12]—[+12]

CPU I/O Skew [Auto]

Configuration options: [Auto] [-4]—[+4]

CPU Spread Spectrum [Auto]

[Auto]   Automatic configuration.

[Disabled]   Enhances the BCLK overclocking ability.

[Enabled]   Sets to [Enabled] for EMI control.

3.4 Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

3.4.1 System Language [English]

Allows you to choose the BIOS language version from the options. Configuration options: [English] [Français] [Deutsch] [简体中文] [繁體中文] [日本語]

3.4.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

3.4.3 System Time [xx:xx:xx]

Allows you to set the system time.

3.4.4 Security

The Security menu items allow you to change the system security settings.
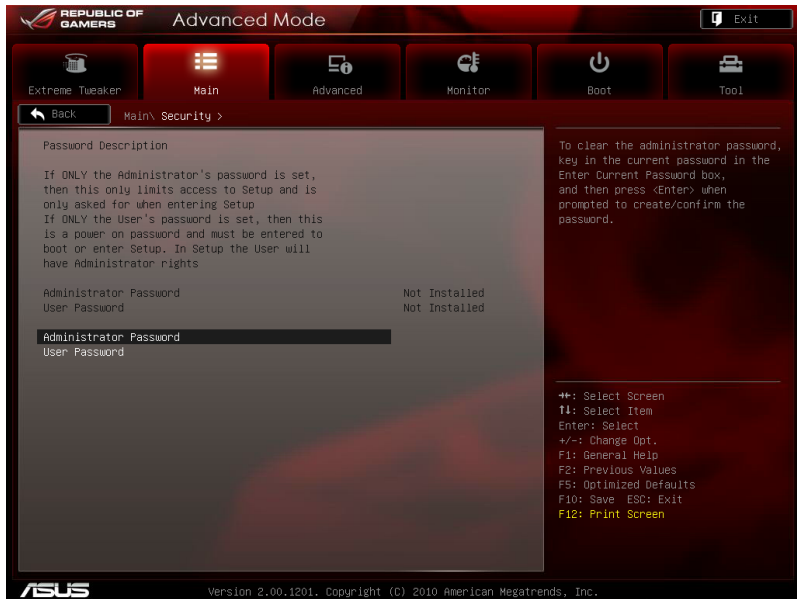
✎
- If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section **2.7.1 Rear panel connectors** for information on how to erase the RTC RAM.
- The **Administrator** or **User Password** items on top of the screen show the default **Not Installed**. After you set a password, these items show **Installed**.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change an administrator password:

1.   Select the **Administrator Password** item and press <Enter>.

2.   From the **Enter Current Password** box, key in the current password, then press <Enter>.

3.   From the **Create New Password** box, key in a new password, then press <Enter>.

4.   Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **Administrator Password** item on top of the screen shows **Not Installed**.

User Password

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a user password:

1.   Select the **User Password** item and press <Enter>.

2.   From the **Create New Password** box, key in a password, then press <Enter>.

3.   Confirm the password when prompted.

To change a user password:

1.   Select the **User Password** item and press <Enter>.

2.   From the **Enter Current Password** box, key in the current password, then press <Enter>.

3.   From the **Create New Password** box, key in a new password, then press <Enter>.

4.   Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

3.5   Advanced menu

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

> Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.
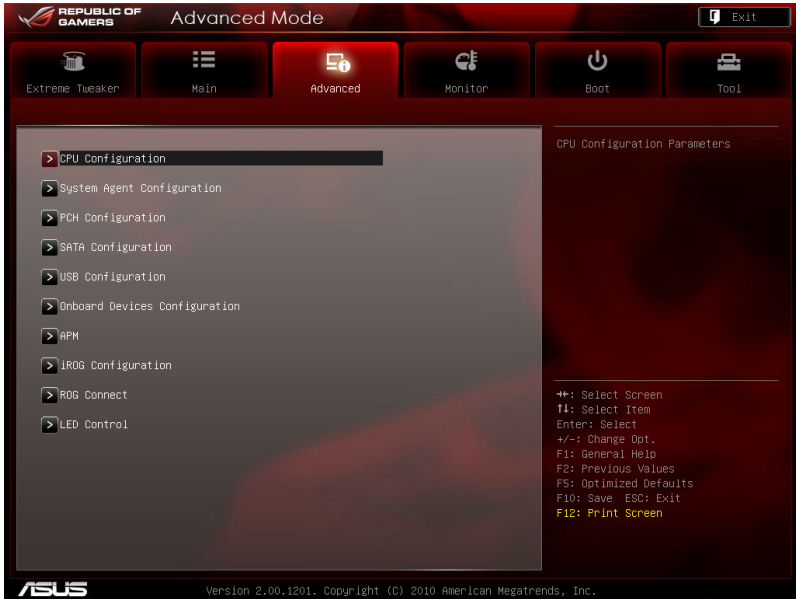
3.5.1   CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

The items shown in this screen may be different due to the CPU you installed.

Scroll down to display the following items:

CPU Ratio [Auto]

Allows you to set the ratio between the CPU Core Clock and the BCLK Frequency. Use <+> and <-> keys to adjust the ratio. The valid value ranges vary according to your CPU model.

Intel Adaptive Thermal Monitor [Enabled]

[Enabled]   Enables the overheated CPU to throttle its clock speed to cool down.

[Disabled]   Disables the CPU thermal monitor function.

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package. Configuration options: [All] [1] [2] [3]

Hyper-Threading [Enabled]

This item appears only when a CPU supporting Hyper-Threading Technology is installed. The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously.

[Enabled]   Two threads per activated core are enabled.
[Disabled]   Only one thread per activated core is enabled.

Limit CPUID Maximum [Disabled]

[Disabled]   Disables this function.
[Enabled]   Allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

Execute Disable Bit [Enabled]

[Disabled]   Forces the XD feature flag to always return to zero (0).
[Enabled]   Enables the No-Execution Page Protection Technology.

Intel(R) Virtualization Technology [Disabled]

[Disabled]   Disables this function.
[Enabled]   Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

Enhanced Intel SpeedStep Technology [Enabled]

Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST).

[Disabled]   The CPU runs at its default speed.
[Enabled]   The operating system controls the CPU speed.

Turbo Mode [Enabled]

This item appears only when you set the **Enhanced Intel SpeedStep Technology** item to [Enabled] and allows you to enable or disable the Intel® Turbo Mode Technology.

[Disabled]   Disables this function.
[Enabled]   Allows processor cores to run faster than marked frequency in specific condition.

CPU C1E [Enabled]

[Disabled]   Disables this function.

[Enabled]   Enables the C1E support function. This item should be enabled in order to enable the Enhanced Halt State.

CPU C3 Report [Enabled]

Allows you to disable or enable the CPU C3 report to OS.

CPU C6 Report [Enabled]

Allows you to disable or enable the CPU C6 report to OS.

Package C State limit [No Limit]

Allows you to set the package C state limit. Configuration options: [C6] [No Limit]

3.5.2   System Agent Configuration
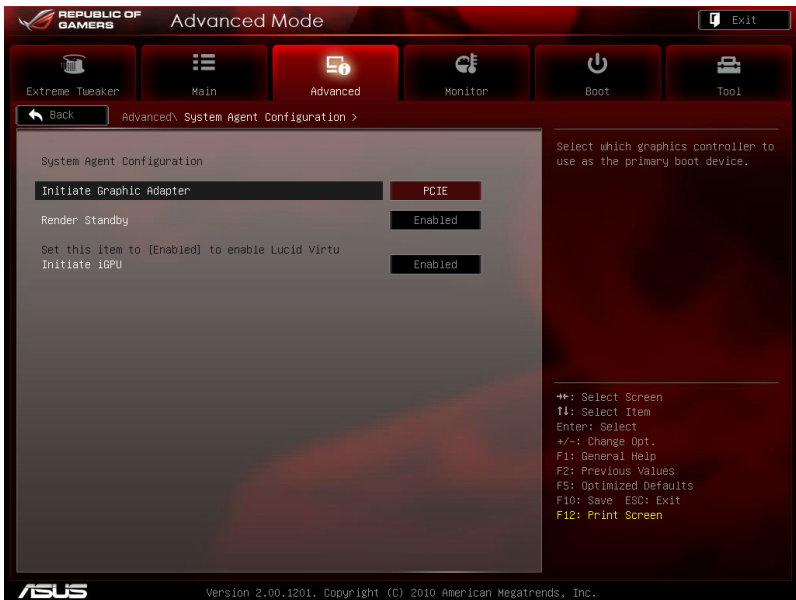
Initial Graphic Adapter [PCIE]

Allows you to select the graphics controller as the primary boot device.
Configuration options: [PCIE]

Render Standby [Enabled]

Configuration options: [Disabled] [Enabled]

Initiate iGPU [Enabled]

For Lucid Virtu function supports, set this item to [Enabled] to empower both integrated and discrete graphics. iGPU shared system memory size will be fixed in 64MB. Configuration options: [Disabled] [Enabled]

3.5.3 PCH Configuration
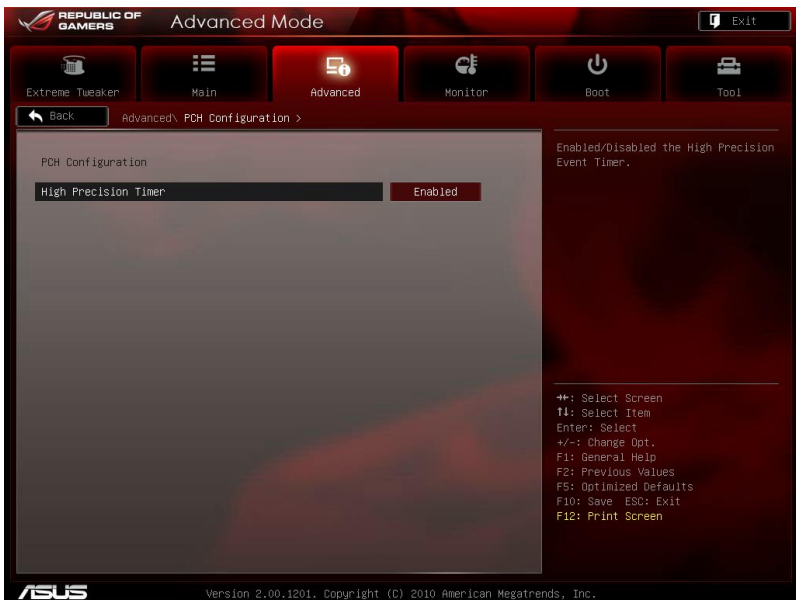
High Precision Timer [Enabled]

Allows you to enable or disable the High Precision Event Timer.
Configuration options: [Enabled] [Disabled]

3.5.4 SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.
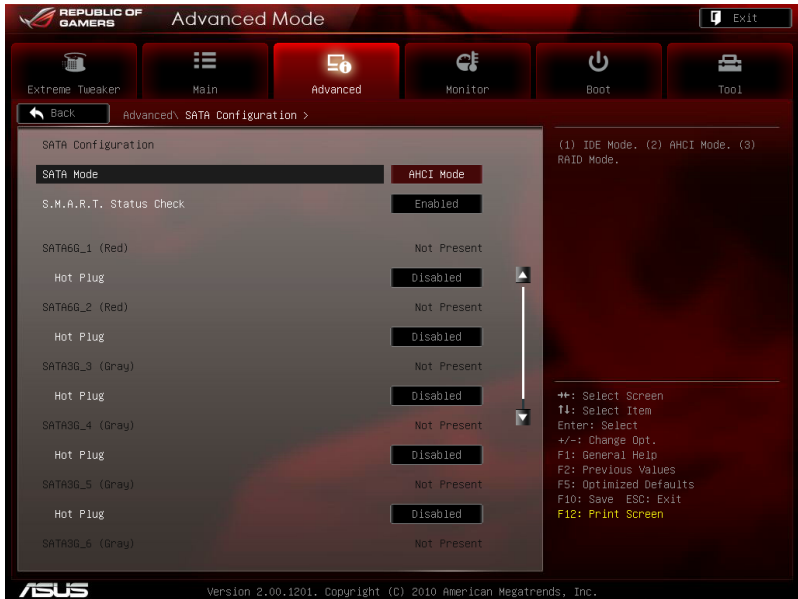
Scroll down to display the following items:

SATA Mode [AHCI Mode]

Allows you to set the SATA configuration.

[Disabled]   Disables the SATA function.

[IDE Mode]   Set to [IDE Mode] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.

[AHCI Mode]   Set to [AHCI Mode] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

[RAID Mode]   Set to [RAID Mode] when you want to create a RAID configuration from the SATA hard disk drives.

S.M.A.R.T. Status Check [Enabled]

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitor
system. When read/write of your hard disk errors occur, this feature allows the hard
disk to report warning messages during the POST.
Configuration options: [Enabled] [Disabled]

Hot Plug [Disabled]

Allows you to enable or disable the hot plug support of the SATA ports.
Configuration options: [Disabled] [Enabled]

3.5.5   USB Configuration

The items in this menu allow you to change the USB-related features.
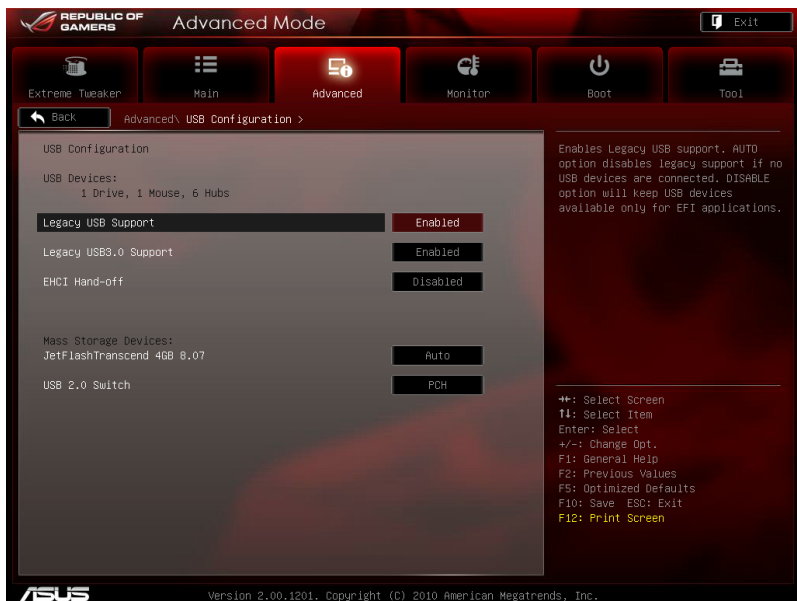
The **USB Devices** item shows the auto-detected values. If no USB device is
detected, the item shows **None**.

Legacy USB Support [Enabled]

[Enabled]   Enables the support for USB devices on legacy operating systems
                (OS).

[Disabled]   The USB devices can be used only for the BIOS setup program.

[Auto]   Allows the system to detect the presence of USB devices at
                startup. If detected, the USB controller legacy mode is enabled. If
                no USB device is detected, the legacy USB support is disabled.

Legacy USB3.0 Support [Enabled]

[Enabled]   Enables the support for USB 3.0 devices on legacy operating
              systems (OS).

[Disabled]   Disables the function.

EHCI Hand-off [Disabled]

[Enabled]   Enables the support for operating systems without an EHCI
              hand-off feature.

[Disabled]   Disables the function.

USB 2.0 Switch [PCH]

Allows you to select from PCH to NEC for USB 2.0 ports.
Configuration options: [PCH] [NEC]

3.5.6 Onboard Devices Configuration
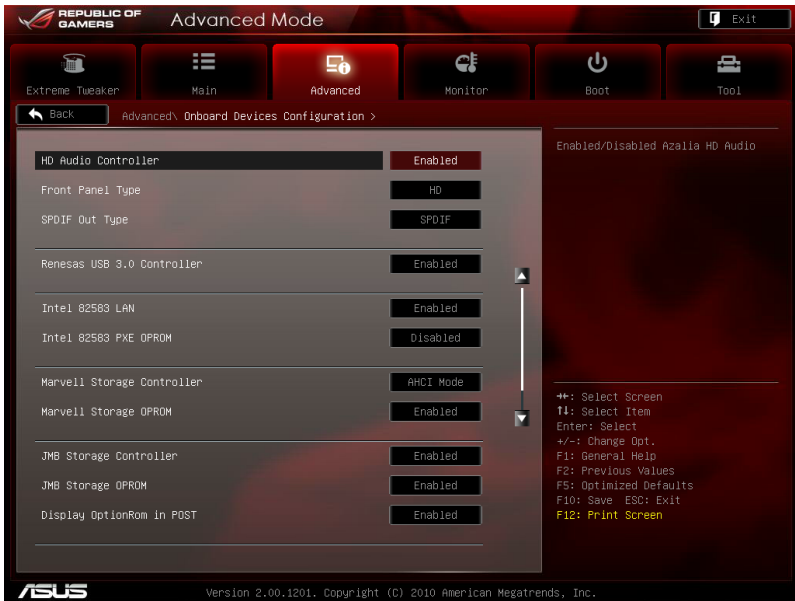
Scroll down for more items.

HD Audio Controller [Enabled]

[Enabled]   Enables the High Definition Audio Controller.

[Disabled]   Disables the controller.

> The following two items appear only when you set the **HD Audio Controller** item to [Enabled].

Front Panel Type [HD]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.

[HD]   Sets the front panel audio connector (AAFP) mode to high definition audio.

[AC97]   Sets the front panel audio connector (AAFP) mode to legacy AC'97.

SPDIF Out Type [SPDIF]

[SPDIF]   Set the SPDIF OUT mode to SPDIF.

[HDMI]   Set the SPDIF OUT mode to HDMI.

Renesas USB 3.0 Controller [Enabled]

[Enabled]   Enables the USB 3.0 controller.

[Disabled]   Disables the controller.

Intel 82583 LAN [Enabled]

[Enabled]   Enables the Intel 82583 LAN controller.

[Disabled]   Disables the controller.

Intel 82583 PXE OPROM [Disabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable boot option for Legacy Network Devices.
Configuration options: [Enabled] [Disabled]

Marvell Storage Controller [AHCI]

Allows you to select the Marvell storage controller operating mode.

[Disabled]   Disables the controller.

[IDE]   Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.

[AHCI]   Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

[RAID]   Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

Marvell Storage OPROM [Enabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the OptionRom of the Marvell storage controller.
Configuration options: [Enabled] [Disabled]

JMB Storage Controller [Enabled]

Allows you to enable or disable the JMB storage controller.
Configuration options: [Disabled] [Enabled]

If you want to use the full functin of the JMB storage contorller (ex. AHCI), we recommend that you set this item to [Enabled] and install the **JMicron JMB36X Controller Driver** from the motherboard support DVD.

JMB Storage OPROM [Enabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the OptionRom of the JMB storage controller.
Configuration options: [Enabled] [Disabled]

Display OptionRom in POST [Enabled]

This item appears only when you set the **JMB Storage OPROM** item to [Enabled] and allows you to display or hide the OptionRom of the JMB storage controller during POST. Configuration options: [Enabled] [Disabled]

Intel 82579 LAN [Enabled]

[Enabled]   Enables the GbE controller.

[Disabled]   Disables the controller.

Intel 82579 PXE OPROM [Disabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the PXE OptionRom of the Intel 82579LAN controller.
Configuration options: [Enabled] [Disabled]

3.5.7   APM
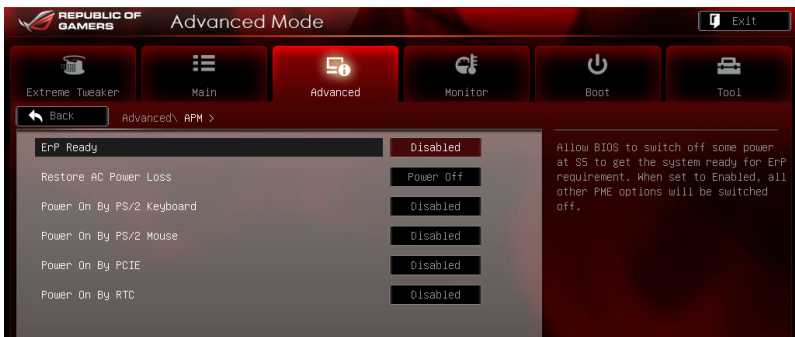
EuP Ready [Disabled]

[Disabled]   Disables the Energy Using Products (EuP) Ready function.

[Enabled]   Allows BIOS to switch off some power at S5 state to get system ready for the EuP requirement. When set to [Enabled], power for WOL, WO_USB, audio and onboard LEDs will be switched off at S5 state.

Restore AC Power Loss [Power Off]

[Power On]   The system goes into on state after an AC power loss.

[Power Off]   The system goes into off state after an AC power loss.

[Last State]   The system goes into either off or on state, whatever the system state was before the AC power loss.

Power On By PS/2 Keyboard [Disabled]

[Disabled]   Disables the Power On by a PS/2 keyboard.

[Space Bar]   Sets the Space Bar on the PS/2 keyboard to turn on the system.

[Ctrl-Esc]   Sets the Ctrl+Esc key on the PS/2 keyboard to turn on the system.

[Power Key]   Sets Power key on the PS/2 keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PS/2 Mouse [Disabled]

[Disabled]   Disables the Power On by a PS/2 mouse.

[Enabled]   Enables the Power On by a PS/2 mouse. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PCIE [Disabled]

[Disabled]   Disables the PCIE devices to generate a wake event.

[Enabled]   Enables the PCIE devices to generate a wake event.

Power On By RTC [Disabled]

[Disabled]   Disables RTC to generate a wake event.

[Enabled]   When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/Minute/Second** will become user-configurable with set values.

3.5.8   iROG Configuration
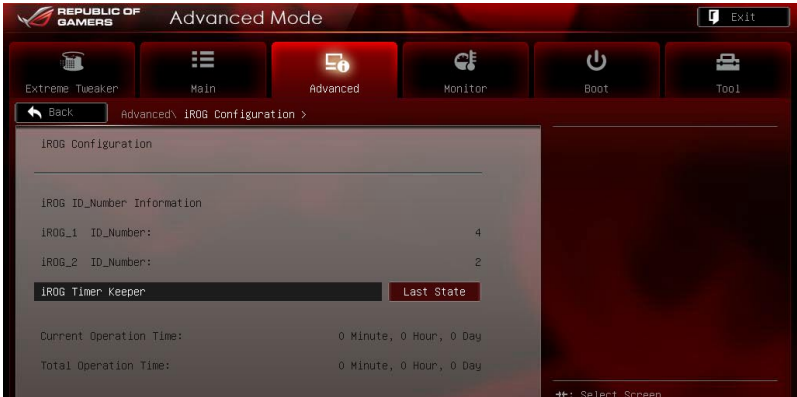
iROG Timer Keeper [Last State]

Allows you to set the iROG Time Keeper operation mode.
Configuration options: [Last State] [Disabled] [Enabled]

3.5.9   ROG Connect

ROG Connect [Enabled]

Allows you to enable or disable the ROG Connect function.
Configuration options: [Enabled] [Disabled]

RC Poster Mode [String]

RC Poster describes what occurs during the POST.
Configuration options: [String] [Code]

3.5.10   LED Control

The LED Control menu items allow you to change the advanced settings for the onboard LEDs.

⚠️ Take caution when changing the settings of the LED Control menu items. Incorrect field values can cause the system to malfunction.
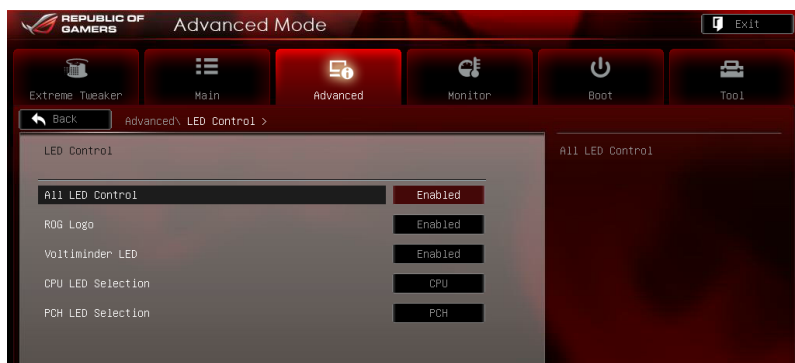
All LED Control [Enabled]

Allows you to enable or disable the onboard LEDs control.
Configuration options: [Enabled] [Disabled]

✏️ The following items appear only when you set **All LED Control** to [Enabled].

ROG Logo [Enabled]

Allows you to enable or disable the onboard ROG logo LED.
Configuration options: [Enabled] [Disabled]

Voltiminder LED [Enabled]

Allows you to enable or disable the onboard Voltiminder LED.
Configuration options: [Enabled] [Disabled]

CPU LED Selection [CPU]

Allows you to switch the onboard CPU LED display between CPU voltage [CPU], VCCSA voltage [VCCSA], VCCIO voltage [VCCIO], and CPU PLL [CPU PLL]. Configuration options: [CPU] [VCCSA] [VCCIO] [CPU PLL]

PCH LED Selection [PCH]

Allows you to switch the onboard PCH LED display between PCH voltage [PCH], and PCH PLL [PCH PLL]. Configuration options: [PCH] [PCH PLL]

3.6 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.
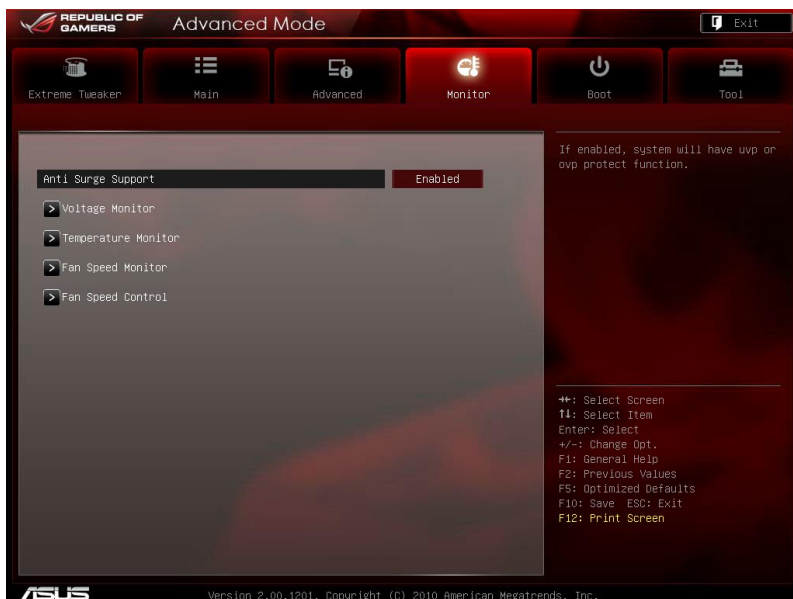
Anti Surge Support [Enabled]

This item allows you to enable or disable the Anti Surge function.
Configuration options: [Disabled] [Enabled]

Voltage Monitor

CPU Voltage; 3.3V Voltage; 5V Voltage; 12V Voltage; DRAM Voltage; PCH Voltage; PCH PLL Voltage; VCCSA/IO Voltage; CPU PLL Voltage; NF200 Voltage
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

Temperature Monitor

CPU Temperature; MB Temperature; OPT1/2/3 Temperature[xxxºC/xxxºF]
The onboard hardware monitor automatically detects and displays the CPU, motherboard, and the assigned devices temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

PCH Overheat Protection [90ºC]
The system automatically shuts down when the PCH is heated over the set temperature to protect it from damage.
Configuration options: [Disabled] [70ºC] [80ºC] [90ºC] **[100ºC]**

PCH OPT TEMP1/2/3 Overheat Protection [90ºC]
Allows you to set the temperature over which the system automatically shuts
down when any of the thermal sensor cables connected to the motherboard
detects device overheat to protect the device from damage.
Configuration options: [Disabled] [70ºC] [80ºC] [90ºC] **[100ºC]**

CPU Socket Temperature [xxxºC/xxxºF]
The onboard hardware monitor automatically detects and displays the
CPU socket temperatures. Select [Ignored] if you do not wish to display the
detected temperatures.

CPU Socket Temperature Protection [90ºC]
The system automatically shuts down when the CPU socket is heated over
the set temperature to protect it from damage.
Configuration options: [Disabled] [70ºC] [80ºC] [90ºC] **[100ºC]**

Fan Speed Monitor

CPU FAN; Chassis FAN1/2/3 Speed; Power FAN;
Opt 1/2/3 FAN Speed [xxxxRPM] or [Ignored] / [N/A]
The onboard hardware monitor automatically detects and displays the CPU
fan, chassis fan, power fan, and optional fan speed in rotations per minute
(RPM). If any of the fans is not connected to the motherboard, the field shows
[N/A]. These items are not user-configurable.

Fan Speed Control

CPU Q-Fan Control [Disabled]
Allows you to enable or disable the CPU fan controller.

[Disabled]   Disables the CPU Q-fan controller.

[Enabled]   Enables the CPU Q-fan controller.

The following three items appear when you enable the CPU Fan Control
feature.

CPU Fan Speed Low Limit [600 RPM]
Allows you to set the low speed limit of the CPU fan and the system sends
warning message when the fan speed drops below the set value.
Configuration options: [Ignored] [200 RPM] [300 RPM] [400 RPM] [500 RPM]
[600 RPM]

CPU Fan Profile [Standard]
Allows you to set the appropriate performance level of the CPU fan.

[Standard]   Sets to [Standard] to make the chassis fan automatically adjust depending on the CPU temperature.

[Silent]   Sets to [Silent] to minimize the fan speed for quiet CPU fan operation.

[Turbo]   Set to [Turbo] to achieve maximum CPU fan speed.

[Manual]   Sets to [Manual] to display more items for you to manually adjust the CPU upper/lower temperature, and CPU fan upper/lower duty cycle.

The following four items appear only when you set **CPU Fan Profile** to [Manual].

CPU Upper Temperature [70]
Use the <+> and <-> keys to adjust the upper limit of the CPU temperature. The values range from 20ºC to 75ºC.

CPU Fan Max. Duty Cycle(%) [100]
Use the <+> and <-> keys to adjust the maximum CPU fan duty cycle. The values range from 60% to 100%. When the CPU temperature reaches the upper limit, the CPU fan will operate at the maximum duty cycle.

CPU Lower Temperature [20]
Displays the lower limit of the CPU temperature.

CPU Fan Min. Duty Cycle(%) [20]
Use the <+> and <-> keys to adjust the minimum CPU fan duty cycle. The values range from 0% to 100%. When the CPU temperature is under 40ºC, the CPU fan will operate at the minimum duty cycle.

Chassis Q-Fan Control [Enabled]

[Disabled]   Disables the Chassis Q-Fan control feature.

[Enabled]   Enables the Chassis Q-Fan control feature.

Chassis Fan Speed Low Limit [600 RPM]

This item appears only when you enable the **Chassis Q-Fan Control** feature and allows you to disable or set the chassis fan warning speed.
Configuration options: [Ignore] [200 RPM] [300 RPM] [400 RPM] [500 RPM] [600 RPM]

Chassis Fan Profile [Standard]

This item appears only when you enable the **Chassis Q-Fan Control** feature and allows you to set the appropriate performance level of the chassis fan.

[Standard] Sets to [Standard] to make the chassis fan automatically adjust depending on the chassis temperature.

[Silent] Sets to [Silent] to minimize the fan speed for quiet chassis fan operation.

[Turbo] Sets to [Turbo] to achieve maximum chassis fan speed.

[Manual] Sets to [Manual] to assign detailed fan speed control parameters.

The following four items appear only when you set **Chassis Fan Profile** to [Manual].

Chassis Upper Temperature [70]
Use the <+> and <-> keys to adjust the upper limit of the CPU temperature. The values range from 40ºC to 90ºC.

Chassis Fan Max. Duty Cycle(%) [100]
Use the <+> and <-> keys to adjust the maximum chassis fan duty cycle. The values range from 60% to 100%. When the chassis temperature reaches the upper limit, the chassis fan will operate at the maximum duty cycle.

Chassis Lower Temperature [40]
Displays the lower limit of the chassis temperature.

Chassis Fan Min. Duty Cycle(%) [60]
Use the <+> and <-> keys to adjust the minimum chassis fan duty cycle. The values range from 0% to 100%. When the chassis temperature is under 40ºC, the chassis fan will operate at the minimum duty cycle.

PWRFAN Control [Disabled]

Allows you to select the optional fan control mode. When this item is set to [Duty Mode], you can configure the **PWRFAN Duty**.
Configuration options: [Disabled] [Duty Mode]

OPTFAN 1/2/3 Control [Disabled]

Allows you to select the optional fan control mode. When this item is set to [Duty Mode], you can configure the **OPT Fan1/2/3 Duty** item. If you set this item to [User Mode], you are allowed to configure the **OPT Fan1/2/3 Low Speed Temp** and **OPT Fan1/2/3 Full Speed Temp** item.
Configuration options: [Disabled] [Duty Mode] [User Mode]

PWRFAN Duty; OPTFAN 1/2/3 Duty [60%]
Allows you to set the fan duty cycle. This item appears when the **PWRFAN Control**
or **OPTFAN1/2/3 Control** item is set to [Duty Mode].
Configuration options: [40%] [50%] [60%] [70%] [80%] [90%]

OPTFAN 1/2/3 Low Speed Temp [25˚C]
Allows you to set the temperature at which the power fan rotates at low speed.
This item appears when the **OPTFAN1/2/3 Control** item is set to [User Mode].
Configuration options: [25˚C] [30˚C] [35˚C] [40˚C]

OPTFAN 1/2/3 Full Speed Temp [60˚C]
Allows you to set the temperature at which the power fan rotates at full speed.
This item appears when the **OPTFAN1/2/3 Control** item is set to [User Mode].
Configuration options: [60˚C] [70˚C] [80˚C] [90˚C]

3.7   Boot menu

The Boot menu items allow you to change the system boot options.
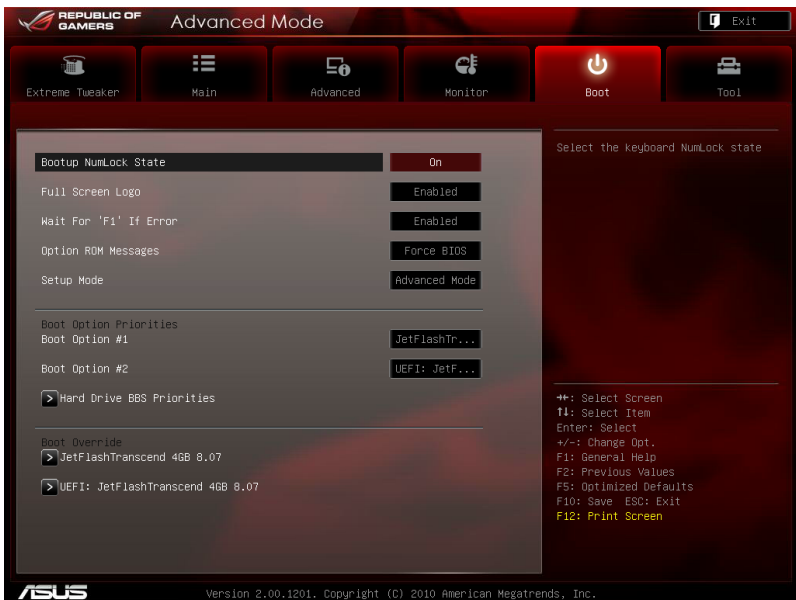
Bootup NumLock State [On]

[On]   Sets the power-on state of the NumLock to [On].

[Off]   Sets the power-on state of the NumLock to [Off].

Full Screen Logo [Enabled]

[Enabled]   Enables the full screen logo display feature.

[Disabled] Disables the full screen logo display feature.

> Set this item to [Enabled] to use the ASUS MyLogo 2™ feature.

Wait for 'F1' If Error [Enabled]

When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs.

Option ROM Messages [Force BIOS]

[Force BIOS] The third-party ROM messages will be forced to display during the boot sequence.

[Keep Current] The third-party ROM messages will be displayed only if the third-party manufacturer had set the add-on device to do so.

Setup Mode [Advanced Mode]

[Advanced Mode] Sets Advanced Mode as the default screen for entering the BIOS setup program.

[EZ Mode] Sets EZ Mode as the default screen for entering the BIOS setup program.

Boot Option Priorities

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

> •   To select the boot device during system startup, press <F8> when ASUS Logo appears.
>
> •   To access Windows OS in Safe Mode, do any of the following:
>   - Press <F5> when ASUS Logo appears.
>   - Press <F8> after POST.

Boot Override

These items displays the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

3.8 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.

3.8.1 ASUS EZ Flash Utility

Allows you to run ASUS EZ Flash Utility. When you press <Enter> to start the application.

For more details, refer to **section 3.10.2 ASUS EZ Flash Utility**.

3.8.2 Asus SPD Information

This item displays the SPD information.

3.8.3   ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.
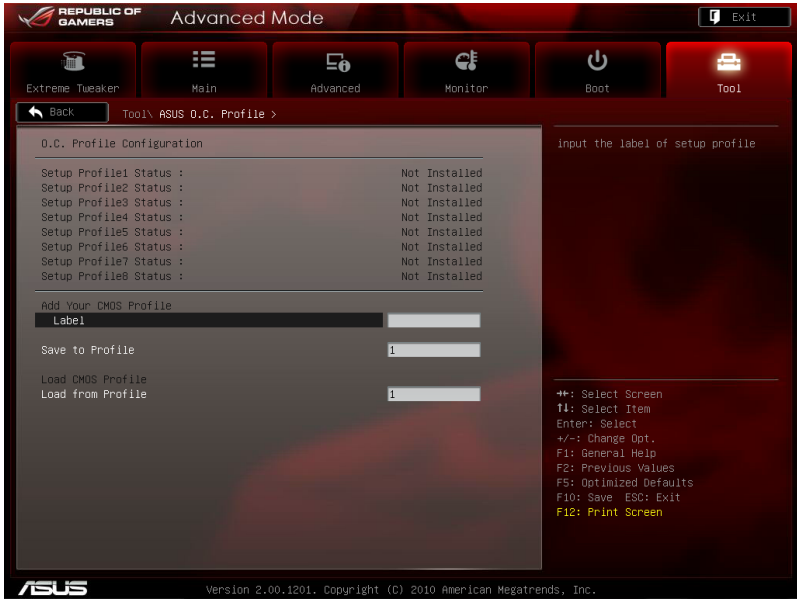
The **Setup Profile Status** items show **Not Installed** if no profile is created.

Save to Profile

Allows you to save the current BIOS settings to the BIOS Flash, and create a profile. Key in a profile number from one to eight, press <Enter>, and then select **Yes**.

Load from Profile

Allows you to load the previous BIOS settings saved in the BIOS Flash. **Key in the profile number that saved your BIOS settings, press <Enter>, and then select **Yes**.

- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!

- We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.

3.8.4 GO Button File

This menu allows you to set the GO Button files, and load the desired GO Button file.
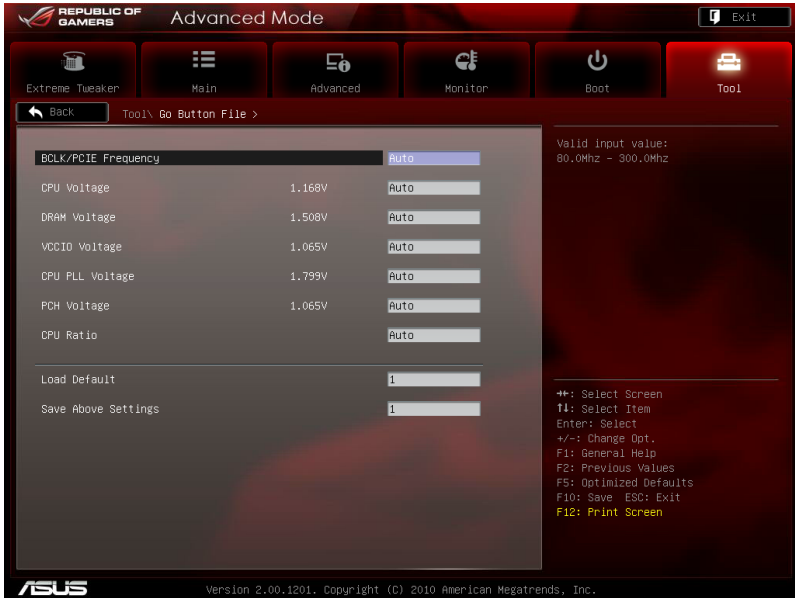
BCLK/PEG Frequency; CPU Voltage; DRAM Voltage; VCCIO Voltage; CPU PLL Voltage; PCH Voltage; CPU Ratio;

Allows you to use the <+> and <-> keys to adjust the values for each item. Refer to **3.3 Extreme Tweaker** Menu for details.

Load Default

Allows you to load default settings.

Save Above Settings

Allows you to save the adjusted values for specific items as a GO Button file.

3.8.5   BIOS FlashBack
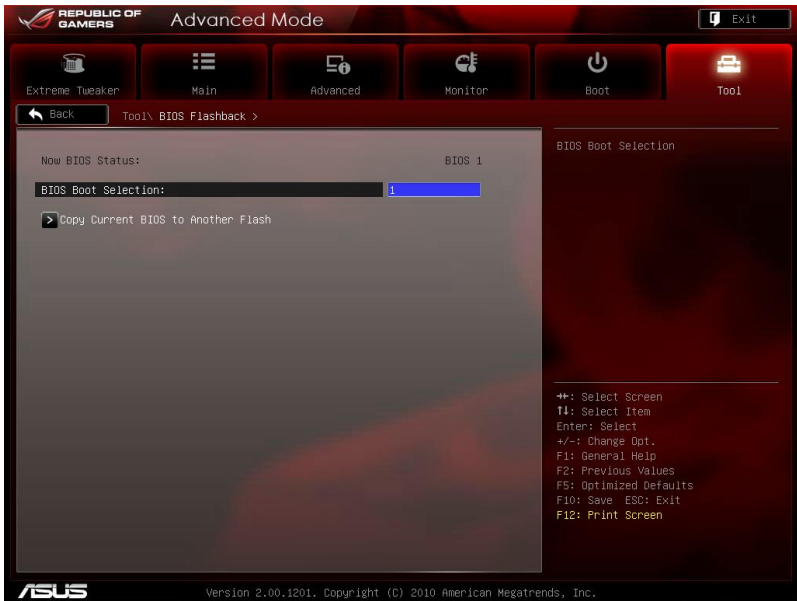
BIOS Boot Selection [1]

Use the numeric key to change the BIOS ROM for booting.

3.9   Exit menu

The Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items. You can access the **EZ Mode** from the Exit menu.
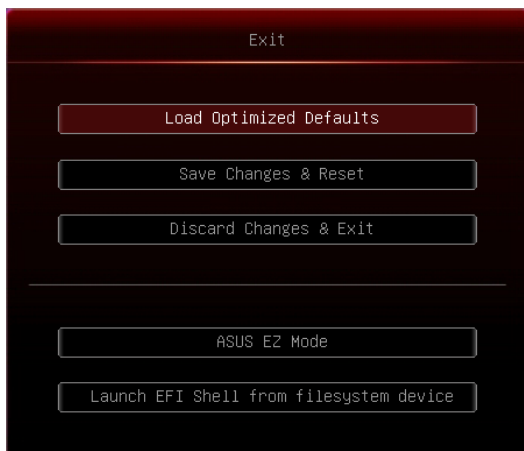
Load Optimized Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Yes** to load the default values.

Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select **Yes** to save changes and exit.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

ASUS EZ Mode

This option allows you to enter the EZ Mode screen.

Launch EFI Shell from filesystem device

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.

3.10 Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility, or performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, **DO NOT manually update the BIOS**. Inappropriate BIOS updating may result in the system's failure to boot. Carefully follow the instructions of this chapter to update your BIOS if necessary.

Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

The following utilities allow you to manage and update the motherboard BIOS setup program.

1. **ASUS Update:** Updates the BIOS in Windows® environment.
2. **ASUS EZ Flash 2:** Updates the BIOS using a USB flash drive.
3. **ASUS CrashFree BIOS 3:** Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.
4. **ASUS BIOS Updater:** Updates and backups the BIOS in DOS environment using the motherboard support DVD and a USB flash disk drive.

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the **ASUS Update** or **BIOS Updater** utilities.

3.10.1   ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Update the BIOS directly from the Internet
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Save the current BIOS file
- View the BIOS version information

This utility is available in the support DVD that comes with the motherboard package.

> ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Launching ASUS Update

After installing AI Suite II from the motherboard support DVD, launch ASUS Update by clicking **Update > ASUS Update** on the AI Suite II main menu bar.

> Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. From the ASUS Update screen, select **Update BIOS from Internet**, and then click **Next**.

2. Select the ASUS FTP site nearest you to avoid network traffic.

    If you want to enable the BIOS downgradable function and auto BIOS backup function, check the checkboxs before the two items on the screen.
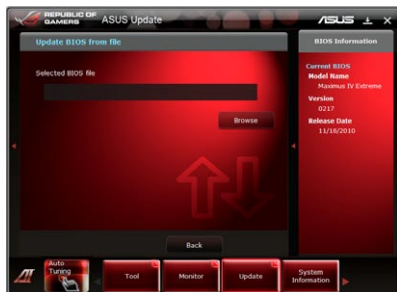
3. Select the BIOS version that you want to download. Click **Next**.

4. You can decide whether to change the BIOS boot logo, which is the image appearing on screen during the Power-On Self-Tests (POST). Click **Yes** if you want to change the boot logo or **No** to continue.

5. Click Browse to locate your desired picture file.

6. Adjust the picture resolution if needed and click **Next** to continue.

7. Follow the onscreen instructions to complete the update process.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. From the ASUS Update screen,
    select **Update BIOS from file**,
    and then click **Next**.

2. Locate the BIOS file from the
    Open window, click **Open**, and
    click **Next**.
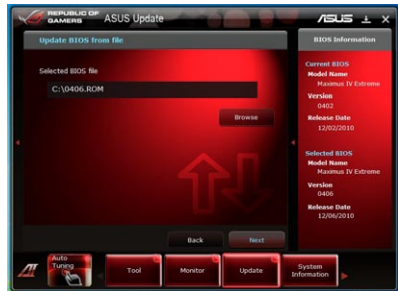
3. You can decide whether to
    change the BIOS boot logo. Click
    Yes if you want to change the
    boot logo or **No** to continue.

4. Follow the onscreen instructions
    to complete the update process.

> •   The screenshots in this section are for reference only. The actual BIOS
>   information vary by models.
>
> •   Refer to the software manual in the support DVD or visit the ASUS website
>   at www.asus.com for detailed software configuration.

3.10.2   ASUS EZ Flash Utility

The ASUS EZ Flash Utility feature allows you to update the BIOS without having to use a bootable floppy disk or an OS-based utility.

> Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash Utility:

1.   Insert the USB flash disk that contains the latest BIOS file to the USB port.
2.   Enter the Advanced Mode of the BIOS setup program. Go to the **Tool** menu to select **ASUS EZ Flash Utility** and press <Enter> to enable it.
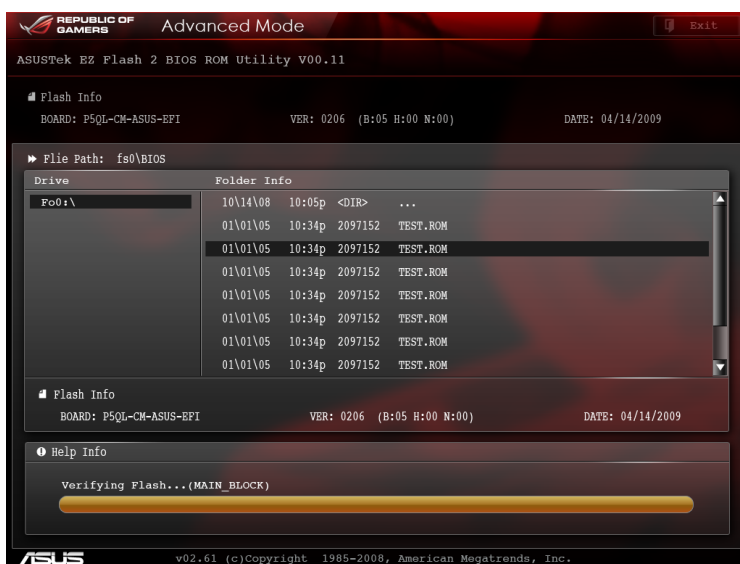
3.   Press <Tab> to switch to the **Drive** field.
4.   Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
5.   Press <Tab> to switch to the **Folder Info** field.
6.   Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.

- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu. See section **3.10 Exit Menu** for details.

3.10.3   ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.

The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at support.asus.com and save it to a USB flash drive.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 2 utility automatically.
4. The system requires you to enter BIOS Setup to recover BIOS setting. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

3.10.4 ASUS BIOS Updater

The ASUS BIOS Updater allows you to update BIOS in DOS environment. This utility also allows you to copy the current BIOS file that you can use as a backup when the BIOS fails or gets corrupted during the updating process.

> The succeeding utility screens are for reference only. The actual utility screen displays may not be same as shown.

Before updating BIOS

1. Prepare the motherboard support DVD and a USB flash drive in FAT32/16 format and single partition.

2. Download the latest BIOS file and BIOS Updater from the ASUS website at http://support.asus.com and save them on the USB flash drive.

> • NTFS is not supported under DOS environment. Do not save the BIOS file and BIOS Updater to a hard disk drive or USB flash drive in NTFS format.
>
> • Do not save the BIOS file to a floppy disk due to low disk capacity.

3. Turn off the computer and disconnect all SATA hard disk drives (optional).

Booting the system in DOS environment

1. Insert the USB flash drive with the latest BIOS file and BIOS Updater to the USB port.

2. Boot your computer. When the ASUS Logo appears, press <F8> to show the **BIOS Boot Device Select Menu**. Insert the support DVD into the optical drive and select the optical drive as the boot device.

```
              Please select boot device:

    SATA:  XXXXXXXXXXXXXXX
    USB  XXXXXXXXXXXXXXXXX
    UEFI:  XXXXXXXXXXXXXXX
    Enter Setup

       ↑ and ↓ to move selection
       ENTER to select boot device
       ESC to boot using defaults
```
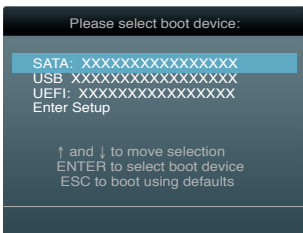
3. When the **Make Disk** menu appears, select the **FreeDOS command prompt** item by pressing the item number.

4. At the FreeDOS prompt, type **d:** and press <Enter> to switch the disk from Drive C (optical drive) to Drive D (USB flash drive).

```
Welcome to FreeDOS (http://www.freedos.org)!
C:\>d:
D:\>
```

Backing up the current BIOS

To backup the current BIOS file using the BIOS Updater

Ensure that the USB flash drive is not write-protected and has enough free space to save the file.

1.   At the FreeDOS prompt, type **bupdater /o[filename]** and press <Enter>.

```
D:\>bupdater /oOLDBIOS1.rom
```

Filename Extension

The [filename] is any user-assigned filename with no more than eight alphanumeric characters for the filename and three alphanumeric characters for the extension.

2.   The BIOS Updater backup screen appears indicating the BIOS backup process. When BIOS backup is done, press any key to return to the DOS prompt.

```
        ASUSTek BIOS Updater for DOS V1.18 [2010/04/29]

        Current ROM                        Update ROM
    BOARD: Maximus IV Extreme-Z    BOARD: Unknown
    VER: 0239                      VER: Unknown
    DATE: 10/08/2010               DATE: Unknown
PATH: A:\

        BIOS backup is done! Press any key to continue.

    Note
Saving BIOS:
```
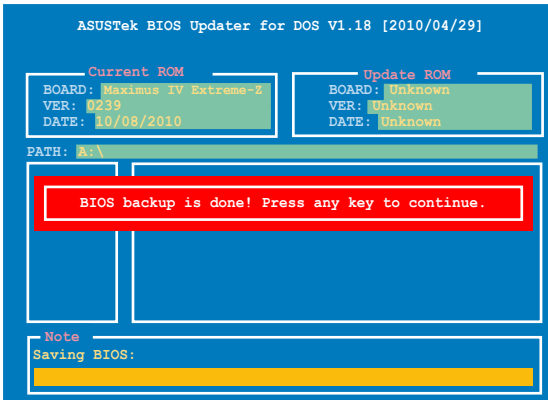
Updating the BIOS file

To update the BIOS file using BIOS Updater

1. At the FreeDOS prompt, type **bupdater /pc /g** and press <Enter>.

```
D:\>bupdater /pc /g
```

2. The BIOS Updater screen appears as below.

```
    ASUSTek BIOS Updater for DOS V1.18 [2010/04/29]


        Current ROM                         Update ROM
    BOARD: Maximus IV Extreme-Z         BOARD: Unknown
    VER: 0204                           VER: Unknown
    DATE: 08/05/2010                    DATE: Unknown

    PATH: A:\

    A:          P8P67D.ROM      4194304 2010-08-05 17:30:48






      Note
      [Enter] Select or Load      [Tab] Switch      [V] Drive Info
      [Up/Down/Home/End] Move      [B] Backup      [Esc] Exit
```
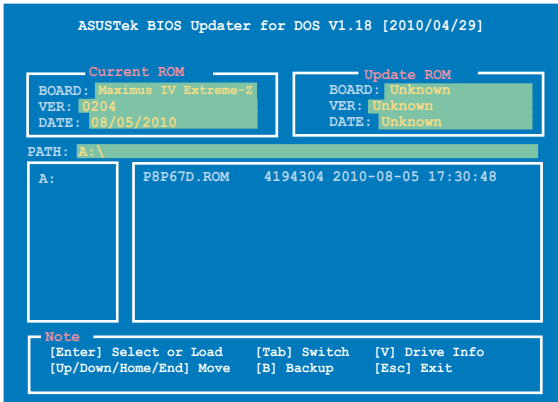
3. Press <Tab> to switch between screen fields and use the <Up/Down/Home/
    End> keys to select the BIOS file and press <Enter>. BIOS Updater checks
    the selected BIOS file and prompts you to confirm BIOS update.

```
        Are you sure to update BIOS?
              Yes      No
```

4. Select **Yes** and press <Enter>. When BIOS update is done, press <ESC> to
    exit BIOS Updater. Restart your computer.

DO NOT shut down or reset the system while updating the BIOS to prevent
system boot failure!

- For BIOS Updater version 1.04 or later, the utility automatically exits to the
  DOS prompt after updating BIOS.

- Ensure to load the BIOS default settings to ensure system compatibility and
  stability. Select the **Load Optimized Defaults** item under the **Exit** BIOS
  menu. See Chaper 3 of your motherboard user manual for details.

- Ensure to connect all SATA hard disk drives after updating the BIOS file if
  you have disconnected them.

This chapter describes the contents of
the support DVD that comes with the
motherboard package and the software.

Software
support

4

Chapter summary

4

4.1 Installing an operating system

This motherboard supports Windows® XP/ 64-bit XP/ Vista / 64-bit Vista / 7 / 64-bit 7 operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Ensure that you install the Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

4.2 Support DVD information

The support DVD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

> The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.

4.2.1 Running the support DVD

Place the support DVD into the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer. Click each menu tab and select the items you want to install.

The Drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to use the devices.

The Make Disk menu contains items to create the RAID/AHCI driver disk.

The Manual menu contains the list of supplementary user manuals. Click an item to open the folder of the user manual.

The Utilities menu shows the applications and other software that the motherboard supports.

Click the Contact tab to display the ASUS contact information.

Click an icon to display DVD/ motherboard information

Click an item to install

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

4.2.2 Obtaining the software manuals

The software manuals are included in the support DVD. Follow the instructions below to get the necessary software manuals.

The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening the files.

1. Click the **Manual** tab. Click **ASUS Motherboard Utility Guide** from the manual list on the left.

2. The **Manual** folder of the support DVD appears. Double-click the folder of your selected software.
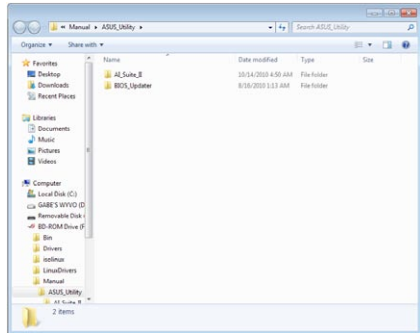
3. Some software manuals are provided in different languages. Double-click the language to show the software manual.
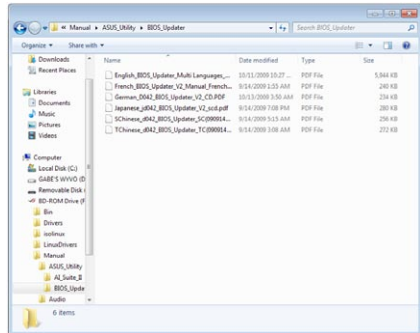
The screenshots in this section are for reference only. The actual software manuals containing in the support DVD vary by models.

4.3 Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

4.3.1 AI Suite II

AI Suite II is an all-in-one interface that integrates several ASUS utilities and allows users to launch and operate these utilities simultaneously.

Installing AI Suite II

To install AI Suite II on your computer

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has enabled the Autorun feature.
2. Click the Utilities tab, then click **AI Suite II**.
3. Follow the onscreen instructions to complete installation.

Using AI Suite II

AI Suite II automatically starts when you enter the Windows® operating system (OS). The AI Suite II icon appears in the Windows® notification area. Click the icon to open the AI Suite II main menu bar.

Click each button to select and launch a utility, to monitor the system, to update the motherboard BIOS, to display the system information, and to customize the settings of AI Suite II.

Click to customize the interface settings

Click to show the system information

Click to update the motherboard BIOS

Click to monitor sensors or CPU frequency

Click to select a utility

Shortcut to the Auto Tuning Mode under TurboV EVO
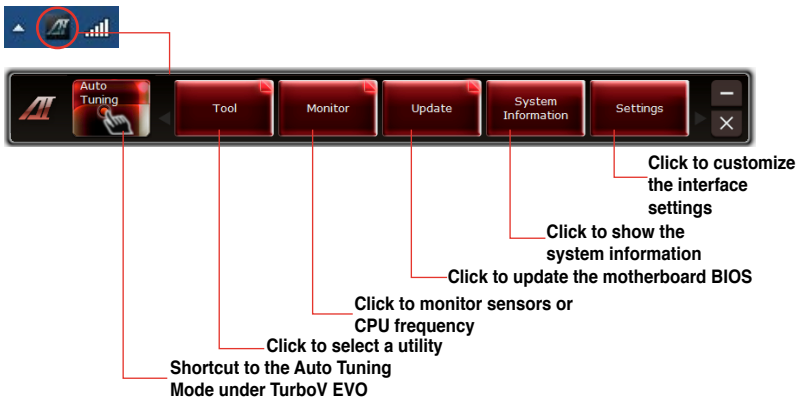
> • The **Auto Tuning** button appears only on models with the TurboV EVO function.
>
> • The applications in the Tool menu vary with models.
>
> • The screenshots of AI Suite II in this user manual are for reference only. The actual screenshots vary with models.
>
> • Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.2   DIGI+ VRM

ASUS DIGI+ VRM allows you to adjust VRM voltage and frequency modulation to enhance reliability and stability. It also provides the highest power efficiency, generating less heat to longer component lifespan and minimize power loss.

After installing AI Suite II from the motherboard support DVD, launch DIGI+ VRM by clicking **Tool > DIGI+ VRM** on the AI Suite II main menu bar.

Undo all changes without applying

Apply all changes immediately

No.	Function description
1	**DIGI+ VRM Load-line Calibration** Higher load-line calibration could get higher voltage and good overclocking performance but increase the CPU and VRM thermal.
2	**DIGI+ VRM CPU Current Capability** DIGI+ VRM CPU Current Capability provides wider total power range for overclocking. A higher value setting gets higher VRM power consumption delivery.
3	**DIGI+ VRM Frequency** Switching frequency will affect the VRM transient response and component thermal. Higher frequency gets quicker transient response.
4	**DIGI+ VRM Phase Control** Increase phase number under heavy system loading to get more transient and better thermal performance. Reduce phase number under light system loading to increase VRM efficiency.
5	**DIGI+ VRM Duty Control** DIGI+ VRM Duty Control adjusts the current of every VRM phase and the thermal of every phase component.

- The actual performance boost may vary depending on your CPU specification.

- Do not remove the thermal module. The thermal conditions should be monitored.

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.3 TurboV EVO

ASUS TurboV EVO introduces **TurboV** that allows you to manually adjust the CPU frequency and related voltages as well as **Auto Tuning** function that offers automatic and easy overclocking and system level up. After installing AI Suite II from the motherboard support DVD, launch TurboV EVO by clicking **Tool > TurboV EVO** on the AI Suite II main menu bar.

> Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

TurboV

TurboV allows you to overclock the BCLK frequency, CPU voltage, IMC voltage, and DRAM Bus voltage in WIndows® environment and takes effect in real-time without exiting and rebooting the OS.

> Refer to the CPU documentation before adjusting CPU voltage settings. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.

> For system stability, all changes made in **TurboV** will not be saved to BIOS settings and will not be kept on the next system boot. Use the **Save Profile** function to save your customized overclocking settings and manually load the profile after Windows starts.

Auto Tuning Mode

TurboV
Load profile
Target values

Current values

Click to show / hide more settings

Save the current settings as a new profile

Voltage Adjustment bars

Undoes all changes without applying

Click to restore all start-up settings

Applies all changes immediately

> For advanced overclock ability, adjust first the BIOS items, and then proceed more detailed adjustments in **More Settings**.

Using Advanced Mode

Click **More Settings**, and then click the **Advanced Mode** tab to adjust the advanced voltage settings.

Advanced mode
Target values

Voltage
Adjustment
bars

Current values
Click to restore
all start-up
settings

Undoes all changes
without applying
Applies all changes
immediately

CPU Ratio

Allows you to manually adjust the CPU ratio.

> The first time you use **CPU Ratio**, go to **Extreme Tweaker** in BIOS and set the **Turbo Ratio** item to **[All cores mode (adjustable in OS)]**, or activate CPU Ratio by clicking the ON button on the CPU Ratio function screen.

1. Click **More Settings**, and then click the **CPU Ratio** tab.
2. Click the ON button to activate CPU Ratio.
3. You will requested to restart the system. Click **Yes** to make the change take effect.

CPU Ratio

Click to restore
all start-up
settings

Click to activate
the CPU Ratio

Applies all changes
immediately

Undoes all changes
without applying

4. Drag the adjustment bar upwards or downwards to the desired value.

Adjustment bar

> • Set the **CPU Ratio Setting** item in BIOS to [Auto] before using the CPU Ratio function in TurboV. Refer to Chapter 3 of your motherboard user manual for details.
>
> • The CPU Ratio bars show the status of the CPU cores, which vary with your CPU model.

Auto Tuning

ASUS TurboV EVO includes two auto tuning modes, providing the most flexible auto-tuning options.

> • The overclocking result varies with the CPU model and the system configuration.
>
> • To prevent overheating from damaging the motherboard, a better thermal environment is strongly recommended.

• **Fast Tuning**: fast CPU overclocking
• **Extreme Tuning**: extreme overclocking for CPU and memory

Using Fast Tuning

1. Click the **Auto Tuning** tab and then click **Fast**.

2. Read through the warning messages and click **OK** to start auto-overclocking.

3. TurboV automatically
    overclocks the CPU, saves
    BIOS settings and restarts
    the system. After re-entering
    Windows, a message appears
    indicating auto tuning success.
    Click **OK** to exit.

Using Extreme Tuning

1. Click the **Auto Tuning** tab and then click **Extreme**.
2. Read through the warning
    messages and click **OK** to start
    auto-overclocking.

3. TurboV automatically
    overclocks the CPU and
    memory and restarts the
    system. After re-entering
    Windows, a message
    appears indicating the current
    overclocking result. To keep the
    result, click **Stop**.

4. If you did not click **Stop** in the previous step, TurboV automatically starts further system overclocking and stability test. An animation appears indicating the overclocking process. Click **Stop** if you want to cancel the Overclocking process.

5. TurboV automatically adjusts and saves BIOS settings and restarts the system. After re-entering Windows, a message appears indicating auto tuning success. Click **OK** to exit.

4.3.4 EPU

EPU is an energy-efficient tool that satisfies different computing needs. This utility provides several modes that you can select to save system power. Selecting Auto mode will have the system shift modes automatically according to current system status. You can also customize each mode by configuring settings like CPU frequency, GPU frequency, vCore Voltage, and Fan Control.

Launching EPU

After installing AI Suite II from the motherboard support DVD, launch EPU by clicking **Tool > EPU** on the AI Suite II main menu bar.

Displays the following message if no VGA power saving engine is detected.

Displays current mode

The items lighting up means power saving engine is activated

Displays the amount of CO2 reduced

*Shifts between the display of Total and Current CO2 reduced

Displays the current CPU power

Advanced settings for each mode

Displays the system properties of each mode

Multiple system operating modes

> *• Select **From EPU Installation** to show the CO2 that has been reduced since you installed EPU.
>
> *• Select **From the Last Reset** to show the total CO2 that has been reduced since you click the Clear button [Clear].
>
> • Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.5 FAN Xpert

Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's system loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

Launching FAN Xpert

After installing AI Suite II from the motherboard support DVD, launch FAN Xpert by clicking **Tool > Fan Xpert** on the AI Suite II main menu bar.

Using FAN Xpert

Click **Fan Name** to select a fan and then click **Setting** to select a preset mode for your selected fan.

Click to select a fan type

Click to select a fan profile

Click to apply the settings

Click to discard the settings

Fan setting

- **Disable:** disables the **Fan Xpert** function.
- **Standard:** adjusts fan speed in a moderate pattern.
- **Silent:** minimizes fan speed for quiet fan operation.
- **Turbo:** maximizes the fan speed for the best cooling effect.
- **Intelligent:** automatically adjusts the CPU fan speed according to the ambient temperature.
- **Stable:** fixes the CPU fan speed to avoid noise caused by the unsteady fan rotation. However, the fan will speed up when the temperature exceeds 70°C.
- **User:** Allows you to configure the CPU fan profile under certain limitations.

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.6   Probe II

Probe II is a utility that monitors the computer's vital components, and detects and alerts you of any problem with these components. Probe II senses fan rotations, CPU temperature, and system voltages, among others. With this utility, you are assured that your computer is always at a healthy operating condition.

Launching Probe II

After installing AI Suite II from the motherboard support DVD, launch Probe II by clicking **Tool > Probe II** on the AI Suite II main menu bar.

Configuring Probe II

Click the **Voltage/Temperature/Fan Speed** tabs to activate the sensors or to adjust the sensor threshold values. The **Preference** tab allows you to customize the time interval of sensor alerts, or change the temperature unit.

Saves your configuration

Loads your saved configuration

Loads the default threshold values for each sensor

Applies your changes

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.7 ROG CPU-Z

ROG CPU-Z allows you to monitor your system status in real-time.

To launch ROG CPU-Z

1. Double-click the CUPID ROG CPU-Z icon on the desktop.
2. Click the tabs on the top to switch display pages.
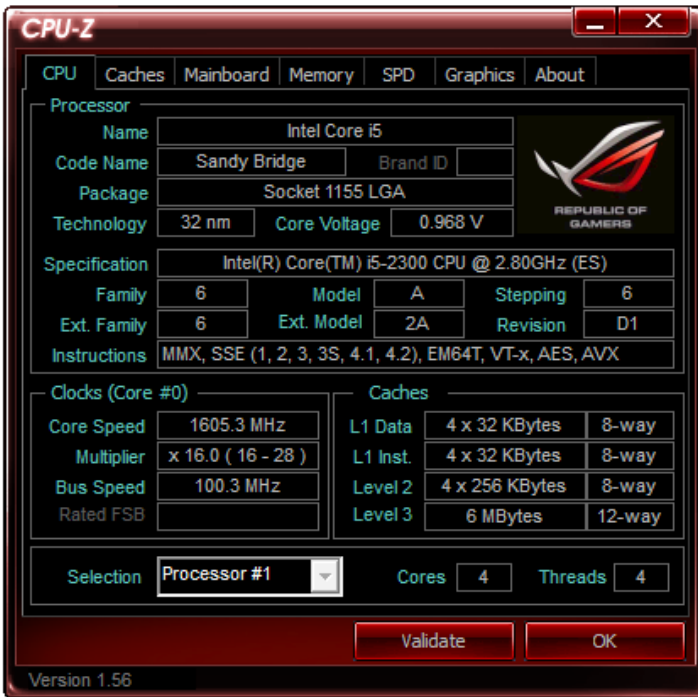
Click the **REPUBLIC OF GAMERS** icon to access ROG official website at http://rog.asus.com/.

4.3.8   MemTweakIt

MemTweakIt allows you to adjust the timing of your installed memory and increase your system potential.

To launch MemTweakIt

1.   Double-click the MemTweakIt icon on the desktop.

2.   Click the down arrow button after each timing to display the available value and select your preferred timing.

3.   Click **Apply** to apply your configuration and you will see your **DRAM Efficiency Score** on the top.

4.   Click **OK** to leave the setup.

A wrong configuration of the DRAM timings may result in an unstable system. Restart your system if needed.

Click **About** on the top to switch the screen and the information of this application is displayed as shown. Click the **REPUBLIC OF GAMERS** icon to access ROG official website at http://rog. asus.com/.
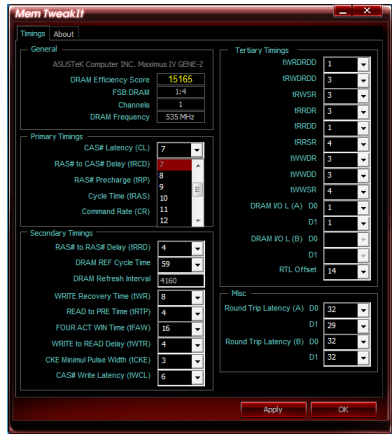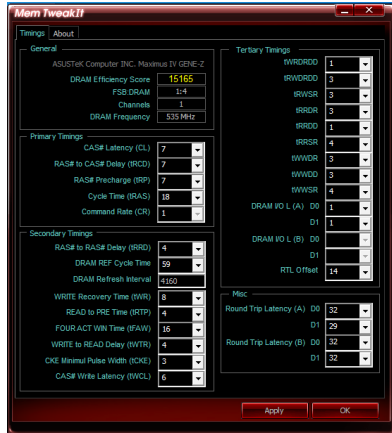
4.3.9   ROG Connect

ROG Connect allows you to monitor and adjust the local PC through your remote PC.

Setting up USB connection between your local and remote PC

> • Install **ROG Connect** on the remote PC from the provided Support DVD before using ROG Connect.
>
> • **ROG Connect** must work with **ROG Connect Plus** to avail full function. Ensure that you install **ROG Connect Plus** on your local PC from the provided Support DVD before using **ROG Connect**.

1. Connect the provided ROG Connect cable to the local PC and the remote PC.
2. Press the ROG Connect Button.
3. Double-click the **RC TweakIt** shortcut on the remote PC to activate the function
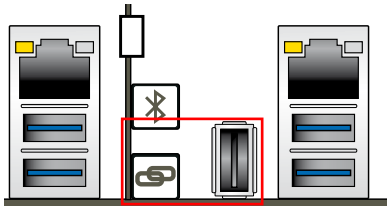
Using RC TweakIt

Use the sliders and buttons to monitor or adjust your local PC.

Click **Function** to display more options.

| RC Poster | RC Remote | RC Diagram | GPU TweakIt |

1.04.10
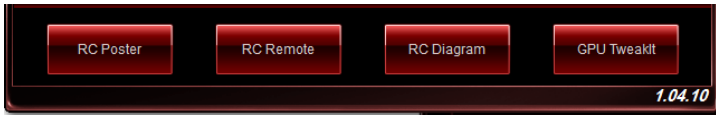
RC Poster

RC Poster shows the status of the local system during the POST. You can switch the display mode between **String** and **Code**.

RC Remote

RC Remote allows you to operate your local system through the ROG Connect cable.

RC Diagram

RC Diagram allows you to monitor and record your local system status.
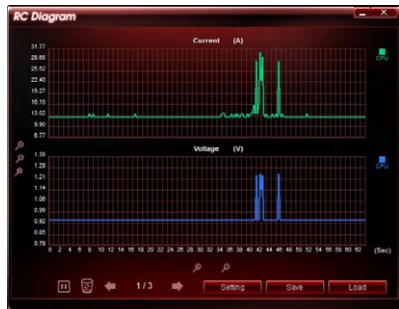
GPU TweakIt

GPU TweakIt allows you to control and monitor the installed GPU on the local system. Use the sliders to adjust the values and click **Apply** to save your customized settings.
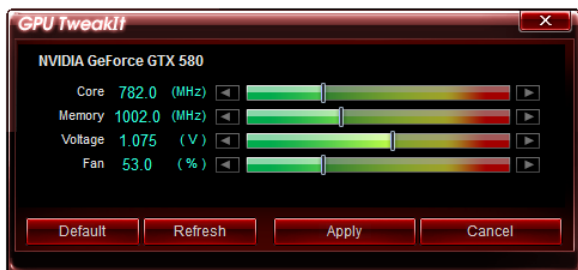
4.3.10   Audio configurations

The Realtek® audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your computer. The software provides Jack-Detection function, S/PDIF Out support, and interrupt capability. The CODEC also includes the Realtek® proprietary UAJ® (Universal Audio Jack) technology for all audio ports, eliminating cable connection errors and giving users plug and play convenience.

Follow the installation wizard to install the Realtek® Audio Driver from the support DVD that came with the motherboard package.

If the Realtek audio software is correctly installed, you will find the **Realtek HD Audio Manager** icon on the taskbar. Double-click on the icon to display the Realtek HD Audio Manager.

Realtek HD Audio Manager

A.   Realtek HD Audio Manager for Windows® Vista™ / 7™
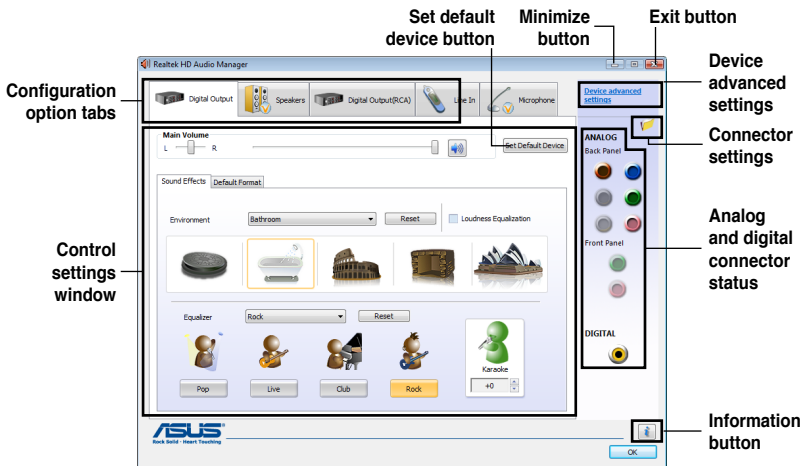
B. Realtek HD Audio Manager for Windows XP

Configuration options

Control settings window

Information button

Exit button

Minimize button

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.4 RAID configurations

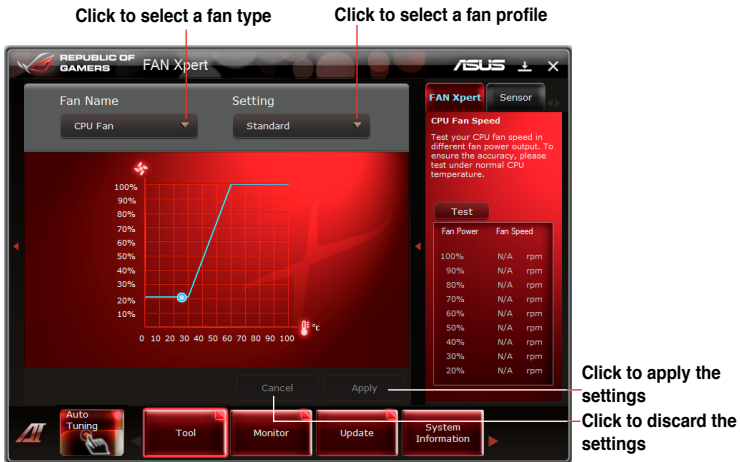The motherboard supports the following SATA RAID solutions:

- **Intel® Rapid Storage Technology** with RAID 0, RAID 1, RAID 10 and RAID 5 support.
- **Mavell® RAID utility** with RAID 0 and RAID 1 support.

- You must install Windows® XP Service Pack 2 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP2 or later versions.

- Due to Windows® XP / Vista limitation, a RAID array with the total capacity over 2TB cannot be set as a boot disk. A RAID array over 2TB can only be set as a data disk only.

- If you want to install a Windows® operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section **4.5 Creating a RAID driver disk** for details.

4.4.1 RAID definitions

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

4.4.2   Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1.   Install the SATA hard disks into the drive bays.

2.   Connect the SATA signal cables.

3.   Connect a SATA power cable to the power connector on each drive.

4.4.3   Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID set(s) using SATA HDDs. To do this:

1.   Enter the BIOS Setup during POST.

2.   Go to the **Advanced** menu > **SATA Configuration**, and then press <Enter>.

3.   Set the **SATA Mode** item to [RAID Mode].

4.   Save your changes, and then exit the BIOS Setup.

> Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

> Due to chipset limitation, when set any of SATA ports to RAID mode, all SATA ports run at RAID mode together.

4.4.4   Intel® Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

1.   Turn on the system.

2.   During POST, press <Ctrl> + <I> to display the utility main menu.

```
        Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

=============================[ MAIN MENU ]=============================
        1. Create RAID Volume            3. Reset Disks to Non-RAID
        2. Delete RAID Volume            4. Recovery Volume Options
                              5. Exit


=====================[ DISK/VOLUME INFORMATION ]======================
     RAID Volumes:
     None defined.

     Physical Devices:
     Port Device Model    Serial #              Size  Type/Status(Vol ID)
     0    ST3160812AS     9LS0HJA4            149.0GB  Non-RAID Disk
     1    ST3160812AS     9LS0F4HL            149.0GB  Non-RAID Disk
     2    ST3160812AS     3LS0JYL8            149.0GB  Non-RAID Disk
     3    ST3160812AS     9LS0BJ5H            149.0GB  Non-RAID Disk




        [↑↓]-Select            [ESC]-Exit           [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

> The utility supports maximum four hard disk drives for RAID configuration.

Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

```
          Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
          Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

                         ===[ CREATE VOLUME MENU ]===
                            Name:   Volume0
                      RAID Level:   RAID0(Stripe)
                           Disks:   Select Disks
                      Strip Size:   128KB
                        Capacity:   0.0   GB
                            Sync:   N/A
                                    Create Volume

                                 ===[ HELP ]===



                Enter a unique volume name that has no special characters and is
                                    16 characters or less.




             [↑↓]Change      [TAB]-Next     [ESC]-Previous Menu     [ENTER]-Select
```
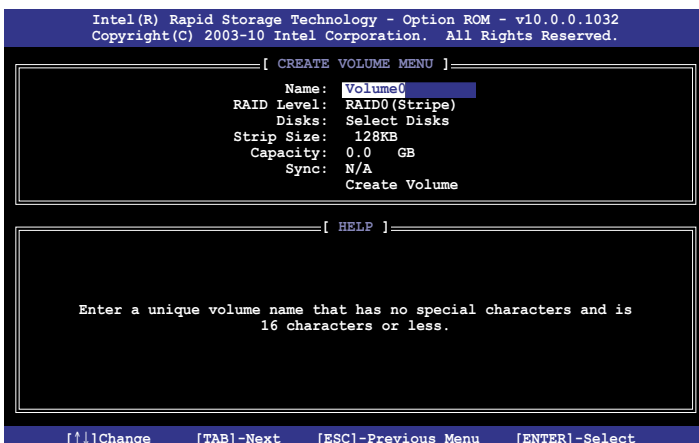
2. Enter a name for the RAID set and press <Enter>.

3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.

4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears:

```
                         ===[ SELECT DISKS ]===
      Port Drive Model      Serial #         Size    Status
      0    ST3160812AS      9LS0HJA4        149.0GB  Non-RAID Disk
      1    ST3160812AS      9LS0F4HL        149.0GB  Non-RAID Disk
      2    ST3160812AS      3LS0JYL8        149.0GB  Non-RAID Disk
      3    ST3160812AS      9LS0BJ5H        149.0GB  Non-RAID Disk


             Select 2 to 6 disks to use in creating the volume.


      ===[↑↓]-Prev/Next [SPACE]-SelectDisk [ENTER]-Done ===
```
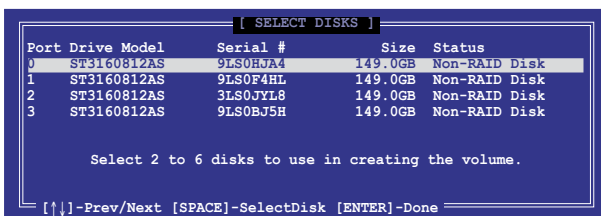
5.   Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6.   Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0, 10 and 5 only),and then press <Enter>. The available stripe size values range from 4KB to 128KB. The following are typical values:
     RAID 0: 128KB
     RAID 10: 64KB
     RAID 5: 64KB

We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

7.   When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

8.   When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

```
        WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
    Are you sure you want to create this volume? (Y/N):
```

9.   Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

Deleting a RAID set

⚠️ Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.
    ══════════════════════════[ DELETE VOLUME MENU ]══════════════════════════
    Name         Level          Drives     Capacity     Status     Bootable
    Volume0      RAID0(Stripe)     2        298.0GB      Normal       Yes



    ════════════════════════════════[ HELP ]═════════════════════════════════

            Deleting a volume will reset the disks to non-RAID.

                  WARNING: ALL DISK DATA WILL BE DELETED.
                  (This does not apply to Recovery volumes)



        [↑↓]-Select         [ESC]-Previous Menu     [DEL]-Delete Volume
```
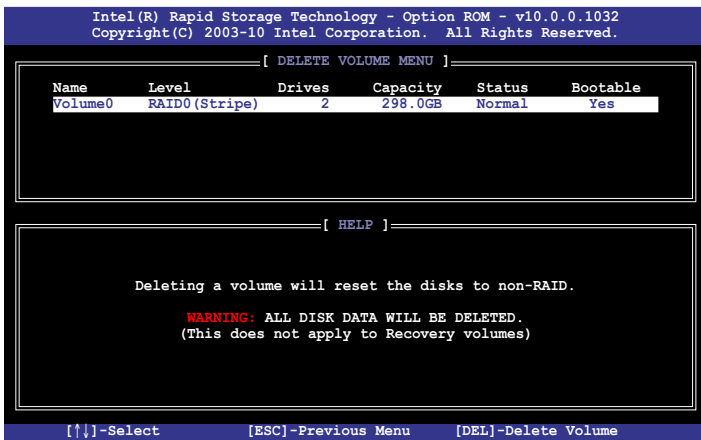
2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears:

```
    ═══════════════════[ DELETE VOLUME VERIFICATION ]═══════════════════

                    ALL DATA IN THE VOLUME WILL BE LOST!
                  (This does not apply to Recovery volumes)

        Are you sure you want to delete volume "Volume0"? (Y/N):
```

3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **5. Exit**, and then press <Enter>. The following warning message appears:

```
    ══════════════════════[ CONFIRM EXIT ]══════════════════════

                    Are you sure you want to exit? (Y/N):
```
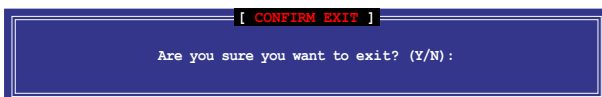
2. Press <Y> to exit or press <N> to return to the utility main menu.

Intel® Smart Response Technology

Intel® Smart Response Technology boosts overall system performance. It uses an installed fast SSD (min 18.6GB available) as a cache for frequently accessed operations, speeding up hard drive/main memory interaction. Key benefits are expedited hard drive speeds, reduced load and wait times, and maximized storage utilization. Power consumption also goes down by reducing unnecessary hard drive spin.

• Intel® Smart Response Technology supports Windows® 7/ Vista operating systems.

• Intel® Smart Response Technology is supported by 2nd generation Intel® Core™ processor family.

• Operating systems must be installed on the HDD to launch Intel® Smart Response Technology. The capacity of the SSD is reserved for caching function.

• Before applying Intel® Smart Response Technology, set the **SATA Mode** BIOS item to [RAID mode] in BIOS setup. Refer to section **3.5.4 SATA Configuration** for details.

To install Intel® Smart Response Technology:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has enabled the Autorun feature.

2. Click the Drivers tab, then click Intel® Rapid Storage Technology Driver software.

3. Follow the onscreen instructions to complete installation.

To use Intel® Smart Response Technology:

1. Click **Accelerate** to launch Smart Response Technology settings.
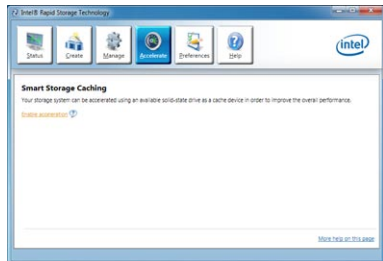
2. a. Select the SSD you want to
        use to accelerate your storage
        system.

    b. Select the size allocated for SSD
        caching.

    c. Select which HDD for caching.

    d. **Enhanced mode**:WRITE
        THROUGH, write to SSD and
        HDD at the same time.

        Maximized mode:WRITE BACK,
        write to SSD and write back to
        HDD in a later time.
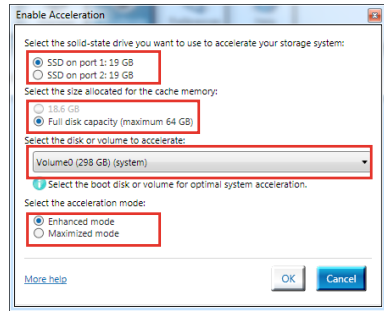
3. Select **Disable Acceleration**
    to disable this function and
    select **Change Mode** to switch
    acceleration mode to Enhanced/
    Maximus.
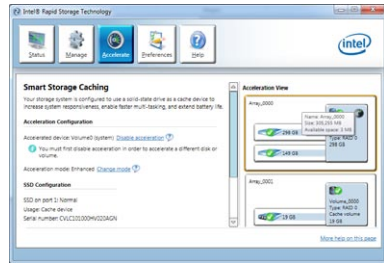
⚠️
  • Only Intel® internal SATA ports support Intel® Smart Response Technology.

  • You need at least one SSD (>18.6GB) and one HDD as a set to enable
    Intel® Smart Response Technology. A single SSD can only be assigned to
    one HDD for caching.

  • The maximum caching size on the SSD is 64GB. If the SSD exceeds
    64GB, storage capacity left out of caching can still be identified by the
    system for normal storage.

  • Be sure to disable the acceleration function of Intel® Smart Response
    Technology under OS when applying the actions below:
    – Removing or replacing the SSD
    – Updating IRST 10.5 driver
    – Updating BIOS

  • If you want to restore the OS, go to BIOS Option ROM utility and select
    Acceleration Options to disable Intel® Smart Response Technology.

  • The performance of Intel® Smart Response Technology varies by SSD.

4.4.5 Marvell RAID utility

The onboard Marvell SATA 6.0 Gb/s controller allows you to create a RAID 0 or RAID 1 array using two SATA hard disk drives. Refer to Chapter 2 of your motherboard user manual for the exact location of the Marvell SATA 6.0 Gb/s connector.

To enter the Marvell utility, press **<Ctrl>** + **<M>** during POST.

⚠️ All exisiting data on the hard disk drives will be erased when creating or deleting a RAID array. Ensure that you have back up all your data in your hard disk drives before making any change to the drive status.

```
┌─────Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.─────┐
│ ┌Topology──────────────┐ ┌Information──────────────────────────┐  │
│ │ HBA 0: Marvell 0     │ │ Vendor ID       :  1B4B             │  │
│ │ ├ Virtual Disks      │ │ Device ID       :  9130             │  │
│ │ └ Free Physical Disks│ │ Revision ID     :  B1               │  │
│ │   ├ PD 0: ST3160812AS│ │ BIOS Version    :  1.0.0.1028       │  │
│ │   └ PD 8: ST3160812AS│ │ Firmware Version:  2.2.0.1105       │  │
│ │                      │ │ PCIe Speed Rate :  5.0Gbps          │  │
│ │                      │ │ Configure SATA as:  AHCI Mode       │  │
│ │                      │ │                                     │  │
│ │                      │ │                                     │  │
│ │                  ►   │ │                                 ►   │  │
│ ├Help──────────────────┴─┴─────────────────────────────────────┤  │
│ │ Marvell RAID on chip controller.                            │  │
│ │ ENTER: Operation   F10: Exit/Save   ESC: Return             │  │
│ └──────────────────────────────────────────────────────────────┘  │
└────────────────────────────────────────────────────────────────────┘
```

Create a RAID Array

1. Move the selection bar to **HBA 0: Marvell 0** and press <Enter>.

2. Select **Configuration Wizard** and press <Enter>.

```
┌─────Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.─────┐
│ ┌Configure->Select free disks─┐ ┌──────────────────────────────┐  │
│ │ HBA 0: Marvell 0            │ │ Port ID       :  0           │  │
│ │ ├ Virtual Disks            │ │ PD ID         :  0           │  │
│ │ └ Free Physical Disks      │ │ Type          :  SATA PD     │  │
│ │ *  ├ PD 0: ST3160812AS     │ │ Status        :  Unconfigured│  │
│ │    └ PD 8: ST3160812AS     │ │ Size          :  152626MB    │  │
│ │                            │ │ Feature Support: MCQ 3G 48Bits│ │
│ │                            │ │ Current Speed :  3G          │  │
│ │                            │ │ Model         :  ST3160812AS │  │
│ │                            │ │ Serial        :  9LS0F4HL    │  │
│ │                        ►   │ │ FW Version    :  3.AAE       │  │
│ ├Help────────────────────────┴─┴──────────────────────────────┤  │
│ │ Use space bar to select the free disks to be used in the array. │
│ │ ENTER: Operation   SPACE: Select   F10: Exit/Save   ESC: Return │
│ └──────────────────────────────────────────────────────────────┘  │
└────────────────────────────────────────────────────────────────────┘
```

3. Press <Space> to select the hard drives to be included in the RAID array. An asterisk (*) appears in front of the selected hard drive. After selecting all the drives needed for the RAID array, press <Enter> to continue.

```
┌────────Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.────────┐
│ ┌Configure->Select free disksCreate Virtual Disk─┐                       │
│ │HBA 0: Marvell 0          │RAID Level      : RAID 0                     │
│ │ ├ Virtual Disks          │Max Size(MB)    : 305253                     │
│ │ └ Free Physical Disks    │Stripe Size     : 64KB                       │
│ │*  ├ PD 0: ST160812AS     │Gigabyte Rounding : 1G                       │
│ │*  └ PD 8: ST160812AS     │Quick Init      : Yes                        │
│ │                          │Name            : Default                    │
│ │                          │Threshold(%)    : 90                         │
│ │                          │Next                                         │
│ │                                                                        │
│ │                                                                        │
│ │                                                                        │
│ │                    ►                                    ►               │
│ ┌Help─────────────────────────────────────────────────────────────────┐ │
│ │Virtual disk configurations.                                          │ │
│ │ENTER: Select   F10: Exit/Save   ESC: Return                          │ │
└────────────────────────────────────────────────────────────────────────┘
```

4. Use the up or down arrow key to move the selection bar and press <Enter> to configure further RAID settings.

    RAID Level: Select a RAID Level. Configuration options: [RAID 0] [RAID 1]

    Stripe Size: Specifies the size of single data block on the virtual disk. In general, a larger stripe size is recommended for applications requiring large data transfers such as audio, video, and graphics. A smaller stripe size is better for applications with content in much smaller size, such as e-mails and documents.
    Configuration options: [32K] [64K]

    Name: Enter a name with 1–10 letters (no special characters) for the RAID array.

5. Move the selection bar to **Next** and press <Enter>. The following warning message appears:

```
┌Create Virtual Disk──────────────────────────────────────┐
│   Do you want to create this virtual disk ?             │
│                                                          │
│                Yes                    No                 │
└──────────────────────────────────────────────────────────┘
```
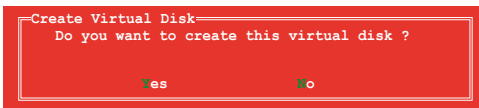
    Press <Y> to create the RAID array, or press <N> to cancel. The new RAID array appears under Virtual Disks, as shown in the image below.
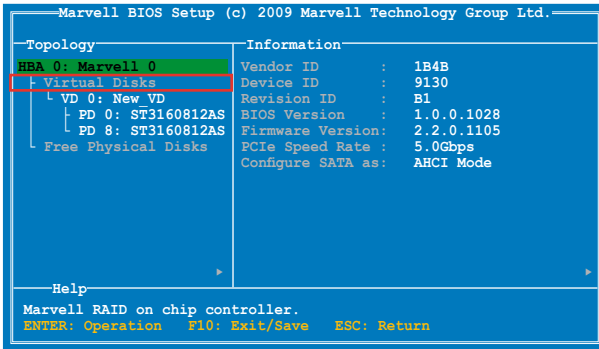
```
┌──Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.──┐
│  ┌Topology─────────────┐  ┌Information─────────────────┐    │
│  HBA 0: Marvell 0          Vendor ID      :   1B4B           │
│  ├ Virtual Disks           Device ID      :   9130           │
│     └ VD 0: New_VD         Revision ID    :   B1             │
│        ├ PD 0: ST3160812AS BIOS Version   :   1.0.0.1028     │
│        └ PD 8: ST3160812AS Firmware Version:  2.2.0.1105     │
│     └ Free Physical Disks  PCIe Speed Rate :   5.0Gbps       │
│                            Configure SATA as:  AHCI Mode     │
│                                                             │
│                                                             │
│                                                             │
│                    ►                            ►           │
│  ┌Help───────────────────────────────────────────────────┐ │
│  Marvell RAID on chip controller.                           │
│  ENTER: Operation   F10: Exit/Save   ESC: Return            │
└─────────────────────────────────────────────────────────────┘
```
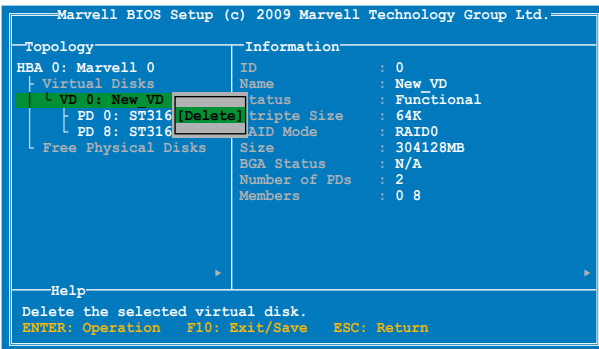
6.   Press <F10>. The following warning message appears:

```
┌Exit──────────────────────────────────────────────┐
│   Do you want to exit from Marvell BIOS Setup?   │
│                                                   │
│             ►Yes              ►No                 │
└───────────────────────────────────────────────────┘
```

Press <Y> to save the RAID setting and exit the Marvell RAID utility.

Delete an existing RAID Array

1.   Select the RAID array to delete and press <Enter>. Select **Delete** and press
      <Enter>.

```
┌──Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.──┐
│  ┌Topology─────────────┐  ┌Information─────────────────┐    │
│  HBA 0: Marvell 0          ID             :   0             │
│  ├ Virtual Disks           Name           :   New_VD        │
│     └ VD 0: New_VD         Status         :   Functional    │
│        ├ PD 0: ST316[Delete]Stripte Size  :   64K           │
│        └ PD 8: ST316       RAID Mode      :   RAID0         │
│     └ Free Physical Disks  Size           :   304128MB      │
│                            BGA Status     :   N/A           │
│                            Number of PDs  :   2             │
│                            Members        :   0 8           │
│                                                             │
│                    ►                            ►           │
│  ┌Help───────────────────────────────────────────────────┐ │
│  Delete the selected virtual disk.                          │
│  ENTER: Operation   F10: Exit/Save   ESC: Return            │
└─────────────────────────────────────────────────────────────┘
```

2. The following warning message appears:

```
┌Delete Virtual Disk━━━━━━━━━━━━━━━━━━━━━━━┐
│ Do you want to delete this virtual disk ? │
│                                           │
│          Yes                No            │
└───────────────────────────────────────────┘
```

Press <Y> to delete the selected RAID array. The following warning message appears:

```
┌Delete MBR━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━┐
│ Do you want to delete MBR from this virtual disk ? │
│          Yes                No            │
└───────────────────────────────────────────┘
```

Press <Y> to delete the Master Boot Record (MBR) from the selected RAID array.

3. Press <F10>. The following warning message appears:

```
┌Exit━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━┐
│    Do you want to exit from Marvell BIOS Setup? │
│                                           │
│              Yes                No        │
└───────────────────────────────────────────┘
```

Press <Y> to save the RAID setting and exit the Marvell RAID utility.

4.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing a Windows® operating system on a hard disk drive that is included in a RAID set.

- • **The motherboard does not provide a floppy drive connector.** You have to use a USB floppy disk drive when creating a **SATA** RAID driver disk.

- • Windows® XP may not recognize the USB floppy disk drive due to Windows® XP limitation. To work around this OS limitation, refer to section **4.5.4 Using a USB floppy disk drive**.

4.5.1 Creating a RAID driver disk without entering the OS

To create a RAID driver disk without entering the OS:

1. Boot your computer.
2. Press <Del> during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support DVD into the optical drive.
5. Save changes and exit BIOS.
6. When the **Make Disk** menu appears, press <1> to create a RAID driver disk.
7. Insert a formatted floppy disk into the USB floppy disk drive, then press <Enter>.
8. Follow the succeeding screen instructions to complete the process.

4.5.2 Creating a RAID driver disk in Windows®

To create a RAID driver disk in Windows®:

1. Start Windows®.
2. Plug the USB floppy disk drive and insert a floppy disk.
3. Place the motherboard support DVD into the optical drive.
4. Go to the **Make Disk** menu, and then click **Intel AHCI/RAID Driver Disk** to create a RAID driver disk.
5. Select USB floppy disk drive as the destination disk.
6. Follow the succeeding screen instructions to complete the process.

Write-protect the floppy disk to avoid a computer virus infection.

4.5.3 Installing the RAID driver during Windows® OS installation

To install the RAID driver in Windows® XP:

1. During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.

2. Press <F6>, and then insert the floppy disk with RAID driver into the USB floppy disk drive.

3. When prompted to select the SCSI adapter to install, select the RAID driver for the corresponding OS version.

4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver for Windows® Vista or later OS:

1. During the OS installation, click **Load Driver** to allow you to select the installation media containing the RAID driver.

2. Insert the USB flash drive with RAID driver into the USB port or the support DVD into the optical drive, and then click **Browse**.

3. Click the name of the device you've inserted, go to **Drivers** > **RAID**, and then select the RAID driver for the corresponding OS version. Click **OK**.

4. Follow the succeeding screen instructions to complete the installation.

Before loading the RAID driver from a USB flash drive, you have to use another computer to copy the RAID driver from the support DVD to the USB flash drive.

4.5.4   Using a USB floppy disk drive

Due to OS limitation, Windows® XP may not recognize the USB floppy disk drive when you install the RAID driver from a floppy disk during the OS installation.

To solve this issue, add the USB floppy disk drive's Vendor ID (VID) and Product ID (PID) to the floppy disk containing the RAID driver. Refer to the steps below:

1.   Using another computer, plug the USB floppy disk drive, and insert the floppy disk containing the RAID driver.

2.   Right-click **My Computer** on the Windows® desktop or **start** menu, and then select **Manage** from the pop-up window.
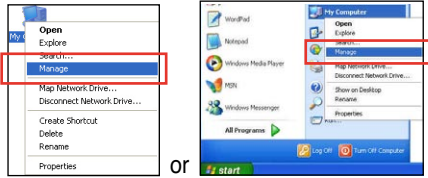
3.   Select **Device Manager**. From the **Universal Serial Bus controllers**, right-click **xxxxxx USB Floppy**, and then select **Properties** from the pop-up window.

> The name of the USB floppy disk drive varies with different vendors.
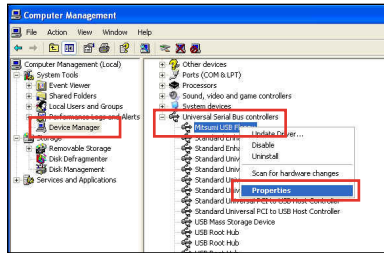
4.   Click **Details** tab. The Vendor ID (VID) and Product ID (PID) are displayed.
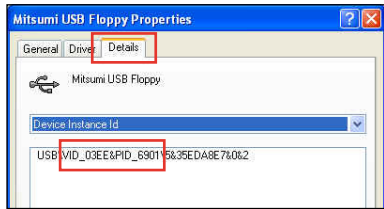
5.   Browse the contents of the RAID driver disk to locate the file **txtsetup.oem**.

6.   Double-click the file. A window appears, allowing you to select the program for opening the oem file.
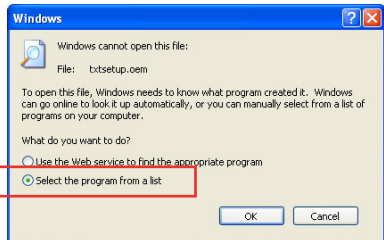
7.   Use Notepad to open the file.
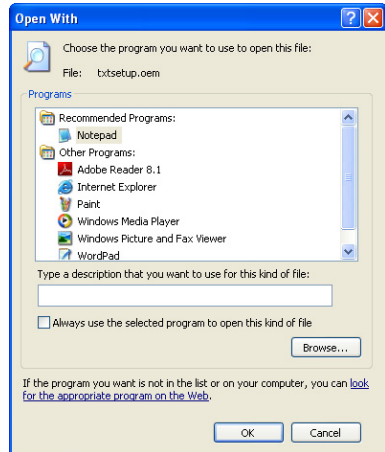
8.   Find the **[HardwareIds.scsi.iaAHCI_DesktopWorkstationServer]** and **[HardwareIds.scsi.iaStor_DesktopWorkstationServer]** sections in the **txtsetup.oem** file.

9.   Type the following line to the bottom of the two sections:
      id = "USB\VID_xxxx&PID_xxxx", "usbstor"

```
[HardwareIds.scsi.iaAHCI_DesktopWorkstationServer]
id= "PCI\VEN 8086&DEV 1C02&CC 0106","iaStor"
id= "USB\VID_03EE&PID_6901", "usbstor"


[HardwareIds.scsi.iaStor_DesktopWorkstationServer]
id= "PCI\VEN 8086&DEV 2822&CC 0104","iaStor"
id= "USB\VID_03EE&PID_6901", "usbstor"
```

Add the same line to both sections.

The VID and PID vary with different vendors.

10.   Save and exit the file.

This chapter describes how to install and
configure multiple ATI® CrossFireX™ and
NVIDIA® SLI™ graphics cards.

5
Multiple GPU
technology support

Chapter summary

5

5.1 ATI® CrossFireX™ technology

The motherboard supports the ATI® CrossFireX™ technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

5.1.1 Requirements

- You should have two identical CrossFireX-ready graphics cards or one CrossFireX-ready dual-GPU graphics card that are ATI® certified.
- Ensure that your graphics card driver supports the ATI CrossFireX technology. Download the latest driver from the AMD website at www.amd.com.
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See page 2-46 for details.

- We recommend that you install additional chassis fans for better thermal environment.
- Visit the ATI Game website at http://game.amd.com for the latest certified graphics card and the supported 3D application list.

5.1.2 Before you begin

For ATI CrossFireX to work properly, you have to uninstall all existing graphics card drivers before installing ATI CrossFireX graphics cards to your system.

To uninstall existing graphics card drivers

1. Close all current applications.
2. For Windows XP, go to **Control Panel > Add/Remove Programs**.
   For Windows Vista, go to **Control Panel > Programs and Features**.
3. Select your current graphics card driver/s.
4. For Windows XP, select **Add/Remove**.
   For Windows Vista, select **Uninstall**.
5. Turn off your computer.

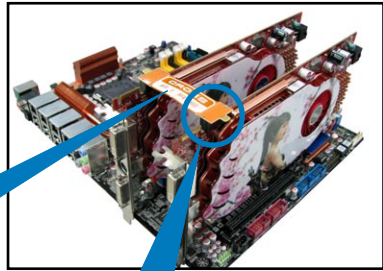### 5.1.3 Installing CrossFireX graphics cards

The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.
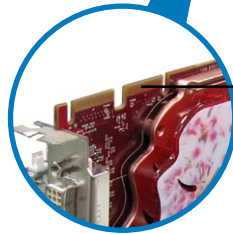
1. Prepare two CrossFireX-ready graphics cards.

2. Insert the two graphics card into the PCIEX16 slots.

3. Ensure that the cards are properly seated on the slots.
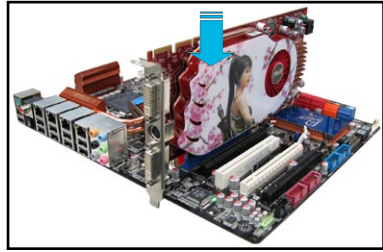
4. Align and firmly insert the CrossFireX bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

CrossFireX bridge

Goldfingers

5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.

6. Connect a VGA or a DVI cable to the graphics card.
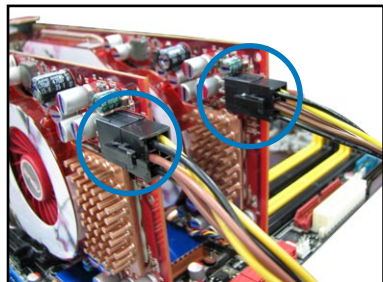
5.1.4   Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.

Ensure that your PCI Express graphics card driver supports the ATI® CrossFireX™ technology. Download the latest driver from the AMD website (www.amd.com).

5.1.5   Enabling the ATI® CrossFireX™ technology

After installing your graphics cards and the device drivers, enable the CrossFireX™ feature through the ATI Catalyst™ Control Center in Windows environment.

Launching the ATI Catalyst Control Center

To launch the ATI Catalyst Control Center

1. Right-click on the Windows® desktop and select **Catalyst(TM) Control Center**. You can also right-click the ATI icon in the Windows notification area and select **Cayalist Control Center**.
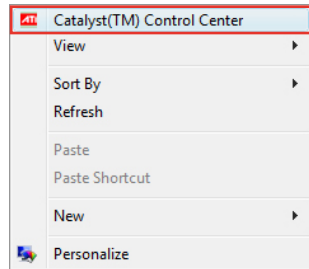
2. The **Catalyst Control Center Setup Assistant** appears when the system detects the existance of multi-graphics cards. Click **Go** to continue to the **Catalyst Control Center Advanced View** window.
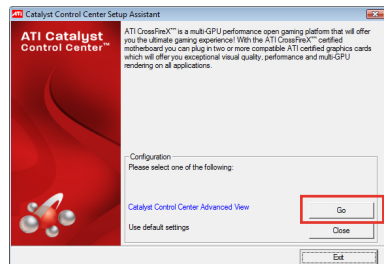
Enabling CrossFireX settings

1. In the Catalyst Control Center window, click **Graphics Settings > CrossFireX > Configure**.

2. From the Graphics Adapter list, select the graphics card to act as the display GPU.

3. Select **Enable CrossFireX**.

4. Click **Apply**, and then click **OK** to exit the window.
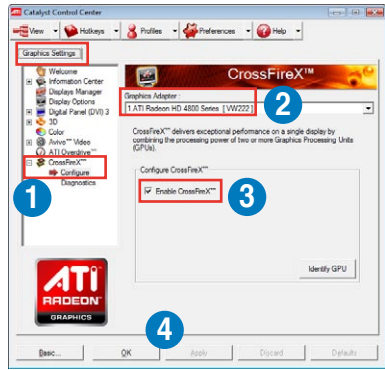
5.2 NVIDIA® SLI™ technology

The motherboard supports the NVIDIA® SLI™ (Scalable Link Interface) technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

5.2.1 Requirements

- In SLI mode, you should have two identical SLI-ready graphics cards that are NVIDIA® certified.
- Ensure that your graphics card driver supports the NVIDIA SLI technology. Download the latest driver from the NVIDIA website (www.nvidia.com).
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See Chapter 2 for details.

> - We recommend that you install additional chassis fans for better thermal environment.
> - Visit the NVIDIA zone website (http://www.nzone.com) for the latest certified graphics card and supported 3D application list.

5.2.2 Installing two SLI-ready graphics cards

> The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

1. Prepare two SLI-ready graphics cards.

2. Insert the two graphics card into the PCIEX16 slots. If your motherboard has more than two PCIEX16 slots, refer to Chapter 2 in this user manual for the locations of the PCIEX16 slots recommended for multi-graphics card installation.

3. Ensure that the cards are properly seated on the slots.
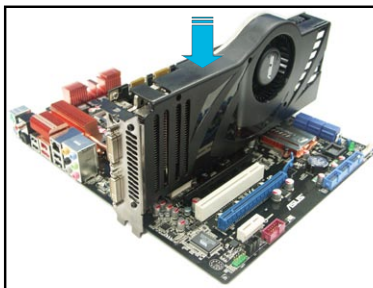
4. Align and firmly insert the SLI bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.

6. Connect a VGA or a DVI cable to the graphics card.
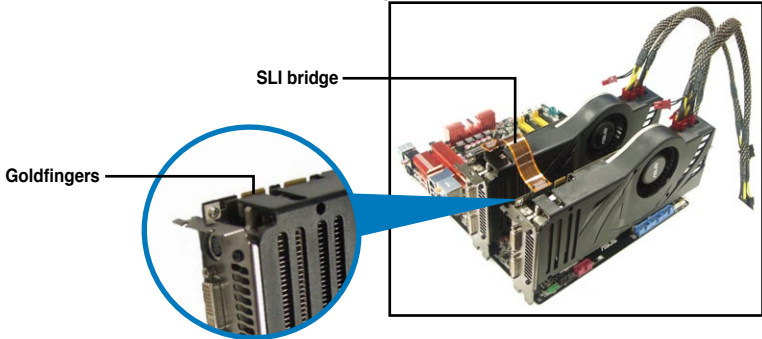
5.2.3   Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.

Ensure that your PCI Express graphics card driver supports the NVIDIA® SLI™ technology. Download the latest driver from the NVIDIA website (www.nvidia. com).

5.2.4   Enabling the NVIDIA® SLI™ technology

After installing your graphics cards and the device drivers, enable the SLI feature in NVIDIA® Control Panel under the Windows® Vista™ operating system.

Launching the NVIDIA Control Panel
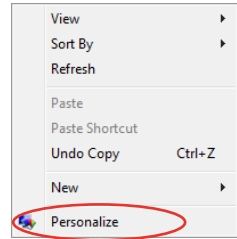
You can launch the NVIDIA Control Panel by the following two methods.

A. Right click on the empty space of the Windows® desktop and select **NVIDIA Control Panel**.

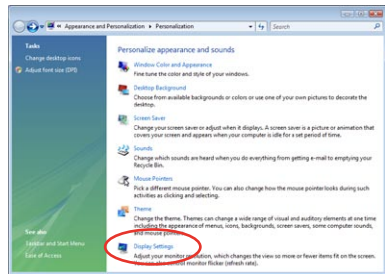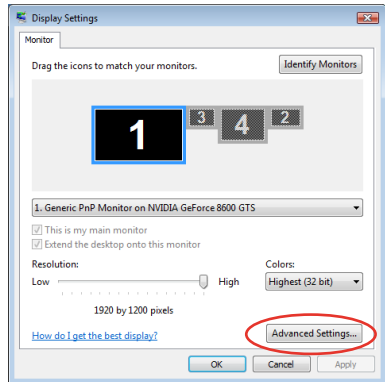The NVIDIA Control Panel window appears (See Step B5).
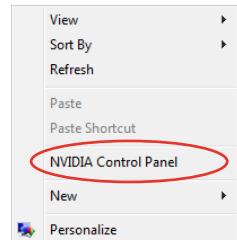
B1. If you cannot see the NVIDIA Control Panel item in step (A), select **Personalize**.

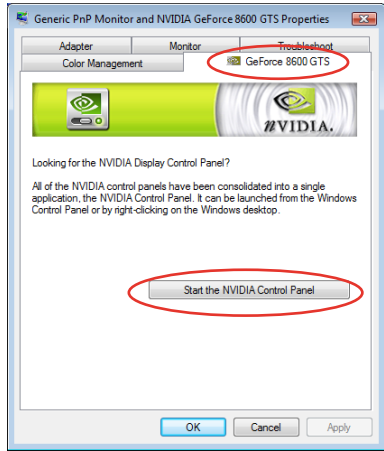| View	▶
Sort By	▶
Refresh	
Paste	
Paste Shortcut	
Undo Copy	Ctrl+Z
New	▶
Personalize	

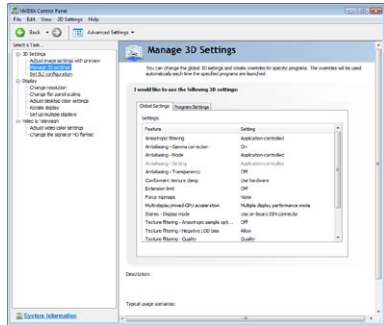B2. From the **Personalization** window, select **Display Settings**.

B3. From the Display Settings dialog box, click **Advanced Settings**.

B4.	Select the NVIDIA GeForce tab, and then click **Start the NVIDIA Control Panel**.
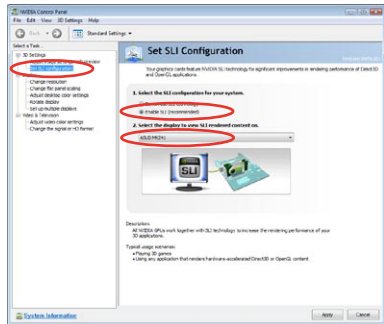
B5.	The NVIDIA Control Panel window appears.

Enabling SLI settings

From the NVIDIA Control Panel window, select **Set SLI Configuration**. Click **Enable SLI** and set the display for viewing SLI rendered content. When done, click **Apply**.

5.3 LucidLogix® Virtu™ solution

LucidLogix® Virtu™ is a new generation GPU virtualization software that blurs the line between embedded graphics and discrete GPU for increased graphics performance. Its GPU virtualization dynamically assigns tasks to the best available graphics resources based on power, performance and system load. It allows users to fully utilize the unique capabilities of advanced Sandy Bridge multimedia features alongside the high end 3D rendering performance provided by installed graphics cards. For users with diverse needs, LucidLogix® Virtu™ GPU virtualization provides great flexibility and efficiency.

> • LucidLogix® Virtu™ supports Windows® 7 operating systems.
>
> • Intel® Quick Sync Video feature is supported by 2nd generation Intel® Core™ processor family.
>
> • iGPU Multi-Monitor support option has to be enabled in BIOS before installing LucidLogix® Virtu™.
>
> • Supports NVIDIA® GF4xx/ 5xx series & AMD® HD5xxx/ 6xxx series graphic cards.

5.3.1 Hardware installation

To install LucidLogix® Virtu™:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has enabled the Autorun feature.

2. Click the Drivers tab, then click LucidLogix® Virtu™ software.

3. Follow the onscreen instructions to complete installation.

i-Mode (output from the Sandy Bridge GPU)

d-Mode (output from the discrete GPU)
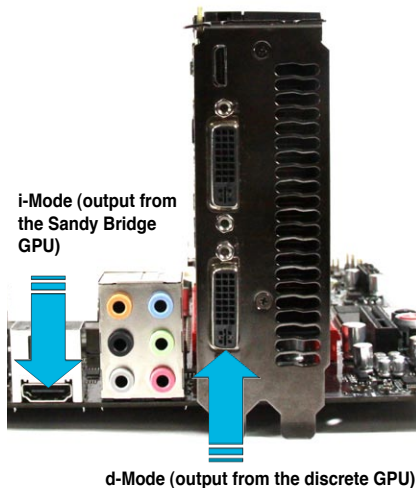
i-Mode

To use LucidLogix® Virtu™ solution in i-Mode, display must be always connected to Sandy Bridge motherboard video output.

iMode is only available on selected models.

d-Mode (recommended mode)

To use LucidLogix® Virtu™ solution in d-Mode, display must be connected to the discrete GPU installed in the system.

Be sure to set Initial Graphic Adaptor to PCIE or PCIE/ PCI in BIOS to enable d-Mode support.

Both i-Mode and d-Mode enjoy the performance of Intel® Sandy Bridge built-in media features and discrete card. d-Mode is recommended for enhanced 3D gaming performance.

5.3.2   Software configuration

After you successfully installed the LucidLogix® Virtu™ from the support DVD that comes with your motherboard package, a LucidLogix® Virtu™ icon appears in the notification area.

To enable LucidLogix® Virtu™

1.   Right-click LucidLogix® Virtu™ icon in the notification area and select **Enable Virtu**.

2.   LucidLogix® Virtu™ is enabled.
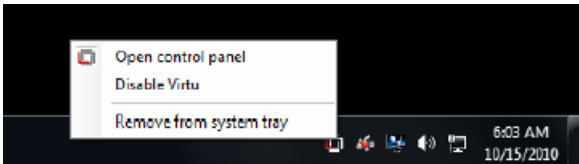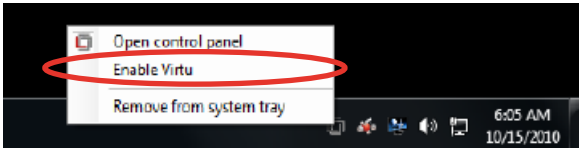
LucidLogix® Virtu™ is automatically activated when your system is powered on. Select **Remove from system tray**, if you want to remove LucidLogix® Virtu™.

To open the control panel

1.   Right-click LucidLogix® Virtu™ icon in the notification area and select **Open control panel**.

2.   In the Main tab, you can check the LucidLogix® Virtu™ status and customize your settings.

Check your current display mode, i-mode (blue) or d-Mode (green)

Adjust Performance optimization, Quality over Performance or Performance over Quality

Select the way to show the Lucid icon when you are in game.

ASUS contact information

ASUSTeK COMPUTER INC.

Address	15 Li-Te Road, Peitou, Taipei, Taiwan 11259
Telephone	+886-2-2894-3447
Fax	+886-2-2890-7798
E-mail	info@asus.com.tw
Web site	www.asus.com.tw

Technical Support

Telephone	+86-21-38429911
Online support	support.asus.com

ASUS COMPUTER INTERNATIONAL (America)

Address	800 Corporate Way, Fremont, CA 94539, USA
Telephone	+1-812-282-3777
Fax	+1-510-608-4555
Web site	usa.asus.com

Technical Support

Telephone	+1-812-282-2787
Support fax	+1-812-284-0883
Online support	support.asus.com

ASUS COMPUTER GmbH (Germany and Austria)

Address	Harkort Str. 21-23, D-40880 Ratingen, Germany
Fax	+49-2102-959911
Web site	www.asus.de
Online contact	www.asus.de/sales

Technical Support

Telephone	+49-1805-010923*
Support Fax	+49-2102-9599-11*
Online support	support.asus.com

*EUR 0.14/minute from a German fixed landline; EUR 0.42/minute from a mobile phone.

EC Declaration of Conformity

We, the undersigned,

Manufacturer:	ASUSTek COMPUTER INC.
Address, City:	No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN R.O.C.
Country:	TAIWAN
Authorized representative in Europe:	ASUS COMPUTER GmbH
Address, City:	HARKORT STR. 21-23, 40880 RATINGEN
Country:	GERMANY

declare the following apparatus:

Product name :	Motherboard
Model name :	MAXIMUS IV EXTREME-Z

conform with the essential requirements of the following directives:

☒2004/108/EC-EMC Directive

☒ EN 55022:2006+A1:2007	☒ EN 55024:1998+A1:2001+A2:2003
☒ EN 61000-3-2:2006+A2:2009	☒ EN 61000-3-3:2008
☐ EN 55013:2001+A1:2003+A2:2006	☐ EN 55020:2007

☒1999/5/EC-R &TTE Directive

☒ EN 300 328 V1.7.1(2006-10)	☒ EN 301 489-1 V1.8.1(2008-04)
☐ EN 300 440-1 V1.4.1(2008-05)	☐ EN 301 489-3 V1.4.1(2002-08)
☐ EN 300 440-2 V1.2.1(2008-03)	☐ EN 301 489-4 V1.3.1(2002-08)
☐ EN 301 511 V9.0.2(2003-03)	☐ EN 301 489-7 V1.3.1(2005-11)
☐ EN 301 908-1 V3.2.1(2007-05)	☐ EN 301 489-9 V1.4.1(2007-11)
☐ EN 301 908-2 V3.2.1(2007-05)	☒ EN 301 489-17 V2.1.1(2009-05)
☐ EN 301 893 V1.4.1(2005-03)	☐ EN 301 489-24 V1.4.1(2007-09)
☐ EN 302 544-2 V1.1.1(2009-01)	☐ EN 302 326-2 V1.2.2(2007-06)
☐ EN 50360:2001	☐ EN 302 326-3 V1.3.1(2007-09)
☐ EN 50371:2002	☐ EN 301 357-2 V1.3.1(2006-05)
☐ EN 50385:2002	☐ EN 302 623 V1.1.1(2009-01)

☒2006/95/EC-LVD Directive

☐ EN 60950-1:2006	☒ EN 60065:2002+A1:2006+A11:2008
☒ EN 60950-1:2006+A11:2009	

☐2009/125/EC-ErP Directive

Regulation (EC) No. 1275/2008	Regulation (EC) No. 278/2009
☐ EN 62301:2005	☐ EN 62301:2005
Regulation (EC) No. 642/2009	
☐ EN 62301:2005	

Ver. 110101

☒CE marking

(EC conformity marking)

CE

Position :	**CEO**
Name :	**Jerry Shen**

Signature : _____

Declaration Date: May. 27, 2011

Year to begin affixing CE marking:2011

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

Responsible Party Name:	**Asus Computer International**
Address:	**800 Corporate Way, Fremont, CA 94539.**
Phone/Fax No:	**(510)739-3777/(510)608-4555**

hereby declares that the product

Product Name : Motherboard

Model Number : MAXIMUS IV EXTREME-Z

Conforms to the following specifications:

☒ FCC Part 15, Subpart B, Unintentional Radiators
☒ FCC Part 15, Subpart C, Intentional Radiators
☐ FCC Part 15, Subpart E, Intentional Radiators

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name : _____ **Steve Chang / President**

Signature : _____

Date : _____ **May. 27, 2011**

Ver. 110101