

## IFC-BOX4000

### Fanless Embedded Box PC

- Intel® Haswell™ Celeron® Processor 2957U Processor

Intel Haswell Core4 I3-4030U-1.9GHz CPU

Intel Haswell Core4 I5-4278U-3.1GHz CPU

Intel Haswell Core4 I7-4578U-3.5GHz CPU

- SODIMM DDR3 Socket
- Intel® HD Graphics Integrated Graphic Card
- DVI-I/HDMI/DP Display
- 4 x Intel®I210 GbE LAN
- 2 x RS-232/ Isolation RS-485, 4 x RS-232
- 4 x USB2.0, 2 x USB3.0
- +9V~+30V Extended Voltage Input



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1. Collect all the information about the problem encountered. (For example, CPU speed, IFC products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
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### FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC part15, CE E50252E, GB9254 Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Technical Support and Assistance

1. Visit the IFC web site at [www.ifc-ipc.cn](http://www.ifc-ipc.cn) where you can find the latest information about the product.
2. Contact your distributor, sales representative, or IFC's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

## Warnings, Cautions and Notes



### **Warning!**

*Warnings indicate conditions, which if not observed, can cause personal injury!*



### **Caution!**

*Cautions are included to help you avoid damaging hardware or losing data.*



**Note!** *Notes provide optional additional information.*

## Safety Instructions

1. Read these safety instructions carefully. Keep this User Manual for later reference.
2. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well, or you cannot get it to work according to the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
15. Do not leave this equipment in an environment where the storage temperature may go below  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) or above  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ). This could damage the equipment. The equipment should be in a controlled environment.
16. Caution: danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer, discard used batteries according to the manufacturer's instructions.
17. Caution: Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. Screws) provided with the accessory box.
18. Caution: The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacture. Discard used batteries according to the manufacturer's instructions.

19. Caution: Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

Disclaimer: This set of instructions is given according to IEC 704-1. IFC disclaims all responsibility for the accuracy of any statements contained herein.

## Packing list

Before installation, please ensure the following items have been shipped:

1 x IFC-BOX4000 BOX PC

AC-DC adapter, DC 19V@4.7A 90W, with 5.08mm JACK, 0 ~ 45 ° C, a perfect solution for home and office application.

## Ordering Information

Model Number	Description
IFC-BOX4300	Intel® Haswell™ Core® Processor i3-4030U 1.9GHz, DVI-I/DP Display , 4 pcs POE Gigabit Network , 4 pcs RS232 , 2 pcs RS232/ Isolation 485 Optional , 4USB , Direct 9-30V Input
IFC-BOX4500	Intel® Haswell™ Core® Processor i5-4278U 3.5GHz, DVI-I/DP Display , 4 pcs POE Gigabit Network , 4 pcs RS232 , 2 pcs RS232/ Isolation 485 Optional , 4USB , Direct 9-30V Input
IFC-BOX4700	Intel® Haswell™ Core® Processor i7-4578U-3.5GHz, DVI-I/DP Display , 4 pcs POE Gigabit Network , 4 pcs RS232 , 2 pcs RS232/ Isolation 485 Optional , 4USB , Direct 9-30V Input

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# Chapter 1

## General Introduction

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**This chapter gives background information on IFC-BOX4000 series.**



## 1.1 Introduction

The fanless embedded computer IFC-BOX4000 is an ideal solution for ready-to-use system applications. All electronics are protected in a compact, sealed aluminum case. It offers anti-vibration and dustproof as well as passive cooling solution making it a convenient & flexible solution for customers embedding in their own cabinet, or to use it as a stand-alone system, thereby meeting the requirements of limited space and harsh environment.

IFC-BOX4000 is designed as a palm-size fanless embedded system and occupies only 260 x 176 x 49 mm 260 x 176, The rugged, cast aluminum case not only provides great protection from EMI, shock/vibration, cold and heat, but also provides passive cooling for quiet, fanless operation. IFC-BOX4000 supports DVI-I+DP three synch. Or asynch. display, 4 x GbE LAN, 2 x USB 2.0, 2 x USB 3.0 and 4 x RS-232, 2 x RS-485, 2.5" SATA HDD, m-SATA SSD, DC +7V~30V extended power supply.

## 1.2 Features

### Key features

- Extremely compact, sealed architecture, fanless design and low power consumption system
- Support Intel® Haswell™ Celeron® Processor 2957U 1.4GHz Dual core CPU  
Intel Haswell Core4 I3-4030U-1.9GHz CPU  
Intel Haswell Core4 I5-4278U-3.1GHz CPU  
Intel Haswell Core4 I7-4578U-3.5GHz CPU
- Ultra-slim handheld system, support 2.5" SATA HDD/M-SATA SSD
- DVI-I/DP dual synch. & asynch. display, support 4K resolution
- 4 x GbE LAN, 2x USB 2.0, 2x USB 3.0, 4 x RS-232, 2 x RS-232 / Isolation RS-485
- Support VESA/ Desktop installation

## 1.3 Specifications

### 1.3.1 General

**CPU:** Intel® Haswell™ Celeron® Processor 2957U 1.4GHz Dual Core CPU,  
Intel Haswell Core4 I3-4030U-1.9GHz CPU  
Intel Haswell Core4 I5-4278U-3.1GHz CPU  
Intel Haswell Core4 I7-4578U-3.5GHz CPU

**System Chipset:** Intel® Haswell™ SOC chipset

**BIOS:** AMI 16 Mbit Flash BIOS

**System Memory:** SODIMM socket, DDR3L-1333/1600 ; LPDDR3-1333/1600, Support Max. 16GB

**Watchdog Timer:** 255-level interval timer, setup by software

**Serial Ports:**

- 2 x RS232/RS485 jumper setting, RS485 supports software flow control;
- 4 x RS232 , Support 3000V Surge protection;

**USB:**

- 2 x USB 2.0
- 2 x USB 3.0

**Audio:** High definition auto encoding

- - Realtek ALC6622 audio card, with MIC/audio output

**Expansion Bus:** Support 1 x full-size Mini-PCle, 3G UIM card, 1 x Half length-size Mini-PCle

**Storage:** Support Msata SSD or 1\* 2.5"SATAIII HDD ( 9.5 mm )

### 1.3.2 Display

- Chipset: Intel® HD Graphics,200-1GHz frequency
- DVI-I/DP dual synch. & asynch. Display
- Resolution: support Max. 4K resolution

### 1.3.3 Ethernet

**Chipset:** Intel® I210 GbE LAN

**Speed:** 10/100/1000 Mbps, support Wake-on-Lan

**Connector:** 4 x RJ45

**Standard:** Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 8023y, IEEE 802.ab.

### 1.3.4 Electrical Specifications

- **Power Input:** DC +9V ~ +30 V
- **Power On Type:** AT / ATX Jumper selection
- **APM:** ACPI 3.0, APM
- **Power Adapter:** AC ~ DC 12V/3A , 36W
- **Power consumption:**

Voltage	2957U-1.4GHz (Fanless)		
	Current	Power	
Idle mode	+12V	0.5	6

Power on	+12V	1.1	13.2
Max load	+12V	1.7	20.4

- Power consumption test conditions:
  - Test Condition: Windows 7 professional Professional, Burntest ver5.3, 32G SSD
  - Idle Mode: The power consumption without running any application software after entering to Windows system.
  - Boot Mode: The max. Power consumption between power-on and entering to system process.
  - Full-load Mode: The power consumption under 100% full-load operation of CPU and graphic card when running Burntest.
- RTC battery: Lithium 3.3V/210mAh CR2032 battery

## 1.4 OS Support

It supports Support Win7, Win8, Win CE 6.0, and Linux Ubuntu 10.04 UP.

## 1.5 Other

- Power switch, power indicator
- 1 -255 sec. watchdog
- 12 bits, support routine, self-define I/O, 3.3V@24mA IFC-BOX4000 User Manual

## 1.6 Environmental Specifications

### Operating temperature:

-20 ~ 60° C (extended temp. SSD/mSATA device)

0 ~ 40° C (HDD)

**Relative humidity:** 95% @ 40°C (non-condensing)

**Storage temperature:** -40 ~ 85°C (-40 ~ 185°F)

### Vibration loading during operation:

– With SSD: 3 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr/axis

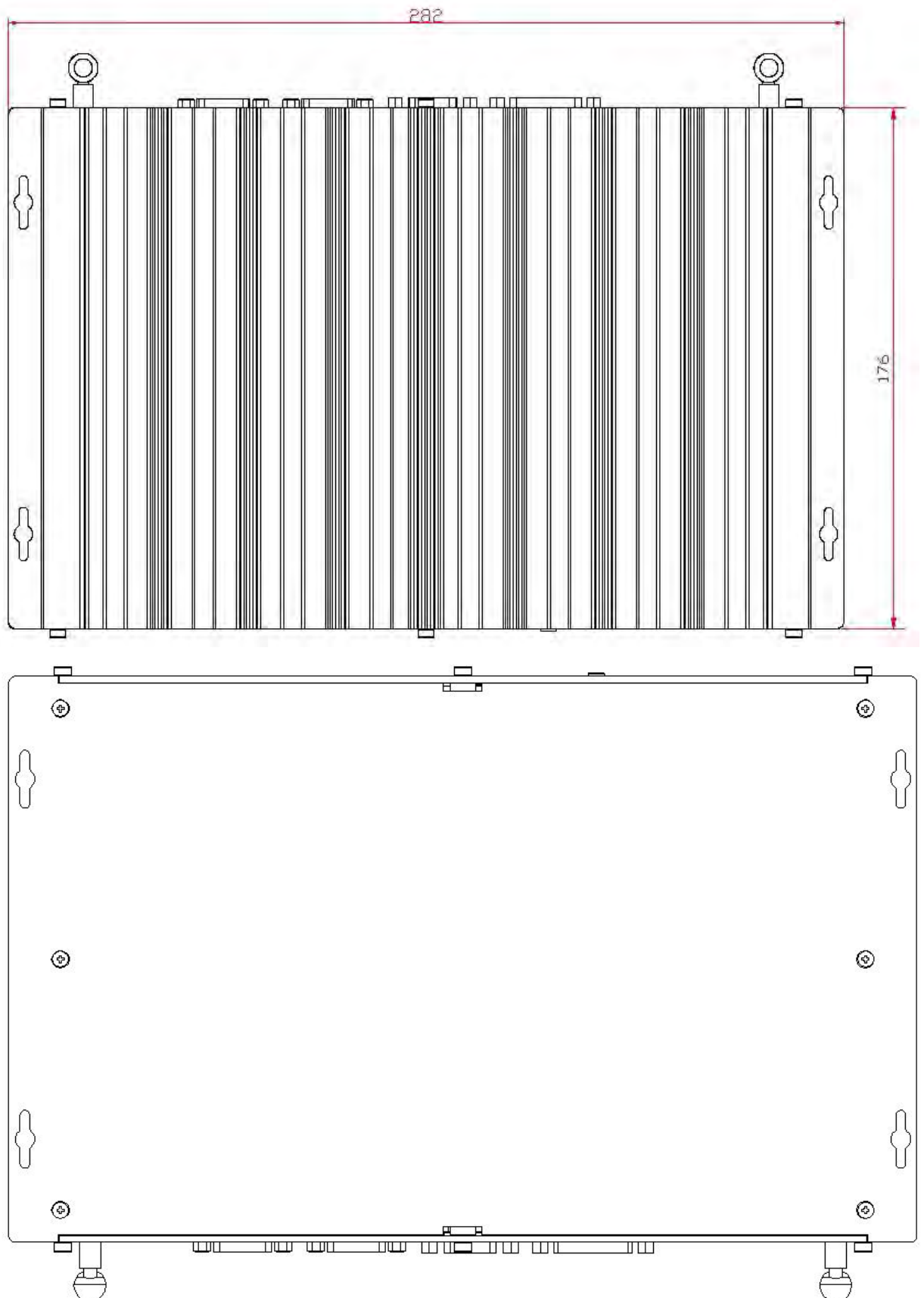
### Shock during operation:

– With SSD: 30 G, IEC 60068-2-64, half sine, 11 ms duration time.

**Safety:** In compliance with UL,CCC

**EMC:** CE, FCC A, ROHS certificate

## 1.7 Mechanical Specifications



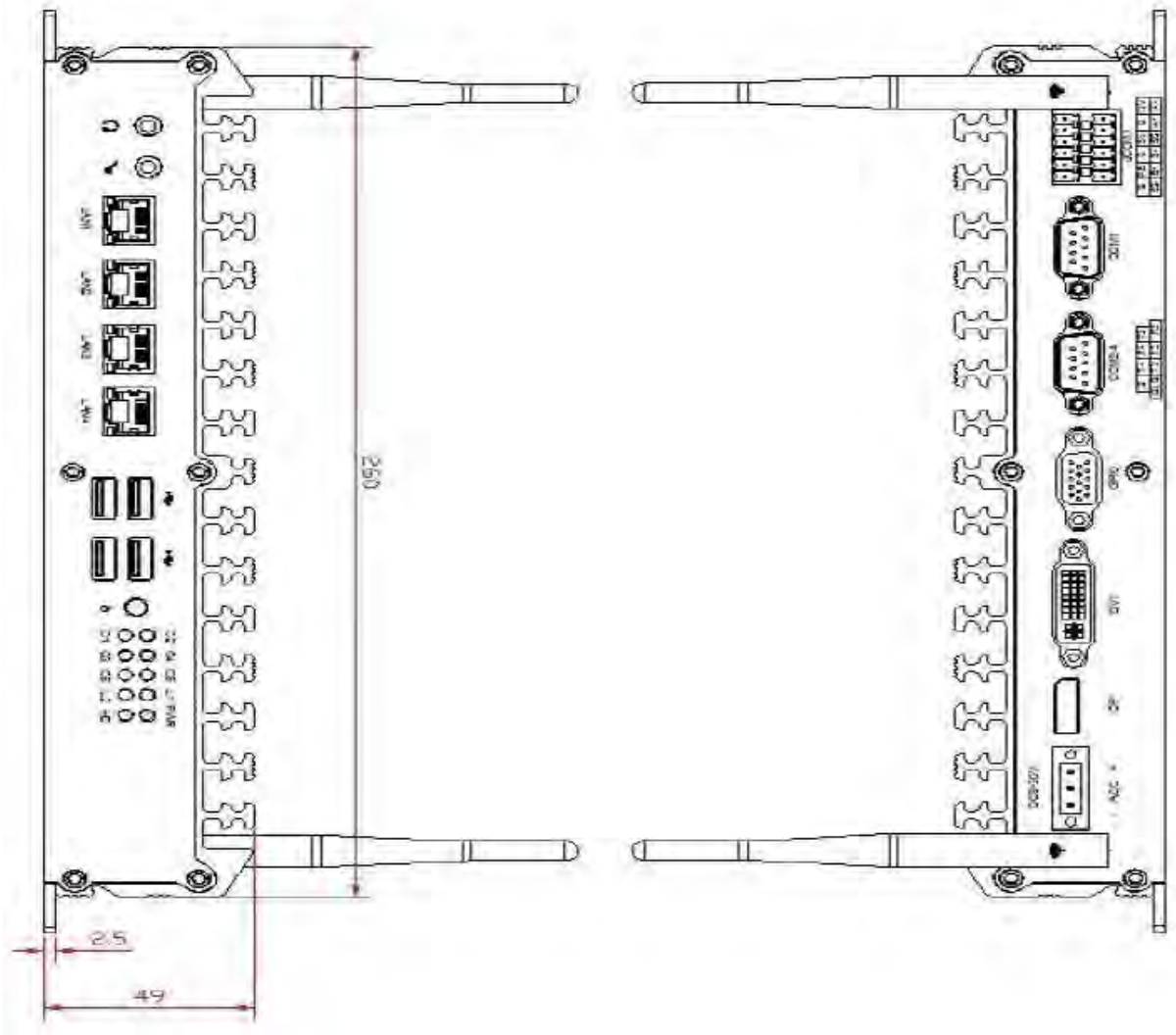


Figure 1.7 IFC-BOX4000 mechanical dimension drawing

# Chapter 2

## H/W Installation

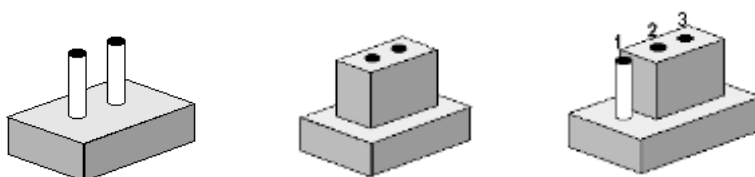
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**This chapter explains the setup procedures of the IFC-BOX4000 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.**

## 2.1 Jumpers

### 2.1.1 Jumper Description

Board can be configured by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you connect the pins with the clip. To open a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically depicted in this manual as follows.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

**Warning!** To avoid damaging the computer, always turn off the power supply before setting jumpers.

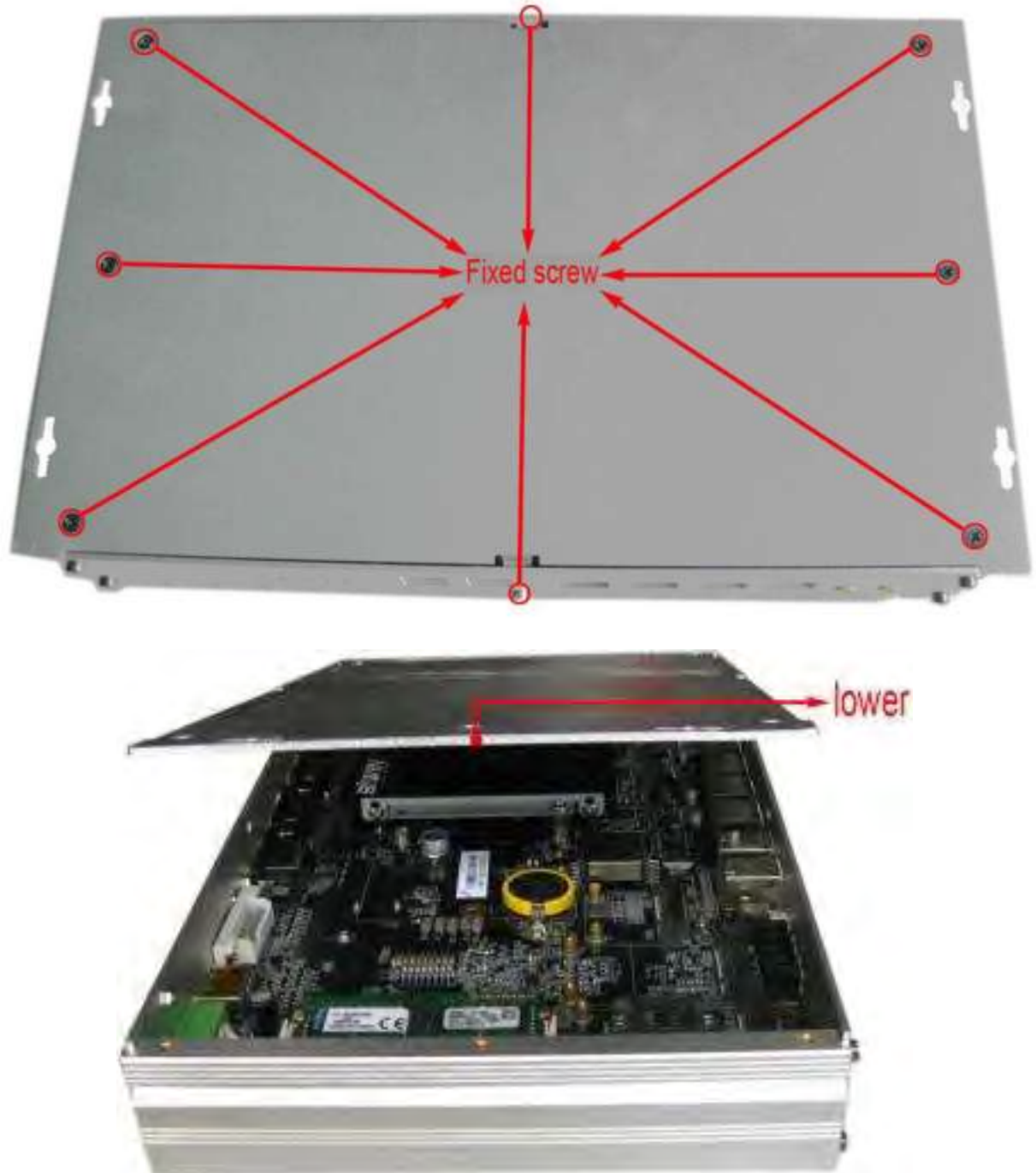


How to verify Pin1 of the jumper?

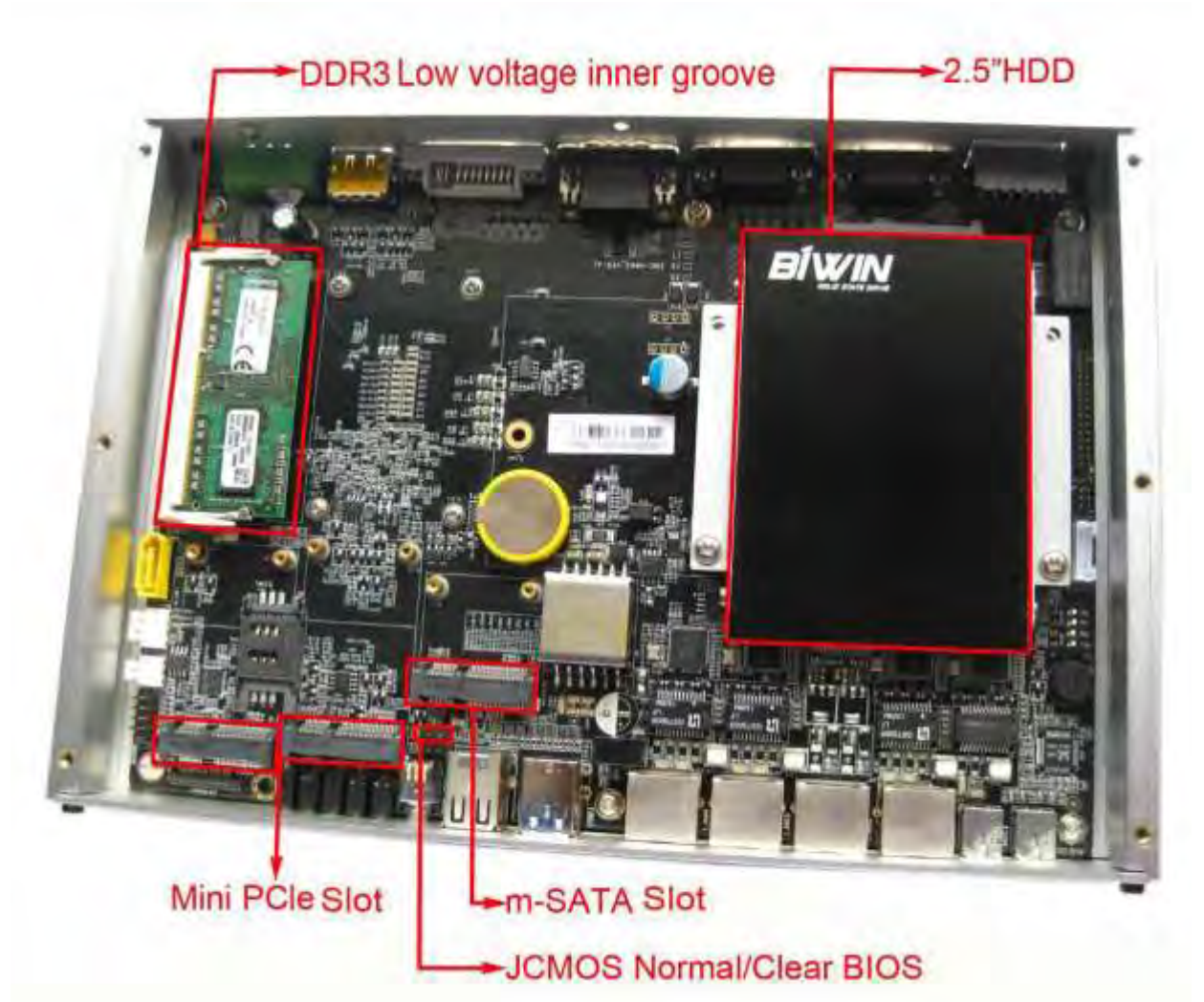
1. Please check the M/B carefully, where there is a mark of "1" or white thick line, there is Pin1.
2. Look into the pad on the back side of the M/B, generally the square side of the pad is Pin1.

## 2.1.2 IFC-BOX4000 Installation

Unscrew pan head fixed chassis around 8 M2.5, remove the lower cover of the computer case can be carried out from the bottom, hard disk, M-SATA, memory, Mini-PCle equipment installation. And can be set up to the corresponding functional jumper

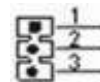






### 2.1.3 Jumper Setting

<b>JCMOS</b>	CMOS Clear/AT & ATX Power Mode Select
Part Number	
Description	Pin Header 1x3Pin 2.54mm DIP & Jumper 2.54mm
<b>Setting</b>	<b>Function</b>
1-2 On (Default)	Normal
2-3 On	Clear BIOS



## 2.1.4 IFC-BOX4000 I/O Indication

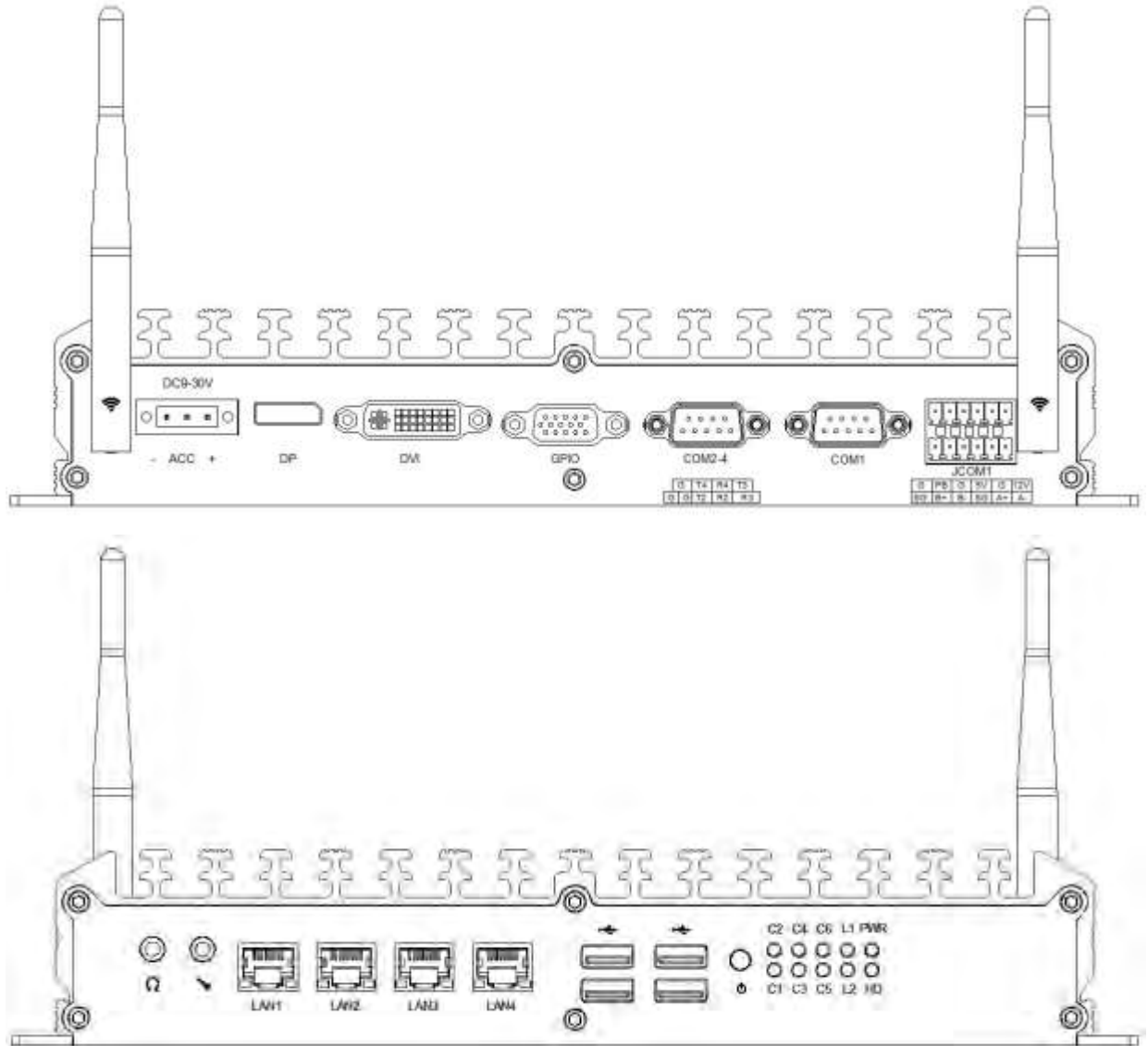


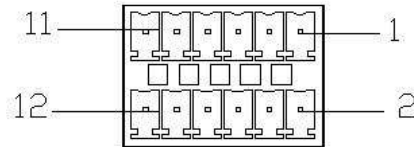
Figure 2.1.4 IFC-BOX4000 mechanical dimension drawing

## 2.2 External I/O Connectors & Pin Assignments

### JCOM1

Part Number \_\_\_\_\_

Description CONN (Green end) 2x6P 3.81mm Male 90°DIP-18



Pin	Signal	Pin	Signal
1	12V@2A Output	2	A- ( COM5-RS485 )
3	G	4	A+ ( COM5-RS485 )
5	5V@2A Output	6	SG
7	G	8	B- ( COM6-RS485 )
9	PB (Power switch signal)	10	B+ ( COM6-RS485 )
11	G	12	SG ( RS485 GND Signal )

Support a maximum rate of 115200bps, RS485 RS485 supports 3000KV isolation, automatic flow, flow control. This interface also supports the connection of external switch, +12V/5V power output is connected to the supply of external equipment.

### COM1

Part Number \_\_\_\_\_

Description COM Port D-Sub 9Pin Male DIP



Pin	Signal	Pin	Signal
1	RX3	2	RX2
3	TX2	4	GND
5	GND	6	TX3
7	RX4	8	TX4
9	GND		

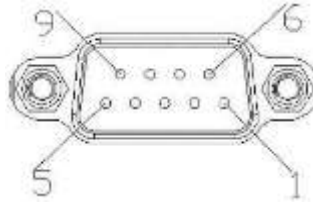
9 Wire RS232 Interface , Support a maximum 115200bps Rate , Support 4000V Surge protection.

### COM2-COM4

Part Number \_\_\_\_\_

Description

COM Port D-Sub 9Pin Male DIP



Pin	Signal	Pin	Signal
1	RX3	2	RX2
3	TX2	4	GND
5	GND	6	TX3
7	RX4	8	TX4
9	GND		

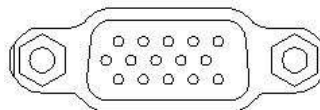
Provide 3 and 3 wire RS-232 serial communication port, support a maximum rate of 115200bps, 4000V surge protection.

### **GPIO**

Part Number

Description

GPIO CONN D-SUB 15Pin VGA DIP-15



Pin	Signal	Pin	Signal
1	GPIO1	2	GPIO2
3	GPIO3	4	GPIO4
5	GPIO5	6	GPIO6
7	GPIO7	8	GPIO8
9	GPIO9	10	GPIO10
11	GPIO11	12	GPIO12
13	GND	14	GND
15	V3.3S		

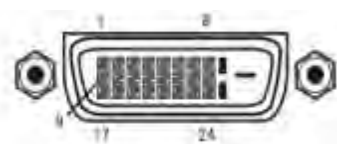
Free programming is defined as the input or output, the driving power of 3.3V@24mA

### **DVI Port**

Part Number

Description

DVI-D 24Pin Fe male DIP



Pin	Signal	Pin	Signal
1	TX2-	2	TX2+
3	SHLD24	4	TX4-

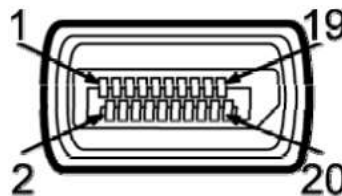
5	TX4+	6	DDCC
7	DDCD	8	VSYNC
9	TX1-	10	TX1+
11	SHLD13	12	TX3-
13	TX3+	14	VDDC
15	GND	16	HPD
17	HPD	18	TX0+
19	SHLD05	20	TX5-
21	TX5+	22	SHLDC
23	TXC+	24	TXC-

DVI-I connector, do not support the VGA signal, you can use the DVI-D switching VGA converter with a VGA monitor, support 4096X2304@24HZ high resolution

### **DP Display Port**

Part Number \_\_\_\_\_

Description \_\_\_\_\_ DP 20Pin Fe male DIP



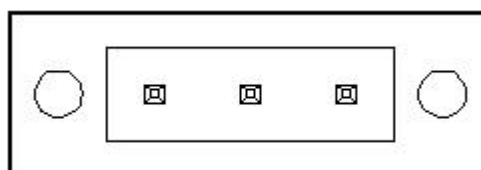
Pin	Signal	Pin	Signal
1	LANE_0P	2	GND
3	LANE_0N	4	LANE_1P
5	GND	6	6 LANE_1N
7	7 LANE_2P	8	GND
9	LANE_2N	10	LANE_3P
11	GND	12	LANE_3N
13	MODE	14	CEC
15	AUXP	16	GND
17	AUXN	18	HPD
19	PWR_RET	20	PWR

DP support max. resolution 3200X2000@60HZ, support DP Dangle device.

### **Power Input Connector (DC IN1)**

Part Number \_\_\_\_\_

Description \_\_\_\_\_ DC-Jack 3Pin DIP



Pin	Signal	Pin	Signal
1	DC	2	DC
3	GND		

IFC-BOX4000 with a 9-30V support DC external power input of the phoenix head jack. The ACC signal is connected with a vehicle ACC signal support.

### **Power ON/OFF Button (PWR SW1)**

Part Number \_\_\_\_\_

Description Power Button LED PTCT-07-A 5P 7Pin DIP

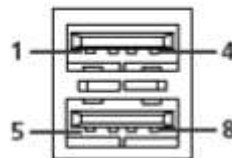


IFC-BOX4000 has a power button with LED indicator.

### **USB1 USB3.0**

Part Number \_\_\_\_\_

Description Double USB Port AF90° 12Pin DIP



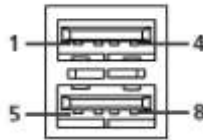
Pin	Signal	Pin	Signal
1	VBUS	2	D-
3	D+	4	GND
5	SSRX-	6	SSRX+
7	DRAIN	8	SSTX-
9	SSTX+		
S1	GND	S2	GND
S3	GND	S4	GND

1. 2 x USB, all support PNP & hot-plug functions. USB ports are in compliance with USB UHCI, Rev. 3.0 standard. It can connect max. 127 external devices.
2. USB port provides max. 1A current load capacity.

### **USB2 USB2.0**

Part Number \_\_\_\_\_

Description Double USB Port AF90° 12Pin DIP



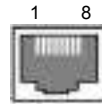
Pin	Signal	Pin	Signal
1	USB_VCC	2	USB_PORT2#
3	USB_PORT2	4	GND
5	USB_VCC	6	USB_PORT3#
7	USB_PORT3	8	GND
9	CHASSIS_USB	10	CHASSIS_USB
11	CHASSIS_USB	12	CHASSIS_USB

1. The 1 provides 2 USB interface, support plug and play and the hot swap function, can be up to 127 external connection equipment. USB interface with USB UHCI, the Rev. 2 standard. The USB interface supports plug and play function, allows to connect or disconnect the device of the user at any time, without having to shut down the computer.
2. USB ports to provide maximum 1A current load capacity.

## Ethernet

Part Number \_\_\_\_\_

Description RJ45 Port 8PIN DIP



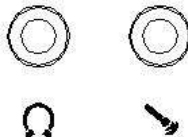
Pin	Signal	Pin	Signal
1	Transmit Data+	2	Transmit Data-
3	Receive Data+	4	Bi-directional Data+
5	Bi-directional Data-	6	Receive Data-
7	Bi-directional Data+	8	Bi-directional Data-

IFC-BOX4000 provides 4 POE RJ45 LAN port, in full compliance with the IEEE 802.3u 10/100/1000 Base-T CSMA/CD standard. RJ-45 connector using standard Ethernet port, support 48V@500mA POE power output, Link/Speed LED lights, for indicating transmission / connection state and speed condition.

## AUDIO

Part Number \_\_\_\_\_

Description AUDIO Jack Green Vertical 5Pin DIP



Pin	Signal	Pin	Signal
-----	--------	-----	--------

Provide two 3.5 stereo audio input & output. Audio chip controller is ALC662, in compliance with Azalea standard.

# Chapter 3

## BIOS Settings

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## 3.1 BIOS Overview

BIOS (Basic Input and Output System) is solidified in the flash memory on the motherboard. Main functions including: initialize system hardware, set operating status of the system components, adjust operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and controlling interface for the upper level software system, guide operating system etc.. BIOS provides users with a parameters for users, control power management mode and adjust the resource distribution of system device.

### Enter BIOS Setup

- After powering on the system, press <Del> or <ESC> to enter BIOS setup when see post logo or post message

### The available keys for the Menu screen are

- Select Menu: < ←> or < →>
- Select Item: < ↑> or < ↓>
- Select Field: <Tab>
- Change Field: <+> or <->
- Help: <F1>
- Load Defaults <F3>
- Save & Exit: <F4>
- Exits the Menu: <Esc>

### **NOTE!**

BIOS setting will affect computer performance directly. Improper parameter setting would cause damage to the computer; it may even be unable to power on. Please use internal default value of BIOS to restore the system. Our company is constantly updating BIOS, so the setup interface may vary sometimes. The default options below are just for reference only.

## 3.2 Main Menu

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

BIOS Information
Project Version          H892HS01 x64
Build Date and Time     09/17/2014 17:43:19

Processor Information
Intel(R) Celeron(R) 2957U @ 1.40GHz
Stepping                Unknown
Number of Processors    2Core(s) / 2Thread(s)

Total Memory            4096 MB (DDR3)
Memory Frequency        1600 Mhz

System Language         [English]

System Date             [Tue 09/16/2014]
System Time             [20:27:11]

Access Level            Administrator

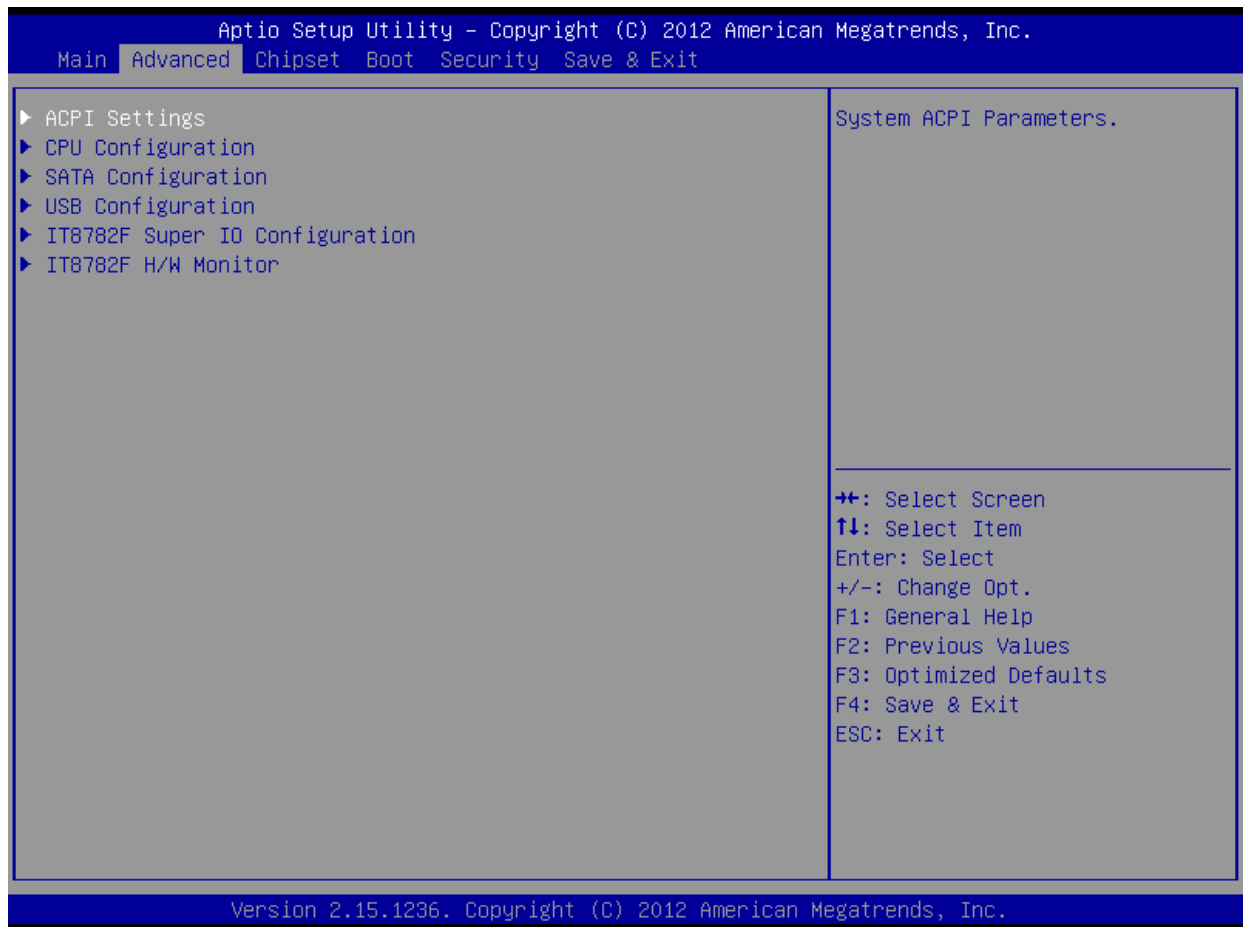
Choose the system default language

++: 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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```

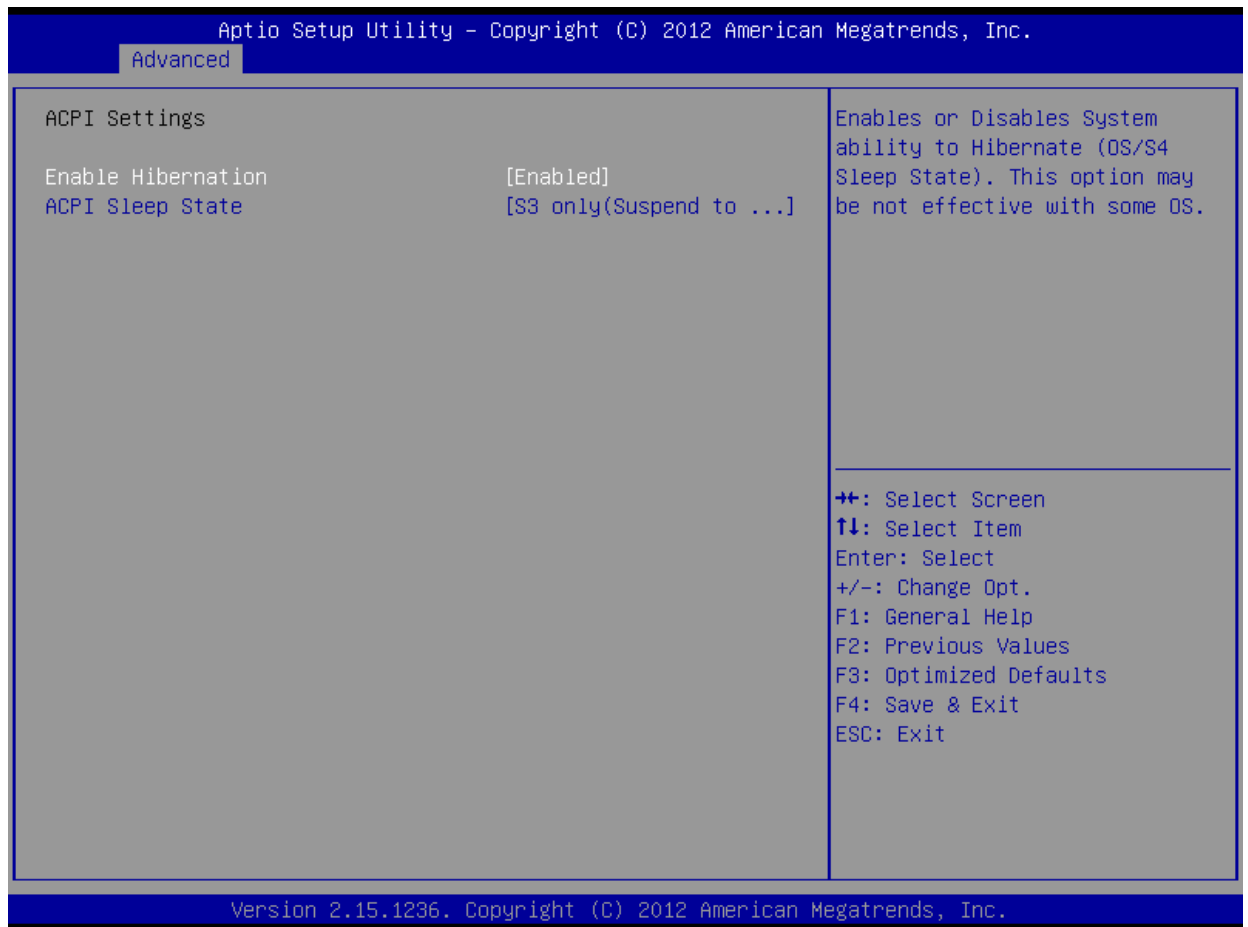
- BIOS Information (read only): To display BIOS info, including Project Name, Build Date ect.
- Processor Information: To display the basic Processor Information
- Total Memory: To display the Total Memory
- Memory Frequency: To display the Frequency Memory is running

## 3.3 Advanced Menu



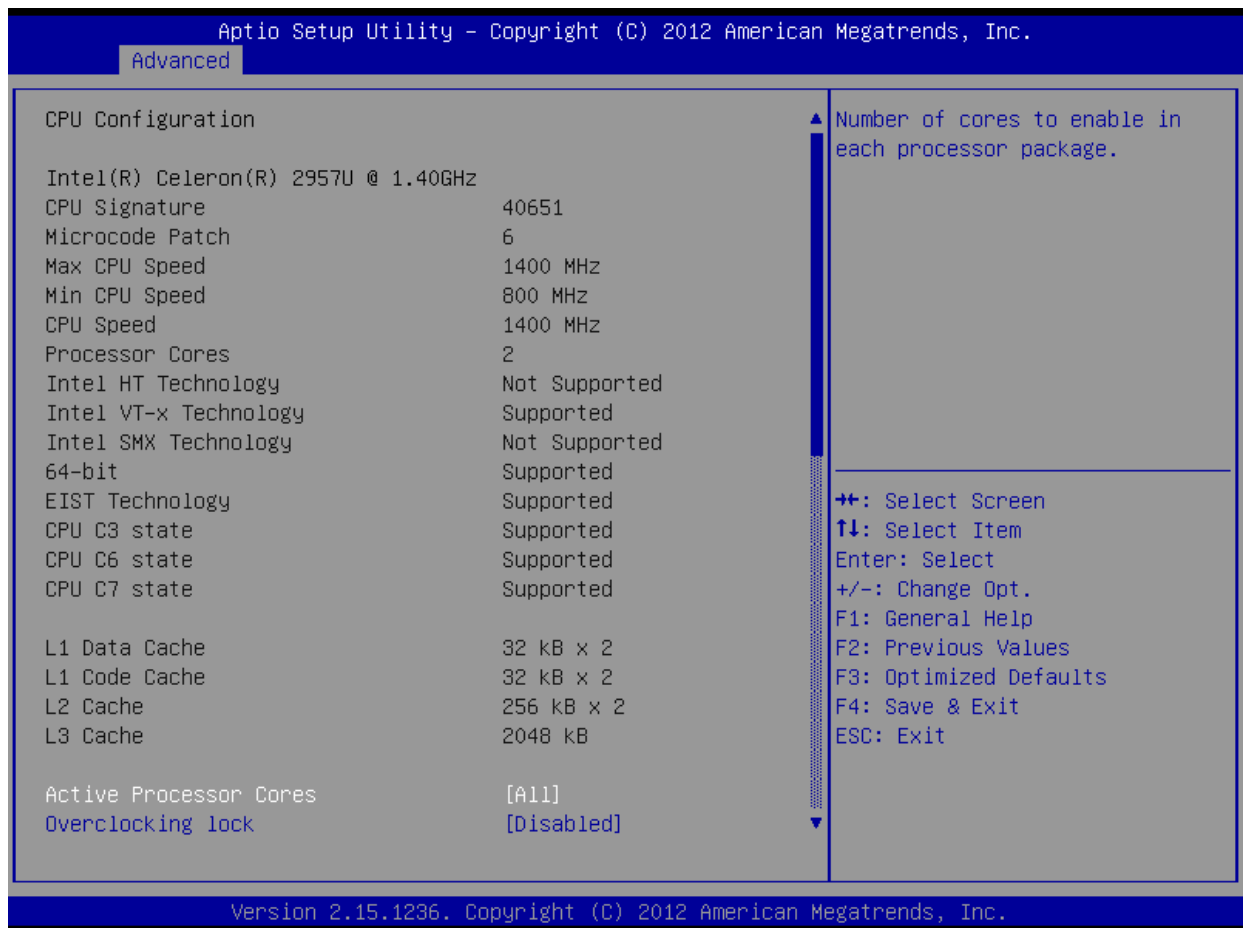
- ACPI Settings.
- CPU Configuration.
- SATA Configuration.
- USB Configuration.
- Super IO Configuration.
- H/W Monitor.

### 3.3.1 ACPI Settings



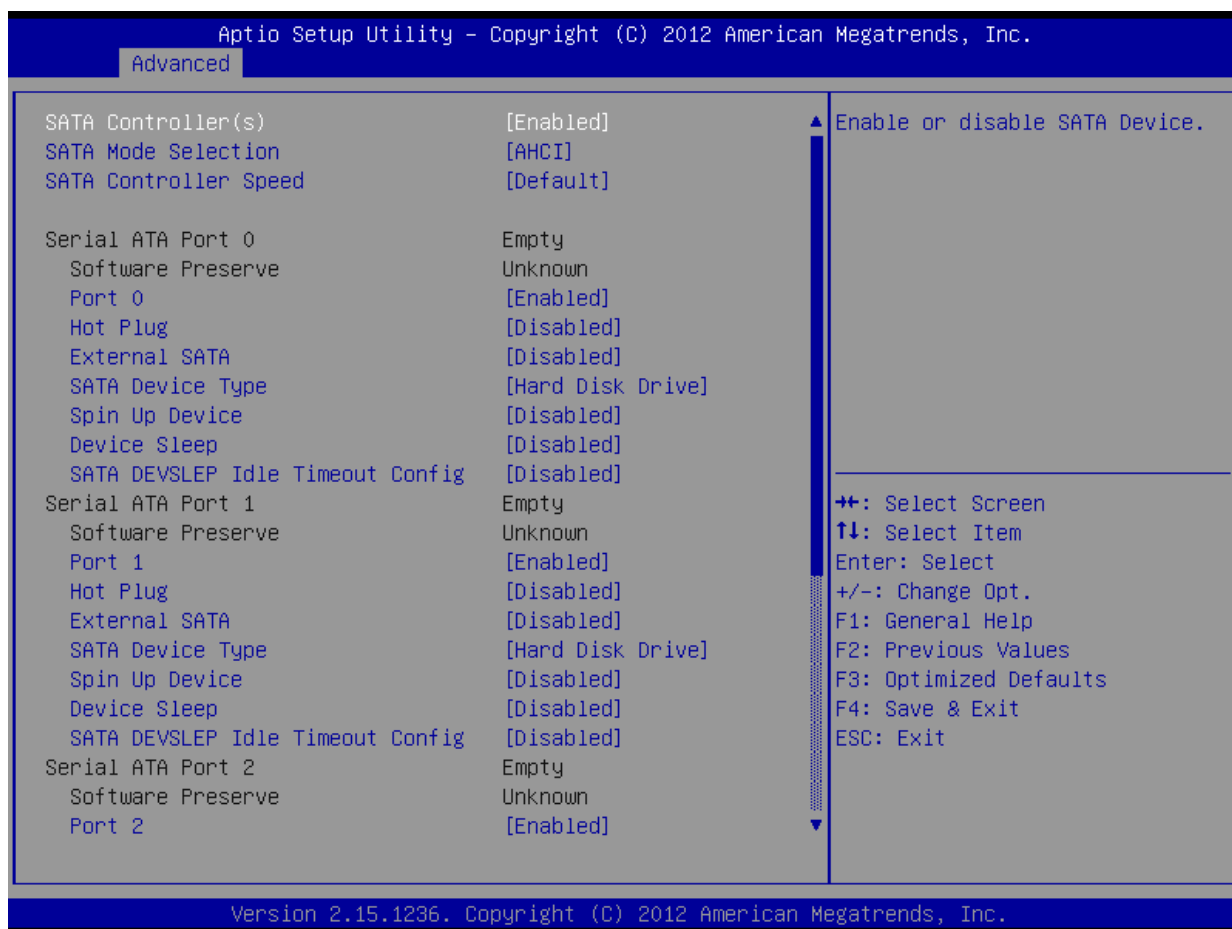
- Enable Hibernation: Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS..
- ACPI Sleep State: Select the ACPI state used for system suspend.(S3 state).

### 3.3.2 CPU Configuration



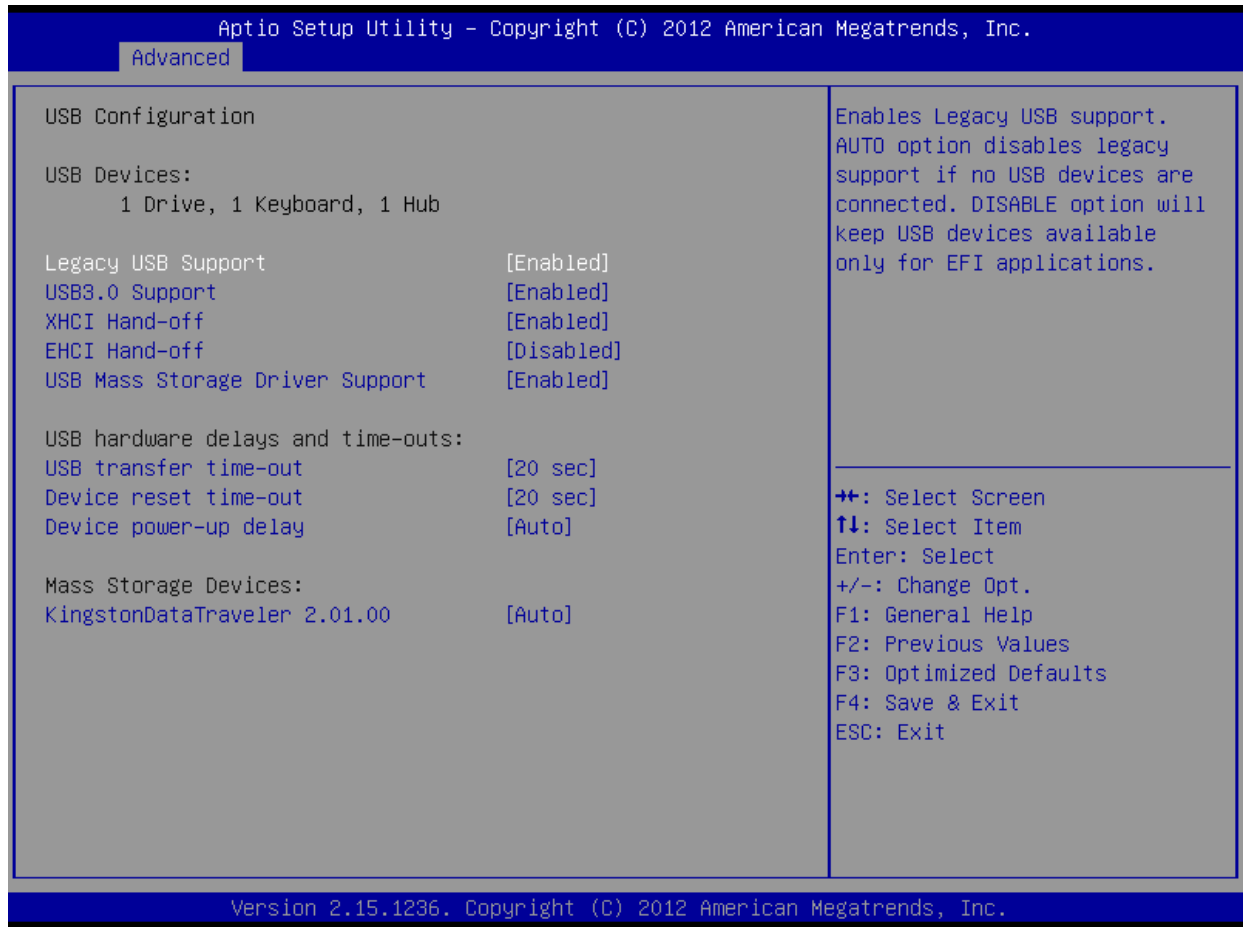
- Show the detail information of the processor and setting for it.

### 3.3.3 SATA Configuration



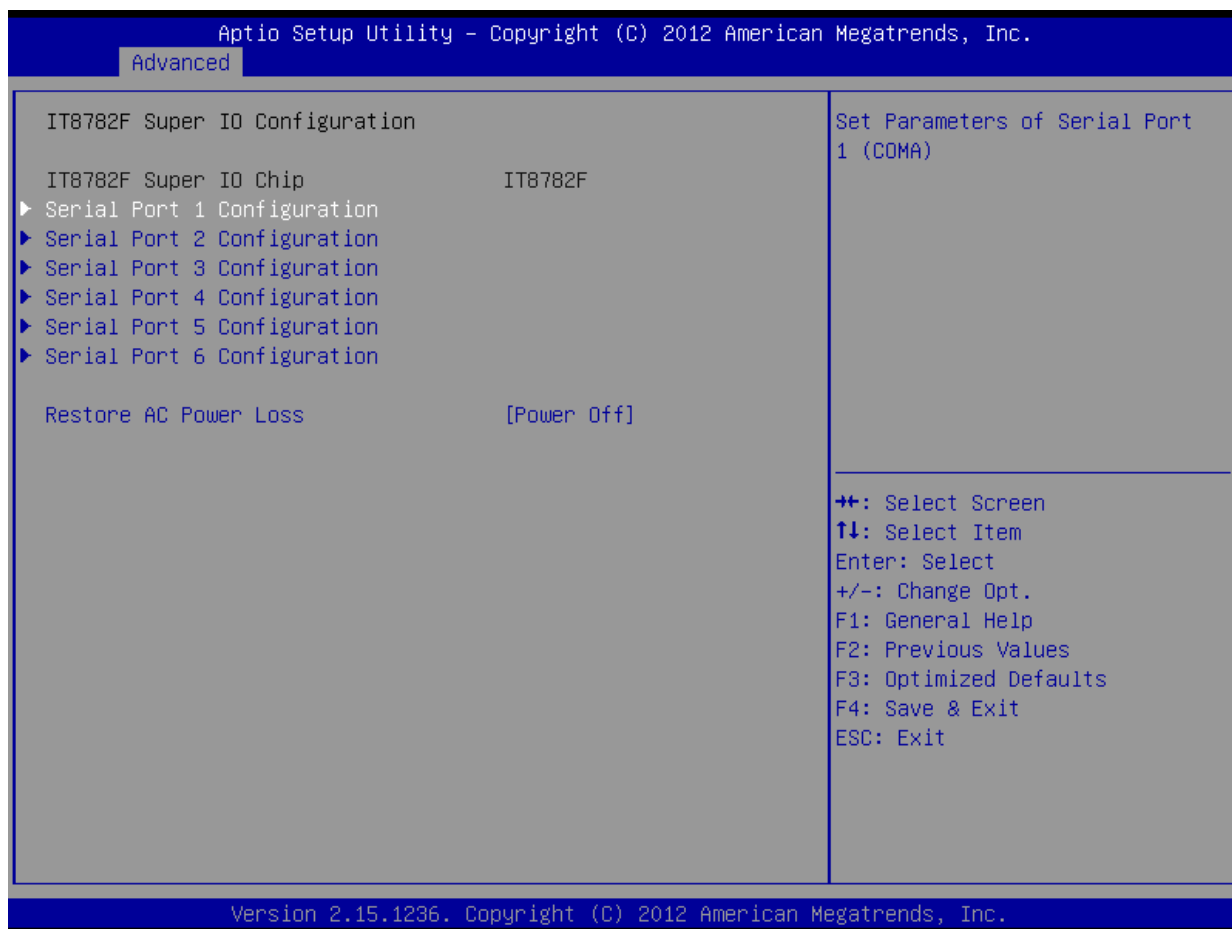
- SATA Controller(s): Enable or disable SATA Device.
- SATA Mode Selection: Determines how SATA controller(s) operate.
- SATA Controller Speed: Indicates the maximum speed the SATA controller can support.
- Serial ATA Port X(0-3): Show the sata device information detected on this port
- Port X(0-3) : Enable or Disable this sata port

### 3.3.4 USB Configuration



- Legacy USB support:
  1. Enables support for legacy USB keyboard.
  2. Auto option disables legacy support if no USB devices are connected.
  3. DISABLE option will keep USB devices available only for EFI applications.
- USB3.0 Support: Enable/Disable USB3.0 (XHCI) Controller support.
- XHCI Hand-off:
  1. This is a workaround for OSes without XHCI hand-off support.
  2. The XHCI ownership change should be claimed by XHCI driver.
- EHCI Hand-off:
  1. This is a workaround for OSes without EHCI hand-off support.
  2. The EHCI ownership change should claim by EHCI driver.
- USB Mass Storage Driver Support: Enable/Disable USB Mass Storage Driver Support.
- USB transfer time-out: The time-out value for Control, Bulk, and Interrupt transfers.
- Device reset time-out :USB mass storage device Start Unit command time-out.
- Device power-up delay: Maximum time the device will take before it properly reports itself to the Host Controller.

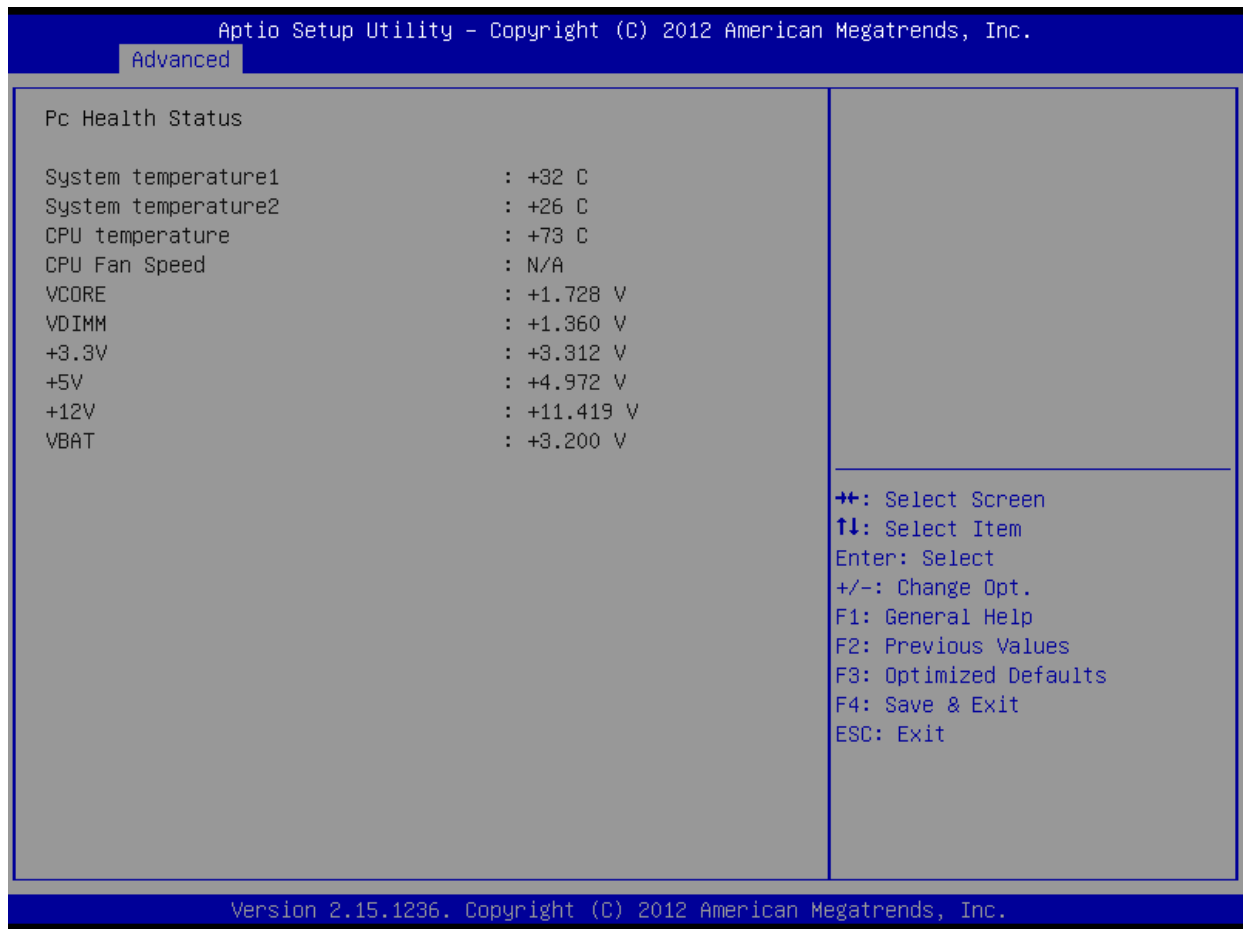
### 3.3.5 Super IO Configuration



- Super IO Chip: Read only, to display Super IO chipset model.
- Serial Port 1-6 Configuration: 6 COM setup, including interruption and default address.
- Restore AC Power Loss: Specify what state to go to when power is re-applied after a power failure (G3 state)..
  1. Power on: System will always power on when restore AC power
  2. Power Off: System will not power on when restore AC power
  3. Last State: whether power on depend on the state when Power Loss

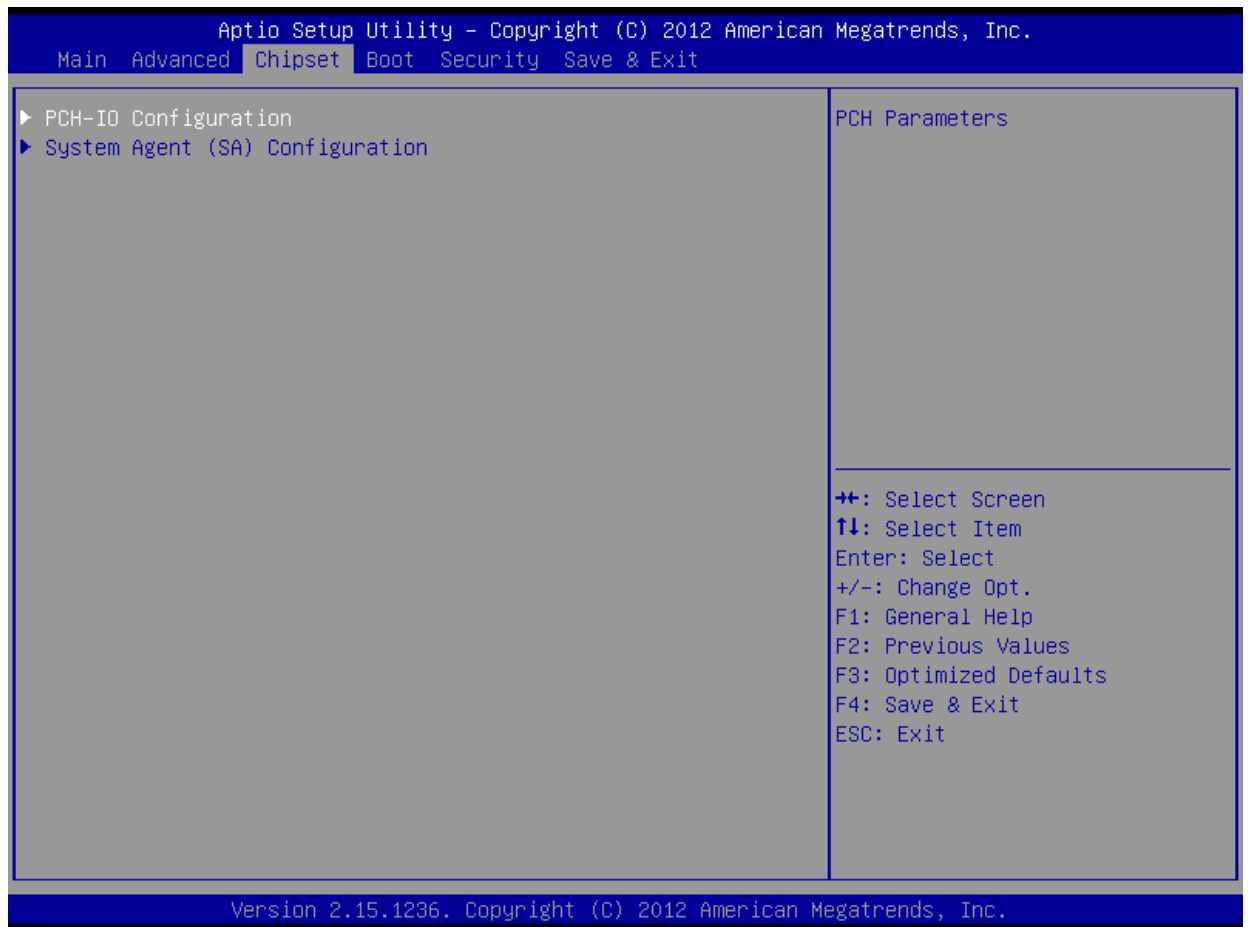


### 3.3.6 H/W Monitor



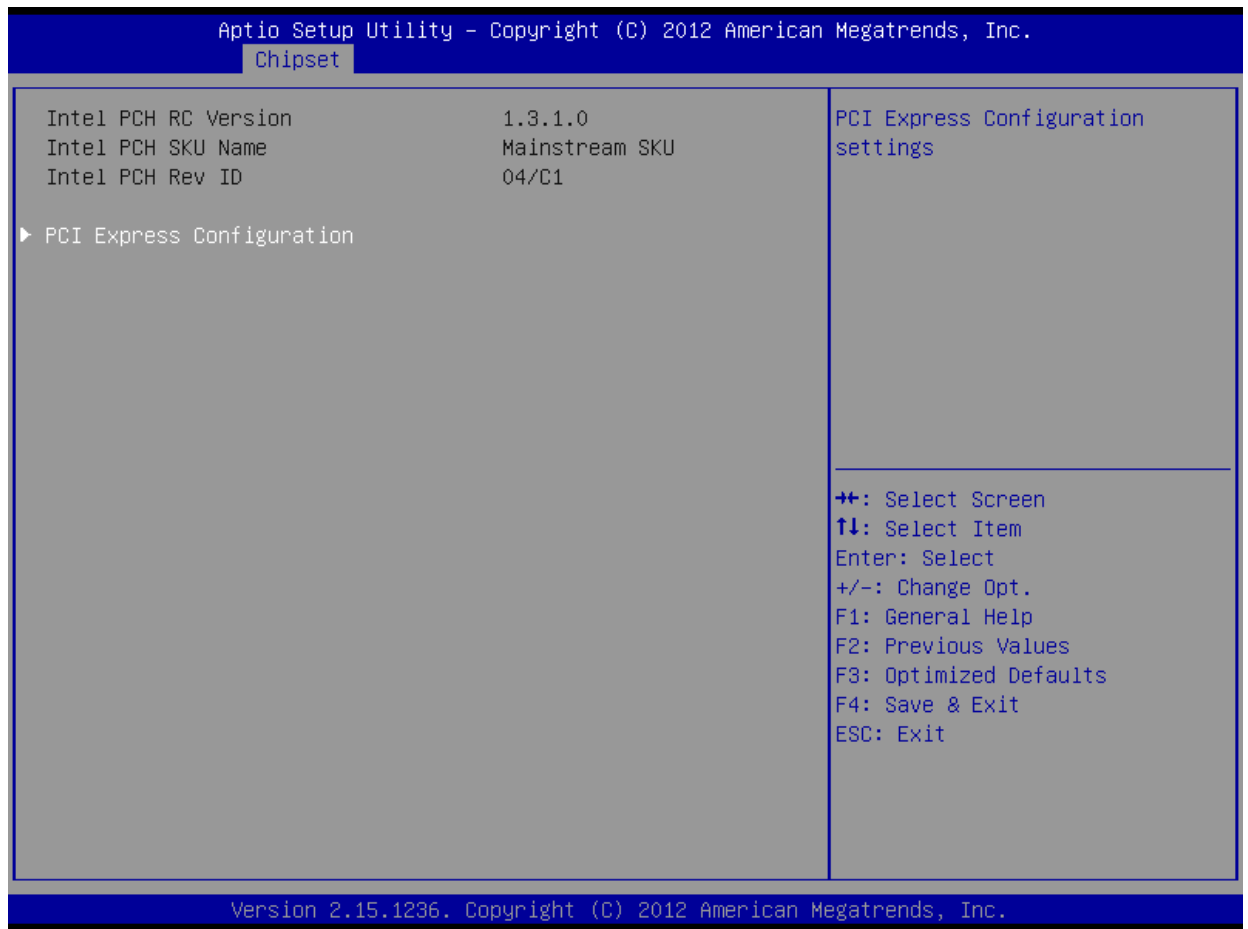
- PC Health Status: read only, including CPU/System temperature, Fan Speed, VCORE, VDIMM, +3.3V, +5V, +12V, VBAT.

## 3.4 Chipset



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

### 3.4.1 PCH-IO Configuration



- PCI Express configuration: PCI Express Root Port 1-6 Setting

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Chipset

<p>PCI Express Configuration</p> <ul style="list-style-type: none"> <li>▶ PCI Express Root Port 1</li> <li>▶ PCI Express Root Port 2</li> <li>▶ PCI Express Root Port 3</li> <li>▶ PCI Express Root Port 4</li> <li>▶ PCI Express Root Port 5</li> <li>▶ PCI Express Root Port 6</li> </ul>	<p>PCI Express Root Port 1 Settings.</p> <hr/> <p>           ++: Select Screen            ↑↓: Select Item            Enter: Select            +/-: Change Opt.            F1: General Help            F2: Previous Values            F3: Optimized Defaults            F4: Save &amp; Exit            ESC: Exit         </p>
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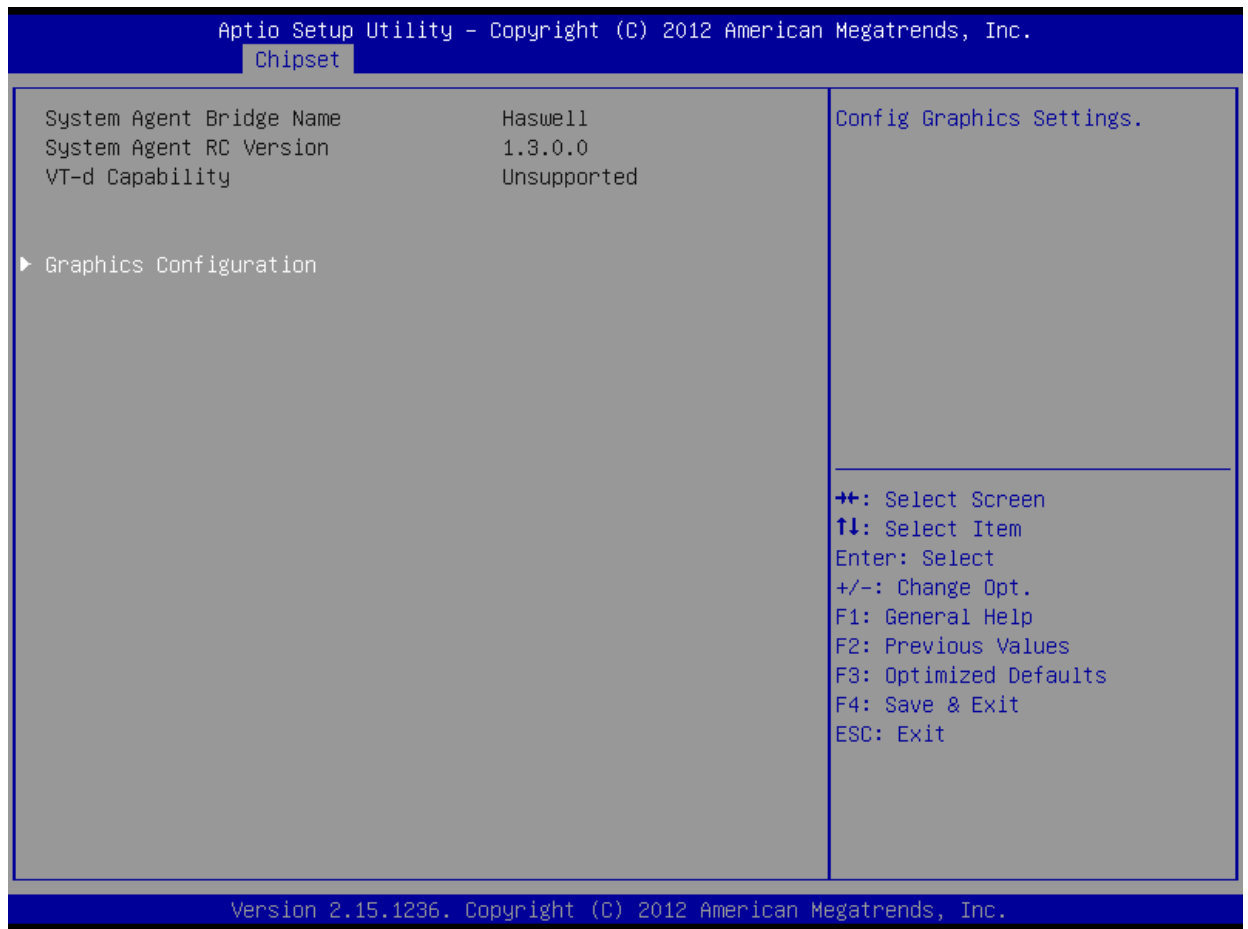
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Chipset

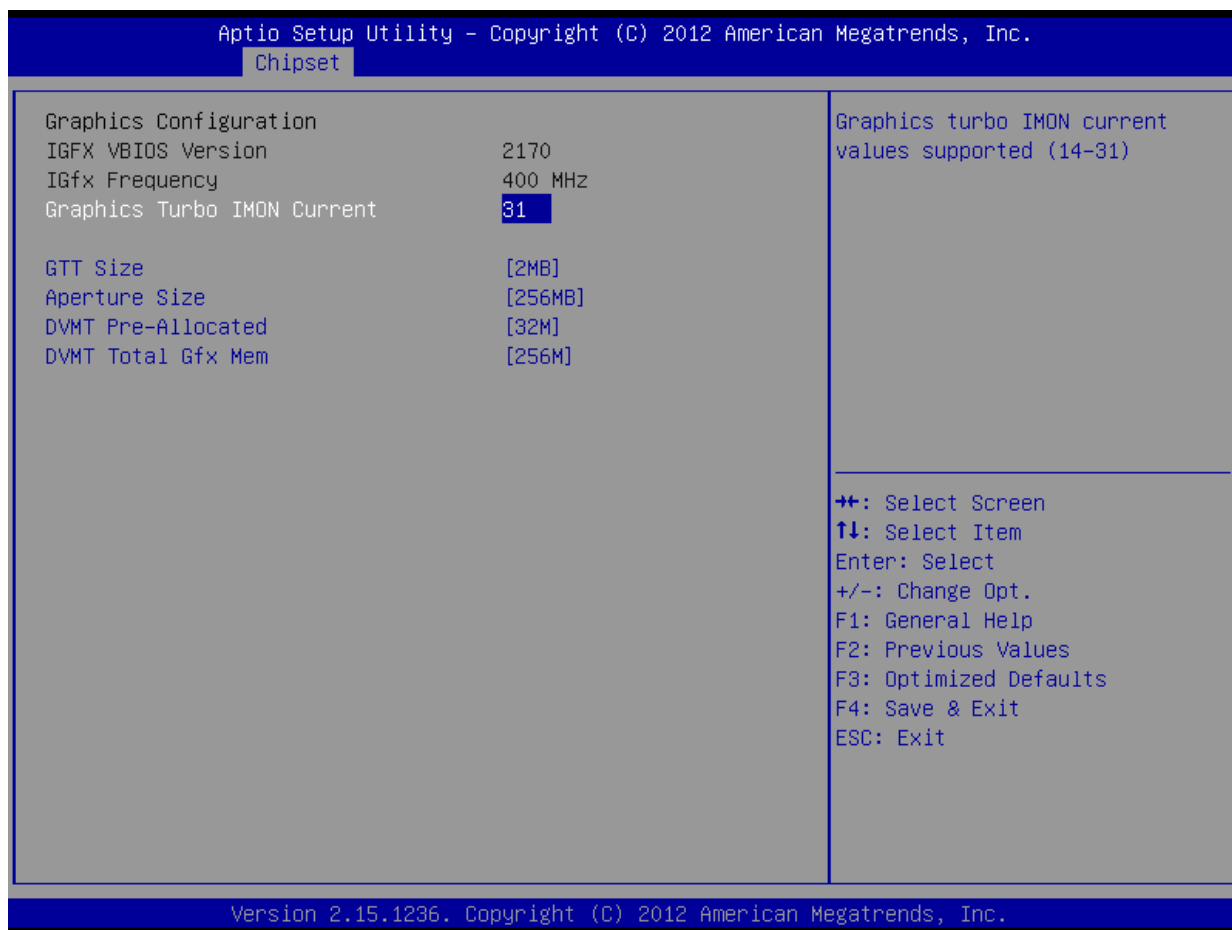
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">PCI Express Root Port 1</td> <td style="width: 20%;">[Enabled]</td> <td style="width: 40%;"></td> </tr> <tr> <td>ASPM Support</td> <td>[Auto]</td> <td></td> </tr> <tr> <td>L1 Substates</td> <td>[L1.1 &amp; L1.2]</td> <td></td> </tr> <tr> <td>  URR</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  FER</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  NFER</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  CER</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  CTO</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  SEFE</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  SENF</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  SECE</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  PME SCI</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>  Hot Plug</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>PCIe Speed</td> <td>[Auto]</td> <td></td> </tr> <tr> <td>Detect Non-Compliance Device</td> <td>[Disabled]</td> <td></td> </tr> <tr> <td>Extra Bus Reserved</td> <td>0</td> <td></td> </tr> <tr> <td>Reserved Memory</td> <td>10</td> <td></td> </tr> <tr> <td>Prefetchable Memory</td> <td>10</td> <td></td> </tr> <tr> <td>Reserved I/O</td> <td>4</td> <td></td> </tr> </table>	PCI Express Root Port 1	[Enabled]		ASPM Support	[Auto]		L1 Substates	[L1.1 & L1.2]		URR	[Disabled]		FER	[Disabled]		NFER	[Disabled]		CER	[Disabled]		CTO	[Disabled]		SEFE	[Disabled]		SENF	[Disabled]		SECE	[Disabled]		PME SCI	[Disabled]		Hot Plug	[Disabled]		PCIe Speed	[Auto]		Detect Non-Compliance Device	[Disabled]		Extra Bus Reserved	0		Reserved Memory	10		Prefetchable Memory	10		Reserved I/O	4		<p>Control the PCI Express Root Port.</p> <hr/> <p>           ++: Select Screen            ↑↓: Select Item            Enter: Select            +/-: Change Opt.            F1: General Help            F2: Previous Values            F3: Optimized Defaults            F4: Save &amp; Exit            ESC: Exit         </p>
PCI Express Root Port 1	[Enabled]																																																									
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Prefetchable Memory	10																																																									
Reserved I/O	4																																																									

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### 3.4.2 System Agent (SA) Configuration

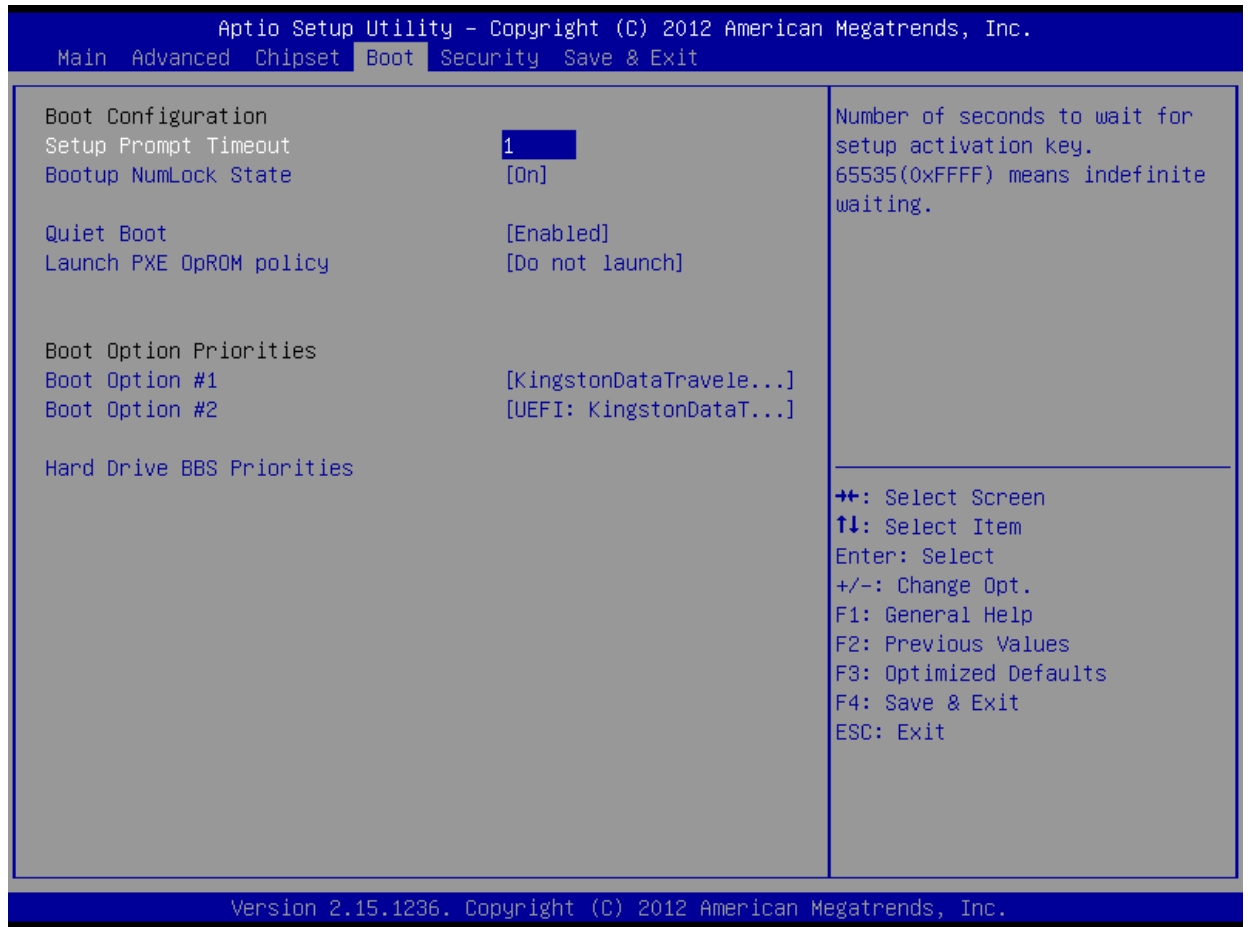


- Graphics Configuration : Graphics Device Settings.



- Graphics Turbo IMON Current: Graphics turbo IMON current values supported (14-31)
- GTT Size: Select the GTT Size that is pre-allocated to support the Internal Graphics Translation Table.
- Aperture Size: Select the size of Internal graphics translation window(GMADR), which is used to access graphics memory allocated using the graphics translation table.
- DVMT Pre-Allocated: Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- DVMT Total Gfx Mem: Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

## 3.5 Boot Menu



### 3.5.1 Boot Configuration

- Setup Prompt Timeout: Setup prompt timeout, to display waiting time.
- Boot up Num lock State: Select Power-on state for num lock, ON/OFF;
- Quiet Boot: Configure whether to display the content of customized Logo.
  1. Disabled: Displays normal POST messages;
  2. Enabled: Displays OEM Logo (no POST messages);
- Launch PXE OpROM policy: Enable or Disable Lan PXE Boot Function;

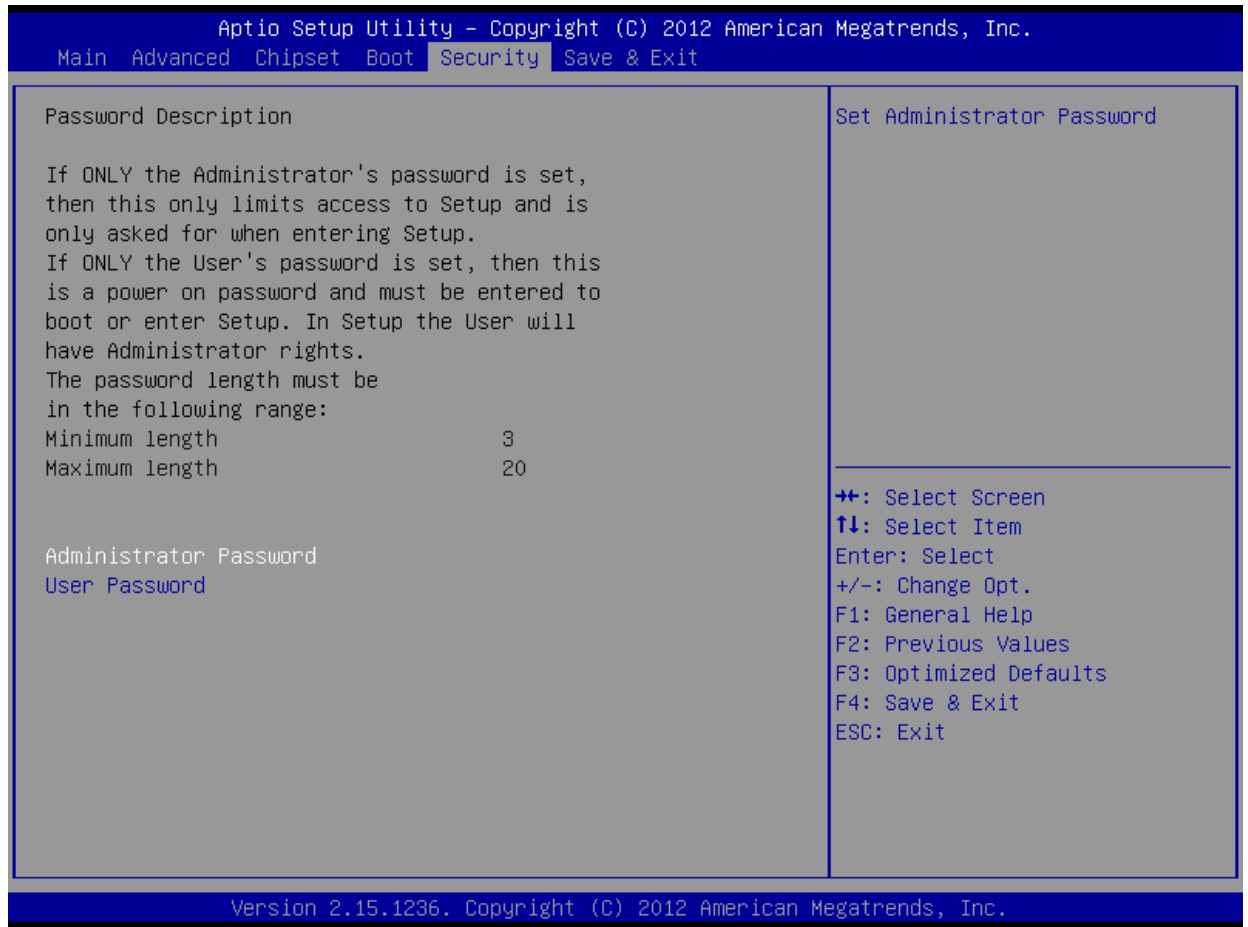
### 3.5.2 Boot Configuration

- Configure the preference of the start-up sequence for devices when the system starts up.

**Note:** When pressing <F7> while booting it is possible manually to select boot device.

1. Boot Option #1: Setting first boot device.
2. Boot Option #2: Setting second boot device.
3. Hard Drive BBS Priorities: Setting the boot priority of Hard Disk

## 3.6 Security Menu



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Main Advanced Chipset Boot Security Save & Exit

Set Administrator Password

Password Description

If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.  
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.  
The password length must be in the following range:

Minimum length	3
Maximum length	20

Administrator Password  
User Password

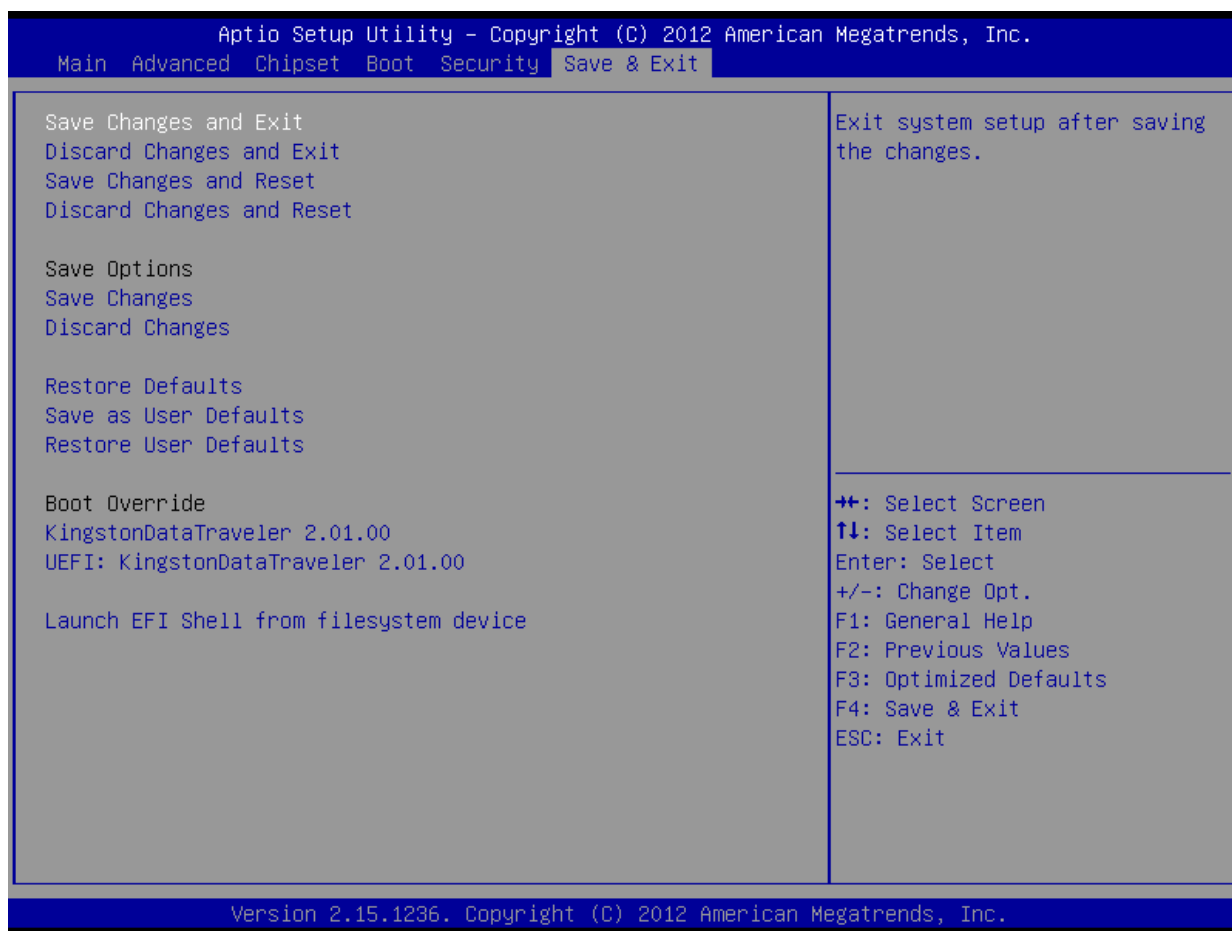
++: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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- Change Administrator / User Password:



## 3.7 Save Changes and Exit



- **Save Changes and Exit**  
This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**  
This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**  
This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**  
This item allows you to rest system setup without saving any changes.
- **Save Changes**  
This item allows you to save changes done so far to any of the options.
- **Discard Changes**  
This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**  
This item allows you to restore/load default values for all the options.
- **Save as User Defaults**  
This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**  
This item allows you to restore the user defaults to all the options.
- **Boot Override**

# Chapter 4

## S/W Introduction & Installation

---

## 4.1 S/W Service Introduction

ICS provides software services as bellow:

### 4.2 Watchdog program example

A watchdog timer (abbreviated as WDT) is a hardware device which triggers an action, e.g. rebooting the system, if the system does not reset the timer within a specific period of time. The WDT program example provides developers with functions such as starting the timer, resetting the timer, and setting the timeout value if the hardware requires customized timeout values.

Please contact our service personnel for program example source code and packaging EXE executable file.

#### 4.2.1 WDT Programming Model

You can use the tool WDT.exe under DOS to test the watchdog function.

Usage:

WDT -? : Show help screen

WDT -S Value: Set Watchdog as seconds mode, and Value is the time

WDT -M Value: Set Watchdog as minutes mode, and Value is the time Example:

WDT -S 5 : Set Watchdog as 5 seconds

WDT -M 2 : Set Watchdog as 2 minutes

### 4.3 GPIO program example

A GPIO is a pin that can be used as input or output, when used as output, you can set it output as low or high.

Please contact our service personnel for program example source code and packaging EXE executable file.

You can use the tool GPIO.exe under DOS to test whether the pin can be used as a GPIO.

Usage:

GPIO -? : Show help screen

GPIO -I Gpio Num : Set GPIO Port as input

GPIO -OH Gpio Num : Set GPIO Port output high

GPIO -OL Gpio Num : Set GPIO Port output Low

Example:

GPIO -I 1 : Set GPIO 1 as input

GPIO -OH 1 : Set GPIO 1 output high

GPIO -OL 1 : Set GPIO 1 output Low

# Chapter 5

## Index: A

---

## A.1 System I/O Ports

Addr.	Range
000-01F	DMA
020-021	Interrupt
040-043	Timer/Counter
060-06F	8042
070-07F	Real-time
080-09F	DMA
0A0-0BF	Interrupt
0C0-0DF	DMA
274-279	ISAPNP read data port
2F8-2FF	COM2
3B0-3DF	VgaSave
3F8-3FF	COM1
400-4D1	Interrupt
500-77F	Motherboard
A79-A79	ISAPNP read data port
B78-B7F	Motherboard

**Table 5.1: System I/O Ports**

## A.2 1st MB Memory Map

Addr. Range (Hex)	Device
00000000h - 00003FFFh	Motherboard resources
000A0000h - FEBFFFFFFh	PCI bus
FEC00000h - FEC00FFFh	Motherboard resources
FED00000h - FED003FFFh	High precision event timer
FED14000h - FED19FFFh	System board
FED1C000h - FEE00FFFh	Motherboard resources
FF000000h - FFFFFFFFh	Intel 82802 firmware Hub Device

**Table 5.2: 1st MB Memory Map**

## A.3 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Available
3	Available
4	Direct memory access controller
5	Available
6	Available
7	Available

Table 5.3: DMA Channel Assignments

## A.4 Interrupt Assignments

Interrupt#	Interrupt source
IRQ0	System timer
IRQ1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ3	COM2
IRQ4	COM1
IRQ8	System CMOS/real time clock
IRQ9	Microsoft ACPI-Compliant System
IRQ11	SMBUS Controller
IRQ16	Network /USB
IRQ17	Network
IRQ18	USB
IRQ19	SATA
IRQ22	HDA
IRQ23	USB

Table 5.4: Interrupt Assignments



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