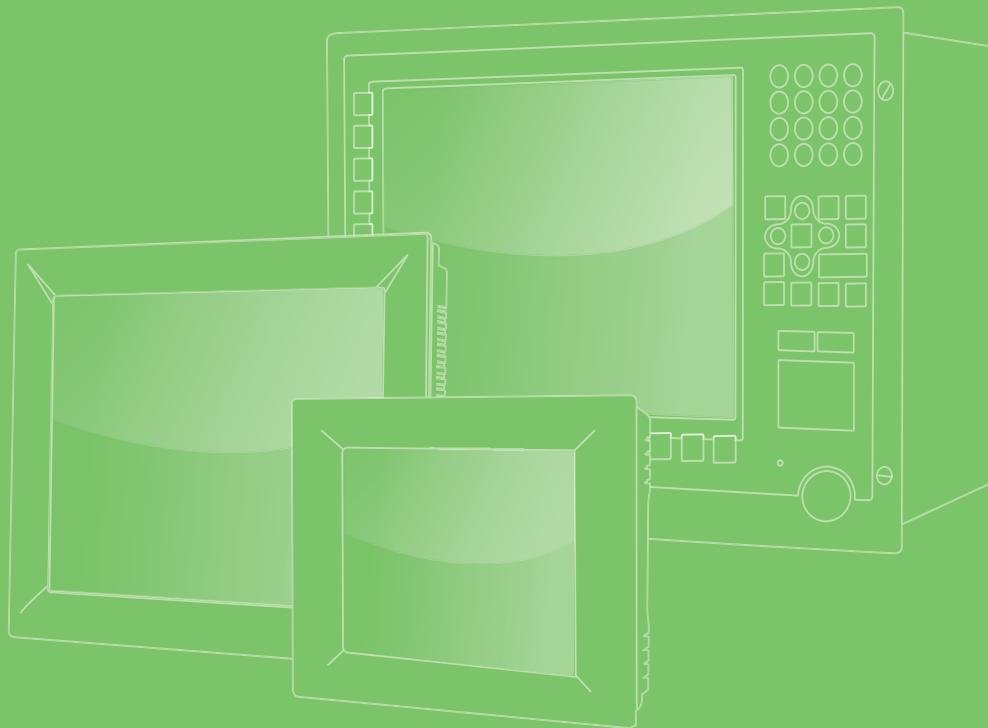


User Manual



PPC-3150/3170/3190

**15"/17"/19" Color TFT LCD panel
PC with Intel® Atom™ E3845
Processor**

ADVANTECH

Enabling an Intelligent Planet

Copyright

The documentation and the software included with this product are copyrighted 2021 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. The information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties that may result from its use.

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows is registered trademark of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

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 A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference. In this event, users are required to correct the interference at their own expense.

Technical Support and Assistance

1. Visit the Advantech website at 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 85 °C (185 °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 85 °C (185 °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-DIEBN2 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, 6 ~ 2A min., and ES1 (or SELV). Contact Advantech for further information.
Le produit doit être alimenté par une alimentation certifiée UL (FSP090-DIEBN2 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, 6 ~ 2A 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.

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.



Contents

Chapter 1 General Information1

1.1	Introduction	2
1.2	Specifications	2
1.2.1	Specifications Comparison	2
1.2.2	General	3
1.2.3	Power Specifications.....	3
1.2.4	Environmental Specifications.....	4
1.2.5	Certification Specifications.....	4
1.2.6	IP Rating	4
1.2.7	Power Consumption Test Conditions.....	4
1.3	Dimensions	5
	Figure 1.1 PPC-3150 Dimensions	5
	Figure 1.2 PPC-3170 Dimensions	6
	Figure 1.3 PPC-3190 Dimensions	7

Chapter 2 System Installation & Setup9

2.1	Quick Installation Guide	10
	Figure 2.1 PPC-31x0-xE4B Series Front Panel.....	10
	Figure 2.2 Side and Rear View	10
	Figure 2.3 I/O Connectors	11
2.2	Installation Procedures.....	12
2.2.1	Connecting the Power Cable	12
	Figure 2.4 Power Cable Connector	12
2.2.2	Connecting the Keyboard and Mouse.....	12
2.3	Memory Card Installation	13
	Figure 2.5	13
	Figure 2.6	13
	Figure 2.7	14
	Figure 2.8	14
2.4	HDD Installation	15
	Figure 2.9	15
	Figure 2.10.....	15
	Figure 2.11.....	16
	Figure 2.12.....	16
	Figure 2.13.....	17
2.5	Mini SATA Installation	17
	Figure 2.14.....	17
	Figure 2.15.....	18
	Figure 2.16.....	18
	Figure 2.17.....	19
	Figure 2.18.....	19
2.6	Wireless LAN Card Installation	20
	Figure 2.19.....	20
	Figure 2.20.....	20
	Figure 2.21.....	21
	Figure 2.22.....	21
	Figure 2.23.....	22
	Figure 2.24.....	22
	Figure 2.25.....	23
	Figure 2.26.....	23
	Figure 2.27.....	24
2.7	Riser Card Installation.....	25
	Figure 2.28.....	25

	Figure 2.29	25
2.8	AT/ATX Function Switch	26
	Figure 2.30ATX Mode	26
	Figure 2.31AT Mode	26
2.9	Mount Bracket Installation.....	27
	Figure 2.32	27
2.10	Optional Module Installation.....	28
	Figure 2.33	28
	Figure 2.34	28
	Figure 2.35	29
	Figure 2.36	29
	Figure 2.37	30
	Figure 2.38	31
	Figure 2.39	31
	Figure 2.40	32
	Figure 2.41	32
	Figure 2.42	33
	Figure 2.43	33
	Figure 2.44	34
	Figure 2.45	35
	Figure 2.46	35
	Figure 2.47	36
	Figure 2.48	36
	Figure 2.49	37
	Figure 2.50	38
	Figure 2.51	38
	Figure 2.52	39
	Figure 2.53	40
	Figure 2.54	40
	Figure 2.55	40
	Figure 2.56	41
	Figure 2.57	41
	Figure 2.58	42
	Figure 2.59	42

Chapter 3 Jumper Settings 43

3.1	Jumpers and Connectors.....	44
	Figure 3.1	44
3.2	External COM Ports and Pin Definitions	47
	Figure 3.2	47

Chapter 4 Software Setup..... 49

4.1	Driver Installation	50
4.2	BIOS Setup Utility	51
4.2.1	Update BIOS.....	51
4.2.2	Entering the BIOS Setup Utility.....	52
4.2.3	LCD Brightness Adjustment.....	52
4.2.4	COM3 Mode Selection (RS422/RS485)	54
4.2.5	COM3 RS485 Terminal Selection.....	55
4.2.6	Wake on LAN.....	56
4.2.7	AT & ATX Setup	60
4.2.8	OS Selection.....	61
4.2.9	SATA Mode Selection.....	62
4.2.10	Boot Options	63

Appendix A

PCI/PCI-E65

A.1 PCI/PCI-E..... 66

Chapter 1

General Information

This chapter gives background information on the PPC-3150/3170/3190 panel PC.

- Introduction
- Specifications
- Dimensions

1.1 Introduction

Advantech's PPC-3150/3170/3190 (15"/17"/19") fanless panel PCs are powered by an Intel® Atom™ E3845 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_{DC}). The provision of multiple I/O interfaces, including four COM (of which two are internal ports for an optional COM module), one USB 3.0, 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

1.2.1 Specifications Comparison

Model Name	PPC-3150		PPC-3170	PPC-3190
	PPC-3150-RE4BE	PPC-3150-PE4BE	PPC-3170-RE4BE	PPC-3190-RE4BE
LCD Size	15"		17"	19"
Display Type	15" TFT LCD with LED backlight		17" TFT LCD with LED backlight	19" TFT LCD with LED backlight
Max. Resolution	1024 x 768		1280 x 1024	1280 x 1024
Color	16.7M		16.7M	16.7M
Dot Matrix	0.297 x 0.297 mm		0.264 x 0.264 mm	0.294x0.294 mm
Viewing Angle	80 (left), 80 (right), 70 (top), 70 (bottom)		80 (left), 80 (right) 60 (top), 80 (bottom)	85 (left), 85 (right) 80 (up), 80 (down)
Brightness	500 cd/m ²		350 cd/m ²	350 cd/m ²
Contrast	2500		800	1,000
Backlight Lifecycle	70,000 hrs		50,000 hrs	50,000 hrs
Touchscreen Type	5-wire resistive	Projected capacitive	5-wire resistive	5-wire resistive
Light Transmission	80% ± -5%	80% ± 3%	80% ± -5%	80% ± -5%
Controller	USB interface			
Durability (Touches)	35 million		35 million	35 million
Weight	5.3 kg (11.6 lb)		6.3 kg (13.9 lb)	7.0 kg (15.4 lb)
Dimensions	392.2 x 313.5 x 55.1 mm (15.4 x 12.3 x 2.1 in)		437 x 357 x 56.5 mm (17.2 x 14.0 x 2.22 in)	454.0 x 379.8 x 62.1 mm (17.8 x 14.9 x 2.4 in)

1.2.2 General

		Frequency	Cache
CPU	Intel® Atom™ E3845	1.91 GHz	2 M
Chipset	Intel® Atom™ E3800 Series		
Memory	1 x 204-pin supports up to 8 GB DDR3L		
Storage 1	1 x 2.5" SATA bay		
Optional Storage & I/O	One of the options below: <ul style="list-style-type: none"> ■ 1 x Full-size mSATA ■ CFast card (optional module) ■ CF card (optional module) ■ Internal USB connector for USB dongle (optional module) ■ 2 x DB9 for 2 x RS-232 or 1 x RS-232 and 1 x GPIO (optional module) 		
Network (LAN)	2 x Gigabit Ethernet (Intel® I210)		
I/O Ports	<ul style="list-style-type: none"> ■ 1 x Isolated RS-422/485 ■ 4 x RS-232 (2 x internal for optional COM module) ■ 1 x GPIO (8 x channels, TTL level) (reserved) ■ 1 x USB 3.0 and 3 x USB 2.0 ■ 2 x Gigabit Ethernet ■ 1 x D-SUB VGA port ■ 1 x DP1.1a port ■ 1 x Line-Out, 1 x Mic-In, 2 x 1 W speaker (internal) 		
Expansion Slots	One of the options below: <ul style="list-style-type: none"> ■ 1 x PCI (standard) ■ 1 x PCIe x 1 (provided in the accessory box) 		
Other Expansion Options	1 x Full-size mini PCIe slot		
OS Support	WES7/Windows 7/Windows 8/Windows 8.1		

1.2.3 Power Specifications

Model Name	PPC-3190	PPC-3170	PPC-3150
Power Consumption	27 W Test system: Windows 7 (32 bit)	34 W Test system: Windows 7 (32 bit)	30 W Test system: Windows 7 (32 bit)
Output Power	50 W		
Input Voltage	9 ~ 32 V _{DC} , 6 A ~ 2 A		

Note! For information regarding the test conditions for the power consumption values presented above, please refer to Section 1.2.7.



1.2.4 Environmental Specifications

Operating Temperature	0 ~ 50 °C (32 ~ 122 °F) with 2.5" SATA HDD -20 ~ 60 °C (-4 ~ 140 °F) with -40 ~ 85 °C mSATA or 2.5" SSD
Storage Temperature	-40 ~ 60 °C (-40 ~ 140 °F)
Relative Temperature	10 ~ 95% @ 40 °C (non-condensing)
Shock	10 G peak acceleration (11 msec duration), IEC 60068-2-27 compliant
Vibration	5 ~ 500 Hz, 1 Grms, IEC 60068-2-64 compliant

1.2.5 Certification Specifications

EMC	BSMI, CE, FCC Class A
Safety	CB, CCC, BSMI, UL

1.2.6 IP Rating

Front Panel Ingress Protection	IP65 compliant
---------------------------------------	----------------

1.2.7 Power Consumption Test Conditions

For PPC-3190

Test Condition	Test Configuration	Test System	Power Consumption
BurnIn Test 7.0	Memory: 4G DDR3L 1333 HDD: 500G 2.5" SATA III I/O: 2 x COM RS-232 loopback, 1 x USB 3.0, 3 x USB 2.0	Intel® Atom™ E3845 2M 1.91G	Windows 7 (32 bit) 27 W

For PPC-3170

Test Condition	Test Configuration	Test System	Power Consumption
BurnIn Test 7.0	Memory: 4G DDR3L 1333 HDD: 500G 2.5" SATA III mSATA: mSATA 32G MLC I/O: 4 x COM RS-232 loopback, 1 x USB 3.0, 4 x USB 2.0	Intel® Atom™ E3845 2M 1.91G	Windows 7 (32 bit) 34 W

For PPC-3150

Test Condition	Test Configuration	Test System	Power Consumption
BurnIn Test 7.0	Memory: 4G DDR3L 1333 HDD: 500G 2.5" SATA III mSATA: mSATA 32G MLC I/O: 4 x COM RS-232 loopback, 1 x USB 3.0, 4 x USB 2.0	Intel® Atom™ E3845 2M 1.91G	Windows 7 (32 bit) 30 W

1.3 Dimensions

PPC-3150-XE4B Series

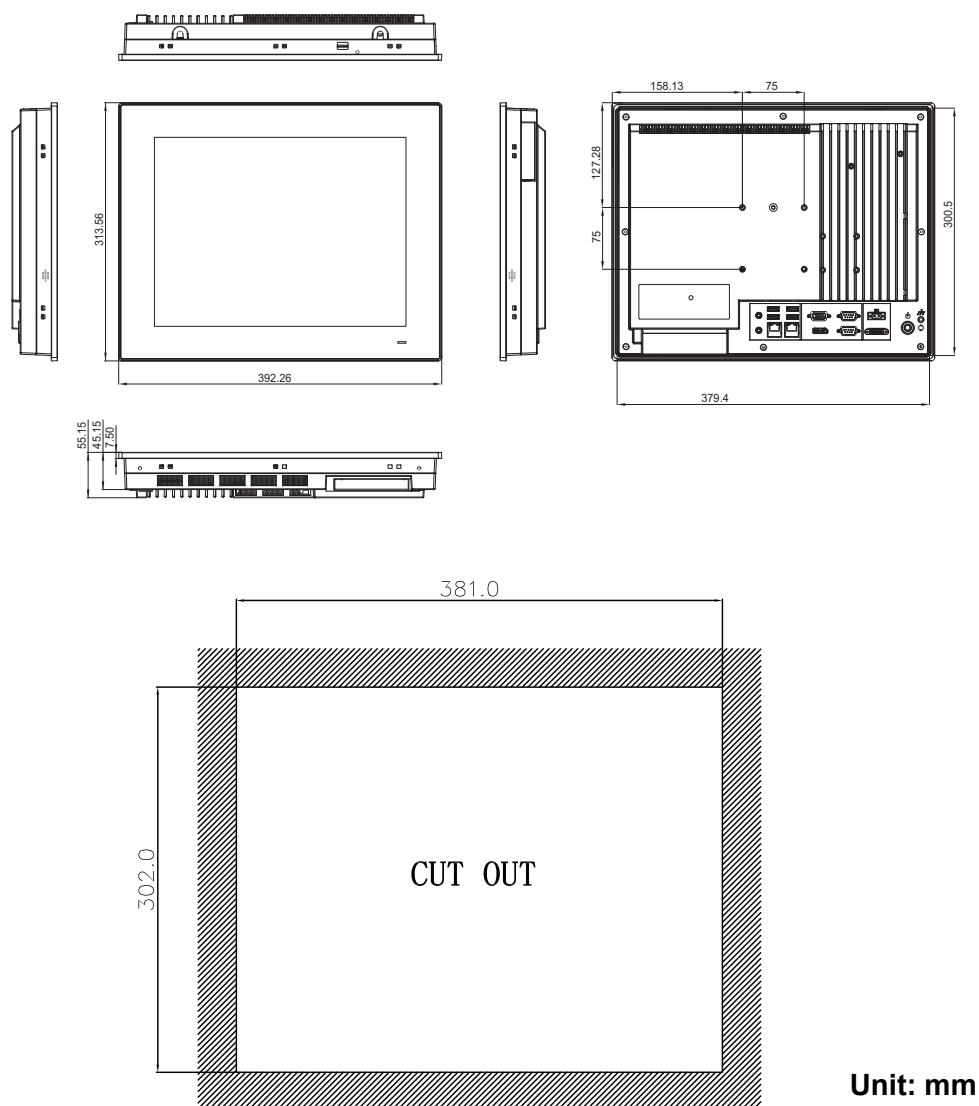


Figure 1.1 PPC-3150 Dimensions

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



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

PPC-3170-xE4B Series

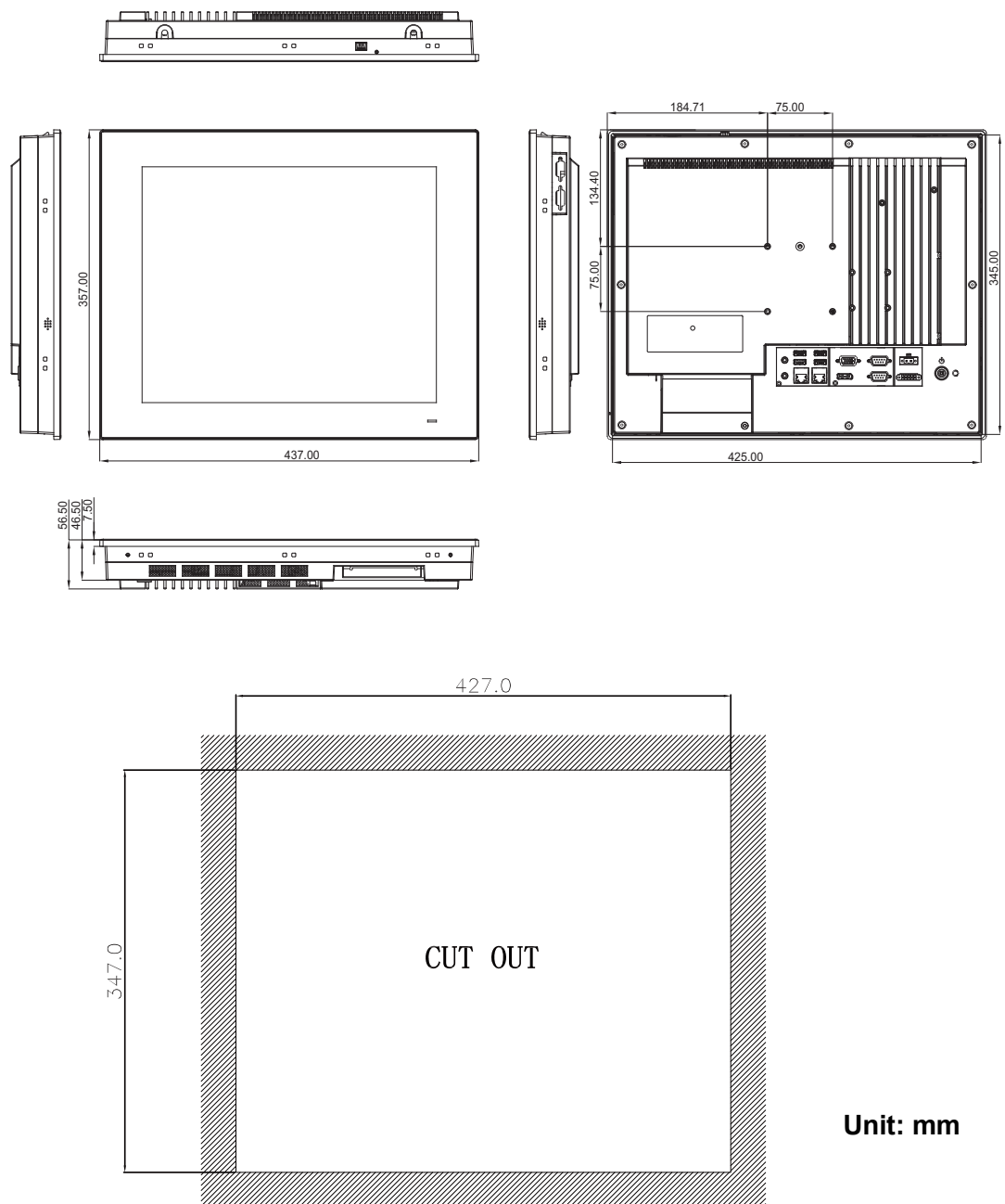


Figure 1.2 PPC-3170 Dimensions

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



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

PPC-3190-xE4B Series

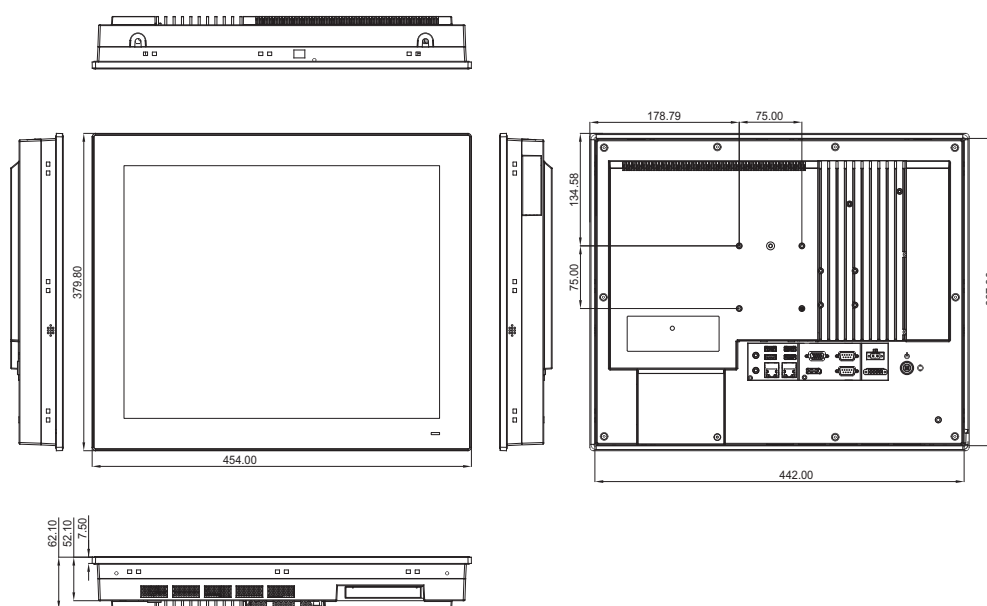
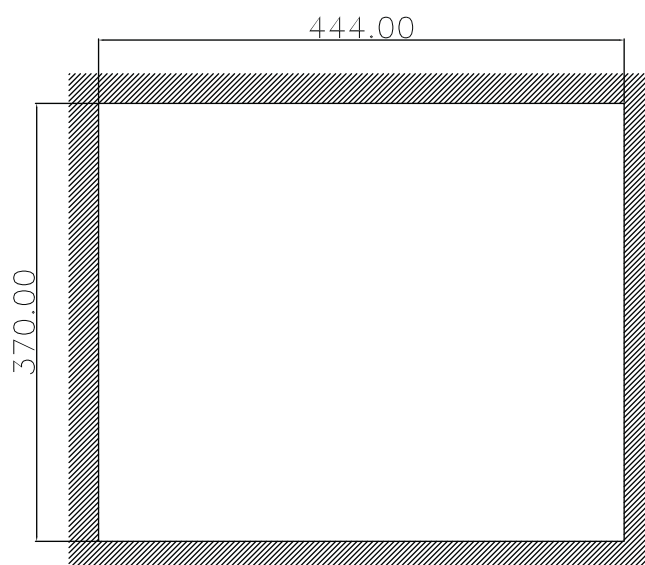


Figure 1.3 PPC-3190 Dimensions



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
- HDD 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-3150/3170/3190 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-3150/3170/3190 panel PC should appear as shown in Fig. 2.1.

(Note: The figures in this chapter show the PPC-3150 model. However, all of the PPC-31x0-xE4xx models feature the same design.)



Figure 2.1 PPC-31x0-xE4B Series Front Panel

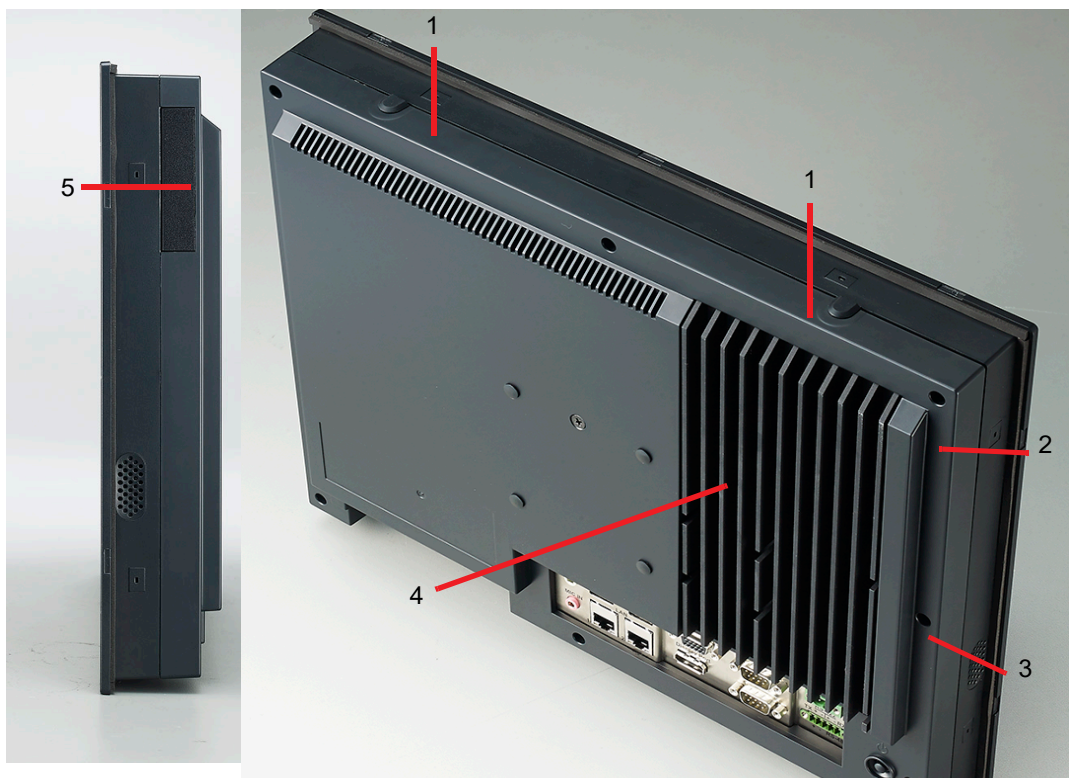


Figure 2.2 Side and Rear View

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

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



I/O Connectors

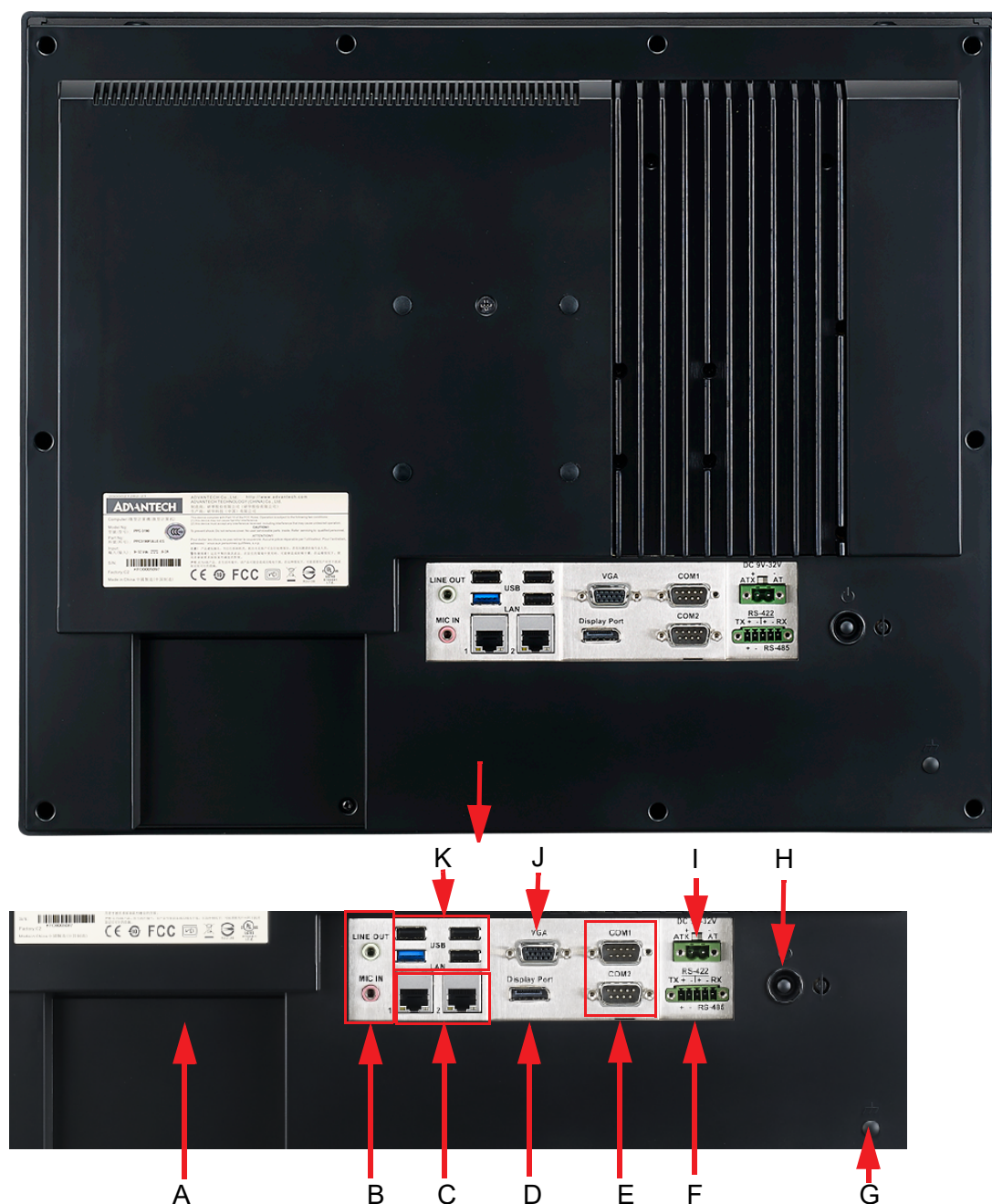


Figure 2.3 I/O Connectors

- | | |
|------------------------------------|-----------------------------------|
| A: Expansion slot (PCI or PCIe x1) | G: Grounding line (PPC-3190 only) |
| B: Line-Out/Mic-In | H: Power button |
| C: 2 x Gigabit Ethernet | I: DC jack and AT/ATX switch |
| D: Displayport | J: VGA |
| E: 2 x RS-232 | K: 1 x USB 3.0 and 3 x USB 2.0 |
| F: Isolated RS-422/485 | |

2.2 Installation Procedures

2.2.1 Connecting the Power Cable

The PPC-3150/3170/3190 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 11 screws (circled in red) and take out the four plugs (circled in yellow) from the rear cover to remove the rear cover (see Figs. 2.5 and 2.6).



Figure 2.5

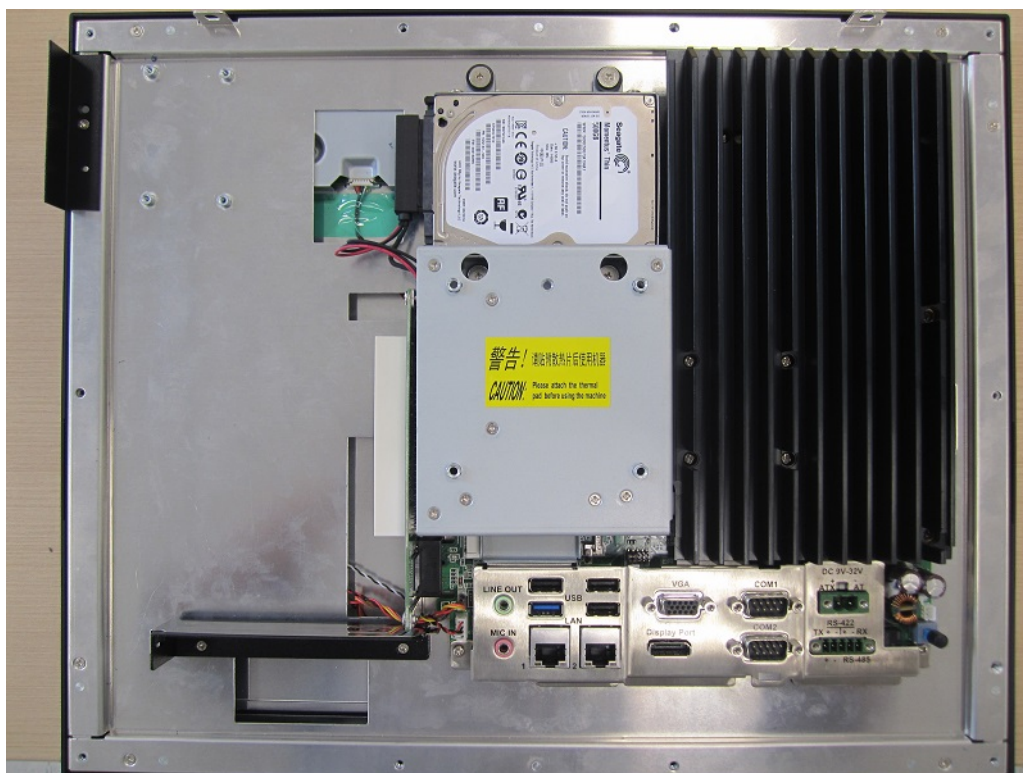


Figure 2.6

2. Remove the eight screws on the heatsink (circled in red in Fig. 2.7) and remove the heatsink.



Figure 2.7

3. 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.

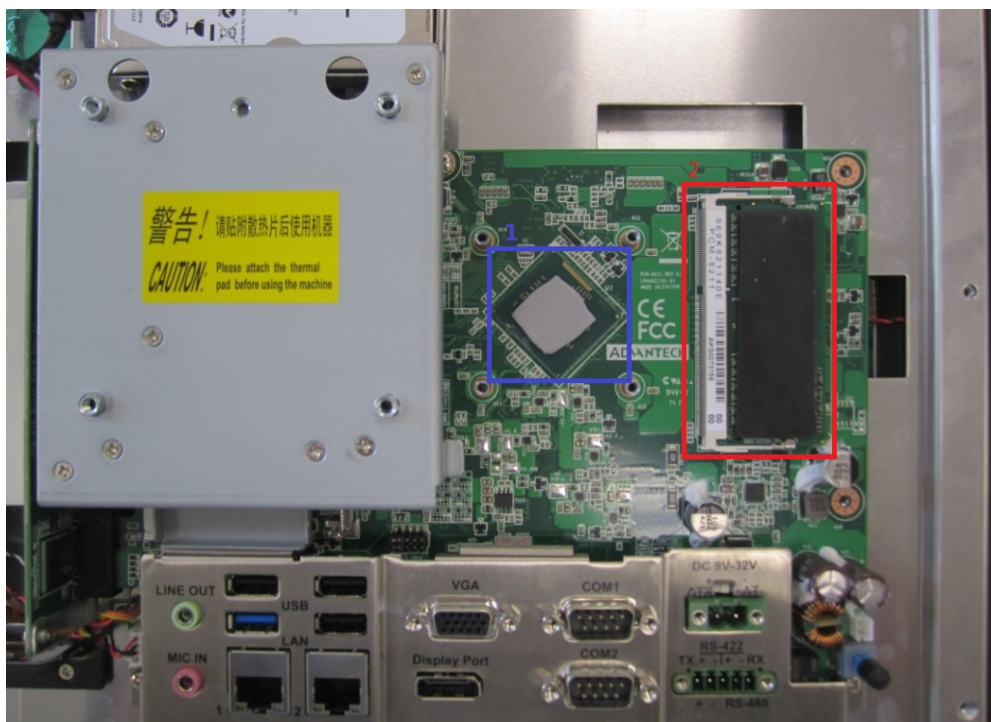


Figure 2.8

2.4 HDD Installation

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

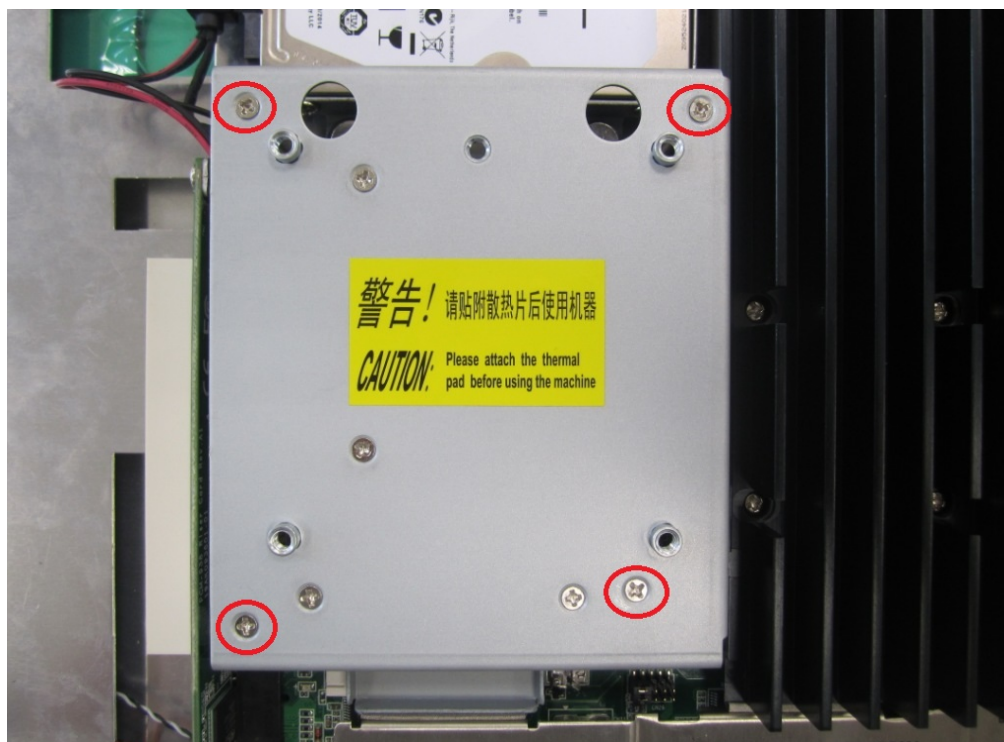


Figure 2.9

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

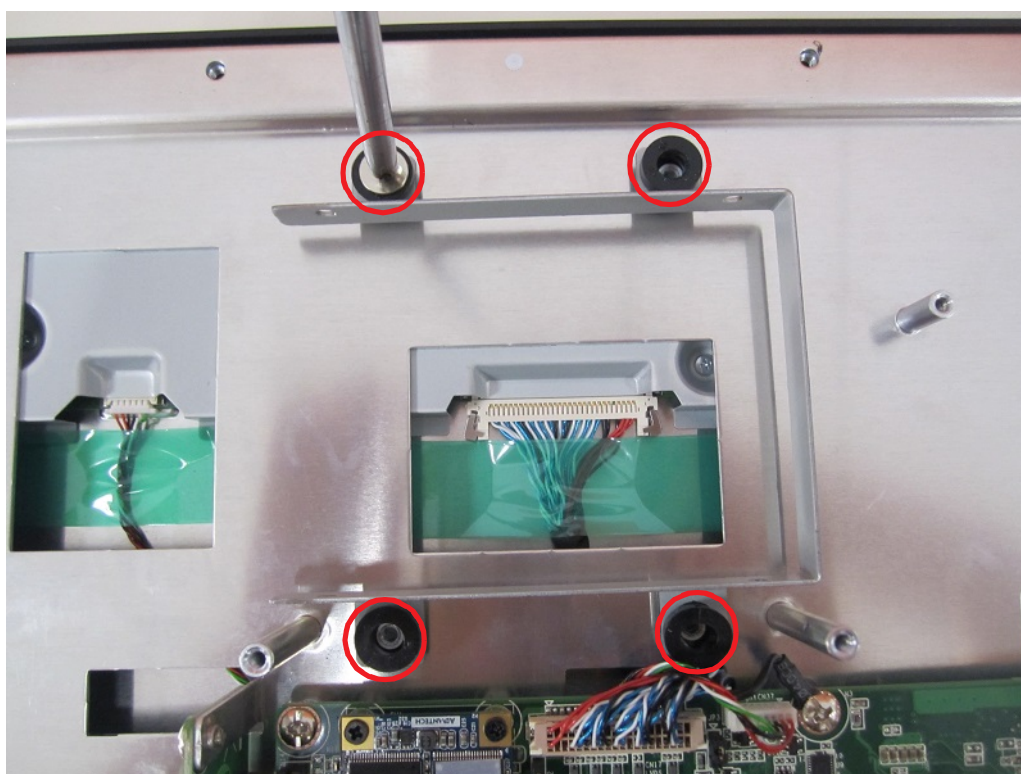


Figure 2.10

4. Retrieve four screws from the accessory box and use them to affix the HDD to the HDD bracket (see Fig. 2.11). Then retrieve the HDD data cable from the accessory box and connect it to the HDD. The assembled HDD module is shown in Fig. 2.12.



Figure 2.11



Figure 2.12

5. Replace the HDD bracket and secure in place. Connect the other end of the HDD data cable to the mainboard (see Fig. 2.13).

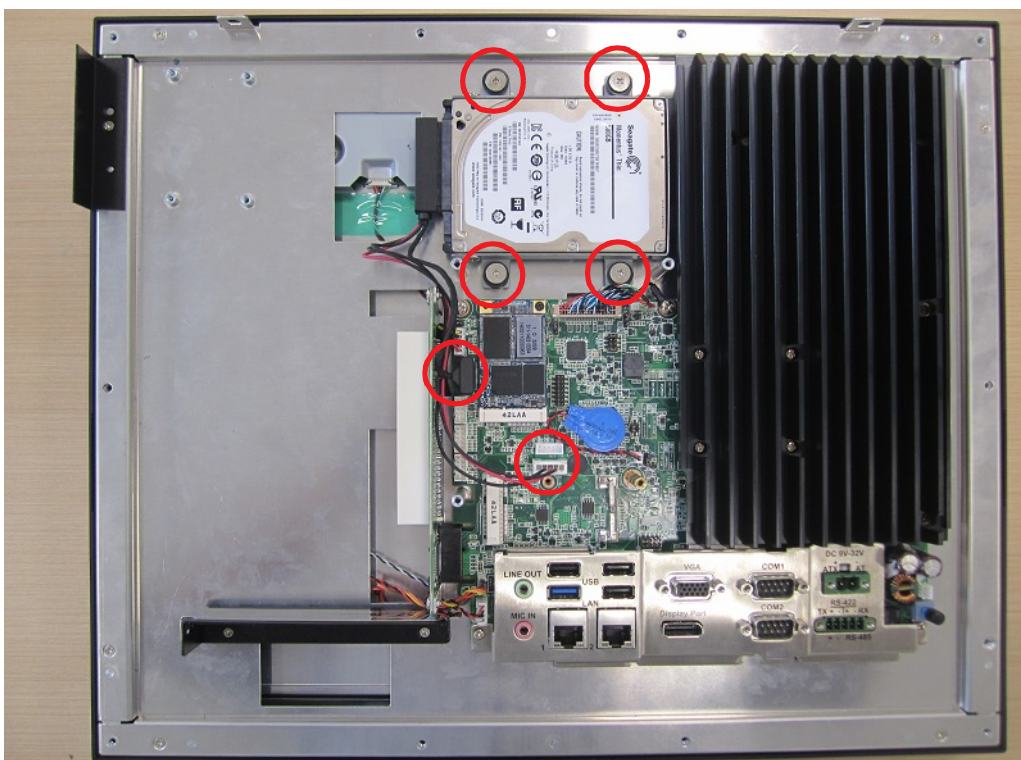


Figure 2.13

2.5 Mini SATA 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. 2.14.

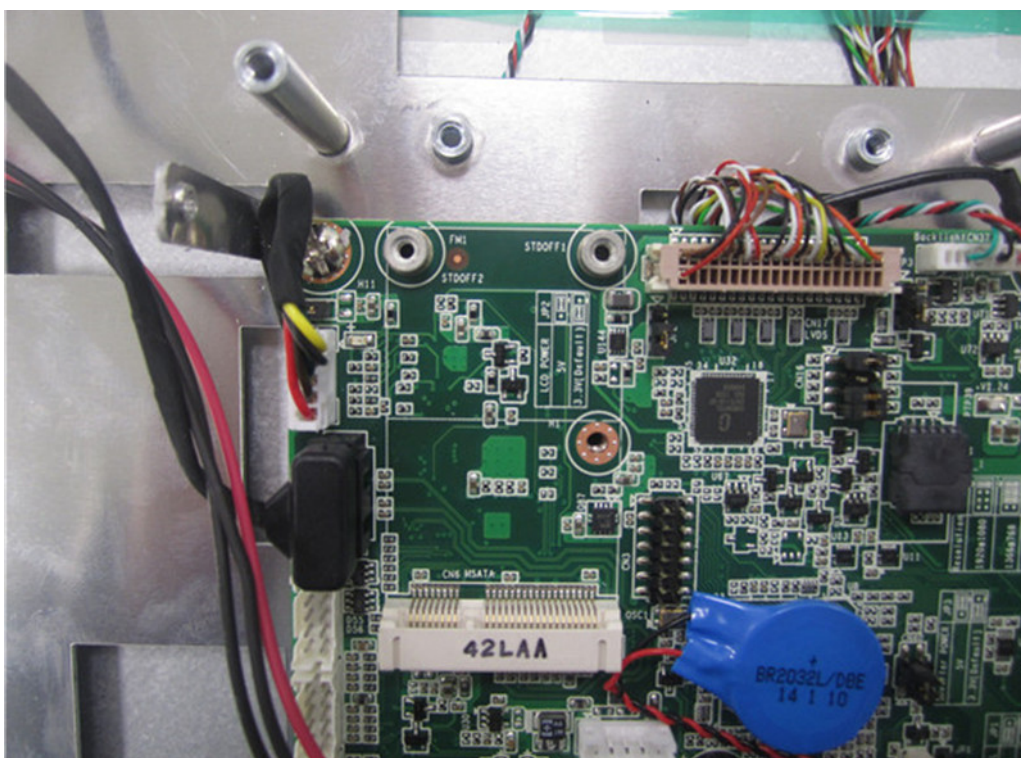


Figure 2.14

2. To install a full-size mini SATA card, insert the mini SATA card into the correct mainboard slot, and affix it in place using two M2.5x4 screws provided in the accessory box. Then retrieve the thermal pad provided in the accessory box and install it atop the mini SATA card (see Fig. 2.15).

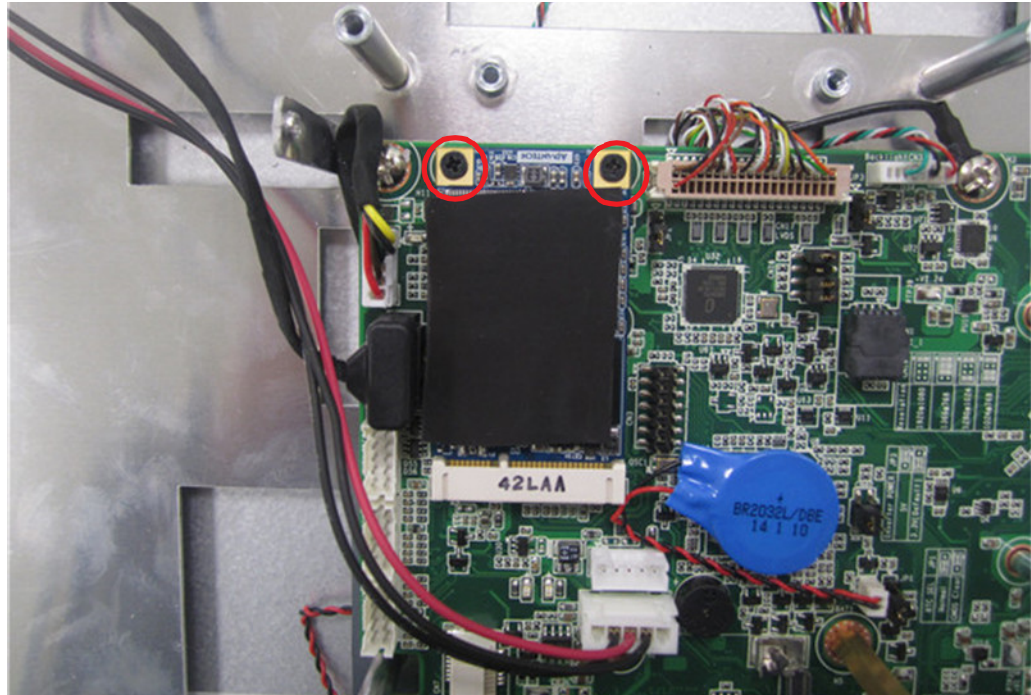


Figure 2.15

3. To install a half-size mini SATA card, insert the mini SATA card into the correct mainboard slot, and affix it in place using a copper cylinder screw (see Fig. 2.16) provided in the accessory box. Then retrieve the thermal pad provided in the accessory box and install it atop the mini SATA card (see Figs. 2.17 and 2.18).

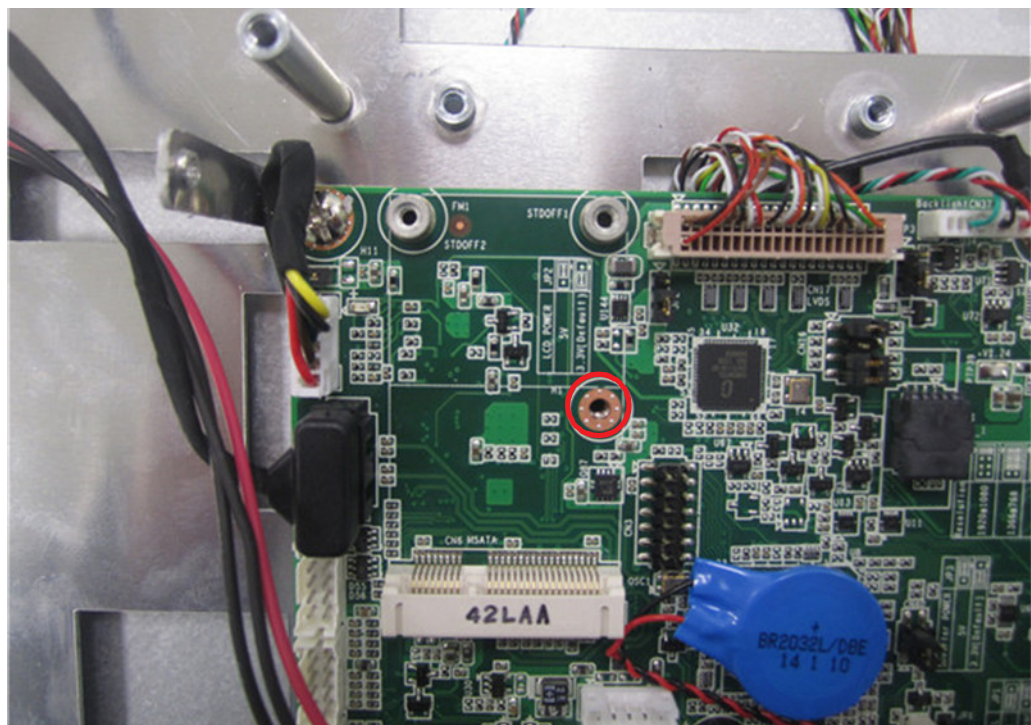


Figure 2.16

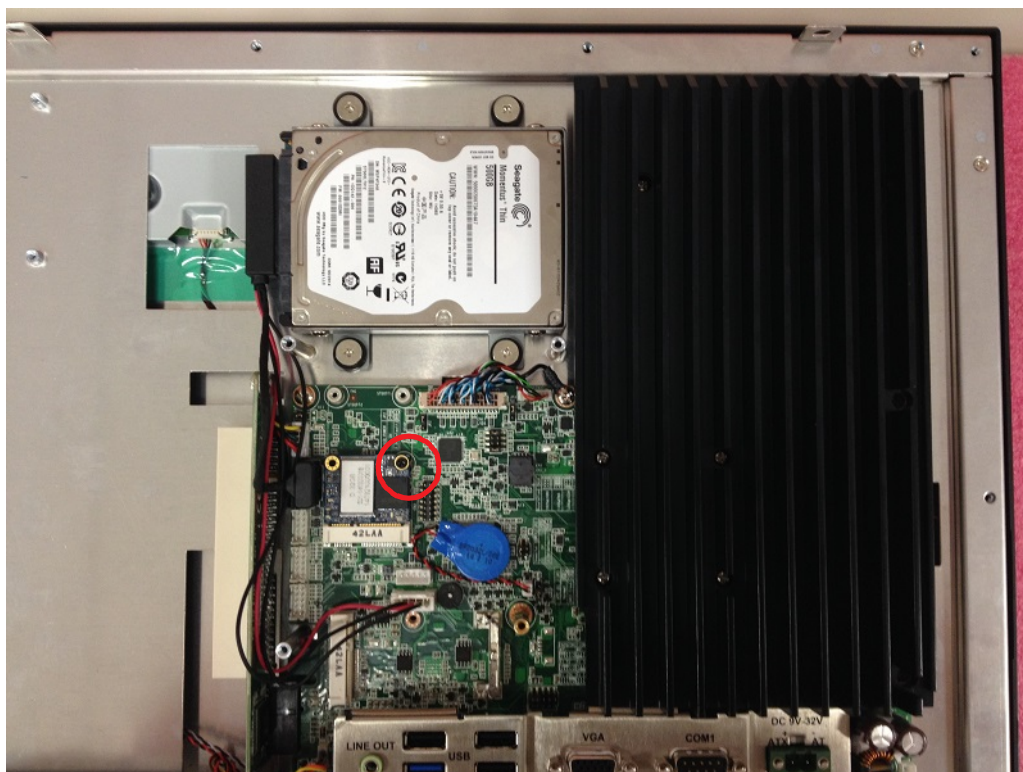


Figure 2.17

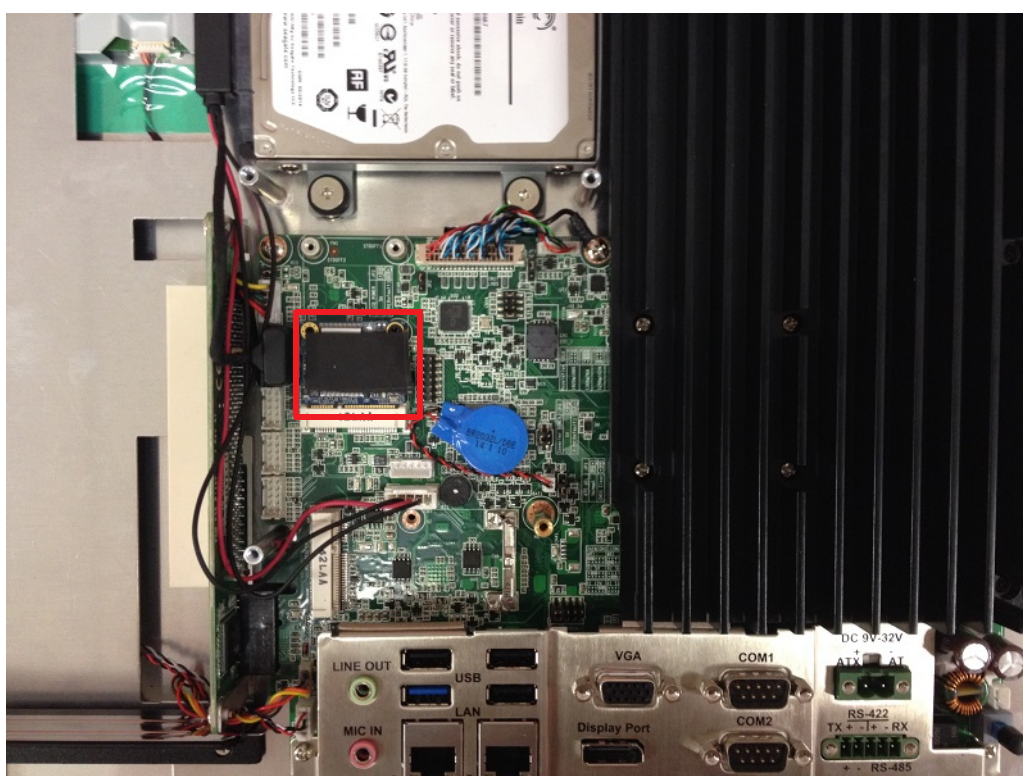


Figure 2.18

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. The disassembled machine should appear as shown in Fig. 2.19.



Figure 2.19

2. Affix the wireless LAN card to the bracket using the screws provided with the Wi-Fi module (model name: PPC-WLAN-C1E).



Figure 2.20



Figure 2.21

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

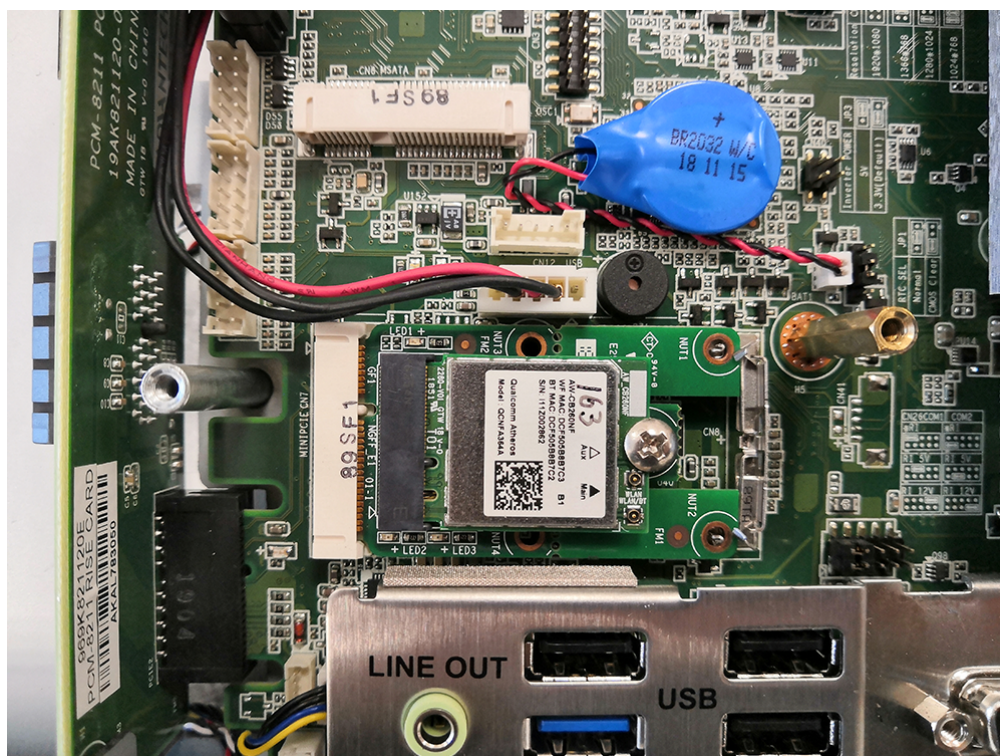


Figure 2.22

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 2.23

5. Secure the assembled antenna holder to the top of the panel PC. Then connect the cables to the wireless LAN card (see Fig. 2.25).

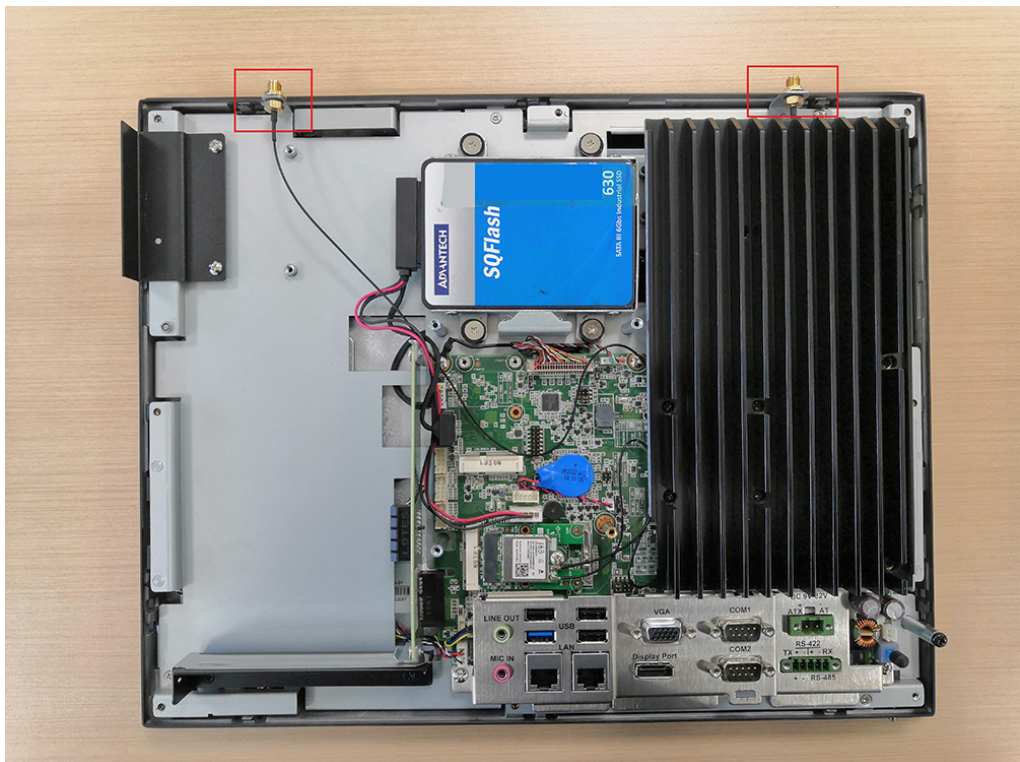


Figure 2.24

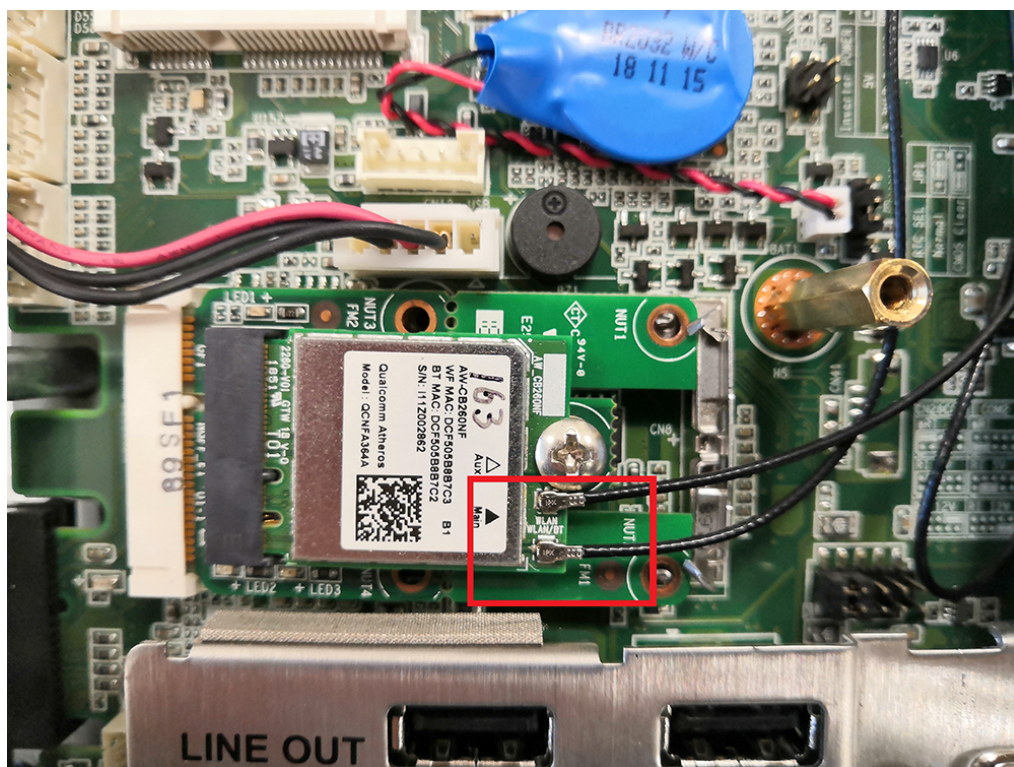


Figure 2.25

6. Replace the VESA mount plate. Take out two plugs located at the top of the rear cover (see Fig. 2.26) 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. 2.27).



Figure 2.26



Figure 2.27

Note! *The wireless LAN card shown in the above images to demonstrate the installation procedures is the PPC-WLAN-C1E Wi-Fi module produced by Advantech.*



2.7 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. 2.28). The default riser card is PCIe-to-PCI. However, a PCIe-to-PCIe card is provided in the accessory box, allowing users to select the appropriate card according to their usage requirements.

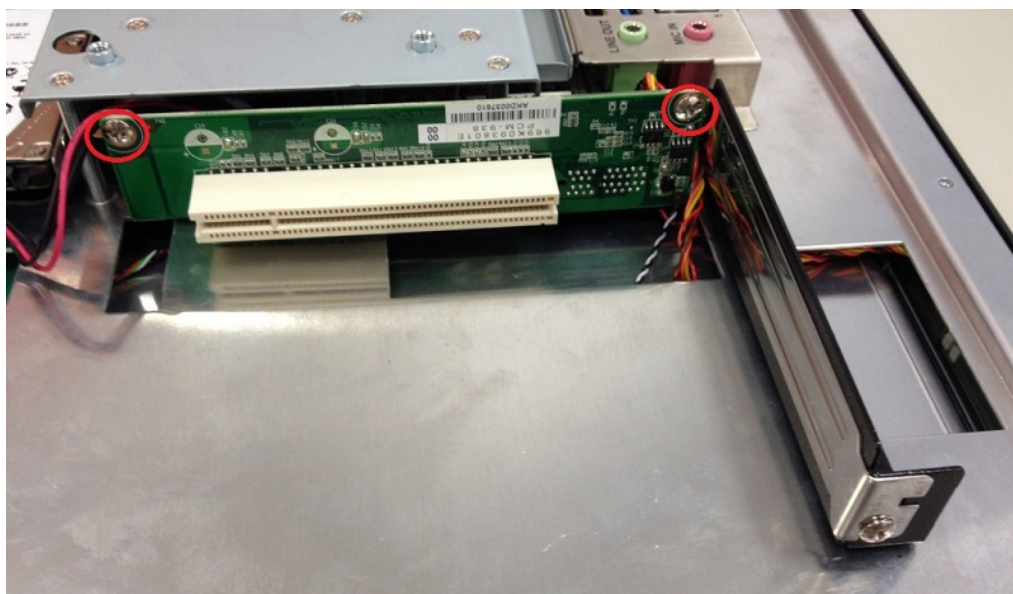


Figure 2.28

3. Remove the card slot shield and insert the card (see Fig. 2.29). Secure the card in place using two screws. Then replace the rear cover.



Figure 2.29

Note! The PPC-3150/3170/3190 panel PCs support riser cards with maximum dimension of 176 x 107 mm.



2.8 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. 2.30 and 2.31).



Figure 2.30 ATX Mode



Figure 2.31 AT Mode

2.9 Mount Bracket Installation

Wall Mount Bracket Installation

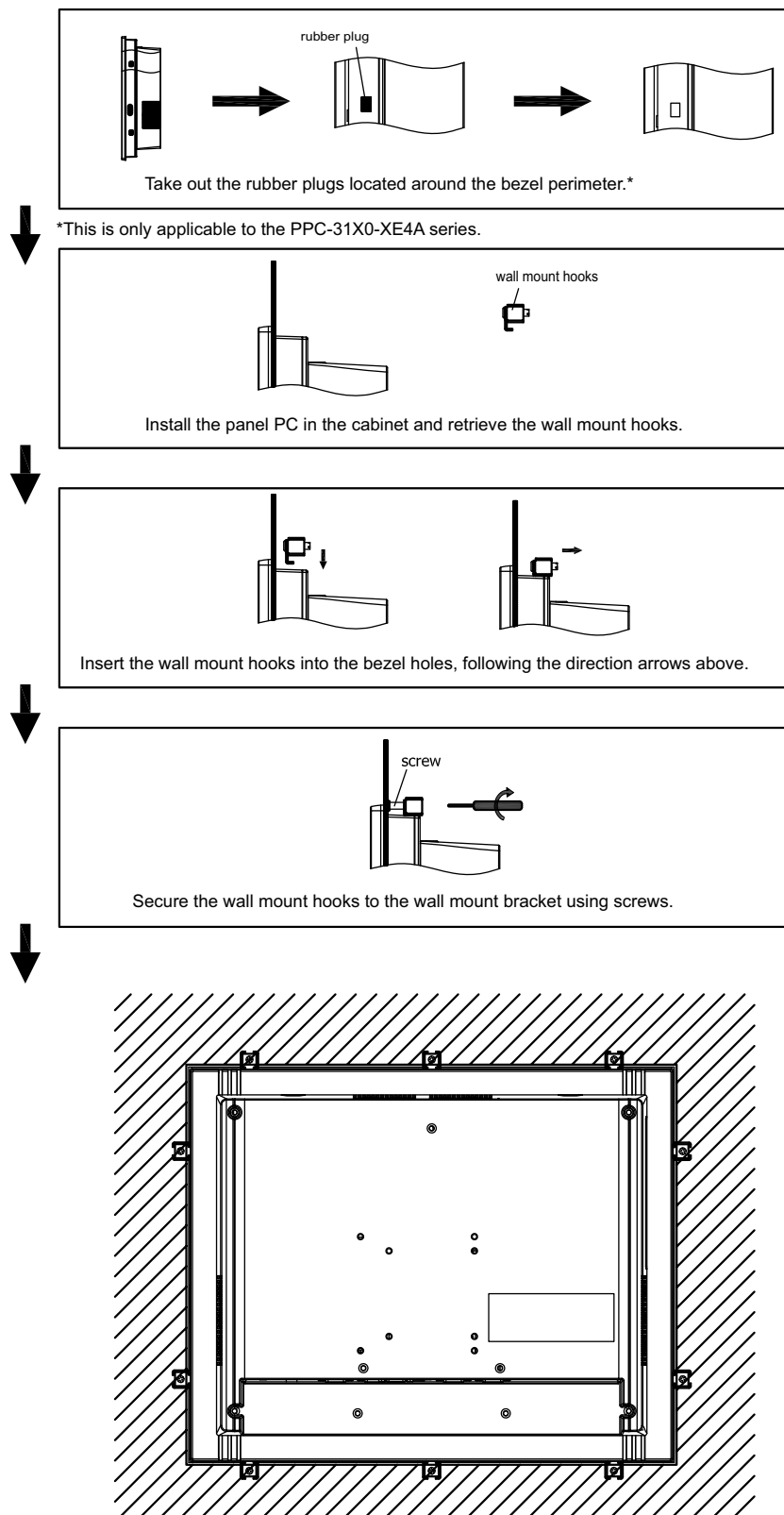


Figure 2.32

2.10 Optional Module Installation

The PPC-3150/3170/3190 supports four optional modules: USB module, CFast module, CF module, and COM module (see Fig. 2.33).

Detailed installation instructions are provided below.

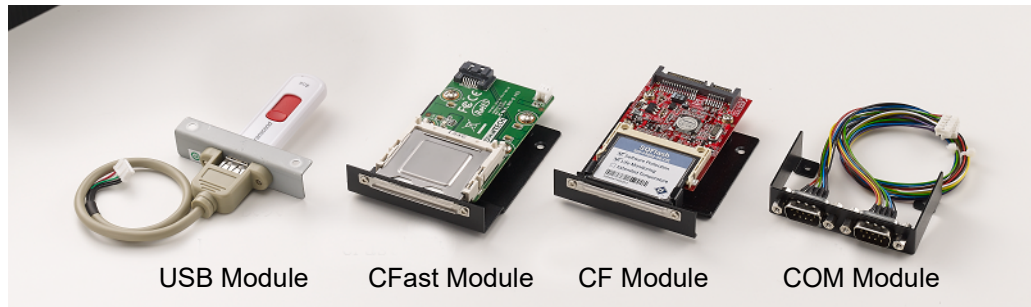


Figure 2.33

A. CFast Module Installation

1. Remove the 11 screws (circled in red) and take out the four plugs (circled in yellow) from the rear cover to remove the rear cover (see Figs. 2.34 and 2.35).



Figure 2.34

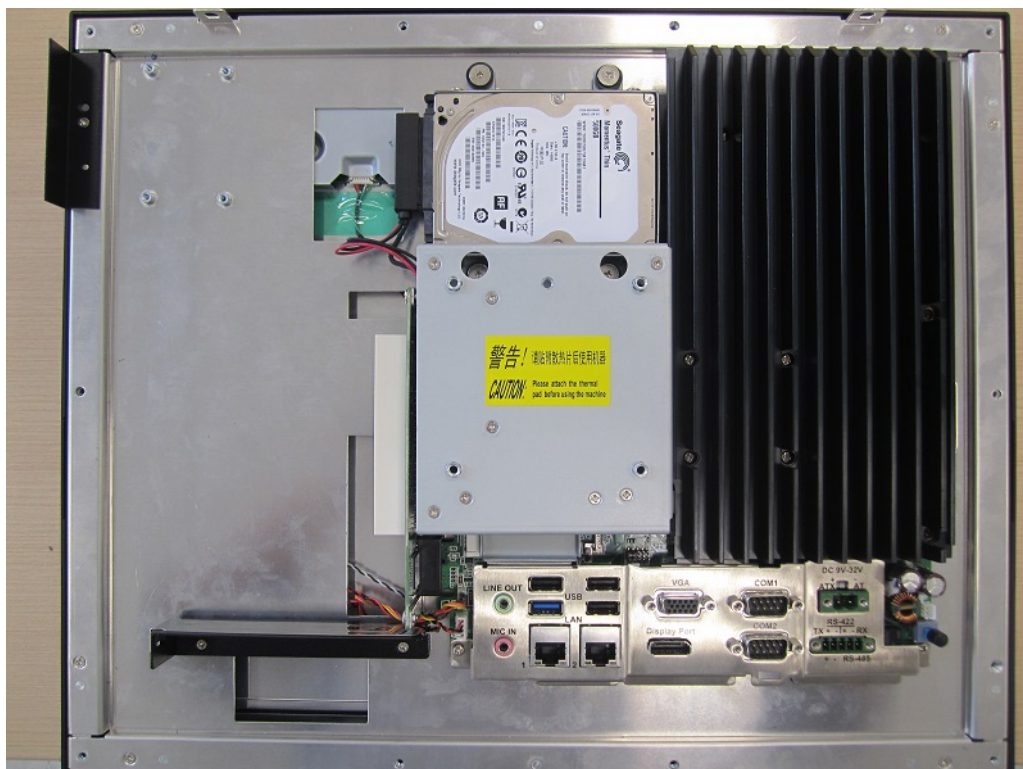


Figure 2.35

2. Remove the four screws (circled in red) on the VESA mount plate (see Fig. 2.36).

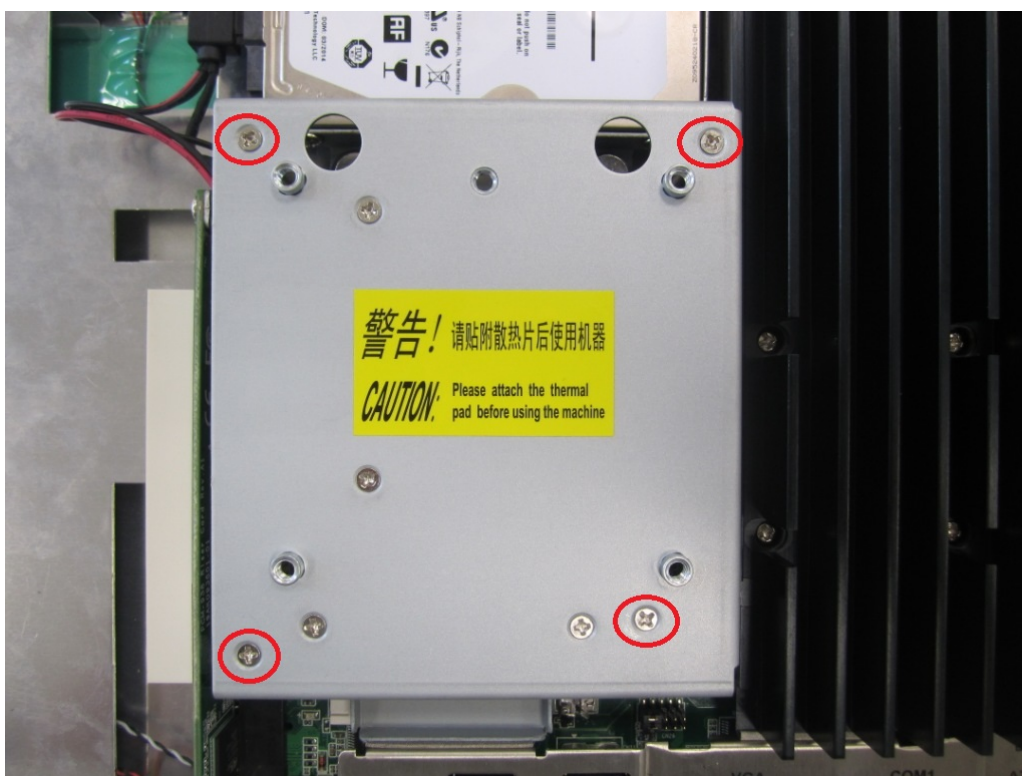


Figure 2.36

3. Remove the screw on the side of the I/O cover (see Fig. 2.37).

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

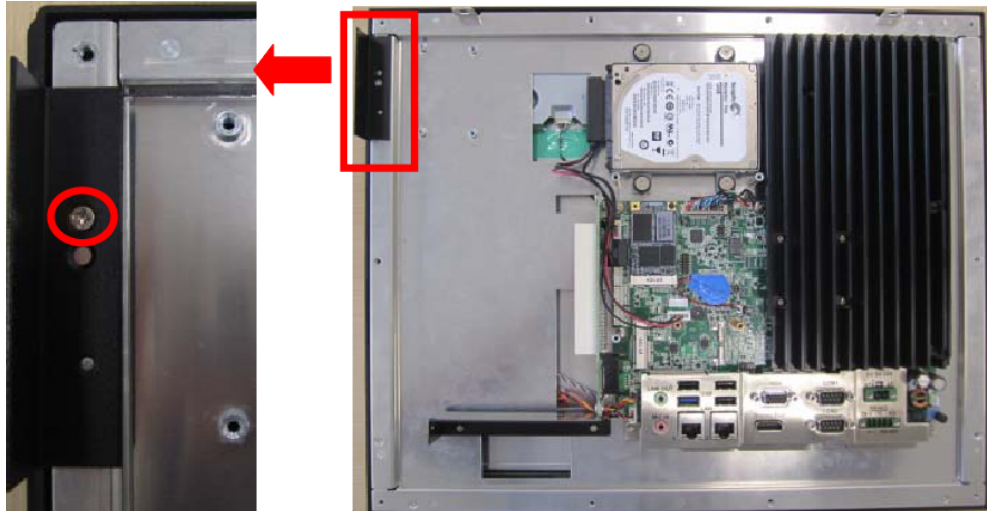


Figure 2.37

4. 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.2.38 (2) and connect the red SATA cable (3). The assembled CFast module should appear as shown in Fig. 2.39.

Note! The CFast module should be below the metal tray when installed.



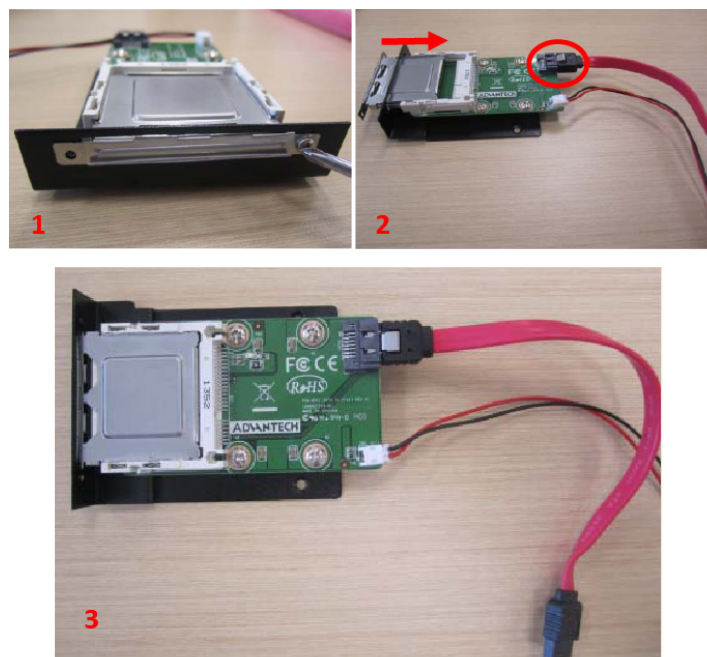


Figure 2.38

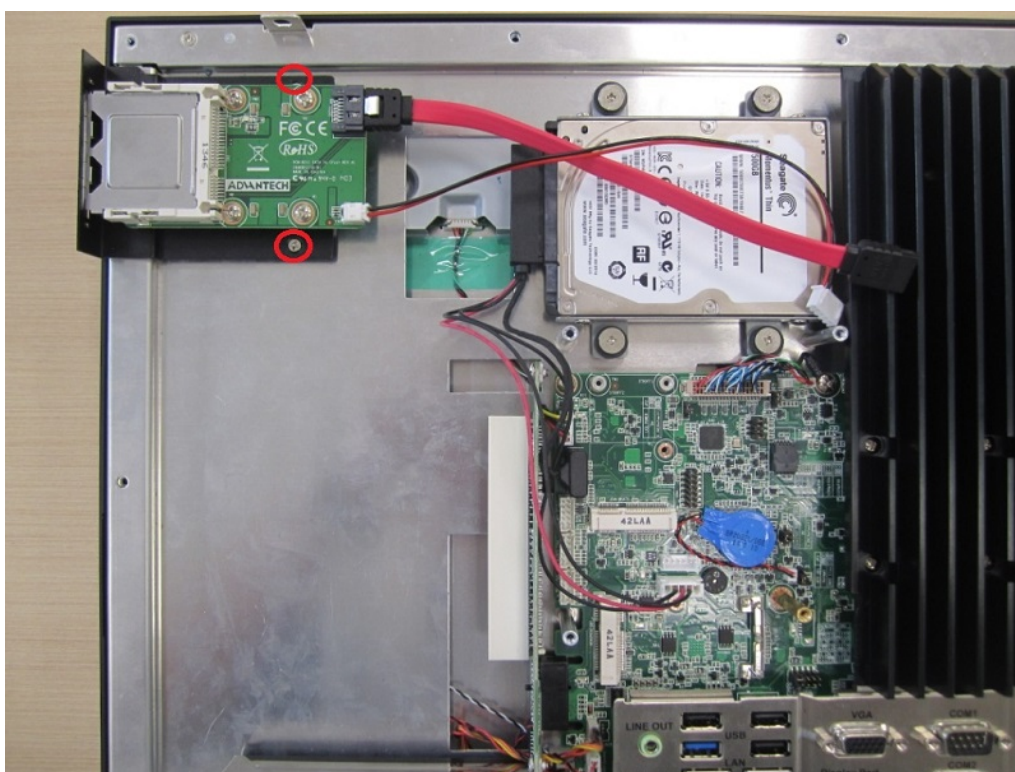


Figure 2.39

5. Retrieve a copper cylinder screw from the accessory box and affix it to the SATA micro ATX board in the position circled in red in Fig. 2.40. Then use a screw to secure the mini SATA to the SATA micro ATX board (the position is indicated with a red rectangle in Fig. 2.41).

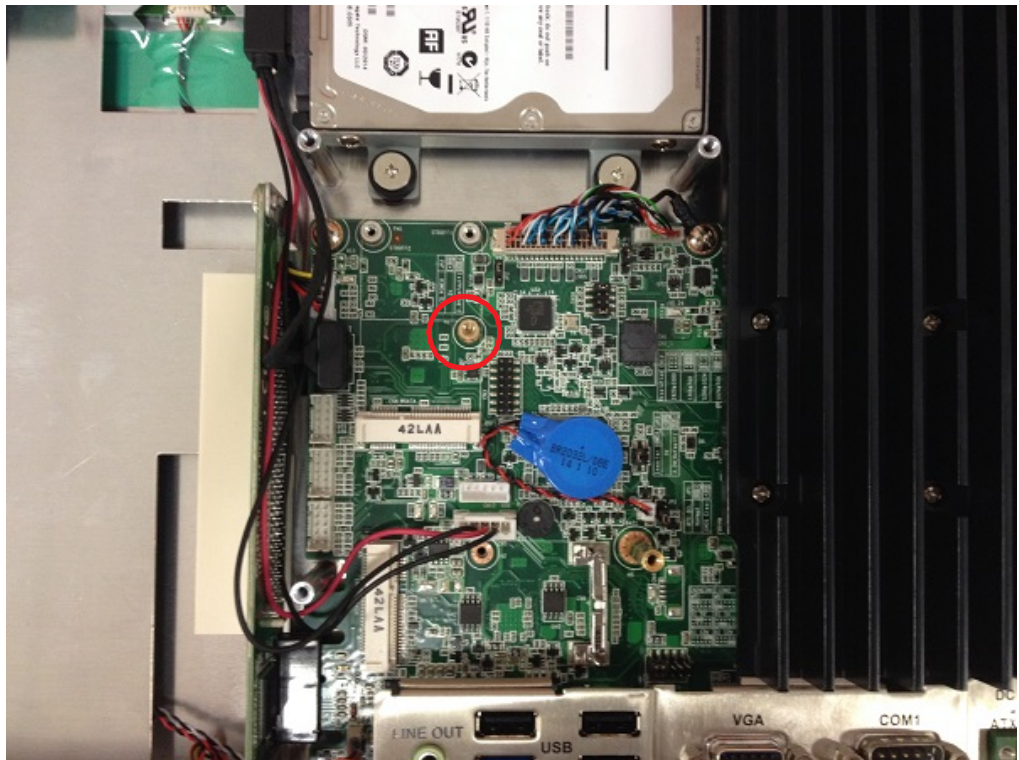


Figure 2.40

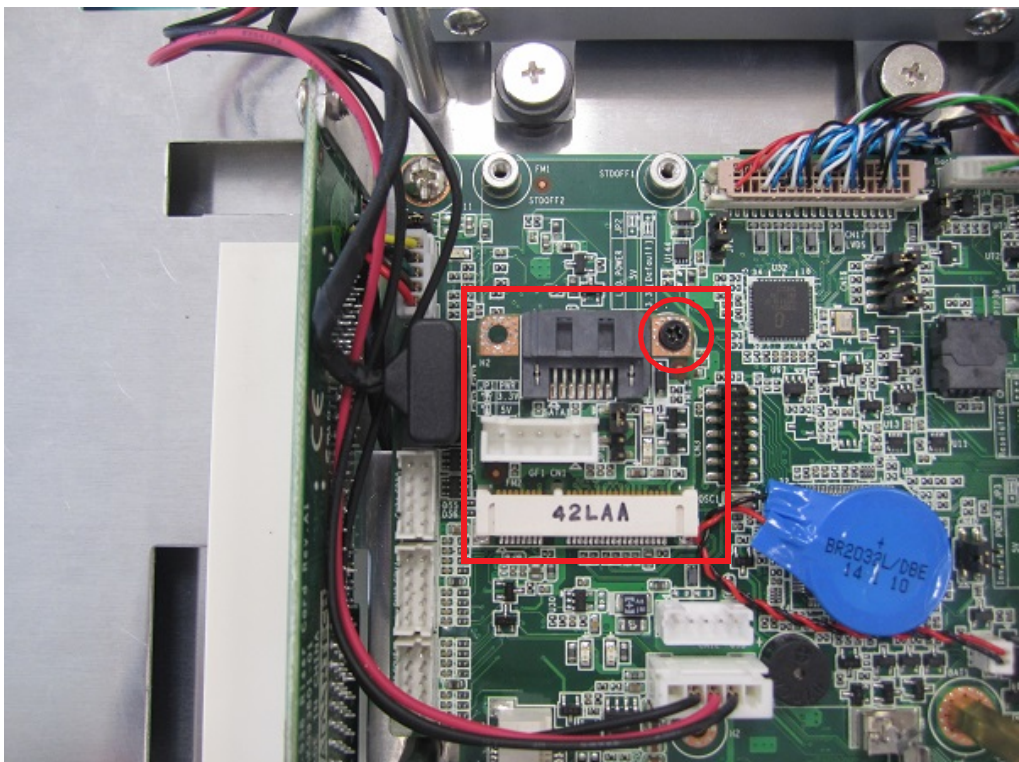


Figure 2.41

6. Connect the red SATA cable and power cable to their respective connectors, and bind them together using a cable tie (see Fig. 2.42).



Figure 2.42

7. Remove the two screws (circled in red) in the VESA mount plate to detach the metal bracket from the underside of the mount plate (see Fig. 2.43). Replace the VESA mount plate (as shown in Fig. 2.44) and secure in place using four screws. Finally, replace the rear cover.

Note! Retain the two screws removed from VESA mount plate to enable future installation of an mSATA module.



Figure 2.43



Figure 2.44

B. CF Module Installation

1. Follow Steps 1 ~ 3 of Subsection A.
2. Retrieve the CF module card from the module case and remove the two screws at the sides of the metal tray (1). Affix the CF module card to the top of the metal tray. Then insert the tray in the direction shown in Fig. 2.45 and connect the SATA-to-SATA power cable (2).
The assembled CF module should appear as shown in Fig. 2.46.

Note! The CF module should be above the metal tray when installed.



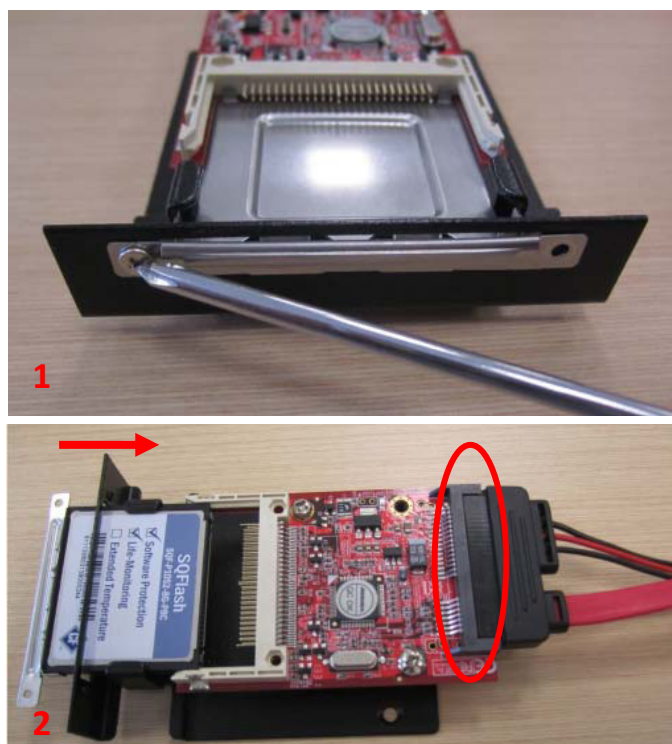


Figure 2.45

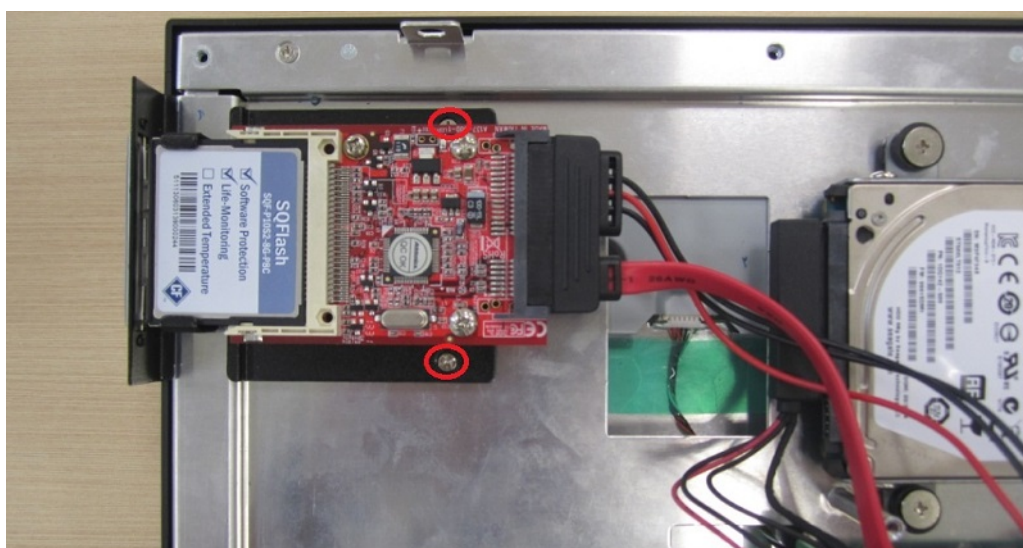


Figure 2.46

3. Follow Step 5 of Subsection A to affix the mini-SATA drive to the SATA board.
4. Connect the other end of SATA-to-SATA power cable to the mainboard, and then bind the cables together using a cable tie (see Fig. 2.47).



Figure 2.47

5. Follow Step 7 of Subsection A to affix the VESA mount plate (see Fig. 2.48) and replace the rear cover to complete the installation.

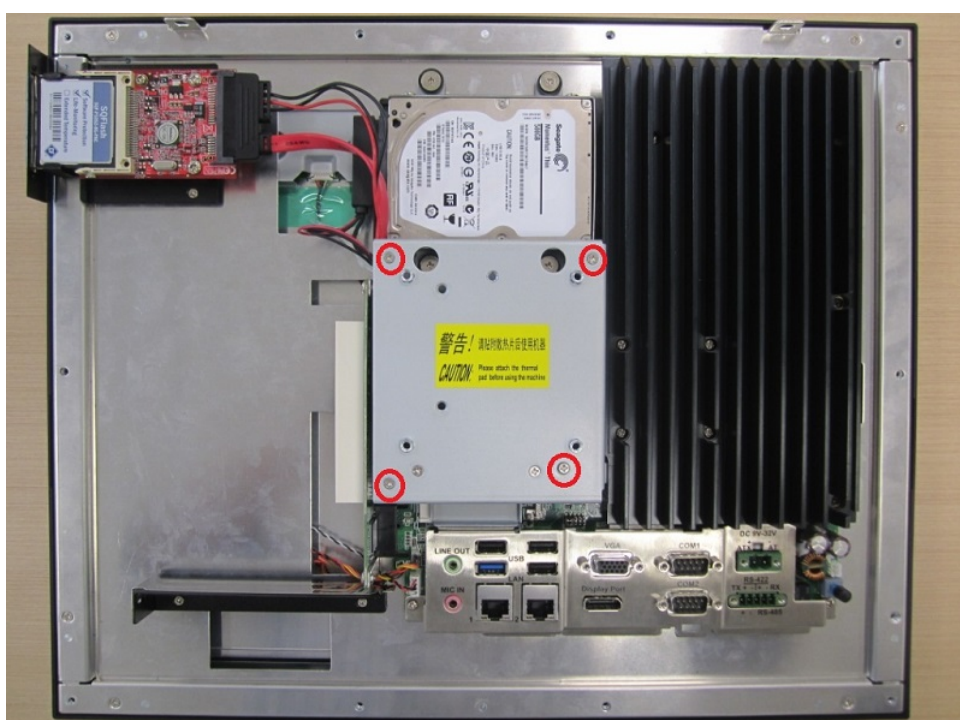


Figure 2.48

Note! The module does not support AHCI mode and should be configured via the BIOS Setup Utility. Refer to Section 4.2.8 for more information.



C. USB Module Installation

1. Follow Steps 1 ~ 2 of Subsection A.
2. Retrieve the USB connector from the module case and affix it in place using two screws. Connect the USB cable to the mainboard and secure with a cable tie (see Fig. 2.49).



Figure 2.49

3. Replace the VESA mount plate (as shown in Fig. 2.50) and secure in place using four screws. Then replace the rear cover to complete the installation.

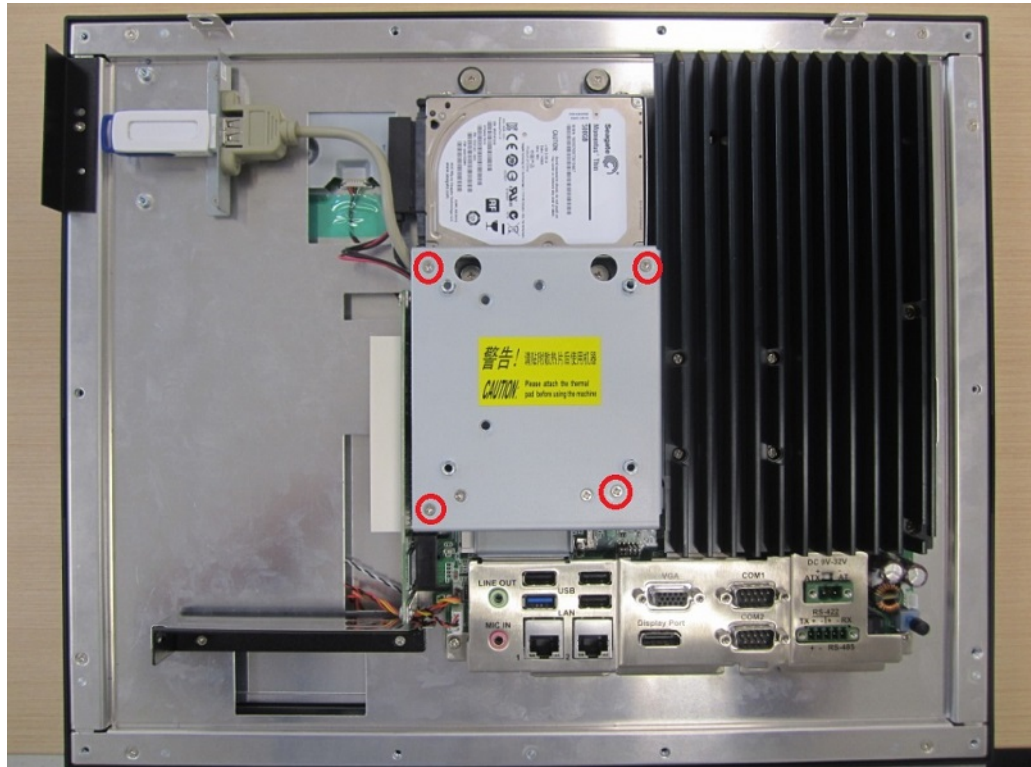


Figure 2.50

Note! Installed USB devices must not exceed a length of 65 mm (see Fig 2.51).

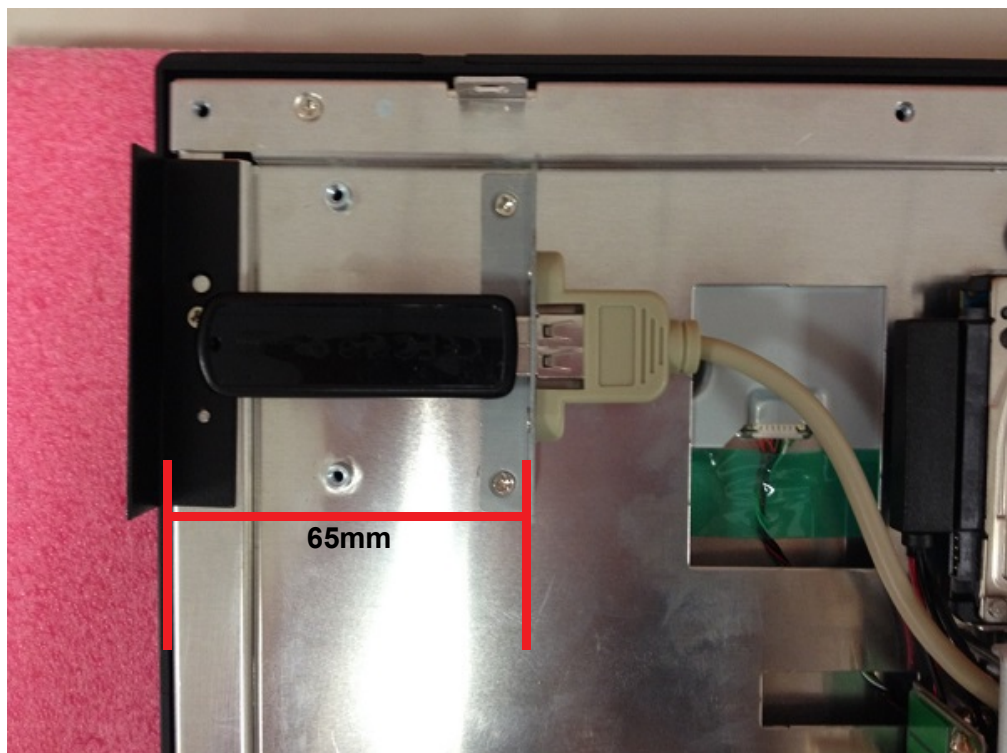


Figure 2.51

D. COM Module Installation

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

D.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).

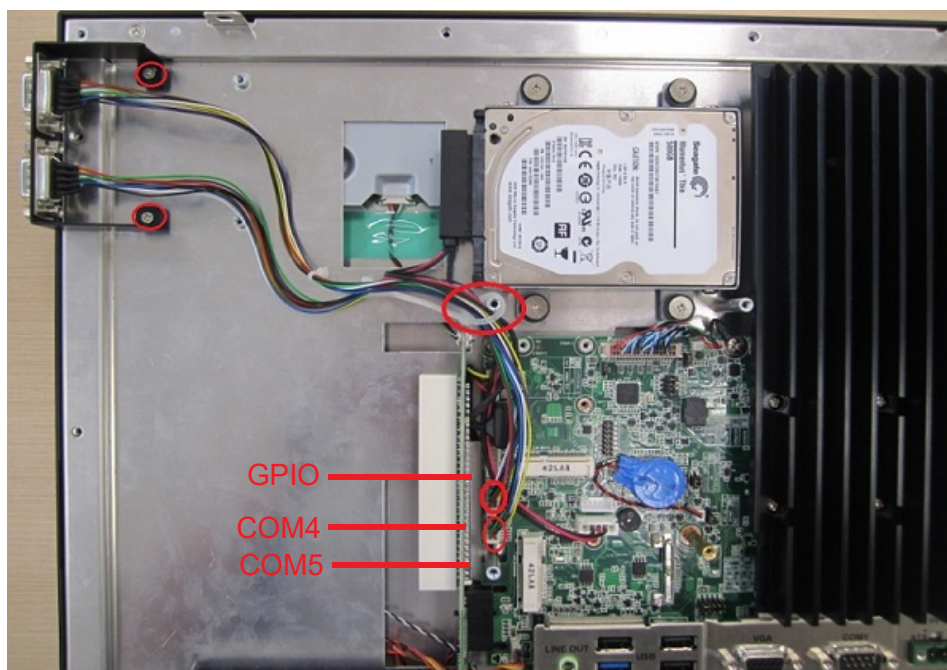


Figure 2.52

3. Replace the VESA mount plate (as shown in Fig. 2.53) and secure in place using four screws. Then replace the rear cover to complete the installation.



Figure 2.53

4. 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 2.54



Figure 2.55

D.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.

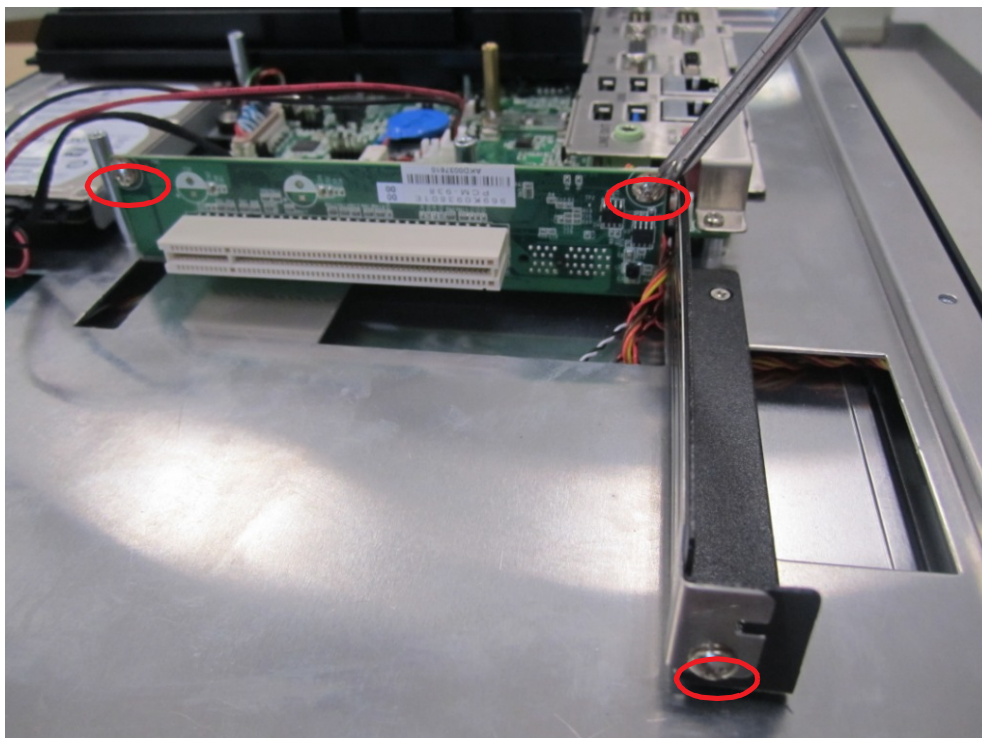


Figure 2.56

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

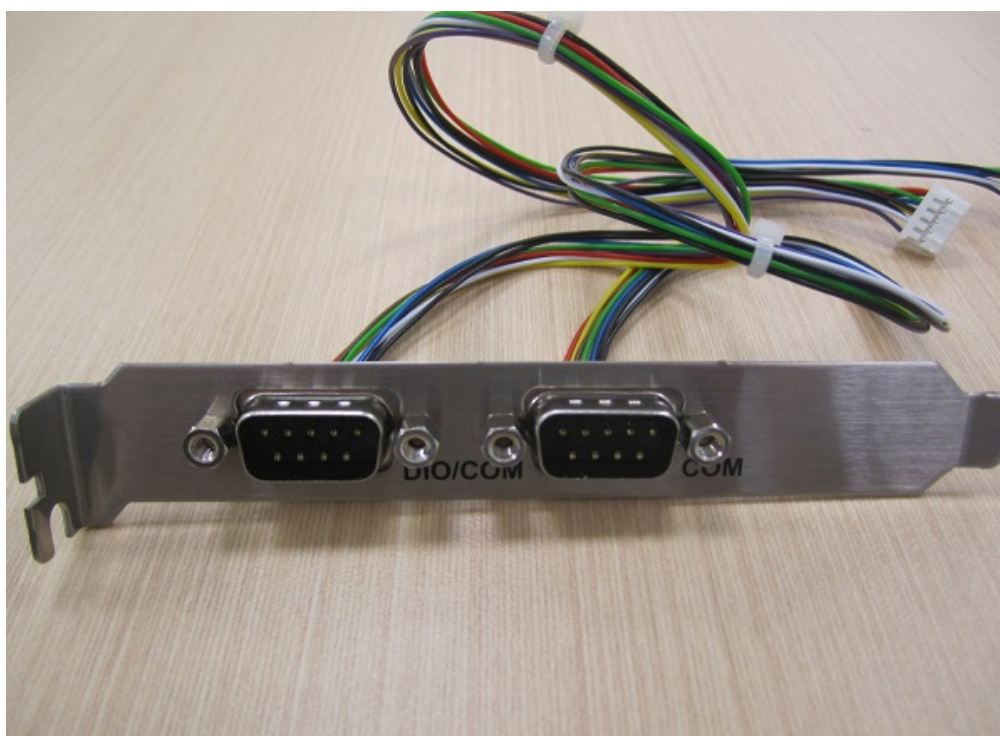


Figure 2.57

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).

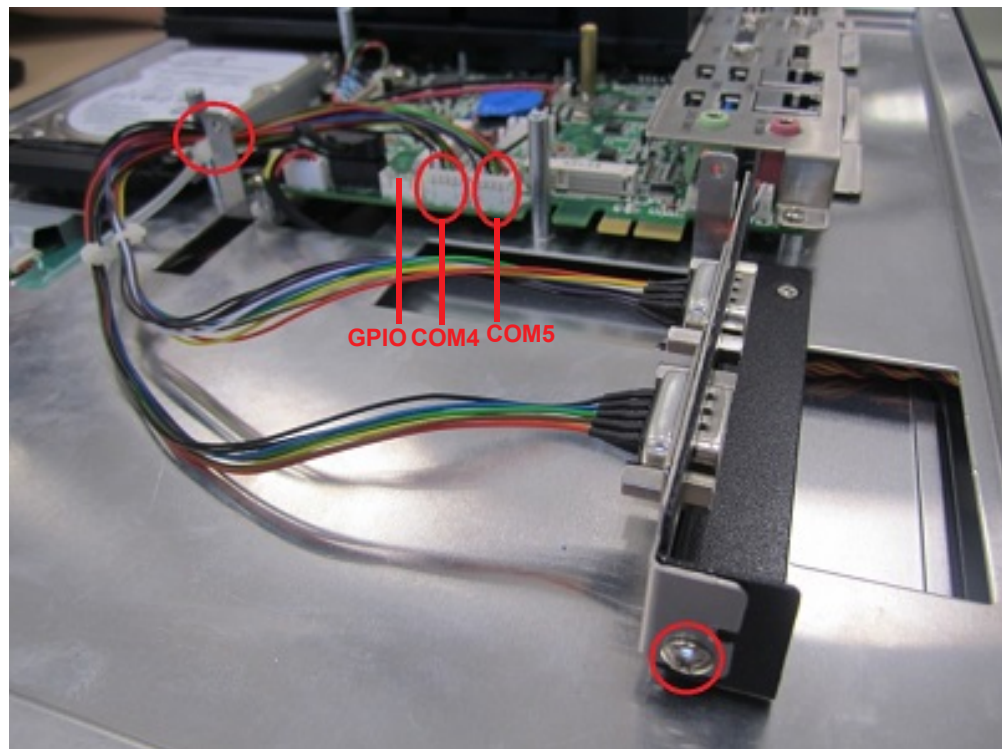


Figure 2.58

5. Replace the VESA mount plate (as shown in Fig. 2.59) and secure in place using four screws. Then replace the rear cover to complete the installation.

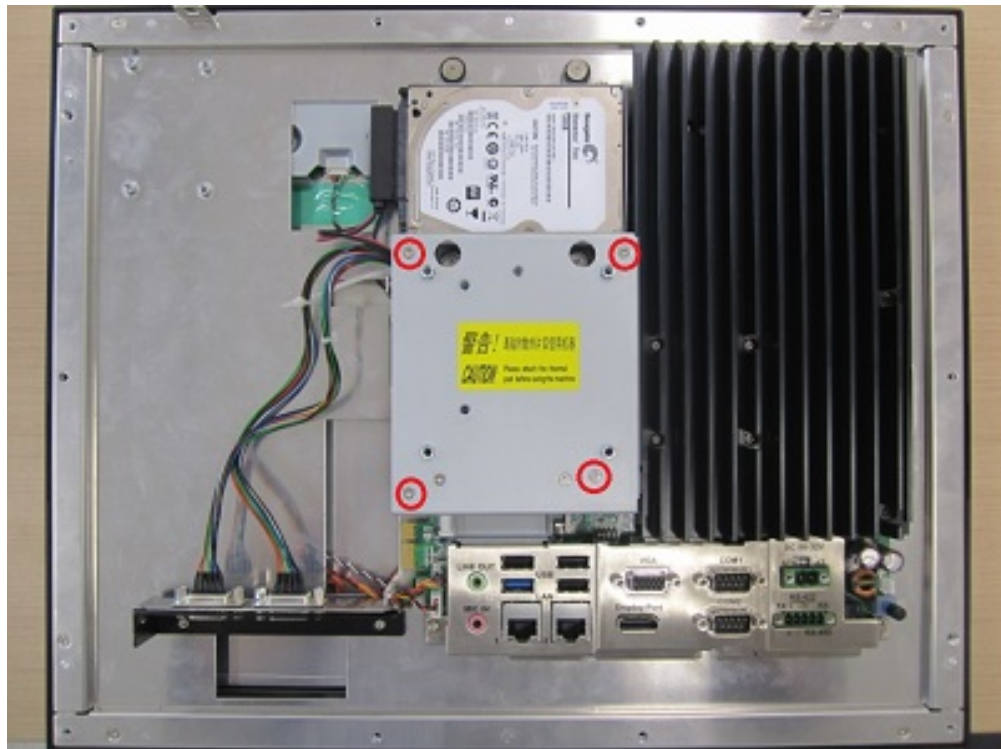


Figure 2.59

Chapter 3

Jumper Settings

- Jumpers and Connectors
- External COM Ports and Pin Definitions

3.1 Jumpers and Connectors

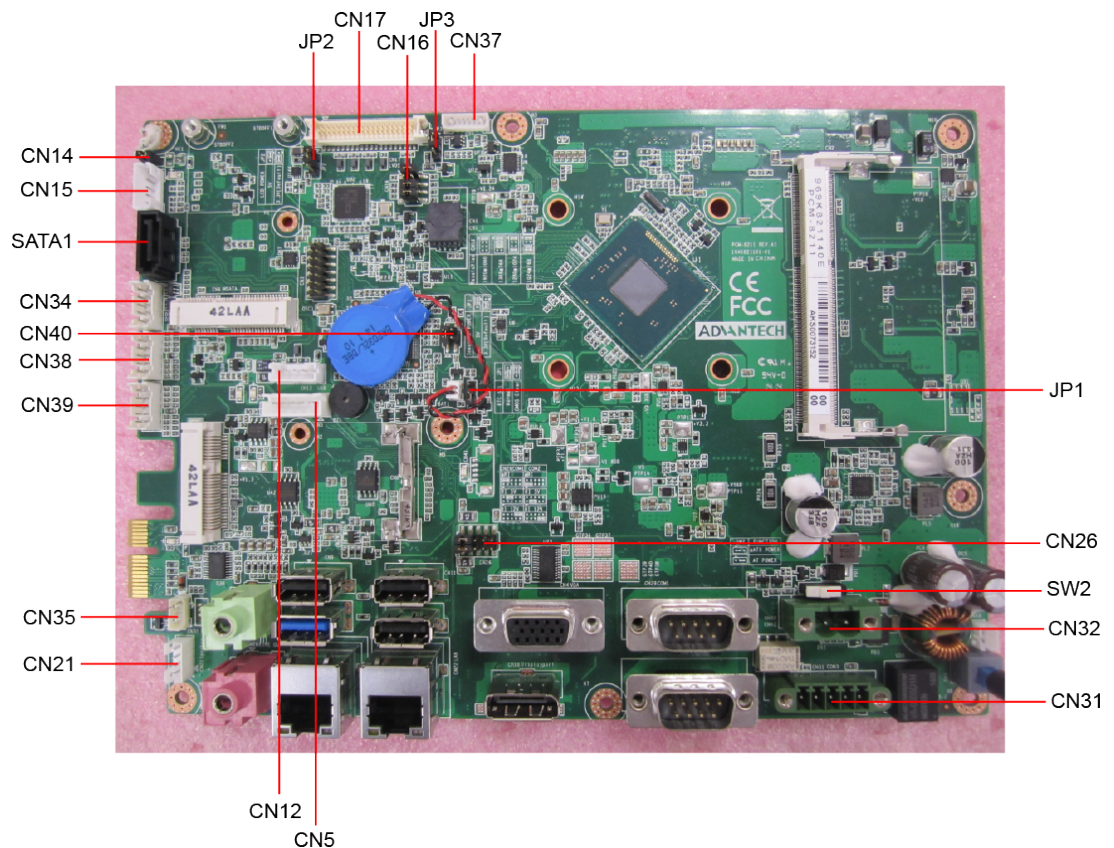


Figure 3.1

Connector	Function
CN5	SATA 1 power
CN12	Internal USB
CN14	Touchscreen power
CN15	Touchscreen connector
CN16	LCD selection
CN17	LVDS
CN21	Speaker
CN26	Pin 9 power selection (COM 1 and COM 2)
CN31	Isolated COM
CN32	Input power
CN33	Power button
CN34	GPIO
CN35	SMBus
CN37	Driving board
CN38/39	COM 4/COM 5
CN40	USB hub (select by switch)
SW2	ATX/AT switch
JP1	Clear CMOS
JP2/JP3	LCD power selection
SATA1	SATA 1

JP1	Icon	RTC Selection	
(2-3)	P1	Normal	Default
(3-4)	P2	Clear CMOS	



P1



P2

JP2	Icon	LCD Power	
(1-2)	P3	5V	
(2-3)	P4	3.3V	Default



P3



P4

JP3	Icon	Driving Board Power	
(1-2)	P5	5V	
(2-3)	P6	3.3V	Default

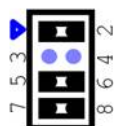


P5

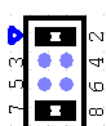


P6

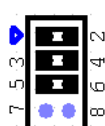
CN16	Icon	Resolution	
(1-2)(5-6)(7-8)	P7	1024x768 (24 bit)	Default (PPC-3150)
(1-2)(7-8)	P8	1280x1024 (24 bit)	Default (PPC-3170/3190)
(1-2)(3-4)(5-6)	P9	1366x768 (18 bit)	
(1-2)	P10	1920x1080 (24 bit)	



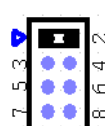
P7



P8

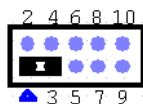


P9

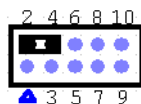


P10

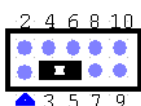
CN26		COM1/2 RI Type Selection	
(1-3)/(2-4)	P11/P12	COM 2/COM 1 RI	Default
(3-5)/(4-6)	P13/P14	COM 2/COM 1 5V	
(7-9)/(8-10)	P15/P16	COM 2/COM 1 12V	



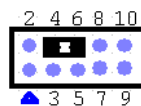
P11



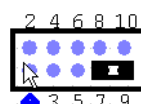
P12



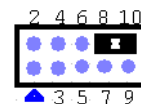
P13



P14

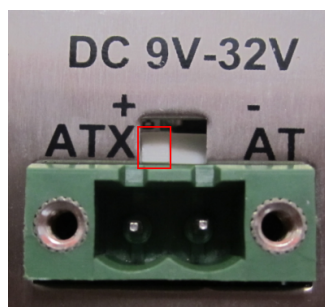


P15

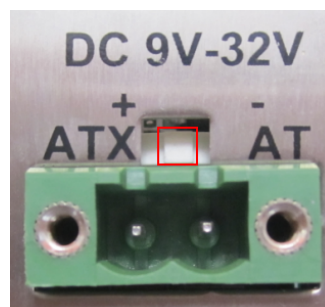


P16

SW2		AT/ATX Selection	
1-3	P17	ATX power	Default
2-3	P18	AT power	



P17



P18

3.2 External COM Ports and Pin Definitions

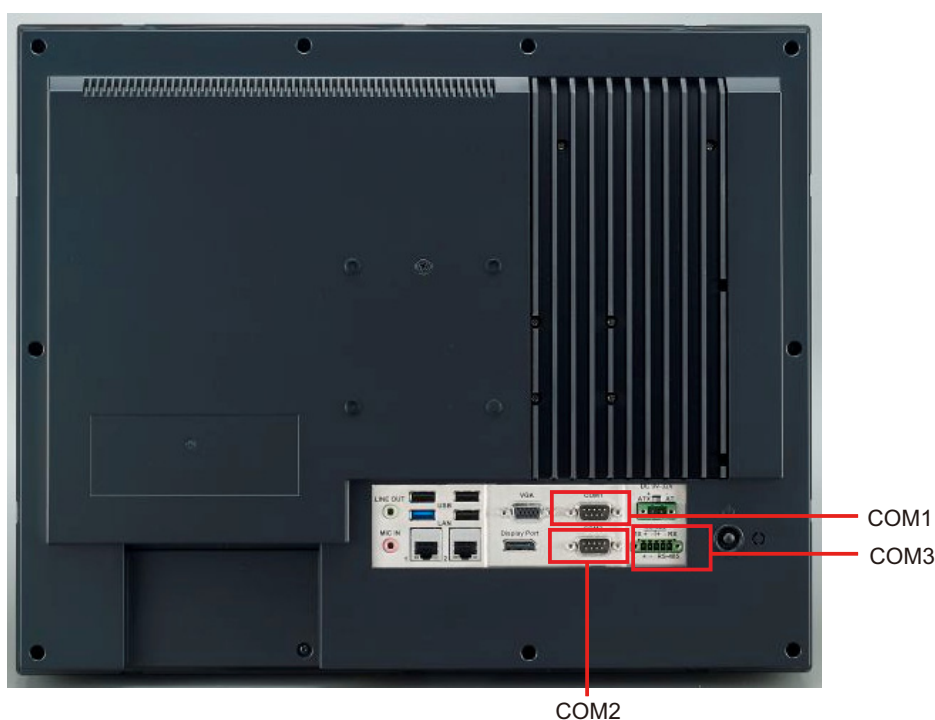


Figure 3.2

COM 1 & 2 and 4 & 5: RS232, COM 1 Pin 9 supports 5V/12V input

COM 3: RS-422/485

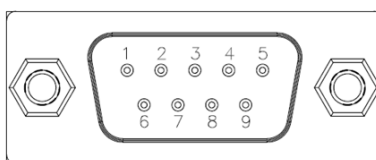
DIO: 8-bit input/output and control with SMBUS

COM 1: Pin 9 is configured as RI signal by default, but can also be set as 5V or 12V output via jumper

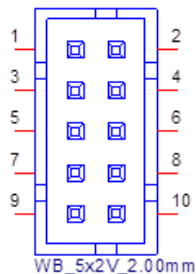
Note! COM 2 does not support Ring function.



Pin	COM 1	COM 2	CN38 & 39 (Internal) /COM 4 & COM 5	GPIO (Internal) /DI/O
1	DCD	DCD	DCD	GND
2	RXD	RXD	RXD	GPIO4
3	TXD	TXD	TXD	GPIO0
4	DTR	DTR	DTR	GPIO5
5	GND	GND	GND	GPIO1
6	DSR	DSR	DSR	GPIO6
7	RTS	RTS	RTS	GPIO2
8	CTS	CTS	CTS	GPIO7
9	Ring or 5V/12V input	For UPS	Ring	GPIO3
10			+5V/-	+5V/-

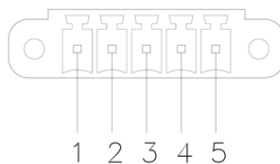


COM1 & 2 and 4 & 5 and DIO



CN38 & 39 and GPIO

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



Pin	1	2	3	4	5
RS-422	TX+	TX-	RX+	RX-	GND
RS-485	D+	D-			GND

UART RS-485 Auto Flow Control

COM 3 supports RS-485 auto-flow control function. When RS-485 auto-flow control function is enabled, it will drive the RTS# pin to high or low.

Chapter 4

Software Setup

- Driver Installation
- BIOS Setup Utility

4.1 Driver Installation

Before OS installation, all corresponding drivers should be installed to ensure full functionality. All drivers are available on the CD-ROM provided in the accessory box.

Windows 7: All drivers required for installation.

Windows 8: All drivers required for installation.

Windows 8.1: All drivers required for installation.

User manual: A digital copy of the user manual is provided on the CD-ROM.

Complete the installation according to your OS. The drivers provided on the CD-ROM may not be the latest version. The latest versions are available for download from the following website:

<http://www.advantech.com/>

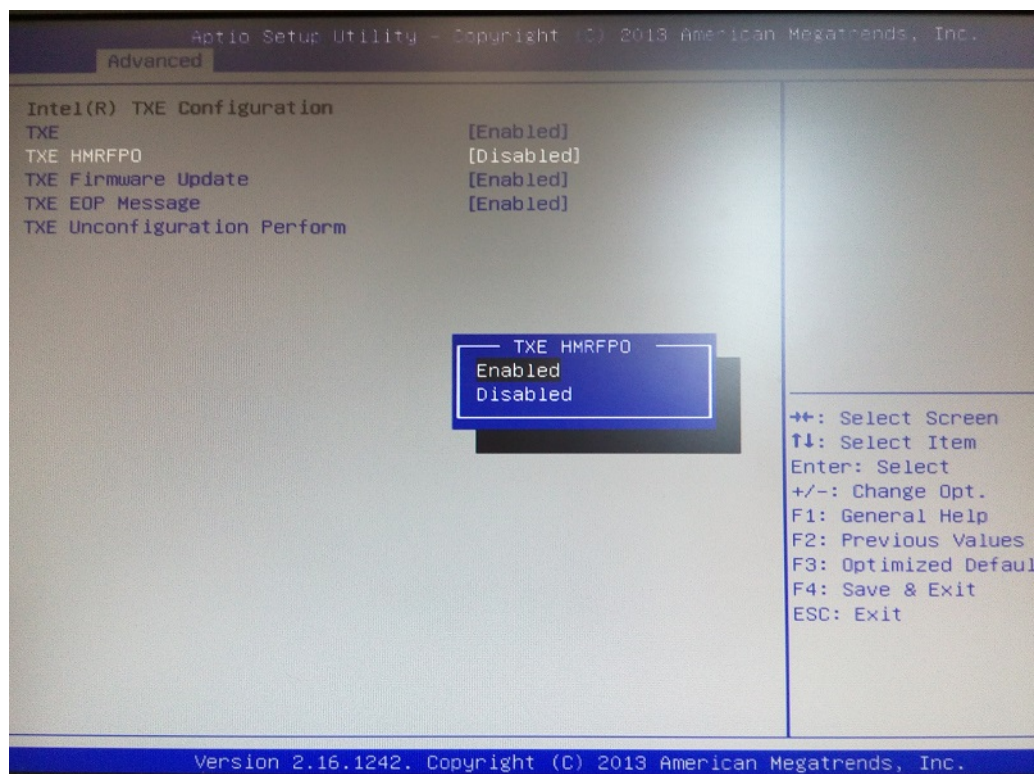
Note! *Before installing Windows 8.x or Android OS, the BIOS settings must be configured as explained in page 60; otherwise, the installation will fail. If installing Windows 7, the BIOS settings do not need to be changed.*



4.2 BIOS Setup Utility

4.2.1 Update BIOS

1. Upon entering the BIOS Setup Utility, go to the Advanced tab, click the Security configuration option, and change the settings for TXE HMRFPD to Enabled.



2. Restart the computer.
3. Execute AFUDOS 8211BIOS.bin /P /B /N /X /ME.
4. Power on the system again after it powers off.
5. The BIOS settings will be updated.

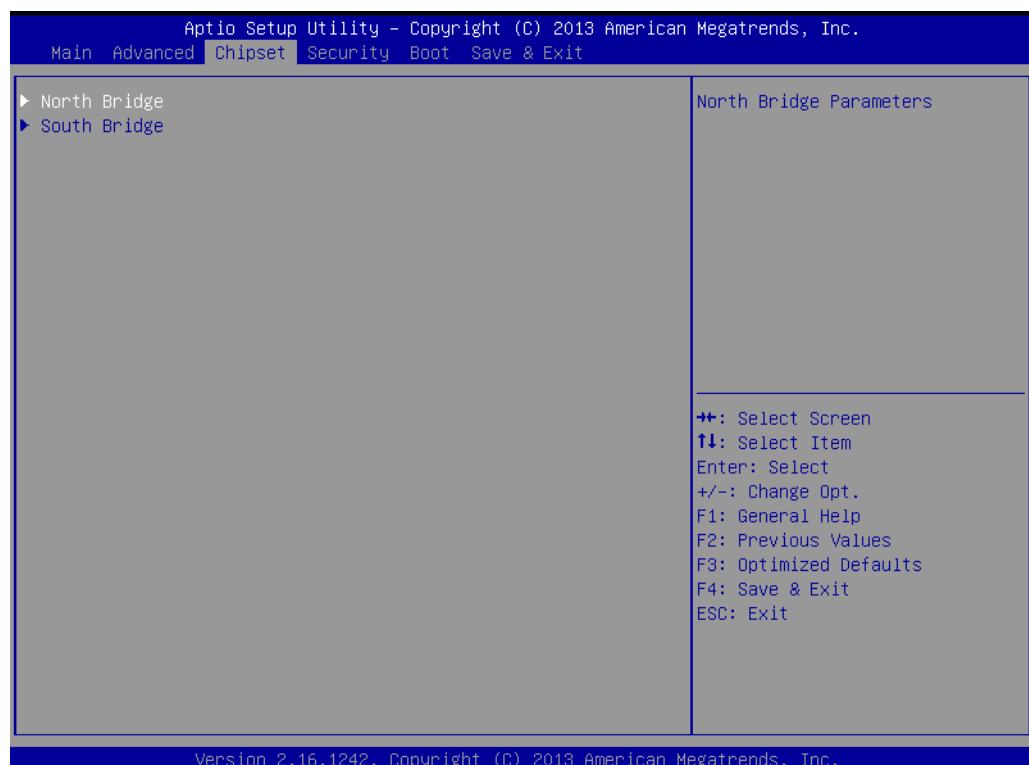
4.2.2 Entering the BIOS Setup Utility

When the system is powered on, press the button to enter BIOS Setup Utility. After adjusting the configuration settings, press <F4> to save and exit; otherwise the settings will not be saved in the BIOS.



4.2.3 LCD Brightness Adjustment

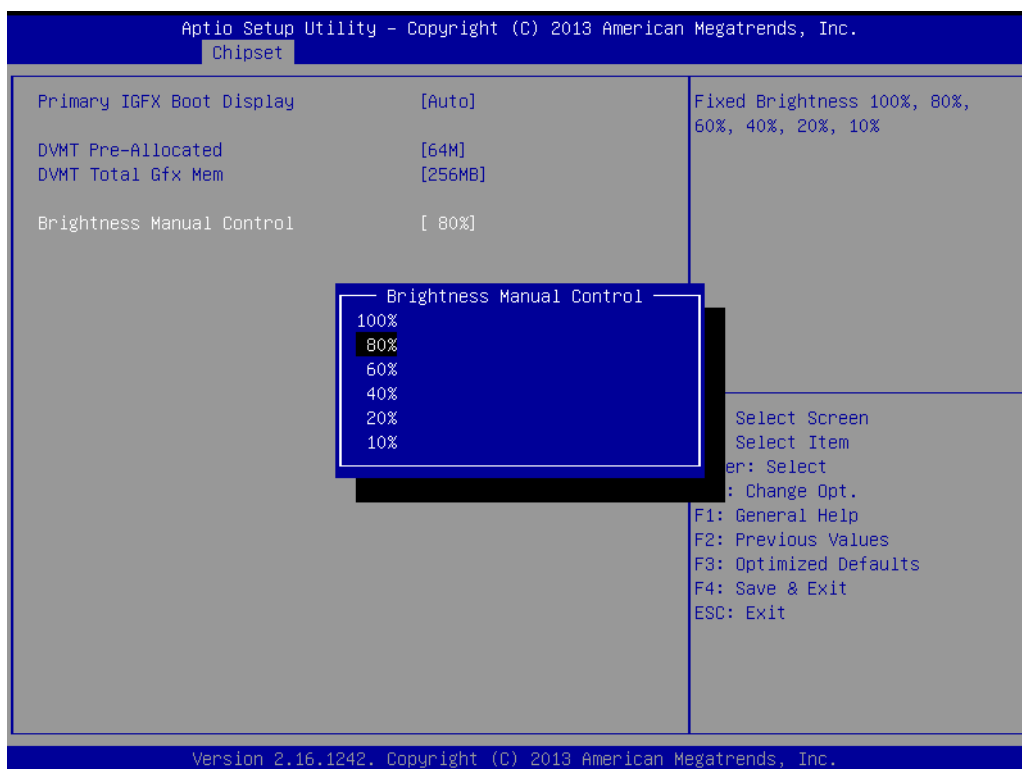
1. Click on Host Bridge in the Chipset tab.



2. Then click Intel IGD Configuration.

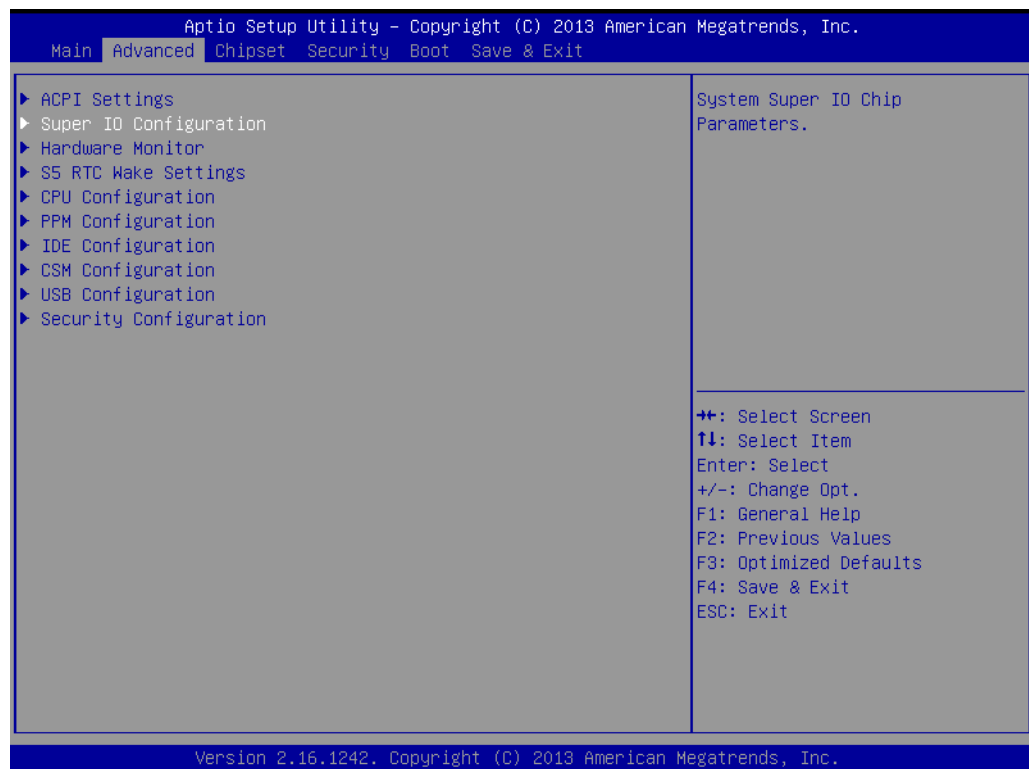


3. The LCD Brightness Control function is set to Manual by default, which allows users to adjust the brightness according to their preference. In the Brightness Control submenu click on the Brightness Manual Control item and choose from six brightness levels.

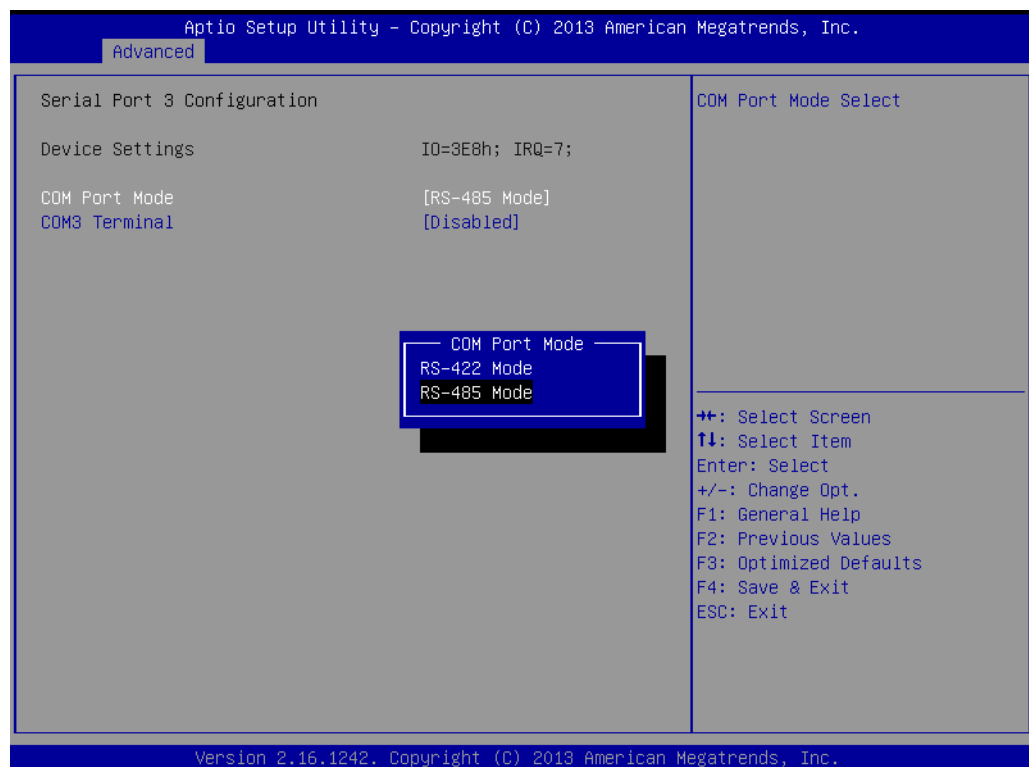


4.2.4 COM3 Mode Selection (RS422/RS485)

1. Click on Super IO Configuration in the Advanced tab.

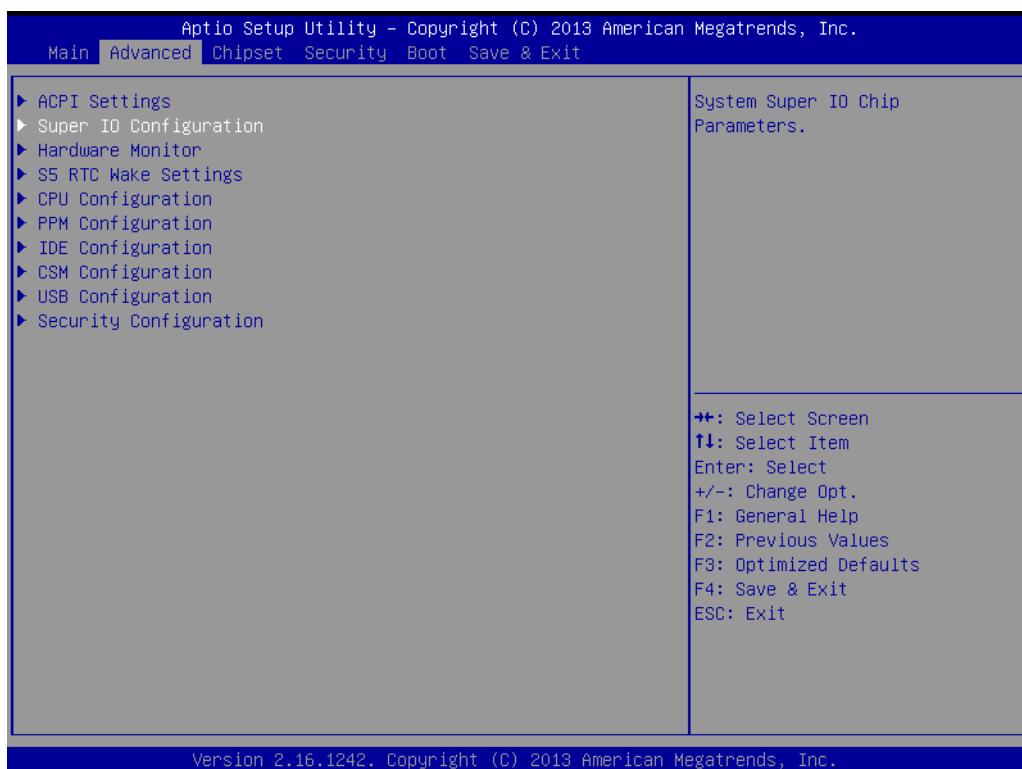


2. Click on Serial Port 3 Configuration to access the submenu, then select COM Port Mode to set the COM3 operation mode.

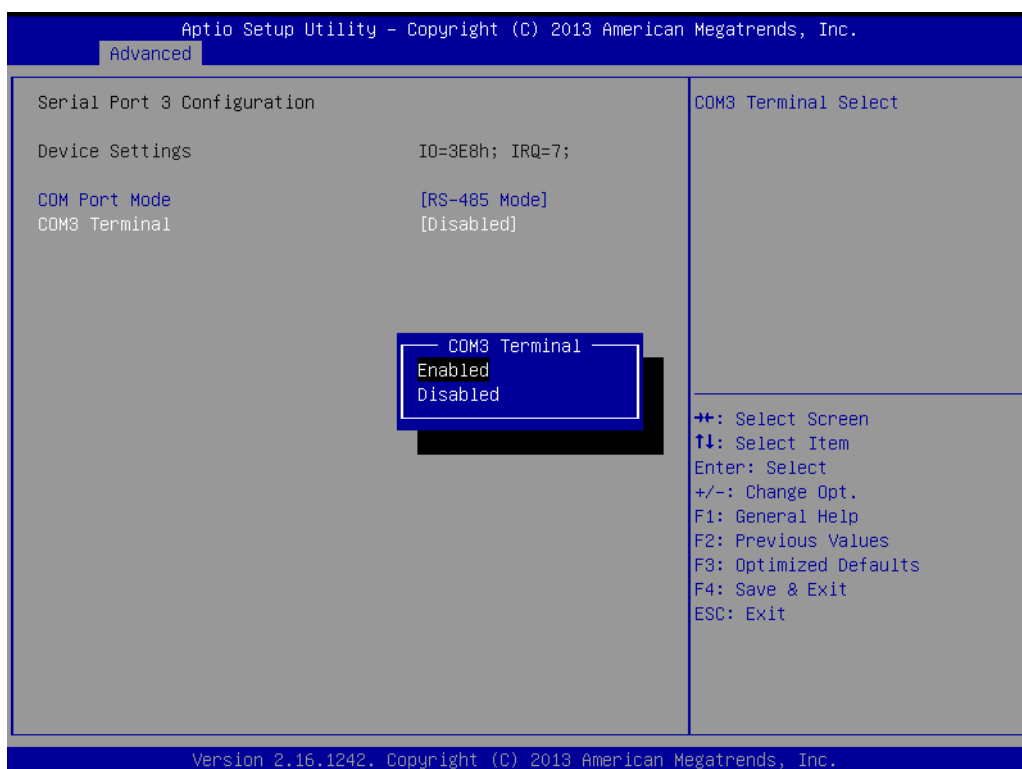


4.2.5 COM3 RS485 Terminal Selection

1. Click on Super IO Configuration in the Advanced tab.



2. In the Serial Port 3 Configuration submenu, set the COM3 Terminal option to Enabled.

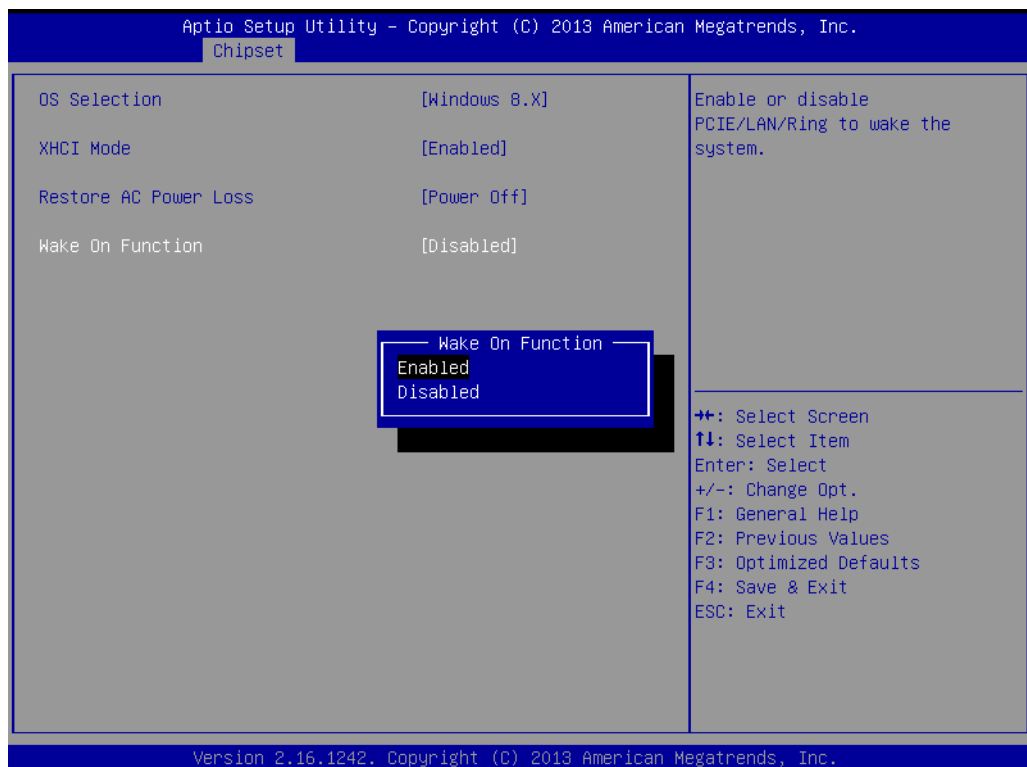


4.2.6 Wake on LAN

1. Click on South Bridge in the Chipset tab.

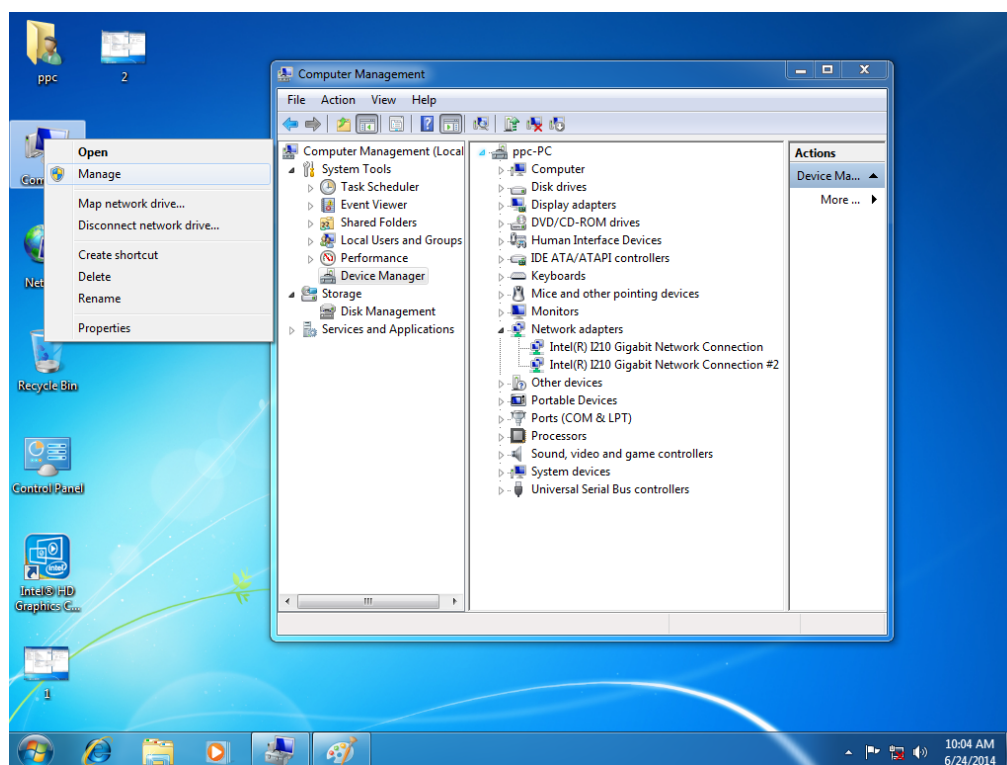


2. Set the Wake-on-Function function to Enabled.

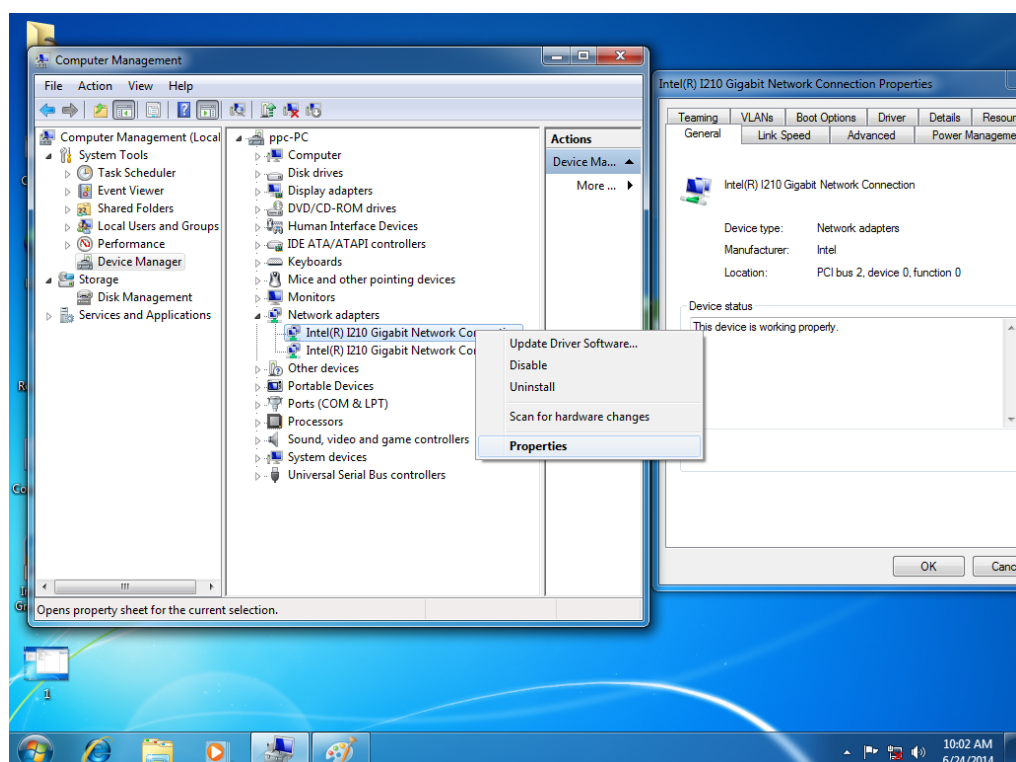


A. Wake-on-LAN in Windows 7

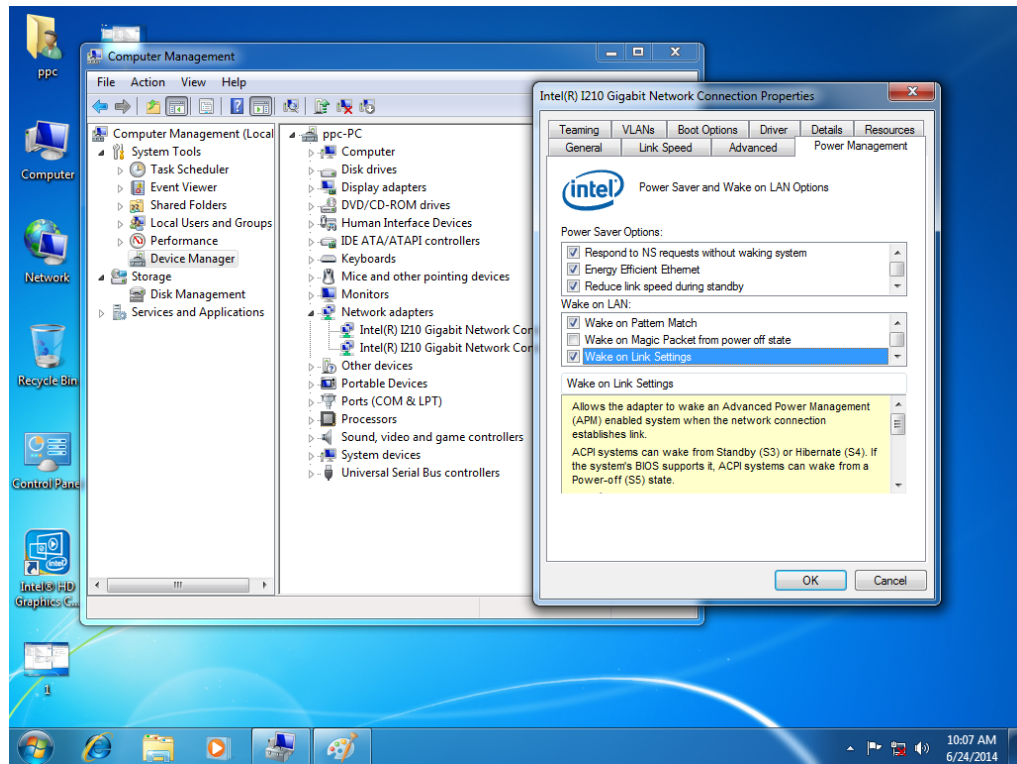
3. Right-click Computer and select “Manage” to open the Computer Management window.



4. Click Device Manager and select “Network Adapters”. Right-click the desired LAN port and select “Properties” to open the Intel GBE Network Controller Properties window.

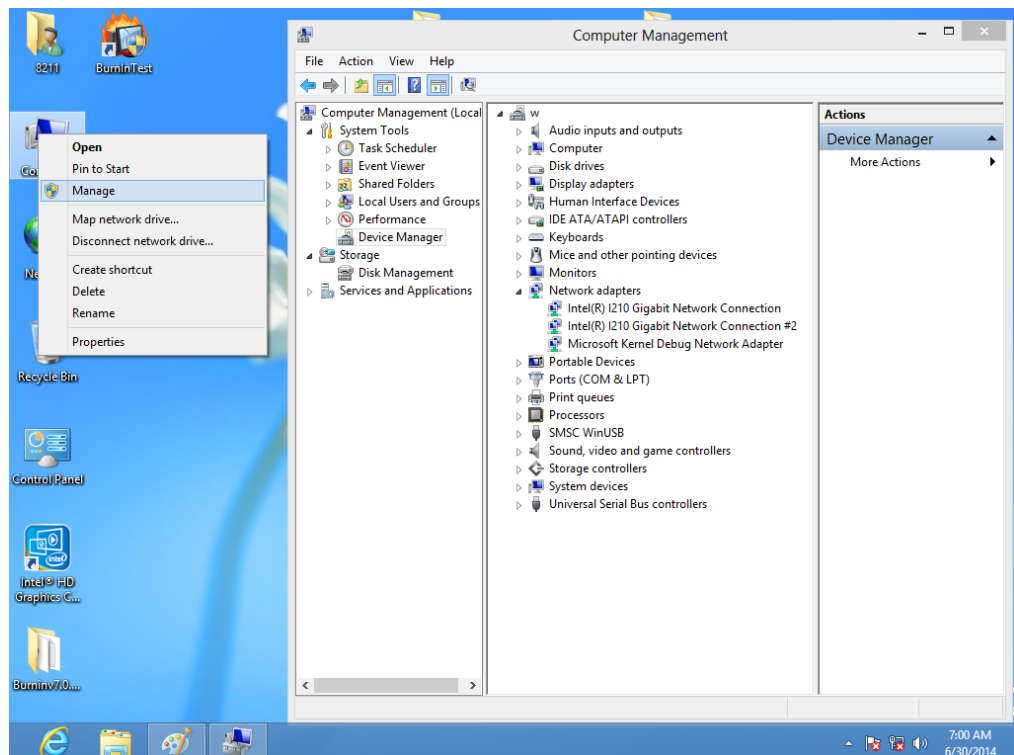


- Click on the Power Management tab in the Intel GBE Network Controller Properties window and ensure that the Wake-on-Link checkbox is ticked.
- Click OK to save the settings and exit the pop-up menu.

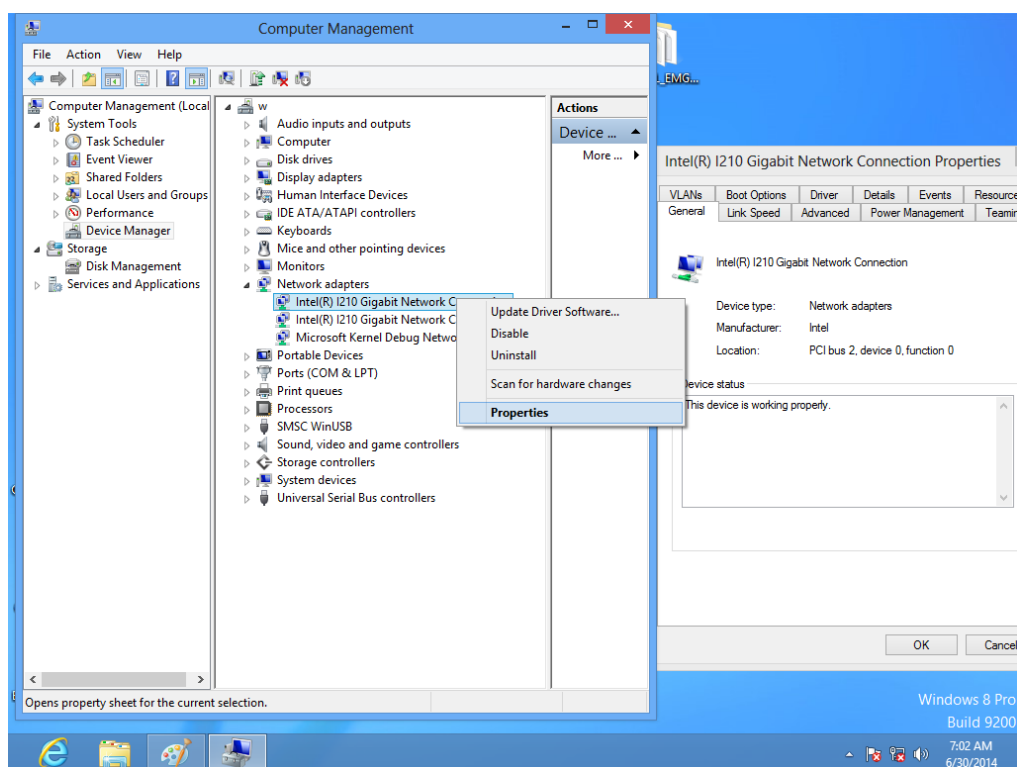


B. Wake-on-LAN in Windows 8

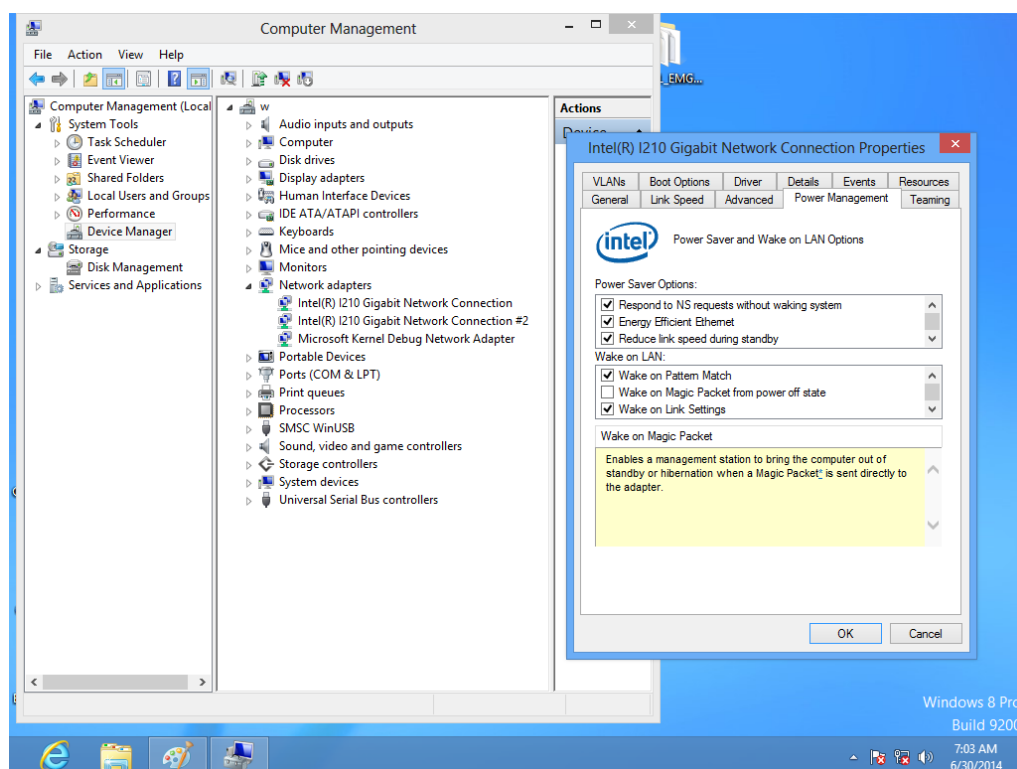
- Right-click Computer and select "Manage" to open the Computer Management window.



- Click on Device Manager and select "Network Adapters". Right-click the desired LAN port and select "Properties" to open the Intel GBE Network Controller Properties window.



- Click on the Power Management tab in the Intel GBE Network Controller Properties window and ensure that the Wake-on-Link checkbox is ticked.
- Click OK to save the settings and exit the pop-up menu.

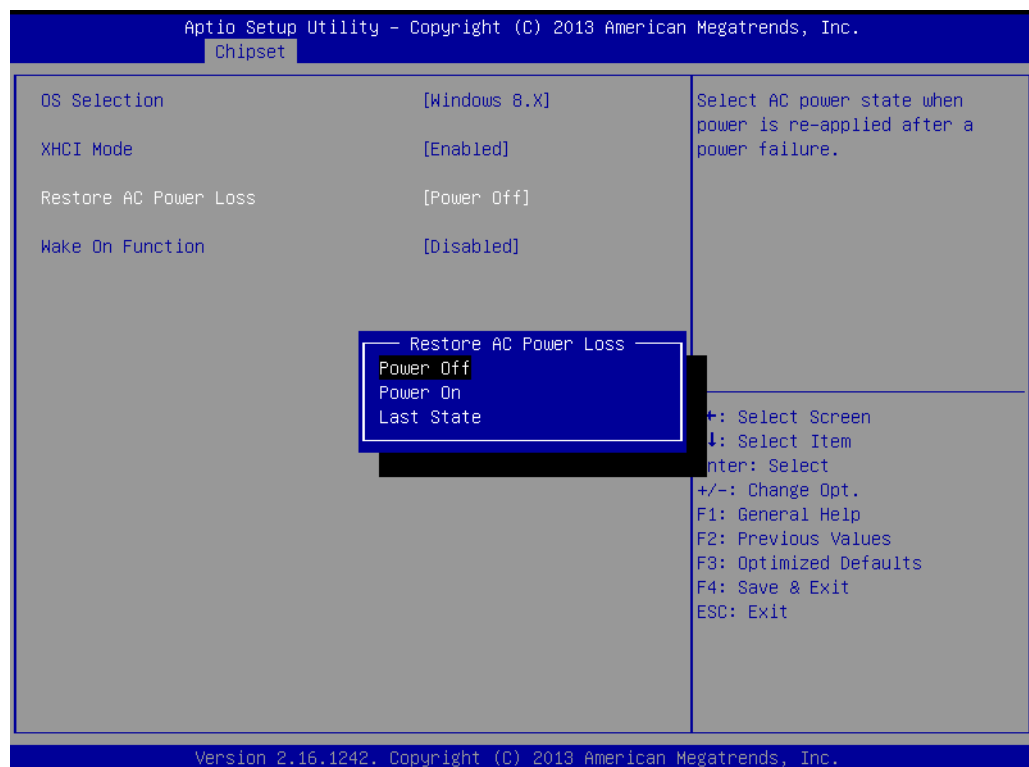


4.2.7 AT & ATX Setup

1. Click on South Bridge in the Chipset tab.

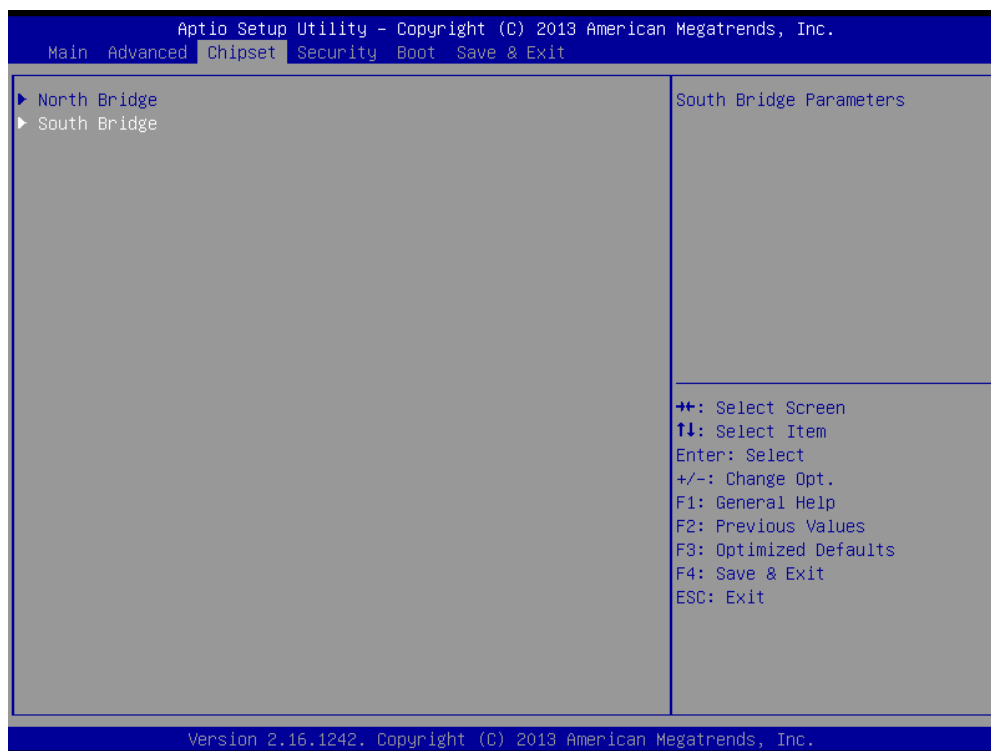


2. In the Restore AC Power Loss submenu, set the Power On function as “AT” and the Power Off function as “ATX”.



4.2.8 OS Selection

1. Click on South Bridge in the Chipset tab.

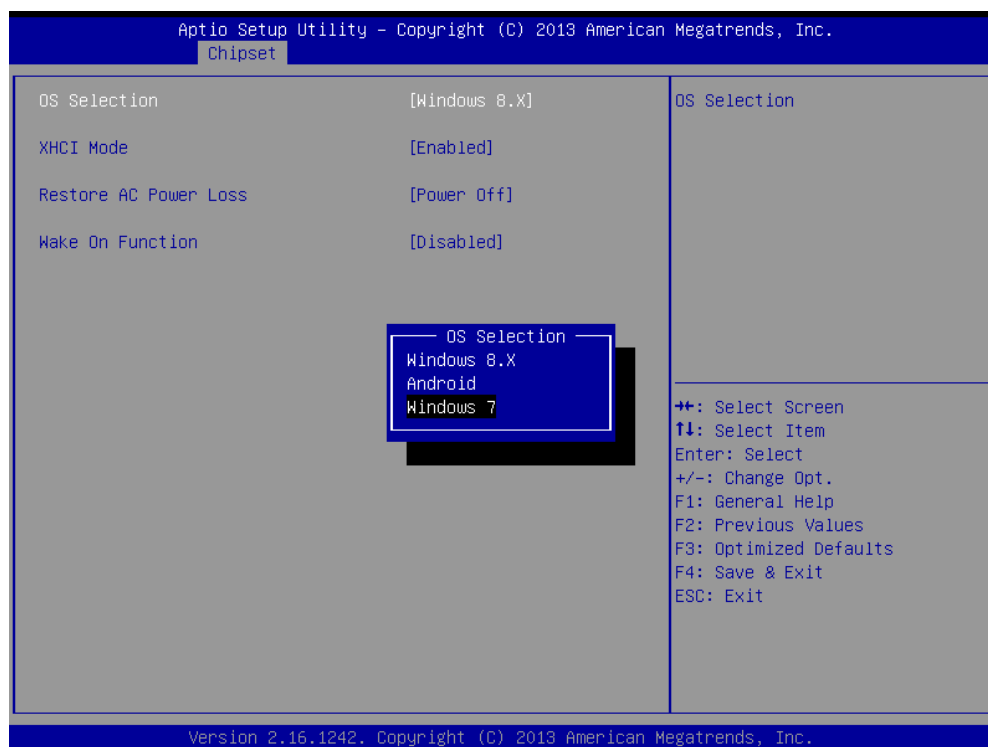


2. Use the OS Selection feature to set the system OS.

Note! The system OS is configured as Windows 7 by default.



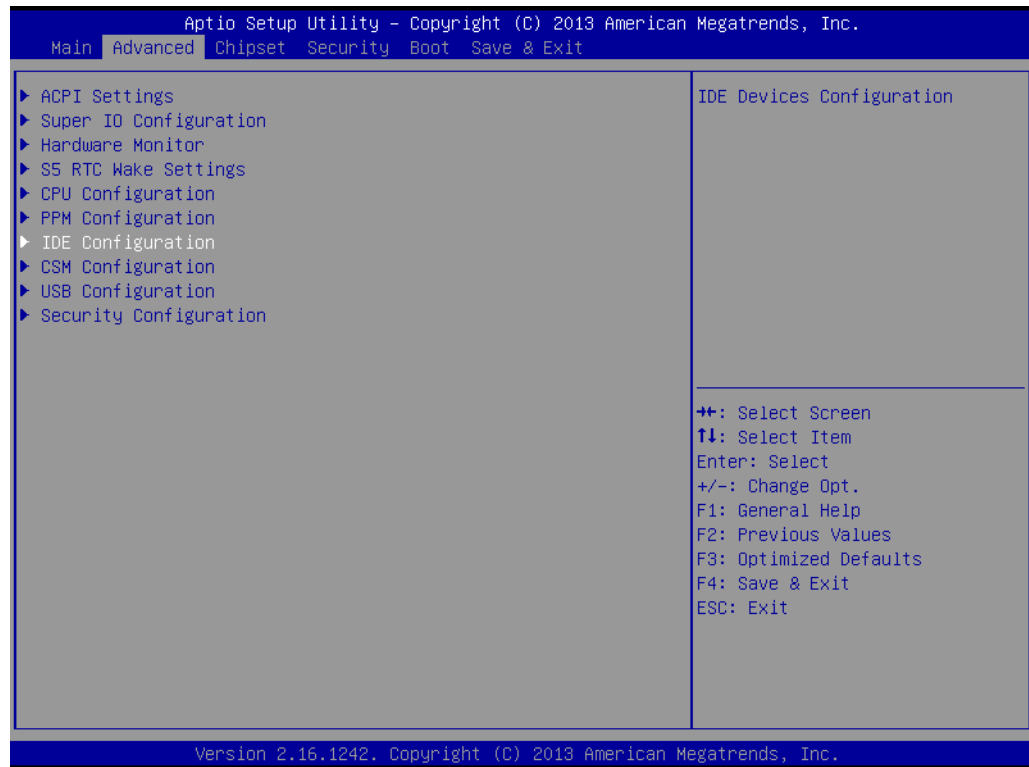
The OS Selection settings must be reconfigured if installing Windows 8.x or Android OS.



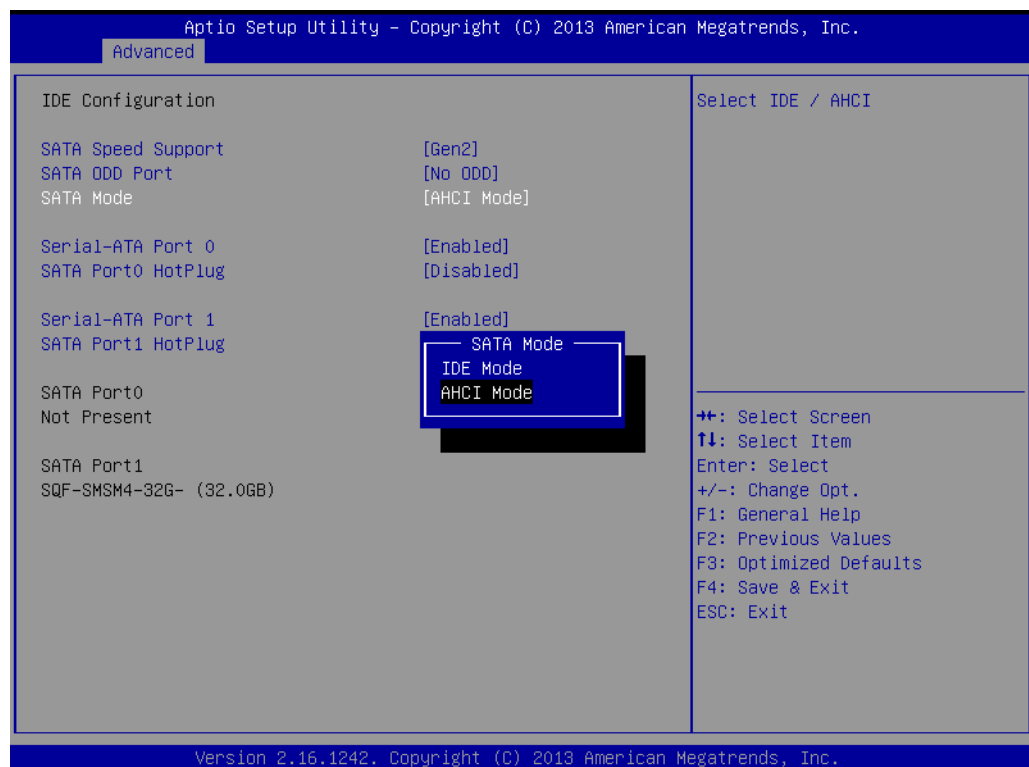
4.2.9 SATA Mode Selection

1. Click on IDE Configuration in the Advanced tab.

Note! The default setting is AHCI Mode. This can only be changed to IDE Mode when a CF module is installed.

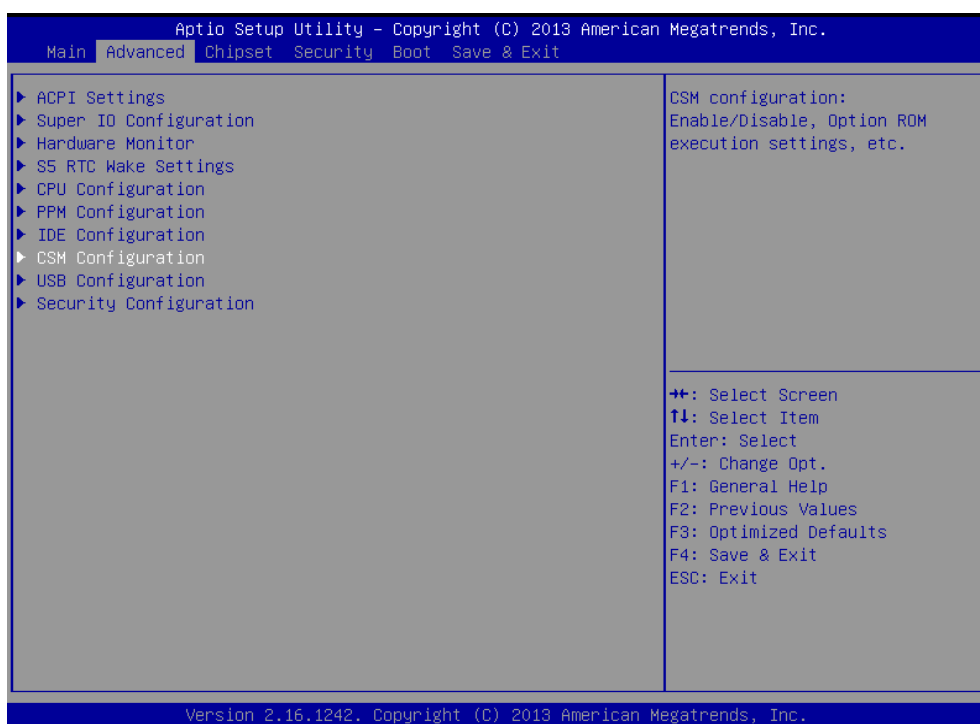


2. Configure the SATA Mode settings.



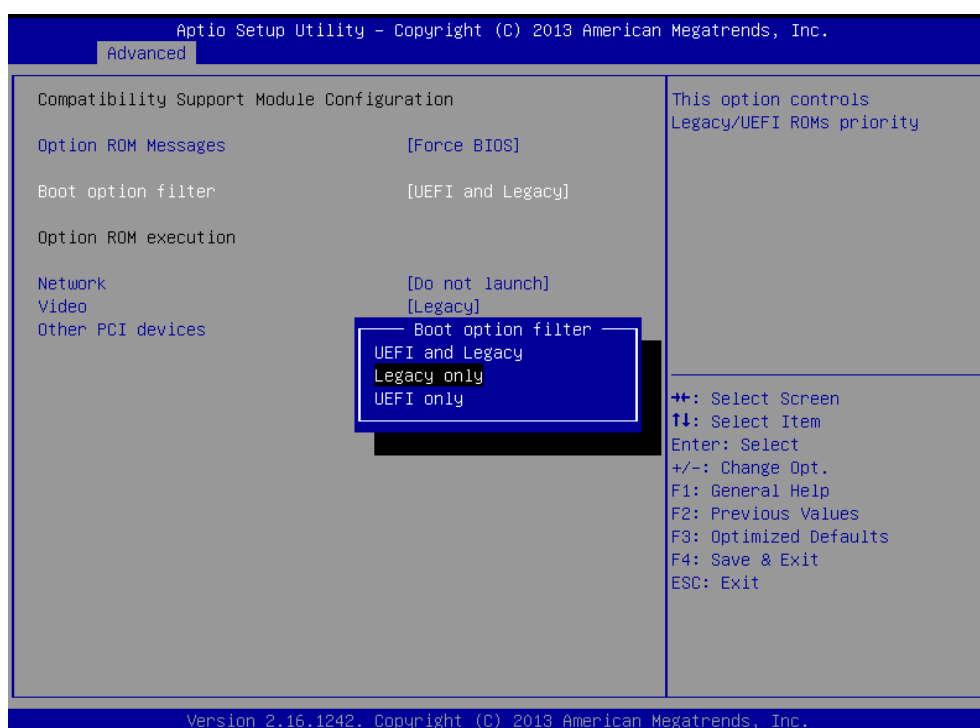
4.2.10 Boot Options

1. Click on CSM Configuration in the Advanced tab.



2. In the CSM Configuration submenu, click on Boot Option Filter to configure the boot option filter settings.

Note! *The Boot Option Filter feature is set as “Legacy only” by default. The “UEFI only” option is only available for Windows 7 (64 bit) or Windows 8.x (64 bit). If a UEFI (32 bit) OS is required, the BIOS settings must be updated.*

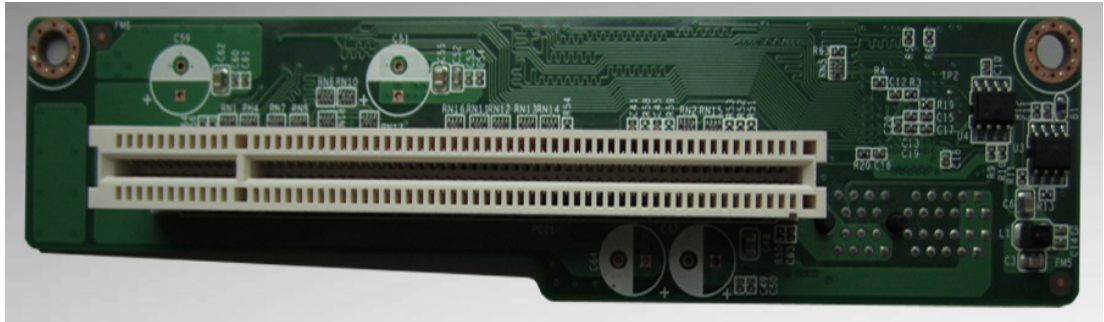


Appendix **A**

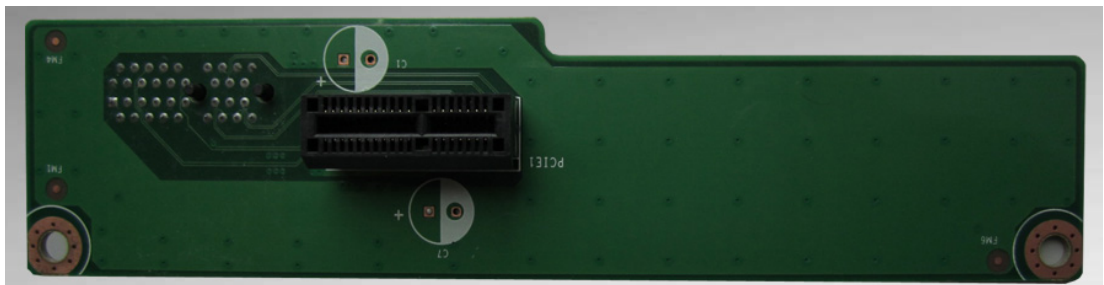
PCI/PCI-E

A.1 PCI/PCI-E

The default PCM-938 PCIe x1-to-PCI slot is shown below. (This riser card is only supported by PPC-3170 and PPC-3190.)



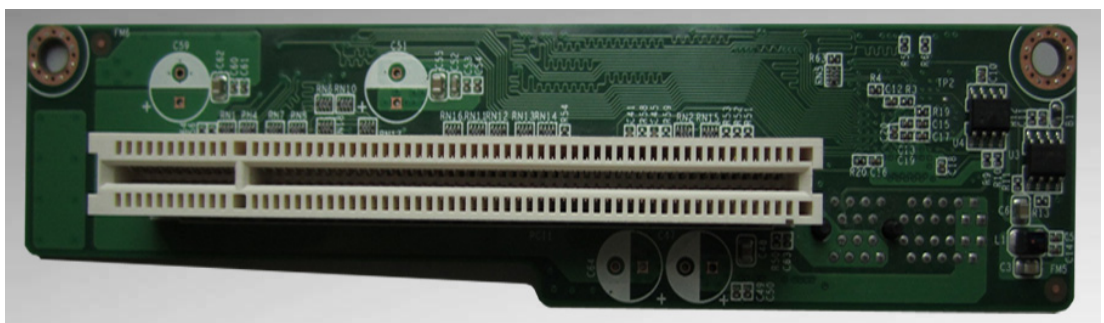
The PCM-939 PCIe x1-to-PCIe x1 slot provided in the accessory box is shown below. (This riser card is only supported by PPC-3170 and PPC-3190.)



The 969K821120E PCIe x1-to-PCIe x1 slot provided in the accessory box is shown below. (This riser card is only supported by PPC-3150.)



The default 969K821130E PCIe x1-to-PCI slot is shown below. (This riser card is only supported by PPC-3150.)



Note! *The PCI or PCIe card should not exceed 176 mm in length and 107 mm in width.*



The space above the card should not exceed 18 mm, and that below should not exceed 10 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.

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, such as electronically, by photocopying, recording, or otherwise, without prior written permission from the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2021