

AEC-6977

Fanless Embedded Box PC

User's Manual 3rd Ed

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● AEC-6977	1
● Phoenix power connector	1
● M3 x 4mm screws	4
● 6# -32 x 10mm screws	6
● Wallmount bracket	2
● Product DVD with User's Manual (in pdf) and drivers	1

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

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.
18. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
19. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

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.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Embedded Box PC/ 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	○	○	○	○	○	○

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。

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。

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。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Embedded Box PC/ Industrial System

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	O	O	O	O	O	O
Wires & Connectors for External Connections	O	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU & RAM	O	O	O	O	O	O
Hard Disk	O	O	O	O	O	O
PSU	O	O	O	O	O	O
<p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p>						

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Chapter 1

Product Specifications

1.1 Specifications

System

- **Pr°Cessor** Intel® 3rd Generation Core™ i/ Celeron® Pr°Cessor (FCBGA1023)
- **System Memory** 204-pin DDR3 1066/1333 MHz SODIMM x 2, up to 16 GB
- **Chipset** Intel® QM77
- **Storage** CFast™ x 1
SSD/HDD: SATA 6.0 Gb/s x 2 (SATA 0, 2),
SATA 3.0 Gb/s x 2 (SATA 2, 3), support RAID 0, 1, 5, 10
- **Rear I/O Panel** USB 3.0 x 2
USB 2.0 x 2
RJ-45 x 2
RS-232 x 2
Mic-in, Line-in, Line-out
Power input x 1
- **Front I/O Panel** USB3.0 x 2
RS-232 x 1, RS-232/422/485 x 1, optional 2.5KV Isolation ,
RS-232 x 6 (optional)
8-bit programmable DIO, optional 2.5KV Isolation 2.5KV, DO x 4 and DI x 4
PS/2 x 1
Power button x 1
Reset button x 1

- **Front Indicators**
 - LED for power status x 1
 - LED for HDD status x 1
- **Expansion Slot**
 - PCIe[x1] x 2 (optional)
 - PCI x2 (optional, limited to 2.1A@12V)
 - Mini card x2 (optional)
 - SIM x 1 (optional)
- **OS Support**
 - Windows® 10
 - Windows® XP Embedded
 - Windows® XP
 - Windows® 7
 - Linux Fedora 10

Mechanical

- **Construction**
 -
- **Mounting**
 - Wallmount
- **Dimension (W x H x D)**
 - 208 x 124.4 x 238mm (8.19" x 4.9" x 9.37")
- **Gross Weight**
 -

Environmental

- **Operating Temperature**
 - Without Airflow, with wide temperature Storage and RAM:
 - 20 ~ 50°C (-4 ~ 122°F) (35W TDP CPU)
 - 20 ~ 65°C (-4 ~ 149°F) (17W TDP CPU, not include riser card)
 - Ambient with Airflow, with wide temperature Storage and RAM:

- Storage Temperature -4°F ~ 140°F (-20°C ~ 60°C) (35W TDP CPU)
-4°F ~ 167°F (-20°C ~ 65°C) (17W TDP CPU, not include riser card)
-20 ~ 70°C (-4 ~ 158°F)
- Operating Humidity -
- Anti-Vibration 3 g rms/ 5~500 Hz/ operation-CFast™;
1 g rms/ 5~500 Hz/ operation-HDD
- Anti-Shock 50 G peak acceleration (11 msec. duration) –CFast™
- EMC CE/FCC Class A

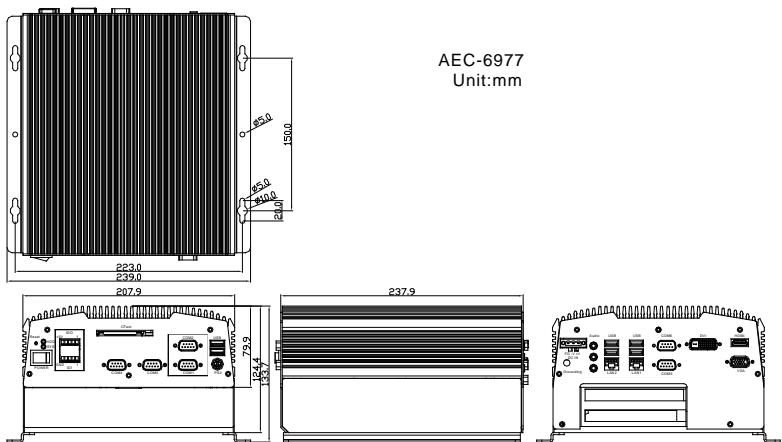
Power Supply

- DC Input DC-in 9~30V input, optional 100~240V

Chapter 2

Hardware Information

2.1 Dimensions



Chapter 2 – Hardware Information



2.3 List of Jumpers

Please refer to the table below for all of the system's jumpers that you can configure for your application

Label	Function
JP1	Clear CMOS
JP2	Clear ME
JP3	Inverter Power Selection
JP4	LVDS Port Backlight Lightness Control Mode Selection
JP5	LVDS Voltage Selection
JP8	RS-232/422/485 Selection
JP9	COM6 +12V/+5V/RING Selection
JP11	COM5 +12V/+5V/RING Selection
J6	Auto Power Button

2.3.1 Clear CMOS Jumper (JP1)

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

2.3.2 Clear ME (JP2)

JP2	Function
1-2	Normal (Default)
2-3	Clear ME

2.3.3 Inverter Power Selection (JP3)

JP3	Function
1-2	+12V (Default)
2-3	+5V

2.3.4 LVDS Port Backlight Lightness Control Mode Selection (JP4)

JP4	Function
1-2	PWM MODE
2-3	VR MODE (Default)

2.3.5 LCD Voltage Selection (JP5)

JP5	Function
1-2	+5V
2-3	+3.3V (Default)

2.3.6 Isolation COM2 RS232/RS485/RS422 selection (JP8)

JP8	Function
RS232	1-2,3-4,5-6 close
RS422	3-4 close , 1-2 5-6 open
RS485	5-6 close , 1-2 3-4 open

2.3.7 COM6 +12V/+5V/Ring Selection (JP9)

JP9	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.3.8 COM5 +12V/+5V/Ring Selection (JP11)

JP11	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.3.9 Auto Power Button (J6)

JP6	Function
OPEN	ATX (Default)
1-2	AT

2.4 List of Connectors

Please refer to the table below for all of the system's connectors that you can configure for your application

Label	Function
CN1	Front Panel Connector
CN2	4-pin ATX Power +12V Connector
CN6 ~ CN7	LAN / USB Connector
CN8	CFast™ Connector
CN10	COM3 RS-232 Box Header
CN11	COM4 RS-232 Box Header
CN13	COM5 / COM6 Connector
CN15	VGA / HDMI Connector
CN16	DVI-I Connector
CN17	LVDS Connector
CN18	LVDS Inverter / Backlight Connector
CN21	Mini Card Connector With SIM
CN24	Mini Card Connector
CN26/CN33	PCIe*4 Connector
CN27	USB X2 / PS2 Connector
CN29	Digital I/O
CN30	ISOLATION COM1 / COM2 Connector
CN31	DC IN
PWR1 ~ PWR2	SATA POWER
SATA1~SATA2	SATA 3.0 Connector
SATA3~SATA4	SATA Connector
DIMM1,DIMM2	DDR3 DIMM Slot
USB1	USB Box Header

Label	Function
FAN1~ FAN2	4 Pin Fan Connector
AUDIO1	AUDIO Connector

2.4.1 SATA Power (PWR1~PWR2)

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

2.4.2 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 (+)

2.4.3 LVDS Connector (CN17)

Pin	Signal	Pin	Signal
1	BKL_EN	2	BKL_CTL
3	LVDSVCC	4	GND
5	LVDSA_CLK#	6	LVDSA_CLK
7	LVDSVCC	8	GND
9	LVDSA_DATA0#	10	LVDSA_DATA0
11	LVDSA_DATA1#	12	LVDSA_DATA1
13	LVDSA_DATA2#	14	LVDSA_DATA2

Pin	Signal	Pin	Signal
15	LVDSA_DATA3#	16	LVDSA_DATA3
17	LVDS_DDC_DATA	18	LVDS_DDC_CLK
19	LVDSB_DATA0#	20	LVDSB_DATA0
21	LVDSB_DATA1#	22	LVDSB_DATA1
23	LVDSB_DATA2#	24	LVDSB_DATA2
25	LVDSB_DATA3#	26	LVDSB_DATA3
27	LVDSVCC	28	GND
29	LVDSB_CLK#	30	LVDSB_CLK

2.4.4 LVDS Inverter/ Backlight Connector (CN18)

Pin	Signal	Pin	Signal
1	VDD	2	BKL_CTL
3	GND	4	GND
5	BKL_EN		

2.4.5 RS-232/422/485 Pin DEFINE (COM2)

RS-232

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

RS-422

Pin	Signal	Pin	Signal
1	TXD-	2	RXD+
3	TXD+	4	RXD-
5	Ground	6	N/C
7	N/C	8	N/C
9	N/C		

RS-485

Pin	Signal	Pin	Signal
1	D-	2	N/C
3	D+	4	N/C
5	Ground	6	N/C
7	N/C	8	N/C
9	N/C		

2.4.6 RS-232 Box Header (COM3)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

2.4.7 RS-232 Box Header (COM4)

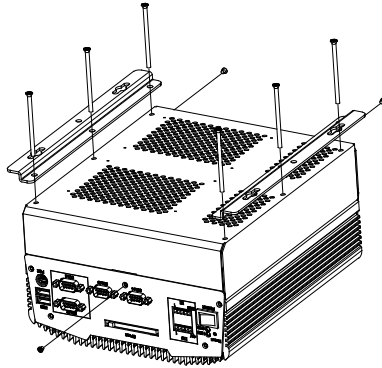
Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

2.4.8 USB Box Header (USB3~USB4)

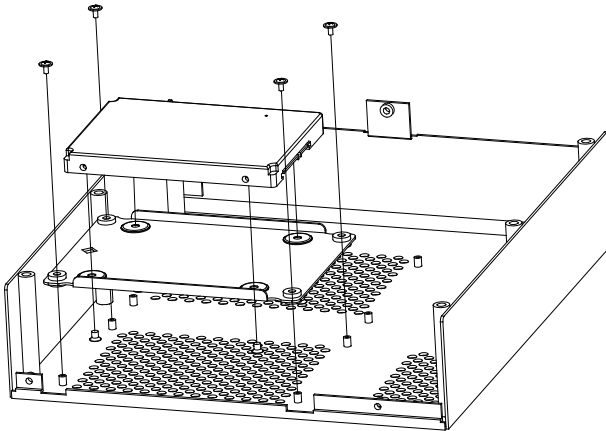
Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD-	4	GND
5	USBD+	6	USBD+
7	GND	8	USBD-
9	GND	10	+5V

2.5 HDD Installation

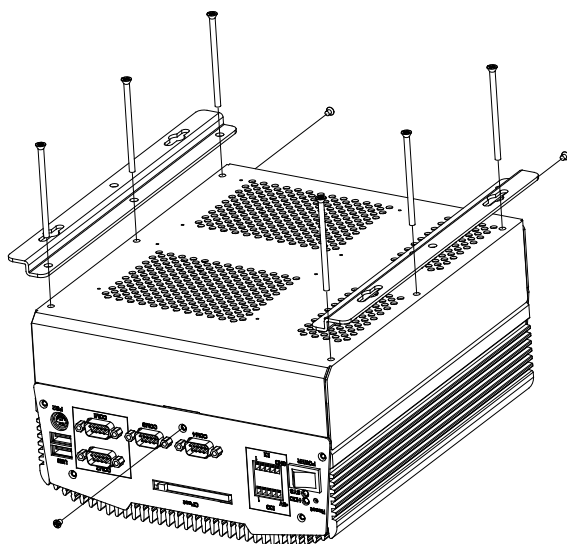
1. Unfasten the six screws on the bottom lid and three screws on the front and rear panel.



2. Place the HDD to the HDD bracket and fasten the four screws to the bottom lid of the AEC-6977.

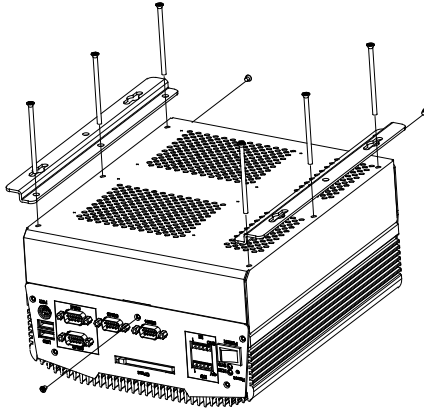


3. Fasten the screws on the front and rear panels, and the brackets of AEC-6977.

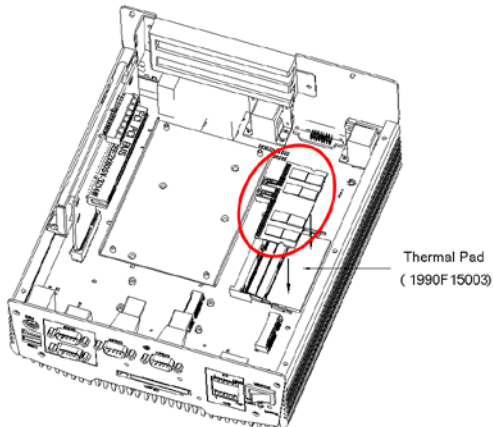


2.6 Memory Card Installation

1. Unfasten the six screws on the bottom lid and three screws on the front and rear panel.



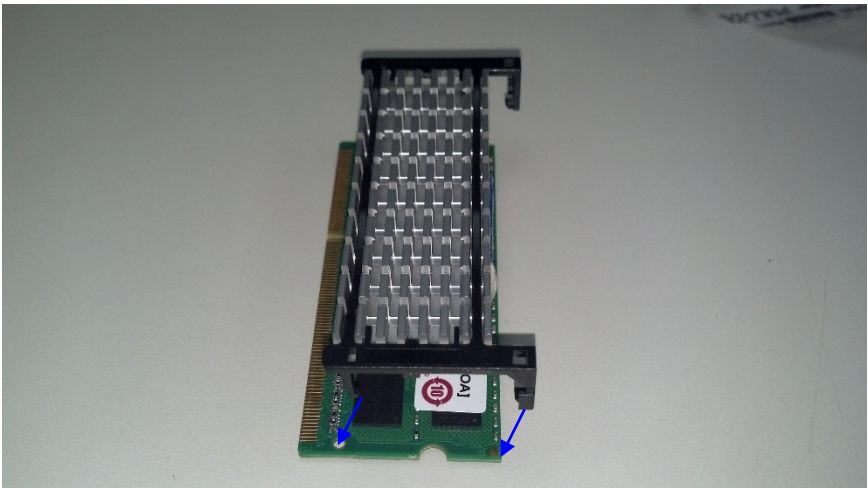
2. Insert the thermal pad to the memory slot first.



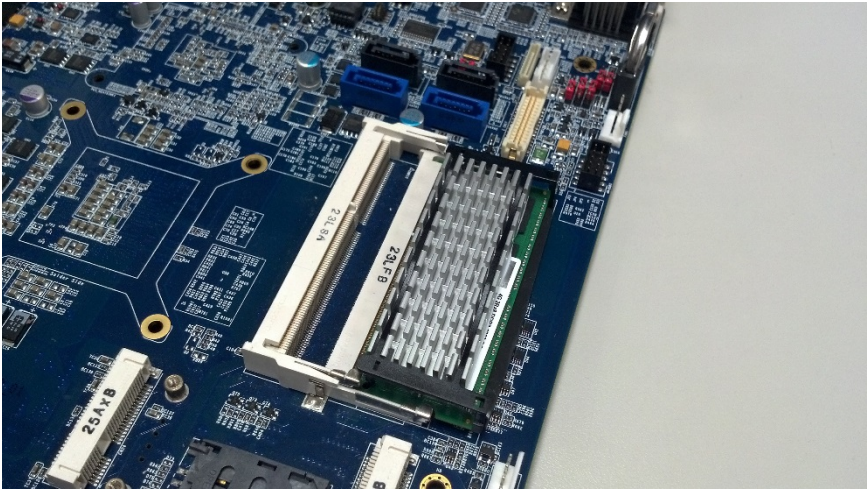
3. Remove the Release Paper (Liner) from the Heatsink module.



4. Line up the left leg of the Heatsink module with the round hole on the RAM card and the right leg with the edge of the RAM card as the following graphic shows. Then combine the Heatsink with the RAM card.



5. Insert the combined RAM module to the mainboard.

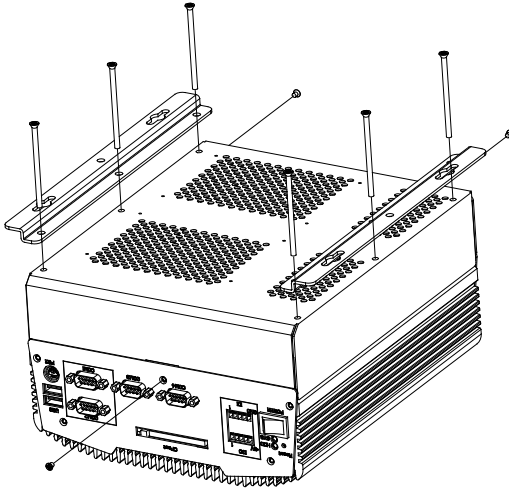


(Single RAM)



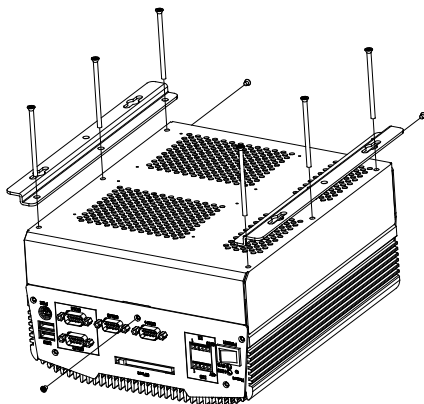
(Dual RAM)

6. Fasten the screws on the front and rear panels, and the brackets of AEC-6977.

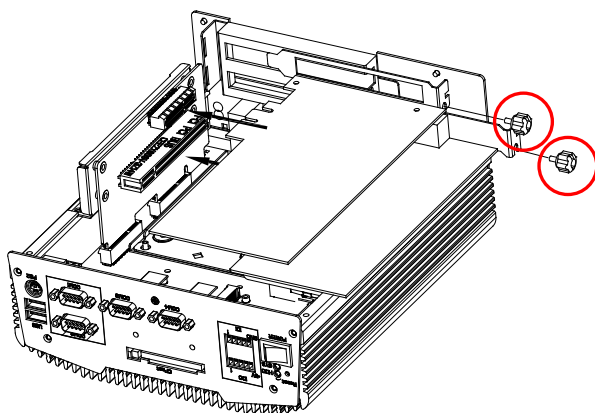


2.7 PCI Card Installation

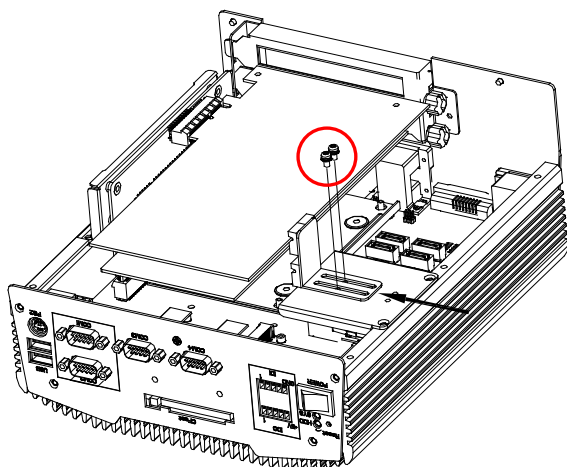
1. Unfasten the six screws on the bottom lid and three screws on the front and rear panel.



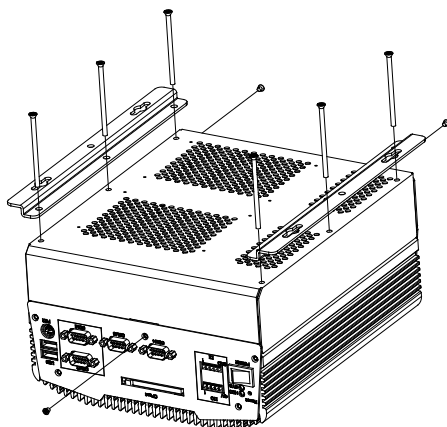
2. Insert the PCI bracket and fasten the two screws to fix the PCI bracket.



3. Install a hold-down bracket to fix the PCI Card and make sure the PCI Card installs properly. Then, use two screws to fix the hold-down bracket.

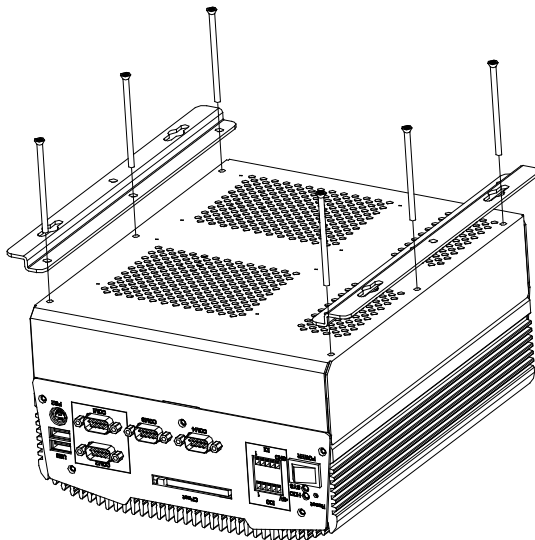


4. Fasten the screws on the front and rear panels, and the brackets of AEC-6977.



2.8 Wallmount Bracket Installation

Fasten the brackets with the appropriate screws.



Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The system uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will 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:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

Chipset – For hosting bridge parameters

Boot – Enable/ Disable quiet Boot Option

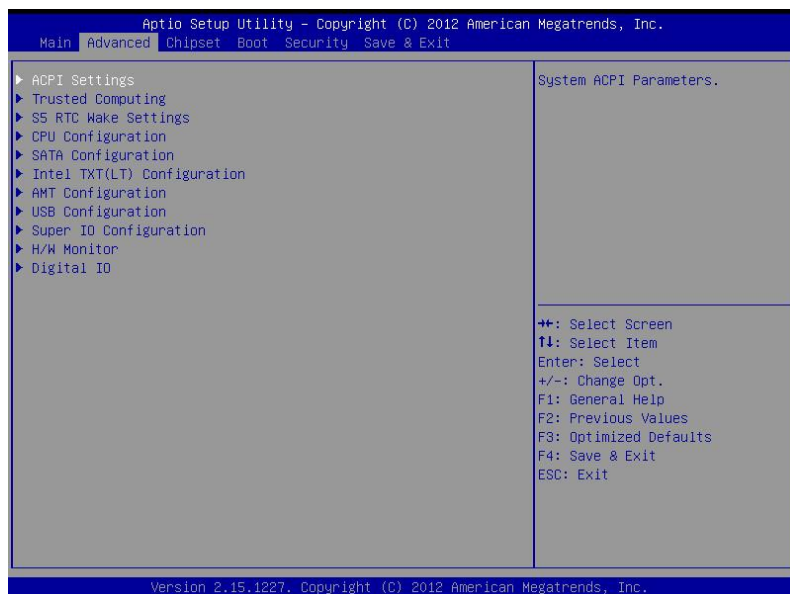
Security – The setup administrator password can be set here

Save & Exit – Save your changes and exit the program

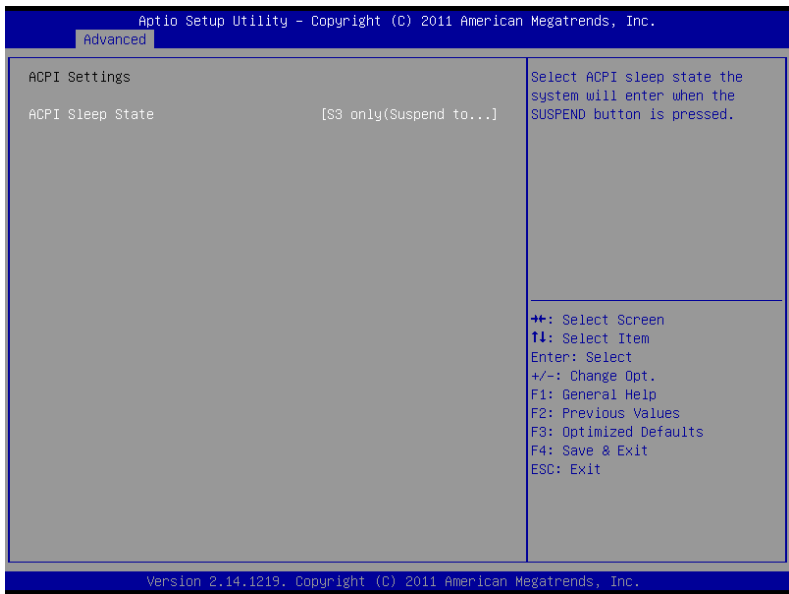
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



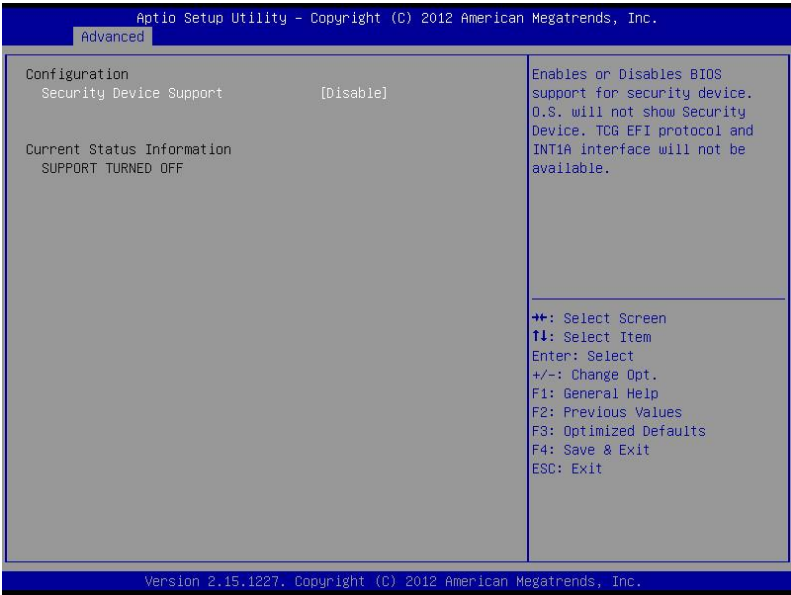
3.4.1 ACPI Settings



Options summary:

Suspend mode	Suspend Disabled	Optimal Default, Failsafe Default
	S1 only (CPU Stop Clock)	
	S3 only (Suspend to RAM)	
Select the ACPI state used for System Suspend		

3.4.2 Advanced: Trusted Computing

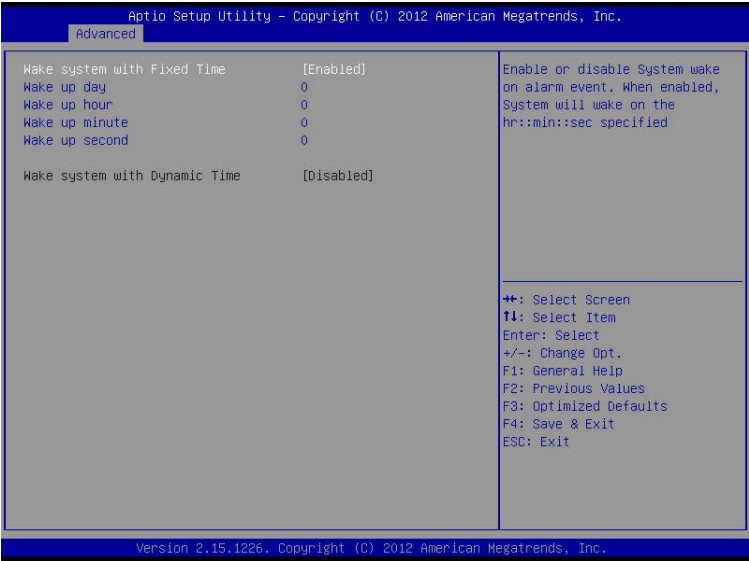


Options summary:

Security Device	Disable	Optimal Default, Failsafe Default
Support	Enable	
Enables or Disabled BIOS support for security device.		

3.4.3 Advanced: S5 RTC Wake Settings (Fixed Time)

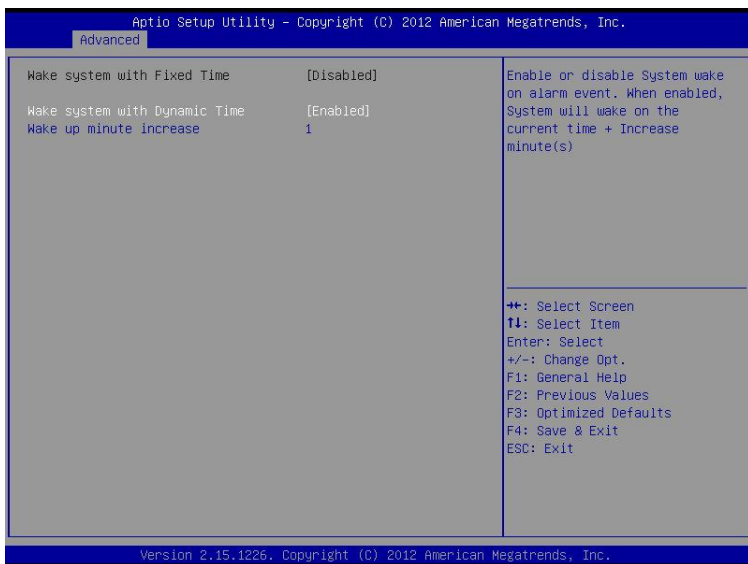
3.4.3.1 S5 RTC Wake Settings: Wake system with Fixed Time



Options summary:

Wake system with Fixed Time	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified		
Wake up day	0-31	Default 0
Select 0 for daily system wake up, 1-31 for witch day of the moth that you would like the system to wake up.		
Wake up day	0-23	Default 0
Select 0-23 For example enter 3 for 3am and 15 for 3pm		
Wake up day	0-59	Default 0
Select 0-59		
Wake up day	0-59	Default 0
Select 0-59		

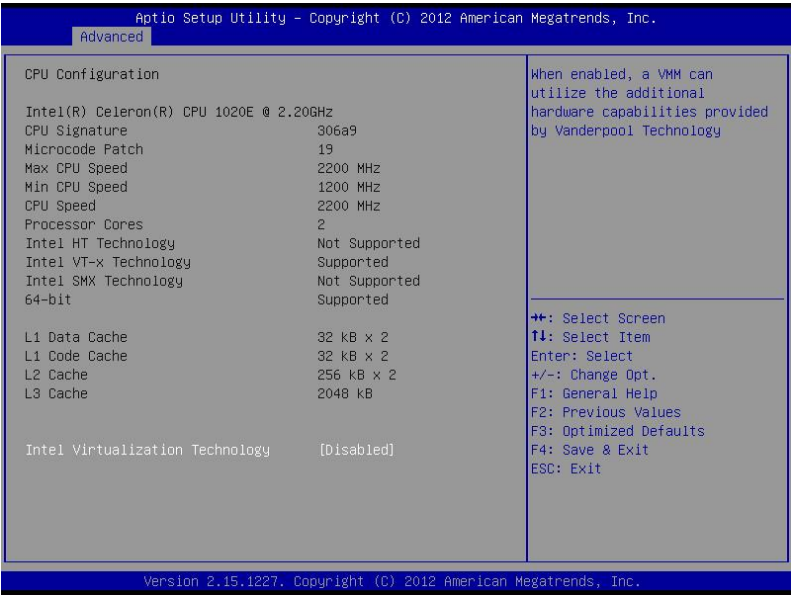
3.4.3.2 S5 RTC Wake Settings: Wake system with Dynamic Time



Options summary:

Wake system with Dynamic Time	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on current time + Increases minutese(s)		
Wake up day	1-5	Default 1
Select 1-5		

3.4.4 Advanced: CPU Configuration

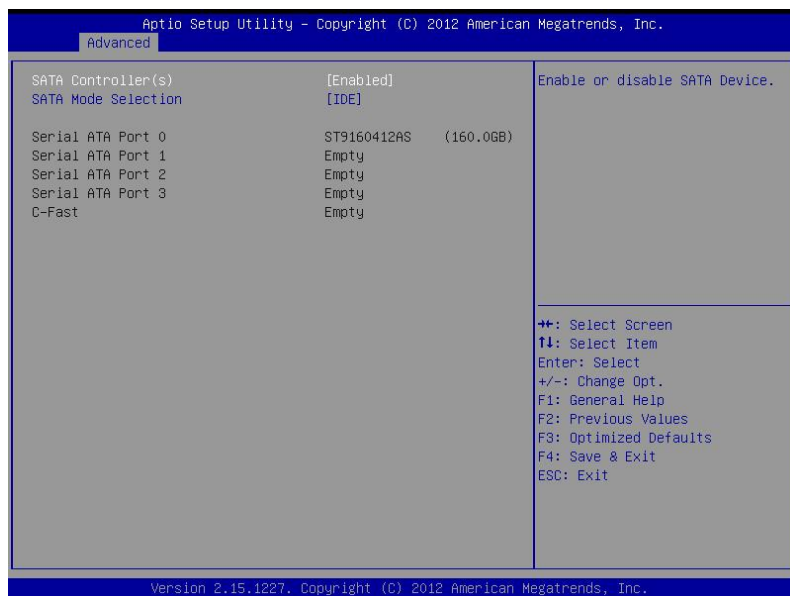


Options summary:

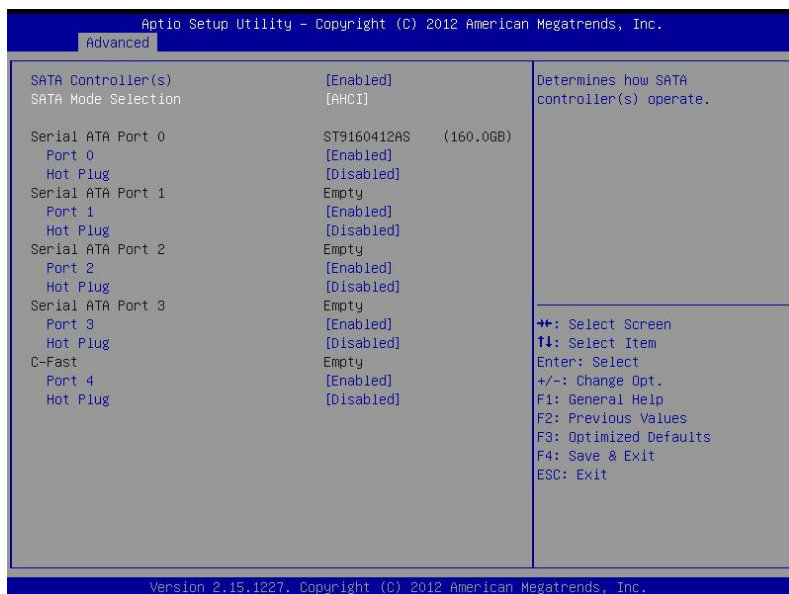
Intel Virtualization Technology	Disabled	Optimal Default, Failsafe Default
	Enabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology		

3.4.5 Advanced: SATA Configuration

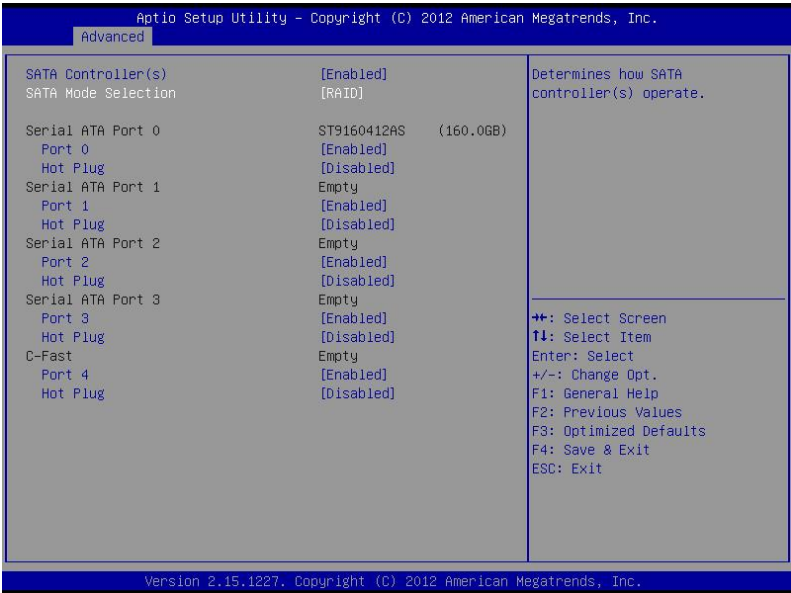
3.4.5.1 SATA Configuration: IDE



3.4.5.2 SATA Configuration: AHCI



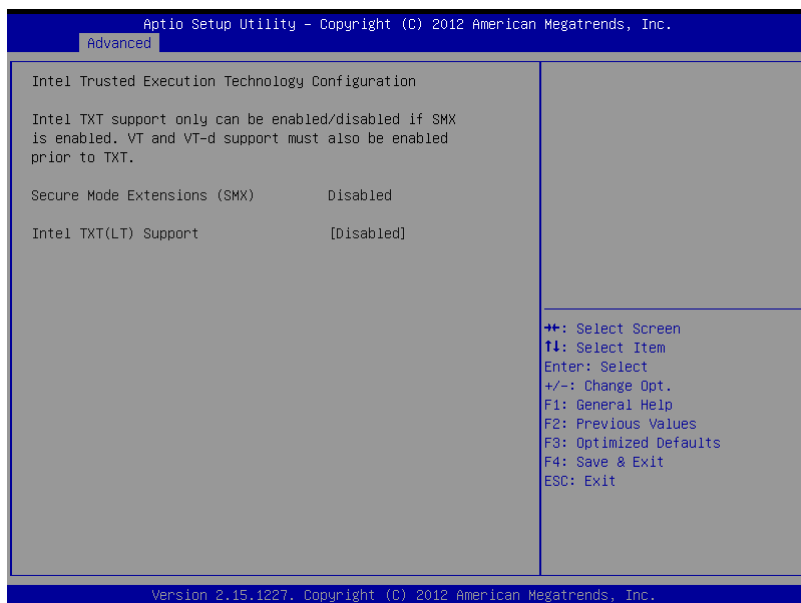
3.4.5.3 SATA Configuration: RAID



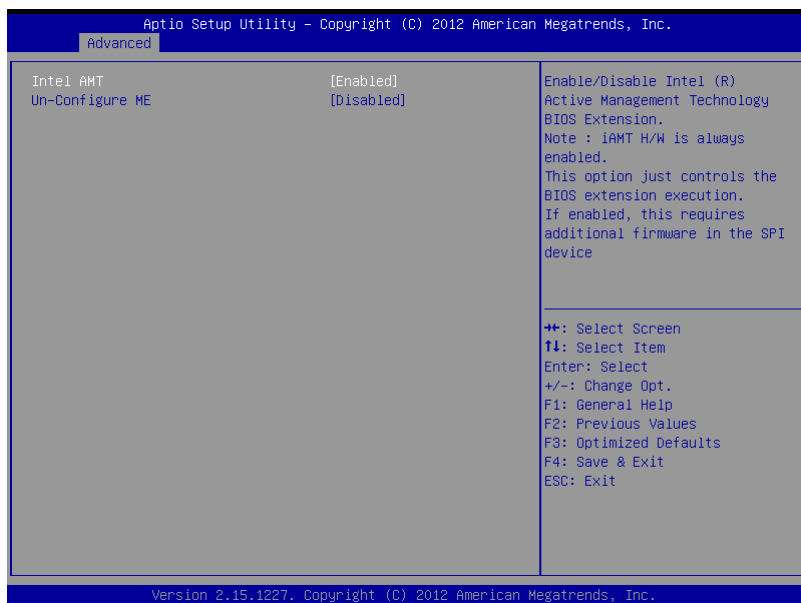
Options summary:

SATA Controllers	Disabled	Default
	Enabled	
En/Disable SATA Controller.		
SATA Mode	IDE	Default
	AHCI	
	RAID	
IDE: Configure SATA controllers as legacy IDEAHCI: Configure SATA controllers to operate in AHCI mode		
Port x	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Hot Plug feature.		

3.4.6 Intel TXT(LT) Configuration



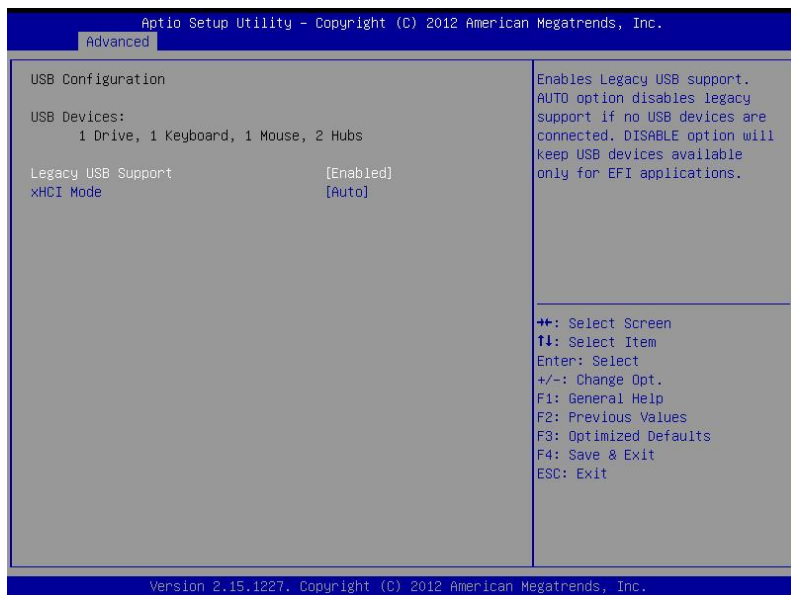
3.4.7 Advanced: AMT Configuration



Options summary:

Intel AMT	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Intel Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.		
Un-configure ME	Disabled	Optimal Default, Failsafe Default
	Enabled	
OEMFlag Bit 15: Un-Configure ME without password.		

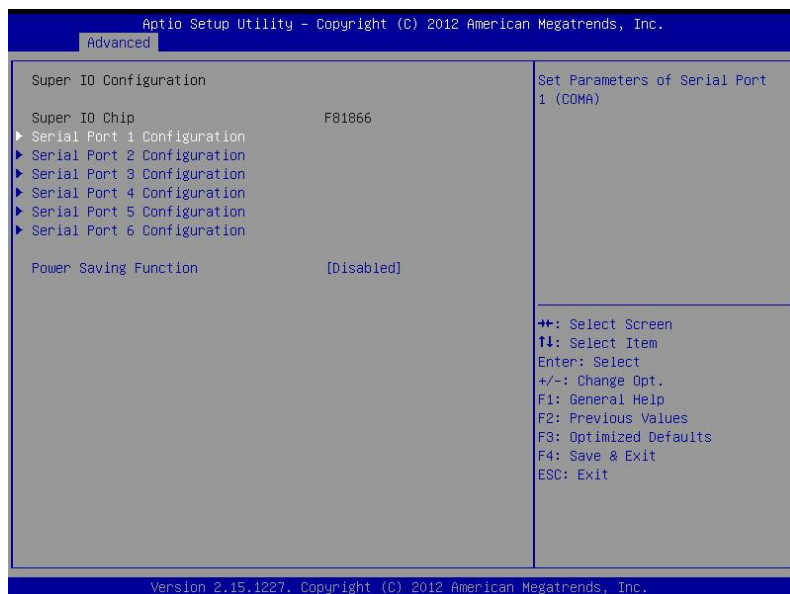
3.4.8 USB Configuration



Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected		
xHCI Mode	Smart Auto	Optimal Default, Failsafe Default
	Auto	
	Enabled	
	Disabled	
Mode of operation of xHCI controller		

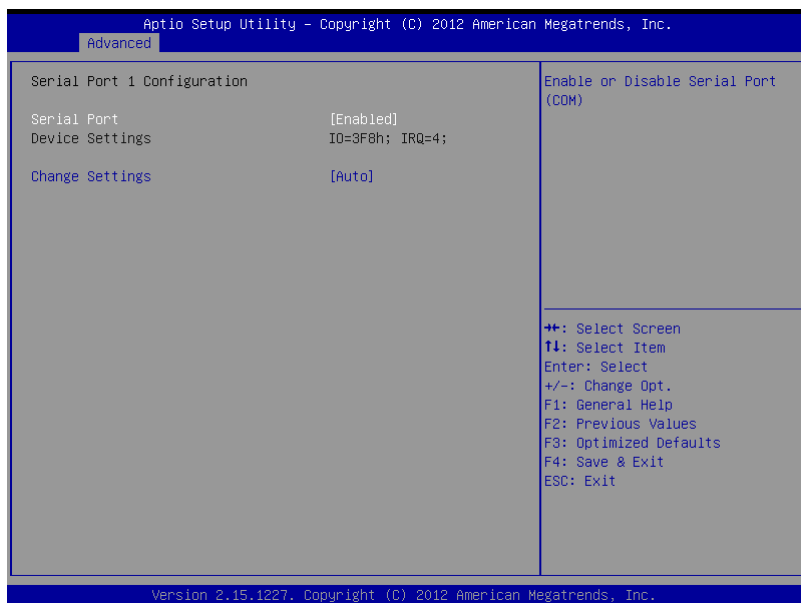
3.4.9 Advanced: Super IO Configuration



Options summary:

Power Saving Function	Disabled	Default
	Enabled	
Enable to reduce power consumption in system off state. When Enabled, only power button can power-up system.		

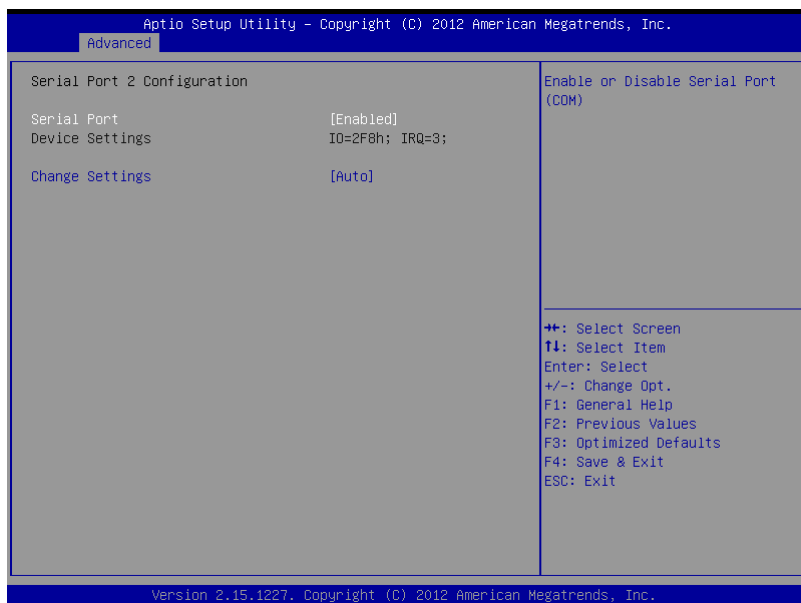
3.4.9.1 Super IO Configuration: Serial Port 1 Configuration



Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h; IRQ=3,4	
	IO=2E8h; IRQ=3,4;	
Allows BIOS to Select Serial Port resource.		

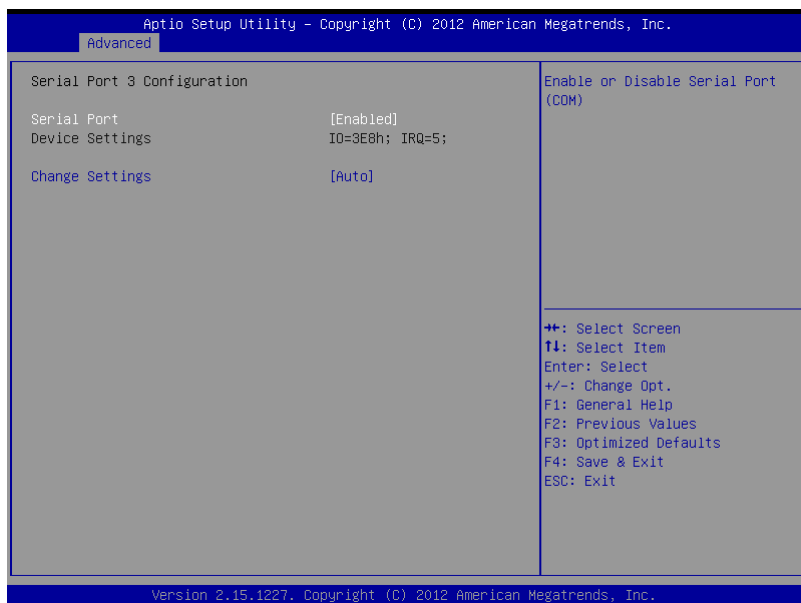
3.4.9.2 Super IO Configuration: Serial Port 2 Configuration



Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h; IRQ=3,4;	
	IO=2E8h; IRQ=3,4;	
Allows BIOS to Select Serial Port resource.		

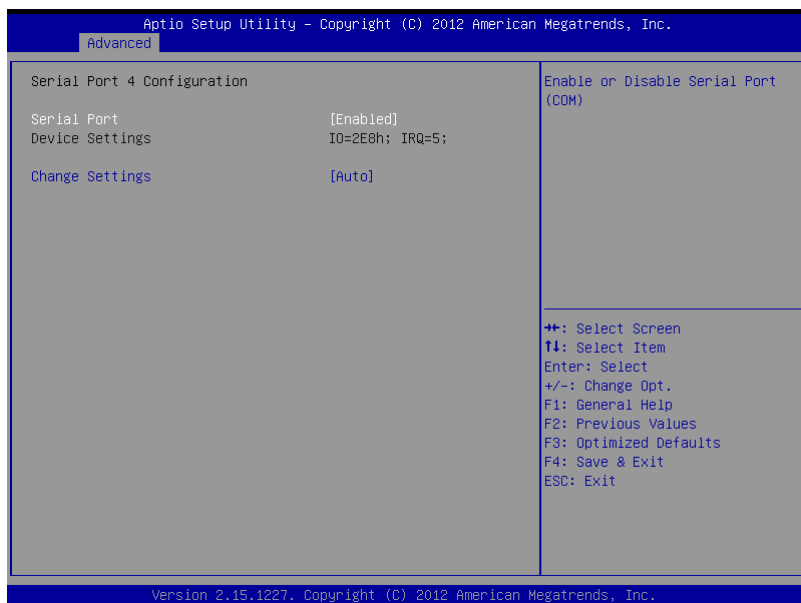
3.4.9.3 Super IO Configuration: Serial Port 3 Configuration



Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=3E8h; IRQ=10;	
	IO=3E8h; IRQ=10,11;;	
	IO=2E8h; IRQ=10,11;	
	IO=2D0h; IRQ=10,11;	
	IO=2D8h; IRQ=10,11;	
Allows BIOS to Select Serial Port resource.		

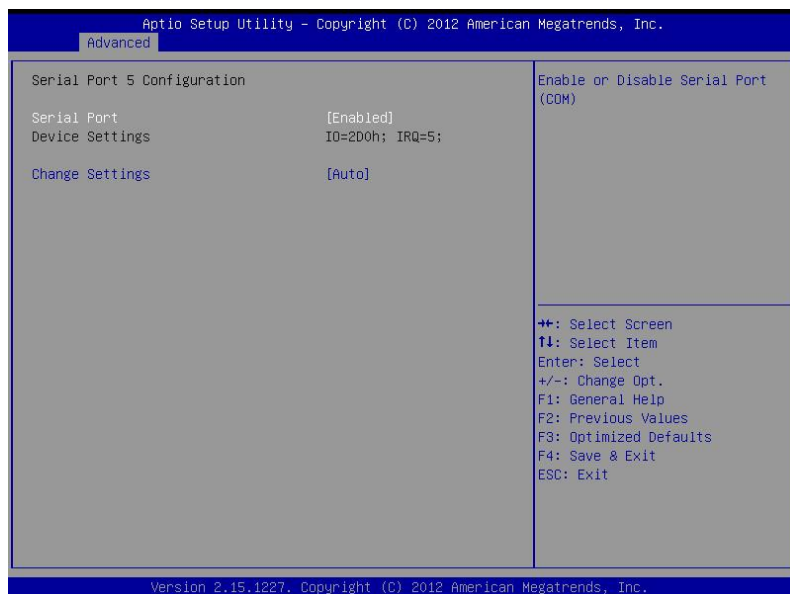
3.4.9.4 Super IO Configuration: Serial Port 4 Configuration



Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2E8h; IRQ=10;	
	IO=3E8h; IRQ=10,11;;	
	IO=2E8h; IRQ=10,11;	
	IO=2D0h; IRQ=10,11;	
	IO=2D8h; IRQ=10,11;	
Allows BIOS to Select Serial Port resource.		

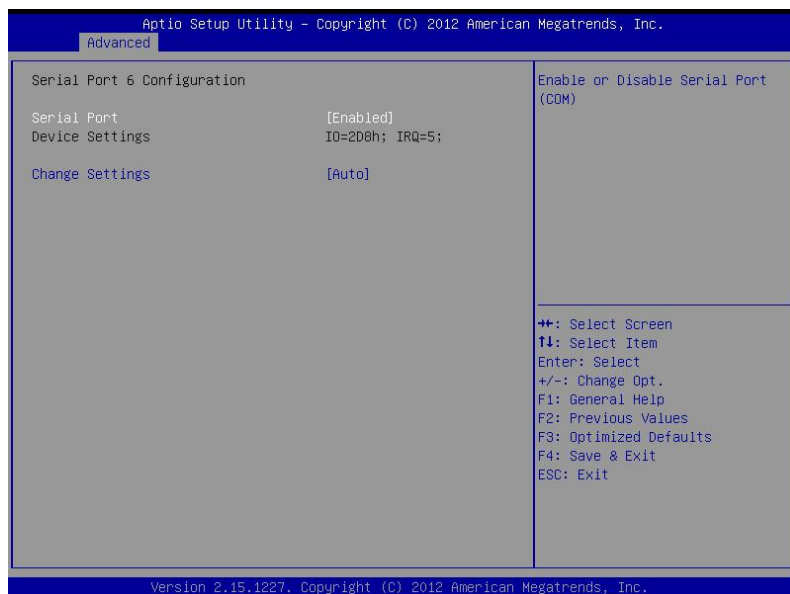
3.4.9.5 Super IO Configuration: Serial Port 5 Configuration



Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2D0h; IRQ=5;	
	IO=3E8h; IRQ=5;	
	IO=2E8h; IRQ=5;	
	IO=2D0h; IRQ=5;	
Allows BIOS to Select Serial Port resource.		

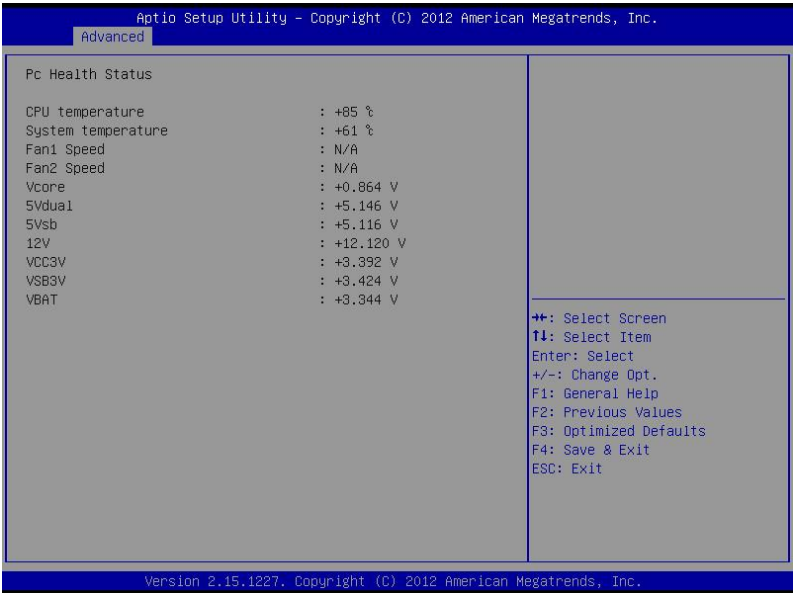
3.4.9.6 Super IO Configuration: Serial Port 6 Configuration



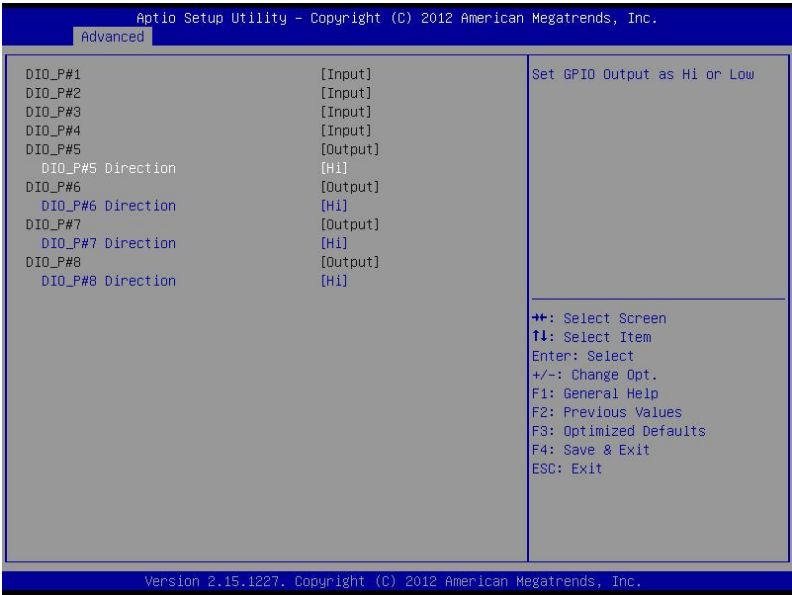
Options summary:

Serial Port	Disabled	Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2D8h; IRQ=5;	
	IO=3E8h; IRQ=5;	
	IO=2E8h; IRQ=5;	
	IO=2D0h; IRQ=5;	
Allows BIOS to Select Serial Port resource.		

3.4.10 Advanced: H/W Monitor



3.4.11 Advanced: Digital IO



Options summary:

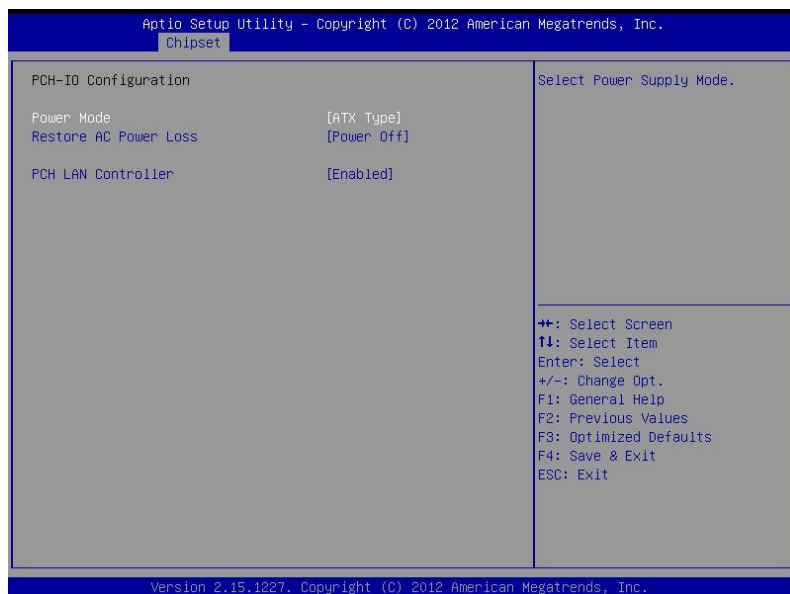
DIO_P#5~8 Direction	Low	Default
	Hi	

Allows BIOS to select high/low voltage level to output to corresponding DIO ping.

3.5 Setup submenu: Chipset



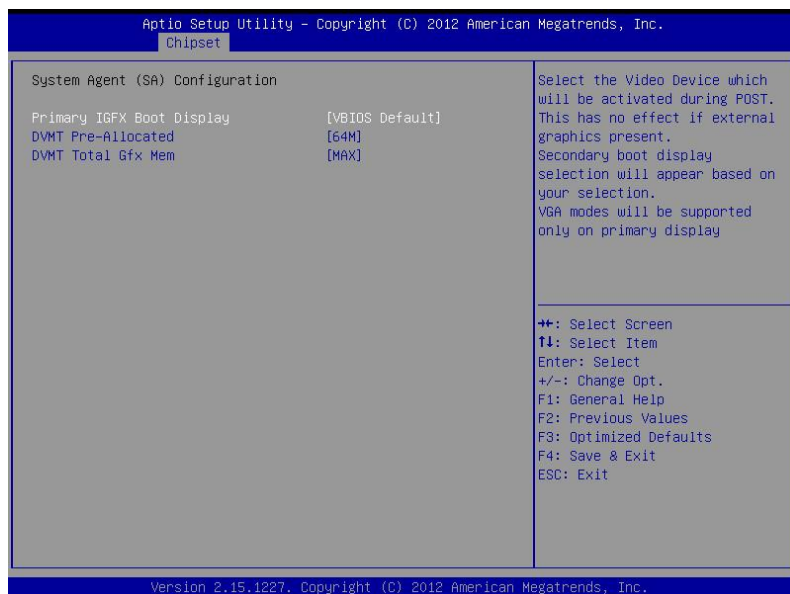
3.5.1 Chipset: PCH-IO Configuration



Options summary:

Power Mode	ATX Type	Default
	AT Type	
Select Power Supply Mode.		
Power Mode	Power Off	Default
	Power On	
	Last State	
Select AC power state when power is re-applied after a power failure.		
PCH LAN Controller	Enabled	Default
	Disabled	
Enable or disable onboard NIC.		

3.5.2 Chipset: System Agent (SA) Configuration

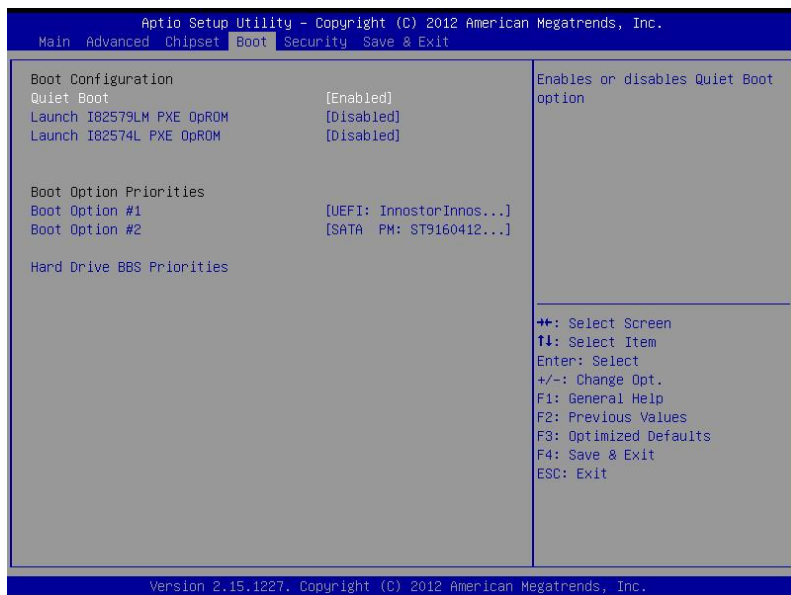


Options summary:

Primary IGFX Boot Display	VBIOS Default	Default
	CRT	
	HDMI	
	DVI	
Select the Video Device which will be activated during POST.		
DVMT Pre-Allocated	32M	Default
	64M	
	96M	
	128M	
	160M	
	192M	
	224M	
	256M	
	288M	
	320M	
	352M	
	284M	

	416M	
	448M	
	480M	
	512M	
	1024M	
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		
DVMT Total Gfx Mem	128M	
	256M	
	MAX	Default
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.		

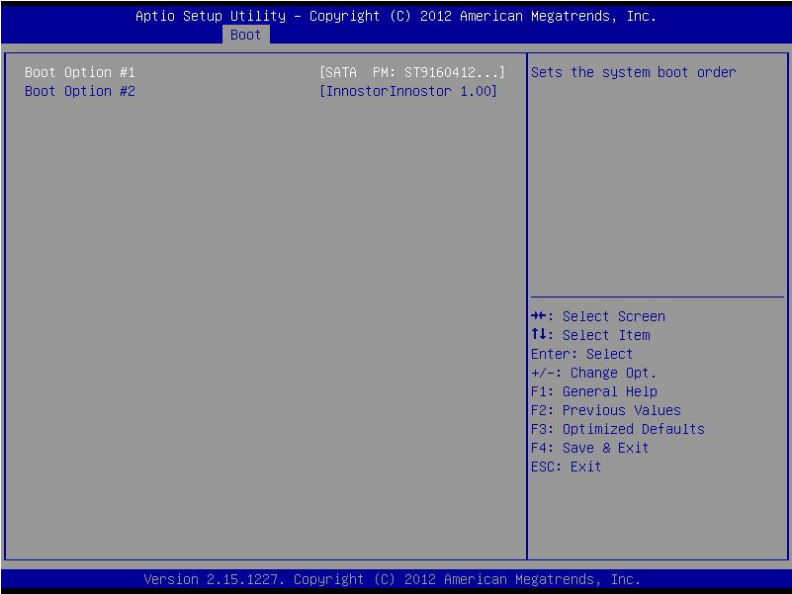
3.6 Setup submenu: Boot



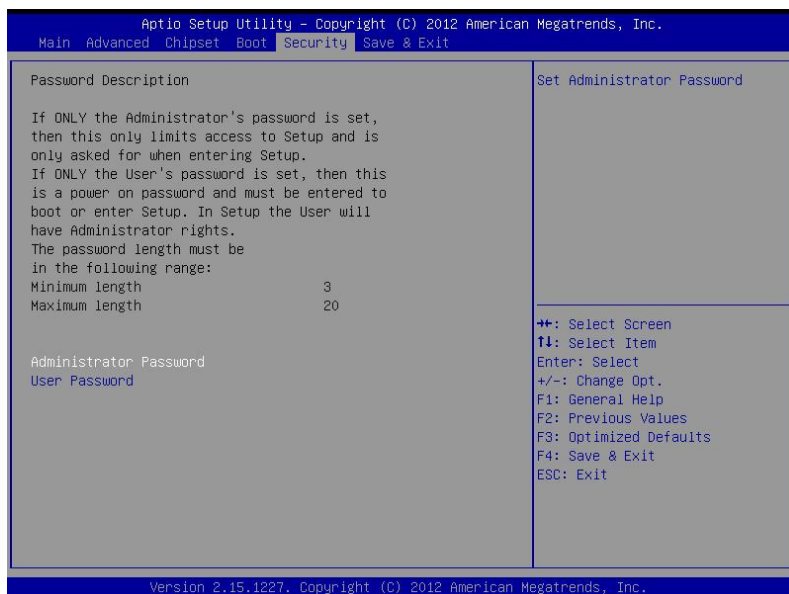
Options summary:

Quiet Boot	Disabled	Default
	Enabled	
En/Disable showing boot logo.		
Launch I82579LM PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option for I82579LM.		
Launch I82574L PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option for I82583V.		

3.6.1 Boot: BBS Priorities



3.7 Setup submenu: Security



Change User/Administrator Password

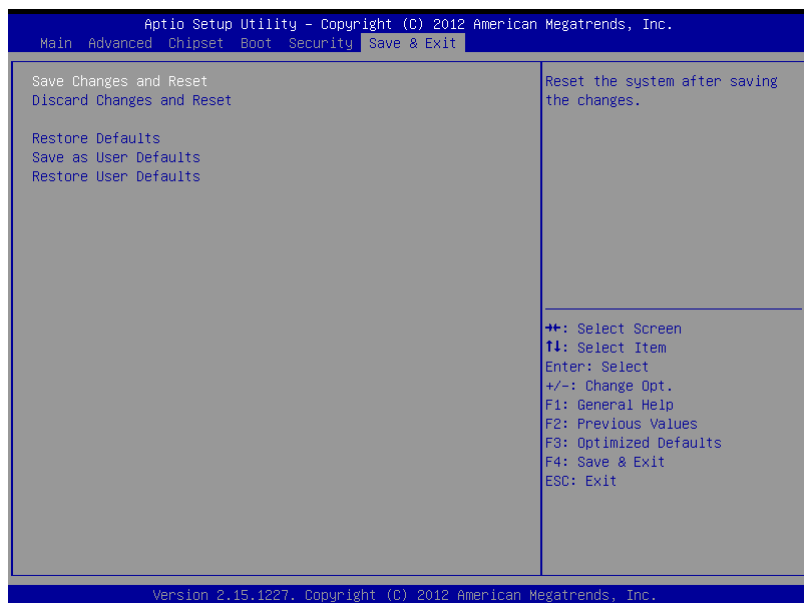
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final confirmation. Press Enter again after you have retyped it correctly.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

3.8 Setup submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Product CD/DVD

The AEC-6977 comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

Step 1 – Install Chipset Drivers

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

Step 2 – Install VGA Driver

1. Open the **Step 2 - 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:

If the OS is Windows® XP, you have to install the driver of dotNet Framework first.

Simply click on dotnetfx35.exe located in .Net Framework folder.

Step 3 – Install LAN Driver

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

Step 4 – Install Audio Driver

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

Step 5 – Install USB 3.0 Driver (Windows 7 only)

1. Open the **Step 4 – USB 3.0** followed by the **Setup.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

Step 6 – Install RAID & AHCI Drivers

Please refer to Appendix C RAID & AHCI Settings

Step 7 – Install ME Drivers

1. Open the **Step 7 – ME** folder and followed by **Setup.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

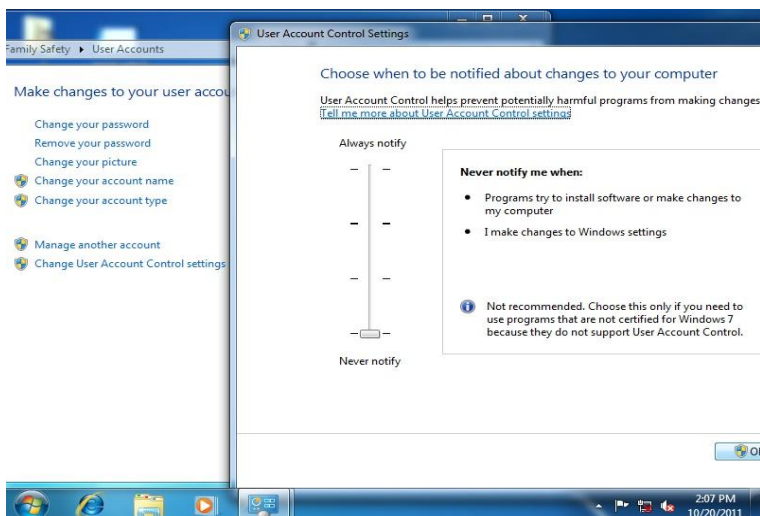
Step 8 – Install TPM Driver

1. Open the **Step 8 - TPM** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

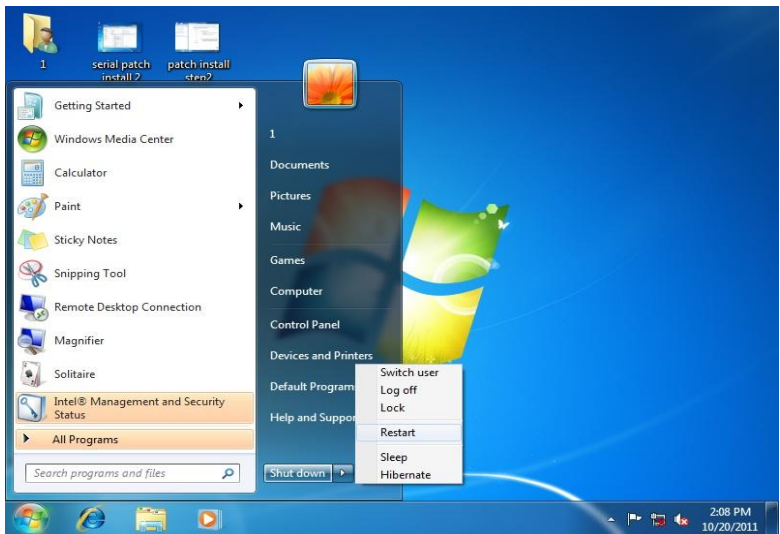
Step 9 – Install Serial Port Driver (Optional)

For Windows 7:

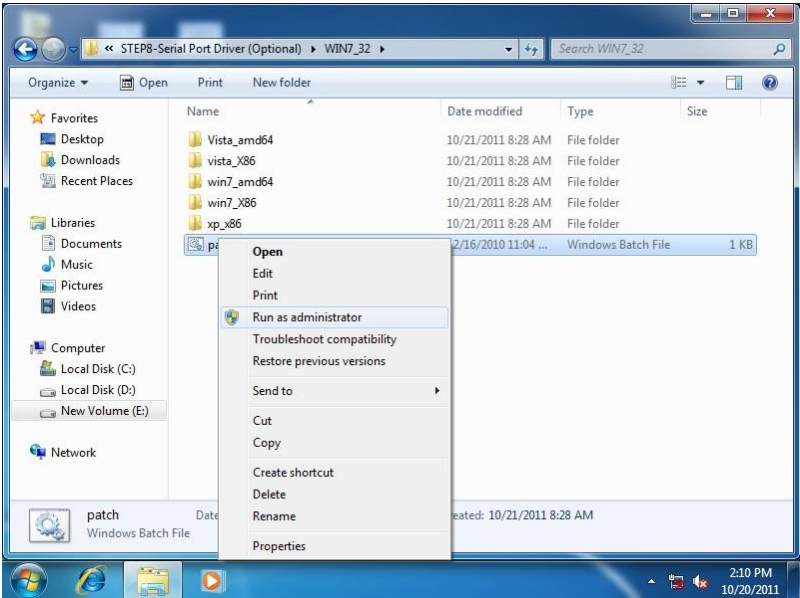
1. Change User Account Control settings to **Never notify**



2. Reboot and log in as administrator



3. Open the **Step 9 - Serial Port Driver (Optional)** folder and run **patch.bat** as administrator



For Windows 8 and Windows 10:

1. Open the **Step 9 - Serial Port Driver (Optional)** folder and select your OS
2. Open the **patch.bat** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Initial Program

Table 1 : SuperIO relative register table

	Default Value	Note
Index	0x2E(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

Table 2 : Watchdog relative register table

	LDN	Register	BitNum	Value	Note
Timer Counter	0x07(Note3)	0xF6(Note4)		(Note24)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	0x07(Note5)	0xF5(Note6)	3(Note7)	0(Note8)	Select time unit. 0: second 1: minute
Watchdog Enable	0x07(Note9)	0xF5(Note10)	5(Note11)	1(Note12)	0: Disable 1: Enable
Timeout Status	0x07(Note13)	0xF5(Note14)	6(Note15)	1	1: Clear timeout status
Output Mode	0x07(Note16)	0xF5(Note17)	4(Note18)	1(Note19)	Select WDTRST# output mode 0: level 1: pulse
WDTRST output	0x07(Note20)	0xFA(Note21)	0(Note22)	1(Note23)	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable

A.2 Watchdog Sample Program

```
*****
// SuperIO relative definition (Please reference to Table 1)
#define byte SIOIndex //This parameter is represented from Note1
#define byte SIOData //This parameter is represented from Note2
#define void IOWriteByte(byte IOPort, byte Value);
#define byte IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerLDN //This parameter is represented from Note3
#define byte TimerReg //This parameter is represented from Note4
#define byte TimerVal // This parameter is represented from Note24
#define byte UnitLDN //This parameter is represented from Note5
#define byte UnitReg //This parameter is represented from Note6
#define byte UnitBit //This parameter is represented from Note7
#define byte UnitVal //This parameter is represented from Note8
#define byte EnableLDN //This parameter is represented from Note9
#define byte EnableReg //This parameter is represented from Note10
#define byte EnableBit //This parameter is represented from Note11
#define byte EnableVal //This parameter is represented from Note12
#define byte StatusLDN // This parameter is represented from Note13
#define byte StatusReg // This parameter is represented from Note14
#define byte StatusBit // This parameter is represented from Note15
#define byte ModeLDN // This parameter is represented from Note16
#define byte ModeReg // This parameter is represented from Note17
#define byte ModeBit // This parameter is represented from Note18
#define byte ModeVal // This parameter is represented from Note19
#define byte WDTRstLDN // This parameter is represented from Note20
#define byte WDTRstReg // This parameter is represented from Note21
#define byte WDTRstBit // This parameter is represented from Note22
#define byte WDTRstVal // This parameter is represented from Note23
*****
```

```
*****
VOID  Main(){
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Time of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AaeonWDTConfig();

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****
```

```

*****
// Procedure : AaeonWDTEnable
VOID  AaeonWDTEnable (){
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID  AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID  WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
    SIOBitSet(LDN, Register, BitNum, Value);
}

VOID  WDTParameterSetting(){
    // Watchdog Timer counter setting
    SIOByteSet(TimerLDN, TimerReg, TimerVal);
    // WDT counting unit setting
    SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
    // WDT output mode setting, level / pulse
    SIOBitSet(ModelLDN, ModeReg, ModeBit, ModeVal);
    // Watchdog timeout output via WDTRST#
    SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

VOID  WDTClearTimeoutStatus(){
    SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}
*****

```

```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID  SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID  SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID  SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****





































```

Appendix B

I/O Information

B.1 I/O Address Map




















































Input/output (I/O)	
[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 PS/2 Keyboard
[00000061 - 00000061]	Motherboard resources
[00000062 - 00000063]	Motherboard resources
[00000063 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard PS/2 Keyboard
[00000065 - 00000065]	Motherboard resources
[00000065 - 0000006F]	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
[000002D0 - 000002D7]	Communications Port (COM5)
















































	[000002D8 - 000002DF]	Communications Port (COM6)
	[000002E8 - 000002EF]	Communications Port (COM4)
	[000002F8 - 000002FF]	Communications Port (COM2)
	[000003B0 - 000003BB]	Intel(R) HD Graphics
	[000003C0 - 000003DF]	Intel(R) HD Graphics
	[000003E8 - 000003EF]	Communications Port (COM3)
	[000003F8 - 000003FF]	Communications Port (COM1)
	[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 - 00000A0F]	Motherboard resources
	[00000A10 - 00000A1F]	Motherboard resources
	[00000A20 - 00000A2F]	Motherboard resources
	[00000D00 - 0000FFFF]	PCI bus
	[00001000 - 0000100F]	Motherboard resources
	[0000164E - 0000164F]	Motherboard resources
	[0000E000 - 0000EFFF]	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	[0000F000 - 0000F03F]	Intel(R) HD Graphics
	[0000F040 - 0000F05F]	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
	[0000F080 - 0000F08F]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F090 - 0000F09F]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F0A0 - 0000F0A3]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F0B0 - 0000F0B7]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F0C0 - 0000F0C3]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F0D0 - 0000F0D7]	Intel(R) 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E09
	[0000F0E0 - 0000F0EF]	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	[0000F100 - 0000F103]	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	[0000F110 - 0000F117]	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	[0000F120 - 0000F123]	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	[0000F130 - 0000F137]	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	[0000FFFF - 0000FFFF]	Motherboard resources
	[0000FFFF - 0000FFFF]	Motherboard resources





































B.2 Memory Address Map

Memory	
[000A0000 - 000BFFFF]	Intel(R) HD Graphics
[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
[40004000 - 40004FFF]	System board
[DFA00000 - DFA00FFF]	Motherboard resources
[DFA00000 - FEAF7FFF]	PCI bus
[E0000000 - EFFFFFFF]	Intel(R) HD Graphics
[F7800000 - F7BFFFFF]	Intel(R) HD Graphics
[F7C00000 - F7C1FFFF]	Intel(R) 82574L Gigabit Network Connection
[F7C00000 - F7CFFFFFF]	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
[F7C20000 - F7C23FFF]	Intel(R) 82574L Gigabit Network Connection
[F7D00000 - F7D1FFFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D20000 - F7D2FFFF]	Intel(R) USB 3.0 eXtensible Host Controller
[F7D30000 - F7D33FFF]	High Definition Audio Controller
[F7D35000 - F7D350FF]	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
[F7D36000 - F7D363FF]	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
[F7D37000 - F7D373FF]	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
[F7D38000 - F7D38FFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D3B000 - F7D3B00F]	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]	System board
[FED45000 - FED8FFFF]	Motherboard resources
[FED90000 - FED93FFF]	Motherboard resources
[FEE00000 - FEEFFFFFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Motherboard resources

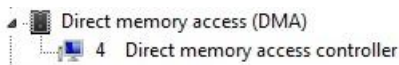
B.3 IRQ Mapping Chart

Interrupt request (IRQ)		
	(ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
	(ISA) 0x00000003 (03)	Communications Port (COM2)
	(ISA) 0x00000004 (04)	Communications Port (COM1)
	(ISA) 0x00000005 (05)	Communications Port (COM3)
	(ISA) 0x00000005 (05)	Communications Port (COM4)
	(ISA) 0x00000005 (05)	Communications Port (COM5)
	(ISA) 0x00000005 (05)	Communications Port (COM6)
	(ISA) 0x00000008 (08)	System CMOS/real time clock
	(ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
	(ISA) 0x0000000D (13)	Numeric data processor
	(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
	(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
	(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
	(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
	(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
	(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
	(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
	(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
	(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
	(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
	(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
	(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
	(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
	(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
	(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
	(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
	(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
	(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
	(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
	(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
	(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
	(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
	(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
	(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
	(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
	(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
	(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
	(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System

	(ISA) 0x0000079 (121)	Microsoft ACPI-Compliant System
	(ISA) 0x000007A (122)	Microsoft ACPI-Compliant System
	(ISA) 0x000007B (123)	Microsoft ACPI-Compliant System
	(ISA) 0x000007C (124)	Microsoft ACPI-Compliant System
	(ISA) 0x000007D (125)	Microsoft ACPI-Compliant System
	(ISA) 0x000007E (126)	Microsoft ACPI-Compliant System
	(ISA) 0x000007F (127)	Microsoft ACPI-Compliant System
	(ISA) 0x0000080 (128)	Microsoft ACPI-Compliant System
	(ISA) 0x0000081 (129)	Microsoft ACPI-Compliant System
	(ISA) 0x0000082 (130)	Microsoft ACPI-Compliant System
	(ISA) 0x0000083 (131)	Microsoft ACPI-Compliant System
	(ISA) 0x0000084 (132)	Microsoft ACPI-Compliant System
	(ISA) 0x0000085 (133)	Microsoft ACPI-Compliant System
	(ISA) 0x0000086 (134)	Microsoft ACPI-Compliant System
	(ISA) 0x0000087 (135)	Microsoft ACPI-Compliant System
	(ISA) 0x0000088 (136)	Microsoft ACPI-Compliant System
	(ISA) 0x0000089 (137)	Microsoft ACPI-Compliant System
	(ISA) 0x000008A (138)	Microsoft ACPI-Compliant System
	(ISA) 0x000008B (139)	Microsoft ACPI-Compliant System
	(ISA) 0x000008C (140)	Microsoft ACPI-Compliant System
	(ISA) 0x000008D (141)	Microsoft ACPI-Compliant System
	(ISA) 0x000008E (142)	Microsoft ACPI-Compliant System
	(ISA) 0x000008F (143)	Microsoft ACPI-Compliant System
	(ISA) 0x0000090 (144)	Microsoft ACPI-Compliant System
	(ISA) 0x0000091 (145)	Microsoft ACPI-Compliant System
	(ISA) 0x0000092 (146)	Microsoft ACPI-Compliant System
	(ISA) 0x0000093 (147)	Microsoft ACPI-Compliant System
	(ISA) 0x0000094 (148)	Microsoft ACPI-Compliant System
	(ISA) 0x0000095 (149)	Microsoft ACPI-Compliant System
	(ISA) 0x0000096 (150)	Microsoft ACPI-Compliant System
	(ISA) 0x0000097 (151)	Microsoft ACPI-Compliant System
	(ISA) 0x0000098 (152)	Microsoft ACPI-Compliant System
	(ISA) 0x0000099 (153)	Microsoft ACPI-Compliant System
	(ISA) 0x000009A (154)	Microsoft ACPI-Compliant System
	(ISA) 0x000009B (155)	Microsoft ACPI-Compliant System
	(ISA) 0x000009C (156)	Microsoft ACPI-Compliant System
	(ISA) 0x000009D (157)	Microsoft ACPI-Compliant System
	(ISA) 0x000009E (158)	Microsoft ACPI-Compliant System
	(ISA) 0x000009F (159)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A0 (160)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A1 (161)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A2 (162)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A3 (163)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A4 (164)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A5 (165)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A6 (166)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A7 (167)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A8 (168)	Microsoft ACPI-Compliant System
	(ISA) 0x00000A9 (169)	Microsoft ACPI-Compliant System
	(ISA) 0x00000AA (170)	Microsoft ACPI-Compliant System
	(ISA) 0x00000AB (171)	Microsoft ACPI-Compliant System

	(ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
	(PCI) 0x0000000B (11)	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
	(PCI) 0x00000010 (16)	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
	(PCI) 0x00000010 (16)	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10
	(PCI) 0x00000010 (16)	Intel(R) Management Engine Interface
	(PCI) 0x00000010 (16)	Xeon(R) processor E3-1200 v2/3rd Gen Core processor PCI Express Root Port - 0151
	(PCI) 0x00000010 (16)	Xeon(R) processor E3-1200 v2/3rd Gen Core processor PCI Express Root Port - 0159
	(PCI) 0x00000011 (17)	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	(PCI) 0x00000013 (19)	Intel(R) 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E01
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0x00000017 (23)	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) 82574L Gigabit Network Connection
	(PCI) 0xFFFFFFF9 (-7)	Intel(R) 82574L Gigabit Network Connection
	(PCI) 0xFFFFFFFA (-6)	Intel(R) 82574L Gigabit Network Connection
	(PCI) 0xFFFFFFF8 (-5)	Intel(R) 82574L Gigabit Network Connection
	(PCI) 0xFFFFFFFC (-4)	Intel(R) 82579LM Gigabit Network Connection
	(PCI) 0xFFFFFFF8 (-3)	Intel(R) USB 3.0 eXtensible Host Controller
	(PCI) 0xFFFFFFF8 (-2)	Intel(R) HD Graphics

B.4 DMA Channel Assignments



Appendix C

RAID & AHCI Settings

C.1 Setting RAID

OS installation to setup RAID Mode

Step 1: Copy the files below from "*Driver CD ->Step 6 - RAID&AHCI*" to Disk

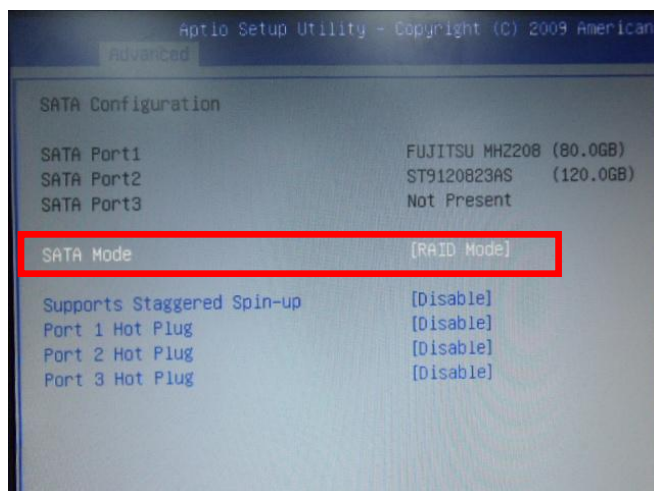


Step 2: Connect the USB Floppy (disk with RAID files) to the board



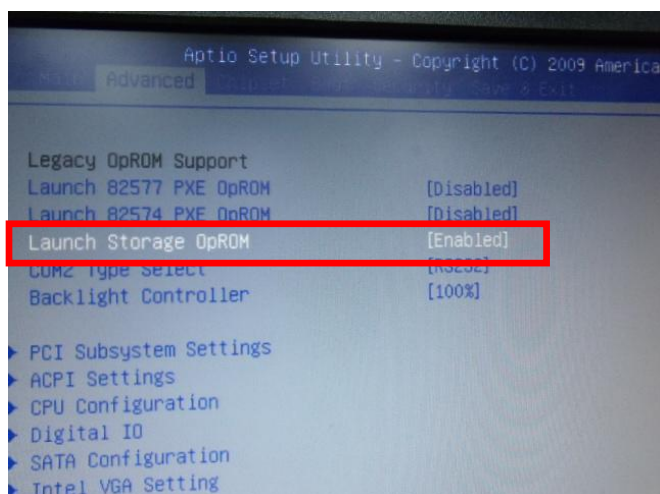
Step 3: The setting procedures "In BIOS Setup Menu"

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



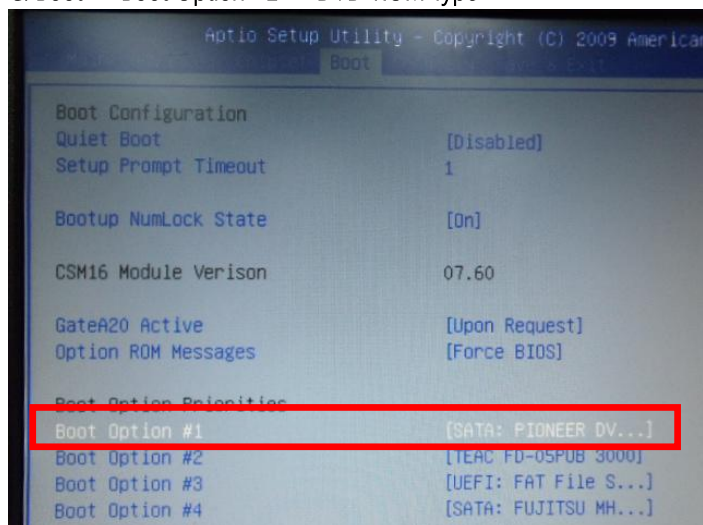
Step 4: The setting procedures "In BIOS Setup Menu"

B: Advanced -> Launch Storage OpROM -> Enabled



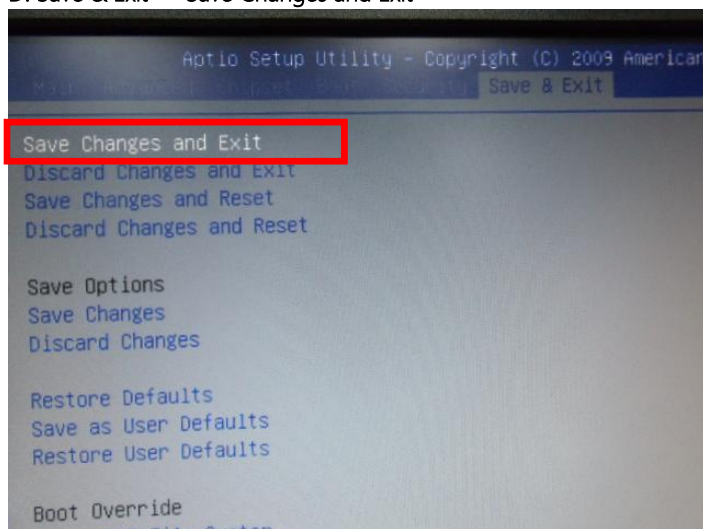
Step 5: The setting procedures "In BIOS Setup Menu"

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

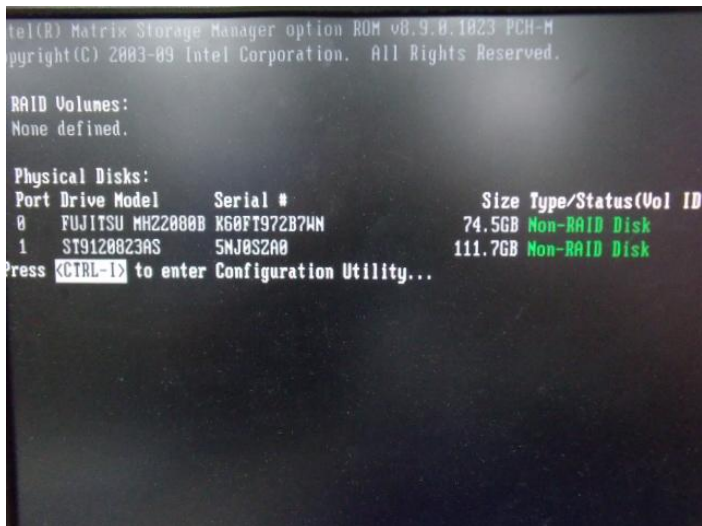


Step 6: The setting procedures "In BIOS Setup Menu"

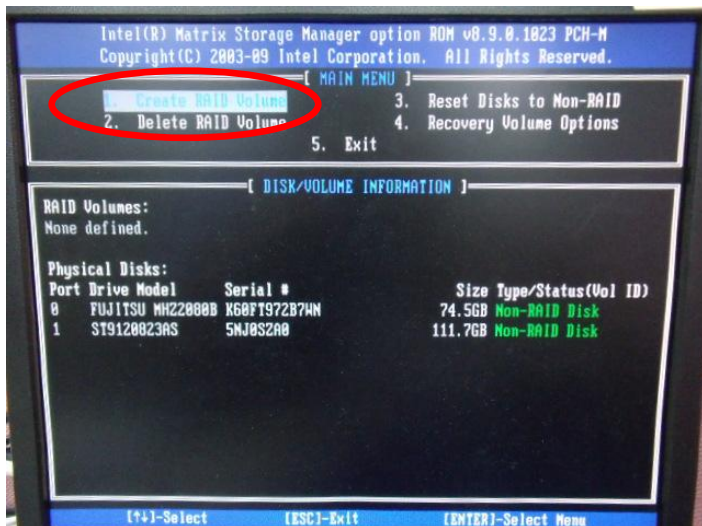
D: Save & Exit -> Save Changes and Exit



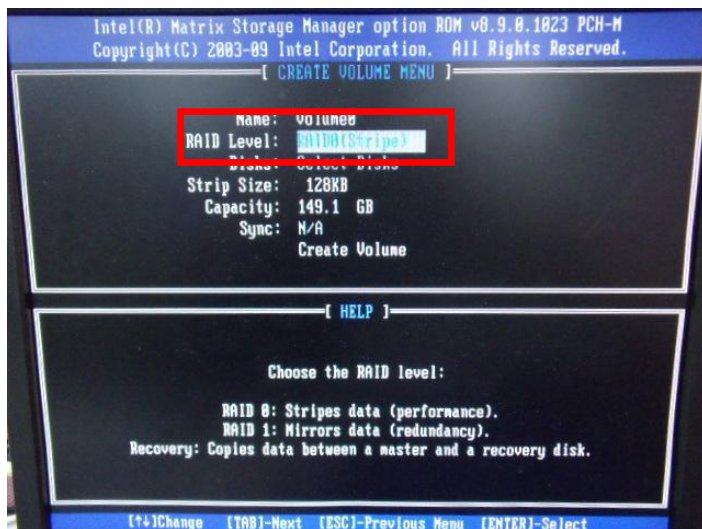
Step 7: Press **Ctrl-I** to enter **MAIN MENU**



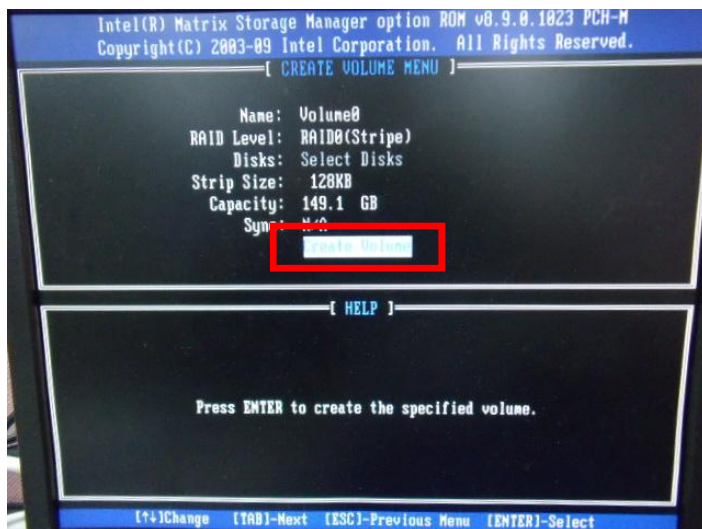
Step 8: Choose "1.Create RAID Volume"



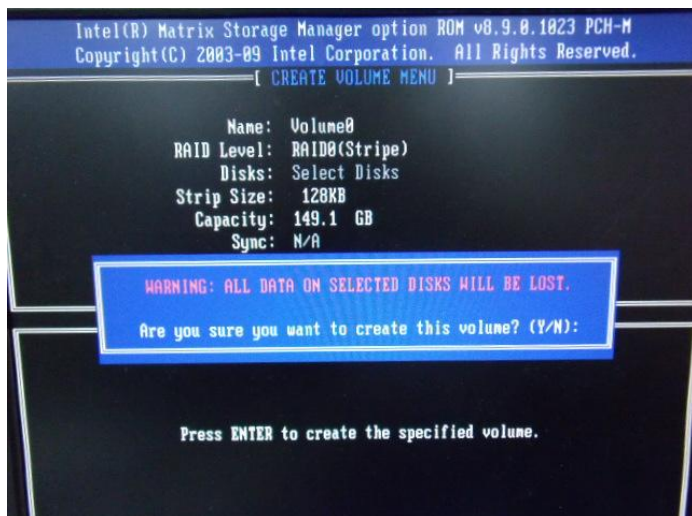
Step 9: RAID Level -> RAID0(Stripe)



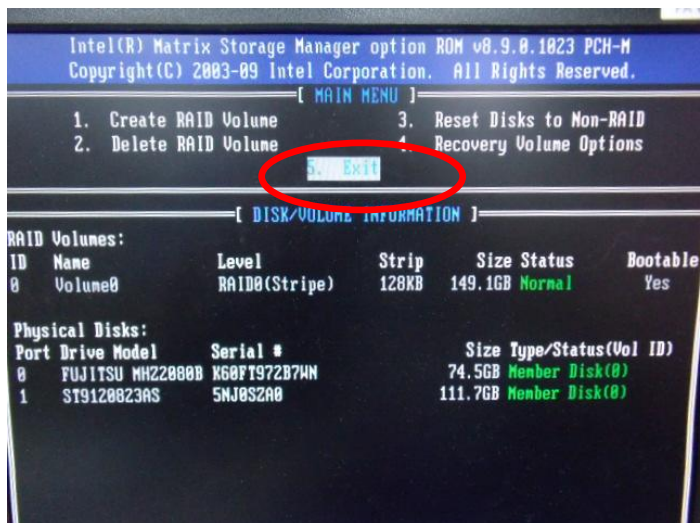
Step 10: Choose "Create Volume"



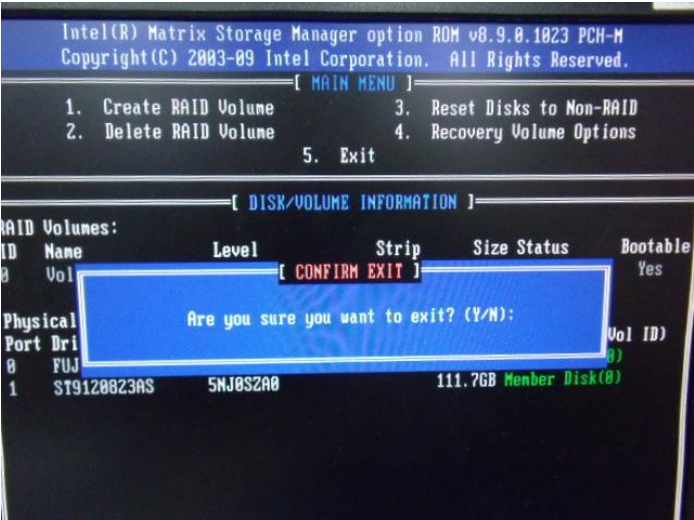
Step 11: Choose "Y"



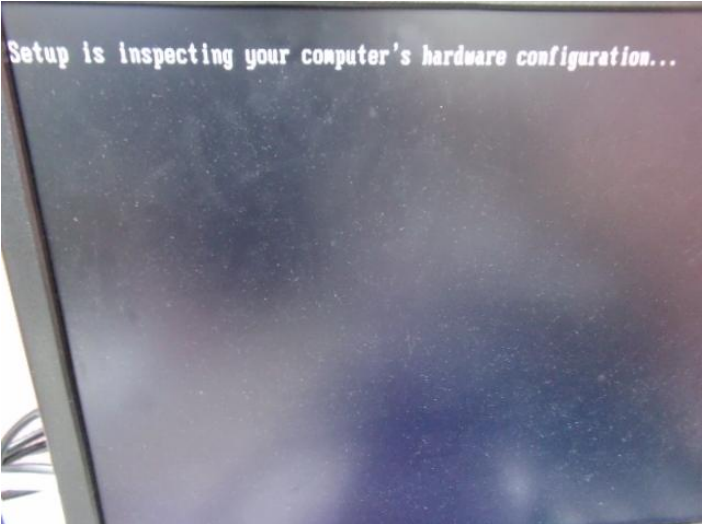
Step 12: Choose "5. Exit"



Step 13: Choose "Y"



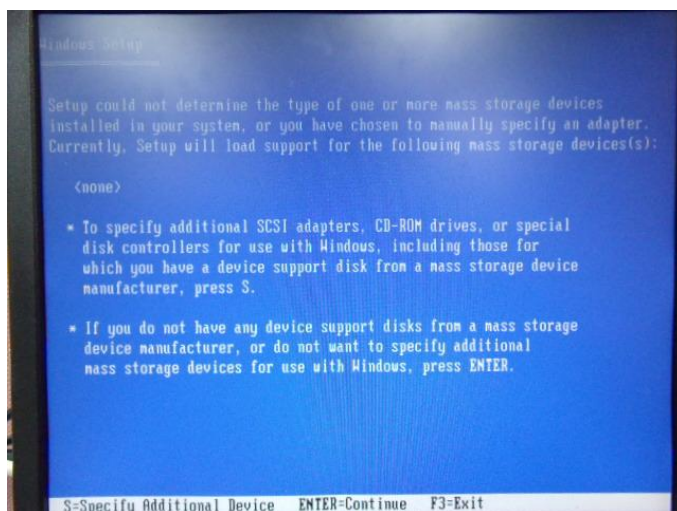
Step 14: Setup OS



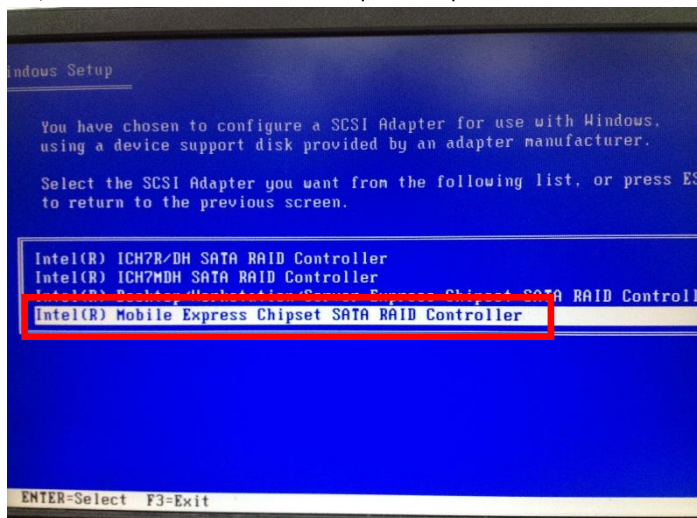
Step 15: Press "F6"



Step 16: Choose "S"



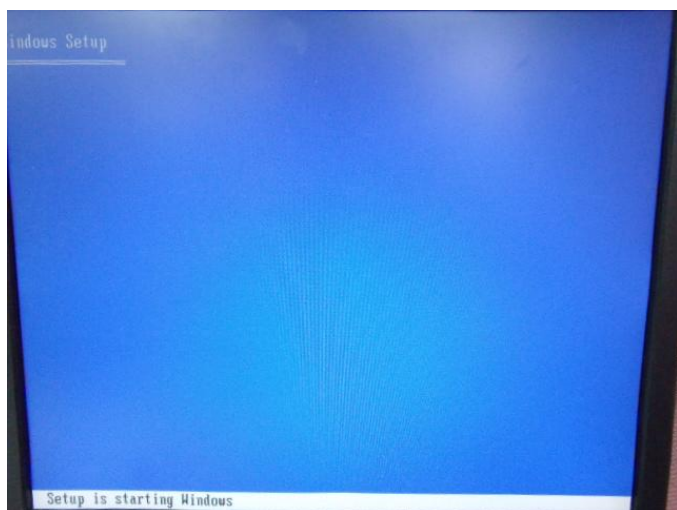
Step 17: Choose "Intel(R) Mobile Express Chipset SATA RAID Controller"



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 -> Step 6 - RAID&AHCI*" to Disk

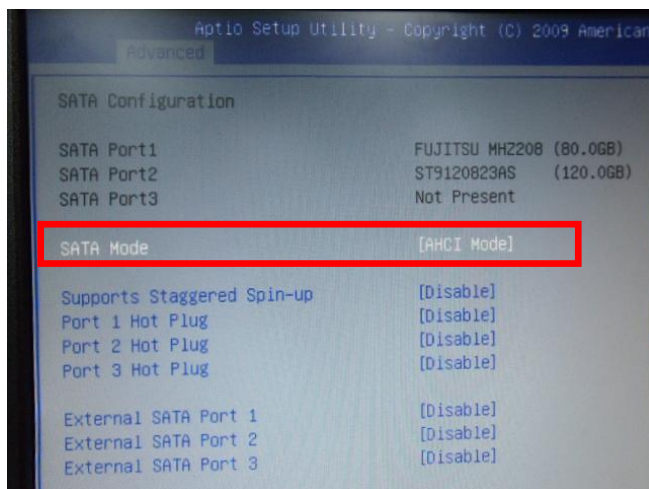


Step 2: Connect the USB Floppy (disk with AHCI files) to the board



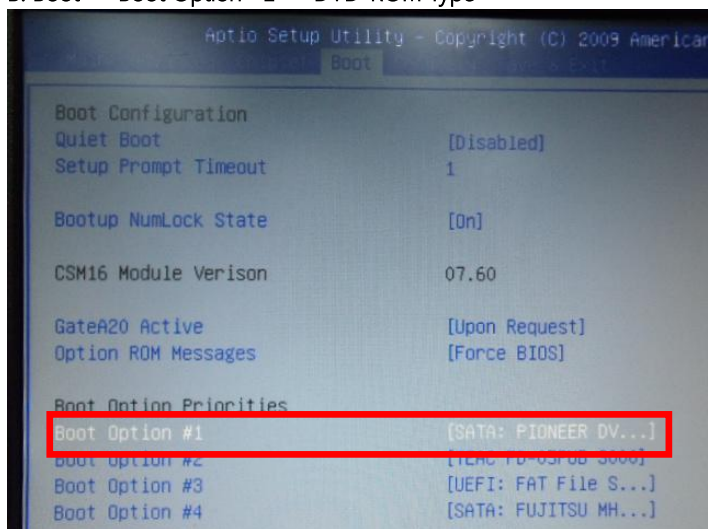
Step 3: The setting procedures "In BIOS Setup Menu"

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



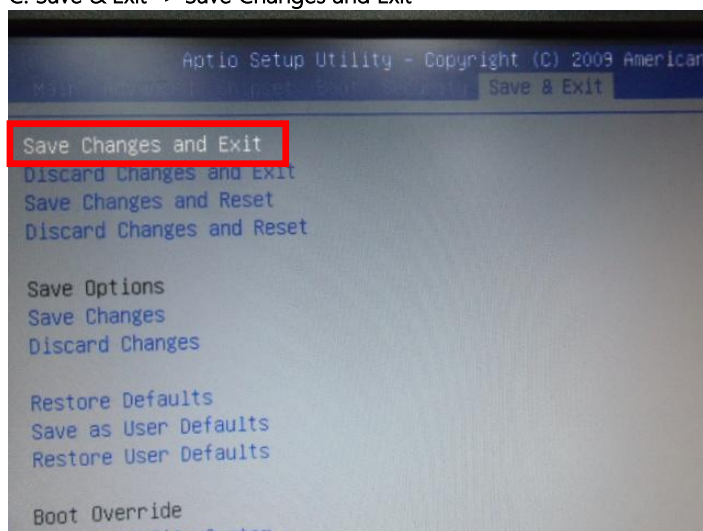
Step 4: The setting procedures "In BIOS Setup Menu"

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

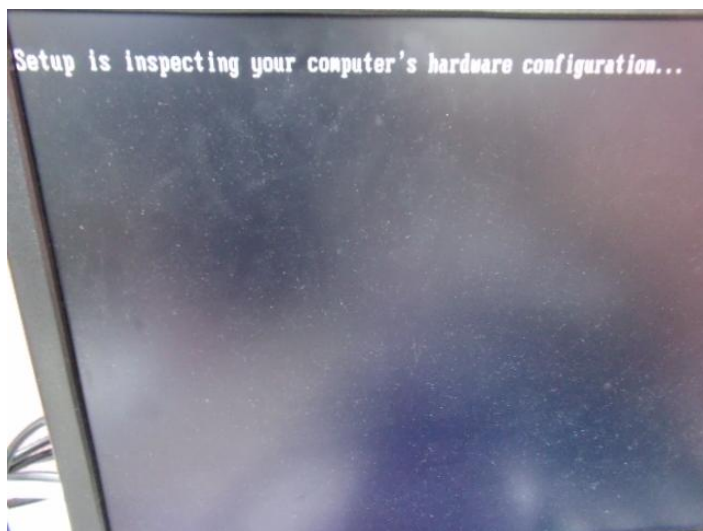


Step 5: The setting procedures "In BIOS Setup Menu"

C: Save & Exit -> Save Changes and Exit



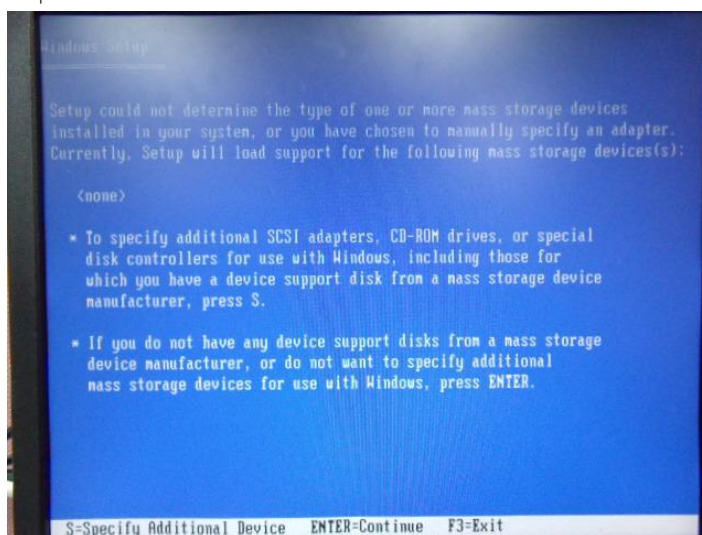
Step 6: Setup OS



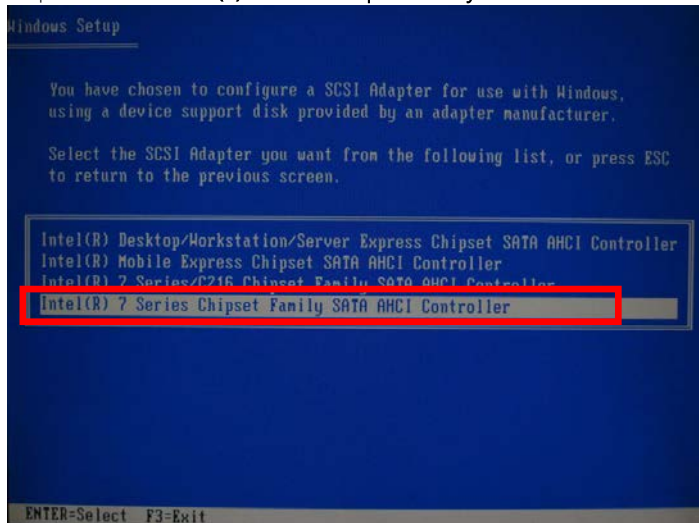
Step 7: Press "F6"



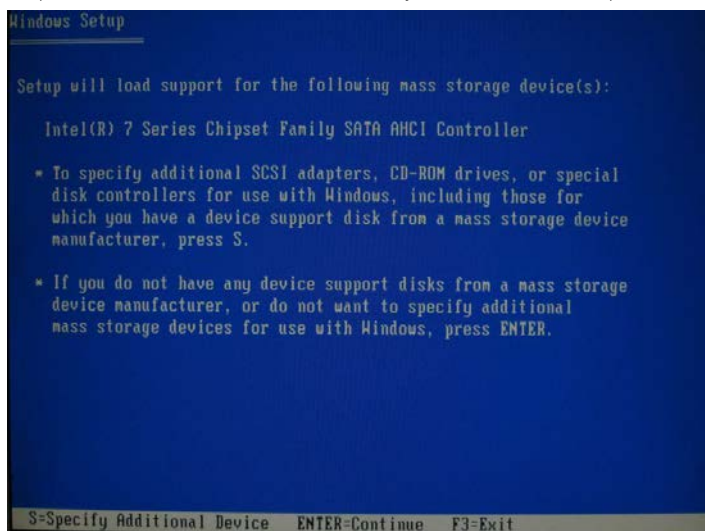
Step 8: Choose "S"



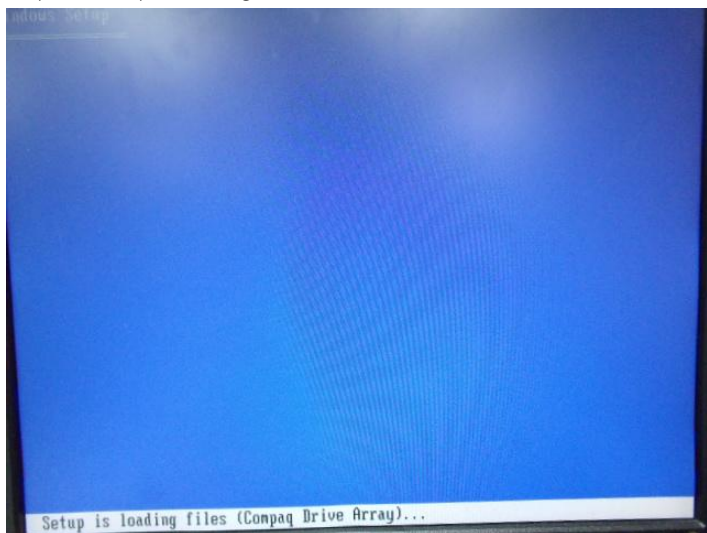
Step 9: Choose "Intel(R) 7 Series Chipset Family SATA AHCI Controller"



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



Step 11: Setup is loading files



Appendix D

Electrical Specifications for I/O Ports

D.1 DIO Programming

AEC-6977 utilizes FINTEK F81866 chipset as its Digital I/O 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.

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. (These three steps are the same as programming WDT)

Please be noted, the Isolation protection DIO is fixed 4 Input / 4 Output type.

DIO_P#1~4 : Input

DIO_P#5~8 : Output

D.2 Digital I/O Register

Table 1 : SuperIO relative register table

	Default Value	Note
Index	0x2E(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

Table 2 : Digital Input relative register table

	LDN	Register	BitNum	Value	Note
DIO-1 Pin Status	0x06(Note3)	0x8A(Note4)	0(Note5)	DI	GPIO80
DIO-2 Pin Status	0x06(Note6)	0x8A(Note7)	1(Note8)	DI	GPIO81
DIO-3 Pin Status	0x06(Note9)	0x8A(Note10)	2(Note11)	DI	GPIO82
DIO-4 Pin Status	0x06(Note12)	0x8A(Note13)	3(Note14)	DI	GPIO83
DIO-5 Pin Status	0x06(Note15)	0x8A(Note16)	4(Note17)	DO	GPIO84
DIO-6 Pin Status	0x06(Note18)	0x8A(Note19)	5(Note20)	DO	GPIO85
DIO-7 Pin Status	0x06(Note21)	0x8A(Note22)	6(Note23)	DO	GPIO86
DIO-8 Pin Status	0x06(Note24)	0x8A(Note25)	7(Note26)	DO	GPIO87

Table 3 : Digital Output relative register table

	LDN	Register	BitNum	Value	Note
DIO-1 Output Data	0x06(Note27)	0x89(Note28)	0(Note29)	(Note30)	GPIO80
DIO-2 Output Data	0x06(Note31)	0x89(Note32)	1(Note33)	(Note34)	GPIO81
DIO-3 Output Data	0x06(Note35)	0x89(Note36)	2(Note37)	(Note38)	GPIO82
DIO-4 Output Data	0x06(Note39)	0x89(Note40)	3(Note41)	(Note42)	GPIO83
DIO-5 Output Data	0x06(Note43)	0x89(Note44)	4(Note45)	(Note46)	GPIO84
DIO-6 Output Data	0x06(Note47)	0x89(Note48)	5(Note49)	(Note50)	GPIO85
DIO-7 Output Data	0x06(Note51)	0x89(Note52)	6(Note53)	(Note54)	GPIO86
DIO-8 Output Data	0x06(Note55)	0x89(Note56)	7(Note57)	(Note58)	GPIO87

D.3 Digital I/O Sample Program

```

*****
// SuperIO relative definition (Please reference to Table 1)
#define byte   SIOIndex   //This parameter is represented from Note1
#define byte   SIOData    //This parameter is represented from Note2
#define void   IOWriteByte(byte IOPort, byte Value);
#define byte   IOReadByte(byte IOPort);
// Digital Input Status relative definition (Please reference to Table 2)
#define byte   DInput1LDN // This parameter is represented from Note3
#define byte   DInput1Reg // This parameter is represented from Note4
#define byte   DInput1Bit // This parameter is represented from Note5
#define byte   DInput2LDN // This parameter is represented from Note6
#define byte   DInput2Reg // This parameter is represented from Note7
#define byte   DInput2Bit // This parameter is represented from Note8
#define byte   DInput3LDN // This parameter is represented from Note9
#define byte   DInput3Reg // This parameter is represented from Note10
#define byte   DInput3Bit // This parameter is represented from Note11
#define byte   DInput4LDN // This parameter is represented from Note12
#define byte   DInput4Reg // This parameter is represented from Note13
#define byte   DInput4Bit // This parameter is represented from Note14
#define byte   DInput5LDN // This parameter is represented from Note15
#define byte   DInput5Reg // This parameter is represented from Note16
#define byte   DInput5Bit // This parameter is represented from Note17
#define byte   DInput6LDN // This parameter is represented from Note18
#define byte   DInput6Reg // This parameter is represented from Note19
#define byte   DInput6Bit // This parameter is represented from Note20
#define byte   DInput7LDN // This parameter is represented from Note21
#define byte   DInput7Reg // This parameter is represented from Note22
#define byte   DInput7Bit // This parameter is represented from Note23
#define byte   DInput8LDN // This parameter is represented from Note24
#define byte   DInput8Reg // This parameter is represented from Note25
#define byte   DInput8Bit // This parameter is represented from Note26
*****

```

```

*****
// Digital Output control relative definition (Please reference to Table 3)
#define byte   DOutput1LDN   // This parameter is represented from Note27
#define byte   DOutput1Reg   // This parameter is represented from Note28
#define byte   DOutput1Bit   // This parameter is represented from Note29
#define byte   DOutput1Val   // This parameter is represented from Note30
#define byte   DOutput2LDN   // This parameter is represented from Note31
#define byte   DOutput2Reg   // This parameter is represented from Note32
#define byte   DOutput2Bit   // This parameter is represented from Note33
#define byte   DOutput2Val   // This parameter is represented from Note34
#define byte   DOutput3LDN   // This parameter is represented from Note35
#define byte   DOutput3Reg   // This parameter is represented from Note36
#define byte   DOutput3Bit   // This parameter is represented from Note37
#define byte   DOutput3Val   // This parameter is represented from Note38
#define byte   DOutput4LDN   // This parameter is represented from Note39
#define byte   DOutput4Reg   // This parameter is represented from Note40
#define byte   DOutput4Bit   // This parameter is represented from Note41
#define byte   DOutput4Val   // This parameter is represented from Note42
#define byte   DOutput5LDN   // This parameter is represented from Note43
#define byte   DOutput5Reg   // This parameter is represented from Note44
#define byte   DOutput5Bit   // This parameter is represented from Note45
#define byte   DOutput5Val   // This parameter is represented from Note46
#define byte   DOutput6LDN   // This parameter is represented from Note47
#define byte   DOutput6Reg   // This parameter is represented from Note48
#define byte   DOutput6Bit   // This parameter is represented from Note49
#define byte   DOutput6Val   // This parameter is represented from Note50
#define byte   DOutput7LDN   // This parameter is represented from Note51
#define byte   DOutput7Reg   // This parameter is represented from Note52
#define byte   DOutput7Bit   // This parameter is represented from Note53
#define byte   DOutput7Val   // This parameter is represented from Note54
#define byte   DOutput8LDN   // This parameter is represented from Note55
#define byte   DOutput8Reg   // This parameter is represented from Note56
#define byte   DOutput8Bit   // This parameter is represented from Note57
#define byte   DOutput8Val   // This parameter is represented from Note58
*****

```

```

*****
VOID  Main(){
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //      Example, Read Digital I/O Pin 3 status
    // Output :
    //      InputStatus :
    //          0: Digital I/O Pin level is low
    //          1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(DInput3LDN, DInput3Reg, DInput3Bit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //      Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DOutput6LDN, DOutput6Reg, DOutput6Bit, DOutput6Val);
}
*****

```

```
*****
Boolean  AaeonReadPinStatus(byte LDN, byte Register, byte BitNum){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(LDN, Register, BitNum);
    Return PinStatus ;
}
VOID  AaeonSetOutputLevel(byte LDN, byte Register, byte BitNum, byte Value){
    ConfigToOutputMode(LDN, Register, BitNum);
    SIOBitSet(LDN, Register, BitNum, Value);
}
*****
```

```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID  SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID  SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID  SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****

```

```

*****
Boolean  SIOBitRead(byte LDN, byte Register, byte BitNum){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= (1 << BitNum);
    SIOExitMBPnPMode();
    If(TmpValue == 0)
        Return 0;
    Return 1;
}

VOID  ConfigToOutputMode(byte LDN, byte Register, byte BitNum){
    Byte TmpValue, OutputEnableReg;

    OutputEnableReg = Register-1;
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, OutputEnableReg);
    TmpValue = IOReadByte(SIOData);
    TmpValue |= (1 << BitNum);
    IOWriteByte(SIOData, OutputEnableReg);
    SIOExitMBPnPMode();
}
*****

```