

**ROG  
MAXIMUS  
XI  
EXTREME**

**ASUS®**

**Motherboard**

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# Contents

Safety information.....	vi
About this guide.....	vii
ROG MAXIMUS XI EXTREME specifications summary .....	ix
Package contents.....	xv
Installation tools and components.....	xvi

## Chapter 1: Product Introduction

1.1	Motherboard overview.....	1-1
1.1.1	Before you proceed.....	1-1
1.1.2	Motherboard layout.....	1-2
1.1.3	Central Processing Unit (CPU) .....	1-4
1.1.4	System memory .....	1-5
1.1.5	Expansion slots.....	1-7
1.1.6	Onboard buttons and switches.....	1-9
1.1.7	Jumper.....	1-14
1.1.8	Onboard LEDs .....	1-15
1.1.9	Internal connectors.....	1-18
1.2.10	Probelt.....	1-32

## Chapter 2: Basic Installation

2.1	Building your PC system.....	2-1
2.1.1	CPU installation.....	2-1
2.1.2	Cooling system installation.....	2-2
2.1.3	Motherboard installation.....	2-4
2.1.4	DIMM installation.....	2-5
2.1.5	ATX power connection .....	2-6
2.1.6	SATA device connection .....	2-7
2.1.7	Front I/O connector .....	2-8
2.1.8	Expansion card installation .....	2-9
2.1.9	M.2 installation .....	2-12
2.1.10	DIMM.2 installation.....	2-13
2.1.11	Wi-Fi antenna installation.....	2-15
2.2	BIOS update utility .....	2-16
2.3	Motherboard rear and audio connections .....	2-17
2.3.1	Rear I/O connection .....	2-17
2.3.2	Audio I/O connections.....	2-19
2.4	Starting up for the first time.....	2-21
2.5	Turning off the computer .....	2-21

## Chapter 3: BIOS Setup

<b>3.1</b>	<b>Knowing BIOS</b> .....	<b>3-1</b>
<b>3.2</b>	<b>BIOS setup program</b> .....	<b>3-2</b>
	3.2.1 Advanced Mode .....	3-3
	3.2.2 EZ Mode.....	3-7
	3.2.3 QFan Control.....	3-8
	3.2.4 AI OC Guide.....	3-10
	3.2.5 EZ Tuning Wizard .....	3-11
<b>3.3</b>	<b>My Favorites</b> .....	<b>3-13</b>
<b>3.4</b>	<b>Main menu</b> .....	<b>3-15</b>
<b>3.5</b>	<b>Extreme Tweaker menu</b> .....	<b>3-15</b>
<b>3.6</b>	<b>Advanced menu</b> .....	<b>3-17</b>
	3.6.1 Platform Misc Configuration .....	3-17
	3.6.2 CPU Configuration .....	3-17
	3.6.3 System Agent (SA) Configuration .....	3-17
	3.6.4 PCH Configuration .....	3-17
	3.6.5 PCH Storage Configuration.....	3-18
	3.6.6 PCH-FW Configuration .....	3-18
	3.6.7 Thunderbolt(TM) Configuration .....	3-18
	3.6.8 Onboard Devices Configuration .....	3-19
	3.6.9 APM Configuration .....	3-20
	3.6.10 PCI Subsystem Settings .....	3-20
	3.6.11 USB Configuration .....	3-20
	3.6.12 Network Stack Configuration.....	3-20
	3.6.13 NVMe Configuration.....	3-20
	3.6.14 HDD/SSD SMART Information .....	3-20
<b>3.7</b>	<b>Monitor menu</b> .....	<b>3-21</b>
<b>3.8</b>	<b>Boot menu</b> .....	<b>3-21</b>
<b>3.9</b>	<b>Tool menu</b> .....	<b>3-23</b>
	3.9.1 ASUS EZ Flash 3 Utility .....	3-23
	3.9.2 ASUS Secure Erase.....	3-24
	3.9.3 ASUS User Profile.....	3-25
	3.9.4 ROG OC Panel H-Key Configure.....	3-25
	3.9.5 ASUS SPD Information .....	3-25
	3.9.6 ASUS Armoury Crate .....	3-26
	3.9.7 Graphics Card Information .....	3-26
<b>3.10</b>	<b>Exit menu</b> .....	<b>3-27</b>

<b>3.11</b>	<b>Updating BIOS</b> .....	<b>3-28</b>
3.11.1	EZ Update.....	3-28
3.11.2	ASUS EZ Flash 3.....	3-29
3.11.3	ASUS CrashFree BIOS 3.....	3-31

**Chapter 4: RAID Support**

<b>4.1</b>	<b>RAID configurations</b> .....	<b>4-1</b>
4.1.1	RAID definitions .....	4-1

**Appendix**

<b>Q-Code table</b> .....	<b>A-1</b>
<b>Notices</b> .....	<b>A-5</b>
<b>ASUS contact information</b> .....	<b>A-11</b>

# 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.
- Your motherboard should only be used in environments with ambient temperatures between 0°C and 40°C.

## 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: 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 website**  
The ASUS website ([www.asus.com](http://www.asus.com)) provides updated information on ASUS hardware and software products.
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 (+).



## ROG MAXIMUS XI EXTREME specifications summary

CPU	<p>Intel® socket 1151 for Intel® Core™ 9000 series, 8th Generation Core™ i7/i5/i3, Pentium® and Celeron® processors</p> <p>Supports 14 nm CPU</p> <p>Supports Intel® Turbo Boost Technology 2.0*</p> <p>* Intel® Turbo Boost Technology 2.0 support depends on the CPU type</p> <p>** Refer to <a href="http://www.asus.com">www.asus.com</a> for CPU support list</p>
Chipset	Intel® Z390 Chipset
Memory	<p>4 x DIMM, Max. 64GB, DDR4 4400+(O.C.) / 4266(O.C.) / 4133(O.C.) / 4000(O.C.) / 3866(O.C.) / 3733(O.C.) / 3600(O.C.) / 3466(O.C.) / 3400(O.C.) / 3333(O.C.) / 3300(O.C.) / 3200(O.C.) / 3000(O.C.) / 2800(O.C.) / 2666 / 2400 / 2133 MHz, Non-ECC, Un-buffered Memory*</p> <p>Dual Channel Memory Architecture</p> <p>Supports Intel® Extreme Memory Profile (XMP)</p> <p>* Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.</p>
Expansion slots	<p>Intel® socket 1151 for Intel® Core™ 9000 series, 8th Generation Core™ i7/i5/i3, Pentium® and Celeron® processors</p> <p>2 x PCIe 3.0/2.0 x16 slots (x16, x8/x8)</p> <p>Intel® Z390 Chipset</p> <p>1 x PCIe 3.0/2.0 x16 slot (x4 mode)*</p> <p>1 x PCIe 3.0/2.0 x1 slot</p> <p>* When SATA56 is enabled, PCIe x16_3 will run at x2 mode.</p>
Graphic	<p><b>Integrated Graphics Processor- Intel® UHD Graphics support</b></p> <p>VGA output support : HDMI</p> <p>- Supports HDMI 1.4b with max. resolution 4096 x 2160@30Hz</p>
Multi-GPU support	<p>Supports NVIDIA® 2-Way/Quad-GPU SL® Technology</p> <p>Supports AMD 3-Way/Quad-GPU CrossFireX™ Technology</p>
Storage	<p><b>Intel® Z390 Chipset with RAID 0, 1, 5, 10, and Intel Rapid Storage Technology support:</b></p> <ul style="list-style-type: none"> <li>- 1 x M.2 Socket 3, with M Key, type 2242/2260/2280 storage devices support (both SATA &amp; PCIe modes)</li> <li>- 1 x M.2 Socket 3, with M key, type 2242/2260/2280/22110 storage devices support (PCIe 3.0 x 4 mode)</li> <li>- 6 x SATA 6Gb/s ports</li> <li>- Intel® Optane™ Memory Ready</li> </ul> <p><b>Intel® Socket 1151 for Intel® Core™ 9000 series, 8th Generation Core™ i7/ i5/ i3, Pentium® and Celeron® processors:</b></p> <ul style="list-style-type: none"> <li>- 1 x DIMM.2 Module supports 2 x M.2 Socket 3 with M Key type 2242/2260/2280/22110 (PCIe 3.0 x 4 from CPU)*</li> </ul> <p>* The DIMM.2 Slots (M.2_1/2) are disabled by default. Please adjust BIOS settings to enable DIMM.2 Slots.</p>

(continued on the next page)

## ROG MAXIMUS XI EXTREME specifications summary

LAN	<p>Aquantia AQC-111C 5G LAN</p> <p>Intel® I219-V Gigabit LAN- Dual interconnect between the integrated Media Access Controller (MAC) and physical layer (PHY)</p> <p>Anti-surge LANGuard</p> <p>ROG GameFirst V Technology</p>
Wireless & Bluetooth	<p>Intel® Wireless-AC 9560</p> <p>2 x 2 Wi-Fi with MU-MIMO 802.11 a/b/g/n/ac supports dual frequency band 2.4/5 GHz</p> <p>Supports channel bandwidth: HT20/HT40/HT80/HT160. Up to 1.73Gbps transfer speed</p> <p>Bluetooth v5.0</p>
Audio	<p><b>ROG SupremeFX S1220 8-Channel high-definition CODEC</b></p> <ul style="list-style-type: none"> <li>- Supports up to 32-Bit/192kHz playback*</li> <li>- High quality 120 dB SNR stereo playback output and 113 dB SNR recording input</li> <li>- Impedance sense for front and rear headphone outputs</li> <li>- ESS® ES9023P High Definition DAC</li> <li>- SupremeFX Shielding Technology</li> <li>- Jack-detection, Multi-streaming, and Front Panel Jack-retasking</li> <li>- Optical S/PDIF out port at back panel</li> </ul> <p><b>Audio Feature:</b></p> <ul style="list-style-type: none"> <li>- Sonic Studio III + Sonic Studio Link</li> <li>- Sonic Radar III</li> </ul> <p>* Due to limitations in HDA bandwidth, 32-Bit/192kHz is not supported for 8-Channel audio.</p>
USB	<p><b>Intel® Z390 Chipset</b></p> <ul style="list-style-type: none"> <li>- 8 x USB 3.1 Gen 1 ports ( 4 ports at back panel [blue], 4 ports at mid-board [grey])</li> <li>- 4 x USB 2.0 ports ( 4 ports at midboard [black])</li> <li>- 1 x USB 3.1 Gen 2 front panel connector</li> <li>- 4 x USB 3.1 Gen 2 ports (3 Type-A [red] and 1 Type-C™ [black] at back panel)</li> </ul> <p><b>ASMedia® USB 3.1 Gen 1 controller</b></p> <ul style="list-style-type: none"> <li>- 2 x USB 3.1 Gen 1 ports (2 ports at back panel [blue])</li> </ul>

*(continued on the next page)*

# ROG MAXIMUS XI EXTREME specifications summary

## Special Features

### Aura

- Aura Lighting Control
- Aura RGB Strip Headers
- Aura Addressable Strip Header
- Aura Lighting Effects Synchronization with compatible ASUS ROG devices

### ASUS Dual Intelligent Processors 5

- 5-way Optimization tuning perfectly consolidates TPU Insight, EPU Guidance, Digi+ Power Control, FanXpert4, and Turbo app

### ASUS Exclusive Features

- MemOK! II
  - OptiMem II
  - Pre-mounted I/O Shield
  - AI Suite 3
  - USB BIOS Flashback
  - ASUS CrashFree BIOS 3
  - ASUS EZ Flash 3
  - ASUS C.P.R.(CPU Parameter Recall)
  - LiveDash
  - Ai Charger
  - BUPDATER
  - Armoury Crate
  - ASUS NODE: hardware control interface
  - BIOS Flashback Button
  - Clear CMOS Button
  - Reset Button
  - SafeDIMM slot
- ### ASUS Q-Design
- Q-Connector
  - Q-DIMM
  - Q-Code
  - Q-LED (CPU [red], DRAM [yellow], VGA [white], Boot Device [yellow green])

*(continued on the next page)*

## ROG MAXIMUS XI EXTREME specifications summary

<b>ROG Exclusive Features</b>	<b>Extreme Engine Digi+</b> <ul style="list-style-type: none"><li>- MicroFine Alloy Choke</li><li>- NexFET MOSFETs</li><li>- 10K Black Metallic Capacitors</li></ul> <b>Start Button</b> <b>Safe Boot Button</b> <b>ReTry Button</b> <b>Extreme Tweaker</b> <b>LN2 Mode</b> <b>ROG Exclusive Software</b> <ul style="list-style-type: none"><li>- Mem Tweakit</li><li>- RAMCache III</li><li>- RAMDisk</li><li>- CPU-Z</li><li>- GameFirst V</li><li>- Sonic Studio III + Sonic Studio Link</li><li>- Sonic Radar III</li></ul>
<b>Back I/O Ports</b>	1 x Clear CMOS Button 1 x BIOS Flashback Button 6 x USB 3.1 Gen 1 ports [blue] 1 x HDMI 1.4b 4 x USB 3.1 Gen 2 ports (3 x Type-A [red] and 1 x Type-C™ [black]) 1 x Anti-surge 5G LAN (RJ45) port 1 x Anti-surge LAN (RJ45) port 1 x 2x2 Wi-Fi Module 1 x Optical S/PDIF out 5 x LED-illuminated audio jacks

*(continued on the next page)*

# ROG MAXIMUS XI EXTREME specifications summary

## Internal connectors

- 1 x USB 3.1 Gen 2 front panel connector
- 2 x USB 3.1 Gen 1 headers support additional 4 USB 3.1 Gen 1 ports
- 2 x USB 2.0 headers support additional 4 USB 2.0 ports
- 1 x NODE connector
- 6 x SATA 6Gb/s ports
- 1 x M.2 Socket 3 with M Key, type 2242/2260/2280 storage devices support (PCIe 3.0 x4 and SATA Modes)
- 1 x M.2 Socket 3 with M Key, type 2242/2260/2280/22110 storage devices support (PCIe 3.0 x4 Mode)
- 1 x 4-Pin CPU\_FAN connector
- 1 x 4-Pin CPU\_OPT fan connector
- 2 x 4-Pin Chassis fan connectors
- 2 x 4-Pin W\_PUMP+ connectors
- 1 x T\_SENSOR connector
- 8 x 4-Pin RAD\_FAN connectors
- 1 x 24-Pin EATX power connector
- 2 x 8-Pin EATX 12V power connector
- 1 x WB\_SENSOR header
- 1 x 2-pin W\_IN connector
- 1 x 2-pin W\_OUT connector
- 1 x 3-pin W\_FLOW connector
- 1 x 5-Pin EXT\_FAN (Extension Fan) connector
- 1 x Start button
- 1 x Reset button
- 1 x SAFE\_BOOT button
- 1 x ReTry button
- 1 x LN2\_MODE jumper
- 1 x MemOK!\_II switch
- 2 x Aura RGB headers
- 2 x Addressable headers
- 1 x Front panel audio connector (AAFP)
- 1 x System panel connector
- 9 x Probelts measurement points
- 1 x EZ\_PLUG connector
- 1 x SLOW\_MODE switch
- 1 x RSVD switch
- 1 x DIMM.2 slot
- 1 x Thunderbolt header
- 1 x BIOS\_SWITCH button

*(continued on the next page)*

## ROG MAXIMUS XI EXTREME specifications summary

<b>BIOS</b>	2 x 128 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI3.0, SM BIOS 3.1, ACPI 6.1
<b>Manageability</b>	WOL, PXE
<b>Software</b>	Overwolf Kaspersky® Anti-Virus Daemon Tools Software WinRAR
<b>Operating System Support</b>	Windows® 10 64-bit
<b>Form Factor</b>	Extended ATX Form Factor, 12 inch x 10.9 inch (30.5 cm x 27.7 cm)



Specifications are subject to change without notice. Please refer to the ASUS website for the latest specifications.

## Package contents

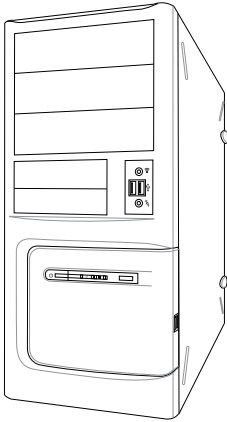
Check your motherboard package for the following items.

Motherboard	1 x ROG MAXIMUS XI EXTREME motherboard
Cables	2 x 2-in-1 SATA 6Gb/s cables
	1 x 2-in-1 ROG Weave SATA 6Gb/s cable
	1 x 5 pin Wafer cable
	1 x 3-in-1 thermistor cable
	1 x Extension Cable for RGB Strips (80cm)
	1 x Extension Cable for Addressable LED Strips (80cm)
Accessories	1 x 2x2 dual-band Wi-Fi moving antennas
	1 x SLI™ HB Bridge (2-WAY-M)
	1 x Q-Connector
	1 x ROG DIMM.2 with Heatsink
	1 x M.2 Pad for ROG DIMM.2
	1 x ROG Coaster
	3 x M.2 Screw packages
	1 x ROG logo plate sticker
1 x ROG sticker	
1 x Fan extension card	
Application USB	1 x USB drive with utilities and drivers
Documentation	1 x User guide

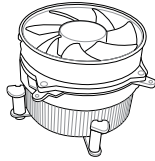


If any of the above items is damaged or missing, contact your retailer.

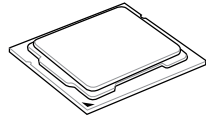
# Installation tools and components



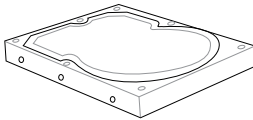
PC chassis



Intel® LGA1151 compatible CPU Fan



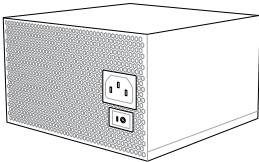
Intel® LGA1151 CPU



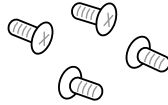
SATA hard disk drive



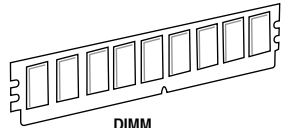
Phillips (cross) screwdriver



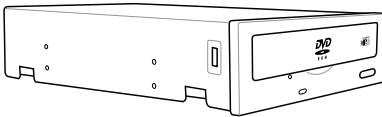
Power supply unit



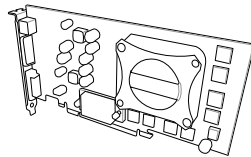
1 bag of screws



DIMM



SATA optical disc drive (optional)



Graphics card (optional)



M.2 SSD module (optional)



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



# Product Introduction

# 1

## 1.1 Motherboard overview

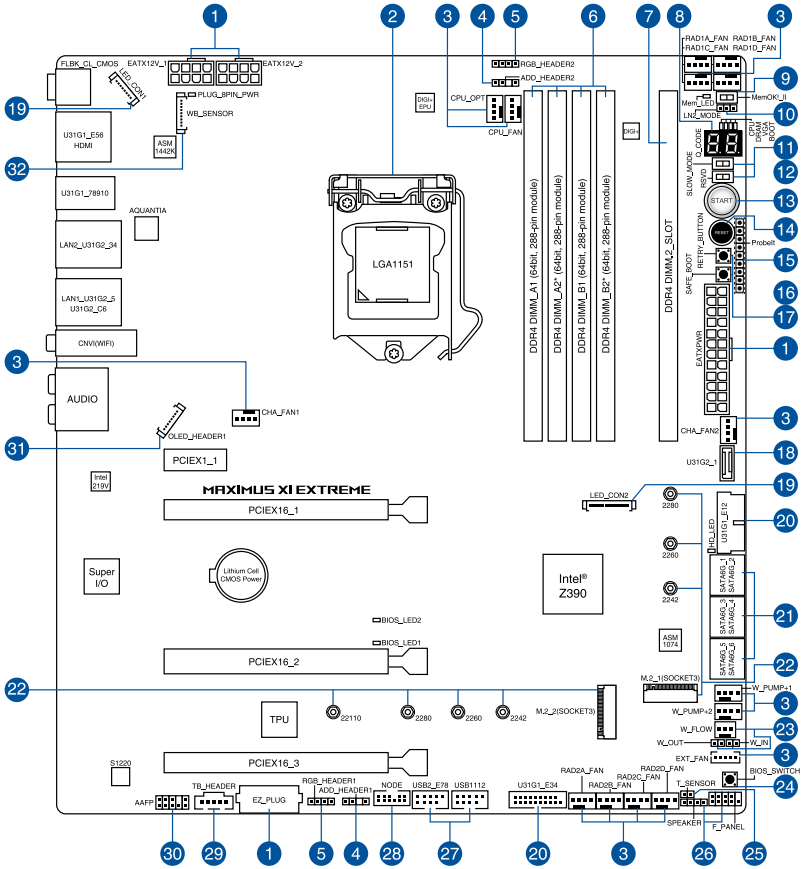
### 1.1.1 Before you proceed

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.
-

## 1.1.2 Motherboard layout



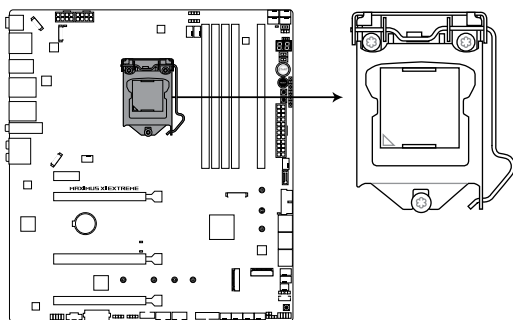
Refer to 1.1.9 Internal connectors and 2.3.1 Rear I/O connection for more information about rear panel connectors and internal connectors.

## Layout contents

Connectors/Jumpers/Buttons and switches/Slots	Page
1. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V_1-2; 4-pin EZ_PLUG)	1-28
2. LGA1151 CPU Socket	1-4
3. Fan and pump connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin RAD1A_FAN-RAD1D_FAN; 4-pin RAD2A_FAN-RAD2D_FAN; 4-pin CHA_FAN1-2; 4-pin W_PUMP+1-2; 5-pin EXT_FAN)	1-25
4. Addressable RGB headers (4-1 pin ADD_HEADER1-2)	1-23
5. AURA RGB headers (4-pin RGB_HEADER1-2)	1-22
6. DDR4 DIMM slots	1-5
7. DIMM.2 slot (DIMM.2_SLOT)	1-31
8. Q_Code LED	1-17
9. MemOK! II switch (MemOK!_II_switch)	1-10
10. LN2 Mode jumper (3-pin LN2_MODE)	1-14
11. Slow Mode switch (SLOW_MODE)	1-12
12. RSVD switch (RSVD)	1-13
13. Power-on button (START)	1-9
14. RESET button (RESET)	1-9
15. ProbelT	1-32
16. ReTry button (RETRY_BUTTON)	1-11
17. Safe Boot button (SAFE_BOOT)	1-11
18. USB 3.1 Gen 2 front panel connector (U31G2_1)	1-20
19. LED connectors (8-pin LED_CON1; 13-pin LED_CON2)	1-21
20. USB 3.1 Gen 1 connectors (20-1 pin U31G1_E12, U31G1_E34)	1-20
21. Intel® Z390 Serial ATA 6 Gb/s connectors (7-pin SATA6G_1-6)	1-18
22. M.2 sockets (M.2_1; M.2_2)	1-30
23. Water in, water out, and water flow connectors (2-pin W_IN2; 2-pin W_OUT2; 3-pin W_FLOW2)	1-26
24. BIOS switch button (BIOS_SWITCH)	1-12
25. Thermal sensor connector (2-pin T_SENSOR)	1-19
26. System panel connectors (10-1 pin F_PANEL; 4-pin SPEAKER)	1-29
27. USB 2.0 connectors (10-1 pin USB2_E78, USB1112)	1-21
28. Node connector (12-1 pin NODE)	1-27
29. Thunderbolt header (5-pin TB_HEADER)	1-24
30. Front panel audio connector (10-1 pin AAFP)	1-19
31. OLED connector (9-pin OLED_HEADER)	1-24
32. Water Block connector (9 pin WB_SENSOR)	1-27

### 1.1.3 Central Processing Unit (CPU)

This motherboard supports Intel® Core™ 9000 series, 8th Generation Core™ i7/ i5/ i3, Pentium® and Celeron® processors on the LGA1151 package, with memory and PCI Express controllers integrated to support dual-channel (4 DIMM) DDR4 memory and 16 PCI Express 3.0/2.0 lanes.



**ROG MAXIMUS XI EXTREME CPU LGA1151**



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Ensure that you install the correct CPU designed for LGA1151 socket only. **DO NOT** install a CPU designed for LGA1150, LGA1155, and LGA1156 sockets in the LGA1151 socket.

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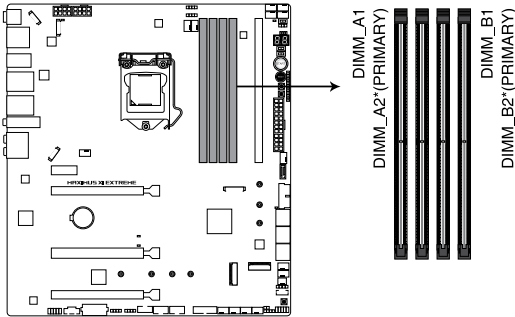
- Ensure that all power cables are unplugged before installing the CPU.
  - Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard 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.
-

## 1.1.4 System memory

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

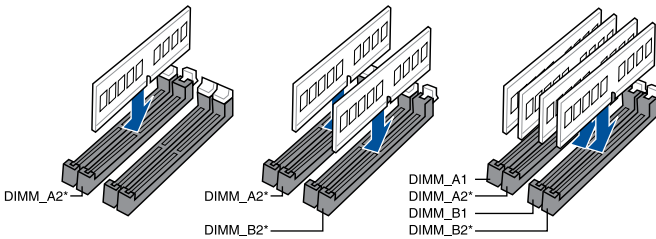


A DDR4 module is notched differently from a DDR, DDR2, or DDR3 module. DO NOT install a DDR, DDR2, or DDR3 memory module to the DDR4 slot.



ROG MAXIMUS XI EXTREME 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.



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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.

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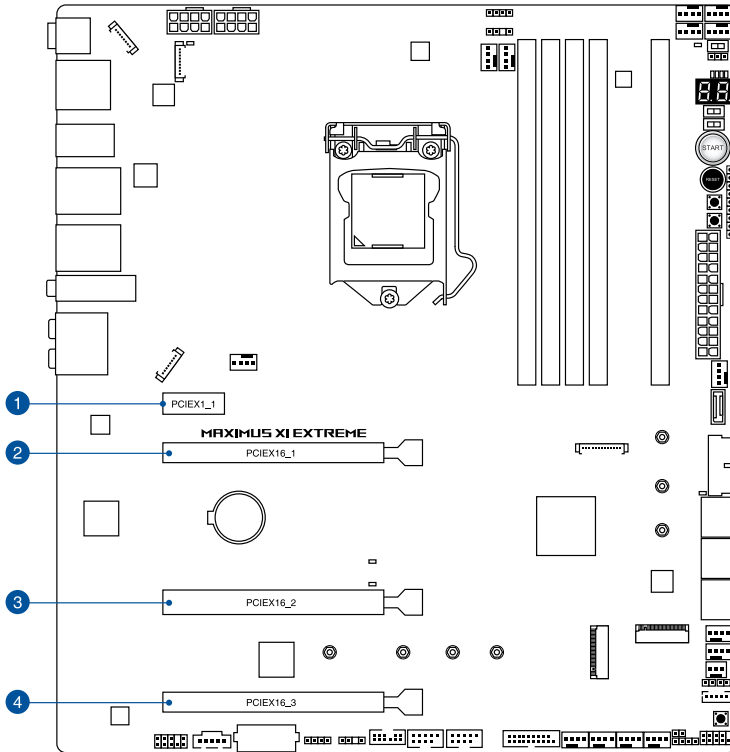


- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
  - For system 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.
  - Visit the ASUS website for the latest QVL.
-

## 1.1.5 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 3.0 x1_1 slot
2	PCIe 3.0 x16_1 slot
3	PCIe 3.0 x16_2 slot
4	PCIe 3.0 x16_3 slot

VGA configuration	PCI Express 3.0 operating mode	
	PCIe_x16_1	PCIe_x16_2
Single VGA/PCIe card	x16 (Recommend for single VGA)	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\_FAN1-2 when using multiple graphics cards for better thermal environment.



PCIe\_x16\_1 slot switches to x8 mode when PCIe\_x16\_2 slot is occupied.

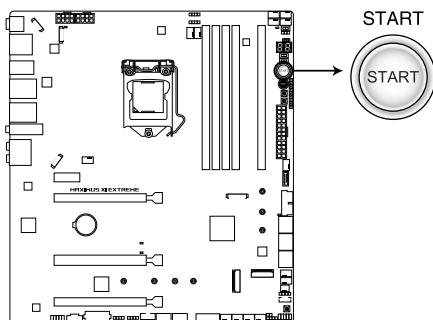


## 1.1.6 Onboard buttons and switches

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

### 1. Power-on button (START)

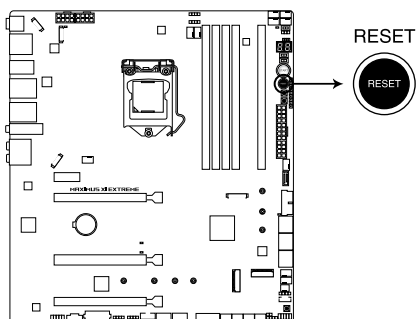
The motherboard comes with a power-on button that allows you to power up or wake up the system. The button also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or installing any motherboard component.



**ROG MAXIMUS XI EXTREME** Power on button

### 2. RESET button (RESET)

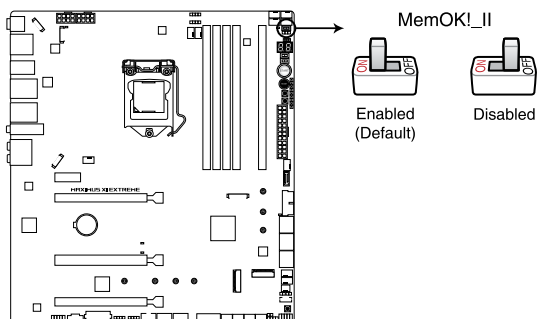
Press the reset button to reboot the system.



**ROG MAXIMUS XI EXTREME** Reset button

### 3. MemOK! II switch (MemOK!\_II)

Installing DIMMs that are not compatible with the motherboard may cause system boot failure. The switch is enabled by default, allowing memory re-training when the motherboard is unresponsive due to memory problems. The Mem\_LED will light up while re-training, and turn off when the re-training is complete.



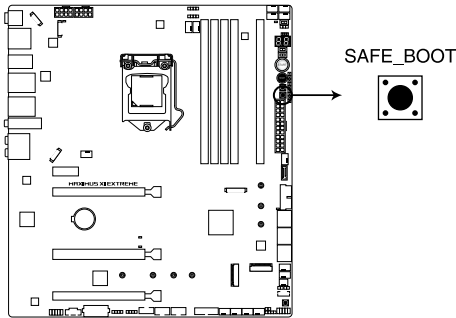
**ROG MAXIMUS XI EXTREME MemOK!\_II switch**



- Refer to section **1.1.8 Onboard LEDs** for the exact location of the MEM 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! II function.
- The MemOK! II switch does not function under Windows® OS environment.
- During the tuning process, the system loads and tests pretest profiles. It takes about 30 seconds for the system to test one set of profiles. If the test fails, the system reboots and tests the next set of profiles. The system will reboot multiple times when training, once the system has completed the training process the Mem\_LED will turn off, please refrain from doing anything before the Mem\_LED turns off.
- Due to memory tuning requirement, the system automatically reboots when each profile is tested. If the installed DIMMs still fail to boot after the whole tuning process, and the Mem\_LED is turned off, please refer to the Q-code LED and Q-code table for more details on the error.
- 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 5–10 seconds, then set the MemOK! II switch to disabled.
- Ensure to replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) at [www.asus.com](http://www.asus.com).
- We recommend that you download and update to the latest BIOS version from [www.asus.com](http://www.asus.com) after using the MemOK! II function.

#### 4. Safe Boot button (SAFE\_BOOT)

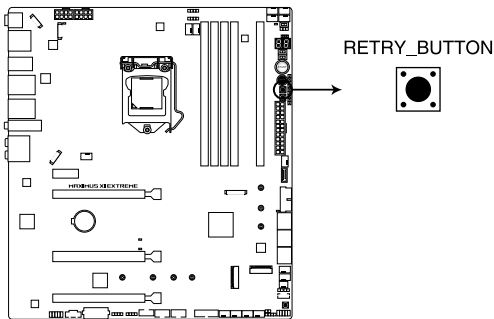
The Safe Boot button can be pressed anytime to force the system to reboot into the BIOS safe mode. This button temporarily applies safe settings to the BIOS while retaining any overlocked settings allowing you to modify the settings causing boot failure. Use this button when overclocking or tweaking the settings of your system.



**ROG MAXIMUS XI EXTREME Safe Boot button**

#### 5. ReTry button (RETRY\_BUTTON)

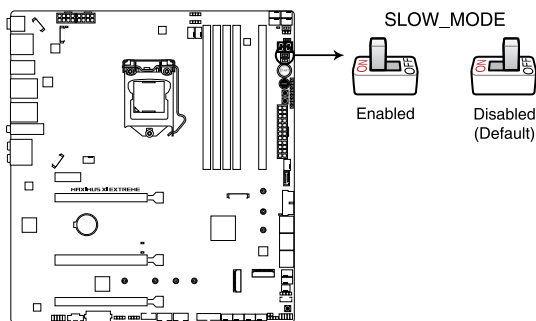
The ReTry button is specially designed for overclockers and is most useful during the booting process where the Reset button is rendered useless. When pressed, it forces the system to reboot while retaining the same settings to be retried in quick succession to achieve a successful POST.



**ROG MAXIMUS XI EXTREME RETRY button**

## 6. Slow Mode Switch (SLOW\_MODE)

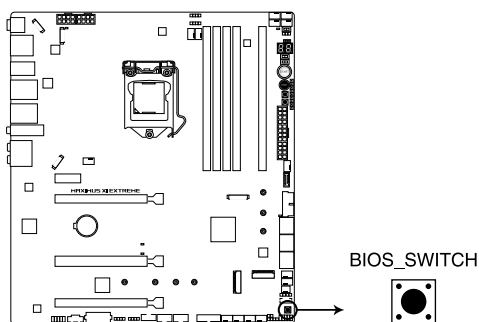
Slow Mode Switch is employed during LN2 benching. The system may crash due to the CPU being unstable when using extreme overclocking, enabling slow mode will decrease the processor frequency and stabilize the system, allowing overclockers to keep track of their overclocking data.



**ROG MAXIMUS XI EXTREME Slow Mode switch**

## 7. BIOS Switch button (BIOS\_SWITCH)

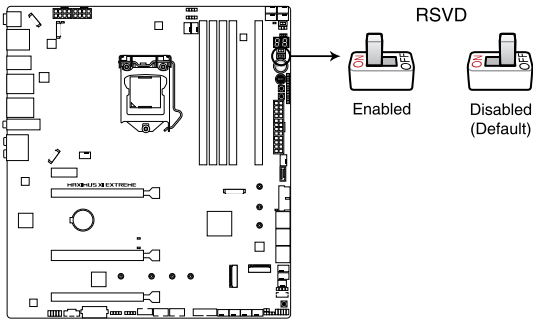
The motherboard comes with two BIOS chips. Press the BIOS button to switch BIOS and load different BIOS settings. The nearby BIOS\_LEDs indicate the currently selected BIOS.



**ROG MAXIMUS XI EXTREME BIOS\_SWITCH button**

## 8. RSVD switch (RSVD)

This switch is reserved for ASUS-authorized technicians only.



**ROG MAXIMUS XI EXTREME RSVD switch**

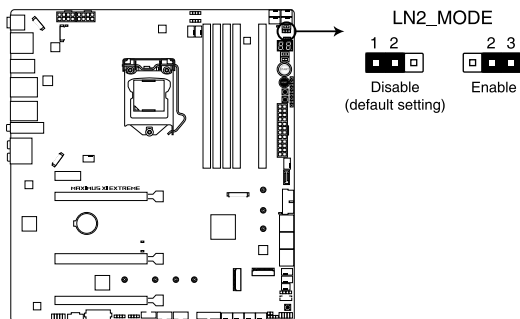


Please ensure the RSVD switch is set to **Disabled**. Setting this switch to **Enabled** may result in damages to your system.

## 1.1.7 Jumper

### 1. LN2 Mode jumper (3-pin LN2\_MODE)

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

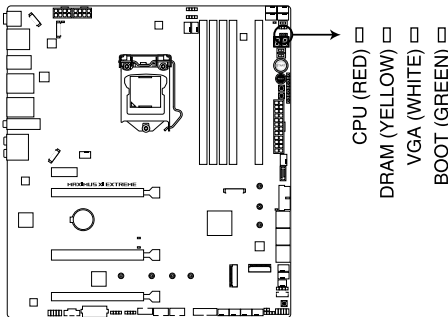


**ROG MAXIMUS XI EXTREME LN2 Mode jumper**

## 1.1.8 Onboard LEDs

### 1. Q LED (BOOT, VGA, DRAM, CPU)

Q LED check key components (CPU, DRAM, VGA card, and booting devices) in sequence during motherboard booting process. If an error is found, the corresponding LED remains lit until the problem is solved. This user-friendly design provides an intuitive way to locate the root problem within seconds.



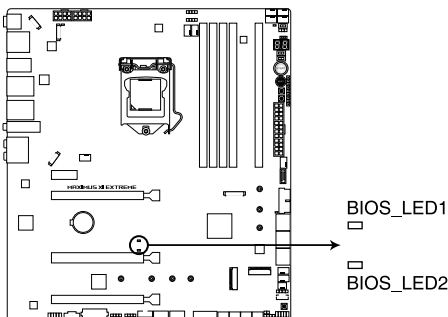
**ROG MAXIMUS XI EXTREME CPU/ DRAM/  
BOOT/ VGA LED**



The Q LEDs provide the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.

### 2. BIOS LEDs (BIOS\_LED1-2)

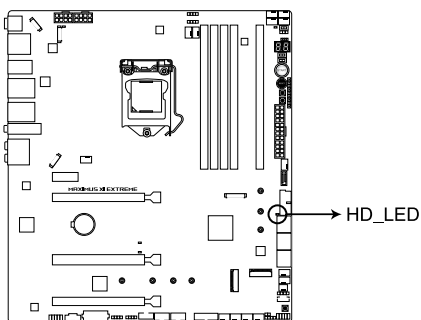
The BIOS LEDs help indicate the BIOS activity. Press the BIOS button to switch between BIOS1 and BIOS2 and the LED lights up when the corresponding BIOS is in use.



**ROG MAXIMUS XI EXTREME BIOS LEDs**

### 3. Hard Disk LED (HD\_LED)

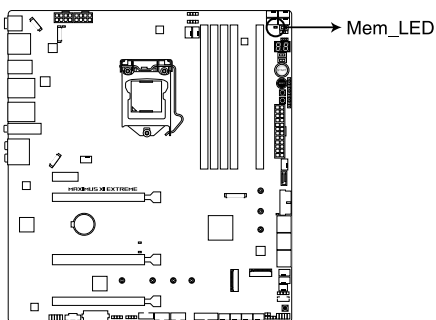
The Hard Disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.



**ROG MAXIMUS XI EXTREME Hard Disk LED**

### 4. Memory LED (Mem\_LED)

The Mem\_LED will light up and remain lit while the MemOK! II function is in use. When the re-training is complete, the Mem\_LED will turn off.

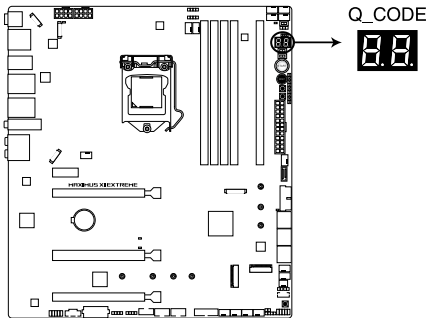


**ROG MAXIMUS XI EXTREME Mem\_LED**



## 5. Q-Code LED

The Q-Code LED design provides you with a 2-digit error code that displays the system status.



**ROG MAXIMUS XI EXTREME Q-Code LED**



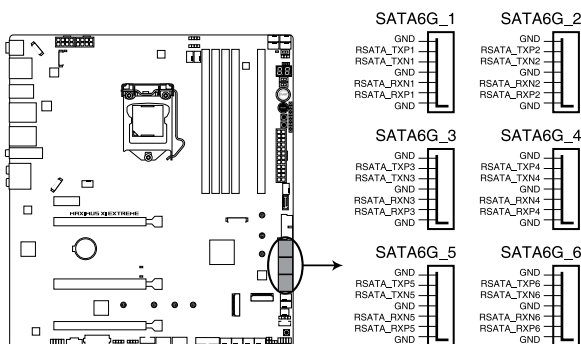
- The Q-Code LED provides the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.
- Please refer to the Q-Code table in the **Appendix** section for more details.

## 1.1.9 Internal connectors

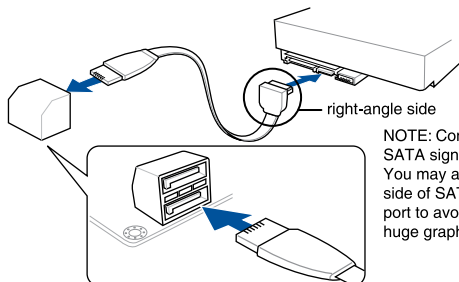
### 1. Intel® Z390 Serial ATA 6 Gb/s connectors (7-pin SATA6G\_1-6)

These connectors connect to Serial ATA 6 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® Z390 chipset.



**ROG MAXIMUS XI EXTREME Intel® Serial ATA 6 Gb/s connectors**



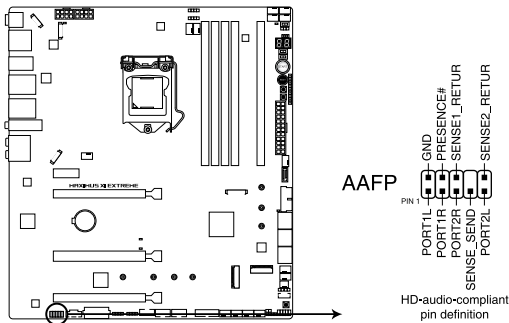
**NOTE:** Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



- These connectors are set to **[AHCI]** by default. If you intend to create a Serial ATA RAID set using these connectors, set the **SATA Mode Selection** item in the BIOS to **[Intel RST Premium With Intel Optane System Acceleration (RAID)]**.
- For more information on configuring your RAID sets, please refer to the **RAID Configuration Guide** which you can find at <https://www.asus.com/support>.

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

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



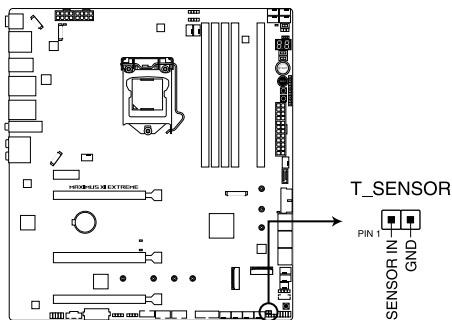
**ROG MAXIMUS XI EXTREME Front panel audio connector**



We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

## 3. Thermal sensor connector (2-pin T\_SENSOR)

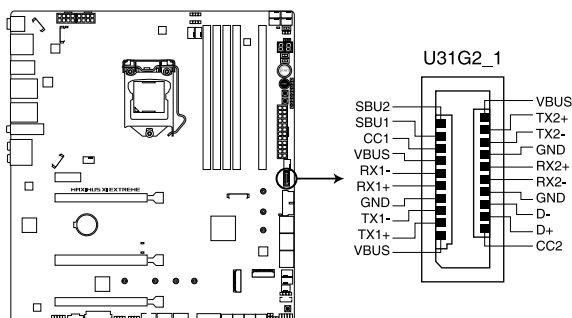
This connector is for the thermistor cable that allows you to monitor the temperature of your motherboard's critical components and connected devices.



**ROG MAXIMUS XI EXTREME Thermal sensor connector**

#### 4. USB 3.1 Gen 2 front panel connector (U31G2\_1)

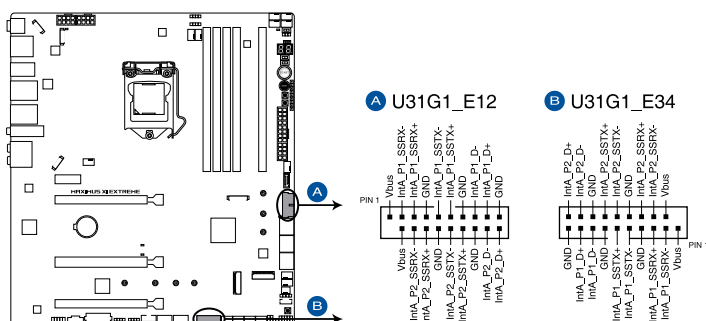
This connector allows you to connect a USB 3.1 Gen 2 module for additional USB 3.1 Gen 2 ports. The latest USB 3.1 Gen 2 connectivity provides data transfer speeds of up to 10 Gbps.



**ROG MAXIMUS XI EXTREME USB 3.1 Gen 2 front panel connector**

#### 5. USB 3.1 Gen 1 connectors (20-pin U31G1\_E12, U31G1\_E34)

These connectors allow you to connect a USB 3.1 Gen 1 module for additional USB 3.1 Gen 1 front or rear panel ports. With an installed USB 3.1 Gen 1 module, you can enjoy all the benefits of USB 3.1 Gen 1 including faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.



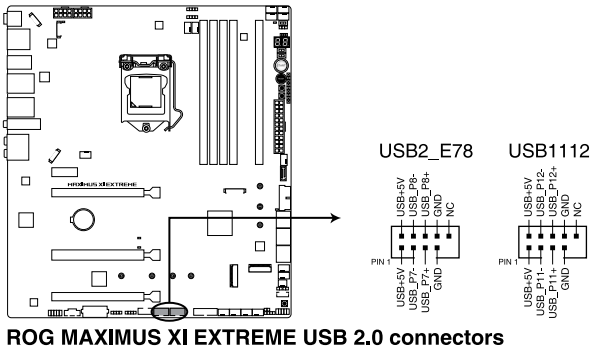
**ROG MAXIMUS XI EXTREME USB 3.1 Gen 1 connectors**



The USB 3.1 Gen 1 module is purchased separately.

## 6. USB 2.0 connectors (10-1 pin USB2\_E78, USB1112)

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



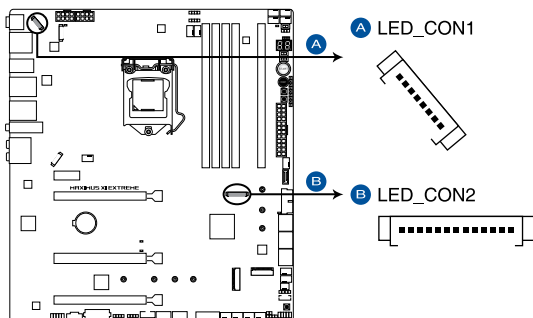
DO NOT connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB 2.0 module is purchased separately.

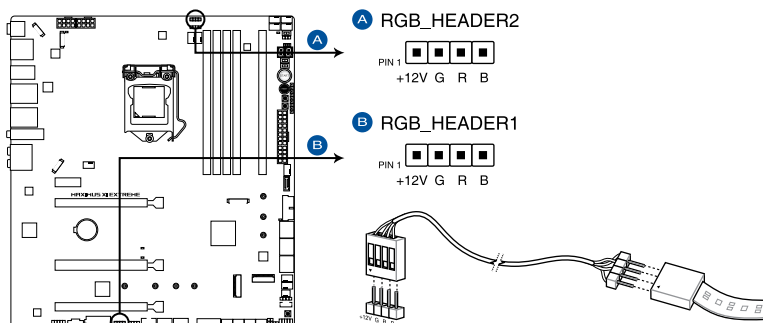
## 7. LED connectors (8-pin LED\_CON1; 13-pin LED\_CON2)

These LED connectors are for connecting LED strips on your back I/O and PCH cover.



## 8. AURA RGB headers (4-pin RGB\_HEADER1-2)

These connectors are for RGB LED strips.



**ROG MAXIMUS XI EXTREME RGB headers**



The RGB header supports 5050 RGB multi-color LED strips (12V/G/R/B), with a maximum power rating of 3A (12V), and no longer than 3 m.



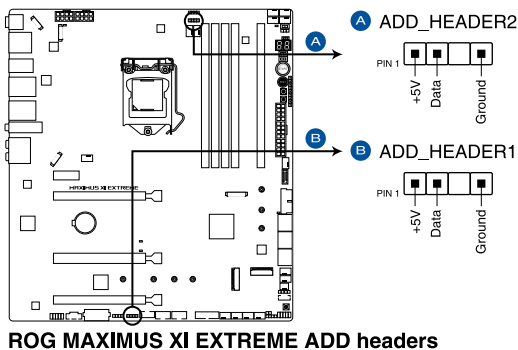
Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.



- Actual lighting and color will vary with LED strip.
- If your LED strip does not light up, check if the RGB LED extension cable and the RGB LED strip is connected in the correct orientation, and the 12V connector is aligned with the 12V header on the motherboard.
- The LED strip will only light up when the system is operating.
- The LED strip is purchased separately.

## 9. Addressable RGB headers (4-1 pin ADD\_HEADER1-2)

These connectors are for individually addressable RGB WS2812B LED strips or WS2812B based LED strips.



**ROG MAXIMUS XI EXTREME ADD headers**



The addressable RGB header supports WS2812B addressable RGB LED strips (5V/Data/Ground), with a maximum power rating of 3A (5V) and a maximum of 120 LEDs.



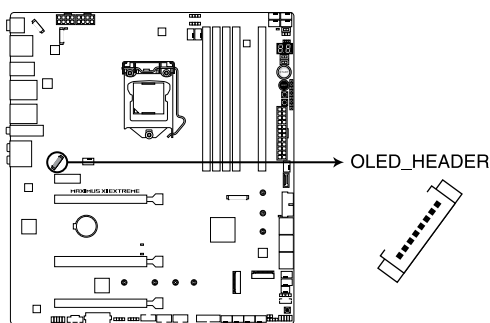
Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.



- Actual lighting and color will vary with LED strip.
- If your LED strip does not light up, check if the addressable RGB LED strip is connected in the correct orientation, and the 5V connector is aligned with the 5V header on the motherboard.
- The addressable RGB LED strip will only light up under the operating system.
- The addressable RGB LED strip is purchased separately.

## 10. OLED connector (9-pin OLED\_HEADER)

This connector is used to connect your LiveDash OLED panel. The OLED panel provides you a quick overview of the system temperature, power status, and fan speeds when your system boots up. There are also more customizable options for your system.



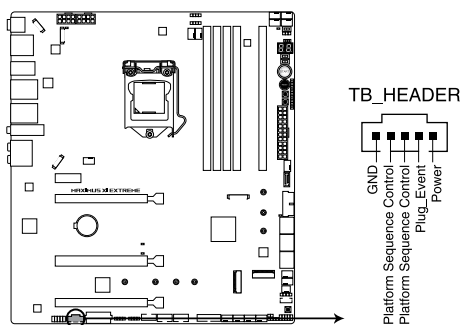
**ROG MAXIMUS XI EXTREME OLED\_HEADER**



- Use the **ROG LiveDash Utility** to configure and customize the OLED panel.
- The LiveDash OLED provides the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.

## 11. 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.



**ROG MAXIMUS XI EXTREME Thunderbolt header**



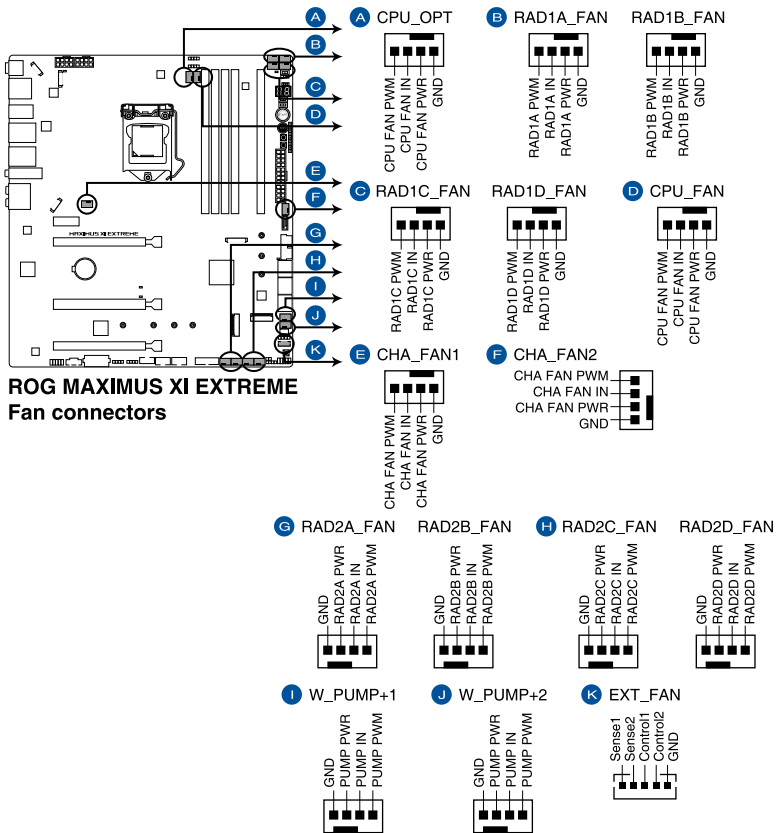
The add-on Thunderbolt I/O card and Thunderbolt cables are purchased separately.



## 12. Fan and pump connectors (4-pin CPU\_FAN; 4-pin CPU\_OPT; 4-pin RAD1A\_FAN-RAD1D\_FAN; 4-pin RAD2A\_FAN-RAD2D\_FAN; 4-pin CHA\_FAN1-2; 4-pin W\_PUMP+1-2; 5-pin EXT\_FAN)

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

The EXT\_FAN connector is only for the fan extension card. For more details on the fan extension card, please refer to the **To install Fan Extension Card** section in this guide.



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

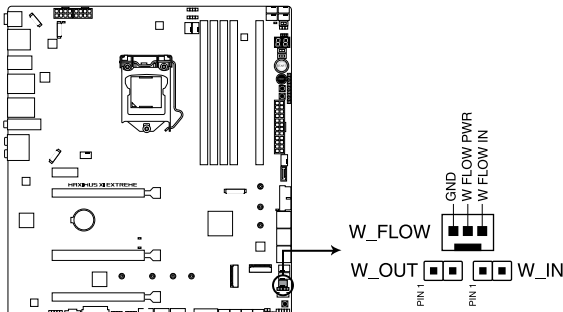


- The FAN Extension card is purchased separately.
- W\_PUMP+ function support depends on water cooling device.
- Connect the fan of your water cooling kit to the W\_PUMP+1/2 connector.

Header	Max. Current	Max. Power	Default Speed	Shared Control
CPU_FAN	1A	12W	Q-Fan Controlled	A
CPU_OPT	1A	12W	Q-Fan Controlled	A
RAD1A_FAN	1A	12W	Q-Fan Controlled	B
RAD1B_FAN	1A	12W	Q-Fan Controlled	B
RAD1C_FAN	1A	12W	Q-Fan Controlled	B
RAD1D_FAN	1A	12W	Q-Fan Controlled	B
RAD2A_FAN	1A	12W	Q-Fan Controlled	C
RAD2B_FAN	1A	12W	Q-Fan Controlled	C
RAD2C_FAN	1A	12W	Q-Fan Controlled	C
RAD2D_FAN	1A	12W	Q-Fan Controlled	C
EXT_FAN	1A	12W	Q-Fan Controlled	-
CHA_FAN1	1A	12W	Q-Fan Controlled	-
CHA_FAN2	1A	12W	Q-Fan Controlled	-
W_PUMP+_1	3A	36W	Full Speed	-
W_PUMP+_2	3A	36W	Full Speed	-

### 13. Water in, water out, and water flow connectors (2-pin W\_IN; 2-pin W\_OUT; 3-pin W\_FLOW)

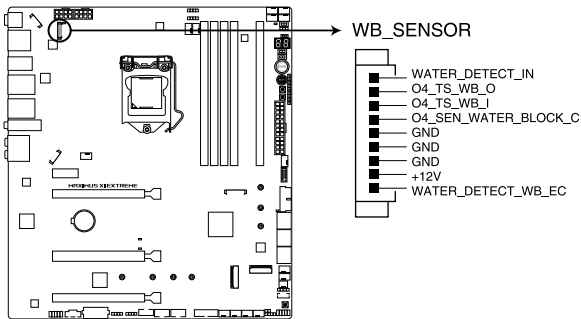
These connectors allow you to connect sensors to monitor the temperature and flow rate of your liquid cooling system. You can manually adjust the fans and water pump to optimize the thermal efficiency of your liquid cooling system.



**ROG MAXIMUS XI EXTREME W\_IN, W\_OUT & W\_Flow**

#### 14. Water Block connector (9-pin WB\_SENSOR)

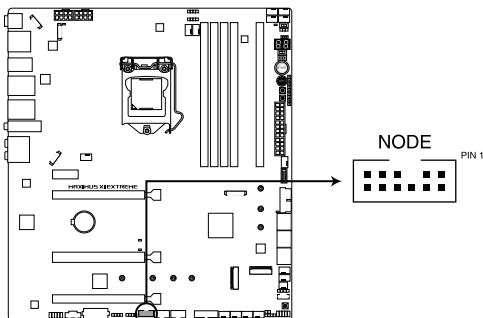
This connector allows you to connect a water block connector to monitor the temperature, flow rate, and water leak signals of your third party monoblocks. You can manually adjust the fans and water pump to optimize the thermal efficiency of your third party monoblocks.



**ROG MAXIMUS XI EXTREME WB\_SENSOR**

#### 15. NODE connector (12-1 pin NODE)

This connector allow you to connect a compatible PSU or control a compatible fan extension card.



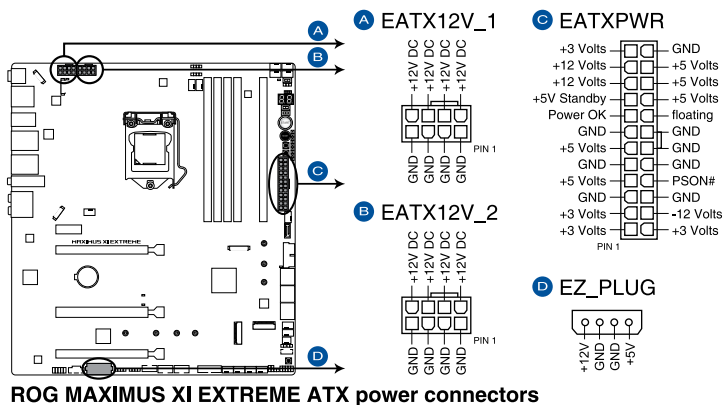
**ROG MAXIMUS XI EXTREME NODE**



Visit [www.asus.com](http://www.asus.com) for more information about the devices and the latest compatibility list.

## 16. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V\_1-2; 4-pin EZ\_PLUG)

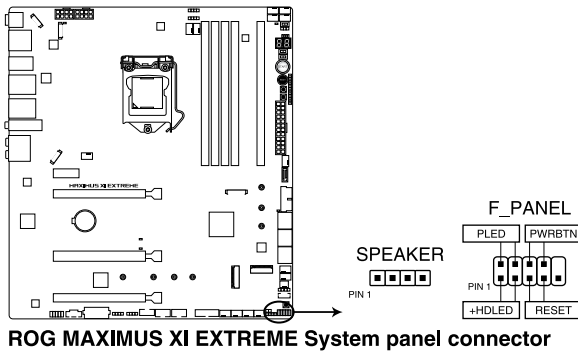
These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version) and provides a minimum power of 350 W.
- Do not forget to connect the 8-pin EATX12V power plug. Otherwise, the system will not boot.
- Connect the 4-pin EZ\_PLUG power plugs to ensure sufficient power when you install multiple graphics cards.
- 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 PCIe x16 cards, use a PSU with 1000W power or above to ensure the system stability.

## 17. System panel connectors (10-1 pin F\_PANEL; 4-pin SPEAKER)

These connectors supports several chassis-mounted functions.



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

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

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

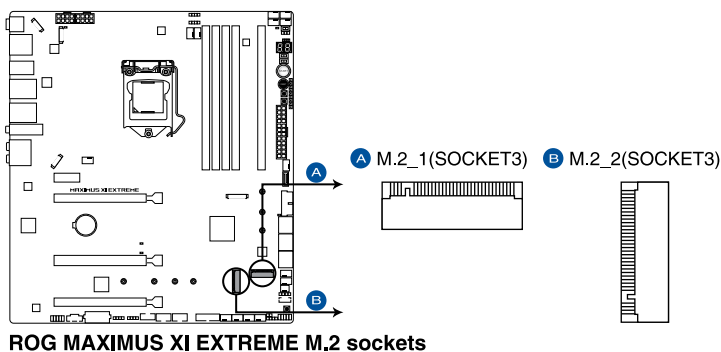
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power button for more than four seconds while the system is ON turns the system OFF.

- **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.

## 18. M.2 sockets (M.2\_1; M.2\_2)

These sockets allow you to install M.2 SSD modules.



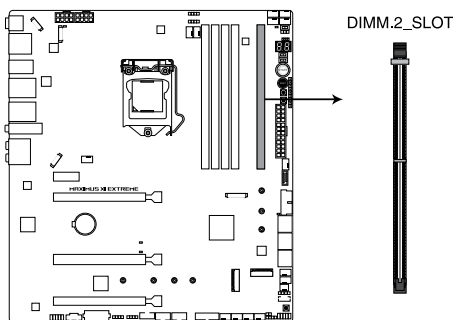
- M.2\_1 socket supports PCIe 3.0 x4 and SATA mode M Key design and type 2242 / 2260 / 2280 PCIe and SATA storage devices.
- M.2\_2 socket supports PCIe 3.0 x4 M Key design and type 2242 / 2260 / 2280 / 22110 PCIe storage devices.
- These sockets support IRST (Intel® Rapid Storage Technology).



The M.2 SSD module is purchased separately.

## 19. DIMM.2 slot (DIMM.2\_SLOT)

This socket allows you to install the bundled DIMM.2 card to connect M.2 SSD modules.



**ROG MAXIMUS XI EXTREME 288-pin DDR4 DIMM.2\_SLOT socket**



- Before you install or remove the DIMM.2 card, 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 or DIMM.2 card.
- The DIMM.2 card is notched to fit in only one orientation. Ensure that the notch on your card is aligned correctly with the DIMM.2 slot before inserting the card.



- DIMM.2 module supports PCIe 3.0 x4 M Key design and type 2242 / 2260 / 2280 / 22110 PCIe storage devices.
- These sockets support IRST (Intel® Rapid Storage Technology).
- The DIMM.2 Slots (M.2\_1/2) are disabled by default. Please adjust BIOS settings to enable DIMM.2 Slots.
- Intel® Optane Technology is only supported by M.2\_1 and M.2\_1(DIMM.2) when sourced from the PCH. Before using Intel® Optane memory modules, ensure that you have updated your motherboard drivers and BIOS to the latest version from ASUS support website.

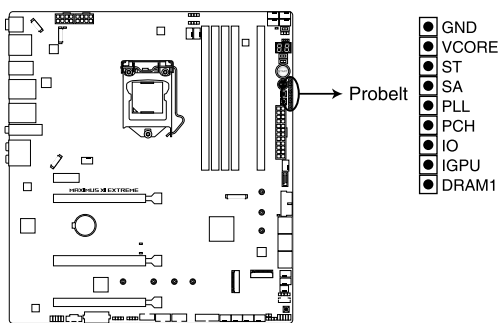


The M.2 SSD module is purchased separately.

## 1.2.10 Probelt

The ROG Probelt allows you to detect your system's current voltage and OC settings. Use a multimeter to measure the Probelt points even during overclocking.

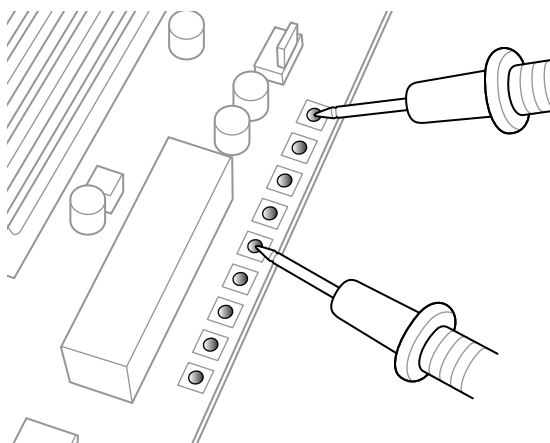
See the illustration below to locate the respective Probelt points.



**ROG MAXIMUS XI EXTREME Probelt**

### Using Probelt

You can connect the multimeter to the motherboard as shown on the following figure.



The illustration above are for reference only, the actual motherboard layout and measure points location may differ by models.



# Basic Installation

# 2

## 2.1 Building your PC system

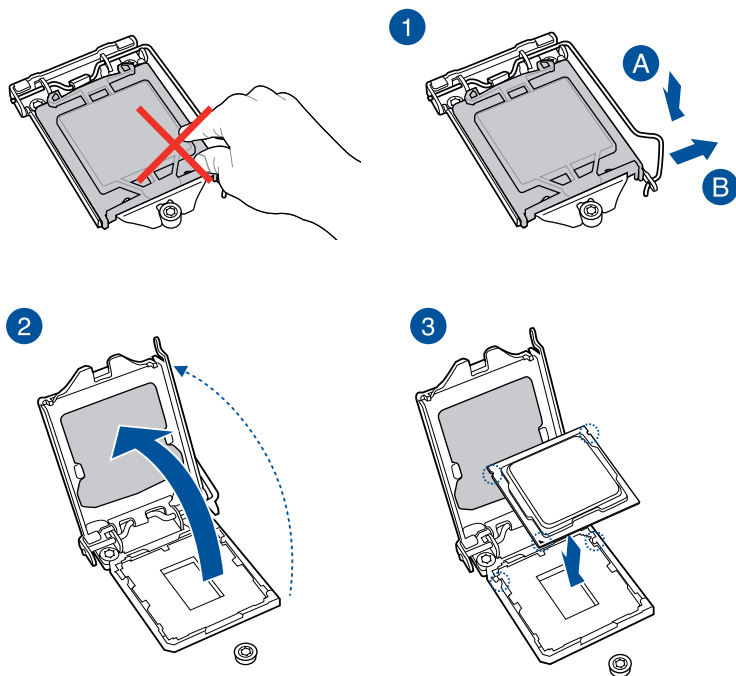


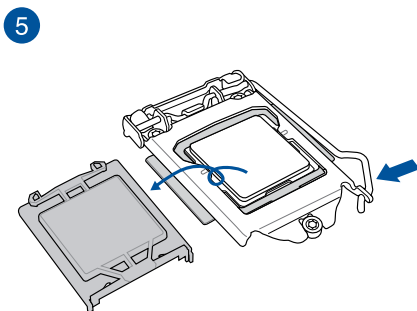
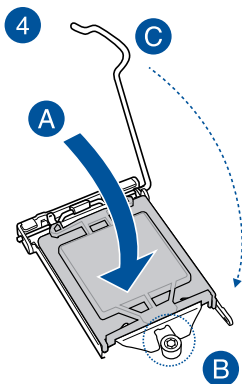
The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

### 2.1.1 CPU installation

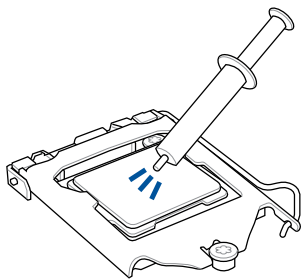


- Ensure that you install the correct CPU designed for LGA1151 socket only. **DO NOT** install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1151 socket.
- ASUS will not cover damages resulting from incorrect CPU installation/removal, incorrect CPU orientation/placement, or other damages resulting from negligence by the user.



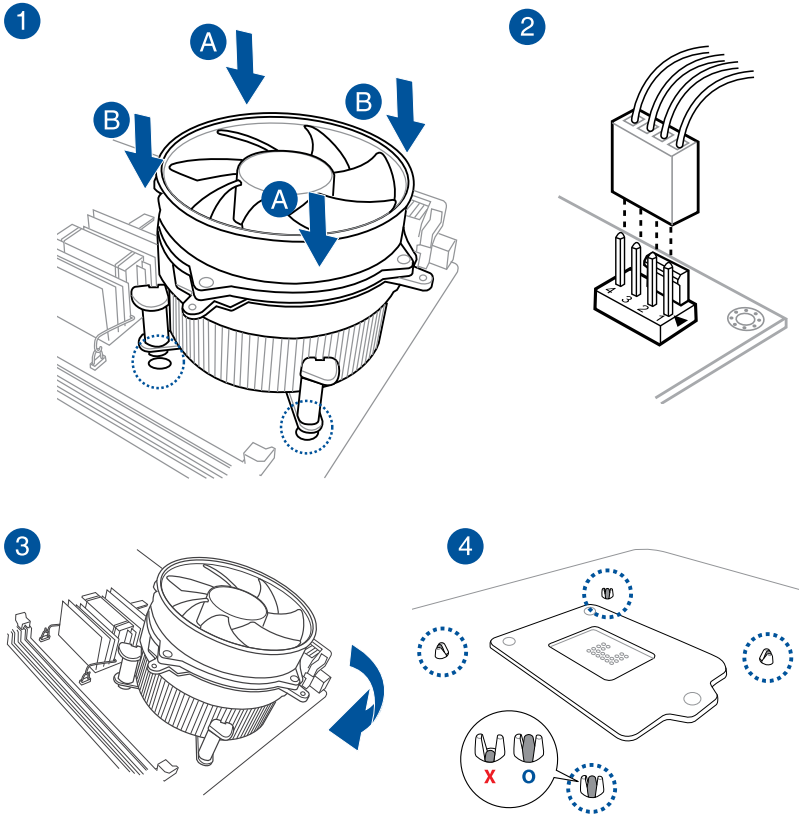


## 2.1.2 Cooling system installation



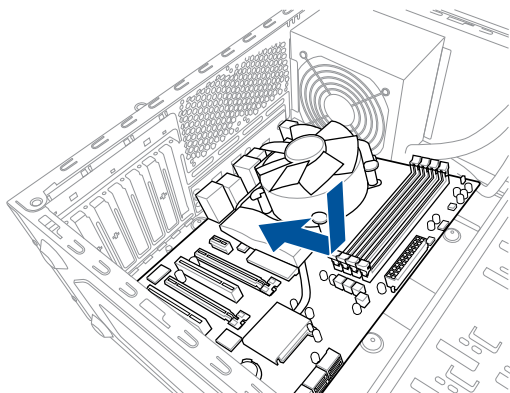
Apply Thermal Interface Material to the CPU cooling system and CPU before you install the cooling system, if necessary.

## To install a CPU heatsink and fan assembly

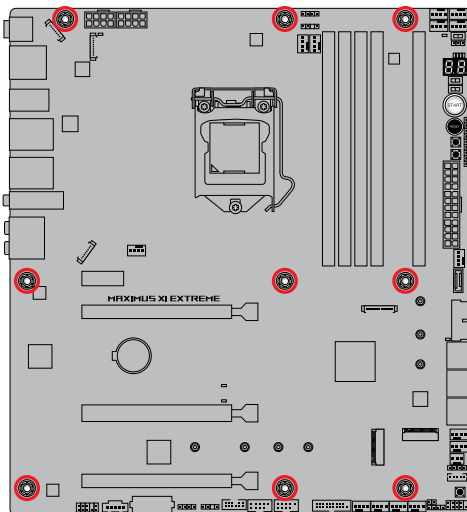
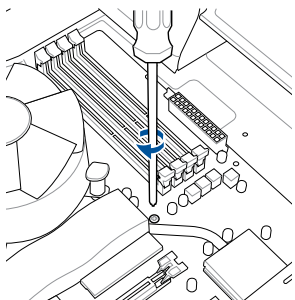


## 2.1.3 Motherboard installation

1. Place the motherboard into the chassis, ensuring that its rear I/O ports are aligned to the chassis' rear I/O panel.

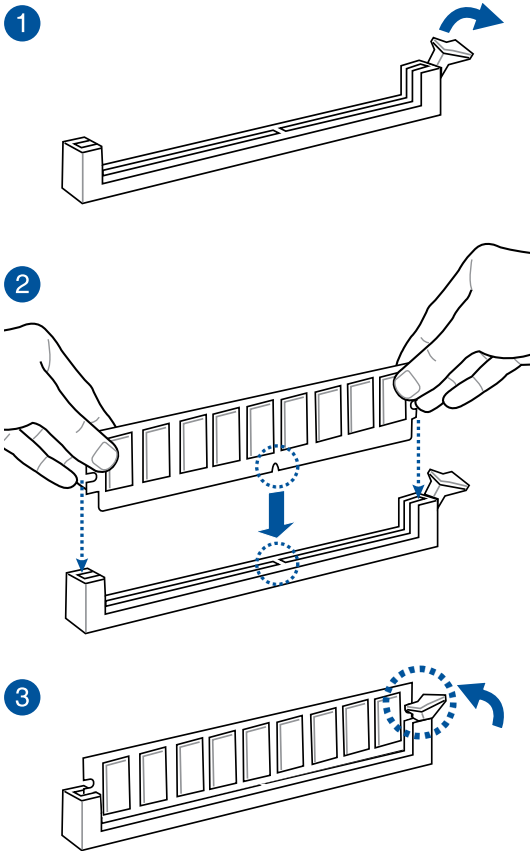


2. Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

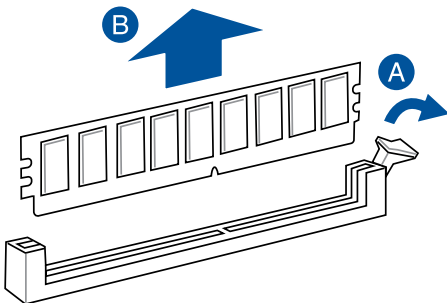


DO NOT overtighten the screws! Doing so can damage the motherboard.

## 2.1.4 DIMM installation

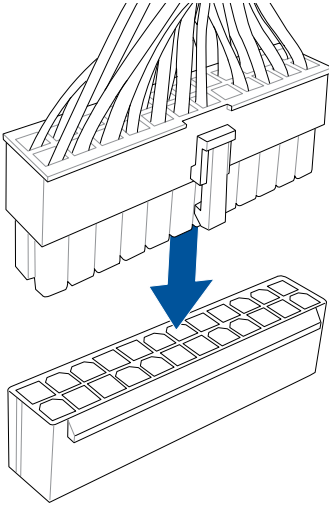


To remove a DIMM

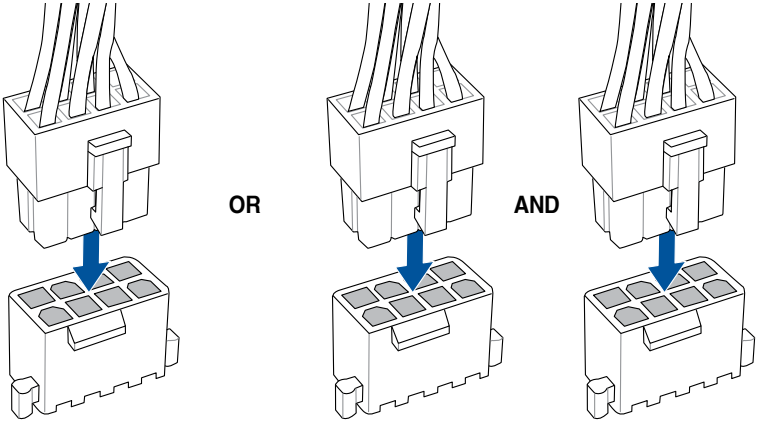


## 2.1.5 ATX power connection

1

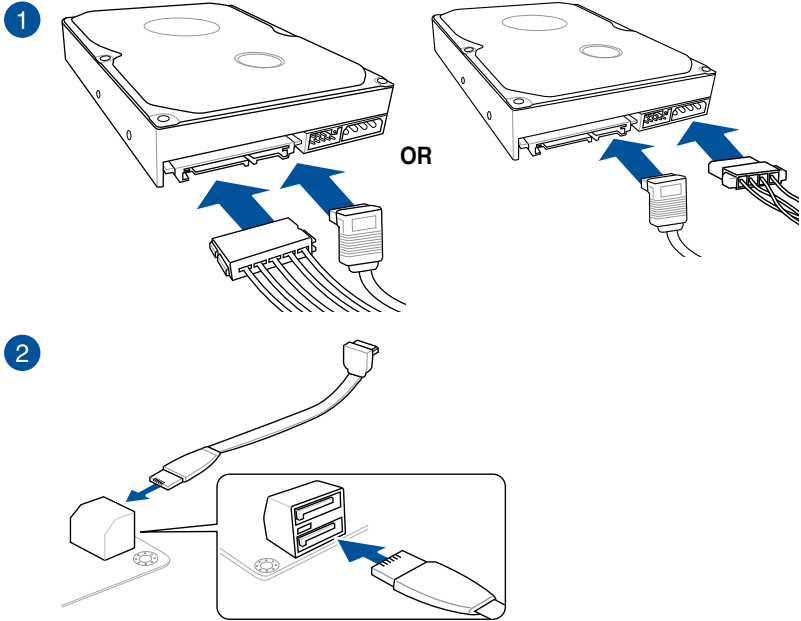


2



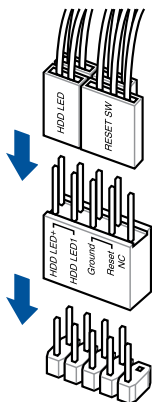
Ensure to connect the 8-pin power plug, or connect both the 8-pin power plugs.

## 2.1.6 SATA device connection

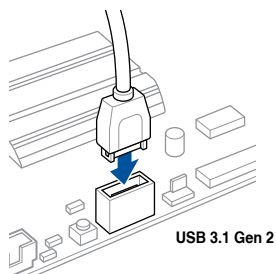


## 2.1.7 Front I/O connector

### To install ASUS Q-Connector

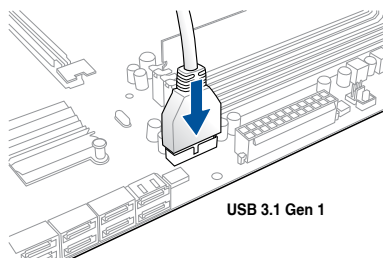


### To install USB 3.1 Gen 2 connector

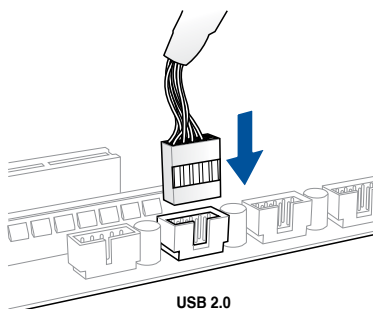


This connector will only fit in one orientation. Push the connector until it clicks into place.

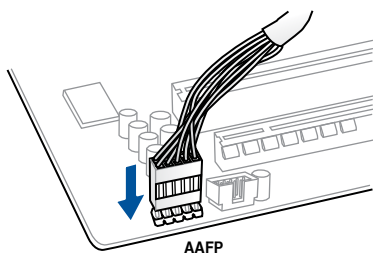
### To install USB 3.1 Gen 1 connector



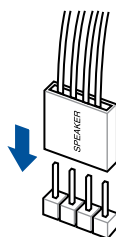
### To install USB 2.0 connector



### To install front panel audio connector



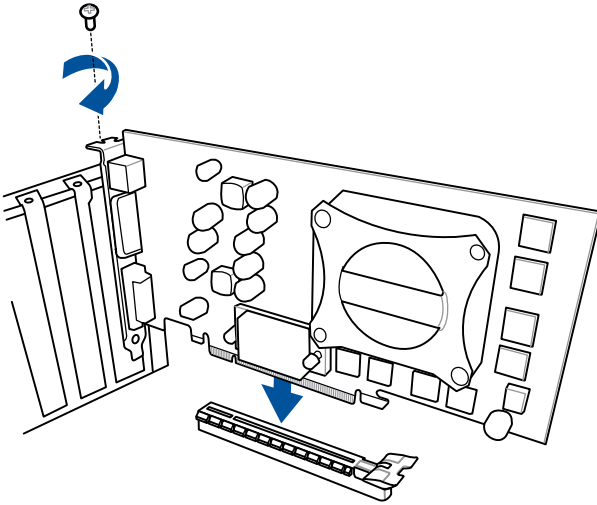
### To install system speaker connector



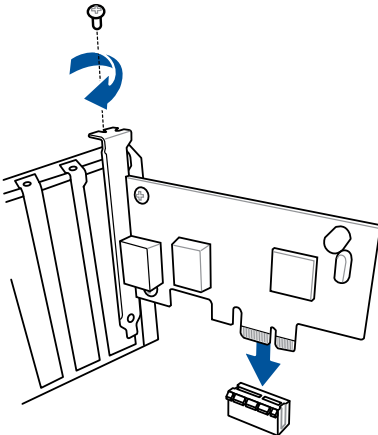


## 2.1.8 Expansion card installation

To install PCIe x16 cards

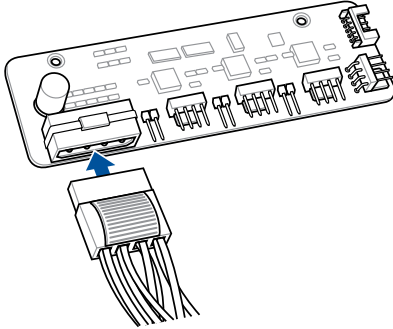


To install PCIe x1 cards

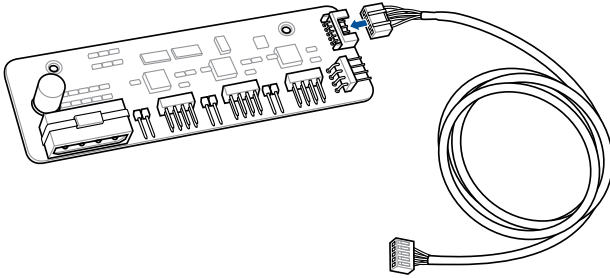


## To install FAN EXTENSION CARD

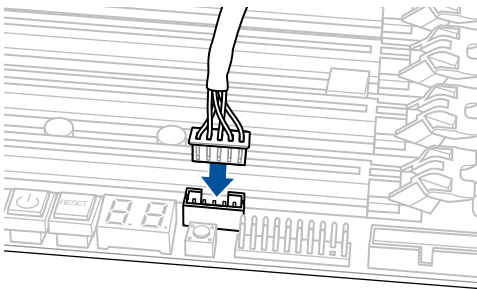
1



2

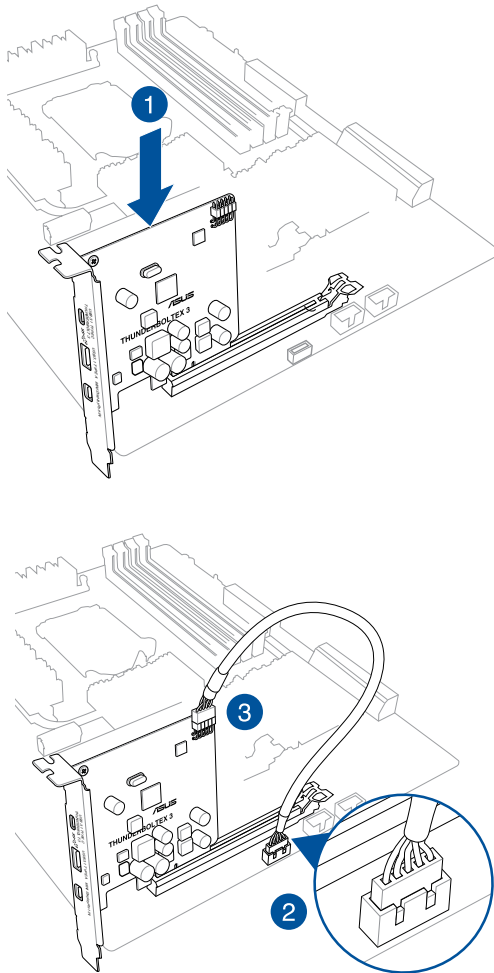


3



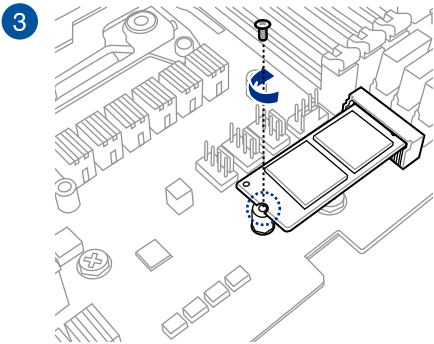
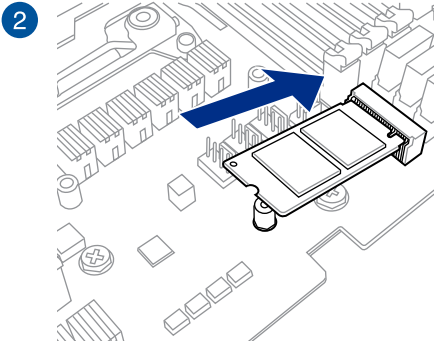
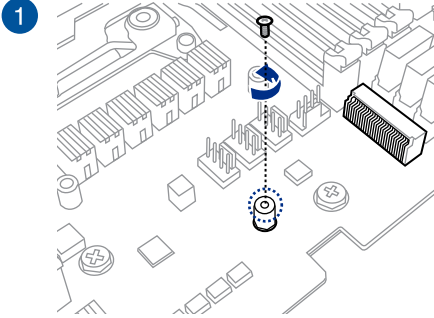
- The illustrations in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.
- The FAN Extension card is purchased separately.

## To install ThunderboltEX 3 card



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

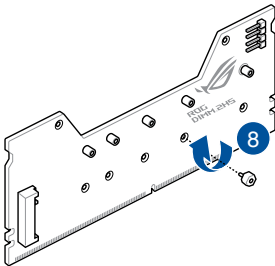
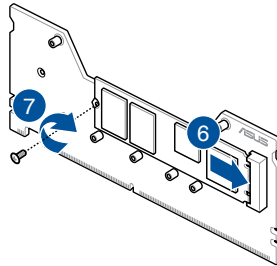
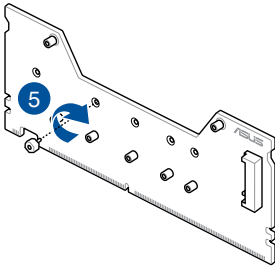
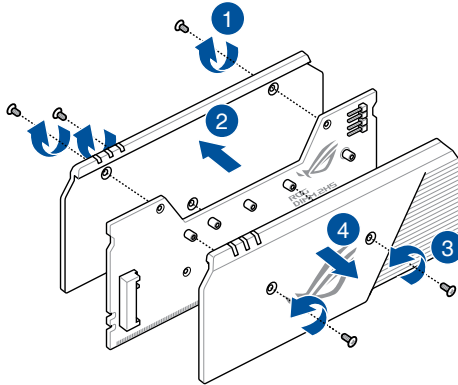
## 2.1.9 M.2 installation

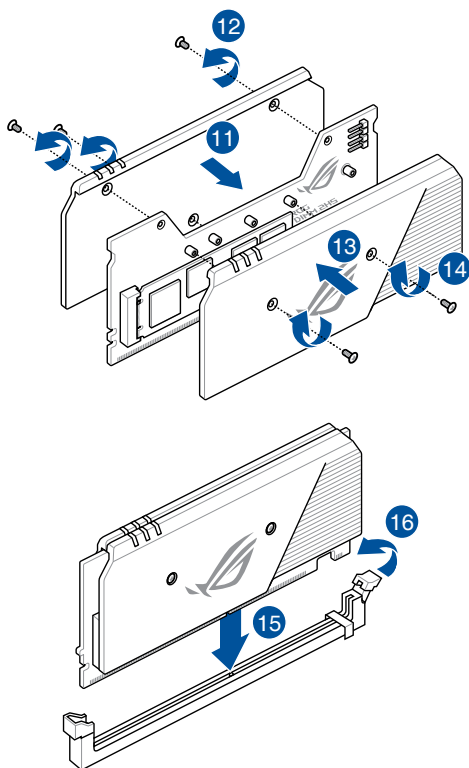


## 2.1.10 DIMM.2 installation



- Supported M.2 type varies per motherboard.
- The M.2 SSD module is purchased separately.





- Before you install or remove the DIMM.2 card, 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 or DIMM.2 card.
- The DIMM.2 card is notched to fit in only one orientation. Ensure that the notch on your card is aligned correctly with the DIMM.2 slot before inserting the card.

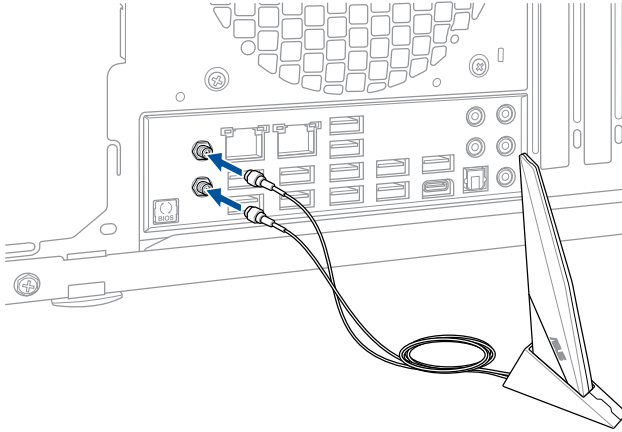


- DIMM.2 module supports PCIe 3.0 x4 M Key design and type 2242 / 2260 / 2280 / 22110 PCIe storage devices.
- These sockets support IRST (Intel® Rapid Storage Technology).
- The DIMM.2 Slots (M.2\_1/2) are disabled by default. Please adjust BIOS settings to enable DIMM.2 Slots.
- When using the DIMM.2 Heatsink module, we recommend removing the M.2 SSD's default thermal heatsink before installing the M.2 SSD to the DIMM.2 Heatsink module.
- If your M.2 SSD does not feature a flash chip on the back, please remove the default M.2 pads on your DIMM.2 module and replace them with the bundled taller M.2 pads.
- Intel® Optane Technology is only supported by M.2\_1 and M.2\_1 (DIMM.2) when sourced from the PCH. Before using Intel® Optane memory modules, ensure that you have updated your motherboard drivers and BIOS to the latest version from ASUS support website.

## 2.1.11 Wi-Fi antenna installation

### Installing the ASUS 2x2 dual band W-Fi antenna

Connect the bundled ASUS 2x2 dual band Wi-Fi antenna connector to the Wi-Fi ports at the back of the chassis.



- Ensure that the ASUS 2x2 dual band Wi-Fi antenna is securely installed to the Wi-Fi ports.
- Ensure that the antenna is at least 20 cm away from all persons.



The illustration above is for reference only. The I/O port layout may vary with models, but the Wi-Fi antenna installation procedure is the same for all models.

## 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.

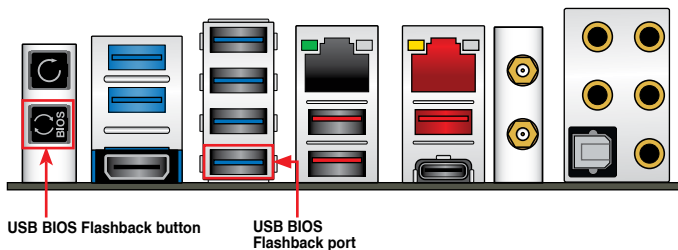
#### To use USB BIOS Flashback:

1. Insert a 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.

2. Visit <https://www.asus.com/support/> and download the latest BIOS version for this motherboard.
3. Rename the file as **M11E.CAP**, then copy it to your USB storage device.
4. Shut down your computer.
5. Press the BIOS Flashback button for three seconds until the Flashback LED blinks three times, indicating that the BIOS Flashback function is enabled.



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



For more BIOS update utilities in BIOS setup, refer to the section **3.11 Updating BIOS** in Chapter 3.

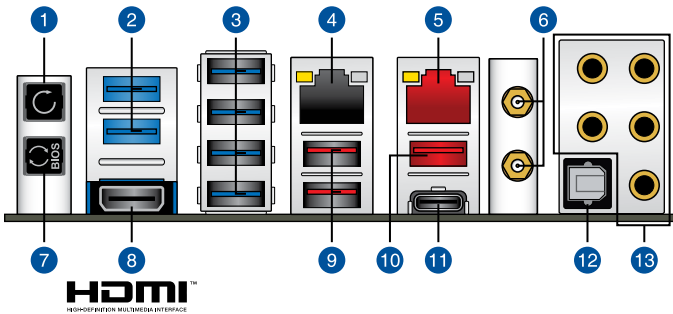


- Do not unplug portable disk, power system, or press the CLR\_CMOS button while BIOS update is ongoing, otherwise update will be interrupted. In case of interruption, please follow the steps again.
- If the light flashes for five seconds and turns into a solid light, this means that the BIOS Flashback 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.  | Clear CMOS button (CLR_CMOS). Press this button to clear the BIOS setup information only when the systems hangs due to overlocking. |
| 2.  | Intel® USB 3.1 Gen 1 ports E5 and E6  |
| 3.  | Intel® USB 3.1 Gen 1 ports 7, 8, 9, and 10.   |
| 4.  | 5G LAN (RJ-45) port*  |
| 5.  | LAN (RJ-45) port*   |
| 6.  | Wi-Fi 802.11 a/b/g/n/ac, Bluetooth V5.0   |
| 7.  | USB BIOS Flashback button   |
| 8.  | HDMI port   |
| 9.  | USB 3.1 Gen 2 Type-A ports 3 and 4  |
| 10. | USB 3.1 Gen 2 Type-A port 5   |
| 11. | USB 3.1 Gen 2 Type-C™ port C6   |
| 12. | Optical S/PDIF OUT port   |
| 13. | Color-coded LED Audio Jacks**   |

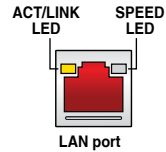
\* and \*\*: Refer to the tables on the next page for LAN port LEDs, and audio port definitions.



- USB 3.1 Gen 1/Gen 2 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 3.1 Gen 1 devices to USB 3.1 Gen 1 ports and your USB 3.1 Gen 2 devices to USB 3.1 Gen 2 ports for faster and better performance for your devices.
- Due to the design of the Intel® chipset, all USB devices connected to the USB 3.1 Gen 1 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.

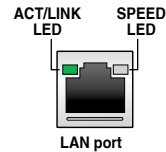
### \* LAN ports LED indications

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



### Aquantia AQC-111C 5G LAN port LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	100 Mbps connection
GREEN	Linked	GREEN	5 Gbps
BLINKING	Data activity	ORANGE	2.5 Gbps / 1 Gbps / 100 Mbps connection

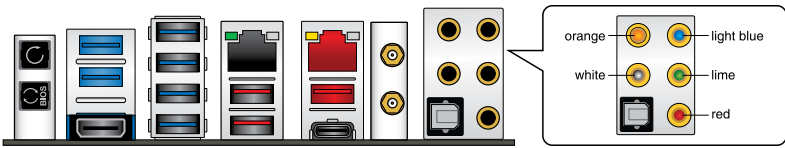


### \*\* Audio 2, 4, 5.1 or 7.1-channel configuration

Port	Headset 2-channel	4-channel	5.1-channel	7.1-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Red	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Sub woofer	Center/Sub woofer
White	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out

## 2.3.2 Audio I/O connections

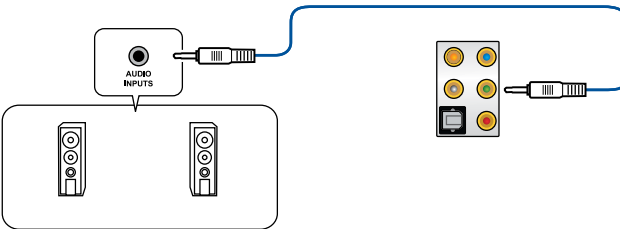
### Color-Coded LED I/O ports



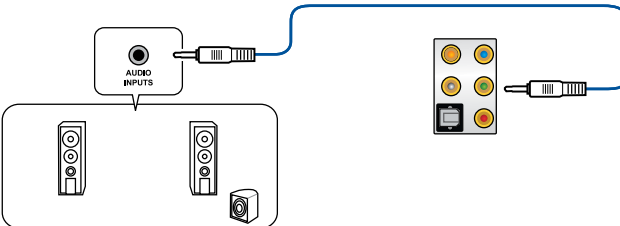
### Connect to Headphone and Mic



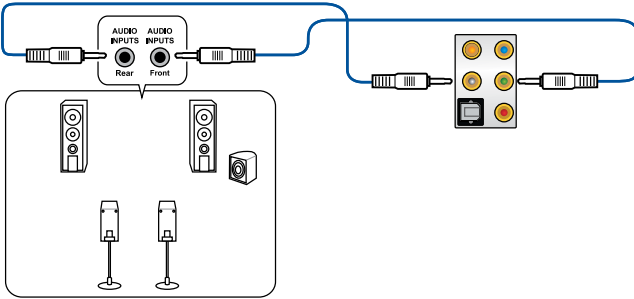
### Connect to Stereo Speakers



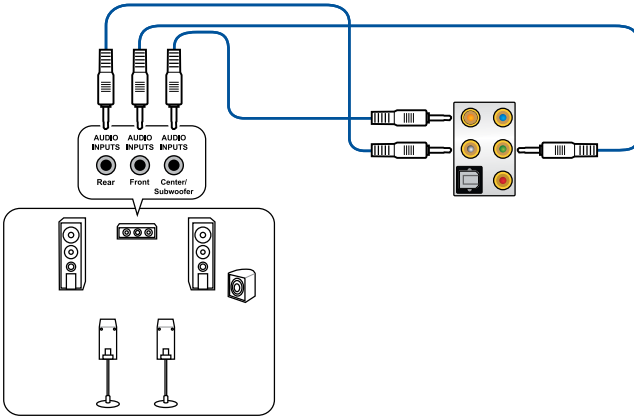
### Connect to 2-channel Speakers



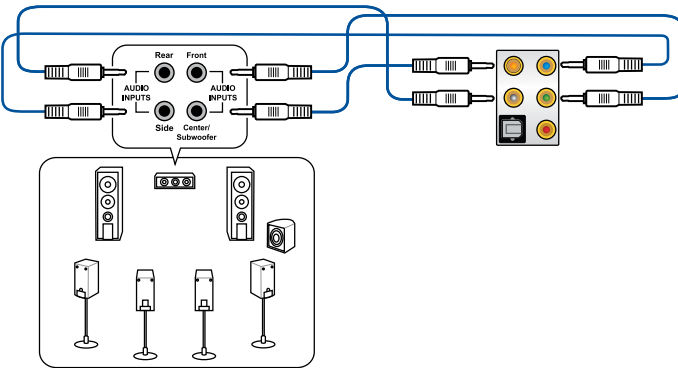
## Connect to 4-channel Speakers



## 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 storage 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 button 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 **M11E.CAP** for this motherboard.
  - BIOS settings and options may vary due to different BIOS release versions. Please refer to the latest BIOS version for settings and options.
-

## 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> or <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, 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 hotkey <F5>. 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 2.3.1 **Rear I/O connection** for the location of the Clear CMOS button to clear RTC RAM.
  - The BIOS setup program does not support the Bluetooth devices.
- 



---

Please visit ASUS website for the detailed BIOS content manual.

---

### BIOS menu screen

The BIOS Setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from **Setup Mode** in **Boot menu** or by pressing the <F7> hotkey.



### 3.2.1 Advanced Mode

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



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

The screenshot shows the ASUS UEFI BIOS Advanced Mode interface. The top bar includes the date (08/13/2018), time (12:33), language (English), and various utility shortcuts like MyFavorite(F3), Qfan Control(F6), AI OC Guide(F11), Search(F9), and AURA ON/OFF(F4). The main menu has tabs for My Favorites, Main, Extreme Tweaker (selected), Advanced, Monitor, Boot, Tool, and Exit. The Extreme Tweaker section is expanded to show settings for LN2 Mode, Target CPU Turbo-Mode Frequency (3600MHz), Target DRAM Frequency (2133MHz), Target Cache Frequency (3300MHz), Ai Overclock Tuner (set to Auto), ASUS MultiCore Enhancement (set to Auto), SVID Behavior (set to XMP I), CPU Core Ratio (set to Auto), DRAM Odd Ratio Mode (set to Enabled), DRAM Frequency (set to Auto), Xtreme Tweaking (set to Disabled), and CPU SVID Support (set to Auto). A detailed help box for the Ai Overclock Tuner is visible, explaining manual mode settings. On the right, the Hardware Monitor section displays CPU/Memory status (3600 MHz, 31°C), BECLK (100.00 MHz, 1.083 V), Ratio (36x, 2133 MHz), and DRAM Volt./Capacity (1.200 V, 4096 MB). A Prediction section shows Sil Quality (70%) and Cooler (119 pts), along with various voltage and frequency stability indicators. The bottom bar contains 'Last Modified', 'EZ Tuning Wizard', 'EZ Mode(F7)', 'Hot Keys', and 'Search on FAQ'. The footer shows 'Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.'

**Configuration fields**

**Pop-up Menu**

**Menu bar** Language MyFavorite(F3) Qfan Control(F6) AI OC Guide(F11) Search(F9) AURA ON/OFF(F4)

**Scroll bar**

**Menu items** General help Last modified settings Go back to EZ Mode Hot Keys Search on the FAQ

**EZ Tuning Wizard**

**Displays a quick overview of the system status and prediction**

## Menu bar

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

<b>My Favorites</b>	For saving the frequently-used system settings and configuration.
<b>Main</b>	For changing the basic system configuration
<b>Extreme Tweaker</b>	For changing the overclocking settings
<b>Advanced</b>	For changing the advanced system settings
<b>Monitor</b>	For displaying the system temperature, power status, and changing the fan settings.
<b>Boot</b>	For changing the system boot configuration
<b>Tool</b>	For configuring options for special functions
<b>Exit</b>	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, Extreme 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 QFan Control** for more information.

---

### AI OC Guide(F11)

This button above the menu bar allows you to view the descriptions of AI overclocking and enable it.



- 
- Refer to section **3.2.4 AI OC Guide** for more information.
  - This function is only enabled when using an unlocked CPU.
-

## Search (F9)

This button allows you to search for BIOS items by entering its name, enter the item name to find the related item listing.

## AURA (F4)

This button allows you to turn the RGB LED lighting or functional LED on or off.

[All On]: All LEDs (Aura or Functional) will be enabled.

[Aura Only]: Aura LEDs will be enabled and functional LEDs will be disabled.

[Aura Off]: Aura LEDs will be disabled, however functional LEDs will still be enabled.

[Stealth Mode]: All LEDs (Aura and Functional) will be disabled.

## 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:



## 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 bottom 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.

## Hot keys

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

## **EZ Tuning Wizard**

This button allows you to view and configure the RAID settings of your system.



---

Refer to section **3.2.5 EZ Tuning Wizard** for more information.

---

## **Last Modified button**

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

### 3.2.2 EZ Mode

The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance, mode and boot device priority. To access the Advanced Mode, select **Advanced Mode** or press the <F7> hotkey for the advanced BIOS settings.



To switch from Advanced Mode to EZ Mode, click **EZ Mode(F7)** or press the <F7> hotkey.

**Displays a quick overview of the system status**

**Displays the system properties of the selected mode. Click < > to switch modes**

**EZ Tuning Wizard**

**Selects the display language of the BIOS setup program**

**AI OC Guide(F11)** **Search(F9)** **AURA ON/OFF(F4)**

**Information**  
 08/13/2018 19:34\* Monday English EZ Tuning Wizard AI OC Guide(F11) Search(F9) AURA ON/OFF(F4)  
 ROG MAXIMUS XI EXTREME BIOS Ver. 0002  
 Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz  
 Speed: 3700 MHz  
 Memory: 4096 MB (DDR4 2133MHz) 33°C

**CPU Temperature** **CPU Core Voltage**  
 0.959 V  
**Motherboard Temperature**  
 31°C

**AI Overclocking**  
 Click the icon below to enable the AI Overclocking feature. This feature can only be enabled when using an unlocked CPU.  
 AI Optimized

**DRAM Status**  
 DIMM\_A1: N/A  
 DIMM\_A2: AVEKIR 4096MB 2133MHz  
 DIMM\_B1: N/A  
 DIMM\_B2: N/A

**Storage Information**  
 AHCI: SATA6G\_4\_ST10000DM0004-1ZC101 (10000.8GB)  
 USB: SMI USB Flash Disk 1100 (8.1GB)

**X.M.P.**  
 Disabled Disabled

**FAN Profile**  
 CPU FAN 527 RPM  
 CHA1 FAN N/A  
 CHA2 FAN N/A  
 RAD1 FAN N/A  
 RAD2 FAN N/A  
 CPU OPT FAN N/A  
 EXT FAN1 N/A  
 EXT FAN2 N/A

**Intel Rapid Storage Technology**  
 On Off

**CPU FAN**  
 Graph showing fan speed vs temperature. QFan Control button.

**Boot Priority**  
 Choose one and drag the items. Switch all  
 Windows Boot Manager (SATA6G\_4: ST10000DM0004-1ZC101) (10000.8GB)  
 UEFI: SMI USB Flash Disk 1100, Partition 1 (8.1GB)

**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**

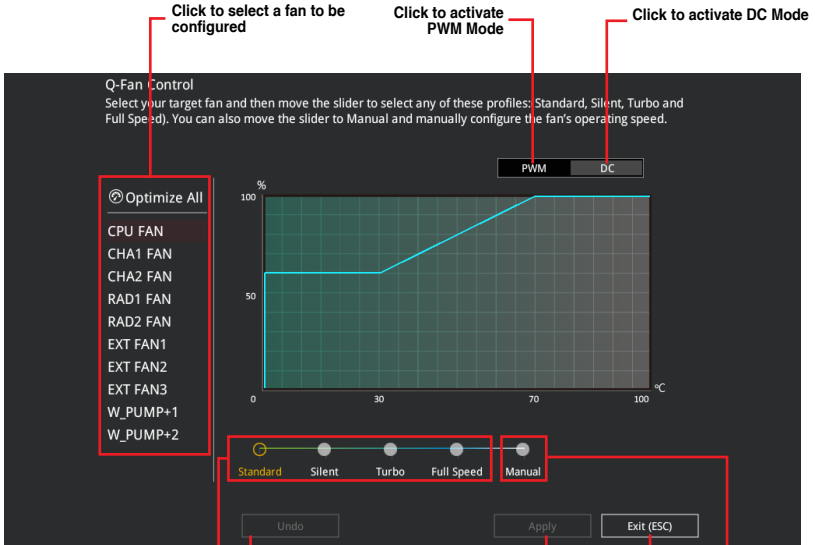
**Selects the boot device priority**



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

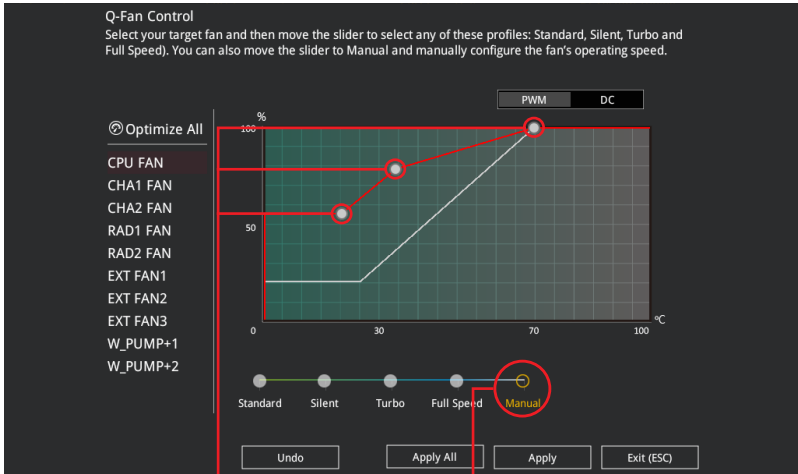
### 3.2.3 QFan Control

The QFan Control allows you to set a fan profile or manually configure the operating speed of your CPU and chassis 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 AI OC Guide



- The screenshot shown in this section is for reference purposes only, and may not exactly match what you see on your screen.
- This function is only enabled when using an unlocked CPU.

The AI OC Guide allows you to enable the Ai Overclocking feature, or view a quick guide of the Ai Overclocking feature which highlights the recommended setup procedure and descriptions of the Ai Overclocking.

Clicking on **Enable AI** will enable Ai Overclocking.

Quick guide topics

Click to view the previous topic in the quick guide

Click to view the next topic in the quick guide

Click to enable AI Overclocking

Click to go back to main menu



## 3.2.5 EZ Tuning Wizard

EZ Tuning Wizard allows you to easily set RAID in your system using this feature.

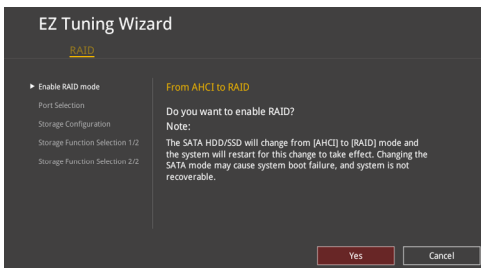
### Creating RAID

To create RAID:

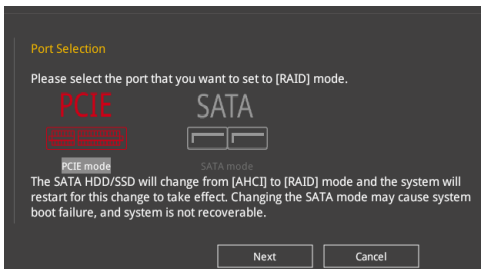
1. Click **EZ Tuning Wizard** from the BIOS screen to open EZ Tuning Wizard screen.
2. Click **Yes** to enable RAID.



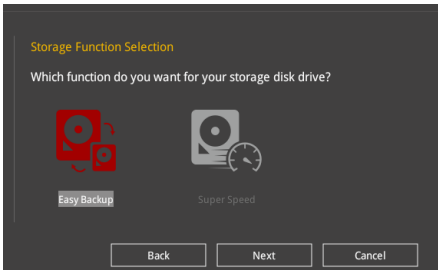
- Ensure that your HDDs have no existing RAID volumes.
- Ensure to connect your HDDs to Intel® SATA connectors.



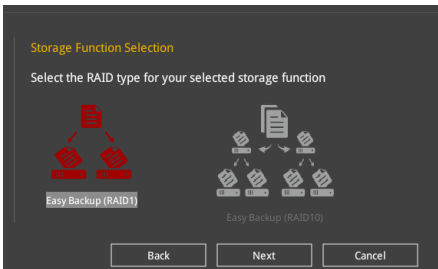
3. Select the port that you want to set to [RAID] mode, **PCIe** or **SATA**, then click **Next**.



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 (RAID 1)** or **Easy Backup (RAID 10)**.

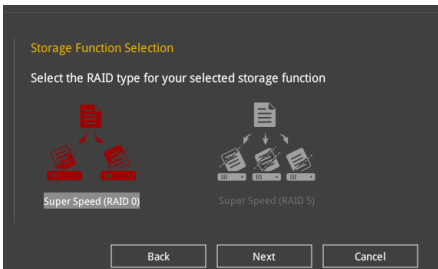


---

You can only select Easy Backup (RAID 10) if you connect four (4) HDDs.

---

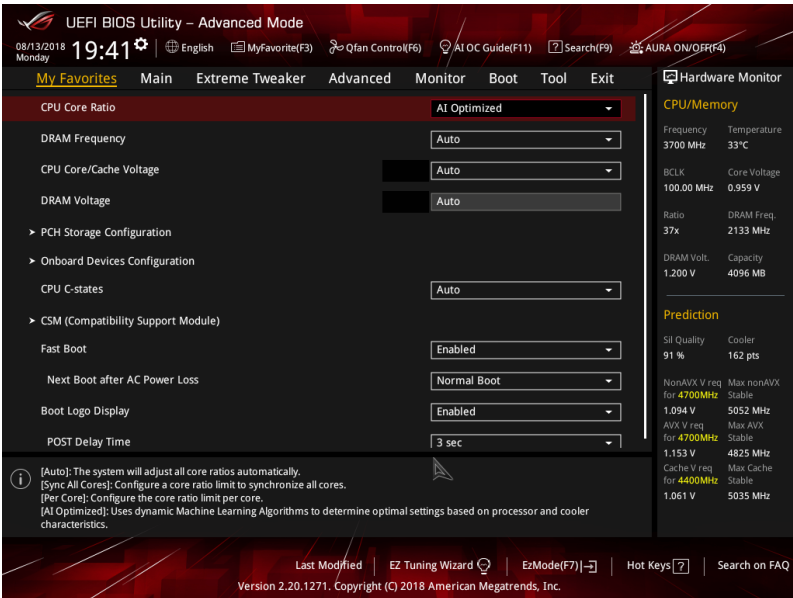
- b. For Super Speed, click **Next** then select from **Super Speed (RAID 0)** or **Super Speed (RAID 5)**.



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.

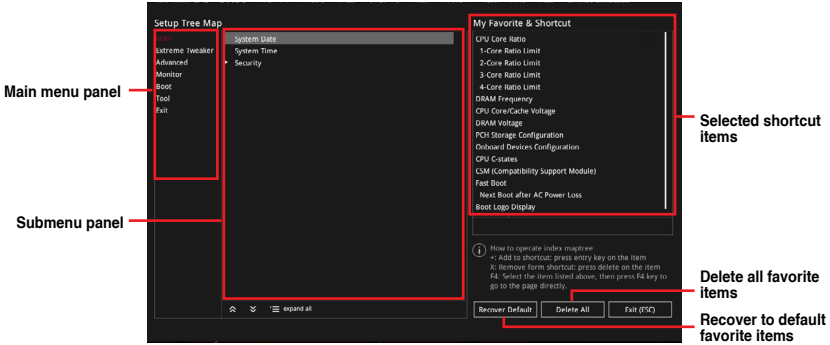


My Favorites comes with several performance, power saving, and fast boot related items by default. You can personalize this screen by adding or removing items.

## Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click **MyFavorites(F3)** 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.

## 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 2.3.1 **Rear I/O connection** for information on the location of the Clear CMOS button to clear RTC RAM.
- The Administrator or User Password items on top of the screen show the default **[Not Installed]**. After you set a password, these items show **[Installed]**.

## 3.5 Extreme Tweaker menu

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



Be cautious when changing the settings of the Extreme 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.

### Ai Overclock Tuner

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Configuration options:

- |          |  |
|----------|--|
| [Auto]   | Loads the optimal settings for the system.   |
| [Manual] | Allows you to individually set overclocking parameters.  |
| [XMP I]  | If you install memory modules supporting the eXtreme Memory Profile (X.M.P.) Technology, choose this item to load the DIMM's default XMP memory timings (CL, TRCD, TRP, TRAS) with BCLK frequency and other memory parameters optimized by ASUS. |
| [XMP II] | If you install memory modules supporting the eXtreme Memory Profile (X.M.P.) Technology, choose this item to load the DIMM's complete default XMP profile.   |



The [XMP I] and [XMP II] configuration option appears only when you install memory modules supporting the eXtreme Memory Profile (X.M.P.) Technology.



---

The following item appears only when you set the **Ai Overclocking Tuner** to **[XMP I]**, **[XMP II]**, or **[Manual]**.

---

### **BCLK Frequency**

This item allows you to set the BCLK (base clock) frequency to enhance the system performance. Use the <+> or <-> to adjust the value. The values range from 40.0 MHz to 650.0 MHz.



---

We recommend you to set the value based on the CPU specification, as high BCLK frequencies may damage the CPU permanently.

---

### **ASUS MultiCore Enhancement**

- [Auto] Allows you to maximize the overclocking performance optimized by ASUS core ratio settings.
- [Disabled] Allows you to set to default core ratio settings.
- [Enabled] Allows you to set the core ratio settings.

### **CPU Core Ratio**

This item allows you to set the CPU core ratios.  
Configuration options: [Auto] [Sync All Cores] [Per Core] [AI Optimized]



---

The **[AI Optimized]** item appears only when you use an unlocked CPU.

---

### **DRAM Frequency**

This item allows you to set the memory operating frequency. The configurable options vary with the BCLK (base clock) frequency setting. Select the auto mode to apply the optimized setting.

Configuration options: [Auto] [DDR4-800MHz] - [DDR4-4266MHz]

### **Internal CPU Power Management**

The subitems in this menu allow you to set the CPU ratio and features.

#### **Intel(R) SpeedStep(tm)**

Allows the operating system to dynamically adjust the processor voltage and cores frequency to decrease the average power consumption and decrease average heat production.

Configuration options: [Auto] [Enabled] [Disabled]

## 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.

---

### 3.6.1 Platform Misc Configuration

The items in this menu allow you to change the ASPM for PCH and SA PCI Express.

### 3.6.2 CPU Configuration

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



---

The items in this menu may vary based on the CPU installed.

---

#### CPU - Power Management Control

This item allows you to manage and configure the CPU's power.

##### Intel(R) SpeedStep(tm)

This item allows more than two frequency to be supported.

Configuration options: [Auto] [Disabled] [Enabled]

##### Intel(R) Speed Shift Technology

This item allows you to enable or disable the Intel(R) Speed Shift Technology support.

When enabled, CPPC v2 interface allows hardware controlled P-states.

Configuration options: [Auto] [Disabled] [Enabled]

##### CPU C states

This item allows you to set the power saving of the CPU states.

Configuration options: [Auto] [Disabled] [Enabled]

### 3.6.3 System Agent (SA) Configuration

The items in this menu allow you to adjust the Link Speed for PEG Port and Multi-Monitor.

### 3.6.4 PCH Configuration

The items in this menu allow you to adjust the PCH PCI Express speed.

#### PCI Express Configuration

This item allows you to configure the PCI Express slots.

##### PCIe Speed

This item allows your system to automatically select the PCI Express port speed.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

### 3.6.5 PCH Storage Configuration

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

#### SATA Controller(s)

This item allows you to enable or disable the SATA Device.

Configuration options: [Enabled] [Disabled]



---

The following items appear only when **SATA Controller(s)** is set to **[Enabled]**.

---

#### SATA Mode Selection

This item allows you to set the SATA configuration.

[AHCI]

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

[Intel RST Premium With Intel Optane System Acceleration(RAID)]

Set to [Intel RST Premium With Intel Optane System Acceleration(RAID)] when you want to create a RAID configuration from the SATA hard disk drives.

#### SMART Self Test

SMART (Self-Monitoring, Analysis and Reporting Technology) is a monitoring system that shows a warning message during POST (Power-on Self Test) when an error occurs in the hard disks.

Configuration options: [On] [Off]

#### SATA6G\_1(Black) - SATA6G\_6(Black)

##### SATA6G\_1(Black) - SATA6G\_6(Black)

This item allows you to enable or disable the selected SATA port.

Configuration options: [Disabled] [Enabled]

##### Hot Plug

These items appears only when the SATA Mode Selection is set to **[AHCI]** and allows you to enable or disable SATA Hot Plug Support.

Configuration options: [Disabled] [Enabled]

### 3.6.6 PCH-FW Configuration

This item allows you to configure the firmware TPM.

### 3.6.7 Thunderbolt(TM) Configuration

The items in this menu allow you to configure Thunderbolt settings.



### 3.6.8 Onboard Devices Configuration

The items in this menu allow you to switch between PCIe Lanes and configure onboard devices.

#### HD Audio

This item allows you to use the Azalia High Definition Audio Controller.

Configuration options: [Disabled] [Enabled]

#### Intel LAN Controller

This item allows you to enable or disable the Intel LAN controller.

Configuration options: [Disabled] [Enabled]

#### 5G LAN Card

This item allows you to enable or disable the 5G LAN Card.

Configuration options: [Disabled] [Enabled]

#### LED lighting

##### When system is in working state

This item allows you to turn the RGB LED lighting on or off when the system is in the working state.

Configuration options: [On] [Off]

##### Q-Code LED Function

[Disabled] Disable the Q-Code LED.

[Auto] Automatically display POST (Power-On Self-Test) code and CPU temperature on Q-Code LED.

[POST Code Only] Show POST (Power-On Self-Test) code on Q-Code LED.

##### When system is in sleep, hibernate or soft off states

This item allows you to turn the RGB LED lighting on or off when the system is in the sleep, hibernate or soft off states.

Configuration options: [On] [Off]

#### PCIEX16\_3 Bandwidth

This item allows you to set the PCIEX4 socket to work under PCIe x2 or PCIe x4 mode. When PCIe x4 mode is enabled, SATA ports 5/6 are disabled.

Configuration options: [X2 Mode] [X4 Mode]

#### CPU PCIe Configuration Mode

This item allows you to configure the CPU PCIe configurations.

Configuration options: [PCIEX16\_1 + PCIEX16\_2] [DIMM.2\_1 + PCIEX16\_2] [DIMM.2\_1 + DIMM.2\_2]

### 3.6.9 APM Configuration

The items in this menu allow you to set system wake and sleep settings.

#### ErP Ready

This item allows you to switch off some power at S4+S5 or S5 to get the system ready for ErP requirement. When set to **[Enabled]**, all other PME options are switched off.

Configuration options: [Disabled] [Enable(S4+S5)] [Enable(S5)]

### 3.6.10 PCI Subsystem Settings

#### SR-IOV Support

This option enables or disables Single Root IO Virtualization Support if the system has SRIOV capable PCIe devices.

Configuration options: [Disabled] [Enabled]

### 3.6.11 USB Configuration

The items in this menu allow you to change the USB-related features.



---

The **Mass Storage Devices** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

---

#### USB Port Disable Override

This item allows you to enable or disable the individual USB ports.



---

Refer to section 1.1.2 **Motherboard layout** for the location of the USB ports.

---

### 3.6.12 Network Stack Configuration

The items in this menu allow you to configure Ipv4 / Ipv6 PXE support.

### 3.6.13 NVMe Configuration

This menu displays the NVMe controller and Drive information of the connected devices.

### 3.6.14 HDD/SSD SMART Information

The items in this menu display the SMART information of the connected devices.



---

NVMe Express devices do not support SMART information.

---

## 3.7 Monitor menu

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

### Qfan Configuration

#### Qfan Tuning

Click this item to automatically detect the lowest speed and configure the minimum duty cycle for each fan.

#### WATER PUMP+ 1 Control

- [Disabled]      Disable the Water Pump+ 1 control feature.
- [Auto]            Detects the type of water pump installed and automatically switches the control modes.
- [DC mode]        Enable the Water Pump+ 1 control in DC mode for 3-pin chassis fan.
- [PWM mode]      Enable the Water Pump+ 1 control in PWM mode for 4-pin chassis fan.

#### WATER PUMP+ 2 Control

- [Disabled]      Disable the Water Pump+ 2 control feature.
- [Auto]            Detects the type of water pump installed and automatically switches the control modes.
- [DC mode]        Enable the Water Pump+ 2 control in DC mode for 3-pin chassis fan.
- [PWM mode]      Enable the Water Pump+ 2 control in PWM mode for 4-pin chassis fan.

## 3.8 Boot menu

The Boot menu items allow you to change the system boot options.

### Boot Configuration

#### Fast Boot

- [Disabled]      Allows your system to go back to its normal boot speed.
- [Enabled]        Allows your system to accelerate the boot speed.




---

The following item appears only when you set **Fast Boot** to **[Enabled]**.

---

#### **Next Boot after AC Power Loss**

- [Normal Boot]   Returns to normal boot on the next boot after an AC power loss.
- [Fast Boot]      Accelerates the boot speed on the next boot after an AC power loss.

#### Setup Mode

- [Advanced Mode] This item allows you to go to Advanced Mode of the BIOS after POST.
- [EZ Mode]        This item allows you to go to EZ Mode of the BIOS after POST.

## CSM (Compatibility Support Module)

This item allows you to configure the CSM (Compatibility Support Module) items to fully support the various VGA, bootable devices and add-on devices for better compatibility.

### Launch CSM

- [Enabled] For better compatibility, enable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.
- [Disabled] Disable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.



---

The following items appear only when you set **Launch CSM** to **[Enabled]**.

---

#### **Boot Devices Control**

This item allows you to select the type of devices that you want to boot.

Configuration options: [UEFI and Legacy OPROM] [Legacy OPROM only] [UEFI only]

#### **Boot from Network Devices**

This item allows you to select the type of network devices that you want to launch.

Configuration options: [Ignore] [Legacy only] [UEFI driver first]

#### **Boot from Storage Devices**

This item allows you to select the type of storage devices that you want to launch.

Configuration options: [Ignore] [Legacy only] [UEFI driver first]

#### **Boot from PCI-E/PCI Expansion Devices**

This item allows you to select the type of PCI-E/PCI expansion devices that you want to launch.

Configuration options: [Legacy only] [UEFI driver first]

## Secure Boot

This item allows you to configure the Windows® Secure Boot settings and manage its keys to protect the system from unauthorized access and malwares during POST.

## Boot Option Priorities

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



- 
- To access Windows® OS in Safe Mode, press <F8> after POST (Windows® 8 not supported).
  - To select the boot device during system startup, press <F8> when the ASUS Logo appears.
- 

## Boot Override

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

## 3.9 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: [Enabled] [Disabled]

### 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 ASUS 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.

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.

Displays the available SSDs

Port #	SSD Name	Status	Total Capacity
P2	ADATA 596 Turbo	Frozen	64.0GB

SSD speed performance may degrade over time due to accumulated files and frequent data writing. Secure Erase completely cleans your SSD and restores it to its factory settings.  
WARNING: Before you run Secure Erase on an incompatible SSD, running Secure Erase on an incompatible SSD will render the SSD totally unusable.  
NOTE: For the list of Secure Erase-compatible SSDs, visit the ASUS Support site at www.asus.com/support.



#### 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 User Profile

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

#### Load 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 ROG OC Panel H-Key Configure

The ROG OC Panel H-Key Configure allows you to input and save values on the CPU core voltage, VCCSA voltage, BCLK Frequency, and CPU ratio in the UEFI BIOS. The saved values can be synchronized to a compatible OC Panel device and these values can be tweaked or configured using the OC Panel without going to the BIOS menu.

#### Load Default

This item allows you to load the default values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

#### Save Above Settings

This item allows you to save the new values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

#### Load from profile

This item allows you to load the previous values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

### 3.9.5 ASUS SPD Information

This item allows you to view the DRAM SPD information.

### 3.9.6 ASUS Armoury Crate

This item allows you to enable or disable the ASUS Armoury Crate. The ASUS Armoury Crate is a fixed Advanced Configuration and Power Interface (ACPI) table that provides Windows with a platform binary that the operating system can execute.

### 3.9.7 Graphics Card Information

This item displays the information about the graphics card installed in your system.

#### GPU Post

This item displays the information and recommended configuration for the PCIe slots that the graphics card is installed in your system.



---

This feature is only supported on selected ASUS graphics cards.

---

#### Bus Interface

This item allows you to select the bus interface.

Configuration options: [PCIEX16\_1] [PCIEx16\_2]



## 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 and 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 item 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 USB drive when the BIOS file fails or gets corrupted.

### 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 USB drive that comes with the motherboard package.
-

### 3.11.2 ASUS EZ Flash 3

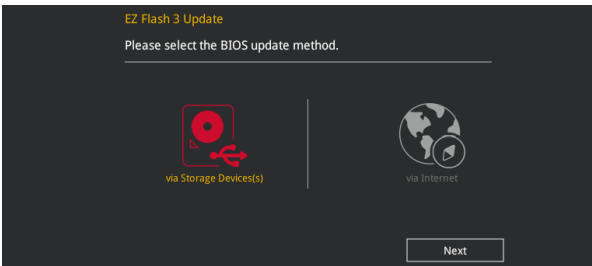
ASUS EZ Flash 3 allows you to download and update to the latest BIOS through the Internet without having to use a bootable floppy disk or an OS-based utility.



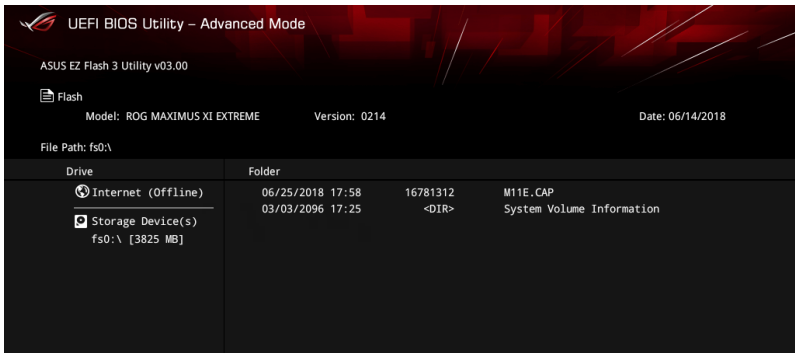
Updating through the Internet varies per region and Internet conditions. Check your local Internet connection before updating through the Internet.

#### 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 3 Utility** and press <Enter>.
2. Insert the USB flash disk that contains the latest BIOS file to the USB port.
3. Select **via Storage Devices(s)**.



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.





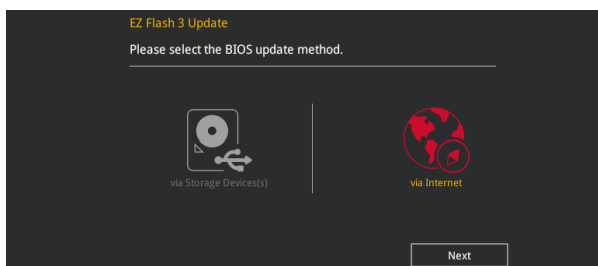
- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!



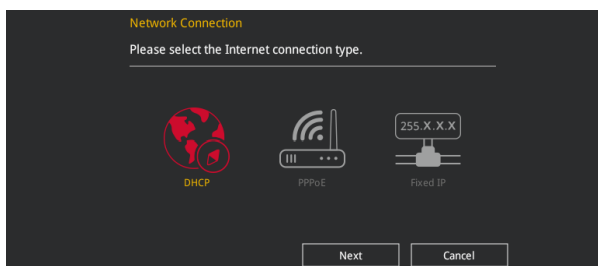
Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu. See section 3.10 **Exit Menu** for details.

### 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 3 Utility** and press <Enter>.
2. Select **via 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 USB drive that contains the BIOS file.



---

The BIOS file in the motherboard support USB drive 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 <https://www.asus.com/support/> 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 USB drive, or a 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!

---



# RAID Support

# 4

## 4.1 RAID configurations

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



For more information on configuring your RAID sets, please refer to the **RAID Configuration Guide** which you can find at <https://www.asus.com/support>.

### 4.1.1 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.





# Appendix

## Q-Code table

Code	Description
00	Not used
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	System Agent initialization before microcode loading
04	PCH initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH initialization after microcode loading
0B	Cache initialization
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
54	Unspecified memory initialization error
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	Reset PPI is not available
5C – 5F	Reserved for future AMI error codes

*(continued on the next page)*

## Q-Code table

Code	Description
E0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4 – E7	Reserved for future AMI progress codes
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC – EF	Reserved for future AMI error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5 – F7	Reserved for future AMI progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes

*(continued on the next page)*

## Q-Code table

Code	Description
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset

*(continued on the next page)*

## Q-Code table

Code	Description
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8– BF	Reserved for future AML codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

## ACPI/ASL Checkpoints (under OS)

Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

## Notices

### FCC Compliance Information

Responsible Party: Asus Computer International  
Address: 48720 Kato Rd., Fremont, CA 94538, USA  
Phone / Fax No: (510)739-3777 / (510)608-4555

#### Identification of the assembled product: INTEL 9560NGW

Identification of the modular components used in the assembly:

Model Name: 9560NGW FCC ID: PD99560NG

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.

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

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

#### RF exposure warning

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

## Compliance Statement of Innovation, Science and Economic Development Canada (ISED)

This device complies with Innovation, Science and Economic Development Canada licence 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.

Operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

CAN ICES-3(B)/NMB-3(B)

## Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La bande 5150–5250 MHz est réservée uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

CAN ICES-3(B)/NMB-3(B)

## 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.

\*당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.

## 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.

## Regional notice for California



### WARNING

Cancer and Reproductive Harm -  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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## NCC: Taiwan Wireless Statement

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

應避免影響附近雷達系統之操作。

## Japan RF Equipment Statement

### 屋外での使用について

本製品は、5GHz帯域での通信に対応しています。電波法の定めにより5.2GHz、5.3GHz帯域の電波は屋外で使用が禁じられています。

### 法律および規制遵守

本製品は電波法及びこれに基づく命令の定めるところに従い使用してください。日本国外では、その国の法律または規制により、本製品の使用ができないことがあります。このような国では、本製品を運用した結果、罰せられることがあります。当社は一切責任を負いかねますのでご了承ください。

## Précautions d'emploi de l'appareil :

- a. Soyez particulièrement vigilant quant à votre sécurité lors de l'utilisation de cet appareil dans certains lieux (les avions, les aéroports, les hôpitaux, les stations-service et les garages professionnels).
- b. Évitez d'utiliser cet appareil à proximité de dispositifs médicaux implantés. Si vous portez un implant électronique (stimulateurs cardiaques, pompes à insuline, neurostimulateurs...), veuillez impérativement respecter une distance minimale de 15 centimètres entre cet appareil et l'implant pour réduire les risques d'interférence.
- c. Utilisez cet appareil dans de bonnes conditions de réception pour minimiser le niveau de rayonnement. Ce n'est pas toujours le cas dans certaines zones ou situations, notamment dans les parkings souterrains, dans les ascenseurs, en train ou en voiture ou tout simplement dans un secteur mal couvert par le réseau.
- d. Tenez cet appareil à distance du ventre des femmes enceintes et du bas-ventre des adolescents.



**Simplified EU Declaration of Conformity**

ASUSTek Computer Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. Full text of EU declaration of conformity is available at <https://www.asus.com/support/>

The WiFi operating in the band 5150-5350MHz shall be restricted to indoor use for countries listed in the table below:

**Déclaration simplifiée de conformité de l'UE**

ASUSTek Computer Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes de la directive 2014/53/UE. La déclaration de conformité de l'UE peut être téléchargée à partir du site internet suivant : <https://www.asus.com/support/>

Dans la plage de fréquence 5150-5350 MHz, le Wi-Fi est restreint à une utilisation en intérieur dans les pays listés dans le tableau ci-dessous:

**Vereinfachte EU-Konformitätserklärung**

ASUSTek COMPUTER INC erklärt hiermit, dass dieses Gerät mit den grundlegenden Anforderungen und anderen relevanten Bestimmungen der Richtlinie 2014/53/EU übereinstimmt. Der gesamte Text der EU-Konformitätserklärung ist verfügbar unter: <https://www.asus.com/support/>. Der WLAN-Betrieb im Band von 5150-5350 MHz ist für die in der unteren Tabelle aufgeführten Länder auf den Innenbereich beschränkt:

**Dichiarazione di conformità UE semplificata**

ASUSTek Computer Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti con la direttiva 2014/53/UE. Il testo completo della dichiarazione di conformità UE è disponibile all'indirizzo: <https://www.asus.com/support/>

L'utilizzo della rete Wi-Fi con frequenza compresa nell'intervallo 5150-5350MHz deve essere limitato all'interno degli edifici per i paesi presenti nella seguente tabella:

**Упрощенное заявление о соответствии европейской директиве**

ASUSTek Computer Inc. заявляет, что устройство соответствует основным требованиям и другим соответствующим условиям директивы 2014/53/ЕU. Полный текст декларации соответствия ЕС доступен на <https://www.asus.com/support/>

Работа Wi-Fi в диапазоне частот 5150-5350 должна быть ограничена использованием в помещениях для стран, перечисленных в таблице ниже:

**إعلان التوافق المبسط الصادر عن الاتحاد الأوروبي**

تقر شركة ASUSTek Computer Inc أن هذا الجهاز يتوافق مع المتطلبات الأساسية والأحكام الأخرى ذات الصلة الخاصة بتوجيه 2014/53/UE. يتوفر النص الكامل لإعلان التوافق الصادر عن الاتحاد الأوروبي على: <https://www.asus.com/support/>

يجب حصر استخدام WiFi العاملة بـ 5150-5350 ميجا هرتز على الاستخدام المنزلي للبلدان المدرجة بالجدول.

**Опрощена декларация за съответствие на ЕС**

С настоящото ASUSTek Computer Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на свързаната Директива 2014/53/ЕС. Пълният текст на ЕС декларация за съвместимост е достъпен на адрес <https://www.asus.com/support/>

WiFi, работеща в диапазон 5150-5350MHz, трябва да се ограничи до употреба на закрито за страните, посочени в таблицата по-долу:

**Declaração de Conformidade UE Simplificada**

ASUSTek Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes relacionadas às diretivas 2014/53/UE. O texto completo da declaração de conformidade CE está disponível em <https://www.asus.com/support/>

O WiFi operando na banda 5150-5350MHz deve ser restrito para uso interno para os países listados na tabela abaixo:

**Поједностављена ЕУ изјава о складности**

ASUSTek Computer Inc. овим изјављује да је овај уређај складан с битним захтевима и осталим одговарајућим одредбама директиве 2014/53/ЕU. Цјели текст ЕУ изјаве о складности доступан је на <https://www.asus.com/support/>. WiFi који ради на опсегу фреквенција 5150-5350 MHz бит ће ограничен на употребу у затвореном простору у земљама на доњем списку:

**Zjednodušené prohlášení o shodě EU**

Spoločenstvo ASUSTek Computer Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení směrnice 2014/53/UE. Plné znění prohlášení o shodě EU je k dispozici na adrese <https://www.asus.com/support/>

V zemích uvedených v tabulce je provoz sítě Wi-Fi ve frekvenčním rozsahu 5150 - 5350 MHz povolen pouze ve vnitřních prostorech:

**Forenklet EU-øverenstemmelseserklæring**

ASUSTek Computer Inc. erklærer hermed at denne enhed er i øverenstemmelse med hovedkravene og øvrige relevante bestemmelser i direktivet 2014/53/UE. Hele EU-øverenstemmelseserklæringen kan findes på <https://www.asus.com/support/>

Wi-Fi, der bruger 5150-5350 MHz skal begrænses til indendørs brug i lande, der er anført i tabellen:

**Vereenvoudigd EU-conformiteitsverklaring**

ASUSTek Computer Inc. verklaart hierbij dat dit apparaat voldoet aan de essentiële vereisten en andere relevante bepalingen van Richtlijn 2014/53/UE. De volledige tekst van de EU-conformiteitsverklaring is beschikbaar op <https://www.asus.com/support/>

De WiFi op 5150-5350MHz zal beperkt zijn tot binnengebruik voor in de tabel vermelde landen:

**Lihtsustatud EÜ vastavusdeklaratsioon**

Käesolevaga kinnitab ASUSTek Computer Inc. et seade vastab direktiivi 2014/53/UE olulistele nõuetele ja teistele asjakohastele sätetele. EL vastavusdeklaratsiooni täisteksti on saadaval veebisaidil <https://www.asus.com/support/>

Sagedusvahemikus 5150-5350 MHz töötava WiFi kasutamine on järgmistes riikides lubatud ainult siseruumides:

**Eurooppa - EY:n vaatimustenmukaisuusvakuutus**

ASUSTek Computer Inc. ilmoittaa täten, että tämä laite on direktiivin 2014/53/UE olennainen vaatimusten ja muiden asiaankuuluvien liisysten mukainen. Koko EY:n vaatimustenmukaisuusvakuutuksen teksti on luettavissa osoitteessa <https://www.asus.com/support/>

5 150 - 5 350 MHz:in taajuudella toimiva WiFi on rajoitettu sisäkäyttöön taulukossa luetelluissa maissa:

**تعبیر از نسخه ساده شده بیانیه انطباقی اروپا**

ASUSTek Computer Inc در اینجا اعلام می کند که این دستگاه با نیازهای اساسی و سایر مقررات مربوط به بیانیه 2014/53/UE مطابقت دارد. متن کامل پیروی از این بیانیه انطباقی اروپا در این آدرس موجود است:

<https://www.asus.com/support/>

سازگاردهای 5150-5350 مگاهرتز برای WiFi باید برای استفاده در فضای داخل ساختمان برای کشورهای فهرست شده در جدول، محدود شود.

**Απλοποιημένη Δήλωση Συμμόρφωσης ΕΕ**

Διά το παρόντος η ASUSTek Computer Inc. δηλώνει ότι αυτή η συσκευή είναι συμμόρφω με τις βασικές προϋποθέσεις και άλλες σχετικές διατάξεις της Οδηγίας 2014/53/ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης της ΕΕ είναι διαθέσιμο στο διεύθυνση <https://www.asus.com/support/>

To WiFi που λειτουργεί στη ζώνη 5150-5350MHz περιορίζεται για χρήση σε εσωτερικούς χώρους για τις χώρες που αναφέρονται στον παρακάτω πίνακα:

**הצהרת התאמה האירופאית מקוצרת עבור האיחוד האירופי**

ASUSTek Computer Inc. מצהירה בראת כי מכשיר זה תואם לדרישות החיוביות ולשאר הסיפיים הרלוונטיים של תקנה 2014/53/UE. ניתן לקרוא את הנוסח המלא של הצהרת התאמה הרגולטורית עבור האיחוד האירופי בתוכנית <https://www.asus.com/support/>

יש להבילי רשתות Wi-Fi הפועלות ברצפת הרדדים 5150-5350MHz לשימוש בתוך מבנים סגורים בארצות המפורטות ברשימה הבאה:

**Egyezsérített EU megfeleléségi nyilatkozat**

Az ASUSTek Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel az 2014/53/UE sz. irányelv alapvető követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfeleléségi nyilatkozat teljes szövegét a következő weboldalon tekintheti meg: <https://www.asus.com/support/>

Az 5150-5350 MHz-es sávban működő Wi-Fi-t beltéri használatra kell korlátozni az alábbi táblázatban felsorolt országokban:

**Pernyataan Kesesuaian UE yang Disederhanakan**

ASUSTek Computer Inc. dengan ini menyatakan bahwa perangkat ini memenuhi persyaratan utama dan ketentuan relevan lainnya yang terdapat pada Peraturan 2014/53/UE. Teks lengkap pernyataan kesesuaian EU tersedia di: <https://www.asus.com/support/>

WiFi yang Beroperasi pada 5150-5350 MHz akan terbatas untuk penggunaan dalam ruangan di negara yang tercantum dalam tabel

**Vienākārsta ES atbilstības paziņojums**

ASUSTek Computer Inc. ar šo paziņo, ka šī ierīce atbilst Direktīvas 2014/53/ES būtiskajām prasībām un citiem citiem saistošajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: <https://www.asus.com/support/>

Wi-Fi darbība 5150-5350 MHz ir jāierobežo lietotāni telpās valstīs, kuras norādītas tālāk.

## Supaplastinta ES atitikties deklaracija

Šiame dokumente bendrovė „ASUSTek Computer Inc.“ pareiškia, kad šis prietaisas atitinka pagrindinius reikalavimus ir kitas susijusias Direktyvos 2014/53/ES nuostatas. Visas ES atitikties deklaracijos tekstas pateikiamas čia: <https://www.asus.com/support/>

Toliau nurodytoje sąlygoje „WiFi“ ryšiu, veikiančiu 5 150–5 350 MHz dažnio juostoje, galima naudotis tik patalpose:

Uvijek uređaj može da se koristi u državama navedenim ispod:

### Forenklijski EU-samsvarserklæring

ASUSTek Computer Inc. erklærer herved at denne enhet er i samsvar med hovedsakelige krav og andre relevante forskrifter i direktivet 2014/53/EU. Fullstendig tekst for EU-samsvarserklæring finnes på: <https://www.asus.com/support/>

Wi-Fi-området 5150–5350 MHz skal begrenses til innendørs bruk for landene som er oppført i tabellen:

### Upraszczona deklaracja zgodności UE

Firma ASUSTek Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami dyrektywy 2014/53/UE. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem <https://www.asus.com/support/>

W krajach wymienionych w tabeli działanie sieci Wi-Fi w paśmie 5150–5350 MHz powinno być ograniczone wyłącznie do pomieszczeń:

### Declaração de Conformidade Simplificada da UE

A ASUSTek Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes da Diretiva 2014/53/UE. O texto integral da declaração de conformidade da UE está disponível em <https://www.asus.com/support/>

A utilização das frequências WiFi de 5150 a 5350MHz está restrita a ambientes interiores nos países apresentados na tabela:

### Declarație de conformitate UE, versiune simplificată

Prin prezenta, ASUSTek Computer Inc. declară că acest dispozitiv este în conformitate cu regulamentele esențiale și cu celelalte prevederi relevante ale Directivei 2014/53/UE. Textul complet al declarației de conformitate UE este disponibil la adresa <https://www.asus.com/support/>

Pentru țările listate în tabelul de mai jos, rețeaua WiFi care funcționează în banda de frecvență de 5.150-5.350 MHz trebuie utilizată doar în interior:

### Pojednostavljena Deklaracija o usaglašenosti EU

ASUSTek Computer Inc. ovim izjavljuje da je ovaj uređaj usaglašen sa osnovnim zahtevima i drugim relevantnim odredbama Direktive 2014/53/EU. Ceo tekst Deklaracije o usaglašenosti EU dostupan je na lokaciji <https://www.asus.com/support/>

WiFi koji radi u frekventnom opsegu od 5150 MHz do 5350 MHz ograničen je isključivo na upotrebu u zatvorenom prostoru za zemlje navedene u tabeli ispod:

### Zjednodušené vyhlásenie o zhode platné pre EÚ

Spoločnosť ASUSTek Computer Inc. týmto vyhlasuje, že toto zariadenie je v súlade so základnými požiadavkami a ďalšími príslušnými ustanoveniami smernice č. 2014/53/EÚ. Plné znenie vyhlásenia o zhode pre EÚ je k dispozícii na lokalite <https://www.asus.com/support/>

Činnosť WiFi v pásme 5150–5350 MHz bude obmedzená na použitie vo vnútornom prostredí pre krajiny uvedené v tabuľke nižšie:

### Poenostavljena izjava EU o skladnosti

ASUSTek Computer Inc. tukaj izjavlja, da je ta naprava skladna s temeljnimi zahtevami in drugimi relevantnimi določili Direktive 2014/53/EU. Polno besedilo izjave EU o skladnosti je na voljo na <https://www.asus.com/support/>

WiFi, ki deluje v pasovnem območju 5150–5350 MHz, mora biti v državah, navedenih v spodnjem seznamu, omejen na notranjo uporabo:

### Declaración de conformidad simplificada para la UE

Por la presente, ASUSTek Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de la directiva 2014/53/UE. En <https://www.asus.com/support/>, está disponible el texto completo de la declaración de conformidad para la UE.

La conexión WiFi con una frecuencia de funcionamiento de 5150-5350 MHz se restringirá al uso en interiores para los países enumerados en la tabla:

### Förenklad EU-försäkran om överensstämmelse

ASUSTek Computer Inc. deklarerar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta bestämmelser i direktiv 2014/53/EU. Fullständig text av EU-försäkran om överensstämmelse finns på <https://www.asus.com/support/>

WiFi som används 5150-5350 MHz kommer att begränsas för användning inomhus i de länder som anges i tabellen:

## ประเทศไทยเกี่ยวกับความสอดคล้องของสภาพผู้โทรแบบเผ่า

ASUSTek Computer Inc.

ขอประกาศในที่นี้ว่าอุปกรณ์นี้มีความสอดคล้องกับความ ต้องการจำเป็นและเงื่อนไขที่เกี่ยวข้องอื่น ๆ ของบทบัญญัติข้อกำหนด 2014/53/UE เฉพาะที่สมรรถนะของประเทศไทยสอดคล้องกับ EU มีอยู่ที่ <https://www.asus.com/support/>

การทำงานของ WiFi ที่ 5150-5350MHz ถูกจำกัดให้ใช้ในอาคารสำหรับประเทศที่แสดงในตาราง

### Basiteřtirimlijski AB Uyumluluk Bildirimi

ASUSTek Computer Inc. bu aygıtın 2014/53/UE yönergesinin temel gereksinimlerine ve diğer ilgili hükümlerine uygun olduğunu bildirir. AB uyumluluk bildiriminin tam metni şu adreste bulunabilir: <https://www.asus.com/support/>

5150-5350 MHz aralındaki WiFi çalışması, tablodaki listelenen ülkeler için iç mekan kullanımıyla kısıtlanacaktır.

### Спрощена декларация про відповідність нормам ЄС

ASUSTek Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним вимогам Директиви 2014 / 53 / EU. Повний текст декларації відповідності нормам ЄС доступний на <https://www.asus.com/support/>

Робота Wi-Fi на частоті 5150-5350 МГц обмежується використанням у приміщенні для країни, поданих у таблиці нижче:



AT	BE	BG	CZ	DK	EE	FR
DE	IS	IE	IT	EL	ES	CY
LV	LI	LT	LU	HU	MT	NL
NO	PL	PT	RO	SI	SK	TR
FI	SE	CH	UK	HR		

### Intel® 9560 NGW output power table:

Function	Frequency	Maximum Output Power (EIRP)
WiFi	2400 - 2483.5 MHz	16.63 dBm
	5150 - 5350 MHz	17.62 dBm
	5470 - 5725 MHz	17.62 dBm
	5725 - 5850 MHz	8.41 dBm
Bluetooth	2400 - 2483.5 MHz	8.73 dBm

For the standard EN 300 440 V2.1.1, if this device operates in 5725-5875 MHz, it will be considered as a receiver category 2.

ASUS Wi-Fi GO! Card 72  
802.11 a/b/g/n/ac WLAN module with Bluetooth 5  
Contains:  
Model: Intel® 9560NGW  
FCC ID: PC09560G  
IC: 1000A-9560G  
India: NR-ETA-18863  
NLS-ETA-0892  
Jordan: TRC-SS-0017392  
MSIP-CRM-INT-0560NGW  
CCC: 0303-17012P  
ID: 170906003  
5.15-5.35 GHz  
IEEE 802.11b/g/n  
Complies with IMDA Standards DB02941  
NCC R-NZ  
New Zealand  
NLS05-171987  
FIM  
REGISTRATION ENDORSEMENT  
FOR EXPORT

## ASUS contact information

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#### **Technical Support**

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### ASUS COMPUTER GmbH (Germany and Austria)

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Online contact <http://eu-rma.asus.com/sales>

#### **Technical Support**

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Support Fax +49-2102-959911  
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