SBC81210 Series
Intel® Socket 1155 Intel Core™ i7 / Core™ i5 / Core™ i3 / Processor
PICMG 1.0 Single Board Computer
User's Manual

Disclaimers

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

September 2011, Version A1

Printed in Taiwan

ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.

Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.

Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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MEMO:

CHAPTER 1
INTRODUCTION

The SBC81210 PICMG 1.0 full-size Single Board Computer supports Intel® Core™ i3 Desktop Processor, Intel® Core™ i5 Desktop Processor, Core™ i7 Desktop Processor with 32nm technology and Transfer Rate 1066/1333 MHz.. The board integrates chipsets Intel® B65 that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There are two DDR3 DIMM sockets for dual channel DDR3 1066/1333, maximum memory capacity up to 8GB. The board also features dual gigabit Ethernet, four serial ATA channels for one serial ATA hard drive at maximum transfer reate up to 6 Gb/sec and three serial ATA hard drives at maximum transfer rate up to 3 Gb/sec, six USB 2.0 high speeds compliant that can achieve the best stability and reliability for industrial applications.

1.1 Specifications

- **CPU**
  - Intel® Core™ i3 Desktop Processor
  - Intel® Core™ i5 Desktop Processor
  - Intel® Core™ i7 Desktop Processor
- **System Chipset**
  - Intel® B65
- **CPU Socket**
  - LGA1155
- **Front-Side Bus**
  - 1066/1333 MHz
- **BIOS**
  - AMI BIOS
- **System Memory**
  - Two x 240-pin DDR3 DIMM sockets
  - Supports DDR3 1066/1333 memory, up to 8GB
- **L2 Cache: integrated in CPU**
- **Onboard Multi-I/O**
  - Parallel Port: one bi-directional with ECP/EPP/SPP support
  - Serial Port: one for RS-232 (COM1) and one port for RS-232/422/485 (COM2)
  - Floppy controller: supports two drives (1.44MB for each)
- **USB Interface**
  - Six USB ports compliant with USB Spec. Rev. 2.0
- **VGA Controller**
  - Chipset Integrated VGA Controller and Supports up to 2048x1536 at 75 Hz resolution on non-interlaced CRT monitors

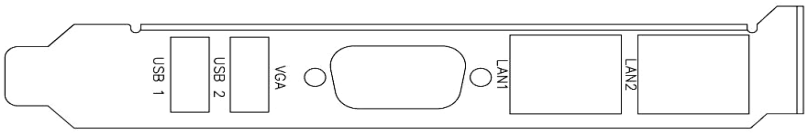
- **Ethernet**
  - The LAN1/LAN2 are Intel 82579LM / Intel 82583V Ethernet controller support 10/100/1000 Mb/s
  - Via PCI Express x1 bus
  - Wake-on-LAN support
- **Serial ATA**
  - One SATA 6 Gb/sec and Three SATA 3 Gb/sec performance(Optional RAID 0/1/10/5 with Q67)
- **Audio**
  - 16-pin 2.54 pin-header (Intel® HD Audio Digital Header)
  - This header can be for Audio kit AX93242 (optional)
- **Hardware Monitoring**
  - Controller: Winbond W83627DHG detection of CPU temperature, system temperature, power failure and fan speed
- **Watchdog Timer**
  - Software programmable time interval and hardware reset only.
  - 1~255 seconds; up to 255 levels
- **Dimensions: 338 x 126 mm (6 layer)**

NOTE All specifications and images are subject to change without notice.

1.2 Utilities Supported

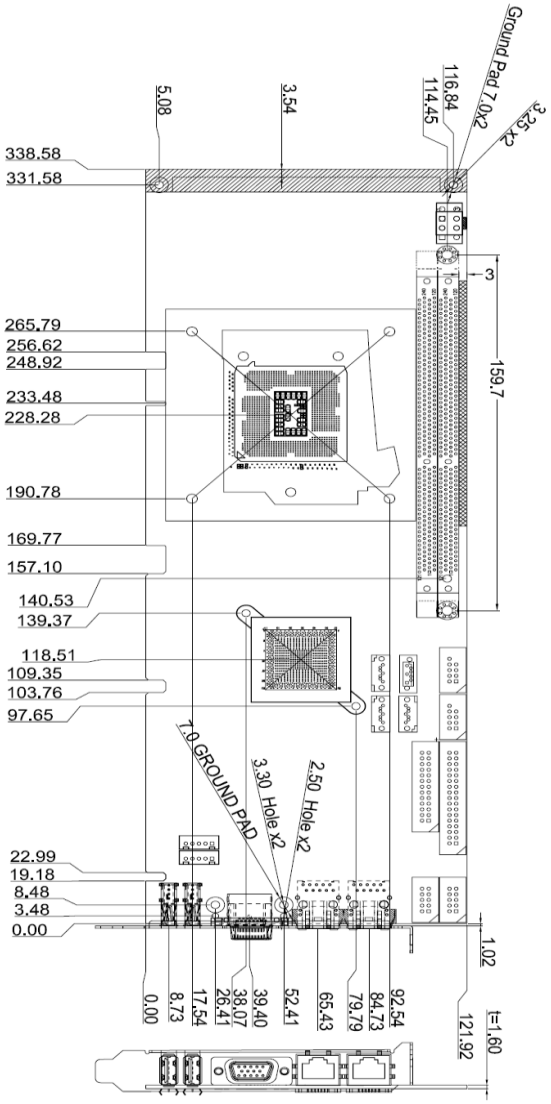
- **Intel® B65 Utility and Drivers**
- **VGA Drivers**
- **Ethernet Utility and Drivers**

1.3 I/O Bracket

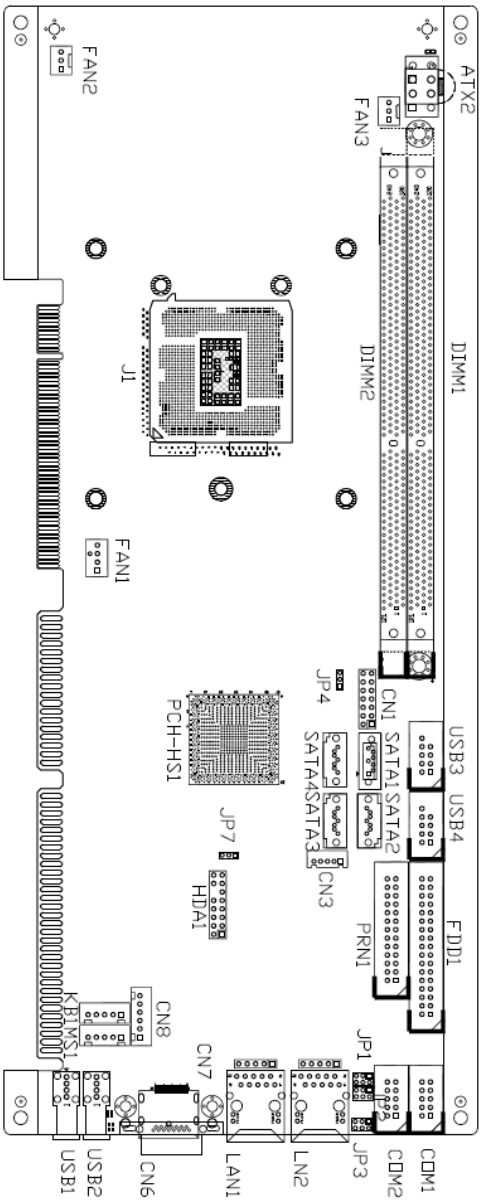


CHAPTER 2
JUMPERS AND CONNECTORS

2.1 Board Dimension



2.2 Board Layout



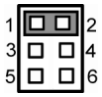
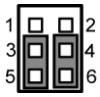
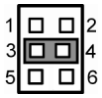
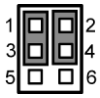
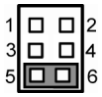
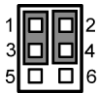
2.3 Jumper Settings

Proper jumper settings configure the SBC81210 to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Jumper	Description	Jumper Setting
JP1	COM2 Mode Selection: RS-232	Short 1-2
JP2	COM2 Mode Selection: RS-232	Short 3-5 , 4-6
JP3	COM2 Mode Selection: RS-232	Short 3-5 , 4-6
JP4	Power On Control Mode	Short 1-2
JP7	CMOS Clear	Short 1-2

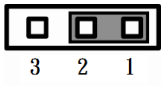
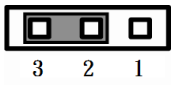
2.3.1 COM2 RS-232/422/485 Mode Select (JP1, JP2, JP3)

These jumpers select the communication mode of COM1 port to operate RS-232 or RS-422 or RS-485. When these jumpers are selected to operate RS-422 or RS485, please make sure the COM1 is on Data mode.

Function	Jumper Setting		
	JP1	JP2	JP3
RS-232 (Default)			
RS-422			
RS-485			

2.3.2 Power On Control Mode (JP4)

The Power On Control mode provides two kinds of power on mode as follows,

Function	Jumper Setting
Power On control by Front Panel Connector (Default)	
Power On control by Power Supply	

2.3.3 CMOS Clear (JP7)

You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Function	Jumper Setting
Normal (Default)	
Clear CMOS (Short 2-3)	

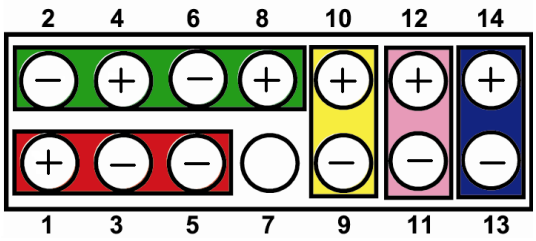
2.4 Connectors

Connectors connect the CPU card with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected.

Here is a summary table shows you all connectors on the board.

Connector	Label	Connector	Label
Axiomtek Front Panel	CN1	USB0 Connector	USB1
SMBUS Pin Header	CN3	USB1 Connector	USB2
LAN2 Extenal LED	CN4	USB Port2.3	USB3
LAN1 Extenal LED	CN5	USB Port4.5	USB4
VGA Connector	CN6	SATA 0 6Gb(SATA3)	SATA1
DISPLAY Connector (Optional)	CN7	SATA Port 1	SATA2
Axiomtek ACPI Connector	CN8	SATA Port 2	SATA3
Keyboard Connector	KB1	SATA Port 3	SATA4
Mouse Connector	MS1	CPU FAN	FAN1
COM1 Connecter	COM1	SYS FAN	FAN2
COM2 Connecter	COM2	AUX FAN	FAN3
RJ45 (WG82579LM)	LAN1	Print Connecter	PRN1
RJ45 (WG82583)	LAN2	Floppy Connecter	FDD1
ATX 4X2 Connector	ATX2	Audio Link	HDA1

2.4.1 Front Panel Connector (CN1)



- **Power LED**

  This 3-pin connector denoted as Pin 1 and Pin 5 connects the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON. Pin 3 is defined as GND.

- **External Speaker and Internal Buzzer Connector**

  Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **ATX Power On/Off Button**

  This 2-pin connector denoted as Pin 9 and 10 connects the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**

  Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

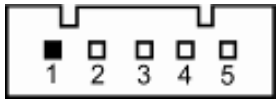
- **HDD Activity LED**

  This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.2 SMBUS Connector (CN3)

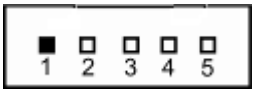
Connector SMBUS CN3 is for SMBUS interface support.

Pin	Signal
1	CLOCK
2	N.C
3	GND
4	DATA
5	+5V



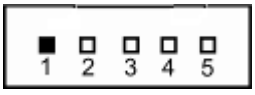
2.4.3 LAN1 LED Connectors (CN5)

Pin	Signal
1	100, Low Active
2	+ 3.3V
3	1000, Low Active
4	
5	LINK_ACT LED(-)



2.4.4 LAN2 LED Connectors (CN4)

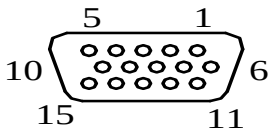
Pin	Signal
1	100, Low Active
2	+ 3.3V
3	1000, Low Active
4	
5	LINK_ACT LED(-)



2.4.5 BD15 CRT Connector (CN6) Co-layout with CN7

CN6 is a DB15 connector commonly used for the CRT Monitor.

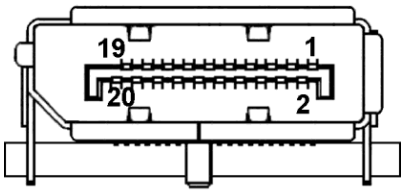
Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK



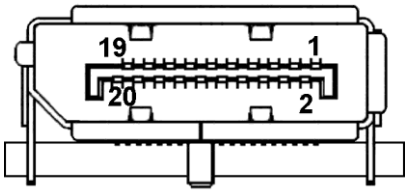
2.4.6 Display Port Connector (CN7) Co-layout with CN6

CN7 is a Standard Display Port Connector co-layout with CN6.

Pin	Signal
1	DPB_LANE0
2	GND
3	DPB_LANE0#
4	DPB_LANE1
5	GND
6	DPB_LANE1#
7	DPB_LANE2
8	GND
9	DPB_LANE2#
10	DPB_LANE3
11	GND



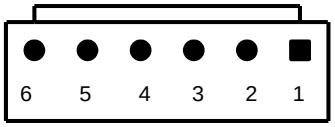
Pin	Signal
12	DPB_LANE3#
13	Detect Pin
14	GND
15	DPB_AUX
16	GND
17	DPB_AUX#
18	DPB_HPDE
19	GND
20	+3.3V



2.4.7 AXIOMTEK ACPI Connector (CN8)

It is to support remote power on/off for turning off the system through software control while using the ATX-compliant power supply.

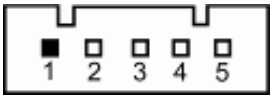
Pin	Signal
1	EXTSMI
2	GND
3	POWER BUTTOM
4	GND
5	SUSB
6	+5VSB



2.4.8 PS/2 Keyboard, Mouse Connectors (KB1,MS1)

The board provides theMouse (KB1)/ Keyboard (MS1) interface with a 5-pin connecter.

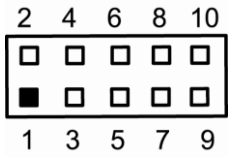
Pin	Signal
1	Clock
2	DATA
3	No connector
4	GND
5	+5VSBY



2.4.9 COM Port RS-232 Pin Assignment (COM1)

COM1 Serial Port 10-pin (Box-header) Connector Pin Assignment list

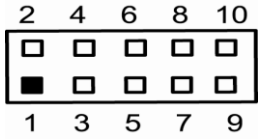
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Disconnect(NI)



2.4.10 RS232/422/485 Pin Assignment (COM2)

The serial interface for the board consists of COM2 support for RS-232 and COM1 for RS-232/RS-422/RS-485.

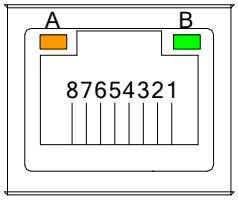
Pin	Signal Name		
	RS-232	RS-422	RS-485
1	Data Carrier Detect (DCD)	TX-	DATA-
2	Data Set Ready (DSR)	No connector	No connector
3	Receive Data (RXD)	TX+	DATA+
4	Request to Send (RTS)	No connector	No connector
5	Transmit Data (TXD)	RX+	No connector
6	Clear to Send (CTS)	No connector	No connector
7	Data Terminal Ready (DTR)	RX-	No connector
8	Ring Indicator (RI)	No connector	No connector
9	Ground (GND)	GND	GND
10	Disconnect(NI)	NI	NI



2.4.11 Ethernet RJ-45 Connectors (LAN1, LAN2)

The RJ-45 connectors LAN1 and LAN2 are for Ethernet. To connect the board to 100-Base-T or 1000-Base-T hub, just plug one end of the cable into LAN1 and connect the other end (phone jack) to a 100-Base-T hub or 1000-Base-T hub.

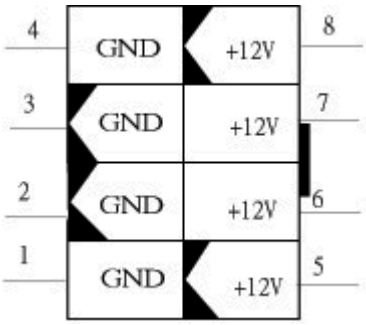
Pin	Signal
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ-1(For 1000 base T-Only)
5	RJ-1(For 1000 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 1000 base T-Only)
8	RJ-1(For 1000 base T-Only)
A	Active LED
B	Speed LED



2.4.12 ATX 8 Pin 12V IN Connector (ATX2)

You can connect it to the ATX12V power supply for CPU Core Voltage.

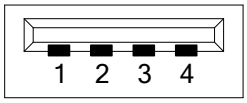
Pin	Signal
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V



2.4.13 External USB Port Connectors (USB1, USB2)

The 4-pin standard Universal Serial Bus (USB) port connector on the board is for the installation of peripherals supporting the USB interface.

Pin	Signal
1	USB_POWER
2	USB -
3	USB +
4	GND

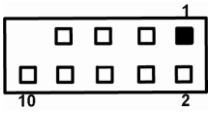


2.4.14 Internal USB Connectors (USB3, USB4)

The 10-pin standard Universal Serial Bus (USB) connectors, CN3/4/5/6, on this board are for installing versatile USB interface peripherals.

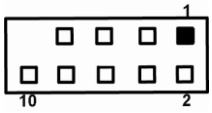
Pin	Signal	Pin	Signal
1	USB_PWR	2	USB_PWR
3	USB2-	4	USB3-
5	USB2+	6	USB3+
7	GND	8	GND
		10	GND

USB3



Pin	Signal	Pin	Signal
1	USB_PWR	2	USB_PWR
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
		10	GND

USB4



2.4.15 SATA Connectors (SATA1,SATA2,SATA3,SATA4)

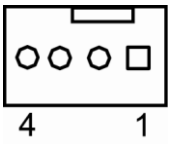
These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

2.4.16 A CPU fan is always needed for cooling CPU heat (FAN1)

The CPU fan connector FAN1 provides power to the CPU fan.

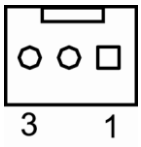
Pin	Signal
1	Ground
2	+12V
3	Rotation Detection
4	Speed Control



2.4.17 System & Auxiliary Fan Connectors (FAN2, FAN3)

You can connect the system cooling fan cable to FAN2/FAN3 for system cooling fan power.

Pin	Signal
1	GND
2	+12V
3	Rotation Detection



2.4.18 Parallel Port Connector (PRN1) Print Port Connector

This board has a multi-mode parallel port to support:

- **Standard Mode:**

  IBM PC/XT, PC/AT and PS/2™ are compatible with bi-directional parallel port.

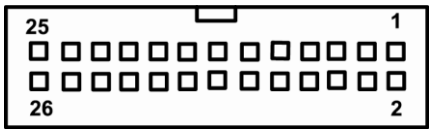
- **Enhanced Mode:**

  Enhance parallel port (EPP) is compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant).

- **High Speed Mode:**

  Microsoft and Hewlett Packard extended capabilities port (ECP) is IEEE 1284 compliant.

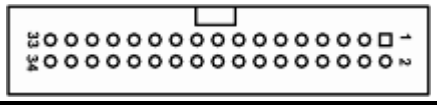
Pin	Signal	Pin	Signal
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error#
5	Data 1	6	Initialize#
7	Data 2	8	Printer Select In#
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge#	20	GND
21	Busy	22	GND
23	Paper Empty#	24	GND
25	Printer Select	26	N.C



2.4.19 Floppy Disk Port Connector (FDD1)

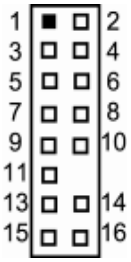
The board provides a 34-pin header type connector, FDD1, supporting up to two floppy drives. The floppy drives may be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB.

Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	Drive Density Select	3	GND
4	No connector	5	GND	6	No connector
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	No connector
13	GND	14	Drive select A#	15	GND
16	No connector	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	No connector	30	Read data#
31	GND	32	Head selection#	33	No connector
34	Disk change#				



2.4.20 Intel® HD Audio Digital Header (HDA1)

Pin	Signal	Pin	Signal
1	BCLK	2	GND
3	RST#	4	VCC3
5	SYNC	6	GND
7	SDOUT	8	VCC3
9	SDI0	10	+12V
11	No connector	13	No connector
14	3VDUAL	15	No connector
16	GND		



CHAPTER 3
HARDWARE INSTALLATION

Before installing the processor, please access Intel® website for more

detail information

Processor Integration Video (LGA1155)**:**

http://www.intel.com/support/tw/processors/sb/CS-030860.htm

3.1 Installing the Processor

The LGA1155 processor socket comes with a cover to protect the processor. Please install the processor into the CPU socket step by step as below:

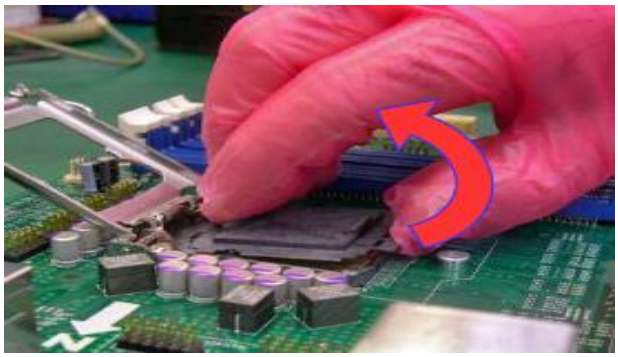
Step1 Opening the Socket:

- Disengage load lever by releasing down and out on the hook. This will clear retention tab.
- Rotate load lever to open position at approximately 135°.
- Rotate load plate to open position at approximately 150°.

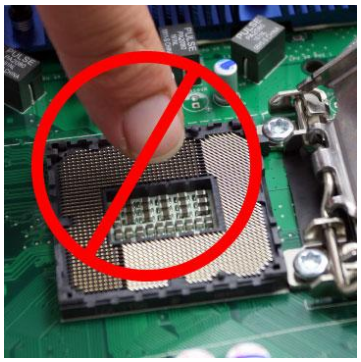
NOTE: Apply pressure to corner with right-hand thumb when opening or closing load lever - otherwise lever will bounce back (as a mouse trap) causing bent contacts.

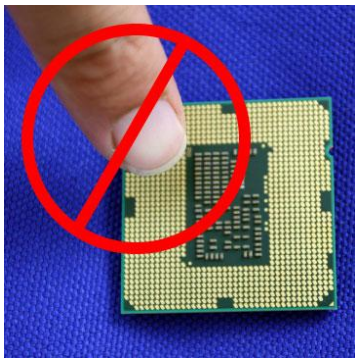
Step2 Removing the socket protective cover:

- Place thumb against the front edge of the protective cover and rest index finger on the rear grip to maintain control of the cover.
- Lift the front edge of the protective cover to disengage from the socket. Keep control of the cover by holding the rear grip with index finger.
- Lift protective cover away from the socket, being careful not to touch the electrical contacts.



NOTE: Vertical removal is NOT recommended, as it requires higher force and can lead to socket contact damage.

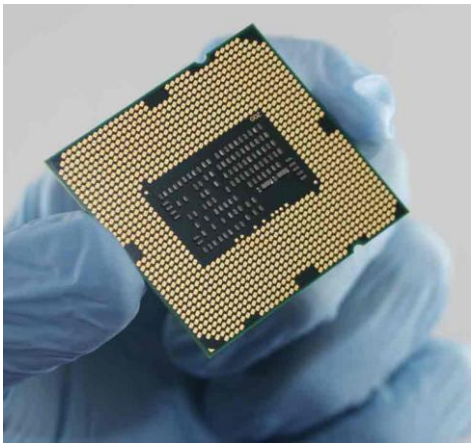




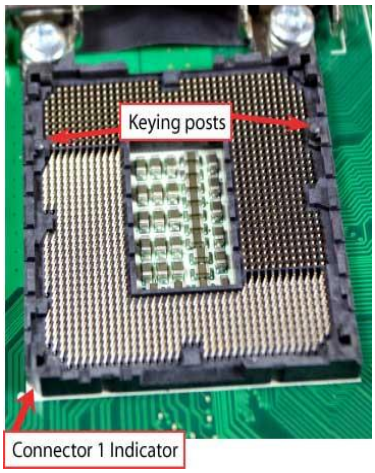
Caution: Never Touch Fragile Socket Contacts to Avoid Damage and Do Not Touch Processor Sensitive Contacts at Any Time During Installation.

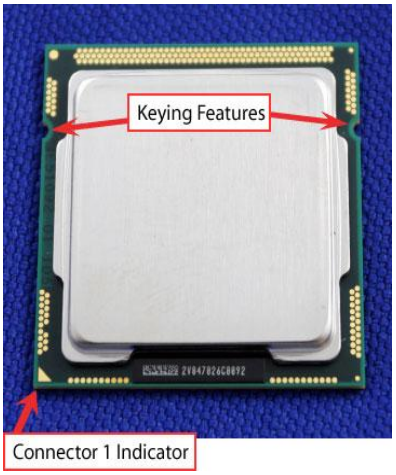
Step3 Processor installation:

- Lift processor package from shipping media by grasping the substrate edges. Scan the processor package gold pads for any presence of foreign material. If necessary, the gold pads can be wiped clean with a soft lint-free cloth and isopropyl alcohol.



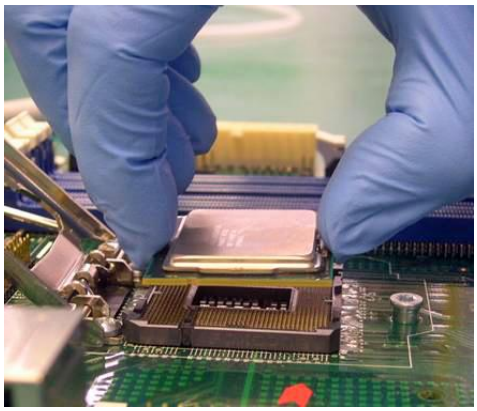
- Scan the processor package gold pads for any presence of foreign material. If necessary, the gold pads can be wiped clean with a soft lint-free cloth and isopropyl alcohol.
- Locate connection 1 indicator on the processor which aligns with connection 1 indicator chamfer on the socket, and notice processor keying features that line up with posts along socket walls.



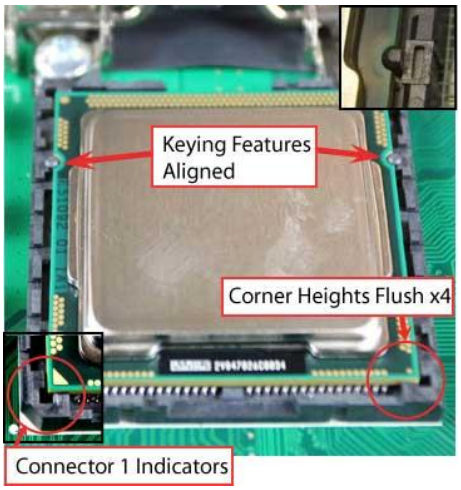


- Grasp the processor with thumb and index finger along the top and bottom edges. (Do not touch the Orientation Notches.) The socket will have cutouts for your fingers to fit into (see image below).
- Carefully place the processor into the socket body vertically (see image below).

NOTE: Tilting or roughly shifting it into place can damage socket contacts. Caution: Do not use a vacuum pen for installation.



- Verify that package is within the socket body and properly connected to orientation keys.

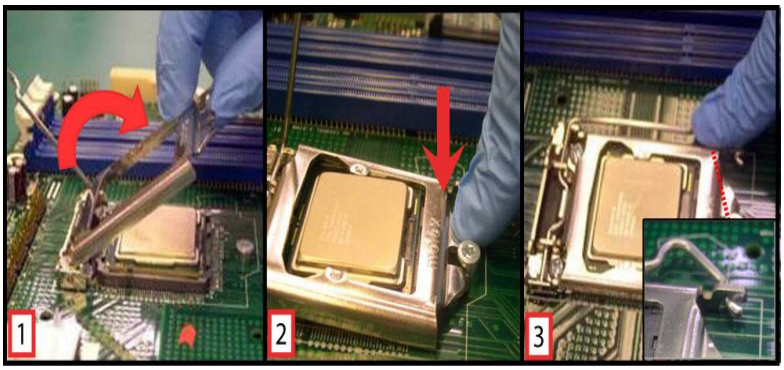


- Close the socket (see image below):

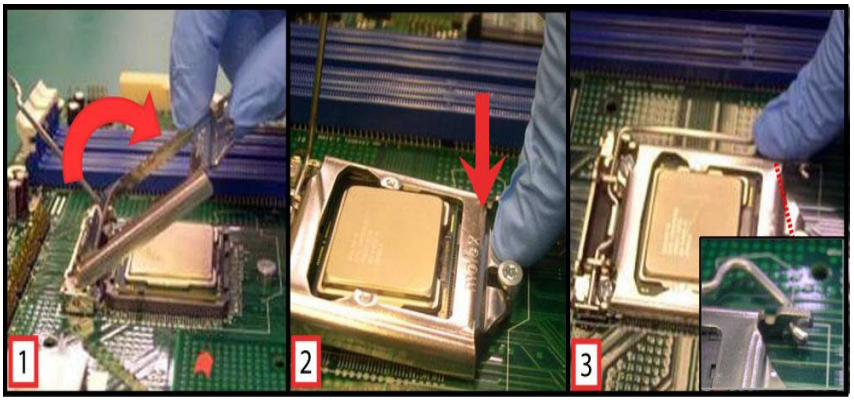
  A. Gently lower the load plate.

  B. Make sure load plate's front edge slides under the shoulder screw cap as the lever is lowered.

  C. Latch the lever under the top plate's corner tab, being cautious not to damage the motherboard with the tip of the lever.

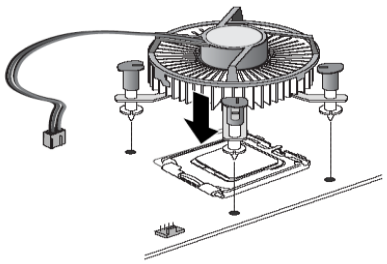


- Close the socket (see image below):
  - A Gently lower the load plate.
  - B Make sure load plate's front edge slides under the shoulder screw cap as the lever is lowered.
  - C atch the lever under the top plate's corner tab being cautious not to damage the motherboard with the tip of the lever.

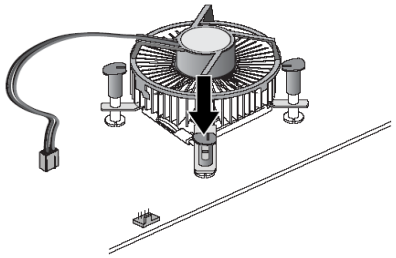


Step4 Fan heatsink handling:

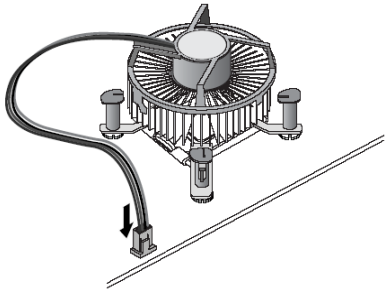
1. Orientate the CPU cooling fan to fixing holes on the board.



2. Screw the CPU cooling fan onto the board.

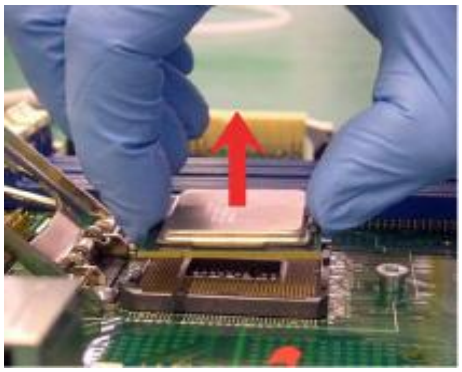


3. Make sure the CPU fan is plugged to the CPU fan connector.



Step5 Removing the processor:

- Open the socket:
  A. Disengage the load lever.
  B. Open the load plate.
- Remove the Processor package, holding along the top and bottom edges, or by using a vacuum pen.
- Maintain Processor horizontal and remove Processor with a vertical motion to avoid damaging the socket contacts.



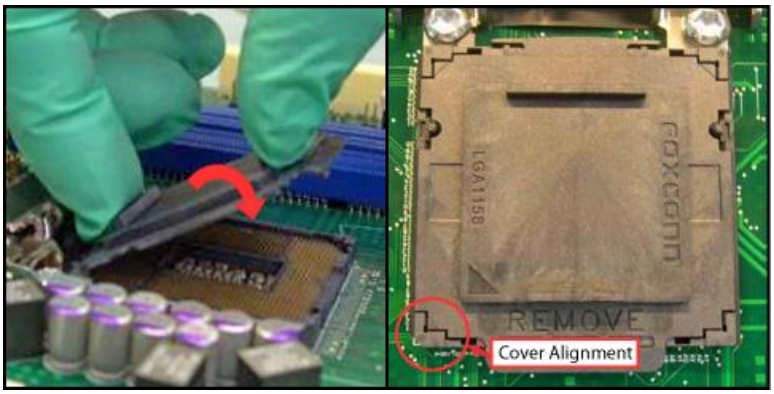
- Place the processor in a specially designed tray or ESD retainer for storage. Do not place directly on table resting on gold lands.
- Assemble LGA1155 socket protective cover:
  A Hold protective cover at 45 degree angle to the LGA1155 Socket
  B Carefully lower protective cover on hinge side first, to contact with the outside wall of the LGA1155 Socket:

i. Engage protective cover retention features to outside of LGA1155 Socket, AND align 2 cover corners to socket corners (This step is critical to avoid Bent Contact Damage!)

ii. Lower protective cover to attach to the LGA1155 Socket on Shoulder screw side

- Perform Visual and Tactile verification that protective cover is properly seated in the LGA1155 Socket:

*Hold cover and move gently "side to side" to feel the play within the cover and the LGA1155 Socket.



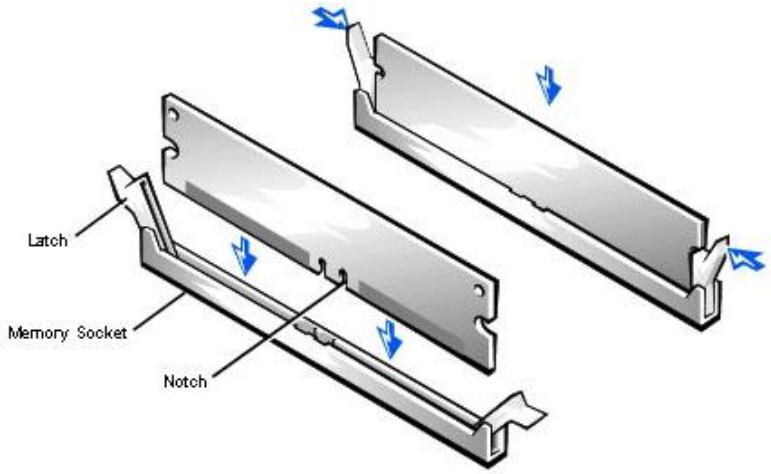
- Close the socket load plate and engage the load lever (see image below).

3.2 Installing the Memory

The board supports two 240-pin DDR2 DIMM memory sockets with maximum memory capacity up to 4 GB.

Please follow steps below to install the memory modules:

1 Push down latches on each side of the DIMM socket.
2 Align the memory module with the socket that notches of memory module must match the socket keys for a correct intallation.
3 Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.
4 Install any remaining DIMM modules.



CHAPTER 4
HARDWARE DESCRIPTION

4.1 Microprocessors

The SBC81210 Series supports Intel® Core™i7 / Core™i5 / Core™i3 / processors, which make your system operated under Windows® XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

4.2 BIOS

The SBC81210 Series uses AMI Plug and Play BIOS with a single 32Mbit SPI Flash.

4.3 System Memory

The SBC81210 Series supports Two 240-pin DDR3 DIMM sockets for a maximum memory of 8GB DDR3 SDRAMs. The memory module can come in sizes of 2GB and 4GB.

4.4 I/O Port Address Map

The Intel® Core™i7 / Core™i5 / Core™i3 processors can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards

Address	Devices
000-01F	DMA controller #1
020-02D, 024-025 028-029, 02C-02D	Interrupt controller #1
02E-02F	Forwarded to LPC(LPC Super I/O)
030-031, 034-035 038-039, 03C-03D	Interrupt controller #2
040-043, 050-053	Timer/Counter (8254)
060	Forwarded to LPC (Microcontroller)
061	NMI
062-066	Forwarded to LPC (Microcontroller)
070-077	Real time clock, NMI
080-091	DMA page register
092	Processor I/F(Reset Generator)
093-09F	DMA page register
0A0-0BF	Interrupt controller #2
0C0-0DF	DMA controller #2
0F0	Processor I/F
0F8-0FF	Math processor
170-177	Forward to SATA (SATA Controller)
1F0-1F7	Forward to SATA (SATA Controller)
376	Forward to SATA(SATA Controller)
378-37F	Parallel Port (LPT)
380-38F	SDLC #2
3A0-3AF	SDLC #1
3B0-3BF	MDA video card
3C0-3CF	EGA card
3D0-3DF	CGA card
3F6	Forward to SATA(SATA Controller)
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

4.5 Interrupt Controller (IRQ) Map

The SBC81210 Series is a 100% PC compatible control board. It consists of 16 interrupt request lines, and four out of them can be programmable. The mapping list of the 16 interrupt request lines is shown as the following table.

IRQ	Parity check error
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	PCI Device Share
IRQ6	Floppy Disk Controller
IRQ7	Parallel port
IRQ8	Real time clock
IRQ9	ACPI Controller
IRQ10	PCI Device Share
IRQ11	PCI Device Share
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	SATA Primary (Legacy Mode)
IRQ15	SATA Secondary (Legacy Mode)

MEMO:

CHAPTER 5
AMI BIOS UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

5.1 Starting

To enter the setup screens, follow the steps below:

- Turn on the computer and press the <F2> key immediately.
- After you press the <F2> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.

5.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

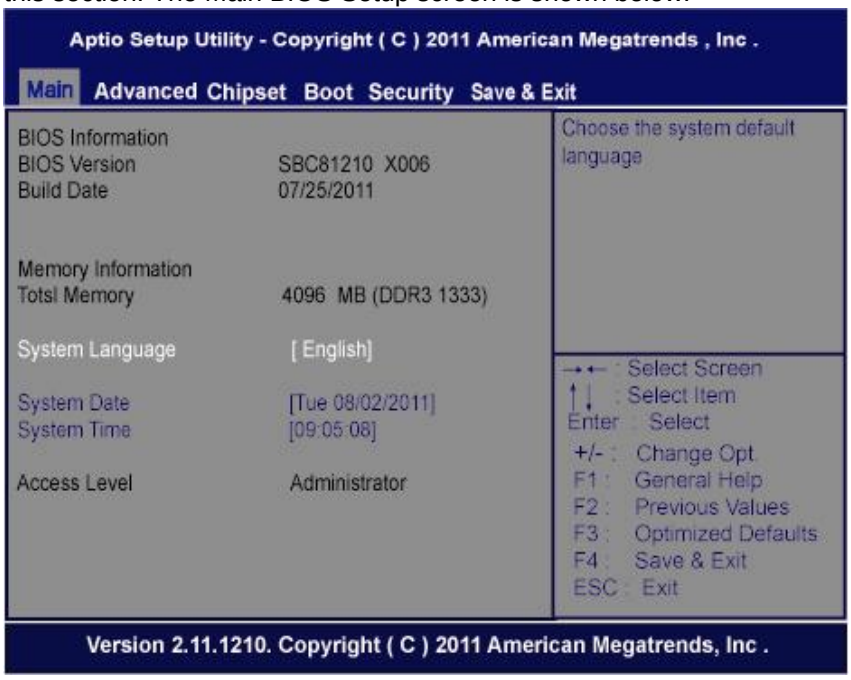
These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

***NOTE*:** Some of navigation keys differ from one screen to another.

← **Left/Right**	The Left <Arrow> keys allow you to select a setup screen.
↑↓ **Up/Down**	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

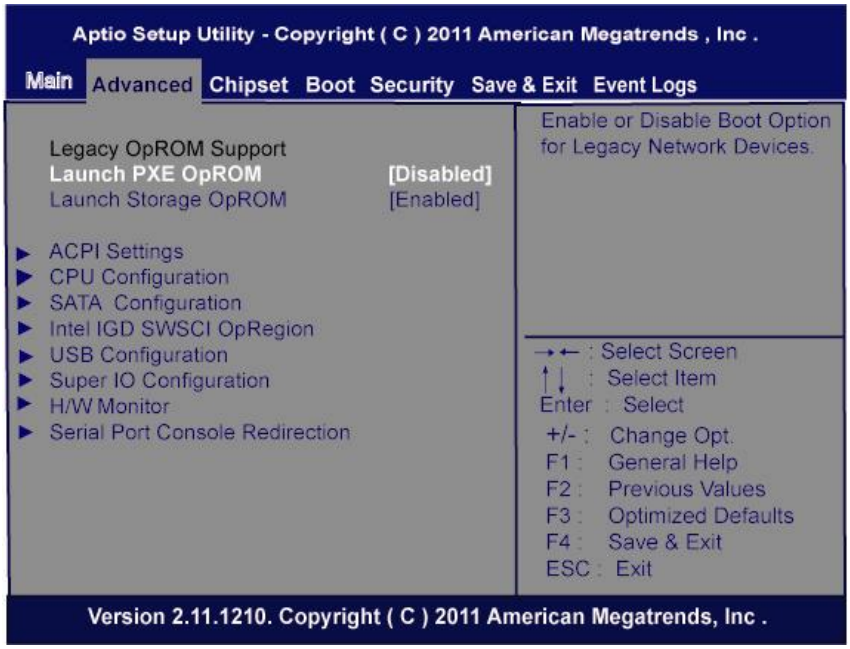
5.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



- System Date/Time
- Use this option to change the system date and time. Highlight System Date or System Time using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Enter> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

5.4 Advanced Menu



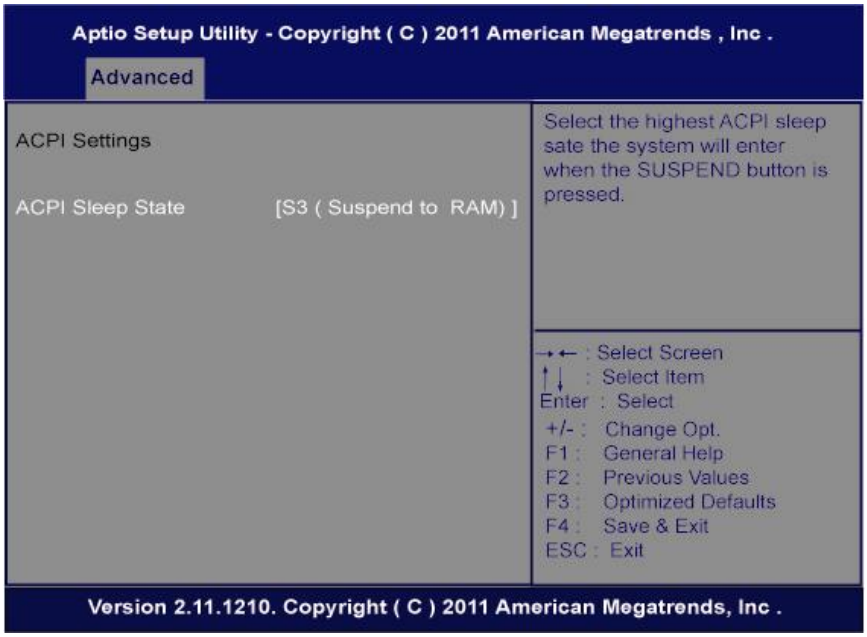
- Launch PXE OpROM
- Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.
- Launch Storage OpROM
- This item can set enable or disable the storage device option ROM with CF device.
- The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:
- ACPI Settings
- CPU Configuration
- SATA Configuration
- Intel IGD SWSCI OpRegion

- USB Configuration
- Super IO Configuration
- H/W Monitor
- Serial Port Console Redirection

  For items marked with "►", please press <Enter> for more options.

- **ACPI Settings**

  You can usethis screen to select options for the ACPI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

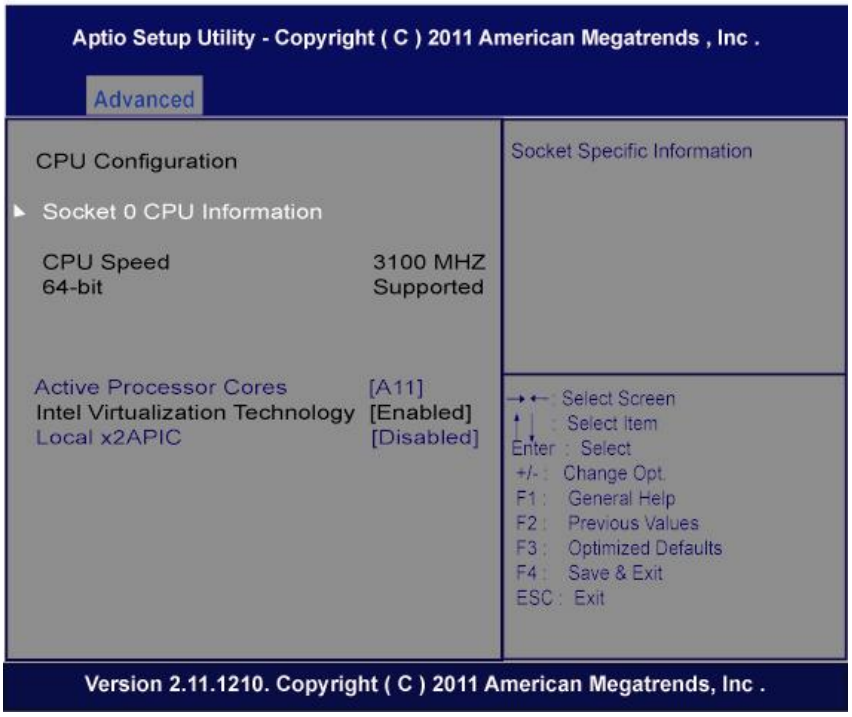


- ACPI Sleep State

  Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection, S1 (CPU Stop Clock), S3 (Suspend to RAM) and Suspend Disable

- **CPU Configuration**

  This screen shows the CPU Configuration, and you can change the value of the selected option.



  - Active Processor Cores
  - This feature controls the number of cores to enable in each processor package.
  - Intel Virtualization Technology

    Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.
  - Local x2APIC

    This item you can Enable or Disable Local x2APIC, default is Disable , please note some OS does not support this funcation.

- **SATA Configuration**

  You can use this screen to select options for the SATA Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

  - SATA Mode

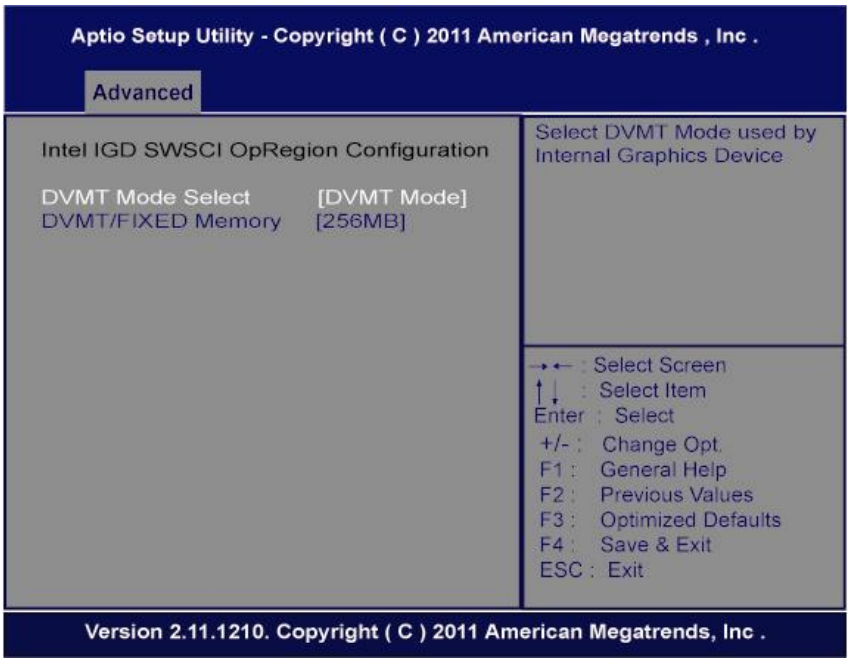
    Use this item to choose the SATA operation mode. Here are the options for your selection, IDE Mode, AHCI Mode and RAID Mode.

  - Serial-ATA Controller 0

    Use this item to control the onboard SATA controller. Here are the options for your selection, Compatible, Enhanced and Disable.

- **Intel IGD SWSCI OpRegion**

  The Intel IGD SWSCI OpRegion allows users to change the integrated graphic device settings.



  - DVMT Mode Select

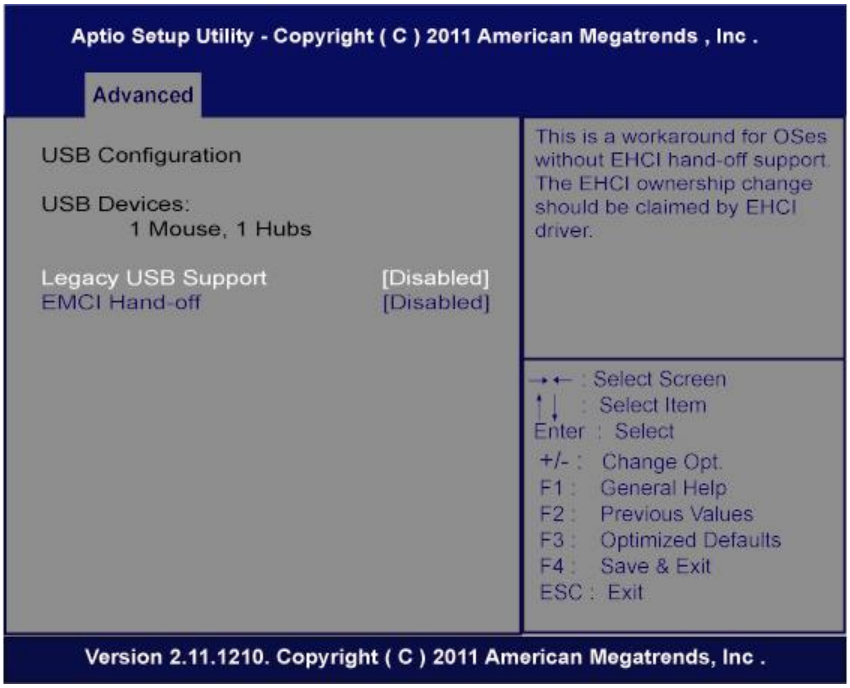
    Allow you to allocate Fixed mode or DVMT mode

  - DVMT/FIXED Memory

    Allow you to allocate a fixed amount of system memory as graphics memory. Here are the options for your selection, 128MB, 256MB and Maximum DVMT.

- **USB Configuration**

  You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



  - Legacy USB Support

    This is for supporting USB device under legacy OS such DOS, when choosing AUTO", the system will automatically dectect any USB device is plugged into the computer and enabele USB legacy mode when a USB device plugged and disable USB legacy mode when no USB device is plugged.

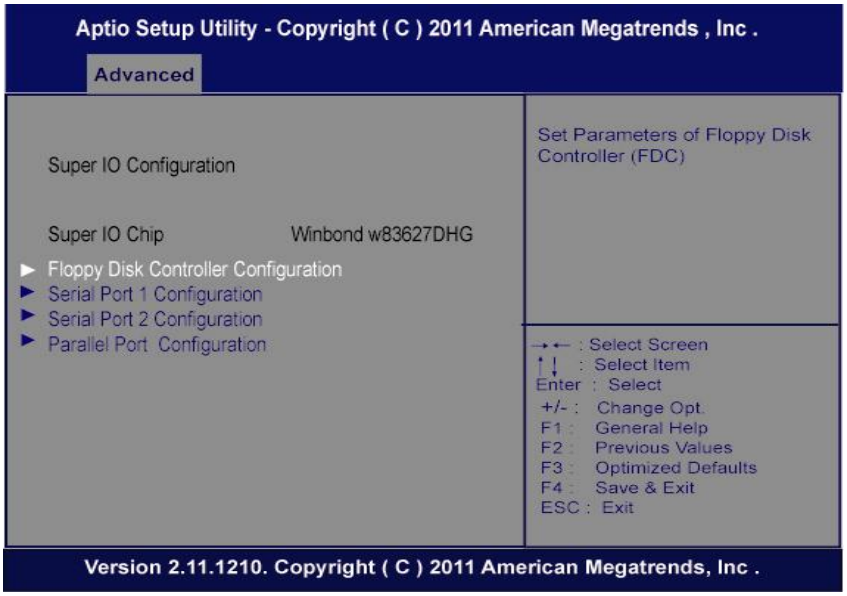
  - EHCI Hand-off

    This is a workaround for OSes without EHCI hand-off support.

    The EHCI ownership change should be claimed by EHCI driver.

- **Super IO Configuration**

  You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



  - Floppy Disk Controller Configuration

    You can use this screen to select options for the Floppy Configuration, and change the value of the selected option.

  - Serial Port 1 Configuration

    This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 2F8/IRQ3.

  - Serial Port 2 Configuration

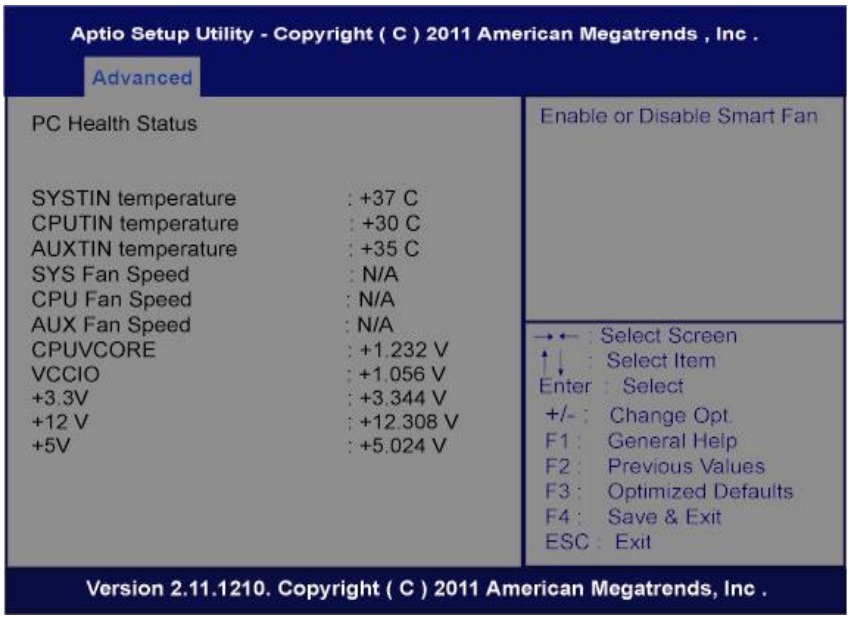
    This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 3F8/IRQ4.

  - Parallel Port Configuration

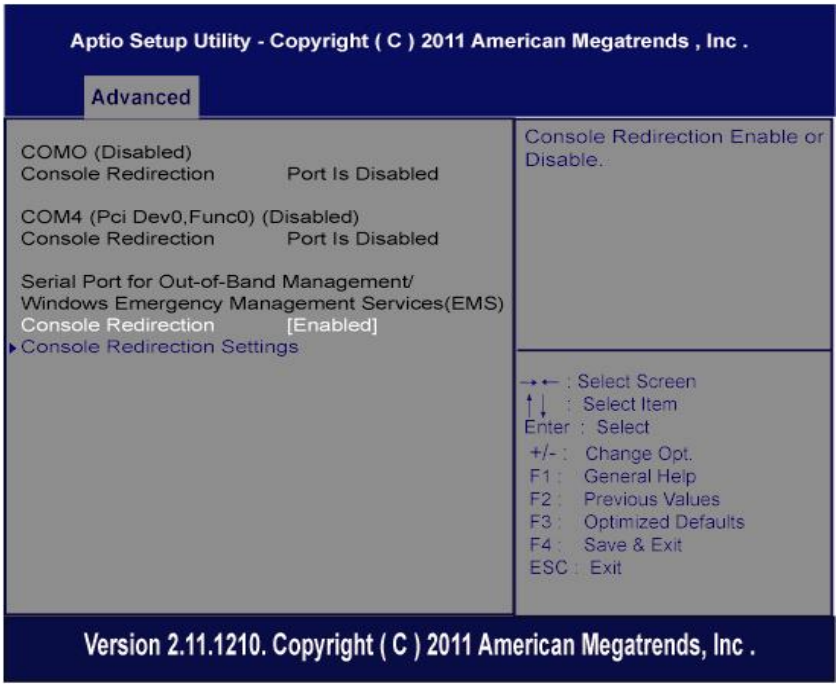
    This item allows you to determine the Parallel Port Mode and I/O address for onboard parallel port.

- **H/W Monitor**

  This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen



- **Serial Port Console Redirection**

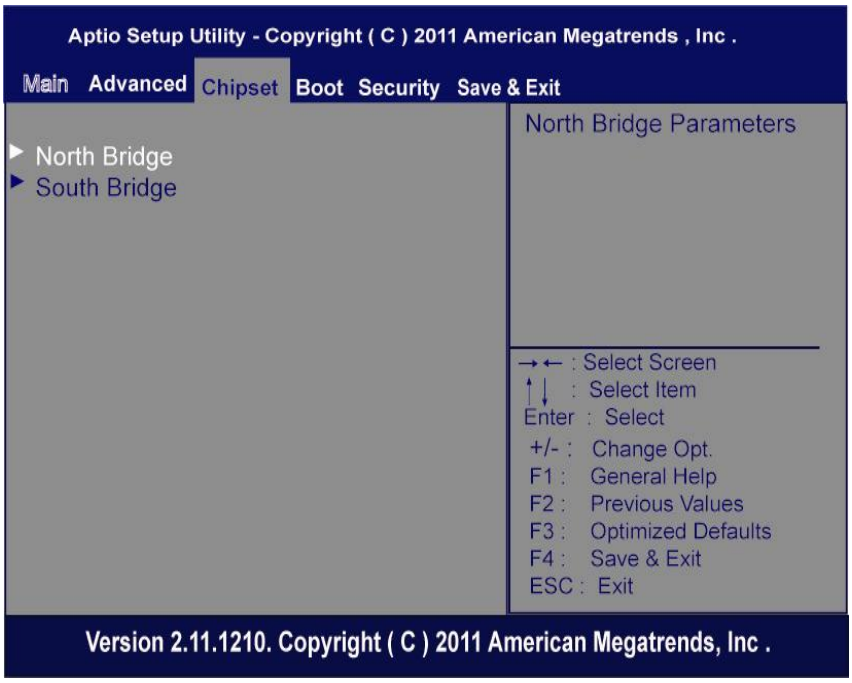


5.5 Chipset Menu

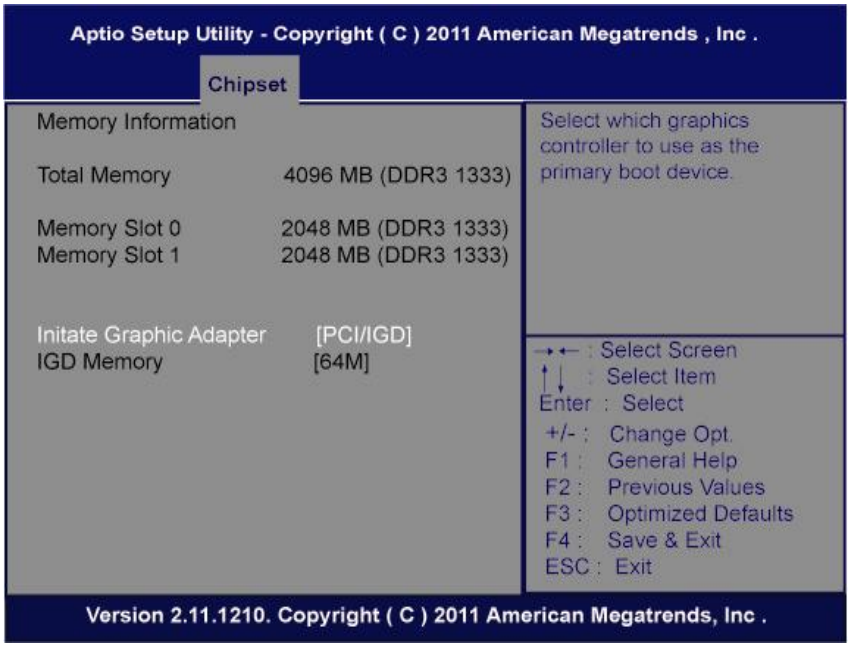
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- **North Bridge**
- **South Bridge**

For items marked with "►", please press <Enter> for more options.



- **North Bridge**



- Initate Graphic Adapter:

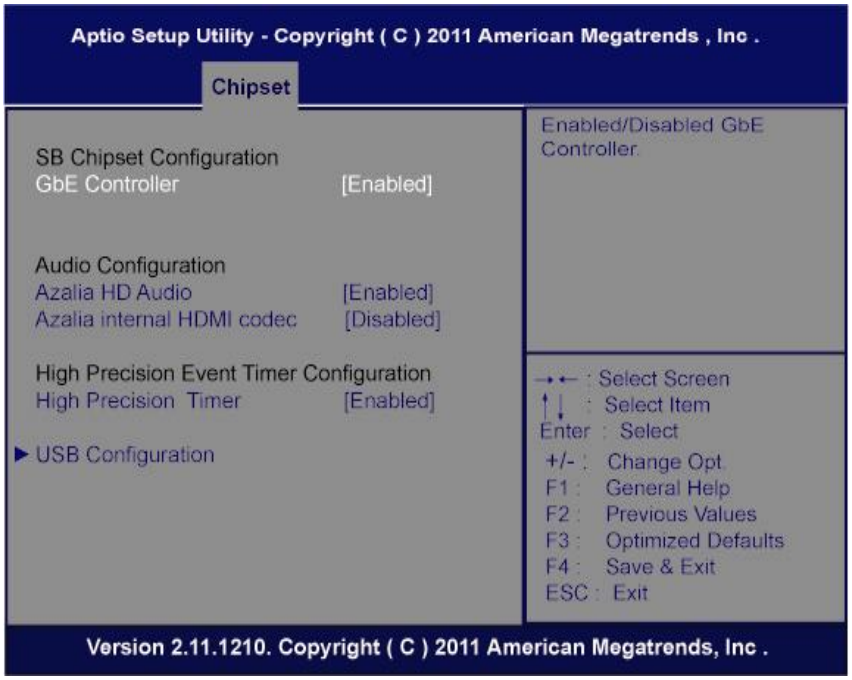
  Allow you choose grachic mode, PCI or IGD.

  ***** Please note:PCI Mode and IGD Mode can not use at same time .You need to remove the IDG driver befor use PCI VGA Card.

- IGD Memory:

  IGD Memory size.set up is 64M.

- **South Bridge**



- GbE Controller:

  You can use this item to Enable or Disable GbE Controller

- Azalia HD Audio

  Select this item to set up HD Audio

- Azalia intenal HDIM Codec

  Select this item to set up HDMI Codec

- High Precison Timer

  Enables or Disables the High Precison Timer for Windows Vista operation (Default : Enabled)

- USB Configuration

  You can use this screen to select options for the USB Configuration, and change the value of the selected option.

5.6 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

- **Setup Prompt Timeout**
- **Bootup NumLock State**
- **Quet Boot**
- **CSM16 Module Verison**
- **GateA20 Active**
- **Option ROM messages**
- **Interrupt 19Capture**
- **Boot Option Priorities**

5.7 Security Menu

The Security menu allows users to change the security settings for the system.

- Administrator Password

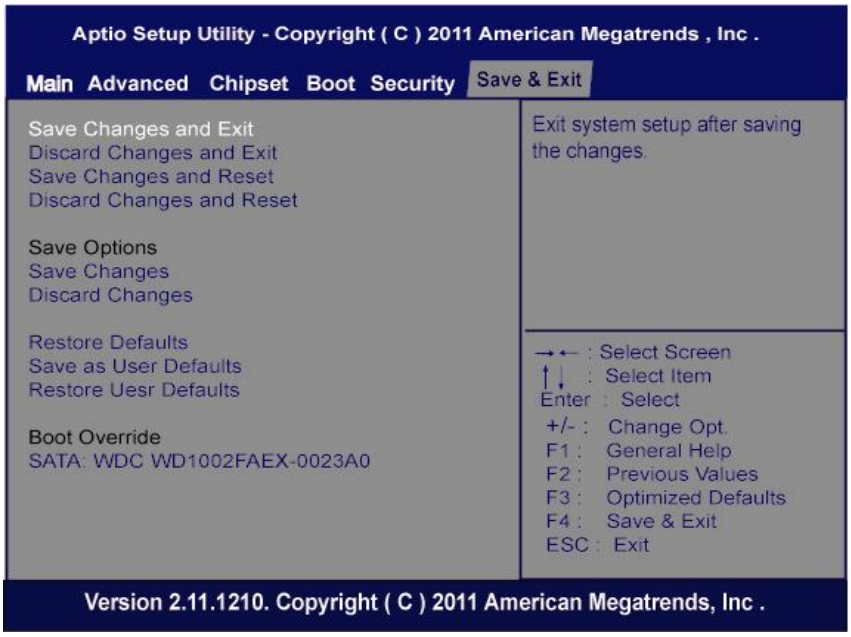
  This item indicates whether an administrator password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- User Password

  This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

5.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or failsafe default values.



- Save Changes and Exit

  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

- Discard Changes and Exit

  Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

- Save Changes and Reset

  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

- Discard Changes and Reset

  Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select *Discard Changes and Reset* from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

- Save Changes

  When you have completed the system configuration changes, select this option to save changes. Select *Save Changes* from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- Discard Changes

  Select this option to quit Setup without making any permanent changes to the system configuration. Select *Discard Changes* from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- Restore Defaults

  It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Restore Defaults from the save & Exit menu and press <Enter>.

MEMO:

APPENDI X A
WATCHDOG TIMER

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start
↓
Un-Lock WDT :O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
Set WDT Funtion O 2E 2D
O 2F 20
Select Logic device
O 2E 07
O 2F 08
↓
Activate WDT :O 2E 30
O 2F 01
Set Second or Minute
O 2E F5
O 2F N N=00 or 08(See below table)
↓
Set base timer :O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓
WDT counting
re-set timer :O 2E F6
O 2F M ; M=00,01,02,…FF(See below table)
↓

IF No re-set timer **:WDT time-out, generate RESET**

IF to disable WDT **:O 2E 30**
O 2F 00 ; Can be disable at any time

N=00

M= 00h: Time-out Disable
01h: Time-out occurs after 1 second
02h: Time-out occurs after 2 second
03h: Time-out occurs after 3 second
…….....
FFh: Time-out occurs after 255 second

N=08

M= 00h: Time-out Disable
01h: Time-out occurs after 1 minute
02h: Time-out occurs after 2 minutes
03h: Time-out occurs after 3 minutes
…….....
FFh: Time-out occurs after 255 minutes

APPENDI X B
PCI IRQ ROUTING

- **PICMG PCI IRQ Routing**

Device	ID	Slot	Int
PCI Slot 0	31	0	BCDA
PCI Slot 1	30	1	CDAB
PCI Slot 2	29	2	DABC
PCI Slot 3	28	3	ABCD

- **On Board Device IRQ Routing**

Device	ID	Slot	Int
PCI-ISA Bridge	22	4	

MEMO:

APPENDI X C
CONFIGURING SATA FOR RAID FUNCTION

Configuring SATA Hard Drive(s) for RAID Function (Controller: Intel® ICH9R/DO only)

Please follow up the steps below to configure SATA hard drive(s):

1) Install SATA hard drive(s) in your system.

2) Enter the BIOS Setup to configure SATA controller mode and boot sequence.

3) Configure RAID by the RAID BIOS.

4) Create a floppy disk for the SATA controller driver.

5) Install the SATA controller driver during the OS installation.

Before you begin the SATA configuration, please prepare:

(a)Two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID with the SATA controller, you may prepare only one hard drive.

(b) An empty formatted floppy disk

(c) Windows XP setup disk

(1) Installing SATA hard drive(s) in your system

Connect one end of the SATA signal cable to the rear of the SATA hard drive, and the other end to available SATA port(s) on the board. Then, connect the power connector of power supply to the hard drive.

(2) Configuring SATA controller mode and boot sequence by the BIOS Setup

You have to make sure whether the SATA controller is configured correctly by system BIOS Setup and set up BIOS boot sequence for the SATA hard drive(s).

(2)-1 Turn on your system and press the Del button to enter BIOS Setup during running POST (Power-On Self Test).

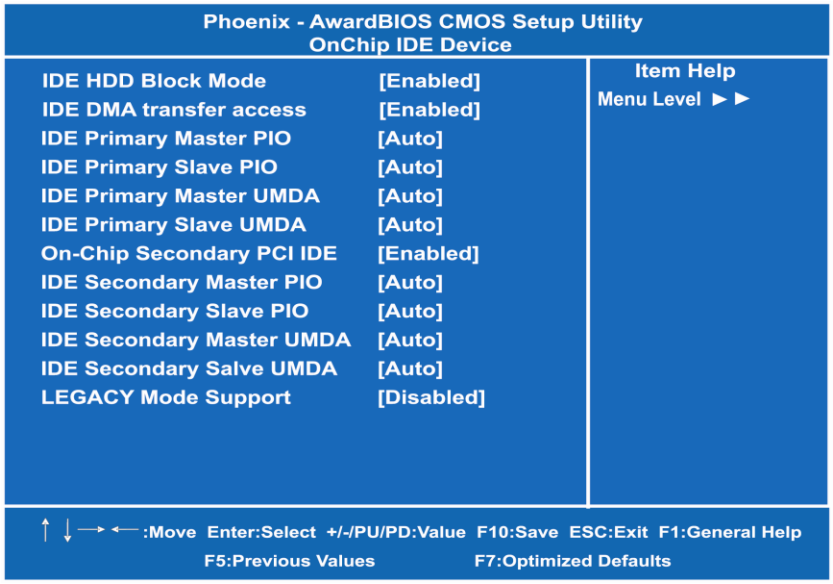


Figure 1

(2)-2 Set CDROM for First Boot Device under the Advanced BIOS Features menu to boot CD-ROM after system restarts (Figure 2).

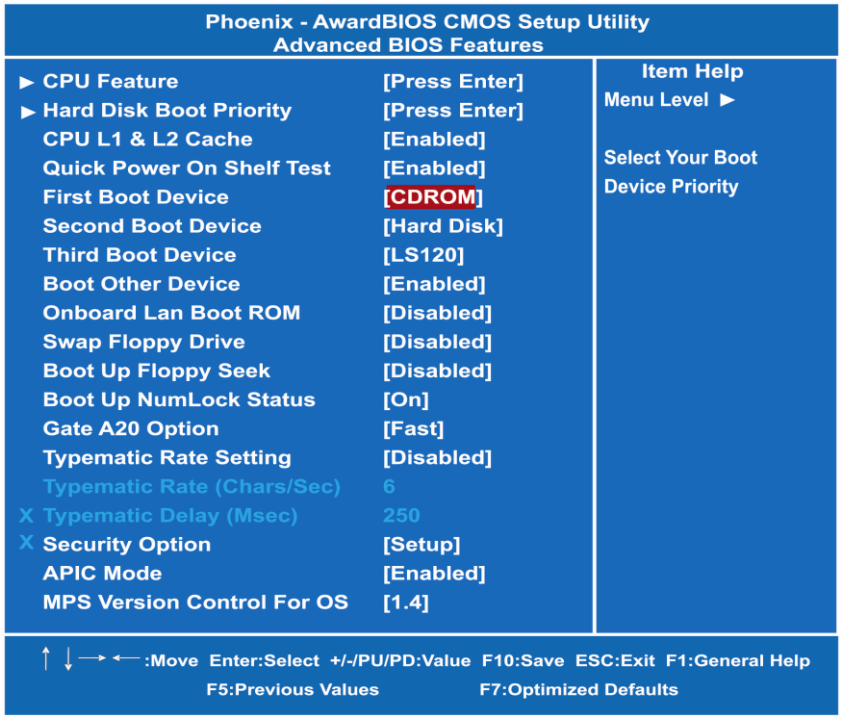


Figure 2

(2)-3 Save and exit the BIOS Setup.

(3) Configuring RAID by the RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to Section 4 if you do not want to create a RAID.

(3)-1 After the POST memory testing and before the operating system booting, a message "Press <Ctrl-I> to enter Configuration Utility" (as Figure 3) shows up, accordingly, press <CTRL+ I> to enter the RAID BIOS setup utility.

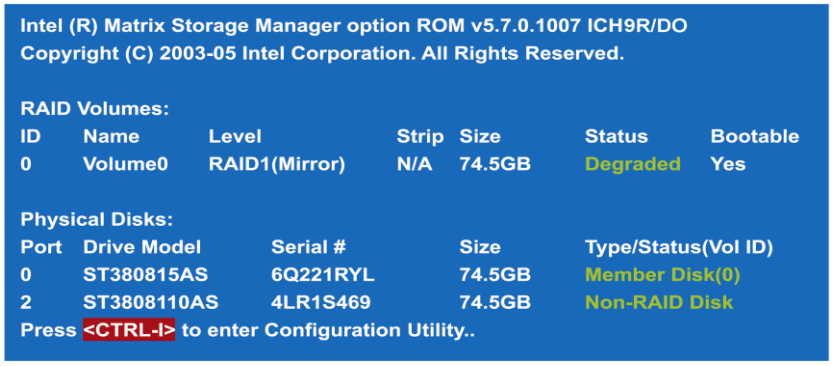


Figure 3

(3)-2 After you press <CTRL+ I>, the Create RAID Volume screen will appear (as Figure 4). If you want to create a RAID array, select the Create RAID Volume option in the Main Menu and press ENTER.

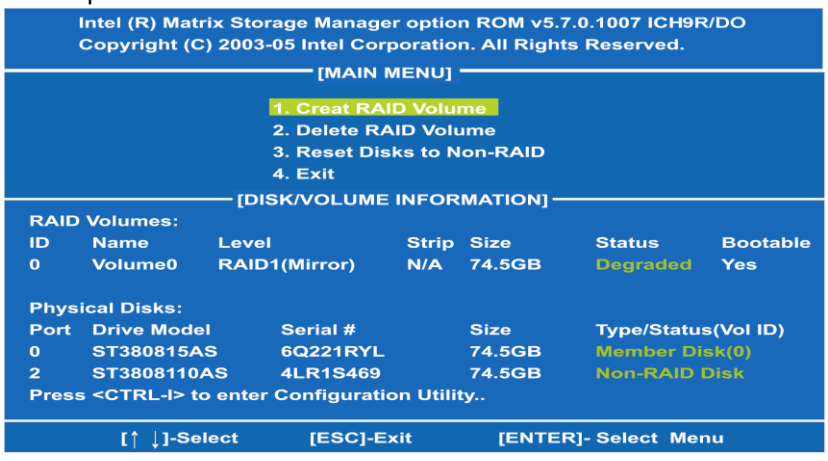


Figure 4

(3)-3 After entering the CREAT VOLUME MENU screen, you can type the disk array name with 1~16 letters (letters cannot be special characters) in the item "Name". When finished, press ENTER to select a RAID level (as Figure 5). There are three RAID levels, RAID0, RAID1 and RAID5&RAID10. Select a RAID level and press ENTER.

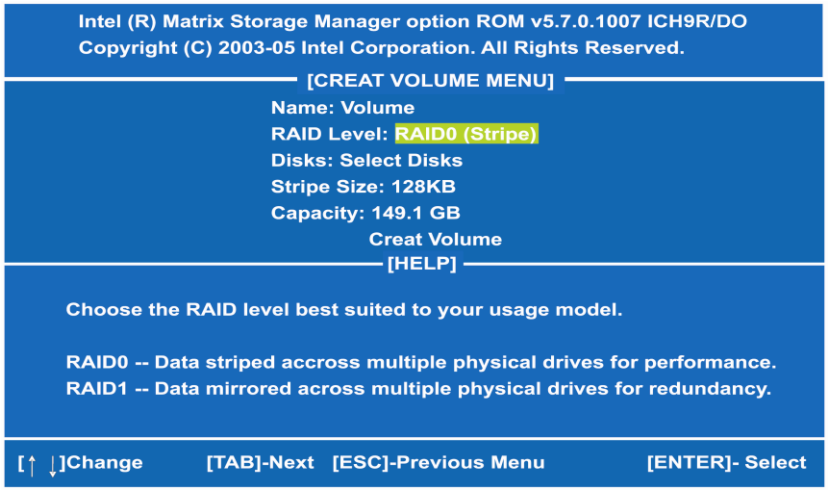


Figure 5

(3)-4 Set the stripe block size (as Figure 6). The KB is the standard unit of stripe block size. The stripe block size can be 4KB to 128KB. After the setting, press ENTER for the array capacity.

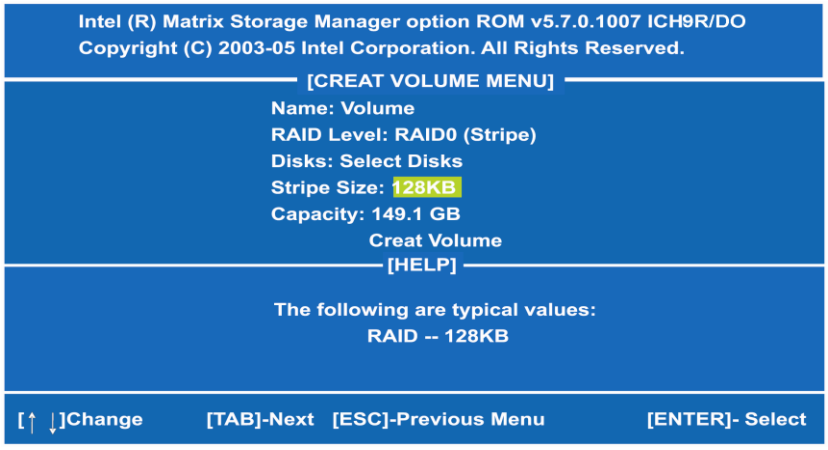


Figure 6

(3)-5 After setting all the items on the menu, select Create Volume and press ENTER (as Figure 7) to start creating the RAID array.

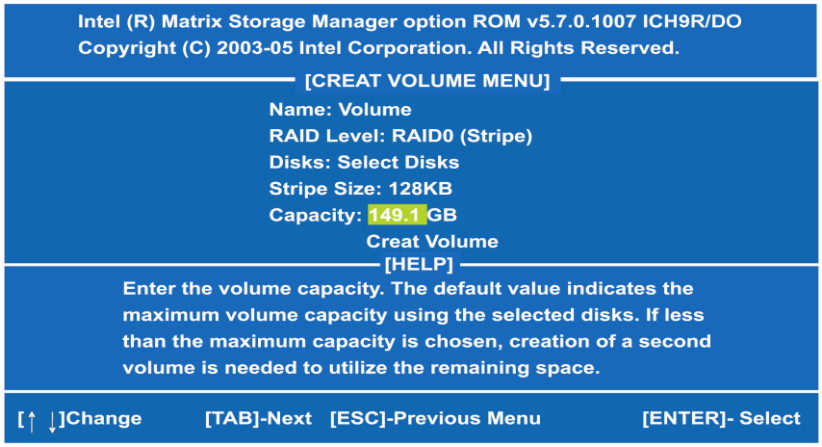


Figure 7

(3)-6 When prompting the confirmation, press "*Y*" to create this volume, or "*N*" to cancel the creation.

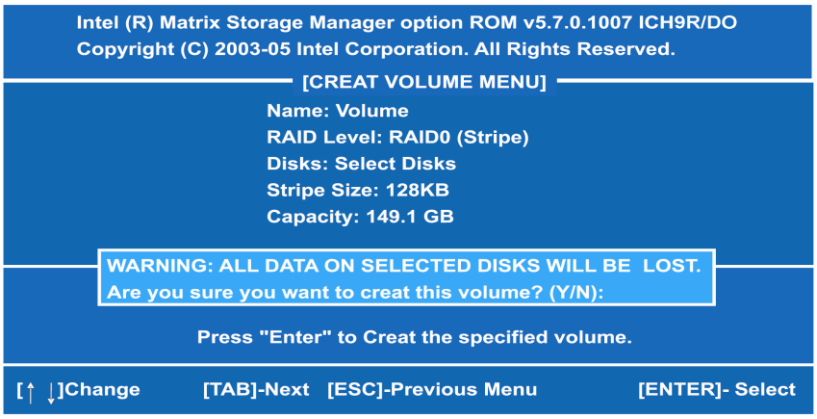


Figure 8

After the creation is completed, you can see detailed information about the RAID Array in the DISK/VOLUME INFORMATION section, including RAID mode, disk block size, disk name, and disk capacity, etc.

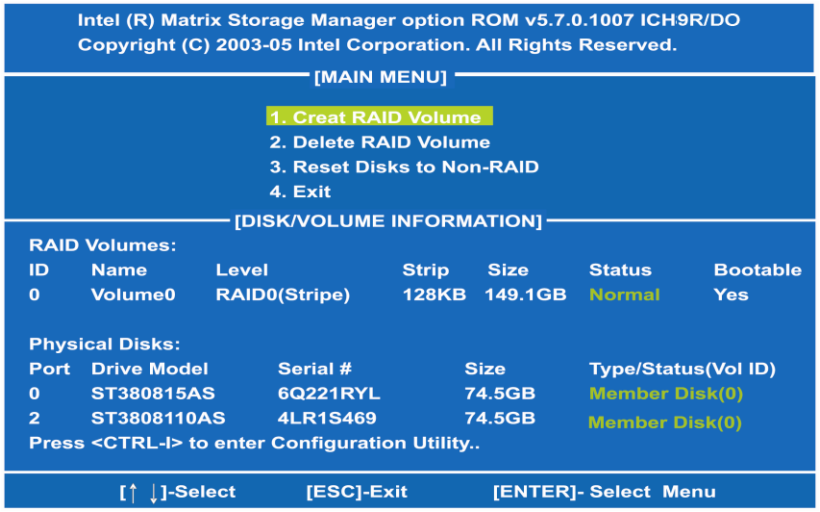


Figure 9

Delete RAID Volume

If you want to delete a RAID volume, select the Delete RAID Volume option in Main Menu. Press ENTER and follow on-screen instructions.

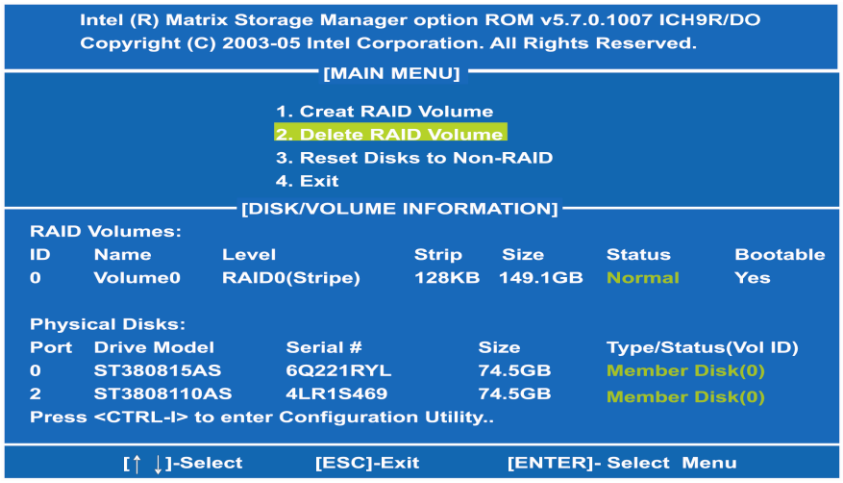


Figure 10

Please press [ESC] to exit theICH9R RAID BIOS utility.

Now, you can proceed to install a SATA driver controller and the operating system.

(4) Making a SATA Driver Disk

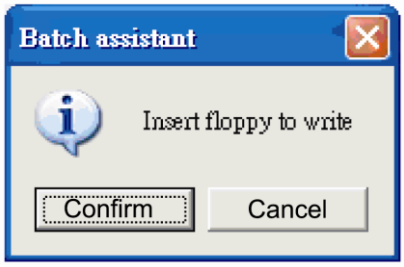
To install the operating system onto a serial ATA hard disk successfully, you need to install the SATA controller driver during the OS installation. Without the driver, the hard disk may not be recognized during the Windows setup process. First of all, please format a blank floppy disk. Secondly, follow up these steps below to produce a SATA driver disk.

(4)-1 Users can insert the Driver CD and the formatted blank floppy disk in another system. And then, please execute the f6flpy32.exe file in the folder of the Driver CD.

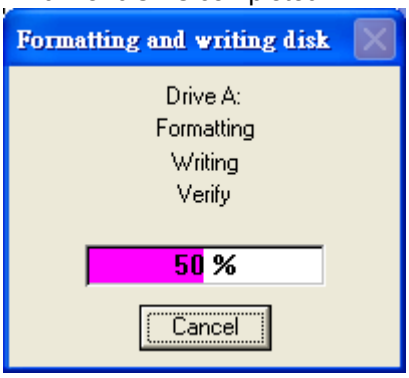
Note: Please execute the f6flpy64.exe file, if installing 64-bit Windows Operating System.

f6flpy32.exe

(4)-2 When this screen pops out, please click the "CONFIRM" button.



(4)-3 When the RAID Driver is written to the floppy disk, the SATA driver disk is completed.



Note Please execute the f6flpy64.exe file, if installing 64-bit Windows Operating System.

(5) Installing the SATA controller driver during the OS installation

Now, the SATA driver disk is ready, and BIOS settings configured, you can proceed to install Windows 2000/XP onto your SATA hard drive using the SATA driver. Here is an example for Windows XP installation.

(5)-1 Restart your system to boot the Windows 2000/XP Setup disk, and press F6 butoon button as soon as you see the message "Press F6 if you need to install a 3rd party SCSI or RAID driver" (as Figure 11). After pressing the F6 button, there will be a few moments for some files being loaded before next screen appears.

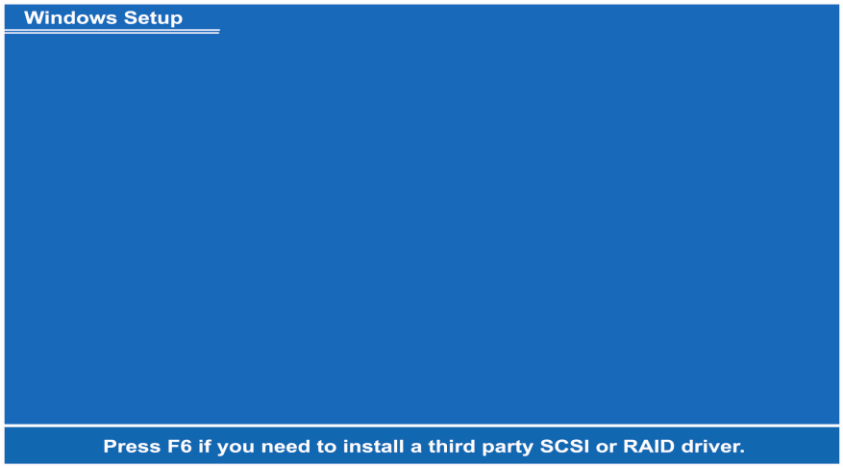


Figure 11

(5)-2 When you see the screen below, insert the floppy disk containing the SATA driver and press "*S*" (as Figure 12).

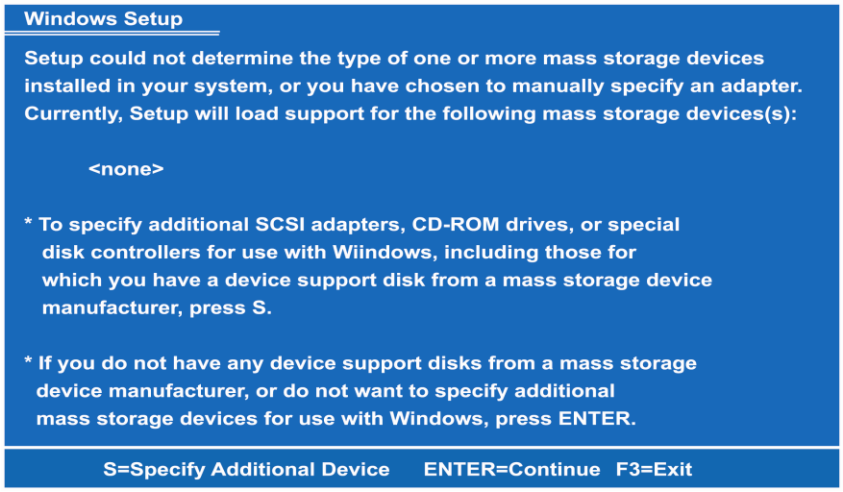


Figure 12

(5)-3 If the Setup correctly recognizes the driver of the floppy disk, a controller menu (as Figure 13) will appear below. Use the ARROW keys to select Intel(R) 82801IR/ IHO SATA RAID Controller and press ENTER. Then it will begin to load the SATA driver from the floppy disk.

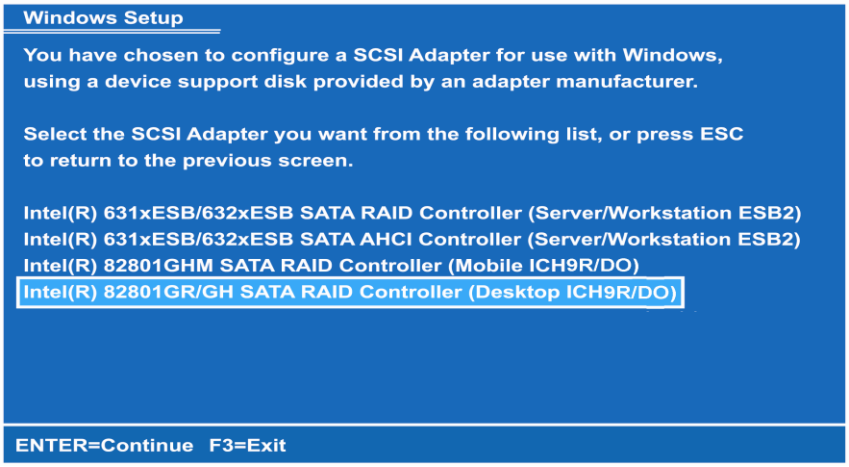


Figure 13

Note: If a message on the screen saying that one or some file(s) cannot be found, please check the floppy disk or copy the correct SATA driver again from the driver CD.

MEMO:

APPENDI X D
MEMORY I/O ADDRESS