AEC-6402

Embedded Controller

Intel® Atom™ N2600 1.6GHz Processor

2 USB2.0, 2 COM, 1 Mini-HDMI

1 CANBus, 1 mSATA

AEC-6402 Manual 1st Ed.
April 25, 2014

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Packing List

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

- 1 AEC-6402 Embedded Controller
- 1 Burn-Proof Bracket
- 3 RJ-45 to Dsub cable
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 mini-HDMI to HDMI cable
- 1 Power Adapter

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。

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Chapter

1

General Information

1.1 Introduction

AAEON introduces the slimmest product in the Boxer series, AEC-6402, which utilizes the Intel® Atom™ N2600 processor: this embedded controller expands its graphics performance greatly with the newest generation of Atom™ processors.

So far, there is no other boxer PC can be so tiny and slim like AEC-6402, not even Pico-ITX system. With this tiny dimension form factor, customers can fit it almost everywhere, and it provides quite a lot of I/O ports for basic applications. AEC-6402 adopts fanless design for high reliability to fit in most rugged environment. It also provides wireless communication features and it's really convenient for customers to build up network connection at all locations and markets.

The AEC-6402 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 diversified markets.

1.2 Features

- Intel® Atom™ N2600 1.6 GHz Processor
- Intel® NM10 Express chipset
- Worldwide Slimmest fanless Boxer: Compact design: (system 125 x 77 x 20mm)
- Uniform I/O ports: USB & RJ-45, CANBus Connector
- mini-HDMI connector for HDMI output
- Anti-drop power connector design
- RJ45 for COM port
- Aluminum CNC enclosure
- Fanless System Design

1.3 Specifications

● CPU		Intel® Atom™ N2600 1.6 GHz
● Chipset		Intel® NM10
● System Memory		DDR3 SODIMM x 1, Max. 2 GB, support DDR3 800/1066
● Display Interface	VGA	—
	DVI	—
	HDMI	Mini HDMI x 1
	Others	—
● Storage Device	SSD	Half-size mSATA
	HDD	—
● Network	LAN	Gigabit Ethernet
	Wireless	Optional
● Front I/O	USB Host	USB2.0 x 2
	LAN	—
	Serial Port	—
	DIO	—
	KB/MS	—
	Others	Mini HDMI x 1 for HDMI, 2-pin for CANBus, Power button
● Rear I/O	USB Host	—
	LAN	RJ-45 x 2
	Serial Port	RJ-45 x 2 for RS-232/422/485

	Others	DC-jack w/ lock for power input
● Expansion	Mini Card	—
	Mini PCI	—
	Others	Onboard USB Pin header x 2
● Indicator	Front	System LED x 1
	Rear	—
● Power Requirement		12V DC in with lockable connector
● Power Consumption		Intel® Atom™ N2600 1.6GHz, 0.79A @ +12V
● System Cooling		Passive cooling
● Mounting		VESA 75/100, DIN-Rail
● Operating Temperature		32°F ~ 104°F (0°C ~ 40°C) (without airflow) 32°F ~ 122°F (0°C ~ 50°C) (with airflow)
● Storage Temperature		-4°F ~ 158°F (-20°C ~ 70°C)
● Anti-Vibration		3 g rms/ 5~500 Hz/ operation–mSATA
● Anti-Shock		50 G peak acceleration (11 msec. duration) –mSATA
● MTBF		50,000
● Certification	EMC	CE/FCC Class A
● Dimension (W x H x D)		4.92” x 3.03” x 0.79” (125mm x 77mm x 20mm)
● Gross Weight		2.64 lb (1.2 Kg)

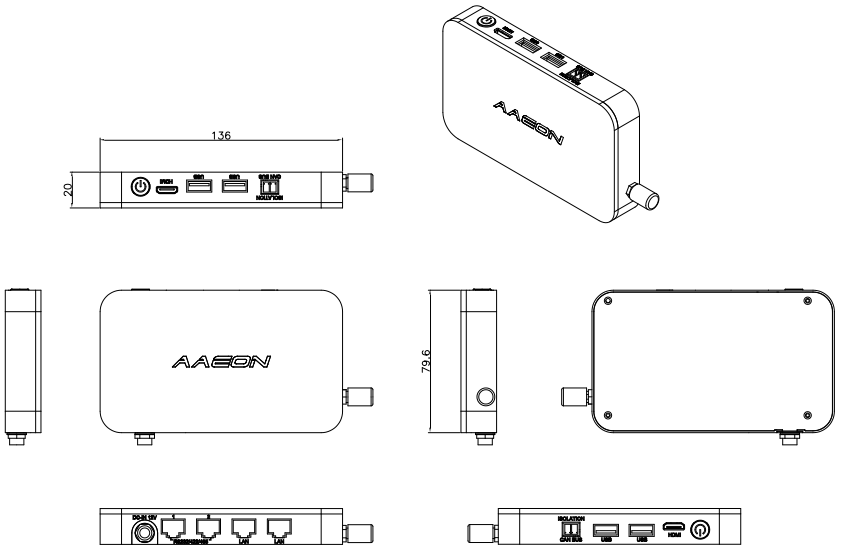
● OS Support	Windows® XP Embedded, Windows® XP, Windows® 7, Windows® Embedded Standard 7

Chapter

2

Hardware Installation

2.1 Dimension and I/O of AEC-6402



2.2 List of Jumpers

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

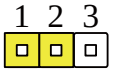
Label	Function
JP2	Clear CMOS
JP6	AT/ATX Mode Selection

2.3 List of Connectors

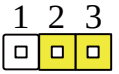
The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	CAN BUS Flash Pin header
CN10	LPC Expansion I/F
CN11	CAN BUS Connector
CN12	RJ-45 Ethernet RTL8111E
CN13	RJ-45 Ethernet RTL8111E
CN17	Mini HDMI TYPE C
CN21	COM1 RS-232/422/485
CN22	COM2 RS-232/422/485
CN25	USB Port 1 Connector
CN26	USB Port 2 Connector
CN27	USB Pin header
BAT1A	Battery Connector
DIMM1	DDR3 SODIMM Slot
PCIEA	mSATA Mini-Card Slot

2.4 Clear CMOS Jumper (JP2)



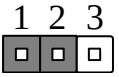
Normal (Default)



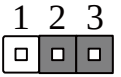
Clear CMOS

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

2.5 AT/ATX Power Supply Mode Selection (JP6)



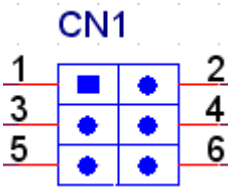
AT Mode



ATX Mode(Default)

JP6	Function
1-2	AT Mode
2-3	ATX Mode (Default)

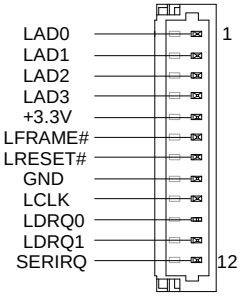
2.6 CAN BUS FLASH PIN HEADER (CN1)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	+3.3V
2	TDO		

3	TCK	
4	TDI	
5	GND	GND
6	TMS	

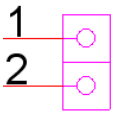
2.7 LPC Port (CN10)



Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	LDRQ0	IN	

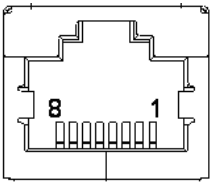
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

2.8 CAN BUS Port (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	CAN0H	DIFF	
2	CAN0L	DIFF	

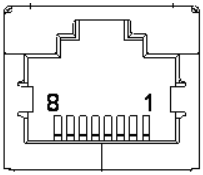
2.9 Realtek LAN (RJ-45) Port (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	

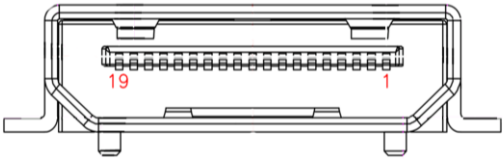
8	MDI3-	DIFF

2.10 Realtek LAN (RJ-45) Port (CN13)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

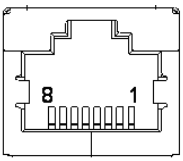
2.11 HDMI Type C (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	

2	HDMI_TX2+	DIFF	
3	HDMI_TX2-	DIFF	
4	GND	GND	
5	HDMI_TX1+	DIFF	
6	HDMI_TX1-	DIFF	
7	GND	GND	
8	HDMI_TX0+	DIFF	
9	HDMI_TX0-	DIFF	
10	GND	GND	
11	HDMI_CLK+	DIFF	
12	HDMI_CLK-	DIFF	
13	GND	GND	
14	NC	NC	
15	HDMI_DDC_CLK	I/O	+5V
16	HDMI_DDC_DATA	I/O	+5V
17	NC	NC	
18	DPD_HPD	IN	
19	DPD_PWR	PWR	+5V

2.12 COM1,COM2 RS-232/422/485 (RJ-45) Port (CN21, CN22)



Pin	RS-232	RS-422	RS-485
1	DSR		
2	RTS		
3	GND		
4	TX		RX+
5	RX	DATA+	TX+
6	DCD	DATA-	TX-
7	CTS		
8	DTR		RX-

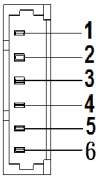
2.13 USB 2.0 Port 1 (CN25)

Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB4_D-	DIFF	
3	USB4_D+	DIFF	
4	GND	GND	

2.14 USB 2.0 Port 2 (CN26)

Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB4_D-	DIFF	
3	USB4_D+	DIFF	
4	GND	GND	

2.15 USB 2.0 Port 3 (CN27)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	
5	NC	NC	
6	WIR_DIS	SINGLE	

2.16 DDR3 SODIMM Slot (DIMM1)

Standard specification

2.17 mSATA Mini-Card Slot (PCIEA)

Pin	Pin Name	Signal Type	Signal Level
1	NC		
2	+3.3V	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	NC		

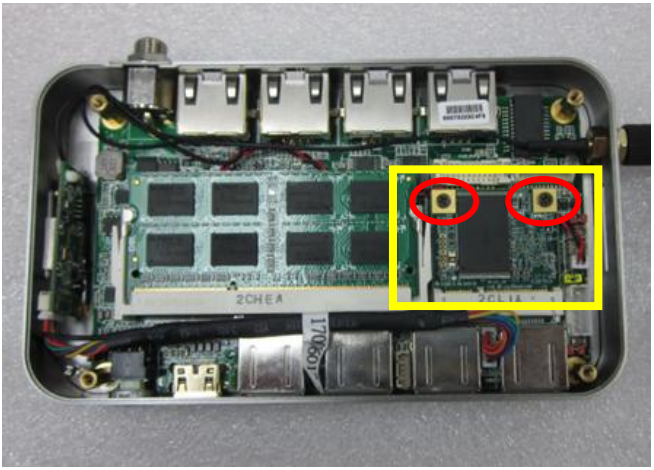
8	NC		
9	GND	GND	
10	NC		
11	NC		
12	NC		
13	NC		
14	NC		
15	GND	GND	
16	NC		
17	NC		
18	GND	GND	
19	NC		
20	NC		
21	GND	GND	
22	NC		
23	mSATA_RX+	DIFF	
24	+3.3V	PWR	+3.3V
25	mSATA_RX-	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	mSATA_TX	DIFF	

32	SMB_DATA	I/O	+3.3V
33	mSATA_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	NC		
37	GND	GND	
38	NC		
39	+3.3V	PWR	+3.3V
40	GND	GND	
41	+3.3V	PWR	+3.3V
42	NC		
43	NC		
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3V	PWR	+3.3V

2.18 mSATA Storage Installation

Step 1: Remove the 4pcs M2*4 screws in the bottom case.

Step 2: Install the mSATA module (screw in 2 pcs M2 x 3).

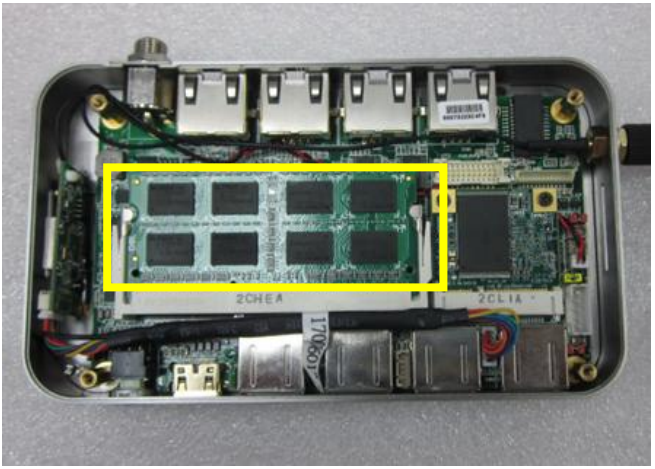


Step 3: Fasten the M4 x 4 screws in the bottom case.

2.19 DRAM Installation

Step 1: Remove the 4pcs M2*4 screws in the bottom case.

Step 2: Install the DRAM module.



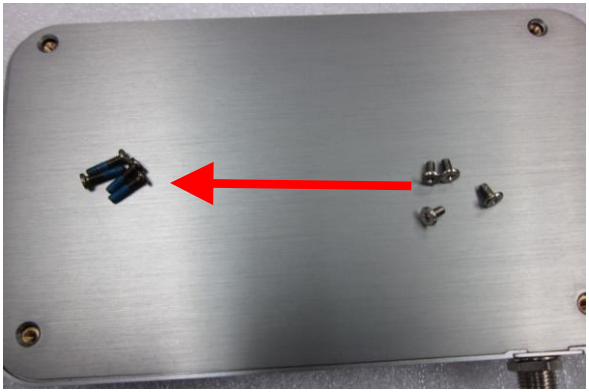
Step 3: Fasten the M4 x 4 screws in the bottom case.

2.20 Mounting Bracket& burn-Proof bracket installation

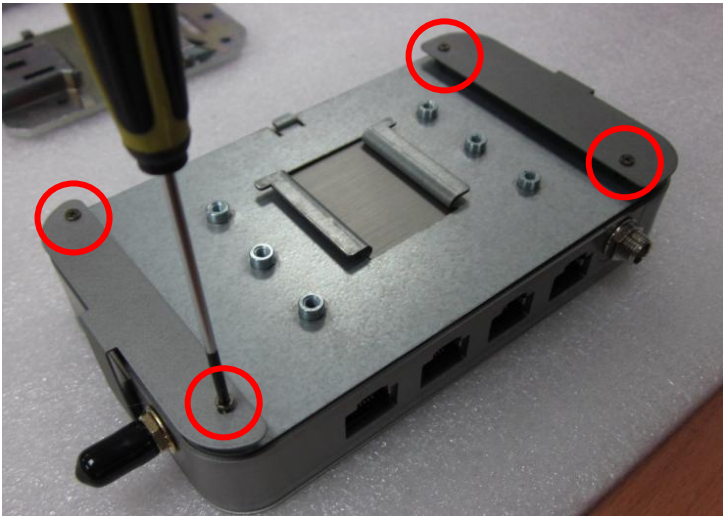
- Mounting bracket is the middle device for DIN-RAIL & VESA-Mount.
- Burn-Proof bracket is crucial for protective use. It's recommended to install for safety.

Step 1: Remove the 4pcs M2*4 screws in the bottom case.

Step 2: Use the longer M2*8 screws in the accessory pack to replace the M2*4 screws.



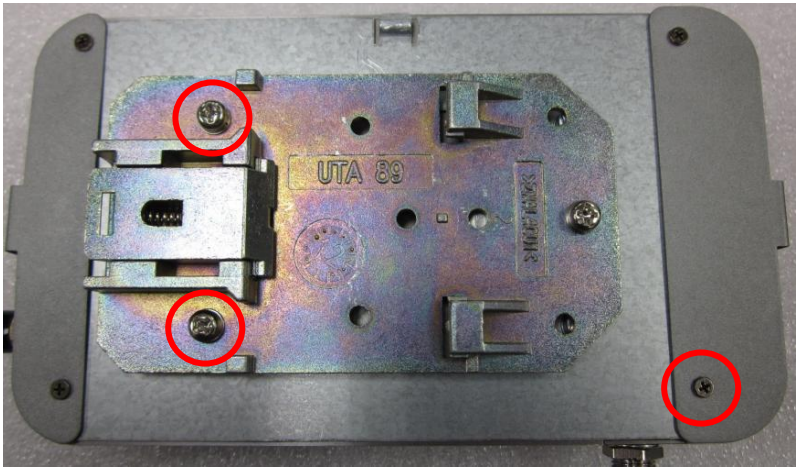
Step 3: Then fasten the screws and install both the Mounting Bracket and Burn-Proof bracket as the following graphics show.



Step 4: The installation complete photo is shown below.

2.21 DIN-RAIL bracket Installation

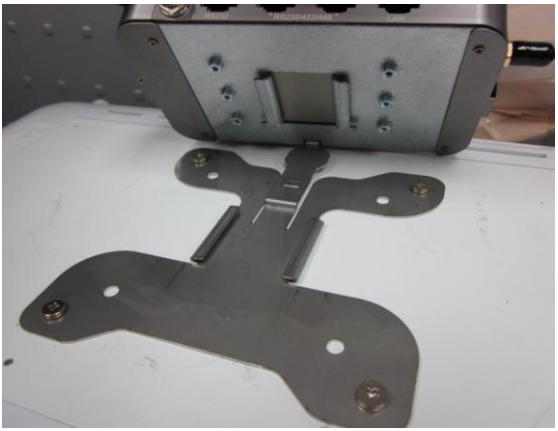
Step 1: First, please install the Mounting Bracket and Burn-proof bracket as the above section 2.4 shows. Then fasten the 3 pcs M3*6 screws to install DIN-RAIL bracket.



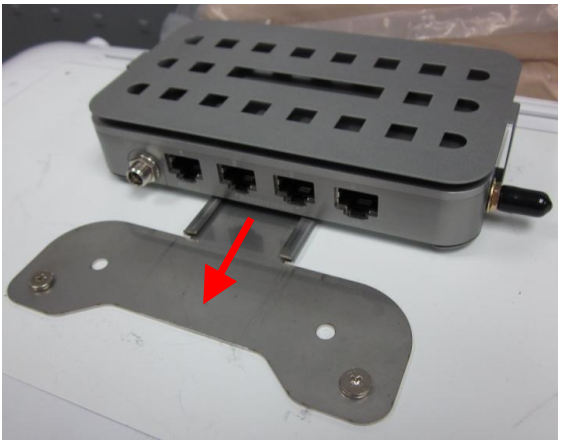
Step 2: The side-view of the installation complete photo is shown below.

2.22 VESA-Mount bracket Installation (for Display Panels)

Step 1: First, please install the Mounting Bracket and Burn-proof bracket as the above section 2.4 shows. Then start to install the VESA-Mount bracket for Display Panels.

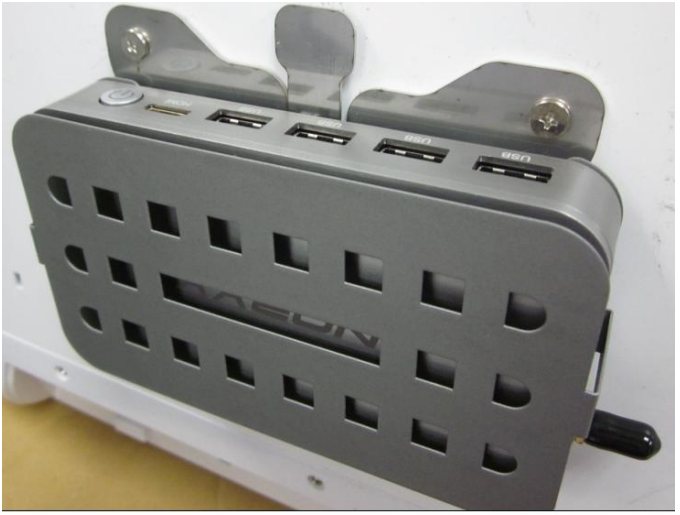


Step 2: Align the AEC-6402 with the VESA-Mount bracket through the rail. Then smoothly push the AEC-6402 to fit in the bracket.



Step 3: The installation complete photos are shown below.

Bottom View



Top View

Chapter

3

AMI BIOS Setup

3.1 System Test and Iinitialization

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-6402 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

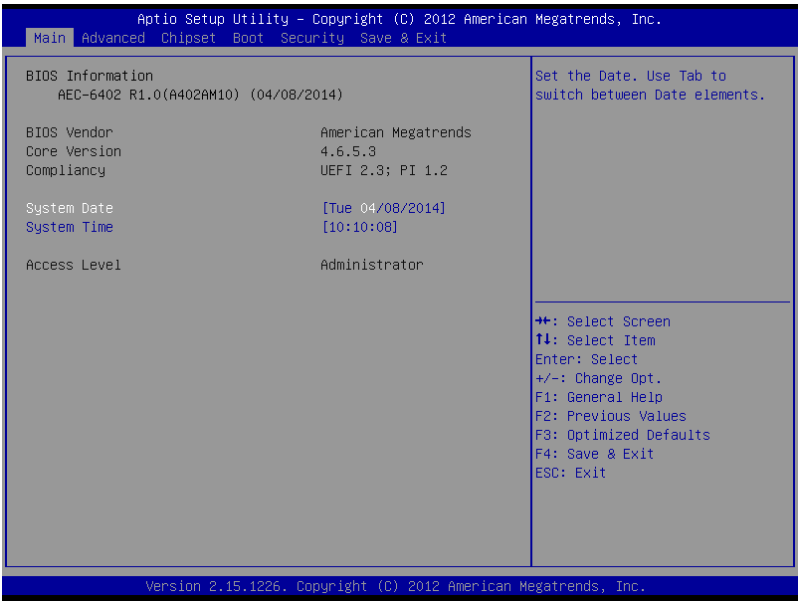
Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

Setup Menu

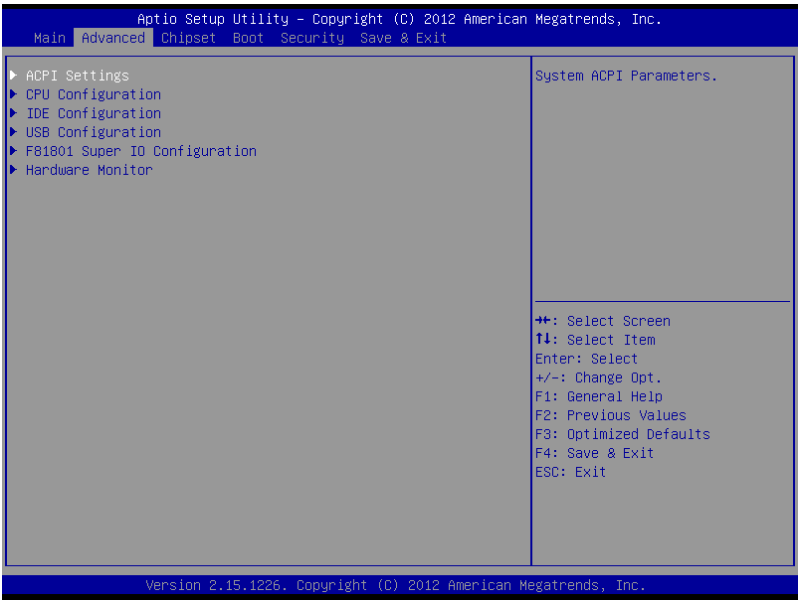
Setup submenu: Main



Options summary: (***default setting***)

System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

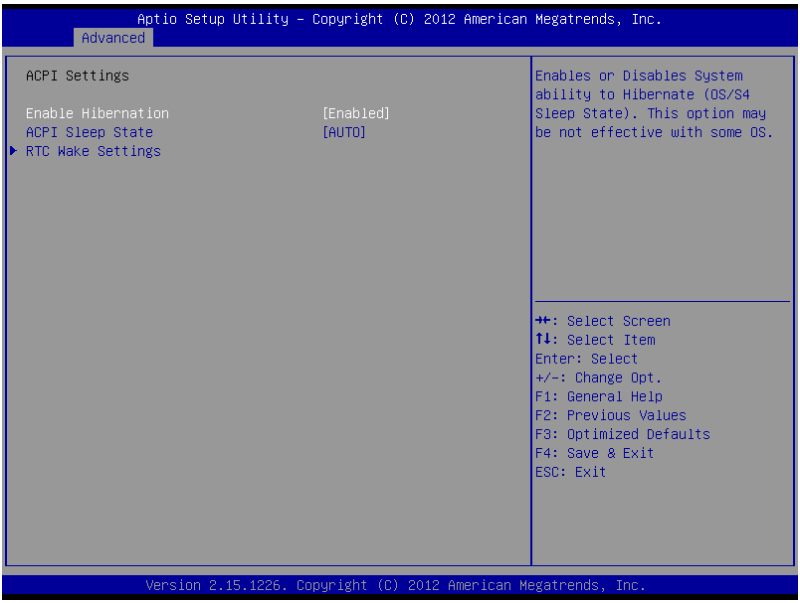


Options summary: (***default setting***)

ACPI Settings		
System ACPI Parameters		
CPU Configuration		
CPU Configuration Parameters		
IDE Configuration		
IDE Device Options Settings		
USB Configuration		
USB Configuration Parameters		
F81801 Super IO Configuration		

System Super IO Parameters		
H/W Monitor		
Monitor hardware status		

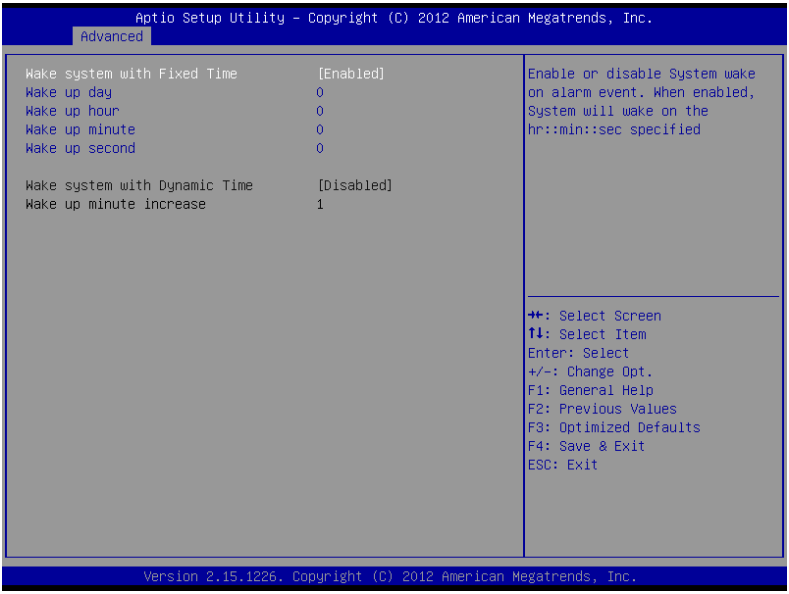
ACPI Settings



Options summary: (***default setting***)

Enable Hibernation	***Enabled***	
	Disabled	
Enabled or disabled hibernate (OS/S4 Sleep State).		
ACPI Sleep State	Suspend Disabled	
	S1 only(CPU Stop Clock)	
	S3 only(Suspend to RAM)	
	AUTO	
Select the ACPI state used for System Suspend		
RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

RTC Wake Settings



Options summary: (***default setting***)

Wake system with Fixed Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	

Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

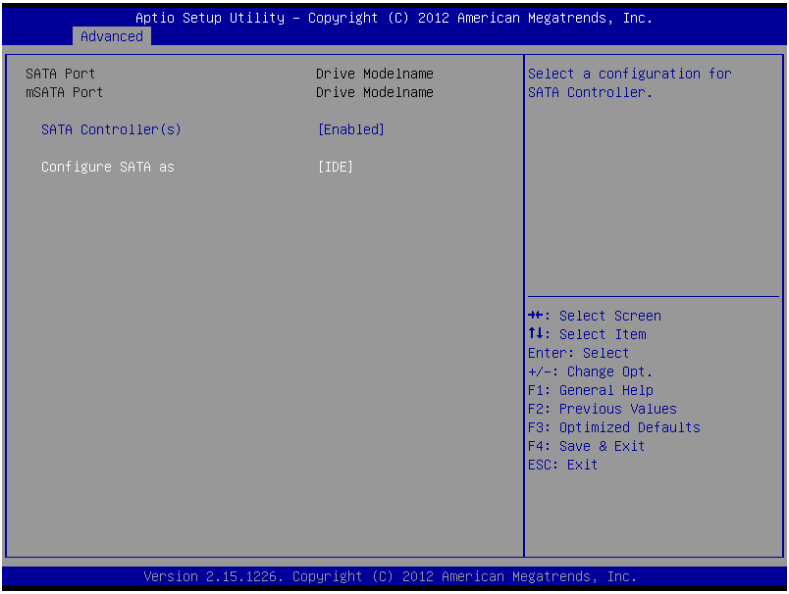
CPU Configuration

Options summary: (***default setting***)

Hyper-Threading	Disabled	
	Enabled	
En/Disable CPU Hyper-Threading function		
Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
Limit CPUID Maximum	***Disabled***	
	Enabled	
Disabled for Windows XP		
CPU Smart Thermal Control	***Disabled***	

	55	
	60	
	65	
	70	
CPU will reduce frequency automatically when CPU temperature higher than the setting value.		

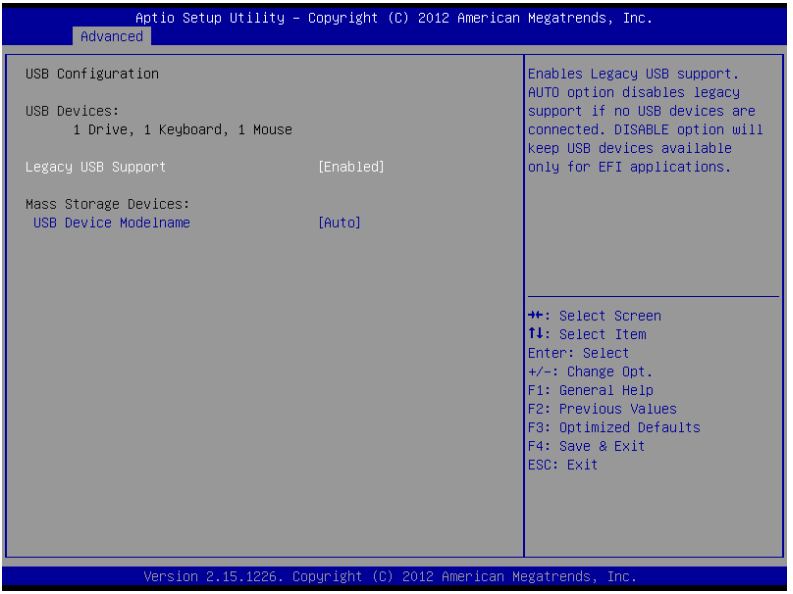
IDE Configuration



Options summary: (***default setting***)

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA controller		
Configure SATA as	IDE	
	AHCI	
Configure SATA controller operating as IDE/AHCI mode.		

USB Configuration



Options summary: (***default setting***)

Legacy USB Support	***Enabled***	
	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. DISABLE option will keep USB devices available only for EFI application		
Device Name (Emulation Type)	**Auto**	
	Floppy	

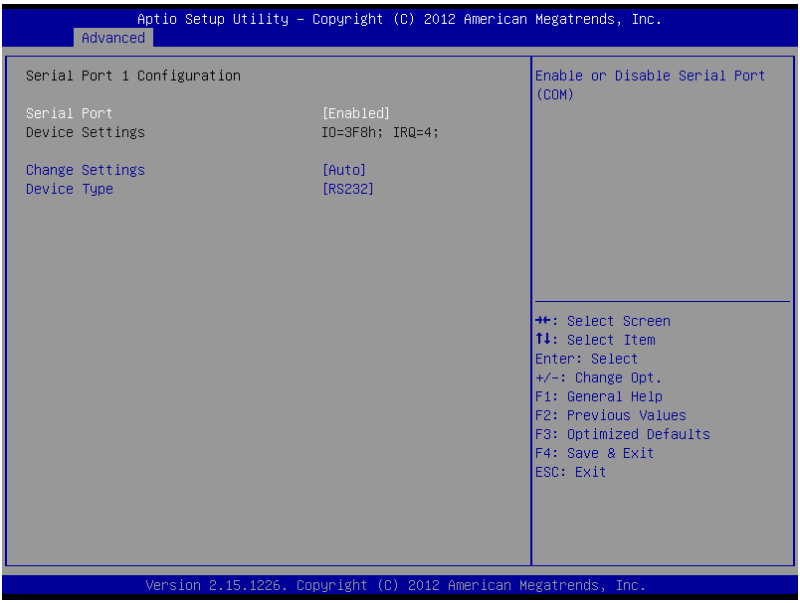
	Forced FDD	
	Hard Disk	
	CD-ROM	
If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)		

F81801 Super IO Configuration

Options summary: (***default setting***)

Serial Port 1/2 Configuration		
Set Parameters of Serial Port 1/2		

Serial Port 1 Configuration

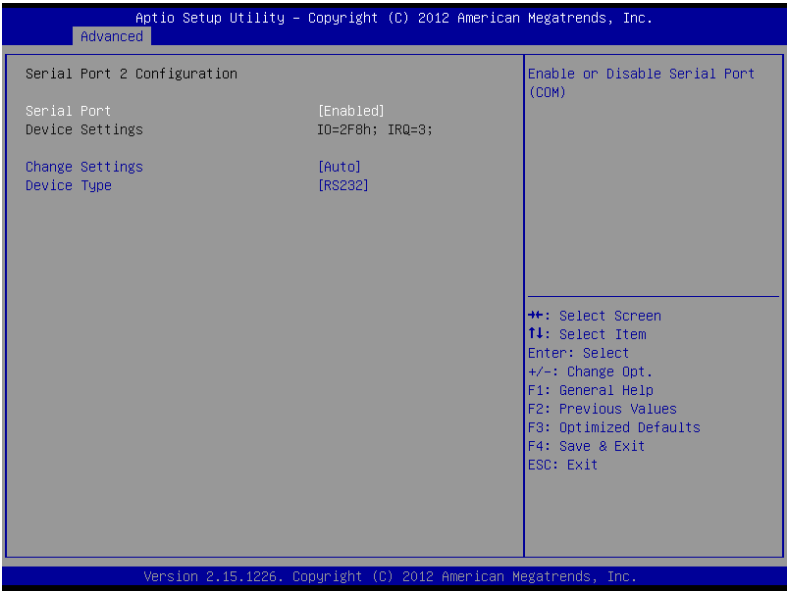


Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	

Select a resource setting for Super IO device.		
Device Type	***RS232***	
	RS422	
	RS485	
Configure COM2 operated as RS232, RS422 or RS485.		

Serial Port 2 Configuration

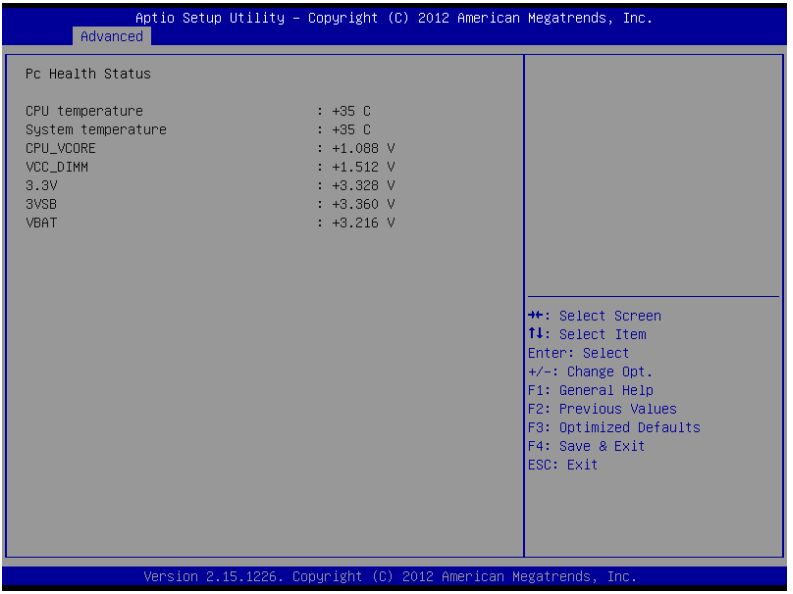


Options summary: (***default setting***)

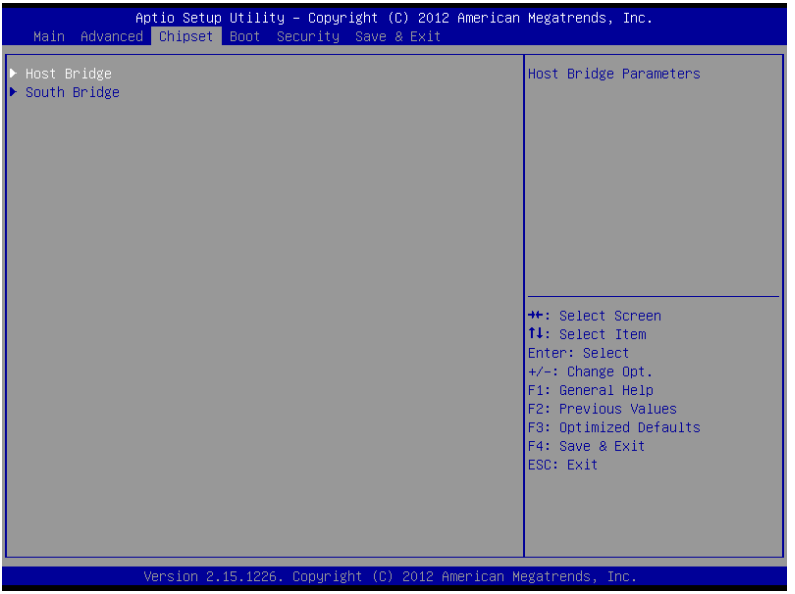
Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	

Select a resource setting for Super IO device.		
Device Type	***RS232***	
	RS422	
	RS485	
Configure COM2 operated as RS232, RS422 or RS485.		

H/W Monitor


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
CPU temperature : +35 C
System temperature : +35 C
CPU_VCORE : +1.088 V
VCC_DIMM : +1.512 V
3.3V : +3.328 V
3VSB : +3.360 V
VBAT : +3.216 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

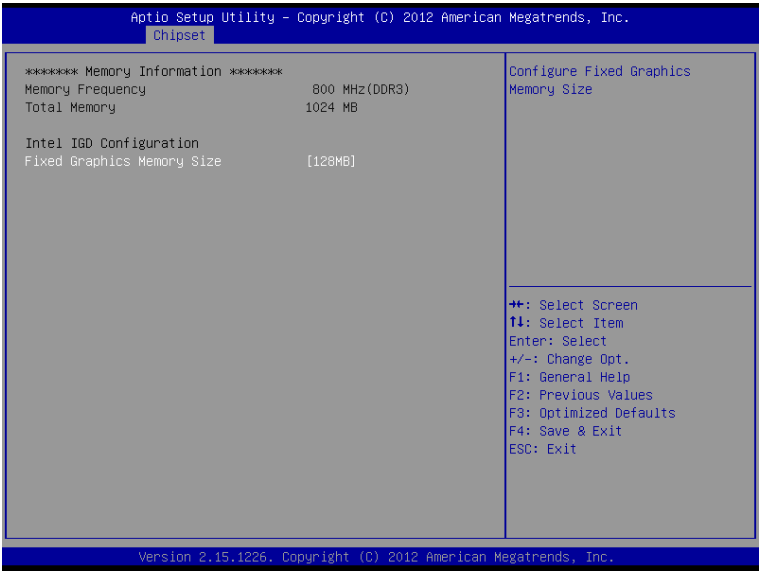
Setup submenu: Chipset



Options summary: (***default setting***)

Host Bridge		
Host Bridge Parameters		
South Bridge		
South Bridge Parameters		

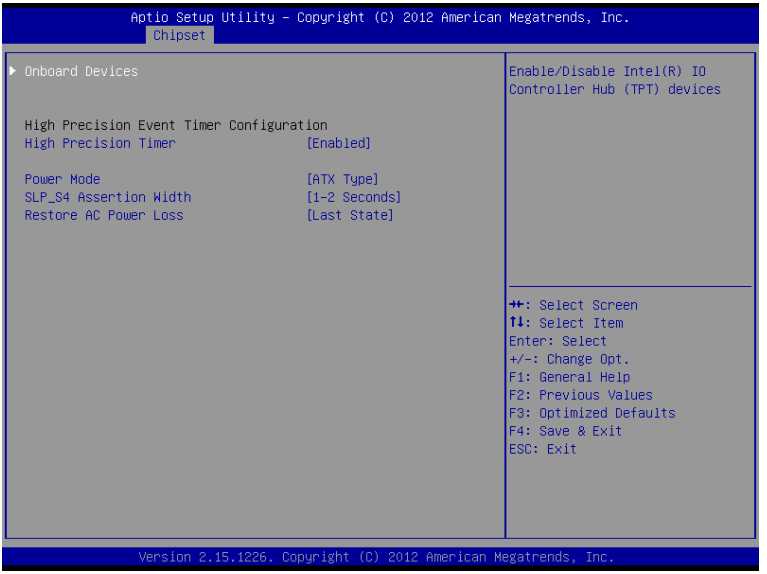
Host Bridge



Options summary: (***default setting***)

Fixed Graphics Memory Size	***128MB***	
	256MB	
Configure Fixed Graphics Memory Size		

South Bridge

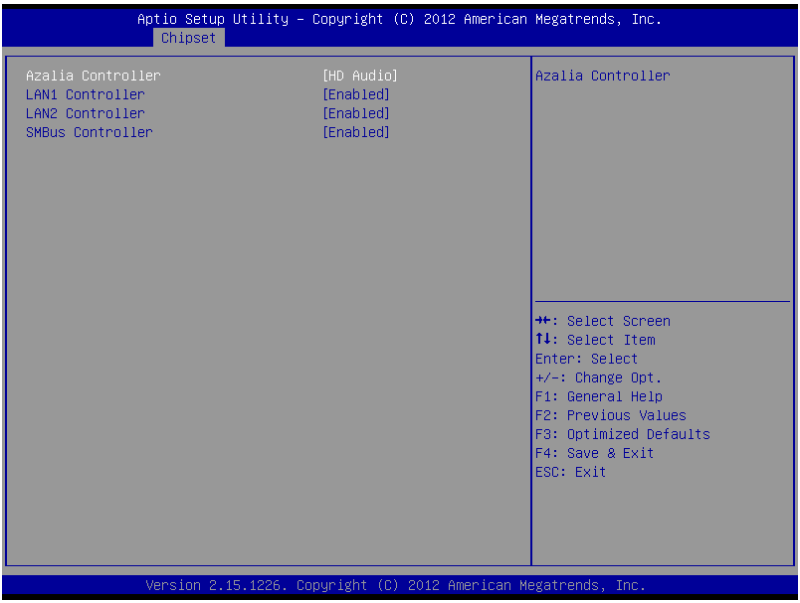


Options summary: (***default setting***)

Onboard Devices		
Onboard devices parameters configurations		
High Precision Timer	***Enabled***	
	Disabled	
Enable or Disable the High Precision Event Timer		
Power Mode	***ATX Type***	
	AT Type	
Select the power type used on the system		
SLP_S4 Assertion Width	***1-2 Seconds***	
	2-3 Seconds	

	3-4 Seconds	
	4-5 Seconds	
Select a minimum assertion width of the SLP_S4# signal		
Restore AC Power Loss	Power On	
	Power Off	
	Last State	
Select AC power state when power is re-applied after a power failure.		

Onboard Devices

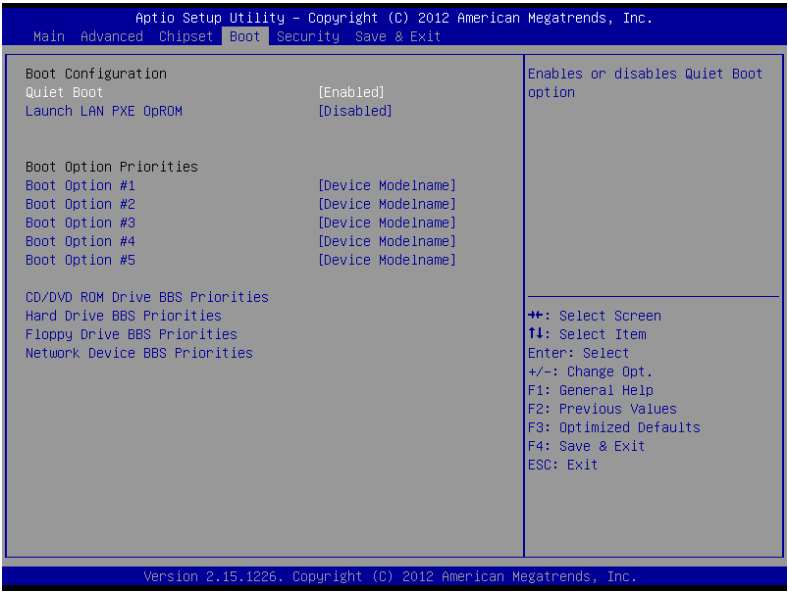


Options summary: (***default setting***)

Azalia Controller	Disabled	
	HD Audio	
Enable or disable Azalia Controller		
LAN1 Controller	Disabled	
	Enabled	
Enable or disable Realtek R8111E PCIE Lan Device		
LAN2 Controller	Disabled	
	Enabled	
Enable or disable Realtek R8111E PCIE Lan Device		

SMBus Controller	Disabled	
	Enabled	
Enable or Disable OnChip SMBus Controller		

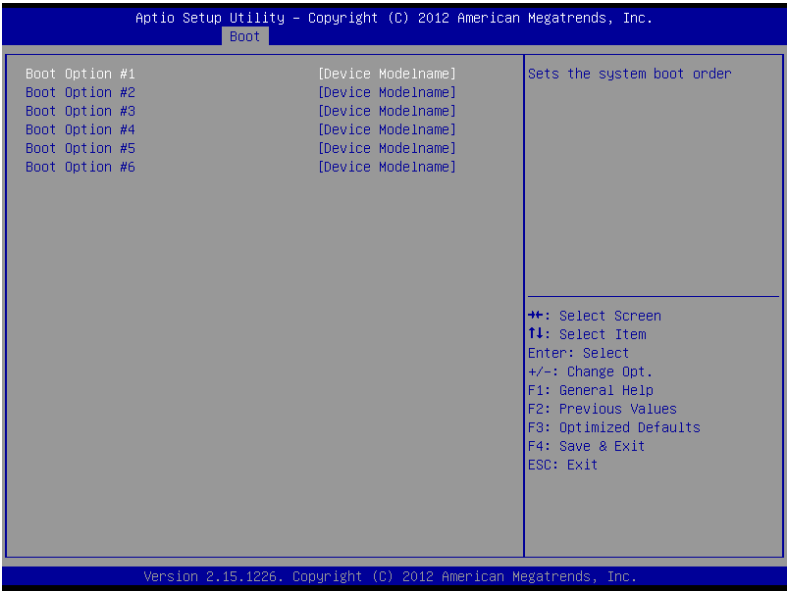
Setup submenu: Boot



Options summary: (***default setting***)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch LAN PXE OpROM	***Disabled***	
	Enabled	
En/Disable PXE boot for RTL8111E LAN		
Boot Option #X/ XXXX Drive BBS Priorities		
The order of boot priorities.		

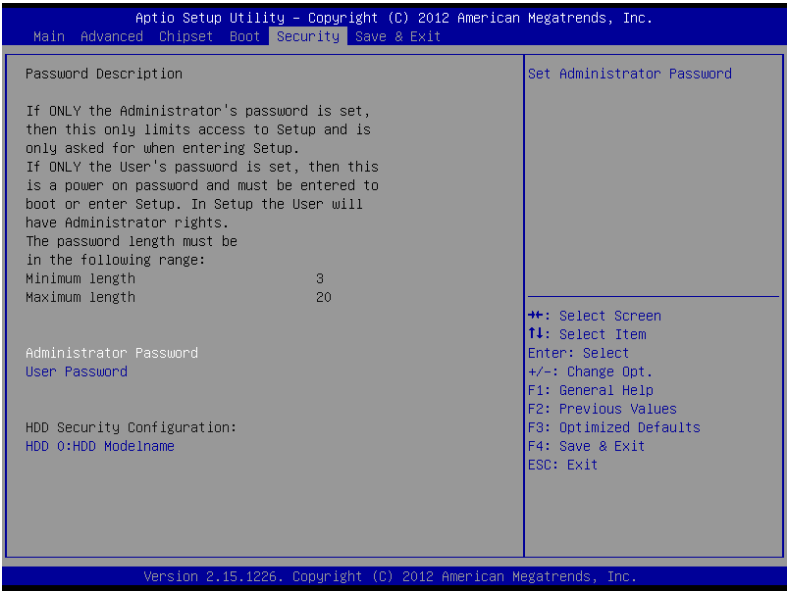
BBS Priorities



Options summary: (***default setting***)

Boot Option #x	Disabled	
	Device name	
Sets the system boot order		

Setup submenu: Security



Options summary: (***default setting***)

Administrator Password/ User Password	***Not set***	

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.

Install the Password:

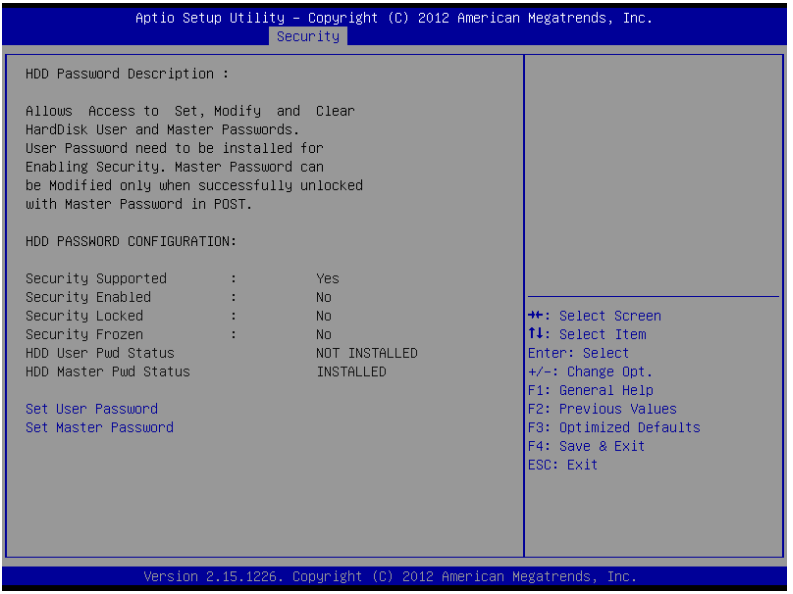
Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The 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.

HDD Security



Options summary: (***default setting***)

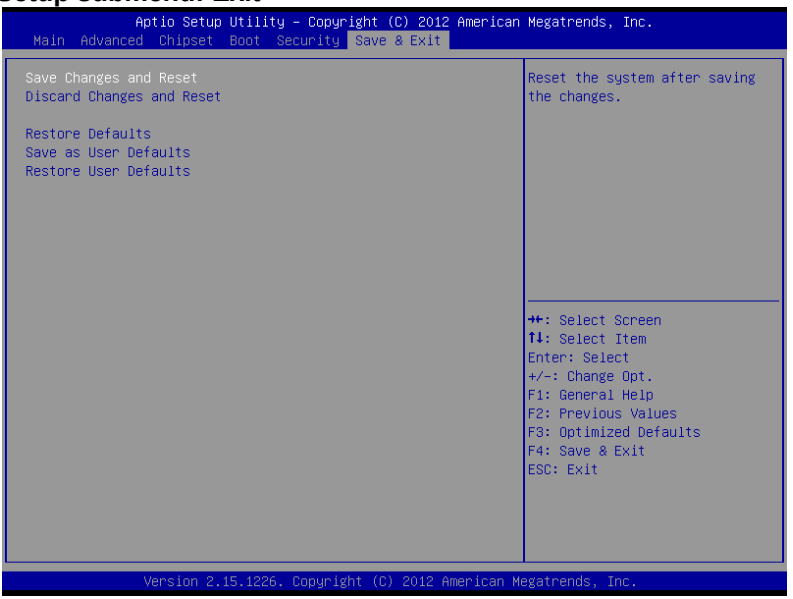
Set User Password/ Set Master Password	***Not set***	
You can install a Master and User password. Before booting to OS, HDD will be set to frozen state. On S3 resume HDD will be unlocked using the HDD Password we entered while system booting. *Install the Password:* Press Enter on this item, a dialog 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



Options summary: (***default setting***)

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		
Save the changes done so far as User Defaults		
Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter

4

Driver Installation

The AEC-6402 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-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 AHCI Driver

Step 5 – Install Serial Port Driver (Optional)

Step 6 – Install Wireless Driver (Optional)

Step 7 – Install CAN Bus Driver (Optional)

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the AEC-6402 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 7 in order.

Step 1 – Install Chipset Driver

1. Click on the ***STEP1-Chipset*** folder and select the OS folder your system is
2. Double click on the ***infinst_autol_1034.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 2 – Install VGA Driver

For Windows® 7

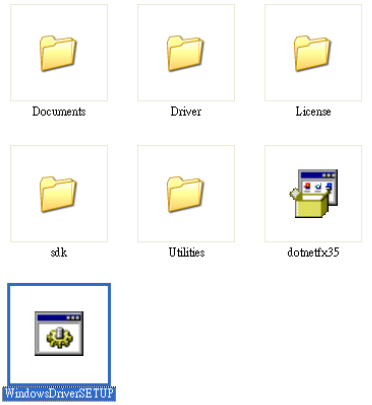
1. Click on the ***STEP2-VGA*** folder and select the folder of ***WIN7_32***
2. Double click on the ***Setup.exe*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

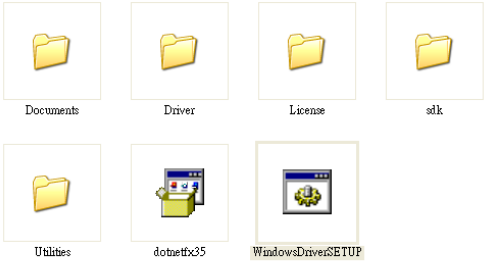
For Windows® XP

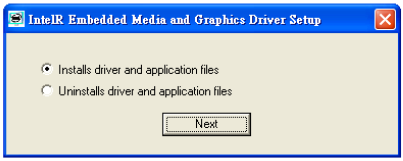
1. Install Framework 3.5
   - Double click on the ***dotnetfx35.exe***
   - Follow the instructions that the window shows
   - The system will help you install the driver automatically

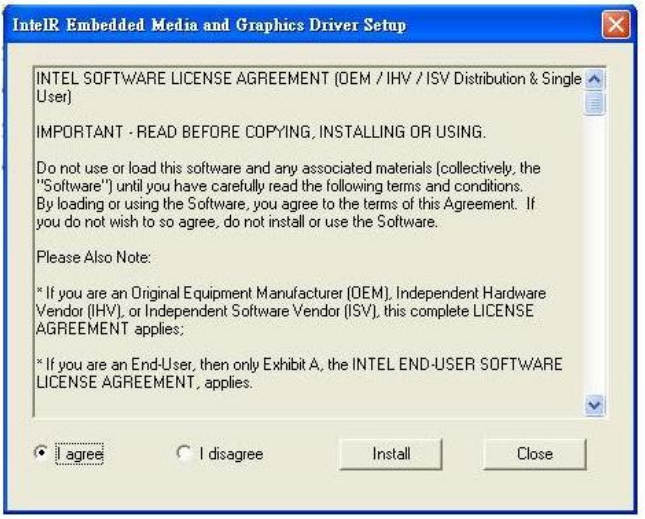
2. Install IEMGD

- Double click on the ***WindowsDriverSETUP.exe***
- Select the configuration
- Follow the instructions that the window shows
- The system will help you install the driver automatically







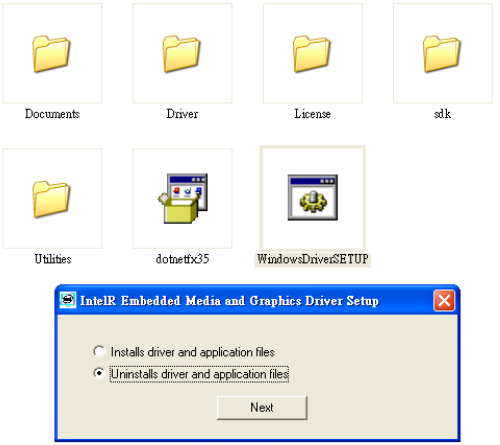

IntelR Embedded Media and Graphics Driver Setup
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL END-USER SOFTWARE LICENSE AGREEMENT, applies.
I agree
I disagree
Install
Close

Software Installation
The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

If you want to update driver, please uninstall driver first.

Uninstall IEMGD

1. Double click on the ***WindowsDriverSETUP.exe***
2. Follow the instructions that the window shows
3. The system will help you uninstall the driver automatically



Step 3 – Install LAN Driver

1. Click on the ***STEP3-LAN*** 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 4 – Install AHCI Driver

Please refer to the Appendix C AHCI Setting

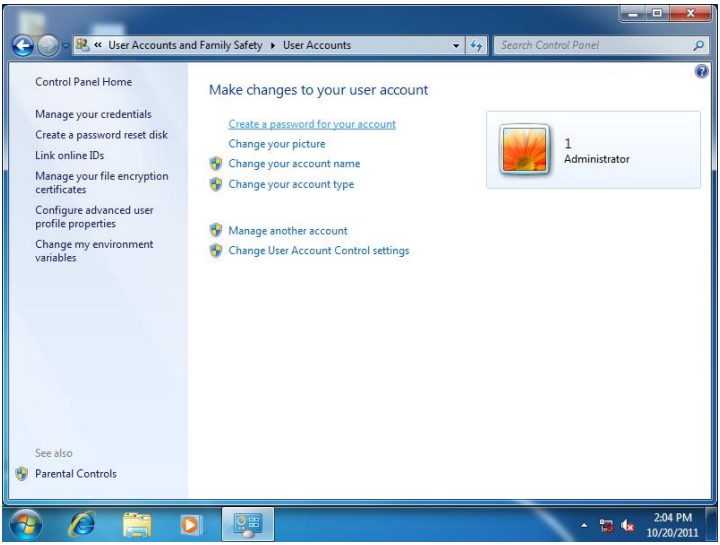
Step 5 – Serial Port Driver (Optional)

For Windows® XP:

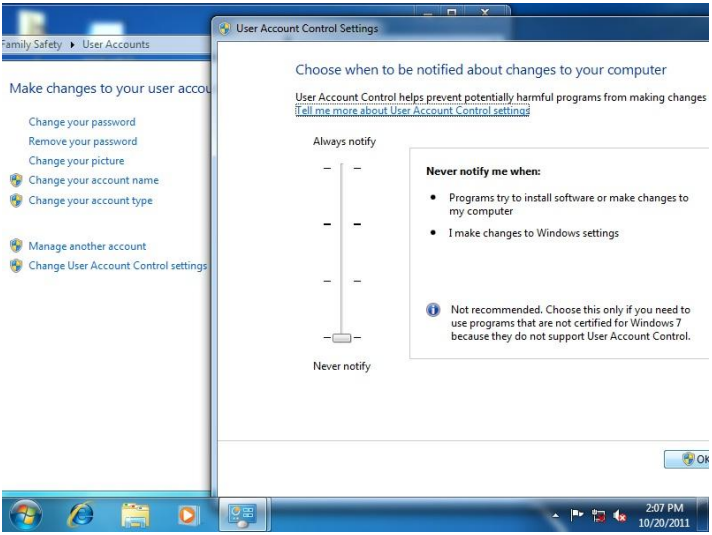
1. Click on the ***STEP5-Serial Port Driver (Optional)*** and select the folder of ***WINXP_32***
2. Double click on ***patch.bat*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

For Windows® 7:

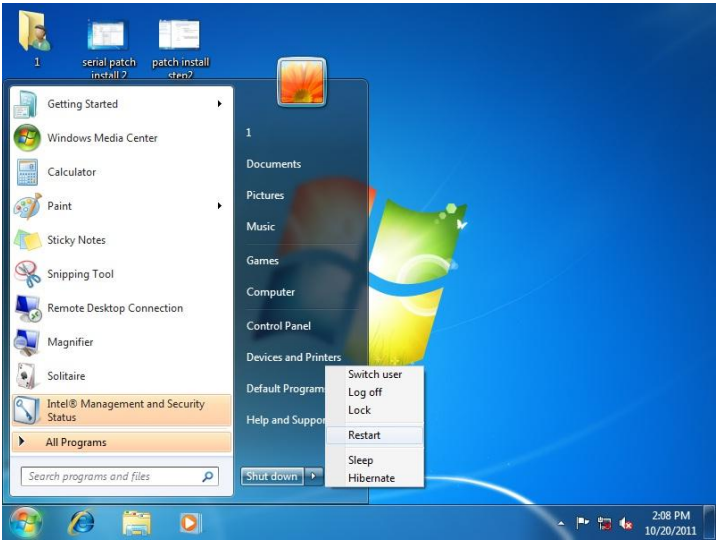
1. Create a password for Administrator account.



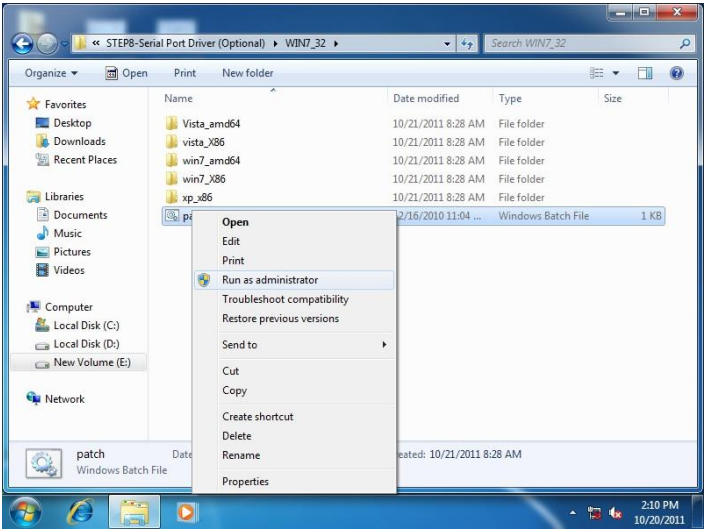
2. Change User Account Control Settings to [Never notify]



3. Reboot and Administrator login.



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



Step 6 – Install Wireless Driver (Optional)

1. Click on the ***STEP6-Wireless (Optional)*** folder and select the OS folder your system is.
2. Double click on the ***VN9271_Windows_V1.3.0.0_x86*** located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 7 – Install CAN Bus Driver (Optional)

1. Click on the ***STEP7-CAN Bus (Optional)*** folder and select the OS folder your system is.
2. Double click on the ***install.exe*** located in each OS folder

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

Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address		
	Default Value	**Note**
I/O Base Address	**0xA00**	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table				
Register	**Offset**	**BitNum**	**Value**	**Note**
Watchdog WDTRST# Enable	**0x00**	**7**	**1**	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	**0x05**	**0:1**	**01**	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s ***Pulse width is must longer then 16ms.***
Signal Polarity	**0x05**	**2**	**0**	0: low active 1: high active ***Must set this bit to 0***
Counting Unit	**0x05**	**3**	**0**	Select time unit. 0: second 1: minute
Output Signal Type	**0x05**	**4**	**1**	0: Level 1: Pulse ***Must set this bit to 1***
Watchdog Timer Enable	**0x05**	**5**	**1**	0: Disable 1: Enable
Timeout Status	**0x05**	**6**	**1**	1: timeout occurred. Write a 1 to clear timeout status
Timer Counter	**0x06**			Time of watchdog timer (0~255)

A.2 WatchDog Sample Program

```
*************************************************************************
****
// WDT I/O operation relative definition (Please reference to Table 1)
#define  WDTAddr      0xA00  // WDT I/O base address
Void  WDTWriteByte(byte Register, byte Value);
byte  WDTReadByte(byte Register);
Void  WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define  DevReg       0x00  // Device configuration register
    #define  WDTRstBit  0x80  // Watchdog WDTRST# (Bit7)
    #define  WDTRstVal  0x80  // Enabled WDTRST#
#define  TimerReg     0x05  // Timer register
    #define  PSWidthBit   0x00   // WDTRST# Pulse width (Bit0:1)
    #define  PSWidthVal   0x01   // 25ms for WDTRST# pulse
    #define  PolarityBit  0x02   // WDTRST# Signal polarity (Bit2)
    #define  PolarityVal  0x00   // Low active for WDTRST#
    #define  UnitBit      0x03   // Unit for timer (Bit3)
    #define  ModeBit      0x04   // WDTRST# mode (Bit4)
    #define  ModeVal      0x01   // 0:level 1: pulse
    #define  EnableBit    0x05   // WDT timer enable (Bit5)
    #define  EnableVal    0x01   // 1: enable
    #define  StatusBit    0x06   // WDT timer status (Bit6)
#define  CounterReg  0x06  // Timer counter register
*************************************************************************
*****

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

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

*************************************************************************
*****
// Procedure : AaeonWDTEnable
VOID  AaeonWDTEnable (){
        WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID  AaeonWDTConfig (byte Counter, BOOLEAN Unit){
        // Disable WDT counting
        WDTEnableDisable(0);
        // Clear Watchdog Timeout Status
        WDTClearTimeoutStatus();
        // WDT relative parameter setting
        WDTParameterSetting(Timer, Unit);
}

VOID  WDTEnableDisable(byte Value){
        If (Value == 1)
            WDTSetBit(TimerReg, EnableBit, 1);
        else
            WDTSetBit(TimerReg, EnableBit, 0);
}

VOID  WDTParameterSetting(byte Counter, BOOLEAN Unit){
        // Watchdog Timer counter setting
        WDTWriteByte(CounterReg, Counter);
        // WDT counting unit setting
        WDTSetBit(TimerReg, UnitBit, Unit);
```

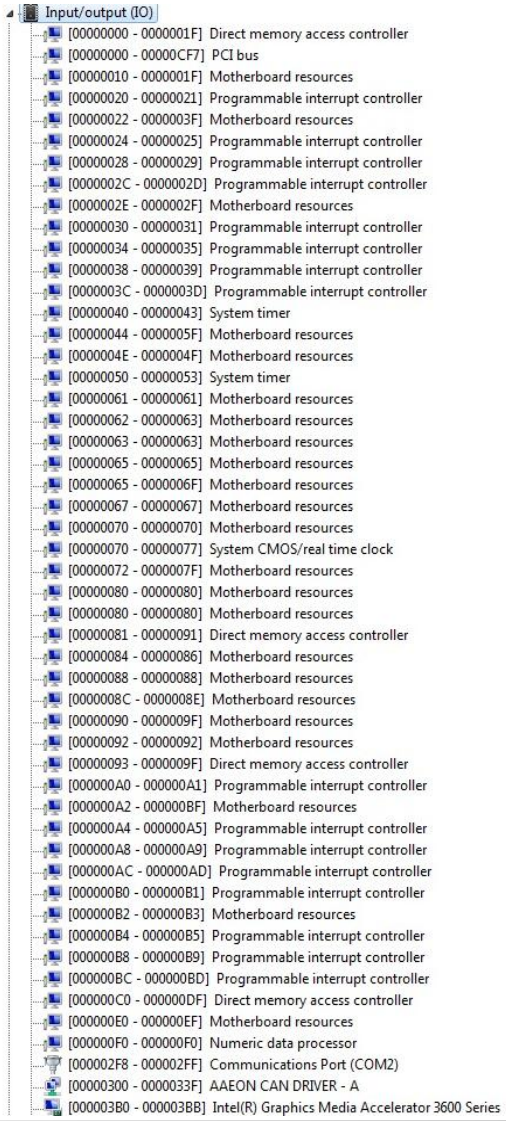
```
        // WDT output mode set to pulse
        WDTSetBit(TimerReg, ModeBit, ModeVal);
        // WDT output mode set to active low
        WDTSetBit(TimerReg, PolarityBit, PolarityVal);
        // WDT output pulse width is 25ms
        WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
        // Watchdog WDTRST# Enable
        WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}

VOID  WDTClearTimeoutStatus(){
        WDTSetBit(TimerReg, StatusBit, 1);
}
*****************************************************************************
*****

*****************************************************************************
*****
VOID  WDTWriteByte(byte Register, byte Value){
        IOWriteByte(WDTAddr+Register, Value);
}

byte  WDTReadByte(byte Register){
        return IOReadByte(WDTAddr+Register);
}

VOID  WDTSetBit(byte Register, byte Bit, byte Val){
        byte TmpValue;

        TmpValue = WDTReadByte(Register);
        TmpValue &= ~(1 << Bit);
        TmpValue |= Val << Bit;
        WDTWriteByte(Register, TmpValue);
}

*****************************************************************************
*****
```

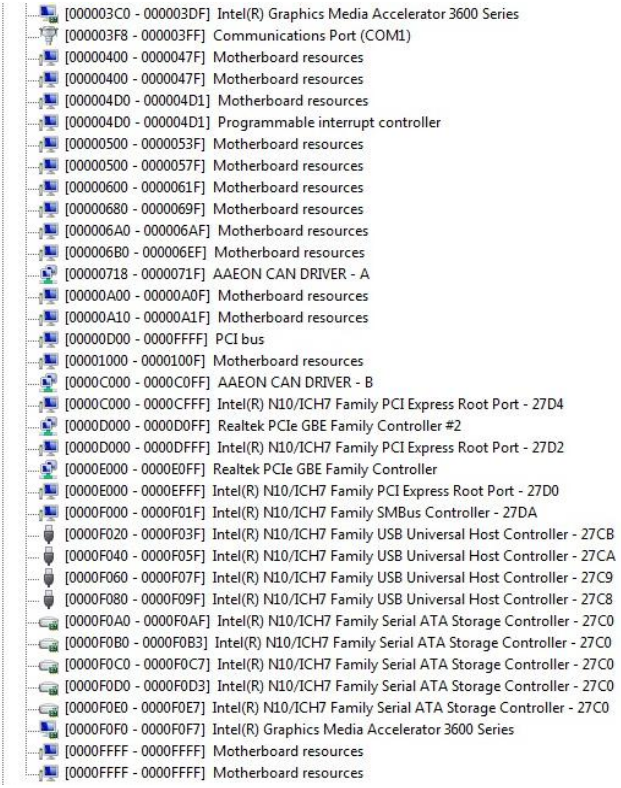
Appendix

B

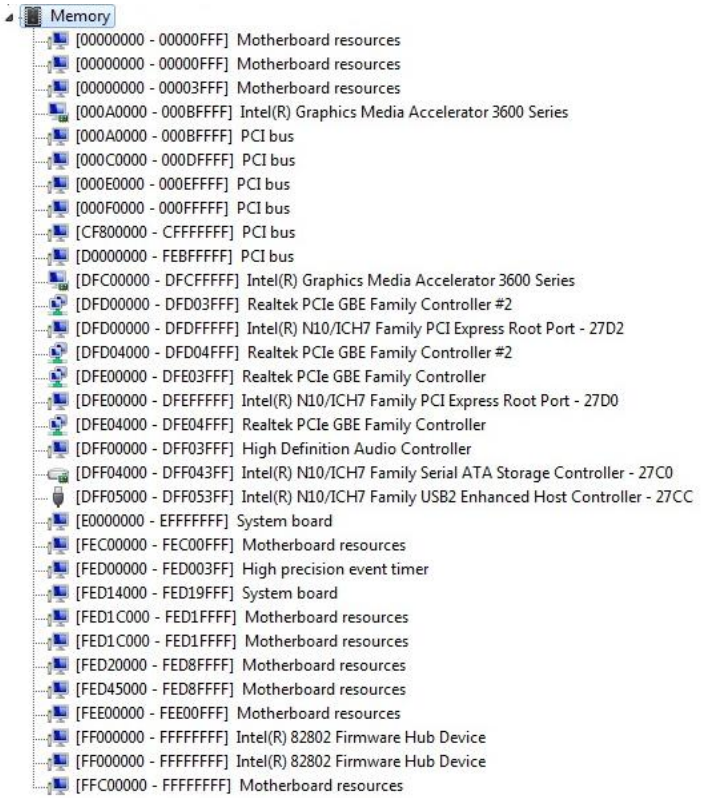
I/O Information

D.1 I/O Address Map

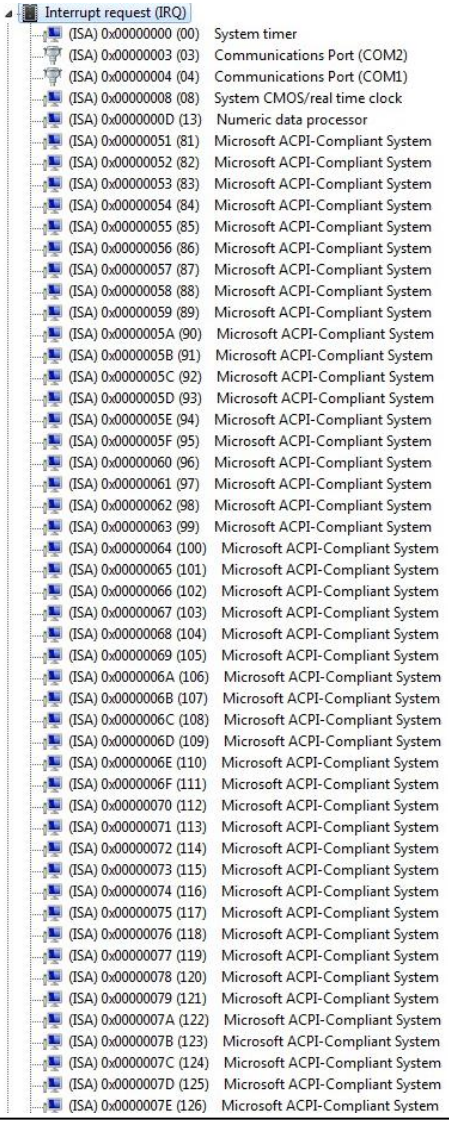



[000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3600 Series
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000047F] Motherboard resources
[00000400 - 0000047F] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[000004D0 - 000004D1] Programmable interrupt controller
[00000500 - 0000053F] Motherboard resources
[00000500 - 0000057F] Motherboard resources
[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[000006A0 - 000006AF] Motherboard resources
[000006B0 - 000006EF] Motherboard resources
[00000718 - 0000071F] AAEON CAN DRIVER - A
[00000A00 - 00000A0F] Motherboard resources
[00000A10 - 00000A1F] Motherboard resources
[00000D00 - 0000FFFF] PCI bus
[00001000 - 0000100F] Motherboard resources
[0000C000 - 0000C0FF] AAEON CAN DRIVER - B
[0000C000 - 0000CFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
[0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #2
[0000D000 - 0000DFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
[0000E000 - 0000EFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[0000F000 - 0000F01F] Intel(R) N10/ICH7 Family SMBus Controller - 27DA
[0000F020 - 0000F03F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
[0000F040 - 0000F05F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
[0000F060 - 0000F07F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
[0000F080 - 0000F09F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
[0000F0A0 - 0000F0AF] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0B0 - 0000F0B3] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0C0 - 0000F0C7] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0D0 - 0000F0D3] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0E0 - 0000F0E7] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0F0 - 0000F0F7] Intel(R) Graphics Media Accelerator 3600 Series
[0000FFFF - 0000FFFF] Motherboard resources
[0000FFFF - 0000FFFF] Motherboard resources

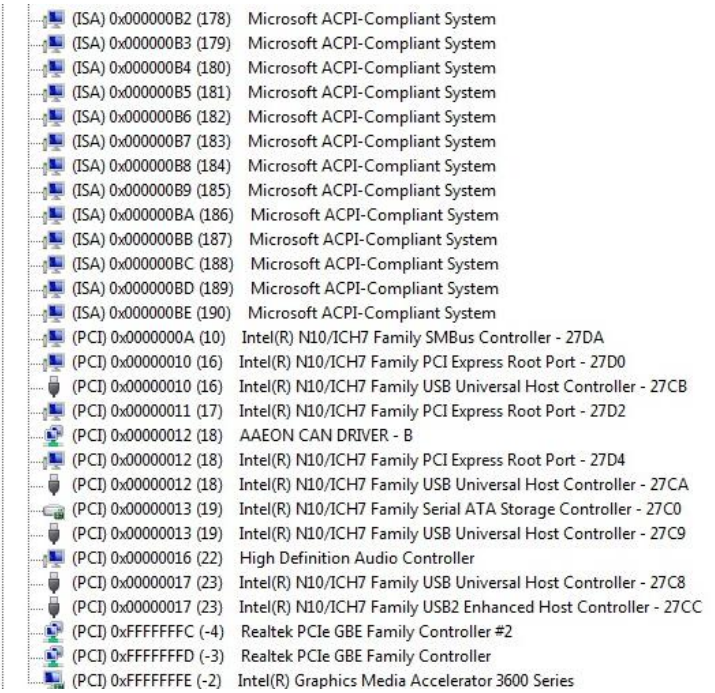
D.2 Memory Address Map



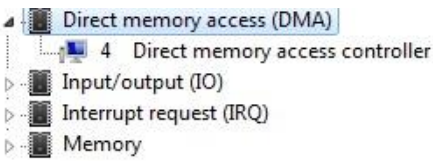
D.3 IRQ Mapping Chart



(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



D.4 DMA Channel Assignments



Appendix

C

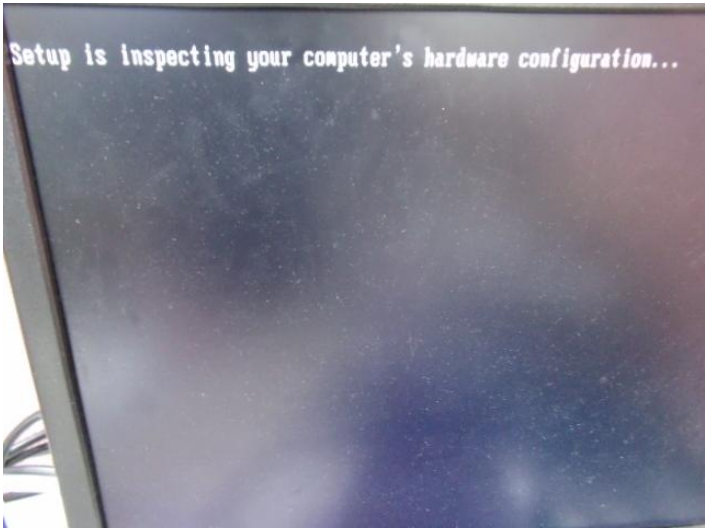
AHCI Setting

C.1 Setting AHCI

OS installation to setup AHCI Mode.

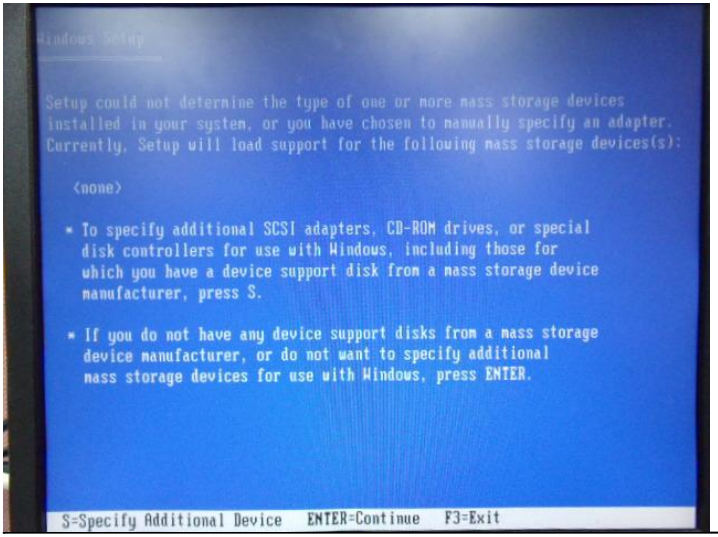
Step 1: Copy the files below from “Driver CD -> STEP5-AHCI\WIN7_32\F6 Install Floppy Create for 32 and 64 bit Windows” to Disk

Step 2: Setup OS

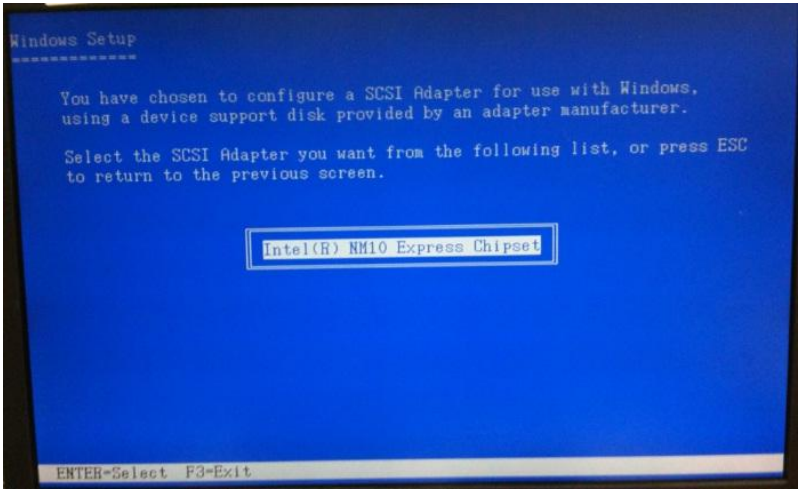


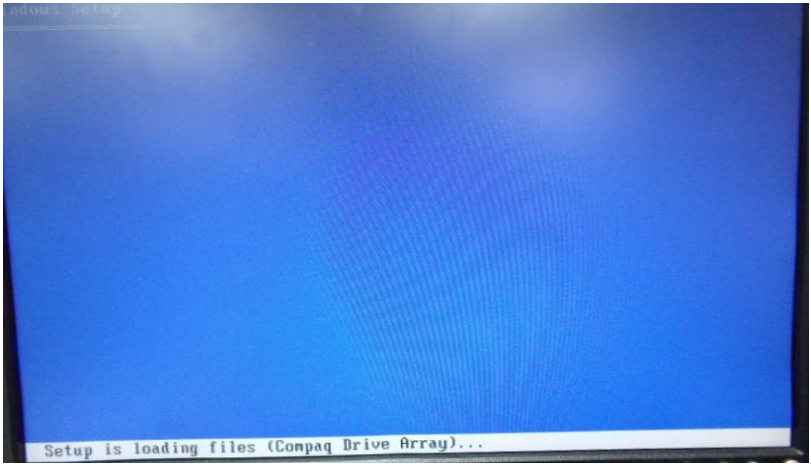
Step 3: Press “**F6**”

Step 4: Choose “**S**”



Step 5: Choose "**Intel® NM10 Express Chipset**"



Step 6: It will show the model number you select and then press "**ENTER**

Step 7: Setup is loading files