



®

AXIOMTEK

eBOX565-500-FL Series

Embedded System

User's Manual



Disclaimers

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Safety Precautions

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

1. The eBOX565-500-FL does not come with an operating system which must be loaded first before installation of any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing any internal components. Use a wrist grounding strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the eBOX565-500-FL prior to making any installation. Be sure both the system and all external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the eBOX565-500-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting it to any power outlet.
5. Turn Off system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave equipment in an uncontrolled environment where the storage temperature is below -40°C or above 80°C as it may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
 - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help discharge any static electricity on human 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 ingress of water: IP40
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
4. Mode of operation: Continuous

General Cleaning Tips

Please keep the following precautions in mind while understanding the details fully before and during any cleaning of the computer and any components within.

A piece of dry cloth is ideal to clean the device.

1. Be cautious of any tiny removable components when using a vacuum cleaner to absorb dirt on the floor.
2. Turn the system off before clean up the computer or any components within.
3. Avoid dropping any components inside the computer or getting circuit board damp or wet.
4. For cleaning, be cautious of all kinds of cleaning solvents or chemicals which may cause allergy to certain individuals.
5. Keep foods, drinks or cigarettes away from the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning computer and peripherals, users can also use house hold items accordingly for cleaning. Listed below are items available for cleaning computer or computer peripherals.

Pay special attention to components requiring designated products for cleaning as mentioned below.

- 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, it is recommended to use a piece of cloth.
- Water or rubbing alcohol: A piece of cloth may be somewhat moistened with water or rubbing alcohol before being rubbed on the computer. Unknown solvents may be harmful to plastic parts.
- Absorb dust, dirt, hair, cigarette and other particles outside of a computer can be one of the best methods of cleaning a computer. Over time these items may restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are applicable to reach areas in keyboard, mouse and other areas.
- Foam swabs: If possible, it is better to use lint free swabs such as foam swabs.



【Note】 : *It is strongly recommended that customer should shut down the system before 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 devices;
5. Pull out power cable.

Scrap Computer Recycling

Please inform the nearest Axiomtek distributor as soon as possible for suitable solutions in case computers require maintenance or repair; or for recycling in case computers are out of order.

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SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the eBOX565-500-FL. The Section 1 includes the following sections:

- General Description
- System Specifications
- Dimensions
- I/O Outlets
- Packing List
- Model List

1.1 General Description

The eBOX565-500-FL is an embedded system that supports Intel® Core™ i5-6300U 2.4 GHz/Celeron®3955U 2.0 GHz onboard to support Windows 10, and Linux, suitable for the most enduring operation.

It features fan less and compact size design with full feature I/O, one 260-pin unbuffered SODIMM socket for one channel DDR4-2133 MHz memory, and enhanced system dependability by built-in Watchdog Timer.

- **Features**

1. 6th generation Intel® Core™ i5-6300U 2.4 GHz/Celeron® 3955U 2.0 GHz
2. Compact size with 9~36VDC wide range input
3. High performance 260-pin DDR4 SO-DIMM max. up to 16 GB
4. Supports 2 HDMI, 2 COM and 4 USB 3.0
5. Supports Jumbo Frame (9.5K),WoL, PXE and Teaming

- **Reliable and Stable Design**
The embedded system supports 6th generation Intel® Core™ i5-6300U/Celeron® 3955U, high flexibility and multi-functional design is the best solution for any industrial field applications.
- **Embedded O.S. Supported**
The eBOX565-500-FL supports not only Windows 7, Windows 10 but also embedded OS, such as Windows 7 Embedded, Windows 10 Embedded and Linux.
- **Various Storage devices supported**
For storage device, the eBOX565-500-FL supports one 2.5" SATA storage drive bay and one mSATA device.

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Intel® Core™ i5-6300U 2.4 GHz/Celeron® 3955U 2.0 GHz
- **Chipset**
 - Intel® Skylake ULT SoC
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
 - One 260-pin unbuffered DDR4-2133 MHz SO-DIMM socket, max. up to 16 GB

1.2.2 I/O System

- One jumper-less RS-232/422/485 9-pin D-Sub male connector (COM1)
- One RS-232 9-pin D-Sub male connector (COM2)
- Two HDMI for display (FHD)
- Two RJ-45 connectors for 10/100/1000 Base-T Ethernet ports (i210AT & i219LM)
- Four USB 3.0 connectors
- One PCI Express Mini Card Slots w/ mSATA supported.
- One Reset switch
- One ATX Power switch
- Two SMA type connector opening for Antenna
- One 9~36VDC power input connector
- Two Indicators LED (System Power, HDD Active)
- One AT/ATX Quick switch

1.2.3 System Specification

- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
 - Input : 9~36VDC
- **Operation Temperature**
 - -10°C~+50°C (-14°F~+122°F), with W.T. SSD & Memory
- **Storage Temperature**
 - -40°C ~ 80°C (-40 °F ~ 176°F)
- **Humidity**
 - 10% ~ 90% (non-condensation)
- **Vibration Endurance**
 - 3Grm w/ SSD (5-500Hz, X, Y, Z directions)
- **Weight**
 - 1.074 kg (1.76lb) without package
 - 1.67 kg (3.68lb) with package
- **Dimensions**
 - 141.6 mm(5.57") (W) x 106 mm(4.17") (D) x 77 mm(3.03") (H)

1.2.4 Driver CD Content

- **Driver**
 - Chipset
 - Ethernet
 - Graphic
 - USB 3.0 hot fix for Windows 8.x
 - ME
- **Manual**
 - User Manual
 - Quick Manual

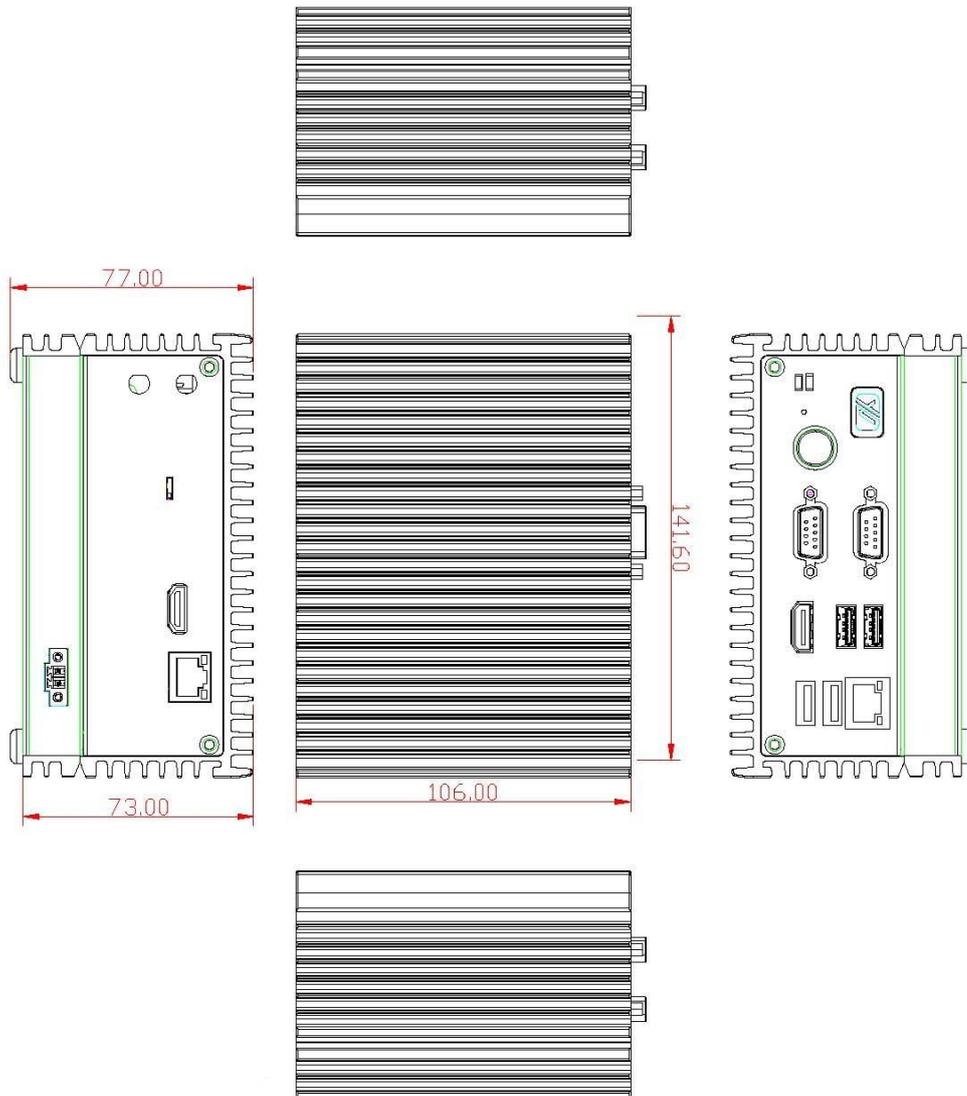


【Note】 : *All specifications and images are subject to change without notice.*

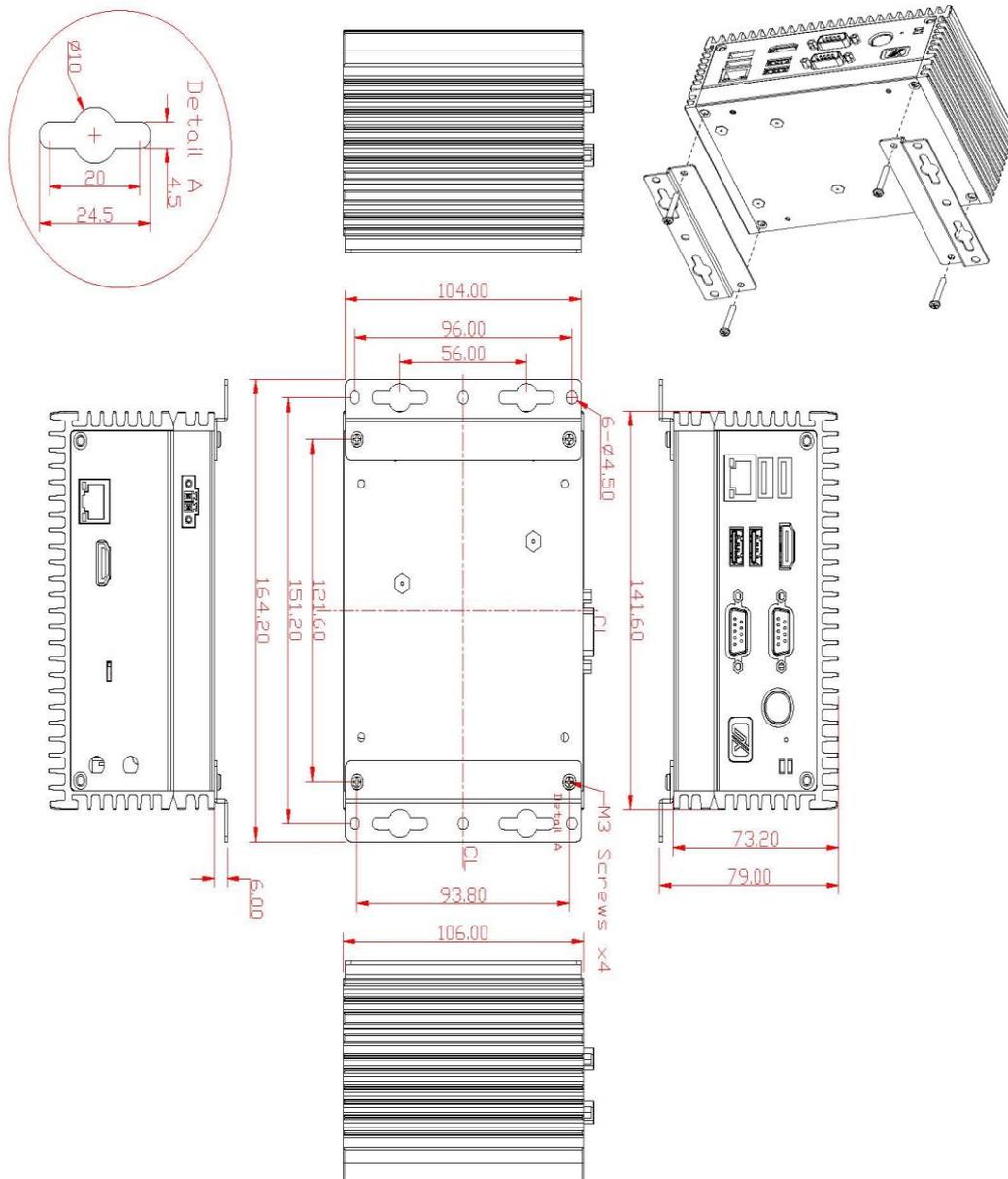
1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX565-500-FL.

1.3.1 System Dimensions



1.3.2 Wall mount Bracket Dimensions



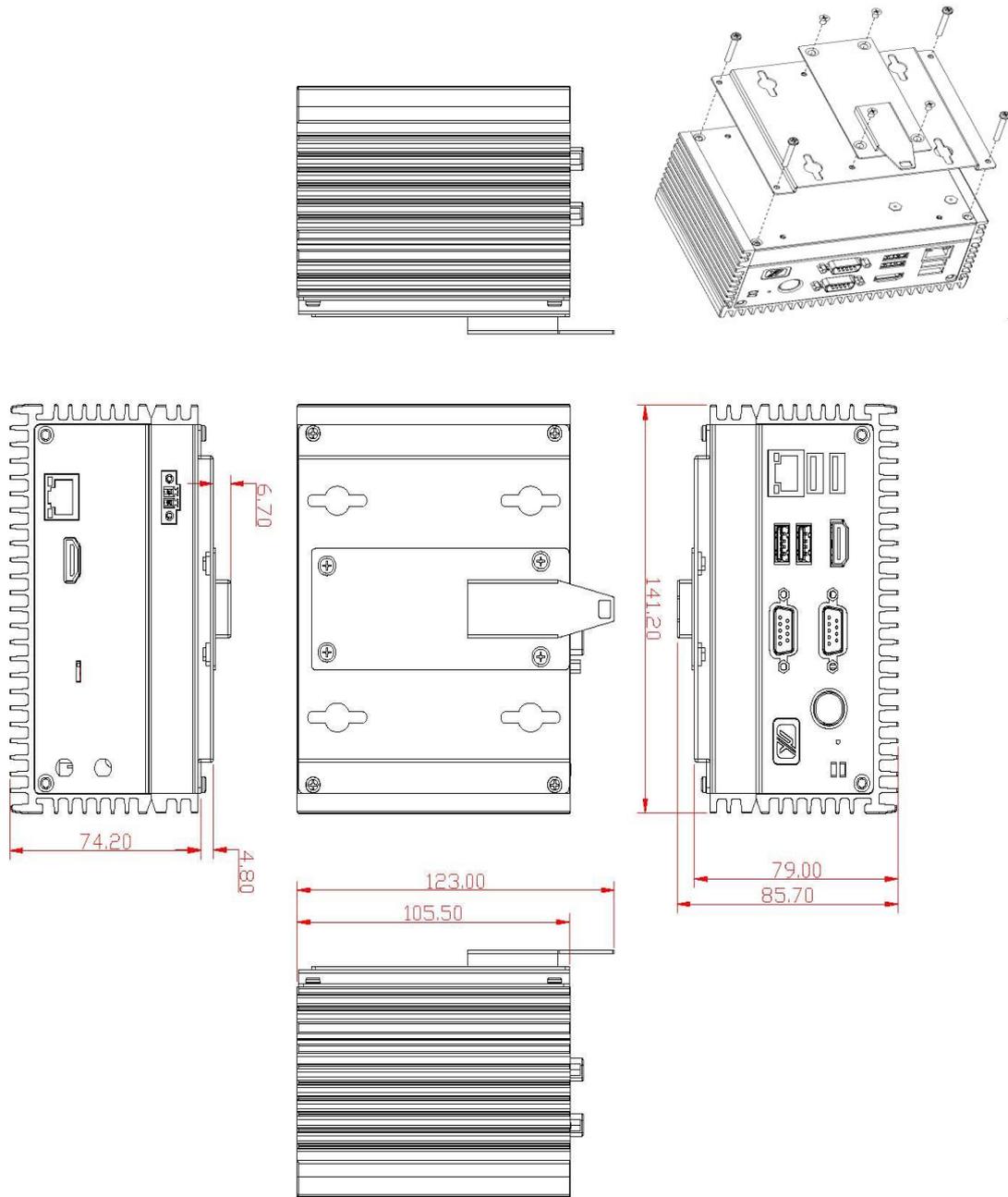
Instruction

Step 1: Screw the two pieces of wall-mount kits to the bottom plate of the device. Total four screws (**metric 3 x25**) are required.

Step 2: Use the device, with wall mount plate attached, as a guide to mark the correct locations of the four screws.

Step 3: Insert a tapping-screw (**thread diameter less than 4mm**) head through middle of the keyhole-shaped aperture on the plate, and then slide the device downwards. Tighten the screw head for added stability.

1.3.3 Din-rail mount Bracket Dimensions



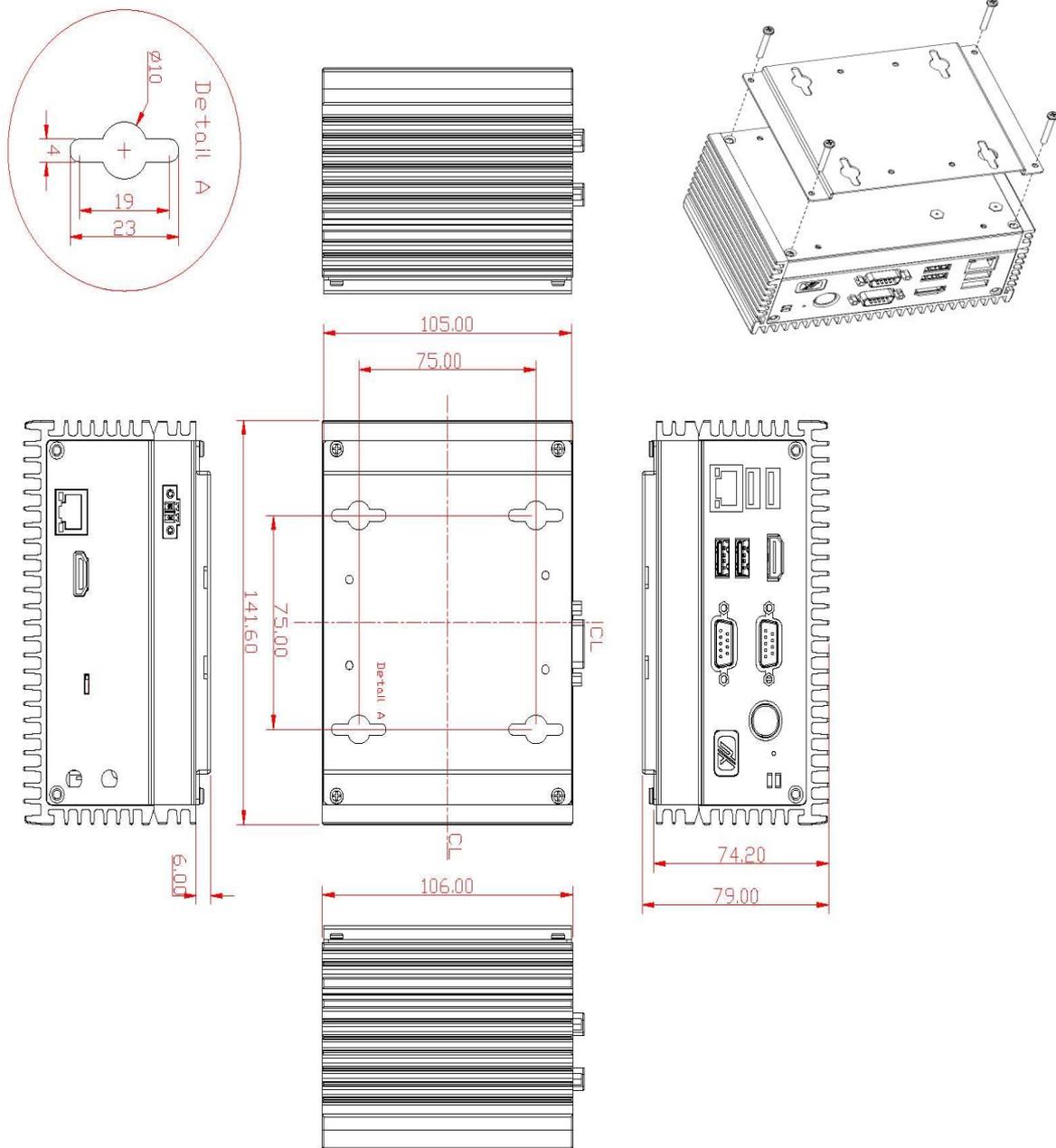
Instruction

Step 1: Screw the Din rail mount Bracket to the bottom plate of the device. Total of four screws (**metric 3 x25**) are required.

Step 2: Screw the Din rail bracket (722C9000300E) and the Din rail mount bracket together. Total four screws (Flat Head **M3 x4**) are required.

Step 3: Users can install the eBOX565 in din-rail bracket through din-rail bracket kit.

1.3.4 VESA mount Bracket Dimensions



Instruction

Step 1: Please refer to above photo to screw the VESA mount bracket kit with the bottom plate of the device. Total four screws (**metric 3 x25**) are required.

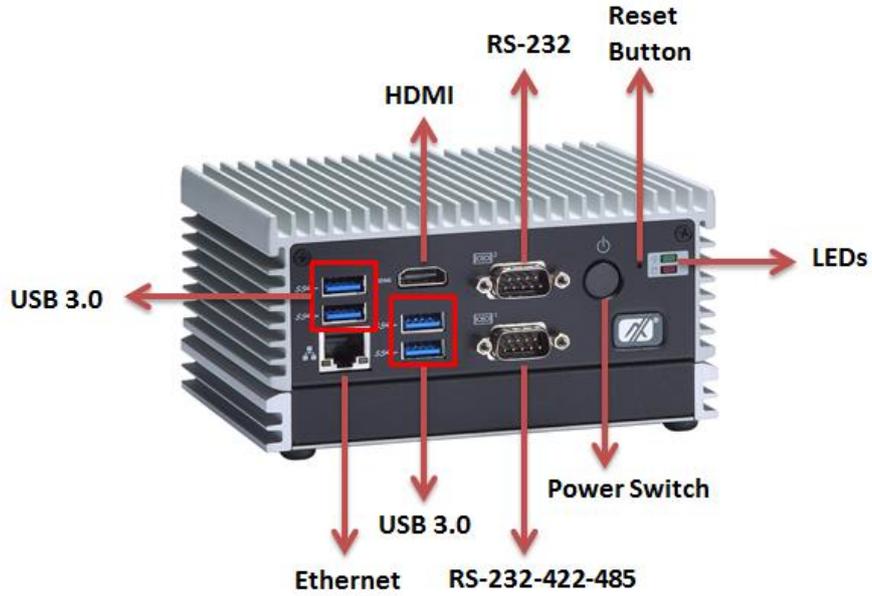
Step 2: Insert four screws into the VESA hole of monitor and reserved a gap about **1.2~1.5mm**.

Step 3: Users can hang the eBOX565 through VESA bracket on the monitor.

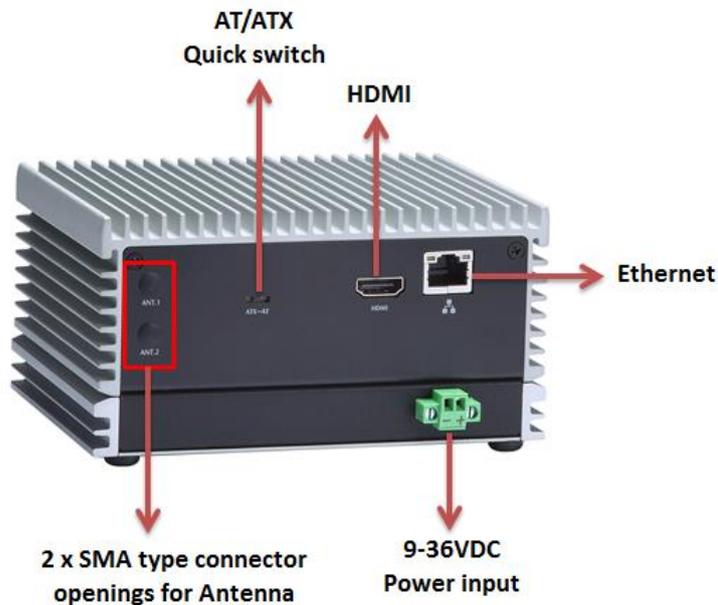
1.4 I/O Outlets

The following figures show I/O outlets on front of the eBOX565-500-FL.

- **Front View**



- **Rear View**



1.5 Packing List

The eBOX565-500-FL comes with the following bundle package:

- eBOX565-500-FL System Unit x 1
- eBOX565-500-FL Quick Installation Guide x 1
- DVD x 1 (For Driver and Manual)
- Screws Pack x 1
- Pre-installed Foot pad x 4
- 2-pin Terminal block x 1

1.6 Model List

eBOX565-500-FL-6300U	Fanless embedded system with 6th generation Intel® Core™ i5-6300U Skylake ULT processor, 2 HDMI, 2 GbE, 4 USB 3.0, 2 COM, PCIe Mini Card and 9~36VDC PWR input
eBOX565-500-FL-3955U	Fanless embedded system with 6th generation Intel® Celeron® 3955U Skylake ULT processor, 2 HDMI, 2 GbE, 4 USB 3.0, 2 COM, PCIe Mini Card and 9~36VDC PWR input

Please contact Axiomtek's distributors immediately in case any abovementioned items are missing.

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SECTION 2 HARDWARE INSTALLATION

The eBOX565-500-FL is convenient for your various hardware configurations, such as HDD (Hard Disk Drive), SSD (Solid State Drive), SO-DIMM or PCI Express Mini Card modules. The section 2 will show how to install the hardware.

2.1 Installation of 2.5" SATA Device

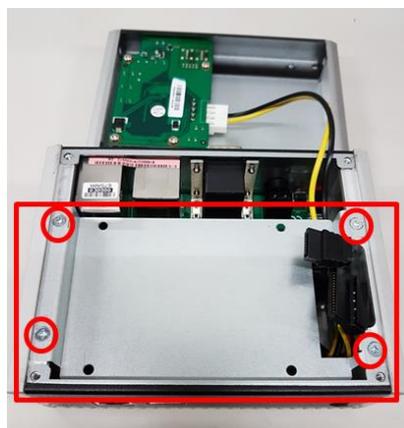
Step 1 Turn off the system, and unplug the power adaptor.

Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.



Step 3 Remove the bottom cover.

Step 4 Locate SSD/HDD within the red line marked.



Step 5 Please prepare the following items to assemble SSD/HDD.



Step 6 Fasten four screws to fix HDD/SSD.



Step 7 Connected the SATA cable and Power cable.



Step 8 Fasten screws of HDD bracket to complete the SSD/HDD installation.



Step 9 Recover and fasten all screws of the bottom cover

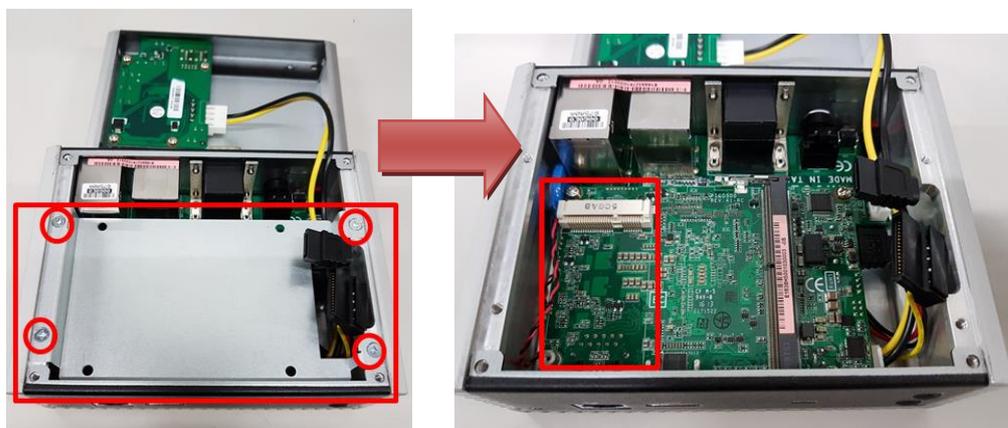
2.2 Installation of Express Mini Card

Step 1 Turn off the system, and unplug the power adaptor.

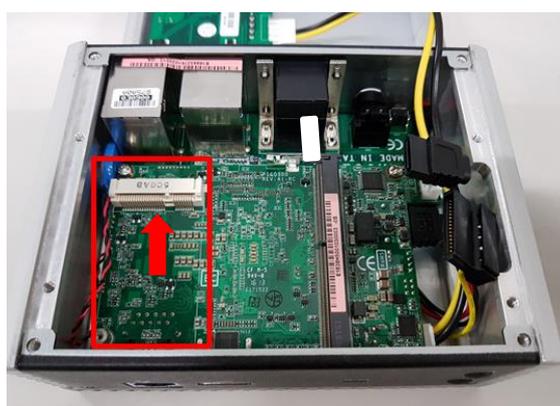
Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.



Step 3 Loosen the screws to remove SSD/HDD bracket and then located the Mini PCIe slot.



Step 4 Please follow your requirement to connect PCI Express Mini Card module, EX: WIFI, mSATA and GPS



Step 5 Slide Mini Card into Mini Card slot with caution, and fasten screw of Express Mini Card.



Step 6 Assembly the bottom cover back and fasten all screws.

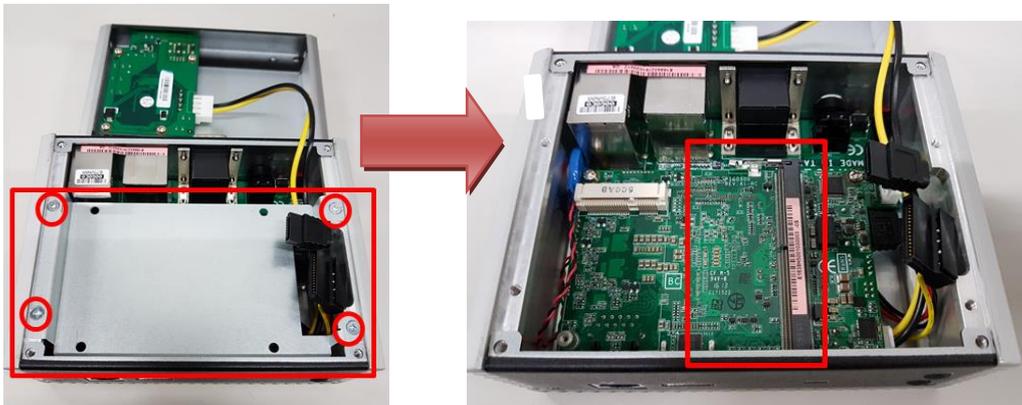
2.3 Installation of SO-DIMM Memory

Step 1 Turn off the system, and unplug the power adaptor.

Step 2 Turn the system upside down to locate screws at the bottom, loosen screws.



Step 3 Loosen the screws to remove SSD/HDD bracket then a SO-DIMM socket on main board is visible.



Step 4 Locate the memory module, insert a gold colored contact into the socket and push the module two end latches till locked.



Step 5 Put the bottom cover and fasten four screws back onto the system.

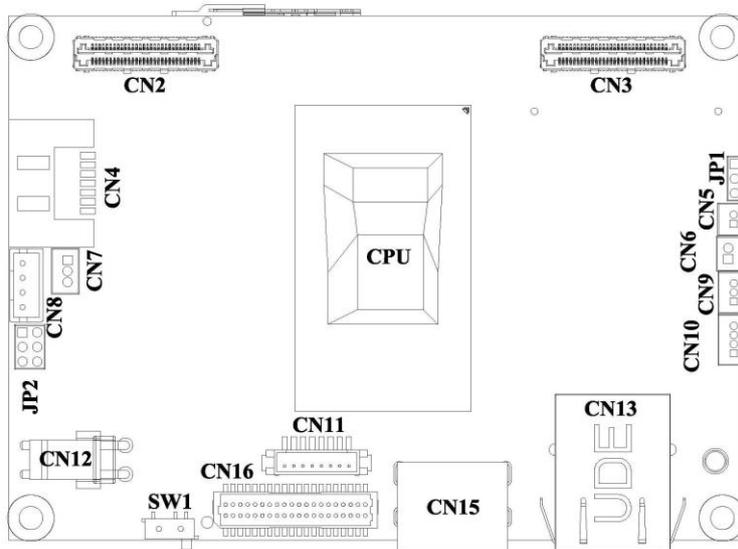
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SECTION 3 JUMPER & CONNECTOR SETTINGS

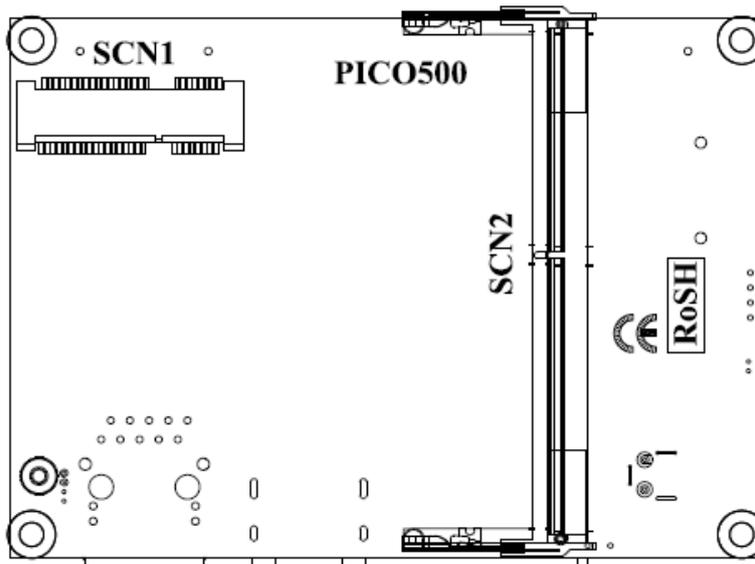
Proper jumper settings configure the eBOX565-500-FL to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

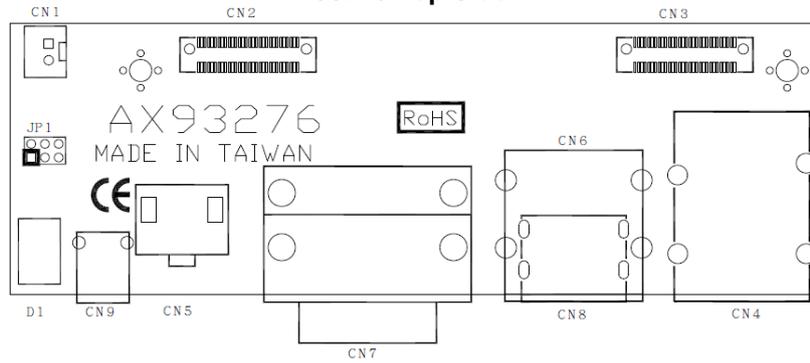
PICO500 Top Side



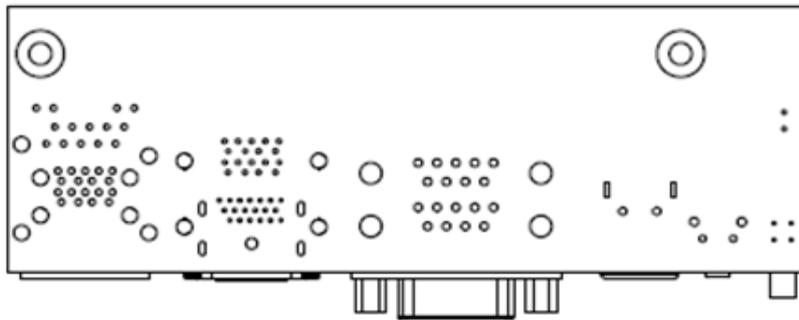
PICO500 Bottom Side



AX93276 Top Side



AX93276 Bottom Side



【Note】 : *It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs.*

Any modifications without instructions might cause system failure.

3.2 Summary of Jumper Settings

Proper jumper settings configure the eBOX565-500-FL to meet various application purposes. A table of all jumpers and their default settings is listed below.

PICO500:

Jumper	Function/Default Setting	Jumper Setting
JP1	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
JP2	LVDS Voltage Selection Default: +3.3V Level	1-2 Close
SW1	ATX/ AT quick switch	Default: ATX Mode

AX93276 I/O Board:

Jumper	Function/Default Setting	Jumper Setting	
JP1	COM1 Data/Power Selection Default: RS-232 Data	CN7B Pin 1: DCD	3-5 Close
		CN7B Pin 9: RI	4-6 Close



【Note】 : How to setup Jumpers

That a cap on a jumper is to “close” the jumper, whereas that offs a jumper is to “open” the jumper.



[Open]



[Closed]



[Pin1-2 Closed]

3.2.1 Restore BIOS Optimal Defaults (JP1)

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

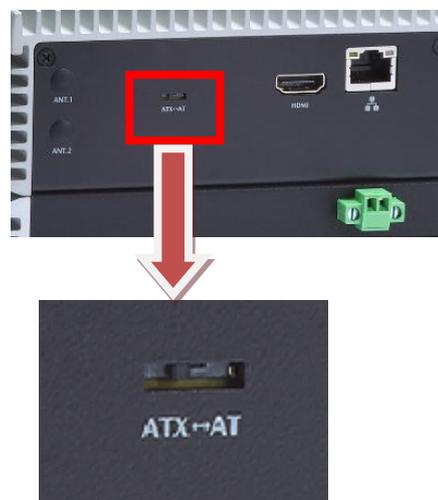
Functions	Settings
Normal (Default)	1-2
Restore BIOS optimal defaults	2-3



3.2.2 ATX/AT Quick Switch

If SW1 is enabled for power input, the system will be automatically power on without pressing soft power button. If SW1 is disabled for power input, it is necessary to manually press soft power button to power on the system.

Functions
AT Mode
ATX Mode (Default)



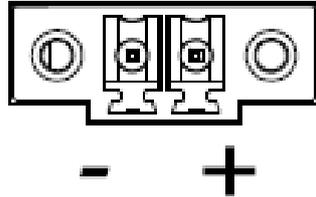
3.3 Connectors

Connectors connect the board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table shows all connectors and button on the **eBOX565-500-FL** Series.

External Connectors / Buttons	Section
Phoenix Power Input	3.3.1
LAN Port	3.3.2
HDMI Connector	3.3.3
COM Serial Port Connector	3.3.4
USB 3.0 Connector	3.3.5
System Power Button	3.3.6
System Reset Button	3.3.7
PCI Express Mini Card interface	3.3.8
Power and HDD LED Indicator	3.3.9

3.3.1 Power Input-Phoenix type (CN12)

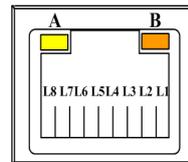
The eBOX565-500-FL equips with a phoenix power connector. It adopts 9-36VDC, please follow the signs on power connector to connect DC power source.



3.3.2 Ethernet Port (LAN1/LAN2)

The board has one RJ-45 Ethernet connector. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

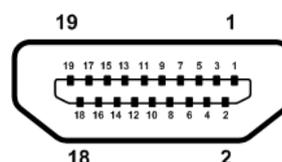
Pins	Signals	Pins	Signals
L1	MDI0P	L5	MDI2P
L2	MDI0N	L6	MDI2N
L3	MDI1P	L7	MDI3P
L4	MDI1N	L8	MDI3N
A	Active LED (Yellow)		
B	100 LAN LED (Green) / 1000 LAN LED (Orange)		



3.3.3 HDMI Connector (CN15/CN8)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pins	Signals	Pins	Signals
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT_Clock+
11	GND	12	HDMI OUT_Clock-
13	N.C.	14	N.C.
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		

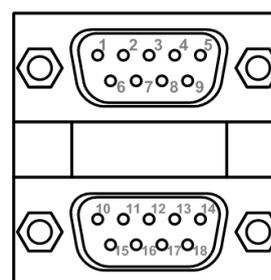


3.3.4 COM Serial Port Connector

The system has two serial ports. COM1 is RS-232/422/485 ports and COM2 is RS-232, please refer to Section 4 for the detail of BIOS setting. The lower connector (CN7A) is for COM2, the upper connector (CN7B) is for COM1.

CN7B Pins	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	No use
4	DTR, Data Terminal Ready	RX-	No use
5	GND, Ground	No use	No use
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use

CN7B



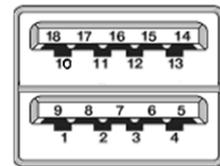
CN7A

CN7A Pins	Signals
10	Data Carrier Detect (DCD)
11	Receive Data (RXD)
12	Transmit Data (TXD)
13	Data Terminal Ready (DTR)
14	Ground (GND)
15	Data Set Ready (DSR)
16	Request to Send (RTS)
17	Clear to Send (CTS)
18	Ring Indicator (RI)

3.3.5 USB 3.0 Connector

The Universal Serial Bus connectors are compliant with USB 3.0 (5Gb/s), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

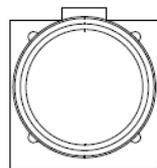
Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data2-	11	USB_Data3-
3	USB_Data2+	12	USB_Data3+
4	GND	13	GND
5	SSRX2-	14	SSRX3-
6	SSRX2+	15	SSRX3+
7	GND	16	GND
8	SSTX2-	17	SSTX3-
9	SSTX2+	18	SSTX3+



3.3.6 System Power Switch

This button is for turning on/off the system power.

Function	Description
On	Turn on/off system
Off	Keep system status



3.3.7 System Reset Switch

This button reboots your computer without turning off the power supply. It is a better way to reboot your system for a longer life of the system power supply.

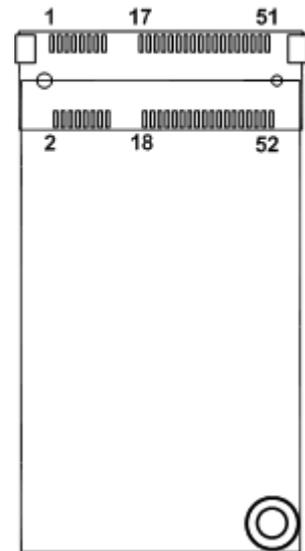
Function	Description
On	Reset system
Off	Keep system status



3.3.8 Express Mini Card Slot

This is a PCI-Express Mini Card connector on the bottom side supporting PCI-Express x1 link and USB 2.0 link. It complies with PCI-Express Mini Card Spec. V1.2. A PCI-Express Mini Card can be applied to either PCI-Express, USB 2.0 or SATA (mSATA). To enable or disable mSATA support, please refer to BIOS setting in section 4.4. The default setting is PCI-Express.

Pins	Signals	Pins	Signals
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	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN3/SATA_RXP	24	+3.3VSB
25	PE_RXP3/SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3/SATA_TXN	32	SMB_DATA
33	PE_TXP3/SATA_TXP	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB

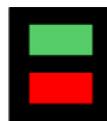


3.3.9 Power and HDD LED Indicator

The Red LED is linked to Hard Disk Drive (HDD) activity signal. LED flashes every time HDD is accessed.

The power LED (green) lights up and will remain steady while the system is powered on.

LED Color	Description
Green	Power on/off
Red	Hard disk drive activity



SECTION 4

BIOS SETUP UTILITY

This section provides users with detailed description how to set up basic system configuration through the 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 press the key, the main BIOS setup menu displays. Users can access to other setup screens, such as the Advanced and Chipset menus, from the main BIOS setup menu.

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

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

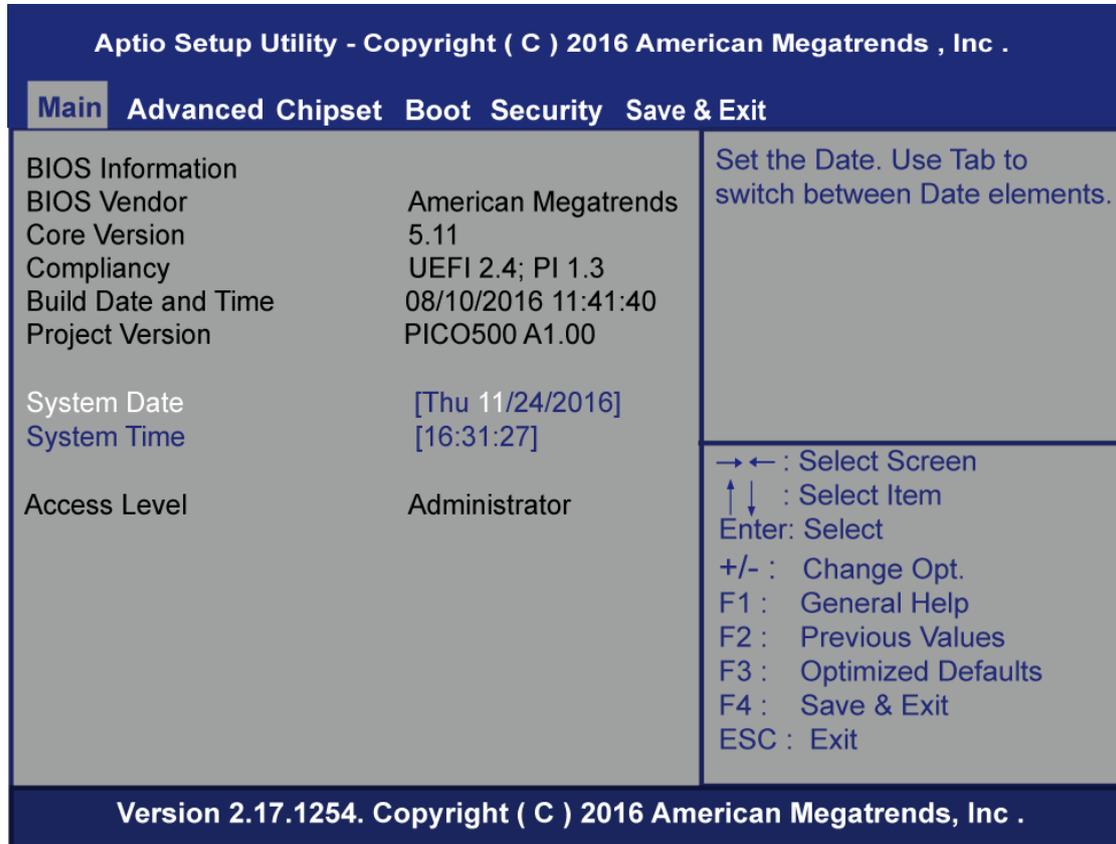


【Note】 : *Some of the navigation keys differ from one screen to another.*

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

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.



BIOS Information/Version

Display the auto-detected BIOS detail information.

System Date/Time

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

Access Level

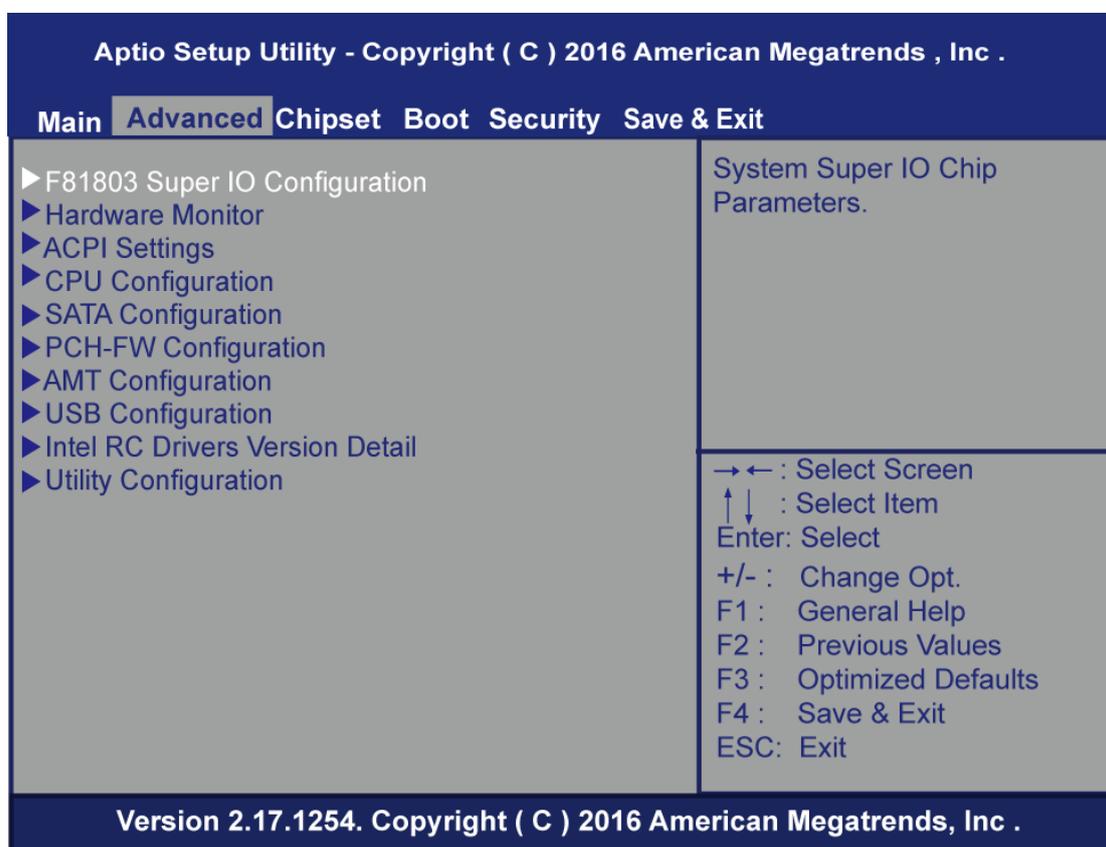
Display the access level of current user.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

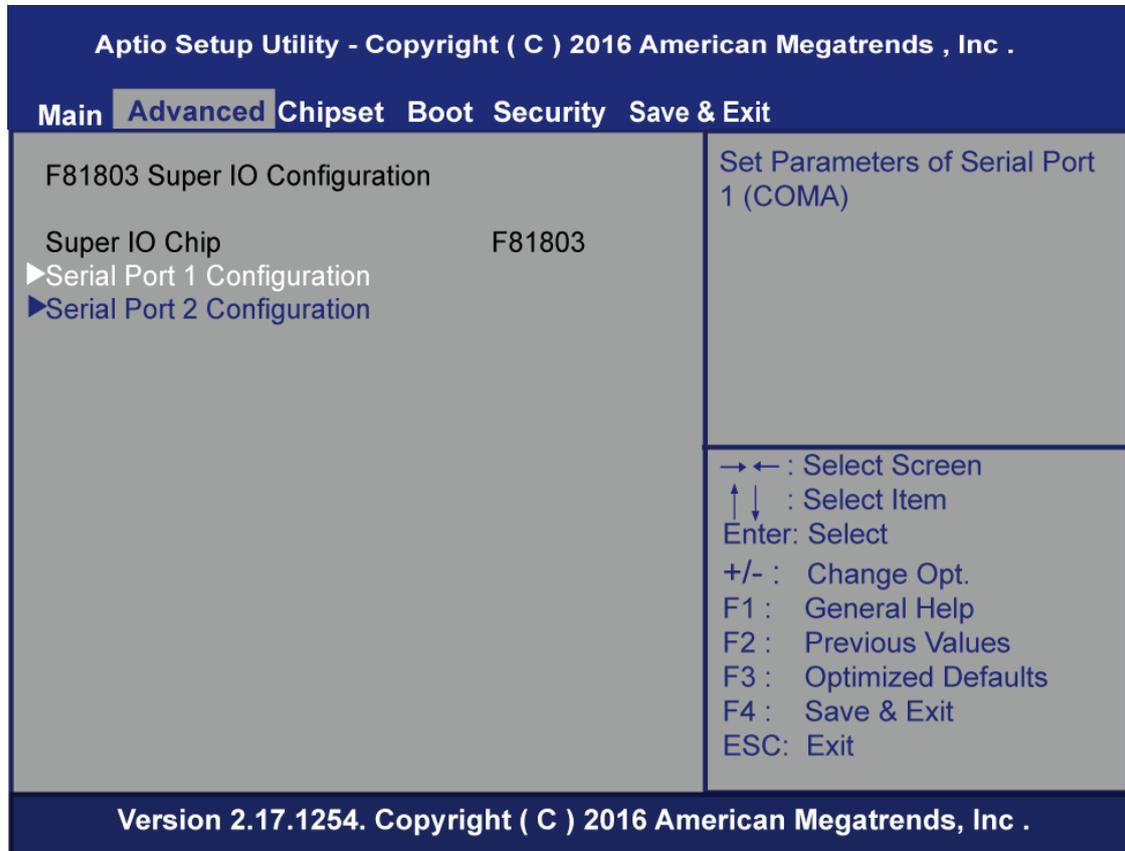
- ▶ F81803 Super IO Configuration
- ▶ Hardware monitor
- ▶ ACPI Settings
- ▶ CPU Configurations
- ▶ SATA Configurations
- ▶ PCH-FW Configurations
- ▶ AMT Configurations
- ▶ USB Configurations
- ▶ Intel RC Drivers Version Details
- ▶ Utility Configurations

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



- **F81803 Super IO Configuration**

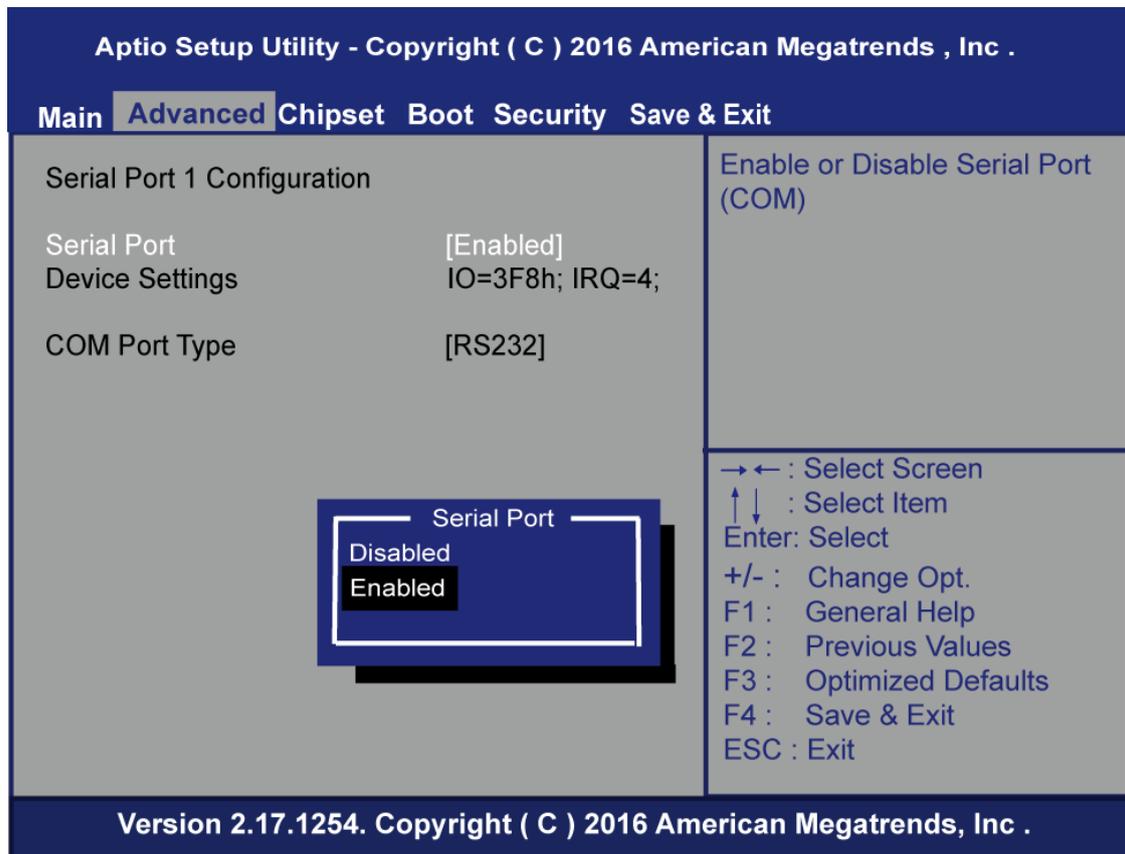
Users can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with “▶”, please press for more options.



Serial Port 1~2 Configuration

Use these items to set parameters of serial port 1~2 when I/O board is installed.

- Serial Port 1



Serial Port

- Disabled: If I/O board is not installed.
- Enabled: If I/O board is installed, this option will be enabled automatically. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4, see image below.

Aptio Setup Utility - Copyright (C) 2016 American Megatrends , Inc .

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

Serial Port 1 Configuration

Serial Port [Enabled]
Device Settings IO=3F8h; IRQ=4;
COM Port Type [RS232]

COM Port Type: RS232, RS422, RS485

Serial Port
RS232
RS422
RS485

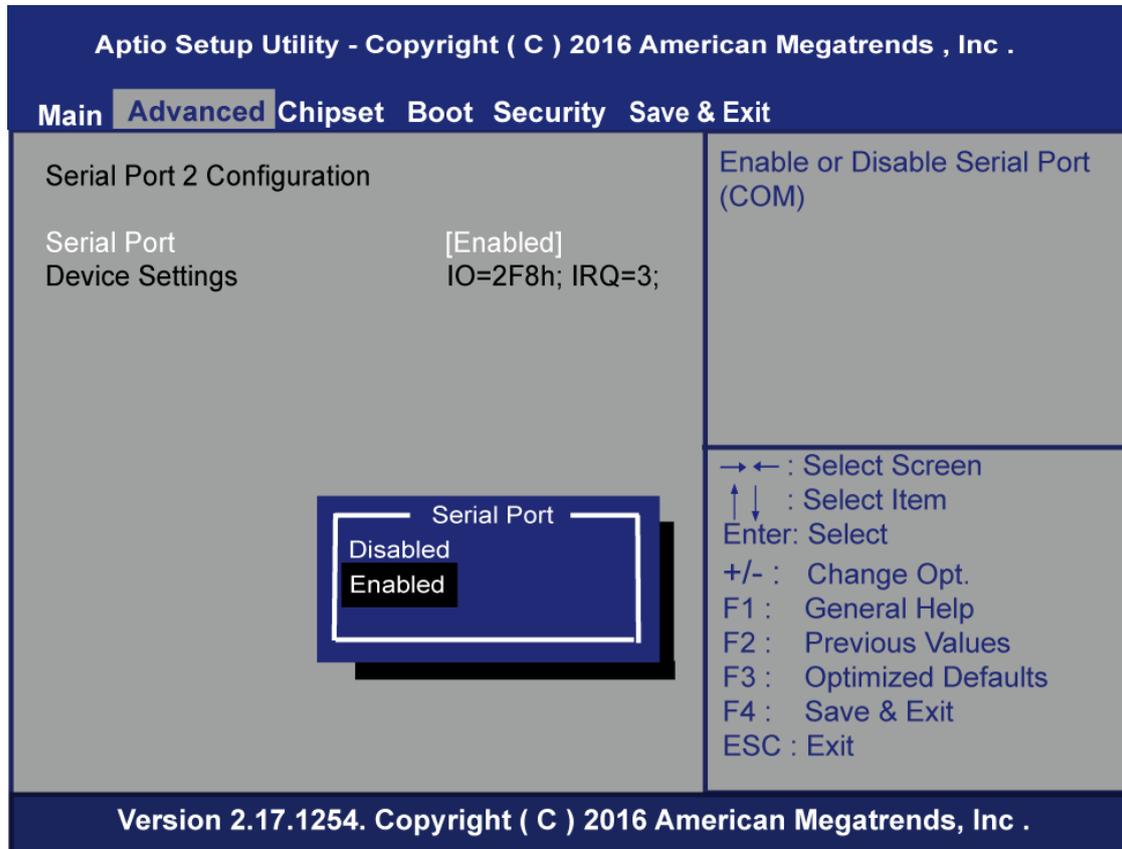
→ ← : Select Screen
↑ ↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit

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COM Port Type

Use this option to set RS-232/422/485 mode for COM1 port on I/O board (see Appendix A for details of I/O Boards).

- Serial Port 2

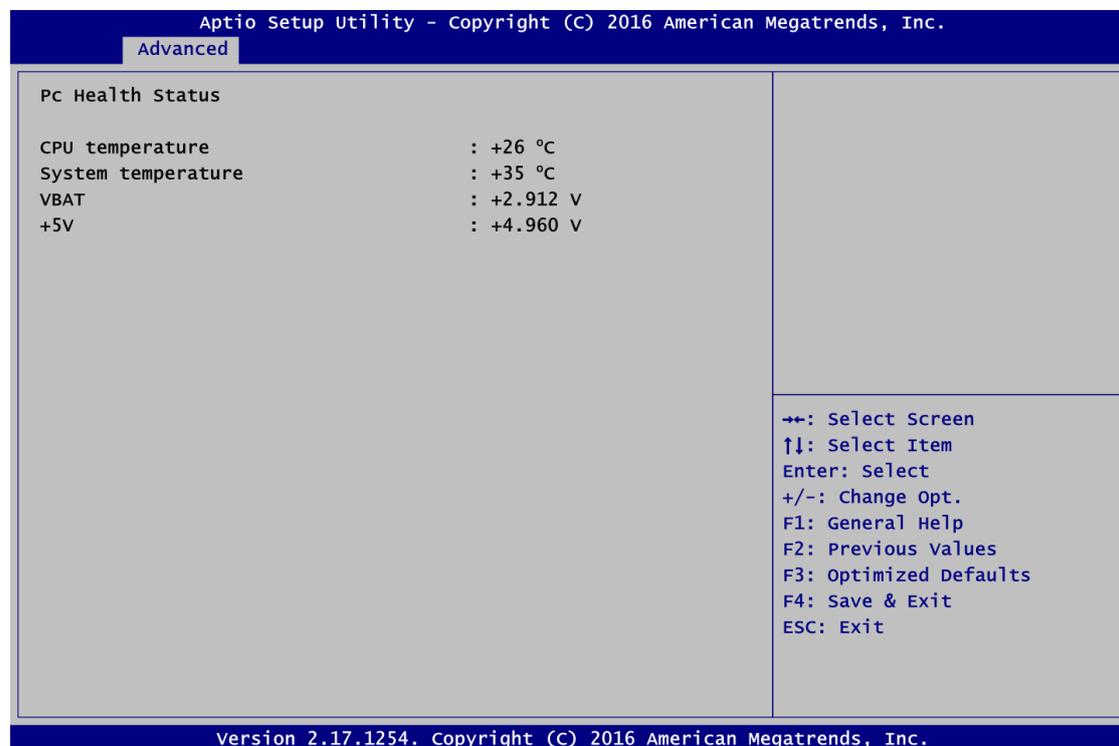


Serial Port

- Disabled: If I/O board is not installed.
- Enabled: If I/O board is installed, this option will be enabled automatically.
The optimal setting for base I/O address is 3E8h and for interrupt request address is IRQ3.

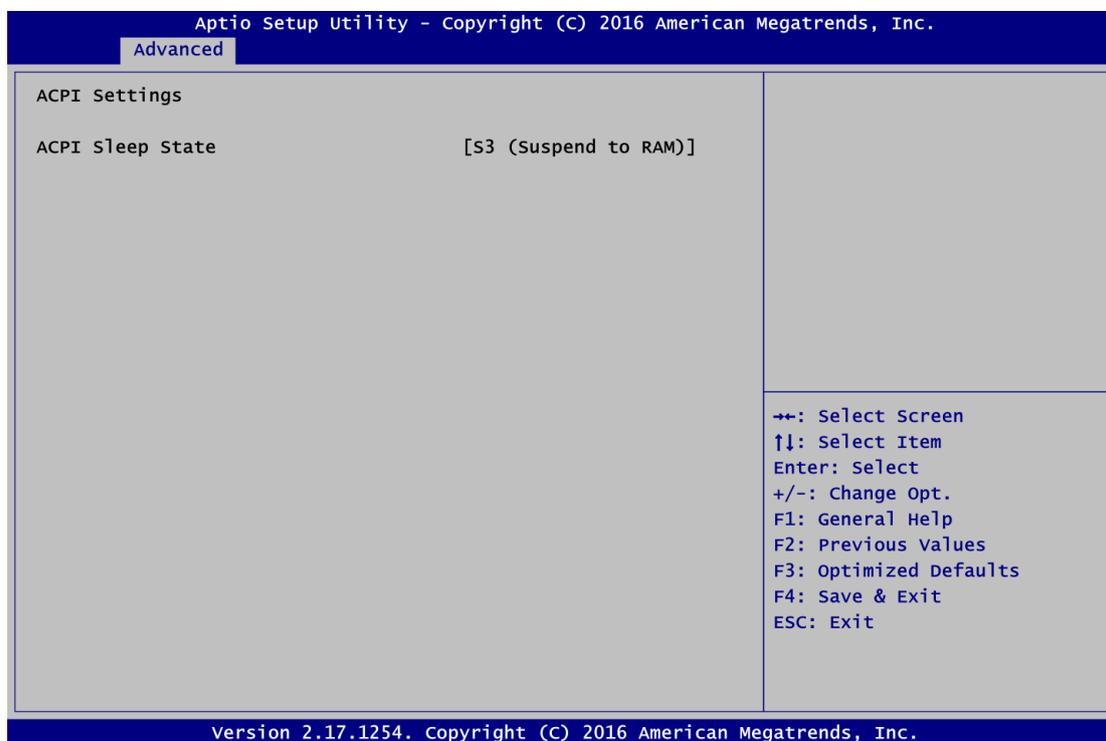
- **Hardware Monitor**

This screen monitors hardware health status.



- **ACPI Settings**

Users 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**

When the suspend button is pressed, the ACPI sleep state is S3 (Suspend to RAM).

● CPU Configurations

This screen shows the CPU version and its detailed information.

Aptio Setup Utility - Copyright (C) 2016 American Megatrends , Inc .

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

CPU Configuration		When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology
Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz		
CPU Signature	406E3	→ ←: Select Screen ↑ ↓ : Select Item Enter: Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC: Exit
Microcode Patch	49	
Max CPU Speed	2400 MHz	
Min CPU Speed	400 MHz	
CPU Speed	2400 MHz	
Processor Cores	2	
Hyper Threading Technology	Supported	
Intel VT-x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
EIST Technology	Supported	
CPU C3 state	Supported	
CPU C6 state	Supported	
CPU C7 state	Supported	
L1 Date Cache	32 KB x 2	
L1 Code Cache	32 KB x 2	
L2 Cache	256 KB x 2	
L3 Cache	3MB	
Intel Virtualization Technology	[Enabled]	

Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc .

● SATA Configurations

In this Configuration menu, users can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



SATA Mode Selection

AHCI (Advanced Host Controller Interface) mode is how SATA controller(s) operate.

Mini PCIe Card Function

- **mSATA**

Enable or disable mSATA device. The default is Disabled.

- **PCIe**

When mSATA is enabled, PCIe is disabled automatically and vice versa.

Serial ATA Port 0

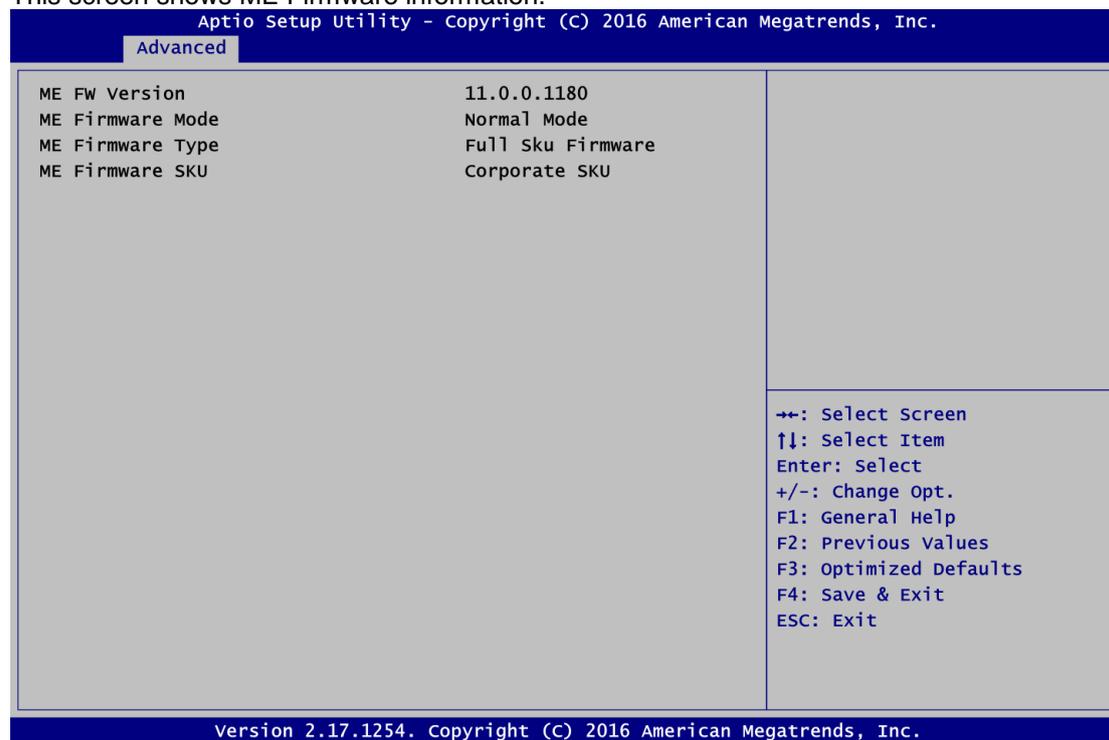
It shows the device installed in connector SATA0.

Serial ATA Port 1

It shows the device installed in connector SATA1.

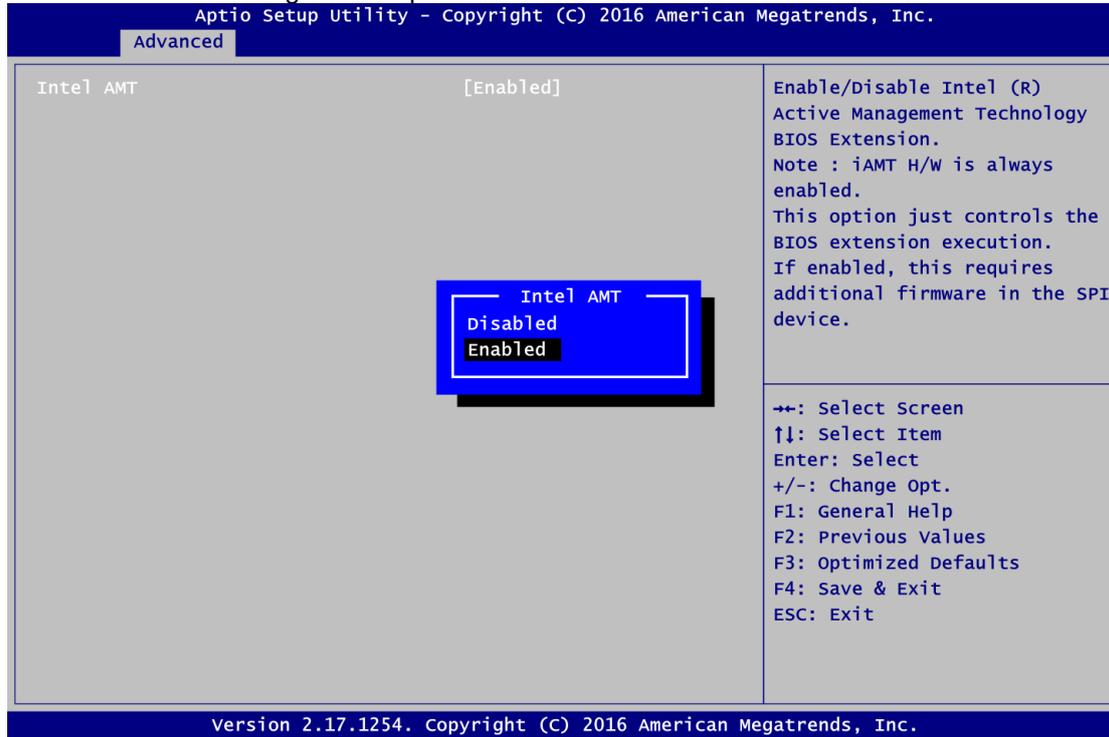
- PCH-HW

This screen shows ME Firmware information.



- **AMT Configurations**

Use this screen to configure AMT parameters.



Intel AMT

Enable or disable Intel® Active Management Technology BIOS Extension.
The default is Enabled.

● **USB Configurations**

The screenshot shows the Aptio Setup Utility interface. At the top, it says "Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc." and "Advanced" is selected. The main area is divided into two columns. The left column contains the following text: "USB Configuration", "USB Module Version 12", and "USB Devices: 1 Keyboard". The right column contains a list of navigation instructions: "←→: Select Screen", "↑↓: Select Item", "Enter: Select", "+/-: Change Opt.", "F1: General Help", "F2: Previous Values", "F3: Optimized Defaults", "F4: Save & Exit", and "ESC: Exit". At the bottom, it says "Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc."

USB Devices

Display all detected USB devices.

- Intel RC Drivers Version Detail

This screen shows Intel® RC driver's version information.

The screenshot displays the 'Advanced' menu of the Aptio Setup Utility. The title bar reads 'Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.' and the sub-menu is 'Advanced'. The main content area shows the following version information:

Intel CPU RC Version	0.0.0.3
Intel SA RC Version	N/A
Intel PCH RC Version	0.0.0.1
Intel ACPI RC Version	N/A
Intel ME RC Version	N/A

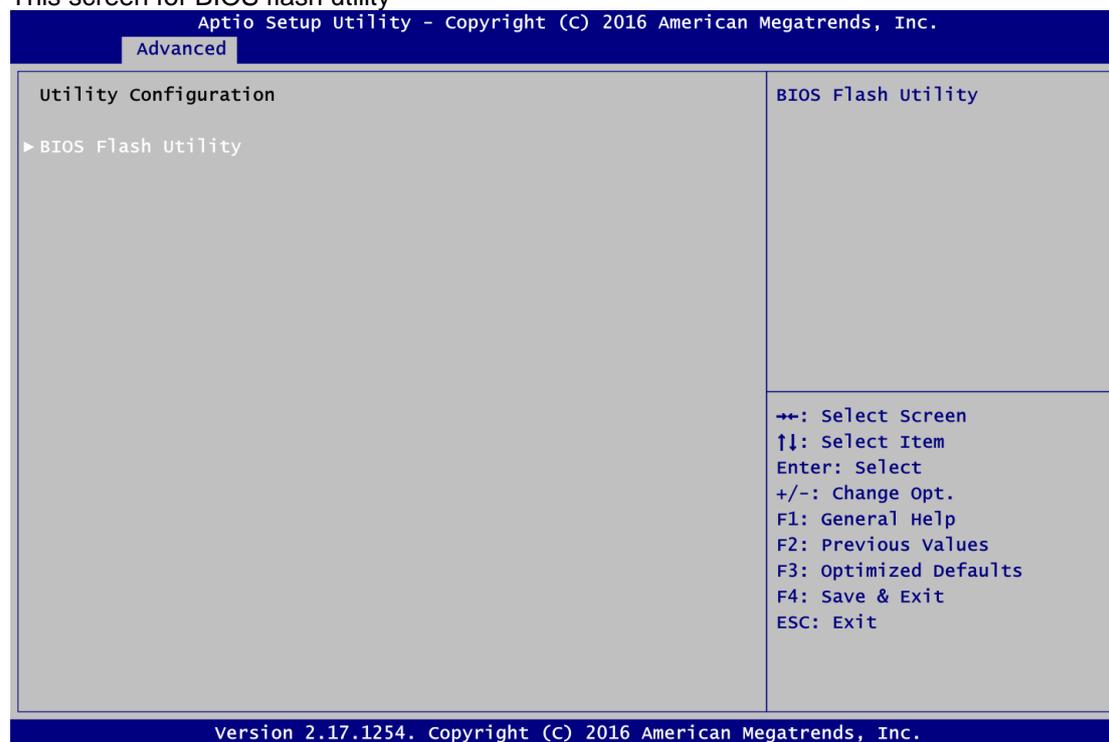
Navigation instructions are listed in the bottom right corner:

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

The footer of the screen reads: 'Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc.'

- **Utility Configurations**

This screen for BIOS flash utility



BIOS Flash Utility

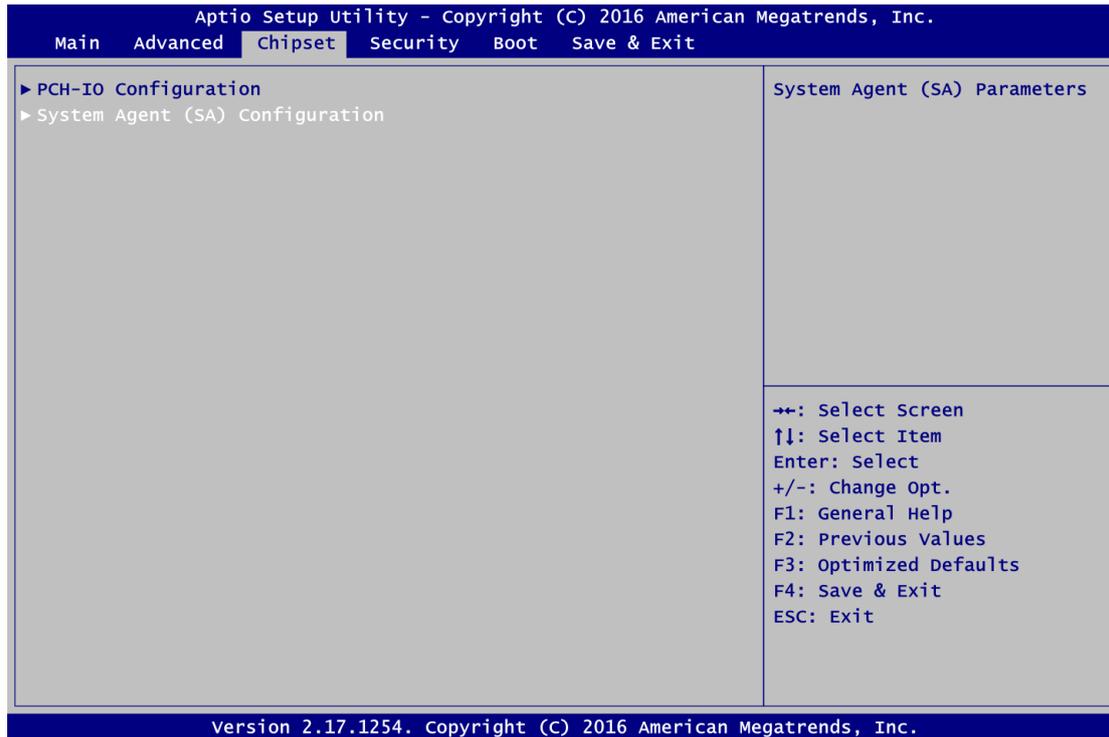
BIOS flash utility configuration.

4.5 Chipset Menu

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

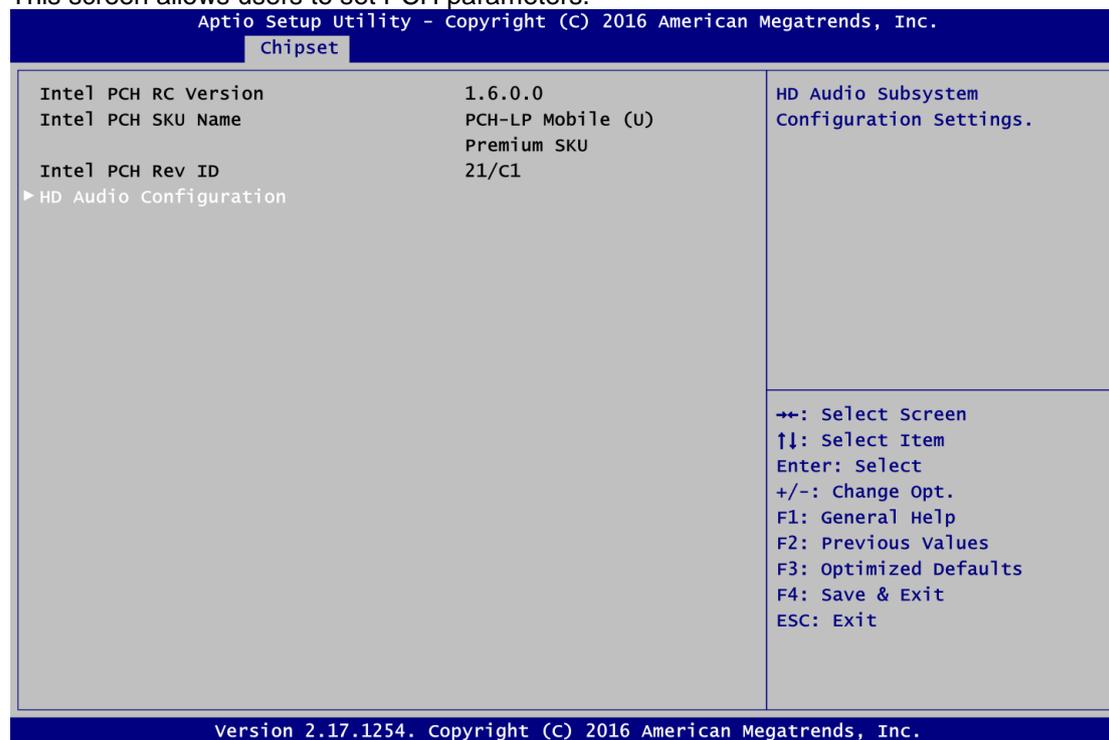
- ▶ PCH-IO Configuration
- ▶ System Agent (SA) Configuration

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



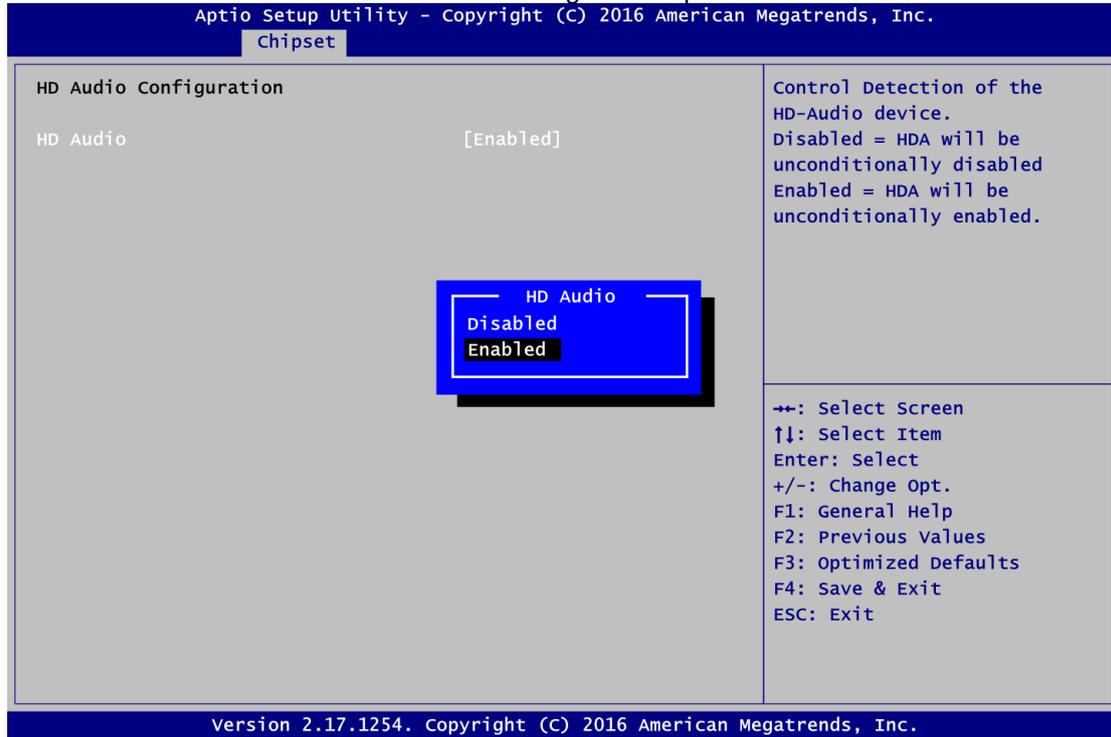
- **PCH-IO Configuration**

This screen allows users to set PCH parameters.



- **HD Audio Configuration**

Control detection of the HD Audio device. Configuration options are Disabled and Enabled.

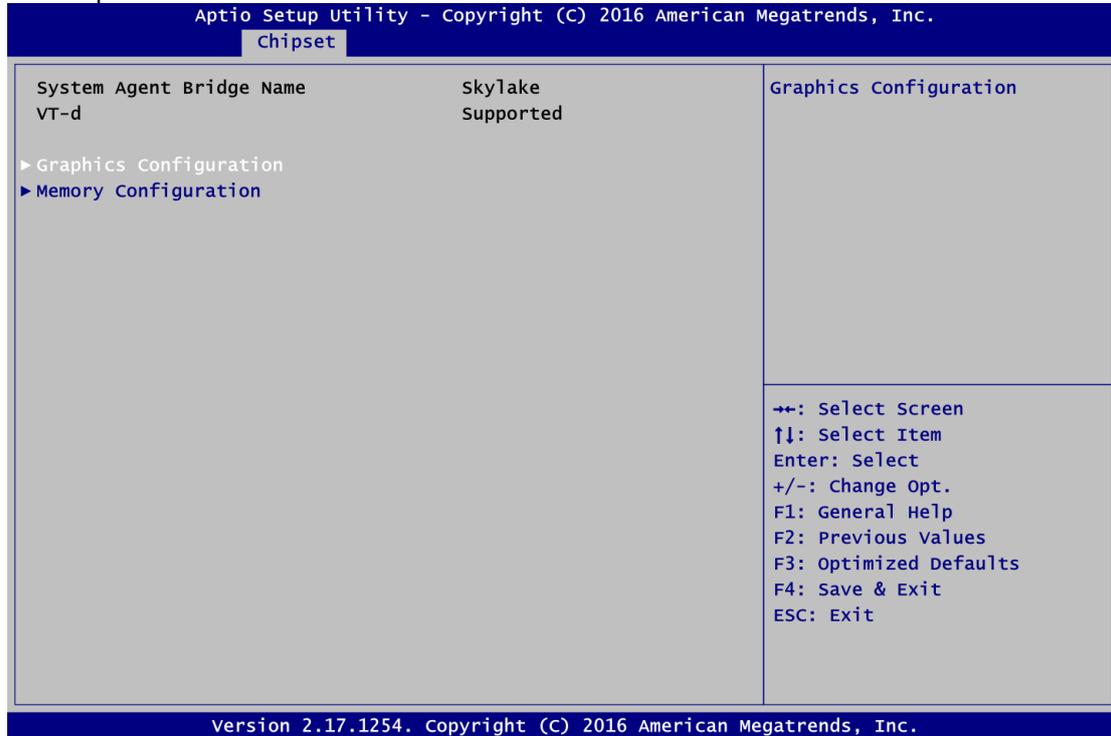


HD Audio Configuration

Use this item for HD Audio configuration settings.

- **System Agent (SA) Configuration**

This screen shows System Agent version information and provides function for specifying related parameters.



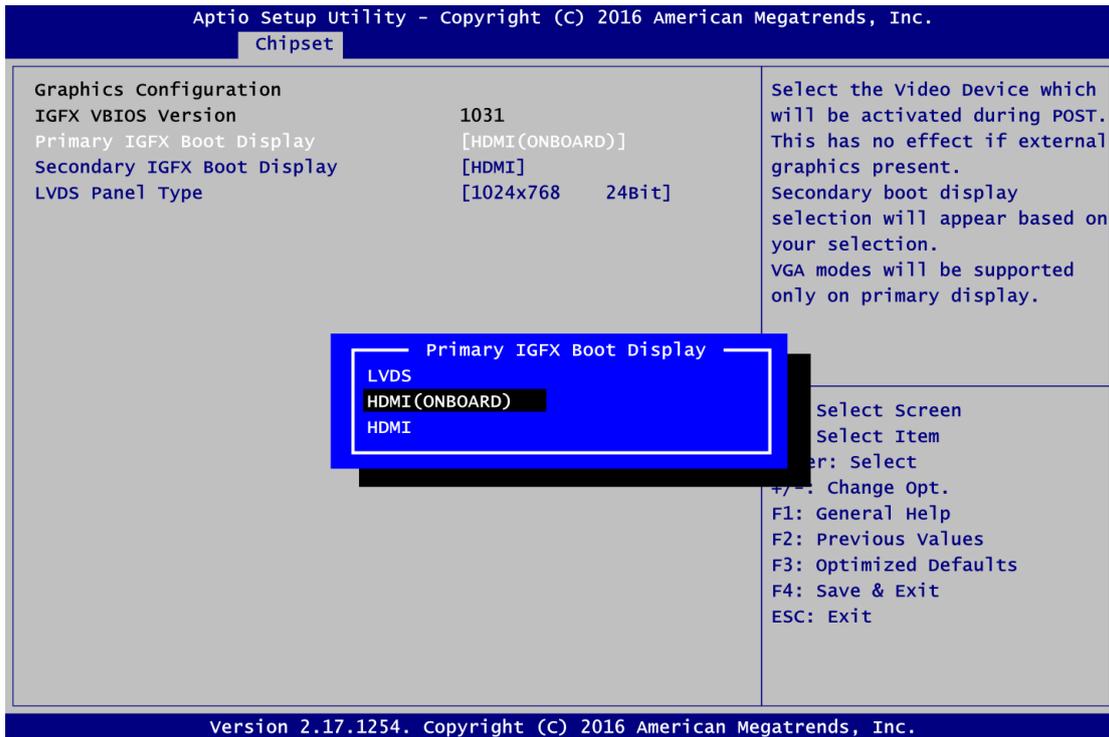
Graphics Configuration

Use this item to configure internal graphics controller.

Memory Configuration

Use this item to refer to the information related to system memory.

● **Graphics Configuration**



Primary IGFX Boot Display

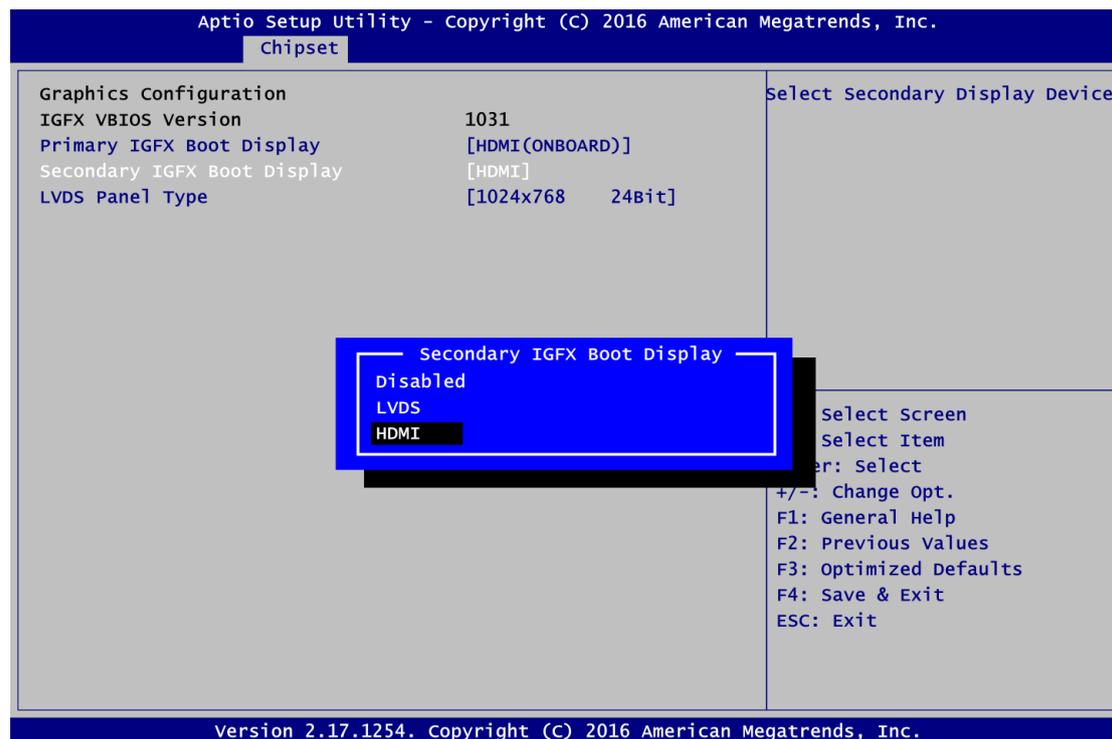
Select the video device which will be activated during POST (Power-On Self Test). The default is HDMI (ONBOARD). The image above shows option list in Primary IGFX Boot Display when no I/O board is installed.



【Note】 : *When powering on eBOX565-500 for the first time, video device must be plugged into HDMI connector (CN15). Then, after first power on, user can set HDMI on AX93276 as primary IGFX boot display.*



HDMI connector (CN15) on rear side



Secondary IGFX Boot Display

Select secondary display device. The default is Disabled.

- **Memory Information**

This screen shows the system memory information.

The screenshot shows the 'Memory Configuration' screen within the 'Chipset' menu of the Aptio Setup Utility. The screen is titled 'Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.' and 'Chipset'. The main content area displays the following memory configuration details:

Memory RC Version	1.6.0.1
Memory Frequency	2133 MHz
Total Memory	8192 MB
VDD	1200
DIMM#0	8192 MB
Memory Timings (tCL-tRCD-tRP-tRAS)	15-36

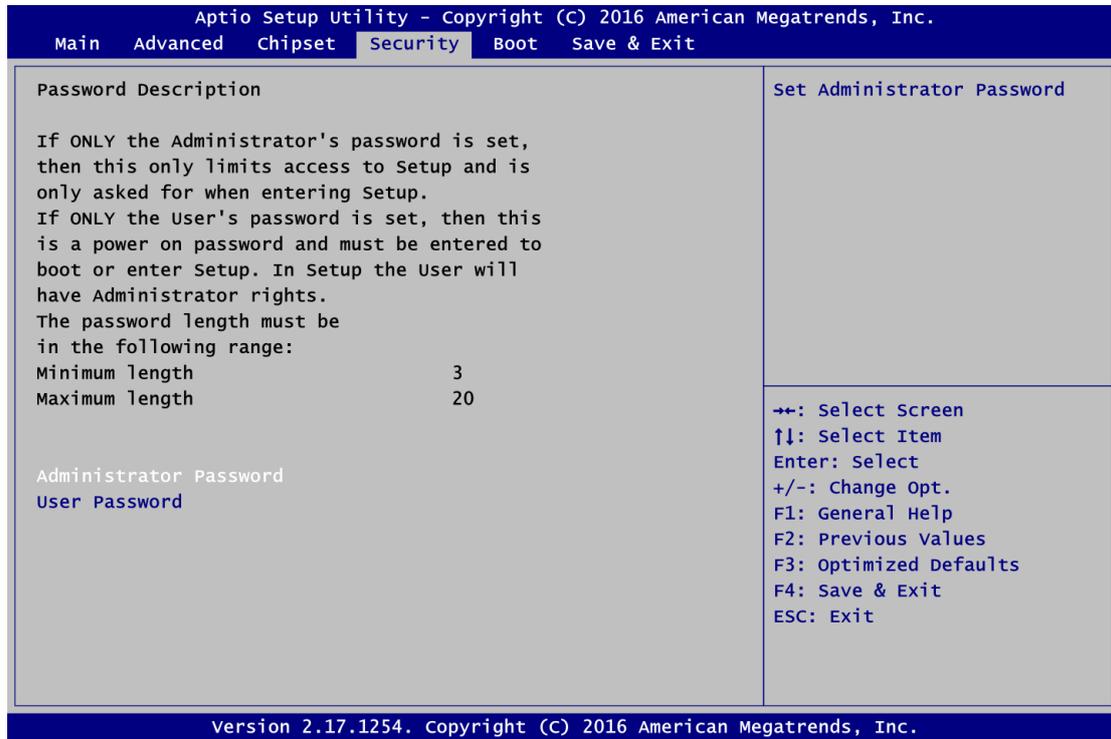
Navigation instructions are listed on the right side of the screen:

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

At the bottom of the screen, the version information is displayed: 'Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc.'

4.6 Security Menu

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



Administrator Password

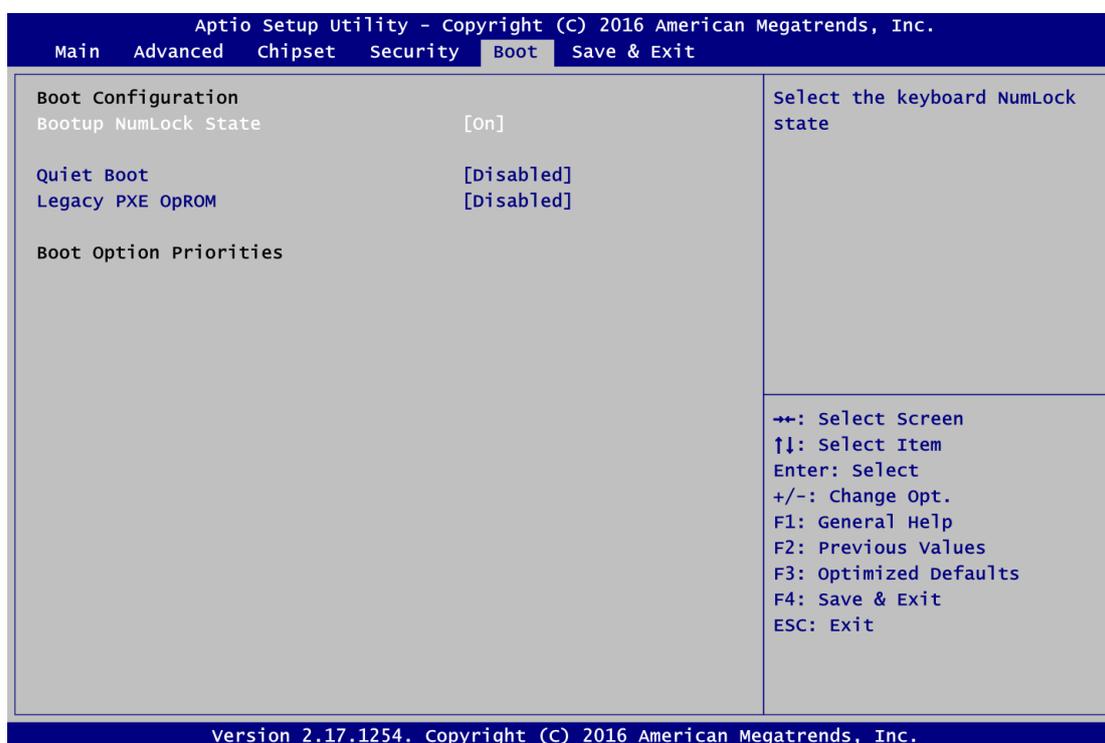
This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

This item indicates whether a user password has been set (installed or uninstalled).

4.7 Boot Menu

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



Bootup NumLock State

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

Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

Legacy PXE Oprom

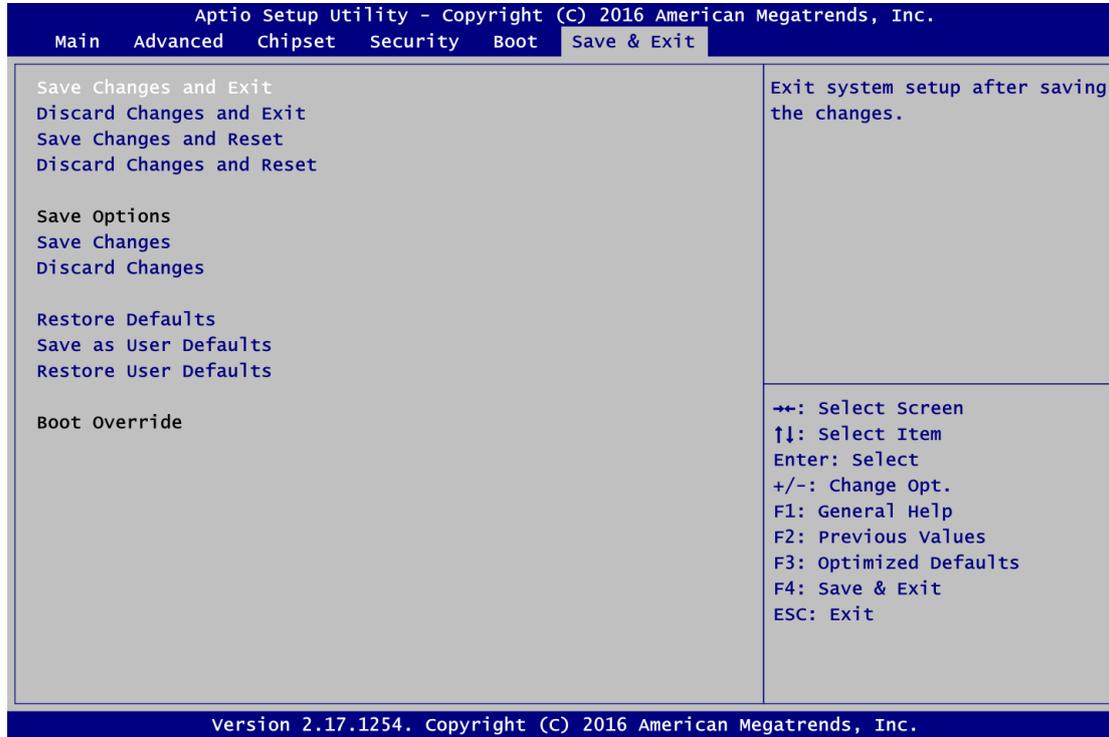
Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

Boot Option Priorities

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.8 Save & Exit Menu

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



Save Changes and Exit

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

Discard Changes and Exit

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

Save Changes and Reset

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

Discard Changes and Reset

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

Save Changes

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

Discard Changes

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

Restore Defaults

It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

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APPENDIX A WATCHDOG TIMER

About Watchdog Timer

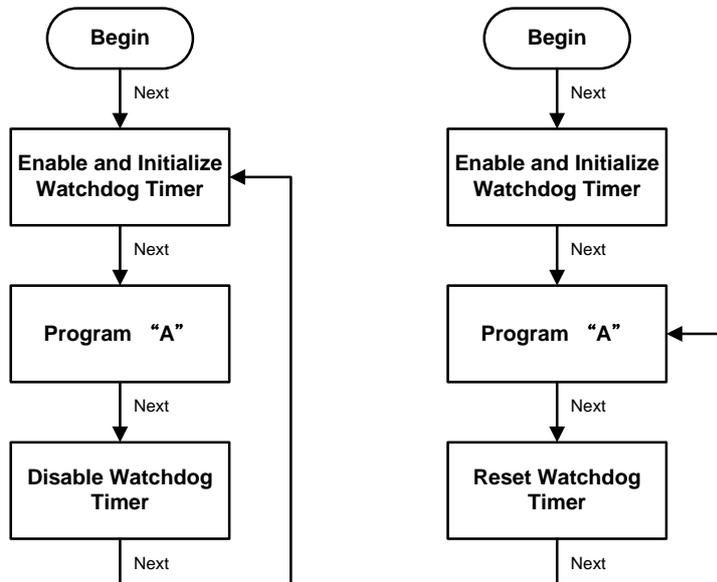
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.



Sample Program

Assembly sample code:

```
;Enable WDT:
mov    dx,2Eh
mov    al,87          ;Un-lock super I/O
out    dx,al
out    dx,al

;Select Logic device:
mov    dx,2Eh
mov    al,07h
out    dx,al
mov    dx,2Fh
mov    al,08h
out    dx,al

;Activate WDT:
mov    dx,2Eh
mov    al,30h
out    dx,al
mov    dx,2Fh
mov    al,01h
out    dx,al

;Set Second or Minute :
mov    dx,2Eh
mov    al,0F5h
out    dx,al
mov    dx,2Fh
mov    al,Nh          ;N=00h or 08h(see below  【Note】)
out    dx,al

;Set base timer :
mov    dx,2Eh
```

```

mov    al,0F6h
out    dx,al
mov    dx,2Fh
mov    al,Mh          ;M=00h,01h,...FFh (hex),value=0 to 255
out    dx,al          ;(see below  Note)

```

;Disable WDT:

```

mov    dx,2Eh
mov    al,30h
out    dx,al
mov    dx,2Fh
mov    al,00h        ;Can be disabled at any time
out    dx,al

```

 **【Note】 :**

If **N=00h**, the time base is set to second.

M = time value

00: Time-out Disable
01: Time-out occurs after 1 second
02: Time-out occurs after 2 seconds
03: Time-out occurs after 3 seconds
.
.
FFh: Time-out occurs after 255 seconds

If **N=08h**, the time base is set to minute.

M = time value

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

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