Panel PC

User’s Manual

NO. G03-PCLE1KCFP-F

Manual Revision: 2.0

Release Date: April 21, 2025

TABLE OF CONTENT

CAUTION Safety Precautions

- Operate the product according to the correct installation steps and with great care to make sure safety and comfort using experience. Please refer to the following safety instruction guide to avoid danger of electric shock or fire. Abide by the previous safety instruction guide to use and maintain the product and the hard disk to make sure of safe operating environment.
- Please follow the instruction manual for operation guide.
- The appropriate operating temperature ranges from 0 °C–50 °C.
- The operation humidity for this product is 5% to 80% RH.
- To avoid high temperature, please DO NOT overload the maximum power of the external power supply while the system is consuming high voltage. Be aware of the maximum temperature allowance of the power supply.
- See to it that the product is not working near the water.
- Always unplug power cable and other hardware cables from the system before cleaning.
- Apply only dry cloth for cleansing the product.
- Make sure that there is no heat source nearby when the product is working.
- Make sure that the thermal louver of the product is not blocked.
- Make sure to remove the power plug from the product when there is a thunder storm.
- Please remove the power plug from the product when you are not going to use the product for a long time.
- Make sure to set up or use the product on a stable surface.
- Make sure not to drop the product or strike it by any means.
- Make sure not to move the product when the power is on.
- Make sure not to step on the power cables and other cables or rest anything in them..
- Be sure to ground yourself to prevent static charge when installing any internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
- Disconnect the power cord from the Panel PC unit prior to any installation. Be sure both the system and all external devices are turned off. Sudden surge of power could ruin sensitive components. Make sure the Panel PC unit is properly grounded.
- 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 human body.
    - When handling boards and components, wear a grounding wrist strap available from most electronic component stores.

- Please contact qualified technician for maintenance or repair.
- Use only accessories and parts that are made by the qualified manufacturer.

User's Notice

This manual contains all information required for the utilization of this product to meet the user's requirements. But it will change, correct at any time without notice. Manufacturer provides this manual "as is" without warranty of any kind, and will not be liable for any indirect, special, incidental or consequential damages (including damages for loss of profit, loss of business, loss of use of data, interruption of business and the like).

Package Contents

AC-DC Adapter	Power Cord	WI-FI antenna	Fixed Parts	USB Fixed Parts
				
X1	**X1**	**X2**	**Optional**	**Optional**

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

Chapter 1
Introduction

1-1 General Descriptions

Thank you for purchasing the system, a new product developed, designed and manufactured under leading technical power and consistent dedication to fine workmanship.

- 10-points Multi Capacitive Touch
- Cable-less,,streamlined enclosure for highly efficient heat dissipation enclosed in robust aluminum casing
- Edge-to-edge narrow bezel design and fan-less cooling system
- Designed for easy wall mount, panel mount, and VESA mount installation
- A true flat, easy-to-clean front surface with edge-to-edge design
- USB 2.0 ports support lock device.
- IO ports designed for easy connection
- 12V-28V DC-input Support, with EOS, OVP design
- Onboard Intel® Elkhart Lake series SoC processor.
- 1* DDR4 3200MHz SO-DIMM up to 32GB
- Support 1 * 2.5" SATA HDD Device, 3* M.2 connector
- Support 2* 2.5 GbE LAN
- Support 4G SIM card socket
- Support 802.11 b/g/n WiFi communication
- Support HDMI output
- Support multiple COM ports

The system has the following features besides other basic functions:

- ***WiFi:*** the Mini PCI-E onboard socket in the board is integrated a with a WiFi card(802.11 b/g/n) that can act as a mini wireless modem when external antennas are connected. Different computers in the house can build wireless connections through the Mini TOP system and take necessary data from it, thus reducing the complexity in network establishment.
- ***Dual 2.5 GbE RJ-45 LAN:*** The system is integrated with dual 2.5GbE RJ-45 LAN network controller realizing efficient power management for the operating system.
- ***USB 3.2:***Experience Fastest data transfers at 5Gb/s with USB3.2 Gen.1 the latest connectivity standard. Built connect easily with next-generation components and peripherals, USB3.2 Gen.1 transfers data 10x faster and backward compatible with previous USB2.0 devices.
- ***CPU Usage:*** The CPU Usage diagram shows a beautiful data curve that indicates a pretty low CPU usage percentage for video playback of different formats. GPU performances are excellent as well.
- ***dB Value:*** The design of the system takes into consideration the needed quiet

operating environment in the living room and the average dB value is below 26 under normal operation to ensure the tranquility when you are absorbed in film watching.

1-2 Specifications

Panel PC Model Common Specifications:

Main System Parameters	
Embedded CPU	**Intel® Elkhart Lake J6412 2.0GHz/QC processor** ***Note:** CPU model may vary from different options. Please visit our website or consult your dealer for more information of onboard CPU.*
RAM	DDR4-3200MHz SO-DIMM up to 32GB
Flash ROM	128MB SPI Flash ROM
Speaker	2* 3W/8Ω Speaker
Watchdog Timer	256 levels, 0~255 sec.
OS Support	Windows 10,11/Linux (Option)
Storage	
SATA Port	Support 1* 2.5” SATA HDD bay
M.2 M Slot	1* M.2 M key (2242/2280, SATA/NVMe)
Expansion	
M.2 Expansion Slot	1* M.2 E key (2230) for WIFI/BT Module 1* M.2 B key (3042/3052) for 4G/5G Module
I/O Connector	
I/O Ports & Switches	***For HPC101SC-FP6412:*** 1* 8-bit GPIO Port-**Male** 1* Lockable 12V~28V DC-in Power Jack 2* 2.5 GbE RJ-45 port **(Intel i225-V)** 2* USB 3.2 (Gen.1) + **2* USB 2.0 port** 2* RS-232/422/485 COM port 1* HDMI 1* Power Button ***For HPC156SC-FP6412/HPC215SC-FP6412:*** 1* 8-bit GPIO Port-**Female** 1* Lockable 12V~28V DC-in Power Jack 2* 2.5 GbE RJ-45 port **(Intel i225-V)** 2* USB 3.2 (Gen.1) + **4* USB 2.0** 2* RS-232/422/485 +2* RS-232 COM port 1* HDMI 1* Power Button
CASE	
Panel Material	Aluminum
Case Material	Iron

Color	Silver + White color
Coating Requirement	**Spray Paint**
Certification Compliance	
Certifications	CE, FCC
Safety	
Shock	15G, 11ms duration
Vibration	5~500Hz/1Grms
Environment	
Temperature	Operating: -10°C ~ 60°C (with W.T. DRAM/HDD in airflow condition)
	Storage: -20°C ~ 70°C
Warranty	
Warranty	2 Years Limited Warranty（Panel and Touch is only Warranty 1 Year）

***** *Specifications subject to change without notice, not responsible for typographical errors. Do not include HDD or OS.*

HPC101SC-FP6412 Series	
Display	
Front Bezel	NEMA 4 rugged protection, full planar metal border
Display Type	10.1" with LED Backlight
Brightness (cd/m²)	400 nits
Display Color	16.2M
Resolution	1280 x 800 @ 60Hz resolution
Viewing Angle	170°/170° (H/V)
Pixel Pitch	0.1695 x 0.1695mm
Aspect Ratio	16:10
Contrast Ratio	800:1
Response Time	35ms
Touch Screen	
Type	Projected capacitive type
Active Range	257.10 x 159.66mm ±0.2mm
Transparency	≧87%
Surface Hardness	≧6H (JIS-5400)
Glass haze value	≦3%
Power	
Power Input	AC version: 100~240V AC-DC 60W power adapter or DC version: 12VDC with over current protection fuse
Power Consumption	25.5W
Dimensions	
Case Dimensions	268.49 x 168.50 x 59.70mm

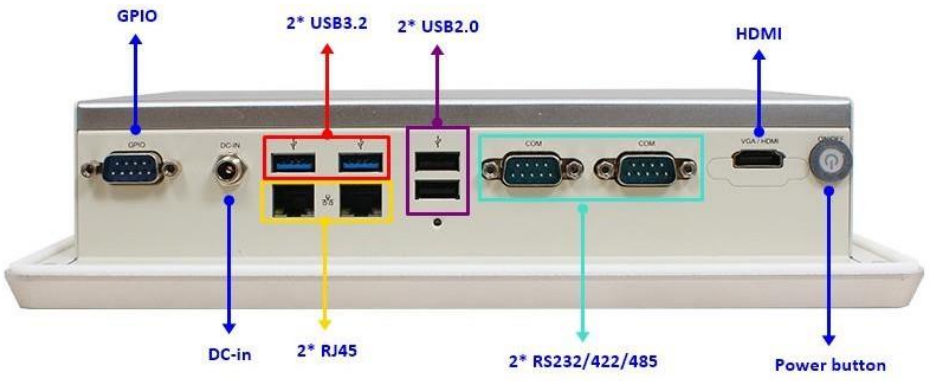
HPC156SC-FP6412 Series	
Display	
Front Bezel	NEMA 4 rugged protection, full planar metal border
Display Type	15.6" with LED Backlight
Brightness (cd/m²)	250 nits
Display Color	256K
Resolution	1920 x 1080 @60Hz
Viewing Angle	170°/170° (H/V)
Pixel Pitch	0.17925 x 0.17925mm
Aspect Ratio	16:9
Contrast Ratio	800:1
Response Time	35ms
Touch Screen	
Type	Projected capacitive type
Active Range	387.00 x 231.00mm ±0.3mm
Transparency	≧85%
Surface Hardness	≧6H (JIS-5400)
Glass haze value	≦3%
Power	
Power Input	AC version: 100~240V AC-DC 60W power adapter or DC version: 12V DC with over current protection fuse
Power Consumption	27.5W
Dimensions	
Case Dimensions	406.81 x 259.12 x 70.0 mm

HPC215SC-FP6412 Series	
Display	
Front Bezel	NEMA 4 rugged protection, full planar metal border
Display Type	21.5" with LED Backlight
Brightness (cd/m²)	250 nits
Display Color	16.7M
Resolution	1920 x 1080 @60Hz
Viewing Angle	170°/160° (H/V)
Pixel Pitch	0.24825 x 0.24825mm
Aspect Ratio	16:9
Contrast Ratio	1000:1
Response Time	8ms
Touch Screen	
Type	Projected capacitive type
Active Range	524.00 x 321.8mm ±0.3mm

Transparency	≧85%
Surface Hardness	≧6H (JIS-5400)
Glass haze value	≦3%
Power	
Power Input	AC version: 100~240V AC-DC 60W power adapter or DC version: 12VDC with over current protection fuse
Power Consumption	32.75W
Dimensions	
Case Dimensions	535.80 x 303.31.00 x 73.50mm

1-3 I/O Outlets

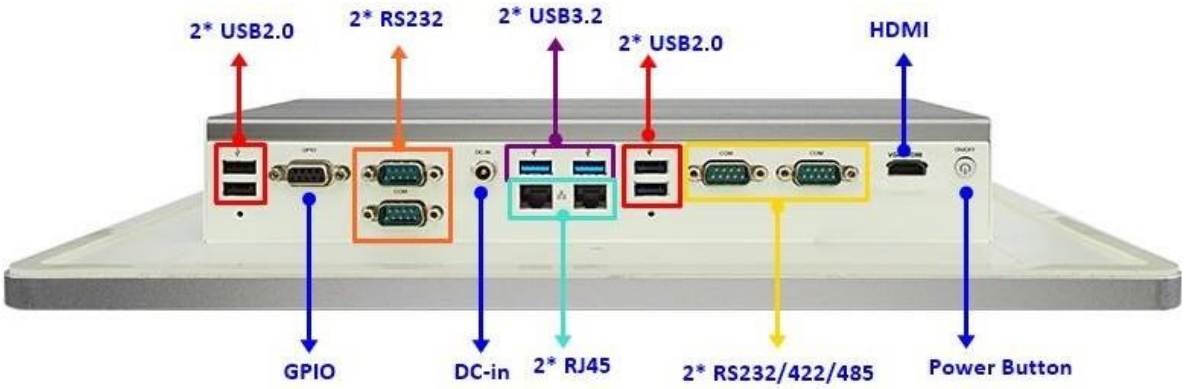
For HPC101SC-FP6412 Series:



Bottom View

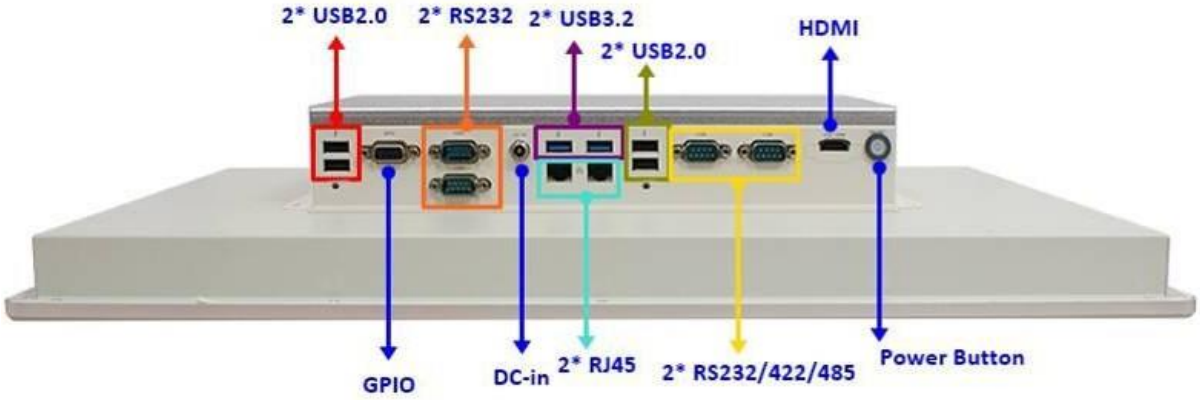
Rear IO	Q'ty
Power Button	1
DC-in	1
HDMI2.0	1
RS232/422/485	2
USB3.2 (Gen.1)	2
USB2.0	2
2.5GbE RJ-45	2
GPIO-**male**	1

For HPC156SC-FP6412 Series:



Bottom View

For HPC215SC-FP6412 Series:



Bottom View

Rear IO	Q'ty
Power Button	1
DC-in	1
HDMI2.0	1
RS232/422/485	2
RS232	**2**
USB3.2(Gen.1)	2
USB2.0	4
2.5GbE RJ-45	2
GPIO-female	1

Notice:

1*. The diagrams in this manual only serve for illustration, if there is any differences that we do not cover, please refer to the actual product you purchase.****2****.Model* ***HPC156SC-FP6412 & HPC215SC-FP6412*** *series share the same IO specifications, as the above diagram shows;* ***3.****The main differences of* ***HPC156SC-FP6412 & HPC215SC-FP6412*** *series are mainly in size and panel frame outlook.*

1-4 Connector Pin Definition

(1) Connector Function

Icon	Name	Function
	**Power Button**	Press to turn on/off the system.
	**HDMI2.0 Port**	To connect display device that support HDMI 2.0 specification.
	**COM Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
	**USB 3.2 (Gen.1) Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.2 (Gen.1) specification. Ports support up to 5Gbps data transfer rate.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB 2.0 specification.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection which supports10/100/1000/2500 Mbps Ethernet data transfer rate ***(*Note: 2.5Gbps** is **only** supported with **CAT 5e UTP cable).***
	**DC-in Power Jack Connector**	For user to connect compatible power adapter to provide power supply for the system.
	**GPIO Connector-Male**	**Male** General Purpose Input Output port.
	**GPIO Connector-Female**	**Female** General Purpose Input Output port.

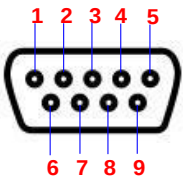
(2) I/O Connectors Pin Definition

COM Port Connector

COM1/COM2: RS232/422/485 Serial Port;

****COM3/COM4**: RS232 Serial Port.*

The pin assignment for RS-232/ 422/ 485 is listed as follows:



Pin NO.	RS232	**RS422 (optional)*	**RS485 (optional)*
1	DCD	TX-	DATA-
2	RXD	TX+	DATA+
3	TXD	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

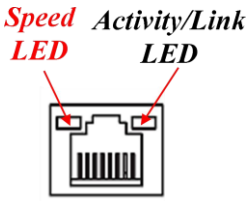
COM1 & COM2 ports can function as RS232/422/485 port. In normal settings COM1/COM2 functions as RS232 port. With compatible COM cable they can function as RS422 or RS 485 port. User also needs to go to BIOS to set ***'Transmission Mode Select'*** for COM1/COM2 **(refer to Page34)** at first, before using specialized cable to connect different pins of this port.

RJ-45 Ethernet Connector

Ethernet connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end (phone jack) to a network hub.

*** There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.*

For 2.5Gbps RJ-45 LAN port LED Signals:

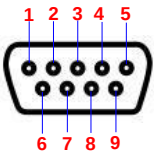


Speed LED		*Activity/Link LED*	
Status	**Description**	**Status**	**Description**
Off	10/100Mbps connection	Off	No Link
Orange	1Gbps connection	**Blinking**	**Data Activity**
Green	2.5Gbps connection	On	Link

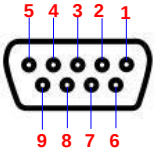
* ***Note:*** ***2.5Gbps*** *high-speed transmission rate is* ***only*** *supported over* ***CAT 5e UTP cable****.*

GPIO (9-pin Block): GPIO Port Connector

The pin assignment for GPIO connector is listed as follows:



GPIO-Male



GPIO-Female

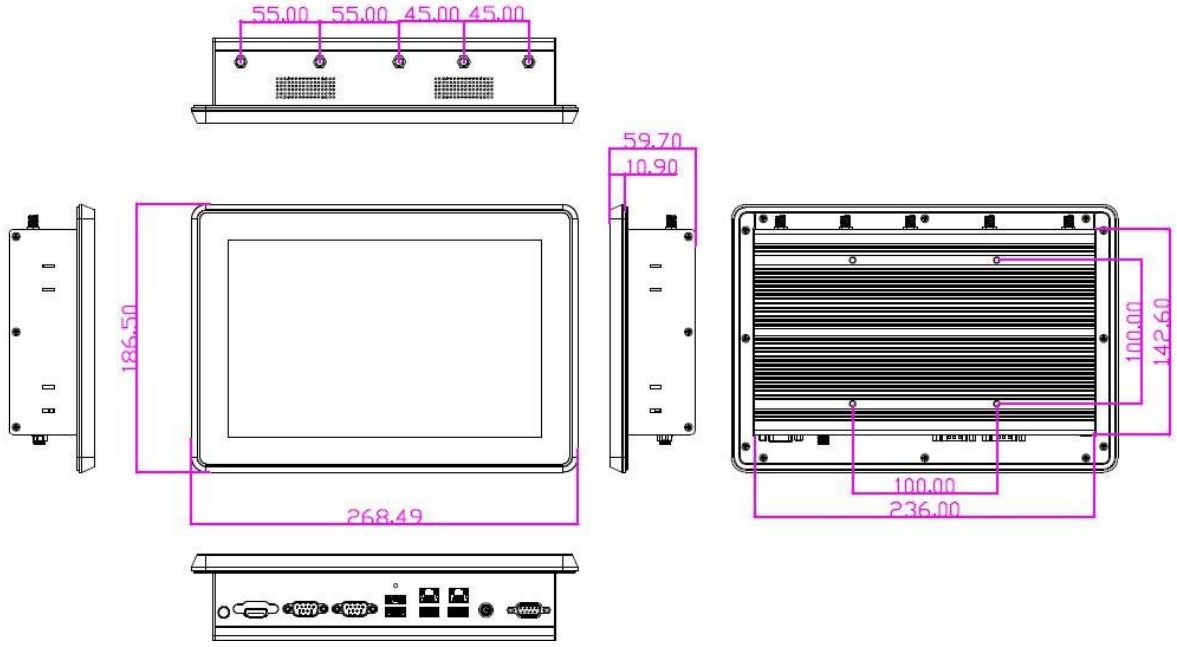
Pin No.	Definition
1	GPIO
2	GPIO
3	GPIO
4	GPIO
5	GND
6	GPIO
7	GPIO
8	GPIO
9	GPIO

****Note:*** *GPIO port comes in 2 types: male GIPO port and female GIPO port. Please refer to the actual specification of the product you purchase and choose compatible cable for correct connection.*

Chapter 2
Hardware and Installation

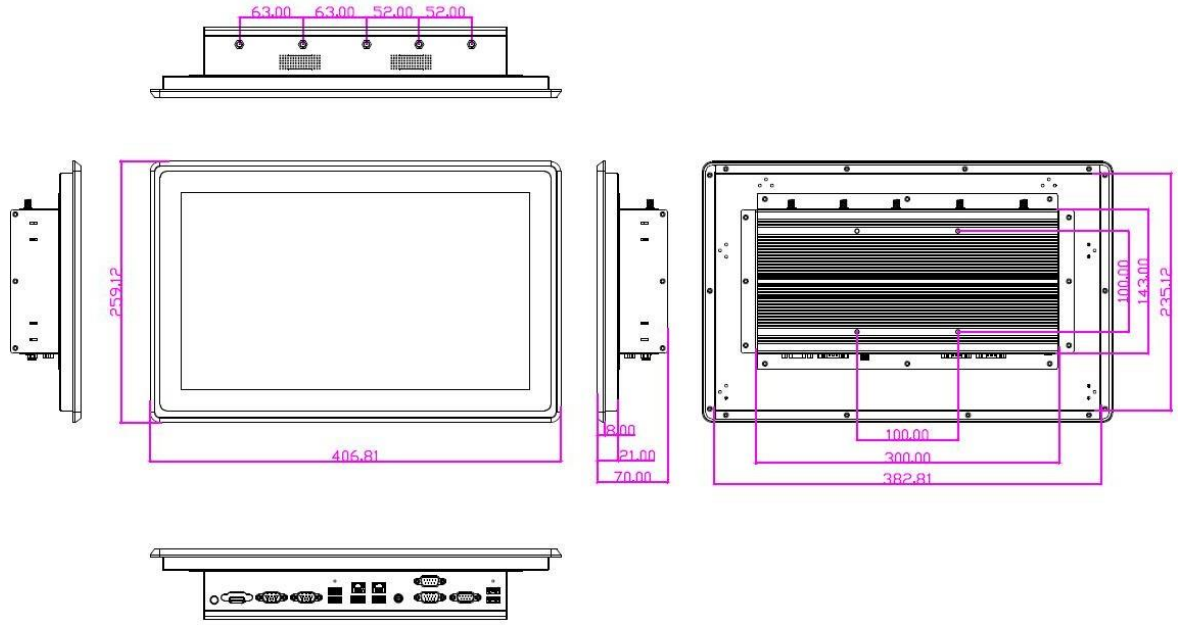
2-1 Dimension and Outlines

Product Dimension for HPC101SC-FP6412 Series:



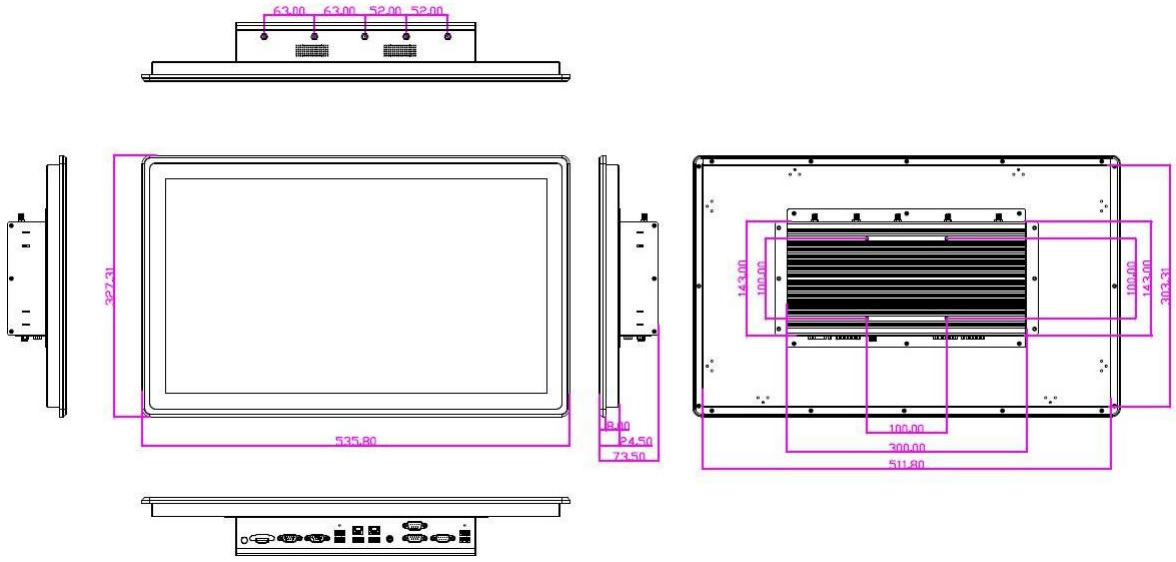
**** Measure Unit: mm.***

Product Dimension for HPC156SC-FP6412 Series:



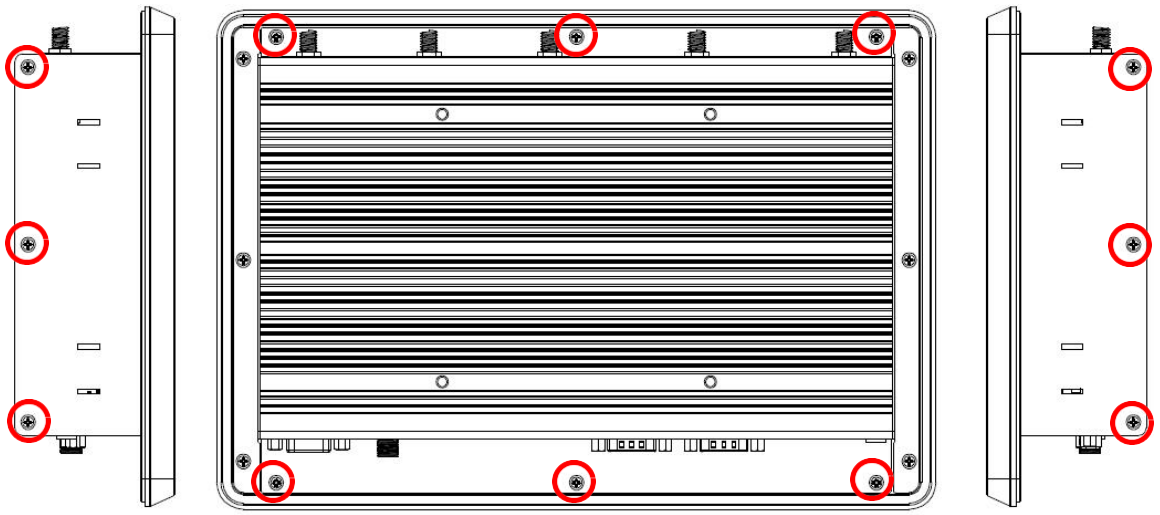
**** Measure Unit: mm.***

Product Dimension for HPC215SC-FP6412 Series:

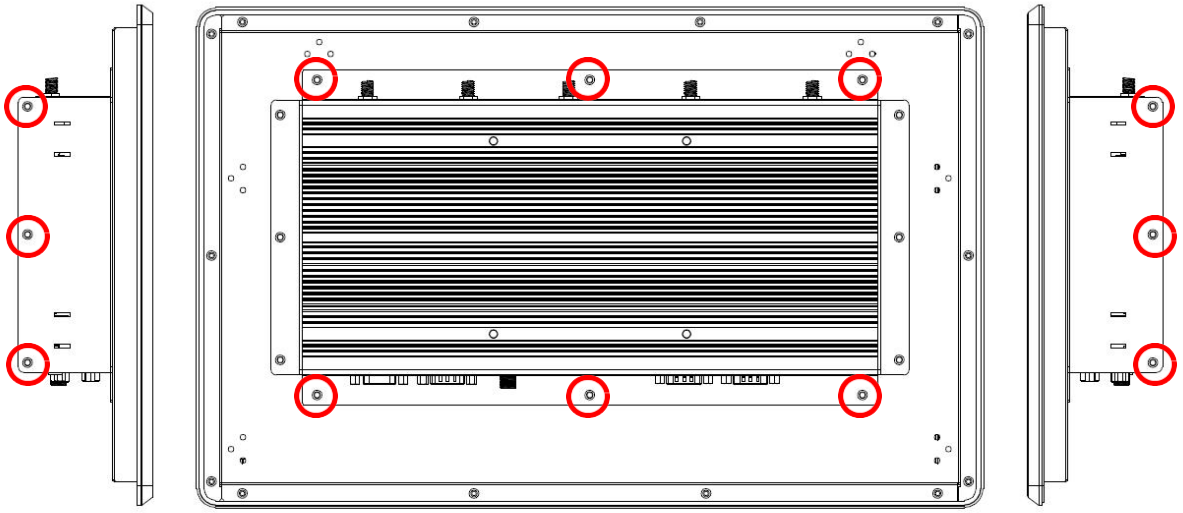


**** Measure Unit: mm.***

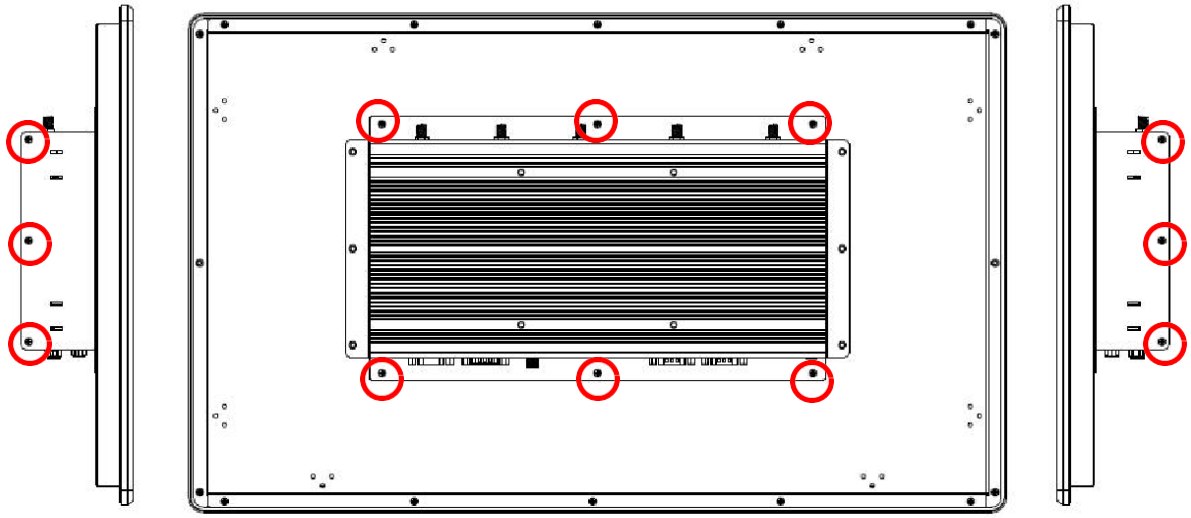
2-2 To Open the Chassis



HPC101SC-FP6412



HPC156SC-FP6412



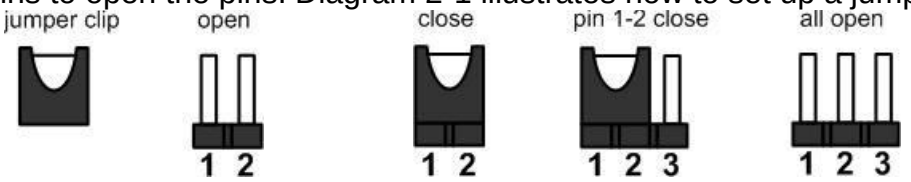
HPC215SC-FP6412

Use a screwdriver to unscrew the screws marked above that lock the back cover (see red circles). Remove them to open the chassis.

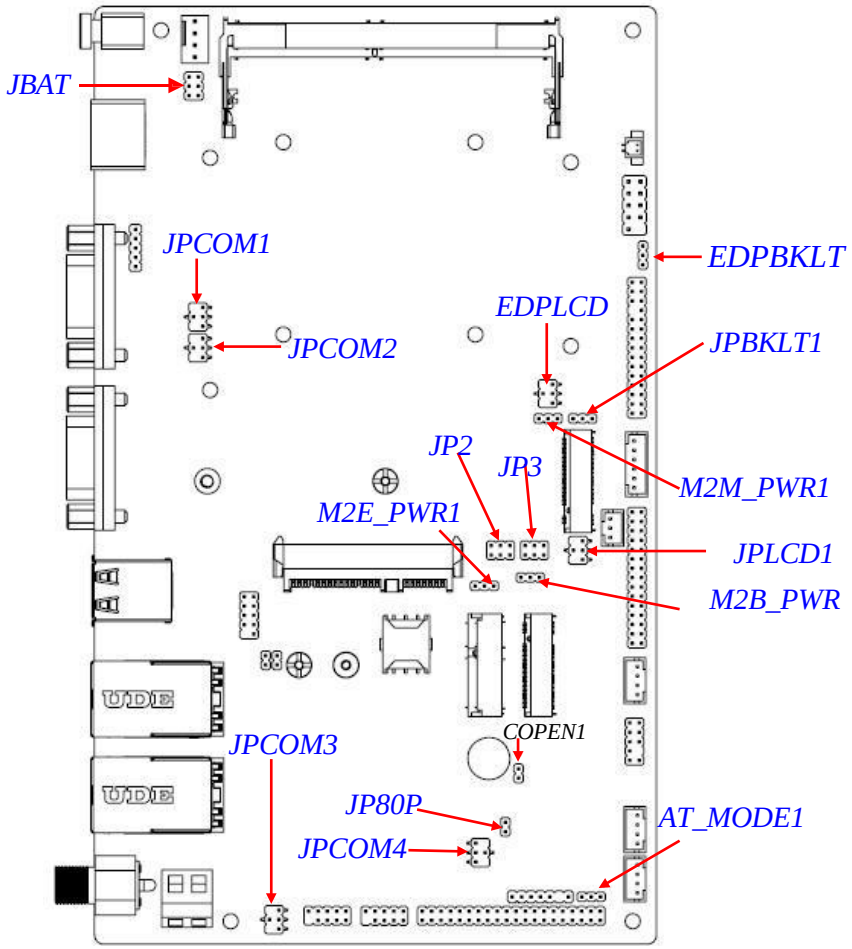
Notice: *When lifting the cover up to open the chassis for further installation, see to it that the connecting cables are not unplugged. It is very important for the cables connected to their original places for normal functioning.*

2-3 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close the pins. And remove jumper clip from 2 jumper pins to open the pins. Diagram 2-1 illustrates how to set up a jumper.



Motherboard Jumper Positions:

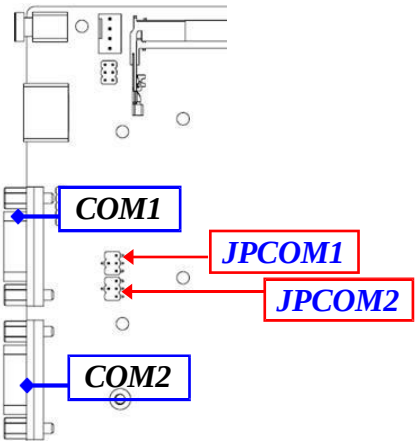


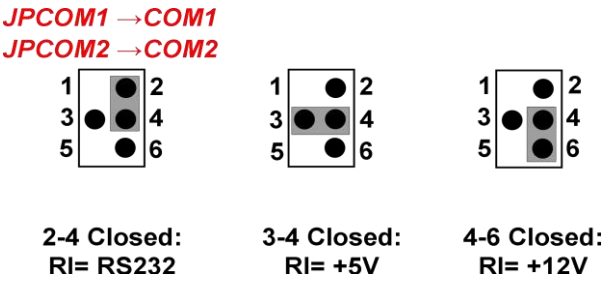
***Note**: The diagrams in the manual are mostly taken from **JLE1K-0E** series for illustration only unless otherwise stated. In the case that there are any differences between the diagram and the actual board, please refer to the board for actual specification.*

Jumpers

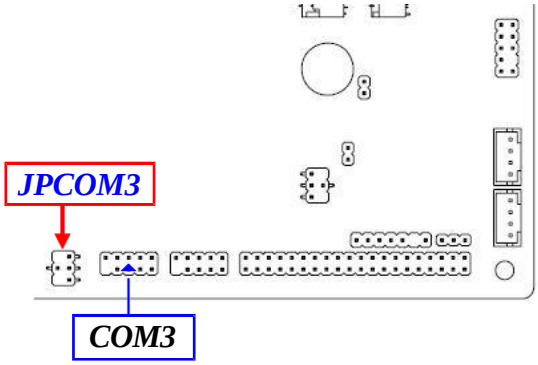
Jumper	Name	Description	Pitch
JPCOM1/JPCOM2	COM1/COM2 Pin9 Function Select	4-Pin Block	2.0mm
JPCOM3	COM3 Pin9 Function Select	4-Pin Block	2.0mm
JPCOM4	COM4 Pin9 Function Select	4-Pin Block	2.0mm
AT_MODE1	ATX Mode/AT Mode Select	3-Pin Block	2.0mm
JP80P1	Set GPIO Port	2-Pin Block	2.0mm
M2E_PWR1/ M2M_PWR1/ M2B_PWR1	M2E1 & M2M1 & M2B1 Power Select	3-Pin Block	2.0mm
JP2 & JP3	M2M1 Connector Function Select	6-Pin Block	2.0mm
JPLCD1	LVDS LCD VCC 3.3V / 5V /12V Select	4-Pin Block	2.0mm
JPBKLT1	LVDS1 LCD BACKLIGHT VCC Select	3-Pin Block	2.0mm
JBAT	***Pin (1&2):*** Clear RTC ***Pin(3&4):*** Clear CMOS ***Pin(5&6):*** ME Disable	6-Pin Block	2.0mm
EDPLCD	eDP1 Screen supply voltage	4-Pin Block	2.0mm
EDPBKLT	eDP1 Backlight voltage	3-Pin Block	2.0mm

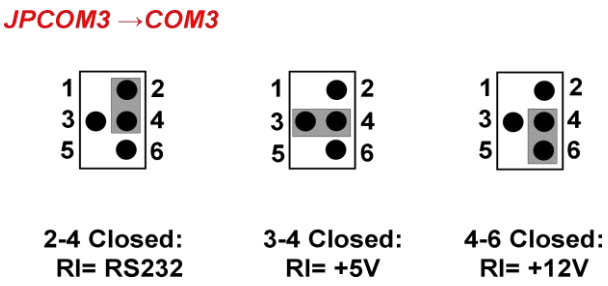
JPCOM1/JPCOM2 (4-pin) :COM1/COM2 Pin9 Function Select Pitch=2.0mm



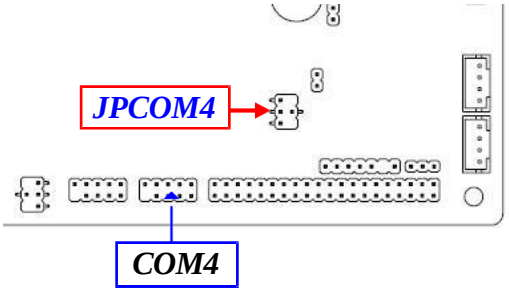


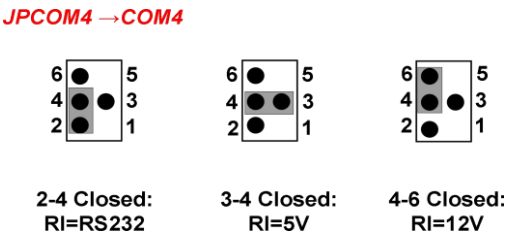
JPCOM3 (4-pin):COM3 Pin9 Function Select Pitch=2.0mm



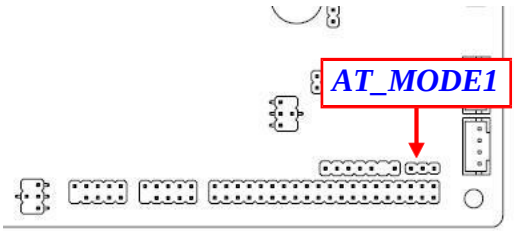


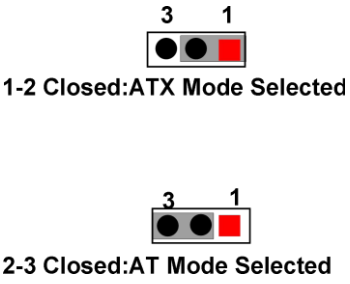
JPCOM4 (4-pin) :COM4 Pin9 Function Select Pitch=2.0mm





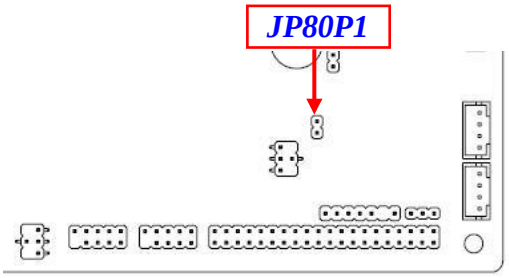
AT_MODE1 (3-pin): ATX Mode/AT Mode Select Pitch=2.0mm

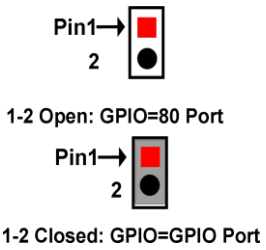




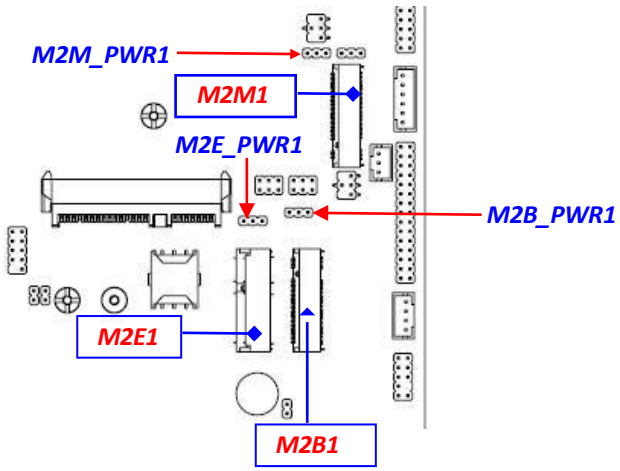
***ATX Mode Selected**: Press power button to power on after power input ready;*
***AT Mode** Selected: Directly power on as power input ready*

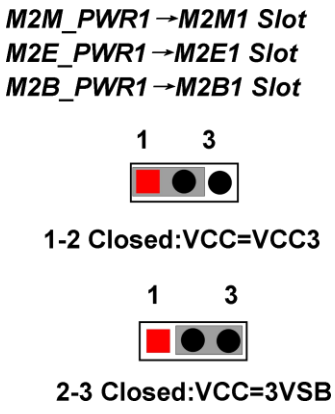
JP80P1 (2-pin): Set GPIO Port Pitch=2.0mm



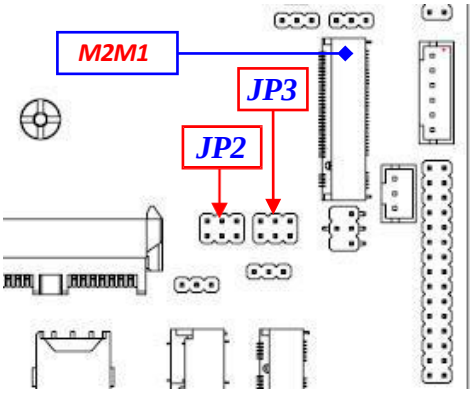


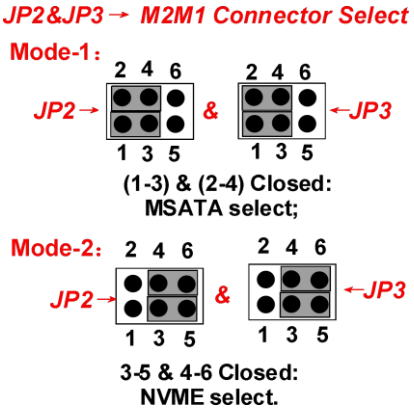
M2B_PWR1 & M2E_PWR1 & M2M_PWR1 (3-pin): M2B1 & M2E1 & M2M1 Power Select Pitch=2.0mm



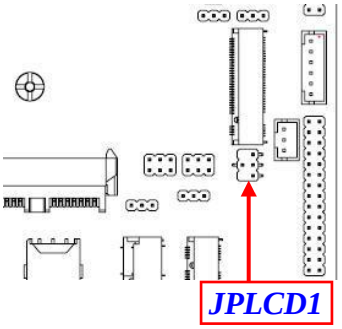


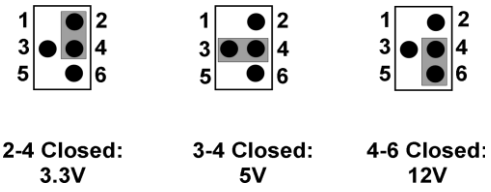
JP2&JP3 (6-pin): M2M1 Connector Function Select Pitch=2.0mm



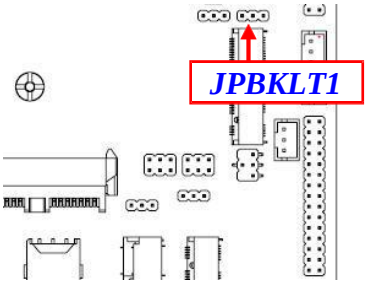


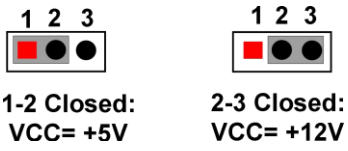
JPLCD1 (4-pin): LVDS LCD VCC 3.3V / 5V /12V Select Pitch=2.0mm



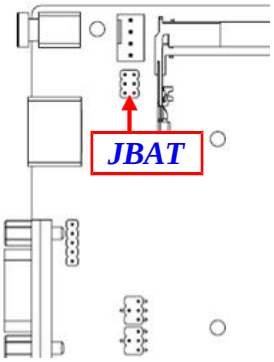


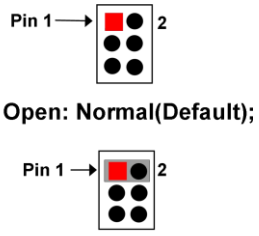
JPBKLT1 (3-pin): LVDS1 LCD BACKLIGHT VCC Select Pitch=2.0mm



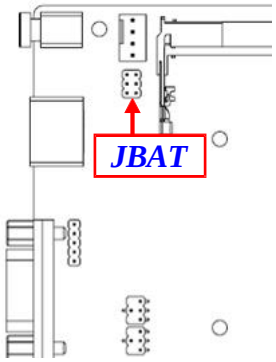


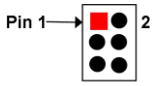
Pin (1-2) of JBAT (6-pin): Clear RTC Pitch=2.0mm



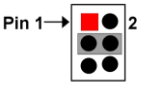


Pin (3-4) of JBAT (6-pin): Clear CMOS *Pitch=2.0mm*



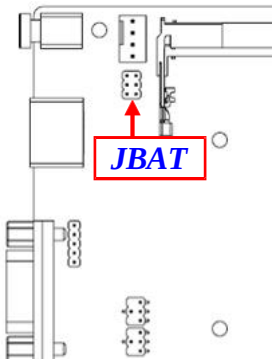


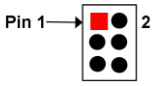
3-4 Open: Normal(Default);



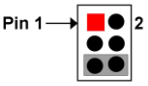
3-4 Closed: Clear CMOS.

Pin (5-6) of JBAT (6-pin): ME Disable *Pitch=2.0mm*



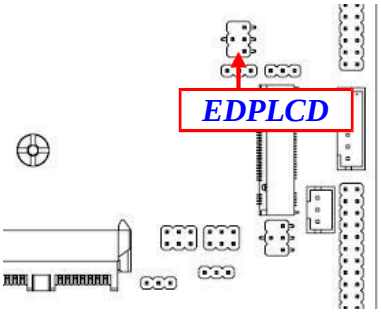


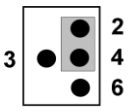
5-6 Open: Normal(Default);



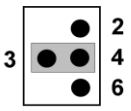
5-6 Closed: ME Disable.

EDPLCD (4-pin): eDP1 Screen supply voltage *Pitch=2.0mm*

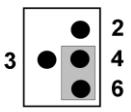




2-4 Closed: 3.3V;

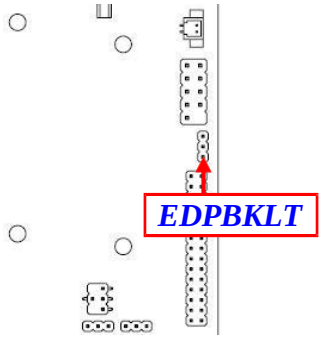


3-4 Closed: 5V;



4-6 Closed: 12V.

EDPBKLT (3-pin): eDP1 Backlight voltage *Pitch=2.0mm*



1-2 Closed:VCC=5V

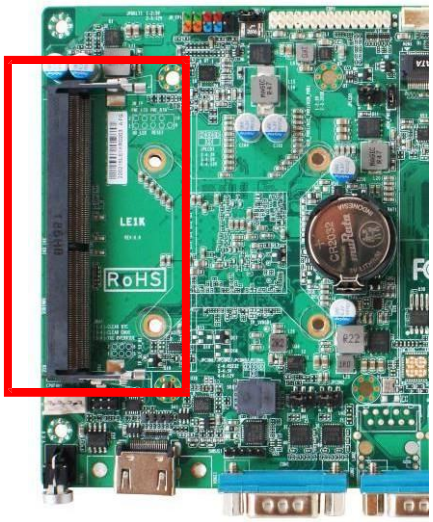
2-3 Closed:VCC=12V

2-4 Hardware Installation

Remove the screws that lock the back cover to the system from the back side before hardware installation procedures **(refer to 2-2).**

Notice: *When lifting the cover up to open the chassis for further installation, see to it that the connecting cables are not unplugged. It is very important for the cables connected to their original places for normal functioning.*

2-4-1 To Install SO-DIMM to the Board



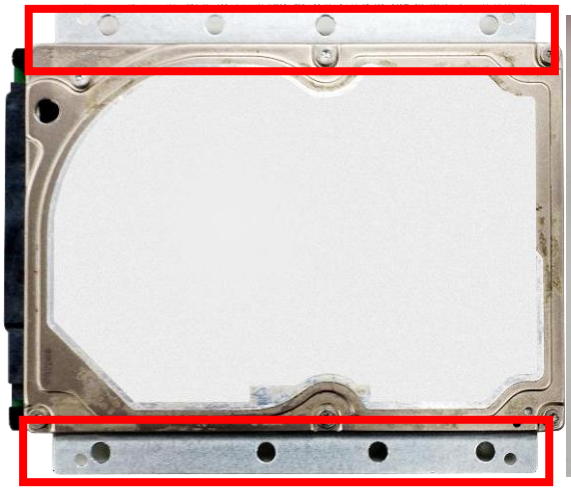
1. Locate the DDR4 SO-DIMM slots on the board.

2. Insert the gold-figure side of a compatible SO-DIMM into the slot at a 30 degree. See to it that the break of the module fit into the notch of the slot and the golden-finger side should be fully plugged into the slot.

3. Press down to secure the SO-DIMM to the slot. The eject tabs will lock automatically if installing direction is correct.

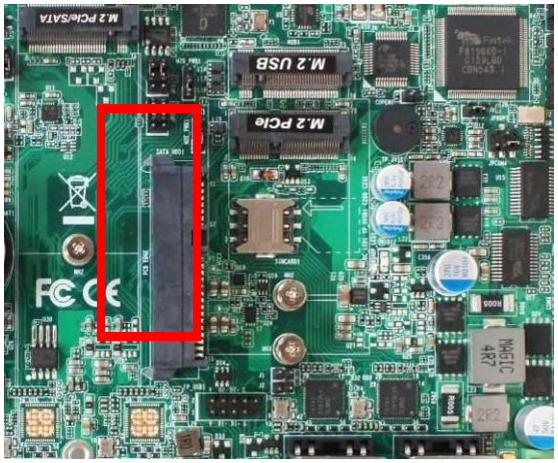
2-4-2 To Install 2.5'' HDD

Please refer to the following instructions and illustration to install a 2.5" SATA HDD. Before installation, **please refer to 2-2** to open the back cover and dissemble the pre-installed HDD racks from the system.

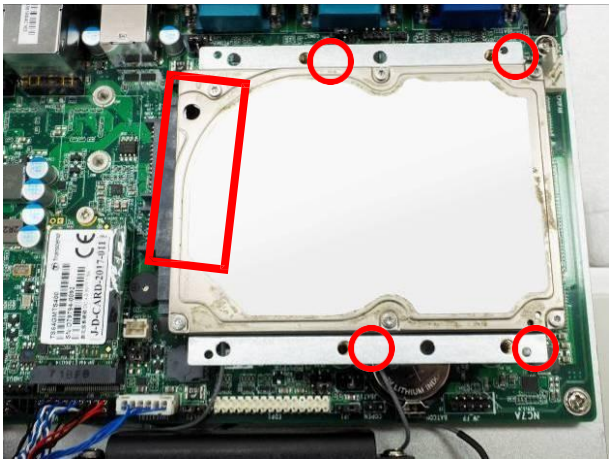


1. Align the racks to both sides of the SATA HDD as showed above. Match the screw holes of the racks to corresponding screw holes of the HDD.

2. Lock the HDD to the HDD racks by tightening screws into matched screw holes.



3. Find the 2.5'' HDD connector on the motherboard.

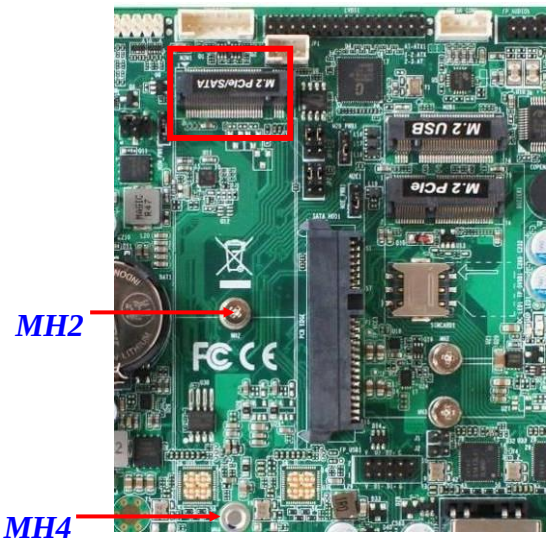


4. Push the installed HDD into HDD connector on the board as showed. Lock the racked with HDD installed to the board by tightening the screws in the marked spots.

2-4-3 To Install M.2 M-Key Card

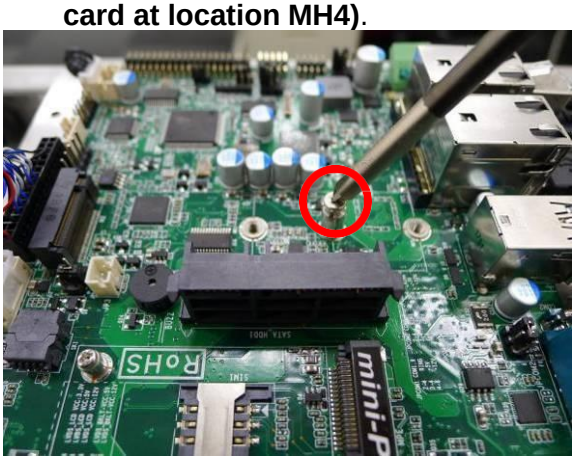
M2M1 M.2 M-Key slot supports compatible type 2242/2280 SATA and NVMe/ PCIex2 module.

Nut Location	MH2	MH4
Card Length	4.2 cm	8 cm
Module Type	Type 2242	Type 2280



1. Find M.2 Slot on the motherboard **(Please install M.2 M-key type-2242 card at location MH2; or type-2280 card at location MH4)**.

2. Prepare compatible M.2 SATA or M.2 PCIe SSD card. Deferent type of cards has different length. Find corresponding nut location for further installation.



3. Remove the screw post and nut fixed at location **MH2** by default (**Skip step 3 &4** and go straight to **Step 5** if you are going to use the default nut).

4. Lock the screw post into the location corresponding to the length of the module you wish to install.

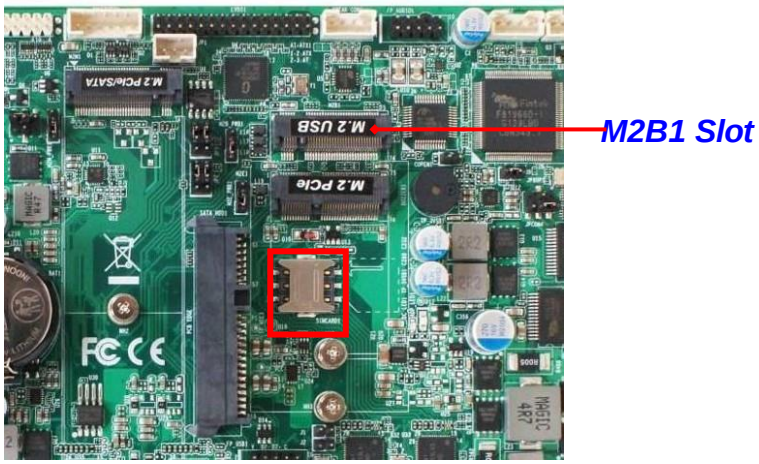
5. Align and insert corresponding M.2 module, as the photo shows.

6. Tighten up the screw to secure the module into the M.2 M-key slot. Make sure not over-tighten the screw to avoid possible damage to the module.

2-4-4 To Install M.2 B-key Card along with Nano-SIM card

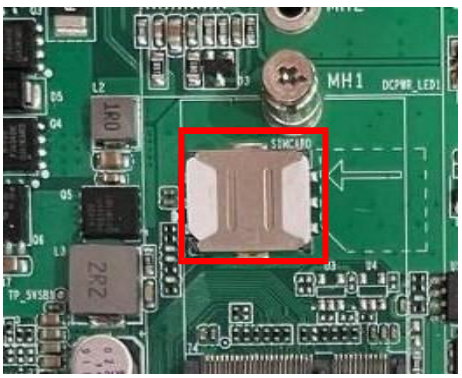
M2B1 slot: M.2 B-Key (3042/3052) supports 3G/4G/5G module, co-function with SIM card installed.

1) to install compatible SIM card into SIM card slot:



1. Locate SIM card slot on the board.

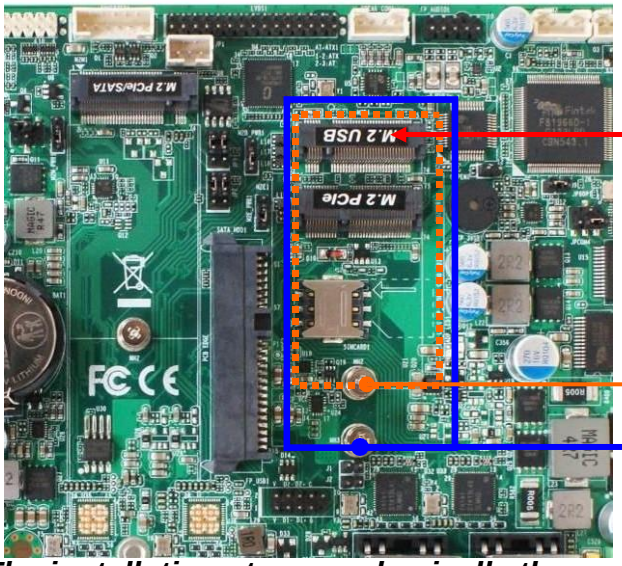
2. Use a pair of tweezers to pick up compatible SIM card and push it into the slot in the direction as shown.



3. The board with compatible SIM card installed in place.

2) to install compatible M2B card:

M2B1 slot supports two different types of M2B cards in different lengths:



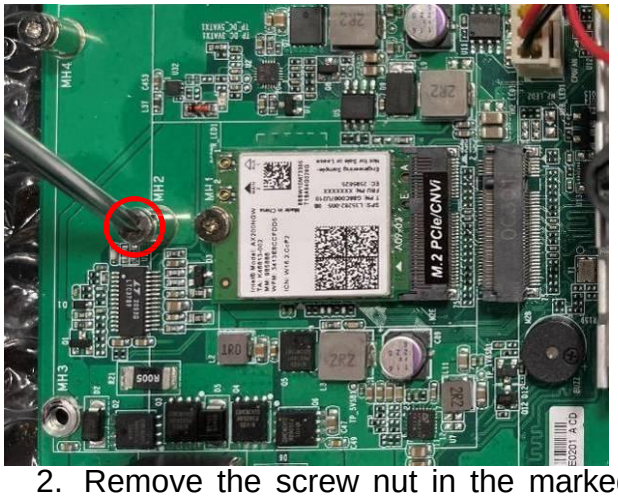
M2B1 Slot

Module	Card Length	Nut Location
Type-3042	**4.2 cm**	**MH2**
Type-3052	**5.2 cm**	**MH3**

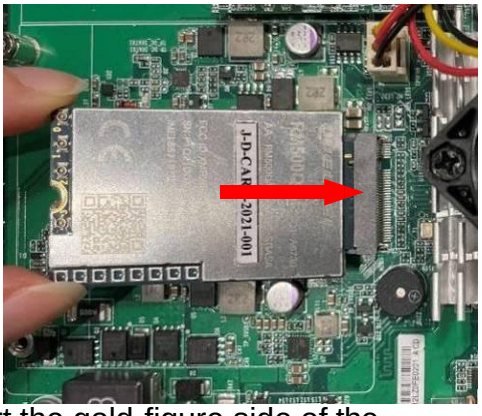
Type-3042
（MH2）
Type-3052
（MH3）

The installation steps are basically the same. Take the installation process of type-3052 card as an example:

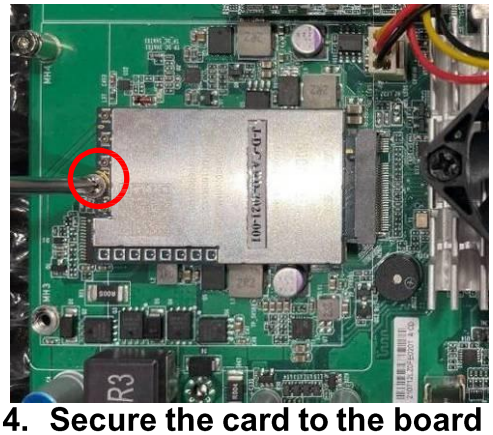
1. Locate M.2 B-key slot on the board.



2. Remove the screw nut in the marked spot **(MH3)** for further installation.



3. Insert the gold-figure side of the compatible M.2 B-key type-3052 card into the slot.



4. **Secure the card to the board by tightening up the screw to the marked spot.**

2-4-5 To Install M.2 E-Key Wireless Card

***Note:** The following photos are for illustration only. If there are any differences from the photos and the actual product, please refer to the actual product.*

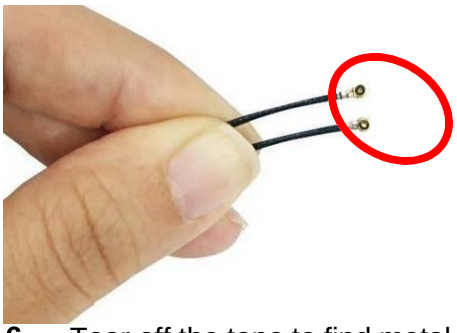
1. Locate the M.2. PCIe, type-2230 slot on the board.

2. Remove the marked screw and use it to lock WIFI card to the slot in later installation.

3. Insert the gold-figure side of the compatible WI-FI card into the slot and press down.

4. Lock the card to the board by tightening up the screw to the marked spot.

5. The metal hats on the end of the antenna string are sealed by acetate tape to avoid possible damage to the system.



6. Tear off the tape to find metal hats of Wi-Fi antenna strings.

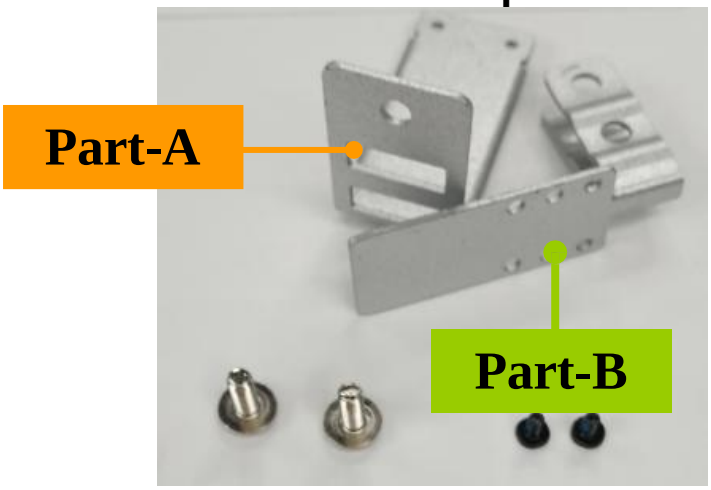
7. Press the metal hat on the end of the antenna string to the antenna slot on the card as showed (If you install two antenna, refer to above steps to finish installation, and press the left metal hat of the left antenna to the left slot, the right metal hat to the right slot).

8. **Internal View:** Put the above metal gasket into the antenna head at first, and then push this antenna head into the back side of the rear panel.

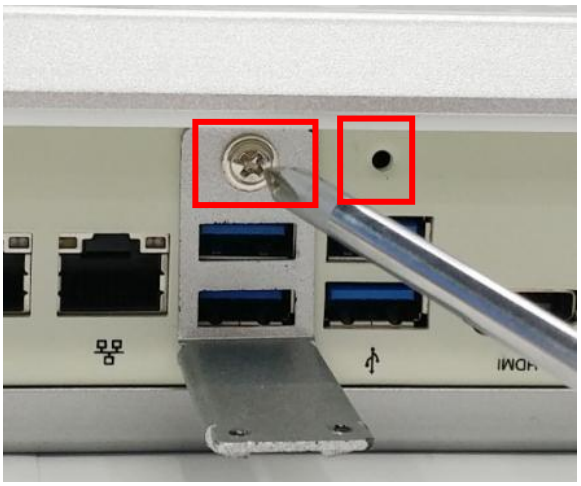
9. **External View:** Put the metal ring into the antenna head, and then lock the antenna head to the front side of the rear panel the above hexagonal bolt.

10. Please connect the external L-Shape Wi-Fi receiver antenna to the antenna head as shown after all installation steps finished.

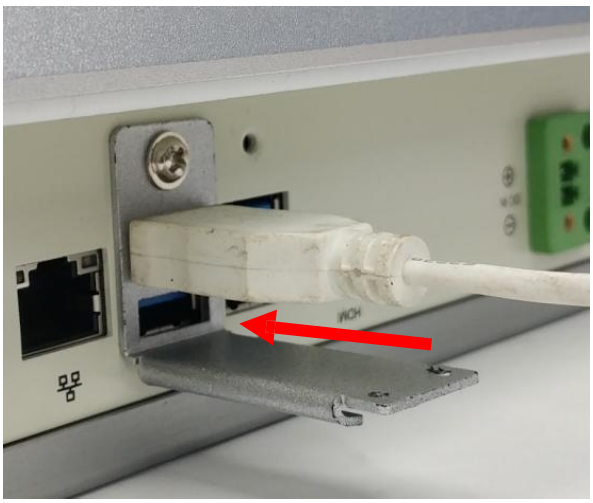
2-4-6 To Install Optional USB Device Fixed Parts



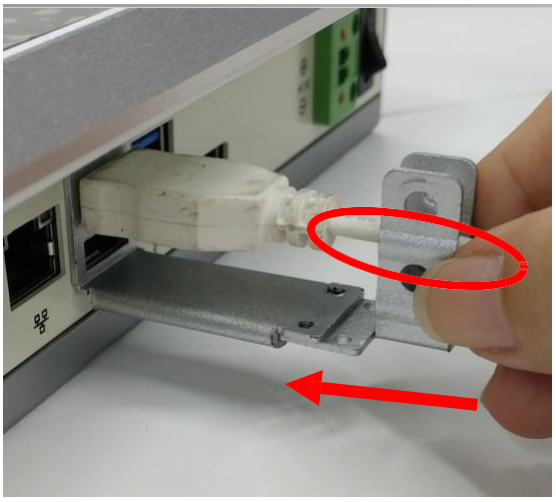
1. The USB device fixed accessories include **Part-A**, **Part-B** and 2 sets of screws of different size.



2. Align the screw hole of **Part-A** to corresponding screws hole from the IO panel of the chassis, and then lock **Part-A** to the panel with the bigger screw, as the photo shows.

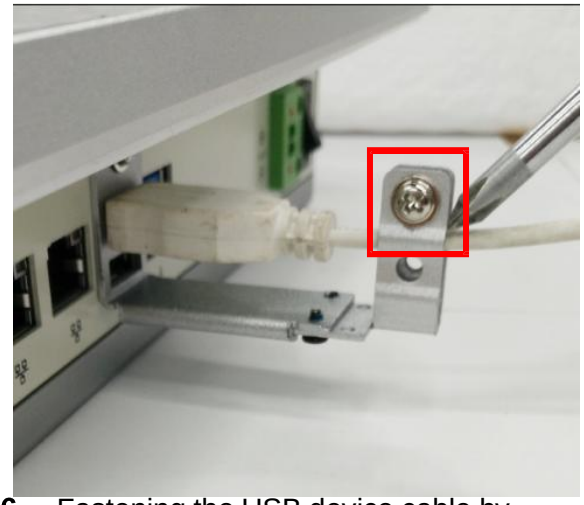


3. Insert the cable end of USB device you wish to connect to USB port of the chassis, as the photo shows.



4. Insert **Part-B** into corresponding slot of the **Part-A** and choose the installing length by adjusting the screw holes from both parts. Make sure the screw holes from both parts matched and the USB cable fitted into the reserved slot of **Part-B**, as the photo shows.

5. Turn over the system on a flat operation platform and lock **Part-B** to **Part-A** by tightening the 2 screws in the marked spots.

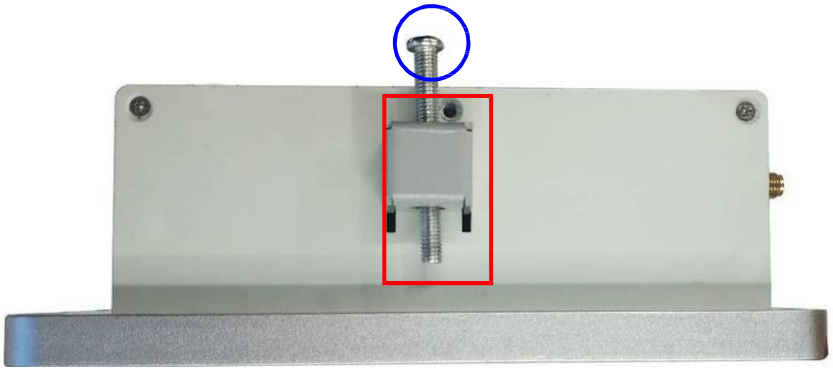


6. Fastening the USB device cable by tightening up the other screw in the marked spot.

2-4-7 To Install Optional Chassis Fixed Parts

1. Insert corresponding edges of the fixed part into the slots until them matched. Make sure the fixed part is installed in the way the photo shows, with protruding tips upwards.

2. The models that support this fixing mode have pairs of slots reserved on both sides of the system. User can choose the height or position of installing spot.



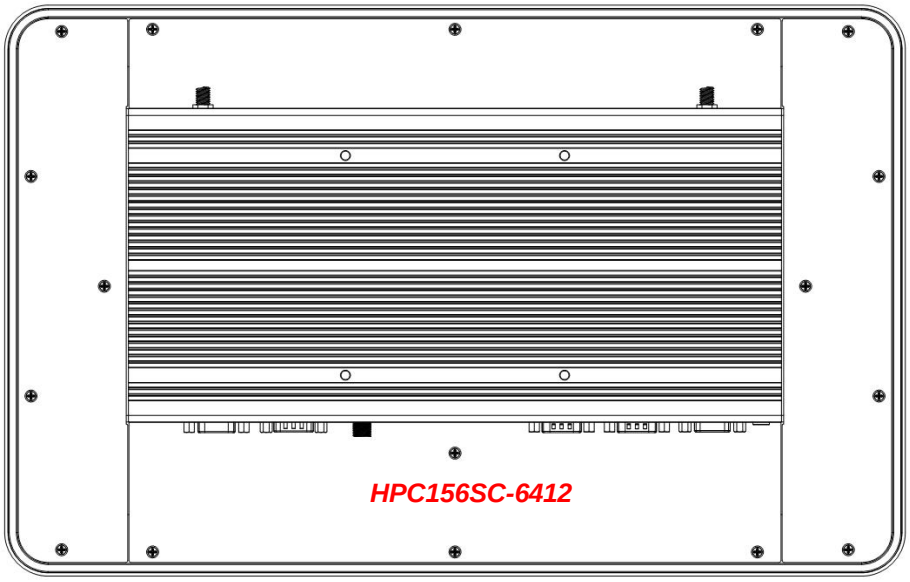
3. Insert corresponding edges of the fixed part into the slots until them matched. Tightening up the screw so that the fixed part can be fitted into the slots tightly. Install other fixed parts to the system in the same way.

Note: **1. Fixed parts are only optional for specific models. Please refer to the actual product for specifications. 2. The photos in the manual are for illustration purpose only. If there are any differences between the photos and the actual product, please refer to the actual product.**

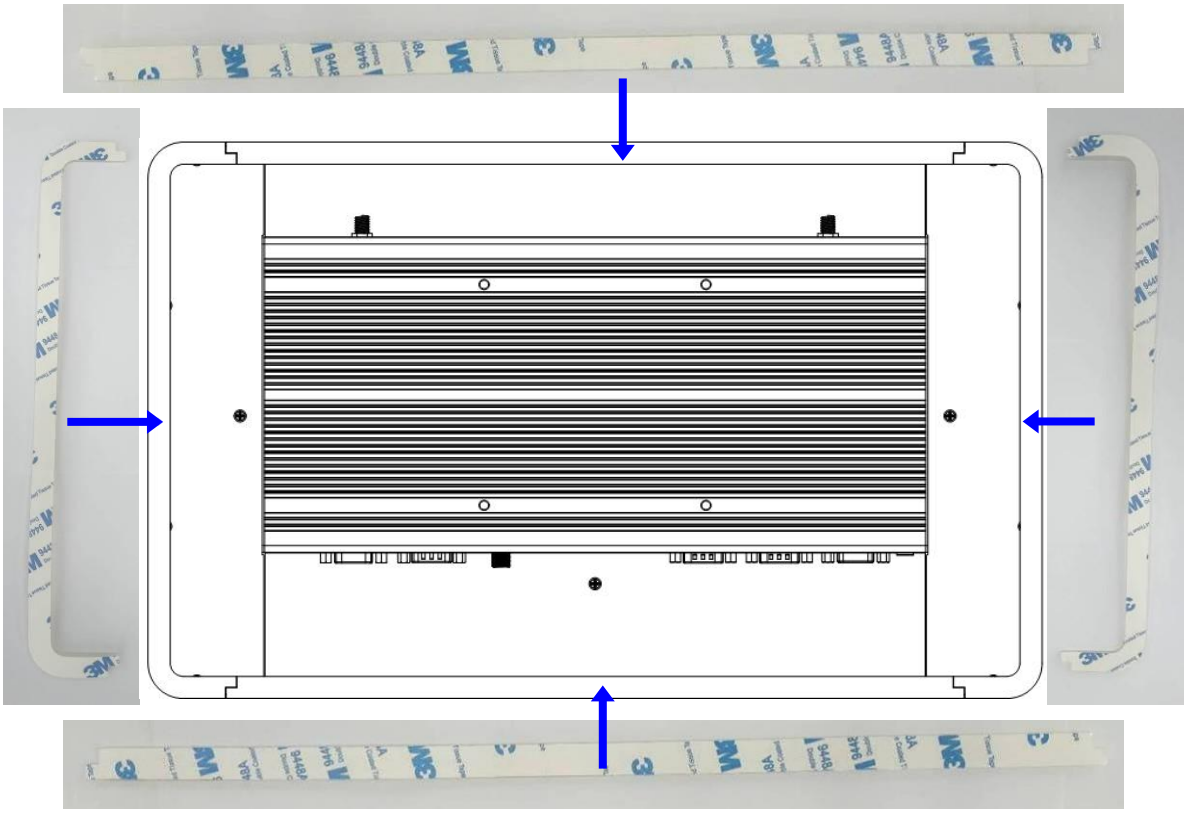
2-5 To Affix Waterproof Silicone Strips

In consideration of expansion purpose from our user, we do not affix the waterproof silicone strips to the back cover of the system **HPC156SC-FP1900B**. User can find the silicone strips from the accessories package and stick them upon the edges of the back cover of the system **HPC156SC-FP1900B** after necessary hardware installation finished**,** as the following steps show:

1. Find the 4* waterproof silicone strips from the accessories package.



2. This is the back cover of the system without silicon strips affixed.



3. Tear off the paper from the back of the adhesive silicon strips and affix the above 4 strips with the adhesive sides upon the edges of the back cover, as the photo show.

The screws on the 4 edges of the back cover are under the strips when this process finished. If the user wishes to open the chassis afterwards, he has to tear off the strips to remove screws. Make sure the adhesive side put upwards without sticking to anything before affixing it back to the cover.

Chapter 3
Introducing BIOS

Notice!	**The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.**

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

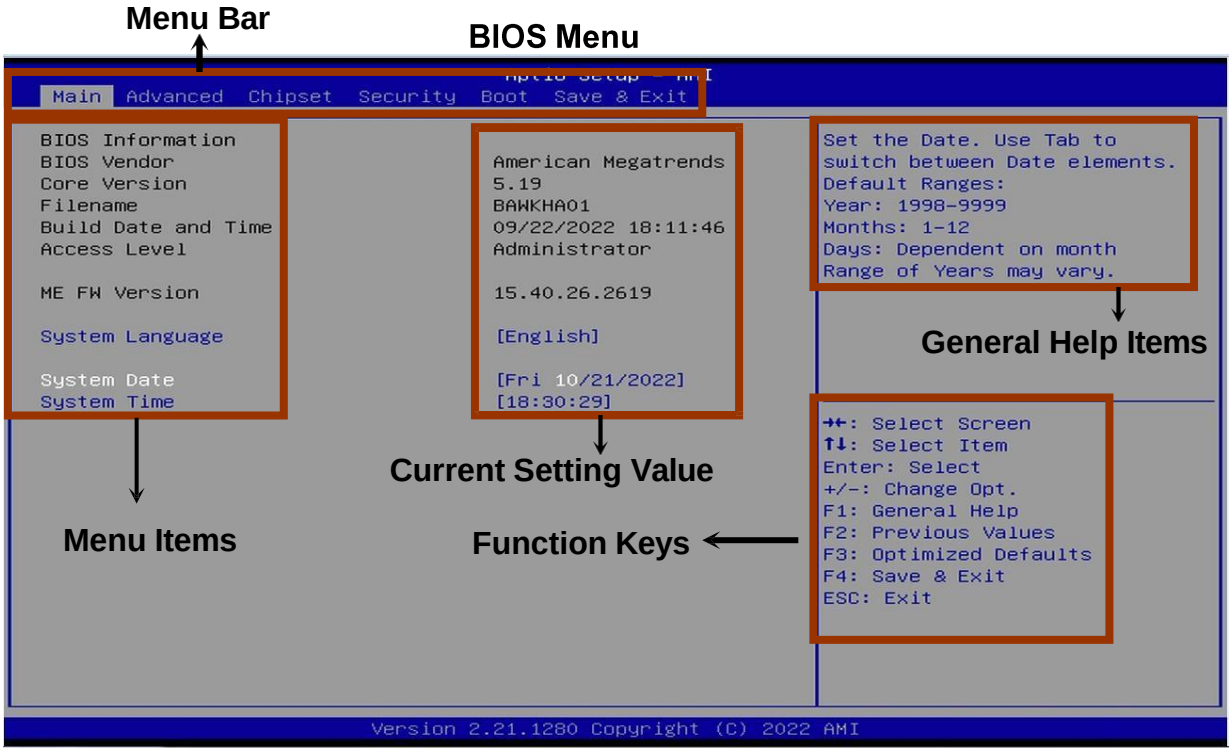
3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press **<Del>** to enter Setup

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press (left, right) to select screen;
- Press (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press **<Enter>** to select.
- Press **<+>/<–>** keys when you want to modify the BIOS parameters for the active option.
- **[F1]:** General help.
- **[F2]:** Previous values.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- Press **<Esc>** to quit the BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press [F1] to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

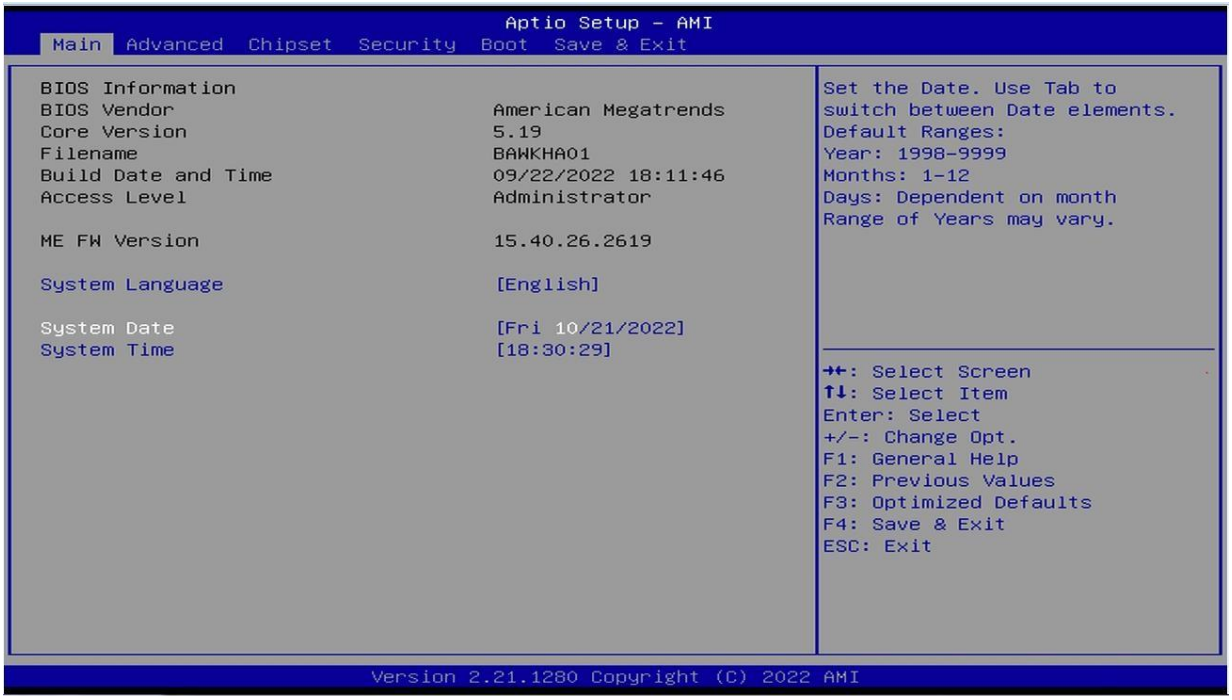
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.



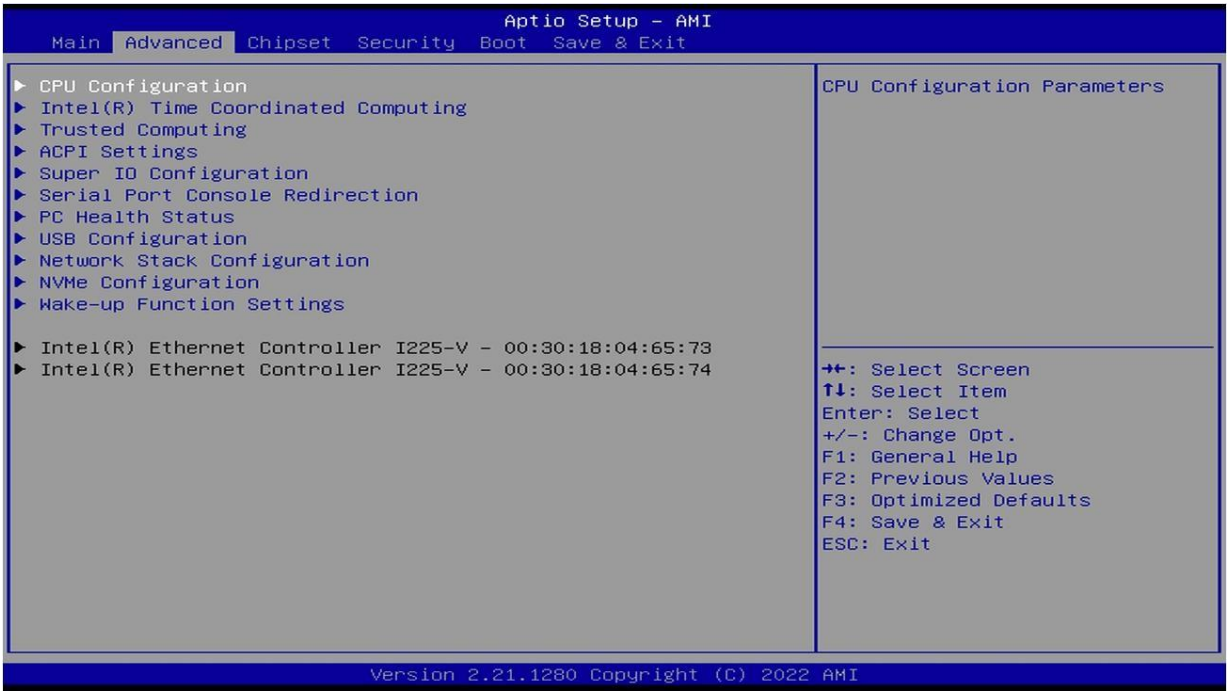
System Date

Set the date. Please use [Tab] to switch between date elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **CPU Configuration**

  Press [Enter] to make settings for the following sub-item:

  Boot Performance Mode

  Use this item to select the performance state that the BIOS will set starting from reset vector.

  The optional settings: [Max Battery]; [Max Non-Turbo Performance]; [Turbo Performance]

  Intel(R) SpeedStep(tm)

  Use this item to allows more than two frequency ranges to be supported.

  The optional settings: [Disabled]; [Enabled]

  When set as [Enabled], the following sub-items shall appear:

  Turbo Mode

  Use this item to enable/disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

  The optional settings: [Disabled]; [Enabled]

  C states

  Use this item to enable/disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized

  The optional settings: [Disabled]; [Enabled]

  When set as [Enabled], the following sub-items shall appear:

  Enhanced C-states

  Use this item to enable/disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

  The optional settings: [Disabled]; [Enabled]

  Package C State Limit

  Use this item to Maximum Package C State Limit Setting. CPU Default: Leaves to Factory default value. AUTO: available Package C State Limit.

  The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [CPU

Default]; [Auto]

Power Limit 1 Override

Use this item to enable/disable Power Limit1 override. If this option is disabled, BIOS will program the default values for Power Limit1 and Power Limit1 Time Window.

The optional settings: [Disabled]; [Enabled]

When set as [Enabled], the following sub-items shall appear:

Power Limit 1

Use this item Power Limit 1 in Milli Watts. BIOS will round to the nearest 1/8W when programming. 0= no custom override. For 12.50W, enter 12500. Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR). Other SKUs:This value must be between Min Power Limit and TDP Limit. If value is 0, BIOS will program TDP value.

Power Limit 1 Time Window

Use this item to power Limit 1 Time Window value in seconds. The value may vary from 0 to 128. 0=default value (28 sec for Mobile and 8 sec for desktop). Defines time Window which TDP value should be maintained.

The optional settings: [0]; [1]; [2]; [3] ; [4] ; [5] ; [6] ; [7] ; [8] ; [10] ; [12] ; [14] ; [16] ; [20] ; [24] ; [28] ; [32] ; [40] ; [48] ; [56] ; [64] ; [80] ; [96] ; [112] ; [128]

Power Limit 2 Override

Use this item to enabled/disable power Limit 2 override. If this option is disabled, BIOS will program the default values for Power Limit 2.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], user can make further settings in the following items:

Power Limit 2

Use this item to power Limit 2 vallue in Milli watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as 1.25*TDP. For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

- **Intel(R) Time Coordinated Computing**

Press [Enter] to make settings for the following sub-item:

Use this item to Intel(R) Time Coordinated Computing (Intel (R) TCC) options

Press [Enter] to make settings for the following sub-items

In tel(R) TCC Mode

Use this item to enable or disable Intel(R) TCC mode. when enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel(R) TCC mode is enabled

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], user can make further settings in the following items:

Intel(R) TCC Authentication

Use this item to enabled/disable authentication of Intel(R) TCC configuration data.

The optional settings: [Disabled]; [Enabled].

When set **Intel(R) TCC Mode** as [Disabled], user can make further settings in the following items:

IO Fabric Low Latency

Use this item to enabled or disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported

The optional settings: [Disabled]; [Enabled].

GT CLOS

Use this item to enabled or disable Graphics Technology(GT) Class of Service. Enable will reduce Gfx LLC allocation to minimize impact of Gfx workload on LLC.

The optional settings: [Disabled]; [Enabled].

Trusted Computing

Press [Enter] to make settings for the following sub-item:

Security Device Support

Use this item to enable or disable BIOS support for security device. OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

Active PCR Banks

Available PCR Banks

SHA-1 PCR Bank

Use this item to enable or disable SHA-1 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SHA384 PCR Bank

Use this item to enable or disable SHA384 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SM3_256 PCR Bank

Use this item to enable or disable SM3_256 PCR Bank

The optional settings are: [Disabled]; [Enabled]

Pending Operation

Use this item to schedule an operation for the security device.

***Note:** Your computer will reboot during restart in order to change state of security device*

The optional settings are: [None]; [TPM Clear]

ACPI Settings

Press [Enter] to make settings for the following sub-item:

ACPI Sleep State

Use this item to select ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 only (Suspend to RAM)].

► **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:

Serial Port 1/2 Configuration

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.
The optional settings are: [Auto]; [IO=3F8h; IRQ=4;]; [IO=2F8h; IRQ=3;]; [IO=3E8h; IRQ=4;]; [IO=2E8h; IRQ=3;].

Transmission Mode Select

Use this item to select transmission mode.
The optional settings are: [RS422]; [RS232]; [RS485].

► **Serial Port 3/4 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.
The optional settings are: [Auto]; [IO=3F8h; IRQ=10;]; [IO=2F8h; IRQ=10;]; [IO=3E8h; IRQ=10;]; [IO=2E8h; IRQ=10;]; [IO=2F0h; IRQ=10;]; [IO=2E0h; IRQ=10;].

ERP Support

Use this item to energy-related products function disable ERP.
The optional settings are: [Disabled]; [Enabled].

Case Open Detect

Use this item to detect Case has already open or not. Show message in POST.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, system will detect if COPEN has been short or not (*refer to **COPEN1** jumper setting for Case Open Detection*); if Pin 1&2 of ***CASE OPEN*** are short, system will show Case Open Message during POST

WatchDog Reset Timer

This item support WDT reset function.
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable WatchDog Timer Control. When set as [Enabled], the following sub-items shall appear:

WatchDog Reset Timer Value

User can set a value in the range of [10] to [255] seconds or in the range of [1] to [255] minutes.

WatchDog Reset Timer Unit

The optional settings are: [Sec.]; [Min.].

WatchDog Wake-up Timer

Support WDT Wake-up.
The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

WatchDog Wake-up Timer Value

User can set a value in the range of [10] to [4095] seconds when‘ **WatchDog Wake-up Timer Unit**’ set as [Sec.], or in the range of [1] to [4095] minutes when ‘**WatchDog Wake-up Timer Unit**’ set as [Min.].

WatchDog Wake-up Timer Unit

The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select ‘AT or ATX Mode’ on MB jumper at first (refer to AT_MODE1 jumper setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select).

Serial Port Console Redirection

COM1

Console Redirection

The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

Console Redirection Settings

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.

Press [Enter] to make settings for the following items:

Terminal Type

The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

Emulation: VT100: ASCII char set; VT100+: Extends VT100 to support color, function keys, etc.; VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes; ANSI: Extended ASCII char set.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

The optional settings: [7]; [8].

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].

Even: parity bit is 0 if the num of 1’s in the data bits is odd; Mark: parity bit is always 1; Space: Parity bit is always 0; Mark and Space Parity do not allow for error detection.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard settings is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

The optional settings: [1]; [2].

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow.

Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
The optional settings: [Disabled]; [Enabled].

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.
The optional settings: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.
The optional settings: [80x24]; [80x25].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

Console Redirection EMS

The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

Console Redirection Settings

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.
Press [Enter] to make settings for the following items:

Terminal Type EMS

The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].
Emulation: VT100: ASCII char set; VT100+: Extends VT100 to support color, function keys, etc.; VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes; ANSI: Extended ASCII char set.

Bits per second EMS

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
The optional settings: [9600]; [19200]; [57600]; [115200].

Flow Control EMS

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits EMS

Parity EMS

Stop Bits EMS

PC Health Status

Press [Enter] to view current hardware health status, set shutdown temperature, or make further settings in ‘**SmartFan Configuration**’.

SmartFan Configuration

Press [Enter] to make settings for SmartFAN Configuration:

CPUFAN Smart Mode

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

CPUFAN Full-Speed Temperature

Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above the pre-set temperature.

CPUFAN Full-Speed Duty

Use this item to set CPUFAN full speed duty. Fan will run at full speed when above the pre-set duty.

CPUFAN Idle-Speed Temperature

Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below the pre-set temperature.

CPUFAN Idle-Speed Duty

Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below the pre-set duty.

USB Configuration

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

The optional settings are: [Disabled]; [Enabled].

USB Hardware Delays and Time-outs

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device power-up delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

The optional settings: [Auto]; [Manual].

Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds'.**

Device Power-up Delay in Seconds

The delay range is from [1] to [40] seconds, in one second increments.

Network Stack Configuration

Press [Enter] to go to '**Network Stack**' screen to enable or disable UEFI Network Stack.

Network Stack

The optional settings are: [Enabled]; [Disabled].

When set as [Enabled], the following sub-items shall appear:

Ipv4 PXE Support

The optional settings are: [Disabled]; [Enabled].

Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot

optional will not be created.

Ipv6 PXE Support

The optional settings are: [Disabled]; [Enabled].

Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.

PXE Boot Wait Time

Use this item to set wait time to press [ESC] key to abort the PXE boot.

Media Detect Count

Use this item to set number of times presence of media will be checked.

Use either [+] / [-] or numeric keys to set the value.

- **NVMe Configuration**

  Press [Enter] to view current NVMe Configuration.

  **Note: options only when NVME device is available.*

- **Wakeup Function Settings**

  Press [Enter] to make settings for the following sub-items:

  Wake-up System with Fixed Time

  Use this item to enable or disable system wake on alarm event.

  The optional settings: [Disabled]; [Enabled].

  When set as [Enabled], system will wake on the hour/min/sec specified.

  Wake-up Hour

  Use this item to 0-23. For example, 3 for 3am and 15 for 3pm

  Wake-up Minute

  Use this item to 0-59

  Wake-up Second

  Use this item to 0-59

  When set **Wake-up System with Fixed Time** as [Enabled], user can make further settings in the following items:

  Wake-up System with Dynamic Time

  Use this item to enable or disable system wake on alarm event.

  System will wake on the current time + Increase minutes.

  The optional settings: [Disabled]; [Enabled].

  When set as [Enabled], system will wake on the current time + increased minute(s).

  Wake-up Time Increase

  Use this item to 1 to 60 minute(s)

  PS2 KB/MS Wake-Up from S3-S5

  Use this item to PS2 KB/MS Wake-Up is affected by ERP function in S4-S5.

  Please disable ERP before activating this function in S4-S5

  The optional settings: [Disabled]; [Enabled].

  USB Power Gating S4- S5

  Use this item to USB Wake-up is affected by ERP function in S4. Please disable ERP before activating this function in S4.

  The optional settings: [Disabled]; [Enabled].

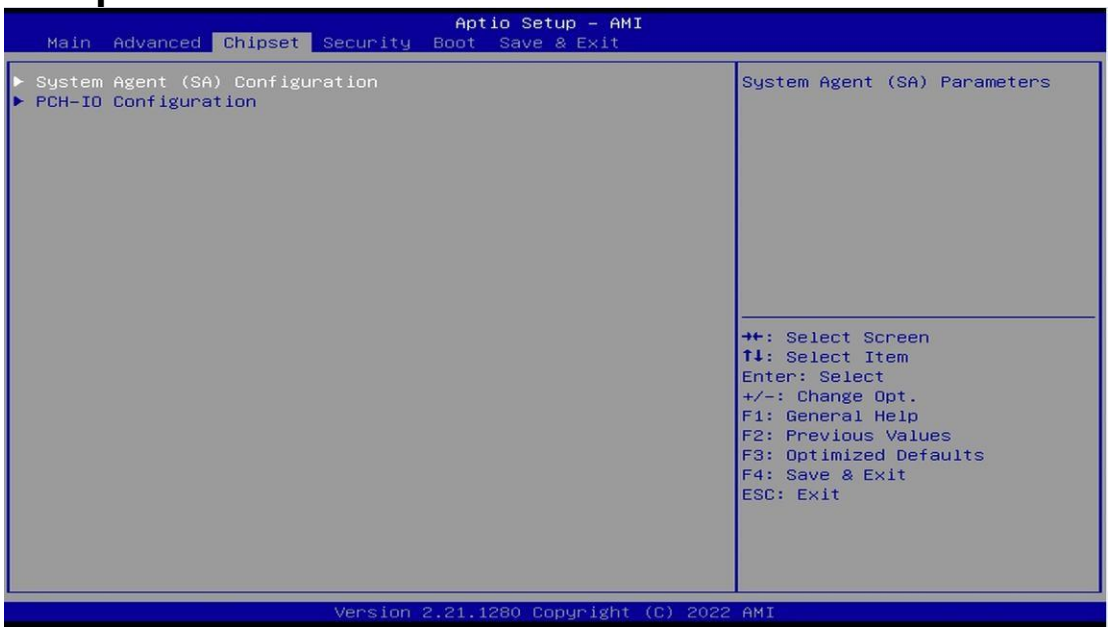
  Note: This function is supported when 'ERP Support**' is set as [Disabled].*

  PCIE Wake-up from S3-S5

  The optional settings: [Disabled]; [Enabled].

- **Intel® Ethernet Controller I225-V- XX:XX:XX:XX:XX:XX**
- **Intel® Ethernet Controller I225-V- XX:XX:XX:XX:XX:XX**

3-8 Chipset Menu



- **System Agent(SA) Configuration**

  Press [Enter] to make settings for the following sub-items:

  GTT Size

  Use this item to select the GTT Size.

  The optional settings: [2MB]; [4MB]; [8MB].

  DVMT Pre-Allocated

  Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

  The optional settings: [0M]; [4M]; [8M]; [12M]; [16M]; [20M]; [24M]; [28M]; [32M]; [36M]; [40M]; [44M]; [48M]; [52M]; [56M] ; [60M] ; [64M] ; [96M] ; [128M] ; [160M]

  DVMT Total Gfx Mem

  Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.

  The optional settings: [128M]; [256M]; [MAX].

  Active LFP

  The optional settings are: [Disable]; [LVDS]

  LVDS Panel Type

  The optional settings are: [800x480 1ch 18-bit]; [800x600 1ch 18-bit]; [800x600 1ch 24-bit]; [1024x600 1ch 18-bit]; [1024x768 1ch 18-bit]; [1024x768 1ch 24-bit]; [1280x768 1ch 24-bit]; [1280x800 1ch 18-bit]; [1280x800 1ch 24-bit]; [1366x768 1ch 18-bit]; [1366x768 1ch 24-bit]; [1440x900 2ch 18-bit]; [1440x900 2ch 24-bit]; [1280x1024 2ch 24-bit]; [1680x1050 2ch 24-bit]; [1920x1080 2ch 24-bit].

  Backlight Control

  Use this item to back light control setting

  The optional settings are: [PWM Inverted]; [PWM Normal]

  Total Memory.

- **PCH-IO Configuration**

  Press [Enter] to make further settings in south bridge parameters.

- **PCI Express Configuration**

Press [Enter] to make further settings in south bridge parameters.

Peer Memory Write Enable

The optional settings: [Enabled]; [Disabled].

SATA Configuration

Press [Enter] to make settings for the following sub-items:

SATA Controller

Use this item to enable/disable SATA Device

When set as [Enabled], the following sub-items shall appear:

SATA Mode Selection

Use this item to Determines how SATA controller(s) operate.

The optional settings: [AHCI]

SATA Port

SATA Port

The optional settings: [Enabled]; [Disabled].

Hot Plug

Use this item to Designates this port as hot pluggable

The optional settings: [Enabled]; [Disabled].

M.2

M.2

The optional settings: [Enabled]; [Disabled].

HD-Audio Support

The optional settings: [Enabled]; [Disabled].

System State after Power Failure

Use this item to specify what state to go to when power is re-applied after a power failure

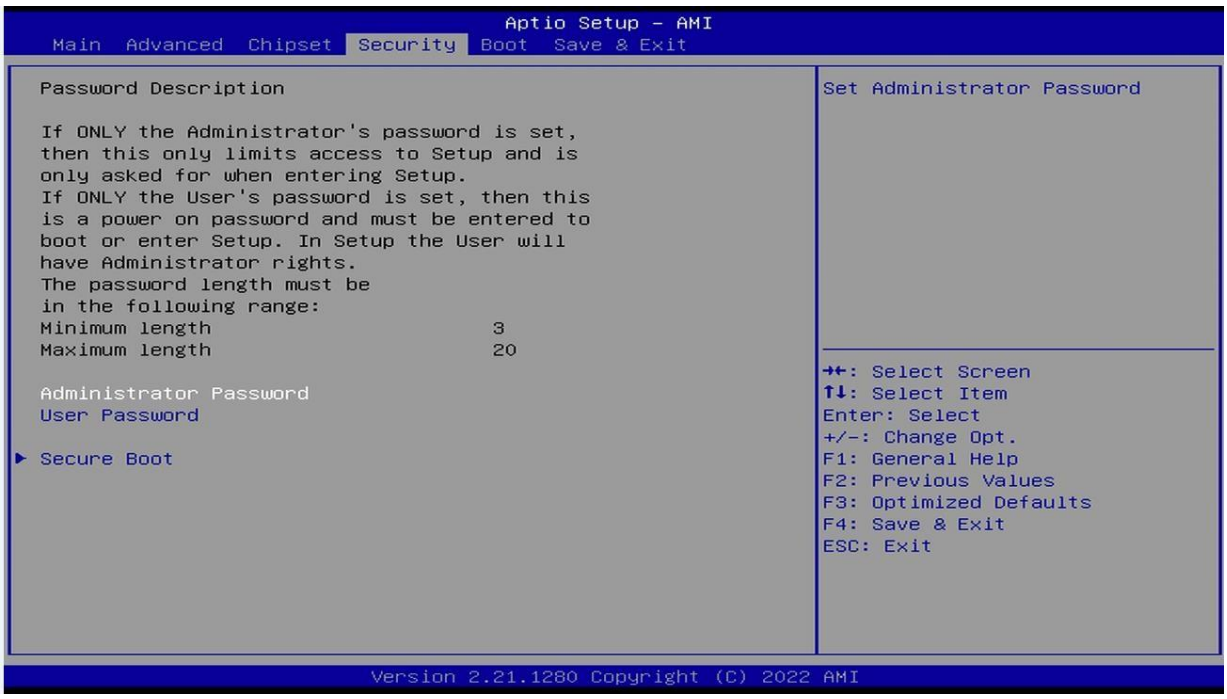
The optional settings: [Always On]; [Always Onff]; [Former State]

PinCntrl Driver GPIO Scheme

Use this item to enable/disable PinCntrl Driver GPIO Scheme

The optional settings: [Enabled]; [Disabled]

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new user password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new user password.

Secure Boot

Press [Enter] to make customized secure settings:

Secure Boot Control

The optional settings are: [Disabled]; [Enabled].

Secure Boot can be enabled if 1. System running in user mode with enrolled Platform Key (PK); 2. CSM function is disabled.

Secure Boot Mode

The optional settings are: [Standard]; [Custom].

Set UEFI Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

**When set as [Custom], user can make further settings in 'Key Management'.*

- **Restore Factory Keys**

Use this item to force system to User Mode, to install factory default Secure Boot key databases.

- **Reset To Setup Mode**

Use this item to delete all Secure Boot key databases from NVRAM.

- **Key Management**

This item enables experienced users to modify Secure Boot variables, witch includes the following items:

Provision Factory Default Keys

This item is for user to install factory default secure boot keys when system is in Setup Mode.

- **Enroll all Factory Default Keys**

This item forces system to User Mode-install all Factory Default keys.

- **Save all Secure Boot Variables**

This item will save NRRAM content of all Secure Boot variables to the files (WFI_SIGNATURE_LIST data format) in root folder on a target file system device.

- **Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OS Recovery Signatures**

Use this item to enroll Factory Defaults or load the keys from a file with:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

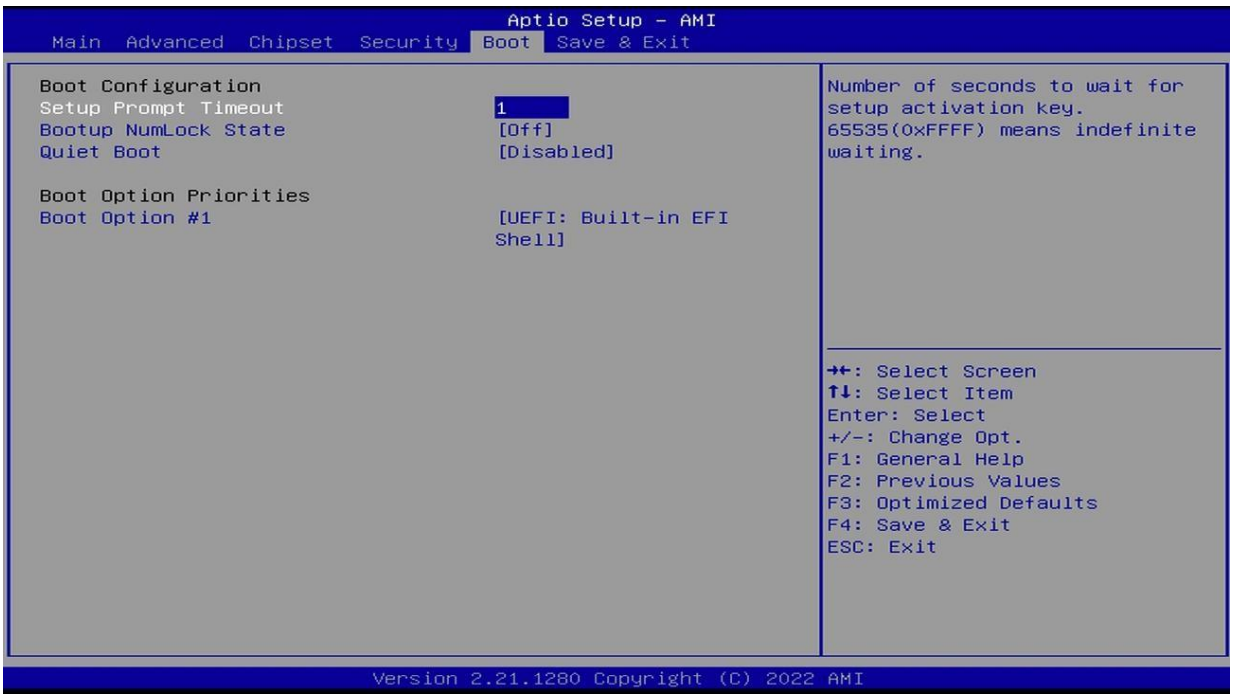
b) EFI_ CERT_X509 (DER encoded)

c) EFI_ CERT_RSA2048 (bin)

d) EFI_ CERT_SHA256 (bin)

2. Authenticated UEFI Variable

3-10 Boot Menu



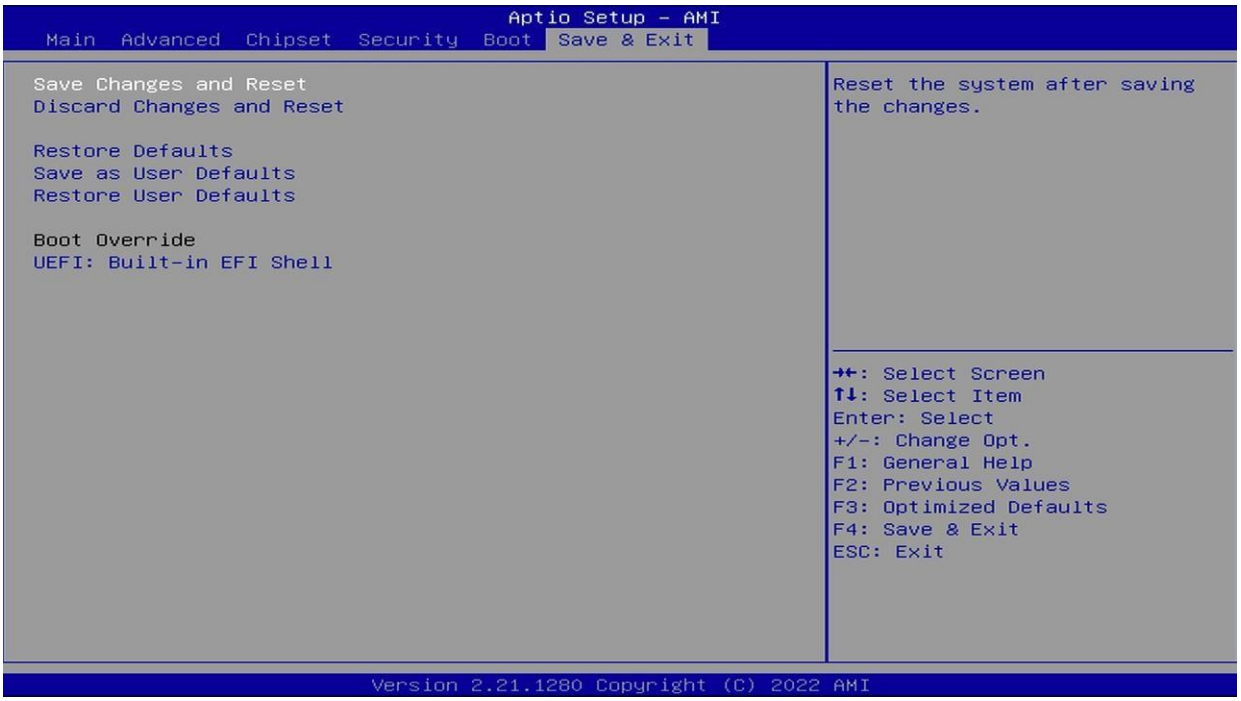
Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State
Use this item to select keyboard NumLock state.
The optional settings are: [On]; [Off].
Quiet Boot
The optional settings are: [Disabled]; [Enabled].
Boot Option Priorities
Boot Option # 1
Use this item to set system boot order.
The optional settings are: [UEFI: Built-in EFI Shell]; [Disabled].

3-11 Save & Exit Menu



Save Changes and Reset
This item allows user to reset the system after saving the changes.

Discard Changes and Reset
This item allows user to reset the system without saving any changes.

Restore Defaults
Use this item to restore /load default values for all the setup options.

Save as User Defaults
Use this item to save the changes done so far as user defaults.

Restore User Defaults
Use this item to restore defaults to all the setup options.

Boot Override

UEFT: Built-in EFI Shell
Launch Internal EFI shell application (shell.efi).

Appendix

General Notices

European Union CE Marking and Compliance Notices

Products intended for sale within the European Union are marked with the Conformity European (CE) Making, which indicates compliance with the applicable Directive and European standards and amendments identified.

Shielded Cables Notice

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Peripheral Devices Notice

Only peripherals (input/out devices, terminals, printers, etc) certified to comply with Class B limits may be attached to this equipment. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Wireless Related Information

Wireless Interoperability

Wireless LAN PCI Express Mini Card is designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CKK), and/or Orthogonal Frequency Division Multiplexing (OFDM) radio technology, and is compliant to:

The IEEE802.11a/b/g/n Standard on Wireless LANs was defined and approved by the Institute of Electrical and Electronics Engineers.

The Wireless Fidelity (WiFi) certification as defined by the Wi-Fi Alliance.

Usage Environment and Your Health

Wireless LAN PCI Express Mini Card emits radio frequency electromagnetic energy like other radio devices. However, the level of energy emitted is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.

Due to the fact that Wireless LAN PCI Express Mini Card operates within the guidelines found in radio frequency safety standards and recommendations, we believe the integrated wireless cards are safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.

In some situation or environment, the use of Wireless LAN PCI Express

Mini Card may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may for example include:

Using the integrated wireless cards on board of airplanes, or in hospitals

In any other environment that the risk of interference to other devices and service are perceived or identified to be harmful.

If you are uncertain of the policy that applies on the use of wireless devices in a specific organization (e.g., airport or hospital), you are encouraged to ask for authorization to use Wireless LAN PCI Express Mini Card prior to turning on the computer.

Electronic Emissions Notices

European Union Compliance Statement Class B Compliance

European Union – Compliance to the Electromagnetic Compatibility Directive

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. We cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the installation of option cards from other manufacturers.

This product has been tested and found to comply with the limits Class B Information Technology Equipment according to European Standard EN55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment.

FCC Rules and Regulations-Part 15

This devices uses, generates and radiates radio frequency energy. The radio frequency energy produced by this device is well below the maximum exposure allowed by the Federal Communications Commission (FCC)

- This device complies with the limits for the Class B digital device pursuant to Part 15 subject to the following two conditions:
- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

The FCC limits are designed to provide reasonable protection against harmful interference when the equipment is installed and used in accordance with the instruction manual and operated in a commercial environment. However, there is no guarantee that interference will not occur in a particular commercial installation, or if operated in a residential area.

If harmful interference with radio or television reception occurs when the device is turned on, the user must correct the situation at the user's own expense. The user is encouraged to try one or more of the following corrective measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that on which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification to said product not expressly approved by Intel could void the user's authority to operate this device.