



Fatal1ty 990FX Professional Series

User Manual

Version 1.0

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Who knew that at age 19, I would be a World Champion PC gamer. When I was 13, I actually played competitive billiards in professional tournaments and won four or five games off guys who played at the highest level. I actually thought of making a career of it, but at that young age situations change rapidly. Because I've been blessed with great hand-eye coordination and a grasp of mathematics (an important element in video gaming) I gravitated to that activity.

GOING PRO

I started professional gaming in 1999 when I entered the CPL (Cyberathlete Professional League) tournament in Dallas and won \$4,000 for coming in third place. Emerging as one of the top players in the United States, a company interested in sponsoring me flew me to Sweden to compete against the top 12 players in the world. I won 18 straight games, lost none, and took first place, becoming the number one ranked Quake III player in the world in the process. Two months later I followed that success by traveling to Dallas and defending my title as the world's best Quake III player, winning the \$40,000 grand prize. From there I entered competitions all over the world, including Singapore, Korea, Germany, Australia, Holland and Brazil in addition to Los Angeles, New York and St. Louis.

WINNING STREAK

I was excited to showcase my true gaming skills when defending my title as CPL Champion of the year at the CPL Winter 2001 because I would be competing in a totally different first person shooter (fps) game, Alien vs. Predator II. I won that competition and walked away with a new car. The next year I won the same title playing Unreal Tournament 2003, becoming the only three-time CPL champion of the year. And I did it playing a different game each year, something no one else has ever done and a feat of which I am extremely proud.

At QuakeCon 2002, I faced off against my rival ZeRo4 in one of the most highly anticipated matches of the year, winning in a 14 to (-1) killer victory. Competing at Quakecon 2004, I became the World's 1st Doom3 Champion by defeating Daler in a series of very challenging matches and earning \$25,000 for the victory.

Since then Fatal1ty has traveled the globe to compete against the best in the world, winning prizes and acclaim, including the 2005 CPL World Tour Championship in New York City for a \$150,000 first place triumph. In August 2007, Johnathan was awarded the first ever Lifetime Achievement Award in the four year history of the eSports-Award for "showing exceptional sportsmanship, taking part in shaping eSports into what it is today and for being the prime representative of this young sport. He has become the surehead for eSports worldwide".



LIVIN' LARGE

Since my first big tournament wins, I have been a "Professional Cyberathlete", traveling the world and livin' large with lots of International media coverage on outlets such as MTV, ESPN and a 60 Minutes segment on CBS to name only a few. It's unreal - it's crazy. I'm living a dream by playing video games for a living. I've always been athletic and took sports like hockey and football very seriously, working out and training hard. This discipline helps me become a better gamer and my drive to be the best has opened the doors necessary to become a professional.

A DREAM

Now, another dream is being realized – building the ultimate gaming computer, made up of the best parts under my own brand. Quality hardware makes a huge difference in competitions...a couple more frames per second and everything gets really nice. It's all about getting the computer processing faster and allowing more fluid movement around the maps.

My vision for Fatal1ty hardware is to allow gamers to focus on the game without worrying about their equipment, something I've preached since I began competing. I don't want to worry about my equipment. I want to be there – over and done with - so I can focus on the game. I want it to be the fastest and most stable computer equipment on the face of the planet, so quality is what Fatal1ty Brand products represent.



Johnathan "Fatal1ty" Wendel



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

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

CALIFORNIA, USA ONLY

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

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

ASRock Website: <http://www.asrock.com>



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1. Introduction

Thank you for purchasing **Fatal1ty 990FX Professional Series** 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

1.1 Package Contents

Fatal1ty 990FX Professional Series Motherboard

(ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm)

Fatal1ty 990FX Professional Series Quick Installation Guide

Fatal1ty 990FX Professional Series Support CD

1 x ASRock SLI_Bridge_2S Card

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

2 x Serial ATA (SATA) HDD Power Cables (Optional)

1 x 3.5mm Audio Cable (Optional)

1 x I/O Panel Shield

1 x Front USB 3.0 Panel

4 x HDD Screws

6 x Chassis Screws

1 x Rear USB 3.0 Bracket



ASRock Reminds You...

To get better performance in Windows® 7 / 7 64-bit / Vista™ / Vista™ 64 bit, it is recommended to set the BIOS option in Storage Configuration to AHCI mode. For the BIOS setup, please refer to the "User Manual" in our support CD for details.

1.2 Specifications

Platform	<ul style="list-style-type: none"> - ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm - All Solid Capacitor design (100% Japan-made high-quality Conductive Polymer Capacitors)
CPU	<ul style="list-style-type: none"> - Support for Socket AM3+ processors - Support for Socket AM3 processors: AMD Phenom™ II X6 / X4 / X3 / X2 (except 920 / 940) / Athlon II X4 / X3 / X2 / Sempron processors - Supports 8-Core CPU - Supports UCC feature (Unlock CPU Core) (see CAUTION 1) - Advanced V12 + 2 Power Phase Design - Supports CPU up to 220W - Supports AMD's Cool 'n' Quiet™ Technology - FSB 2600 MHz (5.2 GT/s) - Supports Untied Overclocking Technology (see CAUTION 2) - Supports Hyper-Transport 3.0 (HT 3.0) Technology
Chipset	<ul style="list-style-type: none"> - Northbridge: AMD 990FX - Southbridge: AMD SB950
Memory	<ul style="list-style-type: none"> - Dual Channel DDR3 Memory Technology (see CAUTION 3) - 4 x DDR3 DIMM slots - Support DDR3 2100(OC)/1866/1600/1333/1066/800 non-ECC, un-buffered memory (see CAUTION 4) - Max. capacity of system memory: 64GB (see CAUTION 5)
Expansion Slot	<ul style="list-style-type: none"> - 3 x PCI Express 2.0 x16 slots (PCIe2/PCIe4: x16 mode; PCIe5: x4 mode) - 2 x PCI Express 2.0 x1 slots - 2 x PCI slots - Supports AMD® Quad CrossFireX™, 3-Way CrossFireX™ and CrossFireX™ - Supports NVIDIA® Quad SLI™ and SLI™
Audio	<ul style="list-style-type: none"> - 7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec) - Premium Blu-ray audio support - Supports THX TruStudio™
LAN	<ul style="list-style-type: none"> - PCIe x1 Gigabit LAN 10/100/1000 Mb/s - Broadcom BCM57781 - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE

Rear Panel I/O	<p>I/O Panel</p> <ul style="list-style-type: none"> - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x Coaxial SPDIF Out Port - 1 x Optical SPDIF Out Port - 5 x Ready-to-Use USB 2.0 Ports - 1 x Fatal1ty Mouse Port (USB 2.0) - 2 x Ready-to-Use USB 3.0 Ports - 2 x eSATA3 Connectors - 2 x RJ-45 LAN Ports with LED (ACT/LINK LED and SPEED LED) - 1 x IEEE 1394 Port - 1 x Clear CMOS Switch with LED - HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone (see CAUTION 6)
SATA3	<ul style="list-style-type: none"> - 6 x SATA3 6.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 0+1, JBOD and RAID 5), NCQ, AHCI and "Hot Plug" functions
USB 3.0	<ul style="list-style-type: none"> - 2 x Rear USB 3.0 ports by Etron EJ168A, support USB 1.0 /2.0/3.0 up to 5Gb/s - 2 x Front USB 3.0 headers (support 4 USB 3.0 ports) by Etron EJ168A, support USB 1.0/2.0/3.0 up to 5Gb/s
Connector	<ul style="list-style-type: none"> - 6 x SATA3 6.0Gb/s connectors - 1 x IR header - 1 x COM port header - 1 x IEEE 1394 header - 1 x HDMI_SPDIF header - 1 x Power LED header - CPU/Chassis/Power FAN connector - 24 pin ATX power connector - 8 pin 12V power connector - Front panel audio connector - 2 x USB 2.0 headers (support 4 USB 2.0 ports) - 2 x USB 3.0 headers (support 4 USB 3.0 ports) - 1 x Dr. Debug (7-Segment Debug LED)
Smart Switch	<ul style="list-style-type: none"> - 1 x Clear CMOS Switch with LED - 1 x Power Switch with LED - 1 x Reset Switch with LED
BIOS Feature	<ul style="list-style-type: none"> - 32Mb AMI UEFI Legal BIOS with GUI support - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events

	<ul style="list-style-type: none"> - Supports jumperfree - SMBIOS 2.3.1 Support - CPU, VCCM, NB, SB Voltage Multi-adjustment
Support CD	<ul style="list-style-type: none"> - Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, AMD Fusion, AMD Fusion Media Explorer, ASRock Software Suite (CyberLink DVD Suite - OEM and Trial)
Unique Feature	<ul style="list-style-type: none"> - F-Stream (see CAUTION 7) - ASRock Instant Boot - ASRock Instant Flash (see CAUTION 8) - ASRock APP Charger (see CAUTION 9) - ASRock SmartView (see CAUTION 10) - ASRock XFast USB (see CAUTION 11) - ASRock On/Off Play Technology (see CAUTION 12) - Hybrid Booster: <ul style="list-style-type: none"> - CPU Frequency Stepless Control (see CAUTION 13) - ASRock U-COP (see CAUTION 14) - Boot Failure Guard (B.F.G.) - Turbo 50 / Turbo 60 CPU Overclocking - Turbo UCC
Hardware Monitor	<ul style="list-style-type: none"> - CPU Temperature Sensing - Chassis Temperature Sensing - CPU/Chassis/Power Fan Tachometer - CPU Quiet Fan - CPU/Chassis Fan Multi-Speed Control - Voltage Monitoring: +12V, +5V, +3.3V, Vcore
OS	<ul style="list-style-type: none"> - Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit compliant
Certifications	<ul style="list-style-type: none"> - FCC, CE, WHQL - ErP/EuP Ready (ErP/EuP ready power supply is required) (see CAUTION 15)

* 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 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.

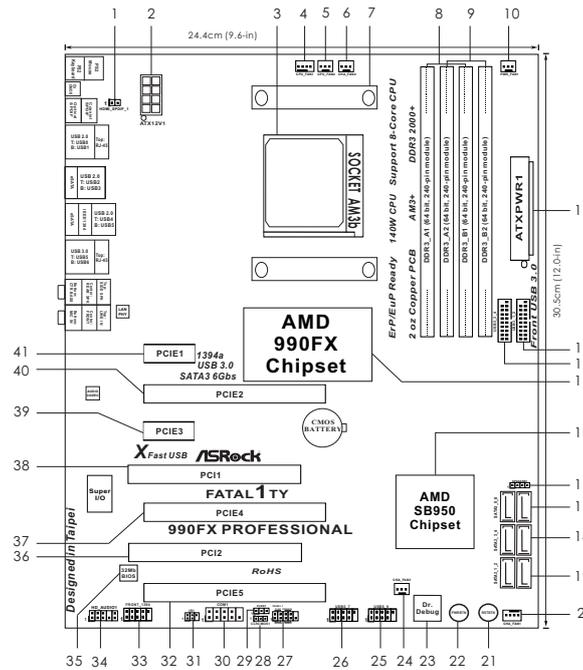
CAUTION!

1. ASRock UCC (Unlock CPU Core) feature simplifies AMD CPU activation. As long as a simple switch of the UEFI option "ASRock UCC", you can unlock the extra CPU core to enjoy an instant performance boost. When UCC feature is enabled, the dual-core or triple-core CPU will boost to the quad-core CPU, and some CPU, including quad-core CPU, can also increase L3 cache size up to 6MB, which means you can enjoy the upgrade CPU performance with a better price. Please be noted that UCC feature is supported with AM3 CPU only, and in addition, not every AM3 CPU can support this function because some CPU's hidden core may be malfunctioned.
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 49 for details.
3. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 19 for proper installation.
4. Whether 2100MHz memory speed is supported depends on the AM3/AM3+ CPU you adopt. If you want to adopt DDR3 2100 memory module on this motherboard, please refer to the memory support list on our website for the compatible memory modules.
ASRock website: <http://www.asrock.com>
5. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 7 / Vista™ / XP. For Windows® 64-bit OS with 64-bit CPU, there is no such limitation.
6. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 15 for proper connection.
7. F-Stream is an all-in-one tool to fine-tune different system functions in a user-friendly interface, which currently includes Hardware Monitor, Fan Control, Overclocking, OC DNA, Mouse Polling and IES. In the Hardware Monitor mode, F-Stream shows the major readings of your system. In Fan Control mode, F-Stream shows the fan speed and temperature for you to adjust. In Overclocking Control mode, F-Stream allows you to overclock the CPU frequency for optimal system performance. In OC DNA mode, you can save your OC settings as a profile and share them with your friends. Your friends can then load the OC profile to their own system to get the same OC settings. In Mouse Polling mode, F-Stream allows you to adjust the mouse polling rate of the Fatal1ty Mouse port to add a professional level mouse configuration. In IES (Intelligent Energy Saver) mode, the voltage regulator can reduce the number of output phases to improve efficiency when the CPU cores are idle without sacrificing computing performance.

-
8. ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.
 9. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPod/iPad Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply installing the APP Charger driver, it makes your iPhone charged much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience than ever.
ASRock website: <http://www.asrock.com/Feature/AppCharger/index.asp>
 10. ASRock SmartView, a new function of internet browser, is the smart start page for IE that combines your most visited web sites, your history, your Facebook friends and your real-time newsfeed into an enhanced view for a more personal Internet experience. ASRock motherboards are exclusively equipped with the ASRock SmartView utility that helps you keep in touch with friends on-the-go. To use ASRock SmartView feature, please make sure your OS version is Windows® 7 / 7 64 bit / Vista™ / Vista™ 64 bit, and your browser version is IE8.
ASRock website: <http://www.asrock.com/Feature/SmartView/index.asp>
 11. ASRock XFast USB can boost USB storage device performance. The performance may depend on the property of the device.
 12. ASRock On/Off Play Technology allows users to enjoy the great audio experience from the portable audio devices, such like MP3 player or mobile phone to your PC, even when the PC is turned off (or in ACPI S5 mode)! This motherboard also provides a free 3.5mm audio cable (optional) that ensures users the most convenient computing environment.
 13. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
 14. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.

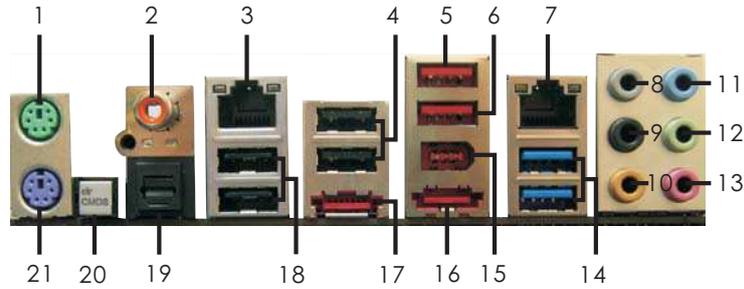
15. EuP, stands for Energy Using Product, was a provision regulated by European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.00W in off mode condition. To meet EuP standard, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v standby power efficiency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details.

1.3 Motherboard Layout



- | | | | |
|----|--|----|---|
| 1 | HDMI_SPDIF Header (HDMI_SPDIF1, Black) | 21 | Reset Switch (RSTBTN) |
| 2 | ATX 12V Power Connector (ATX12V1) | 22 | Power Switch (PWRBTN) |
| 3 | AM3+ CPU Socket | 23 | Dr. Debug (LED) |
| 4 | CPU Fan Connector (CPU_FAN1) | 24 | Chassis Fan Connector (CHA_FAN3) |
| 5 | CPU Fan Connector (CPU_FAN2) | 25 | USB 2.0 Header (USB8_9, Black) |
| 6 | Chassis Fan Connector (CHA_FAN2) | 26 | USB 2.0 Header (USB6_7, Black) |
| 7 | CPU Heatsink Retention Module | 27 | System Panel Header (PANEL1, Black) |
| 8 | 2 x 240-pin DDR3 DIMM Slots
(Dual Channel A: DDR3_A1, DDR3_B1; Red) | 28 | Clear CMOS Jumper (CLRCMOS1) |
| 9 | 2 x 240-pin DDR3 DIMM Slots
(Dual Channel B: DDR3_A2, DDR3_B2; Black) | 29 | Power LED Header (PLED1) |
| 10 | Power Fan Connector (PWR_FAN1) | 30 | Serial Port Connector (COM1) |
| 11 | ATX Power Connector (ATXPWR1) | 31 | Infrared Module Header (IR1) |
| 12 | USB 3.0 Header (USB3_1_2, Black) | 32 | PCI Express 2.0 x16 Slot (PCIE5; Red) |
| 13 | USB 3.0 Header (USB3_3_4, Black) | 33 | Front Panel IEEE 1394 Header
(FRONT_1394, Red) |
| 14 | Northbridge Controller | 34 | Front Panel Audio Header (HD_AUDIO1, Black) |
| 15 | Southbridge Controller | 35 | SPI Flash Memory (32Mb) |
| 16 | Chassis Speaker Header (SPEAKER 1, Black) | 36 | PCI Slot (PCI2) |
| 17 | SATA3 Connector (SATA3_5_6, Red) | 37 | PCI Express 2.0 x16 Slot (PCIE4; Red) |
| 18 | SATA3 Connector (SATA3_3_4, Red) | 38 | PCI Slot (PCI1) |
| 19 | SATA3 Connector (SATA3_1_2, Red) | 39 | PCI Express 2.0 x1 Slot (PCIE3; Black) |
| 20 | Chassis Fan Connector (CHA_FAN1) | 40 | PCI Express 2.0 x16 Slot (PCIE2; Red) |
| | | 41 | PCI Express 2.0 x1 Slot (PCIE1; Black) |

1.4 I/O Panel



- | | |
|------------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | **12 Front Speaker (Lime) |
| 2 Coaxial SPDIF Out Port | 13 Microphone (Pink) |
| *3 LAN RJ-45 Port | 14 USB 3.0 Ports (USB56) |
| 4 USB 2.0 Ports (USB23) | 15 IEEE 1394 Port (IEEE 1394) |
| 5 Fatal1ty Mouse Port (USB4) | ***16 eSATA3 Connector |
| 6 USB 2.0 Port (USB5) | ***17 eSATA3 Connector |
| *7 LAN RJ-45 Port | 18 USB 2.0 Ports (USB01) |
| 8 Side Speaker (Gray) | 19 Optical SPDIF Out Port |
| 9 Rear Speaker (Black) | 20 Clear CMOS Switch (CLRCBTN) |
| 10 Central / Bass (Orange) | 21 PS/2 Keyboard Port (Purple) |
| 11 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		SPEED LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

ACT/LINK SPEED
LED LED



LAN Port

** 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. 12)	Rear Speaker (No. 9)	Central / Bass (No. 10)	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.

*** eSATA3 connector supports SATA Gen3 in cable 1M.

2. Installation

This is an ATX form factor (12.0-in x 9.6-in, 30.5 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

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



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.

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 anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 CPU Installation

- Step 1. Unlock the socket by lifting the lever up to a 90° angle.
- Step 2. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle.
- Step 3. Carefully insert the CPU into the socket until it fits in place.

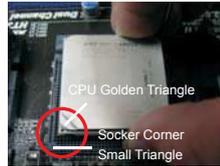


The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

- Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



STEP 1:
Lift Up The Socket Lever



STEP 2 / STEP 3:
Match The CPU Golden Triangle
To The Socket Corner Small
Triangle



STEP 4:
Push Down And Lock
The Socket Lever

2.2 Installation of CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 14, No. 4 or CPU_FAN2, see Page 14, No. 5). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

2.3 Installation of Memory Modules (DIMM)

This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel con guration, you always need to install **identical** (the same brand, speed, size and chip-type) DDR3 DIMM pair in the slots of the same color. In other words, you have to install **identical** DDR3 DIMM pair in **Dual Channel A** (DDR3_A1 and DDR3_B1; Red slots; see p.14 No.8) or **identical** DDR3 DIMM pair in **Dual Channel B** (DDR3_A2 and DDR3_B2; Black slots; see p.14 No.9), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDR3 DIMMs for dual channel con guration, and please install **identical** DDR3 DIMMs in all four slots. You may refer to the Dual Channel Memory Con guration Table below.

Dual Channel Memory Configurations

	DDR3_A1 (Red Slot)	DDR3_A2 (Black Slot)	DDR3_B1 (Red Slot)	DDR3_B2 (Black Slot)
(1)	Populated	-	Populated	-
(2)	-	Populated	-	Populated
(3)*	Populated	Populated	Populated	Populated

* For the con guration (3), please install **identical** DDR3 DIMMs in all four slots.



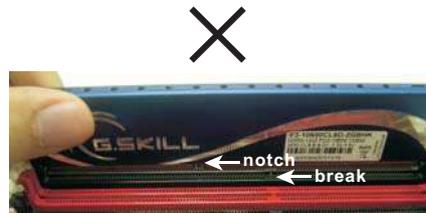
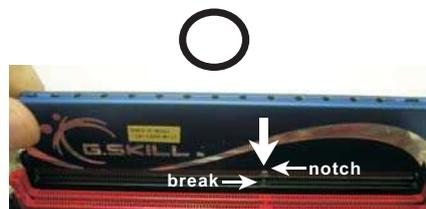
1. Please install the memory module into the black slot (DDR3_A2 and DDR3_B2) for the rst priority.
2. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of red slots (DDR3_A1 and DDR3_B1), or in the set of black slots (DDR3_A2 and DDR3_B2).
3. If only one memory module or three memory modules are installed in the DDR3 DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.
4. If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDR3_A1 and DDR3_A2, it is unable to activate the Dual Channel Memory Technology .
5. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.
6. If you adopt DDR3 2100 memory modules on this motherboard, it is recommended to install them on DDR3_A2 and DDR3_B2 slots.

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 Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 5 PCI Express slots on this motherboard.

PCI Slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCI Express Slots:

PCIE1 / PCIE3 (PCIE x1 slot; Black) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card and SATA2 card.

PCIE2 / PCIE4 (PCIE x16 slot; Red) is used for PCI Express x16 lane width graphics cards, or used to install PCI Express graphics cards to support SLI™ and CrossFireX™ function.

PCIE5 (PCIE x16 slot; Red) is used for PCI Express x4 lane width cards, or used to install PCI Express graphics cards to support 3-Way CrossFireX™ function.



1. In single VGA card mode, it is recommended to install a PCI Express x16 graphics card on PCIE2 slot.
2. In CrossFireX™ or SLI™ mode, please install PCI Express x16 graphics cards on PCIE2 and PCIE4 slots. Therefore, both these two slots will work at x16 bandwidth.
3. In 3-Way CrossFireX™ mode, please install PCI Express x16 graphics cards on PCIE2, PCIE4 and PCIE5 slots. Therefore, PCIE2 and PCIE4 slots will work at x16 bandwidth while PCIE5 slot will work at x4 bandwidth.
4. Please connect a chassis fan to motherboard chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards for better thermal environment.

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.

2.5 SLI™ and Quad SLI™ Operation Guide

This motherboard supports NVIDIA® SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to three identical PCI Express x16 graphics cards. Currently, NVIDIA® SLI™ technology supports Windows® XP / XP 64-bit / Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS. NVIDIA® Quad SLI™ technology support Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS only. Please follow the installation procedures in this section.



Requirements

1. For SLI™ technology, you should have two identical SLI™-ready graphics cards that are NVIDIA® certified. For Quad SLI™ technology, you should have two identical Quad SLI™-ready graphics cards that are NVIDIA® certified.
2. Make sure that your graphics card driver supports NVIDIA® SLI™ technology. Download the driver from NVIDIA® website (www.nvidia.com).
3. Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. It is recommended to use NVIDIA® certified PSU. Please refer to NVIDIA® website for details.

2.5.1 Graphics Card Setup

2.5.1.1 Installing Two SLI™-Ready Graphics Cards

Step 1. Install the identical SLI™-ready graphics cards that are NVIDIA® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



Step 2. If required, connect the auxiliary power source to the PCI Express graphics cards.

Step 3. Align and insert ASRock SLI_Bridge_2S Card to the gold fingers on each graphics card. Make sure ASRock SLI_Bridge_2S Card is firmly in place.



Step 4. Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.

2.5.2 Driver Installation and Setup

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

**For Windows® XP / XP 64-bit OS:
(For SLI™ mode only)**

A. Double-click **NVIDIA Settings icon** on your Windows® taskbar.



B. From the pop-up menu, select **Set SLI and PhysX configuration**. In **Set PhysX GPU acceleration** item, please select **Enabled**. In **Select an SLI configuration** item, please select **Enable SLI**. And click **Apply**.



C. Reboot your system.

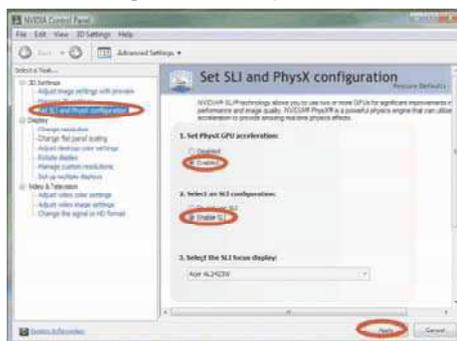
D. You can freely enjoy the benefit of SLI™ feature.

**For Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS:
(For SLI™ and Quad SLI™ mode)**

- A. Click the **Start** icon on your Windows taskbar.
- B. From the pop-up menu, select **All Programs**, and then click **NVIDIA Corporation**.
- C. Select **NVIDIA Control Panel** tab.
- D. Select **Control Panel** tab.



- E. From the pop-up menu, select **Set SLI and PhysX configuration**. In **Set PhysX GPU acceleration** item, please select **Enabled**. In **Select an SLI configuration** item, please select **Enable SLI**. And click **Apply**.



- F. Reboot your system.
- G. You can freely enjoy the benefit of SLI™ or Quad SLI™ feature.

* SLI™ appearing here is a registered trademark of NVIDIA® Technologies Inc., and is used only for identification or explanation and to the owners' benefit, without intent to infringe.

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

This motherboard supports CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ feature. CrossFireX™ technology offers the most advantageous means available of combining multiple high performance Graphics Processing Units (GPU) in a single PC. Combining a range of different operating modes with intelligent software design and an innovative interconnect mechanism, CrossFireX™ enables the highest possible level of performance and image quality in any 3D application. Currently CrossFireX™ feature is supported with Windows® XP with Service Pack 2 / Vista™ / 7 OS. 3-way CrossFireX™ and Quad CrossFireX™ feature are supported with Windows® Vista™ / 7 OS only. Please check AMD™ website for AMD™ CrossFireX™ driver updates.



1. If a customer incorrectly configures their system they will not see the performance benefits of CrossFireX™. All three CrossFireX™ components, a CrossFireX™ Ready graphics card, a CrossFireX™ Ready motherboard and a CrossFireX™ Edition co-processor graphics card, must be installed correctly to benefit from the CrossFireX™ multi-GPU platform.
2. If you pair a 12-pipe CrossFireX™ Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireX™ mode.

2.6.1 Graphics Card Setup

2.6.1.1 Installing Two CrossFireX™-Ready Graphics Cards



Different CrossFireX™ cards may require different methods to enable CrossFireX™ feature. In below procedures, we use Radeon HD 3870 as the example graphics card. For other CrossFireX™ cards that AMD™ has released or will release in the future, please refer to AMD™ graphics card manuals for detailed installation guide.

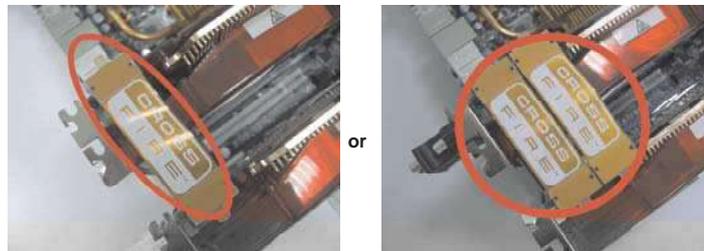
- Step 1. Insert one Radeon graphics card into PCIE2 slot and the other Radeon graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



-
- Step 2. Connect two Radeon graphics cards by installing CrossFire Bridge on CrossFire Bridge Interconnects on the top of Radeon graphics cards. (CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)



CrossFire Bridge



- Step 3. Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE2 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.)

2.6.1.2 Installing Three CrossFire™-Ready Graphics Cards

Cards

- Step 1. Install one Radeon graphics card to PCIE2 slot. For the proper installation procedures, please refer to section “Expansion Slots”.



- Step 2. Install one Radeon graphics card to PCIE4 slot. For the proper installation procedures, please refer to section “Expansion Slots”.



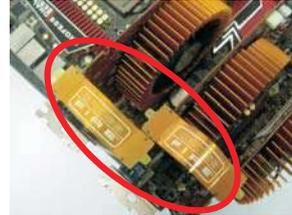
- Step 3. Install one Radeon graphics card to PCIE5 slot. For the proper installation procedures, please refer to section “Expansion Slots”.



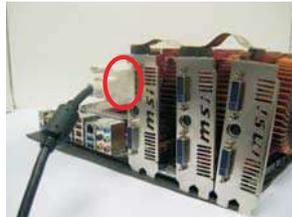
- Step 4. Use one CrossFire™ Bridge to connect Radeon graphics cards on PCIE2 and PCIE4 slots, and use the other CrossFire™ Bridge to connect Radeon graphics cards on PCIE4 and PCIE5 slots. (CrossFire™ Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)



CrossFire™ Bridge



- Step 5. Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE2 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.)



2.6.2 Driver Installation and Setup

- Step 1. Power on your computer and boot into OS.
Step 2. Remove the ATI™ driver if you have any VGA driver installed in your system.



The Catalyst Uninstaller is an optional download. We recommend using this utility to uninstall any previously installed Catalyst drivers prior to installation. Please check AMD website for ATI™ driver updates.

- Step 3. Install the required drivers to your system.

For Windows® XP OS:

- A. AMD™ recommends Windows® XP Service Pack 2 or higher to be installed (If you have Windows® XP Service Pack 2 or higher installed in your system, there is no need to download it again):

<http://www.microsoft.com/windowsxp/sp2/default.msp>

- B. You must have Microsoft .NET Framework installed prior to downloading and installing the CATALYST Control Center. Please check Microsoft website for details.

For Windows® 7 / Vista™ OS:

Install the CATALYST Control Center. Please check AMD website for details.

- Step 4. Restart your computer.
Step 5. Install the VGA card drivers to your system, and restart your computer. Then you will find “ATI Catalyst Control Center” on your Windows® taskbar.



ATI Catalyst Control Center

- Step 6. Double-click “ATI Catalyst Control Center”. Click “View”, select “CrossFireX™”, and then check the item “Enable CrossFireX™”. Select “2 GPUs” and click “Apply” (if you install two Radeon graphics cards). Select “3 GPUs” and click “OK” (if you install three Radeon graphics cards).





Although you have selected the option "Enable CrossFire™", the CrossFireX™ function may not work actually. Your computer will automatically reboot. After restarting your computer, please confirm whether the option "Enable CrossFire™" in "ATI Catalyst Control Center" is selected or not; if not, please select it again, and then you are able to enjoy the benefit of CrossFireX™ feature.

Step 7. You can freely enjoy the benefit of CrossFireX™, 3-Way CrossFireX™ or Quad CrossFireX™ feature.

* CrossFireX™ appearing here is a registered trademark of AMD™ Technologies Inc., and is used only for identification or explanation and to the owners' benefit, without intent to infringe.

* For further information of AMD™ CrossFireX™ technology, please check AMD website for updates and details.

2.7 Surround Display Feature

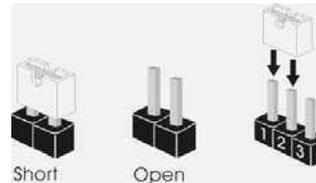
This motherboard supports Surround Display upgrade. With the external add-on PCI Express VGA cards, you can easily enjoy the benefits of Surround Display feature.

For the detailed instruction, please refer to the document at the following path in the Support CD:

..\ Surround Display Information

2.8 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						
Clear CMOS Jumper (CLRCMOS1) (see p.14, No. 28)	<table><tr><td>1_2</td><td>2_3</td></tr><tr><td></td><td></td></tr><tr><td>Default</td><td>Clear CMOS</td></tr></table>	1_2	2_3			Default	Clear CMOS
1_2	2_3						
Default	Clear CMOS						

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. 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 CLRCMOS1 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.



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

2.9 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 ATA (SATA)
Data Cable
(Optional)



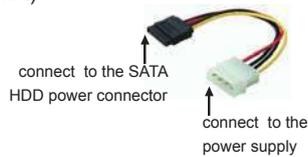
Either end of the SATA data cable can be connected to the SATA3 hard disk or the SATA3 connector on this motherboard.

3.5mm Audio Cable
(Optional)



Either end of the 3.5mm audio cable can be connected to the portable audio devices, such as MP3 player and mobile phone or the Line-in port of your PC.

Serial ATA (SATA)
Power Cable
(Optional)



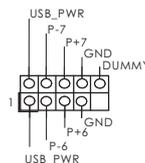
Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

Serial ATA3 Connectors
(SATA3_1_2: see p.14, No. 19)
(SATA3_3_4: see p.14, No. 18)
(SATA3_5_6: see p.14, No. 17)



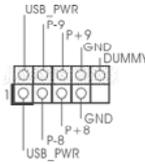
These six Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

USB 2.0 Headers
(9-pin USB6_7)
(see p.14 No. 26)

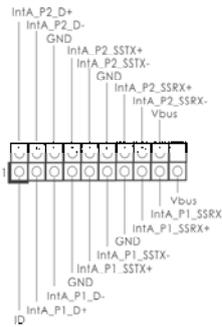


Besides six default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

(9-pin USB8_9)
(see p.14 No. 25)

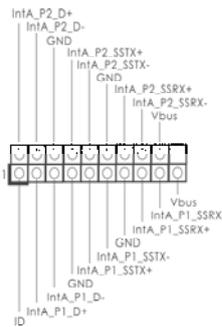


USB 3.0 Header
(19-pin USB3_1_2)
(see p.14 No. 12)

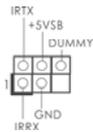


Besides two default USB 3.0 ports on the I/O panel, there are two USB 3.0 headers on this motherboard. Each USB 3.0 header can support two USB 3.0 ports.

(19-pin USB3_3_4)
(see p.14 No. 13)

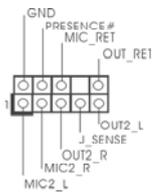


Infrared Module Header
(5-pin IR1)
(see p.14 No. 31)



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

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.14 No. 34)



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



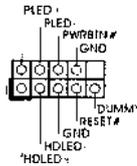
1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio

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® 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.14 No. 27)



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).

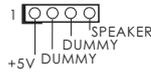
HDLED (Hard Drive Activity LED):

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.14 No. 16)



Please connect the chassis speaker to this header.

Power LED Header

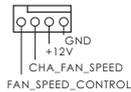
(3-pin PLED1)
(see p.14 No. 29)



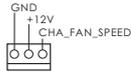
Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1 state. The LED is off in S3/S4 state or S5 state (power off).

Chassis and Power Fan Connectors

(4-pin CHA_FAN1)
(see p.14 No. 20)



(3-pin CHA_FAN2)
(see p.14 No. 6)



(3-pin CHA_FAN3)
(see p.14 No. 24)



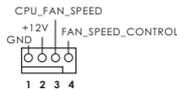
(3-pin PWR_FAN1)
(see p.14 No. 10)



Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA_FAN1/2/3 fan speed can be controlled through UEFI or AXTU.

CPU Fan Connectors

(4-pin CPU_FAN1)
(see p.14 No. 4)



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



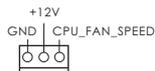
Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Pin 1-3 Connected ←

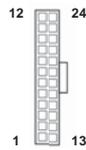
3-Pin Fan Installation



(3-pin CPU_FAN2)
(see p.14 No. 5)



ATX Power Connector
 (24-pin ATXPWR1)
 (see p.14 No. 11)



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
 (8-pin ATX12V1)
 (see p.14 No. 2)



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

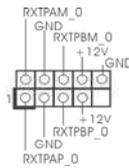


Though this motherboard provides 8-pin ATX 12V power connector, it can still work if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 5.



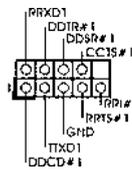
4-Pin ATX 12V Power Supply Installation

IEEE 1394 Header
 (9-pin FRONT_1394)
 (see p.14 No. 33)



Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (FRONT_1394) on this motherboard. This IEEE 1394 header can support one IEEE 1394 port.

Serial port Header
 (9-pin COM1)
 (see p.14 No.30)



This COM1 header supports a serial port module.

HDMI_SPDIF Header
(2-pin HDMI_SPDIF1)
(see p.14 No. 1)



HDMI_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. Please connect the HDMI_SPDIF connector of HDMI VGA card to this header.

Front USB 3.0 Panel Installation Guide

Step 1 Prepare the bundled Front USB 3.0 Panel, four HDD screws, and six chassis screws.



Step 2 Screw the 2.5" HDD/SSD to the Front USB 3.0 Panel with four HDD screws.



Step 3 Install the Front USB 3.0 Panel into the 2.5" drive bay of the chassis.



Step 4 Screw the Front USB 3.0 Panel to the drive bay with six chassis screws.



Step 5 Plug the Front USB 3.0 cable into the USB 3.0 header (USB3_1_2 or USB3_3_4) on the motherboard.



Step 6 The Front USB 3.0 Panel is ready to use.



Rear USB 3.0 Bracket Installation Guide

Step 1 Unscrew the two screws from the Front USB 3.0 Panel.



Step 2 Put the USB 3.0 cable and the rear USB 3.0 bracket together.



Step 3 Screw the two screws into the rear USB 3.0 bracket.



Step 4 Put the rear USB 3.0 bracket into the chassis.



2.10 Smart Switches

This motherboard has three smart switches: power switch, reset switch and clear CMOS switch, allowing users to quickly turn on/off or reset the system or clear the CMOS values.

Power Switch
(PWRBTN)
(see p.14 No. 22)



Power Switch is a smart switch, allowing users to quickly turn on/off the system.

Reset Switch
(RSTBTN)
(see p.14 No. 21)



Reset Switch is a smart switch, allowing users to quickly reset the system.

Clear CMOS Switch
(CLRBTN)
(see p.15 No. 20)



Clear CMOS Switch is a smart switch, allowing users to quickly clear the CMOS values

2.11 Dr. Debug

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

Status Code	Description
0x00	Not used
0x01	Power on. Reset type detection (soft/hard)
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not loaded
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization

0x37	Post-Memory North Bridge initialization is started
0x38	Post-Memory North Bridge initialization (North Bridge module speci c)
0x39	Post-Memory North Bridge initialization (North Bridge module speci c)
0x3A	Post-Memory North Bridge initialization (North Bridge module speci c)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module speci c)
0x3D	Post-Memory South Bridge initialization (South Bridge module speci c)
0x3E	Post-Memory South Bridge initialization (South Bridge module speci c)
0x3F-0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match
0x53	Memory initialization error. No usable memory detected
0x54	Unspeci ed memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	reset PPI is not available
0x5C-0x5F	Reserved for future AMI error codes
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4-0xE7	Reserved for future AMI progress codes
0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC-0xEF	Reserved for future AMI error codes
0xF0	Recovery condition triggered by rmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery rmware image is found
0xF4	Recovery rmware image is loaded
0xF5-0xF7	Reserved for future AMI progress codes
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes
0x60	DXE Core is started
0x61	NVRAM initialization

0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module speci c)
0x65	CPU DXE initialization (CPU module speci c)
0x66	CPU DXE initialization (CPU module speci c)
0x67	CPU DXE initialization (CPU module speci c)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module speci c)
0x6C	North Bridge DXE initialization (North Bridge module speci c)
0x6D	North Bridge DXE initialization (North Bridge module speci c)
0x6E	North Bridge DXE initialization (North Bridge module speci c)
0x6F	North Bridge DXE initialization (North Bridge module speci c)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module speci c)
0x74	South Bridge DXE Initialization (South Bridge module speci c)
0x75	South Bridge DXE Initialization (South Bridge module speci c)
0x76	South Bridge DXE Initialization (South Bridge module speci c)
0x77	South Bridge DXE Initialization (South Bridge module speci c)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset

0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

2.12 Serial ATA3 (SATA3) Hard Disks Installation

This motherboard adopts AMD SB950 chipset that supports Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 0+1, JBOD and RAID 5) functions. You may install SATA3 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA3 hard disks.

STEP 1: Install the SATA3 hard disks into the drive bays of your chassis.

STEP 2: Connect the SATA power cable to the SATA3 hard disk.

STEP 3: Connect one end of the SATA data cable to the motherboard's SATA3 connector.

STEP 4: Connect the other end of the SATA data cable to the SATA3 hard disk.

2.13 Hot Plug and Hot Swap Functions for SATA3 HDDs

This motherboard supports Hot Plug and Hot Swap functions for SATA3 in RAID / AHCI mode. AMD SB950 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed thru a joint industry effort.



NOTE

What is Hot Plug Function?

If the SATA3 HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA3 HDDs while the system is still power-on and in working condition.

However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA3 HDD.

What is Hot Swap Function?

If SATA3 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA3 HDDs while the system is still power-on and in working condition.

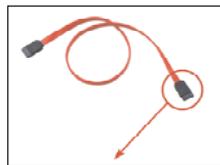
2.14 SATA3 HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA3 HDD in RAID / AHCI mode. Please read below operation guide of Hot Plug feature carefully. Before you process the SATA3 HDD Hot Plug, please check below cable accessories from the motherboard gift box pack.

A. 7-pin SATA data cable

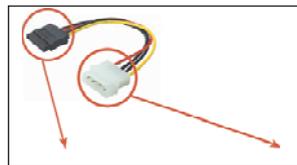
B. SATA power cable with SATA 15-pin power connector interface

A. SATA data cable (Red)



SATA 7-pin connector

B. SATA power cable



The SATA 15-pin power connector (Black) connect to SATA3 HDD

1x4-pin conventional power connector (White) connect to power supply

Caution

1. Without SATA 15-pin power connector interface, the SATA3 Hot Plug cannot be processed.
2. Even some SATA3 HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is definitely not able to support Hot Plug and will cause the HDD damage and data loss.

Points of attention, before you process the Hot Plug:

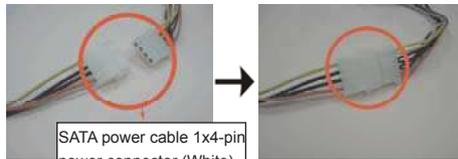
1. Below operation procedure is designed only for our motherboard, which supports SATA3 HDD Hot Plug.
 - * The SATA3 Hot Plug feature might not be supported by the chipset because of its limitation, the SATA3 Hot Plug support information of our motherboard is indicated in the product spec on our website: www.asrock.com
2. Make sure your SATA3 HDD can support Hot Plug function from your dealer or HDD user manual. The SATA3 HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA3 driver is installed into system properly. The latest SATA3 driver is available on our support website: www.asrock.com
4. Make sure to use the SATA power cable & data cable, which are from our motherboard package.
5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss.

How to Hot Plug a SATA3 HDD:

Points of attention, before you process the Hot Plug:

Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA3 HDD damage and data loss.

Step 1 Please connect SATA power cable 1x4-pin end (White) to the power supply 1x4-pin cable.



Step 2 Connect SATA data cable to the motherboard's SATAII / SATA3 connector.



Step 3 Connect SATA 15-pin power cable connector (Black) end to SATA3 HDD.



Step 4 Connect SATA data cable to the SATA3 HDD.

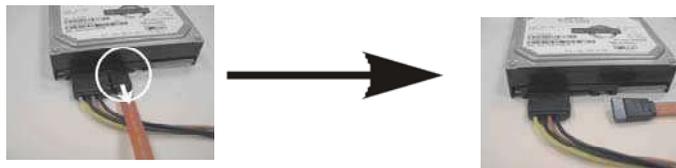


How to Hot Unplug a SATA3 HDD:

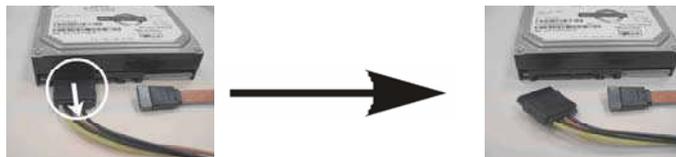
Points of attention, before you process the Hot Unplug:

Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA3 HDD damage and data loss.

Step 1 Unplug SATA data cable from SATA3 HDD side.



Step 2 Unplug SATA 15-pin power cable connector (Black) from SATA3 HDD side.



2.15 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.

2.16 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit With RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit on a RAID disk composed of 2 or more SATA3 HDDs with RAID functions, please follow below procedures according to the OS you install.

2.16.1 Installing Windows® XP / XP 64-bit With RAID Functions

If you want to install Windows® XP / XP 64-bit on a RAID disk composed of 2 or more SATA3 HDDs with RAID functions, please follow below steps.

STEP 1: Set up UEFI.

- A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the "SATA Mode" option to [RAID]. (For SATA3_1 to SATA3_6 ports.)
Set the option "Marvell SATA3 Operation Mode" to [RAID]. (For eSATA3 ports.)

STEP 2: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.)

- A. Insert the ASRock Support CD into your optical drive to boot your system.
- B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
- C. When you see the message on the screen, "Generate Serial ATA driver diskette [YN]?", press <Y>.
- D. Then you will see these messages,
 - Please insert a diskette into the floppy drive.**
 - WARNING! Formatting the floppy diskette will lose ALL data in it!**
 - Start to format and copy files [YN]?**
 - Please insert a floppy diskette into the floppy drive, and press any key.
- E. The system will start to format the floppy diskette and copy SATA3 drivers into the floppy diskette.

STEP 3: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

..\ \ RAID Installation Guide

STEP 4: Install Windows® XP / XP 64-bit OS on your system.

After step 1, 2, 3, you can start to install Windows® XP / XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA3 driver diskette containing the AMD RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install.

2.16.2 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit on a RAID disk composed of 2 or more SATA3 HDDs with RAID functions, please follow below steps.

STEP 1: Set up UEFI.

A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the “SATA Mode” option to [RAID]. (For SATA3_1 to SATA3_6 ports.)

Set the option “Marvell SATA3 Operation Mode” to [RAID]. (For eSATA3 ports.)

STEP 2: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

..\ \ RAID Installation Guide

STEP 3: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.)

Make a SATA3 driver diskette by following section 2.16.1 step 2 on page 46.

STEP 4: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

2.17 Installing Windows® 7 / 7 64-bit / Vista™ /

Vista™ 64-bit / XP / XP 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit OS on your SATA3 HDDs without RAID functions, please follow below procedures according to the OS you install.

2.17.1 Installing Windows® XP / XP 64-bit Without RAID Functions

If you want to install Windows® XP / XP 64-bit on your SATA3 HDDs without RAID functions, please follow below steps.

Using SATA3 HDDs with NCQ and Hot Plug functions (AHCI mode)

STEP 1: Set up UEFI.

A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the "SATA Mode" option to [AHCI]. (For SATA3_1 to SATA3_6 ports.)

Set the option "Marvell SATA3 Operation Mode" to [AHCI]. (For eSATA3 ports.)

STEP 2: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.)

Make a SATA3 driver diskette by following section 2.16.1 step 2 on page 46.

STEP 3: Install Windows® XP / XP 64-bit OS on your system.

You can start to install Windows® XP / XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party AHCI driver. When prompted, insert the SATA3 driver diskette containing the AMD AHCI driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install.

Using SATA3 HDDs without NCQ and Hot Plug functions (IDE mode)

STEP 1: Set up UEFI.

A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the "SATA Mode" option to [IDE]. (For SATA3_1 to SATA3_6 ports.)

Set the option "Marvell SATA3 Operation Mode" to [IDE]. (For eSATA3 ports.)

STEP 2: Install Windows® XP / XP 64-bit OS on your system.

2.17.2 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit on your SATA3 HDDs without RAID functions, please follow below steps.

Using SATA3 HDDs with NCQ and Hot Plug functions (AHCI mode)

STEP 1: Set up UEFI.

- A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Mode” option to [AHCI]. (For SATA3_1 to SATA3_6 ports.)
Set the option “Marvell SATA3 Operation Mode” to [AHCI]. (For eSATA3 ports.)

STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

Using SATA3 HDDs without NCQ and Hot Plug functions (IDE mode)

STEP 1: Set up UEFI.

- A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Mode” option to [IDE]. (For SATA3_1 to SATA3_6 ports.)
Set the option “Marvell SATA3 Operation Mode” to [IDE]. (For eSATA3 ports.)

STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

2.18 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter “Overclock Mode” option of UEFI setup to set the selection from [Auto] to [Manual]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that FSB can operate under a more stable overclocking environment.



Please refer to the warning on page 10 for the possible overclocking risk before you apply Untied Overclocking Technology.

2.19 Teaming Function Operation Guide

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



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

Before setting up Teaming function, please make sure if your Switch (or Router) could support Teaming (IEEE 802.3ad Link Aggregation) function. Then, please refer to following steps to set up Teaming function.

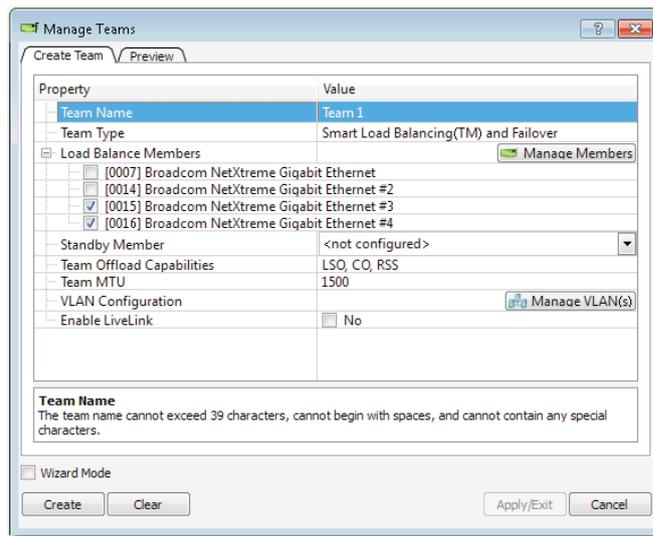
1. Install Teaming driver from the following path of motherboard Support CD:
32-bit: .. \Drivers\LAN\Broadcom\Win7-64_Win7_Vista64_Vista_XP64_XP(v14.8.4.1)\BACS\IA32
64-bit: .. \Drivers\LAN\Broadcom\Win7-64_Win7_Vista64_Vista_XP64_XP(v14.8.4.1)\BACS\X64

(This is a special driver for Teaming function only. If you don't want to use Teaming, please install the LAN driver provided by our support CD link.)

2. From the **Teams** menu, select **Create Team**, or right-click one of the devices in the "Unassigned Adapters" section and select **Create a Team**. This option is not available if there are no devices listed in the "Unassigned Adapters" sections, which means all adapters are already assigned to teams.
3. Click **Expert Mode**.

* If you want to always use Expert Mode to create a team, click Default to Expert Mode on next start.

4. Click the **Create Team** tab.



* The **Create Team** tab appears only if there are teamable adapters available.

5. Click the **Team Name** field to enter a team name.

6. Click the **Team Type** field to select a team type.

7. Assign any available adapter or adapters to the team by selecting the adapter from the **Load Balance Members** list. There must be at least one adapter selected in the **Load Balance Members** list.

8. You can assign any other available adapter to be a standby member by selecting it from the **Standby Member** list.

* There must be at least one Broadcom network adapter assigned to the team. The Large Send Offoad (LSO), Checksum Offoad (CO), and RSS indicate if the LSO, CO, and/or RSS properties are supported for the team. The LSO, CO, and RSS properties are enabled for a team only when all of the members support and are configured for the feature.

* Adding a network adapter to a team where its driver is disabled may negatively affect the offloading capabilities of the team. This may have an impact on the team's performance. Therefore, it is recommended that only driver-enabled network adapters be added as members to a team.

-
9. Type the value for **Team MTU**.
 10. Click **Create** to save the team information.
 11. Repeat steps 5. through 10. to define additional teams. As teams are defined, they can be selected from the team list, but they have not yet been created. Click the **Preview** tab to view the team structure before applying the changes.
 12. Click **Apply/Exit** to create all the teams you have defined and exit the Manage Teams window.
 13. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.
- * The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any of the following characters: & \ / : * ? < > |
 - * Team names must be unique. If you attempt to use a team name more than once, an error message is displayed indicating that the name already exists.
 - * The maximum number of team members is 8.
 - * When team configuration has been correctly performed, a virtual team adapter driver is created for each configured team.
 - * If you disable a virtual team and later want to reenabling it, you must first disable and reenabling all team members before you reenabling the virtual team.
 - * When you create Generic Trunking and Link Aggregation teams, you cannot designate a standby member. Standby members work only with Smart Load Balancing and Failover and SLB (Auto-Fallback Disable) types of teams.
 - * For an SLB (Auto-Fallback Disable) team, to restore traffic to the load balance members from the standby member, click the Fallback button on the Team Properties tab.
 - * When configuring an SLB team, although connecting team members to a hub is supported for testing, it is recommended to connect team members to a switch.
 - * Not all network adapters made by others are supported or fully certified for teaming.

14. Configure the team IP address.

- a. From **Control Panel**, double-click **Network Connections**.
- b. Right-click the name of the team to be configured, and then click **Properties**.
- c. On the **General** tab, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
- d. Configure the IP address and any other necessary TCP/IP configuration for the team, and then click **OK** when finished.

3. UEFI SETUP UTILITY

3.1 Introduction

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

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <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:

- Main** To set up the system time/date information
- OC Tweaker** To set up overclocking features
- Advanced** To set up the advanced UEFI features
- H/W Monitor** To display current hardware status
- Boot** To set up the default system device to locate and load the Operating System
- Security** To set up the security features
- Exit** To exit the current screen or the UEFI SETUP UTILITY

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

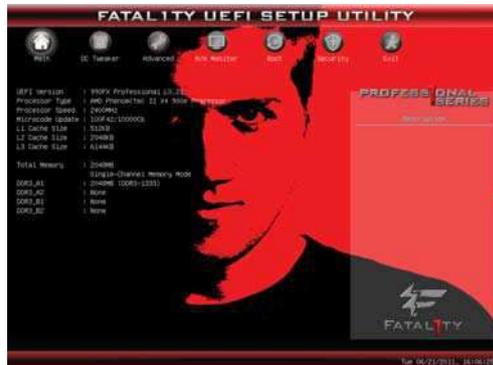
3.1.2 Navigation Keys

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

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<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.



System Time [Hour:Minute:Second]

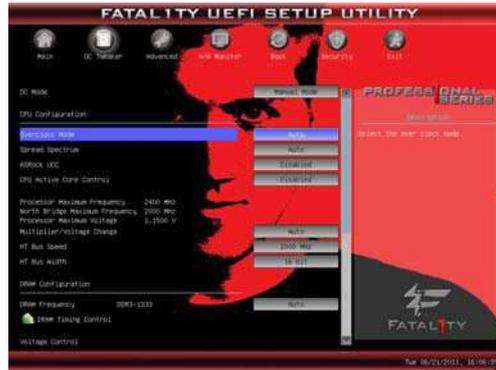
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

3.3 OC Tweaker Screen

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



Turbo Mode

You can use this option to increase your system performance.

Configuration options: [System Performance Increases 50%] and [System Performance Increases 60%].

CPU Configuration

Overclock Mode

Use this to select Overclock Mode. Configuration options: [Auto] and [Manual]. The default value is [Auto].

Spread Spectrum

This item should always be [Auto] for better system stability.

ASRock UCC

ASRock UCC (Unlock CPU Core) feature simplifies AMD CPU activation. As long as a simple switch of the UEFI option "ASRock UCC", you can unlock the extra CPU core to enjoy an instant performance boost. When UCC feature is enabled, the dual-core or triple-core CPU will boost to the quad-core CPU, and some CPU, including quad-core CPU, can also increase L3 cache size up to 6MB, which means you can enjoy the upgrade CPU performance with a better price. Please be noted that UCC feature is supported with AM3/AM3+ CPU only, and in addition, not every AM3/AM3+ CPU can support this function because some CPU's hidden core may be malfunctioned.

CPU Active Core Control

This allows you to adjust CPU Active Core Control feature. The configuration options depend on the CPU core you adopt. The default value is [Disabled].

Processor Maximum Frequency

It will display Processor Maximum Frequency for reference.

North Bridge Maximum Frequency

It will display North Bridge Maximum Frequency for reference.

Processor Maximum Voltage

It will display Processor Maximum Voltage for reference.

Multiplier/Voltage Change

This item is set to [Auto] by default. If it is set to [Manual], you may adjust the value of Processor Frequency and Processor Voltage. However, it is recommended to keep the default value for system stability.

HT Bus Speed

This feature allows you selecting Hyper-Transport bus speed. Configuration options: [200MHz] to [2000MHz].

HT Bus Width

This feature allows you selecting Hyper-Transport bus width. Configuration options: [8 Bit] and [16 Bit].

DRAM 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.

Channel Interleaving

It allows you to enable Channel Memory Interleaving. Configuration options: [Disabled], [Auto]. The default value is [Auto].

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: 1T. Max: 2T. 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 Control**CPU Load-line calibration**

Use this to select CPU Load-line calibration. The default value is [Auto].

DRAM Voltage

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

NB Voltage

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

HT Voltage

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

CPU VDDA Voltage

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

PCIE VDDA Voltage

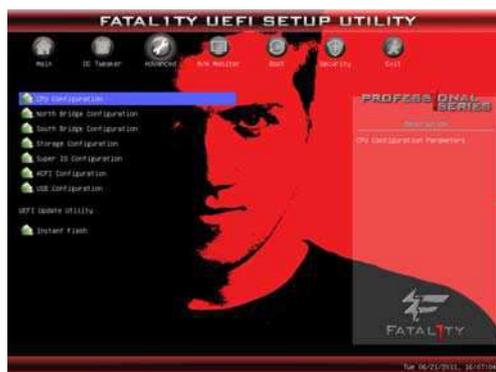
Use this to select PCIE VDDA Voltage. The default value is [Auto].

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.

3.4 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 [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® 7 / Vista™ 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.

Secure Virtual Machine

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

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 Thermal Throttle

Use this item to enable CPU internal thermal control mechanism to keep the CPU from overheated. The default value is [Auto].

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.

On/Off Play

Use this item to enable or disable On/Off Play Technology. The default value is [Enabled]. When On/Off Play is enabled, Deep Sx will be disabled. If you want to enable Deep Sx, please disable On/Off Play first.

Onboard LAN

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

Onboard IEEE 1394 controller

This allows you to enable or disable the onboard IEEE 1394.

Good Night LED

This allows you to enable to turn off Power LED, Lan LED at power on.

Onboard Debug Port LED

This allows you to enable or disable the onboard Debug Port LED.

3.4.4 Storage Configuration



SATA Controller

This item is for SATA3_1 to SATA3_6 ports. Use this item to enable or disable the “SATA Controller” feature.

SATA Mode

This item is for SATA3_1 to SATA3_6 ports. Use this item to adjust SATA Mode. The default value of this option is [IDE Mode]. Configuration options: [AHCI Mode], [RAID Mode] and [IDE Mode].



If you set this item to RAID mode, it is suggested to install SATA ODD driver on SATA3_5 or SATA3_6 port.

SATA IDE Combined Mode

This item is for SATA3_5 and SATA3_6 ports. Use this item to enable or disable SATA IDE combined mode. The default value is [Enabled].



If you want to build RAID on SATA3_5 and SATA3_6 ports, please disable this item.

Marvell SATA3 Operation Mode

This item is for the two Marvell eSATA3 ports. Use this item to adjust the “Marvell SATA3 Operation Mode” feature. Configuration options: [Disabled], [IDE Mode], [AHCI Mode] and [RAID Mode]. The default value is [IDE Mode].

Marvell SATA3 Bootable

Use this to enable or disable Onboard Marvell SATA3 Option ROM. If Option ROM is disabled, UEFI cannot use the SATA device to connect to Marvell SATA3 controller as Boot Device.



We recommend to use SATA3_1 to SATA3_6 ports for your bootable device. This will minimum your boot time and get the best performance. But if you still want to boot from Marvell SATA3 controller, please set this item to [Yes].

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. Con guration 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: [3F8h / IRQ4] and [3E8h / IRQ4].

Infrared Port

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

Infrared Port Address

Use this item to set the address for the onboard infrared port. Configuration options: [2F8h / IRQ3] and [2E8h / IRQ3].

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.

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.

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.

PCI Devices Power On

Use this item to enable or disable PCI 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 the system to wake from S5 using USB Keyboard/Remote.

USB Mouse Power On

Use this item to enable or disable the system to wake from S5 using USB Mouse.

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® Vista™ certification.

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 1 & 2 Setting

This allows you to set the CPU fan 1 & 2 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], [Automatic Mode] and [Manual]. 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]. The default is value [Full On].

Chassis Fan 3 Setting

This allows you to set the chassis fan 3 speed. Configuration options: [Full On] and [Manual]. 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.



Boot Option Priorities

Boot Option #1

Set the first priority of the system boot device.

Hard Drive BBS Priorities

Set the order of the legacy devices in this group.

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

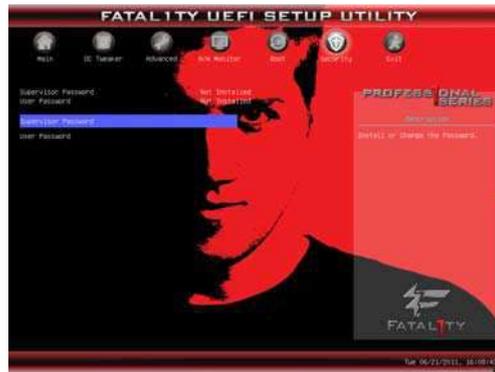
Enable or disable the feature of Boot Failure Guard Count.

Boot From Onboard LAN

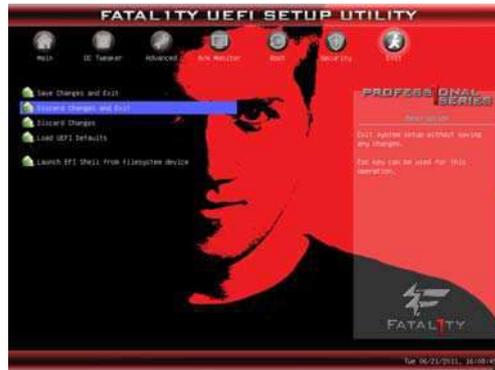
Use this item to enable or disable the Boot From Onboard LAN feature.

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.



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 [Yes] 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 [Yes] 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 [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.

4. Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 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 "ASSETUP.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 the 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)** or **Windows® 7 64-bit**.
2. Set **AHCI Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Press F11 to launch boot menu at system POST.
4. Choose the item "UEFI:xxx" to boot. ("xxx" is the device which contains your Windows® installation files. Normally it is an optical drive.)
5. Start Windows® installation.