AXIOMTEK

eBOX565-312-FL Series

Embedded System

User's Manual

RoHS

Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, or any liability arising from such uses.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update any information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted in any forms or by any means, electronic, mechanical, photocopying, recording, among others, without prior written permissions of Axiomtek Co., Ltd.

©Copyright 2018 Axiomtek Co., Ltd.

All Rights Reserved

March 2018, Version A1

Printed in Taiwan

Safety Precautions

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

1. The eBOX565-312-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 eBOX565-312-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 eBOX565-312-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℃ or above 80℃ 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 production 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.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd.
IBM, PC/AT, PS/2, VGA are trademarks of International Business Machines Corporation.
Intel® and Pentium® are registered trademarks of Intel Corporation.
MS-DOS, Microsoft C and QuickBasic are trademarks of Microsoft Corporation.
Windows 8.1, Windows 10, Linux and other brand names and trademarks are the properties and registered brands of their respective owners.

Table of Contents

Disclaimers ii
Safety Precautions iii
Classification iv
General Cleaning Tips v
Scrap Computer Recycling vi

SECTION 1 INTRODUCTION 1
1.1 General Description 1
1.2 System Specifications 2
1.2.1 CPU 2
1.2.2 I/O System 2
1.2.3 System Specification 3
1.2.4 Driver CD Content 3
1.3 Dimensions 4
1.3.1 System Dimensions 4
1.3.2 Wall mount Bracket Dimensions 5
1.3.3 Din-rail mount Bracket Dimensions 6
1.3.4 VESA mount Bracket Dimensions 6
1.4 I/O Outlets 8
1.5 Packing List 9
1.6 Model List 9

SECTION 2 HARDWARE INSTALLATION 11
2.1 Installation of 2.5” SATA Device 11
2.2 Installation of Express Mini Card 13

SECTION 3 JUMPER & CONNECTOR SETTINGS 17
3.1 Locations of Jumpers & Connectors 17
3.2 Summary of Jumper Settings 19
3.2.1 Restore BIOS Optimal Defaults (JP1) 19
3.2.2 ATX/AT Quick Switch 20
3.3 Connectors 21
3.3.1 Power Input-phoenix type (CN12) 22
3.3.2 Ethernet Port (LAN1) 22
3.3.3 HDMI Connector (CN13) 23
3.3.4 COM Serial Port Connector 23
3.3.5 USB 3.0 Connector 24
3.3.6 System Power Switch 25
3.3.7 System Reset Switch 25
3.3.8 Express Mini Card Slot (SCN1) 26
3.3.9 Power and HDD LED Indicator 26

SECTION 4 BIOS SETUP UTILITY 27
4.1 Starting 27
4.2 Navigation Keys 27
4.3 Main Menu 28

4.4 Advanced Menu 29
4.5 Chipset Menu 43
4.6 Security Menu 47
4.7 Boot Menu 48
4.8 Save & Exit Menu 49

APPENDIX A WATCHDOG TIMER 51
About Watchdog Timer 51
How to Use Watchdog Timer 51
Sample Program 52

SECTION 1
INTRODUCTION

This section contains general information and detailed specifications of the eBOX565-312-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 eBOX565-312-FL is an embedded system that supports Intel® Pentium® N4200 2.5 GHz/Celeron® N3350 2.4 GHz onboard to support Windows 10, and Linux, suitable for the most endurable operation.

It features fan less and compact size design with full feature I/O, one 204-pin unbuffered SODIMM socket for one channel DDR3L-1867 MHz memory, and enhanced system dependability by built-in Watchdog Timer.

- **Features**
  1. Intel® Pentium® N4200 (optional) /Celeron® N3350 2.4 GHz
  2. Compact size with 12VDC power input
  3. High performance 204-pin DDR3L-1867 SO-DIMM max. up to 8 GB
  4. 1 CH PoE, IEEE802.3AF
  5. Supports 2 HDMI, 2 COM and 4 USB 3.0
  6. AXView 2.0 intelligent embedded monitoring software for IoT

- **Reliable and Stable Design**
  The embedded system supports Intel® Pentium® N4200(optional)/Celeron®N3350, high flexibility and multi-functional design is the best solution for any industrial field applications.

- **Embedded O.S. Supported**
  The eBOX565-312-FL supports not only Windows 10 but also embedded OS, such as Windows 10 Embedded and Linux.

- **Various Storage devices supported**
  For storage device, the eBOX565-312-FL supports one 2.5" hot swappable SATA storage drive bay and one mSATA device.

1.2 System Specifications

1.2.1 CPU

- **CPU**
  - Intel® Pentium® N4200 (optional) /Celeron® N3350 2.4 GHz
- **Chipset**
  - SoC Integrated
- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
  - One 204-pin unbuffered DDR3L-1867 MHz SO-DIMM socket, max. up to 8 GB

1.2.2 I/O System

- Two jumper-less RS-232/422/485 9-pin D-Sub male connector (COM1/COM2)
- Two HDMI for display (FHD)
- One RJ-45 connectors for 10/100/1000 Base-T Ethernet ports (i211AT)
- One PSE, IEEE802.3AF (RJ-45 connector)
- 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 12VDC 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 : 12VDC
- **Operation Temperature**
  - -20℃~+50℃ (-4°F ~ +122°F), with W.T. SSD & Memory
- **Storage Temperature**
  - -40℃ ~ 80℃ (-40 ºF ~ 176ºF)
- **Humidity**
  - 10% ~ 90% (non-condensation)
- **Vibration Endurance**
  - 2.25g @ 5~500Hz,(Random Vibration)
- **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 73 mm (2.87") (H)

1.2.4 Driver CD Content

- **Driver**
  - Chipset
  - Ethernet
  - Graphic
  - TXE

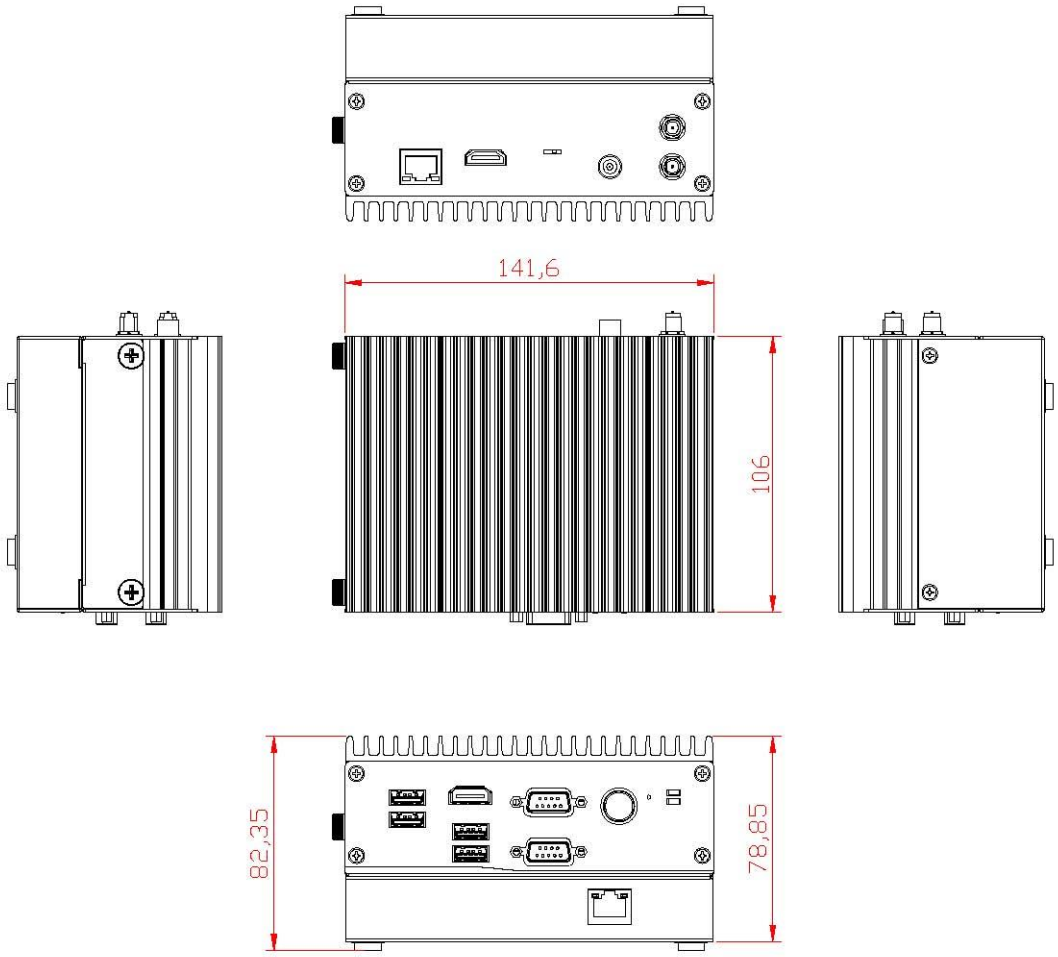
- **Manual**
  - User Manual
  - Quick Manual

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

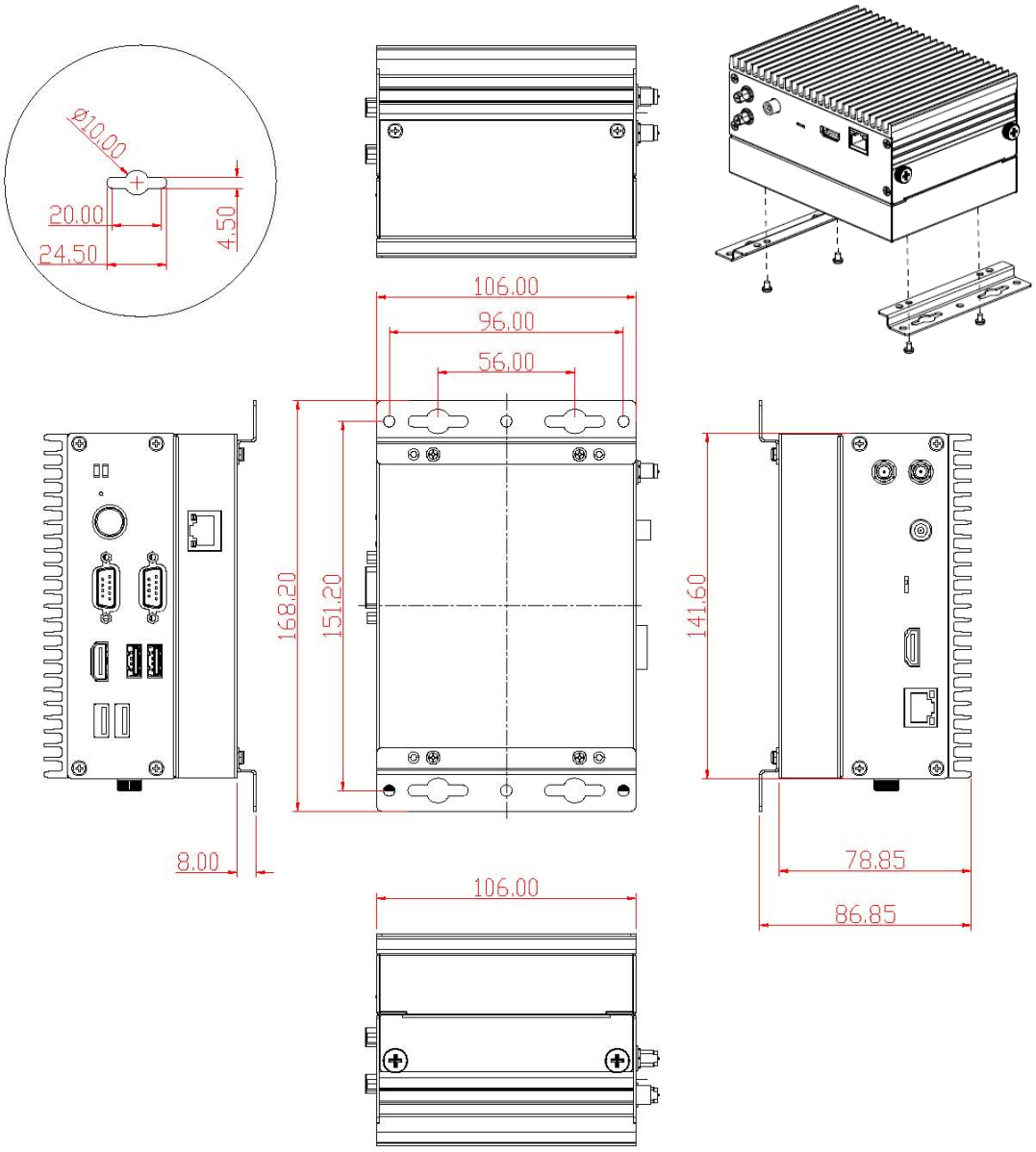
1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX565-312-FL.

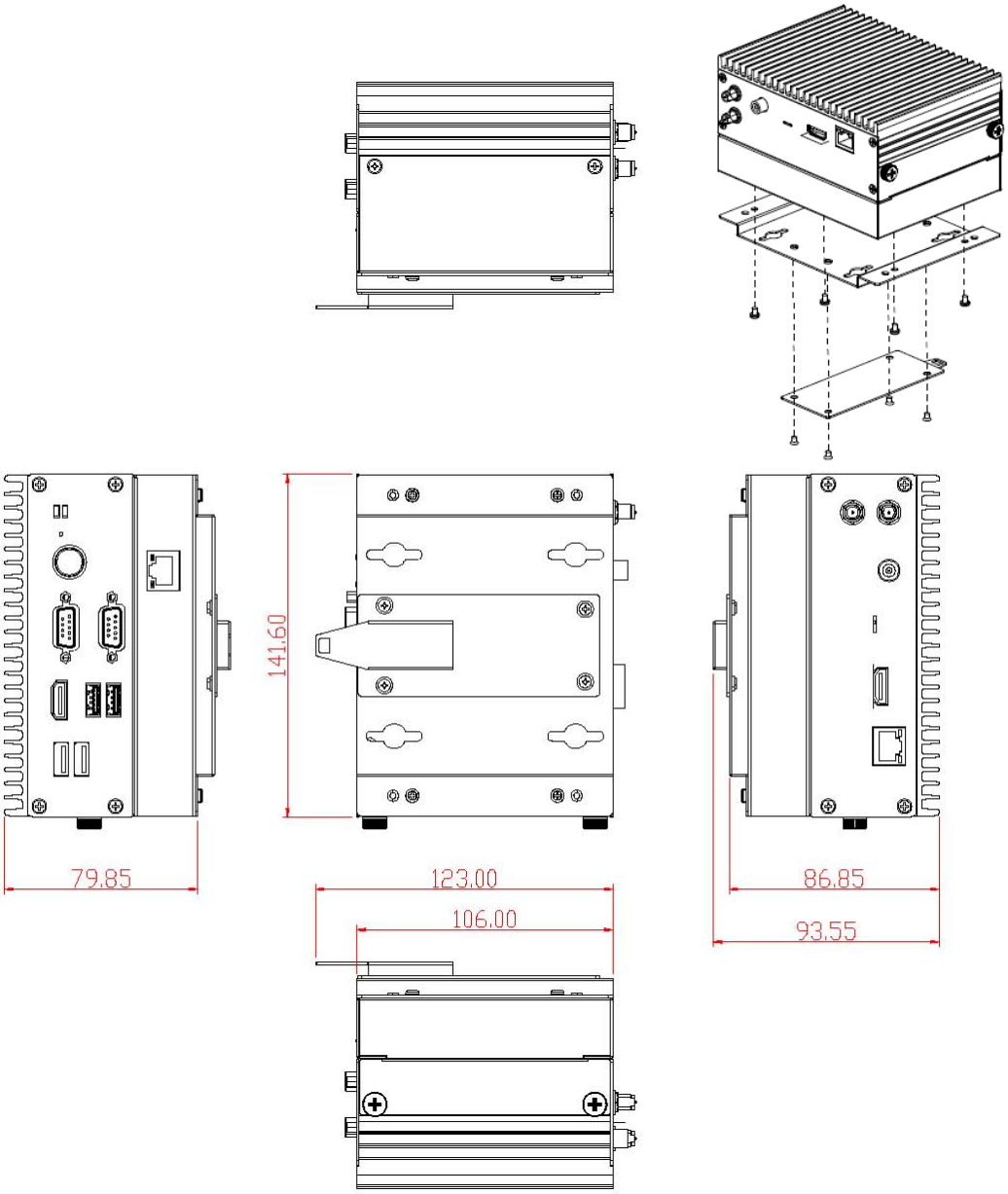
1.3.1 System Dimensions



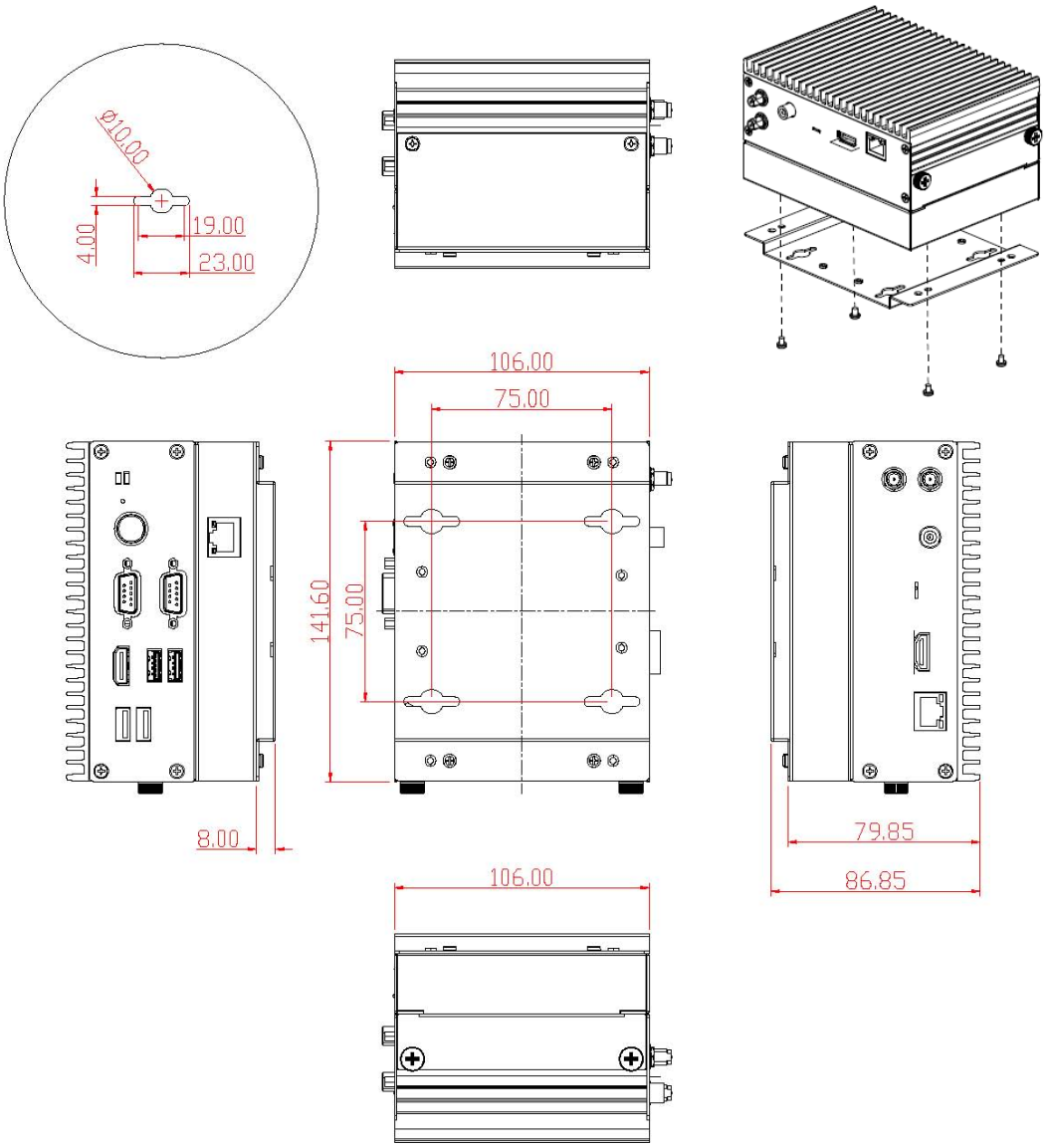
1.3.2 Wall mount Bracket Dimensions



1.3.3 Din-rail mount Bracket Dimensions



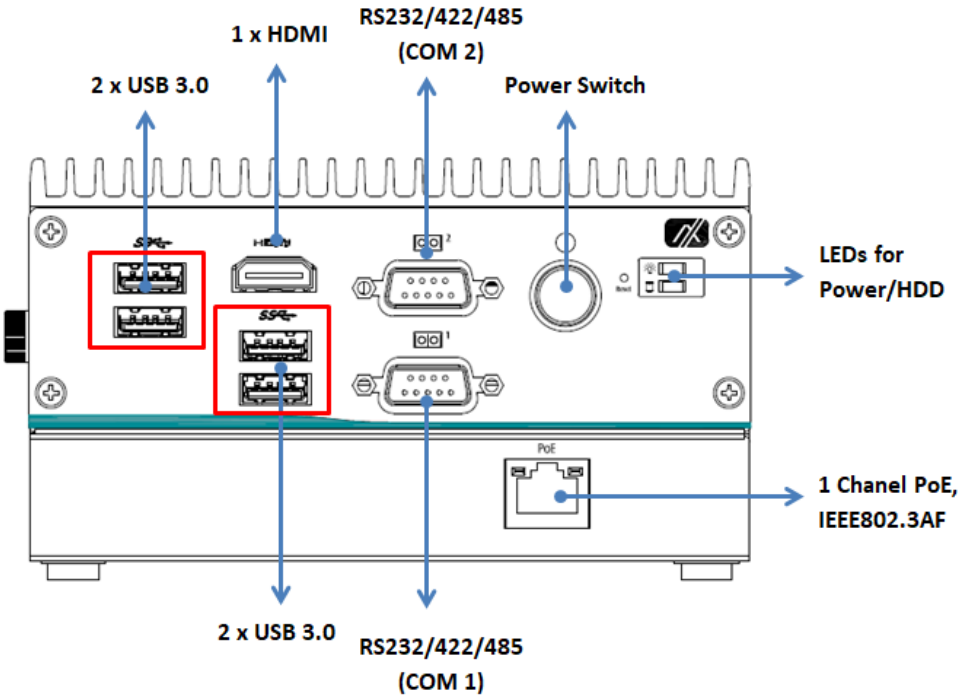
1.3.4 VESA mount Bracket Dimensions



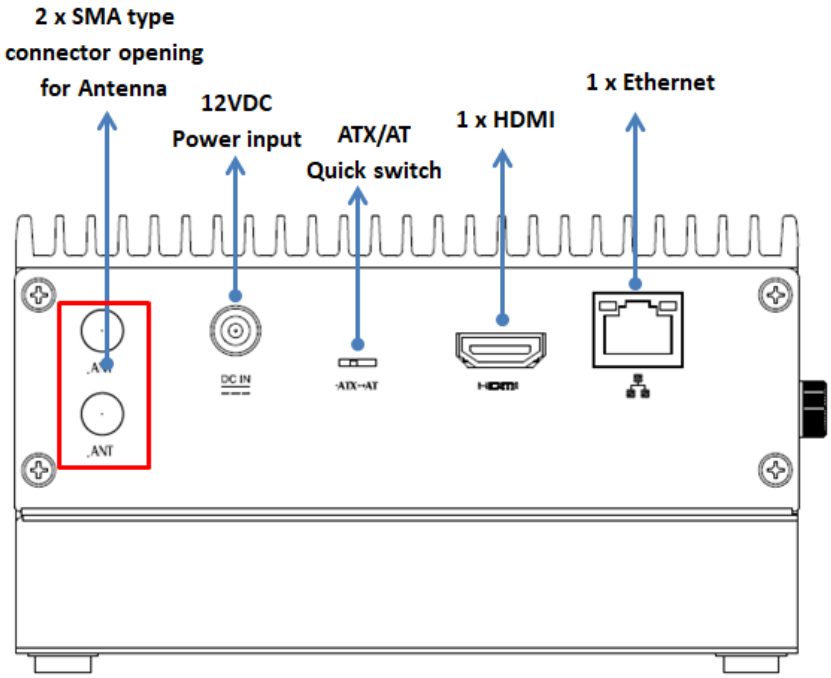
1.4 I/O Outlets

The following figures show I/O outlets on front of the eBOX565-312-FL.

- **Front View**



- **Rear View**



1.5 Packing List

The eBOX565-312-FL comes with the following bundle package:

- eBOX565-312-FL System Unit x 1
- eBOX565-312-FL Quick Installation Guide x 1
- DVD x 1 (For Driver and Manual)
- Screws Pack x 1
- Pre-installed Foot pad x 4

1.6 Model List

eBOX565-312-FL-DC-N3350	Fanless embedded system with Intel® Celeron N3350 2.4 GHz, 2 HDMI, 1 GbE LANs,1 CH PSE, 4 USB 3.0, 2 COM, PCI Express Mini Card slot and 12 VDC power input
eBOX565-312-FL-DC-N4200	Fanless embedded system with Intel® Pentium® N4200 2.5 GHz, 2 HDMI, 1 GbE LANs, 1 CH PSE, 4 USB 3.0, 2 COM, PCI Express Mini Card slot and 12 VDC power input

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

This page is intentionally left blank.

SECTION 2
HARDWARE INSTALLATION

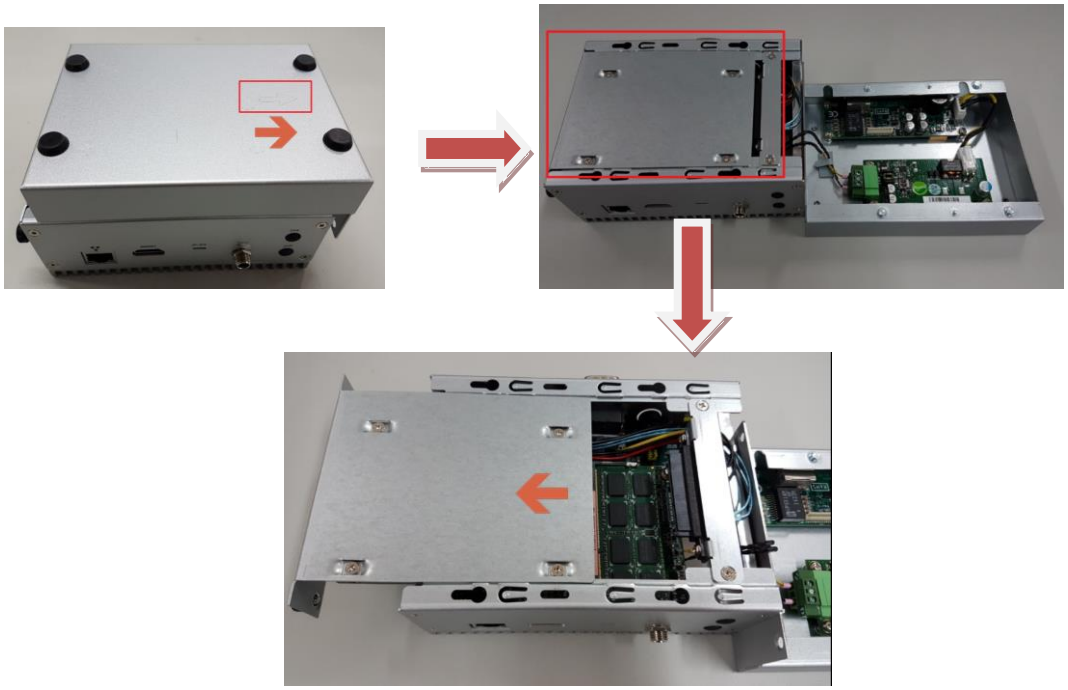
The eBOX565-312-FL is convenient for your various hardware configurations, such as HDD (Hard Disk Drive), SSD (Solid State Drive), SO-DIMM or PCI Express Mini Card modules. The section 2 will show how to install the hardware.

2.1 Installation of 2.5" SATA Device

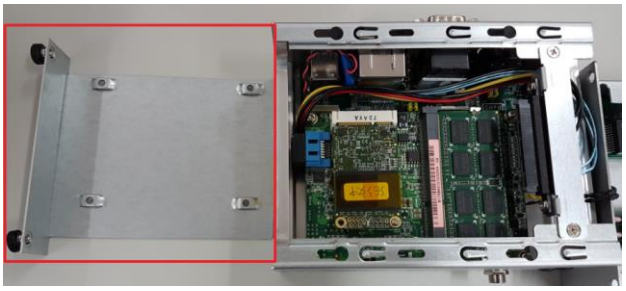
Step 1 Turn off the system, and unplug the power adaptor.

Step 2 Turn the system upside down to locate screws at the side of the system, and then loosen two screws.

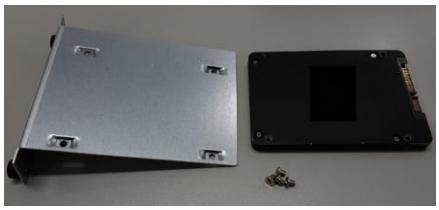
Step 3 Remove the bottom cover (notice the direction mark) and HDD cover.



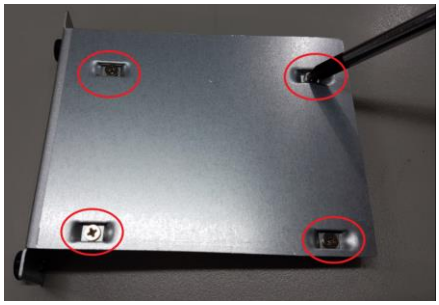
Step 4 Located SSD/HDD within the red line marked.



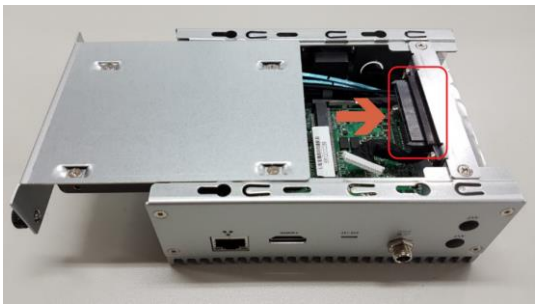
Step 5 Please prepare the following items to assemble SSD/HDD.



Step 6 Fasten four screws to fix HDD/SSD.



Step 7 Connected the SSD/HDD directly and make sure the insertion is complete.



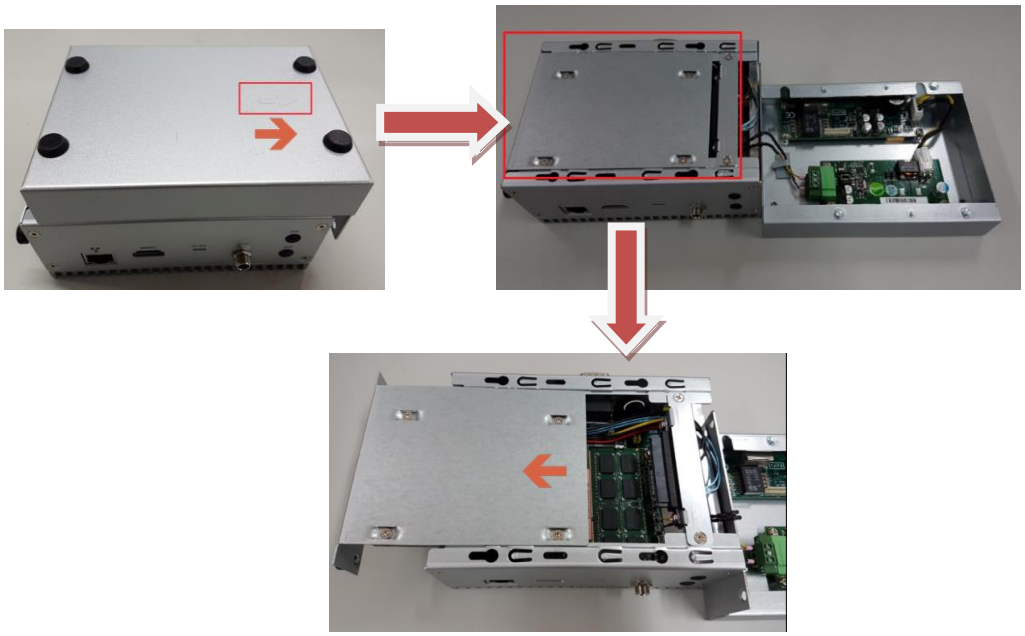
Step 8 Recover the bottom cover and fasten two screws on the side of the system.

2.2 Installation of Express Mini Card

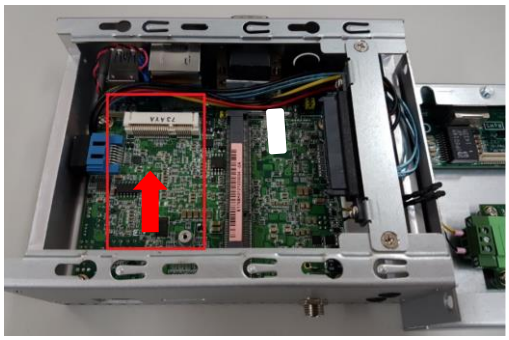
Step 1 Turn off the system, and unplug the power adaptor.

Step 2 Turn the system upside down to locate screws at the side of the system, and then loosen two screws.

Step 3 Remove the bottom cover (notice the direction mark) and HDD cover.



Step 4 Locate the mini card slot location, and 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.

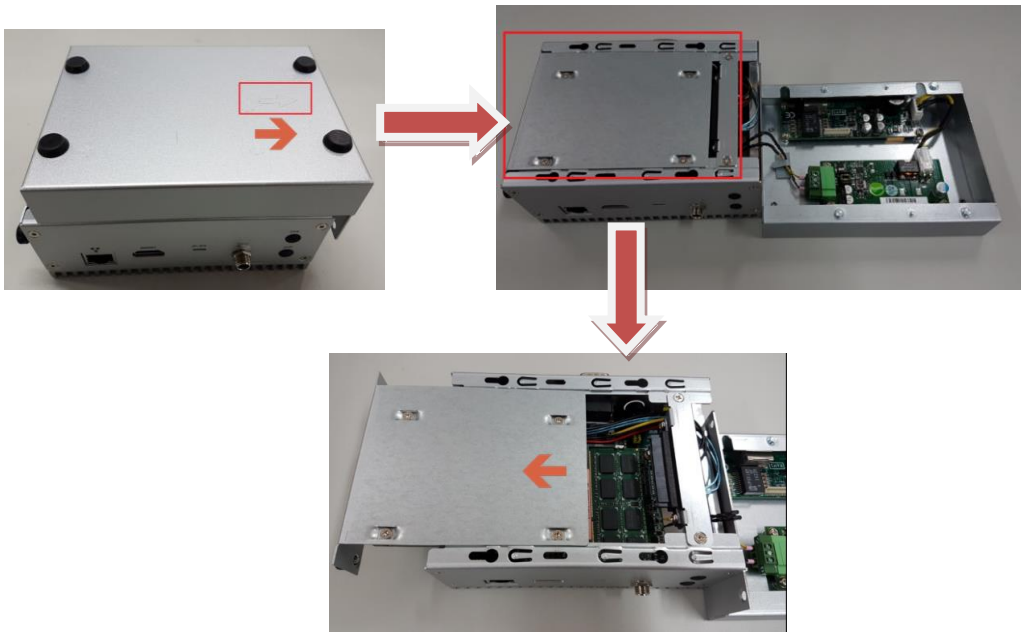
Step 6 Recover the HDD cover and bottom cover, and then fasten two screws on the side of the system.

2.3 Installation of SO-DIMM Memory

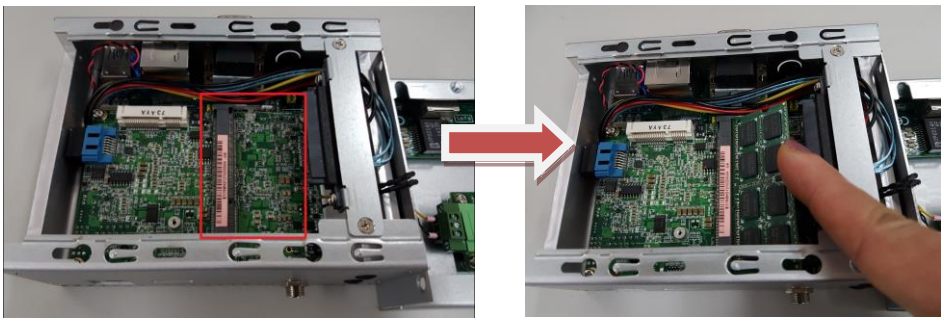
Step 1 **Turn off the system, and unplug the power adaptor.**

Step 2 **Turn the system upside down to locate screws at the side of the system, and then loosen two screws.**

Step 3 **Remove the bottom cover (notice the direction mark) and HDD cover.**



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



Step 5 **Recover the HDD cover and bottom cover, and then fasten two screws on the side of the system.**

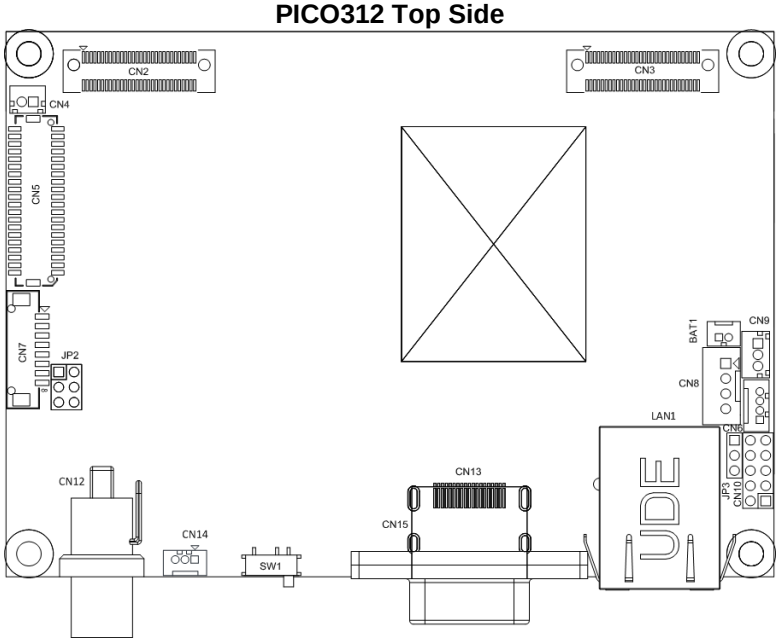
This page is intentionally left blank.

SECTION 3
JUMPER & CONNECTOR SETTINGS

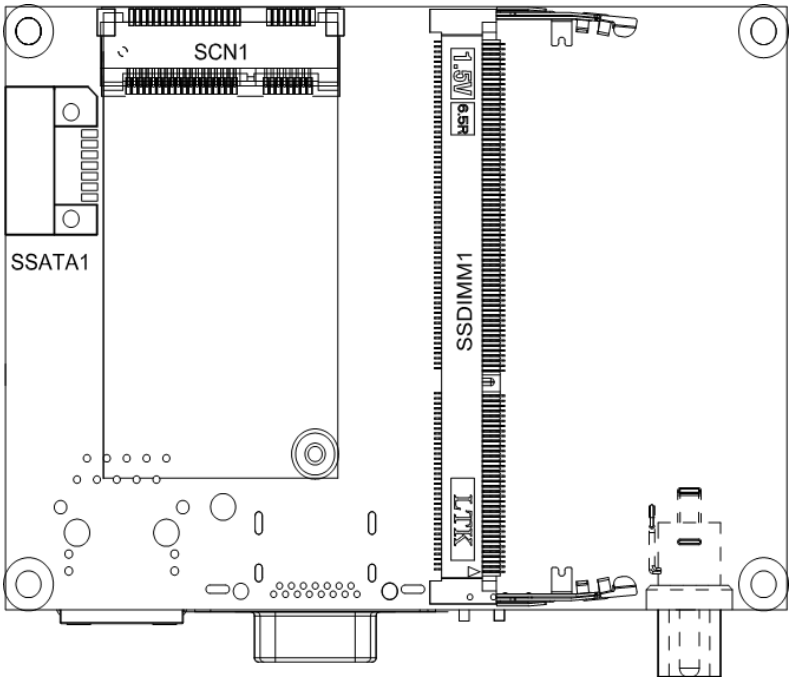
Proper jumper settings configure the eBOX565-312-FL to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

PICO312 Top Side

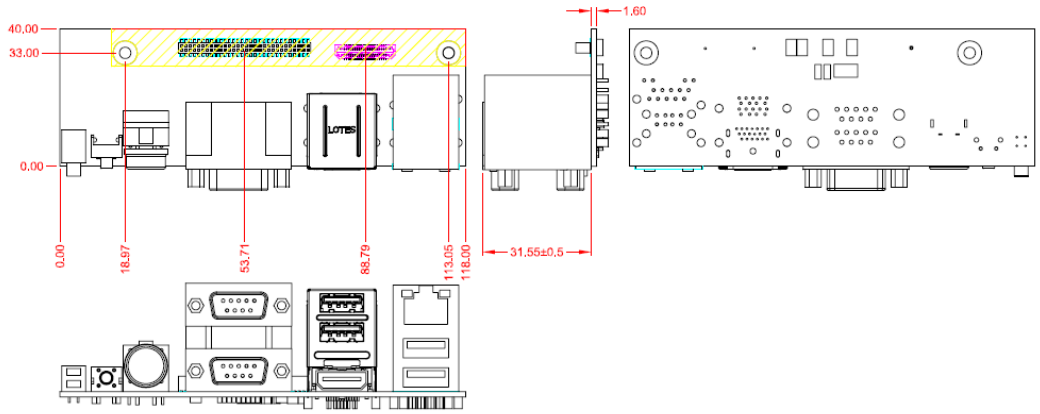


PICO312 Bottom Side

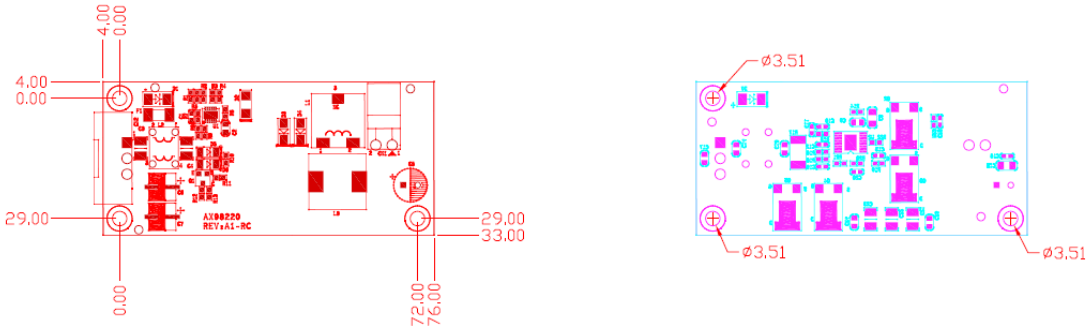


AX93728

Component Side Solder Side



AX98220



TOP side (Top view) BOTTOM side (Top view)

【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 eBOX565-312-FL to meet various application purposes. A table of all jumpers and their default settings is listed below.

PICO312:

Jumper and Switch	Descriptions	Settings
JP2	LVDS +3.3V/+5V/+12V Voltage Selection Default: +3.3V	1-2 Close
JP3	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
SW1	Auto Power On Default: Enable	2-3 Close

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]

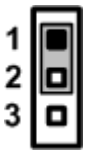
[Closed]

[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.

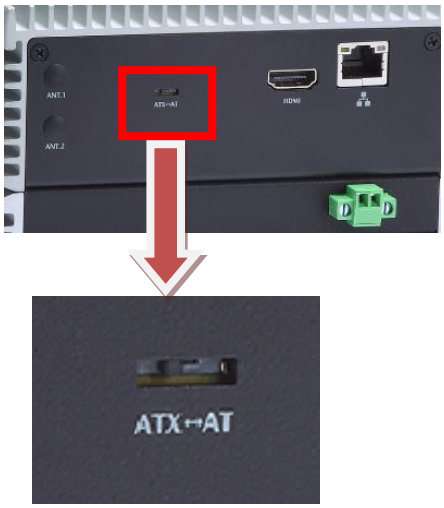
Functions	Settings
Normal (Default)	1-2
Restore BIOS optimal defaults	2-3



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)



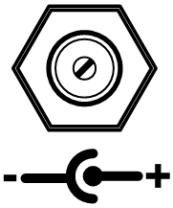
3.3 Connectors

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 **eBOX565-312-FL** Series.

Connectors	Descriptions
CN2	Board to Board Connector 1 (Low Speed Signal)
CN3	Board to Board Connector 2 (High Speed Signal)
CN6	USB 2.0 Wafer Connector
CN8	SATA Power Connector
CN10	Front Panel Connector
CN12	DC Jack Power Connector w/ Screw
CN13	HDMI Connector
CN14	I2C Connector
CN15	VGA Connector
LAN1	Ethernet Port
SSATA1	SATA Connector
SCN1	Full-size PCI-Express Mini Card and mSATA Connector
SSDIMM1	DDR3L SO-DIMM Connector

3.3.1 Power Input-phoenix type (CN12)

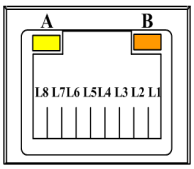
The eBOX565-312-FL equips with a screw type power connector. The CN12 is a DC jack (Φ2.5) with screw. Firmly insert approximately 60W/12V adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.

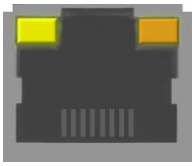


3.3.2 Ethernet Port (LAN1)

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	1000 Base-T	100/10 Base-T	Description
L1	BI_DA+	TX+	Bidirectional or Transmit Data+
L2	BI_DA-	TX-	Bidirectional or Transmit Data-
L3	BI_DB+	RX+	Bidirectional or Receive Data+
L4	BI_DC+	N.C.	Bidirectional or Not Connected
L5	BI_DC-	N.C.	Bidirectional or Not Connected
L6	BI_DB-	RX-	Bidirectional or Receive Data-
L7	BI_DD+	N.C.	Bidirectional or Not Connected
L8	BI_DD-	N.C.	Bidirectional or Not Connected
A	Active Link LED (Yellow) Off: No link Blinking: Data activity detected		
B	Speed LED 1000: Orange 100/10: OFF/Green		

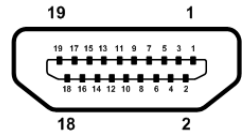




3.3.3 HDMI Connector (CN13)

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	HDMI_VCC (+5V level)
19	HDMI_OUT_HPD		

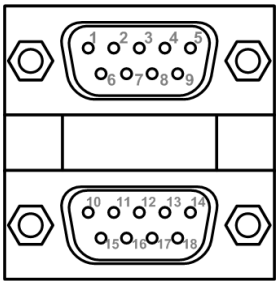


3.3.4 COM Serial Port Connector

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



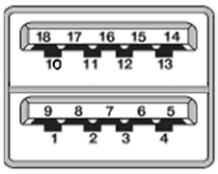
CN7A

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.

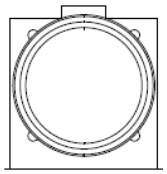
Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data2-	11	USB_Data3-
3	USB_Data2+	12	USB_Data3+
4	GND	13	GND
5	SSRX2-	14	SSRX3-
6	SSRX2+	15	SSRX3+
7	GND	16	GND
8	SSTX2-	17	SSTX3-
9	SSTX2+	18	SSTX3+



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

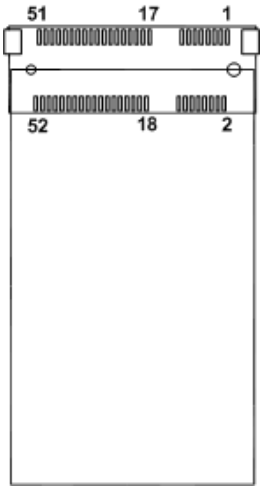
This button reboots your computer without turning off the power supply. It is a better way to reboot your system for a longer life of the system power supply.

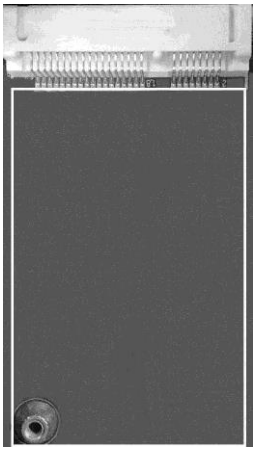
Function	Description
On	Reset system
Off	Keep system status

3.3.8 Express Mini Card Slot (SCN1)

This is a PCI-Express Mini Card connector on the bottom side supporting PCI-Express x1 or SATA and USB 2.0. It complies with PCI-Express Mini Card Spec. V1.2. To enable or disable SATA for mSATA card, please refer to BIOS setting in section 4.4. The default setting is mSATA.

Pins	Signals	Pins	Signals
1	PCIE_WAKE2_N	2	+3.3V_SBY
3	No use	4	GND
5	No use	6	+V1.5S
7	GND	8	No use
9	GND	10	No use
11	PCIE_REFCLK2_DN	12	No use
13	PCIE_REFCLK2_DP	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	+3.3V_SBY
21	GND	22	PLTRST_1_N
23	PCIE_mSATA_Card _RXN	24	+3.3V_SBY
25	PCIE_mSATA_Card _RXP	26	GND
27	GND	28	+V1.5S
29	GND	30	SMB_CLK_3P3_ SBY
31	PCIE_mSATA_Card _TXN	32	SMB_DATA_3P3 _SBY
33	PCIE_mSATA_Card _TXP	34	GND
35	GND	36	USB_DN5
37	GND	38	USB_DP5
39	+3.3V_SBY	40	GND
41	+3.3V_SBY	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+V1.5S
49	No use	50	GND
51	No use	52	+3.3V_SBY



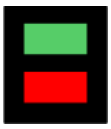


3.3.9 Power and HDD LED Indicator

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 <Del> key immediately.
2. After press the <Del> 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

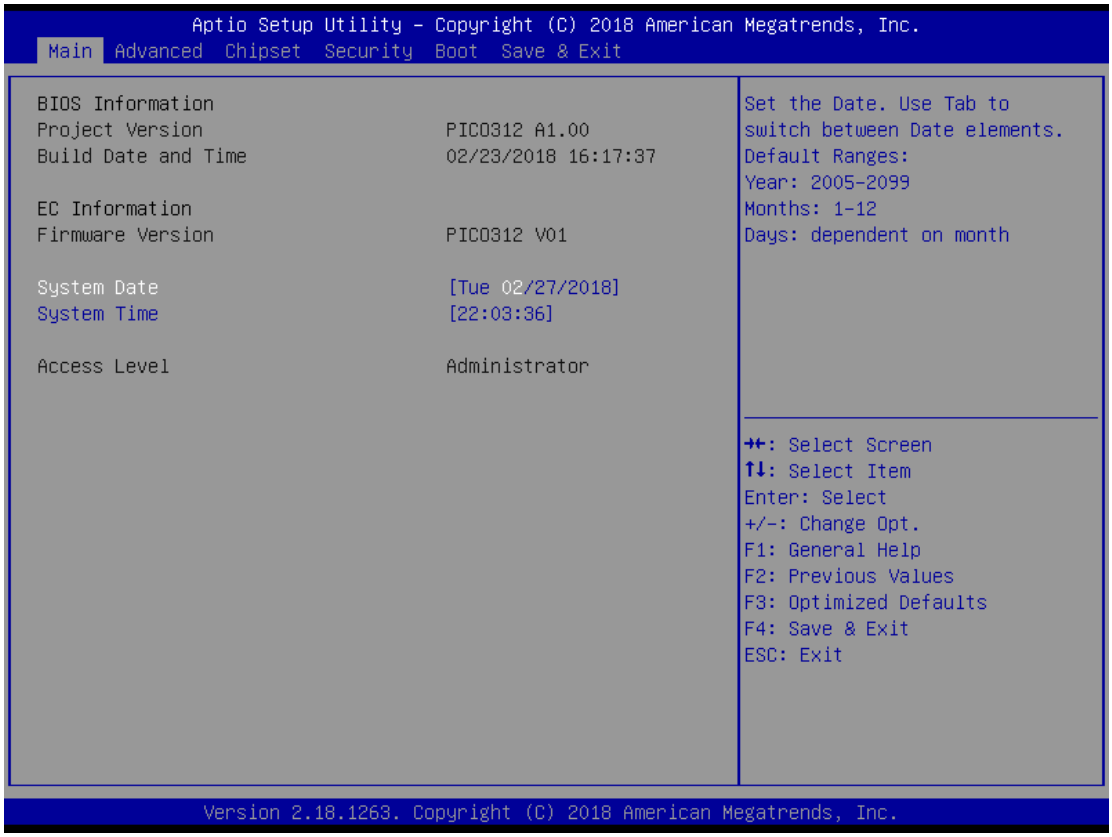
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

【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.

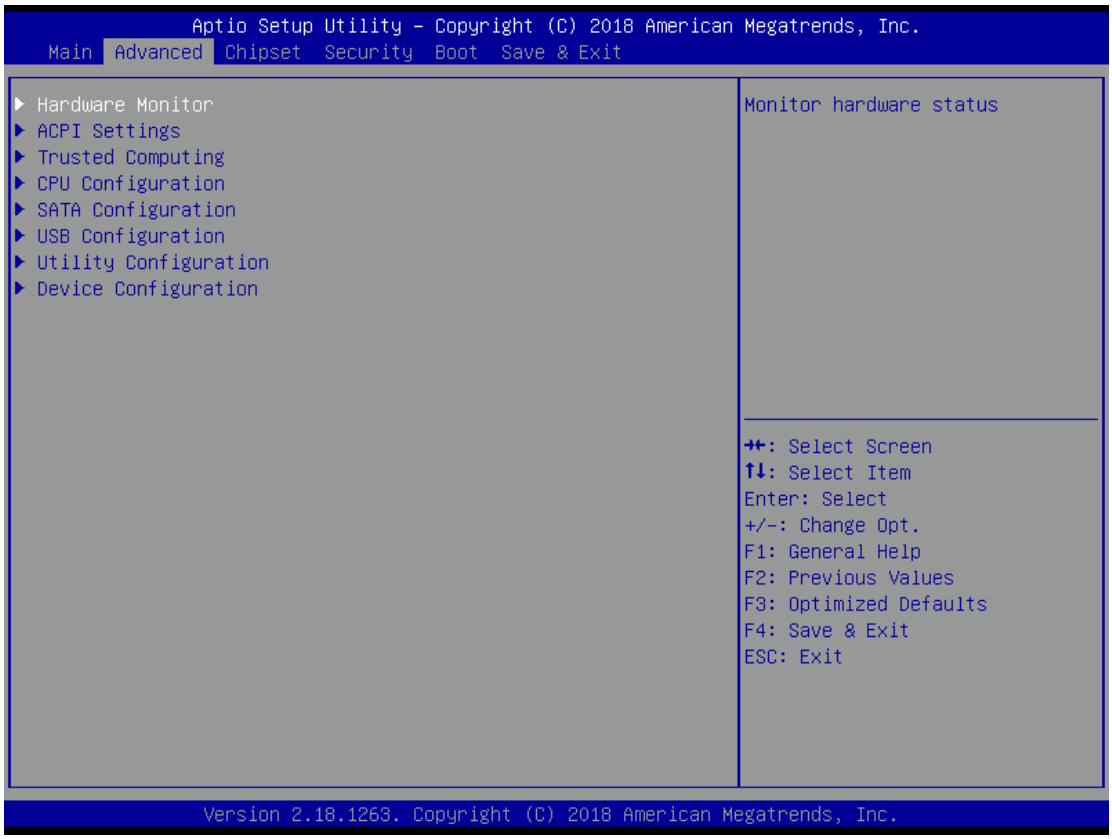
Access Level
Display the access level of current user.

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:

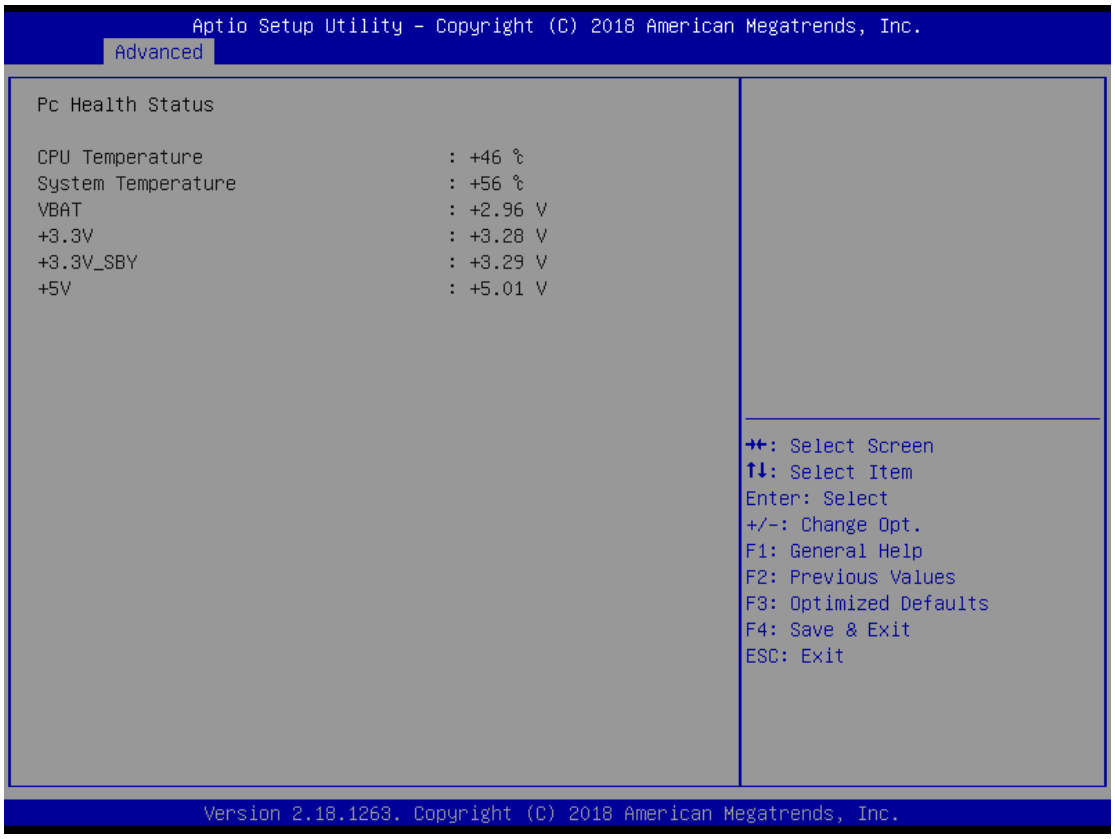
- ► Hardware monitor
- ► ACPI Settings
- ► Trusted Computing
- ► SATA Configurations
- ► USB Configurations
- ► Utility Configurations
- ► Device Configuration

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



- **Hardware Monitor**

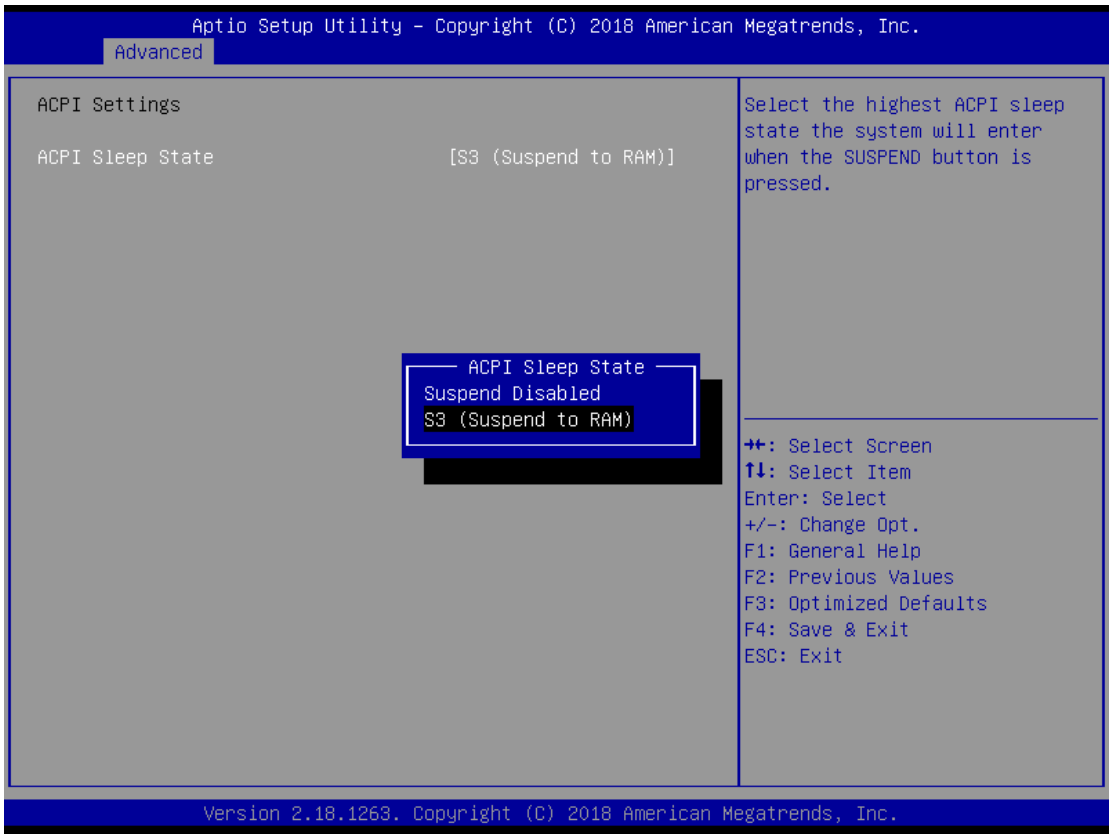
This screen monitors hardware health status.



This screen displays the temperature of system and CPU, system voltages (VBAT, +3.3V, +3.3V_SBY and +5V).

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.

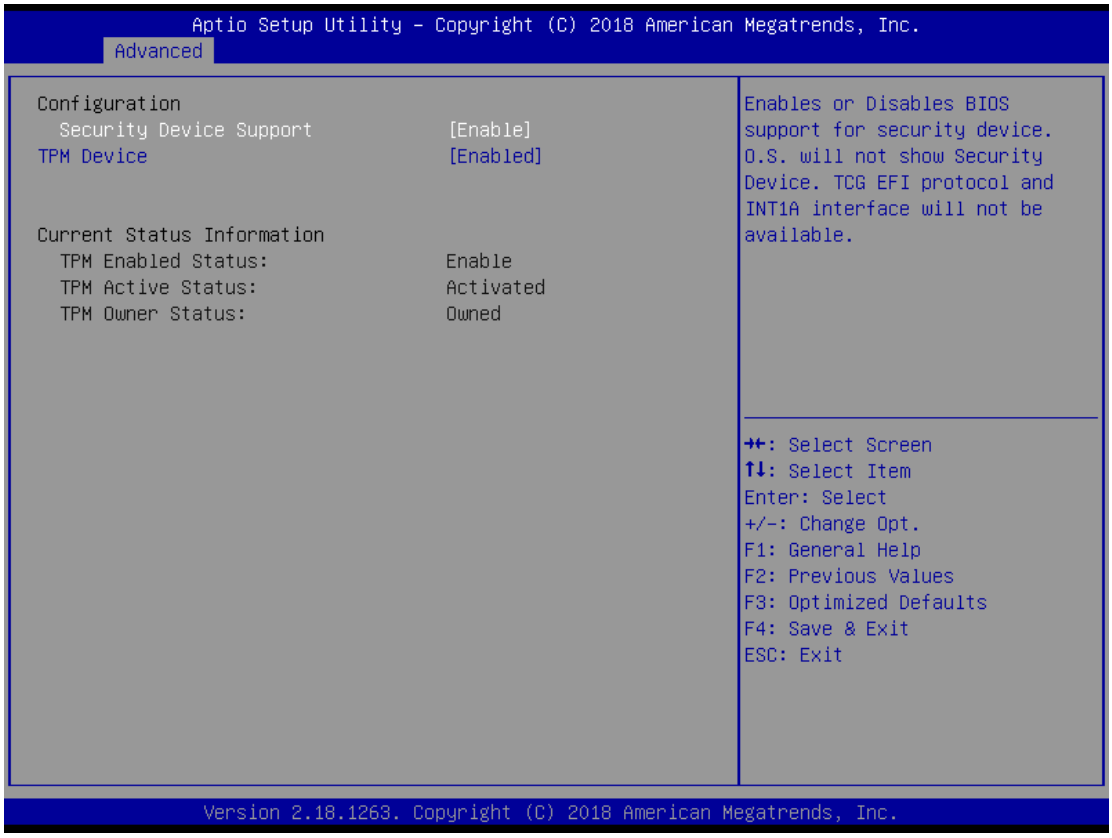


ACPI Sleep State

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

- **Trusted Computing**

This screen provides function for specifying the TPM settings.



Security Device Support

Enable or disable BIOS support for security device. The default setting is Enable.

TPM Device

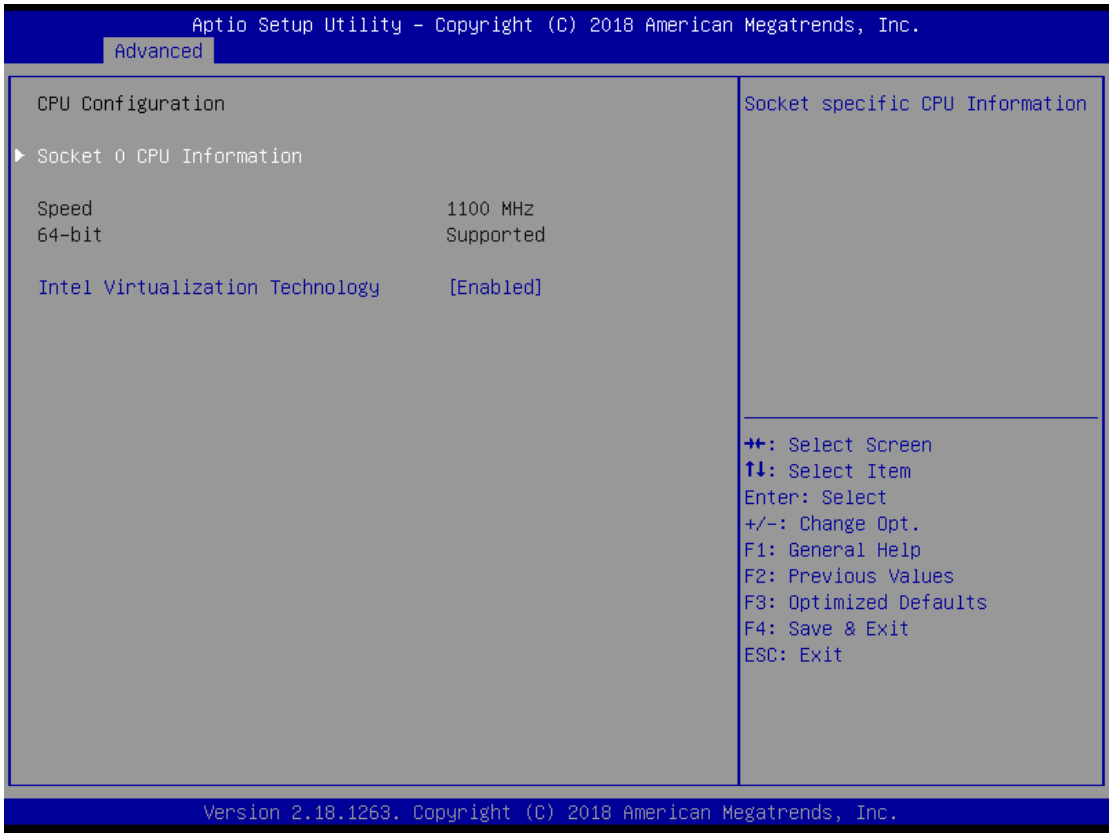
Enable or disable TPM device that supports TPM 1.2 specifications.

Current Status Information

Display current TPM status information.

- **CPU Configuration**

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



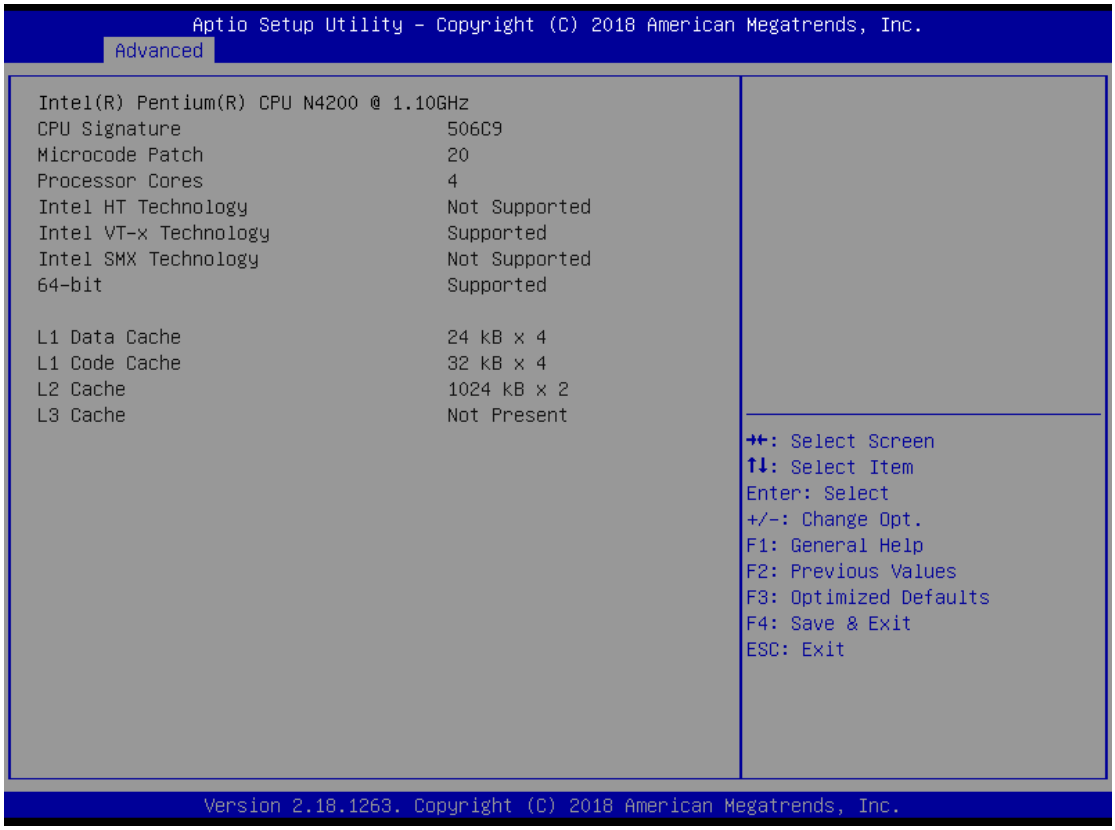
Socket 0 CPU Information

Socket specific CPU information.

Intel Virtualization Technology

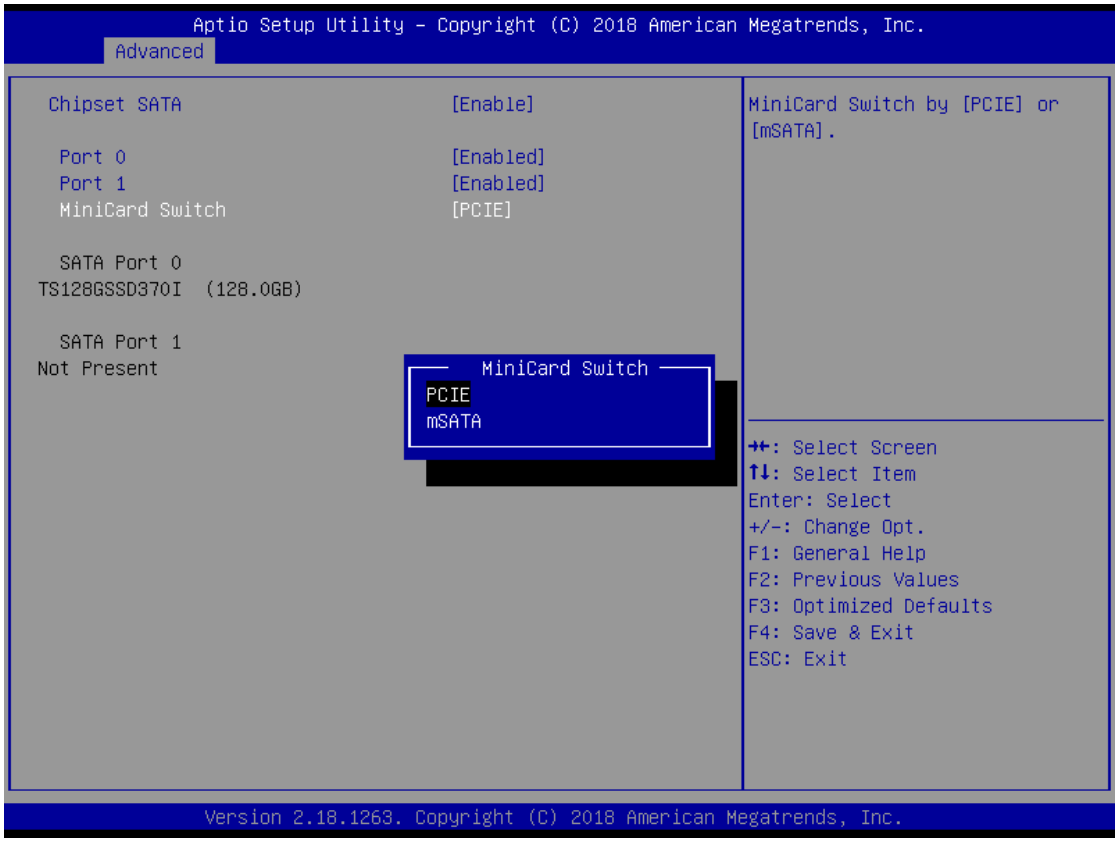
Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

- **CPU Configuration**



- **SATA Configuration**

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



Chipset SATA

Enable or disable the SATA chipset.

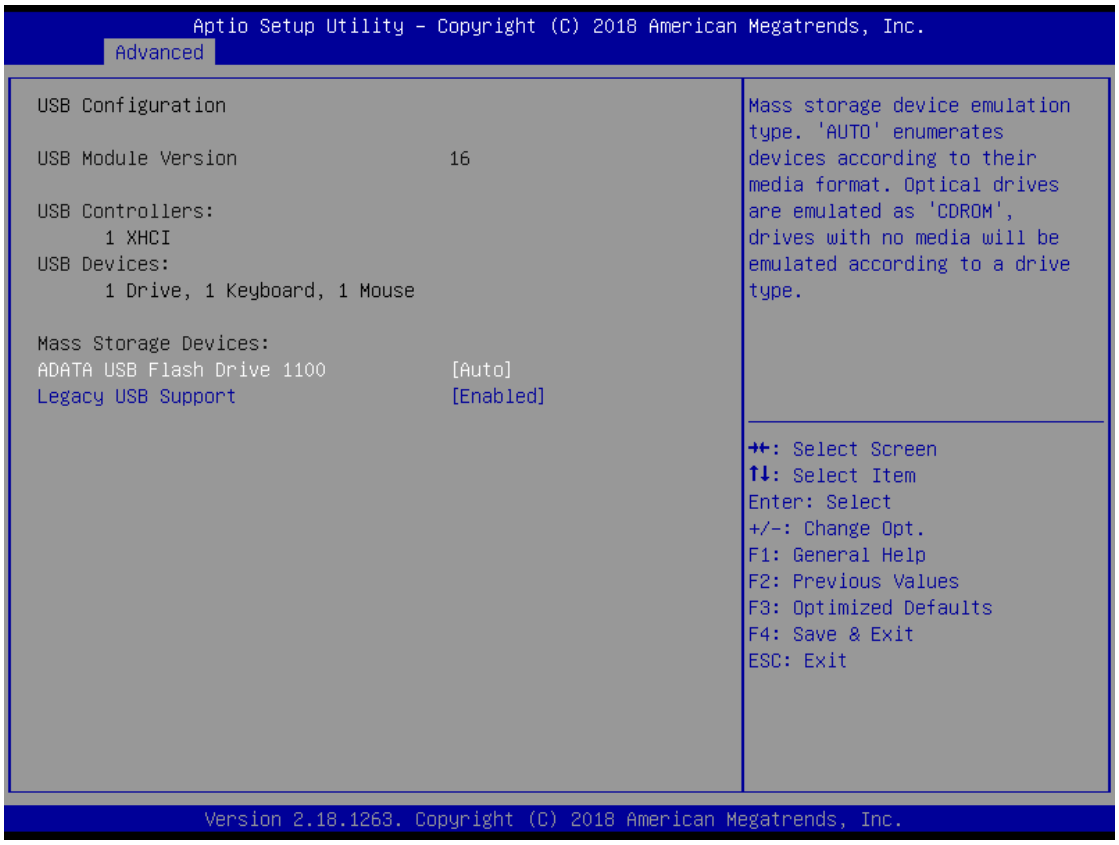
Port 0~1

Enable or disable SATA port 0~1.

MiniCard Switch

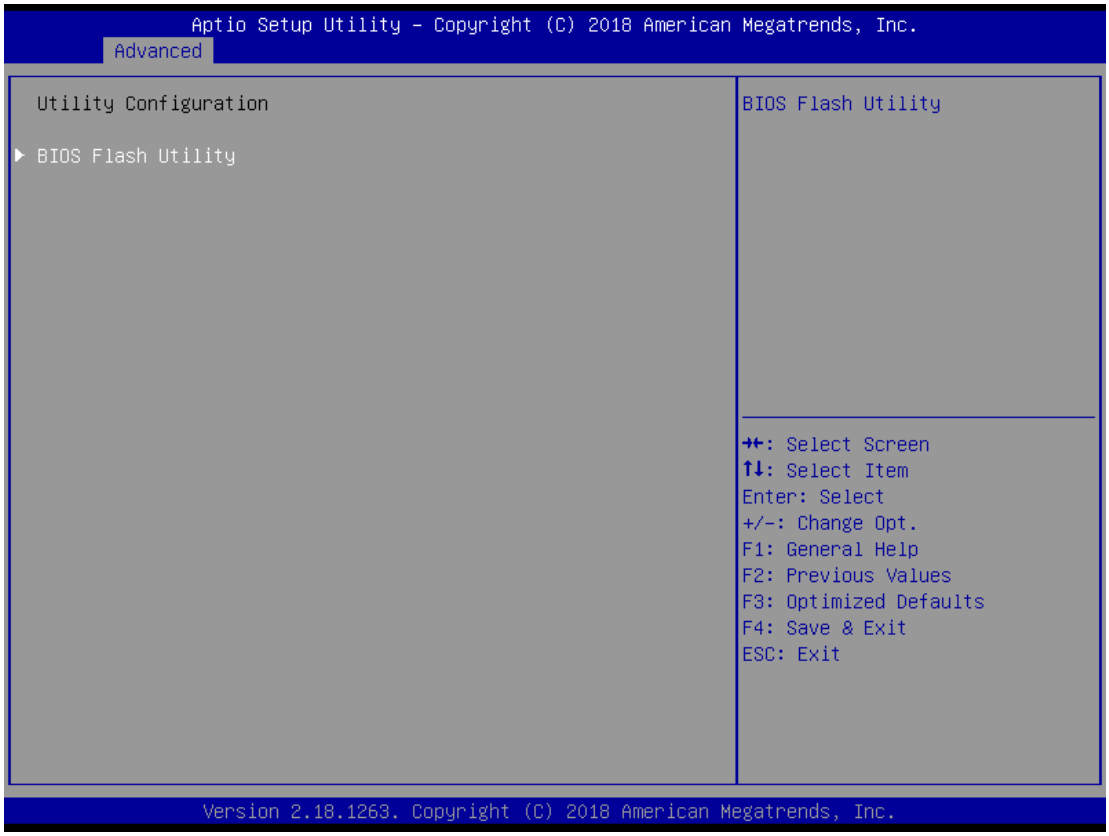
Choose PCIE or mSATA for PCI-Express Mini Card. The default is mSATA.

- **USB Configurations**



USB Devices
Display all detected USB devices.

- **Utility Configuration**

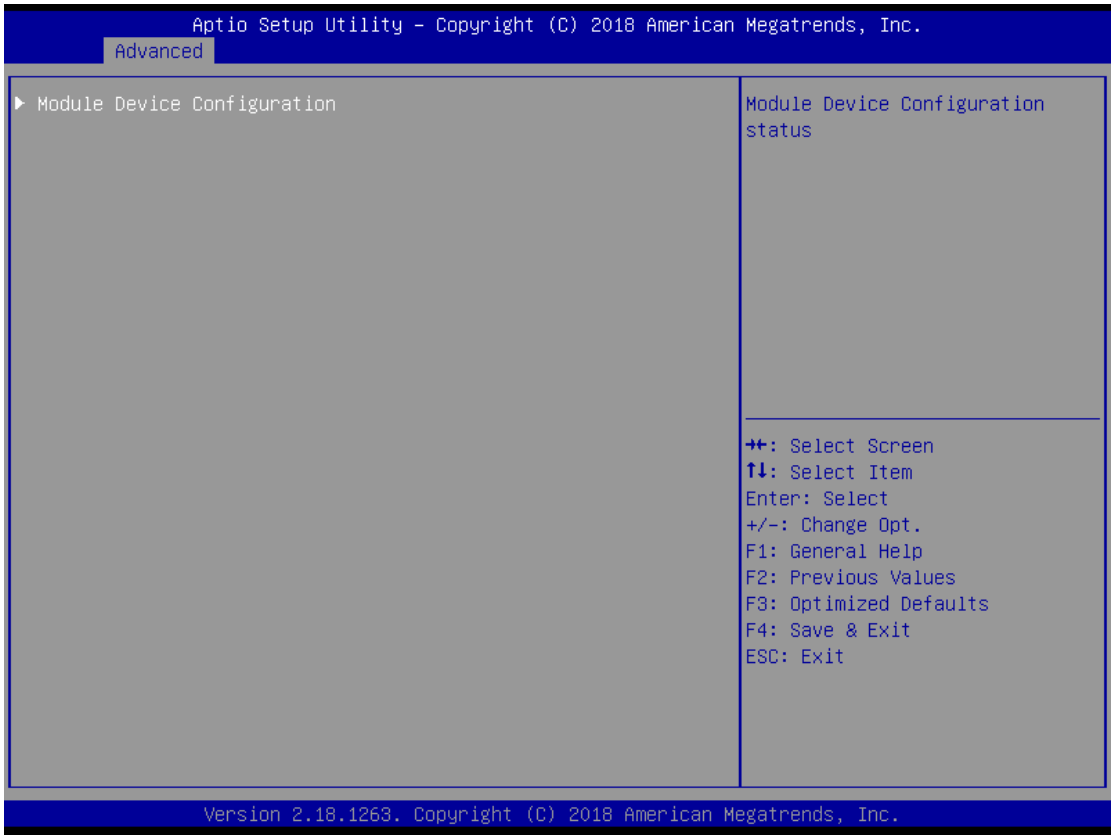


BIOS Flash Utility

BIOS flash utility configuration. For more detailed information, please refer to Appendix B.

- **Device Configurations**

A description of selected item appears on the right side of the screen. For items marked with " " , please press <Enter> for more options.

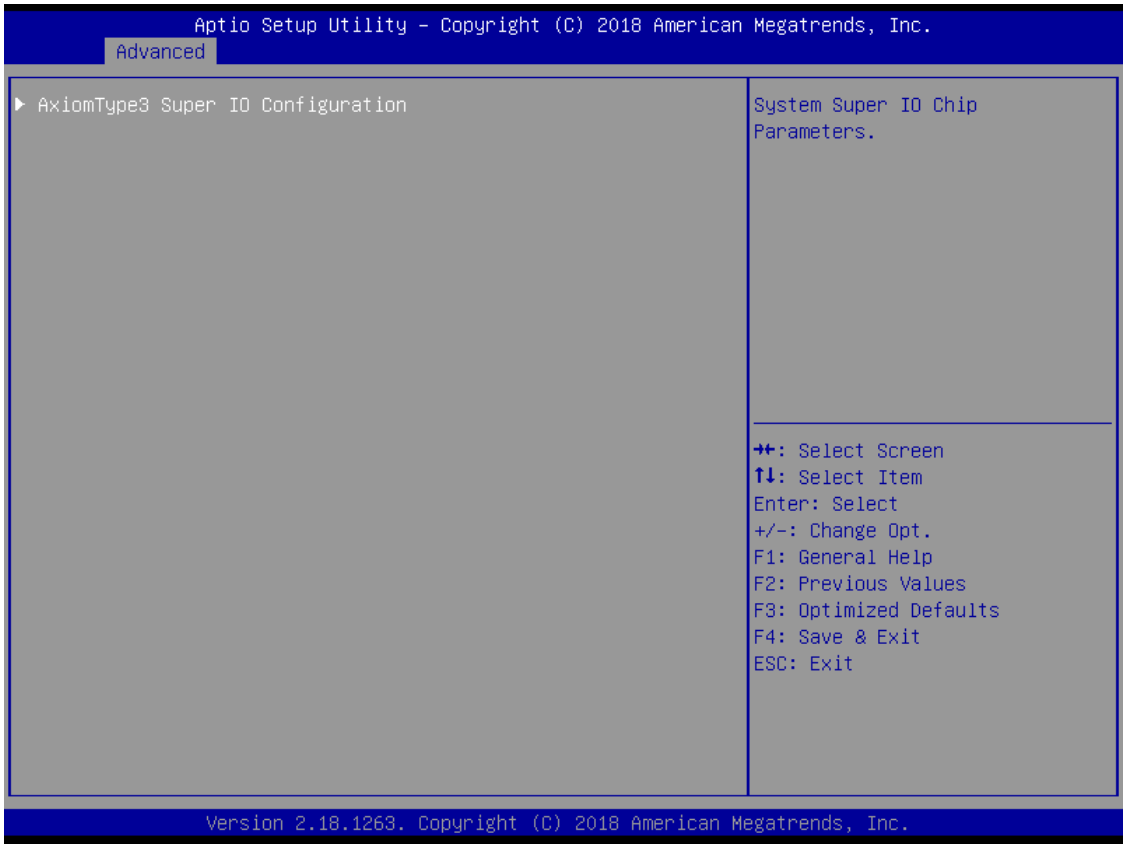


Module Device Configuration

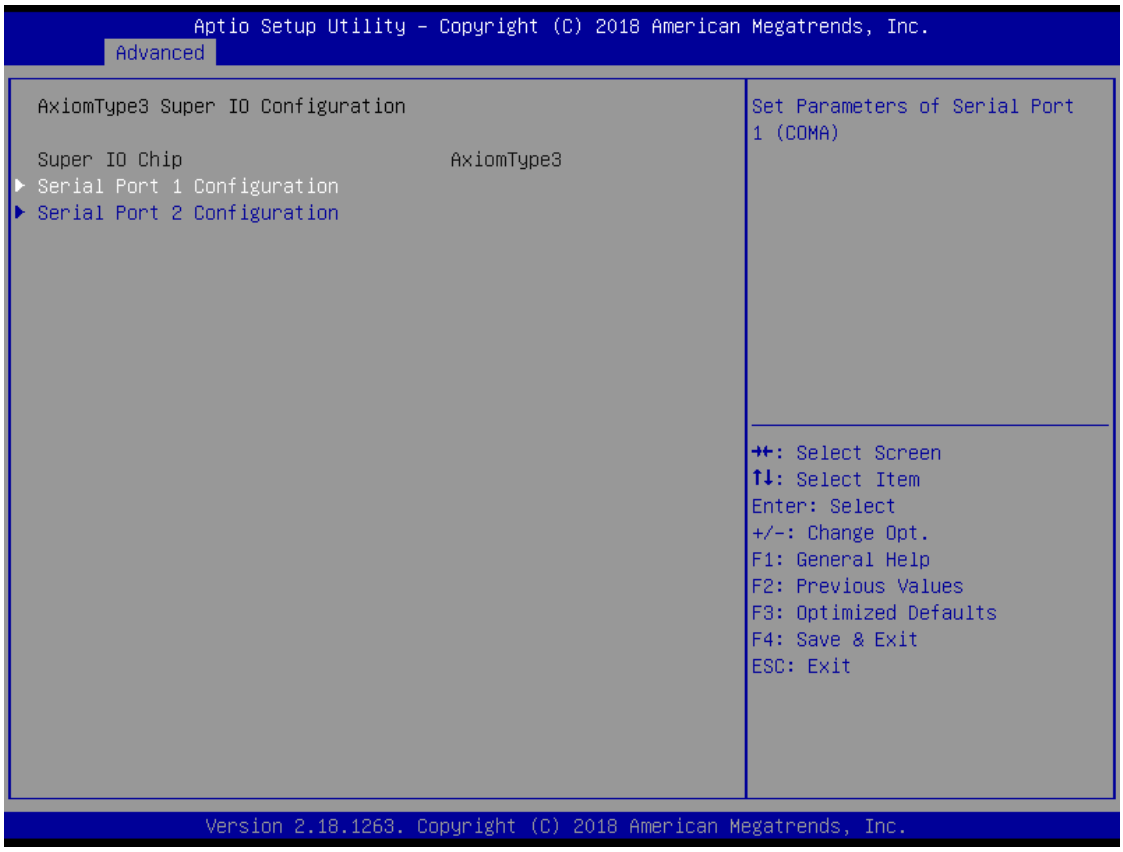
This option appears only if an I/O board is installed. BIOS will auto-detect all supported functions and you can use it to change settings on the I/O board. The PICO312 supports the following I/O boards: AX93A00, AX93A01, AX93A02 and AX93A09.

- **Module Device configure**

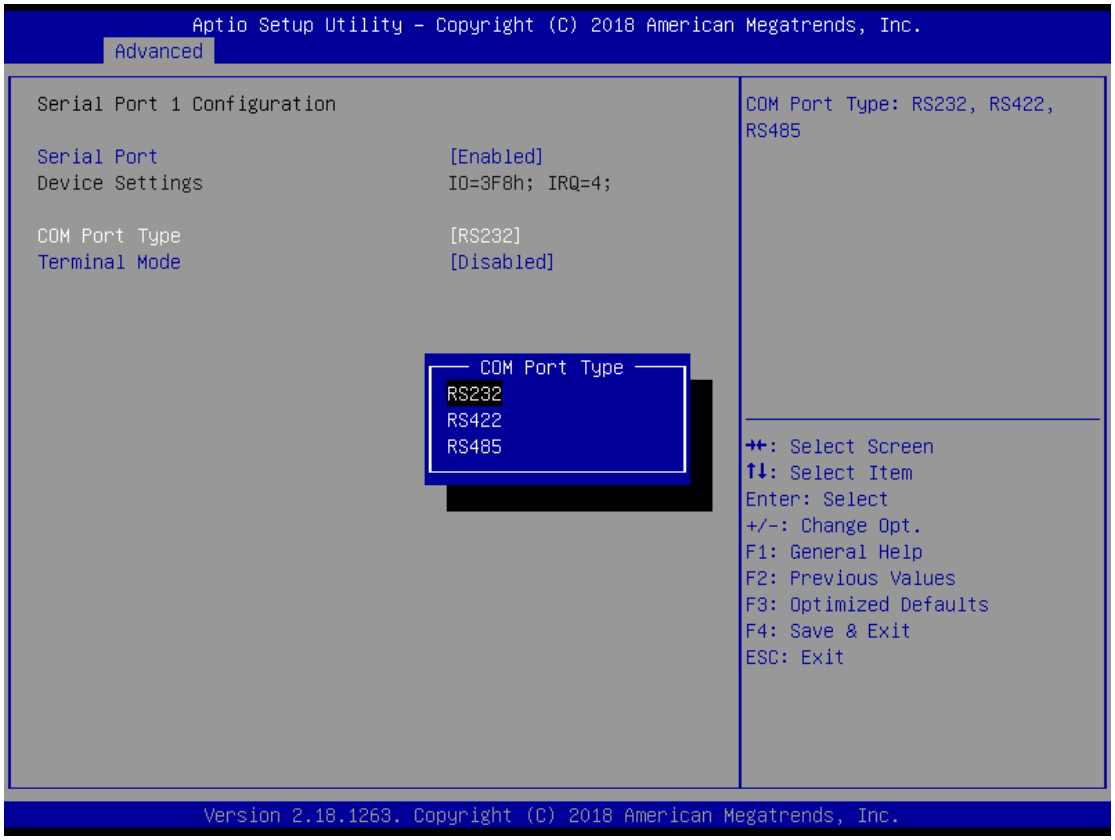
This screen is available only if an I/O board with serial ports is connected. For items marked with "►", please press <Enter> for more options.



- **AxiomType3 Super IO Configure**



- **Serial Port 1**

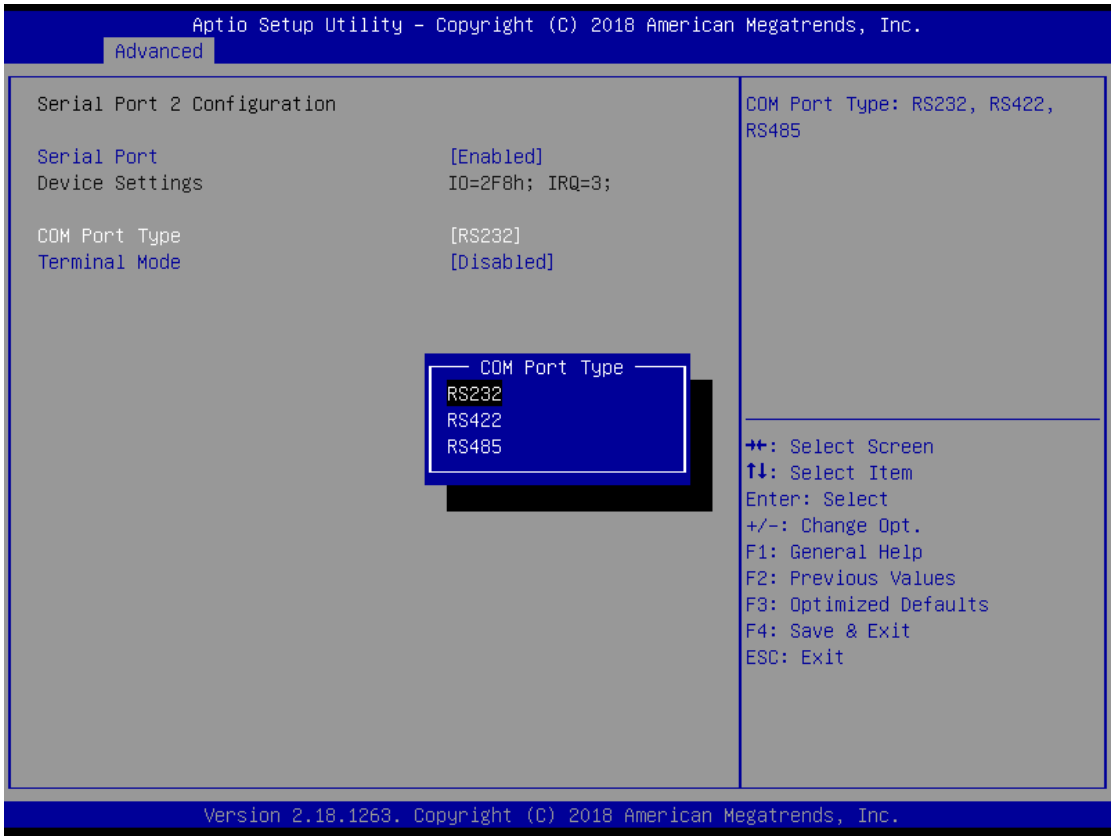


Serial Port
Enable or disable serial port 1 on I/O board. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

COM Port Type
Use this item to set RS-232/422/485 communication mode.

Terminal Mode
Enable or disable terminal mode.

- **Serial Port 2**



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

COM Port Type
Use this item to set RS-232/422/485 communication mode.

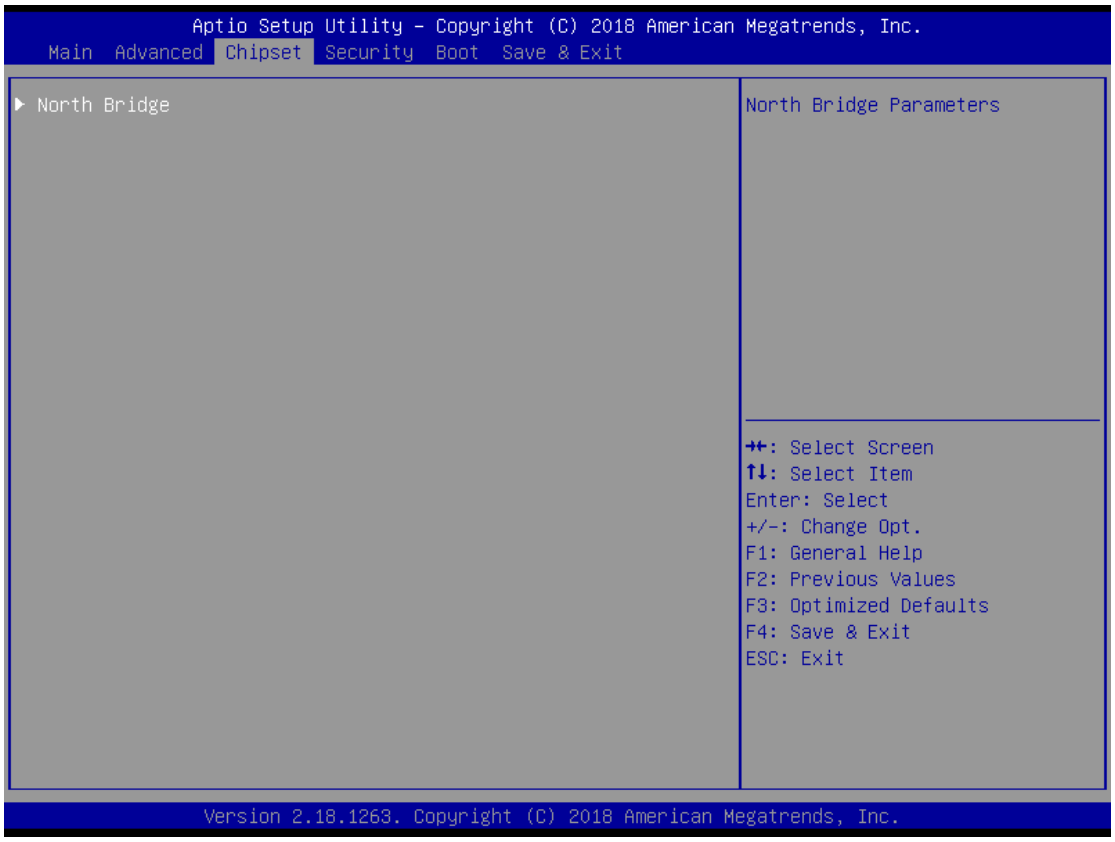
Terminal Mode
Enable or disable terminal mode.

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:

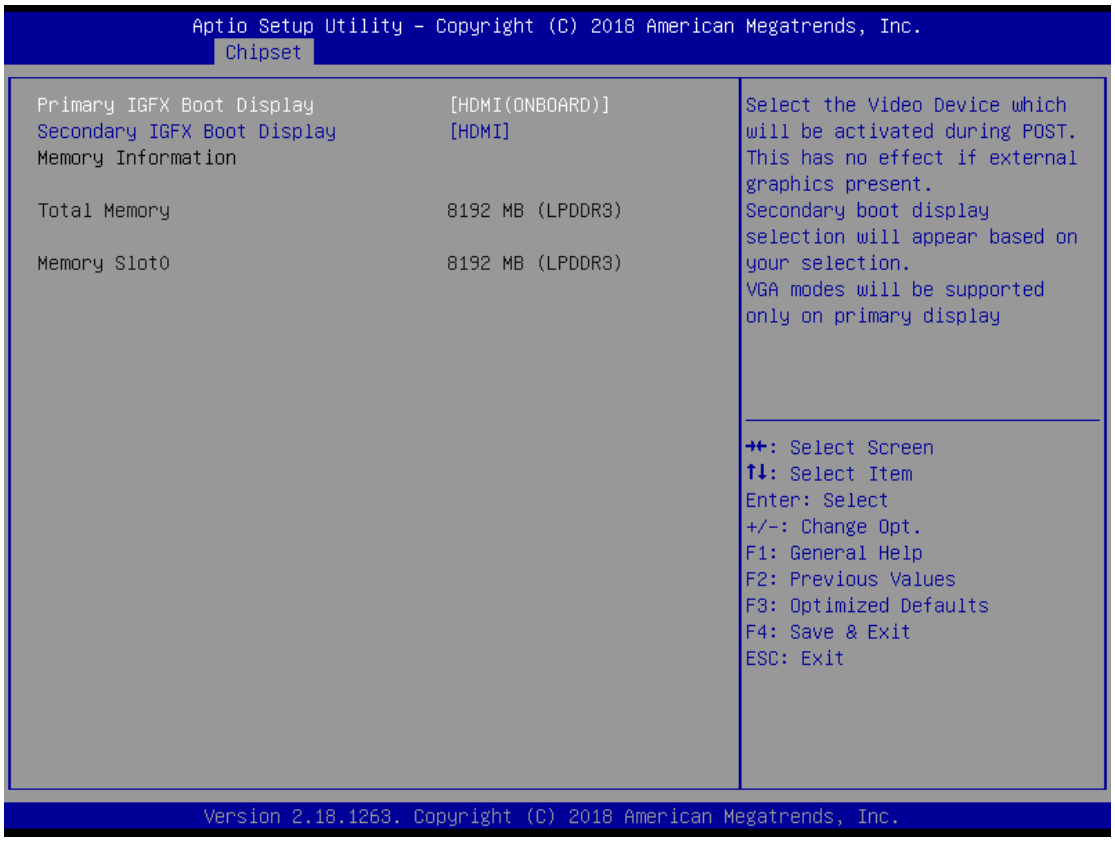
► North Bridge

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



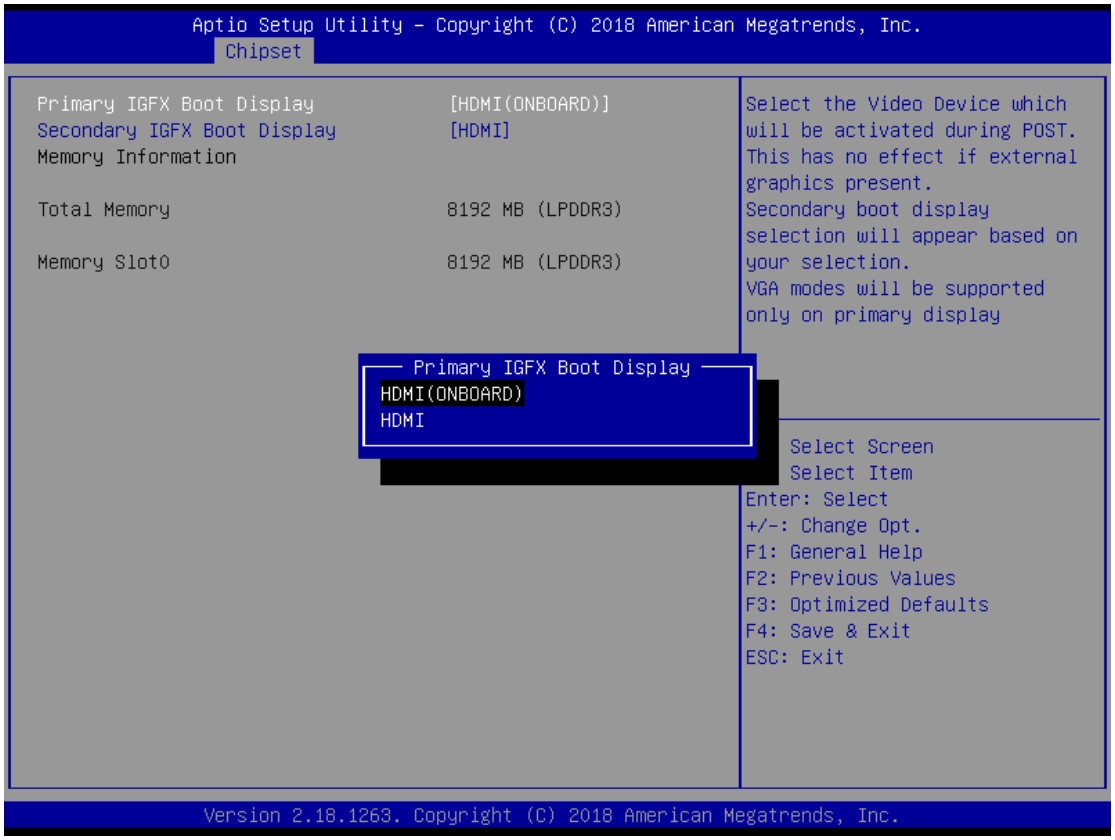
- **North Bridge**

This screen allows users to configure parameters of North Bridge chipset.



Memory Information

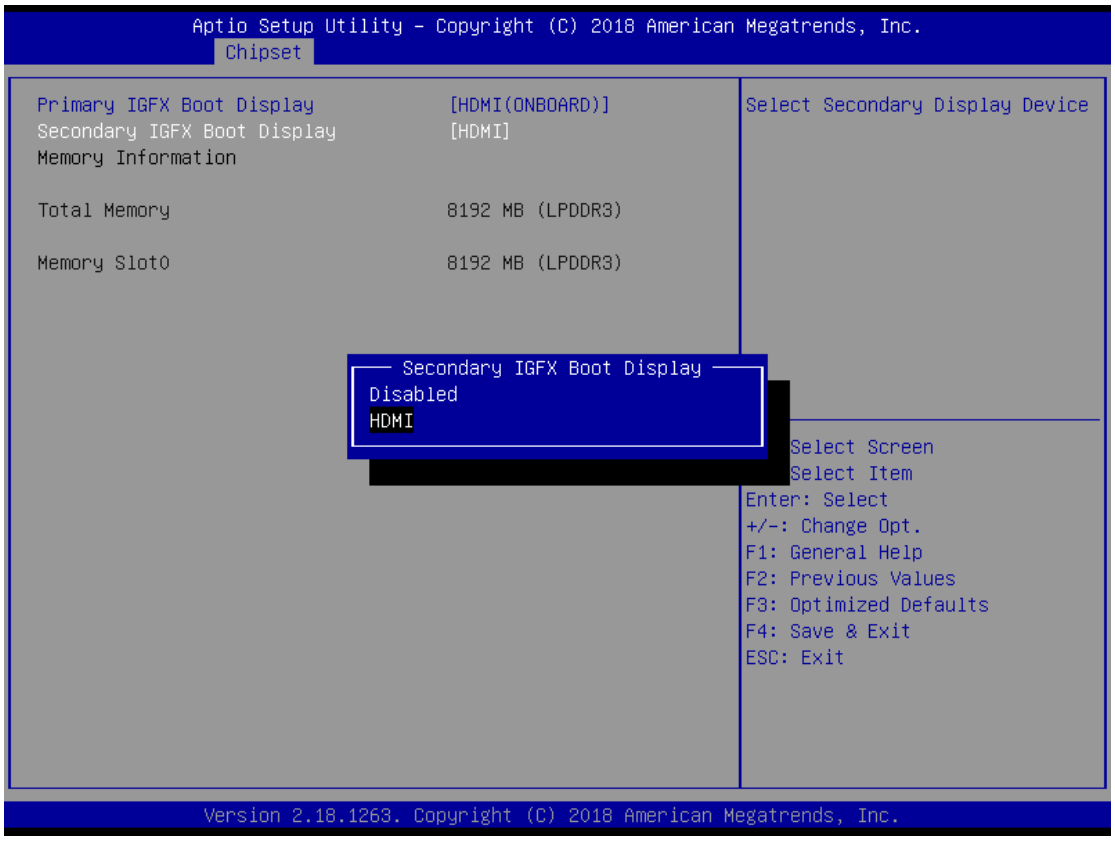
Show the information related to system memory.



Note: ***The LVDS option can only be selected in Primary IGFX Boot Display.***

Primary IGFX Boot Display

Select the video device which will be activated during POST (Power-On Self Test).
-With no I/O board connected, the default is LVDS.
-With I/O board connected, the default is display device on PICO312 (onboard HDMI or onboard VGA).

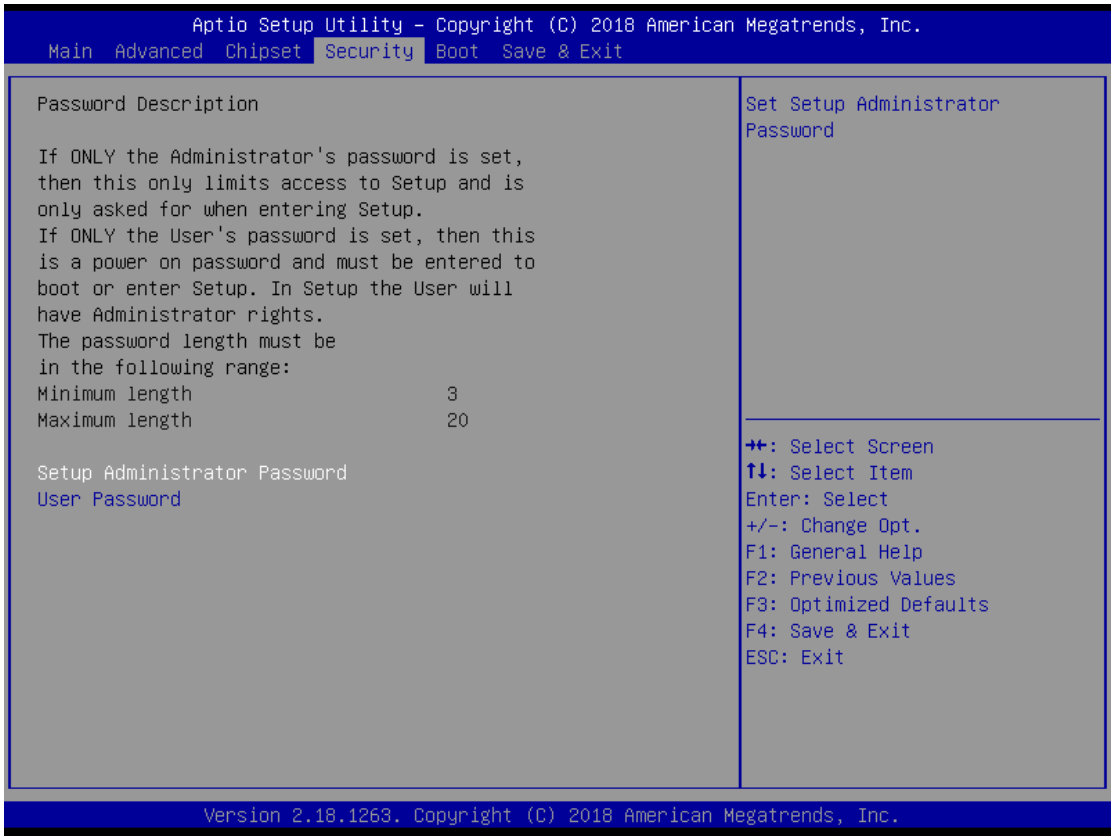


Secondary IGFX Boot Display

Select secondary display device.
-With no I/O board connected, the default is display device on PICO312 (onboard HDMI or onboard VGA).
-With I/O board connected, the default is display device on I/O board (VGA on AX93A00 or HDMI on AX93A01).

4.6 Security Menu

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

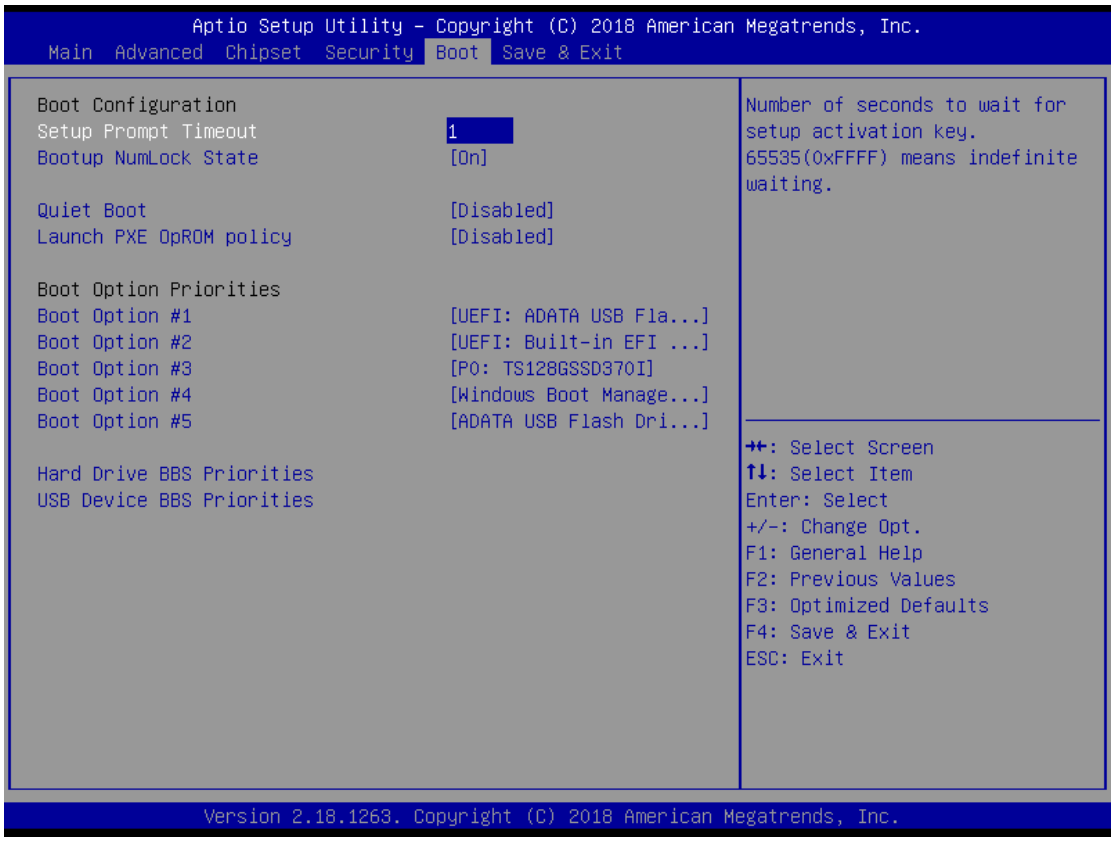


Administrator Password
This item indicates whether an administrator password has been set (installed or uninstalled).

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.



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

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

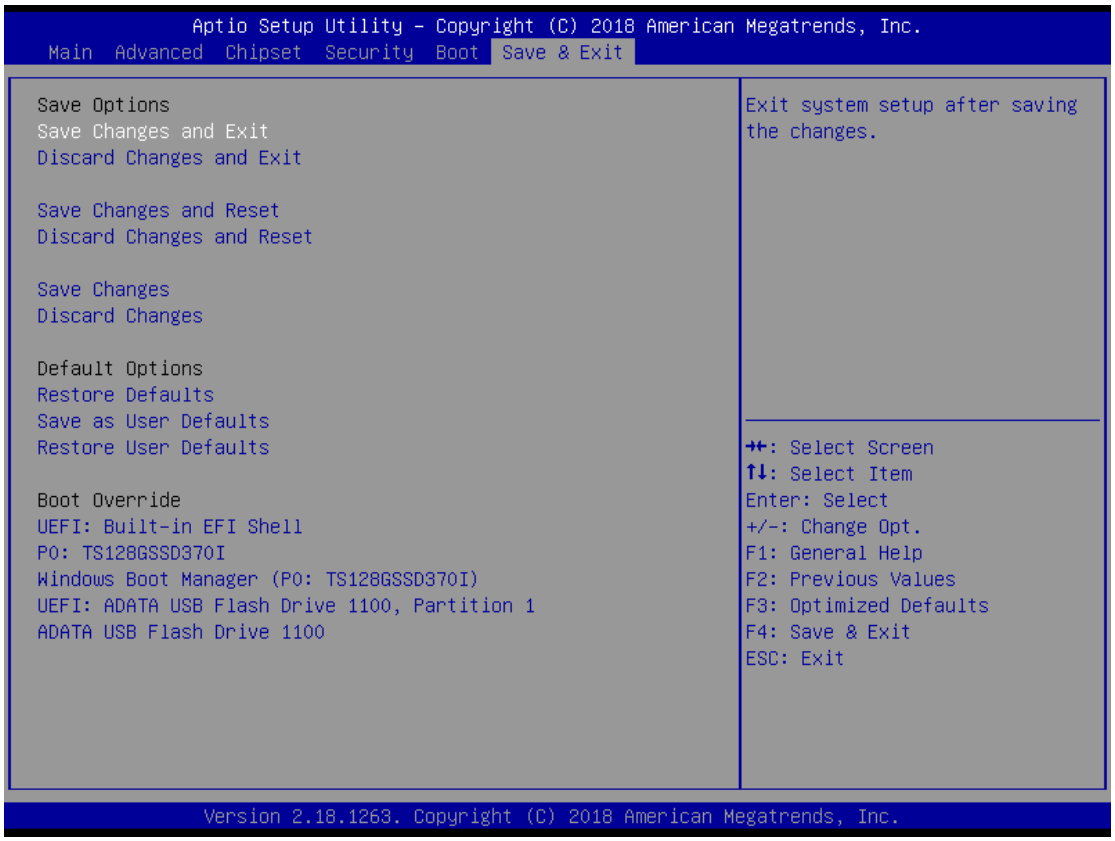
Quiet Boot
Select to display either POST output messages or a splash screen during boot-up.

Legacy PXE 0pROM policy
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.

APPENDIX A
WATCHDOG TIMER

About Watchdog Timer

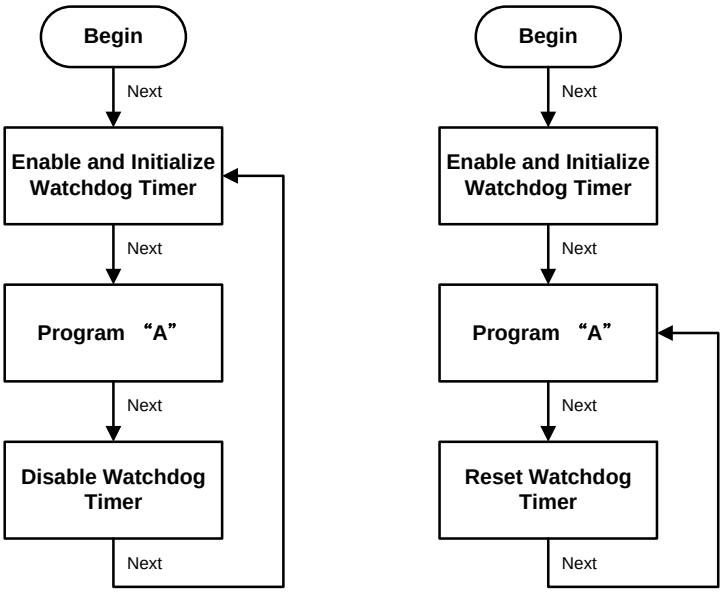
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

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

This page is intentionally left blank.