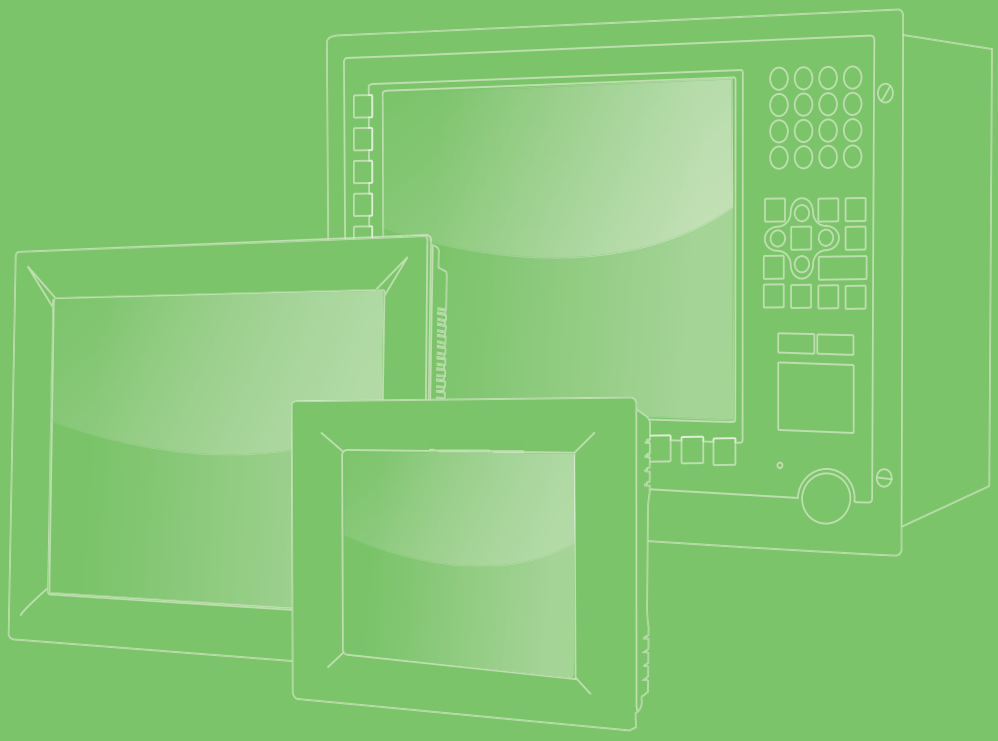

User Manual

PPC-6121

12.1" Color TFT LCD Panel PC with Intel® Core™ i/Celeron® processor

Vertrieb durch AMC

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Enabling an Intelligent Planet

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Product Warranty (2 years)

Advantech warrants the original purchaser that 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. However, 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 are 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 relevant information readily available.
3. If your product is diagnosed as defective, obtain an return merchandize 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 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 on the outside, and ship the package prepaid to your dealer.

Part No. 2003612100 Edition 1

Printed in China January 2020

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from damage resulting from electrostatic discharge (ESD) or electromagnetic interference (EMI) leakage, we strongly recommend using CE-compliant industrial enclosure products.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com 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 to hand 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 startup 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. Ensure to connect the power cord to a socket-outlet with earthing connection.
   Pour les appareils enfichables, la prise de courant doit être placée près de l'appareil et facilement accessible. Veillez à cordon d'alimentation connecté à un socle de prises de courant avec connexion à la terre.
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 skilled person.
    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 and 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 -20 °C (-4 °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 -20 °C (-4 °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 postion 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. 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.
19. Warning for using the product in ITE environments:
    Suitable for installation in information technology rooms that accord with Article 645 of the National Electrical Code and NFPA 75.
    Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

Safety Precautions - Static Electricity

Follow the simple precautions below 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 equipment is powered on.
- Disconnect the power before executing any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

Battery Information

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

Icon Description

Warning! *Warnings indicate conditions that, if not observed, can cause personal injury!*

Caution! *Cautions are included to prevent hardware damage and data loss.*

For example, "Batteries are at risk of exploding if replaced with an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Par exemple, "Si la batterie est remplacée par un modèle inapproprié, il y a un risque d'explosion. Remplacer les produits identiques ou équivalents recommandés par le fabricant. Traitement des piles usagées selon les instructions du fabricant."

Note! *Notes provide additional optional information.*

Revision

Date	Version	Description/Change
January 2020	1.0	Initial

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Chapter 1

General Information

This chapter provides general information regarding PPC-6121.

- Introduction
- Specifications
- Dimensions

1.1 Introduction

Advantech's PPC-6121 is a 12.1" color TFT LCD panel PC powered by an 8th gen Intel® Core™ i/Celeron® processor.The PPC-6121 panel PC is designed for high-performance computing, features diverse I/O, including four RS232, one isolated RS422/485, dual Gb Ethernet connectors that support Intel® AMT, and one expansion slot, and can support a wide range of applications. Moreover, the user-friendly interface makes the panel PC an ideal host device for various information-related operations.

1.2 Key Features

- Robust IP65-rated true-flat color TFT LCD
- 8th generation Intel® Core™ i/Celeron® processor (thermal power design: 35W)
- 2 x 260-pin SODIMM DDR4 2666 MHz (max. 32 GB)
- 1 x M.2 2230 (E key)
- 1 x mSATA bay (supports RAID 0 and 1)
- 1 x Optional TPM 2.0
- 1 x Optional PCI/PCIe x4 expansion kit
- 1 x Isolated RS422/485 (terminal block)
- Dual GbE with Intel® AMT12.0 support
- Optional mini PCIe 802.11b/g/n wireless module

1.3 Front Panel

The PPC-6121 front panel is a true-flat color TFT LCD resistive touch touchscreen (see Figure 1.1) with an IP65 rating for dust and water tolerance.

Figure 1.1 Front panel

1.4 Rear Panel

The PPC-6121 rear panel features four VESA mount (75 x75 mm) holes (see Figure 1.2) for easy mounting.

Figure 1.2 Rear panel

1.5 Panel Underside

The system I/O listed below are located in the underside of the panel (see Figure 1.3).

- 1 x Line-Out/ Mic-In
- 2 x Intel Gigabit Ethernet
- 4 x USB 3.1
- 1 x DIO
- 1 x Isolated RS-422/485
- 1 x VGA
- 1 x HDMI
- 4 x RS-232
- 1 x DC input
- 1 x Power button

Figure 1.3 Panel underside

1.6 Dimensions

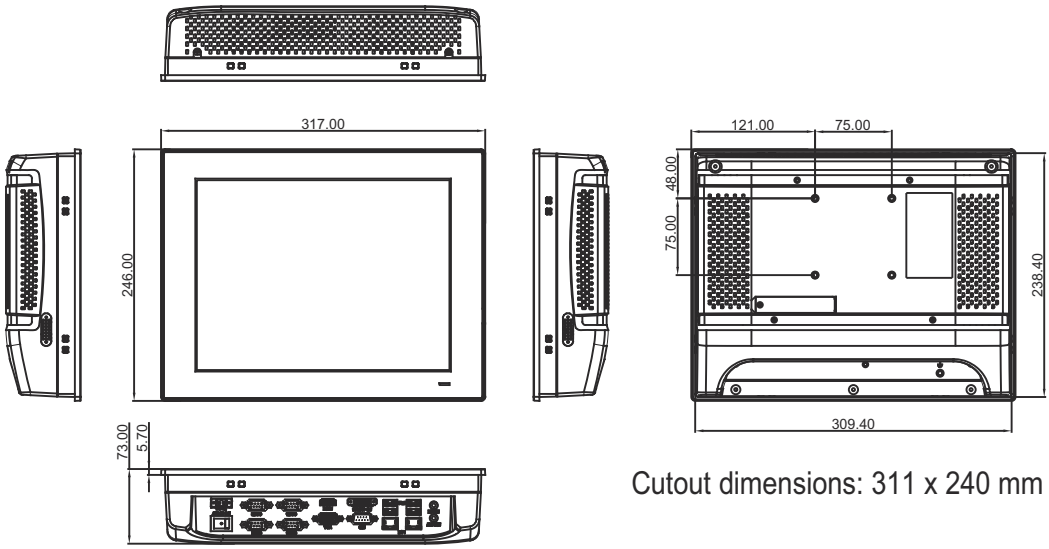


Figure 1.4 PPC-6121 dimensions

Note! *The screws specified for the VESA mount are 4 x M4 screws. The screw hole depth is a maximum of 8 mm.*

1.7 Specifications

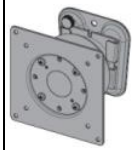
Product	PPC-6121-R8IA
LCD Size	12.1 inch
Display Type	TFT LCD (with LED backlight)
Resolution	1024 x 768 (max.)
Brightness	600 cd/m^2
Active Area	245.7(H) x 184.3(V)
Viewing Angle	89 (Left), 89 (Right), 89 (Up), 89 (bottom)
Contrast Ratio	1000:1
Backlight Lifetime	50,000 hr (min.)
Touchscreen Type	5-wire resistive touch
Light Transmission	80% ± 5%
Controller	USB interface
CPU	Supports 8th gen Intel® Core™ i7-8700T/i5-8500T/i3-8100T/ Pentium® G5400T/Celeron® G4900T
Memory	2 x 260-pin SODIMM DDR4 2666 MHz (max. 32 GB)
Storage	1 x 2.5” SATA bay 1 x mSATA bay (SATA HDD + mSATA with RAID 0 & 1 support)
Network (LAN)	2 x 10/100/1000 Mbps Ethernet (Intel® I219-LM + Intel® I211), supports Intel AMT 12.0 (only i7/i5)
I/O	4 x RS-232, 1 x RS-422/485 with 1K VDC isolation 4 x USB 3.1 1 x DB15 VGA, 1 x HDMI 1.4 1 x Mic In, 1 x Line Out 1 x GPIO (TTL, 8 pin programmable) 1 x TPM 2.0 (optional)
Expansion	1 x M.2 2230 (E key) 1 x PCIe x4 or 1 x PCI (optional)
Watchdog Timer	255 timer levels, setup via software
Speaker	2 x 1W
OS Support	Microsoft® Windows 10 (64 bit) and Linux (Ubuntu, Fedora 28)
Power Supply	12 ~ 30 VDC
Power Consumption	120W
Operating Temperature	0 ~ 50 °C (32 ~ 122 °F)
Storage Temperature	-40 ~ 90 °C (-40 ~ 194 °F)
Relative Humidity	10 ~ 95% @ 40 °C (non-condensing)
Shock	Operating: 10 G peak acceleration (11 ms duration), in compliance with IEC 60068-2-27 specifications

Vibration	Operating: Random vibration test, 5 ~ 500 Hz, 1 Grms with HDD; 2 Grms with SSD, in compliance with IEC 60068-2-64 specifications
Safety and EMC	Safety: CB, UL, CCC, BSMI EMC: CE, FCC Class A, BSMI
Dimensions	317 x 246 x 73mm (12.48 x 9.69 x 2.87 in)
Weight	3.8 kg (8.38 lb)

Note! *The test conditions for the power consumption values provided above were as follows:*

Memory: 16 GB DDR4 2666
HDD: 500 G HDD
OS: Windows 10 (64 bit)
Software: Burn-In Test 8.1

1.8 Ordering Information

Part Number	Description	Image
PPC-6121-R8iA	12.1" 8th gen Intel® Core ™ i/Celeron® CPU W/R_TS	
96PSA-A150W19P2-3	Adaptor A/D 100 ~ 240V 150W 19V C14 2-pin terminal block	
PPC-WLAN-C1E	Wi-Fi module with antenna	
PPC-ARM-A03	VESA standard arm mount	
PPC-174T-WL-MTE	Wall mount	
PPC-Stand-A1E	Stand mount	

Chapter 2

System Installation and Setup

- Quick System Tour
- Memory Card Installation
- HDD Installation
- mSATA Installation
- Wireless LAN Card Installation
- TPM installation
- Mounting the System

2.1 Quick System Tour

Before setting up the panel PC, take a moment to identify the locations of the device controls, drives, connectors, and ports (as shown in Figure 2.3). When placed upright, the PPC-6121 front panel should appear as shown in Figure 2.1.

Figure 2.1 Panel PC front view

1. Power status LED indicator - Power On: blue/Standby: orange

Figure 2.2 Panel PC rear view

1. Speaker
2. Expansion slot

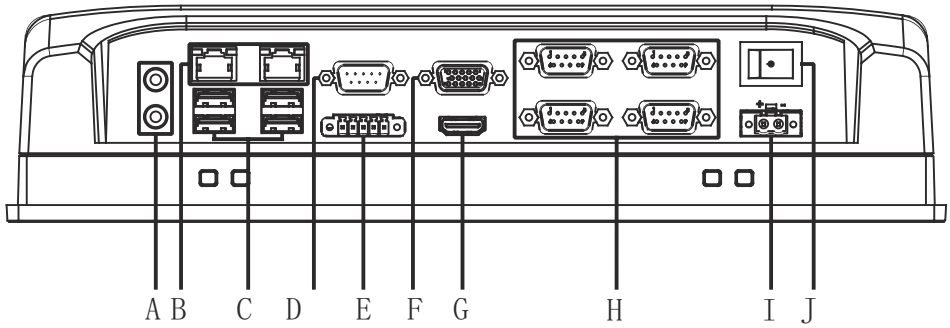


Figure 2.3 System I/O

A.1 x Line-Out/ Mic-In
B.2 x Intel Gigabit Ethernet
C.4 x USB 3.1
D.1 x DIO
E.1 x Isolated RS-422/485
F.1 x VGA
G.1 x HDMI
H.4 x RS-232
I.1 x DC input
J.1 x Power button

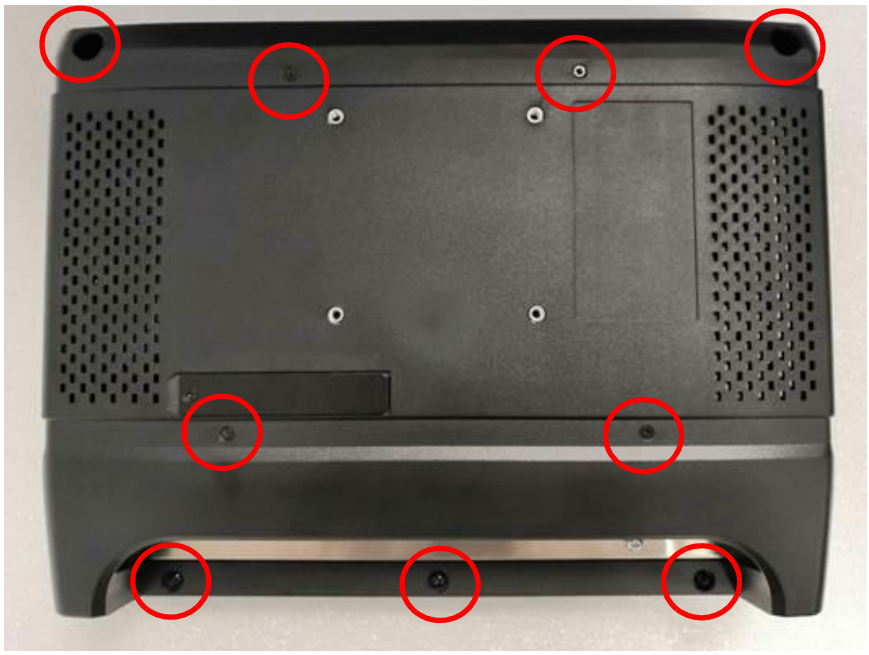
2.2 Installation Procedures

The system should be installed and configured in the following order:

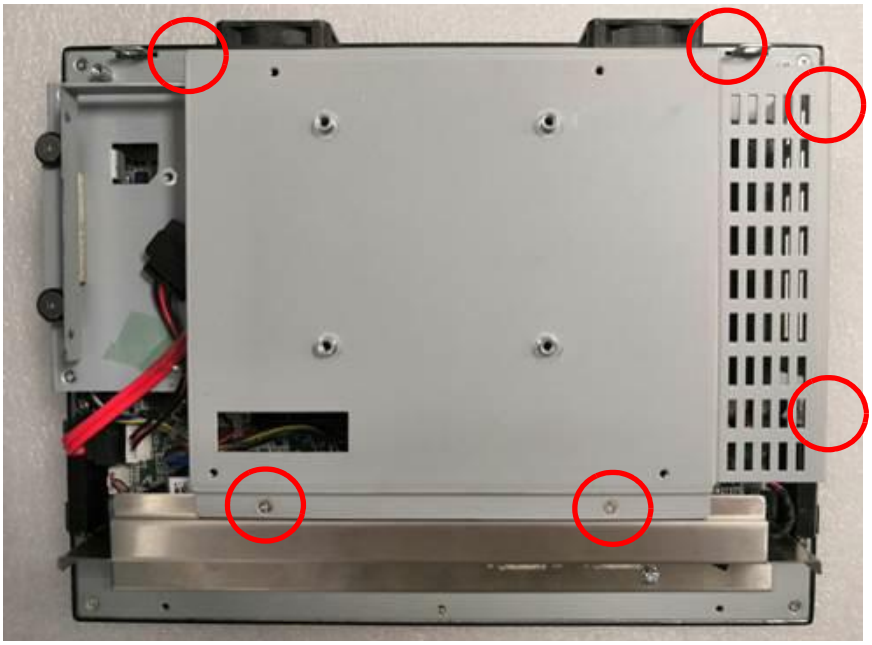
1. Install the CPU and memory
2. Install a SATA HDD or mSATA storage devices
3. Install peripheral devices
4. Mount the panel PC
5. Configure the system

2.2.1 CPU and Memory Installation

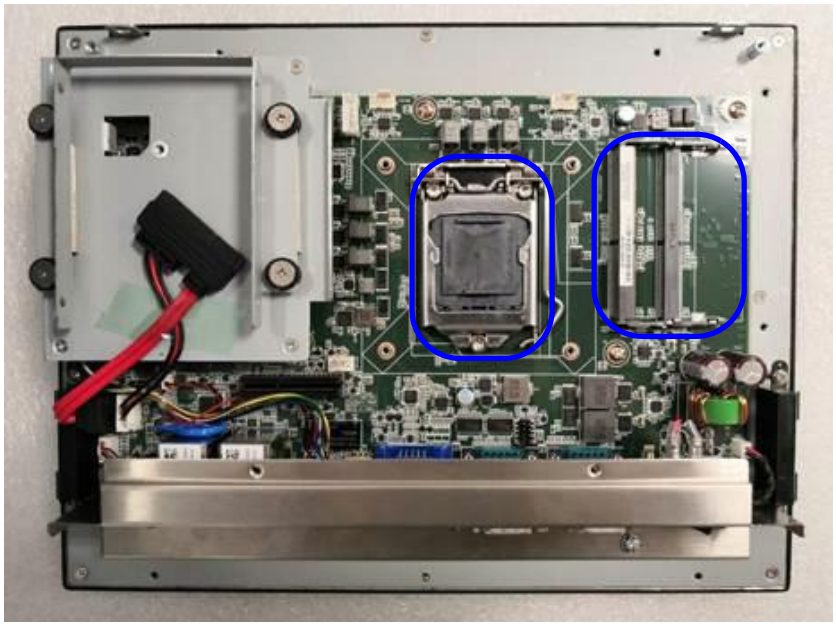
1. Loosen and remove the screws circled in red in the image below to remove the rear cover.



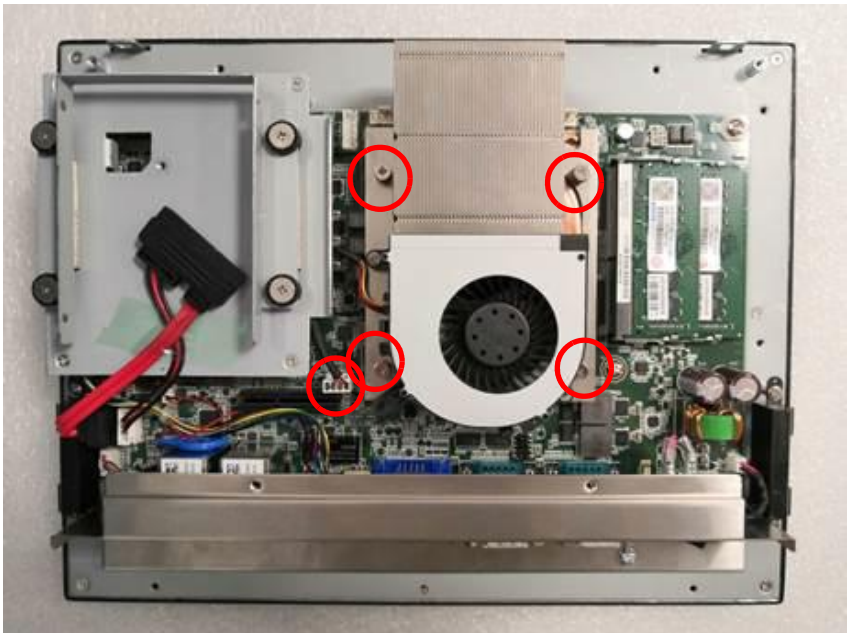
2. Loosen and remove the screws circled in red in the image below to remove the VESA bracket.



3. Install the CPU and memory in the areas marked in blue in the image below.

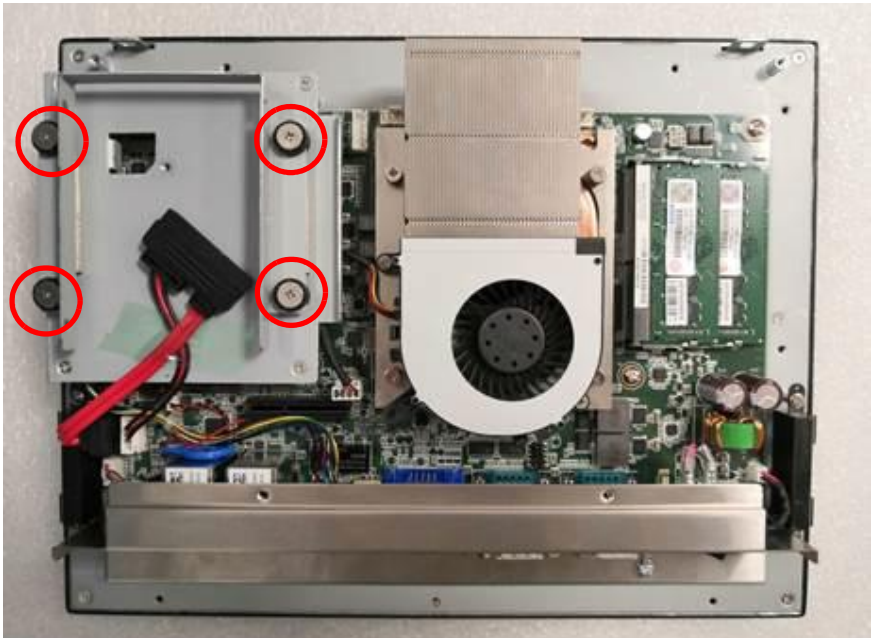


4. Retrieve the CPU heat sink from the product accessory box and secure it to the motherboard. Then connect the Fan cable to the motherboard.

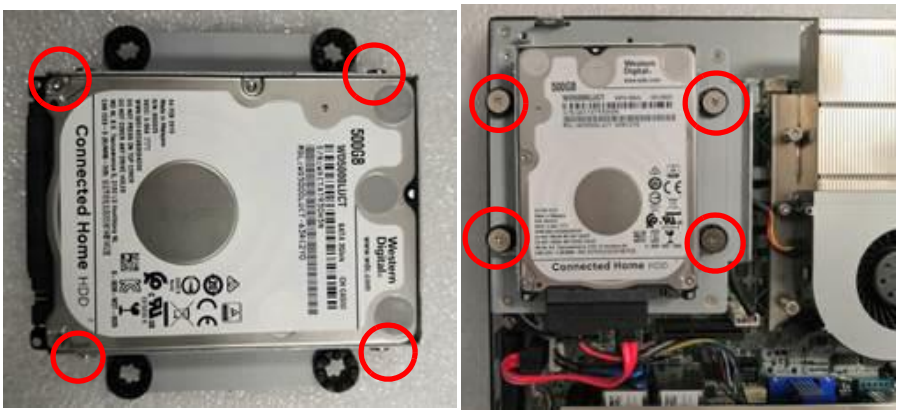


2.2.2 HDD Installation

1. Follow Steps 1 and 2 in Section 2.2.1 to remove the rear cover and VESA bracket. Remove the screws circled in red in the image below to remove the HDD bracket.

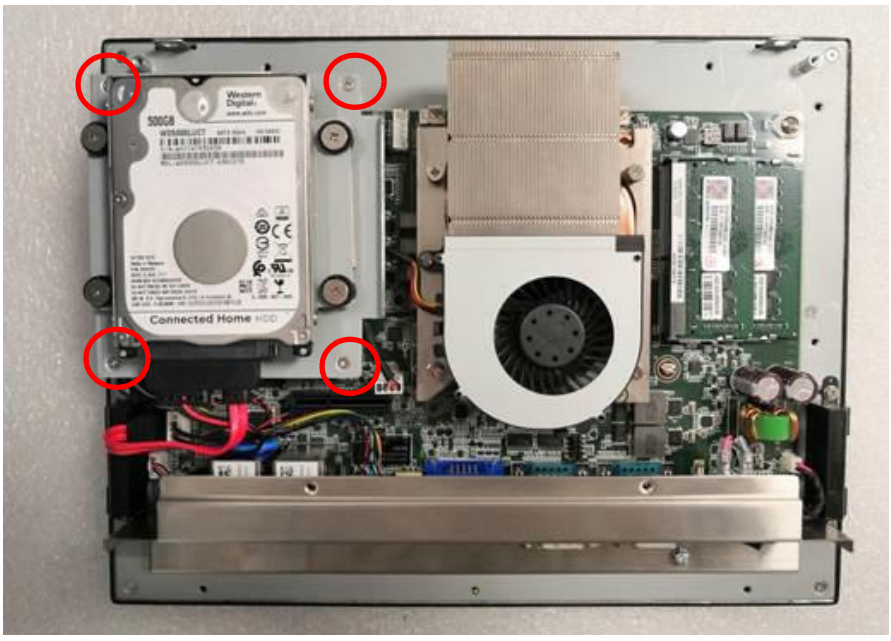


2. Retrieve four screws from the product accessory box and use them to attach the HDD to the HDD bracket. Connect the SATA cable and affix the HDD bracket in place.



2.2.3 mSATA Installation

1. Follow Steps 1 and 2 in Section 2.2.1 to remove the rear cover and VESA bracket. Remove the screws circled in red in the image below to remove the HDD module.

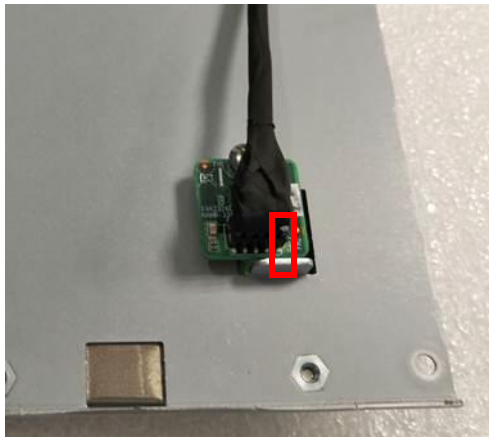


2. Retrieve two screws from the product accessory box and use them to affix the mSATA drive to the motherboard.

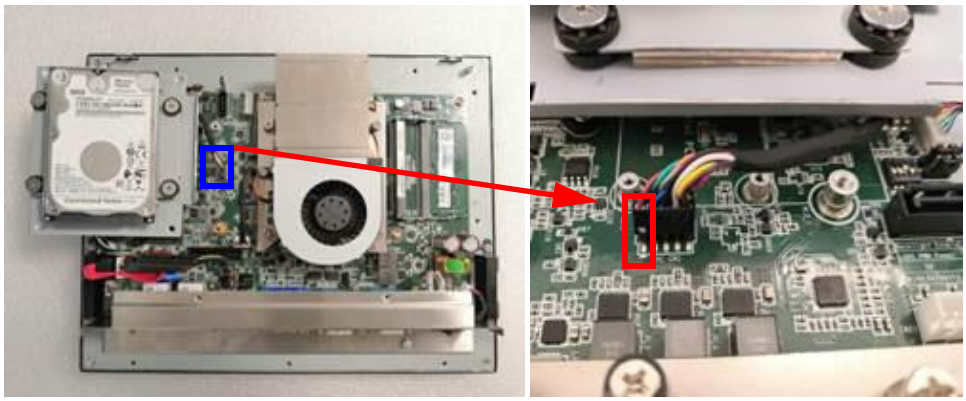
2.2.4 TPM Installation

1. Follow Step 1 in Section 2.2.3 to remove the rear cover, VESA bracket, and HDD module.
2. Retrieve one screw from the product accessory box and use it to affix the TPM chip to the HDD module.

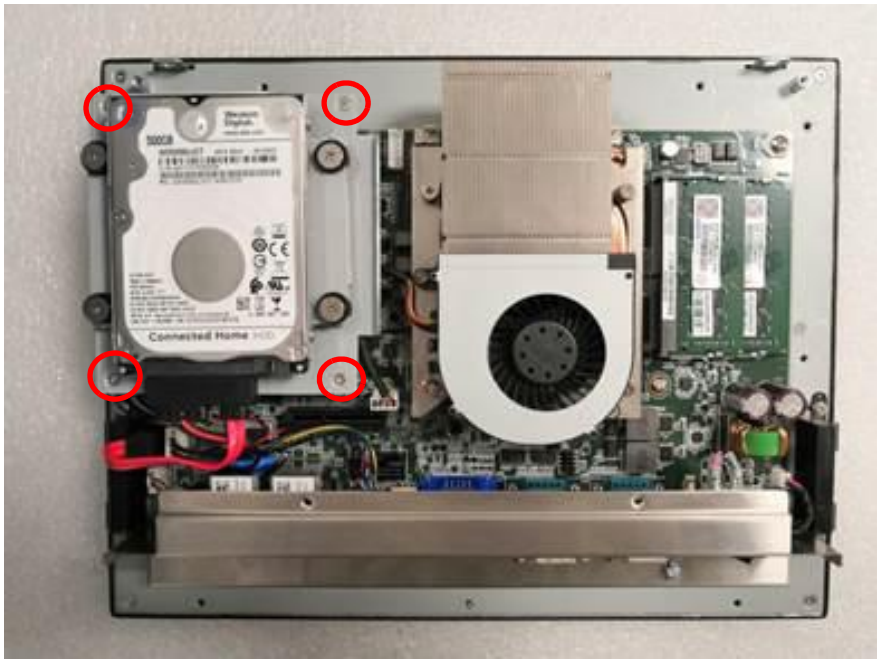
3. Connect the cable to the TPM chip as shown in the image below (note the placement of the first pin).



4. Connect the other end of the cable to the motherboard (note the placement of the first pin).



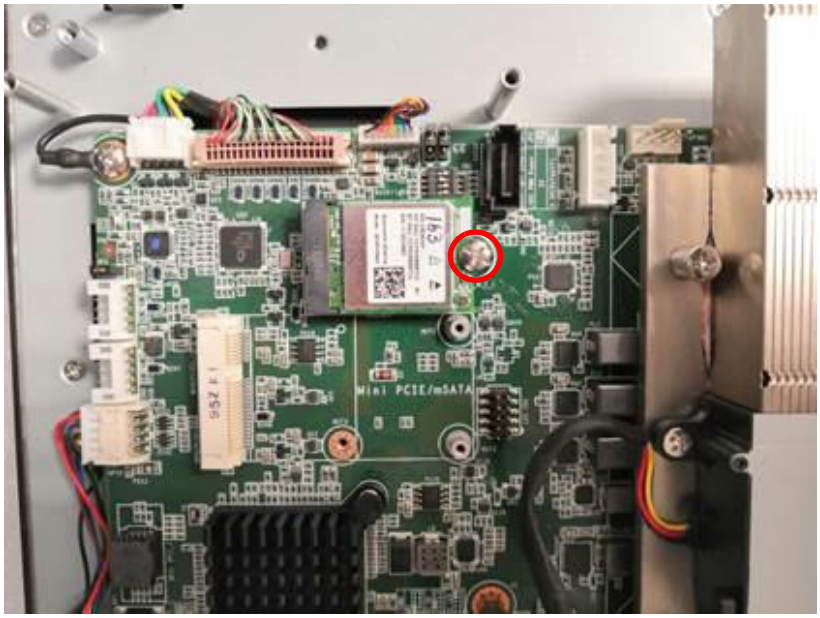
5. Use four screws (circled in red in the image below) to secure the HDD module in place.



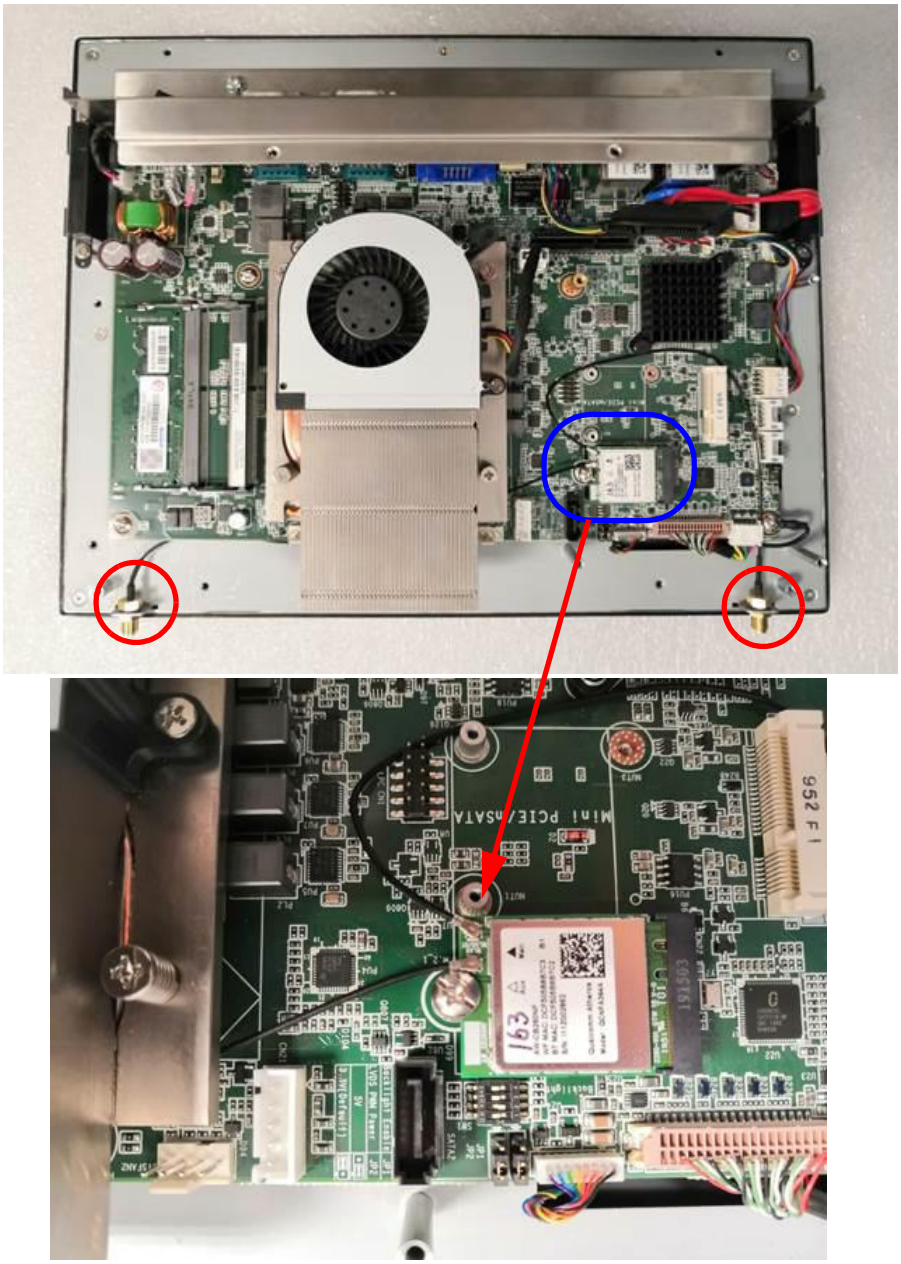
2.2.5 Wireless LAN Card Installation

1. Follow Step 1 in Section 2.2.3 to remove the rear cover, VESA bracket, and HDD module.
2. Retrieve one screw from the product accessory box and use it to attach the wireless LAN card to the motherboard as shown in the image below (circled in red).

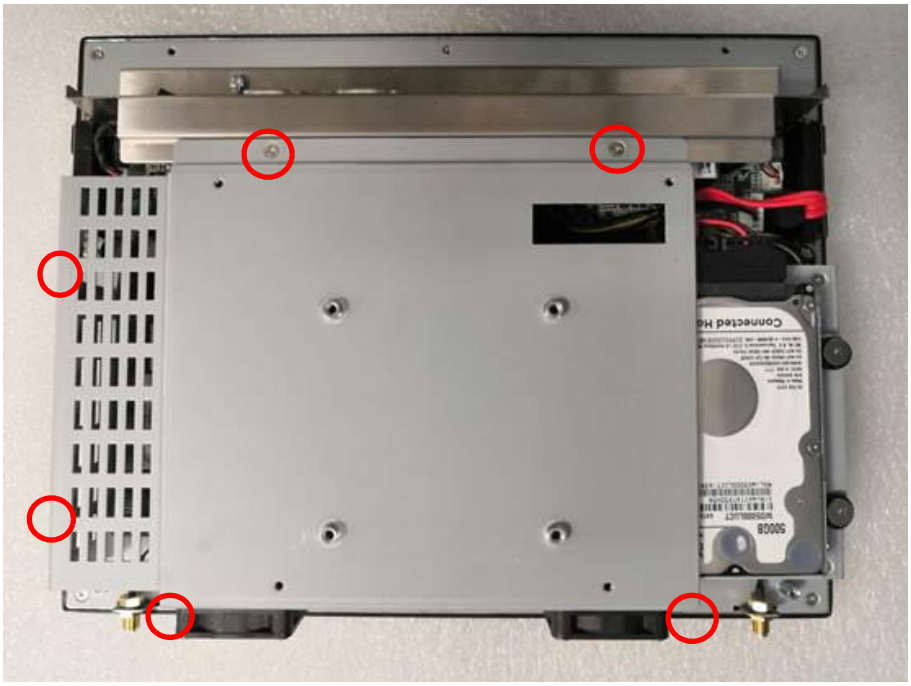
Note! *For a wireless LAN card module, we recommend the Advantech product PPC-WLAN-C1E.*



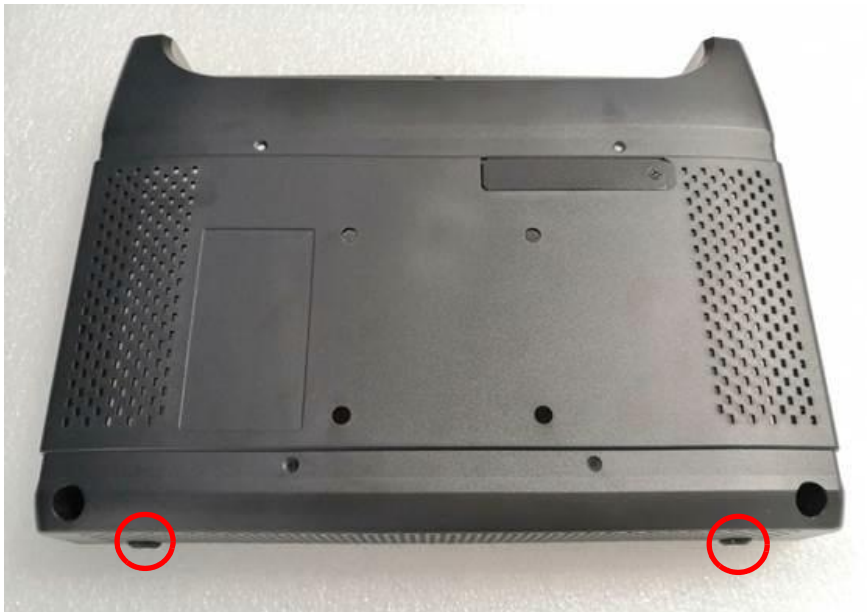
3. Connect the wireless LAN antenna cable.



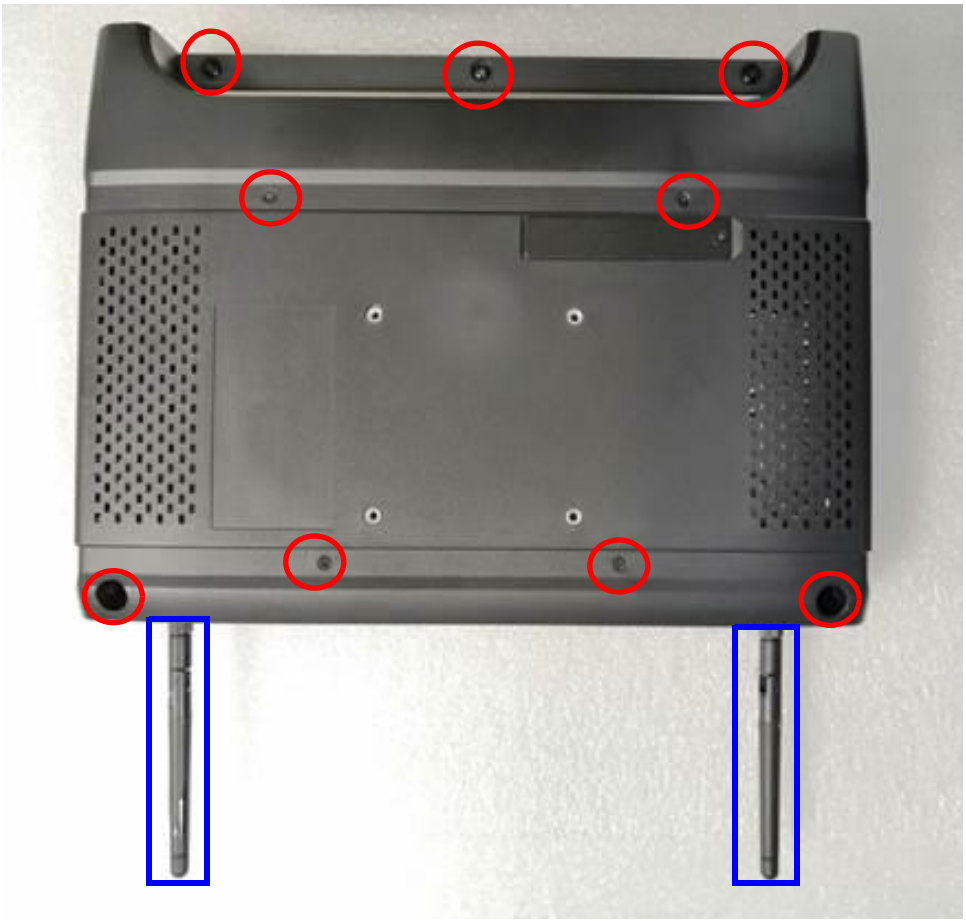
4. Attach the VESA bracket. Note that the system fan should be connected to the motherboard.



5. Remove the two plugs on the rear cover (circled in red in the image below).

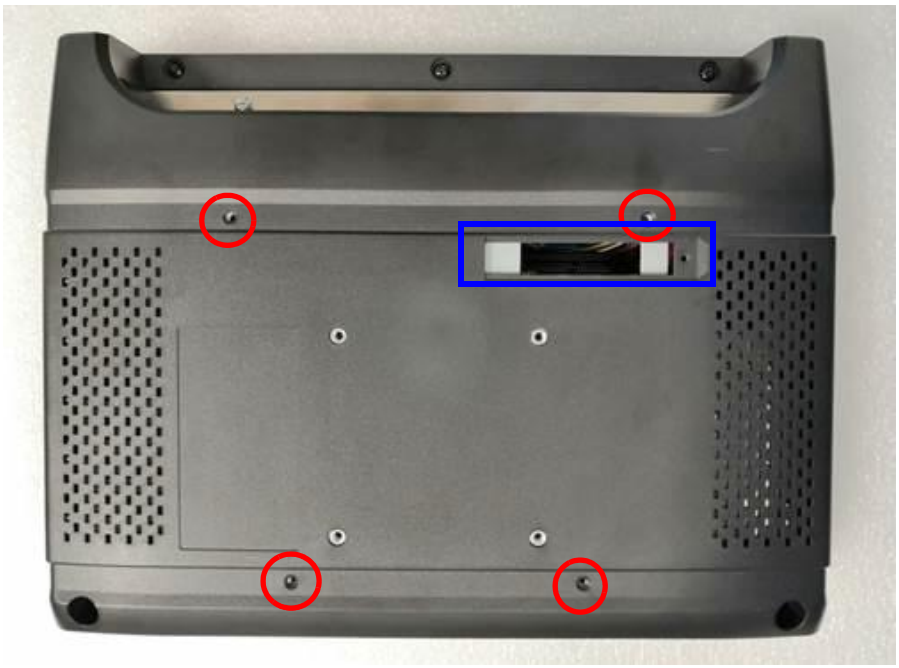


6. Replace the rear cover and secure in place using screws (as shown in the image below). Then install the antennas.

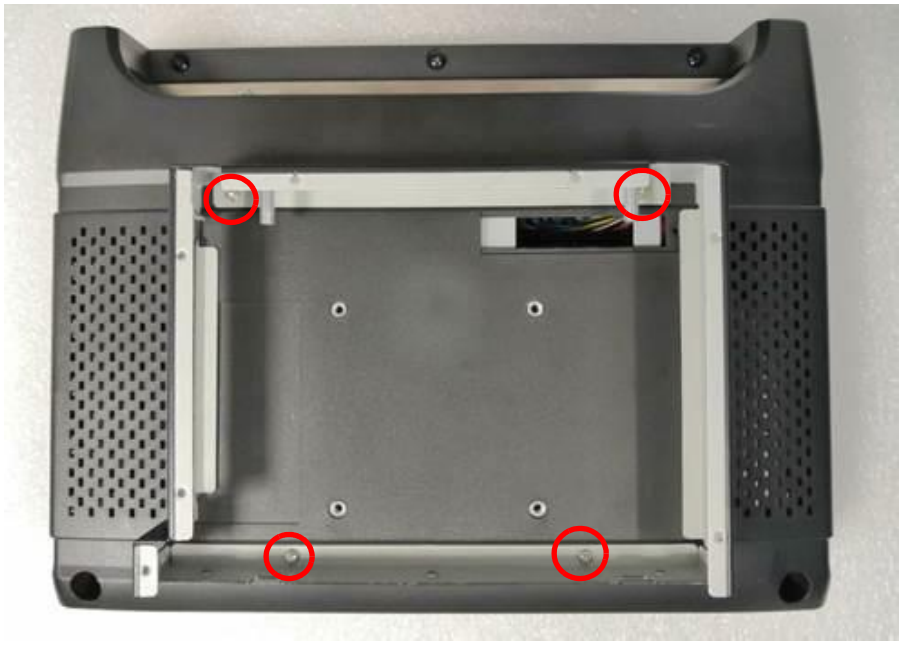


2.2.6 Expansion Card Installation

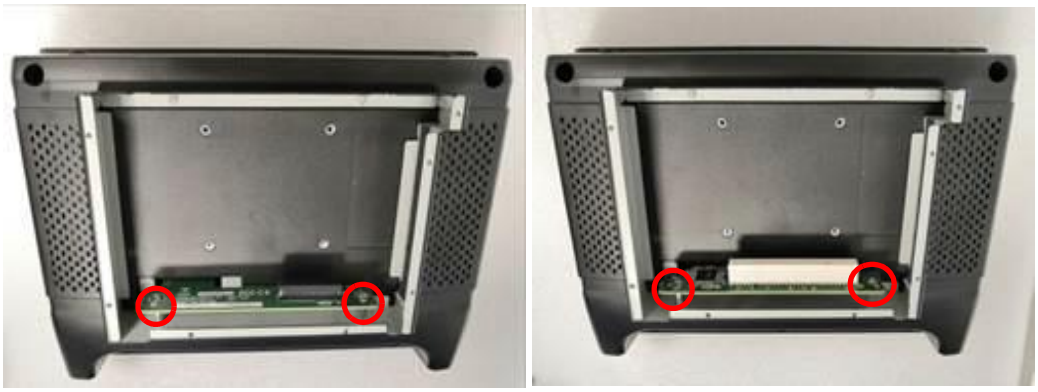
1. Remove the panel for the riser card socket and remove the four screws circled in red in the image below.



2. Retrieve four screws (M3 x 8 mm) from the product accessory box and use them to attach the riser card bracket to the rear cover (as shown in the image below).



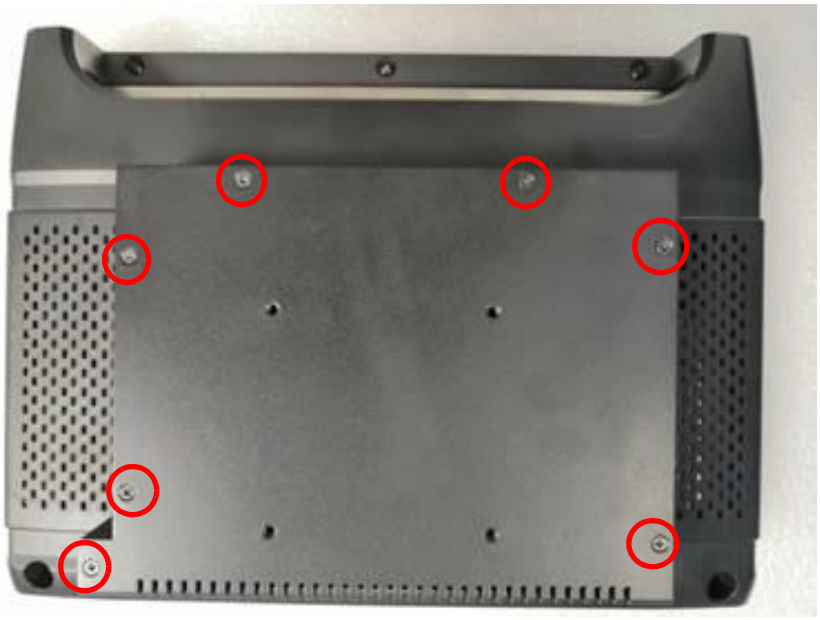
3. Affix one riser card to the riser card bracket using two screws.



4. Install the expansion card and affix in place using one screw.

Note! *The PCI/PCIE card must not exceed 175 mm in length and 110 mm in width.*

5. Replace the riser card cover panel and affix in place using screws (circled in red in the image below).



2.3 Mounting the System

Warning! *When mounting the panel PC, more than one person should perform the installation to prevent accidental damage to the panel or personal injury.*

Le comité constate qu'el-nasr " mounting, Plus d'une personne installation to prevent the cadre accidental damage to the personal injury.

The panel PC supports various mounting options, as listed below.

- Wall mounting
- Panel mounting
- Arm mounting
- Stand mounting

2.3.1 Wall Mounting

To mount the panel PC onto a wall, follow the instructions below (see Figure 2.4 for additional detail).

1. Select the location on the wall for the wall mount plate.
2. Mark the location of the two plate screw holes on the wall.
3. Drill two pilot holes into the wall at the marked locations.
4. Align the wall mount plate screw holes with the pilot holes.
5. Secure the mount plate to the wall by inserting screws into the two pilot holes and tightening them.

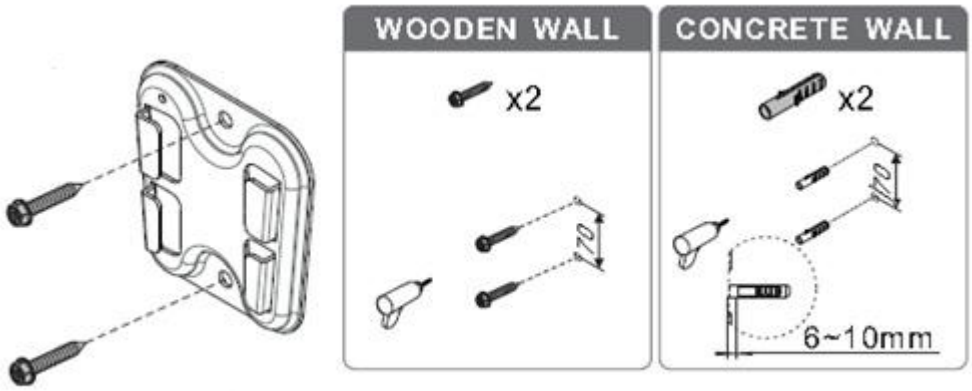


Figure 2.4 Wall mount plate

6. Insert four M4 screws into the holes on the panel PC and tighten them to secure the bracket to the rear panel.

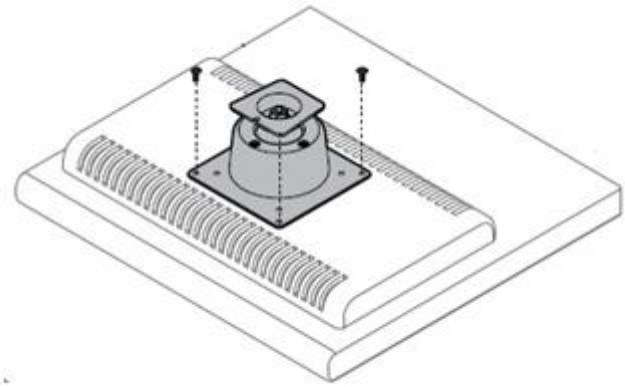
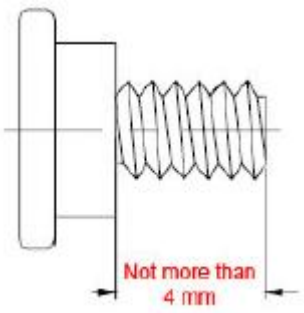


Figure 2.5 Screw locations on the rear panel

Warning! *Ensure that the thread depth of the screws on the rear panel does not exceed 4 mm.*

Assurez-vous que la profondeur du filetage des vis sur le panneau arrière ne dépasse pas 4 mm.



7. To mount the panel PC on the wall, align the wall mount bracket attached to the panel PC with the wall mount plate on the wall and slide the panel PC downwards to hang the bracket on the mount plate.

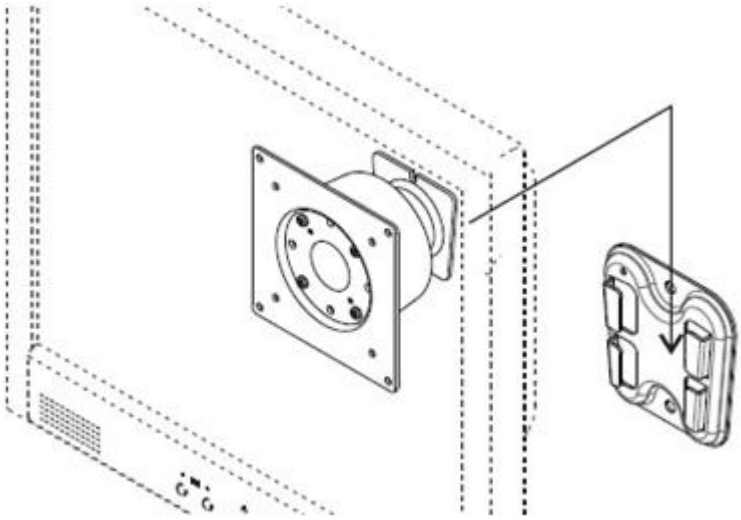


Figure 2.6 Mounting the panel PC on a wall

8. Secure the panel PC in place by tightening the screws in the wall mount bracket.

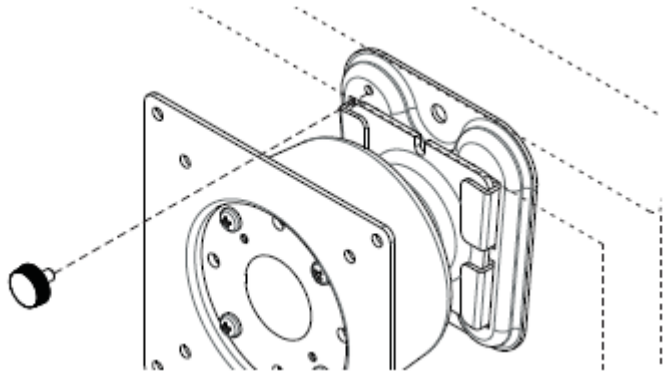


Figure 2.7 Securing the panel PC

2.3.2 Panel Mounting

To mount the flat bezel panel PC into a panel, follow the steps below.

1. Prepare a panel cutout according to the panel PC dimensions. PPC-6121 panel cutout dimensions: 311 x 240 mm (12.24 x 9.44 in)
2. Install the panel PC in the cabinet and retrieve eight hook brackets from the product accessory box.

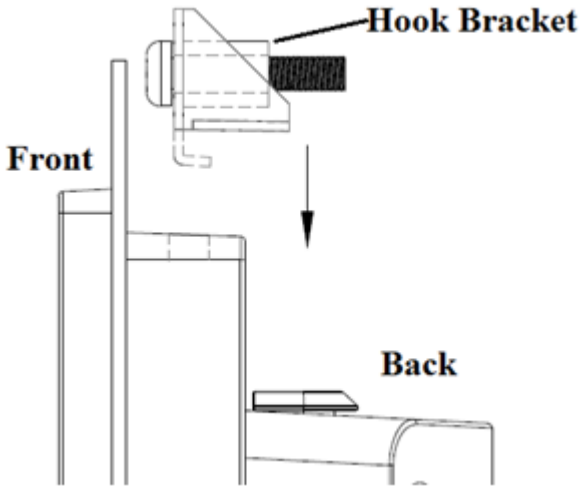


Figure 2.8 Hook brackets for panel mounting

3. Insert the hook brackets into the holes following the direction of the arrows shown in Figure 2.9 and hang the panel PC.

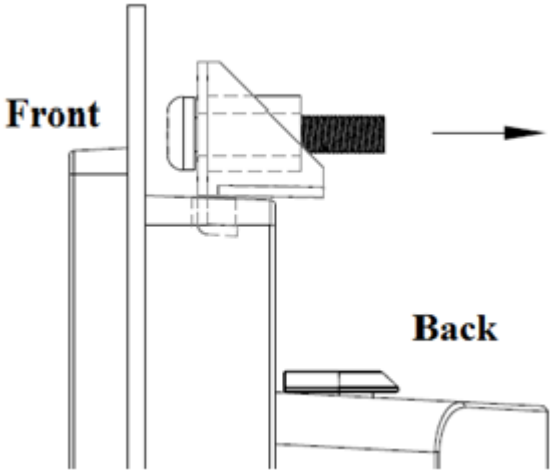


Figure 2.9 Hook bracket locations

4. Tighten the screws to affix the panel PC in place (Figure 2.10).

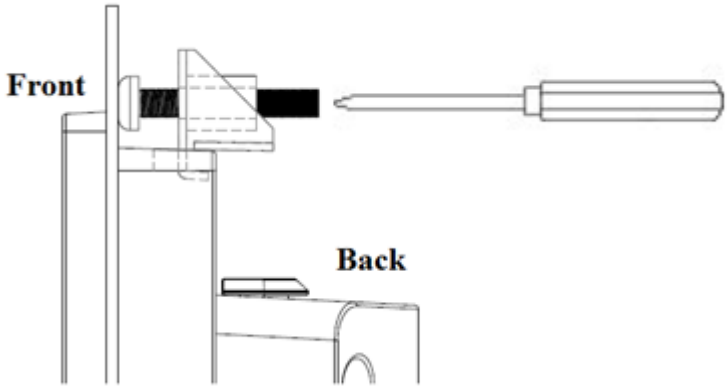


Figure 2.10 Fasten the hook bracket

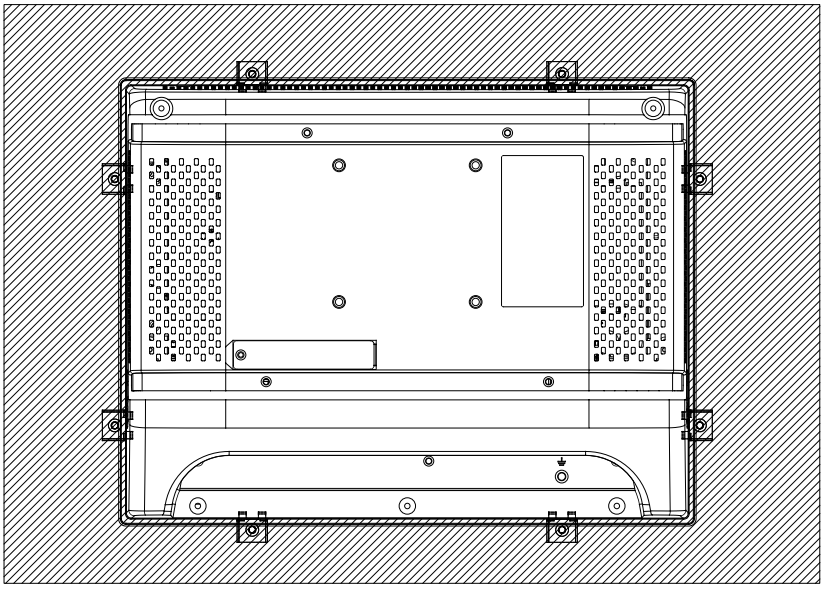


Figure 2.11 Panel mount rear view

2.3.3 Arm Mounting

PPC-6121 can be mounted on a VESA-compliant arm mount with a 100 mm interface pad. To affix the panel PC to an arm mount, follow the steps below.

1. Refer to the installation instructions provided with the arm mount to correctly mount the arm onto a surface as a base.
2. Align the screw holes of the arm mount interface with the VESA mount holes at the rear of the panel PC. Secure the panel PC to the arm mount using four M4 screws.

Figure 2.12 Arm mount for panel PC

Warning! *Ensure that the thread depth of the screws on the rear panel does not exceed 4 mm.*

Ensure that the thread depth of the screws on the rear panel does not exceed 4 mm.

2.3.4 Stand Mounting

Before stand mounting, check that the product was shipped with the items shown in the image below.

Packing List

No.	Name	Qty.	Pic.	No.	Name	Qty.	Pic.
A	Screw (M4x8L)	12 (4 x spare)		B	Screw (M4x6L)	6 (2 x spare)	
C	Screw (M4x5L)	2 (1 x spare)		1	Hinge	1	
2	VESA Bracket	1		3	Hinge Cover	1	
4	Base Plate	1					

To mount the panel PC onto a stand, follow the steps below.

1. Use four M4 x 8L screws to affix the VESA bracket to the panel PC. Users can choose 75 x 75 mm VESA mount according to their requirements.

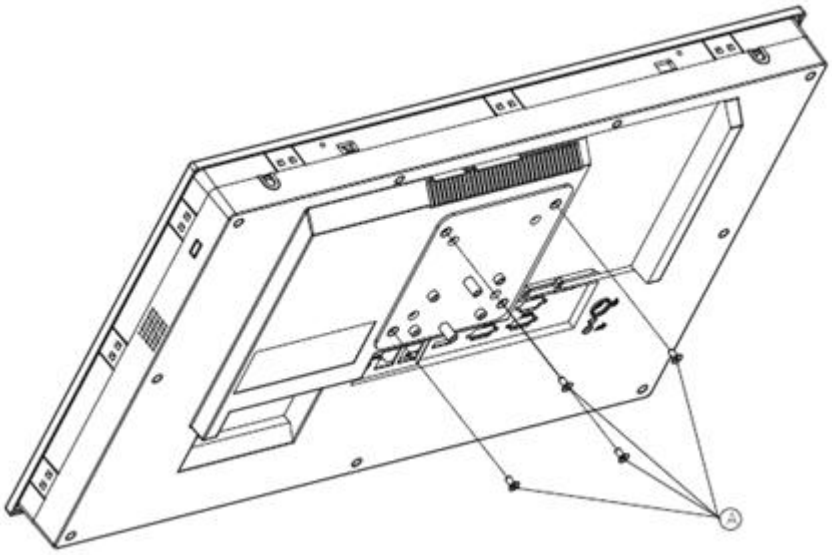


Figure 2.13 VESA mount screw holes

2. Use four M4 x 8L screws to secure the base plate to the mount stand.

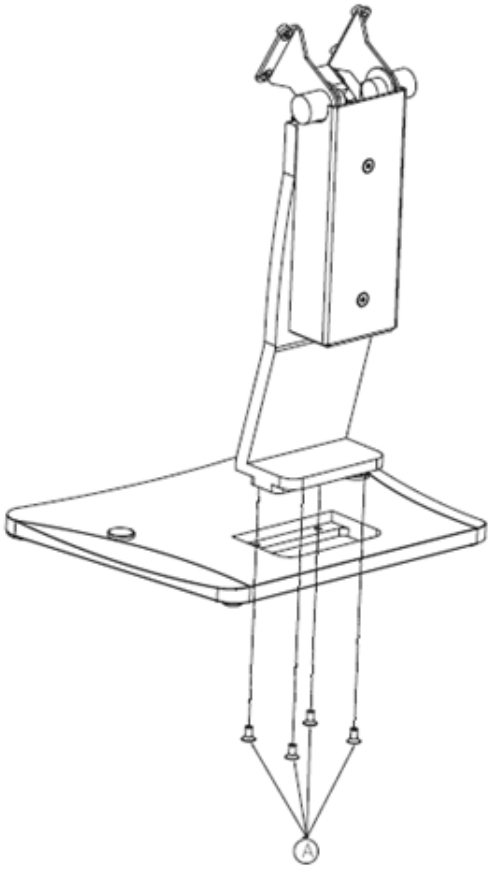


Figure 2.14 Securing the VESA mount base

3. Use four M4 x 6L screws to secure the mount stand to the VESA mount bracket.

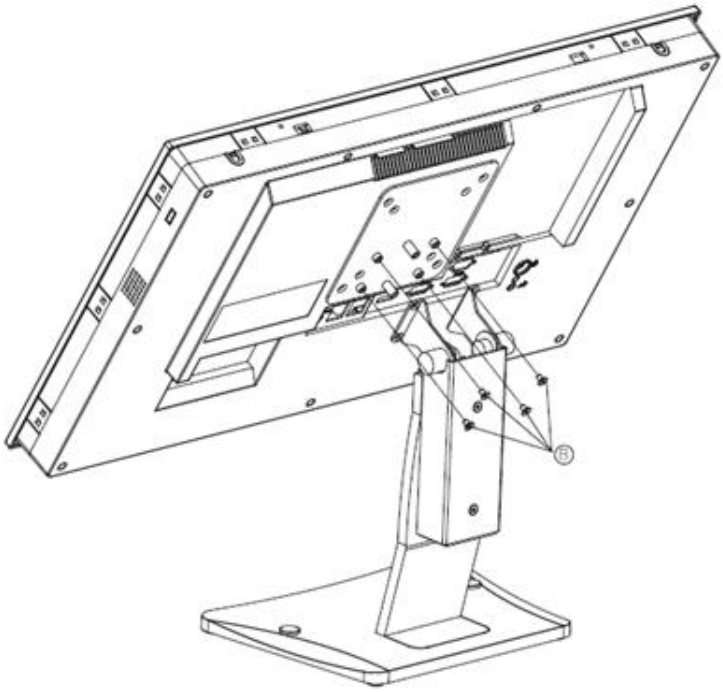


Figure 2.15 Securing the VESA mount bracket

4. Use one M4 x 5L screw to secure the stand mount hinge cover.

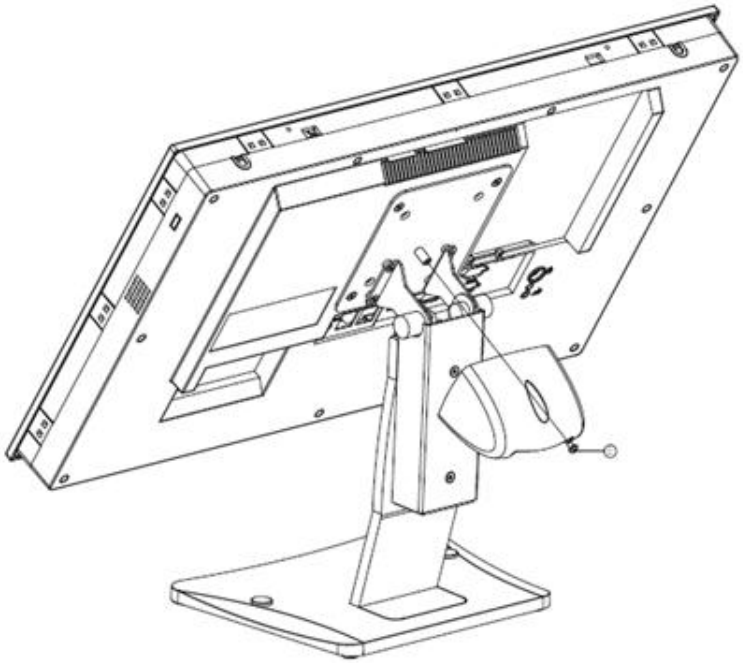


Figure 2.16 Securing the stand mount hinge cover

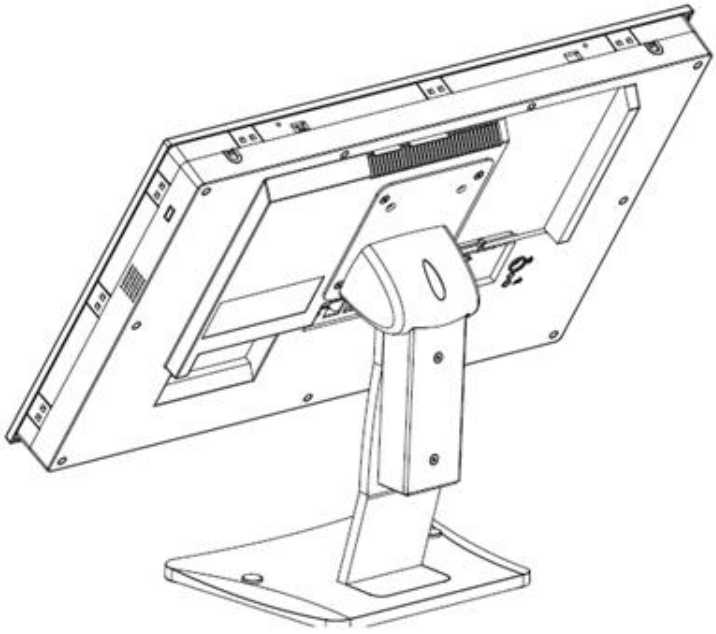


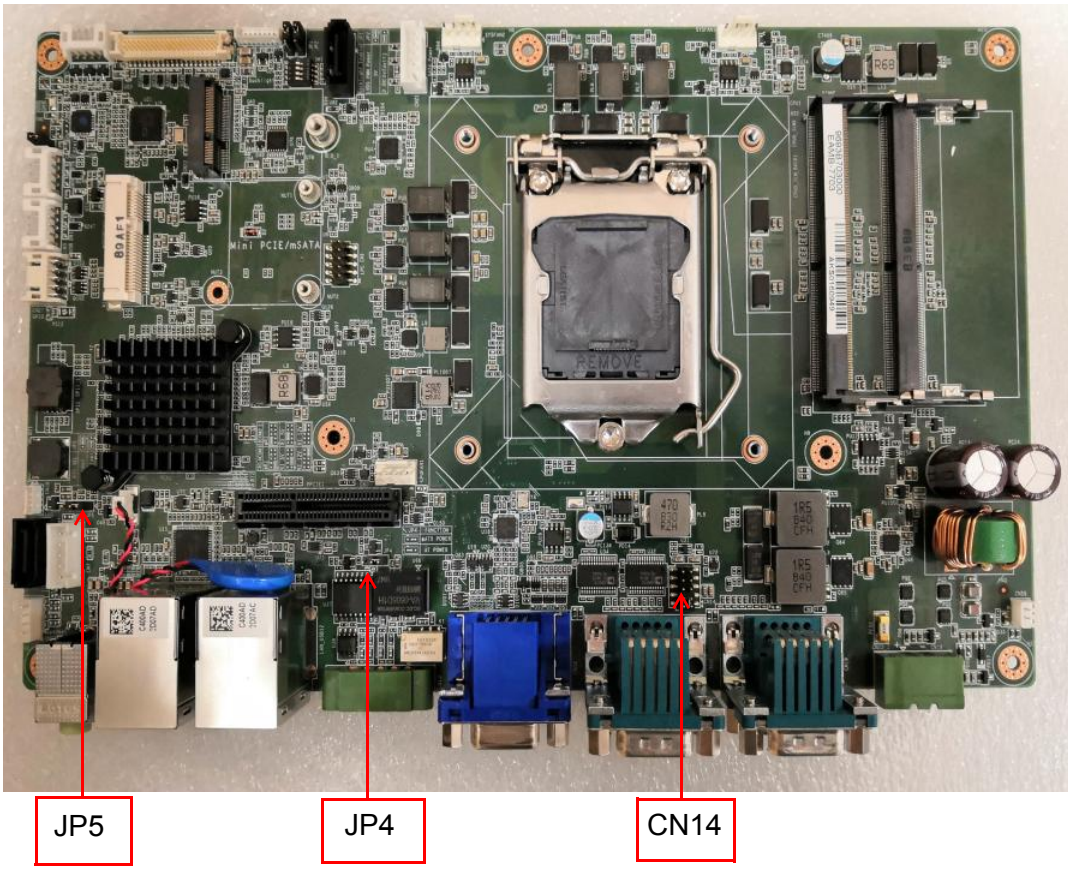
Figure 2.17 Completed stand mount

Chapter 3

Jumper and Switch Settings

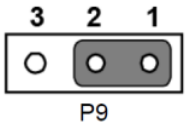
- Jumpers and Connectors
- DIO Switch
- External COM Port Pin Assignments

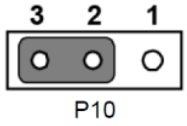
3.1 Jumpers and Connectors



Connector	Function
CN14	COM Pin 9 power selection
JP4	AT/ATX selection
JP5	Clear CMOS

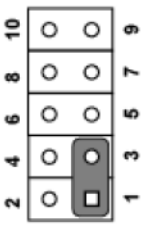
JP5	Icon	Clear CMOS	
(1-2)	P9	Normal	Default
(2-3)	P10	Clear CMOS	



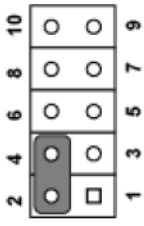


JP4	Icon	AT/ATX Selection
(1-2)	P9	AT mode
(2-3)	P10	ATX mode

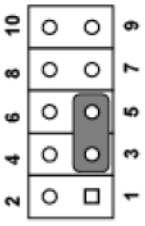
CN14		COM 1/2 RI-Type Selection
(1-3)(2-4)	P9/P10	COM 1/COM 2 RI Default
(3-5)(4-6)	P11/P12	COM 1/COM 2 5V
(7-9)(8-10)	P13/P14	COM 1/COM 2 12V



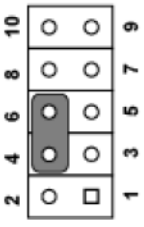
P9



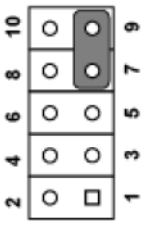
P10



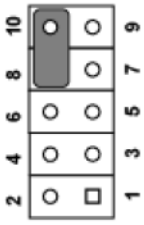
P11



P12

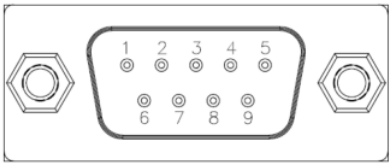


P13



P14

3.2 DIO Switch



Pin	DIO
1	GND
2	GPIO4
3	GPIO0
4	GPIO5
5	GPIO1
6	GPIO6
7	GPIO2
8	GPIO7
9	GPIO3

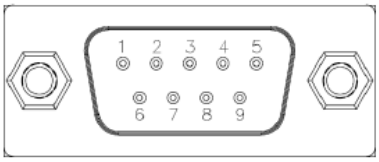
3.3 External COM Port Pin Assignments

COM 1, COM 2 (RS232, Pin 9 supports 5 V/12 V output)
COM 3, COM4 (RS232), COM 5 RS-422/485

3.3.1 COM1-4

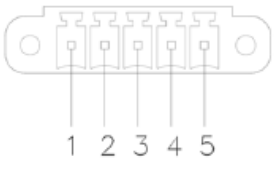
Pin	COM1/COM2
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RING or 5V/12V output

Pin 9 is set as the RI-Signal-In COM port by default. However, Pin 9 can be set as 5V/12V output via a jumper. 12V: Max. 200 mA; 5V: Max. 500 mA.



3.3.2 COM 5

RS422/485 supports an isolation voltage of 1000 VDC, which can be selected in the BIOS.



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

UART RS485 auto flow control

COM 5 supports the RS485 auto-flow control function.

When enabling the RS485 auto-flow control function. The system will automatically drive the RTS# pin to logic high or low for flow control.

Chapter 4

Software Setup

- Driver Installation
- BIOS Setup Program

4.1 Driver Installation

Before installing software on the panel PC, install the corresponding drivers to ensure full functionality.

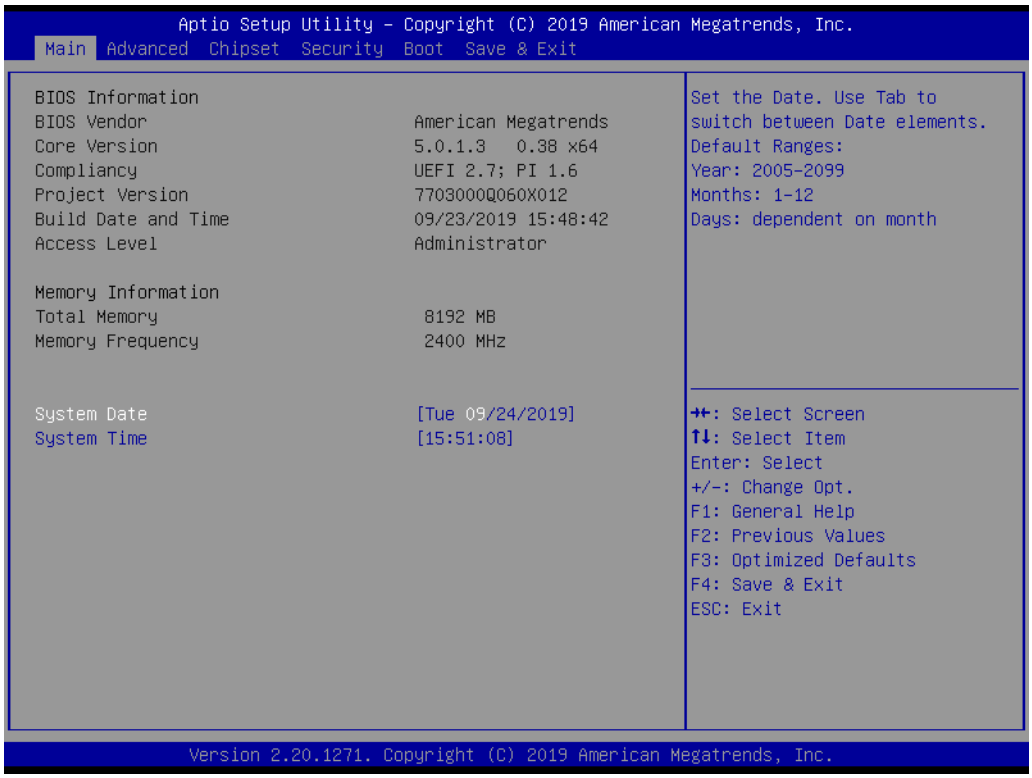
All drivers can be downloaded from the Advantech website

http://www.advantech.com

4.2 BIOS Setup Program

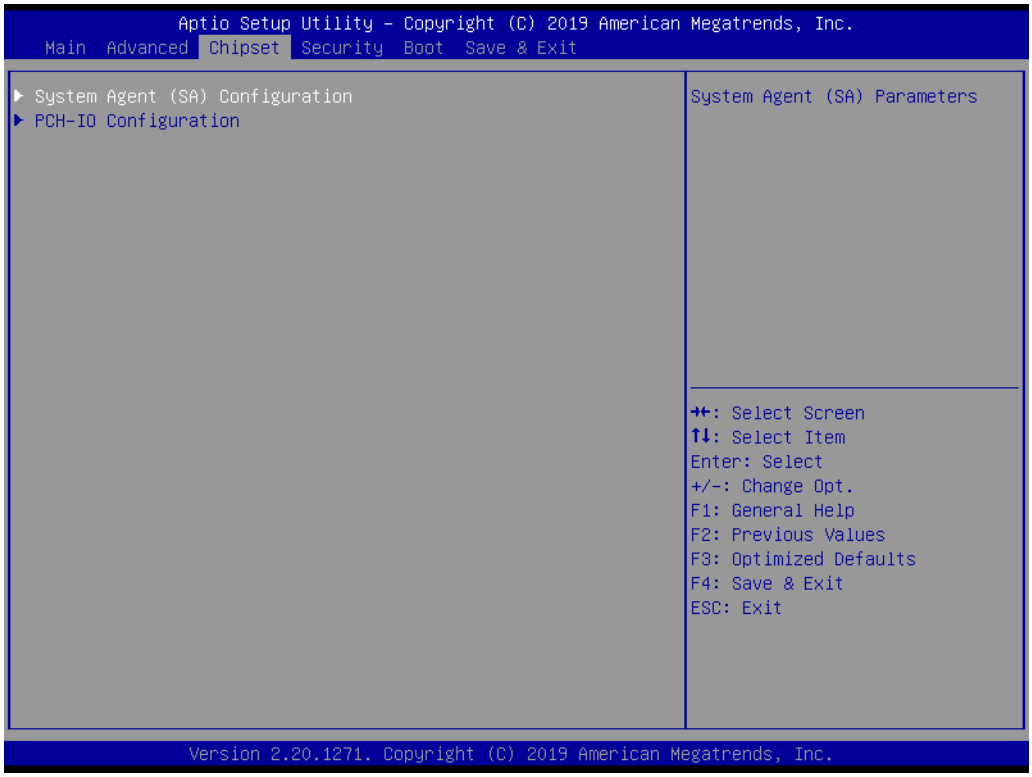
4.2.1 Entering BIOS Setup

When the power is turned on, press the <Del> button to enter BIOS setup screen. Whenever a change is made, press <F4> to save and exit; otherwise the settings will not be saved in the BIOS.

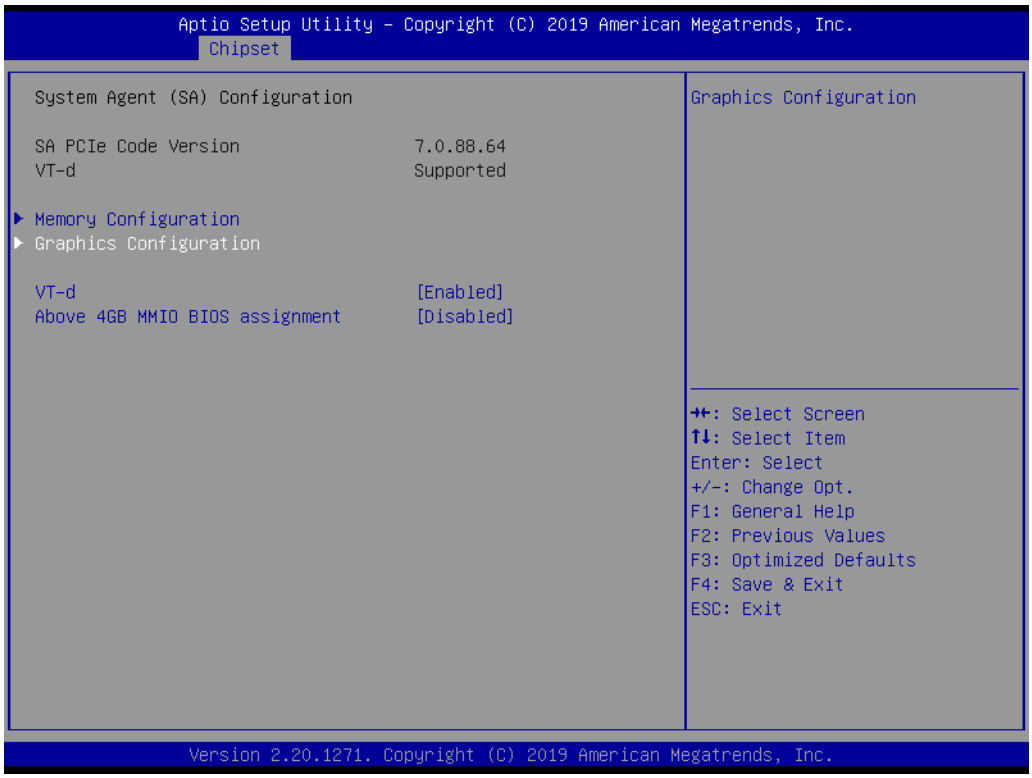


4.2.2 Adjustment of LCD Brightness

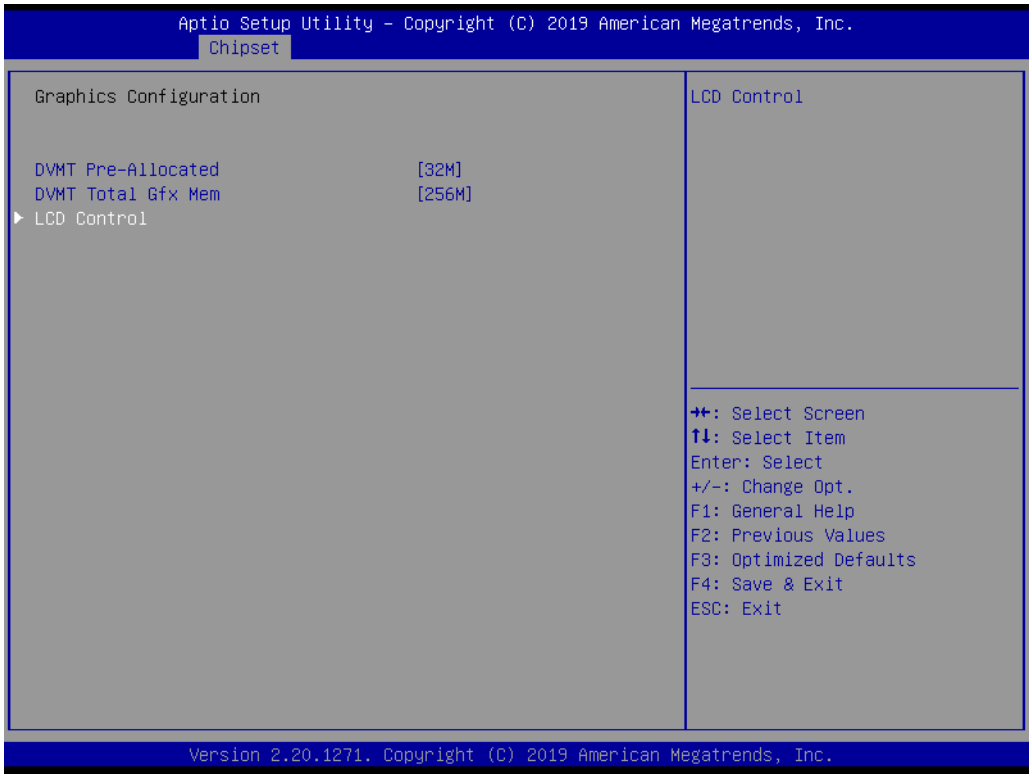
1. Select “System Agent (SA) Configuration” in the Chipset tab.



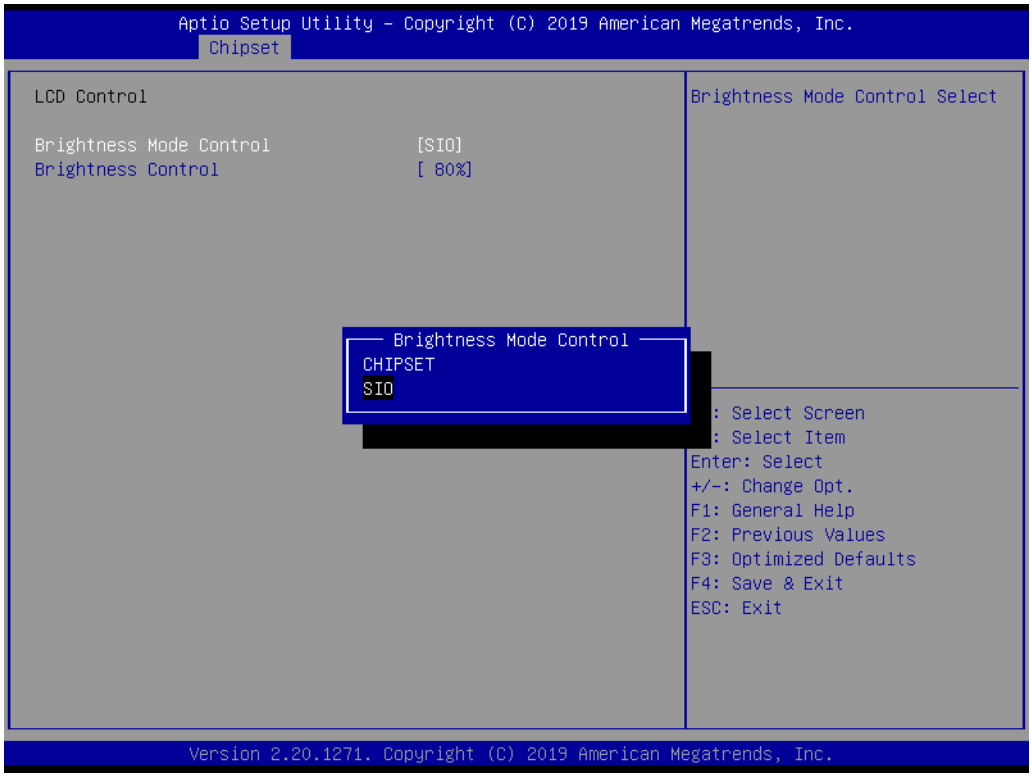
2. Then select “Graphics Configuration”.



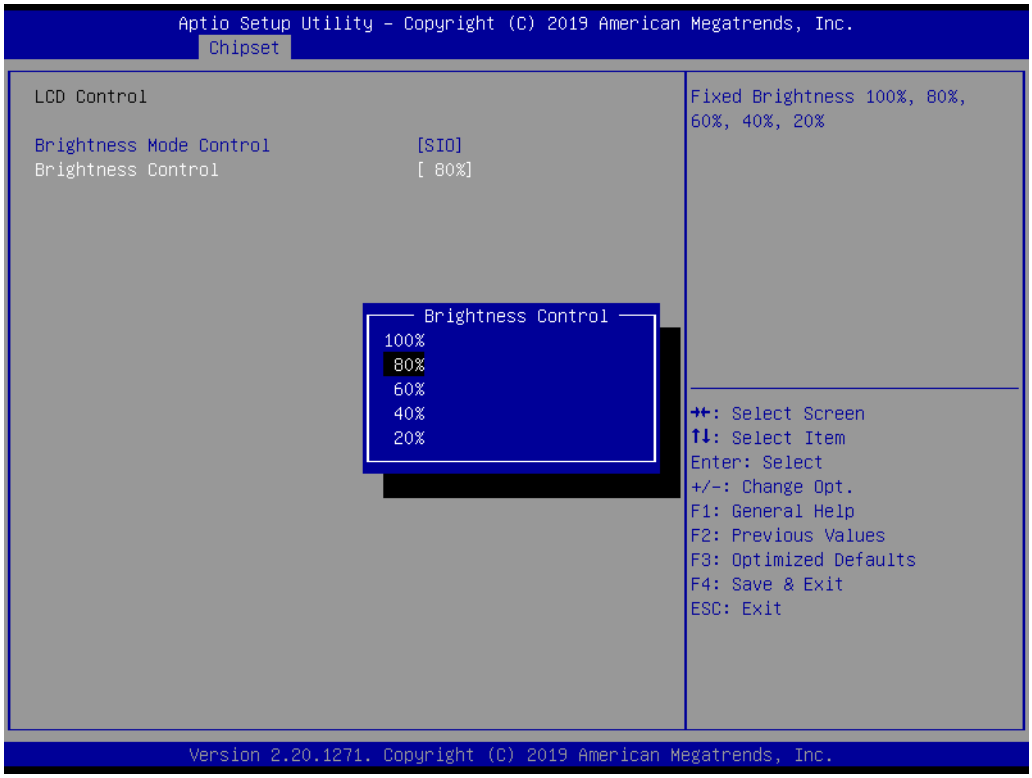
3. Select “LCD Control”.



4. There are two mode options to choose from, as shown below.
CHIPSET: Brightness adjustment via the OS.
SIO: Brightness adjustment via the BIOS.

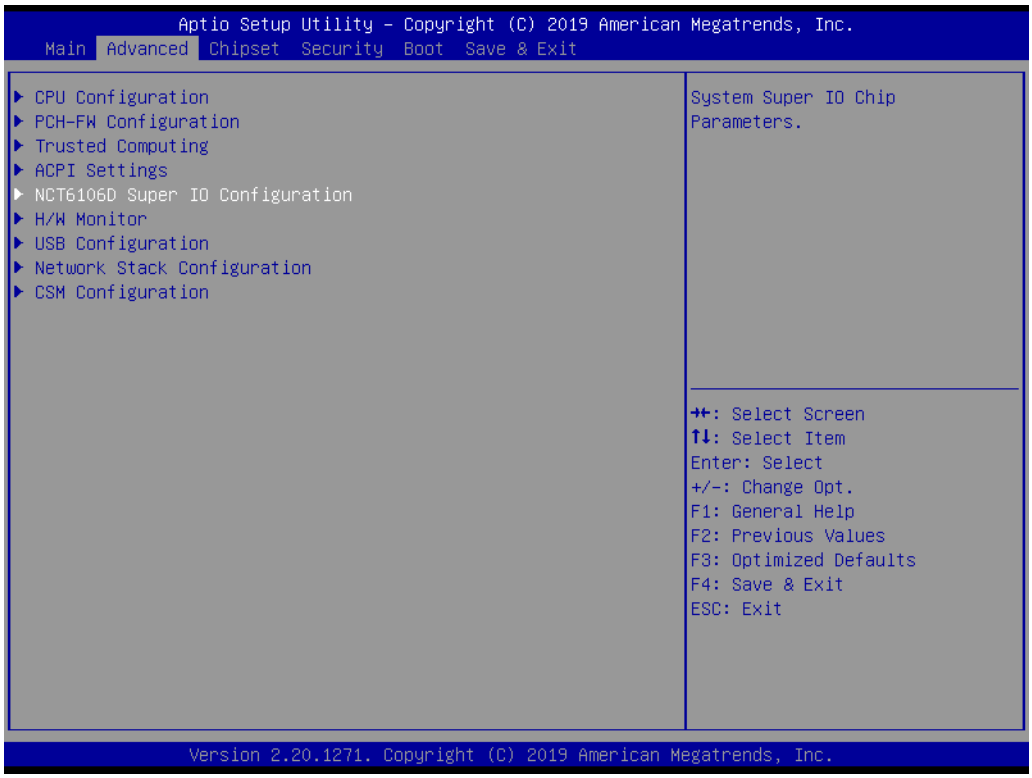


5. There are six brightness options in “SIO” mode.

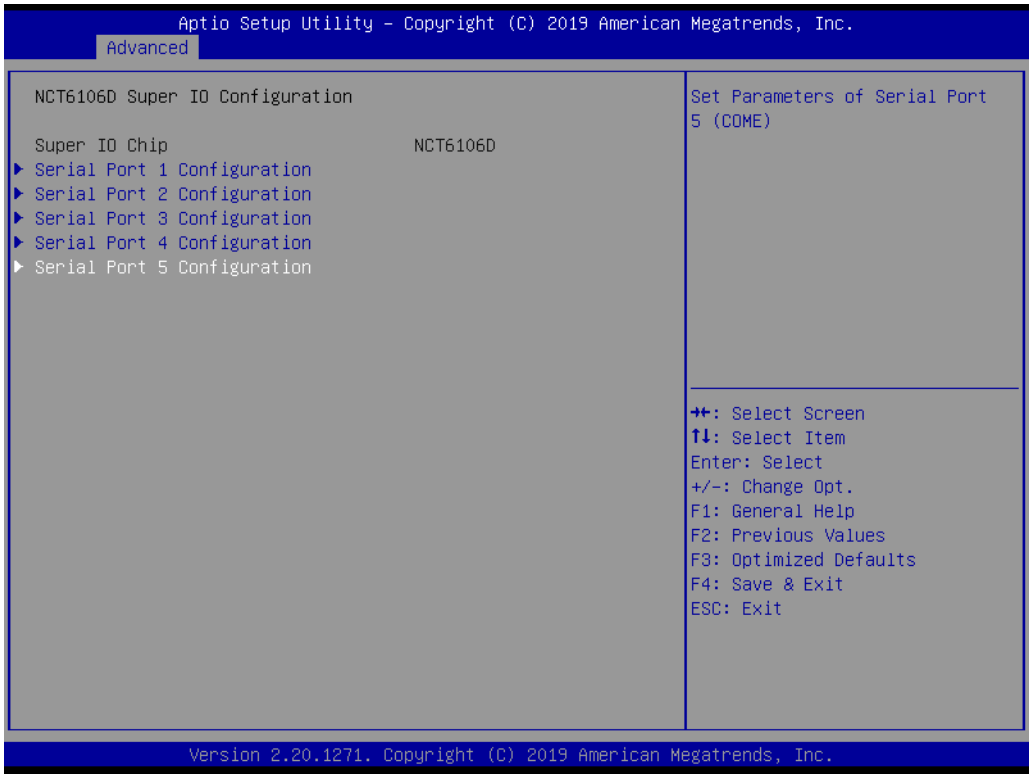


4.2.3 COM 5 Mode Selection (RS422/RS485)

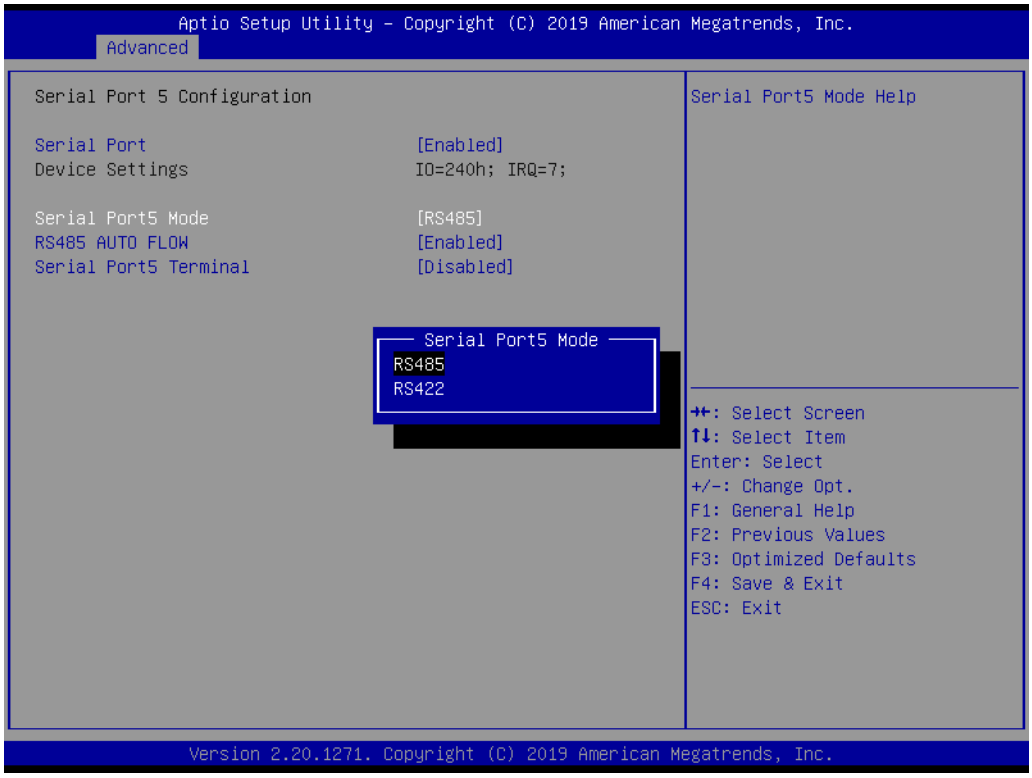
1. Select “NCT6106D Super IO Configuration” in the Advanced tab.



2. Select “Serial Port 5 Configuration”.

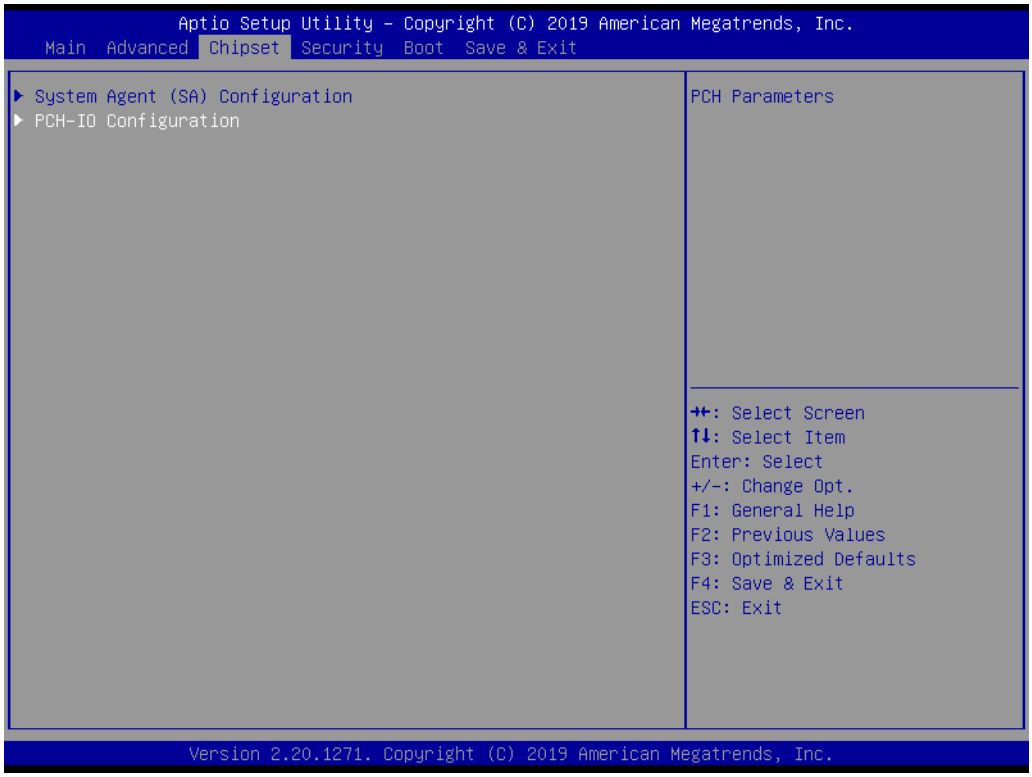


3. Select “Serial Port 5 Mode” and double click to set the COM5 operation mode as RS422 or RS485.

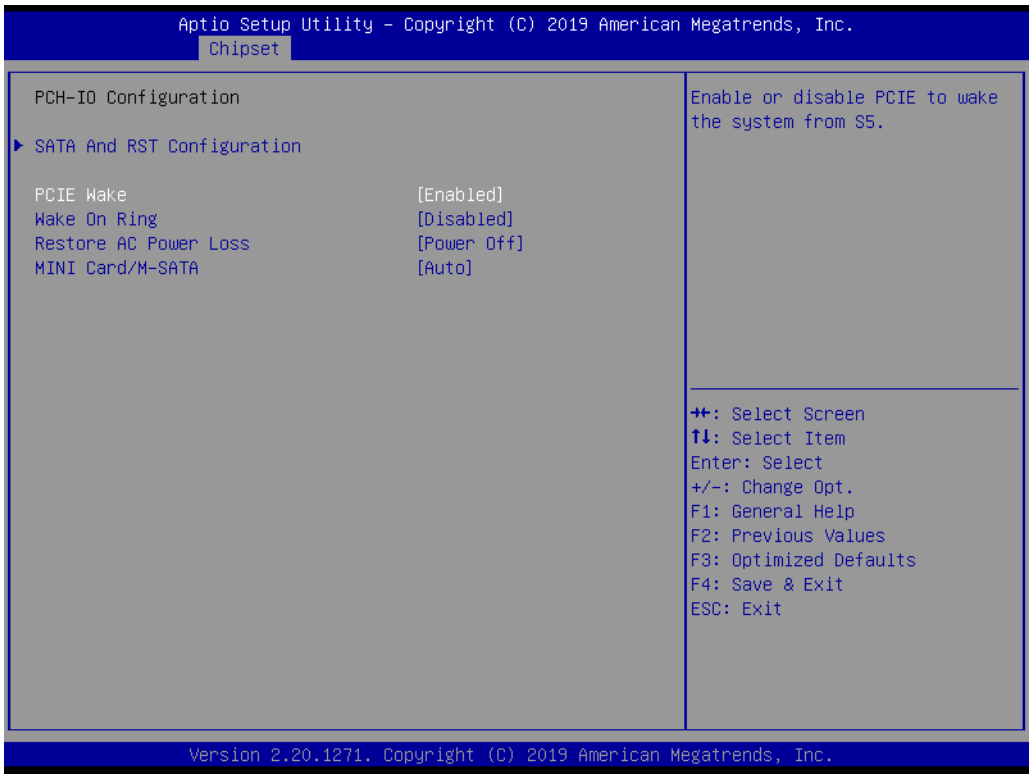


4.2.4 Wake on LAN or Ring

1. Select “PCH-IO Configuration” in the Chipset tab.

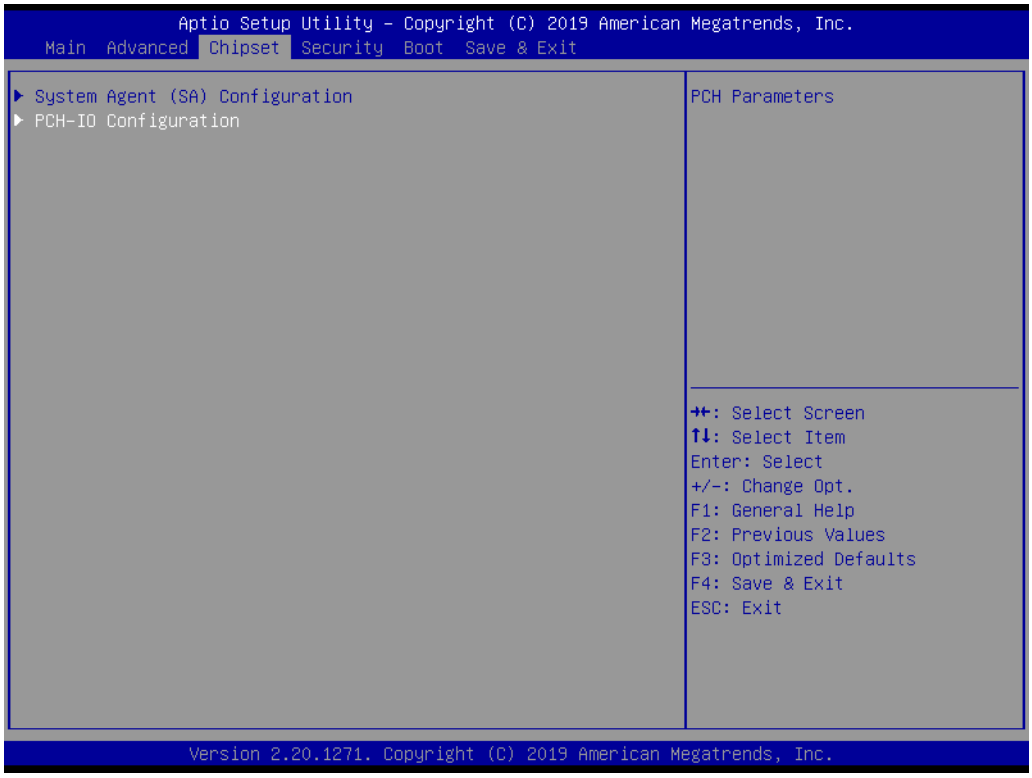


2. Set “PCIE Wake” to Enabled.

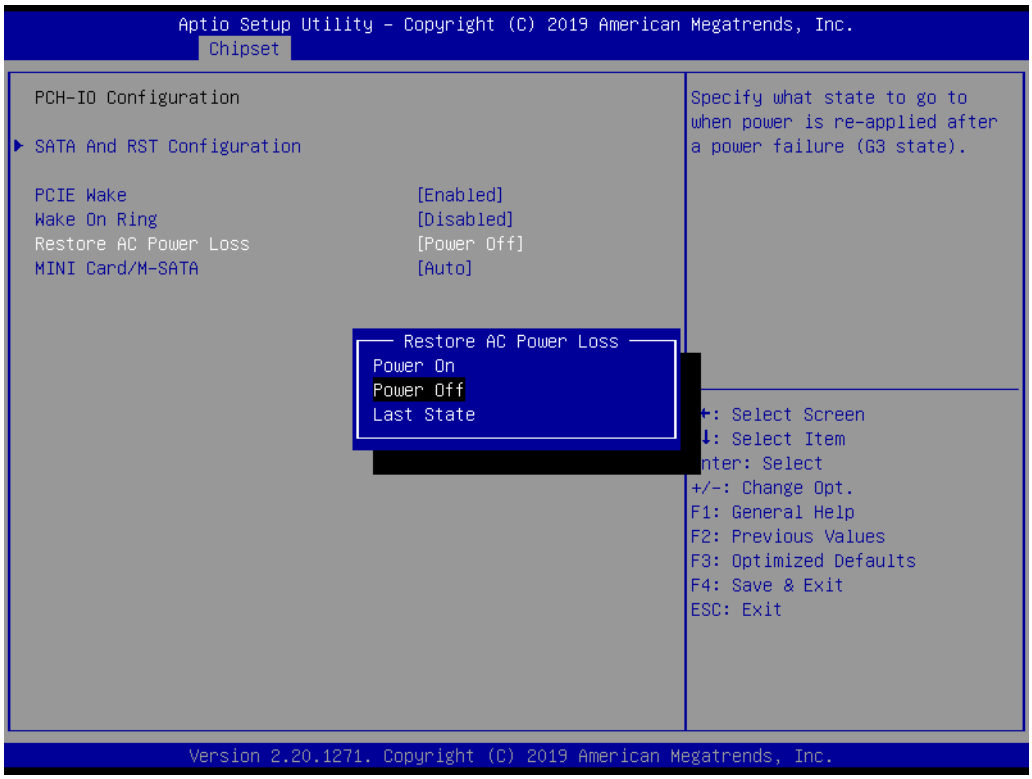


4.2.5 BIOS AT and ATX Setup

1. Select “PCH-IO Configuration” in the Chipset tab.

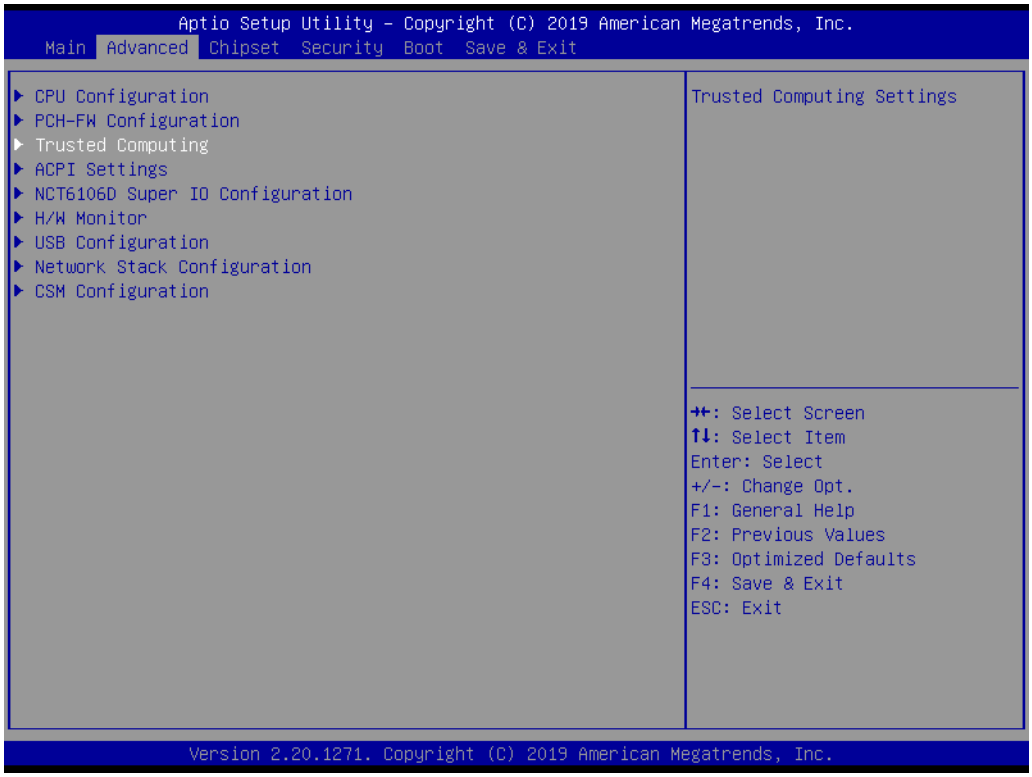


2. In the “Restore AC Power Loss” item, configure AT Mode as Power On and ATX Mode as Power Off.

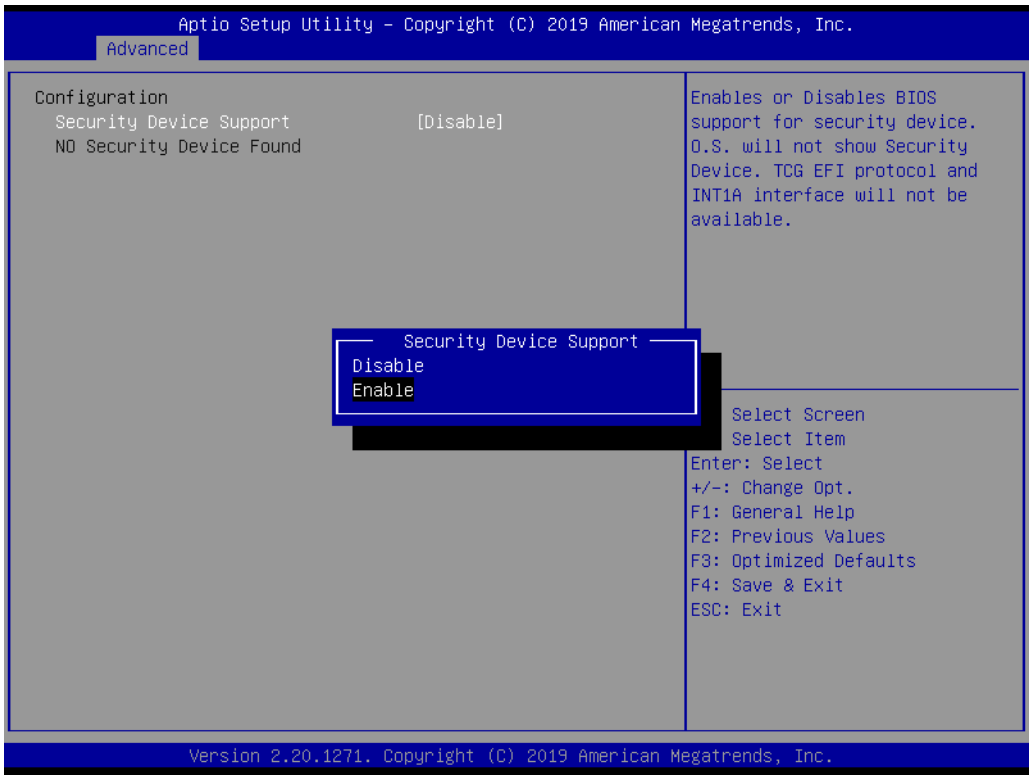


4.2.6 TPM Settings

1. Select “Trusted Computing” in the Advanced tab.



2. Set the “Security Device Support” item as Enabled. Save and exit the BIOS and restart the system.



Appendix A

BSMI RoHS

A.1 BSMI RoHS

設備名稱：電腦 Equipment name			型號（型式）：PPC-6121 Type designation (Type)			
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
液晶面板	—	○	○	○	○	○
電路板	—	○	○	○	○	○
配件（電源供應器）	—	○	○	○	○	○
其它固定組件（螺絲）	—	○	○	○	○	○
內外殼（外殼、按鍵、支架…等）	—	○	○	○	○	○

備考 1.“超出 0.1 wt %”及“超出 0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。
Note 1. “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考 2.“○”係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2. “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考 3.“－”係指該項限用物質為排除項目。
Note 3. “-” indicates that the restricted substance corresponds to the exemption.

Appendix B

China RoHS

B.1 China RoHS

Thank you for choosing an Advantech product. In compliance with the China RoHS standard SJ/T11364, “Marking for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products”, all hazardous substances present in the product are disclosed below.

Please disregard this notice if the product is not to be sold or installed in China.

Model Name	**PPC-3211SW/3181SW/3151SW**					
Substance	Name and concentration of hazardous substances contained in product					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chrome (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Battery	X	O	O	O	O	O
Touchscreen	X	O	O	O	O	O
Copper stub	X	O	O	O	O	O
Electronic parts and components	X	O	O	O	O	O

O: Indicates that the concentration of this hazardous substance in all homogeneous materials of the product comply with the limit specified in the GB/T 26572 standard.

X: Indicates that the concentration of this hazardous substance in at least one homogeneous material of the product exceeds the limit specified in the GB/T 26572 standard.

Enterprise Statement: (For substances exceeding the maximum allowable limit)

The Environmentally-Friendly Use Period (EFUP) for all enclosed products and their parts is per the symbol shown, unless otherwise marked. The EFUP is valid only when the product is operated under the conditions defined in the user manual.

Products labeled with a pollution control symbol do not contain hazardous substances, can be recycled, and should not be casually discarded.

Appendix C

Watchdog Program Example

C.1 Watchdog Program Example

The watchdog timer is provided to ensure that standalone systems can always recover from catastrophic CPU failures and crashes. Such events may have been caused by external EMI or a software bug. If the CPU is malfunctioning, the watchdog timer performs a hardware reset to return the system to a previous state.

The following watchdog timer example code is written in Intel 8086 assembly language for a DOS environment. The number of watchdog timer intervals can be set as 0 ~ 255 via software.

```
------------------------------------------------
; Enter the Extended Function Mode
;------------------------------------------------
MOV DX, 2EH; dependency by HW strap to 2Eh
MOV AL, 87H
OUT DX, AL
OUT DX, AL
;-------------------------------------------------------------------------
; Configure logical device 8, configuration register CR30
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, 07H
OUT DX, AL; point to logical device number reg.
MOV DX, 2FH
MOV AL, 08H
OUT DX, AL; select logical device 8

;-------------------------------------------------------------------------
;Set WDT logic device to active
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, 30H
OUT DX, AL; select CR30
MOV DX, 2FH
MOV AL, 01H
OUT DX, AL; set WDT active

;-------------------------------------------------------------------------
;Initial WDT mode
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, F0H
OUT DX, AL
MOV DX, 2FH
MOV AL, 00H; bit 0: 0 = pulse mode, 1 = level mode; bit 3: 0 = second mode, 1 = minute mode
OUT DX, AL; set second mode, default value
```

```
;--------------------------------------------------------------------------
;Set WDT timeout value
;--------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, F1H
OUT DX, AL
MOV DX, 2FH
MOV AL, 05H
OUT DX, AL; set timeout value as 5s; 00 = timeout disabled

;----------------------------------------------
; Exit the Extended Function Mode
;----------------------------------------------
MOV DX, 2EH
MOV AL, AAH
OUT DX, AL
```

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