

USER'S MANUAL

tBOX520-ADL-MR Series

Embedded Systems

User's Manual



www.axiomtek.com

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 rights of any third party, 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 2023 Axiomtek Co., Ltd.
All Rights Reserved
December 2023, Version A1
Printed in Taiwan

Safety Precautions

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

1. User should not modify any unmentioned jumper setting without Axiomtek FAE's instruction. Any modification without instructions might damage the system.
2. The tBOX520-ADL-MR does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
3. 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.
4. Disconnect the power cord from the tBOX520-ADL-MR 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 tBOX520-ADL-MR is properly grounded.
5. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
6. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
7. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -40°C or above 85°C. It may damage the equipment.
8. 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 a human body.
 - When handling boards and components, wear a grounding wrist strap, available from most electronic component stores.

Classification

1. Degree of protection against electric shock: not classified
2. Degree of protection against the ingress of water: IP30
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.

1. 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.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. 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 cleaned using a product designed for cleaning the same types of components. Please read the instructions that come with a cleaning product to avoid misuse.

- 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 using a piece of cloth to rub hardware parts.
- 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: Using a vacuum cleaner to suck 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 the circuitry to corrode.
- Cotton swabs: Cotton swabs 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: Please shut down the system before you start to clean any single component.

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 the 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 or no longer in use.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd.

Windows® is a trademark of Microsoft Corporation.

AMI® is a registered trademark of American Megatrends Inc.

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

Intel® and Atom™ are trademarks of Intel Corporation.

Winbond is a trademark of Winbond Electronics Corp.

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

Table of Contents

Safety Precautions	iii
Classification	iv
SECTION 1 INTRODUCTION	1
1.1 General Description	1
1.2 System Specifications	2
1.2.1 CPU	2
1.2.2 System I/O	2
1.2.3 System Specification	3
1.3 Dimensions	4
1.4 Packing List	6
1.5 Optional Accessories	6
SECTION 2 HARDWARE INSTALLATION	7
2.1 Installing the Swappable HDD/SSD & Value-added Module (VAM)	7
2.2 Installing the DDR module and M.2 NVMe	8
2.3 Installing the Wall Mount Kits	9
2.4 Installing the Wireless Module	10
2.5 Installing the Cable Fixing Plate	13
SECTION 3 CONNECTOR	15
3.1 Connectors	15
3.1.1 HDMI Connector	15
3.1.2 Serial Port Connector	16
3.1.3 USB3.1 Stack Ports	16
3.1.4 LED Indicators	17
3.1.5 DC Power Input Connector	17
3.1.6 LAN Connector	18
3.1.7 NanoSIM Card Connector	19
3.1.8 PCI-Express Mini Card Connector (CN10)	20
3.1.9 Antenna Opening	21
3.1.10 HDD Tray Locker	21
3.1.11 Restore BIOS Optimal Default Settings(SW1)	21
3.1.12 M.2 2280 Key M NVMe SSD (CN11)	22
3.1.13 M.2 Key B+M.2 Key E (CN8)	23
3.1.14 Value-Added Module Specification	25
SECTION 4 AMI BIOS SETUP UTILITY	27
4.1 Starting	27
4.2 Navigation Keys	28
4.3 Main Menu	29
4.4 Advanced Menu	30
4.5 Chipset Menu	50
4.6 Security Menu	53
4.7 Boot Menu	55
4.8 Save & Exit Menu	56
APPENDIX A WATCHDOG TIMER	59
A.1 About Watchdog Timer	59
A.2 Sample Program	59
APPENDIX B WINDOWS POWER BUTTON SETTING	63

APPENDIX C Programmable LED.....67

SECTION 1 INTRODUCTION

This chapter contains general information and detailed specifications of the tBOX520-ADL-MR. Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets
- Package List

1.1 General Description

The tBOX520-ADL-MR is an embedded system that supports the 12th Gen. Intel® Core™ i7/i5/i3 or Celeron® processor (Alder Lake-P) TDP 15W onboard. It is compatible with Windows® 11 and Linux and has been optimized for the most enduring operation. It also features fanless design with rich I/O, supports dual SO-DIMM up to 32GB, and delivers enhanced system reliability including the built-in Watchdog Timer.

● Features

- 12th Generation Intel® Core™ i7/i5/i3 or Celeron® processor (Alder Lake-P) TDP 15W onboard
- Supports dual SO-DIMM non-ECC DDR5 262pin 5V 4800MT/s max. up to 32GB, single channel 16GB
- CE, FCC, EN 50155, EN 45545-2 certified
- Fanless with operating temperature range from -40°C to +70°C with W.T. DRAM & SSD at air flow 0.5m/s
0°C to +60°C with HDD
-40°C to +55°C with VAM701/703/705/707 (internal PoE PSU, please refer to NOTE1)
- 1x COM Port RS-232/422/485.
- Supports USB 3.1 and SATA3
- 2x swappable & lockable 2.5" SATA drive bays.
- 3x M.2 slot and 2x NanoSIM slot
- Supports 1x Port 100/1000/2500 Base-T Ethernet LAN connector.



NOTE: 1. -40°C to 55°C with Max consumption, POE budget 60W@24VDC; PoE budget 90W@36-110VDC

2. -40°C 0 to +70°C with SDP application, SDP condition, POE port all use IPCAM, and use software for recording and live-view, without additional testing software to occupy CPU resources

**** SDP refers to "scenario design power"**

- **Reliable and Stable Design**
 - The tBOX520-ADL-MR adopts an advanced cooling system and rugged design that support 3 Grms w/ SSD for vibration, which makes it especially suitable for harsh environments and the best solution for on board surveillance, communication, intelligent video analysis, and etc. applications in transportation market.
- **Embedded O/S Supported**
 - The tBOX520-ADL-MR supports Windows® 11 Embedded and Linux. For storage devices, the tBOX520-ADL-MR supports 2x 2.5" SATA drive bays and 1x NVMe slot.

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Onboard Intel® 12th Core™ i7/i5/i3, Pentium®/Celeron® processors TDP 15W
- **BIOS**
 - American Megatrends Inc. BIOS.
 - “Load Optimized Default” to backup customized Settings in the BIOS flash chip to prevent CMOS battery fail.
- **System Memory**
 - Dual SO-DIMM non-ECC DDR5 262pin 5V 4800MT/s max. up to 32GB, single channel up to 16GB
- **Graphics**
 - Intel® Iris® XeGraphics (Core™ i7/i5), Intel® UHD Graphics (Core™ i3 and Celeron®)

1.2.2 System I/O

- **Front Side**
 - 2x HDMI Female Connector
 - 2x Audio Connectors (MIC-IN/LINE-OUT)
 - 1x RJ-45 100/1000/2500 Mbps Ethernet
 - 4x USB 3.1 Gen1
 - 1x DB9 serial console for RS232/422/485
 - 1x Power Switch
 - 1x Reset Button
 - 2x Nano SIM Slot
- **Rear Side**
 - 1 x M12 DC-in
 - 8x Antenna Opening
 - 2 x modular IO slot (for VAM, value-added module)

1.2.3 System Specification

- **Watchdog Timer**
 - Reset supported; 255 levels, 1~255 sec.
- **Power Supply**
 - 24-110 VDC-in power supply
 - Power Rate:3.5A@24VDC; 0.75A@110VDC
 - Power Rate:5.5A@24VDC; 1.2A@110VDC (For internal PoE PSU SKU)
- **Operation Temperature**
 - -40°C to +70°C (-40°F to 158°F) with W.T. SSD
 - 0°C to +60°C (+32°F to +140°F) with HDD
 - -40°C to +55°C (- 40 °F to 131°F) with VAM701/703/705/707 (with internal PoE PSU)
- **Storage Temperature**
 - -40°C ~ +85°C (- 40°F ~ 176°F)
- **Humidity**
 - 5% ~ 95% (non-condensation)
- **Vibration Endurance**
 - 3Grms w/ SSD (5 ~ 500Hz, X, Y, Z direction; random)
- **Weight**
 - 3.5 kg (7.72lb) without package
 - 4.5kg (11.02lb) with package
- **Dimensions**
 - 321mm(12.64")(W) x 210.2mm(8.28")(D) x 73.3mm(2.89")(H)

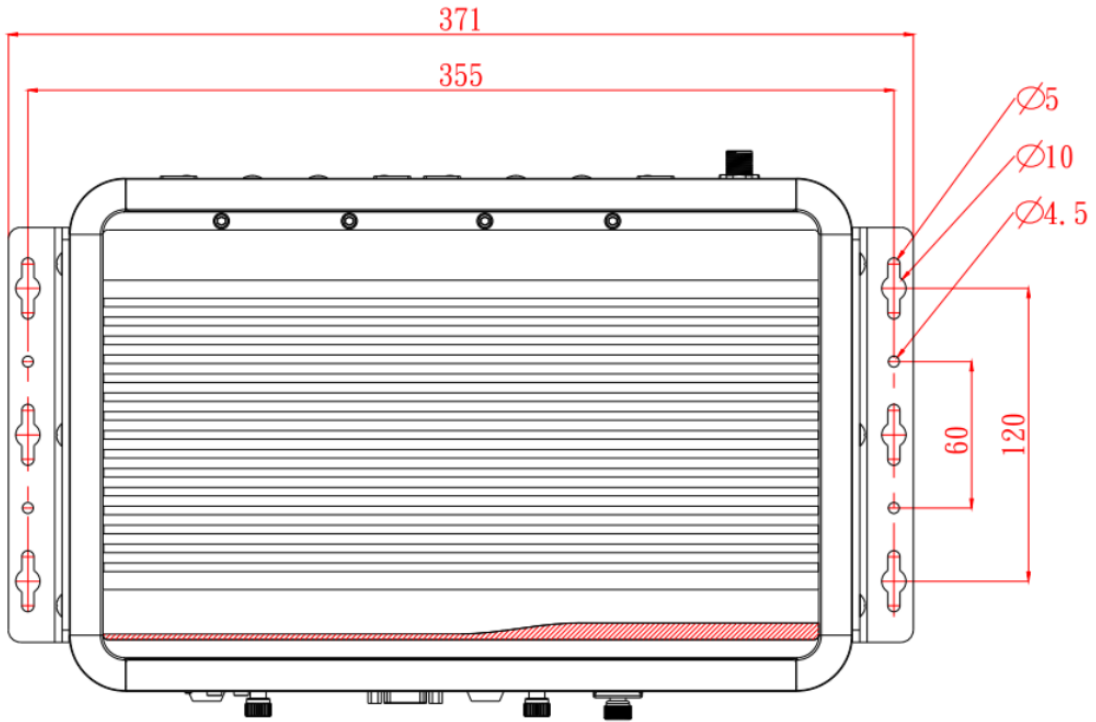


NOTE: All specifications and images are subject to change without notice.

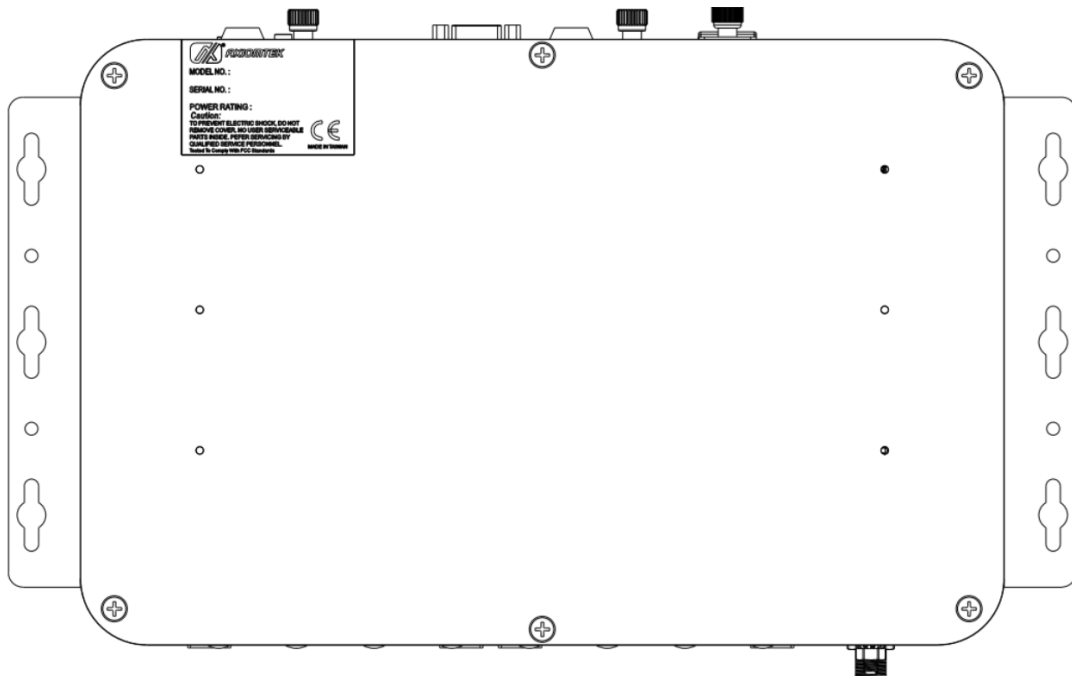
CAUTION: High Temperature on Surface
Please turn off power and check the temperature of system heatsink before maintenance.

1.3 Dimensions

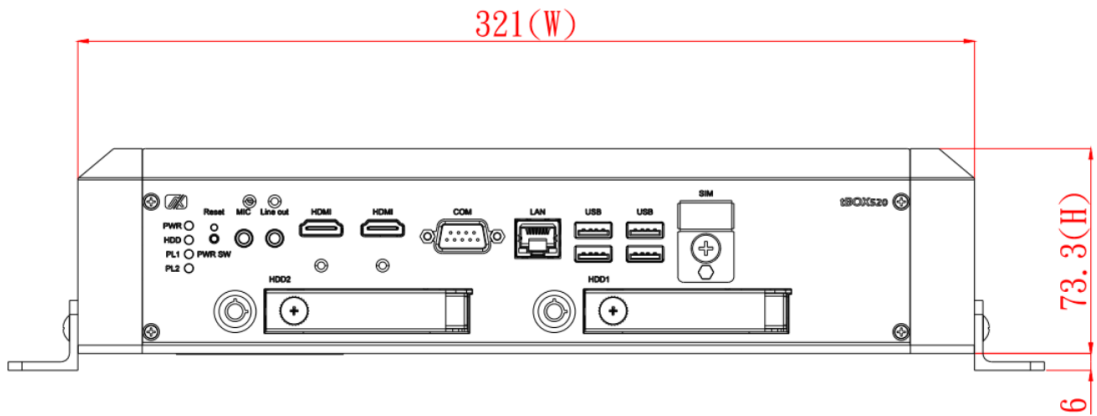
The following diagrams show the dimensions and outlines of the tBOX520-ADL-MR.



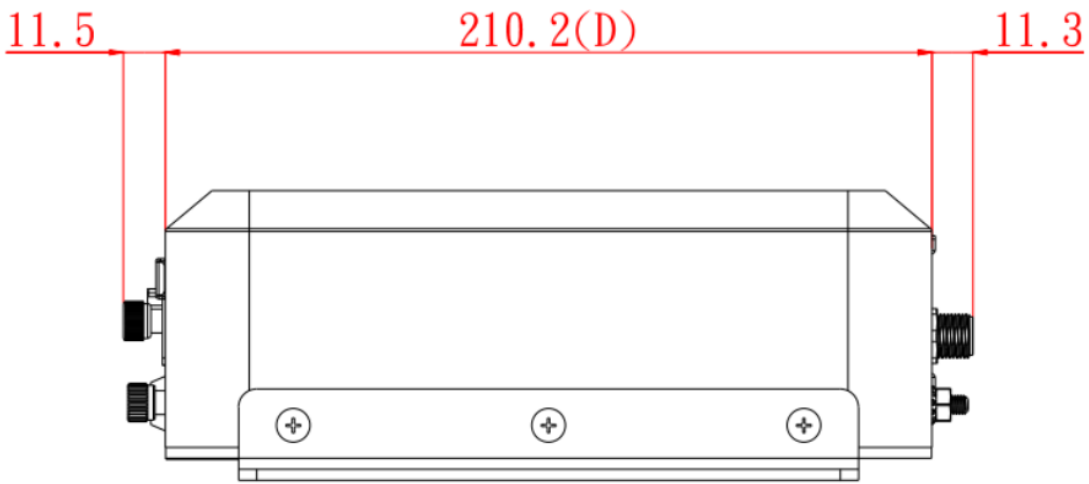
▲ Top View (with wall mount)



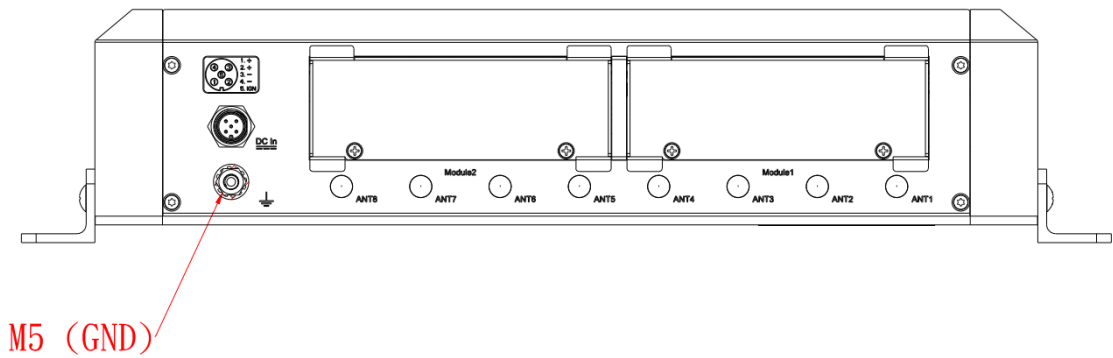
▲ Bottom View (with wall mount)



▲ Front View (with wall mount)



▲ Side View (with wall mount)



▲ Rear View: M12 DC-IN (with wall mount)

1.4 Packing List

The package bundled with your tBOX520-ADL-MR should contain the following items:

- **tBOX520-ADL-MR System Unit x 1**
- **Screw pack x 1**
- **Foot pad x 4**
- **Wall-mount bracket x 2**
- **Thermal pad for DDR, NVMe module**
- **Mylar tablets x4 for HDD/SSD**

If you cannot find this package or any of the above-mentioned items is missing, please contact your local distributor immediately.

1.5 Optional Accessories

- **Adapter 24V with M12 connector x 1 (optional)**
- **M12 5pin DCin power cable x 1 (1.8M for testing, optional)**
- **Power cord in US/EU/UK/JP standard (optional)**
- **HDD/SSD/mSATA (optional)**
- **NVMe (optional)**
- **Express Mini Card module (optional)**
- **4G/5G/GPS module (optional)**
- **Wi-Fi/Bluetooth module (optional)**
- **Value-added module x 2 (maximum, optional)**
- **Anti-vibration kit (optional)**

SECTION 2 HARDWARE INSTALLATION

Chapter 2 will show you how to install the hardware into tBOX520-ADL-MR.

2.1 Installing the Swappable HDD/SSD & Value-added Module (VAM)

Step 1 Attach a piece of Mylar on the back of an HDD/SSD as shown.



Step 2 As shown in the picture, slide the HDD/SSD into the SATA tray. Insert screws into each side of the SATA drive through the corresponding holes.



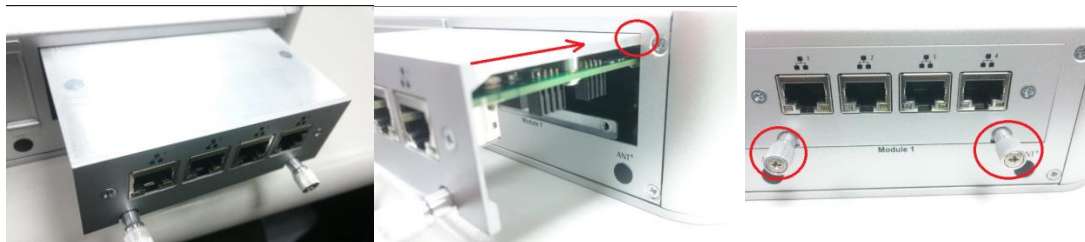
Step 3 Install the SATA drive into the slot and lock the SATA drive to complete the installation.



- Step 4** For VAM module installation, unscrew the top side screws (x4) and rear side screws (x2), and then remove the module slot cover.



- Step 5** Insert the value-added module (VAM) as shown below. Make sure the module is on the track and slide the module gently into the slot until it clicks in place. Secure the module with the screws.

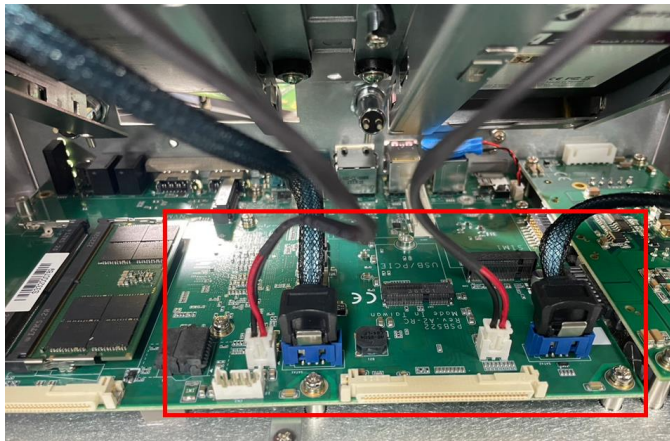


2.2 Installing the DDR module and M.2 NVMe.

- Step 1** Make sure system power is off and unplug the power cord.
- Step 2** Turn the tBOX520-ADL-MR upside down, loosen the cover screws and lift the bracket a little bit as shown.



- Step 3** Disconnect the four SATA connectors and remove the cover.



Step 4 Loosen the four screws to remove the bracket and put the thermal pad on the slot.



Step 5 Install the DDR module and M.2 module.



Step 6 Place the thermal pad above the module and screw the bracket back.



2.3 Installing the Wall Mount Kits

The tBOX520-ADL-MR provides Wall Mount kits that customers can install as below:

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

Step 2 Prepare the wall mount assembling components (screws and bracket).

Step 3 Locate the wall mount screw holes on both sides of the system.

Step 4 Attach the wall mount to the system and fasten the screws tightly as shown below to complete the installation.



2.4 Installing the Wireless Module

Step 1 Loosen the screw and remove the cover.

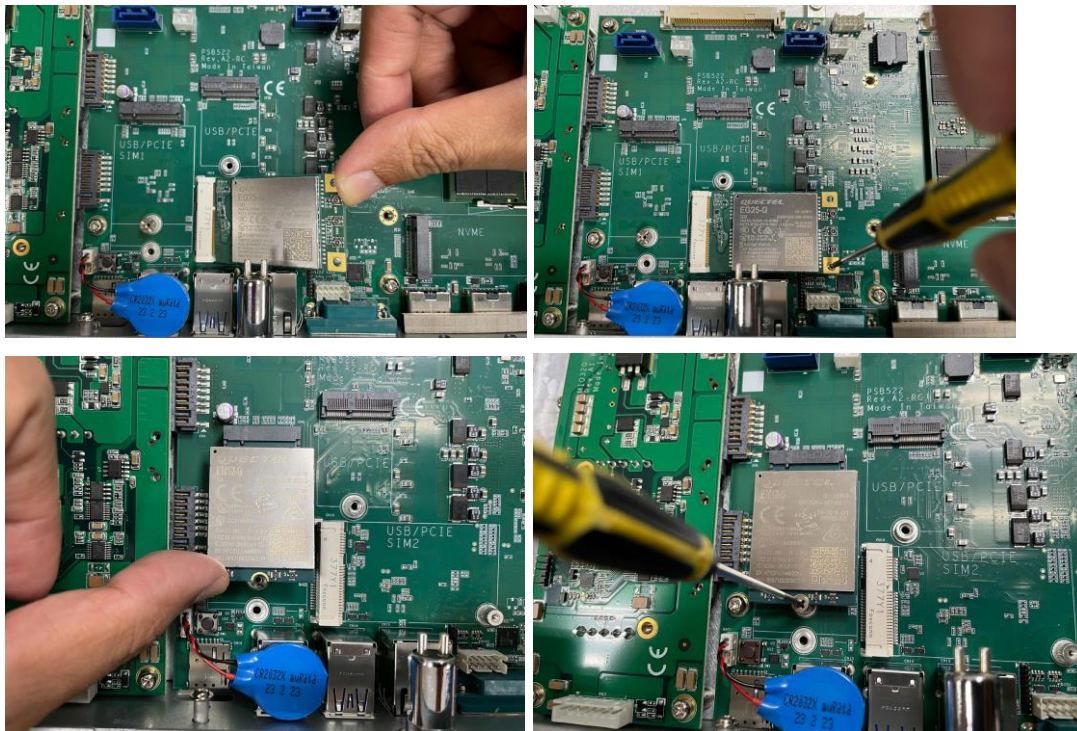


Step 2 Insert the SIM Card into the socket and push in. Then put back the cover and tighten the screw.



SIM slot	Wireless module insert slot
S1(up)	CN8
S2(down)	CN10

Step 3 Install the wireless module into the slot and tighten the screws.



Step 4 Remove the antenna plug from one antenna hole on the system chassis, and prepare the antenna cable.



Step 5 Make the antenna cable's gold connector through the antenna hole on the system chassis and screw it tight with the antenna nut and gasket.



Step 6 Screw the RF antenna to the gold connector.

Step 7 Connect the other end of the cable to the connector on the wireless module.

2.5 Installing the Cable Fixing Plate

For HDMI:

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

Step 2 To fasten the HDMI cable fixing plate (Figure 1) to the system, align the hole on the plate with the hole on the system chassis, insert the screw* into the holes, and tighten the screw to fasten the plate, as shown in Figure 2 below.



Note: *Large flat head cross mechanical tooth flat tail nickel-plated M3*6L screw

Step 3 Insert the HDMI cable into the system's HDMI port. Then fasten a cable tie through the loop of the cable fixing plate to bind the HDMI cable to the plate, as shown in Figure 3 below.



(Figure 1)



(Figure 2)



(Figure 3)

For Audio Jack:

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

Step 2 To fasten the Audio cable fixing plate (Figure 4) to the system, align the hole on the plate with the hole on the system chassis, insert the screw* into the holes, and turn the screw tightly to fasten the plate, as shown in Figure 5 below.

Step 3 Insert the Audio cable into the system's Audio port. Then insert a cable tie through the loop of the cable fixing plate to bind the Audio cable to the plate, as shown in Figure 6 below.



(Figure 4)



(Figure 5)



(Figure 6)



Note: *Large flat head cross mechanical tooth flat tail nickel-plated M3*6L screw

This page is intentionally left blank.

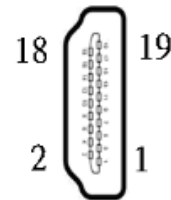
SECTION 3 CONNECTOR

3.1 Connectors

Connectors connect to the CPU board with the other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected before your turn on the system.

3.1.1 HDMI Connector

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

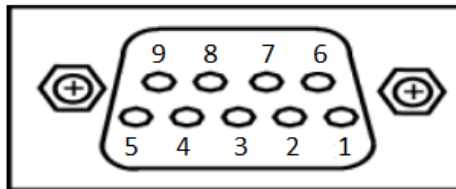


3.1.2 Serial Port Connector

The COM1 port connector is a DB9 connector. The pin assignment of RS-232/RS-422/RS-485 is listed in the following table. If you need the COM port to support RS-422 or RS-485, please set it up in BIOS settings.

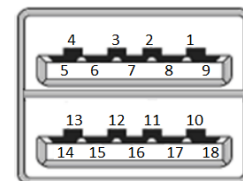
Pin	RS-232	RS-422	RS-485
1	DCD, Data carrier detect	TX-	Data-
2	RXD, Receive data	TX+	Data+
3	TXD, Transmit data	RX+	NC
4	DTR, Data terminal ready	RX-	NC
5	GND, ground	GND, ground	GND, ground
6	DSR, Data set ready	NC	NC
7	RTS, Request to send	NC	NC
8	CTS, Clear to send	NC	NC
9	RI, Ring indicator	NC	NC
10	NC	NC	NC

COM



3.1.3 USB3.1 Stack Ports

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+



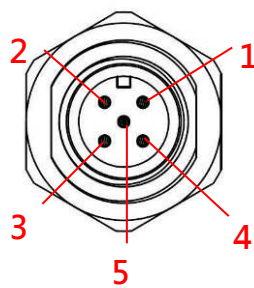
3.1.4 LED Indicators

LED Indicator	Function	Description
PWR/Green	Power on	Indicates power status. When the DC input is connected, the LED will light on.
HDD/Green	HDD activity	Indicates storage status. The LED flashes when storage is being accessed.
PL1/Green	Programmable LED1	The LED will be in accordance with the program.
PL2/Green	Programmable LED2	The LED will be in accordance with the program.

3.1.5 DC Power Input Connector

The DC-in power input connector is an M12 A-code Male 5Pin connector.

Pin	Signal
1	VCC
2	VCC
3	System GND
4	System GND
5	IGN



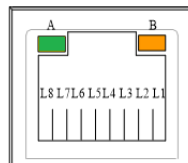
Note: Default IGN Trigger: Disabled, refer to Smart Ignition Management

3.1.6 LAN Connector

The RJ-45 LAN connectors can support 100/1000/2500 Mbps.

Ethernet (optional)

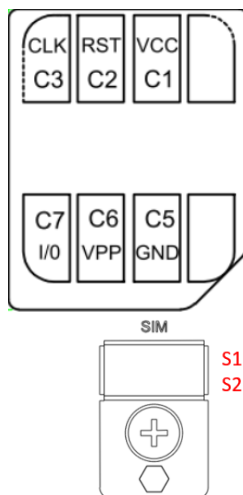
Pin	Description	100Base-T	1000/2500Base-T
1	Transmit Data+ or Bidirectional	TX+	BI_DA+
2	Transmit Data- or Bidirectional	TX-	BI_DA-
3	Receive Data+ or Bidirectional	RX+	BI_DB+
4	Not Connected or Bidirectional	N.C.	BI_DC+
5	Not Connected or Bidirectional	N.C.	BI_DC-
6	Receive Data- or Bidirectional	RX-	BI_DB-
7	Not Connected or Bidirectional	N.C.	BI_DD+
8	Not Connected or Bidirectional	N.C.	BI_DD-
B	Speed LED	OFF	Green / Orange
A	Activity Link LED(Yellow)	OFF: No Link Blinking: Data activity detected	



3.1.7 NanoSIM Card Connector

The NanoSIM Card slot is an ISO 7816 standard 6-pin connector for the PCI Express M.2/Mini Card.

Pin	Signal
C1	SIM_PWR
C2	SIM_RESET
C3	SIM_CLK
C5	GND
C6	SIM_VPP
C7	SIM_DATA

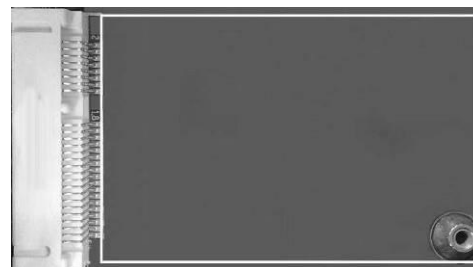
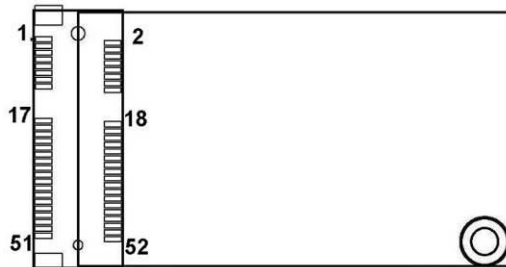


SIM slot	Wireless module insert slot
S1	CN8
S2	CN10

3.1.8 PCI-Express Mini Card Connector (CN10)

The PCI Express Mini Card connectors support 1x PCI Express lane and 2x USB 2.0 lanes. A PCI Express Mini Card can be applied to either PCI Express or USB 2.0. It's very helpful that we have designed the USB 2.0 and PCI Express lanes in the same slot for an interface migration. We provide a convenient and low-cost solution for you with this friendly design.

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	+3.3VSB
21	GND	22	PERST#
23	PE_RXN4	24	+3.3VSB
25	PE_RXP4	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN4	32	SMB_DATA
33	PE_TXP4	34	GND
35	GND	36	USB_D3-
37	GND	38	USB_D3+
39	+3.3VSB	40	GND
41	+3.3VSB	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	No use	46	LED_WPAN#
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.1.9 Antenna Opening



Profile opening is reserved for Wi-Fi/3G/4G/5G antennas.



ANT1

3.1.10 HDD Tray Locker

Lock and secure the swappable HDD/SSD bay.

Status	Diagram
Unlocked	
Locked	

3.1.11 Restore BIOS Optimal Default Settings(SW1)

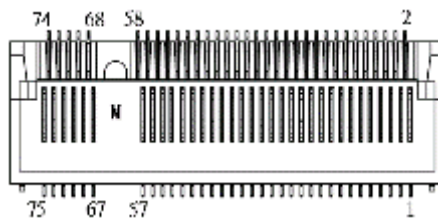
Function	Setting
Normal operation (Default)	OPEN
Restore BIOS optimal default setting	Push (down)



3.1.12 M.2 2280 Key M NVMe SSD (CN11)

The M.2 2280 Key M NVMe Express SSD for storage.

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V	3	GND	4	+3.3V
5	PERn3	6	NC	7	PERp3	8	NC
9	GND	10	LED_1#	11	PETn3	12	+3.3V
13	PETp3	14	+3.3V	15	GND	16	+3.3V
17	PERn2	18	+3.3V	19	PERp2	20	NC
21	GND	22	NC	23	PETn2	24	NC
25	PETp2	26	NC	27	GND	28	NC
29	PERn1	30	NC	31	PERp1	32	NC
33	GND	34	NC	35	PETn1	36	NC
37	PETp1	38	NC	39	GND	40	NC
41	PERn0	42	NC	43	PERp0	44	NC
45	GND	46	NC	47	PETn0	48	NC
49	PETp0	50	PERST#	51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#	55	REFCLKp	56	NC
57	GND	58	NC	59	CONNECTOR Key M	60	CONNECTOR Key M
61	CONNECTOR Key M	62	CONNECTOR Key M	63	CONNECTOR Key M	64	CONNECTOR Key M
65	CONNECTOR Key M	66	CONNECTOR Key M	67	NC	68	NC
69	NC	70	+3.3V	71	GND	72	+3.3V
73	GND	74	+3.3V	75	GND		



3.1.13 M.2 Key B+M.2 Key E (CN8)

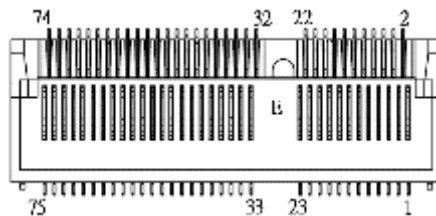
Key B

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	CONFIG_3	2	+3.3V	3	GND	4	+3.3V
5	GND	6	Full Card PWR OFF	7	USB_D+	8	W_DISABLE1#
9	USB_D-	10	GPIO_9	11	GND	12	Key B
13	Key B	14	Key B	15	Key B	16	Key B
17	Key B	18	Key B	19	Key B	20	GPIO_5
21	CONFIG_0	22	GPIO_6	23	GPIO_11	24	GPIO_7
25	DPR	26	GPIO_10	27	GND	28	GPIO_8
29	USB3.1-Tx-	30	UIM-RESET	31	USB3.1-Tx+	32	UIM-CLK (O)
33	GND	34	UIM-DATA (I/O)	35	USB3.1-Rx-	36	UIM-PWR (O)
37	USB3.1-Rx+	38	NC	39	GND	40	GPIO_0
41	PERn0	42	GPIO_1	43	PERp0	44	GPIO_2
45	GND	46	GPIO_3	47	PETn0	48	GPIO_4
49	PETp0	50	PERST#	51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#	55	REFCLKp	56	NC
57	GND	58	NC	59	ANTCTL0	60	COEX3
61	ANTCTL1	62	COEX_RXD	63	ANTCTL2	64	COEX_TXD
65	ANTCTL3	66	SIM_DETECT	67	RESET# (I)(0/1.8V)	68	SUSCLK
69	CONFIG_1	70	+3.3V	71	GND	72	+3.3V
73	GND	74	+3.3V	75	CONFIG_2		



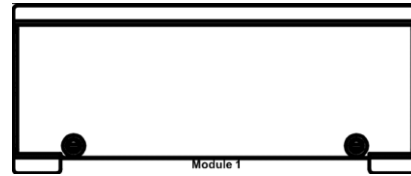
Key E

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V	3	USB_D+	4	+3.3V
5	USB_D-	6	NC	7	GND	8	NC
9	NC	10	NC	11	NC	12	NC
13	NC	14	NC	15	NC	16	NC
17	NC	18	GND	19	NC	20	NC
21	NC	22	NC	23	NC	24	CONNECTOR KEY E
25	CONNECTOR KEY E	26	CONNECTOR KEY E	27	CONNECTOR KEY E	28	CONNECTOR KEY E
29	CONNECTOR KEY E	30	CONNECTOR KEY E	31	CONNECTOR KEY E	32	NC
33	GND	34	NC	35	PETp0	36	NC
37	PETn0	38	NC	39	GND	40	NC
41	PERp0	42	NC	43	PERn0	44	NC
45	GND	46	NC	47	REFCLKp0	48	NC
49	REFCLKn0	50	SUSCLK	51	GND	52	PERST0#
53	CLKREQ0#	54	W_DISABLE2#	55	PEWAKE0#	56	W_DISABLE1#
57	GND	58	I2C_DATA	59	NC	60	I2C_CLK
61	NC	62	ALERT#	63	GND	64	NC
65	NC	66	NC	67	NC	68	NC
69	GND	70	NC	71	NC	72	+3.3V
73	NC	74	+3.3V	75	GND		








3.1.14 Value-Added Module Specification

Module	Description
1,2	The system offers two expansion I/O module slots, Value-added Module, to support expanding the I/O functions of tBOX520. For detailed specifications of each VAM, please refer to the quick manual of the individual module.



Item	Spec& Drawing	Item	Spec& Drawing
#1	<p>VAM700: 4x M12 A-coded Gb Ethernet VAM701: 4x M12 A-coded Gb Ethernet with PoE</p>	#2	<p>VAM702: 4x RJ-45 Gb Ethernet VAM703: 4x RJ-45 Gb Ethernet with PoE</p>
#3	<p>VAM704: 4x M12 D-coded Gb Ethernet VAM705: 4x M12 D-coded Gb Ethernet with PoE</p>	#4	<p>VAM706: 4x M12 X-coded Gb Ethernet VAM707: 4x M12 X-coded Gb Ethernet with PoE</p>
#5	<p>VAM708: 4x M12 A-coded Gb Ethernet with LAN BYPASS</p>	#6	<p>VAM900: Mini PCI Express + SIM, isolated CANbus, RS232/422/485, 8-in/8-out isolated DIO</p>
#7	<p>VAM100: 4x 4-wire isolated RS-232/422/485</p>	#8	<p>VAM200: 8-in/8-out isolated DIO</p>

			
#9	VAM400: Video & Audio-in + mini PCIe capture card 	#10	VAM102: 4x isolated CANbus 2.0A/B 
#11	VAM600: Mini PCI Express + SIM 		

This page is intentionally left blank.

SECTION 4 AMI BIOS SETUP UTILITY

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a 16MB flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps as below:

1. Turn on the computer and press the key immediately.
2. After pressing the <Delete> key, the main BIOS setup menu displays. You can access other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.



Note: If your computer cannot boot after making and saving system changes with Setup, you can restore BIOS optimal defaults by setting SW1 (see section 3.1.11).

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 might differ from one screen to another.

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
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.
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.

4.3 Main Menu

When you first 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.



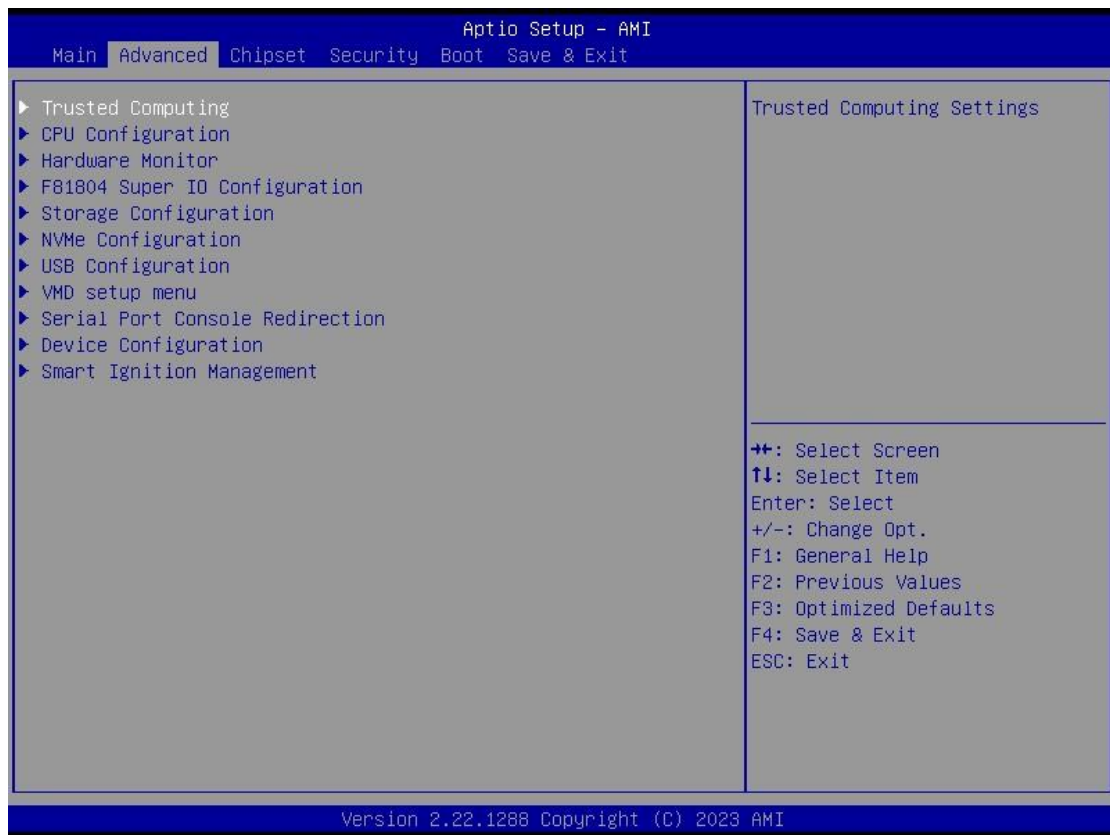
- **BIOS Information**
Display the BIOS information.
- **System Date/Time**
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date 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 allows users to set the 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 menu:

- ▶ Trusted Computing
- ▶ CPU Configuration
- ▶ Hardware Monitor
- ▶ F81804 Super IO Configuration
- ▶ Storage Configuration
- ▶ NVMe Configuration
- ▶ USB Configuration
- ▶ VMD setup menu
- ▶ Serial port Console Redirection
- ▶ Device Configuration
- ▶ Smart Ignition Management

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



- **Trusted Computing**

This sub-menu will allow you to enable/disable Trusted Platform Module (TPM) support and to configure the TPM State. Select Trusted Computing and press Enter to access the sub-menu.

Select the Security Device Support item to enable the TPM device.



● **CPU Configuration**

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



➤ Hyper-Threading

- **Enable or disable Hyper-Threading Technology. When enabled, it allows a single physical processor to multitask as multiple logical processors. When disabled, only one thread per enabled core is enabled. The default setting is Enabled.**

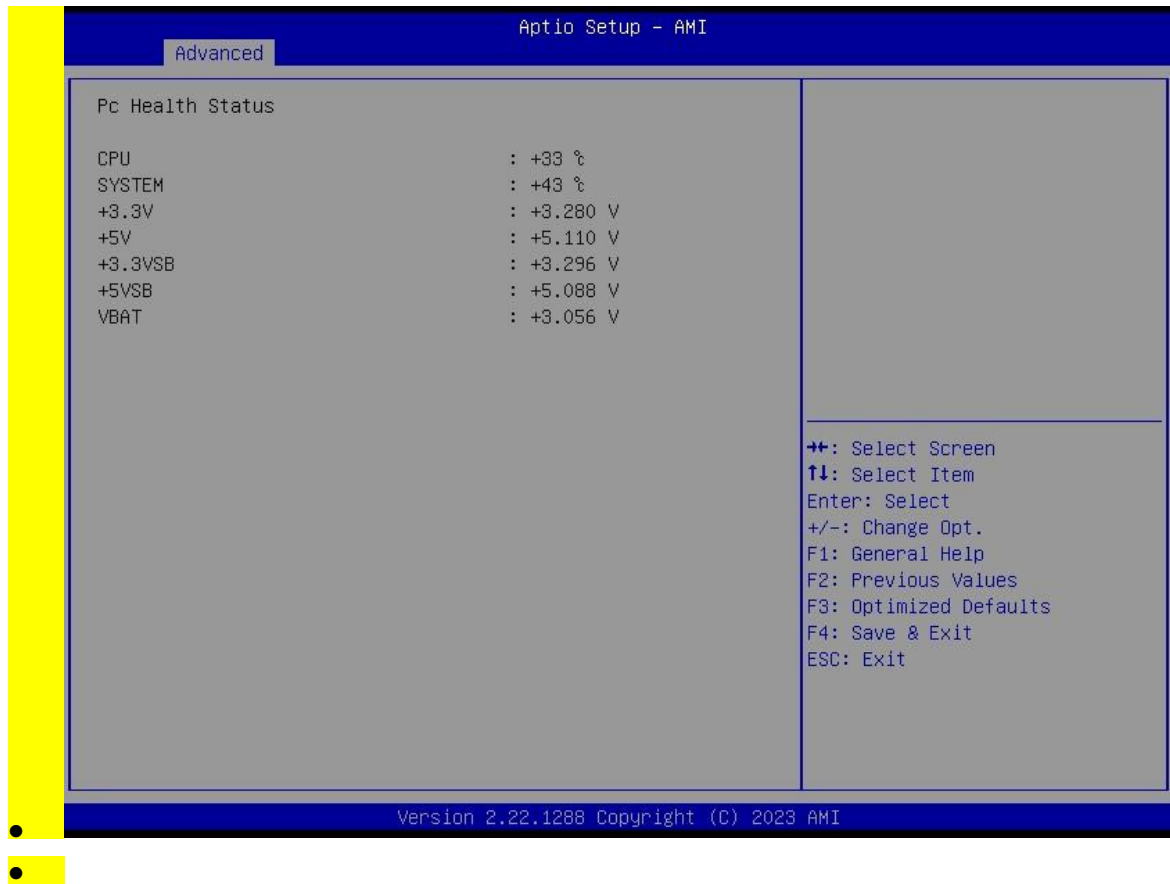
➤ Intel (VMX) Virtualization Technology

- **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 single computer system to work as several virtual systems. The default setting is Enabled.**

-
-
-
-
-
-

- **Hardware Monitor**

This screen shows the Hardware Health Configuration.



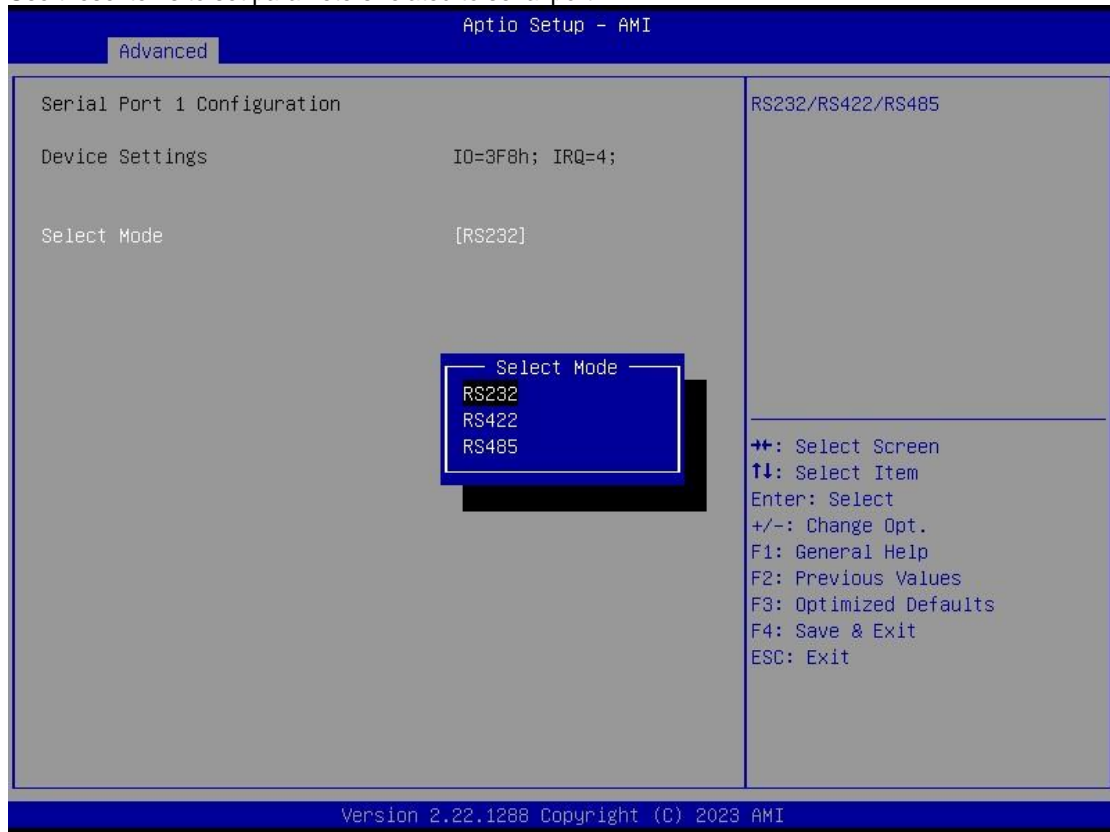
- **F81804 Super IO Configuration**

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 Configuration**

Use these items to set parameters related to serial port 1.



- **Serial Port 1**

This item allows you to use it as RS232/422/485. The default is RS232.

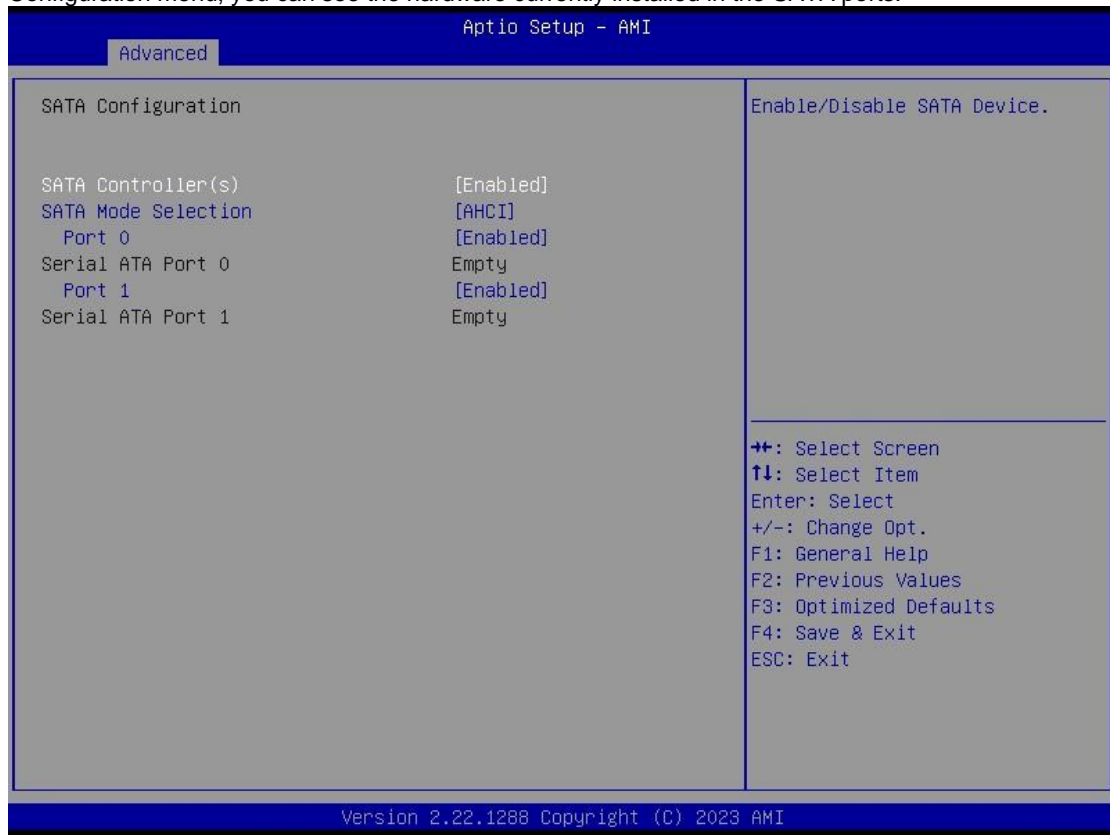
- **Storage Configuration**

This screen shows storage information.



- **SATA Configuration**

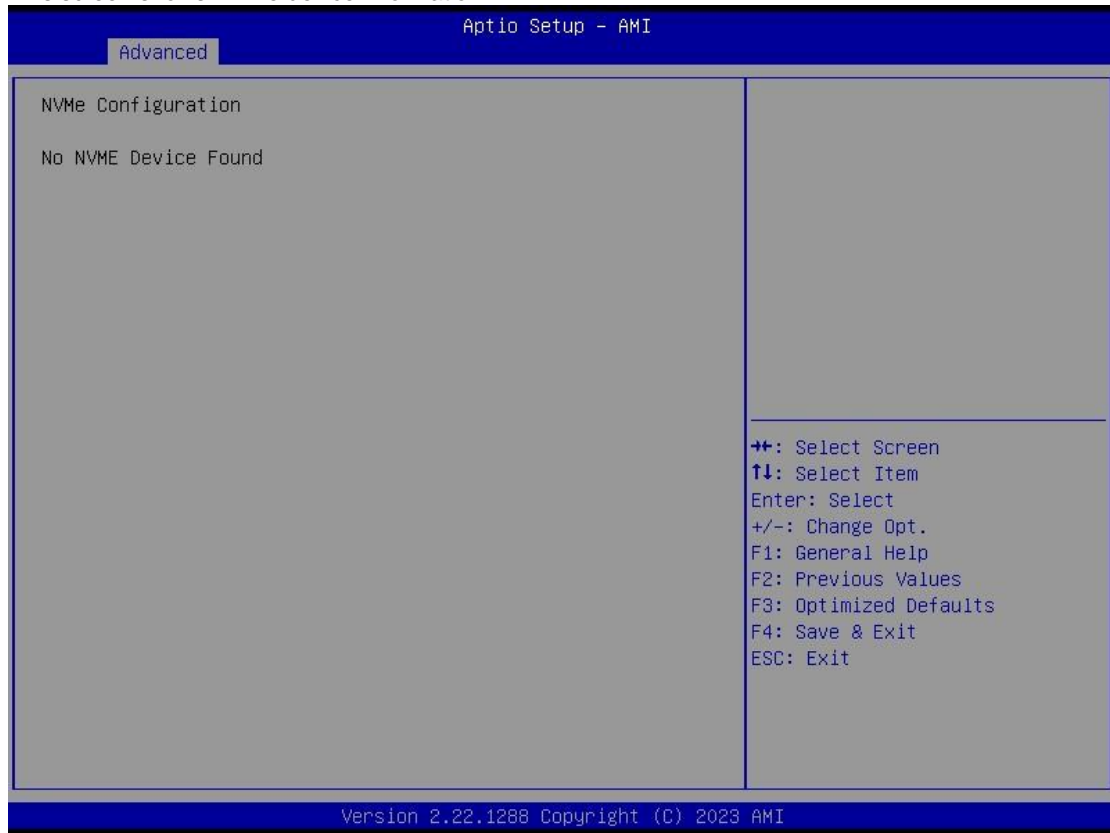
During system boot up, the BIOS automatically detects the presence of SATA devices. In the SATA Configuration menu, you can see the hardware currently installed in the SATA ports.



- **SATA Controller(s)**
Enable or disable the SATA Controller feature. The default is Enabled.

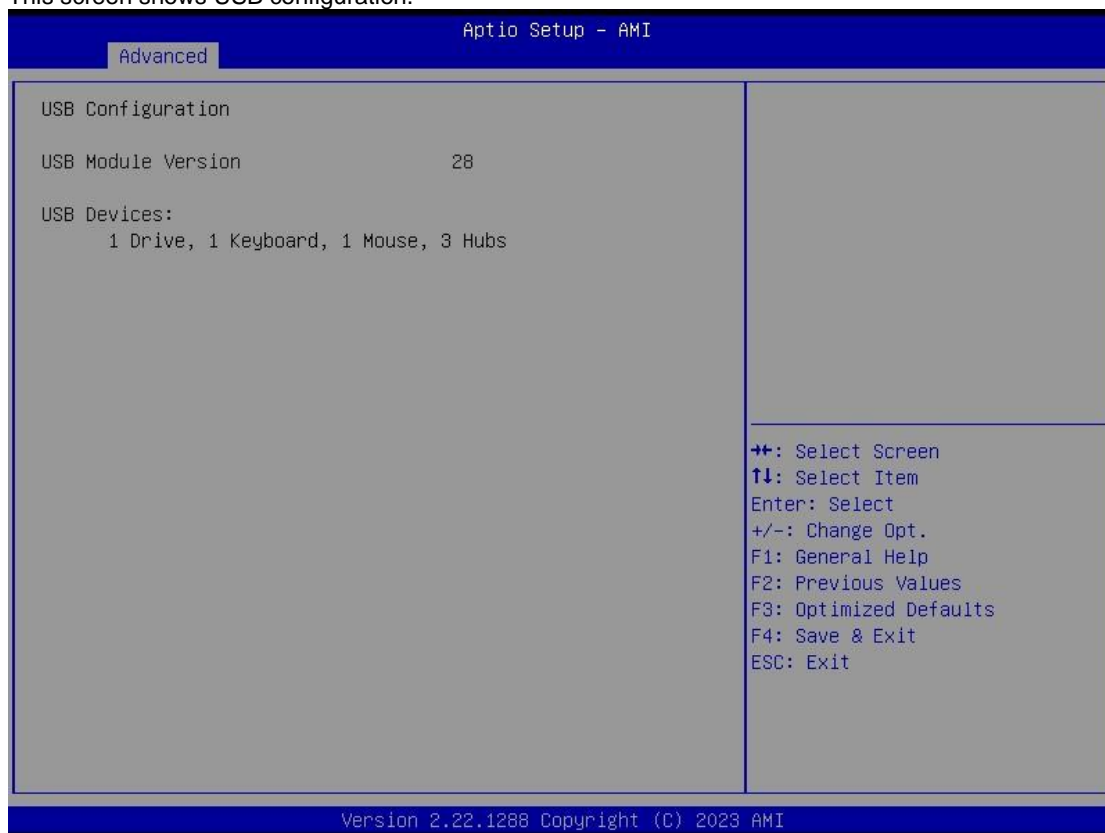
- **NVMe Configuration**

This screen shows NVMe device information.

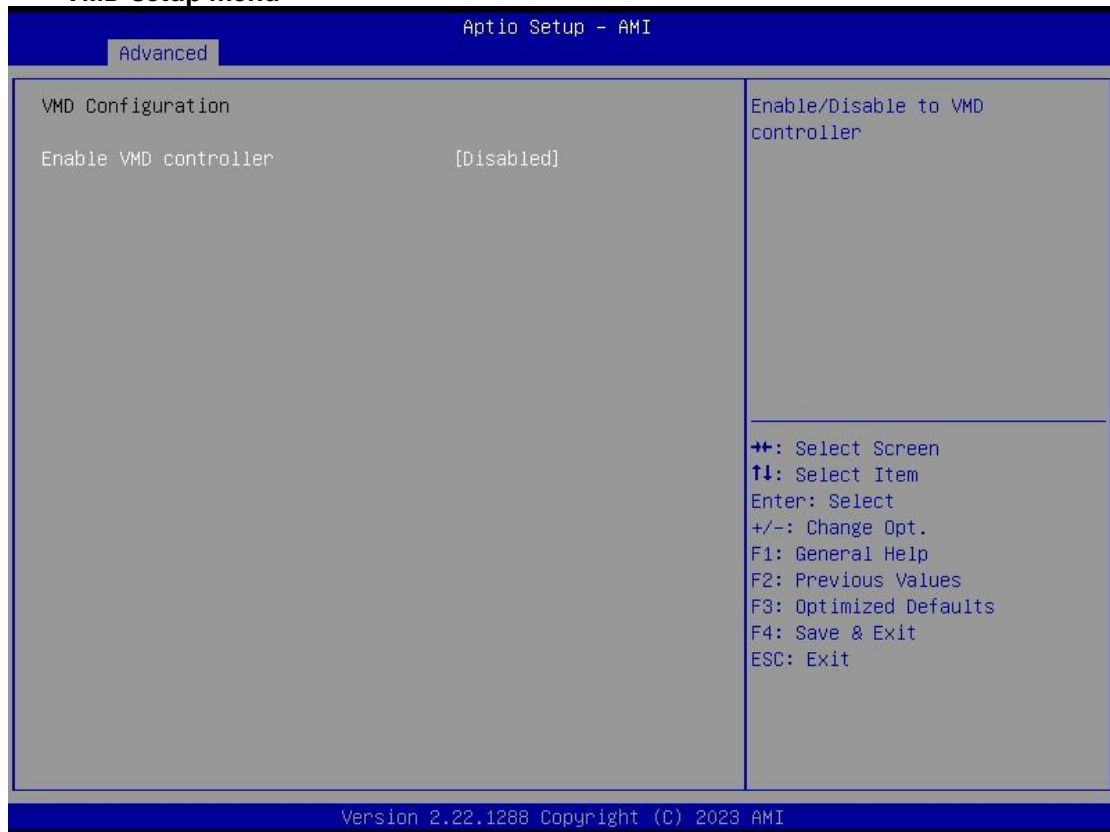


- **USB Configuration**

This screen shows USB configuration.



- **VMD setup menu**



- **VMD Setup Menu**
VMD Configuration settings. The default is Disabled.

How to Create Raid?

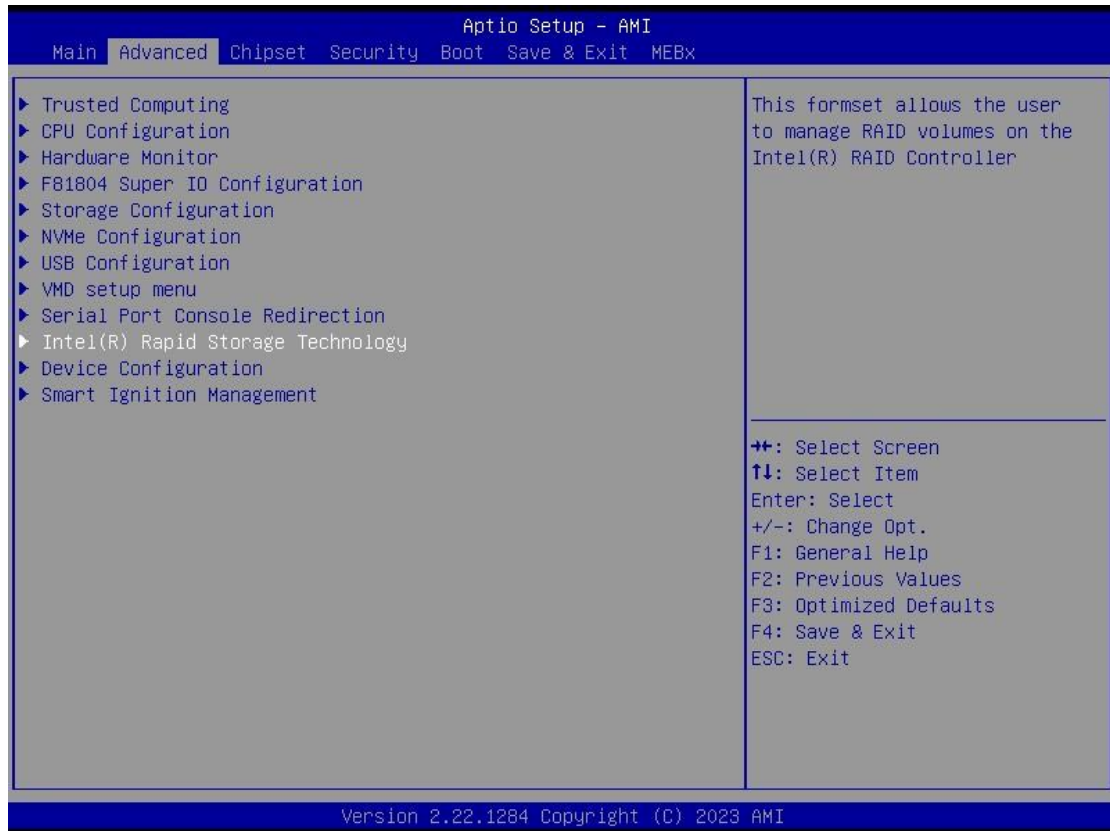
Step 1.

In SATA Configuration, Enabled VMD Controller and save&reset.



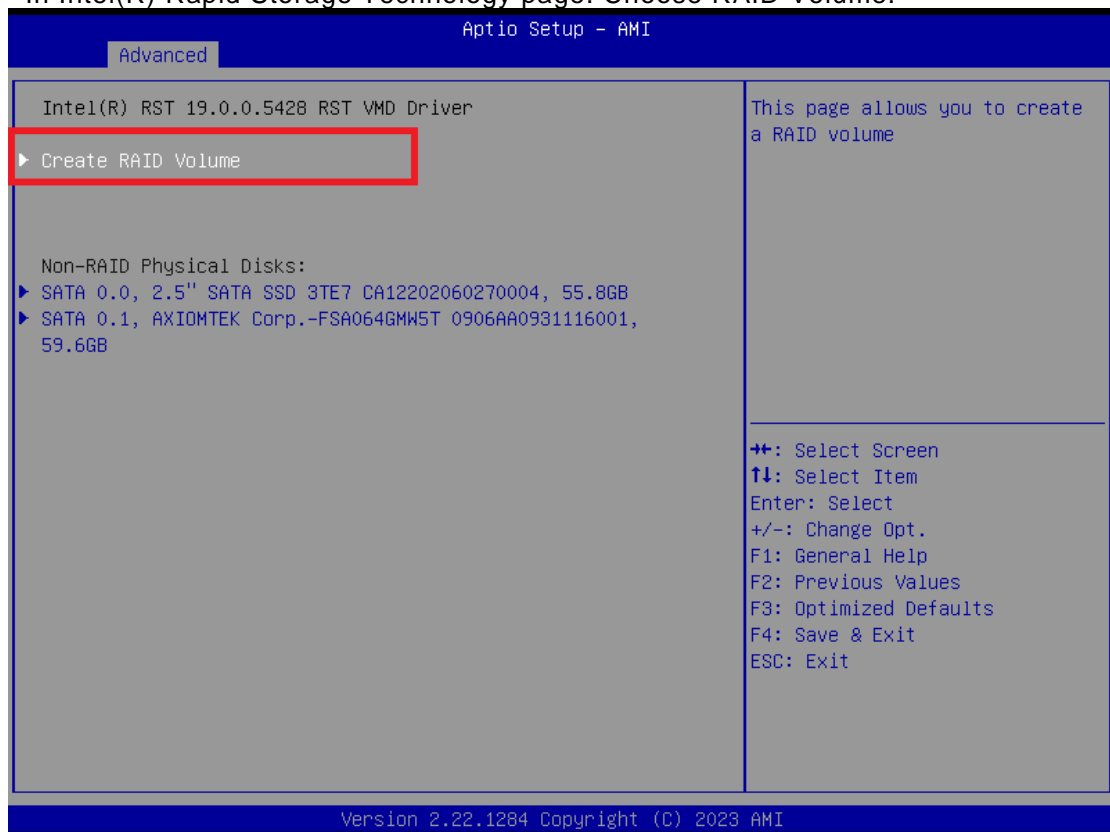
Step2.

After Restart, enter del to Bios Setup Menu. In Advanced Page, choose Intel(R) Rapid Storage Technology.



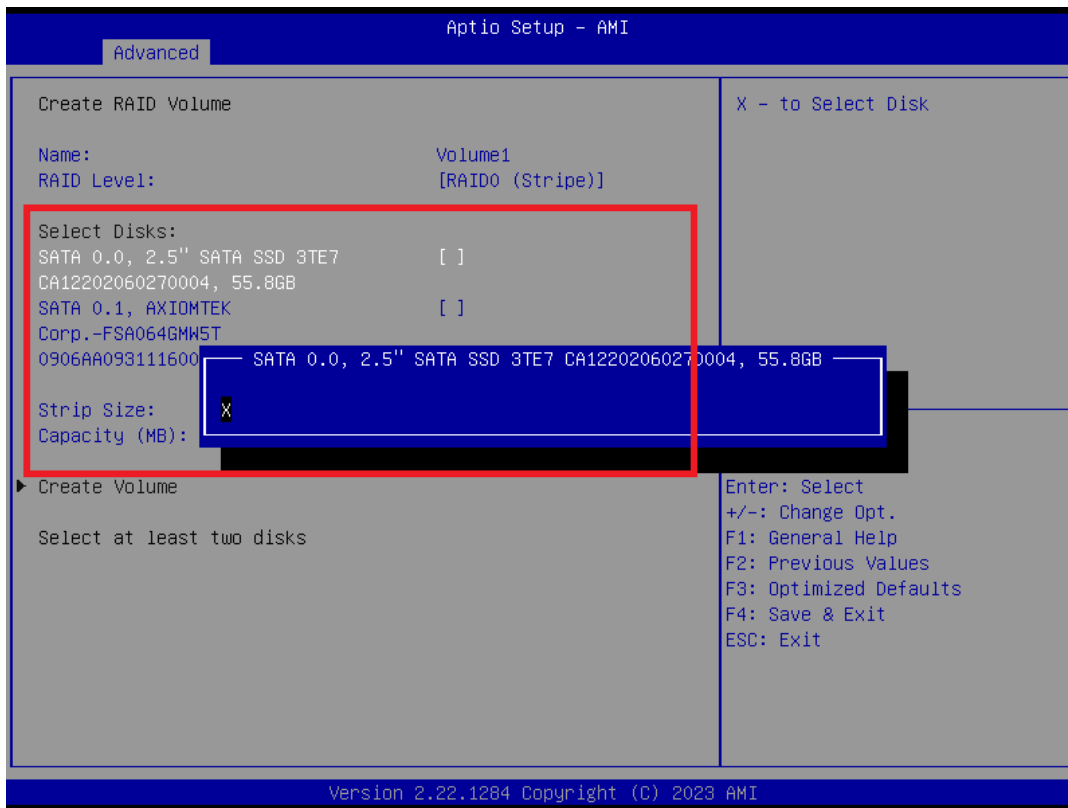
Step3.

In Intel(R) Rapid Storage Technology page. Choose RAID Volume.



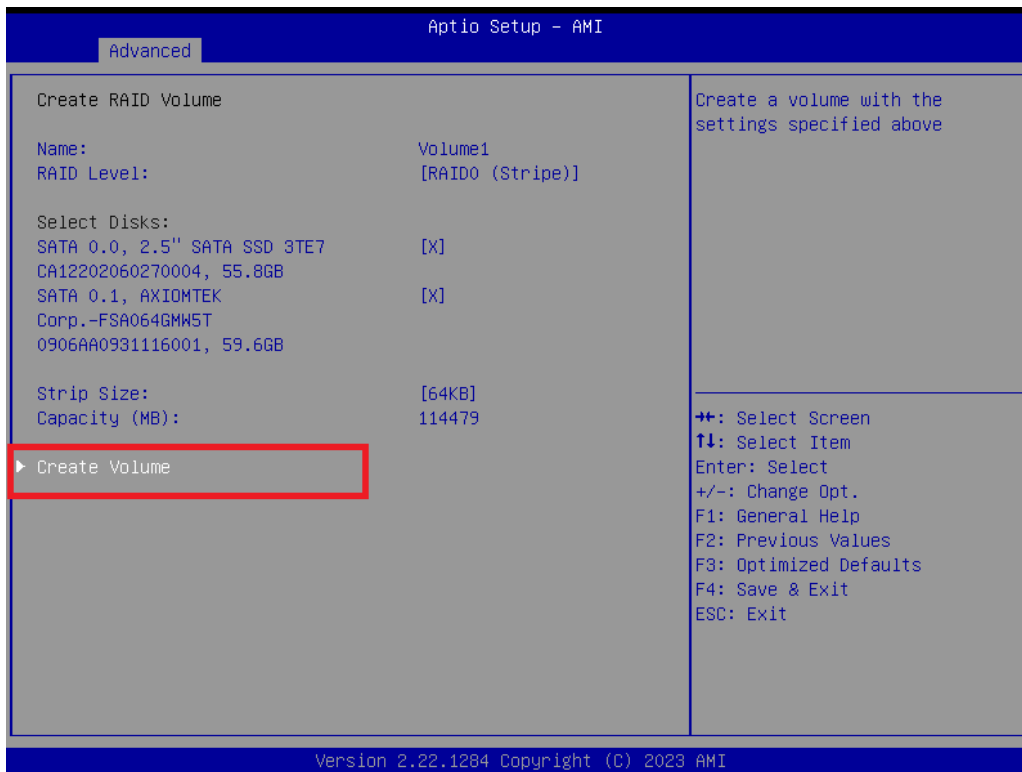
Step4.

Select the disk to be merged.



Step5.

Finally, implement create Volume.



- **Serial port Console Redirection**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

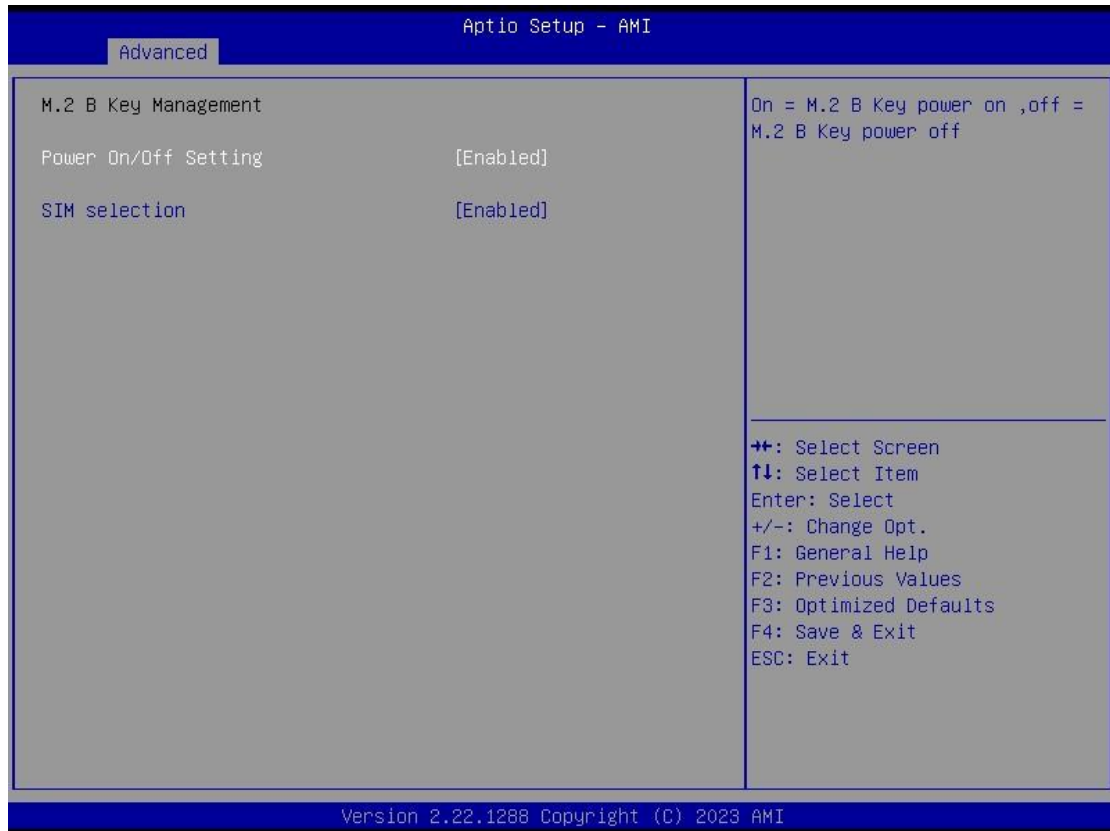


- **Console Redirection**
Console Redirection. The default is Disabled.

● **Device Configuration**

Aptio Setup - AMI	
Advanced	
▶ Onboard Device Configuration	Onboard Device Configuration status
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1288 Copyright (C) 2023 AMI	

Aptio Setup - AMI	
Advanced	
▶ M.2 B Key Management	Onboard Connection Management
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1288 Copyright (C) 2023 AMI	



● **Smart Ignition Configuration**

Press Enter to access the sub-menu. Calculated based on the 24-hour military-time clock.

The screenshot shows the 'Advanced' section of the Aptio Setup - AMI BIOS. The 'Smart Ignition Management' menu is expanded, showing the following settings:

- Smart Ignition Management: Enabled
- Manufacturer: Axiomtek
- Model: MI0320
- Firmware Version: V101
- PSU State: System On
- Power Mode: AT Mode
- Vin Voltage(V): 23.9
- IGN Signal: Off
- Shutdown Delay Timer (IGN Off): 00:00:02
- Shutdown Delay Timer (Low Voltage): 00:03:00
- Ignition Management: [Disabled]
- Auto Power On: [Enabled]

Navigation instructions on the right side of the screen include: ++: Select Screen, ↑↓: Select Item, Enter: Select, +/-: Change Opt., F1: General Help, F2: Previous Values, F3: Optimized Defaults, F4: Save & Exit, ESC: Exit.

At the bottom of the screen, it says 'Version 2.22.1288 Copyright (C) 2023 AMI'.

BIOS menu item	Description
Ignition Management	<p>Enabled Switch to In-Vehicle mode *Note: IGN signal will only be triggered when DCIN M12 pin5 IGN is connected to VCC.</p> <p>Disabled Switch to AT/Railway mode *Note: System will be reset after Ignition Management setting has been changed and saved.</p>
Auto Power On	<p>Enabled System will turn on automatically under following conditions. - Manually disconnect and reconnect system power - Power interruption: Resume power after power failure</p> <p>Disabled System will not turn on automatically when power is connected or when power resumes from a power failure.</p>
Advance Setting	Set system on/off timing and voltage threshold levels
Save Settings	Save the current settings
Restore Factory Settings	Restores factory defaults to remove any incorrect or corrupt settings that might have prevented the system from properly powering on/off.

Advanced		Aptio Setup - AMI	
===== Voltage =====			The counter will be activated once power source voltage is smaller than the value of [Low Voltage Trigger], then, system will be forced to turn off when time's up
Activate Voltage Trigger(V)	16		
Low Voltage Trigger(V)	14		
Shutdown Delay Timer (Low Voltage)			
Minuium Timer	00:01:00		
Maximum Timer	03:00:00		
Hour	0		
Minute	3		
Second	0		
===== IGN Function =====			
IGN Trigger	[Disabled]		
++: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit			
Version 2.22.1288 Copyright (C) 2023 AMI			

Advanced		Aptio Setup - AMI	
===== Voltage =====			Enable : IGN signal would trigger [System Turn On Delay] and [Shutdown Delay] Disable: IGN signal would not affect any power managment
Activate Voltage Trigger(V)	16		
Low Voltage Trigger(V)	14		
Shutdown Delay Timer (Low Voltage)			
Minuium Timer	00:01:00		
Maximum Timer	03:00:00		
Hour	0		
Minute	3		
Second	0		
===== IGN Function =====			
IGN Trigger	[Enabled]		
System Turn On Delay Timer(IGN On)			
Minuium Timer	00:00:02		
Maximum Timer	00:30:00		
Hour	0		
Minute	0		
Second	2		
Shutdown Delay Timer (IGN Off)			
Minuium Timer	00:00:01		
Maximum Timer	06:00:00		
Hour	0		
Minute	0		
Second	2		
++: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit			
Version 2.22.1288 Copyright (C) 2023 AMI			

BIOS menu item	Description
----------------	-------------

Activate Voltage Trigger	The system turns on only when the voltage delivered by the power source is higher than the value you set here.
Low Voltage Trigger	The system will begin the countdown once voltage drops below the value you set here. If the power source voltage does not return to the value higher than [Activate Voltage Trigger] within the time you set for [Shutdown Delay Time (Low Voltage)], the system will shut down and remain off.
Shutdown Delay Timer (Low Voltage)	The timer will be activated once power source voltage drops below the value defined in [Low Voltage Trigger]. The system will be forced to turn off once timer completes countdown.
IGN Trigger	Enable [System Turn On Delay] and [Shutdown Delay] will be triggered by IGN. Disable IGN signal will not affect any power management.



Note: Please refer to APPENDIX B for setting the motion in OS application

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:

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

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



- **System Agent (SA) Configuration**

This screen shows the memory information.

The screenshot displays the BIOS setup utility interface. At the top, it says 'Aptio Setup - AMI' and 'Chipset'. The main area is divided into three sections: System Agent (SA) Configuration, Memory Configuration, and Graphics Configuration. The System Agent (SA) Configuration section shows 'System Agent (SA) Configuration' with a value of '0.0.3.96'. The Memory Configuration section shows 'Memory RC Version' as '0.0.3.96', 'Frequency' as '4800 MHz', and 'tCL-tRCD-tRP-tRAS' as '40-39-39-77'. The Memory Configuration section also shows 'MC 0 Ch 0 DIMM 0' as 'Not Populated / Disabled' and 'MC 1 Ch 0 DIMM 0' as 'Populated & Enabled'. The Memory Configuration section also shows 'Size' as '32768 MB (DDR5)', 'Number of Ranks' as '2', and 'Manufacturer' as 'Unknown'. The Graphics Configuration section shows 'IGFX GOP Version' as '21.0.1053'. On the right side, there is a list of navigation keys: '←→: Select Screen', '↑↓: Select Item', 'Enter: Select', '+/-: Change Opt.', 'F1: General Help', 'F2: Previous Values', 'F3: Optimized Defaults', 'F4: Save & Exit', and 'ESC: Exit'. At the bottom, it says 'Version 2.22.1288 Copyright (C) 2023 AMI'.

System Agent (SA) Configuration	
System Agent (SA) Configuration	0.0.3.96

Memory Configuration	
Memory RC Version	0.0.3.96
Frequency	4800 MHz
tCL-tRCD-tRP-tRAS	40-39-39-77
MC 0 Ch 0 DIMM 0	Not Populated / Disabled
MC 1 Ch 0 DIMM 0	Populated & Enabled
Size	32768 MB (DDR5)
Number of Ranks	2
Manufacturer	Unknown

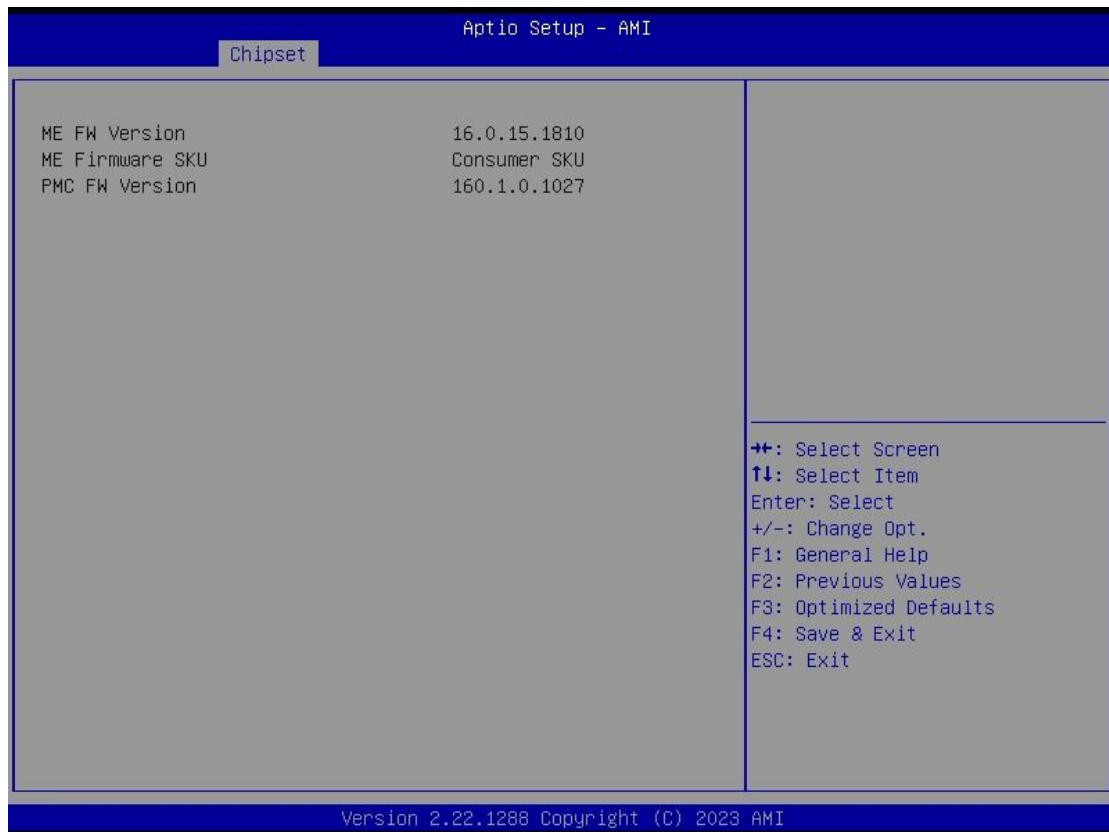
Graphics Configuration	
IGFX GOP Version	21.0.1053

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

Version 2.22.1288 Copyright (C) 2023 AMI

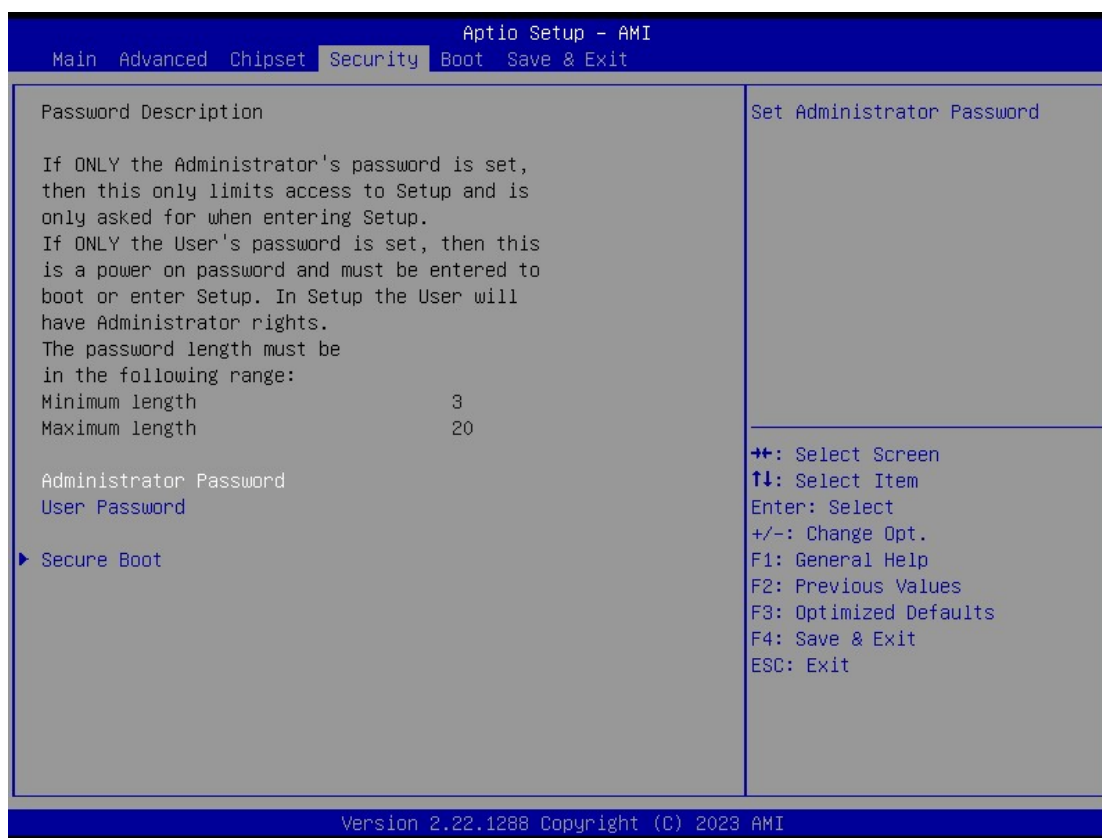
- **PCH-IO Configuration**

Display ME firmware version and ME firmware SKU.



4.6 Security Menu

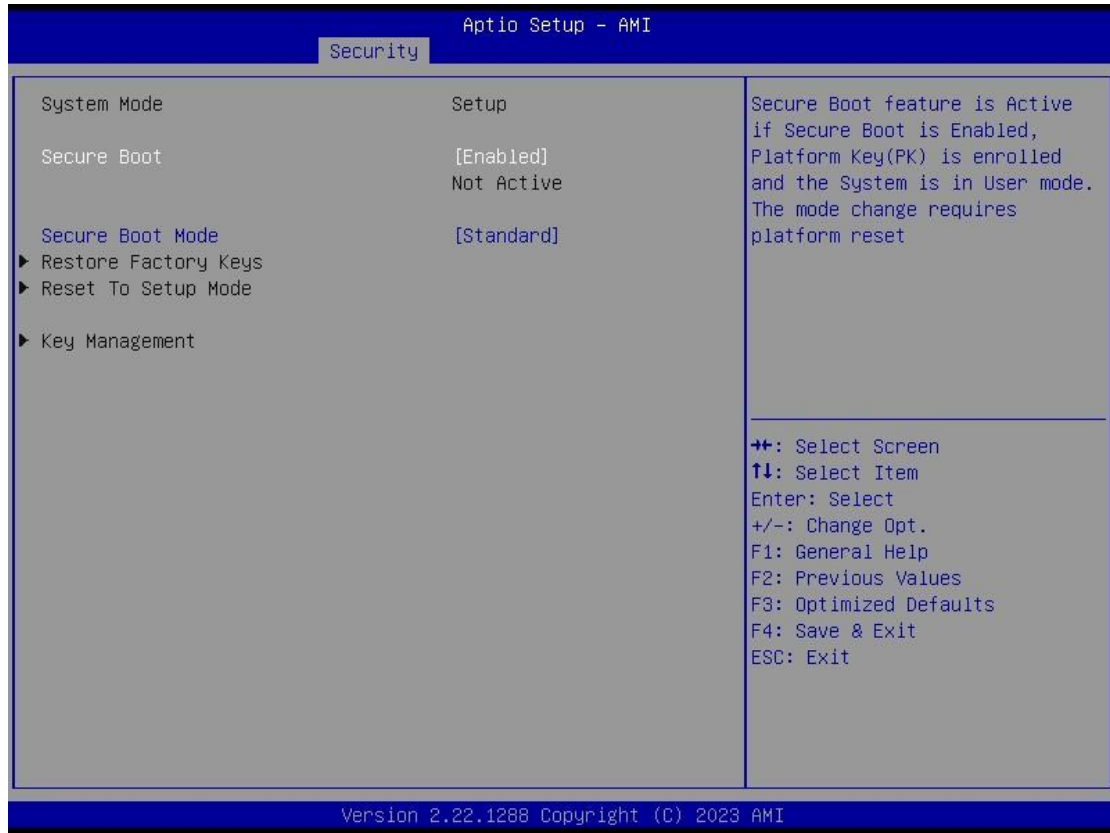
The security menu allows users to change the security settings for the system.



- 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).

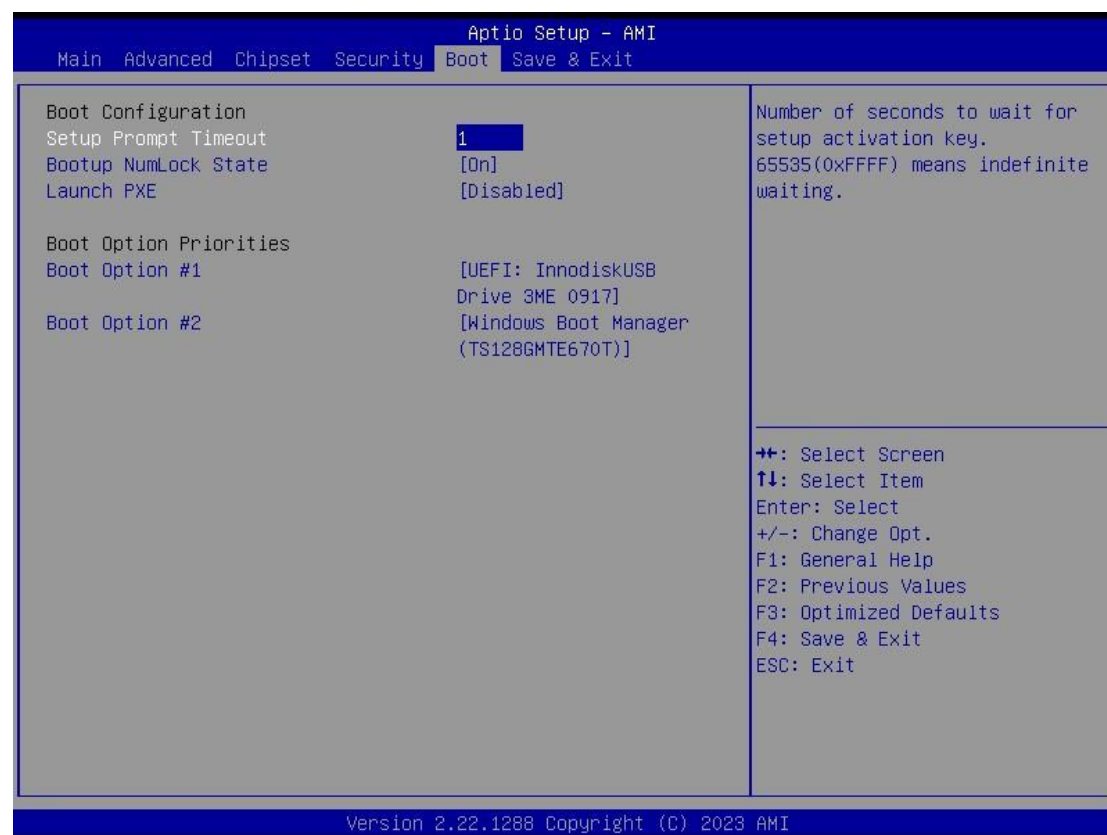
- **Secure Boot**

This item is available on the UEFI firmware to provide a secure environment.



4.7 Boot Menu

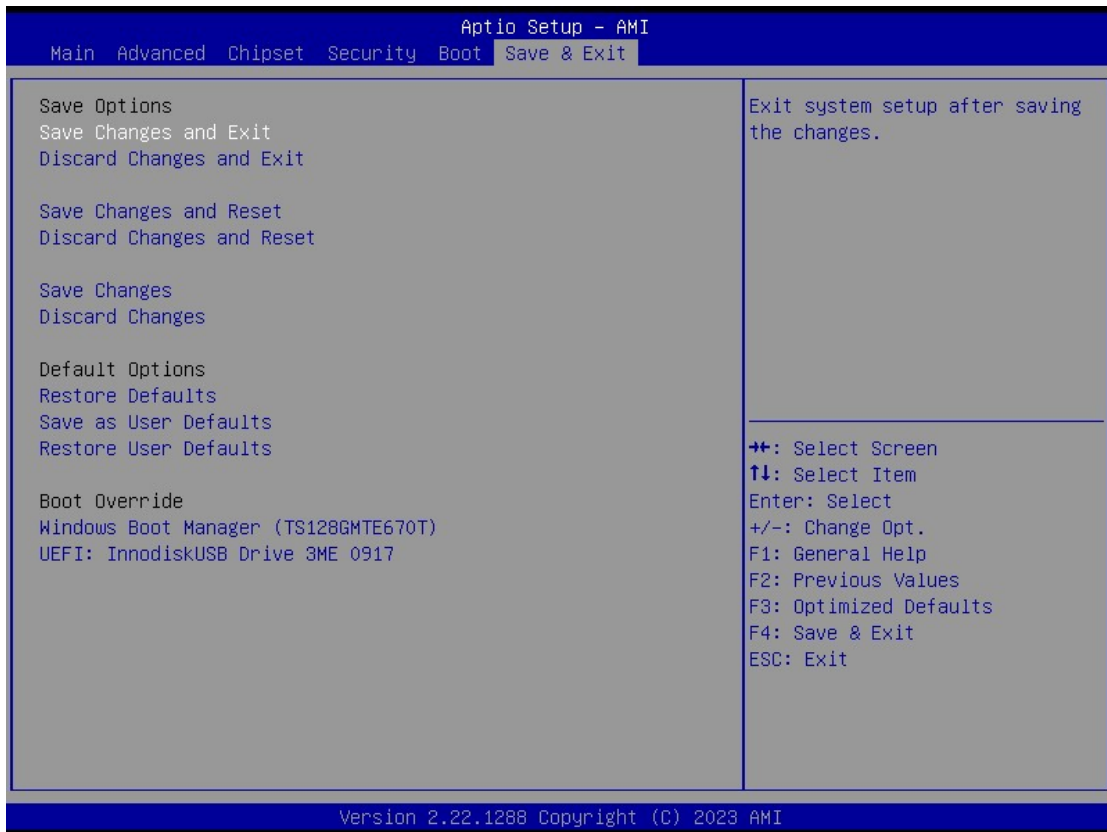
The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menu:



- Setup Prompt Timeout
Set the 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.
- Launch PXE OpROM 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 determine whether to accept their modifications to the system configuration, or to keep default settings for optimal fail-safe performance.



- **Save Changes and Exit**
When finishing the system configuration settings, 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 finishing the system configuration settings, 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 finishing the system configuration settings, 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**
After selecting this option, all the settings will be restored to defaults automatically. Select Restore Defaults from the Save & Exit menu and press <Enter>.
- **Save as User Defaults**
Select this option to save your current system configuration settings as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
- **Restore User Defaults**
After selecting this option, all the settings will be restored to user defaults automatically. 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.

This page is intentionally left blank.

APPENDIX A WATCHDOG TIMER

A.1 About Watchdog Timer

Software stability is a major issue in most applications. Some embedded systems are not watched by an operator for 24 hours. It is usually too late 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 a solution in this regard.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts the 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.

A.2 Sample Program

```
#include "stdafx.h"

#include <windows.h>
#include <stdio.h>
#include <tchar.h>
#include <stdlib.h>
#ifdef _DEBUG
#define new DEBUG_NEW
#endif
#pragma comment (lib, "User32.lib" )
#define IDT_TIMER WM_USER + 200
#define _CRT_SECURE_NO_WARNINGS 1
#define setbit(value,x) (value |= (1<<x))
#define clrbit(value,x) (value &= ~(1<<x))
HINSTANCE hinstLibDLL = NULL;

LONG WDTDATA = 0;

typedef ULONG(*LPFNDDLGETIOSPACE)(ULONG);
LPFNDDLGETIOSPACE lpFnDll_Get_IO;
typedef void(*LPFNDDLSETIOSPACE)(ULONG, ULONG);
LPFNDDLSETIOSPACE lpFnDll_Set_IO;
int _tmain(int argc, _TCHAR* argv[])
{
int unit = 0;
int WDTtimer = 0;
if (hinstLibDLL == NULL)
```

```
{
hinstLibDLL = LoadLibrary(TEXT("diodll.dll"));
if (hinstLibDLL == NULL)
{
//MessageBox("Load diodll dll error", "", MB_OK);
}
}

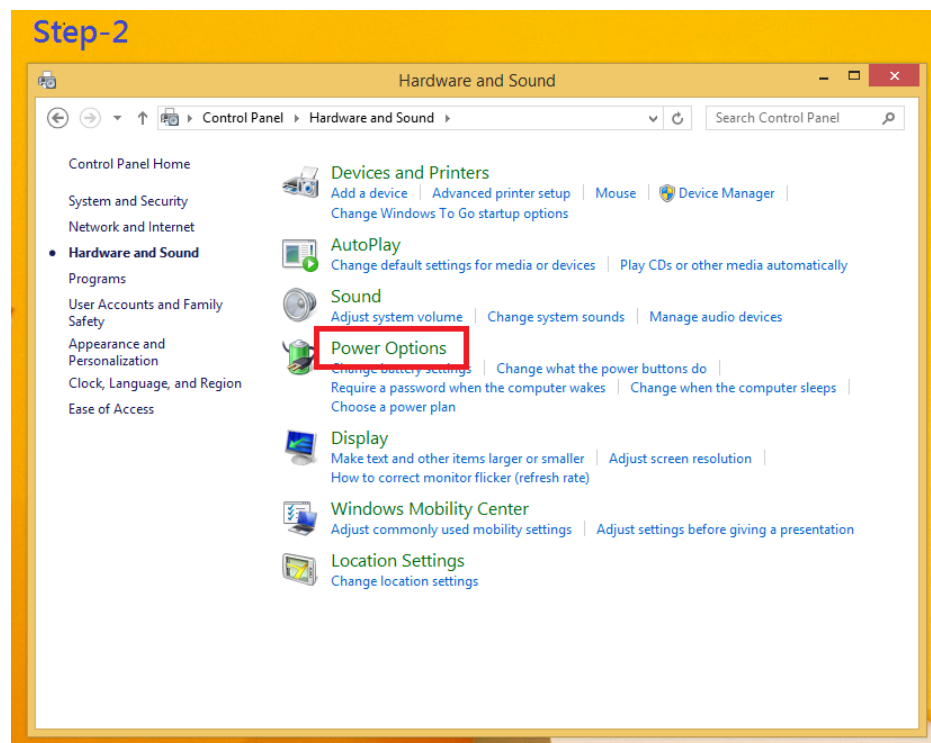
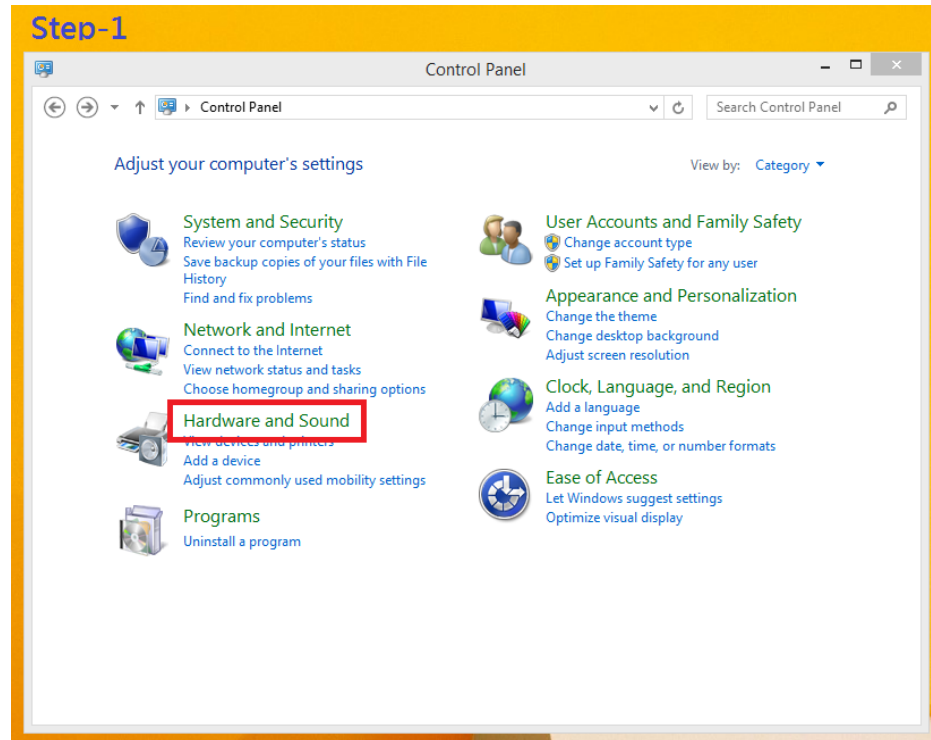
if (hinstLibDLL)
{
lpFnDII_Get_IO = (LPFNDDLGETIOSPACE)GetProcAddress(GetModuleHandle("diodll.dll"),
"GetIoSpaceByte");
lpFnDII_Set_IO = (LPFNDDLSETIOSPACE)GetProcAddress(GetModuleHandle("diodll.dll"),
"SetIoSpaceByte");
}
printf("Input Watch Dog Timer type, 1:Second ; 2:Minute :");
scanf("%d",&unit);
printf("\nInput Timer to countdown:");
scanf("%d", &WDTtimer);
printf("Start to countdown...");
//==Enter MB Pnp Mode==
lpFnDII_Set_IO(0x2e, 0x87);
lpFnDII_Set_IO(0x2e, 0x87);
lpFnDII_Set_IO(0x2e, 0x07);
lpFnDII_Set_IO(0x2f, 0x07); //SET LDN 07
//set LDN07 FA 10 to 11
lpFnDII_Set_IO(0x2e, 0xFA);
WDTDATA = lpFnDII_Get_IO(0x2f);
WDTDATA = setbit(WDTDATA, 0);
lpFnDII_Set_IO(0x2f, WDTDATA);
if (unit == 1)
{
lpFnDII_Set_IO(0x2e, 0xF6);
lpFnDII_Set_IO(0x2f, WDTtimer);
//start watchdog counting
lpFnDII_Set_IO(0x2e, 0xF5);
WDTDATA = lpFnDII_Get_IO(0x2f);
WDTDATA = setbit(WDTDATA, 5);
lpFnDII_Set_IO(0x2f, WDTDATA);
}
else if (unit == 2)
{
```

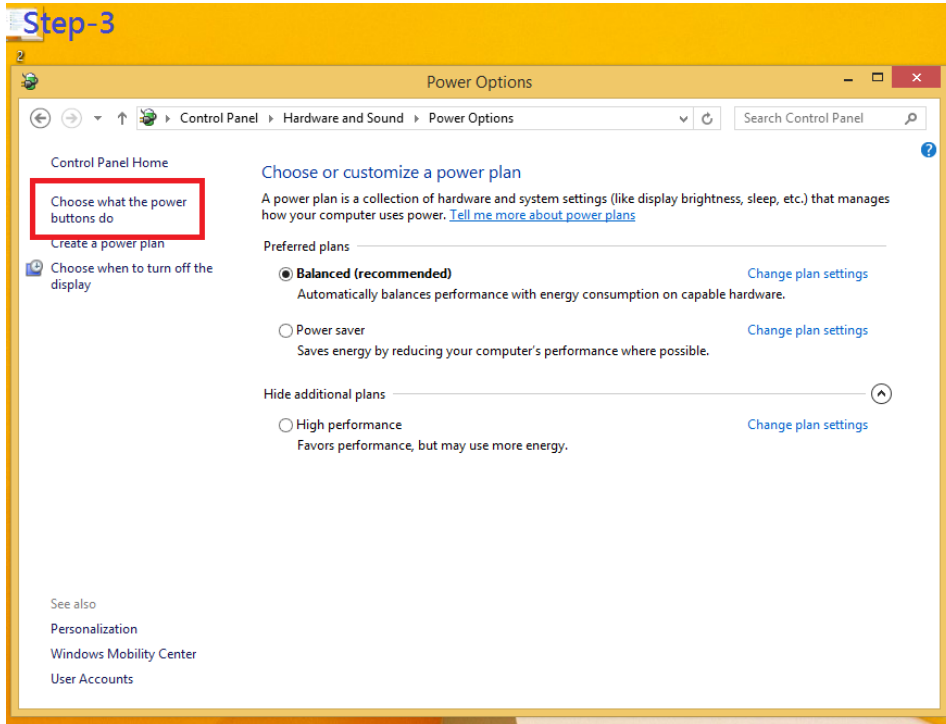
```
//set WDT Timer
lpFnDII_Set_IO(0x2e, 0xF6);
lpFnDII_Set_IO(0x2f, WDTtimer);
//set watchdog time unit to min
lpFnDII_Set_IO(0x2e, 0xF5);
WDTDATA = lpFnDII_Get_IO(0x2f);
WDTDATA = setbit(WDTDATA, 3);
lpFnDII_Set_IO(0x2f, WDTDATA);
//start watchdog counting
lpFnDII_Set_IO(0x2e, 0xF5);
WDTDATA = lpFnDII_Get_IO(0x2f);
WDTDATA = setbit(WDTDATA, 5);
lpFnDII_Set_IO(0x2f, WDTDATA);
}
system("pause");
return 0;
}
```

This page is intentionally left blank.

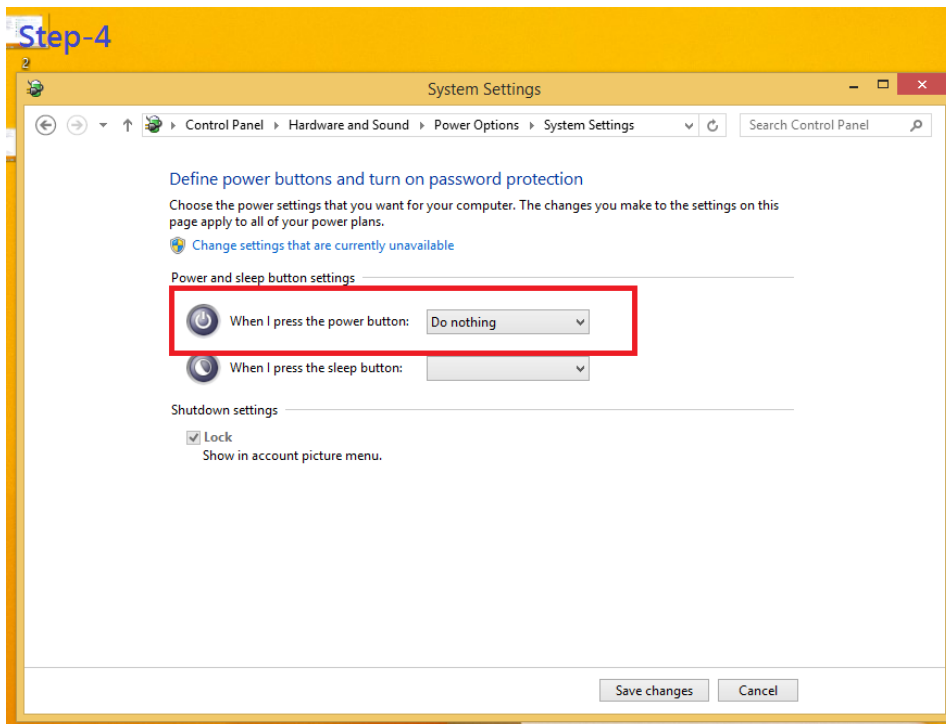
APPENDIX B WINDOWS POWER BUTTON SETTING

Please enter the power button setting through the PC console, and then follow below steps to complete the setting.

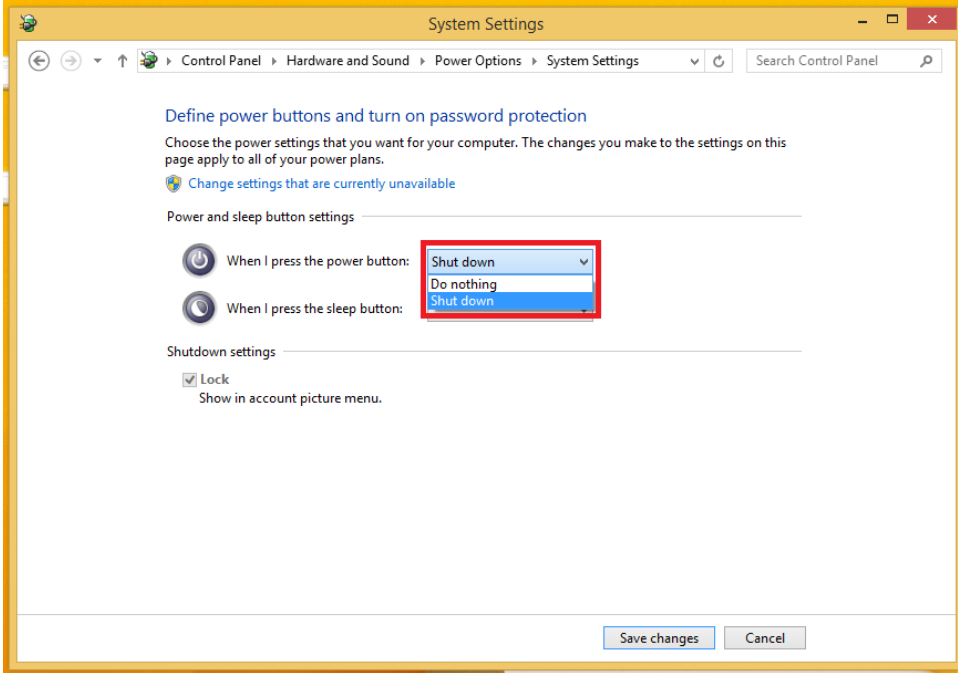




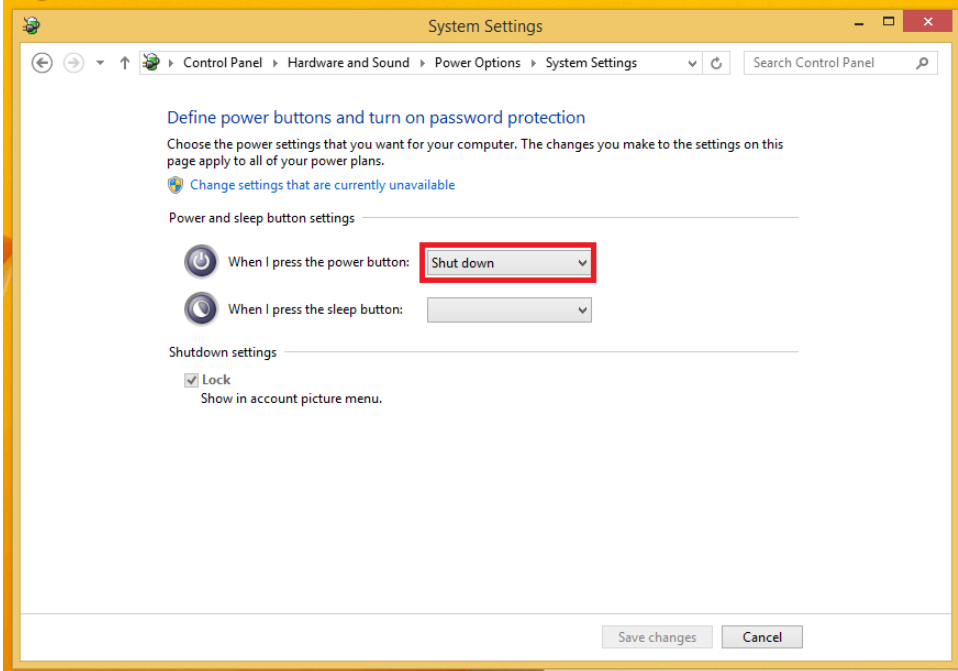
When IGN function has been used, the power button's setting must be switched to "Shut down" as below. Then the system can be shut down normally, after IGN has been turned off.



Step-5



Step-6



This page is intentionally left blank.

APPENDIX C

Programmable LED

If the user needs to use this function, please contact FAE for further information.