SABERTOOTH Z170 MARK 1

Motherboard

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Contents

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.

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.

- Place the product on a stable surface.

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

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. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 2: Basic Installation**

  This chapter lists the hardware setup procedures that you have to perform when installing system components.

- **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: RAID support**

  This chapter describes the RAID configurations.

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 (+).

SABERTOOTH Z170 MARK 1 specifications summary

CPU	LGA1151 socket for 6th Generation Intel® Core™ i7/ i5/ i3/Pentium®/ Celeron® Processors Supports 14nm CPU Supports Intel® Turbo Boost Technology 2.0* *** The support of these features depends on the CPU types.** **** Refer to <u>www.asus.com</u> for the complete CPU support list.**
Chipset	Intel® Z170 Express Chipset
Memory	4 x DIMM, max. 64GB, DDR4 2400/2133 MHz, non-ECC, un-buffered memory Dual channel memory architecture Supports Intel® Extreme Memory Profile (XMP) *** Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.** **** Refer to www.asus.com or this user guide for the complete Memory QVL (Qualified Vendors List).**
Expansion slots	2 x PCI Express 3.0/2.0 x16 slots (single at x16 or dual at x8/x8 mode) 1 x PCI Express 3.0/2.0 x16 slot* (max. at x4 mode, compatible with PCIe x1, x2 and x4 devices) 3 x PCI Express 3.0/2.0 x1 slots *** The PCIe x16_3 slot shares bandwidth with SATA6G_56. The PCIe x16_3 is default set at x2 mode.**
VGA	Integrated Graphics Processor- Intel® HD Graphics support Multi-VGA output support: DisplayPort/HDMI port Supports DisplayPort 1.2* with max. resolution 4096 x 2160@24Hz / 3840 x 2160@60Hz Supports HDMI 1.4b with max. resolution 4096 x 2160@24Hz / 2560 x 1600@60Hz Supports Intel® InTru™ 3D/Quick Sync Video/Clear Video HD Technology/Insider™ Maximum shared memory of 512MB *** DP 1.2 Multi-Stream Transport compliant, supports DP 1.2 monitor daisy chain up to 3 displays**
Multi-GPU support	Supports NVIDIA® 2-Way/Quad-GPU SLI™ Technology (with 2 PCIex16 graphics card) Supports AMD® 3-Way/Quad-GPU CrossFireX™ Technology
LAN	Gigabit Intel LAN connection- 802.3az Energy Efficient Ethernet (EEE) appliance Intel® I219-V Gigabit LAN- Dual interconnect between the integrated Media Access Controller (MAC) and physical layer (PHY) Realtek® 8111H Gigabit LAN controller TUF LANGuard ASUS Turbo LAN Utility

(continued on the next page)

SABERTOOTH Z170 MARK 1 specifications summary

Storage	**Intel® Z170 Express Chipset with RAID 0, 1, 5, 10 and Intel Rapid Storage Technology 14 support*** - 2 x SATA Express ports (compatible with 4 x SATA 6.0 Gb/s ports) - 1 x M.2 Socket 3 with M Key, type 2242/2260/2280/22110 storage devices support (both SATA & PCIE mode)** - 6 x SATA 6.0 Gb/s ports (4 from SATA Express) - Supports Intel® Smart Response Technology*** **ASMedia® SATA 6Gb/s controller****** - 2 x SATA 6Gb/s ports (beige) ***** **Supports PCIE RAID configurations via onboard M.2 and PCIEX16_3 slot storages.** ****** **The M.2 socket shares SATA ports with SATA Express_1 ports. Adjust BIOS settings to use an M.2 SATA device.** ******* **These functions will work depending on the CPU installed.** ******** **These SATA ports are for data hard drivers only. ATAPI devices are not supported.**
Audio	**Realtek® ALC1150 8-Channel High Definition Audio CODEC** - Audio shielding ensures precision analog/digital separation and greatly reduced multi-lateral interference - Separate layer for left and right track, ensuring both sound deliver equal quality - Top notch audio sensation delivers according to the audio configuration - Audio Amplifier to enhance the highest quality sound for headphone and speakers - High quality 112dB SNR stereo playback output (Line-out@back) & 104dB SNR recording input (Line-in) support - Absolute Pitch 192khz/24bit True BD Lossless Sound - BD Audio Layer Content Protection - Supports Jack-Detection, Multi-streaming, and Front Panel Jack-Retasking - Optical S/PDIF out port at back I/O
USB	**Intel® Z170 Express Chipset supports ASUS USB 3.1 Boost** - 6 x USB 3.0/2.0 ports (4 ports @mid-board, 2 port @back panel, blue) - 8 x USB 2.0/1.1 ports (4 ports @mid-board, 4 port @back panel, black) **ASMedia® USB 3.1 controllers supports ASUS USB 3.1 Boost and 3A power output** - 1 x USB 3.1/3.0/2.0 port @back panel (teal blue, Type A) - 1 x USB 3.1/3.0/2.0 port @back panel (Type C)

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Exclusive TUF Features	**"Ultimate COOL!" Thermal Solution** - TUF Thermal Armor with Flow Valve - TUF Thermal Radar 2 with Thermistors - TUF ICe **"We Got Your Back!" Shape Force** - TUF Fortifier **"TUF ENGINE!" Power Design** - 8+4 Digital Phase Power Design - TUF Components (10K Ti-Cap, TUF Chokes & MOSFET; certified by military-standard) - ASUS DIGI+ Power Control Utility **"Safe & Stable!" Guardian Angel** - TUF Detective 2 - TUF ESD Guards 2 - Dust Defenders with connector covers and back I/O dust filter - MemOK!
Other Special Features	- USB 3.1 Boost featuring speedy USB 3.1 transmission - USB BIOS Flashback with USB BIOS Flashback Wizard for EZ BIOS download scheduling - ASUS UEFI BIOS EZ Mode featuring friendly graphics user interface - Turbo LAN to experience smooth online gaming with lower pings and less lags - AI Suite 3 - ASUS Q-Connector - ASUS Q-Shield - ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) - ASUS Q-Slot - ASUS Q-DIMM - ASUS O.C. Profile - ASUS CrashFree BIOS 3 - EZ Update - ASUS EZ Flash 3 - Multi-language BIOS

SABERTOOTH Z170 MARK 1 specifications summary

Back Panel I/O Ports	1 x DisplayPort
	1 x HDMI port
	1 x TUF Detective USB port
	1 x USB BIOS Flashback Button
	1 x Optical S/PDIF out
	2 x LAN (RJ45) ports
	1 x USB 3.1/3.0/2.0 ports (teal blue, Type A)
	1 x USB 3.1/3.0/2.0 (Type C)
	2 x USB 3.0/2.0 ports (blue, supports Key Express)
	4 x USB 2.0/1.1 ports (black, supports USB BIOS Flashback)
	8-channel Audio I/O ports
Internal I/O connectors	2 x USB 3.0/2.0 connectors support additional 4 USB ports (19-pin)
	2 x USB 2.0/1/1 connectors support additional 4 USB ports
	1 x M.2 Socket 3 (for M Key, type 2242/2260/2280/22110 devices)
	2 x SATA Express connectors
	8 x SATA 6.0Gb/s connectors (4 x gray, from SATA Express ports; 2 x black; 2 x beige)
	1 x CPU Fan connector (4-pin) for both 3-pin(DC mode) and 4-pin(PWM mode) CPU coolers control with auto detection support
	1 x CPU OPT Fan connector (4-pin)
	1 x Water Pump header (4-pin)
	6 x Chassis Fan connectors (4-pin) for both 3-pin(DC mode) and 4-pin(PWM mode) coolers control
	3 x Assistant Fan connectors (1 x 3-pin, 2 x 4-pin [White])
	1 x Front panel audio connector (AAFP)
	1 x S/PDIF out header
	1 x Thunderbolt header (5-pin) for ASUS ThunderboltEX series support
	1 x TPM connector
	1 x 24-pin EATX Power connector
	1 x 8-pin EATX 12V Power connector
	1 x System Panel (Q-Connector)
	1 x MemOK! button
	1 x Clear CMOS jumper
	1 x DRCT(Direct Key) connector
	3 x T_Sensor (Thermal Sensor) headers
	1 x 5-pin EXT_FAN(Extension Fan) connector

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BIOS Features	128 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI3.0, WfM2.0, SM BIOS 3.0, ACPI 5.0, Multi-language BIOS, ASUS EZ Flash 3, CrashFree BIOS 3, F11 EZ Tuning Wizard, F6 Qfan Control, F3 My Favorites, Quick Note, Last Modified log, F12 PrintScreen and ASUS DRAM SPD (Serial Presence Detect) memory information
Manageability	WfM 2.0, DMI 3.0, WOL by PME, PXE
Support DVD contents	Drivers ASUS Utilities EZ Update Anti-virus software (OEM version)
Operating System Support	Windows® 10* Windows® 8.1* Windows® 7 *64-bit supported only
Form factor	ATX Form Factor, 12"x 9.6" (30.5 cm x 24.4 cm)

Specifications are subject to change without notice.

Package contents

Check your motherboard package for the following items:
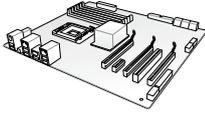
ASUS SABERTOOTH Z170 MARK 1 motherboard

Technical documentations, certification and warranty card

Support DVD
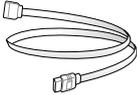
4 x Serial ATA 6.0 Gb/s cables

1 x ASUS SLI™ bridge connector (7 cm)

1 x ASUS Q-Shield
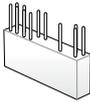
1 x ASUS Q-Connector kit

2 x Assistant fans (40 mm & 35 mm)
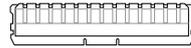
2 x DRAM slot covers

3 x PCIe x16 slot covers
3 x PCIe x1 slot covers

1 x CPU Installation Tool

3 x Thermistor cables

TUF Accessory Installation Guide

1 x Connector cap set (On board USB 3.0, DVI, HDMI, DP, LAN)

5 x Audio connector caps
1 x Bead chain

7 x SATA connector caps
2 x SATA Expresss connector caps
8 x Back I/O USB connector caps
1 x USB Type C connector cover
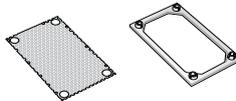
1 x back I/O dust frame
1 x back I/O dust grid

2 x Short fan screws
4 x Long fan screws

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

• The illustrated items above are for reference only. Actual product specifications may vary with different models.

Installation tools and components
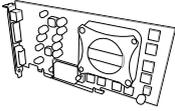
Graphics card (optional)

Phillips (cross) screwdriver

PC chassis

Power supply unit

Intel® LGA1151 CPU

Intel® LGA1151 compatible CPU Fan
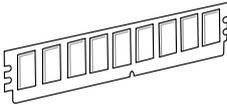
DIMM
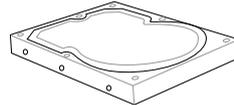
SATA hard disk drive
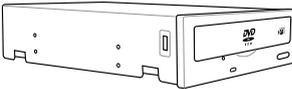
SATA optical disc drive (optional)

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

Product Introduction

1

1.1 Special features

1.1.1 Product highlights

LGA1151 socket for the 6th Generation Intel® Core™ i7/Intel® Core™ i5/Intel® Core™ i3, Pentium® and Celeron® processors

This motherboard supports 6th generation Intel® Core™ i7/Intel® Core™ i5/Intel® Core™ i3, Pentium® , and Celeron® processors in the LGA1151 package. It provides great graphics and system performance with its GPU, dual-channel DDR4 memory slots and PCI Express 2.0/3.0 expansion slots.

Intel® Z170 Express Chipset

Intel® Z170 Express Chipset is a single chipset that supports the LGA1151 socket for the 6th generation Intel® Core™ i7/Intel® Core™ i5/Intel® Core™ i3, Pentium® , and Celeron® processors. It utilizes the serial point-to-point links, which increases bandwidth and enhances the system's performance. It natively supports up to ten USB 3.0 ports, six SATA 6 Gb/s ports, and M.2 Gen 3 X4 support for faster data retrieval.

PCI Express® 3.0

PCI Express® 3.0 (PCIe 3.0) is the PCI Express bus standard that provides twice the performance and speed of PCIe 2.0. It provides an optimal graphics performance, unprecedented data speed and seamless transition with its complete backward compatibility to PCIe 1.0/2.0 devices.

QUAD-GPU SLI and 3-WAY CrossFireX™ Support

The motherboard features Quad-GPU SLI and 3-Way AMD CrossfireX support that enables multi-GPU setup, giving you the full power of the latest graphics technologies.

SATA Express support

SATA Express provides faster data transfer speeds of up to 10Gb/s, allowing your system to catch up with the speed of the SSDs. It also features backward compatibility with up to two SATA drives of the same speed.

PCIe 3.0 x4 M.2 Support

With a 4x PCI Express 3.0/2.0 bandwidth, the M.2 can support up to 32 Gbit/s of data transfer speed. It is a perfect choice for the operating system or application drive, making your system and its installed apps work in a faster pace.

Complete USB 3.1 integration

This motherboard has the latest USB 3.1 connectivity built in with dual Type-A ports for the very fastest USB data transfers — that's up to 10Gb/s, or twice as fast as USB 3.0. The next-generation standard is completely backward-compatible with your existing USB devices, and you'll be all set for USB 3.1's breakneck speeds.

1.1.2   "Ultimate COOL" Thermal Solutions

Thermal Armor

The Thermal Armor is the world's first ever thermal design for the entire motherboard, not just for select critical areas. It safeguards the system against hot air generated by connected cards and components, keeping temps down. With its sophisticated and agile integrated shunt design, the Thermal Armor improves cool air circulation, directing it towards every important part for a complete motherboard cool down. It effectively conducts hot air away and out of the case through special airflow channels, contributing to enhanced system stability and extending component lifespan.

Thermal Radar 2

Thermal Radar 2 uses multiple sensors to control motherboard temperatures, automatically adjusting fan speeds for better system stability and power efficiency. It also provides customizable fan management that displays real-time motherboard, CPU and VGA zone cooling status, and promotes extended system longevity, power saving solution, and noise reduction.

1.1.3 "TUF Engine" Power Design

Digital Power Control

ASUS DIGI+ Power Control features the revolutionary and innovative digital VRM, DRAM, and CPU Voltage controllers. These controllers offers ultra-precise memory and voltage tuning for optimal system efficiency, stability and performance.

TUF Components (Choke, 10K Ti-Cap. & MOSFET; certified by military-standard)

The motherboard's TUF components features military-standard robust TUF new chokes, titanium solid state capacitors, and MOSFETS. These TUF components support up to a massive 40A rated current, eliminates buzzing noise and vibration, and delivers better performance, and durability during the most extreme usage.

1.1.4 "Safe & Stable!" Guardian Angel

TUF Fortifier

The metal base TUF Fortifier strengthens the base of the motherboard and secures the Thermal Armor and the motherboard in place. It reinforces the motherboard's PCB to support the Thermal Armor, CPU, VGA card, additional expansion cards, and other peripherals. It also makes the motherboard easier to handle and helps protect your hands.

Dust Defenders

Dust Defenders provides rear I/O filter and special shields that help reduce dust build-up on critical points within slots and connectors, minimizing any harm to the components' optimal functions, data transfer efficiency, and system performance.

TUF ESD Guards 2

TUF ESD (Electrostatic Discharge) Guards provides protection against electrostatic discharges, which can damage the motherboard's components. The ASUS exclusive Anti-Static chip and circuit design, and the I/O shield provide four times better protection and ensure the motherboard's lifespan.

MemOK!

MemOK!, the remarkable memory rescue tool, allows you to simply press a button to patch memory issues, ensure memory boot compatibility, determine fail-safe settings, and dramatically improve the system's bootup.

1.1.5   ASUS EZ DIY

ASUS UEFI BIOS (EZ Mode)

ASUS UEFI BIOS, a UEFI compliant architecture, offers the first mouse-controlled intuitive graphical BIOS interface that goes beyond the traditional keyboard-only BIOS controls, providing you with more flexibility, convenience, and easy to navigate UEFI BIOS than the traditional BIOS versions. It offers you with dual selectable modes and native support for hard drives larger than 2.2 TB.

ASUS UEFI BIOS includes the following new features:

*   New My Favorites function allows you to quickly access the frequently used items.

*   New quick Note function allows you to take notes in the BIOS environment.

*   New Last Modified log allows you to view all your modified settings.

*   F12 BIOS snapshot hotkey.

*   ASUS DRAM SPD (Serial Presence Detect) information detecting faulty DIMMs, and helping with difficult POST situations.

ASUS Q-Design

ASUS Q-Design enhances your DIY experience. All of Q-Slot and Q-Shield design speed up and simplify the DIY process.

ASUS Q-shield

ASUS Q-Shield's special design makes it convenient and easy to install on your motherboard. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against EMI (Electronic Magnetic Interference).

ASUS Q-connector

ASUS Q-Connector is a unique adapter that allows you to easily connect or disconnect the chassis front panel cables to one module, eliminating the hassle of plugging one cable at a time and making the connection quick and accurate.

1.1.6   ASUS Exclusive Features

USB Charger+

With a dedicated onboard controller, quick-charge all your smart devices such as smartphones, tablets and more, all up to three times faster, even when the system is powered off, in sleep or hibernation mode.

USB BIOS Flashback

USB BIOS Flashback offers a hassle-free updating solution for your ultimate convenience. Install a USB storage device containing the BIOS file, press the BIOS Flashback button for about three seconds, and the UEFI BIOS is automatically updated even without entering the existing BIOS or operating system. It also allows you to regularly check for UEFI BIOS updates, and download the latest BIOS automatically.

AI Suite 3

With its user-friendly interface, ASUS AI Suite 3 consolidates all the exclusive ASUS features into one simple-to-use software package. It allows you to supervise fan speed control, voltage and sensor readings. This all-in-one software offers diverse and easy to use functions, with no need to switch back and forth between different utilities.

1.1.7   Other special features

ErP Ready

The motherboard is European Union's Energy-related Products (ErP) ready, and ErP requires products to meet certain energy efficiency requirement in regards to energy consumptions. This is in line with ASUS vision of creating environment-friendly and energy-efficient products through product design and innovation to reduce carbon footprint of the product and thus mitigate environmental impacts.

1.2 Motherboard overview

1.2.1 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.

1.2.2   Motherboard layout
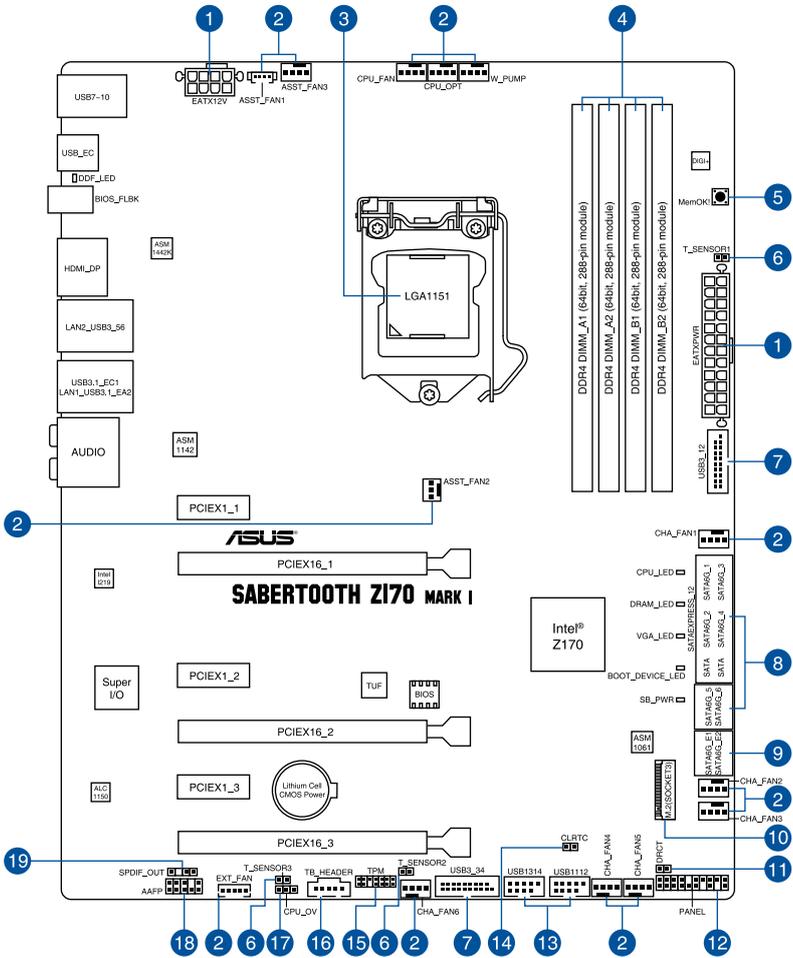
Refer to **1.2.9 Internal connectors** and **2.3.1 Rear I/O connection** for more information about rear panel connectors and internal connectors.

Layout contents

Connectors/Jumpers/Buttons and switches/Slots	Page
1. ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	1-31
2. CPU, water pump, CPU optional, assistant fan, extension, and chassis fan connectors (4-pin CPU_FAN; 4-pin W_PUMP; 4-pin CPU_OPT; 5-pin EXT_FAN; 4-pin CHA_FAN1-6; 4-pin ASST_FAN1-3)	1-28
3. LGA1151 CPU socket	1-9
4. DDR4 DIMM slots	1-10
5. MemOK! button	1-20
6. Thermal Sensor connector (2-pin T_SENSOR1)	1-30
7. USB 3.0 connectors (20-1 pin USB3_12, USB3_34)	1-25
8. Intel® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_56 [black]; SATAEXPRESS12 [gray])	1-24
9. ASMedia® Serial ATA 6 Gb/s connectors (7-pin SATA6G_E12)	1-36
10. M.2 Socket 3	1-35
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12. System panel connector (20-3 pin PANEL)	1-32
13. USB 2.0 connectors (10-1 pin USB1112; USB1314)	1-27
14. Clear RTC RAM (2-pin CLRTC)	1-21
15. TPM connector (20-1 pin TPM)	1-33
16. Thunderbolt header (5-pin TB_HEADER)	1-34
17. CPU Over Voltage jumper (3-pin CPU_OV)	1-17
18. Front panel audio connector (10-1 pin AAFP)	1-29
19. Digital audio connector (4-1 pin SPDIF_OUT)	1-26

1.2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1151 socket designed for the 6th Generation Intel® Core™ i7 / Intel® Core™ i5 / Intel® Core™ i3, Pentium®, and Celeron® processors.
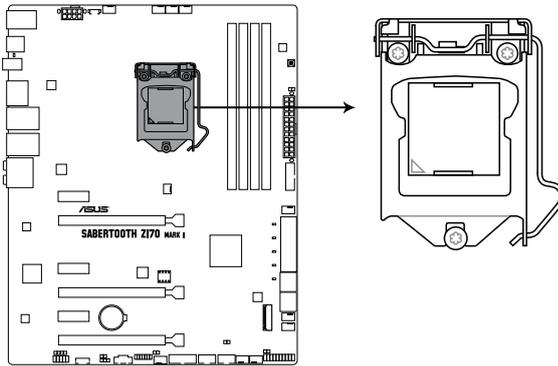
SABERTOOTH Z170 MARK 1 CPU LGA1151

Ensure that you install the correct CPU designed for LGA1151 socket only. DO NOT install a CPU designed for other sockets on the LGA1151 socket.

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

- 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 LGA1151 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.

1.2.4 System memory

The motherboard comes with four Double Data Rate 4 (DDR4) Dual Inline Memory Modules (DIMM) slots.

⚠️ A DDR4 module is notched differently from a DDR, DDR2, or DDR3 module. DO NOT install a DDR, DDR2, or DDR3 memory module to the DDR4 slot.
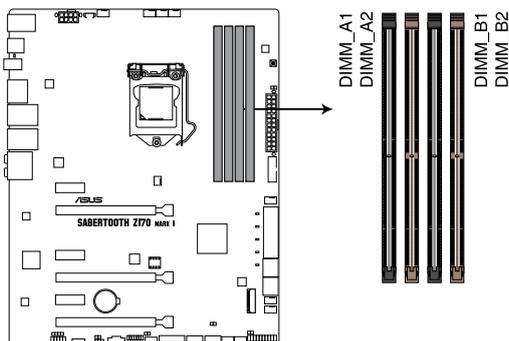
SABERTOOTH Z170 MARK 1 288-pin DDR4 DIMM socket

Recommended memory configurations
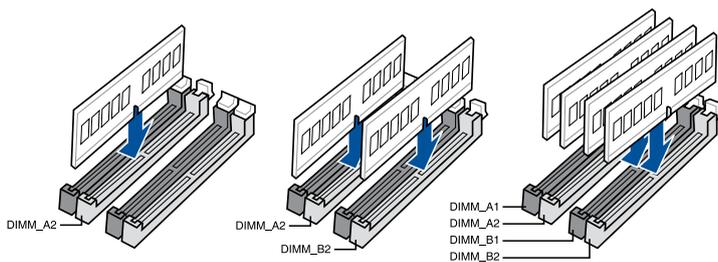
Memory configurations

You may install 2 GB, 4 GB, 8 GB, and 16 GB unbuffered and non-ECC DDR4 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.

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

- 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:

  a) Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.

  b) Install a 64-bit Windows® OS when you want to install 4 GB or more on the motherboard.

  c) 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 512 Mb (64 MB) 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 **3.5 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.

- Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.

SABERTOOTH Z170 MARK 1 Motherboard Qualified Vendors Lists (QVL)

DDR4 3400 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
CORSAIR	CMD16GX4M4B3400C16	16GB(4GB*4)	SS	Samsung	K4A4G085WD	16-18-18-38	1.35V		•	

DDR4 3333 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
G.SKILL	F4-3333C16D-8GTZ	8GB(4GB*2)	SS	SK hynix	H5AN4G8NMFR	16-18-18-38	1.35V		•	
G.SKILL	F4-3333C16Q-16GRKD	16GB(4GB*4)	SS	Samsung	K4A4G085WD	16-16-16-36	1.35V		•	
CORSAIR	CMD16GX4M4B3333C16 ver4.23	16GB(4GB*4)	SS	Samsung	K4A4G085WD	16-18-18-36	1.35V		•	
A-DATA	AX4U3333W4G16	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V		•	

DDR4 3300 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
G.SKILL	F4-3300C16Q-16GRK	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V		•	
G.SKILL	F4-3300C16D-8GTZ	8GB(4GB*2)	SS	Samsung	K4A4G085WD	16-18-18-38	1.35V		•	
CORSAIR	CMD16GX4M4B3300C16	16GB(4GB*4)	SS	Samsung	K4A4G085WD	16-18-18-36	1.35V		•	

DDR4 3200 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
G.SKILL	F4-3200C16Q-16GRR	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V		•	
G.SKILL	F4-3200C16Q-16GRB	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V		•	
G.SKILL	F4-3200C16Q-16GRRK	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V		•	
AVEXIR	AVD4U32001604G-4BZ1	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-18-18-36	1.35V		•	
AVEXIR	AVD4U32001604G-4CIR	16GB(4GB*4)	SS			16-18-18-36	1.35V		•	
CORSAIR	CMD16GX4M4A3200C16	16GB(4GB*4)	SS			16-18-18-36	1.35V		•	
GEIL	GPR416GB3200C15QC	16GB(4GB*4)	SS			15-15-15-35	1.35V		•	
Kingston	HX432C16PB2K4/16	16GB(4GB*4)	SS			16-16-16-39	1.35V		•	
Panram	PUD43200C164G4NJW	16GB(4GB*4)	SS			16-18-18-39	1.35V		•	

DDR4 3000 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
G.SKILL	F4-3000C15Q-32GRR	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15Q-32GRB	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15Q-32GRK	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C16Q-32GRR	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V	•		
G.SKILL	F4-3000C16Q-32GRB	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V	•		
G.SKILL	F4-3000C16Q-32GRK	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	16-16-16-36	1.35V	•		
G.SKILL	F4-3000C15Q-16GRR	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15Q-16GRB	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15Q-16GRK	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15Q2-32GRK	32GB(4GB*8)	SS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
G.SKILL	F4-3000C15D-8GTZ	8GB(4GB*2)	SS	Samsung	K4A4G085WD	15-15-15-35	1.35V	•		
AVEXIR	AVD4U30001604G-4CI	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	16-18-18-36	1.35V	•		
AVEXIR	AVD4U30001504G-4BZ1	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	15-15-15-35	1.35V	•		
AVEXIR	AVD4U30001608G-4CI	32GB(8GB*4)	DS	SK hynix	H5AN4G8NMFR	16-18-18-36	1.35V	•		
Kingston	HX430C15PB2K4/16	16GB(4GB*4)	SS			15-16-16-39	1.35V	•		
CORSAIR	CMD16GX4M4B3000C15	16GB(4GB*4)	SS	Samsung	K4A4G085WD	15-17-17-35	1.35V	•		
CORSAIR	CMK16GX4M4B3000C15	16GB(4GB*4)	SS	Samsung	K4A4G085WD	15-17-17-35	1.35V	•		
panram	PUD43000C154G4NJW	16GB(4GB*4)	SS			15-17-17-35	1.35V	•		
Asint	SLA404G08-EWWHMX	16GB(4GB*4)	SS	SK hynix	H5AN4G8NMFR	15-15-15-44	1.35V	•		

DDR4 2800 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
ADATA	AX4U2800W4G17	32GB (8x 4GB)	DS	-	-	17-17-17-36	1.2	•	•	•
ADATA	AX4U2800W8G17	8GB	DS	-	-	15-15-15-36	1.2	•	•	•
Apacer	78.BAGM8.AF20B(XMP)	4GB	SS	-	-	17-17-17-36	-	•	•	•
Apacer	78.CAGM8.AF30B(XMP)	8GB	DS	-	-	17-17-17-36	-	•	•	
AVEXIR	AVD4U28001504G-4CIR(XMP)	4GB	SS	-	-	15-15-15-35	1.35	•	•	•
AVEXIR	AVD4U28001608G-4CIR(XMP)	32GB (8x 4GB)	DS	-	-	16-16-16-36	1.2	•	•	•
CORSAIR	CMD16GX4M4A2800C16 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	16-18-18-36	1.2	•	•	•
CORSAIR	CMD16GX4M4A2800C16 (Ver5.29)	16GB (4x 4GB)	SS	-	-	16-18-18-36	1.2	•	•	•
CORSAIR	CMD32GX4M4A2800C16 (Ver5.29)(XMP)	32GB (4x 8GB)	DS	-	-	18-18-18-36	1.2	•	•	•
CORSAIR	CMK16GX4M4A2800C16 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	16-16-18-36	1.2	•	•	•

(continued on the next page)

DDR4 2800 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
CORSAIR	CMK16GX4M4A2800C16(Ver5.29)	16GB (4x 4GB)	SS	-	-	16-18-18-36	1.2	•	•	•
CORSAIR	CMK32GX4M4A2800C16(Ver5.29) (XMP)	32GB (4x 8GB)	DS	-	-	16-18-18-36	1.2	•	•	•
G.SKILL	F4-2800C15Q2-64GRK(XMP)	64GB (8x 8GB)	DS	-	-	15-16-16-35	1.25	•	•	•
G.SKILL	F4-2800C16Q-16GRR(XMP)	16GB (4x 4GB)	SS	-	-	16-16-16-36	1.2	•	•	•
G.SKILL	F4-2800C16Q-32GRR(XMP)	32GB (4x 8GB)	DS	-	-	16-16-16-36	1.2	•	•	•
Kingston	HX428C14PBK4/16(XMP)	16GB (4x 4GB)	SS	-	-	14-15-15-40-2	1.35	•	•	•
Panram	PUD42800C164G4NJW(XMP)	16GB (4x 4GB)	SS	-	-	2800-16-18-18-36	1.25	•	•	•

DDR4 2666 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
AVEXIR	AVD4U26661504G-4CIR (XMP)	4GB	SS	-	-	15-15-15-35	1.2	•		•
AVEXIR	AVD4U26661608G-4CIR (XMP)	32GB (8x 4GB)	DS	-	-	16-16-16-36	1.2	•		•
CORSAIR	CMD16GX4M4A2666C15 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMD16GX4M4A2666C16 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	16-18-18-35	1.2	•	•	•
CORSAIR	CMD16GX4M4A2666C16 (Ver5.29)(XMP)	16GB (4x 4GB)	SS	-	-	16-18-18-35	1.2	•	•	•
CORSAIR	CMD32GX4M4A2666C15 (Ver4.23)(XMP)	32GB (4x 8GB)	DS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMD32GX4M4A2666C15 (Ver5.29)	32GB (4x 8GB)	DS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMD32GX4M4A2666C16 (Ver4.23)(XMP)	32GB (4x 8GB)	DS	-	-	16-18-18-35	1.2	•	•	•
CORSAIR	CMK16GX4M4A2666C15 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMK16GX4M4A2666C15 (Ver5.29)	16GB (4x 4GB)	SS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMK16GX4M4A2666C16 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	16-18-18-35	1.2	•	•	•
CORSAIR	CMK16GX4M4A2666C16 (Ver5.29)(XMP)	16GB (4x 4GB)	SS	-	-	16-18-18-35	1.2	•	•	•
CORSAIR	CMK32GX4M4A2666C15 (Ver4.23)(XMP)	32GB (4x 8GB)	DS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMK32GX4M4A2666C15 (Ver5.29)(XMP)	32GB (4x 8GB)	DS	-	-	15-17-17-35	1.2	•	•	•
CORSAIR	CMK32GX4M4A2666C16 (Ver5.29)(XMP)	32GB (4x 8GB)	DS	-	-	16-16-18-35	1.2	•	•	•
CORSAIR	CMK32GX4M4A2666C16R (Ver4.23)(XMP)	32GB (4x 8GB)	DS	-	-	16-18-18-35	1.2	•	•	•
G.SKILL	F4-2666C15Q-16GRR (XMP)	16GB (4x 4GB)	SS	-	-	15-15-15-35	1.2	•		•
G.SKILL	F4-2666C15Q-32GRR (XMP)	32GB (4x 8GB)	DS	-	-	15-15-15-35	1.2	•	•	•
G.SKILL	F4-2666C16Q2-64GRB(XMP)	64GB (8x 8GB)	DS	-	-	16-16-16-36	1.2	•	•	•

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DDR4 2666 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
ISDT	IMA41GU6MFR8N-CF0(XMP)	8GB	DS	ISDT	I5AN4G8NMFR	15-15-15-35	1.2	•		•
ISDT	IMA451U6MFR8N-CF0(XMP)	4GB	SS	ISDT	I5AN4G8NMFR	15-15-15-35	1.2	•	•	•
Team	TCD44G2666C15ABK (XMP)	4GB	SS	Samsung	K4A4G085WD	15-15-15-35	1.2	•	•	•
Team	TCD48G2666C15ABK (XMP)	32GB(4x 8GB)	DS	Team	TCD48G2666C15ABK	15-15-15-35	1.2	•	•	•

DDR4 2400 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
AVEXIR	AVD4U24001608G-4M	32GB (8x 4GB)	DS	SK Hynix	H5AN4G8NMFRTFC	16-16-16-39	1.2	•	•	•
CORSAIR	CMD16GX4M4A2400C14 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	14-16-16-31	1.2	•	•	•
CORSAIR	CMK16GX4M4A2400C14 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	14-16-16-31	1.2		•	•
Crucial	BLS4G4D240FSA.8FAD	4GB	SS	-	-	16-16-16-40	1.2	•	•	•
crucial	BLS4G4D240FSA.8FAR (XMP)	4GB	SS	-	-	17-16-16-39-2	1.2	•	•	•
Crucial	BLS8G4D240FSA.16FAD	8GB	DS	-	-	16-16-16-40	1.2	•	•	•
Panram	PUD42400C154G4NJW	16GB (4x 4GB)	SS	-	-	2400-15-15-15-35	1.2	•	•	•
Panram	PUD42400C158G4NJW	32GB (4x 8GB)	DS	-	-	2400-15-15-15-35	1.2	•	•	
Team	TED44GM2400C16BK	4GB	SS	Samsung	K4A4G085WD	16-16-16-39	1.2	•	•	•
Team	TED48GM2400C16BK	8GB	DS	Samsung	K4A4G085WD	16-16-16-39	1.2	•	•	•
V-color	TD4G8C17-UH	4GB	SS	V-color	DW3J0460HM	2400-15-15-15-36	1.2	•	•	•

DDR4 2133 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
ADATA	AD4U2133W4G15-B	4GB	SS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	-	•	•	•
ADATA	AD4U2133W8G15	8GB	DS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	1.2	•	•	•
Apacer	78.B1GM3.AF00B	4GB	SS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	1.2	•	•	•
Apacer	78.C1GM3.AF10B	8GB	DS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	1.2	•	•	•
AVEXIR	AVD4U21331504G-4M	4GB	SS	AVEXIR	512X8DDR4	15-15-15-35	1.2	•	•	•
Century	CD8G-D4U2133	8GB	DS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	-	•	•	•
CORSAIR	CMK16GX4M4A2133C13 (Ver4.23)(XMP)	16GB (4x 4GB)	SS	-	-	13-15-15-28	1.2	•	•	
CORSAIR	CMK32GX4M4A2133C13 (Ver4.23)(XMP)	32GB (4x 8GB)	DS	-	-	13-15-15-28	1.2	•	•	•
CORSAIR	CMK64GX4M8A2133C13 (Ver4.23)(XMP)	64GB (8x 8GB)	DS	-	-	13-15-15-28	1.2	•	•	•
CORSAIR	CMV4GX4M1A2133C15	4GB	SS	-	-	15-15-15-36	1.2	•	•	•
CORSAIR	CMV8GX4M1A2133C15	8GB	DS	-	-	15-15-15-36	1.2	•	•	•

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DDR4 2133 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1	2	4
G.SKILL	F4-2133C15Q-16GRR	16GB (4x 4GB)	SS	-	-	15-15-15-35	1.2	•	•	•
G.SKILL	F4-2133C15Q-32GRR	32GB (4x 8GB)	DS	-	-	15-15-15-35	-	•	•	•
ISDT	IMA41GU6MFR8N-TF0	8GB	DS	ISDT	I5AN4G8NMFR	15-15-15-35	1.2	•	•	
ISDT	IMA451U6MFR8N-TF0	4GB	SS	ISDT	I5AN4G8NMFR	15-15-15-35	1.2	•	•	•
Panram	PUD42133C134G4NJW	16GB (4x 4GB)	SS	-	-	2133-13-13-13-35	1.2	•	•	
Panram	PUD42133C138G4NJW	32GB (4x 8GB)	DS	-	-	2133-13-13-13-35	1.2	•	•	•
Panram	PUD42133C154G2VS	8GB (2x 4GB)	SS	SK Hynix	H5AN4GBNMFRTFC	2133-15-15-15-36	1.2	•	•	•
Panram	PUD42133C154GNJK	4GB	SS	-	-	15-15-15-36	1.2	•	•	•
Panram	PUD42133C158G2VS	16GB (2x 8GB)	DS	SK Hynix	H5AN4GBNMFRTFC	2133-15-15-15-36	1.2	•	•	•
panram	PUD42133C158GNJK	8GB	DS	-	-	15-15-15-36	1.2	•	•	•
SanMax	SMD-4G28HP-21P	4GB	SS	SK Hynix	H5AN4G8NMFRTFC	15-15-37-2	-	•	•	•
SanMax	SMD-8G28HP-21P	8GB	DS	SK Hynix	H5AN4G8NMFRTFC	15-15-37-2	-	•	•	•
SUPER TALENT	FBU2B008GM	8GB	DS	Micron	D9RGQ	15-15-15-36	1.2	•	•	•
Team	TED44GM2133C15ABK	4GB	SS	SK Hynix	H5AN4G8NMFRTFC	15-15-15-36	1.2	•	•	•
Transcend	TS1GLH64V1H	8GB	DS	Samsung	K4A4G085WD	2133-15-15-15-37	-	•	•	•
Transcend	TS512MLH64V1H	4GB	SS	Samsung	K4A4G085WD	2133-15-15-15-37	-	•	•	•
UMAX	84G44G93MC-21OMCALGF15	4GB	SS	Micron	D9RGQ	15-15-15-36	-	•	•	•
UMAX	84G48G93MC-21OMCGNGF15	8GB	DS	Micron	D9RGQ	15-15-15-36	-	•	•	•

Side(s): SS - Single-sided   DS - Double-sided DIMM support:

`1` Supports one (1) module inserted into any slot as Single-channel memory configuration. We suggest that you install the module into A2 slot.

`2` Supports two (2) modules inserted into one pair of the beige slots or the black slots as one pair of dual-channel memory configuration. We suggest that you install the modules into slots A2 and B2 for better compatibility.

`4` Supports four (4) modules inserted into both the beige slots and black slots as two pairs of quad-channel memory configuration. We suggest that you install the modules into slots A1, A2, B1, and B2 for better compatibility.

- ASUS exclusively provides hyper DIMM support function.

- Hyper DIMM support is subject to the physical characteristics of individual CPUs. Load the X.M.P. or D.O.C.P. settings in the BIOS for the hyper DIMM support.

- Visit the ASUS website for the latest QVL.

- When you run XMP at DDR4 3200 MHz or higher, system stability depends on the CPU capabilities.

1.2.5   Expansion slots

Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.
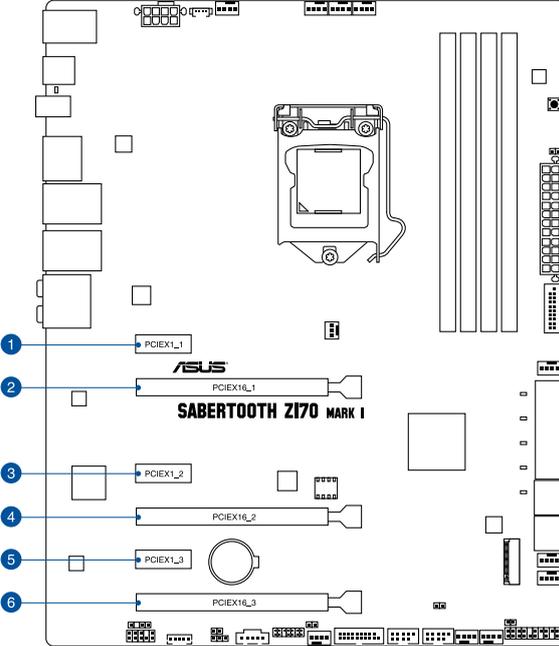
Slot No.	Slot Description
1	PCIE 2.0 x1_1 slot
2	PCIE 3.0/2.0 x16_1 slot
3	PCIE 2.0 x1_2 slot
4	PCIE 3.0/2.0 x16_2 slot
5	PCIE 2.0 x1_4 slot
6	PCIE 3.0/2.0 x16_3 slot

VGA configuration	PCI Express 3.0 operating mode	
	PCIe 3.0/2.0 x16_1	PCIe 3.0/2.0 x16_2
Single VGA/PCIe card	x16 (single VGA recommended)	N/A
Dual VGA/PCIe card	x8	x8

- We recommend that you provide sufficient power when running CrossFireX™ or SLI™ mode.

- Connect a chassis fan to the motherboard connector labeled CHA_FAN1-4 when using multiple graphics cards for better thermal environment.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIe x16_1	shared	-	-	-	-	-	-	-
PCIe x16_2	-	shared	-	-	-	-	-	-
PCIe x16_3	shared	-	-	-	-	-	-	-
PCIe x1_1	-	-	-	shared	-	-	-	-
PCIe x1_2	-	-	shared	-	-	-	-	-
PCIe x1_3	-	-	-	shared	-	-	-	-
SMBUS Controller	shared	-	-	-	-	-	-	-
Intel SATA Controller	shared	-	-	-	-	-	-	-
Intel LAN1(i219)	shared	-	-	-	-	-	-	-
Realtek 8111H	shared	-	-	-	-	-	-	-
ASMedia SATA Controller1 (1061)	-	shared	-	-	-	-	-	-
Intel xHCI	shared	-	-	-	-	-	-	-
HD Audio	shared	-	-	-	-	-	-	-

1.2.6 Onboard buttons

1. **MemOK! button**

   Installing DIMMs that are not compatible with the motherboard may cause system boot failure, and the DRAM_LED near the MemOK! switch lights continuously. Press and hold the MemOK! button until the DRAM_LED starts blinking to begin automatic memory compatibility tuning for successful boot.
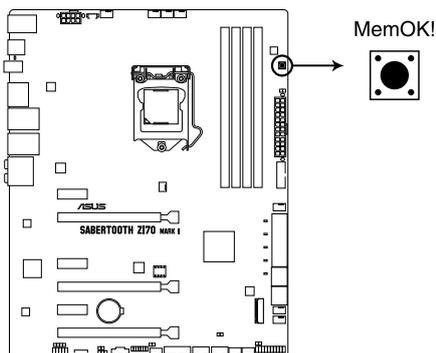
SABERTOOTH Z170 MARK 1 MemOK! button

> • Refer to section **1.2.8 Onboard LEDs** for the exact location of the DRAM_LED.
>
> • The DRAM_LED also lights up when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.
>
> • The MemOK! button does not function under Windows® OS environment.
>
> • During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and tests the next set of failsafe settings. The blinking speed of the DRAM_LED increases, indicating different test processes.
>
> • Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM_LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) in this user manual or on the ASUS website at www.asus.com.
>
> • If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer. To stop memory tuning, turn off the computer and unplug the power cord for about 5–10 seconds.
>
> • If your system fails to boot up due to BIOS overclocking, press the MemOK! button to boot and load the BIOS default settings. A message will appear during POST reminding you that the BIOS has been restored to its default settings.
>
> • We recommend that you download and update to the latest BIOS version from the ASUS website at www.asus.com after using the MemOK! function.

1.2.7 Jumpers

1. Clear RTC RAM (2-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.
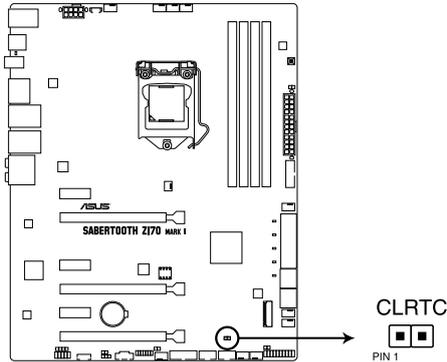
CLRTC
PIN 1

SABERTOOTH Z170 MARK 1 CLRTC connector

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.

2. Short-circuit pin 1-2 with a metal object or jumper cap for about 5-10 seconds.

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.

Except when clearing the RTC RAM, never short-circuit the CLRTC jumper. Shorting the CLRTC jumper 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 clearing the CMOS, 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 CPU Parameter Recall (C.P.R.) feature. Shut down and reboot the system, then the BIOS automatically resets parameter settings to default values.

- Due to 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. CPU Over Voltage jumper (3-pin CPU_OV)

The CPU Over Voltage jumper allows you to set a higher CPU voltage for a flexible overclocking system, depending on the type of the installed CPU. To gain more CPU voltage setting, insert the jumper to pins 2-3. To go back to its default CPU voltage setting, insert the jumper to pins 1-2.

CPU_OV

1 2 — Disable (default setting)

2 3 — Enable
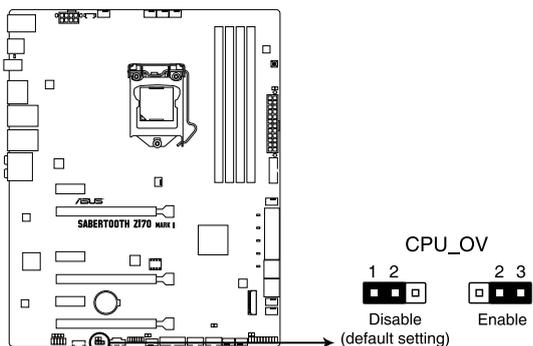
SABERTOOTH Z170 MARK 1 CPU_OV setting

1.2.8   Onboard LEDs

1.   **POST State LEDs**

The POST State LEDs provide the status of these key components during POST (Power-On-Self Test): CPU, memory modules, VGA card, and hard disk drives. If an error is found, the critical component's LED stays lit up until the problem is solved.

☐ CPU_LED

☐ DRAM_LED

☐ VGA_LED
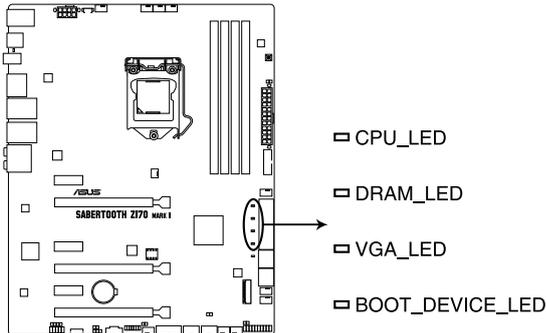
☐ BOOT_DEVICE_LED

SABERTOOTH Z170 MARK 1 CPU/ DRAM/ BOOT_DEVICE/ VGA LED

2.   **Standby Power LED (SBPWR)**

The motherboard comes with a standby power LED. The green LED 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 LED.

SB_PWR

ON
Standby Power

OFF
Powered Off
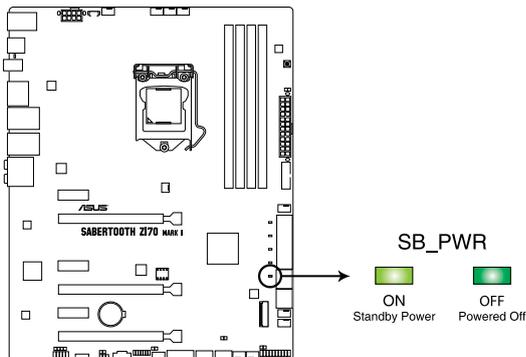
SABERTOOTH Z170 MARK 1 Standby Power LED

1.2.9 Internal connectors

1. Intel® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_56 [black]; SATAEXPRESS12 [gray])

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6 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® Z170 chipset.
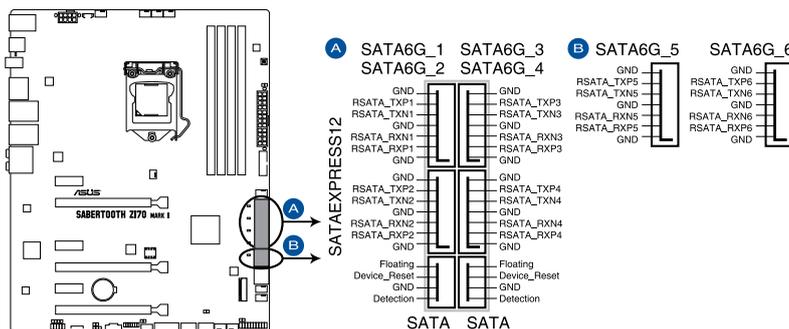
SABERTOOTH Z170 MARK 1 Intel® SATA 6 Gb/s connectors
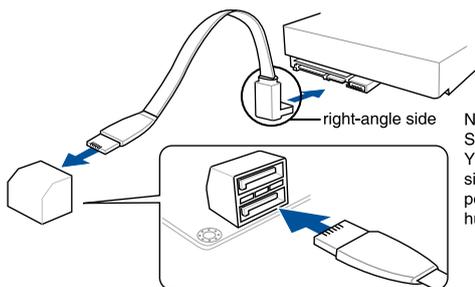
right-angle side

NOTE: Connect the right-angle side of SATA signal cable to SATA device. You may also 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**].

- Before creating a RAID set, refer to section **5.1 RAID configurations** or the manual bundled in the motherboard support DVD.

2. **USB 3.0 connector (20-1 pin USB3_12, USB3_34)**

These connectors allow you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5 Gb/s, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

SABERTOOTH Z170 MARK 1 USB3.0 connectors

The USB 3.0 module is purchased separately.

- Ensure to install the related driver to fully use the USB 3.0 ports under Windows® 7.

- The plugged USB 3.0 device may run on xHCi or EHCI mode depending on the operating system's setting.

- These USB 3.0 ports support native UASP transfer standard in Windows® 8 / Windows® 8.1 and Turbo Mode when using USB 3.1 Boost feature.

3. **Digital audio connector (4-1 pin SPDIF_OUT)**

    This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port. 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.
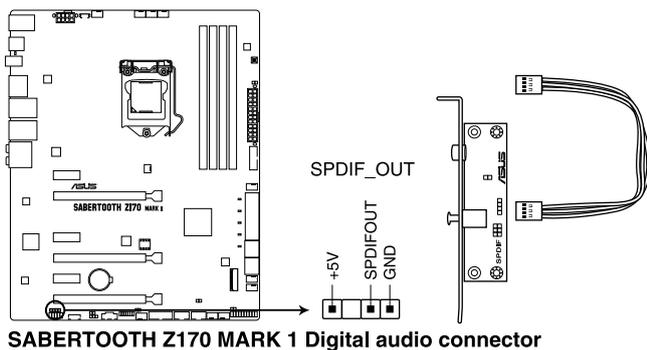
SABERTOOTH Z170 MARK 1 Digital audio connector

The S/PDIF module is purchased separately.

4. **USB 2.0 connectors (10-1 pin USB1112; USB1314)**

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 48 MBps connection speed.

SABERTOOTH Z170 MARK 1 USB2.0 connectors
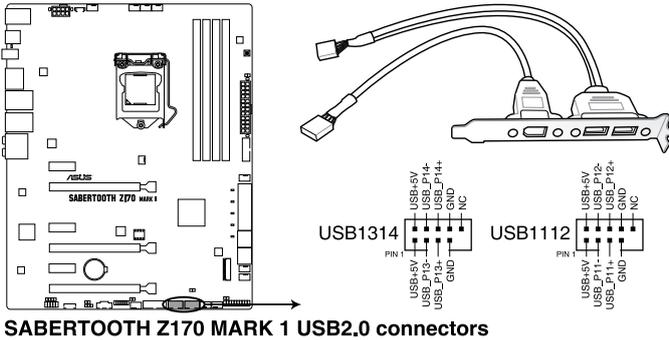
DO NOT connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

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

The USB 2.0 module is purchased separately.

5. **CPU, water pump, CPU optional, assistant fan, extension, and chassis fan connectors (4-pin CPU_FAN; 4-pin W_PUMP; 4-pin CPU_OPT; 5-pin EXT_FAN; 4-pin CHA_FAN1-6; 4-pin ASST_FAN1-3)**

Connect the fan cables to the fan connectors on the motherboard.
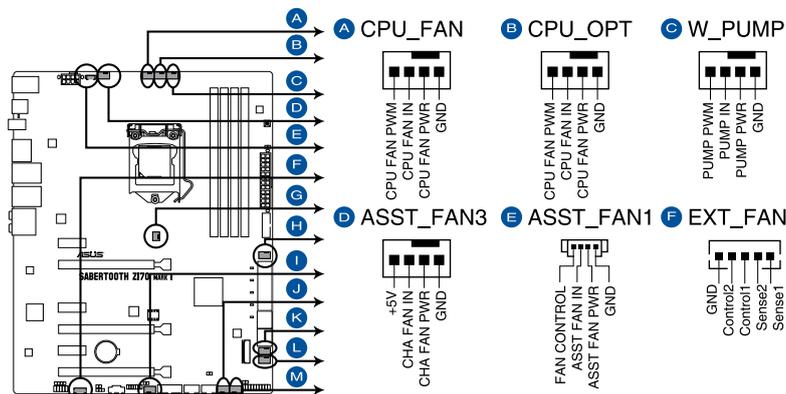
SABERTOOTH Z170 MARK 1 Fan connectors

Ⓐ CPU_FAN
CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

Ⓑ CPU_OPT
CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

Ⓒ W_PUMP
PUMP PWM
PUMP IN
PUMP PWR
GND

Ⓓ ASST_FAN3
+5V
CHA FAN IN
CHA FAN PWR
GND

Ⓔ ASST_FAN1
FAN CONTROL
ASST FAN IN
ASST FAN PWR
GND

Ⓕ EXT_FAN
GND
Control2
Control1
Sense2
Sense1

Ⓖ ASST_FAN2
Rotation
+12V
GND

Ⓗ CHA_FAN3
CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

Ⓘ CHA_FAN6
GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

Ⓙ CHA_FAN4
GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

Ⓚ CHA_FAN2
CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

Ⓛ CHA_FAN3
CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

Ⓜ CHA_FAN5
GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

⚠️
- 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!
- Ensure that the CPU FAN cable is securely installed to the CPU fan connector.

✎
- The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.
- The CPU_FAN, CHA_FAN and ASST_FAN connectors support the TUF Thermal Radar 2 feature.
- W_PUMP function support depends on water cooling device.
- To fully use the fan control function, ensure that you connect only an assistant fan to the ASST_FAN connectors.

6. Front panel audio connector (10- 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.

SABERTOOTH Z170 MARK 1 Analog front panel connector
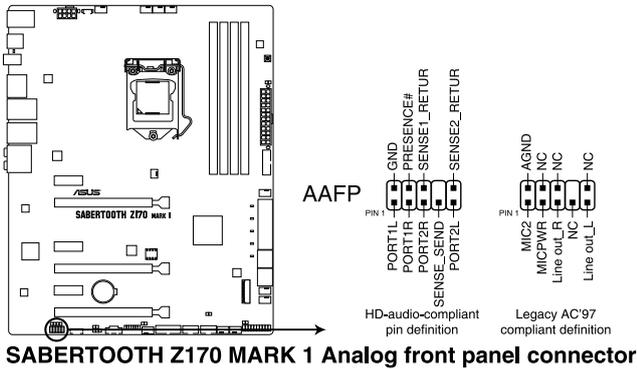
• We recommend that you connect a high-definition front panel audio module to this connector to avail the motherboard's high-definition audio capability.

• If you want to connect a high-definition or an AC`97 front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to [**HD Audio**] or [**AC97**].

7.   **Thermal Sensor connectors (2-pin T_SENSOR1; T_SENSOR2; T_SENSOR3)**

These connectors are for the thermistor cables that monitor the temperature of the devices and the critical components inside the motherboard. Connect the thermistor cable and place the sensor on the device or the motherboard's component to detect its temperature.
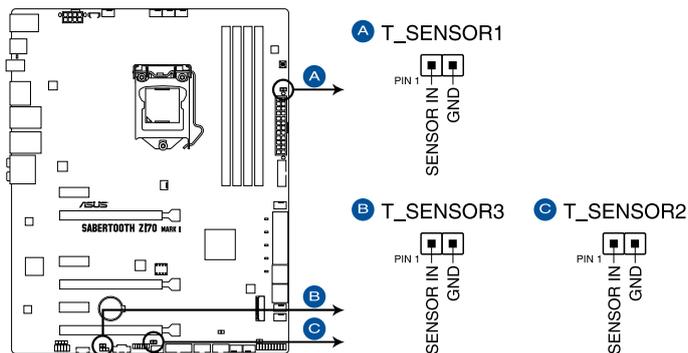
SABERTOOTH Z170 MARK 1 T_SENSOR connector

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

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.
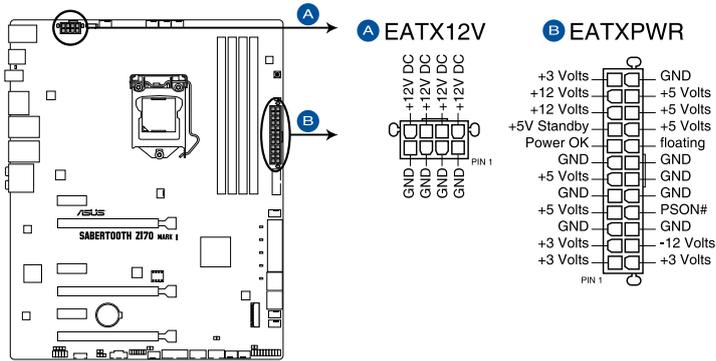
SABERTOOTH Z170 MARK 1 ATX power connectors

- 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 4-pin/8-pin EATX12 V power plug. Otherwise, the system will not boot.

- We recommend that you use a PSU with a higher power output 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 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.

9. System panel connector (20-3 pin PANEL)

This connector supports several chassis-mounted functions.
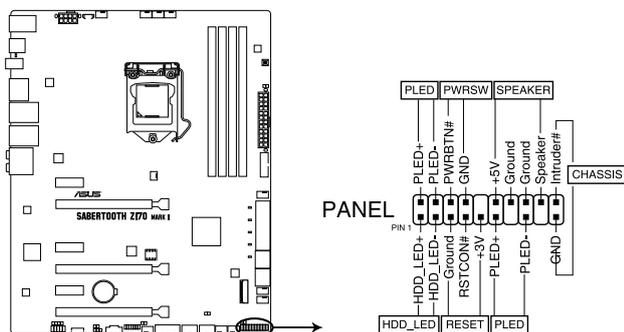
SABERTOOTH Z170 MARK 1 System panel connector

- **System power LED (2-pin or 3-1 pin PLED)**

  The 2-pin or 3-1 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 HDD_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD 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 operating system 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.

- **Chassis intrusion connector (2-pin CHASSIS)**

  This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

10. TPM connector (20-1 pin TPM)

This connector supports a Trusted Platform Module (TPM) system, which securely store keys, digital certificates, passwords and data. A TPM system also helps enhance the network security, protects digital identities, and ensures platform integrity.

SABERTOOTH Z170 MARK 1 TPM connector
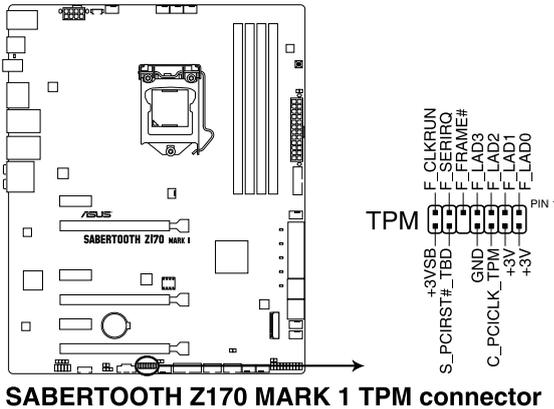
11. DirectKey connector (2-pin DRCT)

This connector is for the chassis-mounted button that supports the DirectKey function. Connect the button cable that supports DirectKey, from the chassis to this connector on the motherboard.

SABERTOOTH Z170 MARK 1 DRCT connector
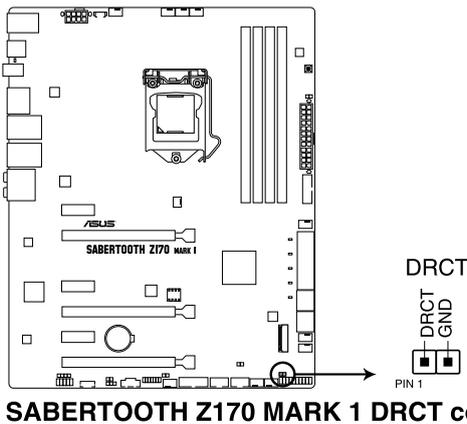
Ensure that your chassis comes with the extra button cable that supports the DirectKey feature. Refer to the technical documentation that came with the chassis for details.

12.   Thunderbolt header (5-pin TB_HEADER)

This connector is for the add-on Thunderbolt I/O card that supports Intel®'s Thunderbolt Technology, allowing you to connect up to six Thunderbolt-enabled devices and a DisplayPort-enabled display in a daisy-chain configuration.
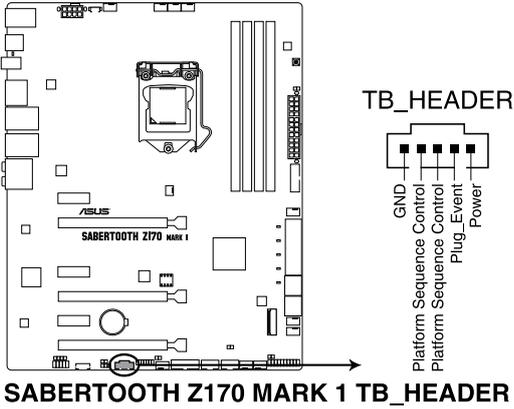
SABERTOOTH Z170 MARK 1 TB_HEADER connector

The add-on Thunderbolt I/O card and Thunderbolt cables are purchased separately.

13. M.2 socket 3

This socket allows you to install an M.2 (NGFF) SSD module.
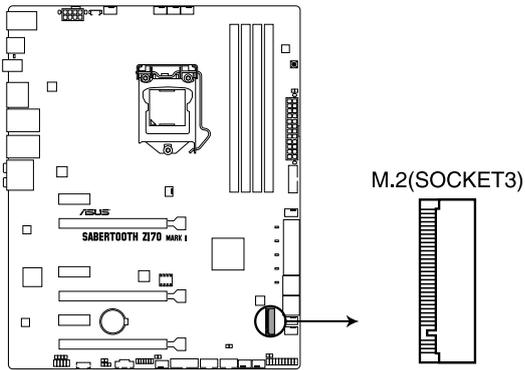
M.2(SOCKET3)

SABERTOOTH Z170 MARK 1 M.2(SOCKET3)

- This socket supports M Key and type 2242/2260/2280 storage devices.

- The M.2 Socket 3 shares bandwidth with PCIe x16_3 slot.

The M.2 (NGFF) SSD module is purchased separately.

14. ASMedia® Serial ATA 6 Gb/s connectors (7-pin SATA6G_E12)

These connectors connect to Serial ATA 6 Gb/s hard disk drives via Serial ATA 6 Gb/s signal cables.

SATA6G_E1   SATA6G_E2

GND
RSATA_TXP1
RSATA_TXN1
GND
RSATA_RXN1
RSATA_RXP1
GND

GND
RSATA_TXP2
RSATA_TXN2
GND
RSATA_RXN2
RSATA_RXP2
GND
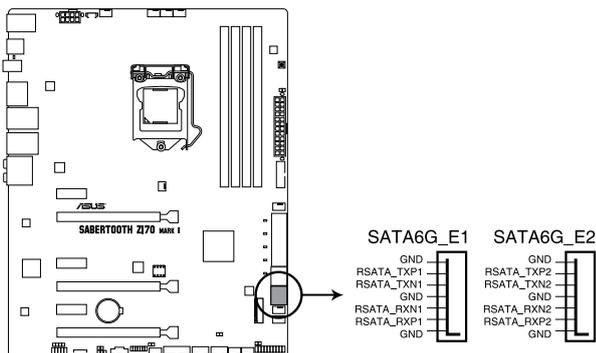
SABERTOOTH Z170 MARK 1 ASMedia® SATA 6 Gb/s connectors

• ASMedia storage controller can only support AHCI mode.

• These SATA ports are for data drives only.

Basic Installation

2

2.1 Building your PC system

2.1.1 Motherboard installation

The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

1. Install the ASUS Q-Shield to the chassis rear I/O panel.
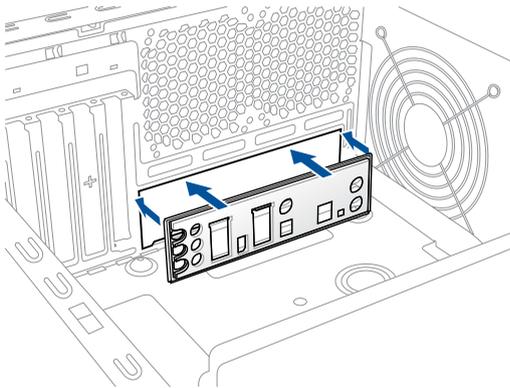
2. Place the motherboard into the chassis, ensuring that its rear I/O ports are aligned to the chassis' rear I/O panel.
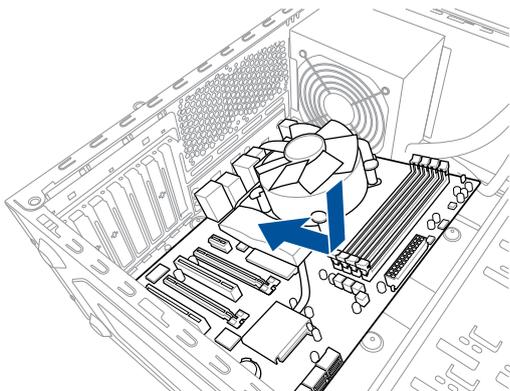
3. Place nine screws into the holes indicated by circles to secure the motherboard to the chassis.

SABERTOOTH Z170 MARK I
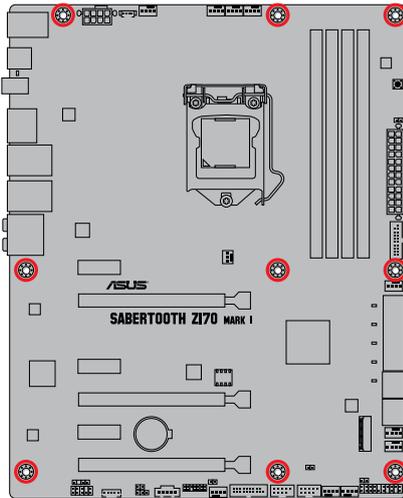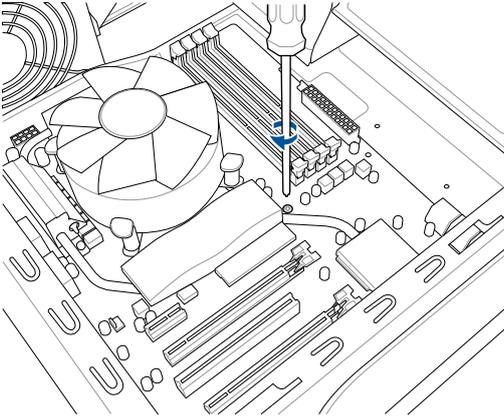
DO NOT over tighten the screws! Doing so can damage the motherboard.

2.1.2 CPU installation

⚠ Ensure that you install the correct CPU designed for LGA1151 socket only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1151 socket.

Top of CPU

Bottom of CPU

Bottom of CPU

6

7

A

C

THIS SIDE UP

Top of CPU

B

8
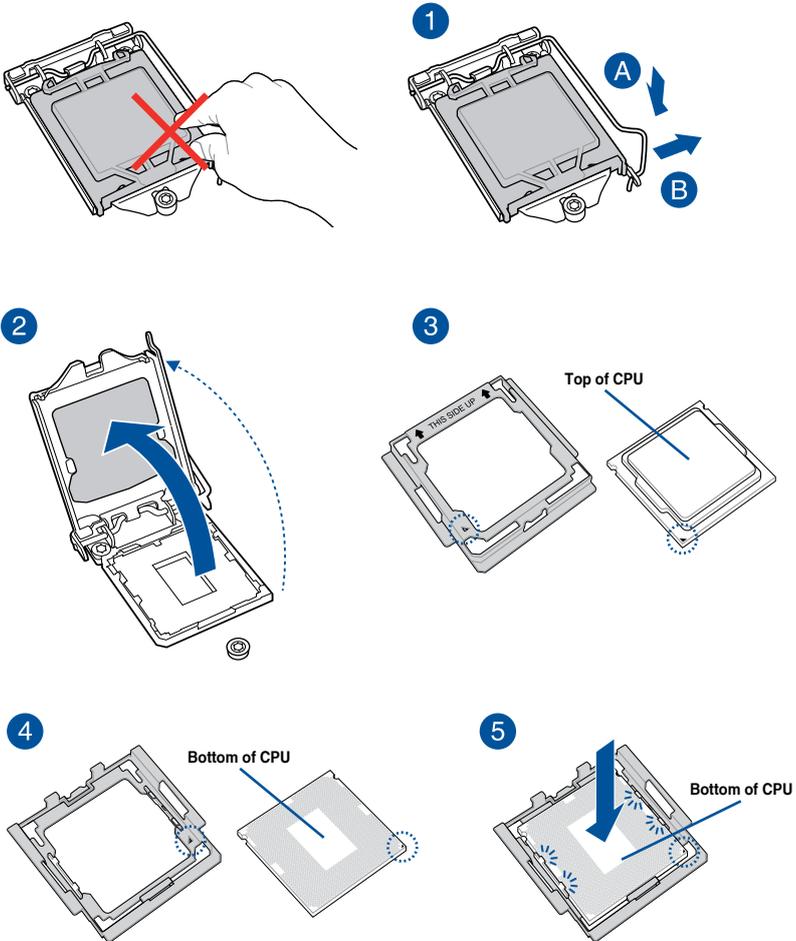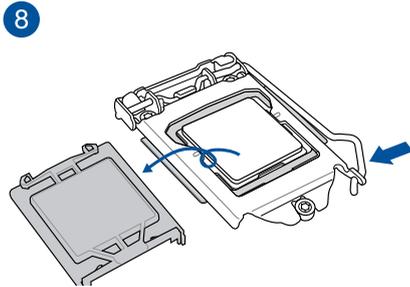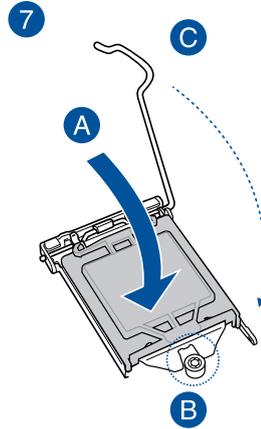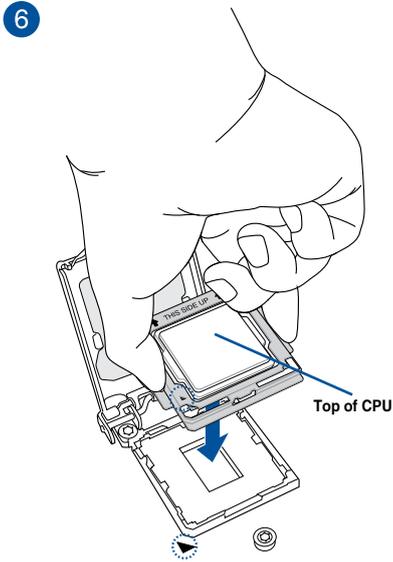
⚠️ • Ensure that the CPU is firmly clicked into place before installing it onto the CPU socket on the motherboard.

• Use the CPU Installation Tool for installing the CPU only. DO NOT damage or bend the CPU Installation Tool.

• Always firmly hold both sides of the CPU Installation Tool when installing, removing, or picking up the CPU Installation Tool.

• ASUS will not cover damages resulting from incorrect CPU installation/removal, incorrect CPU orientation/placement, or other damages resulting from negligence by the user.

2.1.3   CPU heatsink and fan assembly installation
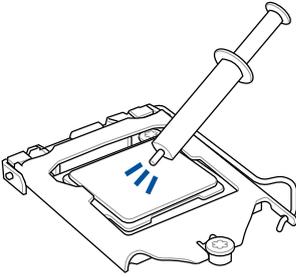
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan, if necessary.

To install the CPU heatsink and fan assembly
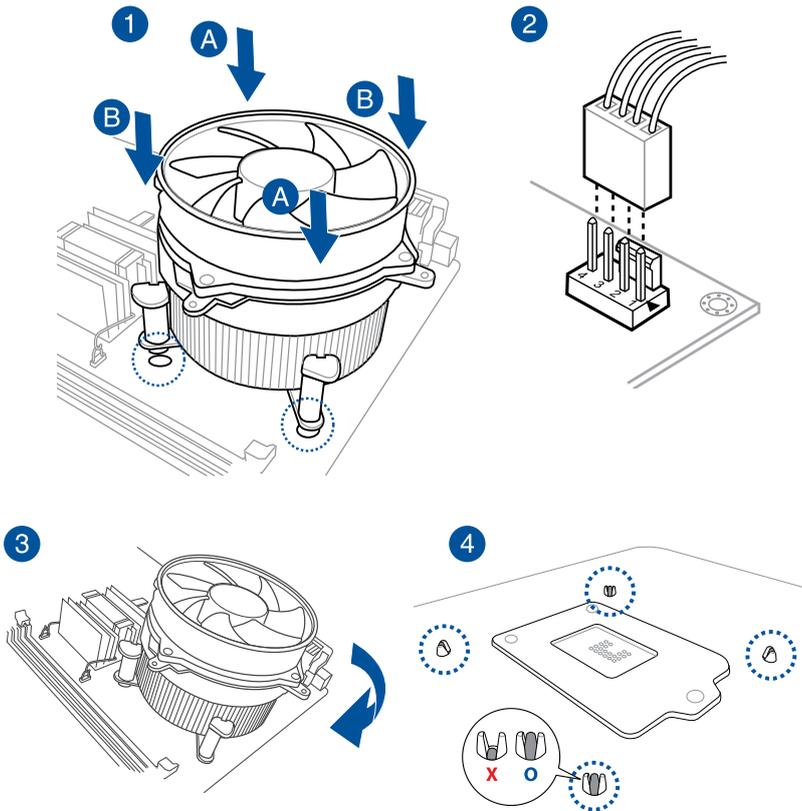
To uninstall the CPU heatsink and fan assembly
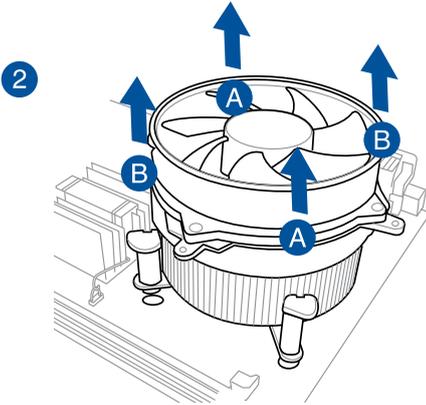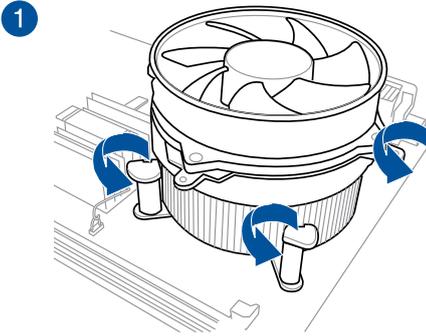
2.1.4   DIMM installation
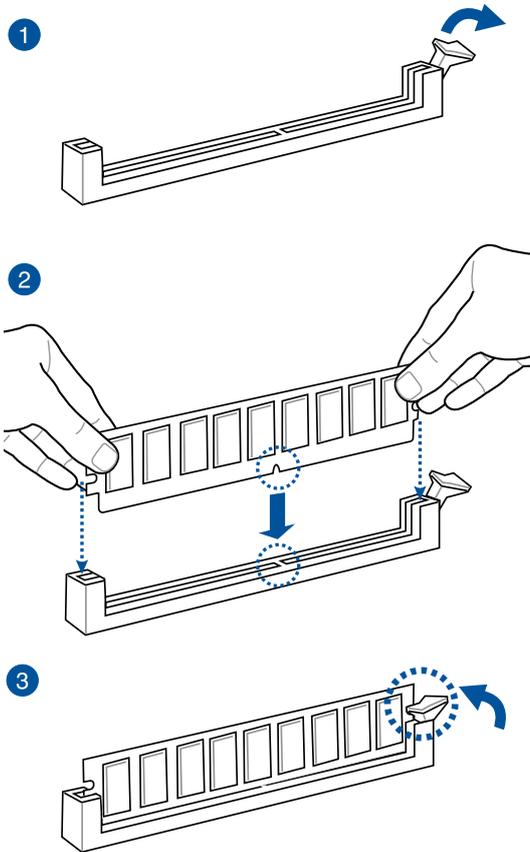
To remove a DIMM
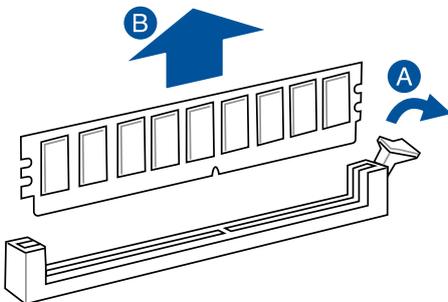
2.1.5 ATX Power connection

OR **OR**
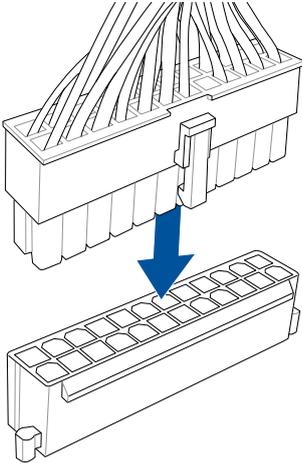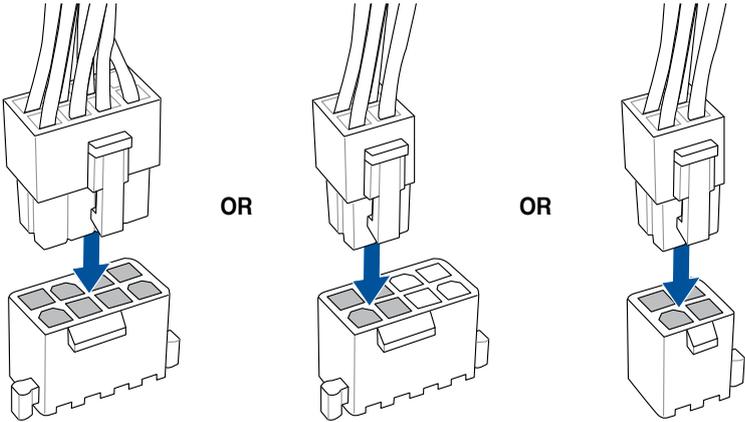
2.1.6   SATA device connection

OR
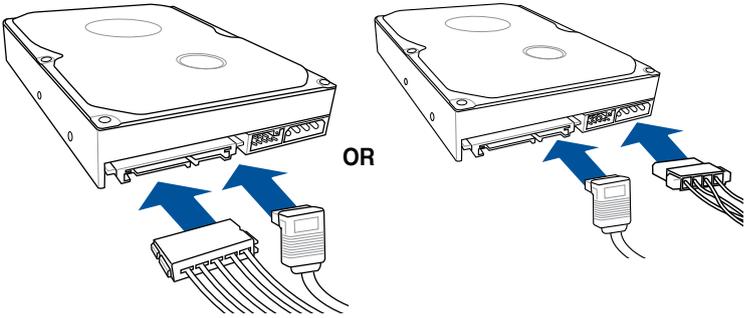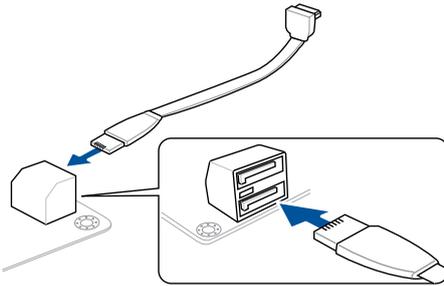
OR
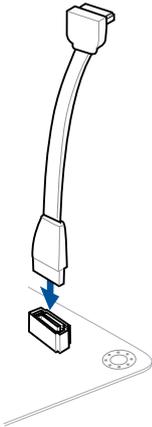
2.1.7 Front I/O Connector

To install ASUS Q-Connector
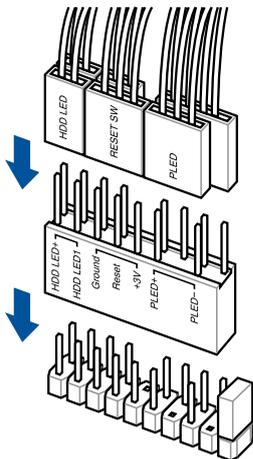
To install USB 2.0 connector
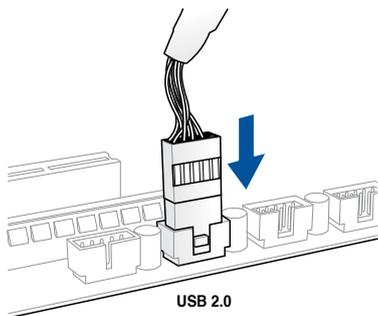
To install front panel audio connector

USB 2.0

AAFP
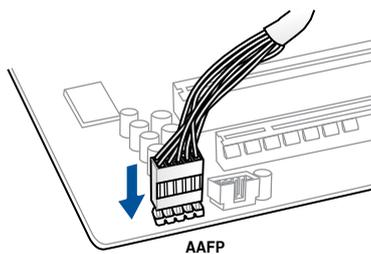
To install USB 3.0 connector

USB 3.0
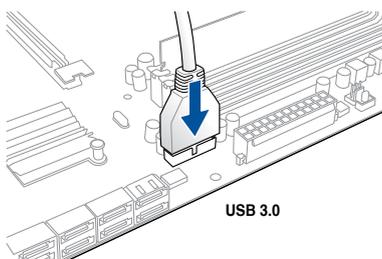
2.1.8   Expansion Card installation

To install PCIe x16 cards
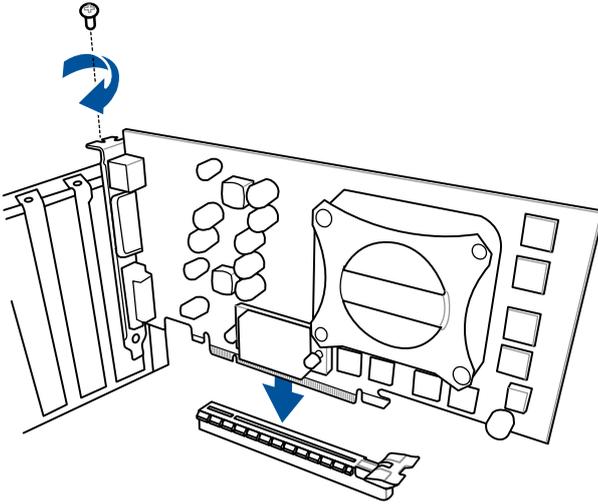
To install PCIe x1 cards
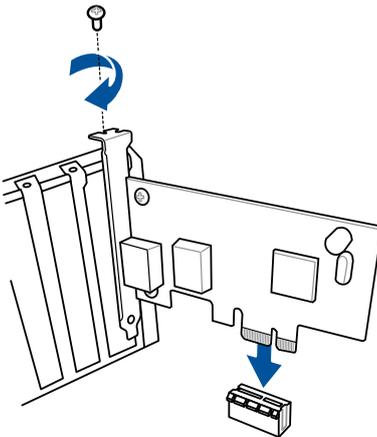
2.2 BIOS update utility

USB BIOS Flashback

USB BIOS Flashback allows you to easily update the BIOS without entering the existing BIOS or operating system. Simply insert a USB storage device to the USB port, press the USB BIOS Flashback button for three seconds, and the BIOS is updated automatically.

To use USB BIOS Flashback:

1. Place the bundled support DVD to the optical drive and install the USB BIOS Flashback Wizard. Follow the onscreen instructions to complete the installation.

2. Insert the USB storage device to the USB Flashback port.

- We recommend you to use a USB 2.0 storage device to save the latest BIOS version for better compatibility and stability.

- Please ensure to use the BIOS file named Z170ST1.CAP. Please refer to Chapter 3: BIOS setup for more information.

3. Launch the USB BIOS Flashback Wizard to automatically download the latest BIOS version.

4. Press the BIOS Flashback button for three seconds until a flashing light appears, which indicates that the BIOS Flashback function is enabled.

5. Wait until the light goes out, indicating that the BIOS updating process is completed.

USB BIOS Flashback button   **USB BIOS Flashback port**
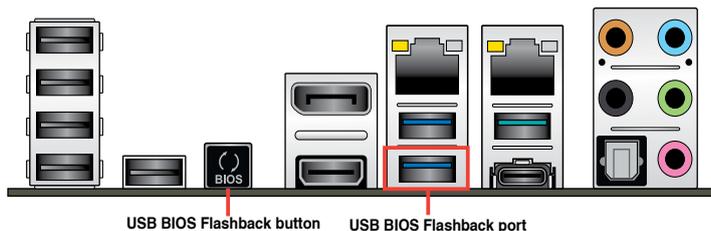
For more BIOS update utilities in BIOS setup, refer to the section **Updating BIOS** in Chapter 3.

- DO NOT unplug portable disk, power system, or use the CLR_CMOS jumper while BIOS update is ongoing, otherwise update will be interrupted. In case of interruption, please follow the steps again.

- If the light flashes for five seconds and turns into a solid light, this means that the BIOS Flashback is not operating properly. This may be caused by improper installation of the USB storage device and filename/file format error. If this scenario happens, please restart the system to turn off the light.

- Updating BIOS may have risks. If the BIOS program is damaged during the process and results to the system's failure to boot up, please contact your local ASUS Service Center.

2.3 Motherboard rear and audio connections

2.3.1 Rear I/O connection
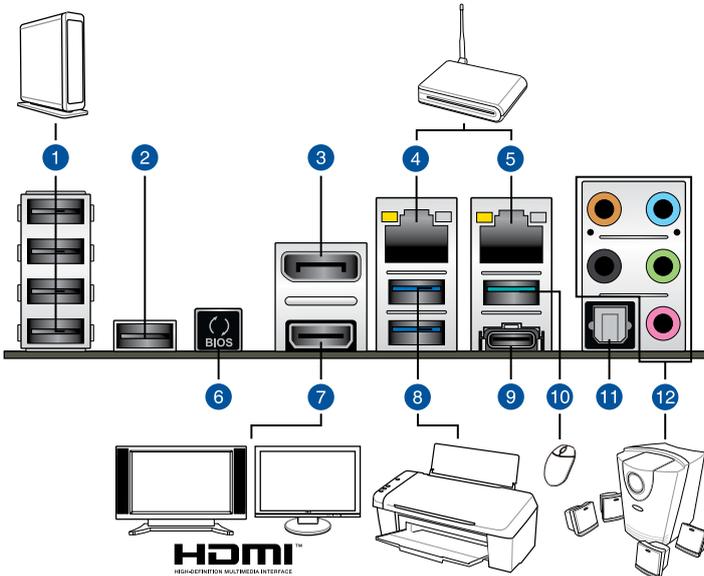
Rear panel connectors			
1.	USB 2.0 ports 7-10	7.	HDMI port
2.	USB port EC (supports TUF Detective only)	8.	USB 3.0 ports 56 (supports USB 3.0 Boost, bottom port supports USB BIOS Flashback)
3.	DisplayPort	9.	USB Type-C port EC1 (supports USB 3.1 Boost)
4.	Intel LAN port*	10.	USB 3.1 port EA1 (supports USB 3.1 Boost)
5.	Realtek LAN port*	11.	Optical S/PDIF Out port
6.	USB BIOS Flashback button	12.	Audio I/O ports**

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

- USB 3.1/3.0 devices can only be used as data storage only.

- We strongly recommend that you connect your devices to ports with matching data transfer rate. Please connect your USB 3.0 devices to USB 3.0 ports and your USB 3.1 devices to USB 3.1 ports for faster and better performance for your devices.

- All USB devices connected to the USB 2.0 and USB 3.0 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.

* LAN ports LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		

ACT/LINK LED   SPEED LED

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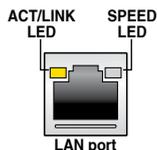
** Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In or side speaker
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

2.3.2 Audio I/O connections

Audio I/O ports

orange	light blue
black	lime
gray	pink
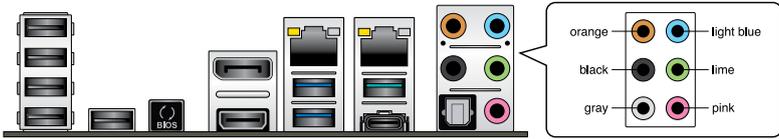
Connect to Headphone and Mic

Connect to Stereo Speakers
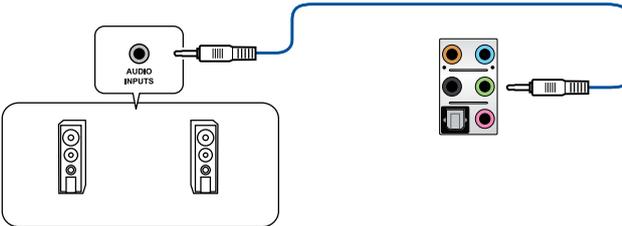
Connect to 2.1 channel Speakers

Chapter 2
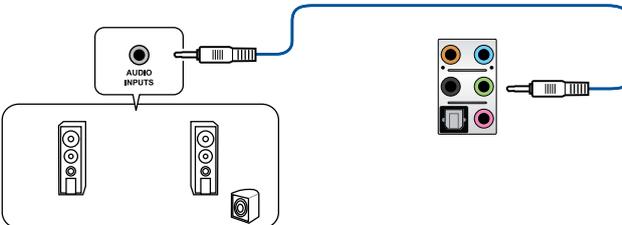
Connect to 4.1 channel Speakers
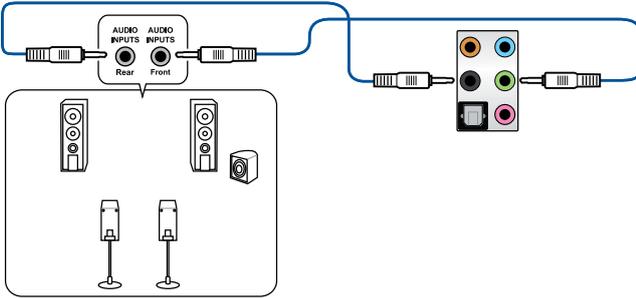
Connect to 5.1 channel Speakers
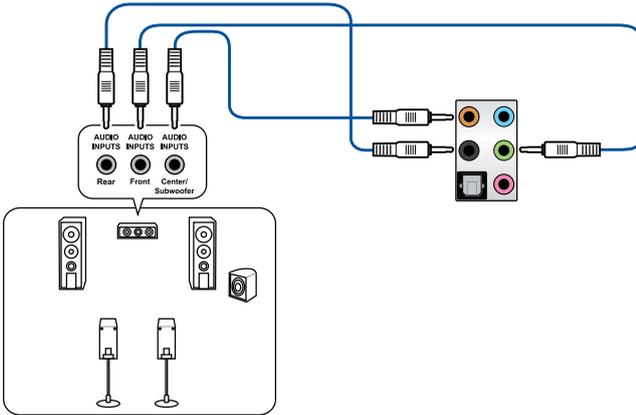
Connect to 7.1 channel Speakers
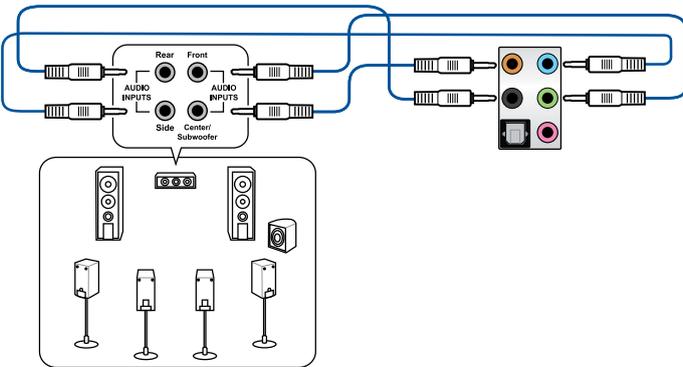
2.4 Starting up for the first time

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

2. Ensure 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 (POST). While the tests are running, the BIOS beeps (refer to the BIOS beep codes table) 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, press the power button for less than four seconds to put the system on sleep mode or soft-off mode, depending on the BIOS setting. Press the power switch for more than four seconds to let the system enter the soft-off mode regardless of the BIOS setting.

BIOS Setup

3

3.1 Knowing BIOS

The new ASUS UEFI BIOS is a Unified Extensible Interface that complies with UEFI architecture, offering a user-friendly interface that goes beyond the traditional keyboard-only BIOS controls to enable a more flexible and convenient mouse input. You can easily navigate the new UEFI BIOS with the same smoothness as your operating system. The term "BIOS" in this user manual refers to "UEFI BIOS" unless otherwise specified.

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

When downloading or updating the BIOS file, rename it as **Z170ST1.CAP** for this motherboard.

3.2   BIOS setup program

Use the BIOS Setup to update the BIOS or configure its parameters. The BIOS screen include navigation keys and brief onscreen help to guide you in using the BIOS Setup program.

Entering BIOS at startup

To enter BIOS Setup at startup, press <Delete> during the Power-On Self Test (POST). If you do not press <Delete>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

•   Press <Ctrl>+<Alt>+<Delete> simultaneously.

•   Press the reset button on the system chassis.

•   Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

After doing either of the three options, press <Delete> key to enter BIOS.

> •   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 or press the **<F5>** hotkey. See section **3.10 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 **1.2.7 Jumpers** for information on how to erase the RTC RAM.
>
> •   The BIOS setup program does not support Bluetooth devices.

BIOS menu screen

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** screen.

3.2.1 EZ Mode

By default, the EZ Mode screen appears when you enter the BIOS setup program. 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 **Advanced Mode** or press the <F7> hotkey for the advanced BIOS settings.

> The default screen for entering the BIOS setup program can be changed between EZ Mode or Advanced Mode. Refer to the Setup Mode item in section **3.8 Boot menu** for details.

Displays the system properties of the selected mode.
Click < or > to switch EZ System Tuning modes

Displays the CPU/motherboard temperature, CPU voltage output, CPU/chassis/power fan speed, and SATA information

Selects the display language of the BIOS setup program

Creates storage RAID and configures system overclocking

UEFI BIOS Utility — EZ Mode

07/18/2015 Saturday 10:10 English EZ Tuning Wizard(F11)

Information
SABERTOOTH Z170 MARK 1   BIOS Ver. 0228
Intel(R) Core(TM) i5-6400 CPU @ 2.70GHz
Speed: 2700 MHz
Memory: 4096 MB (DDR4 2133MHz)

CPU Temperature

CPU Core Voltage
2.096 V
Motherboard Temperature
32°C

33°C

EZ System Tuning
Click the icon below to apply a pre-configured profile for improved system performance or energy savings.
Quiet
Performance
Energy Saving

Normal

DRAM Status
DIMM_A1: N/A
DIMM_A2: Panram 4096MB 2133MHz
DIMM_B1: N/A
DIMM_B2: N/A

SATA Information
P1: N/A
P2: N/A
P3: ST3160812AS (160.0GB)
P4: N/A
P5: N/A
P6: N/A
E1: N/A

X.M.P.
Disabled

Intel Rapid Storage Technology
On   Off

Boot Priority
Choose one and drag the items.   Switch all

UEFI: JetFlashTranscend 4GB 8.07, Partition 1 (3830MB)

P3: ST3160812AS (152627MB)

JetFlashTranscend 4GB 8.07 (3830MB)

FAN Profile
CPU FAN
2099 RPM
CHA2 FAN
N/A
CHA4 FAN
N/A
ASST3 FAN
N/A

CHA1 FAN
N/A
CHA3 FAN
N/A
ASST2 FAN
N/A
CPU OPT FAN
N/A

CPU FAN
%
100

50

0   30   70   100
QFan Control

Boot Menu(F8)

Default(F5)   Save & Exit(F10)   Advanced Mode(F7)   Search on FAQ

Enables or disables the SATA RAID mode for Intel Rapid Storage Technology

Displays the CPU Fan's speed. Click the button to manually tune the fans

Loads optimized default settings

Saves the changes and resets the system

Click to go to Advanced mode

Search on the FAQ

Click to display boot devices

Selects the boot device priority

> The boot device options vary depending on the devices you installed to the system.

3.2.2 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 switch from EZ Mode to Advanced Mode, click **Advanced Mode** or press <F7> hotkey.

Configuration fields

Quick Note (F9)

Scroll bar

Menu bar   Language   MyFavorite(F3)   Qfan Control(F6)   EZ Tuning Wizard(F11)

Hot Keys

Sub-menu item   General help   Last modified settings   Go back to EZ Mode

Menu items

Search on the FAQ

Displays the CPU temperature,
CPU, and memory voltage output

Menu bar

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

My Favorites	For saving the frequently-used system settings and configuration.
Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
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

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

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>.

Language

This button above the menu bar contains the languages that you can select for your BIOS. Click this button to select the language that you want to display in your BIOS screen.

My Favorites (F3)

This button above the menu bar shows all BIOS items in a Tree Map setup. Select frequently-used BIOS settings and save it to MyFavorites menu.

Refer to section **3.3 My Favorites** for more information.

Q-Fan Control (F6)

This button above the menu bar displays the current settings of your fans. Use this button to manually tweak the fans to your desired settings.

Refer to section **3.2.3 Q-Fan Control** for more information.

EZ Tuning Wizard (F11)

This button above the menu bar allows you to view and tweak the overclocking settings of your system. It also allows you to change the motherboard's SATA mode from AHCI to RAID mode.

Refer to section **3.2.4 EZ Tuning Wizard** for more information.

Search on FAQ

Move your mouse over this button to show a QR code, scan this QR code on your mobile device to connect to the BIOS FAQ web page of the ASUS support website. You can also scan the following QR code:

Quick Note (F9)

This button above the menu bar allows you to key in notes of the activities that you have done in BIOS.

- The Quick Note function does not support the following keyboard functions: delete, cut, copy, and paste.

- You can only use the alphanumeric characters to enter your notes.

Hot keys

This button above the menu bar contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

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.

General help

At the top right corner of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

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.

Last Modified button

This button shows the items that you last modified and saved in BIOS Setup.

3.2.3 Q-Fan Control

The Q-Fan Control allows you to set a fan profile or manually configure the operating speed of your CPU and chassis fans.

Click to select a fan to be configured

Click to activate PWM Mode

Click to activate DC Mode

Select a profile to apply to your fans

Click to apply the fan setting

Click to undo the changes

Click to go back to main menu

Select to manually configure your fans

Configuring fans manually

Select **Manual** from the list of profiles to manually configure your fans' operating speed.
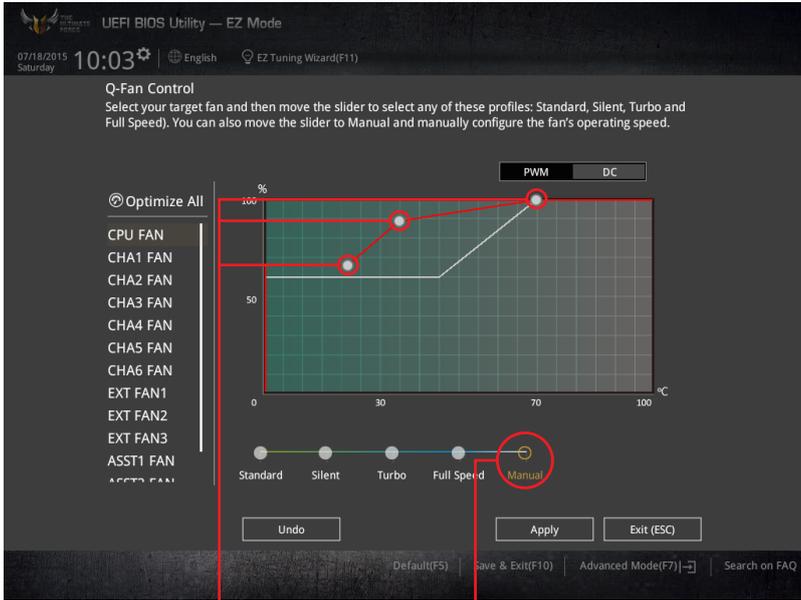
Speed points

Select to manually configure your fans

To configure your fans:

1.   Select the fan that you want to configure and to view its current status.

2.   Click and drag the speed points to adjust the fans' operating speed.

3.   Click **Apply** to save the changes then click **Exit (ESC)**.

3.2.4   EZ Tuning Wizard

EZ Tuning Wizard allows you to easily overclock your CPU and DRAM, computer usage, and CPU fan to their best settings. You can also set RAID in your system using this feature.

OC setup   **RAID setup**
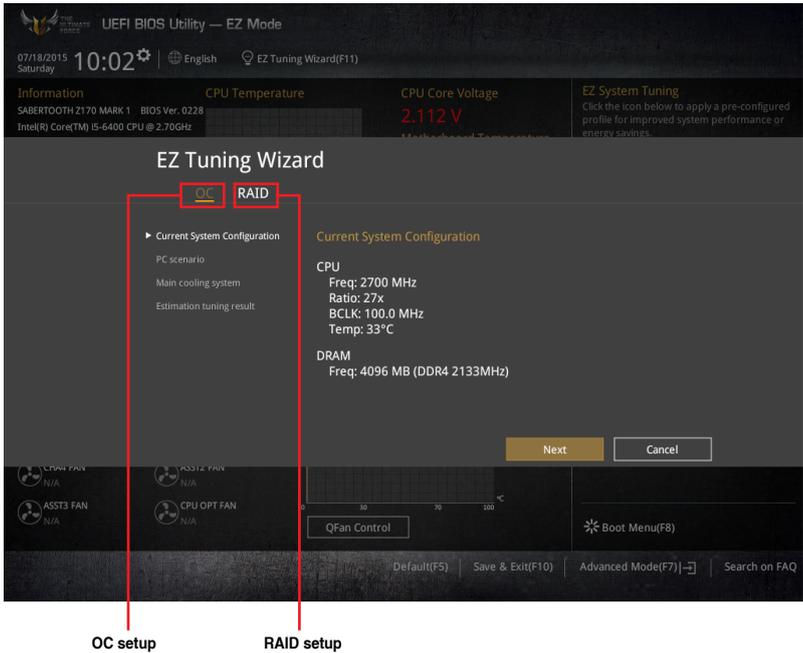
OC Tuning

To start OC Tuning:
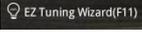
1.   Press <F11> on your keyboard or click [EZ Tuning Wizard(F11)] from the BIOS screen to open EZ Tuning Wizard screen.

2.   Click **OC** then click **Next**.

3.   Select a PC scenario **Daily Computing** or **Gaming/Media Editing,** then click **Next**.
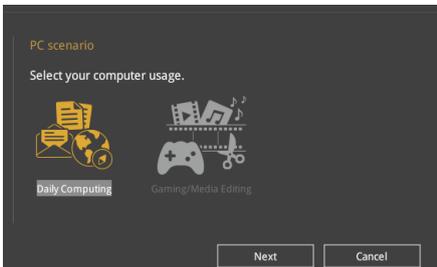
4. Select a Main Cooling System **BOX cooler, Tower cooler, Water cooler,** or **I'm not sure,** then click **Next**.

5. After selecting the Main Cooling System, click **Next** then click **Yes** to start the OC Tuning.

Creating RAID

To create RAID:

1. Press <F11> on your keyboard or click [EZ Tuning Wizard(F11)] from the BIOS screen to open EZ Tuning Wizard screen.

2. Click **RAID** then click **Next**.

> • Ensure that your HDDs have no existing RAID volumes.
>
> • Ensure to connect your HDDs to Intel® SATA connectors.

3. Select the port that you want to set to [RAID] mode, **PCIE** or **SATA**, then click **Next**.
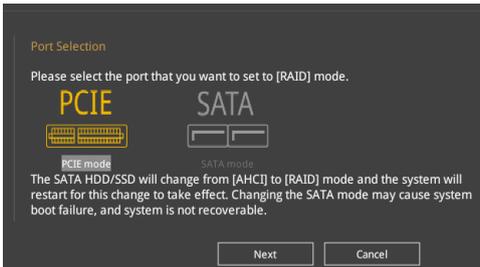
4. Select the type of storage for your RAID, **Easy Backup** or **Super Speed**, then click **Next**.

a. For Easy Backup, click **Next** then select from **Easy Backup (RAID1)** or **Easy Backup (RAID10)**.
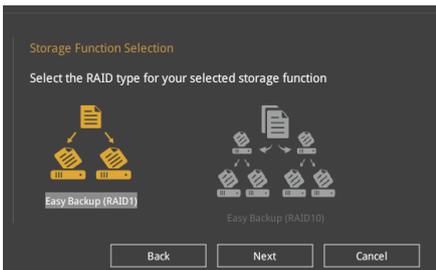
You can only select Easy Backup (RAID 10) if you connect four (4) HDDs.

b. For Super Speed, click **Next** then select from **Super Speed (RAID0)** or **Super Speed (RAID5)**.
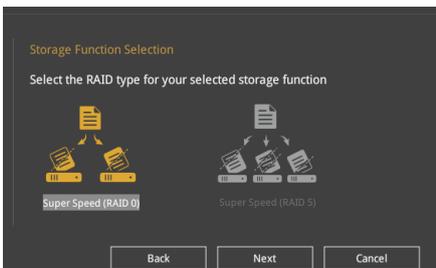
5. After selecting the type of RAID, click **Next** then click **Yes** to continue the RAID setup.

6. After the RAID setup is done, click **Yes** to exit the setup then click **OK** to reset your system.

3.3   My Favorites

My Favorites is your personal space where you can easily save and access your favorite BIOS items. My Favorites comes with several performance, power saving, and fast boot related items by default. You can personalize this screen by adding or removing items.

Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click [(F3)MyFavorite] from the BIOS screen to open Setup Tree Map screen.

2. On the Setup Tree Map screen, select the BIOS items that you want to save in My Favorites screen.
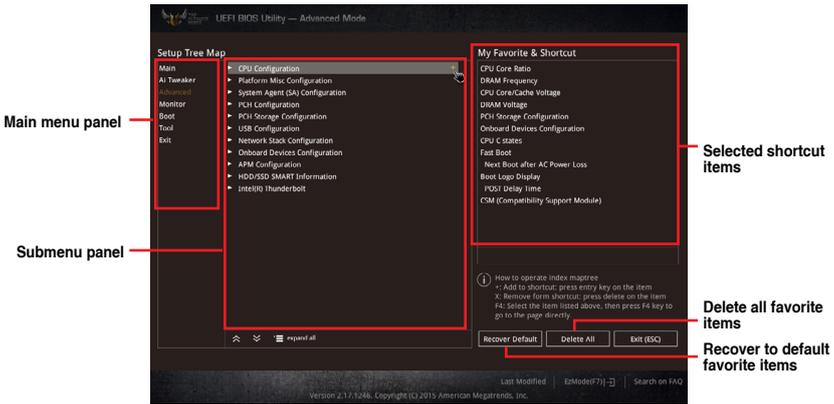
3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and click [+] or press <Enter> on your keyboard.

> You cannot add the following items to My Favorite items:
>
> • Items with submenu options.
>
> • User-managed items such as language and boot order.
>
> • Configuration items such as Memory SPD Information, system time and date.

4. Click **Exit (ESC)** or press <Esc> key to close Setup Tree Map screen.

5. Go to My Favorites menu to view the saved BIOS items.

Chapter 3

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.
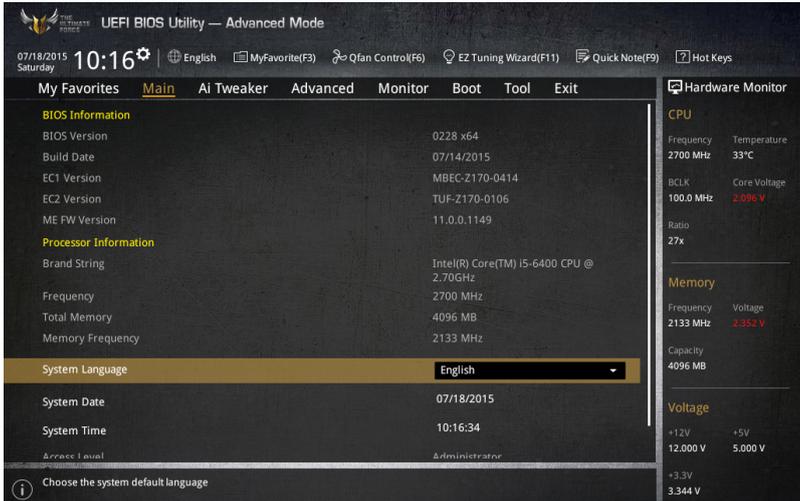
Security

The Security menu items allow you to change the system security settings.
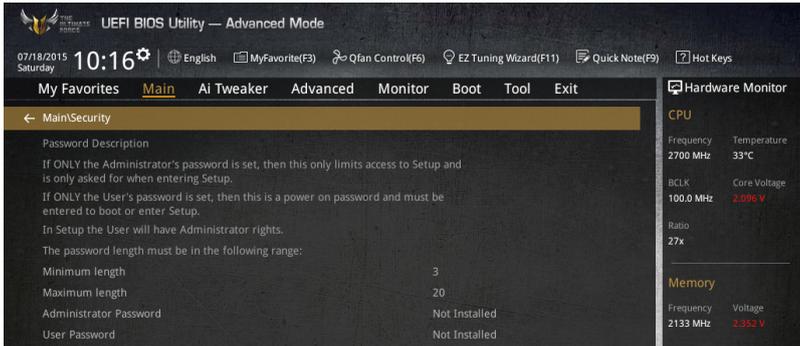
• If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section **1.2.6 Onboard buttons** for information on how to erase the RTC RAM via the Clear CMOS button.

• 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.

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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   Ai Tweaker menu

The Ai 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 other BIOS items.

3.6   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.

3.7 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

Scroll down to display the other BIOS items.

3.8 Boot menu

The Boot menu items allow you to change the system boot options and boot device priority.
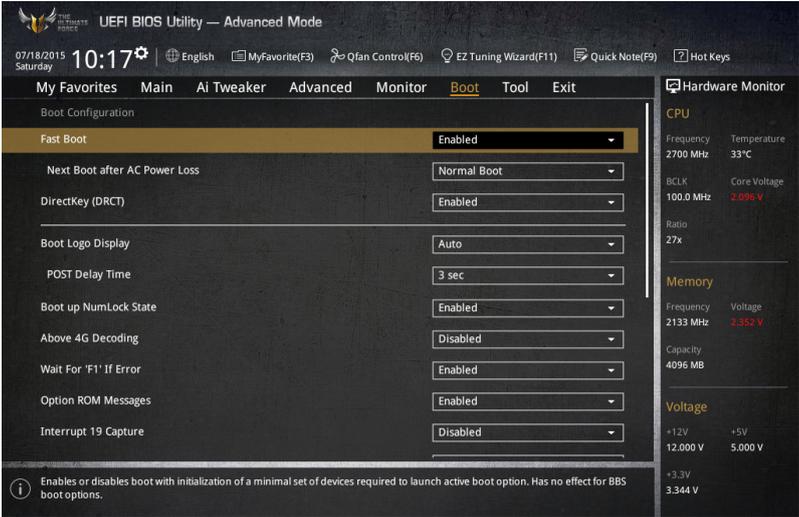
3.9 Tool menu

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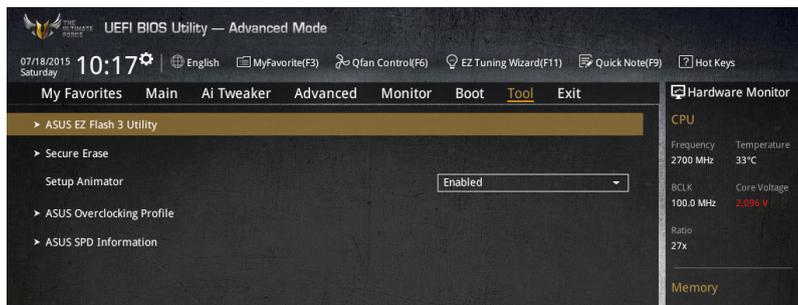
Setup Animator

This item allows you to enable or disable the Setup animator.

Configuration options: [Disabled] [Enabled]

3.9.1 ASUS EZ Flash 3 Utility

This item allows you to run ASUS EZ Flash 3. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.

> For more details, refer to section **3.11.2 ASUS EZ Flash 3**.

3.9.2 Secure Erase

SSD speeds may lower over time as with any storage medium due to data processing. Secure Erase completely and safely cleans your SSD, restoring it to factory performance levels.

> Secure Erase is only available in AHCI mode. Ensure to set the SATA mode to AHCI. Click **Advanced > SATA Configuration > AHCI.**

To launch Secure Erase, click **Tool > Secure Erase** on the Advanced mode menu.

> ⚠ Check the ASUS support site for a full list of SSDs tested with Secure Erase. The drive may become unstable if you run Secure Erase on an incompatible SSD.

> • The time to erase the contents of your SSD may take a while depending on its size. Do not turn off the system during the process.
>
> • Secure Erase is only supported on Intel SATA port. For more information about Intel SATA ports, refer to section 1.2.2 of this manual.

Displays the available SSDs
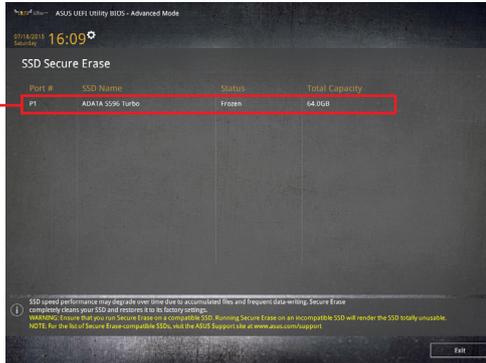
Status definition:

- **Frozen.** The frozen state is the result of a BIOS protective measure. The BIOS guards drives that do not have password protection by freezing them prior to booting. If the drive is frozen, a power off or hard reset of your PC must be performed to proceed with the Secure Erase.

- **Locked.** SSDs might be locked if the Secure Erase process is either incomplete or was stopped. This may be due to a third party software that uses a different password defined by ASUS. You have to unlock the SSD in the software before proceeding with Secure Erase.

3.9.3   ASUS Overclocking Profile

This item allows you to store or load multiple BIOS settings.
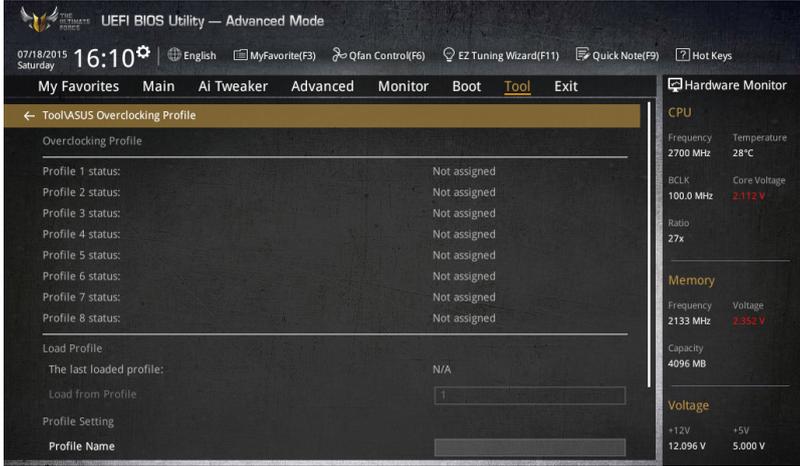
Load from Profile

This item 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.

Profile Name

This item allows you to key in a profile name.

Save to Profile

This item 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/Save Profile from/to USB Drive

This item allows you to load or save profile from your USB drive, load and save profile to your USB drive.

3.9.4 ASUS SPD Information

This item allows you to view the DRAM SPD information.

3.10   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.
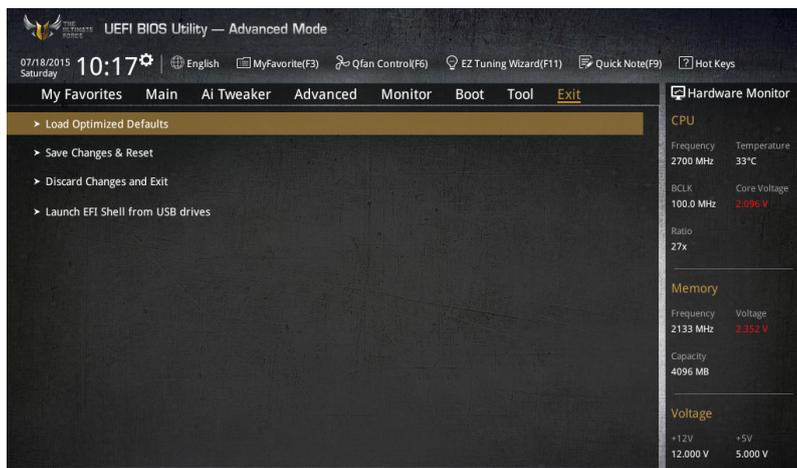
Load Optimized Defaults

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 **OK** 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 **OK** 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.

Launch EFI Shell from USB drives

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

3.11 Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility,and 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 to system's failure to boot. Carefully follow the instructions in this chapter to update your BIOS when necessary.

Visit http://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. EZ Update: Updates the BIOS in Windows® environment.

2. ASUS EZ Flash 3: 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 the BIOS in DOS environment using the motherboard support DVD and a USB flash disk drive.

3.11.1 EZ Update

The EZ Update is a utility that allows you to update the motherboard BIOS in Windows® environment.

- • EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).

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

- • Refer to section **4.4.2 EZ Update** of this user guide for more information.

Chapter 3

3.11.2   ASUS EZ Flash 3

ASUS EZ Flash 3 allows you to download and update to the latest BIOS through the Internet without having to use a bootable floppy disk or an OS-based utility.

Updating through the Internet varies per region and Internet conditions. Check your local Internet connection before updating through the Internet.

To update the BIOS by USB:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash Utility** and press <Enter>.

2. Insert the USB flash disk that contains the latest BIOS file to the USB port.

3. Select **by USB.**

4. Press <Tab> to switch to the Drive field.

5. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.

6. Press <Tab> to switch to the Folder Info field.

7. 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.

To update the BIOS by Internet:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash Utility** and press <Enter>.

2. Select **by Internet.**

3. Press the Left/Right arrow keys to select an Internet connection method, and then press <Enter>.
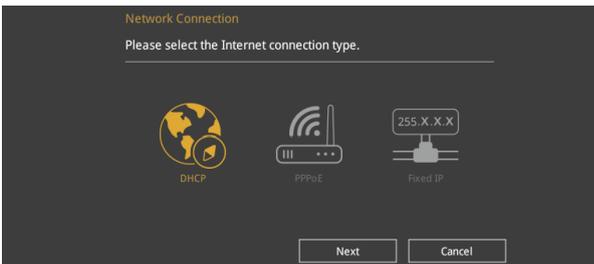
4. Follow the onscreen instructions to complete the update.

5. Reboot the system when the update process is done.

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.

3.11.3 ASUS CrashFree BIOS 3

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 http://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 3 automatically.

4. The system requires you to enter BIOS Setup to recover the 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!

Software Support

4

4.1   Installing an operating system

- This motherboard supports 32-bit/64-bit Windows® 7, 32-bit/64-bit Windows® 8, and 32-bit/64-bit Windows® 8.1 operating systems (OS).

- Motherboard settings and hardware options vary. The setup procedures presented in this chapter are for reference only. Refer to Windows® operating system documentation for detailed information.

4.2   Support DVD information

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

Ensure that you have an Administrator account before running the support DVD in Windows® 7, Windows® 8, or Windows® 8.1 operating systems.

To run the support DVD:

1.   Place the Support DVD into the optical drive.

2.   In the **AutoPlay** dialog box, click or tap **Run ASSETUP.EXE**.

If the **AutoPlay** dialog box does not appear, browse the contents of the support DVD and double-click or tap **\bin\ASSETUP.EXE** to launch the **ASUS motherboard support DVD** main menu.

Support DVD main menu

Shows the available device drivers
if the system detects installed
devices. Install the necessary
drivers to use the devices.

Click to display the applications
and other software that the
motherboard supports

Contains the list of supplementary
user manuals. Click an item to
open the folder of the user guide

Click to display product
related information
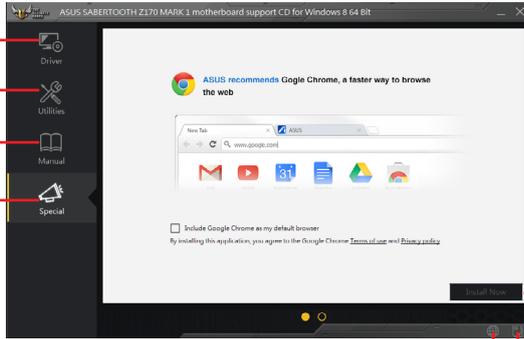
Click to display the ASUS contact information

Click to browse the file list of the suport CD

Click to install the selected items

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** tab before opening the files.

To read about your motherboard's software manual:

1.   Run the Support DVD.

2.   In the Support DVD main menu, click the **Manual** tab.

3.   Click the software manual that you wish to read.

The screenshots in this section are for reference only. The actual software manuals containing in the support DVD vary by models.

Chapter 4

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.

4.4　AI Suite 3

AI Suite 3 is an all-in-one interface that integrates several ASUS utilities and allows you to launch and operate these utilities simultaneously.

Installing AI Suite 3

Ensure that you have an Administrator account before installing AI Suite 3 in Windows® 7, Windows® 8, or Windows® 8.1 operating systems.

To install AI Suite 3 on your computer:

Windows® 7 OS

1.　Place the Support DVD into the optical drive.

2.　In the **AutoPlay** dialog box, click or tap **Run ASSETUP.exe** then select the **Utilities** tab.
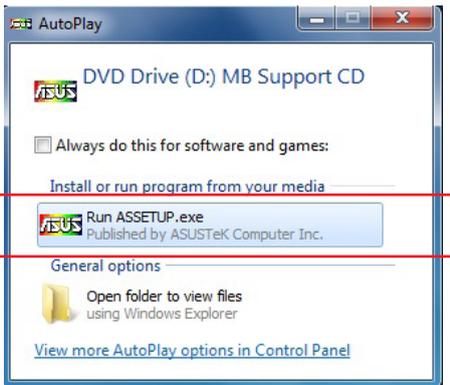
3.　From the **Utilities** tab, click or tap **AI Suite 3** then follow the succeeding onscreen instructions.

Chapter 4

Windows® 8 and Windows® 8.1 OS

1.   Place the Support DVD into the optical drive then follow onscreen instructions.

2.   From the **ASUS motherboard support DVD** main menu, select the Utilities tab and click or tap **AI Suite 3**.

3.   Follow the succeeding onscreen instructions.

      If the **ASUS motherboard support DVD** main menu did not appear, try the following:

      a.   Go to the **Start Screen** then click or tap the **Desktop** app.

      b.   On the lower left corner of the Desktop, click or tap **File Explorer** 🗂 then select your DVD drive and tap or double-click or tap the **Setup** application.

Launching AI Suite 3

Windows® 7 OS

From the Desktop, click or tap **Start > All Programs > ASUS > AI Suite 3 > AI Suite 3**.

You can also launch AI Suite in Windows® 7 by clicking or tapping 🔷 on the Notification area.

Windows® 8 and Windows® 8.1 OS

To launch AI Suite 3 in Windows® 8 or Windows® 8.1, tap the AI Suite 3 app on the Start Screen (or if you're using a mouse, click or tap the AI Suite 3 app on the Start Screen).
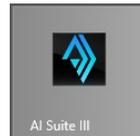
AI Suite 3 Main menu

The AI Suite 3 main menu gives you easy-access controls and insight to what's going on with your computer - allowing you to optimize performance settings while at the same time ensuring system stability.

The AI Suite main menu includes is a quick-access menu bar that allows you to swiftly launch any of the integrated ASUS utilities. Click on the left of the menu to launch the menu bar.

The AI Suite 3 screenshots in this section are for reference only and can vary depending on motherboard model.
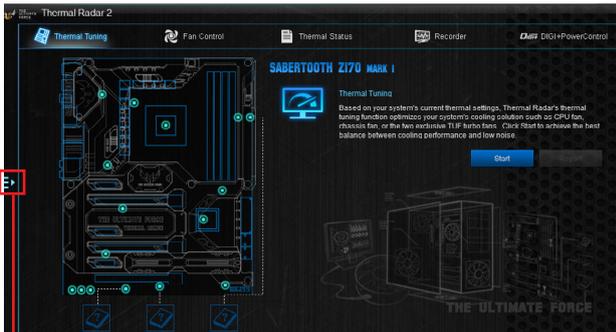
Click to launch AI Suite 3 menu bar

AI Suite 3 main menu bar
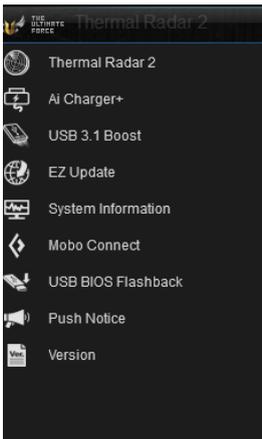
- Some functions in the AI Suite 3 main menu in this user guide may vary depending on the motherboard model.

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

Thermal Radar 2

Thermal Radar 2 lets you control fans, monitor your graphics card temperature and other key components in real time, or auto-tune your thermal settings.

Thermal Tuning

This function optimizes your system's cooling solution based on your system's current thermal settings. It allows you to configure your CPU, chassis, and the exclusive TUF Turbo fan to achieve the best balance between cooling performance and low noise.
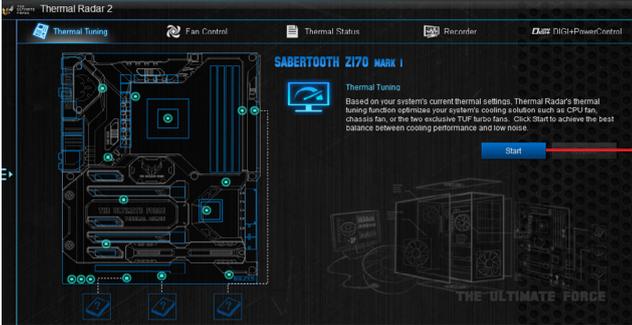
Click or tap to automatically start the Thermal Tuning process

Thermal Status

Displays the current status of the thermal condition of your system.
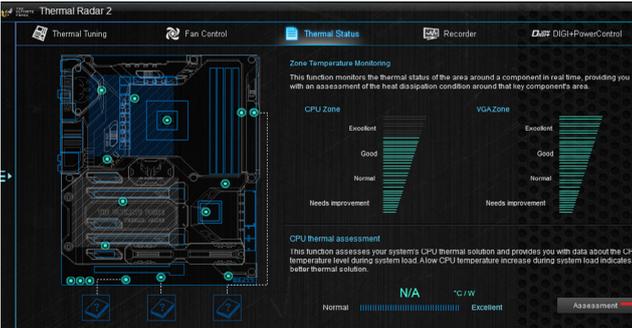
Click or tap to run the assessment report of your current thermal settings.

Chapter 4

Recorder

Displays and monitors the status of the thermal setting and condition of your system.

Click or tap to scroll down/up
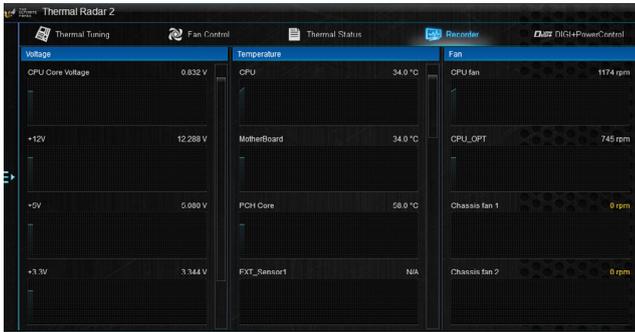
Fan Control

Allows you to configure the settings of the fans installed on your system. You can also load or save a fan's profile to tune the thermal condition of your system.

Click or tap to load saved profiles

Click or tap to switch between items

Click or tap to save the settings of the new profile

Fan Overtime settings

Dust de-Fan settings
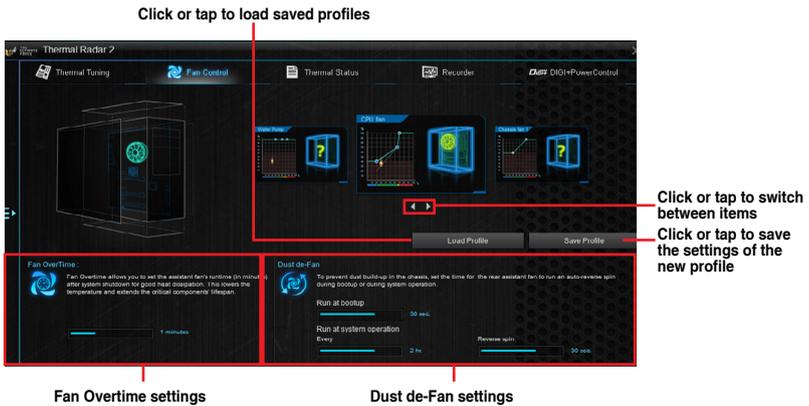
DIGI+ Power Control

ASUS DIGI+ Power Control features the revolutionary and innovative digital VRM and DRAM Voltage controllers. These controllers offers ultra-precise memory and voltage tuning for optimal system efficiency, stability and performance.

Click or tap to go the CPU configurations screen

Click or tap to go the DRAM configurations screen

DIGI+PowerControl - CPU

Click or tap to go back to the previous screen

Click or tap to switch between items

Click or tap to undo the changes

Click or tap to apply the changes

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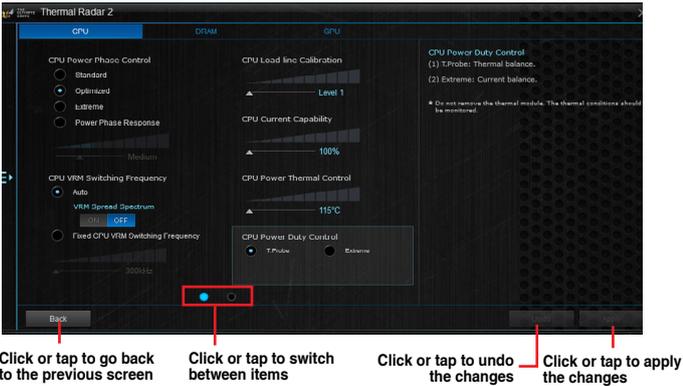
DIGI+PowerControl - DRAM
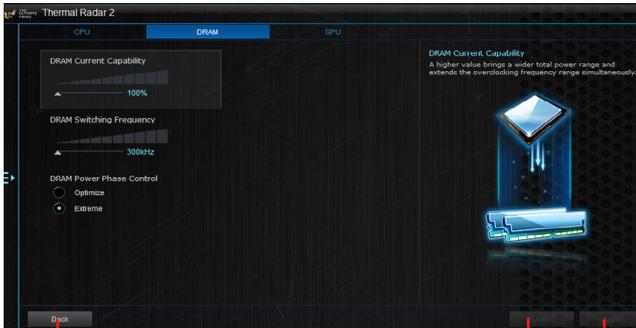
Click or tap to go back
to the previous screen

Click or tap to undo
the changes

Click or tap to apply
the changes

DIGI+PowerControl - GPU
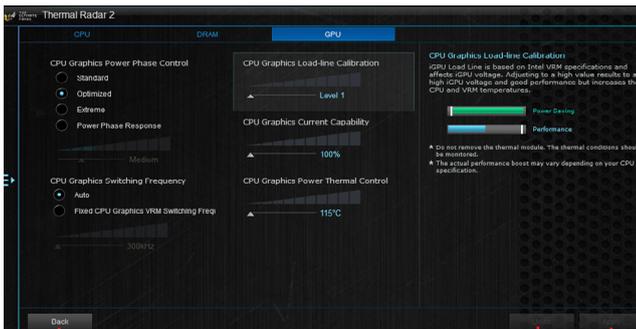
Click or tap to go back
to the previous screen

Click or tap to undo
the changes

Click or tap to apply
the changes

Chapter 4

4.4.1 Ai Charger+

Ai Charger+ allows you to fast-charge your portable BC 1.1* mobile devices on your computer's USB port three times faster than the standard USB devices**.

Launching Ai Charger+

To launch Ai Charger+, click [icon] on the left of the AI Suite 3 main menu, then select **Ai Charger+**.

> Ai Charger+ is available only in selected motherboard models.

Ai Charger+ screen
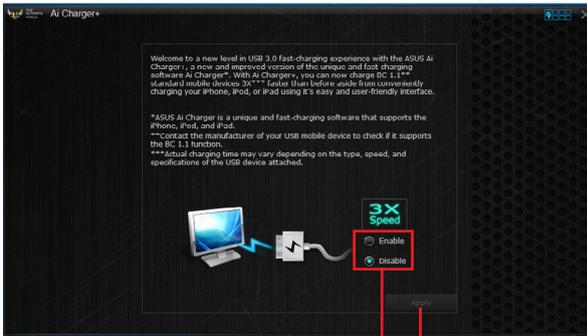
Tick to enable or disable Ai Charger+   **Click or tap to apply the selection**

> • * Check the manufacturer if your USB device is a Battery Charging Specification 1.1 (BC 1.1) compliant or compatible device.
>
> • ** Actual charging speeds may vary depending on the charging rate and specifications of your USB device.
>
> • To ensure normal charging function, disconnect and reconnect your USB device every time you enable or disable Ai Charger+.
>
> • Ai Charger+ does not support USB hubs, USB extension cables, and generic USB cables.

4.4.2 EZ Update

EZ Update is a utility that allows you to automatically update your motherboard's software, drivers and BIOS easily.

With this utility, you can also manually update the BIOS and select the boot logo that displays during POST.

Launching EZ Update

To launch EZ Update, click ▤ on the left of the AI Suite 3 main menu, then select **EZ Update**.

Using EZ Update

Click or tap to automatically update your motherboard driver, software and firmware

Click or tap to search and select the BIOS file

Click or tap to select a boot logo

Click or tap to update the BIOS
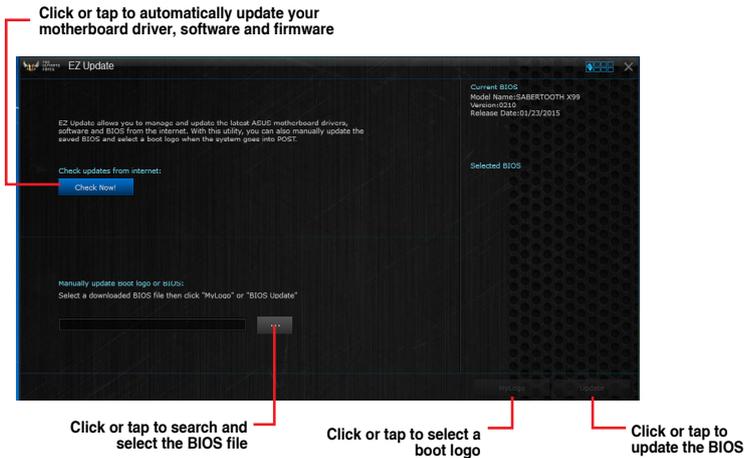
Manually update the BIOS and selecting a boot logo

Click or tap to search an image file for your boot logo

Click or tap to go back to
EZ Update main screen

Click or tap to proceed the updating
BIOS and boot logo
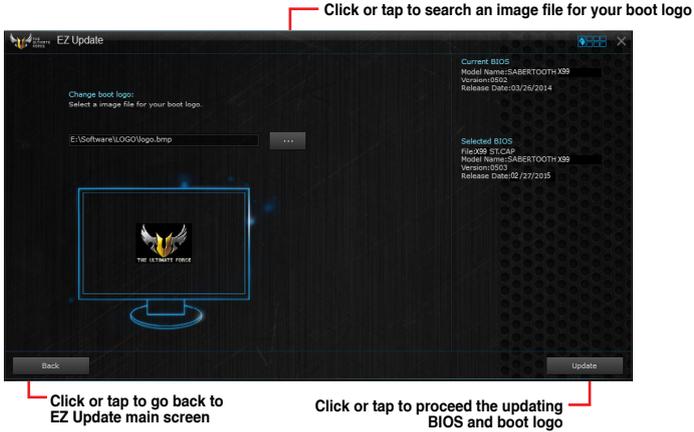
After you click or tap **BIOS Update** button, click or tap **Flash** to update the BIOS and upload the boot logo in your system.

4.4.3 USB BIOS Flashback

USB BIOS Flashback allows you to check and save the latest BIOS version to a USB storage device. Use this utility to quickly check for the latest available BIOS and set the BIOS download schedule.

Launching USB BIOS Flashback

To launch USB BIOS Flashback, click on the left of the AI Suite 3 main menu, then select **USB BIOS Flashback**.

> USB BIOS Flashback is available only in selected motherboard models.

Using USB BIOS Flashback

Set a schedule for the BIOS Update download

Click or tap to cancel the download schedule setting

Click or tap to check for a new BIOS update available for download

Click or tap to apply the download schedule setting

Scheduling the BIOS download

1. In the Download Setting field, tick **Schedule (days)** then select the number of days for the BIOS download schedule.

2. Click or tap **Apply** to save the BIOS download schedule. Click or tap **Cancel** to cancel the download schedule.

Chapter 4

Downloading the latest BIOS

Before you start downloading, ensure that you have installed the USB storage device to your computer's USB port that supports USB BIOS Flashback. Refer to section **2.3.1 Rear I/O connection** of this user guide for more details.

To download the updated BIOS:

1. From the USB BIOS Flashback screen, click or tap **Check for New BIOS Update**.

    Wait for the system to check the latest BIOS version.
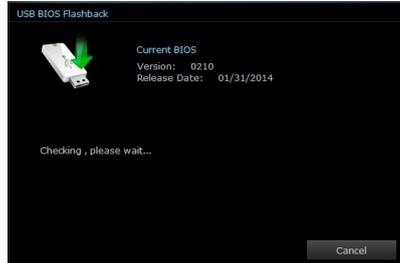
2. After the utility detects a new BIOS, click or tap [arrow] from the Save to: field, select the USB flash drive, then click or tap **Download**.

3. After the download is complete, click or tap **OK**.

4.4.4 Push Notice

This utility allows you get the detailed status of your system to your smart device. You can also send messages to your smart device using this utility.

> Before using this utility, ensure that you pair your computer with your smart device. For pairing information, refer to section **Pairing your computer and smart device**.

Launching Push Notice on your computer

To launch Push Notice, click on the left of the AI Suite 3 main menu, then select **Push Notice**.

Push Notice screen

Click or tap to enable or disable Push Notice

Tick to select the smart device

Click or tap to discard the settings

Click or tap to apply the settings

> You can also enable the Push Notice via the Push Notice shortcut on the lower-right corner of your screen. To do this, click or tap **<<** then click or tap then select .

Pairing your computer and smart device

To pair your computer and smart device:

1. On your smart device, tap to launch Push Notice.

2. Tap **Push Scan** then tap the name of your computer that you want to pair with.

> To pair your computer and smart device, ensure that both are connected to the same wireless network.

Setting up PC Mode alerts of your computer

This feature allows you to restart, shut down, or put your computer to sleep mode and sends an alert to your smart device.

Tick these to enable mode alerts

Set the day and time to enable the PC modes

Set the minutes to send the alert before the PC mode/s activation

Key in your messages for more information

Tick to select the smart device

Setting up PC Status alerts

This feature allows you to send alerts of the unusual activities of the voltage, temperature, and fan settings of your computer to your smart device.

Tick to select and send alerts to your smart device

Tick to select the smart device

Tick to send alert when the components selected are back to its normal status

Sending messages to your smart device

This feature allows you to send messages to your smart device.

You can also send messages via the Push Notice messaging shortcut on the lower-right corner of your screen. To do this, click or tap **<<** then click or tap [icon] then select [icon].

Tick to select the smart device

Click or tap to send your message

Click or tap to key in your message

Click to clear all the text on the text box

Click to save the text message

Viewing your computer status on your smart device

Tap [icon] Push Notice on your smart device to launch Push Notice.

Tap to view PC mode alerts

Tap to view PC status alerts

Tap to view PC sent messages

Tap to scan more host computers

Tap to delete PC alerts
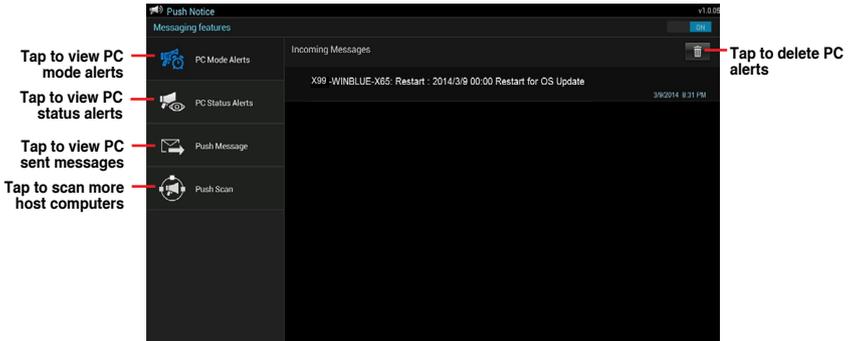
4.4.5 USB 3.1 Boost

USB 3.1 Boost technology supports UASP (USB Attached SCSI Protocol) that automatically speeds up the transfer rates of your USB storage devices.

Launching USB 3.1 Boost

To launch USB 3.1 Boost, cclick [icon] on the left of the AI Suite 3 main menu, then select **USB 3.1 Boost**.

Using the USB 3.1 Boost

Click or tap to select a USB device

Click or tap to enable the USB device's normal data transfer rate

Click or tap to enable UASP or Turbo Mode for a faster data transfer rate
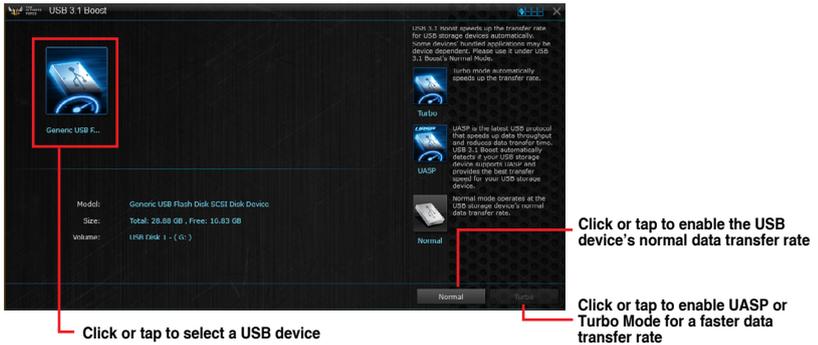
Ensure to connect your USB 3.1/3.0 device to the USB 3.1/3.0 ports that support USB 3.1 Boost. Refer to section **2.3.1 Rear I/O connection** of your user guide for more details.

• USB 3.1 Boost automatically detects the USB 3.1/3.0 devices that support UASP.

• The data transfer speed varies with USB devices. For a higher data transfer performance, use a USB 3.1 device.

4.4.6 System Information

This utility allows you get the detailed information of the motherboard, CPU, and memory settings.

Launching the System Information

To launch System Information, click on the left of the AI Suite 3 main menu, then select **System Information**.

Viewing the motherboard information

Click or tap the **MB** tab to view the motherboard's information.
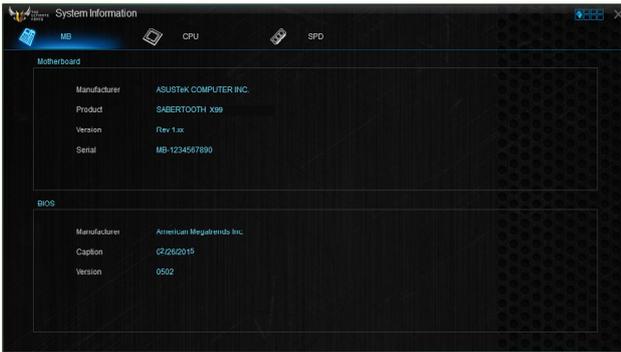
Viewing the CPU information

Click or tap the **CPU** tab to view the processor's information.

Chapter 4

Viewing the SPD information

Click or tap the **SPD** tab to view the memory's information.
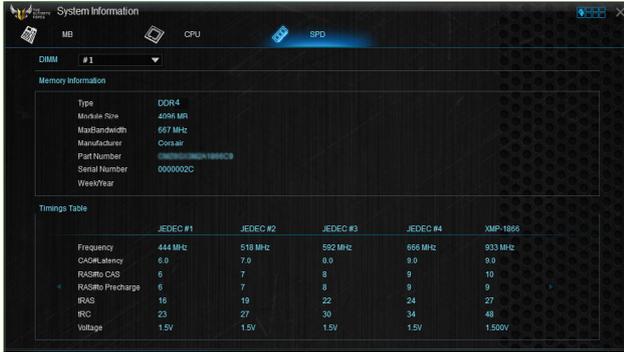
4.4.7   Mobo Connect

Mobo Connect allows you to share the PC's keyboard/mouse for smart devices, or stream audio playback from your smart device yo the PC.

Launching Mobo Connect

To launch Mobo Connect, click ☰ on the left of the AI Suite 3 main menu, then select **Mobo Connect.**
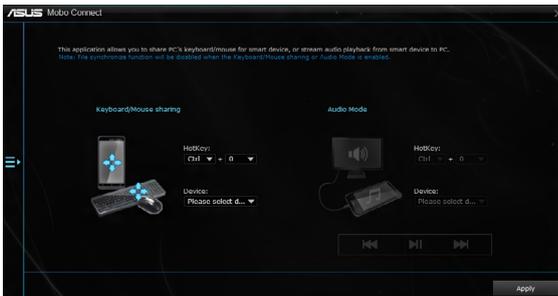
4.4.8   Version

Displays the installed software or utilities and their current version.
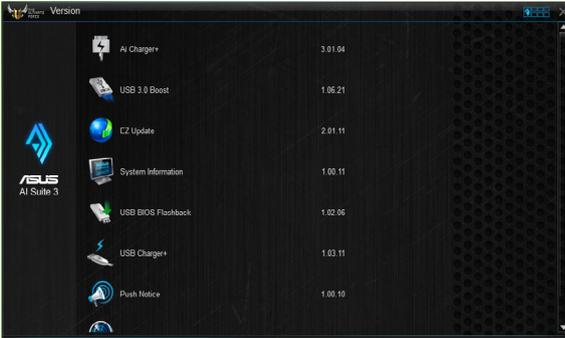
4.5 Turbo LAN

Turbo LAN is a network traffic shaping technology that lowers lag and helps reduce delays during data transfers or when playing online games. It allows you to set programs or application's network priorities to currently running games or applications.

Turbo LAN features an intuitive user interface and an Advance Mode that tweakers can use to configure hardcore controls or settings.

To launch Turbo LAN, click or tap [icon] the on the desktop.

Displays the Network Adapter information

Displays the current connection and bandwidth usage status

Adjust the slider to set a program or application's priority

Click to delete an application or program on the list

Click to view the programs under these utilities

Click to open Advanced Mode

Click to open an item

Using the Advance Mode

The Advance Mode allows you to configure the priorities of your programs or applications or configure your network device.

To go to the Advanced Mode, click or tap [icon].

The Advanced Mode contains the following utilities:

- **Preferences:** Allows you to control the network's traffic to optimize the program's performance, favor ping time, and avoid packet loss.

- **Protocols:** Allows you to set priority to the network adapter and its protocol to reduce delay during data transfer, and maintain the speed of Internet access.

- **Programs:** Allows you to set priority to the programs or applications.

- **Traffic Shaping:** Allows you set the priority to the network adapter and its protocol to reduce delay during data transfer and speeds up the Internet access.

- **Adapter Info:** Displays the information about the installed network adapter in your system.

- **Online Budgets:** Allows you to set an online budget time to your network adapters.

- **Traffic Analysis:** Allows you to assign protocols and programs in one set.

4.6 TUF Detective

TUF Detective allows you to remotely manage and control your computer using your Android mobile device. It also provides relevant system information.

To use TUF Detective:

1. Connect your mobile device to the TUF Detective port located at the rear panel.

2. On your mobile device, download and install the TUF Detective app.

    Download the TUF Detective app from Play Store or use the QR code to find the app.

3. Launch the TUF Detective app to remotely control and manage your computer.
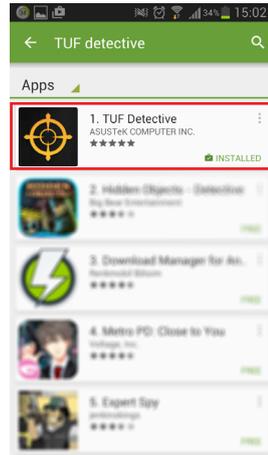
Select this App to install TUF Detective in your mobile phone.

Scan the QR code to find the app.

4.6.1 Post

The Post page provides the POST (Power-On Self Test) status..
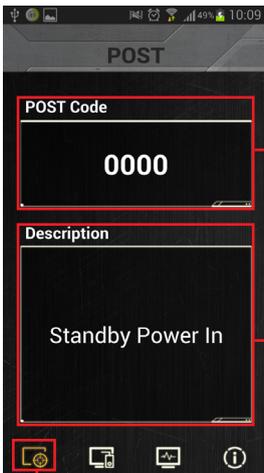
Code for the POST status

Details about the POST status.

Post

4.6.2 Control

The Control page allows you to remotely control the functions of your computer.

Control

Tap the **POWER** button and select **Yes** to power your computer on or off.

Tap the **RESTART** button and select **Yes** to restart your computer.

Tap **FORCE SHUTDOWN** to force the system to shutdown without saving data.
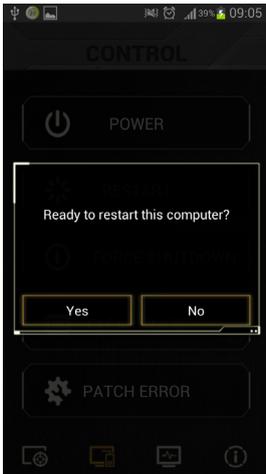
Tap **CLEAR CMOS** and select **Yes** to clear the CMOS RTC RAM data.

Tap **PATCH ERROR** and select **Yes** to automatically repair your computer.
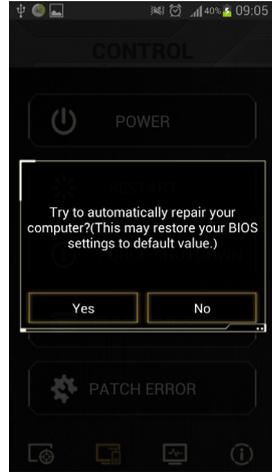
4.6.3 Monitor

The Monitor page allows you to monitor voltage, temperature, and fan speed.

Monitor

Tap the triangle icon to monitor the voltage.
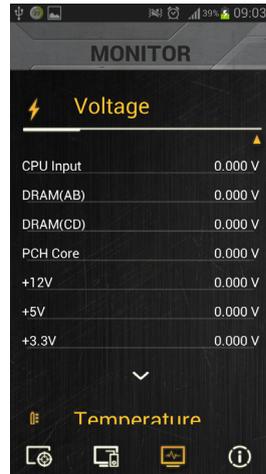
Tap the triangle icon to monitor the temperature.
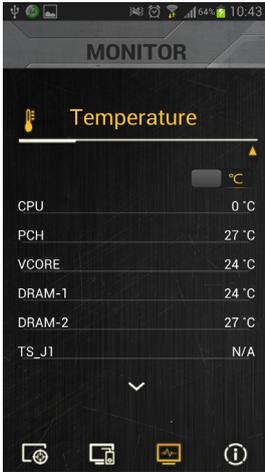
Tap the triangle icon to monitor the fan speed.

4.6.4 Information

The Information page provides you with important details about the system such as the model name, BIOS version, product number, operating time, CPU information, and DRAM information.

Information

4.7 Audio configurations

The Realtek® audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your computer. The software provides Jack-Sensing 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 or tap on the icon to display the Realtek® HD Audio Manager.

Realtek® HD Audio Manager

Realtek® HD Audio Manager

Configuration option tabs (vary with the audio devices connected)

Advanced settings

Control settings panel

Set default device button

Analog and digital connector status

Chapter 4

Selecting an audio output

Realtek HD Audio Manager allows you to select the type of audio output depending on the output device that you are using.

To select an audio output:

1. Insert the audio device's jack to the Line Out (lime) port. If the audio device's jack is already inserted to the corresponding port, click or tap ⊙ on the Realtek HD Audio Manager.

2. On the pop-up window, tick the audio device that you plugged to the Line Out port then click or tap **Next**.

    Which device did you plug in?
    - ○ Headphone
    - ○ Front Speaker Out

    [Next]
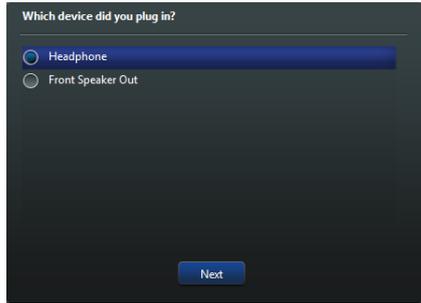
    a. If you select **Headphone**, click or tap to select the type of headphone installed then click or tap **OK**.

    Select headphone type

    (Auto)

    [OK]
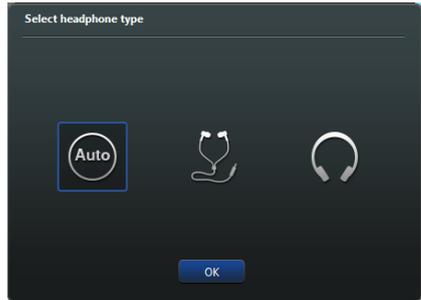
    b. If you select **Front Speaker Out,** click or tap to select the type of speaker installed then click or tap **OK**.

    Select speaker type

    (Auto)

    [OK]
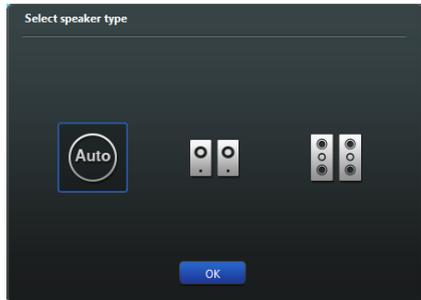
RAID Configurations

5

5.1 RAID configurations

The motherboard comes with the Intel® Rapid Storage Technology that supports RAID 0, RAID 1, RAID 10 and RAID 5 configuration.

5.1.1 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.

5.1.2   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.

5.1.3   Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID sets 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 SATA ports are set to RAID mode, all SATA ports run at RAID mode together.

5.1.4   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 - v10.5.1.1070
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

    ═══════════════════════════[ MAIN MENU ]═══════════════════════════
        1. Create RAID Volume        4. Recovery Volume Options
        2. Delete RAID Volume        5. Acceleration Options
        3. Reset Disks to Non-RAID   6. 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 - v10.5.1.1070
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.
━━━━━━━━━━━━━━━━━━━━━━━━━━━━ [ CREATE VOLUME MENU ] ━━━━━━━━━━━━━━━━━━━━━━━
                          Name:  Volume0
                    RAID Level:
                         Disks:
                    Strip Size:
                      Capacity:
                          Sync:
                    Create volume

━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ [ HELP ] ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━


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



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

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.

Chapter 5

Deleting a RAID set

⚠️ Be cautious 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:

```
================= [ 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
```
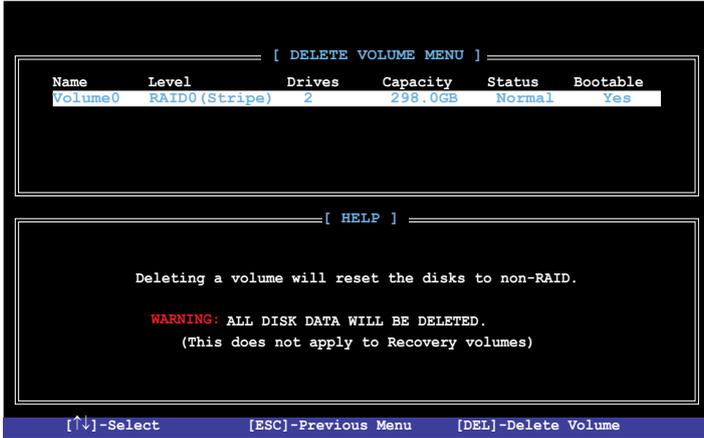
2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:

```
======= [ 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**, 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.

5.2   Installing the RAID driver during Windows® OS installation

To install the RAID driver for Windows® 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.

> To set up a Windows® UEFI operating system under RAID mode, ensure to load the UEFI driver for your optical drive.

Chapter 5

Appendices

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.

• 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.

IC: Canadian Compliance Statement

Complies with the Canadian ICES-003 Class B specifications. This device complies with RSS 210 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cut appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Cet appareil est conforme aux normes CNR exemptes de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes :

(1) cet appareil ne doit pas provoquer d'interférences et

(2) cet appareil doit accepter toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

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.

VCCI: Japan Compliance Statement

Class B ITE

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)
이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

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.

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to http://csr.asus.com/english/Takeback.htm for detailed recycling information in different regions.

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http://www.apache.org/licenses/LICENSE-2.0

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Appendices

English AsusTek Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of CE Directives. Please see the CE Declaration of Conformity for more details.

Français AsusTek Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes des directives européennes. Veuillez consulter la déclaration de conformité CE pour plus d'informations.

Deutsch AsusTek Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der CE-Richtlinien übereinstimmt. Weitere Einzelheiten entnehmen Sie bitte der CE-Konformitätserklärung.

Italiano AsusTek Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti alle direttive CE. Per maggiori informazioni fate riferimento alla dichiarazione di conformità CE.

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Čeština Spoločnosť AsusTek Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení směrnic CE. Další podrobnosti viz Prohlášení o shodě CE.

Dansk AsusTek Inc. Erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene and andre relevante bestemmelser i CE-direktiverne. Du kan læse mere i CE-overensstemmelseserklæring.

Nederlands AsusTek Inc. verklaart hierbij dat dit apparaat compatibel is met de essentiële vereisten en andere relevante bepalingen van CE-richtlijnen. Raadpleeg de CE-verklaring van conformiteit voor meer details.

Eesti Käesolevaga kinnitab AsusTek Inc., et see seade vastab CE direktiivide oluliste nõuetele ja teistele asjakohastele sätetele. Vt üksikasju CE vastavusdeklaratsioonist.

Suomi AsusTek Inc. vakuuttaa täten, että tämä laite on CE-direktiivien olennaisten vaatimusten ja muiden asiaan kuuluvien lisäysten mukainen. Katso lisätietoja CE-vaatimustenmukaisuusvakuutuksesta.

Ελληνικά Με το παρόν, η AsusTek Inc. Δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Για περισσότερες λεπτομέρειες ανατρέξτε στην Δήλωση Συμμόρφωσης ΕΕ.

Magyar Az AsusTek Inc. ezennel kijelenti, hogy a készülék megfelel a CE-irányelvek alapvető követelményeinek és ide vonatkozó egyéb rendelkezéseinek. További részletekért tekintse meg a CE-megfelelőségi nyilatkozatot.

Latviski Lidz ar šo AsusTek Inc. paziņo, ka šī ierīce atbilst būtiskajām prasībām un citiem saistošajiem nosacījumiem, kas norādīti CE direktīvā. Lai uzzinātu vairāk, skatiet CE Atbilstības deklarāciju.

Lietuvių Šiuo dokumentu bendrovė „AsusTek Inc." pareiškia, kad šis įrenginys atitinka pagrindinius CE direktyvų reikalavimus ir kitas susijusias nuostatas. Daugiau informacijos rasite CE atitikties deklaracijoje.

Norsk AsusTek Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i CE-direktiver. Du finner mer informasjon i CE-samsvarserklæringen.

Polski Niniejszym AsusTek Inc. deklaruje, że urządzenie jest zgodne z istotnymi wymaganiami oraz innymi powiązanymi zaleceniami Dyrektyw CE. W celu uzyskania szczegółów, sprawdź Deklarację zgodności CE.

Português A AsusTek Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas da CE. Para mais detalhes, consulte a Declaração de Conformidade CE.

Română Prin prezenta, AsusTek Inc. declară faptul că acest dispozitiv respectă cerințele esențiale și alte prevederi relevante ale directivelor CE. Pentru mai multe detalii, consultați declarația de conformitate CE.

Srpski AsusTek Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa ključnim zahtevima i drugim relevantnim odredbama CE Direktiva. Molimo vas, pogledajte CE Deklaraciju o usklađenosti za više detalja.

Slovensky Spoločnosť AsusTek Inc. týmto prehlasuje, že toto zariadenie vyhovuje príslušným požiadavkám a ďalším súvisiacim ustanoveniam smerníc ES. Viac podrobností si pozrite v prehlásení o zhode ES.

Slovenščina AsusTek Inc. tukaj izjavlja, da je ta naprava skladna s temeljnimi zahtevami in drugimi relevantnimi določili direktiv CE. Za več informacij glejte Izjavo CE o skladnosti.

Español Por la presente, AsusTek Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones relevantes de las directivas de la CE. Consulte la Declaración de conformidad de la CE para obtener más detalles.

Svenska AsusTek Inc. förklarar härmed att denna enhet är i överensstämmelse med de grundläggande kraven och andra relevanta bestämmelser i CE-direktiven. Se CE-försäkran om överensstämmelse för mer information.

Українська AsusTek Inc. заявляє, що цей пристрій відповідає основним вимогам відповідних Директив ЄС. Будь ласка, див. більше подробиць у Декларації відповідності нормам ЄС.

Türkçe AsusTek Inc., bu aygıtın temel gereksinimlerle ve CE Yönergelerinin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. Daha fazla ayrıntı için lütfen CE Uygunluk Beyanına bakın.

Bosanski AsusTek Inc. ovim potvrđuje da je ovaj uređaj usklađen s osnovnim zahtjevima i drugim relevantnim propisima Direktiva EK. Za više informacija molimo pogledajte Deklaraciju o usklađenosti EK.

Appendices

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/

Technical Support

Telephone   +86-21-38429911
Fax   +86-21-5866-8722, ext. 9101#
Online support   http://www.asus.com/tw/support/

ASUS COMPUTER INTERNATIONAL (America)

Address   800 Corporate Way, Fremont, CA 94539, USA
Telephone   +1-510-739-3777
Fax   +1-510-608-4555
Web site   http://www.asus.com/us/

Technical Support

Support fax   +1-812-284-0883
Telephone   +1-812-282-2787
Online support   http://www.service.asus.com/

ASUS COMPUTER GmbH (Germany and Austria)

Address   Harkort Str. 21-23, D-40880 Ratingen, Germany
Fax   +49-2102-959911
Web site   http://www.asus.com/de
Online contact   http://eu-rma.asus.com/sales

Technical Support

Telephone   +49-1805-010923
Support Fax   +49-2102-9599-11
Online support   http://www.asus.com/de/support/

Appendices

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 : SABERTOOTH Z170 MARK 1

Conforms to the following specifications:

☒ FCC Part 15, Subpart B, Unintentional 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 : **July. 31, 2015**

Ver. 140331

IN SEARCH OF INCREDIBLE

EC Declaration of Conformity

We, the undersigned,

Manufacturer:	ASUSTeK COMPUTER INC.
Address:	4F, No. 150, LI-TE Rd., PEITOU, TAIPEI 112, 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 :	SABERTOOTH Z170 MARK 1

conform with the essential requirements of the following directives:

☒2004/108/EC-EMC Directive

☒ EN 55022:2010+AC:2011	☒ EN 55024:2010
☒ EN 61000-3-2:2006+A2:2009	☒ EN 61000-3-3:2013
☐ EN 55013:2001+A1:2003+A2:2006	☒ EN 55020:2007+A11:2011

☐1999/5/EC-R&TTE Directive

☐ EN 300 328 V1.8.1(2012-06)	☐ EN 301 489-1 V1.9.2(2011-09)
☐ EN 300 440-1 V1.6.1(2010-08)	☐ EN 301 489-3 V1.4.1(2002-08)
☐ EN 300 440-2 V1.4.1(2010-08)	☐ EN 301 489-4 V1.4.1(2009-05)
☐ EN 301 511 V9.0.2(2003-03)	☐ EN 301 489-7 V1.3.1(2005-11)
☐ EN 301 908-1 V5.2.1(2011-05)	☐ EN 301 489-9 V1.4.1(2007-11)
☐ EN 301 908-2 V5.2.1(2011-07)	☐ EN 301 489-17 V2.2.1(2012-09)
☐ EN 301 893 V1.7.1(2012-06)	☐ EN 301 489-24 V1.5.1(2010-09)
☐ EN 302 544-2 V1.1.1(2009-01)	☐ EN 302 326-2 V1.2.2(2007-06)
☐ EN 302 623 V1.1.1(2009-01)	☐ EN 302 326-3 V1.3.1(2007-09)
☐ EN 50360:2001	☐ EN 301 357-2 V1.4.1(2008-11)
☐ EN 62479:2010	☐ EN 302 291-1 V1.1.1(2005-07)
☐ EN 50385:2002	☐ EN 302 291-2 V1.1.1(2005-07)
☐ EN 62311:2008	☐ EN 50566:2013

☒2006/95/EC-LVD Directive

☒ EN 60950-1: 2006 / A12: 2011	☐ EN 60065:2002 / A12: 2011
☐ EN 60950-1: 2006 / A2: 2013	

☐2009/125/EC-ErP Directive

☐ Regulation (EC) No. 1275/2008	☐ Regulation (EC) No. 278/2009
☐ Regulation (EC) No. 642/2009	☐ Regulation (EC) No. 617/2013

☒2011/65/EU-RoHS Directive Ver. 150326

☒CE marking

(EC conformity marking)

Position : **CEO**

Name : **Jerry Shen**

Declaration Date: 07/31/2015

Year to begin affixing CE marking: 2015

Signature : _____