FOXCONN®

# H77MXV Series

## Motherboard

# User's Manual

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**Trademark:**

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**Version:**

User's Manual V1.1 for H77MXV Series motherboard.

**Symbol description:**

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

Caution:
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:
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All images are for reference only, please refer to the physical motherboard for specific features.

# Declaration of conformity

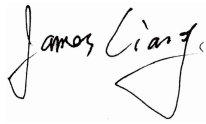
CE

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 H77MXV Series

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)<br>Part 3: Limits<br>Section 2: Limits for harmonic current emissions (equipment input current <= 16A per phase) |
| ■ EN 61000-3-3/A1:2001 | Electromagnetic compatibility (EMC)<br>Part 3: Limits<br>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/2012

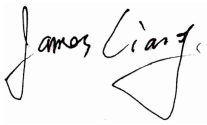
Printed Name : James Liang

# Declaration of conformity

| | |
|---|---|
| Trade Name: | FOXCONN |
| Model Name: | H77MXV Series |
| Responsible Party: | PCE Industry Inc. |
| Address: | 458 E. Lambert Rd.<br>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 : 2012

## 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.

## Technical Support

**Website:** http://www.foxconnchannel.com
**Support Website:** http://www.foxconnsupport.com
**Worldwide online contact Support:** http://www.foxconnsupport.com/inquiry.aspx
**CPU Support List:** http://www.foxconnsupport.com/cpusupportlist.aspx
**Memory, VGA Compatibility List:** http://www.foxconnsupport.com/complist.aspx

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# Chapter 1 Product Introduction

Thank you for buying Foxconn H77MXV Series motherboard. Foxconn products are engineered to maximize computing power, providing only what you need for break-through performance.

This chapter includes the following information:

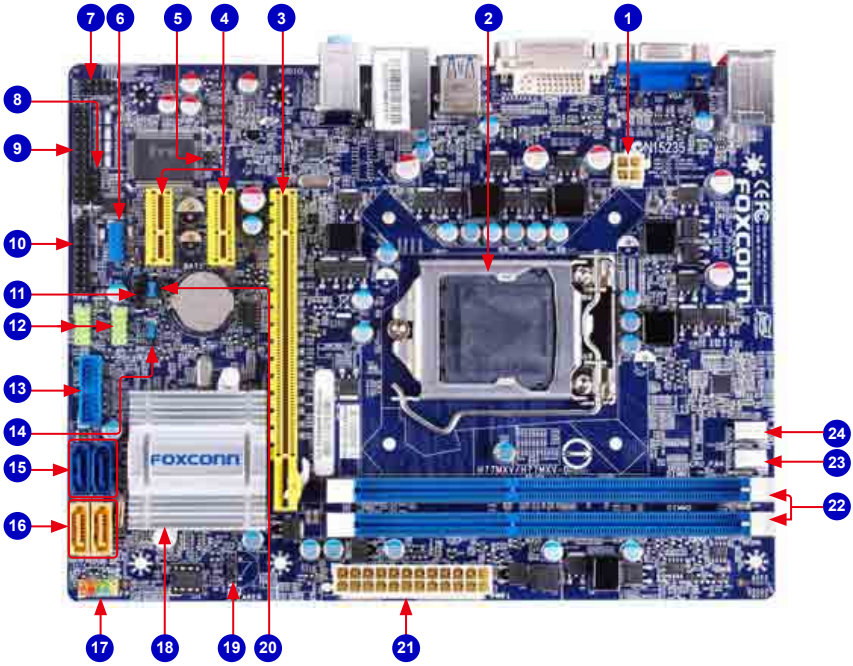
- Product Specifications
- Layout
- Back Panel Connectors

## 1-1 Product Specifications

| | |
|---|---|
| CPU | Support Intel® Ivy Bridge/Sandy Bridge LGA1155 Processors<br>Max processor power up to 95W<br>For the latest CPU information, please visit:<br>http://www.foxconnsupport.com/cpusupportlist.aspx |
| Chipset | Intel® H77 |
| Memory | 2 x 240-pin DDR3 DIMMs<br>Support up to 16GB of system memory<br>Dual channel DDR3 1600(Ivy Bridge)/1333/1066MHz |
| Expansion Slots | 1 x PCI Express X16 slot<br>- Support PCI Express Gen2 5GT/S data rate (Sandy Bridge)<br>- Support PCI Express Gen3 8GT/s data rate (Ivy Bridge)<br>2 x PCI Express X1 slots<br>- Support PCI Express Gen2 5GT/S data rate |
| Storage | Intel® H77 chipset<br>- 2 x SATA 2.0 connectors (3Gb/s data transfer rate)<br>- 2 x SATA 3.0 connectors (6Gb/s data transfer rate)<br>Support RAID 0, 1, 5,10 |
| LAN | Realtek RTL8111F-CG Gigabit LAN chip<br>Support 10/100/1000Mbps |
| Audio | Realtek ALC662-GR audio chip<br>- High Definition Audio<br>- 2/4/5.1-channel<br>- Support Jack-Sensing function |
| USB | Support up to 8 x USB 2.0 ports (4 rear panel ports, 2 onboard USB headers supporting 4 extra ports)<br>Support USB 2.0 protocol up to 480Mb/s<br>Support up to 4 x USB 3.0 ports (2 rear panel ports, 1 onboard USB header supporting 2 extra ports)<br>Support USB 3.0 protocol up to 5Gb/s |
| Internal Connectors | 1 x 24-Pin ATX power connector<br>1 x 4-pin ATX 12V power connector<br>2 x SATA 3.0 connectors<br>2 x SATA 2.0 connectors<br>2 x USB 2.0 headers<br>1 x USB 3.0 header<br>1 x CPU FAN header (4-pin)<br>1 x System FAN header (4-pin)<br>1 x Front panel header<br>1 x Front audio header<br>1 x Speaker header<br>1 x SPDIF OUT header<br>1 x TPM header<br>1 x LPT header<br>1 x CIR header |

| | |
|---|---|
| | 1 x INTR header<br>1 x COM1 header<br>1 x Clear CMOS header<br>1 x ME header |
| Back Panel Connectors | 1 x PS/2 Keyboard port<br>1 x VGA port<br>4 x USB 2.0 ports<br>2 x USB 3.0 ports<br>1 x DVI-D port(H77MXV-D)<br>1 x HDMI port(H77MXV)<br>1 x RJ-45 LAN port<br>3 x Audio ports |
| Hardware Monitor | System voltage detection<br>CPU/System temperature detection<br>CPU/System fan speed detection<br>CPU Overheating warning<br>CPU/System fan speed control |
| Green Function | Support ACPI (Advanced Configuration and Power Interface)<br>Support S0 (normal), S1 (power on suspend), S3 (suspend to RAM), S4 (suspend to disk), S5 (soft - off)<br>Support EuP function |
| Bundled Software | FOX ONE<br>FOX LiveUpdate<br>FOX LOGO<br>FOX DMI<br>Smart Charger |
| Operating System | Support for Microsoft® Windows® 8/7/XP |
| Form Factor | Micro ATX Form Factor, 9.2 inches x 7.0 inches (23.4cm x 17.8cm) |

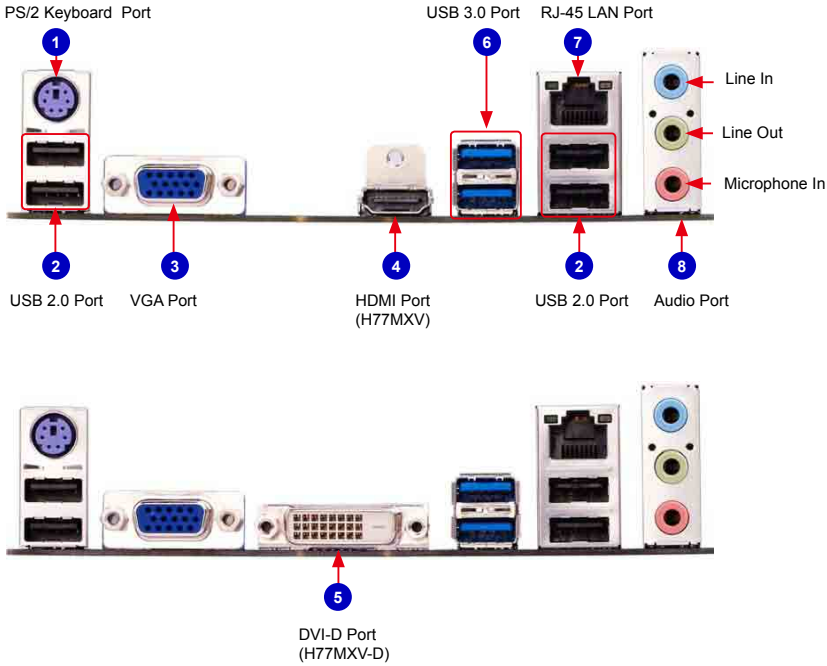
## 1-2 Layout




1. 4-pin ATX 12V Power Connector
2. LGA1155 CPU Socket
3. PCI Express x16 Slot
4. PCI Express x1 Slot
5. INTR Header
6. COM1 Header
7. Front Audio Header
8. CIR Header
9. LPT Header
10. TPM Header
11. SPDIF_OUT Header
12. Front USB 2.0 Header
13. Front USB 3.0 Header
14. Clear CMOS Header
15. SATA 2.0 Connector
16. SATA 3.0 Connector
17. Front Panel Header
18. Chipset: Intel® H77
19. Speaker Header
20. ME Header
21. 24-pin ATX Power Connector
22. DDR3 DIMM Slot
23. CPU_FAN Header
24. SYS_FAN Header

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 Keyboard Port**

Use the upper port to connect a PS/2 keyboard.

**2. USB 2.0 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.

**3. VGA Port**

Use this port to connect external display devices, such as monitor or LCD display.

**4. HDMI Port**

The HDMI (High-Definition Multimedia Interface) provides an all-digital audio/video interface to transmit the uncompressed audio/video signals and is HDCP compliant. Connect the HDMI audio/video device to this port. The HDMI Technology can support a maximum resolution of 1920x1080p but the actual resolutions supported depend on the monitor being used.

**5. DVI_D Port**

The DVI-D port supports DVI-D specification. Connect a monitor that supports DVI-D connection to this port.

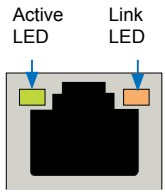
**6. USB 3.0 Port**

The USB port supports the USB 3.0/2.0/1.0 specification. Use this port for USB devices such as an USB keyboard/mouse, USB printer, USB flash drive and etc. But you need to install the USB 3.0 driver in the Driver CD before using it.

**7. RJ-45 LAN Port**

The Ethernet LAN port provides Internet connection at up to 10/100/1000Mb/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 | 10Mb/s Connection |
| | | | Green | 100Mb/s Connection |
| | | | Orange | 1000Mb/s Connection |




**8. Audio Ports**

For the definition of each audio port, please refer to the table below:

| Port | 2-channel | 4-channel | 5.1-channel |
|---|---|---|---|
| Blue | Line In | Rear Speaker Out* | Rear Speaker Out* |
| Green | Line Out | Front Speaker Out | Front Speaker Out |
| Pink | Microphone In | Microphone In | Center/Subwoofer Out* |

*: Please refer to Chapter 4, and run the Realtek audio driver (in CD) to assign the audio output ports for different applications of 2/4/5.1 channels. The fundamental audio outputs are depicted in the table above.

# Chapter 2 Hardware Installation

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

## 2-1 Install the CPU and CPU Cooler

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

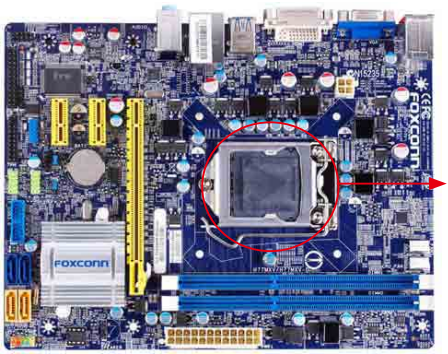
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power supply before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on 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.

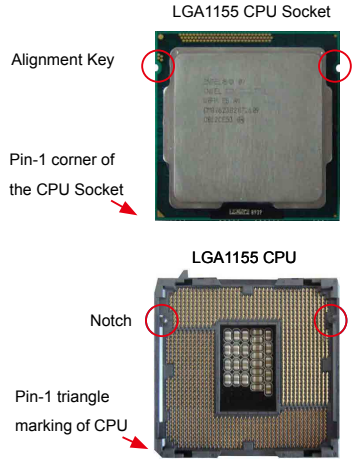
Hyper-Threading Technology System Requirements:
(Go to Intel's website for more information about the Hyper-Threading Technology)

- 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

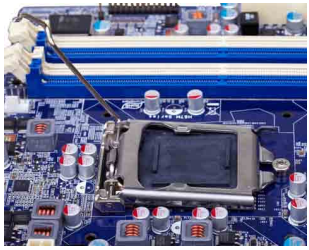
Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



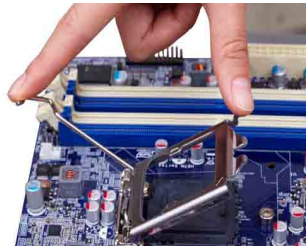


Follow the steps to install the CPU onto the CPU socket :

NOTE 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. Release the CPU socket lever.



2. Lift the metal cover on the CPU socket.

3. Remove protective socket cover.

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.

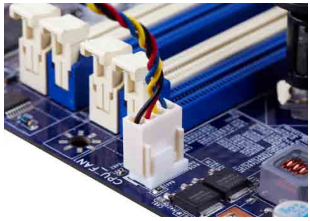
## Install the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard.

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 header 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.

NOTE 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

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, and please select Dual channel first to achieve optimum performance.
- 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

Channel 0 : DIMM1
Channel 1 : DIMM2

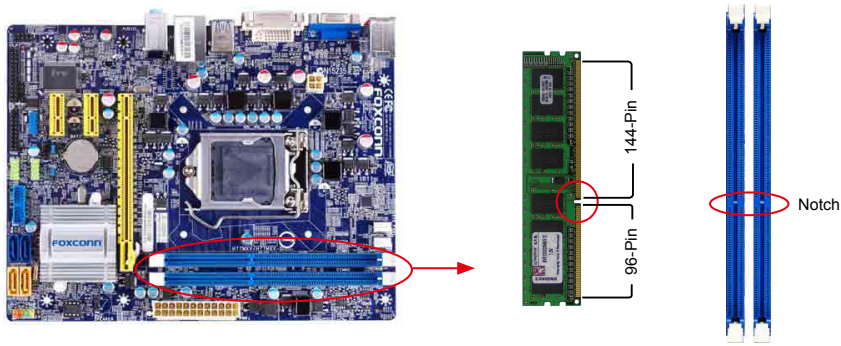
The combinations of DIMM modules are:

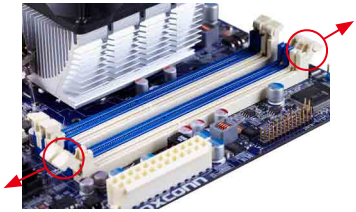
| | DIMM1 | DIMM2 |
|---|---|---|
| Single Channel | DS/SS | - |
| Single Channel | - | DS/SS |
| Dual Channel | DS/SS | DS/SS |

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

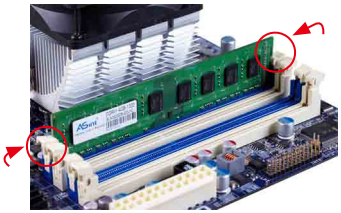
### Installing a Memory

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.

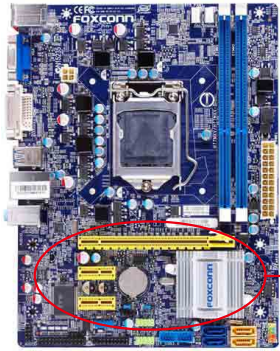


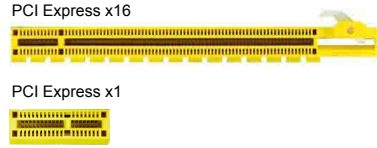
Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

## 2-3 Install an Expansion Card

NOTE

- Make sure the motherboard supports the 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.



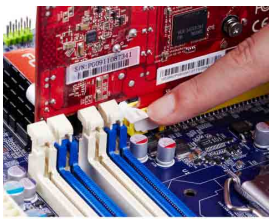



**Follow the steps below to correctly install your expansion card in the expansion slot.**

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.

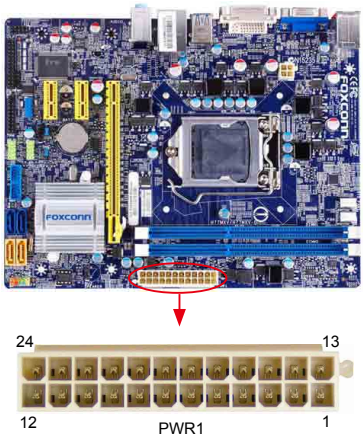
## 2-4 Install other Internal Connectors

### 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

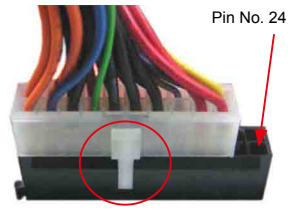
PWR1 is the ATX power supply connector. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.




| 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 |

NOTE

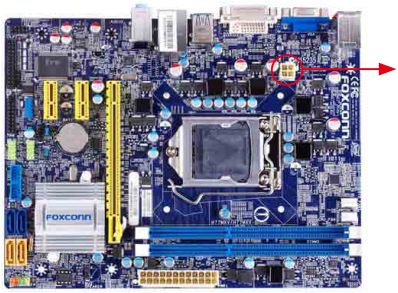
We recommend you using a 24-pin power supply. If you are using a 20-pin power supply, you need to align the ATX power connector according to the picture.




20-Pin Power

### 4-pin ATX 12 V Power Connector: PWR2

Connect the 4-pin ATX 12V power supply to PWR2 and provides power to the CPU.



PWR2

| Pin # | Definition |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | +12V |
| 4 | +12V |

**Front Panel Connector: FP1**

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

**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.

**Speaker Connector: SPEAKER**

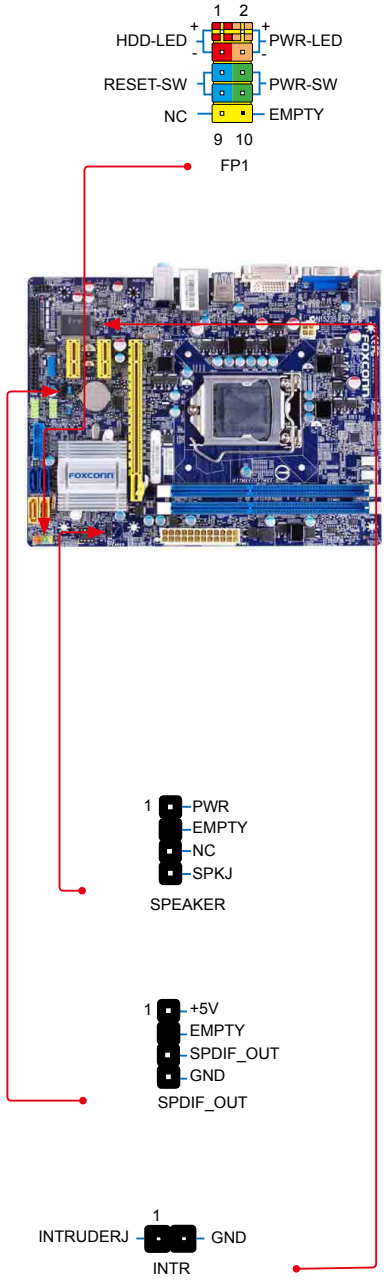
The speaker connector is used to connect speaker of the chassis.

**S/PDIF Connector: SPDIF_OUT**

The connector is used for S/PDIF output.

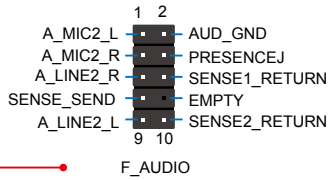
**Chassis Intruder Alarm Connector : INTR**

The connector can be connected to a security switch on the chassis. The system can detect the chassis intrusion through the function of this connector. If eventually the chassis is closed, the system will send a message out.



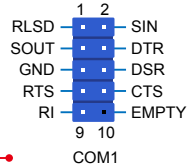
**Audio Connector: F_AUDIO**

The audio connector supports HD Audio standard. It provides the Front Audio output choice.



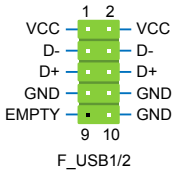

**COM Connector : COM1**

This motherboard supports one serial RS232 COM port for legacy compatibility. User must purchase another RS232 cable with a 9-pin D-sub connector at one end to connect with the external RS232 device and another end with 10-pin female connector to connect with COM1 connector in the motherboard.



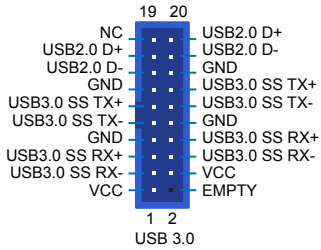

**USB 2.0 Connectors: F_USB1/2**

These connectors comply with USB 2.0 specification, you can get USB ports by connecting the USB module cable to any of these connectors.



**USB 3.0 Connectors: F_USB3.0**

This connector complies with the USB 3.0 specification, and is for the additional USB 3.0 ports. You need to install the USB 3.0 driver in the Driver CD before using it.

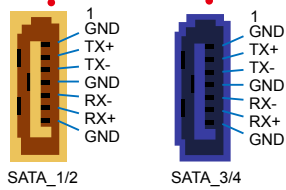



**Serial ATA 3.0 Connectors: SATA_1/2**

These connectors are used to connect with SATA 3.0 Hard Disk drives.

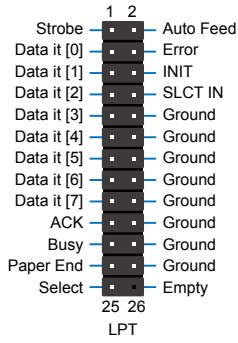
**Serial ATA 2.0 Connectors: SATA_3/4**

These connectors are used to connect with SATA 2.0 Hard Disk drives or optical disc devices.



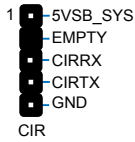
**LPT Connector: LPT**

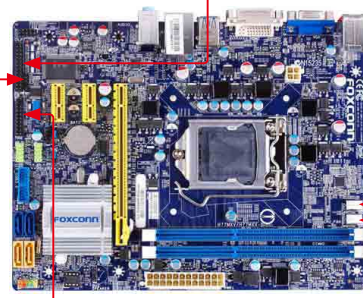
The connector supports parallel port which can be connected to a printer or a scanner. System usually assign IRQ7 as it's default interrupt request and the parallel port has three operation mode: [SPP], [EPP], [ECP].




**CIR Header: CIR**

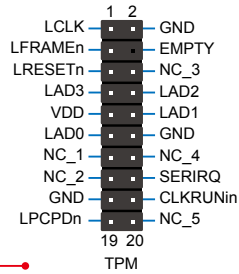
This connector supports infrared wireless transmitting and receiving device.



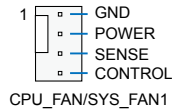
**TPM Connector: TPM**

The TPM (Trusted Platform Module) provides the ability to the PC to run applications more secure and to make transactions and communication more trustworthy. To utilize this function, you should purchase additional device and install it.




**Fan Connectors: CPU_FAN, SYS_FAN1**

The fan speed can be controlled and monitored in the BIOS Setup. These fans can be automatically turned off after the system enters S3, S4 and S5 sleeping states.



## 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.

**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.

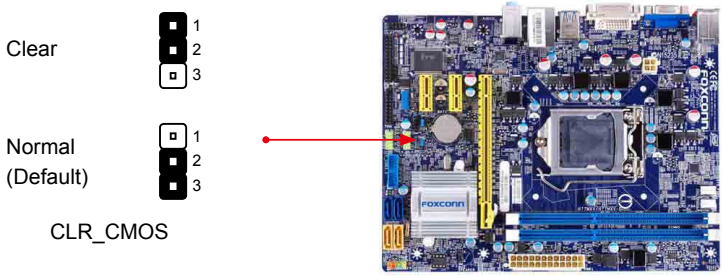
| Jumper | Diagram | Definition | Description |
|---|---|---|---|
| 1 | 1 | Closed | Set Pin 1 and Pin 2 closed |
| | 1 | Open | Set Pin 1 and Pin 2 Open |
| 1 | 1 | 1-2 | Set Pin 1 and Pin 2 closed |
| | 1 | 2-3 | Set Pin 2 and Pin 3 closed |

**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.



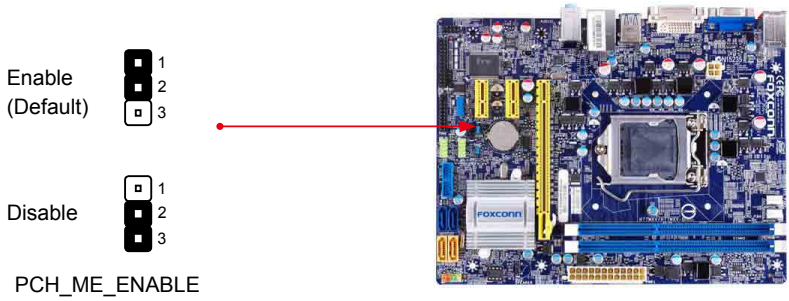

- Disconnect the power cable before adjusting the jumper settings.
- Do not clear the CMOS while the system is turned on.

**Intel® ME Jumper: PCH_ME_ENABLE**

This motherboard uses this jumper to enable or disable Intel® Management Engine function. Intel® Management Engine (ME) is an embedded microcontroller located in Intel chipset. It provides latest IT management features such as Intel® AMT, that allows to improve management of corporate assets.

Set the jumper to pins 1-2, you can enable the Intel® Management Engine function.

Set the jumper to pins 2-3, you can disable the Intel® Management Engine function.




CAUTION

Before flashing BIOS ROM, you need to set ME jumper to pins 2-3 first.

# Chapter 3 BIOS Setup

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
- F-Center
- Advanced
- Boot
- Power
- Health
- Security
- Save & Exit

## 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 <DEL> to enter Setup, <F7> to Boot Menu**" 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.

Use the arrow right/left keys or click the menu tag to select a specific function and go to the submenu. Each function is explained below:

**Main**
It displays the basic system configuration, such as CPU Name, memory size, system date, time and so on. They all can be viewed or set up through this menu.

**F-Center**
The advanced system features can be set up through this menu.

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

**Boot**
Boot features can be set up through this menu. You can set the boot device priority here.

**Power**
All the items related with Green function features can be setup through this menu.

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

**Security**
The Administrator/User password can be set up through this menu to prevent unauthorized use of your computer. If you set a password, the system will ask you to key in correct password before boot or access to Setup.

**Save&Exit**
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. You also can save or discard the changes and exit BIOS setup here.

## Main

► System Date
<weekday><month><date> <year> format.
Day—weekday from Sun. to Sat., this message is automatically displayed by BIOS (Read Only).
Month—month from 1 to 12.
Date—date from 1 to 31.
Year—year, set up by users.
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field. Use [+] or [-] to input the value.

► System Time
This item allows you to configure the desired time. Use [ENTER], [TAB] or [SHIFT-TAB] to select a field. Use [+] or [-] to input the value.
The three fields of the setting are <hour> : <minute> : <second> respectively.

► Access Level
It displays your current access level. If you enter system with a user password, it will display “User”. If no password is set or you enter system with administrator password, this item will display “Administrator”.

► Model Name
This item shows the model name of this product.

► ME Version
It displays the current ME version.

► BIOS Version
It displays the current BIOS version. User can check this information and discuss with the field service people if a BIOS upgrade is needed.

► Build Date and Time
This item shows the BIOS building date and time.

► Halt On
This category determines whether or not the computer will stop if an error is detected during powering up.
[All Errors]: All errors can result in system halt.

[No Errors]: No error can result in system halt.

[All, but keyboard]: All errors but keyboard can result in system halt.

► CPU Brand Name

It displays the current CPU name.

► Total Memory

This item displays the total memory size. The size is depending on how many memory modules are installed in your system before powering on.

► MAC Address

This item displays the onboard LAN MAC address.

## F-Center

► Super BIOS Protect
To protect the system BIOS, there is a BIOS write-protection mechanism provided to prevent BIOS FLASH tool being improperly used to update BIOS or the vicious virus(such as CHI,etc) rewriting BIOS setup.

► Smart BIOS/Fox Intelligent Stepping/CPU Configuration/Performance Tuning
Press <Enter> to go to relative submenu.

## Smart BIOS

► 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.

► Smart Boot Menu

When PC starts, it will ask you to press [Del] key to enter setup or press [F7] key to enter smart boot menu. If [Disabled] is selected, then pressing [F7] has no function. This also prevents user without password trying to get into your computer through smart boot menu.

## Fox Intelligent Stepping

► 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.

► Intel(R) Rapid Start Technology

This item is used to enable or disable Intel(R) Rapid Start Technology.

## CPU Configuration

► Intel AES-NI
This item is used to disable or enable Advanced Encryption Standard feature.

► Intel XD 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 .

► Limit CPUID Maximum
This item is used to enable or disable CPUID maximum value limit configuration.
Set [Enabled] : the maxium CPUID is 3.Set [Disabled] for WinXP.

► Intel Virtualization Technology (Appears only when CPU supports)
Virtualization (i.e. Intel® Vanderpool Technology) allows a platform to run multiple operating systems and applications in independent partitions or "containers." One physical computer 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 or disable it.

► CPU C3 Report
This item is used to enable or disable CPU C3 (ACPI C2) report to OS.

► CPU C6 report
This item is used to enable or disable CPU C6 (ACPI C3) report to OS.

## Performance Tuning

► CPU Configuration/North Bridge Configuration
Press <Enter> to go to relative submenu.

### CPU Configuration

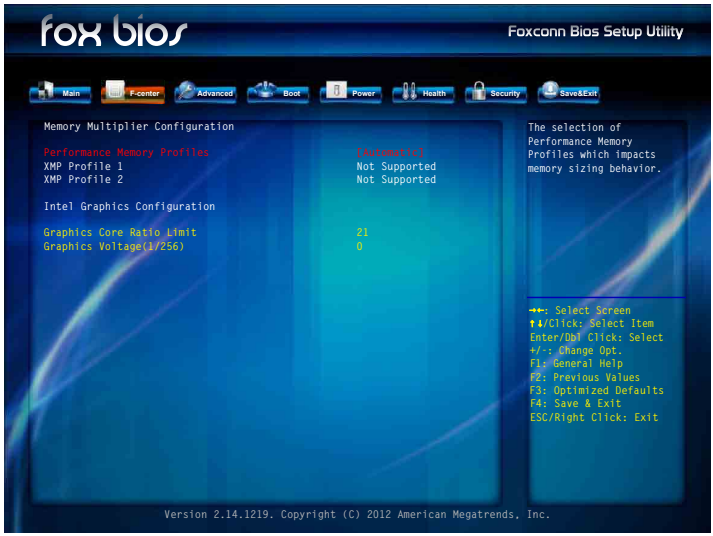
► EIST
You can enable or disable the EIST (Processor Power Management, PPM) through this item.

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.

►Turbo Mode

Turbo mode allows processor cores to run faster than its marked frequency in specific condition.

**North Bridge Configuration**




► Performance Memory Profiles

This item is used to select performance memory profile.

Options:[Automatic], [Manual], [XMP Profile 1], [XMP Profile 2].

[Automatic]- Configuration database of using performance memory profile.

[Manual]- Configuration database of using performance memory profile. The next submenu will appear when select this item.

[XMP Profile 1]-Configuration database of using XMP timing profile 1.

[XMP Profile 2]- Configuration database of using XMP timing profile 2.

The following items appear only when the option is set to “Manual”.

► Memory Clock Multiplier

This item is used to set the memory clock multiplier.

► Memory Multiplier

This item is used to set the memory multiplier.

► tCL

The number of memory clocks it takes a DRAM to return data after the read CAS_L isasserted depends on the memory clock frequency. The value that BIOS programs into the memory controller is a function of the target clock frequency. The target clock frequency is

determined from the supported CAS latencies at given clock frequencies of each DIMM.

► tRP
This item allows you to select the row precharge time (in clock cycles).

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

► tRAS
This item allows you to set the minimum RAS# active time (in clock cycles).

► tWR
This item allows you to select the write recovery time (in clock cycles).

► tRFC
Refresh to Refresh or Refresh to Active command interval.

► tWTR
This item allows you to select a delay time (in clock cycles) between sending the last data from a write operation to the memory and issuing a read command.

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

► tRTP
Internal READ Command to PRECHARGE Command delay

► tFAW
This item allows you to specify the time window in which four activates are allowed the same rank.

► Graphics Core Ratio Limit
This item is used to set the graphics care ratio limit.

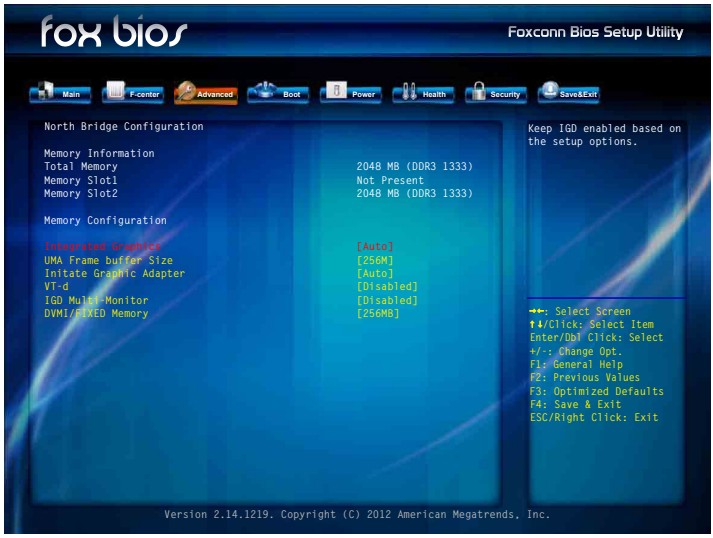
► Graphics Voltage(1/256)
This item is used to set the graphics voltage.

## Advanced

► North Bridge/ME Subsystem/Onboard Device Configuration/SATA Configuration/Super IO Configuration/Trusted Computing/Network Stack

Press <Enter> to go to relative submenu.

### North Bridge




► Total Memory

This item displays the current using memory information.

► Memory Slot 1/2

These items display the memory size installed on each slot.

► Integrated Graphics

This item is used to set the mode of the Integrated Graphics.

► UMA Frame buffer Size

Allocates system memory for use as video memory to ensure the most efficient use of available resources for maximum 2D/3D graphics performance.

This is a memory allocation method addition to the Unified Memory Architecture (UMA) concept, wherein a static amount of page-locked graphics memory is allocated during driver initialization. This fixed amount of memory will provide the user with a guaranteed graphics memory at all times, and will no longer be available to the OS.

► Initial Graphic Adapter

This item is used to select which graphics controller is used as the primary boot device.

► VT-d

This item is used to enable or disable the VT-d feature. Intel® Virtualization Technology for Directed I/O (VT-d) can help end users improve security and reliability of the systems and also improve performance of I/O devices in virtualized environment.

► IGD Multi-Monitor

This item is used to enable or disable the IGD Multi-Monitor by internal graphics device.

► DVMT/FIXED Memory

This item is used to select DVMT/FIXED Memory size used by Internal Graphics Device.

## ME Subsystem

► ME firmware Version

It displays the current ME version.

## Onboard Device Configuration

► Onboard LAN Controller
This item is used to enable or disable the onboard LAN controller.

► Onboard LAN PXE OpROM
This item is used to enable or disable onboard LAN PXE option ROM.

► Onboard USB Controller
This item is used to enable or disable the onboard USB controller.

► Legacy USB Support
This item is used to enable the support for USB devices on legacy OS. If you have a USB keyboard or mouse, set to auto or enabled.
[Enabled]: This option will enable the legacy USB support.
[Disabled]: This option will keep USB devices available only for EFI applications.
[Auto]: This option will disable the legacy support if no USB devices are connected.

► USB3.0 Support
This item is used to enable or disable the support for USB 3.0 devices.

► Azalia HD Audio Controller
This item is enable or disable the Azalia HD Audio Controller.

## SATA Configuration

► SATA Controller(s)

This item is used to enable or disable SATA device.

► Onboard SATA Mode

This item is used to set the operating mode of your SATA ports.

[Native IDE] - This configures the SATA ports to support native IDE mode.

[AHCI] - The Advanced Host Controller Interface (AHCI) specification describes the register level interface for a Host Controller for Serial ATA. The specification includes a description of the hardware/software interface between system software and the host controller hardware. AHCI provides more advanced features including SATA features, but some SATA drives may not support AHCI, unless they are labeled with AHCI support in its specification.

If your motherboard supporting AHCI, and you have a SATA device, which also supports AHCI, then you can select IDE option to have fair performance (only PATA, SATA level), or you can select AHCI to get its best performance.

[RAID] - When you enable RAID, it means all your SATA drives must also support AHCI.

► SATA Port1/SATA Port2/SATA Port3/SATA Port4

Press <Enter> to go to its submenu. This item is used to show the SATA Device information.

## Super IO Configuration

Serial Port 0 Configuration

► Serial Port
This item is used to enable or disable the serial port (COM).

► Device Settings
This item shows the resource assigned to the serial port.

► Change Settings
This item is used to select an optimal settings for Super IO device.

Parallel Port Configuration

► Parallel Port
This item is used to enable or disable the parallel port (LPT/LPTE).

► Device Settings
This item shows the resource assigned to the parallel port.

► Change Settings
This item is used to select an optimal settings for Super IO device.

► Device Mode
This item is used to change the printer port mode.

CIR Controller Configuration

► CIR Controller
This item is used to enable or disable the CIR Controller.

► Device Settings
This item shows the resource assigned to the CIR Controller.

► Change Settings
This item is used to select an optimal settings for Super IO device.

## Trusted Computing

► TPM SUPPORT

This item is used to decide whether to support TPM (Trusted Platform Module) device function. Default option is [Disabled]. If you want to support TPM, first you need to install a TPM device on the motherboard and set this item to [Enabled], then save changing and reset your computer, otherwise the operation system can not show the relative information.

## Network Stack

► Network stack

This item is used to enable or disable UEFI Network stack.

The UEFI(Unified Extensible Firmware Interface)Network Stack implements the TCP/IP network interfaces such as SNP, MNP,ARP, IP, UDP, DHCP, MTFTP, and TCP.

## Boot

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

► Quiet Boot
This item is used to enable/disable the quiet boot.
[Disabled] : Displays the normal POST messages.
[Enabled] : Displays OEM customer logo instead of POST messages.

► Fast Boot
While Enabled, this option allows BIOS to skip certain tests while booting, this will shorten the time needed to boot the system.

► Interrupt 19 Capture
Enable this item can allow Option ROMs to trap Interrupt 19.

► CSM parameters
Press <Enter> to go to relative submenu.

► Set Boot Priorities
These items are used to set the system boot order.

► Hard Disk Drive BBS Priorities / CD/DVD ROM Drive BBS Priorities/USB Floppy Drive BBS Priorities / USB CD/DVD ROM Drive BBS Priorities / USB HardDisk Drive BBS Priorities / USB KEY Drive BBS Priorities / NETWORK Device BBS Priorities / UEFI Boot Drive BBS Priorities
These items appear only when the devices are available. Use this items to specify the boot device priority sequence of the detected devices.

## CSM parameters

► Launch CSM
This item controls if CSM will be launched.

► Boot option filter
This item controls what devices system can boot to.

► Launch PXE OpROM policy
This item controls the execution of UEFI and Legacy PXE OpROM.

► Launch Storage OpROM policy
This item controls the execution of UEFI and Legacy storage OpROM.

► Launch Video OpROM policy
This item controls the execution of UEFI and Legacy Video OpROM.

► Other PCI device ROM priority
This item is used to specify the PCI device ROM Priority.

## Power

► ACPI Sleep State
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.

► Resume by PS2 Keyboard
This item is used to enable/disable the PS2 keyboard to generate a wake up.

► Resume by USB Device(s)
This item is used to enable/disable the USB device(s) to generate a wake up.

► Resume by PCIE Device(s)
This item is used to enable or disable the PCI Express device to generate a wake up.

► Resume by Onboard LAN
This item is used to enable or disable the onboard LAN to generate a wake up.

► Resume by RTC
This item is used to enable or disable RTC alarm event to generate a wake up.
RTC is system real time clock.

► Energy-using Products
This item is used to enable or disable the EuP(Energy-using Products) feature. When enable, the suspend power of the chipset will be cut off in S5 suspend mode in order to reduce the power consumption of motherboard.
Enabled: S1/S3/S4 is normal, S5 wake up only by pressing the power button.
Disabled: Normal ACPI function.

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

## Health

► Case Open Warning
This item is used to enable or disable case open warning function.

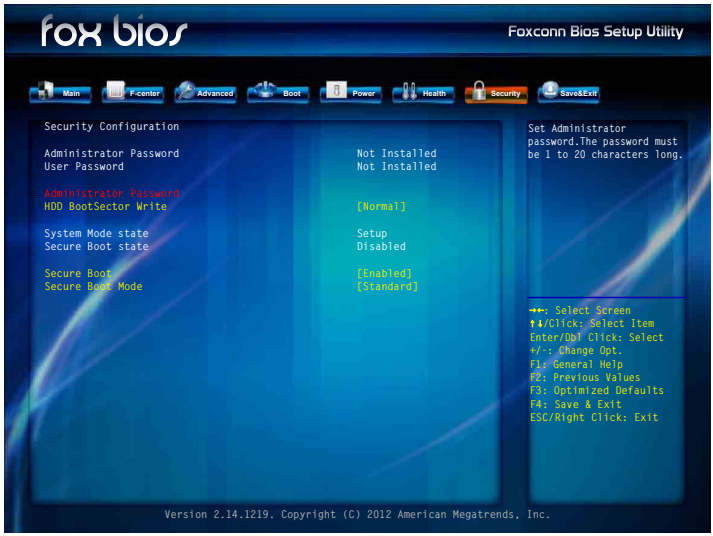
► CPU Warning Temperature
This option is used to set the warning temperature for the system. When the temperature of CPU is higher than the set value, the motherboard will send out warning information.

► CPU 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.
This function works only when your operating system is supporting ACPI.

► CPU Smart Fan Control
This option is used to enable or disable CPU smart fan function. Default value is [Disabled].

► System Smart Fan Control
This option is used to enable or disable system smart fan function. Default value is [Disabled].

## Security




► Administrator Password

This item is used to install or change administrator password.

After you input administrator password, it then will ask you to confirm the password.

► User Password

This item is used to install or change user password.

Only when there exists a Administrator password, then this setting can be activated.

► Security option

To protect the BIOS from being changed by the unauthorized users, there is a security option provided for your choice. Only when there exists a Administrator password, then this setting can be activated.

[setup]:A password will be required to enter the BIOS.(Only check password when enter setup)

[Always]:A password will be required to enter both the system and BIOS. (Always check password)

► HDD BootSector Write

This item is used to enable or disable writes to Hard Disk Sector 0.

► Secure Boot

This item is used to enable or disable the secure boot control.

► Secure Boot Mode

This item is used to set the secure boot mode.

The detailed parameter submenus will appear when you select “Custom” Mode.

## Save & Exit

► Save Changes and Reset

If you select this option and press <Enter>, a message will be displayed in the screen. Select [Yes] to save your changes and reset computer, select [No] or <ESC> to return to the main menu.

► Discard Changes and Reset

If you select this option and press <Enter>, a message will be displayed in the screen. Select [Yes] to exit setup utility and reset computer without saving your modifications, select [No] or <ESC> to return to the main menu.

► Restore Defaults

Optimal defaults are the best settings of this motherboard.

Always load the Optimal defaults after updating the BIOS or after clearing the CMOS values. Select this option and press Enter, it will pop out a dialogue box to let you load the defaults. Select <Yes> and then press <Enter> to load the defaults. Select <No> and press <Enter>, it will not load.

By this default, BIOS have set the optimal performance parameters of system to improve the performances of system components. But if the optimal performance parameters to be set cannot be supported by your hardware devices (for example, too many expansion cards were installed), the system might fail to work.

► Boot Override

BIOS auto detect the presence of connected devices, select the device you want to boot from and press <Enter>, then the system will directly boot from the selected devices.

# Chapter 4 CD Instruction

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

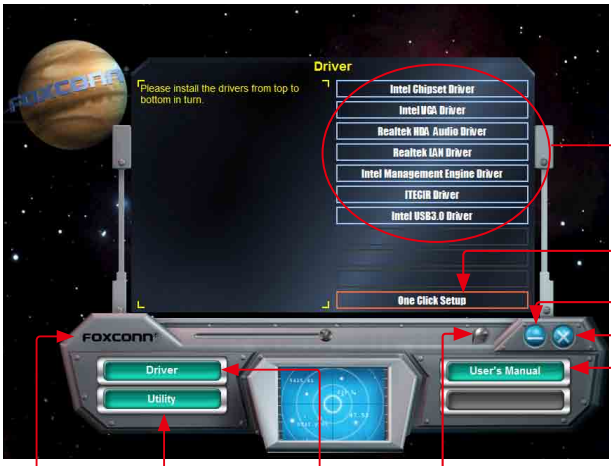
This chapter includes the following information:

- Install driver and utility
- FOX ONE
- FOX LiveUpdate
- FOX LOGO
- FOX DMI
- Smart Charger

## 4-1 Install driver and utility

### 1. Install Driver

Use these options to install all the drivers for your system. You must click "Intel Chipset Driver" to install it first. After that, you can click “One Click Setup” and then choose the items you want to install, or you can click on each individual driver to install it manually.




Manual Installation Step by Step

Automatic Installation by One Click

Drop to System Tray

Exit the program

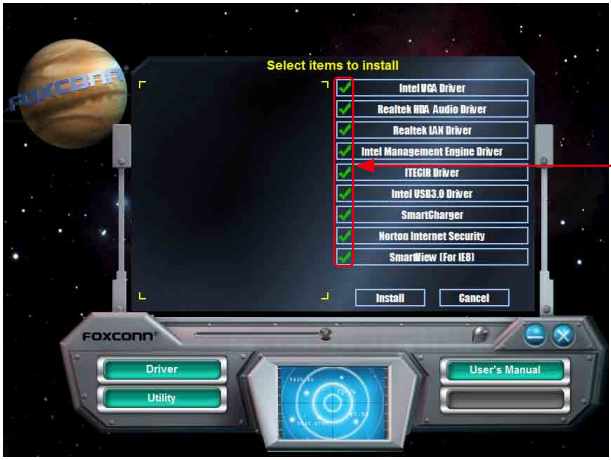
Visit Foxconn's website

Show Utilities

Show Drivers

Browse CD

View User’s Manual




Choose the items you want to Install

## 2. Install Utility

Use these options to install additional software programs. And click “User’s Manual“ button to view the product manual.

NOTE The Driver and Utility items displayed above represent a Windows 7 based system. The appearance may change with different Operating Systems.

## 4-2 FOX ONE

FOX ONE is a powerful utility for easily modifying system settings. It also allows users to monitor various temperature values, voltage values, frequencies and fan speeds at any time.

With FOX ONE, you can :

- Modify system performance settings, such as the CPU and memory bus speeds, CPU voltages, fan speeds, and other system performance options.
- Monitor hardware temperatures, voltages, frequencies and fan speeds.

Supporting Operating Systems :

- Windows XP (32-bit and 64-bit)
- Windows 7 (32-bit and 64-bit)
- Windows 8 (32-bit and 64-bit)

NOTE Depending on hardware support, voltage monitoring and Fox Intelligent Stepping features are optional and only supported in some models. If the option is selectable, it also means the feature is supported.

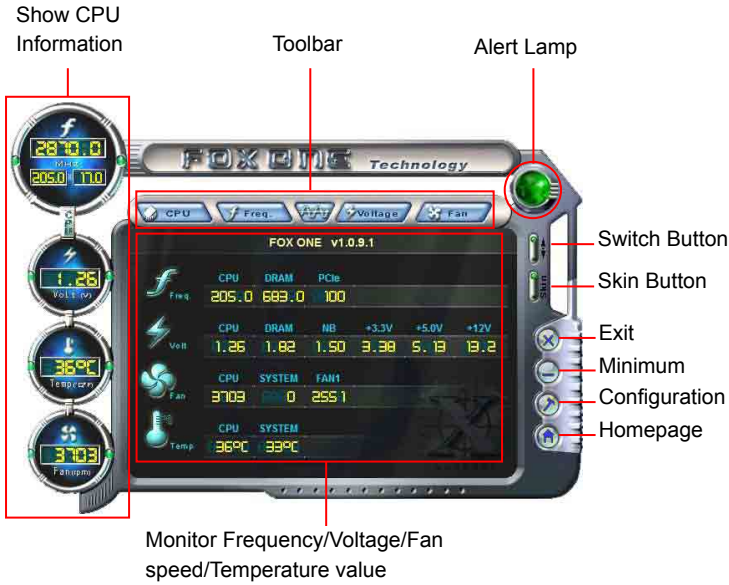
- Voltage Monitoring is supported only in FOX ONE Premium & Deluxe products.
- Fox Intelligent Stepping is supported only in FOX ONE Deluxe products.

Using FOX ONE :

The very first time you run FOX ONE, F.I.S. Calibration function (FOX Intelligent Stepping) will require you to calibrate the CPU's loading. Click "OK" to proceed and start the Utility. F.I.S. is a feature of FOX ONE, which can automatically adjust your CPU clock based on your current system loading.

NOTE Before you running the FOX ONE program, the system parameters (such as CPU clock, voltage...etc.) are controlled by BIOS settings. After you run FOX ONE, it will take over, and the controlling right will be transferred to FOX ONE. Later, if you exit FOX ONE, then BIOS control will be back again.

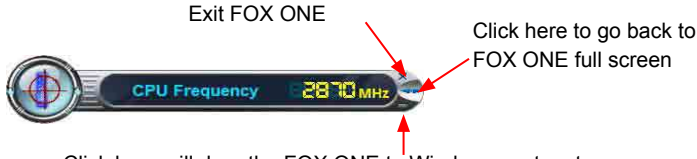
## 1. Main Page



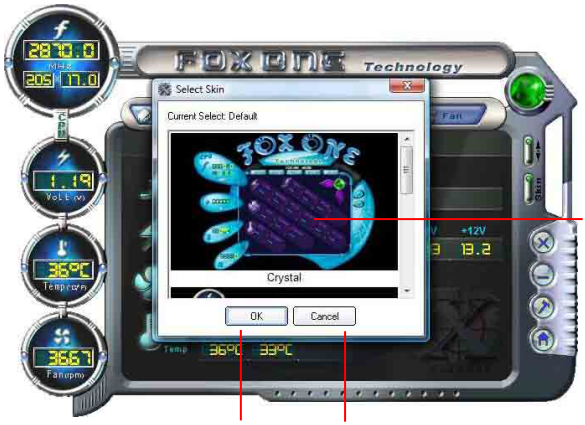

**Toolbar**
Use the toolbar to navigate to other pages.

**Alert Lamp**
When the system is in healthy state, the color of alert lamp is green. When the system is in abnormal state, the alert lamp color is red.

**Switch Button**
Click this button, it will simplify the whole FOX ONE control panel to a smaller information bar (i.e. Simple Mode) as depicted below, you can drag this bar to any place on your screen to help you monitoring system status.




**Skin Button**
There are more choices of FOX ONE screen panels. Click this button, you can select your favorite skin (FOX ONE Panel).




**Exit**

Click this button to exit the program.

**Minimum**

Click this button to drop the FOX ONE to Windows system tray located at the lower right corner of your screen.

**Homepage**

Click this button to visit Foxconn motherboard website :
http://www.foxconnchannel.com

**Configuration**

1). Monitor interval (ms) :

This is to define the interval of different messages of system settings which are to be displayed on Simple Mode screen. Minimum value is 1 second.

2). Simple Mode ：

To select which message of system settings are to be displayed in the Simple Mode. Messages such as CPU frequency, voltage...etc., they can be displayed one by one in Simple Mode.

3). F.I.S. Calibration (FOX Intelligent Stepping, Optional)

This function will re-calibrate the CPU's loading, and it may take several minutes to proceed. The FOX ONE calibration process will apply different loadings to your CPU, record PWM IC voltage together with the CPU clock running at these loadings, so it can define and estimate within a particular range of system loading, what the CPU clock should be.

Step 1 : Click Calibration icon, a message pops out to ask for continue. Select Yes.

Step 2 : After data is collected, it will ask you to restart your computer now.

Later on, when the FOX ONE program is activated, and F.I.S. feature (in CPU Page) is also enabled, FOX ONE will automatically adjust your CPU clock according to your system loadings. (Loadings are like Power Gaming, Data Mining...etc.)

## 2. CPU Page - CPU Control

This page lets you select (or overclock) CPU clock to meet the current performance level of the system. The fastest and suitable CPU clock running for current system can be calculated by FOX ONE automatically or manually input by yourselves.

**Manual :**

You can press the up/down button to adjust your CPU clock.

**Auto :**

Click this button to let FOX ONE check the highest CPU clock you can use. System will raise the CPU clock step by step until it hangs, you can then push the RESET button on your PC panel to restart the system. When system restarts, run FOX ONE again, it will display a recommended highest CPU clock for you, click <Yes> to apply it.

A message informs you to push RESET button later if the system hangs finally. Click Yes to continue.

You can see the system is raising CPU clock until the system hangs.
Push RESET button on the front panel of your system to restart the computer.

Run FOX ONE program again, it will inform you the previous test found that 255MHz is the recommended CPU clock for your system.
Click Yes to apply it to your system.

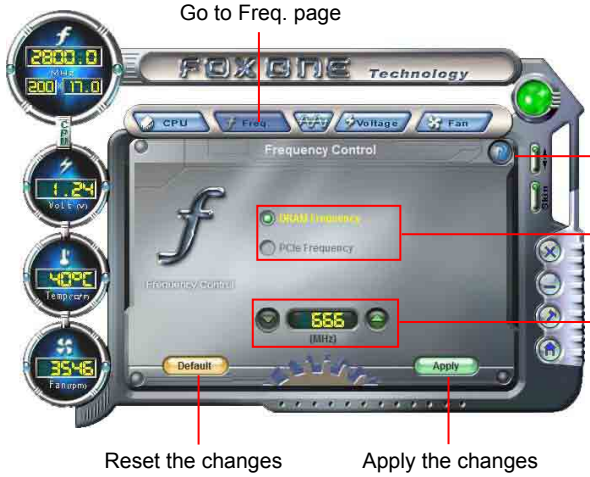
Now, your system is running at a CPU clock of 255MHz.

**FOX Intelligent Stepping (F.I.S., Optional)**

Select FOX Intelligent Stepping will allow your system to automatically adjust your CPU clock rate based on different system loadings. For example, if you select Power Gaming, CPU clock will be driven to run at its maximum speed. While in Energy Saving, CPU will lower down its speed to a minimum. The four benchmarks - Power Gaming, Data Mining, Office and Energy Saving, the references of their system loading were calculated and defined in the FIS Calibration option of Configuration menu. Select Auto, CPU will automatically adjust its clock according to current system loading.

### 3. Frequency Page - Frequency Control (Optional)

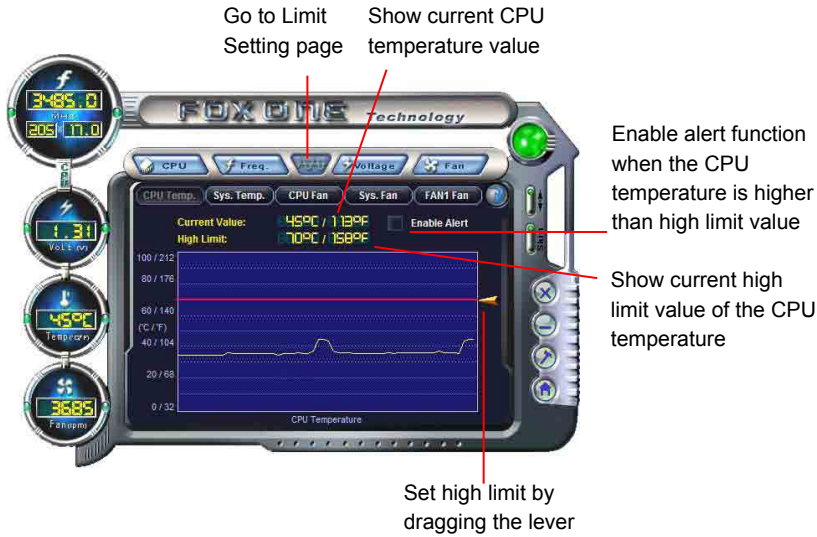
This page lets you set memory and PCI Express frequencies by manual.




### 4. Limit Setting

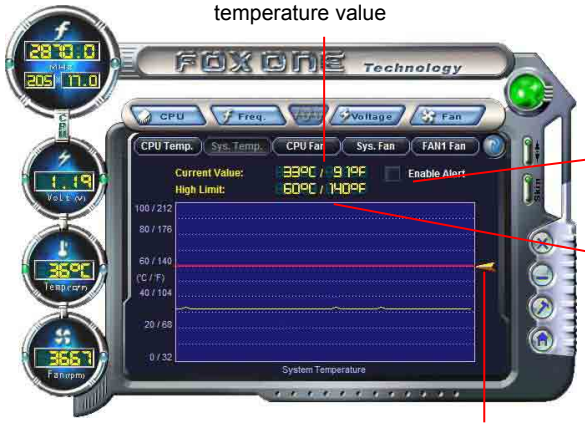
4.1 Limit Setting - CPU Temperature

This page lets you to set CPU high limit temperature and enable the alert function.



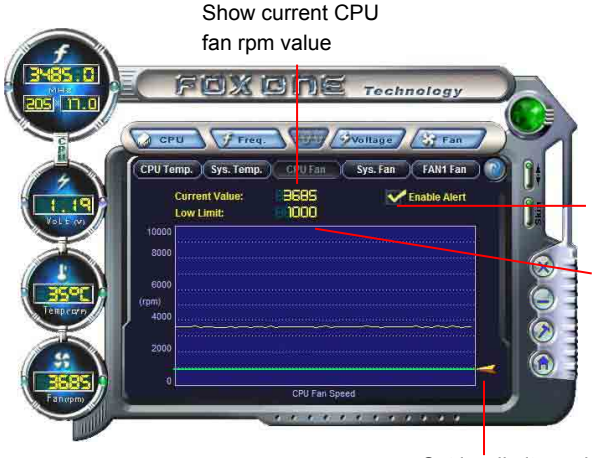
4.2 Limit Setting - System Temperature

This page lets you to set system high limit temperature and enable the alert function.



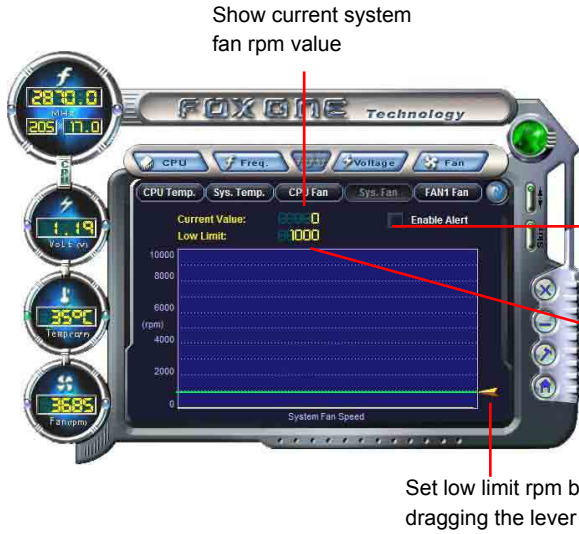

4.3 Limit Setting - CPU Fan

This page lets you to set CPU fan low limit rpm and enable the alert function.



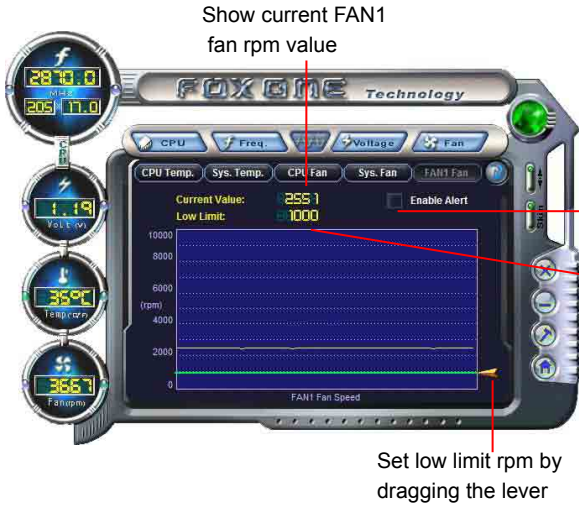
4.4 Limit Setting - System Fan

This page lets you to set system fan low limit rpm and enable the alert function.



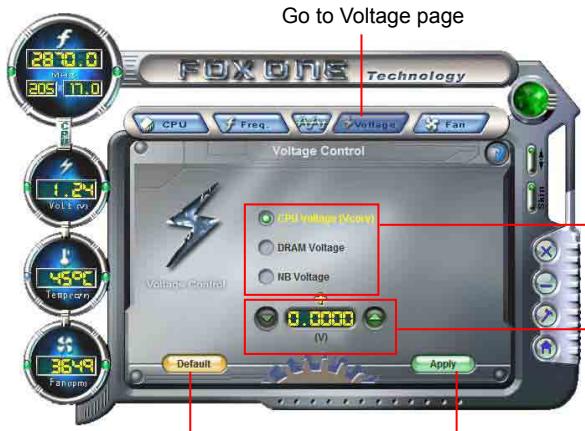

4.5 Limit Setting - FAN1 Fan

This page lets you to set FAN1 fan low limit rpm and enable the alert function.



### 5. Voltage Page - Voltage Control (Optional)

This page lets you set CPU voltage, memory voltage and North Bridge voltage manually. CPU voltage can be stepped up/down by a unit of 12.5mV, while memory is 0.05V/step, and North Bridge is 0.04V/step.




### 6. Fan Page - Fan Control

This page lets you enable Smart Fan function or set the fan speed by manual.
When Smart Fan is selected, you must use a 4-pin CPU cooler in your system.

## 4-3 FOX LiveUpdate

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

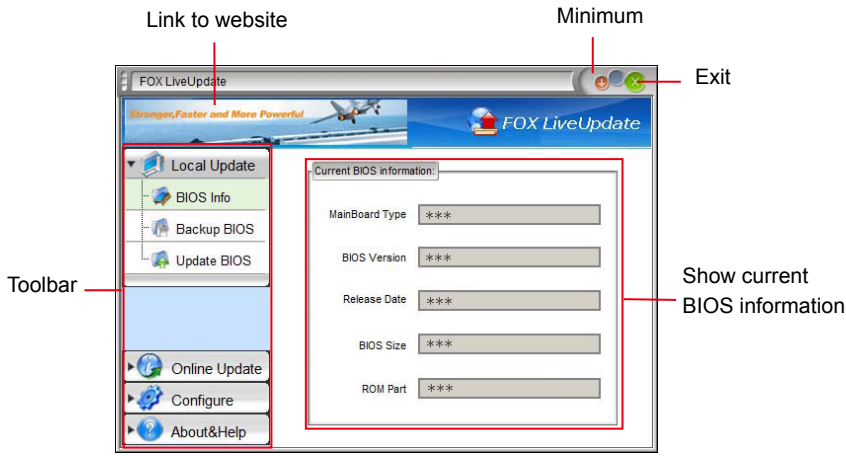
Supporting Operating Systems :

- Windows XP (32-bit and 64-bit)
- Windows 7 (32-bit and 64-bit)
- Windows 8 (32-bit and 64-bit)

NOTE Please set the BIOS setting “BIOS Write Protect” or “Super BIOS Protect” to [Disabled] when running this application.

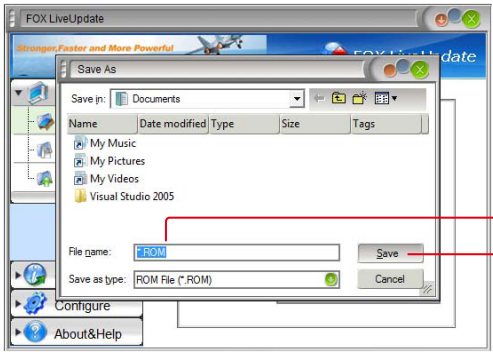
### 1. Local Update

1-1 Local Update - BIOS Information
This page lets you know your system BIOS information.



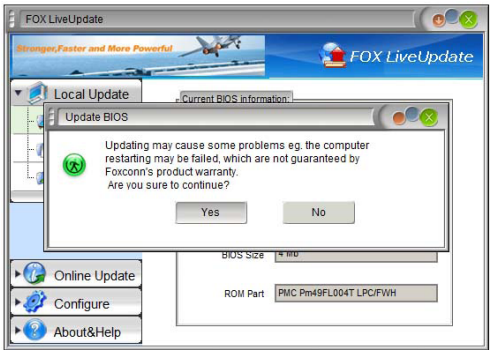

*** : Please refer to the physical motherboard for detail.

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. 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.



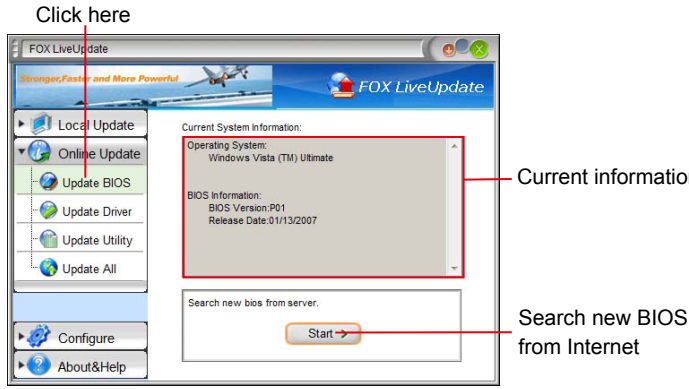

NOTE

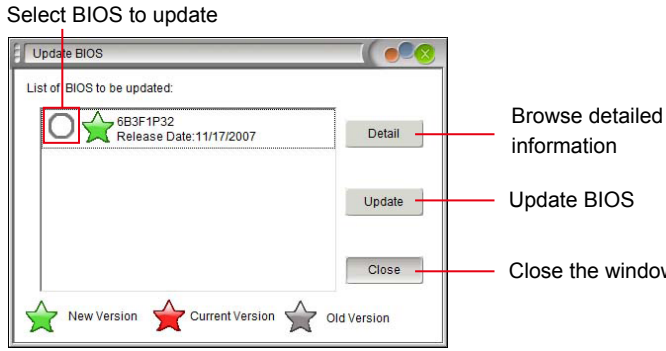
FOX LiveUpdate can automatically backup old BIOS before update. This feature can be enabled in the "Configure-System" setup. Please refer to "Configure-System" section for more detail. The default backup directory is C:\LiveUpdate_Temp, but the backup file name will be automatically generated. It is 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

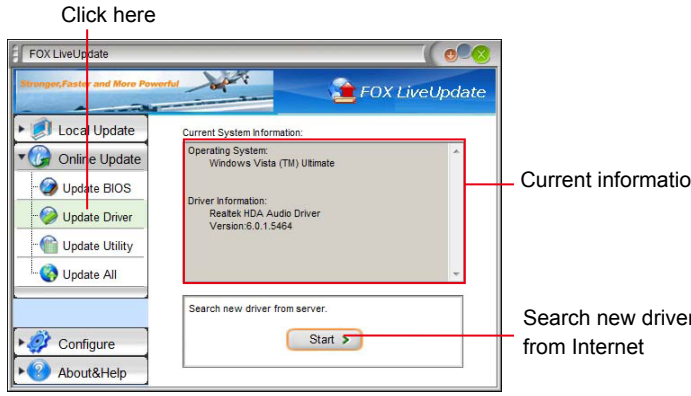
This page lets you update your system BIOS from Internet. Click “Start”, it will search the new BIOS from Internet. Then follow the wizard to finish the update operation.

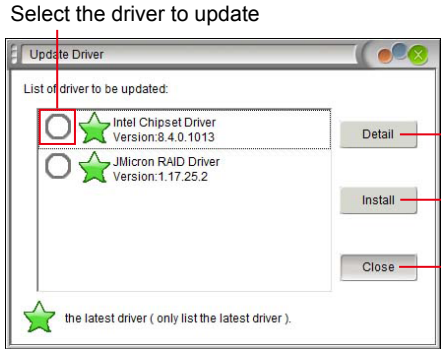



2-2 Online Update - Update Driver

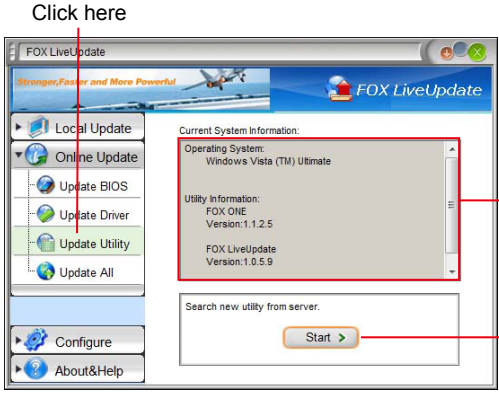
This page lets you update your system drivers from Internet. Click “Start”, it will search the new drivers from Internet. Then follow the wizard to finish the update operation.

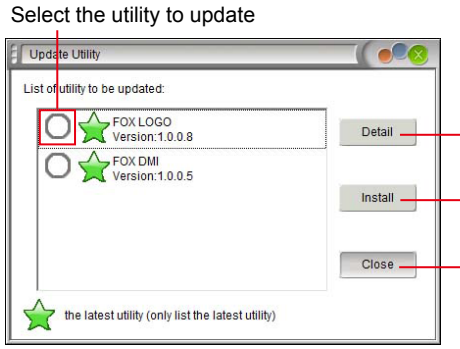





2-3 Online Update - Update Utility

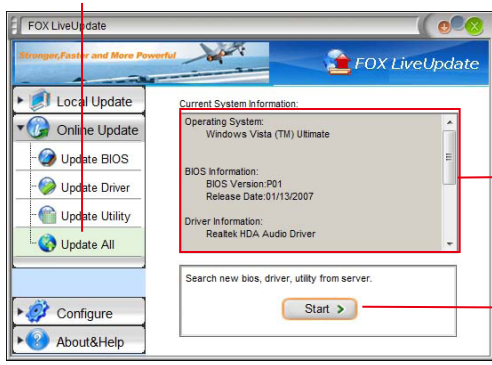
This page lets you update utilities from Internet. Click “Start”, it will search the new utilities from Internet. Then follow the wizard to finish the update operation.

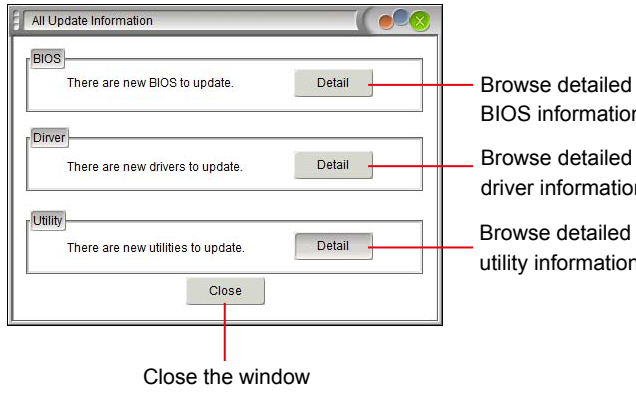


2-4 Online Update - Update All

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.

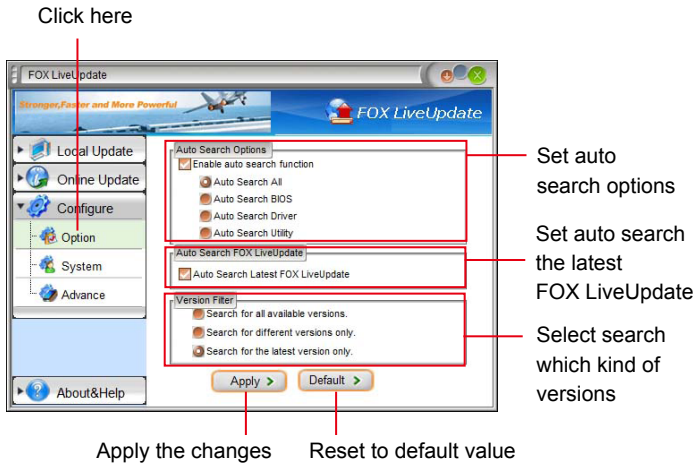


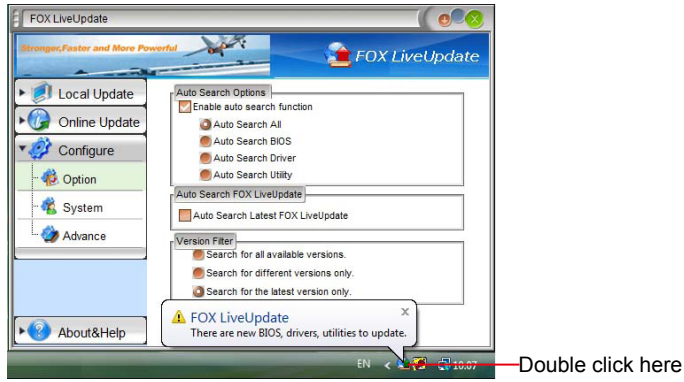
## 3. Configure

3-1 Configure - option

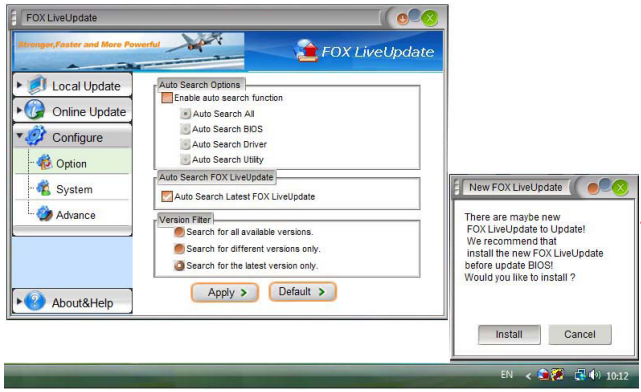
This page lets you set auto search options. After you enable the auto search function, FOX LiveUpdate will start its searching from Internet and if any qualified item found, it will pop out a message on the task bar to inform you to do the next step.




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

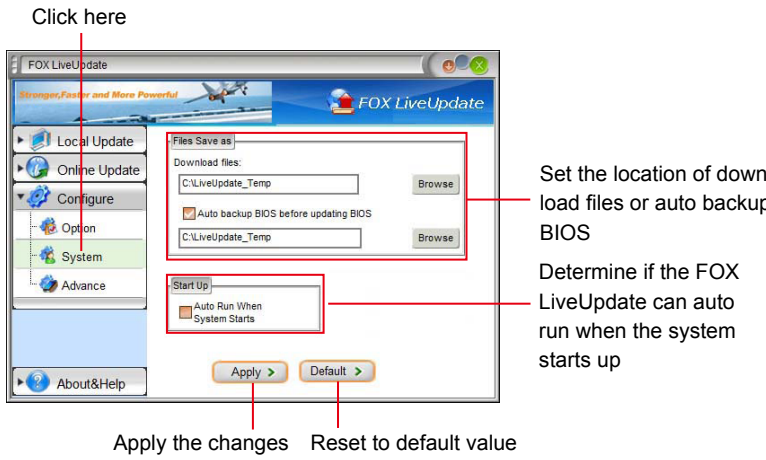


When you enable "Auto Search FOX LiveUpdate", if your FOX LiveUpdate version is older, it will auto search from internet and prompt you to install the new version.



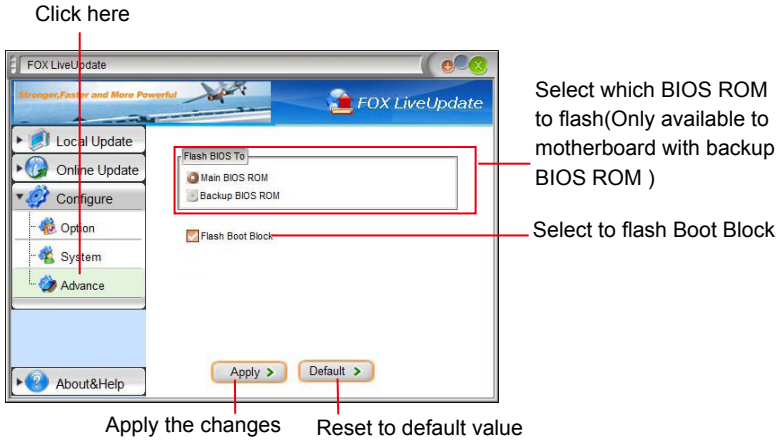

3-2 Configure - System

This page lets you set the backup BIOS location and determine if the FOX LiveUpdate can auto run when the system starts up.



3-3 Configure - Advance

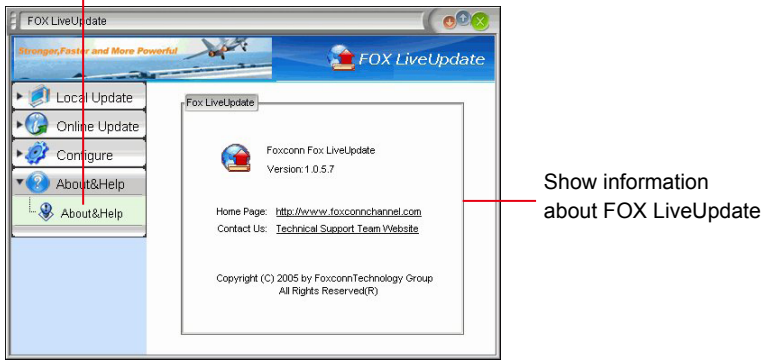
This page lets you select to flash BIOS and Boot Block. If you choose Flash Boot Block, it means BIOS is not protective, and you must make sure the flash process is continuous and without any interruption.




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

## 4. About & Help

This page shows some information about FOX LiveUpdate.



## 4-4 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 JPG image (1024x768) file, then use FOX LOGO to open it and change the boot time Logo. Boot time Logo will be displayed if you enable the “Quiet Boot” setting in BIOS.

Supporting Operating Systems :

- Windows XP (32-bit and 64-bit)
- Windows 7 (32-bit and 64-bit)
- Windows 8 (32-bit and 64-bit)

CAUTION

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.

## 4-5 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 motherboard if there is any problem occurred.

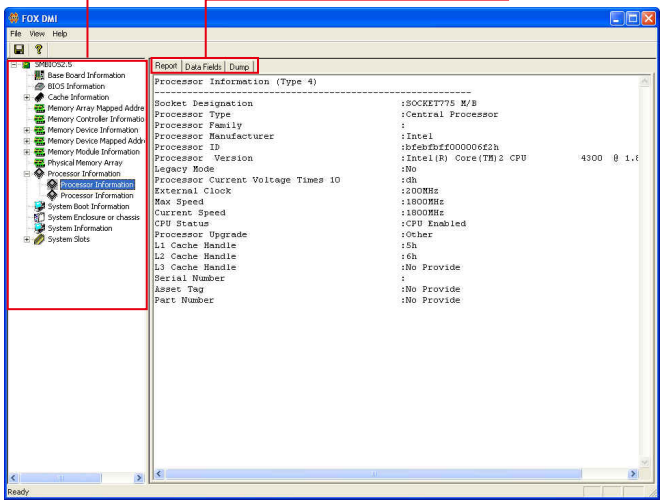
Supporting Operating Systems :

- Windows XP (32-bit and 64-bit)
- Windows 7 (32-bit and 64-bit)
- Windows 8 (32-bit and 64-bit)

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




## 4-6 Smart charger

Smart Charger is used for iPad recharging ,and when connected, an icon will appear on the right bottom corner of the PC screen.

# Chapter 5 RAID Configuration

This chapter includes the following information:

- RAID Configuration Introduction
- Intel® Rapid Storage Technology
- Steps to Install Serial ATA Hard Disks
- Create a RAID Driver Diskette
- BIOS Configuration
- Create RAID in BIOS
- Install a New Windows XP

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.
5. A motherboard driver CD.
6. Windows XP or Windows 7 Install CD.

Steps to install a new Windows XP (Windows 7) in a brand new RAID system:
1. Follow 5-3 to install SATA hard disks.
2. Follow 5-4 to create a RAID driver diskette.
   (Windows 7 has in-box driver by its own and can skip this step).
3. Follow 5-5 to set BIOS setting “SATA Mode” to RAID or AHCI.
4. Follow 5-6 to create RAID in BIOS.
5. Follow 5-7 to Install Windows Operating System.

## 5-1 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® PCH. 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.

Recovery
This level copies data between a master and a recovery disk, so the capacity of the array is equal to the capacity of the smaller drive. It’s no need to set the strip size for Recovery, but you must select a sync mode to update the volume.

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<br>Write slower | Good | Limited budget |
| RAID10 | >=4<br>(Even number) | Smallest<br>*2 | High | Excellent | Unlimited budget |
| Recovery | 2 | Smaller | Read faster | Excellent | 100% Data backup |

## 5-2 Intel® Rapid Storage Technology

The Intel® Rapid Storage Technology 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 149.0GBs and two 74.5GBs. 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.

## 5-3 Steps to Install Serial ATA Hard Disks

NOTE 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.

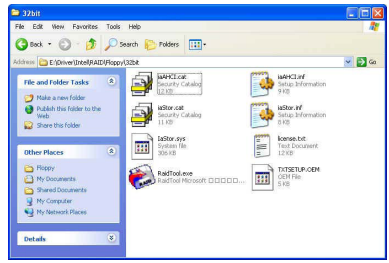
1. Install SATA hard disks into the drive bays.
2. Connect one end of the SATA cable to motherboard's SATA connector, and the other end to SATA hard disk.
3. Connect SATA power cable to the power connector of SATA hard disk.

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

## 5-4 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 7 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.



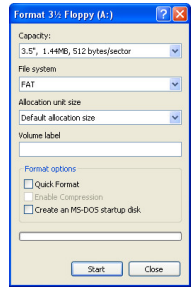

2. Depending on which platform your system is, normally, it is a 32-bit XP system. Use Windows explorer, and go to CD:\Driver\Intel\RAID\Floppy\32bit, click on RaidTool icon to start the creation.

3. Click "GO" to start.

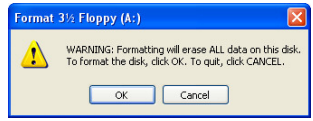
4. Select the desired destination FDD drive. It can be the default drive A: or any USB FDD. Click "OK" to continue.

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

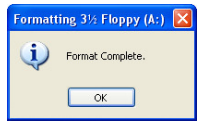
6. You can input a volume label for this diskette, click on "Start" to format.



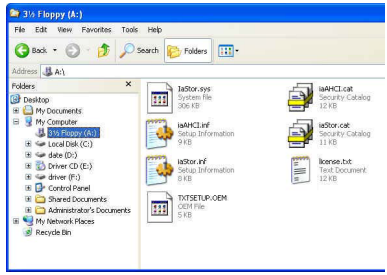

7. Click on "OK" to go through this warning message.



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.

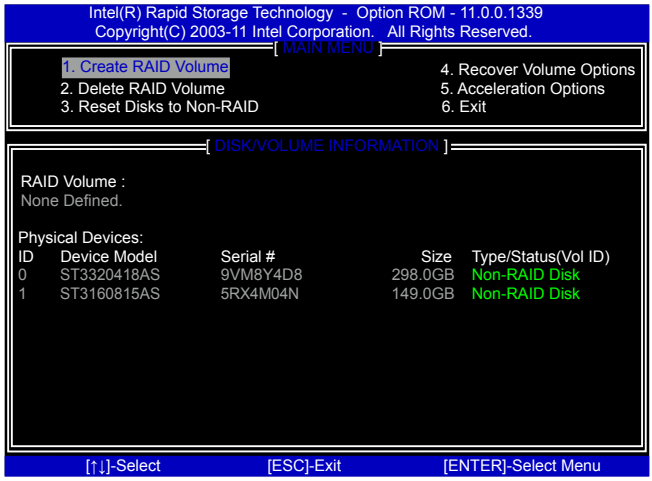
## 5-5 BIOS Configuration

1. Enter the BIOS setup by pressing <DEL> key during the POST(Power On Self Test).
2. Set the “SATA Mode” to “RAID Mode”. (Please refer to Chapter 3 BIOS Setup)
3. Press <F4> to save the setting then PC will reboot itself.

## 5-6 Create RAID in BIOS

### 1. Enter RAID BIOS Setup

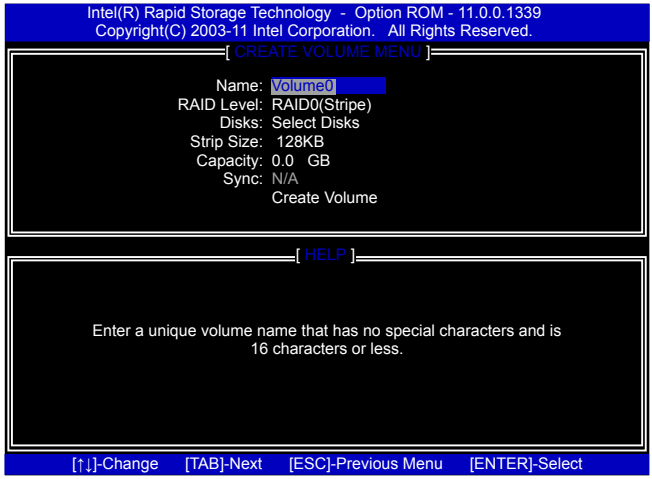
When BIOS is restarted, it will display a message asking you to press <Ctrl>+<I> keys simultaneously to enter the main menu of Intel® Rapid Storage Technology Option ROM Utility. Press the <Ctrl>+<I> to enter Configuration Utility.



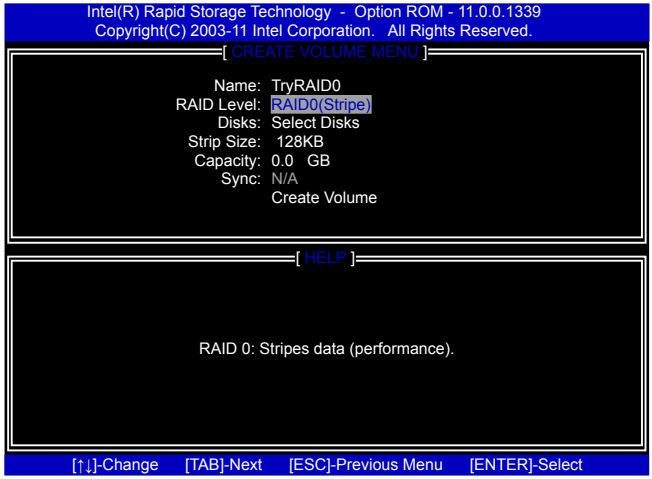
## 2. Create RAID Volume

Create RAID 0 (1st Volume)

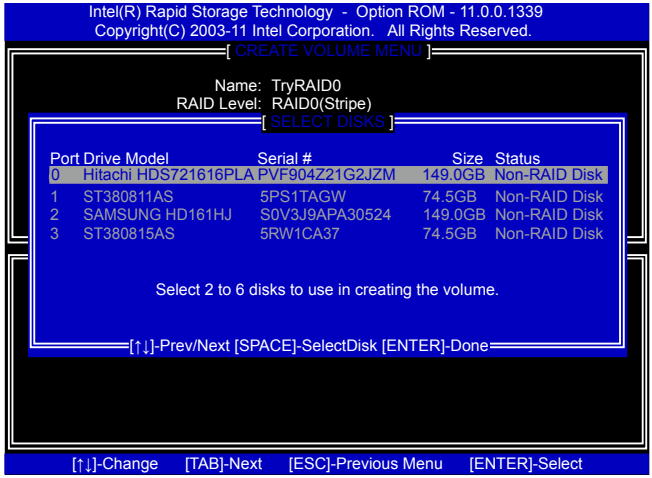
1. Select “1. Create RAID Volume” from the menu and press <Enter>. The menu appears :



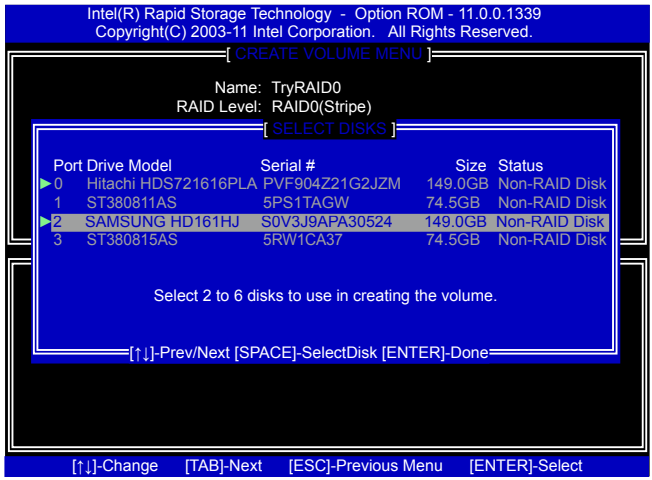

2. In "Name" item, you can input a device name for the RAID0 system and press <Enter> to apply it. Here, we name it as TryRAID0 to replace the default Volume0.
3. In “RAID Level” item, you can use Up or Down arrow key to make a selection. Select RAID0 (Stripe) and press <Enter>.



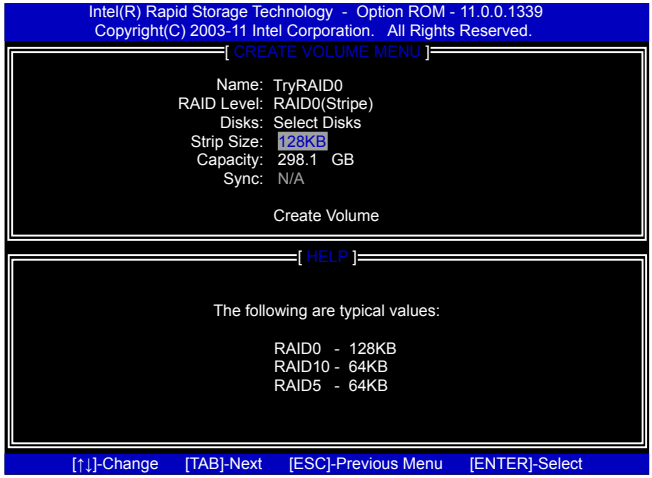

4. It then goes to “Disks” item. Press <Enter> to display the hard disks list for this RAID0 system.



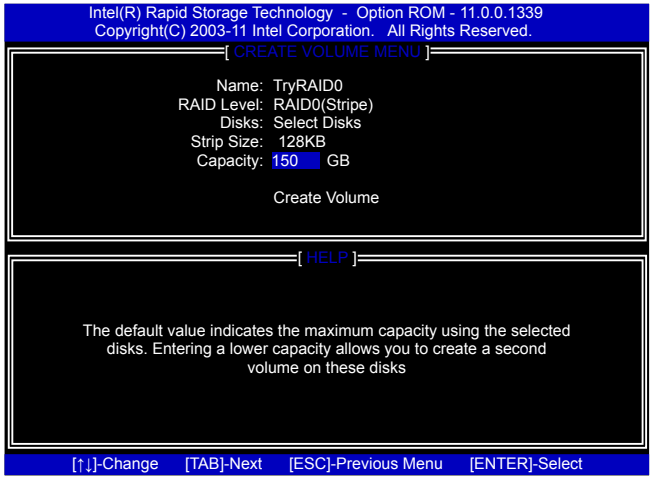

5. From the hard drive list, use Up or Down arrow key to reach the hard disks you want to combine them as RAID0, then press <Space> key to select them. A triangle sign will appear to indicate the drive selected. Here, we select two 149.0GB hard disks as an example. Press <Enter> key to finish the selection.



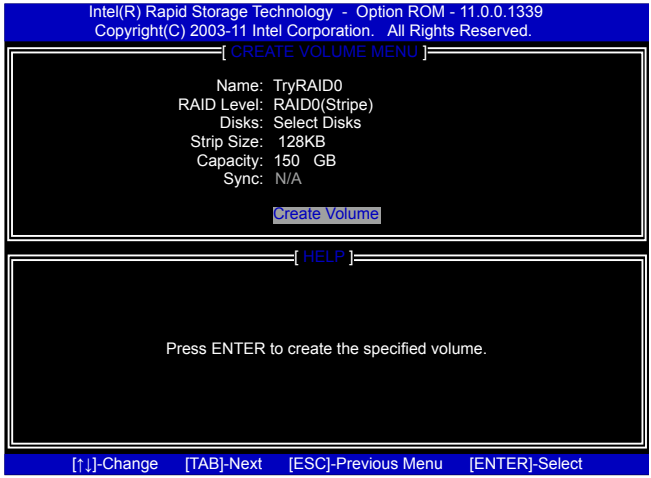

6. It is now entering “Strip Size” menu. Use Up or Down arrow key to select the desired strip size. The available values range from 4KB to 128KB. The strip value should be selected based on different applications. Some suggested choices are :
   16K - Best for sequential transfer.
   64K - Good general purpose strip size.
   128K - Best performance for most desktops and workstations .
   The default value is 128K for RAID0. Press <Enter>.




7. In “Capacity” item, the default value indicates the maximum capacity using the selected disks. 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 150GB here to build the first volume. Later, we will also describe how the second volume is generated. Input 150GB, and press <Enter>.

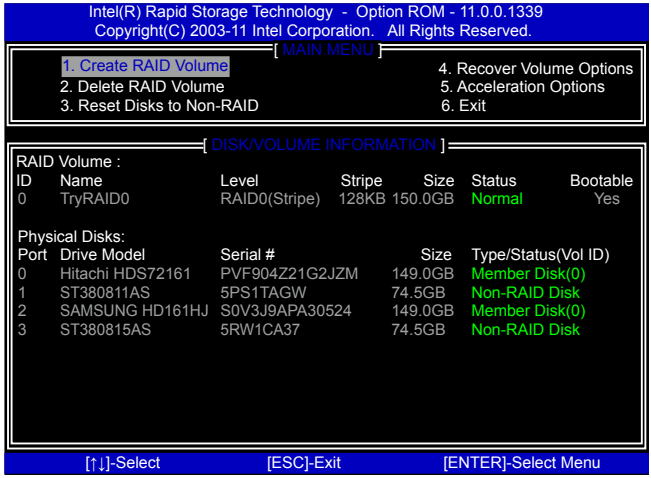



8. In “Create Volume” item, press <Enter>.



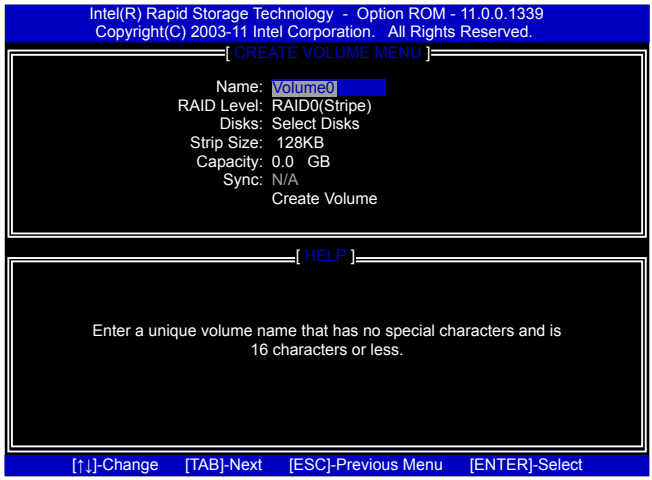

A warning message will appear :

9. Press <Y> to create the volume and return to the main menu, a 150GB RAID0 system is normally configured.

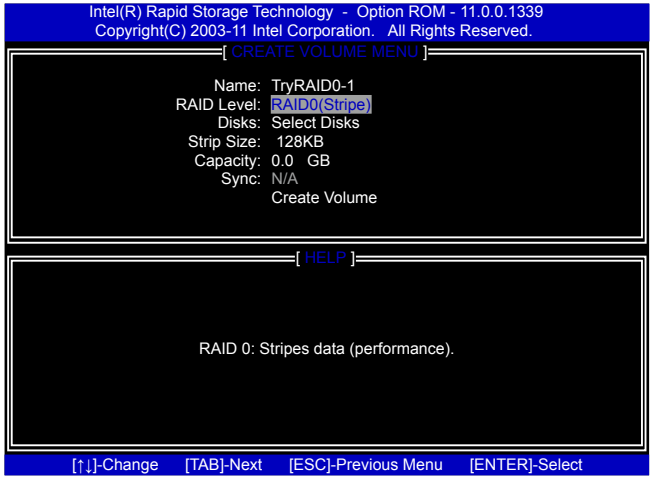


Create RAID0 (2nd Volume)

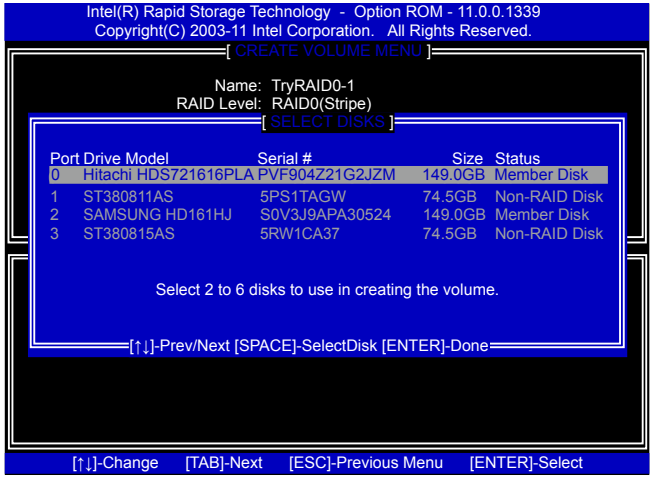
1. Select “1. Create RAID Volume” from the menu and press <Enter>. The menu appears :



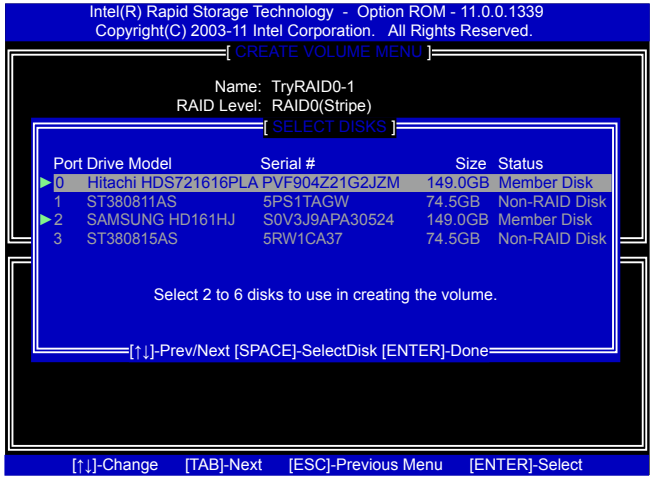

2. In "Name" item, we name it as TryRAID0-1 for second volume.
3. In “RAID Level” item, you can use Up or Down arrow key to make a selection, only RAID0, 1 can be selected. Select RAID0 (Stripe) and press <Enter>.
   (Note : You also can try to select RAID1 for the second volume as an experiment here)



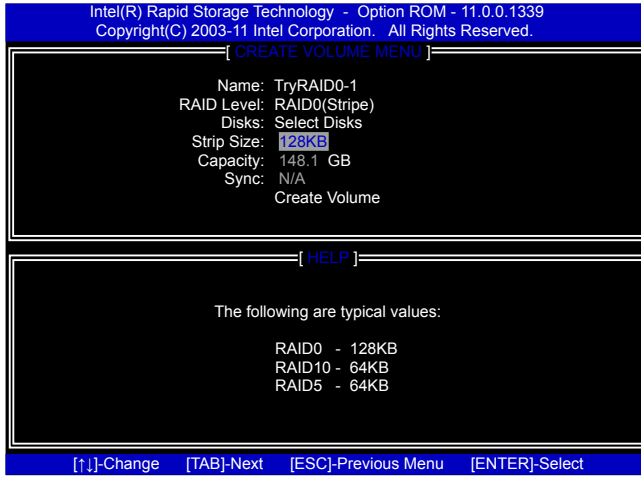

4. It then goes to “Disks” item. Press <Enter> to display the hard disks list for this RAID0 second volume system.



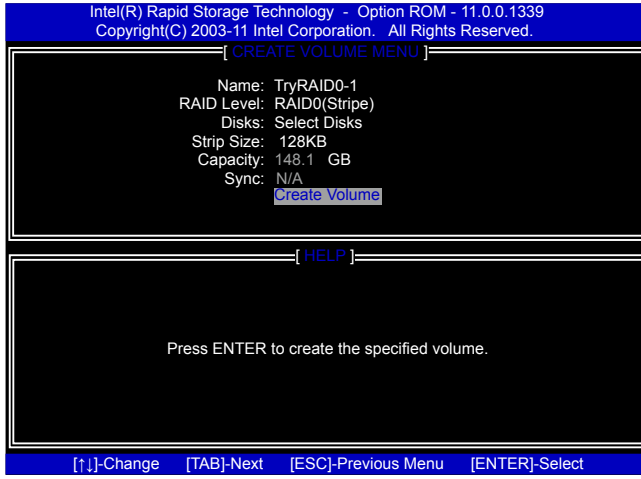

5. From the hard disk list, select the previously configured RAID0 hard disks, and press <Space> key to select them. Two signs will appear to indicate the selections. Press <Enter> to continue.




6. It goes to “Strip Size” menu directly. Capacity automatically displays 148.1GB, 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>.

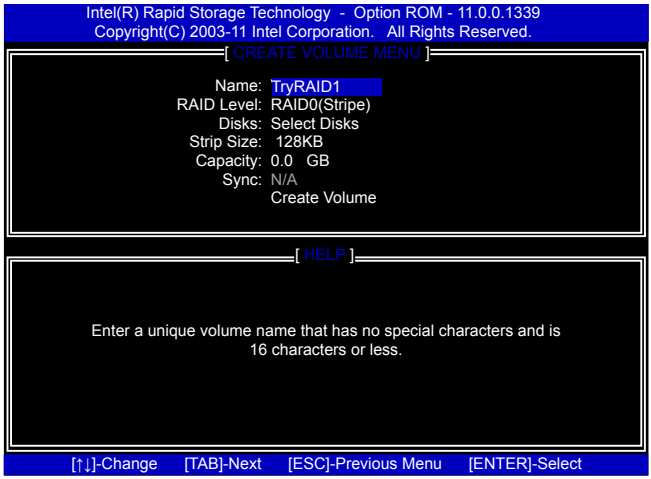



A message will appear :

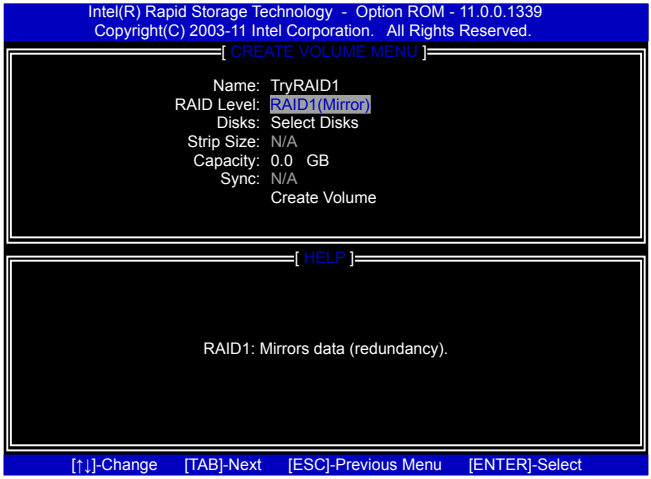
Press <Y> to create the volume and return to the main menu. Two RAID0 volumes were configured.

Create RAID 1

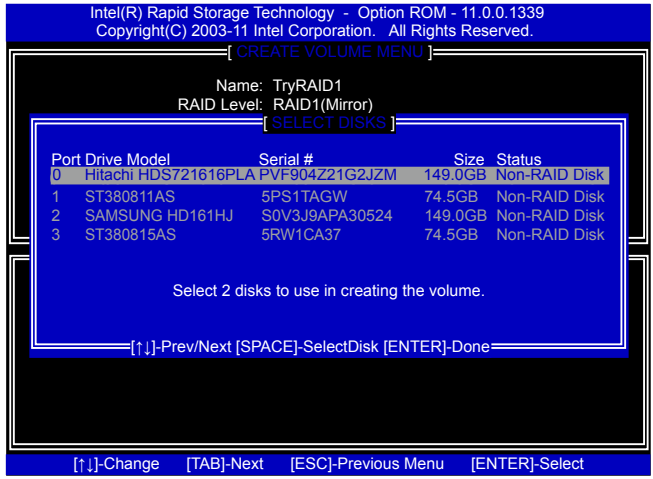
1. Select “1.Create RAID Volume” from the main menu and press <Enter>.
2. In "Name" item, you can input a device name for the RAID1 system and press <Enter> to apply it. Here, we name it as TryRAID1 to replace the default Volume0.



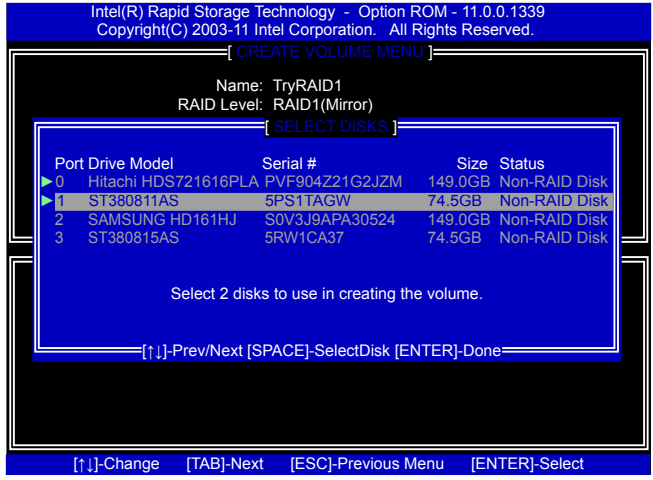

3. In “RAID Level” item, you can use Up or Down arrow key to make a selection. Select RAID1 (Mirror) and press <Enter>.



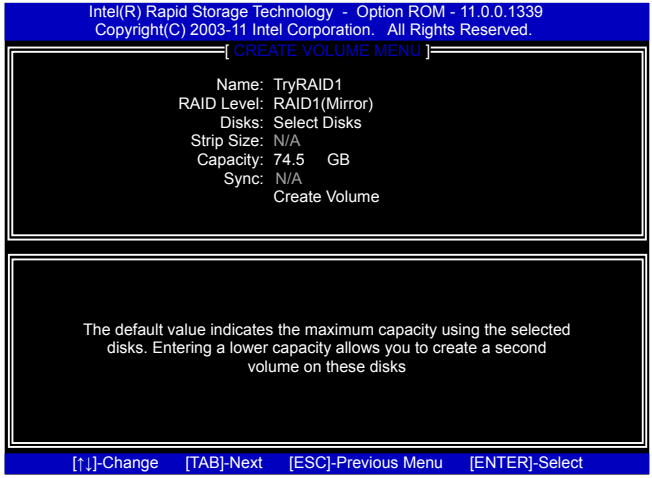
4. It then goes to “Disks” item. Press <Enter> to dispaly the hard disks list for this RAID1 system.




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 149.0GB and one 74.5GB hard disks. Press <Enter> key to finish the selection.



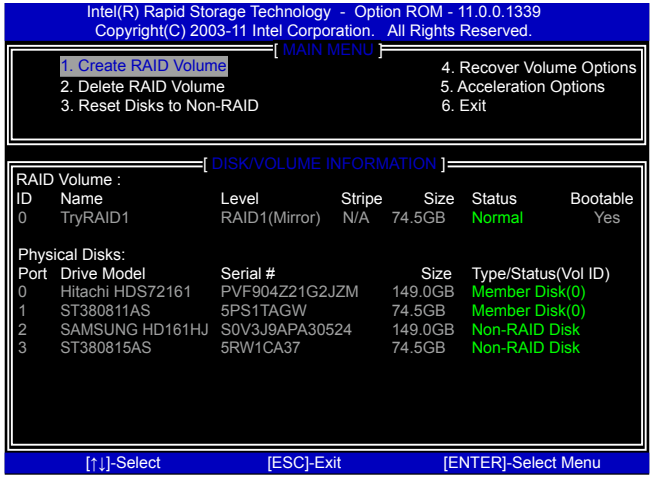
6. It will skip “Strip Size” menu for RAID1.




7. In “Capacity” item, use the default value, and press <Enter>. The size of the smaller hard disk 74.5GB is becoming the default value, and it indicates the maximum capacity.

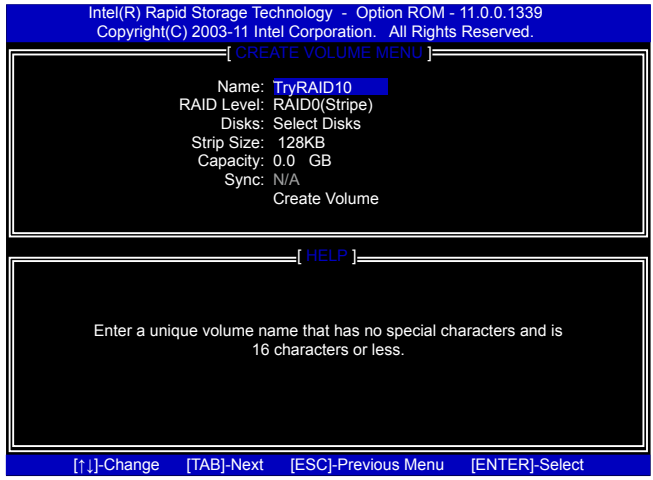
8. Select “Create Volume” and press <Enter>. A warning message will appear:

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

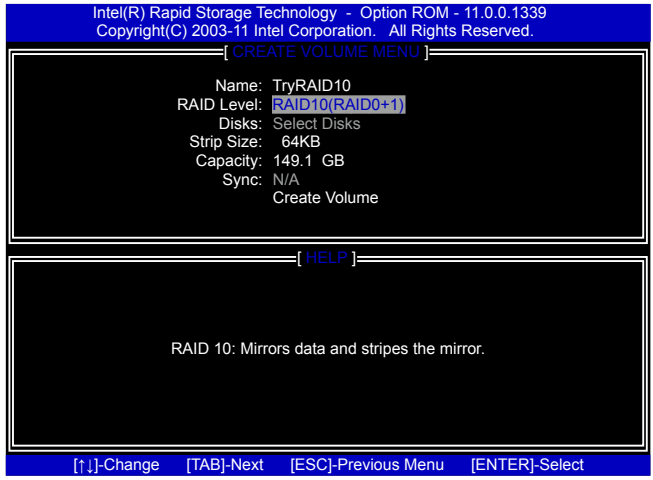


Create RAID 10 (0+1)

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.

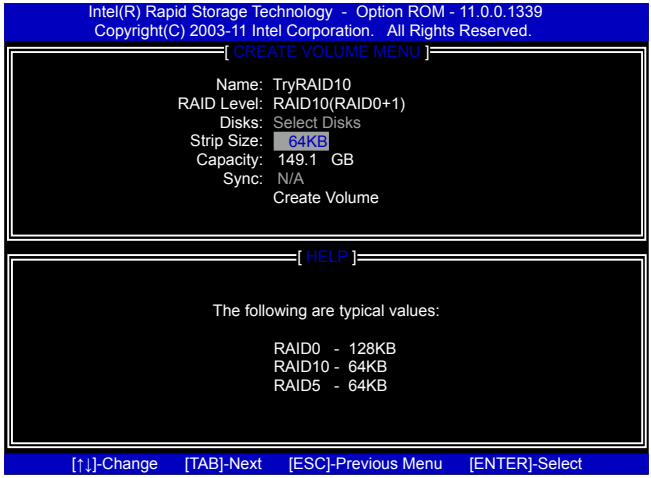



3. In “RAID Level” item, you can use Up or Down arrow key to make a selection. Select RAID10(RAID0+1) and press <Enter>.



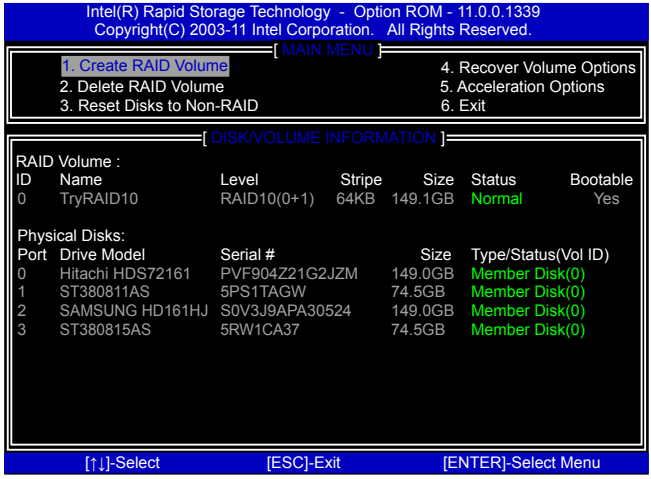

4. After exiting from "RAID Level", it goes directly to "Stripe Size" item. Because all four disks are elected for RAID10, so there is no need to go to Disks option.

5. Use Up or Down arrow key to select the desired strip size when entering “Strip Size” menu. The default value is 64K.



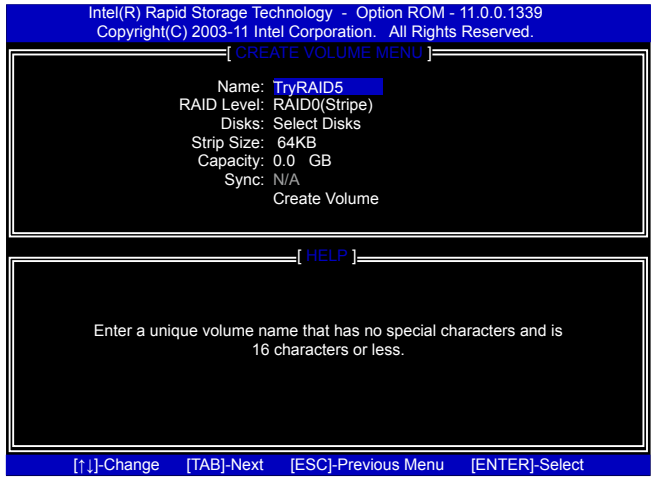

6. In “Capacity” item, use the default value, and press <Enter>. The default value is twice the smallest hard disk size, that is, 74.5GB * 2 = 149GB.
7. Select “Create Volume” and press <Enter>. A warning message will appear :

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

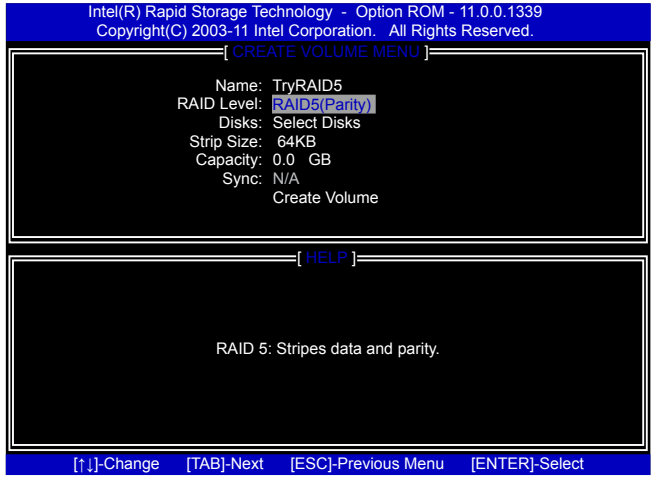


Create RAID5 (Parity)

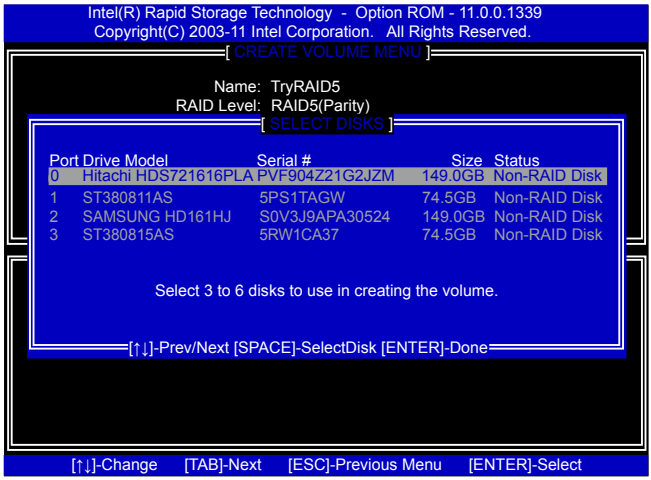
1. Select “1.Create RAID Volume” from the main menu and press <Enter>.
2. In "Name" item, you can input a device name for the RAID5 system and press <Enter> to apply it. Here, we name it as TryRAID5 to replace the default Volume0.



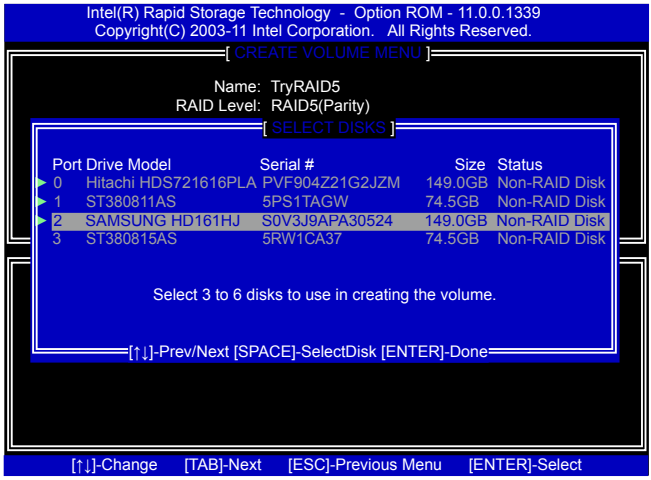

3. In “RAID Level” item, you can use Up or Down arrow key to make a selection. Select RAID5(Parity) and press <Enter>.



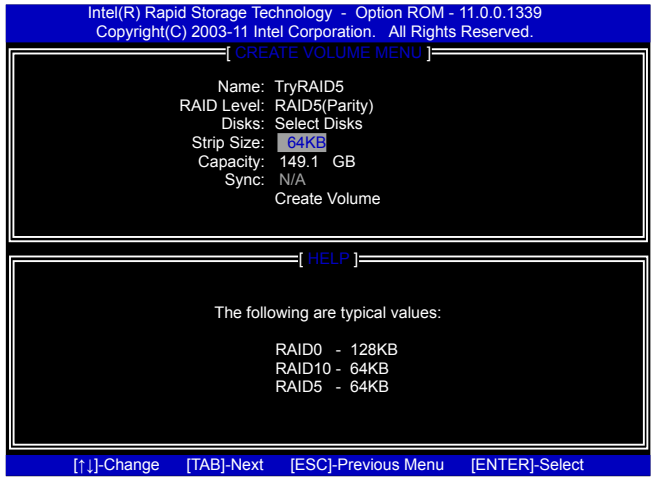
4. It then goes to “Disks” item. Press <Enter> to display the hard disks list for this RAID5 system.




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 two 149.0GB and 74.5GB hard disks for an example. Press <Enter> key to finish the selection.

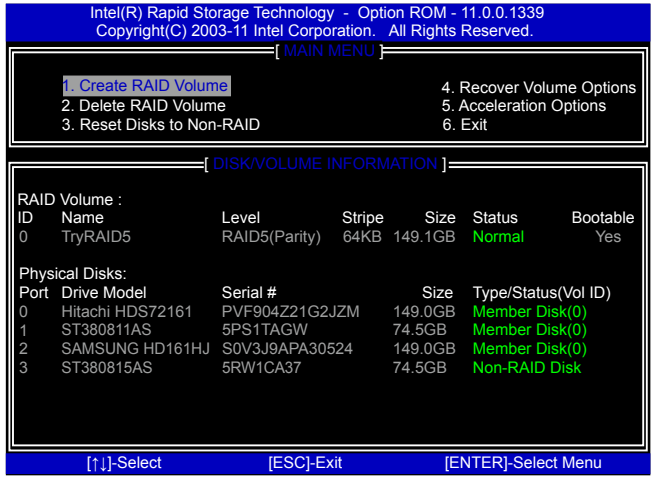


6. Use Up or Down arrow key to select the desired strip size when entering “Strip Size” menu. The default value is 64K. Press <Enter>.



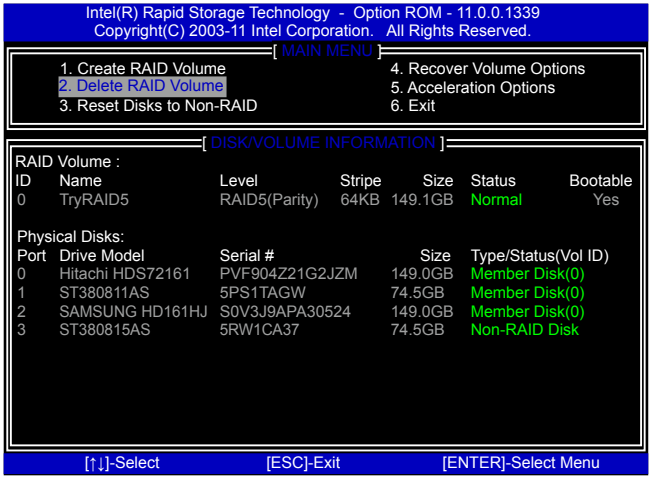

7. In “Capacity” item, use the default value, and press <Enter>. The default value is twice that of the smallest hard disk size, that is, 74.5GB * 2 = 149GB.
8. Select “Create Volume” and press <Enter>. A warning message will appear :

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

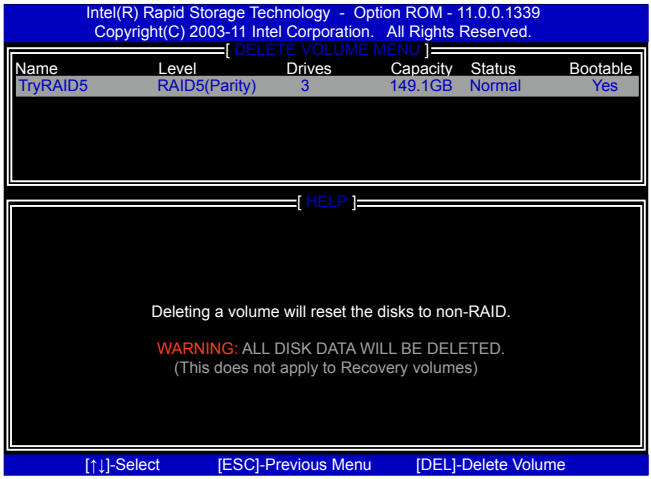


## 3. Delete RAID Volume

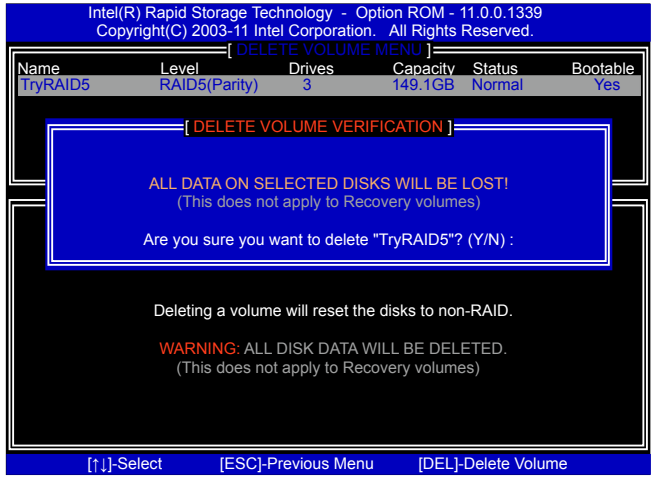
1. Take TryRAID5 for example. Select “2. Delete RAID Volume” in main menu and press <Enter>.



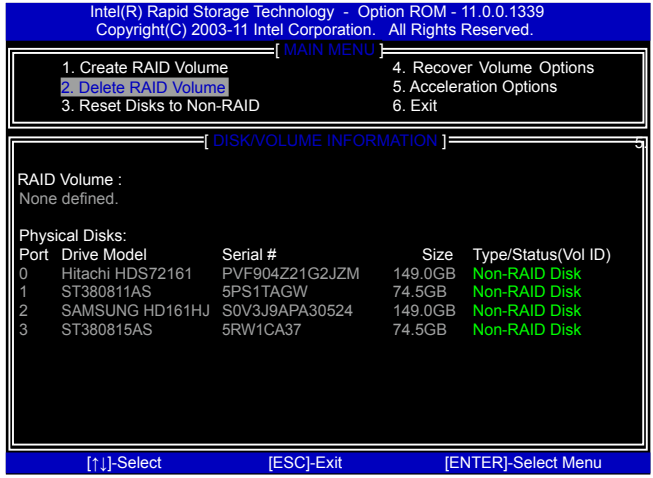

2. Use Up or Down arrow key to select the RAID set you want to delete. Here only one RAID5 is seen, so press <DEL> key to continue.




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




4. Return to Main Menu.

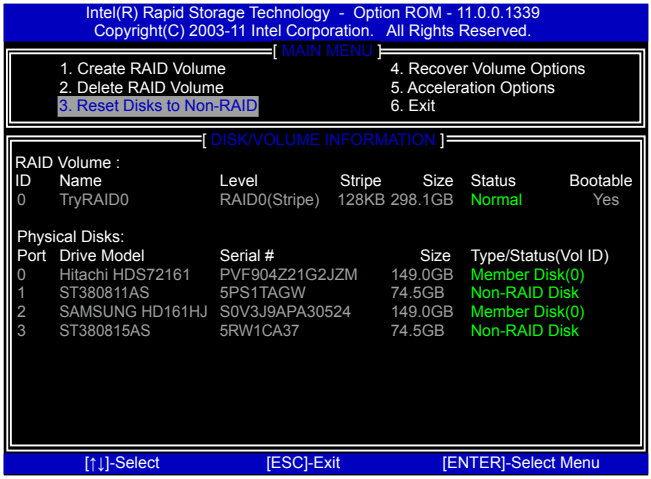



## 4. Reset Disks to Non-RAID

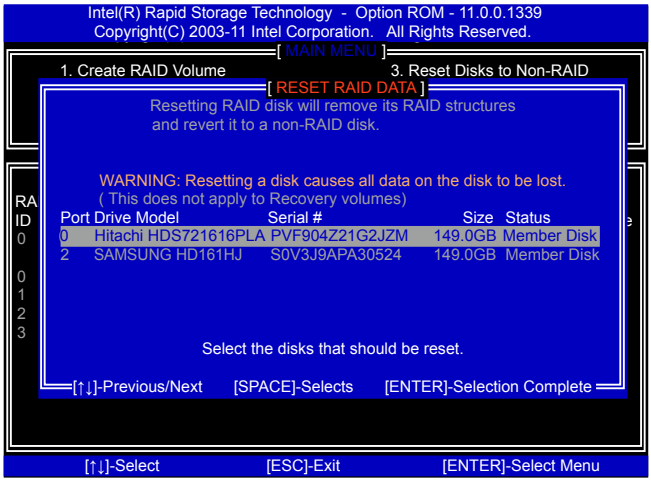
Reset RAID volume allows you to replace a failed disk with a new one, and the operating system will rebuild the data later. For RAID0, reset a hard disk would totally crash the system, but for RAID1, RAID10 and RAID5, they all can be rebuilt.
When rebuild is needed, you must first install a new hard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

Example 1. Reset a RAID0 system.

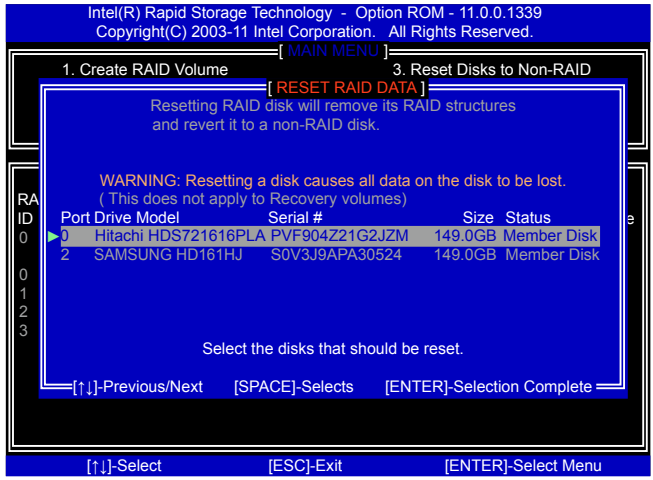
1. A TryRAID0 volume was built with two 149.0GB hard disks, we want to reset one of them. Select “3. Reset Disks to Non-RAID” in main menu and press <Enter>.



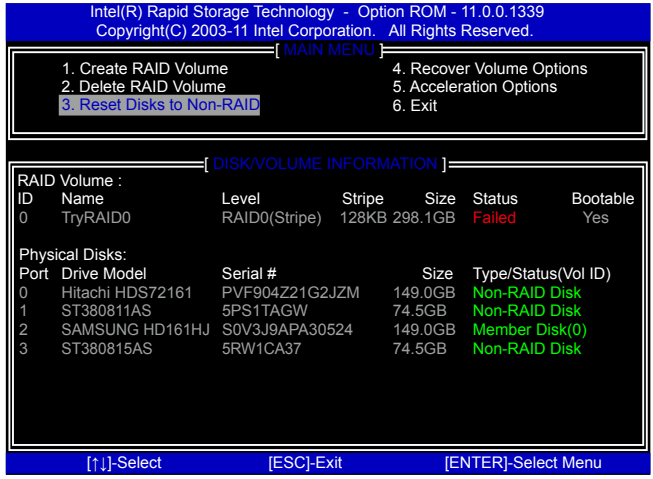

2. A warning message is displayed.



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

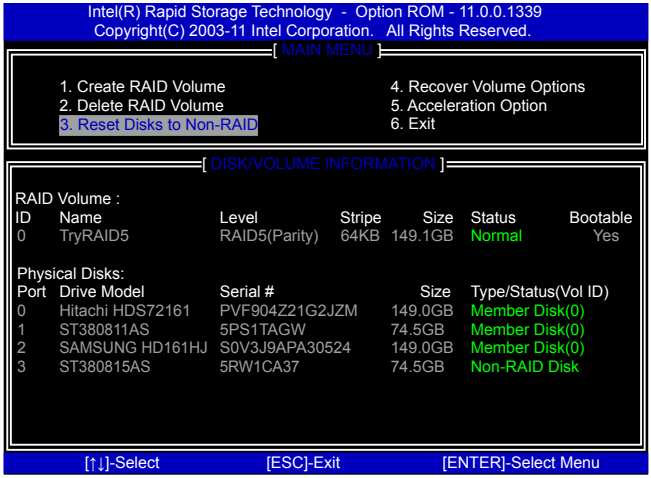



4. It goes back to Main menu with a “Failed” status of RAID0 volume.

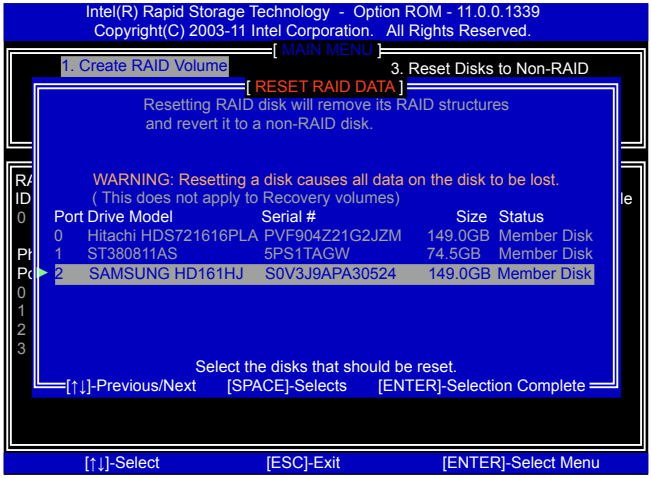


Example 2. Reset a RAID5 system

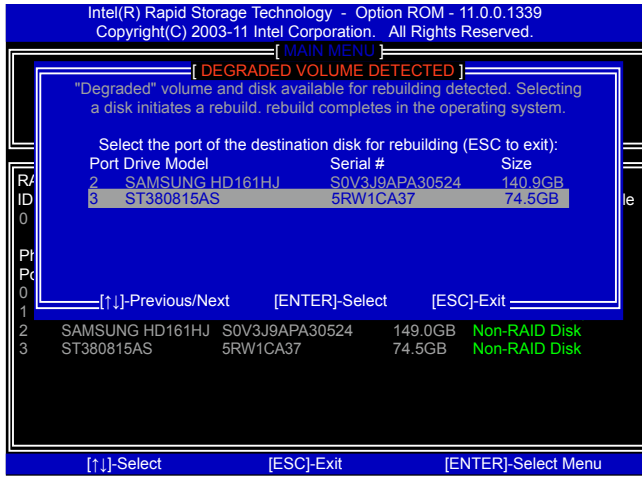
1. A TryRAID5 volume was built with three hard disks, we want to reset one of them. Select “3. Reset Disks to Non-RAID” in main menu and press <Enter>.



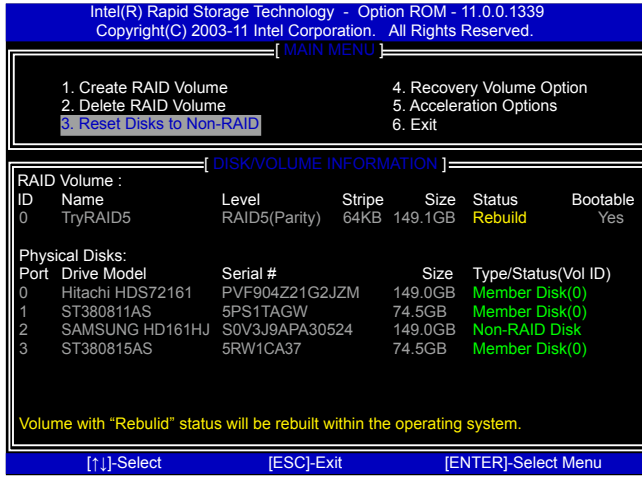

2. A warning message is displayed.
3. Select “Port 2 - SAMSUNG HD161HJ” hard disk as the one to be reset. Press <Enter>. A double confirmation message pops out, press <Y> to confirm.




4. A "DEGRADED VOLUME DETECTED" screen pops out asking you to select a new hard disk for rebuilding. Here, we select ST 74.5GB. Press <Enter> to select it.

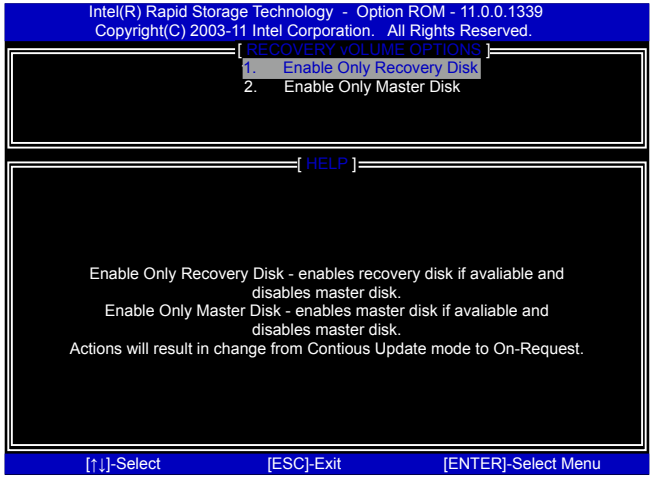



5. It goes back to Main menu with a "Rebuild" status of RAID5 volume. Eventually, a replacement hard disk has to join in and it always keeps three hard disks in the RAID5 system.
6. Operating System will perform the rebuilding later.

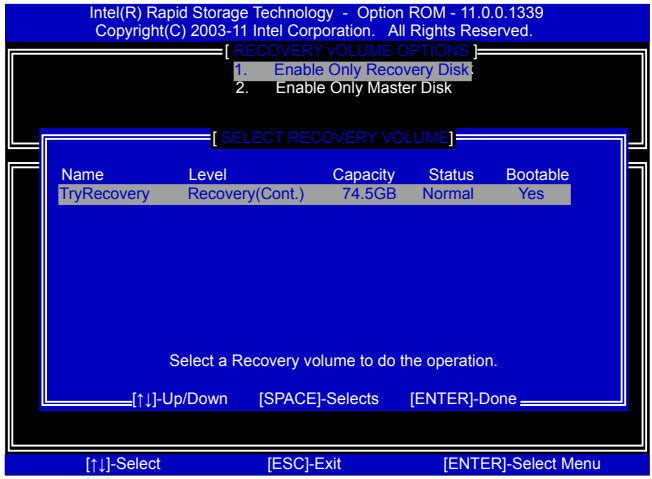


## 5. Recovery Volume Options

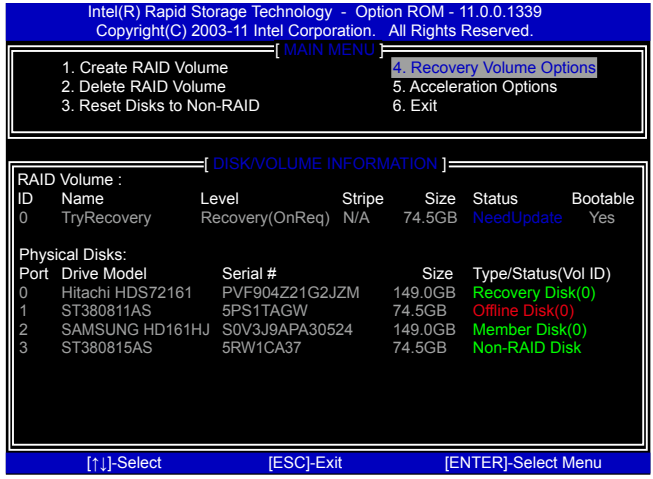
1. “Recovery Volume Options” is only available when “Recovery” is built. Here, we take TryRecovery as an example, select “4. Recovery Volume Options” in main menu and press <Enter>. The screen displays:




2. Use Up or Down key to make a selection to enable Recovery or Master disk.
3. Here, we select “1.Enable Only Recovery Disk“ and press<Enter> to continue. The screen display:

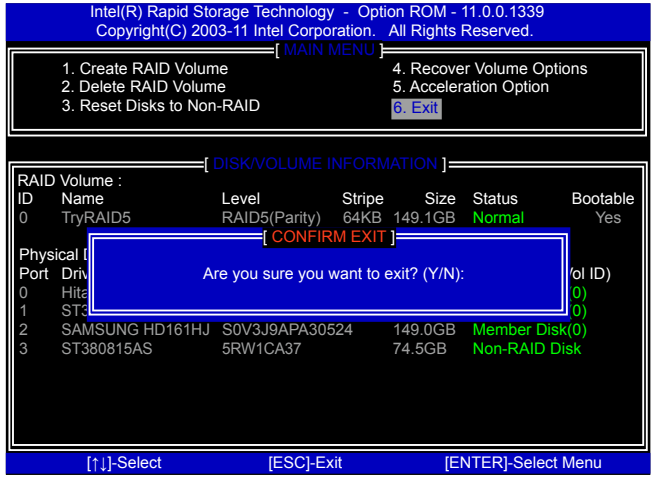


4. Press <Space> key to select it and press <Enter>, it returns to the main menu. You can see the 74.5GB disk is offline, and actions of Recovery change from Contious Update mode to On-Request.




## 6. Exit RAID BIOS

1. Take TryRAID5 as an example, select “5. Exit” in main menu and press <Enter>. The screen displays:



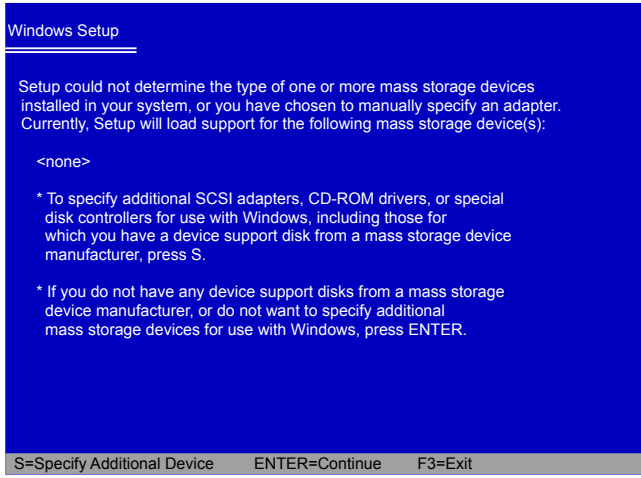

2. Press <Y> to exit Intel® Rapid Storage Technology program. The system will enter BIOS setup.
3. Shut down the computer, remove the Non-RAID disk, and we will continue for Windows OS installation. If you do not remove irrelevant hard disk, Windows may detect it during the installation, and you could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

## 5-7 Install a New Windows XP

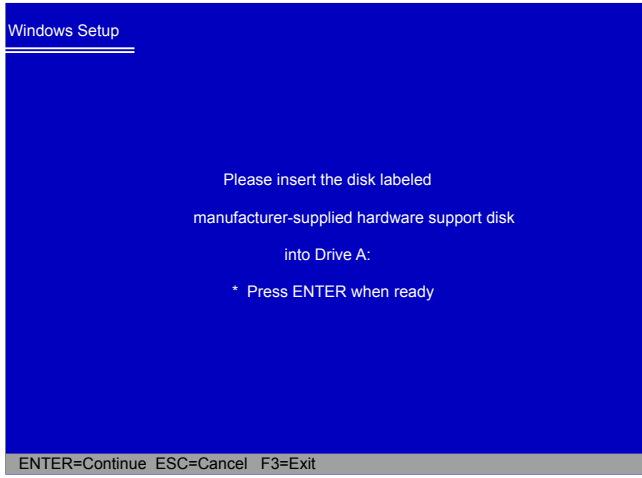
NOTE When set the SATA Mode in BIOS to either AHCI or RAID, you need to follow the following steps to install Windows OS.

1. Press <DEL> to enter BIOS Setup during POST.
2. Insert the Windows installation CD into the optical drive.
3. Set the first Boot device to CD/DVD, save changes and exit the BIOS setup. (Please refer to Chapter 3 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.

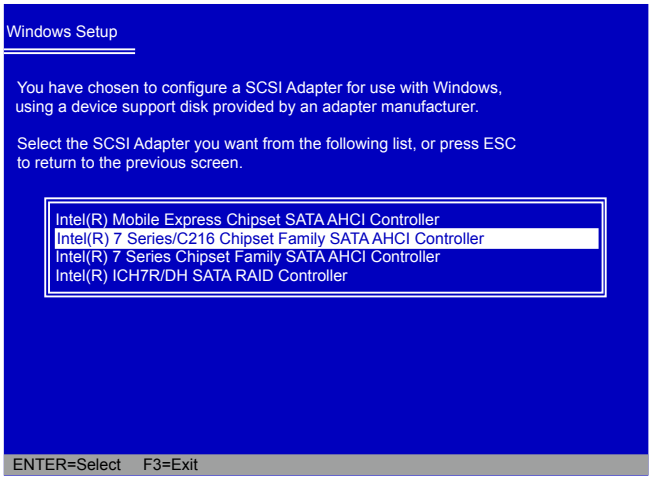
5. After some files are copied to your system, the following picture appears, press <S> to continue the specific driver installation.



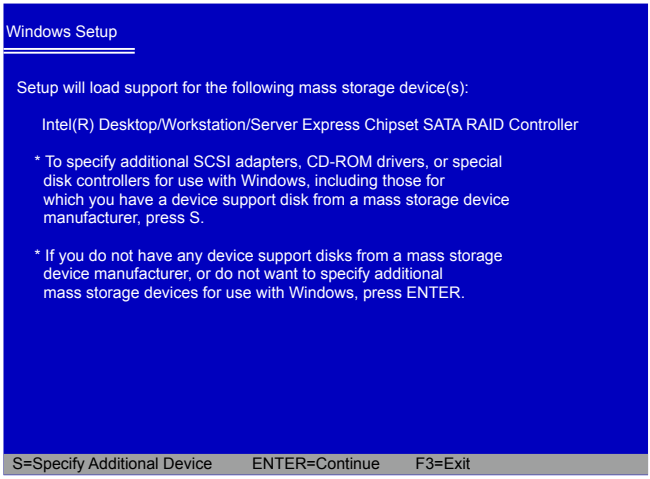

6. It will ask you to insert the RAID driver diskette into you floppy drive. Press <Enter> after it is done.



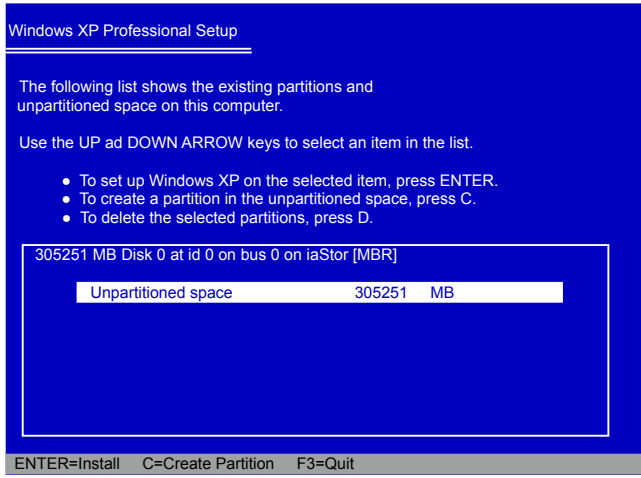
7. Depending on South Bridge chip of your system, select appropriate driver for it. Here, because the SATA mode is set to RAID, we choose "Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller" . Press <Enter> to select it.
   If the SATA mode in BIOS is set to AHCI, this screen will show different drivers, and we need choose the item shown bellow.

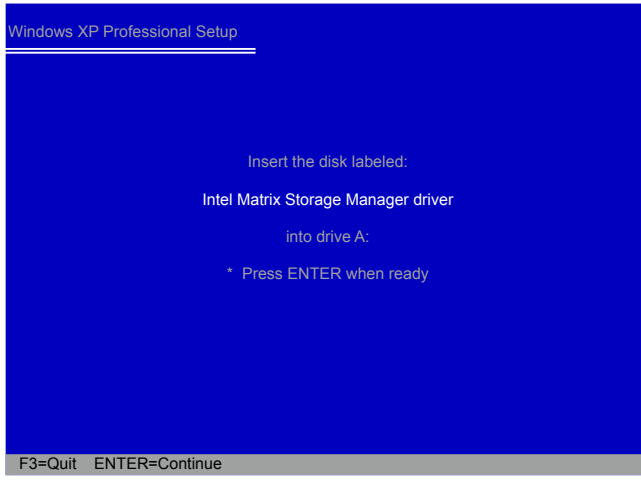



8. A confirmation message pops out to double check if the driver is really what we wanted. Press <Enter> to continue.



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.