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GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

X470D4U
B450D4U-V1L



User Manual

English



Version 1.0

Published August 2019

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at www.ASRockRack.com; or you may contact your dealer for further information.

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Contents

Chapter 1 Introduction	1
1.1 Package Contents	1
1.2 Specifications	2
1.3 Unique Features	6
1.4 Motherboard Layout	7
1.5 Onboard LED Indicators	10
1.6 I/O Panel	12
1.7 Block Diagram	14
Chapter 2 Installation	16
2.1 Screw Holes	16
2.2 Pre-installation Precautions	16
2.3 Installing the CPU	17
2.4 Installing the CPU Fan and Heatsink	19
2.5 Installing Memory Modules (DIMM)	22
2.6 Expansion Slots (PCI Express Slots)	24
2.7 Jumpers Setup	26
2.8 Onboard Headers and Connectors	28
2.9 Dr. Debug	34
2.10 Unit Identification purpose LED/Switch	40
2.11 Driver Installation Guide	40
2.12 M.2_SSD (NGFF) Module Installation Guide (X470D4U only)	41
Chapter 3 UEFI Setup Utility	43
3.1 Introduction	43

3.1.1	UEFI Menu Bar	43
3.1.2	Navigation Keys	44
3.2	Main Screen	45
3.3	Advanced Screen	46
3.3.1	CPU Configuration	47
3.3.2	Chipset Configuration	48
3.3.3	Storage Configuration	49
3.3.4	ACPI Configuration	50
3.3.5	USB Configuration	51
3.3.6	Super IO Configuration	52
3.3.7	H/W Monitor	53
3.3.8	AMD CBS	55
3.3.9	AMD PBS	56
3.3.10	Instant Flash	59
3.4	Server Mgmt	60
3.4.1	System Event Log	61
3.4.2	BMC Network Configuration	62
3.5	Security	64
3.5.1	Key Management	65
3.6	Boot Screen	68
3.6.1	CSM Parameters	70
3.7	Exit Screen	72
	Chapter 4 Software Support	73
4.1	Install Operating System	73

4.2	Support CD Information	73
4.2.1	Running The Support CD	73
4.2.2	Drivers Menu	73
4.2.3	Utilities Menu	73
4.2.4	Contact Information	73
	Chapter 5 Troubleshooting	74
5.1	Troubleshooting Procedures	74
5.2	Technical Support Procedures	76
5.3	Returning Merchandise for Service	76

Chapter 1 Introduction

Thank you for purchasing ASRock Rack **X470D4U / B450D4U-V1L** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock Rack website without further notice. You may find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com

*If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
<http://www.asrockrack.com/support/>*

1.1 Package Contents

- ASRock Rack X470D4U / B450D4U-V1L Motherboard
(micro-ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm)
- Quick Installation Guide
- 1 x I/O Shield
- 1 x SATA3 Cable (60cm)
- 2 x Screws for M.2 Sockets (*X470D4U only*)



If any items are missing or appear damaged, contact your authorized dealer.

1.2 Specifications

X470D4U / B450D4U-V1L	
MB Physical Status	
Form Factor	micro-ATX
Dimension	9.6" x 9.6" (24.4 cm x 24.4 cm)
Processor System	
CPU	AMD AM4 Socket Ryzen™ PRO/ Ryzen™ 2 nd and 3 rd generation series processors
Socket	AM4 PGA 1331
Chipset	AMD X470 / B450
System Memory	
Capacity	- 4 x 288-pin DDR4 DIMM slots - Support up to 128GB DDR4 ECC/UDIMM
Type	- Dual Channel DDR4 memory technology - Support DDR4 ECC/UDIMM* <i>*For Picasso and Raven Ridge CPUs, ECC is only supported with PRO CPUs. **Conditionally supports ECC error reporting function.</i>
DIMM Size Per DIMM	- ECC/UDIMM: 32GB, 16GB, 8GB
DIMM Frequency	- ECC/UDIMM: 3200/2933/2666/2400/2133 MHz
Voltage	1.2V
Expansion Slot	
PCIe 3.0 x 16	X470D4U: PCIe6: Gen3 x16 link (splittable in x4/4/4/4); auto switch to x8 link when PCIe4 is occupied. PCIe4: Gen3 x8 link B450D4U-V1L: PCIe6: Gen3 x16 link (splittable in x4/4/4/4)
PCIe 3.0 x 8	PCIe5: Gen3 x4 link
Storage	
SATA Controller	X470D4U: 6 x SATA3 6.0 Gb/s (1x SATA DOM port), support RAID 0, 1, 10 B450D4U-V1L: 2 x SATA3 6.0 Gb/s, support RAID 0, 1
Additional SATA Controller	X470D4U: Asmedia 1061: 2 x SATA3 6.0 Gb/s B450D4U-V1L: N/A
M.2 Slot	X470D4U: 2 (2242/2260/2280/22110, supports SATA3 and PCIe 3.0 x2 or supports PCIe 2.0 x4 only) B450D4U-V1L: N/A
Ethernet	
Interface	1000 /100 /10 Mbps by Intel I210AT

LAN Controller	<p>X470D4U:</p> <ul style="list-style-type: none"> - 2 x RJ45 GLAN by Intel® I210AT - 1 x RJ45 Dedicated IPMI LAN port - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE - LAN1 supports NCSI <p>B450D4U-V1L:</p> <ul style="list-style-type: none"> - 1 x RJ45 GLAN by Intel® I210AT - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports PXE
Management	
BMC Controller	ASPEED AST2500 <i>(X470D4U only)</i>
IPMI Dedicated GLAN	<p>X470D4U:</p> <p>1 x Realtek RTL8211E for dedicated management GLAN</p> <p>B450D4U-V1L:</p> <p>N/A</p>
Features	Watch Dog
Graphics	
Controller	<p>X470D4U: ASPEED AST2500</p> <p>B450D4U-V1L: ASPEED AST2510</p>
VRAM	DDR4 16MB
Rear Panel I/O	
VGA Port	1 x D-Sub
Serial port	<p>X470D4U: 1 x COM port</p> <p>B450D4U-V1L: N/A</p>
USB 3.0 Port	2
LAN Port	<p>X470D4U:</p> <ul style="list-style-type: none"> - 2 x RJ45 Gigabit Ethernet LAN ports - 1 x RJ45 Dedicated IPMI LAN port - LAN Ports with LED (ACT/LINK LED and SPEED LED) <p>B450D4U-V1L:</p> <ul style="list-style-type: none"> - 1 x RJ45 Gigabit Ethernet LAN port - LAN Ports with LED (ACT/LINK LED and SPEED LED)
UID	<p>X470D4U: 1</p> <p>B450D4U-V1L: N/A</p>

Internal Connector	
Auxiliary Panel Header	X470D4U: 1 (includes chassis intrusion, location button & LED, and front LAN LED) B450D4U-V1L: 1 (includes chassis intrusion, and front LAN LED)
TPM Header	1
IPMB Header	X470D4U: 1 B450D4U-V1L: N/A
Fan Header	6 Fans x 4-pin (FAN1(CPU)/FAN2~FAN6(5Front))
ATX Power	1 x (24-pin) + 1 x (8-pin)
USB 3.1 Gen1 Header	1 (supports 2 USB 3.1 Gen1 ports)
M.2	X470D4U: 2 (M2_1: 2242/2260/2280/22110, PCIE(X4); M2_2:2242/2260/2280/22110, SATA/PCIE(X2)) B450D4U-V1L: N/A
SATA DOM	X470D4U: 1 B450D4U-V1L: N/A
BMC_SMB1	X470D4U: 1 B450D4U-V1L: N/A
PSU_SMB1	X470D4U: 1 B450D4U-V1L: N/A
80 debug port LED	1
Buzzer	X470D4U: 1 B450D4U-V1L: N/A
Clear CMOS	1 (short pad)
OH/FanFail LED	6 (only Fan Fail LED)
System BIOS	
BIOS Type	16MB AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8 Support - ASRock Rack Instant Flash
Hardware Monitor	
Temperature	- CPU/DDR temperature sensing - MB/Card side temperature sensing
Fan	- Fan Tachometer - Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) - Fan Multi-Speed Control
Voltage	Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore, DRAM, 1.05V_PCH, +BAT, 3VSB, 5VSB

Support OS	
OS	<p>Microsoft® Windows®: Windows 10 (64 bit)</p> <p>Linux®: - Ubuntu 16.04.4 (64 bit) - RedHat Enterprise Linux Server 7.3 (64bit) - RedHat Enterprise Linux Server 7.4 (64bit)</p> <p><i>* Please refer to our website for the latest OS support list.</i> <i>*The Linux system doesn't support Raid mode.</i> <i>*Supports UEFI BOOT only.</i></p>
Environment	
Temperature	<p>Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C</p>

NOTE: Please refer to our website for the latest specifications.



This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN1&2 can wake up S5 under OS.

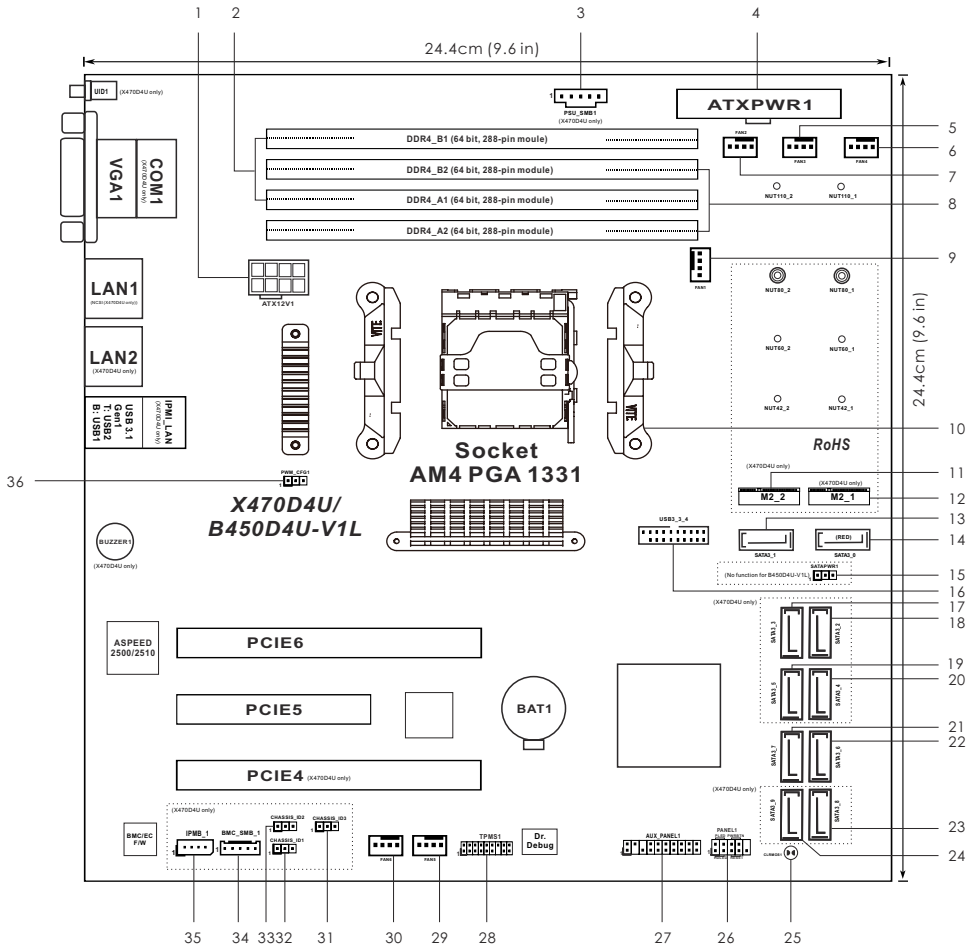


If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

1.3 Unique Features

ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Rack Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

1.4 Motherboard Layout



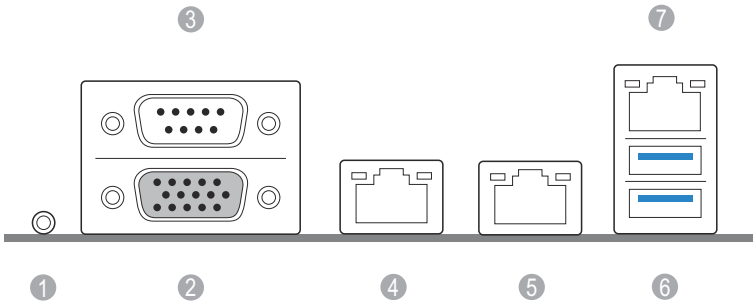
No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, Blue)
3	PSU SMBus Header (PSU_SMB1) <i>(X470D4U only)</i>
4	ATX Power Connector (ATXPWR1)
5	Front Fan Connector (FAN3)
6	Front Fan Connector (FAN4)
7	Front Fan Connector (FAN2)
8	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, White)
9	CPU Fan Connector (FAN1)
10	AM4 PGA 1331 Socket
11	M.2 Socket (M2_2) (Type 2242 / 2260 / 2280 / 22110) <i>(X470D4U only)</i>
12	M.2 Socket (M2_1) (Type 2242 / 2260 / 2280 / 22110) <i>(X470D4U only)</i>
13	SATA3 Connector (SATA3_1)
	X470D4U:
14	SATA3 DOM Connector (SATA3_0)
	B450D4U-V1L:
	SATA3 Connector (SATA3_0)
15	SATA DOM Power Jumper (SATAPWR1) <i>(No function for B450D4U-V1L)</i>
16	USB 3.1 Gen1 Header (USB3_3_4)
17	SATA3 Connector (SATA3_3) <i>(X470D4U only)</i>
18	SATA3 Connector (SATA3_2) <i>(X470D4U only)</i>
19	SATA3 Connector (SATA3_5) <i>(X470D4U only)</i>
20	SATA3 Connector (SATA3_4) <i>(X470D4U only)</i>
21	SATA3 Connector (SATA3_7) <i>(B450D4U-V1L only)</i>
22	SATA3 Connector (SATA3_6) <i>(B450D4U-V1L only)</i>
23	SATA3 Connector (SATA3_8) <i>(X470D4U only)</i>
24	SATA3 Connector (SATA3_9) <i>(X470D4U only)</i>
25	Clear CMOS Pad (CLRMOS1)
26	System Panel Header (PANEL1)
27	Auxiliary Panel Header (AUX_PANEL1)
28	TPM Header (TPMS1)
29	Front Fan Connector (FAN5)
30	Front Fan Connector (FAN6)
31	Chassis ID3 Jumper (CHASSIS_ID3) <i>(X470D4U only)</i>

No.	Description
32	Chassis ID1 Jumper (CHASSIS_ID1) <i>(X470D4U only)</i>
33	Chassis ID2 Jumper (CHASSIS_ID2) <i>(X470D4U only)</i>
34	BMC SMBus Header (BMC_SMB_1) <i>(X470D4U only)</i>
35	Intelligent Platform Management Bus header (IPMB1) <i>(X470D4U only)</i>
36	PWM Configuration Header (PWM_CFG1)

**For DIMM installation and configuration instructions, please see p.22 (Installation of Memory Modules (DIMM)) for more details.*

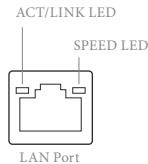
No.	Item	Status	Description
1	SB_PWR1	Green	STB PWR ready
2	FAN_LED4	Amber	FAN4 failed
3	FAN_LED3	Amber	FAN3 failed
4	FAN_LED2	Amber	FAN2 failed
5	FAN_LED1	Amber	FAN1(CPU) failed
6	FAN_LED5	Amber	FAN5 failed
7	FAN_LED6	Amber	FAN6 failed
8	BMC_LED1	Green	BMC heartbeat LED

1.6 I/O Panel



No.	Description	No.	Description
1	UID Switch (UID1) <i>(X470D4U only)</i>	5	GLAN RJ-45 Port (LAN2) <i>(X470D4U only)</i>
2	VGA Port (VGA1)	6	USB 3.1 Gen1 Ports (USB3_1_2)
3	Serial Port (COM1) <i>(X470D4U only)</i>	7	LAN RJ-45 Port (IPMI_LAN1) <i>(X470D4U only)</i>
4	GLAN RJ-45 Port (LAN1)		

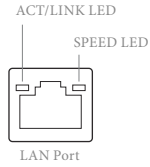
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



Dedicated IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10M bps connection or no link
Blinking Yellow	Data Activity	Yellow	100M bps connection
On	Link	Green	1Gbps connection

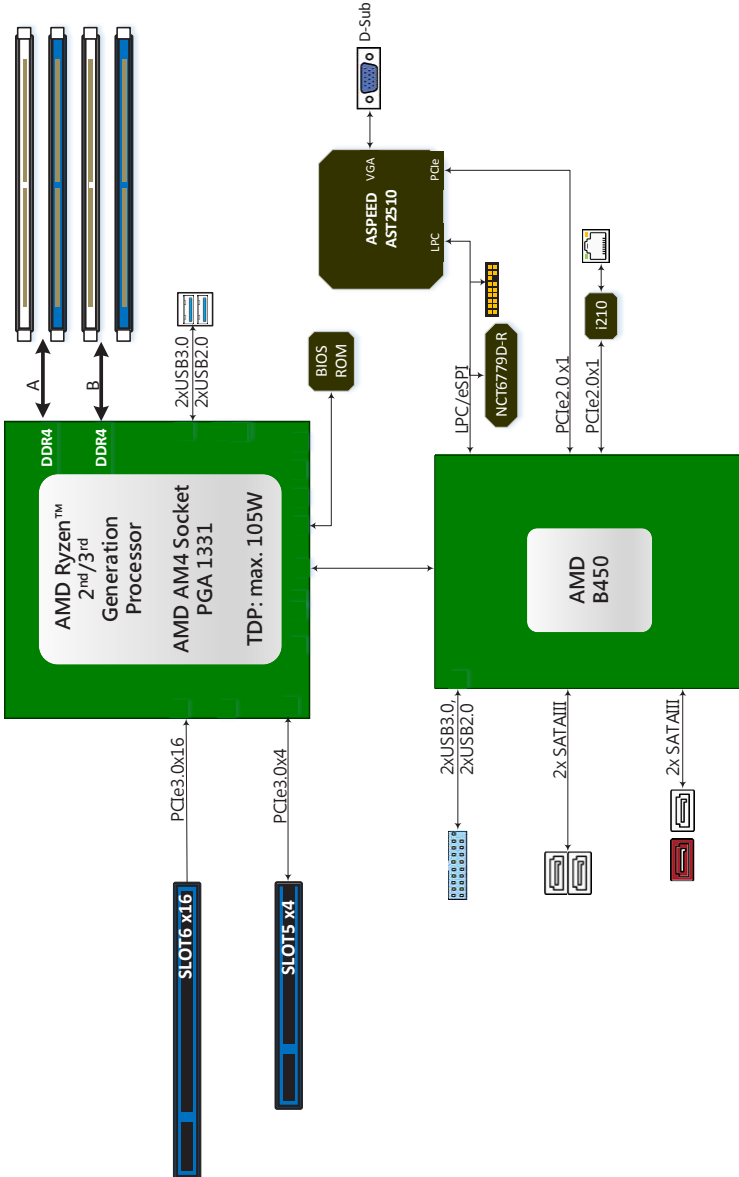
**There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.



LAN Port (LAN1, LAN2) LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection or no link
Blinking Green	Data Activity	Off	100Mbps connection
On	Link	Yellow	1Gbps connection

B450D4U-V1L



Chapter 2 Installation

This is a micro-ATX form factor (9.6" x 9.6", 24.4 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.



Attention! Before installing this motherboard, be sure to unscrew and remove the standoffs at the marked location, under the motherboard, from the chassis, in order to avoid electrical short circuit and damage to your motherboard.



Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

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

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

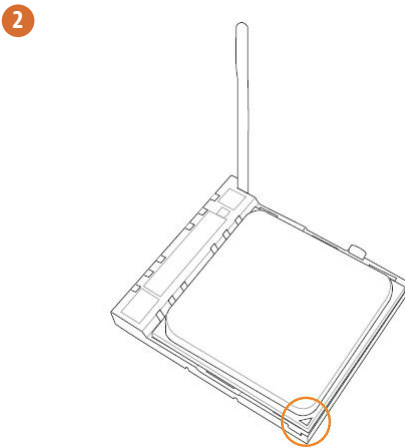
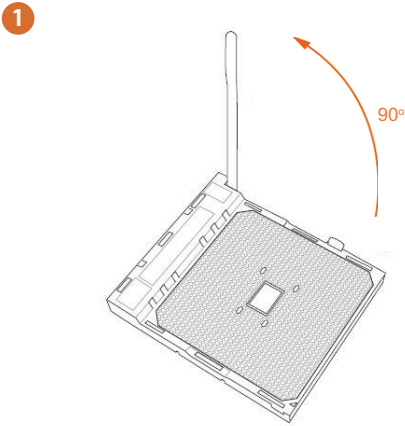


Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

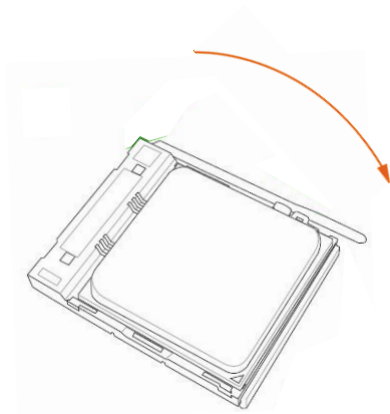
2.3 Installing the CPU



Unplug all power cables before installing the CPU.



3



2.4 Installing the CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other.



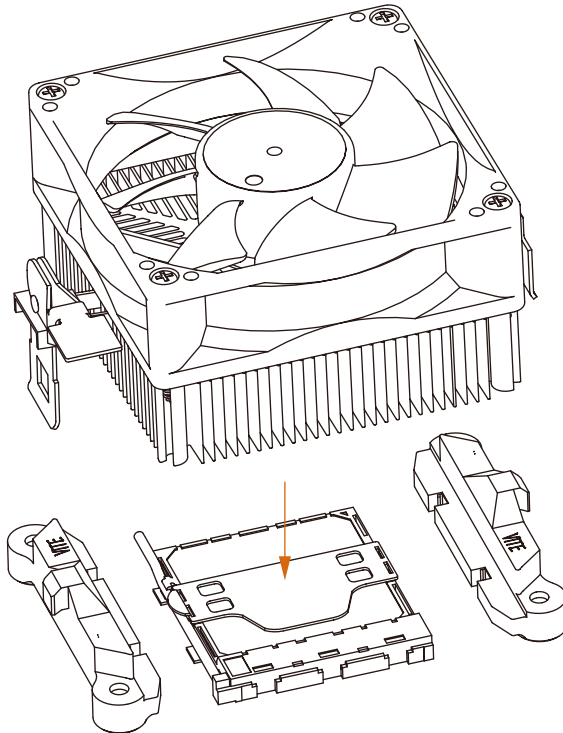
*Please be aware of the maximum dimensions of the heatsink to be used is 116 * 83.65mm.*



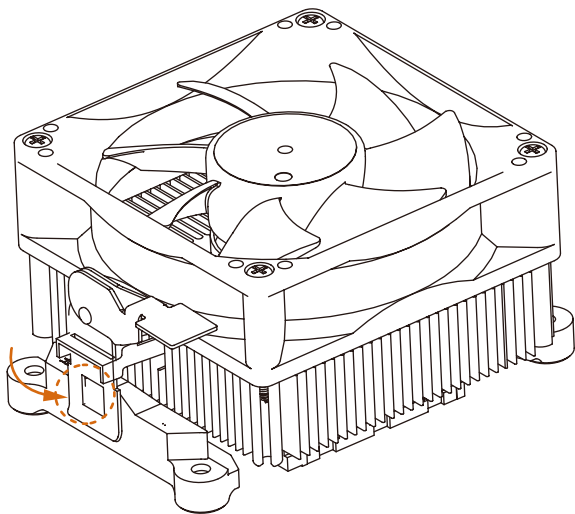
Please turn off the power or remove the power cord before changing a CPU or heatsink.

Installing the CPU Box Cooler SR1

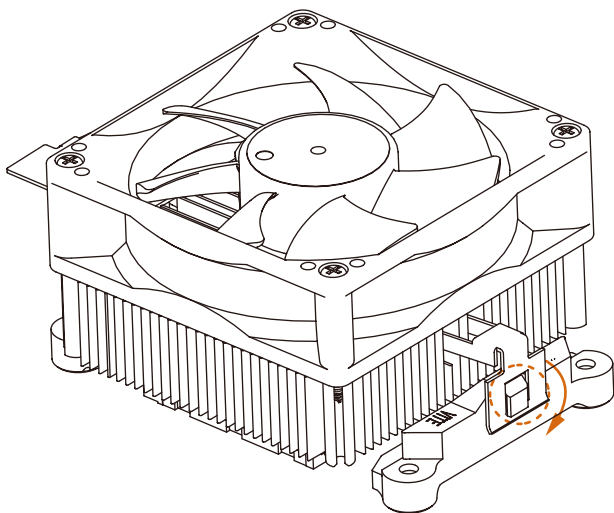
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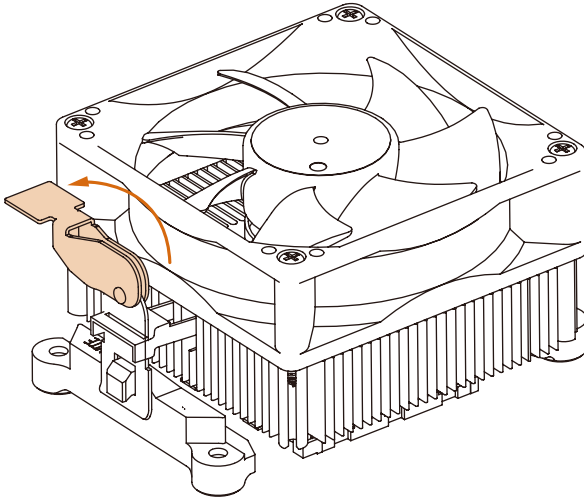
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4



2.5 Installing Memory Modules (DIMM)

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

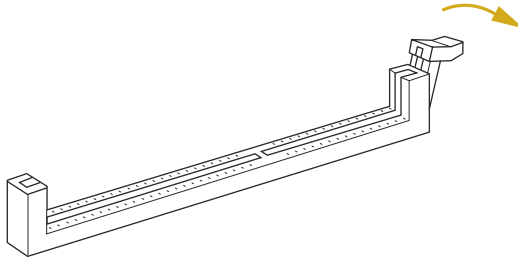


1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.
2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
3. It is not allowed to install a DDR, DDR2 or DDR3 memory module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

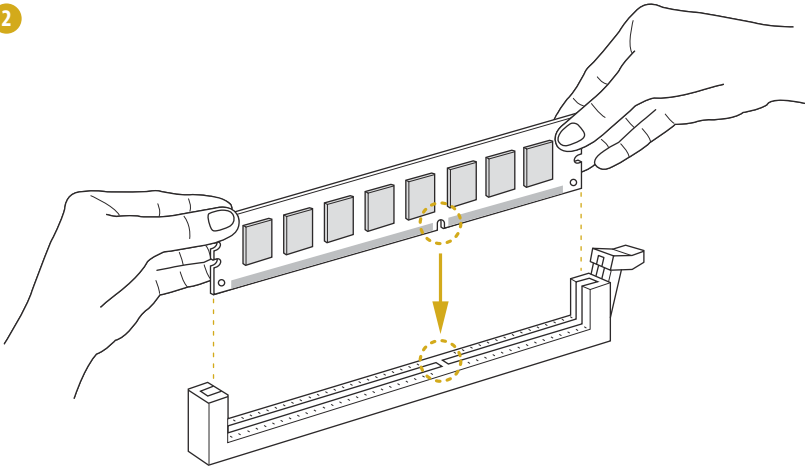
DDR4 UDIMM Maximum Frequency Support

UDIMM Memory Slot				Raven Ridge/ Picasso	Pinnacle Ridge	Matisse
A2	A1	B2	B1	Freq(Mhz)	Freq(Mhz)	Freq(Mhz)
-	SR	-	-	2666	2666	3200
-	DR	-	-	2666	2666	3200
-	SR	-	SR	2666	2666	3200
-	DR	-	DR	2400	2400	3200
SR	SR	SR	SR	2133	2133	2666
DR	DR	DR	DR	1866	1866	2400

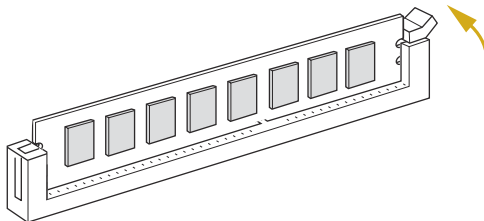
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2



3



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.

2.6 Expansion Slots (PCI Express Slots)

There are 3 PCI Express slots on this motherboard.

PCIe slot:

PCIe4 (PCIe 3.0 x16 slot, from CPU) is used for PCI Express x8 lane width cards. (*X470D4U only*)

PCIe5 (PCIe 3.0 x8 slot, from CPU) is used for PCI Express x4 lane width cards.

PCIe6 (PCIe 3.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIe6	3.0	x16	x16	CPU
PCIe5	3.0	x8	x4	CPU
PCIe4 (<i>X470D4U only</i>)	3.0	x16	x8	CPU

PCIe Slot Configurations (*X470D4U only*)

	PCIe4	PCIe6
Single PCIe Card	N/A	x16
Two PCIe Cards	x8	x8



For Matisse CPU users, if you want to use the PCIe4 slot, please first switch the PCIe x16 slot to [2x8] in the BIOS settings:

Go to "Advanced" > "AMD PBS" > "PCIe x16/2x8/4x4 Switch" > select "[2x8]" and press F10 to save and exit. For more information, please see Chapter 3.3.9 AMD PBS.

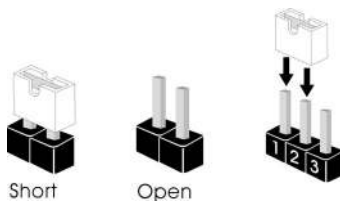
Installing an expansion card

- Step 1. 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.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

2.7 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.



X470D4U:

Chassis ID1 Jumper
(3-pin CHASSIS_ID1)
(see p.7, No. 32)



Chassis ID2 Jumper
(3-pin CHASSIS_ID2)
(see p.7, No. 33)



Chassis ID3 Jumper
(3-pin CHASSIS_ID3)
(see p.7, No. 31)



Board Level SKU (Default)

Reserved for system level use

X470D4U:

Chassis ID1 Jumper
(3-pin CHASSIS_ID1)
(see p.7, No. 32)



Chassis ID2 Jumper
(3-pin CHASSIS_ID2)
(see p.7, No. 33)

















Chassis ID3 Jumper
(3-pin CHASSIS_ID3)
(see p.7, No. 31)



Reserved for system level use

Reserved for system level use

X470D4U:		
Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 32)		
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 33)		
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.7, No. 31)	Reserved for system level use	Reserved for system level use
X470D4U:		
Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 32)		
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 33)		
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.7, No. 31)	Reserved for system level use	Reserved for system level use
SATA DOM Power Jumper <i>(No function for B450D4U-V1L)</i> (3-pin SATAPWR1) (see p.7, No. 15)	 SATA DOM with Pin7 power support (Pin7 for 5V power supply)	 1. SATA HDD 2. SATADOM that requires external power source from PSU (Default: Pin7 for GND)



Consult the documentation that comes with your SATA DOM and check whether or not Pin 7 requires 5V power supply.

If the connected SATA DOM requires 5V power supply, move the jumper caps placed on the SATA DOM Power Jumper (SATAPWR1) from pins 2-3 (default) to pins 1-2.

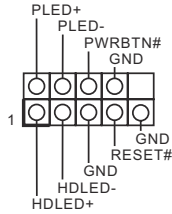
Warning! Incorrect setting of the SATA DOM Power Jumper (SATAPWR1) may cause damage to the motherboard or your SATA DOM.

2.8 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.7, No. 26)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments. Particularly note the positive and negative 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 is off when the system is in S4 sleep state or powered off (S5).

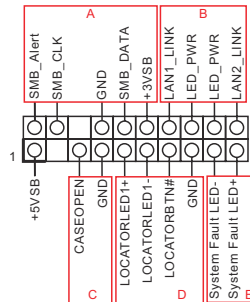
HDLED (Hard Drive Activity LED):

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, 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.

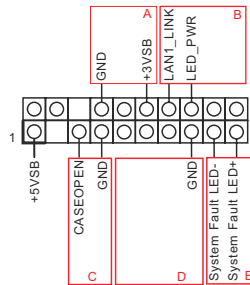
Auxiliary Panel Header
(18-pin AUX PANEL1)
(see p.7, No. 27)

X470D4U:



This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

B450D4U-V1L:



A. Front panel SMBus connecting pin (6-1 pin FPSMB)

This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)

These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS)

This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (4-pin LOCATOR)

This header is for the locator switch and LED on the front panel.

E. System Fault LED (2-pin LOCATOR)

This header is for the Fault LED on the system.

X470D4U:

Serial ATA3 DOM
Connector
(SATA3_0)
(see p.7, No. 14)

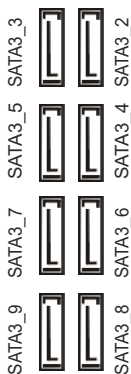


The SATA3 DOM connector supports both a SATA DOM (Disk-On-Module) and a SATA data cable for internal storage device.

Serial ATA3 Connectors

X470D4U:

(SATA3_1:
see p.7, No. 13)
(SATA3_2:
see p.7, No. 18)
(SATA3_3:
see p.7, No. 17)
(SATA3_4:
see p.7, No. 20)
(SATA3_5:
see p.7, No. 19)
(SATA3_8:
see p.7, No. 23)
(SATA3_9:
see p.7, No. 24)

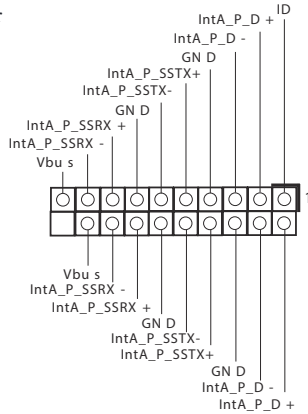


These connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

B450D4U-V1L:

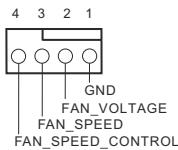
(SATA3_0)
(see p.7, No. 14)
(SATA3_6:
see p.7, No. 21)
(SATA3_7:
see p.7, No. 22)

USB 3.1 Gen1 Header
(19-pin USB3_3_4)
(see p.7, No. 16)



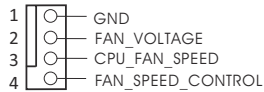
Besides two default USB 3.1 Gen1 ports on the I/O panel, there is one USB 3.1 Gen1 header on this motherboard. This USB 3.1 Gen1 header can support two USB 3.1 Gen1 ports.

Front Fan Connectors
(4-pin FAN2)
(see p.7, No. 7)
(4-pin FAN3)
(see p.7, No. 5)
(4-pin FAN4)
(see p.7, No. 6)
(4-pin FAN5)
(see p.7, No. 29)
(4-pin FAN6)
(see p.7, No. 30)



Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

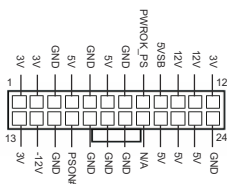
CPU Fan Connector
(4-pin FAN1)
(see p.7, No. 9)



This motherboard provides one 4-Pin CPU fan (Quiet Fan) connectors. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

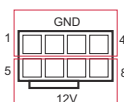
**For more details, please refer to the Cooler QVL list on the ASRock Rack website.*

ATX Power Connector
(24-pin ATXPWR1)
(see p.7, No. 4)



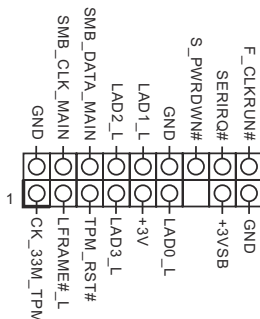
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V1)
(see p.7, No. 1)



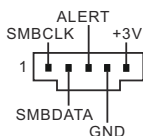
This motherboard provides one 8-pin ATX 12V power connector.

TPM Header
(17-pin TPMS1)
(see p.7, No. 28)



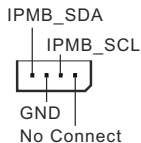
This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

X470D4U:
PSU SMBus Header
(5-pin PSU_SMB1)
(see p.7, No. 3)



PSU SMBus monitors the status of the power supply, fan and system temperature.

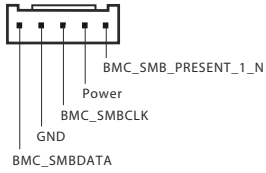
X470D4U:
Intelligent Platform Management Bus Header
(4-pin IPMB_1)
(see p.7, No. 35)



This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.

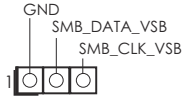
X470D4U:

Baseboard Management
Controller SMBus Header
(5-pin BMC_SMB_1)
(see p.7, No. 34)



The header is used for the SM
BUS devices.

PWM Configuration
Header
(3-pin PWM_CFG1)
(see p.7, No. 36)



This header is used for PWM
configurations.

Clear CMOS Pad
(CLRMOS1)
(see p.7, No. 25)



This allows you to clear the
data in CMOS. To clear CMOS,
take out the CMOS battery and
short the Clear CMOS Pad.

2.9 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
0x10	PEI_CORE_STARTED
0x11	PEI_CAR_CPU_INIT
0x15	PEI_CAR_NB_INIT
0x19	PEI_CAR_SB_INIT
0x31	PEI_MEMORY_INSTALLED
0x32	PEI_CPU_INIT
0x33	PEI_CPU_CACHE_INIT
0x34	PEI_CPU_AP_INIT
0x35	PEI_CPU_BSP_SELECT
0x36	PEI_CPU_SMM_INIT
0x37	PEI_MEM_NB_INIT
0x3B	PEI_MEM_SB_INIT
0x4F	PEI_DXE_IPL_STARTED
0x60	DXE_CORE_STARTED
0x61	DXE_NVRAM_INIT
0x62	DXE_SBRUN_INIT

0x63	DXE_CPU_INIT
0x68	DXE_NB_HB_INIT
0x69	DXE_NB_INIT
0x6A	DXE_NB_SMM_INIT
0x70	DXE_SB_INIT
0x71	DXE_SB_SMM_INIT
0x72	DXE_SB_DEVICES_INIT
0x78	DXE_ACPI_INIT
0x79	DXE_CSM_INIT
0x90	DXE_BDS_STARTED
0x91	DXE_BDS_CONNECT_DRIVERS
0x92	DXE_PCI_BUS_BEGIN
0x93	DXE_PCI_BUS_HPC_INIT
0x94	DXE_PCI_BUS_ENUM
0x95	DXE_PCI_BUS_REQUEST_RESOURCES
0x96	DXE_PCI_BUS_ASSIGN_RESOURCES
0x97	DXE_CON_OUT_CONNECT
0x98	DXE_CON_IN_CONNECT

0x99	DXE_SIO_INIT
0x9A	DXE_USB_BEGIN
0x9B	DXE_USB_RESET
0x9C	DXE_USB_DETECT
0x9D	DXE_USB_ENABLE
0xA0	DXE_IDE_BEGIN
0xA1	DXE_IDE_RESET
0xA2	DXE_IDE_DETECT
0xA3	DXE_IDE_ENABLE
0xA4	DXE_SCSI_BEGIN
0xA5	DXE_SCSI_RESET
0xA6	DXE_SCSI_DETECT
0xA7	DXE_SCSI_ENABLE
0xA8	DXE_SETUP_VERIFYING_PASSWORD
0xA9	DXE_SETUP_START
0xAB	DXE_SETUP_INPUT_WAIT
0xAD	DXE_READY_TO_BOOT
0xAE	DXE_LEGACY_BOOT

0xAF	DXE_EXIT_BOOT_SERVICES
0xB0	RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN
0xB1	RT_SET_VIRTUAL_ADDRESS_MAP_END
0xB2	DXE_LEGACY_OPROM_INIT
0xB3	DXE_RESET_SYSTEM
0xB4	DXE_USB_HOTPLUG
0xB5	DXE_PCI_BUS_HOTPLUG
0xB6	DXE_NVRAM_CLEANUP
0xB7	DXE_CONFIGURATION_RESET
0xF0	PEI_RECOVERY_AUTO
0xF1	PEI_RECOVERY_USER
0xF2	PEI_RECOVERY_STARTED
0xF3	PEI_RECOVERY_CAPSULE_FOUND
0xF4	PEI_RECOVERY_CAPSULE_LOADED
0xE0	PEI_S3_STARTED
0xE1	PEI_S3_BOOT_SCRIPT
0xE2	PEI_S3_VIDEO_REPOST

0xE3	PEI_S3_OS_WAKE
0x50	PEI_MEMORY_INVALID_TYPE
0x53	PEI_MEMORY_NOT_DETECTED
0x55	PEI_MEMORY_NOT_INSTALLED
0x57	PEI_CPU_MISMATCH
0x58	PEI_CPU_SELF_TEST_FAILED
0x59	PEI_CPU_NO_MICROCODE
0x5A	PEI_CPU_ERROR
0x5B	PEI_RESET_NOT_AVAILABLE
0xD0	DXE_CPU_ERROR
0xD1	DXE_NB_ERROR
0xD2	DXE_SB_ERROR
0xD3	DXE_ARCH_PROTOCOL_NOT_AVAILABLE
0xD4	DXE_PCI_BUS_OUT_OF_RESOURCES
0xD5	DXE_LEGACY_OPROM_NO_SPACE
0xD6	DXE_NO_CON_OUT
0xD7	DXE_NO_CON_IN

0xD8	DXE_INVALID_PASSWORD
0xD9	DXE_BOOT_OPTION_LOAD_ERROR
0xDA	DXE_BOOT_OPTION_FAILED
0xDB	DXE_FLASH_UPDATE_FAILED
0xDC	DXE_RESET_NOT_AVAILABLE
0xE8	PEI_MEMORY_S3_RESUME_FAILED
0xE9	PEI_S3_RESUME_PPI_NOT_FOUND
0xEA	PEI_S3_BOOT_SCRIPT_ERROR
0xEB	PEI_S3_OS_WAKE_ERROR

2.10 Unit Identification purpose LED/Switch

With the UID button, You are able to locate the server you're working on from behind a rack of servers.

X470D4U:

Unit Identification
purpose LED/Switch
(UID1)



When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be turned on. Press the UID button again to turn off the indicator.

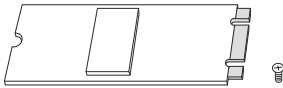
2.11 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

2.12 M.2_SSD (NGFF) Module Installation Guide (X470D4U only)

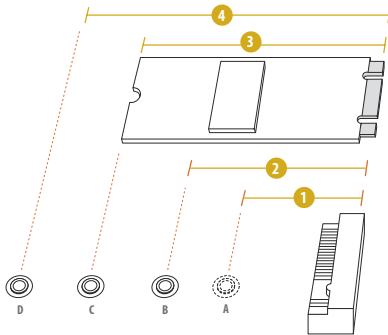
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2_SSD (NGFF) Socket 3 (M2_1) can accommodate either a M.2 PCI Express module up to Gen 2 x4 (20Gb/s). The M.2_SSD (NGFF) Socket 3 (M2_2) can accommodate either a M.2 SATA3 6.0 Gb/s module or a M.2 PCI Express module up to Gen 3 x2 (16Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

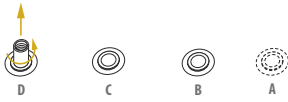
Prepare a M.2_SSD (NGFF) module and the screw.



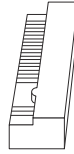
Step 2

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	4.2cm	6cm	8cm	10cm
Module Type	Type 2242	Type2260	Type 2280	Type 22110



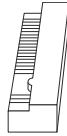
Step 3



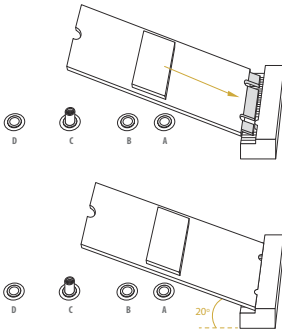
Move the standoff based on the module type and length. The standoff is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.



Step 4

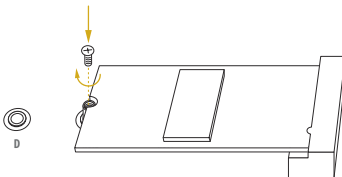


Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



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.

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

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctrl> + <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.

3.1.1 UEFI Menu Bar

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

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
Server Mgmt	To manage the server
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Event Logs	For event log configuration
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use <←→> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

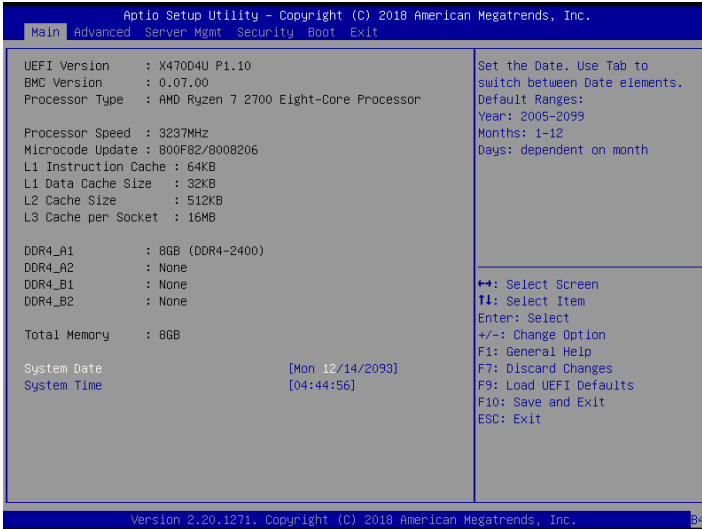
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<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
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

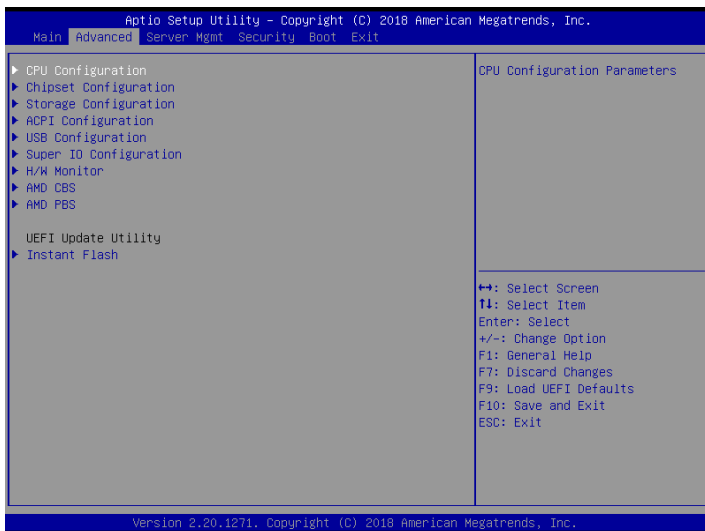
3.2 Main Screen

Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



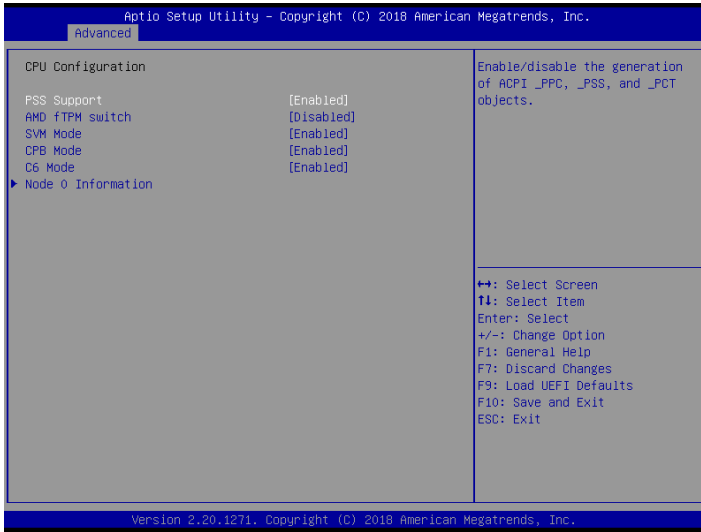
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, H/W Monitor, PSP Firmware Versions, AMD CBS, AMD PBS and Instant Flash.



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

3.3.1 CPU Configuration



PSS Support

Enable/disable the generation of ACPI _PPC, _PSS, and _PCT objects.

AMD fTPM Switch

To select .0: Auto (Depend on Tcg module). 1: Disabled fTPM. 2: OnBoard SPI TPM2.0

SVM Mode

Enable/disable CPU Virtualization.

CPB Mode

Enable/disable CPB.

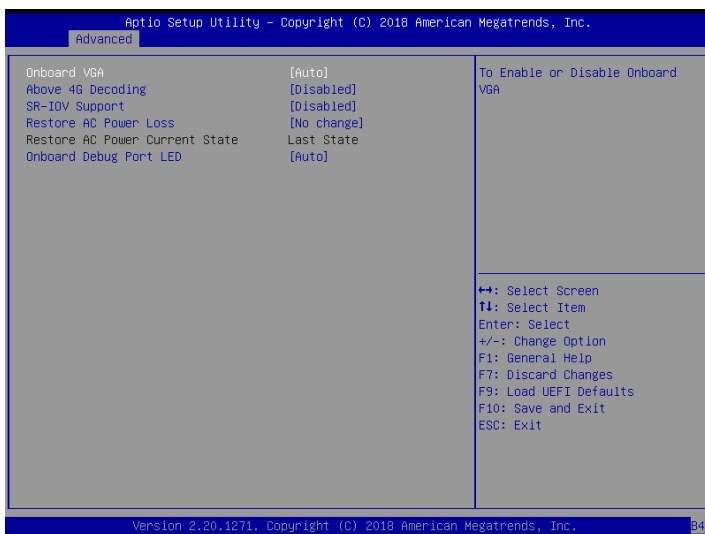
C6 Mode

Enable/disable C6.

Node 0 Information

View Memory Information related to Node 0.

3.3.2 Chipset Configuration



Onboard VGA

To enable or disable Onboard VGA.

Above 4G Decoding

Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

Restore AC Power Loss

This allows you to set 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.

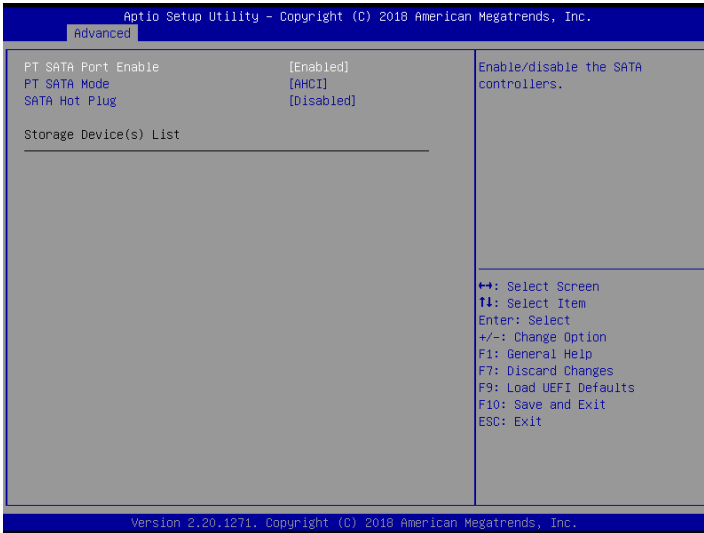
Restore AC Power Current State

This allows you to restore AC Power Current State.

Onboard Debug Port LED

Enable or disable the onboard Dr. Debug LED.

3.3.3 Storage Configuration



PT SATA Port Enable

Enable/disable the SATA controllers.

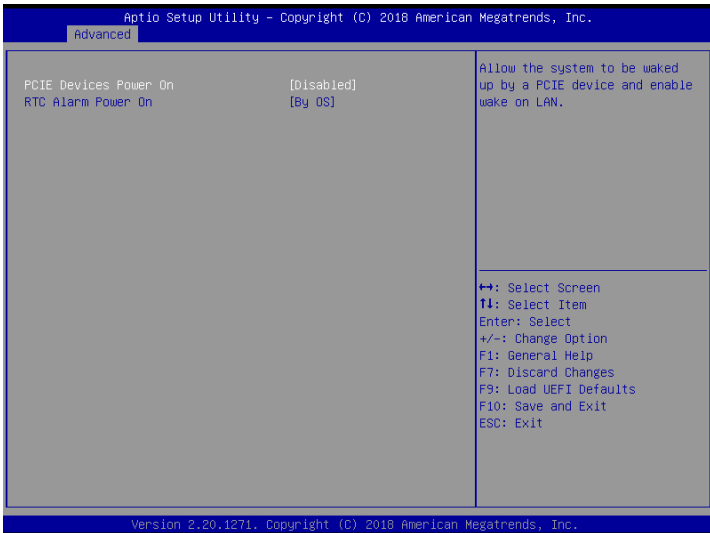
PT SATA Mode

Select Promontory SATA Type.

SATA Hot Plug

Enable/disable the SATA Hot Plug Function.

3.3.4 ACPI Configuration



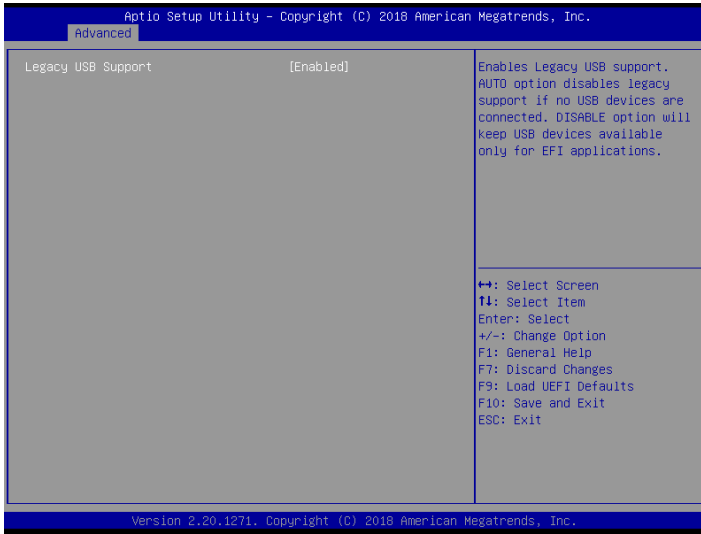
PCIE Devices Power On

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

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

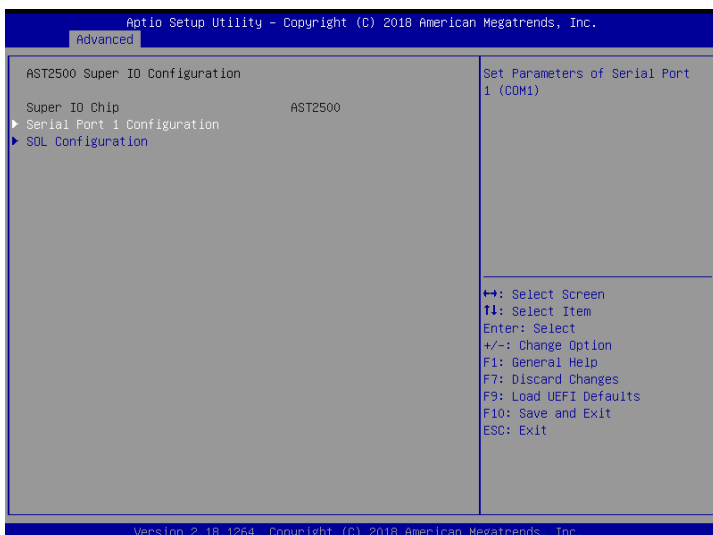
3.3.5 USB Configuration



Legacy USB Support

Use this option to enable or disable legacy support for USB devices. The default value is [Enabled].

3.3.6 Super IO Configuration



Serial Port 1 Configuration

Use this item to set parameters of Serial Port 1 (COM1).

Serial Port

Use this item to enable or disable the serial port.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

SOL Configuration

Use this item to set parameters of SOL.

SOL Port

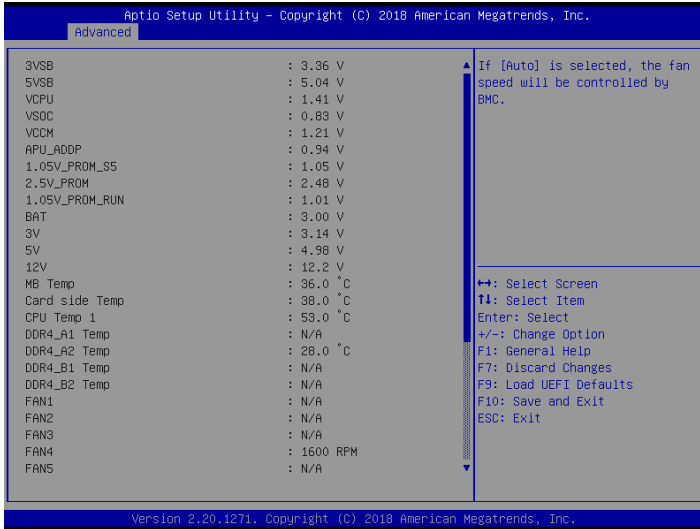
Use this item to set parameters of SOL.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

3.3.7 H/W Monitor

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



Fan Control

If [Auto] is selected, the fan speed will controlled by BMC.

If [Manual] is selected, configure the items below.

FAN1

This allows you to set the CPU fan1's speed. The default value is [Smart Fan].

FAN2

This allows you to set the front fan 2's speed. The default value is [Smart Fan].

FAN3

This allows you to set the front fan 3's speed. The default value is [Smart Fan].

FAN4

This allows you to set the front fan 4's speed. The default value is [Smart Fan].

FAN5

This allows you to set the front fan 5's speed. The default value is [Smart Fan].

FAN 6

This allows you to set the front fan 6's speed. The default value is [Smart Fan].

Smart Fan Control

This allows you to set the Smart fan's level speed.

Smart Fan Duty Control

Smart Fan Duty x (x means 1 to 11 stage)

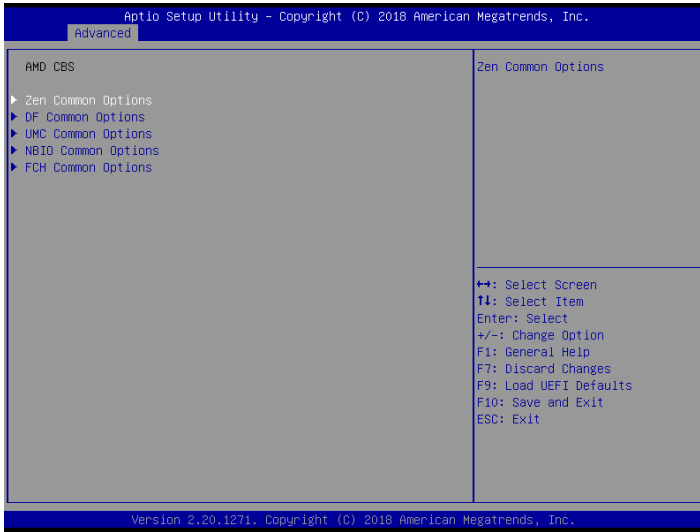
This allows you to set duty cycle for each stage.

Smart Fan Temp Control

Smart Fan Temp x (x means 1 to 11 stage)

This allows you to set temperature for each stage.

3.3.8 AMD CBS



Zen Common Options

Use this item to configure Zen Common options.

DF Common Options

Use this item to configure DF Common options.

UMC Common Options

Use this item to configure UMC Common options.

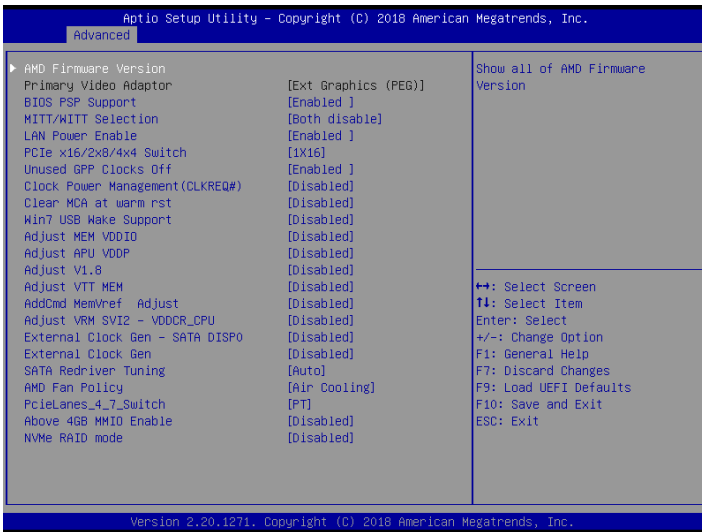
NBIO Common Options

Use this item to configure NBIO Common options.

FCH Common Options

Use this item to configure FCH Common options.

3.3.9 AMD PBS



AMD Firmware Version

Show all of AMD Firmware Version.

BIOS PSP Support

Enable/Disable BIOS PSP driver execution (including all C2P/P2C mailbox, Secure S3, fTPM Support).

MITT/WITT Selection

Use this item to configure MITT/WITT Selection.

LAN Power Enable

Enable or disable LAN Power.

PCIe x16/2x8/4x4 Switch *(X470D4U only)*

Switch PCIe x16 slot to 1x16, 2x8 or 4x4.

Unused GPP Clocks Off

Turn Unused GPP Clocks Off.

Clock Power Management (CLKREQ#)

Enable or disable CLKREQ#.

Clear CMA at warm rst

Enable or disable clearing MCA errors at warm reset. If Enabled, just clear MCA status including that MC0: MSR0000_0401, MC1: MSR0000_0405, MC2: MSR0000_0409, MC4: MSR0000_0411 and MC5: MSR0000_0415.

Win7 USB Wake Support

This option enables USB devices to wake up the system (work with Win7 only).

Adjust MEM VDDIO

Adjust MEM VDDIO, stepping is 4mV. $V_{ddIo} = 1.2V \pm N * 4 \text{ mV}$, input range is 0-31. Tuning range is 13mV on Turpan.

Adjust APU VDDP

Adjust APU VDDP.

Adjust V1.8

Adjust V1.8, stepping is 3mV. $V1.8 = 1.8V \pm N * 3 \text{ mV}$, input range is 0-33. Tuning range is +/- 100 mV.

Adjust VTT MEM

Adjust VTT MEM, stepping is $VDDIO * (1/256)$. $VTT_MEM = VDDIO * (N / 256)$, input range is 113-143.

AddCmd MemVref Adjust

AddCmd MemVref Adjust, stepping is $VDDIO * (1/256)$. $MEM_VREF = VDDIO * (N / 256)$, input range is 114-142.

Adjust VRM SVI2 - VDDCR_CPU

Offset Mode: +/- based on VID; Gamer Mode: Set VID Directly All the value limit is for test; there's no guarantee that these options are safe.

External Clock Gen - SATA DISP0

Enable External Clock Gen - SATA DISP0.

External Clock Gen

Enable External Clock Gen.

SATA Redriver Tuning

Enable or disable SATA Redriver Tuning.

AMD Fan Policy

[Air Cooling] follows platform defined policy, [Water Cooling] forces PWM 100%;
Selecting [Fan Control] to [Manual] in CBS will override this option.

PcieLanes_4_7_Switch

[PT] Pcie Lanes route to PT CHIP; [CPU] Pcie Lane route to CPU PCIE.

Above 4GB MMIO Enable

Enable or disable Above 4GB MMIO.

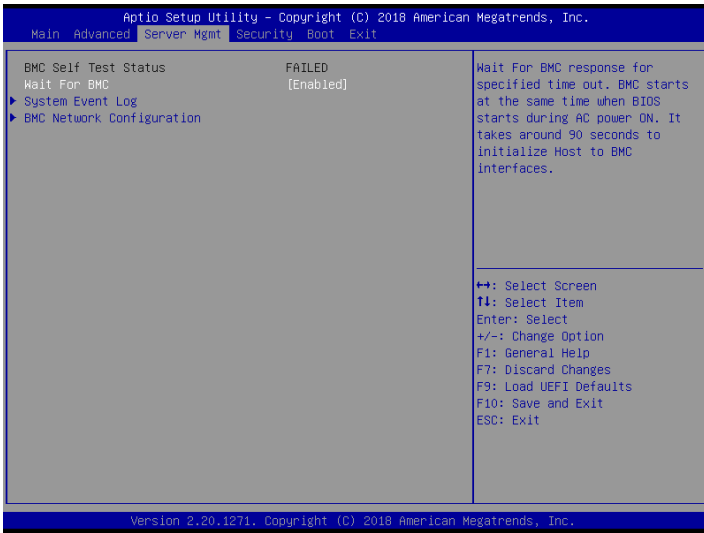
NVMe RAID mode

Enable or disable NVMe RAID mode.

3.3.10 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows[®]. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

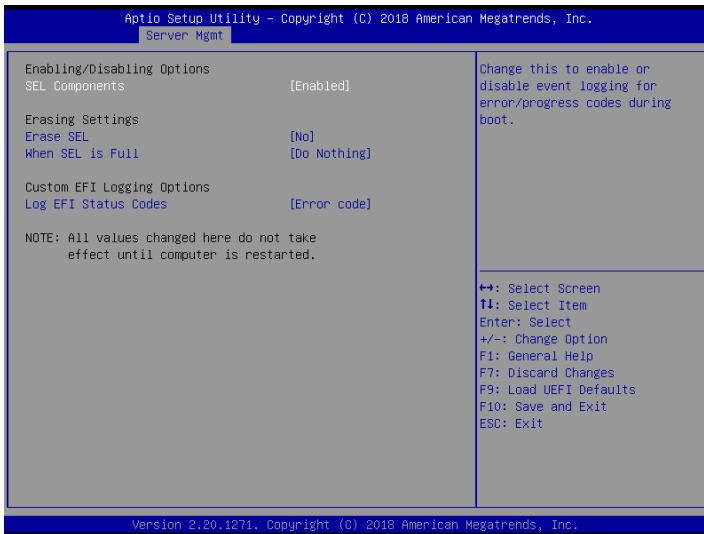
3.4 Server Mgmt



Wait For BMC

Wait For BMC response for specified time out. BMC starts at the same time when BIOS starts during AC power ON. It takes around 90 seconds to initialize Host to BMC interfaces.

3.4.1 System Event Log



SEL Components

Change this to enable or disable event logging for error/progress codes during boot.

Erase SEL

Use this to choose options for erasing SEL.

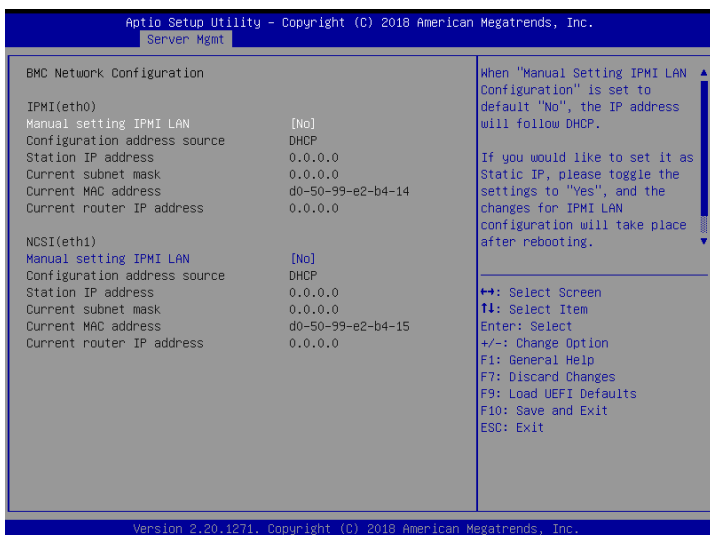
When SEL is Full

Use this to choose options for reactions to a full SEL.

Log EFI Status Codes

Use this item to disable the logging of EFI Status Codes or log only error code or only progress code or both.

3.4.2 BMC Network Configuration



Lan Channel (Failover)

Manual Setting IPMI LAN

If [No] is selected, the IP address is assigned by DHCP. If you prefer using a static IP address, toggle to [Yes], and the changes take effect after the system reboots. The default value is [No].

Configuration Address Source

Select to configure BMC network parameters statically or dynamically (by BIOS or BMC). Configuration options: [Static] and [DHCP].

Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.

DHCP: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.



When [DHCP] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.



The default login information for the IPMI web interface is:

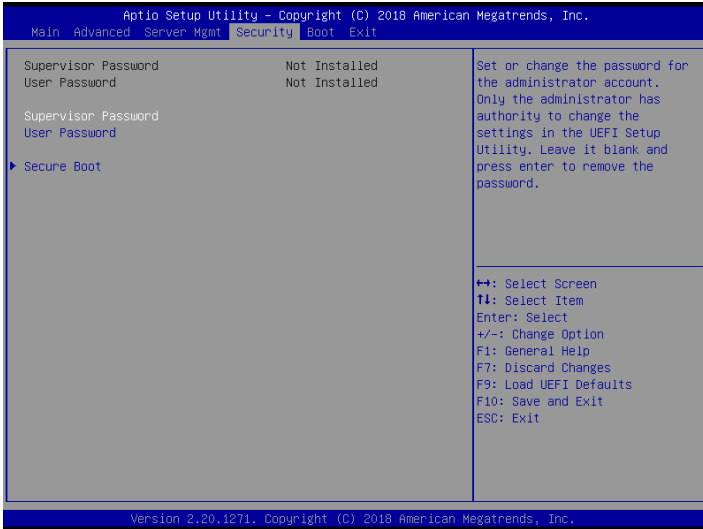
Username: admin

Password: admin

For more instructions on how to set up remote control environment and use the IPMI management platform, please refer to the IPMI Configuration User Guide or go to the Support website at: <http://www.asrockrack.com/support/faq.asp>

3.5 Security

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



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

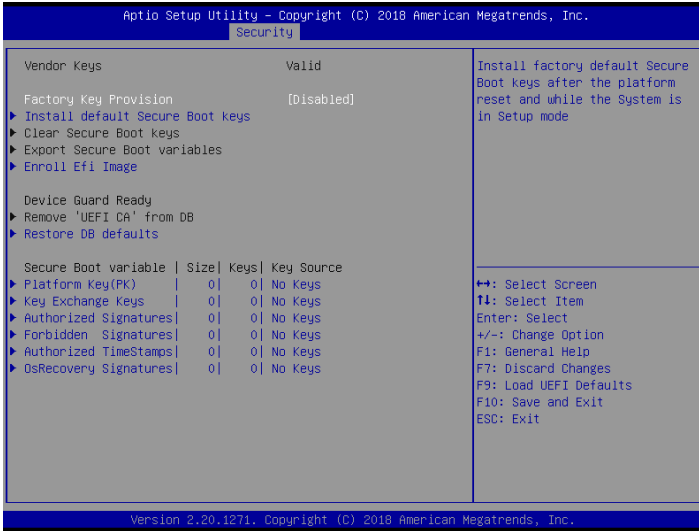
Use this to enable or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

3.5.1 Key Management

In this section, expert users can modify Secure Boot Policy variables without full authentication.



Provision Factory Defaults

Allow to provision factory default Secure Boot keys when System is in Setup Mode.

Install Default Secure Boot Keys

Please install default secure boot keys if it's the first time you use secure boot.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db).

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER encoded)
- c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Key Exchange Keys

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Authorized Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Forbidden Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
 - b) EFI_CERT_X509 (DER encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512
2. Authenticated UEFI Variable
 3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Authorized TimeStamps

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:
 - a) EFI_SIGNATURE_LIST
 - b) EFI_CERT_X509 (DER encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512
2. Authenticated UEFI Variable
3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

OsRecovery Signatures

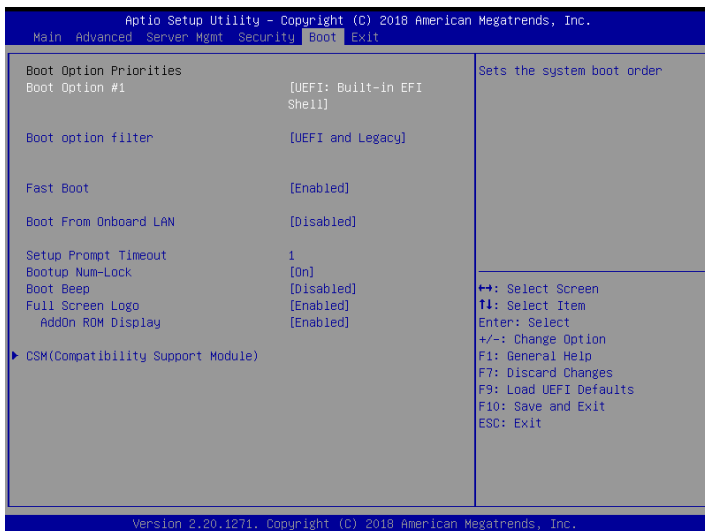
Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:
 - a) EFI_SIGNATURE_LIST
 - b) EFI_CERT_X509 (DER encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512
2. Authenticated UEFI Variable
3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

Use this item to set the system boot order.

Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

Fast Boot

Enables/Disables fast boot which skips memory training and attempts to boot using last known good configuration.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

Configure the number of seconds to wait for the UEFI setup utility.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-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.

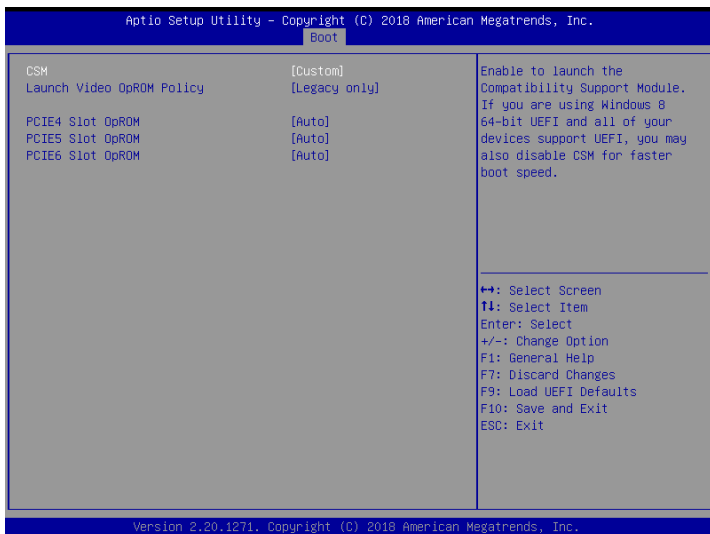
Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option “Full Screen Logo” but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

3.6.1 CSM Parameters



CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows Server 2012 R2 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

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.

PCIe4 Slot OpROM *(X470D4U only)*

Use this item to select slot storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

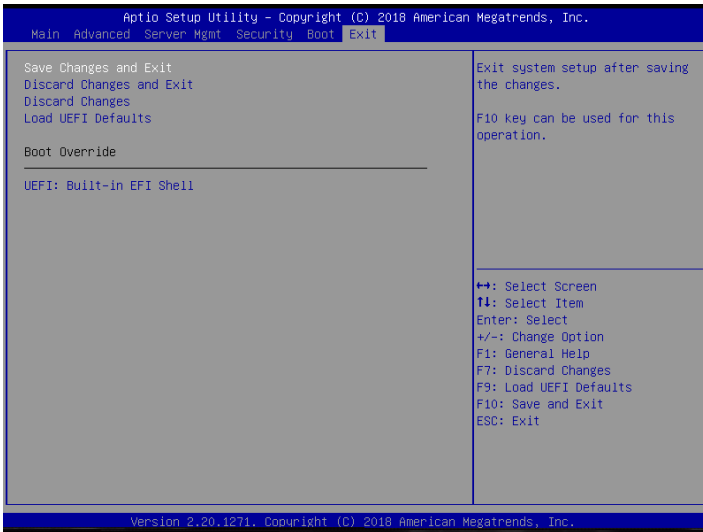
PCIe5 Slot OpROM

Use this item to select slot storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

PCIe6 Slot OpROM

Use this item to select slot storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

3.7 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop-out. Press <F10> key or select [Yes] to save the 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. Press <ESC> key or select [Yes] 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. Press <F7> key or select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Boot Override

These items displays the available devices. Select an item to start booting from the selected device.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® / Linux compliant. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

**Please download the AMD SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to your USB drive or simply install the SATA driver from the Support CD while installing OS in SATA RAID mode.*

4.2 Support CD Information

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

4.2.1 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" from the root folder in the Support CD to display the menu.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

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

4.2.4 Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack's website at <http://www.ASRockRack.com>; or you may contact your dealer for further information.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.



Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries to you and damages to motherboard components.

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard. Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...

1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...

1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR4 ECC/UDIMMs.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.
2. Confirm whether your power supply provides adequate and stable power.

Other problems...

1. Try searching keywords related to your problem on ASRock Rack's FAQ page:
<http://www.asrockrack.com/support>

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

1. Your contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

You may contact ASRock Rack's technical support at:
<http://www.asrockrack.com/support/tsd.asp>

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of your invoice marked with the date of purchase is required. By calling your vendor or going to our RMA website (<http://event.asrockrack.com/tsd.asp>) you may obtain a Returned Merchandise Authorization (RMA) number.

The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when you return the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact your distributor first for any product related problems during the warranty period.