



OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation

Motherboard

EP2C612 WS

User Manual

English



Version 1.1

Published October 2016

Copyright©2016 ASRock Rack Inc. All rights reserved.

Copyright Notice:

No part of this documentation may be reproduced, transcribed, transmitted, or translated in any language, in any form or by any means, except duplication of documentation by the purchaser for backup purpose, without written consent of ASRock Rack Inc.

Products and corporate names appearing in this documentation may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Disclaimer:

Specifications and information contained in this documentation are furnished for informational use only and subject to change without notice, and should not be constructed as a commitment by ASRock Rack. ASRock Rack assumes no responsibility for any errors or omissions that may appear in this documentation.

With respect to the contents of this documentation, ASRock Rack does not provide warranty of any kind, either expressed or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose.

In no event shall ASRock Rack, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of data, interruption of business and the like), even if ASRock Rack has been advised of the possibility of such damages arising from any defect or error in the documentation or product.



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

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

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

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

ASRock Rack's Website: www.ASRockRack.com

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.

ASRock Rack Incorporation

6F., No.37, Sec. 2, Jhongyang S. Rd., Beitou District,

Taipei City 112, Taiwan (R.O.C.)

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	15
2.1 Screw Holes	15
2.2 Pre-installation Precautions	15
2.3 Installing the CPU	16
2.4 Installing the CPU Fan and Heatsink	19
2.5 Installation of Memory Modules (DIMM)	20
2.6 Expansion Slots (PCI Express Slots)	23
2.7 Jumper Setup	25
2.8 Onboard Headers and Connectors	28
2.9 Dr. Debug	37
2.10 SLI™, 3-Way SLI™, 4-Way SLI™ and Quad SLI™ Operation Guide	38
2.10.1 Installing Two SLI™-Ready Graphics Cards	38
2.10.2 Installing Three SLI™-Ready Graphics Cards	40
2.10.3 Installing Four SLI™-Ready Graphics Cards	42

2.11	CrossFireX™, 3-Way CrossFireX™, 4-Way CrossFireX™ and Quad CrossFireX™ Operation Guide	45
2.11.1	Installing Two CrossFireX™-Ready Graphics Cards	45
2.11.2	Installing Three CrossFireX™-Ready Graphics Cards	46
2.11.3	Installing Four CrossFireX™-Ready Graphics Cards	46
2.11.4	Driver Installation and Setup	47
2.12	Driver Installation Guide	48
2.13	Dual LAN and Teaming Operation Guide	49
Chapter 3 UEFI Setup Utility		50
3.1	Introduction	50
3.1.1	UEFI Menu Bar	50
3.1.2	Navigation Keys	51
3.2	Main Screen	52
3.3	OC Tweaker Screen	53
3.4	Advanced Screen	55
3.4.1	CPU Configuration	56
3.4.2	DRAM Configuration	59
3.4.3	ACPI Configuration	60
3.4.4	Configure Super IO Settings	62
3.4.5	Serial Port Console Redirection	63
3.4.6	Trusted Computing	66
3.4.7	USB Configuration	68
3.4.8	Chipset Configuration	69
3.4.9	Storage Configuration	72

3.4.10	H/W Monitor Screen	75
3.4.11	Intel ME Configuration	77
3.4.12	WHEA Configuration	78
3.4.13	Easy RAID Installer	79
3.4.14	Instant Flash	80
3.5	Server Mgmt	81
3.5.1	System Event Log	82
3.5.2	BMC Network Configuration	83
3.6	Security Screen	85
3.7	Boot Screen	86
3.7.1	CSM Parameters	88
3.8	Event Logs	90
3.9	Exit Screen	92
Chapter 4 Software Support		93
4.1	Install Operating System	93
4.2	Support CD Information	93
4.2.1	Running The Support CD	93
4.2.2	Drivers Menu	93
4.2.3	Utilities Menu	93
4.2.4	Contact Information	93
Chapter 5 Troubleshooting		94
5.1	Troubleshooting Procedures	94
5.2	Technical Support Procedures	96
5.3	Returning Merchandise for Service	96

Chapter 6	Net Framework Installation Guide	97
6.1	Installing .Net Framework 3.5.1 (For Server 2008 R2)	97

Chapter 1 Introduction

Thank you for purchasing ASRock Rack **EP2C612 WS** 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 EP2C612 WS Motherboard
(SSI EEB Form Factor: 12.0-in x 13.0-in, 30.5 cm x 33.0 cm)
- Support CD
- User Manual
- 4 x SATA3 Cables (50cm)
- 2 x SATA3 Cables (60cm)
- 1 x I/O Shield



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

1.2 Specifications

EP2C612 WS	
MB Physical Status	
Form Factor	SSI EEB
Dimension	12" x 13" (30.5 cm x 33.0 cm)
Processor System	
CPU	Intel® Xeon® processor E5-2600 v3/v4* series <i>*BIOS version 2.0 or above is required</i>
Socket	Dual Socket LGA 2011 R3
Chipset	Intel® C612
System Memory	
Capacity	8 DIMM slots
Type	- Quad Channel memory technology - Supports DDR4 2400*/2133/1866/1600 RDIMM and LRDIMM <i>*Only E5-2600 V4 CPUs support DDR4 2400.</i>
Voltage	1.2V
DIMM Sizes	RDIMM: 32GB, 16GB, 8GB, 4GB LRDIMM: 64GB, 32GB
Expansion Slot	
PCIe 3.0 x 16	- 7 slots (PCIe3/PCIe4 : x16/x0 or x8/x8 mode; PCIe6/PCIe7: x0/x16 or x8/x8 mode) <i>*Please refer to the section entitled "2.6 Expansion Slots" for more details.</i> - Supports NVIDIA® Quad SLI™, 4-Way SLI™, 3-Way SLI™ and SLI™ - Supports AMD GPU-Quad CrossFireX™, 4-Way CrossFireX™, 3-Way CrossFireX™ and CrossFireX™
Storage	
SATA Controller	Intel® C612: 10 x SATA3 6Gb/s (6 x SATA3 + 4 x SSATA3, support 2 x SATA DOM, 1 x SATA Express), support RAID 0, 1, 5, 10
Ethernet	
Interface	1000 /100 /10 Mbps
LAN	2 x RJ45 by 2 x Intel® i210 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

Management	
BMC Controller	ASPEED AST2400
IPMI Dedicated GLAN	- 1 x Realtek RTL8211E for dedicated management GLAN
Features	- Watch Dog - NMI
Graphics	
Controller	ASPEED AST2400
VRAM	DDR3 16MB
Audio	
Audio Codec	Realtek ALC1150
Rear Panel I/O	
PS/2 KB/Mouse	1
VGA Port	1 x D-Sub
USB 3.0 Port	4
LAN Port	RJ45: 2 + 1 (IPMI) LAN Ports with LED (ACT/LINK LED and SPEED LED)
Serial Port	1 (COM1)
SPDIF	1
Audio Jack	5 Jack
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED, system fault LED)
TPM Header	1
IPMB Header	1
Buzzer	1
Fan Header	2 x CPU Fans, 5 x System Fans (4-pin)
ATX Power	1 (24-pin) + 2 (8-pin)
USB 3.0 Header	1 (supports 2 USB 3.0 ports)
USB 2.0 Header	1 (supports 2 USB 2.0 ports)
Type A USB 3.0 Port	1
Front Panel	1
4 pin 5V box connector	1
System BIOS	
BIOS Type	128Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8.0 Support - ASRock Rack Instant Flash

Hardware Monitor	
Temperature	- CPU Temperature Sensing - System Temperature Sensing - System Inlet Temperature Sensing - Card-side Temperature Sensing
Fan	- CPU/Rear/Front Fan Tachometer - CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) - CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore, DRAM, 1.05V_PCH, +BAT, 3.3VSB, 5VSB
Support OS	
OS	Client: Microsoft® Windows® - Windows 7 (32 / 64 bit) - Windows 8 (32 / 64 bit) - Windows 8.1 (32 / 64 bit) - Windows 10 (64 bit) Server: Microsoft® Windows® - Server 2008 R2 SP1 (64 bit) - Server 2012 (64 bit) - Server 2012 R2 (64 bit) - Server 2016 (64 bit) Linux® - RedHat Enterprise Linux Server 6.5 (32 / 64 bit) - CentOS 5.10 / 6.5 (32 / 64 bit) - SUSE Enterprise Linux Server 11 SP3 (32 / 64 bit) - FreeBSD 9.2 (32 / 64 bit) - Fedora core 19 (64 bit) - Ubuntu 12.04.2 (64 bit) / 12.10 (64 bit) Virtual - VMWare® ESXi 5.5 * Please refer to our website for the latest OS support list.
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C
GPU Support	
Technology	- Supports NVIDIA® 4-Way SLI™ Technology - Supports AMD Quad-GPU CrossFireX™ Technology



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.

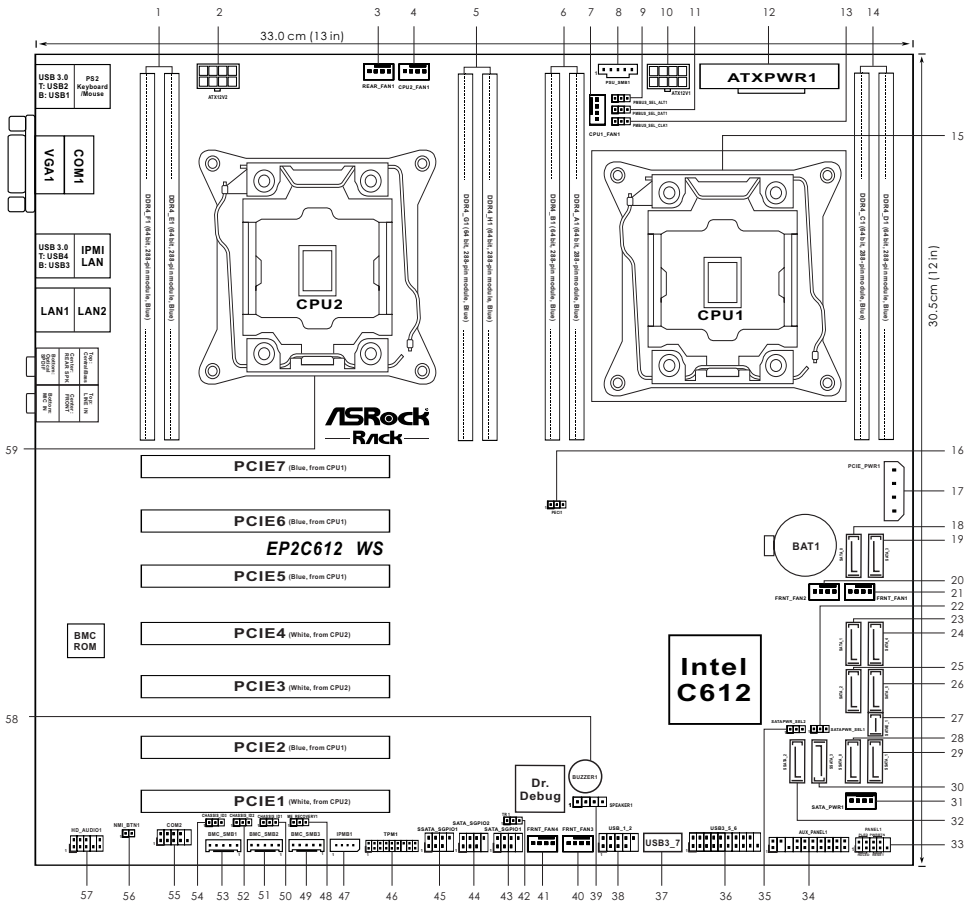


If you install Intel® LAN or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

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

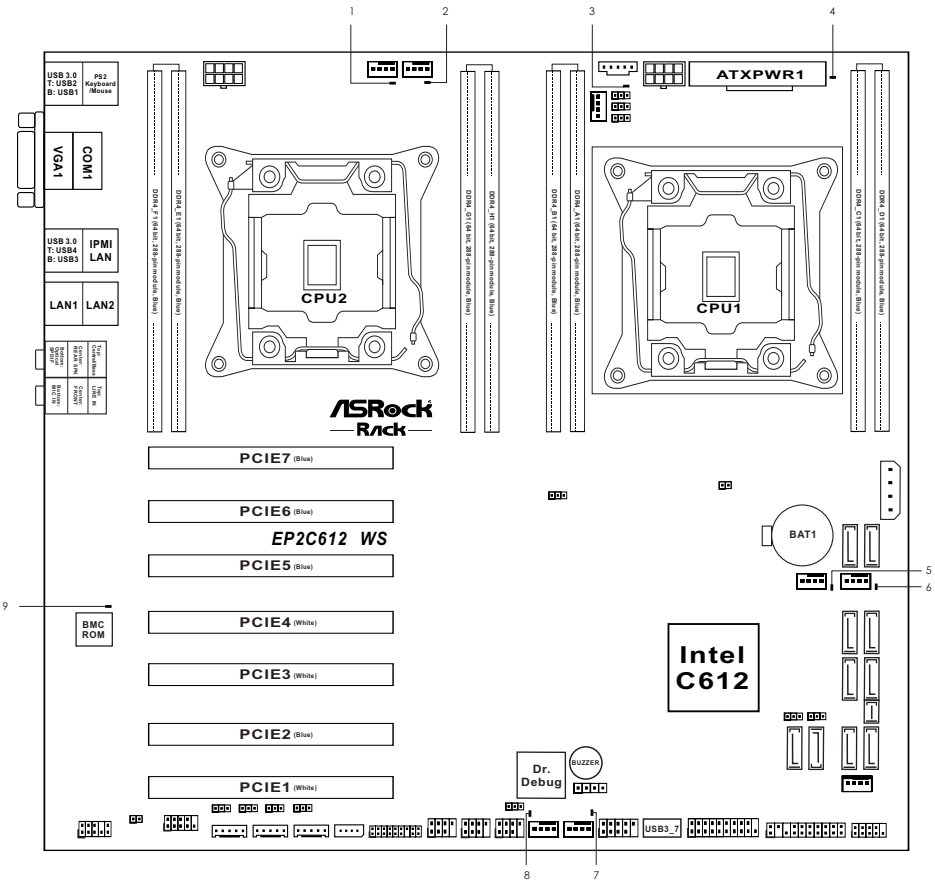


No.	Description
1	2 x 288-pin DDR4 DIMM Slots (DDR4_E1, DDR4_F1, Blue)
2	ATX 12V Power Connector (ATX12V2)
3	Rear Fan Connector (REAR_FAN1)
4	CPU 2 Fan Connector (CPU2_FAN1)
5	2 x 288-pin DDR4 DIMM Slots (DDR4_G1, DDR4_H1, Blue)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, Blue)
7	CPU 1 Fan Connector (CPU1_FAN1)
8	PSU SMBus (PSU_SMB1)
9	PMBUS Mode Jumper (PMBUS_SEL_ALT1)
10	ATX 12V Power Connector (ATX12V1)
11	PMBUS Mode Jumper (PMBUS_SEL_DAT1)
12	ATX Power Connector (ATXPWR1)
13	PMBUS Mode Jumper (PMBUS_SEL_CLK1)
14	2 x 288-pin DDR4 DIMM Slots (DDR4_C1, DDR4_D1, Blue)
15	LGA 2011 R3 CPU Socket 1 (CPU1)
16	CPU PECI Mode Jumper (PECI1)
17	PCIe Power Connector (PCIE_PWR1)
18	SATA3 Connector (SATA_0, Blue, from PCH)
19	SATA3 Connector (SATA_3, Blue, from PCH)
20	Front Fan Connector (FRNT_FAN2)
21	Front Fan Connector (FRNT_FAN1)
22	SATA DOM Power Jumper 1 (SATAPWR_SEL1)
23	SATA3 Connector (SATA_1, White, from PCH)
24	SATA3 Connector (SATA_4, White, from PCH)
25	SATA3 Connector (SATA_2, White, from PCH)
26	SATA3 Connector (SATA_5, White, from PCH)
27	SATA Express Connector (SATAE_1, White, from PCH)
28	SATA3 Connector (SSATA_0, Blue, from PCH)
29	SATA3 Connector (SSATA_1, Blue, from PCH)
30	SATA3 DOM Connector (SSATA_3, Red)
31	SATA DOM Power Header (SATA_PWR_1)
32	SATA3 DOM Connector (SSATA_2, Red)
33	System Panel Header (PANEL1)

No.	Description
34	Auxiliary Panel Header (AUX_PANEL1)
35	SATA DOM Power Jumper 2 (SATAPWR_SEL2)
36	USB 3.0 Header (USB3_4_5)
37	Vertical Type A USB 3.0 (USB3_7)
38	USB 2.0 Header (USB_1_2)
39	Speaker Header (SPEAKER1)
40	Front Fan Connector (FRNT_FAN3)
41	Front Fan Connector (FRNT_FAN4)
42	Thermal Sensor Header (TR1)
43	SATA SGPIO Connector (SATA_SGPIO1)
44	SATA SGPIO Connector (SATA_SGPIO2)
45	SSATA SGPIO Connector (SSATA_SGPIO1)
46	TPM Header (TPM1)
47	Intelligent Platform Management Bus header (IPMB1)
48	ME Recovery Jumper (ME_RECOVERY1)
49	BMC SMBus Header (BMC_SMB_3)
50	Chassis ID1 Jumper (CHASSIS_ID1)
51	BMC SMBus Header (BMC_SMB_2)
52	Chassis ID2 Jumper (CHASSIS_ID2)
53	BMC SMBus Header (BMC_SMB_1)
54	Chassis ID3 Jumper (CHASSIS_ID3)
55	COM Port Header (COM2)
56	Non Maskable Interrupt Button (NMI_BTN1)
57	Front Panel Audio Header (HD_AUDIO1)
58	Buzzer (Buzzer1)
59	LGA 2011 R3 CPU Socket 2 (CPU2)

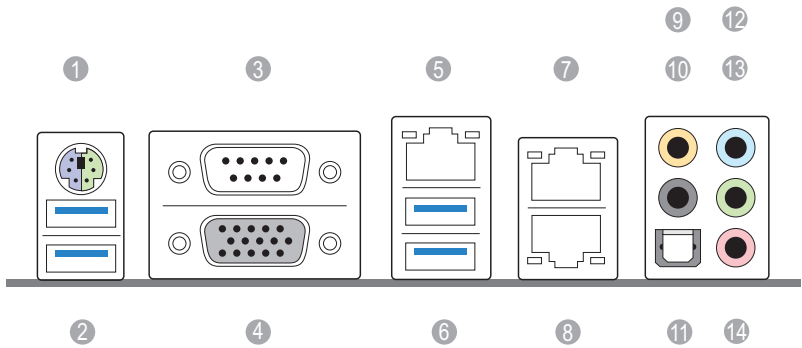
**For DIMM installation and configuration instructions, please see p.20 (Installation of Memory Modules (DIMM)) for more details.*

1.5 Onboard LED Indicators



No.	Status	Description
1	Amber	Rear_FAN1 failed
2	Amber	CPU2_FAN1 failed
3	Amber	CPU1_FAN1 failed
4	Green	STB PWR ready
5	Amber	Front_FAN2 failed
6	Amber	Front_FAN1 failed
7	Amber	Front_FAN3 failed
8	Amber	Front_FAN4 failed
9	Green	BMC heartbeat LED

1.6 I/O Panel

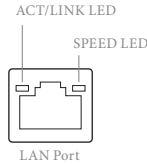


No.	Description	No.	Description
1	PS/2 Mouse/Keyboard Port	8	LAN RJ-45 Port (LAN1)**
2	USB 3.0 Ports (USB3_1_2)	9	Central / Bass (Orange)
3	Serial Port (COM1)	10	Rear Speaker (Black)
4	VGA Port (VGA1)	11	Optical SPDIF Out Port
5	LAN RJ-45 Port (IPMI_LAN)*	12	Line In (Light Blue)
6	USB 3.0 Ports (USB3_3_4)	13	Front Speaker (Lime)***
7	LAN RJ-45 Port (LAN2)**	14	Microphone (Pink)

Note: LAN1 supports NCSI.

LAN Port LED Indications

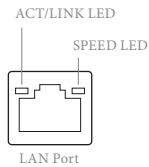
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



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	Green	100M bps connection
On	Link	Yellow	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	Yellow	100Mbps connection
On	Link	Green	1Gbps connection

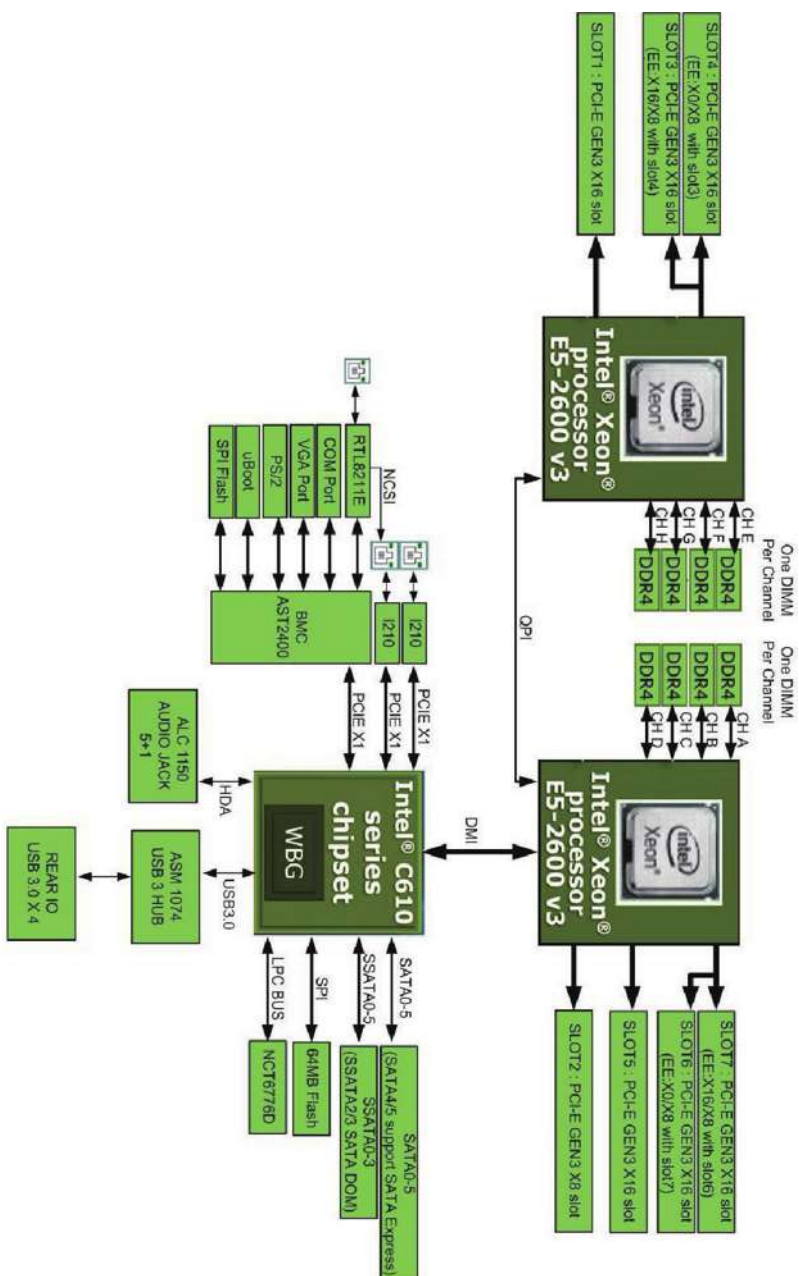
*** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.

Audio Output Channels	Front Speaker (No. 13)	Rear Speaker (No. 10)	Central / Bass (No. 9)	Line In (No. 12)
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.

1.7 Block Diagram



Chapter 2 Installation

This is a SSI EEB form factor (12" x 13", 30.5 cm x 33.0 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

EP2C612 Series are dual socket motherboards that support Intel® Xeon processor E5-2600/4600 & v3 series Processors. Please install a primary processor (Boot/Strap Processor) into "CPU1" socket and then install a non-Primary Processor (Application Processors) into "CPU2" socket. *For a single CPU, please install it into "CPU1" socket (framed by a square).



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.



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

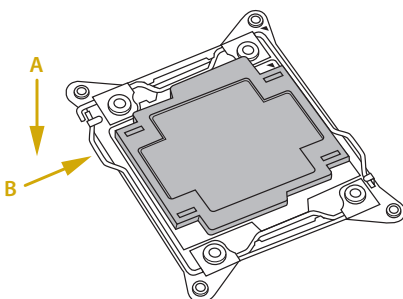


1. Before you insert the 2011-3-Pin CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power cables before installing the CPU.

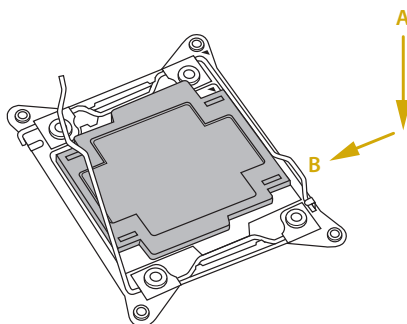
CAUTION:

Please note that C612 platform is only compatible with the LGA 2011-3 socket, which is incompatible with the LGA 2011 socket

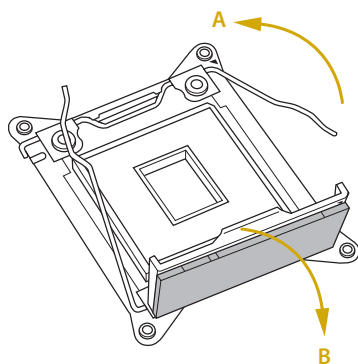
1



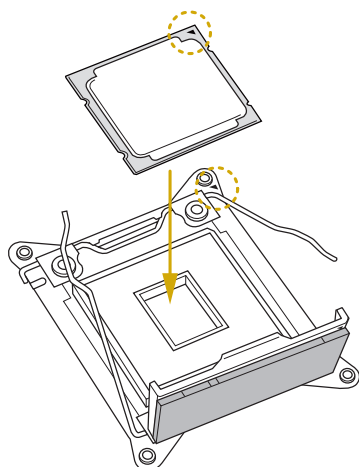
2



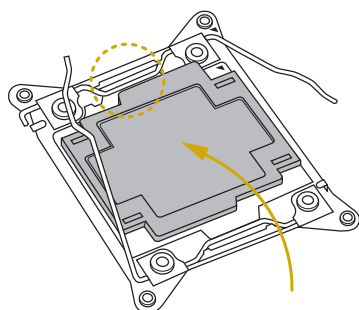
3



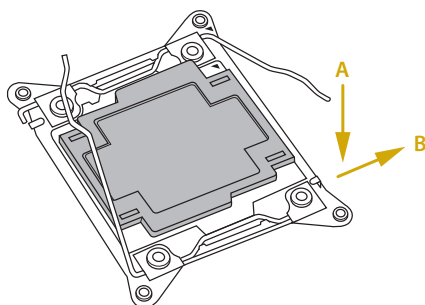
4



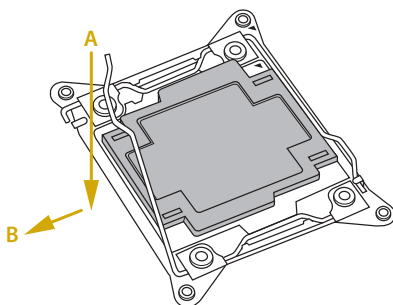
5



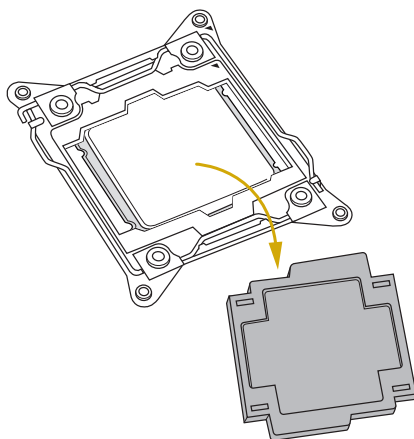
6



7



8

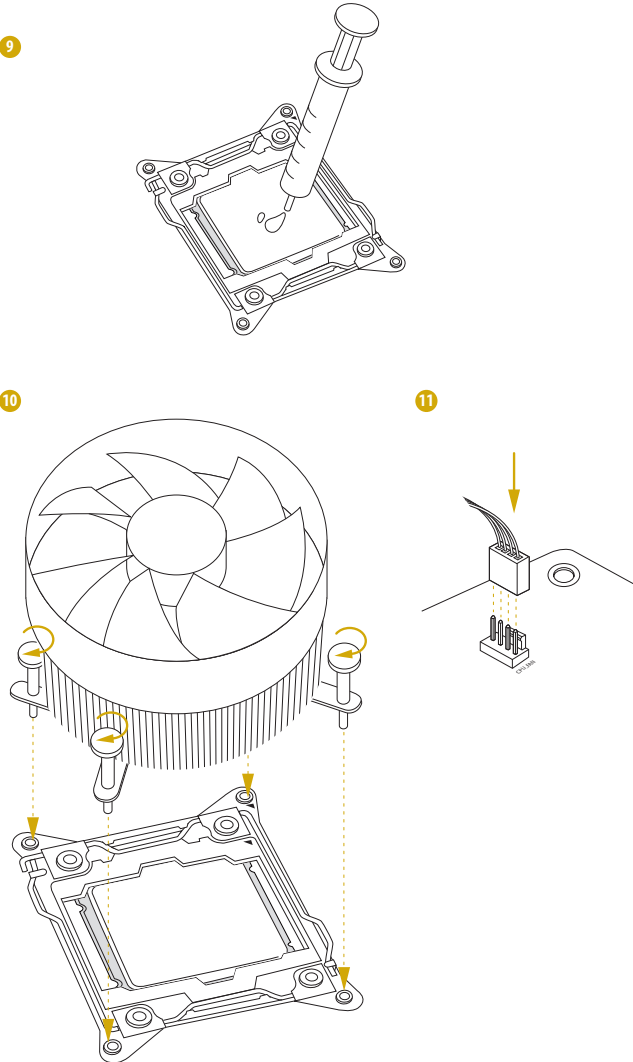


The cover must be placed if returning the motherboard for after service.

2.4 Installing the CPU Fan and Heatsink



Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.



2.5 Installation of Memory Modules (DIMM)

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



1. 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.
2. For quad channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMMs.
3. It is required to install four memory modules to activate Quad Channel Memory Technology.

Capacity	CPU1	CPU2
512GB*	DDR4_A1, B1, C1, D1 (Blue)	DDR4_E1, F1, G1, H1 (Blue)

*The total capacity is estimated when all eight DIMM slots are populated with the LR-DIMMs (64GB).

Single-Processor Memory Configurations

If you install only one CPU (CPU1) on the motherboard, you can install a single memory module into any of the DDR4_A1, DDR4_B1, DDR4_C1, or DDR4_D1 slot.

	CPU1			
	A1	B1	C1	D1
1 DIMM	#			
2 DIMMS	#		#	
4 DIMMS	#	#	#	#

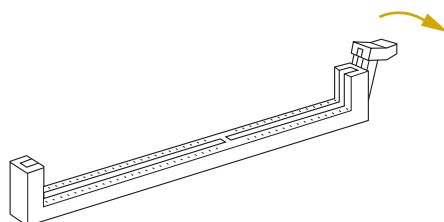
Dual-Processor Memory Configurations

If you install both CPUs (CPU1 and CPU2) on the motherboard, be sure to install your DIMM into any of the DDR4_A1, DDR4_C1, DDR4_E1, or DDR4_G1 slot, before you install the other DIMM(s) into the DDR4_B1, DDR4_D1, DDR4_F1, or DDR4_H1 slot.

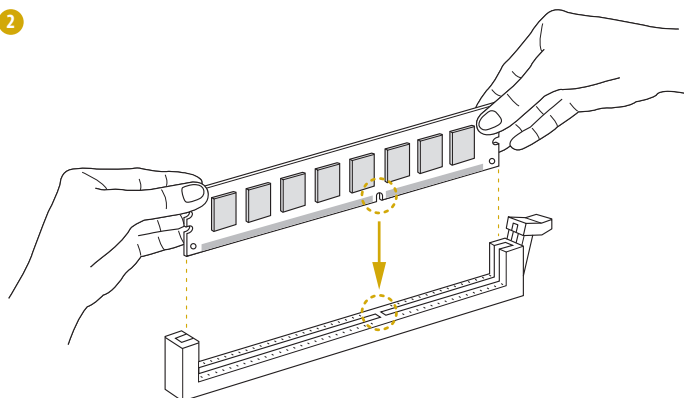
	CPU1				CPU2			
	A1	B1	C1	D1	E1	F1	G1	H1
1 DIMM	#							
2 DIMMS	#				#			
4 DIMMS	#		#		#		#	
8 DIMMS	#	#	#	#	#	#	#	#

*The symbol # indicates the slot is populated by a memory module.

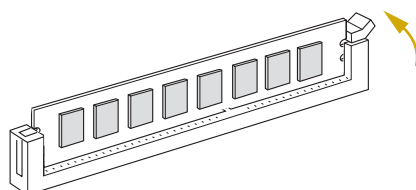
1



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 7 PCI Express slots on this motherboard.

PCIe slot:

PCIE1 (PCIe 3.0 x16 slot, from CPU 2) is used for PCI Express x16 lane width cards.
PCIE2 (PCIe 3.0 x16 slot, from CPU 1) is used for PCI Express x8 lane width cards.
PCIE3 (PCIe 3.0 x16 slot, from CPU 2) is used for PCI Express x16 lane width cards.
PCIE4 (PCIe 3.0 x16 slot, from CPU 2) is used for PCI Express x8 lane width cards.
PCIE5 (PCIe 3.0 x16 slot, from CPU 1) is used for PCI Express x16 lane width cards.
PCIE6 (PCIe 3.0 x16 slot, from CPU 1) is used for PCI Express x8 lane width cards.
PCIE7 (PCIe 3.0 x16 slot, from CPU 1) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE 7	3.0	x16	x16	CPU 1
PCIE 6	3.0	x16	x8	CPU 1
PCIE 5	3.0	x16	x16	CPU 1
PCIE 4	3.0	x16	x8	CPU 2
PCIE 3	3.0	x16	x16	CPU 2
PCIE 2	3.0	x16	x8	CPU 1
PCIE 1	3.0	x16	x16	CPU 2

PCI Express Slot Configuration

	PCIE 7	PCIE 6
Single PCIe Card	x16	x0
Two PCIe Cards	x8	x8

	PCIE 3	PCIE 4
Single PCIe Card	x16	x0
Two PCIe Cards	x8	x8

PCI Express Slot Configuration (SLI™ and CrossFireX™ Mode)

	PCIE1	PCIE3	PCIE5	PCIE7
Two Graphics Cards in CrossFireX™ or SLI™ Mode	x16	x16	N/A	N/A
	N/A	N/A	x16	x16
Three Graphics Cards in 3-Way CrossFireX™ or 3-Way SLI™ Mode	x16	x16	x16	N/A
	N/A	x16	x16	x16
Four Graphics Cards in 4-Way CrossFireX™ or 4-Way SLI™ Mode	x16	x16	x16	x16



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.

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.

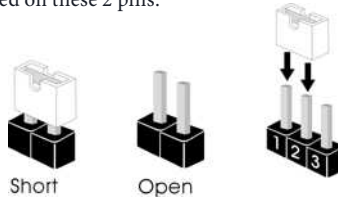
Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5.

Fasten the card to the chassis with screws.
- Step 6.

Replace the system cover.

2.7 Jumper 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.



SATA DOM Power Jumper
(3-pin SATAPWR_SEL1)
(see p.6, No. 22)



SATA DOM (SSATA_3)
requires 5V power supply



SATA DOM (SSATA_3)
does NOT require 5V power
supply (Default)

SATA DOM Power Jumper
(3-pin SATAPWR_SEL2)
(see p.6, No. 35)



SATA DOM (SSATA_2)
requires 5V power supply



SATA DOM (SSATA_2)
does NOT require 5V power
supply (Default)



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 (SATAPWR_SEL1 or SATAPWR_SEL2) from pins 2-3 (default) to pins 1-2.

If the connected SATA DOM does NOT require 5V power supply, connect the SATA DOM power cable to the SATA DOM power header (SATA_PWR_1) and there is no need to change the default jumper setting of the SATA DOM Power Jumper (pins 2-3).

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

Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.6, No. 54)		
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.6, No. 52)		
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.6, No. 50)		
	Board Level SKU (Default)	Reserved for system level use

Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.6, No. 54)		
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.6, No. 52)		
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.6, No. 50)		
	Reserved for system level use	Reserved for system level use

Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.6, No. 54)		
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.6, No. 52)		
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.6, No. 50)		
	Reserved for system level use	Reserved for system level use

ME Recovery Jumper (3-pin ME_RECOVERY1) (see p.6, No. 48)		
	Normal Mode (Default)	ME Recovery Mode

CPU PECI Mode Jumper

(3-pin PECI1)

(see p.6, No. 16)

1_2

CPU PECI connect to PCH

2_3CPU PECI connect to BMC
(Default)

PMBUS Mode Jumper

(3-pin PMBUS_SEL_ALT1)

(see p.6, No. 9)

(3-pin PMBUS_SEL_DAT1)

(see p.6, No. 11)

(3-pin PMBUS_SEL_CLK1)

(see p.6, No. 13)

1_2PMBus connected to BMC
(Default)**2_3**

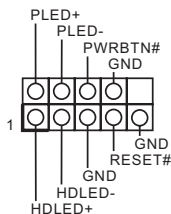
PMBus connected to PCH

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.6, No. 33)



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 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):

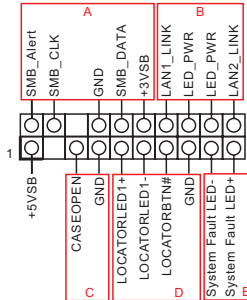
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

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, 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.

Auxiliary Panel Header
(18-pin AUX PANEL_1)
 (see p.6, No. 34)



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



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.

Serial ATA3 Connectors

(SATA_0)

(see p.6, No. 18)

(SATA_1)

(see p.6, No. 23)

(SATA_2)

(see p.6, No. 25)

(SATA_3)

(see p.6, No. 19)

(SATA_4)

(see p.6, No. 24)

(SATA_5)

(see p.6, No. 26)



These eight SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

Serial ATA Express

Connector

(SATAE_1)

(see p.6, No. 27)



Please connect either SATA or PCIe storage devices to this connector. *The SATA Express interface is a combination of SATAE_1, SATA3_4, and SATA3_5.

Serial ATA3 DOM

Connectors

(SSATA_2)

(see p.6, No. 32)

(SSATA_3)

(see p.6, No. 30)



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



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 (SATAPWR_SEL1 or SATAPWR_SEL2) from pins 2-3 (default) to pins 1-2.

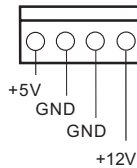
If the connected SATA DOM does NOT require 5V power supply, connect the SATA DOM power cable to the SATA DOM power header (SATA_PWR_1) and there is no need to change the default jumper setting of the SATA DOM Power Jumper (pins 2-3).

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

SATA Power Connectors

(4-pin SATA_PWR1)

(see p.6, No. 31)



Please connect a SATA power cable.

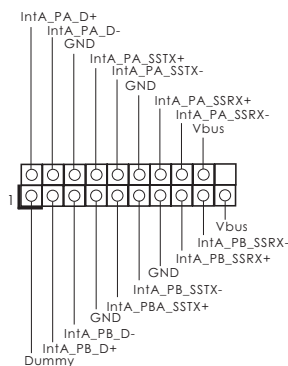
USB 3.0 Connector

(USB3_7)

(see p.6, No. 37)

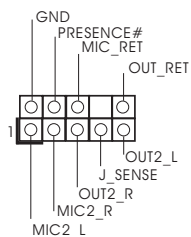


USB 3.0 Header
(19-pin USB3_5_6)
(see p.6, No. 36)



Besides four default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.6, No. 57)

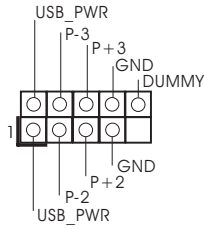


This header is for connecting audio devices to the front audio panel.



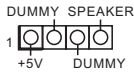
1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instructions in our manual and chassis manual to install your system.
2. If you use an AC'97 audio panel, please install it to the front panel audio header by the 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".

USB 2.0 Header
(9-pin USB_1_2)
(see p.6, No. 38)



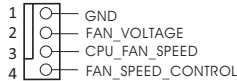
There is one USB 2.0 header on this motherboard. Each USB 2.0 header can support two ports.

Chassis Speaker Header
(4-pin SPEAKER1)
(see p.6, No. 39)



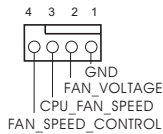
Please connect the chassis speaker to this header.

CPU Fan Connectors
(4-pin CPU1_FAN1)
(see p.6, No. 7)
(4-pin CPU2_FAN1)
(see p.6, No. 4)

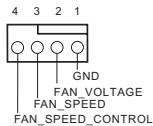


This motherboard provides two 4-Pin CPU fan (Quiet Fan) connectors. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

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



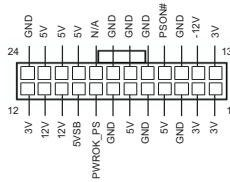
Front and Rear Fan Connectors
(4-pin FRNT_FAN1)
(see p.6, No. 21)
(4-pin FRNT_FAN2)
(see p.6, No. 20)
(4-pin FRNT_FAN3)
(see p.6, No. 40)
(4-pin FRNT_FAN4)
(see p.6, No. 41)



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

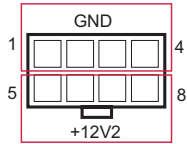
(4-pin REAR_FAN1)
(see p.6, No. 3)

ATX Power Connector
(24-pin ATX12V1)
(see p.6, No. 12)



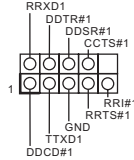
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V1)
(see p.6, No. 10)
(8-pin ATX12V2)
(see p.6, No. 2)



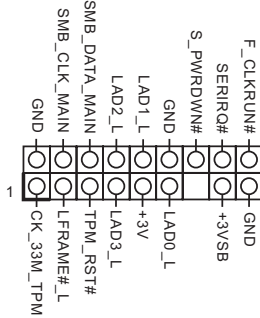
This motherboard provides two 8-pin ATX 12V power connectors.

Serial Port Header
(9-pin COM1)
(see p.6, No. 55)



This COM1 header supports a serial port module.

TPM Header
(17-pin TPM1)
(see p.6, No. 46)



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.

Serial General Purpose Input/Output Headers

(7-pin SATA_SGPI01)

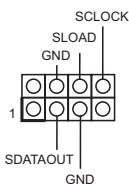
(see p.6, No. 43)

(7-pin SATA_SGPI02)

(see p.6, No. 44)

(7-pin SSATA_SGPI01)

(see p.6, No. 45)

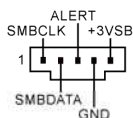


This header supports Serial Link interface for onboard SATA connections.

PSU SMBus

(PSU_SMB1)

(see p.6, No. 8)



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

Non Maskable Interrupt

Button Header

(NMI_BTN1)

(see p.6, No. 56)

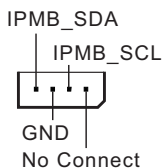


Please connect a NMI device to this header.

Intelligent Platform Management Bus header

(4-pin IPMB1)

(see p.6, No. 47)



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.

Baseboard Management Controller SMBus Header

(5-pin BMC_SMB_1)

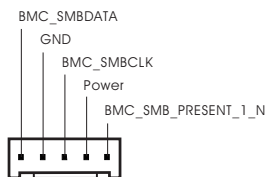
(see p.6, No. 53)

(5-pin BMC_SMB_2)

(see p.6, No. 51)

(5-pin BMC_SMB_3)

(see p.6, No. 49)

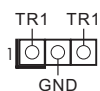


These headers are used for the SM BUS devices.

Thermal Sensor Header

(3-pin TR1)

(see p.6, No. 42)



Please connect the thermal sensor cable to either pin 1-2 or pin 2-3 and the other end to the device which you wish to monitor its temperature.

PCIe Power Connector

(4-pin PCIE_PWR1)

(see p.6, No. 17)



Please connect a 4 pin molex power cable to this connector when more than three PCI Express cards are installed.

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
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.
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.

2.10 SLI™, 3-Way SLI™, 4-Way SLI™ and Quad SLI™ Operation Guide

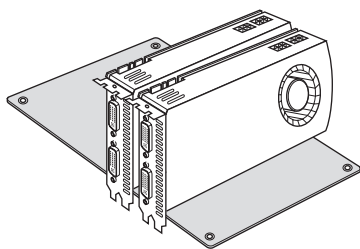
This motherboard supports NVIDIA® SLI™, 3-way SLI™, 4-way SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to four identical PCI Express x16 graphics cards. Currently, NVIDIA® SLI™ and Quad SLI™ technology supports Windows® 7 / 7 64-bit / 8 / 8 64-bit / 8.1 / 8.1 64-bit OS.



Requirements

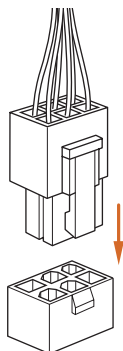
1. You should only use identical SLI™-ready graphics cards that are NVIDIA® certified.
2. Make sure that your graphics card driver supports NVIDIA® SLI™ technology. Download the drivers from the NVIDIA® website: www.nvidia.com
3. Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a NVIDIA® certified PSU. Please refer to the NVIDIA® website for details.
4. When using the SLI™, be sure to connect the power cord to the PCIe Power connector (PCI_E_PWR1).

2.10.1 Installing Two SLI™-Ready Graphics Cards



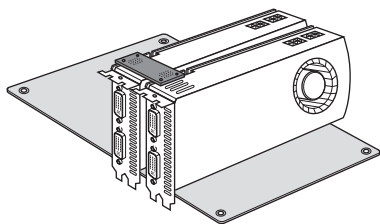
Step 1

Insert one graphics card into PCIe1 slot and the other graphics card to PCIe3 slot, or insert one graphics card into PCIe5 slot and the other graphics card to PCIe7 slot. Make sure that the cards are properly seated on the slots.



Step 2

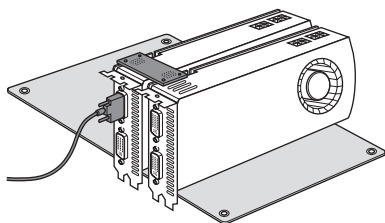
If required, connect the auxiliary power source to the PCI Express graphics cards.

**Step 3**

Align and insert the SLI_Bridge_3S Card to the goldfingers on each graphics card. Make sure the SLI_Bridge_3S Card is firmly in place.

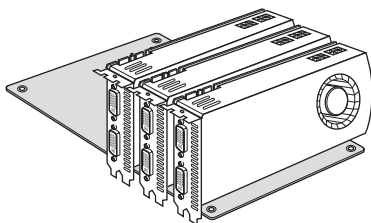


SLI_Bridge_3S Card

**Step 4**

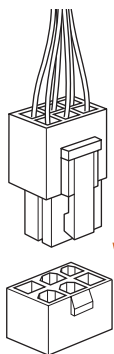
Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

2.10.2 Installing Three SLI™-Ready Graphics Cards



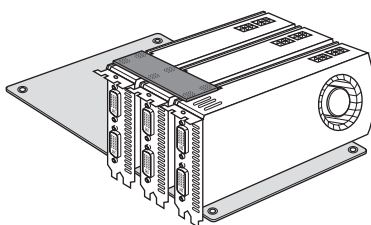
Step 1

Insert one graphics card into PCIe1 slot, another graphics card to PCIe3 slot, and the other graphics card to PCIe5 slot, or insert one graphics card into PCIe3 slot, another graphics card to PCIe5 slot, and the other graphics card to PCIe7 slot. Make sure that the cards are properly seated on the slots.



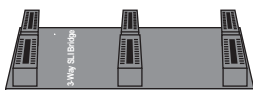
Step 2

Connect the auxiliary power source to the PCI Express graphics card. Please make sure that both power connectors on the PCI Express graphics card are connected. Repeat this step on the three graphics cards.

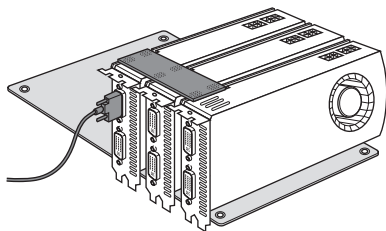


Step 3

Align and insert the 3-Way SLI Bridge Card to the goldfingers on each graphics card. Make sure the 3-Way SLI Bridge Card is firmly in place.

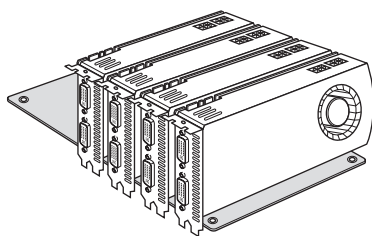


3-Way SLI Bridge Card

**Step 4**

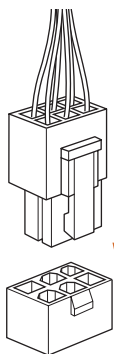
Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

2.10.3 Installing Four SLI™-Ready Graphics Cards



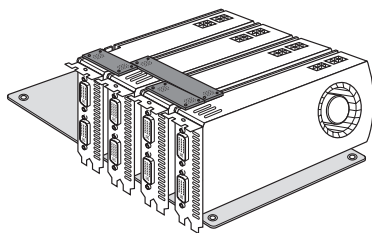
Step 1

Insert one graphics card into the PCIe1 slot, another graphics card into the PCIe3 slot, the third graphics card into the PCIe5 slot and the last graphics card into the PCIe7 slot. Make sure that the cards are properly seated on the slots.



Step 2

Connect the auxiliary power source to the PCI Express graphics card. Please make sure that both power connectors on the PCI Express graphics card are connected. Repeat this step on the three graphics cards.

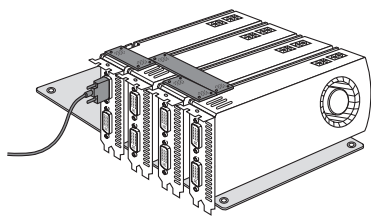


Step 3

Align and insert an SLI Bridge Card to the goldfingers of the first and second graphics card. Install the second SLI Bridge Card to the goldfingers of the third and fourth graphics card. Connect the second and the fourth graphics card with the SLI_Bridge_3S Card. Make sure the SLI Bridge Cards are firmly in place.



2 SLI_Bridge Cards
and a SLI_Bridge_3S 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 PCIE1 slot.

2.10.4 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.



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.

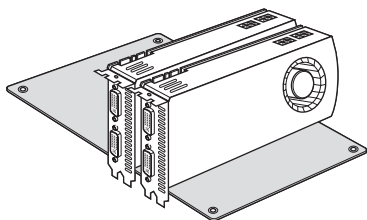
2.11 CrossFireX™, 3-Way CrossFireX™, 4-Way CrossFireX™ and Quad CrossFireX™ Operation Guide

This motherboard supports CrossFireX™, 3-way CrossFireX™, 4-way CrossFireX™ and Quad CrossFireX™ that allows you to install up to four identical PCI Express x16 graphics cards. Currently CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ are supported with Windows® 7 / 7 64-bit / 8 / 8 64-bit / 8.1 / 8.1 64-bit OS.



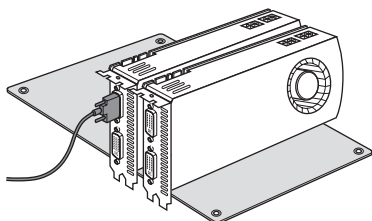
1. You should only use identical CrossFireX™-ready graphics cards that are AMD certified.
2. Make sure that your graphics card driver supports AMD CrossFireX™ technology. Download the drivers from the AMD's website: www.amd.com
3. Make sure that your power supply unit (PSU) can provide at least the minimum 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.
6. When using the CrossFireX™, be sure to connect the power cord to the PCIe Power connector (PCIE_PWR1).

2.11.1 Installing Two CrossFireX™-Ready Graphics Cards



Step 1

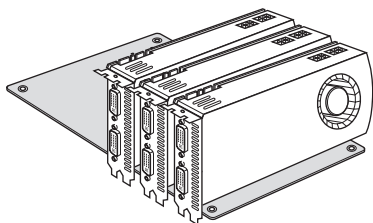
Insert one graphics card into PCIe1 slot and the other graphics card to PCIe3 slot, or insert one graphics card into PCIe5 slot and the other graphics card to PCIe7 slot. Make sure that the cards are properly seated on the slots.



Step 2

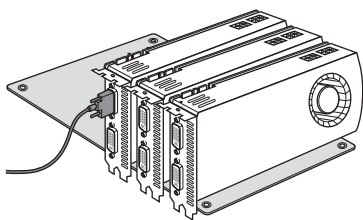
Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIe1 slot.

2.11.2 Installing Three CrossFireX™-Ready Graphics Cards



Step 1

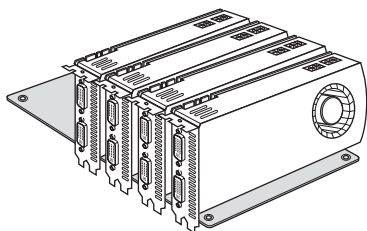
Insert one graphics card into PCIe1 slot, another graphics card to PCIe3 slot, and the other graphics card to PCIe5 slot, or insert one graphics card into PCIe3 slot, another graphics card to PCIe5 slot, and the other graphics card to PCIe7 slot. Make sure that the cards are properly seated on the slots.



Step 2

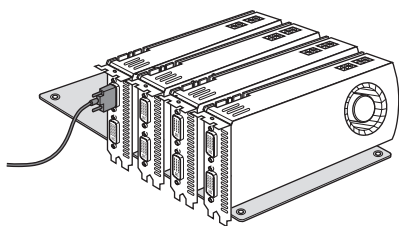
Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIe1 slot.

2.11.3 Installing Four CrossFireX™-Ready Graphics Cards



Step 1

Insert one graphics card into PCIe1 slot, another graphics card into PCIe3 slot, the third graphics card into PCIe5 slot and the last graphics card into PCIe7 slot. Make sure that the cards are properly seated on the slots.



Step 2

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIe1 slot.

2.11.4 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 uninstall 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**.

2.12 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.

2.13 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.



The speed of transmission is subject to the actual network environment or status even with Teaming enabled.

Before setting up Teaming, please make sure whether your Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). You can specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

Select the adapter you want to be the primary adapter and click the **Set Primary** button.

If you do not specify a preferred primary adapter, the software will choose an adapter of the highest capability (model and speed) to act as the default primary. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

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
OC Tweaker	For overclocking configurations
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. You can also use the mouse to click your required item.

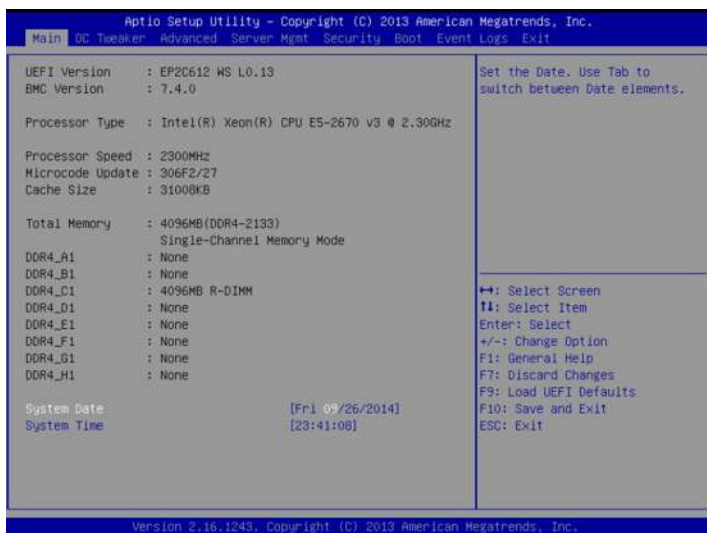
3.1.2 Navigation Keys

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

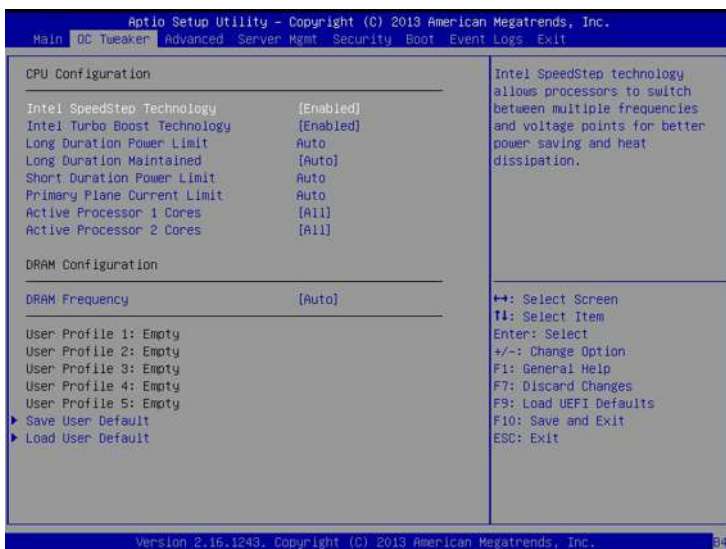
3.2 Main Screen

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 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.

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.

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.

Primary Plane Current Limit

Configure the current limit of the CPU under Turbo Mode in ampere. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Active Processor 1 Cores

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

Active Processor 2 Cores

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

DRAM Configuration

DRAM Frequency

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

Save User Default

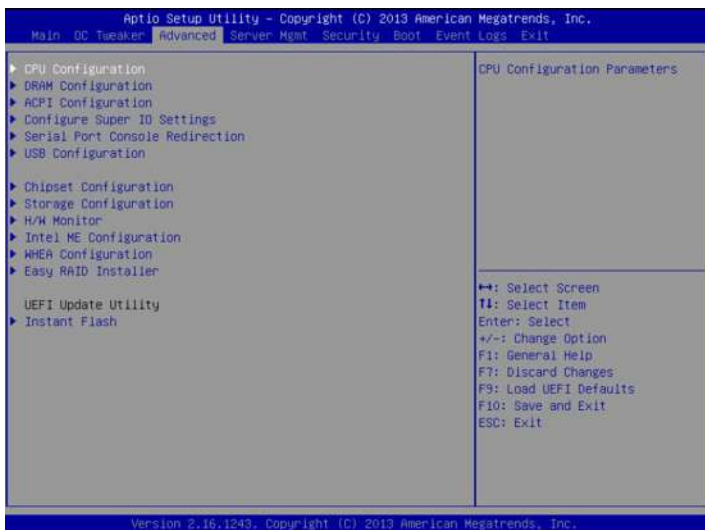
Type a profile name and press enter to save your settings as user default.

Load User Default

Load previously saved user defaults.

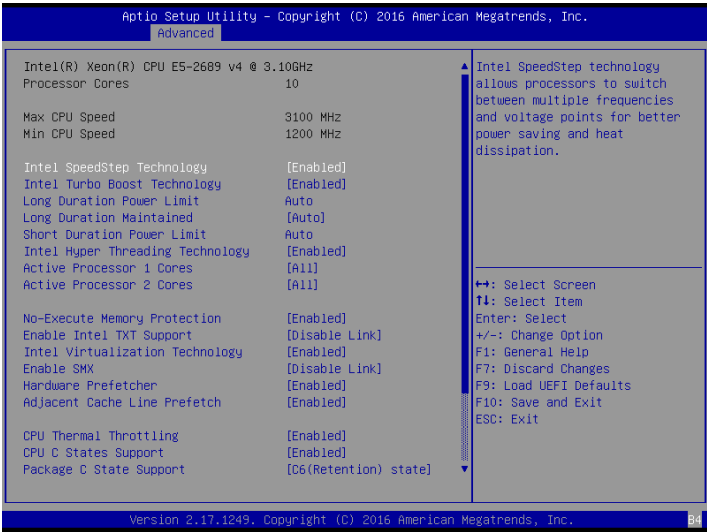
3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, DRAM Configuration, ACPI Configuration, Configure Super IO Settings, Serial Port Console Redirection, Trusted Computing, USB Configuration, Chipset Configuration, Storage Configuration, H/W Monitor, Intel ME Configuration, WHEA Configuration, Easy RAID Installer and Instant Flash.



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

3.4.1 CPU Configuration



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.

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.

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor 1 Cores

Use this item to select the number of cores to enable in each processor package.

Active Processor 2 Cores

Use this item to select the number of cores to enable in each processor package.

No-Execute Memory Protection

Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks.

Enable Intel TXT Support

Enable Intel Trusted Execution Technology configuration. Please disable “EX DFX 60 English Features” when TXT is enabled.

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 system.

Enable SMX

Use this item to enable Safer Mode Extensions.

Hardware Prefetcher

Use this item to 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.

CPU Thermal Throttling

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

CPU C States Support

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

Package C State Support

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

CPU C3 State Support

Enable C3 sleep state for lower power consumption.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

Enhanced Halt State(C1E)

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

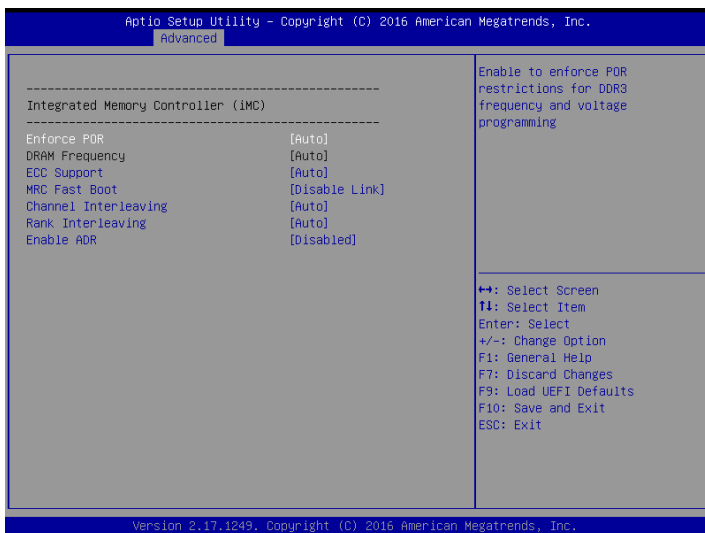
Enable CPU HWPM

Enable CPU HWPM for CPU for better Energy performance.

Enable CPU Autonomous Cstate

Enable CPU Autonomous Cstate which is CPU converts HALT instruction to MWAIT.

3.4.2 DRAM Configuration



DRAM Frequency

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

ECC Support

This allows you to enable or disable the DDR ECC support feature.

MRC Fast Boot

When enabled, portions of memory reference code will be skipped when possible to increase boot speed.

Channel Interleaving

Use this item to select Channel Interleaving setting.

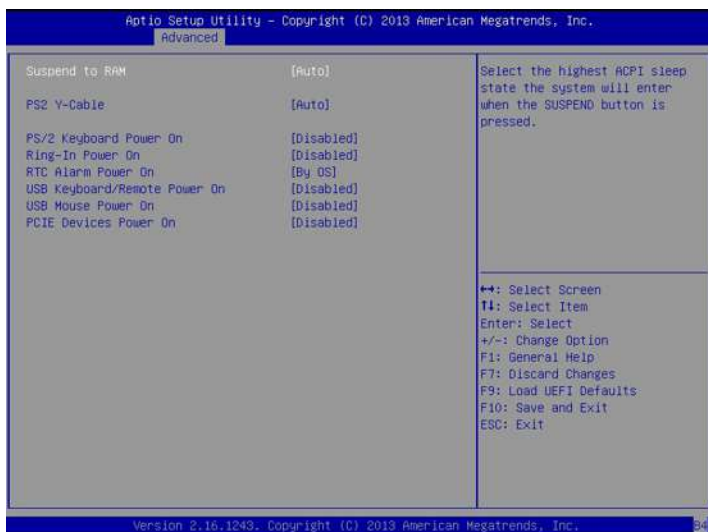
Rank Interleaving

Use this item to select Rank Interleaving setting.

Enable ADR

Use this item to enable the ADR.

3.4.3 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Selecting [Auto] will enable this feature if the OS supports it.

PS2 Y-Cable

Auto/Enable PS2 Y-Cable

PS/2 Keyboard Power On

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

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

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

USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote to turn on the system from the power-soft-off mode.

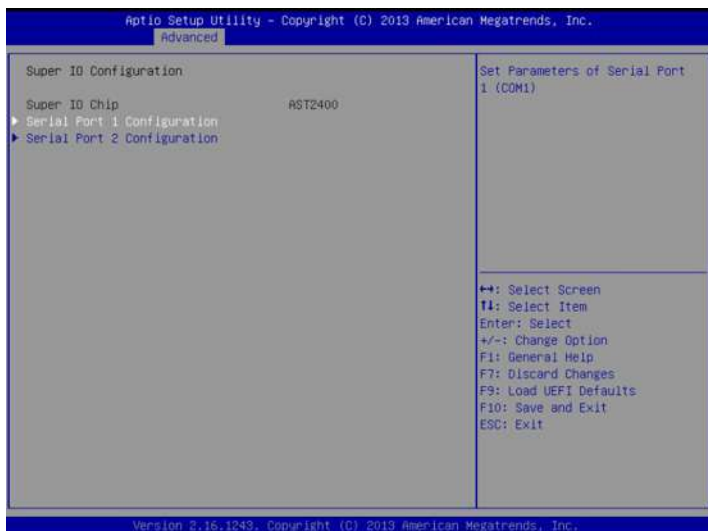
USB Mouse Power On

Use this item to enable or disable USB Mouse to turn on the system from the power-soft-off mode.

PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

3.4.4 Configure Super IO Settings



Serial Port 1 Configuration

Use this item to configure the onboard serial port 1.

Select and enter the "Serial Port 1 Configuration" and you will see the followings:

Serial Port

Use this item to enable or disable the onboard serial port.

Change Settings

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

Serial Port 2 Configuration

Use this item to configure the onboard serial port 2.

Select and enter the "Serial Port 2 Configuration" and you will see the followings:

Serial Port

Use this item to enable or disable the onboard serial port.

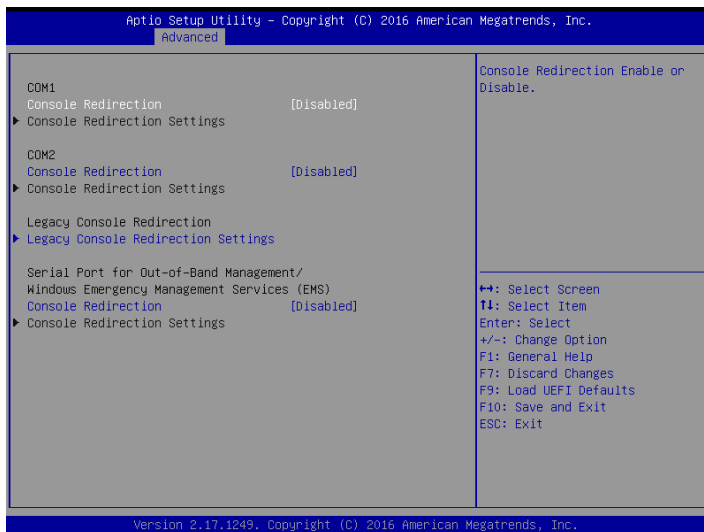
Change Settings

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

Serial Port Mode

Use this item to select Serial Over LAN or COM mode.

3.4.5 Serial Port Console Redirection



COM1 / COM2

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Terminal Type

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second

Use this item to select the serial port transmission speed. The speed used in the host

computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Data Bits

Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity

Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space].

Stop Bits

The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None] and [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode

Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

Resolution 100x31

Use this item to enable or disable extended terminal resolution support.

Legacy OS Redirection Resolution

Use this item to select the number of rows and columns used in legacy OS redirection.

Putty Keypad

Use this item to select Function Key and Keypad on Putty.

Redirection After BIOS POST

If the [LoadBooster] is selected, legacy console redirection is disabled before booting to legacy OS. If [Always Enabled] is selected, legacy console redirection is enabled for legacy OS. The default value is [Always Enabled].

Legacy Console Redirection Settings

Legacy Serial Redirection Port

Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Terminal Type

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Flow Control

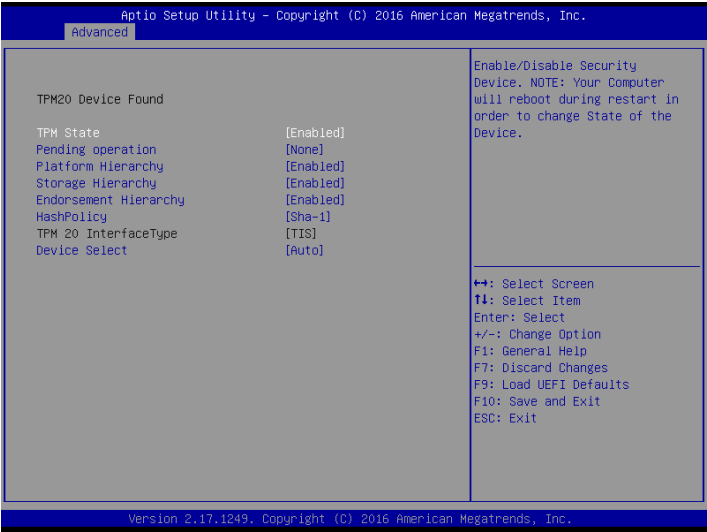
Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/CTS], and [Software Xon/Xoff].

Data Bits

Parity

Stop Bits

3.4.6 Trusted Computing



NOTE: Options vary depending on the version of your connected TPM module. Here is an example of TPM2.0.

TPM State

Use this item to enable or disable Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Pending Operation

Schedule an Operation for the Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Platform Hierarchy

Use this item to enable or disable Platform Hierarchy.

Storage Hierarchy

Use this item to enable or disable Storage Hierarchy.

Endorsement Hierarchy

Use this item to enable or disable Endorsement Hierarchy.

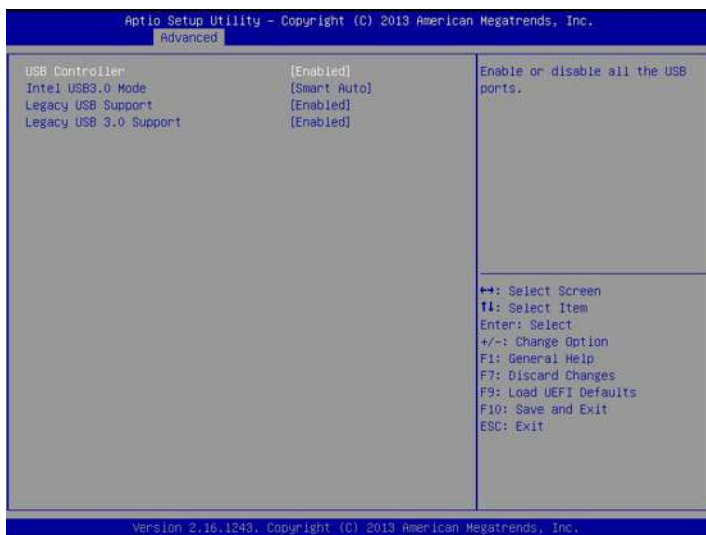
Hash Policy

Select the Hash policy to use. SHA-2 is most secure but might not be supported by all Operating Systems.

Device Select

TPM 1.2 will restrict support to TPM 1.2 devices; TPM 2.0 will restrict support to TPM 2.0 devices; Auto will support both with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

3.4.7 USB Configuration



USB Controller

Enable or disable all the USB ports.

Intel USB3.0 Mode

Use this item to select the mode of operation of Intel USB3.0 controller.

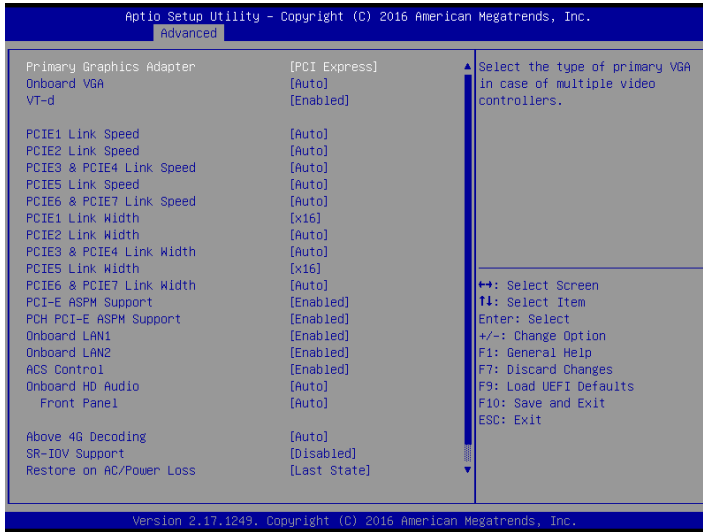
Legacy USB Support

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.

Legacy USB 3.0 Support

Use this item to enable or disable Legacy OS Support for USB 3.0 devices.

3.4.8 Chipset Configuration



Primary Graphics Adapter

If PCI Express graphics card is installed on the motherboard, you may use this option to select PCI Express or Onboard as the primary graphics adapter.

Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Auto].

**This item is not available when the Primary Graphic Adapter is set to [Onboard].*

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.

PCIe 1 Link Speed

This allows you to select PCIe 1 Link Speed. The default value is [Auto].

PCIe 2 Link Speed

This allows you to select PCIe 2 Link Speed. The default value is [Auto].

PCIE 3 & PCIE 4 Link Speed

This allows you to select PCIE 3 & PCIE 4 Link Speed. The default value is [Auto].

PCIE 5 Link Speed

This allows you to select PCIE 5 Link Speed. The default value is [Auto].

PCIE 6 & PCIE 7 Link Speed

This allows you to select PCIE 6 & PCIE 7 Link Speed. The default value is [Auto].

PCIE 1 Link Width

This allows you to select PCIE 1 Link Width. The default value is [Auto].

PCIE 2 Link Width

This allows you to select PCIE 2 Link Width. The default value is [Auto].

PCIE 3 & PCIE 4 Link Width

This allows you to select PCIE 3 & PCIE 4 Link Width. The default value is [Auto].

PCIE 5 Link Width

This allows you to select PCIE 5 Link Width. The default value is [Auto].

PCIE 6 & PCIE 7 Link Width

This allows you to select PCIE 6 & PCIE 7 Link Width. The default value is [Auto].

PCI-E ASPM Support

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

PCH PCI-E ASPM Support

This option enables or disables the ASPM support for all PCH downstream devices.

Onboard LAN1

This tem allows you to enable or disable the Onboard LAN 1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN 2 feature.

ACS Control

Enable: Programs ACS only to Chipset PCIe Root Ports Bridges

Disable: Programs ACS to all PCIe bridges

Onboard HD Audio

Use this item to automatically enable or disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.

Front Panel

Use this item to set front panel HD audio to Auto or Disabled.

Above 4G Decoding

Enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the 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 on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, it will recover to the state before AC/power loss.

Onboard Debug Port LED

Use this item to turn on or off Onboard Debug Port LED.

3.4.9 Storage Configuration



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

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

SATA Storage Configuration

SATA Controller

Use this item to enable or disable SATA Controller.

SATA Mode Selection

Use this to select SATA mode. Configuration options: [Disabled], [IDE], [AHCI] and [RAID] mode. The default value is [AHCI].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

SATA AHCI LPM

Use this item to enable or disable Link Power Management.

SATA Aggressive Link Power Mgmt

Use this item to configure SATA Aggressive Link Power Management.

SATA Port 0 / 1 / 2 / 3 / 4 / 5

Depending on how many SATA ports you have, you will see SATA_x (x means number) listed on the screen, with its status indicated as SATA device [(Model Name)] or [Not Detected].

This model supports SATA Express. When a HDD is plugged into the the SATA Express port, the HDD information here appears as [SATA_4/SATAE_0] and [SATA_5/SATAE_1].

External SATA

Use this item to enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.

Hot Plug

Designates this port as Hot Pluggable.

Spin Up Device

If enabled for any of ports, Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

SATA Rx Setting

Adjust SATA DTLE DATA Values (0-15).

SATA Device Type

Identify the SATA port connected to Solid State Drive or Hard Disk Drive.

sSATA Storage Configuration

sSATA Controller

Use this item to enable or disable sSATA Controller.

sSATA Mode Selection

Use this to select sSATA mode. Configuration options: [Disabled], [IDE], [AHCI] and [RAID] mode. The default value is [AHCI].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

sSATA AHCI LPM

Use this item to enable or disable Link Power Management.

sSATA Aggressive Link Power Mgmt

Use this item to configure sSATA Aggressive Link Power Management.

sSATA Port 0 / 1 / 2 / 3

Depending on how many sSATA ports you have, you will see sSATA_x (x means number) listed on the screen, with its status indicated as SATA device [(Model Name)] or [Not Detected].

External sSATA

Use this item to enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.

Hot Plug

Designates this port as Hot Pluggable.

Spin Up Device

If enabled for any of ports, Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

SATA Rx Setting

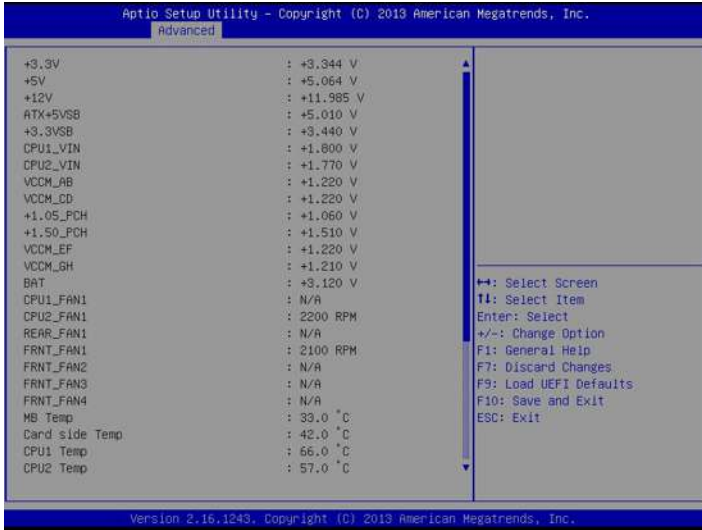
Adjust SATA DTLE DATA Values (0-15).

SATA Device Type

Identify the SATA port connected to Solid State Drive or Hard Disk Drive.

3.4.10 H/W Monitor Screen

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.

CPU1_FAN 1

This allows you to set the CPU 1 fan speed. The default value is [Smart Fan].

CPU2_FAN 1

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

REAR_FAN 1

This allows you to set the rear fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 1

This allows you to set the front fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 2

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

FRNT_FAN 3

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

FRNT_FAN 4

This allows you to set the front fan 4'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.

Watch Dog Timer

This allows you to enable or disable the Watch Dog Timer. The default value is [Disabled].

3.4.11 Intel ME Configuration



ME Subsystem screen displays the Intel ME Subsystem Configuration information, such as Operational Firmware Version, ME Firmware, ME Firmware Type, ME Firmware SKU and ME File System Integrity Value.

Spread Spectrum

Select Spread spectrum mode.

3.4.12 WHEA Configuration



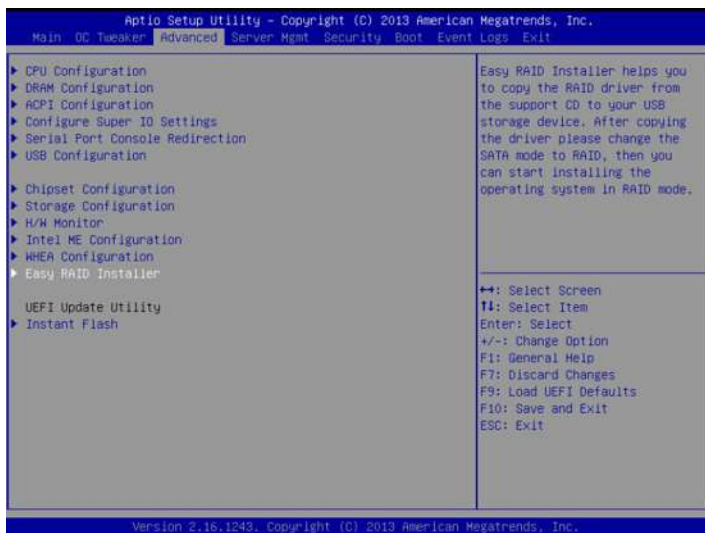
WHEA Support

Use this item to enable or disable Windows Hardware Error Architecture.

System Error

Use this item to enable or disable System Error feature. When it is set to [Enabled], you can configure Memory Error and PCIE Error log features.

3.4.13 Easy RAID Installer



Easy RAID Installer can help you to copy the RAID driver from a support CD to your USB storage device. After copying the RAID driver to your USB storage device, please change “SATA Mode” to “RAID”, then you can start installing the OS in RAID mode.

3.4.14 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.

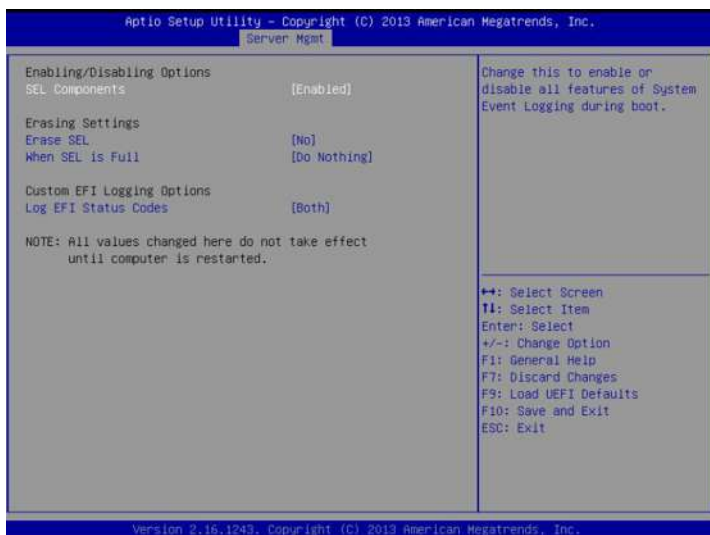
3.5 Server Mgmt



Wait For BMC

Wait For BMC response for specified time out. In PILOTII, BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize Host to BMC interfaces.

3.5.1 System Event Log



SEL Components

Change this to enable or disable all features of System Event Logging 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 or both.

3.5.2 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/ipmi.asp>

BMC Mac Backup Tool

Use this to restore BMC Mac from the backup.

3.6 Security Screen

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.

3.7 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 From Onboard LAN

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

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

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].

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.

3.7.1 CSM Parameters



Use this option to configure the parameters of OpROM execution, boot options filter, etc.

CSM

Enable to launch the Compatibility Support Module. If you are using Windows 8 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Boot Option Filter

Use this option to control what devices system can boot to. Configuration options: [UEFI and Legacy], [Legacy only] and [UEFI only].

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 to 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.

PCIE1 Slot OpROM

Select PCIE1 Storage and Network Option ROM policy. (This item can't select Video

Option ROM policy.)

PCIE2 Slot OpROM

Select PCIE2 Storage and Network Option ROM policy. (This item can't select Video Option ROM policy.)

PCIE3 and PCIE4 Slot OpROM

Select PCIE3 and PCIE4 Storage and Network Option ROM policy. (This item can't select Video Option ROM policy.)

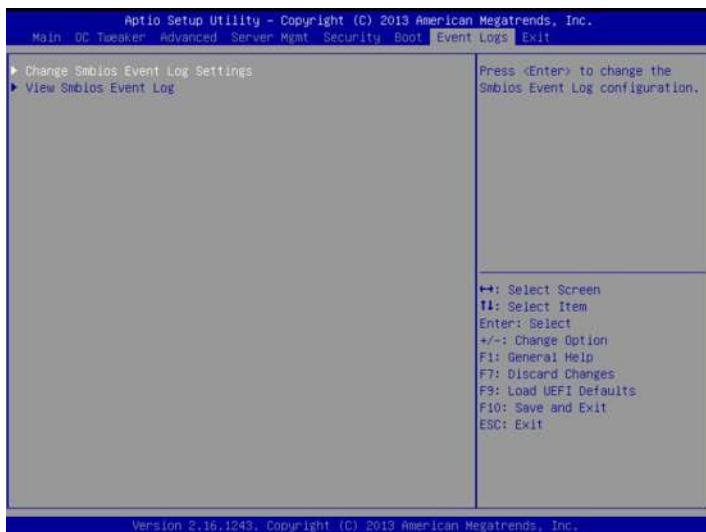
PCIE5 Slot OpROM

Select PCIE5 Storage and Network Option ROM policy. (This item can't select Video Option ROM policy.)

PCIE6 and PCIE7 Slot OpROM

Select PCIE6 and PCIE7 Storage and Network Option ROM policy. (This item can't select Video Option ROM policy.)

3.8 Event Logs



Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

Smbios Event Log

Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erase Event Log

The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full

Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

MECI (Multiple Event Count Increment)

Use this item to enter the increment value for the multiple event counter. The valid range is from 1 to 33.

METW (Multiple Event Time Window)

Use this item to specify the number of minutes which must pass between duplicate log

entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

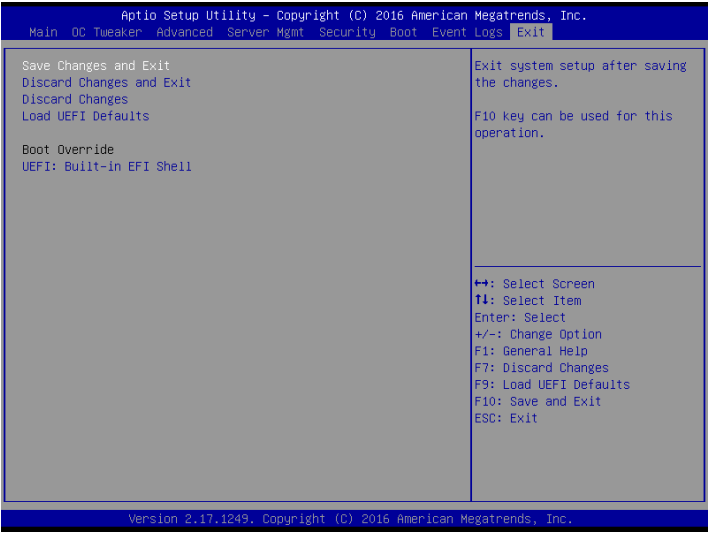
View Smbios Event Log

This allows you to view the Smbios Event Log records.



All values changed here do not take effect until computer is restarted.

3.9 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop-out. 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. 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. 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® 7 / 8 / 8.1 / 10 / Server 2008 R2 SP1 / 2012 / 2012 R2 / 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 Intel® 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 2133 R-DIMMs.
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.

Chapter 6: Net Framework Installation Guide

To let Intel® RSTe works properly, it is required to install Net Framework. Please follow the steps below to enable “.Net Framework” feature on Microsoft® Windows® Server 2008 R2.

6.1 Installing .Net Framework 3.5.1 (For Server 2008 R2)

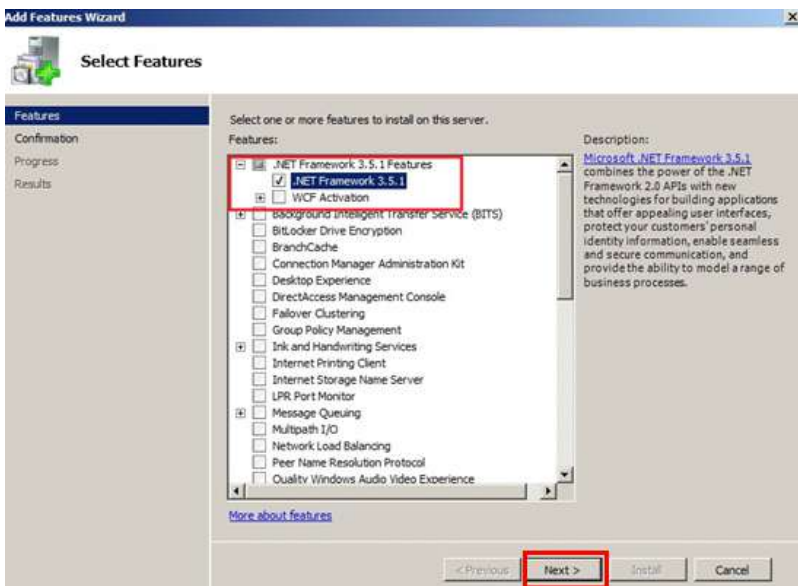
1. Double-click the Server Manager icon in the Windows system tray.



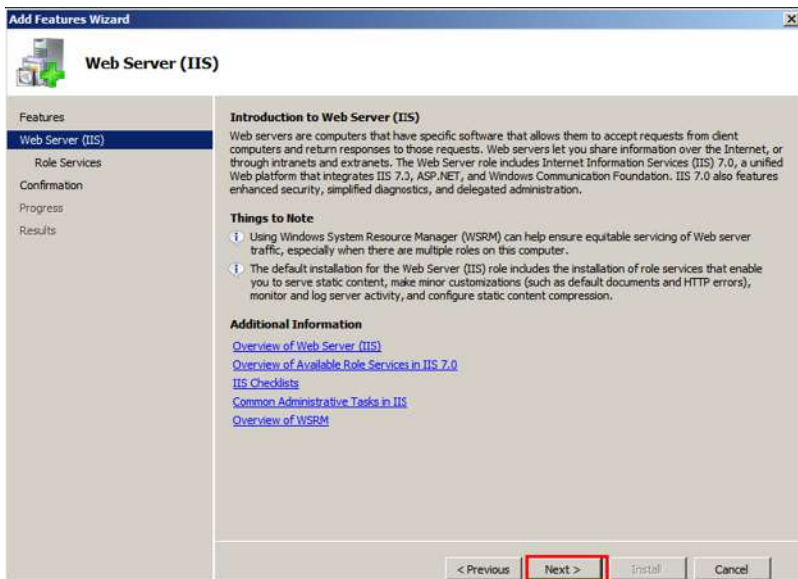
2. Click Add Features in the right hand pane.



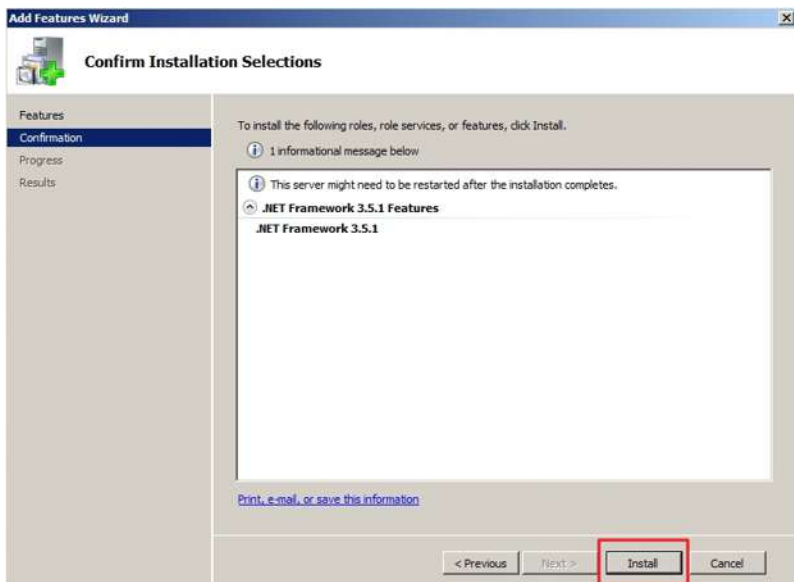
3. Check the box next to .Net Framework 3.5.1 and then click **Next**.



4. Click **Next** to continue.



5. Click **Install** to start installing .Net Framework 3.5.1.



6. After the installation completes, click **Close**.

