

# A AXIOMTEK

# eBOX560-300-FL Series

**Embedded System** 

**User's Manual** 



#### **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, and any liability arising from such use.

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 the 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 form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

©Copyright 2016 Axiomtek Co., Ltd.
All Rights Reserved
April 2016, Version A1
Printed in Taiwan

#### **Safety Precautions**

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

- 1. The eBOX560-300-FL does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
- Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
- Disconnect the power cord from the eBOX560-300-FL before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the eBOX560-300-FL is properly grounded.
- 4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 5. Turn OFF the 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 this equipment in an uncontrolled environment where the storage temperature is below -40 $^{\circ}$ C or above 80 $^{\circ}$ C. 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 to discharge any static electricity on your body.
  - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

#### 8. CAUTION

- RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE
- DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

### Classification

- 1. Degree of production against electric shock : not classified
- 2. Degree of protection against the ingress of water: IP40
- 3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- 4. Mode of operation : Continuous

#### General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

- Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
- 2. Turn the system off before you start to clean up the component or computer.
- Never drop the components inside the computer or get circuit board damp or wet.
- Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
- 5. Try not to put any food, drink or cigarette around the computer.

#### **Cleaning Tools:**

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.



Note: We strongly recommended that you should shut down the system before you start to clean any single components.

#### Please follow the steps below:

- Close all application programs
- 2. Close operating software
- Turn off power switch 3.
- Remove all device
- Pull out power cable

#### **Scrap Computer Recycling**

If the computer equipment's needs the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

#### **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 7, Windows 10, Linux and other brand names and trademarks are the properties and registered brands of their respective owners.

# **Table of Contents**

Disclaimers	S	ii
Safety Prec	autions	. iii
Classificati	on	. iv
General Cle	eaning Tips	v
Scrap Com	puter Recycling	. vi
CHAPTER	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 Dimension	
1.3.2	Wall mount Bracket Dimension	5
1.3.3	Din-rail mount Bracket Dimension	
1.3.4	VESA mount Bracket Dimension	
1.4	I/O Outlets	
1.5	Packing List	10
CHAPTER	2 HARDWARE INSTALLATION	.11
2.1	Installing the 2.5" SATA Device	11
2.2	Installing the Express Mini Card	13
2.3	Installing the SO-DIMM Memory	15
CHAPTER	3 JUMPER SETTING & CONNECTOR	.17
3.1	Jumper & Connector Location	17
3.2	Jumper Setting Summary	19
3.2.1	Restore BIOS Optimal Defaults (JP1)	
3.2.2	AT/ATX Quick Switch	20
3.3	Connectors	21
3.3.1	DC Power Jack w/ Screw (CN14)	. 22
3.3.2	Ethernet Port (LAN1/LAN2)	. 22
3.3.3	HDMI Connector (CN15/CN16)	. 22
3.3.4	COM Serial Port Connector	. 23
3.3.5	USB 3.0 Connector	
3.3.6	Serial ATA Connectors	
3.3.7	Serial ATA Power Connectors	
3.3.8	System Power Switch	
3.3.9	System Reset Switch	
	Express Mini Card Slot	
3.3.11	Power and HDD LED Indicator	. 27
CHAPTER	4 BIOS SETUP UTILITY	.29
41	Starting	29

4.2	Navigation Keys	29
4.3	Main Menu	30
4.4	Advanced Menu	31
4.5	Chipset Menu	41
4.6	Security Menu	44
4.7	Boot Menu	45
4.8	Save & Exit Menu	46
APPEN	DIX A WATCHDOG TIMER	49
Abou	ıt Watchdog Timer	49
	to Use Watchdog Timer	
Samp	ole Program	50

# CHAPTER 1 INTRODUCTION



This chapter contains general information and detailed specifications of the eBOX560-300-FL. The Chapter 1 includes the following sections:

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

#### 1.1 General Description

The eBOX560-300-FL is an embedded system that supports Intel® Pentium® Processor N3710 onboard to support Windows 7, Windows 10, and Linux, suitable for the most endurable operation.

It features fan less design with full feature I/O, one 204-pin unbuffered SODIMM socket for one channel DDR3L-1333/1600 MHz memory, and enhanced system dependability by built-in Watchdog Timer.

#### Features

- 1. Intel® Pentium® N3710 1.6GHz Braswell Quad-Core SoC
- 2. Maximum up to 8GB SO-DIMM DDR3L 1600 MHz memory capacity
- 3. Fan-less design with compact size
- 4. Supports 4 USB 3.0 ports
- 5. Supports 1 RS-232/422/485 and 1 RS-232
- 6. Supports 2 10/100/1000Mbps Ethernet ports

- 7. Supports ATX power button
- 8. Supports Reset button
- 9. Two HDMI
- 10. One 2.5" SATA HDD drive bay
- 11. One PCI Express Mini Card Slots w/ mSATA supported.
- 12. Watchdog timer
- 13. 12V DC power input
- 14. Two Antenna openings
- 15. One AT/ATX mode quick switch
- 16. Option Wall / VESA / DIN Rail Mounting Kits

#### Reliable and Stable Design

The eBOX560-300-FL adopts the advanced cooling system and supporting the mSATA, which makes it especially suitable for vibration environments, best for industrial automation, digital signage and gaming application.

#### • Embedded O.S. Supported

The eBOX560-300-FL not only supports Windows 7, Win 10 but also supports embedded OS, such as Windows 7 Embedded, Windows 8 Embedded, Windows 10 IoT and Linux.

#### Various Storage devices supported

For storage device, the eBOX560-300-FL supports one 2.5" SATA storage drive bay and one mSATA device.

#### 1.2 System Specifications

#### 1.2.1 CPU

- CPU
  - Intel<sup>®</sup> Pentium<sup>®</sup> N3710
- Chipset
  - Intel<sup>®</sup> Braswell quad-cord SoC
- BIOS
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.

#### System Memory

 One 204-pin unbuffered DDR3L 1600 MHz SO-DIMM socket, max. up to 8GB

#### 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 (support FHD)
- Two RJ-45 connectors for 10/100/1000 Base-T Ethernet ports (i210AT & i211AT)
- Four USB 3.0 connectors
- One PCI Express Mini Card Slots w/ mSATA supported.
- One Reset button
- One Power button
- Two SMA type connector opening for Antenna

- 12 VDC Power jack 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: AC 90~264V, AC 60W adaptor with lock Output: DC 12V@5A
- **Operation Temperature** 
  - -20°C ~+50°C (-4°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
  - 0.8 kg(1.76lb) without package
  - 1.5 kg(3.31lb) with package
- **Dimensions** 
  - 141.5 mm(5.57") (W) x 106 mm(4.17") (D) x 55 mm(217") (H)

#### 1.2.4 **Driver CD Content**

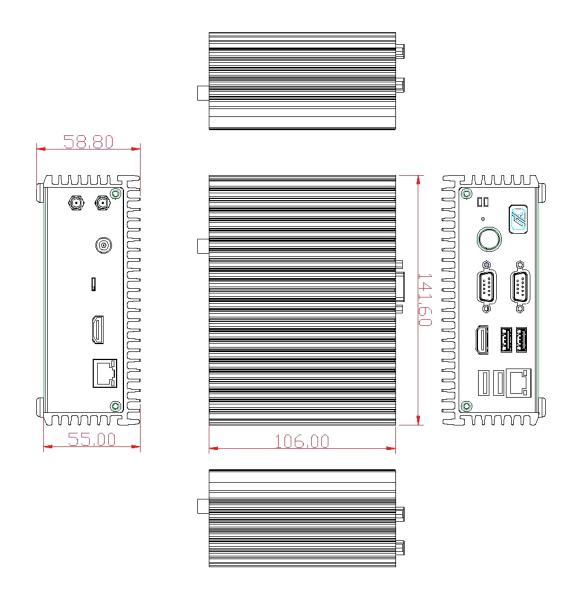
- Driver
  - Chipset
  - Ethernet
  - Graphic
  - **USB 3.0**
  - TXE
- Manual
  - User Manual
  - Quick Manual

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

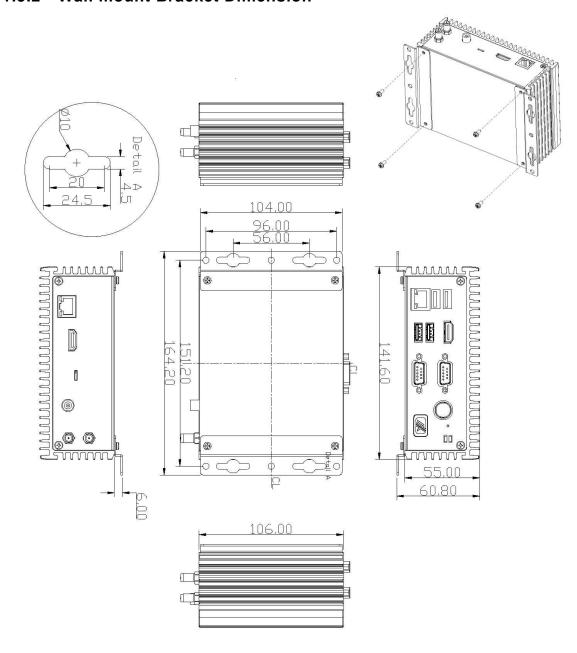
#### 1.3 Dimensions

The following diagrams show you dimensions and outlines of the eBOX560-300-FL.

### 1.3.1 System Dimension



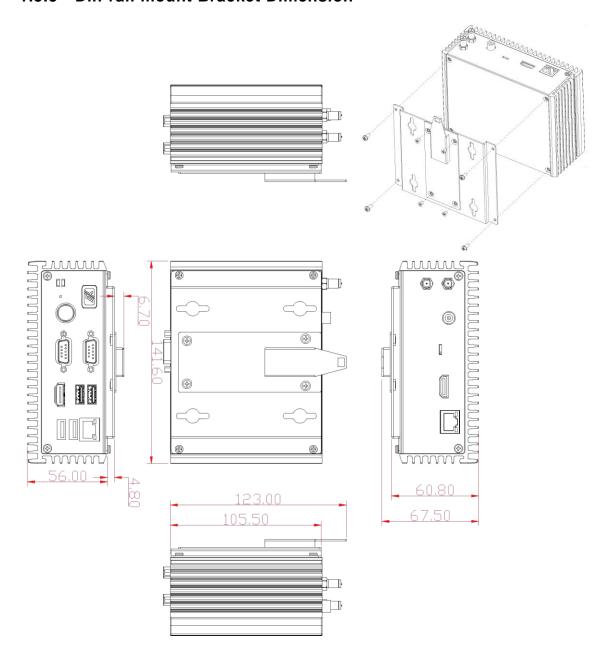
#### 1.3.2 Wall mount Bracket Dimension



#### Instruction

- Step 1: Screw the two pieces of wall-mount kits to the bottom plate of the device. Total four screws (metric 3 x6) 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.

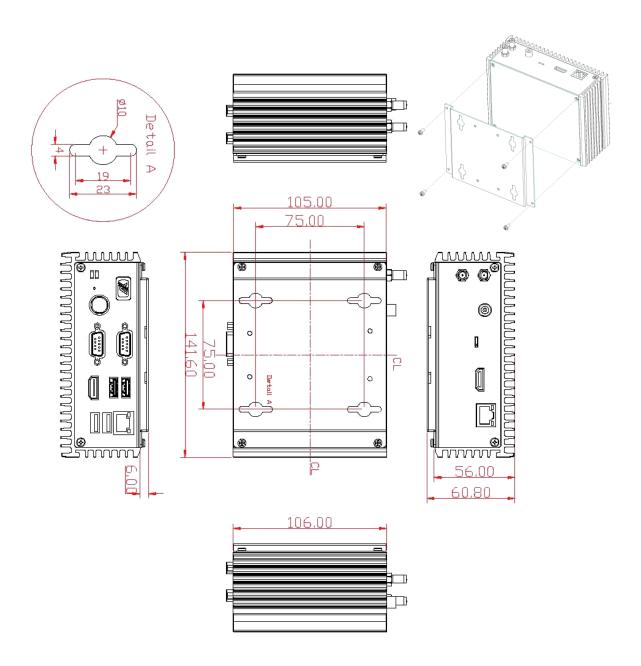
#### 1.3.3 Din-rail mount Bracket Dimension



#### Instruction

- Step 1: Screw the Din rail mount Bracket to the bottom plate of the device. Total of four screws (metric  $3 \times 6$ ) 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 eBOX560 in din-rail bracket through din-rail bracket kit.

#### 1.3.4 VESA mount Bracket Dimension



#### 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  $3 \times 6$ ) are required.

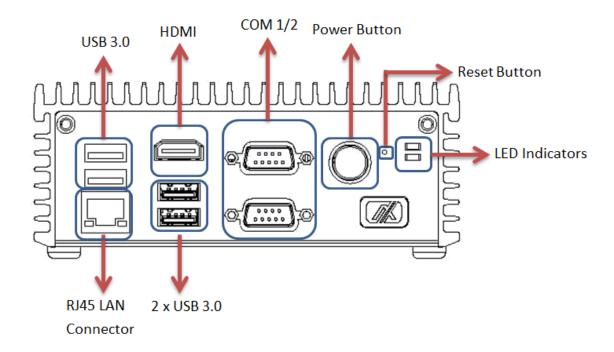
Step 2: Insert four screws into the VESA hole of monitor and reserved a gap about 1.2~1.5mm.

Step 3: Users can hang the eBOX560 through VESA bracket on the monitor.

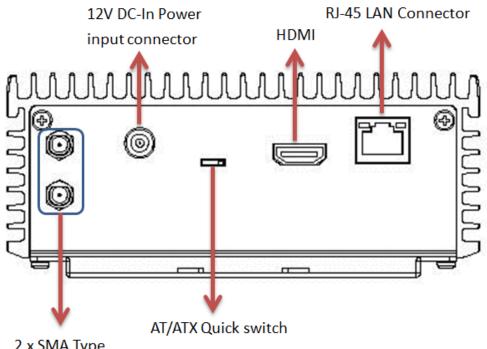
#### 1.4 I/O Outlets

The following figures show you I/O outlets on front view of the eBOX560-300-FL.

#### • Front View drawing



#### • Rear View drawing



2 x SMA Type Connector opening for Antenna

#### 1.5 Packing List

The package bundled with your eBOX560-300-FL should contain the following items:

- eBOX560-300-FL System Unit x 1
- eBOX560-300-FL Quick Installation Guide x 1
- CD x 1 (For Driver and Manual)
- Screws Pack x1
- Pre-installed Foot pad x4
- 12VDC / 60W AC to DC Adapter
- Optional DDR3L SO-DIMM Memory
- Optional Wall-mount kit
- Optional VESA / DIN-Rail kit
- Optional Antenna
- Optional Mini Card module
- Optional 2.5" SATA Storage
- Optional mSATA

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

# CHAPTER 2 HARDWARE INSTALLATION

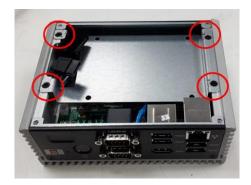
The eBOX560-300-FL is convenient for your various hardware configurations, such as HDD (Hard Disk Drive), SSD (Solid State Drive) or PCI Express Mini Card modules. The chapter 2 will show you how to install the hardware.

### 2.1 Installing the 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, loosen screws.



- Step 3 Remove the bottom cover.
- Step 4 Please find the HDD bracket location then loosen four screws of HDD bracket to take out it.



Step 5 Please prepare the following items to assemble HDD.



Step 6 Fasten total four screws to fix HDD/SSD.



 $\ensuremath{\mathbb{X}}$  Please notice that you should base on the photo to check the direction of HDD.

- Step 7 Lock the HDD and fasten screws then connect SATA & Power cables.
- Step 8 Please fasten screws of HDD bracket to complete first HDD installation.



### 2.2 Installing the 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, loosen screws.



Step 3 Remove the HDD bracket then find Mini Card location.



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 Installing the 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 Please find the HDD bracket location then loosen four screws of HDD bracket to take out it.



Step 4 Then insert your memory into the slot carefully.



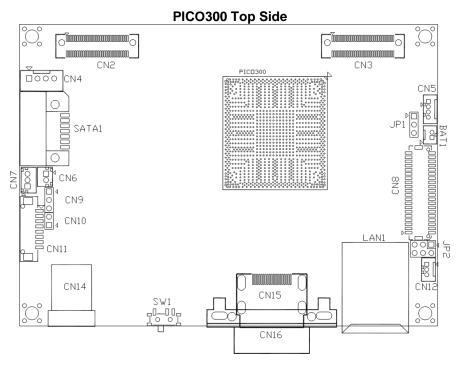
Step 5 Finally, please fasten the HDD bracket and bottom cover to complete installation.



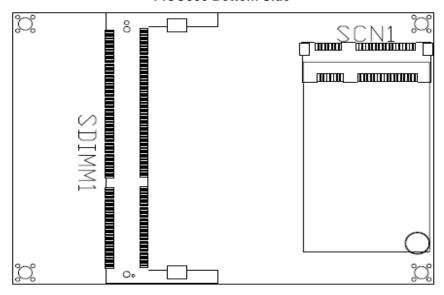
# CHAPTER 3 JUMPER SETTING & CONNECTOR

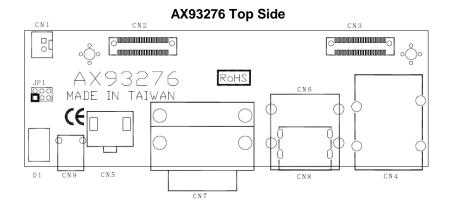
Proper jumper settings configure the **eBOX560-300-FL** to meet your application purpose. We are here with listing a summary table of all jumpers and default settings for onboard devices, respectively.

### 3.1 Jumper & Connector Location

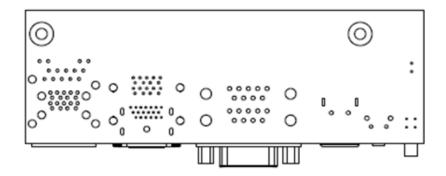


#### **PICO300 Bottom Side**





AX93276 Bottom Side



Note: We strongly recommended that you should not modify any unmentioned jumper setting without Axiomtek FAE's instruction. Any modification without instruction might cause system to become damage.

#### 3.2 **Jumper Setting Summary**

Proper jumper settings configure the eBOX560-300-FL to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

#### PICO300:

Jumper and Switch	Description	Setting	
JP1	Restore BIOS Optimal Defaults	1-2 Close	
	Default: Normal Operation  LVDS +3.3V/+5V/+12V Voltage Selection		
JP2	Default: +3.3V	1-2 Close	
SW1	Auto Power On	2-3 Close	
	Default: Enable	_ 0 0.000	

#### AX93276 I/O Board:

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



Note: How to setup Jumpers

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is "close", if not, that means the jumper is "open".





[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. Doing this procedure can restore BIOS optimal defaults.

Function	Setting
Normal (Default)	1-2
Restore BIOS optimal defaults	2-3



### 3.2.2 AT/ATX Quick Switch

Please refer the following setting

Function	Setting
AT Mode: Enable auto power on	1-2 close
ATX Mode: Disable auto power on (Default)	2-3 close



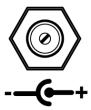
#### 3.3 Connectors

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 you all connectors and button on the **eBOX560-300-FL** Series.

External Connectors / Buttons	Section
DC Power Jack w/ Screw	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
Serial ATA Connectors	3.3.6
Serial ATA Power Connectors	3.3.7
System Power Button	3.3.8
System Reset Button	3.3.9
PCI Express Mini Card interface	3.3.10
Power and HDD LED Indicator	3.3.11

#### 3.3.1 DC Power Jack w/ Screw (CN14)

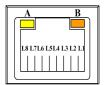
The CN14 is a DC jack with screw. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.



#### 3.3.2 Ethernet Port (LAN1/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.

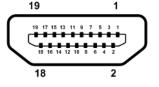
Pin	Signal	Pin	Signal
L1	MDI0P	L5	MDI2P
L2	MDION	L6	MDI2N
L3	MDI1P	L7	MDI3P
L4	MDI1N	L8	MDI3N
Α	Active LED (Yellow)		
В	100 LAN LED (Green) / 1000 LAN LED (Orange)		



#### 3.3.3 HDMI Connector (CN15/CN16)

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.

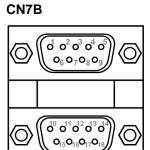
Pin	Signal	Pin	Signal
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT_Clock+
11	GND	12	HDMI OUT_Clock-
13	N.C.	14	N.C.
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		



#### 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 Chapter 4 for the detail of BIOS setting. The lower connector (CN7A) is for COM2 and the upper connector (CN7B) is for COM1.

CN7B Pin	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	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



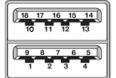
CN7A

CN7A Pin	Signal	
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.

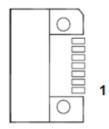
Pin	Signal USB Port 0	Pin	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data2-	11	USB_Data3-
3	USB_Data2+	12	USB_Data3+
4	GND	13	GND
5	SSRX2-	14	SSRX3-
6	SSRX2+	15	SSRX3+
7	GND	16	GND
8	SSTX2-	17	SSTX3-
9	SSTX2+	18	SSTX3+



#### 3.3.6 Serial ATA Connectors

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface port. It is a computer bus interface for connecting to devices such as hard disk drives.

Pin	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



#### 3.3.7 Serial ATA Power Connectors

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V



#### 3.3.8 System Power Switch

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

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



#### 3.3.9 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.

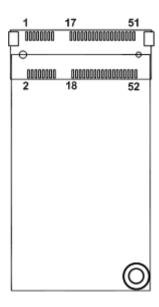
Function	Description	
On	Reset system	
Off	Keep system status	



#### 3.3.10 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.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	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



#### 3.3.11 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	



This page is intentionally left blank.

# CHAPTER 4 BIOS SETUP UTILITY

This chapter 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.
- After you press the <Del> key, the main BIOS setup menu displays. You can access the
  other setup screens from the main BIOS setup menu, such as the Advanced and
  Chipset menus.

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

# 4.2 Navigation Keys

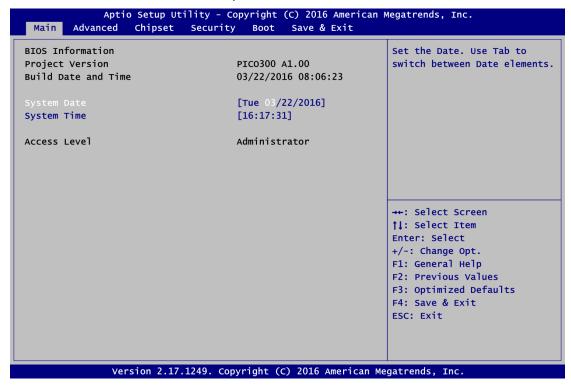
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

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

Hot Keys	Description	
→← Left/Right	The Left and Right <arrow> keys allow you to select a setup screen.</arrow>	
↑↓ Up/Down	The Up and Down <arrow> keys allow you to select a setup screen or subscreen.</arrow>	
+- Plus/Minus	The Plus and Minus <arrow> keys allow you to change the field value of a particular setup item.</arrow>	
Tab	The <tab> key allows you to select setup fields.</tab>	
F1	The <f1> key allows you to display the General Help screen.</f1>	
F2	The <f2> key allows you to Load Previous Values.</f2>	
F3	The <f3> key allows you to Load Optimized Defaults.</f3>	
F4	The <f4> key allows you to save any changes you have made and exit Setup. Press the <f4> key to save your changes.</f4></f4>	
Esc	The <esc> key allows you to discard any changes you have made and exit the Setup. Press the <esc> key to exit the setup without saving your changes.</esc></esc>	
Enter	The <enter> key allows you to display or change the setup option listed for a particular setup item. The <enter> key can also allow you to display the setup sub- screens.</enter></enter>	

# 4.3 Main Menu

The first time you enter the setup utility, you will enter the Main setup screen. You 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 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**

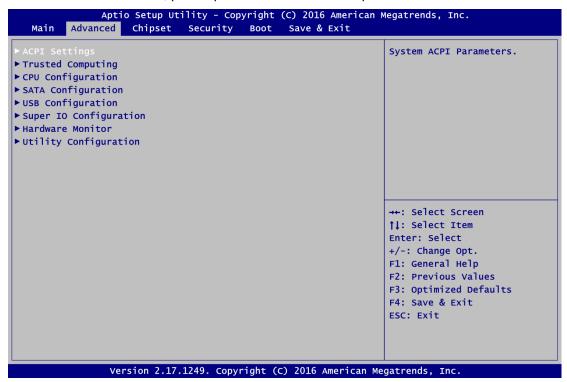
Display the access level of current user.

# 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:

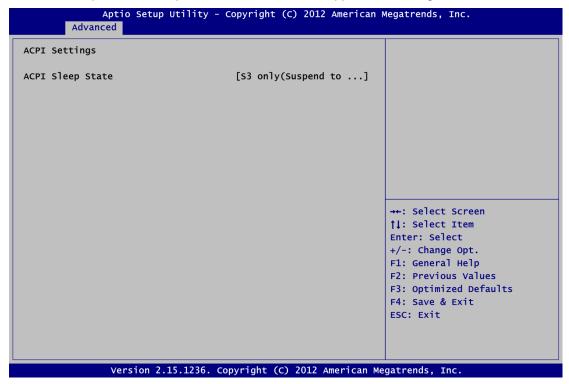
- ACPI Settings
- ► Trusted Computing
- ► CPU Configuration
- ► SATA Configuration
- ► USB Configuration
- Super IO Configuration
- ► H/W Monitor
- ► Utility Configuration

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



# ACPI Settings

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

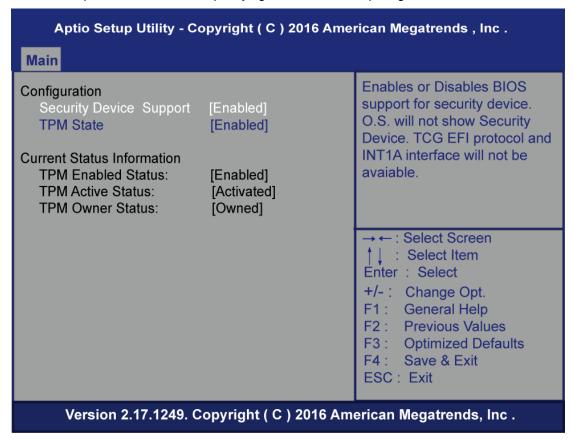


### **ACPI Sleep State**

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

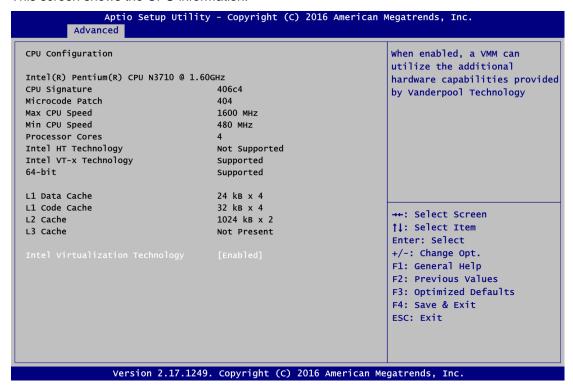
### • Trusted Computing

This screen provides function for specifying the Trusted Computing



# • CPU Configuration

This screen shows the CPU information.

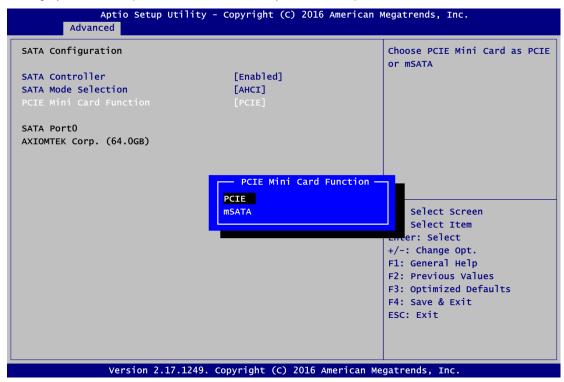


### Intel Virtualization Technology

If you want to enable or disable Intel Virtualization Technology function through BIOS, please adjust this item.

# • SATA Configuration

In this Configuration menu, you 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 PCle Card Function**

**■** mSATA

Enable or disable mSATA device. The default is Disabled.

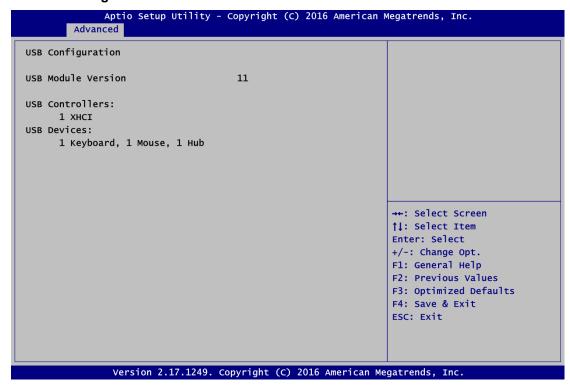
■ PCle

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

#### **Serial ATA Port 0**

It shows the device installed in connector SATA0.

# • USB Configuration



### **USB Devices**

Display all detected USB devices which are installed in connector CN4 and CN6 on AX93276 of I/O Board.

# • Super IO Configuration

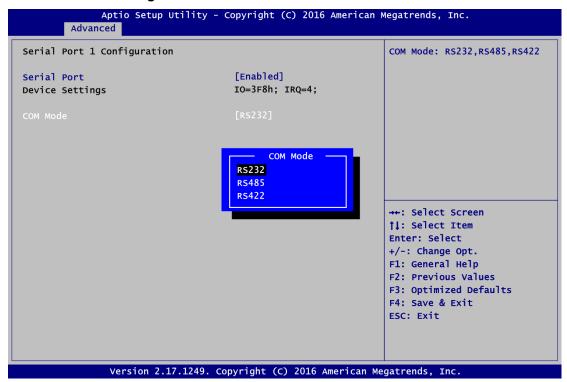
You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



# Serial Port 1~2 Configuration

Use these items to set parameters of serial port 1~2.

# Serial Port 1 Configuration



### **COM Mode Setting**

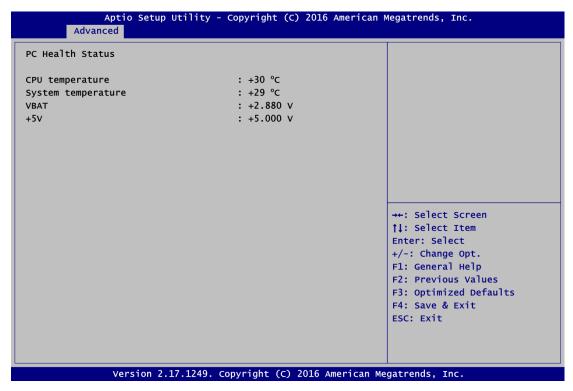
Use this option to set RS-232/RS-422/RS-485 mode.

### Serial Port 2 Configuration



# • H/W Monitor

This screen monitors hardware health status.



This screen displays the temperature of system and CPU, and system voltages (VCORE and 5V).

# • Utility Configuration

This screen for Bios flash utility

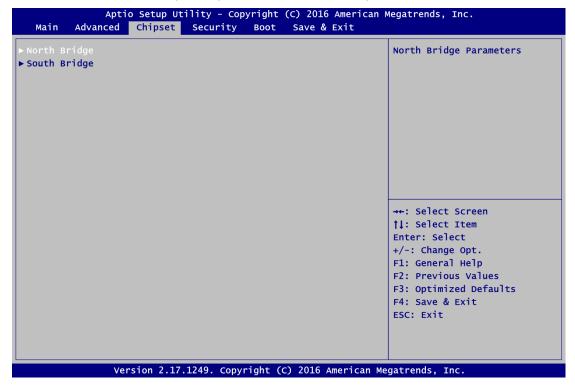


# 4.5 Chipset Menu

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

- North Bridge
- ► South Bridge

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



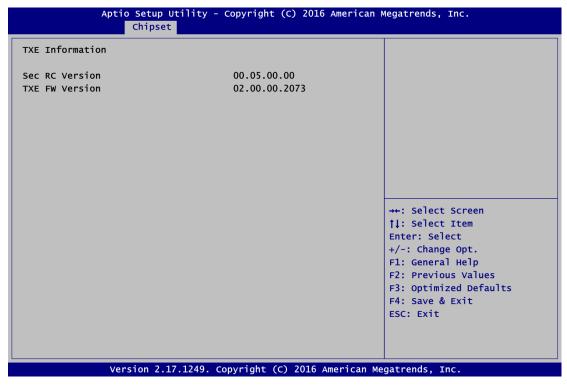
# • North Bridge

This screen shows memory information. This menu allows users setting Max TOLUD function, for items marked with " $\blacktriangleright$ ", please press <Enter> for more options.

Aptio Setup Utility - Copyright ( C ) 2016 American Megatrends , Inc .			
Chipset			
Memory Information			
Total Memory	4096 MB (LPDDR3)		
Memory Slot 0	4096 MB (LPDDR3)		
		→ ←: Select Screen  ↑ ↓ : Select Item  Enter : Select  +/-: Change Opt.  F1: General Help  F2: Previous Values  F3: Optimized Defaults  F4: Save & Exit  ESC: Exit	
Version 2.17.1249. Copyright ( C ) 2016 American Megatrends, Inc .			

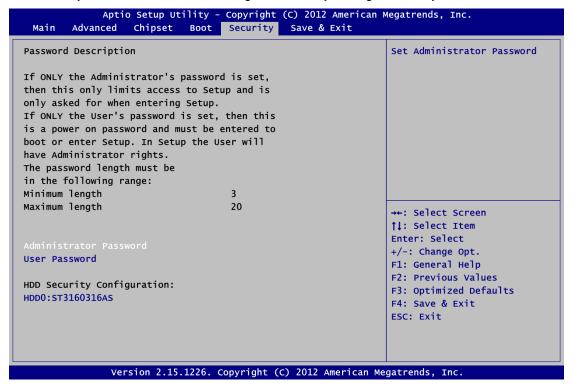
# • South Bridge

This screen shows TXE information. For items marked with "▶", please press <Enter> for more options.



# 4.6 Security Menu

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



### **Administrator Password**

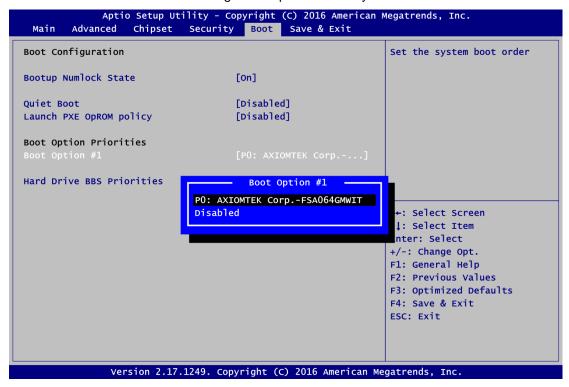
This item indicates whether an administrator password has been set (installed or uninstalled).

### **User Password**

This item indicates whether an 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.

### Launch PXE 0Prom policy

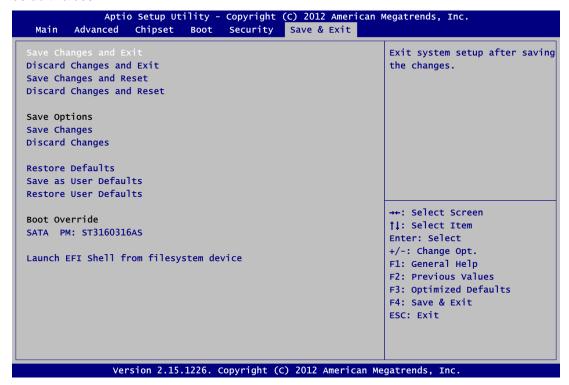
Select to display either POST output messages or a splash screen during boot-up.

### 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 your system configuration with optimal or fail-safe default values.



### Save Changes and Exit

When you 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 configuration 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 you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and 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 you have 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 you 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.

### Launch EFI Shell from filesystem device

Attempt to launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

This page is intentionally left blank.

# APPENDIX A WATCHDOG TIMER

# **About Watchdog Timer**

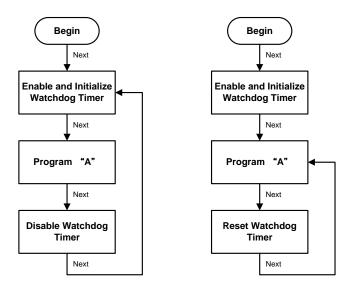
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

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
       al,87
                        ;Un-lock super I/O
mov
out
       dx,al
       dx,al
out
;Select Logic device:
mov
       dx,2Eh
       al,07h
mov
       dx,al
out
mov
       dx,2Fh
       a1,08h
mov
out
       dx,al
;Activate WDT:
mov
       dx,2Eh
       a1,30h
mov
out
       dx,al
       dx,2Fh
\text{mov}
       al,01h
mov
       dx,al
out
;Set Second or Minute :
       dx,2Eh
mov
       a1,0F5h
mov
out
       dx,al
mov
       dx,2Fh
                       ;N=00h or 08h(see below W Note)
mov
       al, Nh
out
       dx,al
;Set base timer :
       dx,2Eh
mov
       a1,0F6h
mov
```

```
dx,al
out
mov
         dx,2Fh
                            ;M=00h,01h,...Ffh (hex), Value=0 to 255
\text{mov}
         al,Mh
                            ;(see below <sup>∞</sup> Note)
         dx,al
out
;Disable WDT:
mov
         dx,2Eh
         a1,30h
mov
         dx,al
out
         dx,2Fh
mov
mov
         al,00h
                           ;Can be disabled at any time
out
         dx,al
Sel 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.