



H61M-S+

User Manual

Version 1.0

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

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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](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)”

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# Chapter 1: Introduction

Thank you for purchasing ASRock **H61M-S+** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain 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 website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

[www.asrock.com/support/index.asp](http://www.asrock.com/support/index.asp)

## 1.1 Package Contents

ASRock **H61M-S+** Motherboard (Micro ATX Form Factor)

ASRock **H61M-S+** Quick Installation Guide

ASRock **H61M-S+** Support CD

2 x Serial ATA (SATA) Data Cables (Optional)

1 x I/O Panel Shield

## 1.2 Specifications

<b>Platform</b>	<ul style="list-style-type: none"> <li>- Micro ATX Form Factor</li> <li>- All Solid Capacitor design</li> <li>- High Density Glass Fabric PCB</li> </ul>
<b>CPU</b>	<ul style="list-style-type: none"> <li>- Supports 3<sup>rd</sup> and 2<sup>nd</sup> Generation Intel® Core™ i7 / i5 / i3 / Xeon® / Pentium® / Celeron® in LGA1155 Package</li> <li>- Supports Intel® Turbo Boost 2.0 Technology</li> <li>- Supports K-Series unlocked CPU</li> <li>- Supports Hyper-Threading Technology</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>- Intel® H61</li> <li>- Supports Intel® Rapid Start Technology and Smart Connect Technology</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>- Dual Channel DDR3 Memory Technology</li> <li>- 2 x DDR3 DIMM slots</li> <li>- Supports DDR3 1600/1333/1066 non-ECC, un-buffered memory (DDR3 1600 with Intel® Ivy Bridge CPU, DDR3 1333 with Intel® Sandy Bridge CPU)</li> <li>- Max. capacity of system memory: 16GB (see <b>CAUTION 1</b>)</li> <li>- Supports Intel® Extreme Memory Profile (XMP) 1.3 / 1.2 with Intel® Ivy Bridge CPU</li> </ul>
<b>Expansion Slot</b>	<ul style="list-style-type: none"> <li>- 1 x PCI Express 3.0 x16 slot (blue @ x16 mode)</li> <li>* PCIE 3.0 is only supported with Intel® Ivy Bridge CPU. With Intel® Sandy Bridge CPU, it only supports PCIE 2.0.</li> <li>- 1 x PCI Express 2.0 x1 slot</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>* Intel® HD Graphics Built-in Visuals and the VGA outputs can be supported only with processors which are GPU integrated.</li> <li>- Supports Intel® HD Graphics Built-in Visuals: Intel® Quick Sync Video 2.0, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® Insider™, Intel® HD Graphics 2500/4000 with Intel® Ivy Bridge CPU</li> <li>- Supports Intel® HD Graphics Built-in Visuals: Intel® Quick Sync Video, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® HD Graphics 2000/3000, Intel® Advanced Vector Extensions (AVX) with Intel® Sandy Bridge CPU</li> <li>- Pixel Shader 5.0, DirectX 11 with Intel® Ivy Bridge CPU. Pixel Shader 4.1, DirectX 10.1 with Intel® Sandy Bridge CPU.</li> <li>- Max. shared memory 1760MB with Intel® Ivy Bridge CPU. Max. shared memory 1759MB with Intel® Sandy Bridge</li> </ul>

	<p>CPU.</p> <ul style="list-style-type: none"> <li>- Supports D-Sub with max. resolution up to 2048x1536 @ 75Hz</li> </ul>
<b>Audio</b>	<ul style="list-style-type: none"> <li>- 5.1 CH HD Audio (Realtek ALC662 Audio Codec)</li> </ul>
<b>LAN</b>	<ul style="list-style-type: none"> <li>- PCIE x1 Gigabit LAN 10/100/1000 Mb/s</li> <li>- Realtek RTL8111E</li> <li>- Supports Wake-On-LAN</li> <li>- Supports Lightning/ESD Protection (ASRock Full Spike Protection)</li> <li>- Supports LAN Cable Detection</li> <li>- Supports Energy Efficient Ethernet 802.3az</li> <li>- Supports PXE</li> </ul>
<b>Rear Panel I/O</b>	<ul style="list-style-type: none"> <li>- 1 x PS/2 Mouse Port</li> <li>- 1 x PS/2 Keyboard Port</li> <li>- 1 x D-Sub Port</li> <li>- 4 x USB 2.0 Ports</li> <li>- 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED)</li> <li>- HD Audio Jacks: Line in / Front Speaker / Microphone</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>- 4 x SATA2 3.0 Gb/s Connectors, support NCQ, AHCI and Hot Plug</li> </ul>
<b>Connector</b>	<ul style="list-style-type: none"> <li>- 1 x IR Header</li> <li>- 1 x Power LED Header</li> <li>- 1 x Chassis Intrusion Header</li> <li>- 1 x LPC/TPM Header</li> <li>- 1 x CPU Fan Connector (4-pin)</li> <li>- 1 x Chassis Fan Connector (4-pin)</li> <li>- 1 x 24 pin ATX Power Connector</li> <li>- 1 x 4 pin 12V Power Connector</li> <li>- 1 x Front Panel Audio Connector</li> <li>- 1 x SPDIF Out Connector</li> <li>- 2 x USB 2.0 Headers (Support 4 USB 2.0 ports)</li> </ul>
<b>BIOS Feature</b>	<ul style="list-style-type: none"> <li>- 32Mb AMI UEFI Legal BIOS with GUI support</li> <li>- Supports "Plug and Play"</li> <li>- ACPI 1.1 Compliant wake up events</li> <li>- Supports jumperfree</li> <li>- SMBIOS 2.3.1 support</li> </ul>

<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>- CPU/Chassis temperature sensing</li> <li>- CPU/Chassis Fan Tachometer</li> <li>- CPU Quiet Fan (Auto adjust chassis fan speed by CPU temperature)</li> <li>- CPU/Chassis Fan multi-speed control</li> <li>- CASE OPEN detection</li> <li>- Voltage monitoring: +12V, +5V, +3.3V, CPU Vcore</li> </ul>
<b>OS</b>	- Microsoft® Windows® 8.1 32-bit / 8.1 64-bit / 8 32-bit / 8 64-bit / 7 32-bit / 7 64-bit / Vista™ 32-bit / Vista™ 64-bit / XP 32-bit / XP 64-bit
<b>Certifications</b>	- FCC, CE, WHQL

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

### **WARNING**

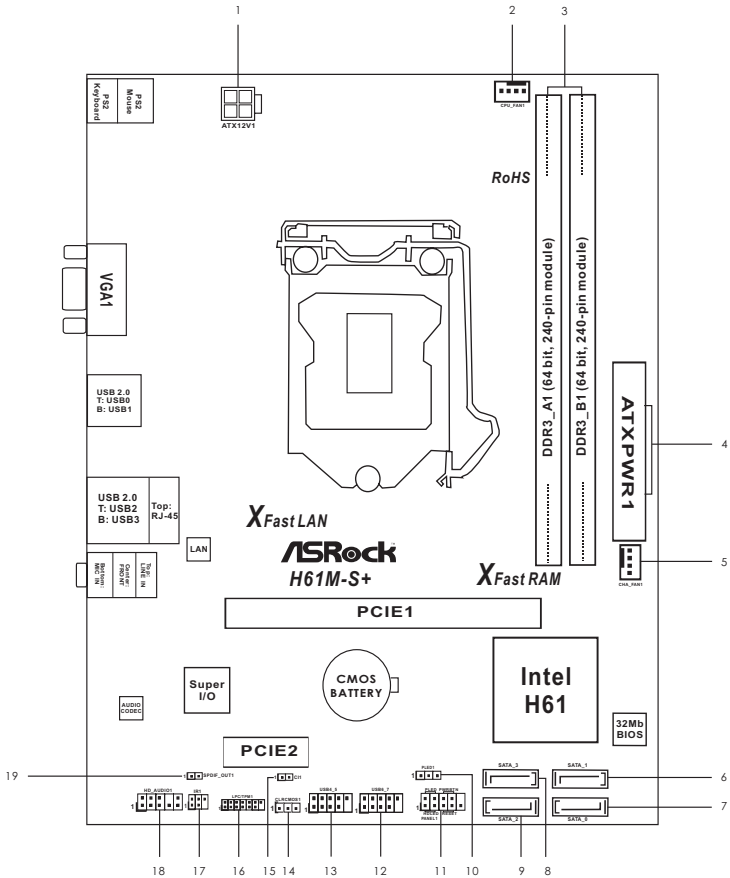
Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of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

### **CAUTION!**

1. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 8.1 / 8 / 7 / Vista™ / XP. For Windows® OS with 64-bit CPU, there is no such limitation. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use.

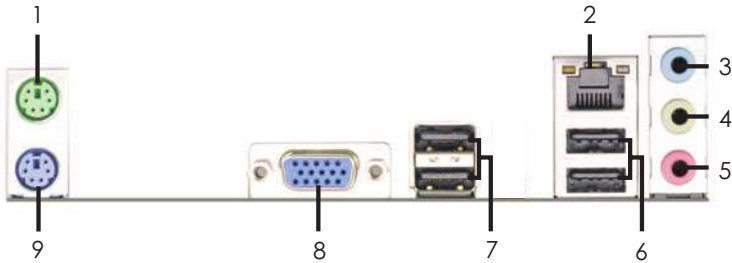


### 1.3 Motherboard Layout



- |   |   |    |                                      |
|---|---|----|--------------------------------------|
| 1 | ATX 12V Power Connector (ATX12V1)                               | 10 | Power LED Header (PLED1)             |
| 2 | CPU Fan Connector (CPU_FAN1)                                    | 11 | System Panel Header (PANEL1)         |
| 3 | 2 x 240-pin DDR3 DIMM Slots<br>(Dual Channel: DDR3_A1, DDR3_B1) | 12 | USB 2.0 Header (USB6_7)              |
| 4 | ATX Power Connector (ATXPWR1)                                   | 13 | USB 2.0 Header (USB4_5)              |
| 5 | Chassis Fan Connector (CHA_FAN1)                                | 14 | Clear CMOS Jumper (CLRCMOS1)         |
| 6 | SATA2 Connector (SATA_1)  | 15 | Chassis Intrusion Header (CI1)       |
| 7 | SATA2 Connector (SATA_0)  | 16 | LPC / TPM Header (LPC/TPM1)          |
| 8 | SATA2 Connector (SATA_3)  | 17 | Infrared Module Header (IR1)         |
| 9 | SATA2 Connector (SATA_2)  | 18 | Front Panel Audio Header (HD_AUDIO1) |
|   |   | 19 | SPDIF Out Connector (SPDIF_OUT1)     |

## 1.4 I/O Panel



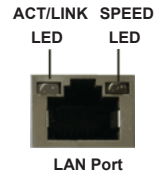
- |                           |                               |
|---------------------------|-------------------------------|
| 1 PS/2 Mouse Port (Green) | 6 USB 2.0 Ports (USB23)       |
| 2 LAN RJ-45 Port*         | 7 USB 2.0 Ports (USB01)       |
| 3 Line In (Light Blue)    | 8 D-Sub Port (VGA1)           |
| 4 Front Speaker (Lime)    | 9 PS/2 Keyboard Port (Purple) |
| 5 Microphone (Pink)       |                               |

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

### LAN Port LED Indications


Activity/Link LED	
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED	
Status	Description
Off	10Mbps connection
Orange	100Mbps connection
Green	1Gbps connection



To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. Please refer to below steps for the software setting of Multi-Streaming.

For Windows® XP:

After restarting your computer, you will find "Mixer" tool on your system. Please select "Mixer ToolBox" , click "Enable playback multi-streaming", and click "ok". Choose "2CH" or

"4CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio. Then reboot your system.

For Windows® 8.1 / 8 / 7 / Vista™:

After restarting your computer, please double-click "Realtek HD Audio Manager" on the system tray. Set "Speaker Configuration" to "Quadraphonic" or "Stereo". Click "Device advanced settings", choose "Make front and rear output devices playbacks two different audio streams simultaneously", and click "ok". Then reboot your system.

---

## Chapter 2: Installation

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



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

### 2.1 Screw Holes

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



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 component.
2. To avoid damaging the motherboard 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 components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.

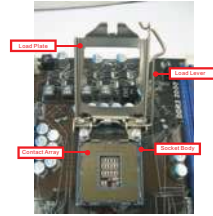


Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

---

## 2.3 CPU Installation

For the installation of Intel 1155-Pin CPU, please follow the steps below.



1155-Pin Socket Overview



Before you insert the 1155-Pin CPU into the socket, please check if the CPU surface is unclean or if there is any bent pin on the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

### Step 1. Open the socket:

Step 1-1. Disengaging the lever by depressing down and out on the hook to clear retention tab.



Step 1-2. Rotate the load lever to fully open position at approximately 135 degrees.

Step 1-3. Rotate the load plate to fully open position at approximately 100 degrees.



### Step 2. Remove PnP Cap:

Step 2-1. Attach your index finger to the upper edge of the PnP Cap.

Step 2-2. Use your thumb to remove PnP Cap (Pick and Place Cap) from the CPU socket by lifting the cap tab.



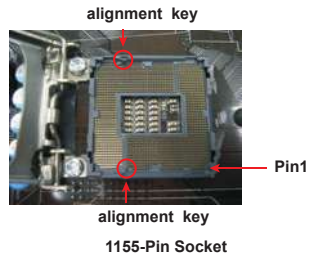
1. It is recommended to use the cap tab to handle and avoid kicking off the PnP cap.
2. This cap must be placed if returning the motherboard for after service.

Step 3. Insert the 1155-Pin CPU:

Step 3-1. Hold the CPU by the edge where is marked with black line.



Step 3-2. Orient the CPU with IHS (Integrated Heat Sink) up. Locate Pin1 and the two orientation key notches.



For proper inserting, please ensure to match the two orientation key notches of the CPU with the two alignment keys of the socket.

Step 3-3. Carefully place the CPU into the socket by using a purely vertical motion.



Step 3-4. Verify that the CPU is within the socket and properly mated to the orientation keys.

Step 4. Close the socket:

Step 4-1. Rotate the load plate onto the IHS.

Step 4-2. While pressing down lightly on load plate, engage the load lever.

Step 4-3. Secure load lever with load plate tab under retention tab of load lever.



Please be noticed that this motherboard supports Combo Cooler Option (C.C.O.), which provides the flexible option to adopt three different CPU cooler types, Socket LGA 775, LGA 1155 and LGA 1156. The white throughholes are for Socket LGA 1155/1156 CPU fan.



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## 2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 1155-Pin socket that supports Intel 1155-Pin CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 1155-Pin CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU\_FAN connector (CPU\_FAN1, see page 9, No. 2).

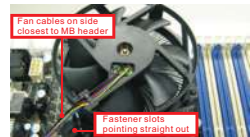
**For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.**

Below is an example to illustrate the installation of the heatsink for 1155-Pin CPU.

Step 1. Apply thermal interface material onto center of IHS on the socket surface.



Step 2. Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU\_FAN1, see page 9, No. 2).



Step 3. Align fasteners with the motherboard through-holes.

Step 4. Rotate the fastener clockwise, then press down on fastener caps with thumb to install and lock. Repeat with remaining fasteners.



If you press down the fasteners without rotating them clockwise, the heatsink cannot be secured on the motherboard.

Step 5. Connect fan header with the CPU fan connector on the motherboard.  
Step 6. Secure excess cable with tie-wrap to ensure cable does not interfere with fan operation or contact other components.

---

## 2.5 Installation of Memory Modules (DIMM)

This motherboard provides two 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two identical (the same brand, speed, size and chip-type) memory modules in the DDR3 DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.



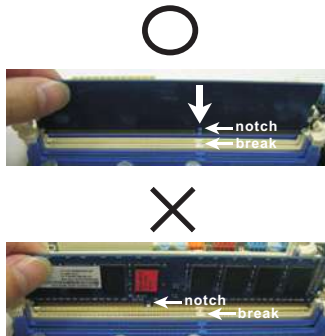
1. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.
2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.
3. Some DDR3 1GB double-sided DIMMs with 16 chips may not work on this motherboard. It is not recommended to install them on this motherboard.

### Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

- Step 1. Unlock a DIMM slot by pressing the retaining clips outward.
- Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



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.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

---

## 2.6 Expansion Slots (PCI Express Slots)

There are 2 PCI Express slots on this motherboard.

### PCIe slots:

PCIe1 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards.

PCIe2 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.



Only PCIe1 slot supports Gen 3 speed. To run the PCI Express in Gen 3 speed, please install an Ivy Bridge CPU. If you install a Sandy Bridge CPU, the PCI Express will run only at PCI Express Gen 2 speed.

### Installing an expansion card

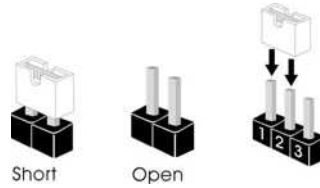
- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.





---

## 2.7 Jumpers Setup

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



Jumper	Setting	Description
Clear CMOS Jumper (CLR CMOS1) (see p.9, No. 14)	 1_2 Default	 2_3 Clear CMOS

Note: CLR CMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLR CMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time and user default profile will be cleared only if the CMOS battery is removed.



If you clear the CMOS, the case open may be detected. Please adjust the BIOS option “Clear Status” to clear the record of previous chassis intrusion status.

## 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 of the motherboard!

### Serial ATA2 Connectors

(SATA\_0: see p.9, No. 7)

(SATA\_1: see p.9, No. 6)

(SATA\_2: see p.9, No. 9)

(SATA\_3: see p.9, No. 8)



These four Serial ATA2 (SATA2) connectors support SATA data cables for internal storage devices. The current SATA2 interface allows up to 3.0 Gb/s data transfer rate.

### Serial ATA (SATA)

#### Data Cable

(Optional)

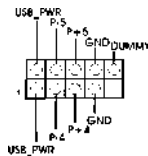


Either end of the SATA data cable can be connected to the SATA / SATA2 hard disk or the SATA2 connector on this motherboard.

### USB 2.0 Headers

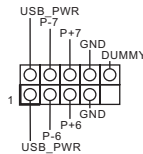
(9-pin USB4\_5)

(see p.9 No. 13)



(9-pin USB6\_7)

(see p.9 No. 12)

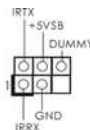


Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

### Infrared Module Header

(5-pin IR1)

(see p.9 No. 17)

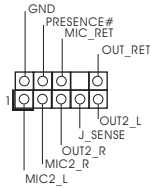


This header supports an optional wireless transmitting and receiving infrared module.

## Front Panel Audio Header

(9-pin HD\_AUDIO1)

(see p.9 No. 18)



This is an interface for front panel audio cable that allows convenient connection and control of audio devices.



1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as 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 HD audio panel only. You don't need to connect them for AC'97 audio panel.
- E. To activate the front mic.

For Windows® XP / XP 64-bit OS:

Select "Mixer". Select "Recorder". Then click "FrontMic".

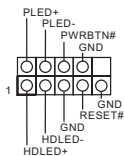
For Windows® 8.1 / 8.1 64-bit / 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:

Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".

## System Panel Header

(9-pin PANEL1)

(see p.9 No. 11)



This header accommodates several system front panel functions.



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

### **PWRBTN (Power Switch):**

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

### **RESET (Reset Switch):**

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

### **PLED (System Power LED):**

Connect to the power status indicator on the chassis front panel. The LED

is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

**HDLED (Hard Drive Activity LED):**

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

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

**Power LED Header**

(3-pin PLED1)

(see p.9 No. 10)

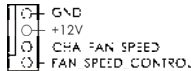


Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1 state. The LED is off in S3/S4 state or S5 state (power off).

**Chassis Fan Connector**

(4-pin CHA\_FAN1)

(see p.9 No. 5)

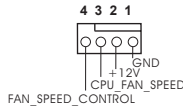


Please connect the fan cables to the fan connectors and match the black wire to the ground pin.

**CPU Fan Connectors**

(4-pin CPU\_FAN1)

(see p.9 No. 2)



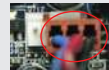
Please connect the CPU fan cable to the connector and match the black wire to the ground pin.



Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

**Pin 1-3 Connected** ←

3-Pin Fan Installation

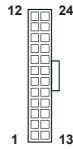


---

### ATX Power Connector

(24-pin ATXPWR1)

(see p.9 No. 4)



Please connect an ATX power supply to this connector.



Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.



20-Pin ATX Power Supply Installation

---

### ATX 12V Power Connector

(4-pin ATX12V1)

(see p.9 No. 1)



Please connect an ATX 12V power supply to this connector.

---

### Chassis Intrusion Header

(2-pin C11)

(see p.9, No. 15)



This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

---

### SPDIF Out Connector

(2-pin SPDIF\_OUT1)

(see p.9, No. 19)



Please connect the SPDIF\_OUT connector of a HDMI VGA card to this header with a cable.

---

## LPC/TPM Header

(13-pin LPC/TPM1)

(see p.9, No. 16)



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.

PIN	Signal Name	PIN	Signal Name
14	+3V	13	No pin
12	+3V	11	+3V
10	GND	9	GND
8	LAD3	7	LAD2
6	LAD1	5	LAD0
4	LFRAME#	3	RESET#
2	GND	1	CLK

---

## 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 <Del> 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 <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



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

#### 3.1.1 UEFI Menu Bar

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

<b>Main</b>	To set up the system time/date information
<b>OC Tweaker</b>	To set up overclocking features
<b>Advanced</b>	To set up the advanced UEFI features
<b>Tool</b>	Useful tools
<b>H/W Monitor</b>	To display current hardware status
<b>Boot</b>	To set up the default system device to locate and load the Operating System
<b>Security</b>	To set up the security features
<b>Exit</b>	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

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





---

### 3.3 OC Tweaker Screen

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



#### CPU Configuration

##### CPU Ratio

Use this item to change the ratio value of this motherboard.

##### Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 / 8 / 8.1 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

##### Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

##### Long Duration Power Limit

Use this item to configure long duration power limit in watts. The default value is [Auto].

##### Long Duration Maintained

Use this item to configure time window which the long duration power is maintained. The default value is [Auto].

---

### Short Duration Power Limit

Use this item to configure short duration power limit in watts. The default value is [Auto].

### Primary Plane Current Limit

Use this item to configure the maximum instantaneous current allowed for the primary plane. The default value is [Auto].

### Secondary Plane Current Limit

Use this item to configure the maximum instantaneous current allowed for the secondary plane. The default value is [Auto].

### GT OverClocking Support

Use this item to enable or disable GT OverClocking Support. The default value is [Disabled].

## DRAM Timing Configuration

### Load XMP Setting

Use this to load XMP setting. Configuration options: [Auto], [Default], [Profile 1] and [Profile 2]. The default value is [Auto].

### DRAM Frequency

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

## DRAM Configuration



### DRAM tCL

Use this item to change CAS# Latency (tCL) Auto/Manual setting. The default is [Auto].

### DRAM tRCD

Use this item to change RAS# to CAS# Delay (tRCD) Auto/Manual setting. The default is [Auto].

---

**DRAM tRP**

Use this item to change Row Precharge Time (tRP) Auto/Manual setting.  
The default is [Auto].

**DRAM tRAS**

Use this item to change RAS# Active Time (tRAS) Auto/Manual setting.  
The default is [Auto].

**Command Rate (CR)**

Use this item to change Command Rate (CR) Auto/Manual setting. The default is [Auto].

**DRAM tWR**

Use this item to change Write Recovery Time (tWR) Auto/Manual setting.  
The default is [Auto].

**DRAM tRFC**

Use this item to change Refresh Cycle Time (tRFC) Auto/Manual setting.  
The default is [Auto].

**DRAM tRRD**

Use this item to change RAS to RAS Delay (tRRD) Auto/Manual setting.  
The default is [Auto].

**DRAM tWTR**

Use this item to change Write to Read Delay (tWTR) Auto/Manual setting.  
The default is [Auto].

**DRAM tRTP**

Use this item to change Read to Precharge (tRTP) Auto/Manual setting.  
The default is [Auto].

**DRAM tFAW**

Use this item to change Four Activate Window (tFAW) Auto/Manual setting. The default is [Auto].

**DRAM tCWL**

Use this item to change CAS# Write Latency (tCWL) Auto/Manual setting.  
The default is [Auto].

**ODT WR (CHA)**

Use this item to change ODT WR (CHA) setting. The default is [Auto].

**ODT WR (CHB)**

Use this item to change ODT WR (CHB) setting. The default is [Auto].

**ODT NOM (CHA)**

Use this item to change ODT NOM (CHA) setting. The default is [Auto].

**ODT NOM (CHB)**

Use this item to change ODT NOM (CHB) setting. The default is [Auto].

---

**MRC Fast Boot**

Use this item to enable or disable MRC Fast Boot. The default is [Enabled].

**Voltage Configuration****DRAM Voltage**

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

---

### 3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, North Bridge Configuration, South Bridge Configuration, Storage Configuration, Intel(R) Rapid Start Technology, Intel(R) Smart Connect Technology, Super IO Configuration, ACPI Configuration and USB Configuration.



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

---

## 3.4.1 CPU Configuration



### Intel Hyper Threading Technology

To enable this feature, a computer system with an Intel processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP / Vista™ / 7 / 8 / 8.1 is required. Set to [Enabled] if using Microsoft® Windows® XP, Vista™, 7, 8, 8.1, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

### Active Processor Cores

Use this item to select the number of cores to enable in each processor package. The default value is [All].

### Enhance Halt State (C1E)

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

### CPU C3 State Support

Use this to enable or disable CPU C3 (ACPI C2) report to OS.

### CPU C6 State Support

Use this to enable or disable CPU C6 (ACPI C3) report to OS.

### Package C State Support

Selected option will program into C State package limit register. The default value is [Auto].

### CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

---

**No-Execute Memory Protection**

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with “No Execute (NX) Memory Protection” can prevent data pages from being used by malicious software to execute codes. This option will be hidden if the current CPU does not support No-Execute Memory Protection.

**Intel Virtualization Technology**

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

**Hardware Prefetcher**

Use this item to turn on/off the MLC streamer prefetcher.

**Adjacent Cache Line Prefetch**

Use this item to turn on/off prefetching of adjacent cache lines.

---

## 3.4.2 North Bridge Configuration



### Primary Graphics Adapter

This allows you to select [Onboard] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

### VT-d

Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

### PCI-E1 Link Speed

This allows you to select PCI-E1 Link Speed. The default value is [Auto].

### Share Memory

This allows you to set onboard VGA share memory feature. The default value is [Auto].

### IGPU Multi-Monitor

This allows you to enable or disable IGPU Multi-Monitor. The default value is [Enabled]. If you install the PCI Express card under Windows® XP / Vista™ OS, please disable this option.

### Render Standby

Use this to enable or disable Render Standby by Internal Graphics Device. The default value is [Enabled].



---

### 3.4.3 South Bridge Configuration



#### Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

#### Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

#### Onboard LAN

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

#### 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.

#### Good Night LED

Use this item to enable or disable Power LED and LAN LED.

---

## 3.4.4 Storage Configuration



### SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

### SATA Mode Selection

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



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 Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

### 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].

---

### 3.4.5 Intel(R) Rapid Start Technology



#### Intel(R) Rapid Start Technology

Use this item to enable or disable Intel(R) Rapid Start Technology. Intel(R) Rapid Start Technology is a new zero power hibernation mode which allows users to resume in just 5-6 seconds. The default is [Enabled].

#### Entry After

Select a time to enable RTC wake timer at S3 entry. The default is [10 minutes].

#### Active Page Threshold Support

This allows you to enable or disable Active Page Threshold Support. The default is [Disabled].

---

### 3.4.6 Intel(R) Smart Connect Technology



#### Intel(R) Smart Connect Technology

Use this item to enable or disable Intel(R) Smart Connect Technology. Intel(R) Smart Connect Technology keeps your e-mail and social networks, such as Twitter, Facebook, etc. updated automatically while the computer is in sleep mode. The default is [Enabled].

---

### 3.4.7 Super IO Configuration



#### Infrared Port

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

---

## 3.4.8 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.

### **Check Ready Bit**

Use this item to enable or disable the feature Check Ready Bit.

### **ACPI HPET Table**

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

### **PS/2 Keyboard Power On**

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

### **PCIe Device Power On**

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

### **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.

---

## CSM

Please disable CSM when you enable Fast Boot option. The default value is [Enabled].

### 3.4.9 USB Configuration



#### USB 2.0 Controller

Use this item to enable or disable the use of USB 2.0 controller.

#### Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

[Disabled] - USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issue, it is recommended to select [Disabled] to enter OS.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

---

## 3.5 Tool



### OMG(Online Management Guard)

Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG. You may schedule the starting and ending hours of internet access granted to other users. In order to prevent users from bypassing OMG, guest accounts without permission to modify the system time are required.

### UEFI Update Utility

#### 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.

#### Internet Flash

Internet Flash searches for available UEFI firmware updates from our servers. In other words, the system can auto-detect the latest UEFI from our servers and flash them without entering Windows OS. Please note that you must be running on a DHCP configured computer in order to enable this function.



---

## Network Configuration



### Internet Setting

Use this item to set up the internet connection mode. Configuration options: [DHCP (Auto IP)] and [PPPOE].

### UEFI Download Server

Use this item to select UEFI firmware download server for Internet Flash. Configuration options: [Asia], [Europe], [USA] and [China].

### Dehumidifier Function

Users may prevent motherboard damages due to dampness by enabling "Dehumidifier Function". When enabling Dehumidifier Function, the computer will power on automatically to dehumidify the system after entering S4/S5 state.

#### Dehumidifier Period

This allows users to configure the period of time until the computer powers on and enables "Dehumidifier" after entering S4/S5 state.

#### Dehumidifier Duration

This allows users to configure the duration of the dehumidifying process before it returns to S4/S5 state.

#### Dehumidifier CPU Fan Setting

Use this setting to configure CPU fan speed while "Dehumidifier" is enabled.

### Would you like to save current setting user defaults?

In this option, you are allowed to load and save three user defaults according to your own requirements.

---

### 3.6 Hardware Health Event Monitoring 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.



#### CPU Fan 1 Setting

This allows you to set the CPU fan 1 speed. Configuration options: [Full On] and [Automatic Mode]. The default is value [Full On].

#### Chassis Fan 1 Setting

This allows you to set the Chassis fan 1 speed. Configuration options: [Full On] and [Automatic Mode]. The default is value [Full On].

#### Case Open Feature

This allows you to enable or disable case open detection feature. The default is value [Enabled].

#### Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

---

## 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.



### Fast Boot

Fast Boot minimizes your computer's boot time. There are three configuration options: [Disabled], [Fast] and [Ultra Fast]. The default value is [Disabled]. Please refer to below descriptions for the details of these three options:

[Disabled] - Disable Fast Boot.

[Fast] - The only restriction is you may not boot by using an USB flash drive.

[Ultra Fast] - There are a few restrictions.

1. Only supports Windows® 8 / 8.1 UEFI operating system.
2. You will not be able to enter BIOS Setup (Clear CMOS or run utility in Windows® to enter BIOS Setup).
3. If you are using an external graphics card, the VBIOS must support UEFI GOP in order to boot.

### 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.

### Bootable Num-Lock

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

---

### **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**

Enable or disable the feature of Boot Failure Guard.

### **Boot Failure Guard Count**

Enable or disable the feature of Boot Failure Guard Count.

---

## 3.8 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.



### Secure Boot

Use this to enable or disable Secure Boot. The default value is [Disabled].

---

### 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.

#### **Launch EFI Shell from filesystem device**

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

---

## **Chapter 4: Software Support**

### **4.1 Install Operating System**

This motherboard supports various Microsoft® Windows® operating systems: 8.1 / 8.1 64-bit / 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit. 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.

### **4.2 Support CD Information**

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard 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 did not appear automatically, locate and double click on the file "ASRSETUP.EXE" from the BIN folder in the Support CD to display the menus.

#### **4.2.2 Drivers Menu**

The Drivers Menu shows the available devices 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 applications software 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 or want to know more about ASRock, welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.