

CES-CV101

Embedded Controller

Intel® Atom™ D2550 1.86GHz Processor

3 GbE LAN, 4 USB2.0, 6 COM

1 Mini Card

Copyright Notice

This document is copyrighted, 2014. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEON reserves the right to make changes in the product design without notice to its users.

Acknowledgments

All other products' name or trademarks are properties of their respective owners.

- AMI is a trademark of American Megatrends, Inc.
- CompactFlash™ is a trademark of the Compact Flash Association.
- Microsoft Windows® is a registered trademark of Microsoft Corp.
- Intel®, Atom™ are trademarks of Intel Corporation.
- 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 are enclosed:

- 1 CES-CV101 Embedded Controller
- 2 Wallmount Brackets
- 1 Screw Package
- 1 DVD-ROM for manual (in PDF format) and drivers
- 1 Phoenix Power Connector

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.

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。

Chapter 1 General Information

1.1 Introduction.....	1-2
1.2 Features	1-3
1.3 Specifications	1-4

Chapter 2 Hardware Installation

2.1 Dimension and I/O of CES-CV101	2-2
2.2 Location of Connectors and Jumpers of the Main Board	2-3
2.3 List of Jumpers	2-5
2.4 List of Connectors	2-6
2.5 LVDS Operating VDD Selection (JP1)	2-7
2.6 LVDS Backlight Inverter VCC Selection (JP2)	2-7
2.7 LVDS Backlight Lightness Control Mode Selection (JP3)	2-7
2.8 COM1 RS-422 RX Termination (JP4)	2-8
2.9 COM1 RS-422 TX Termination/ RS485 Termination (JP5)	2-8
2.10 AT/ATX Power Supply Mode Selection (JP8)	2-8
2.11 Clear CMOS Jumper (JP9)	2-9
2.12 VGA / DVI Ports (CN1).....	2-9
2.13 External Power Input (CN2)	2-11
2.14 COM Port 1/2 (Isolation) (CN3).....	2-12
2.15 COM Port 3/4 (CN4).....	2-13
2.16 Audio Port (CN5).....	2-14

2.17 RJ45 Ethernet/Dual USB (CN6)..... 2-15

2.18 Dual RJ-45 Ethernet (CN7) 2-16

2.19 LVDS Port Inverter / Backlight Connector (Optional)
(CN8)..... 2-17

2.20 CFast Slot (CN16)..... 2-17

2.21 USB Pin Header (Port6) (USB1)..... 2-18

2.22 DUAL USB (CN19)..... 2-19

2.23 COM Port 5/6 (D-SUB 9) (CN20) 2-20

2.24 USB Pin Header (Port5) (USB2)..... 2-20

2.25 18/24-bit LVDS Output(Optional) (LVDS1) 2-21

2.26 SATA Port (SATA1)..... 2-23

2.27 SATA PWR Connector (+5V) (SATAPWR1)..... 2-23

2.28 Digital IO Header (4in /4out) (DIO1)..... 2-24

2.29 Mini PCIe Slot (MINICARD) 2-24

2.30 CMOS Battery Connector (BAT1A1)..... 2-27

2.31 List of Buttons and Indicators..... 2-27

2.32 Hard Disk Drive Installation..... 2-28

2.33 Wallmount Installation 2-31

Chapter 3 AMI BIOS Setup

3.1 System Test and Initialization. 3-2

3.2 AMI BIOS Setup..... 3-3

Chapter 4 Driver Installation

4.1 Installation 4-3

Appendix A Programming The Watchdog Timer

A.1 Watchdog Timer RegistersA-2
 A.2 Watchdog Sample ProgramA-4

Appendix B I/O Information

B.1 I/O Address MapB-2
 B.2 1st MB Memory Address MapB-4
 B.3 IRQ Mapping ChartB-5
 B.4 DMA Channel AssignmentsB-5

Appendix C AHCI Setting

C.1 Setting AHCI C-2

Chapter

1

**General
Information**

1.1 Introduction

AAEON introduces the newest product in the Boxer series, CES-CV101, which utilizes the Intel® Atom™ D2550 1.86 GHz processor and Intel® NM10 chipset: this embedded controller expands its graphics performance greatly with the Atom™ processors.

In this era of information explosion, the advertising of consumer products will not be confined to the family television, but will also spread to high-traffic public areas, like department stores, the bus, transportation station, the supermarket etc. The advertising marketing industry will resort to every conceivable mean to transmit product information to consumers. System integrators will need a multifunction device to satisfy commercial needs for such public advertising.

The CES-CV101 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
- Supports Intel Atom D2550 1.86GHz Processor
- Onboard DDR3 800/1066MHz 2GB RAM
- VGA & DVI output support 18/24-bit single channel LVDS (depending on selected CPU)
- Onboard Realtek RTL8111E Gigabit Ethernet x 2
- SATA interface x 1, CFAST x 1 (Default) co-lay with CFD connector
- Mini Card x 1
- RS-232 x 4, RS-232/422/485 x 2 with isolated/ Auto flow control/ full-function
- USB2.0 x 4
- DC input 12~24V Power Supply

1.3 Specifications

System

- CPU Intel® Atom™ D2550 1.86 GHz Processor
- Memory DDR3 800/1066 SODIMM x 1, Max. 2GB
- Storage 2.5" HDD Bay x 1 (SATA interface)
- Front I/O
 - Power ON/OFF switch x 1
 - System ON LED x 1
 - HDD active LED x 1
 - LAN LED (Link + Active) x 3
 - USB 2.0 port x 2
 - Power button w/ power on LED
 - COM port x 2: COM 5/6 (RS-232)
- Rear I/O
 - VGA x 1 (DB-15)
 - DVI-I x 1
 - Audio port (Line out, MIC)
 - Power in Phoenix connector (2-pin) x 1
 - COM port x 4: COM 1/2 (isolated RS-232/422/485), COM 3/4 (RS-232)
 - Onboard Gigabit Ethernet x 2 by RJ-45
 - USB2.0 x 2

Note: isolated ports cannot link to chassis ground
- Expansion
 - CFast™ x 1 (default) co-lay with CF connector
 - Mini Card x 1
 - SIM slot (optional)

- Power Supply AT/ ATX power function
DC Input 12~24V, with 2-pin Phoenix connector
- OS Support Windows® XP Pro 32bit, Windows® XP Embedded 32 bit, Windows® 7 32 bit, Linux Fedora

Mechanical and Environmental

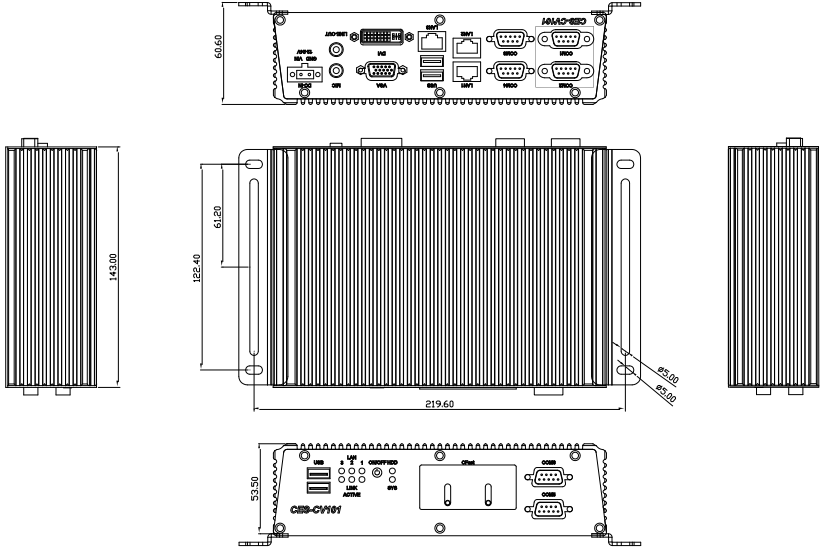
- Construction Aluminum Alloy Chassis
- Color Dark Gray
- Mounting Wallmount
- Dimension 7.76"(W) x 5.63"(H) x 2.11"(D)
(197 mm x 143 mm x 53.5 mm)
- Gross Weight 5.5 lb (2.5 kg)
- Net Weight 3.3 lb (1.5 kg)
- Operating Temperature 32°F ~ 140°F (0°C ~ 60°C) w/ airflow
- Storage Temperature -4°F ~ 158°F (-20°C ~ 70°C)
- Storage Humidity 5 ~ 90% @ 40°C, non-condensing

Chapter

2

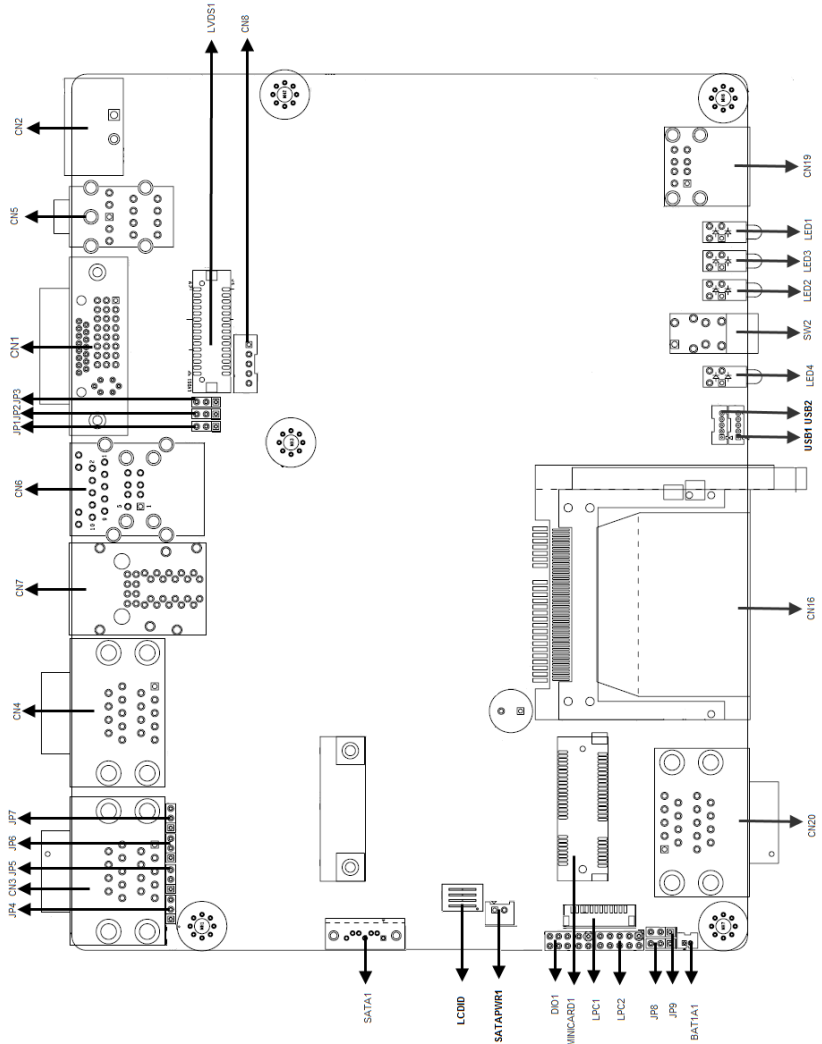
**Hardware
Installation**

2.1 Dimension and I/O of CES-CV101

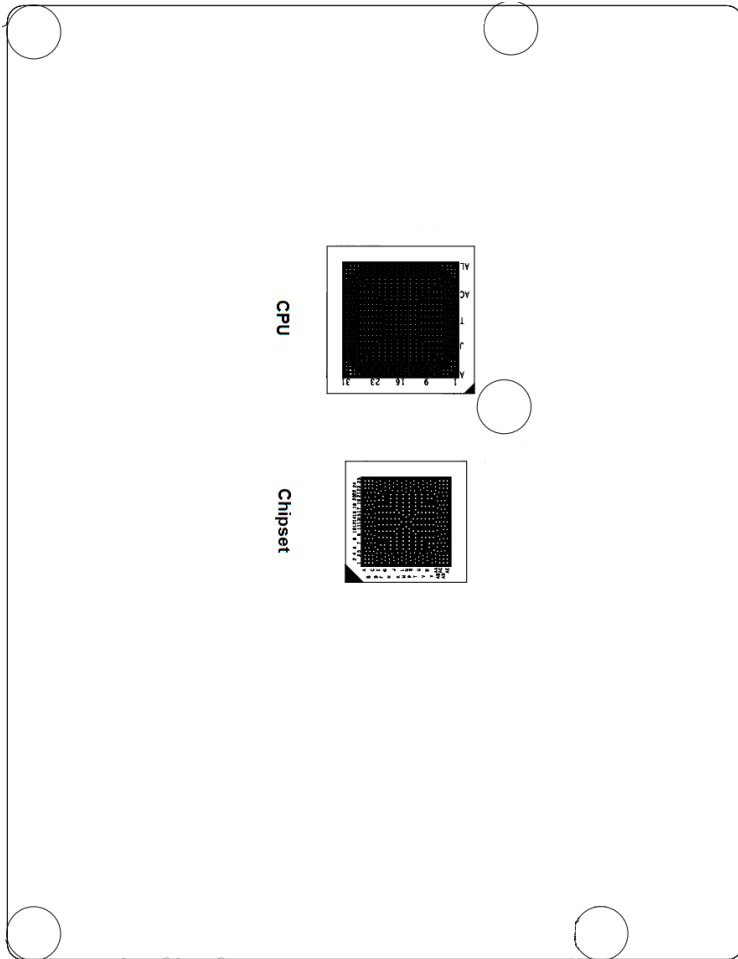


2.2 Connectors and Jumpers of The Main Board

Component Side



Solder Side



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:

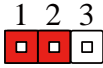
Label	Function
JP1	LVDS Operating Voltage Selection
JP2	LVDS Inverter/ Backlight Voltage Selection
JP3	LVDS Inverter/ Backlight Bias/PWM Mode Selection
JP4	COM1 RS422 RX Termination
JP5	COM1 RS422 TX Termination/ RS485 Termination
JP6	COM2 RS422 RX Termination
JP7	COM2 RS422 TX Termination/ RS485 Termination
JP8	AT/ATX Mode Selection
JP9	Clear CMOS

2.4 List of Connectors

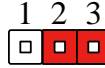
The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	VGA/DVI Port
CN2	External Power Input(+12V~+24V)
CN3	COM Port 1/2 (Isolation)
CN4	COM Port 3/4
CN5	Audio I/O Port
CN6	RJ45 Ethernet/Dual USB
CN7	Dual RJ-45 Ethernet
CN8	LVDS Inverter / Backlight Connector
SATAPWR1	SATA PWR Connector (+5V)
CN16	CFast Slot
USB1	USB Pin Header
CN19	DUAL USB Port
CN20	COM Port 5/6
USB2	USB Pin Header
LVDS1	18/24-bit LVDS Output(depending on CPU Skew)
SATA1	SATA Port
DIO1	Digital IO Header (4In / 4out)
MINICARD1	MINI PCIe Slot
BAT1A1	CMOS Battery Connector

2.5 LVDS Operating VDD Selection (JP1)



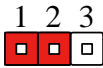
+5V



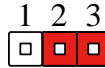
+3.3V (Default)

JP1	Function
1-2	+5V
2-3	+3.3V (Default)

2.6 LVDS Backlight Inverter VCC Selection (JP2)



+12V



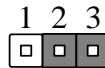
+5V (Default)

JP2	Function
1-2	+12V
2-3	+5V (Default)

2.7 LVDS Backlight Lightness Control Mode Selection (JP3)



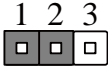
VR Mode



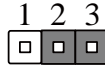
PWM Mode

JP3	Function
1-2	VR Mode
2-3	PWM Mode

2.8 COM1 RS-422 RX Termination (JP4)



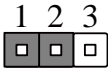
No Termination



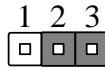
Termination With 120 ohm

JP4	Function
1-2	No Termination
2-3	Termination with 120 ohm

2.9 COM1 RS-422 TX Termination/ RS485 Termination (JP5)



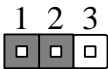
No Termination



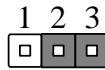
Termination With 120 ohm

JP5	Function
1-2	No Termination
2-3	Termination with 120 ohm

2.10 AT/ATX Power Supply Mode Selection (JP8)



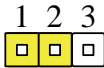
ATX Mode



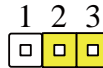
AT Mode

JP8	Function
1-2	ATX Mode
2-3	AT Mode

2.11 Clear CMOS Jumper (JP9)



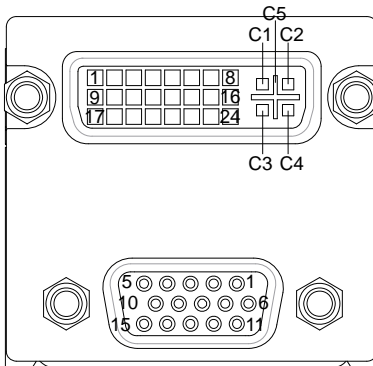
Normal (Default)



Clear CMOS

JP9	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.12 VGA / DVI Ports (CN1)



VGA

Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		

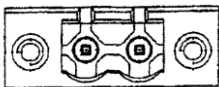
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

DVI

Pin	Pin Name	Signal Type	Signal Level
1	TMDS_DAT2+	DIFF	
2	TMDS_DAT2-	DIFF	
3	GND	GND	
4	VGA_DDC_CLK	I/O	
5	VGA_DDC_DATA	I/O	
6	DVI_DDC_CLK	I/O	+5V
7	DVI_DDC_DATA	I/O	+5V
8	VSYNC	OUT	
9	TMDS_DAT1-	DIFF	
10	TMDS_DAT1+	DIFF	

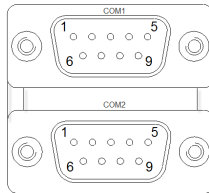
11	GND	GND	
12	TMDS_DAT3-	DIFF	
13	TMDS_DAT3+	DIFF	
14	+5V	PWR	+5V
15	GND	GND	
16	HPLG_DETECT	IN	
17	TMDS_DAT0-	DIFF	
18	TMDS_DAT0+	DIFF	
19	GND	GND	
20	NC		
21	NC		
22	GND	GND	
23	TMDS_CLK+	DIFF	
24	TMDS_CLK-	DIFF	
C1	RED	OUT	
C2	GREEN	OUT	
C3	BLUE	OUT	
C4	HSYNC	OUT	
C5	GND_ANALOG	GND	

2.13 External Power Input (CN2)



Pin	Pin Name	Signal Type	Signal Level
1	Power In	PWR	+12V~+24V
2	GND	GND	

2.14 COM Port 1/2 (Isolation) (CN3)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	
4	DTR	OUT	
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	
8	CTS	IN	
9	RI	IN	

RS-422

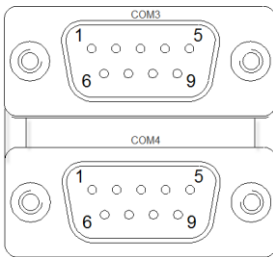
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	

3	RS422_RX+	IN
4	RS422_RX-	IN
5	GND	GND

RS-485

Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3			
4			
5	GND	GND	

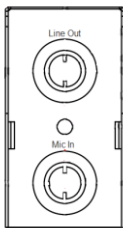
2.15 COM Port 3/4 (CN4)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	
4	DTR	OUT	
5	GND	GND	

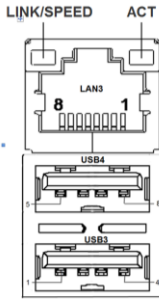
6	DSR	IN
7	RTS	OUT
8	CTS	IN
9	RI	IN

2.16 Audio Port (CN5)



Pin	Pin Name	Signal Type	Signal Level
1	GND_AUDIO	IN	
2	MIC_L	IN	
3	MIC-JD_CON	IN	
4	GND_AUDIO	IN	
5	MIC_R	IN	
6	LOUT_L	OUT	
7	FRONT-JD_CON	IN	
8	GND_AUDIO	GND	
9	LOUT_R	OUT	

2.17 RJ45 Ethernet/Dual USB (CN6)



RJ-45

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	

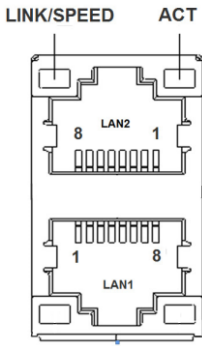
USB3

Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	±5V
2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	GND	

USB4

Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	±5V
2	USB3_D-	DIFF	
3	USB3_D+	DIFF	±5V
4	GND	GND	

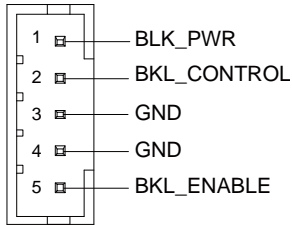
2.18 Dual RJ-45 Ethernet (CN7)



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

2.19 LVDS Port Inverter / Backlight Connector (Optional) (CN8)



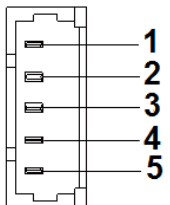
Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

2.20 CFast Slot (CN16)

Pin	Pin Name	Signal Type	Signal Level
S1	GND	GND	
S2	SATA_TX+	DIFF	
S3	SATA_TX-	DIFF	
S4	GND	GND	
S5	SATA_RX-	DIFF	
S6	SATA_RX+	DIFF	
S7	GND	GND	
PC1	NC		

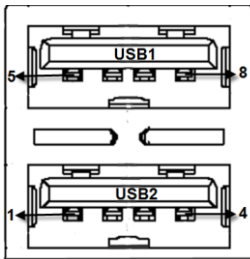
PC2	GND	GND	
PC3	NC		
PC4	NC		
PC5	NC		
PC6	NC		
PC7	GND	GND	
PC8	NC		
PC9	NC		
PC10	NC		
PC11	NC		
PC12	NC		
PC13	+3.3V	PWR	+3.3V
PC14	+3.3V	PWR	+3.3V
PC15	GND	GND	
PC16	GND	GND	
PC17	NC		

2.21 USB Pin Header (Port6) (USB1)



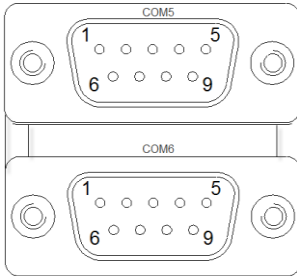
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	
5	GND	GND	

2.22 DUAL USB (CN19)



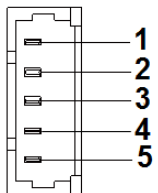
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	+5VSB	PWR	+5V
6	USB0_D-	DIFF	
7	USB0_D+	DIFF	
8	GND	GND	

2.23 COM Port 5/6 (D-SUB 9) (CN20)



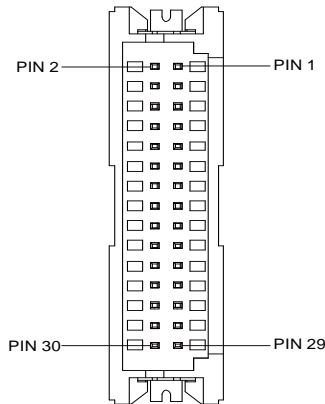
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	
4	DTR	OUT	
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	
8	CTS	IN	
9	RI	IN	

2.24 USB Pin Header (Port5) (USB2)



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

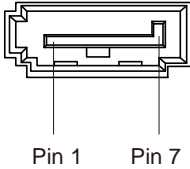
2.25 18/24-bit LVDS Output(Optional) (LVDS1)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	

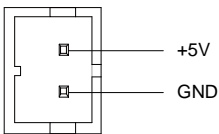
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	
12	LVDS_DA1+	DIFF	
13	LVDS_DA2-	DIFF	
14	LVDS_DA2+	DIFF	
15	LVDS_DA3-	DIFF	
16	LVDS_DA3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

2.26 SATA Port (SATA1)



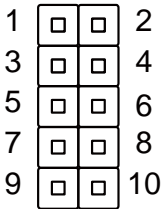
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.27 SATA PWR Connector (+5V) (SATAPWR1)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.28 Digital IO Header (4in /4out) (DIO1)



Pin	Pin Name	Signal Type	Signal Level
1	DIO0		
2	DIO1		
3	DIO2		
4	DIO3		
5	DIO4		
6	DIO5		
7	DIO6		
8	DIO7		
9	+3.3V		
10	GND		

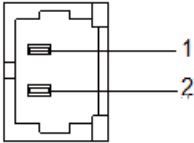
2.29 Mini PCIe Slot (MINICARD)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	

5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	UIM_PWR	PWR	
9	GND	GND	
10	UIM_DATA	I/O	
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK	IN	
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST	IN	
15	GND	GND	
16	UIM_VPP	PWR	
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V
25	PCIE_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	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

2.30 CMOS Battery Connector (BAT1A1)



Pin	Pin Name	Signal Type	Signal Level
1	3.3VSB	PWR	+3.3V
2	GND	GND	

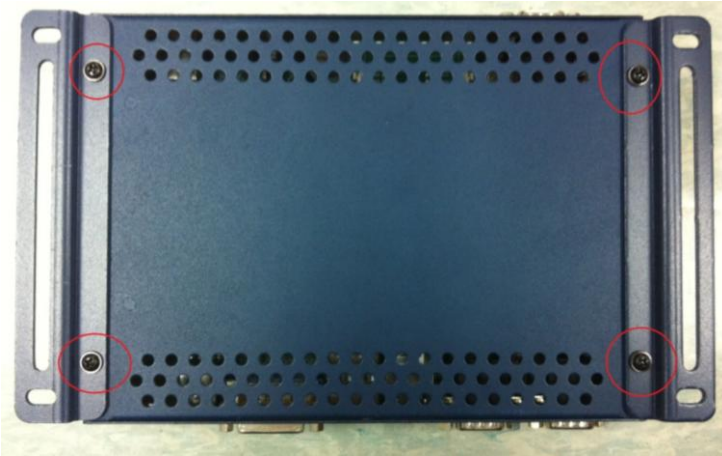
2.31 List of Buttons and Indicators

Connectors on board access link to external devices such as hard disk drives, a keyboard.

Label	Function
SW2	Power Button
LED1	LAN3
LED2	LAN1
LED3	LAN2
LED4	HDD LED & POWER LED

2.32 Hard Disk Drive Installation

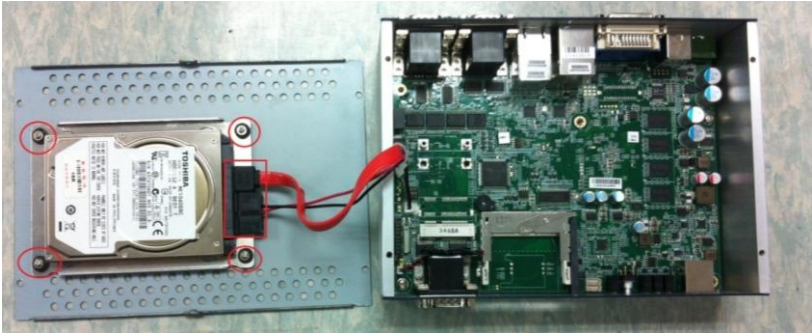
Step 1: Unfasten the four screws to release the brackets



Step 2: Unfasten the two screws on the side of the Box PC



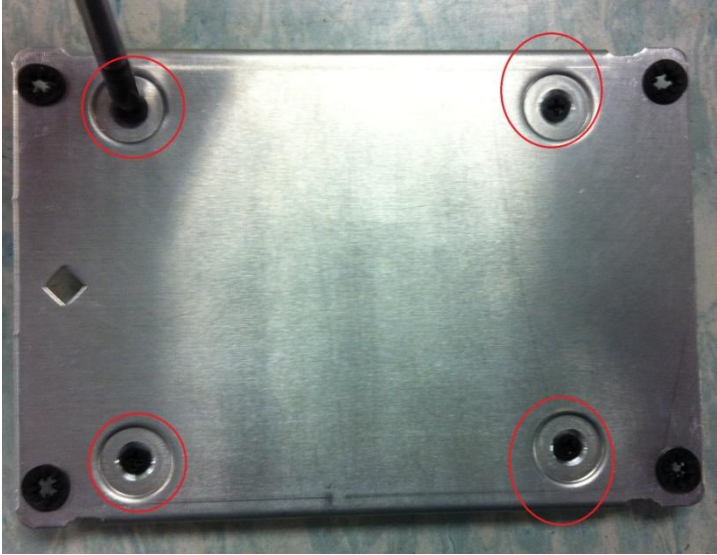
Step 3: Unfasten the four screws of the HDD bracket, and disconnect the SATA and power cables



Step 4: Take out the HDD vertically to separate the HDD and the bottom case of the Box PC

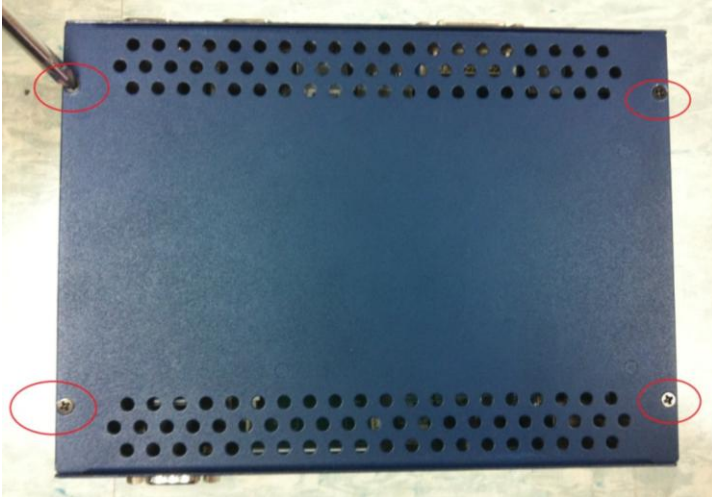


Step 5: Unfasten the four screws on the back of the HDD bracket. Replace the HDD and fasten the screws mentioned on the steps above



2.33 Wallmount Installation

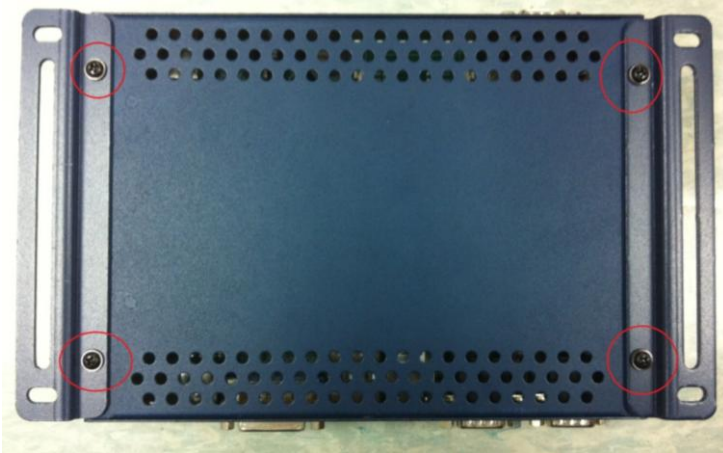
Step 1: Unfasten the four screws of the bottom case of the Box PC



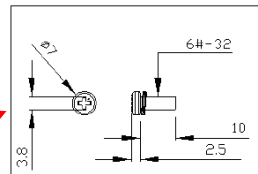
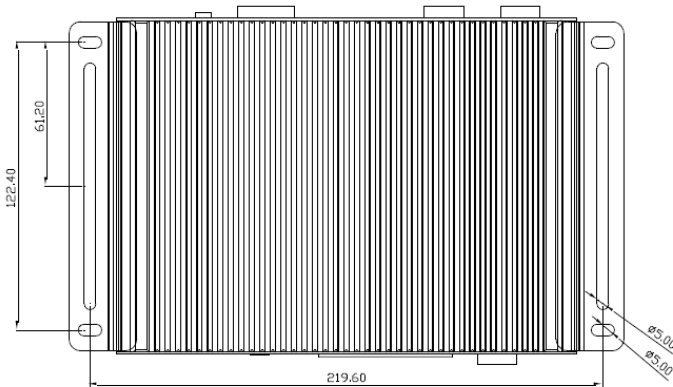
Step 2: Get the brackets and screws ready



Step 3: Fasten the brackets with the screws.



Step 4: Fasten the brackets with the screws.



We suggest using this screw.

Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

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

System configuration verification

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

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

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

The CES-CV101 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it runs down.

3.2 AMI BIOS Setup

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

Entering Setup

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

Main

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

Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

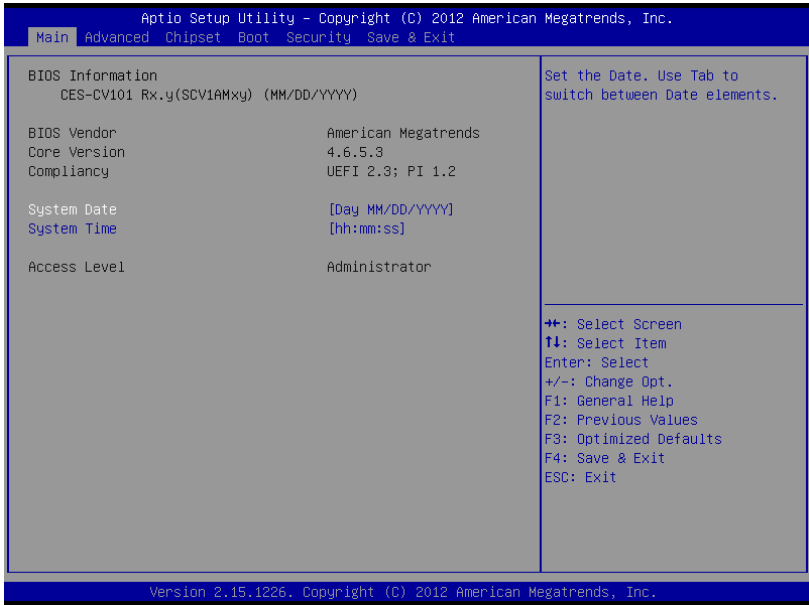
Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Setup Menu

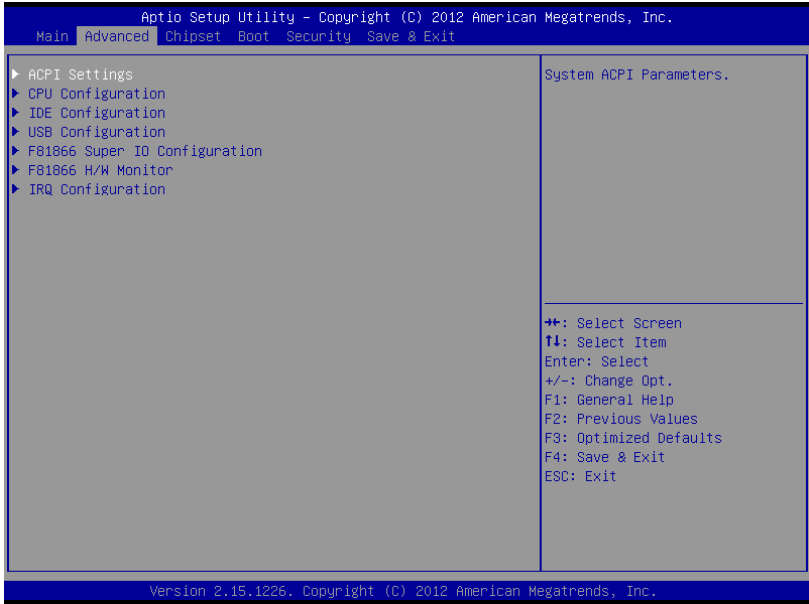
Setup submenu: Main



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		

F81866 Super IO Configuration Port Configuration		
Super IO Configuration Parameters		
F81866 H/W Monitor		
Monitor hardware status		
IRQ Configuration		
Configure IRQs for ISA or PCI devices.		

ACPI Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

<p>ACPI Settings</p> <p>Enable Hibernation [Enabled]</p> <p>ACPI Sleep State [S3 only(Suspend to ...)]</p> <p>Wake on Ring [Enabled]</p> <p>▶ RTC Wake Settings</p>	<p>Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.</p> <hr/> <p> ++: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
---	--

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

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)	
Select the ACPI state used for System Suspend		
Wake on Ring	Enabled	
	Disabled	
Enabled or disabled wake on ring function.		
RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

RTC Wake Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

Wake system with Fixed Time	[Enabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min::sec specified
Wake up day	0	
Wake up hour	0	
Wake up minute	0	
Wake up second	0	
Wake system with Dynamic Time	[Disabled]	
Wake up minute increase	1	

++: Select Screen
 T1: 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.

Options summary: (default setting)

Wake system with Fixed Time	Disabled	
Time	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	Disabled	
Dynamic Time	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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

CPU Configuration		Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
Processor Type	Intel(R) Atom(TM) CPU D2 EMT64	
Processor Speed	1865 MHz	
System Bus Speed	533 MHz	
Ratio Status	14	
Actual Ratio	14	
System Bus Speed	533 MHz	
Processor Stepping	30661	
Microcode Revision	269	
L1 Cache RAM	2x56 k	
L2 Cache RAM	2x512 k	
Processor Core	Dual	
Hyper-Threading	Supported	
Hyper-Threading	[Enabled]	
Execute Disable Bit	[Enabled]	
Limit CPUID Maximum	[Disabled]	
▶ CPU Power Management		

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

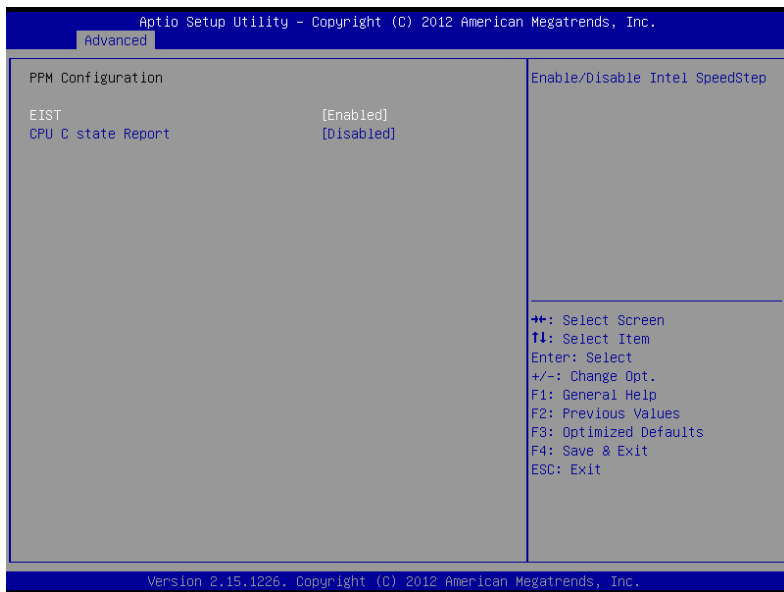
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

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 Power Management		
Configure CPU PPM parameters		

CPU Power Management



Options summary: **(default setting)**

EIST	Disabled	
	Enabled	
En/Disable Intel SpeedStep		
CPU C State Report	Disabled	
	Enabled	

Report C State support for ACPI OS

IDE Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

SATA Port CFast	Drive Modelname Drive Modelname	SATA/CFast Port Device Names If Present and Enabled.
SATA Controller(s)	[Enabled]	
Configure SATA as	[IDE]	

++: 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.

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

<p>USB Configuration</p> <p>USB Devices: 1 Drive, 1 Keyboard, 1 Mouse</p> <p>Legacy USB Support [Enabled]</p> <p>Mass Storage Devices: USB Device Modelname [Auto]</p>	<p>Enables 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.</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

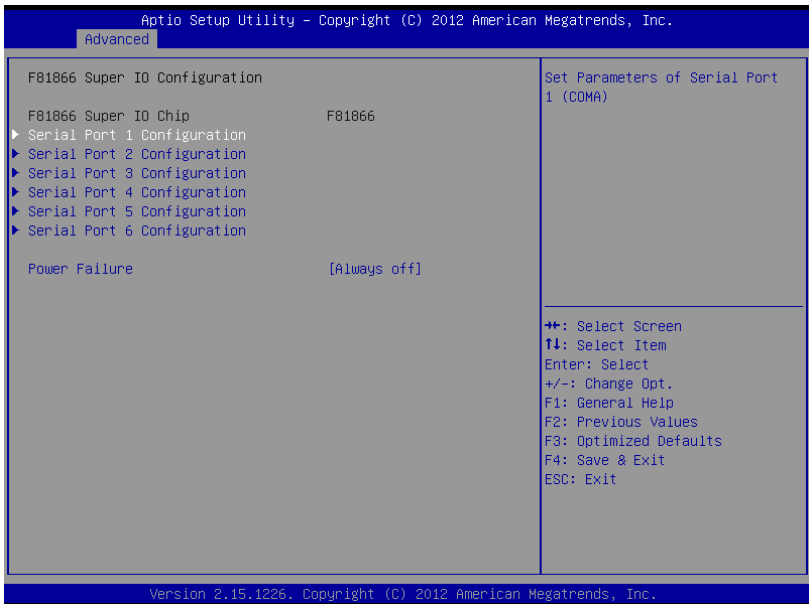
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Options summary: **(default setting)**

Legacy USB Support	Enabled	
	Disabled	
	Auto	
<p>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</p>		
Device Name	Auto	
(Emulation Type)	Floppy	

	Forced FDD	
	Hard Disk	
	CD-ROM	
<p>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)</p>		

F81866 Super IO Configuration



Options summary: **(default setting)**

Serial Port 1/2/3/4/5/6 Configuration		
---------------------------------------	--	--

Set Parameters of Serial Port 1/2/3/4/5/6

Power Failure

Configure system state after power failure.

Serial Port 1/2/3/4/5/6 Configuration



Options summary: **(default setting)**

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings (COM1)	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;	
Change Settings (COM2)	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;	
Change Settings (COM3)	Auto	
	IO=3E8h; IRQ=7;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2D0h; IRQ=3,4,5,7,10,11,12;	
	IO=2C0h; IRQ=3,4,5,7,10,11,12;	
Change Settings (COM4)	Auto	
	IO=2E8h; IRQ=7;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2D0h; IRQ=3,4,5,7,10,11,12;	
	IO=2C0h; IRQ=3,4,5,7,10,11,12;	
Change Settings (COM5)	Auto	
	IO=2D0h; IRQ=10;	

	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2D0h; IRQ=3,4,5,7,10,11,12;	
	IO=2C0h; IRQ=3,4,5,7,10,11,12;	
Change Settings (COM6)	Auto	
	IO=2C0h; IRQ=10;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2D0h; IRQ=3,4,5,7,10,11,12;	
	IO=2C0h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		
Port Mode	RS232	
	RS422	
	RS485	
Configure COM operated as RS232, RS422 or RS485. Only COM1 and COM2 support this function.		

Digital IO Port Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

<pre> Digital IO Port Configuration I/O Port: 0x502 Bit0(Port1)-Bit7(Port8) DIO Port1 [Output] Output Level [Low] DIO Port2 [Output] Output Level [Low] DIO Port3 [Output] Output Level [Low] DIO Port4 [Output] Output Level [Low] DIO Port5 [Input] DIO Port6 [Input] DIO Port7 [Input] DIO Port8 [Input] </pre>	<p>Set DIO as Input or Output</p> <hr/> <pre> +*: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </pre>
---	---

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Options summary: **(default setting)**

DIO Port1/2/3/4	Input	
	Output	
Set DIO Port1/2/3/4 as Input or Output		
DIO Port5/6/7/8	Input	
	Output	
Set GPIO3/GPIO4 as Input or Output		
Output Level	Hi	
	Low	
Set GPIO Level when used as Output		

H/W Monitor

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

Pc Health Status	
CPU Temperature	: +33 %
System temperature	: +32 %
CPU Vcore	: +1.208 V
1.5V	: +1.536 V
GFX VCC	: +1.064 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.

IRQ Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

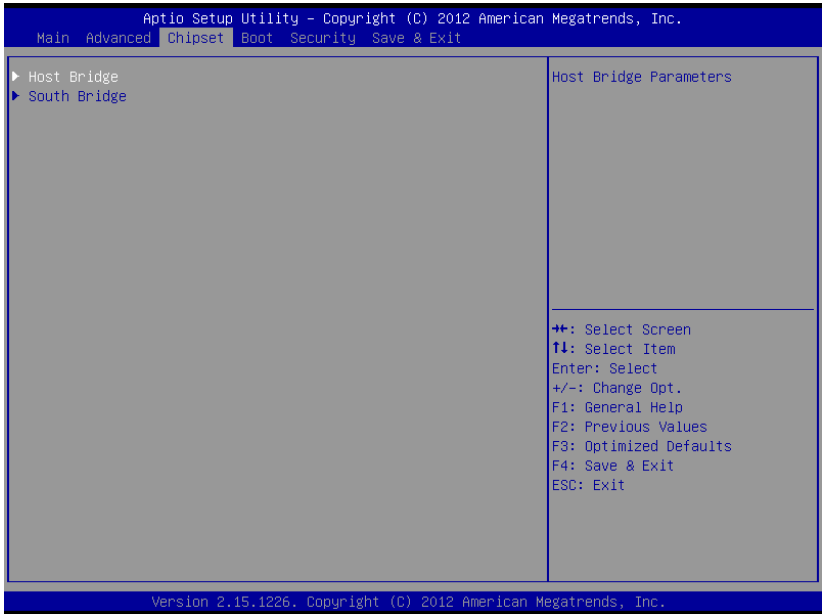
<p>IRQ Configuration</p> <p>IRQ3 [For PCI] IRQ4 [For PCI] IRQ5 [For PCI] IRQ7 [For PCI] IRQ10 [For PCI] IRQ11 [For PCI] IRQ14 [Reserved] IRQ15 [For PCI]</p>	<p>Select IRQ usage.</p> <hr/> <p>+/: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
---	--

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Options summary: (**default setting**)

IRQ 3/4/5/7/10/11/15	For PCI	
	Reserved	
IRQ 14	For PCI	
	Reserved	
Select IRQ usage		

Setup submenu: Chipset



Options summary: **(default setting)**

Host Bridge		
Host Bridge Parameters		
South Bridge		
South Bridge Parameters		

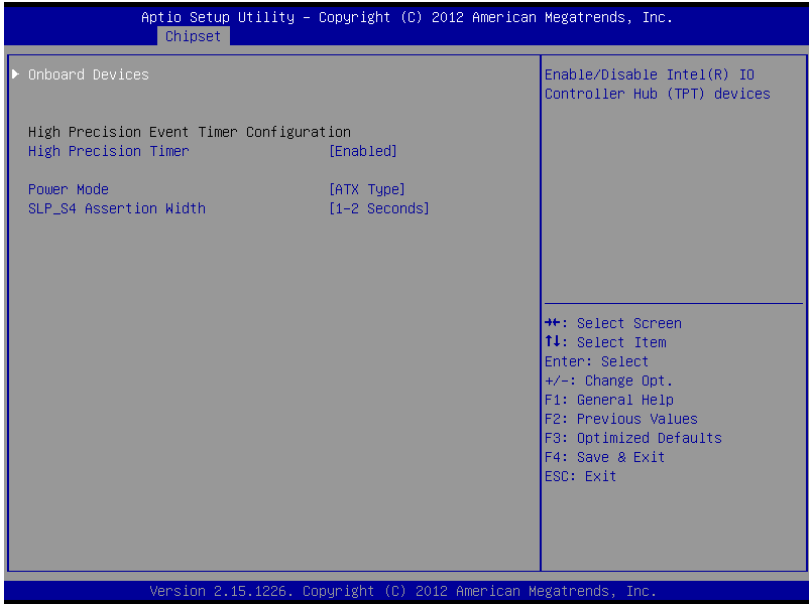
Host Bridge



Options summary: **(default setting)**

Fixed Graphics Memory	128MB	
Size	256MB	
Configure Fixed Graphics Memory Size		
IGFX - Boot Type	Auto Detect	
	CRT	
	DVI	
Select Primary boot display device		

South Bridge

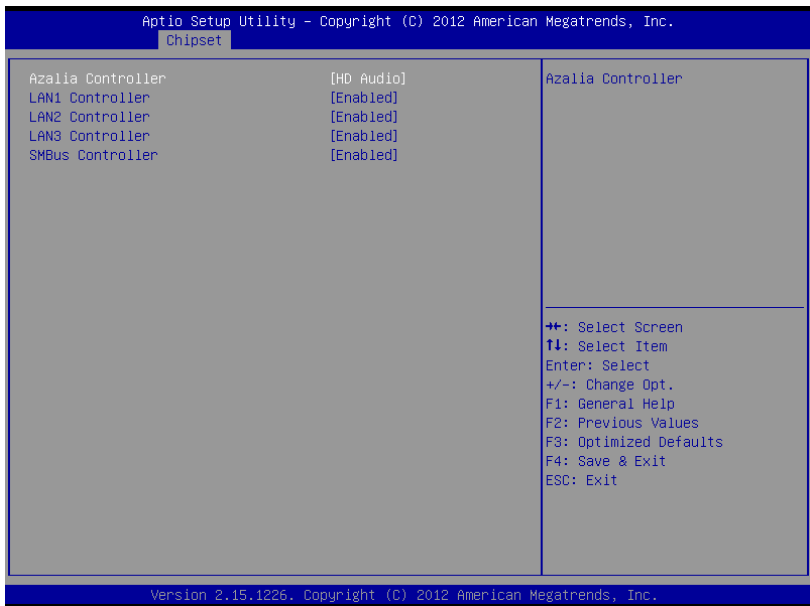


Options summary: (**default setting**)

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		

Onboard Devices

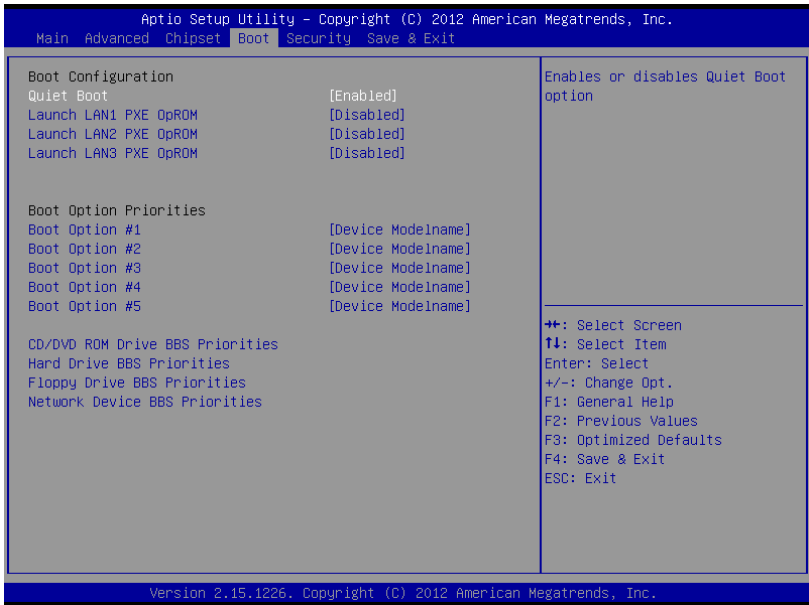


Options summary: **(default setting)**

Azalia Controller	Disabled	
	HD Audio	
Enable or disabled Azalia controller		
LAN1/2/3 Controller	Disabled	

	<i>Enabled</i>	
Enable or disable Realtek R8111E PCIE Lan Device		
SMBus Controller	Disabled	
	<i>Enabled</i>	
Enable or Disable OnChip SMBus Controller		

Setup submenu: Boot



Options summary: *(default setting)*

Quiet Boot	Disabled	
	<i>Enabled</i>	
En/Disable showing boot logo.		

Launch LAN1/2/3 PXE	Disabled	
OpROM	Enabled	
En/Disable PXE boot for RTL8111E LAN		
Boot Option #X/		
XXXX Drive BBS Priorities		
The order of boot priorities.		

BBS Priorities

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Boot

<pre> Boot Option #1 [Device Modelname] Boot Option #2 [Device Modelname] Boot Option #3 [Device Modelname] Boot Option #4 [Device Modelname] Boot Option #5 [Device Modelname] Boot Option #6 [Device Modelname] </pre>	<p>Sets the system boot order</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

Version 2.15.1226, Copyright (C) 2012 American Megatrends, Inc.

Options summary: **(default setting)**

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

Setup submenu: Security

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Main | Advanced | Chipset | Boot | Security | Save & Exit

<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.</p> <p>If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.</p> <p>The password length must be in the following range:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password</p> <p>User Password</p>	Minimum length	3	Maximum length	20	<p>Set Administrator Password</p> <hr/> <p> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
Minimum length	3				
Maximum length	20				

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Options summary: (default setting)

Administrator Password/	Not set	
User 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.

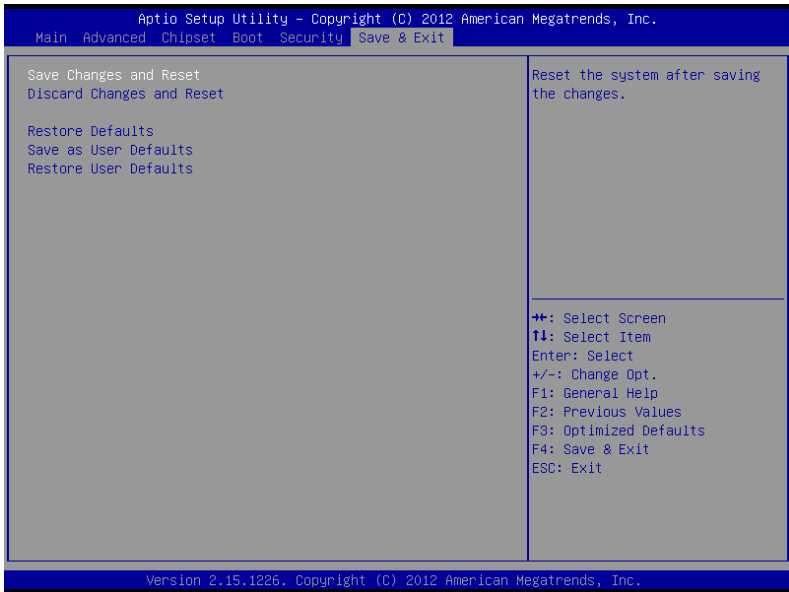
Install the Password:

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 CES-CV101 comes with a DVD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install SATA Driver

Step 4 – Install LAN Driver

Step 5 – Install Audio Driver

Step 6 – Install Serial Port Driver (Optional)

4.1 Installation:

Insert the CES-CV101 DVD-ROM into the DVD-ROM drive, and then install the drivers from Step 1 to Step 6 in order.

Step 1 – Install Chipset Driver

1. Click on the **STEP1-CHIPSET** folder and select the OS folder according to your operating system.
2. Double click on the **infinst_autol.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

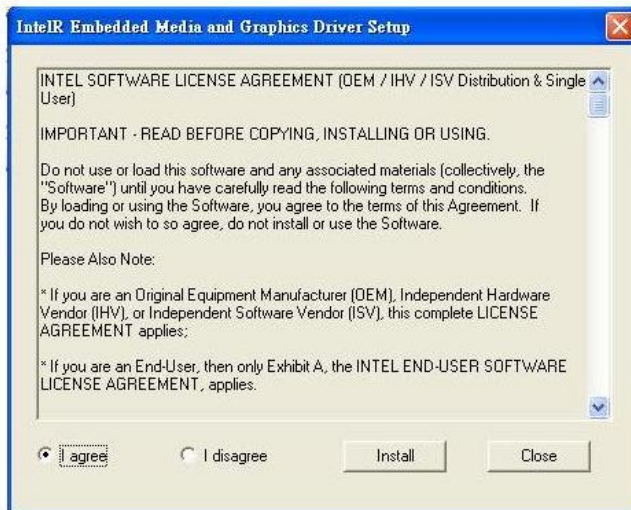
For Windows® XP

1. Click on the **STEP2-VGA** folder and select the folder of **WINXP_32**
2. 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 ***IEMGDInstall.exe***
- Select the configuration
- Follow the instructions that the window shows
- The system will help you install the driver automatically





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

Uninstall IEMGD

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



Step 3 – Install SATA Driver (optional, for SATA in AHCI mode only)

1. Click on the **STEP3-SATA** folder and select the OS folder according to your operating system.
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

Note: AHCI mode is not supported by native Windows XP installation process. Please refer to **Appendix C AHCI Setting** to install F6 driver for installation Windows® XP with AHCI mode.

Step 4 – Install LAN Driver

5. Click on the **STEP4-LAN** folder and select the OS folder according to your operating system.
6. Double click on the **setup.exe** file located in each OS folder
7. Follow the instructions that the window shows
8. The system will help you install the driver automatically

Step 5 – Install Audio Driver

1. Click on the **STEP5-AUDIO** folder and select the OS folder according to your operating system.
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 6 – Serial Port Driver (Optional)

Please refer to ***readme.txt*** in the STEP6 - Serial Port Driver (Optional) folder.

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	0xA10	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	0x05	6	1	1: timeout occurred.

Status				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      0x510 // 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 WDRstBit 0x80 // Watchdog WDTRST# (Bit7)
    #define WDRstVal 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 procedure will enable the WDT counting.

```

```

    AeonWDTEnable();
}
*****

*****

// Procedure : AeonWDTEnable
VOID AeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AeonWDTConfig
VOID AeonWDTConfig (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 WDRST# Enable
    WDTSetBit(DevReg, WDRstBit, WDRstVal);
}

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

B.1 I/O Address Map


























Input/output (IO)	
[00000000 - 0000001F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000024 - 00000025]	Programmable interrupt controller
[00000028 - 00000029]	Programmable interrupt controller
[0000002C - 0000002D]	Programmable interrupt controller
[0000002E - 0000002F]	Motherboard resources
[00000030 - 00000031]	Programmable interrupt controller
[00000034 - 00000035]	Programmable interrupt controller
[00000038 - 00000039]	Programmable interrupt controller
[0000003C - 0000003D]	Programmable interrupt controller
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[0000004E - 0000004F]	Motherboard resources
[00000050 - 00000053]	System timer
[00000061 - 00000061]	Motherboard resources
[00000062 - 00000063]	Motherboard resources
[00000063 - 00000063]	Motherboard resources
[00000065 - 00000065]	Motherboard resources
[00000065 - 0000006F]	Motherboard resources
[00000067 - 00000067]	Motherboard resources
[00000070 - 00000070]	Motherboard resources
[00000070 - 00000077]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000091]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000088 - 00000088]	Motherboard resources
[0000008C - 0000008E]	Motherboard resources
[00000090 - 0000009F]	Motherboard resources
[00000092 - 00000092]	Motherboard resources
[00000093 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000A4 - 000000A5]	Programmable interrupt controller
[000000A8 - 000000A9]	Programmable interrupt controller
[000000AC - 000000AD]	Programmable interrupt controller

	[000000B0 - 000000B1]	Programmable interrupt controller
	[000000B2 - 000000B3]	Motherboard resources
	[000000B4 - 000000B5]	Programmable interrupt controller
	[000000B8 - 000000B9]	Programmable interrupt controller
	[000000BC - 000000BD]	Programmable interrupt controller
	[000000C0 - 000000DF]	Direct memory access controller
	[000000E0 - 000000EF]	Motherboard resources
	[000000F0 - 000000F0]	Numeric data processor
	[000002C0 - 000002C7]	Communications Port (COM6)
	[000002D0 - 000002D7]	Communications Port (COM5)
	[000002E8 - 000002EF]	Communications Port (COM4)
	[000002F8 - 000002FF]	Communications Port (COM2)
	[000003B0 - 000003BB]	Intel(R) Graphics Media Accelerator 3600 Series
	[000003C0 - 000003DF]	Intel(R) Graphics Media Accelerator 3600 Series
	[000003E8 - 000003EF]	Communications Port (COM3)
	[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
	[00000A00 - 00000A0F]	Motherboard resources
	[00000A10 - 00000A1F]	Motherboard resources
	[00000A20 - 00000A2F]	Motherboard resources
	[00000D00 - 0000FFFF]	PCI bus
	[00001000 - 0000100F]	Motherboard resources
	[0000C000 - 0000C0FF]	Realtek PCIe GBE Family Controller #2
	[0000C000 - 0000CFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
	[0000D000 - 0000D0FF]	Realtek PCIe GBE Family Controller #3
	[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



B.2 1st MB Memory Address Map

Address Range	Device Name
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00003FFF]	Motherboard resources
[000A0000 - 000BFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	PCI bus
[000F0000 - 000FFFFFF]	PCI bus
[7F800000 - 7FFFFFFF]	PCI bus
[80000000 - FEBFFFFF]	PCI bus
[DFB00000 - DFBFFFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[DFC00000 - DFC03FFF]	Realtek PCIe GBE Family Controller #2
[DFC00000 - DFC0FFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
[DFC04000 - DFC04FFF]	Realtek PCIe GBE Family Controller #2
[DFD00000 - DFD03FFF]	Realtek PCIe GBE Family Controller #3
[DFD00000 - DFD0FFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
[DFD04000 - DFD04FFF]	Realtek PCIe GBE Family Controller #3
[DFE00000 - DFE03FFF]	Realtek PCIe GBE Family Controller
[DFE00000 - DFE0FFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[DFE04000 - DFE04FFF]	Realtek PCIe GBE Family Controller
[DFF00000 - DFF03FFF]	High Definition Audio Controller
[DFF04000 - DFF043FF]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[DFF05000 - DFF053FF]	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
[E0000000 - EFFFFFFF]	System board
[FEC00000 - FEC00FFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED14000 - FED19FFF]	System board
[FED1C000 - FED1FFFF]	Motherboard resources
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED8FFFF]	Motherboard resources
[FED45000 - FED8FFFF]	Motherboard resources
[FEE00000 - FEE00FFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFC00000 - FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart

	Interrupt request (IRQ)	
	(ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000003 (03)	Communications Port (COM2)
	(ISA) 0x00000004 (04)	Communications Port (COM1)
	(ISA) 0x00000007 (07)	Communications Port (COM3)
	(ISA) 0x00000007 (07)	Communications Port (COM4)
	(ISA) 0x00000008 (08)	System CMOS/real time clock
	(ISA) 0x0000000A (10)	Communications Port (COM5)
	(ISA) 0x0000000A (10)	Communications Port (COM6)
	(ISA) 0x0000000D (13)	Numeric data processor
	(PCI) 0x00000005 (05)	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
	(PCI) 0x00000011 (17)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
	(PCI) 0x00000012 (18)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
	(PCI) 0x00000012 (18)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
	(PCI) 0x00000013 (19)	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	(PCI) 0x00000013 (19)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0x00000017 (23)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
	(PCI) 0x00000017 (23)	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
	(PCI) 0xFFFFFFF8 (-5)	Realtek PCIe GBE Family Controller #2
	(PCI) 0xFFFFFFF8 (-4)	Realtek PCIe GBE Family Controller #3
	(PCI) 0xFFFFFFF8 (-3)	Realtek PCIe GBE Family Controller
	(PCI) 0xFFFFFFF8 (-2)	Intel(R) Graphics Media Accelerator 3600 Series

B.4 DMA Channel Assignments

	Direct memory access (DMA)
	4 Direct memory access controller

Appendix

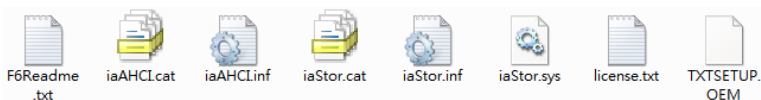
C

AHCI Setting

C.1 Setting AHCI

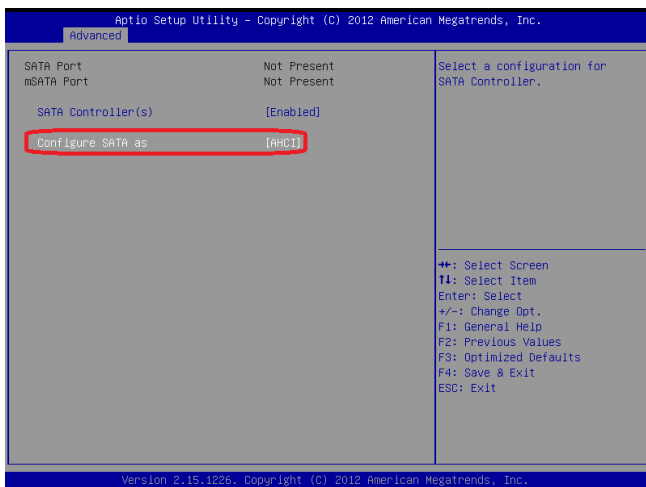
OS installation to SETUP AHCI Mode

Step 1: Copy below files from “Driver CD -> STEP3-SATA WinXP_32\F6 Install Floppy for Windows” and to diskette.

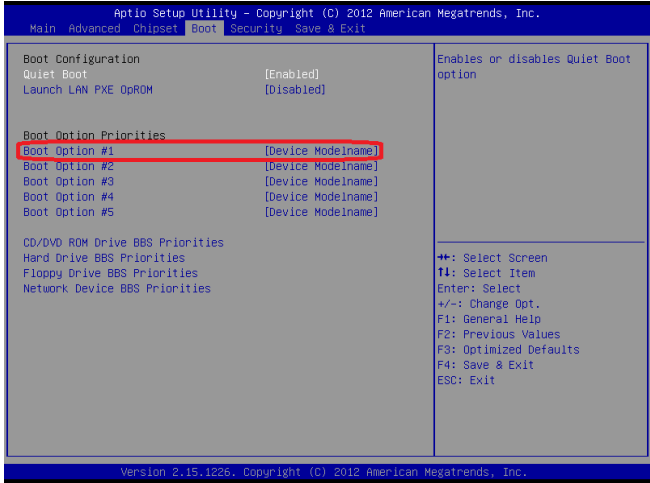


Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.

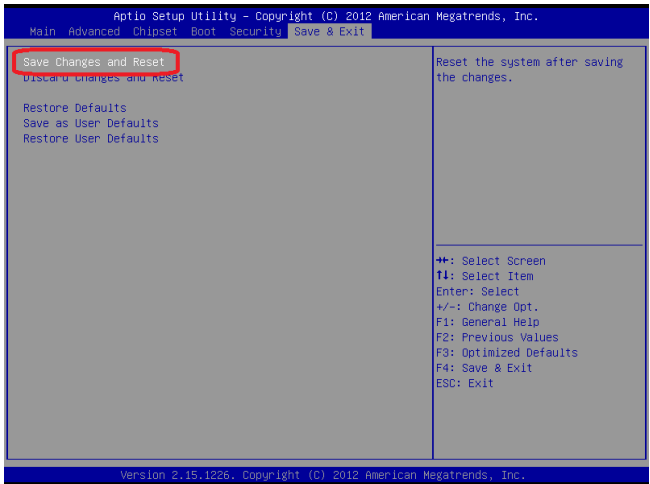
Step 3: Configure SATA Controller to AHCI mode in **BIOS SETUP Menu: Advanced -> IDE Configuration -> SATA Mode -> AHCI Mode**



Step 4: Configure DVD/CD-ROM drive as the first boot device.

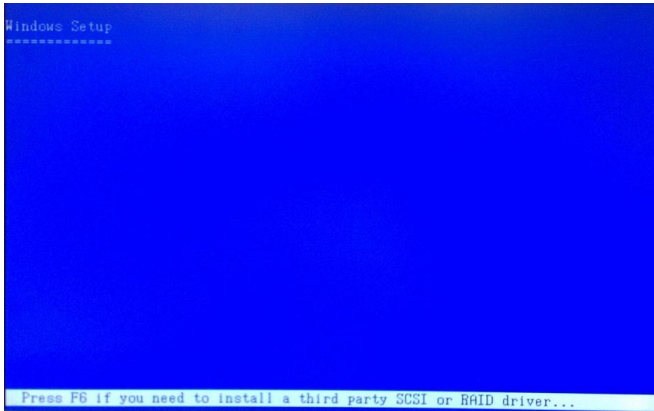


Step 5: Save changes and exit BIOS SETUP

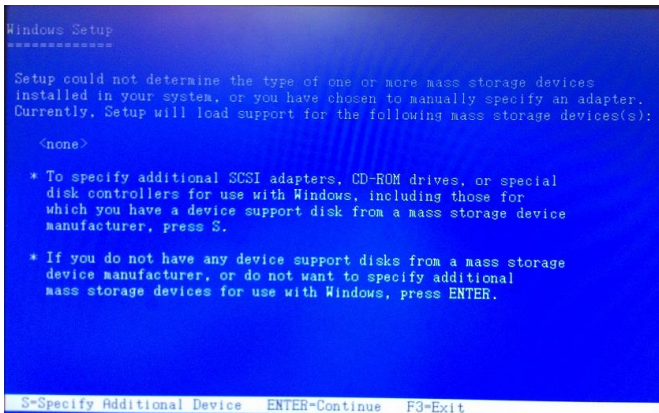


Step 6 – Boot to DVD/CD-ROM device to install OS

Step 7 – Press “**F6**” to install AHCI driver



Step 8 – Press “**S**” to install AHCI driver



Step 9 – Choose “**Intel(R) NM10 Express Chipset**”

Step 10 – Windows Setup will display the controller name you selected in previous step and continue to install OS when “**ENTER**” pressed.