



®

AXIOMTEK

tBOX810-838-FL Series

Embedded System

User's Manual



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Safety Precautions

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

1. User should not modify any unmentioned jumper settings without Axiomtek FAE's instruction. Any modifications without instruction might cause system damaged.
2. Operating system follows the configuration you had in tBOX810-838-FL.
3. Be sure to ground yourself to prevent static charge when installing internal components. Using a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
4. Disconnect the power input with tBOX830-838-FL before making any installation. Be sure both the system and the external devices are TURNED OFF. Sudden surge of power could damage sensitive components. Make sure the tBOX810-838-FL is properly grounded.
5. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
6. TURN OFF the system power before cleaning.
7. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -40°C or above 80°C or It may damage the equipment.
8. Do not open the system's bottom 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 protection against electric shock: not classified
2. Degree of protection against the ingress of water: IP40
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

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 swabs 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: We 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

This chapter contains general information and detailed specifications of the tBOX810-838-FL. The Chapter 1 includes the following sections:

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

1.1 General Description

The tBOX810-838-FL is an embedded system that supports onboard Intel® Atom™ E3845 (1.91 GHz) and E3827 processor (1.75 GHz), to provide Windows® 7, Windows® 8, Windows® 10 IoT, Windows® embedded ,Linux and VxWorks7, suitable for the most enduring operation. It features fanless design with full feature I/O, supports onboard 4GB DDR3L memory, and enhanced system dependability by built-in Watchdog Timer.

● Features

- E-Mark, ISO 7637, EN 50155, EN 50121, DNV 2.4 certified and IEC 60945 compliance
- Intel® Bay Trail-I Atom™ E3845 (10W) 4C@1.91GHz or E3827(8W) 2C@1.75GHz processor onboard.
- DDR3 4GB system memory onboard comes with high performance and reliability.
- Fanless with operating temperature range of -40°C ~ +70°C.
- Intelligent power management solution.
- Compact size with rich multiple I/O ports, DIN rail and wall mount supported.
- 2x full size PCI Express mini card slot, 1x SIM card socket for various applications

● Reliable and Stable Design

- The tBOX810-838-FL is designed for fanless and wide operating temperature range system, also we enhance vibration endurance such as: lockable I/O outlets, onboard processor, onboard system memory and follow IEC60068 regulation, make sure filled embedded system reliability and stability, best for mobility control unit, passenger information system, onboard video surveillance and many more applications.

● Embedded O.S. Supported

- The tBOX810-838-FL is not only support Windows® 7/8/10, but also supports embedded OS, such as Windows® 7/8 embedded, WinCE, Linux and VxWorks7. For storage device, the tBOX810-838-FL supports one 2.5" 9.5mm SATA HDD drive bay, and one mSATA.

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Intel® Atom™ E3845 processor (Quad Core, 2M Cache, 1.91 GHz) onboard.
 - Intel® Atom™ E3827 processor (Dual Core, 2M Cache, 1.75 GHz) onboard.
- **BIOS**
 - American Megatrends Inc. BIOS.
 - “Load Optimized Default” to backup customized Setting in the BIOS flash chip to prevent from CMOS battery fail.
- **System Memory**
 - 4GB DDR3L-1333 system memory onboard.
- **Graphics**
 - Integrated in the Intel® HD Graphics for VGA.

1.2.2 System I/O

- **Rear Side**
 - 2x GbE LAN (M12 A-coded, RJ-45 is optional)
 - 1x power input (M12 GbE LAN comes with M12 power input, RJ-45 GbE LAN comes with terminal block power input)
 - 4x antenna opening
- **Front Side**
 - 2x RS-232/422/485
 - 1x 8bit programmable DIO
 - 1x VGA
 - 2x USB 2.0
 - 1x reset button
 - 1x remote power switch

1.2.3 System Specification

- **Watchdog Timer**
 - Reset supported; 255 levels, 1~255 sec and min.
- **Power Supply**
 - 9~36 VDC-in power supply (Typical as +12/24V)
 - Power Rate:9-36Vdc, 1.8A@12/24Vdc
- **Operation Temperature**
 - -40°C - +70°C (- 40°F - +158°F)

- **Storage Temperature**
 - -40°C - +85°C (- 40°F - +176°F)
- **Humidity**
 - 10% - 95% (non-condensation)
- **Vibration Endurance**
 - 3Grms w/ SSD, (5 - 500Hz, X, Y, Z direction; Random)
 - 1Grms w/ HDD, (5 – 500Hz, X, Y, Z direction; Random)
- **Weight**
 - 0.77 kg (1.69 lb) without package
 - 1.26 kg (2.78 lb) with package
- **Dimensions**
 - 163.8mm(W) x 108mm(D) x 44mm(H)



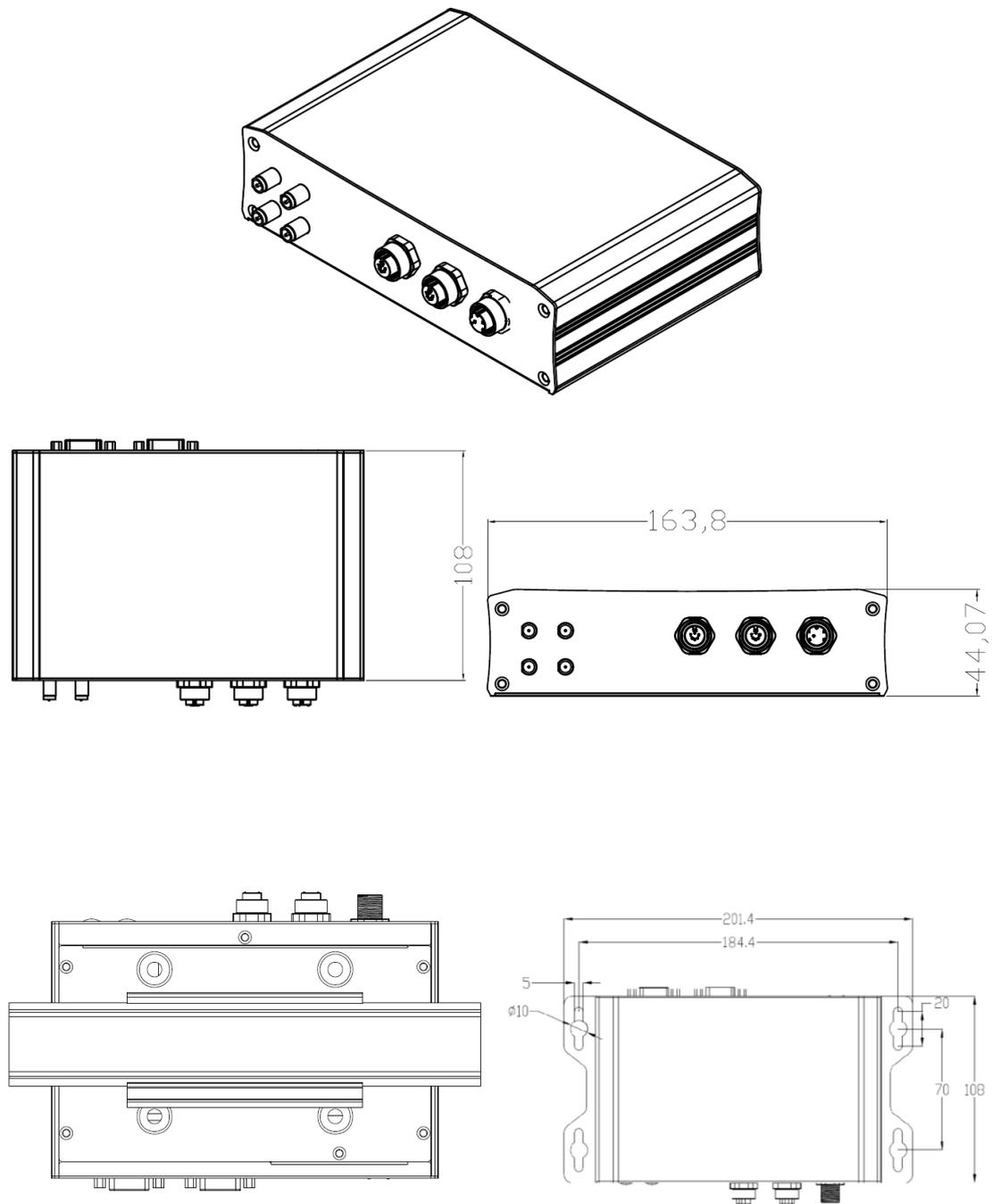
NOTE: All specifications and images are subject to change without notice.

1.2.4 Driver CD Content

- **Chipset Driver**
- **Graphic Drivers**
- **Ethernet Driver**

1.3 Dimensions

The following diagrams show you dimensions and outlines of the tBOX810-838-FL.



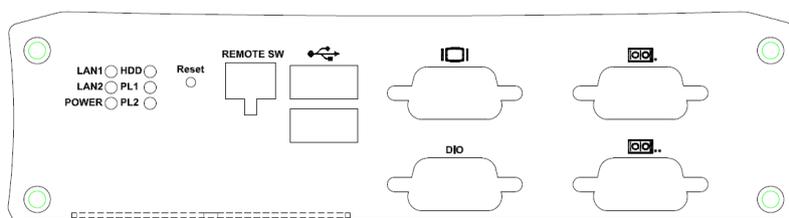
1.4 I/O Outlets

The following figures show you panoramic view of tBOX810-838-FL.

- **Front View**



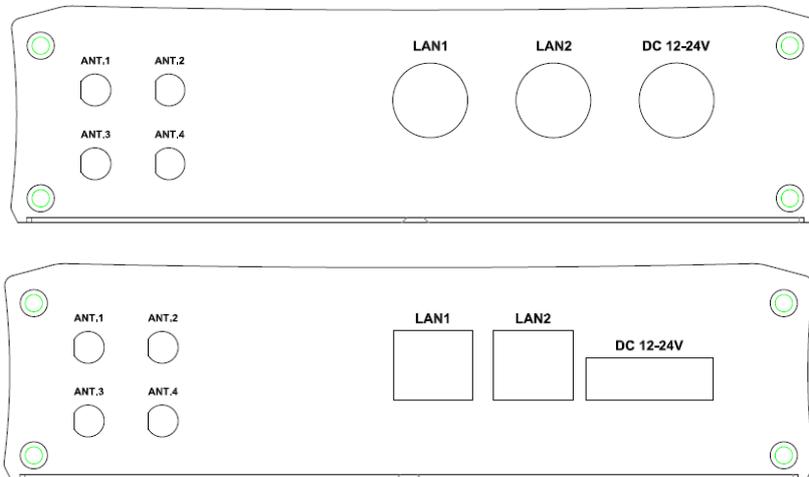
- **Front View drawing**



- **Rear View type #1 & type #2**



- **Rear View drawing type #1 & type #2**



1.5 Packing List

The package bundled with your tBOX810-838-FL should contain the following items:

- **1x tBOX810-838-FL system unit.**
- **1x tBOX810-838-FL quick manual**
- **1x Driver CD**
- **1x Screws pack**
- **1x foot pad kit**
- **1x terminal power jack (RJ-45 GbE LAN version only)**
- **1x Wall-mount bracket kit**
- **1x DIN-rail kit**
- **HDD/SSD (optional)**
- **M12 LAN cable (optional)**
- **M12 power cable (optional)**
- **M12 power adapter (optional)**
- **Remote switch cable (optional)**
- **PCI Express mini card module (optional)**

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

CHAPTER 2 HARDWARE INSTALLATION

The tBOX810-838-FL is convenient for your various hardware configurations, such as HDD and PCI Express mini card. The chapter 2 will show you how to install the components.

2.1 HDD/SSD Installation

Step 1 Turn off the system, and unplug the power cord. Loosen the screws as shown.



Step 2 Remove 4x rubber pad as shown.



Step 3 Fasten 4x screw and rubber pad with HDD/SSD as shown.
Note the direction of SATA connector



Step 4 Connect SATA and power cable with HDD/SSD as shown.



Step 5 Fasten bottom cover as shown.



2.2 PCI Express mini card and SIM card Installation

Step 1 Turn off the system, and unplug the power cord. Loosen the screws as shown.



Step 2 Install the module card and fasten screw as shown.



Step 3 Fasten 6x screw on bottom cover as shown.



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CHAPTER 3 CONNECTOR

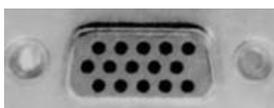
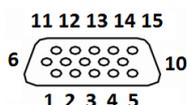
3.1 Connectors

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

3.1.1 VGA Connector

DB15 connector is commonly used for the CRT monitor.

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



3.1.2 Remote switch Connector

Remote switch is ideal for a remote button which can act as an ATX power on/off button.

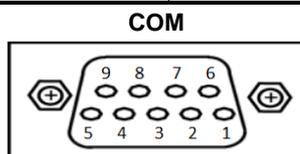
Pin	Signal	Description
1	NC	
2	Switch Signal	Low Active. Act as PC's ATX switch when external switch installed (Pin 3 Active) **Internal pull up resistor did not connect to any power source
3	Ext. SW Sensor	Low Active. To detect external power switch install or not. ** Internal pull up resistor did not connect to any power source
4	GND	



3.1.3 Serial Port Connector

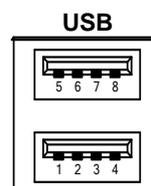
The pin definitions of RS-232/422/485 are listed as following matrix. You may select RS-232/422/485 function in BOS settings.

Pin	RS-232	RS-422	RS-485
1	DCD, Data carrier detect	TX-	Data-
2	RXD, Receive data	TX+	Data+
3	TXD, Transmit data	RX+	NC
4	DTR, Data terminal ready	RX-	NC
5	GND, ground	GND, ground	GND, ground
6	DSR, Data set ready	NC	NC
7	RTS, Request to send	NC	NC
8	CTS, Clear to send	NC	NC
9	RI, Ring indicator	NC	NC



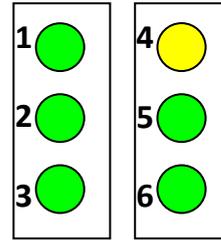
3.1.4 USB2.0 Stack Ports

Pin	Signal USB Port 0	Pin	Signal USB Port 6
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #6_D-
3	USB #0_D+	7	USB #6_D+
4	Ground (GND)	8	Ground (GND)



3.1.5 LED Indicators

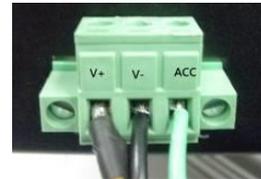
Number	LED Indicator	Function
1	Green	Power on
2	Green	Programable #1
3	Green	Programable #2
4	Yellow	HDD active
5	Green	LAN #1 active
6	Green	LAN #2 active



3.1.6 DC Power Input connector

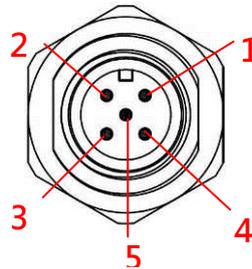
There are three pins of the DC-in connector as below.

Pin	Description	Defination
1	V+	For DC power in V+.
2	V-	For DC power in V-
3	ACC	For ACC (Ignition)



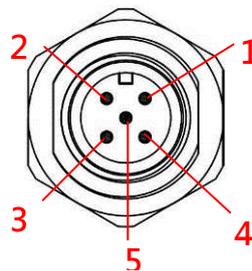
The DC power input connector is M12 A-code Male 5Pin connector.

Pin	Signal
1	VCC
2	VCC
3	System GND
4	System GND
5	Chassis GND



The DC power input connector is M12 A-code Male 5Pin connector for **Vehicle**.

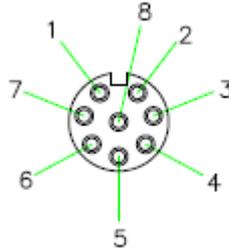
Pin	Signal
1	VCC
2	VCC
3	System GND
4	System GND
5	ACC ignition



3.1.7 LAN Connector (LAN#1, LAN#2)

The M12-8pin LAN connector is A-Code type and able to support 10/100/1000Mbps.

Pin	10/100 Mbps	1000 Mbps
1	--	MDI 2+
2	--	MDI 3+
3	--	MDI 3-
4	TX -	MDI 0-
5	RX +	MDI 1+
6	TX +	MDI 0+
7	--	MDI 2 -
8	RX -	MDI 1 -



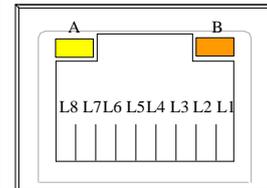
M12-A Code 8Pin/ Female



NOTE: The M12-8pin type LAN connector pin definition may differ with other devices.

The RJ-45 LAN connector is able to support 10/100/1000Mbps.

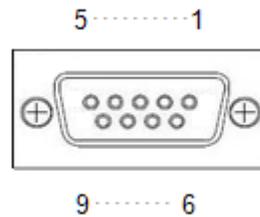
Pin	Description	10/100Base-T	1000Base-T
1	Transmit Data+ or Bidirectional	TX+	BI_DA+
2	Transmit Data- or Bidirectional	TX-	BI_DA-
3	Receive Data+ or Bidirectional	RX+	BI_DB+
4	Not Connected or Bidirectional	N.C.	BI_DC+
5	Not Connected or Bidirectional	N.C.	BI_DC-
6	Receive Data- or Bidirectional	RX-	BI_DB-
7	Not Connected or Bidirectional	N.C.	BI_DD+
8	Not Connected or Bidirectional	N.C.	BI_DD-
A	Activity Link LED(Yellow)	OFF: No Link Blinking: Data activity detected	
B	Speed LED	OFF/Green	Orange



3.1.8 Digital I/O Connector

The tBOX810-838-FL supports a TTL 8bit programmable DIO.

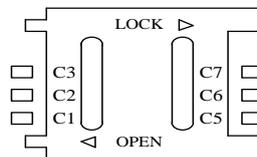
Pin	Signal
1	DIO0
2	DIO1
3	DIO2
4	DIO3
5	DIO4
6	DIO5
7	DIO6
8	DIO7
9	GND



3.1.9 SIM Card Connector

The SIM Card slot is a ISO 7816 standard 6-pin connector for PCI Express Mini Card used.

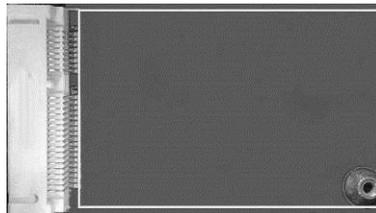
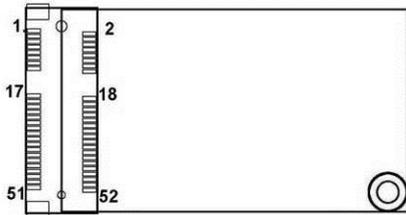
Pin	Signal
C1	SIM_PWR
C2	SIM_RESET
C3	SIM_CLK
C5	GND
C6	SIM_VPP
C7	SIM_DATA



3.1.10 PCI Express mini card Connector

The PCI Express mini card connector is able to support a PCI Express x1 link and a USB 2.0 link.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	+3.3VSB
21	GND	22	PERST#
23	PE_RXN4	24	+3.3VSB
25	PE_RXP4	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN4	32	SMB_DATA
33	PE_TXP4	34	GND
35	GND	36	USB_D3-
37	GND	38	USB_D3+
39	+3.3VSB	40	GND
41	+3.3VSB	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	No use	46	LED_WPAN#
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



A mini PCIe card can be applied to either PCIe or USB 2.0. The USB 2.0 function will be helpful during the transition to PCIe, because peripheral vendors will need time to design their chipsets to have the PCIe function. During the transition, Mini PCIe cards can be quickly implemented by using USB 2.0.

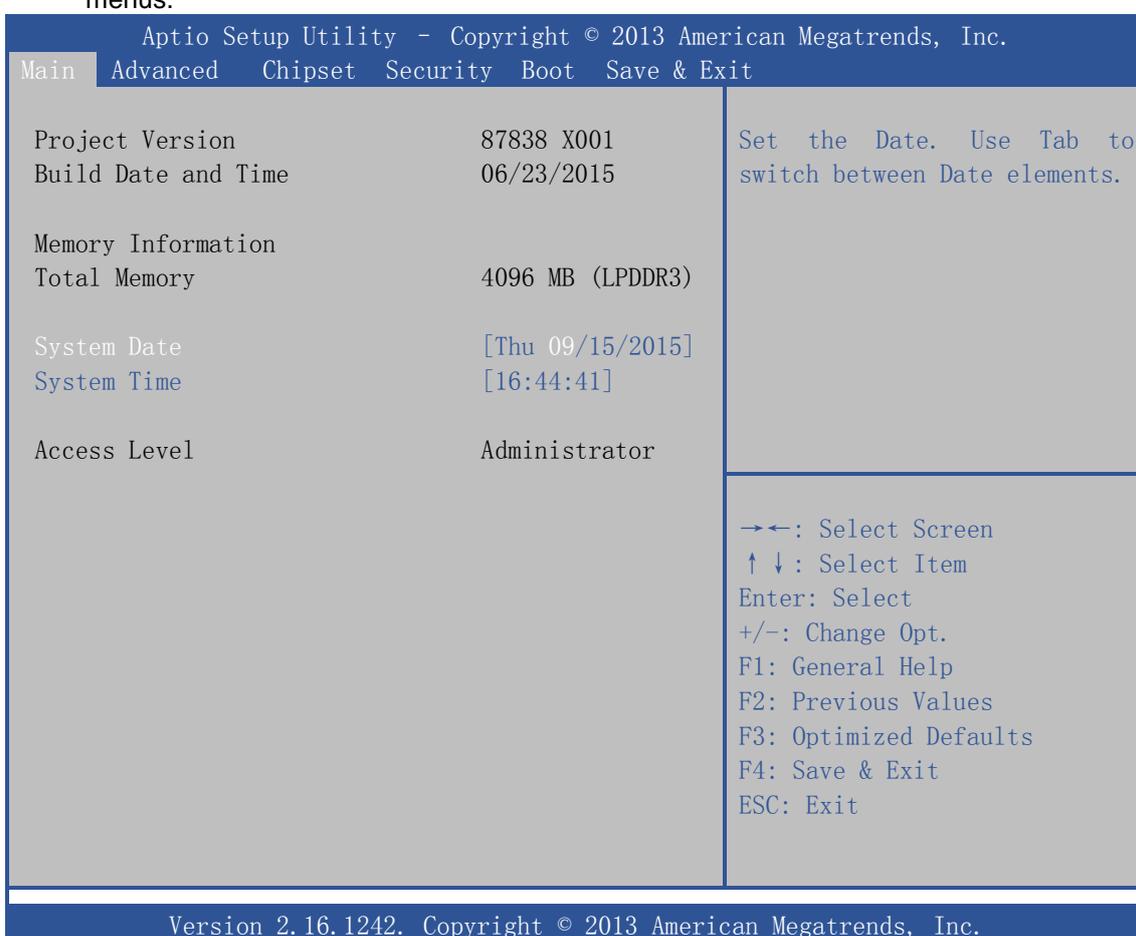
CHAPTER 4 AMI BIOS SETUP UTILITY

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

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After pressing the <Delete> key, the main BIOS setup menu displays. You can access to other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.



4.2 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>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.



NOTE: Some of 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.
F10	The <F10> key allows you to save any changes you have made and exit Setup. Press the <F10> 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.

4.3 Main Menu

Aptio Setup Utility - Copyright © 2013 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
Project Version	87838	X001	Set the Date. Use Tab to switch between Date elements.		
Build Date and Time	06/23/2015				
Memory Information					
Total Memory	4096 MB	(LPDDR3)			
System Date	[Thu 09/15/2015]				
System Time	[16:44:41]				
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 2.16.1242. Copyright © 2013 American Megatrends, Inc.					

➤ System Time/Date

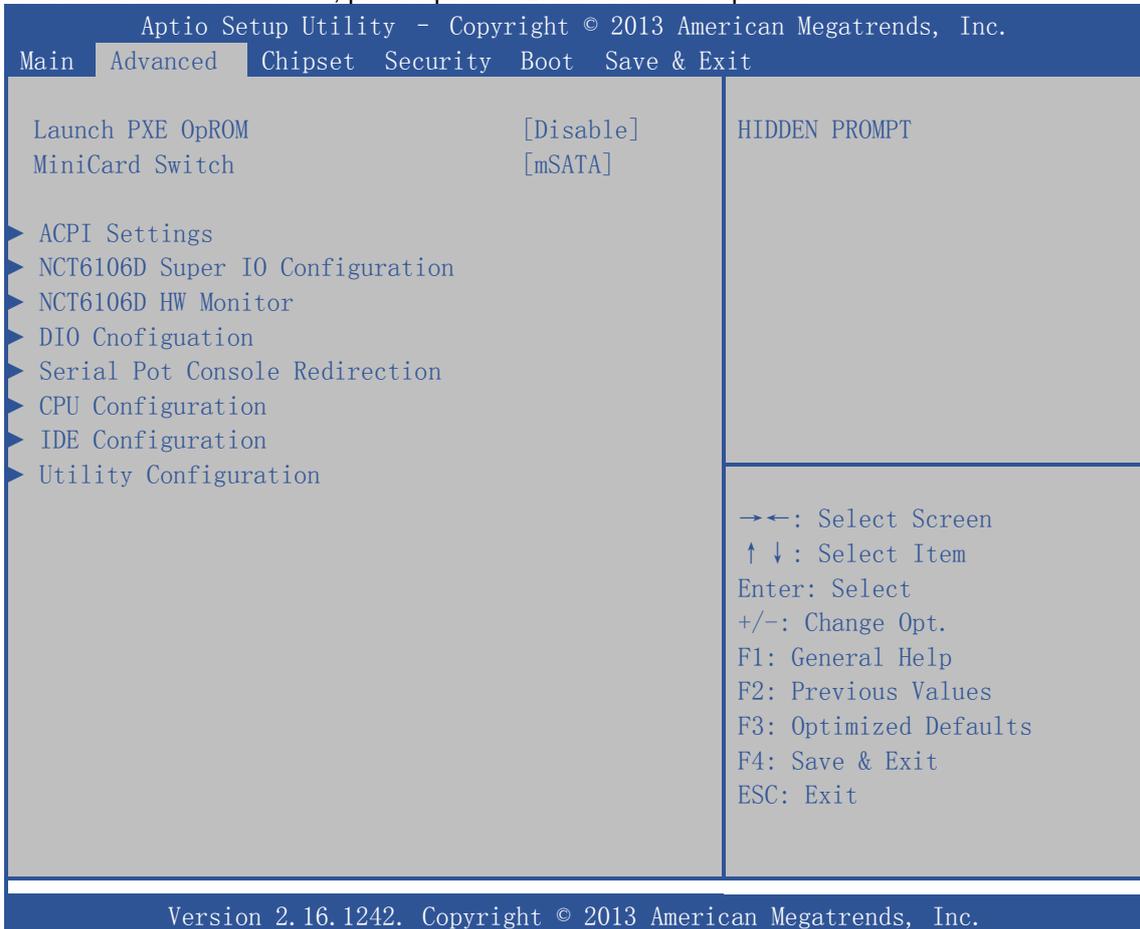
You may change the system time and date by this option. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

4.4 Advanced Menu

The Advanced menu 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
- ▶ NCT6106D Super IO Configuration
- ▶ NCT6106D H/W Monitor
- ▶ DIO Configuration
- ▶ Serial Port Console Redirection
- ▶ CPU Configuration
- ▶ IDE Configuration
- ▶ Utility Configuration

For items marked with “▶”, please press <Enter> for more options.



ACPI Settings

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

➤ ACPI Sleep State

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

Aptio Setup Utility - Copyright © 2013 American Megatrends, Inc.	
Advanced	
ACPI Settings	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
ACPI Sleep State [S3 (Suspend to RAM)]	→←: 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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NCT6106D Super IO Configuration

You may set settings for Super IO configuration by this option, and change the value of the selected option

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Advanced

NCT6106D Super IO Configuration

Super IO Chip NCT6106D

- ▶ Serial Port 1 Configuration
- ▶ Serial Port 2 Configuration

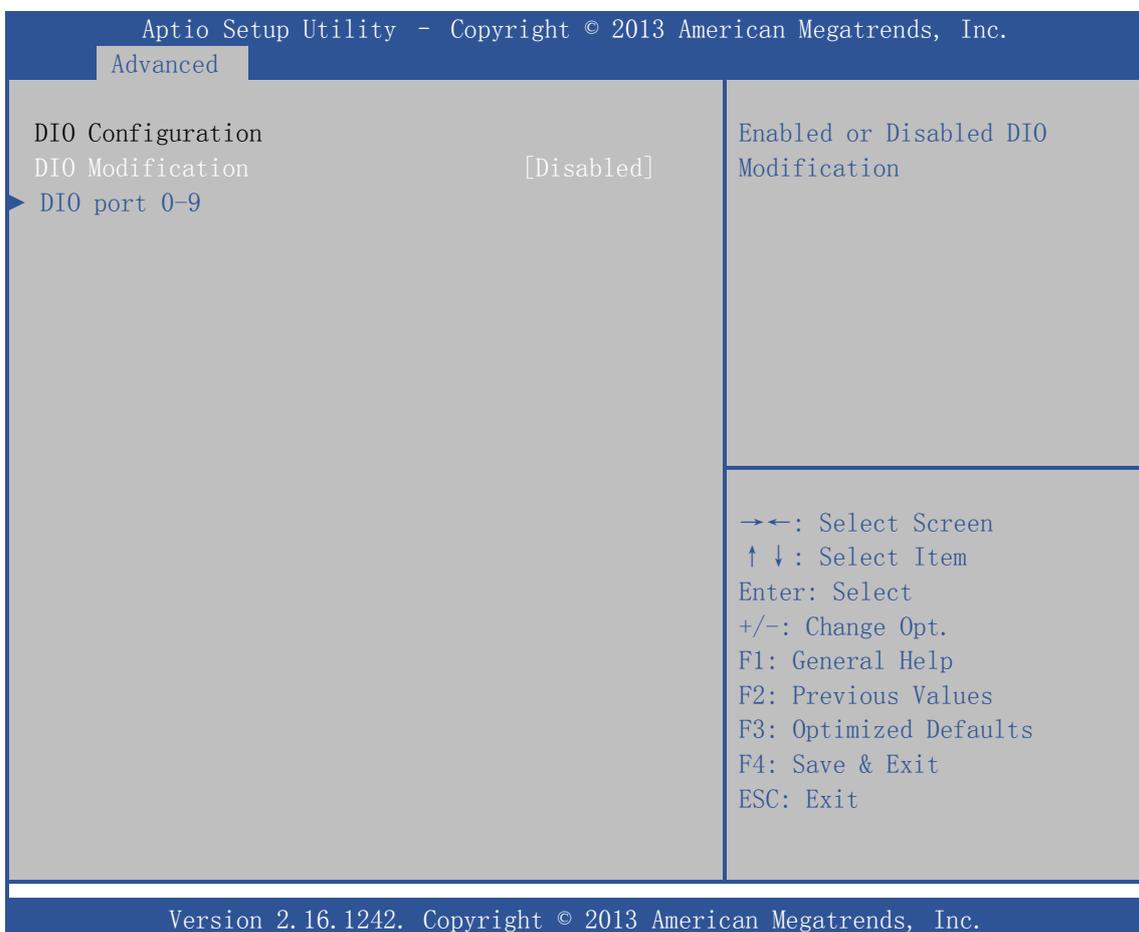
Set Parameters of Serial Port 1 (COMA)

→←: 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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DIO Configuration

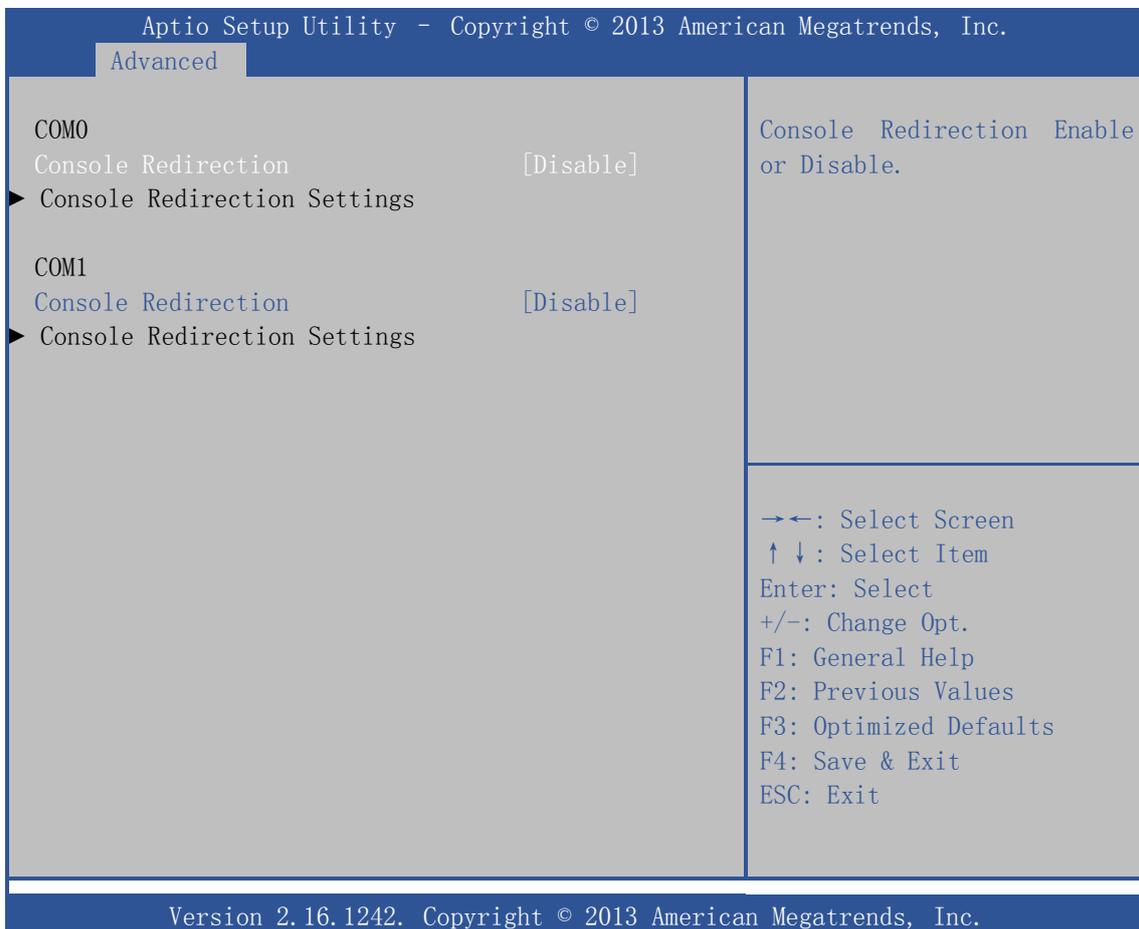
You may set settings for DIO configuration by this option, enable the DIO Modification and get into DIO port 0-9 settings.



Serial Port 0-1 configuration

1. Serial port:

You may enable or disable serial port by this setting.



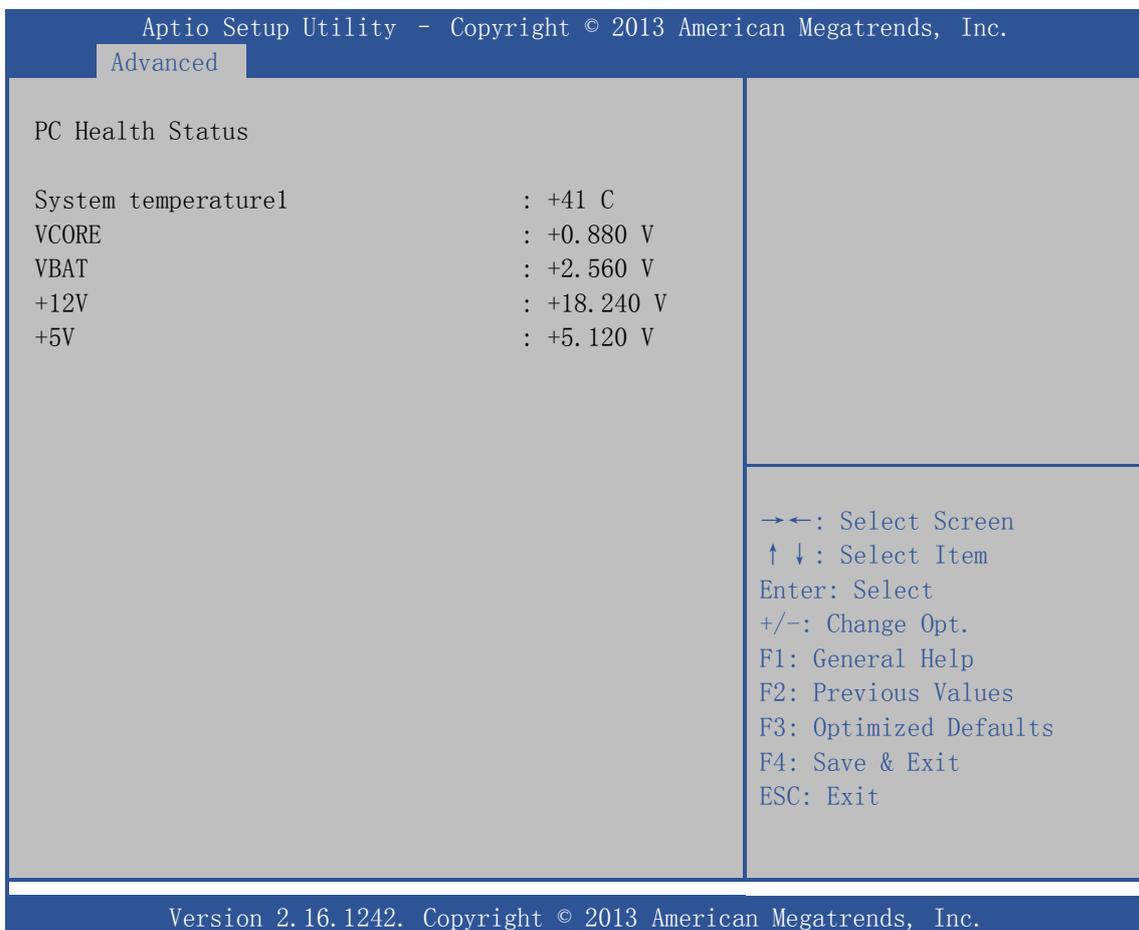
2. Console Redirection Settings:

You may apply different serial port options in this item..

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Advanced		
COM0		Emulation: ANSI: Extended ASCII char set. VT00: ASCII Char set. VT100+: Extends VT100 to support color, Function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Console Redirection Settings		
Terminal Type	[ANSI]	
Bits per second	[115200]	
Data Bits	[8]	
Parity	[None]	
Stop Bits	[1]	
Flow Control	[None]	
VT-UTF8 Combo Key Support	[Enabled]	
Recorder Mode	[Disabled]	
Resolution 100x31	[Disabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Legacy OS Redirection Resolution	[80x24]	
Putty KeyPad	[VT100]	
Redirection After BIOS POST	[Always Enable]	
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NCT6106D H/W Monitor

This screen shows the Hardware Health Configuration.



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Advanced

PC Health Status

System temperature1	:	+41 C
VCORE	:	+0.880 V
VBAT	:	+2.560 V
+12V	:	+18.240 V
+5V	:	+5.120 V

→←: 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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CPU Configuration

This screen shows the CPU Configuration.

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

CPU Configuration

Intel® Atom™ CPU E3827 @1.74GHz	
CPU Signature	30679
Microcode Patch	901
Max CPU Speed	1740 MHz
Min CPU Speed	500 MHz
Processor Cores	2
Intel HT Technology	Not Supported
Intel VT-X Technology	Supported

→←: 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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IDE Configuration

You may select SATA configuration by this setting.

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Advanced

IDE Configuration

SATA Mode [AHCI Mode]

SATA Port0
Not Present

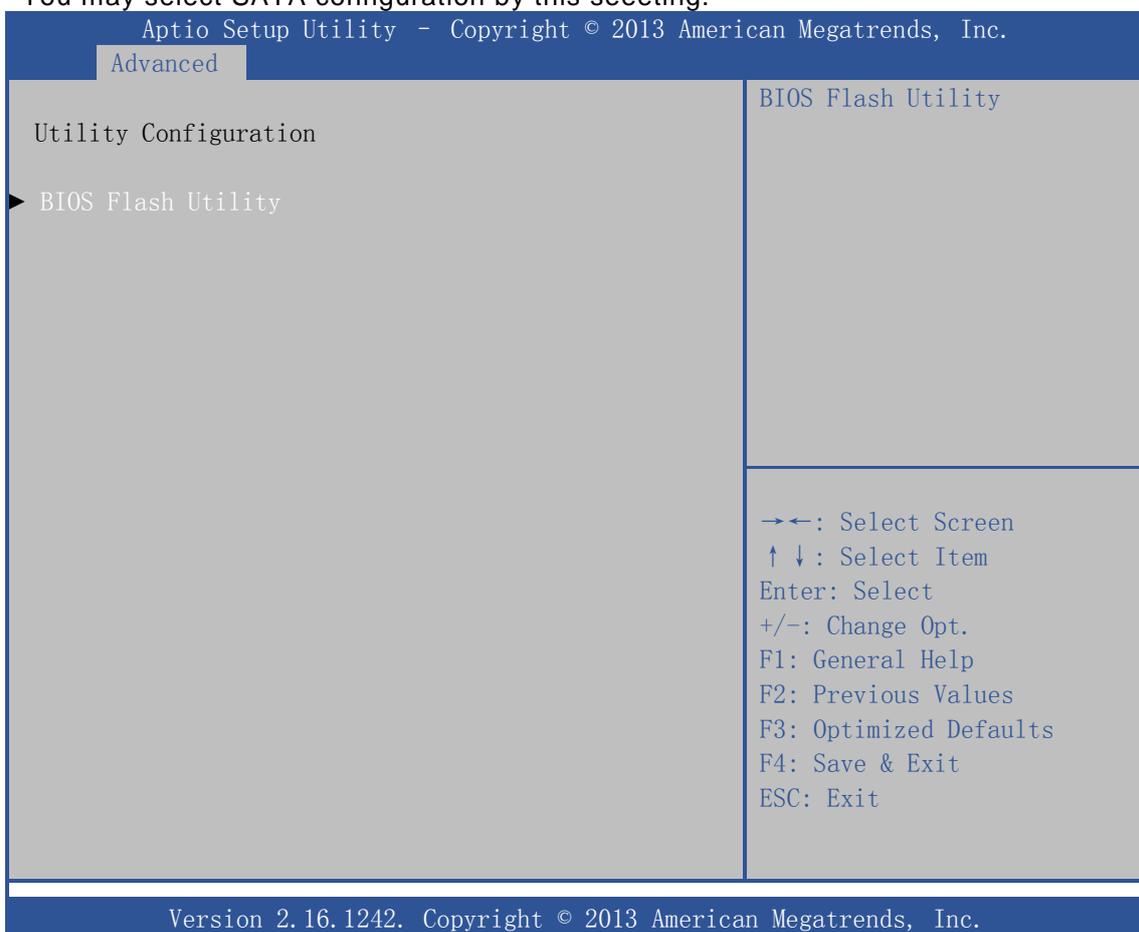
SATA Port1
Not Present

→←: 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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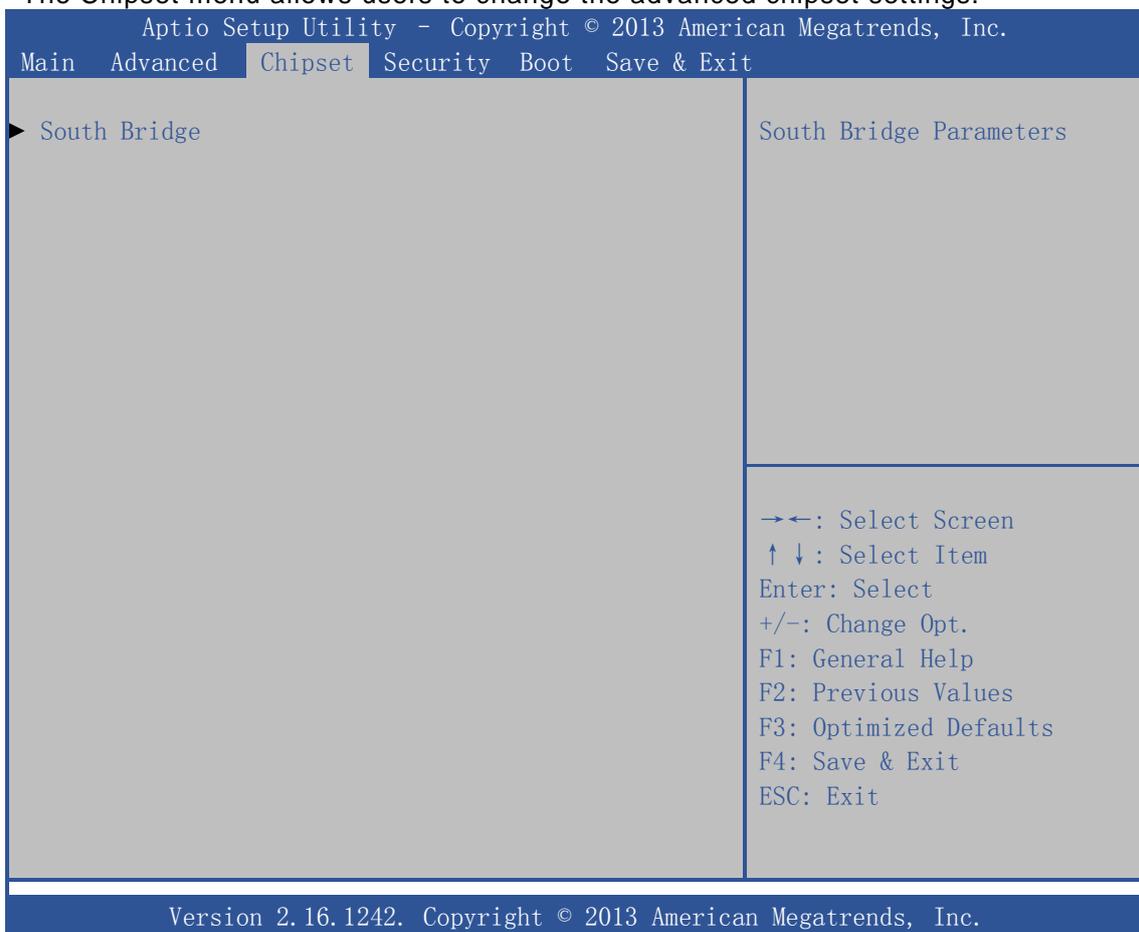
IDE Configuration

You may select SATA configuration by this setting.



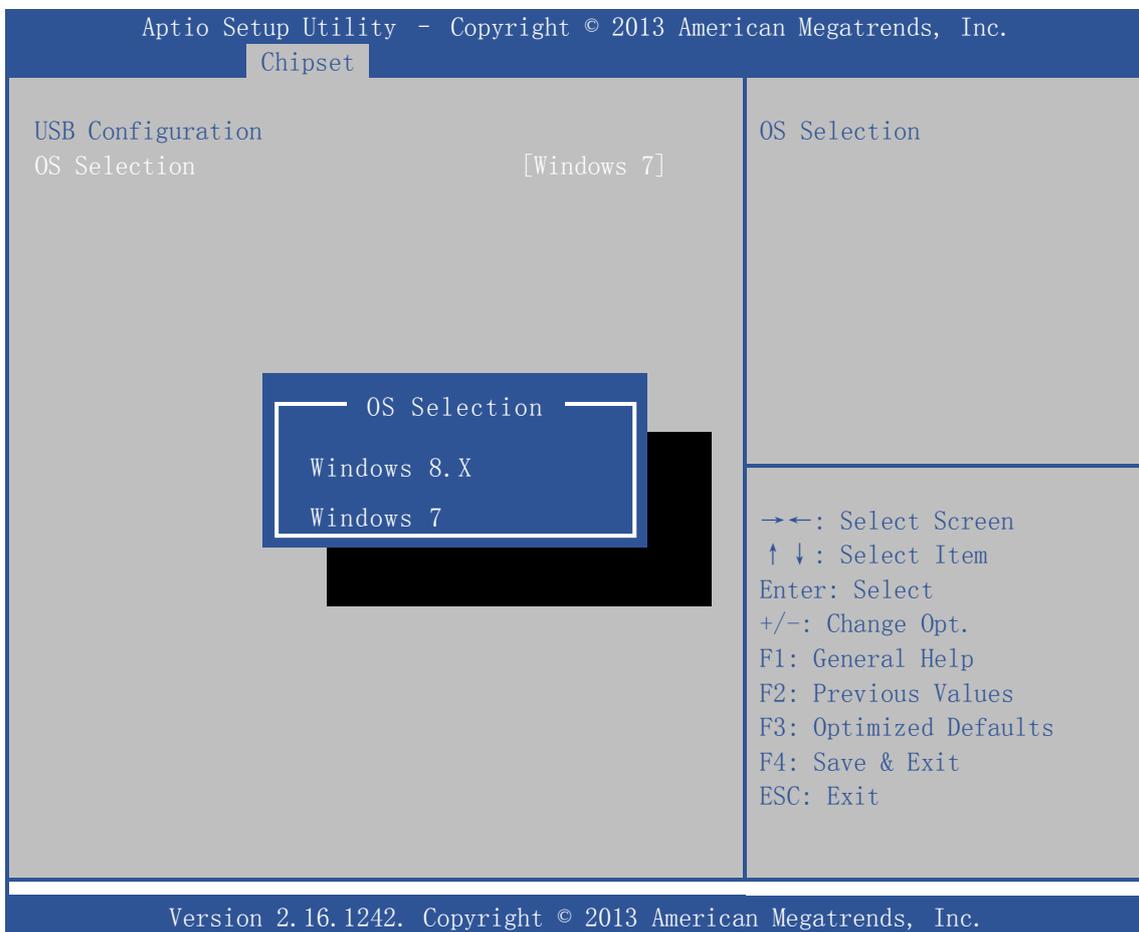
4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings.



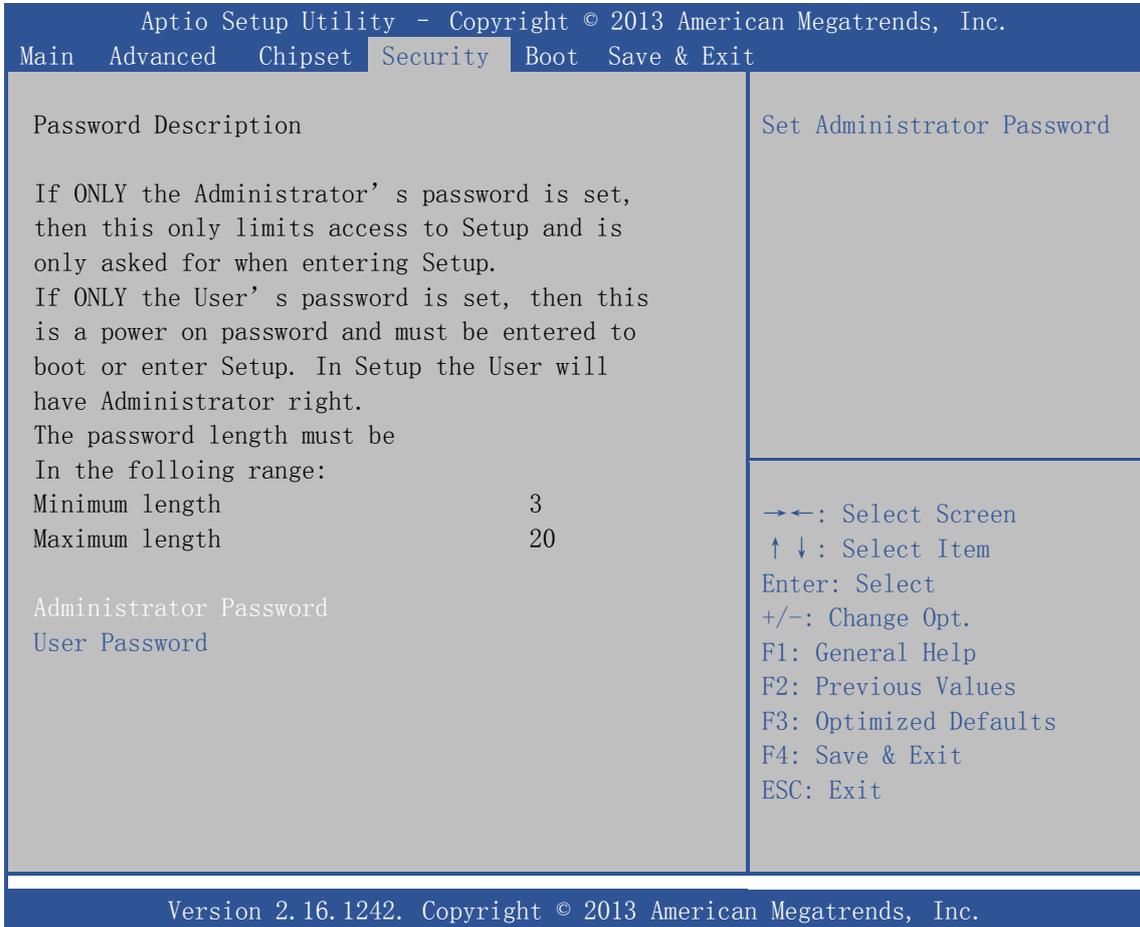
➤ **USB Configuration**

This screen shows O/S configuration support



4.6 Security Menu

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



➤ Administrator Password

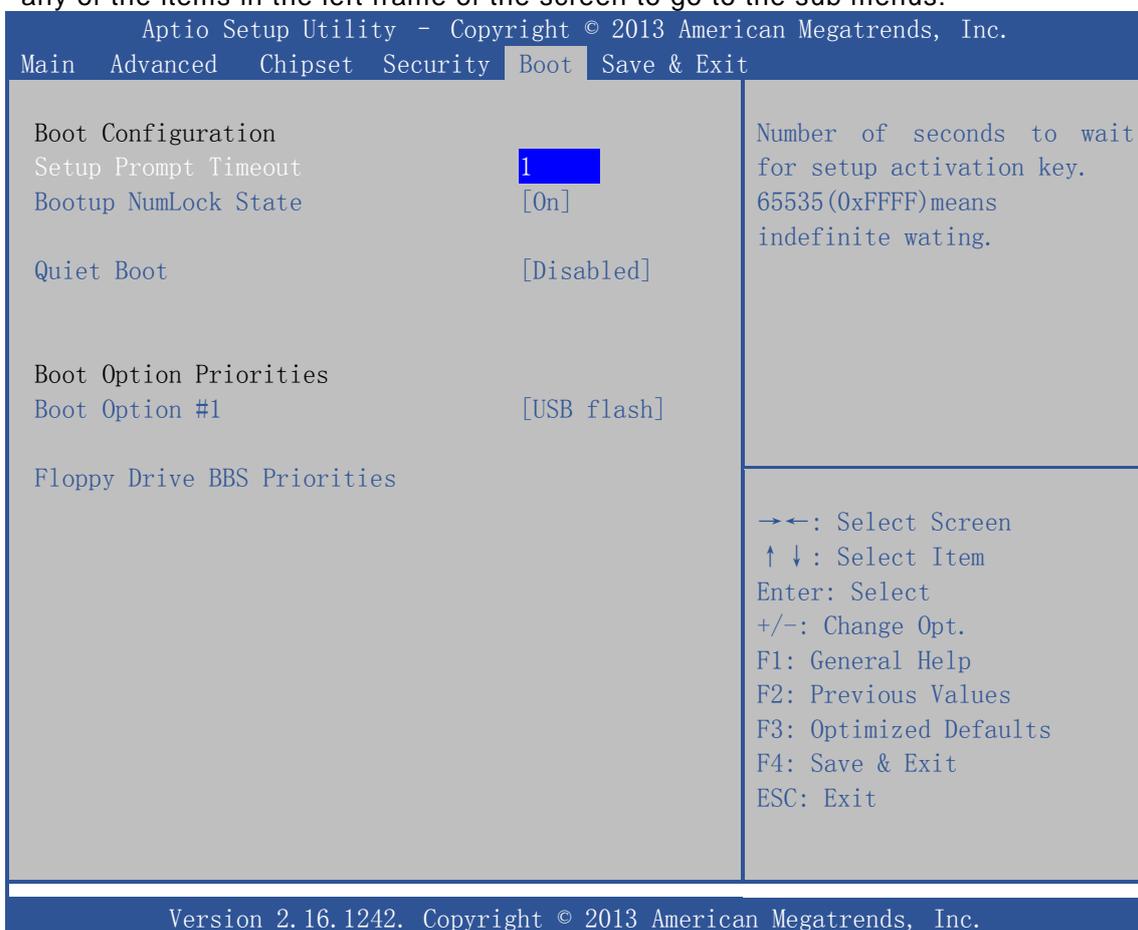
This item indicates whether a supervisor password has been set. If the password has been installed, 『 Installed 』 displays. If not, 『 Not Installed 』 displays.

➤ User Password

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

4.7 Boot Menu

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



➤ Setup Prompt Timeout

Set the Timeout for wait press key to enter Setup Menu

➤ Bootup NumLock State

You may set NumLock on/off while power on, default setting is on.

➤ Quiet Boot

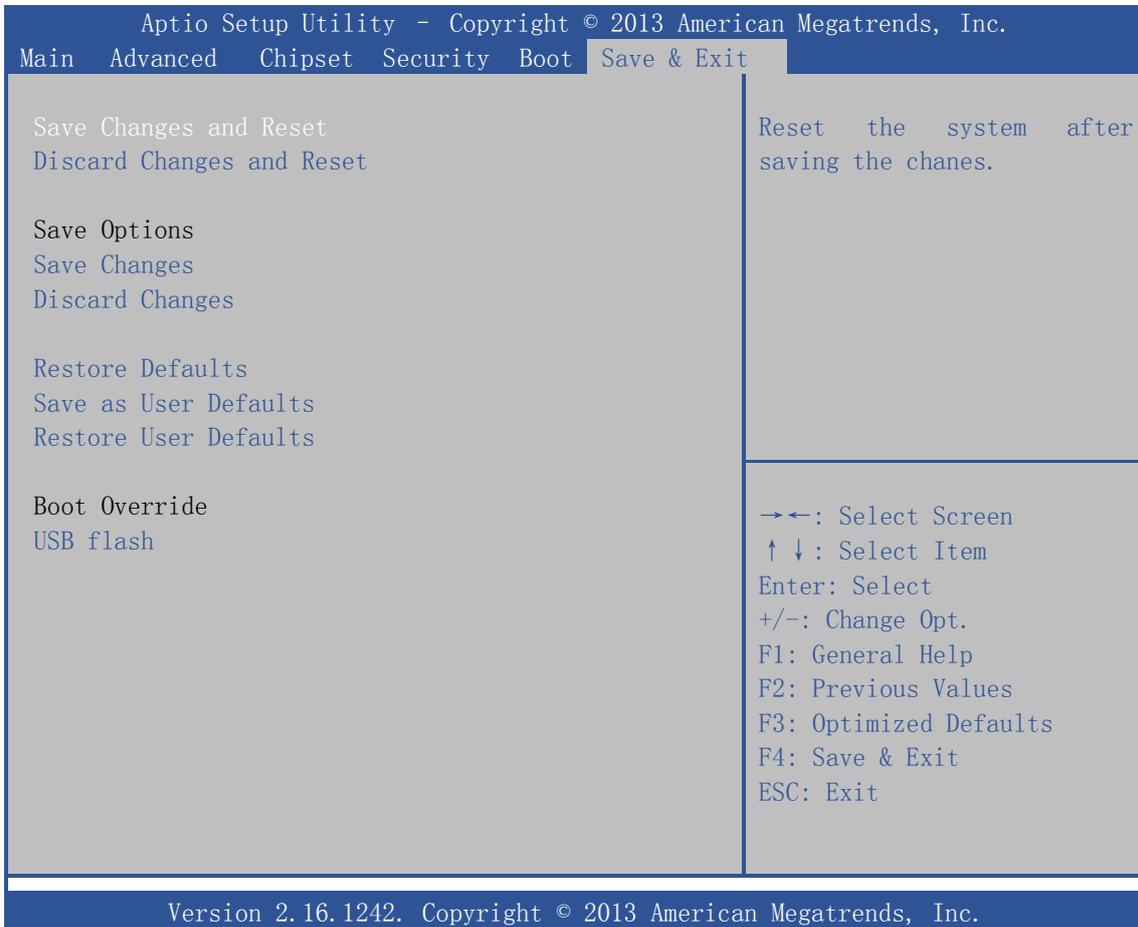
You may set Quite Boot state is enable or disable, default setting is off.

➤ Boot Option Priorities

Specifies the overall boot order from the available devices.

4.8 Save & Exit Menu

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



➤ Save Changes and Reset

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

➤ Discard Changes and Reset

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

➤ Discard Changes

Use this item to abandon all changes.

➤ Restore Defaults

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

➤ **Restore user Defaults**

It automatically sets all Setup options to a complete set of default settings when you select this option. The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if your computer is experiencing system configuration problems.

Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. Select Ok to load Fail-Safe defaults.

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APPENDIX A WATCHDOG TIMER

What is Watchdog Timer

The integrated Watchdog Timer can be set up by programming. There are 1~255 levels available. As long as the value of timer is set, after enabling, the countdown of the value is starting. It needs to reset or disable watchdog, otherwise auto-reset will be running when the value is counted to 0.

How to Use the Watchdog Timer

(Following is example to enable configuration by using debug tool)

Enable WDT

1. Enable configuration

-O 2E 87

-O 2E 87

2. Select Logic device:

-O 2E 07

-O 2F 08

3. WDT Device Enable

-O 2E 30

-O 2F 01

4. Set timer unit

-O 2E F0

-O 2F 00 → (00: Sec; 08: Minute)

5. Set base timer:

-O 2E F1

-O 2F 0A → Set Reset Time (Ex.0A:10 Sec)

Disable WDT

1. Enable configuration

-O 2E 87

-O 2E 87

2. Select Logic device:

-O 2E 07

-O 2F 08

3. WDT Device Disable

-O 2E 30

-O 2F 00

Sample of Watchdog application

Assume there is program A which needs to maintain running in a system. The value of Watchdog Timer must be set bigger than the running time of program A. Then, after the running time of program A is finished, either to disable or to reset watchdog timer.

When program A has problems to make system shut down, the system can be rebooted by Watchdog timer when the value of watchdog timer is countdowned to 0.

The below flowchart can be referred to edit program A

