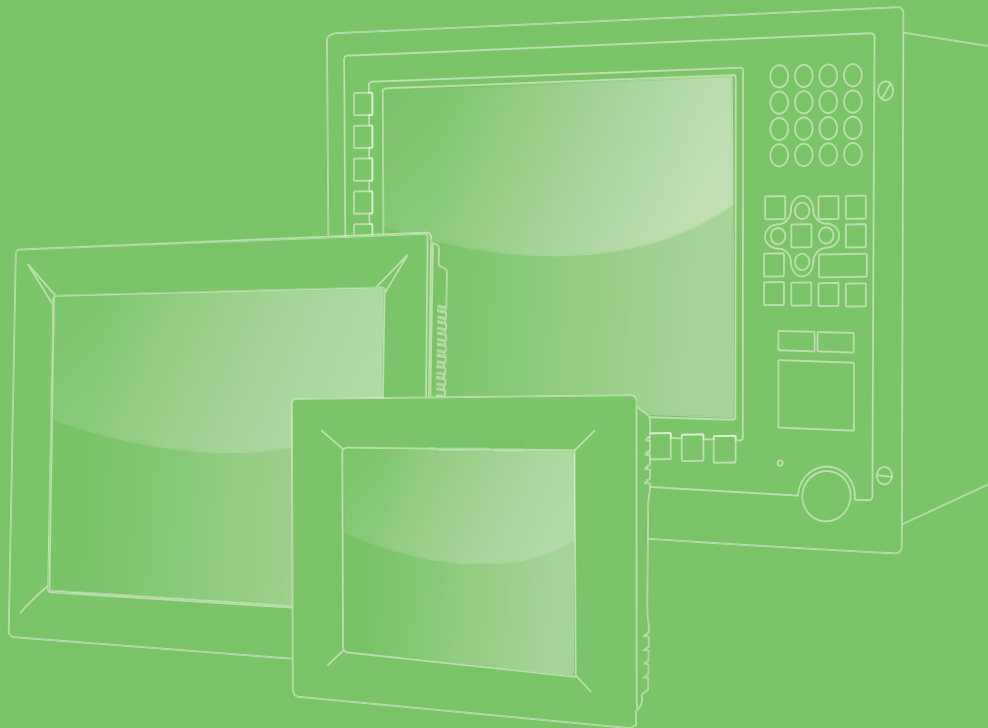


User Manual



## PPC-415/417/419 EHL

15"/17"/19" Color TFT LCD panel  
PC with Intel<sup>®</sup> Atom<sup>™</sup> x6425E  
Processor

VICPAS  
HMI Parts Center

ADVANTECH

*Enabling an Intelligent Planet*

## Copyright

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## Acknowledgements

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Microsoft Windows is registered trademark of Microsoft Corp.

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## Product Warranty (2 years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

## Declaration of Conformity

### CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

Test conditions for passing also include the equipment being operated within an industrial enclosure. In order to protect the product from damage caused by electrostatic discharge (ESD) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

### FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient 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 to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

## Technical Support and Assistance

1. Visit the Advantech website at [www.advantech.com/support](http://www.advantech.com/support) to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

## Safety Instructions

1. Read these safety instructions carefully.  
Veuillez lire attentivement ce manuel d'instructions de sécurité.
2. Retain this user manual for future reference.  
Veuillez conserver ce manuel d'instructions pour référence ultérieure.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.  
Débranchez l'appareil de toutes les prises de courant avant le nettoyage. Nettoyez-le uniquement à l'aide d'un chiffon humide. Ne pas utiliser de détergents liquides ou pulvérisateurs.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.  
Pour les appareils enfichables, la prise de courant doit être placée près de l'appareil et facilement accessible.
5. Protect the equipment from humidity.  
Protégez l'appareil contre l'humidité.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.  
Placez l'appareil sur une surface fiable pendant l'installation. L'abandon ou la chute de l'appareil pourrait causer des dommages.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.  
Les ouvertures du boîtier sont pour la convection d'air. Protégez l'appareil contre la surchauffe. Ne couvrez pas les ouvertures.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. The power outlet socket should have grounded connection.  
Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'appareil à une prise de courant. La prise de courant doit avoir une bonne connexion mise à la terre.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.  
Placez le cordon d'alimentation à l'écart des zones à fort trafic. Ne placez rien sur le cordon d'alimentation.
10. All cautions and warnings on the equipment should be noted.  
Attention à toutes les précautions et avertissements indiqués sur l'appareil.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.  
Si l'appareil n'est pas utilisé pendant une longue période, déconnectez-le de la source d'alimentation pour éviter les dommages causés par une surtension transitoire.
12. Never pour liquid into an opening. This may cause fire or electrical shock.  
Ne versez jamais de liquide dans une ouverture. Sinon, cela pourrait provoquer un incendie ou un choc électrique.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.  
N'ouvrez jamais l'appareil. Pour des raisons de sécurité, l'appareil ne doit être ouvert que par un technicien qualifié.
14. If one of the following occurs, have the equipment checked by service personnel:  
Si l'un des cas suivants se produit, demandez aide à un technicien qualifié:

- The power cord or plug is damaged.  
Le cordon d'alimentation ou la fiche est endommagé.
  - Liquid has penetrated the equipment.  
Le liquide a pénétré dans l'appareil.
  - The equipment has been exposed to moisture.  
L'appareil a été exposé à l'humidité.
  - The equipment is malfunctioning or does not function according to the user manual.  
L'appareil est défectueux ou ne fonctionne pas conformément aux instructions.
  - The equipment has been dropped or damaged.  
L'appareil a été abandonné et endommagé.
  - The equipment shows obvious signs of breakage.  
L'appareil montre des signes évidents de rupture.
15. Do not leave the equipment in an environment with a storage temperature of below -40 °C (-40 °F) or above 60 °C (140 °F) as this may cause damage. The equipment should be kept in a controlled environment.  
Ne laissez pas cet appareil dans un environnement dont la température de stockage est inférieure à -40 °C (-40 °F) ou supérieure à 60 °C (140 °F), car cela pourrait causer des dommages. L'appareil doit être surveillé dans l'environnement.
  16. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.  
ATTENTION: Il y a danger d'explosion s'il y a remplacement incorrect de la pile. Remplacer uniquement avec une pile du même type ou d'un type équivalent recommandé par le constructeur.
  17. In accordance with the IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).  
Conformément aux spécifications de l'IEC 704-1:1982, le niveau de pression acoustique à la position de l'opérateur ne dépasse pas 70 dB (A).
  18. The equipment is intended to be supplied by a UL-certified power supply (FSP090-DBBN3 adapter) or DC power source suitable for use at a TMA of at least 40 °C with the output rated as 19 Vdc, 4.74A min., and ES1 (or SELV); or at a TMA of at least 60 °C with the output rated as 9 ~ 32 Vdc, 10~3A min., and ES1 (or SELV). Contact Advantech for further information.  
Le produit doit être alimenté par une alimentation certifiée UL (FSP090-DBBN3 adaptateur) approprié pour l'utilisation à une température de 40 °C au minimum, et la sortie nominale est 19 VDC, 4.74 A min., ES1 (ou SELV); ou pour l'utilisation à une température de 60 °C au minimum, et la sortie nominale est 9 ~ 32 VDC, 10~3A min., ES1 (ou SELV). Pour plus d'informations, veuillez contacter Advantech.
  19. DISCLAIMER: These instructions are provided in accordance with IEC 704-1 standards. Advantech disclaims all responsibility for the accuracy of any statements contained herein.  
AVERTISSEMENT: Ces instructions sont fournies conformément aux normes IEC 704-1. Advantech décline toute responsabilité quant à la précision de toute déclaration contenue dans le présent document.
  20. CAUTION: This product is not intended for use by children and is not suitable for use in locations where children are likely to be present (this product is not a toy).  
ATTENTION: Ce produit n'est pas un jouet et devrait être gardé hors de la portée des enfants.
  21. Please Keep the monitor out of direct sunlight, very strong bright lights and away from any other heat source. Lengthy exposure to this type of environment may result in discoloration and damage to the monitor.

Veillez ne pas placer les écrans dans le rayonnement solaire direct, dans la haute lumière et dans d'autres sources de chaleur. L'exposition prolongée dans cet environnement peut entraîner la décoloration et l'endommagement de l'affichage.

## Safety Precautions - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

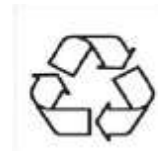
- To avoid electrical shock, always disconnect the power from the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.
- Disconnect the power before making any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

## Power Warning

The power supply is suitable for operation in environments with an altitude of below 5,000 M.

## Battery Information

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with local regulations.



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# Chapter 1

## General Information

This chapter gives background information on the PPC-415/417/419 panel PC.

- Introduction
- Specifications
- Dimensions

## 1.1 Introduction

Advantech's PPC-415/417/419 (15"/17"/19") fanless panel PCs are powered by an Intel® Atom™ x6425E processor that delivers high-performance computing and supports a wide operating temperature (-20 ~ 60 °C/-4 ~ 140 °F) and wide power input range (9 ~ 32 V<sub>DC</sub>). The provision of multiple I/O interfaces, including four COM (of which two are internal ports for an optional COM module), two USB 3.2, one isolated RS-422/485, and dual Intel® Gigabit Ethernet, ensure easy integration of additional peripherals and convenient deployment. A PCI/PCIe expansion slot is also provided to support the addition of a fieldbus or proprietary card, increasing the application potential for a wide range of industries.

## 1.2 Specifications

Table 1.1: Specifications			
Product	PPC-415-XX6	PPC-417-XX6	PPC-419-XX6
<b>LCD Specification</b>	15" LCD	17" LCD	19" LCD
<b>Display Type</b>	15" TFT LCD (LED backlight)	17" TFT LCD (LED backlight)	19" TFT LCD (LED Backlight)
<b>Max. Resolution</b>	1024 x 768	1280 x 1024	1280 x 1024
<b>Color</b>	16.7M	16.7M	16.7M
<b>Dot matrix</b>	0.297 x 0.297 mm	0.264 x 0.264 mm	0.294x0.294 mm
<b>Viewing Angle</b>	80 (left), 80 (right), 70 (top), 70 (bottom)	80 (left), 80 (right), 60 (top), 80 (bottom)	85 (left), 85 (right), 80 (up), 80 (down)
<b>Brightness</b>	500 cd/m <sup>2</sup>	350 cd/m <sup>2</sup>	350 cd/m <sup>2</sup>
<b>Contrast</b>	2500	800	1,000
<b>Backlight Lifecycle</b>	70, 000 hours	50, 000 hours	50, 000 hours
<b>Touchscreen</b>	5-wire analog resistive,projected capacitive (by request)		
<b>Weight</b>	5.3 kg (11.6 lb)	6.27 kg (13.9 lb)	7.9kg (17.3lb)
<b>Dimensions</b>	396.5 x 317.6 x 65.3(mm) (15.6" x 12.5" x 2.57")	442.0 x 362.0 x 69.5 (mm) (17.4" x 14.25" x 2.73")	458.2 x 384 x 67.3(mm) (18" x 15" x 2.6")
<b>Chipset</b>	Intel Atom Processor X6425E		
<b>Memory</b>	1 x SODIMM DDR4 3200MHz (max.32GB)		
<b>Storage</b>	1 x 2.5" SATA bay 1 x M.2 B key bay (size: 2242/2280 or 3042/3052 mm; Singal: SATA, PCIe X1, USB 3.0)		
<b>Network (LAN)</b>	2 x 10/100/1000/2500 Mbps Ethernet (Intel I226)		
<b>I/O Ports</b>	5 x Serial ports: 2 x RS-232, 1 x RS-422/485 with 1K VDC isolation,2 x RS-232 (on right side optional)		
	2 x USB 3.2, 3 x USB2.0 (2pcs default, 1pcs optional)		
	1 x Line-out, 1 x Mic-in, 2 x 1 W speaker (internal)		
	1 x HDMI 1.4		
	1 x DP 1.4		
	1 x GPIO (8 channels, TTL level) (optional)		
<b>Expansion Slots</b>	1 x TPM2.0(internal)		
	1 x PCIe x 1 (default)		
	1 x PCI (optional) 1 x M.2 2230 E Key slot for wireless card		

**Table 1.1: Specifications**

<b>Other Expansions</b>	CFast card (optional module) 2 x DB9 for two RS-232 or one RS-232 and one GPIO (optional module)
<b>OS Support</b>	Microsoft® Windows 10/11(64-bit), Win10 IOT LTSC, Linux
<b>Power Consumption</b> *	50W    60 W    55 W
<b>Input Voltage</b>	9 ~ 32 VDC, 10 A ~ 3 A (19Vdc, 4.74A optional Adapter)

\* Test conditions of power consumption for PPC-415-XX6:

Test condition	Test Configuration	Test System	Power Consumption (W)
Burn-in 8.1	Memory: 8G DDR4 SSD: 64G 2.5"SATAIII MSATA: MSATA 32G MLC IO: COM Port RS232 loopback x 4, USB 3.2 x 2,USB 2.0 x 2	Window 10 64 bit	50

\* Test conditions of power consumption for PPC-417-XX6:

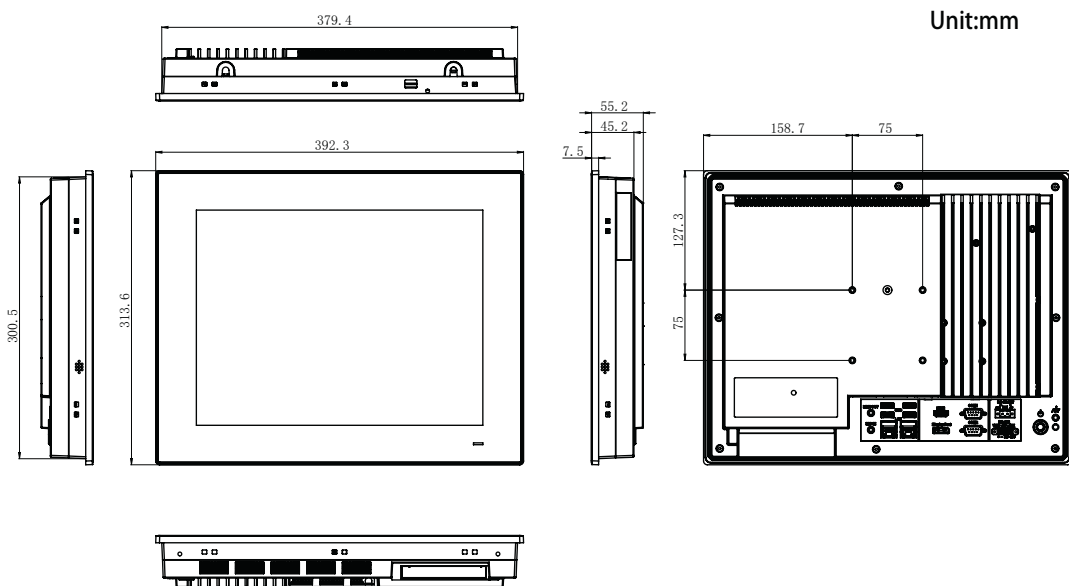
Test condition	Test Configuration	Test System	Power Consumption (W)
Burn-in 8.1	Memory: 8G DDR4 SSD: 64G 2.5"SATAIII MSATA: MSATA 32G MLC IO: COM Port RS232 loopback x 4, USB 3.2 x 2,USB 2.0 x 2	Window 10 64 bit	60

\* Test conditions of power consumption for PPC-419-XX6:

Test condition	Test Configuration	Test System	Power Consumption (W)
Burn-in 8.1	Memory: 8G DDR4 SSD: 64G 2.5"SATAIII MSATA: MSATA 32G MLC IO: COM Port RS232 loopback x 4, USB 3.2 x 2,USB 2.0 x 2	Window 10 64 bit	55

## 1.3 Dimensions

### PPC-415-XX6 Series



Panel Cutout Dimensions: 382x303(15.03x11.92in)

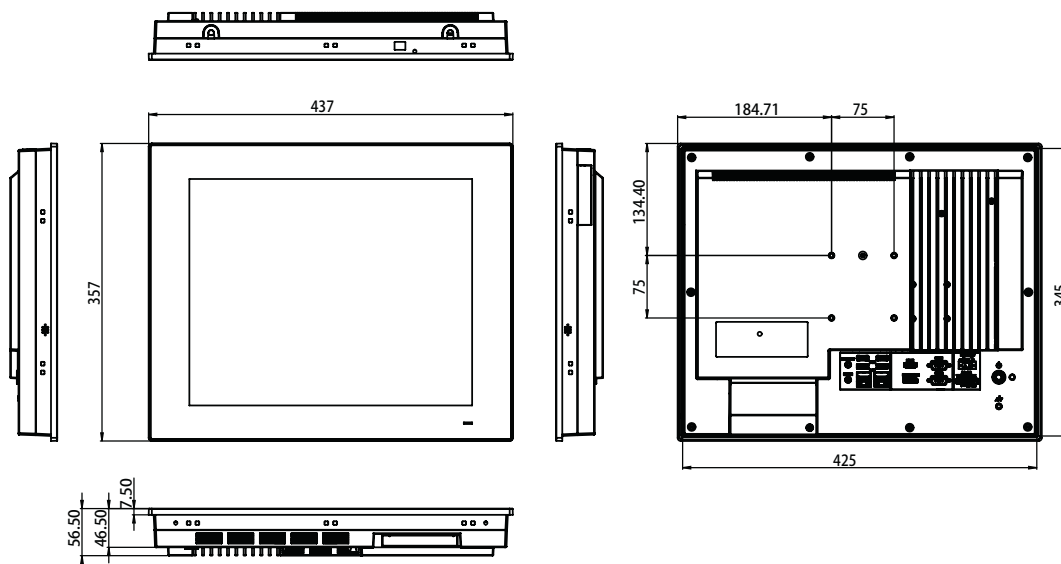
**Figure 1.1 PPC-415-XX6 Dimensions**

**Warning!** To prevent personal injury and product damage, always use suitable mounting apparatus.



VESA screw specifications: Type: M4; Screw depth: 8 mm

### PPC-417-XX6 Series



Panel Cutout Dimensions: 427 x 347 mm (16.81 x 13.66 in)

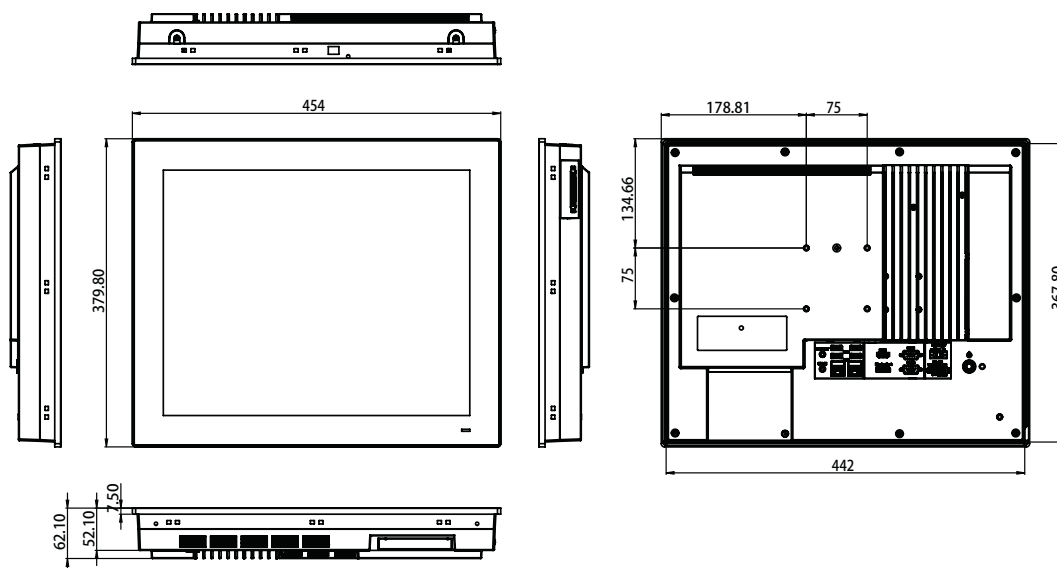
**Figure 1.2 PPC-417-XX6 Dimensions**

**Warning!** To prevent personal injury and product damage, always use suitable mounting apparatus.



VESA screw specifications: Type: M4; Screw depth: 8 mm

### PPC-419-XX6 Series



Panel Cutout Dimensions: 444 x 370 mm (17.48 x 14.56 in)

**Figure 1.3 PPC-419-XX6 Dimensions**

**Warning!** To prevent personal injury and product damage, always use suitable mounting apparatus.



VESA screw specifications: Type: M4; Screw depth: 8 mm





# Chapter 2

## System Installation & Setup

- Quick Installation Guide
- Installation Procedures
- Memory Card Installation
- SSD Installation
- Mini SATA Installation
- Wireless LAN Card Installation
- Riser Card Installation
- AT/ATX Function Switch
- Mount Bracket Installation
- Optional Module Installation

## 2.1 Quick Installation Guide

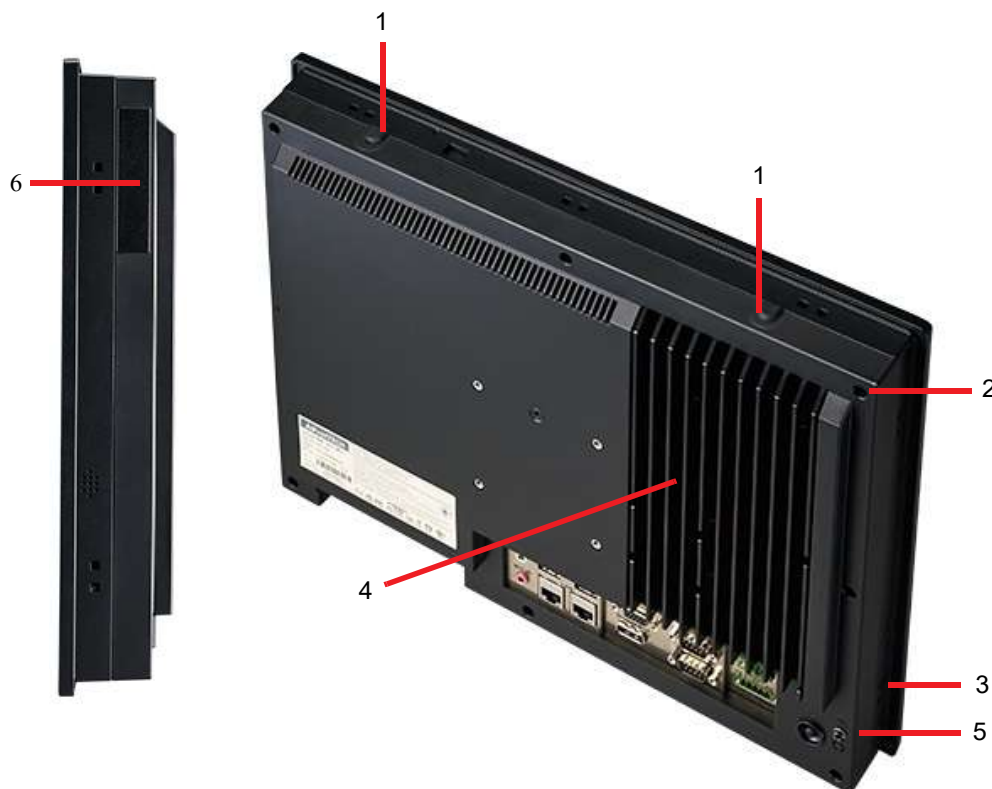
Before setting up the PPC-415/417/419 panel PC, take a moment to familiarize yourself with the functions and locations of the controls, drives, connectors, and ports (as shown in the figures below). When placed upright on the desktop, the PPC-415/417/419 panel PC should appear as shown in Fig. 2.1.

(Note: The figures in this chapter show the PPC-415 model. However, all of the PPC-41x-xx6 models feature the same design.)



**Figure 2.1 PPC-41x-xx6 Series Front Panel**

Power status LED: Off (S5) Orange; Sleep (S3) Orange; On (S0) Blue



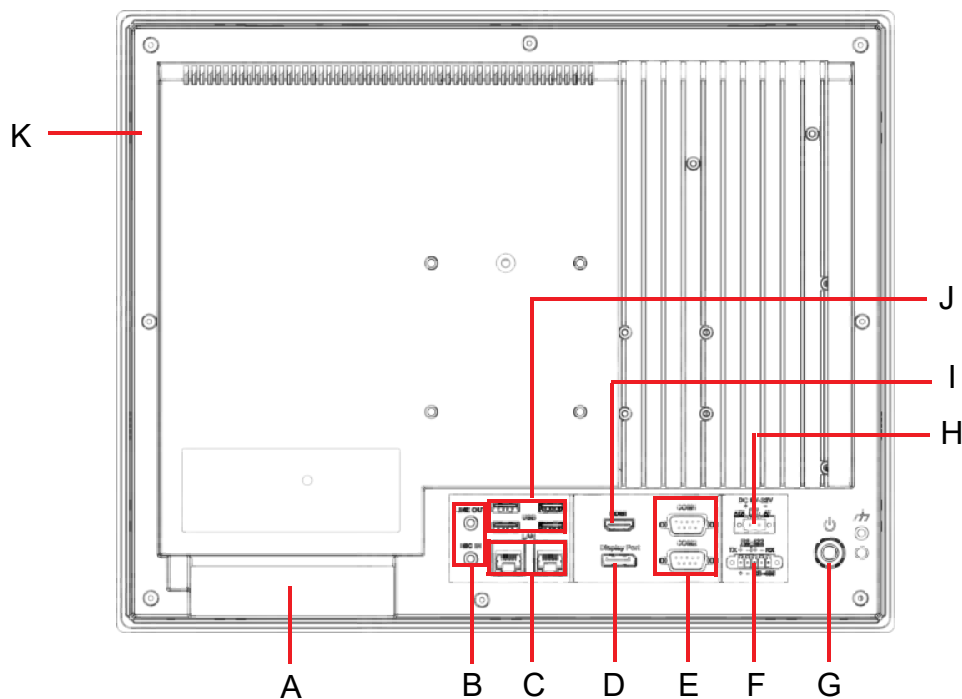
**Figure 2.2 Side and Rear View**

1. Antenna holes
2. Panel mount hook holes
3. Speakers (right and left)
4. CPU heatsink
5. Ground screw
6. Optional module expansion slot

**Note!** VESA screw specifications: Type: M4; Screw depth: 8 mm



## I/O Connectors



**Figure 2.3 I/O Connectors**

- |  |                              |
|--|------------------------------|
| A: 1 x Expansion slot (PCI or PCIe x1) | G: Power Button              |
| B: Mic-in/Line-Out                     | H: DC jack and AT/ATX switch |
| C: 2 x Intel Gigabit Ethernet          | I: 1 x HDMI                  |
| D: 1 x DisplayPort                     | J: 2 x USB3.2, 2 x USB2.0    |
| E: 2 x RS-232                          | K: Optional modules          |
| F: 1 x Isolated RS-422/485             |                              |

## 2.2 Installation Procedures

### 2.2.1 Connecting the Power Cable

The PPC-415/417/419 panel PC features a DC power socket (9 ~ 32 V). When connecting the power cable, hold the cable at the plug end.

Follow the procedures outlined below to ensure correct setup.

1. Before connecting the power cable, check that the system's power mode setting is configured according to your requirements. To use AT power, flip the AT/ATX switch (shown below) to AT mode (the default setting is ATX mode).
2. Connect the 2-pin male connector of the power cable (provided in the accessory box) to the power socket.

#### Power Button

The power button is located on the bottom right of the panel PC.

**Note!** The power cable and adapter are optional.



Figure 2.4 Power Cable Connector

### 2.2.2 Connecting the Keyboard and Mouse

Connect the keyboard and mouse to the I/O interfaces located at the rear of the panel PC.

## 2.3 Memory Card Installation

1. Remove the 9 screws (circled in red) and take out the clip from the rear cover to remove the rear cover (see Figs. 2.5 and 2.6).

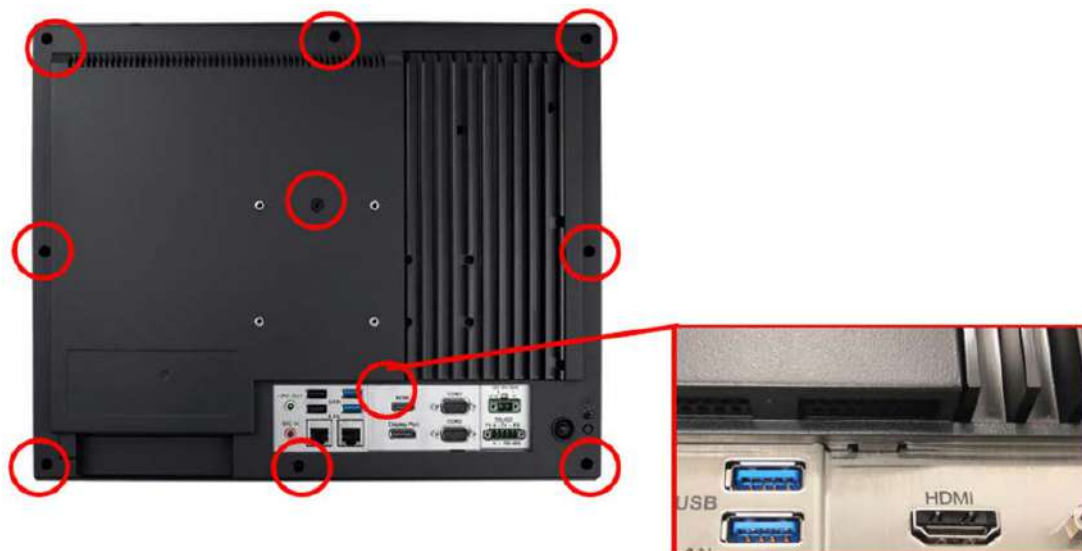


Figure 2.5

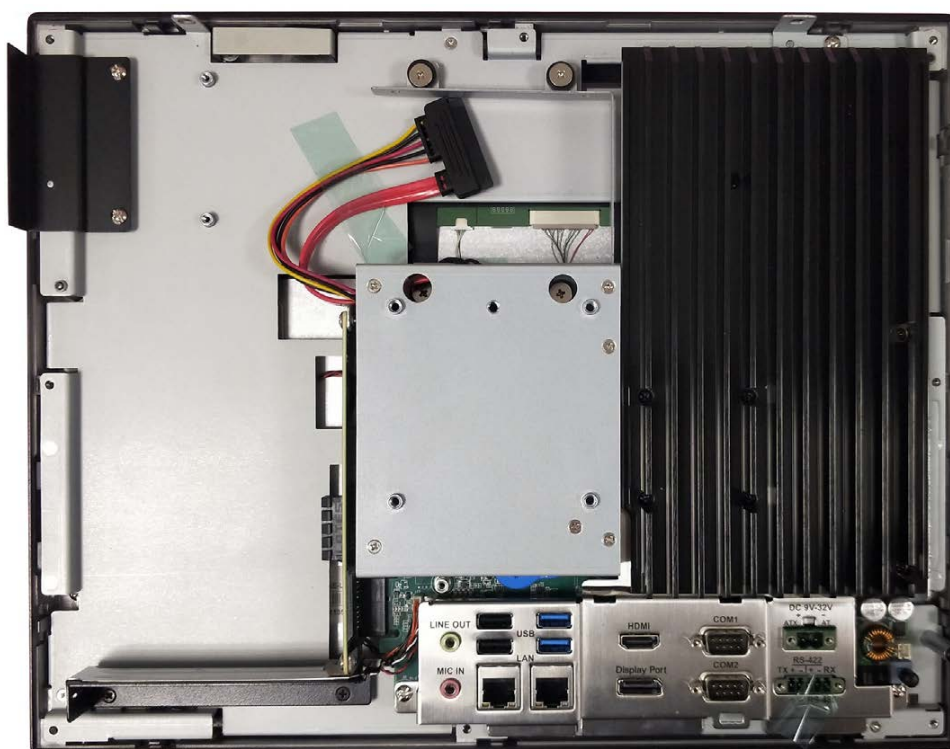


Figure 2.6



- Remove the eight screws on the heatsink and remove the heatsink.

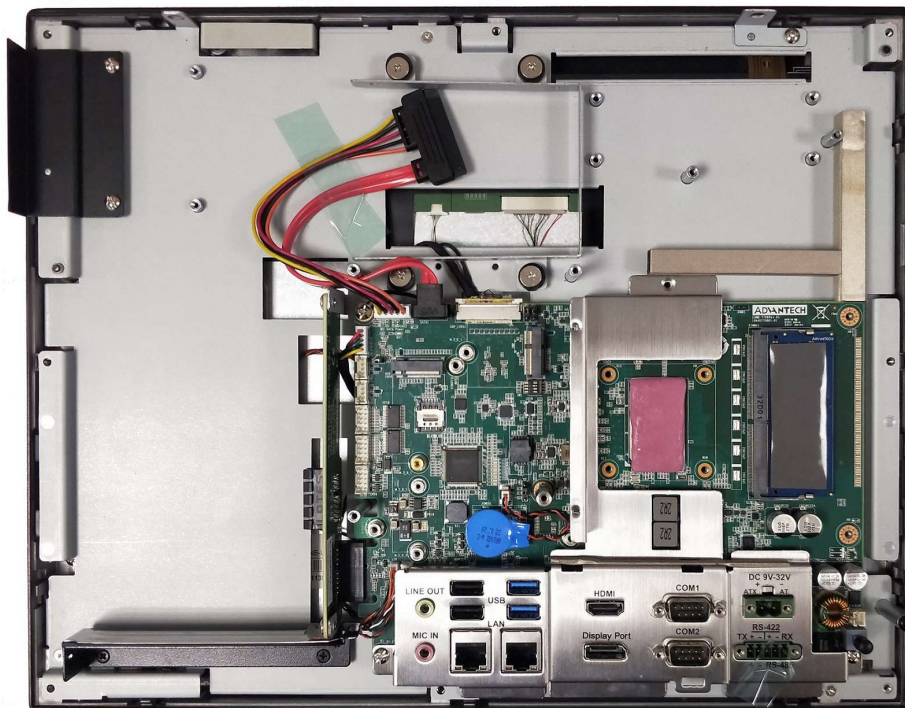


Figure 2.7

- Insert the memory card into the slot (highlighted in the red square in Fig. 2.8). Retrieve the thermal pad provided in the accessory box and install it directly atop the memory card and CPU. Then replace the heatsink.  
(CPU Thermal pad PN:1990034408N010; Memory Thermal pad PN:1990031601N000)

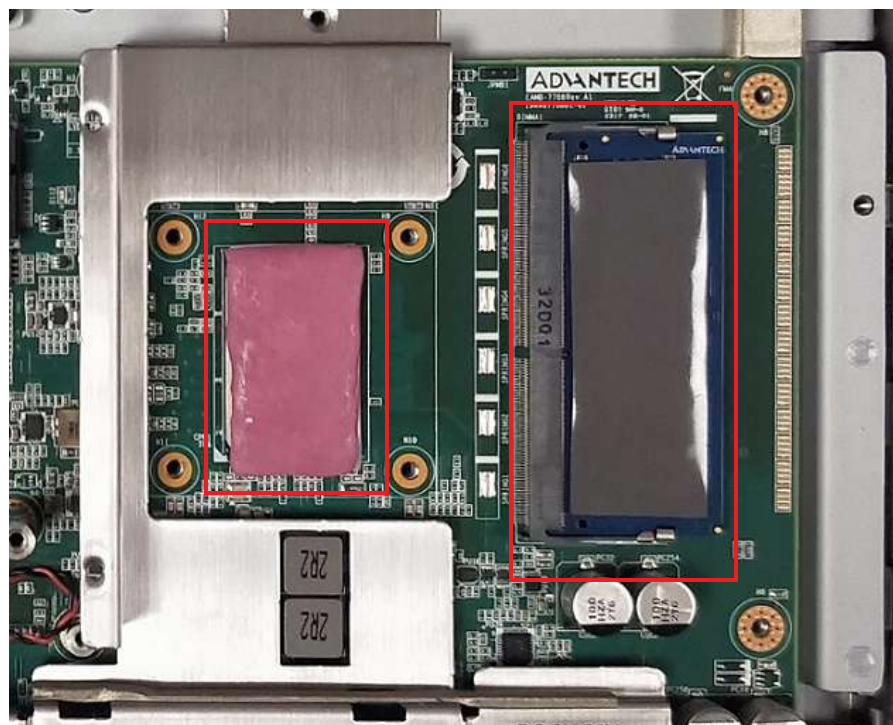


Figure 2.8

## 2.4 SSD Installation

1. Follow Step 1 of Section 2.3 to remove the rear cover (see Figs. 2.5 and 2.6).
2. Remove the six screws (circled in red) to remove the VESA mount plate (see Fig. 2.9).

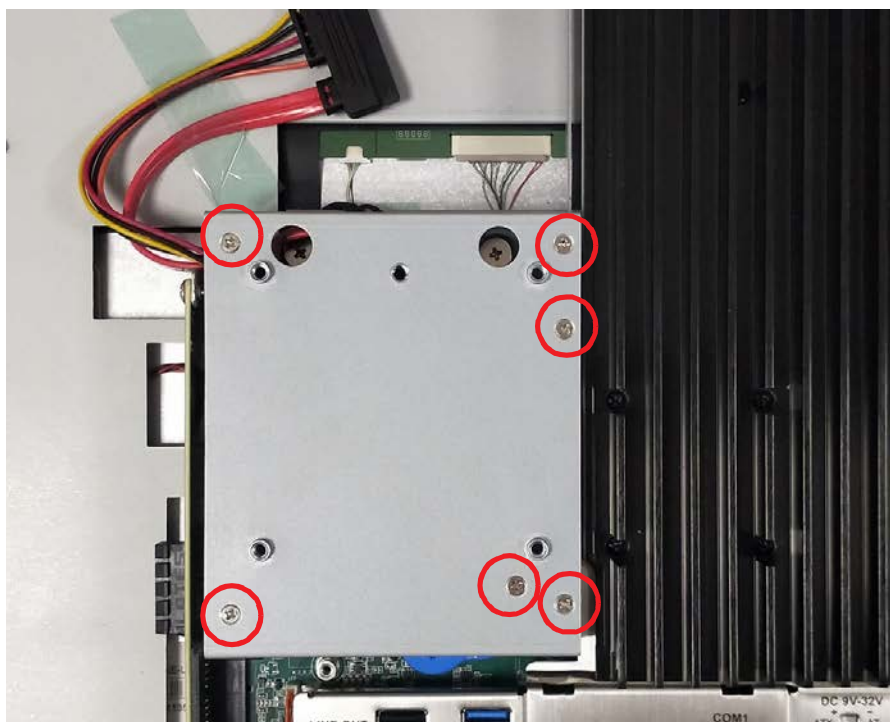


Figure 2.9

3. Remove the four screws (circled in red in Fig. 2.10) to remove the SSD cover.

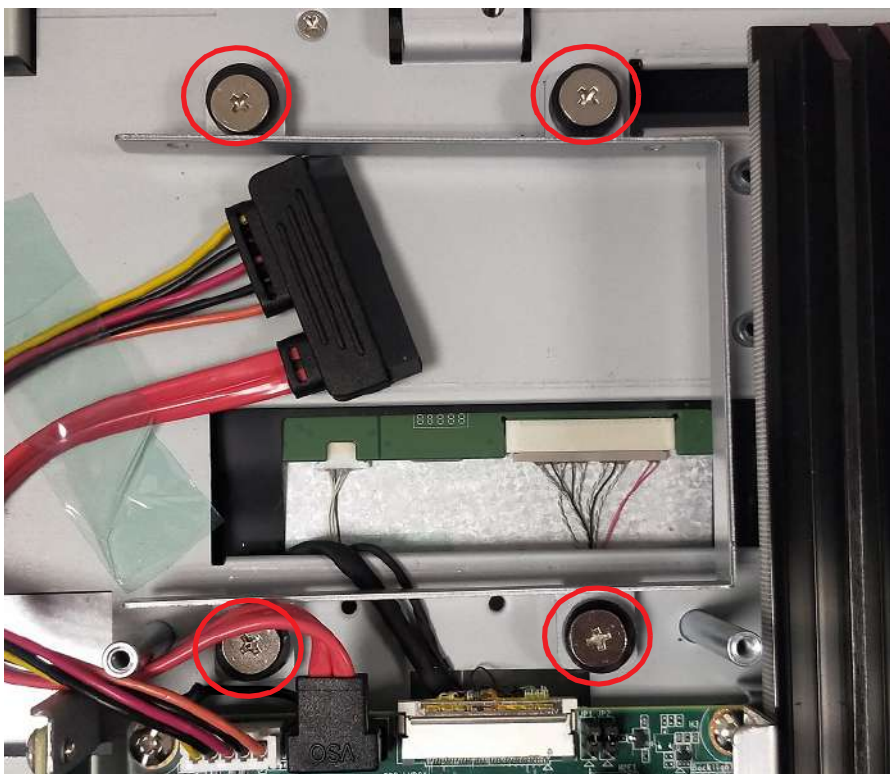


Figure 2.10

- Retrieve four screws from the accessory box and use them to affix the SSD to the SSD bracket (see Fig. 2.11). Then connect SSD cable to the SSD (see Fig 2.12).



Figure 2.11



Figure 2.12



## 2.5 M.2 Installation

1. Follow Steps 1 and 2 of Section 2.4 to remove the rear cover and VESA mount plate. The disassembled machine should appear as shown in Fig. 2.13.



Figure 2.13

2. To install a 22X80mm size M.2 card, insert the M.2 card into the correct main-board slot, and affix it in place using one M3x5L screws provided in the accessory box.

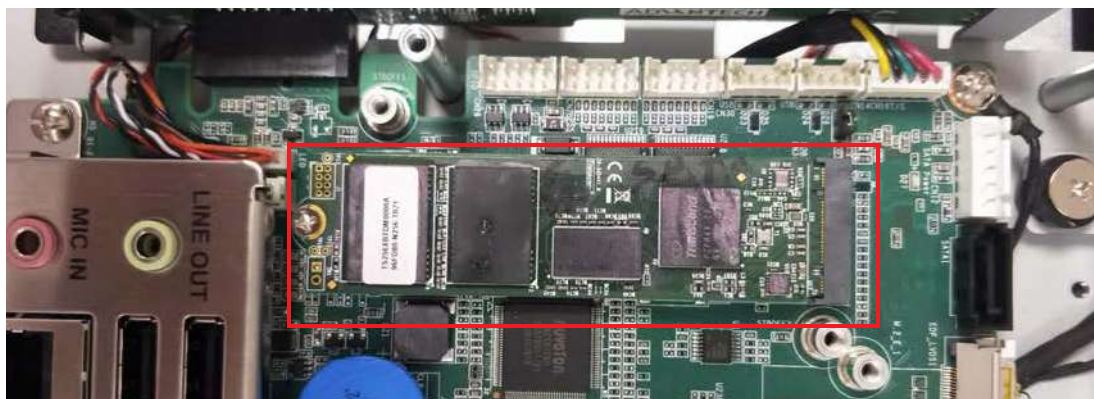


Figure 2.14

3. To install a 22X42 mm size M.2 card, add a copper cylinder screw (see Fig. 2.15) which provided in the accessory box . Then insert the M.2 card into the correct mainboard slot, and affix it in place using one M2.5x3L screws.

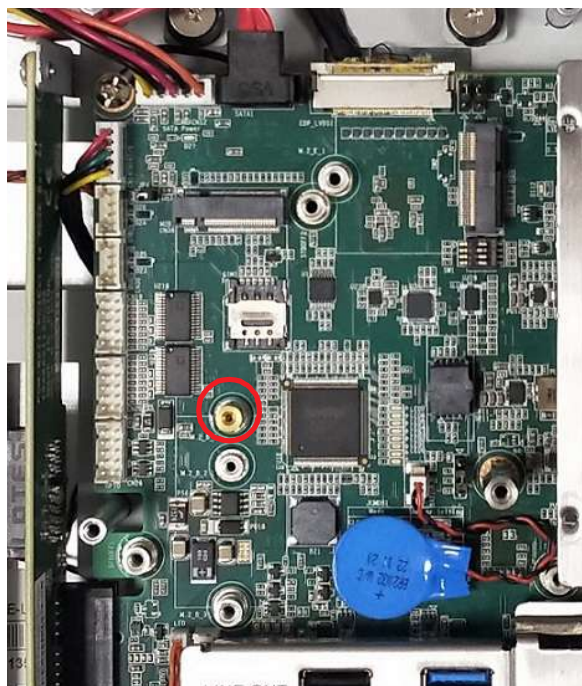


Figure 2.15

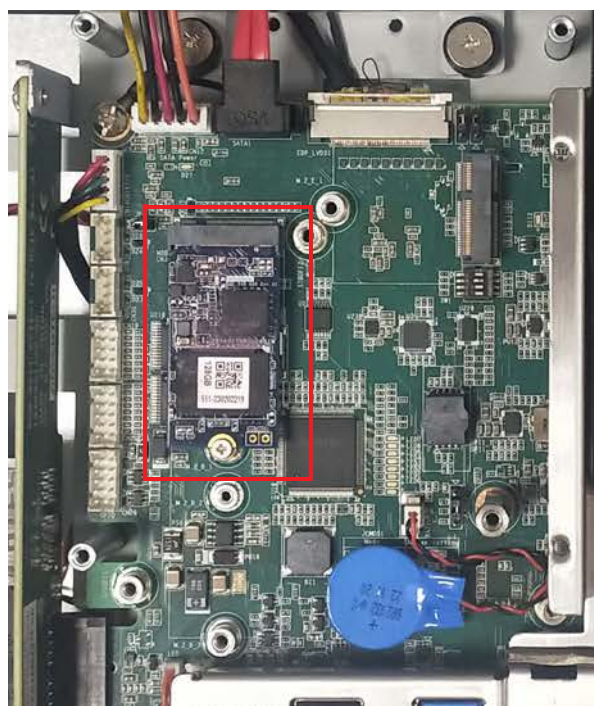


Figure 2.16

4. Replace the VESA mount plate and rear cover and secure with screws.



## 2.6 Wireless LAN Card Installation

1. Follow Steps 1 and 2 of Section 2.4 to remove the rear cover and VESA mount plate.
2. Affix the wireless LAN card to the bracket using the screws provided with the Wi-Fi module (model name: PPC-WLAN-D2).



Figure 2.17

3. Insert the wireless LAN card into the appropriate mainboard slot.

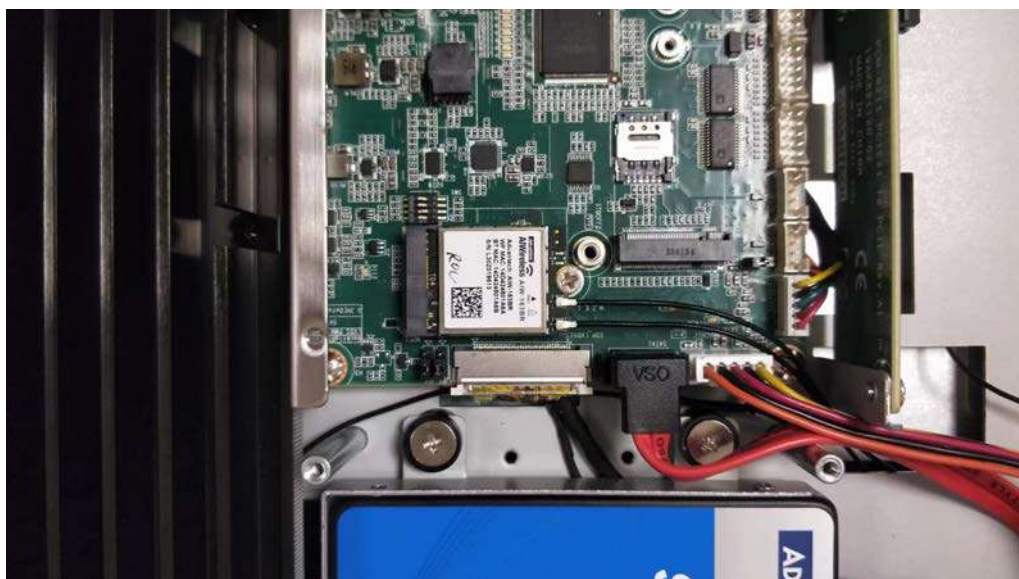


Figure 2.18

4. Connect the cables of the wireless LAN card to the antenna holder. Note the installation direction of the cable end and nut/washer.



Figure 2.19

5. Secure the assembled antenna holder to the top of the panel PC. Then connect the cables to the wireless LAN card (see Fig. 2.20).

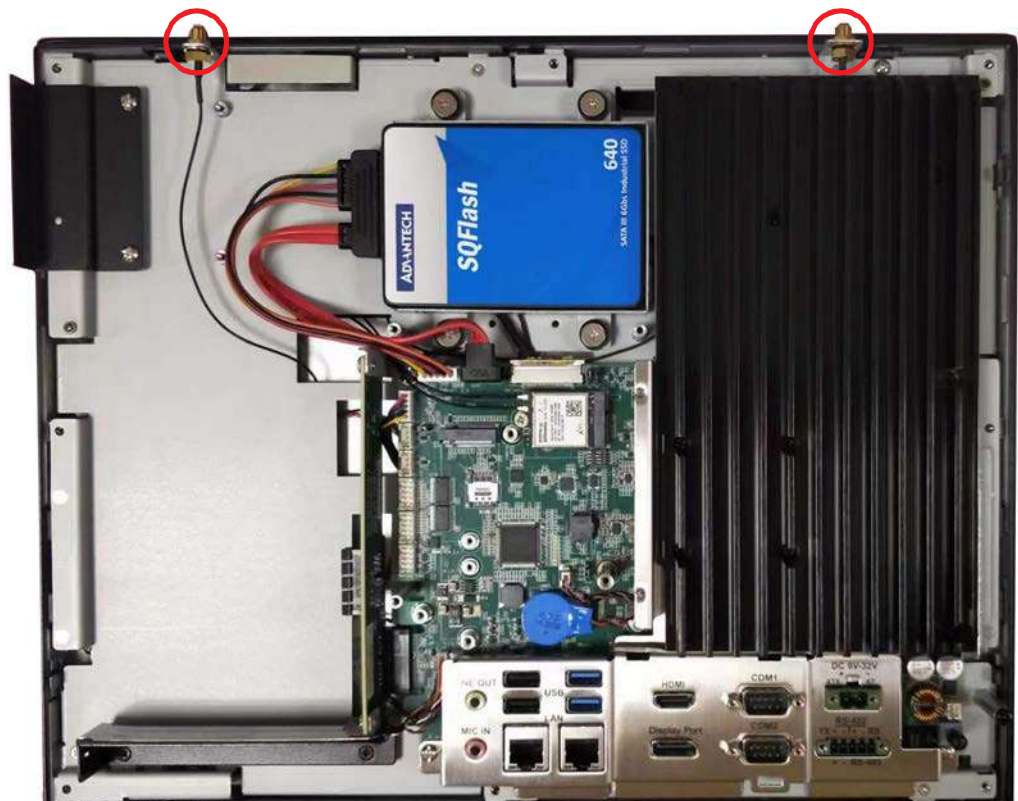
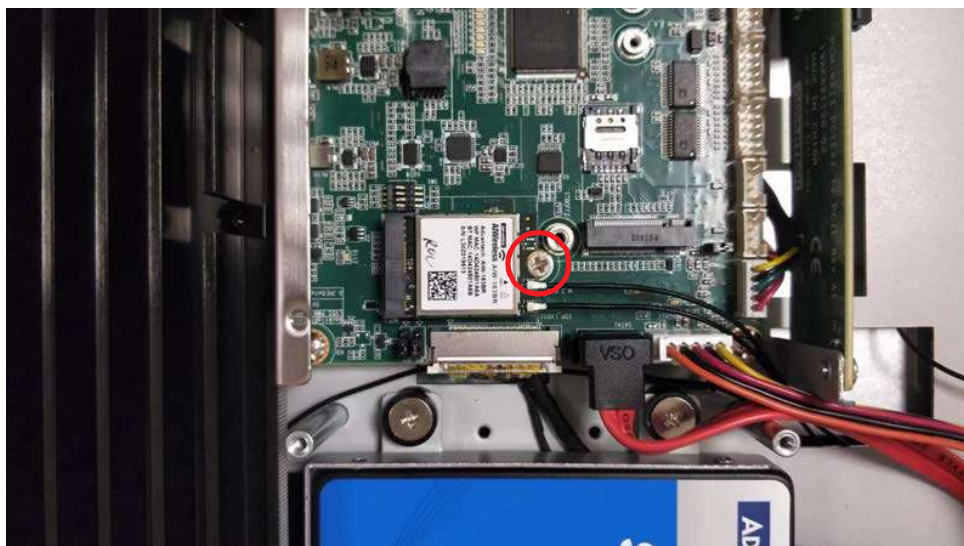


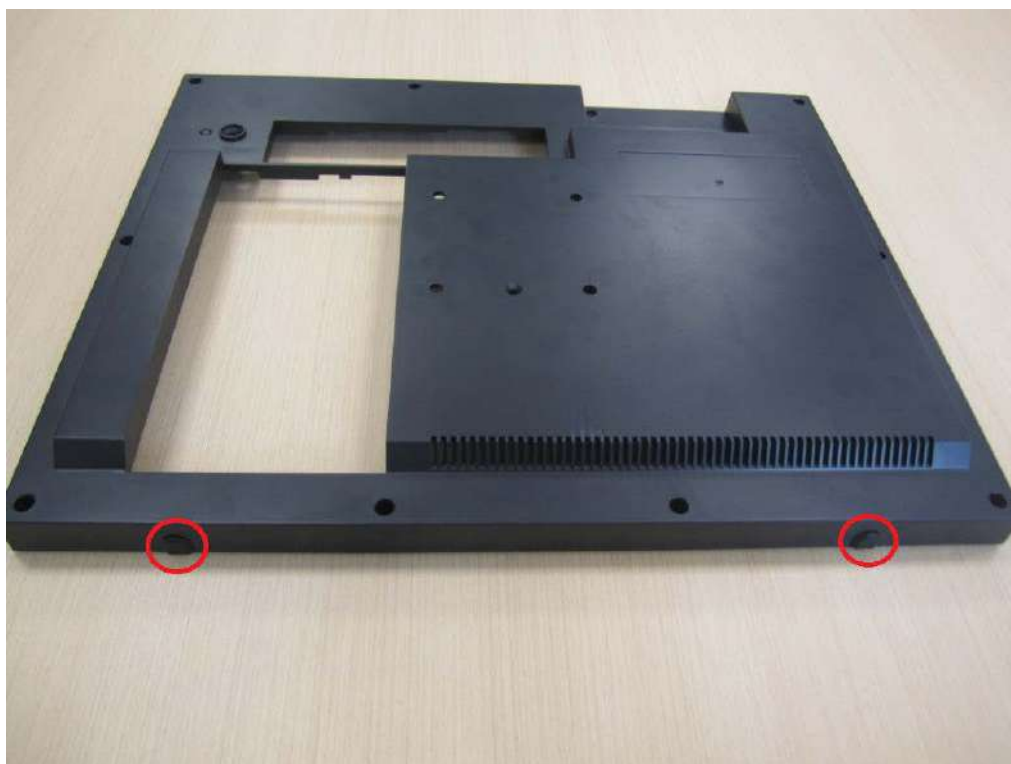
Figure 2.20





**Figure 2.21**

6. Replace the VESA mount plate. Take out two plugs located at the top of the rear cover (see Fig. 2.22) for the antenna connectors. Then replace the rear cover and secure in place using screws. Finally, attach the antennas to the two antenna connectors located at the top of the panel (see Fig. 2.23).



**Figure 2.22**



Figure 2.23

**Note!** *The wireless LAN card shown in the above images to demonstrate the installation procedures is the PPC-WLAN-D2 Wi-Fi module produced by Advantech.*



## 2.7 Install 4G/5G Devices

1. Follow Steps 1 and 2 of Section 2.4 to remove the rear cover and VESA mount plate. The disassembled machine should appear as shown in Fig. 2.13.
2. Add a copper cylinder screw (see Fig. 2.24) provided in the accessory box. Then insert the M.2 card into the correct mainboard slot, and affix it in place using one M2.5x3L screws.

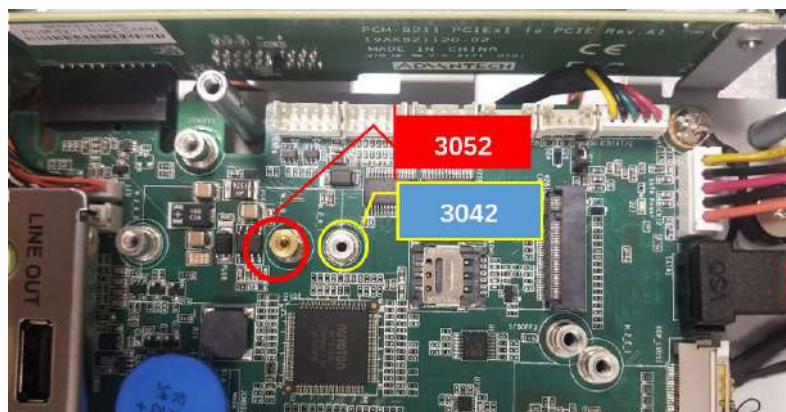


Figure 2.24



Figure 2.25

3. Replace the VESA mount plate and rear cover.

4. Fix the antenna to the bracket (bracket PN is 1960104428N001, need to purchase separately). Then Fix the antenna Bracket and connect the antenna.



Figure 2.26



## 2.8 Riser Card Installation

1. Follow Step 1 of Section 2.3 to remove the rear cover of the panel PC (refer to Figs. 2.5 and 2.6).
2. Insert the riser card into the slot, and secure in place using two screws (see Fig. 2.27). The default riser card is PCIe-to-PCIe. However, a PCIe-to-PCI card (989K821131E for PPC-415, 989K093802E for PPC-417/419) is optional, allowing users to select the appropriate card according to their usage requirements.

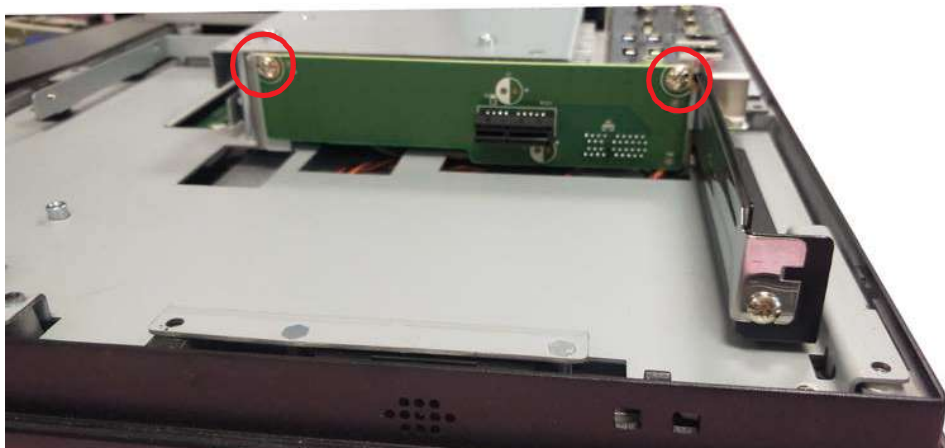


Figure 2.27

3. Remove the card slot shield and insert the card (see Fig. 2.28). Secure the card in place using the screws. Then replace the rear cover.



Figure 2.28

**Note!** The PPC-415 panel PCs support riser cards with maximum dimension of 176 x 107 mm.



The PPC-417/419 panel PCs support riser cards with maximum dimension of 240.0\*127 mm.

## 2.9 AT/ATX Function Switch

Located at the rear of the panel PC is an AT/ATX function switch that allows users to choose between AT/ATX mode without removing the rear cover (see Figs. 2.29 and 2.30).



Figure 2.29 ATX Mode



Figure 2.30 AT Mode

## 2.10 Mount Bracket Installation

### Wall Mount Bracket Installation

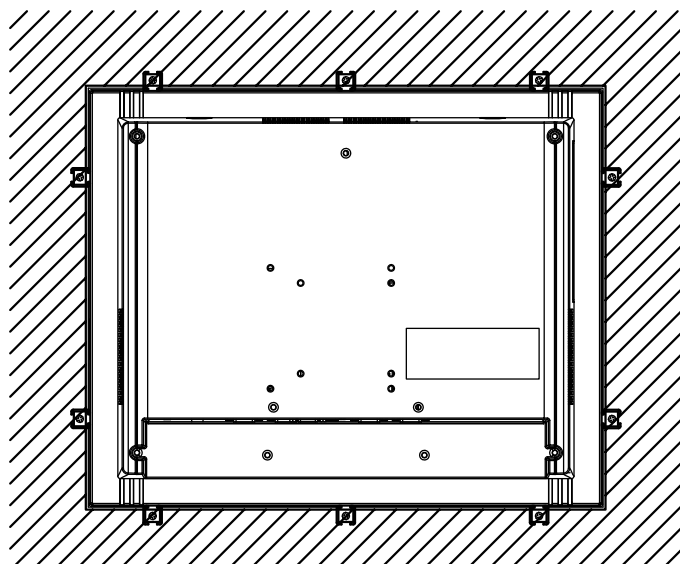
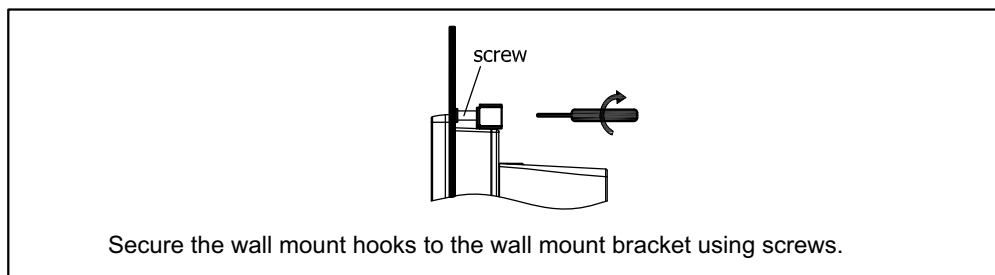
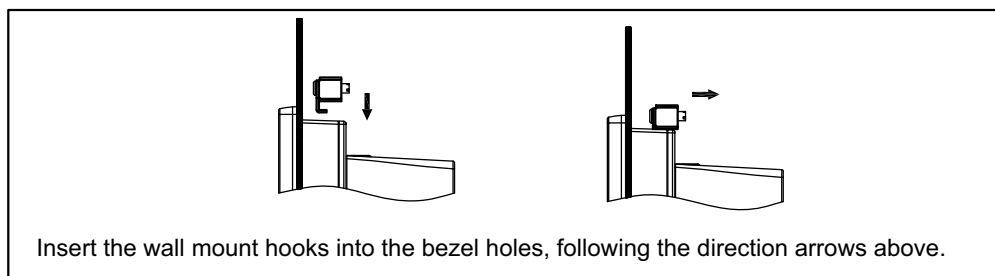
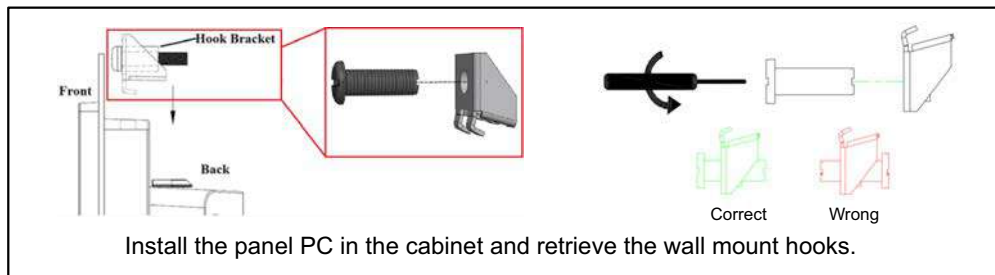
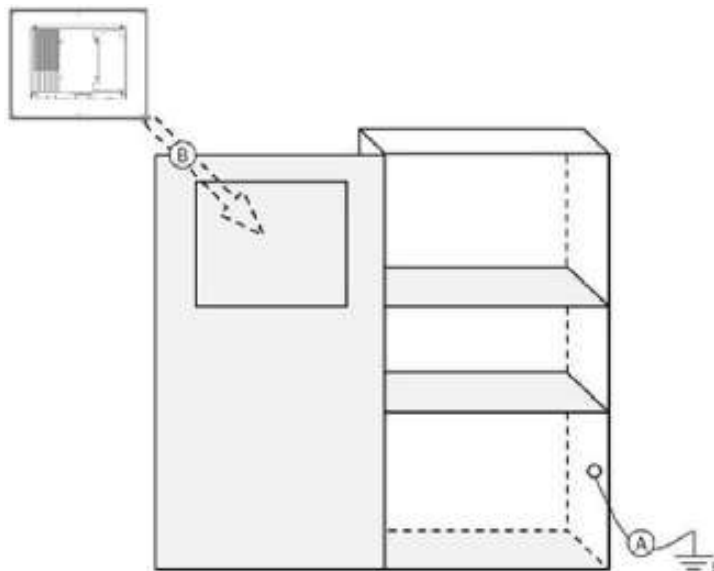


Figure 2.31

## 2.11 Cabinet Installation and Grounding

Follow these instructions to install the PPC system, and pay attention to the ground pin which should be connected to the earth/ground. PPC system should give the best performance for EMI optimum EMI immunity, ESD immunity, surge immunity, and system isolation. If the PPC system is embedded in the cabinet, the PPC system's ground, cabinet's ground and earth/ground should be connected together.

1. Install the PPC system into the cabinet.

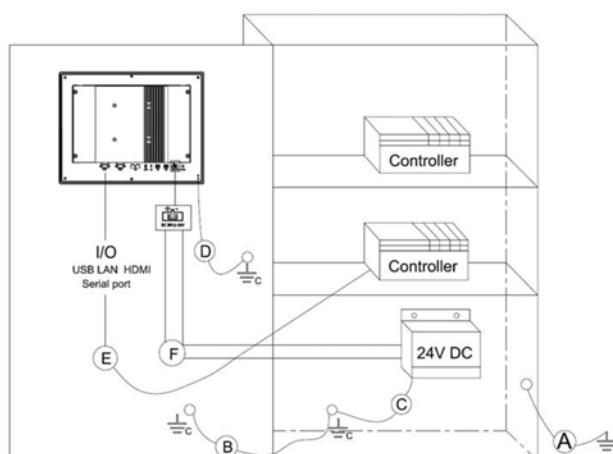


**Figure 2.32 Cabinet Installation**

**Step A:** Connect the cabinet to the earth/ground.

**Step B:** Embed null PPC system into the cabinet without any I/O cable and power.

2. System wiring.



**Figure 2.33 System Wiring Diagram**

**Step A:** Connect the cabinet to the earth/ground.

**Step B:** Ensure that all cabinets have been grounded together.

**Step C:** Connect the ground of the power supply to the cabinet.

**Step D:** Connect the ground pin of PPC system to the cabinet.

**Note!** *The wire of the protective earthing conductor shall be green-and-yellow, xx AWG/ 0.75mm<sup>2</sup> and connecting to earth of building.*  
*Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. By means of a power cord connected to a socket- outlet with earthing connection.*



## 2.12 Optional Module Installation

The PPC-415/417/419 supports four optional modules: USB module, CFast module, CF module, and COM module (see Fig. 2.34).

Detailed installation instructions are provided below.

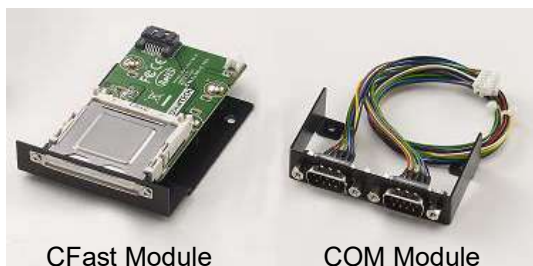


Figure 2.34

### A. CFast Module Installation

1. Remove the screw on the side of the I/O cover (see Fig. 2.35).

**Note!** *Retain the I/O cover for future use when a module is not installed.*

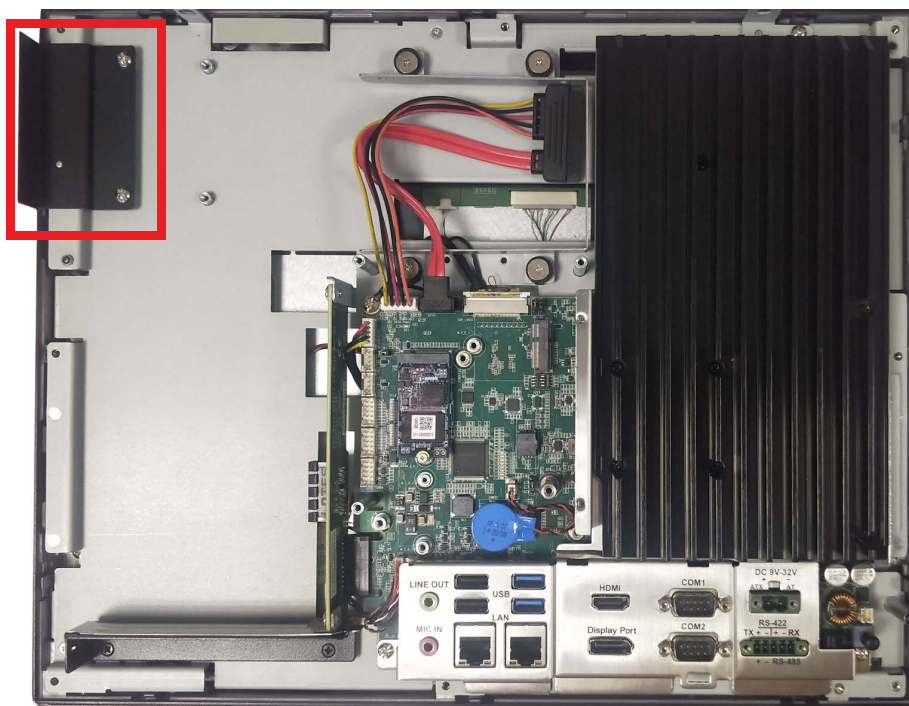


Figure 2.35



- Retrieve the CFast module card from the module case and remove the two screws located at the side (1) of the metal tray. Affix the CFast card to the underside of the metal tray. Then insert the tray in the direction shown in Fig.2.36 (2) and connect the red SATA cable (3). The assembled CFast module should appear as shown in Fig. 2.37.

**Note!** The CFast module should be below the metal tray when installed.  
(98R1C415000 for PPC-415/417;98R1C419000 for PPC-419)



Figure 2.36

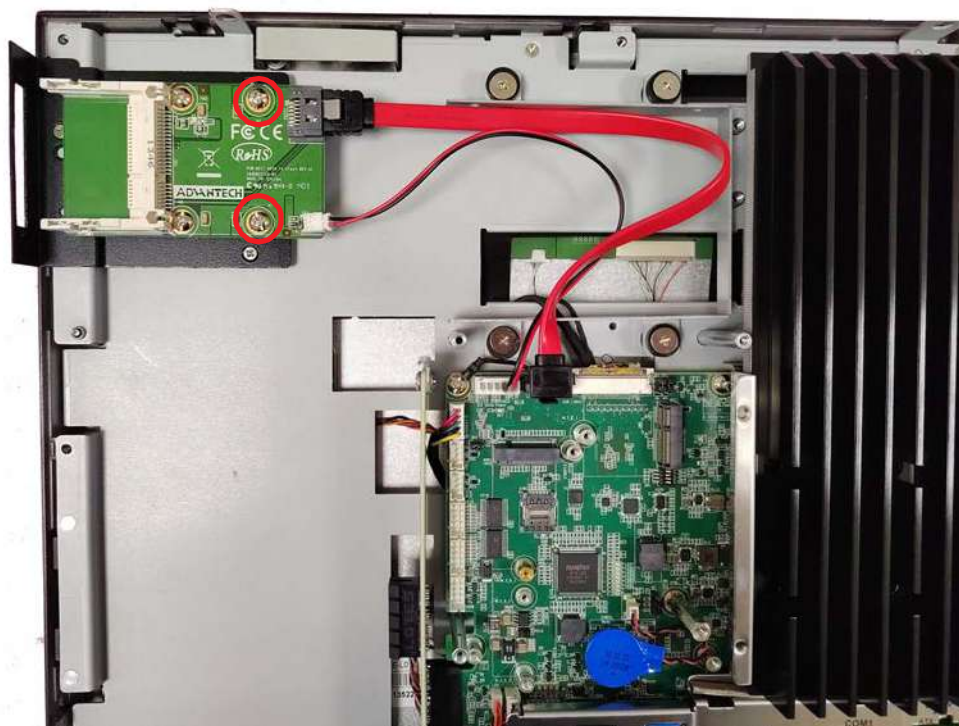


Figure 2.37

## B. COM Module (98R3C31500E for PPC-415/417; 98R3C31900E for PPC-419) Installation

There are two options for COM module installation: Via the I/O or via the expansion slot. Both methods of installation are explained below.

### B.1 Via the I/O

1. Follow Steps 1 ~ 3 of Subsection A.
2. Retrieve the two COM connectors from the module case and affix them to the I/O shield at the side of the device using two screws. Then connect the COM cables to the mainboard and secure with a cable tie (see Fig. 2.52).

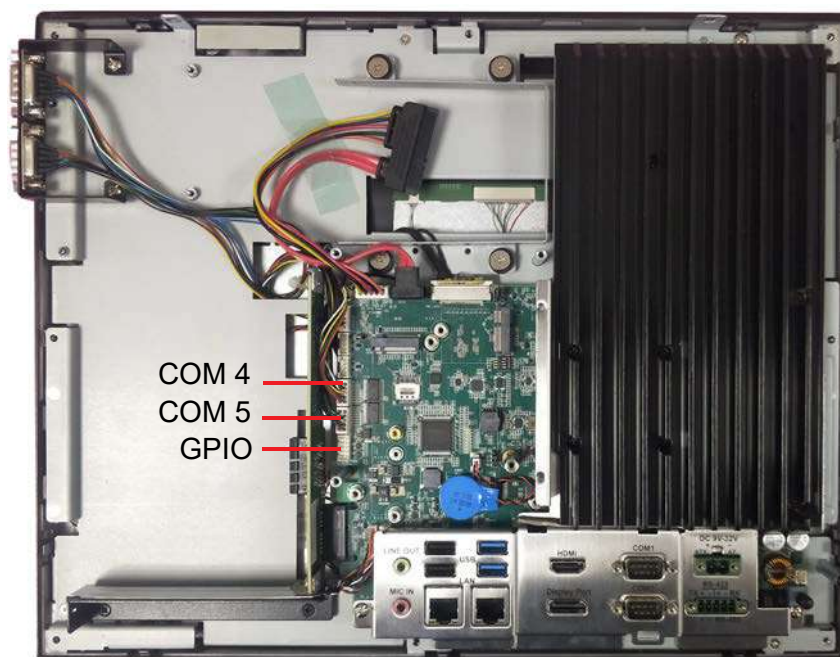


Figure 2.38

3. If you are using wall mount installation, please help to replace the hook which marked N (in the module box) as shown in Figure 2.54 and 2.55.



Figure 2.39



Figure 2.40

### B.2 Via the expansion slot

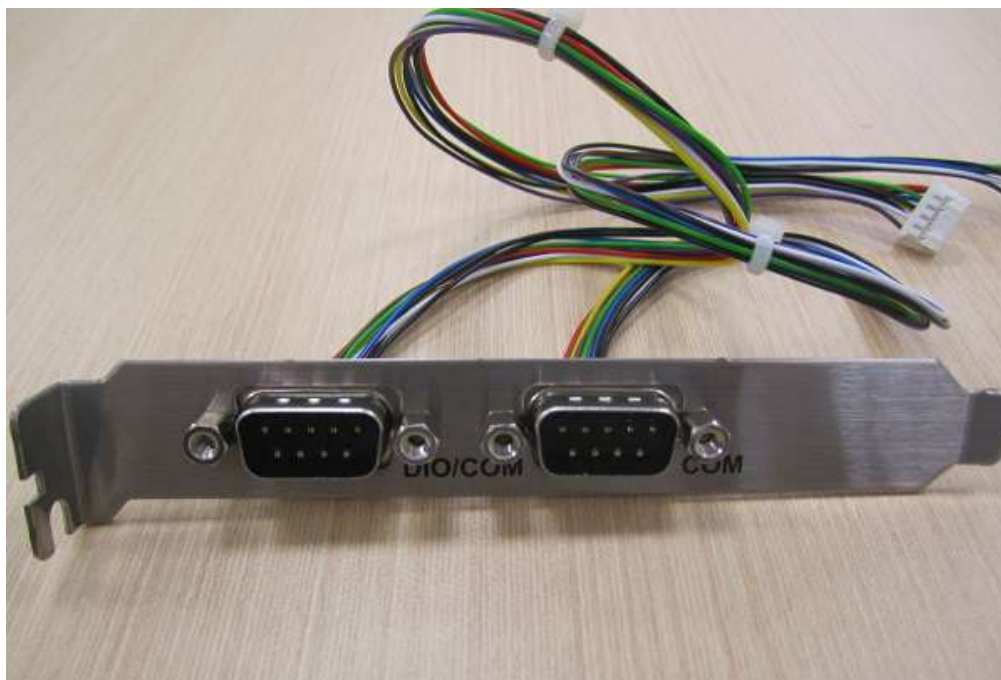
1. Follow Steps 1 ~ 2 of Subsection A.
2. Remove the two screws on the riser card and the screw on the expansion slot shield (see Fig. 2.56) to retrieve the expansion slot shield.



Figure 2.41



3. Remove the two COM connectors from the module case and affix them to the expansion slot shield (as shown in Fig. 2.57).



**Figure 2.42**

4. Affix the shield with COM connectors to the expansion slot backplate and secure in place using a screw. Connect the two COM cables to the mainboard and secure with cable ties (see Fig. 2.58).



**Figure 2.43**

5. Replace the VESA mount plate and the rear cover to complete the installation.



# Chapter **3**

## Jumper Settings

- Jumpers and Connectors
- External COM Ports and Pin Definitions

## 3.1 Jumpers and Connectors

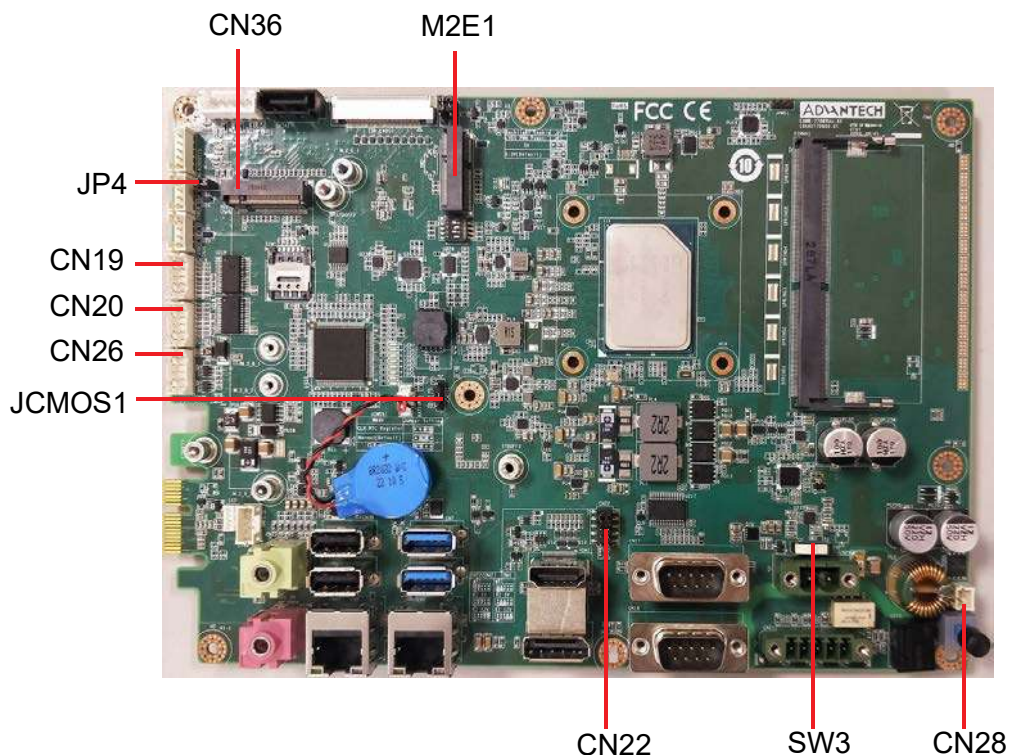
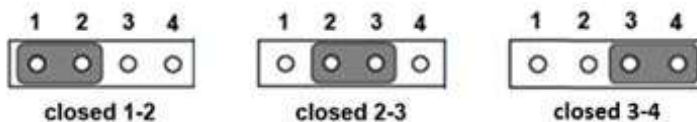


Figure 3.1

**Table 3.1: Jumpers and Connectors**

Connector	Function
CN36	M.2 B-Key 2242/2280/3042/3052
M2E1	M.2 E-Key 2230
JCMOS1	RTC Select
JP4	Resistance Touch Power Select
CN19	COM 4
CN20	COM 5
CN26	GPIO
CN22	Pin 9 power selection (COM 1 and COM 2)
SW3	ATX/AT Select
CN28	Power button connection

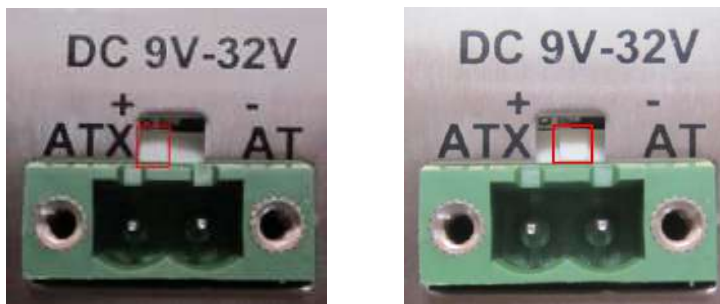
### 3.1.1 RTC Select



**Table 3.2:**

JCMOS1	Function
1-2 pin	CLR RTC Register
2-3 pin	Normal (Default*)
3-4 pin	CLR CMOS

### 3.1.2 ATX/AT Select



**Table 3.3:**

SW3	Function
1-3pin	ATX power (Default*)
2-3pin	AT power

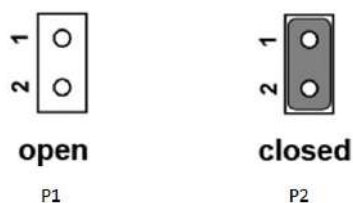
### 3.1.3 Power Button Connection



**Table 3.4:**

CN28	Function
Power Button	Used as a switch if connected to an extension cord.

### 3.1.4 Touch Power Select



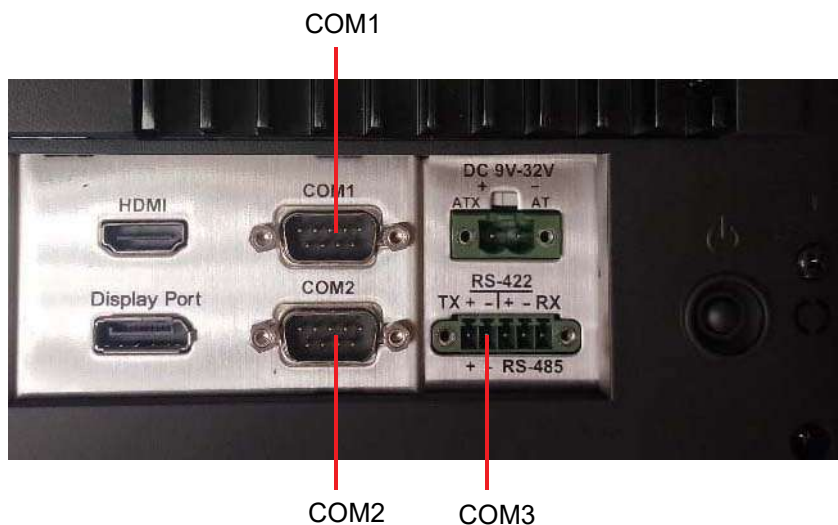
**Table 3.5:**

JP4	Function
Open	Capacitive PCT
Closed	Resistive RES

**Note!** JP4 needs to be connected for resistive screen, while disconnected for capacitive screen.



## 3.2 External COM Ports and Pin Definitions



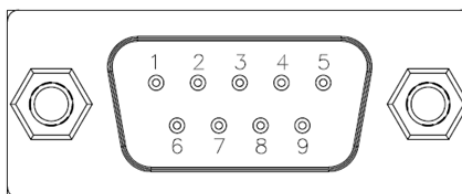
**Figure 3.2**

COM1/COM2: RS-232

COM1/COM2 Pin 9 is set as “RI” by default. This setting can be changed to 5V or 12V output using a jumper.

**Table 3.6:**

	COM1/COM2	COM4/COM5	GPIO
1	DCD	DCD	GND
2	RXD	RXD	GPIO4
3	TXD	TXD	GPIO0
4	DTR	DTR	GPIO5
5	GND	GND	GPIO1
6	DSR	DSR	GPIO6
7	RTS	RTS	GPIO2
8	CTS	CTS	GPIO7
9	RI or 5V/12V output	RI	GPIO3

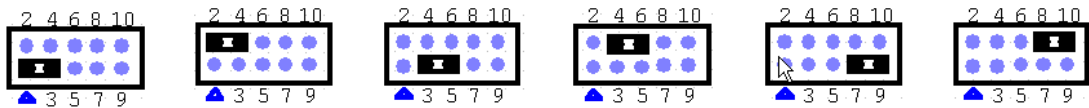




### 3.2.1 COM1 /COM2 Pin 9 Power Select

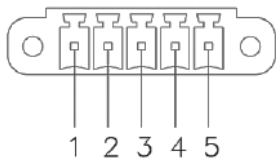
**Table 3.7:**

CN22	Function
(1-3)/(2-4) pin	COM1/COM2 RI (Default*)
(3-5)/(4-6) pin	COM1/COM2 pin 9 5V
(7-9)/(8-10) pin	COM1/COM2 pin 9 12V



### 3.2.2 COM3

COM 3: RS-422/485 with isolated 1000 VDC (configurable via the BIOS Setup Utility).



**Table 3.8:**

COM3	1pin	2pin	3pin	4pin	5pin
RS422	TX+	TX-	RX+	RX-	GND
RS485	D+	D-			GND



# Chapter 4

## Software Setup

- Installing Drivers
- BIOS Setup Utility

## 4.1 Installing Drivers

When you install the system for the first time, please install the corresponding drivers in advance to make sure all the functions run normally. Please select the drivers to be installed based on the OS you use. Please go to the Advantech.

## 4.2 BIOS Setup Utility

### 4.2.1 Entering BIOS Setup

You can enter BIOS setup utility by pressing "Delete".

You should always press "F4" to save the settings you have made and exit the setup utility, otherwise those settings will not be saved in BIOS.



Figure 4.1

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

#### ■ System Time / System Date

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 must be entered in HH:MM:SS format.

## 4.2.2 CPU Configuration

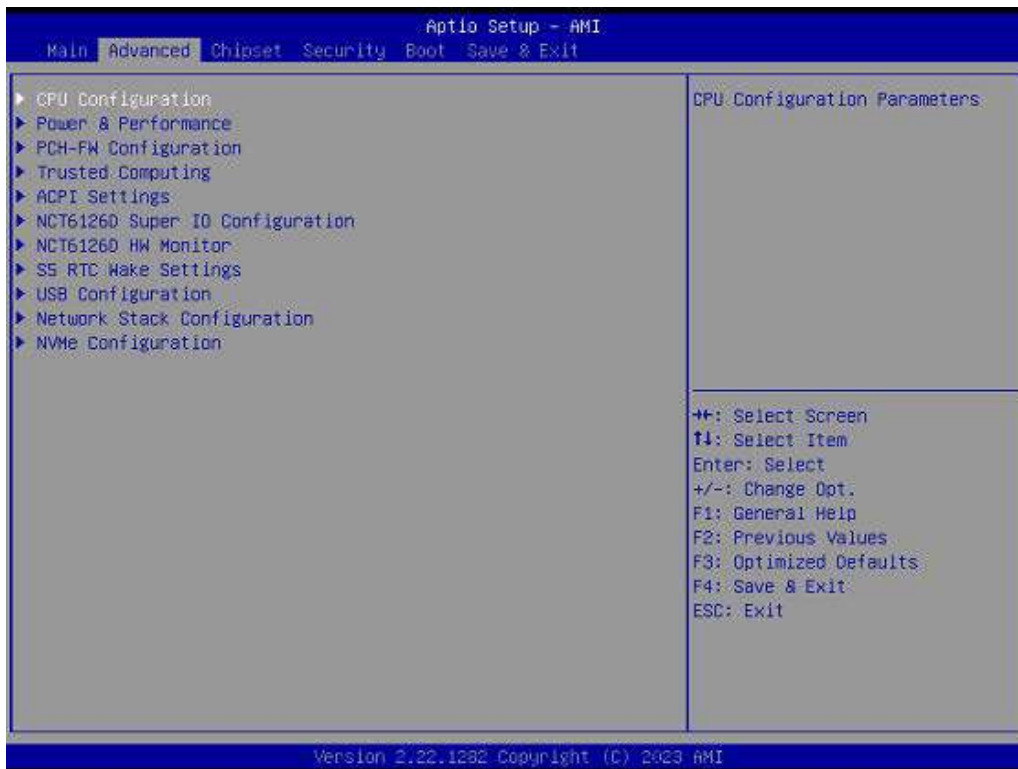


Figure 4.2

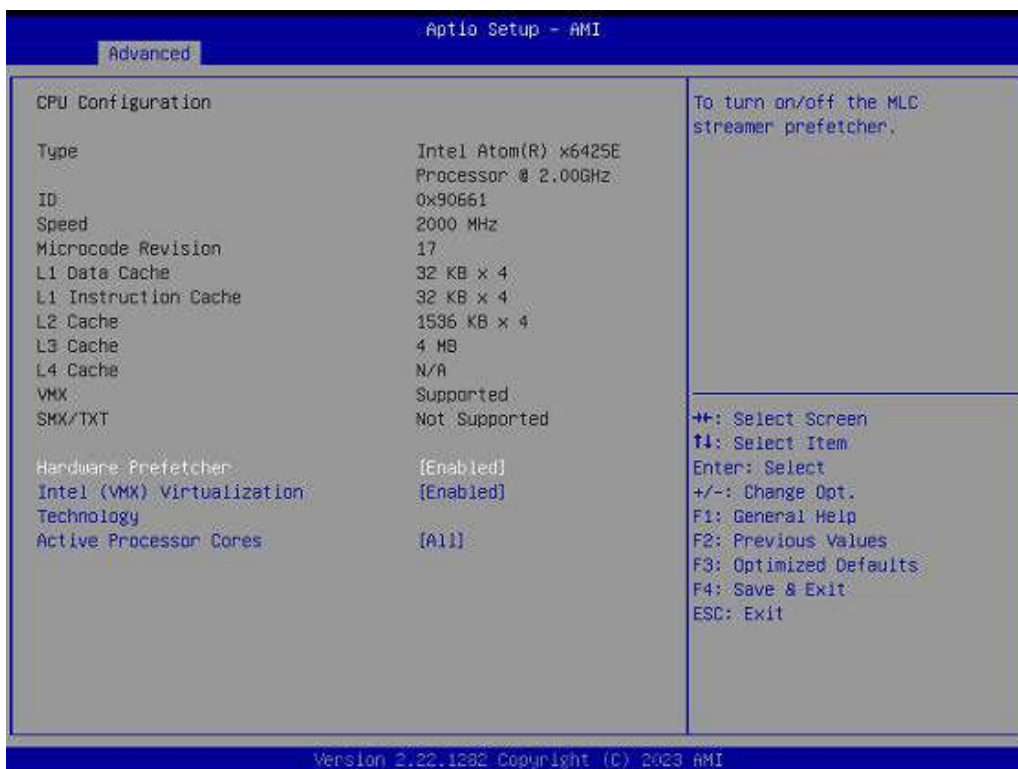


Figure 4.3

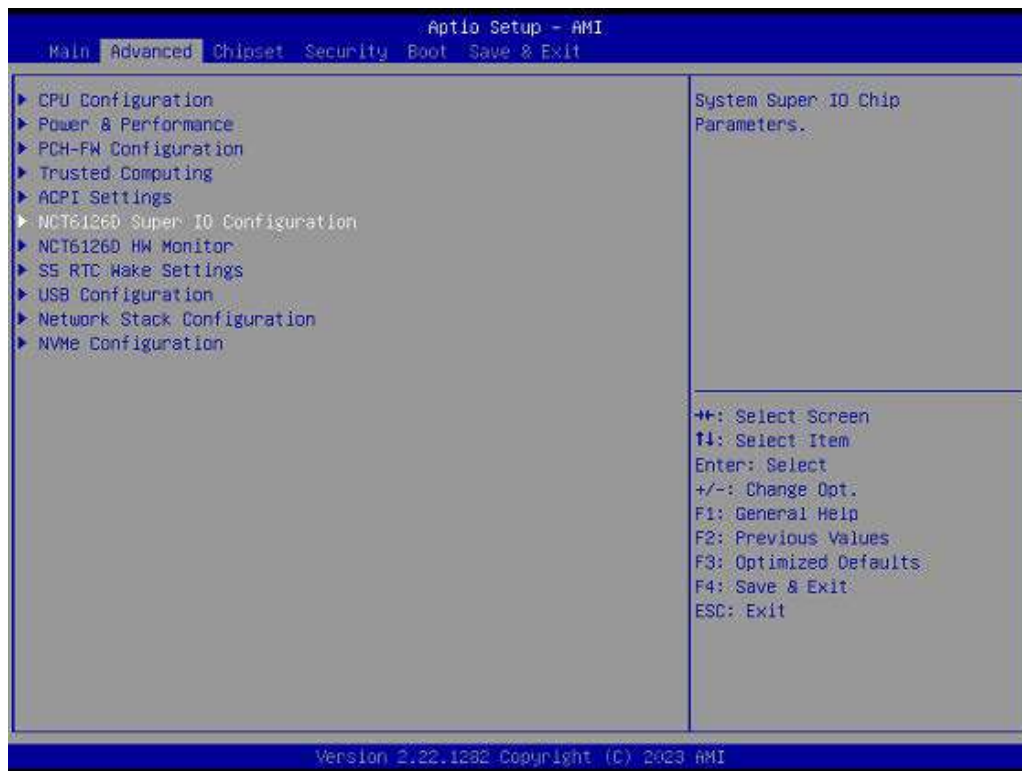
- **CPU Configuration**  
CPU type and frequency.

■ **Intel Virtualization Technology**

This item allows users to enable or disable Intel Virtualization Technology. When enabled, a VMM can utilize additional hardware capabilities provided by Vander-pool Technology.

**4.2.3 COM3 Mode Selection (RS422/RS485)**

1. Select NCT6126D Super IO Configuration in the Advanced tab.



**Figure 4.4**



2. Select Serial Port 3 Configuration option.



Figure 4.5

3. Select Serial Port 3 Mode option to set the COM3 operation mode as RS422, or RS485.

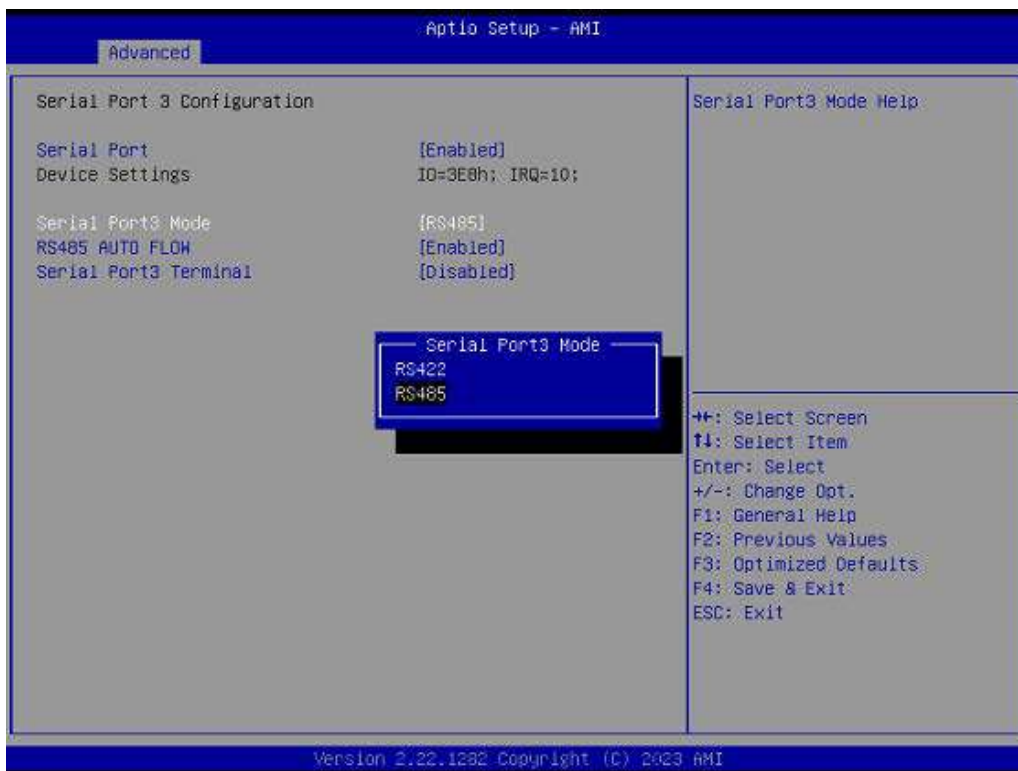
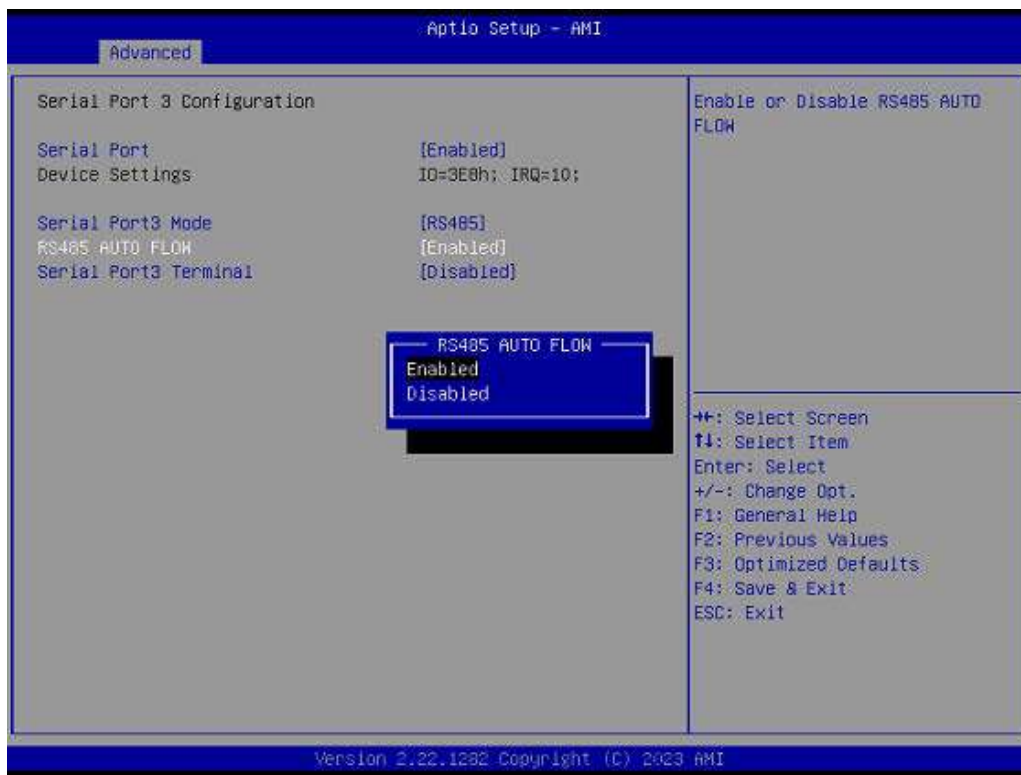


Figure 4.6

- **Serial Port 3 Configuration**  
Select Serial Port 3 setting (RS422/RS485)
4. If COM3 mode is set as RS485, the RS485 Auto Flow control option can be Enabled or Disabled.



**Figure 4.7**

- **Serial Port 3 RS485 Configuration**  
RS485 Auto Flow control option can be (Enabled or Disabled)

## 4.2.4 Hardware Monitor

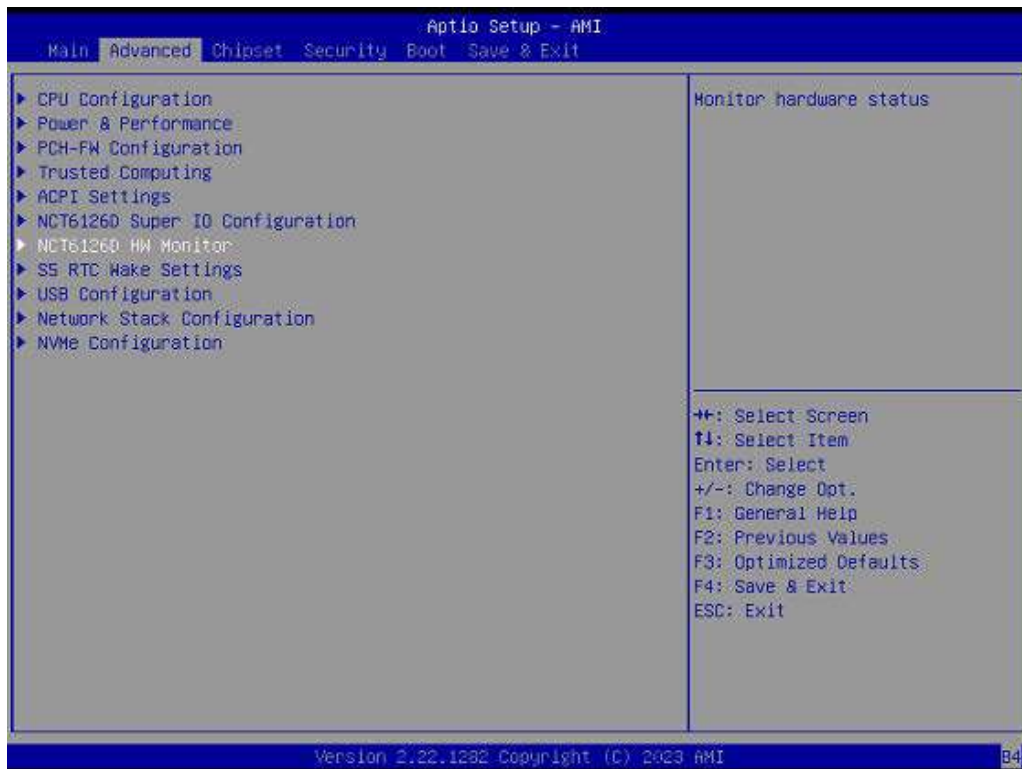


Figure 4.8

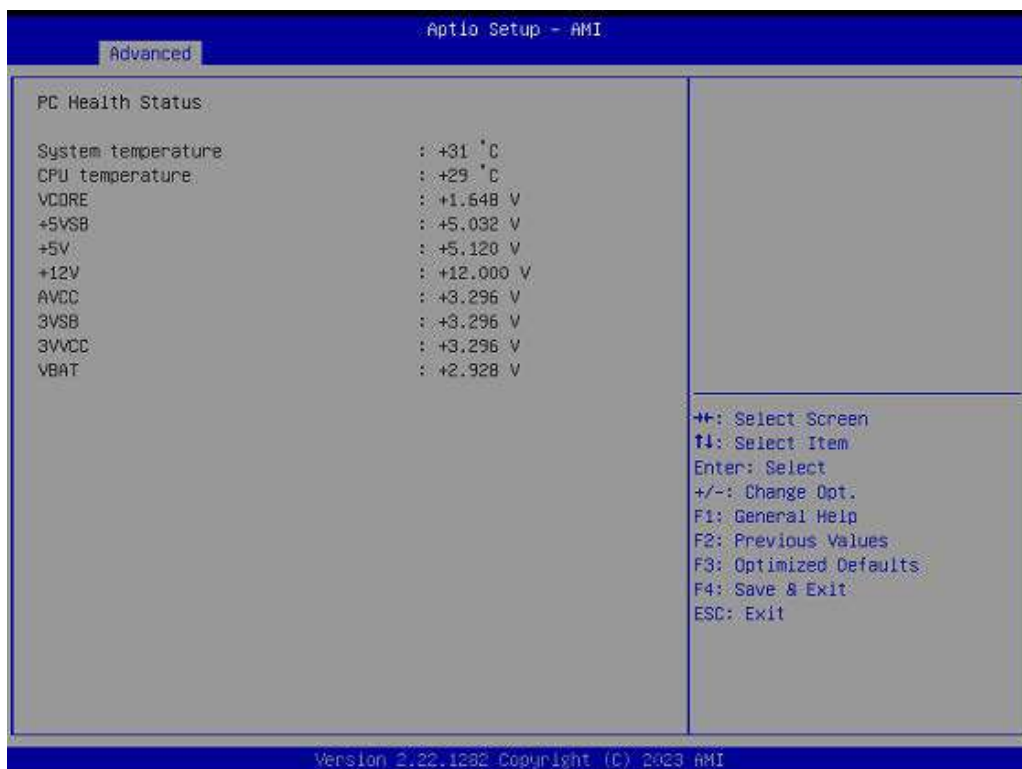


Figure 4.9

- **EC Hardware Monitor**

This page displays all information about system Temperature/Voltage/Current.

## 4.2.5 USB Configuration

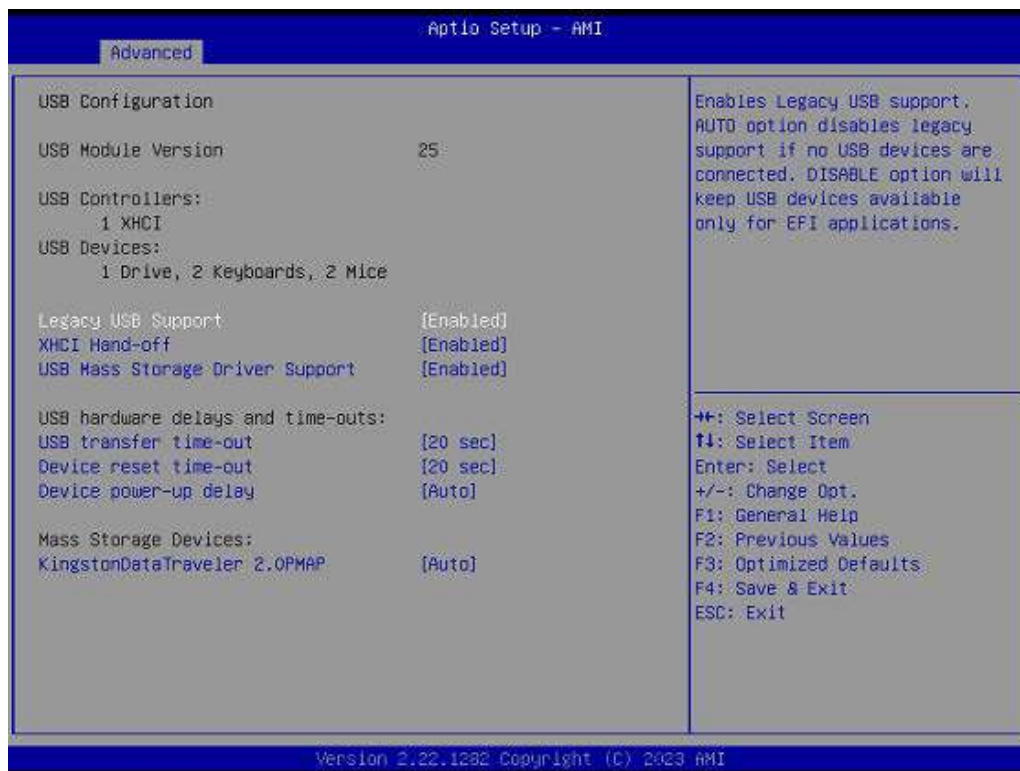


Figure 4.10

- **XHCI Hand-off**  
This is a workaround of 0Secs without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**  
Enable/Disable USB Mass Storage Driver Support

## 4.2.6 SATA configuration

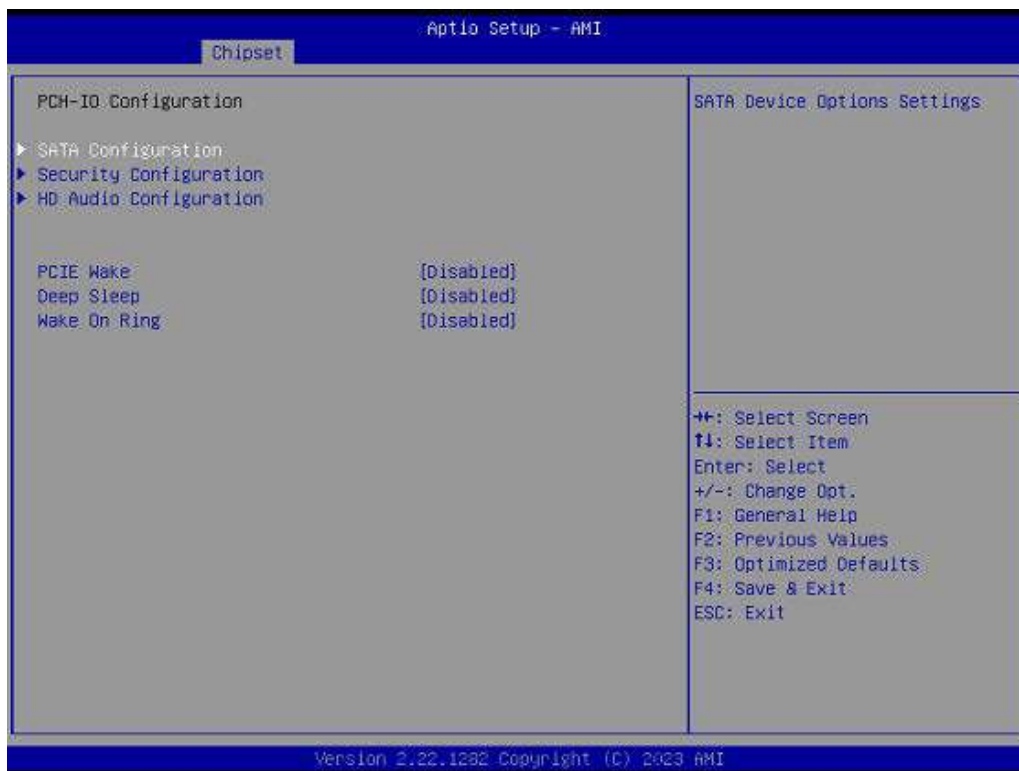


Figure 4.11

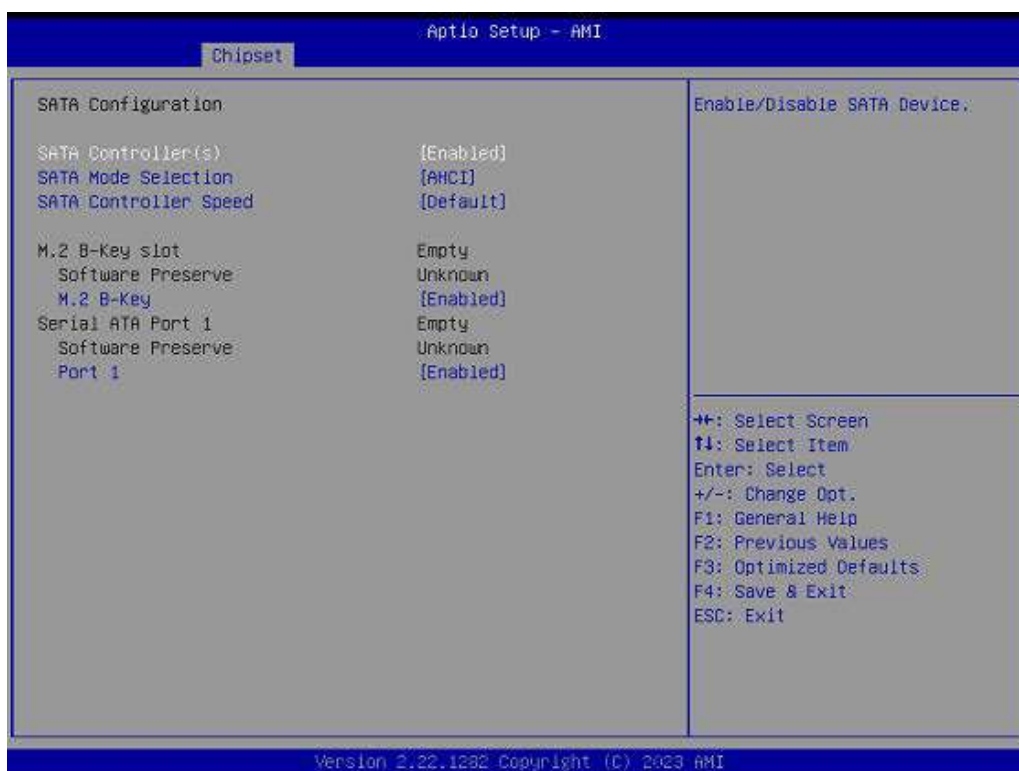


Figure 4.12

- **SATA Controller**  
Enable/Disable SATA Device

- **SATA Mode Selection**  
Determines how SATA controller(s) operate
- **SATA Controller Speed**  
Indicates the maximum speed the SATA controller can support. (Gen1/Gen2/Gen3)
- **M.2 B-key Slot**  
Enable or Disable M.2 B-key port
- **Serial ATA Port**  
Enable or Disable Serial ATA port

## 4.2.7 Wake-on-LAN

1. Select PCH-IO Configuration option in the Chipset tab.

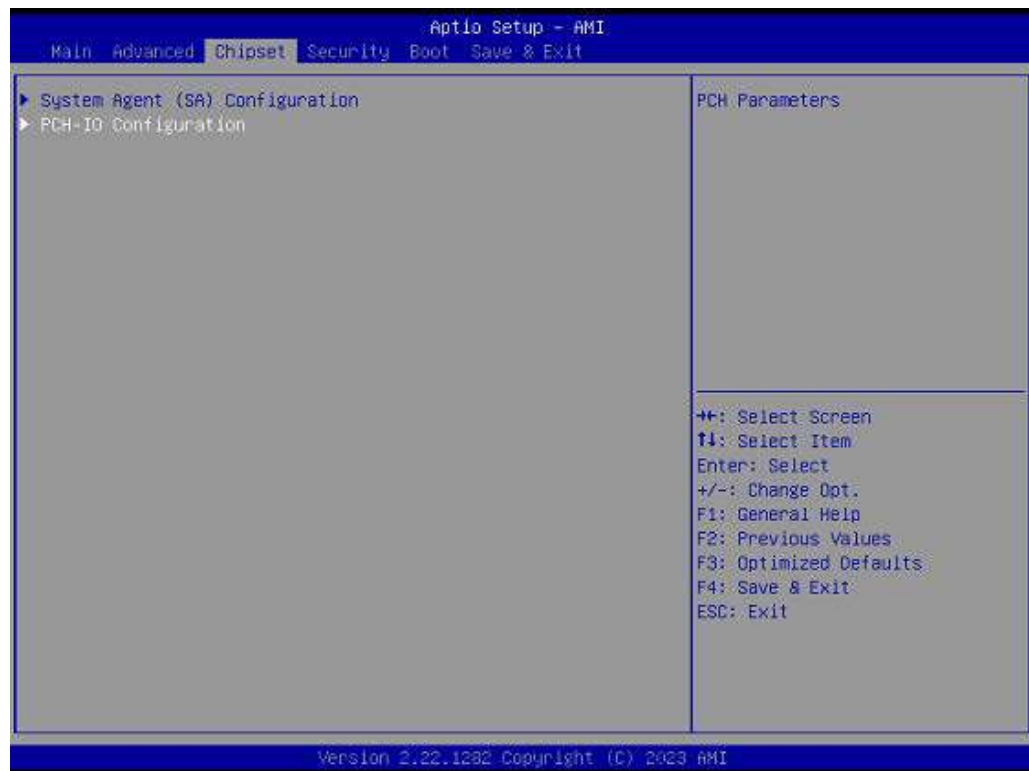


Figure 4.13



2. Set the Wake On By option to Enabled.

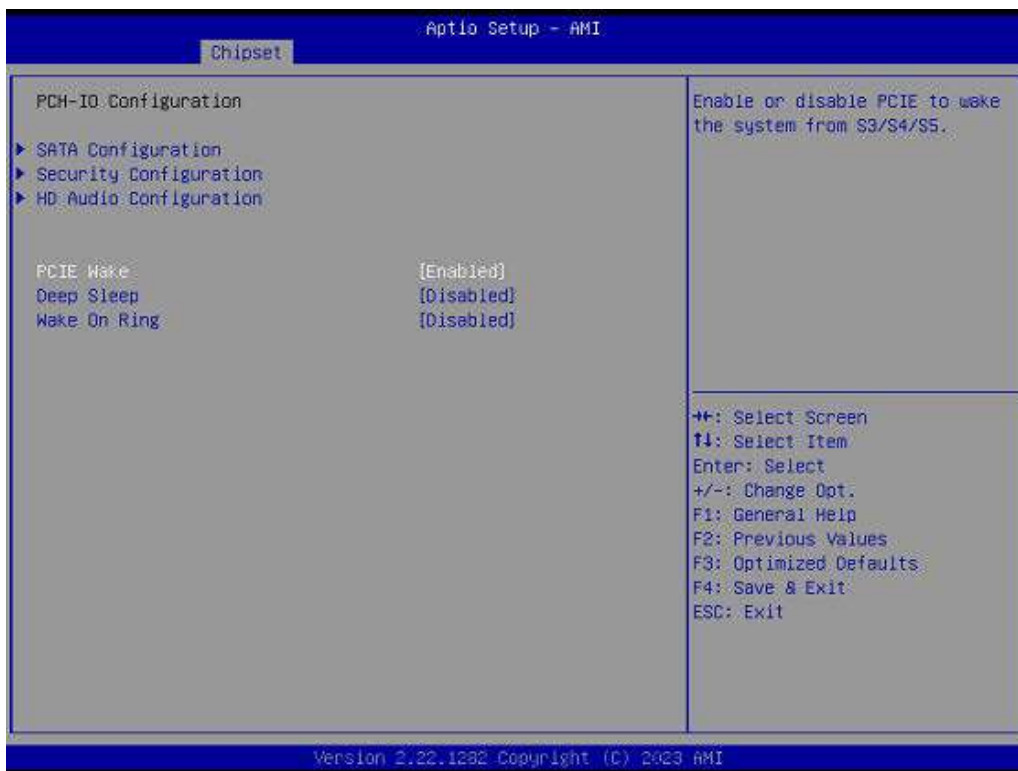


Figure 4.14

### 4.2.8 Deep Sleep

1. Select **PCH-IO Configuration** option in the **Chipset** tab.

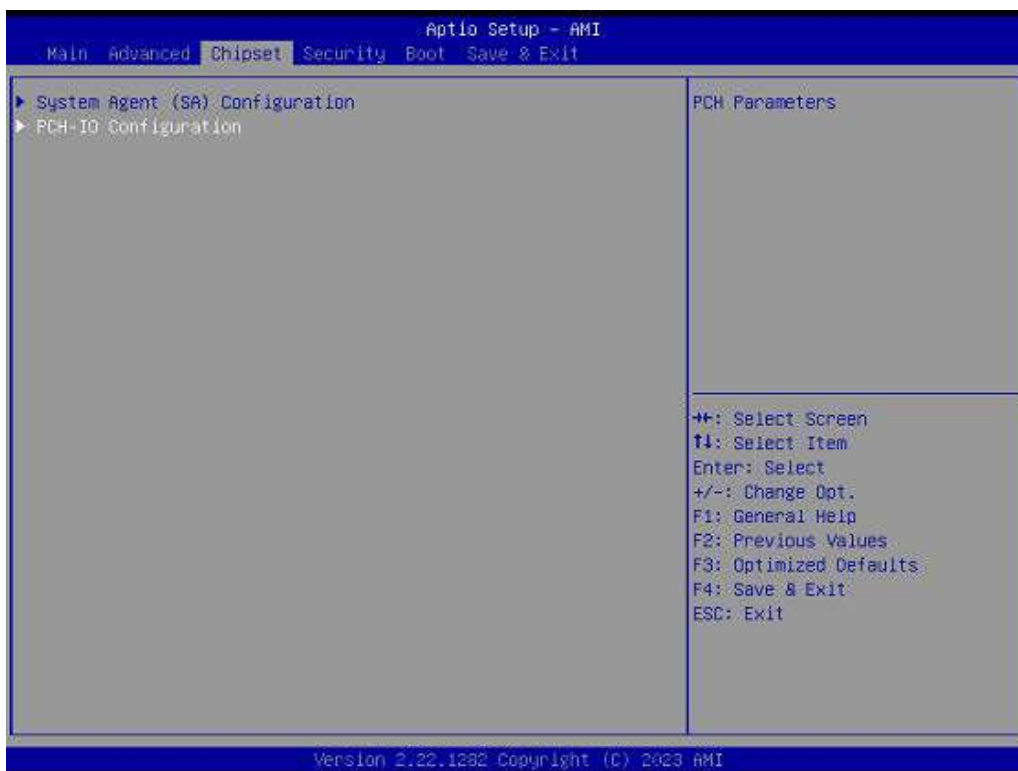


Figure 4.15

2. Set the Deep Sleep by option to **Enabled/Disabled** for ERP.

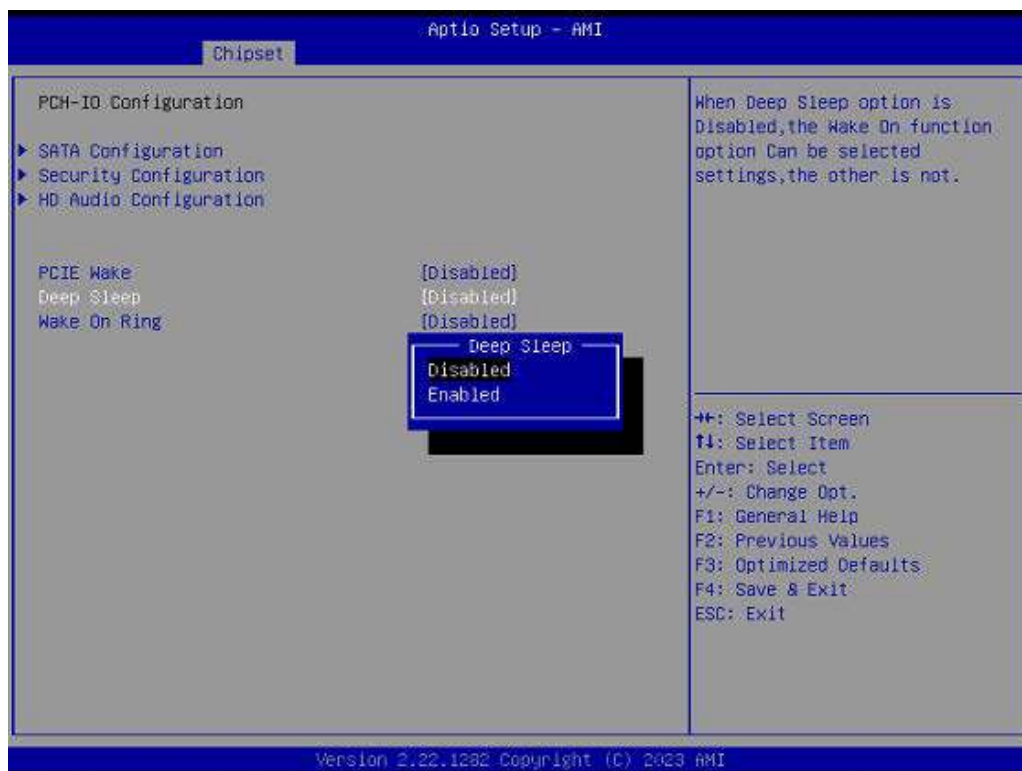


Figure 4.16

## 4.2.9 Security

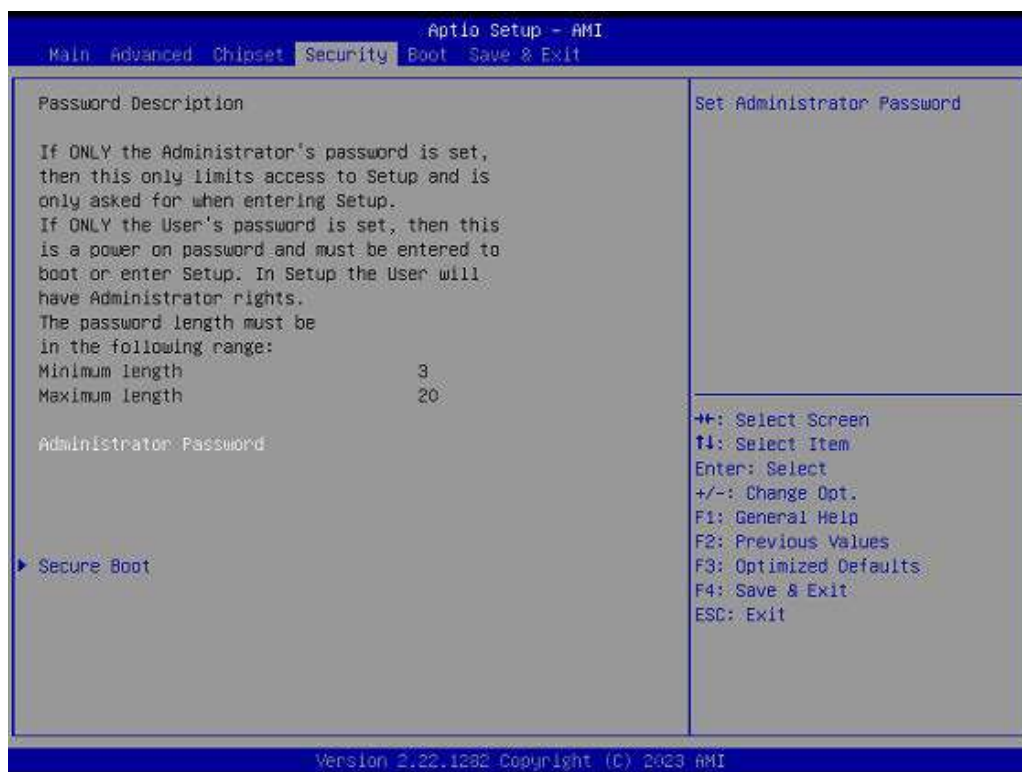


Figure 4.17

Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this sec-

tion. To access the sub menu for the following items, select the item and press <Enter>:

- **Administrator Password**  
Set the administrator password.

## 4.2.10 Boot

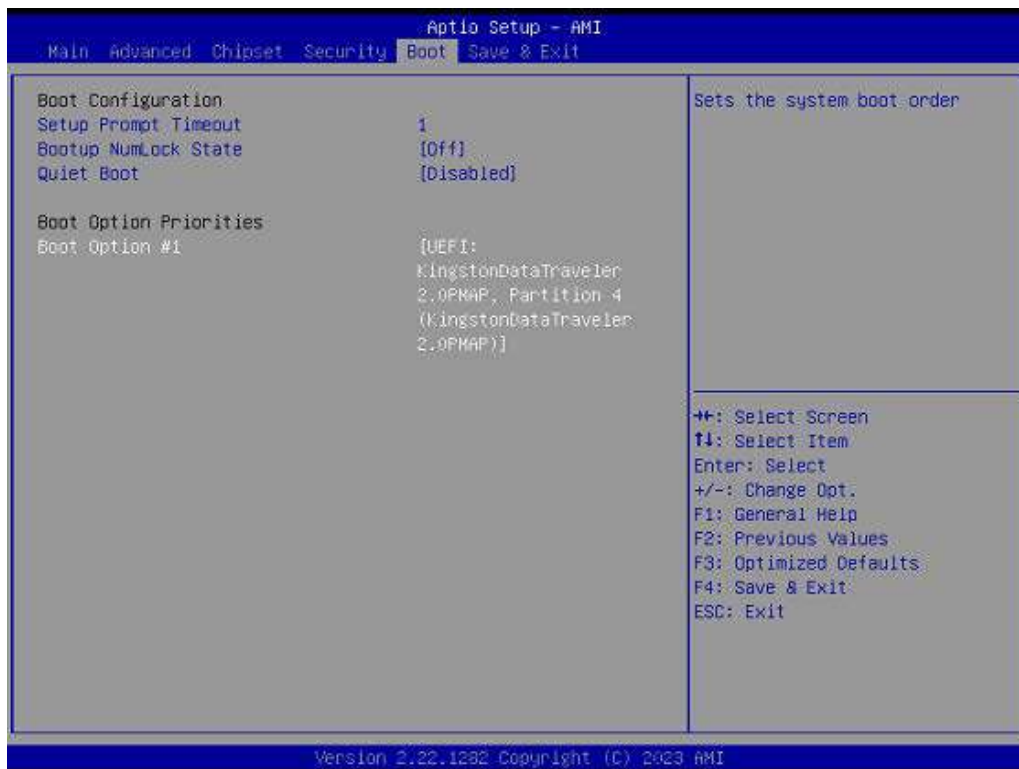


Figure 4.18

- **Setup Prompt Timeout**  
Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535(0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.
- **Bootup NumLock State**  
Select the keyboard NumLock state.
- **Quiet Boot**  
Enables or disables Quiet Boot option.
- **Boot Option #1**  
Sets the system boot order

## 4.2.11 Save and Exit

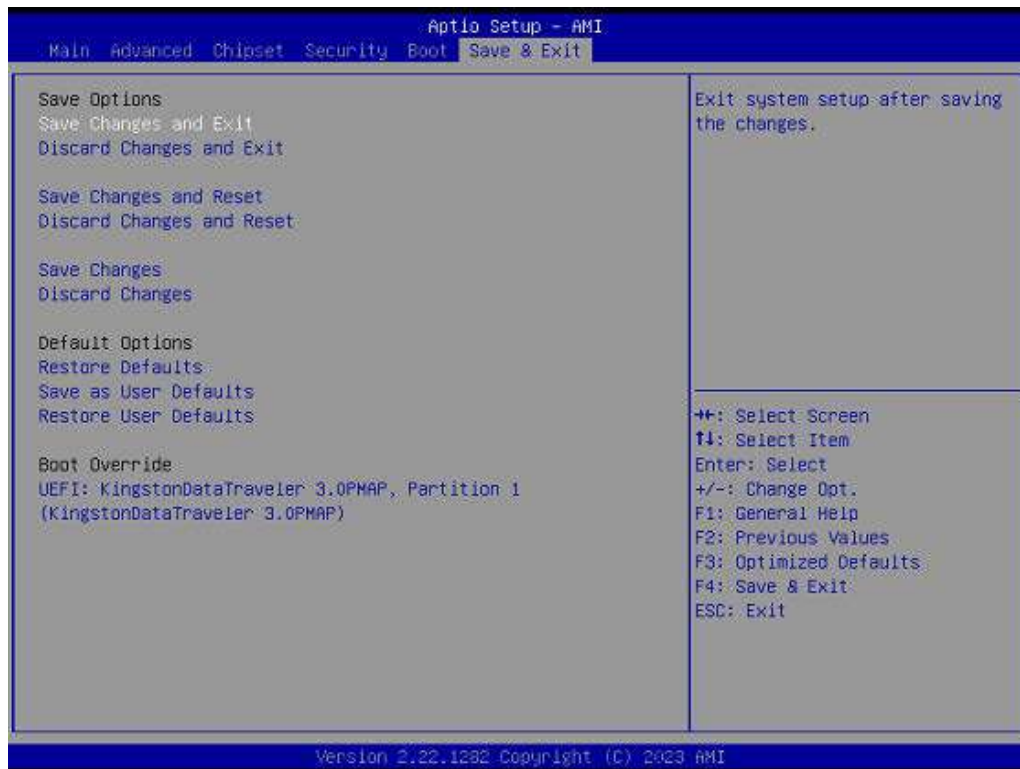


Figure 4.19

- **Save options**  
Save settings and exit system.
- **Default Options**  
Restore default settings.

# Appendix **A**

PCI/PCI-E

## A.1 PCI/PCI-E

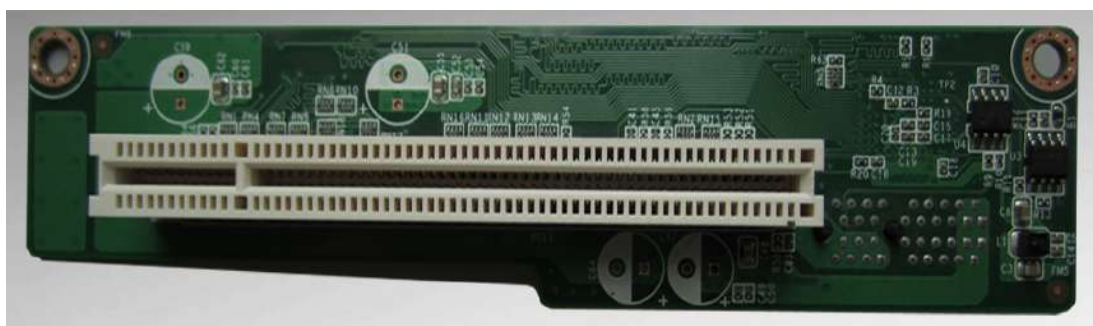
The default 989K821120E PCIe x1-to-PCIe x1 slot provided in the accessory box is shown below. (This riser card is only supported by PPC-415.)



The optional 989K821131E PCIe x1-to-PCI slot is shown below. (This riser card is only supported by PPC-415.)



The optional 989K821131E PCIe x1-to-PCI slot is shown below. (This riser card is only supported by PPC-415.)



The optional 989K093802E PCIe x1-to-PCI slot is shown below. (This riser card is only supported by PPC-417 and PPC-419.)





**Note!** The PPC-415 panel PCs support riser cards with maximum dimension of 176 x 107 mm.



The PPC-417/419 panel PCs support riser cards with maximum dimension of 240.0\*127 mm.

The total load current supported by the PCIe expansion slot is listed below.

12 V	0.5 A
3.3 V	3 A
3.3 SB	0.375 A

The total output power for 12V, 3.3V, and 3.3 SB should not exceed 17 W.

The total load current supported by the PCI expansion slot is listed below.

12 V	0.5 A
5 V	2 A
3.3 V	3 A
-12 V	0.1A

The total output power for 12V, 5V, 3.3V, and -12V should not exceed 25 W.

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