Fatal1ty X79 Champion Series

User Manual

Version 1.0
Published March 2012

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 figurehead 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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Disclaimer:

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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

Contents

Chapter 1: Introduction

Thank you for purchasing ***Fatal1ty X79 Champion 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 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the Support CD.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock's 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 X79 Champion Series Motherboard
(ATX Form Factor: 12.0-in x 10.5-in, 30.5 cm x 26.7 cm)
Fatal1ty X79 Champion Series Quick Installation Guide
Fatal1ty X79 Champion Series Support CD
6 x Serial ATA (SATA) Data Cables (Optional)
2 x Serial ATA (SATA) HDD Power Cables (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
2 x ASRock SLI_Bridge Cards
1 x ASRock SLI_Bridge_3S Card
1 x ASRock 3-Way SLI Bridge Card
1 x ASRock 3-Way SLI-2S2S Bridge Card

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	- ATX Form Factor: 12.0-in x 10.5-in, 30.5 cm x 26.7 cm - Premium Gold Capacitor design (100% Japan-made high-quality Conductive Polymer Capacitors)
CPU	- Supports Intel® Core™ i7 processor family for the LGA 2011 Socket - Digi Power Design - Advanced 12 + 2 Power Phase Design - Dual-Stack MOSFET (DSM) (see **CAUTION 1**) - Supports Intel® Turbo Boost 2.0 Technology - Supports Hyper-Threading Technology (see **CAUTION 2**) - Supports Untied Overclocking Technology
Chipset	- Intel® X79
Memory	- Quad Channel DDR3 Memory Technology (see **CAUTION 3**) - 8 x DDR3 DIMM slots - Supports DDR3 2500+(OC)/2133(OC)/1866(OC)/1600/1333/1066 non-ECC, un-buffered memory - Supports DDR3 ECC, un-buffered memory with Intel® Workstation 1S Xeon® processors E5 16xx/26xx/46xx series in socket LGA 2011 - Max. capacity of system memory: 64GB (see **CAUTION 4**) - Supports Intel® Extreme Memory Profile (XMP)1.3/1.2
Expansion Slot	- 5 x PCI Express 3.0 x16 slots (PCIE/PCIE5: x16/16 mode; PCIE1/PCIE3/PCIE5: x16/8/8 mode; PCIE1/PCIE4/PCIE7: x16/8/8 mode; PCIE1/PCIE3/PCIE5/PCIE7: x16/8/8/8 mode) (see **CAUTION 5**) - 2 x PCI Express 2.0 x 1 slots - Supports AMD Quad CrossFireX™, 4-Way CrossFireX™, 3-Way CrossFireX™ and CrossFireX™ - Supports NVIDIA® Quad SLI™, 4-Way SLI™, 3-Way SLI™ and SLI™
Audio	- 7.1 CH HD Audio - Creative Sound Core3D quad-core sound and voice processor - Supports THX TruStudio™ PRO - Supports CrystalVoice - Supports Scout Mode - Supports EAX1.0 to EAX5.0 - Premium Headset Amplifier (PHA) (see **CAUTION 6**)
LAN	- 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	I/O Panel - 1 x PS/2 Keyboard Port - 1 x Optical SPDIF Out Port - 1 x Ready-to-Use USB 2.0 Ports - 1 x Fatal1ty Mouse Port (USB 2.0) - 2 x eSATA3 Connectors - 8 x Ready-to-Use USB 3.0 Ports - 2 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - 1 x IEEE 1394 Port - 1 x Clear CMOS Switch with LED - HD Audio Jack: Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone (see **CAUTION 7**)
SATA3	- 2 x SATA3 6.0 Gb/s connectors by Intel® X79, support RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage 3.0), NCQ, AHCI and "Hot Plug" functions - 4 x SATA3 6.0 Gb/s connectors by Marvell SE9230, support RAID (RAID 0, RAID 1 and RAID10), NCQ, AHCI and "Hot Plug" functions
USB3.0	- 8 x Rear USB 3.0 ports by TI®, 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 TI®, support USB 1.0/2.0/3.0 up to 5Gb/s
Connector	- 4 x SATA2 3.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage 3.0), NCQ, AHCI and Hot Plug functions - 6 x SATA3 6.0Gb/s connectors - 1 x IR header - 1 x CIR header - 1 x COM port header - 1 x HDMI_SPDIF header - 1 x IEEE 1394 header - 1 x Power LED header - 1 x V-Probe™: 7-set of onboard voltage measurement points laid - CPU/Chassis/Power FAN connectors

	- 24 pin ATX power connector - 8 pin 12V power connector - SLI/XFire power connector - Front panel audio connector - 3 x USB 2.0 headers (support 6 USB 2.0 ports) - 2 x USB 3.0 header (supports 4 USB 3.0 ports) - 1 x Dr. Debug with LED - 1 x Post Status Checker (PSC) (see **CAUTION 8**)
Smart Switch	- 1 x Power Switch with LED - 1 x Reset Switch with LED - 1 x Clear CMOS Switch with LED
BIOS Feature	- 64Mb AMI UEFI Legal BIOS with GUI support - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - SMBIOS 2.3.1 Support - CPU, VCCSA, DRAM, VTT, CPU PLL, PCH1.1V, PCH1.5V Voltage Multi-adjustment
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, ASRock MAGIX Multimedia Suite - OEM

Unique Feature	- F-Stream (see **CAUTION 9**)
	- ASRock Instant Boot
	- ASRock Instant Flash (see **CAUTION 10**)
	- ASRock APP Charger (see **CAUTION 11**)
	- ASRock SmartView (see **CAUTION 12**)
	- ASRock XFast USB (see **CAUTION 13**)
	- ASRock XFast LAN (see **CAUTION 14**)
	- ASRock XFast RAM (see **CAUTION 15**)
	- ASRock Crashless BIOS (see **CAUTION 16**)
	- ASRock OMG (Online Management Guard) (see **CAUTION 17**)
	- ASRock Internet Flash (see **CAUTION 18**)
	- ASRock HyperDuo Plus Technology (see **CAUTION 19**)
	- Hybrid Booster:
	  - CPU Frequency Stepless Control (see **CAUTION 20**)
	  - ASRock U-COP (see **CAUTION 21**)
	  - Boot Failure Guard (B.F.G.)
	- Good Night LED

Hardware Monitor	- CPU Temperature Sensing - Chassis Temperature Sensing

	- CPU/Chassis/Power Fan Tachometer - CPU/Chassis Quiet Fan (Allows Chassis Fan Speed Auto-Adjust by CPU Temperature) - CPU/Chassis Fan Multi-Speed Control - Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore
OS	- Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit compliant
Certifications	- FCC, CE, WHQL - ErP/EuP Ready (ErP/EuP ready power supply is required) (see **CAUTION 22**)

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

WARNING

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

CAUTION!

1. Dual-Stack MOSFET (DSM) is an innovative new design of MOSFETs. The silicon die area is doubled by stacking two dies into a MOSFET. The larger the die area, the lower Rds(on). Compared to traditional discrete MOSFET, DSM can provide larger die area and lower Rds(on), so the power supply for CPU Vcore is more efficient.
2. About the setting of "Hyper Threading Technology", please check page 79.
3. This motherboard supports Quad Channel Memory Technology. Before you implement Quad Channel Memory Technology, make sure to read the installation guide of memory modules on page 21 for proper installation.
4. 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™. For Windows® OS with 64-bit CPU, there is no such limitation. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use.

5. Currently Intel® Socket 2011 Sandy Bridge-E Processor doesn't support PCIE 3.0, but this motherboard is already PCIE 3.0 hardware ready. It depends on Intel's CPU to enable PCIE 3.0. Please check Intel's website for information on future CPU updates and releases.
6. For serious gamers and enthusiasts who cannot tolerate mediocre audio, Premium Headset Amplifier (PHA) provides wider bandwidth, higher slew rate with lower noise and distortion. It also supports up to 250 Ohm high-end headsets, which delivers crisper audio into the users ears.
7. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 6-channel, and 8-channel modes. Please check the table on page 5 for proper connection.
8. Post Status Checker (PSC) diagnoses the computer when users power on the machine. It emits a red light to indicate whether the CPU, memory, VGA or storage is dysfunctional. The lights go off if the four mentioned above are functioning normally.
9. 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 in 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.
10. 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 the <F6> key during the POST or the <F2> key to enter into the 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.
11. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPad/iPod Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply install the APP Charger driver, it makes your iPhone charge 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.

ASRock website: http://www.asrock.com/Feature/AppCharger/index.asp

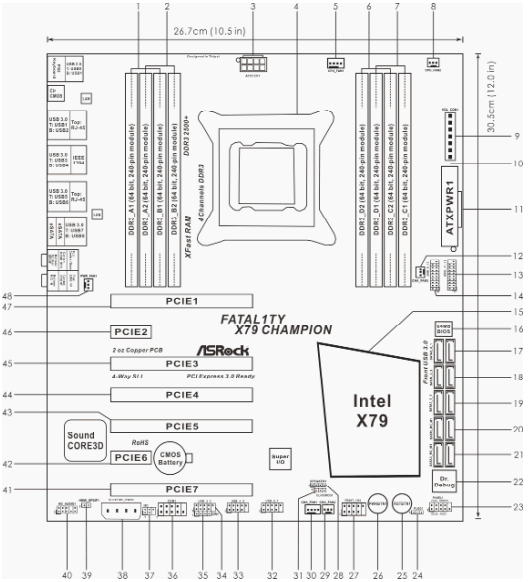
12. ASRock SmartView, a new function for internet browsers, is the smart start page for IE that combines your most visited web sites, your history, your Facebook friends and your real-time newsfeed into an enhanced view for a more personal Internet experience. ASRock motherboards are exclusively equipped 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
13. ASRock XFast USB can boost USB storage device performance. The performance may depend on the properties of the device.
14. ASRock XFast LAN provides a faster internet access, which includes the benefits listed below. LAN Application Prioritization: You can configure your application's priority ideally and/or add new programs. Lower Latency in Game: After setting online game's priority higher, it can lower the latency in games. Traffic Shaping: You can watch Youtube HD videos and download simultaneously. Real-Time Analysis of Your Data: With the status window, you can easily recognize which data streams you are transferring currently.
15. ASRock XFast RAM is a new function that is included into F-Stream. It fully utilizes the memory space that cannot be used under Windows® OS 32-bit CPU. ASRock XFast RAM shortens the loading time of previously visited websites, making web surfing faster than ever. And it also boosts the speed of Adobe Photoshop 5 times faster. Another advantage of ASRock XFast RAM is that it reduces the frequency of accessing your SSDs or HDDs in order to extend their lifespan.
16. ASRock Crashless BIOS allows users to update their BIOS without fear of failing. If power loss occurs during the BIOS update process, ASRock Crashless BIOS will automatically finish the BIOS update procedure after regaining power. Please note that BIOS files need to be placed in the root directory of your USB disk. Only USB2.0 ports support this feature.
17. Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG. You may schedule the starting and ending hours of internet access granted to other users. In order to prevent users from bypassing OMG, guest accounts without permission to modify the system time are required.
18. Internet Flash searches for available UEFI firmware updates from our servers. In other words, the system can auto-detect the latest UEFI from our servers and flash them without entering Windows OS. Please note that you must be running on a DHCP configured computer in order to

enable this function.

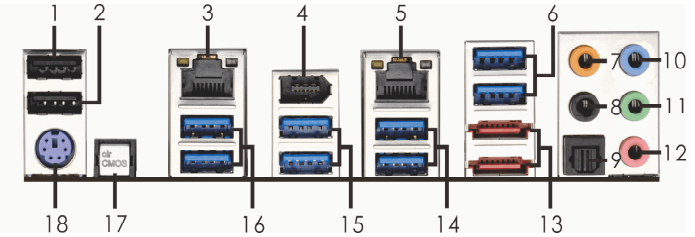
19. Get 14 times faster performance! While a SSD and a HDD are connected, HyperDuo Plus™ makes the SSD become the cache of the HDD and delivers SSD like performance.
20. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause instability of the system or damage the CPU.
21. 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.
22. EuP stands for Energy Using Product, was a provision regulated by the European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system should be under 1.00W in off mode condition. To meet EuP standards, 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, and the standby power efficiency should be higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you to check with the power supply manufacturer for more details.

1.3 Motherboard Layout



1	2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1, Red)	26	Power Switch (PWRBTN1)
2	2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2, Black)	27	Front Panel IEEE 1394 Header (FRONT_1394, Red)
3	ATX 12V Power Connector (ATX12V1)	28	Chassis Speaker Header (SPEAKER1, Black)
4	2011-Pin CPU Socket	29	Chassis Fan Connector (CHA_FAN2)
5	CPU Fan Connector (CPU_FAN1)	30	Chassis Fan Connector (CHA_FAN1)
6	2 x 240-pin DDR3 DIMM Slots (DDR3_D2, DDR3_C2, Black)	31	Clear CMOS Jumper (CLRCMOS1)
7	2 x 240-pin DDR3 DIMM Slots (DDR3_D1, DDR3_C1, Red)	32	USB 2.0 Header (USB_6_7, Black)
8	CPU Fan Connector (CPU_FAN2)	33	USB 2.0 Header (USB_4_5, Black)
9	V-Probe™ (VOL_CON1)	34	USB 2.0 Header (USB_2_3, Black)
10	Post Status Checker (PSC)	35	Consumer Infrared Module Header (CIR1, Gray)
11	ATX Power Connector (ATXPWR1)	36	COM Port Header (COM1)
12	Chassis Fan Connector (CHA_FAN3)	37	Infrared Module Header (IR1)
13	USB 3.0 Header (USB3_11_12, Black)	38	SLI / XFIRE Power Connector
14	USB 3.0 Header (USB3_9_10, Black)	39	HDMI_SPDIF Header (HDMI_SPDIF1, Black)
15	Intel X79 Chipset	40	Front Panel Audio Header (HD_AUDIO1, Black)
16	SPI Flash Memory (64Mb)	41	PCI Express 3.0 x16 Slot (PCIE7, Red)
17	SATA2 Connector (SATA2_0_1, Black)	42	PCI Express 2.0 x1 Slot (PCIE6, Black)
18	SATA2 Connector (SATA2_2_3, Black)	43	PCI Express 3.0 x16 Slot (PCIE5, Red)
19	SATA3 Connector (SATA3_0_1, Red)	44	PCI Express 3.0 x16 Slot (PCIE4, Red)
20	SATA3 Connector (SATA3_M0_M1, Red)	45	PCI Express 3.0 x16 Slot (PCIE3, Red)
21	SATA3 Connector (SATA3_M2_M3, Red)	46	PCI Express 2.0 x1 Slot (PCIE2, Black)
22	Dr. Debug	47	PCI Express 3.0 x16 Slot (PCIE1, Red)
23	System Panel Header (PANEL1, Black)	48	Power Fan Connector (PWR_FAN1)
24	Power LED Header (PLED1)		
25	Reset Switch (RSTBTN1)		

1.4 I/O Panel



1	Fatal1ty Mouse Port (USB0)	10	Line In (Light Blue)
2	USB 2.0 Port (USB1)	** 11	Front Speaker (Lime)
* 3	LAN RJ-45 Port	12	Microphone (Pink)
4	IEEE 1394 Port (IEEE 1394)	*** 13	eSATA3 Connectors
* 5	LAN RJ-45 Port	14	USB 3.0 Ports (USB3_56)
6	USB 3.0 Ports (USB3_78)	15	USB 3.0 Ports (USB3_34)
7	Central / Bass (Orange)	16	USB 3.0 Ports (USB3_12)
8	Rear Speaker (Black)	17	Clear CMOS Switch (CLRCBTN)
9	Optical SPDIF Out Port	18	PS/2 Keyboard Port (Purple)

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

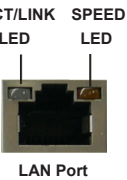
LAN Port LED Indications

Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED

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



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

TABLE for Audio Output Connection

Audio Output Channels	Front Speaker (No. 11)	Rear Speaker (No. 8)	Central / Bass (No. 7)	Line in (No. 10)
2	V	--	--	--
4	--	--	--	--
6	V	V	V	--
8	V	V	V	V

*** eSATA3 connectors support SATA Gen3 in cable 1M.

Chapter 2: Installation

This is an ATX form factor (12.0" x 10.5", 30.5 x 26.7 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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

2.1 Screw Holes

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

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

2.2 Pre-installation Precautions

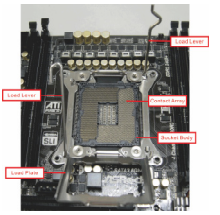
Take note of the following precautions before you install motherboard components or change any motherboard settings.

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

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

2.3 CPU Installation

For the installation of Intel 2011-Pin CPU, please follow the steps below.

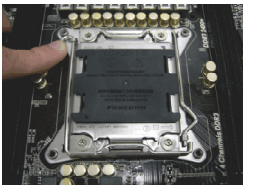


2011-Pin Socket Overview

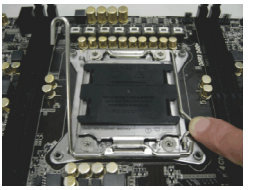
Before you insert the 2011-Pin CPU into the socket, please check if the CPU surface is unclean or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

Step 1. Open the socket:

Step 1-1. Disengage the left lever by pressing it down and sliding it out of the hook.



Step 1-2. Disengage the right lever by pressing it down and sliding it out of the hook.

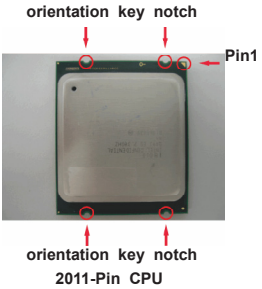


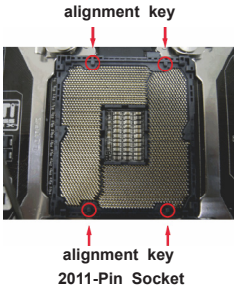
Step 1-3. Keep the right lever positioned at about 90 degrees in order to flip up the load plate.

Step 2. Insert the 2011-Pin CPU:

Step 2-1. Hold the CPU by the edge with the triangle mark(Pin 1) on your upper right corner.

Step 2-2. Locate Pin1 and the two orientation key notches.





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

Step 2-3. Carefully place the CPU into the socket by using a purely vertical motion.

Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.

Step 3. Close the socket:

Step 3-1. Flip the load plate onto the IHS, then the cover will automatically come off by itself.

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

Step 3-2. Press down the right load lever, and secure it with the load plate tab under the retention tab.

Step 3-3. Press down the left load lever, and secure it with the load plate tab under the retention tab.

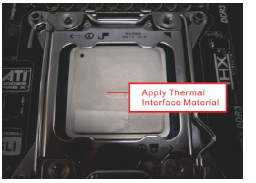
2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with a 2011-Pin socket that supports Intel 2011-Pin CPUs. Please adopt the type of heatsink and cooling fan compliant with Intel 2011-Pin CPU to dissipate heat. Before you install the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector (CPU_FAN1, see page 15, No. 5 or CPU_FAN2, see page 15, No. 8).

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

Below is an example to illustrate the installation of the heatsink for 2011-Pin CPUs.

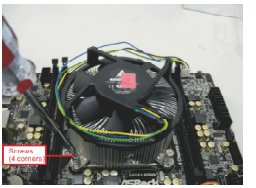
Step 1. Apply thermal interface material onto center of IHS on the socket's surface.



Step 2. Place the heatsink onto the socket. Ensure that the fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU_FAN1, see page 15, No. 5 or CPU_FAN2, see page 15, No. 8).

Step 3. Align screws with the motherboard's holes.

Step 4. Use a screw driver to install the screws.



If you don't fasten the screws, the heatsink cannot be secured on the motherboard.

Step 5. Connect fan header with the CPU fan connector on the motherboard.

Step 6. Secure redundant cable with tie-wrap to ensure the cable does not interfere with fan operation or contact other components.

2.5 Installation of Memory Modules (DIMM)

This motherboard provides eight 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Quad Channel Memory Technology. For quad channel configuration, you always need to install **identical** (the same brand, speed, size and chip-type) DDR3 DIMM in the slots, so that Quad Channel Memory Technology can be activated.

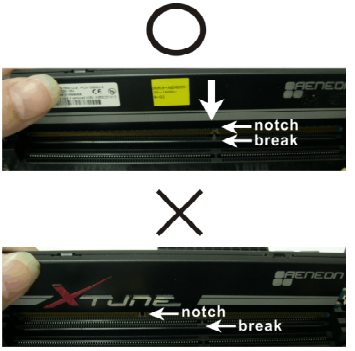
1. Due to Intel® CPU spec definition, please install the memory modules on DDR3_A1, DDR3_B1, DDR3_C1 and DDR3_D1 for first priority. If the four DDR3 DIMM slots above are fully installed, and you want to use more than four memory modules, please install the other memory modules from left to right (from DDR3_A2, DDR3_B2, DDR3_D2 to DDR3_C2.)
2. If only two memory modules are installed in the DDR3 DIMM slots, then Dual Channel Memory Technology is activated. If three memory modules are installed, then Triple Channel Memory Technology is activated. If more than four memory modules are installed in the DDR3 DIMM slots, then Quad Channel Memory Technology is activated.
3. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.

Installing a DIMM

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

Step 1. Unlock the DIMM slot by pressing the retaining clips outward.

Step 2. Align the 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 in incorrect orientation.

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

2.6 Expansion Slots (PCI and PCI Express Slots)

There are 7 PCI Express slots on this motherboard.

PCIE slots: PCIE1 / PCIE3 / PCIE4 / PCIE5 /PCIE7 (PCIE 3.0 x16 slots) are used for PCI Express graphics cards.

PCIE2 / PCIE6 (PCIE2.0 x1 slots) are used for PCI Express cards with x1 lane width. Such as Gigabit LAN card or SATA2 cards, etc.

PCIE Slot Configurations

	PCIE1	PCIE3	PCIE4	PCIE5	PCIE7
Two Graphics Cards in CrossFireX™ or SLI™ Mode	x16	N/A	N/A	x16	N/A
Three Graphics Cards in 3-Way CrossFireX™ or 3-Way SLI™ Mode	x16 x16	x8 N/A	N/A x8	x16 N/A	N/A x8
Four Graphics Cards in 4-Way CrossFireX™ or 4-Way SLI™ Mode	x16	x8	N/A	x8	x8

1. In single VGA card mode, it is recommended to install a PCI Express x16 graphics card in the PCIE1 slot.
2. In CrossFireX™ mode or SLI™ mode, please install the PCI Express x16 graphics cards in PCIE1 and PCIE5 slots. Both these two slots will work at x16 bandwidth.
3. In 3-Way CrossFireX™ or 3-Way SLI™ mode, please install the PCI Express x16 graphics cards in PCIE1, PCIE3 and PCIE5 slots. PCIE1 and PCIE5 will work at x16 bandwidth, while PCIE3 works at x8 bandwidth. Or install the PCI Express x16 graphics cards in PCIE1, PCIE4 and PCIE7 slots. PCIE1 will work at x16 bandwidth, while PCIE4 and PCIE7 works at x8 bandwidth.
4. In 4-Way CrossFireX™ or 4-Way SLI™ mode, please install the PCI Express x16 graphics cards in PCIE1, PCIE3, PCIE5 and PCIE7 slots. PCIE1 will work at x16 bandwidth, while PCIE3, PCIE5 and PCIE7 works at x8 bandwidth.
5. Please connect a chassis fan to the motherboard's chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards for better thermal environment.
6. Currently Intel® Socket 2011 Sandy Bridge-E Processors don't support PCIE 3.0, but this motherboard is already PCIE 3.0 hardware ready. It depends on Intel's CPU to enable PCIE 3.0. Please check Intel's website for information on future CPU updates and releases.

Installing an expansion card

Step 1. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5. Fasten the card to the chassis with screws.

Step 6. Replace the system cover.

2.7 ASRock Game Blaster Configuration

This section explains how to configure your ASRock Game Blaster.

2.7.1 THX TRUSTUDIO PRO

THX TruStudio Pro

Click the power button on the left to activate or deactivate.

Surround

Control the level of audio immersion in music, movies and games.

Crystalizer

Enhance music and movies to make them sound livelier.

Bass

Control the desired level of bass.

Crossover Frequency

Redirect all frequencies below this value to the optimal speaker for better bass response.

Smart Volume

Adjust the loudness of your audio playback automatically to minimize sudden volume changes.

Dialog Plus

Enhance the voices in movies for clearer dialog.

2.7.2 CRYSTALVOICE

Select a recording device

Mic Volume

Control the level of mic volume.

Mic Boost

Control the level of mic boost.

CrystalVoice

Click the power button on the left to activate or deactivate.

FX

Morph your voice into different characters and accents.

Smart Volume

Be heard clearly without having to shout or whisper.

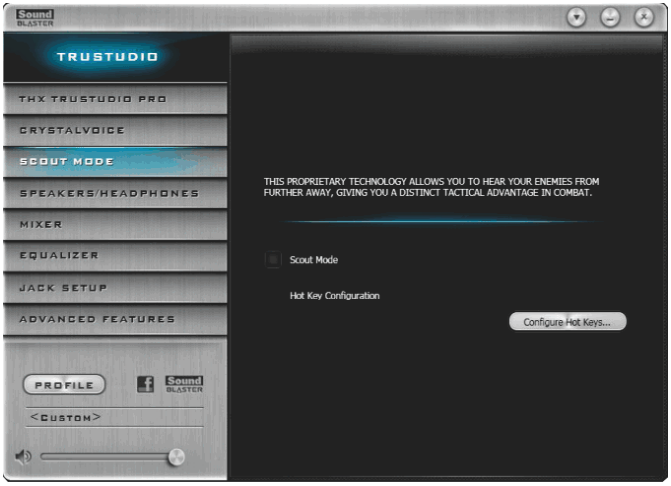
Noise Reduction

Eliminate unwanted background noise in your conversation.

Acoustic Echo Cancellation

Eliminate echoes that interfere with your conversation.

2.7.3 SCOUT MODE



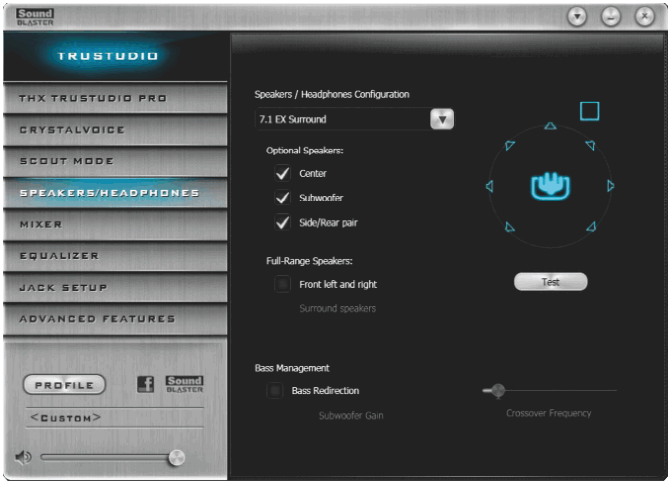
Scout Mode

Enable or disable scout mode. This proprietary technology allows you to hear your enemies from further away, giving you a distinct tactical advantage in combat.

Hot Key Configuration

Configure hot keys to enable or disable scout mode.

2.7.4 SPEAKERS/HEADPHONES



Speakers / Headphones Configuration

Select the device connected.

If there are both speakers and front headphones connected, please select the device you desire to use as audio output.

Optional Speakers:

Center

Enable or disable center speaker.

Subwoofer

Enable or disable subwoofer.

Rear pair

Enable or disable rear pair speakers.

Full-Range Speakers:

Select full-range speakers.

Front left and right

Surround speakers

Bass Management

Bass Redirection

Enable or disable bass redirection.

Subwoofer Gain

Enable or disable subwoofer gain.

Crossover Frequency

Redirect all frequencies below this value to the optimal speaker for better bass response.

2.7.5 MIXER

Playback

Speakers

Control the level of speakers playback.

SPDIF-Out

Control the level of SPDIF-Out playback.

Balance

Control the level of various speaker's balance.

REC

Input Device

Select input device.

What U Hear

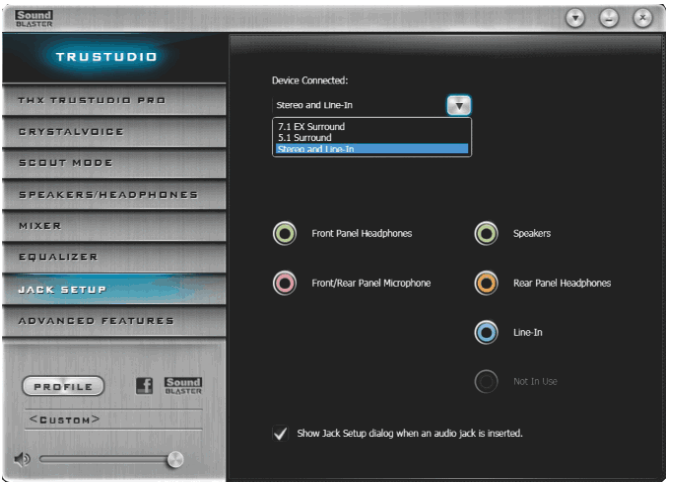
Control the level of playback redirect.

2.7.6 EQUALIZER

EQ

Choose from Flat, Acoustic, Classical, Country, Dance, Jazz, New Age, Pop, Rock and Vocal.

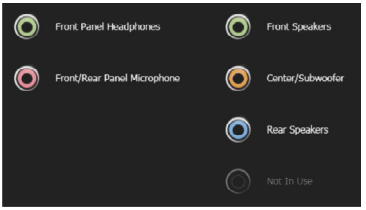
2.7.7 JACK SETUP



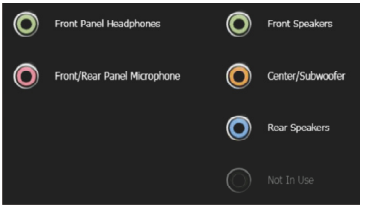
Device Connected:

Select the device connected.

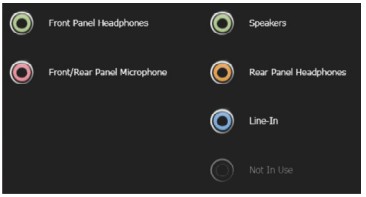
5.1 Surround



7.1 EX Surround



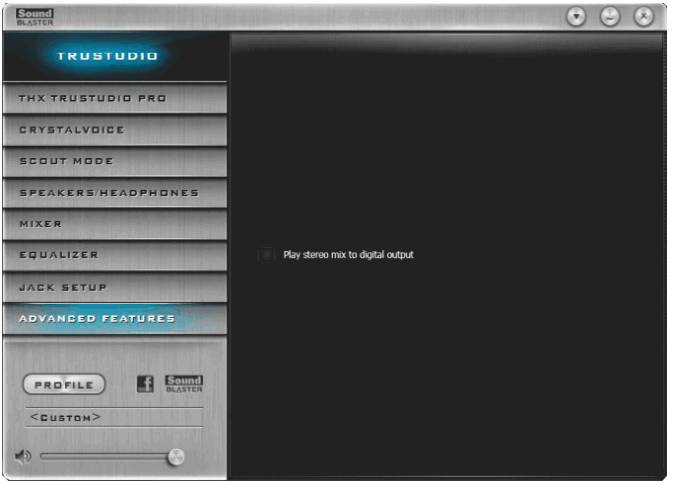
Stereo and Line-In



Show Jack Setup dialog when an audio jack is inserted

Enable or disable Jack Setup dialog.

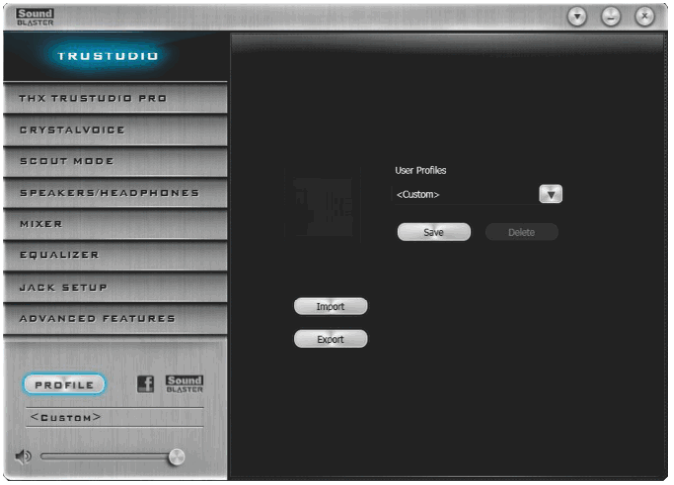
2.7.8 ADVANCED FEATURES



Play stereo mix to digital output

Enable or disable play stereo mix to digital output.

2.7.9 PROFILE



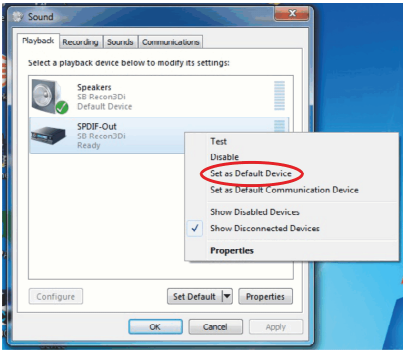
User Profiles

You can save, load or delete your user profiles. The default is <Custom>.

Note

1. If you want to hear your own voice through the microphone (Playback mode). You can change your settings to "playback mode" by checking the **"Listen to this device"** box in **Control panel → Sound → Recording → Microphone Properties → Listen**.

2. If you want to change your playback device to a SPDIF-Out device, go into **Control panel → Sound → Playback,** then right click on **SPDIF-Out** and check the **"Set as Default Device"** option.



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

This motherboard supports NVIDIA® SLI™, 3-Way SLI™, 4-Way SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to four identical PCI Express x16 graphics cards. Currently, NVIDIA® SLI™ technology supports Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS. NVIDIA® 3-Way SLI™, 4-Way SLI™ and Quad SLI™ technology supports Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS only. Please follow the installation procedures in this section.

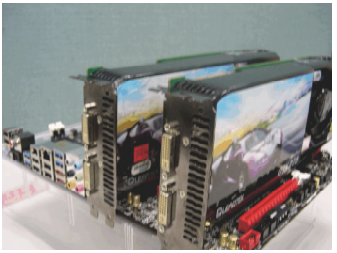
Requirements

1. For SLI™ technology, you should have two identical SLI™-ready graphics cards that are NVIDIA® certified. For 3-Way SLI™ technology you should have three, whereas for 4-Way SLI™ technology you should have four. 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 (driver version 280.41 and later). 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.

2.8.1 Graphics Card Setup

2.8.1.1 Installing Two SLI™-Ready Graphics Cards

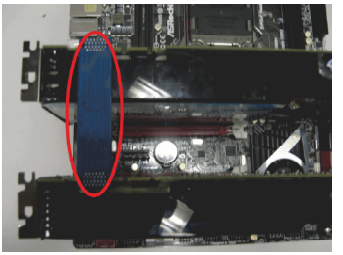
Step 1. Install identical SLI™-ready graphics cards that are NVIDIA® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE1 slot and the other graphics card to PCIE5 slot. Make sure that the cards are properly seated on the slots.



Step2. If required, connect the auxiliary power source to the PCI Express graphics cards.

Step3. Align and insert the ASRock SLI_Bridge_3S Card to the goldfingers on each graphics card. Make sure the ASRock SLI_Bridge_3S Card is firmly in place.

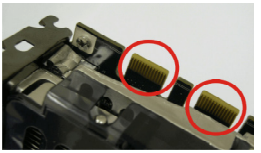
ASRock SLI_Bridge_3S Card



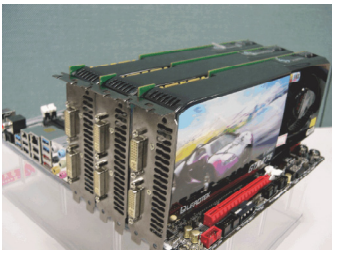
Step4. Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

2.8.1.2 Installing Three SLI™-Ready Graphics Cards

Step 1. Install identical 3-Way 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.) Each graphics card should have two goldfingers for the 3-Way SLI Bridge connector. Insert one graphics card into PCIE1 slot, another graphics card to PCIE3 slot, and the other graphics card to PCIE5 slot. Make sure that the cards are properly seated on the slots.



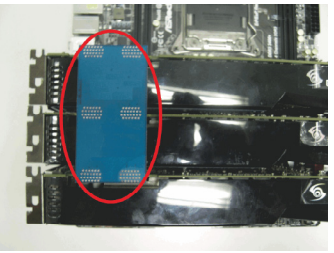
Two Goldfingers



Step2. Connect the auxiliary power source to the PCI Express graphics card. Please make sure that both power connectors on the PCI Express graphics card are connected. Repeat this step on the three graphics cards.

Step3. Align and insert the ASRock 3-Way SLI Bridge Card to the goldfingers on each graphics card. Make sure the ASRock 3-Way SLI Bridge Card is firmly in place.

ASRock 3-Way SLI Bridge Card



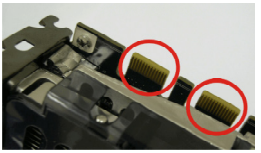
Step4. Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

For dual slot or triple slot graphics cards, we suggest inserting them in PCIE1, PCIE4 and PCIE7 slots. Then align and insert the ASRock 3-Way SLI-2S2S Bridge Card to the goldfingers on each graphics card.

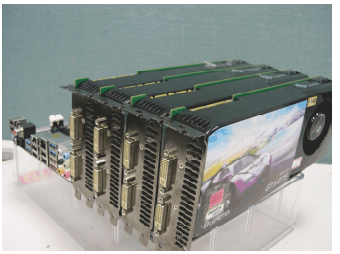
ASRock 3-Way SLI-2S2S Bridge Card

2.8.1.3 Installing Four SLI™-Ready Graphics Cards

Step 1. Install identical 4-Way 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.) Each graphics card should have two goldfingers for the ASRock SLI Bridge Card connectors. Insert one graphics card into the PCIE1 slot, another graphics card into the PCIE3 slot, the third graphics card into the PCIE5 slot and the last graphics card into the PCIE7 slot. Make sure that the cards are properly seated on the slots.



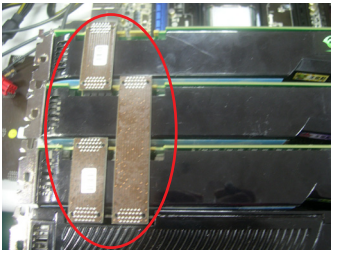
Two Goldfingers



Step2. Connect the auxiliary power source to the PCI Express graphics card. Please make sure that both power connectors on the PCI Express graphics card are connected. Repeat this step on the other graphics cards.

Step3. Align and insert an ASRock SLI Bridge Card to the goldfingers of the first and second graphics card. Install the second ASRock SLI Bridge Card to the goldfingers of the third and fourth graphics card. Connect the second and the fourth graphics card with the ASRock SLI_Bridge_3S Card. Make sure the ASRock SLI Bridge Cards are firmly in place.

2 ASRock SLI_Bridge Cards and an ASRock SLI_Bridge_3S Card



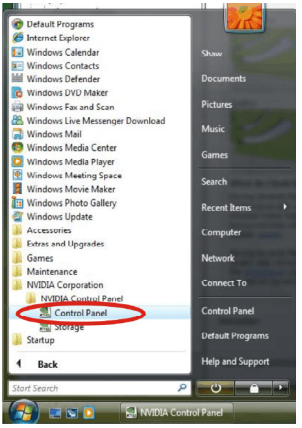
Step4. Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

2.8.2 Driver Installation and Setup

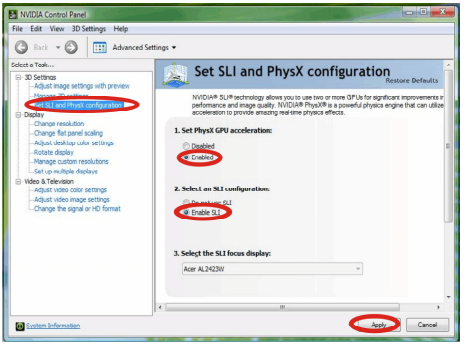
Install the graphics card drivers to your system. After that, you can enable the Multi-Graphics Processing Unit (GPU) feature in the NVIDIA® nView system tray utility. Please follow the below procedures to enable the multi-GPU feature.

For Windows® 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**.
F. In **Select an SLI configuration** item, please select **Enable SLI**. And click **Apply**.



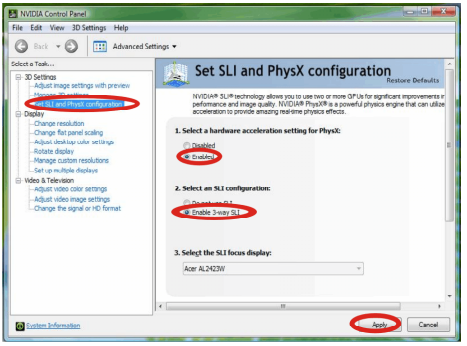
G. Reboot your system.

H. You can freely enjoy the benefits of SLI™ or Quad SLI™.

For Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS:
(For 3-Way SLI™ or 4-Way SLI™ mode)

A. Follow steps A to E on page 39.

B. In **Select an SLI configuration** item, please select **Enable 3-way SLI** or **Enable 4-way SLI** and click **Apply**.



C. Reboot your system.

D. You can freely enjoy the benefits of 3-Way SLI™ or 4-Way SLI™.

* 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.

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

This motherboard supports CrossFireX™, 3-way CrossFireX™, 4-way CrossFireX™ and Quad CrossFireX™. 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™ is supported with Windows® Vista™ / 7 OS. 3-way CrossFireX™, 4-way CrossFireX™ and Quad CrossFireX™ are supported with Windows® Vista™ / 7 OS only. Please check AMD's website for 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.

2.9.1 Graphics Card Setup

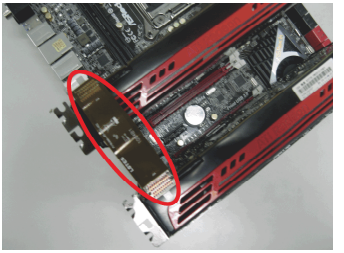
2.9.1.1 Installing Two CrossFireX™-Ready Graphics Cards

Different CrossFireX™ cards may require different methods to enable CrossFireX™ feature. 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.

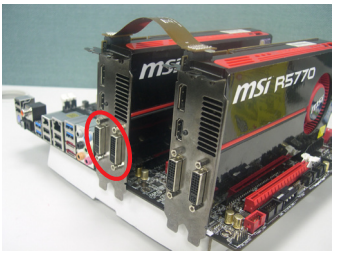
Step 1. Insert one Radeon graphics card into PCIE1 slot and the other Radeon graphics card to PCIE5 slot. Make sure that the cards are properly seated on the slots.

Step 2. Connect two Radeon graphics cards by installing a CrossFire Bridge on the CrossFire Bridge Interconnects on the top of the Radeon graphics cards. (The 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 PCIE1 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.)

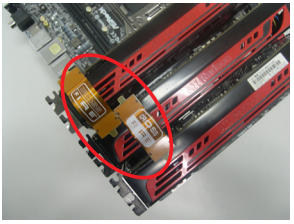


2.9.1.2 Installing Three CrossFireX™-Ready Graphics Cards

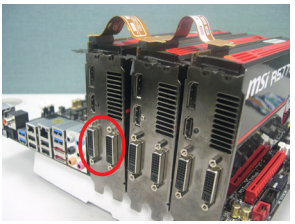
Step 1. Install identical 3-Way CrossFireX™-ready graphics cards that are AMD® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE1 slot, another graphics card to PCIE3 slot, and the other graphics card to PCIE5 slot. Make sure that the cards are properly seated on the slots. (For dual slot or triple slot graphics cards, we suggest inserting them in PCIE1, PCIE4 and PCIE7 slots.)

Step 2. Use one CrossFire™ Bridge to connect the Radeon graphics cards on PCIE1 and PCIE3 slots, and use the other CrossFire™ Bridge to connect the Radeon graphics cards on PCIE3 and PCIE5 slots. (The 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 PCIE1 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.)

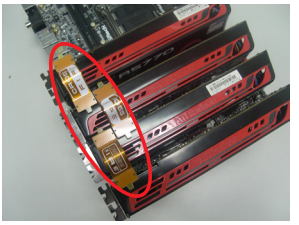


2.9.1.3 Installing Four CrossFireX™-Ready Graphics Cards

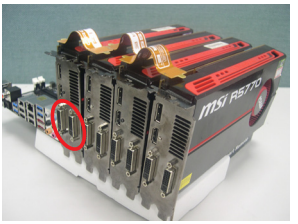
Step 1. Install identical 4-Way CrossFireX™-ready graphics cards that are AMD® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE1 slot, another graphics card into PCIE3 slot, the third graphics card into PCIE5 slot and the last graphics card into PCIE7 slot. Make sure that the cards are properly seated on the slots.

Step 2. Use one CrossFire™ Bridge to connect the Radeon graphics cards on PCIE1 and PCIE3 slots, another CrossFire™ Bridge to connect the Radeon graphics cards on PCIE3 and PCIE5 slots, and use the third CrossFire™ Bridge to connect the Radeon graphics cards on PCIE5 and PCIE7 slots. (The 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 PCIE1 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.)



2.9.2 Driver Installation and Setup

Step 1. Power on your computer and boot into OS.

Step 2. Remove the AMD drivers if you have any VGA drivers installed in your system.

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

Step 3. Install the required drivers to your system.
For Windows® 7 / Vista™ OS:
Install the CATALYST Control Center. Please check AMD's website for details.

Step 4. Restart your computer.

Step 5. Install the VGA card drivers to your system, and restart your computer. You will find "AMD Catalyst Control Center" on your Windows® taskbar.

AMD 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). Select "4 GPUs" and click "OK" (if you install four 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 “AMD Catalyst Control Center” is selected or not; if not, please select it again, and then you are able to enjoy the benefits of CrossFireX™.

Step 7. You can freely enjoy the benefits of CrossFireX™, 3-Way CrossFireX™, 4-Way CrossFireX™ or Quad CrossFireX™.

* 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’s website for updates and details.

2.10 Surround Display Feature

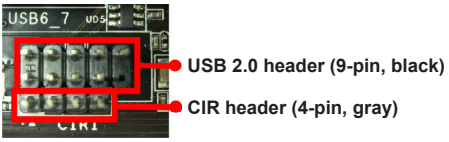
This motherboard supports Surround Display upgrade. With the external add-on PCI Express VGA cards, you can easily enjoy the benefits of Surround Display feature. For detailed instructions, please refer to the document at the following path in the Support CD:

..\ Surround Display Information

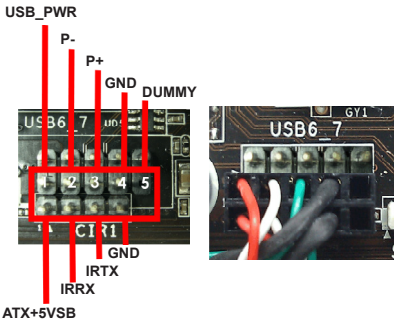
2.11 ASRock Smart Remote Installation Guide

ASRock Smart Remote is only used for ASRock motherboards with a CIR header. Please refer to the procedures below for the quick installation and usage of ASRock Smart Remote.

Step1. Find the CIR header located next to the USB 2.0 header on your ASRock motherboard.



Step2. Connect the front USB cable to the USB 2.0 header (as below, pin 1-5) and the CIR header. Please make sure the wire assignments and the pin assignments are matched correctly.

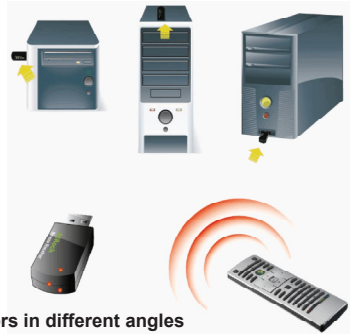


Step3. Install the Multi-Angle CIR Receiver to the front USB port.

Step4. Boot up your system. Press <F2> or <Del> to enter the BIOS Setup Utility. Make sure the option "CIR Controller" is set to [Enabled]. (Advanced -> Super IO Configuration -> CIR Controller -> [Enabled])

If you cannot find this option, please shut down your system and install the Multi-Angle CIR Receiver to the other front USB port then try again.

Step5. Enter Windows. Execute ASRock's support CD and install the CIR Driver. (It is listed at the bottom of driver list.)



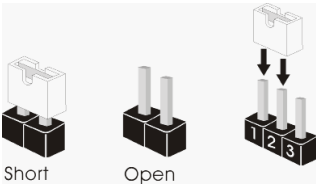
3 CIR sensors in different angles

1. Only one of the front USB ports can support CIR. When CIR is enabled, the other ports will remain USB ports.
2. The Multi-Angle CIR Receiver is used for the front USB only. Please do not use the rear USB bracket to connect it on the rear panel. The Multi-Angle CIR Receiver can receive multi-directional infrared signals (top, down and front), which is compatible with most of the chassis on the market.
3. The Multi-Angle CIR Receiver does not support Hot-Plug. Please install it before you boot the system.

* ASRock Smart Remote is only supported by some ASRock motherboards. Please refer to ASRock's website for the motherboard support list: http://www.asrock.com

2.12 Jumpers Setup

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



Jumper	Setting	Description
Clear CMOS Jumper (CLRCMOS1) (see p.15, No. 31)	1_2 Default; 2_3 Clear CMOS	

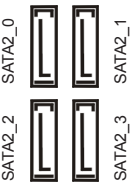
Note: CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please 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. Please be noted that the password, date, time, user default profile, 1394 GUID and MAC address will be cleared only if the CMOS battery is removed.

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

2.13 Onboard Headers and Connectors

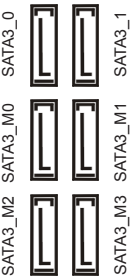
Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Serial ATA2 Connectors
(SATA2_0_1: see p.15, No. 17)
(SATA2_2_3: see p.15, No. 18)



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

Serial ATA3 Connectors
(SATA3_0_1: see p.15, No. 19)
(SATA3_M0_M1: see p.15, No. 20)
(SATA3_M2_M3: see p.15, No. 21)

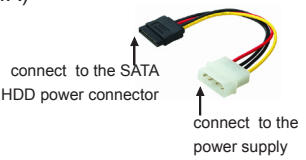


These six Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

Serial ATA (SATA) Data Cable
(Optional)

Either end of the SATA data cable can be connected to the SATA / SATA2 / SATA3 hard disk or the SATA2 / SATA3 connector on this motherboard.

Serial ATA (SATA) Power Cable
(Optional)

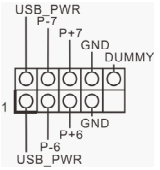


Please connect the black end of the SATA power cable to the power connector on each drive. Then connect the white end of the SATA power cable to the power connector of the power supply.

USB 2.0 Headers

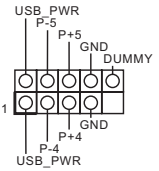
(9-pin USB_6_7)

(see p.15 No. 32)



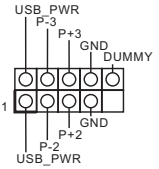
(9-pin USB_4_5)

(see p.15 No. 33)



(9-pin USB_2_3)

(see p.15 No. 34)

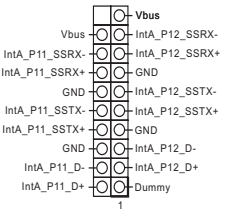


Besides two default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

USB 3.0 Header

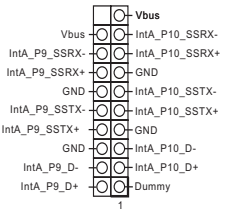
(19-pin USB3_11_12)

(see p.15 No. 13)



(19-pin USB3_9_10)

(see p.15 No. 14)

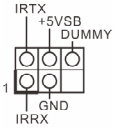


Besides eight default USB 3.0 ports on the I/O panel, there are two USB 3.0 headers on this motherboard. Each USB 3.0 header can support two USB 3.0 ports.

Infrared Module Header

(5-pin IR1)

(see p.15 No. 37)

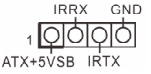


This header supports an optional wireless transmitting and receiving infrared module.

Consumer Infrared Module Header

(4-pin CIR1)

(see p.15 No. 35)

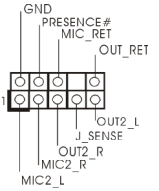


This header can be used to connect the remote controller receiver.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.15 No. 40)



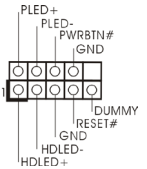
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
   E. To activate the front mic.
      For Windows® XP / XP 64-bit OS:
      Select "Mixer". Select "Recorder". Then click "FrontMic".
      For Windows® 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.15 No. 23)



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.

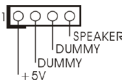
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

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

Chassis Speaker Header
(4-pin SPEAKER 1)
(see p.15 No. 28)



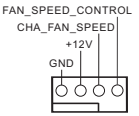
Please connect the chassis speaker to this header.

Power LED Header
(3-pin PLED1)
(see p.15 No. 24)

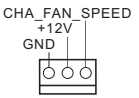
Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1/S3 state. The LED is off in S4 state or S5 state (power off).

Chassis and Power Fan Connectors

(4-pin CHA_FAN1)
(see p.15 No. 30)

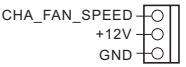


(3-pin CHA_FAN2)
(see p.15 No. 29)

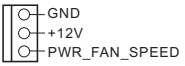


Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA_FAN1, CHA_FAN2 and CHA_FAN3 support Fan Control.

(3-pin CHA_FAN3)
(see p.15 No. 12)



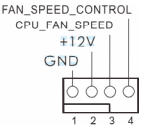
(3-pin PWR_FAN1)
(see p.15 No. 48)



CPU Fan Connectors

(4-pin CPU_FAN1)

(see p.15 No. 5)



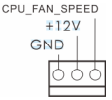
Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

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

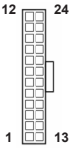
(3-pin CPU_FAN2)
(see p.15 No. 8)



ATX Power Connector

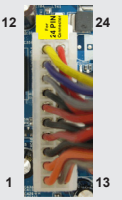
(24-pin ATXPWR1)

(see p.15 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.

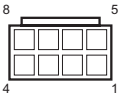


20-Pin ATX Power Supply Installation

ATX 12V Power Connector

(8-pin ATX12V1)

(see p.15 No. 3)



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

SLI/XFIRE Power Connector

(4-pin SLI/XFIRE_PWR2)

(see p.15 No. 38)

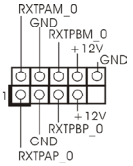
SLI/XFIRE_POWER2

It is not necessary to use this connector, but please connect it with a hard disk power connecor when two graphics cards are plugged to this motherboard.

IEEE 1394 Header

(9-pin FRONT_1394)

(see p.15 No. 27)

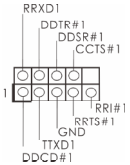


Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (FRONT_1394) on this motherboard. This IEEE 1394 header can support one IEEE 1394 port.

Serial port Header

(9-pin COM1)

(see p.15 No. 36)



This COM header supports a serial port module.

HDMI_SPDIF Header

(2-pin HDMI_SPDIF1)

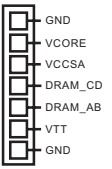
(see p.15 No. 39)

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.

V-Probe™

(7-pin VOL_CON1)

(see p.15 No. 9)

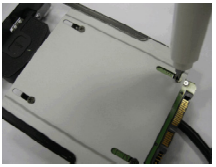


Users are able to measure onboard components voltage, including VCORE, VCCSA, DRAM_CD, DRAM_AB and VTT.

The Installation Guide of Front USB 3.0 Panel

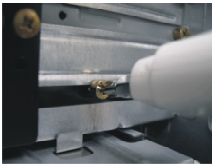
Step 1 Prepare the bundled Front USB 3.0 Panel, four HDD screws, and six chassis screws.

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



Step 3 Intall 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_9_10 or USB3_11_12) on the motherboard.

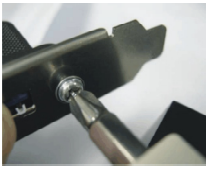
Step 6 The Front USB 3.0 Panel is ready to use.

The Installation Guide of Rear USB 3.0 Bracket

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.

2.14 Smart Switches

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

Power Switch (PWRBTN) (see p.15 No. 26)		Power Switch is a smart switch, allowing users to quickly turn on/off the system.
Reset Switch (RSTBTN) (see p.15 No. 25)		Reset Switch is a smart switch, allowing users to quickly reset the system.
Clear CMOS Switch (CLRCBTN) (see p.16 No. 17)		Clear CMOS Switch is a smart switch, allowing users to quickly clear the CMOS values.

2.15 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
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 specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
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	Unspecified 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 stared (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 firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware 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 specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
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 specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
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 specific)
0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
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
0xAB	Setup Input Wait
0xAC	Reserved for ASL
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

2.16 Post Status Checker (PSC)

Post Status Checker (PSC) diagnoses the computer when users power on the machine. It emits a red light to indicate whether the CPU, memory, VGA or storage is dysfunctional. The lights go off if the four mentioned above are functioning normally.

2.17 Serial ATA (SATA) / Serial ATA2 (SATA2) Hard Disks Installation

This motherboard adopts Intel® X79 chipset that supports Serial ATA (SATA) / Serial ATA2 (SATA2) hard disks and RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage 3.0) functions. You may install SATA / SATA2 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATA2 hard disks.

STEP 1: Install the SATA / SATA2 hard disks into the drive bays of your chassis.
STEP 2: Connect the SATA power cable to the SATA / SATA2 hard disk.
STEP 3: Connect one end of the SATA data cable to the motherboard's SATA2 connector.
STEP 4: Connect the other end of the SATA data cable to the SATA / SATA2 hard disk.

2.18 Serial ATA3 (SATA3) Hard Disks Installation

This motherboard adopts Intel® X79 chipset that supports Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage 3.0) functions for SATA3_0 and SATA3_1 connectors. It also adopts Marvell SE9230 chipsets which support Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1 and RAID10) for SATA3_M0 to SATA3_M3 connectors. 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.

2.19 Hot Plug and Hot Swap for SATA / SATA2 HDDs

This motherboard supports Hot Plug and Hot Swap for SATA / SATA2 in RAID / AHCI mode. Intel® X79 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed through a joint industry effort.

NOTE

What is Hot Plug?

If the SATA / SATA2 HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA / SATA2 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 SATA / SATA2 HDD.

What is Hot Swap?

If SATA / SATA2 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA / SATA2 HDDs while the system is still power-on and in working condition.

2.20 Hot Plug and Hot Swap for SATA3 HDDs

This motherboard supports Hot Plug and Hot Swap for SATA3 in RAID / AHCI mode. Intel® X79 and Marvell SE9230 chipsets provide hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed through a joint industry effort.

NOTE

What is Hot Plug?

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?

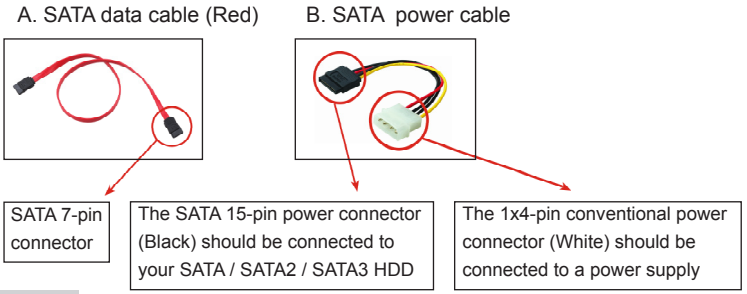
If SATA3 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA3 HDDs while the system is still power-on and in working condition.

2.21 SATA / SATA2 / SATA3 HDD Hot Plug and Operation Guide

This motherboard supports Hot Plug for SATA / SATA2 / SATA3 HDDs in RAID / AHCI mode. Please read the operation guide of Hot Plug below carefully. Before you process the SATA / SATA2 / SATA3 HDD Hot Plug, please check the cable accessories from the motherboard gift box pack below.

A. 7-pin SATA data cable

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



Caution

1. Without the SATA 15-pin power connector interface, the SATA / SATA2 / SATA3 Hot Plug cannot be processed.
2. Even though some SATA / SATA2 / SATA3 HDDs provide both SATA 15-pin power connectors and IDE 1x4-pin conventional power connectors, IDE 1x4-pin conventional power connector interface is definitely unable to support Hot Plug and will cause the HDD damage and data loss.

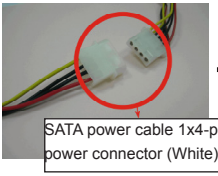
Points of attention, before you process Hot Plug:

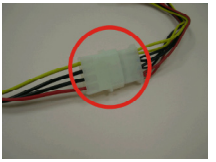
1. The operation procedure below is designed only for our motherboard, which supports SATA / SATA2 / SATA3 HDD Hot Plug.
   * The SATA / SATA2 / SATA3 Hot Plug feature might not be supported by the chipset because of its limitation. The SATA / SATA2 / SATA3 Hot Plug support information of our motherboards is indicated in the product spec on our website: www.asrock.com
2. Make sure your SATA / SATA2 / SATA3 HDD can support Hot Plug from your dealer or HDD user manual. SATA / SATA2 / SATA3 HDDs which do not support Hot Plug will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATA2 / SATA3 driver is installed into system properly. The latest SATA / SATA2 / SATA3 driver is available on our support website: www.asrock.com
4. Make sure to use the SATA power cable & data cable from our motherboard package.
5. Please follow the instructions below step by step to reduce the risk of HDD crash or data loss.

How to Hot Plug a SATA / SATA2 / SATA3 HDD:

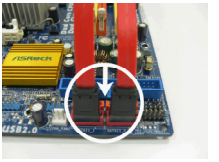
Points of attention, before you process Hot Plug:
Please follow the instructions below to process Hot Plug. Improper procedures will cause the SATA / SATA2 / SATA3 HDD damage and data loss.

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





Step 2 Connect the SATA data cable to the motherboard's SATA2 / SATA3 connector.



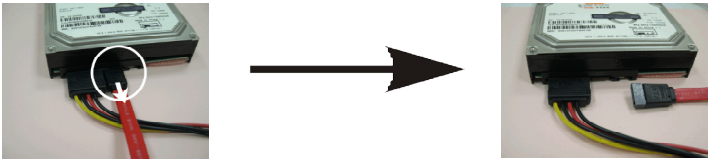
Step 3 Connect the SATA 15-pin power cable connector's (Black) end to the SATA / SATA2 / SATA3 HDD.

Step 4 Connect the SATA data cable to the SATA / SATA2 / SATA3 HDD.

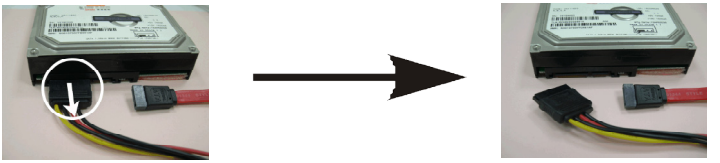
How to Hot Unplug a SATA / SATA2 / SATA3 HDD:

Points of attention, before you process Hot Unplug:
Please follow the instructions below to process Hot Unplug. Improper procedures will cause the SATA / SATA2 / SATA3 HDD damage and data loss.

Step 1 Unplug the SATA data cable from the SATA / SATA2 / SATA3 HDD's side.



Step 2 Unplug the SATA 15-pin power cable connector (Black) from the SATA / SATA2 / SATA3 HDD's side.



2.22 Driver Installation Guide

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

2.23 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 OS on your SATA / SATA2 / SATA3 HDDs with RAID functions, please follow the steps below.

STEP 1: Set up UEFI.

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

B. Set the option "SATA Mode" to [RAID] for Intel® SATA2 / SATA3 ports.
Set the option "Bootable Marvell SATA3 Controller" to [Yes] for Marvell SATA ports.

STEP 2: Use "RAID Installation Guide" to set RAID configuration.

Before you start to configure the RAID function, you need to check the installation guide in the Support CD for proper configuration. Please refer to the document in the Support CD, "Guide to SATA Hard Disks Installation and RAID Configuration", which is located in the folder at the following path:

.. \ RAID Installation Guide

STEP 3: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

After the installation of Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS, if you want to manage RAID functions, you are allowed to use both "RAID Installation Guide" and "Intel Rapid Storage Information" for RAID configuration. Please refer to the document in the Support CD, "Guide to SATA Hard Disks Installation and RAID Configuration", which is located in the folder at the following path: **.. \ RAID Installation Guide** and the document in the support CD, "Guide to Intel Rapid Storage", which is located in the folder at the following path: **.. \ Intel Rapid Storage Information**

If you want to make the USB flash driver disk, please copy above Intel® RAID drivers from our Support CD to your USB flash, and then load drivers from the USB flash disk.

2.24 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 OS on your SATA / SATA2 / SATA3 HDDs without RAID functions, please follow the procedures below according to the OS you install.

Using SATA / SATA2 / SATA3 HDDs with NCQ function

STEP 1: Set Up UEFI.

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

B. Set the option "SATA Mode" to [AHCI]. (For SATA2_0 to SATA2_3, SATA3_0 and SATA3_1 ports.)

Set the options "Marvell 9230 SATA3_M0_M1_M2_M3 Operation Mode" and "Marvell 9172 eSATA3_0_1 Operation Mode" to [AHCI].

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

Using SATA / SATA2 / SATA3 HDDs without NCQ function

STEP 1: Set Up UEFI.

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

B. Set the option "SATA Mode" to [IDE]. (For SATA2_0 to SATA2_3, SATA3_0 and SATA3_1 ports.)

Set the options "Marvell 9230 SATA3_M0_M1_M2_M3 Operation Mode" and "Marvell 9172 eSATA3_0_1 Operation Mode" to [IDE].

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

2.25 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, BCLK 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, BCLK is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that BCLK can operate under a more stable overclocking environment.

Please refer to the warning on page 11 for the possible overclocking risk before you apply Untied Overclocking Technology.

Chapter 3: UEFI SETUP UTILITY

3.1 Introduction

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

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

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

3.1.1 UEFI Menu Bar

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

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. You can also use the mouse to click your required item.

3.1.2 Navigation Keys

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

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

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

System Browser

System Browser can let you easily check your current system configuration in UEFI setup.

OMG(Online Management Guard)

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

3.3 OC Tweaker Screen

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

Load CPU EZ OC Setting

You can use this option to load CPU EZ overclocking settings. Please note that overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

CPU Configuration

CPU Ratio Setting

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

Internal PLL Overvoltage

Use this item to enable/disable CPU Internal PLL Overvoltage Function.

OS Real-Time Adjust CPU Ratio

Use this item to enable/disable Real-Time Adjust CPU Ratio in OS level.

Intel SpeedStep Technology

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

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

Intel Turbo Mode Technology

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

Turbo Boost Power Limit

Use this item to adjust Turbo Boost power limit. Configuration options: [Auto] and [Manual]. The default value is [Auto].

Core Current Limit

Use this item to add voltage when CPU is in Turbo mode.

Additional Turbo Voltage

Use this item to add voltage when CPU is in Turbo mode.

Active Processor Cores

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

Host Clock Override (BCLK)

Use this to adjust the host clock (BCLK) frequency. The default value is [100.0].

DRAM Timing Configuration

Load XMP Setting

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

DRAM Frequency

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

DRAM Configuration

DRAM tCL

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

DRAM tRCD

Use this item to change RAS# to CAS# Delay (tRCD) Auto/Manual setting.

The default is [Auto].

DRAM tRP

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

DRAM tRAS

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

DRAM tRFC

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

DRAM tWR

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

DRAM tWTR

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

DRAM tRRD

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

DRAM tRTP

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

DRAM tFAW

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

DRAM tCWL

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

Command Rate

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

DRAM Power Down Mode

Use this item to adjust DDR power down mode. Configuration options: [Auto], [Slow] and [Fast]. The default value is [Auto].

ODT WR (CH A)

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

ODT NOM (CH A)

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

ODT WR (CH B)

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

ODT NOM (CH B)

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

ODT WR (CH C)

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

ODT NOM (CH C)

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

ODT WR (CH D)

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

ODT NOM (CH D)

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

Memory Power Savings Mode

Use this item to configure Memory Power Savings Mode. The default value is [Auto].

Memory Mode

Use this item to configure Memory Mode. The default value is [Auto].

Channel Interleaving

It allows you to enable Channel Memory Interleaving. The default value is [Auto].

Rank Interleaving

It allows you to configure Rank Interleaving. The default value is [Auto].

DRAM tCCD

Use this item to change DRAM tCCD Auto/Manual setting. The default is [Auto].

DRAM tRWSR

Use this item to change DRAM tRWSR Auto/Manual setting. The default is [Auto].

DRAM tWRDD

Use this item to change DRAM tWRDD Auto/Manual setting. The default is [Auto].

DRAM tWRDR

Use this item to change DRAM tWRDR Auto/Manual setting. The default is [Auto].

DRAM tRWDD

Use this item to change DRAM tWRDD Auto/Manual setting. The default is [Auto].

DRAM tRWDR

Use this item to change DRAM tRWDR Auto/Manual setting. The default is [Auto].

DRAM tWWDD

Use this item to change DRAM tWWDD Auto/Manual setting. The default is [Auto].

DRAM tWWDR

Use this item to change DRAM tWWDR Auto/Manual setting. The default is [Auto].

DRAM tRRDD

Use this item to change DRAM tRRDD Auto/Manual setting. The default is [Auto].

DRAM tRRDR

Use this item to change DRAM tRRDR Auto/Manual setting. The default is [Auto].

DRAM Fine Tuning - SP

Use this item to configure DRAM Fine Tuning - SP. The default is [Auto].

DRAM Fine Tuning - SN

Use this item to configure DRAM Fine Tuning - SN. The default is [Auto].

Voltage Configuration

CPU Core Voltage

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

VCCSA Voltage

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

CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when the-system is under heavy load.

VTT Voltage

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

CPU PLL Voltage

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

PCH 1.1V Voltage

Use this to select PCH 1.1V Voltage. The default value is [Auto].

PCH 1.5V Voltage

Use this to select PCH 1.5V Voltage. The default value is [Auto].

DRAM Channel A/B Voltage

Use this to select DRAM Chanel A/B Voltage. The default value is [Auto].

DRAM Channel C/D Voltage

Use this to select DRAM Chanel C/D Voltage. The default value is [Auto].

DRAM Channel A/B CA

Use this to select DRAM Chanel A/B CA. The default value is [Auto].

DRAM Channel A/B DQ

Use this to select DRAM Chanel A/B DQ. The default value is [Auto].

DRAM Channel C/D CA

Use this to select DRAM Chanel C/D CA. The default value is [Auto].

DRAM Channel C/D DQ

Use this to select DRAM Chanel C/D DQ. The default value is [Auto].

Load Power Saving Mode

Use this option to load Power Saving Mode settings.

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, USB Configuration and ME Subsystem.

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 save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

Internet Flash

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

3.4.1 CPU Configuration

CPU Ratio Setting

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

Intel Hyper Threading Technology

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

Active Processor Cores

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

No-Execute Memory Protection

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

Hardware Prefetcher

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

Adjacent Cache Line Prefetch

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

Intel Virtualization Technology

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

CPU Power Management Configuration

Intel SpeedStep Technology

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

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

Intel Turbo Mode Technology

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

CPU Thermal Throttling

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

Enhance Halt State (C1E)

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

CPU C3 State Support

Use this to enable or disable CPU C3 report to OS.

CPU C6 State Support

Use this to enable or disable CPU C6 report to OS.

CPU C7 State Support

Use this to enable or disable CPU C7 report to OS.

Package C State Support

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

Internal PLL Overvoltage

Use this item to enable/disable CPU Internal PLL Overvoltage Function.

OS Real-Time Adjust CPU Ratio

Use this item to enable/disable Real-Time Adjust CPU Ratio in OS level.

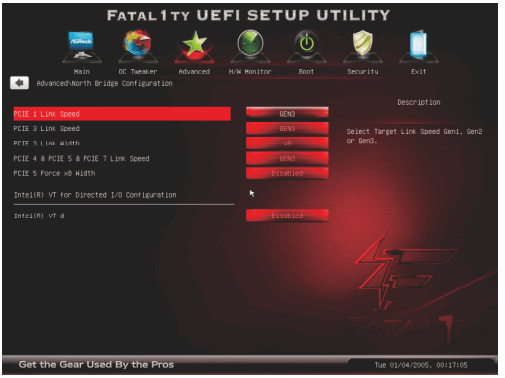
Turbo Boost Power Limit

Use this item to adjust Turbo Boost power limit. Configuration options: [Auto] and [Manual]. The default value is [Auto].

Core Current Limit

Use this item to add voltage when CPU is in Turbo mode.

3.4.2 North Bridge Configuration



PCIE 1 Link Speed

This allows you to select PCIE 1 Link Speed. The default value is [GEN3].

PCIE 3 Link Speed

This allows you to select PCIE 3 Link Speed. The default value is [GEN3].

PCIE 3 Link Width

This allows you to select PCIE 3 Link Width. The default value is [x8].

PCIE 4 & PCIE 5 & PCIE 7 Link Speed

This allows you to select PCIE 4&5&7 Link Speed. The default value is [GEN3].

PCIE 5 Force x8 Width

Use this to enable or disable PCIE 5 force x8 width.

Intel(R) VT for Directed I/O Configuration

Intel(R) VT-d

Use this item to enable/disable Intel(R) Virtualization Technology for Directed I/O.

3.4.3 South Bridge Configuration

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.

Deep Sx

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. Configuration options: [Disabled], [Enabled in S5] and [Enabled in S4 and S5]. The default value is [Disabled].

Onboard LAN 1

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

Onboard LAN 2

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

Onboard 1394

This allows you to enable or disable the “Onboard 1394” feature.

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.

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.

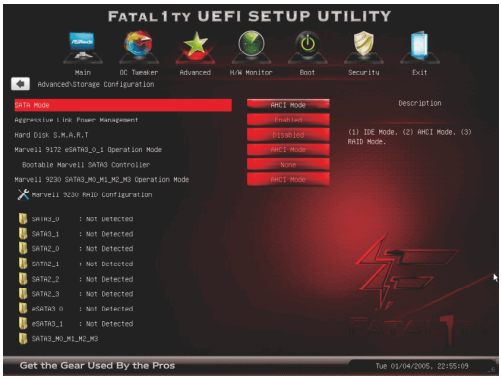
Good Night LED

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

Onboard Debug Port LED

Use this item to enable or disable Onboard Debug Port LED.

3.4.4 Storage Configuration



SATA Mode

This item is for SATA3_0, SATA3_1 and SATA2_0 to SATA2_3 ports. Use this to select SATA mode. Configuration options: [IDE Mode], [AHCI Mode], [RAID Mode] and [Disabled]. The default value is [AHCI Mode].

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

Aggressive Link Power Management

Use this item to configure Aggressive Link Power Management.

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

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

Marvell 9172 eSATA3_0_1 Operation Mode

This item is for eSATA3 ports. Use this to select Marvell SATA3 operation mode. Configuration options: [IDE Mode], [AHCI Mode], [RAID Mode] and [Disabled]. The default value is [AHCI Mode].

Bootable Marvell SATA3 Controller

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 Intel® X79 SATA ports (SATA3_0, SATA3_1 and SATA2_0 to SATA2_3) for your bootable devices. This will minimum your boot time and get the best performance. But if you still want to boot from a Marvell SATA3 controller, you can enable this in the UEFI.

Marvell 9230 SATA3_M0_M1_M2_M3 Operation Mode

This item is for SATA3_M0_M1_M2_M3 ports. Use this to select Marvell SATA3 operation mode. Configuration options: [IDE Mode], [AHCI Mode], and [Disabled]. The default value is [AHCI Mode].

Marvell 9230 RAID Configuration

Enter into Marvell Raid Configuration utility.

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.

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.

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 USB Keyboard/Remote to turn on the system from the power-soft-off mode.

USB Mouse Power On

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

3.4.7 USB Configuration

USB 2.0 Controller

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

USB 3.0 Controller

Use this item to enable or disable the use of USB 3.0 controller.

Legacy USB Support

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

[Enabled] - Enables support for legacy USB.

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

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

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

Legacy USB 3.0 Support

Use this option to enable or disable legacy support for USB 3.0 devices. The default value is [Enabled].

3.4.8 ME Subsystem

Intel ME Subsystem Configuration

ME Version

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 CPU fan 1 & 2's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

Chassis Fan 1 Setting

This allows you to set chassis fan 1's speed. Configuration options: [Full On], [Automatic Mode] and [Manual]. The default value is [Full On].

Chassis Fan 2 Setting

This allows you to set chassis fan 2's speed. Configuration options: [Level 1] to [Level 4]. The default value is [Level 4].

Chassis Fan 3 Setting

This allows you to set chassis fan 3's speed. Configuration options: [Level 1] to [Level 4]. The default value is [Level 4].

Over Temperature Protection

Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

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.

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.

PCI ROM Priority

Use this item to adjust PCI ROM Priority. The default value is [Legacy ROM].

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 From Onboard LAN

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

Boot Failure Guard

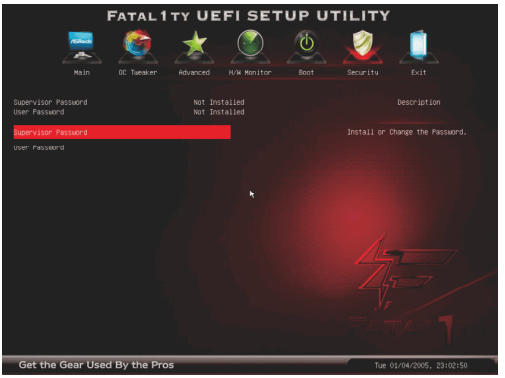
Enable or disable the feature of Boot Failure Guard.

Boot Failure Guard Count

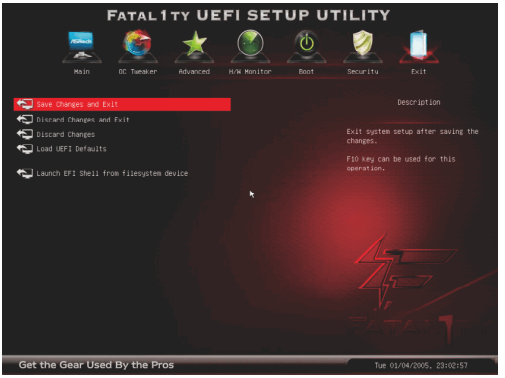
Enable or disable the feature of Boot Failure Guard Count.

3.7 Security Screen

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



3.8 Exit Screen



Save Changes and Exit

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

Discard Changes and Exit

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

Discard Changes

When you select this option, the following message “Discard changes?” will pop-out. Select [Yes] to discard all changes.

Load UEFI Defaults

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

Launch EFI Shell from filesystem device

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

Chapter 4: Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 7 / 7 64-bit / Vista™ / Vista™ 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer 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's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.EXE" in the Support CD to display the menu.

4.2.2 Drivers Menu

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

4.2.3 Utilities Menu

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

4.2.4 Contact Information

If you need to contact ASRock 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 in AHCI Mode

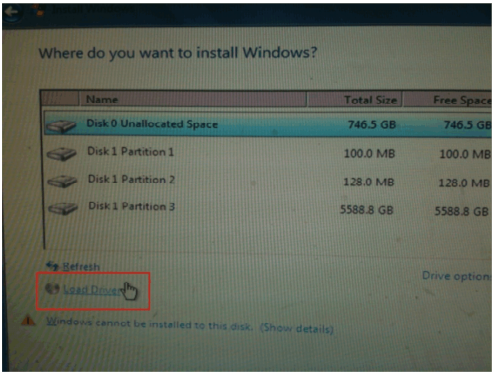
This motherboard adopts UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow the procedures below to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)** or **Windows® 7 64-bit**.
2. Press <F2> or <Delete> at system POST. Set **AHCI Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Choose the item **"UEFI:xxx"** to boot in UEFI Setup Utility > Boot > Boot Option #1. ("xxx" is the device which contains your Windows® installation files. Normally it is an optical drive.) You can also press <F11> to launch boot menu at system POST and choose the item **"UEFI:xxx"** to boot.
4. Start Windows® installation.

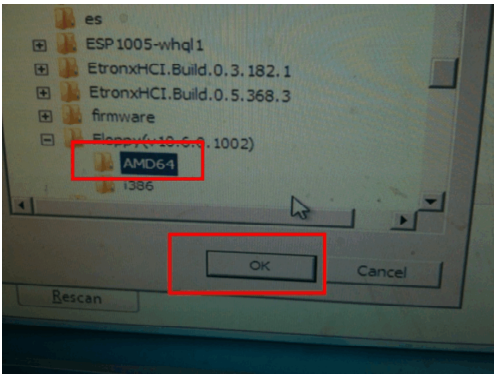
Installing OS on a HDD Larger Than 2TB in RAID Mode

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

1. Please make sure to use **Windows® Vista™ 64-bit (with SP2 or above)** or **Windows® 7 64-bit (with SP1 or above)**.
2. Copy Intel® RAID drivers into a USB flash disk. You can download the driver from ASRock's website and unzip the file into a USB flash disk **OR** copy the file from ASRock motherboard support CD. (please copy the files under the following directory:
   32 bit: ..\i386\Win7_Vista_Intel..
   64-bit: ..\AMD64\Win7-64_Vista64_Intel..
3. Create a RAID array for you system. Please refer to "Intel RAID Installation Guide" file for details.
4. Install Windows® Vista™ 64-bit / 7 64-bit:
   A. Insert your Windows® Vista™ 64-bit / 7 64-bit installation disc to the optical drive.
   B. Press <F11> to launch boot menu at system POST and choose the item “UEFI:xxx“ to boot.
   C. Start Windows® Installation. When you see “Where do you want to install Windows?” page, please click “Load Driver”.



   D. Plug the USB flash disk into your USB port; select “Browse” to find the RAID driver. Then choose the directory (xx\AMD64\) you have copied in the first step.



E. Please keep the USB flash disk installed until the system's first reboot.

F. Continue to install OS by following the Windows® instructions.

5. Follow Windows® Installation Guide to install OS.

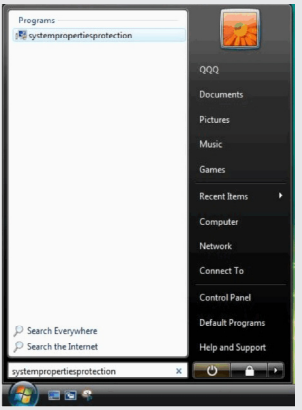
If you install Windows® 7 64-bit / Vista™ 64-bit on a large hard disk (ex. Disk volume > 2TB), it may take more time to boot into Windows® or install driver/utilities. If you encounter this problem, you will need to follow the instructions below to fix this problem.

Windows® Vista™ 64-bit:

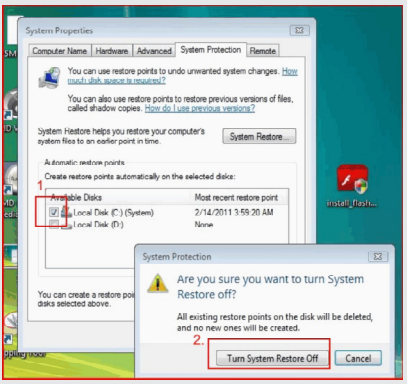
Microsoft® does not provide hotfix for this problem. The steps listed below are Microsoft®'s suggested solution:

A. Disable System Restore.

a. Type “systempropertiesprotection” in the Start Menu. Then press "Enter".

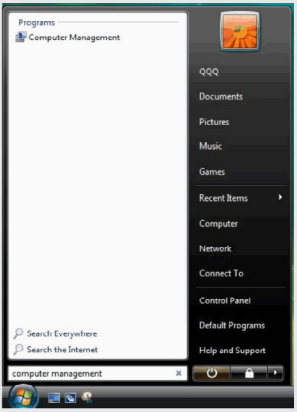


b. De-select Local Disks for System Restore. Then Click “Turn System Restore Off” to confirm. Then Press “Ok”.

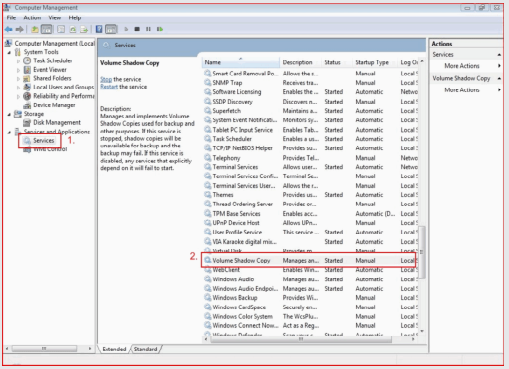


B. Disable “Volume Shadow Copy” service.

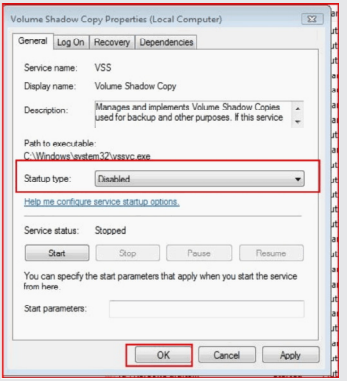
a. Type “computer management” in the Start Menu, then press “Enter”.



b. Go to “Services and Applications>Services”; Then double click “Volume Shadow Copy”.



c. Set “Startup type” to “Disable” then Click “OK”.



C. Reboot your system.

D. After reboot, please start to install motherboard drivers and utilities.

Windows® 7 64-bit:

A. Please request the hotfix KB2505454 through this link:
http://support.microsoft.com/kb/2505454/

B. After installing Windows® 7 64-bit, install the hotfix kb2505454.
(This may take a long time; >30 mins.)

C. Reboot your system. (It may take about 5 minutes to reboot.)

D. Windows® will install this hotfix then reboot by itself.

E. Please start to install motherboard drivers and utilities.

6. Finish.