AEC-6950

Fanless Embedded Controller
Intel® Core™ i7-3517UE 1.7GHz Processor
2 PCI or PCI-E[x1]/ PCI-E[x16]
2 GbE/ 8 COMs/
4 USB2.0, 2 USB3.0
Mini PCIe x 2

AEC-6950 Manual 2nd Ed.
August 12, 2014

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Packing List

Before you begin operating your PC, please make sure that the following materials have been shipped:

- 1 AEC-6950 Embedded Controller
- 1 Phoenix Power Connector
- 4 M3 x 4mm Screws
- 6 M4 x 8mm Screws
- 2 Wallmount Brackets
- 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 70°C (158°F). IT MAY DAMAGE THE EQUIPMENT.

FCC

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.

Below Table for 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	×	○	○	○	○	○

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。

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Chapter

1

General Information

1.1 Introduction

Due to the growing popularity from the IPC market, the newest Boxer series AEC-6950 has been introduced by AAEON. Being a control center, the AEC-6950 is suitable for Machine Control, Data Processing, Fleet Management, Data Management. AEC-6950 equips a high efficiency heat conduction mechanism.

The AEC-6950 is compact in size but has attractive and flexible extension capabilities such as 4 USB 2.0 ports and 2 USB 3.0 ports, VGA, Audio, 8 COM ports, and 2 PCI or PCI-E[x1].

Stable Design for Rugged Environment

The AEC-6950 is designed for rugged environments due to the following reasons; first, it can withstand tough vibration testing up to 3 g rms. With the anti-vibration hard drive device option, the AEC-6950 can be used in high vibration environments. In addition, the AEC-6950 offers low power consumption system that while operating in ambient temperatures ranging from -20° to 65°C with Intel® Atom™ D2550 processor.

The AEC-6950 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

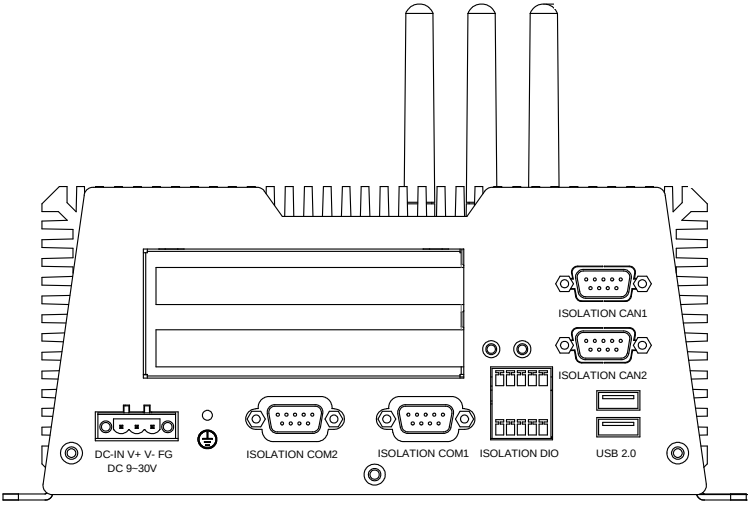
- Intel® Core™ i7-3517UE 1.7GHz Processor
- QM77 Chipset
- COM Module Integrated
- Isolation DI x 4 & DO x 4 (3KV)
- Isolation RS-232/422/485 x 2 (3KV)
- PCI x 2 or PCIe x 1/ PCIe x 16
- SIM Slot x 1 on the Mini PCI-E x 2
- Fanless Operation (-20°C ~ 50°C)

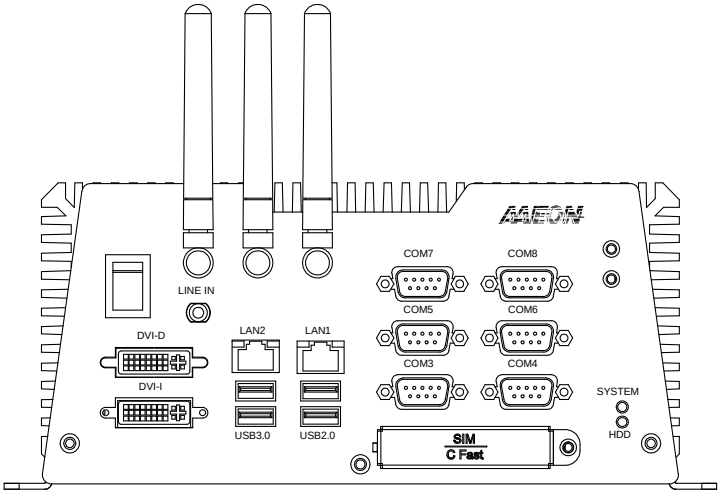
1.3 Specifications

● CPU		Intel® Core™ i7 3517UE .17GHz
● Chipset		Intel® QM77PCH (COM module)
● System Memory		DDR3 1333/1600 SODIMM x 2, , Max.16GB
● Display Interface	VGA	—
	DVI	DVI-I X 1 DVI-D X 1
	HDMI	—
	Others	—
● Storage Device	SSD	CFast™ slot x 1
	HDD	2.5" HDD x 1
	Others	—
● Network	LAN	Gigabit Ethernet, RJ-45 x 2
	Wireless	Optional 3G, WiFi, GPS, BT
● Front I/O	USB Host	USB3.0 x 2, USB2.0 x 2
	Display	DVI-I x 1 DVI-D x 1
	Wireless	SIM slot x 1, Antenna hole x 3
	Storage	CFast™ slot x 1
	Audio	Line in
	USB Host	USB Type A x 2 for USB 2.0 USB Type A x 2 for USB 3.0

	DIO	—
	Others	Power Button x 1 Indicator x 2 (system x 1 and HDD x 1) SIM Slot x 1
● Rear I/O	USB Host	USB TYPEA X 2 FOR USB 2.0
	LAN	RJ-45 x 2,Gigabit Ethernet
	Serial Port	Isolation Digital Input/Output x 10 pins (DI x 4, DO x 4)(3KV) Isolation DB-9 x 2 for RS-232/422/485 x 2 (3KV ,Jumper selection)
	Expansion	PCI x 2 or PCIe x 1/PCIe x 16
	Others	3-pin terminal block x 1 Grounding screw x 1 Isolation CAN Bus x 2 (Optional, 3KV)
● Expansion	PCI-E[x1]	—
	PCI	PCI x 2 or PCIe x 1/PCIe x 16
	Mini Card	Mini PCIe card x 2
	Mini PCI	—
	Others	—
● Indicator	Front	HDD LED x 1, System LED x 1
	Rear	—
● Power Requirement		DC 9-30V
● Power Consumption		—
● System Cooling		Passive

● Mounting		Wallmount/Din-rail
● Operating Temperature		-4°F ~ 122°F (-20°C ~ 50°C) w/o Airflow -4°F ~ 131°F (-20°C ~ 55°C) w/ Airflow *The total power consumption of the PCI and PCIe cards have to be lower 30W
● Storage Temperature		-20°C ~ 70°C (-4°F ~ 158°F)
● Anti-Vibration		3g rms / 5 ~ 500Hz / operation – CFast 1g rms / 5~ 500Hz / operation – HDD
● Anti-Shock		50G peak acceleration (11 msec. duration) – CFD 20G peak acceleration (11 msec. duration) – HDD
● Certification	EMC	CE/FCC Class A
	Safety	—
● Dimension (W x H x D)		9.52” x 8.43” x 3.95” (241.8mm x 214mm x 100.2mm)
● Gross Weight		15.29 lb (6.95 Kg)
● Net Weight		11 lb (5 Kg)
● OS Support		Windows® XP Embedded, Windows® XP Embedded Standard 7, Windows® XP Pro, Windows® 7, Linux Fedora kernel 2.6.3


ISOLATION CAN1
ISOLATION CAN2
DC-IN V+ V- FG
DC 9~30V
ISOLATION COM2
ISOLATION COM1
ISOLATION DIO
USB 2.0

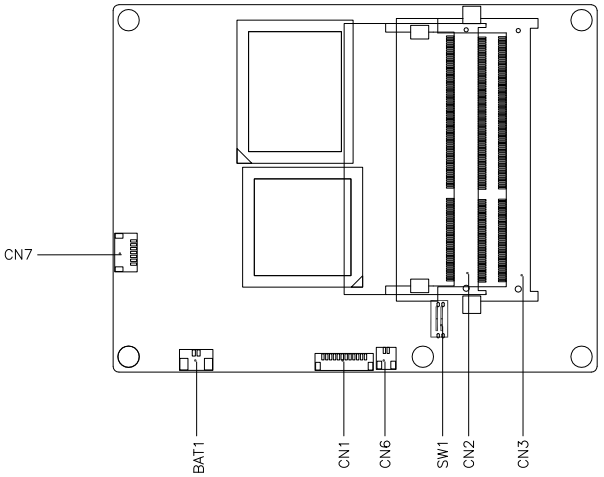

LINE IN
DVI-D
DVI-I
LAN2
LAN1
USB3.0
USB2.0
COM7
COM8
COM5
COM6
COM3
COM4
SYSTEM
HDD
SIM
C Fast

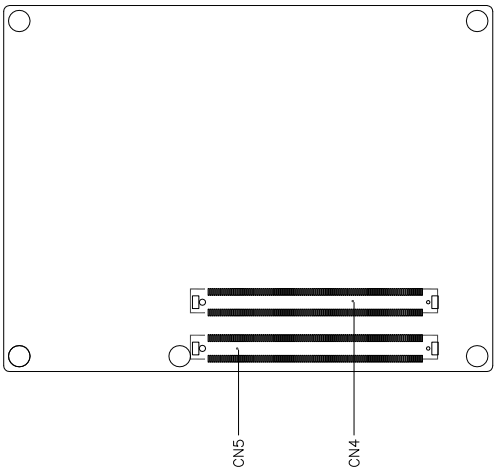
Chapter

2

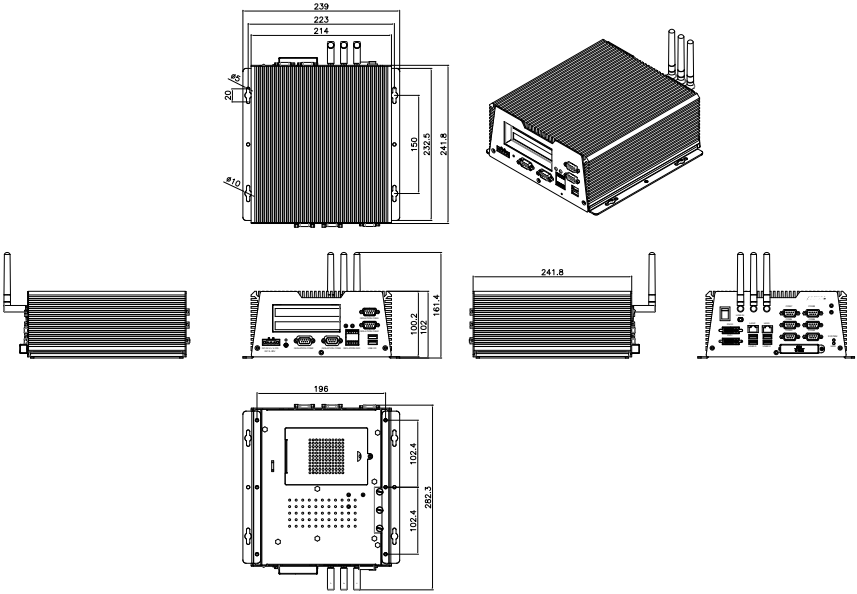
Hardware Installation

2.1 Jumpers and Connectors of Main Board





2.2 Dimension



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	PEG Enable
JP3	RS-232/422/485 Selection (com1)
JP4	RS-232/422/485 Selection (com2)
JP5	LVDS Port Backlight Lightness Control Mode Selection
JP8	LVDS inverter Voltage Selection
JP9	LCD Voltage Selection
JP11	COM3 +12V/+5V/RING Selection
JP12	COM4 +12V/+5V/RING Selection
JP13	Clear cmos
JP16	RS-232/422/485 Selection (com8)
JP17	RS-232/422/485 Selection (com7)
J1	AT/ATX mode select

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 of the board's connectors:

Label	Function
CN3	COM SLOT
CN4	DVI-I/DVI-D connector

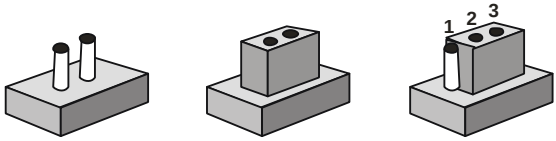
CN5	Mini Card Connector With external SIM
CN6	Mini Card Connector With on board SIM
CN8	PCIE*16 Connector
CN9	CFast™ Connector(SATA 3.0)
CN10,CN11	SATA power
CN12	USB2.0 X2 / LAN1 Connector
CN13	USB3.0 X2 / LAN2 Connector
CN17	LVDS Connector
CN18	LPC Debug port
CN19	ISOLATION COM1 Connector
CN26	ISOLATION COM2 Connector
CN20	COM3 RS-232 1x9 Header
CN21	COM4 RS-232 1x9 Header
CN22	COM6 RS-232 1x9 Header
CN23	COM5 RS-232 1x9 Header
CN24	COM7 RS-232/RS422/RS485 1x9 Header
CN25	COM8 RS-232/RS422/RS485 1x9 Header
CN27	Keyboard/Mouse header
CN28	DC IN
CN29	Digital I/O
CN30	USB2.0 x2 Connector
CN32	LVDS Inverter / Backlight Connector
CN33	4-pin ATX12V Power Connector
CN38	Front Panel Connector
CN39	AUDIO Connector

SATA1	SATA 3.0 Connector
SATA2	SATA2.0 Connector
FAN1	4-pin Fan 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.



Open **Closed** **Closed 2-3**

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 Isolation COM1, COM2 RS232/RS485/RS422 selection (JP3, JP4)

JP3,JP4	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

2.7 LVDS Port Backlight Lightness Control Mode Selection (JP5)

JP5	Function
1-2	PWM MODE
2-3	VR MODE (Default)

2.8 Inverter Power Selection (JP8)

JP8	Function
1-2	+12V (Default)
2-3	+5V

2.9 LCD Voltage Selection (JP9)

JP9	Function
1-2	+5V
2-3	+3.3V (Default)

2.10 COM3 +12V/+5V/Ring Selection (JP11)

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

2.11 COM4 +12V/+5V/Ring Selection (JP12)

JP12	Signal
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.12 Clear CMOS (JP13)

JP13	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.13 Auto Power Button (J1)

J1	Function
OPEN	ATX (Default)
1-2	AT

2.14 SATA Power (CN10~CN11)

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

2.15 1000Base-T Ethernet Connector with Dock USB 2.0 Connector (CN12)

Pin	Signal	Pin	Signal
1	TCT	2	MDI0+
3	MDI0-	4	MDI1+

5	MDI1-	6	MDI2+
7	MDI2-	8	MDI3+
9	MDI3-	10	GND
11	LAN_LED_ACT#	12	LAN_LED_ACT
13	LAN_LED_LINK100#	14	LAN_LED_LINK 1000#
19	+5V	20	USBD2-
21	USBD2+	22	GND
23	+5V	24	USBD3-
25	USBD3+	26	GND

2.16 1000Base-T Ethernet Connector with Dock USB 3.0 Connector (CN13)

Pin	Signal	Pin	Signal
R1	TCT	R2	MDI0+
R3	MDI0-	R4	MDI1+
R5	MDI1-	R6	MDI2+
R7	MDI2-	R8	MDI3+
R9	MDI3-	R10	GND
L1	LAN_LED_ACT#	L2	LAN_LED_ACT
L3	LAN_LED_LINK100#	L4	LAN_LED_LINK 1000#
U1	+5V	U2	USBD0-
U3	USBD0+	U4	GND

U5	USB_SSRX0N_C	U6	USB_SSRX0P_C
U7	GND	U8	USB_SSTX0N_C
U9	USB_SSTX0P_C	U10	+5V
U11	USBD1-	U12	USBD1+
U13	GND	U14	USB_SSRX1N_C
U15	USB_SSRX1P_C	U16	GND
U17	USB_SSTX1N_C	U18	USB_SSTX1P_C

2.17 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
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

2.18 RS-232/422/485 Pin DEFINE (COM1)(CN19)

RS-232 Mode

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

RS-422 Mode

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

RS-485 Mode

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

2.19 RS-232 Header (COM3)(CN20)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+5V/+12V		

2.20 RS-232 Header (COM4) (CN21)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+5V/+12V		

2.21 RS-232 Header (COM6)(CN22)

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

2.22 RS-232 Header (COM5)(CN23)

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

9	RI

2.23 RS-232/422/485 Pin DEFINE (COM7)(CN24)

RS-232 Mode

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

RS-422 Mode

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

RS-485 Mode

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

2.24 RS-232/422/485 Pin DEFINE (COM8)(CN25)

RS-232 Mode

Pin	Signal	Pin	Signal
1	DCD	2	RXD

3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

RS-422 mode

Pin	Signal	Pin	Signal
1	TXD-	2	RXD+
3	TXD+	4	RXD-
5	GND	6	NC
7	NC	8	NC
9	NC		

RS-485 mode

Pin	Signal	Pin	Signal
1	D-	2	NC
3	D+	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC		

2.25 RS-232/422/485 Pin DEFINE (COM2)(CN26)

RS-232 Mode

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

RS-422 Mode

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

RS-485 Mode

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

2.26 ISO DIO(CN29)

Pin	Signal	Pin	Signal
1	IDO1	2	IDI1
3	IDO2	4	IDI2
5	IDO3	6	IDI3
7	IDO4	8	IDI4
9	VISO	10	ISO_GND

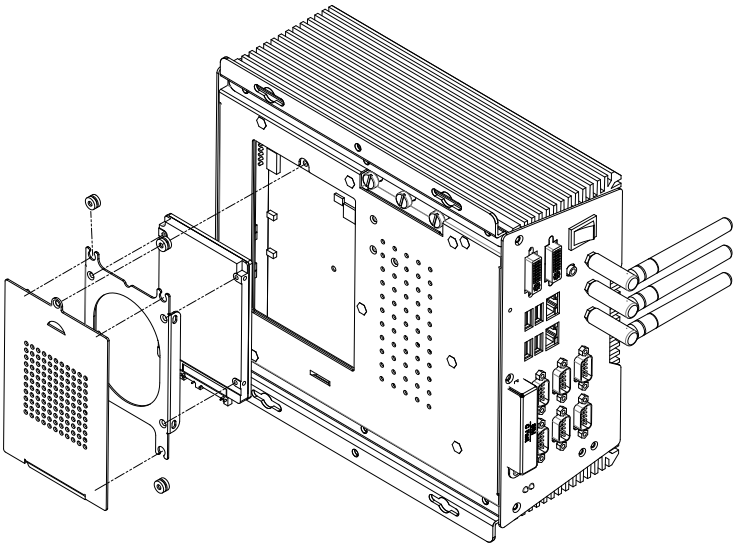
2.27 LVDS Inverter/ Backlight Connector (CN32)

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

2.28 Front Panel Connector (CN38)

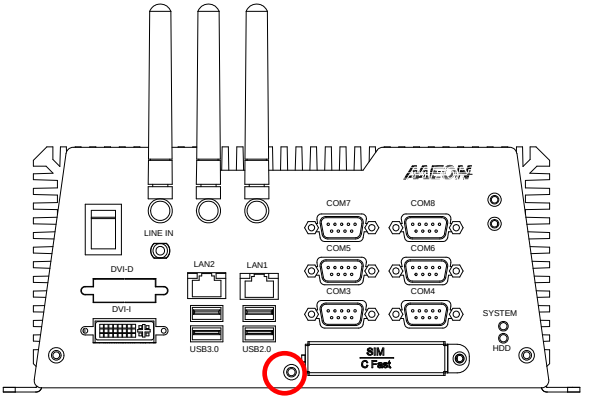
Pin	Signal	Pin	Signal
1	Power On Button (-)	2	Power On Button (+)
3	HDD LED (-)	4	HDD LED (+)
5	SPEAKER(-)	6	SPEAKER(+)
7	Power LED (-)	8	Power LED (+)
9	Reset Switch (-)	10	Reset Switch (+)

2.29 Hard Disk Drive Installation

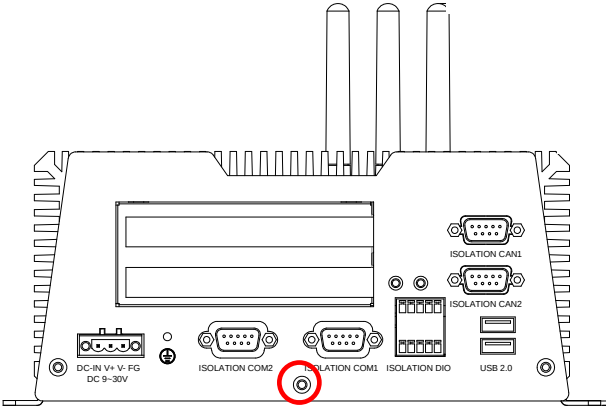


2.30 PCI Card Installation

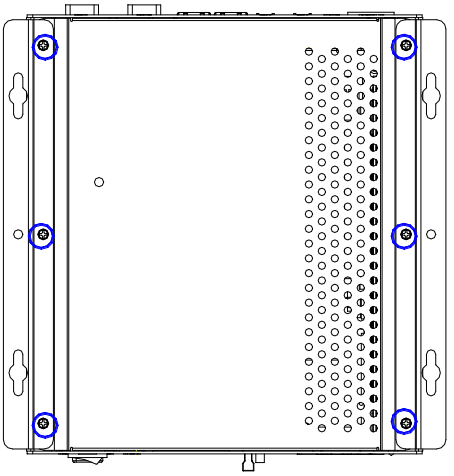
Step 1: Unfasten the screw on the rear panel.



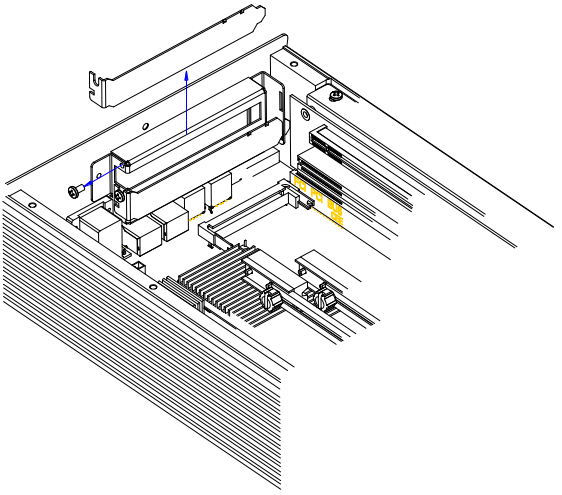
Step 2: Unfasten the screw on the front panel.



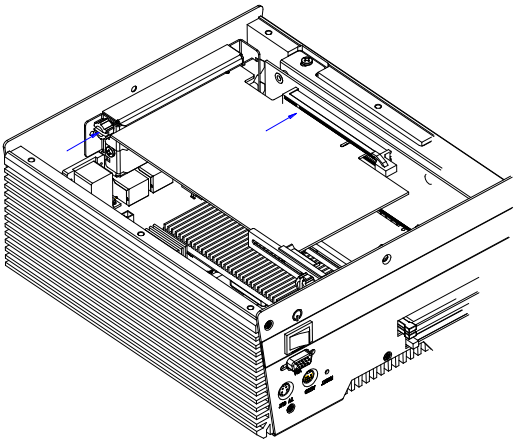
Step 3: Unfasten the six screws on the bottom lid.



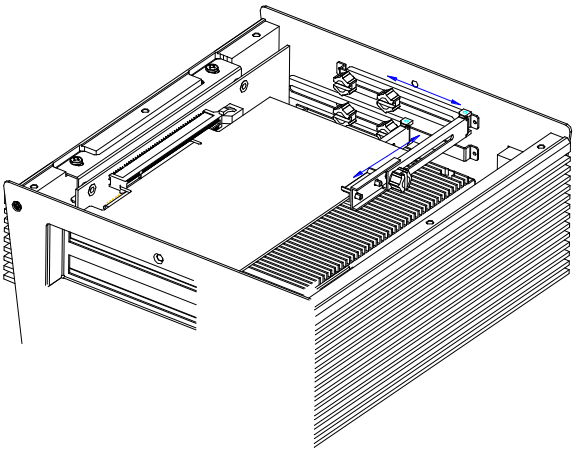
Step 4: Remove the screw with your finger and get the PCI card ready to install. You should keep the shield and screw for use later.



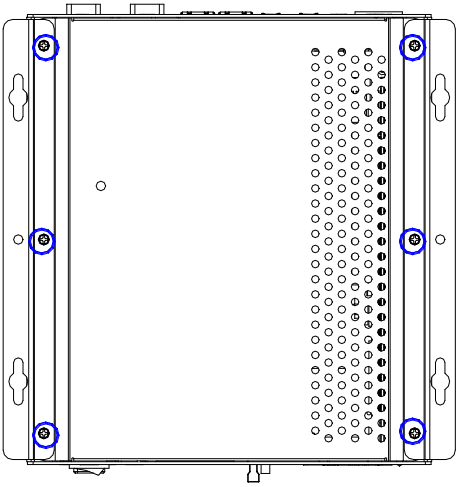
Step 5: Insert the PCI card into the PCI slot and reattach the screw.



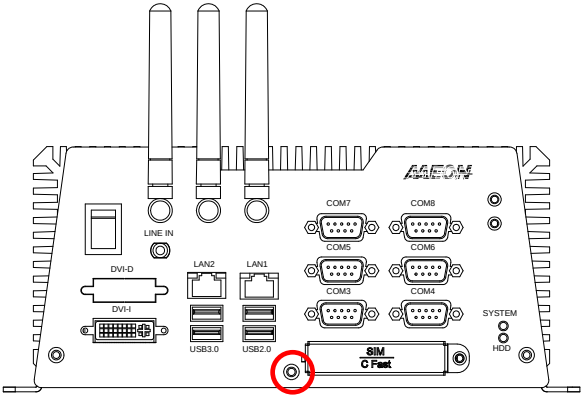
Step 6: Unfasten the screws and push the tenon to lock the PCI card in position.

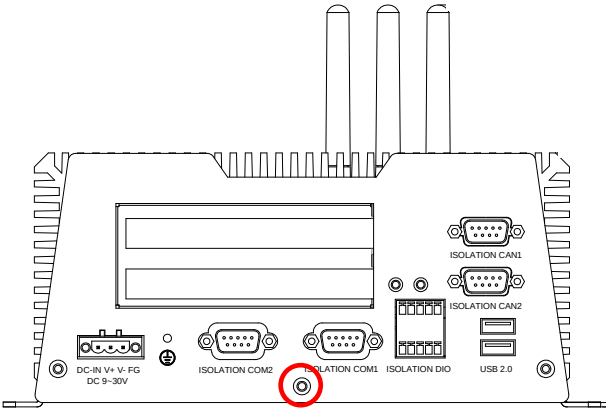


Step 7: Close the bottom lid of the AEC-6950 and fasten six screws on bottom lid.



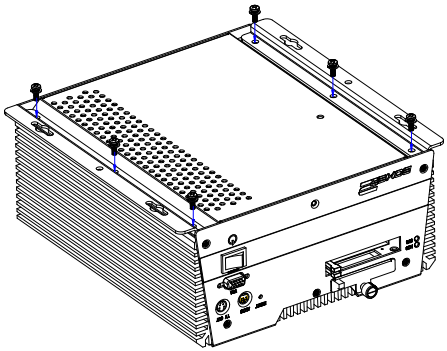
Step 8: Fasten the one screw on the front panel and one screw on the rear panel

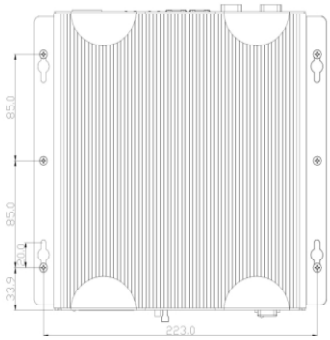


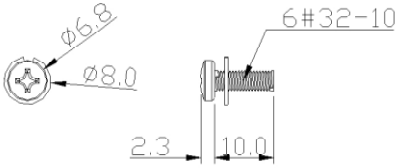

ISOLATION CAN1
ISOLATION CAN2
DC-IN V+ V- FG
DC 9~30V
ISOLATION COM2
ISOLATION COM1
ISOLATION DIO
USB 2.0

2.31 Wallmount kit Installation

Step 1: Get the brackets ready and fasten appropriate three screws on each bracket. After fastening the two brackets on the bottom lid of AEC-6950, the wallmount kit installation is finished







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 these tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal or 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 stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:
1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The AEC-6950 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 and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> 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/disable quiet boot option.

Security

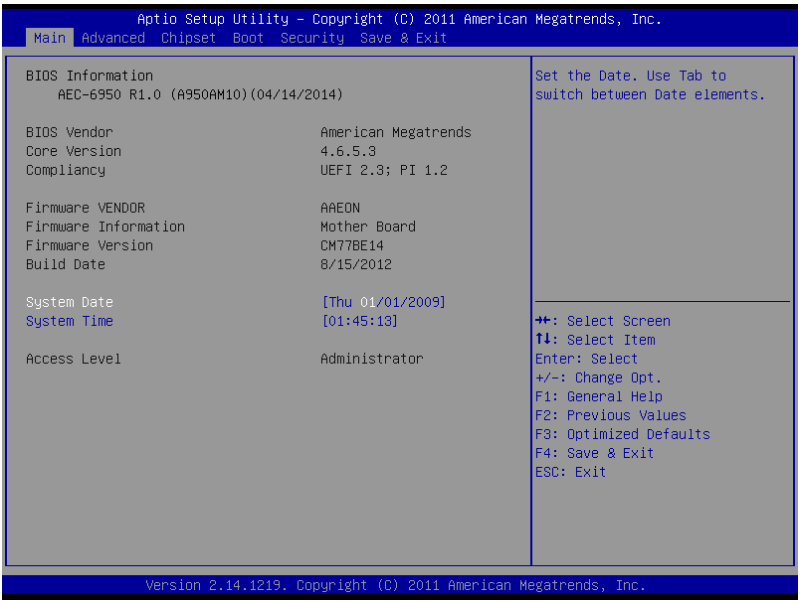
Set setup administrator password.

Save&Exit

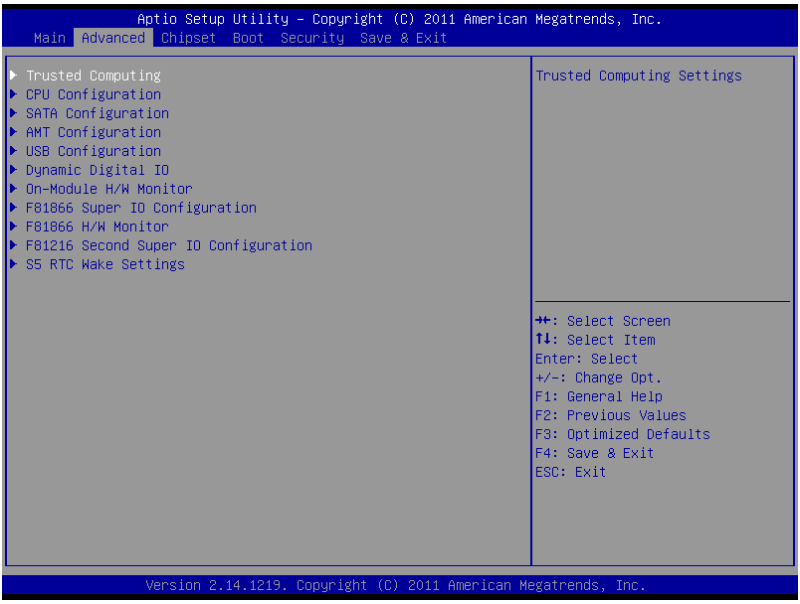
Exit system setup after saving the changes.

Setup Menu

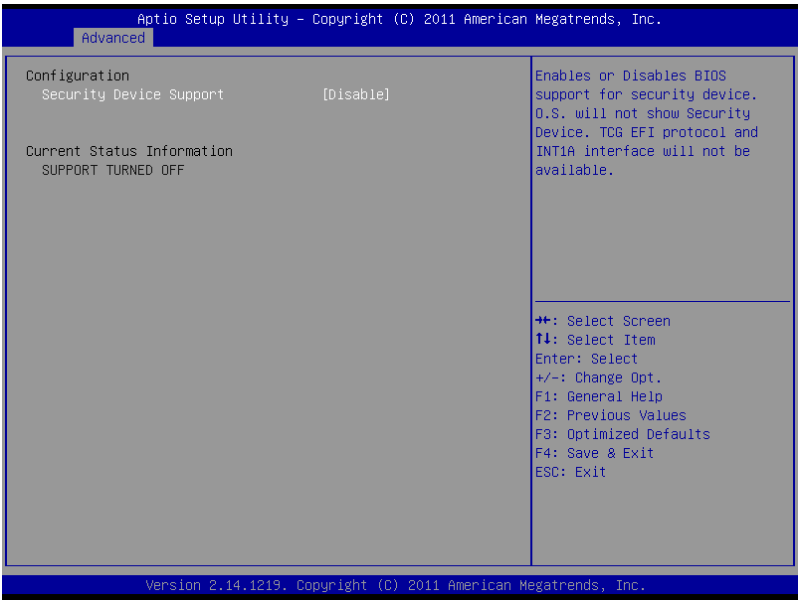
Setup submenu: Main



Setup submenu: Advanced



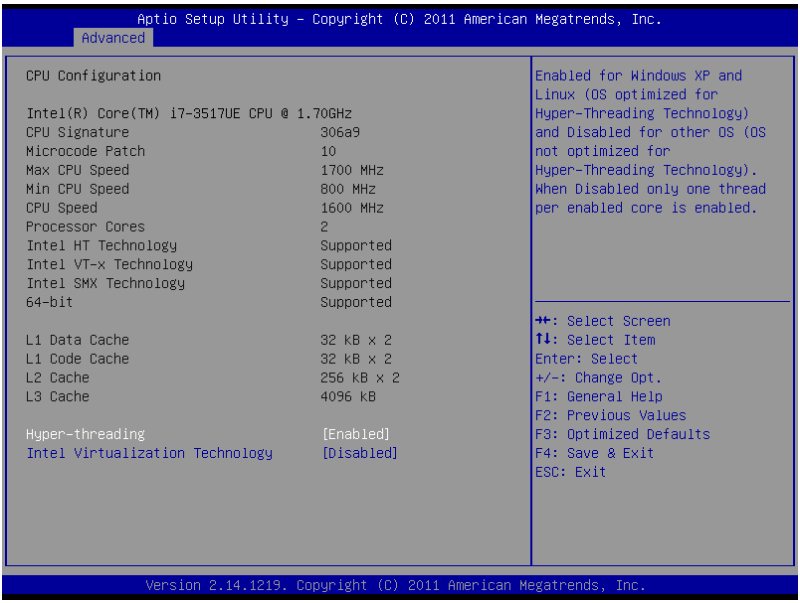
Trusted Computing



Option summary:

Security Device Support	Disable	Default
	Enable	
Enables or Disables BIOS support for security device. O.S. will not show security device. TCG EFI protocol and INT1A interface will not be available.		

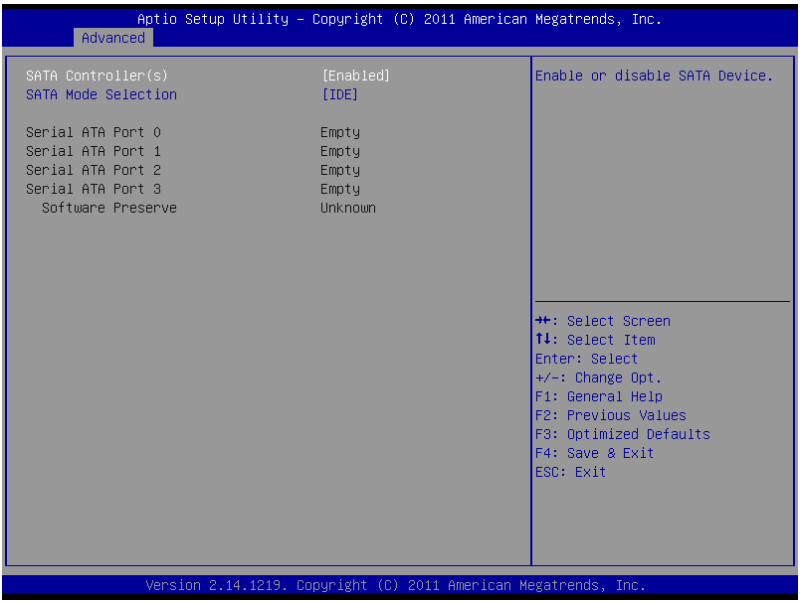
CPU Configuration



Option summary:

Hyper-Threading	Disabled	
	Enabled	Default
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.		
Intel Virtualization Technology	Disabled	Default
	Enabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		

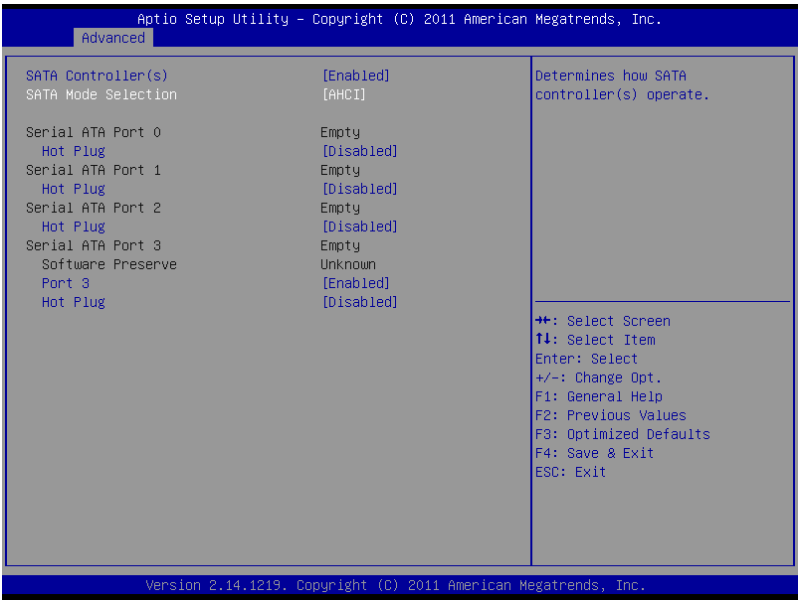
SATA Configuration (IDE)



Option summary:

SATA Controllers	Disabled	
	Enabled	Default
En/Disable SATA Controller.		
SATA Mode Selection	IDE	Default
	AHCI	
	RAID	
Determines how SATA controller(s) operate.		

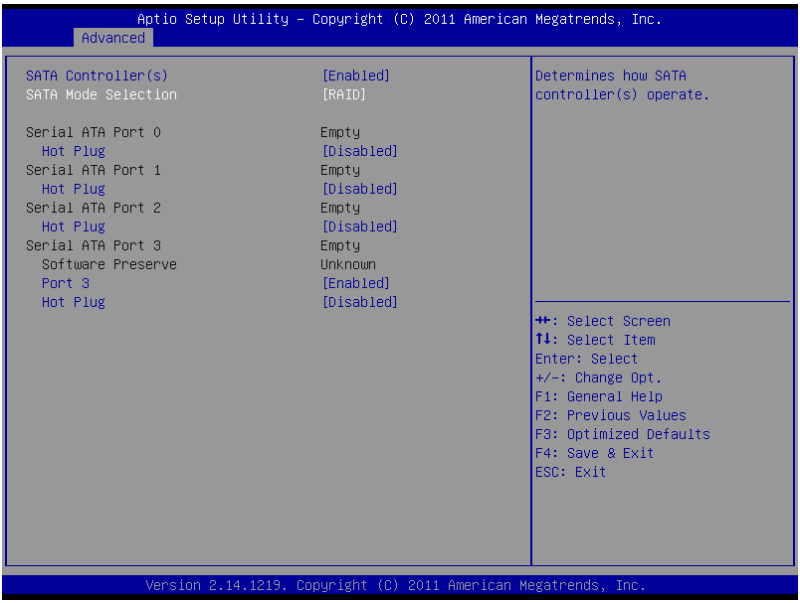
SATA Configuration (AHCI)



Option summary:

Hot Plug	Disabled	
	Enabled	Default
En/Disable Hot Plug feature.		
Port 3	Disabled	
	Enabled	Default
En/Disable SATA Port.		

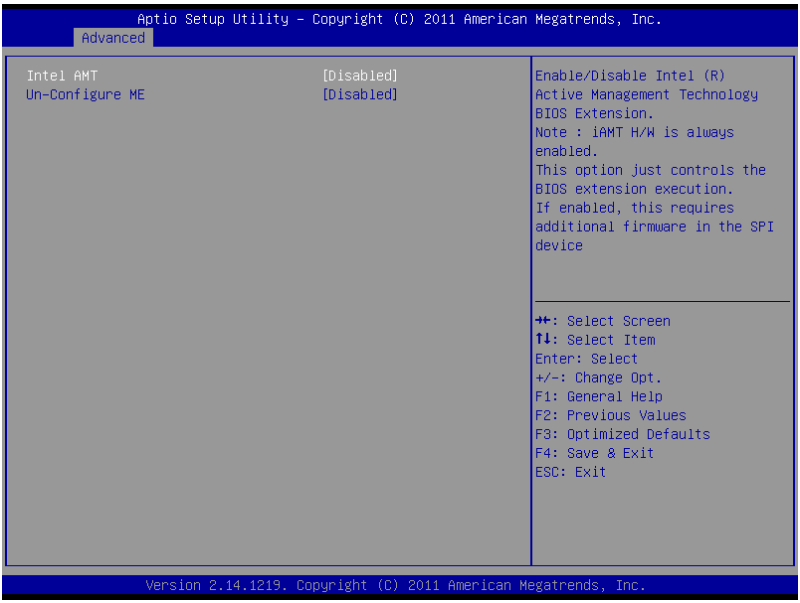
SATA Configuration (RAID)



Option summary:

Hot Plug	Disabled	
	Enabled	Default
En/Disable Hot Plug feature.		
Port 3	Disabled	
	Enabled	Default
En/Disable SATA Port.		

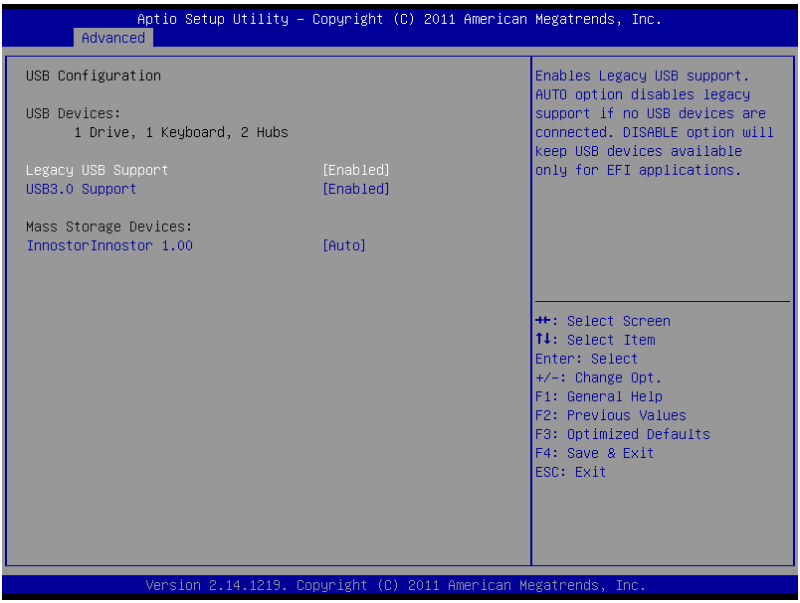
AMT Configuration



Option summary:

Intel AMT	Disabled	Default
	Enabled	
Enables or Disables Intel(R) 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	Default
	Enabled	
OEMFlag Bit 15: Un-configure ME without password.		

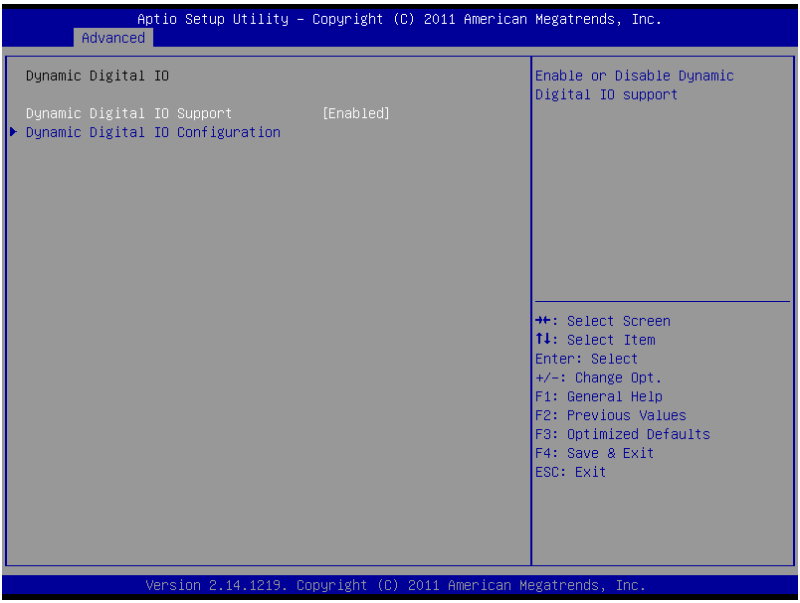
USB Configuration



Option summary:

Legacy USB Support	Enabled	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		
USB3.0 Support	Enabled	Default
	Disabled	
Enable/Disable USB3.0 (XHCI) Controller support.		

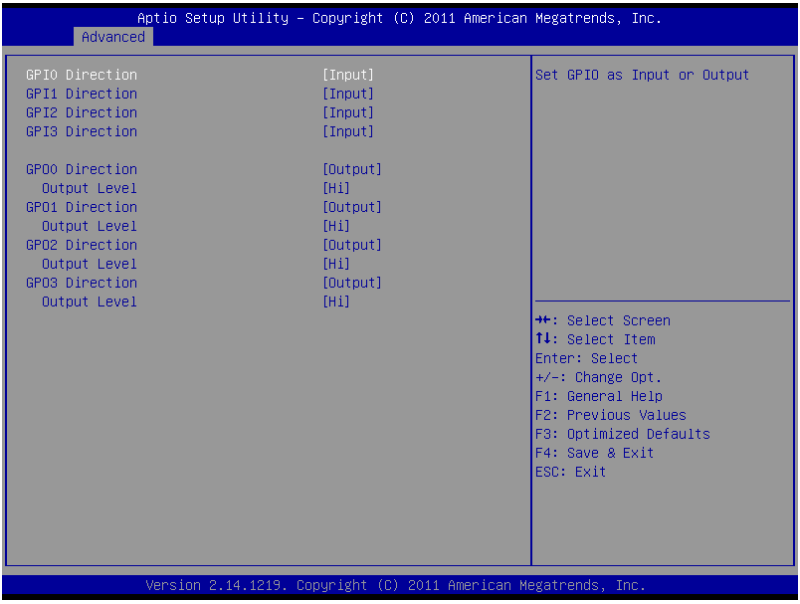
Dynamic Digital IO



Options summary:

Dynamic Digital IO Support	Disabled	Default
	Enabled	
En/Disable Dynamic Digital IO Support.		

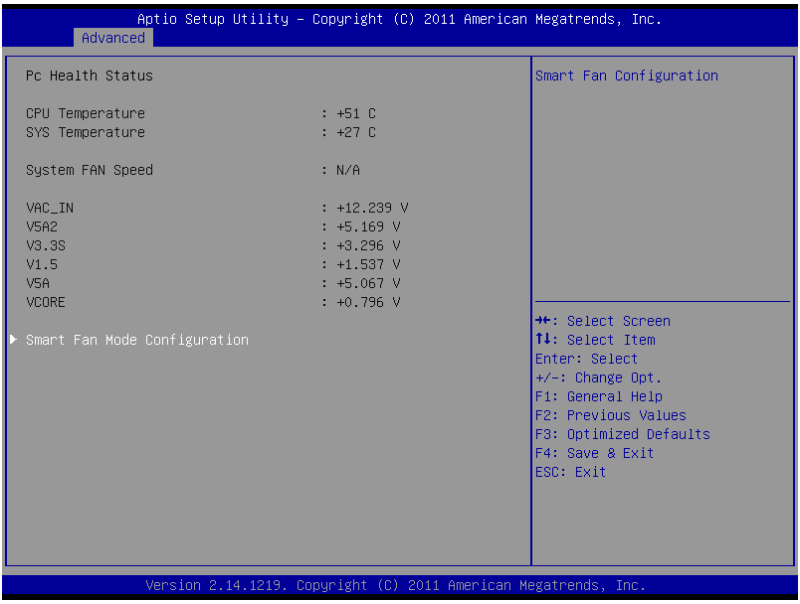
Dynamic Digital IO Configuration



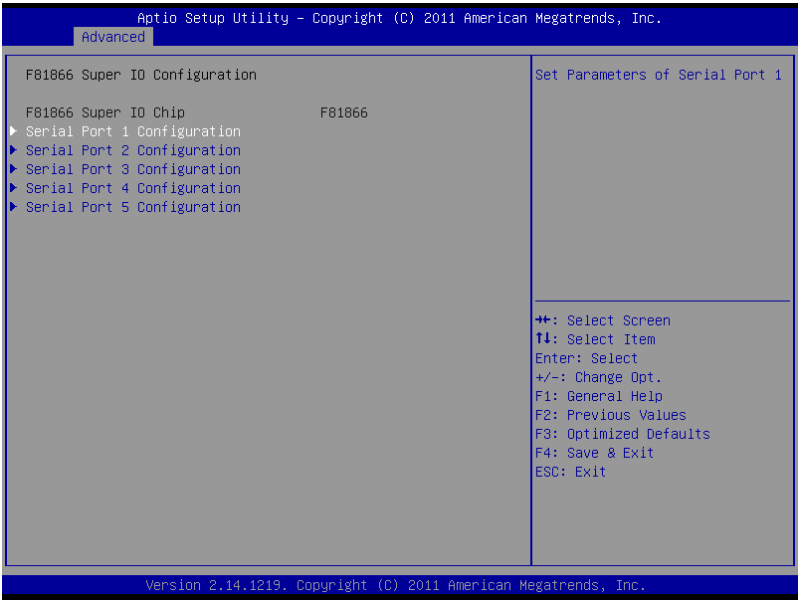
Options summary:

GPI0~3 Direction	Input	Default
	Output	
Set GPIO as Input or Output.		
GPO0~3 Direction	Input	
	Output	Default
Set GPIO as Input or Output.		
Output Level	Low	
	Hi	Default
Allows BIOS to select high/low voltage level to output to corresponding DIO ping.		

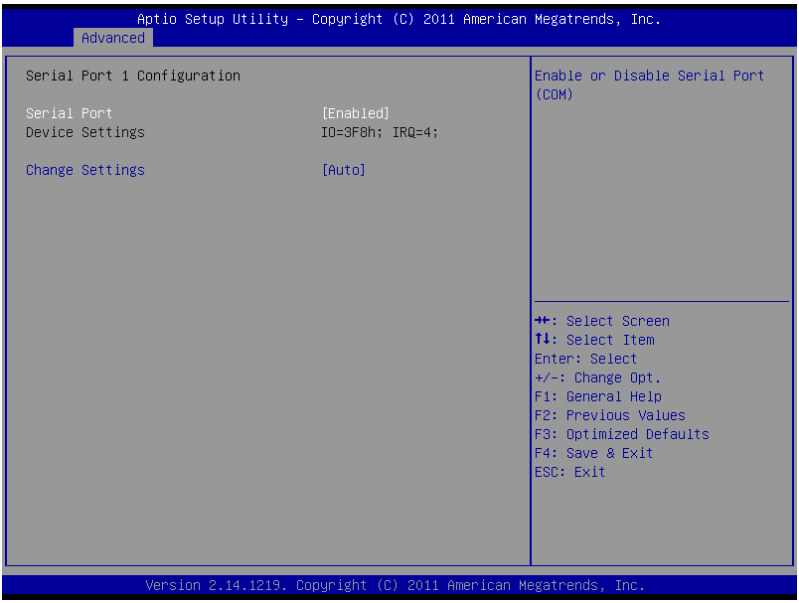
On-Module H/W Monitor



F81866 Super IO Configuration



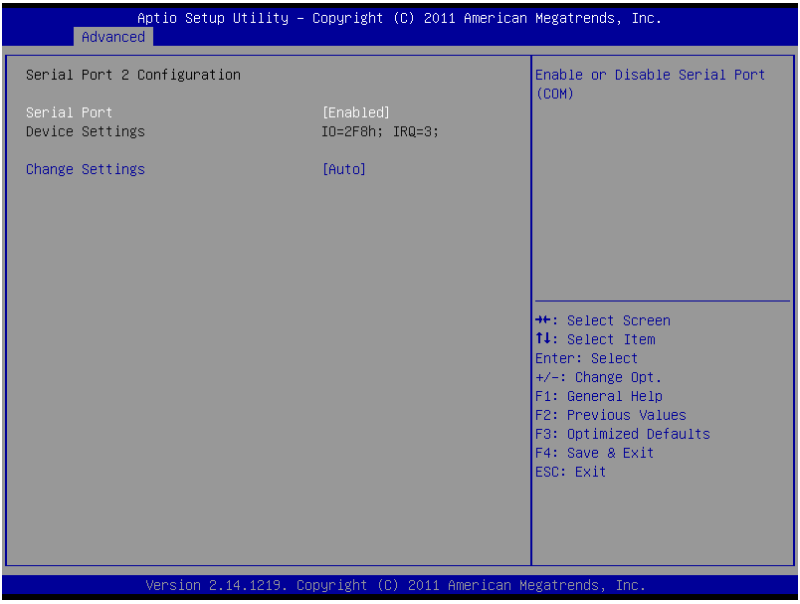
Serial Port 1 Configuration



Options summary:

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

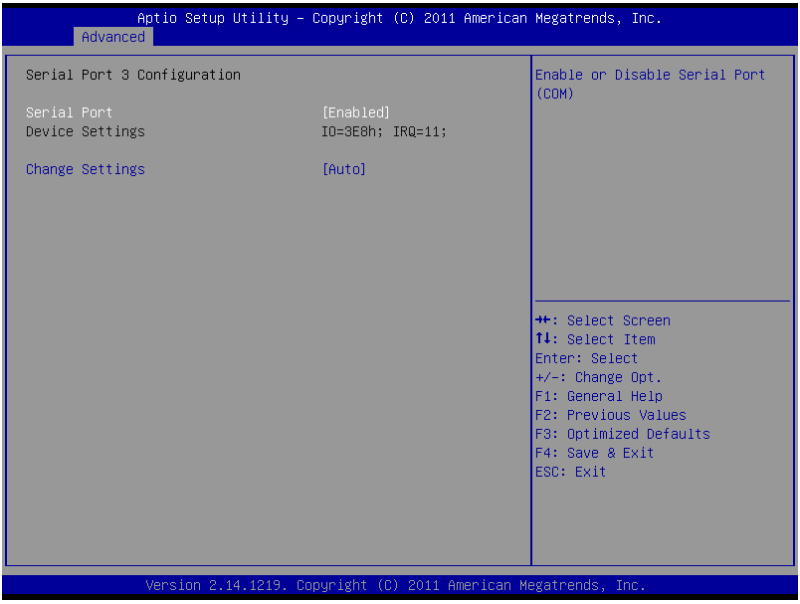
Serial Port 2 Configuration



Options summary:

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

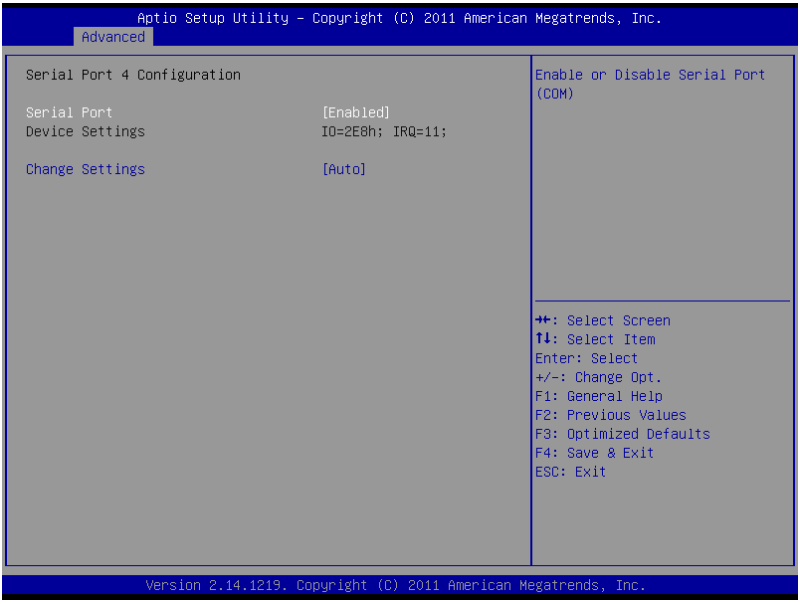
Serial Port 3 Configuration



Options summary:

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

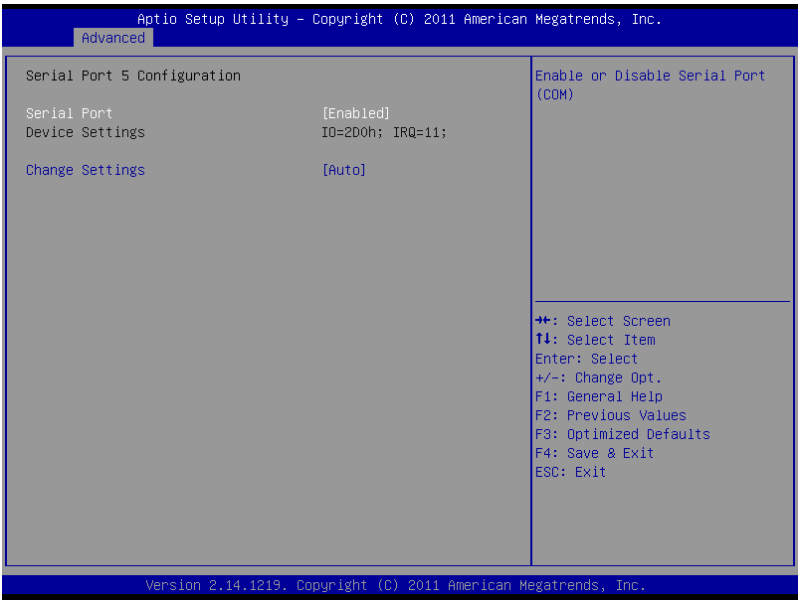
Serial Port 4 Configuration



Options summary:

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

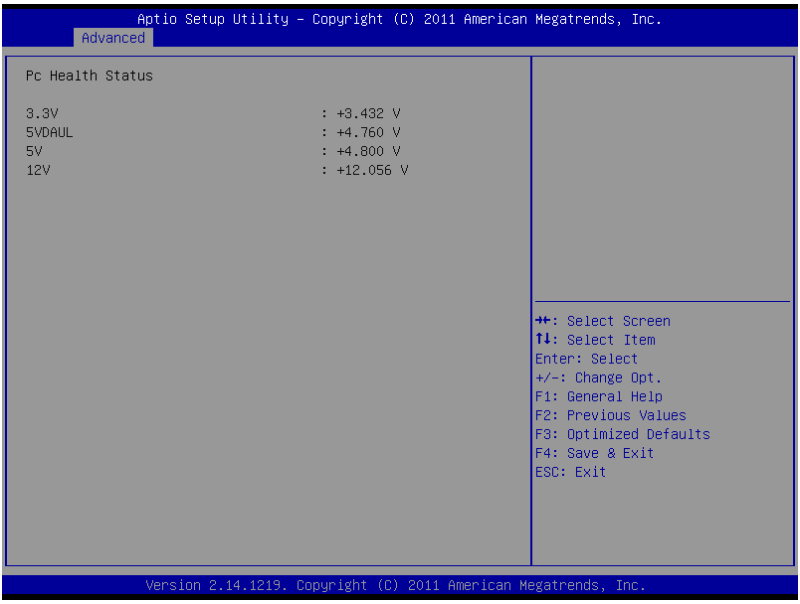
Serial Port 5 Configuration



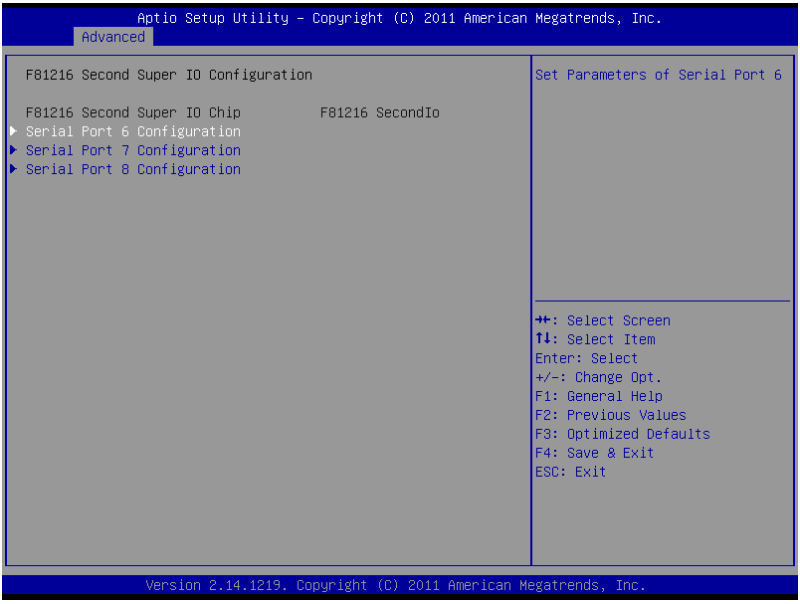
Options summary:

Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2D0h; IRQ=11;	
	IO=2C0h; IRQ=10;	
Allows BIOS to Select Serial Port resource.		

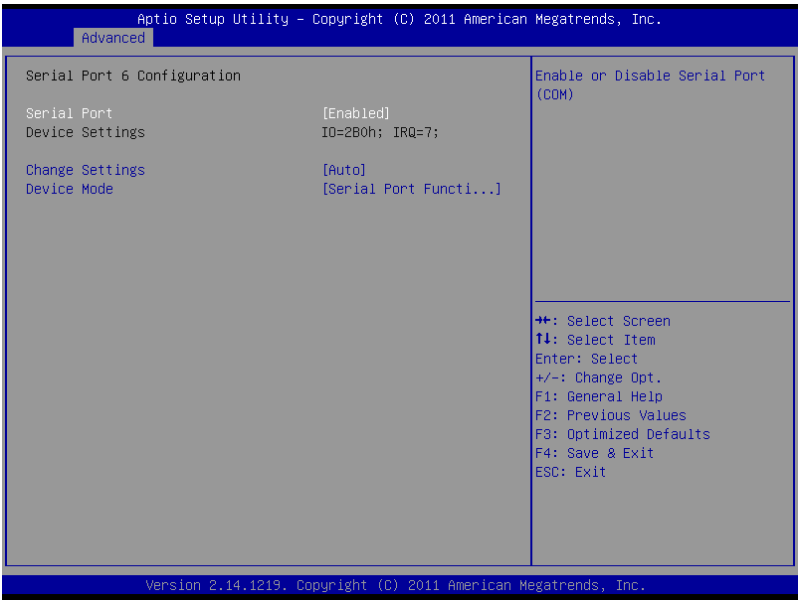
F81866 H/W Monitor



F81216 Second Super IO Configuration



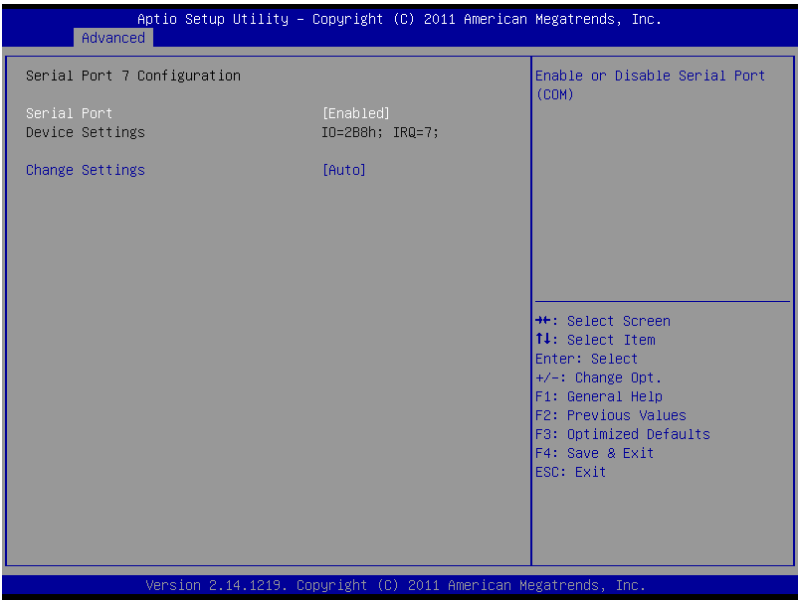
Serial Port 6 Configuration



Options summary:

Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2B0h; IRQ=7;	
	IO=2B8h; IRQ=7;	
Allows BIOS to Select Serial Port resource.		
Device Mode	Serial Port Function Mode	Default
	IR Mode, Pulse 1.6us,Full Duplex	
	IR Mode, Pulse 1.6us,Half Duplex	
	IR Mode, Pulse 3/16 Bit Time, Full Duplex	
	IR Mode, Pulse 3/16 Bit Time, Half Duplex	
Enable or Disable Serial Port (COM).		

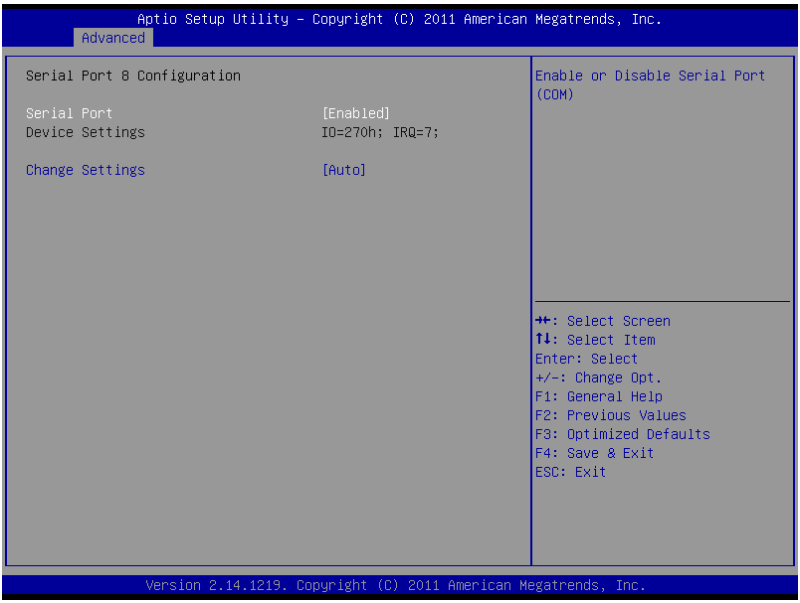
Serial Port 7 Configuration



Options summary:

Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=2B0h; IRQ=7;	
	IO=2B8h; IRQ=7;	
Allows BIOS to Select Serial Port resource.		

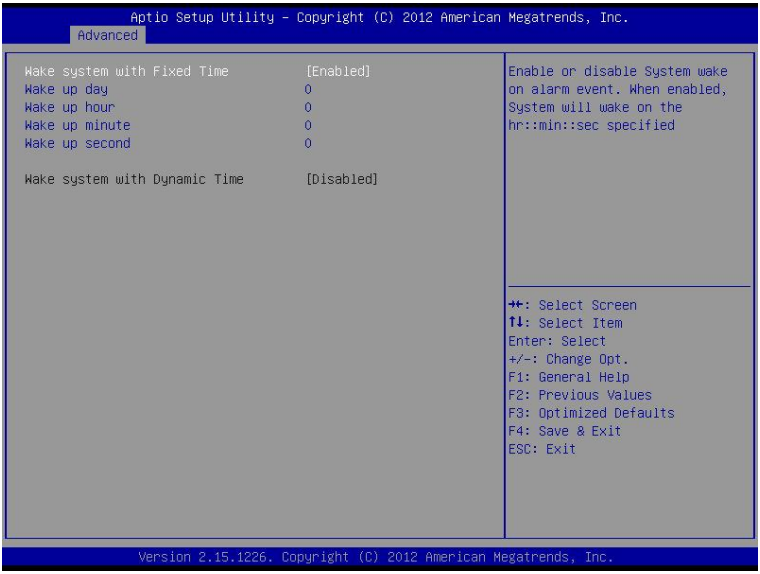
Serial Port 8 Configuration



Options summary:

Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Default
	IO=270h; IRQ=7;	
	IO=278h; IRQ=7;	
Allows BIOS to Select Serial Port resource.		

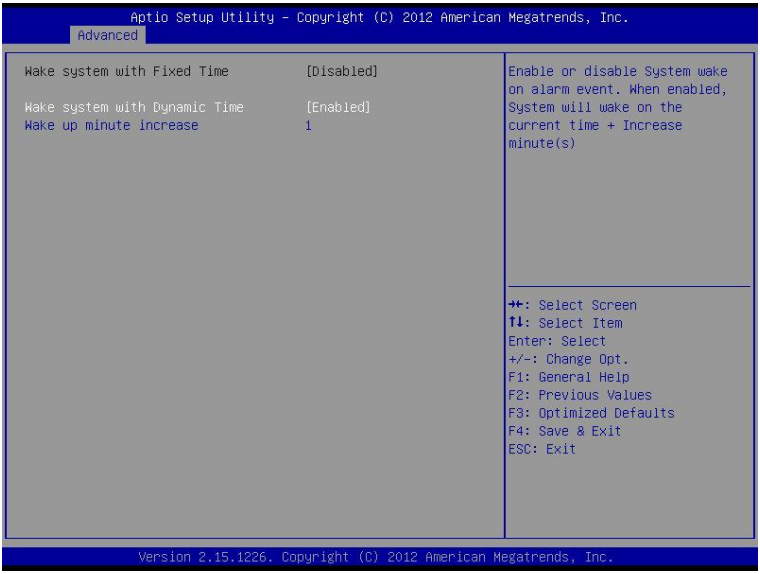
S5 RTC Wake Settings (Fixed Time)



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		

S5 RTC Wake Settings (Dynamic Time)

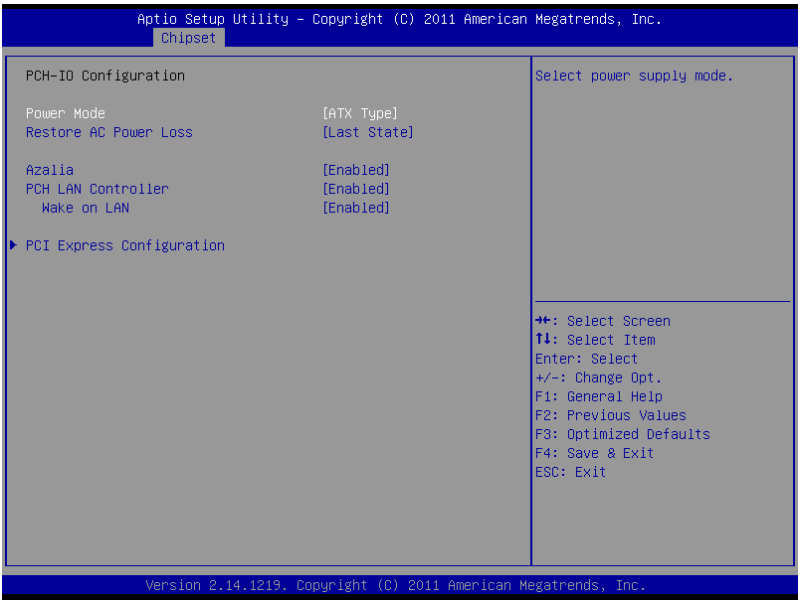


Options summary:

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		

Setup submenu: Chipset

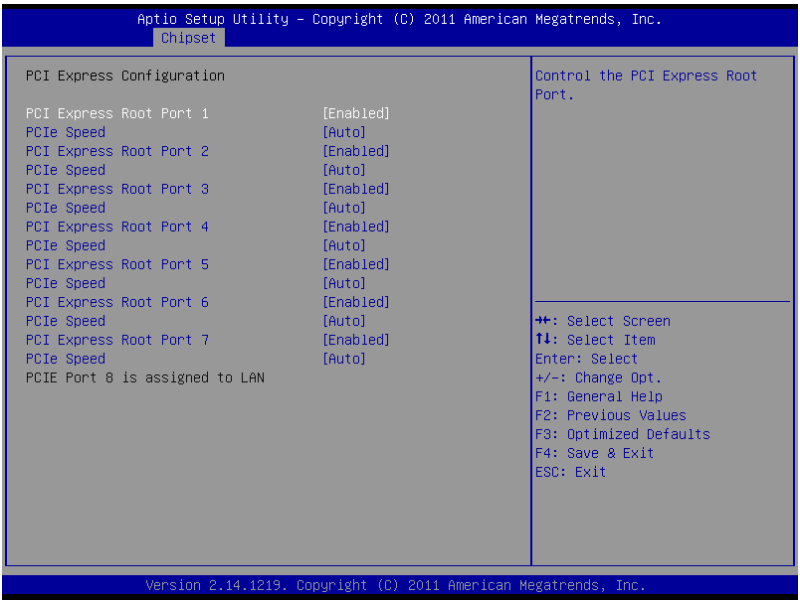
PCH-IO Configuration



Option summary:

Power Mode	ATX Type	Default
	AT Type	
Select power supply mode		
Restore on AC Power Loss	Last State	Default
	Always On	
	Always Off	
Power Failure feature / AC Power Loss feature		
Azalia	Disabled	
	Enabled	Default
Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled. Auto = Azalia will be enabled if present, disabled other wise.		
PCH LAN Controller	Disabled	
	Enabled	Default
Enable or disable onboard NIC.		
Wake on LAN	Disabled	
	Enabled	Default
Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state)		

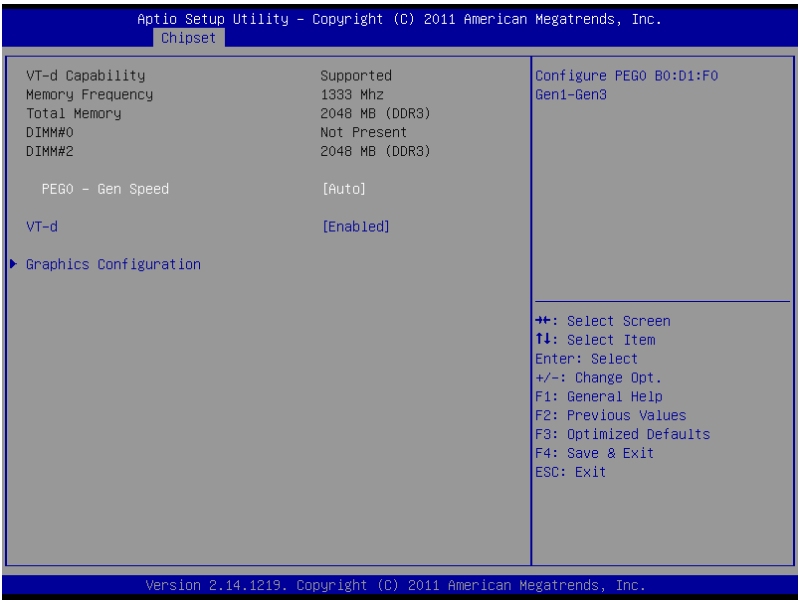
PCI Express Configuration



Option summary:

PCI Express Root Port (1 - 7)	Enabled	Default
	Disabled	
Control the PCI Express Root Port.		
PCI Speed	Auto	Default
	Gen1	
	Gen2	
Select PCI Express port speed.		

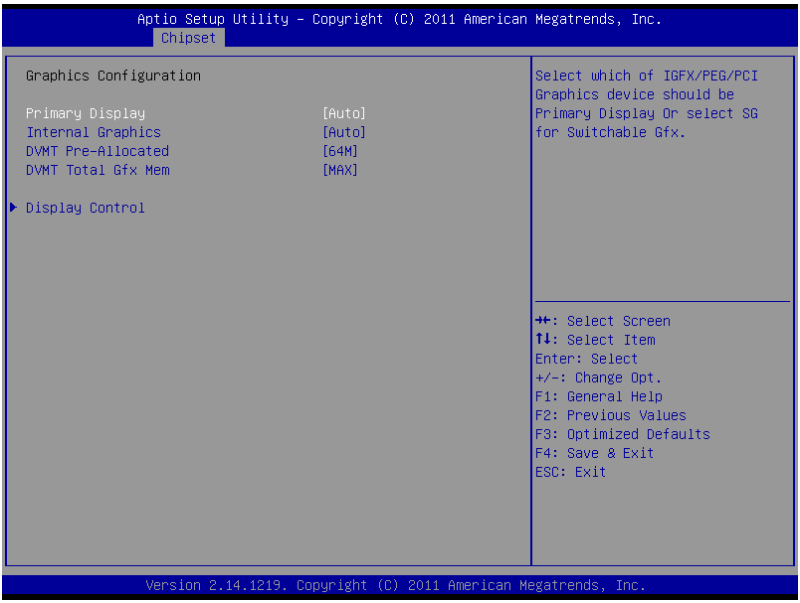
System Agent (SA) Configuration



Option summary:

PEGO – Gen Speed	Auto	Default
	Gen1	
	Gen2	
	Gen3	
Configure PEG0 B0:D1:F0 Gen1-Gen3		
VT-d	Enabled	Default
	Disabled	
Check to enable VT-D function on MCH		

Graphics Configuration

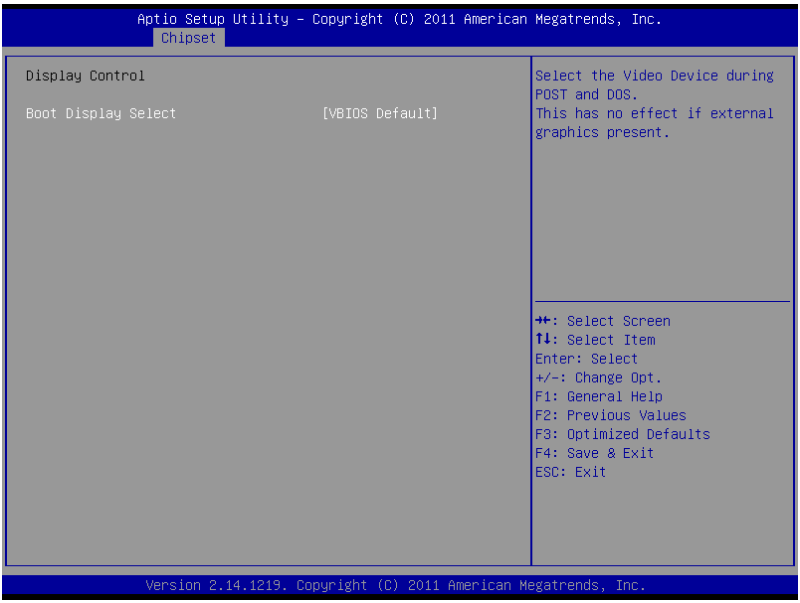


Option summary:

Primary Display	Auto	Default
	IGFX	
	PEG	
	PCI	
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.		
Internal Graphics	Auto	Default
	Disabled	
	Enabled	
Keep IGD enabled based on the setup Option.		
DVMT Pre-Allocated	32M	
	64M	Default
	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.		

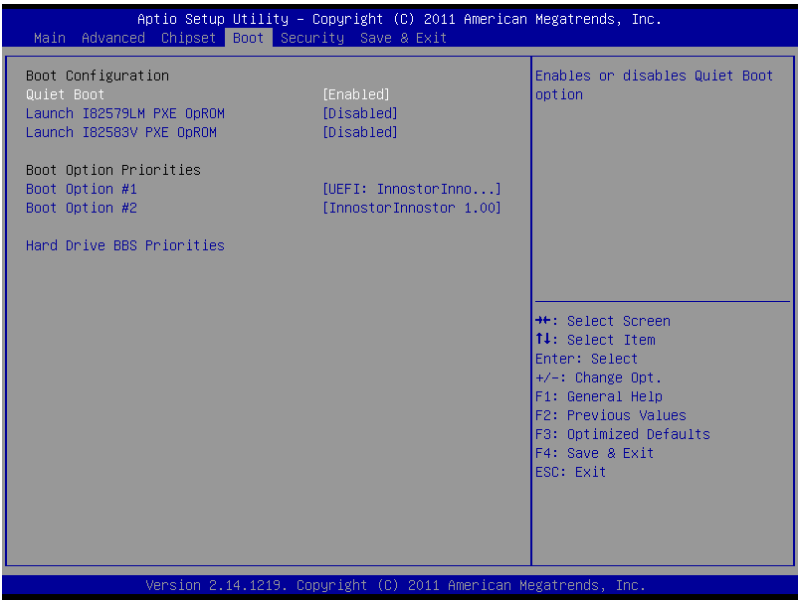
Display Control



Option summary:

Boot Display Select	VBIOS Default	Default
	CRT	
	DVI-I	
	DVI-D	
Select the Video Device which will be activated during POST and DOS. This has no effect if external graphics present.		

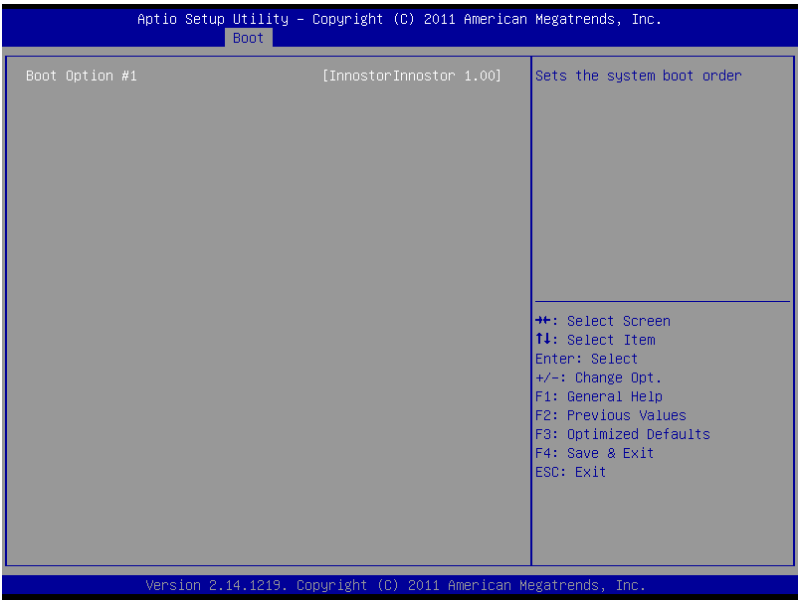
Setup submenu: Boot



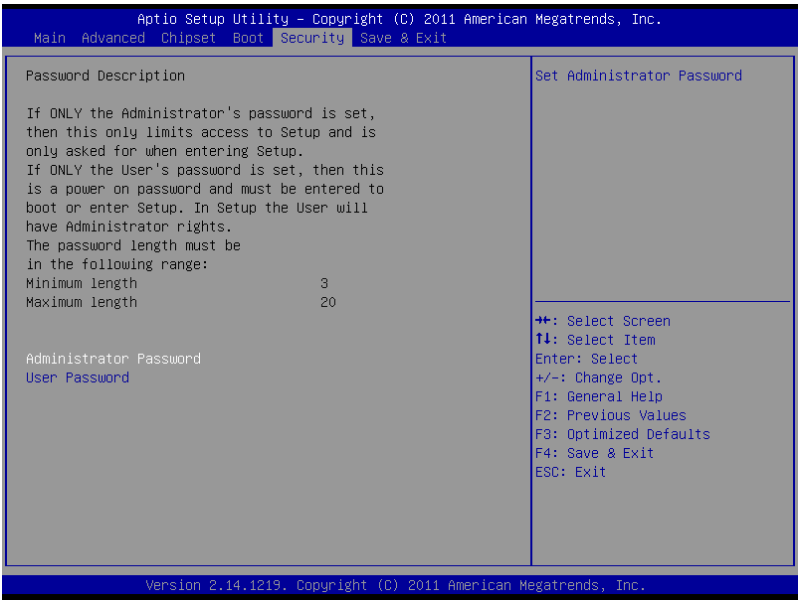
Option summary:

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

BBS Priorities



Security



Change User/Supervisor Password

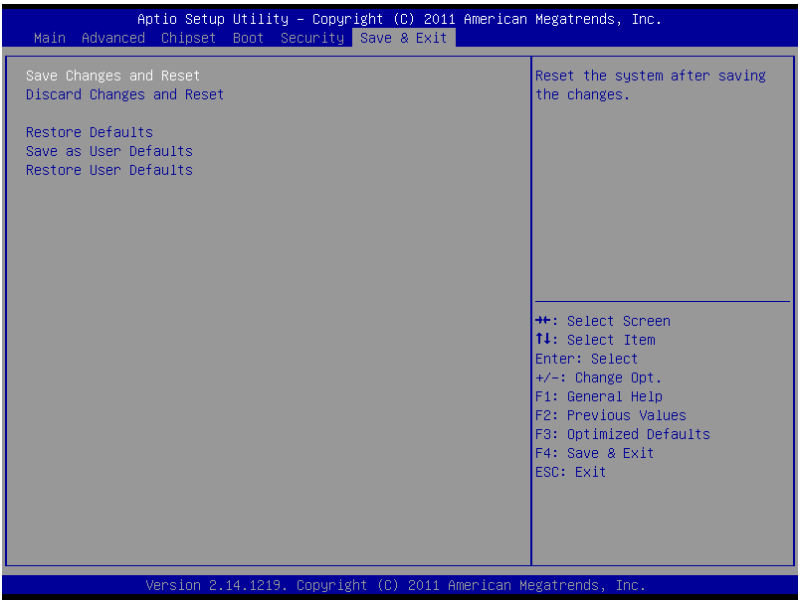
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

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

Setup submenu: Exit



Chapter

4

Driver Installation

The AEC-6950 comes with an AutoRun DVD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver DVD, the driver DVD-title will auto start and show the installation guide. If not, 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 USB3.0 Driver

Step 6 – Install RAID & AHCI Driver

Step 7 – Install ME Driver

Step 8 – Install TPM Driver

Step 9 – Serial Port Driver (Optional)

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the AEC-6950 DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 9 in order.

Step 1 – Install Chipset Driver

1. Click on the ***Step 1 - Chipset*** folder and double click on the ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the ***Step 2 - Graphics*** folder and select the OS folder your system is
2. Double click on the ***Setup.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 –Install LAN Driver

1. Click on the ***Step 3 - LAN*** folder and select the OS folder your system is
2. Double click on the ***.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 4 –Install Audio Driver

1. Click on the ***Step 4 - Audio*** folder and select the OS folder your system is
2. Double click on the ***Setup.exe*** located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 – Install USB3.0 Driver

1. Click on the ***Step 5 - USB3.0*** folder and select the folder of ***Driver_Installer***
2. Double click on the ***Setup.exe*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 6 – Install RAID & AHCI Driver

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

Step 7 – Install ME Driver

1. Click on the ***Step 7 - ME*** folder and double click on the ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

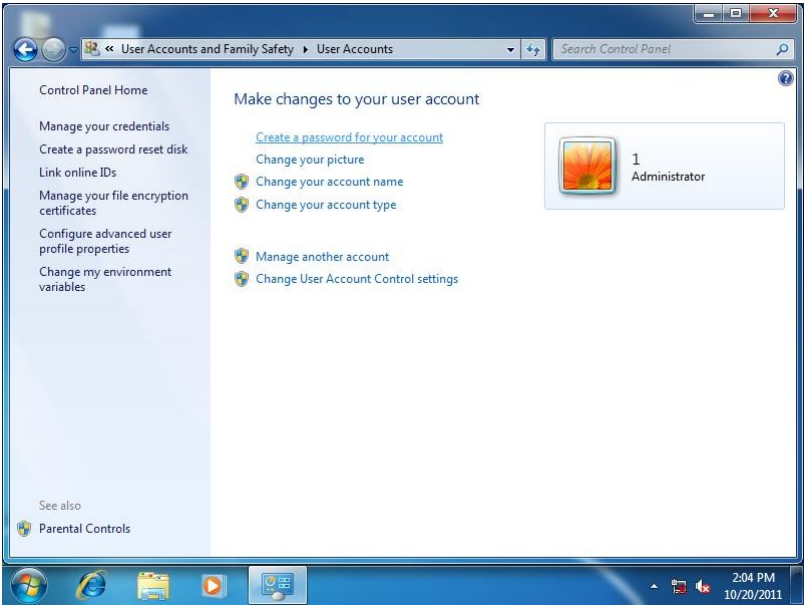
Step 8 –Install TPM Driver

1. Click on the ***Step 8 - TPM*** folder and select the OS folder your system is
2. Double click on the ***Setup.exe*** located in each OS folder

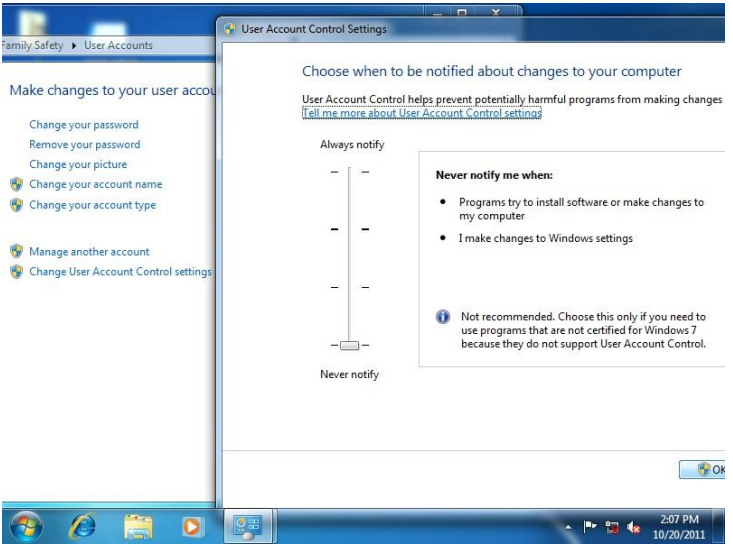
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 9 – Install Serial Port Driver (Optional)

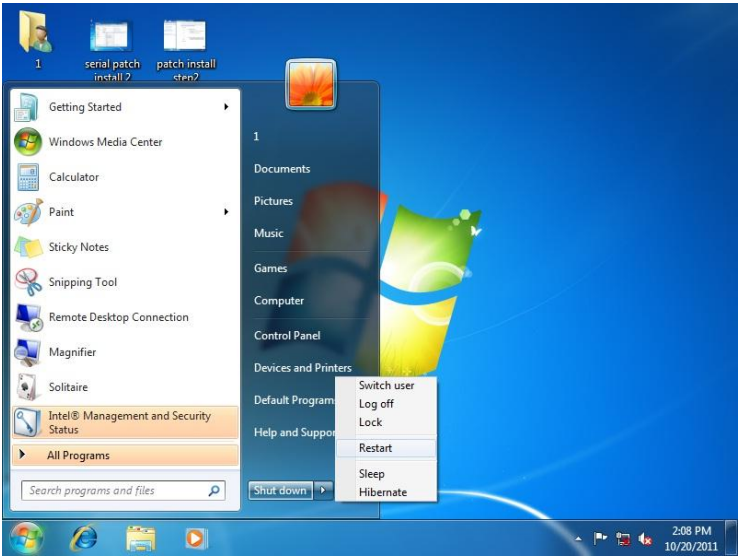
1. Create a password for Administrator account



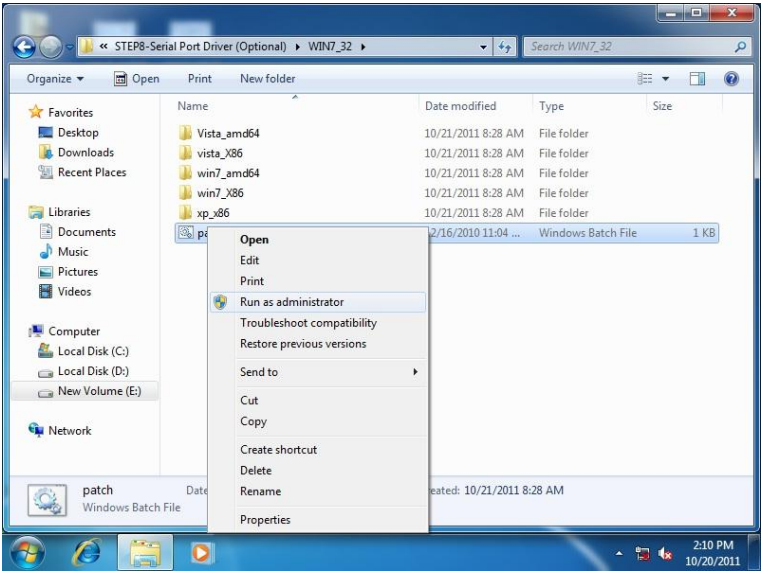
2. Change User Account Control Settings to [Never notify]

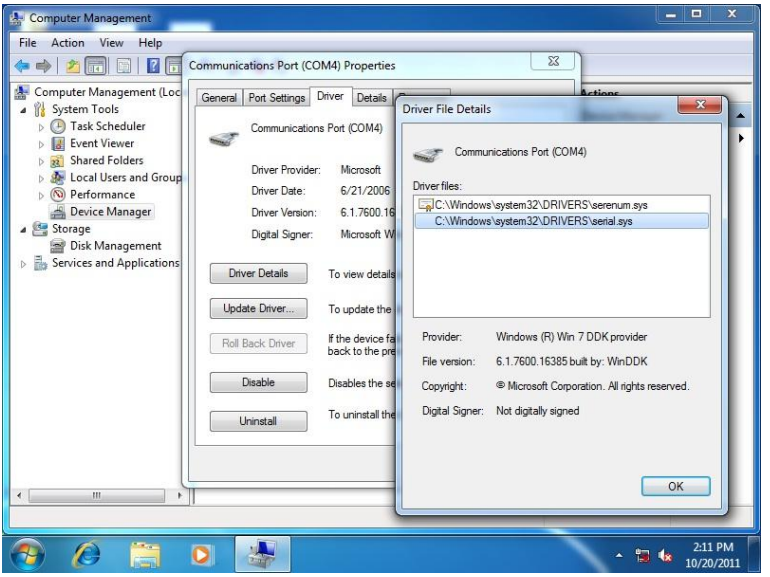


3. Reboot and Administrator login



4. To run patch.bat with [Run as administrator]





Appendix

A

Programming the Watchdog Timer

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

```
*********************************************************************************
// 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 procudure 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(ModeLDN, ModeReg, ModeBit, ModeVal);
        // Watchdog timeout output via WDTRST#
        SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

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

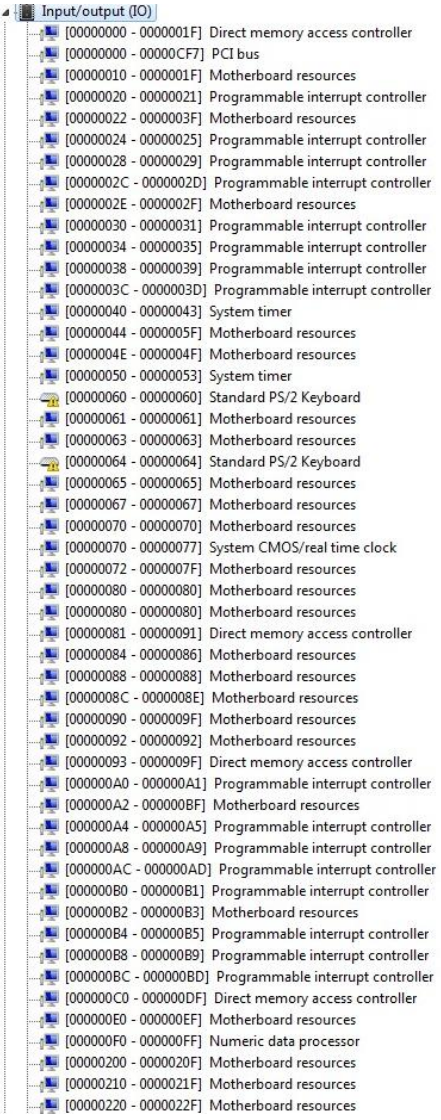
```
*****************************************************************************
VOID   SIOEnterMBPnPMode(){
        IOWriteByte(SIOIndex, 0x87);
        IOWriteByte(SIOIndex, 0x87);
}

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

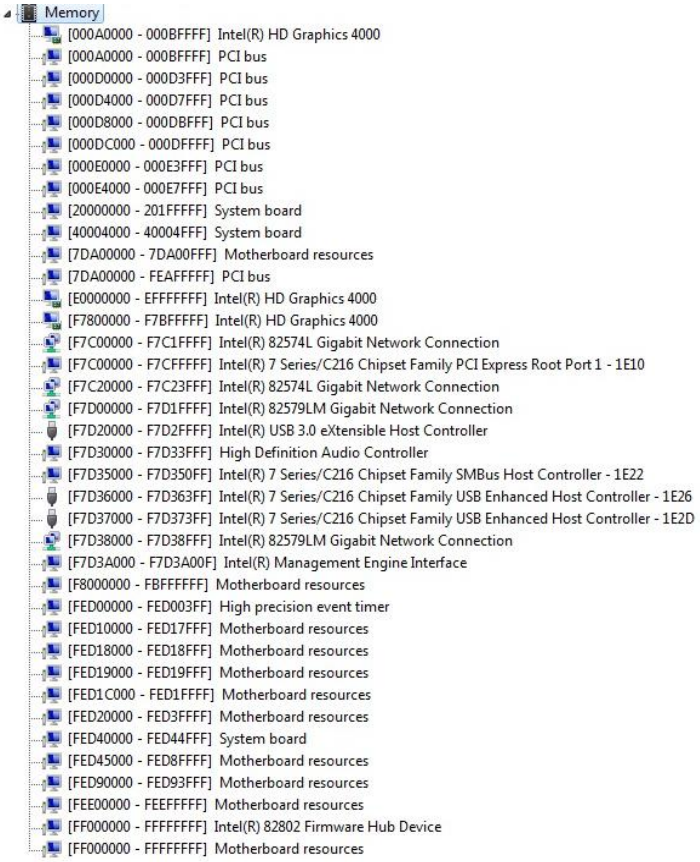
I/O Information

B.1 I/O Address Map

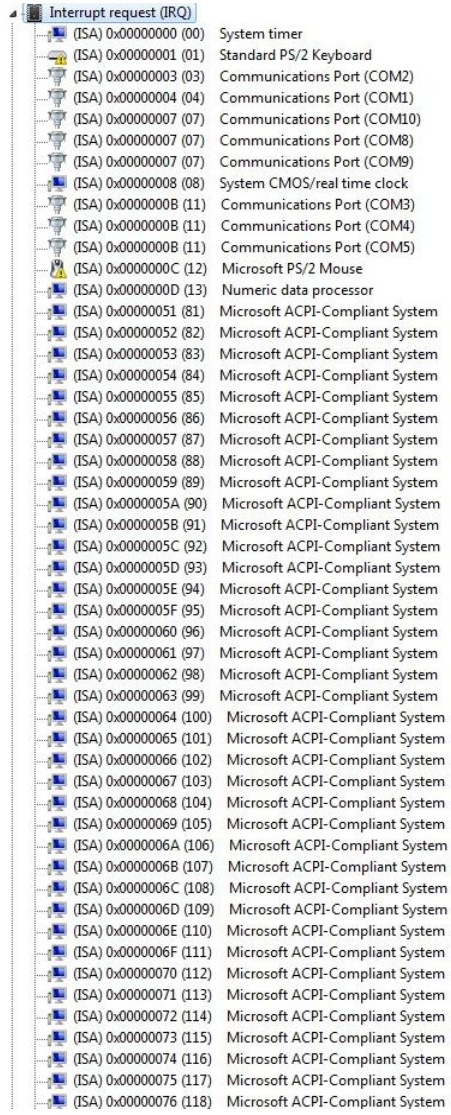


- [00000270 - 00000277] Communications Port (COM8)
- [000002B0 - 000002B7] Communications Port (COM9)
- [000002B8 - 000002BF] Communications Port (COM10)
- [000002D0 - 000002D7] Communications Port (COM5)
- [000002E8 - 000002EF] Communications Port (COM4)
- [000002F8 - 000002FF] Communications Port (COM2)
- [000003B0 - 000003BB] Intel(R) HD Graphics 4000
- [000003C0 - 000003DF] Intel(R) HD Graphics 4000
- [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
- [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 1 - 1E10
- [0000F000 - 0000F03F] Intel(R) HD Graphics 4000
- [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
- [0000F0F0 - 0000F0FF] 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

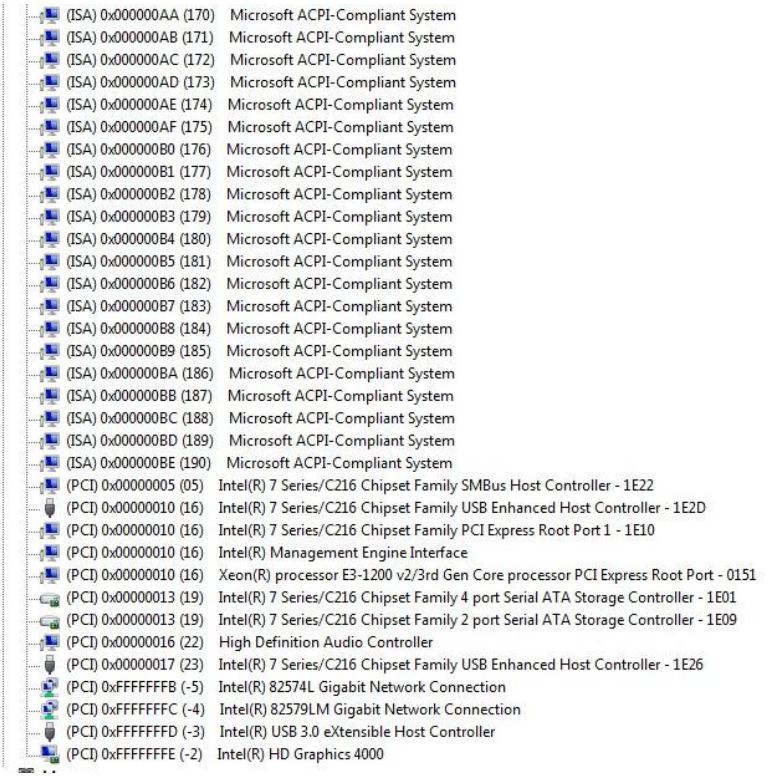
B.2 Memory Address Map



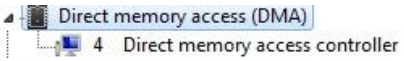
B.3 IRQ Mapping Chart



(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System



B.4 DMA Channel Assignments



Appendix

C

RAID & AHCI Settings

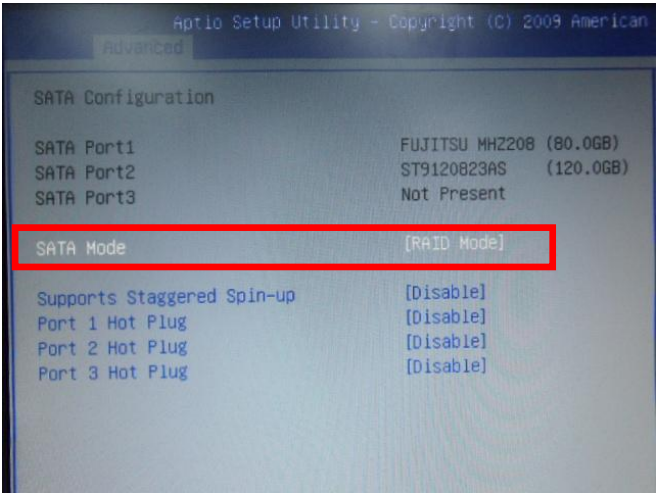
C.1 Setting RAID

OS installation to setup RAID Mode

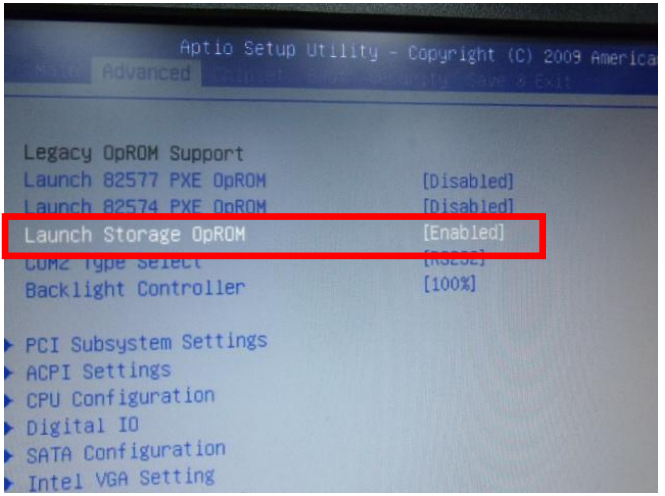
Step 1: Copy the files below from "***Driver CD ->Step 6 - RAID&AHCI"*** to Disk

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

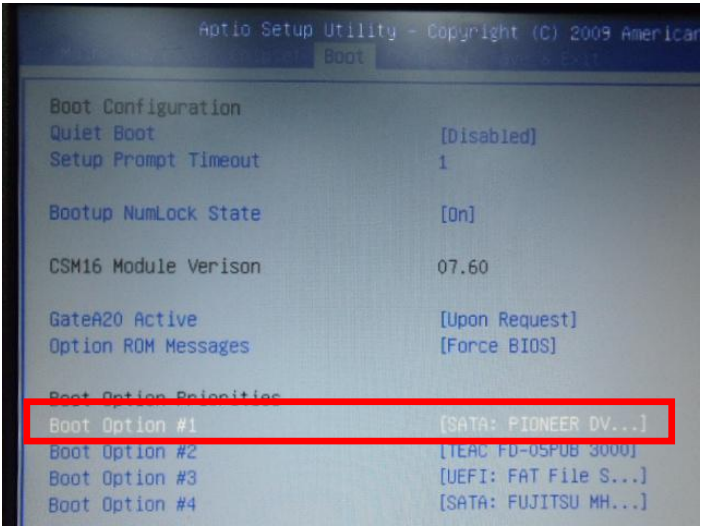
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> SATA Configuration -> SATA Mode -> RAID Mode



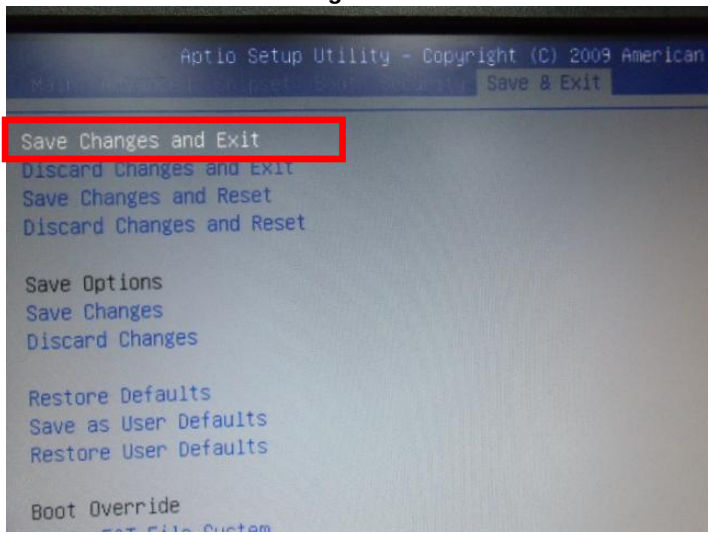
Step 4: The setting procedures "**In BIOS Setup Menu**"
B: Advanced -> Launch Storage OpROM -> Enabled



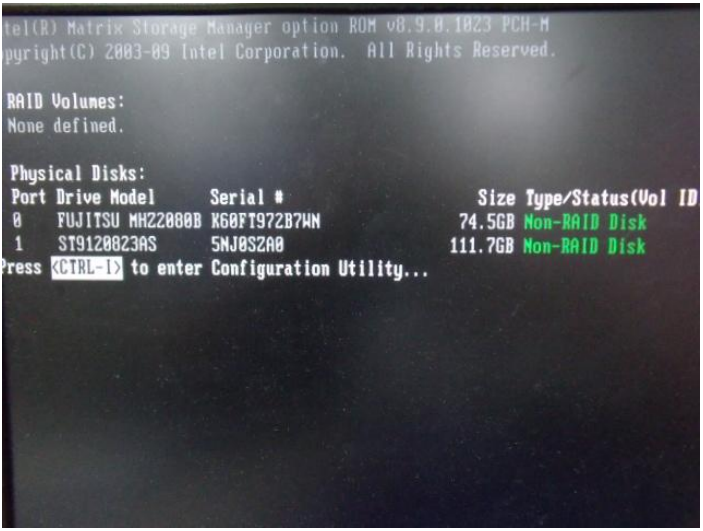
Step 5: The setting procedures "**In BIOS Setup Menu"**
C: Boot -> Boot Option #1 -> DVD-ROM Type



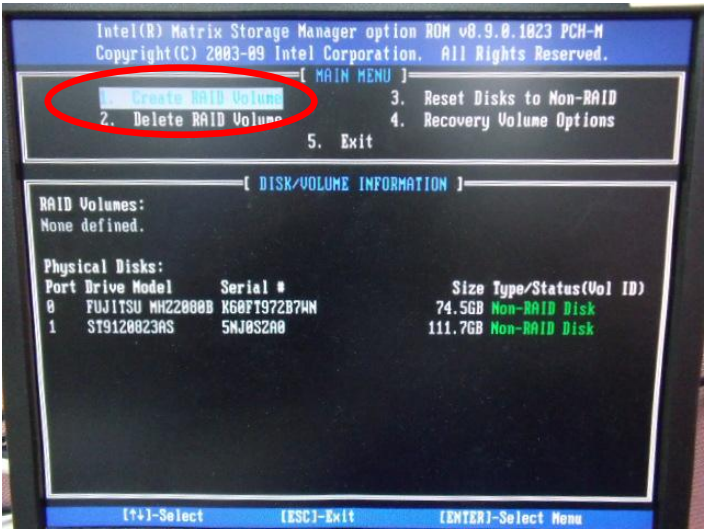
Step 6: The setting procedures "**In BIOS Setup Menu"**
D: Save & Exit -> Save Changes and Exit



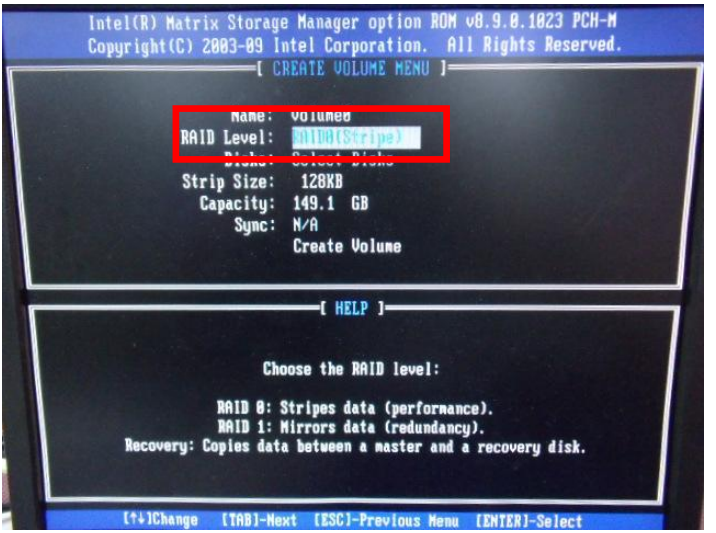
Step 7: Press **Ctrl-I** to enter **MAIN MENU**



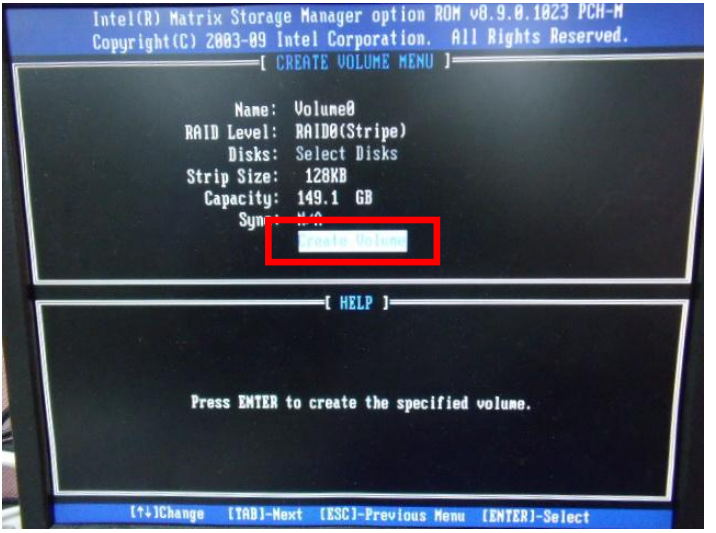
Step 8: Choose "**1.Create RAID Volume**"



Step 9: RAID Level -> RAID0(Stripe)

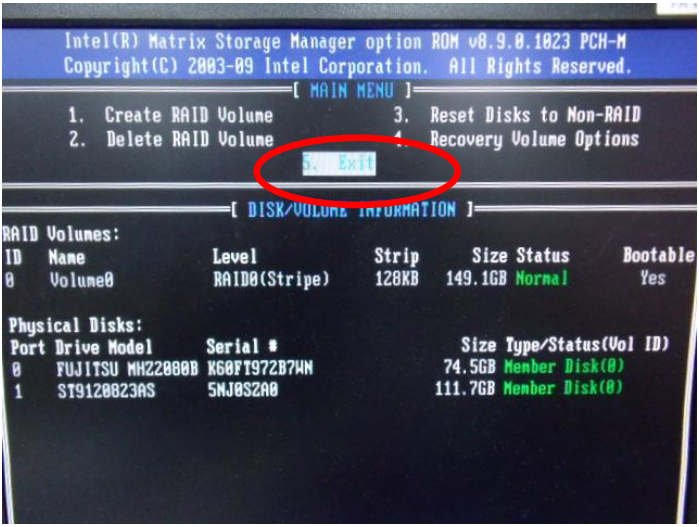


Step 10: Choose "**Create Volume**"

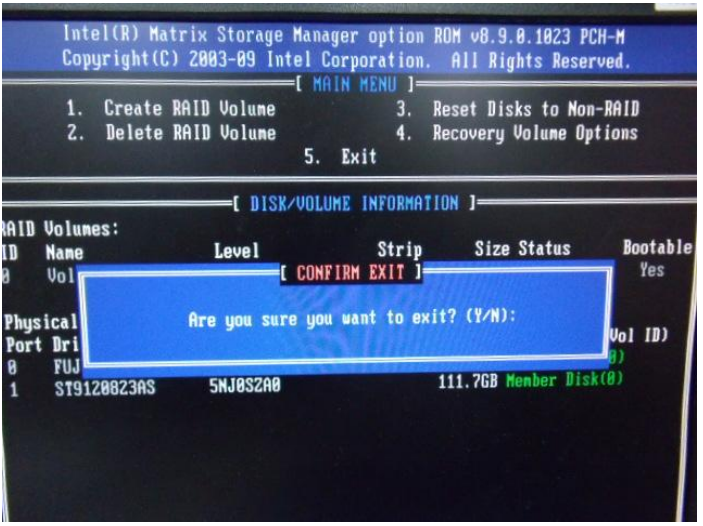


Step 11: Choose "**Y**"

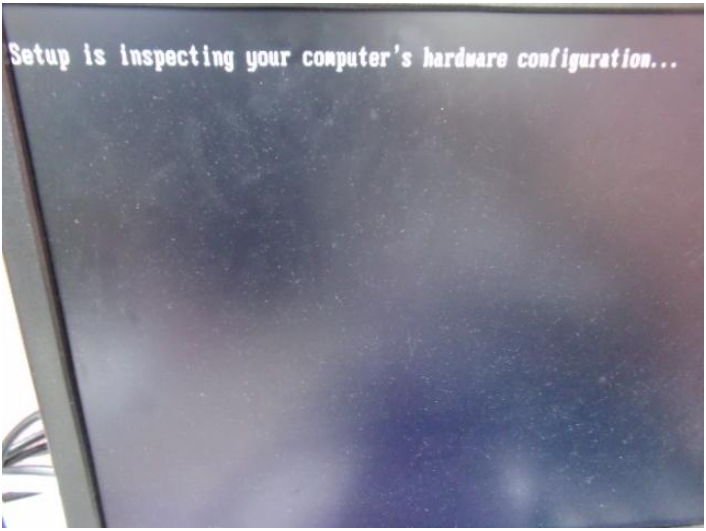
Step 12: Choose "**5. Exit**"



Step 13: Choose "**Y**"

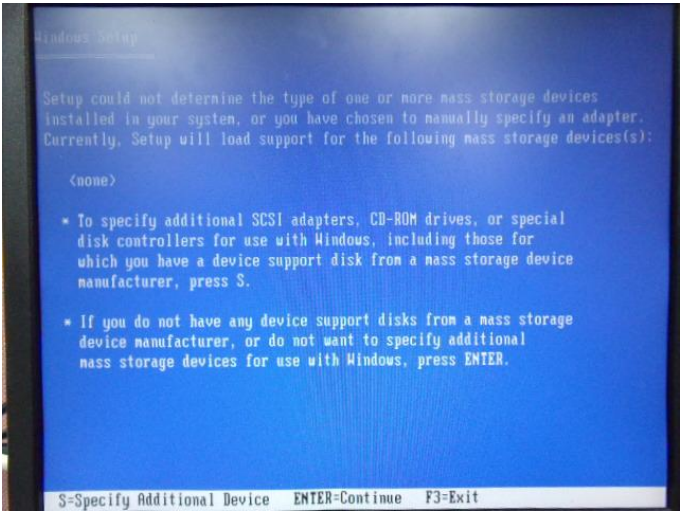


Step 14: Setup OS

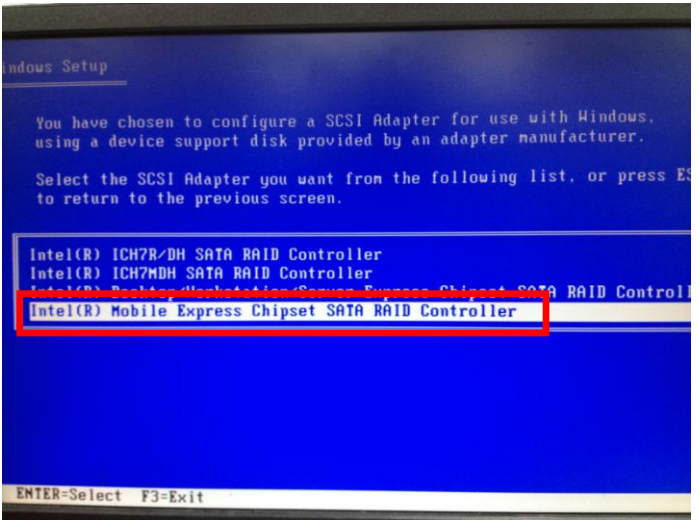


Step 15: Press “**F6**”

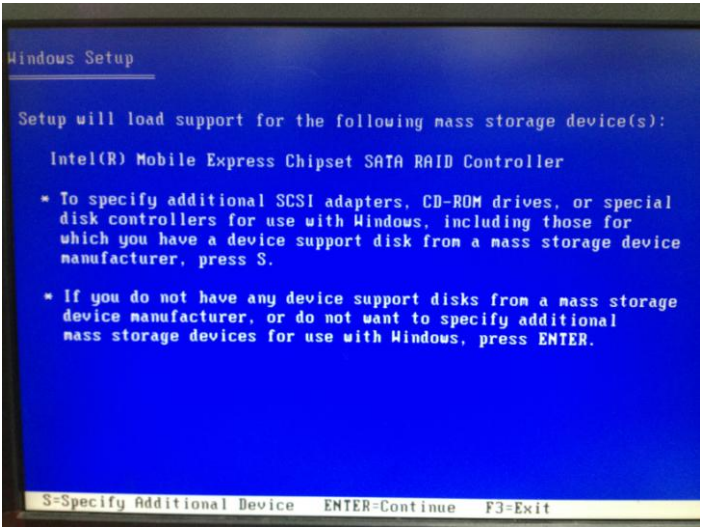
Step 16: Choose “**S**”



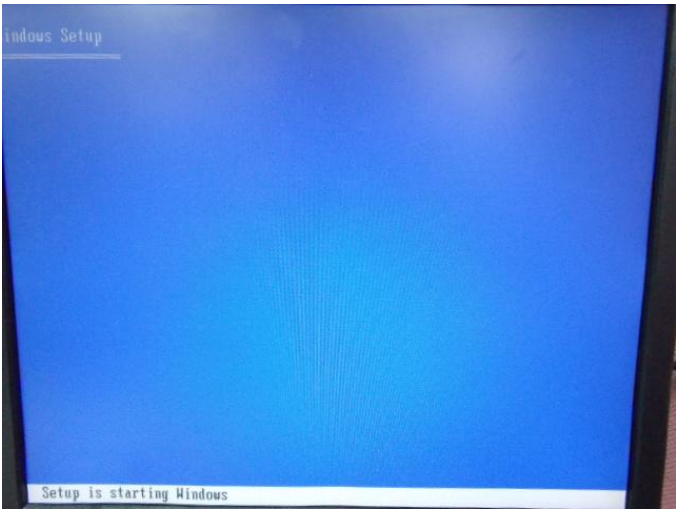
Step 17: Choose "**Intel(R) Mobile Express Chipset SATA RAID Controller"**



Step 18: It will show the model number you select and then press "**ENTER**"



Step 19: Setup is starting Windows



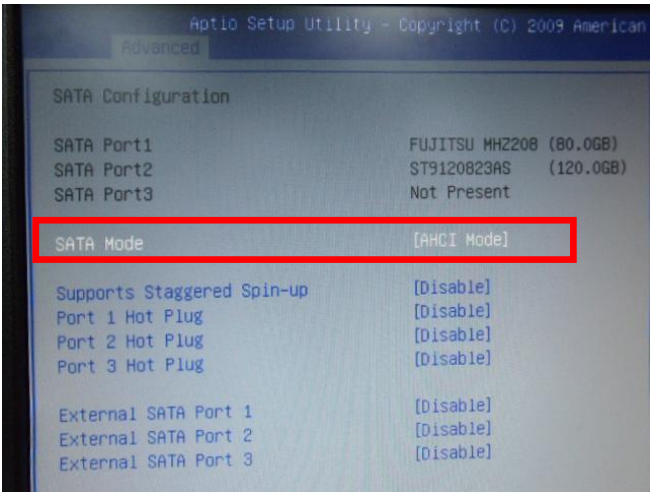
C.2 Setting AHCI

OS installation to setup AHCI Mode

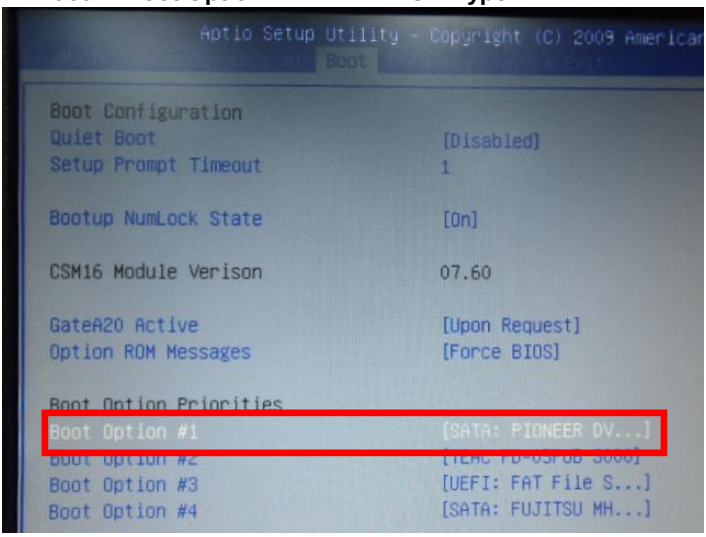
Step 1: Copy the files below from "***Driver CD ->Step 6 - RAID&AHCI"*** to Disk

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

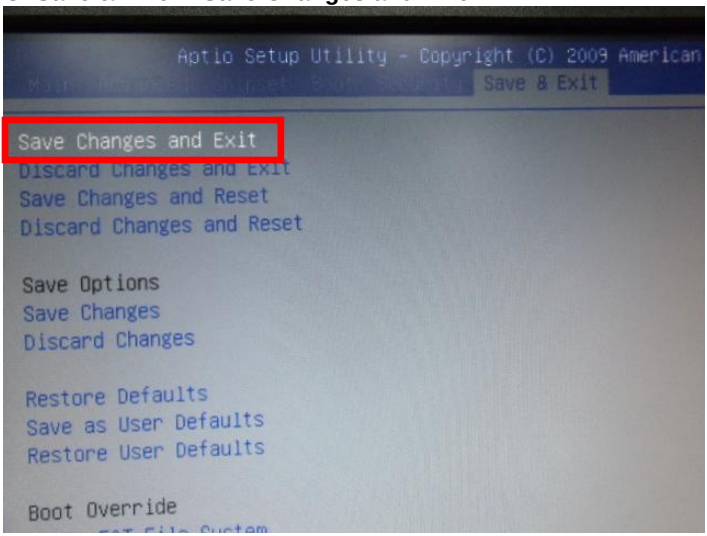
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode



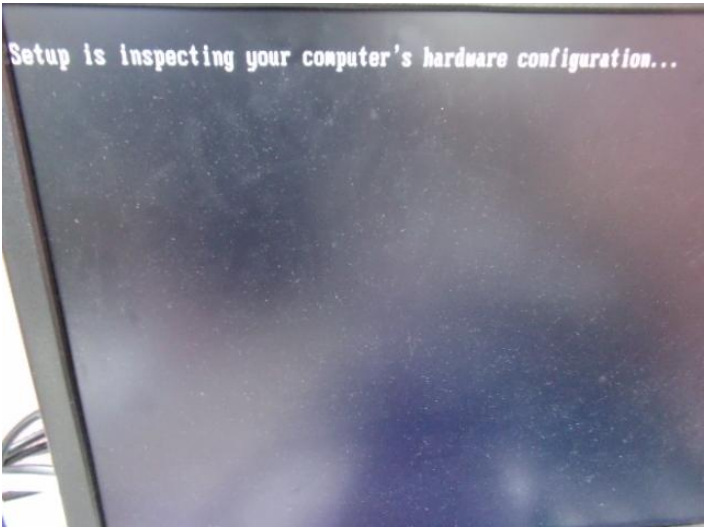
Step 4: The setting procedures "**In BIOS Setup Menu"**
B: Boot -> Boot Option #1 -> DVD-ROM Type



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

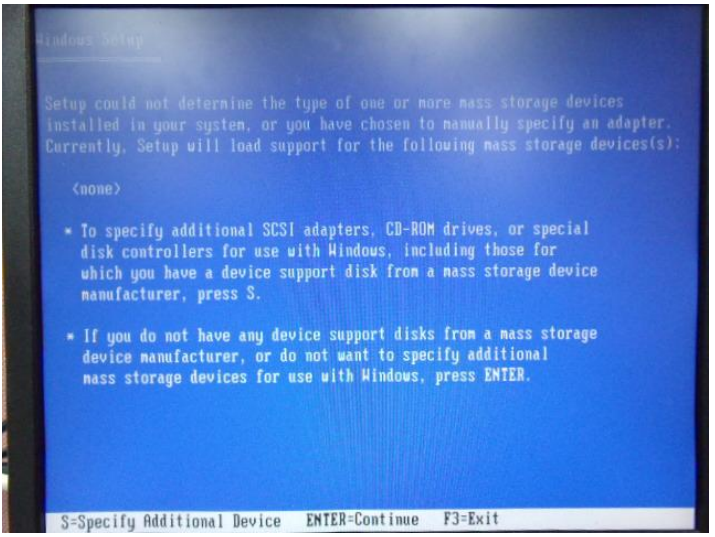


Step 6: Setup OS

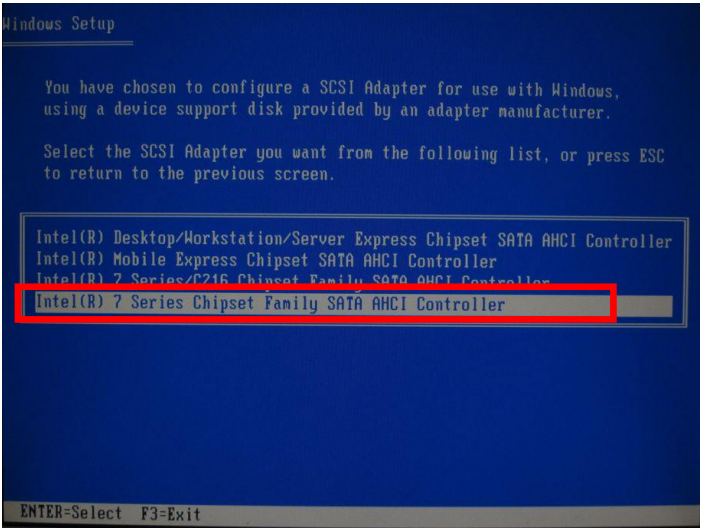


Step 7: Press "**F6**"

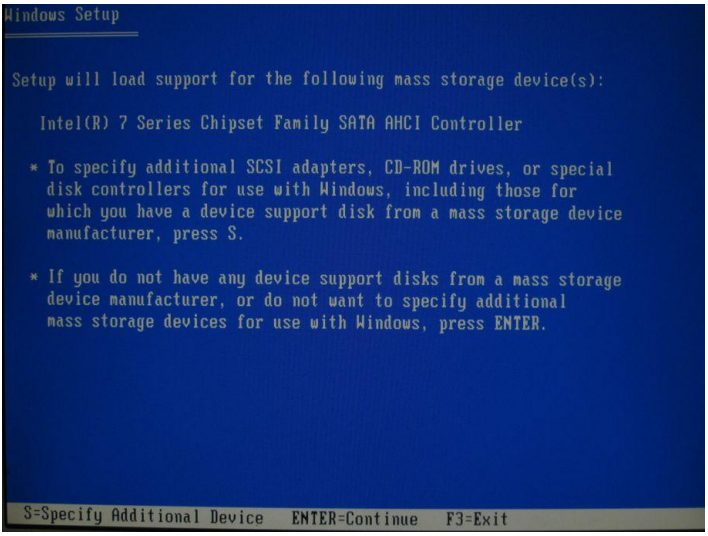
Step 8: Choose "**S**"



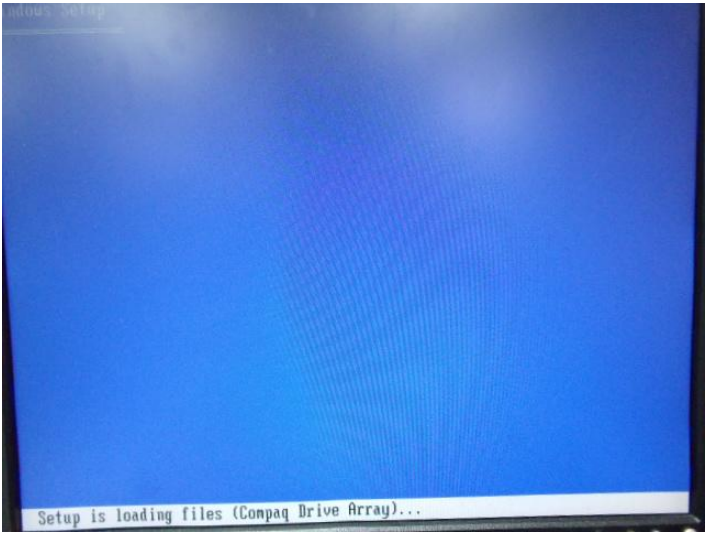
Step 9: Choose "**Intel(R) 7 Series Chipset Family SATA AHCI Controller**"



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-6950 utilizes FINTEK 81866 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)

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)		GPIO80
DIO-2 Pin Status	**0x06**(Note6)	**0x8A**(Note7)	**1**(Note8)		GPIO81
DIO-3 Pin Status	**0x06**(Note9)	**0x8A**(Note10)	**2**(Note11)		GPIO82
DIO-4 Pin Status	**0x06**(Note12)	**0x8A**(Note13)	**3**(Note14)		GPIO83
DIO-5 Pin Status	**0x06**(Note15)	**0x8A**(Note16)	**4**(Note17)		GPIO84
DIO-6 Pin Status	**0x06**(Note18)	**0x8A**(Note19)	**5**(Note20)		GPIO85
DIO-7 Pin Status	**0x06**(Note21)	**0x8A**(Note22)	**6**(Note23)		GPIO86
DIO-8 Pin Status	**0x06**(Note24)	**0x8A**(Note25)	**7**(Note26)		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();
}
*****************************************************************************
```