ASRock

Z270 Taichi

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Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Z270 Taichi motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this documentation, Chapter 1 and 2 contains the introduction of the motherboard and step-by-step installation guides. Chapter 3 contains the operation guide of the software and utilities. Chapter 4 contains the configuration guide of the BIOS setup.

Because the motherboard specifications and the BIOS software might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock's website without further notice. If you require technical support related to this motherboard, please visit our website for specific information about the model you are using. You may find the latest VGA cards and CPU support list on ASRock's website as well. ASRock website http://www.asrock.com.

1.1 Package Contents

- ASRock Z270 Taichi Motherboard (ATX Form Factor)
- ASRock Z270 Taichi Quick Installation Guide
- ASRock Z270 Taichi Support CD
- 4 x Serial ATA (SATA) Data Cables (Optional)
- 1 x ASRock SLI_Bridge_2S Card (Optional)
- 1 x ASRock SLI_HB_Bridge_2S Card (Optional)
- 2 x ASRock WiFi 2.4/5 GHz Antennas (Optional)
- 1 x I/O Panel Shield
- 3 x Screws for M.2 Sockets (Optional)

English

1.2 Specifications

Platform	• ATX Form Factor

CPU	• Supports 7th and 6th Generation Intel® Core™ i7/i5/i3/ Pentium®/Celeron® Processors (Socket 1151) • Digi Power design • 12 Power Phase design • Supports Intel® Turbo Boost 2.0 Technology • Supports Intel® K-Series unlocked CPUs • Supports ASRock BCLK Full-range Overclocking • Supports ASRock Hyper BCLK Engine II

Chipset	• Intel® Z270

Memory	• Dual Channel DDR4 Memory Technology • 4 x DDR4 DIMM Slots • Supports DDR4 3733+(OC)*/3600(OC)/3200(OC)/2933(OC)/2800(OC)/2400**/2133 non-ECC, un-buffered memory * Please refer to Memory Support List on ASRock's website for more information. (http://www.asrock.com/) ** 7th Gen Intel® CPU supports DDR4 up to 2400; 6th Gen Intel® CPU supports DDR4 up to 2133. • Supports ECC UDIMM memory modules (operate in non-ECC mode) • Max. capacity of system memory: 64GB • Supports Intel® Extreme Memory Profile (XMP) 2.0 • 15µ Gold Contact in DIMM Slots

Expansion Slot	• 4 x PCI Express 3.0 x16 Slots (PCIE2/PCIE3/PCIE4/PCIE5: single at x16 (PCIE2); dual at x8 (PCIE2) / x8 (PCIE4); triple at x8 (PCIE2) / x4 (PCIE4) / x4 (PCIE5). PCIE3: x4 mode)* * Supports NVMe SSD as boot disks • 1 x PCI Express 3.0 x1 Slot (Flexible PCIe) • Supports AMD Quad CrossFireX™, 3-Way CrossFireX™ and CrossFireX™ • Supports NVIDIA® Quad SLI™ and SLI™

	• 1 x Vertical M.2 Socket (Key E) with the bundled WiFi-802.11ac module (on the rear I/O) • 15μ Gold Contact in VGA PCIe Slot (PCIE2)
Graphics	* Intel® HD Graphics Built-in Visuals and the VGA outputs can be supported only with processors which are GPU integrated. • Supports Intel® HD Graphics Built-in Visuals : Intel® Quick Sync Video with AVC, MVC (S3D) and MPEG-2 Full HW Encode1, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® Insider™, Intel® HD Graphics • Gen9 LP, DX11.3, DX12 • HWAEncode/Decode: VP8, HEVC 8b, VP9, HEVC 10b (For 7th Gen Intel® CPU) • HWA Encode/Decode: VP8 , HEVC 8b; GPU/SWEncode/Decode: VP9, HEVC 10b (For 6th Gen Intel® CPU) • Max. shared memory 1024MB * The size of maximum shared memory may vary from different operating systems. • Dual graphics output: Support HDMI and DisplayPort 1.2 ports by independent display controllers • Supports HDMI with max. resolution up to 4K x 2K (4096x2160) @ 24Hz / (3840x2160) @ 30Hz • Supports DisplayPort 1.2 with max. resolution up to 4K x 2K (4096x2304) @ 60Hz • Supports Auto Lip Sync, Deep Color (12bpc), xvYCC and HBR (High Bit Rate Audio) with HDMI Port (Compliant HDMI monitor is required) • Supports HDCP with HDMI and DisplayPort 1.2 Ports • Supports Full HD 1080p Blu-ray (BD) playback with HDMI and DisplayPort 1.2 Ports
Audio	• 7.1 CH HD Audio with Content Protection (Realtek ALC1220 Audio Codec) • Premium Blu-ray Audio support • Supports Surge Protection (ASRock Full Spike Protection) • Supports Purity Sound™ 4 - Nichicon Fine Gold Series Audio Caps - 120dB SNR DAC with Differential Amplifier

English

        - TI® NE5532 Premium Headset Amplifier for Front Panel
         Audio Connector (Supports up to 600 Ohm headsets)
- Pure Power-In
- Direct Drive Technology
- PCB Isolate Shielding
- Impedance Sensing on Front Out port
- Individual PCB Layers for R/L Audio Channel
- AURA RGB LED
- Gold Audio Jacks
- 15μ Gold Audio Connector
- Supports DTS Connect

LAN	• Gigabit LAN 10/100/1000 Mb/s
	• 1 x Giga PHY Intel® I219V, 1 x GigaLAN Intel® I211AT
	• Supports Wake-On-LAN
	• Supports Lightning/ESD Protection (ASRock Full Spike Protection)
	• Supports Dual LAN with Teaming*
	* Teaming is not supported on Win 10.
	• Supports Energy Efficient Ethernet 802.3az
	• Supports PXE

Wireless LAN	• Intel® 802.11ac WiFi Module (Free Bundle)
	• Supports IEEE 802.11a/b/g/n/ac
	• Supports Dual-Band (2.4/5 GHz)
	• Supports high speed wireless connections up to 433Mbps
	• Supports Bluetooth 4.0 / 3.0 + High speed class II

Rear Panel I/O	• 2 x Antenna Ports
	• 1 x PS/2 Mouse/Keyboard Port
	• 1 x HDMI Port
	• 1 x DisplayPort 1.2
	• 1 x Optical SPDIF Out Port
	• 1 x USB 3.1 Type-A Port (10 Gb/s) (ASMedia ASM2142) (Supports ESD Protection (ASRock Full Spike Protection))
	• 1 x USB 3.1 Type-C Port (10 Gb/s) (ASMedia ASM2142) (Supports ESD Protection (ASRock Full Spike Protection))
	• 4 x USB 3.0 Ports (Intel® Z270) (Supports ESD Protection (ASRock Full Spike Protection))

- 2 x RJ-45 LAN Ports with LED (ACT/LINK LED and SPEED LED)
- 1 x Clear CMOS Switch
- HD Audio Jacks: Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone (Gold Audio Jacks)

Storage	• 6 x SATA3 6.0 Gb/s Connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel Rapid Storage Technology 15 and Intel Smart Response Technology), NCQ, AHCI and Hot Plug*

* M2_1, SATA3_0 and SATA3_1 share lanes. If either one of them is in use, the others will be disabled.

* M2_2, SATA3_4 and SATA3_5 share lanes. If either one of them is in use, the others will be disabled.

* If M2_3 is occupied by a SATA-type M.2 device, SATA3_3 will be disabled.

- 4 x SATA3 6.0 Gb/s Connectors by ASMedia ASM1061, support NCQ, AHCI and Hot Plug
- 2 x SATA Express 10 Gb/s Connectors**

** Support to be announced

- 3 x Ultra M.2 Sockets, support type 2230/2242/2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)***

*** Supports Intel® Optane™ Technology

*** Supports NVMe SSD as boot disks

*** Supports ASRock U.2 Kit

Connector	• 1 x TPM Header

- 1 x Power LED and Speaker Header
- 1 x AURA RGB LED Header
- 1 x CPU Fan Connector (4-pin)

* The CPU Fan Connector supports the CPU fan of maximum 1A (12W) fan power.

- 1 x CPU Optional/Water Pump Fan Connector (4-pin) (Smart Fan Speed Control)

* The CPU Optional/Water Pump Fan supports the water cooler fan of maximum 1.5A (18W) fan power.

English

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- 2 x Chassis Fan Connectors (4-pin) (Smart Fan Speed Control)
- 1 x Chassis Optional/Water Pump Fan Connector (4-pin) (Smart Fan Speed Control)

* The Chassis Optional/Water Pump Fan supports the water cooler fan of maximum 1.5A (18W) fan power.

* CPU_OPT/W_PUMP, CHA_FAN1, CHA_FAN2 and CHA_FAN3/W_PUMP can auto detect if 3-pin or 4-pin fan is in use.

- 1 x 24 pin ATX Power Connector (Hi-Density Power Connector)
- 1 x 8 pin 12V Power Connector (Hi-Density Power Connector)
- 1 x Front Panel Audio Connector (15μ Gold Audio Connector)
- 1 x Thunderbolt AIC Connector (5-pin)

* Only one Thunderbolt AIC Card is supported.

- 3 x USB 2.0 Headers (Support 6 USB 2.0 ports) (Intel® Z270) (Supports ESD Protection (ASRock Full Spike Protection))
- 2 x USB 3.0 Headers (Support 4 USB 3.0 ports) (ASMedia ASM1074 hub) (Supports ESD Protection (ASRock Full Spike Protection))
- 1 x Vertical Type A USB 3.0 (Intel® Z270)
- 1 x Dr. Debug with LED
- 1 x XMP Switch

BIOS Feature	• 2 x AMI UEFI Legal BIOS with multilingual GUI support (1 x Main BIOS and 1 x Backup BIOS) • Supports Secure Backup UEFI Technology • ACPI 6.0 Compliant wake up events • SMBIOS 2.7 Support • CPU, GT_CPU, DRAM, VPPM, PCH 1.0V, VCCIO, VCCST, VCCSA, VCCPLL Voltage Multi-adjustment
Hardware Monitor	• Temperature Sensing: CPU, CPU Optional/Water Pump, Chassis, Chassis Optional/Water Pump Fans • Fan Tachometer: CPU, CPU Optional/Water Pump, Chassis, Chassis Optional/Water Pump Fans

- Quiet Fan (Auto adjust chassis fan speed by CPU temperature): CPU, CPU Optional/Water Pump, Chassis, Chassis Optional/Water Pump Fans
- Fan Multi-Speed Control: CPU, CPU Optional/Water Pump, Chassis, Chassis Optional/Water Pump Fans
- Voltage monitoring: +12V, +5V, +3.3V, CPU Vcore, DRAM, VPPM, PCH 1.0V, VCCSA, VCCST

OS	
	- Microsoft® Windows® 10 64-bit (For 7th Gen Intel® CPU)
	- Microsoft® Windows® 10 64-bit / 8.1 64-bit / 7 32-bit / 7 64-bit (For 6th Gen Intel® CPU)

* To install Windows® 7 OS, a modified installation disk with xHCI drivers packed into the ISO file is required. Please refer to page 51 for more detailed instructions.

* For the updated Windows® 10 driver, please visit ASRock's website for details: http://www.asrock.com

Certifications
- FCC, CE, WHQL
- ErP/EuP ready (ErP/EuP ready power supply is required)

* For detailed product information, please visit our website: http://www.asrock.com

⚠ *Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.*

English

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1.3 Motherboard Layout

Z270 Taichi
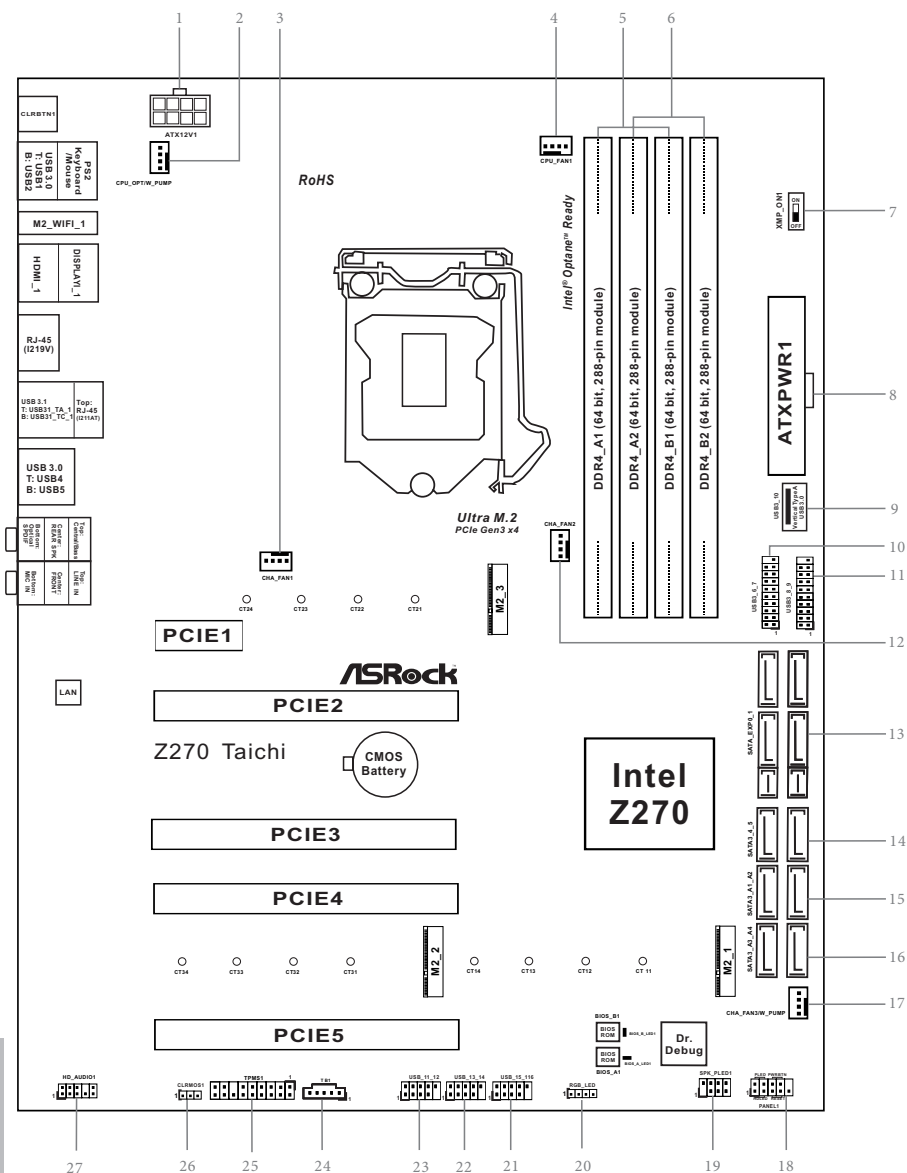
No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	CPU Fan / Waterpump Fan Connector (CPU_OPT/W_PUMP)
3	Chassis Fan Connector (CHA_FAN1)
4	CPU Fan Connector (CPU_FAN1)
5	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2)
7	XMP Switch (XMP_ON1)
8	ATX Power Connector (ATXPWR1)
9	Vertical Type A USB 3.0 (USB_9)
10	USB 3.0 Header (USB3_5_6)
11	USB 3.0 Header (USB3_7_8)
12	Chassis Fan Connector (CHA_FAN2)
13	SATA Express Connectors (SATA_EXP0_1)
14	SATA3 Connectors (SATA3_4_5)
15	SATA3 Connectors (SATA3_A1_A2)
16	SATA3 Connectors (SATA3_A3_A4)
17	Chassis Fan / Waterpump Fan Connector (CHA_FAN3/W_PUMP)
18	System Panel Header (PANEL1)
19	Power LED and Speaker Header (SPK_PLED1)
20	AURA RGB LED Header (RGB_LED1)
21	USB 2.0 Header (USB_14_15)
22	USB 2.0 Header (USB_12_13)
23	USB 2.0 Header (USB_10_11)
24	Thunderbolt AIC Connector (TB2)
25	TPM Header (TPMS1)
26	Clear CMOS Jumper (CLRMOS1)
27	Front Panel Audio Header (HD_AUDIO1)

1.4 I/O Panel
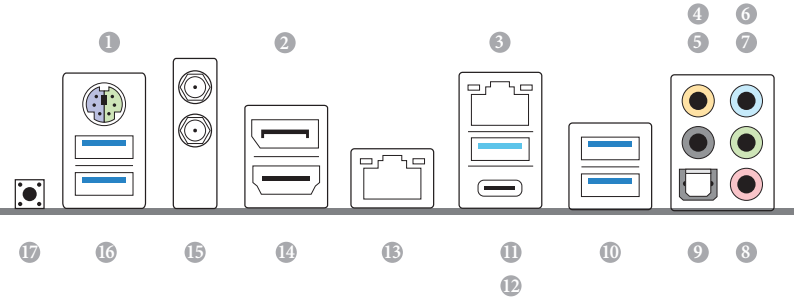
No.	Description	No.	Description
1	PS/2 Mouse/Keyboard Port	10	USB 3.0 Ports (USB_4_5)
2	DisplayPort 1.2	11	USB 3.1 Type-A Port (USB31_TA_1)
3	LAN RJ-45 Port (Intel® I211AT)*	12	USB 3.1 Type-C Port (USB31_TC_1)
4	Central / Bass (Orange)	13	LAN RJ-45 Port (Intel® I219V)*
5	Rear Speaker (Black)	14	HDMI Port
6	Line In (Light Blue)	15	Antenna Ports
7	Front Speaker (Lime)**	16	USB 3.0 Ports (USB_1_2)
8	Microphone (Pink)	17	Clear CMOS Switch
9	Optical SPDIF Out Port		

* There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.

ACT/LINK LED

SPEED LED

LAN Port
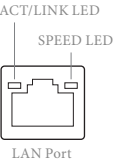
Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.

Audio Output Channels	Front Speaker (No. 7)	Rear Speaker (No. 5)	Central / Bass (No. 4)	Line In (No. 6)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

To enable Multi-Streaming, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find the "Mixer" tool on your system. Please select "Mixer ToolBox" , click "Enable playback multi-streaming", and click "ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use the Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use the front panel audio.

1.5 WiFi-802.11ac Module and ASRock WiFi 2.4/5 GHz Antenna

WiFi-802.11ac + BT Module

This motherboard comes with an exclusive WiFi 802.11 a/b/g/n/ac + BT v4.0 module (pre-installed on the rear I/O panel) that offers support for WiFi 802.11 a/b/g/n/ac connectivity standards and Bluetooth v4.0. WiFi + BT module is an easy-to-use wireless local area network (WLAN) adapter to support WiFi + BT. Bluetooth v4.0 standard features Smart Ready technology that adds a whole new class of functionality into the mobile devices. BT 4.0 also includes Low Energy Technology and ensures extraordinary low power consumption for PCs.

* The transmission speed may vary according to the environment.

WiFi + BT Module
(pre-installed Intel® Dual Band
Wireless-AC 3160)

ASRock WiFi 2.4/5 GHz Antennas
(included in the package)
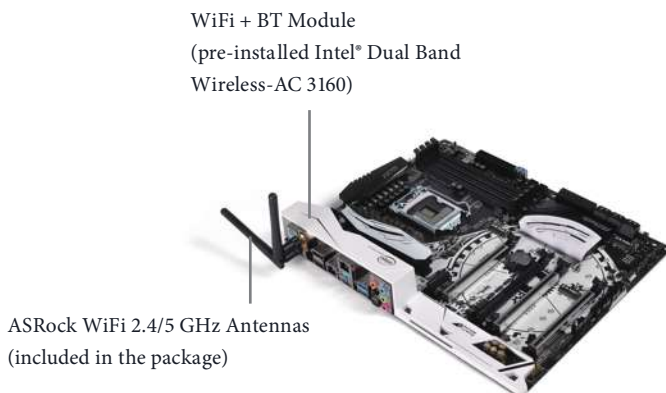
WiFi Antennas Installation Guide
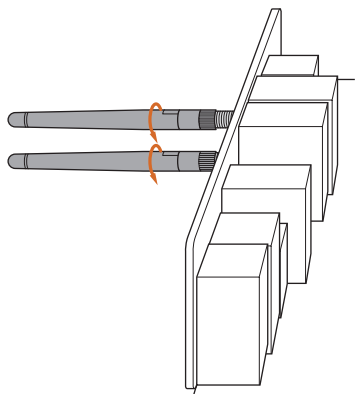
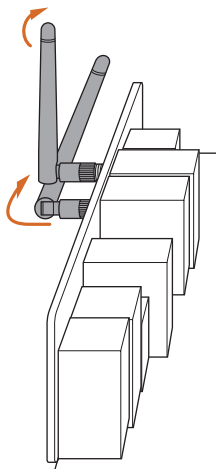**Step 1**

Prepare the WiFi 2.4/5 GHz Antennas that come with the package.

Step 2

Connect the two WiFi 2.4/5 GHz Antennas to the antenna connectors. Turn the antenna clockwise until it is securely connected.

Step 3

Set the WiFi 2.4/5 GHz Antenna as shown in the illustration.

*You may need to adjust the direction of the antenna for a stronger signal.

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Chapter 2 Installation

This is an ATX form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

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

- Make sure to unplug the power cord before installing or removing the motherboard components. Failure to do so may cause physical injuries and damages to motherboard components.
- In order to avoid damage from static electricity to the motherboard's components, NEVER place your motherboard directly on a carpet. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
- Hold components by the edges and do not touch the ICs.
- Whenever you uninstall any components, place them on a grounded anti-static pad or in the bag that comes with the components.
- When placing screws to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 Installing the CPU

1. Before you insert the 1151-Pin CPU into the socket, please check if the **PnP cap** is on the socket, if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power cables before installing the CPU.
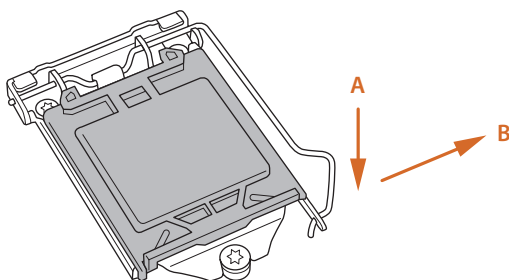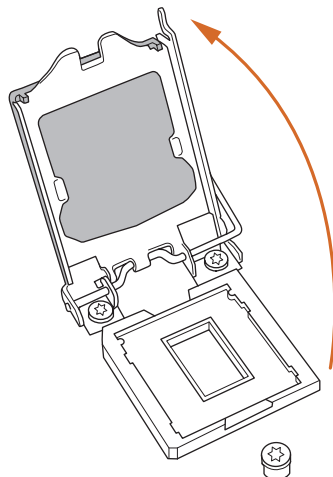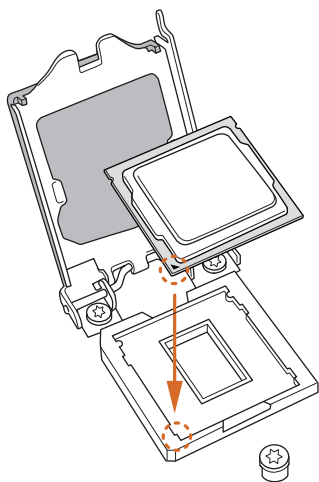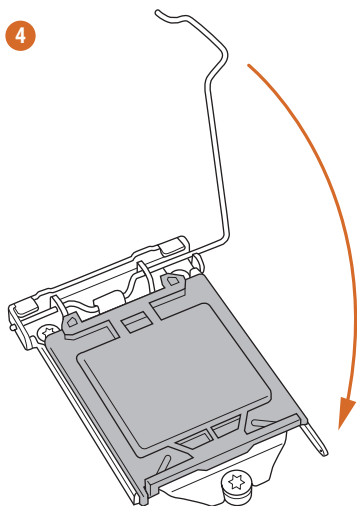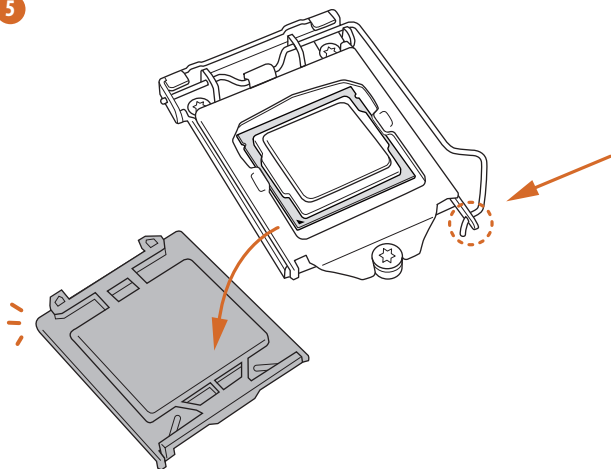
Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

2.2 Installing the CPU Fan and Heatsink
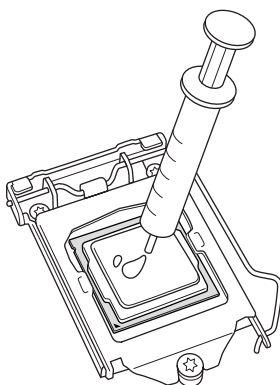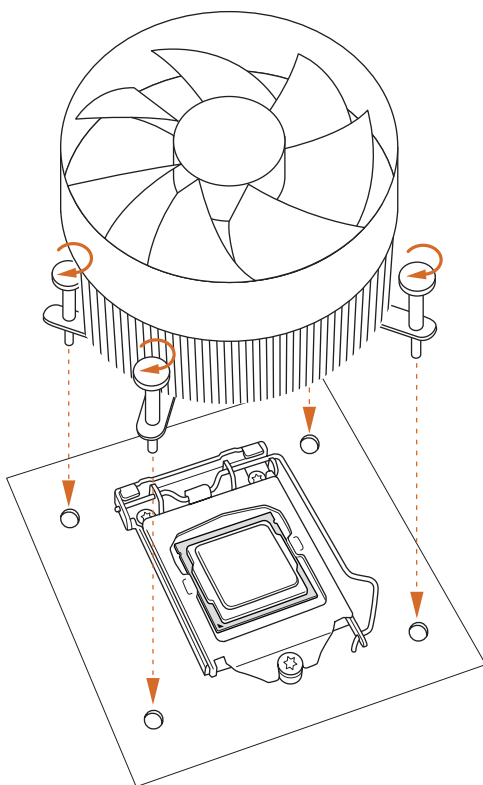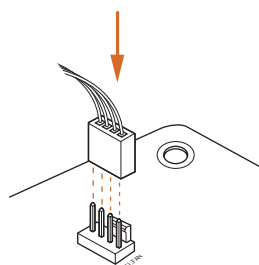
2.3 Installing Memory Modules (DIMM)

This motherboard provides four 288-pin DDR4 (Double Data Rate 4) DIMM slots, and supports Dual Channel Memory Technology.

☆
1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.
2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
3. It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.

Dual Channel Memory Configuration

Priority	DDR4_A1	DDR4_A2	DDR4_B1	DDR4_B2
1		Populated		Populated
2	Populated		Populated	
3	Populated	Populated	Populated	Populated

⚠ *The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.*
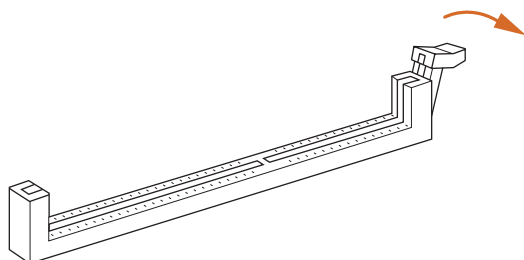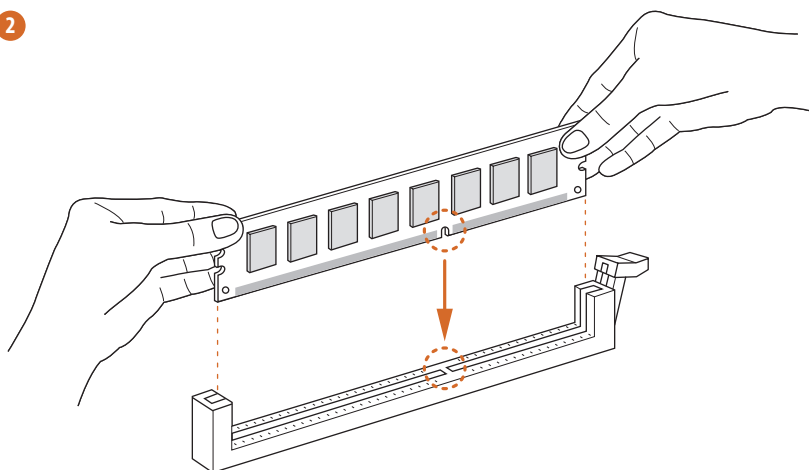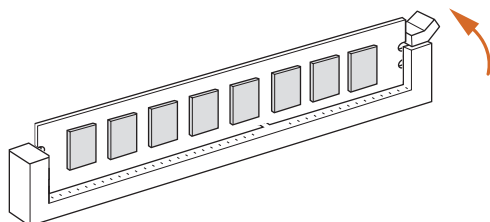
2.4 Expansion Slots (PCI and PCI Express Slots)

There are 5 PCI Express slots on the motherboard.

> ⚠ *Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.*

PCIe slots:

PCIE1 (PCIe 3.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE2 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards.
PCIE3 (PCIe 3.0 x16 slot) is used for PCI Express x4 lane width graphics cards.
PCIE4 (PCIe 3.0 x16 slot) is used for PCI Express x8 lane width graphics cards.
PCIE5 (PCIe 3.0 x16 slot) is used for PCI Express x4 lane width graphics cards.

PCIe Slot Configurations

	PCIE2	PCIE4	PCIE5
Single Graphics Card	x16	N/A	N/A
Two Graphics Cards in CrossFireX™ or SLI™ Mode	x8	x8	N/A
Three Graphics Cards in 3-Way CrossFireX™ Mode	x8	x4	x4

> 🔍 *For a better thermal environment, please connect a chassis fan to the motherboard's chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards.*

2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins.

Clear CMOS Jumper
(CLRMOS1)
(see p.8, No. 26)

1_2   2_3
Default   Clear CMOS
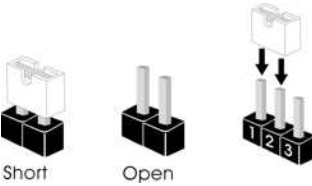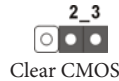
CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, and user default profile will be cleared only if the CMOS battery is removed.

The Clear CMOS Switch has the same function as the Clear CMOS jumper.

2.6 Onboard Headers and Connectors

⚠️ *Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.*

System Panel Header
(9-pin PANEL1)
(see p.8, No. 18)

PLED+
PLED-
PWRBTN#
GND

1

GND
RESET#
GND
HDLED-
HDLED+
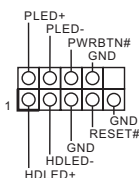
Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

🔍 **PWRBTN (Power Switch):**
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Power LED and Speaker
Header
(7-pin SPK_PLED1)
(see p.8, No. 19)

SPEAKER
DUMMY
DUMMY
+5V

1

PLED+
PLED+
PLED-
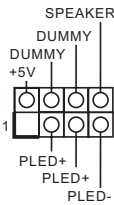
Please connect the
chassis power LED and
the chassis speaker to this
header.

Serial ATA3 Connectors
(SATA3_0_1:
see p.8, No. 13)
(SATA3_2_3:
see p.8, No. 13)
(SATA3_4_5:
see p.8, No. 14)
(SATA3_A1_A2:
see p.8, No. 15)
(SATA3_A3_A4:
see p.8, No. 16)

SATA3_0
SATA3_1
SATA3_4
SATA3_A1
SATA3_A3

SATA3_2
SATA3_3
SATA3_5
SATA3_A2
SATA3_A4
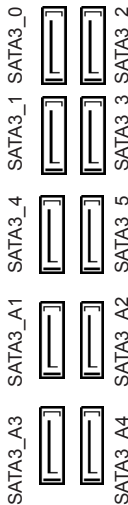
These ten SATA3
connectors support SATA
data cables for internal
storage devices with up to
6.0 Gb/s data transfer rate.

M2_1, SATA3_0 and
SATA3_1 share lanes. If
either one of them is in use,
the others will be disabled.

M2_2, SATA3_4 and
SATA3_5 share lanes. If
either one of them is in use,
the others will be disabled.

If M2_3 is occupied by a
SATA-type M.2 device,
SATA3_3 will be disabled.

To minimize the boot
time, use Intel® Z270 SATA
ports (SATA3_0) for your
bootable devices.

Serial ATA Express
Connectors
(SATA_EXP_0_1:
see p.8, No. 13)

SATA_EXP_0
SATA3_1
SATA3_0
SATA3_3
SATA3_2
SATA_EXP_1
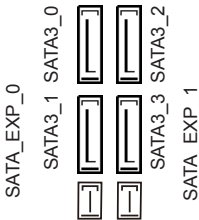
Please connect either
SATA or PCIe storage
devices to these
connectors.

USB 2.0 Headers
(9-pin USB_10_11)
(see p.8, No. 23)
(9-pin USB_12_13)
(see p.8, No. 22)
(9-pin USB_14_15)
(see p.8, No. 21)

USB_PWR
P-
P+
GND
DUMMY
1
GND
P+
P-
USB_PWR
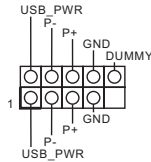
There are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two ports.

USB 3.0 Headers
(19-pin USB3_5_6)
(see p.8, No. 10)
(19-pin USB3_7_8)
(see p.8, No. 11)

Vbus
Vbus
IntA_PA_SSRX-
IntA_PA_SSRX+
GND
IntA_PA_SSTX-
IntA_PA_SSTX+
GND
IntA_PA_D-
IntA_PA_D+
IntA_PB_SSRX-
IntA_PB_SSRX+
GND
IntA_PB_SSTX-
IntA_PB_SSTX+
GND
IntA_PB_D-
IntA_PB_D+
Dummy
1
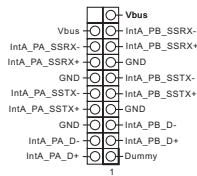
Besides four USB 3.0 ports on the I/O panel, there are two headers and one port on this motherboard. Each USB 3.0 header can support two ports.

(USB_9)
(see p.8, No. 9)

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.8, No. 27)

GND
PRESENCE#
MIC_RET
OUT_RET
1
OUT2_L
J_SENSE
OUT2_R
MIC2_R
MIC2_L
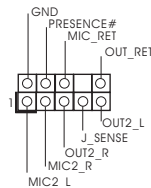
This header is for connecting audio devices to the front audio panel.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instructions in our manual and chassis manual to install your system.
2. If you use an AC'97 audio panel, please install it to the front panel audio header by the steps below:
A. Connect Mic_IN (MIC) to MIC2_L.
B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
C. Connect Ground (GND) to Ground (GND).
D. MIC_RET and OUT_RET are for the HD audio panel only. You don't need to connect them for the AC'97 audio panel.
E. To activate the front mic, go to the "FrontMic" Tab in the Realtek Control panel and adjust "Recording Volume".

Chassis Fan Connectors
(4-pin CHA_FAN1)
(see p.8, No. 3)

FAN_SPEED_CONTROL
CHA_FAN_SPEED
FAN_VOLTAGE
GND
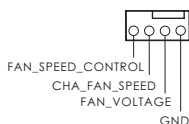
Please connect fan cables to the fan connectors and match the black wire to the ground pin.

(4-pin CHA_FAN2)
(see p.8, No. 12)

FAN_SPEED_CONTROL
CHA_FAN_SPEED
FAN_VOLTAGE
GND

Chassis Fan / Waterpump
Fan Connector
(4-pin CHA_FAN3/W_PUMP)
(see p.8, No. 17)

FAN_SPEED_CONTROL
CHA_FAN_SPEED
FAN_VOLTAGE
GND
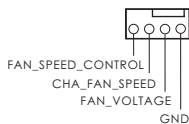
Please connect fan cables to the fan connector and match the black wire to the ground pin.

CPU Fan Connector
(4-pin CPU_FAN1)
(see p.8, No. 4)

FAN_VOLTAGE
CPU_FAN_SPEED
GND
FAN_SPEED_CONTROL
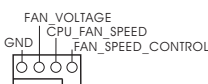
This motherboard provides a 4-Pin CPU fan (Quiet Fan) connector. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

CPU Optional/Water
Pump Fan Connector
(4-pin CPU_OPT/W_PUMP)
(see p.8, No. 2)

FAN_SPEED_CONTROL
CPU_FAN_SPEED
FAN_VOLTAGE
GND
4
3
2
1
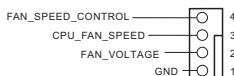
This motherboard provides a 4-Pin water cooling CPU fan connector. If you plan to connect a 3-Pin CPU water cooler fan, please connect it to Pin 1-3.

ATX Power Connector
(24-pin ATXPWR1)
(see p.8, No. 8)

1
13
12
24
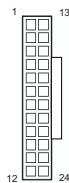
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connector
(8-pin ATX12V1)
(see p.8, No. 1)
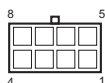
This motherboard provides an 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.

TPM Header
(17-pin TPMS1)
(see p.8, No. 25)
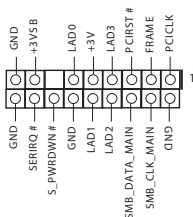
This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

Thunderbolt AIC Connector
(5-pin TB1)
(see p.8, No. 24)

Please connect a Thunderbolt™ add-in card (AIC) to this connector via the GPIO cable.

AURA RGB LED Header
(4-pin RGB_LED1)
(see p.8, No. 20)

RGB header is used to connect RGB LED extension cable which allows users to choose from various LED lighting effects. **Caution: Never install the RGB LED cable in the wrong orientation; otherwise, the cable may be damaged.**

English

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2.7 Smart Switches

The motherboard has three smart switches: Power Switch, Reset Switch and Clear CMOS Switch, allowing users to quickly turn on/off the system, reset the system or clear the CMOS values.

XMP Switch
(XMP_ON1)
(see p.8, No. 7)

ON

OFF

The XMP switch allows users to easily load XMP profiles to automatically configure the overclocked DRAM voltages for stable operation.

Clear CMOS Switch
(CLRBTN1)

Clear CMOS Switch allows users to quickly clear the CMOS values.

This function is workable only when you power off your computer and unplug the power supply.

2.8 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
00	Please check if the CPU is installed correctly and then clear CMOS.
0d	Problem related to memory, VGA card or other devices. Please clear CMOS, re-install the memory and VGA card, and remove other USB, PCI devices.
01 - 54 (except 0d), 5A- 60	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
55	The Memory could not be detected. Please re-install the memory and CPU. If the problem still exists, please install only one memory module or try using other memory modules.
61 - 91	Chipset initialization error. Please press reset or clear CMOS.
92 - 99	Problem related to PCI-E devices. Please re-install PCI-E devices or try installing them in other slots. If the problem still exists, please remove all PCI-E devices or try using another VGA card.
A0 - A7	Problem related to IDE or SATA devices. Please re-install IDE and SATA devices. If the problem still exists, please clear CMOS and try removing all SATA devices.
b0	Problem related to memory. Please re-install the CPU and memory. If the problem still exists, please install only one memory module or try using other memory modules.

English

b4	Problem related to USB devices. Please try removing all USB devices.
b7	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
d6	The VGA could not be recognized. Please clear CMOS and try re-installing the VGA card. If the problem still exists, please try installing the VGA card in other slots or use other VGA cards.
d7	The Keyboard and mouse could not be recognized. Please try re-installing the keyboard and mouse.
d8	Invalid Password.
FF	Please check if the CPU is installed correctly and then clear CMOS.

2.9 SLI™ and Quad SLI™ Operation Guide

This motherboard supports NVIDIA® SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to two identical PCI Express x16 graphics cards.

Requirements

1. *You should only use identical SLI™-ready graphics cards that are NVIDIA® certified.*
2. *Make sure that your graphics card driver supports NVIDIA® SLI™ technology. Download the drivers from the NVIDIA® website: www.nvidia.com*
3. *Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a NVIDIA® certified PSU. Please refer to the NVIDIA® website for details.*

2.9.1 Installing Two SLI™-Ready Graphics Cards
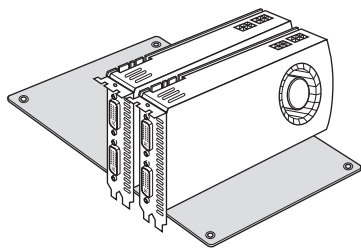
Step 1

Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.
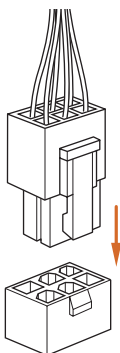
Step 2

If required, connect the auxiliary power source to the PCI Express graphics cards.

English
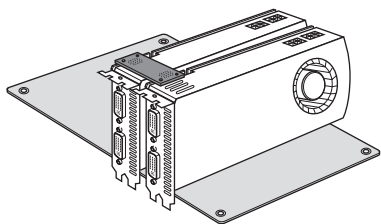
Step 3

Align and insert the ASRock SLI_HB_ Bridge_2S Card / ASRock SLI_Bridge_2S Card to the goldfingers on each graphics card. Make sure the ASRock SLI_HB_ Bridge_2S Card is firmly in place.
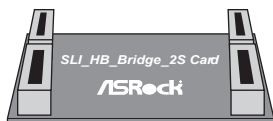
ASRock SLI_HB_Bridge_2S Card

ASRock SLI_Bridge_2S Card
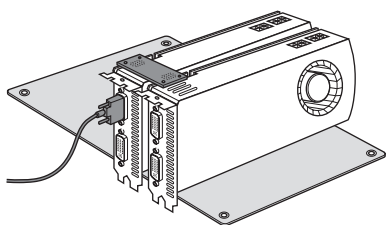
Step 4

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.

2.9.2 Driver Installation and Setup

Install the graphics card drivers to your system. After that, you can enable the Multi-Graphics Processing Unit (GPU) in the NVIDIA® nView system tray utility. Please follow the below procedures to enable the multi-GPU.

For SLI™ and Quad SLI™ mode

Step 1

Double-click the **NVIDIA Control Panel** icon in the Windows® system tray.

Step 2

In the left pane, click **Set SLI and PhysX configuration**. Then select **Maximize 3D performance** and click **Apply**.

Step 3

Reboot your system.

Step 4

You can freely enjoy the benefits of SLI™ or Quad SLI™.

2.10 CrossFireX™, 3-Way CrossFireX™ and Quad CrossFireX™ Operation Guide

This motherboard supports CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ that allows you to install up to three identical PCI Express x16 graphics cards.

> 1. You should only use identical CrossFireX™-ready graphics cards that are AMD certified.
> 2. Make sure that your graphics card driver supports AMD CrossFireX™ technology. Download the drivers from the AMD's website: www.amd.com
> 3. Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a AMD certified PSU. Please refer to the AMD's website for details.
> 4. If you pair a 12-pipe CrossFireX™ Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireX™ mode.
> 5. Different CrossFireX™ cards may require different methods to enable CrossFireX™. Please refer to AMD graphics card manuals for detailed installation guide.

2.10.1 Installing Two CrossFireX™-Ready Graphics Cards
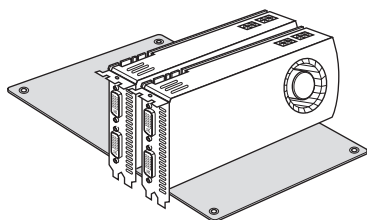
***Step 1***

Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.

CrossFire Bridge

Step 2

Connect two graphics cards by installing a CrossFire Bridge on the CrossFire Bridge Interconnects on the top of the graphics cards. (The CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)
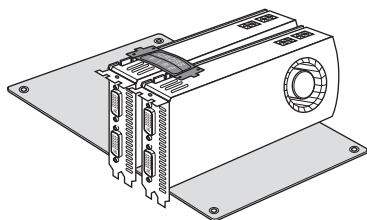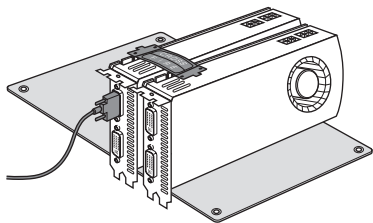
Step 3

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.

2.10.2 Installing Three CrossFireX™-Ready Graphics Cards
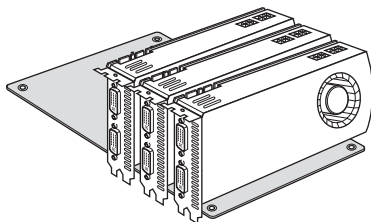
Step 1

Insert one graphics card into PCIE2 slot, another graphics card to PCIE4 slot, and the other graphics card to PCIE6 slot. Make sure that the cards are properly seated on the slots.

CrossFire Bridge

Step 2

Use one CrossFire Bridge to connect the graphics cards on PCIE2 and PCIE4 slots, and use the other CrossFire Bridge to connect the graphics cards on PCIE4 and PCIE6 slots. (The CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)
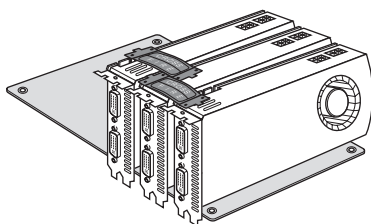
Step 3

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.
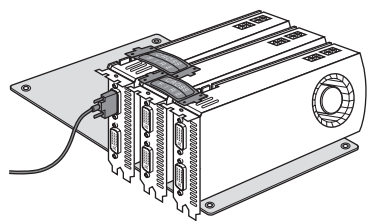
2.10.3 Driver Installation and Setup

Step 1

Power on your computer and boot into OS.

Step 2

Remove the AMD drivers if you have any VGA drivers installed in your system.

The Catalyst Uninstaller is an optional download. We recommend using this utility to un-install any previously installed Catalyst drivers prior to installation. Please check AMD's website for AMD driver updates.

Step 3

Install the required drivers and CATALYST Control Center then restart your computer. Please check AMD's website for details.

AMD Catalyst Control Center

Step 4

Double-click the **AMD Catalyst Control Center** icon in the Windows* system tray.
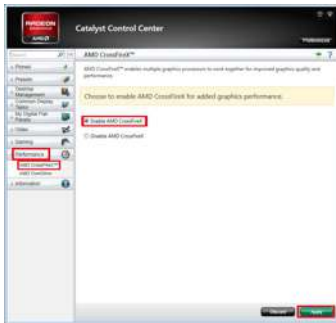
Step 5

In the left pane, click **Performance** and then **AMD CrossFireX™**. Then select **Enable AMD CrossFireX** and click **Apply**. Select the GPU number according to your graphics card and click **Apply**.

2.11 M.2_SSD (NGFF) Module Installation Guide

The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The Ultra M.2 Sockets (M2_1 and M2_2) support SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s).

* M2_1, SATA3_0 and SATA3_1 share lanes. If either one of them is in use, the others will be disabled.

* M2_2, SATA3_4 and SATA3_5 share lanes. If either one of them is in use, the others will be disabled.

* If M2_3 is occupied by a SATA-type M.2 device, SATA3_3 will be disabled.

Installing the M.2_SSD (NGFF) Module
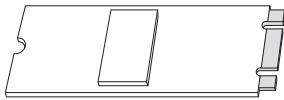
Step 1

Prepare a M.2_SSD (NGFF) module and the screw.
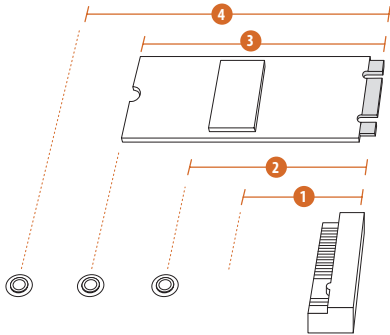
Step 2

Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type2230	Type 2242	Type2260	Type 2280
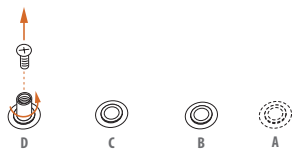
Step 3

Move the standoff based on the module type and length.
The standoff is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.

Step 4
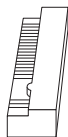
Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.
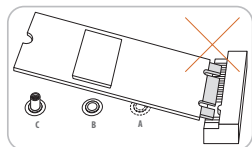
Step 5

Align and gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.
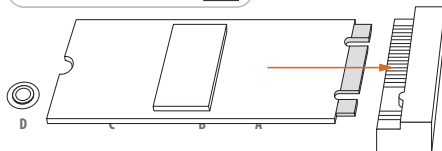
Step 6
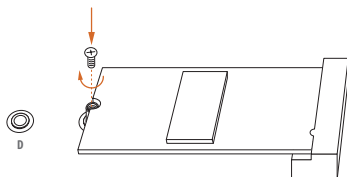
Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

English

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M.2_SSD (NGFF) Module Support List

Vendor	Size	Interface	Length	P/N
ADATA	128GB	SATA3	2280	AXNS381E-128GM-B
ADATA	256GB	SATA3	2280	AXNS381E-256GM-B
ADATA	32GB	SATA3	2230	AXNS330E-32GM-B
Crucial	120GB	SATA3	2280	CT120M500SSD4
Crucial	240GB	SATA3	2280	CT240M500SSD4
Intel	80GB	SATA3	2280	Intel SSDSCKGW080A401/80G
Intel	256GB	PCIe3 x4	2280	SSDPEKKF256G7
Intel	512GB	PCIe3 x4	2280	SSDPEKKF512G7
Kingston	120GB	SATA3	2280	SM2280S3
Kingston	480GB	PCIe2 x4	2280	SH2280S3/480G
OCZ	512GB	PCIe3 x4	2280	RVD400 -M2280-512G (NVME)
Plextor	128GB	PCIe3 x4	2280	PX-128M8PeG
Plextor	1TB	PCIe3 x4	2280	PX-1TM8PeG
Plextor	256GB	PCIe3 x4	2280	PX-256M8PeG
Plextor	256GB	PCIe	2280	PX-G256M6e
Plextor	512GB	PCIe3 x4	2280	PX-512M8PeG
Plextor	512GB	PCIe	2280	PX-G512M6e
Samsung	256GB	PCIe3 x4	2280	SM951 (MZHPV256HDGL)
Samsung	256GB	PCIe3 x4	2280	SM951 (NVME)
Samsung	512GB	PCIe3 x4	2280	SM951 (MZHPV512HDGL)
Samsung	512GB	PCIe3 x4	2280	SM951 (NVME)
Samsung	512GB	PCIe x4	2280	XP941-512G (MZHPU512HCGL)
SanDisk	128GB	PCIe	2260	SD6PP4M-128G
SanDisk	256GB	PCIe	2260	SD6PP4M-256G
Team	128GB	SATA3	2242	TM4PS4128GMC105
Team	128GB	SATA3	2280	TM8PS4128GMC105
Team	256GB	SATA3	2280	TM8PS4256GMC105
Team	256GB	SATA3	2242	TM4PS4256GMC105
Transcend	256GB	SATA3	2242	TS256GMTS400
Transcend	512GB	SATA3	2260	TS512GMTS600
Transcend	512GB	SATA3	2280	TS512GMTS800
V-Color	120GB	SATA3	2280	VLM100-120G-2280B-RD
V-Color	240GB	SATA3	2280	VLM100-240G-2280B-RD
V-Color	240GB	SATA3	2280	VSM100-240G-2280

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrock.com

Chapter 3 Software and Utilities Operation

3.1 Installing Drivers

The Support CD that comes with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.EXE" in the Support CD to display the menu.

Drivers Menu

The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click **Install All** or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

> ☆ *To improve Windows 7 compatibility, please download and install the following hot fix provided by Microsoft.*
> *"KB2720599": http://support.microsoft.com/kb/2720599/en-us*

3.2 A-Tuning

A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities.

3.2.1 Installing A-Tuning

A-Tuning can be downloaded from ASRock Live Update & APP Shop. After the installation, you will find the icon "A-Tuning" on your desktop. Double-click the "A-Tuning" ![icon] icon, A-Tuning main menu will pop up.

3.2.2 Using A-Tuning

There are six sections in A-Tuning main menu: Operation Mode, OC Tweaker, System Info, FAN-Tastic Tuning and Settings.

Operation Mode

Choose an operation mode for your computer.
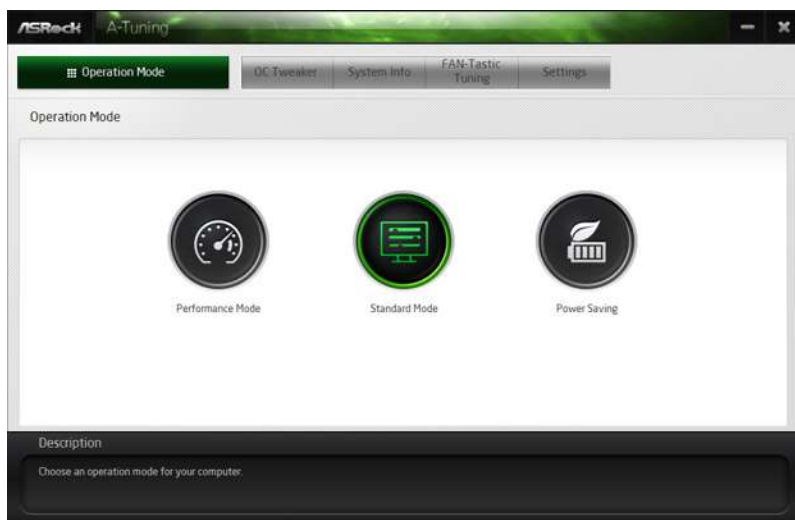
OC Tweaker

Configurations for overclocking the system.
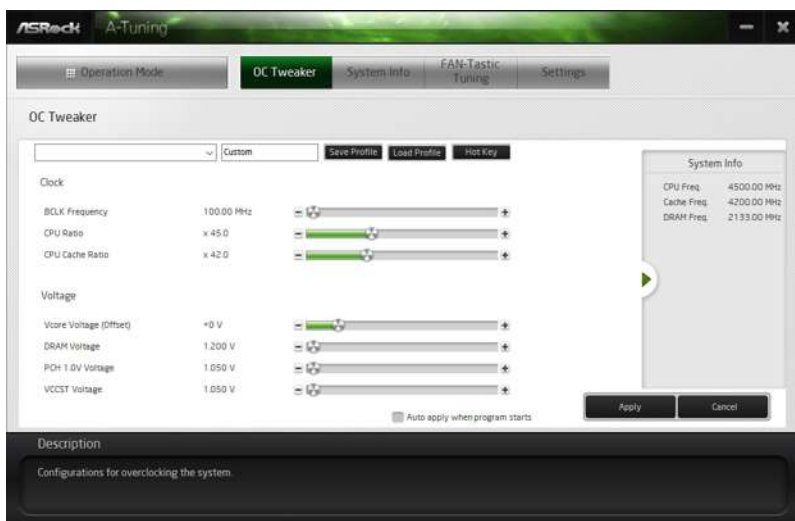
System Info

View information about the system.

*The System Browser tab may not appear for certain models.
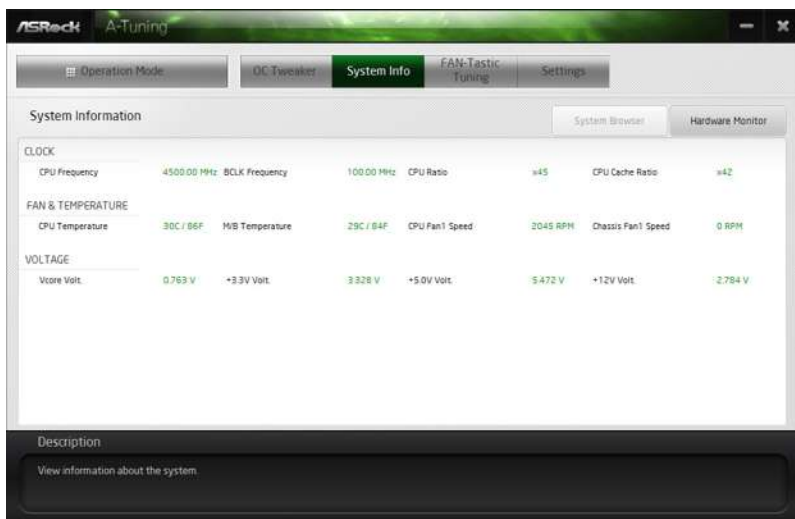
FAN-Tastic Tuning

Configure up to five different fan speeds using the graph. The fans will automatically shift to the next speed level when the assigned temperature is met.

Settings

Configure ASRock A-Tuning. Click to select "Auto run at Windows Startup" if you want A-Tuning to be launched when you start up the Windows operating system.
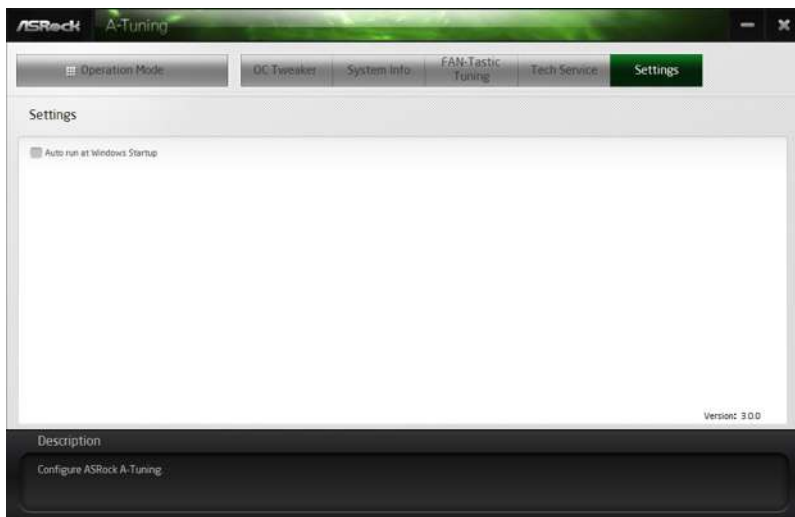
3.3 ASRock Live Update & APP Shop

The ASRock Live Update & APP Shop is an online store for purchasing and downloading software applications for your ASRock computer. You can quickly and easily install various apps and support utilities. With ASRock APP Shop, you can optimize your system and keep your motherboard up to date simply with a few clicks.

Double-click on your desktop to access ASRock Live Update & APP Shop utility.

*You need to be connected to the Internet to download apps from the ASRock Live Update & APP Shop.

3.3.1 UI Overview

Category Panel   Hot News
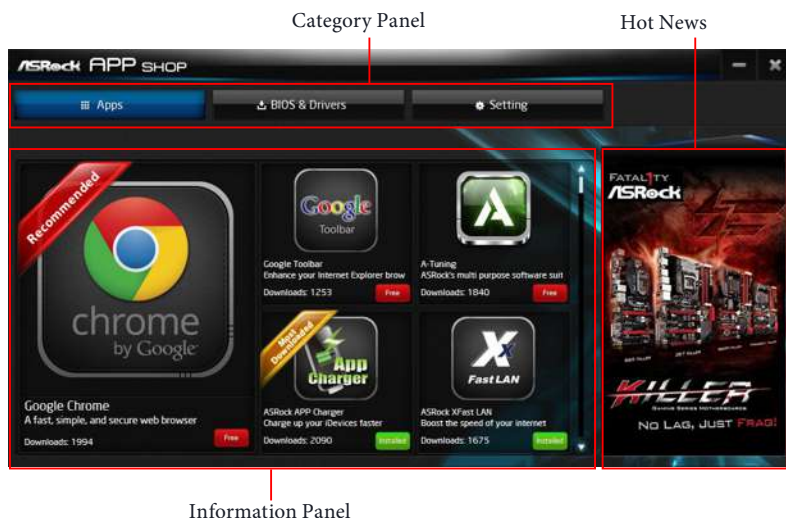
Information Panel

Category Panel: The category panel contains several category tabs or buttons that when selected the information panel below displays the relative information.

Information Panel: The information panel in the center displays data about the currently selected category and allows users to perform job-related tasks.

Hot News: The hot news section displays the various latest news. Click on the image to visit the website of the selected news and know more.

3.3.2 Apps

When the "Apps" tab is selected, you will see all the available apps on screen for you to download.

Installing an App

Step 1

Find the app you want to install.

The most recommended app appears on the left side of the screen. The other various apps are shown on the right. Please scroll up and down to see more apps listed.

You can check the price of the app and whether you have already intalled it or not.

Free - The red icon displays the price or "Free" if the app is free of charge.

Installed - The green "Installed" icon means the app is installed on your computer.

Step 2

Click on the app icon to see more details about the selected app.

Step 3

If you want to install the app, click on the red icon [Free] to start downloading.

Step 4

When installation completes, you can find the green "Installed" icon appears on the upper right corner.

To uninstall it, simply click on the trash can icon 🗑.
*The trash icon may not appear for certain apps.

Upgrading an App

You can only upgrade the apps you have already installed. When there is an available new version for your app, you will find the mark of "New Version" appears below the installed app icon.

Step 1

Click on the app icon to see more details.

Step 2

Click on the yellow icon to start upgrading.

3.3.3 BIOS & Drivers

Installing BIOS or Drivers

When the "BIOS & Drivers" tab is selected, you will see a list of recommended or critical updates for the BIOS or drivers. Please update them all soon.
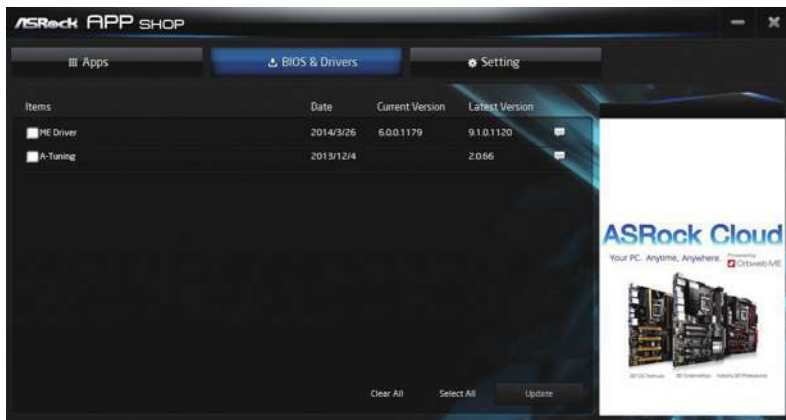
Step 1

Please check the item information before update. Click on 🖳 to see more details.

Step 2

Click to select one or more items you want to update.

Step 3

Click Update to start the update process.

3.3.4 Setting

In the "Setting" page, you can change the language, select the server location, and determine if you want to automatically run the ASRock Live Update & APP Shop on Windows startup.

3.4 Enabling USB Ports for Windows® 7 Installation

Intel® new processors have removed removed their support for the Enhanced Host Controller Interface (EHCI – USB2.0) and only kept the eXtensible Host Controller Interface (XHCI – USB3.0). Due to that fact that XHCI is not included in the Windows 7 inbox drivers, users may find it difficult to install Windows 7 operating system because the USB ports on their motherboard won't work. In order for the USB ports to function properly, please create a Windows® 7 installation disk with the Intel® USB 3.0 eXtensible Host Controller (xHCI) drivers packed into the ISO file.

Requirements
•   A Windows® 7 installation disk or USB drive
•   USB 3.0 drivers (included in the ASRock Support CD or website)
•   A Windows® PC
•   Win7 USB Patcher (included in the ASRock Support CD or website)

Scenarios

You have an ODD and PS/2 ports:

If there is an optical disc drive, PS/2 ports and PS/2 Keyboard or mouse on your computer, you can skip the instructions below and go ahead to install Windows® 7 OS.

You've got nothing:

If you do not have an optical disc drive, please find another computer and follow the instructions below to create a new ISO file with the "Win7 USB Patcher". Then use the new patched Windows® 7 installation USB drive to install Windows® 7 OS.

English

Instructions
Step 1

Insert the Windows® 7 installation disk or USB drive to your system.

Step 2

Extract the tool (Win7 USB Patcher) and launch it.

Step 3

Select the "Win7 Folder" from Step1 by clicking the red circle as shown as the picture below.

Step 4

Select the "USB Driver Folder" by clicking the red circle as shown as the picture below.

If you are using ASRock's Support CD for the USB 3.0 driver, please select your CD-ROM.

Step 5

Select where to save the ISO file by pressing the red circle as shown as the picture below.

Step 6

If you want to burn the patched image to a CD, please check "Burn Image" and select "Target Device to Burn". If not, the patched ISO image will be exported to the destination selected in Step5. Then Press "Start" to proceed.

Step 7

Now you are able to install Windows® 7 on processors with the new burned CD. Or please use the patched ISO image to make an OS USB drive to install the OS.

3.5 ASRock AURA RGB LED

ASRock AURA RGB LED allows you to build your own colorful lighting system. By connecting LED strip, you can adjust the RGB LED color through ASRock AURA RGB LED utility.

Drag the tab to customize your preference.

Toggle on/off the RGB LED switch

Select a RGB LED light effect from the drop-down menu.

Apply the settings
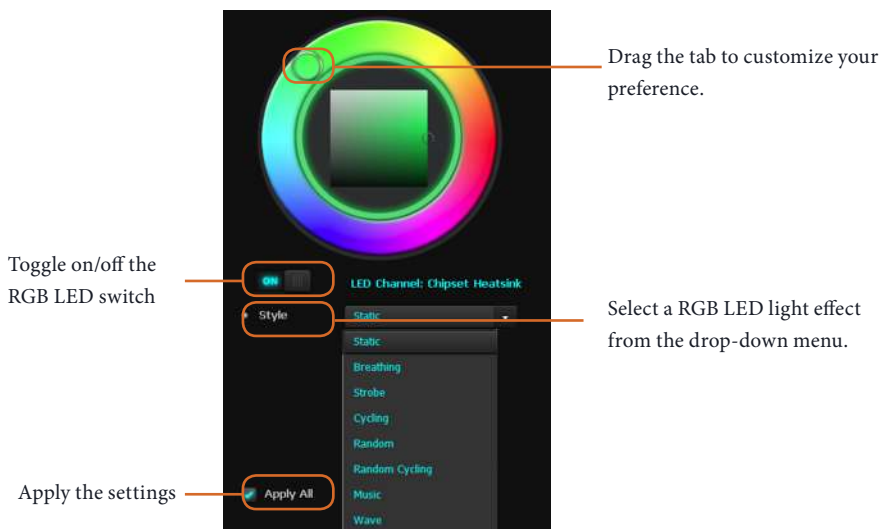
Chapter 4 UEFI SETUP UTILITY

4.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. You may run the UEFI SETUP UTILITY by pressing <F2> or <Del> right after you power on the computer, otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

English

4.2 EZ Mode

The EZ Mode screen appears when you enter the BIOS setup program by default. EZ mode is a dashboard which contains multiple readings of the system's current status. You can check the most crucial information of your system, such as CPU speed, DRAM frequency, SATA information, fan speed, etc.

Press <F6> or click the "Advanced Mode" button at the upper right corner of the screen to switch to "Advanced Mode" for more options.

No.	Function
1	Help
2	Load UEFI Defaults
3	Save Changes and Exit
4	Discard Changes
5	Change Language
6	Switch to Advanced Mode

4.3 Advanced Mode

The Advanced Mode provides more options to configure the BIOS settings. Refer to the following sections for the detailed configurations.

To access the EZ Mode, press <F6> or click the "EZ Mode" button at the upper right corner of the screen.

4.3.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
OC Tweaker	For overclocking configurations
Advanced	For advanced system configurations
Tool	Useful tools
H/W Monitor	Displays current hardware status
Security	For security settings
Boot	For configuring boot settings and boot priority
Exit	Exit the current screen or the UEFI Setup Utility

English

4.3.2 Navigation Keys

Use <◄─> key or <─►> key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
+ / -	To change option for the selected items
<Tab>	Switch to next function
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F5>	Add / Remove Favorite
<F7>	Discard changes and exit the SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

4.4 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.

Favorite

Display your collection of BIOS items. Press F5 to add/remove your favorite items.

4.5 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.

> *Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.*

Load Optimized CPU OC Setting

You can use this option to load optimized CPU overclocking setting. Please note that overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

CPU Configuration

Multi Core Enhancement

Improve the system's performance by forcing the CPU to perform the highest frequency on all CPU cores simultaneously. Disable to reduce power consumption .

CPU Ratio

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the CPU Ratio will increase the internal CPU clock speed without affecting the clock speed of other components.

CPU Cache Ratio

The CPU Internal Bus Speed Ratio. The maximum should be the same as the CPU Ratio.

Minimum CPU Cache Ratio

Set the minimum CPU Internal Bus Speed Ratio.

BCLK Frequency

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the BCLK will increase the internal CPU clock speed but also affect the clock speed of other components.

Spread Spectrum

Enable Spread Spectrum to reduce electromagnetic interference for passing EMI tests. Disable to achieve higher clock speeds when overclocking.

CPU Amplitude

Configure the CPU Amplitude.

CPU Slew Rate

Adjust the BCLK signal by defining the maximum change rate of the output voltage. Higher values will result in a shorter signal rising time.

CPU PLL ORT

Configure the CPU PLL ORT.

Divider

The default is set to 4 where the max BCLK is 300 MHz, while divider 12 lowers the max BCLK to 170 MHz, and divider 2 turns it into 300+ MHz.

Boot Performance Mode

Select the performance state that the BIOS will set before OS handoff.

Reliability Stress Restrictor

Disable or Enable Reliability Stress Restrictor feature.

FCLK Frequency

Configure the FCLK Frequency.

AVX Ratio Offset

AVX Ratio Offset specifies a negative offset from the CPU Ratio for AVX workloads. AVX is a more stressful workload that lower the AVX ratio to ensure maximum possible ratio for SSE workloads.

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

Intel Speed Shift Technology

Enable/Disable Intel Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

Long Duration Power Limit

Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Long Duration Maintained

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.

Short Duration Power Limit

Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

System Agent Current Limit

Configure the current limit of the system agent. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

CPU Core Current Limit

Configure the current limit of the CPU core. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

DRAM Configuration

DRAM Tweaker

Fine tune the DRAM settings by leaving marks in checkboxes. Click OK to confirm and apply your new settings.

DRAM Timing Configuration

Load XMP Setting

Load XMP settings to overclock the DDR memory and perform beyond standard specifications.

BCLK Frequency

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the BCLK will increase the internal CPU clock speed but also affect the clock speed of other components.

DRAM Reference Clock

Select Auto for optimized settings.

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

Primary Timing

CAS# Latency (tCL)

The time between sending a column address to the memory and the beginning of the data in response.

RAS# to CAS# Delay and Row Precharge (tRCDtRP) O

RAS# to CAS# Delay : The number of clock cycles required between the opening of a row of memory and accessing columns within it.
Row Precharge: The number of clock cycles required between the issuing of the precharge command and opening the next row.

RAS# Active Time (tRAS)

The number of clock cycles required between a bank active command and issuing the precharge command.

Command Rate (CR)

The delay between when a memory chip is selected and when the first active command can be issued.

Secondary Timing

Write Recovery Time (tWR)

The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged.

Refresh Cycle Time (tRFC)

The number of clocks from a Refresh command until the first Activate command to the same rank.

RAS to RAS Delay (tRRD_L)

The number of clocks between two rows activated in different banks of the same rank.

RAS to RAS Delay (tRRD_S)

The number of clocks between two rows activated in different banks of the same rank.

Write to Read Delay (tWTR_L)

The number of clocks between the last valid write operation and the next read command to the same internal bank.

Write to Read Delay (tWTR_S)

The number of clocks between the last valid write operation and the next read command to the same internal bank.

Read to Precharge (tRTP)

The number of clocks that are inserted between a read command to a row precharge command to the same rank.

Four Activate Window (tFAW)

The time window in which four activates are allowed the same rank.

CAS Write Latency (tCWL)

Configure CAS Write Latency.

Third Timing

tREFI
Configure refresh cycles at an average periodic interval.

tCKE
Configure the period of time the DDR4 initiates a minimum of one refresh command internally once it enters Self-Refresh mode.

tRDRD_sg
Configure between module read to read delay.

tRDRD_dg
Configure between module read to read delay.

tRDRD_dr
Configure between module read to read delay.

tRDRD_dd
Configure between module read to read delay.

tRDWR_sg
Configure between module read to write delay.

tRDWR_dg
Configure between module read to write delay.

tRDWR_dr
Configure between module read to write delay.

tRDWR_dd
Configure between module read to write delay.

tWRRD_sg
Configure between module write to read delay.

tWRRD_dg
Configure between module write to read delay.

tWRRD_dr

Configure between module write to read delay.

tWRRD_dd
Configure between module write to read delay.

tWRWR_sg
Configure between module write to write delay.

tWRWR_dg
Configure between module write to write delay.

tWRWR_dr
Configure between module write to write delay.

tWRWR_dd
Configure between module write to write delay.

RTL Init Value
Configure round trip latency init value for round trip latency training.

IO-L Init Value
Configure IO latency init value for IO latency traning.

RTL (CH A)
Configure round trip latency for channel A.

RTL (CH B)
Configure round trip latency for channel B.

IO-L (CH A)
Configure IO latency for channel A.

IO-L (CH B)
Configure IO latency for channel B.

IO-L Offset (CH A)
Configure IO latency offset for channel A.

IO-L Offset (CH B)
Configure IO latency offset for channel B.

RFR Delay (CH A)

Configure RFR Delay for Channel A.

RFR Delay (CH B)

Configure RFR Delay for Channel B.

Advanced Setting

MRC Fast Boot

Enable Memory Fast Boot to skip DRAM memory training for booting faster.

ODT WR (CH A)

Configure the memory on die termination resistors' WR for channel A.

ODT WR (CH B)

Configure the memory on die termination resistors' WR for channel B.

ODT PARK (CH A)

Configure the memory on die termination resistors' PARK for channel A.

ODT PARK (CH B)

Configure the memory on die termination resistors' PARK for channel B.

ODT NOM (CH A)

Use this to change ODT (CH A) Auto/Manual settings. The default is [Auto].

ODT NOM (CH B)

Use this to change ODT (CH B) Auto/Manual settings. The default is [Auto].

Dll Bandwidth 0

Configure the Dll Bandwidth 0.

Dll Bandwidth 1

Configure the Dll Bandwidth 1.

Dll Bandwidth 2

Configure the Dll Bandwidth 2.

Dll Bandwidth 3

Configure the Dll Bandwidth 3.

Voltage Configuration

CPU Vcore Voltage

Configure the voltage for the CPU Vcore.

CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy loading.

DRAM Voltage

Use this to configure DRAM Voltage. The default value is [Auto].

DRAM Activating Power Supply

Configure the voltage for the DRAM Activating Power Supply.

VTT DDR Voltage

Configure the VTT DDR Voltage.

PCH +1.0 Voltage

Configure the chipset voltage (1.0V).

PCH PLL Voltage

PCH PLL voltage helps BCLK overclocking, also slightly improves memory overclocking.

VCCIO Voltage

Configure the voltage for the VCCIO.

Boot CPU PLL Voltage

CPU PLL voltage for BCLK and memory training. CPU PLL volt helps BCLK overclocking, also slightly improves memory overclocking. Setting this voltage higher helps CPU cold bug under LN2 cooling. Keep CPU PLL Voltage around 1.650V-1.800V will improve cold bug under LN2 benching.

Eventual CPU PLL Voltage

CPU PLL Voltage used for botting into OS. CPU PLL volt helps BCLK overclocking, also slightly improves memory overclocking. Setting this voltage higher helps CPU cold bug under LN2 cooling. Keep CPU PLL Voltage around 1.650V-1.800V will improve cold bug under LN2 benching.

VCCSA Voltage

Configure the voltage for the VCCSA.

VCC PLL Voltage

VCC PLL helps BCLK overclocking. Also this voltage rail is input source of CPU internal PLL voltage. Please set this voltage as 1.400V~1.500V when CPU is under LN2 benching. Very few CPU requests 2.500V~2.800V to get rid of cold bug.

CPU Cold Bug Killer Voltage

CPU Cold Bug Killer Voltage. Recommended to set 2.200V~2.400V for Ln2 benching. It will solve most of CPU cold bug.

CLK VDD Voltage

Configure the CLK VDD Voltage.

DMI Voltage

Some CPU request 1.400V~1.800V to get rid of cold bug. Especially benching 3D with Gen3 mode.

CPU Internal PLL Voltage

Default is 0.900V. Each step is 0.015V. Adding 9- 15 steps will helps CPU PLL to lock internal clock during High frequency under Ln2 cooling. For example: 1.020V - 1.125V will be proper value. But the voltage level will be different on each processor. User has to find the best value for your own processor. CPU Vcore Voltage must higher than CPU Internal PLL Voltage, or your processor will hang.

Save User Default

Type a profile name and press enter to save your settings as user default.

Load User Default

Load previously saved user defaults.

Save User UEFI Setup Profile to Disk

Save current UEFI settings as an user default profile to disk.

Load User UEFI Setup Profile from Disk

Load previously saved user defaults from the disk.

English

4.6 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration, USB Configuration and Trusted Computing.

Setting wrong values in this section may cause the system to malfunction.

UEFI Configuration

UEFI Setup Style

Select the default mode when entering the UEFI setup utility.

Active Page on Entry

Select the default page when entering the UEFI setup utility.

Full HD UEFI

When [Auto] is selected, the resolution will be set to 1920 x 1080 if the monitor supports Full HD resolution. If the monitor does not support Full HD resolution, then the resolution will be set to 1024 x 768. When [Disable] is selected, the resolution will be set to 1024 x 768 directly.

4.6.1 CPU Configuration

Active Processor Cores

Select the number of cores to enable in each processor package.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

CPU C3 State Support

Enable C3 sleep state for lower power consumption.

CPU C6 State Support

Enable C6 sleep state for lower power consumption.

CPU C7 State Support

Enable C7 sleep state for lower power consumption.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

CFG Lock

This item allows you to disable or enable the CFG Lock.

CPU Thermal Throttling

Enable CPU internal thermal control mechanisms to keep the CPU from overheating.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

SW Guard Extensions (SGX)

Intel SGX is a set of new CPU instructions that can be used by applications to set aside private regions of code and data.

4.6.2 Chipset Configuration

Primary Graphics Adapter

Select a primary VGA.

Top Of Lower Usable Dram

Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

PCIE1 Link Speed

Select the link speed for PCIE1.

PCIE2 Link Speed

Select the link speed for PCIE2.

PCIE3 Link Speed

Select the link speed for PCIE3.

PCIE4 Link Speed

Select the link speed for PCIE4.

PCIE5 Link Speed

Select the link speed for PCIE5.

PCI Express Native Control

Select Enable for enhanced PCI Express power saving in OS.

PCIE ASPM Support

This option enables/disables the ASPM support for all CPU downstream devices.

PCH PCIE ASPM Support

This option enables/disables the ASPM support for all PCH PCIE devices.

DMI ASPM Support

This option enables/disables the control of ASPM on CPU side of the DMI Link.

PCH DMI ASPM Support

This option enables/disables the ASPM support for all PCH DMI devices.

IOAPIC 24-119 Entries

I/O APICs contain a redirection table, which is used to route the interrupts it receives from peripheral buses to one or more local APICs. Enable/disable IOAPIC 24-119 Entries to expand to PIROI-PIROX.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

IGPU Multi-Monitor

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

Inte(R) Ethernet Connection I219-V

Enable or disable the onboard network interface controller (Intel® I219V).

Inte(R) Ethernet Connection I211

Enable or disable the onboard network interface controller (Intel® I211).

Onboard HD Audio

Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.

Front Panel

Enable/disable front panel HD audio.

WAN Radio

Enable/disable the WiFi module's connectivity.

Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down.

Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

Onboard Debug Port LED

Enable/disable the onboard Dr. Debug LED.

4.6.3 Storage Configuration

SATA Controller(s)

Enable/disable the SATA controllers.

SATA Controller(s)

Indicates the maximum speed the SATA controller can support.

SATA Mode Selection

AHCI: Supports new features that improve performance.

RAID: Combine multiple disk drives into a logical unit.

SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode.

Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

4.6.4 Intel® Thunderbolt™

Intel(R) Thunderbolt Technology

Enable/Disable the Intel(R) Thunderbolt function.

Security Level

Allows you to choose a security level for the Thunderbolt ports.

4.6.5 Super IO Configuration

PS2 Y-Cable

Enable the PS2 Y-Cable or set this option to Auto.

4.6.6 ACPI Configuration

Suspend to RAM

Select disable for ACPI suspend type S1. It is recommended to select auto for ACPI S3 power saving.

ACPI HEPT Table

Enable the High Precision Event Timer for better performance.

PS/2 Keyboard Power On

Allow the system to be waked up by a PS/2 Keyboard.

PCIE Devices Power On

Allow the system to be waked up by a PCIE device and enable wake on LAN.

RTC Alarm Power On

Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

USB Keyboard/Remote Power On

Allow the system to be waked up by an USB keyboard or remote controller.

USB Mouse Power On

Allow the system to be waked up by an USB mouse.

4.6.7 USB Configuration

Legacy USB Support

Enable or disable Legacy OS Support for USB 2.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support. Select UEFI Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only.

PS/2 Simulator

Enable PS/2 Simulator. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
*Enable this option if you install Windows 7.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI owner-ship change should be claimed by XHCI driver.

PS2_KB1_USB3 PORT1

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

PS2_KB1_USB3 PORT2

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

5GLAN_USB3 PORT4

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

5GLAN_USB3 PORT5

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT10

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT11

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT12

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT13

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT14

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT15

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

USB PORT16

Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

4.6.8 Trusted Computing

Security Device Support

Enable or disable BIOS support for security device.

4.7 Tools

System Browser

ASRock System Browser shows the overview of your current PC and the devices connected.

UEFI Tech Service

Contact ASRock Tech Service if you are having trouble with your PC. Please setup network configuration before using UEFI Tech Service.

Easy RAID Installer

Easy RAID Installer helps you to copy the RAID driver from the support CD to your USB storage device. After copying the drivers please change the SATA mode to RAID, then you can start installing the operating system in RAID mode.

Boot Manager

Boot Manager is specifically designed for the dual OS platform/multi-OS platform users to easily customize and manage the boot menu.
*Please connect more than one boot devices to use this tool.

Boot Manager

Enable/disable the Boot Manager.

Boot Manager Timeout

Enable/disable the Boot Manager Timeout.

Timeout Seconds

Configure the number of seconds to wait for the Boot Manager.

Instant Flash

Save UEFI files in your USB storage device and run Instant Flash to update your UEFI.

Internet Flash - DHCP (Auto IP), Auto

ASRock Internet Flash downloads and updates the latest UEFI firmware version from our servers for you. Please setup network configuration before using Internet Flash.

*For BIOS backup and recovery purpose, it is recommended to plug in your USB pen drive before using this function.

Secure Backup UEFI

Whenever one of the ROM images are outdated or corrupted, switch to the other flash ROM and execute Secure Backup UEFI to duplicate the current working ROM

image to the secondary flash ROM.

Network Configuration

Use this to configure internet connection settings for Internet Flash.

Internet Setting

Enable or disable sound effects in the setup utility.

UEFI Download Server

Select a server to download the UEFI firmware.

4.8 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, fan speed and voltage.

Fan Tuning

Measure Fan Min Duty Cycle.

Fan-Tastic Tuning

Select a fan mode for CPU Fans 1&2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Fan 1 Setting

Select a fan mode for CPU Fans 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Fan Step Up

Set the value of CPU Fan Step Up.

CPU Fan Step Down

Set the value of CPU Fan Step Down.

CPU_OPT / W_Pump Switch

Select CPU Optional or Water Pump mode.

CPU Optional Fan Control Mode

Select PWM mode or DC mode for CPU Optional fan.

CPU Optional Fan Setting

Select a fan mode for CPU Optional fan, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Optional Fan Temp Source

Select a fan temperature source for CPU Optional fan.

CPU Optional Fan Step Up

Set the value of CPU Optional fan Step Up.

CPU Optional Fan Step Down

Set the value of CPU Optional fan S-tep Down.

Chassis Fan 1 Setting

Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 1 Temp Source

Select a fan temperature source for Chassis Fan 3.

Chassis Fan 1 Step Up

Set the value of Chassis Fan 1 Step Up.

Chassis Fan 1 Step Down

Set the value of Chassis Fan 1 Step Down.

Chassis Fan 2 Setting

Select a fan mode for Chassis Fan 2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 2 Temp Source

Select a fan temperature source for Chassis Fan 3.

Chassis Fan 2 Step Up

Set the value of Chassis Fan 1 Step Up.

English

Chassis Fan 2 Step Down

Set the value of Chassis Fan 1 Step Down.

CHA_FAN3 / W_Pump Switch

Select CHA_FAN3/CPU Optional or Water Pump mode.

Chassis Fan 3 Control Mode

Select PWM mode or DC mode for Chassis Fan 3.

Chassis Fan 3 Setting

Select a fan mode for Chassis Fan 3, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 3 Temp Source

Select a fan temperature source for Chassis Fan 3.

Chassis Fan 3 Step Up

Set the value of Chassis Fan 1 Step Up.

Chassis Fan 3 Step Down

Set the value of Chassis Fan 1 Step Down.

Over Temperature Protection

When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated.

4.9 Security Screen

In this section you may set or change the supervisor/user password for the system. You may also clear the user password.

Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Use this item to enable or disable support for Windows 8.1 Secure Boot.

Intel(R) Platform Trust Technology

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

4.10 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.

Boot From Onboard LAN

Allow the system to be waked up by the onboard LAN.

Setup Prompt Timeout

Configure the number of seconds to wait for the setup hot key.

Bootup Num-Lock

Select whether Num Lock should be turned on or off when the system boots up.

Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

Full Screen Logo

Enable to display the boot logo or disable to show normal POST messages.

AddOn ROM Display

Enable AddOn ROM Display to see the AddOn ROM messages or configure the AddOn ROM if you've enabled Full Screen Logo. Disable for faster boot speed.

Boot Failure Guard

If the computer fails to boot for a number of times the system automatically restores the default settings.

Boot Failure Guard Count

Configure the number of attempts to boot until the system automatically restores the default settings.

CSM (Compatibility Support Module)

CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows 8.1 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

Launch Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

4.11 Exit Screen

Save Changes and Exit

When you select this option the following message, "Save configuration changes and exit setup?" will pop out. Select [OK] to save changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option the following message, "Discard changes and exit setup?" will pop out. Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option the following message, "Discard changes?" will pop out. Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all options. The F9 key can be used for this operation.

Launch EFI Shell from filesystem device

Copy shellx64.efi to the root directory to launch EFI Shell.

Contact Information

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information. For technical questions, please submit a support request form at http://www.asrock.com/support/tsd.asp

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