

AIS-E1

Advanced System Controller

2.5" HDD/SSD x 4

Slim ODD x 1

Gigabit Ethernet x 2

COM x 1, USB2.0 x 6

HD Audio Codec

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Packing List

Before you begin operating your PC, please make sure that the following materials are enclosed:

- 1 9761E10000 Gift Box
- 1 AIS-E1
- 1 DVD-ROM for manual (in PDF format) and drivers

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.

- d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 65°C (149°F). IT MAY DAMAGE THE EQUIPMENT.

FCC

Warning!



This device complies with Part 15 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.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

China RoHS Requirements
产品中有毒有害物质或元素名称及含量
AAEON Boxer/ Industrial System

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
外壳	×	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
电源	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 一、此产品所标示之环保使用期限, 系指在一般正常使用状况下。 二、上述部件物质中央处理器、内存、硬盘、电源为选购品。</p>						

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Chapter

1

**General
Information**

1.1 Introduction

AIS-E1 adopts the Intel® Core™ i7/ i5/ Celeron® QC/DC Processor up to 45W. The chipset is equipped with Intel® QM67. Moreover, the system memory features two DDR3 1066/1333/1600 MHz SODIMM up to 16 GB. It deploys two LAN ports that consist of 10/100/1000Base-TX Ethernet RJ-45 ports. AIS-E1 condensed appearance features desktop and wallmount form factor that fits nicely into a space-limited environment.

This AIS-E1 supports up to one 3.5" Hard Disk Drive and four 2.5" HDD/SSD and one slim ODD. Moreover, the flexible expansion interfaces feature one PCI-Express[x4], one Mini PCIe socket, and one CFast™. In addition, this model supports one RS-232/422/485 port, optional five RS-232 ports, and six USB2.0 (two ports on the front panel, four with USB2.0 connectors). Furthermore, the Realtek ALC892 supports HD audio codec and the AIS-E1 can support dual displays with VGA, DVI-D, and HDMI via Intel® QM67.

With the increasing demands of high performance in audio and video, AAEON released the specific Advanced System Controller to fulfill the needs of the applications, such as Factory Automation, Building Automation, and etc.

1.2 Features

- Mini-ITX Based Chassis with scalable expansion slots.
- Socket G2 (rPGA988B) 2nd Generation for Intel® Core™ i7 / i5 / Celeron® QC / DC processors up to 45W Max
- 2 x 204-pin Dual-channel DDR3 1066/1333/1600 MHz SODIMM up to 16GB
- Intel® Integrated Graphics Engine supports Dual View by VGA, DVI, HDMI, LVDS
- LAN 1 : Intel® 82579 PHY Gigabit Ethernet
LAN 2 : Realtek RTL 8111E Gigabit Ethernet
- Up to 2.5" HDD/SSD x 4 or up to 2.5" HDD/SSD x 3 and 3.5" HDD/SSD x 1, Support RAID 0,1,5,10
- USB 2.0 x 6, COM x 1 (up to 6 COM Port via expanded DB9 Holes and expansion slot)
- Mini PCIe socket x 1, Cfast™ x 1 (Optional PCI-E [x4] x 1 Riser Card)
- Dimension: 315mm(W) x 70mm(H) x 300mm(D)

1.3 Specifications

● CPU		Socket G2 (rPGA988B) 2nd Generation for Intel® Core™ i7 / i5 / Celeron® QC / DC processors up to 45W
● Chipset		Intel® QM67
● System Memory		204-pin Dual Channel DDR3 1066/1333/1600 MHz SODIMM x2, up to 16GB
● Display Interface	VGA	DB-15 x 1
	DVI	DVI-D x 1
	Others	HDMI x 1
● Storage Device	SSD	CFast x 1
	HDD	2.5" SATA HDD bay x 4
● Network	LAN	Gigabit Ethernet
	Wireless	Optional by Mini Card
● Front I/O	USB Host	USB2.0 x 2
	Others	Power Switch x 1
● Rear I/O	USB Host	USB2.0 x 4
	LAN	RJ-45 x 2
	Serial Port	RS-232/422/485 x 1
	Audio	Mic-in, Line-in, Line-out
	KB/MS	KB/MS x 2
	Others	Power input x 1

● Expansion	Mini Card	Mini Card x 1
	Others	PCI-Express [x4]
● Indicator	Front	PWR, HDD
● Power Requirement		12V DC-in
● System Cooling		CPU cooler x 1 System Cooler x 1
● Mounting		Wallmount
● Operating Temperature		32°F ~ 113°F (0°C ~ 45°C)
● Storage Temperature		-40°F ~ 176°F (-40°C ~ 80°C)
● Anti-Vibration		0.5g rms / 5 ~ 500Hz / operation – HDD 3.5g rms / 5~ 500Hz / operation – SSD
● Anti-Shock		10 G peak acceleration (11 msec. duration) – HDD 20 G peak acceleration (11 msec. duration) – SSD
● Certification	EMC	CE/ FCC class A
● Dimension (W x H x D)		12.4" x 2.76" x 11.81" (315mm x 70mm x 300mm)
● OS Support		Windows® XP Pro, Windows® 7, Linux Kernal 2.6.x

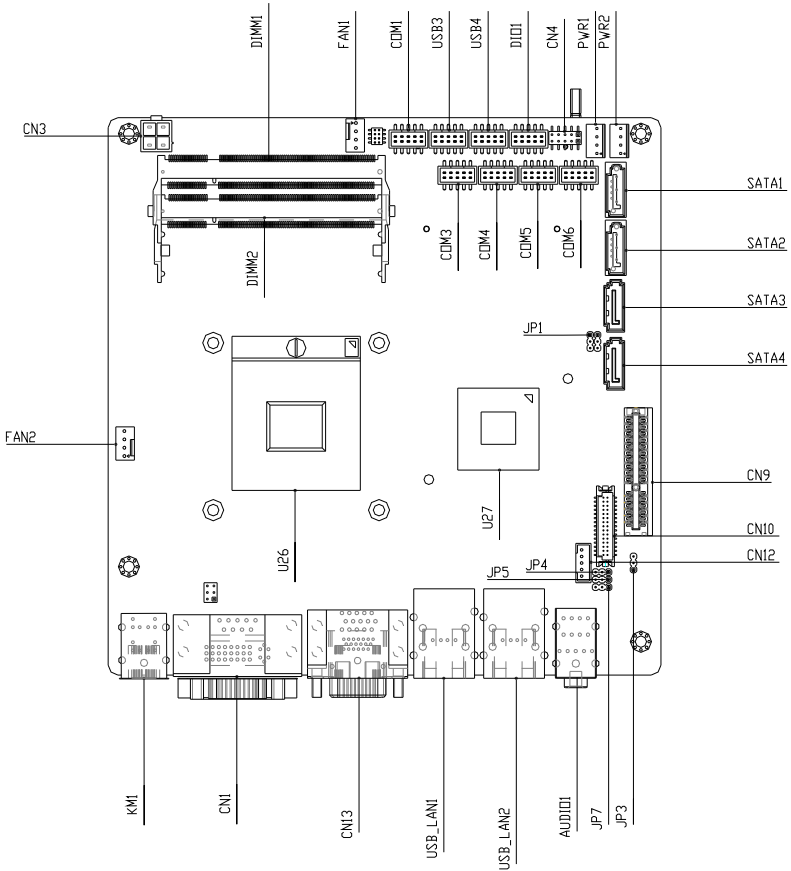
Chapter

2

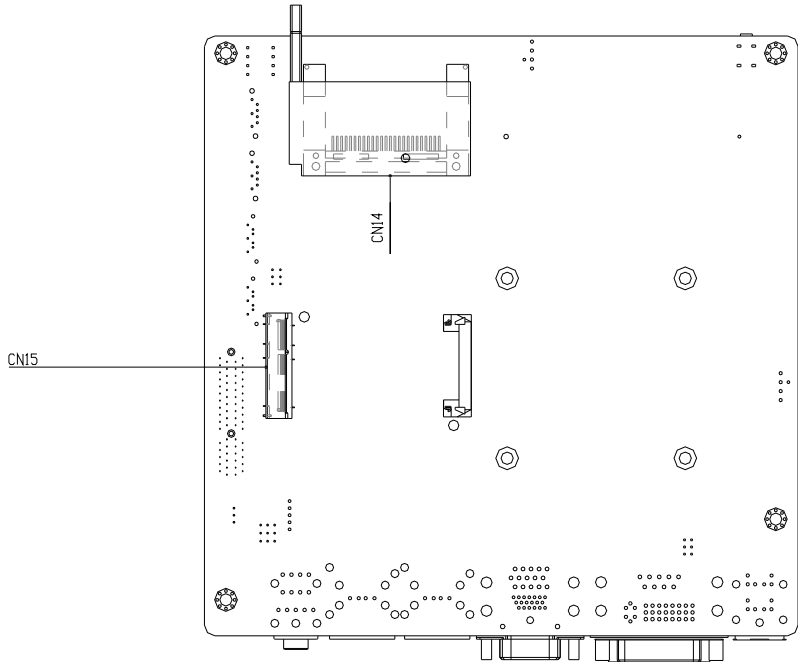
**Hardware
Installation**

2.1 Location of Connectors (Main Board)

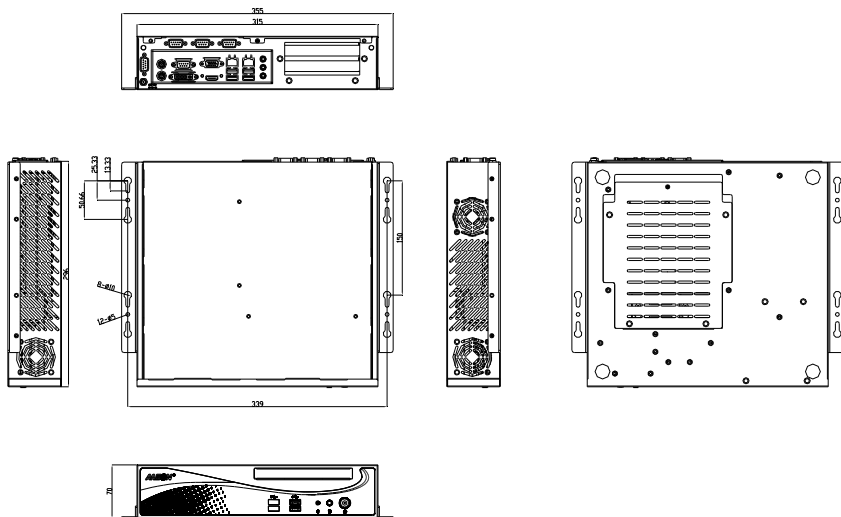
Component Side



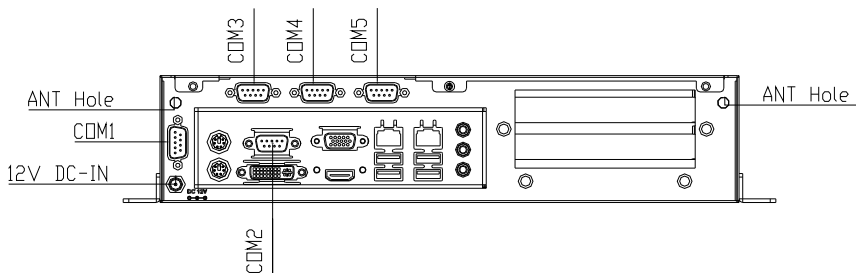
Solder Side



2.2 Mechanical Drawing of AIS-E1



I/O Ports



2.3 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	Clear CMOS
JP3	Auto Power Button
JP6	+12V/+5V/RING Selection
JP7	Inverter Power Selection

2.4 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

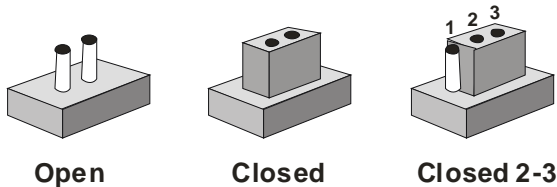
Label	Function
DIO1	Digital I/O
PWR1 ~ PWR2	SATA POWER
CN1	COM2 / DVI Connector
CN3	4-pin ATX Power +12V Connector
CN4	Front Panel Connector 1
CN9	PCIE*4 Connector
CN13	VGA / HDMI Connector
CN14	CFast™ Connector
CN15	Mini Card Connector
KM1	Keyboard/Mouse Connector
COM2	RS-232/422/485 Connector

COM1, COM3 ~ COM5	RS-232 Connector
SATA1~SATA2	SATA 3.0 Connector
SATA3~SATA4	SATA Connector
USB_LAN1 ~ USB_LAN2	LAN / USB Connector
DIMM1,DIMM2	DDR3 DIMM Slot
USB3 ~ USB4	USB Box Header
FAN1~ FAN2	4 Pin Fan Connector
AUDIO1	AUDIO Connector

2.5 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.6 Clear CMOS (JP1)

JP1	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.7 Auto Power Button (JP3)

JP3	Function
1-2	ATX (Default)
2-3	AT

2.8 +12V/+5V/Ring Selection (JP6)

JP6	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.9 Inverter Power Selection (JP7)

JP7	Function
1-2	+12V (Default)
2-3	+5V

2.10 Digital I/O (DIO1)

This connector offers 4-pair of digital I/O functions and address is A00H.

The pin definitions are illustrated below:

Pin	Signal	Pin	Signal
1	Digital- IN/OUT(Port1 Bit 1)	2	Digital- IN/OUT (Port1 Bit 2)
3	Digital- IN/OUT (Port1 Bit 4)	4	Digital- IN/OUT (Port3 Bit 4)
5	Digital- IN/OUT (Port3 Bit 5)	6	Digital- IN/OUT (Port3 Bit 6)
7	Digital- IN/OUT (Port3 Bit 7)	8	Digital- IN/OUT (Port6 Bit 3)
9	+3.3V	10	GND

The pin definitions and registers mapping are illustrated below:

Address: A00H

4 in / 4 out

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPI 11	GPI 12	GPI 14	GPI 34	GPO 35	GPO 36	GPO 37	GPO 63

8 in

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPI 11	GPI 12	GPI 14	GPI 34	GPO 35	GPO 36	GPO 37	GPO 63

8 out

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPI 11	GPI 12	GPI 14	GPI 34	GPO 35	GPO 36	GPO 37	GPO 63

2.11 SATA Power (PWR1~PWR2)

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

2.12 Front Panel Connector (CN4)

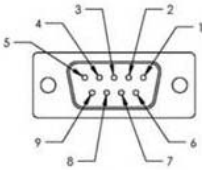
Pin	Signal	Pin	Signal
1	Power On Button (-)	2	Power On Button (+)
3	HDD LED (-)	4	HDD LED (+)
5	SPEAKER(-)	6	SPEAKER(+)
7	Power LED (-)	8	Power LED (+)
9	Reset Switch (-)	10	Reset Switch (+)

2.13 LAN1~LAN2 Active /Link/ Speed LED (CN6)

Pin	Signal	Pin	Signal
1	LAN1_LED_D2	2	LAN1_LED_LNK#_ACT
3	LAN1_LED_1000#	4	LAN1_LED_100#
5	LAN2_LED_D2	6	LAN2_LED_LNK#_ACT
7	LAN2_LED_1000#	8	LAN2_LED_100#

2.14 RS-232/422/485 Connector (COM2)

Different device implement the RS-232/422/485 standard in different ways. If you have problems with a serial device, check the pin assignments below for the connector.



Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

2.15 RS-232 Connector (COM1, COM3~COM5)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR

5	GND	6	DSR
7	RTS	8	CTS
9	RI		

2.16 USB Box Header (USB3~USB4)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD-	4	GND
5	USBD+	6	USBD+
7	GND	8	USBD-
9	GND	10	+5V

2.17 Installing the Hard Disk Drive

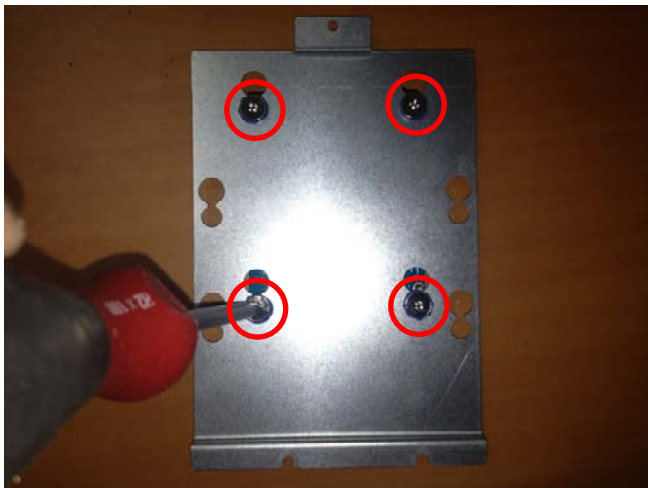
Step 1: Unfasten the screw of the AIS-E1



Step 2: Open the upper cover of the AIS-E1



Step 3: Get the HDD Bracket and fasten the four screws with the HDD



Step 4: Put the HDD and bracket back to the chassis by sliding the HDD bracket and lock to the position.



Step 5: Fasten the screw to finish installing the HDD



2.18 Installing Three 2.5" Hard Disk Drives

If you have three HDD to install, please refer to the installation below.

Step 1: Unfasten the screw of the AIS-E1

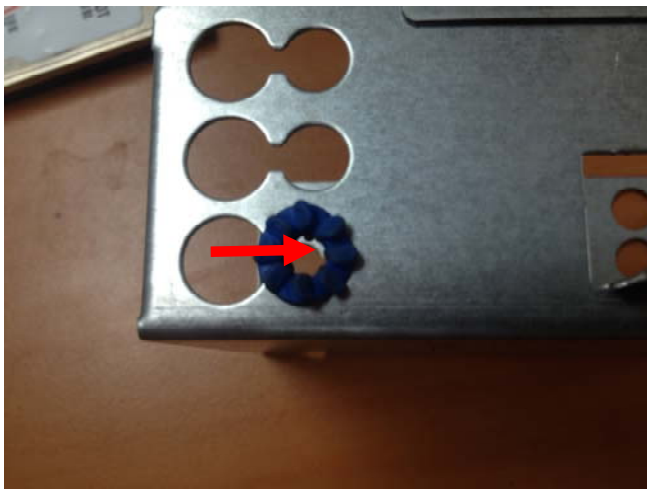


Step 2: Open the upper cover of the AIS-E1



Step 3: Put the blue rubber damper to the 3-layer HDD bracket and move the damper to the smaller fillister (you have to put 12 blue rubber dampers if you have three HDD to install)



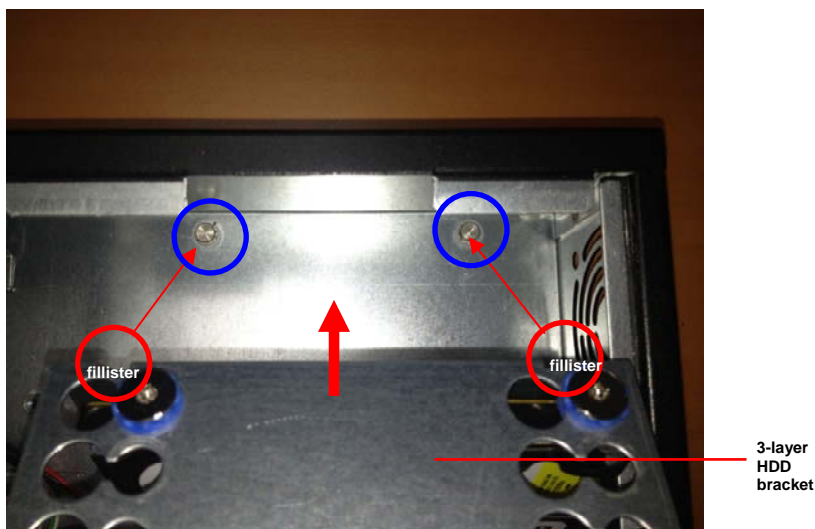


Step 4: Get the four screws ready and pierce to the dampers and lock the HDD (12 screws for three HDD installations)





Step 5: Make sure that the fillisters of the 3-layer HDD bracket has been latched to I-shape nails (blue circles)





Step 6: Fasten the screw to lock the HDD bracket with the Chassis and you've done installing the three HDD



Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The AIS-E1 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Chapter

4

**Driver
Installation**

The AIS-E1 comes with a driver disk that contains all drivers and utilities that can help you setup your product.

Insert the disk and the installation guide will start automatically. If it doesn't, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

- Step 1 – Install Chipset Driver
- Step 2 – Install VGA Driver
- Step 3 – Install LAN Driver
- Step 4 – Install Audio Driver
- Step 5 – Install ME Driver
- Step 6 – Install RAID & AHCI Driver
- Step 7 – Install TPM Driver
- Step 8 – Install Serial Port Driver (Optional)

Note: If you encounter any compatible issues relating to the COM port, please install the drivers in step 8 as administrator.

Please read instructions below for further detailed installations.

4.1 Installation

Insert the AIS-E1 driver disk into the disk drive. And install the drivers from Step 1 to Step 8 in order.

Step 1 – Install Chipset Driver

1. Open the **STEP 1-CHIPSET** folder
2. Open the **infinst_autol.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Step 2 – Install VGA Driver

1. Open the **STEP2-VGA** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Note 1:

- This motherboard supports VGA and LVDS display devices. In Single Display mode, use the hot keys to switch between VGA to LVDS device or vice versa. By default, press **<Ctrl>+<Alt>+<F1>** to switch to VGA device and press **<Ctrl>+<Alt>+<F3>** to switch to LVDS device.
- Before removing the current display device, connect the display device that you want to use, and then press the hot keys to switch to that device.

Note 2: Install dotNet Framework first (dotnetfx35.exe) if you are using Windows® XP

Step 3 –Install LAN Driver

1. Open the **STEP3-LAN** folder and select your LAN chip manufacturer (**Intel 82579LM or Realtek 8111E**).
2. Select your OS and open the **.exe** file located in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 –Install Audio Driver

1. Open the **STEP4-AUDIO** folder and select your OS
2. Open **Setup.exe** in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install ME Driver

1. Open the **STEP5-ME** folder and select your OS
2. Open **Setup.exe** in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install RAID & AHCI Driver

Please refer to the **Appendix C RAID & AHCI Settings**

Step 7 – Install TPM Driver

1. Open the **STEP7-TPM** folder and select your OS

2. Open **Setup.exe** in the folder
3. Follow the instructions
4. Drivers will be installed automatically

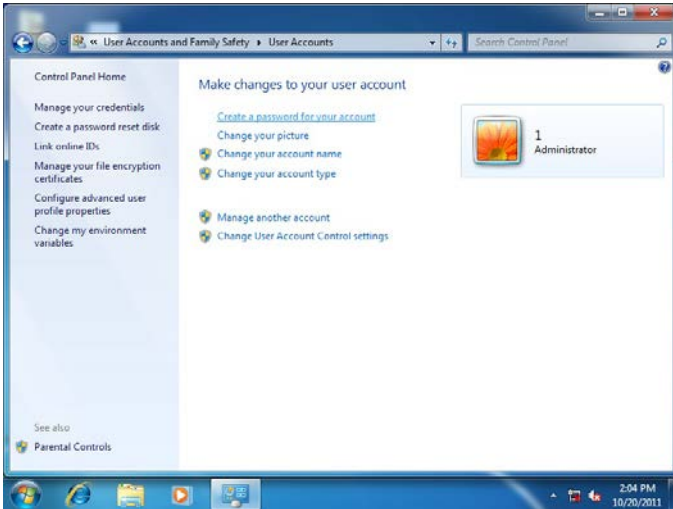
Step 8 –Install Serial Port Driver (Optional)

For Windows® XP 32-bit

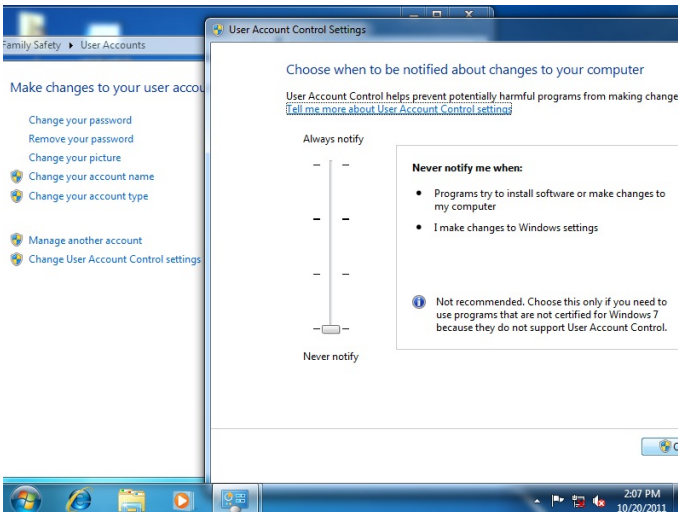
1. Open the **STEP8-Serial Port Driver (Optional)** folder followed by the **WINXP_32** folder
2. Open **patch.bat**
3. Follow the instructions
4. Drivers will be installed automatically

For Windows® 7 32-bit/ 64-bit

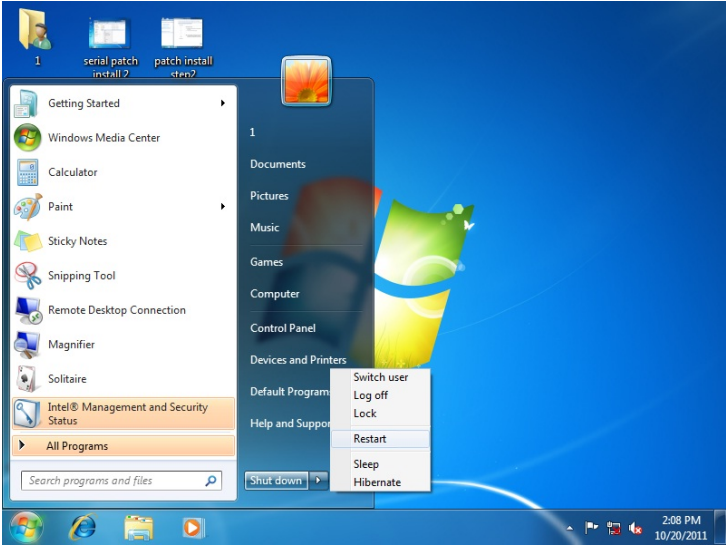
1. Create a password for Administrator account.



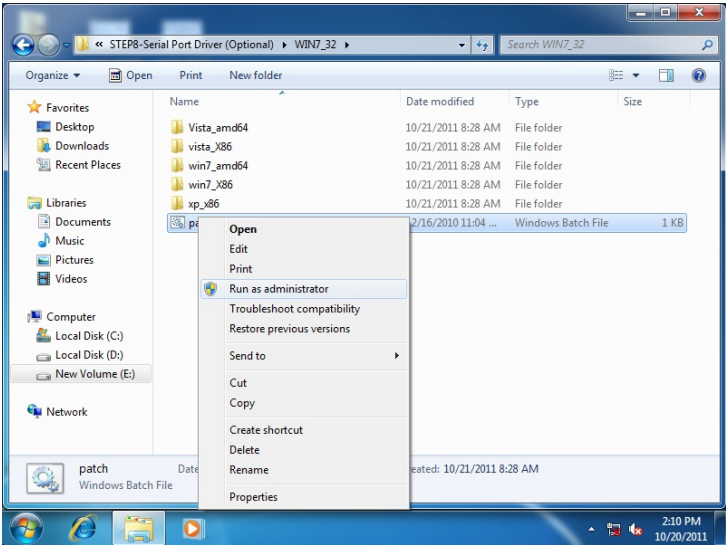
2. Change User Account Control Settings to [Never notify]



3. Reboot and Administrator login.



4. Run patch.bat as administrator.



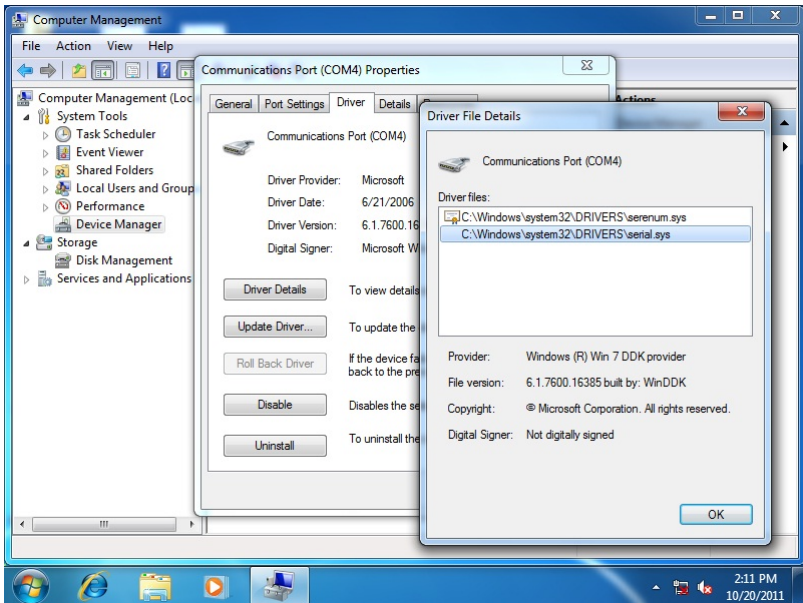
You also can install the serial port driver for Windows 7 by the Installation Procedures below:

-Win7 32-bit

Copy the Driver CD\Serial Port Driver (Optional) \WIN7_32\
win7_X86 \serial.sys to C:\WINDOWS\system32\drivers\

-Win7 64-bit

Copy the Driver CD\Serial Port Driver (Optional) \WIN7_64\
win7_amd64\serial.sys to C:\WINDOWS\system32\drivers\



Appendix

A

Programming the Watchdog Timer

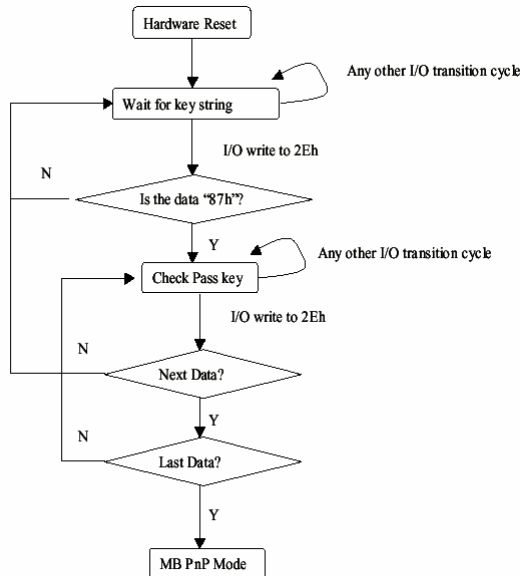
A.1 Programming

AIS-E1 utilizes ITE IT8728 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8728 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h, Default=00h)

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level ^{Note} for WDT

WatchDog Timer Time-out Value Register (Index=73h, Default=00h)

Bit	Description
7-0	WDT Time-out value 7-0

A.2 ITE8728 Watchdog Timer Initial Program

.MODEL SMALL

.CODE

Main:

CALL Enter_Configuration_mode

CALL Check_Chip

mov cl, 7

call Set_Logic_Device

;time setting

mov cl, 10 ; 10 Sec

dec al

Watch_Dog_Setting:

;Timer setting

mov al, cl

mov cl, 73h

call Superio_Set_Reg

;Clear by keyboard or mouse interrupt

mov al, 0f0h

mov cl, 71h

call Superio_Set_Reg

;unit is second.

mov al, 0C0H

mov cl, 72h

call Superio_Set_Reg

```
; game port enable  
mov cl, 9  
call Set_Logic_Device
```

```
Initial_OK:  
CALL Exit_Configuration_mode  
MOV AH,4Ch  
INT 21h
```

```
Enter_Configuration_Mode PROC NEAR  
MOV SI,WORD PTR CS:[Offset Cfg_Port]
```

```
MOV DX,02Eh  
MOV CX,04h  
Init_1:  
MOV AL,BYTE PTR CS:[SI]  
OUT DX,AL  
INC SI  
LOOP Init_1  
RET  
Enter_Configuration_Mode ENDP
```

```
Exit_Configuration_Mode PROC NEAR  
MOV AX,0202h  
CALL Write_Configuration_Data
```

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h

CALL Read_Configuration_Data

CMP AL,87h

JNE Not_Initial

MOV AL,21h

CALL Read_Configuration_Data

CMP AL,12h

JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg_Port+04h]

OUT DX,AL

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
```

```
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
```

```
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
Set_Logic_Device proc near
```

```
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
```

```
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected












































Appendix

B

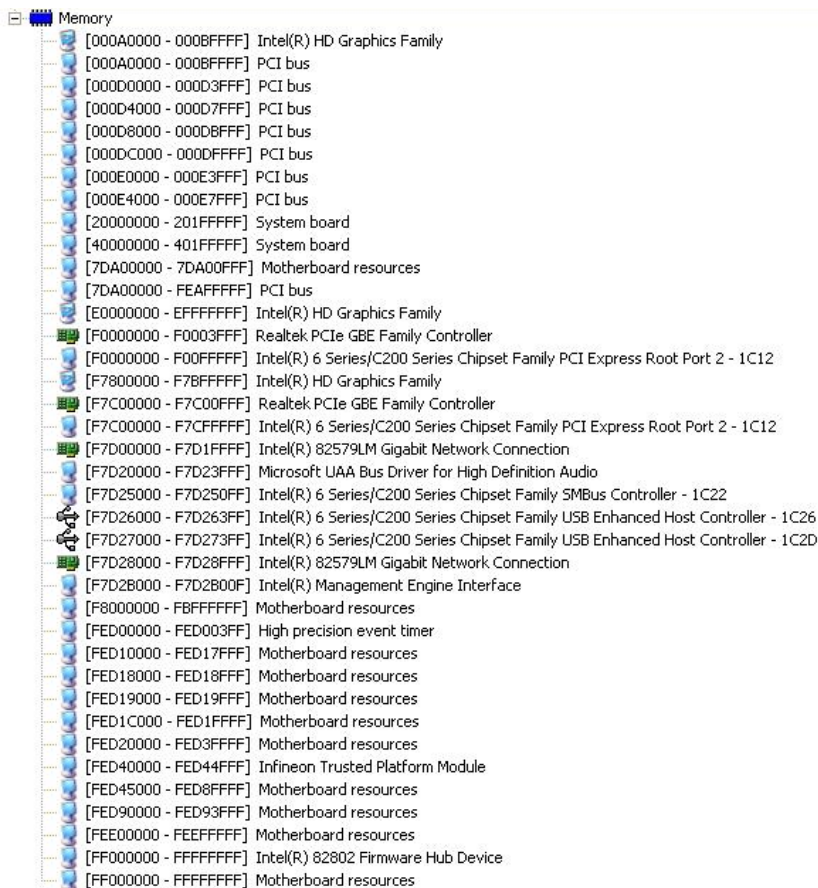
I/O Information

B.1 I/O Address Map

Input/output (IO)	
[00000000 - 0000001F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000024 - 00000025]	Programmable interrupt controller
[00000028 - 00000029]	Programmable interrupt controller
[0000002C - 0000002D]	Programmable interrupt controller
[0000002E - 0000002F]	Motherboard resources
[00000030 - 00000031]	Programmable interrupt controller
[00000034 - 00000035]	Programmable interrupt controller
[00000038 - 00000039]	Programmable interrupt controller
[0000003C - 0000003D]	Programmable interrupt controller
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[0000004E - 0000004F]	Motherboard resources
[00000050 - 00000053]	System timer
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	Motherboard resources
[00000063 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 00000065]	Motherboard resources
[00000067 - 00000067]	Motherboard resources
[00000070 - 00000070]	Motherboard resources
[00000070 - 00000077]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000091]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000088 - 00000088]	Motherboard resources
[0000008C - 0000008E]	Motherboard resources
[00000090 - 0000009F]	Motherboard resources
[00000092 - 00000092]	Motherboard resources
[00000093 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000A4 - 000000A5]	Programmable interrupt controller
[000000A8 - 000000A9]	Programmable interrupt controller
[000000AC - 000000AD]	Programmable interrupt controller
[000000B0 - 000000B1]	Programmable interrupt controller
[000000B2 - 000000B3]	Motherboard resources
[000000B4 - 000000B5]	Programmable interrupt controller
[000000B8 - 000000B9]	Programmable interrupt controller
[000000BC - 000000BD]	Programmable interrupt controller
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor

	[00000274 - 00000277] ISAPNP Read Data Port
	[00000279 - 00000279] ISAPNP Read Data Port
	[000002B0 - 000002B7] Communications Port (COM5)
	[000002B8 - 000002BF] Communications Port (COM6)
	[000002C0 - 000002C7] Communications Port (COM3)
	[000002C8 - 000002CF] Communications Port (COM4)
	[000002F8 - 000002FF] Communications Port (COM1)
	[000003B0 - 000003BB] Intel(R) HD Graphics Family
	[000003C0 - 000003DF] Intel(R) HD Graphics Family
	[000003F8 - 000003FF] Communications Port (COM2)
	[00000400 - 00000453] Motherboard resources
	[00000454 - 00000457] Motherboard resources
	[00000458 - 0000047F] Motherboard resources
	[000004D0 - 000004D1] Motherboard resources
	[000004D0 - 000004D1] Programmable interrupt controller
	[00000500 - 0000057F] Motherboard resources
	[00000680 - 0000069F] Motherboard resources
	[00000A00 - 00000A1F] Motherboard resources
	[00000A20 - 00000A2F] Motherboard resources
	[00000A30 - 00000A3F] Motherboard resources
	[00000A79 - 00000A79] ISAPNP Read Data Port
	[00000D00 - 0000FFFF] PCI bus
	[00001000 - 0000100F] Motherboard resources
	[0000164E - 0000164F] Motherboard resources
	[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
	[0000E000 - 0000EFFF] Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12
	[0000F000 - 0000F03F] Intel(R) HD Graphics Family
	[0000F040 - 0000F05F] Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22
	[0000F060 - 0000F07F] Intel(R) 82579LM Gigabit Network Connection
	[0000F080 - 0000F08F] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F090 - 0000F09F] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F0A0 - 0000F0A3] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F0B0 - 0000F0B7] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F0C0 - 0000F0C3] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F0D0 - 0000F0D7] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
	[0000F0E0 - 0000F0EF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000F0F0 - 0000F0FF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000F100 - 0000F103] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000F110 - 0000F117] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000F120 - 0000F123] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000F130 - 0000F137] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
	[0000FFFF - 0000FFFF] Motherboard resources
	[0000FFFF - 0000FFFF] Motherboard resources

B.2 Memory Address Map



The image shows a screenshot of the Windows System Information tool, specifically the 'Memory' section. It displays a list of memory addresses and their corresponding hardware components. The list is sorted by address in ascending order. Each entry includes a memory address range in hexadecimal, a small icon representing the device type, and the name of the device. The devices listed include Intel HD Graphics Family, PCI buses, System board, Motherboard resources, Realtek PCIe GBE Family Controller, Intel 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12, Intel HD Graphics Family, Intel 82579LM Gigabit Network Connection, Microsoft UAA Bus Driver for High Definition Audio, Intel 6 Series/C200 Series Chipset Family SMBus Controller - 1C22, Intel 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26, Intel 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D, Intel 82579LM Gigabit Network Connection, Intel Management Engine Interface, and various Motherboard resources.

Memory Address Range	Device Name
[000A0000 - 000BFFFF]	Intel(R) HD Graphics Family
[000A0000 - 000BFFFF]	PCI bus
[000D0000 - 000D3FFF]	PCI bus
[000D4000 - 000D7FFF]	PCI bus
[000D8000 - 000DBFFF]	PCI bus
[000DC000 - 000DFFFF]	PCI bus
[000E0000 - 000E3FFF]	PCI bus
[000E4000 - 000E7FFF]	PCI bus
[20000000 - 201FFFFFF]	System board
[40000000 - 401FFFFFF]	System board
[7DA00000 - 7DA00FFF]	Motherboard resources
[7DA00000 - FEAF7FFF]	PCI bus
[E0000000 - EFFFFFFF]	Intel(R) HD Graphics Family
[F0000000 - F0033FFF]	Realtek PCIe GBE Family Controller
[F0000000 - F00FFFFFF]	Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12
[F7800000 - F7BFFFFFF]	Intel(R) HD Graphics Family
[F7C00000 - F7C00FFF]	Realtek PCIe GBE Family Controller
[F7C00000 - F7C7FFFF]	Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12
[F7D00000 - F7D1FFFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D20000 - F7D23FFF]	Microsoft UAA Bus Driver for High Definition Audio
[F7D25000 - F7D250FF]	Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22
[F7D26000 - F7D263FF]	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26
[F7D27000 - F7D273FF]	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D
[F7D28000 - F7D28FFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D2B000 - F7D2B00F]	Intel(R) Management Engine Interface
[F8000000 - FBFFFFFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED10000 - FED17FFF]	Motherboard resources
[FED18000 - FED18FFF]	Motherboard resources
[FED19000 - FED19FFF]	Motherboard resources
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED3FFFF]	Motherboard resources
[FED40000 - FED44FFF]	Infineon Trusted Platform Module
[FED45000 - FED6FFFF]	Motherboard resources
[FED90000 - FED93FFF]	Motherboard resources
[FEE00000 - FEEFFFFFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
(ISA) 0	System timer
(ISA) 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
(ISA) 3	Communications Port (COM1)
(ISA) 4	Communications Port (COM2)
(ISA) 5	Communications Port (COM3)
(ISA) 5	Communications Port (COM4)
(ISA) 5	Communications Port (COM5)
(ISA) 5	Communications Port (COM6)
(ISA) 8	System CMOS/real time clock
(ISA) 9	Microsoft ACPI-Compliant System
(ISA) 12	Microsoft PS/2 Mouse
(ISA) 13	Numeric data processor
(PCI) 11	Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22
(PCI) 16	Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 1 - 1C10
(PCI) 16	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D
(PCI) 16	Intel(R) HD Graphics Family
(PCI) 16	Intel(R) Management Engine Interface
(PCI) 17	Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12
(PCI) 17	Realtek PCIe GBE Family Controller
(PCI) 19	Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
(PCI) 19	Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
(PCI) 20	Intel(R) 82579LM Gigabit Network Connection
(PCI) 22	Microsoft UAA Bus Driver for High Definition Audio
(PCI) 23	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26

B.4 DMA Channel Assignments

Direct memory access (DMA)	
4	Direct memory access controller

Appendix

C

RAID & AHCI Settings

C.1 Setting RAID

OS installation to setup RAID Mode

Step 1: Copy the files below from “**Driver CD -> Raid Driver -> F6 Floppy - x86**” to Disk

 F6Readme
文字文件
8 KB

 iaAHCI
安裝資訊
9 KB

 iaStor
安裝資訊
8 KB

 license
文字文件
5 KB

 TXTSETUP.OEM
OEM 檔案
6 KB

 iaAHCI
安全性目錄
9 KB

 iaStor
安全性目錄
8 KB

 iaStor
系統檔案
423 KB

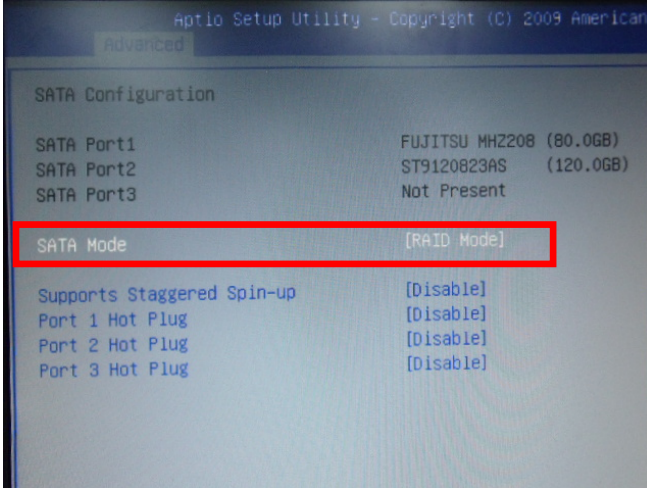
 readme
文字文件
78 KB

Step 2: Connect the USB Floppy (disk with RAID files) to the board



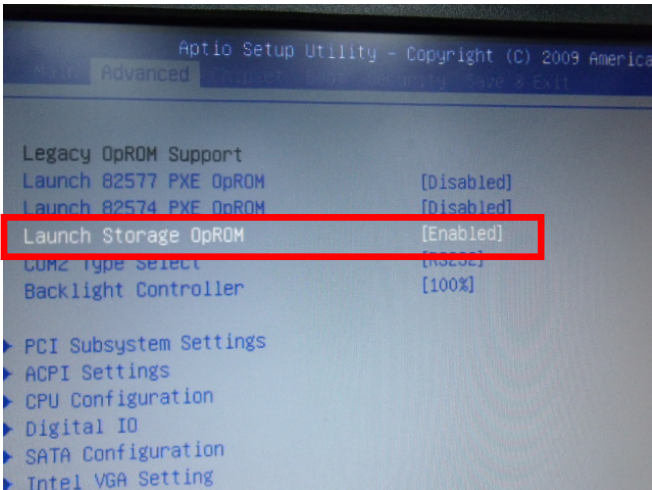
Step 3: The setting procedures “In BIOS Setup Menu”

A: Advanced -> SATA Configuration -> SATA Mode -> RAID Mode



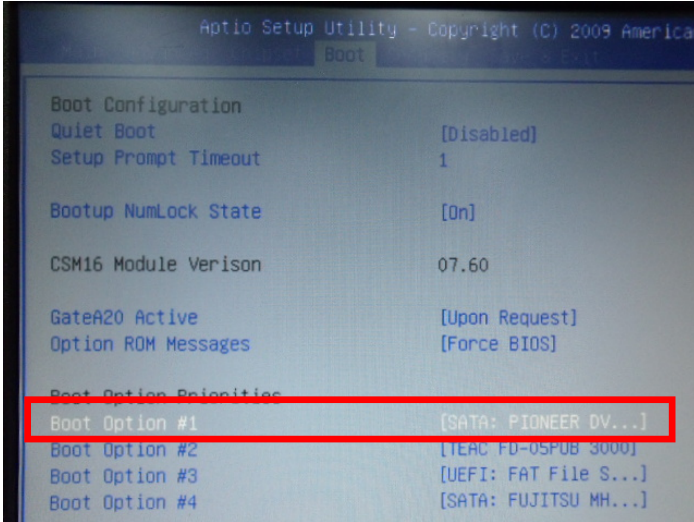
Step 4: The setting procedures “In BIOS Setup Menu”

B: Advanced -> Launch Storage OpROM -> Enabled



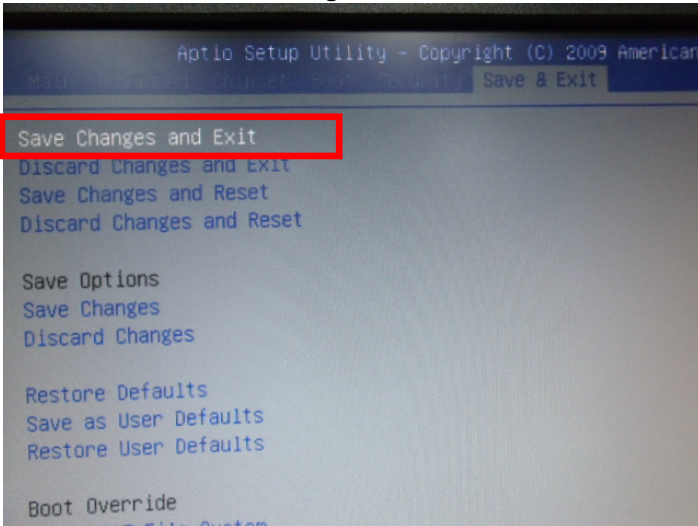
Step 5: The setting procedures "In BIOS Setup Menu"

C: Boot -> Boot Option #1 -> DVD-ROM Type

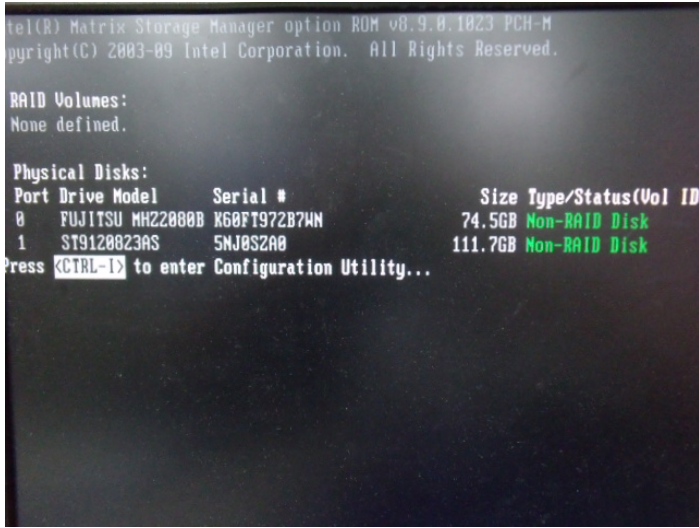


Step 6: The setting procedures "In BIOS Setup Menu"

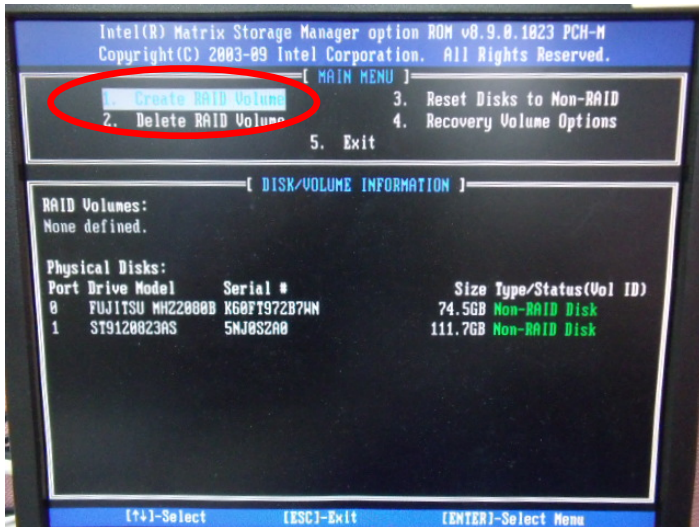
D: Save & Exit -> Save Changes and Exit



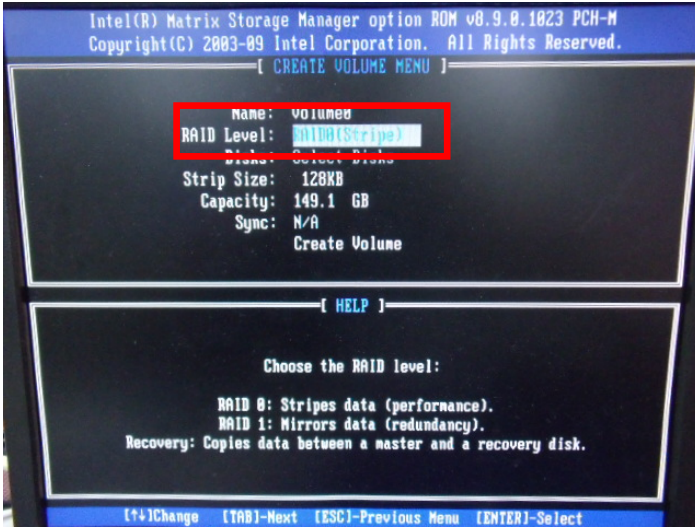
Step 7: Press **Ctrl-I** to enter **MAIN MENU**



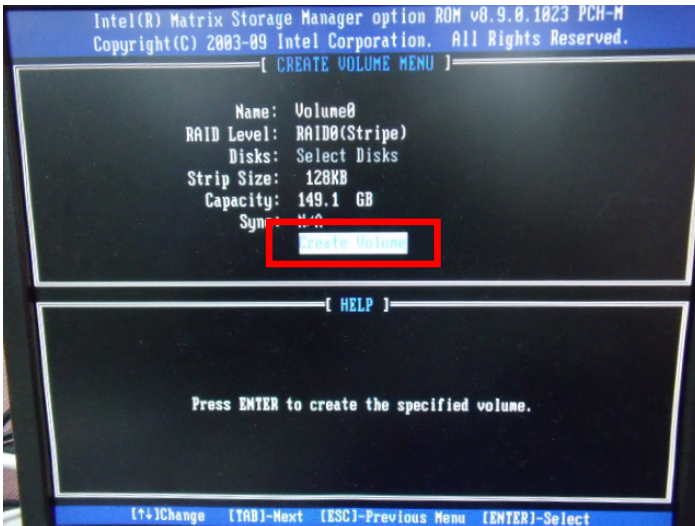
Step 8: Choose "1.Create RAID Volume"



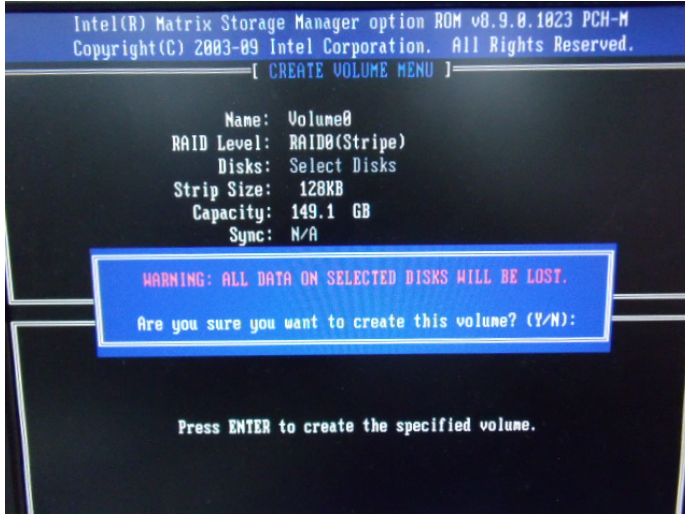
Step 9: RAID Level -> RAID0(Stripe)



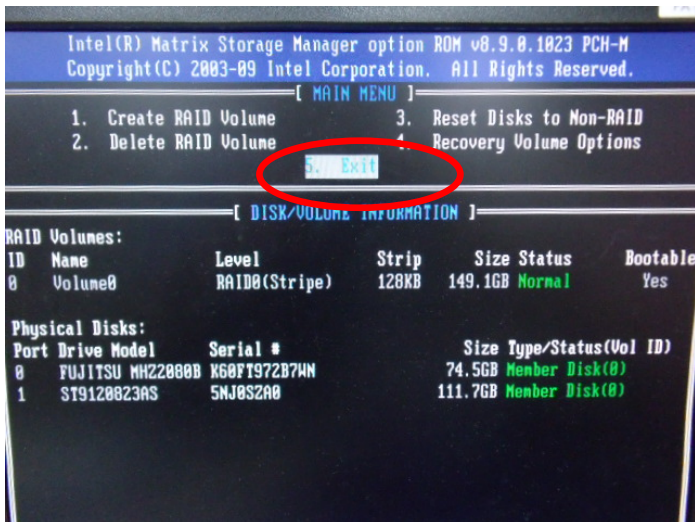
Step 10: Choose "Create Volume"



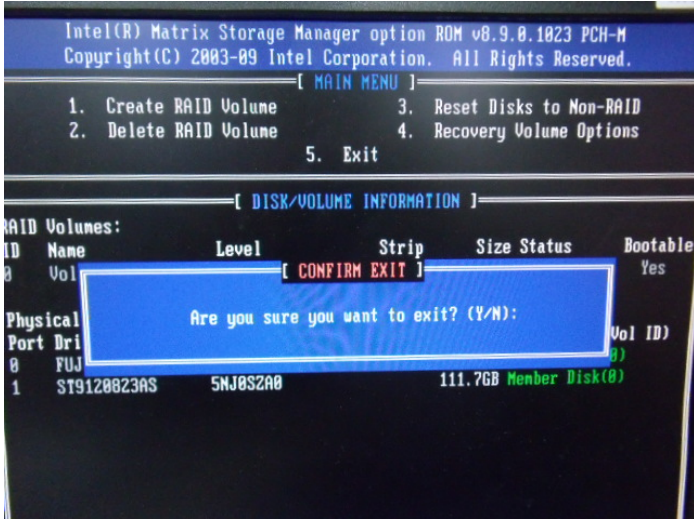
Step 11: Choose "Y"



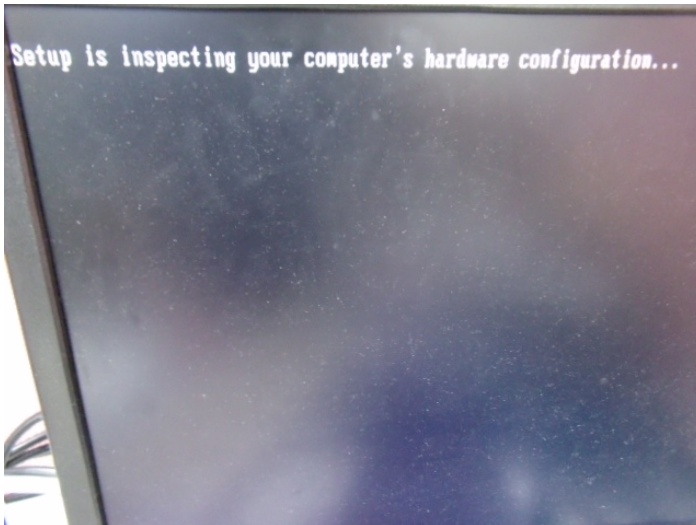
Step 12: Choose "5. Exit"



Step 13: Choose "Y"



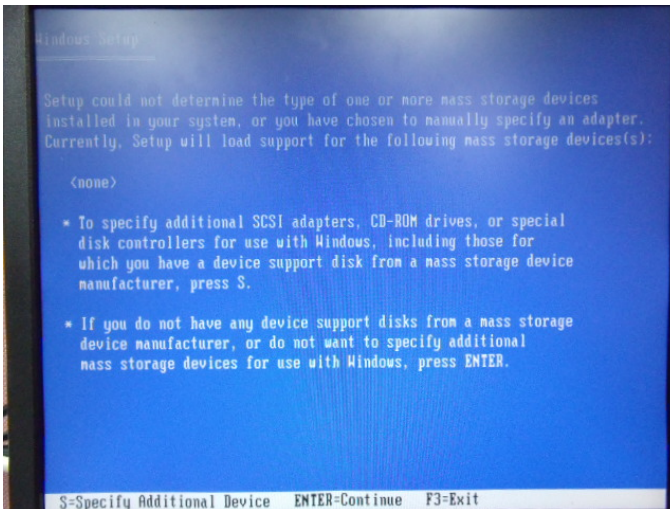
Step 14: Setup OS



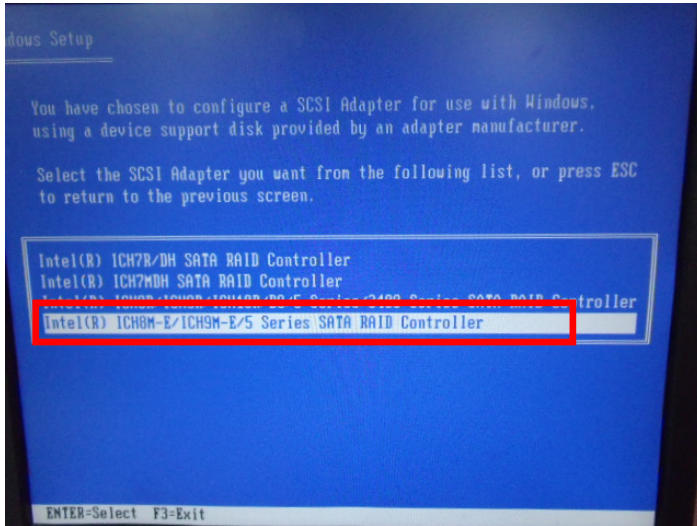
Step 15: Press “F6”



Step 16: Choose “S”



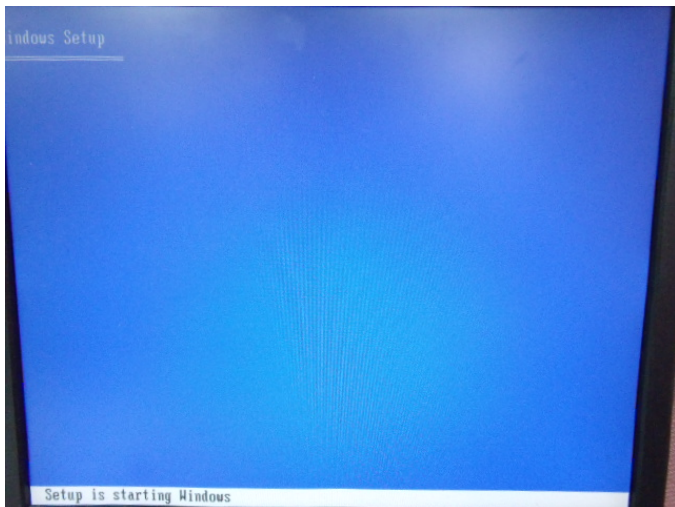
Step 17: Choose “Intel(R) ICH8M-E/ICH9M-E/5 Series SATA RAID Controller”



Step 18: It will show the model number you select and then press “ENTER”



Step 19: Setup is starting Windows



C.2 Setting AHCI

OS installation to setup AHCI Mode

Step 1: Copy the files below from “**Driver CD -> Raid Driver -> F6 Floppy - x86**” to Disk

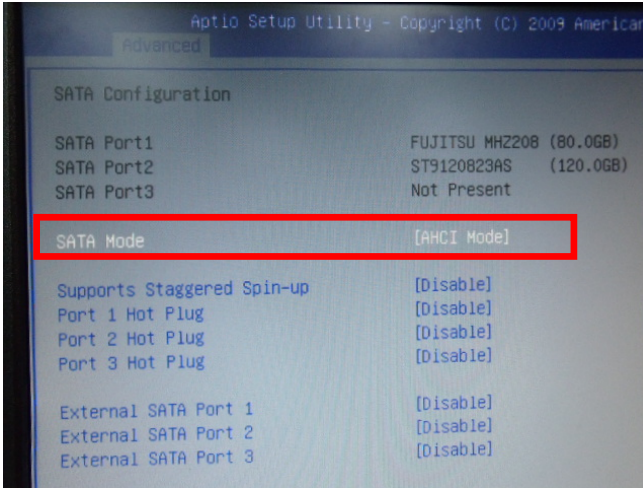
 F6Readme 文字文件 8 KB	 iaAHCI 安全性目錄 9 KB
 iaAHCI 安裝資訊 9 KB	 iaStor 安全性目錄 8 KB
 iaStor 安裝資訊 8 KB	 iaStor 系統檔案 423 KB
 license 文字文件 5 KB	 readme 文字文件 78 KB
 TXTSETUP.OEM OEM 檔案 6 KB	

Step 2: Connect the USB Floppy (disk with RAID files) to the board



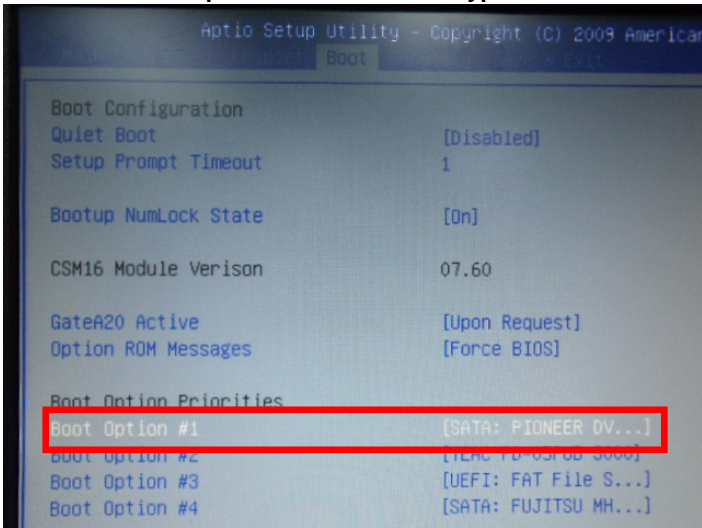
Step 3: The setting procedures “In BIOS Setup Menu”

A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode

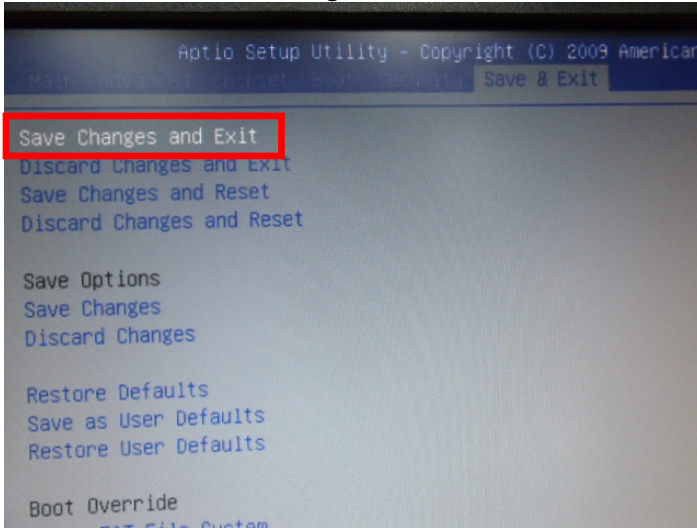


Step 4: The setting procedures “In BIOS Setup Menu”

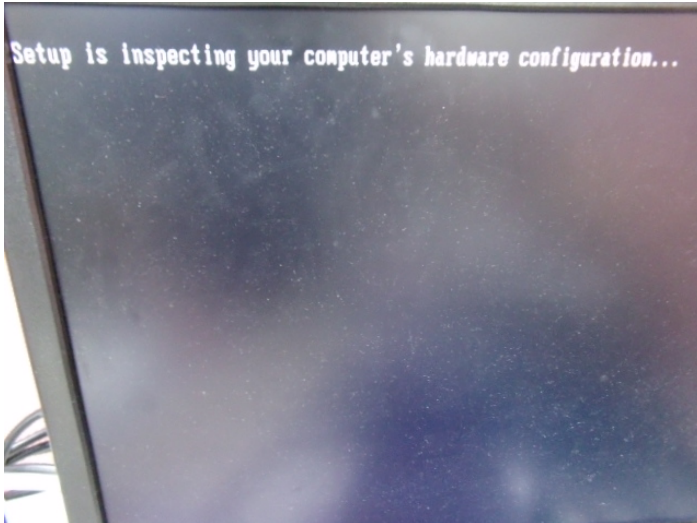
B: Boot -> Boot Option #1 -> DVD-ROM Type



Step 5: The setting procedures "In BIOS Setup Menu"
C: Save & Exit -> Save Changes and Exit



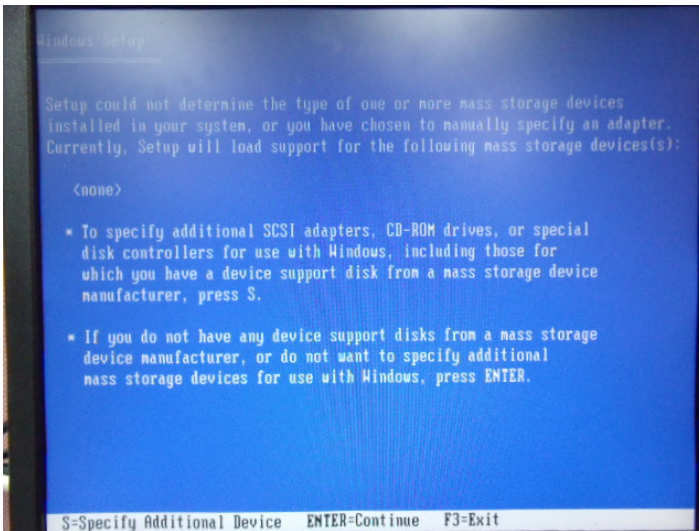
Step 6: Setup OS



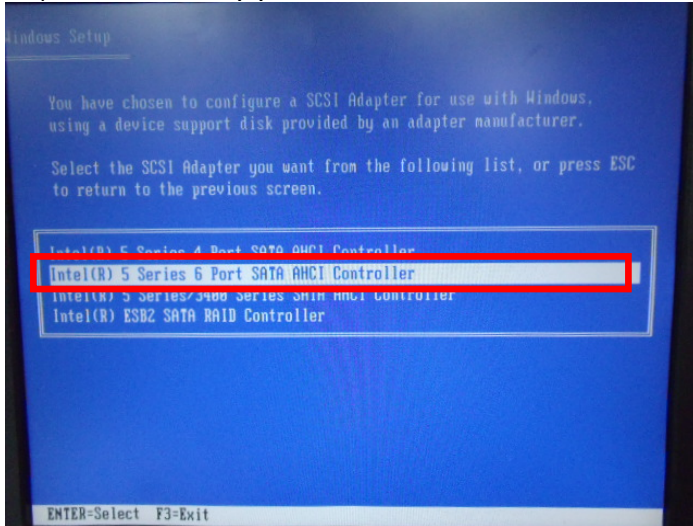
Step 7: Press "F6"



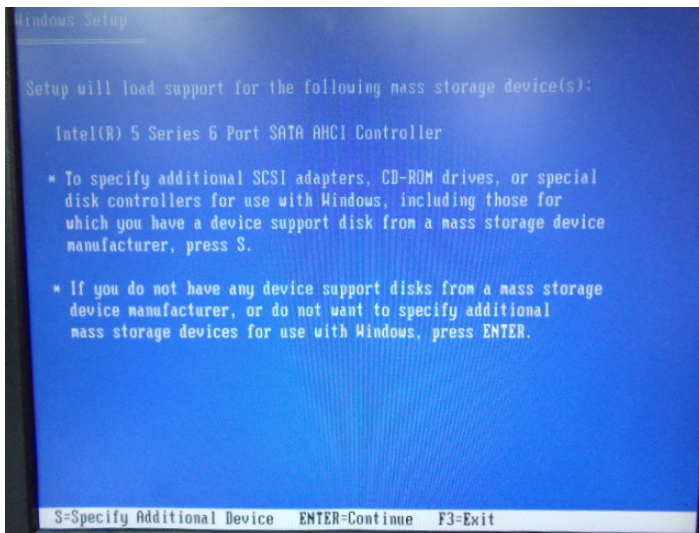
Step 8: Choose "S"



Step 9: Choose “Intel(R) 5 Series 6 Port SATA AHCI Controller”



Step 10: It will show the model number you select and then press “ENTER”



Step 11: Setup is loading files

