



T48EM1

# 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 **T48EM1** 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 **T48EM1** Motherboard (Mini-ITX Form Factor)

ASRock **T48EM1** Quick Installation Guide

ASRock **T48EM1** Support CD

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

1 x I/O Panel Shield

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## 1.2 Specifications

<b>Platform</b>	<ul style="list-style-type: none"><li>- Mini-ITX Form Factor</li><li>- Solid Capacitor for CPU power</li><li>- High Density Glass Fabric PCB</li></ul>
<b>CPU</b>	<ul style="list-style-type: none"><li>- AMD Embedded G-Series APU T48E</li><li>- Supports AMD's Cool 'n' Quiet Technology</li><li>- UMI 2.5 GT/s</li></ul>
<b>Chipset</b>	<ul style="list-style-type: none"><li>- AMD A50M Chipset</li></ul>
<b>Memory</b>	<ul style="list-style-type: none"><li>- 2 x DDR3 DIMM Slots</li><li>- Supports DDR3 1333/1066/800 non-ECC, un-buffered memory</li><li>- Max. capacity of system memory: 16GB (see <b>CAUTION 1</b>)</li></ul>
<b>Expansion Slot</b>	<ul style="list-style-type: none"><li>- 1 x PCI Express 2.0 x16 Slot (PCIE1 @ x4 mode)</li></ul>
<b>Graphics</b>	<ul style="list-style-type: none"><li>- Integrated AMD Radeon HD 6250 graphics</li><li>- DX11 class iGPU, Pixel Shader 5.0</li><li>- Max. shared memory 512MB</li><li>- Three graphics output options: D-Sub, DVI-D and HDMI</li><li>- Supports HDMI with max. resolution up to 1920x1200 (1080P)</li><li>- Supports DVI-D with max. resolution up to 1920x1200 @ 75Hz</li><li>- Supports D-Sub with max. resolution up to 2048x1536 @ 85Hz</li><li>- Supports HDCP with DVI-D and HDMI Ports</li><li>- Supports Full HD 1080p Blu-ray (BD) playback with DVI-D and HDMI Ports</li><li>- Supports Dolby® TrueHD and DTS-HD Master Audio through HDMI Port</li></ul>
<b>Audio</b>	<ul style="list-style-type: none"><li>- 7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec)</li><li>- Premium Blu-ray Audio support</li><li>- Supports Surge Protection (ASRock Full Spike Protection)</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>

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<b>Rear Panel I/O</b>	<ul style="list-style-type: none"> <li>- 1 x PS/2 Keyboard/Mouse Port</li> <li>- 1 x D-Sub Port</li> <li>- 1 x DVI-D Port</li> <li>- 1 x HDMI Port</li> <li>- 1 x Optical SPDIF Out Port</li> <li>- 6 x USB 2.0 Ports (Supports ESD Protection (ASRock Full Spike Protection))</li> <li>- 1 x eSATA3 Connector</li> <li>- 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED)</li> <li>- HD Audio Jacks: Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>- 4 x SATA3 6.0 Gb/s Connectors, support NCQ, AHCI and Hot Plug</li> </ul>
<b>Connector</b>	<ul style="list-style-type: none"> <li>- 1 x CIR Header</li> <li>- 1 x COM Port Header</li> <li>- 1 x CPU Fan Connector (3-pin)</li> <li>- 2 x Chassis Fan Connectors (1 x 4-pin, 1 x 3-pin)</li> <li>- 1 x 24 pin ATX Power Connector</li> <li>- 1 x Front Panel Audio Connector</li> <li>- 2 x USB 2.0 Headers (Support 4 USB 2.0 ports) (Supports ESD Protection (ASRock Full Spike Protection))</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> <li>- DRAM, FCH, +1V, +1.8V Voltage multi-adjustment</li> </ul>
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>- CPU temperature sensing</li> <li>- Chassis temperature sensing</li> <li>- CPU/Chassis Fan Tachometer</li> <li>- CPU/Chassis Quiet Fan (Auto adjust chassis fan speed by CPU temperature)</li> <li>- CPU/Chassis Fan multi-speed control</li> <li>- Voltage monitoring: +12V, +5V, +3.3V, CPU Vcore</li> </ul>
<b>OS</b>	<ul style="list-style-type: none"> <li>- Microsoft® Windows® 8.1 32-bit / 8.1 64-bit / 8 32-bit / 8 64-bit / 7 32-bit / 7 64-bit / XP 32-bit / XP 64-bit</li> </ul>
<b>Certifications</b>	<ul style="list-style-type: none"> <li>- FCC, CE, WHQL</li> <li>- ErP/EuP ready (ErP/EuP ready power supply is required)</li> </ul>

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

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**WARNING**

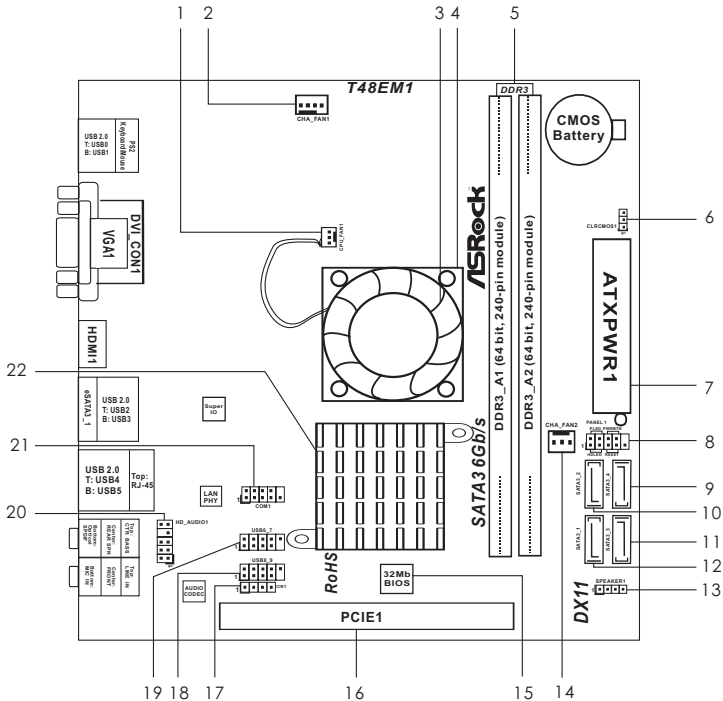
Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices 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 / XP. For Windows® OS with 64-bit CPU, there is no such limitation.

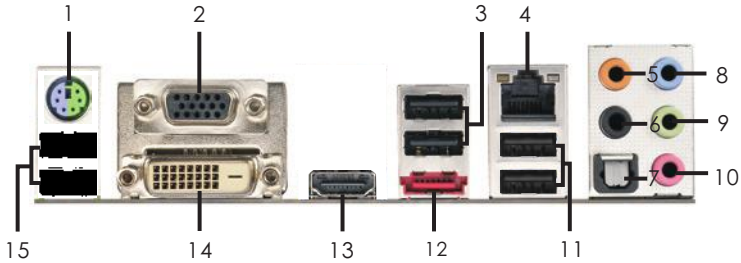


## 1.3 Motherboard Layout



- |    |  |    |  |
|----|--|----|--|
| 1  | CPU Fan Connector (CPU_FAN1)                   | 12 | SATA3 Connector (SATA3_1)              |
| 2  | Chassis Fan Connector (CHA_FAN1)               | 13 | Chassis Speaker Header (SPEAKER 1)     |
| 3  | CPU Fan  | 14 | Chassis Fan Connector (CHA_FAN2)       |
| 4  | CPU Heatsink                                   | 15 | 32Mb SPI Flash                         |
| 5  | 2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_A2) | 16 | PCI Express 2.0 x16 Slot (PCIe1)       |
| 6  | Clear CMOS Jumper (CLRCMOS1)                   | 17 | Consumer Infrared Module Header (CIR1) |
| 7  | ATX Power Connector (ATXPWR1)                  | 18 | USB 2.0 Header (USB8_9)                |
| 8  | System Panel Header (PANEL1)                   | 19 | USB 2.0 Header (USB6_7)                |
| 9  | SATA3 Connector (SATA3_4)                      | 20 | Front Panel Audio Header (HD_AUDIO1)   |
| 10 | SATA3 Connector (SATA3_2)                      | 21 | COM Port Header (COM1)                 |
| 11 | SATA3 Connector (SATA3_3)                      | 22 | AMD A50M Chipset                       |

## 1.4 I/O Panel



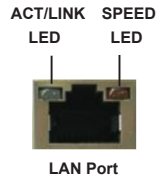
- |   |                          |
|---|--------------------------|
| 1 PS/2 Keyboard/Mouse Port (Purple/Green) | 9 Front Speaker (Lime)** |
| 2 D-Sub Port                              | 10 Microphone (Pink)     |
| 3 USB 2.0 Ports (USB23)                   | 11 USB 2.0 Ports (USB45) |
| 4 LAN RJ-45 Port*                         | 12 eSATA3 Port           |
| 5 Central / Bass (Orange)                 | 13 HDMI Port             |
| 6 Rear Speaker (Black)                    | 14 DVI-D Port            |
| 7 Optical SPDIF Out Port                  | 15 USB 2.0 Ports (USB01) |
| 8 Line In (Light Blue)                    |                          |

\* 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




\*\* If you use 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.

**TABLE for Audio Output Connection**

Audio Output Channels	Front Speaker (No. 9)	Rear Speaker (No. 6)	Central / Bass (No. 5)	Line In or Side Speaker (No. 8)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

---

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. 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", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio.

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## Chapter 2: Installation

This is a Mini-ITX 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.

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## 2.3 Installation of Memory Modules (DIMM)

**T48EM1** motherboard provides two 240-pin DDR3 (Double Data Rate 3) DIMM slots.



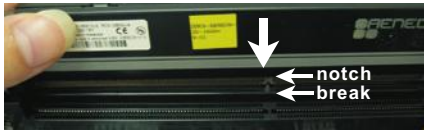
It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.

### 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.

---

## 2.4 Expansion Slot (PCI Express Slot)

There is 1 PCI Express slot on this motherboard.

### **PCIe slot:**

PCIe1 (PCIe x16 slot) is used for PCI Express x4 lane width graphics cards.

### **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.

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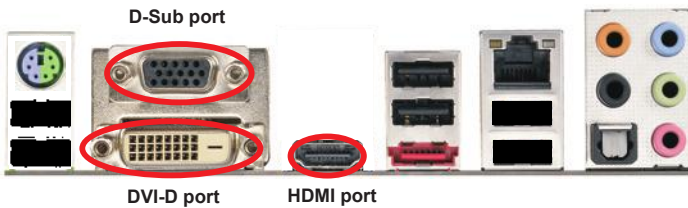
## 2.5 Dual Monitor Feature

### Dual Monitor Feature

This motherboard supports dual monitor feature. With the internal graphics output support (DVI-D, D-Sub and HDMI), you can easily enjoy the benefits of dual monitor feature without installing any add-on graphics card to this motherboard. This motherboard also provides independent display controllers for DVI-D, D-Sub and HDMI to support dual graphics output so that DVI-D, D-sub and HDMI can drive same or different display contents.

To enable dual monitor feature, please follow the below steps:

1. Connect DVI-D monitor cable to DVI-D port on the I/O panel, connect D-Sub monitor cable to D-Sub port on the I/O panel, or connect HDMI monitor cable to HDMI port on the I/O panel.



2. If you have installed onboard graphics driver from our support CD to your system already, you can freely enjoy the benefits of dual monitor function after your system boots. If you haven't installed onboard graphics driver yet, please install onboard graphics driver from our support CD to your system and restart your computer.



D-Sub, DVI-D and HDMI monitors cannot be enabled at the same time. You can only choose the combination: DVI-D + HDMI, DVI-D + D-Sub, or HDMI + D-Sub.



### **HDCP Function**

HDCP function is supported on this motherboard. To use HDCP function with this motherboard, you need to adopt the monitor that supports HDCP function as well. Therefore, you can enjoy the superior display quality with high-definition HDCP encryption contents. Please refer to below instruction for more details about HDCP function.

### **What is HDCP?**

HDCP stands for High-Bandwidth Digital Content Protection, a specification developed by Intel® for protecting digital entertainment content that uses the DVI interface. HDCP is a copy protection scheme to eliminate the possibility of intercepting digital data midstream between the video source, or transmitter - such as a computer, DVD player or set-top box - and the digital display, or receiver - such as a monitor, television or projector. In other words, HDCP specification is designed to protect the integrity of content as it is being transmitted.

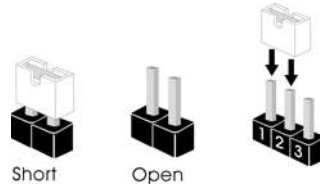
Products compatible with the HDCP scheme such as DVD players, satellite and cable HDTV set-top-boxes, as well as few entertainment PCs requires a secure connection to a compliant display. Due to the increase in manufacturers employing HDCP in their equipment, it is highly recommended that the HDTV or LCD monitor you purchase is compatible.





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## 2.6 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. 6)	 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, user default profile, 1394 GUID and MAC address will be cleared only if the CMOS battery is removed.

## 2.7 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 ATA3 Connectors

(SATA3\_1: see p.9, No. 12)

(SATA3\_2: see p.9, No. 10)

(SATA3\_3: see p.9, No. 11)

(SATA3\_4: see p.9, No. 9)



These four Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

### Serial ATA (SATA)

#### Data Cable

(Optional)

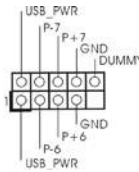


Either end of the SATA data cable can be connected to the SATA / SATAII / SATA3 hard disk or the SATAII / SATA3 connector on this motherboard.

### USB 2.0 Headers

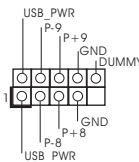
(9-pin USB6\_7)

(see p.9 No. 19)



(9-pin USB8\_9)

(see p.9 No. 18)



Besides six 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.

### Consumer Infrared Module Header

(4-pin CIR1)

(see p.9 No. 17)

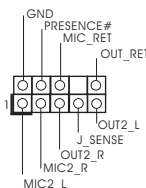


This header can be used to connect the remote controller receiver.

### Front Panel Audio Header

(9-pin HD\_AUDIO1)

(see p.9 No. 20)



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

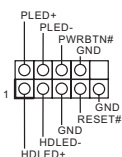


1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
  - 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 OS:  
Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".

### System Panel Header

(9-pin PANEL1)

(see p.9 No. 8)



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).

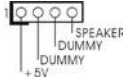
#### **HDLED (Hard Drive Activity LED):**

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.

### Chassis Speaker Header

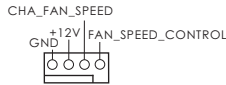
(4-pin SPEAKER 1)  
(see p.9 No. 13)



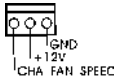
Please connect the chassis speaker to this header.

### Chassis Fan Connectors

(4-pin CHA\_FAN1)  
(see p.9 No. 2)



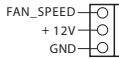
(3-pin CHA\_FAN2)  
(see p.9 No. 14)



Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA\_FAN2 supports fan speed control by fan power voltage.

### CPU Fan Connectors

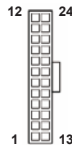
(3-pin CPU\_FAN1)  
(see p.9 No. 1)



Please connect the CPU fan cable to the connector and match the black wire to the ground pin. CPU\_FAN1 supports fan speed control.

### ATX Power Connector

(24-pin ATXPWR1)  
(see p.9 No. 7)



Please connect an ATX power supply to this connector.



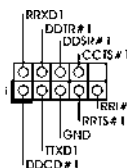
Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.



20-Pin ATX Power Supply Installation

### Serial port Header

(9-pin COM1)  
(see p.9 No. 21)



This COM1 header supports a serial port module.

---

## **2.8 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 up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

---

## 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>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
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<ESC>	To 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.



#### DRAM Timing Configuration

##### DRAM Frequency

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

##### DRAM Timing Control



##### Power Down Enable

Use this item to enable or disable DDR power down mode.

##### Bank Interleaving

Interleaving allows memory accesses to be spread out over banks on the same node, or across nodes, decreasing access contention.

##### CAS# Latency (tCL)

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



---

**RAS# to CAS# Delay (tRCD)**

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

**Row Precharge Time (tRP)**

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

**RAS# Active Time (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. Min:  
1N. Max: 2N. The default is [Auto].

**RAS# Cycle Time (tRC)**

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

**Write Recovery Time (tWR)**

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

**Refresh Cycle Time (tRFC)**

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

**RAS to RAS Delay (tRRD)**

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

**Write to Read Delay (tWTR)**

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

**Read to Precharge (tRTP)**

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

**Four Activate Window (tFAW)**

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

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

Use this to select DRAM Voltage. Configuration options: [Auto], [1.300V]  
to [1.965V]. The default value is [Auto].

**FCH Voltage**

Use this to select FCH Voltage. Configuration options: [Auto], [1.10V] to  
[1.40V]. The default value is [Auto].

---

**+1.8V Voltage**

Use this to select +1.8V Voltage. Configuration options: [Auto], [1.85V] to [2.10V]. The default value is [Auto].

**+1V Voltage**

Use this to select +1V Voltage. Configuration options: [Auto], [1.07V] to [1.16V]. The default value is [Auto].

**User Default**

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

---

### 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, Super IO Configuration, ACPI Configuration and USB Configuration.



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

#### 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 launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, 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 UEFI update process completes.

---

### 3.4.1 CPU Configuration



#### Cool 'n' Quiet

Use this item to enable or disable AMD's Cool 'n' Quiet™ technology. The default value is [Auto]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® 8.1 / 8 / 7 / XP and want to enable this function, please set this item to [Enabled]. Please note that enabling this function may reduce CPU voltage and memory frequency, and lead to system stability or compatibility issue with some memory modules or power supplies. Please set this item to [Disable] if above issue occurs.

#### SVM Mode

Use this to enable or disable SVM (Secure Virtual Machine) architecture. When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by AMD-V. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

#### C6 Mode

Use this to enable or disable CPU C6 state. The default value is [Disabled].

---

## 3.4.2 North Bridge Configuration



### Primary Graphics Adapter

This item allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI Express].

Configuration options: [Onboard] and [PCI Express].

### Share Memory

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

### Onboard HDMI HD Audio

This allows you to enable or disable the "Onboard HDMI HD Audio" feature.

---

### 3.4.3 South Bridge Configuration



#### Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature.

#### 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.

#### 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.

---

## 3.4.4 Storage Configuration



### SATA Controller

Use this to enable or disable SATA controller. The default value is [Enabled].

### SATA Mode

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



1. 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.
2. AHCI mode is not supported under Windows® XP / XP 64-bit OS.

### SATA IDE Combined Mode

This option is for eSATA3 port. Use this to enable or disable SATA IDE Combined Mode. The default value is [Enabled].

### 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 Super IO Configuration



### Serial Port

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

### Serial Port Address

Use this item to set the address for the onboard serial port. Configuration options: [Auto], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

### CIR Controller

Use this item to enable or disable CIR controller. The default value is [Disabled].



---

## 3.4.6 ACPI Configuration



### Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [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.

### Onboard LAN Power On

Use this item to enable or disable Onboard LAN 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].

---

### 3.4.7 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 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 Setting

This allows you to set the CPU fan 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 [Manual Mode]. The default is value [Full On].

#### Chassis Fan 2 Setting

This allows you to set the chassis fan 2 speed. Configuration options: [Full On] and [Manual Mode]. The default is value [Full On].

---

## 3.6 Boot Screen

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



### 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® 8.1 / 8 UEFI operating system.
2. You will not be able to enter BIOS Setup (Clear CMOS or run utility in Widows® 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.

### Bootup 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.

---

## 3.7 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].

---

### 3.8 Exit Screen



#### **Save Changes and Exit**

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

#### **Discard Changes and Exit**

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

#### **Discard Changes**

When you select this option, it will pop-out the following message, “Discard changes?” Select [OK] 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 32-bit / 8.1 64-bit / 8 32-bit / 8 64-bit / 7 32-bit / 7 64-bit / XP 32-bit / 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.

---

## **Installing OS on a HDD Larger Than 2TB**

This motherboard is adopting UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow below procedure to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)**, **Windows® 7 64-bit** or **Windows® 8 64-bit**.
2. Press <F2> or <Delete> at system POST. Set **AHCI Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Choose the item “**UEFI:xxx**“ to boot in UEFI Setup Utility > Boot > Boot Option #1. (“xxx” is the device which contains your Windows® installation files. Normally it is an optical drive.) You can also press <F11> to launch boot menu at system POST and choose the item “**UEFI:xxx**“ to boot.
4. Start Windows® installation.
5. If you install **Windows® 7 64-bit** OS, OS will be formatted by GPT (GUID Partition Table). Please install the hotfix file from Microsoft®:  
<http://support.microsoft.com/kb/979903>