AEC-6967

Fanless Embedded Controller

Intel® 2nd Generation Core™ i/ Celeron®

Processor (FCBGA1023)

with 2 Gigabit Ethernet

COM x 6, USB x 6, CFast™, Mini Card x 2

SATA 6.0Gb/s x 2, SATA 3.0Gb/s x 2

PCI x 2 or PCI x 1 + PCI-E[x4] x 1 or PCI-E[x4] x 2

VGA x 1, HDMI x 1, DVI-D x 1

Dual-Channel 24-bit LVDS

AEC-6967 Manual 1st Ed.

September 2012

Copyright Notice

Acknowledgments

- Award is a trademark of Award Software International, Inc.
- CFast™ is a trademark of the Compact Flash Association.
- Intel®, Celeron® and Core™ are trademarkes of Intel® Corporation.
- Microsoft Windows® is a registered trademark of Microsoft Corp.
- PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

All other product names or trademarks are properties of their respective owners.

Packing List

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

- 1 AEC-6967 Embedded Controller
- 1 Phoenix Power Connector
- 4 M3 x 4mm Screws
- 6 6# -32 x 10mm 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.

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。

Contents

Appendix C RAID & AHCI Settings

Appendix D Electrical Specifications for I/O Ports

Chapter

1

General Information

1.1 Introduction

Due to the growing popularity from the IPC market, the newest Boxer series AEC-6967 has been introduced by AAEON. Being a control center, the AEC-6967 is suitable for Machine Control, Data Processing, Fleet Management, Data Management. AEC-6976 equips a high efficiency heat conduction mechanism.

The AEC-6967 is compact in size but has attractive and flexible extension capabilities such as 6 USB2.0 ports, VGA, Audio, 6 COM ports, PCI and PCI-E[x4].

Stable Design for Rugged Environment

The AEC-6967 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-6967 can be used in high vibration environments. In addition, the AEC-6967 offers low power consumption system that while operating in ambient temperatures ranging from -20° to 65°C with Core™ i7-2610UE processor.

The AEC-6967 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

- Fanless Design
- Intel® 2nd Generation Core™ i/ Celeron® Processor (FCBGA1023)
- Intel® QM67 Chipset
- Gigabit Ethernet, RJ-45 x 2
- Intel® Integrated Graphics Engine Supports Dual View by VGA, DVI-D, HDMI
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2, Support RAID 0, 1, 5, 10
- USB2.0 x 6, COM x 6 (2.5KV Isolation x 2), 2.5KV Isolated DIO x 1 (4 in, 4 out)
- Mini Card x 2, CFast™ x 1
- PCI x 2 or PCI x 1 + PCI-Express[x4] x 1 or PCI-Express[x4] x 2

1.3 Specifications

● CPU		Intel® 2nd Generation Core™ i/ Celeron® Processor (FCBGA1023)
● Chipset		Intel® QM67
● System Memory		DDR3 SODIMM x 2, Max. 16 GB, support DDR3 1066/ 1333
● Display Interface	VGA	DB-15 x 1, shared system memory up to 512MB/DVMT 5.0
	DVI	DVI-D x 1 (optional 2nd DVI, support 1920x1200 @ 60 Hz
	HDMI	HDMI x 1, support 1920x1200 @ 60 Hz
	Others	Dual-channel 24-bit LVDS (optional extension kit)
● Storage Device	SSD	CFast™ slot
	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
● Network	LAN	Gigabit Ethernet
	Wireless	Optional by Mini Card
● Front I/O	USB Host	USB2.0 x 2
	Serial Port	RS-232 x 1, RS-232/422/485 x 1, both support optional 2.5KV Isolation , optional extra RS-232 x 6
	DIO	8-bit programmable, optional 2.5KV

		Isolation protection
	KB/MS	PS/2 x 1
	Others	Power button x 1, Reset button x 1
● Rear I/O	USB Host	USB2.0 x 4
	LAN	RJ-45 x 2
	Serial Port	RS-232 x 2
	Audio	Mic-in, Line-in, Line-out
	Others	Power input x 1
● Expansion	PCIe[x1]	2 (optional)
	PCI	2 (optional, limited 2.1A @ +12V)
	Mini Card	2 (optional)
	Others	SIM x 1 (optional)
● Indicator	Front	System LED x 1, HDD LED x 1
● Power Requirement		DC-in 9~30V input, optional 100~240V
● System Cooling		Passive cooling
● Mounting		Wallmount
● Operating Temperature		*Without Airflow, with wide temperature Storage and RAM:* -4°F ~ 122°F (-20°C ~ 50°C) (35W TDP CPU) -4°F ~ 149°F (-20°C ~ 65°C) (17W TDP CPU, not include riser card) *Ambient with Airflow, with wide temperature Storage and RAM:*

		-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
● Storage Temperature		-4°F ~ 158°F (-20°C ~ 70°C)
● 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™
● Certification	EMC	CE/FCC Class A
● Dimension (W x H x D)		8.19” x 4.9” x 9.37” (208mm x 124.4mm x 238mm)
● OS Support		Windows® XP Embedded, Windows® XP, Windows® 7, Linux Fedora 10


Isolation
DIO
CFAST
Isolation
COM
USB
PS2

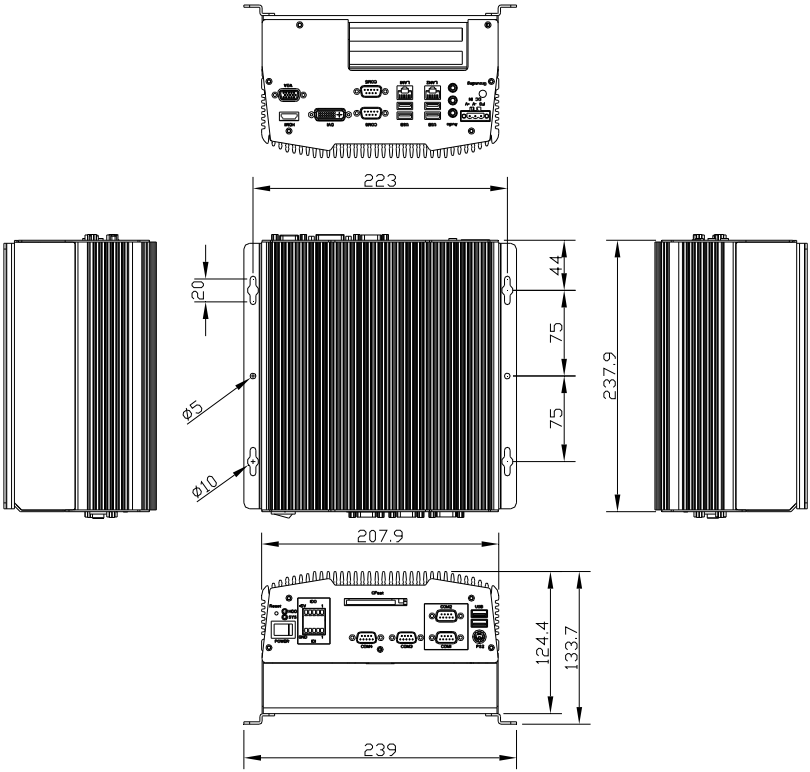

Audio
USB
USB
COM
DVI
HDMI
LAN
LAN
VGA

Chapter

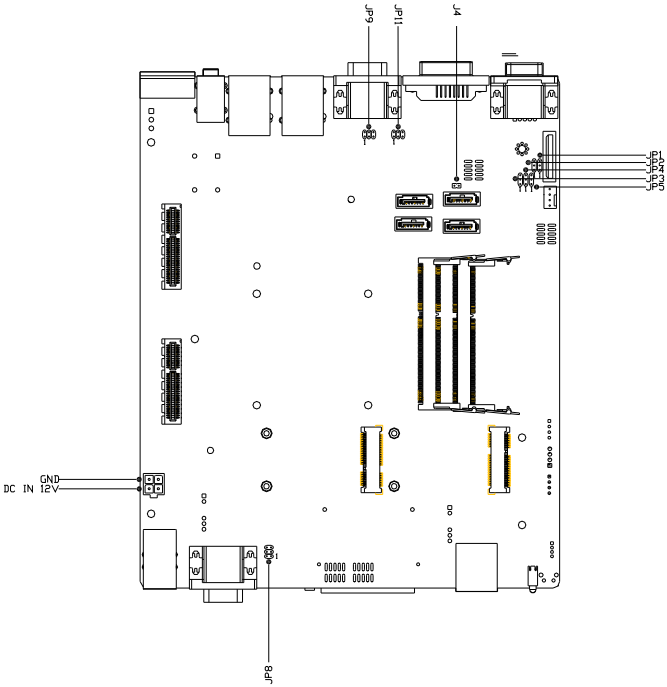
2

Hardware Installation

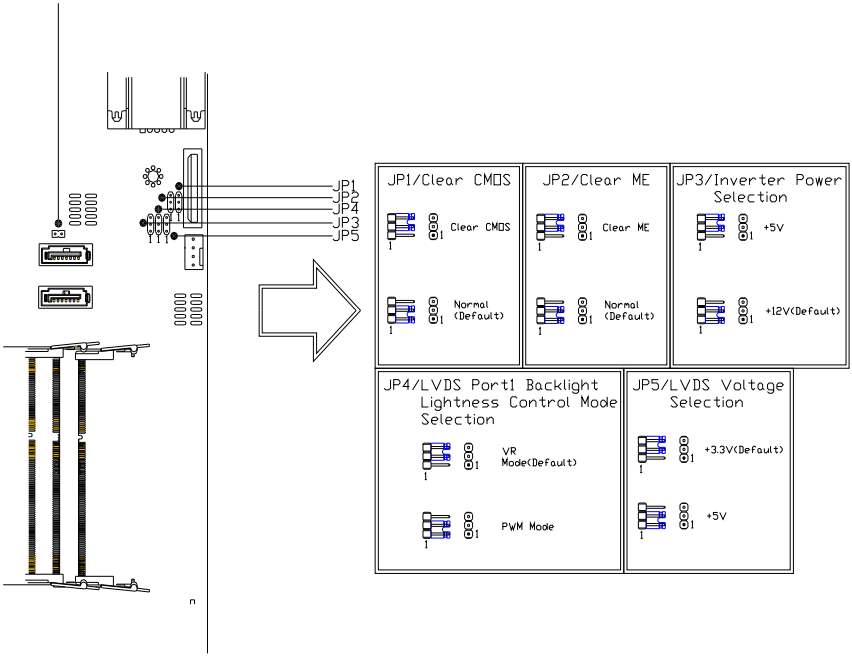
2.1 Dimension



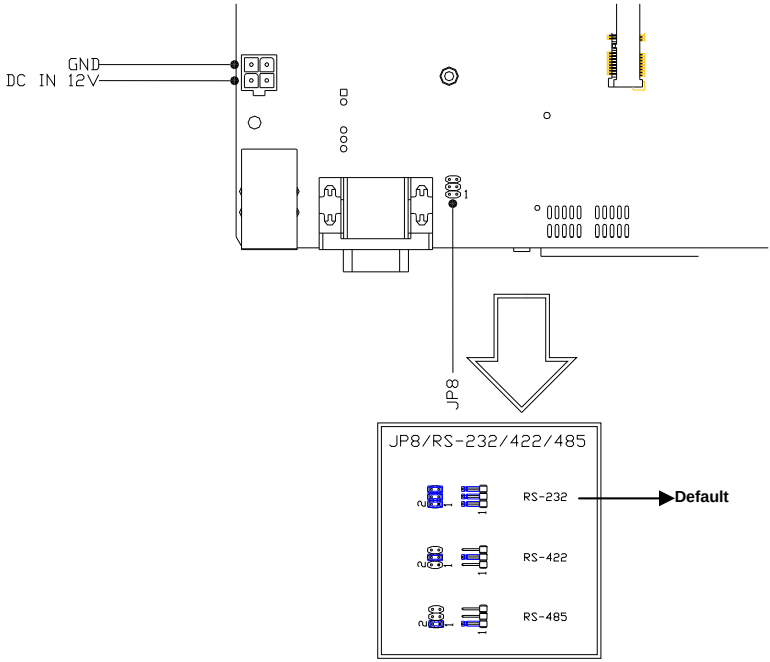
2.2 Location of Jumpers and Connectors



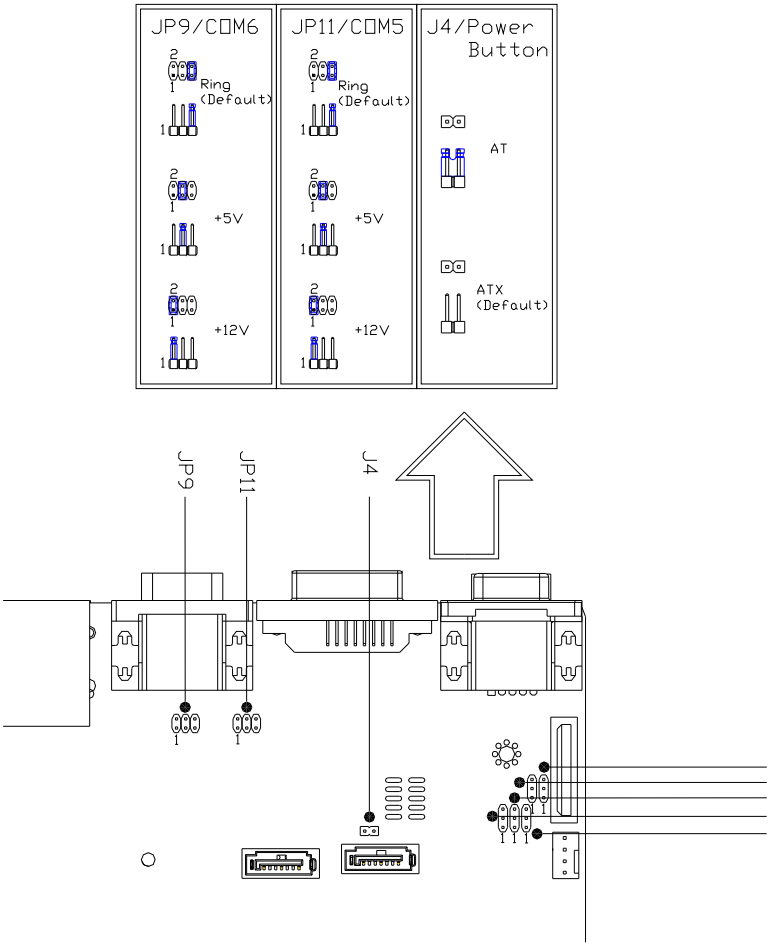
JP1, JP2, JP3, JP4, JP5



JP8


GND
DC IN 12V
1
JP8
JP8/RS-232/422/485
RS-232
Default
RS-422
RS-485

JP9, JP11, J4


JP9/COM6
Ring
(Default)
+5V
+12V
JP11/COM5
Ring
(Default)
+5V
+12V
J4/Power
Button
AT
ATX
(Default)
JP9
JP11
J4

2.3 List of Jumpers

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

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

Label	Function
JP1	Clear CMOS
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

2.4 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:

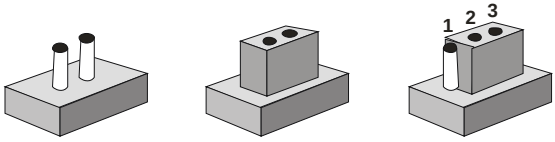
Label	Function
CN1	Front Panel Connector
CN2	4-pin ATX Power +12V Connector
CN6 ~ CN7	LAN / USB Connector
CN8	CFast™ Connector
CN10	COM3 RS-232 Box Header

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
FAN1~ FAN2	4 Pin Fan Connector
AUDIO1	AUDIO Connector

2.5 Setting Jumpers

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

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



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 Clear CMOS (JP1)

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

2.7 Clear ME (JP2)

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

2.8 Inverter Power Selection (JP3)

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

2.9 LVDS Port Backlight Lightness Control Mode Selection (JP4)

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

2.10 LCD Voltage Selection (JP5)

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

2.11 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

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

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

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

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

2.14 Auto Power Button (J6)

J6	Function
OPEN	ATX (Default)
1-2	AT

2.15 SATA Power (PWR1~PWR2)

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

2.16 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 (+)

2.17 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 LVDS Inverter/ Backlight Connector (CN18)

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

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

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

2.20 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		

2.21 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		

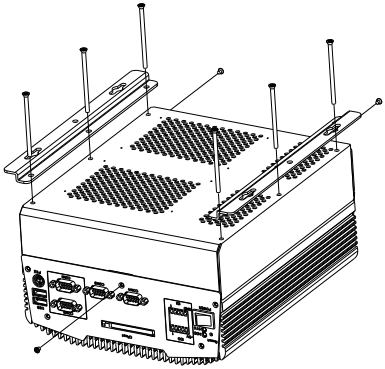
2.22 USB Box Header (USB3~USB4)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD-	4	GND
5	USBD+	6	USBD+

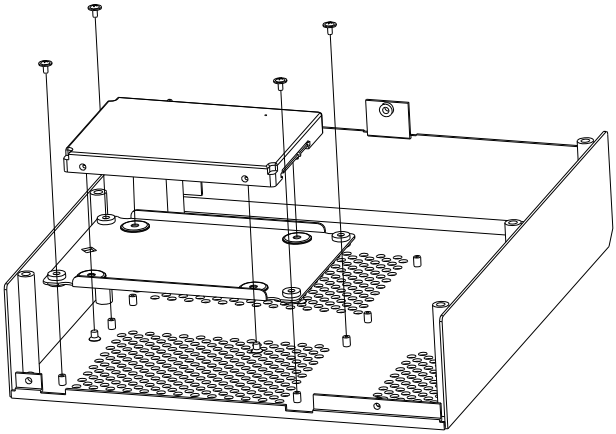
7	GND	8	USBD-
9	GND	10	+5V

2.23 HDD Installation

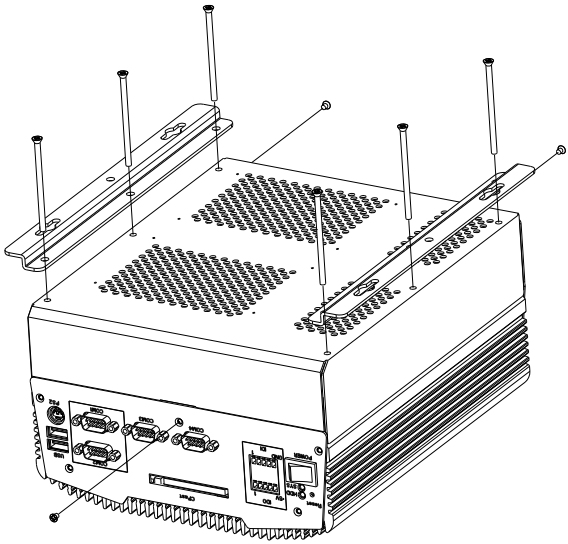
Step 1: Unfasten the six screws on the bottom lid and three screws on the front and rear panel



Step 2: Place the HDD to the HDD bracket and fasten the four screws to the bottom lid of the AEC-6967

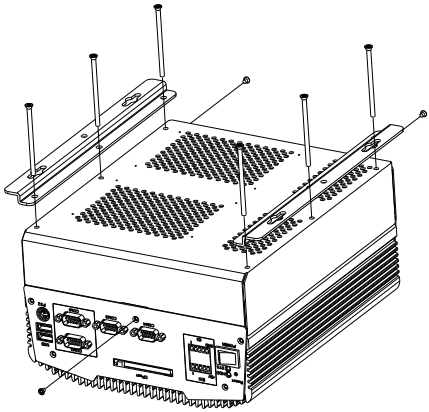


Step 3: Fasten the screws on the front and rear panels, and the brackets of AEC-6967

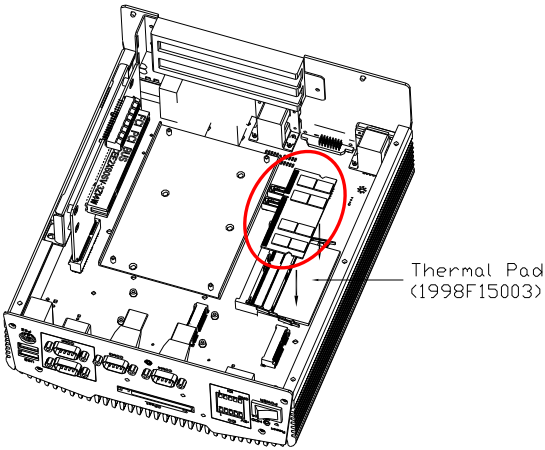


2.24 Memory Card Installation

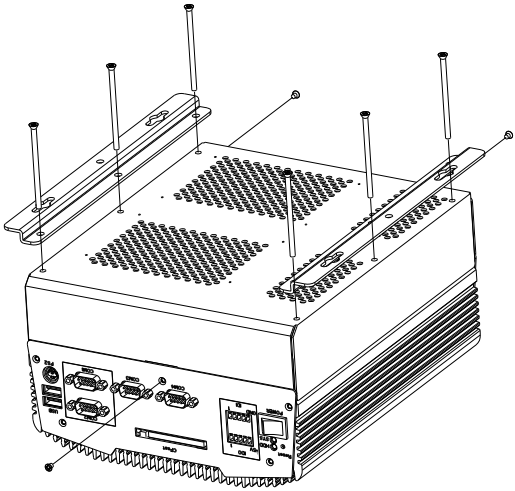
Step 1: Unfasten the six screws on the bottom lid and three screws on the front and rear panel



Step 2: Insert the RAM card to the memory slot

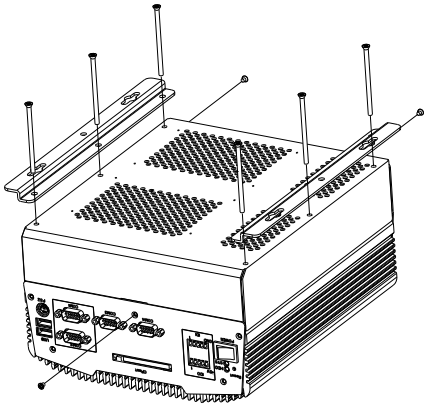


Step 3: Fasten the screws on the front and rear panels, and the brackets of AEC-6967

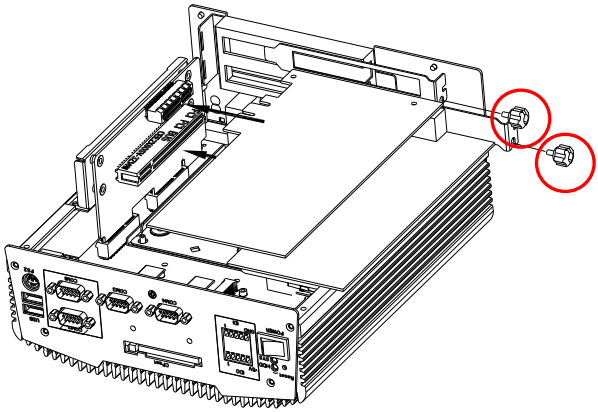


2.25 PCI Card Installation

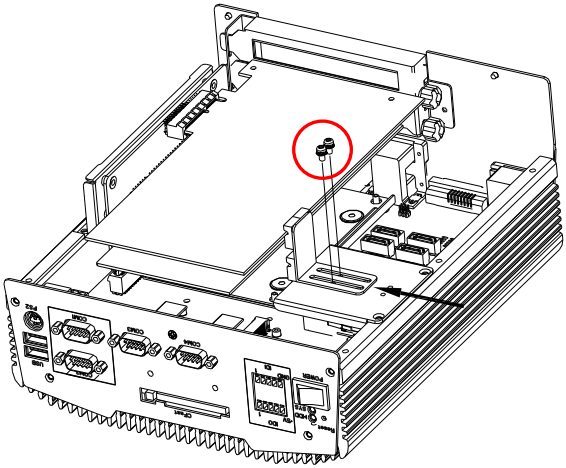
Step 1: Unfasten the six screws on the bottom lid and the three screws on front and rear panels



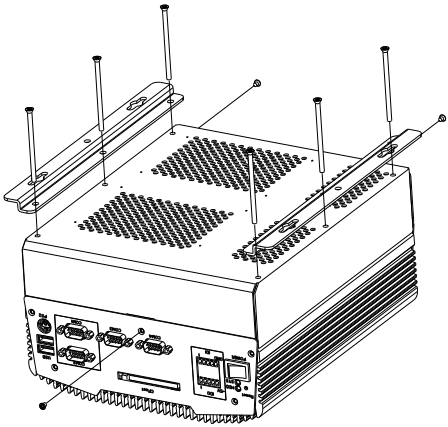
Step 2: Insert the PCI bracket and fasten the two screws to fix the PCI bracket



Step 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

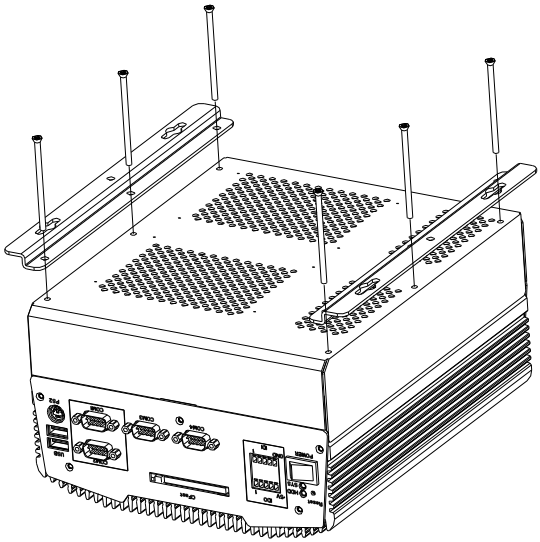


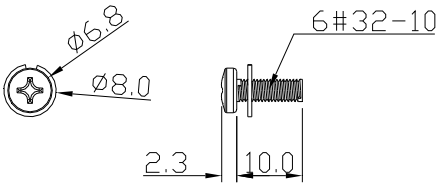
Step 4: Fasten the screws on the front and rear panels, and the brackets of AEC-6967



2.26 Wallmount Bracket Installation

Fasten the brackets with the appropriate screws.





Chapter

3

AMI BIOS Setup

3.1 System Test and Initialization

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

System configuration verification

These routines check the current system configuration 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-6967 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

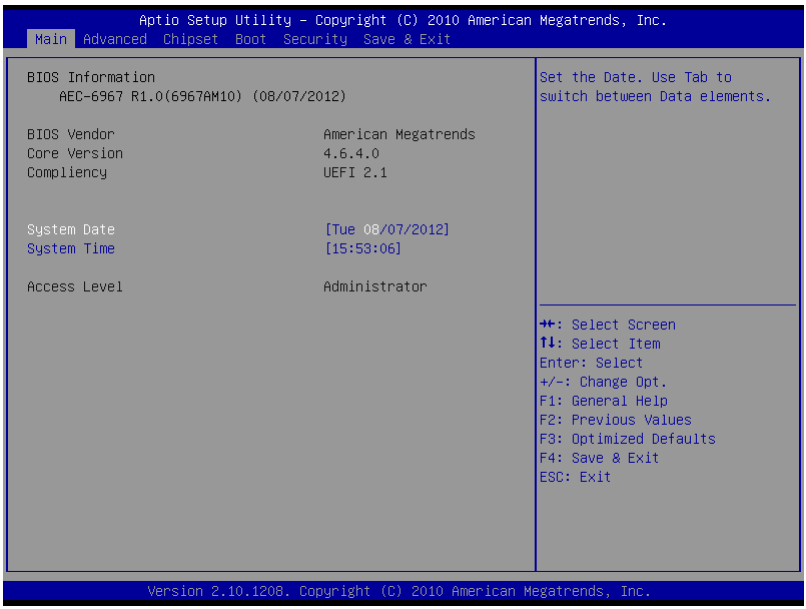
AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

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

Setup Menu

Setup submenu: Main



Setup submenu: Advanced

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit

▶ ACPI Settings                          Configure Management Engine
▶ Trusted Computing                      Technology Parameters
▶ CPU Configuration
▶ Digital IO
▶ SATA Configuration
▶ Intel TXT(LT) Configuation
▶ PCH-FW Configuration
▶ AMT Configuration
▶ USB Configuration
▶ Super IO Configuration
▶ H/W Monitor

                                         →←: Select Screen
                                         ↑↓: Select Item
                                         Enter: Select
                                         +/-: Change Opt.
                                         F1: General Help
                                         F2: Previous Values
                                         F3: Optimized Defaults
                                         F4: Save & Exit
                                         ESC: Exit

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```
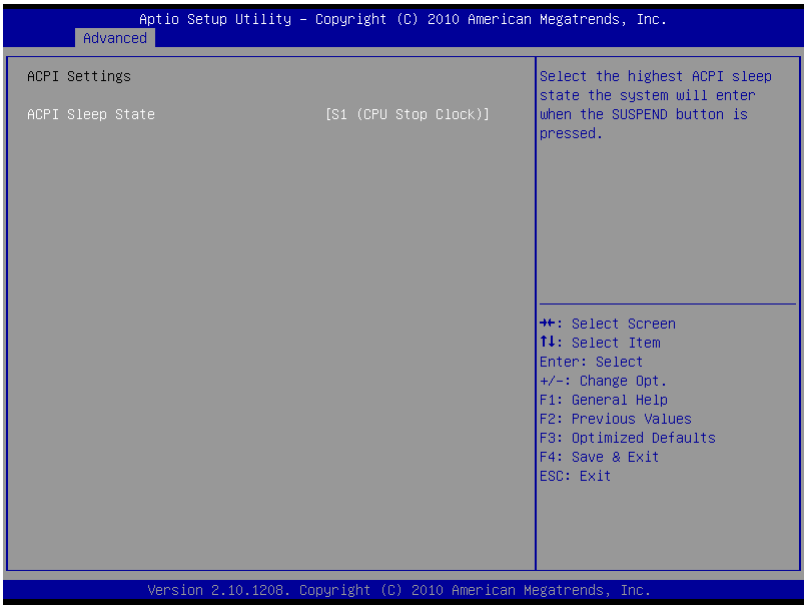
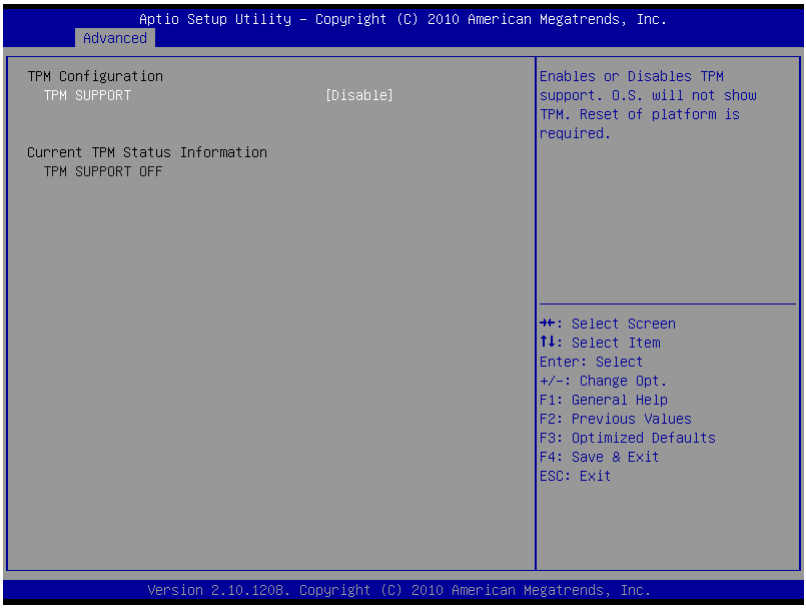

ACPI Settings



Options Summary :

ACPI Sleep State	Suspend Disabled	
	S1 (CPU Stop Clock)	
	S3 (Suspend to RAM)	Default
Select the Highest ACPI sleep state the system will enter when the SUSPEND button is pressed.		

Trusted Computing



Option Summary :

TPM SUPPORT	Disable	Default
	Enable	
Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.		

CPU Configuration

```
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Advanced

CPU Configuration                                  When enabled, a VMM can
                                                   utilize the additional
Intel(R) Celeron(R) CPU 827E @ 1.40GHz             hardware capabilities provided
CPU Signature                    206a7             by Vanderpool Technology
Microcode Patch                  25
Max CPU Speed                    1400 MHz
Min CPU Speed                    800 MHz
Processor Cores                  1
Intel HT Technology              Not Supported
Intel VT-x Technology            Supported
Intel SMX Technology             Not Supported
64-bit                           Supported

L1 Data Cache                    32 kB x 1         →←: Select Screen
L1 Code Cache                    32 kB x 1         ↑↓: Select Item
L2 Cache                         256 kB x 1        Enter: Select
L3 Cache                         1536 kB           +/-: Change Opt.
                                                   F1: General Help
Intel Virtualization Technology  [Enabled]         F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```
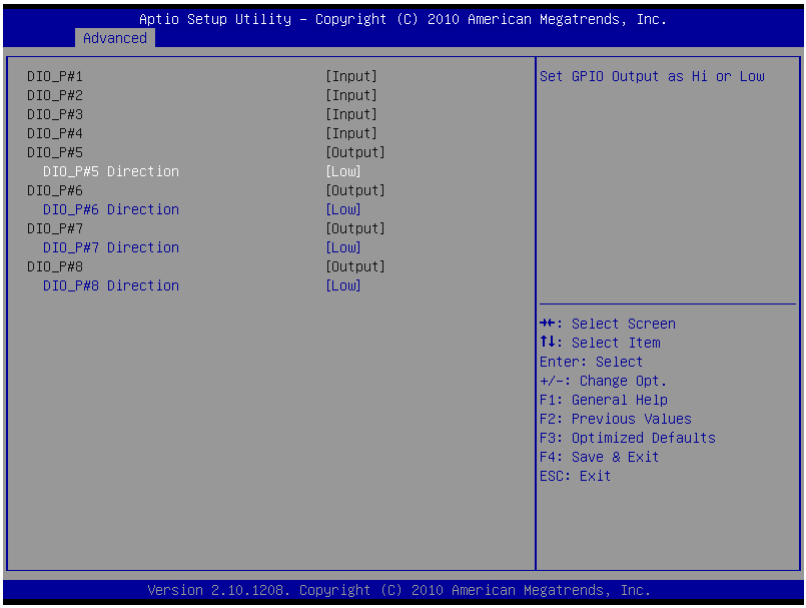

Options Summary :

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

Digital IO

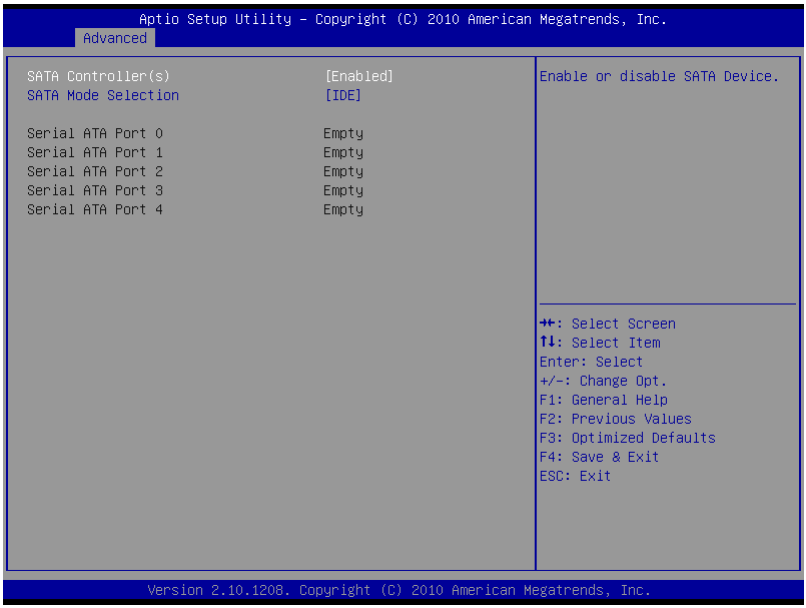


Options Summary :

DIO_P#1	Input	Default
DIO_P#2	Input	Default
DIO_P#3	Input	Default
DIO_P#4	Input	Default
DIO_P#5	Output	Default
DIO_P#5 Direction	Low	Default
	Hi	
DIO_P#6	Output	Default
DIO_P#6 Direction	Low	Default

	Hi	
DIO_P#7	Output	Default
DIO_P#7 Direction	Low	Default
	Hi	
DIO_P#8	Output	Default
DIO_P#8 Direction	Low	Default
	Hi	
Set GPIO Output as Hi or Low		

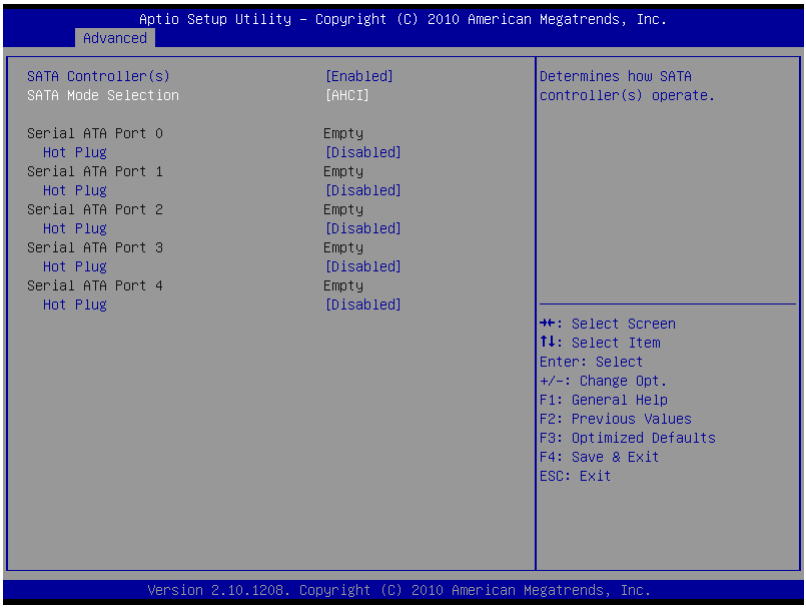
SATA Configuration (IDE)



Options Summary :

SATA Controller(s)	Enabled	Default
	Disabled	
Enable or disable SATA Device.		
SATA Mode Selection	IDE	Default
	AHCI	
	RAID	
Determines how SATA controller(s) operate.		

IDE Configuration (AHCI)

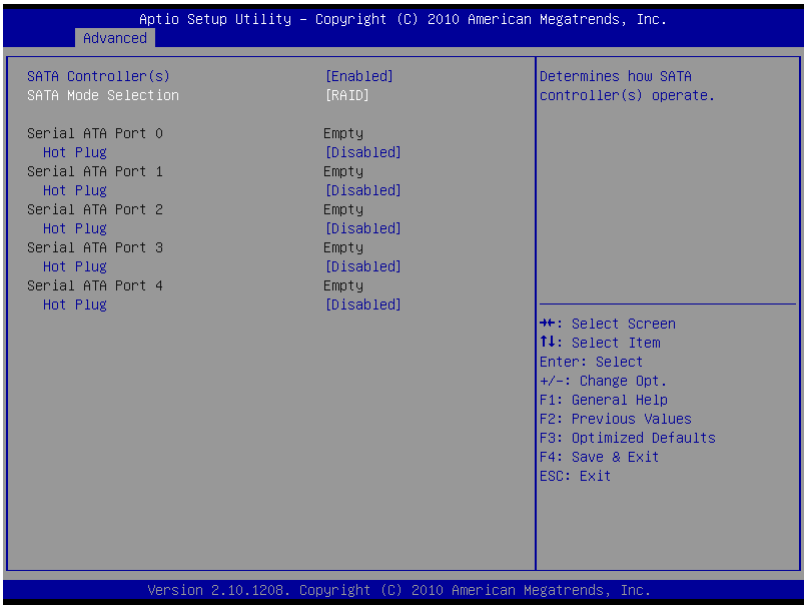


Options Summary :

SATA Controller(s)	Disabled	
	Enabled	Default
Enable or Disable SATA Port.		
SATA Mode	IDE	
	AHCI	Selected
	RAID	
Determines how SATA controller(s) operate.		
SATA Port 0 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 1 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 2 Hot Plug	Disable	Default
	Enabled	

Designates this port as Hot Pluggable.		
SATA Port 3 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 4 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		

IDE Configuration (RAID)



Options Summary :

SATA Controller(s)	Disabled	
	Enabled	Default
Enable or Disable SATA Port.		
SATA Mode	IDE	
	AHCI	Selected
	RAID	
Determines how SATA controller(s) operate.		
SATA Port 0 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 1 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 2 Hot Plug	Disable	Default
	Enabled	

Designates this port as Hot Pluggable.		
SATA Port 3 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		
SATA Port 4 Hot Plug	Disable	Default
	Enabled	
Designates this port as Hot Pluggable.		

Intel TXT(LT) Configuration

```
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Advanced

Intel Trusted Execution Technology Configuration

Intel TXT support only can be enabled/disabled if SMX
enabled. And must enables the VT support prior to TXT.

Secure Mode Extensons (SMX)          [Disabled]
Intel TXT(LT) Support                [Disabled]

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```
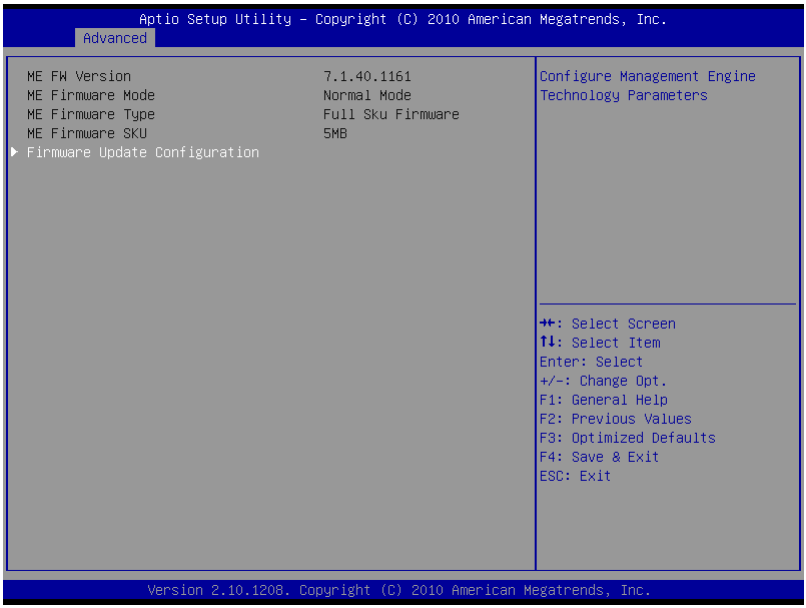
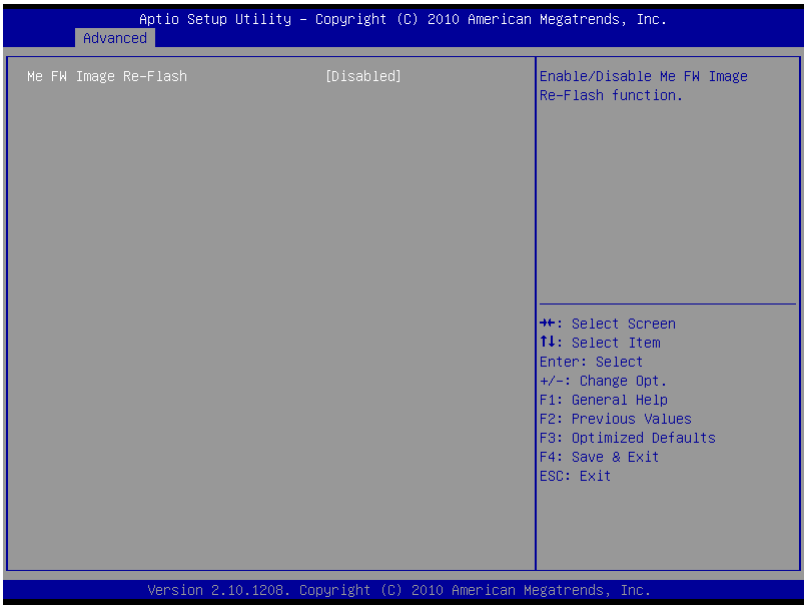

PCH-FW Configuration



Options Summary :

Firmware Update Configuration	Configure Management Engine Technology Parameters.

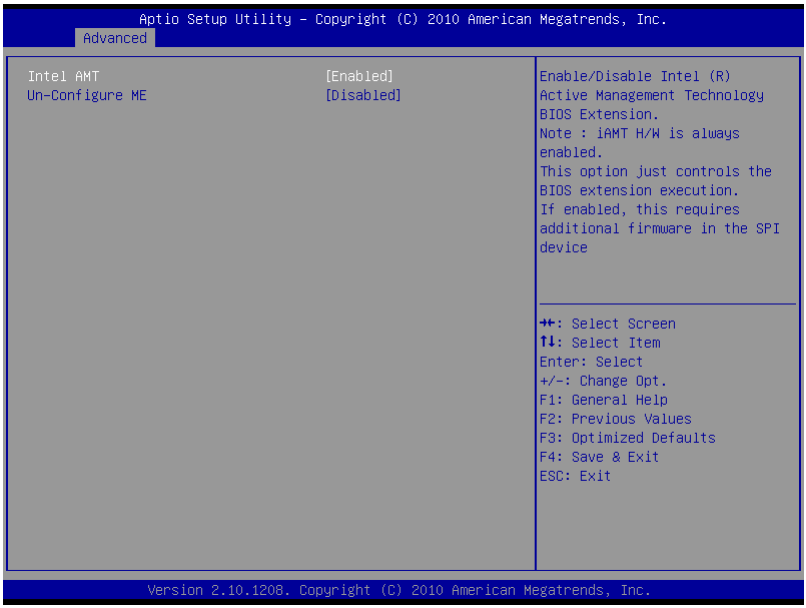
Firmware Update Configuration



Options Summary :

Me FW Image Re-Flash	Disabled	Default
	Enabled	
Enable/Disable Me FW Image Re-Flash function.		

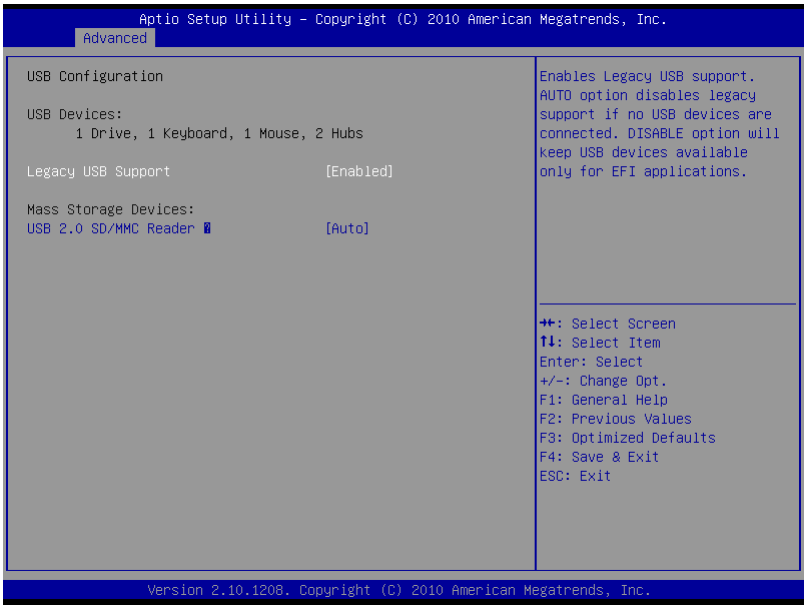
AMT Configuration



Options Summary :

Intel AMT	Disabled	
	Enabled	Default
Enable/Disable 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.		

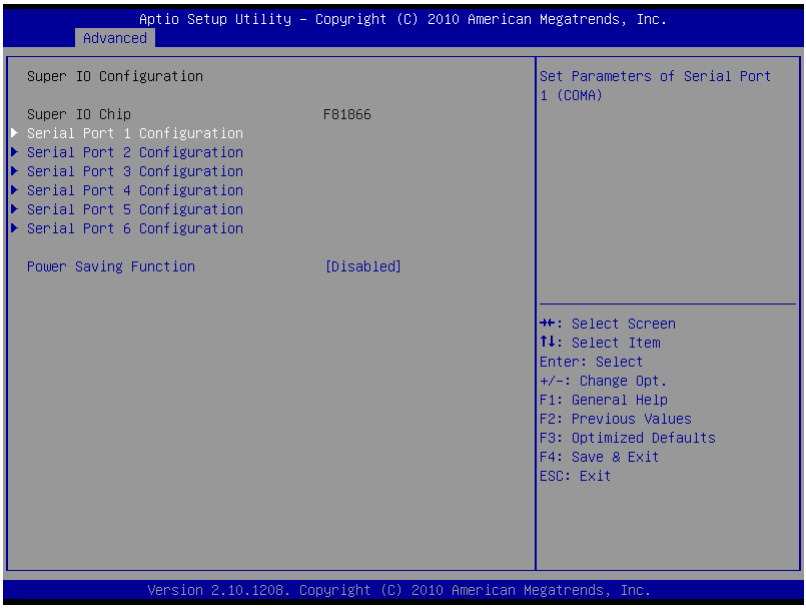
USB Configuration



Options Summary :

Legacy USB Support	Enabled	Default
	Disabled	
	Auto	
Enable Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.		

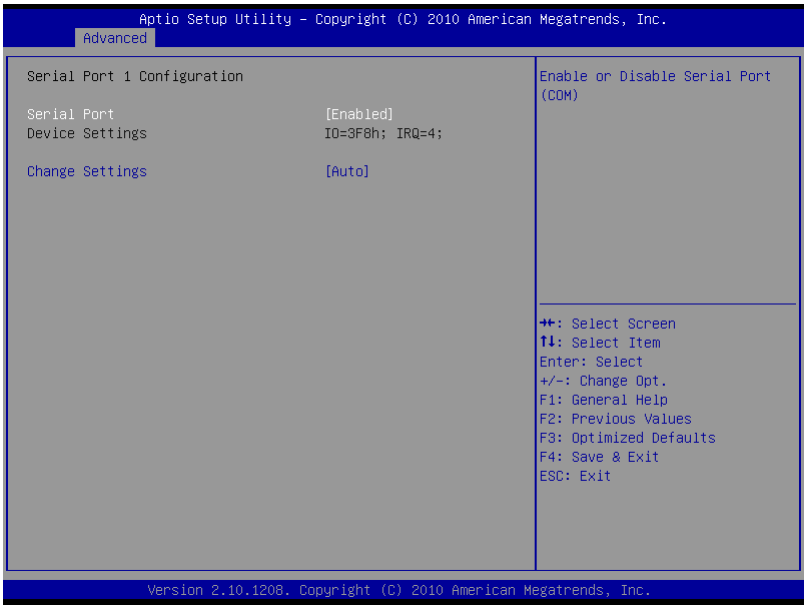
Super IO Configuration



Options Summary :

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

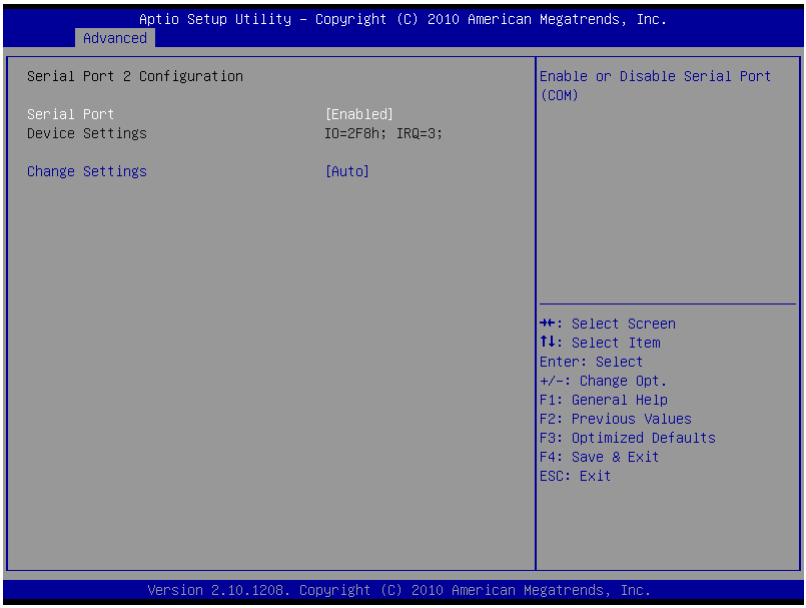
Serial Port 1 Configuration



Options Summary :

Serial Port	Disabled	
	Enabled	Default
Enable or Disable serial Port (COM)		
Change Settings (Serial Port 1)	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;	
Select an optimal setting for Super IO device.		

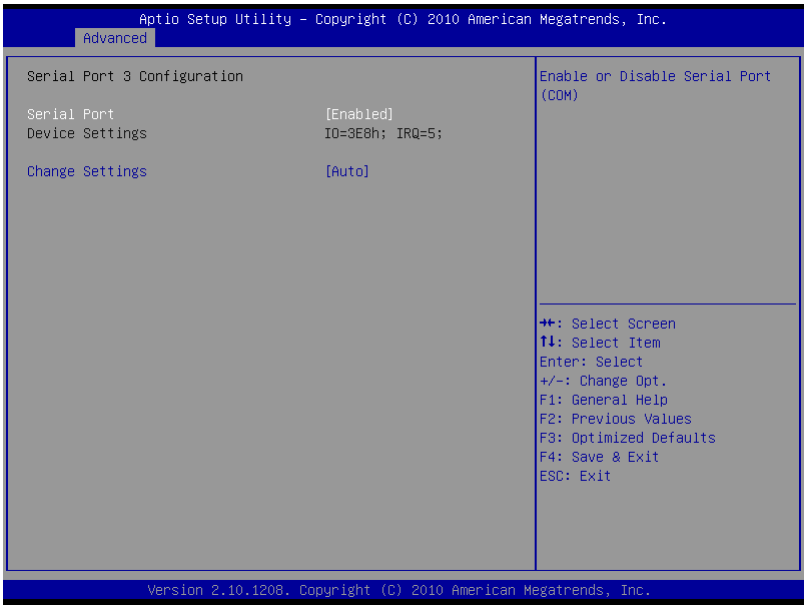
Serial Port 2 Configuration



Options Summary :

Serial Port	Enabled	Default
	Disabled	
Enable or Disable Serial Port (COM)		
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;	
Select an optimal setting for Super IO device.		

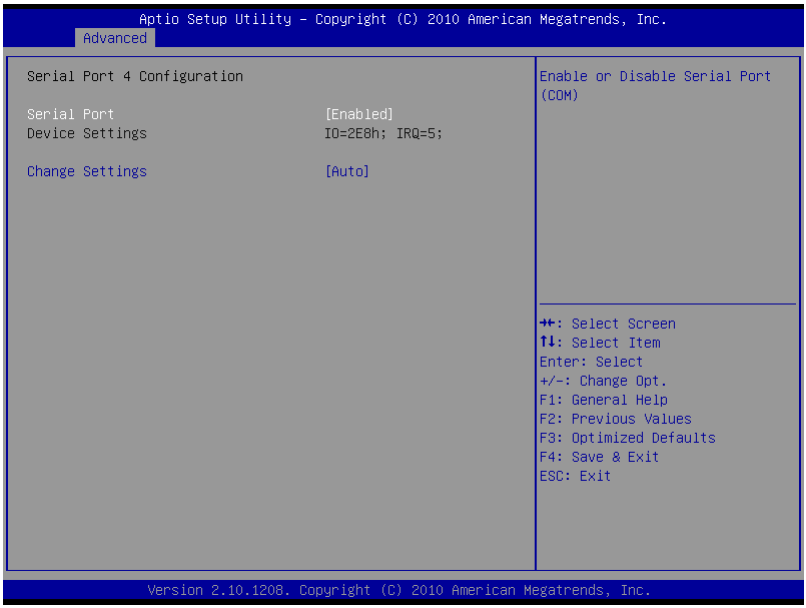
Serial Port 3 Configuration



Options Summary :

Serial Port	Enabled	Default
	Disabled	
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=3E8h; IRQ=5;	
	IO=2E8h; IRQ=5;	
	IO=2D0h; IRQ=5’	
	IO=2D8h; IRQ=5;	
Select an optimal setting for Super IO device.		

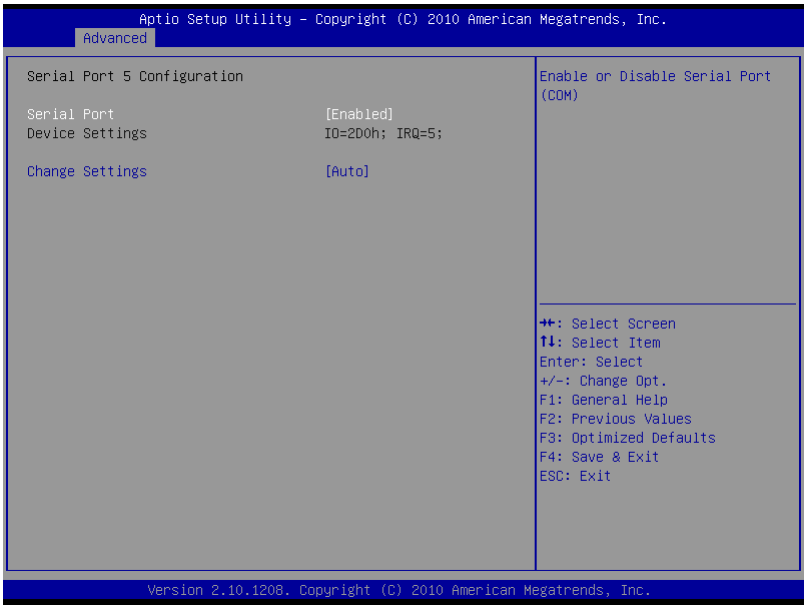
Serial Port 4 Configuration



Options Summary :

Serial Port	Enabled	Default
	Disabled	
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=2E8h; IRQ=5;	
	IO=3E8h; IRQ=5;	
	IO=2D0h; IRQ=5;	
	IO=2D8h; IRQ=5;	
Select an optimal setting for Super IO device.		

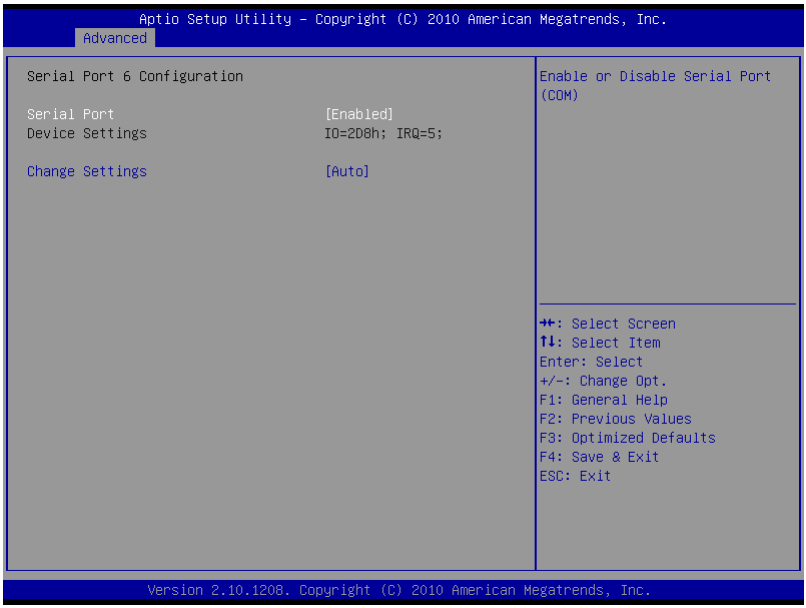
Serial Port 5 Configuration



Options Summary :

Serial Port	Enabled	Default
	Disabled	
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=2D0h; IRQ=5;	
	IO=3E8h; IRQ=5;	
	IO=2E8h; IRQ=5;	
	IO=2D8h; IRQ=5;	
Select an optimal setting for Super IO device.		

Serial Port 6 Configuration



Options Summary :

Serial Port	Enabled	Default
	Disabled	
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=2D8h; IRQ=5	
	IO=3E8h; IRQ=5;	
	IO=2E8h; IRQ=5;	
	IO=2D0h; IRQ=5;	
Select an optimal setting for Super IO device.		

H/W Monitor

```
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Advanced

Pc Health Status

PCH Outside Temperature          : +39 °C
CPU Outside Temperature          : +41 °C
CPU Inside Temperature           : +32 °C
PCH Inside Temperature           : +43 °C
VCC_CORE                         : +0.976 V
V5A_DUAL                         : +5.080 V
V5S                              : +5.080 V
V12S                             : +11.792 V
VSB5V                            : +5.304 V
VCC3V                            : +3.392 V
VSB3V                            : +3.376 V
VBAT                             : +3.344 V

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```
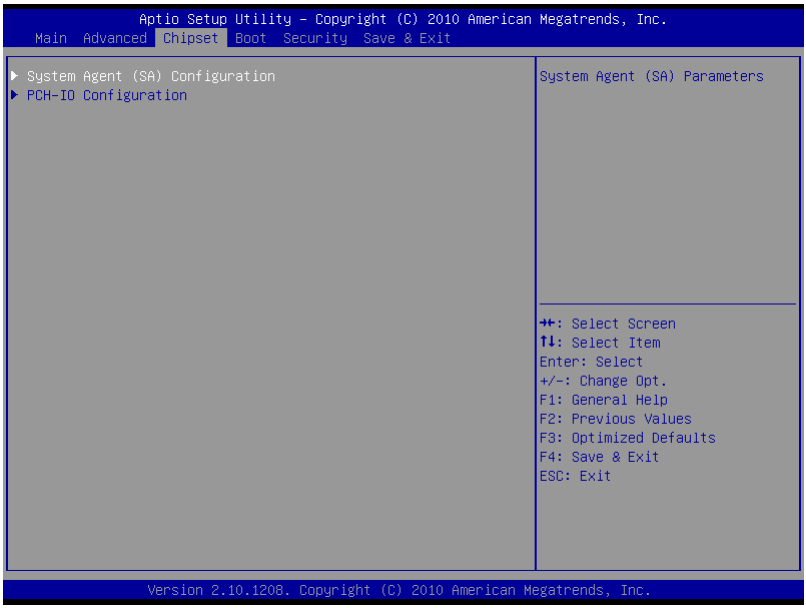
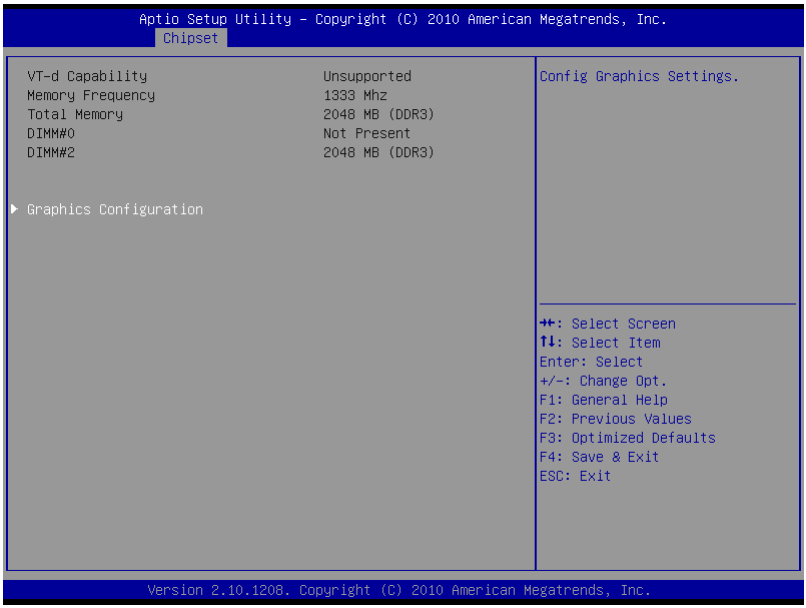

Setup submenu: Chipset



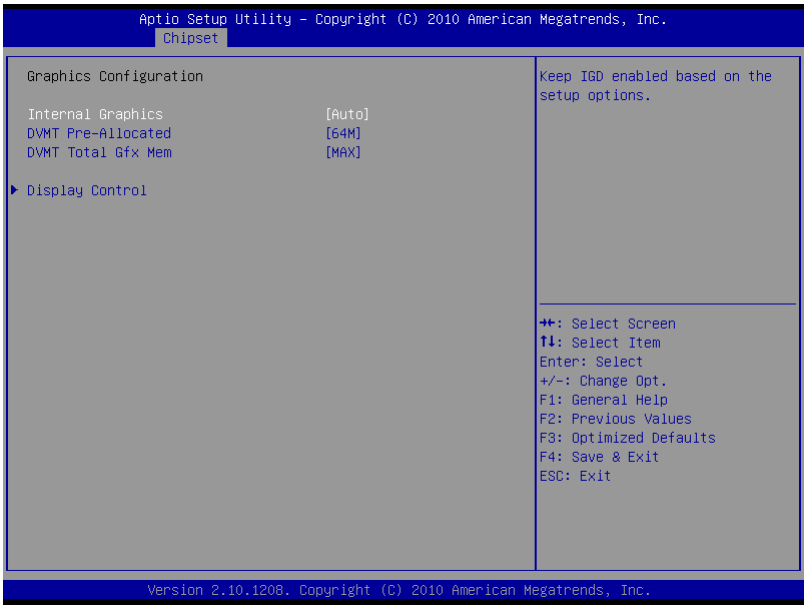
System Agent (SA) Configuration



Options Summary :

Graphics Configuration	Config Graphics Settings.

Graphics Configuration

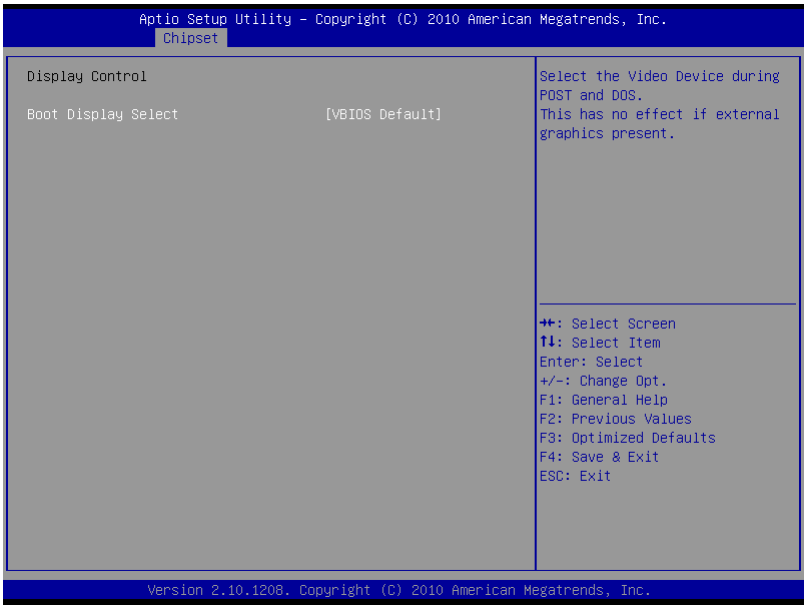


Options Summary :

Internal Graphics	Auto	Default
	Disabled	
	Enabled	
Keep IGD enabled based on the setup options.		
DVMT Pre-Allocated	0M	
	32M	
	64M	Default
	96M	
	128M	
	160M	
	192M	
	224M	
	256M	
	288M	
	320M	

	352M	
	384M	
	416M	
	448M	
	480M	
	512M	
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		
DVMT Total Gfx Men	128M	
	256M	
	MAX	Default
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.		

Display Control



Options Summary :

Boot Display Select	VBIOS Default	Default
	CRT	
	HDMI	
	DVI	
Select the Video Device during POST and DOS. This has no effect if external graphics present.		

PCH-IO Configuration

```
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Chipset

PCH-IO Configuration                                  Select power supply mode.

Power Mode                          [ATX Type]
Restore AC Power Loss               [Last State]

Azalia                              [Auto]
  Azalia Internal HDMI Codec        [Enabled]
    Azalia HDMI codec Port B        [Disabled]
    Azalia HDMI codec Port C        [Enabled]
    Azalia HDMI codec Port D        [Disabled]

PCH LAN Controller                  [Enabled]
  Wake on LAN                       [Enabled]

OnBoard LAN 2                       [Enabled]
PCIe Mini-Card 1                    [Enabled]
PCIe Mini-Card 2                    [Enabled]

                                    →←: Select Screen
                                    ↑↓: Select Item
                                    Enter: Select
                                    +/-: Change Opt.
                                    F1: General Help
                                    F2: Previous Values
                                    F3: Optimized Defaults
                                    F4: Save & Exit
                                    ESC: Exit

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```

Options Summary :

Power Mode	ATX Type	Default
	AT Type	
Select power supply mode.		
Restore AC Power Loss	Power off	
	Power on	
	Last State	Default
Select AC power state when power is re-applied after a power failure.		
Azalia	Disabled	
	Enabled	
	Auto	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 otherwise.		
Azalia Internal HDMI Codec for Azalia	Disabled	
	Enabled	Default
Enable or disable internal HDMI codec for Azalia.		
Azalia HDMI codec Port B	Disabled	Default
	Enabled	
Enable or disable internal HDMI codec Port for Azalia.		
Azalia HDMI codec Port C	Disabled	
	Enabled	Default
Enable or disable internal HDMI codec Port for Azalia.		
Azalia HDMI codec Port D	Disabled	Default
	Enabled	
Enable or disable internal HDMI codec Port for Azalia.		
PCH LAN Controller	Enabled	Default
	Disabled	
Enable or disable onboard NIC.		
Wake on LAN	Enabled	Default
	Disabled	
Enable or disable integrated LAN to wake the system.		
OnBoard LAN 2	Disabled	
	Enabled	Default
OnBoard LAN 2 RTL8111E LAN En/Disable Control		
PCIe Mini-Card 1	Disabled	
	Enabled	Default
Enable / Disable PCIe Mini-Card 1		
PCIe Mini-Card 2	Disabled	
	Enabled	Default
Enable / Disable PCIe Mini-Card 2		

Setup submenu: Boot

```
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Main  Advanced  Chipset  Boot  Security  Save & Exit

Boot Configuration                                  Enables or disables Quiet Boot
Quiet Boot                          [Enabled]       option
Launch I82579LM PXE OpROM           [Disabled]
Launch RTL8111E PXE OpROM           [Disabled]

Boot Option Priorities
Boot Option #1                      [UEFI: USB 2.0 SD/M...]
Boot Option #2                      [USB 2.0 SD/MMC Rea...]

Hard Drive BBS Priorities

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```
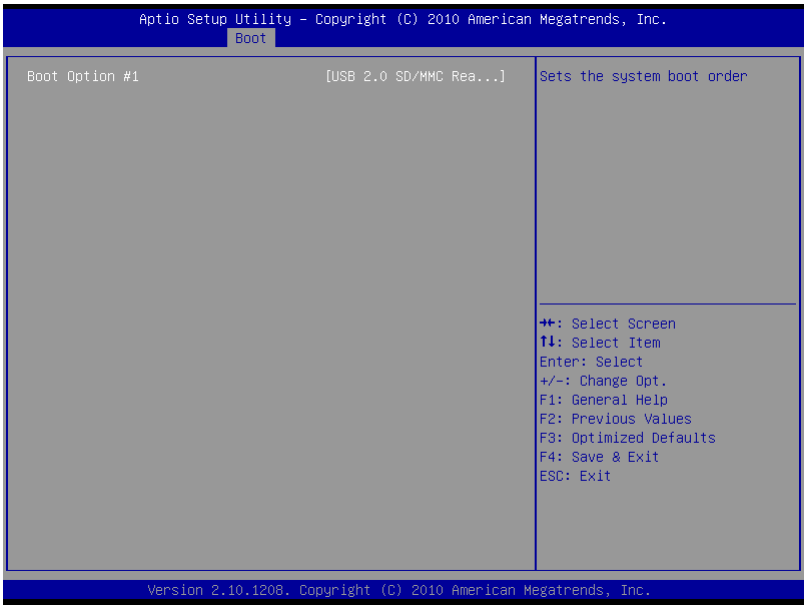
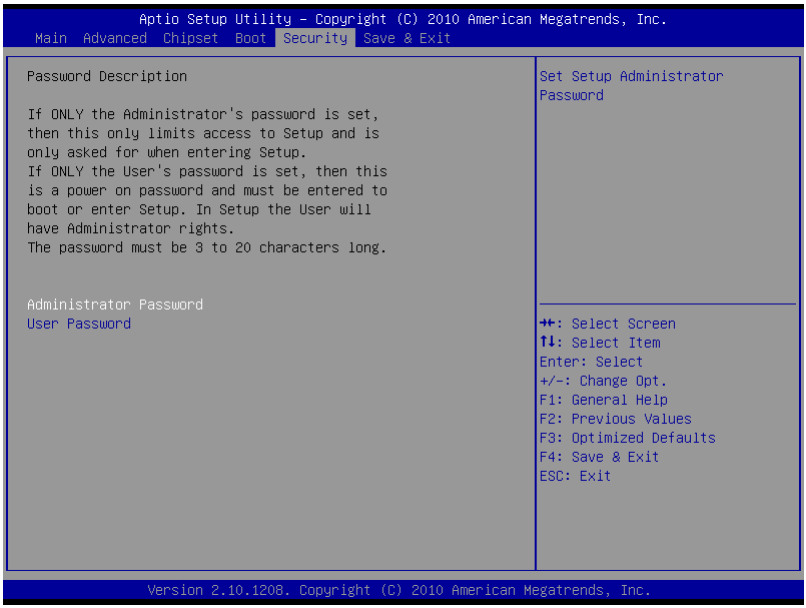

Options Summary :

Quiet Boot	Disabled	
	Enabled	Default
Enables or disables Quiet Boot option		
Launch I82579LM PXE OpROM	Disabled	Default
	Enabled	
Enable or Disable Legacy Boot Option for I82579LM.		
Launch RTL8111E PXE OpROM	Disabled	Default
	Enabled	
Enable or Disable Legacy Boot Option for RTL8111E		
Boot options #X	Your storage/disk devices	
Sets the system boot order		

Hard Drives BBS Priorities



Submenu: 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

```
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Main  Advanced  Chipset  Boot  Security  Save & Exit

Save Changes and Reset                  Reset the system after saving
Discard Changes and Reset               the changes.

Restore Defaults
Save as User Defaults
Restore User Defaults

                                        →←: Select Screen
                                        ↑↓: Select Item
                                        Enter: Select
                                        +/-: Change Opt.
                                        F1: General Help
                                        F2: Previous Values
                                        F3: Optimized Defaults
                                        F4: Save & Exit
                                        ESC: Exit

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```

Chapter

4

Driver Installation

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The AEC-6967 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 Audio Driver

Step 4 – Install LAN Driver

Step 5 – Install ME Driver

Step 6 – Install RAID & AHCI Driver

Step 7 – Install TPM Driver

Step 8 – Install Serial Port Driver (Optional)

Note: If you got compatible issue for COM port, please find its driver under STEP 8 folder and then install it by administrative login permission.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the AEC-6967 DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 8 in order.

Step 1 – Install Chipset Driver

1. Click on the ***STEP 1-CHIPSET*** folder and double click on the ***infinst_autol.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 ***STEP2-VGA*** 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

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

dotNet Framwork folder.

Step 3 –Install Audio Driver

1. Click on the ***STEP3-AUDIO*** folder and select the OS folder your system is
2. Double click on the ***.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 4 –Install LAN Driver

1. Click on the ***STEP4-LAN*** folder and select the folder of ***intel_82579*** or ***realtek_8111E*** based on the LAN chipset in your system.
2. Select the OS folder your system is located in the chipset folder, then double click on ***.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 5 – Install ME Driver

1. Click on the ***STEP5-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 6 – Install RAID & AHCI Driver

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

Step 7 – Install TPM Driver

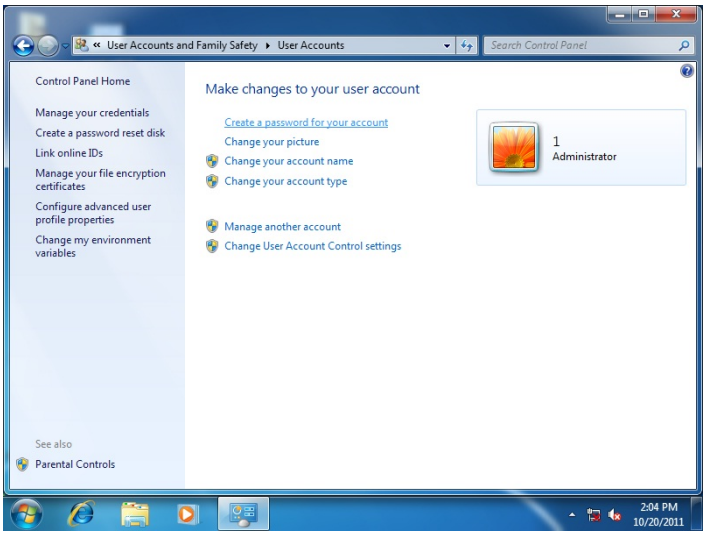
1. Click on the ***STEP7-TPM*** folder and double click on the ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 8 –Install Serial Port Driver (Optional)

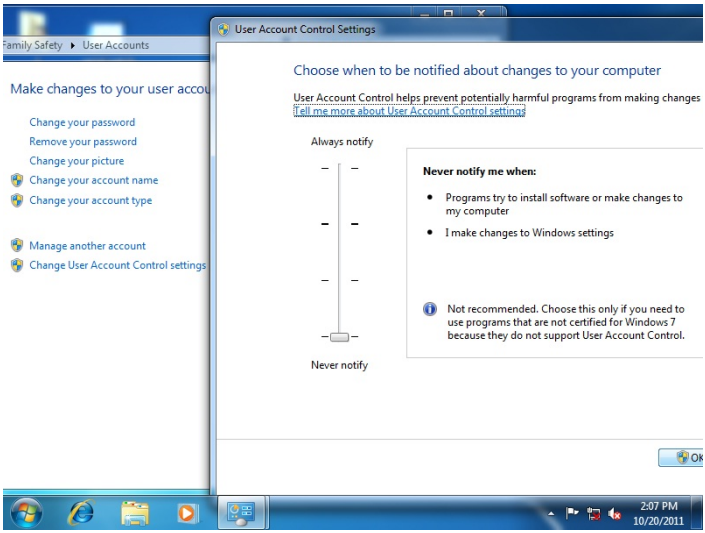
For Windows® XP 32-bit, select the folder of ***WINXP_32*** and double click on the ***patch.bat***

For Windows® 7, please refer to the installation procedures below.

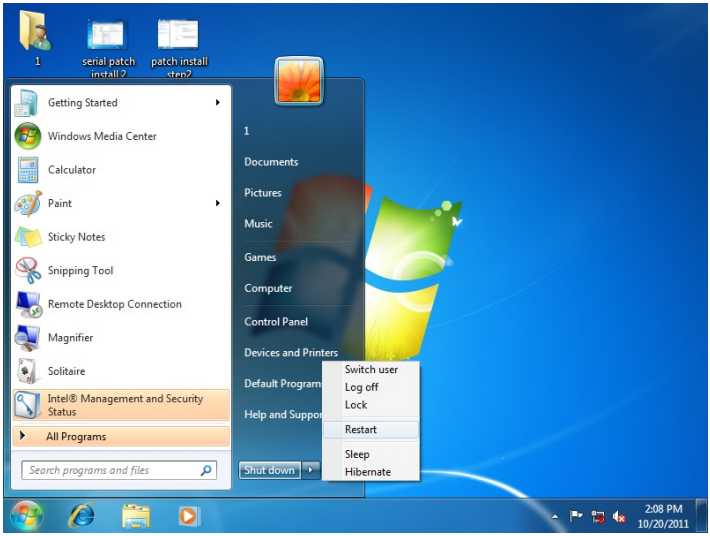
1. Create a password for Administrator account.



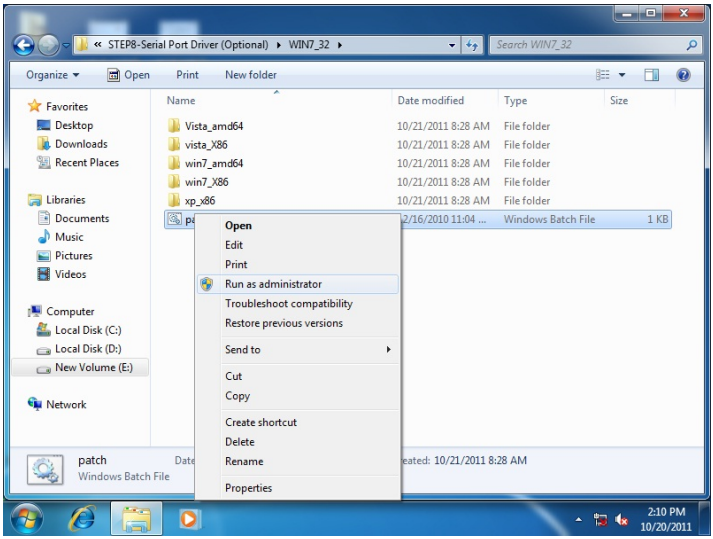
2. Change User Account Control Settings to [Never notify]

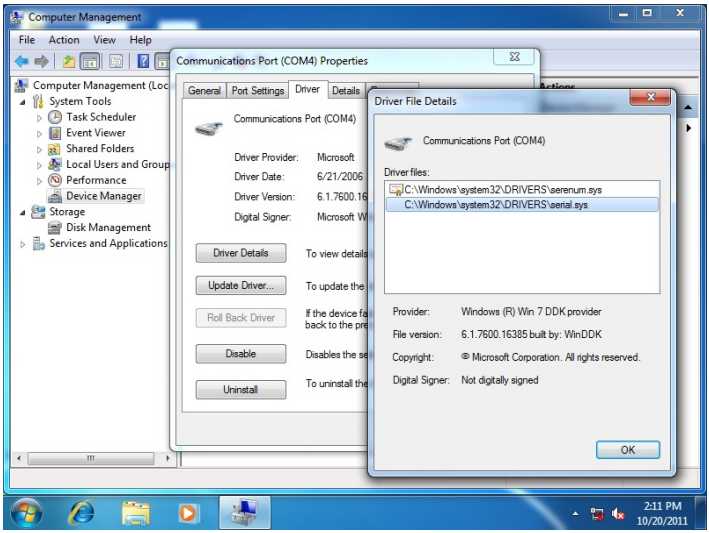


3. Reboot and Administrator login.



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

- Input/output (IO)
  - [00000000 - 00000CF7] PCI bus
  - [00000D00 - 0000FFFF] PCI bus

B.2 Memory Address Map

- Memory
  - [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 - 201FFFFF] System board
  - [40000000 - 401FFFFF] System board
  - [7DA00000 - FEAFFFFF] PCI bus
  - [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 - FEEFFFFF] Motherboard resources
  - [FF000000 - FFFFFFFF] Intel(R) 82802 Firmware Hub Device

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) 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
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (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) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22
(PCI) 0x00000010 (16) Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D
(PCI) 0x00000010 (16) Intel(R) Management Engine Interface
(PCI) 0x00000013 (19) Standard Dual Channel PCI IDE Controller
(PCI) 0x00000013 (19) Standard Dual Channel PCI IDE Controller
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26
(PCI) 0xFFFFFFF8 (-8) Realtek PCIe GBE Family Controller #8
(PCI) 0xFFFFFFF9 (-7) Intel(R) 82579LM Gigabit Network Connection #2
(PCI) 0xFFFFFFFA (-6) Intel(R) HD Graphics
(PCI) 0xFFFFFFFB (-5) Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 2 - 1C12
(PCI) 0xFFFFFFFC (-4) Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 1 - 1C10
(PCI) 0xFFFFFFFD (-3) PCI Express standard Root Port
(PCI) 0xFFFFFFFE (-2) PCI Express standard Root Port

B.4 DMA Channel Assignments

Direct memory access (DMA)
4 Direct memory access controller

Appendix

C

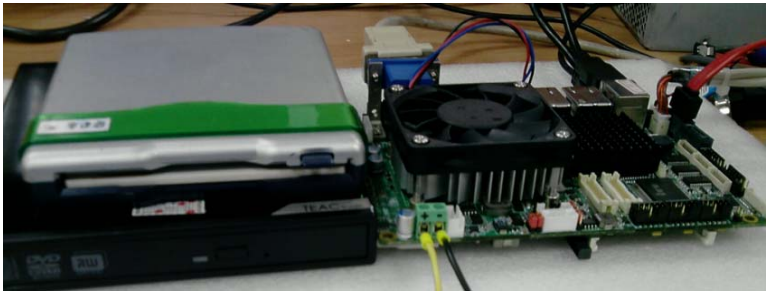
RAID & AHCI Settings

C.1 Setting RAID

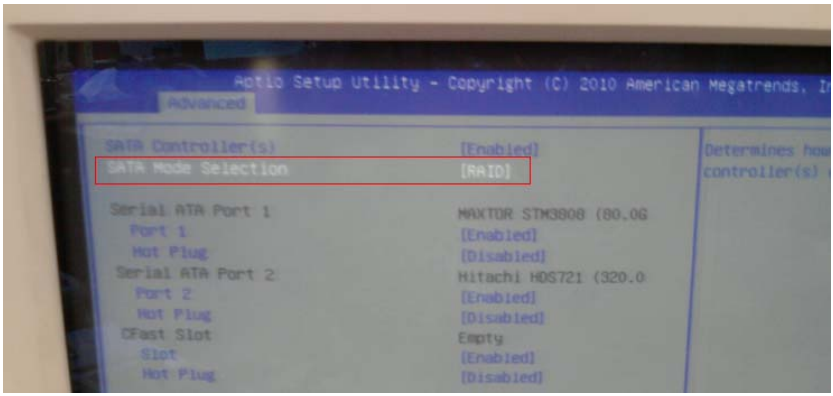
OS installation to setup RAID mode

Step 1: Copy the files below from the Driver CD: STEP 6 - RAID&AHCI\WINXP_32 to Disk.

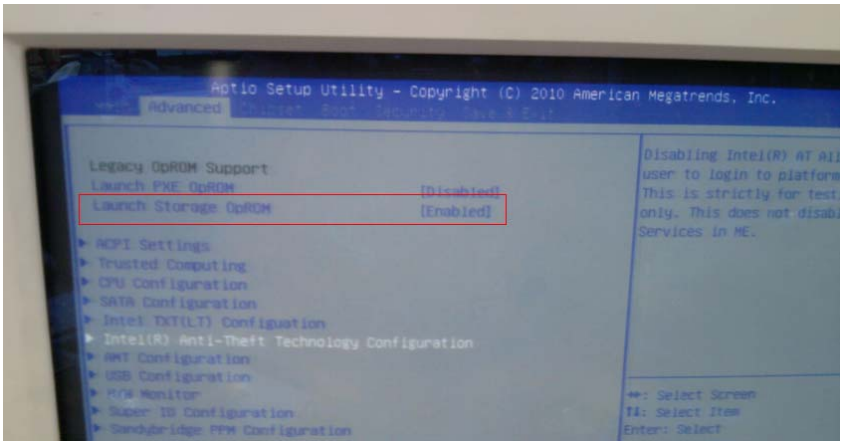
Step 2: Connect the USB Floppy (Disk with the RAID&AHCI files) to the board.



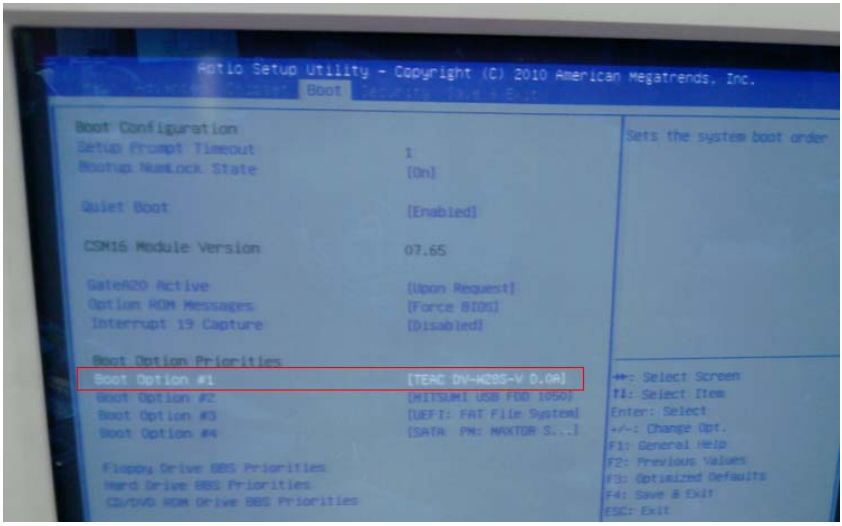
Step 3: The setting procedures "**In BIOS Setup Menu**": Select **Advanced -> SATA Configuration -> SATA Mode Selection -> RAID**



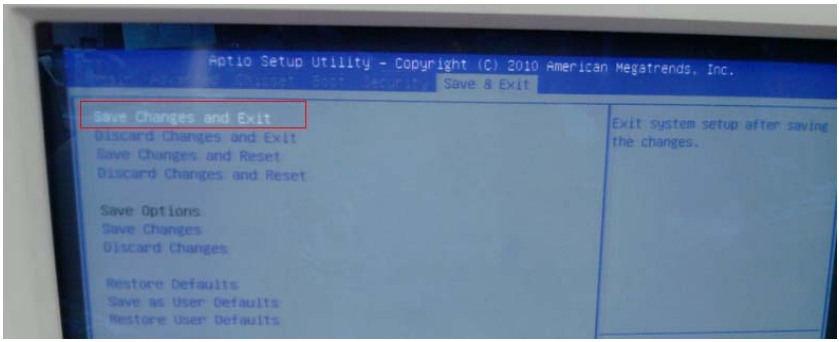
Step 4: Select **Advanced** -> **Launch Storage OpROM** -> **Enabled**



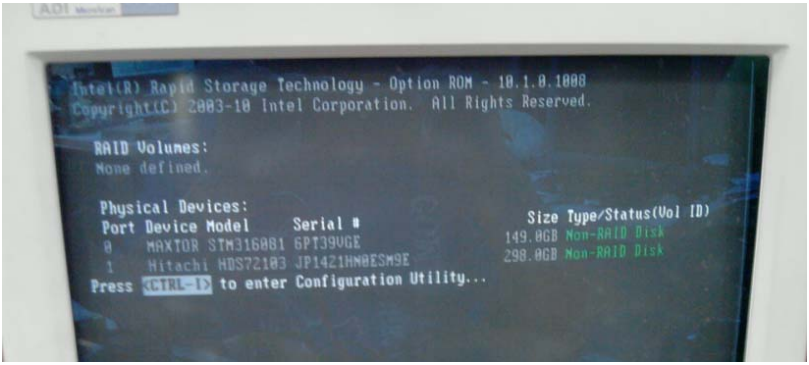
Step 5: Select **Boot** -> **Boot Option #1** -> **DVD ROM Type**



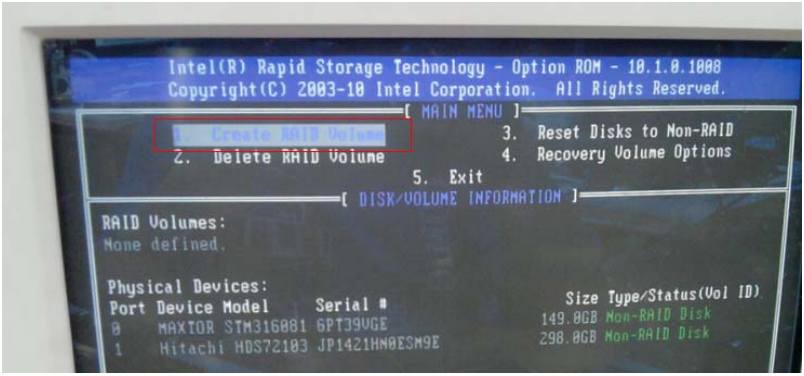
Step 6: Select **Save & Exit** -> **Save Changes and Exit**



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

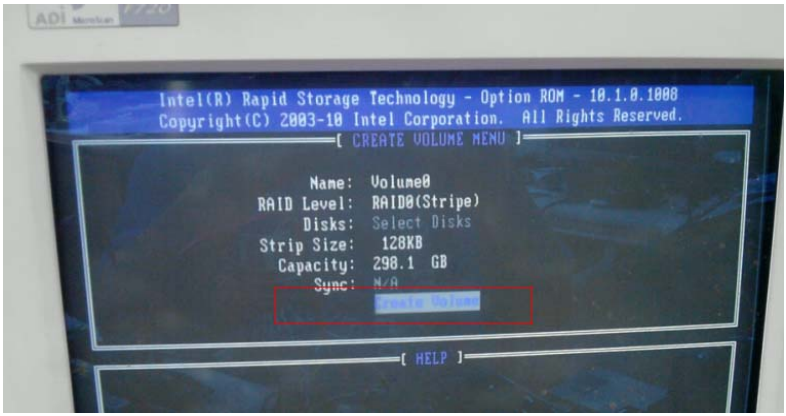


Step 8: Select “**1. Create RAID Volume**”

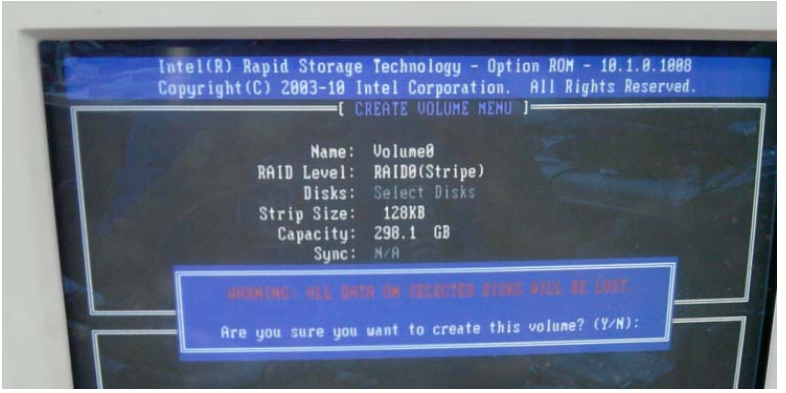


Step 9: Select **RAID Level -> RAID0(Stripe)**

Step 10: Select "**Create Volume**"

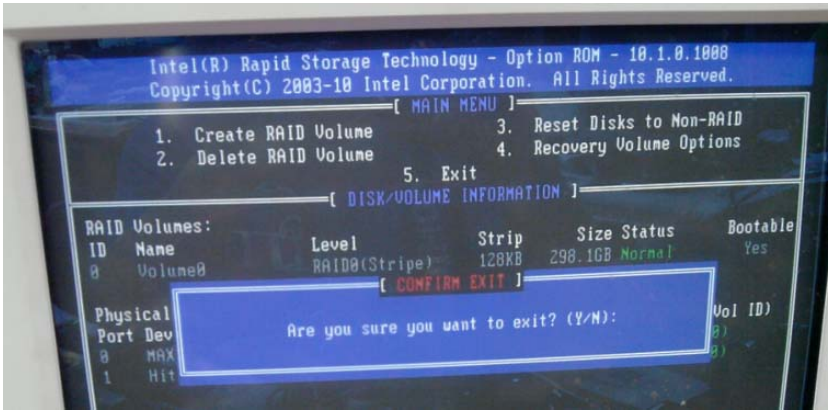


Step 11: Type “**Y**” for confirmation

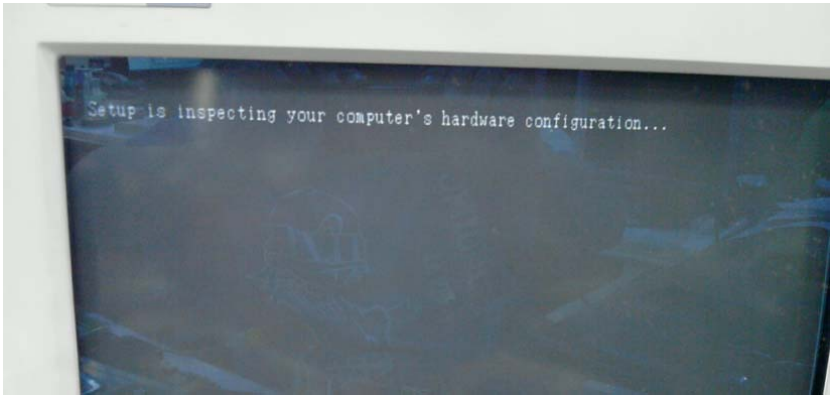


Step 12: Select “**5. Exit**”

Step 13: Choose "**Y**"

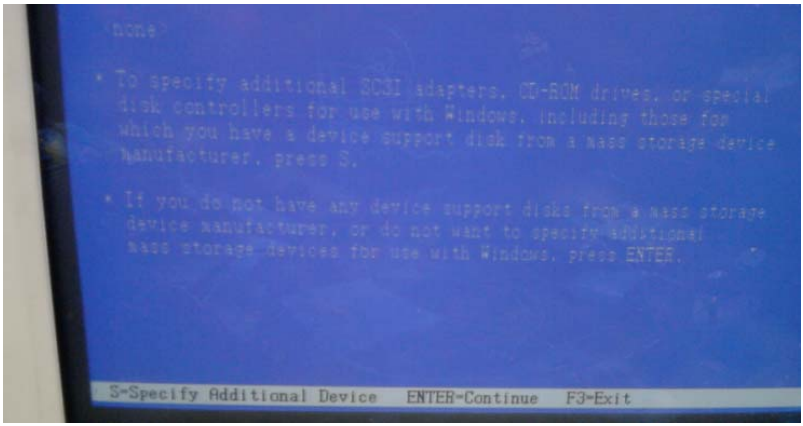


Step 14: Setup OS

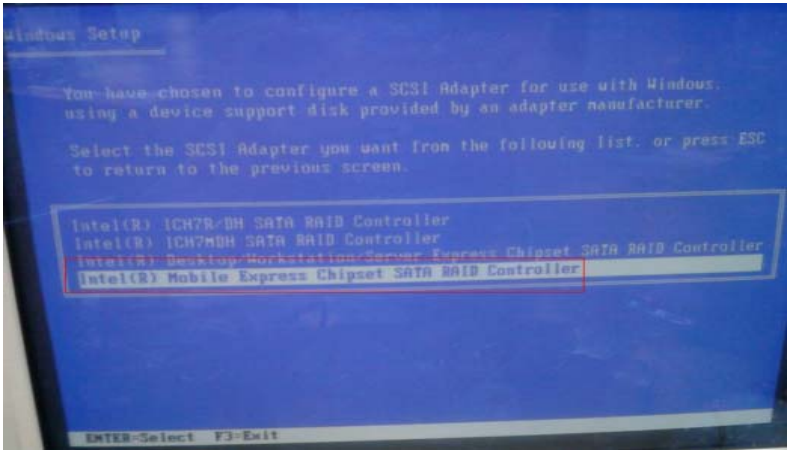


Step 15: Press “**F6**”

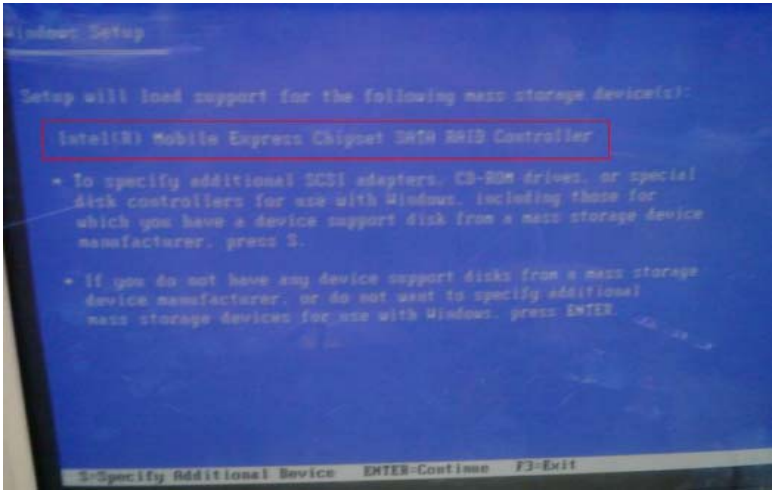
Step 16: Choose “**S**”



Step 17: Select the "**Intel® Mobile Express Chipset SATA RAID Controller**"



Step 18: Select "ENTER" after choosing the model number.



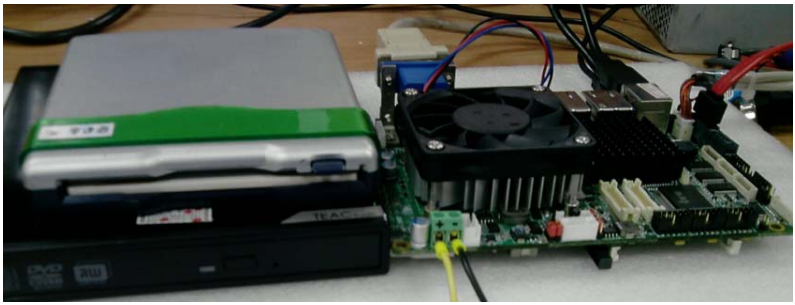
Step 19: Setup is loading files.

C.2 Setting AHCI

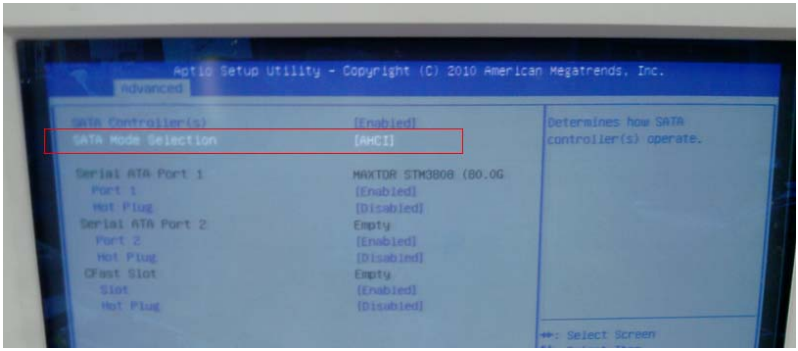
OS Installation to Setup AHCI mode

Step 1: Copy the files below from the Driver CD: STEP 6 - RAID&AHCI\WINXP_32 to Disk.

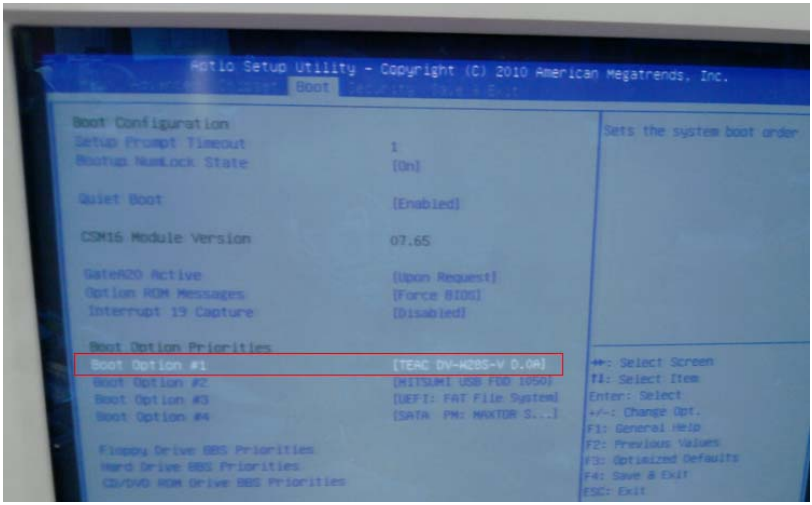
Step 2: Connect the USB Floppy Disk with the RAID&AHCI files to the board.



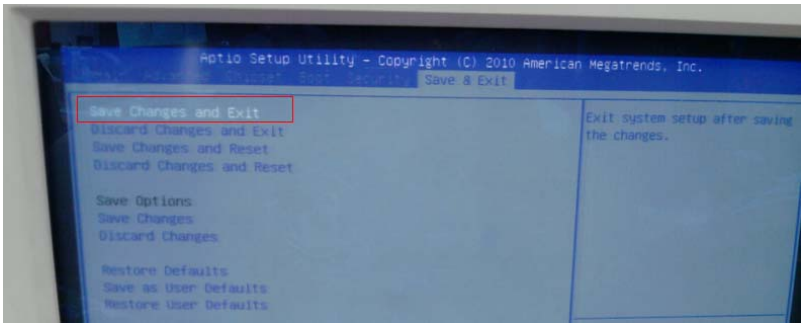
Step 3: To install **"In BIOS Setup Menu"**, select **Advanced** -> **SATA Configuration** -> **SATA Mode Selection** -> **AHCI**



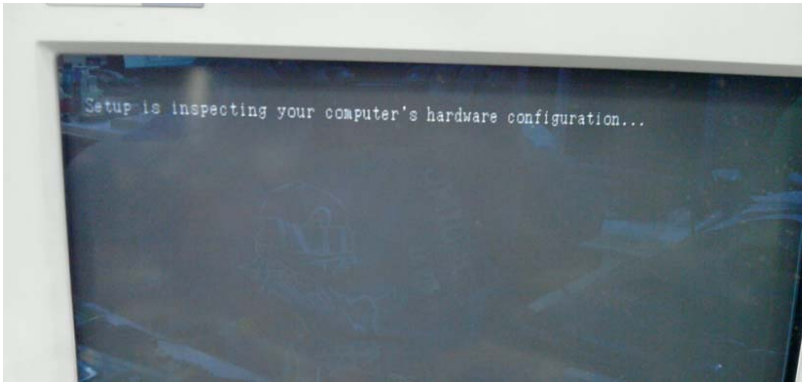
Step 4: Next, select **Boot** -> **Boot Option #1** -> **DVD ROM Type**



Step 5: To save, select **Save & Exit** -> **Save Changes and Exit**

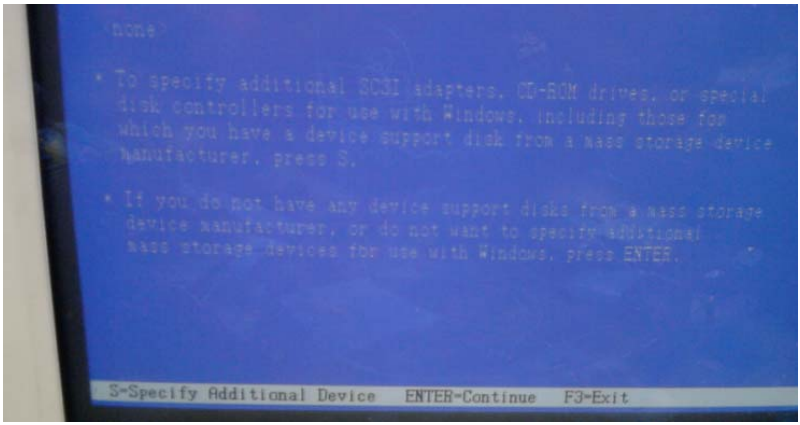


Step 6: Setup OS

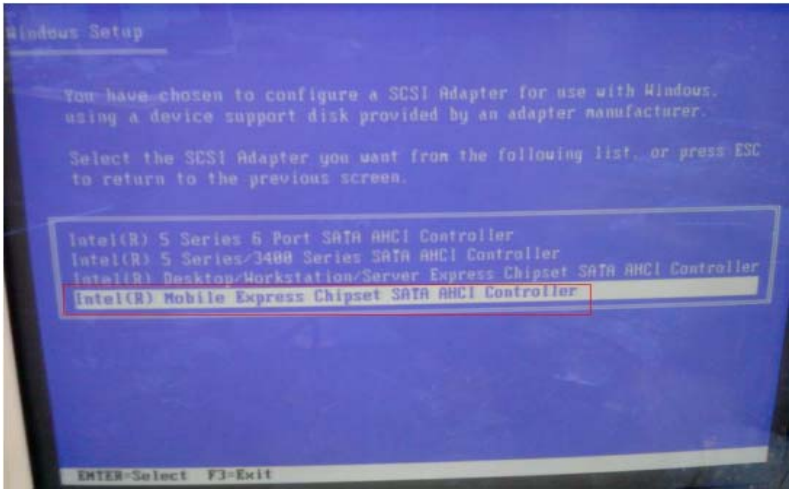


Step 7: Press “**F6**”

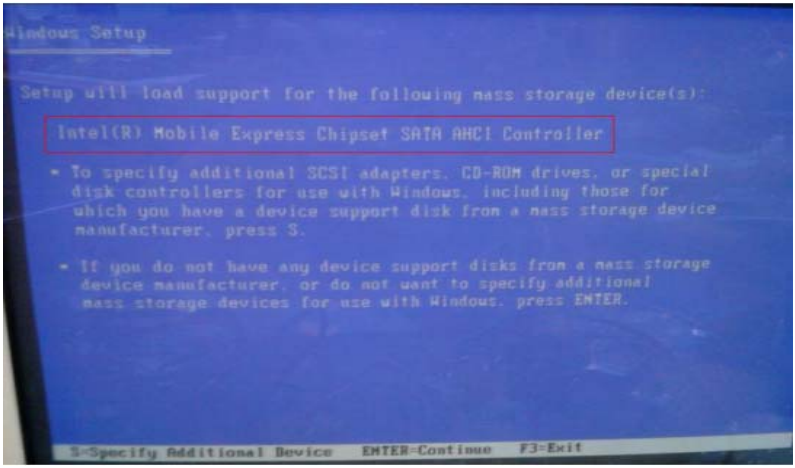
Step 8: Choose “**S**”



Step 9: Choose “Intel® Mobile Express Chipset SATA AHCI Controller



Step 10: Select “ENTER” to choose the model number



Step 11: Setup is loading files

Appendix

D

Electrical Specifications for I/O Ports

D.1 DIO Programming

AEC-6967 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_P#1 Pin Status	**0x06**(Note3)	**0x8A**(Note4)	**0**(Note5)		GPIO80
DIO_P#2 Pin Status	**0x06**(Note6)	**0x8A**(Note7)	**1**(Note8)		GPIO81
DIO_P#3 Pin Status	**0x06**(Note9)	**0x8A**(Note10)	**2**(Note11)		GPIO82
DIO_P#4 Pin Status	**0x06**(Note12)	**0x8A**(Note13)	**3**(Note14)		GPIO83
DIO_P#5 Pin Status	**0x06**(Note15)	**0x8A**(Note16)	**4**(Note17)		GPIO84
DIO_P#6 Pin Status	**0x06**(Note18)	**0x8A**(Note19)	**5**(Note20)		GPIO85
DIO_P#7 Pin Status	**0x06**(Note21)	**0x8A**(Note22)	**6**(Note23)		GPIO86
DIO_P#8 Pin Status	**0x06**(Note24)	**0x8A**(Note25)	**7**(Note26)		GPIO87

Table 3 : Digital Output relative register table					
	LDN	**Register**	**BitNum**	**Value**	**Note**
DIO_P#5 Output Data	**0x06**(Note43)	**0x89**(Note44)	**4**(Note45)	(Note46)	GPIO84
DIO_P#6 Output Data	**0x06**(Note47)	**0x89**(Note48)	**5**(Note49)	(Note50)	GPIO85
DIO_P#7 Output Data	**0x06**(Note51)	**0x89**(Note52)	**6**(Note53)	(Note54)	GPIO86
DIO_P#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    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();
}
*****************************************************************************************
```