IEI Integration Corp.

MODEL:

ECN-380-QM87

High Performance Fanless Embedded System with Intel® Core™ i5-4400E 2.7 GHz/Celeron® 2000E processor, VGA, Dual HDMI, RoHS Compliant

User Manual

Rev. 1.00 – 23 October 2014

RoHS Lead Free

Revision

Date	Version	Changes
23 October, 2014	1.00	Initial release

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Table of Contents

1 INTRODUCTION 1

1.1 OVERVIEW 2
1.2 MODEL VARIATIONS 2
1.3 FEATURES 3
1.4 TECHNICAL SPECIFICATIONS 3
1.5 FRONT PANEL 5
1.6 REAR PANEL 5
1.6.1 ECN-380-QM87-C/4G-R10 Rear Panel 5
1.6.2 ECN-380-QM87-i5/WD/4G-R10 Rear Panel 6
1.7 DIMENSIONS 8

2 UNPACKING 9

2.1 ANTI-STATIC PRECAUTIONS 10
2.2 UNPACKING PRECAUTIONS 10
2.3 UNPACKING CHECKLIST 11

3 INSTALLATION 13

3.1 INSTALLATION PRECAUTIONS 14
3.2 HARD DISK DRIVE (HDD) INSTALLATION 14
3.3 SO-DIMM INSTALLATION 17
3.4 PLUGGABLE DC-IN TERMINAL BLOCK INSTALLATION 19
3.5 MOUNTING THE SYSTEM WITH MOUNTING BRACKETS 19
3.6 EXTERNAL PERIPHERAL INTERFACE CONNECTORS 20
3.6.1 Audio Connection 21
3.6.2 HDMI Device Connection 22
3.6.3 LAN Connection 22
3.6.4 DB-9 Serial Port Connection 23
3.6.5 USB Device Connection 24
3.6.6 VGA Monitor Connection 25
3.7 POWERING ON/OFF THE SYSTEM 26

4 BIOS 28

4.1 INTRODUCTION *29*
4.1.1 Starting Setup *29*
4.1.2 Using Setup *29*
4.1.3 Getting Help *30*
4.1.4 Unable to Reboot after Configuration Changes *30*
4.1.5 BIOS Menu Bar *30*
4.2 MAIN *32*
4.3 ADVANCED *33*
4.3.1 ACPI Settings *34*
4.3.2 RTC Wake Settings *35*
4.3.3 Trusted Computing *36*
4.3.4 CPU Configuration *38*
4.3.5 SATA Configuration *40*
4.3.6 Intel(R) Rapid Start Technology *41*
4.3.7 AMT Configuration *42*
4.3.8 USB Configuration *44*
4.3.9 iWDD H/W Monitor *45*
4.3.9.1 Smart Fan Mode Configuration *45*
4.3.10 F81866 Super IO Configuration *47*
4.3.10.1 Serial Port n Configuration *48*
4.3.11 F81866 H/W Monitor *51*
4.3.12 Serial Port Console Redirection *51*
4.3.13 iEi Feature *55*
4.4 CHIPSET *55*
4.4.1 PCH-IO Configuration *57*
4.4.1.1 PCI Express Configuration *58*
4.4.2 System Agent (SA) Configuration *60*
4.4.2.1 Graphics Configuration *60*
4.4.2.2 Memory Configuration *63*
4.5 BOOT *64*
4.6 SECURITY *66*
4.7 SAVE & EXIT *67*

A SAFETY PRECAUTIONS ***68***

A.1 SAFETY PRECAUTIONS *69*

A.1.1 General Safety Precautions *69*
A.1.2 Anti-static Precautions *69*
A.1.3 Product Disposal *70*
A.2 MAINTENANCE AND CLEANING PRECAUTIONS *71*
A.2.1 Maintenance and Cleaning *71*
A.2.2 Cleaning Tools *71*

B HAZARDOUS MATERIALS DISCLOSURE ***73***

B.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY *74*

List of Figures

Figure 1-1: ECN-380-QM87 2
Figure 1-2: ECN-380-QM87 Front Panel 5
Figure 1-3: ECN-380-QM87 Rear Panel 6
Figure 1-4: ECN-380-QM87 Rear Panel 7
Figure 1-5: Physical Dimensions (mm) 8
Figure 3-1: HDD Cover Retention Screws 15
Figure 3-2: HDD Installation 15
Figure 3-3: HDD Retention Screws 16
Figure 3-4: Memory Cover Retention Screw 17
Figure 3-5: SO-DIMM Socket 18
Figure 3-6: SO-DIMM Installation 18
Figure 3-7: Pluggable DC-in Terminal Block Installation 19
Figure 3-8: Mounting Bracket Retention Screws 20
Figure 3-9: Audio Connector 21
Figure 3-10: HDMI Connection 22
Figure 3-11: LAN Connection 23
Figure 3-12: DB-9 Serial Port Connector 24
Figure 3-13: USB Device Connection 25
Figure 3-14: VGA Connector 26
Figure 3-15: Power Button 27

List of Tables

Table 1-1: ECN-380-QM87 Model Variations 3
Table 1-2: Technical Specifications 5
Table 4-1: BIOS Navigation Keys 30

Chapter

1

Introduction

1.1 Overview

Figure 1-1: ECN-380-QM87

The ECN-380-QM87 is a platform based on Intel® Core™ i5-4400E or Intel® Celeron® 2000E processor and the Intel® QM87 chipset.

The ECN-380-QM87 contains one VGA and two HDMI video outputs, which can be applied to multi-display application and support high Full HD video quality. The ECN-380-QM87 is equipped with an abundant of I/O ports and supports a wide range of operating temperature. Four USB 2.0 and two USB 3.0 ports provide flexible expansion options. Serial device connectivity is provided by two RS-232 ports.

1.2 Model Variations

The model variations of the ECN-380-QM87 Series are listed below.

Model No.	Processor	Power	Memory
ECN-380-QM87-i5-R10	Intel® Core™ i5-4400E 2.7 GHz	12 V DC	w/o memory
ECN-380-QM87-C-R10	Intel® Celeron® 2000E 2.2 GHz	12 V DC	w/o memory
ECN-380-QM87-i5/WD-R10	Intel® Core™ i5-4400E 2.7 GHz	9 V~36V DC	w/o memory
ECN-380-QM87-C/WD-R10	Intel® Celeron® 2000E 2.2 GHz	9 V~36V DC	w/o memory
ECN-380-QM87-i5/4G-R10	Intel® Core™ i5-4400E 2.7 GHz	12 V DC	4GB memory pre-installed
ECN-380-QM87-C/4G-R10	Intel® Celeron® 2000E 2.2 GHz	12 V DC	4GB memory pre-installed
ECN-380-QM87-i5/WD/4G-R10	Intel® Core™ i5-4400E 2.7 GHz	9 V~36V DC	4GB memory pre-installed

Model No.	Processor	Power	Memory
ECN-380-QM87-C/WD/4G-R10	Intel® Celeron® 2000E 2.2 GHz	9 V~36V DC	4GB memory pre-installed

Table 1-1: ECN-380-QM87 Model Variations

1.3 Features

The ECN-380-QM87 features are listed below:

- Intel® Core™ i5-4400E 2.7 GHz/Celeron® 2000E 2.2 GHz
- Triple video outputs: 2 x HDMI + VGA
- Two 2.5" SATA 6Gb/s HDD/SSD drive bays

1.4 Technical Specifications

The ECN-380-QM87 technical specifications are listed in **Table 1-2**.

Specifications	
Chassis	
Color	Silver
Dimensions (WxDxH)	265 x 134 x 56.7 mm
System Fan	Fanless
Chassis Construction	Aluminum alloys with heavy duty metal
Motherboard	
CPU	Intel® Core™ i5-4400E 2.7 GHz Intel® Celeron® 2000E 2.2 GHz
Chipset	Intel® QM87
Memory	One 204-pin DDR3 4GB SO-DIMMs pre-installed (system max: 8GB)
Storage	
Hard Drive	2 x 2.5" SATA 6Gb/s HDD/SSD drive bay
I/O Interfaces	
USB	2 x USB 3.0 ports 4 x USB 2.0 ports

Specifications	
Ethernet	2 x RJ-45 Intel® I210 PCIe GbE controller Intel® Clarkvill-V PHY with Intel® AMT 9.0 support
RS-232	2 x DB-9
Display	2 x HDMI, 1 x VGA
Resolution	VGA: Up to 1920 x 1200@60Hz HDMI: Up to 2500 x 1600@60Hz
Audio	1 x Line-out, 1 x Mic-in
Wireless	802.1b/g/n 2T2R (optional)
Expansions	
PCIe Mini	1 x Full-size PCIe Mini (Reserved for Wi-Fi)
Remote Management	
iRIS(iEi Remote Intelligent Systems)	1 x iRIS-2400 (Optional)
Power	
Power Input	12V DC SKU: 2 pin DC Jack only 9~36V DC SKU: 2 pin DC Jack & 3 pin terminal
Power Consumption	12 V@4.6 A (Intel® mobile Core™ Core i5-4400E with 4GB 1333MHz DDR3 memory)
Reliability	
Mounting	Wall mount, VESA 100
Operating Temperature	-20°C ~60°C with air flow (SSD)
Humidity	5% ~ 95%, non-condensing
Operating Shock	Half-sine wave shock 5G, 11ms, 3 shocks per axis

Specifications	
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Weight (Net/Gross)	2.4 kg/4.2 kg

Table 1-2: Technical Specifications

1.5 Front Panel

The ECN-380-QM87 front panel contains:

- 1 x HDD LED
- 1 x Power button
- 2 x RS-232 serial ports
- 2 x USB 2.0 ports

An overview of the front panel is shown in **Figure 1-2**.

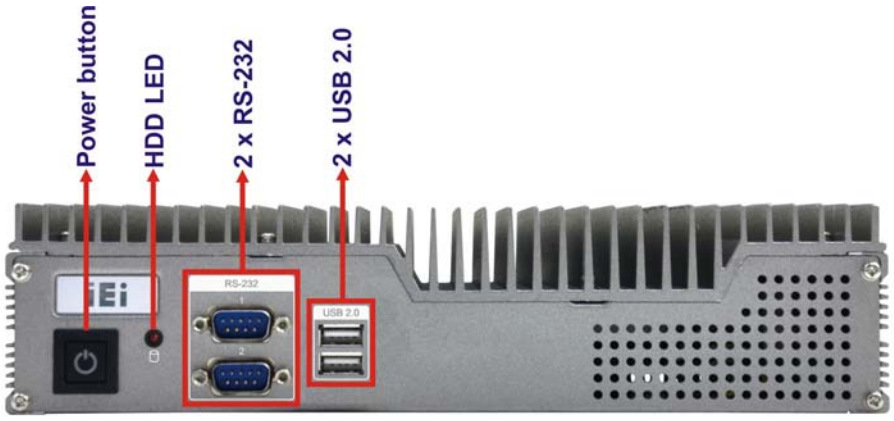


Figure 1-2: ECN-380-QM87 Front Panel

1.6 Rear Panel

1.6.1 ECN-380-QM87-C/4G-R10 Rear Panel

The ECN-380-QM87 rear panel contains:

- 1 x HDD bay
- 2 x HDMI ports
- 1 x Line-out port

- 1 x Mic-in port
- 1 x DC jack for 12V DC power input
- 2 x RJ-45 LAN ports
- 2 x USB 3.0 ports
- 2 x USB 2.0 ports
- 1 x VGA port

An overview of the rear panel is shown in **Figure 1-3** below.

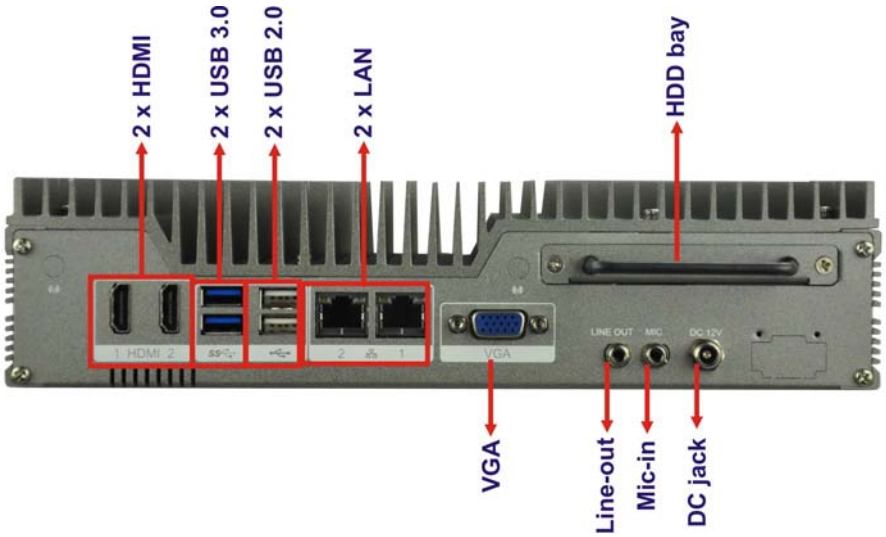


Figure 1-3: ECN-380-QM87 Rear Panel

1.6.2 ECN-380-QM87-i5/WD/4G-R10 Rear Panel

The ECN-380-QM87 rear panel contains:

- 1 x HDD bay
- 2 x HDMI ports
- 1 x Line-out port
- 1 x Mic-in port
- 1 x DC jack for 9 V ~ 36 V power input
- 1 x 3-pin terminal block for 9 V ~ 36 V power input
- 2 x RJ-45 LAN ports
- 2 x USB 3.0 ports
- 2 x USB 2.0 ports
- 1 x VGA port

An overview of the rear panel is shown in **Figure 1-3** below.

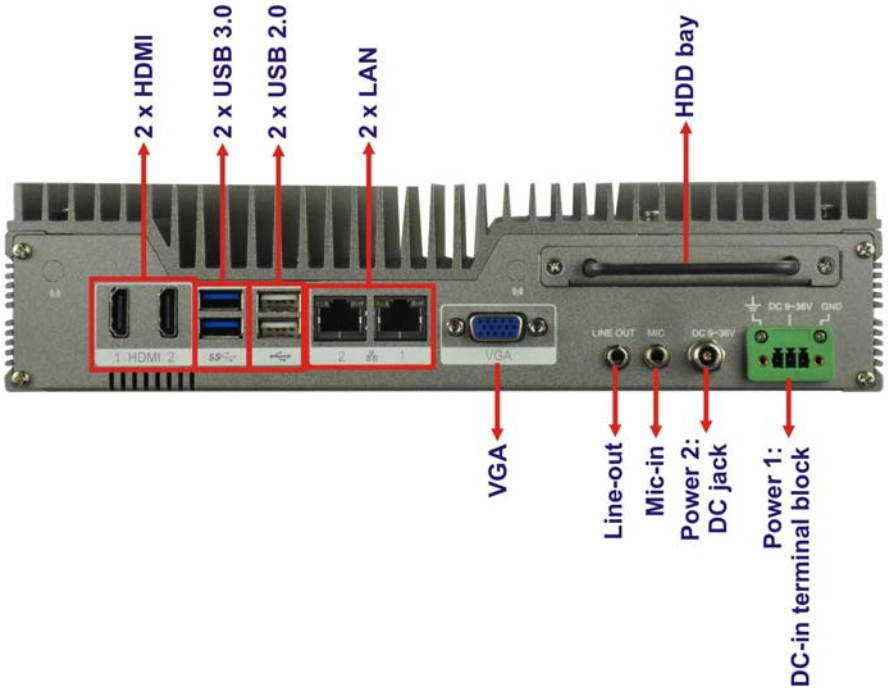


Figure 1-4: ECN-380-QM87 Rear Panel

1.7 Dimensions

The physical dimensions are shown below:

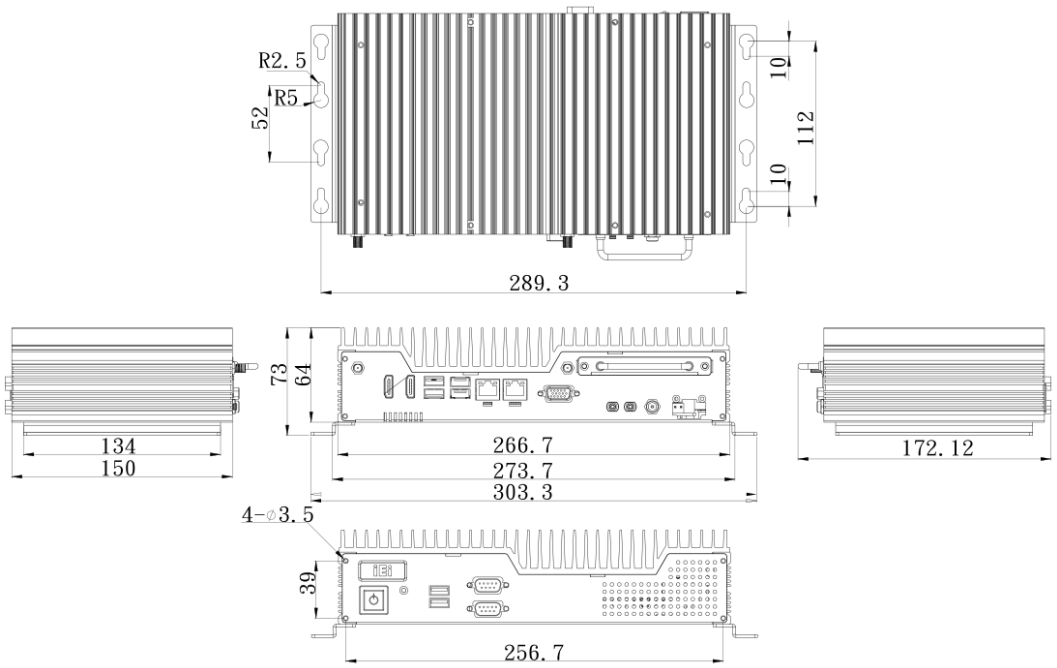


Figure 1-5: Physical Dimensions (mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the ECN-380-QM87 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECN-380-QM87. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECN-380-QM87 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Touch any grounded conducting material before handling the board. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the ECN-380-QM87, place it on an antic-static pad. This reduces the possibility of ESD damaging the ECN-380-QM87.

2.2 Unpacking Precautions

When the ECN-380-QM87 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the ECN-380-QM87 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the ECN-380-QM87 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The ECN-380-QM87 is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	ECN-380-QM87 Series	
1	Power Adapter	
1	Power Cord	
2	Mounting brackets (**P/N:** 41020-0396J4-00-RS)	

Quantity	Item and Part Number	Image
Standard		
1	Utility CD	
1	One Key Recovery CD	

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the ECN-380-QM87, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the ECN-380-QM87 must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the ECN-380-QM87 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The ECN-380-QM87 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the ECN-380-QM87. The ECN-380-QM87's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the ECN-380-QM87. Leave at least 5 cm of clearance around the ECN-380-QM87 to prevent overheating.
- **Grounding**: The ECN-380-QM87 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the ECN-380-QM87.

3.2 Hard Disk Drive (HDD) Installation

To install the hard drive to the removable HDD bay, please follow the steps below:

Step 1: Remove two HDD cover retention screws from the rear panel.

Figure 3-1: HDD Cover Retention Screws

Step 2: Lift the HDD bracket out of the ECN-380-QM87 and attach the HDD to the HDD bracket.

Figure 3-2: HDD Installation

Step 3: Secure the HDD with the HDD bracket by four retention screws.

Figure 3-3: HDD Retention Screws

Step 4: Reinstall the HDD cover that was previously removed in the same position it was before.

3.3 SO-DIMM Installation

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the ECN-380-QM87. Please make sure the purchased SO-DIMM complies with the memory specifications of the ECN-380-QM87.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below.

Step 1: Remove the memory cover retention screw from the bottom panel (**Figure 3-1**).

Figure 3-4: Memory Cover Retention Screw

Step 2: Locate the SO-DIMM socket on the motherboard (**Figure 3-5**).

Figure 3-5: SO-DIMM Socket

Step 3: Align the SO-DIMM with the socket. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 3-6**).

Step 4: Push the SO-DIMM into the socket at an angle (**Figure 3-6**).

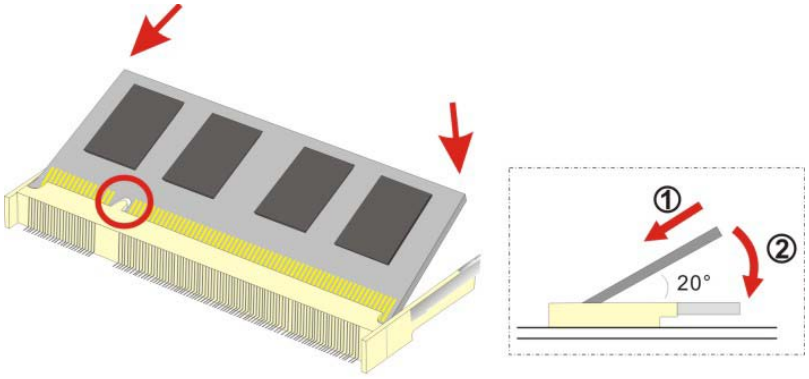


Figure 3-6: SO-DIMM Installation

Step 5: Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down (**Figure 3-6**).

Step 6: Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Step 7: Reinstall the memory cover that was previously removed in the same position it was before.

3.4 Pluggable DC-In Terminal Block Installation

To install the pluggable DC-in terminal block, please follow the steps below:

Step 1: Locate the DC-in terminal block connector. The location of the connector is shown in **Figure 1-3**.

Step 2: Align the pluggable DC-in terminal block with the DC-in terminal block connector on the ECN-380-QM87.

Step 3: Once aligned, insert the pluggable DC-in terminal block into the DC-in terminal block connector.

Step 4: Secure the pluggable DC-in terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-7**).

Figure 3-7: Pluggable DC-in Terminal Block Installation

3.5 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface (**Figure 3-11**).

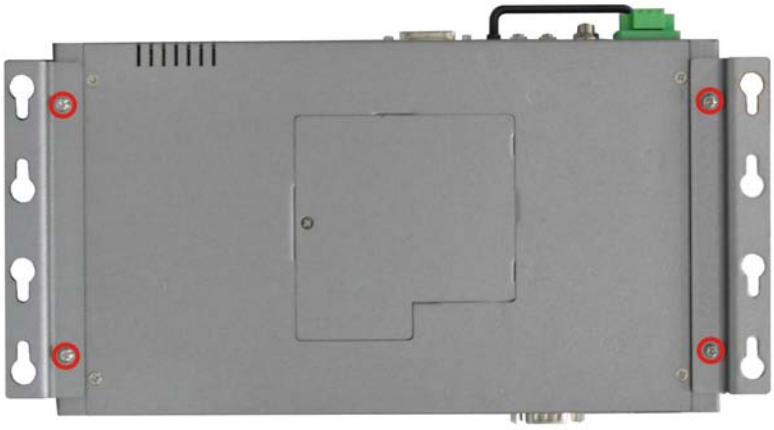


Figure 3-8: Mounting Bracket Retention Screws

Step 3: Secure the brackets to the system by tightening two retention screws into each bracket (**Figure 3-11**).

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

3.6 External Peripheral Interface Connectors

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- HDMI devices
- RJ-45 Ethernet cable connector
- Serial devices
- USB devices
- VGA monitor

3.6.1 Audio Connection

The audio jacks on the external audio connector enable the ECN-380-QM87 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: **Plug the audio plugs into the audio jacks**. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port (LINE OUT):** Connects to a headphone or a speaker.
- **Microphone (MIC):** Connects to a microphone.

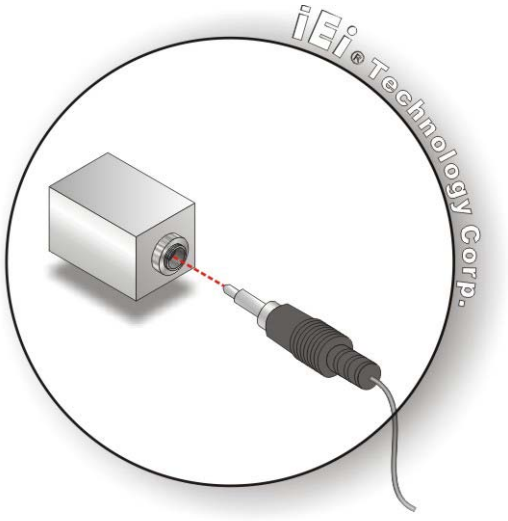


Figure 3-9: Audio Connector

Step 3: **Check audio clarity**. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

3.6.2 HDMI Device Connection

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. To connect the HDMI cable to the ECN-380-QM87, follow the steps below.

Step 1: **Locate the HDMI connector**. The location is shown in **Chapter 1**.

Step 2: **Align the connector.** Align the HDMI connector with the HDMI port. Make sure the orientation of the connector is correct.

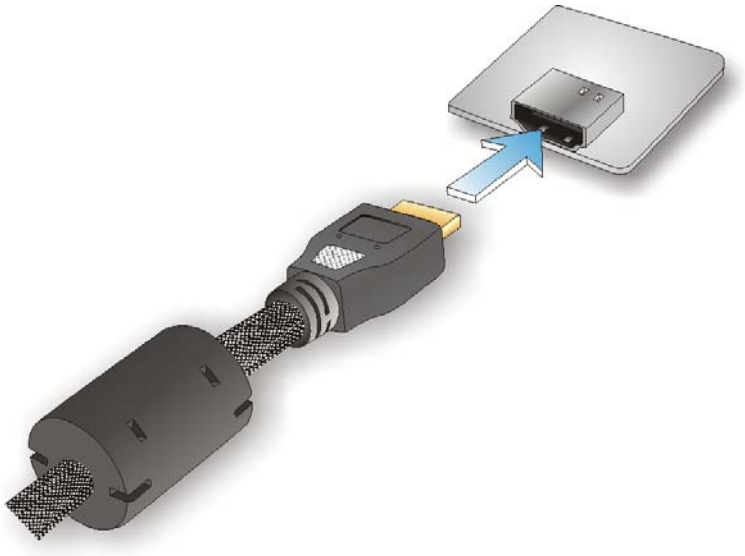


Figure 3-10: HDMI Connection

Step 3: **Insert the HDMI connector.** Gently insert the HDMI connector. The connector should engage with a gentle push. If the connector does not insert easily, check again that the connector is aligned correctly, and that the connector is being inserted with the right way up.

3.6.3 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The location of the LAN connector is shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the ECN-380-QM87. See Figure 3-11.

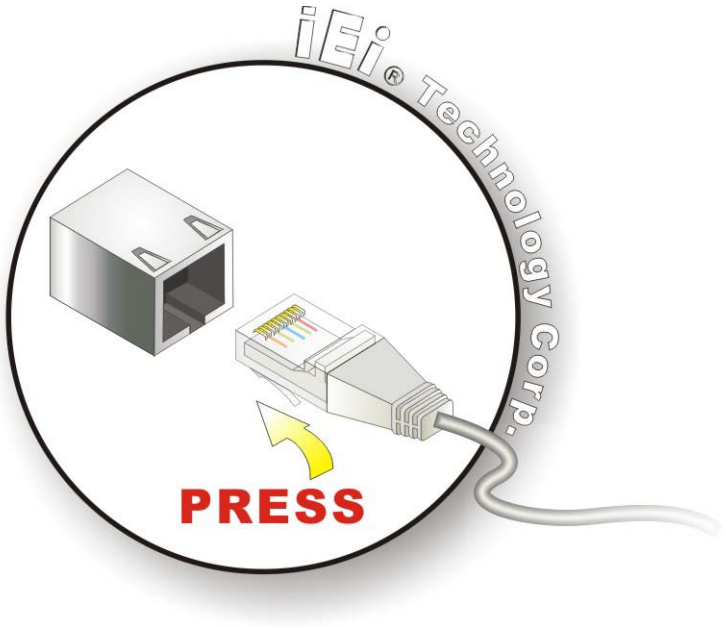


Figure 3-11: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the RJ-45 connector.

3.6.4 DB-9 Serial Port Connection

There are two RS-232 DB-9 connectors of the ECN-380-QM87 for serial device connection. Follow the steps below to connect a serial device to the DB-9 connector of the ECN-380-QM87.

Step 1: **Locate the DB-9 connector**. The locations of the DB-9 connectors are shown in **Chapter 1**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the rear panel. See Figure 3-12.

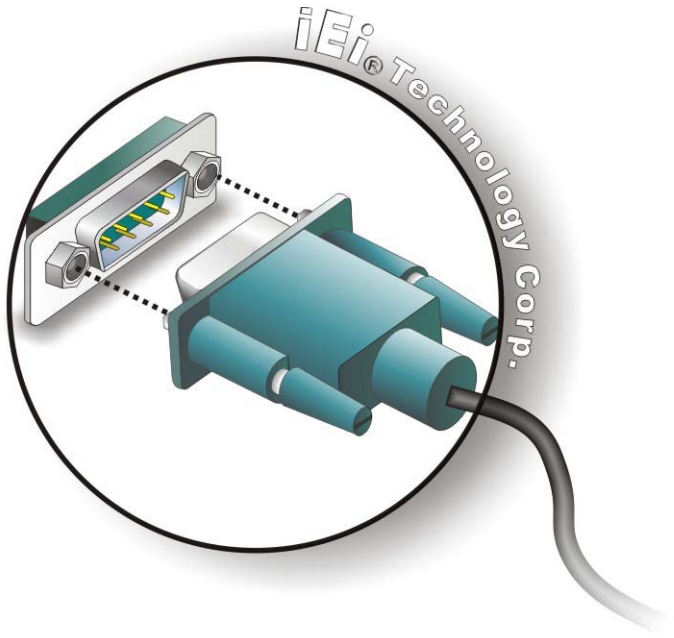


Figure 3-12: DB-9 Serial Port Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

3.6.5 USB Device Connection

NOTE:

User must install the USB 3.0 driver before connecting a USB device to the system or else the system may not recognize the connected device.

There are four USB 2.0 connectors and two USB 3.0 connectors on the ECN-380-QM87. To connect a USB device, please follow the instructions below.

Step 1: **Locate the USB connectors**. The locations of the USB connectors are shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors on the external peripheral interface. See Figure 3-13.

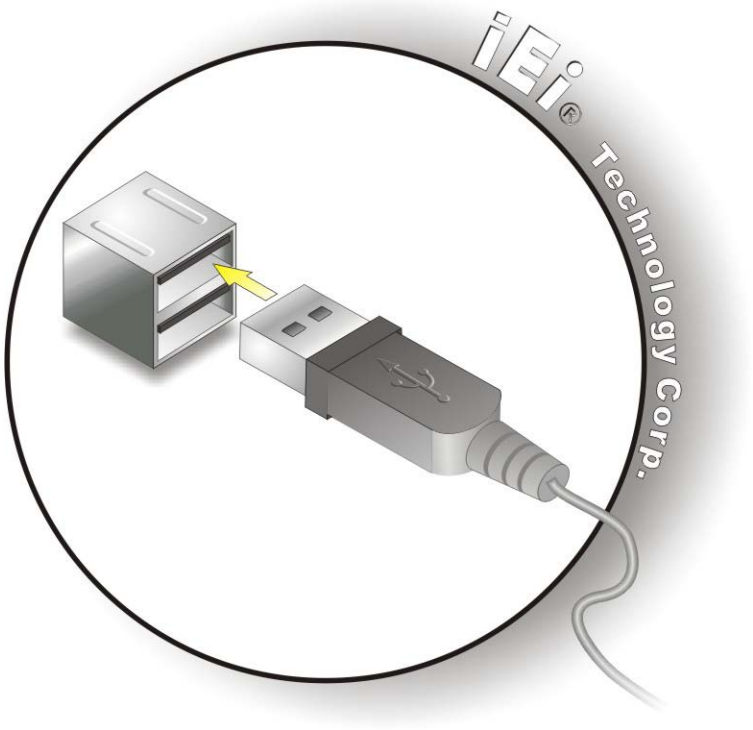


Figure 3-13: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the onboard connector.

3.6.6 VGA Monitor Connection

The ECN-380-QM87 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the ECN-380-QM87, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 1**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the ECN-380-QM87. See **Figure 3-14**.

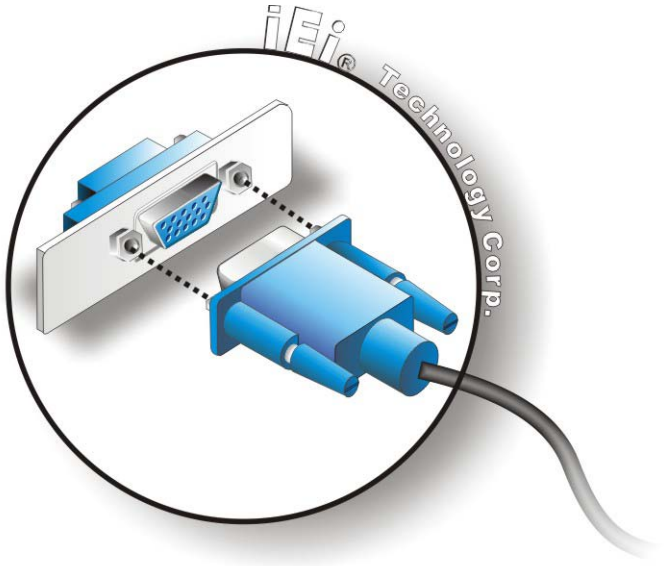


Figure 3-14: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

3.7 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 1 second
- **Power off** the system: press the power button for 1 second

Figure 3-15: Power Button

Chapter

4

BIOS

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

Key	Function
-	Decrease the numeric value or make changes
Page Up key	Move to the next page
Page Dn key	Move to the previous page
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the jumper described in **Chapter 4**.

4.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings.

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

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

BIOS Information                                  Set the Date. Use Tab to
BIOS Vendor                    American Megatrends switch between Date
Core Version                   4.6.5.4             elements.
Compliancy                     UEFI 2.3.1; PI 1.2
Project Version                E416AR11.ROM
Build Date and Time            12/13/2013 18:12:23

iWDD Vendor                    iEi
iWDD Version                   E416ER11.bin

Processor Information
Name                           Haswell
Brand String                   Intel(R) Core(TM) i5-440
Frequency                      2700 MHz
Processor ID                   306c3
Stepping                       CO
Number of Processors           2Core(s) / 4Thread(s)
Microcode Revision             16
GT Info                        GT2 (800 MHz)

IGFX VBIOS Version             2167
Memory RC Version              1.6.2.1
Total Memory                   4096 MB (DDR3)
Memory Frequency               1600 MHz

PCH Information
Name                           LynxPoint
PCH SKU                        QM87
Stepping                       05/C2
LAN PHY Revision               A3                 ----------------------

ME FW Version                  9.0.10.1372
ME Firmware SKU                5MB                →←: Select Screen
                                                  ↑ ↓: Select Item
SPI Clock Frequency                               Enter:  Select
DOFR Support                   Unsupported        +/-:  Change Opt.
Read Status Clock Frequnecy    50 MHz             F1:   General Help
Write Status Clock Frequnecy   50 MHz             F2:   Previous Values
Fast Read Status Clock Frequnecy 50 MHz           F3:   Optimized Defaults
                                                  F4:   Save & Exit
System Date                    [Tue 10/21/2014]   ESC:  Exit
System Time                    [15:10:27]

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

BIOS Menu 1: Main

- System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

  - BIOS Information
  - Processor Information
  - Memory Information
  - PCH Information
  - SPI Clock Frequency

The System Overview field also has two user configurable fields:

- System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

- System Time [xx:xx:xx]

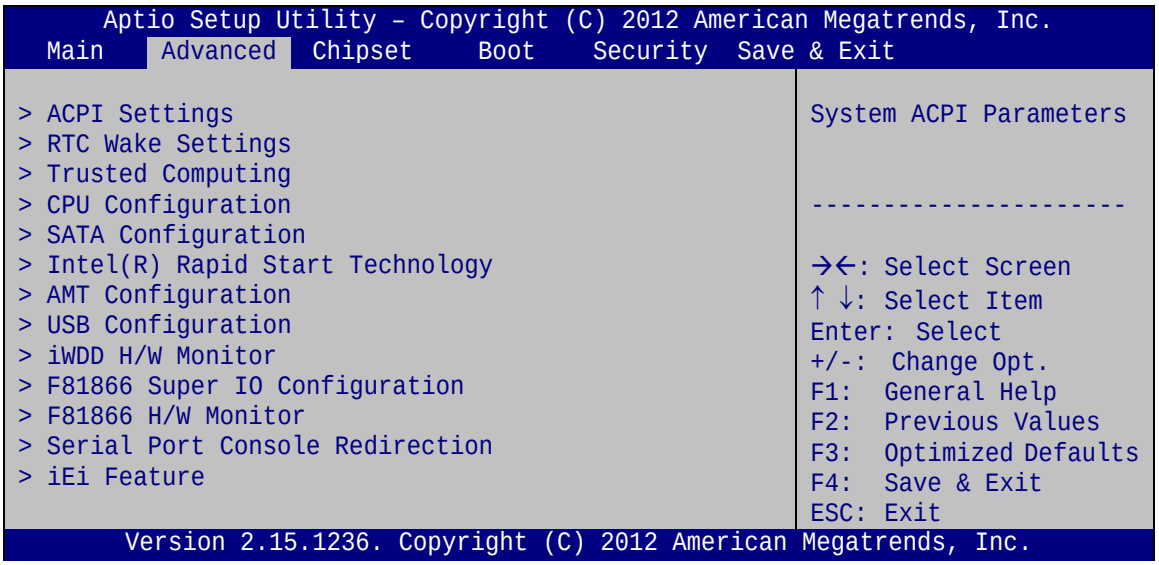
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

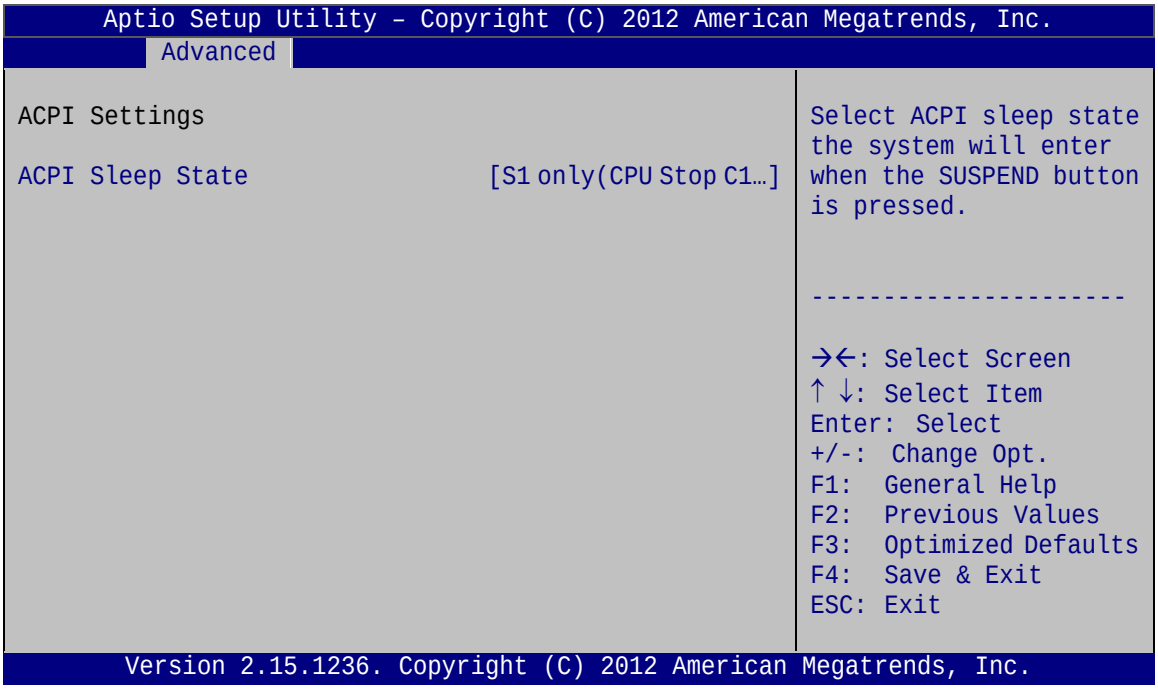
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

4.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 3: ACPI Settings

- ACPI Sleep State [S1 only (CPU Stop Clock)]

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔	**S1 only (CPU Stop Clock)** **DEFAULT**	The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
➔	**S3 only (Suspend to RAM)**	The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
        Advanced
Wake system with Fixed Time      [Disabled]

Enable or disable System
wake on alarm event. When
enabled, System will
wake on the
date::hr::min::sec
specified

----------------------

→←: 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.
```

BIOS Menu 4: RTC Wake Settings

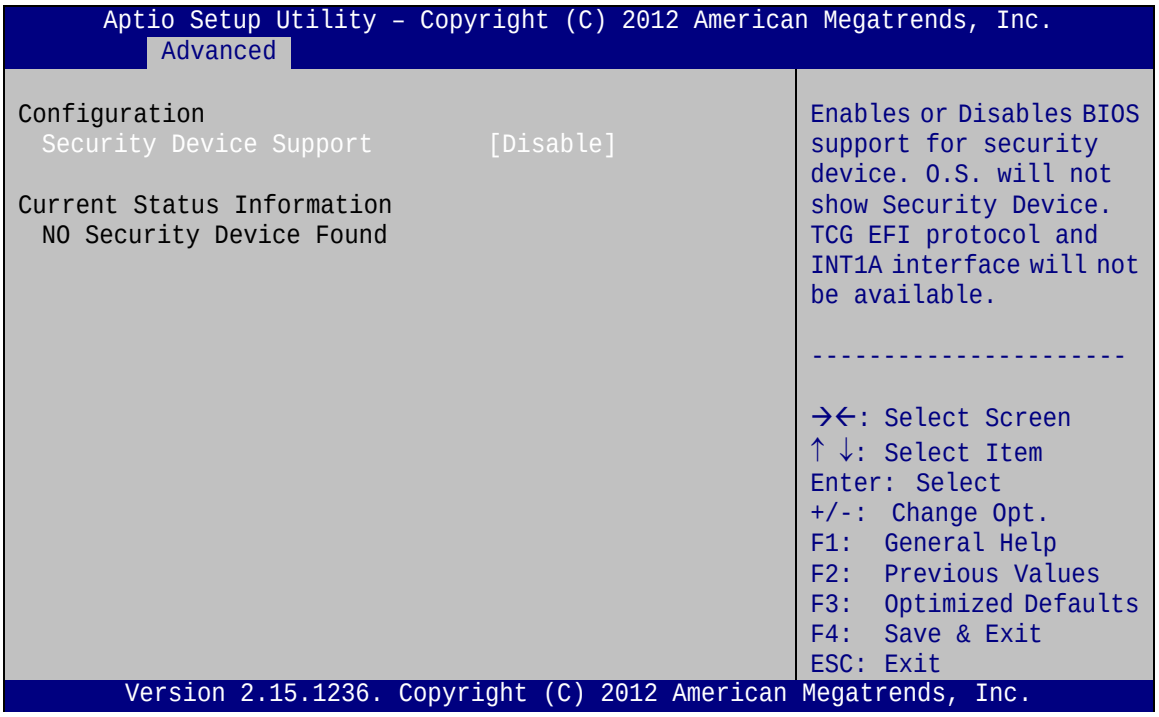
- Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected: Wake up every day Wake up date Wake up hour Wake up minute Wake up second After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

4.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 5**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 5: Trusted Computing

- Security Device Support [Disable]

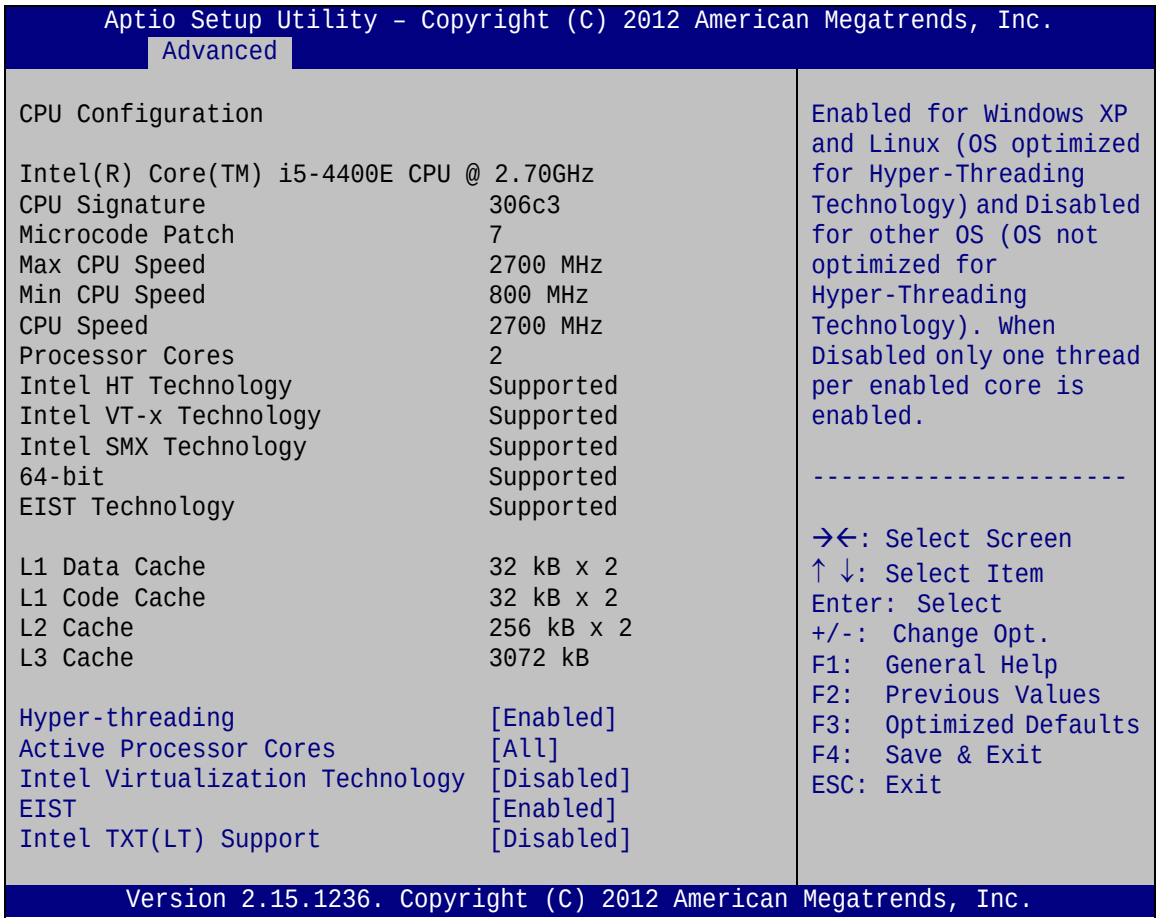
Use the **Security Device Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

4.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed
- Processor Cores: Lists the number of the processor core

- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- EIST Technology: Indicates if the Enhanced Intel SpeedStep® Technology (EIST) is supported by the CPU.
- 64-bit: Indicates if 64-bit is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

- Hyper-threading [Enabled]

Use the **Hyper-Threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

➔	**Disabled**		Disables the Intel Hyper-Threading Technology.
➔	**Enabled**	**DEFAULT**	Enables the Intel Hyper-Threading Technology.

- Active Processor Cores [All]

Use the **Active Processor Cores** option to configure the number of the active processor cores.

➔	**All**	**DEFAULT**	Active all of the processor cores
➔	**1**		Active one of the processor cores

- Intel Virtualization Technology [Disabled]

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled** **DEFAULT** Disables Intel Virtualization Technology.

➔ **Enabled** Enables Intel Virtualization Technology.

- EIST [Enabled]

Use the **EIST** option to enable or disable the Intel Speed Step Technology.

➔ **Disabled** Disables the Intel Speed Step Technology.

➔ **Enabled** **DEFAULT** Enables the Intel Speed Step Technology.

- Intel TXT(LT) Support [Disabled]

Use the **Intel TXT(LT) Support** BIOS option to enable or disable the Intel Trusted Execution Technology.

➔ **Disabled** **DEFAULT** Disables the Intel Trusted Execution Technology.

➔ **Enabled** Enables the Intel Trusted Execution Technology.

4.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
        Advanced
SATA Controller(s)              [Enabled]       Enable or disable SATA
SATA Mode Selection             [IDE]           Device.

S_ATA1                          Empty           ---------------------
S_ATA2                          Empty
S_ATA3                          Empty           →←: Select Screen
S_ATA4                          Empty           ↑ ↓: Select Item
M-SATA1                         Empty           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.
```

BIOS Menu 7: SATA Configuration

- SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to configure the SATA controller.

➔ **Enabled**	**DEFAULT**	Enable SATA controller.
➔ **Disabled**		Disable SATA controller.

- SATA Mode Selection [IDE]

Use the **SATA Mode Selection** option to configure SATA devices.

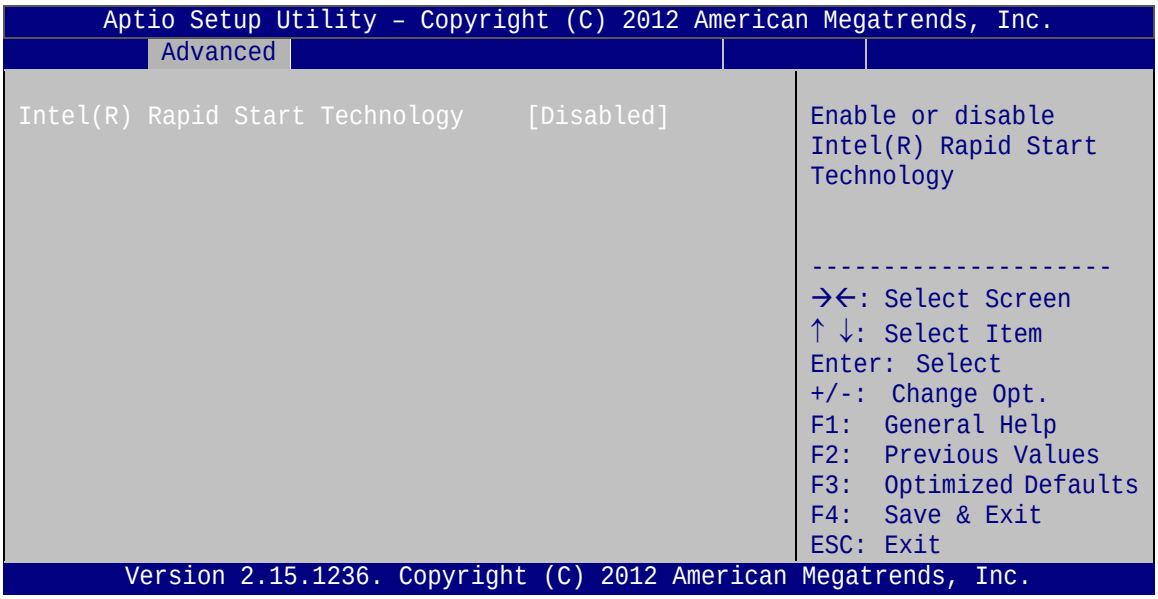
➔ **IDE**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔ **AHCI**		Configures SATA devices as AHCI device.
➔ **RAID**		Configures SATA devices as RAID device.

NOTE:

Before accessing the RAID configuration utility, ensure to set the Option ROM Messages BIOS option in the Boot menu to Force BIOS. This is to allow the “Press <CTRL+I> to enter Configuration Utility……” message to appear during POST. Press Ctrl+I when prompted to enter the RAID configuration utility.

4.3.6 Intel(R) Rapid Start Technology

Use the **Intel(R) Rapid Start Technology** (**BIOS Menu 8**) menu to configure Intel® Rapid Start Technology support.



BIOS Menu 8: Intel(R) Rapid Start Technology

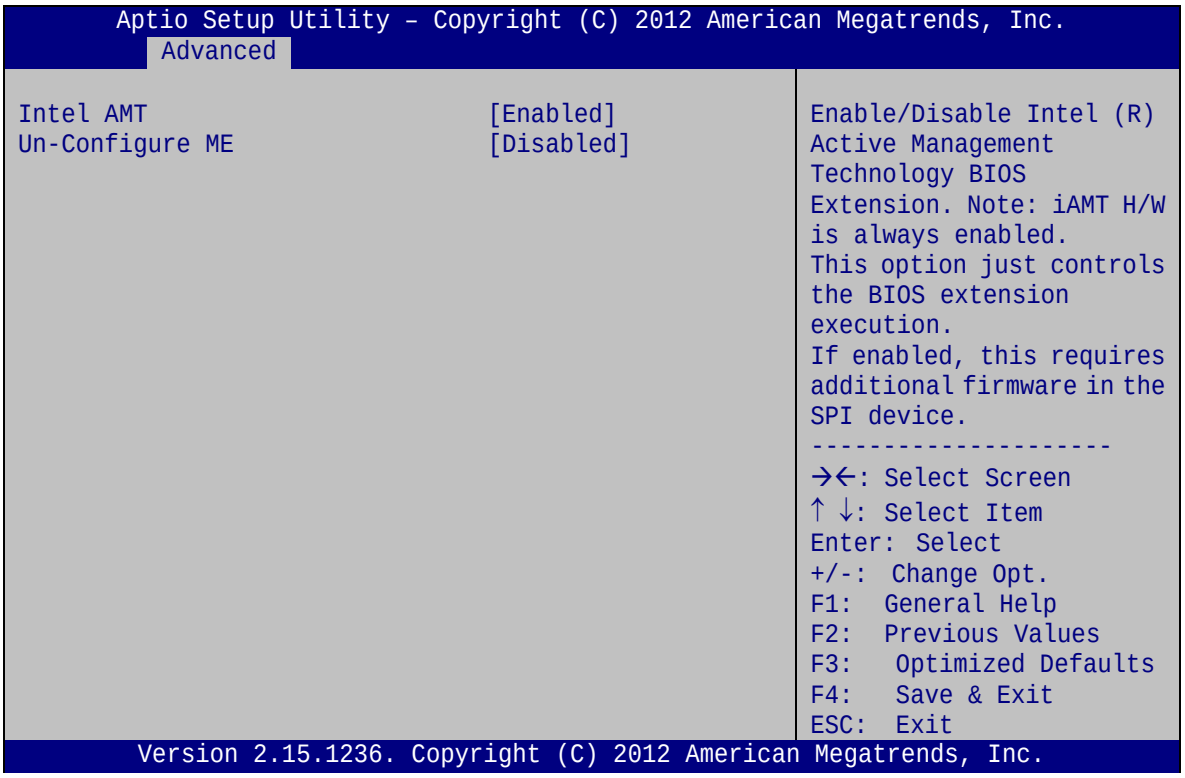
- Intel(R) Rapid Start Technology [Disabled]

Use **Intel(R) Rapid Start Technology** option to enable or disable the Intel® Rapid Start Technology function.

➔	**Disabled**	**DEFAULT**	Intel® Rapid Start Technology is disabled
➔	**Enabled**		Intel® Rapid Start Technology is enabled

4.3.7 AMT Configuration

The **AMT Configuration** menu (**BIOS Menu 9**) allows the advanced power management options to be configured.



BIOS Menu 9: AMT Configuration

- Intel AMT [Enabled]

Use **Intel AMT** option to enable or disable the Intel® AMT function.

➔	**Disabled**		Intel® AMT is disabled
➔	**Enabled**	**DEFAULT**	Intel® AMT is enabled

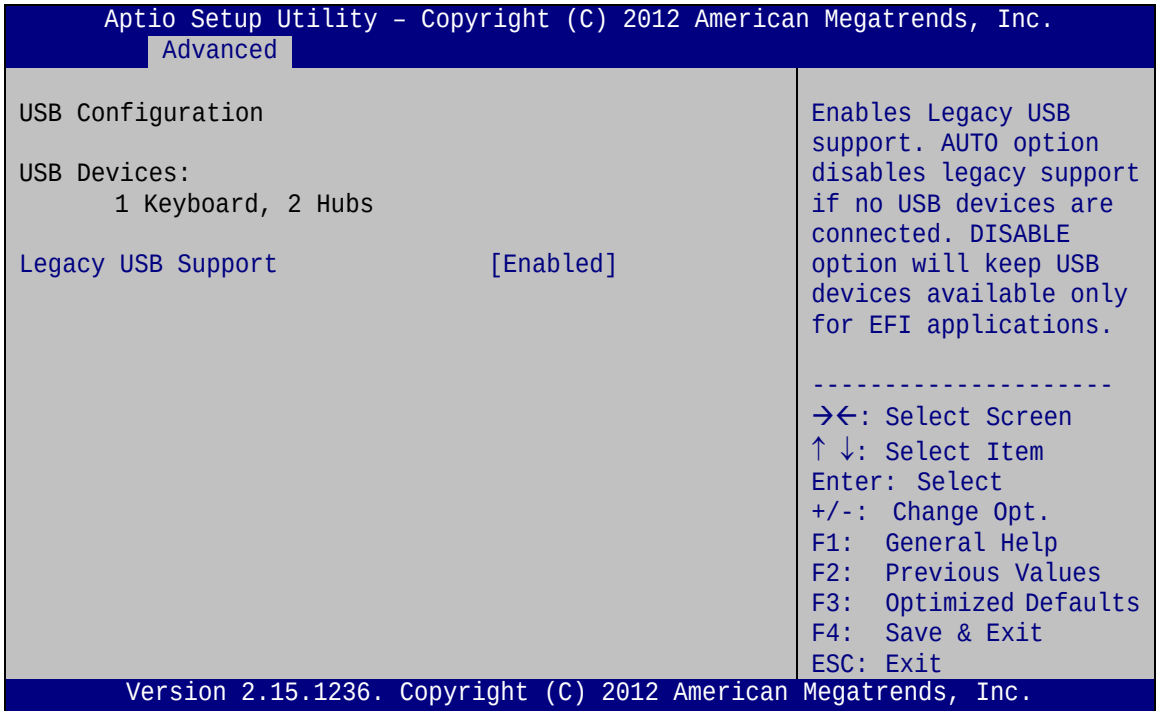
- Un-Configure ME [Disabled]

Use the **Un-Configure ME** option to perform ME unconfigure without password operation.

➔	**Disabled**	**DEFAULT**	Not perform ME unconfigure
➔	**Enabled**		To perform ME unconfigure

4.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 10**) to read USB configuration information and configure the USB settings.



BIOS Menu 10: USB Configuration

- USB Devices

The **USB Devices** field lists the USB devices that are enabled on the system

- Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Disabled**		Legacy USB support disabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

4.3.9 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 11**) displays the CPU temperature and CPU fan speed, and contains the fan configuration submenu.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
        Advanced
PC Health Status                          Smart Fan Mode Select

CPU temperature                : +60 C
CPU_FAN1 Speed                 : N/A
SYS_FAN1 Speed                 : N/A      ---------------------
                                          →←: Select Screen
> Smart Fan Mode Configuration            ↑ ↓: 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.
```

BIOS Menu 11: iWDD H/W Monitor

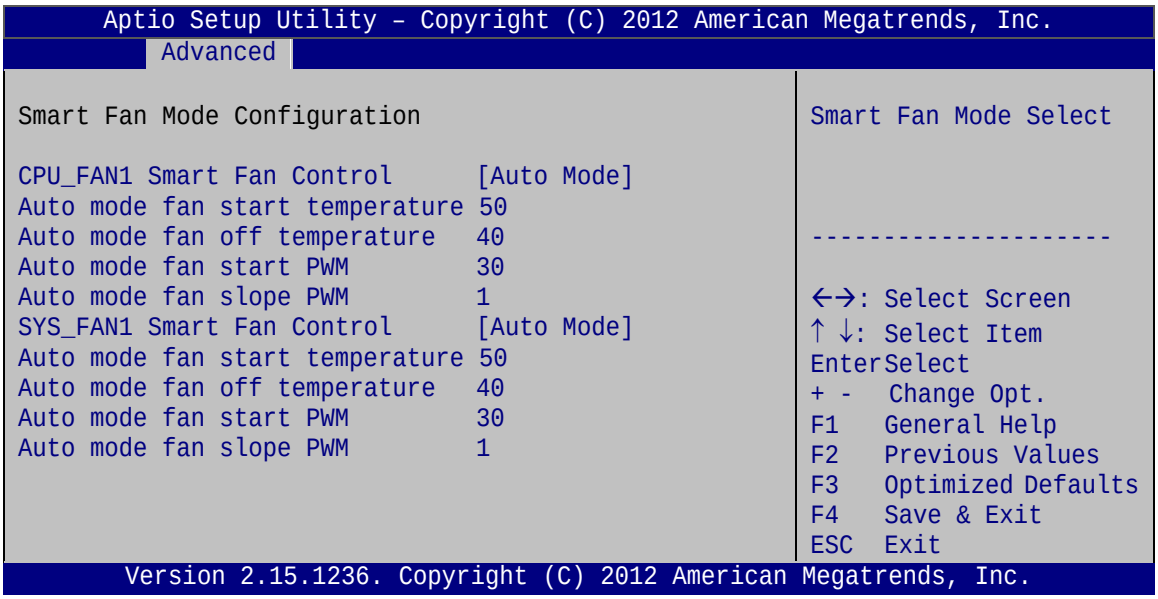
- PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- CPU Temperature
- CPU Fan Speed
- System Fan Speed

4.3.9.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 12**) to configure the smart fan temperature and speed settings.



BIOS Menu 12: Smar Fan Mode Configuration

- CPU_FAN1/SYS_FAN1 Smart Fan Control [Auto Mode]

Use the **CPU_FAN1/SYS_FAN1 Smart Fan Control** option to configure the CPU/System Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto by Duty-Cycle settings

- Auto mode fan start/off temperature

Use the + or – key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

- Auto mode fan start PWM

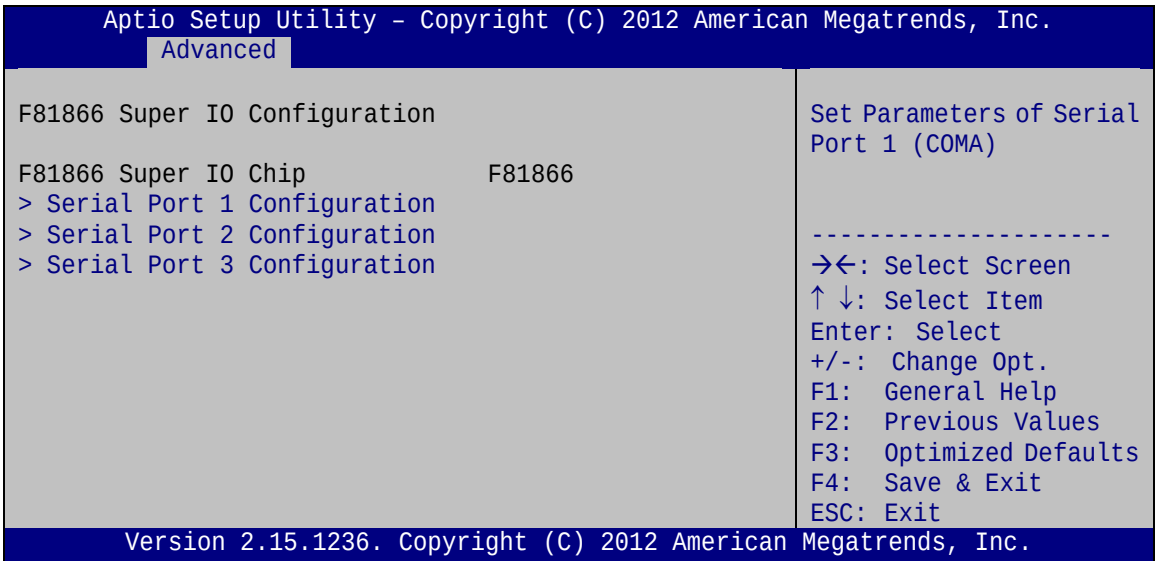
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 128.

- Auto mode fan slope PWM

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 64.

4.3.10 F81866 Super IO Configuration

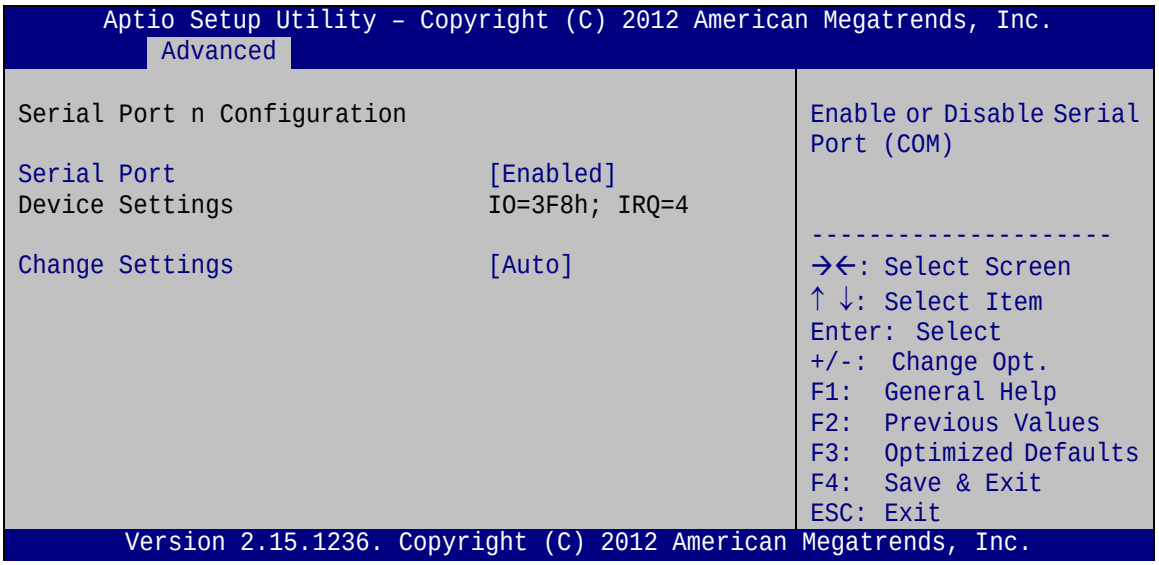
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 13**) to set or change the configurations for the serial ports.



BIOS Menu 13: F81866 Super IO Configuration

4.3.10.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 14**) to configure the serial port n.



BIOS Menu 14: Serial Port n Configuration Menu

4.3.10.1.1 Serial Port 1 Configuration

- Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔	**Disabled**		Disable the serial port
➔	**Enabled**	**DEFAULT**	Enable the serial port

- Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔	**IO=3F8h; IRQ=4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.10.1.2 Serial Port 2 Configuration

- Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

- Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2F8h; IRQ=3**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.10.1.3 Serial Port 3 Configuration

- Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

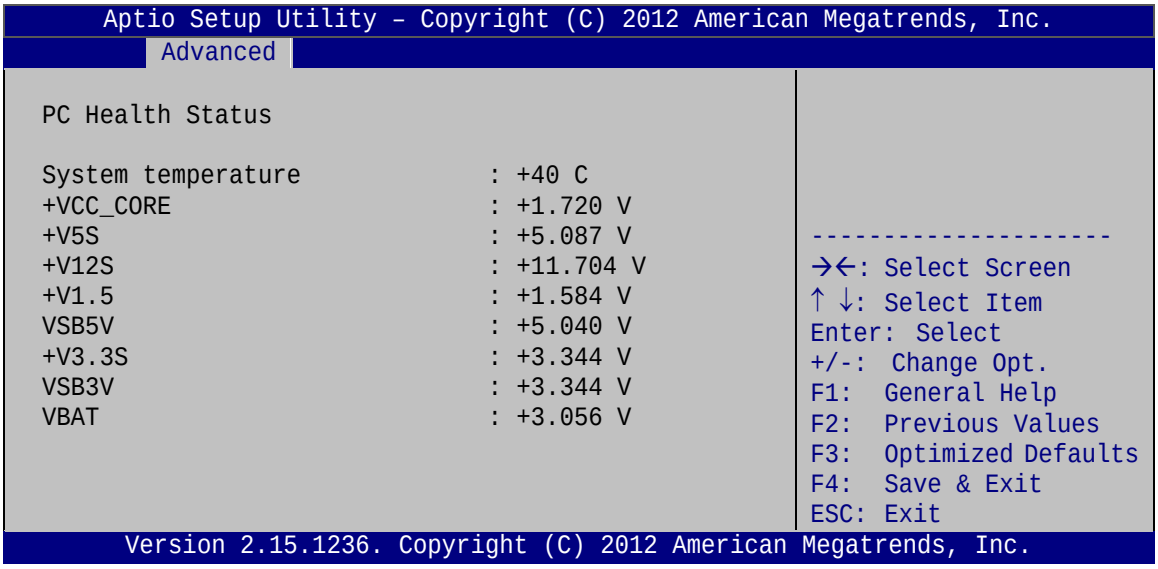
- Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=3E8h; IRQ=10**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

4.3.11 F81866 H/W Monitor

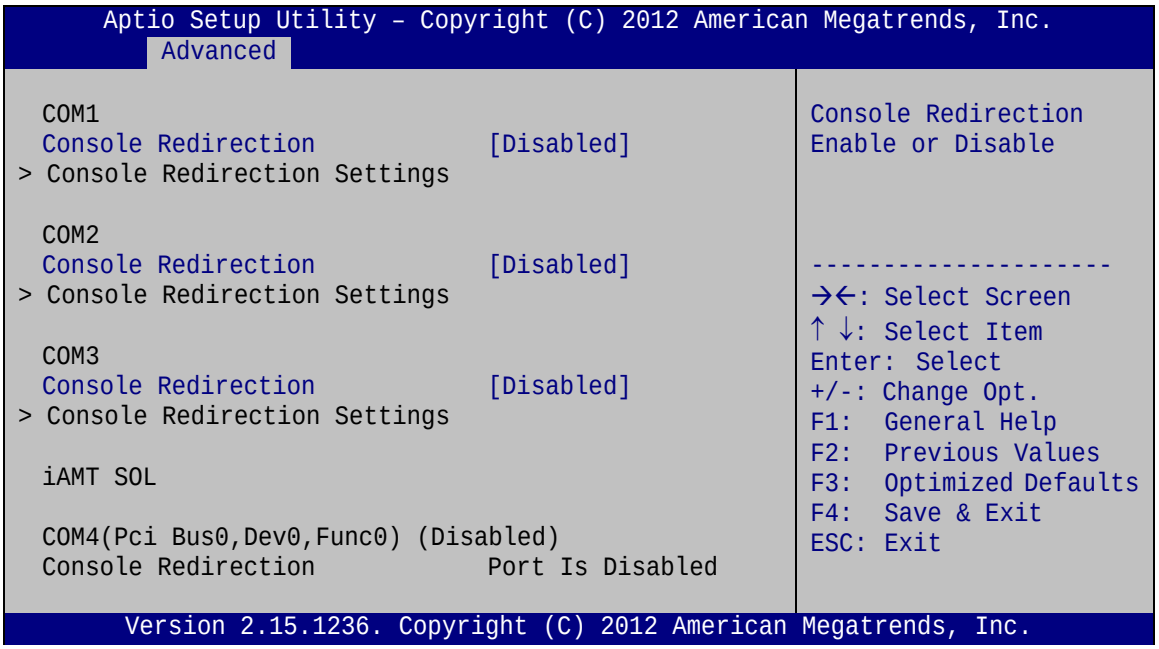
The **F81866 H/W Monitor** menu (**BIOS Menu 15**) displays the system temperature and voltages.



BIOS Menu 15: F81866 H/W Monitor

4.3.12 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 16**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 16: Serial Port Console Redirection

- Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

➔	**Disabled**	**DEFAULT**	Disabled the console redirection function
➔	**Enabled**		Enabled the console redirection function

NOTE:

The following five options appear when the Console Redirection option is enabled.

- Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type.

➔	**VT100**	The target terminal type is VT100

➔	**VT100+**		The target terminal type is VT100+
➔	**VT-UTF8**		The target terminal type is VT-UTF8
➔	**ANSI**	**DEFAULT**	The target terminal type is ANSI

- Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

➔	**9600**		Sets the serial port transmission speed at 9600.
➔	**19200**		Sets the serial port transmission speed at 19200.
➔	**38400**		Sets the serial port transmission speed at 38400.
➔	**57600**		Sets the serial port transmission speed at 57600.
➔	**115200**	**DEFAULT**	Sets the serial port transmission speed at 115200.

- Data Bits [8]

Use the **Data Bits** option to specify the number of data bits.

➔	**7**		Sets the data bits at 7.
➔	**8**	**DEFAULT**	Sets the data bits at 8.

- Parity [None]

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

➔	**None**	**DEFAULT**	No parity bit is sent with the data bits.
➔	**Even**		The parity bit is 0 if the number of ones in the data bits is even.
➔	**Odd**		The parity bit is 0 if the number of ones in the data bits is odd.

➔ **Mark** The parity bit is always 1. This option does not provide error detection.

➔ **Space** The parity bit is always 0. This option does not provide error detection.

- Stop Bits [1]

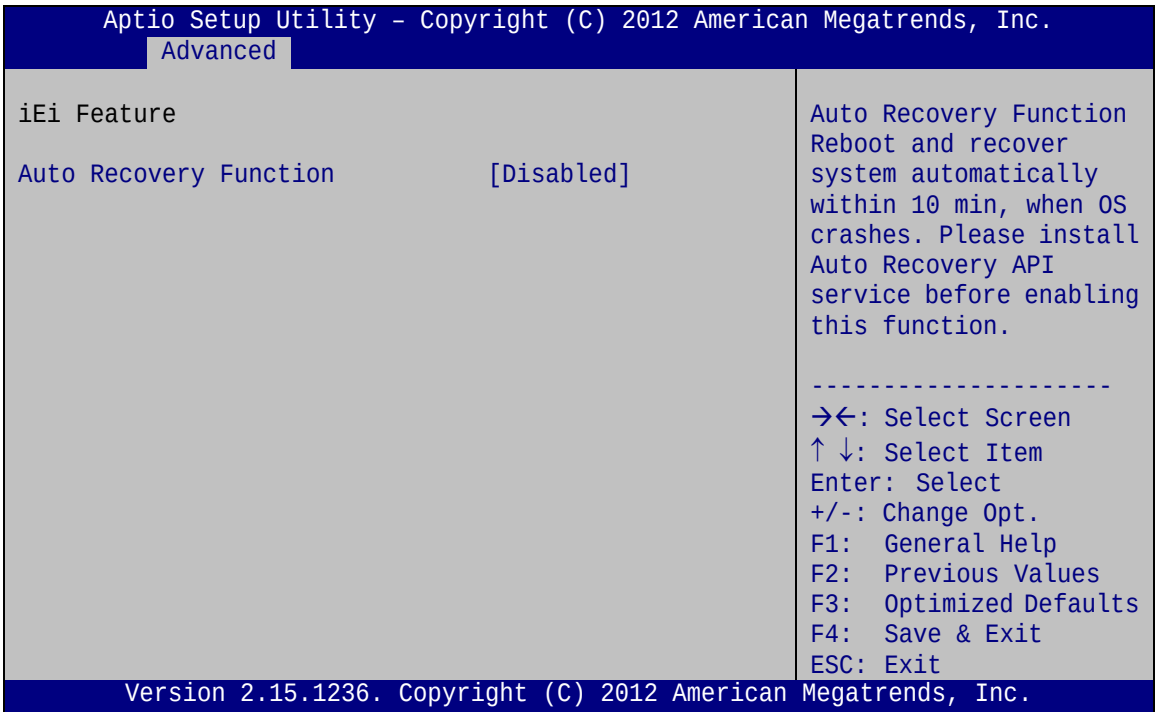
Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

➔ **1** **DEFAULT** Sets the number of stop bits at 1.

➔ **2** Sets the number of stop bits at 2.

4.3.13 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 17**) to configure One Key Recovery function.



BIOS Menu 17: iEi Feature

- Auto Recovery Function [Disabled]

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

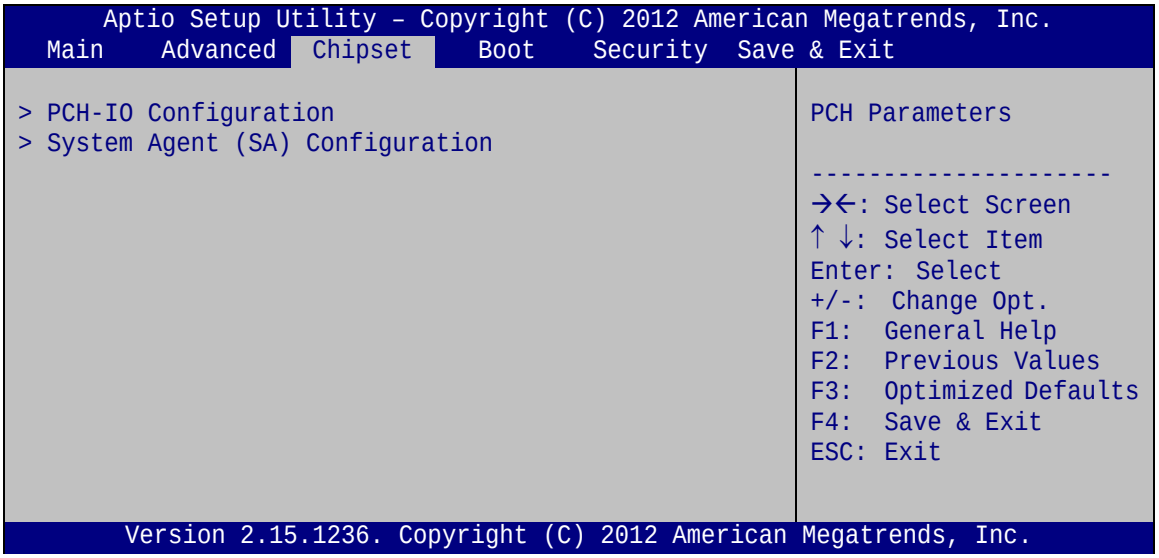
➔	**Disabled**	**DEFAULT**	Auto recovery function disabled
➔	**Enabled**		Auto recovery function enabled

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the PCH IO and System Agent (SA) configuration menus.

WARNING!

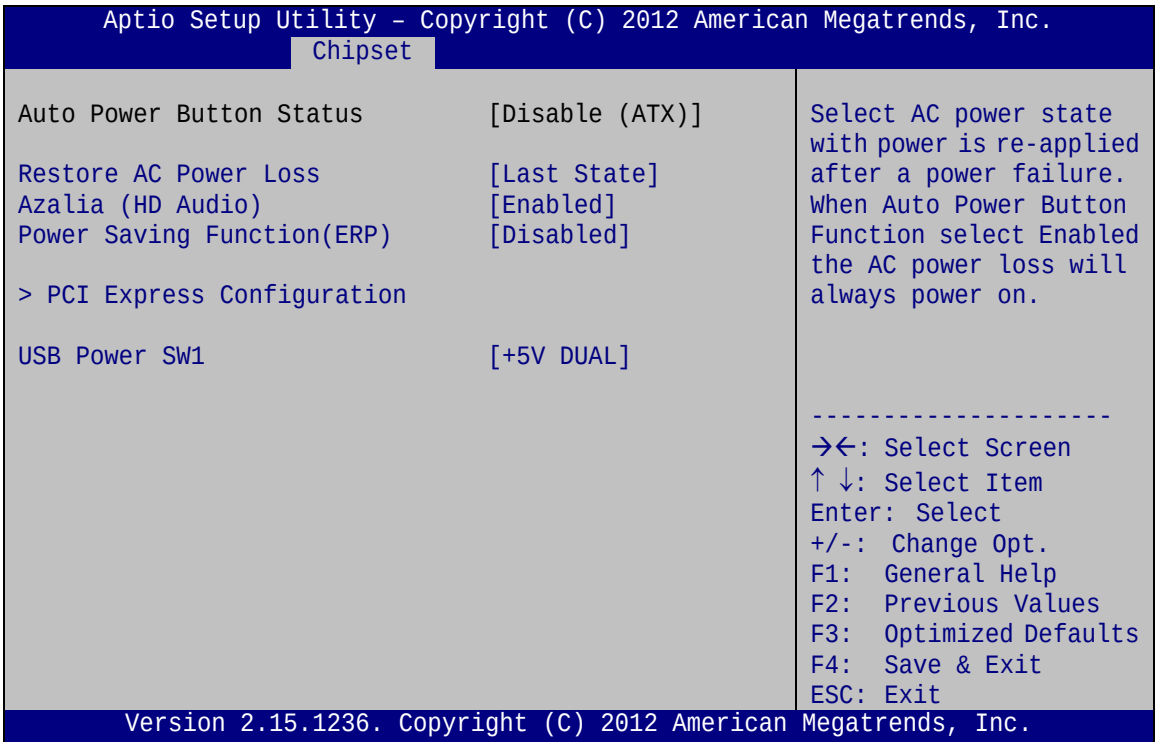
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 18: Chipset

4.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 19**) to configure the PCH parameters.



BIOS Menu 19: PCH-IO Configuration

- Restore AC Power Loss [Last State]

Use the **Restore on AC Power Loss** option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

- Azalia (HD Audio) [Enabled]

Use the **Azalia(HD Audio)** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled

- Power Saving Function [Disabled]

Use the **Power Saving Function** option to enable or disable power saving function.

➔ **Disabled** **DEFAULT** Power saving function is disabled

➔ **Enabled** Enable to reduce power consumption in system off state.

- USB Power SW1 [+5V DUAL]

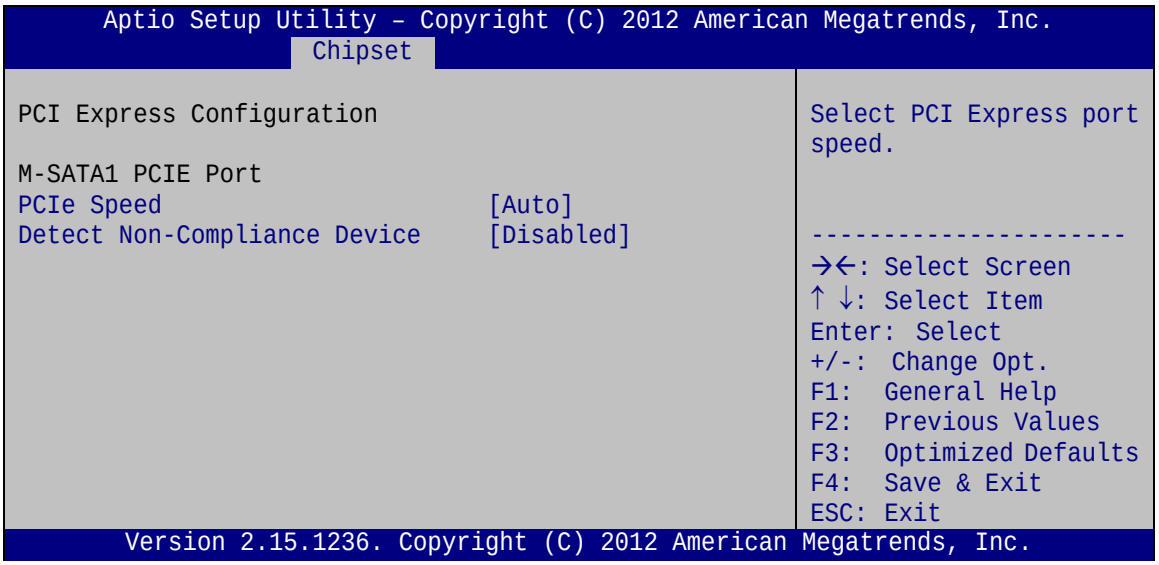
Use the **USB Power SW1** BIOS option to configure the power of USB port by software.

➔ **+5V** Sets to +5V

➔ **+5V DUAL** **DEFAULT** Sets to +5V DUAL

4.4.1.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 20**) to select the support type of the PCI Express or PCIe Mini slots.



BIOS Menu 20: PCI Express Configuration

- PCIe Speed [Auto]

Use PCIe Speed option to select the speed type of the PCI Express or PCIe Mini slots. The following options are available:

- Auto **Default**
- Gen1
- Gen2

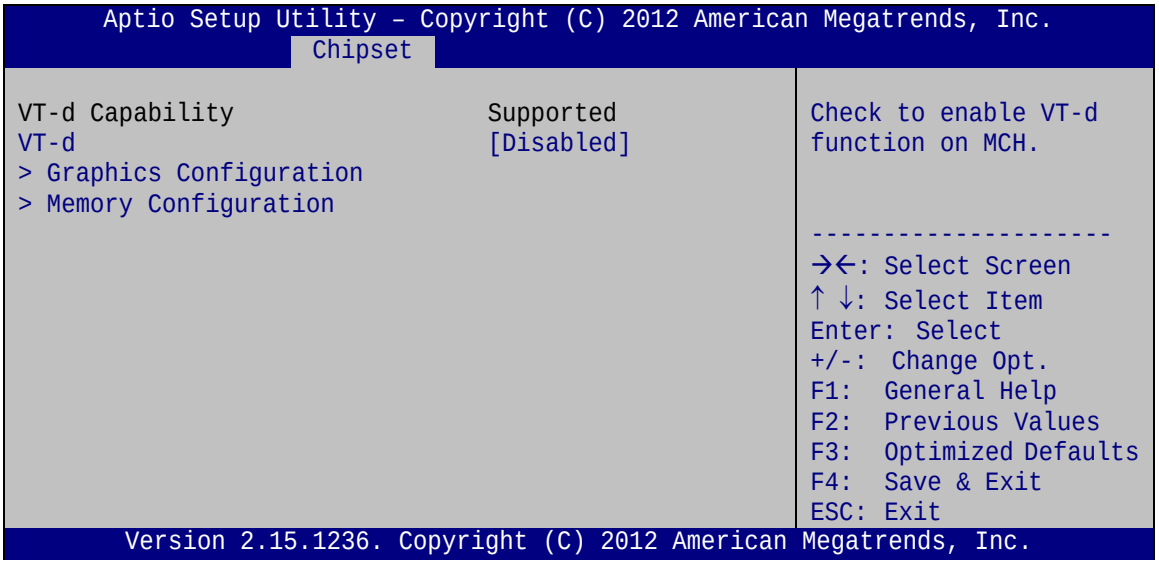
- Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to enable or disable the "detect no-compliance PCIe device" function.

➔ **Disabled**	**DEFAULT**	Detect no-compliance PCIe device function is disabled
➔ **Enabled**		Detect no-compliance PCIe device function is enabled. If will take more time at POST if it is enabled.

4.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 21**) to configure the System Agent (SA) parameters.



BIOS Menu 21: System Agent (SA) Configuration

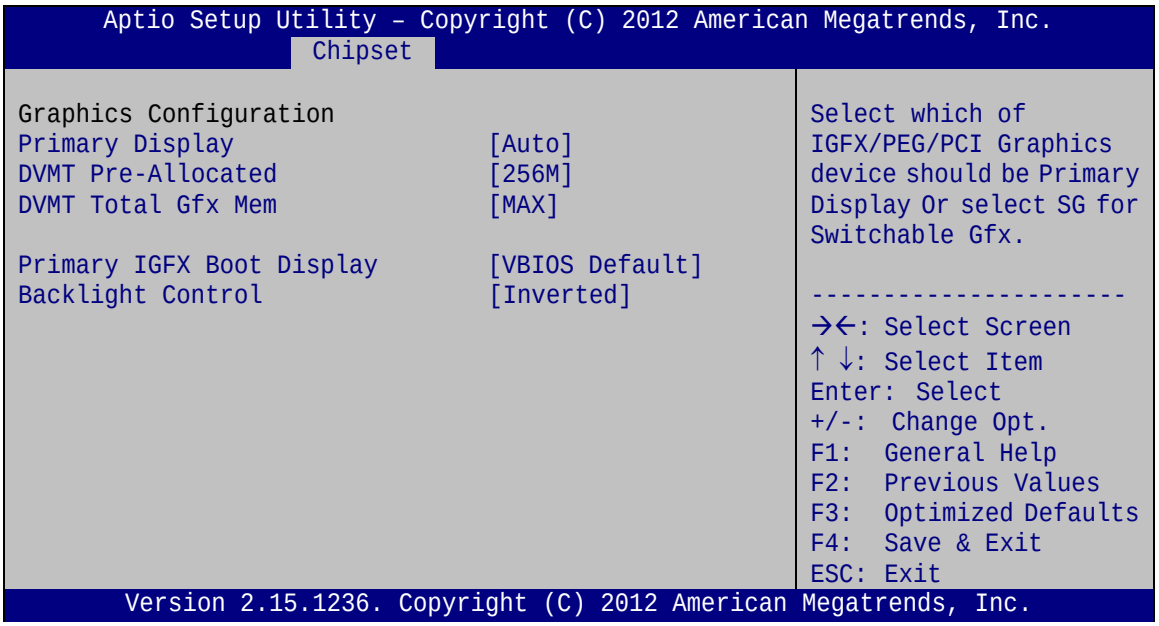
- VT-d [Disabled]

Use the **VT-d** option to enable or disable VT-d support.

➔	**Disabled**	**DEFAULT**	Disables VT-d support.
➔	**Enabled**		Enables VT-d support.

4.4.2.1 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 22**) menu to configure the video device connected to the system.



BIOS Menu 22: Graphics Configuration

- Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto **Default**
- IGFX
- PCIE

- DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 128M
- 256M **Default**
- 512M

- DVMT Total Gfx Mem [MAX]

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

- Primary IGFX Boot Display [VBIOS Default]

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**
- CRT
- LVDS
- HDMI 1
- HDMI 2

- Backlight Control [CCFL]

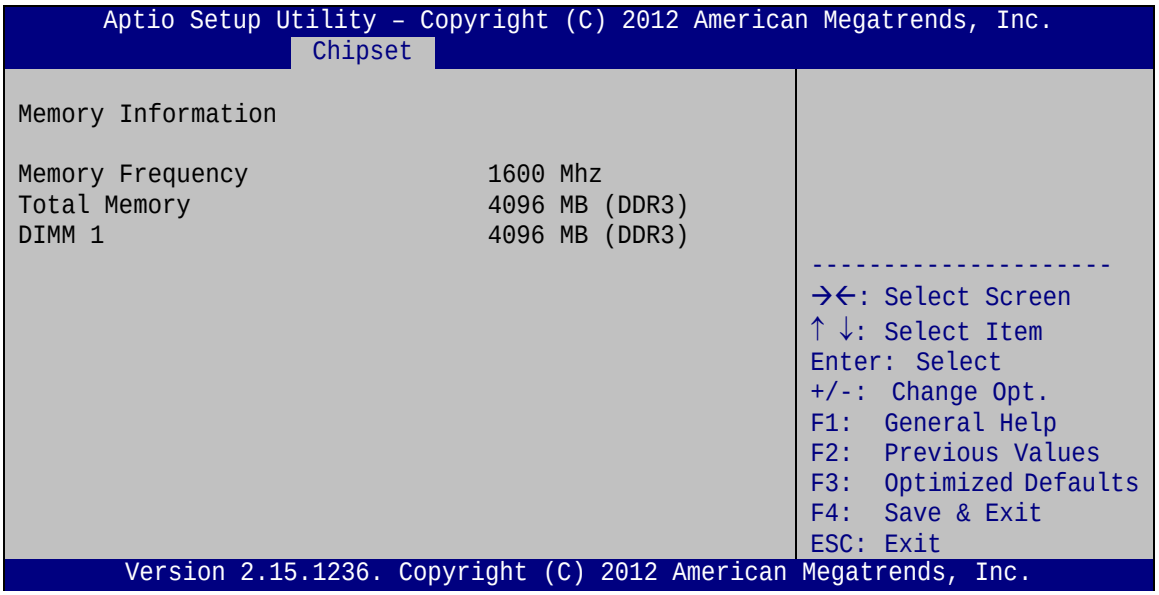
Use the **Backlight Control** option to select the backlight control mode.

➔ **LED** The LVDS backlight is LED.

➔ **CCFL** **DEFAULT** The LVDS backlight is CCFL.

4.4.2.2 Memory Configuration

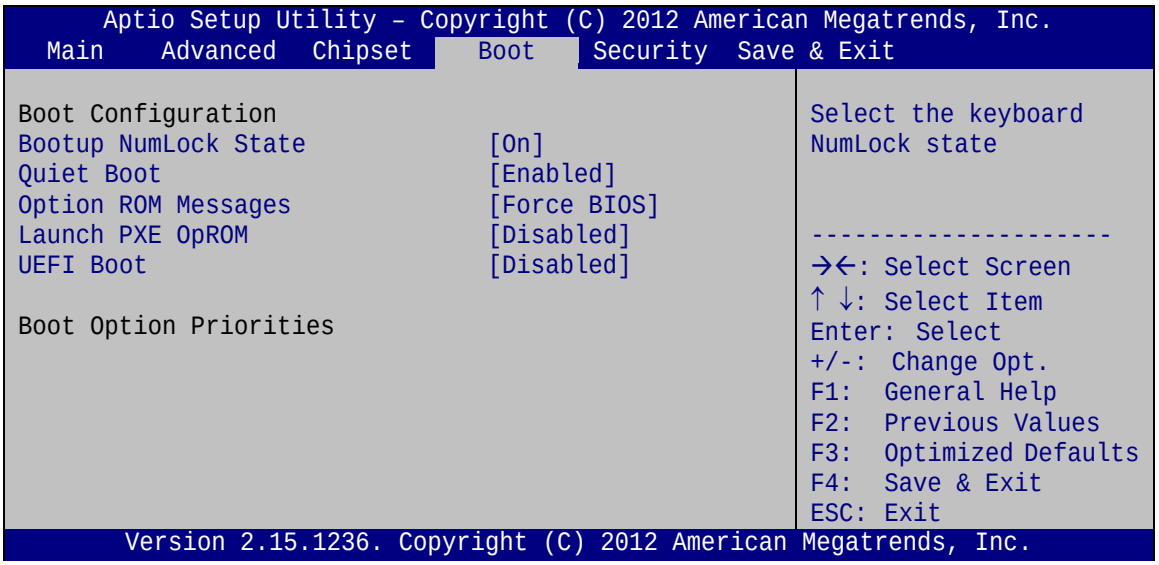
Use the **Memory Configuration** submenu (**BIOS Menu 23**) to view memory information.



BIOS Menu 23: Memory Configuration

4.5 Boot

Use the **Boot menu** (**BIOS Menu 24**) to configure system boot options.



BIOS Menu 24: Boot

- Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

- Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔	**Disabled**		Normal POST messages displayed
➔	**Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

- Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔	**Force BIOS**	**DEFAULT**	Sets display mode to force BIOS.
➔	**Keep Current**		Sets display mode to current.

- Launch PXE OpROM [Disabled]

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔	**Disabled**	**DEFAULT**	Ignore all PXE Option ROMs
➔	**Enabled**		Load PXE Option ROMs.

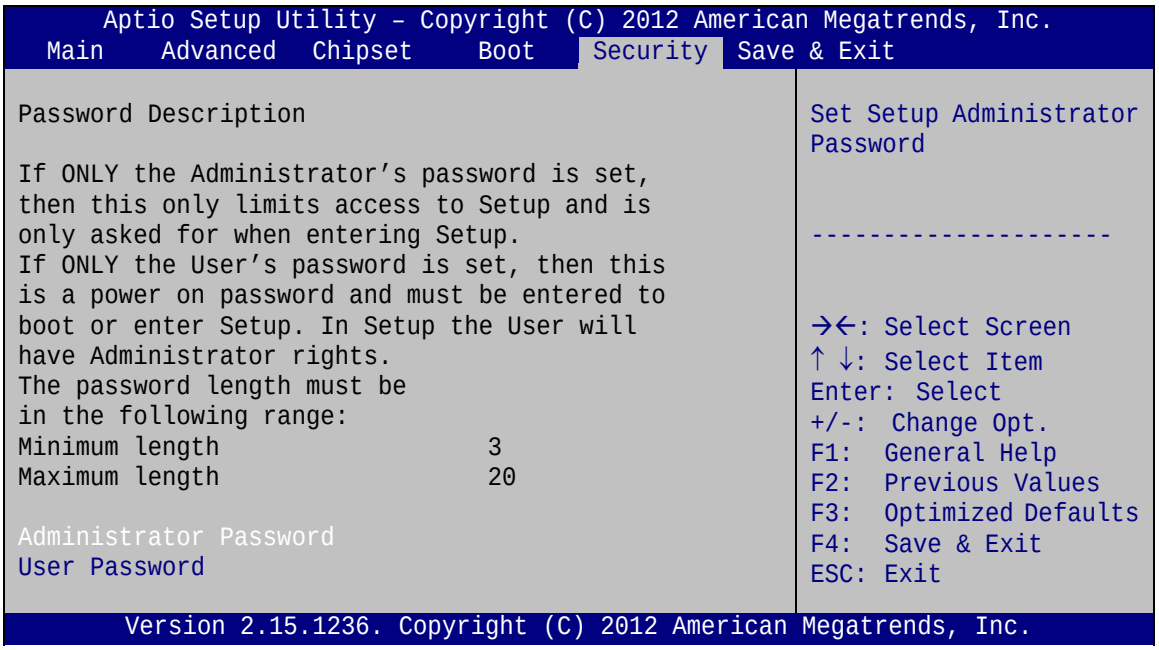
- UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

➔	**Disabled**	**DEFAULT**	Disables to boot from the UEFI devices.
➔	**Enabled**		Enables to boot from the UEFI devices.

4.6 Security

Use the **Security** menu (**BIOS Menu 25**) to set system and user passwords.



BIOS Menu 25: Security

- Administrator Password

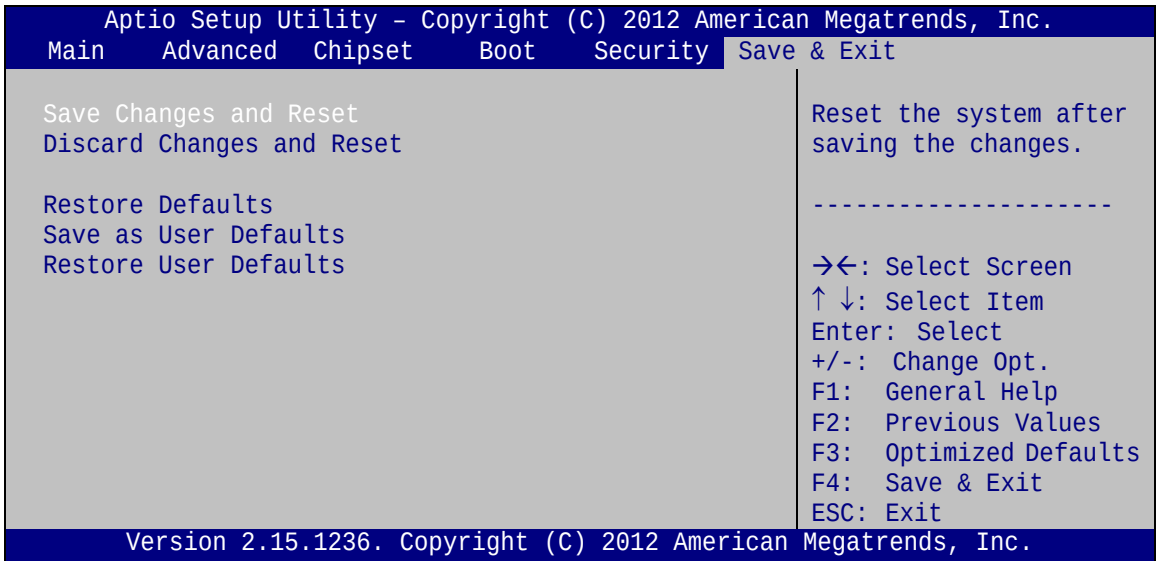
Use the **Administrator Password** to set or change an administrator password.

- User Password

Use the **User Password** to set or change a user password.

4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 26: Save & Exit

- Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

- Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

- Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

- Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

- Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

Safety Precautions

A.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the ECN-380-QM87.

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ECN-380-QM87 may result in permanent damage to the ECN-380-QM87 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECN-380-QM87. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECN-380-QM87 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

A.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:

EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes

monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECN-380-QM87, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECN-380-QM87, please read the details below.

- The interior of the ECN-380-QM87 does not require cleaning. Keep fluids away from the ECN-380-QM87 interior.
- Be cautious of all small removable components when vacuuming the ECN-380-QM87.
- Turn the ECN-380-QM87 off before cleaning the ECN-380-QM87.
- Never drop any objects or liquids through the openings of the ECN-380-QM87.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECN-380-QM87.
- Avoid eating, drinking and smoking within vicinity of the ECN-380-QM87.

A.2.2 Cleaning Tools

Some components in the ECN-380-QM87 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the ECN-380-QM87.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECN-380-QM87.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the ECN-380-QM87.

- ***Using solvents*** – The use of solvents is not recommended when cleaning the ECN-380-QM87 as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the ECN-380-QM87. Dust and dirt can restrict the airflow in the ECN-380-QM87 and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

Hazardous Materials Disclosure

B.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						