



***AXIOMTEK***

**MPC103-845**

**All-in-One  
10.1" WXGA TFT Fanless Touch  
Panel Computer with Intel®  
Celeron® Processor N3060 onboard**

**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.

## **CAUTION**

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

**©Copyright 2018 Axiomtek Co., Ltd.**

**All Rights Reserved**

**May 2018, Version A1**

**Printed in Taiwan**

## Safety Precautions

Before getting started, read the following important cautions.

1. 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.
2. Disconnect the power cords from the MPC103-845 Series 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 MPC103-845 Series is properly grounded.
3. Do not open the system's top 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.

## Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd.

Windows<sup>®</sup> is a trademark of Microsoft Corporation.

IBM, PC/AT, PS/2, VGA are trademarks of International Business Machines Corporation.

Intel<sup>®</sup> and Pentium<sup>®</sup> are trademarks of Intel Corporation.

AMI is trademark of American Megatrend Inc.

Other brand names and trademarks are the properties and registered brands of their respective owners.

# Table of Contents

---

Disclaimers.....	ii
Safety Precautions.....	iii
<b>Chapter 1 Introduction.....</b>	<b>1</b>
1.1 General Description .....	1
1.2 Specifications .....	2
1.2.1 Main CPU Board .....	2
1.2.2 I/O System.....	2
1.2.3 System Specifications .....	3
1.3 Dimensions.....	4
1.4 I/O Outlets .....	5
1.5 Packing List.....	6
<b>Chapter 2 Hardware and Installation .....</b>	<b>7</b>
2.1 Jumper and Connector Settings.....	7
2.1.1 Jumper Settings .....	8
2.1.2 Connector Settings.....	9
2.2 Port Definitions .....	15
2.2.1 COM Port .....	15
2.2.2 Ethernet Port .....	16
2.3 Mountings – Panel/Wall/Desktop/VESA .....	17
2.3.1 Panel-Mounting .....	17
2.3.2 VESA-ARM/Wall-Mount .....	18
2.4 HDD Installation.....	19
2.4.1 Half-slim SSD Installation.....	19
2.5 DRAM Installation.....	21
2.6 Mini Card Installation .....	23
2.6.1 Wireless LAN Card Installation .....	23
2.6.2 mSATA Card Installation.....	25
2.7 Power Input (Phoenix type) .....	26
<b>Chapter 3 AMI BIOS Setup Utility .....</b>	<b>27</b>
3.1 Navigation Keys .....	27
3.2 Main Menu.....	28
3.3 Advanced Menu.....	29
3.3.1 NCT6102D Super IO Configuration .....	30

3.3.2	Hardware Monitor .....	32
3.3.3	ACPI Settings .....	33
3.3.4	CPU Configuration .....	34
3.3.5	SATA Configuration .....	35
3.3.6	USB Configuration.....	36
3.3.7	Utility Configuration .....	36
3.3.8	PCIE/mSATA Mini Card Configuration .....	37
<b>3.4</b>	<b>Chipset Menu.....</b>	<b>38</b>
3.4.1	North Bridge .....	38
3.4.2	South Bridge.....	39
<b>3.5</b>	<b>Security Menu.....</b>	<b>40</b>
<b>3.6</b>	<b>Boot Menu.....</b>	<b>41</b>
<b>3.7</b>	<b>Save &amp; Exit Menu .....</b>	<b>42</b>
<b>Chapter 4</b>	<b>Drivers Installation .....</b>	<b>43</b>
<b>4.1</b>	<b>System .....</b>	<b>43</b>
4.1.1	Windows 7, 8.X, 10 .....	43
<b>4.2</b>	<b>Touch Screen.....</b>	<b>44</b>
4.2.1	Specification .....	44
4.2.2	Driver Installation- Windows 7/8.X/10 .....	44
<b>4.3</b>	<b>Embedded O.S.....</b>	<b>45</b>
4.3.1	WES 7 & WE8S.....	45
<b>Appendix A</b>	<b>Watchdog Timer &amp; DIO Programming ...</b>	<b>47</b>
	About Watchdog Timer .....	47
	How to Use Watchdog Timer.....	47
	WDT Sample Program .....	48
	How to Use DIO Software Programming.....	49
<b>Appendix B</b>	<b>Volume Control .....</b>	<b>51</b>
	About Volume Control .....	51
	How to Use Volume Control .....	51
	Removed Volume Control Tool .....	58

**This page is intentionally left blank.**

# Chapter 1

## Introduction

This chapter contains general information and detailed specifications of the MPC103-845. Chapter 1 includes the following sections:

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

### 1.1 General Description

The MPC103-845 is a fan-less and compact-size medical touch panel computer, equipped with a 10.1" TFT LCD display and low power consumption Intel® Celeron® Processor N3060 of low power consumption (with 2M cache, up to 2.48 GHz). It is compatible with Windows 7, Windows 8.x, Windows 10 and Windows embedded OS. This panel computer can house an mSATA for storage and two Mini card slots for wireless connection. Its excellent ID and friendly user interface make it a professional yet easy-to-use panel computer. The MPC103-845 is an ideal for space-limited in medical application.

#### **MPC103-845: 10.1" TFT XGA Fanless Medical Touch Panel Computer**

- **Reliable and stable design**  
The MPC103-845 adopts a fanless cooling system which makes it suitable for environments prone to vibration.
- **Embedded O.S. supported**  
The MPC103-845 supports not only Windows 7, Windows 8.x, and Windows 10, but also embedded O.S. Regarding storage device, the MPC103-845 supports a half slim SSD and an mSATA.
- **Industrial-grade product design**  
The MPC103-845 was adaptively designed to be used in different industrial environments.

The front bezel meets the IP65 and whole enclosure meets IPX1 standard.

For connecting other devices, the MPC103-845 also features several interfaces: USB, Ethernet, and RS-232/422/485.

## 1.2 Specifications

### 1.2.1 Main CPU Board

- **CPU**
  - Intel® Celeron® Processor N3060 (2M Cache, up to 2.48 GHz) onboard.
- **System Memory**
  - One 204-pin DDR3L-1600 SO-DIMM socket
  - Maximum memory up to 8 GB
- **BIOS**
  - America Megatrends BIOS

### 1.2.2 I/O System

- **Standard I/O**
  - One RS-232/422/485 port
  - One RS-232 port
  - Two USB 2.0 ports
  - Two USB 3.0 ports
- **Ethernet**
  - Two RJ45 Giga Ethernet ports (Intel i211AT)
- **Audio**
  - One Line out
- **Expansion**
  - One Mini-card slot (with SIM slot)
  - One Mini-card slot (mSATA supported as an option)
- **Storage**
  - One mSATA
  - One half slim SSD
- **Power connector**
  - MPC103-845-J: 12 VDC with external 65W AC adapter and screw type connector;
  - MPC103-845-DC : 9~36 VDC with phoenix power connector



### 1.2.3 System Specifications

- **10.1" WXGA (1280x800) LCD with LED backlight**
- **Project capacitive multi-touch**
- **Fanless heat dispensing design**
- **Disk drive housing:**
  - One half slim SSD(optional only for MPC103-845-J)
  - mSATA
- **Net Weight**
  - 1.08 kg (2.38 lb)
- **Dimension (size of main body)**
  - 260.8 mm x 194.1 mm x 38 mm
- **Operation temperature**
  - 0°C to 40°C
- **Relative humidity**
  - 10% to 90% @ 40°C, -non-condensing
- **Vibration**
  - 2.0 G, 5 to 500 Hz, random for SSD
- **Power input**
  - 9~36 VDC with phoenix power connector or
  - External 65W AC adapter
    - Power input: 100 to 240 VAC
    - Power output: 12 VDC, Max. 5.42 A



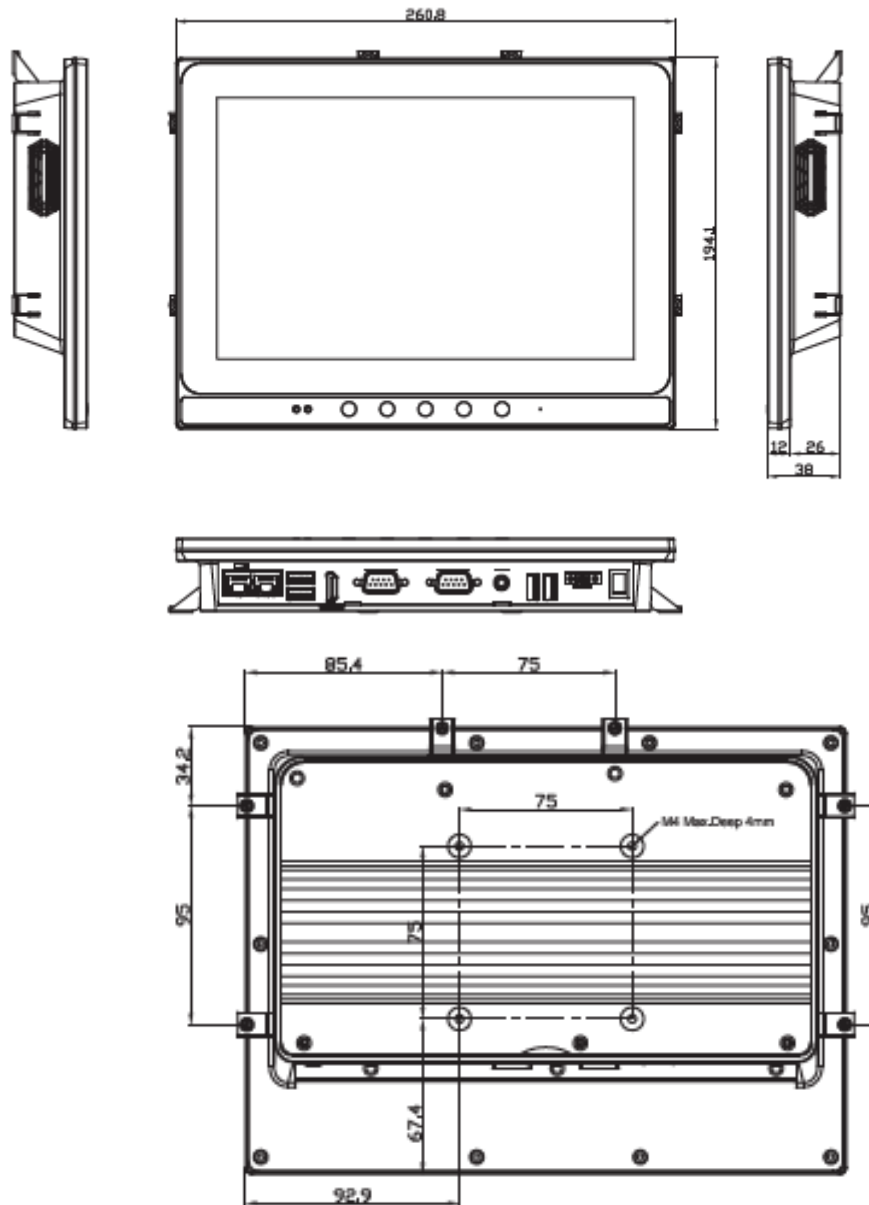
**NOTE** *All specifications and images are subject to change without notice.*



**NOTE** *The DC power source to be used with MPC103-845 must be galvanically isolated according to IEC60601-1 safety of medical devices!*

### 1.3 Dimensions

This diagram shows you dimensions and outlines of the MPC103-845.



## 1.4 I/O Outlets

Please refer to Figures 1-1 and Table 1-1 for I/O locations at the bottom of the MPC103-845.

**Figure 1-1 Front view of the MPC103-845**



**Figure 1-2 Bottom view of the MPC103-845**



**Table 1-1 Descriptions of I/O Functions at the bottom of the MPC103-845**

No	Function	No	Function
1	Power switch (ATX)	7	COM 2 (RS-232)
2	Power Input connector (Screw)	8	Two USB 3.0 ports
3	Power Input connector (Phoenix)	9	Two RJ45 Ethernet
4	Two USB 2.0 ports	10	AT/ATX selectable switch
5	Audio (Line-out)		
6	COM 1 (RS-232/422/485)		

## **1.5 Packing List**

When you receive the MPC103-845, the bundled package should contain the following items:

- **MPC103-845 x 1**
- **Driver CD x1**
- **Screws for HDD x4**
- **Phoenix connector x 1 (for MPC103-845-DC)**
- **Power Adapter & power cord (for MPC103-845-J)**

If you can't find the package or any items are missing, please contact Axiomtek distributors immediately.

# Chapter 2

## Hardware and Installation

The MPC103-845 provides rich I/O ports and flexible expansions for users to meet different demands. The Section is describing hardware installation, including the following subsections:

- Jumper and Connector Settings
- Port Definitions
- Hardware Installation
- Mounting Methods
- Connecting the Power Input

### 2.1 Jumper and Connector Settings

Diagram 2-1 Component Side of the Board

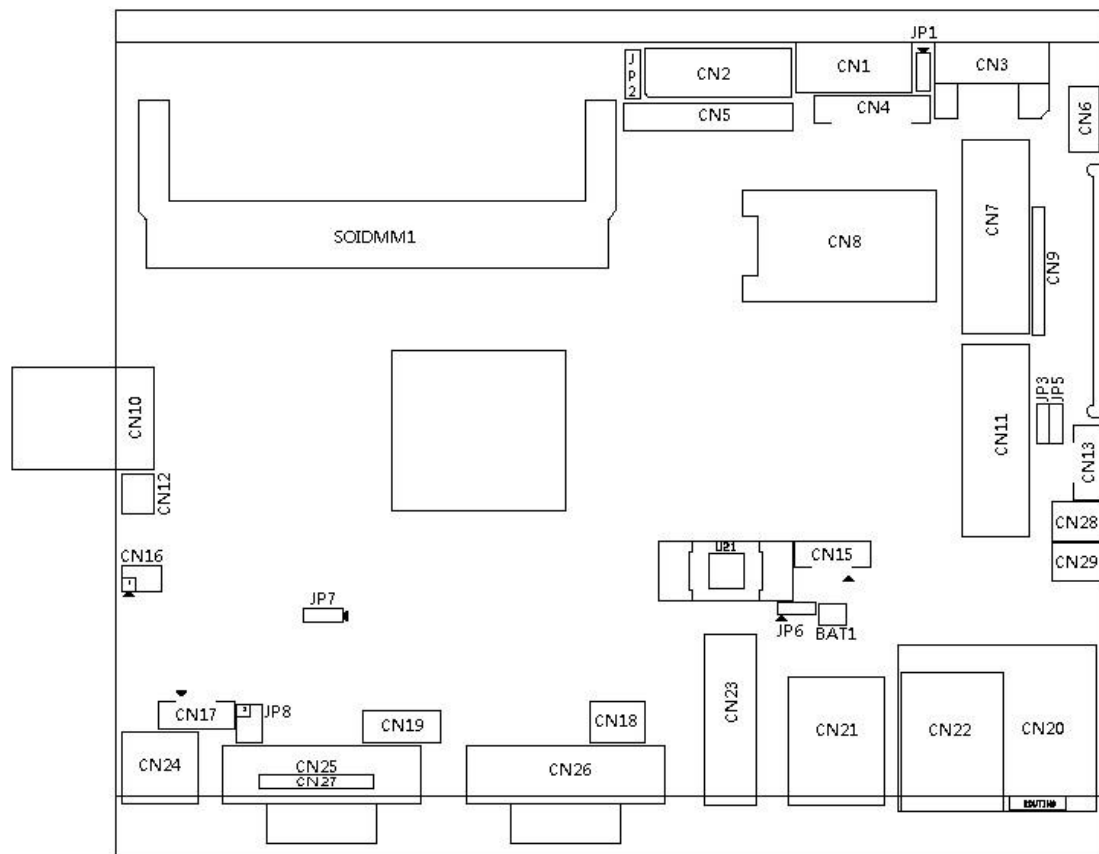
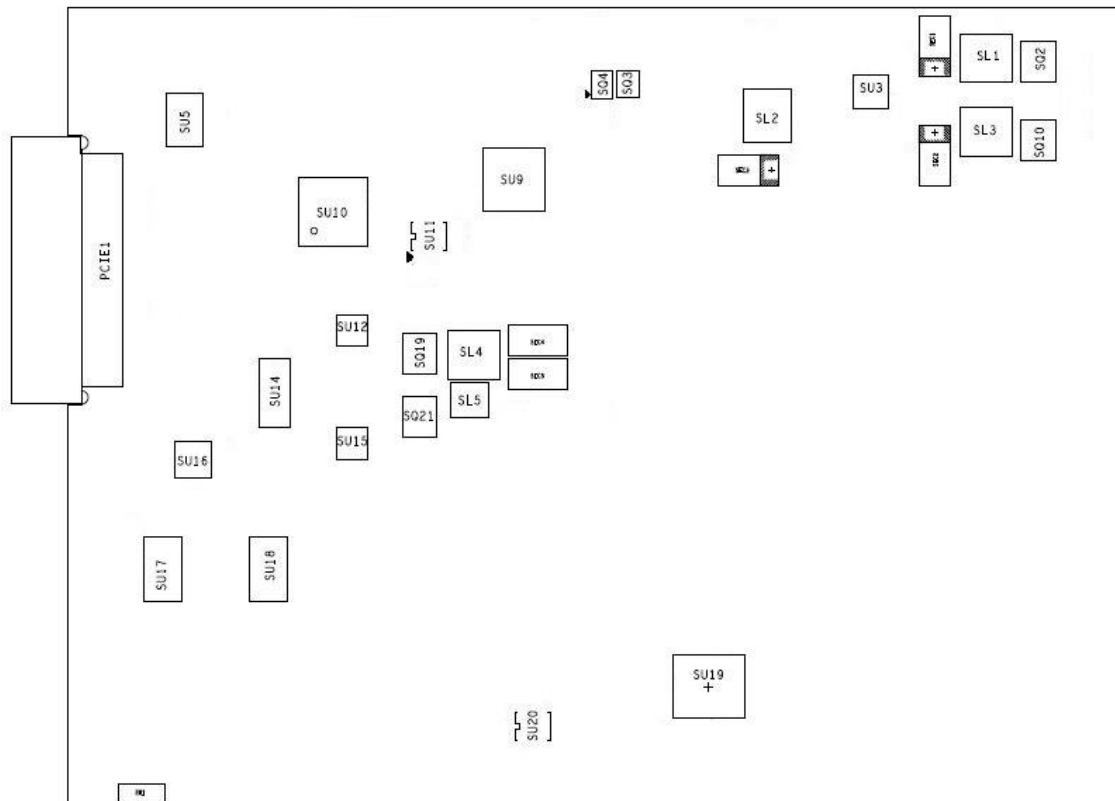


Diagram 2-2 Solder Side of the Board



### 2.1.1 Jumper Settings

Users can make proper jumper settings to configure the board **SBC87845** to suit the needs of their applications.

Table 2-1 shows the default jumper settings for the MPC103-845.

**Table 2-1 Default jumper settings**

Jumper	Description	Default Settings
JP1	★ OSD function: LCD ON/OFF OSD function: Touch ON/OFF	Short 1-2 Short 2-3
JP2	★ LVDS Panel Power : 3.3V LVDS Panel Power : 5V	Short 1-2 Short 2-3
JP3	★ ATX mode AT mode	Short 1-2 Short 2-3
JP5	Touch Controller: 4,8 WIRE ★ Touch Controller: 5 WIRE	Short 1-2 Short 2-3
JP6	★ Normal Clear CMOS	Short 1-2 Short 2-3
JP7	★ Internal Buzzer ENABLE Internal Buzzer DISABLE	Short 1-2 Short 2-3
JP8	★ COM1 normal mode COM1 pin1 with power :+5V COM1 pin9 with power :+12V	Short 3-5,4-6 Short 1-3,4-6 Short 3-5,2-4



**NOTE** ★ shown above is for default setting.

## 2.1.2 Connector Settings

The connectors on the CPU Board allow the CPU Board to connect with other parts of the system. Ensure that all connectors are in place and firmly attached. Table 2-2 lists the function of each connector on the Board SBC87845.

**Table 2-2 Connector Settings**

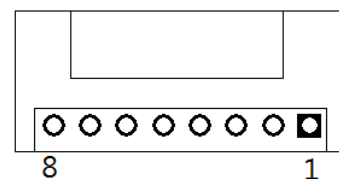
Connectors	Description
CN1	LVDS inverter connector
CN2	LVDS connector
CN3	SATA connector
CN4	OSD connector
CN6	HDD power connector
CN7,CN11	Full size min-PCIe connector
CN8	SIM card connector
CN9	DIO connector
CN10	Power connector
CN12	Power Button connector
CN13	Touch connector
CN16	LIN/MIC In connector
CN17	Speaker Out connector
CN18	System Fan connector
CN19	USB2.0 connector
CN20,CN22	RJ45 connector
CN21	USB3.0 connector
CN24	Audio out connector
CN25,CN27	RS232/422/485 Port connector
CN26	RS232 Port connector
CN28,CN29	+5V Standby Power connector

### LVDS inverter connector: CN1

**Table 2-3 CN1 pin assignment**

Pin	Signal	Pin	Signal
1	GND	5	Inverter ON-OFF
2	GND	6	+12V
3	GND	7	+12V
4	Backlight control	8	+12V

**Diagram 2-3 CN1 pin mapping**

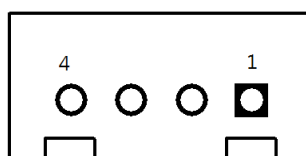


**LVDS connector: CN2****Table 2-4 CN2 pin assignment**

Pin	Signal	Pin	Signal
1	VCC	21	GND
2	VCC	22	GND
3	VCC	23	LVDSA_DATAN0
4	VCC	24	LVDSB_DATAN2
5	VCC	25	LVDSA_DATAP0
6	VCC	26	LVDSB_DATAP2
7	Resolution selection[0]	27	GND
8	Resolution selection[1]	28	GND
9	GND	29	LVDSA_DATAN1
10	GND	30	LVDSA_DATAN3
11	LVDSB_DATAN3	31	LVDSA_DATAP1
12	LVDSB_DATAN0	32	LVDSA_DATAP3
13	LVDSB_DATAP3	33	GND
14	LVDSB_DATAP0	34	GND
15	GND	35	LVDSA_DATAN2
16	GND	36	LVDSA_CLKN
17	LVDSB_CLKN	37	LVDSA_DATAP2
18	LVDSB_DATAN1	38	LVDSA_CLKP
19	LVDSB_CLKP	39	Resolution selection[2]
20	LVDSB_DATAP1	40	Resolution selection[3]

**Diagram 2-4 CN2 pin mapping****HDD power connector: CN6****Table 2-5 CN6 Pin Assignment**

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

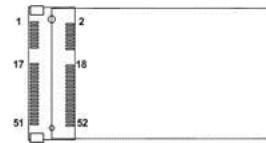
**Diagram 2-5 CN6 pin mapping**



### Full-size PCI-Express Mini Card: CN7

This is a full-size PCI-Express Mini Card connector on the top side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express or USB 2.0.

Pin	Signal	Pin	Signal
1	PCIE_WAKE3_N	2	+3.3V_SBY
3	No use	4	GND
5	No use	6	+1.5V
7	GND	8	SIM_PWR
9	GND	10	SIM_DATA
11	PCIE_REFCLK3_DN	12	SIM_CLK
13	PCIE_REFCLK3_DP	14	SIM_REST
15	GND	16	SIM_VPP
17	No use	18	GND
19	No use	20	+3.3V_SBY
21	GND	22	PLTRST_1_N
23	PCIE_P3_RXN	24	+3.3V_SBY
25	PCIE_P3_RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK_SBY
31	PCIE_P3_TXN	32	SMB_DATA_SBY
33	PCIE_P3_TXP	34	GND
35	GND	36	USB_DN1
37	GND	38	USB_DP1
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	+1.5V
49	No use	50	GND
51	No use	52	+3.3V_SBY

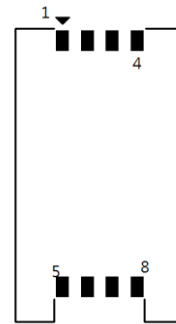


**SIM card connector: CN8**

**Table 2-6 CN8 pin assignment**

Pin	Signal	Pin	Signal
1	UIM PWR	5	GND
2	UIM RST	6	UIM VPP
3	UIM CLK	7	UIM DATA
4	NC	8	NC

**Diagram 2-6 CN8 pin mapping**



**DIO connector: CN9**

**Table 2-7 CN9 pin assignment**

Pin	Signal
1	GPIO0
2	GPIO1
3	GPIO2
4	GPIO3
5	GPIO4
6	GND
7	GPIO5
8	GPIO6
9	+3.3V
10	GPIO7

**Diagram 2-7 CN9 pin mapping**

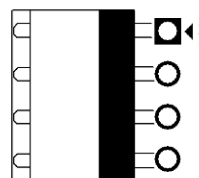


**Power connector: CN10**

**Table 2-8 CN10 pin assignment**

Pin	Signal
1	DCIN (+12V)
2	DCIN (+12V)
3	GND
4	GND

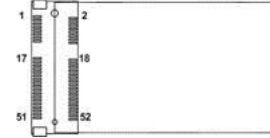
**Diagram 2-8 CN10 pin mapping**



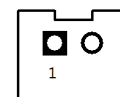
**Full-size PCI-Express Mini Card and mSATA Connector: CN11**

This is a full-size PCI-Express Mini Card connector on the top side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express, USB 2.0 or SATA (mSATA).

Pin	Signal	Pin	Signal
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_DN2
37	GND	38	USB_DP2
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

**Power button connector: CN12****Table 2-9 CN12 pin assignment**

Pin	Signal	Pin	Signal
1	GND	2	PWBTN

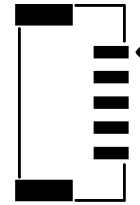
**Diagram 2-9 CN12 pin mapping**

### TOUCH connector: CN13

Table 2-11 CN13 pin assignment

Pin	Signal
1	Sense
2	X+
3	X-
4	Y+
5	Y-

Diagram 2-10 CN13 pin mapping

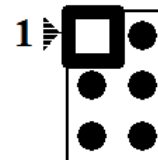


### Lin/Mic In connector: CN16

Table 2-11 CN16 pin assignment

Pin	Signal	Pin	Signal
1	LIN IN R	2	GND
3	LIN IN L	4	GND
5	MIC IN	6	GND

Diagram 2-11 CN16 pin mapping



### Speaker connector: CN17

Table 2-12 CN17 pin assignment

Pin	Signal
1	SPKOUT_L-
2	SPKOUT_L+
3	SPKOUT_R-
4	SPKOUT_R+
5	GND

Diagram 2-12 CN17 pin mapping

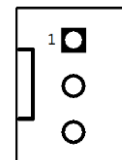


### System Fan connector: CN18

Table 2-13 CN18 pin assignment

Pin	Signal
1	GND
2	+12V / Speed control output
3	Fan speed detect

Diagram 2-13 CN18 pin mapping

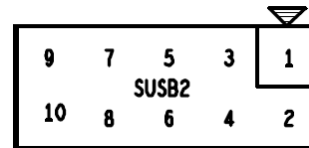


## USB2.0 connector: CN19

Table 2-14 CN19 pin assignment

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB-	4	USB-
5	USB+	6	USB+
7	GND	8	GND
9	GND	10	GND

Diagram 2-14 CN19 pin mapping

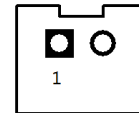


## +5V Standby Power connector: CN28, CN29

Table 2-15 CN28/ 29 pin assignment

Pin	Signal	Pin	Signal
1	GND	2	+5V_SBY

Diagram 2-15 CN28/ 29 pin mapping



## 2.2 Port Definitions

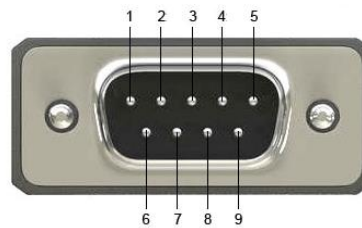
### 2.2.1 COM Port

Table 2-16 shows the pin assignment for RS-232/ 422/ 485 port.

Table 2-16 COM port pin assignment

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	No use
4	DTR	RX-	No use
5	GND	GND	GND
6	DSR	No use	No use
7	RTS	No use	No use
8	CTS	No use	No use
9	RI	No use	No use

Diagram 2-16 Com port pin mapping



## 2.2.2 Ethernet Port

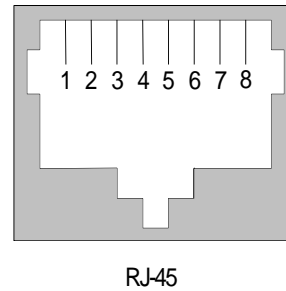
The MPC103-845 is equipped with two high-performance Plug and Play Ethernet interfaces which are fully compliant with IEEE 802.3 standards and can be connected with a RJ-45 LAN connector.

Please refer to detailed pin assignment for the Ethernet ports below in Table 2-18.

**Table 2-18 Ethernet port pin assignment**

Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	Rx- (Data reception negative)
7	RJ45 termination
8	RJ45 termination

**Diagram 2-18 Ethernet port pin mapping**



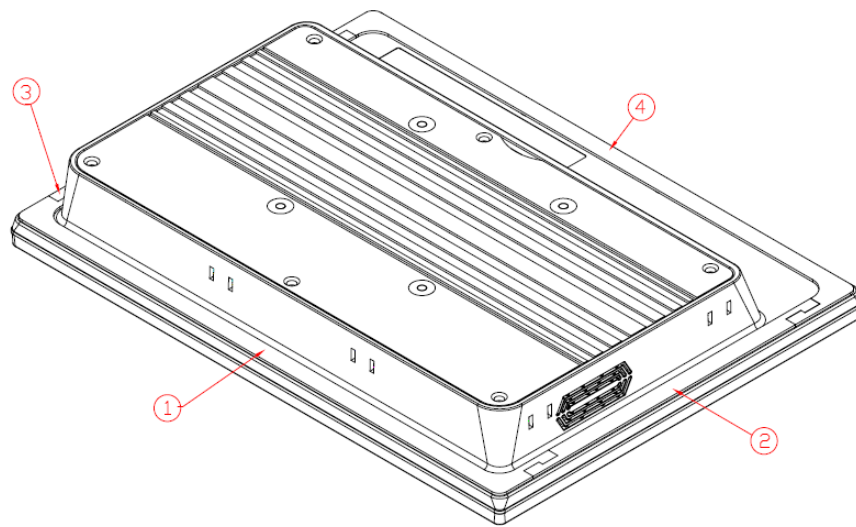
## 2.3 Mountings – Panel/Wall/Desktop/VESA

There are several mounting ways for the MPC103-845, Wall, Desktop , VESA and panel mountings.

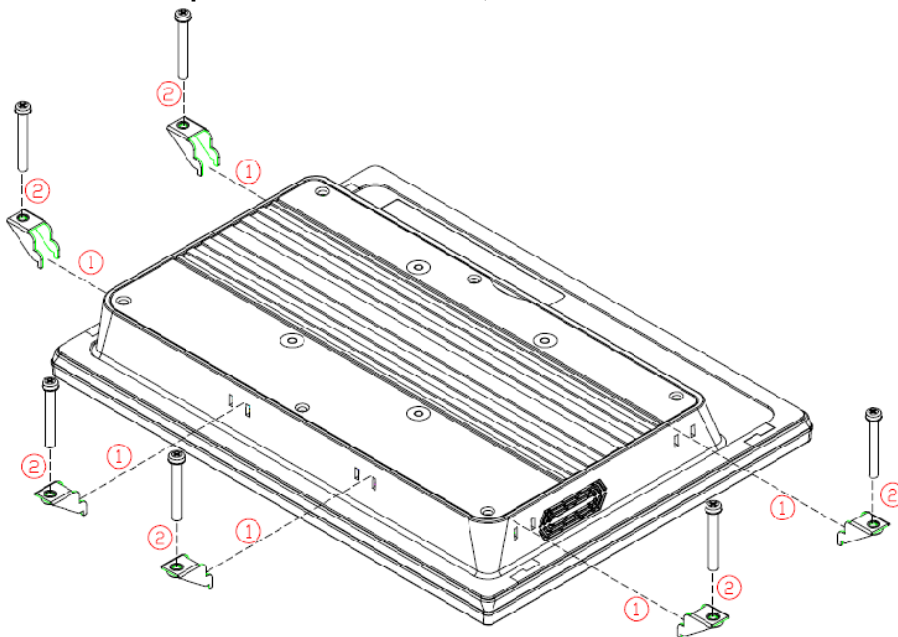
### 2.3.1 Panel-Mounting

The MPC103-845 is designed for panel mount application. A set of standard mounting kit are bundled with the system package that you can use it to mount the MPC103-845.

**Step1 Sticks 4 sealing pads on the edges of chassis.**



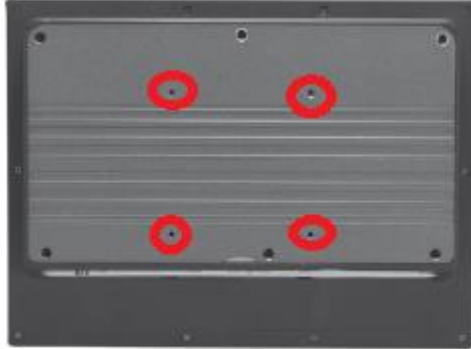
**Step2 Assemble the panel kit to the chassis, and fix the screws.**



### 2.3.2 VESA-ARM/Wall-Mount

The MPC103-845 provides VESA mount: 75x75 mm. Screw four screws to fix the kit in the back chassis.

**Step1 Find out the screws as marked on the back side of chassis.**



**Step2 Assemble the VESA bracket to the back side of the chassis, and fix the screws.**



**Step 3 VESA mounting Installation completed.**



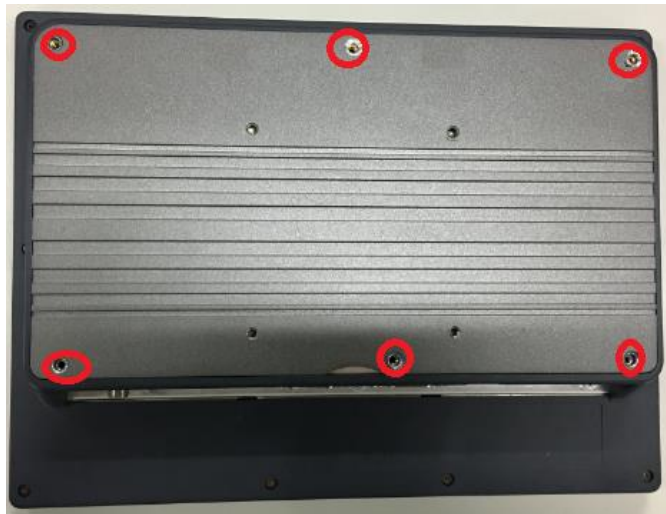
## 2.4 HDD Installation

### 2.4.1 Half-slim SSD Installation

The MPC103-845 provides an optional half-slim SSD for users to install. Please refer to the following instructions for installation:

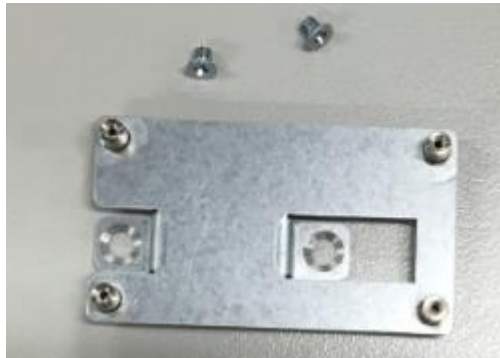
**Step 1** Turn off the system, and unplug the power cord.

**Step 2** Remove the back cover.



**Step 3** Screw half-slim SSD bracket into the system.





**Step 4** Plug the data and power cable to half-slim SSD. Screws the half-slim SSD into the system, and Installation complete.



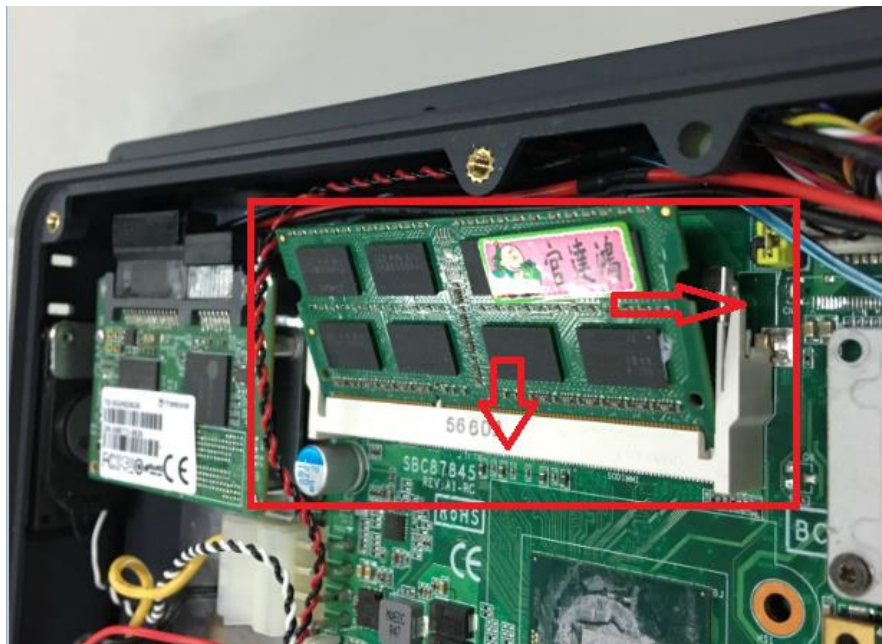
## 2.5 DRAM Installation

The MPC103-845 provides one 204-pin DDR3L SODIMM socket that support system memory up to 8GB. Please follow steps below to install the memory modules:

**Step 1** Open the back cover and find out the DIMM socket on main board(SBC87845).



**Step 2** Insert the DRAM to the DIMM socket, and then push it down firmly until it is clipped by the socket.



- Step 3** Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.





## 2.6 Mini Card Installation

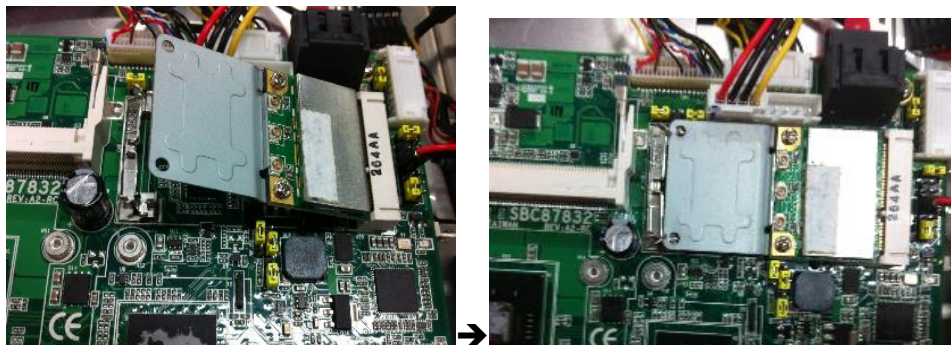
### 2.6.1 Wireless LAN Card Installation

The MPC103-845 provides two Mini card slots for user to install wireless LAN cards. You can choose either slot 1 or slot 2 to install the wireless LAN card and refer to the following instructions and illustration:

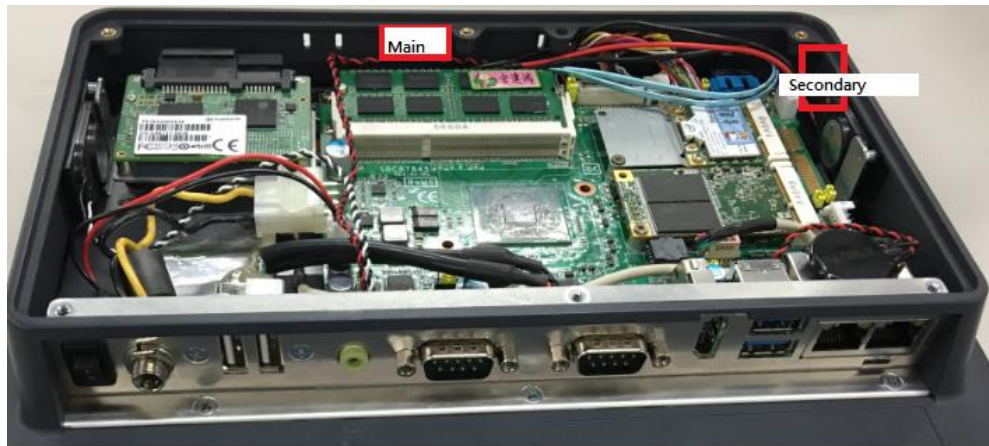
**Step 1** Open the back cover and find out the mini-card slot on main board.



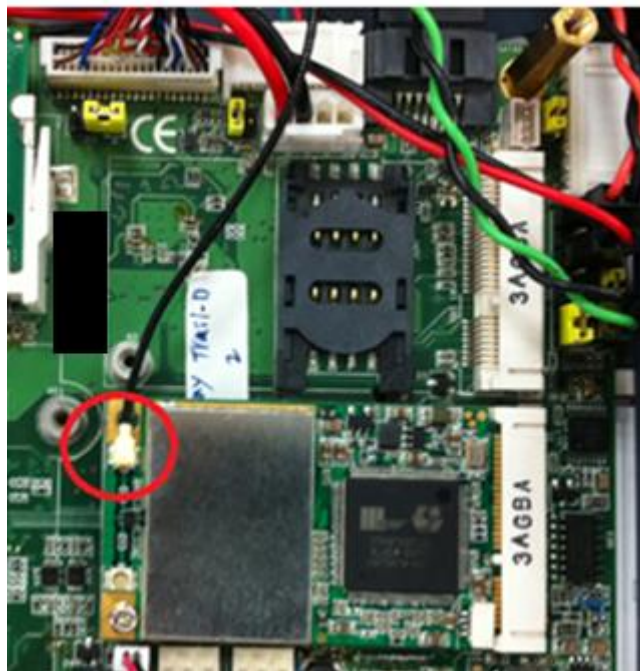
**Step 2** Insert the wireless LAN card to the slot. Screw it firmly on the slot.



**Step 3** Sticks antenna cables on the chassis as below.



**Step 4** There are two connectors on wireless LAN card. One is MAIN, and the other is Secondary. Connect antenna cable to MAIN connector on wireless LAN card.



## 2.6.2 mSATA Card Installation

The MPC103-845 provides one Mini card slot for user to install mSATA. Please choose the slot 2 when installing the mSATA card and refer to the following instructions and illustration:

**Step 1** Open the back cover and find out the mini-card slot on main board.



**Step 2** Insert the mSATA card to the slot 2. Screw it firmly on the slot.

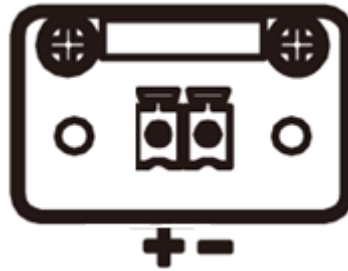


**NOTE** The type of screws used for the Mini Card slots is M12.

## 2.7 Power Input (Phoenix type)

MPC103-845 equips with a phoenix type power connector. It adopts 9~36 VDC. Please follow the signs on power connector to connect DC power source.

+: Power positive      -: Power negative



**NOTE** The safety ground must be connected to ensure the unit working appropriately.



# Chapter 3

## AMI BIOS Setup Utility

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

### 3.1 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the hot keys for the BIOS setup utility can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc. (as listed in Table 3-1).



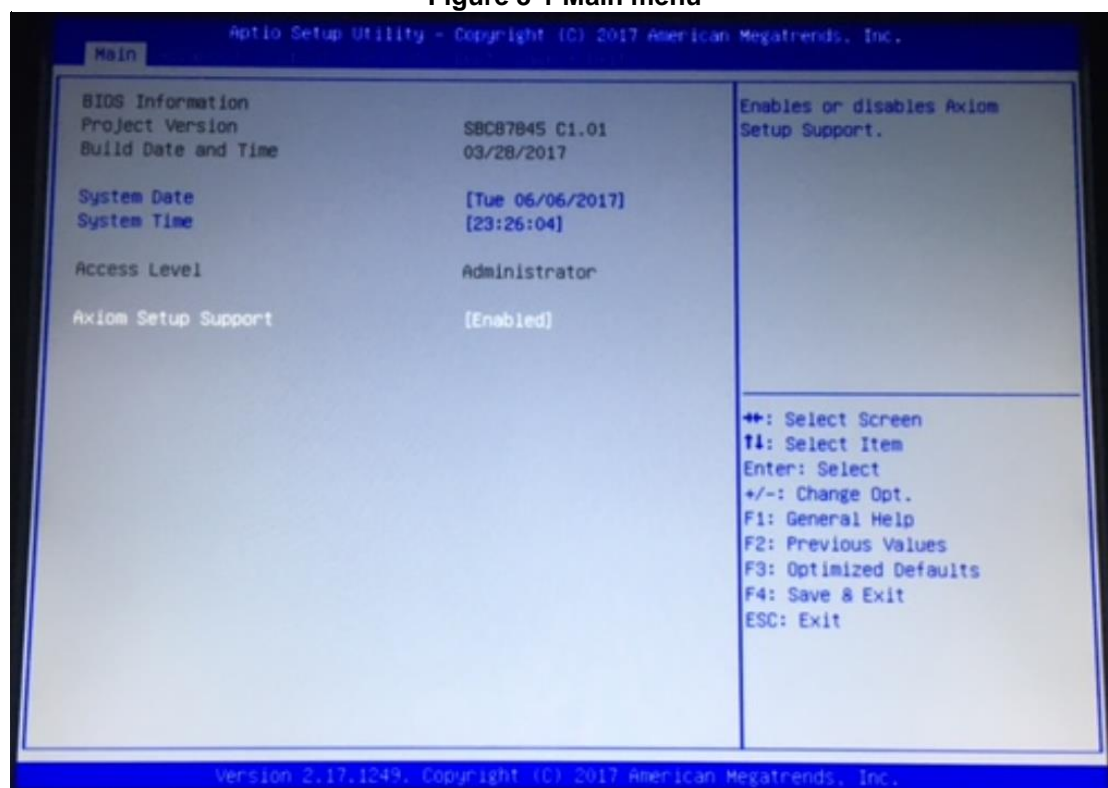
**NOTE** Some of navigation keys may differ from one screen to another.

Table 3-1 Descriptions of hot keys

Hot Keys	Descriptions
<→> and <←> Left/Right	The <→> and <←> keys are used to select a setup screen.
<↑> and <↓> Up/Down	The <↑> and <↓> keys are used to select a setup screen or sub-screen.
<+> and <-> Plus/Minus	The <+> and <-> keys you are used to change the field value of a particular setup item.
<Tab>	The <Tab> key is used to select setup fields.
<F1>	The <F1> key is used to display the general help screen.
<F2>	The <F2> key is used to load previous values.
<F3>	The <F3> key is used to load optimized defaults.
<F4>	The <F4> key is used to save any changes made then exit the setup. Press the <F4> key to save any changes.
<Esc>	The <Esc> key is used to discard any changes made then exit the setup. Press the <Esc> key to exit the setup without saving your changes.
<Enter>	The <Enter> key is used to display or change the setup option listed for a particular setup item. The <Enter> key is also used to display the setup sub- screens.

## 3.2 Main Menu

Figure 3-1 Main menu

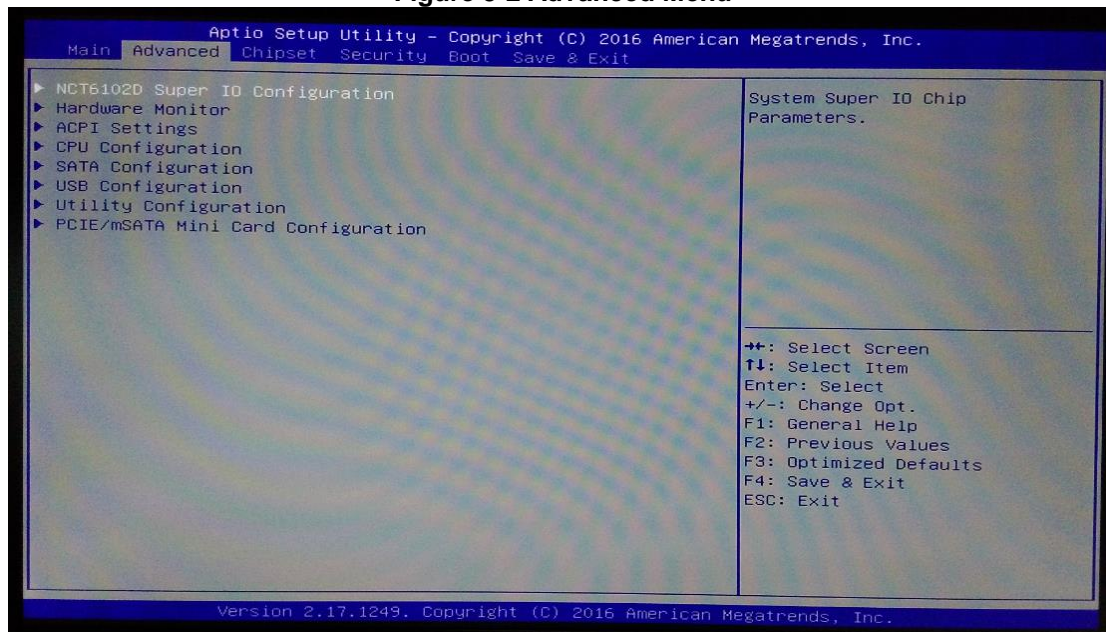


### System Time/Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the up/ down/ left and right arrow keys (see Figure 3-1).. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date entered must be in MM/DD/YY format. The time is entered in HH:MM:SS format.

### 3.3 Advanced Menu

Figure 3-2 Advanced Menu



The Advanced menu allows users to set configurations of the CPU and other system devices. Select any item on the left to go to the sub-menus (as shown in Figure 3-2).

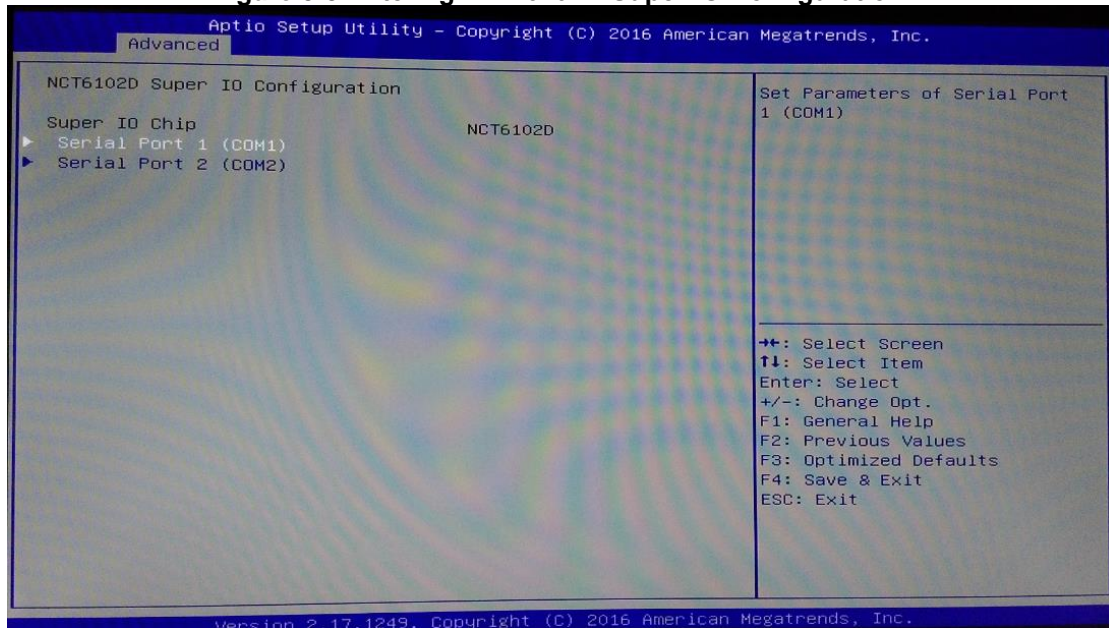
- ▶ *NCT6102D Super IO Configuration*
- ▶ *Hardware Monitor*
- ▶ *ACPI Settings*
- ▶ *CPU Configuration*
- ▶ *SATA Configuration*
- ▶ *USB Configuration*
- ▶ *Utility Configuration*
- ▶ *PCIE/mSATA Mini Card Configuration*

Simply highlight the item of choice, then press <Enter> to go to sub-menus for more specific options.

### 3.3.1 NCT6102D Super IO Configuration

The 'NCT6102D Super IO Configuration' page is to change the value of the Super IO Configuration. The description of the selected item will appear on the right side of the screen (as shown in Figure 3-3). For items marked with "▶", please press <Enter> for further options (as shown in Figure 3-4).

**Figure 3-3 Entering 'NCT6102D Super IO Configuration'**



► **Serial Port 1 (COM1) / Serial Port 2 (COM2)**

**Serial port**

This option is used to enable or disable serial port COM1/COM2.

**Device Setting**

This item specifies the base I/O port address and Interrupt Request (IRQ) address of serial port.

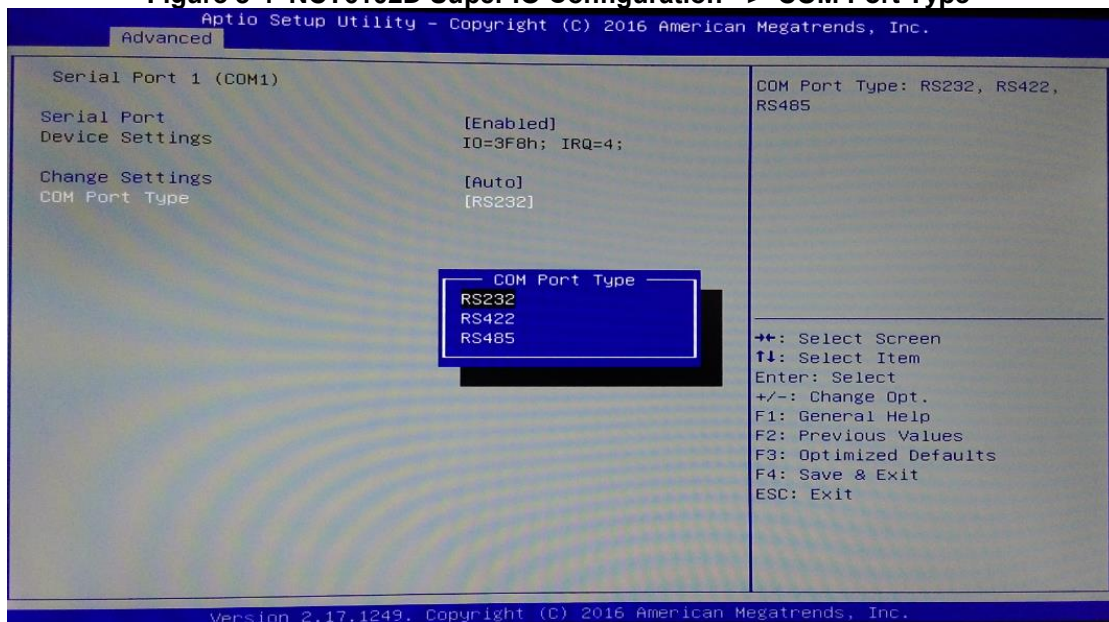
Optimal setting for Port 1 is [3F8/IRQ4].

Optimal setting for Port 2 is [2E8/IRQ3].

**COM Port Type**

This option is used to select COM Port Type: [RS-232] or [RS-422] or [RS-485].

**Figure 3-4 'NCT6102D Super IO Configuration' -> 'COM Port Type'**

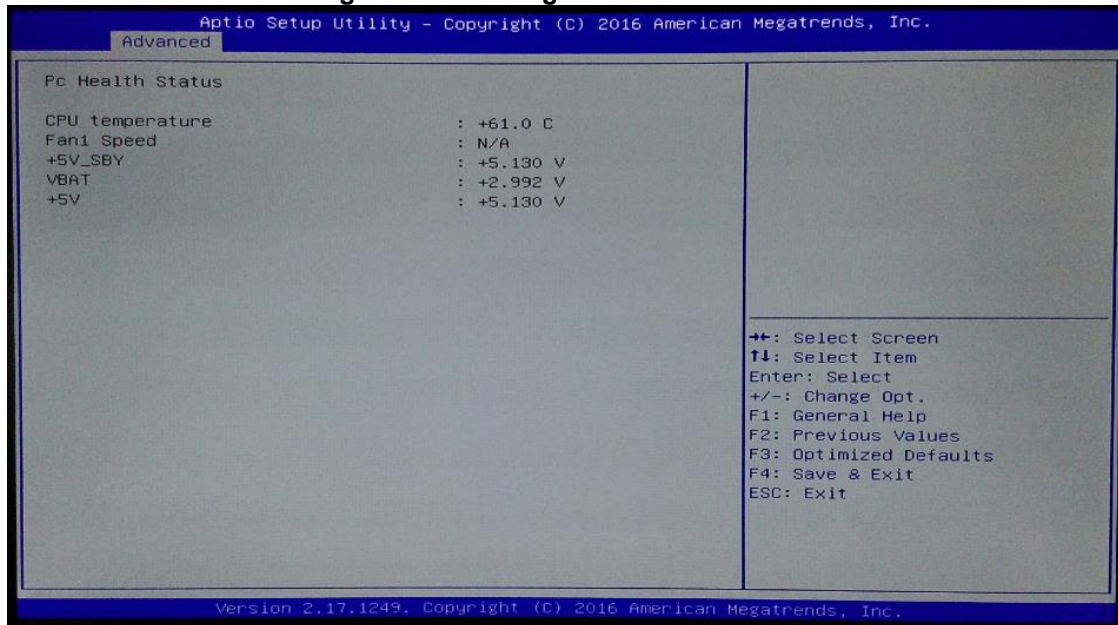




### 3.3.2 Hardware Monitor

Figure 3-5 shows a screen reflecting the 'PC Health Status' of the hardware in real time.

**Figure 3-5 Entering 'Hardware Monitor'**



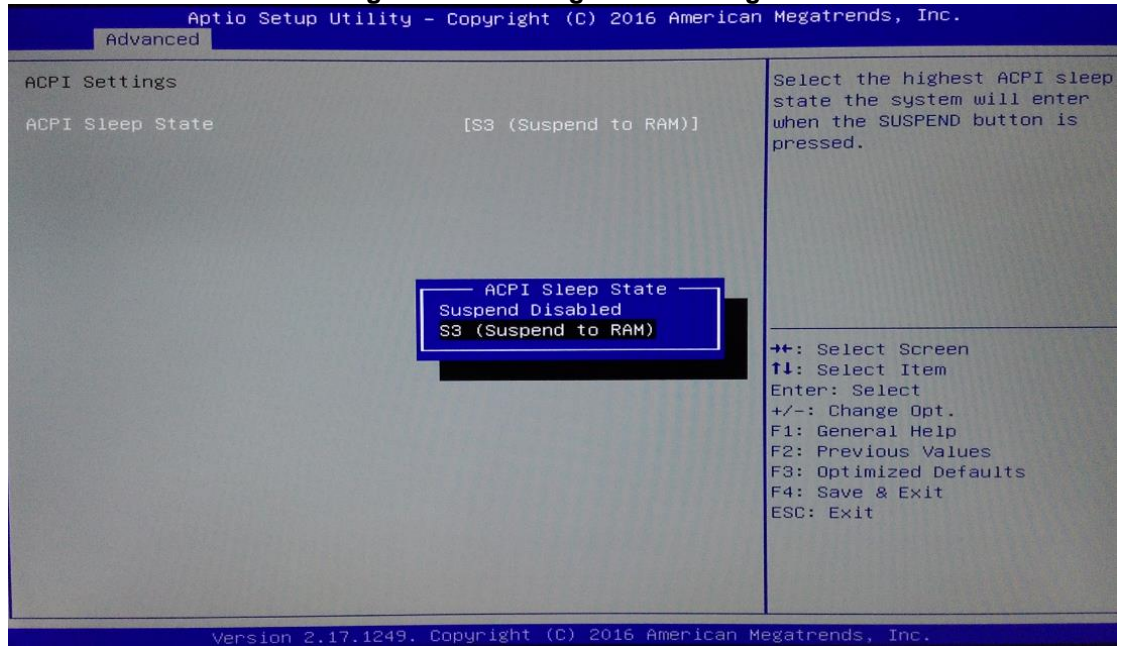
### 3.3.3 ACPI Settings

This screen is used to select options of 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

This item allows users to select the *Advanced Configuration and Power Interface* (ACPI) state to be used for system suspension. There are two choices under this selection: [Suspend Disable] or [S3 (Suspend to RAM)] (as shown in Figure 3-6).

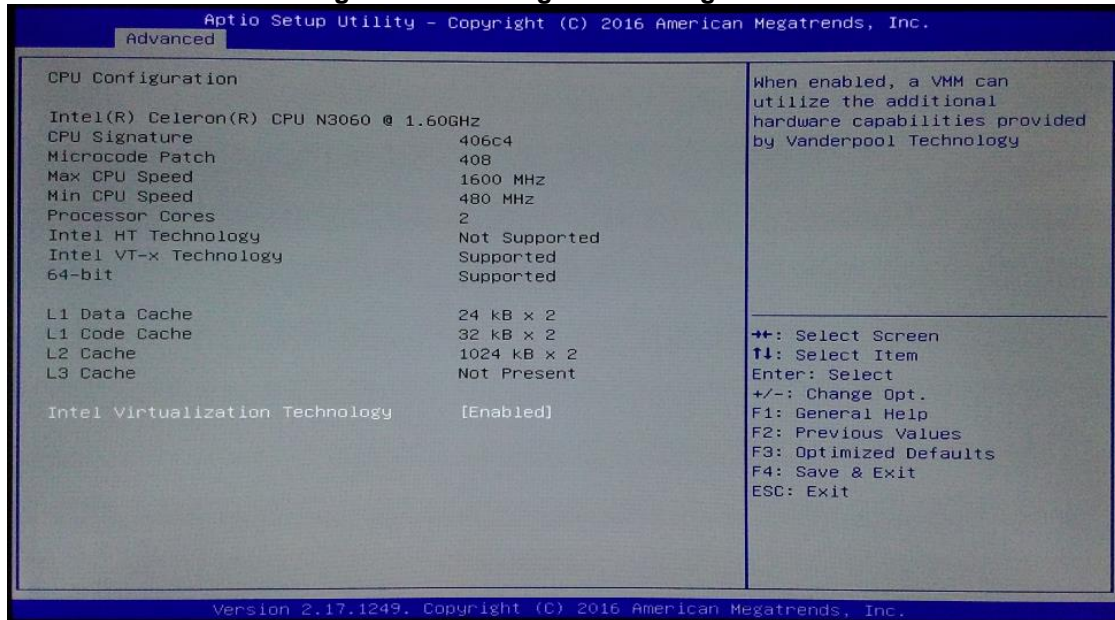
Figure 3-6 Entering 'ACPI Settings'



### 3.3.4 CPU Configuration

Figure 3-7 shows a page of CPU configuration with item *Intel Virtualization Technology* highlighted for [Enabled] or [Disabled].

**Figure 3-7 Entering 'CPU Configuration'**





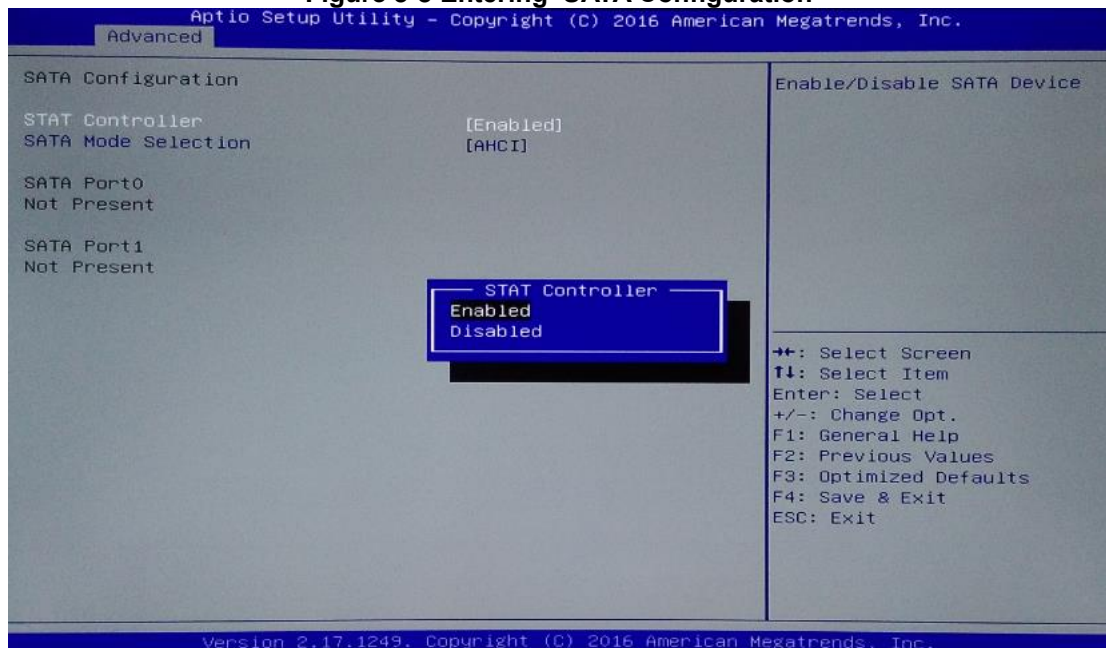
### 3.3.5 SATA Configuration

This screen allows users to select options for SATA Configuration, and change the value of the selected option (see Figure 3-8).

#### SATA Controller

Highlight this item to set up SATA Controller to be [Enable] or [Disable].

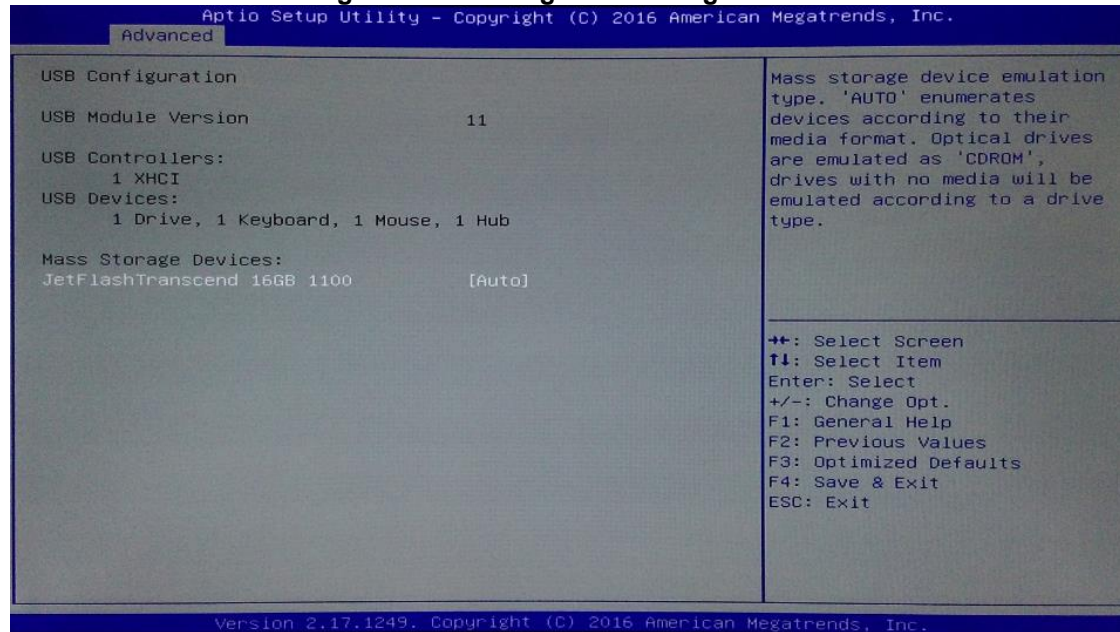
Figure 3-8 Entering 'SATA Configuration'



### 3.3.6 USB Configuration

Please see Figure 3-9 to see what items can be set up under the page of *USB Configuration*.

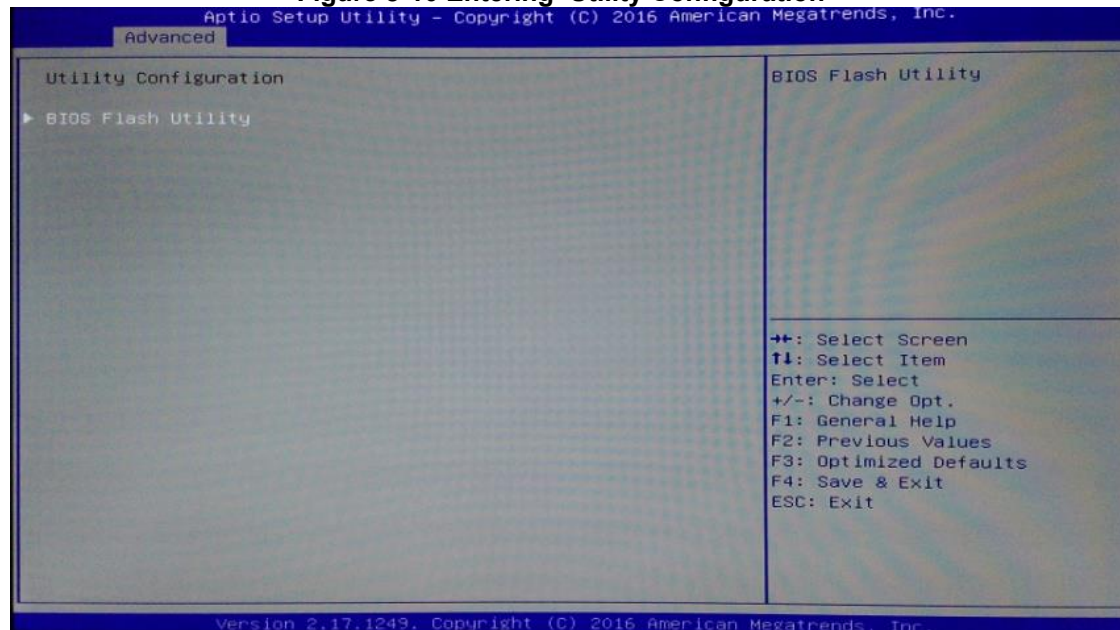
**Figure 3-9 Entering 'USB Configuration'**



### 3.3.7 Utility Configuration

Figure 3-10 shows the page once entering *Utility Configuration*.

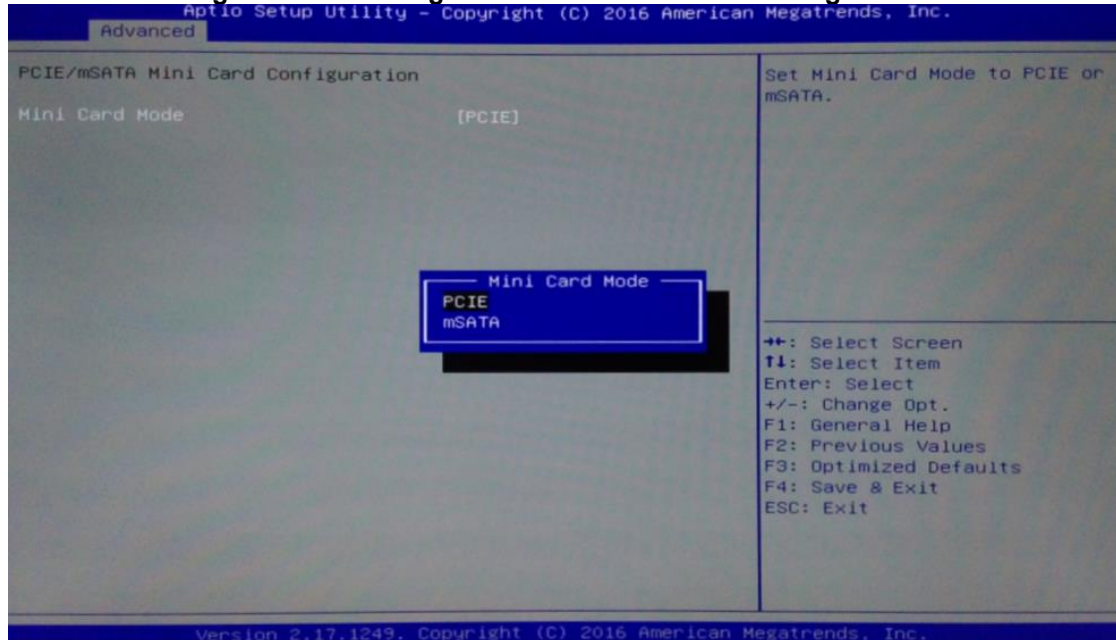
**Figure 3-10 Entering 'Utility Configuration'**



### 3.3.8 PCIE/mSATA Mini Card Configuration

Figure 3-11 shows the page once entering *PCIE/mSATA Mini Card Configuration*. There are two options to choose from [PCIE] and [mSATA].

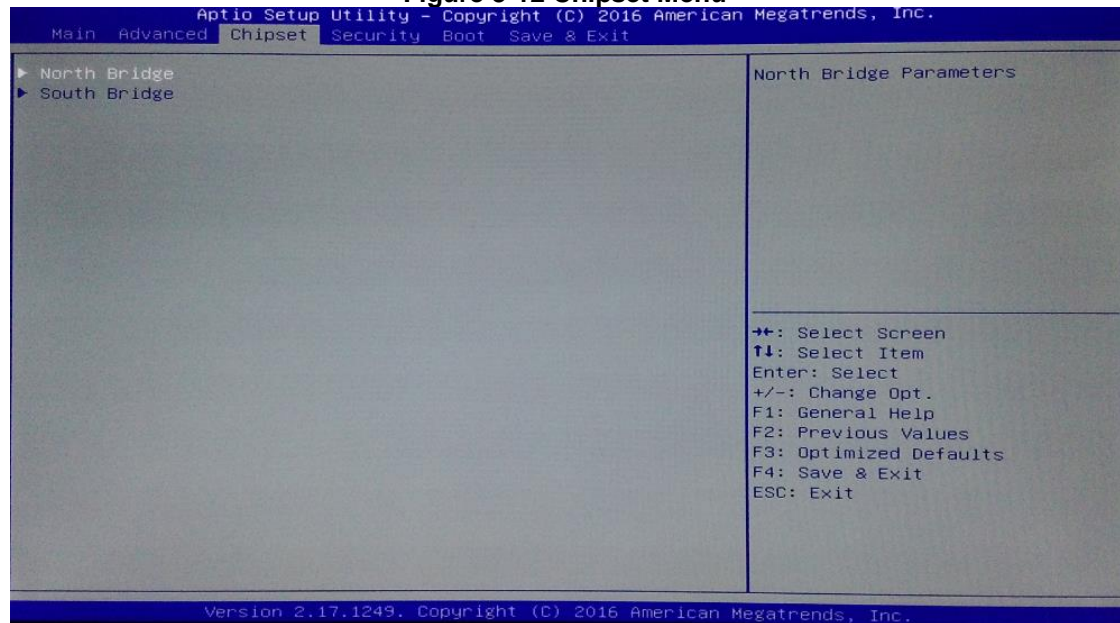
**Figure 3-11 Entering 'PCIE/mSATA Mini Card Configuration'**



### 3.4 Chipset Menu

The Chipset menu gives memory information about the North Bridge and South Bridge (see Figure 3-12).

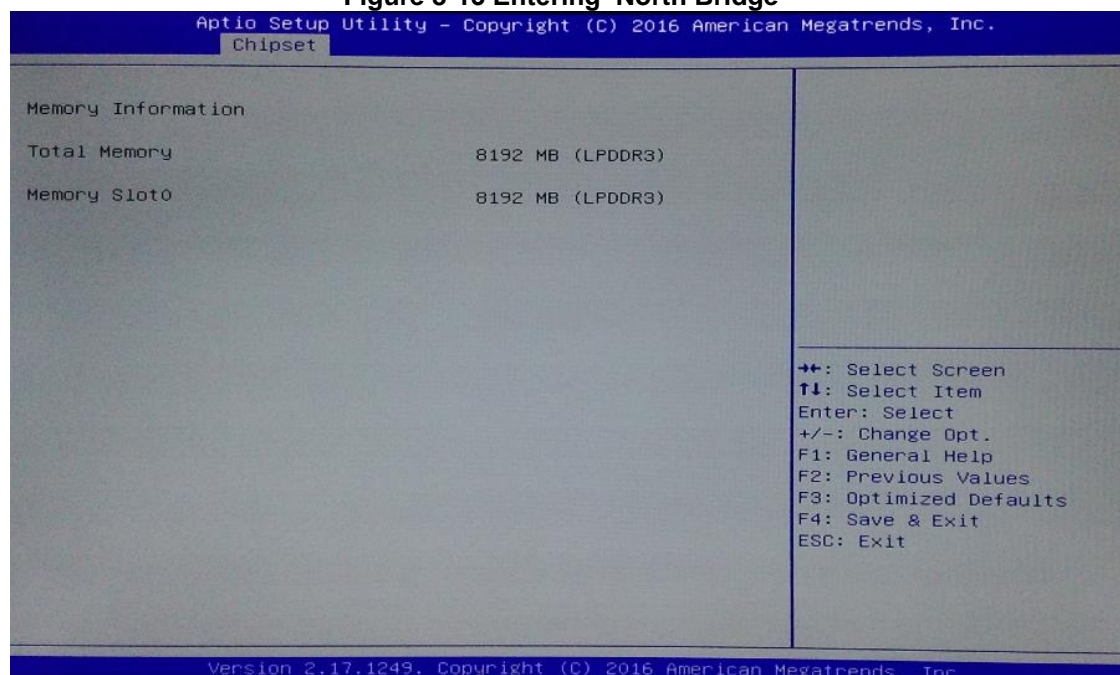
**Figure 3-12 Chipset Menu**



#### 3.4.1 North Bridge

North Bridge memory information is shown in Figure 3-13.

**Figure 3-13 Entering 'North Bridge'**

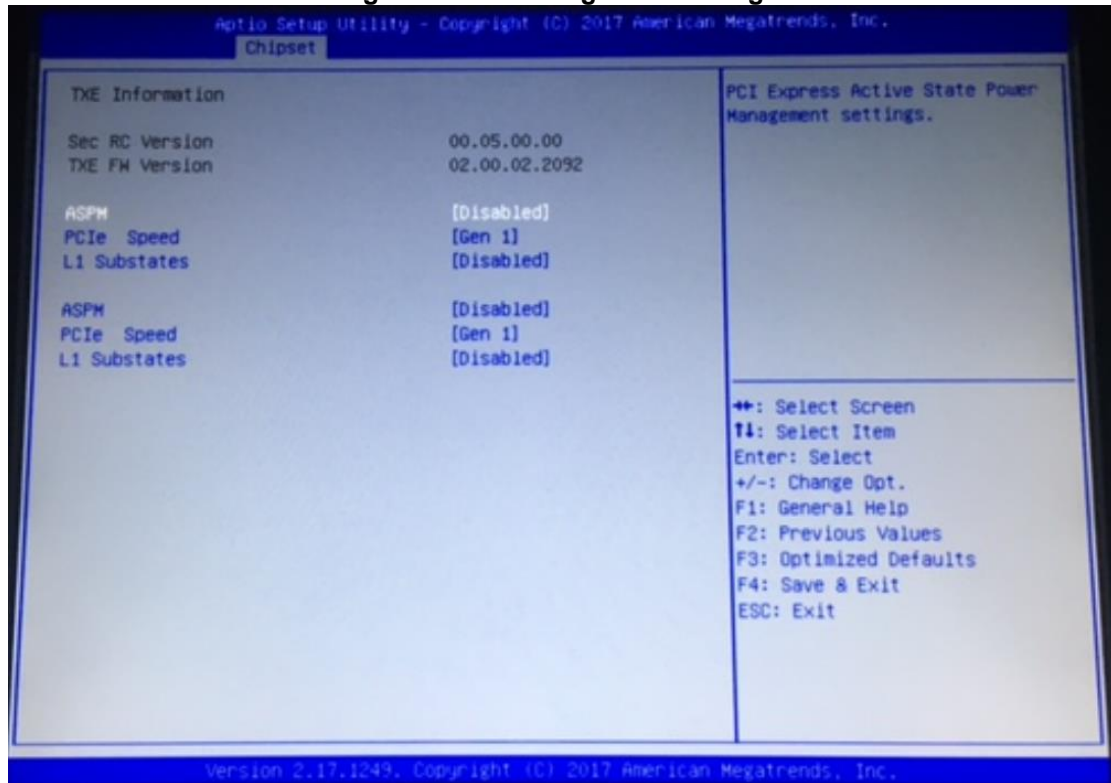




### 3.4.2 South Bridge

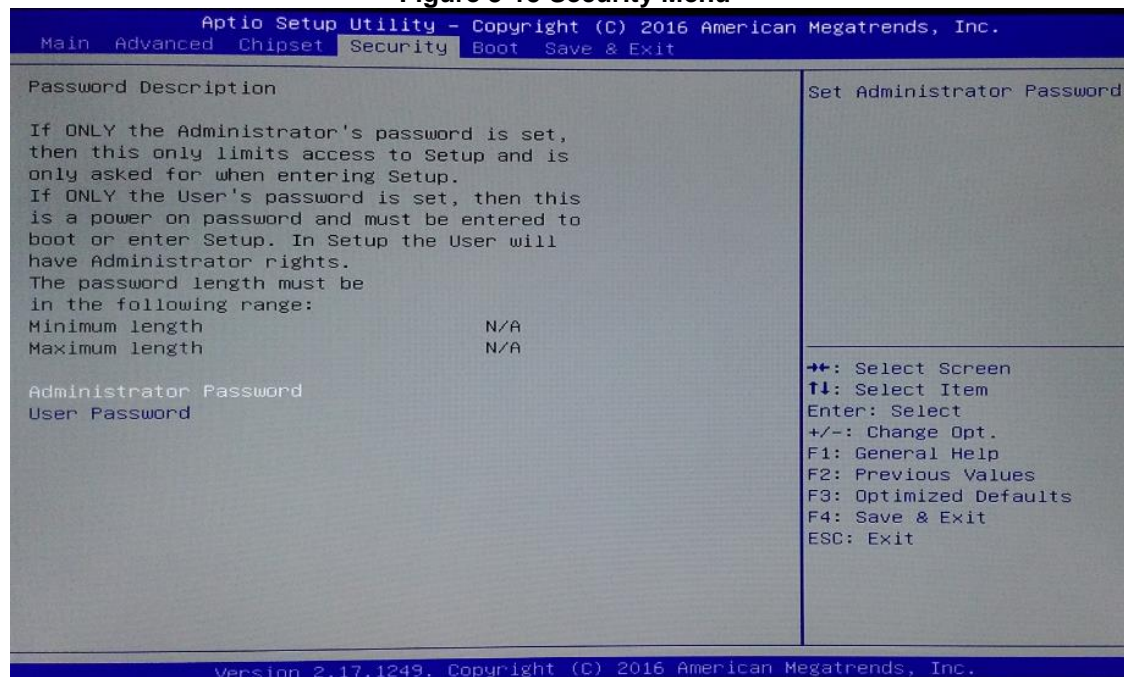
South Bridge TXE information is shown in Figure 3-14.

Figure 3-14 Entering 'South Bridge'



### 3.5 Security Menu

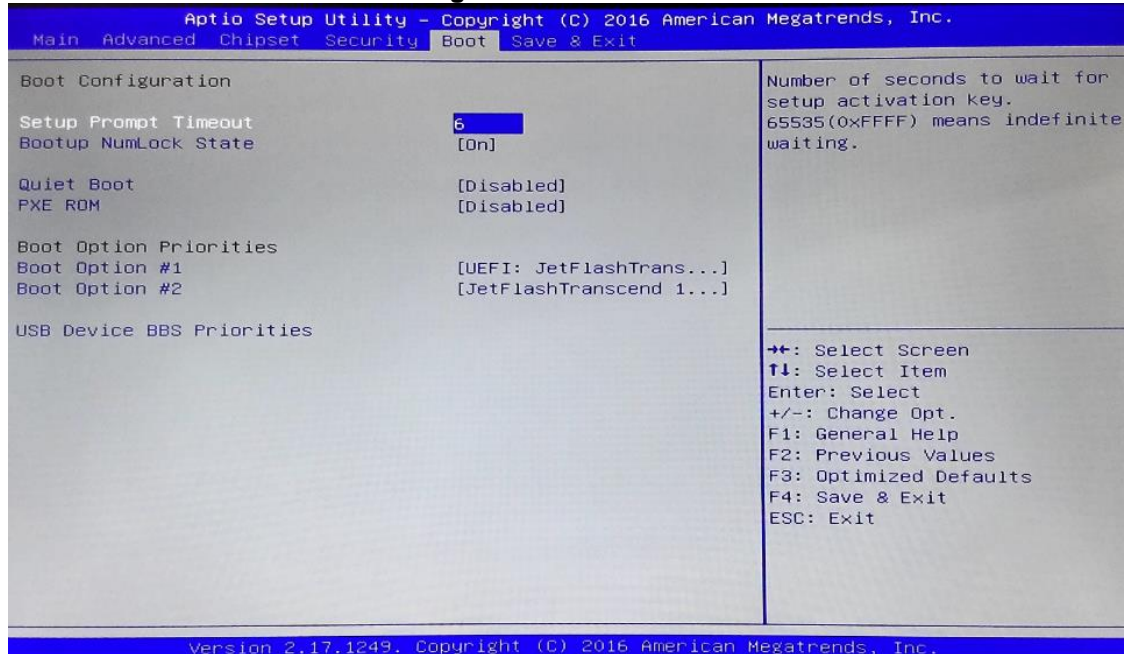
Figure 3-15 Security Menu



## 3.6 Boot Menu

The Boot menu allows users to change boot options of the system. Users can highlight any of the items on the left frame of the screen to go to any particular sub menus (as shown in Figure 3-16).

**Figure 3-16 Boot Menu**



### Setup Prompt Timeout

Enter a numeric value here as the length for timeout.

### Bootup NumLock State

Use this item to select the power-on state for the NumLock. The default setting is [On].

### Quiet Boot

Use this item to enable or disable the Quiet Boot state. The default setting is [Disabled].

### PXE ROM

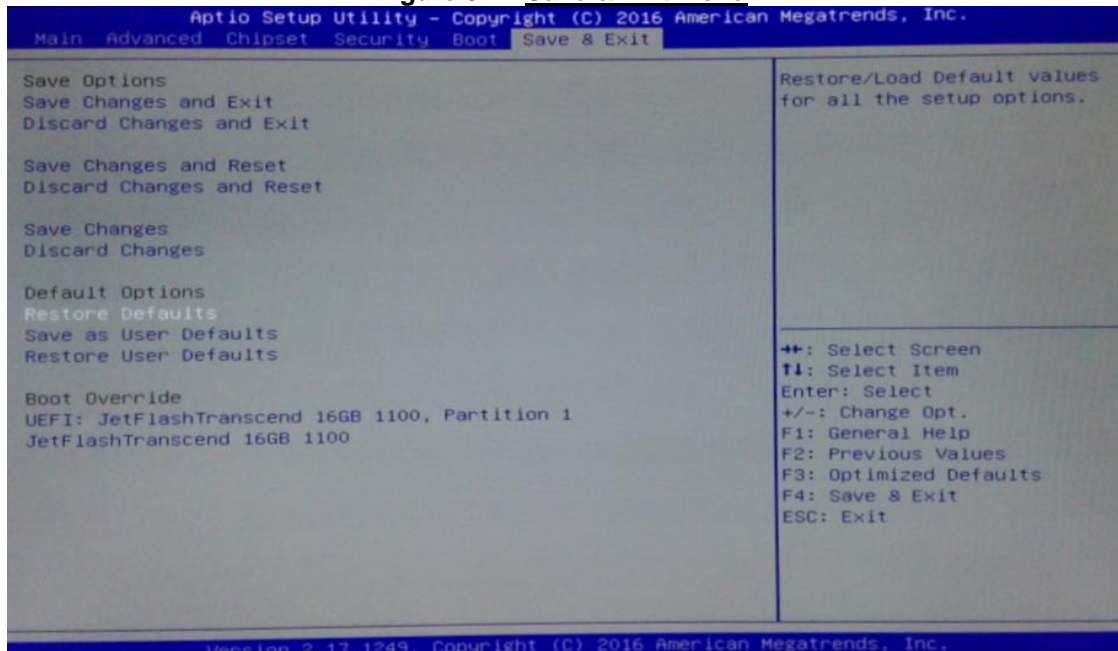
Use this item to enable or disable the Pre-boot Execution Environment (PXE). The default setting is [Disabled].

### Boot Option Priorities

Use this item to specify the overall boot order among the available devices.

### 3.7 Save & Exit Menu

Figure 3-17 Save & Exit Menu





# Chapter 4

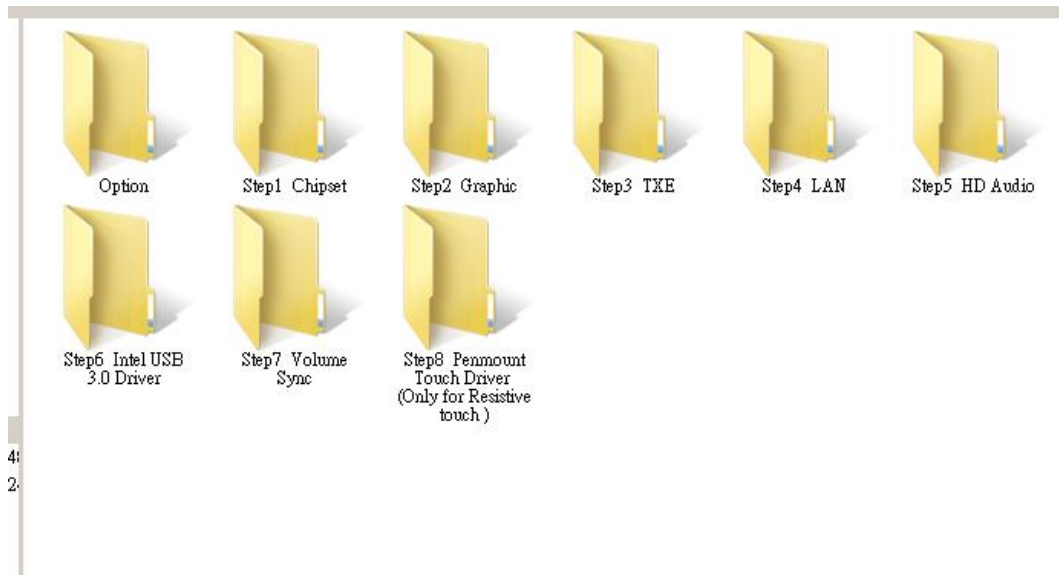
## Drivers Installation

### 4.1 System

MPC103-845 supports Windows 7, Windows 8.1, Windows 10 ,WES 7 and WE8S. To facilitate the installation of system driver, please carefully read the instructions in this chapter before start installing.

#### 4.1.1 Windows 7, 8.X, 10

1. Insert Driver CD and select the “\Drivers”.
2. Select all files and follow the installing procedure.



## 4.2 Touch Screen

The MPC103-845 uses projected capacitive multi-touch. There are the specification and driver installation which are listed below.

It also can drive the touch panel to get ten fingers touch function that based on the Windows 7 support.

### 4.2.1 Specification

<b>Touch Screen</b>	Projected capacitive multi-touch
<b>Touch Control Board</b>	COF
<b>Communications</b>	USB interface
<b>Power Supply</b>	5V
<b>Power Consumption</b>	40mA
<b>Input Method</b>	Finger or Cap.Stylus
<b>Resolution</b>	25ppi(Min.)_ Note: Base on WIN7 definition, ppi(Pixel per inch)
<b>Win7 USB Driver</b>	Non-Driver
<b>Calibration</b>	Non-Calibration

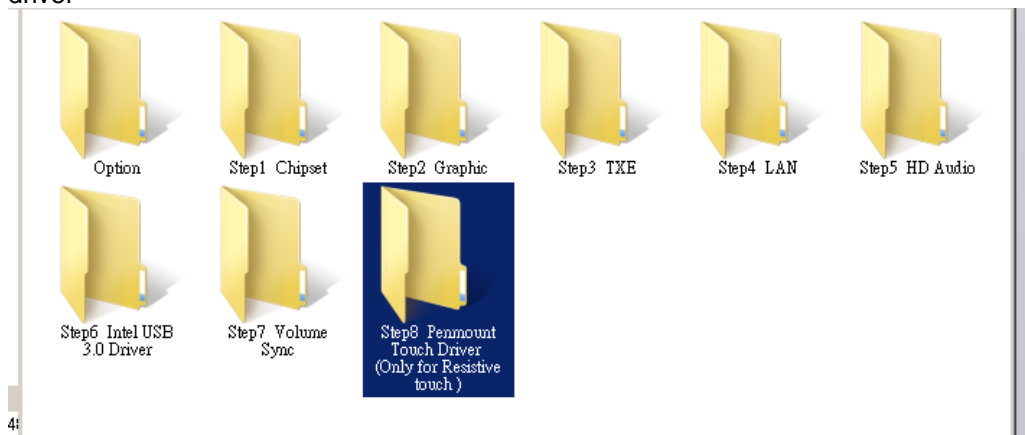


**NOTE** The projected capacitive multi-touch can drive the touch panel to get ten fingers touch function that based on the Windows 7 & Windows 8.x support.

### 4.2.2 Driver Installation- Windows 7/8.X/10

The MPC103-845 (resistive touch model) provides a touch screen driver that users can install it under the operating system Windows 7/8.x/10. To facilitate installation of the touch screen driver, you should read the instructions in this chapter carefully before you attempt installation.

1. Insert Driver CD and follow the path to select the “\Drivers\Step 8 – Penmount Touch driver



2. Follow the installing procedure and press OK.

## **4.3 Embedded O.S.**

The MPC103-845 provides the WES 7, WE8S and Win10 IoT Embedded. The O.S. is supported devices which are listed below.

### **4.3.1 WES 7 & WE8S**

Here are supported onboard devices:

- Onboard Multi I/O
- Half-Sim SATA HDD
- USB
- CRT/LCD display
- 10/100/1000 base-T Ethernet
- mSATA
- Onboard Audio
- Touch Screen

**This page is intentionally left blank.**

# Appendix A

## Watchdog Timer & DIO Programming

### About Watchdog Timer

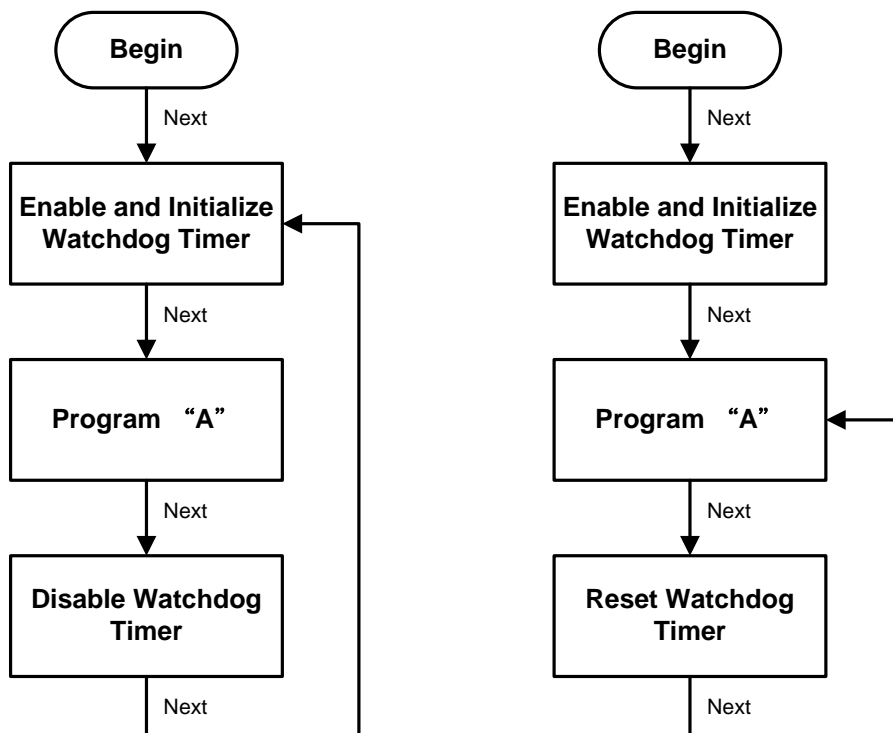
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

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.



### WDT Sample Program

#### Enable WDT

1. Enable configuration

- O 2E 87
- O 2E 87

2. Select Logic device:

- O 2E 07
- O 2F 08

3. WDT Device Enable

- O 2E 30
- O 2F 01

4. Set timer unit

- O 2E F0
- O 2F 00 → (00: Sec; 08: Minute)

5. Set base timer:

- O 2E F1
- O 2F 0A → Set Reset Time (Ex.0A:10 Sec)

#### Disable WDT

1. Enable configuration

- O 2E 87
- O 2E 87

2. Select Logic device:

- O 2E 07
- O 2F 08

3. WDT Device Disable

- O 2E 30
- O 2F 00

## How to Use DIO Software Programming

### Digital I/O Software Programming

- I2C to GPIO PCA9554
- I2C address: 0b01000000.

#### Register 0 - Input Port register

This register is a read-only port. It reflects the incoming logic levels of the pins, regardless of whether the pin is defined as an input or an output by Register 3. Writes to this register have no effect.

The default 'X' is determined by the externally applied logic level, normally '1' when no external signal externally applied because of the internal pull-up resistors.

**Table 4. Register 0 - Input Port register bit description**

Bit	Symbol	Access	Value	Description
7	I7	read only	X	determined by externally applied logic level
6	I6	read only	X	
5	I5	read only	X	
4	I4	read only	X	
3	I3	read only	X	
2	I2	read only	X	
1	I1	read only	X	
0	I0	read only	X	

#### Register 1 - Output Port register

This register reflects the outgoing logic levels of the pins defined as outputs by Register 3. Bit values in this register have no effect on pins defined as inputs. Reads from this register return the value that is in the flip-flop controlling the output selection, **not** the actual pin value.

**Table 5. Register 1 - Output Port register bit description**

*Legend: \* default value.*

Bit	Symbol	Access	Value	Description
7	O7	R	1*	reflects outgoing logic levels of pins defined as outputs by Register 3
6	O6	R	1*	
5	O5	R	1*	
4	O4	R	1*	
3	O3	R	1*	
2	O2	R	1*	
1	O1	R	1*	
0	O0	R	1*	

## Register 2 - Polarity Inversion register

This register allows the user to invert the polarity of the Input Port register data. If a bit in this register is set (written with '1'), the corresponding Input Port data is inverted. If a bit in this register is cleared (written with a '0'), the Input Port data polarity is retained.

**Table 6. Register 2 - Polarity Inversion register bit description**

Legend: \* default value.

Bit	Symbol	Access	Value	Description
7	N7	R/W	0*	inverts polarity of Input Port register data
6	N6	R/W	0*	0 = Input Port register data retained (default value)
5	N5	R/W	0*	1 = Input Port register data inverted
4	N4	R/W	0*	
3	N3	R/W	0*	
2	N2	R/W	0*	
1	N1	R/W	0*	
0	N0	R/W	0*	

## Register 3 - Configuration register

This register configures the directions of the I/O pins. If a bit in this register is set, the corresponding port pin is enabled as an input with high-impedance output driver. If a bit in this register is cleared, the corresponding port pin is enabled as an output. At reset, the I/Os are configured as inputs with a weak pull-up to  $V_{DD}$ .

**Table 7. Register 3 - Configuration register bit description**

Legend: \* default value.

Bit	Symbol	Access	Value	Description
7	C7	R/W	1*	configures the directions of the I/O pins
6	C6	R/W	1*	0 = corresponding port pin enabled as an output
5	C5	R/W	1*	1 = corresponding port pin configured as input (default value)
4	C4	R/W	1*	
3	C3	R/W	1*	
2	C2	R/W	1*	
1	C1	R/W	1*	
0	C0	R/W	1*	



# Appendix B

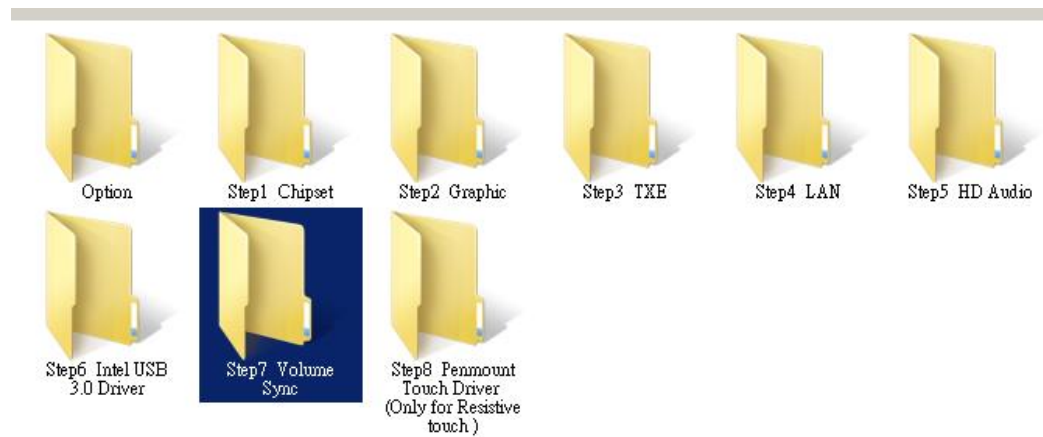
## Volume Control

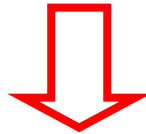
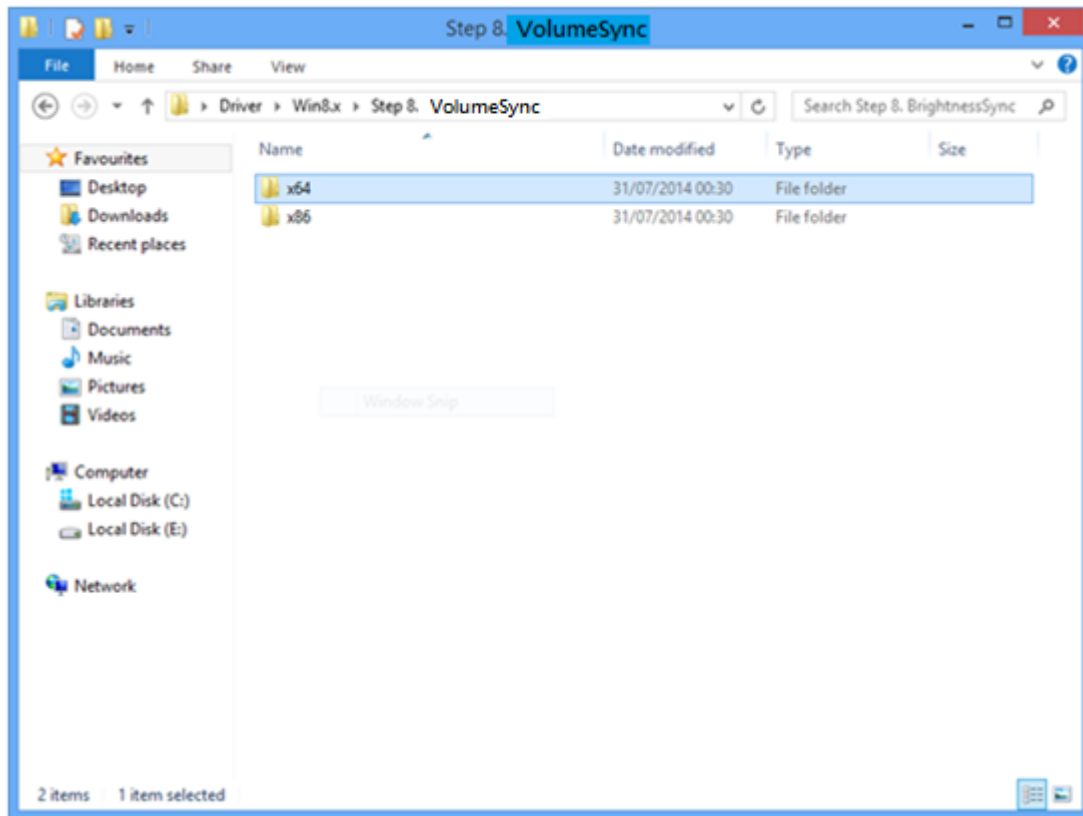
### About Volume Control

Axiomtek offers the volume control tool under Windows 7 Windows 8 and Windows 10, people can adjust the system volume depending on your personal taste and the amount of ambient volume in the room after installing the volume control tool.

### How to Use Volume Control

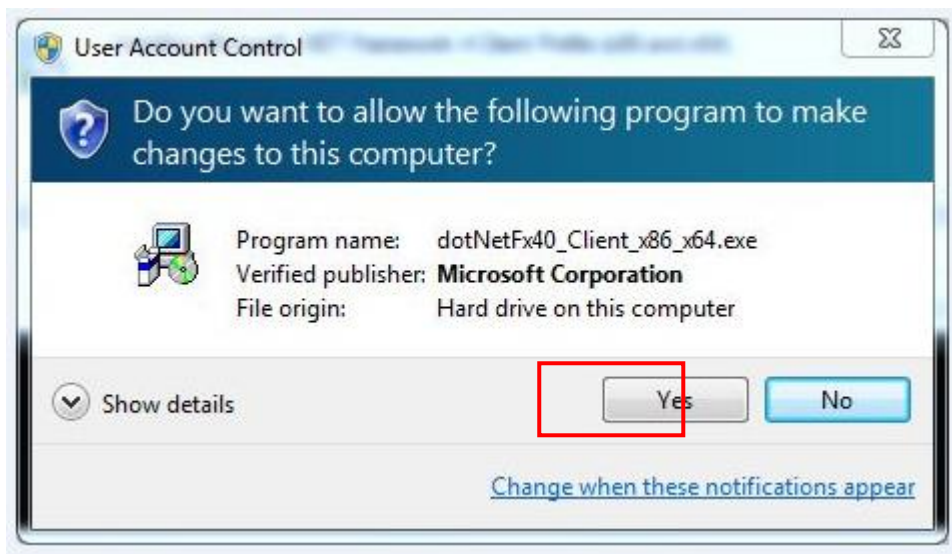
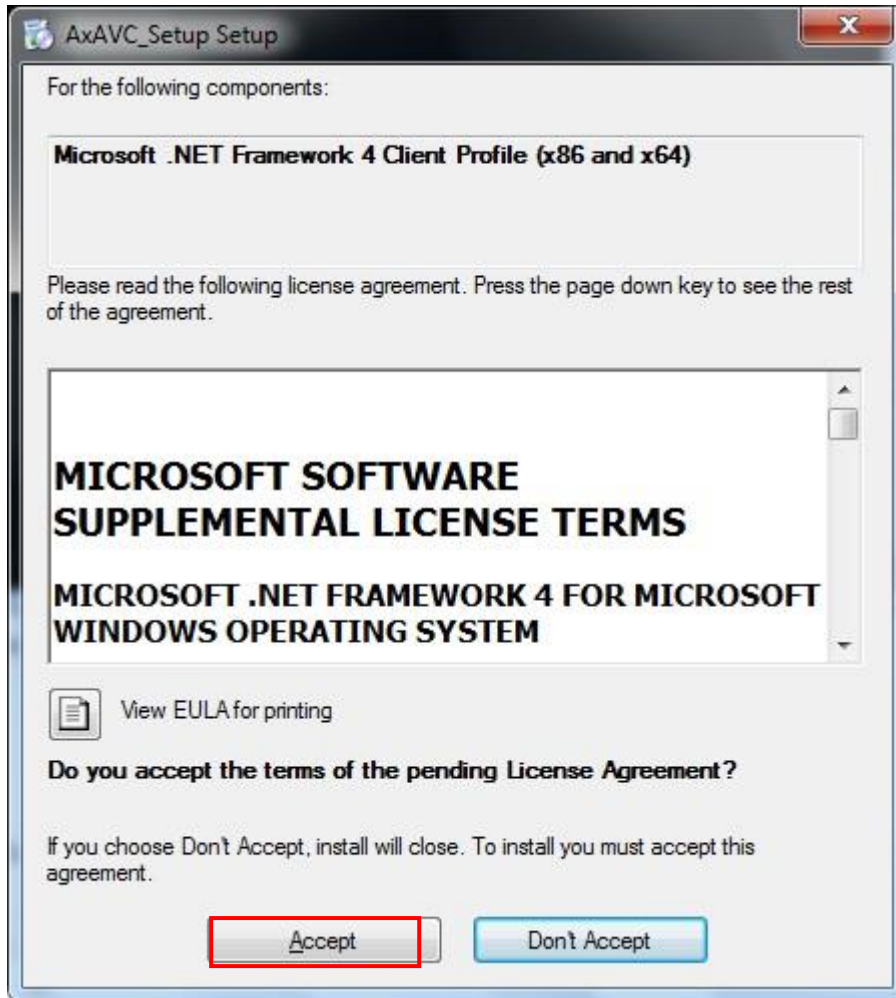
**Step 1** According to the OS version, please insert the driver CD and follow the path to select the proper driver, Driver\Step 7 – VolumeSync”

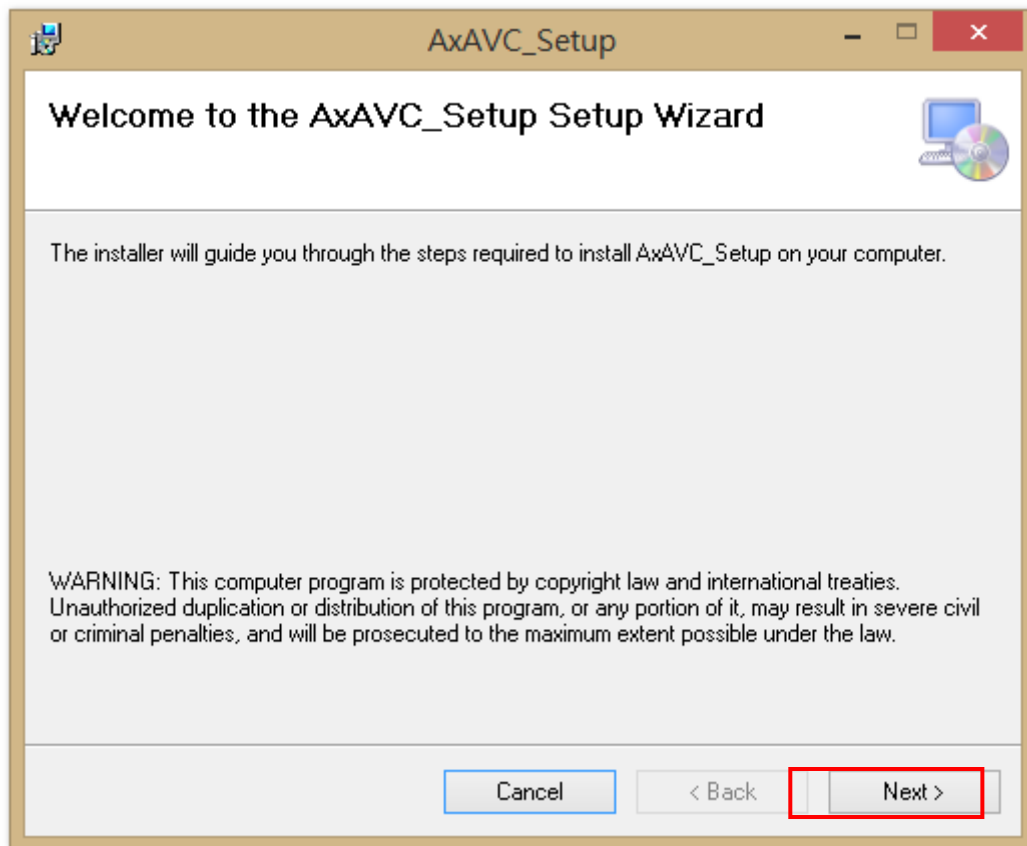
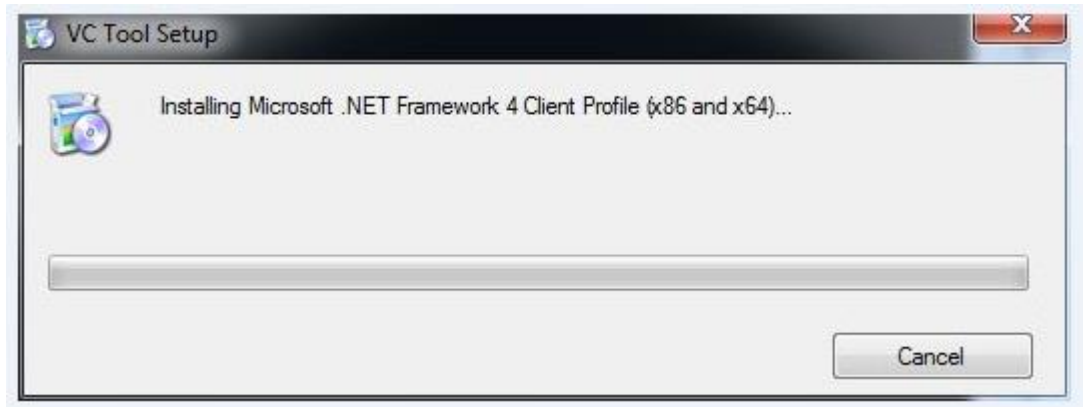


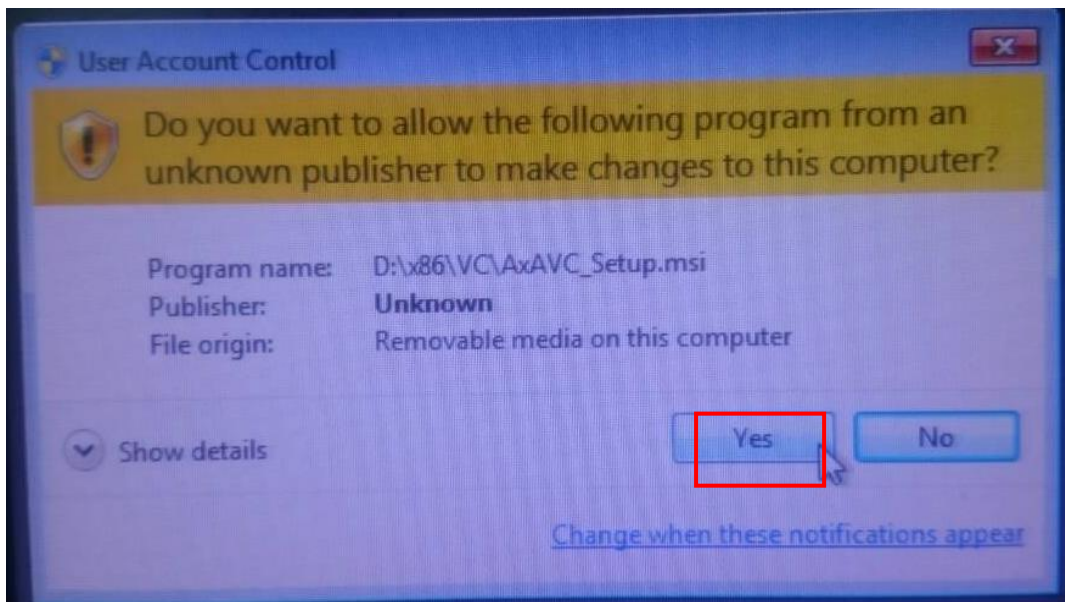
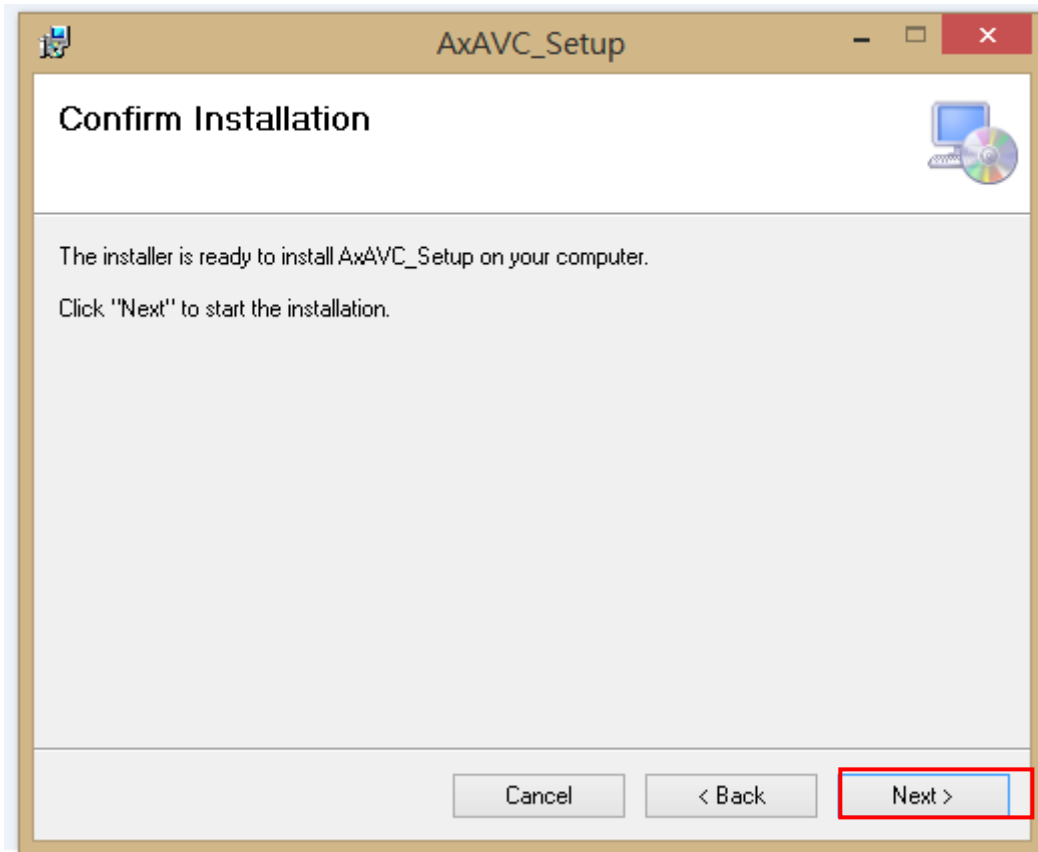


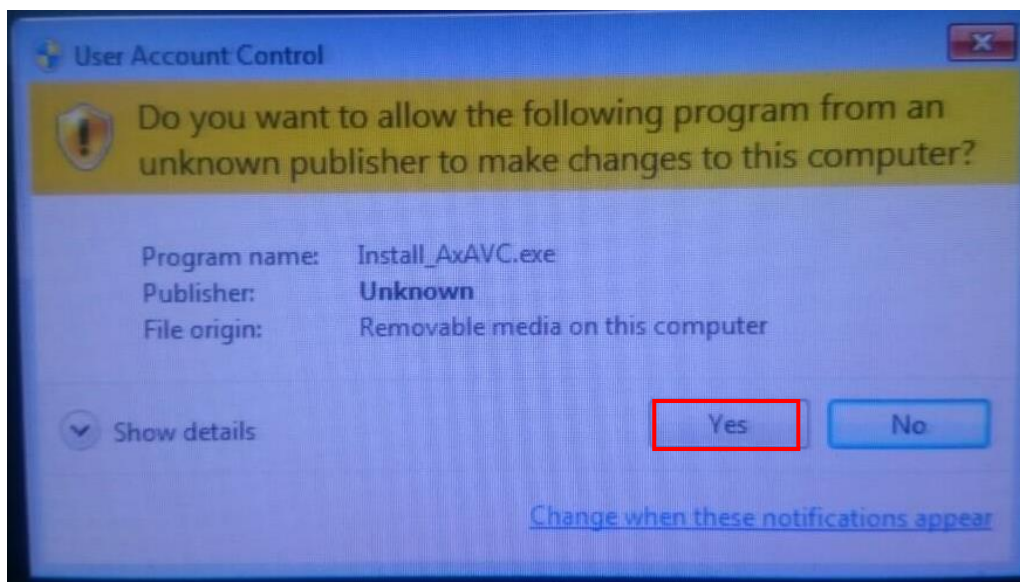
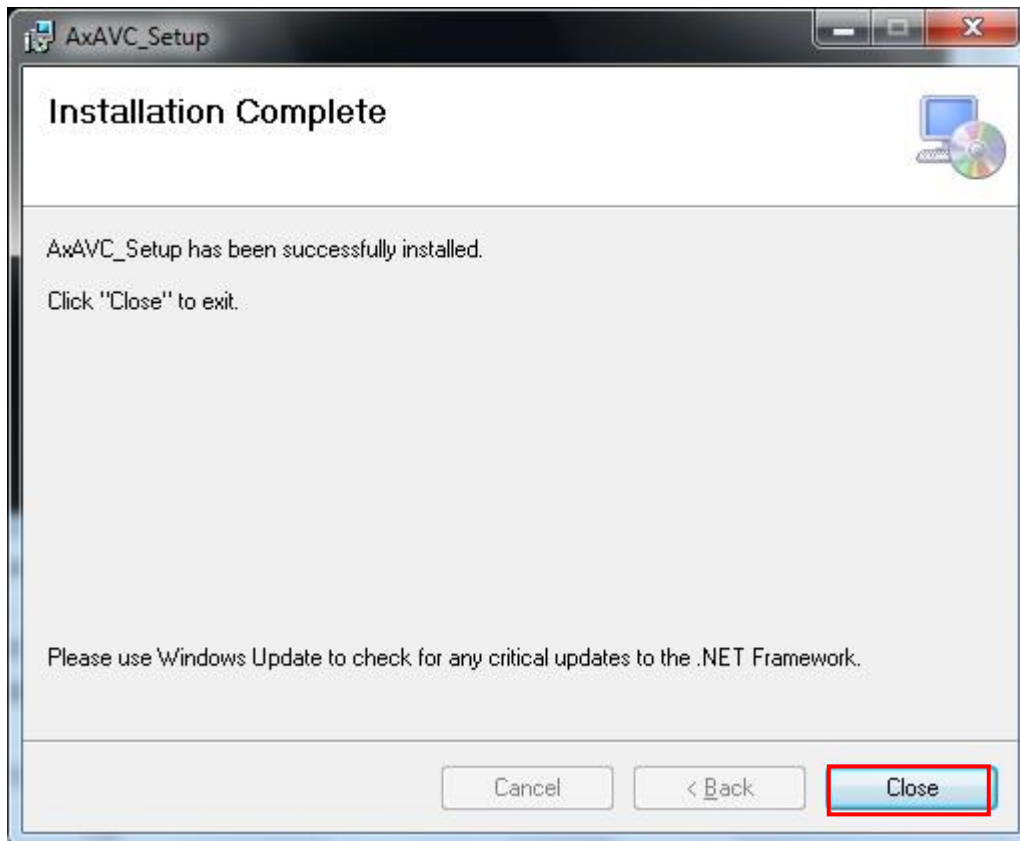
名稱	修改日期	類型	大小
VC	2015/10/30 下午 ...	檔案資料夾	
ReadMe.txt	2015/9/23 下午 0...	文字文件	1 KB
Setup.bat	2015/9/23 下午 0...	Windows 批次檔案	2 KB











**Step 2** System auto reboot, installation completed.

- Step 3** Select “△” icon then finding out the “Axiomtek” to ensure the volume driver is installed appropriately.

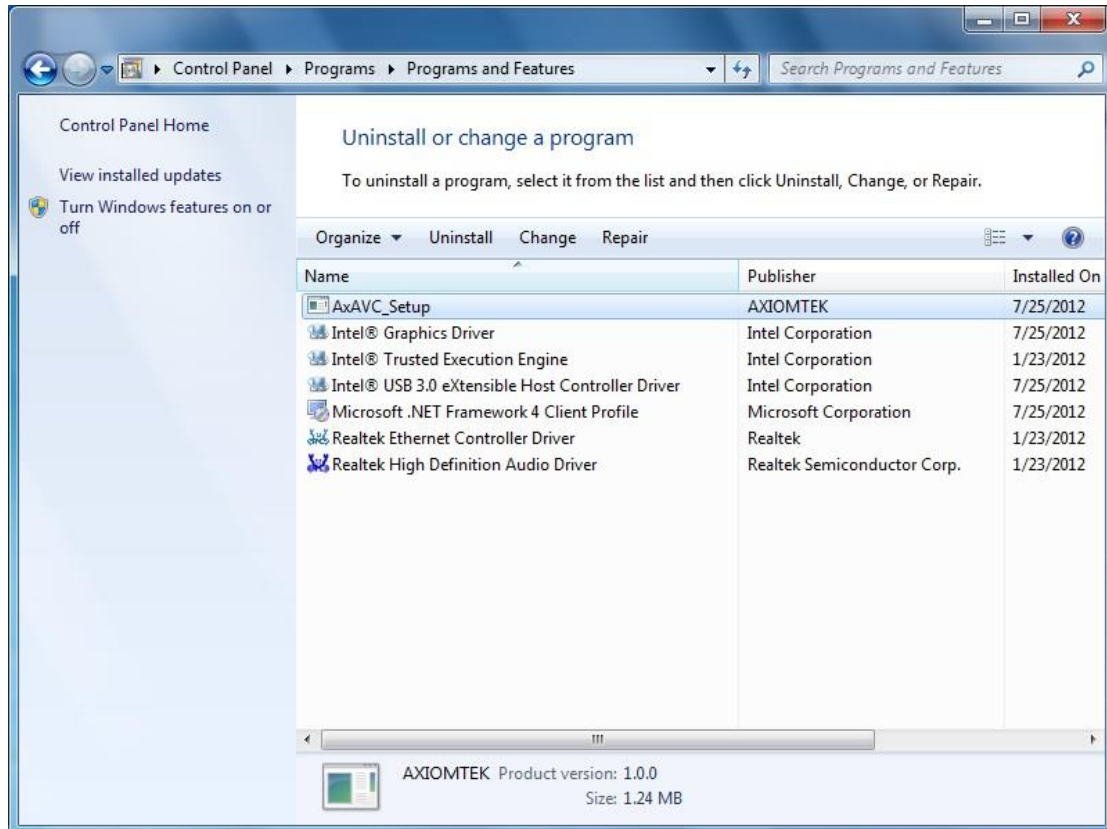


- Step 4** **How to use the Volume Control**  
Select volume +/- to adjust the system volume.



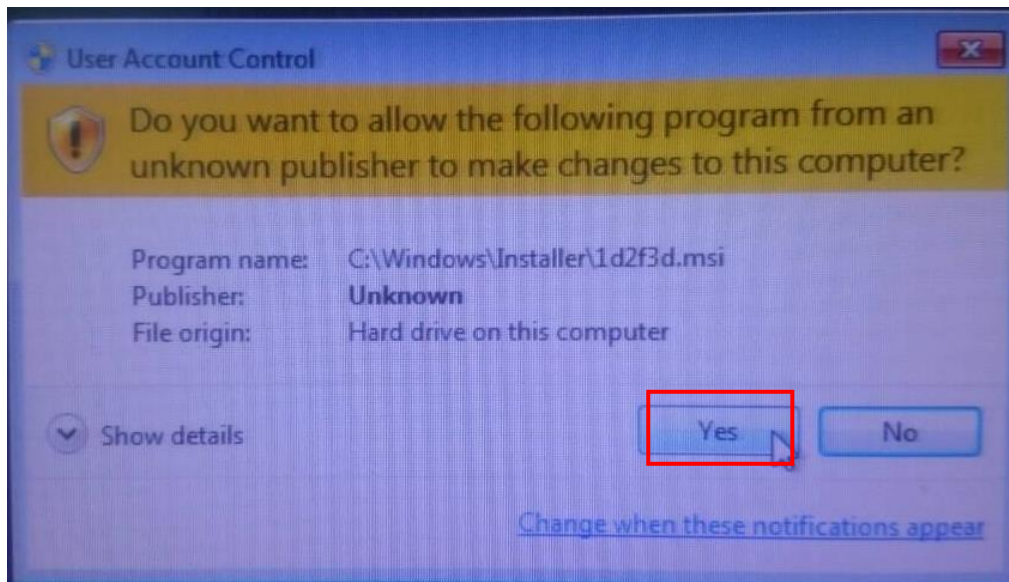
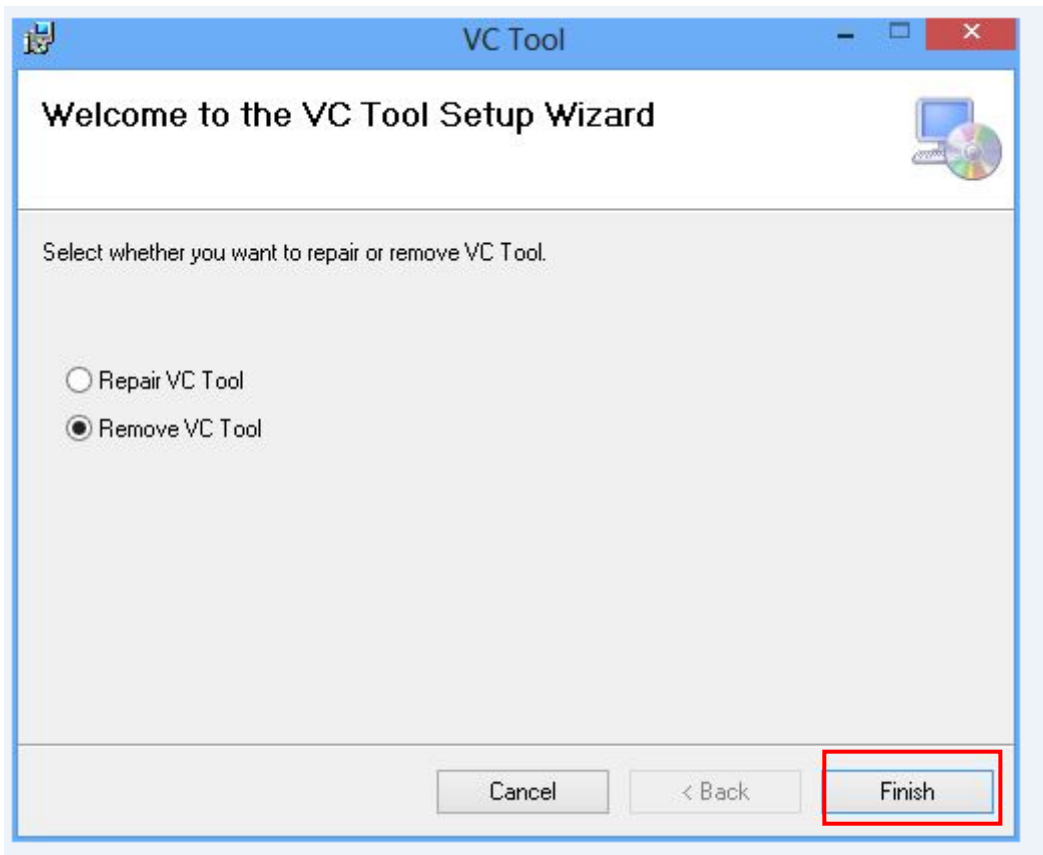
## Removed Volume Control Tool

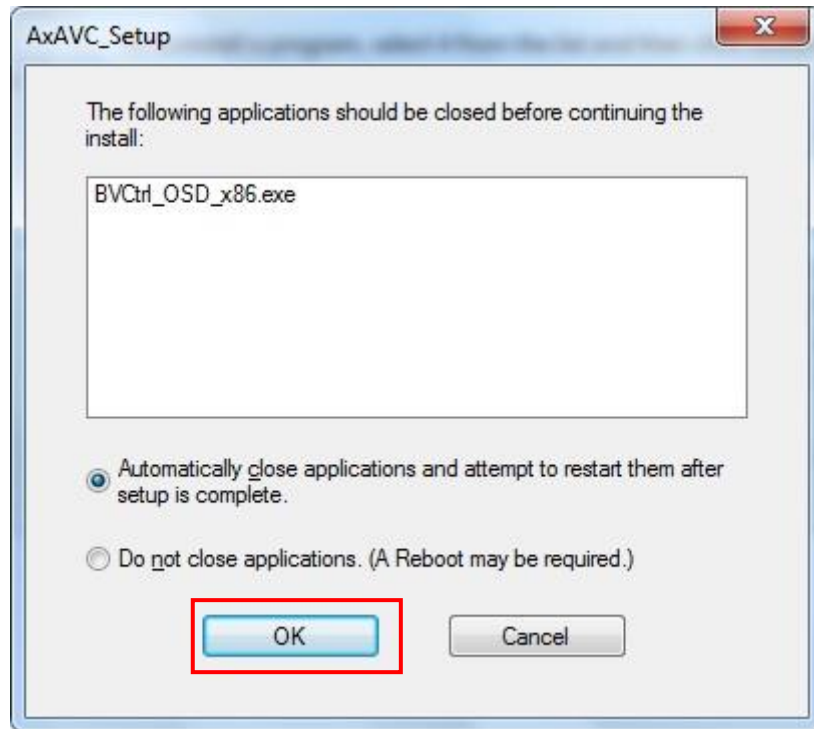
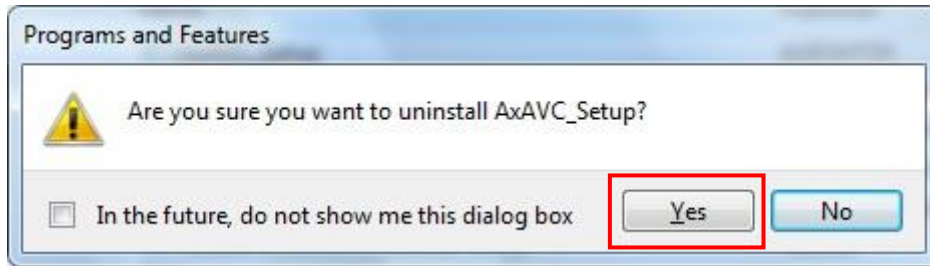
**Step 1** Go to Control Panel -> Programs -> Programs and Features. Select Uninstall on AxAVC\_Setup.





Step 2 Follow the procedures and press "Close".





**Step 3 System auto reboot, uninstallation completed.**