# IPC934-230-FL Series

**Industrial and Fanless Computers**

**User's Manual**

RoHS

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## Safety Precautions

Before getting started, please read the following important safety precautions.

1. The IPC934-230-FL Series does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.

2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.

3. Disconnect the power cord from the IPC934-230-FL Series before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the IPC934-230-FL Series is properly grounded.

4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.

6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20℃ or above 80℃. It may damage the equipment.

7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

   ■ Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.

   ■ When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

## Classification

1. Degree of production against electric shock: not classified

2. Degree of protection against the ingress of water: IPX0

3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

4. Mode of operation: Continuous

5. Type of protection against electric shock: Class I equipment

## General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.

2. Turn the system off before you start to clean up the component or computer.

3. Never drop the components inside the computer or get circuit board damp or wet.

4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.

5. Try not to put any food, drink or cigarette around the computer.

**Cleaning Tools:**

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.

- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.

- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.

- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.

- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

*Note: It is strongly recommended that you should shut down the system before you start to clean any single components.*

**Please follow the steps below:**

1. Close all application programs

2. Close operating software

3. Turn off power switch

4. Remove all device

5. Pull out power cable

## Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

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# CHAPTER 1
# INTRODUCTION

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This chapter contains general information and a detailed specification of the IPC934-230-FL Series. Chapter 1 includes the following sections:

- General Description
- System Specifications
- Dimensions
- I/O Outlets
- Package List
- Jumper Settings
- Connectors

## 1.1   General Description

The IPC934-230-FL Series is a fanless system that can support LGA1150 socket for Intel® Core™ i7/i5/i3 processors. The IPC934-230-FL Series supports Windows® 7, and Windows® 8 and Windows® 7 embedded, and Fedora, suitable for the most endurable operation.

> ➢ The IPC934-230-FL Series support two hard-drive bays, which makes it easy to install for customer maintain the system.

> ➢ Embedded O.S. Supported

> The IPC934-230-FL Series not only supports Windows® 7, but also supports embedded OS, such as Windows® 7 embedded. For storage device, the IPC934-230-FL Series supports two 2.5" HDD driver bay and one onboard CFast™ socket.

## 1.2   System Specifications

### 1.2.1  Main CPU Board

- **CPU**

  - Socket LGA1150 for 4th Generation Intel$^®$ Core$^{TM}$ i7/i5/i3 processors, up to 45W

- **System Chipset**

  - Intel$^®$ Q87 chipset

- **BIOS**

  - AMI BIOS, with Smart View and Customer CMOS Backup.

- **System Memory**

  - Two 204-pin DDR3 1333/1600 MHz SODIMM sockets, with maximum up to 16 GB

- **Features**

  - Fanless Operation

  - Compact & Front IO design

  - Supports Four expansion slots

  - DC to DC power supply support 10V to 30V

  - Rugged, up to -10°C ~ +50°C Fanless operation with W.T SSD or CFast™ or HDD

  - Supports iAMT 9.0

  - Supports SATA 6GBs with RAID 0,1

### 1.2.2  I/O System

- **Standard I/O Interface -- Font**

  - One ATX power on/off switch

  - One ATX/AT Mode switch

  - One 2-pin connector output for remote power on/off switch

  - 10VDC to 30VDC with phoenix power plug or External 150W AC Adapter

  - Two USB 3.0 ports

  - Four USB 2.0 ports

  - HDD access/Power LEDs

  - Two RS-232/422/485 (COM 1/2)

  - Two RS232(COM 3/4)

  - Two G.E. LAN ports  (i217LM & i210AT)

  *Note: The Intel$^®$ i217LM does not support S1 LAN Wake.*

  - 1 x DVI-I

  - 1 x Digital I/O (Female DB9 Connector) (4 IN and 4 OUT)

  - 1 x Audio (MIC-in/Line-out)

  - 1 x PS/2 keyboard/mouse

- **Expansion Slot**

    - HAB104: 4 PCI

    - HAB105: 2 PCI & 1 PCIe x1 & 1 PCIe x16

    *Note:* **The maximum power rating for expansion slots at 50℃ can not be exceeded the following values:**

    **The maximum loading of +3.3V /1A, +5V /5A ,+12V /3A<60W**

## 1.2.3  System Specification

- **Drive Capacity**

    - Supports two 2.5" HDD driver bay; one onboard CFast™ Socket

    *Note: Due to Gen. 2 SSD with JMicron controller has compatibility issue with Intel Q87 PCH, we strongly recommend to use Gen. 3 SSD on IPC934 Series.*

- **Power Input**

    - 10VDC to 30VDC with phoenix power plug

    - External 150W AC Adapter

        − Power Input : 100VAC to 240VAC, 2A, 50~60HZ

        − Power Output : 19VDC

        − Operation termperature : 0℃ ~ +50℃

- **Operation Temperature**

    - Ambient with air flow: -10℃ ~ +50℃

- **Storage Temperature**

    - -20℃ ~ 80℃

- **Humidity**

    - 10% ~ 90% (Non-condensing)

- **Dimensions**

    - 200.54 mm (7.96") (W) x 251.8mm (9.99")(D) x 185 mm(7.3")(H)

*Note:  All specifications and images are subject to change without notice.*

## 1.3   Dimensions

The following diagrams show you dimensions and outlines of the IPC934-230-FL Series.
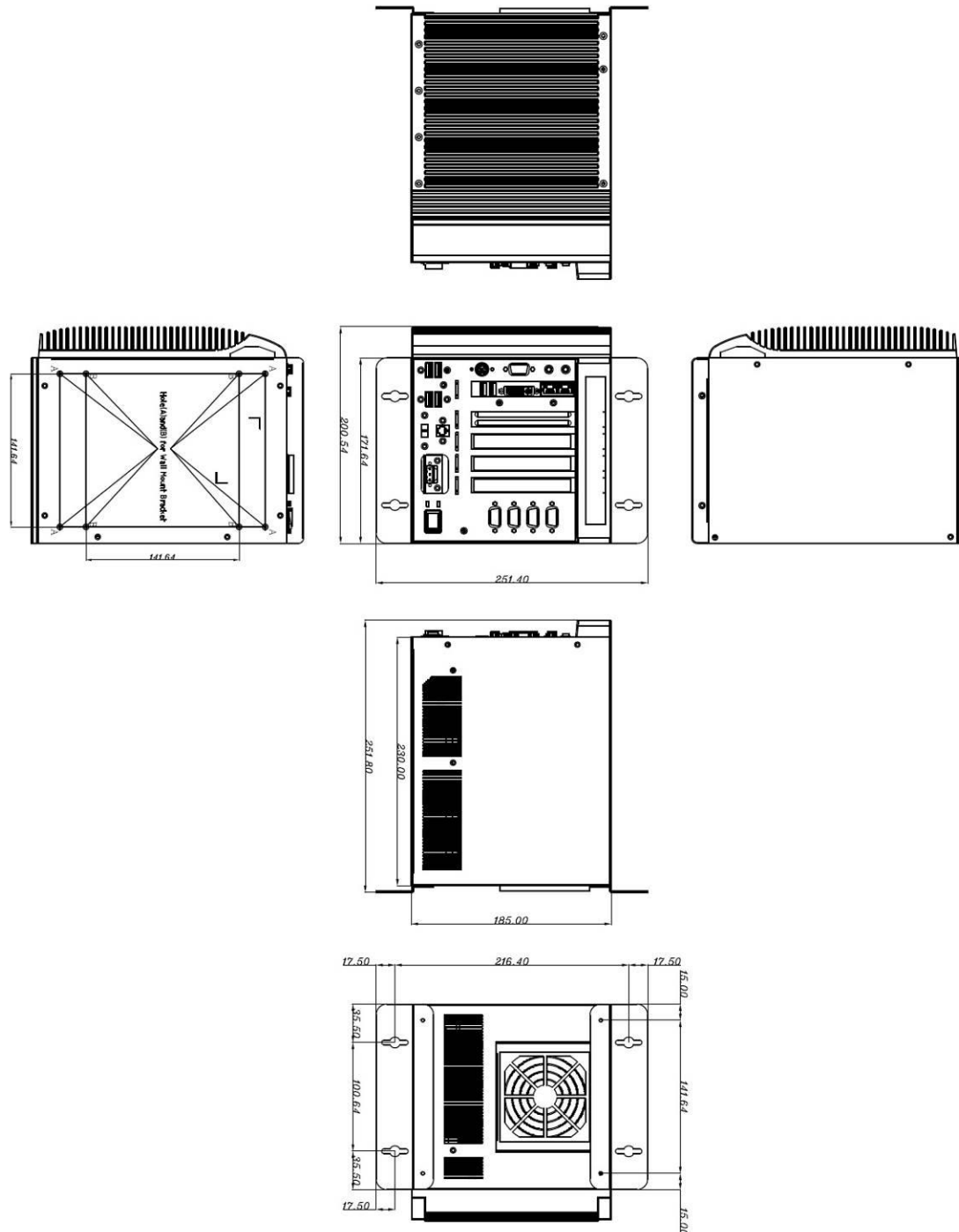
## 1.4  I/O Outlets

The following figures show you I/O outlets on front and rear panels of the IPC934-230-FL Series.

**Front Panel**
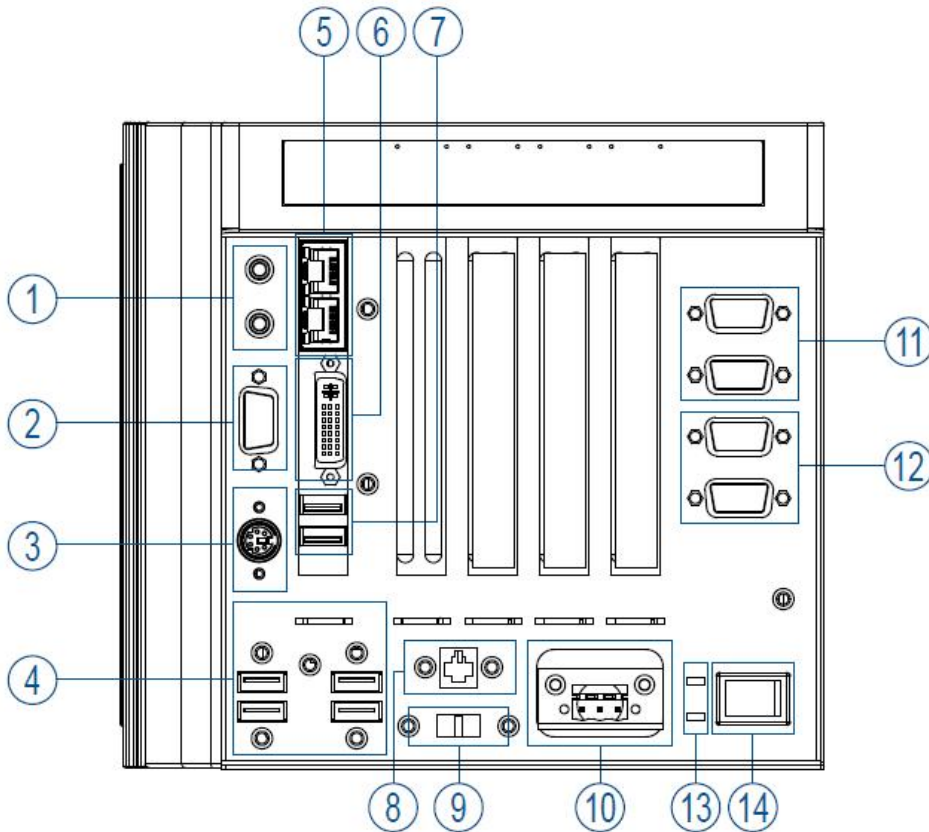


1.  Audio(Mic-in/Line out)
2.  Digital I/O
3.  PS/2 Keyboard/Mouse
4.  USB 2.0 x 4
5.  Ethernet x 2
6.  DVI-I
7.  USB 3.0 x 2
8.  Remote power switch
9.  ATX/AT Mode switch
10. Power connector (Din-Jack or Phoenix plug)
11. RS-232/422/485 (COM 1/2)
12. RS-232 (COM 3/4)
13. LED for Power and HDD
14. ATX Power switch

## 1.5   Packing List

The package bundled with your IPC934-230-FL Series should contain the following items:

- **IPC934-230-FL Series Unit x 1**

- **19V 150W Adapter (for AC Version)**

- **Driver CD**

- **Quick Manual**

- **Wall Mount Bracket x 2**

- **Screw pack x 1**

- **Foot pad x 4**

- **CPU Thermal Pad  x 1**

- **HDD Bracket x 2**

- **HDD Mylar x 2**

- **Terminal block x 1 (for DC version)**

- **Remote power switch cable x 1**


If you can not find this package or any items are missing, please contact Axiomtek distributors immediately.

## 1.6   Jumper Settings

The IPC934-230-FL has a number of jumpers inside the chassis that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.
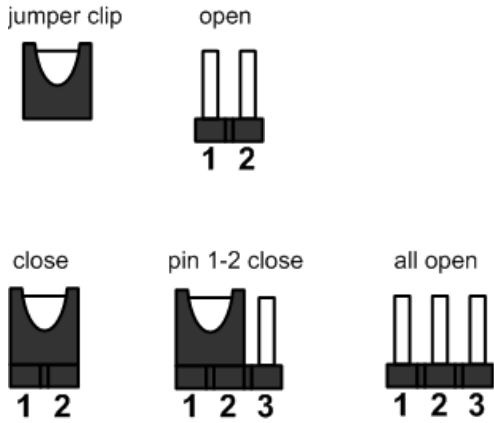
| Jumper | Description | Jumper Setting |
|:---:|:---:|:---:|
| JP1 | Clear RTC : Normal | 1-2 close |

### 1.6.1   Restore BIOS Optimal Defaults (JP1)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

| Function | Setting |
|:---|:---:|
| Normal operation (Default) | 1-2 close |
| Restore BIOS optimal defaults | 2-3 close |
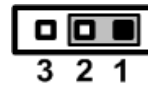
## 1.7    Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

| Connector | Label |
|---|---|
| External Temperature Sensor Connector (Optional) | CN2 |
| Digital I/O | CN1 |
| DVI-I Connector | CN6 |
| USB Port 3/4 | CN10 |
| USB Port 5/6 | CN12 |
| Axiomtek Front Panel | CN3 |
| USB2.0/3.0 Port 1 | CN11 |
| PS2 Connector(Keyboard & Mouse) | CN8 |
| USB2.0/3.0 Port 2 | CN9 |
| SYS FAN | FAN1 |
| CPU FAN | FAN2 |
| RJ45 (i217LM) | LAN1 |
| RJ45 (i210AT) | LAN2 |
| SATA 1 ~ 2 6Gb(SATA3) | SATA1~SATA2 |
| CFast™ Connector | SCF1 |
| COM1 ~ COM2 Connecters | COM1 |
| Audio Connector | AUDIO1 |

### 1.7.1  Internal Digital I/O Connector (CN1)

The board is equipped with an 8-channel digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | DIO 1  | 2   | DIO 8  |
| 3   | DIO 2  | 4   | DIO 7  |
| 5   | DIO 3  | 6   | DIO 6  |
| 7   | DIO 4  | 8   | DIO 5  |
| 9   | NC     | 10  | GND    |
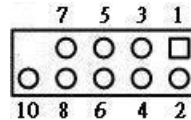
### 1.7.2  External Digital I/O Connector

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | DIO 1  | 2   | DIO 3  |
| 3   | DIO 5  | 4   | DIO 7  |
| 5   | DIO 8  | 6   | DIO 6  |
| 7   | DIO 4  | 8   | DIO 2  |
| 9   | GND    |     |        |
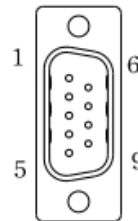
### 1.7.3  Internal USB 2.0 Connectors onboard (CN10, CN12)

These are internal connectors for USB 2.0 interfaces.

| Pin | Signal  | Pin | Signal  |
|-----|---------|-----|---------|
| 1   | USB_PWR | 2   | USB_PWR |
| 3   | USB -   | 4   | USB -   |
| 5   | USB +   | 6   | USB +   |
| 7   | GND     | 8   | GND     |
|     |         | 10  | GND     |

**CN12 (USB port 5 and 6)**

**CN10 (USB port 3 and 4)**
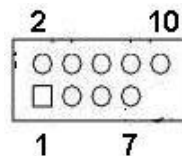
### 1.7.4 External USB 2.0 Connectors

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | USB VCC (+5V level) | 2 | USB #0_D- |
| 3 | USB #0_D+ | 4 | Ground (GND) |
| 5 | USB VCC (+5V level) | 6 | USB #1_D- |
| 7 | USB #1_D+ | 8 | Ground (GND) |
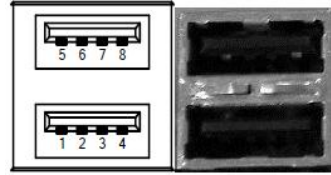
### 1.7.5 Front Panel Connector onboad (CN3)

| Pin | Signal |
|-----|--------|
| 1 | PWRLED+ |
| 2 | EXT SPK- |
| 3 | GND |
| 4 | Buzzer |
| 5 | PWRLED- |
| 6 | N.C. |
| 7 | N.C. |
| 8 | EXT SPK+ |
| 9 | PWRSW- |
| 10 | PWRSW+ |
| 11 | HW RST- |
| 12 | HW RST+ |
| 13 | HDDLED- |
| 14 | HDDLED+ |
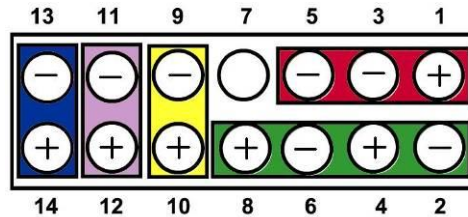
●  **Power LED**

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 +.

## 1.7.6  External USB 3.0 Connectors (CN11 and CN9)

These are standard USB 3.0 connectors on rear I/O for installing USB 3.0 compliant interface peripherals.

| Pin | Signal |
|-----|-----------|
| 1 | VCC |
| 2 | D- |
| 3 | D+ |
| 4 | GND |
| 5 | StdA_SSRX- |
| 6 | StdA_SSRX+ |
| 7 | GND_DRAIN |
| 8 | StdA_SSTX- |
| 9 | StdA_SSTX+ |
| 10 | Shield |

**CN11 (USB 3.0 port 1)**

**CN9 (USB 3.0 port 2)**
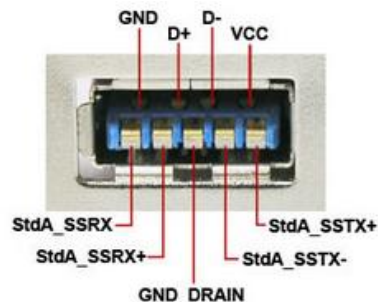
## 1.7.7 Internal Keyboard and Mouse Connectors onboard (CN8)

The system comes with keyboard and mouse interfaces.

| Pin | Signal |
|-----|--------|
| 1 | Mouse DATA |
| 2 | Mouse Clock |
| 3 | Keyboard DATA |
| 4 | Keyboard Clock |
| 5 | GND |
| 6 | 5VSBY |
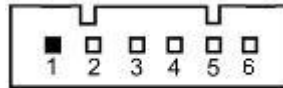
## 1.7.8 External Keyboard and Mouse Connectors

| Pin | Signal |
|-----|--------|
| 1 | Keyboard DATA |
| 2 | Mouse DATA |
| 3 | GND |
| 4 | 5VSBY |
| 5 | Keyboard Clock |
| 6 | Mouse Clock |
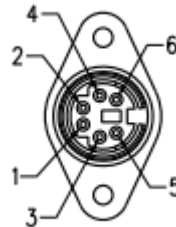
## 1.7.9  Internal FAN Connectors (FAN1, FAN2)

Fans are always needed for cooling down CPU and system temperature. The board has two fan connectors. You can find fan speed option(s) at BIOS Setup Utility if either fan is installed. For further information, see BIOS Setup Utility: Advanced\HW Monitor\PC Health Status.System and auxiliary fan interfaces are available through FAN1 and FAN2, see table below.

| Pin | Signal |
|-----|--------|
| 1 | GND |
| 2 | +12V level |
| 3 | Rotation detection |
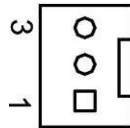
CPU fan interface is available through FAN2, see table below.

| Pin | Signal |
|-----|--------|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation Detection |
| 4 | Speed Control |
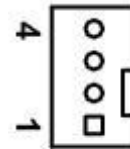
## 1.7.10  External Ethernet Ports (LAN1 and LAN2)

The board has two RJ-45 connectors; LAN1 (for i217LM) and LAN2 (for i210AT). Ethernet connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-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 |
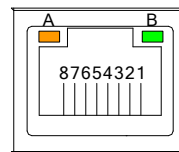
## 1.7.11  Internal Serial ATA Connectors (SATA1~SATA2)

These Serial Advanced Technology Attachment (Serial ATA or SATA) connectors are for high-speed SATA interfaces. They are computer bus interfaces for connecting to devices such as hard disk drives.This system has two SATA 3.0 ports with 6Gb/s performance.

*Note:*  ***Due to Gen. 2 SSD with JMicron controller has compatibility issue with Intel Q87 PCH, we strongly recommend to use Gen. 3 SSD on IPC934.***

| Pin | Signal |
|-----|--------|
| 1 | GND |
| 2 | SATA_TX+ |
| 3 | SATA_TX- |
| 4 | GND |
| 5 | SATA_RX- |
| 6 | SATA_RX+ |
| 7 | GND |
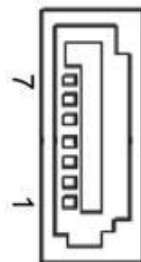
## 1.7.12 Internal CFast™ Socket (SCF1)

The board is equipped with a CFast™ socket to support CFast™ card which is based on the Serial ATA bus. The socket is specially designed to avoid incorrect installation of CFast™ card. When installing or removing CFast™ card, please make sure system power is off. The CFast™ card by default identifies itself as C: or D: drive in your PC system.

| Pin | Signal | Pin | Signal |
|-----|--------|------|--------|
| S1 | GND | PC1 | NC |
| S2 | TX+ | PC2 | GND |
| S3 | TX- | PC3 | NC |
| S4 | GND | PC4 | NC |
| S5 | RX- | PC5 | NC |
| S6 | RX+ | PC6 | NC |
| S7 | GND | PC7 | GND |
|  |  | PC8 | NC |
|  |  | PC9 | NC |
|  |  | PC10 | NC |
|  |  | PC11 | NC |
|  |  | PC12 | NC |
|  |  | PC13 | 3.3V |
|  |  | PC14 | 3.3V |
|  |  | PC15 | GND |
|  |  | PC16 | GND |
|  |  | PC17 | NC |
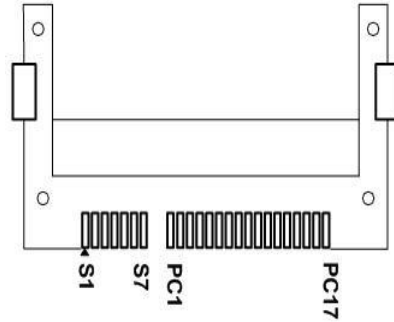
## 1.7.13 Internal COM Connectors (COM1~COM4)

The COM1/2 ports supports RS-232/RS-422/RS-485 mode operation, the COM3/4 ports supports RS-232 mode operation, see table below for its pin assignments. You can change the transmission mode via BIOS setting.

| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1 | Data Carrier Detect (DCD1) | TX1- | DATA1- |
| 2 | Data Set Ready (DSR1) | No connector | No connector |
| 3 | Receive Data (RXD1) | TX1+ | DATA1+ |
| 4 | Request to Send (RTS1) | No connector | No connector |
| 5 | Transmit Data (TXD1) | RX1+ | No connector |
| 6 | Clear to Send (CTS1) | No connector | No connector |
| 7 | Data Terminal Ready (DTR1) | RX1- | No connector |
| 8 | Ring Indicator (RI1) | No connector | No connector |
| 9 | Ground (GND) | GND | GND |
| 10 | Disconnect (NI) | NI | NI |
| 11 | Data Carrier Detect (DCD2) | TX2- | DATA2- |
| 12 | Data Set Ready (DSR2) | No connector | No connector |
| 13 | Receive Data (RXD2) | TX2+ | DATA2+ |
| 14 | Request to Send (RTS2) | No connector | No connector |
| 15 | Transmit Data (TXD2) | RX2+ | No connector |
| 16 | Clear to Send (CTS2) | No connector | No connector |
| 17 | Data Terminal Ready (DTR2) | RX2- | No connector |
| 18 | Ring Indicator (RI2) | No connector | No connector |
| 19 | Ground (GND) | GND | GND |
| 20 | Disconnect (NI) | NI | NI |
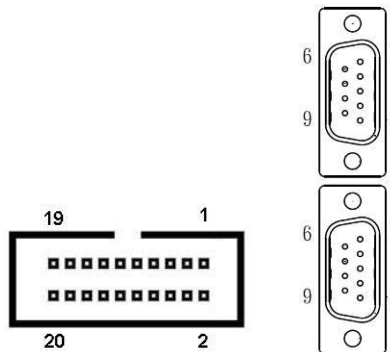
## 1.7.14 External Power connector

| Pin | Signal |
|-----|--------|
| 1 | - |
| 2 | GND |
| 3 | + |
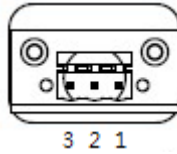
## 1.7.15 External Remote power switch connector

| Pin | Signal |
|-----|--------|
| 1 | PWR_BT |
| 2 | GND |
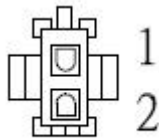
## 1.7.16 Internal DVI-I Connector

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | TX2- | 2 | TX2+ |
| 3 | Ground | 4 | NC |
| 5 | NC | 6 | DVI_SPD_CLK |
| 7 | DVI_SPD DATA | 8 | CRT-VSYNC |
| 9 | TX1- | 10 | TX1+ |
| 11 | Ground | 12 | NC |
| 13 | NC | 14 | VGAVCC |
| 15 | Ground | 16 | FPDETECT |
| 17 | TX0- | 18 | TX0+ |
| 19 | Ground | 20 | NC |
| 21 | NC | 22 | Ground |
| 23 | TXC+ | 24 | TXC- |
| C1 | CRT-RED | C2 | CRT-GREEN |
| C3 | CRT-BLUE | C4 | CRT-HSYNC |
| C5 | VGAGND | | |
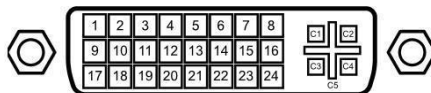
## 1.7.17 AT/ATX Switcher Connector

The AT/ATX switcher's default setting is ATX mode.

| Pin | Signal |
|-----|--------|
| 1-2 | ATX |
| 2-3 | AT |
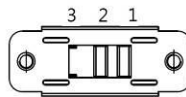
# CHAPTER 2
# HARDWARE INSTALLATION

The IPC934-230-FL Series are convenient for your various hardware configurations, such as CPU (Central Processing Unit), Memory Module, HDD (Hard Disk Drive) and PCIe card. The chapter 2 will show you how to install the hardware. It includes:

## 2.1   Installing the Processor

The Intel® Core™ i7/i5/i3 processors are available as a boxed processor for IPC934-230-FL system. Intel recommends the processors should be installed by a computer professional since this electronic device may cause serious damage to the installer, system and processor if installed improperly.

*Important Notes Before attempting to install a new processor, carefully review the documentation that came with your system and make sure that you will not be voiding your warranty by opening the computer or replacing your processor.*

**Instructions:**

1.   Make sure that your system can accommodate the Intel® Core™ i7/i5/i3/Celeron® Processors that you want to install. Check for CPU Card, BIOS, and thermal compatibility by using the manufacturer's documentation for the system, or by contacting the vendor if necessary. This processor should only be installed in systems supporting the Intel® Core™ i7/i5/i3/Celeron® Processors.

2.   Obtain access to your processor socket as described in the documentation for your system.

3.   If the cooling solution prevents you from accessing the processor socket, you may need to remove it. Instructions on how to remove your cooling solution should be provided in the documentation that came with the system.

**Procedure of Installation:**

**Step 1**   Turn off the system.

**Step 2**   Disconnect the power connector.

**Step 3**   Loosen screws to remove the Heatsink cover from the chassis.



**Step 4**   After opening the HS cover, you can locate the CPU socket as marked. Align pins of the CPU with pin holes of the socket. Be careful of the CPU's orientation that you need to align the arrow mark on the CPU with the arrow key on the socket. Please remove the Mylar before you install the CPU into the socket.
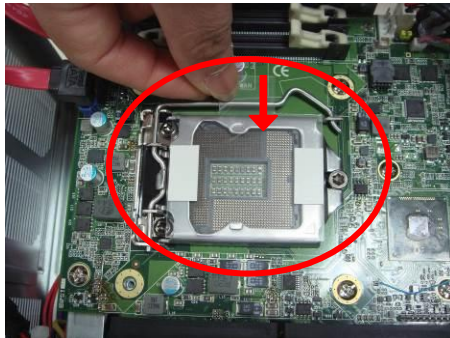


**Step 5**   Then, put a thermal pad on top of the CPU



**Step 6**   After install the ram module, please close the HS cover back to the chassis and fasten all screws.

## 2.2 Installing the Memory Module

**Step 1** Turn off the system.

**Step 2** Disconnect the power connector.

**Step 3** Loosen screws to remove the Heatsink cover from the chassis.



**Step 4** Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are clipped on to the edges of the SO-DIMM.



**Step 5** After install the ram module, please close the Heatsink cover back to the chassis and fasten all screws.

## 2.3   Installing the Hard Disk Drive

The IPC934-230-FL Series offers a convenient drive bay module for users to install HDD. The system offers users two 2.5" Hard Disk Drive for installation. Please follow the steps:

**Step 1**   Turn off the system.

**Step 2**    Disconnect the power connector.

**Step 3**   Loosen screws to remove the top cover from the chassis.

**Step 4**   Open the top cover and locate the Hard Disk Drives as red marked.
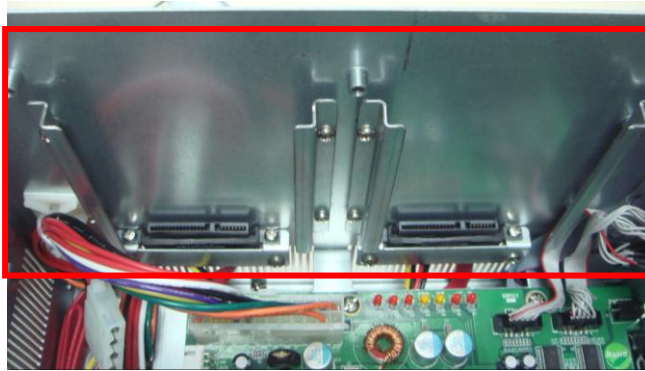


**Step 5**   There is a thermal pad and 2 x HDD brackets in the accessory box, please sticker the HDD Mylar before assembly the HDD with the bracket.



**Step 6**   Insert the HDD module into the HDD socket.



**Step 7**   Close the HDD top cover back to the chassis and fasten all screws.

## 2.4   Installing the PCI or PCIe Card

IPC934-230-FL provides one PCIex1 and one PCIex4 or one PCI & one PCIex4 for expansion. The procedure of installing the PCI / PCIe expansion card into IPC934-230-FL is instructed below.

**Step 1**   Turn off the system.

**Step 2**   Disconnect the power connector.

**Step 3**   Loosen screws to remove the top cover from the chassis. Removing the PCI or PCIe bracket by releasing the button as marked.
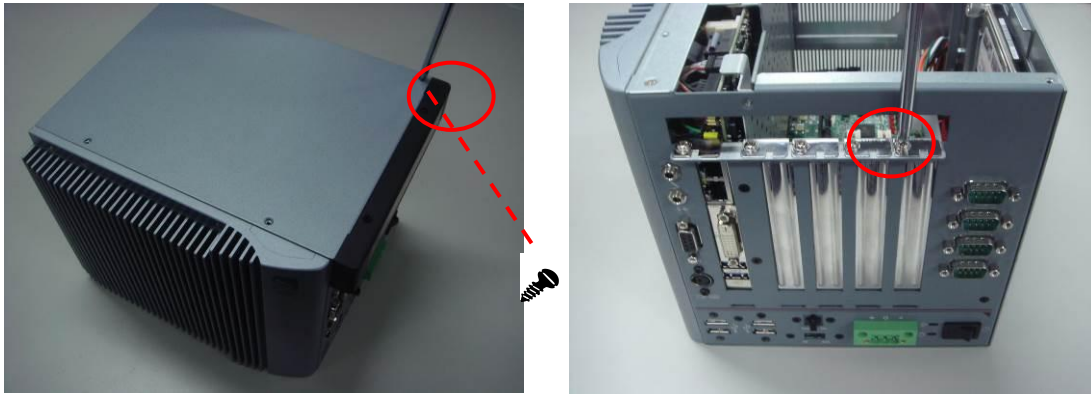


**Step 4**   Locate the PCI or PCIe slots.



**Step 5**   Align the PCI or PCIe card with the slot, and press the card into the slot until it is firmly seated.



**Step 6**   Close the top cover back to the chassis and fasten all screws.

## 2.5   Installing the optinal Fan Module

IPC934-230-FL provides one PCIex1 and one PCIex4 or 1 PCI & 1 PCIex4 for expansion. For the system dissipation generated by PCI/PCIe cards, we strongly suggest that customer should use our optional fan module, to install the optional system fan, please follow the steps below:

**Step 1**   Turn off the system.

**Step 2**   Disconnect the power connector.

**Step 3**   Loosen screws to remove the top cover from the chassis and remove the two screws on the rear panel as red marked.
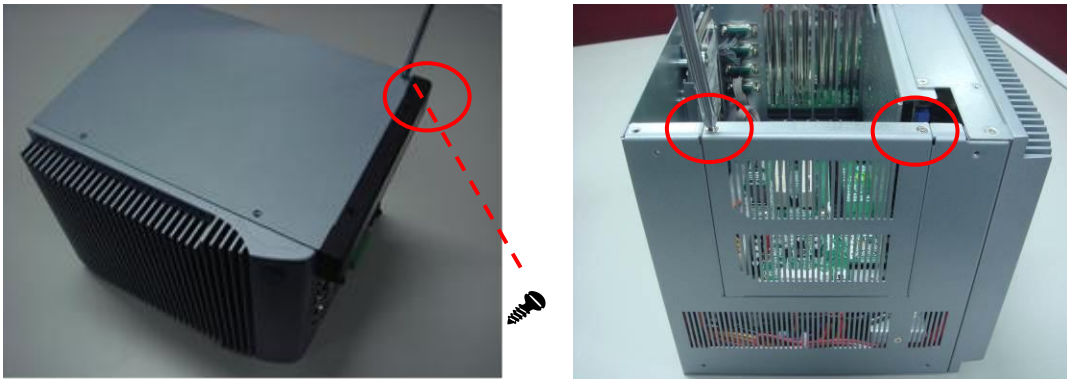


**Step 4**   Plug the fan cables connected to the IPC934, and then attach the system fan module to the IPC934 and secure it by two screws.

# CHAPTER 3
# AMI BIOS UTILITY

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a 16MB flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

## 3.1    Starting

To enter the setup screens, follow the steps below:

1.    Turn on the computer and press the <Del> key immediately.

2.    After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

*Note:*    ***If your computer cannot boot after making and saving system changes with Setup, you can restore BIOS optimal defaults by setting JP1 (see section 1.6.2).***

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

## 3.2   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 the navigation keys differ from one screen to another.***

| Hot Keys | Description |
|---|---|
| →← **Left/Right** | The Left and Right <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. |

## 3.3   Main Menu

The first time you enter the setup utility, you will be in the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.

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

 Main

 BIOS Information                                    Choose the system default
 BIOS version           SHB230 A1.00                language
 Build Date             04/24/2014


 System Language        [English]
 System Date            [Fri 04/25/2014]
 System Time            [11:08:27]

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

          Version 2.15.1236. Copyright ( C ) 2012 American Megatrends, Inc .
```

➢  System LanguageUse this item to choose the system default language.

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

## 3.4 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.

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

► PCH-FW Configuration

► AMT Configuration

► USB Configuration

► W83627H Super I/O configuration

► F81801 Super I/O Configuration

► F81801 HW Monitor

► Intel RC Drivers version Detail

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

*IPC934-230-FL Series User's Manual*
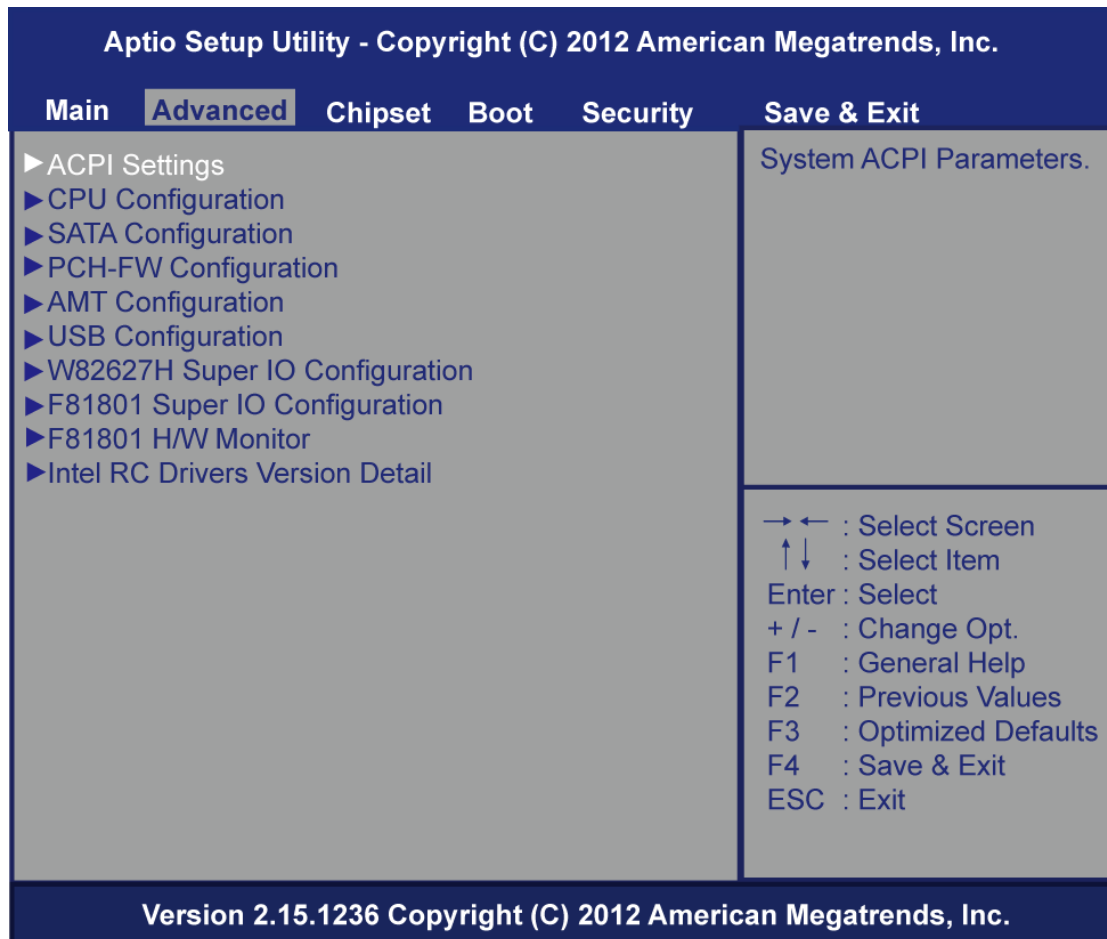
● **ACPI Settings**

ACPI configuration can be configured in ACPI Settings. A description of the selected item appears on the right side of the screen.
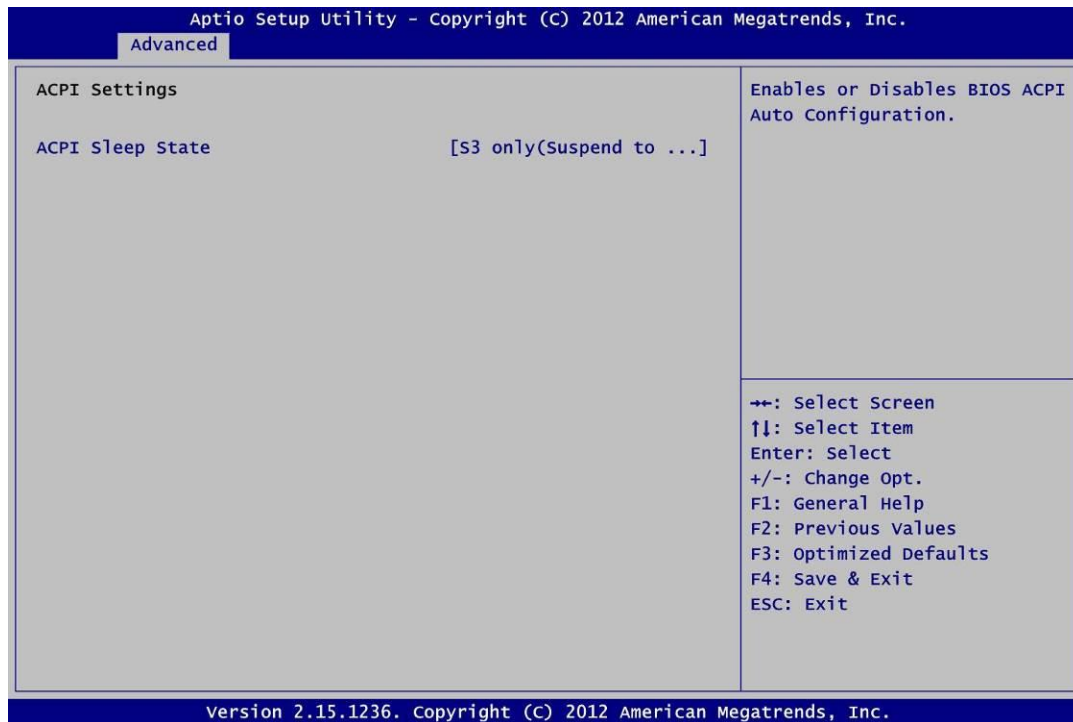


➢ **ACPI Sleep State**

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. Configuration options are Suspend S3 only (Suspend to RAM).

*AMI BIOS Utility*                                                                        29

●  **CPU Configuration**

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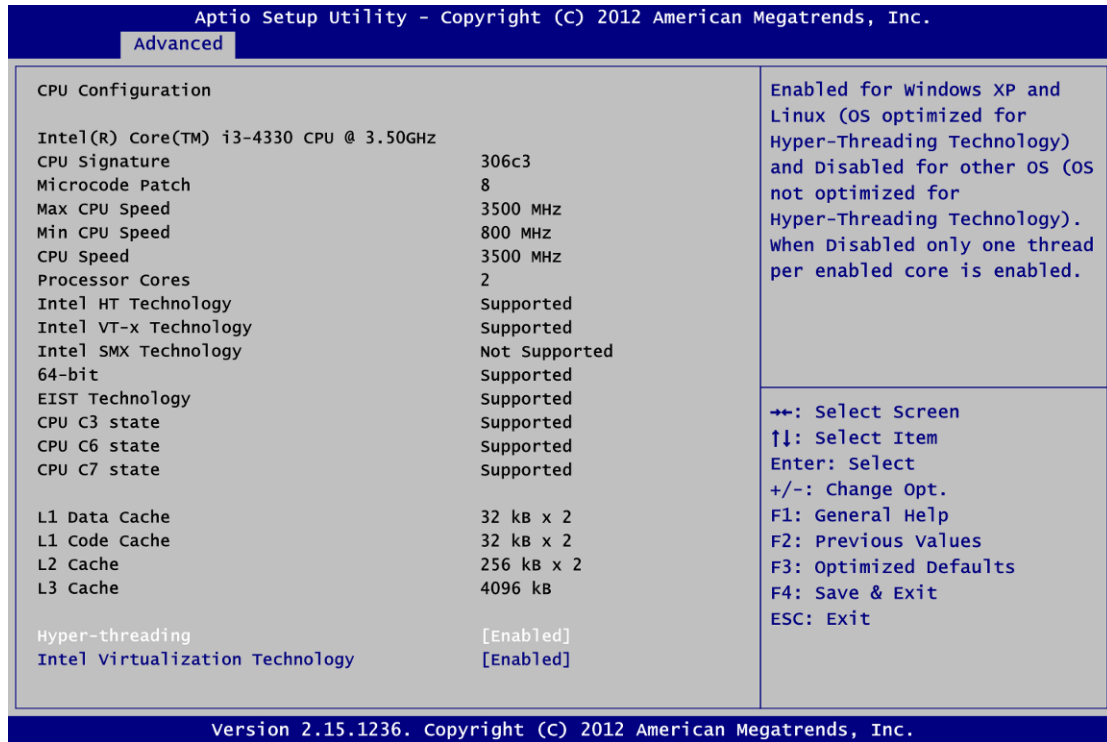


➢  **Hyper-threading**

Use this item to enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking function as two logical ones.

➢  **Intel Virtualization Technology**

This item allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

● **SATA Configuration**

You can read the current installed hardware configurations from those SATA ports in the SATA Configuration menu. During system boot up, BIOS will detect the present SATA devices automatically.
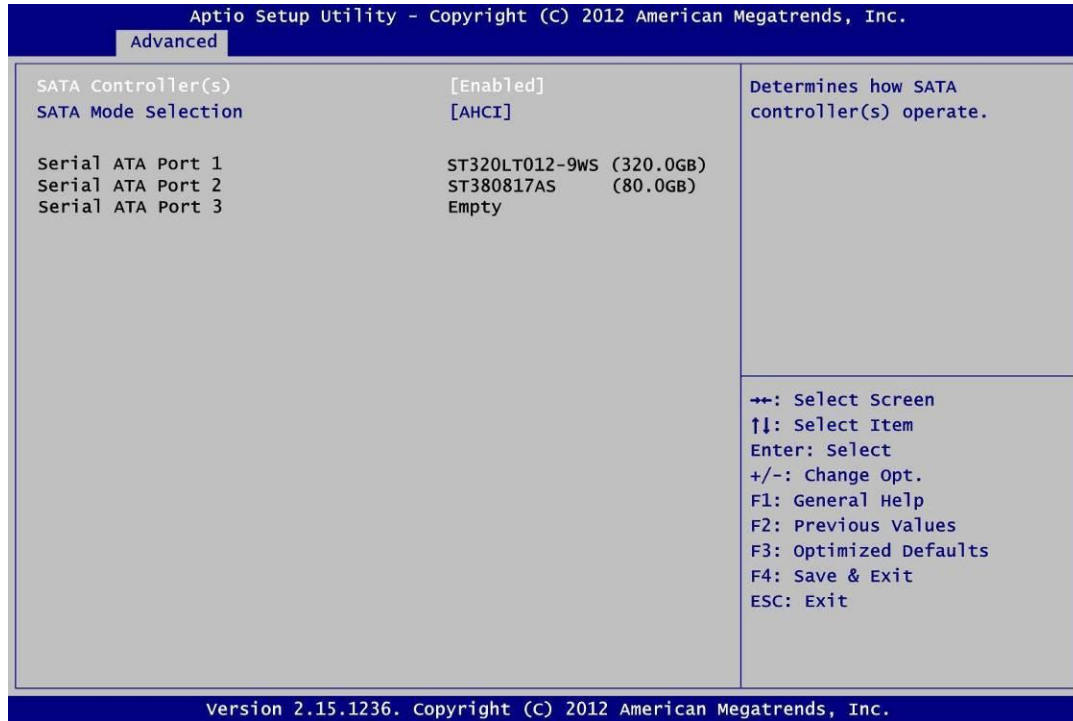
● **PCH-FW Configuation**

Display ME firmware information

● **AMT Configuration**

Enable/Disable Intel Active Management Technology.

Configuration options: [Disabled] [Enabled]
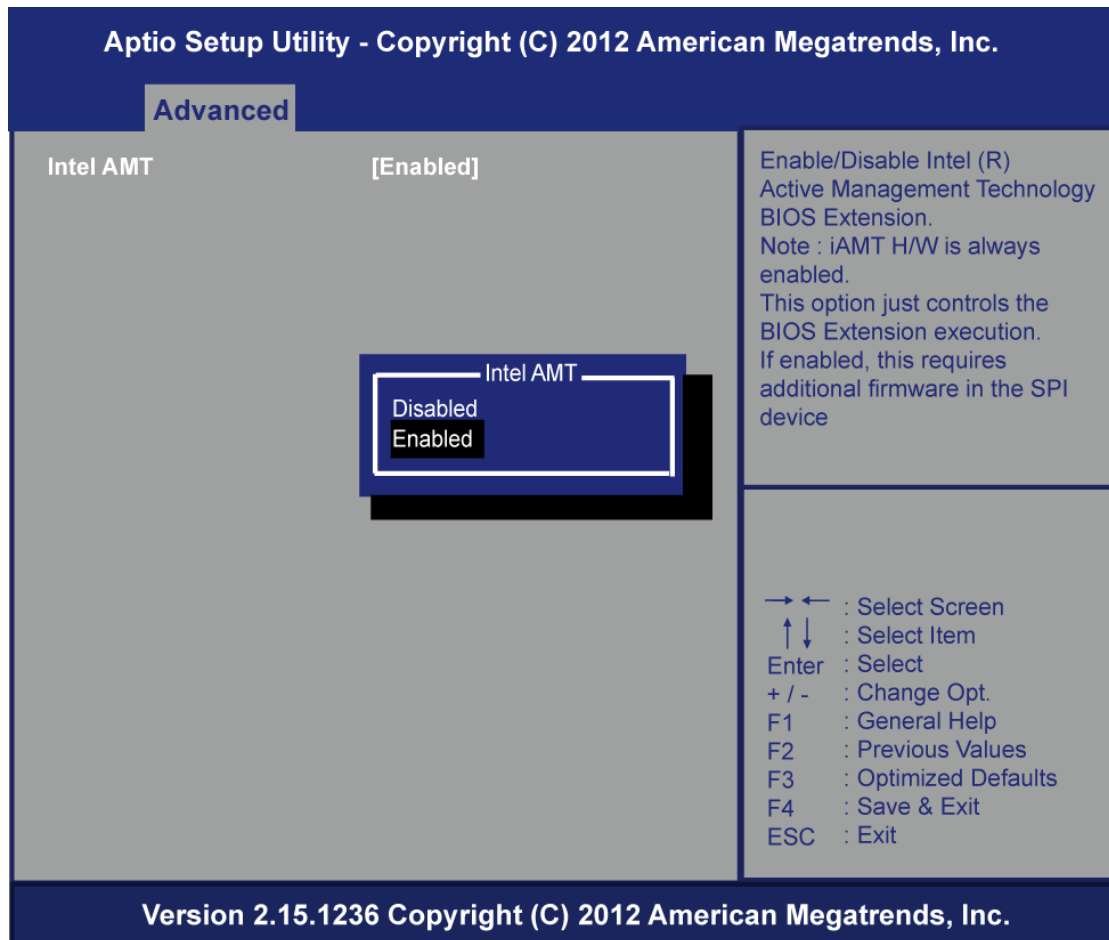
● **USB Configuration**

USB configuration can be configured here by selecting and changing each item. A description of the selected item appears on the right side of the screen.
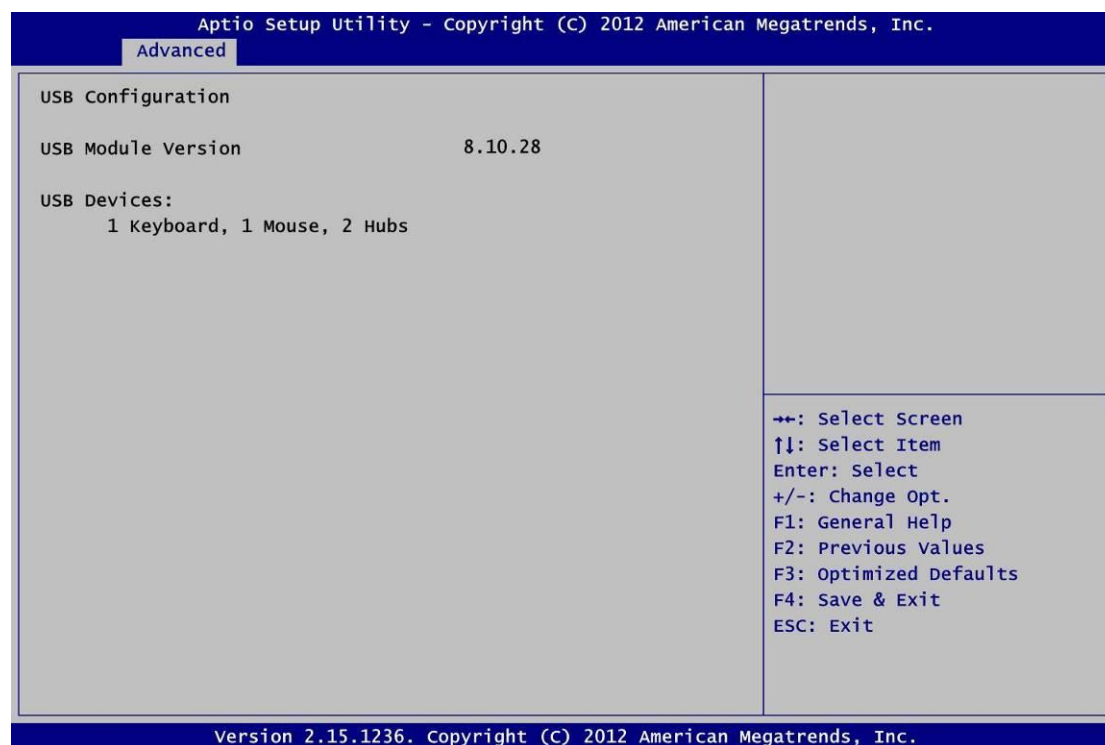


➢ **USB Devices**

Display all detected USB devices.

● **W83627H Super IO Configuraion**

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| Advanced | |
|---|---|
| W83627H Super IO Configuration | Set Parameters of Serial Port 0 (COMA) |
| W83627H Super IO Chip        W83627H | |
| ▶Serial Port 0 Configuration | |
| ▶Serial Port 1 Configuration | |
| | → ← : Select Screen |
| | ↑↓   : Select Item |
| | Enter : Select |
| | + / -  : Change Opt. |
| | F1     : General Help |
| | F2     : Previous Values |
| | F3     : Optimized Defaults |
| | F4     : Save & Exit |
| | ESC  : Exit |

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➢ **Serial Port 0~1 Configuration**

Use this item to set parameters of serial port 0 to 1.

● **Serial port 0 Configuration**
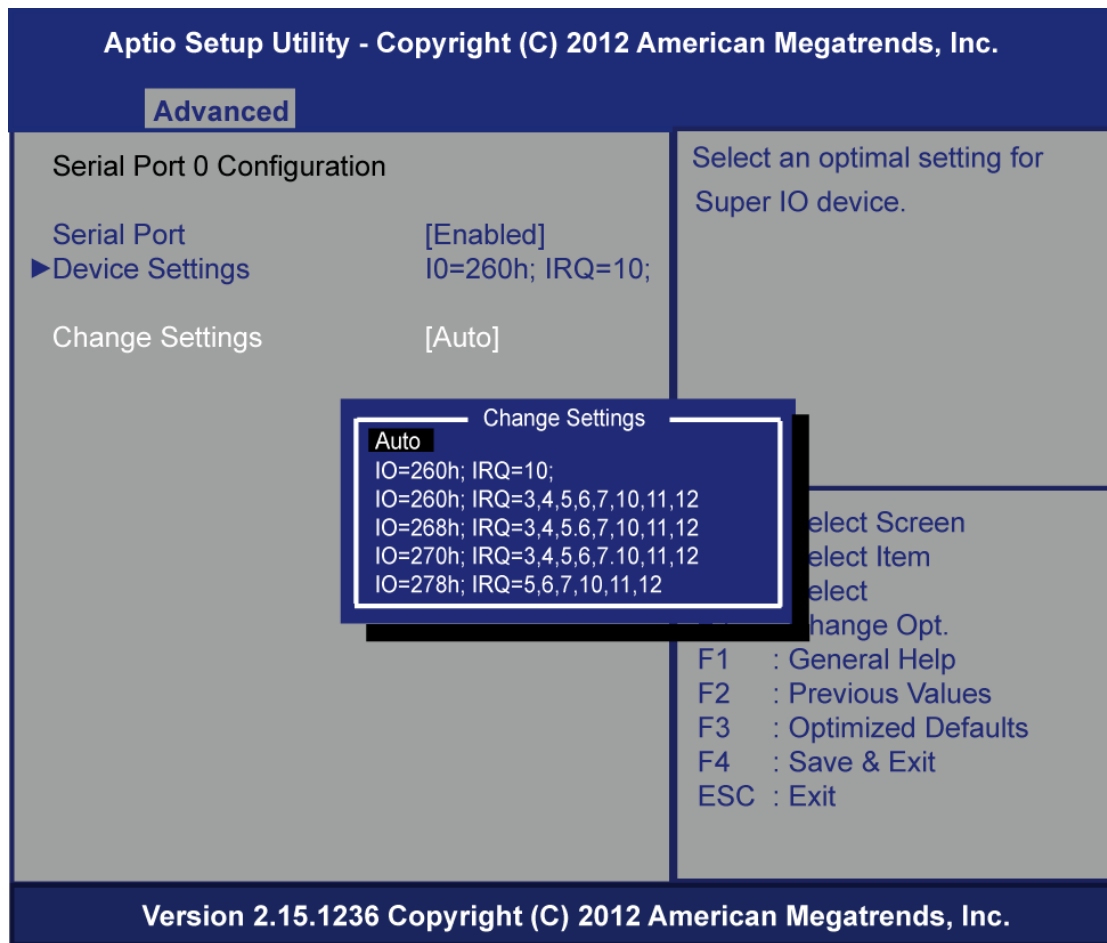


> **Serial Port**

Enable or disable serial port 0. The optimal setting for base I/O address is 260h and for interrupt request address is IRQ10.

> **Change Setting**

Change the serial port 0 base I/O address and interrupt request address.

● **Serial port 1 Configuration**

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

Advanced

Serial Port 0 Configuration

Select an optimal setting for
Super IO device.

| | |
|---|---|
| Serial Port | [Enabled] |
| Device Settings | I0=268h; IRQ=11; |
| | |
| Change Settings | [Auto] |

Change Settings

Auto
IO=268h; IRQ=10;
IO=260h; IRQ=3,4,5,6,7,10,11,12
IO=268h; IRQ=3,4,5.6,7,10,11,12
IO=270h; IRQ=3,4,5,6,7.10,11,12
IO=278h; IRQ=5,6,7,10,11,12

elect Screen
elect Item
elect
hange Opt.
F1    : General Help
F2    : Previous Values
F3    : Optimized Defaults
F4    : Save & Exit
ESC  : Exit

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➢ **Serial Port**

Enable or disable serial port 1. The optimal setting for base I/O address is 268h and for interrupt request address is IRQ11.

➢ **Change Setting**

Change the serial port 1 base I/O address and interrupt request address.

● **F81801 Super IO Configuration**



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

  F81801  Super IO Configuration                                    Set Parameters of Serial Port
                                                                    1.
  F81801  Super IO Chip                        F81801
 ▶ Serial Port 1
 ▶ Serial Port 2




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


            Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

➢ **Serial Port 1~2 Configuration**

Use this item to set parameters of serial port 1 to 2.

● **Serial Port 1 Configuration**

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

 Serial Port 1                                     Setting UART mode to RS232
                                                   RS485(Half Duplex)
 Serial Port                    [Enabled]          RS422/485(Full Duplex)
 Device Settings                IO=3F8h; IRQ=4;

 Mode Setting                   [RS232]
 Change Settings                [Auto]

                     ┌──────── Mode Setting ────────┐
                     │ RS232                         │
                     │ RS485                         │
                     │ RS422                         │
                     └───────────────────────────────┘
                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit


          Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

➢ **Serial Port**

Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

➢ **Mode Setting**

Use this option to set RS-232/RS-422/RS-485 mode for serial port 1.

● **Serial Port 2 Configuration**



➢ **Serial Port**

Enable or disable serial port 2. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

➢ **Mode Setting**

Use this option to set RS-232/RS-422/RS-485 mode for serial port 2.

- **F81801 HW Monitor**

This screen monitors hardware health.



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

   PC Health Status                                    Enable or Disable Smart Fan

   CPU Fan Function            [Disabled]
   CPU temperature            : +56 C
   System temperature         : +49 C
   Fan1 Speed                 : N/A
   Fan2 Speed                 : N/A
   VCORE                      : +1.736 V
   V_SM                       : +1.488 V

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

           Version 2.15.1236 Copyright (C) 2012 American Megatrends, Inc.
```
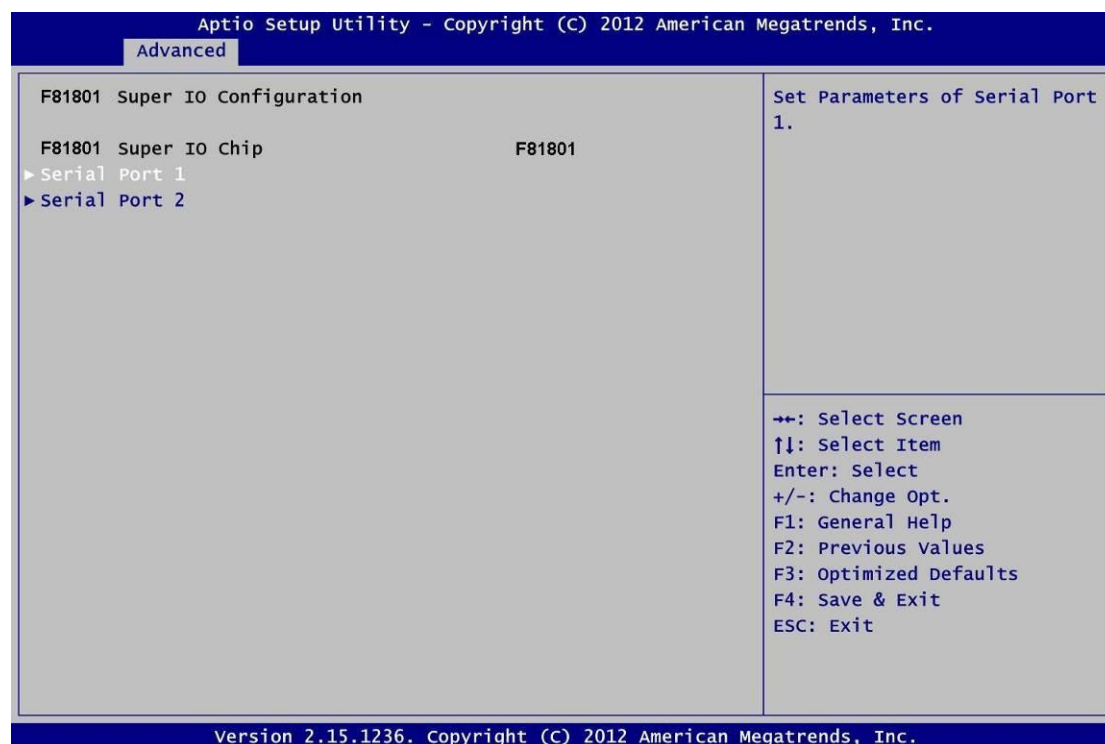
- **Smart Fan Function**

Enable or disable Smart Fan function.

● **Intel RC Drivers version Detail**

Displays Version String for drivers

## 3.5   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:

► **PCH-IO Configuration**

► **System Agent (SA) Configuration**

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

```
          Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main    Advanced   Chipset   Boot   Security   Save & Exit   Event Logs

  ►PCH-IO Configuration                                    PCH Parameters
  ►System Agent (SA) Configuration




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


          Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
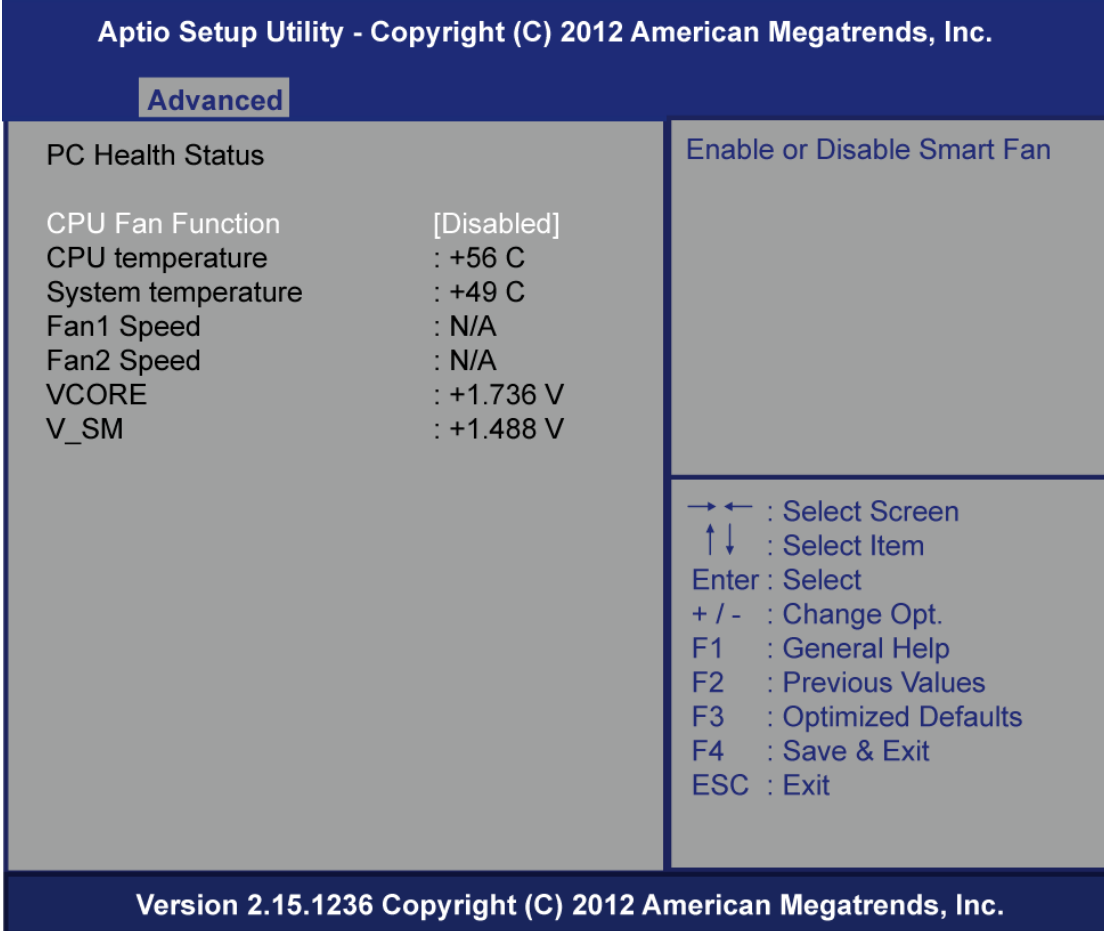
● **PCH-IO Configuration**

This screen allows you to set PCH parameters.

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

 Intel PCH RC Version            1.6.2.0              PCH Azalia Configuration
 Intel PCH SKU Name              Q87                  settings.
 Intel PCH Rev ID                05/C2

▶ PCH Azalia Configuration




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



           Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
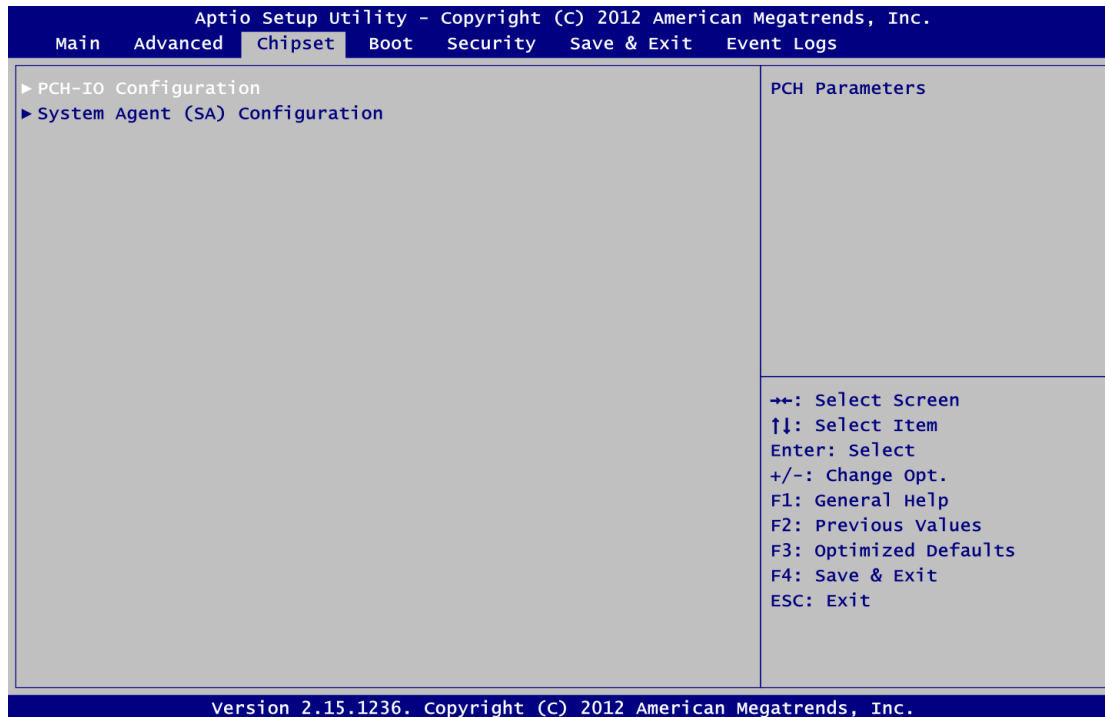
➢ **PCH Azalia Configuration**

Use this item for PCH Azalia configuration settings.

● **System Agent (SA) Configuration**

This screen shows System Agent information and provides function for specifying related parameters. For items marked with "▶", please press <Enter> for more options.

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

 System Agent Bridge Name         Haswell            Config Graphics Settings
 System Agent RC Version          1.6.2.0
 VT-d Capability                  Unsupported


 ▶ Graphics Configuration
 ▶ Memory Configuration



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



         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
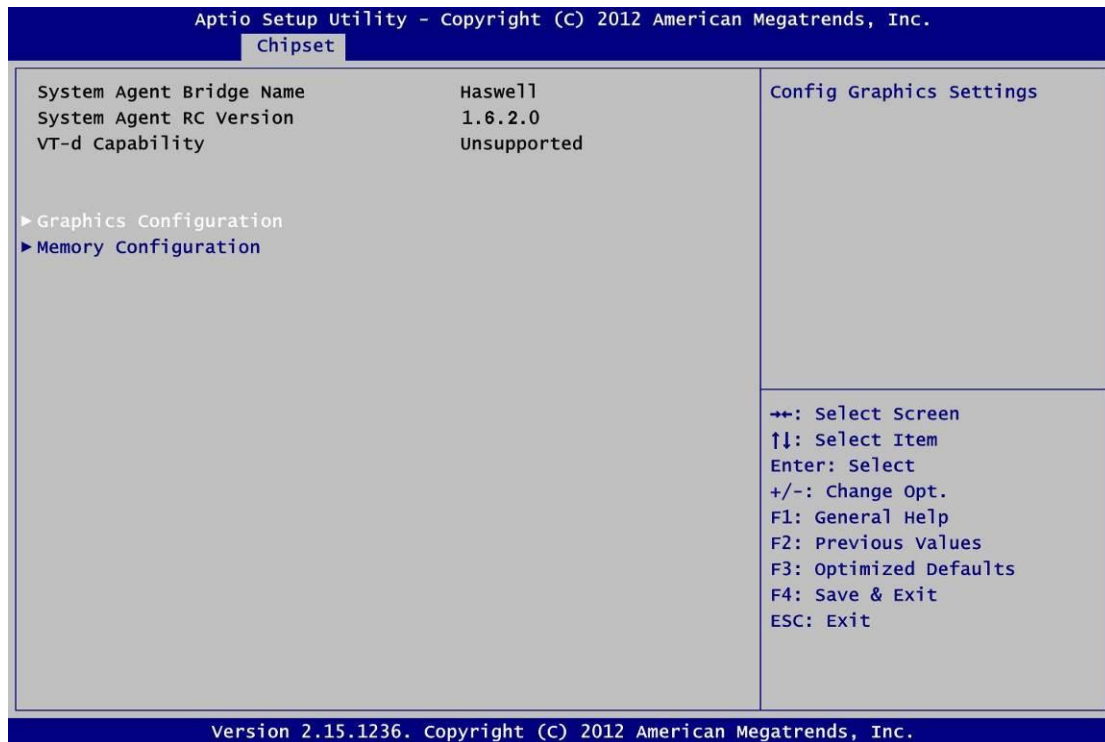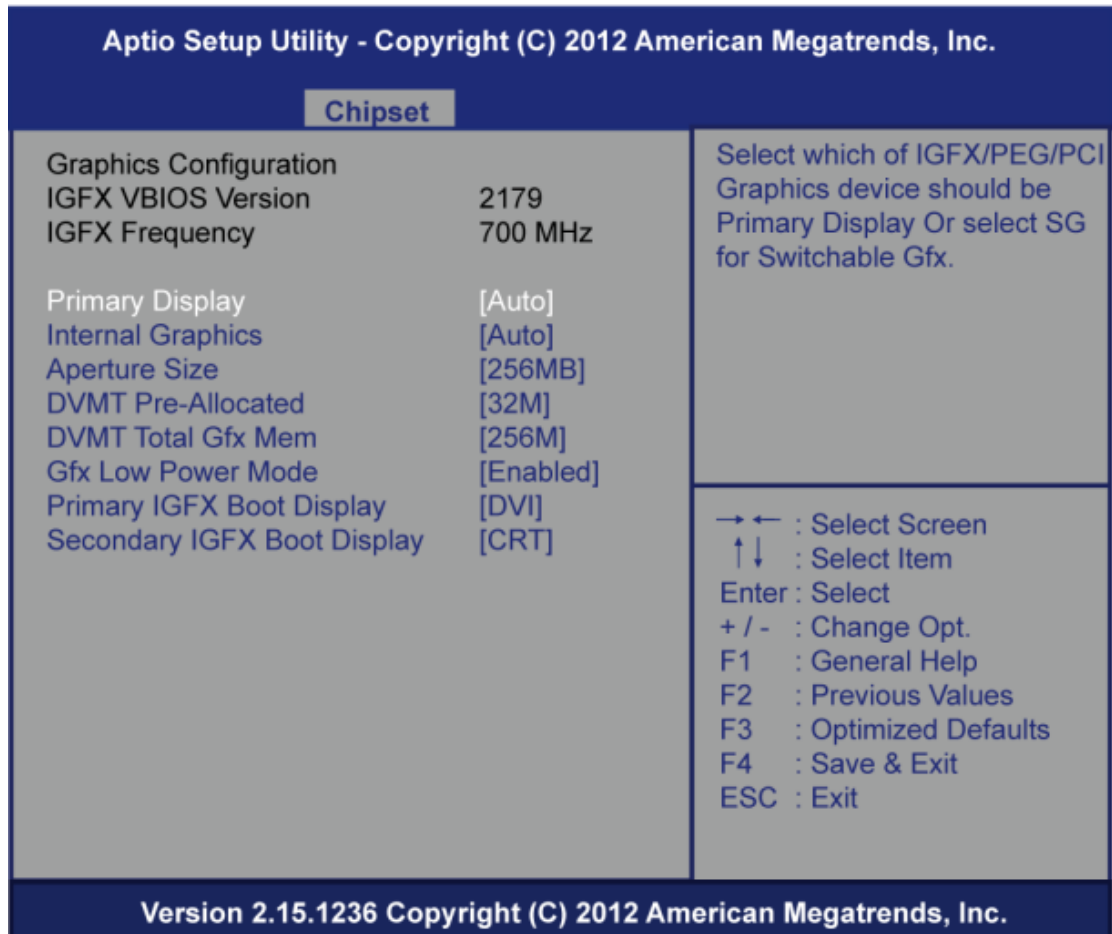
➢ **Graphics Configuration**

Use this item for graphics configuration settings.

➢ **Memory Configuration**

Use this item for memory configuration settings.

● **Graphic Configuration**



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

Chipset

| Graphics Configuration | | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. |
|---|---|---|
| IGFX VBIOS Version | 2179 | |
| IGFX Frequency | 700 MHz | |
| | | |
| Primary Display | [Auto] | |
| Internal Graphics | [Auto] | |
| Aperture Size | [256MB] | |
| DVMT Pre-Allocated | [32M] | |
| DVMT Total Gfx Mem | [256M] | |
| Gfx Low Power Mode | [Enabled] | |
| Primary IGFX Boot Display | [DVI] | |
| Secondary IGFX Boot Display | [CRT] | |

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

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➢ **Primary Display**

Allow you to select which graphics controller to use as the primary boot device.

➢ **Internal Graphic[Auto]**

Keep IGD enable based on the setup option.
Configuration options: [Auto] [Disabled] [Enabled].

➢ **Aperture Size [256MB]**

Set Aperture Size.
Configuration options: [128MB][256MB][512MB]

➢ **DVMT Pre-Allocated**

Select DVMT pre-allocated memory size.
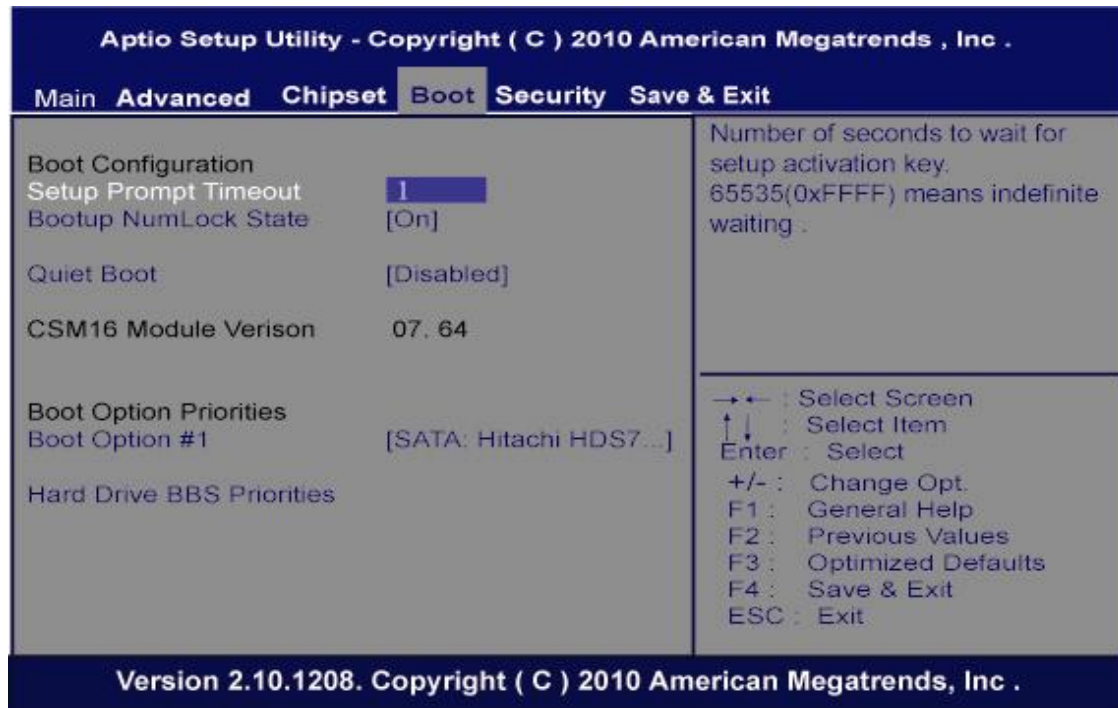
➢ **DVMT Total Gfx Mem**

Select DVMT total memory size.

➢ **Gfx Low Power Mode[Disable]**

This option is applicable for SFF only.
Configuration options: [Disabled] [Enabled].

## 3.6  Boot Menu

The Boot menu allows users to change boot options of the system.



&#10148;  **Setup Prompt Timeout**

Number of seconds to wait for setup activation key.65535 (0xFFFF) means indefinite waiting.

&#10148;  **Boot up Unlock State**

Use this item to select the power-on state for the Unlock.

&#10148;  **Quiet Boot**

Enable or disable Quiet Boot option.

## 3.7    Security Menu

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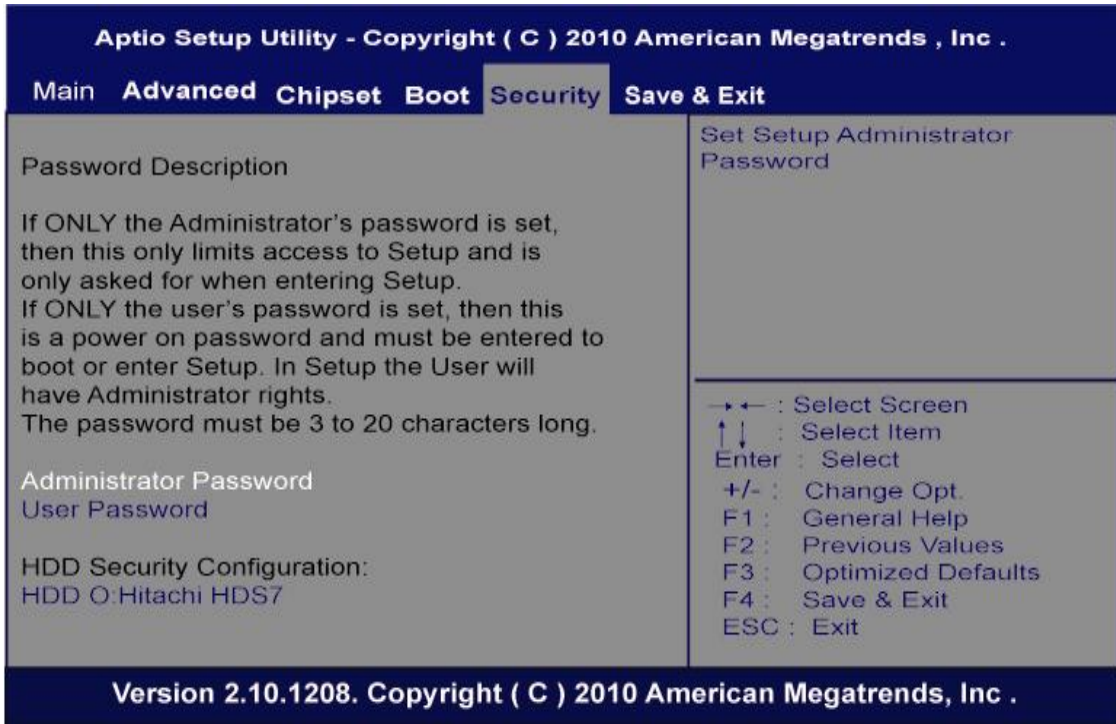


> ➢ **Administrator Password**
>
> This item indicates whether an administrator password has been set (installed or uninstalled).

> ➢ **User Password**
>
> This item indicates whether an user password has been set (installed or uninstalled).

## 3.8   Save & Exit Menu

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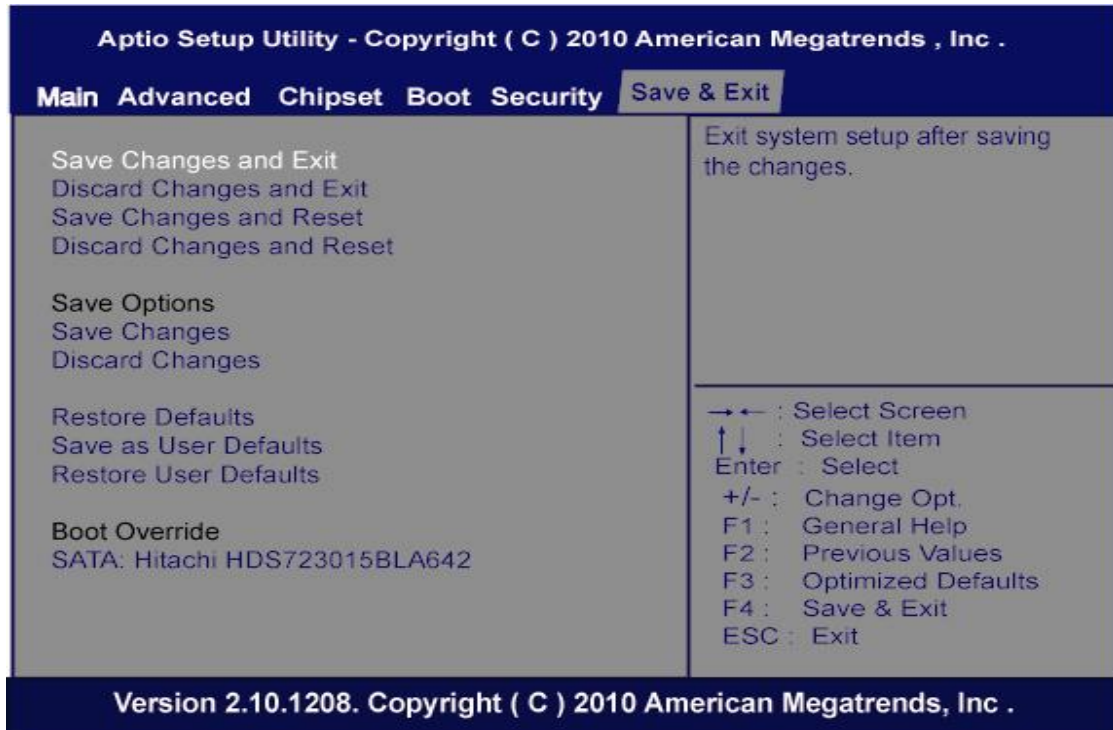


> ➢ **Save Changes and Exit**
>
> When finish the system configuration settings, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

> ➢ **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 finish the system configuration settings, 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 finish the system configuration settings, 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**

When select this option, all the settings will be restored to defaults automatically. Select Restore Defaults from the Save & Exit menu and press <Enter>.

> **Save as User Defaults**

Select this option to save your current system configuration settings as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

> **Restore User Defaults**

When select this option, all the settings will be restored to user defaults automatically. Select Restore User Defaults from the Save & Exit menu and press <Enter>.