AVENGER Motherboard

User's Manual

FOXCONN®

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Version:

User's Manual V1.0 for AVENGER motherboard.

Symbol description:

Caution: refers to important information that can help you to use motherboard better, and tells you how to avoid problems.

Warning: indicating a potential risk of hardware damage or physical injury may exist.

WEEE:

The use of this symbol indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased this product.

More information:

If you want more information about our products, please visit Foxconn's website: http://www.foxconnchannel.com

Declaration of conformity

CE

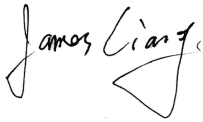
HON HAI PRECISION INDUSTRY COMPANY LTD
66 , CHUNG SHAN RD., TU-CHENG INDUSTRIAL DISTRICT,
TAIPEI HSIEN, TAIWAN, R.O.C.

declares that the product

Motherboard AVENGER

is in conformity with
(reference to the specification under which conformity is declared in accordance with 89/336 EEC-EMC Directive)

- EN 55022: 1998/A2: 2003 Limits and methods of measurements of radio disturbance characteristics of information technology equipment
- EN 61000-3-2/:2000 Electromagnetic compatibility (EMC)
  Part 3: Limits
  Section 2: Limits for harmonic current emissions (equipment input current <= 16A per phase)
- EN 61000-3-3/A1:2001 Electromagnetic compatibility (EMC)
  Part 3: Limits
  Section 2: Limits of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current <= 16A
- EN 55024/A2:2003 Information technology equipment-Immunity characteristics limits and methods of measurement

Signature : 

Place / Date : TAIPEI/2008

Printed Name : James Liang

Declaration of conformity

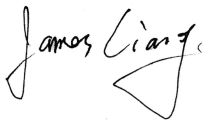
Trade Name:	FOXCONN
Model Name:	AVENGER
Responsible Party:	PCE Industry Inc.
Address:	458 E. Lambert Rd. Fullerton, CA 92835
Telephone:	714-738-8868
Facsimile:	714-738-8838

Equipment Classification:	FCC Class B Subassembly
Type of Product:	Motherboard
Manufacturer:	HON HAI PRECISION INDUSTRY COMPANY LTD
Address:	66 , CHUNG SHAN RD., TU-CHENG INDUSTRIAL DISTRICT, TAIPEI HSIEN, TAIWAN, R.O.C.

Supplementary Information:

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.

Tested to comply with FCC standards.

Signature :  Date : 2008

Installation Precautions

- Electrostatic discharge (ESD) is the sudden and momentary electric current that flows between two objects at different electrical potentials. Normally it comes out as a spark which will quickly damage your electronic equipment. Please wear an electrostatic discharge (ESD) wrist strap when handling components such as a motherboard, CPU or memory.
- Ensure that the DC power supply is turned off before installing or removing CPU, memory, expansion cards or other peripherals. It is recommended to unplug the AC power cord from the power supply outlet. Failure to unplug the power supply cord may result in serious damage to your system.

Please carefully read the following procedures to install your computer :

- It is suggested to select high-quality, certified fans in order to avoid damage to the motherboard and CPU due to high temperature. Never turn on the computer if the CPU fan is not properly installed.
- We cannot guarantee that your system can operate normally when your CPU is overclocked. Normal operation depends on the overclocking capacity of your device.
- If there is any, when connecting USB, audio, 1394a, RS232 COM, IrDA or S/PDIF cables to the internal connectors on the motherboard, make sure their pinouts are matching with the connectors on the motherboard. Incorrect connections might damage the motherboard.
- When handling the motherboard, avoid touching any metal leads or connectors.
- If there is a PCI Express x16 graphics card installed in your system, we recommend using a 24-pin ATX power supply to get the best performance.
- Before turning on the power, please make sure the power supply AC input voltage setting has been configured to the local standard.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components. Also, make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

TABLE OF CONTENTS

Technical Support :

Support

Website :
http://www.foxconnchannel.com

Support Website :
http://www.foxconnsupport.com

Worldwide online contact Support :
http://www.foxconnchannel.com/support/online.aspx

CPU, Memory, VGA Compatibility Supporting Website :
http://www.foxconnchannel.com/product/Motherboards/compatibility.aspx

Thank you for buying Foxconn Quantum Force series motherboard-AVENGER. Foxconn Quantum Force products are engineered to maximize computing power, providing only what you need for break-through performance.

With advanced overclocking capability and a range of connectivity features for today multi-media computing requirements, AVENGER enables you to unleash more power from your computer.

This chapter includes the following information:

- Package List
- Product Specifications
- Layout
- Back Panel Connectors

Package List

Check your product package for the following items:

Motherboard	Foxconn AVENGER motherboard
I/O modules	1 X USB 2.0 x 2 ports and 1 x 1394a module
Cables	4 X SATA Power and Signal cables 2 X SATA Power and Signal cables right angle 1 X Ultra DMA 133/100/66 cable 1 X Floppy Disk Drive cable
Accessory	I/O Shield 1 X SONAR Card 1 X Quantum lap 1 X Quantum drift 2 X Resistors 15 X Cable Ties
Application CD	Foxconn motherboard support CD
Documentation	User's Manual Quick Installation Guide Registration Card Quantum Force stickers Quantum Force tattoos Quantum Force Dogtags

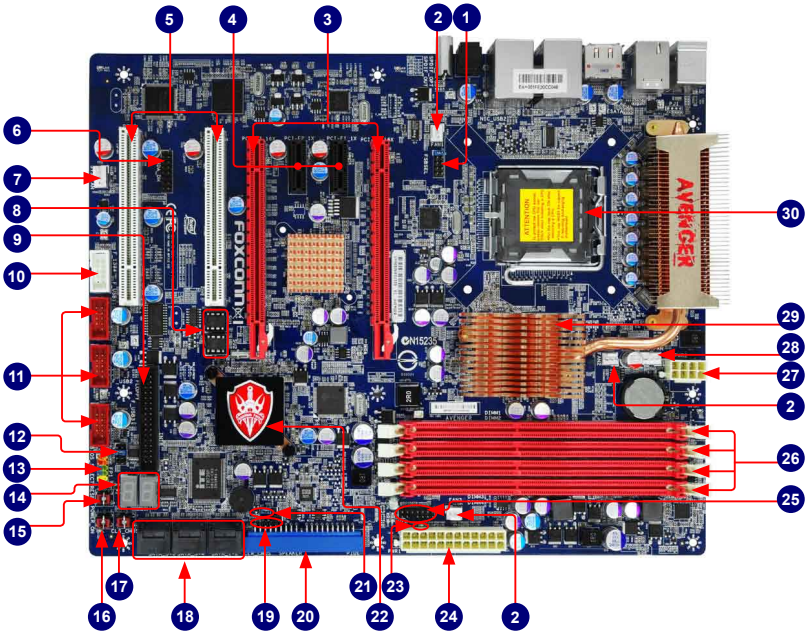
Before your purchase, if any of the above items is damaged or missing, please contact your retailer. Accessories are not in the warranty, only motherboard is.

1-1 Product Specifications

CPU	Support LGA775 socket Intel® CPU: Core™ 2 Extreme / Core™ 2 Quad / Core™ 2 Duo processors Supports 45nm processors Support Intel® Hyper-Threading Technology
Front Side Bus	1600/1333/1066/800 MHz FSB
Chipset	North Bridge: Intel® P45 chipset South Bridge: Intel® ICH10R
Memory	4 x 240-pin DDR3 DIMM sockets Support up to 8GB of system memory Dual channel DDR3 2000(oc*)/1600/1333/1066/800MHz architecture (oc* : Overclocking)
Audio	Realtek ALC885 chip High Definition Audio 2/4/5.1/7.1-channel Support for S/PDIF out Support Jack-Sensing function
LAN	Broadcom 5786 (PCI Express) Gigabit LAN chip Broadcom 5788 (PCI) Gigabit LAN chip
Expansion Slots	2 x PCI Express x16 slots 2 x PCI Express x1 slots 2 x PCI slots
Onboard Serial ATA	6 x SATA connectors 2 x External SATA connectors 300MB/s data transfer rate Support hot plug and NCQ (Native Command Queuing) Support RAID 0, RAID 1, RAID 5, RAID 10 Support Intel® Matrix Storage Technology
USB	Support hot plug Support up to 12 USB 2.0 ports (6 rear panel ports, 3 onboard USB connectors providing 6 extra ports) Support USB 2.0 protocol up to 480Mb/s
Internal Connectors	1 x 24-pin ATX main power connector 1 x 8-pin ATX 12V power connector 1 x Floppy disk drive connector 1 x IDE connector 6 x SATA connectors 3 x USB 2.0 connectors (supporting 6 x USB devices) 1 x CPU fan header (4-pin) 1 x System fan header (4-pin) 3 x Power fan headers (3-pin)(FAN1, FAN2, FAN3) 1 x Front panel connector 1 x 1394a connector 1 x Speaker connector

Back Panel Connectors	1 x PS/2 Keyboard port 1 x PS/2 Mouse port 1 x Optical S/PDIF out connector 1 x Coaxial S/PDIF out connector 6 x USB 2.0 ports 2 x RJ-45 LAN ports 1 x 1394a port 2 x External SATA ports
Hardware Monitor	System voltage detection CPU/System temperature detection CPU/System fan speed detection CPU/System overheating shutdown CPU/System fan speed control
Onboard 1394a	Support hot plug 400Mb/s transmission rate Support 2 independent 1394a units synchronously at most
PCI Express x1	Support 250MB/s bandwidth Low power consumption and power management features
PCI Express x16	Support 8GB/s (16GB/s concurrent) bandwidth Low power consumption and power management features
Green Function	Support ACPI (Advanced Configuration and Power Interface) Support S0 (normal), S1 (power on suspend), S3 (suspend to RAM), S4 (suspend to disk), and S5 (soft - off)
Bundled Software	AEGIS PANEL FOX LiveUpdate FOX DMI FOX LOGO
Operating System	Support for Microsoft® Windows® Vista/XP
Form Factor	ATX Form Factor, 12 inches x 9.6 inches (30.5cm x 24.4cm)

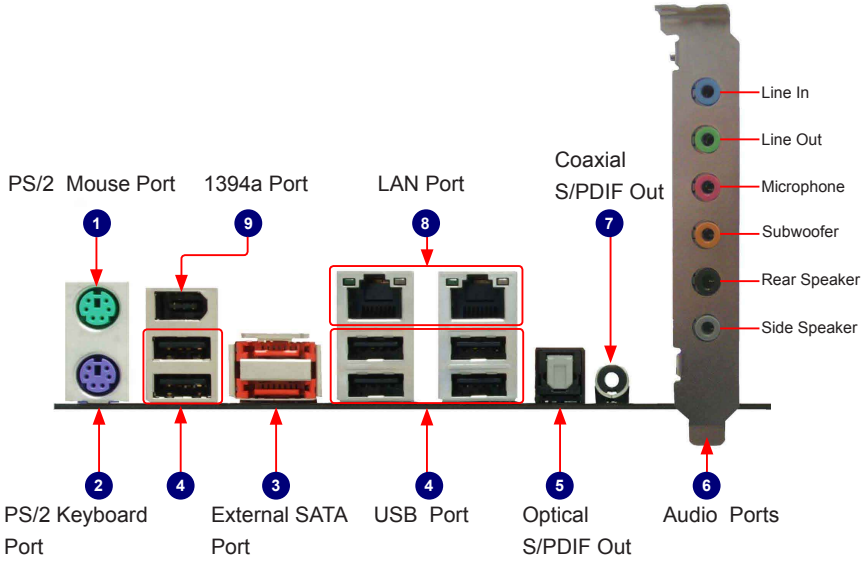
1-2 Layout



1. FSB Select Jumper
2. FAN1/FAN2/FAN3 Header
3. PCI Express x16 Slots
4. PCI Express x1 Slots
5. PCI Slots
6. HDA_DH Header
7. SYS_FAN Header
8. BIOS ROM 1, BIOS ROM 2
9. Floppy Connector
10. 1394a Connector
11. Front USB Connectors
12. BIOS Select Jumper
13. Front Panel Connector
14. Debug LED
15. Reset Button
16. Power on Button
17. Clear CMOS Button
18. SATA Connectors
19. Speaker Connector
20. IDE Connector
21. Clear CMOS Jumper
22. South Bridge: Intel® ICH10R
23. +5V Standby LED
24. 24-pin ATX Power Connector
25. VFD Connector
26. DDR3 DIMM Slots
27. 8-pin ATX 12V Power Connector
28. CPU_FAN Header
29. North Bridge: Intel® P45 Chipset
30. LGA 775 CPU Socket

Note : The above motherboard layout is for reference only, please refer to the physical motherboard for detail.

1-3 Back Panel Connectors



1. PS/2 Mouse Port
Use the upper port (green) to connect a PS/2 mouse.

2. PS/2 Keyboard Port
Use the lower port (purple) to connect a PS/2 keyboard.

3. External SATA Port
To connect external SATA device(s) to your system by expanding the internal SATA port(s) to the chassis back panel. External SATA device shall provide power by its own.

4. USB Port
The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as an USB keyboard/mouse, USB printer, USB flash drive and etc.

5.Optical S/PDIF Out Connector
This connector provides digital audio out to an external audio system that supports digital optical audio.

6. Audio Ports (SONAR Card)
For the definition of each audio port, please refer to the table below :

Port	2-channel	4-channel	5.1-channel	7.1-channel
Blue	Line In	Line In	Line In	Line In
Green	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Microphone In	Microphone In	Microphone In	Microphone In
Orange	-	-	Center/Subwoofer Out	Center/Subwoofer Out
Black	-	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Grey	-	-	-	Side Speaker Out

Note: The SONAR card is in the package, you can connect it to the back panel.

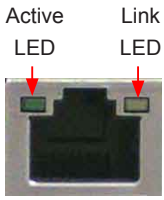
7. Coaxial S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital coaxial audio. Before using this feature, ensure that your audio system provides a coaxial digital audio in connector.

8. RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1Gb/s data rate.

LAN Type	Left: Active		Right: Link	
	Status	Description	Status	Description
1000M	Off	No Link	Off	No Link
	Green Blinking	Data Activity	Off	10 Mb/s Connection
			Green	100 Mb/s Connection
			Orange	1000 Mb/s Connection



9. 1394a Port

This port is used to connect a 1394a device.

This chapter introduces the hardware installation process, including the installation of the CPU, memory, power supply, slots, pin headers and the mounting of jumpers. Caution should be exercised during the installation of these modules. Please refer to the motherboard layout prior to any installation and read the contents in this chapter carefully.

This chapter includes the following information :

- Install the CPU and CPU Cooler
- Install the Memory
- Install an Expansion Card
- Install other Internal Connectors
- Jumpers
- Onboard Button
- Onboard LED
- Onboard Debug LED

Please visit this website for more supporting information about CPU, Memory and VGA for your motherboard :
http://www.foxconnchannel.com/product/Motherboards/compatibility.aspx

2-1 Install the CPU and CPU Cooler

CAUTION

Read the following guidelines before you begin to install the CPU :

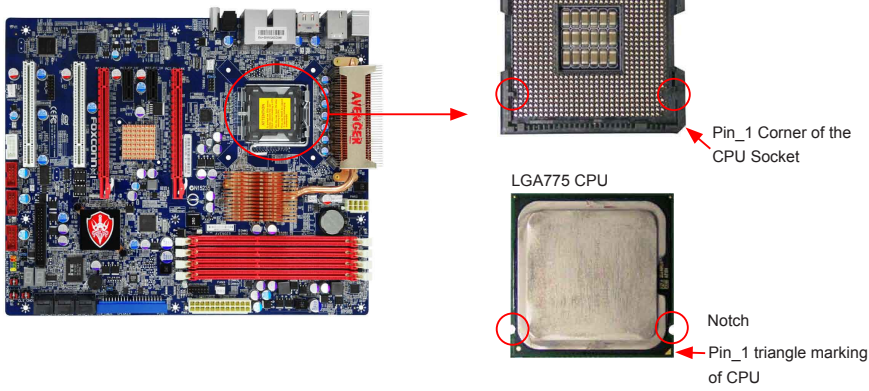
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power supply before installing the CPU to prevent hardware damage.
- Locate the Pin_1 of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

Hyper-Threading Technology System Requirements:
(Go to Intel's website for more information about the Hyper-Threading Technology)

- An Intel® CPU that supports HT Technology
- A chipset that supports HT Technology
- An operating system that is optimized for HT Technology
- A BIOS that supports HT Technology and has it enabled

Install the CPU

Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.

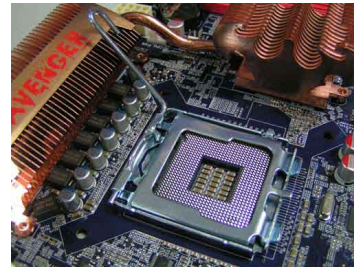


Follow the steps to install the CPU onto the CPU socket :

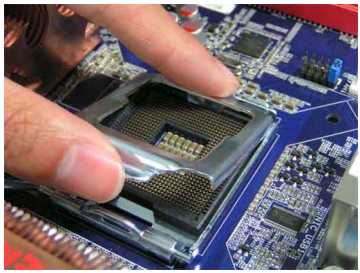
CAUTION

Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.

1. Remove protective socket cover.



2. Release the CPU socket lever.



3. Lift the metal cover on the CPU socket.

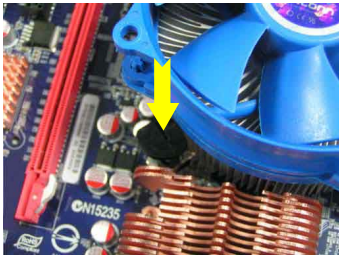
4. Check pin one marking (triangle) with the pin one corner of the CPU socket, align the CPU notches with the socket alignment keys and gently put the CPU onto the socket.

5. When CPU is properly seated, replace the metal cover and push the CPU socket lever back to its locked position.

Install the CPU Cooler

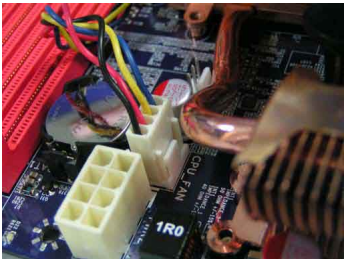
Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedures use Foxconn cooler as the example.)

1. Apply and spread an even thermal grease on the surface of CPU.

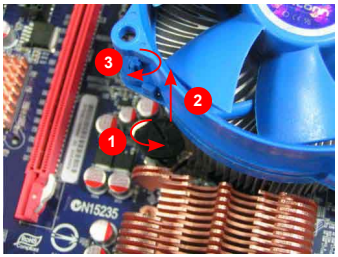


2. Place the four bolts of the CPU cooler to the holes of the motherboard, push them straight down from the top, and the bolts will be fastened on the motherboard. That's it.

3. Check the solder side of the motherboard, the push pin should be fixed as depicted in the picture.



4. Attach the 4-wire CPU cooler connector to the CPU FAN socket on the motherboard .



Release bolts of CPU cooler from motherboard :

1. Turning the push pin (bolt) along with the direction of arrow (counterclockwise).
2. Pull the push pin straight up.
3. Turning push pin clockwise to its default position.

CAUTION

Use extreme care when removing the CPU cooler because the thermal grease may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

2-2 Install the Memory

CAUTION

Read the following guidelines before you begin to install the memory :

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. When memory is installed, the BIOS will automatically check the memory in your system.

Four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:
Channel 0 : DIMM1, DIMM2
Channel 1 : DIMM3, DIMM4

The combinations of DIMM modules are :

	DIMM1	DIMM2	DIMM3	DIMM4
Single Channel	DS/SS	-	-	-
Single Channel	DS/SS	DS/SS		-
Single Channel	-	-	DS/SS	-
Single Channel	-	-	DS/SS	DS/SS
Dual Channel	DS/SS	-	DS/SS	-
Dual Channel	-	DS/SS	-	DS/SS
Dual Channel	DS/SS	DS/SS	DS/SS	DS/SS

(DS : Double Side, SS : Single Side, - : No Memory)

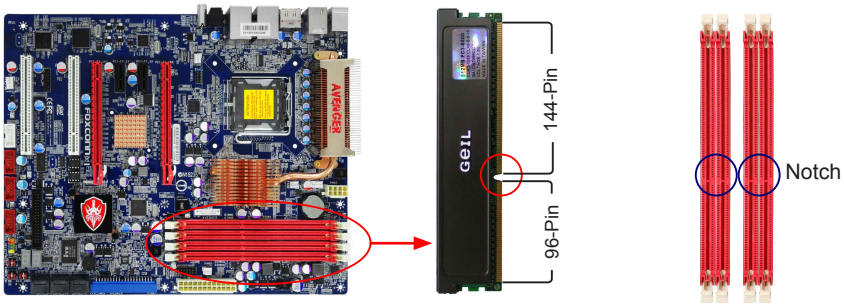
CAUTION

It is recommended that memory of the same capacity, brand, speed, and chips be used and please select dual channel first to achieve optimum performance.

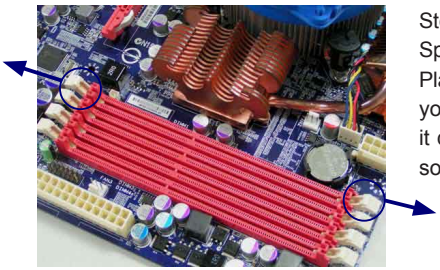
Installing a Memory

CAUTION

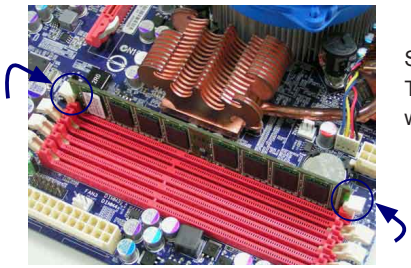
Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. Be sure to install DDR3 DIMMs on this motherboard.



If you take a look at front side of memory module, it has asymmetric pin counts on both sides separated by a notch in the middle, so it can only fit in one direction. Follow the steps below to correctly install your memory modules into the sockets.



Step 1:
Spread the clips at both ends of the memory socket. Place the memory module onto the socket, then put your fingers on top edge of the module, and push it down firmly and seat it vertically into the memory socket.

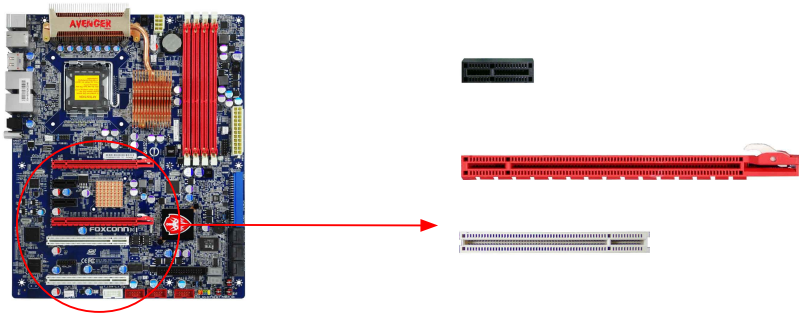


Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

2-3 Install an Expansion Card

CAUTION

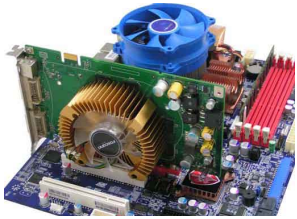
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.



Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover.
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

Installing and Removing a PCI Express x16 Graphics Card :



• Installing a Graphics Card:
Gently insert the graphics card into the PCI Express x16 slot. Make sure the graphics card is locked by the latch at the end of the PCI Express x16 slot.

• Removing the Card:
Push the latch at the end of the PCI Express x16 slot to release the card and then pull the card straight up from the slot.

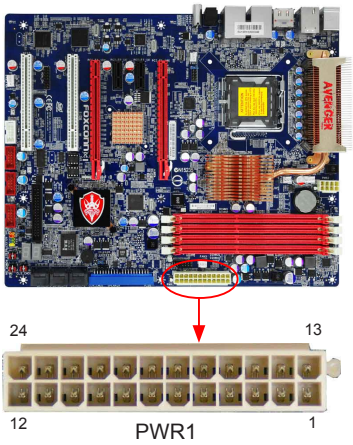
2-4 Install other Internal Connectors

Power Connectors

This motherboard uses an ATX power supply. In order not to damage any device, make sure all the devices have been installed properly before applying the power supply.

24-pin ATX power connector : PWR1

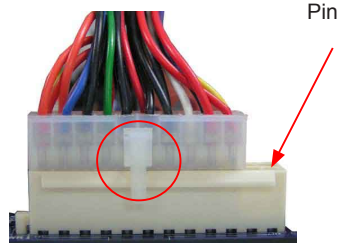
PWR1 is the ATX power supply connector. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.



Pin #	Definition	Pin #	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON(Soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	NC
9	+5V SB(Stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

CAUTION

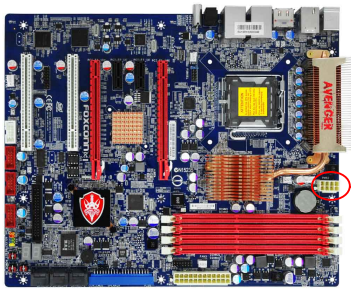
We recommend you using a 24-pin power supply. If you are using a 20-pin power supply, you need to align the ATX power connector according to the picture.

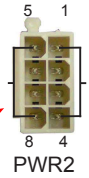


20-Pin Power

8-pin ATX 12 V Power Connector : PWR2

The 8-pin ATX 12V power supply connects to PWR2 and provides power to the CPU.



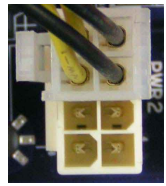


Pin #	Definition	Pin #	Definition
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

CAUTION

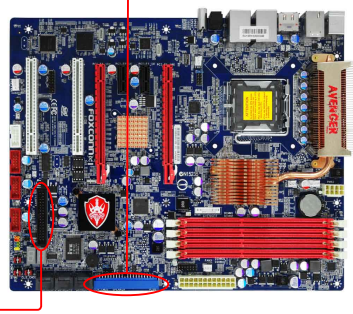
We recommend you using an 8-pin ATX 12V power supply. If you are using a 4-pin power supply, you need to align the ATX power connector according to the picture on the right.

Connect a 4-pin power plug



IDE Connector : PIDE

With the provided Ultra DMA133/100/66 IDE ribbon cable, you can connect to any IDE type of hard disk and CD/DVD ROM/RW drive. You also can configure as a disk array through the JMicron RAID controller.

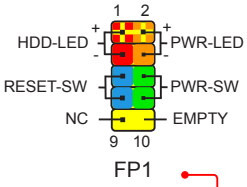


Floppy Disk Drive Connector : FLOPPY

This motherboard includes a standard floppy disk drive(FDD) connector, supporting 360KB, 720KB, 1.2MB, 1.44MB, and 2.88MB FDDs.

Front Panel Connector : FP1

This motherboard includes one connector for connecting the front panel switch and LED Indicators.



FP1

Hard Disk LED Connector (HDD-LED)

Connect to the chassis front panel IDE indicator LED. It indicates the active status of the hard disks. This 2-pin connector is directional with +/- sign.

Reset Switch (RESET-SW)

Attach the connector to the Reset switch on the front panel of the case; the system will restart when the switch is pressed.

Power LED Connector (PWR-LED)

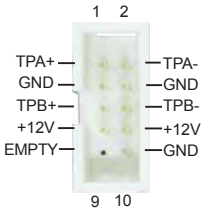
Connect to the power LED indicator on the front panel of the chassis. The Power LED indicates the system's status. When the system is in operation (S0 status), the LED is on. When the system gets into sleep mode (S1) , the LED is blinking; When the system is in S3/S4 sleep state or power off mode (S5), the LED is off. This 2-pin connector is directional with +/- sign.

Power Switch Connector (PWR-SW)

Connect to the power button on the front panel of the chassis. Push this switch allows the system to be turned on and off rather than using the power supply button.

1394a Connector : F_1394

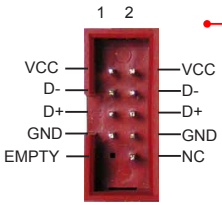
The 1394a expansion cable can be connected to either the front (provided that the front panel of your chassis is equipped with the appropriate interface) or real panel of the chassis.



F_1394

USB Connectors : F_USB1/2/3

In addition to the six USB ports on the rear panel, this product also provides three 10-pin USB connectors on its motherboard. By connecting through USB cables with them, user can quickly expand another six USB ports on the front panel .



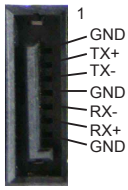
F_USB 1/2/3

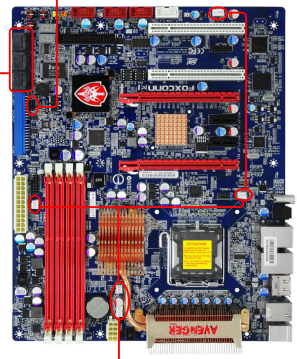
Speaker Connector : SPEAKER

The speaker connector is used to connect speaker of the chassis.

Serial ATA Connectors : SATA_1/2/3/4/5/6

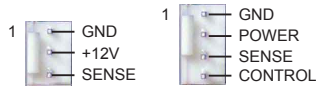
The Serial ATA connector is used to connect with SATA Hard Disk or CD devices which supporting this feature. The current Serial ATA II interface allows up to 300MB/s data transfer rate.





Fan Connectors : CPU_FAN, SYS_FAN, FAN1/2/3

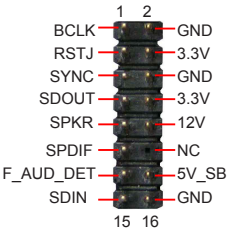
There are five fan headers on this motherboard. The fan speed can be controlled and monitored in “PC Health Status” section of the BIOS Setup. These fans can be automatically turned off after the system enters S3, S4 and S5 sleeping states.



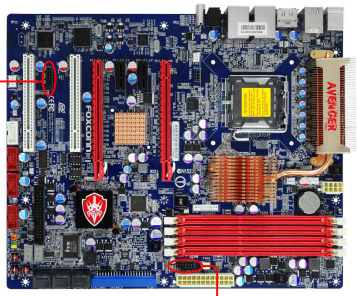
HD Audio Connector : HDA_DH

There is no onboard audio on the motherboard, so we outfit a SONAR card (in the package). This header is used to connect the SONAR card to the back panel.

SONAR Card



HDA_DH

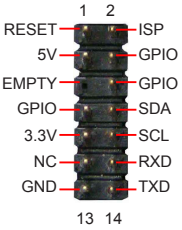


The following picture shows the SONAR card installed on the motherboard.

VFD Connector : VFD

VFD stands for Vacuum Fluorescent Display. It is an optional 5.25 inches display device – QF OC Panel, which can be used to display the system Real Time Clock, monitor current CPU fan speed, CPU temperature, DRAM voltage and so on. With several buttons located on the front panel, you can easily set the Front Side Bus speed, adjust CPU, DRAM and VTT NB voltage and change fan speed.

OC Panel can be installed inside a 5.25 inches drive bay. You may purchase it to easily overclock or fine tune your motherboard.



VFD

2-5 Jumpers

For some features needed, users can change the jumper settings on this motherboard to modify them. This section explains how to use the various functions of this motherboard by changing the jumper settings. Users should read the following content carefully prior to modifying any jumper setting.

2

Description of Jumpers

1. For any jumper on this motherboard, pin 1 can be identified by the bold silkscreen next to it. However, in this manual, pin 1 is simply labeled as “1”.
2. The following table explains different types of the jumper settings. "Closed" means placing a jumper cap on the two pins to temporarily short them. The shorting can also be done by touching two pins by a screwdriver for a few seconds, but using jumper cap is recommended. It can prevent hazardous ESD (Electrical Static Discharge) problem.

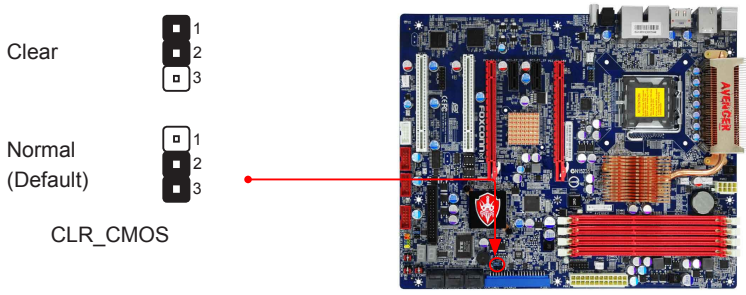
Jumper	Diagram	Definition	Description
1	1	1-2	Set Pin 1 and Pin 2 closed
	1	2-3	Set Pin 2 and Pin 3 closed

Clear CMOS Jumper: CLR_CMOS

The motherboard uses CMOS RAM to store the basic hardware information (such as BIOS data, date, time information, hardware password...etc.). Clear CMOS data is the fast way to go back to factory default when the BIOS settings were mistakenly modified.

The steps to clear CMOS data are :

1. Turn off the computer, unplug the power cord from the power outlet.
2. Remove jumper cap from pins 2-3, put it onto pins 1-2 to short them. This will clear CMOS data.
3. Return the setting to its original with pins 2-3 closed.
4. Plug in the power cord to your computer and turn it on.
5. Go to BIOS Setup to configure new system as described in next chapter.

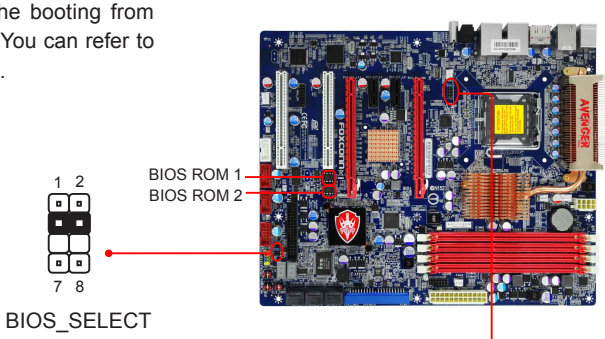


WARNING!

- Disconnect the power cable before adjusting the jumper settings.
- Do not clear the CMOS while the system is turned on.

BIOS Select Jumper: BIOS_SELECT

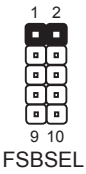
The jumper is used to select the booting from BIOS ROM 1 or BIOS ROM 2. You can refer to the following table for the setting.



Definition	Description	Function
1-2	Set Pin 1 and Pin 2 closed	Force BIOS ROM 1
3-4 (default)	Set Pin 3 and Pin 4 closed	Force BIOS ROM 2
7-8	Set Pin 7 and Pin 8 closed	BIOS select, default is BIOS ROM 2

FSB Select Jumper: FSBSEL

The jumper is used to select the FSB clock, the setting values are: Auto, 266MHz, 333MHz, 400MHz, 450MHz. See the table as below.



Definition	Description	Function
1-2(default)	Set Pin 1 and Pin 2 closed	Auto
3-4	Set Pin 3 and Pin 4 closed	266MHz
5-6	Set Pin 5 and Pin 6 closed	333MHz
7-8	Set Pin 7 and Pin 8 closed	400MHz
9-10	Set Pin 9 and Pin 10 closed	450MHz

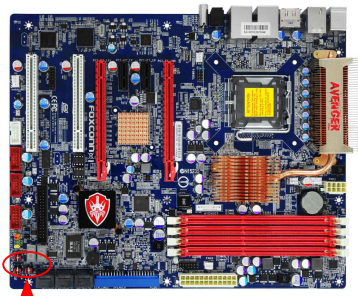
Note : When you set the jumper to pins 1-2, FSB clock can be set by BIOS setup. But if you select other settings, FSB clock will work at corresponding value.

2-6 Onboard Button

Power on Button: POWER_ON
Push the power on button to power on the system.

Reset Button: RESET
Push the reset button to reboot the system.

Clear CMOS Button: CLS_CMOS
Turn off the AC power supply, push the CLS_CMOS button and hold there for a couple of seconds to clear CMOS.



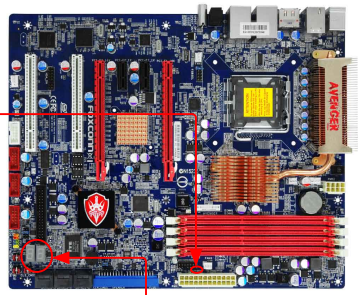
POWER_ON RESET CLS_CMOS

CAUTION

- Make sure the power supply is turned off before pressing the CLS_CMOS button to clear CMOS.
- Push down the CLS_CMOS button and hold it there for a couple of seconds to clear the CMOS completely, then release.

2-7 Onboard LED

+5V Standby LED:
It will light whenever the power supply that connected to the motherboard is switched on.



WARNING!

Do not remove or plug in any device when the onboard LED is lighting on.

2-8 Onboard Debug LED

2-digital LED readout displays hardware status and enables quick error diagnosis.

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

You have to run the Setup Program when the following cases occur :

1. An error message appears on the screen during the system Power On Self Test (POST) process.
2. You want to change the default CMOS settings.

This chapter includes the following information :

- Enter BIOS Setup
- Main Menu
- Standard CMOS Features
- Advanced BIOS Features
- Advanced Chipset Features
- Integrated Peripherals
- Power Management Setup
- PnP/PCI Configurations
- PC Health Status
- Quantum BIOS
- Board Information
- Load Optimized Defaults
- Set Supervisor Password
- Set User Password
- Save & Exit Setup
- Exit Without Saving

Since BIOS could be updated some other times, the BIOS information described in this manual is for reference only. We do not guarantee the content of this manual will remain consistent with the newly released BIOS at any given time in the future. Please visit our support website for updated manual if it is available.

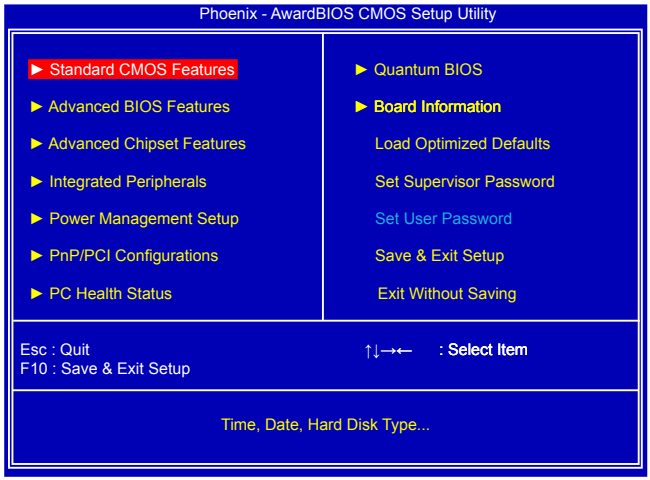
Enter BIOS Setup

The BIOS is the communication bridge between hardware and software, correctly setting up the BIOS parameters is critical to maintain optimal system performance. Power on the computer, when the message "**Press TAB to show POST screen, DEL to enter SETUP**" appears at the bottom of the screen, you can press <Del> key to enter SETUP.

We do not suggest that you change the default values in the BIOS Setup, and we shall not be responsible for any damage which resulted from the change you made.

Main Menu

The main menu allows you to select from a list of setup functions together with two exit choices. Use the arrow keys to select a specific item and press <Enter> to go to the submenu.



Each item in the main menu is explained below:

► **Standard CMOS Features**

It displays the basic system configuration, such as system date, time and floppy drive. They all can be set up through this menu.

► **Advanced BIOS Features**

The advanced system features can be set up through this menu.

► **Advanced Chipset Features**

The values for the chipset can be changed through this menu, and the system performance can be optimized.

► **Integrated Peripherals**

All onboard peripherals can be set up through this menu.There are IDE devices, Super I/O devices such as Serial I/O, Parallel port and other USB, PCI Enhanced ports...etc.

► **Power Management Setup**

All the items related with Green function features can be set up through this menu.

► **PnP/PCI Configurations**

PCI/PnP features, such as O/S supporting, IRQ/DMA settings and bus master enabling/ disabling...etc. can be modified through this menu.

► **PC Health Status**

This setup enables you to read/change fan speeds, and displays temperatures and voltages of your CPU/System.

► **Quantum BIOS**

Some special proprietary features (such as overclocking) can be set up through this menu.

► **Board Information**

It displays the basic board information, such as BIOS ID, version, onboard LAN MAC address...etc.

► **Load Optimized Defaults**

The optimal performance settings can be loaded through this menu. However, it may offer better performance in some ways (such as less I/O cards, less memory ...etc.), still, it may cause problem if you have more memory or I/O cards installed. It means, if your system loading is heavy, set to optimal default may sometimes come out an unstable system. What you need now is to adjust BIOS setting one by one, trial and error, to find out the best setting for your current system.

► **Set Supervisor Password**

The supervisor password can be set up through this menu.

► **Set User Password**

The user password can be set up through this menu.

► **Save & Exit Setup**

Save setting values to CMOS and exit.

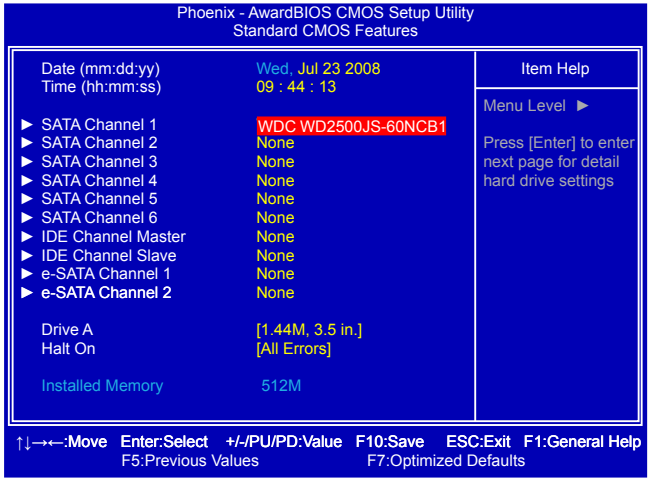
► **Exit Without Saving**

Do not change anything and exit the setup.

When we talk about <+> and <-> keys in this manual, they are the single-keypad keys of the numeric keypad which is located at the right hand side of your desktop keyboard. They are not the combination keys made by pressing and holding down <Shift> key first, then press <+ => or <-_> key the next.

Standard CMOS Features

This submenu is used to set up the standard BIOS features, such as the date, time, floppy drive and so on. Use the arrow up/down keys to select an item, then use the <+> or <-> keys to change the setting.



► **Date -** <weekday><month><date> <year> format

Day—weekday from Sun. to Sat., automatically displayed by BIOS (Read Only).

Month—month from 1 to 12.

Date—date from 1st to 31st.

Year—year, set up by users.

Use <Enter>, <Tab> keys to select a field. Use <+>, <->, <PageUp> or <PageDown> to select a value.

► **Time -** <hour> : <minute> : <second> format

This item allows you to configure the desired time. Use <Enter>, <Tab> to move forward and select a field. Directly input a value or use <PageUp>, <PageDown>, <+> or <-> to select a value.

► **SATA Channel 1/2/3/4/5/6, IDE Channel Master/Slave, e-SATA Channel 1/2**

These categories identify the hard disks connected to the Intel® ICH10R and JMicron controllers in the system. In each channel's display, you can press [Enter] to go to its sub-menu. You can further configure specific drive settings.

[None], [Auto], and [Manual]. "None" means no HDD is installed or set; "Auto" means the system can auto-detect the hard disk when booting up; by choosing "Manual" and changing Access Mode to "CHS", the related information should be entered manually.

In Access Mode setting, selections of [CHS], [LBA], [Large] and [Auto] can help you to select hard drive for legacy compatibility.

Award (Phoenix) BIOS can support 3 HDD modes: CHS, LBA and Large.

CHS	For HDD <528MB
LBA	For HDD >528MB & Supporting LBA (Logical Block Addressing)
Large	For HDD>528MB but not supporting LBA

Note: Set to [Auto] , the system can detect the hard disk and select the HDD mode automatically. Suggest you select this option.

The SATA Channel information will not be displayed if SATA mode is set to [AHCI] or [RAID]. In these two modes, the hard disk information can be found by getting into Intel® Matrix Storage Manager option ROM utility (or RAID BIOS). We will discuss RAID BIOS later.

► **Drive A**

This option allows you to select which kind of the Floppy Disk Drive is installed in your system. It can be [360KB, 5.25in], [1.2MB, 5.25in], [720KB, 3.5in], [1.44MB, 3.5in] and [2.88 MB, 3.5in].

► **Halt On**

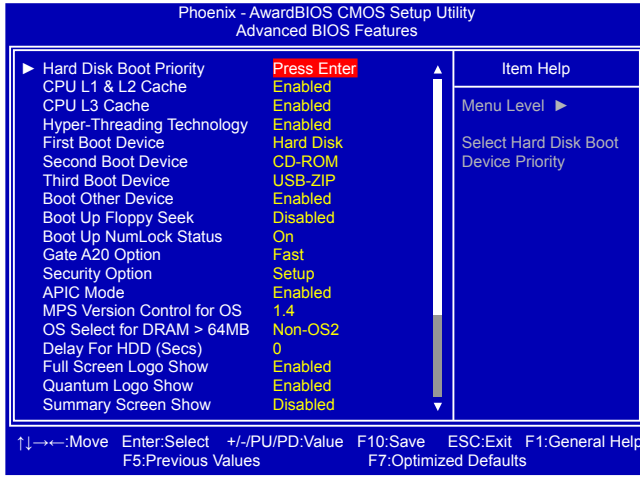
This category determines whether or not the computer will stop if an error is detected during powering up.

All Errors	Whenever the BIOS detects a nonfatal error, the system will stop and you will be prompted.
No Errors	The system boot will not stop for any errors that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; but it will stop for all other errors.
All, But Diskette	The system boot will not stop for a diskette error; but it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error, but it will stop for all other errors.

► **Installed Memory**

These are Display-Only information of the system memory, determined by POST(Power On Self Test) of the BIOS.

Advanced BIOS Features



► Hard Disk Boot Priority

This option is used to select the Priority for HDD startup. After pressing <Enter>, you can select the HDD using the Up/Down arrow keys, and change the HDD priority using <PageUp>/<PageDown>; you can exit this menu by pressing <Esc>.

► CPU L1 & L2 Cache

Enable/Disable CPU cache setting. L1, L2 cache are small, fast memory caches that are built into a CPU and help speed access to important and frequently-used data. L1 cache is typically smaller and faster than L2 cache. L1 cache is an abbreviation of Level 1 cache.

► CPU L3 Cache

This item will be displayed only if your CPU is supporting this feature. If the CPU do support L3, you may set this item to enable or disable. Leave this item at the default value for better performance.

► Hyper-Threading Technology

Hyper-Threading Technology allows one physical processor package to be perceived as two separate logical processors within the operating system. This option is used to enable or disable the feature. It will be displayed only if your CPU is supporting this feature.

► First/Second/Third Boot Device

These three options allow you to select the priority of boot sequence from different devices.

► Boot Other Device

With this function set to enable, the system will boot from some other devices provided that the first/second/third boot devices failed.

► Boot Up NumLock Status

This item defines if the keyboard Num Lock key is active when your system is started. The available settings are: On (default) and Off.

► Gate A20 Option

This feature determines how Gate A20 is used to address memory above 1MB. When this option is set to Fast, the motherboard chipset controls the operation of Gate A20. But when set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves memory access speed and thus, overall system speed, especially with OS/2 and

Windows. This is because OS/2 and Windows enter and leave protected mode via the BIOS a lot so Gate A20 needs to switch often from enabled to disabled and back again. Setting this feature to Fast improves memory access performance above 1MB because the chipset is much faster in switching Gate A20 than the keyboard controller. It is recommended that you set it to Fast for faster memory accesses.

► **Security Option**

When it is set to “Setup”, a password is required to enter the CMOS Setup screen; When it is set to “System”, a password is required not only to enter CMOS Setup, but also to start up your PC.

► **APIC Mode (**Advanced Programmable Interrupt Controller)

This item is used to enable or disable APIC function.

APIC interrupt subsystems can have as many IRQs as are required in a specific machine. APICs are beneficial for the following reasons :

• APICs can contribute to resolving resource conflicts in the PC platform.

• Windows operating systems have been designed with APICs in mind.

• APICs are necessary for enabling new features in the PCI specification.

► **MPS Version Control for OS** (Multi-Processor Specification)

This feature is only applicable to multiprocessor motherboards as it specifies the version of the MPS that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors. MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future. In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge.

If your operating system comes with support for MPS 1.4, you should keep the setting as the default 1.4. You also need to enable MPS 1.4 support if you need to make use of the secondary PCI bus on a motherboard that doesn't come with a PCI bridge.

You should only leave it as 1.1 only if you are running an older operating system that only supports MPS 1.1.

► **OS Select for DRAM>64MB**

This item is only required if you have installed more that 64MB of memory and you are running the OS/2 operating system.

► **Delay For HDD (Secs)**

This item allows you to select the delay for detecting ATA/ATAPI devices while booting. Time out value: 0~15s.

► **Full Screen Logo Show**

This item allows you to enable or disable full screen logo show.

► **Quantum Logo Show**

This item allows you to enable or disable the Quantum logo.

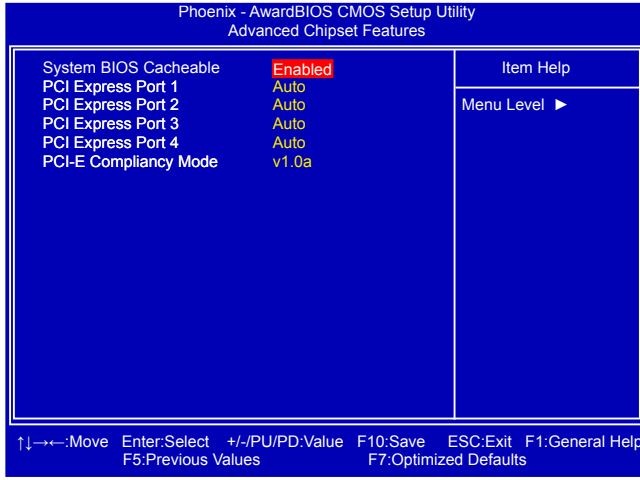
► **Summary Screen Show**

This item allows you to enable or disable the summary screen show.

► **Debug Code Control**

This item allows you to select debug code control mode. Select "LPC", you can use onboard seven segment LED; Select "PCI", you must insert debug card into PCI slot.

Advanced Chipset Features



► **System BIOS Cacheable**

Select “Enabled” to allow caching of the system BIOS which may improve performance. If any other program writes to this memory area, a system error may result.

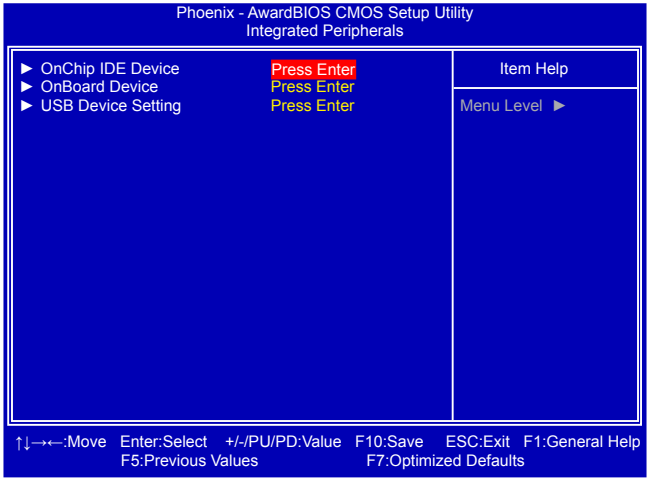
► **PCI Express Port 1/2/3/4**

This option is used to enable or disable the PCI Express port. Setting to [Auto] allows the system to detect the PCI Express devices automatically. If detected, the PCI Express Port is enabled, or the PCI Express Port is disabled.

► **PCI-E Compliancy Mode**

This item is used to set the PCI-E compliancy mode. Setting options: [v1.0a]; [v1.0].

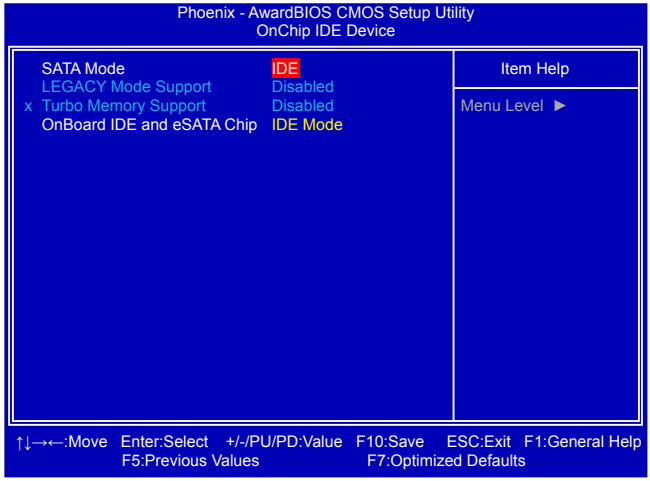
Integrated Peripherals



► OnChip IDE Device / OnBoard Device / USB Device Setting

Press <Enter> to go to relative submenu, please refer to the next sections.

OnChip IDE Device



► **SATA Mode**

This item is used to set the Serial ATA Mode. Setting options: [IDE]; [RAID]; [AHCI].

The SATA interface is controlled by Intel® south bridge chip ICH10R.

► **LEGACY Mode Support**

There are Native IDE and Legacy (or compatible) IDE modes. Legacy mode supports OS through legacy IDE driver. Most SATA functions are not supported in Legacy mode, like SATA II 3G, NCQ, Hot Plug and etc, and Native mode supports SATA II 3G, NCQ, and Hot plug.

This item is used to enable/disable the Legacy IDE mode support for the SATA ports. Certain OS is not supported under Native mode, and must choose Legacy mode.

► **Turbo Memory (Robson Technology) Support**

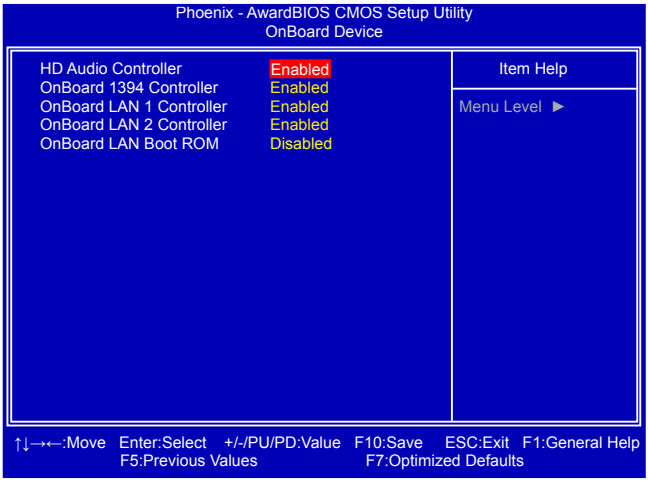
Turbo Memory (Robson Technology) features an integrated disk cache using flash memory in order to speed up disk access and also save energy. It uses non-volatile memory (Flash memory) to increase system responsiveness, make multi-tasking faster, and extend battery life.

This item is used for supporting the Turbo Memory.

► **OnBoard IDE and eSATA Chip**

You may set your PATA and e-SATA to IDE mode or RAID Mode or AHCI+IDE mode(AHCI for e-SATA, IDE for PATA). We are using JMicron chip to control PATA and e-SATA devices.

OnBoard Device



► **HD Audio Controller**

This item is used to set whether the HD Audio controller is enabled.

► **OnBoard 1394 Controller**

This item is used to set whether the onboard 1394 controller is enabled.

► **OnBoard LAN 1 Controller**

This item is used to set whether the onboard LAN 1 controller is enabled.

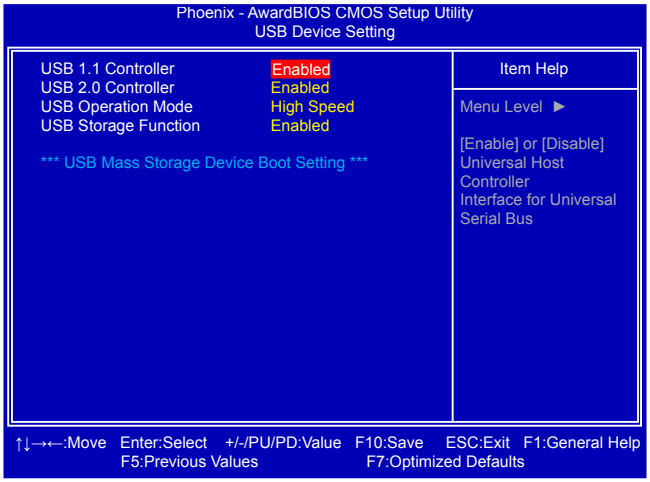
► **OnBoard LAN 2 Controller**

This item is used to set whether the onboard LAN 2 controller is enabled.

► **OnBoard LAN Boot ROM**

This item is used to enable or disable the onboard LAN boot optional ROM. A LAN boot ROM lets you set up a diskless workstation on the network. By installing a boot ROM in the network board, you can enable a client PC system on the network to be booted remotely.

USB Device Setting



► **USB 1.1 Controller**

This item is used to enable or disable the Universal Host Controller Interface for USB.

► **USB 2.0 Controller**

This item is used to enable or disable the Enhanced Host Controller Interface for USB.

► **USB Operation Mode**

This item is used to set the USB operation mode. If you select the [High Speed], then the USB operation mode is determined by the USB device; select [Full/Low Speed], the USB device operates on full/low speed.

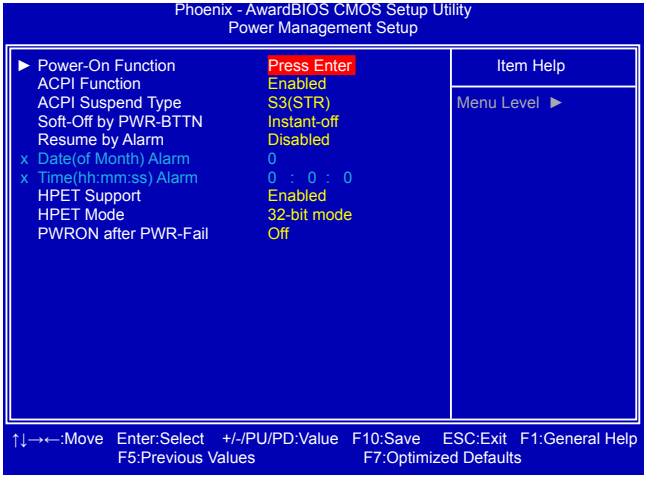
► **USB Storage Function**

This option is used to set whether the USB Mass Storage controller is enabled in a legacy operating system (such as DOS).

► *****USB Mass Storage Device Boot Setting*****

BIOS auto detects the presence of USB Mass Storage Devices, you can configure the Boot setting mode for the detected USB MSD.

Power Management Setup



ACPI (Advanced Configuration and Power Interface) is an open industry standard that defines power and configuration management interfaces between an operating system and the BIOS. In other words, it is a standard that describes how computer components work together to manage system hardware. In order to use this function the ACPI specification must be supported by the OS (for example, Windows 2000 or Windows XP).

ACPI defines five sleeping states, they are :

S1 - The S1 sleeping state is a low wake latency sleeping state. In this state, no system context is lost (CPU or chip set) and hardware maintains all system context. (also called **Power On Suspend**)

S2 - The S2 sleeping state is a low wake latency sleeping state. This state is similar to the S1 sleeping state except that the CPU and system cache context is lost (the OS is responsible for maintaining the caches and CPU context). Control starts from the processor's reset vector after the wake event.

S3 - The S3 sleeping state is a low wake latency sleeping state where all system context is lost except system memory. CPU, cache, and chip set context are lost in this state. Hardware maintains memory context and restores some CPU and L2 configuration context. Control starts from the processor's reset vector after the wake event. (also called **Suspend to RAM**)

S4 - The S4 sleeping state is the lowest power, longest wake latency sleeping state supported by ACPI. In order to reduce power to a minimum, it is assumed that the hardware platform has powered off all devices. Platform context is maintained. (also called **Suspend to Disk**)

S5 - The S5 state is similar to the S4 state except that the OS does not save any context. The system is in the "soft" off state and requires a complete boot when it wakes. Software uses a different state value to distinguish between the S5 state and the S4 state to allow for initial boot operations within the BIOS to distinguish whether or not the boot is going to wake from a saved memory image.

► **Power-On Function**

Press <Enter> to its submenu.

► **ACPI Function**

This item is used to enable or disable the ACPI function.

► **ACPI Suspend Type**

This item is used to set the energy saving mode of the ACPI function. When you select “S1 (POS)” mode, the power is always on and computer can be resumed at any time. When you select “S3 (STR)” mode, the power will be down after a period of time. The status of the computer before it entering STR will be saved in memory, and the computer can quickly return to previous state when the STR function wakes.

When you select "S1&S3", it means OS will automatically take care and assign which mode is the most suitable now.

► **Soft-Off by PWR-BTTN**

This item is used to set the power down method. This function is only valid for systems using an ATX power supply. When set to [Delay 4 Sec.], the power button will put the system in Suspend mode if you push the power button in less than 4 Second then release. If set to [Instant-Off], the PC powers off immediately when the power button is pressed.

► **Resume by Alarm**

This item is used to set the timing of the start-up function. In order to use this function, the start-up password function must be disabled. Also, the PC power source must not be turned off.

► **Date (of Month) Alarm**

When Resume by Alarm is set to “Enabled”, this item can be modified. It is used to set the timing for the start-up date.

► **Time (hh:mm:ss) Alarm**

When Resume by Alarm is set to “Enabled”, this item can be modified. It is used to set the timing for the start-up time.

► **HPET Support**

HPET stands for High Precision Even Timer. If you have the HPET disabled, then windows does not have access to it and therefore falls back to less accurate timing methods. This item is used to enable or disable the HPET Support.

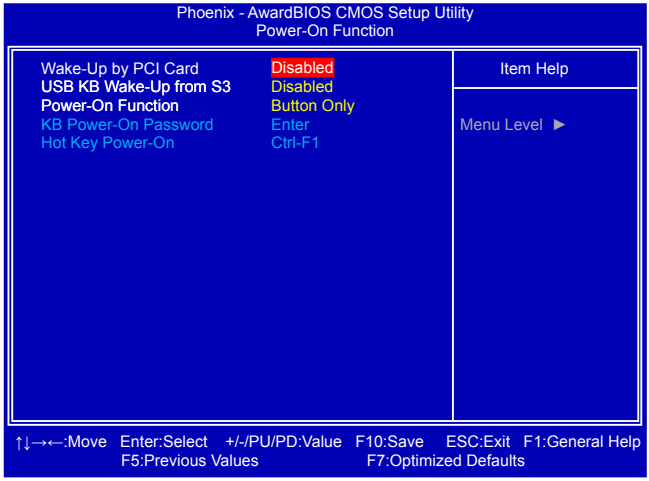
► **HPET Mode**

This item is used to set the HPET Mode. Configuration options: [32-bit mode]; [64-bit mode]. It can be available only when the HPET Support is enabled.

► **PWRON after PWR-Fail**

This item is used to set which state the PC will take with when it resumes after an AC power loss.

Power-On Function



► **Wake-Up by PCI Card**

This item is used to set the system to wake up by PCI card.

► **USB KB Wake-Up from S3**

This item is used to set the system to wake up by USB equipment when it is in S3(Suspend to RAM) mode.

► **Power-On Function**

This item is used to set the Power-On Function. The setting values:[Password], [Hot Key], [Mouse Click], [Any Key], [Button Only], [Keyboard 98].

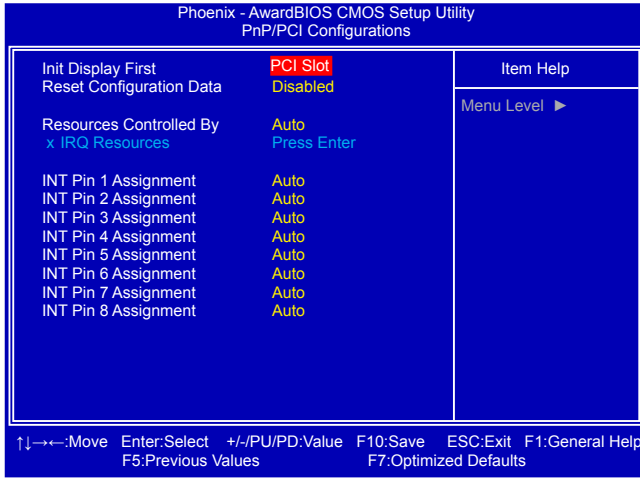
► **KB Power-On Password**

It will active when "Power-On Function" is set to "Password" value, Normally it is show only. When enabled, it allows you to input a password to wake up the system from soft off and green mode. This feature requires an ATX power supply.

► **Hot Key Power-On**

It will active when "Power-On Function" is set to "Hot Key" value, Normally it is show only. This item allows you to press a [Ctrl] + Function key to wake up the system from soft off and green mode.

PnP/PCI Configurations



► **Init Display First**

This item is used to choose the initial display device which will be used first when your PC starts up. Options are : [PCI Slot] and [PCIEx].

► **Reset Configuration Data**

This item is used to enable or disable the reset configuration data function.

► **Resources Controlled By**

This item is used to define the system resource control scheme. If all cards you use support PnP, then select [Auto] and the BIOS will automatically distribute interruption resources. If the PCI cards you installed need special IRQ resources, you will need to select [Manual] and manually adjust interruption resources in the event of hardware conflicts.

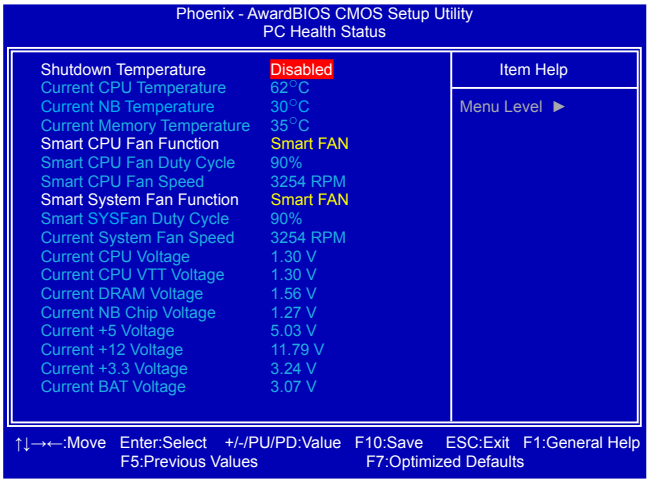
► **IRQ Resources**

When "IRQ Resources" is set to "Manual", you can press the <Enter> key, then manually set IRQ resources.

► **INT Pin 1/2/3/4/5/6/7/8 Assignment**

This item is used to assign IRQ resources for INT Pin 1/2/3/4/5/6/7/8. Default INT Pin assignments can be found from the help menu.

PC Health Status



► **Shutdown Temperature**

This item is used to set the system temperature upper limit. When the temperature exceeds the set value, the system will shut down automatically.

► **Current CPU/NB(North Bridge)/Memory Temperature**

These items show the current CPU/NB temperature/Memory detected automatically by the system.

► **Smart CPU Fan Function**

This item is used to set the Smart CPU Fan function. Configuration options: [Full Speed]; [By Duty-Cycle]; [Smart FAN].

► **Smart CPU Fan Duty Cycle**

It allows you to control the fan by the Duty-Cycle directly. You can input the value between 0 and 99.

► **Smart CPU Fan Speed**

This item shows the Smart CPU Fan speed detected automatically by the system.

► **Smart System Fan Function**

It allows you to set the smart System Fan function. Configuration options: [Full Speed]; [By Duty-Cycle]; [Smart FAN].

► **Smart SYSFan Duty Cycle**

This item is used to control the fan by the Duty-Cycle directly. You can input the value between 0 and 99.

► **Current System Fan Speed**

This item shows the Current System Fan speed detected automatically by the system.

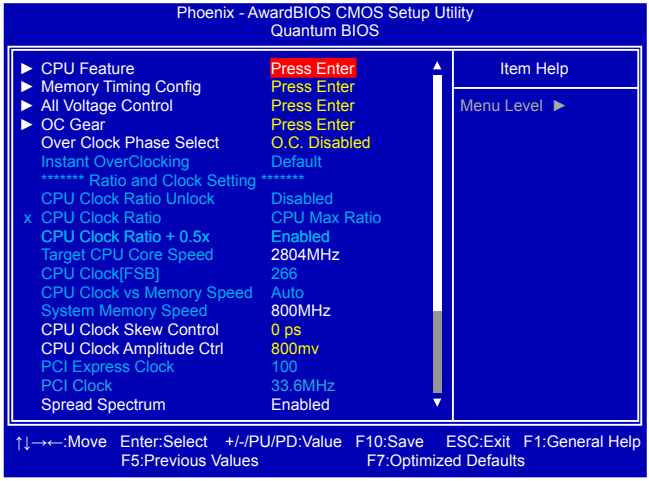
► **Current CPU/CPU VTT/DRAM/NB Chip Voltage**

These items show the Current CPU/CPU VTT/DRAM/NB Voltage detected automatically by the system.

► **Current + 5/+ 12/+ 3.3/BAT Voltage**

These items show the + 5.0V / + 12V / + 3.3V / BAT Voltage detected automatically by the system.

Quantum BIOS



► **CPU Feature / Memory Timing Config / All Voltage Control / OC Gear**

Press <Enter> to go to each Submenu.

► **Over Clock (O.C.) Phase Select**

It allows you to select the over clock phase. Setting values: [O.C. Disabled]; [Manual O.C.]; [Instant O.C.].

► **Instant OverClocking**

This item is used for instant OverClocking, you may choose over clock instantly by 5%, 10%,15%.....etc.

Ratio and Clock Setting

► **CPU Clock Ratio Unlock**

This item is used to enable or disable the CPU Clock Ratio Unlock. If CPU ratio is unlock, this item will be hidden.

► **CPU Clock Ratio**

This item is used to set the ratio of an unlocked CPU. Using different CPU, the setting values are different.

► **CPU Clock Ratio +0.5x**

This item allows you to set the N/2 ratio of an unlocked CPU. If CPU do not support N/2 ratio, this item will be hidden.

► **Target CPU Core Speed**

This item shows target CPU core speed.

► **CPU Clock(FSB)**

This item allows you to set CPU clock.

► **CPU Clock vs Memory Speed**

When "CPU Clock Ratio" is set to "Manual O.C", this item allows you to set the ratio between CPU Clock and Memory Speed.

► **System Memory Speed**

This item shows the System Memory Speed.

► **CPU Clock Skew Control**

This item allows you to adjust the phase of the CPU clock.

► **CPU Clock Amplitude Ctrl**

This item allows you to adjust the amplitude of CPU clock.

► **PCI Express Clock**

This item allows you to adjust the PCI Express bus clock.

► **PCI Clock**

This item allows you to adjust the PCI bus clock. Configuration options: [Synchronous] (Synchronous with PCI Express bus clock); [33.6 MHz]; [37.3 MHz]; [42.0 MHz].

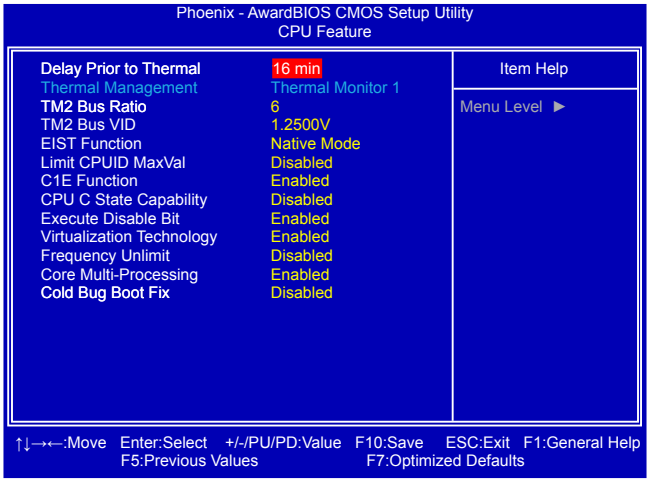
► **Spread Spectrum**

If you enabled this function, it can significantly reduce the EMI (ElectroMagnetic Interference) generated by the system, so to comply with FCC regulation. But if overclocking is activated, you had better disable it.

► **Over Clock Recovery**

When this feature is enabled, once system failed after overclocking, it will load the previous CMOS settings (before overclocking) back, so the system can always work.

CPU Feature



► **Delay Prior to Thermal (Appears only when CPU supports)**

Some processors come with a Thermal Monitor which consists of a on-die thermal sensor and a Thermal Control Circuit (TCC).

When the thermal sensor detects that the processor has reached its maximum safe operating temperature, it will activate the TCC. The TCC will then modulate the clock cycles by inserting null cycles, typically at a rate of 50-70% of the total number of clock cycles. This results in the processor "resting" 50-70% of the time.

As the die temperature drops, the TCC will gradually reduce the number of null cycles until no more is required to keep the die temperature below the safe point. Then the thermal sensor turns the TCC off. This mechanism allows the processor to dynamically adjust its duty cycles to ensure its die temperature remains within safe limits.

The Delay Prior To Thermal BIOS feature controls the activation of the Thermal Monitor's mode. It allows you to determine when the Thermal Monitor should be activated after the sys-

tem boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor 16 minutes after the system starts booting up.

Generally, the Thermal Monitor should not be activated immediately on booting as the processor will be under a heavy load during the booting process. Lower delay time unnecessarily reduces the processor's performance during the booting up process.

Therefore, to ensure optimal booting performance, the activation of the Thermal Monitor must be delayed for a set period of time.

It is recommended that you set this BIOS feature to the lowest value (in minutes) that exceeds the time it takes to fully boot up your computer. For example, if it takes 5 minutes to fully boot up your system, you should select 8 Minutes.

You should not select a delay value that is unnecessarily long. Without the Thermal Monitor, your processor may heat up to a critical temperature (approximately 135°C), at which point the thermal sensor shuts down your processor by removing the core voltage within 0.5 seconds.

► **Thermal Management**

Thermal Monitor 1 (TM1) is implemented in Pentium 4, Xeon and Pentium M processors. It is a CPU clock modulation mechanism which prevents CPU overheating in emergency cases by reducing duty cycle of the processor for up to 46%. The task of this mechanism is to maintain the CPU temperature at maximum safe level by decreasing its performance, or, in terms, by reducing CPU Load.

Thermal Monitor 2 (TM2) is an advanced mechanism of CPU overheating protection. A considerable difference is that TM2 can control the frequency and CPU voltage, while TM1 only modulates CPU clock. Due to reduced voltage, TM2 allows to retain better processor performance in case of overheating at the same reduction of power consumption level.

TM2 is recommended for 2.8 GHz processors and higher (166 MHz bus) and 3.6 GHz and higher (200 MHz bus), while TM1 is recommended for junior models.

This item will be displayed only when the CPU support this feature.

► **TM2 Bus Ratio**

This item represents the frequency (bus ratio) of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.

► **TM2 Bus VID**

This item represents the voltage of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.

► **EIST Function**

You can select the EIST (Processor Power Management, PPM) through this item. Setting values: [Native Mode] (For fully support ACPI OS, e.g. Windows XP, Vista); [SMM Mode] (For legacy OS, e.g. Windows2000).

Enhanced Intel SpeedStep® technology (EIST) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production. There are some system requirements must be met, including CPU, chipset, motherboard, BIOS and operation system. Please refer to Intel website for more information.

► **Limit CPUID MaxVal**

This item is used to enable or disable CPUID maximum value limit configuration. Set Limit

CPUID MaxVal to 3. Should be [Disabled] for WinXP.

► **C1E Function**

C1E represents Enhanced HALT State. It is a feature which Intel CPU uses to reduce power consumption when in halt state. C1E drops the CPU's multiplier and voltage to lower levels when a HLT (halt) command is issued. This item is used to enable/disable the C1E support.

► **CPU C State Capability**

C-states are states in which the CPU is idle. Different processors support different numbers of C-states in which various parts of the CPU are turned off. When EIST Function is enabled, This item allows you select the lowest C state supported according as CPU and motherboard.

► **Execute Disable Bit**

This item is used to enable/disable the Execute Disable Bit feature.

Intel's Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.

Execute Disable Bit allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation. Replacing older computers with Execute Disable Bit-enabled systems can halt worm attacks, reducing the need for virus-related repairs. By combining Execute Disable Bit with anti-virus, firewall, spyware removal, e-mail filtering software, and other network security measures, IT managers can free IT resources for other initiatives.

► **Virtualization Technology**

Virtualization (i.e. Intel® Vanderpool Technology) allows a platform to run multiple operating systems and applications in independent partitions or “containers.” One physical compute system can function as multiple “virtual” systems. Vanderpool Technology can help improve future virtualization solutions. This item will be displayed only when the CPU is supporting this feature and the setting is used to enable/disable it.

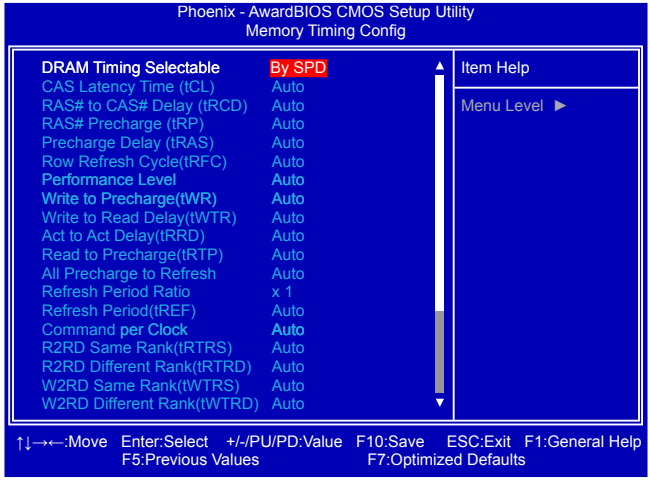
► **Frequency Unlimit**

It means the processor is not ratio locked and has no factory configured maximum ratio limit on the Smithfield XE multi-processing CPU core.

► **Core Multi-Processing**

When disabled, it will disable one execution core of each CPU die. It is going to provide backward compatibility, any way, keep it enabled.

Memory Timing Config



► **DRAM Timing Selectable**

This item is used to enable/disable provision of DRAM timing by SPD device. The Serial Presence Detect (SPD) device is a small EEPROM chip, mounted on a memory module. It contains important information about the module's speed, size, addressing mode and various other parameters, so that the motherboard memory controller (chipset) can better access the memory.

When "DRAM Timing Selectable" is set to [Manual], the following items can be set manually.

► **CAS Latency Time (tCL)**

This item controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

► **RAS# to CAS# Delay (tRCD)**

This item allows you to select a delay time (in clock cycles) between the CAS and RAS strobe signals.

► **RAS# Precharge (tRP)**

This item allows you to select the DRAM RAS precharge time (in clock cycles).

► **Precharge Delay (tRAS)**

This item allows you to set the precharge delay time (in clock cycles).

► **Row Refresh Cycle (tRFC)**

This item allows you to set Row Refresh Cycle (in clock cycles).

► **Performance Level**

This item allows you to set the performance level for your memory.

► **Write to Precharge (tWR)**

This item allows you to set Write to Precharge delay (in clock cycles).

► **Write to Read Delay (tWTR)**

This item allows you to set minimum Write-to-read delay (in clock cycles).

► **Act to Act Delay (tRRD)**

This item allows you to set Act to Act Delay (in clock cycles).

► **Read to Precharge (tRTP)**

This item is used to set the read CAS to precharge time (in clock cycles).

► **All Precharge to Refresh**

This item is used to set the all precharge to refresh delay(in clock cycles).

► **Refresh Period Ratio**

This item is used to set refresh period ratio.

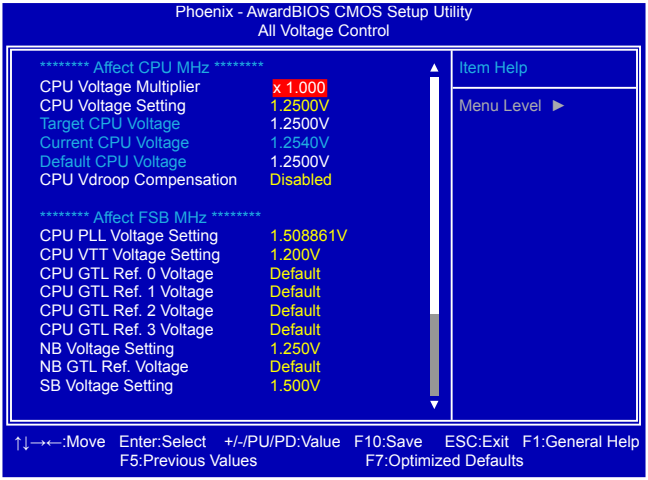
► **Refresh Period (tREF)**

This item is used to set refresh period(in clock cycles).

► **Command per Clock**

This item is used to set the Command per clock for your memory (in clock cycles).

All Voltage Control



**********Affect CPU MHz**********

► **CPU Voltage Multiplier**

This item is used to set CPU Voltage Multiplier.

► **CPU Voltage Setting**

This item is used to set CPU Voltage.

► **Target CPU/Current CPU/Default CPU Voltage**

These items show the Target/Current/Default CPU Voltage.

NOTE: The Target CPU Voltage equal to “CPU Voltage Multiplier” multiply “CPU Voltage Setting”.

► **CPU Vdroop Compensation**

This item is enable or disable CPU vdroop compensation.

**********Affect FSB MHz**********

► **CPU PLL Voltage Setting**

This item is used to set CPU PLL Voltage. The default voltage is 1.500V.

► **CPU VTT Voltage Setting**

This item is used to set CPU VTT Voltage. The default voltage is 1.200V.

► **CPU GTL Ref. 0/Ref. 1/Ref. 2/Ref. 3 Voltage**

This item is used to adjust CPU GTL reference voltage.

► **NB Voltage Setting / NB GTL Ref. Voltage**

This item is used to set NB/ NB GTL reference voltage.

► **SB Voltage Setting**

This item is used to set SB Voltage. The default voltage is 1.500V.

**********Affect Memory MHz**********

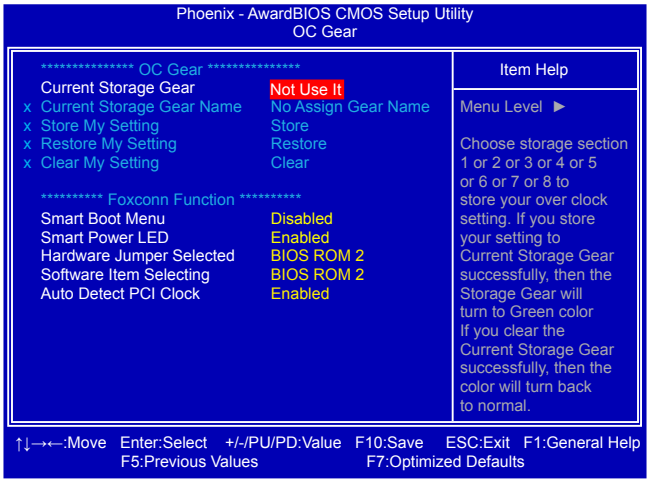
► **DRAM Voltage Setting**

This item is used to set DRAM voltage. The default voltage is 1.648V.

► **DRAM Ref. Voltage**

These items are used to set DRAM reference voltage.

OC Gear



**********OC Gear**********

► **Current Storage Gear**

We have more spaces in CMOS to allow you to store up to 8 sets of BIOS configuration data. You can change any setting of BIOS, including the overclocking information, and save the whole BIOS settings to one of eight storage area. Later, you can retrieve BIOS settings by restore it. This item is used to choose storage section to store your BIOS settings. Setting values: [Not Use It]; [Storage Gear 1]; [Storage Gear 2]; [Storage Gear 3]; [Storage Gear 4]; [Storage Gear 5]; [Storage Gear 6]; [Storage Gear 7]; [Storage Gear 8].

► **Current Storage Gear Name**

This item will be avaliable when Current Storage Gear is set to [Storage Gear 1], [Storage Gear 2]...[Storage Gear 8], then you can select the overclock setting for the Current Storage Gear. Setting values: [No Assign Gear Name]; [Still Tweaking]; [Max CPU]; [Max FSB]; [2d Benching]; [3d Benching]; [24/7 OverClock]; [Tweaked Stock Speed].

► **Store/Restore/Clear My Setting**

This item allows you to Store/Restore/Clear the BIOS settings. See the help string in “Item Help” table for detail.

********Foxconn Function********

► **Smart Boot Menu**

When PC starts, if [Enabled] is selected, a Boot Menu will be automatically displayed to inform you to select a boot device. If no device is selected, the first device will be used. If [Disabled] is selected, then PC will ask you to press [Esc] key to get into Boot Menu. This setting simplifies

multiple boot devices user from pressing [Esc] key to enter boot menu.

► **Smart Power LED**

Smart Power LED is a feature built on your motherboard to indicate different states during Power On Self Test (POST). The LED is located at the front panel, and it displays POST state by different long-short blinking intervals. You can always leave this state enabled.

System Status	Power LED Status	Stop Blinking Condition
Normal	Always On	Always On
No Memory	Continue blinking On (1sec.), Off (1sec.)	Reboot & Memory OK
No Display	Continue blinking On (2sec.), Off (2sec.)	Reboot & Display OK
Post Error Message	Quick blinking twice (1/3sec. On, 1/3sec. Off), one long On (1sec.), continuously.	Enter Setup or Skip
No CPU Fan	Continue blinking On (1/2sec.), Off (1/2sec.)	Reboot & Fan OK

► **Hardware Jumper Selected**

When BIOS_SELECT jumper, which is on the motherboard, is set to 1-2 or 3-4, this item will auto detect power-on boot BIOS.

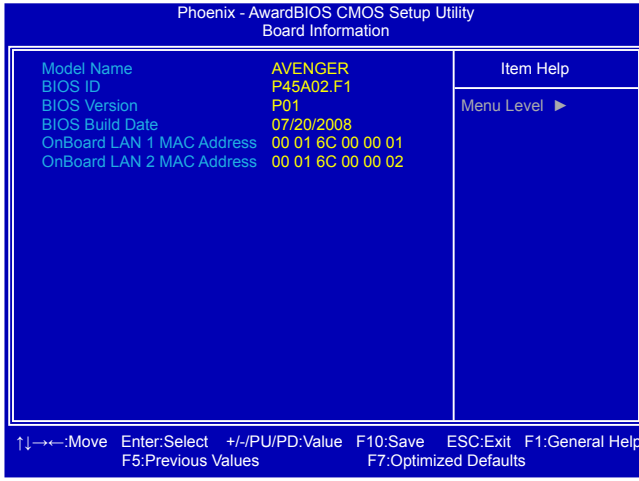
► **Software Item Selecting**

When BIOS_SELECT jumper, which is on the motherboard, is set to 7-8, you can select the power-on boot BIOS by this item. Its default is BIOS ROM 2.

► **Auto Detect PCI Clock**

This item is used to allow the system to supply the PCI slot bus clock if system detect a PCI card on the slot.

Board Information



► **Model Name**

This item shows the model name.

► **BIOS ID/Version**

This item shows the BIOS ID/version.

► **BIOS Build Date**

This item shows the BIOS building date.

► **OnBoard LAN 1/2 MAC Address**

This item shows the onboard LAN 1/2 MAC address.

Load Optimized Defaults

Select this option and press <Enter>. A dialogue pops out, select <Y> then press <Enter> to load the defaults; press <N> to skip. By this default, BIOS have set the optimized performance parameters of system to improve the performances of system components. But if the optimized performance parameters to be set cannot be supported by your hardware devices, the system may fail to work. It may happen on when you installed too many add-on cards on your system, or overloaded the hardware until it can not afford.

Set Supervisor Password

The access rights and permissions associated with the Supervisor password are higher than those of a regular User password. The Supervisor password can be used to start the system or modify the CMOS settings, while User password can only be used to start the system, view the CMOS settings, but modify CMOS settings is not allowable.

When you select the Set Supervisor/User Password option, the Enter Password message will appear :

The supervisor password can be set up through this menu. Key in a password, not exceeding 8 characters, save the change and exit. The next time, when you enter the BIOS, it will ask you to input this password to confirm your access right. After you get the right to access the BIOS, you then can select this setting again, and press <Enter> to disable this function or input a new password to replace the original one.

If you select “System” for the Security Option in “Advanced BIOS Features” menu, then you will be asked to enter a password when the system is started or when you try to enter the CMOS setting program. If an incorrect password is entered, you will be hold there.
If you select “Setup” for the Security Option in “Advanced BIOS Features” menu, you will be asked to enter a password only when you enter the CMOS setting program.

Set User Password

The user password can be set up through this menu. Only when there exists a Supervisor password, then this setting can be activated.

Save & Exit Setup

When you select this option and press <Enter>,
Select <Y> to save your changes to CMOS and exit the program;
Select <N> or <ESC> to return to the main menu.

Exit Without Saving

If you select this option and press <Enter>,
Select <Y> to exit CMOS without saving your modifications;
Select <N> or <ESC> to return to the main menu.

The utility CD that came with the motherboard contains useful software and several utility drivers that enhance the motherboard features.

This chapter includes the following information :

- Utility CD Introduction
- AEGIS PANEL
- FOX LiveUpdate
- FOX LOGO
- FOX DMI

Note : Because each module is independent, so the section number will be reorganized and unique to each module, please understand.

Utility CD introduction

This motherboard comes with one Utility CD. To begin with, simply insert the CD into your CD drive. The CD will automatically run and display the main menu on the screen.

1. Install Driver

Click on "**Driver**", then use these options to install all the necessary drivers for your motherboard. You need to restart your computer after finishing all the installations of drivers.

Intel Chipset Driver

Use it to install Intel chipset driver.

Realtek HDA Audio Driver

Use it to install Realtek Audio driver.

Broadcom LAN Driver

Use it to install Broadcom LAN driver.

Intel RAID Driver
Use it to install Intel RAID driver.

JMicron RAID Driver
Use it to install JMicron RAID driver. JMircon provides one external SATA port together with two IDE PATA ports (Master/Slave). Due to limitation of RAID interface on JMircon, we recommend you building RAID system by using onboard SATA ports (controlled by Intel ICH10R) instead of JMicron.

One Click Setup
You must click "Intel Chipset Driver" to install it first. After that, you can click "One Click Setup" to install all the other drivers left, or you can click on each individual driver to install it manually.

2. Install Utility

Click on "**Utility**", use these options to install additional software programs.

AEGIS PANEL
Foxconn new utility software for monitoring system information. See “AEGIS PANEL” for details.

Fox LiveUpdate
The Fox LiveUpdate allows you to backup or update the system BIOS, drivers and utilities in Windows® environment. See “Fox LiveUpdate” for details.

FOX LOGO
The FOX LOGO is a simple and useful utility to backup, change and delete the boot time Logo. See “FOX LOGO” for details.

FOX DMI
The FOX DMI is a full Desktop Management Interface viewer, and it provides three DMI data formats. See “FOX DMI” for details.

Microsoft DirectX 9.0
Use it to install Microsoft DirectX 9.0 driver.

Adobe Acrobat Reader
Installs Adobe® Acrobat® Reader that is used for viewing and printing the PDF document.

Norton Internet Security
Installs Norton® Internet Security to protect your PC from being affected by viruses.

Intel RAID Utility
Use it to install Intel RAID utility.

3. Foxconn Website
Click to visit Foxconn's website.

4. Browse CD
Click it to browse the CD content.

AEGIS PANEL

Aegis Panel, is a Windows innovation tool which provides settings of overclocking, voltage calibration, fan control and alarm function. It also displays system monitoring information such as fan speed, temperature, voltage and CPU clock etc..

The powerful features are:

HW Monitor(Hardware Monitor Information)
Overclocking
Quantum Light
QF OC Panel (Quantum Force OverColck Panel)
Voltage Calibration

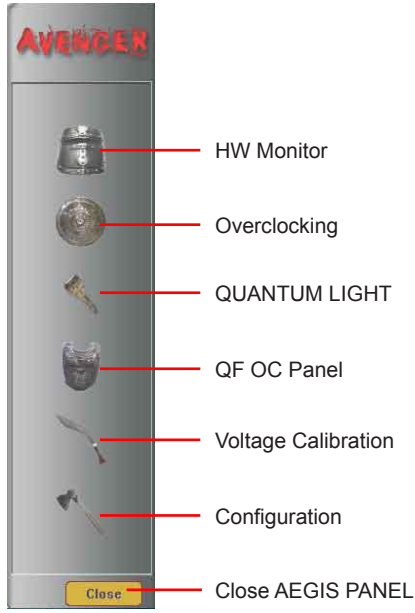
Supported Operating Systems :

-Windows XP (32-bit and 64-bit)
-Windows Vista (32-bit and 64-bit)

Using AEGIS PANEL:

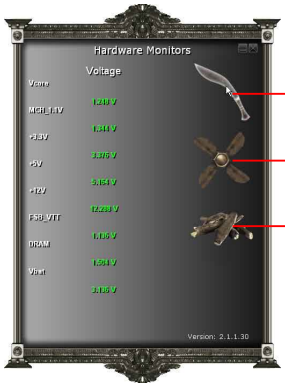
1. Main Panel

When AEGIS Panel is running, a main menu appears at the right hand side of the screen. This menu will disappear if you remove the mouse from it a few seconds later. If you move the mouse to touch the screen right where the menu stayed before, it will appear again.



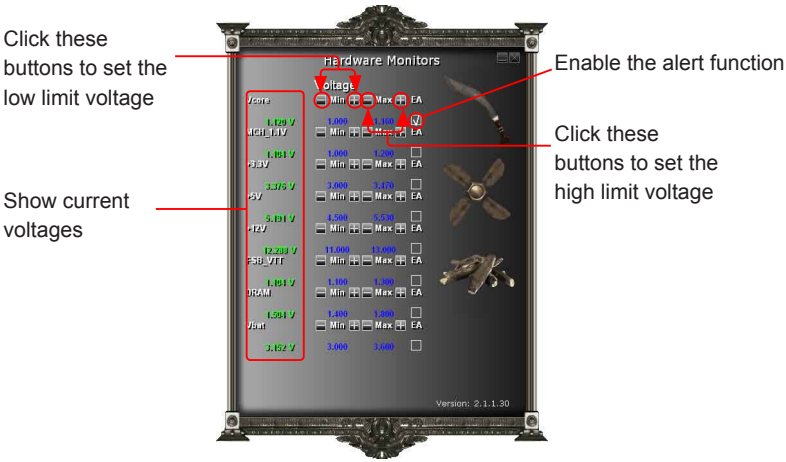
2. HW Monitor

Click on "HW Monitor" icon  , its panel appears. By moving the mouse on the voltage icon, it will display voltage information. Move the mouse on fan or temperature icon will show relative information accordingly.



2.1 HW Monitor - Voltage

Click on voltage icon  to get into the voltage setting menu. It allows you to set the low/high limits of Vcore, MCH 1.1V, +3.3V, +5V, +12V, FSB_VTT, DRAM and Vbat voltages, and to enable the alert function. If the current voltage value is lower than the low limit or higher than the high limit, then a buzzer sounds.



2.2 HW Monitor - Fan

Move the mouse on the fan icon  , its menu appears. Click on the fan icon to get into the fan setting menu. It allows you to set the low/high limits of the CPU and system fan speeds, and to enable the alert function. If the current fan value is lower than the low limit or higher than the high limit, then a buzzer sounds.

Click these buttons to set the low limit fan speed

Show current fan speeds

Enable the alert function

Click these buttons to set the high limit fan speed

Fan control has three operating modes :

By Full Speed :

Running at full speed.

By Duty-Cycle :

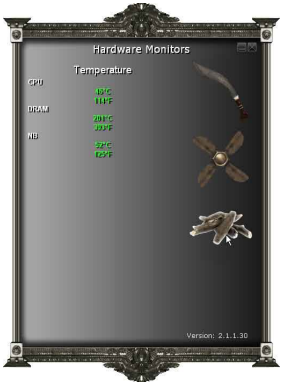
The fan speed is controlled by setting the percentage to the fan duty (between 0% ~ 100%).

By SmartFan:

Fan speed is controlled by the system automatically.

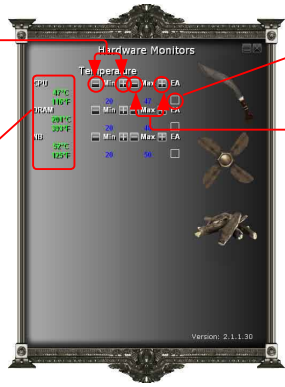
2.3 HW Monitor - Temperature

Move the mouse on the temperature icon  , its menu appears. Click on the temperature icon to get into the temperature setting menu. It allows you to set the low/high limits of CPU temperature, DRAM temperature and NB temperature, and to enable the alert function. If the current temperature value is lower than the low limit or higher than the high limit, then a buzzer sounds.



Click these buttons to set the low limit CPU temperature

Show current temperatures

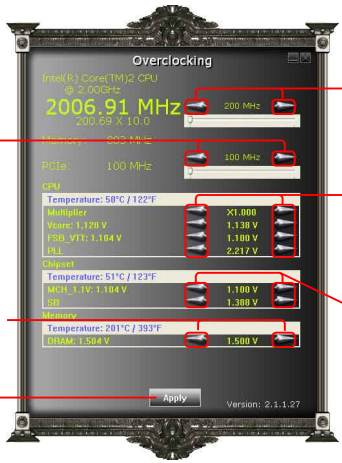


Enable the alert function

Click these buttons to set the high limit CPU temperature

3. Overclocking

Click "Overclocking" icon  to enter the overclok setting menu. It allows you to adjust CPU and PCIe clocks, and to change the voltages of CPU, chipset and memory. After you set the values, click [Apply] button to apply it.



Click these buttons to adjust the CPU clock

Click these buttons to adjust the PCIe clock

Click these buttons to adjust the CPU voltages

Click these buttons to adjust the memory voltage

Click these buttons to adjust the Northbridge and Southbridge voltage

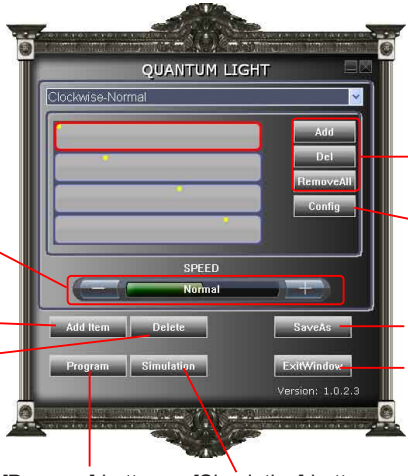
Apply the changes

4. Quantum Light

Click "Quantum Light" icon  to open its menu. There are ten LEDs located on the mother-board, and you can control the way the LEDs are lighting to show off.

4.1 Deafult Patterns

This interface supports four default patterns: Clockwise-Normal, CounterClockwise-Normal, Twinkle-Normal and Twinkle-Slower. You can select a pattern, then click [Program] button to start the LED blinking.



[SPEED] button, there are five options : Slow-est, Slower, Normal, Faster, and Fastest.

Add, delete or remove pattern button

[Config] button

[Add Item] button

[Delete] button

[SaveAs] button

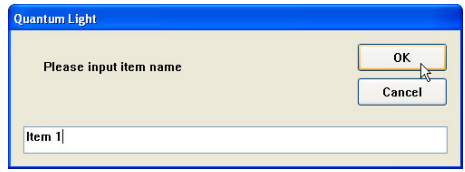
[Exit Window]

[Program] button

[Simulation] button

4.2 User Created Patterns

You can create a new lighting pattern by yourself. The steps are :
Step 1. Click [Add Item] button, then key in a pattern name to identify itself, click "OK" to continue.

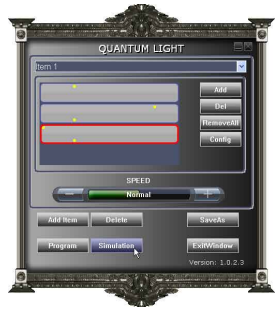


Step 2. Press [Add] button to start creating a new pattern. A grey, horizontal bar is displayed at this moment, and you can select LED pattern sets from Step 3.

Step 3. Click [Config] button, a picture of motherboard with LEDs appears. You can then click and select the LEDs from the picture, then apply [Close] to finish the selection. One set of LED pattern has just been created, and you can repeat from step 2 to step 3 to generate more sets, and all these sets will become one display pattern.

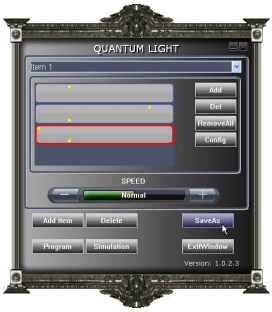
For example, select any of two LEDs as one set and total five sets are selected as one pattern. You can then click [Simulation] to preview the pattern or click [Program] to activate it. Five sets of LEDs are displaying one after one, and this is called one pattern.

Step 4. Click [Simulation] button to preview the currently selected pattern on screen picture.



Step 5. If you like the display pattern just created, click [Program] button to make the LEDs start blinking on the motherboard.

Step 6. If you want the pattern being stored permanently into the pattern list, you must click [SaveAs] button to save it, otherwise, the setting will not be effective next time.



5. QF OC Panel

QF OC Panel module is an optional 5.25 inches display device, it can be purchased separately and you can install it in your PC's 5.25 inches drive bay. This panel can display the system real time clock, allow you to monitor current CPU fan speed, CPU temperature, DRAM voltage and so on. With several buttons located on its front panel, user can easily set the Front Side Bus speed, adjust CPU, DRAM and VTT NB voltages and change fan speeds. For detailed descriptions, please refer to separate QF OC Panel manual.

Click "QF OC Panel" icon  to open its panel. This panel will appear on your screen only when the QF OC Panel module is installed in your system. The display information on the screen will be synchronized with any actions taken on the QF OC Panel module.

6. Voltage Calibration

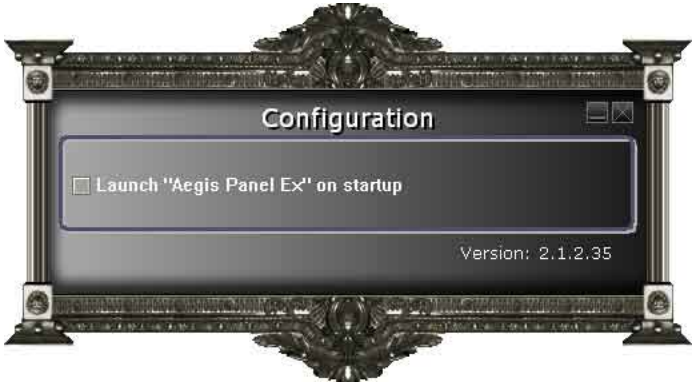
Click "Voltage Calibration" icon  to start the voltage calibration. The system will automatically adjust the voltages according to your hardware status, and a picture will flash on the screen to inform you the settings are done. Please refer to the table below for the setting values.

CPU Temperature	Voltage (V)		CPU Temperature	Voltage (V)	
20 °C~30 °C	Vcore	1.52	51 °C~55 °C	Vcore	1.32
	VTT	1.35		VTT	1.30
	PLL	1.6		PLL	1.54
31 °C~35 °C	Vcore	1.5	56 °C~60 °C	Vcore	1.3
	VTT	1.35		VTT	1.25
	PLL	1.6		PLL	1.5
36 °C~40 °C	Vcore	1.47	61 °C~65 °C	Vcore	1.25
	VTT	1.35		VTT	1.20
	PLL	1.6		PLL	1.5
41 °C~45 °C	Vcore	1.42	66 °C~	Vcore	1.20
	VTT	1.35		VTT	1.2
	PLL	1.54		PLL	1.5
46 °C~50 °C	Vcore	1.38			
	VTT	1.30			
	PLL	1.54			

CPU Temperature	NB Voltage (V)
20 °C~30 °C	1.5
31 °C~35 °C	1.45
36 °C~40 °C	1.4
41 °C~45 °C	1.35
46 °C~50 °C	1.3
51 °C~55 °C	1.25
56 °C~60 °C	1.2
61 °C~	1.1

7. Configuration

Click "Configuration" icon  to configure Aegis function. You can enable or disable the launch of "Aegis Panel Ex" on startup. If enabled, the Aegis Panel will be automatically activated when the Windows operating system is running.



FOX LiveUpdate

FOX LiveUpdate is a useful utility to backup and update your system BIOS, drivers and utilities by local or online.

Supporting Operating Systems :

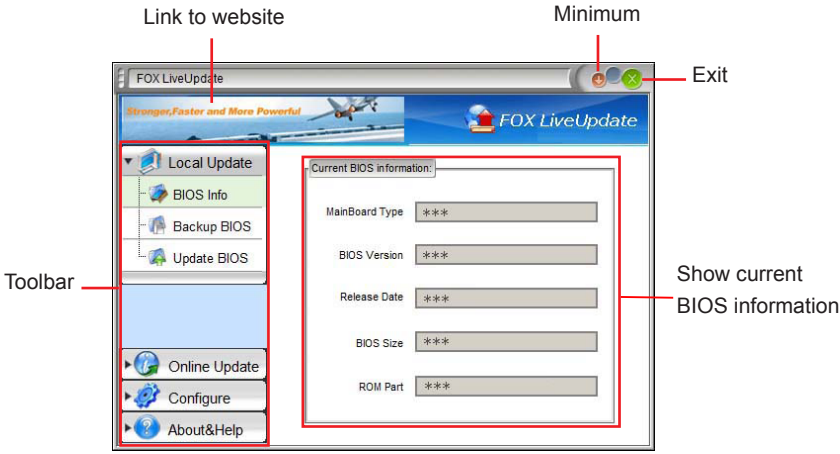
- Windows 2000
- Windows XP (32-bit and 64-bit)
- Windows 2003 (32-bit and 64-bit)
- Windows Vista (32-bit and 64-bit)

Using FOX LiveUpdate :

1. Local Update

1-1 Local Update - BIOS Information

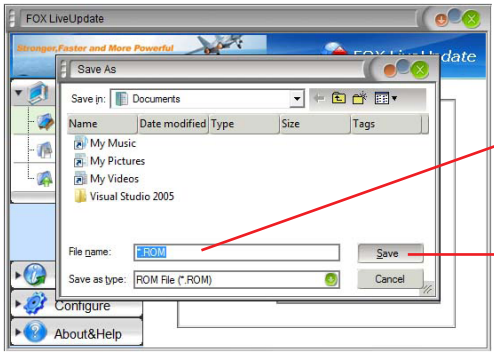
This page lets you know your system BIOS information.



*** : please refer to the physical motherboard for detail.

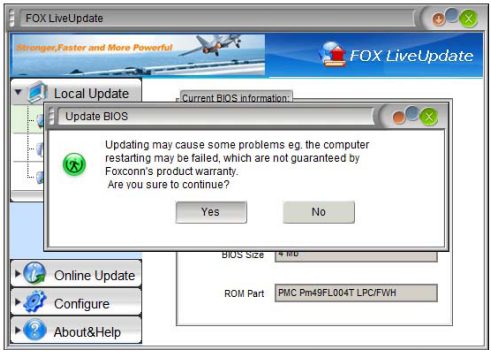
1-2 Local Update - Backup

This page can backup your system BIOS. You can click “Backup”, and key in a file name, then click “Save” to finish the backup operation. The extension of this backup file is ".BIN" for Award BIOS and ".ROM" for AMI BIOS. Default directory is "C:\Desktop\My Documents" in Windows XP and "Documents" in Vista. Make sure you can remember the file name together with the directory which it is stored, prevented that you may need them to recover your BIOS later.



1-3 Local Update - Update

This page helps you to update your BIOS from a local file. After click “Update”, An alert message will be displayed to ensure if you really want to continue, click “Yes” to confirm. A setup wizard will guide you to load a local BIOS file to finish the operation. You must remember from which directory to load your new BIOS file (with an extension of ".BIN" for Award BIOS, ".ROM" for AMI BIOS) before the setup wizard starts.



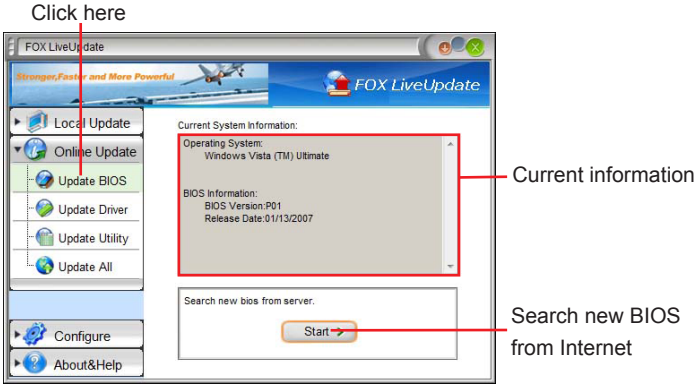
CAUTION

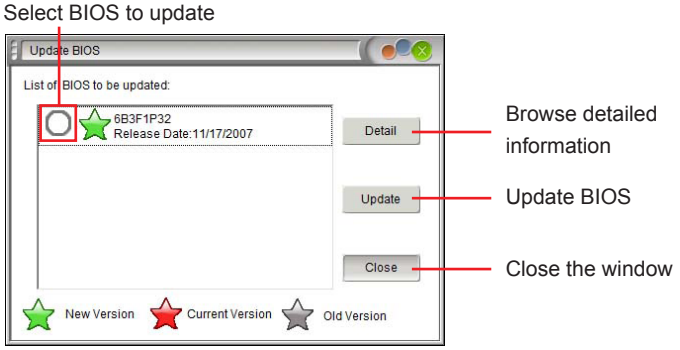
FOX LiveUpdate can automatically backup old BIOS before update. This feature can be enabled in the "Configure-System" setup. Please refer to "Configure-System" section for more detail. The default backup directory is C:\LiveUpdate_Temp, but the backup file name will be automatically generated. It is hard to find it out from a backup directory, and we recommend you using Explorer to check date/time message of this backup file to find it out and write its name down to remember it.

2. Online Update

2-1 Online Update - Update BIOS

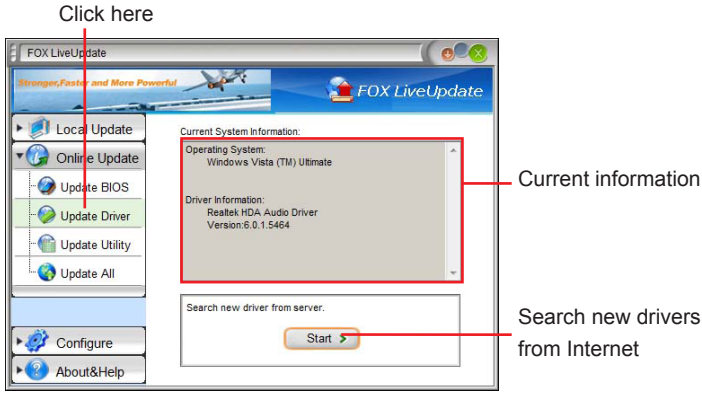
This page lets you update your system BIOS from Internet. Click “start”, it will search the new BIOS from Internet. Then follow the wizard to finish the update operation.

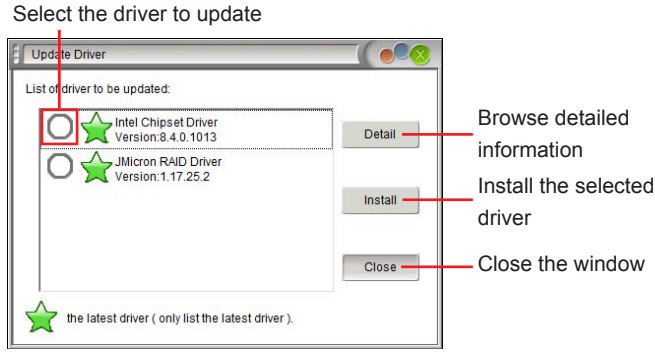




2-2 Online Update - Update Driver

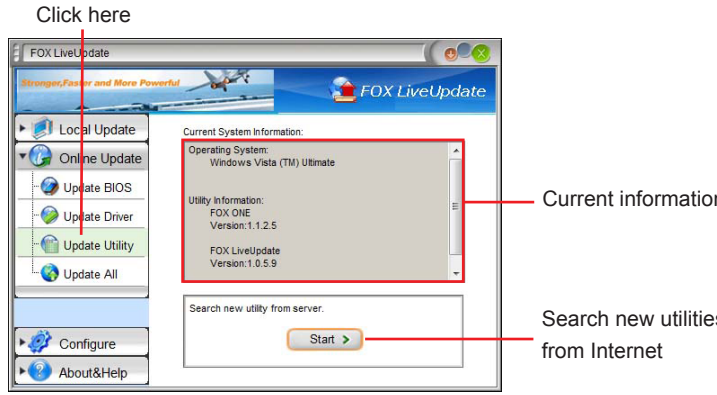
This page lets you update your system drivers from Internet. Click “start”, it will search the new drivers from Internet. Then follow the wizard to finish the update operation.

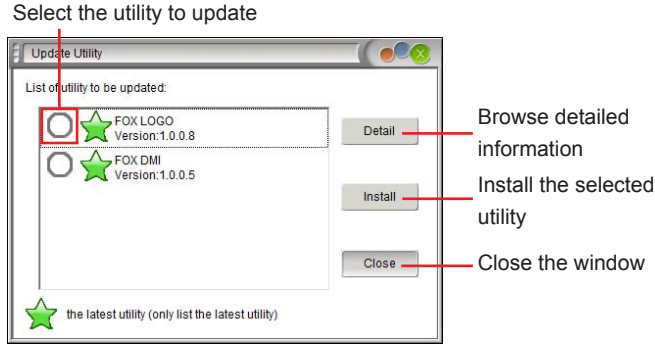




2-3 Online Update - Update Utility

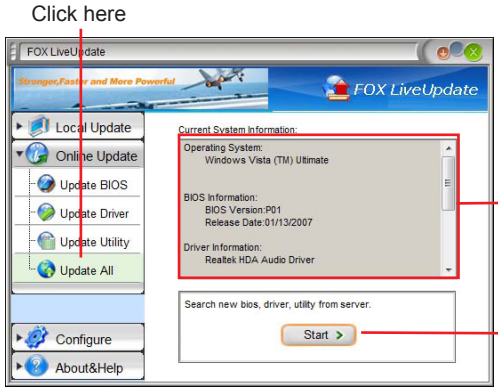
This page lets you update utilities from Internet. Click “start”, it will search the new utilities from Internet. Then follow the wizard to finish the update operation.

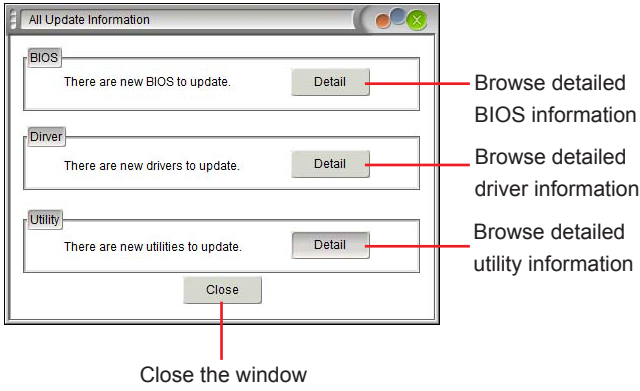




2-4 Online Update - Update All

This page lets you update your system drivers from Internet. Click “start”, it will search all new BIOS/drivers/utilities from Internet. Then follow the wizard to finish the update operation.

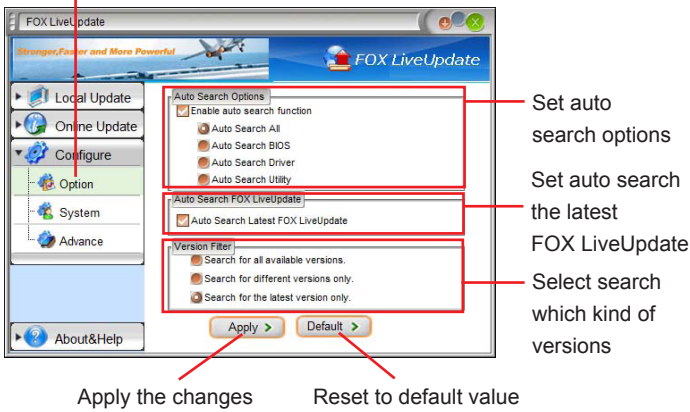




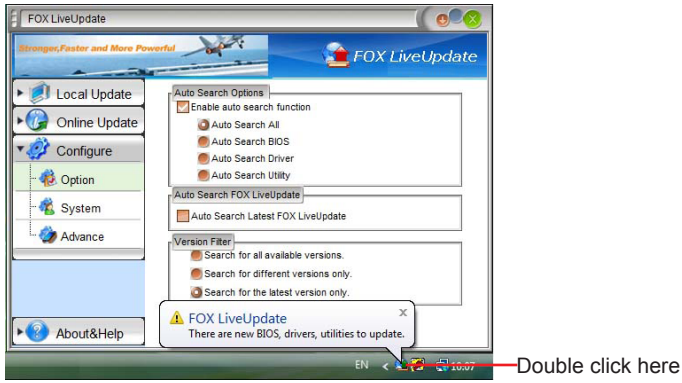
3. Configure

3-1 Configure - option

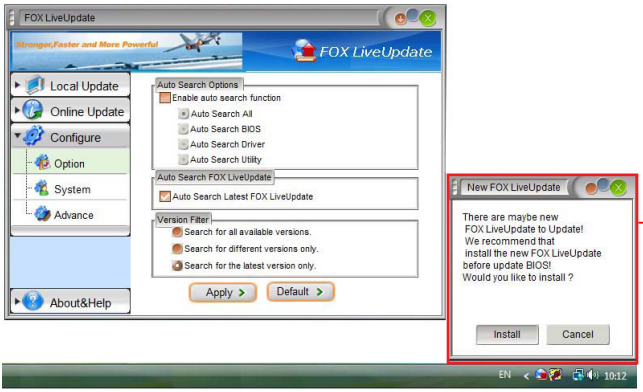
This page lets you set auto search options. After you enable the auto search function, FOX LiveUpdate will start its searching from Internet and if any qualified item found, it will pop out a message on the task bar to inform you to do the next step.



Double click on the icon as show below, you can see the detailed information.



When you enable "Auto Search FOX LiveUpdate", if your FOX LiveUpdate version is older, it will auto search from internet and prompt you to install the new version.

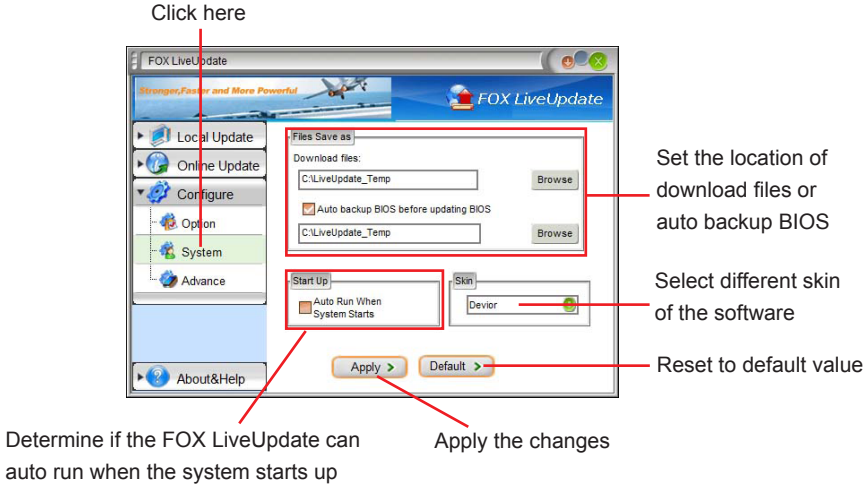


Prompt you to install the new FOX LiveUpdate

4

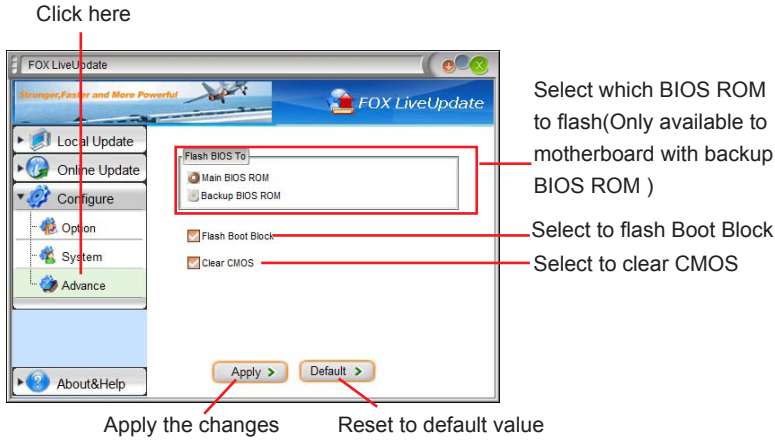
3-2 Configure - System

This page lets you set the backup BIOS location and change different skin of the FOX LiveUpdate utility.



3-3 Configure - Advance

This page lets you select to flash BIOS / Boot Block and clear CMOS. If you choose Flash Boot Block, it means BIOS is not protective, and you must make sure the flash process is continuous and without any interruption.

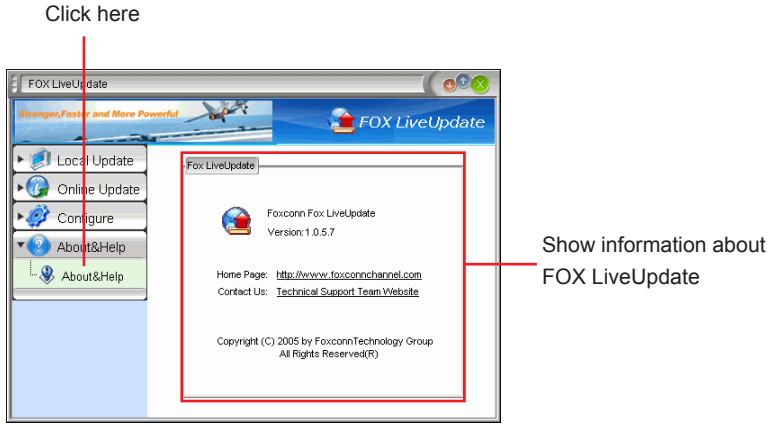


CAUTION

We recommend that you should better keep the default setting unchanged to avoid any damage.

4. About & Help

This page shows some information about FOX LiveUpdate.



FOX LOGO

FOX LOGO is a simple and useful utility to backup, change and delete the boot time Logo. The boot Logo is the image that appears on screen during POST (Power-On Self-Test).

You can prepare a bitmap image (640x480) file, then use FOX LOGO to open it and change the boot time Logo. Boot time Logo will be displayed if you enable the BIOS "Full Screen Logo Show" setting in "Advanced BIOS Features" menu.

Supporting Operating Systems :

- Windows 2000
- Windows XP (32-bit and 64-bit)
- Windows 2003 (32-bit and 64-bit)
- Windows Vista (32-bit and 64-bit)

Using FOX LOGO:

Main Page

When you change Logo or delete current Logo, the system will flash BIOS file automatically. During this time, please DO NOT shut down the application and the system, or the motherboard will be damaged seriously.

FOX DMI

FOX DMI is a full Desktop Management Interface viewer, and it provides three DMI data formats : Report, Data Fields and Memory Dump.
With DMI information, system maker can easily analyze and troubleshoot your mother-board if there is any problem occurred.

Supporting Operating Systems :

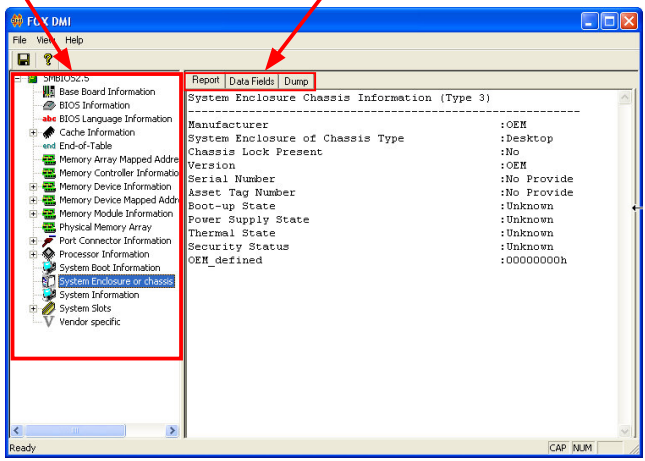
- Windows 2000
- Windows XP (32-bit and 64-bit)
- Windows 2003 (32-bit and 64-bit)
- Windows Vista (32-bit and 64-bit)

Using FOX DMI:

Please operate this utility as the comments shows.

Click here to select the type you want to view.

Click here to select the DMI Data format you need



This chapter will cover two topics :

- Installing a new Windows XP (Vista) in a brand new RAID system.
- Existing Windows XP (Vista) system with new RAID built as data storage.

It includes the following information :

- RAID Configuration Introduction
- Intel® Matrix Storage Manager
- Create a RAID Driver Diskette
- BIOS Configuration
- Create RAID in BIOS
- Install a New Windows XP
- Existing Windows XP with RAID built as data storage

The RAID BIOS Setup pictures shown in this chapter are for reference only, please refer to the practical screen.

Installing a new Windows XP (Vista) in a brand new RAID system.

1. Follow 5-1 to create a RAID driver diskette.
   (Windows Vista has in-box driver by its own and can skip this step).
2. Follow 5-2 to set BIOS setting SATA mode to RAID or AHCI.
3. Follow 5-3 to create RAID in BIOS.
4. Follow 5-4 to Install Windows Operating System.

What kinds of hardware and software you need here :
1. A floppy drive.
2. A CD-ROM drive.
3. Several SATA hard disks.
4. A RAID driver diskette. (Could be bundled in motherboard package.)
5. BLACKOPS CD. (To create RAID driver diskette if it is not bundled.)
6. Windows XP or Vista Install CD.

Existing Windows XP (Vista) system with new RAID built as data storage.

Follow 5-5 to go through the processes to build a new RAID data storage in your existing Windows XP system, it includes :
1. Copy RAID driver setup program to your hard disk. (Vista can skip)
2. Follow 5-2 to set BIOS setting SATA mode to RAID or AHCI.
3. Follow 5-3 to create RAID in BIOS.
4. Run setup program to install Intel® Matrix Storage Manager driver into your current Windows XP system. (Vista can skip this step)
5. Format new RAID partitions.

What kinds of hardware and software you need here :
1. A CD-ROM drive.
2. Several SATA hard disks.
3. A BLACKOPS driver CD.

RAID Configuration Introduction

RAID (Redundant Array of Independent Disks) is a method for computer data storage schemes that divide and/or replicate data among multiple hard drives. RAID can be designed to provide increased data reliability (fault tolerance) or increased I/O (input/output) performance, or both. The motherboard comes with the Intel ICH10R. The following RAID configurations are provided for users.

There are three major key concepts in RAID:
1. Mirroring : The copying of data to more than one disk;
2. Striping : The splitting of data across more than one disk;
3. Error correction : Where redundant data is stored to allow problems to be detected and possibly fixed (known as fault tolerance).

Different RAID levels use one or more of these techniques, depending on the system requirements. The main aims of using RAID are to improve reliability, important for protecting information that is critical to a business, for example a database of customer orders; or where speed is important, for example a system that delivers video on demand TV programs to many viewers.

The configuration affects reliability and performance in different ways. The problem with using more disks is that it is more likely that one will go wrong, but by using error checking the total system can be made more reliable by being able to survive and repair the failure. Basic mirroring can speed up reading data as a system can read different data from both the disks, but it may be slow for writing if it insists that both disks must confirm that the data is correctly written. Striping is often used for performance, where it allows sequences of data to be read off multiple disks at the same time. Error checking typically will slow the system down as data needs to be read from several places and compared. The design of RAID systems is therefore a compromise and understanding the requirements of a system is important. Modern disk arrays typically provide the facility to select the appropriate RAID configuration.

RAID is often used in high availability systems, where it is important that the system keeps running as much of the time as possible.

RAID 0 (Stripe)

RAID 0 reads and writes sectors of data interleaved among multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 128KB. RAID 0 does not support fault tolerance.

RAID 1 (Mirror)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the “spare drive” can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

RAID 5 (Parity)

RAID 5 provides data striping at the byte level and also stripes error correction information. This results in excellent performance and good fault tolerance. Level 5 is one of the most popular implementations of RAID.

RAID 10 (0+1)

RAID 10 is a combination of striping and mirroring. This configuration provides optimal speed and reliability, but you need four SATA hard disks.

Comparison Table :

Solution	Hard Disks No.	Capacity	Performance	Reliability	Application
RAID0	>=2	All	Highest	Dangerous	Look for speed
RAID1	2	50%	Read faster	Excellent	100% Data backup
RAID5	>=3	N-1	Read faster Write slower	Good	Limited budget
RAID10	>=4 (Even number)	Smallest *2	High	Excellent	Unlimited budget

Intel® Matrix Storage Manager

The Intel® Matrix Storage technology supports RAID 0 ,RAID 1, RAID 5, and RAID 10 (0+1) functions. It allows you to get high performance with fault tolerance, big capacity, or data safety provided by different RAID functions.

In this section, we will use four SATA hard disks as an example to guide you how to configure your RAID system. There are two 232.9GBs, one 298.1GB, and one 279.5GB. A creation of second volume will also be well described.

In each screen, there is also a message bar about each key's function, such as <Tab>, <Enter>, <Del>...etc. it is to help making your selection easier.

Two topics will be introduced :

1). Installing a new Windows XP in a brand new RAID system.

2). Existing Windows XP system with new RAID built as data storage.

Before installing the SATA hard disks, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the hardware.

Steps to Install Serial ATA Hard Disks :

1. Install SATA hard disks into the drive bays.
2. Connect one end of the SATA cable to motherboard's SATA connector, and the other end to SATA hard disk.
3. Connect SATA power cable to the power connector of SATA hard disk.

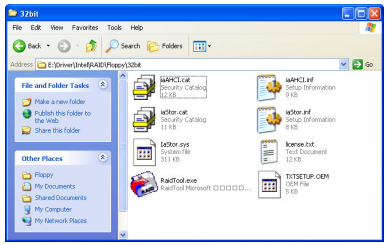
- Both AHCI and RAID modes need to install **Intel® Matrix Storage driver.**
- Set SATA mode in BIOS to AHCI, you can skip RAID BIOS creation steps, but the software driver installation of **Intel® Matrix Storage Manager** shall follow the same rule as described for RAID.

5-1 Create a RAID driver diskette

If you want to install a brand new Windows XP on a AHCI or RAID system, you need to configure the SATA Mode in BIOS to either AHCI or RAID first. You also need to create a RAID driver diskette for use in installing your Windows XP system.
Windows Vista has native RAID driver in itself, you can skip these steps.

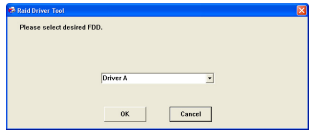
1. Find a PC, put a diskette into its floppy drive A:, this diskette will be formatted later. Put the driver CD into DVD-ROM drive.

2. Depending on which platform your system is, normally, it is a 32-bit XP system. Use Windows explorer, and go to **CD:\Driver\Intel\RAID\Floppy\32bit**, click on **RaidTool** icon to start the creation.

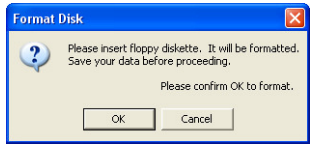


3. Click "GO" to start.

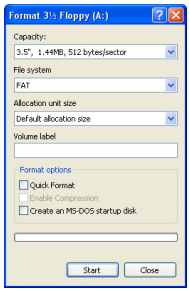
4. Select the desired destination FDD drive. It can be the default drive A: or any USB FDD. Click "OK" to continue.



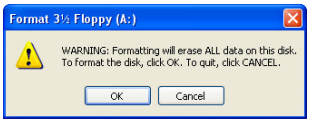
5. Insert a diskette, click "OK" to continue.



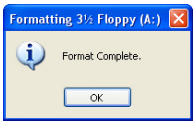
6. You can input a volume label for this diskette, click on "Start" to format.



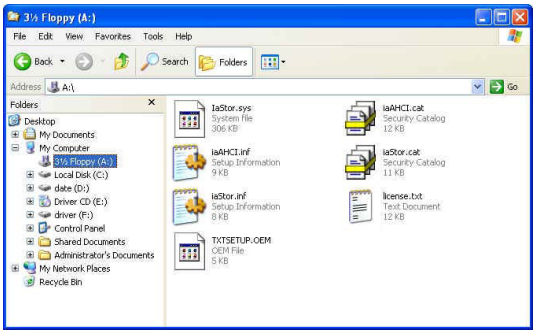
7. Click on "OK" to go through this warning message.



8. Format finished. Click "OK" to continue copying of RAID driver into this diskette.



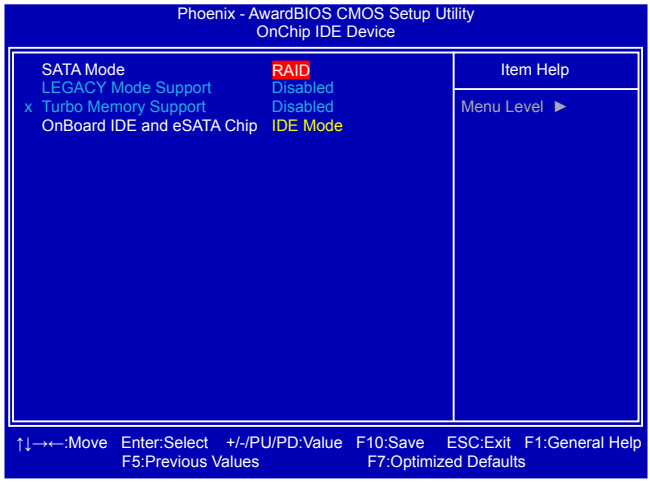
9. Check if the diskette contains the driver files.
   Later, when in the process of installing Windows XP in your RAID system, it will ask you to use this floppy diskette to provide driver for additional specific devices, for example, a RAID device.



10. Install Serial ATA Hard Disks :
    10-1. Shut down your computer.
    10-2. Install SATA hard disks into the drive bays, connect all power and SATA cables.

5-2 BIOS Configuration

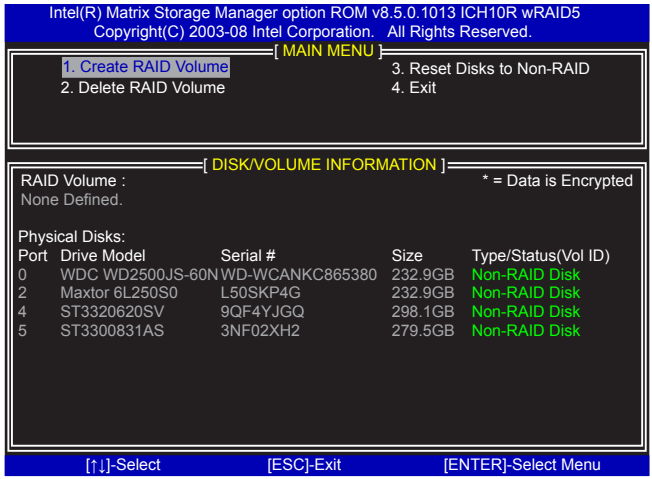
1. Enter the BIOS setup by pressing <DEL> key during the POST(Power On Self Test).
2. Select the “Integrated Peripherals” from the “Main menu”, then select the “OnChip ATA Device” item and press <Enter> to go to the configuration items.
3. Select and Set the “SATA Mode” option to [RAID].
4. Press <F10> to save the setting then PC will reboot itself.



5-3 Create RAID in BIOS

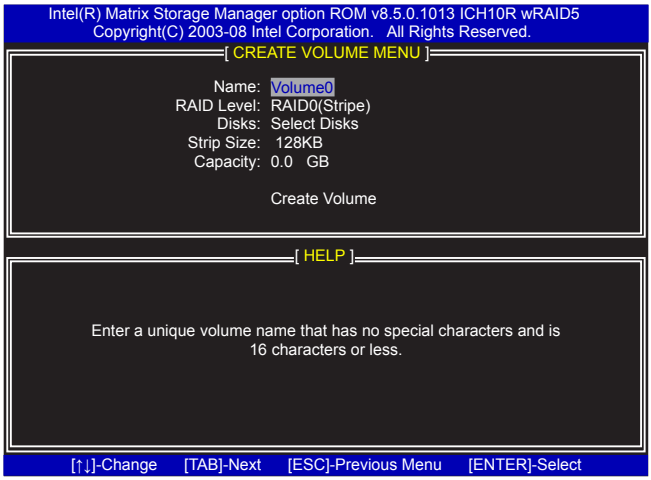
Enter RAID BIOS Setup

When BIOS is restarted, it will display a message asking you to press <Ctrl>+<I> keys simultaneously to enter the main menu of Intel® Matrix Storage Manager Option ROM Utility. Press the <Ctrl>+<I> to enter Configuration Utility.



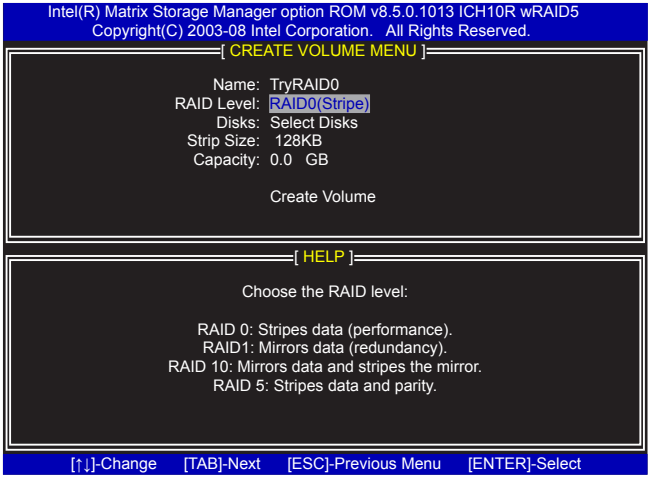
Create RAID Volume
Create RAID 0 (1st Volume)

1. Select "**1. Create RAID Volume**" from the menu and press <Enter>.
The menu appears :

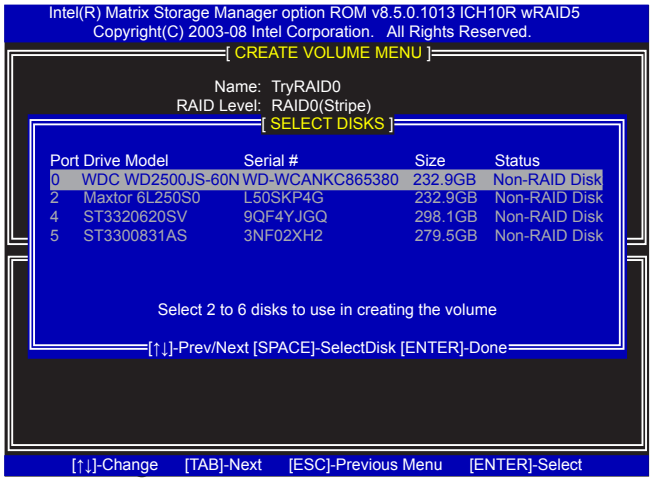


2. In "**Name**" item, you can input a device name for the RAID0 system and press <Enter> to apply it. Here, we name it as TryRAID0 to replace the default Volume0.

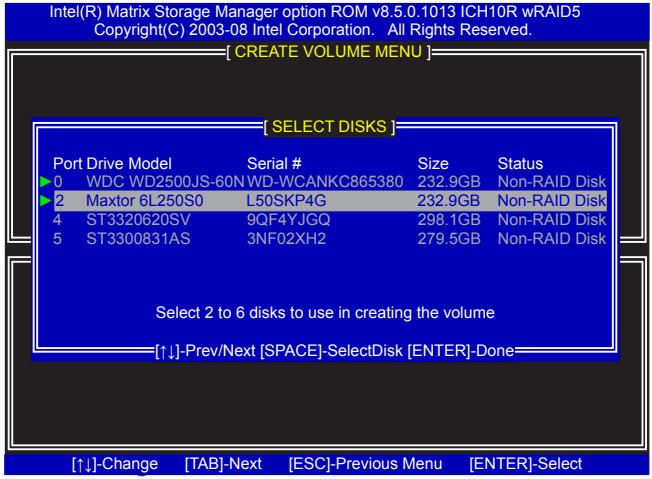
3. In "**RAID Level**" item, you can use Up or Down arrow key to make a selection from one of RAID0, 1, 5, 10 items. Select RAID0 (Stripe) and press <Enter>.



4. It then goes to “**Disks**” item. Press <Enter> to choose the hard disks for this RAID0 system.

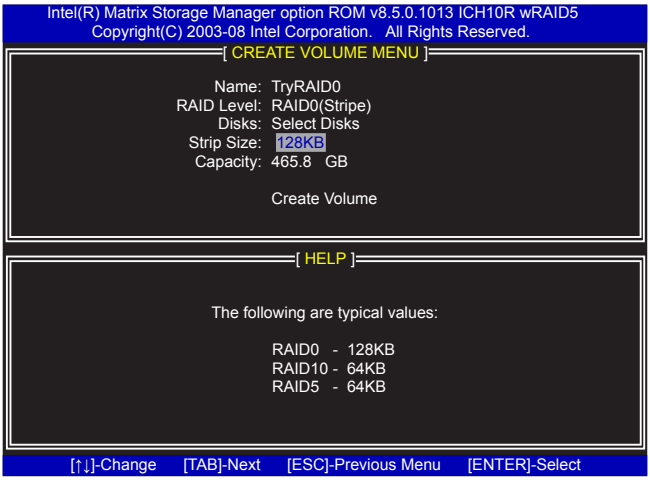


5. From the hard drive list, use Up or Down arrow key to reach the hard disks you want to combine them as RAID0, then press <Space> key to select them. A triangle sign will appear to indicate the drive selected. Here, we select two 232.9GB hard disks as an example. Press <Enter> key to finish the selection.

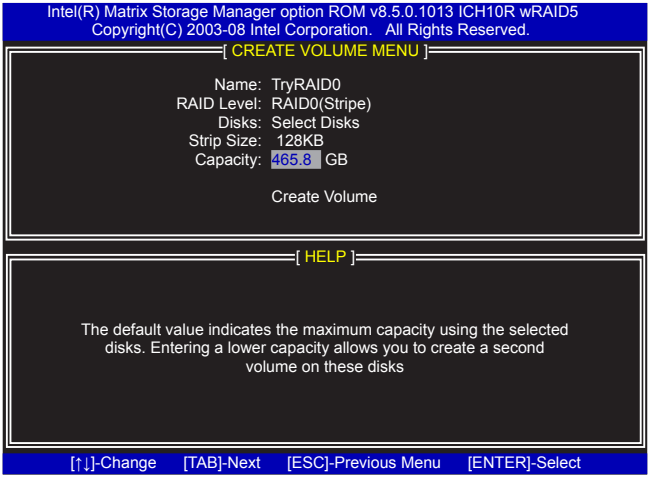


6. It is now entering “**Strip Size**” menu. Use Up or Down arrow key to select the desired strip size. The available values range from 4KB to 128KB. The strip value should be selected based on different applications. Some suggested choices are :
   16K - Best for sequential transfer.
   64K - Good general purpose strip size.
   128K - Best performance for most desktops and workstations .

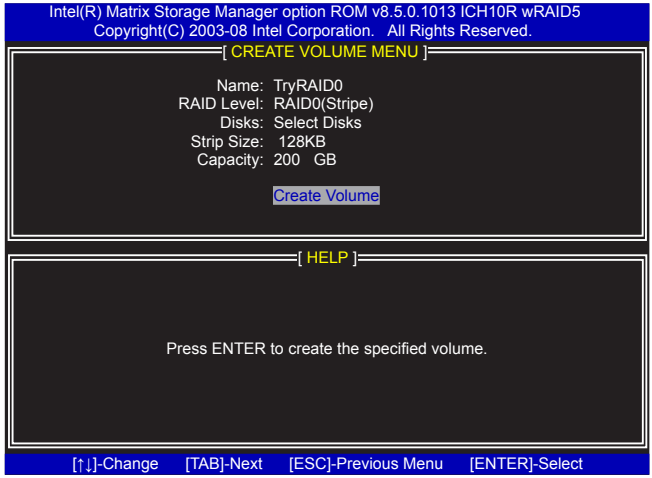
The default value is 128K for RAID0. Press <Enter>.



7. In “**Capacity**” line, it displays there are maximum 232.9GB * 2 = 465.8GB available. As we want to introduce how to create two disk volumes (like logical devices C: and D:) in a RAID0 system, so we only key in 200GB here to build the first volume. Later, we will also describe how the second volume is generated. Input 200GB, and press <Enter>.

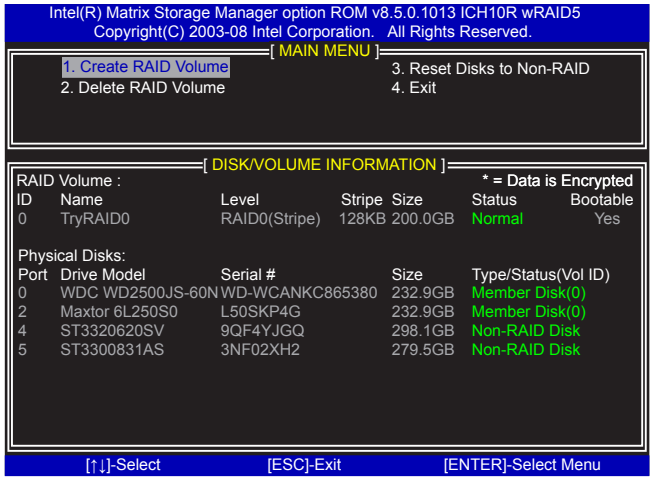


8. In “**Create Volume**” item, press <Enter>.



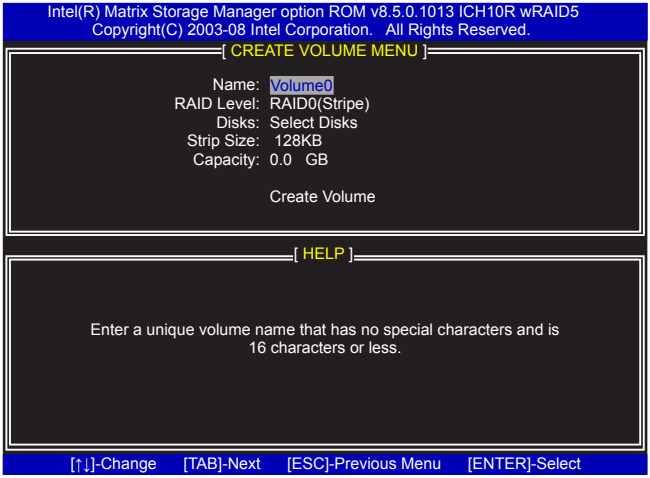
A warning message will appear :

9. Press <Y> to create the volume and return to the main menu, a 200GB RAID0 system is normally configured.



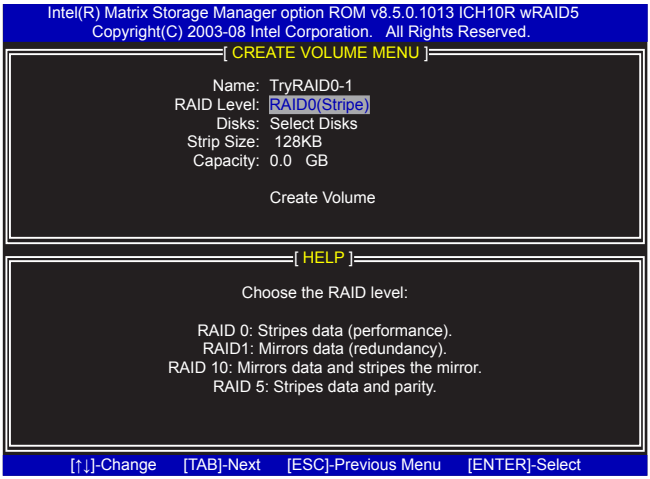
Create RAID0 (2nd Volume)

1. Select "**1. Create RAID Volume**" from the menu and press <Enter>.
   The menu appears :

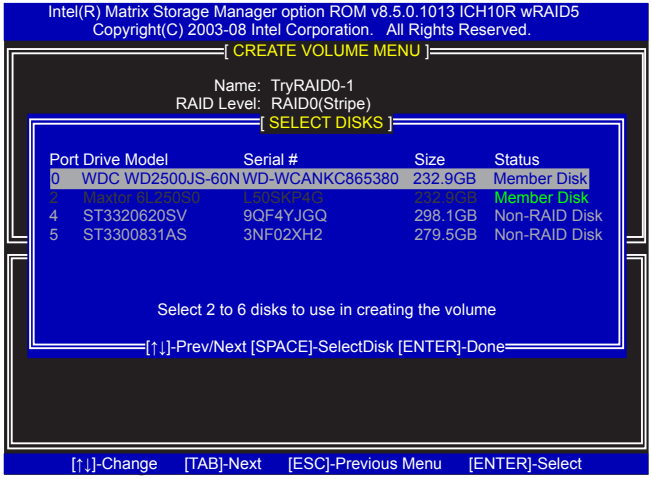


2. In "**Name**" item, we name it as TryRAID0-1 for second volume.
3. In "**RAID Level**" item, you can use Up or Down arrow key to make a selection, only RAID0, 1 can be selected. Select RAID0 (Stripe) and press <Enter>.

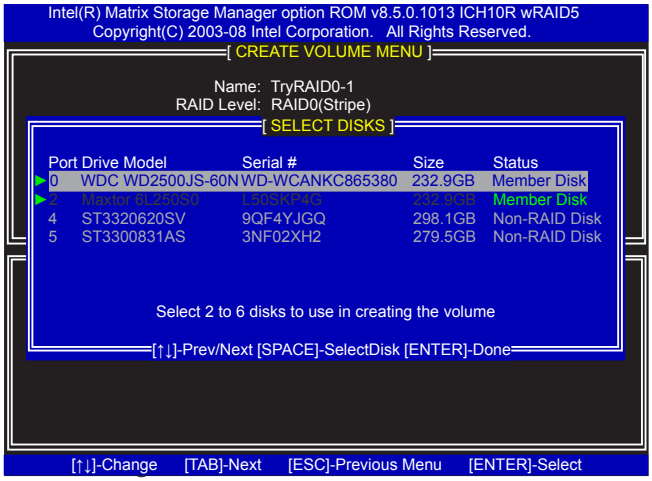
(Note : You also can try to select RAID1 for the second volume as an experiment here)



4. It then goes to “**Disks**” item. Press <Enter> to choose the hard disks for this RAID0 second volume system.



5. From the hard disk list, select the previously configured RAID0 hard disks, and press <Space> key to select them. Two triangle signs will appear to indicate the selections. Press <Enter> to continue.



6. It goes to “**Strip Size**” menu directly. Capacity automatically displays 265.8GB, and at this time, you can not input any value in capacity as there is no additional volume available.

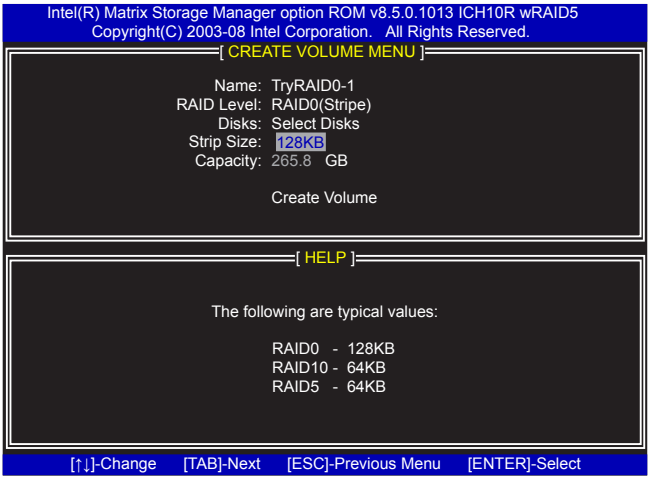
The available values of Strip Size range from 4KB to 128KB. The strip value should be selected based on different applications. Some suggested choices are :

16K - Best for sequential transfer.

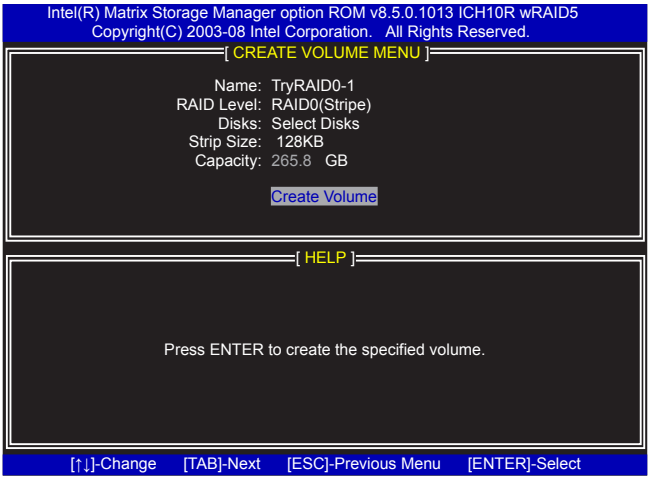
64K - Good general purpose strip size.

128K - Best performance for most desktops and workstations .

The default value is 128K. Press <Enter>.

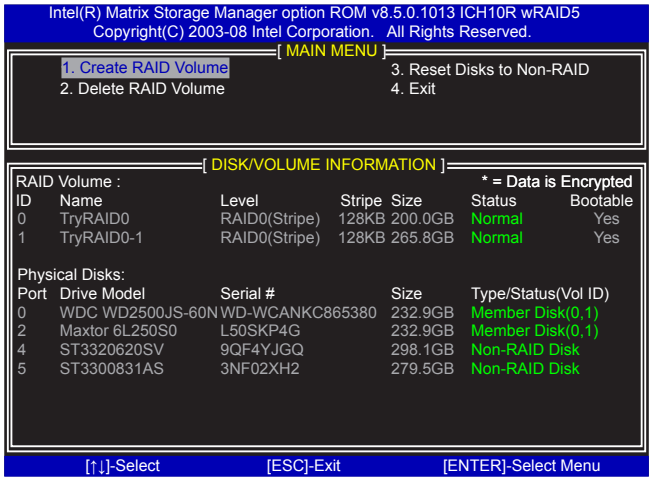


7. Select “**Create Volume**” and press <Enter>.



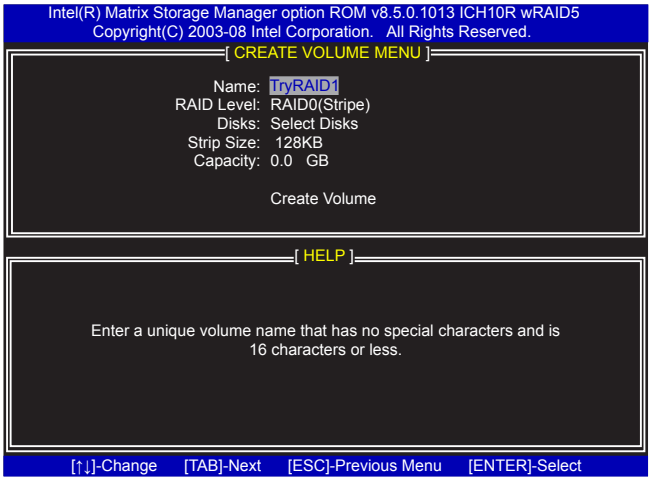
A message will appear :

Press <Y> to create the volume and return to the main menu. Two RAID0 volumes were configured.

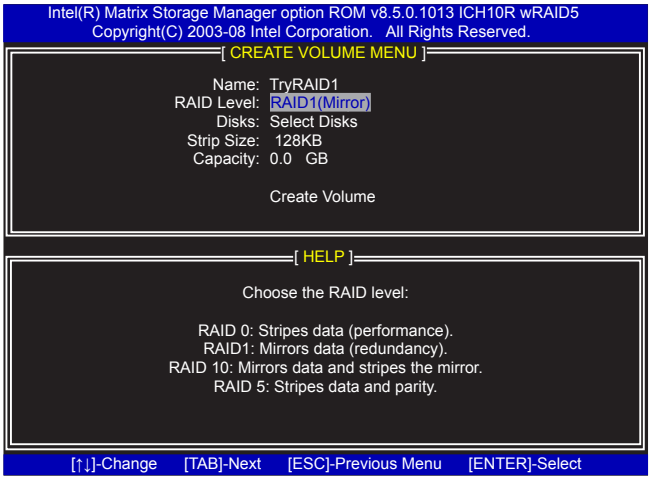


Create RAID 1

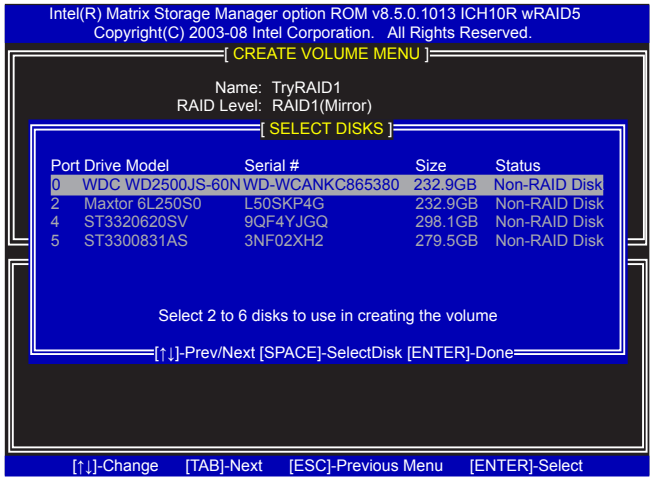
1. Select “**1.Create RAID Volume**” from the main menu and press <Enter>.
2. In "**Name**" item, you can input a device name for the RAID1 system and press <Enter> to apply it. Here, we name it as TryRAID1 to replace the default Volume0.



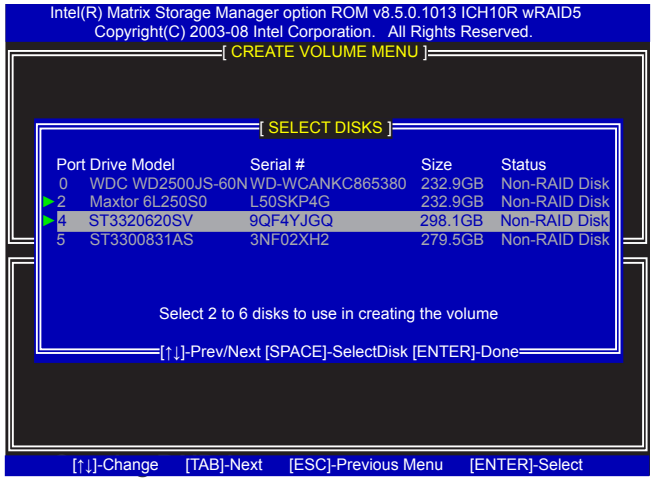
3. In “**RAID Level**” item, you can use Up or Down arrow key to make a selection from one of RAID0, 1, 5, 10 items. Select RAID1 (Mirror) and press <Enter>.



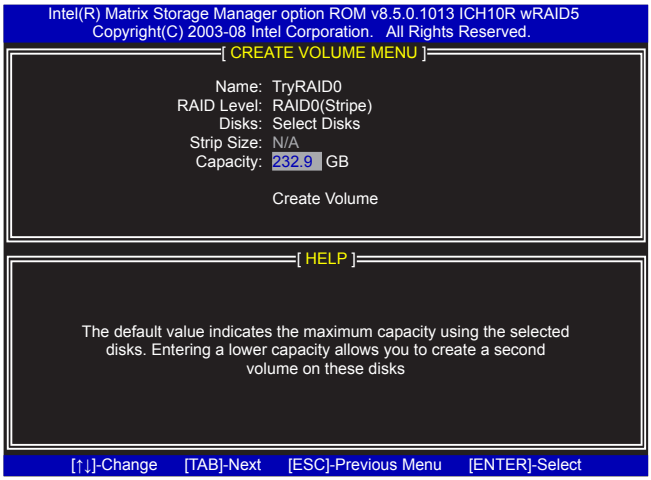
4. It then goes to "**Disks**" item. Press <Enter> to choose the hard disks for this RAID1 system.



5. From the hard drive list, use Up or Down arrow key to reach the hard disks you want to combine them as RAID1, then press <Space> key to select them. A triangle sign will appear to indicate the drive selection. Here, we select one 232.9GB and one 298.1GB hard disks. Press <Enter> key to finish the selection.

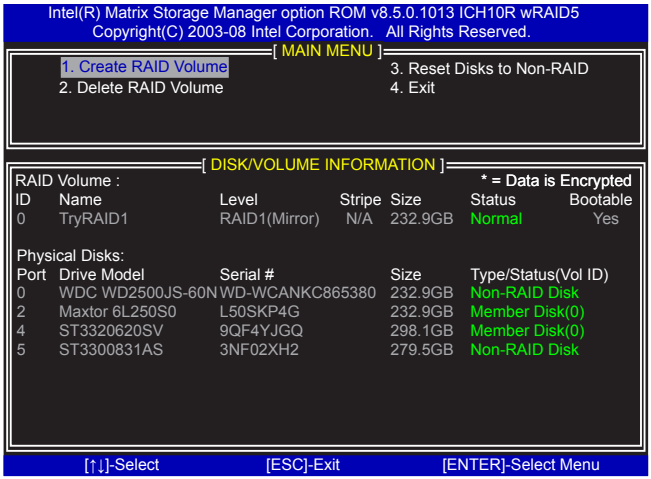


6. It will skip “**Strip Size**” menu for RAID1.



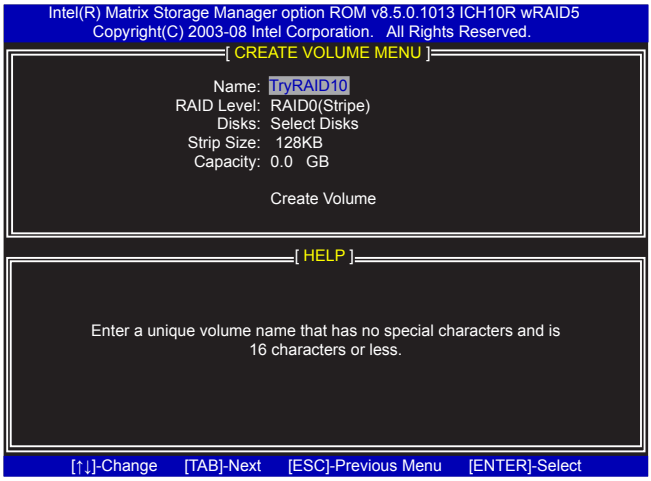
7. In “**Capacity**” item, use the default value, and press <Enter>. The size of the smaller hard disk 232.9GB is becoming the default value, and it indicates the maximum capacity.
8. Select “**Create Volume**” and press <Enter>. A warning message will appear :

Press <Y> to create the volume and return to the main menu.

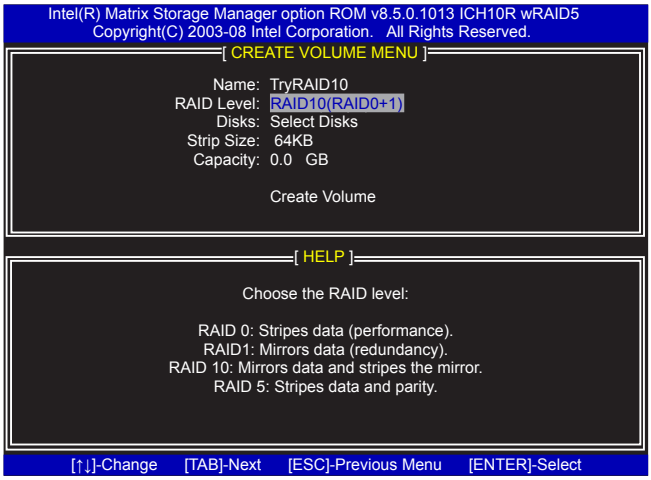


Create RAID 10 (0+1)

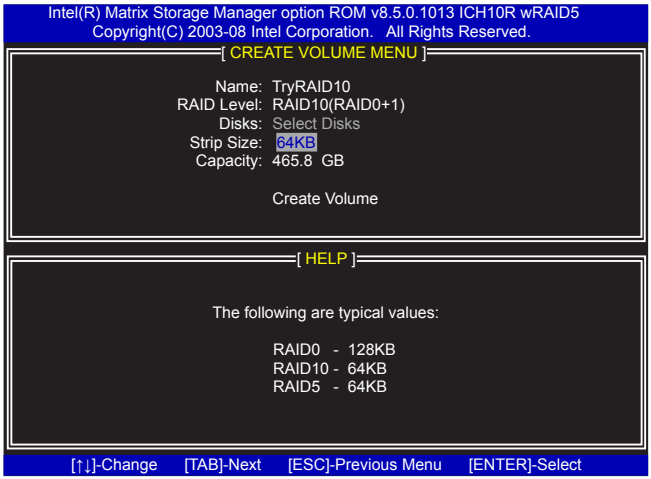
1. Select "**1.Create RAID Volume**" from the main menu and press <Enter>.
2. In "**Name**" item, you can input a device name for the RAID10 system and press <Enter> to apply it. Here, we name it as TryRAID10 to replace the default Volume0.



3. In "**RAID Level**" item, you can use Up or Down arrow key to make a selection from one of RAID0, 1, 5, 10 items. Select RAID10(RAID0+1) and press <Enter>.

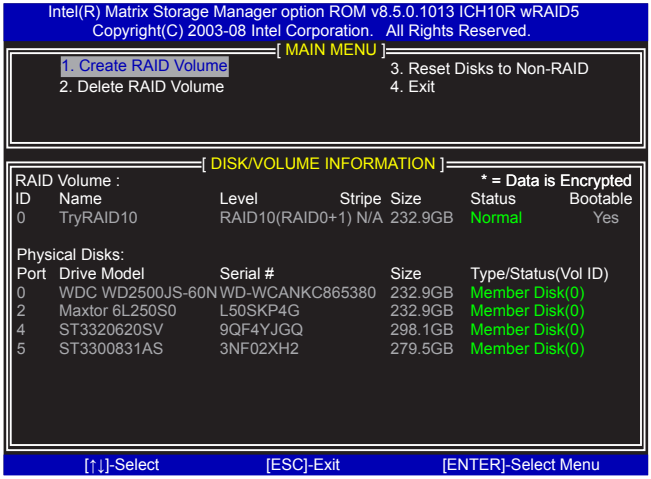


4. After exiting from "**RAID Level**", it goes directly to "**Stripe Size**" item. Because all four disks are selected for RAID10, so there is no need to go to **Disks** option.
5. Use Up or Down arrow key to select the desired strip size when entering "**Strip Size**" menu. The default value is 64K.



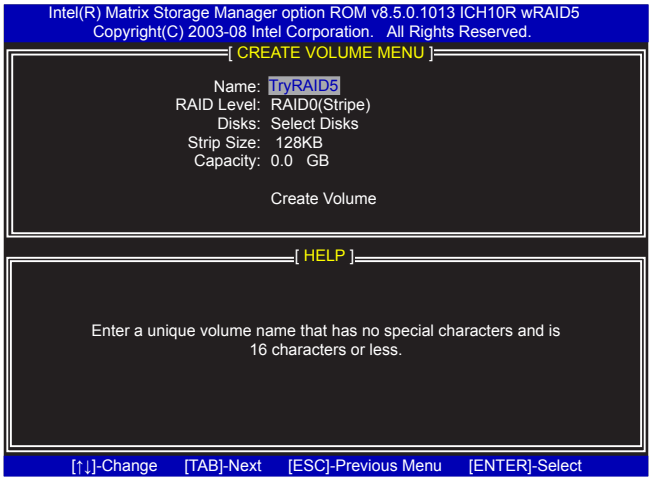
6. In "**Capacity**" item, use the default value, and press <Enter>. The default value is twice the smallest hard disk size, that is, 232.9GB * 2 = 465.8GB.
7. Select "**Create Volume**" and press <Enter>. A warning message will appear :

Press <Y> to create the volume and return to the main menu.

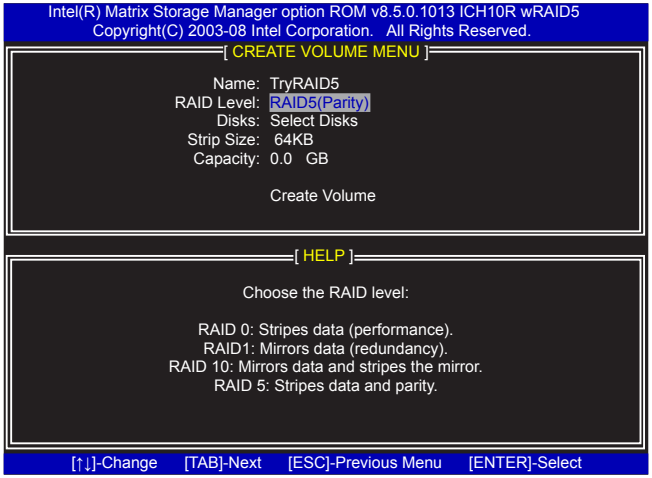


Create RAID5 (Parity)

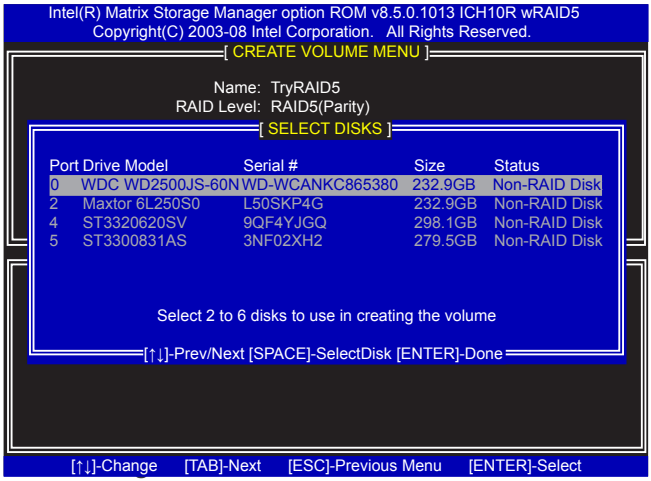
1. Select “**1.Create RAID Volume**” from the main menu and press <Enter>.
2. In "**Name**" item, you can input a device name for the RAID5 system and press <Enter> to apply it. Here, we name it as TryRAID5 to replace the default Volume0.



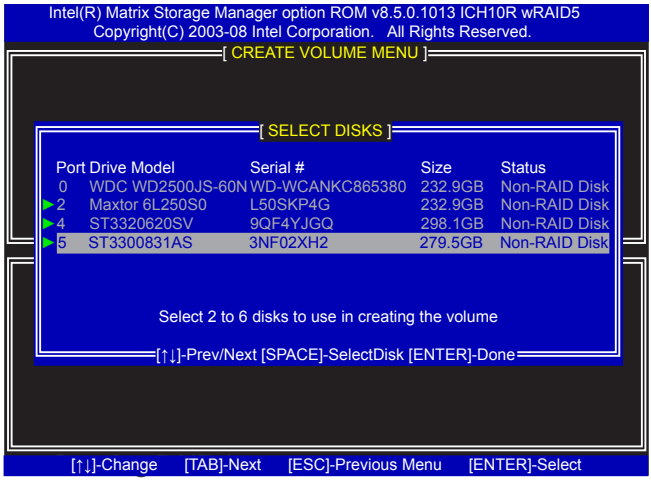
3. In “**RAID Level**” item, you can use Up or Down arrow key to make a selection from one of RAID0, 1, 5, 10 items. Select RAID5(Parity) and press <Enter>.



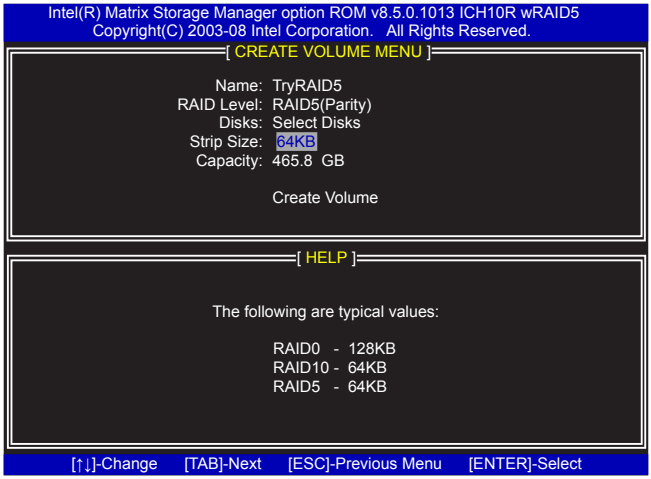
4. It then goes to “**Disks**” item. Press <Enter> to choose the hard disks for this RAID5 system.



5. From the hard drive list, use Up or Down arrow key to reach the hard disks you want to combine them as RAID5, then press <Space> key to select them. A triangle sign will appear to indicate the drive selection. Here, we select 232.9GB, 298.1GB and 279.5GB hard disks for an example. Press <Enter> key to finish the selection.

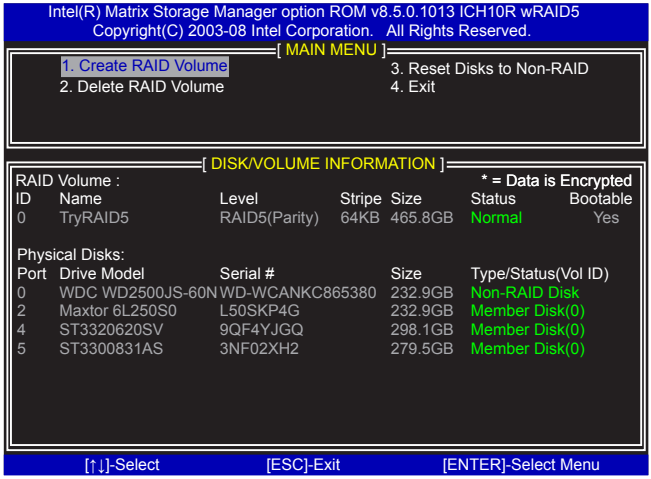


6. Use Up or Down arrow key to select the desired strip size when entering "**Strip Size**" menu. The default value is 64K. Press <Enter>.



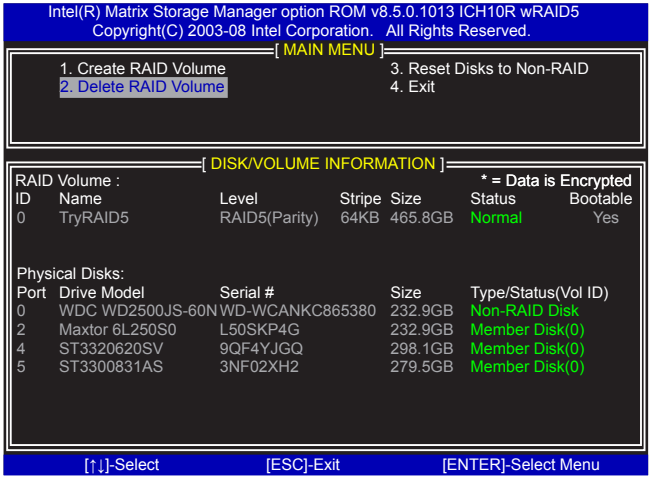
7. In "**Capacity**" item, use the default value, and press <Enter>. The default value is twice that of the smallest hard disk size, that is, 232.9GB * 2 = 465.8GB.
8. Select "**Create Volume**" and press <Enter>. A warning message will appear :

Press <Y> to create the volume and return to the main menu.

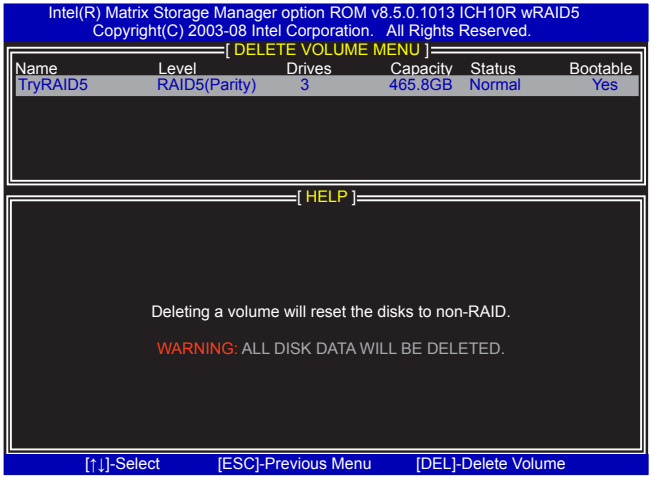


Delete RAID Volume

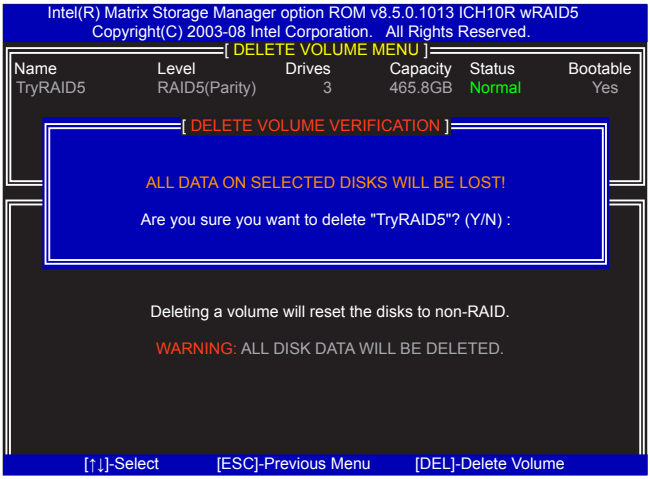
1. Take TryRAID5 for example. Select "**2. Delete RAID Volume**" in main menu and press <Enter>.



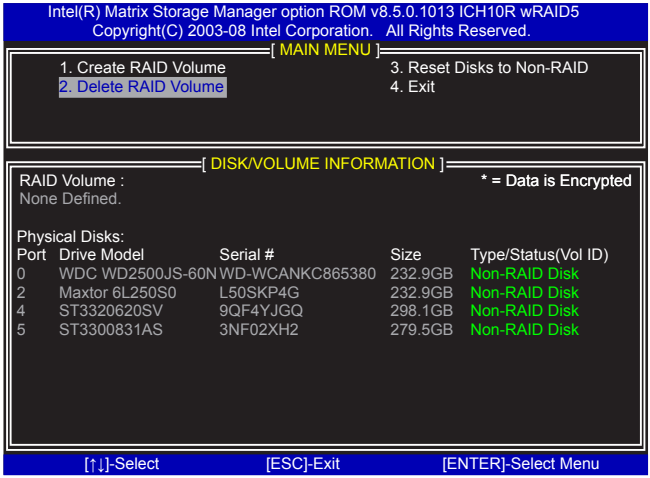
2. Use Up or Down arrow key to select the RAID set you want to delete. Here only one RAID5 is seen, so press <DEL> key to continue.



3. After <DEL> key is pressed, the screen appears as below:
Press <Y> key to confirm the volume deletion.



4. Return to Main Menu.

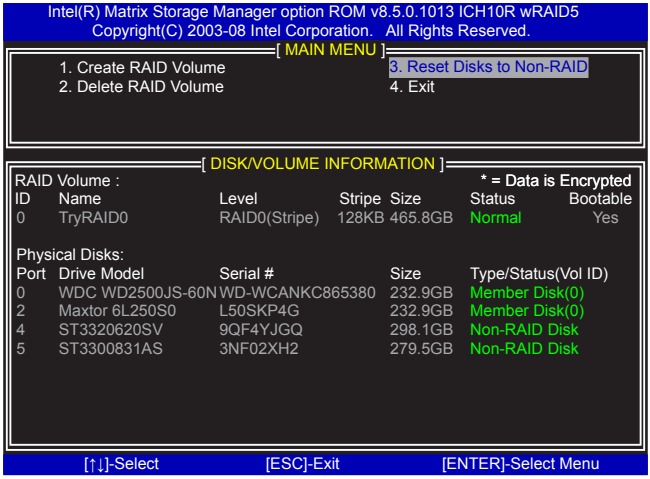


Reset Disks to Non-RAID

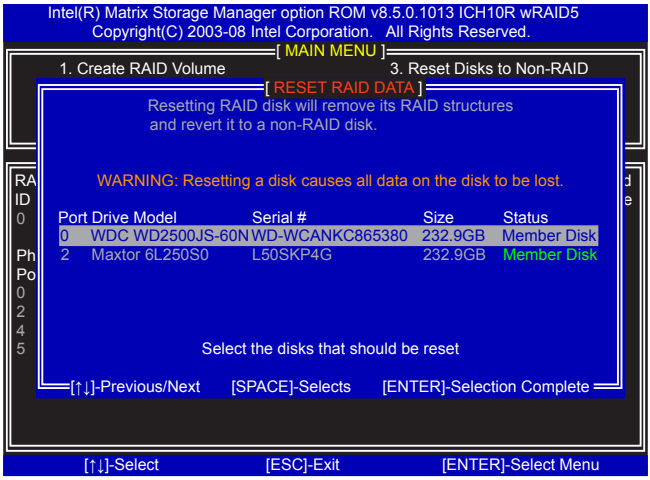
Reset RAID volume allows you to replace a failed disk with a new one, and the operating system will rebuild the data later. For RAID0, reset a hard disk would totally crash the system, but for RAID1, RAID10 and RAID5, they all can be rebuilt.
When rebuild is needed, you must first install a new hard disk in your system before getting into Intel® Matrix Storage Manager utility, because the utility will ask you which hard disk the new rebuild will be performed.

Example 1. Reset a RAID0 system.

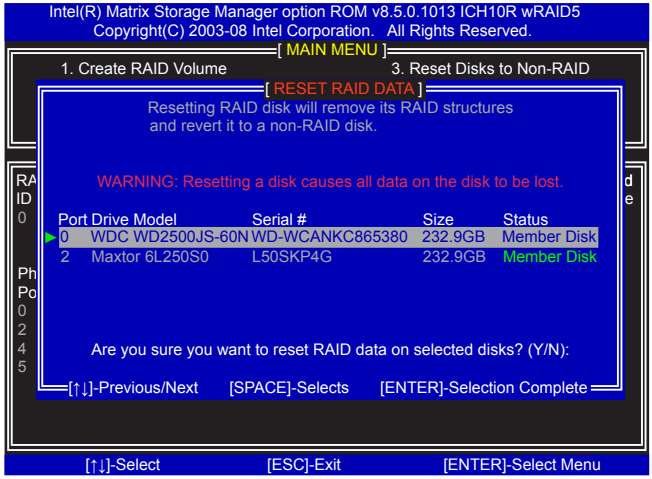
1. A TryRAID0 volume was built with two 232.9GB hard disks, we want to reset one of them. Select "**3. Reset Disks to Non-RAID**" in main menu and press <Enter>.



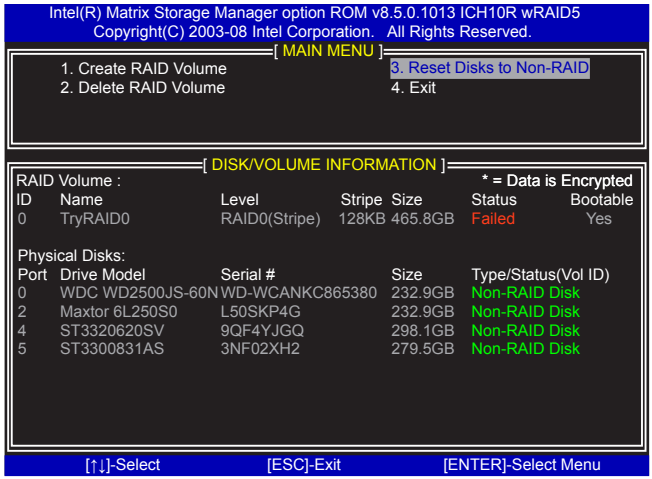
2. A warning message is displayed.



3. Select WDC hard disk as the one to be reset. Press <Enter>. A double confirmation message pops out, press <Y> to confirm.

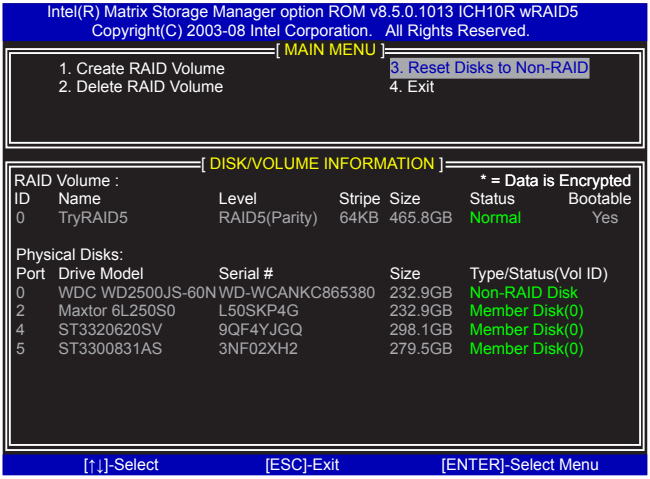


4. It goes back to Main menu with a "Failed" status of RAID0 volume.

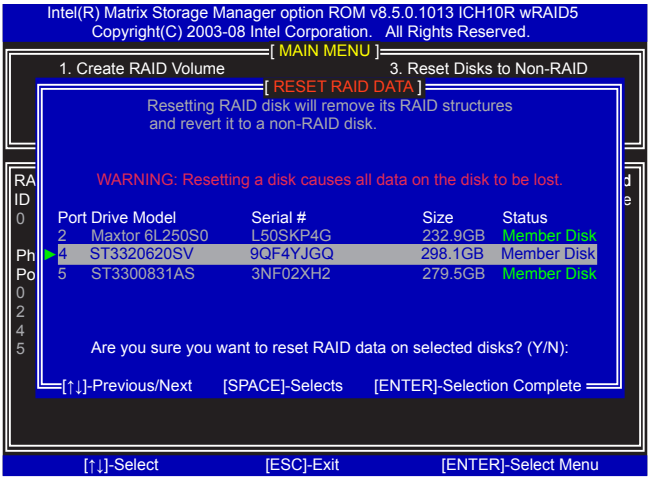


Example 2. Reset a RAID5 system

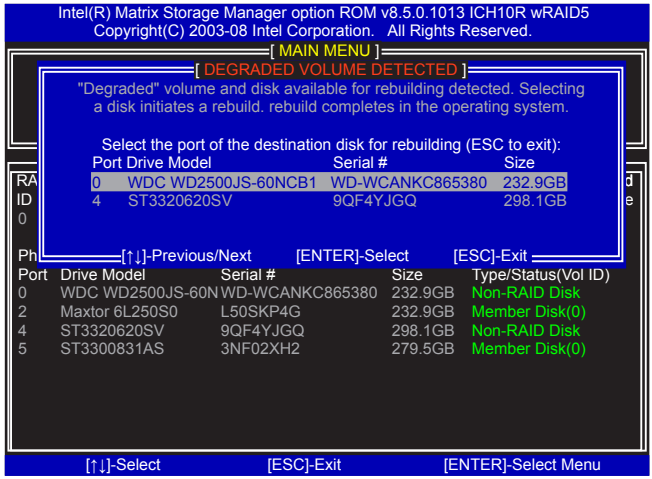
1. A TryRAID5 volume was built with three hard disks, we want to reset one of them. Select "**3. Reset Disks to Non-RAID**" in main menu and press <Enter>.



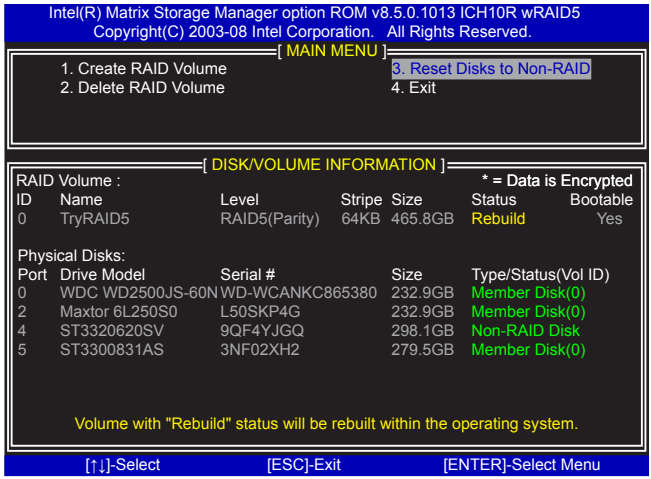
2. A warning message is displayed.
3. Select "**Port 4 - ST3320620SV**" hard disk as the one to be reset. Press <Enter>. A double confirmation message pops out, press <Y> to confirm.



4. A "**DEGRADED VOLUME DETECTED**" screen pops out asking you to select a new hard disk for rebuilding. Here, we select WDC 232.9GB. Press <Enter> to select it.

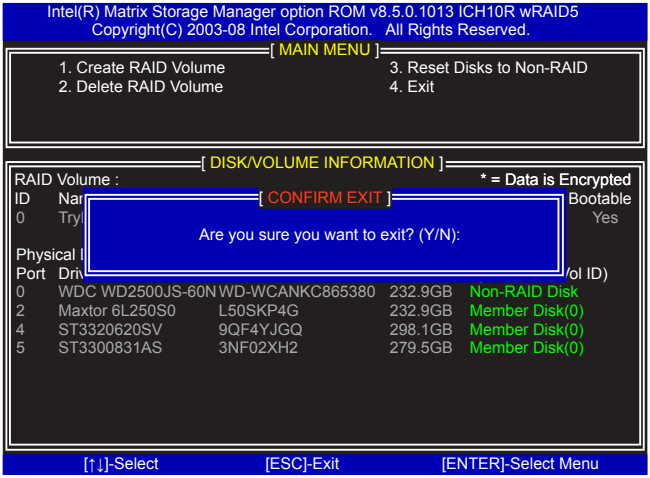


5. It goes back to Main menu with a "Rebuild" status of RAID5 volume. Eventually, a replacement hard disk has to join in and it always keeps three hard disks in the RAID5 system.
6. Operating System will perform the rebuilding later.



Exit RAID BIOS

1. Take TryRAID5 as an example, select "**4. Exit**" in main menu and press <Enter>. The screen displays :



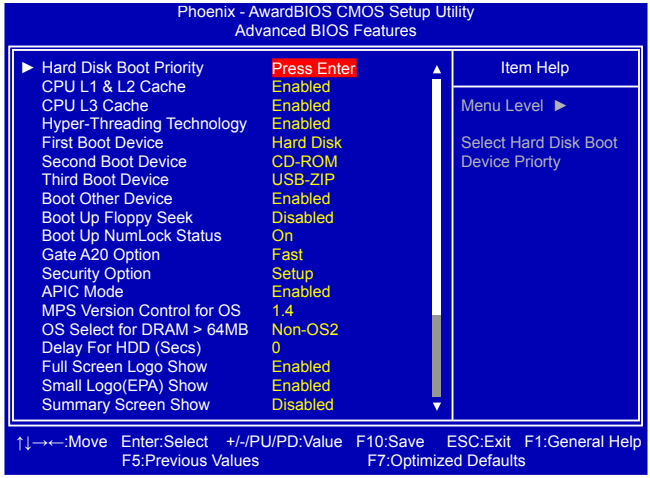
2. Press <Y> to exit Intel® Matrix Storage Manager program. The system will reboot.
3. Shut down the computer, remove WD hard disk, and we will continue for Windows OS installation. If you do not remove irrelevant WD hard disk, Windows may detect it during the installation, and you could be confused.
4. Remove any diskette from floppy drive.
5. Restart computer to start Windows installation.

5-4 Install a New Windows XP

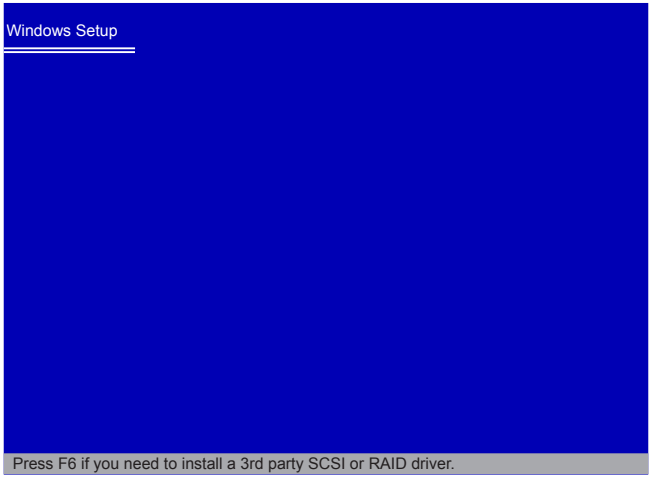
CAUTION

When you set the SATA Mode in BIOS to either AHCI or RAID, you need to follow these steps to install your Windows XP system.

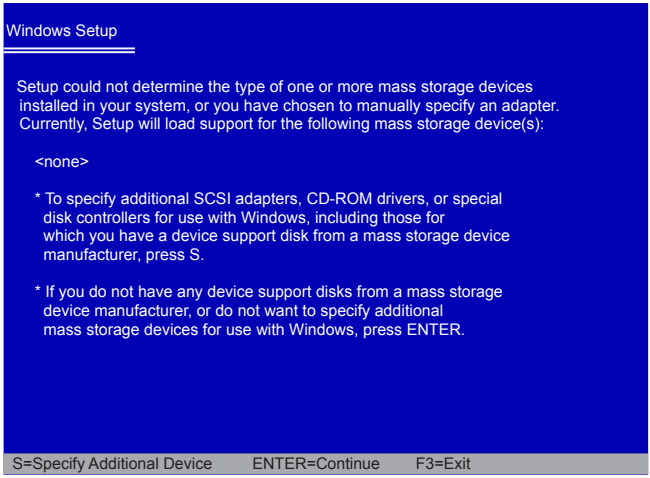
1. Press <DEL> to enter BIOS Setup during POST.
2. Insert the Windows installation CD into the optical drive.
3. Set the “1st Boot Device” to “CDROM”, save changes and exit the BIOS setup.



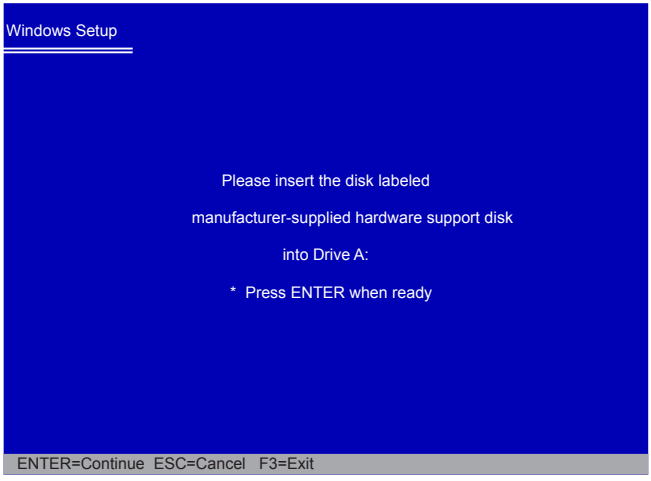
4. The computer will reboot, and it will start installing Windows Operating System. Watch the screen carefully, when the following picture appears, press <F6> key immediately. If you forgot to do this, PC will go to an fatal blue screen, and you may need to reboot the system again. PC may not respond to your <F6> input immediately, and it keeps loading files until the next screen displays.



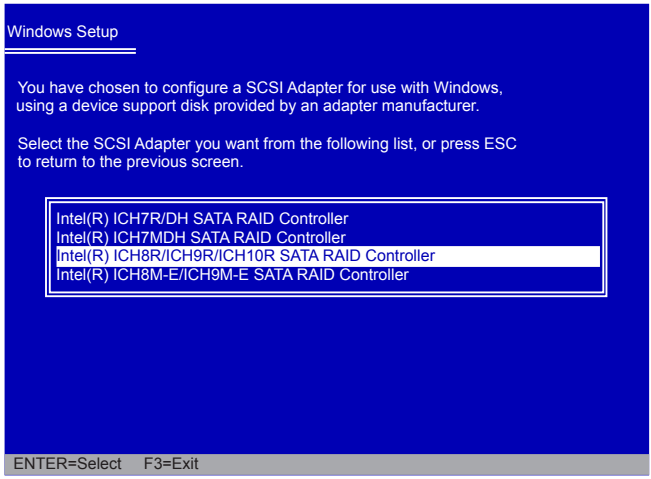
5. After some files are copied to your system, the following picture appears, press <S> to continue the specific driver installation.



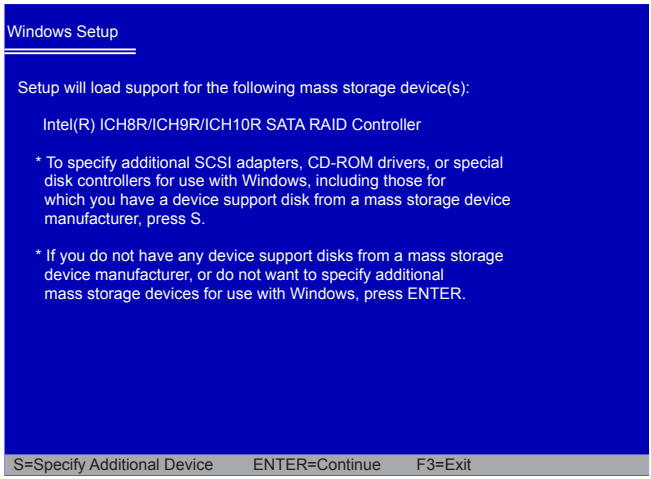
6. It will ask you to insert the RAID driver diskette into you floppy drive. Press <Enter> after it is done.



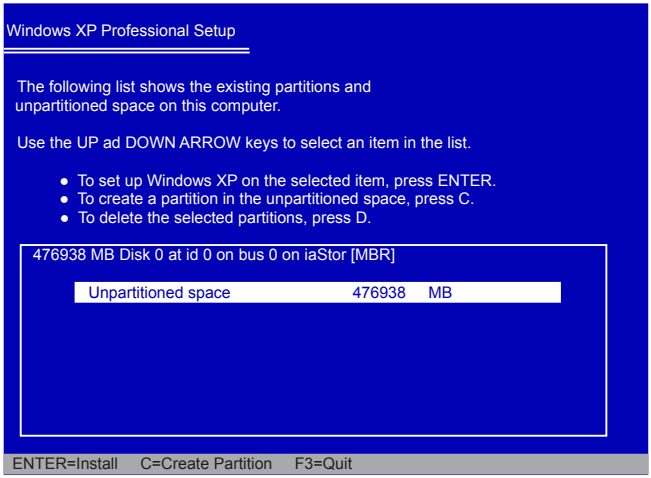
7. Depending on South Bridge chip of your system, select appropriate driver for it. Here, we choose Intel® ICH8R/ICH9R/ICH10R SATA RAID Controller. Press <Enter> to select it.



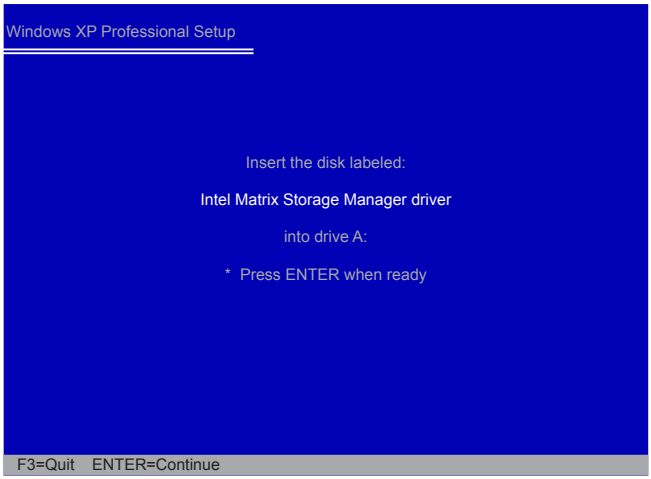
8. A confirmation message pops out to double check if the driver is really what we wanted. Press <Enter> to continue.



9. Windows will display the partition of your system, you have to create partitions as many as you wish, assign them C:, D: or E: drive names. After partitions were done, you can press <Enter> to continue. It will ask you to format your hard disk, then copy files...etc., until the whole Windows is setup.



10. You must always keep RAID diskette in the floppy drive during Windows XP installation, otherwise, Windows may ask you to put it inside again by below message. There are many times Windows XP may copy files from the floppy drive, please remember.
11. Follow the Windows XP install processes to finish the set up.



5-5 Existing Windows XP with RAID built as data storage

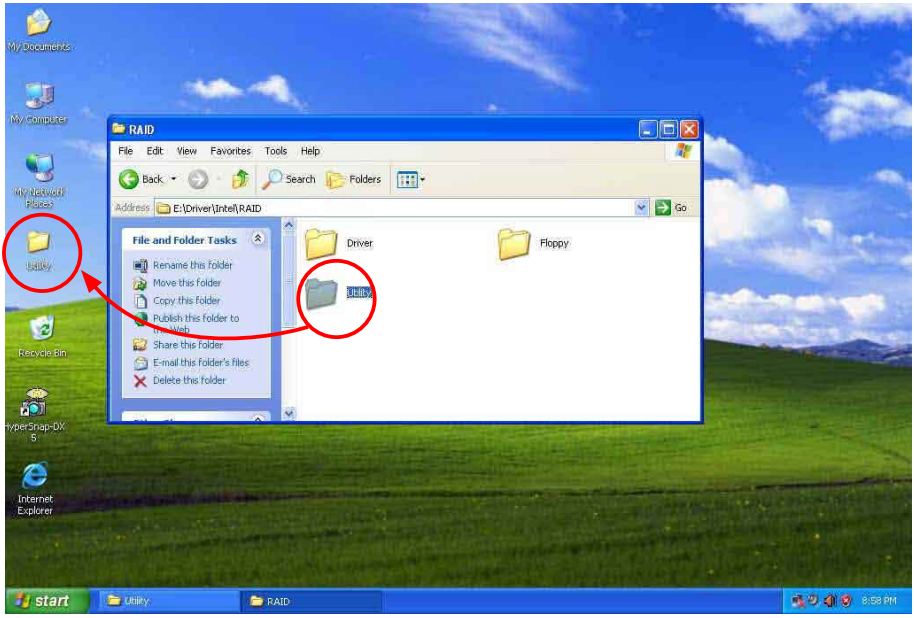
When you already have a Windows XP system running at a traditional IDE hard disk, and you want to keep it unchanged, but you also want to expand the system with some SATA hard disks, to come out a new RAID system for data storage. In this case, you need to install the Intel® Matrix Storage Manager into your Windows XP system first.

The conditions to install Intel® driver successfully, you need :
1. BIOS SATA mode must be set to [AHCI] or [RAID].
2. You'd better have an IDE CD drive.

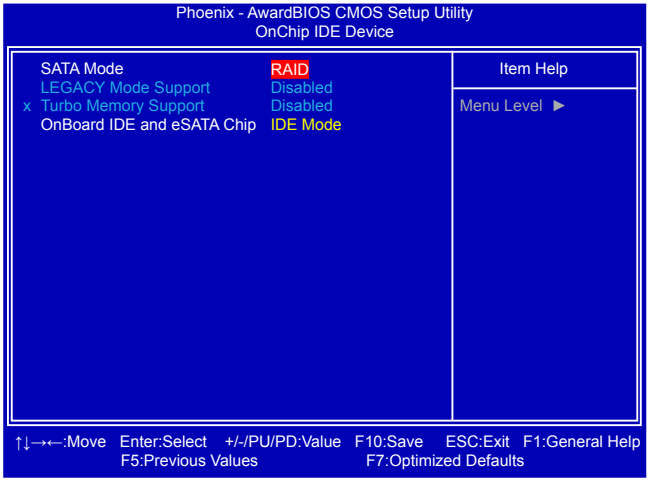
If you have a SATA CD drive and the BIOS SATA mode was set to [AHCI] or [RAID], in Windows XP platform, this CD drive can not be recognized if Intel® Matrix Storage Manager has not been installed. If the system can not recognize it, how can the driver be installed ? This is the reason why we need to come out a standard procedure for SATA CD drive users.

The correct steps are :

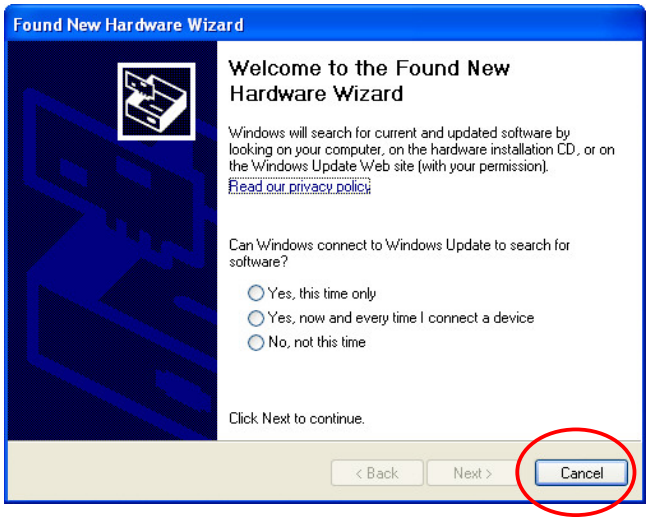
1. In current Windows XP system (no matter what SATA or IDE CD drive you have), browse the CD, copy the whole directory of Intel® Matrix Storage Manager setup program to your desktop. For example, drag and copy directory "**\Driver\Intel\RAID\Utility**" to your desktop.



2. Copy section 5-2, BIOS Configuration.
   Shut down the computer, connect SATA hard disks to SATA ports, power on computer again.
   Press <Del> key, get into BIOS, set SATA mode to [RAID], press <F10> to save and exit BIOS. PC will reboot.

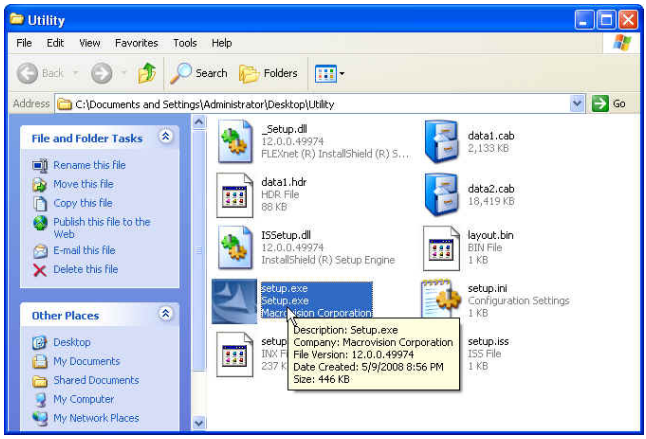


3. Copy section 5-3, Create RAID in BIOS.
   Press <CTRL><I> simultaneously to get into RAID BIOS set up (Intel® Matrix Storage Manager option ROM utility).
   Configure your new hard disks to RAID0, 1, 5 or 10. Exit RAID BIOS. PC will reboot.
4. The Windows XP is running again and a new hardware of RAID disk was found.
   Click [Cancel] to skip this Wizard.

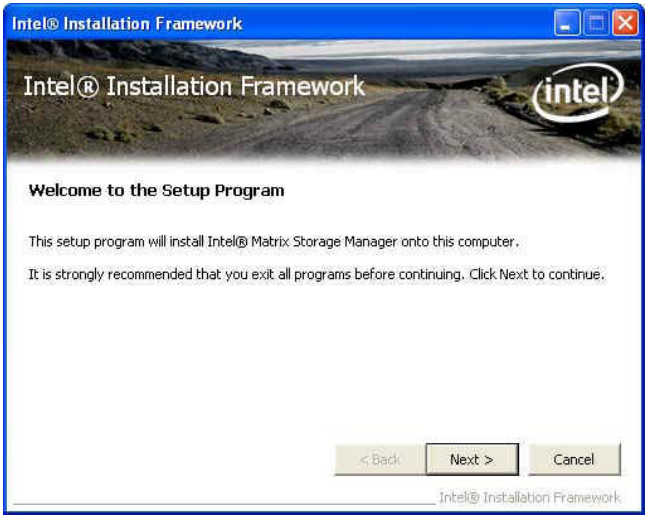


Click to exit.

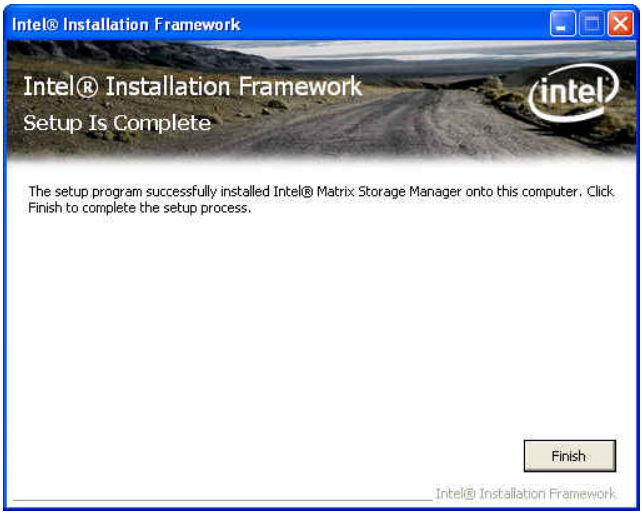
5. Use Explorer to get into the Intel® driver directory which was previously copied to the desktop.



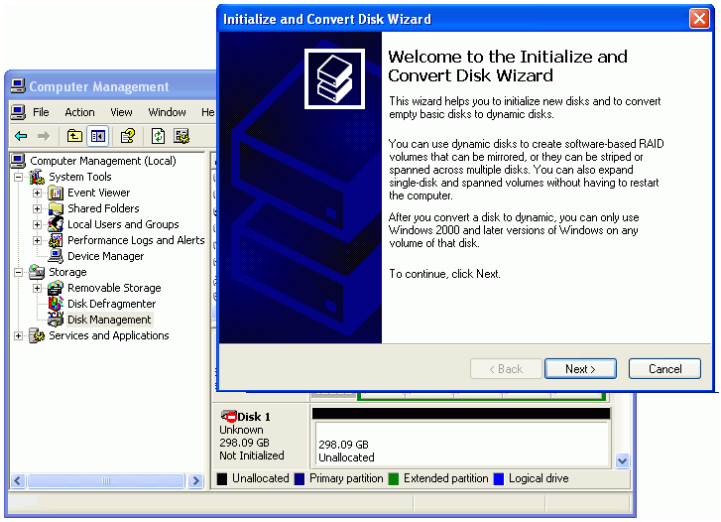
6. Click on Setup.exe to install Intel® Matrix Storage Manager driver.



7. Install complete.



8. In Windows Explorer, right click on My Computer, click on Manage, then click on Disk Management to format these new RAID disks. Follow the Wizard to finish the job.



Appendix - CrossFire™ Technology

Introduction

CrossFire™ technology is a newly introduced product from ATI Technologies. It is designed to dramatically improve the graphics performance for applications which is used by players and other high-end users.

The CrossFire™ aspect requires the following components to be available in order to appear as an option within Catalyst™ Control Center :

- CrossFire™ Ready motherboard, such as Foxconn's AVENGER.
- CrossFire™ Edition graphics card that works as the master graphics card.
- CrossFire™ Ready graphics card from the same brand-family that works as the slave graphics card.

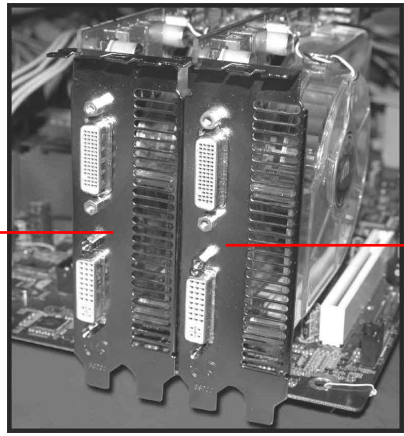
For the detailed CrossFire Graphic Card support list on this motherboard, please visit the website: http://www.foxconnchannel.com

Using CrossFire™ Technology

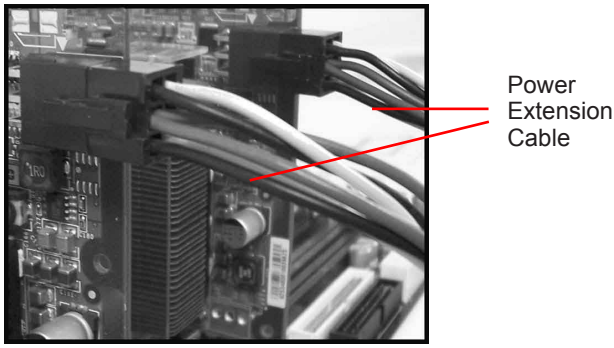
1. Please uninstall any existing graphics card drivers which would possibly create a conflict before attempting to install this display card.

2. Install the Radeon CrossFire™ Edition graphics card (master) to PCI-E1_X16 slot.

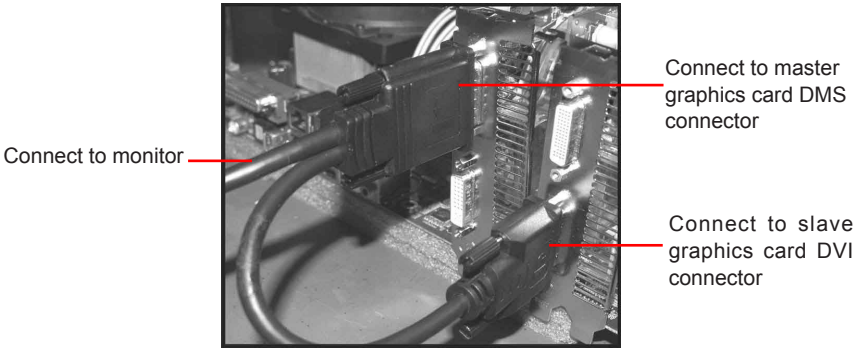
3. Install the Radeon CrossFire™ Ready graphics card (slave) to PCI-E2_X16 slot.



4. Connect an auxiliary power source from the power supply to the graphics card.



5. Connect the DMS-59 cable to the DVI monitor connector and two graphics cards that you install as shown.



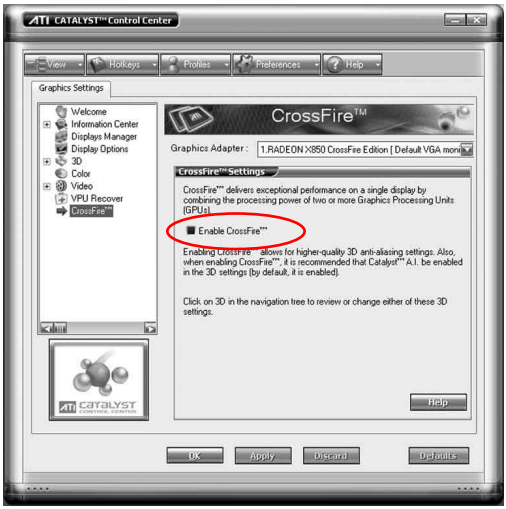
6. Power on your computer and get into OS (Windows® XP 32-bit with SP2 or Windows® XP Professional 64-bit Edition).

7. Install Microsoft's .NET Framework Version 1.1. Without it, The ATI Catalyst™ Control Center can not launch properly.

8. Install the ATI graphics card drivers and restart your computer. Then you will find "ATI Catalyst Control Center" on your desktop.

9. Double-click on the ATI Catalyst Control Center icon 

to launch it. Click "View"-->Select "Advanced View" -->Click "CrossFire™"-->Set "Enable CrossFire™" to Yes.



Now you can enjoy the advanced CrossFire™ technology.

CAUTION

- It is recommended using 400-450 Watt power supply or above to enjoy the benefit of CrossFire™ technology.
- If you use dual R3870 graphics card, it is recommended using fans to work with them to provide extra heat dissipation.
- The all new Radeon X1300 and X1600 graphics cards do not need a CrossFire™ Edition co-processor or external cable.