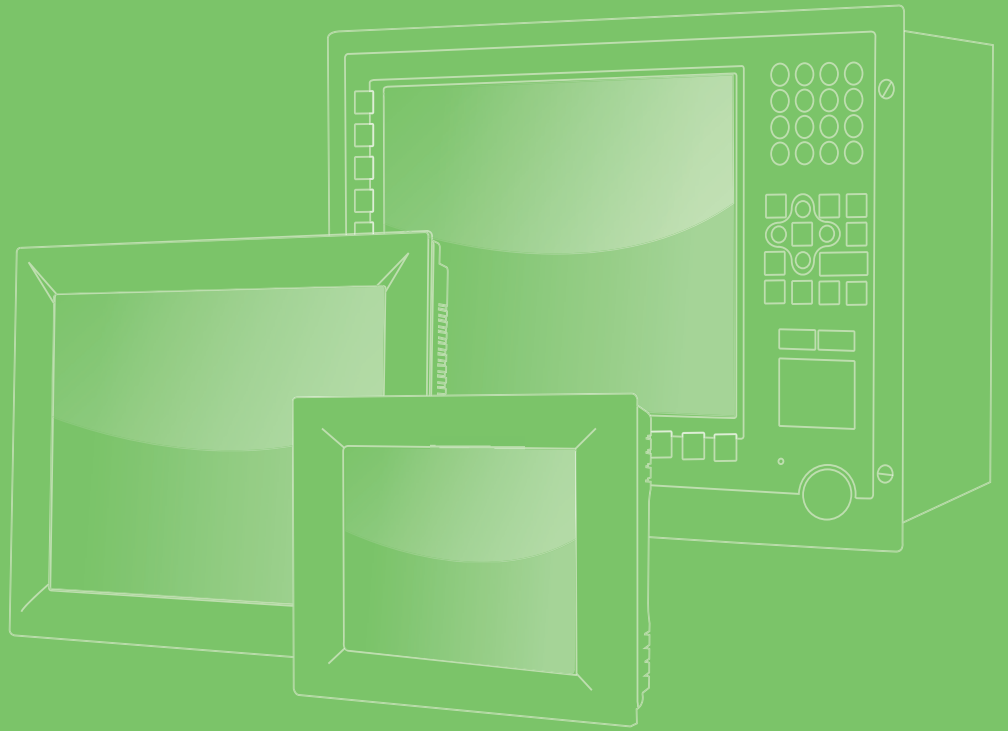


User Manual



# PPC-3100S/3120S/3150S/ 3210SW

Intel® Celeron® N2930 Panel PC with  
10.4"/12.1"/15"/21.5" Color TFT LCD  
Display

**ADVANTECH**

**VICPAS**  
HMI Parts Center

*Enabling an Intelligent Planet*

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## Product Warranty (2 years)

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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 a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
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5. Write the RMA number on the outside, 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 using shielded cables. Such cables is available from Advantech. Please contact your local supplier for ordering information.

### 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.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the power source voltage is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is malfunctioning or does not operate according to the user manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
15. Do not store the equipment in an environment where the temperature fluctuates below  $-40\text{ }^{\circ}\text{C}$  ( $-40\text{ }^{\circ}\text{F}$ ) or above  $60\text{ }^{\circ}\text{C}$  ( $140\text{ }^{\circ}\text{F}$ ) as this may cause damage. The equipment should be stored in a controlled environment.
16. Batteries are at risk of exploding if incorrectly installed. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. Power to this equipment should be supplied by an approved power adapter or DC power source with an output rating of  $15\text{ } \sim 24\text{V}_{\text{DC}}$ ,  $4\text{ } \sim 2.5\text{A}$  for board A, or  $12\text{ } \sim 24\text{V}_{\text{DC}}$ ,  $5\text{ } \sim 2.5\text{A}$  for board B, and an operating temperature tolerance of  $50\text{ }^{\circ}\text{C}$  for SSDs or  $40\text{ }^{\circ}\text{C}$  for HDDs. For further assistance, please contact Advantech.

In compliance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).

DISCLAIMER: These instructions are provided according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

## Safety Precaution - 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. Please use the public collection system to return, recycle, or treat them in compliance with local regulations.



## Manual Conventions

**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."

**Note!** Notes provide additional optional information.



## Revision

| <b>Date</b> | <b>Version</b> | <b>Description/Change</b>          |
|-------------|----------------|------------------------------------|
| May 2016    | 1.0            | Initial                            |
| Feb 2017    | 1.1            | PPC-3150S specifications added     |
| April 2017  | 1.2            | PPC-3100S-PBE specifications added |
| August 2017 | 1.3            | PPC-3210SW specifications added    |

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# Chapter 1

## General Information

This chapter provides general information regarding PPC-3100S/3120S/3150S/3210SW.

- Introduction
- Specifications
- Dimensions

## 1.1 Introduction

Advantech's PPC-3100S/3120S/3150S/3210SW is a fanless ultra-slim panel PC equipped with an industrial-grade TFT LCD and low-power Intel® Celeron® N2930, 1.86 GHz processor. PPC-3100S/3120S/3150S/3210SW provides high-performance computing in a compact embedded system.

Designed for high durability, PPC-3100S/3120S/3150S/3210SW features a true-flat 5-wire resistive or projected capacitive touchscreen, IP65-rated front panel, and die cast aluminum alloy enclosure. The system I/O includes two serial ports, two or three USB ports, and dual GbE LAN to support diverse industrial applications. Moreover, to enhance system monitoring and protection, an E-Eye LED display is included in the rear cover for indicating the system status.

## 1.2 Key Features

- Robust IP65-rated true-flat color TFT LCD
- Ultra-thin fanless design with solid aluminum alloy enclosure
- Intel® Celeron® N2930 quad-core, 1.83 GHz, processor
- 1 x 204-pin DDR3L SODIMM slot (supports up to 8 GB)
- 2 x Full-size mini PCIe card slots (one supports mSATA SSD)
- 1 x USB 3.0 port
- Supports SATA 6Gb/s interface for 2.5" SATA storage
- Supports E-Eye technology for enhanced system monitoring
- Optional mini PCIe 802.11b/g/n wireless module

## 1.3 Front Panel

The PPC-3100S/3120S/3150S/3210SW front panel is a true-flat color TFT LCD touchscreen with 5-wire resistive touch control. The front panel is IP65 rated for dust and water tolerance (Figure 1.1).

**Note!** The panel PC shown in Figure 1.1 is PPC-3100S. The PPC-3000S model follows the same design.



Figure 1.1 PPC-3XX0S front panel

## 1.4 Rear Panel

The PPC-3100S/3120S/3150S/3210SW rear panel features four VESA mounting (75 x 75 mm) holes and an E-Eye LED display located below the side of product label (Figure 1.2).

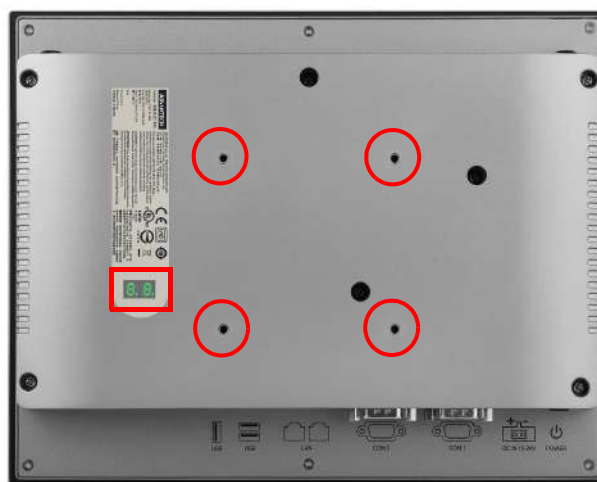


Figure 1.2 PPC-3XX0S rear panel

## 1.5 Panel Underside

The system I/O located at the panel underside (Figures 1.3 and 1.4) are listed below.

- 1 x Power input connector
- 1 x Power switch
- 1 x RS-232 connector (COM1)
- 1 x RS-232/422/485 connector (COM2)
- 2 x RJ45 GbE
- 1 x USB 3.0
- 2 x USB 2.0 (only 1 x USB 2.0 for projected capacitive models)



Figure 1.3 Resistive touch model panel underside



Figure 1.4 Projected capacitive model panel underside

## 1.6 Dimensions

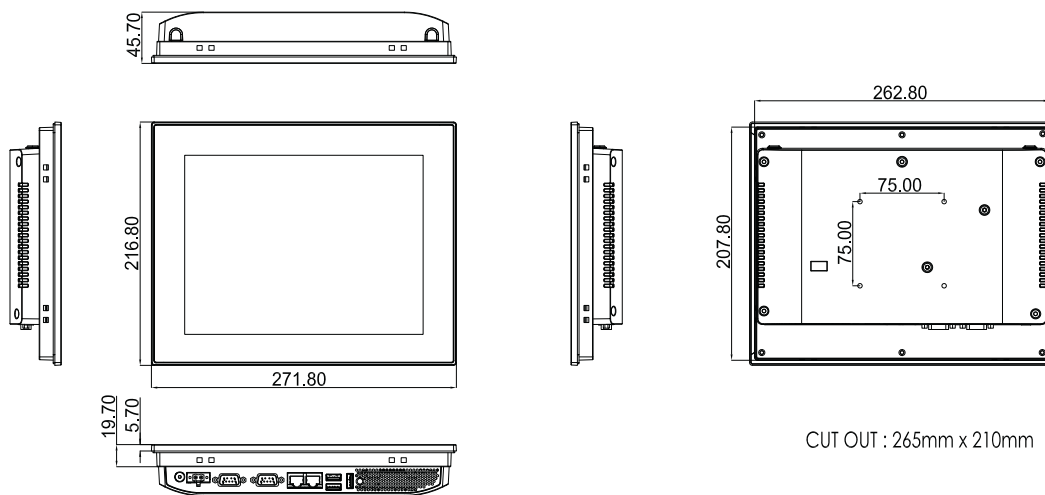


Figure 1.5 PPC-3100S dimensions

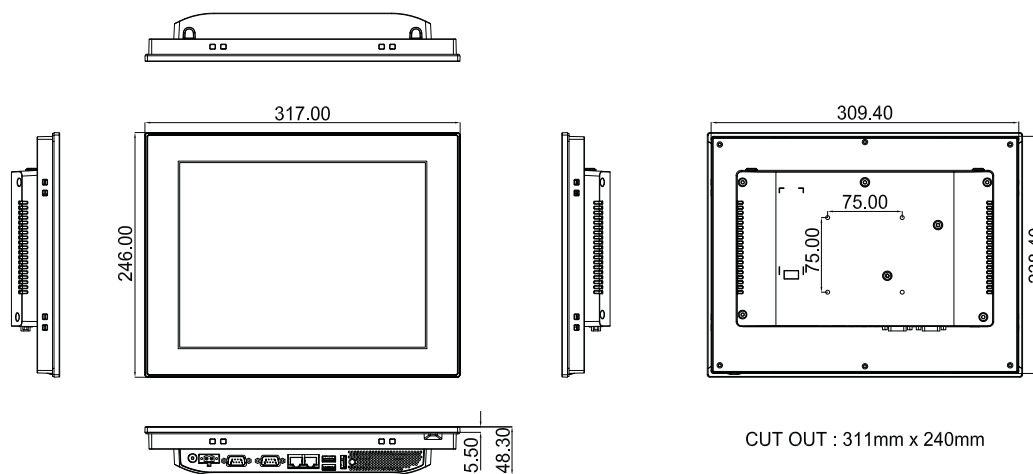


Figure 1.6 PPC-3120S dimensions

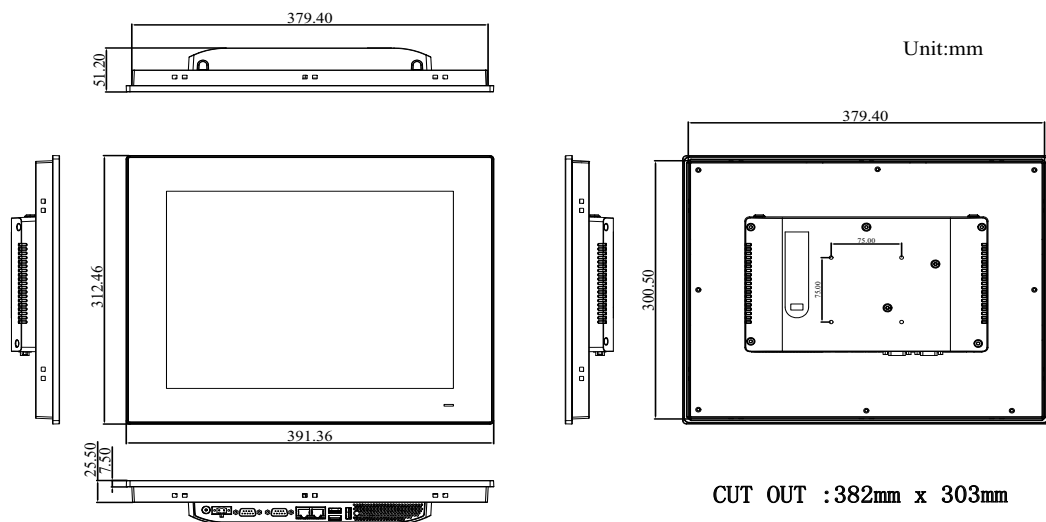


Figure 1.7 PPC-3150S dimensions

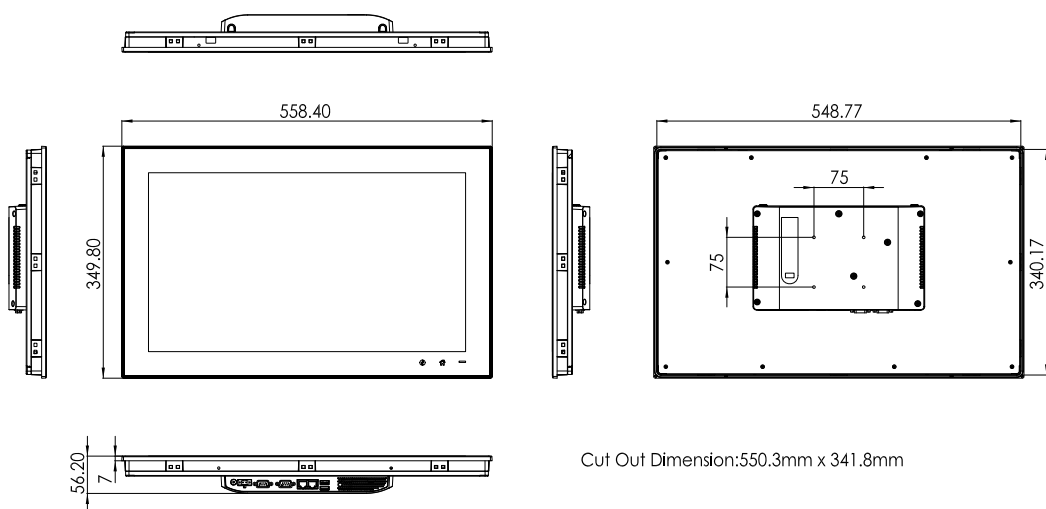


Figure 1.8 PPC-3210SW dimensions

## 1.7 Specifications

### 1.7.1 Specifications Comparison

|                            | PPC-3100S-RAE | PPC-3100S-PBE   | PPC-3120S   | PPC-3150S    | PPC-3210SW      |
|----------------------------|---------------|-----------------|-------------|--------------|-----------------|
| <b>LCD Size</b>            | 10.4"         | 10.4"           | 12.1"       | 15"          | 21.5"           |
| <b>Display Type</b>        | TFT LCD       | TFT LCD         | TFT LCD     | TFT LCD      | TFT LCD         |
| <b>Resolution</b>          | 800 x 600     | 1024 x 768      | 1024 x 768  | 1024 x 768   | 1920 x 1080     |
| <b>Brightness</b>          | 400           | 350             | 500         | 400          | 300             |
| <b>Color</b>               | 16.2M/262k    | 16.2M/262k      | 16.2M/262k  | 16.2M/262k   | 16.7M           |
| <b>Pixel Pitch (H x V)</b> | 0.264 x 0.264 | 0.0685 x 0.2055 | 0.24 x 0.24 | 0.29 x 0.297 | 248.25 x 248.25 |
| <b>Viewing Angle</b>       | 160, 140      | 176, 176        | 160, 140    | 160, 140     | 178, 178        |
| <b>Contrast</b>            | 700           | 1200            | 700         | 700          | 5000            |

|                              |   |  |                             |                             |   |
|------------------------------|---|--|-----------------------------|-----------------------------|---|
| <b>Backlight Lifetime</b>    | 30,000 hrs  | 30,000 hrs                               | 30,000 hrs                  | 50,000 hrs                  | 50,000 hrs                                |
| <b>Touchscreen Type</b>      | 5-wire resistive  | Projected capacitive 5-point multi-touch | 5-wire resistive            | 5-wire resistive            | Projected capacitive 10-point multi-touch |
| <b>Resolution</b>            | 4096 x 4096   | 2048 x 2048                              | 4096 x 4096                 | 2048 x 2048                 | 2048 x 2048                               |
| <b>Light Transmission</b>    | 80±5% at 550nm wavelength   | 88±2%                                    | 80±5% at 550nm wavelength   | 81±3%                       | 81±3%                                     |
| <b>Controller</b>            | RS-232 interface  | USB interface                            | RS-232 interface            | RS-232 interface            | USB interface                             |
| <b>Durability</b>            | At least 35,000,000 touches   | Glass surface hardness 7H                | At least 35,000,000 touches | At least 36,000,000 touches | Glass surface hardness 7H                 |
| <b>Enclosure</b>             | Aluminum alloy  |  |                             |                             |   |
| <b>CPU</b>                   | Intel® Celeron® N2930 quad-core, 1.83 GHz, 7.5 W  |  |                             |                             |   |
| <b>Memory</b>                | 1 x SODIMM DDR3L 1333, up to 8 GB   |  |                             |                             |   |
| <b>Storage 1</b>             | 1 x 2.5" SATA slot (optional, for the PPC-3100S-HDDE model with HDD bracket)  |  |                             |                             |   |
| <b>Optional Storage</b>      | 1 x mSATA   |  |                             |                             |   |
| <b>Network (LAN)</b>         | 2 x RJ45 LAN  |  |                             |                             |   |
| <b>I/O Ports</b>             | 1 x RS-232<br>1 x RS-232/422/485<br>2 x USB 2.0 (only 1 x USB 2.0 for projected capacitive model)<br>1 x USB 3.0<br>1 x Full-size mini PCIe |  |                             |                             |   |
| <b>OS Support</b>            | Windows 7/8.1/10, WES7, WEC7, Android, Linux  |  |                             |                             |   |
| <b>Power Supply</b>          | 12 ~ 24 VDC   |  |                             |                             |   |
| <b>Power Consumption</b>     | 16W   | 16W                                      | 18W                         | 20W                         | 25W                                       |
| <b>Operating Temperature</b> | 0 ~ 50 °C (32 ~ 122 °F) with SSD<br>0 ~ 40 °C (32 ~ 104 °F) with HDD  |  |                             |                             |   |
| <b>Storage Temperature</b>   | -40 ~ 60 °C (-40 ~ 140 °F)  |  |                             |                             |   |
| <b>Relative Humidity</b>     | 10 ~ 95% @ 40 °C (non-condensing)   |  |                             |                             |   |
| <b>Shock</b>                 | Operating 10G peak acceleration (11ms duration), compliant with IEC 60068-2-27  |  |                             |                             |   |
| <b>Vibration</b>             | Operating random vibration test, 5 ~ 500Hz, 1Grms with HDD, 2Grms with SSD, compliant with IEC 60068-2-64                                   |  |                             |                             |   |
| <b>IP Rating</b>             | IP65  |  |                             |                             |   |
| <b>Certifications</b>        | Safety: CE, UL, CCC, BSMI<br>EMC: CE, FCC Class B, BSMI   |  |                             |                             |   |
| <b>Dimensions</b>            | 272 x 217 x 46 mm   | 272 x 217 x 46 mm                        | 317 x 246 x 49 mm           | 391.36 x 312.46 x 51.5 mm   | 558 x 350 x 56                            |
| <b>Weight</b>                | 1.9 kg  | 1.9 kg                                   | 2.1 kg                      | 4 kg                        | 7.5 kg                                    |

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



Memory: 4G DDR3L 1333  
HDD: 500G 2.5" SATA III  
OS: Windows 7 (32 bit)  
Software: BurnIn Test 7.0

The PPC-3000S series only supports Windows 10/8 installation in UEFI mode.



## 1.8 Ordering Information

| Part Number  | Description  | Image   |
|--|--|---|
| PPC-3100S-RAE<br>PPC-3100S-PBE<br>PPC-3120S-RAE<br>PPC-3150S-RAE<br>PPC-3210SW-PAE | Panel PC with Intel® Celeron® N2930 processor                |    |
| PPC-3100S-HDDE   | Bracket for 2.5" SSD/HDD installation                        |    |
| 96PSA-A90W19OT-1   | Power adapter 100 ~ 240 V <sub>DC</sub> , 90 W, 19V with PFC |    |
| PPC-WLAN-B1E   | Wi-Fi module with antenna                                    |    |
| PPC-ARM-A03  | Arm mount VESA standard                                      |   |
| PPC-174T-WL-MTE  | Wall mount kit   |  |
| PPC-Stand-A1E  | Stand kit  |  |



# Chapter 2

## System Installation and Setup

- Quick System Tour
- Memory Card Installation
- HDD Installation
- mSATA Installation
- Wireless LAN Card 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-3100S/3120S/3150S/3210SW front panel should appear as shown in Figure 2.1.



**Figure 2.1 Panel PC front view**



**Figure 2.2 Panel PC rear view**

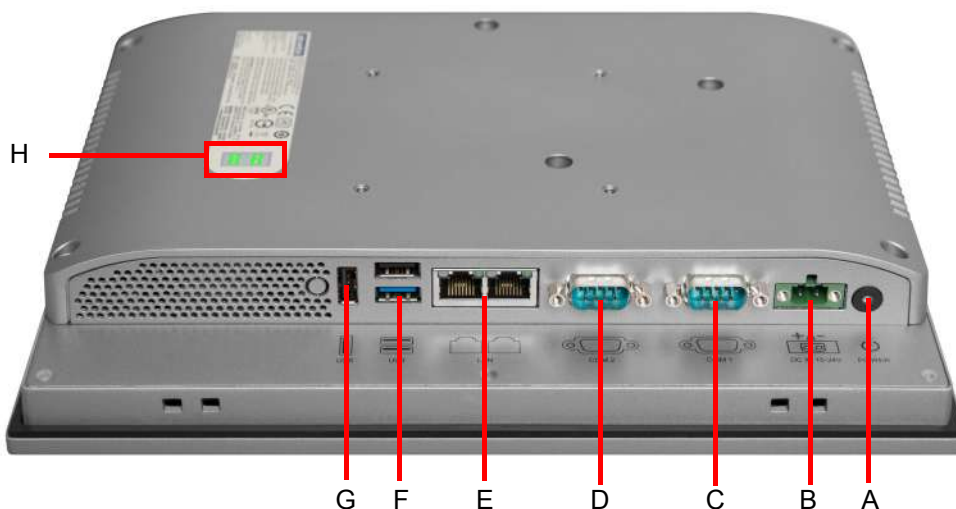


Figure 2.3 Panel PC underside with I/O

- |                         |  |
|-------------------------|--|
| A: Power button         | E: 2 x Gigabit Ethernet ports                        |
| B: DC In                | F: 1 x USB 3.0 and 1 x USB 2.0                       |
| C: COM1(RS-232)         | G: 1 x USB 2.0 (N/A for projected capacitive models) |
| D: COM2(RS-232/422/485) | H: E-Eye display                                     |

## 2.2 Installation Procedures

When installing system hardware, adhere to the following order:

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

### 2.2.1 Memory Card Installation

1. Remove the seven retention screws and disconnect the E-Eye display cable from the main board to remove the rear cover (see Figures 2.4 and 2.5).

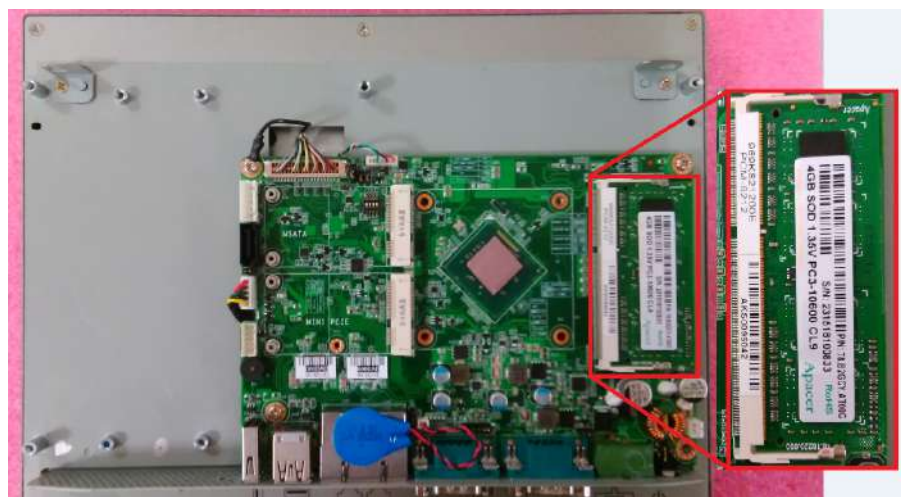


Figure 2.4 Retention screws on rear cover



**Figure 2.5 Disconnect E-Eye display cable from the main board**

2. Insert the memory card into the corresponding slot on the main board (see the area marked in red in Figure 2.6). Then place the memory thermal pad provided in the accessory box on top of the memory card (Figure 2.7).



**Figure 2.6 Memory card installation**



Figure 2.7 Thermal pad placed on the memory card

**Warning!** Ensure that the thermal pad (provided in the accessory box) is placed on top of the memory card, as shown in Figure 2.7.

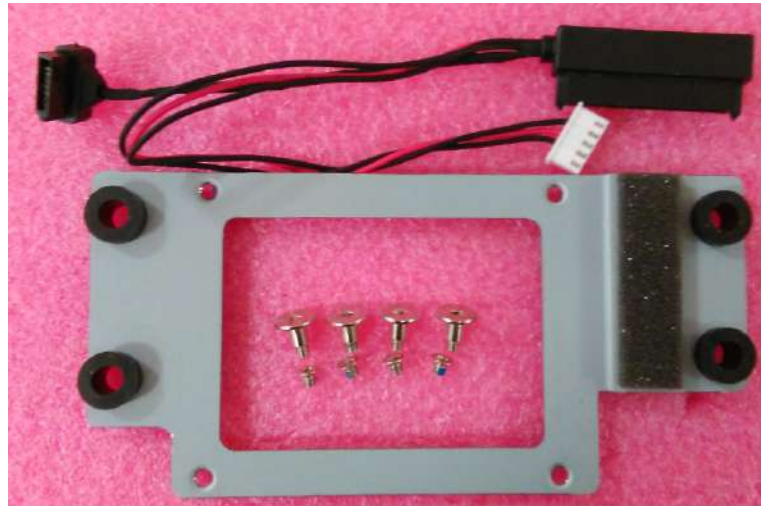


## 2.2.2 HDD Installation

1. Remove the four retention screws on the HDD bracket (Figures 2.8 and 2.9).



Figure 2.8 Retention screws on HDD bracket



**Figure 2.9 HDD module bracket**

2. Connect the SATA cable provided in the accessory box to the SATA HDD module (Figure 2.10).



**Figure 2.10 SATA cable connected to SATA HDD**



- Using the four screws provided in the accessory box, affix the SATA HDD module to the HDD bracket (Figure 2.11).



Figure 2.11 Secure SATA HDD with screws

- Affix the SATA HDD bracket to the main board. Tie the SATA power cable in place and then plug the cable into the corresponding connector on the motherboard (Figure 2.12).

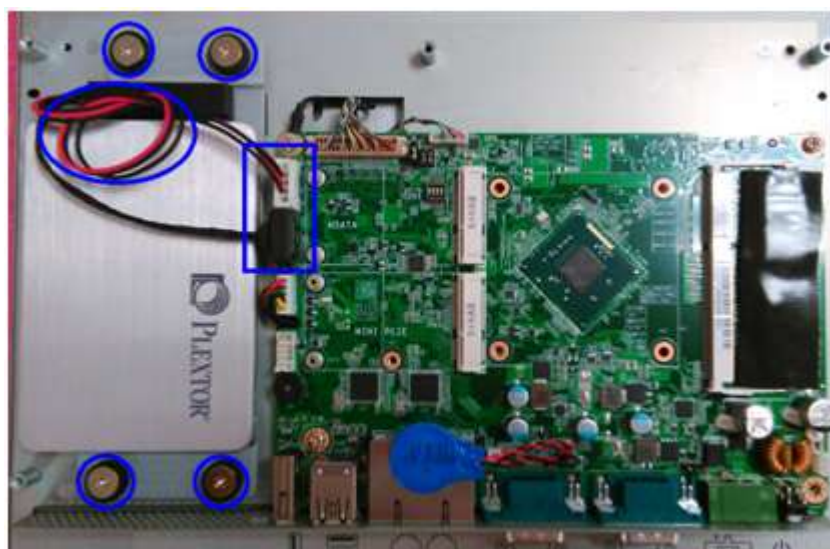


Figure 2.12 SATA HDD connected to the main board

## 2.2.3 mSATA Installation

1. Insert the mSATA card into the socket. Secure the card in place using two screws provided in the accessory box (Figure 2.13).

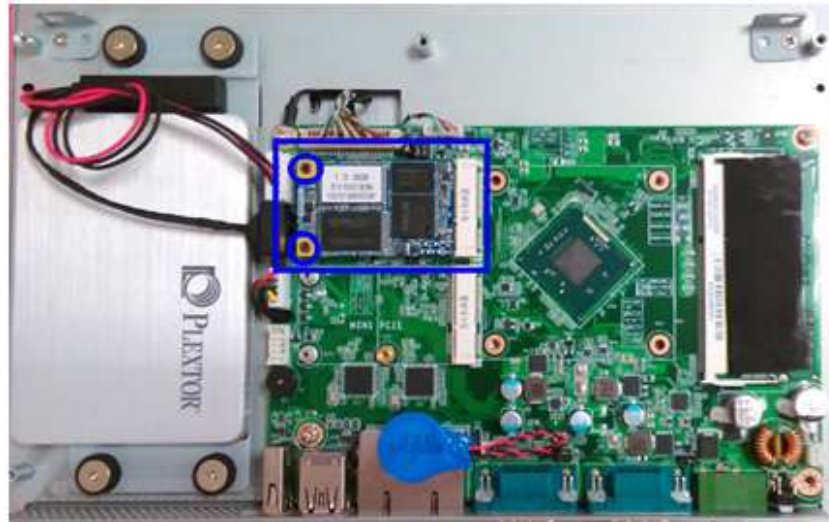


Figure 2.13 mSATA module installation

## 2.2.4 Wireless LAN Card Installation

### 2.2.4.1 Full-Size Mini PCIe Installation

1. Insert the full-size mini PCIe card into the socket. Secure the card in place using two screws provided in the accessory box. Next, replace the original bracket with the holed antenna bracket provided in the accessory box (Figure 2.14).

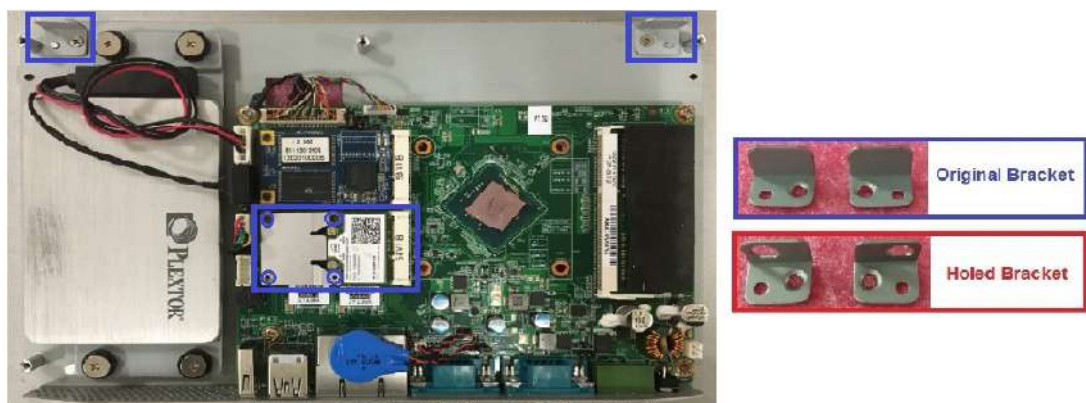


Figure 2.14 Installing the wireless LAN card

### 2.2.4.2 Half-Size Mini PCIe Installation

1. Retrieve the hexagonal screw provided in the accessory box. Align the screw with the notch on the PCB and secure in place (Figure 2.15).

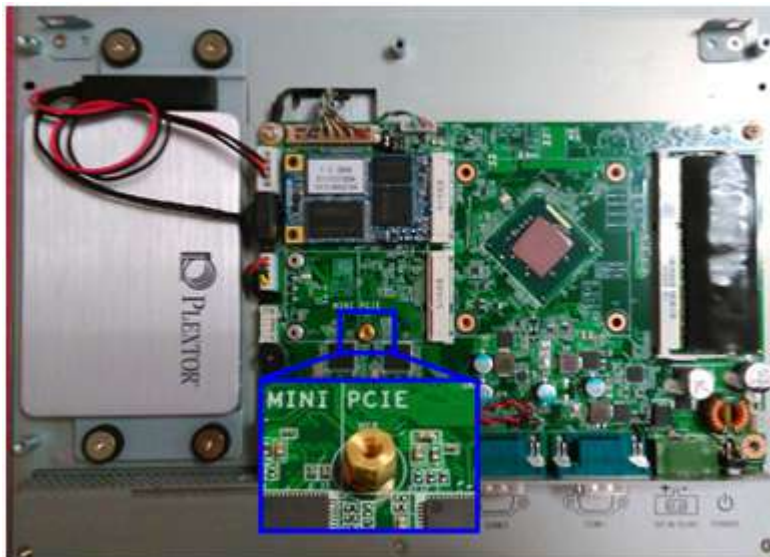


Figure 2.15 Hexagonal screw location

2. Insert the half-size mini PCIe card into the socket at a 45-degree angle. Secure the card in place using a screw provided in the accessory box. Next, replace the original bracket with the holed antenna bracket provided in the accessory box (Figure 2.16).

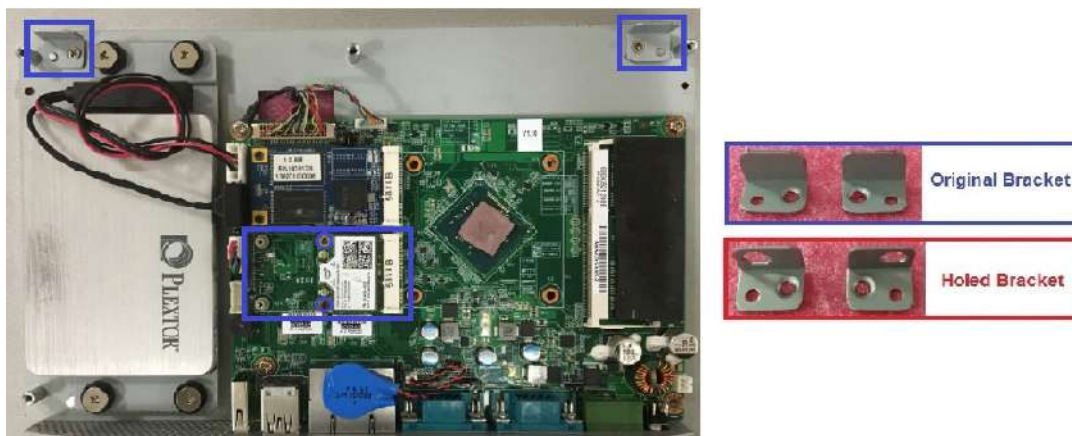


Figure 2.16 Installing the half-size mini PCIe card

3. Connect the antenna cables. Fix the cables on the brackets while noting the cable routing (Figures 2.17 and 2.18).



**Figure 2.17 Full-size mini PCIe LAN antenna cables**



**Figure 2.18 Half-size mini PCIe LAN antenna cables**

4. Remove the two plugs located at the top of the rear cover (Figure 2.19).



**Figure 2.19 Removing plugs for the antennae**

5. Connect the cable to the main board and secure the rear cover (Figure 2.20)



**Figure 2.20 Replacing the rear cover**

6. Install the external antennae (Figure 2.21).



**Figure 2.21 Location of external antennae**

## 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.



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 2.22 for additional reference).

1. Select the location on the wall for the wall mount plate.
2. Mark the locations of the two plate screws holes on the wall.
3. Drill two pilot holes at the marked locations on the wall.
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.

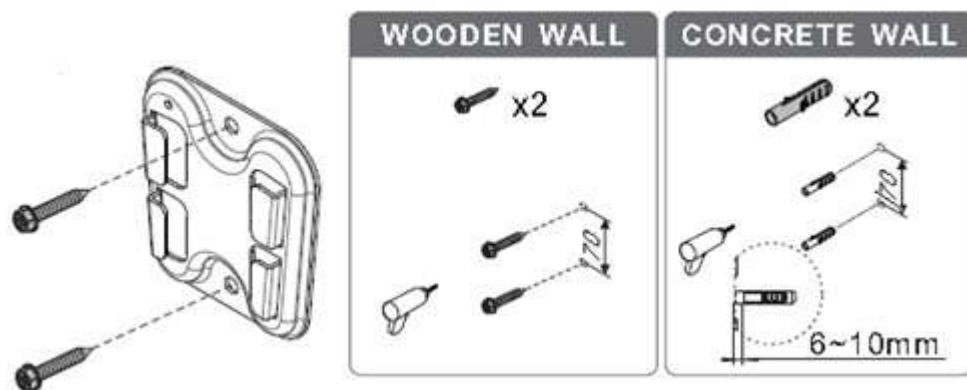


Figure 2.22 Wall mount plate

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

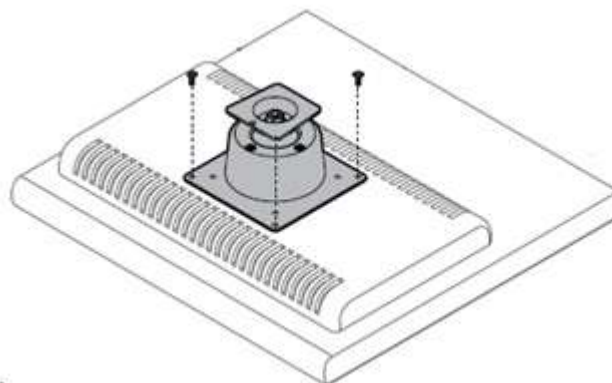
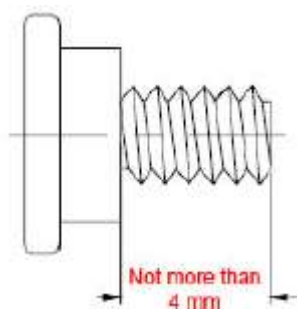


Figure 2.23 Screw locations on the rear panel

**Warning!** Ensure that the thread depth of the screws on the rear panel does not exceed 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 2.24).

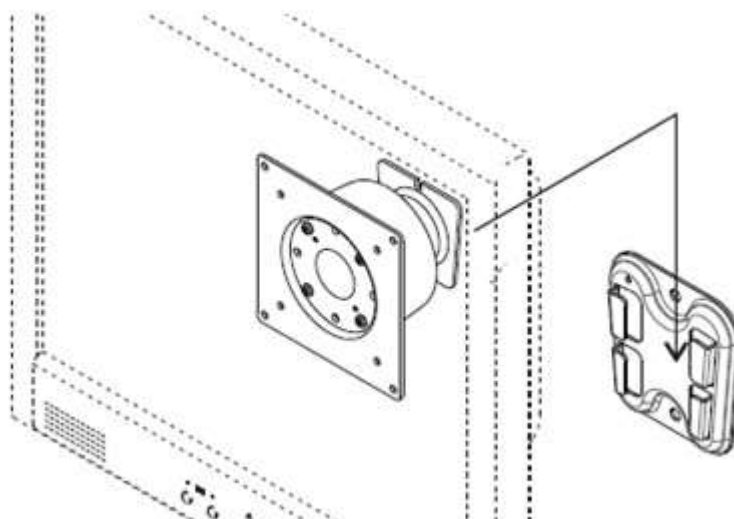
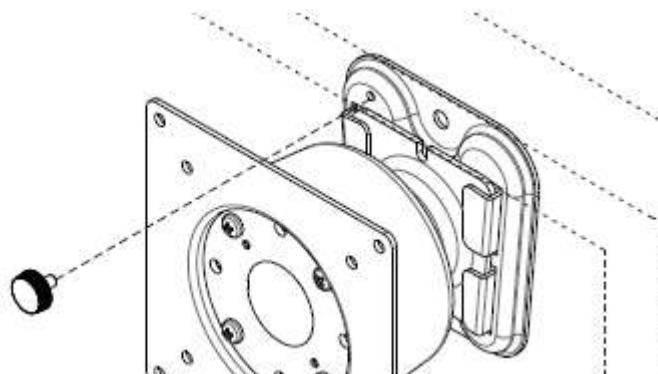


Figure 2.24 Mounting the panel PC on a wall

8. Secure the panel PC in place by tightening screws in the wall mount bracket (Figure 2.25).

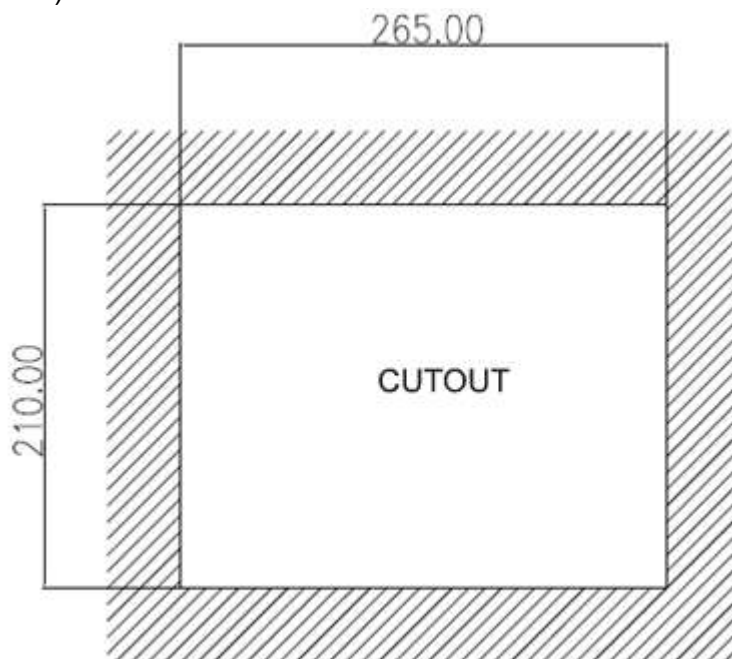


**Figure 2.25 Securing the panel PC**

### 2.3.2 Panel Mounting

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

1. Cut out a panel corresponding to the size shown in Figures 2.26, 2.27, and 2.28. (unit: mm).



**Figure 2.26 PPC-3100S cutout dimensions**



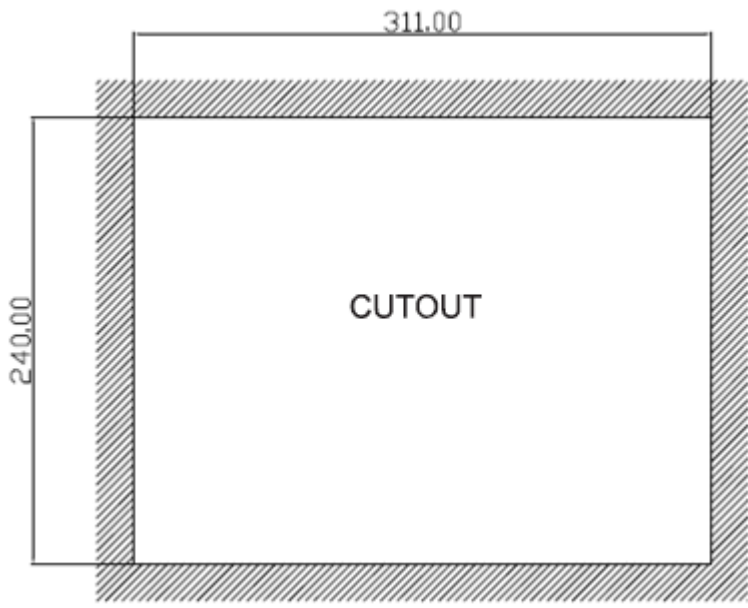


Figure 2.27 PPC-3120S cutout dimensions

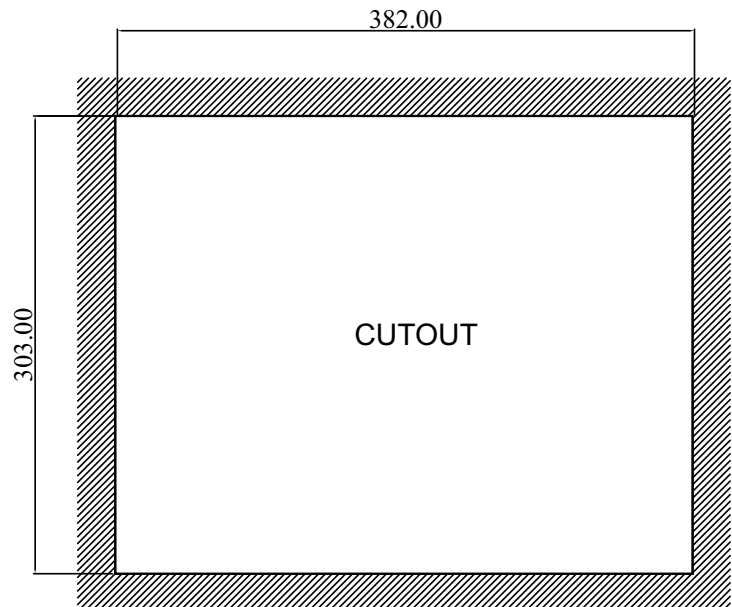
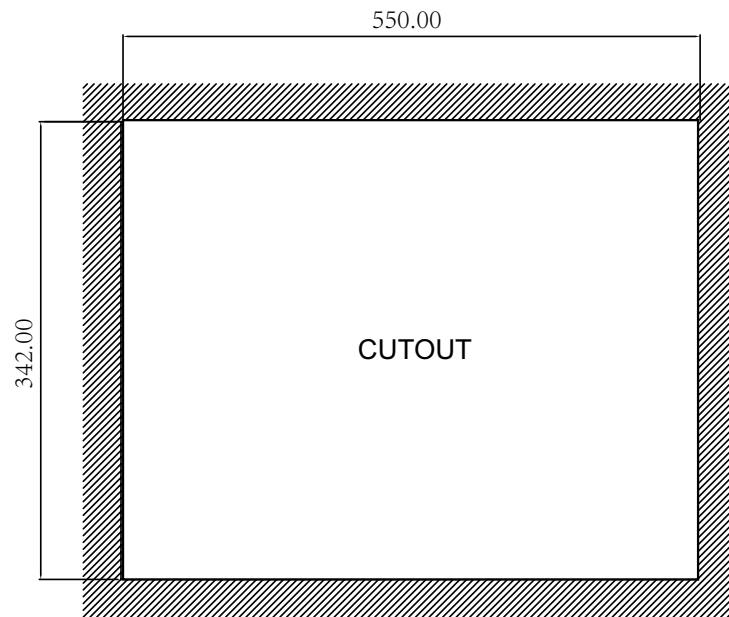
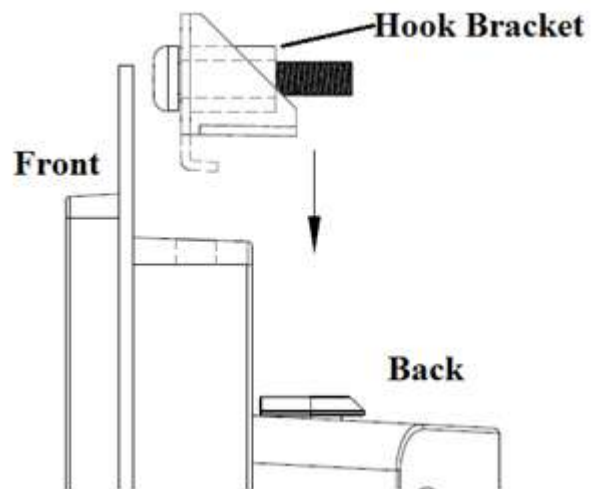


Figure 2.28 PPC-3150S cutout dimensions



**Figure 2.29 PPC-3210SW cutout dimensions**

2. Install the panel PC in the cabinet and retrieve eight hook brackets from the accessory box (Figure 2.29).



**Figure 2.30 Hook brackets for panel mounting**

3. Insert the hook brackets into the holes following the direction of the arrows shown in Figure 2.30 and hang the panel PC.

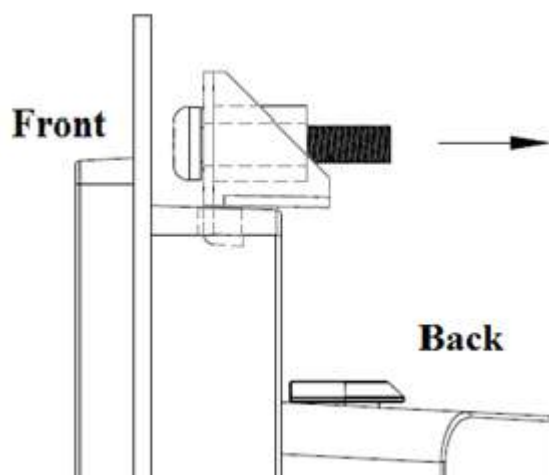


Figure 2.31 Hook brackets location

4. Tighten the screws to affix the panel PC in place (Figure 2.31).

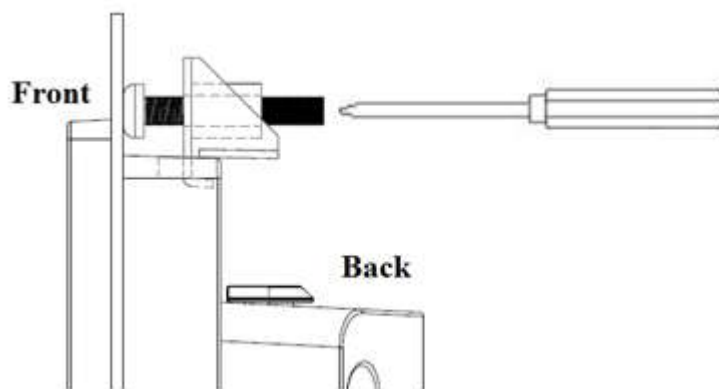


Figure 2.32 Fasten the hook bracket

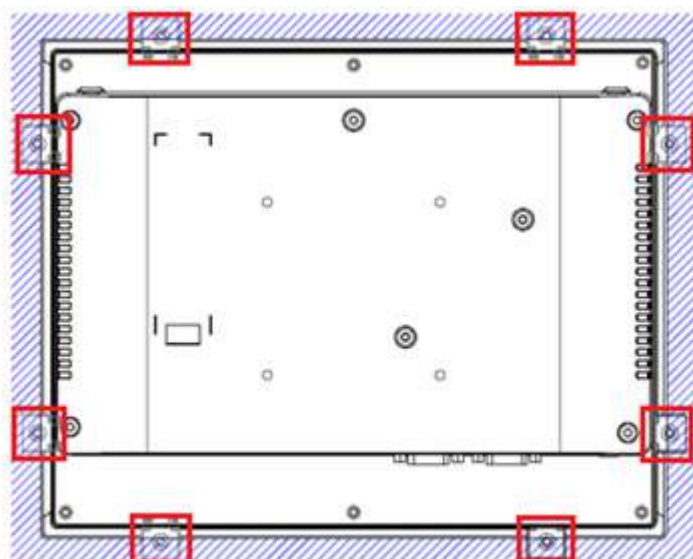


Figure 2.33 Panel mount rear view

### 2.3.3 Arm Mounting

PPC-3100S/3120S/3150S/3210SW can be mounted on a VESA-compliant arm mount with a 75 mm interface pad. To affix the panel PC to an arm mount, follow the steps below.

1. Refer to the installation instruction of the mounting arm to correctly mount the arm onto the surface as a base.
2. Align the retention screw holes on the mounting arm interface with VESA holes in the panel PC, and secure the panel PC by four M4 retention screws. (see Figure 2.33)



Figure 2.34 Arm mount for panel PC

**Warning!** 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 following items:

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

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

1. Use four M4 x 8L screws to affix the VESA bracket to the panel PC. Users can choose between a 75 x 75 mm or 100 x 100 mm VESA mount according to their requirements.

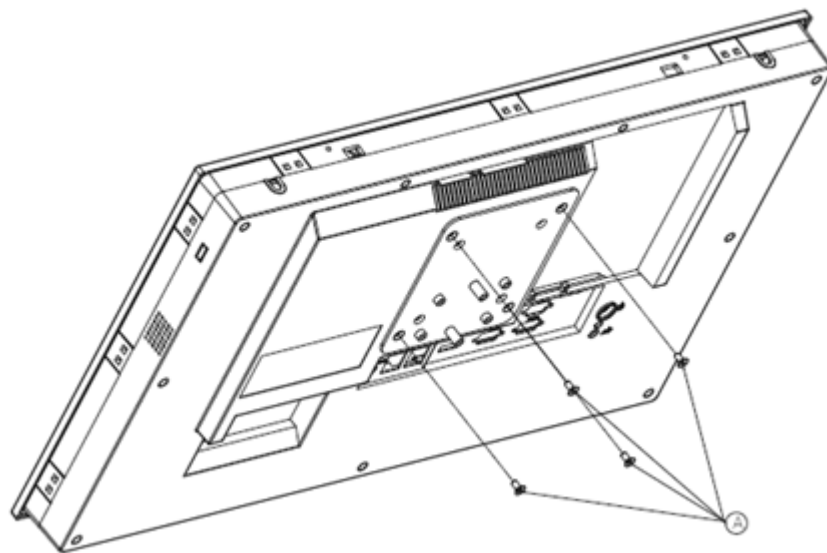
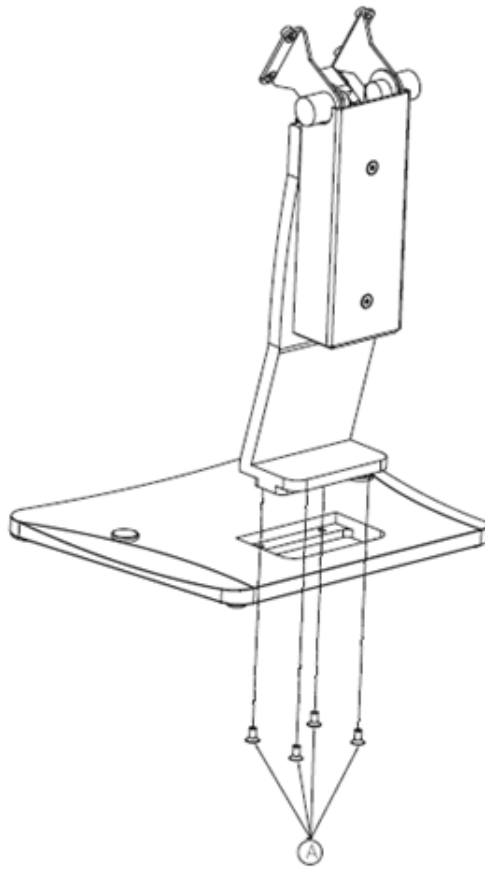


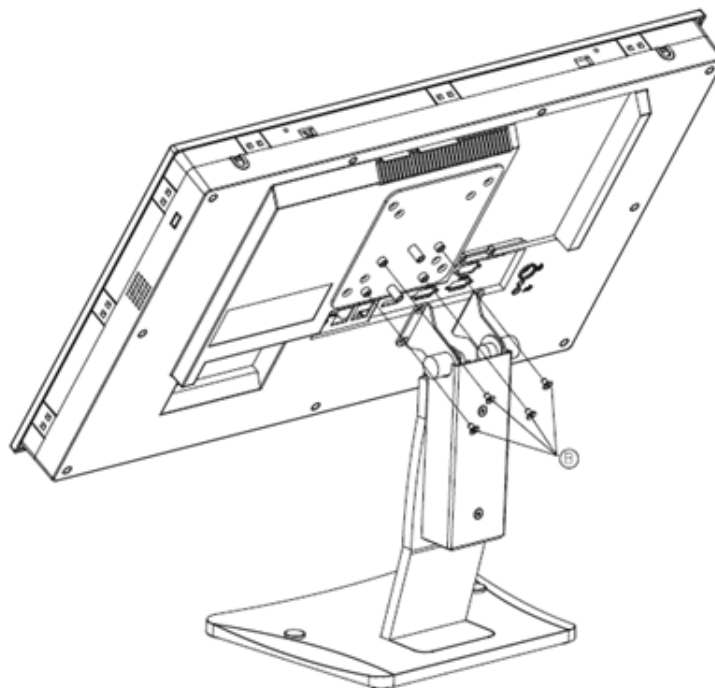
Figure 2.35 VESA mount screw holes

2. Use four M4 x 8L screws to secure the base plate to the mount stand (Figure 2.35).



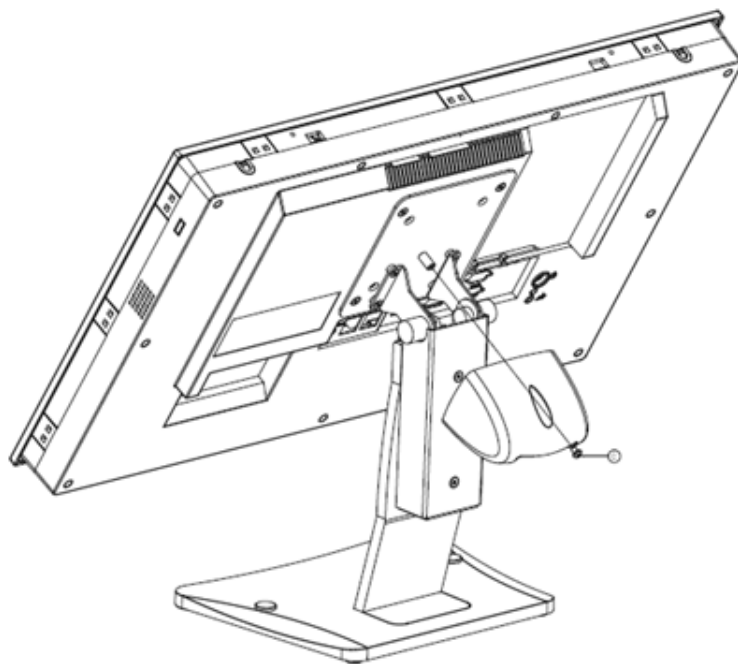
**Figure 2.36 Securing the VESA mount base**

3. Use four M4 x 6L screws to secure the mount stand to the VESA mount bracket (Figure 2.36).

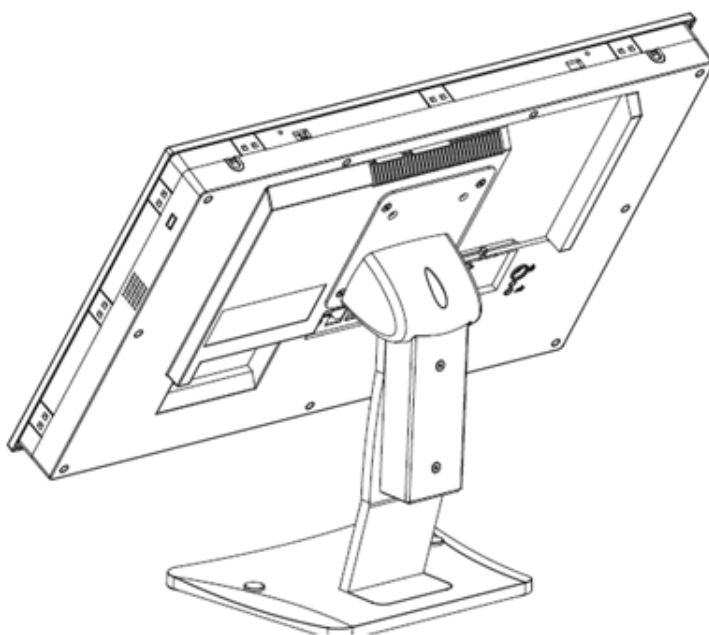


**Figure 2.37 Securing the VESA mount bracket**

4. Use one M4 x 5L screw to secure the stand mount hinge cover (Figure 2.37).



**Figure 2.38 Securing the stand mount hinge cover**



**Figure 2.39 Completed stand mount**





# Chapter 3

## Jumper Settings

- Motherboard Layout
- Jumpers and Connectors
- External COM Ports and Pin Definitions

## 3.1 Motherboard Layout

A diagram of the motherboard layout showing the locations of the internal peripheral connectors is provided below (Figure 3.1). The internal peripheral connectors are accessible when the motherboard is outside of the chassis.

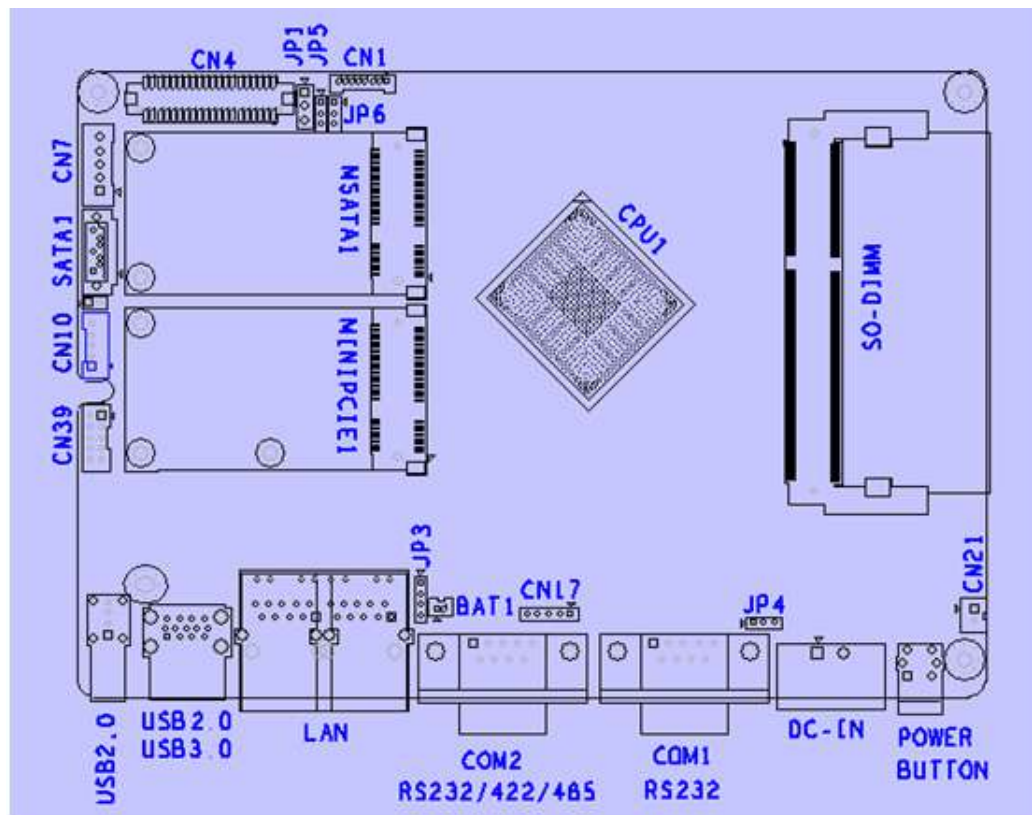


Figure 3.1 Motherboard layout diagram

## 3.2 Internal Jumpers and Connectors

The internal jumpers and connectors on the motherboard, and their pinouts, are listed in the table below.

**Table 3.1: Internal Jumpers and Connectors**

| Connectors | Function                          | Type                  |
|------------|-----------------------------------|-----------------------|
| CN1        | LVDS backlight connector          | Wafer 8P 1.25 mm      |
| CN4        | LVDS connector                    | Wafer 20 x 2P 1.25 mm |
| CN7        | SATA power connector              | Wafer 5P 2.5 mm       |
| SATA1      | SATA connector                    | SATA 7P connector     |
| CN10       | Touchscreen connector             | Wafer 5P 2.0 mm       |
| CN17       | COM1 Pin 9 power select connector | Pin header 5P 2.0 mm  |
| CN21       | Power button                      | Wafer 2P 2.0 mm       |
| CN39       | LPC connector                     | Wafer 5 x 2P 2.0 mm   |
| JP1        | LVDS power select jumper          | Pin header 3P 2.54 mm |
| JP3        | RTC select jumper                 | Pin header 4P 2.0 mm  |
| JP4        | ATX/AT select jumper              | Pin header 3P 2.0 mm  |
| JP5        | LVDS PWM power select jumper      | Pin header 3P 2.0 mm  |
| JP6        | LVDS enable power select jumper   | Pin header 3P 2.0 mm  |

### 3.2.1 LVDS Power Select Jumper

| JP1   | Icon | LVDS Power Select Jumper |
|-------|------|--------------------------|
| (1-2) | P1   | 5V                       |
| (2-3) | P2   | 3.3V                     |
|       |      | Default*                 |



P1



P2

### 3.2.2 LVDS PWM Power Select Jumper

| JP5   | Icon | LVDS PWM Power Select Jumper |
|-------|------|------------------------------|
| (1-2) | P3   | 5V                           |
| (2-3) | P4   | 3.3V                         |
|       |      | Default*                     |



P3



P4

### 3.2.3 LVDS Enable Power Select Jumper

| JP6   | Icon | LVDS Enable Power Select Jumper |
|-------|------|---------------------------------|
| (1-2) | P5   | 5V                              |
| (2-3) | P6   | 3.3V                            |
|       |      | Default*                        |



P5



P6

### 3.2.4 RTC Select

| JP3   | Icon | RTC Select |
|-------|------|------------|
| (2-3) | P7   | Normal     |
| (3-4) | P8   | Clear CMOS |
|       |      | Default*   |



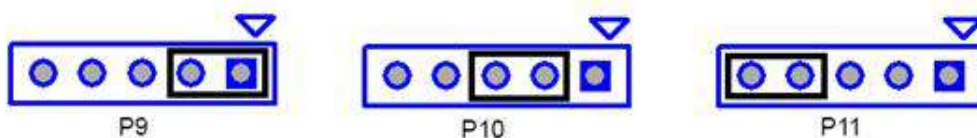
P7



P8

### 3.2.5 COM1 Pin 9 Power Select

| CN17  | Icon | COM1 Pin 9 Power Select |
|-------|------|-------------------------|
| (1-2) | P9   | COM1 RI Default*        |
| (2-3) | P10  | COM1 Pin 9 5V           |
| (4-5) | P11  | COM1 Pin 9 12V          |



### 3.2.6 ATX/AT Select

| JP4   | Icon | ATX/AT Select |
|-------|------|---------------|
| (1-2) | P12  | AT            |
| (2-3) | P13  | ATX Default*  |



## 3.3 External COM Ports and Pin Definitions

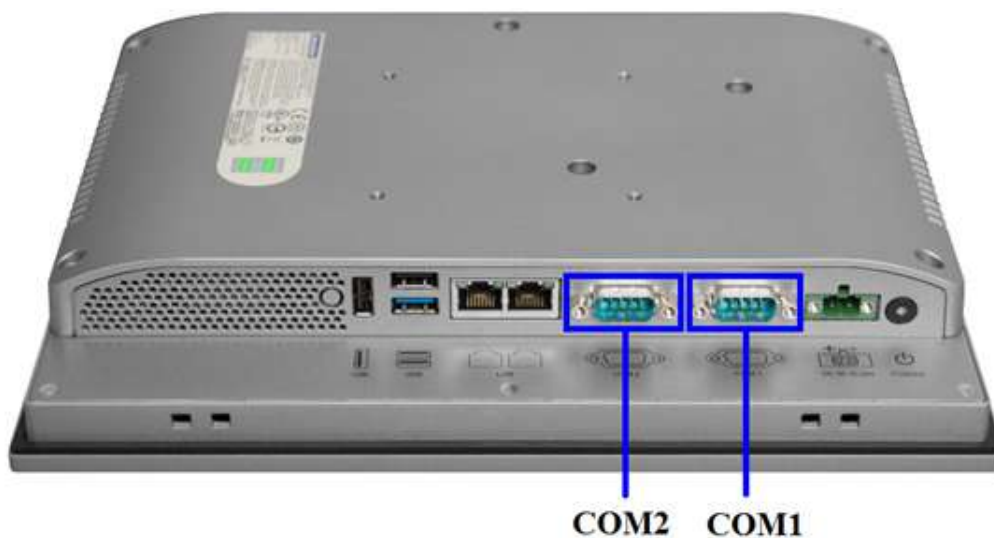


Figure 3.2 Location of COM1 and COM2 ports

**COM1:** RS-232

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

**COM2:** RS-232/422/485

**Note!** COM2 does not support Ring function.



| Pin | COM1                  | COM2   |        |        |
|-----|-----------------------|--------|--------|--------|
|     | RS-232                | RS-232 | RS-422 | RS-485 |
| 1   | DCD                   | DCD    | TX-    | DATA-  |
| 2   | RXD                   | RXD    | TX+    | DATA+  |
| 3   | TXD                   | TXD    | RX+    | NC     |
| 4   | DTR                   | DTR    | RX-    | NC     |
| 5   | GND                   | GND    | NC     | NC     |
| 6   | DSR                   | DSR    | NC     | NC     |
| 7   | RTS                   | RTS    | NC     | NC     |
| 8   | CTS                   | CTS    | NC     | NC     |
| 9   | Ring or 5V/12V output | RING   | NC     | NC     |



# 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>

**Note!** *Before installing Windows 8.x or Android OS, adjust the BIOS settings as explained in Section 4.2.5 “OS Selection”. Otherwise, OS installation failure will occur. However, if Windows 7 OS is already installed, the BIOS settings do not need to be adjusted.*

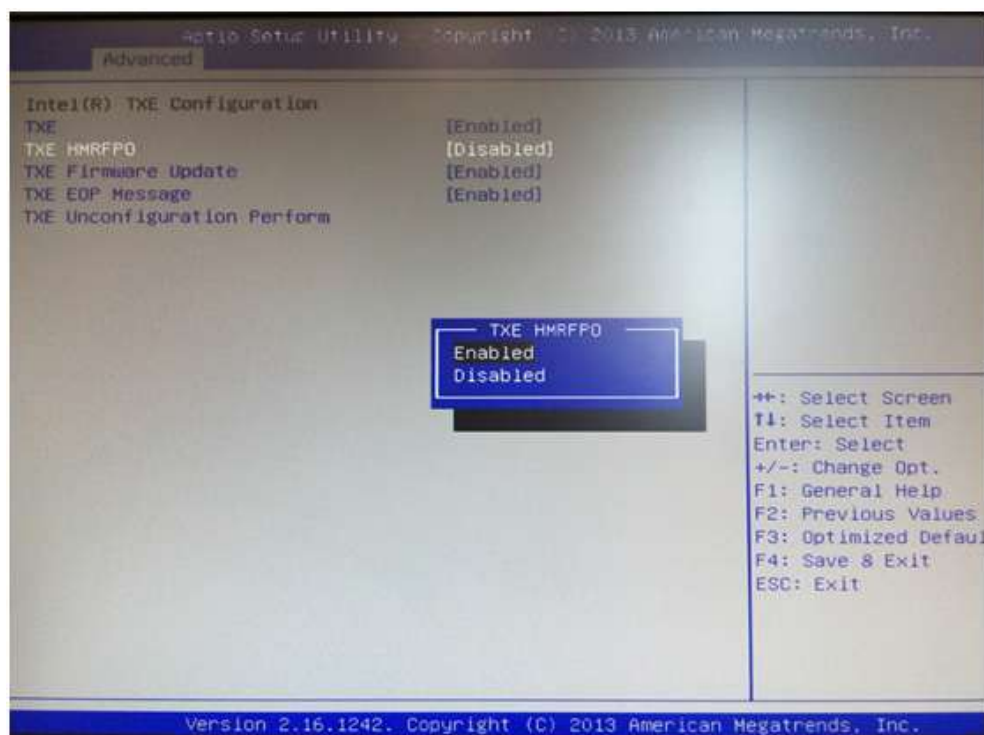


*The PPC-3000S series only supports Windows 10/8 installation in UEFI mode.*

## 4.2 BIOS Setup Program

### 4.2.1 Update BIOS

1. Upon entering the BIOS menu, click Advanced → Security Configuration → TXE HMRFP0 → Enable



2. Restart the computer
3. Execute AFUDOS 8211BIOS.bin /P /B /N /X /ME
4. Power on the system again after it shuts down
5. The BIOS update is complete



## 4.2.2 Entering BIOS Setup

After powering on the system, press the <Del> button to access the BIOS Setup screen.

After adjusting the settings, press <F4> to save and exit; otherwise, the settings will not be saved in the BIOS.



## 4.2.3 Adjustment of LCD Brightness

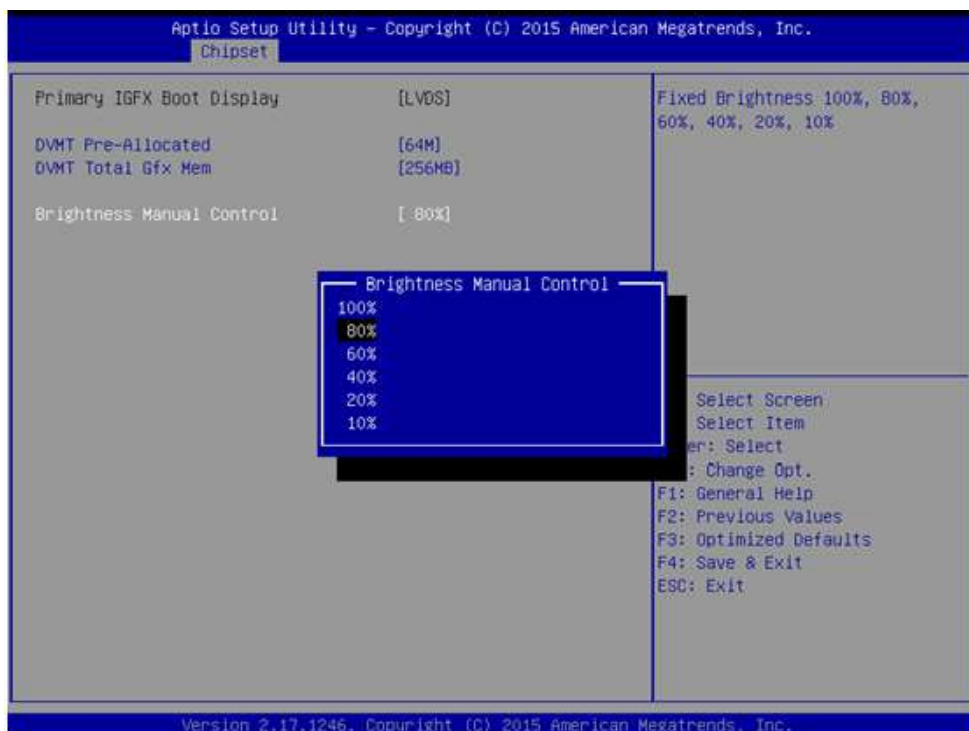
1. Click on the "North Bridge" option in the "Chipset" tab.



2. Click on the "Intel IGD Configuration" option.



3. Click on the "Brightness Manual Control" option to choose between six brightness levels.



#### 4.2.4 COM2 Mode Selection (RS232/RS422/RS485)

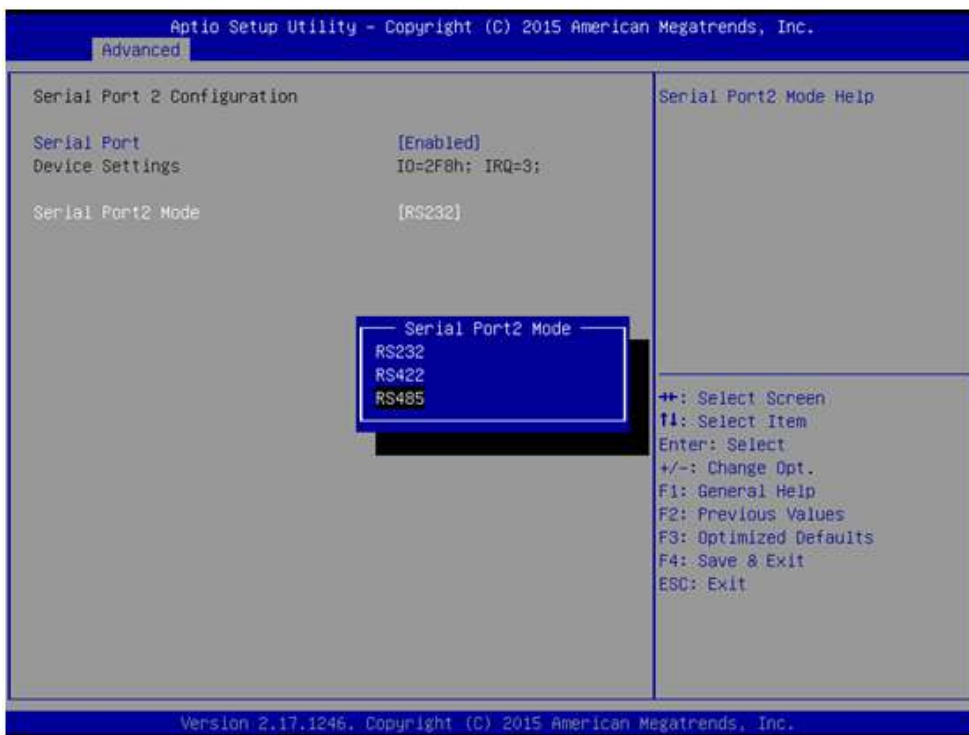
1. Click on the “NCT5523D Super IO Configuration” option in the “Advanced” tab.



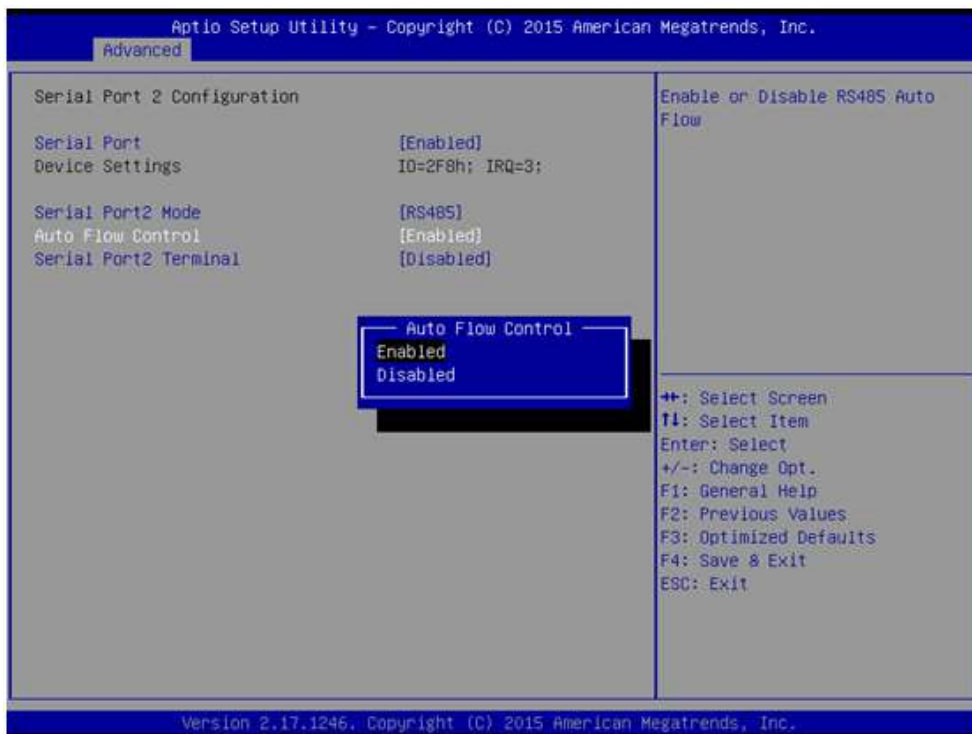
2. Click on the “Serial Port 2 Configuration” option.



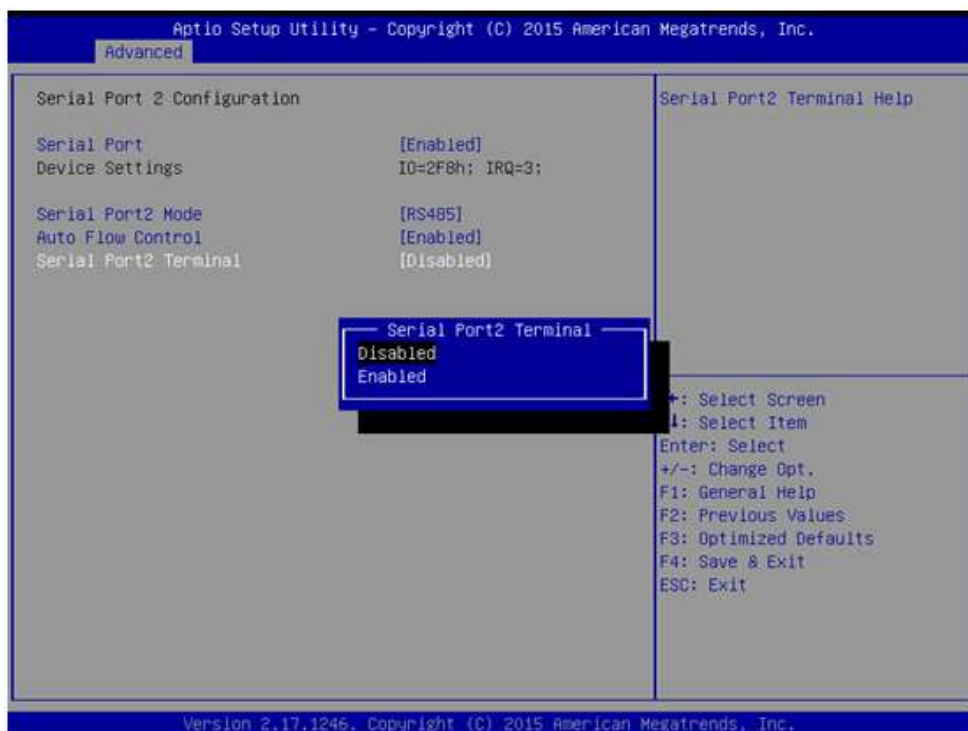
- Click on the “Serial Port 2 Mode” option to set the COM2 operation mode as RS232, RS422, or RS485.



- If the COM2 mode is set as “RS485”, the “Auto Flow Control” option can be enabled or disabled.



- If the COM2 mode is set as "RS485", the "Serial Port2 Terminal" option can be enabled or disabled.



#### 4.2.5 OS Selection

- Click on the "South Bridge" option in the "Chipset" tab.
- Click on the "OS Selection" option to configure the system OS settings



**Note!** The default "OS Selection" setting is Windows 7. If installing Windows 8.X or Android OS, adjust this setting.



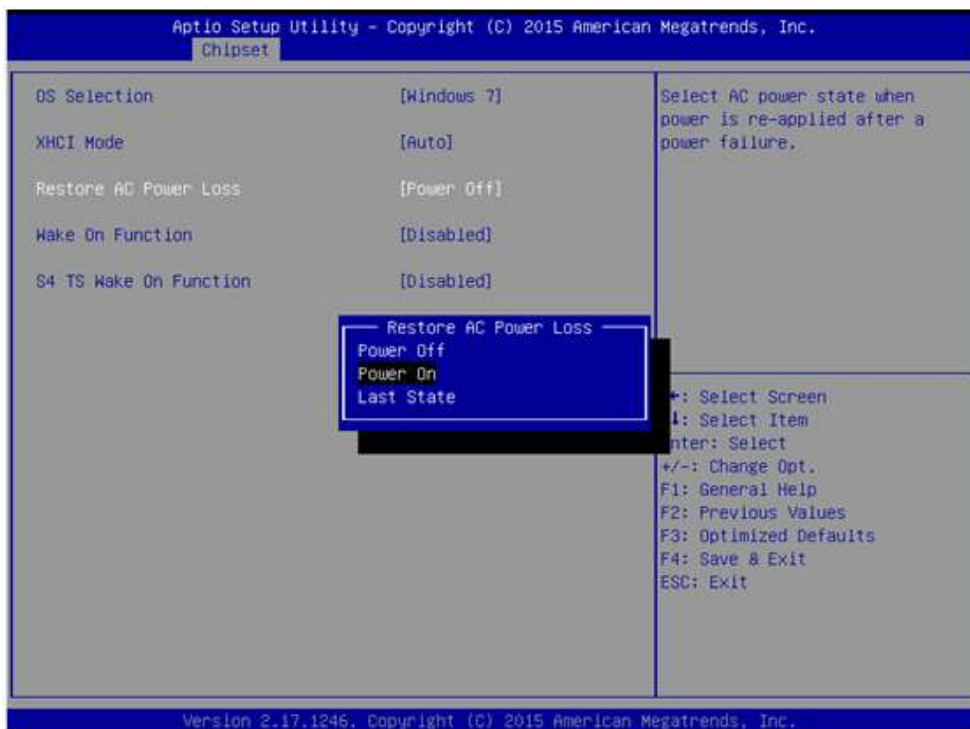


## 4.2.6 BIOS AT and ATX Setup

1. Click on the “South Bridge” option in the “Chipset” tab.



2. Click on “Restore AC Power Loss” and set the “Power On” option to AT and the “Power Off” option to ATX.



### 4.2.7 Wake-on-LAN

1. Click on the "South Bridge" option in the "Chipset" tab.

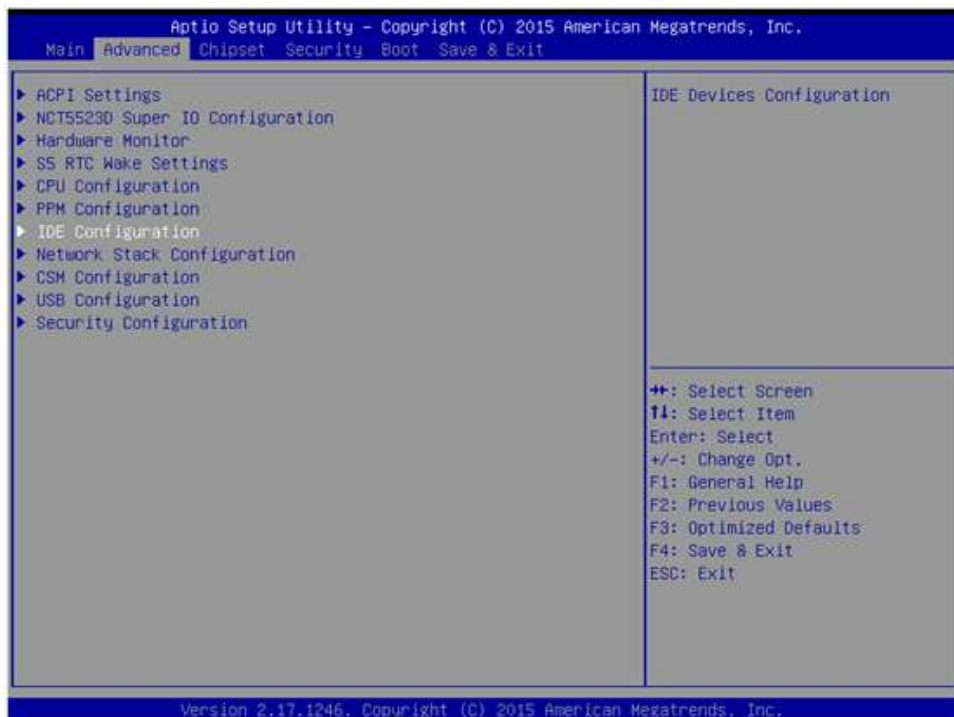


2. Set the “Wake on Function” option to Enabled.



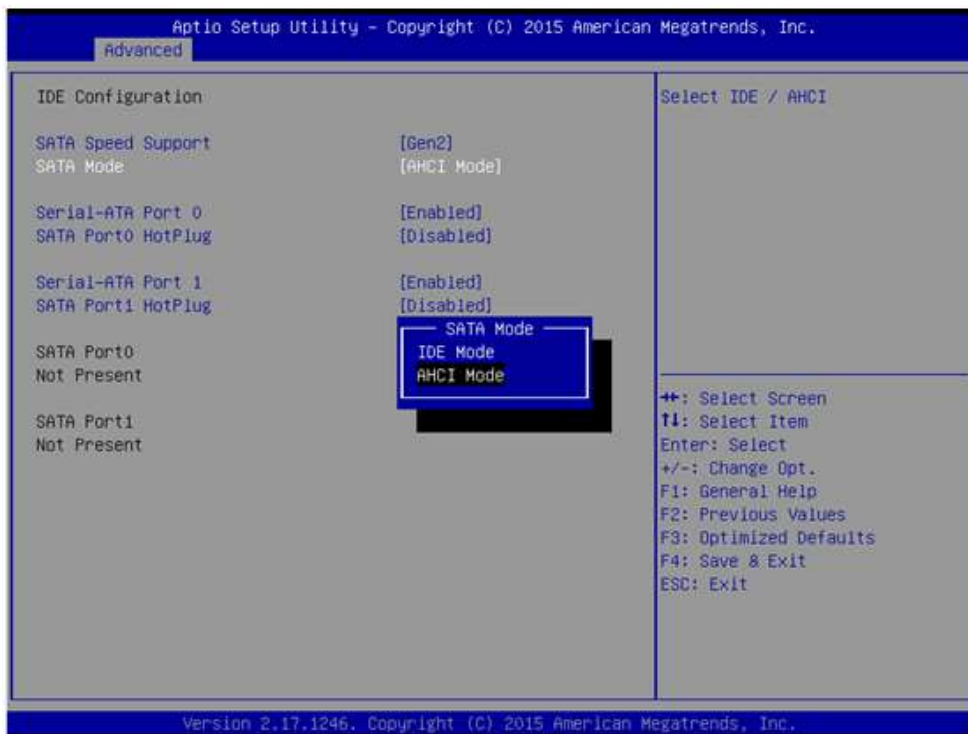
#### 4.2.8 SATA Mode Selection

1. Click on the “IDE Configuration” option in the “Advanced” tab.





2. Click "SATA Mode" to adjust the settings.



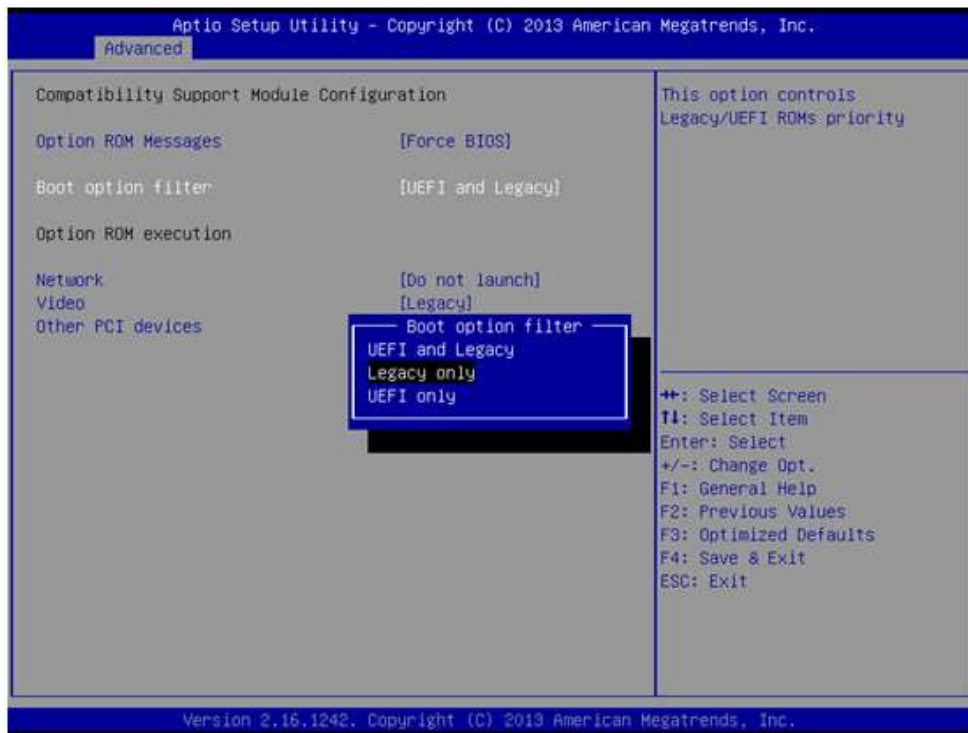
## 4.2.9 Boot Options

1. Click on the "CSM Configuration" option in the "Advanced" tab.



- Click on “Boot Option Filter” to adjust the settings.

**Note!** *The default Boot Option Filter setting is “Legacy only”. If this is changed to “UEFI only”, the system can only support Windows 7 (64 bit) or 8.x(64 bit) OS. If UEFI 32-bit OS is required, update the BIOS.*



# Appendix **A**

BSMI RoHS

## A.1 BSMI RoHS

| 設備名稱：電腦<br>Equipment name   |  | 型號（型式）：PPC-3100S/3120S/3150S/3210SW<br>Type designation (Type) |                |   |                                     |   |
|---|--|--|----------------|---|-------------------------------------|---|
| 單元 Unit   | 限用物質及其化學符號<br>Restricted substances and its chemical symbols |  |                |   |                                     |   |
|   | 鉛 Lead (Pb)  | 汞 Mercury (Hg)   | 鎘 Cadmium (Cd) | 六價鉻 Hexavalent chromium (Cr <sup>+6</sup> ) | 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）   | —  | ○  | ○              | ○   | ○                                   | ○   |
| <p>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。<br/>           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.</p> <p>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。<br/>           Note 2. “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.</p> <p>備考 3. “—” 係指該項限用物質為排除項目。<br/>           Note 3. “-” indicates that the restricted substance corresponds to the exemption.</p> |  |  |                |   |                                     |   |

# Appendix **B**

China RoHS

## B.1 China RoHS

Dear Customer,

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-3100S/3120S/3150S/3210SW  |              |              |                            |                                |                                       |
|---------------------------------|---|--------------|--------------|----------------------------|--------------------------------|---------------------------------------|
| 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**

## E-Eye Function

## C.1 E-Eye Function

| Table C.1: E-Eye Monitoring Function List |                     |              |                                     |  |
|---|---------------------|--------------|-------------------------------------|--|
| Item                                      | Function            | Failure Code | Error Description                   | Checking/Repair Suggestion   |
| 1   | Main board          | E0           | Main board start-up error           | <ol style="list-style-type: none"> <li>1. Check the power input</li> <li>2. Check that no cable or system short circuits have occurred</li> <li>3. Send the main board for repair</li> </ol>   |
| 2   | Memory              | E1           | Memory error                        | <ol style="list-style-type: none"> <li>1. Check the memory type is correct and verify installation</li> <li>2. Check the memory slot function</li> <li>3. Send the main board for repair</li> </ol>  |
| 3   | Touchscreen         | E2           | Touchscreen controller error        | <ol style="list-style-type: none"> <li>1. Check that touch function is enabled for the operating system</li> <li>2. Check that the touch controller type is correct via the Device Manager</li> <li>3. Send the main board for repair</li> </ol>           |
| 4   | LVDS                | E3           | LVDS transfer controller error      | <ol style="list-style-type: none"> <li>1. Check the display settings of the operating system</li> <li>2. Send the main board for repair</li> </ol>   |
| 5   | USB                 | E4           | USB internal detecting error        | <ol style="list-style-type: none"> <li>1. Check USB function by testing the USB device in another system</li> <li>2. Send the main board for repair</li> </ol>   |
| 6   | Serial port         | E5           | Serial port internal loopback error | <ol style="list-style-type: none"> <li>1. Check serial port function using an external device</li> <li>2. Send the main board for repair</li> </ol>  |
| 7   | LAN port            | E6           | LAN port controller error           | <ol style="list-style-type: none"> <li>1. Check LAN port function to verify LAN connection</li> <li>2. Send the main board for repair</li> </ol>   |
| 9   | SATA storage device | E8           | SATA storage connection error       | <ol style="list-style-type: none"> <li>1. Check that the SATA/mSATA device is connected</li> <li>2. Check SATA that the cable or mSATA device is secure</li> <li>3. Check SATA/mSATA device function</li> <li>4. Send the main board for repair</li> </ol> |

**Note!** E-Eye should show “FF” after a successful startup and self-diagnosis test.



If E-Eye shows E0 ~ E8 codes, there are one or more errors.

Failure codes outside of E0 ~ E8 suggest the error may be caused by other drivers or software.

If certain functions are showing problems but E-Eye shows “FF”, this may be due to limitations in the self-diagnosis function.



# Appendix **D**

## Watchdog Timer Programming Example

## D.1 Watchdog Timer Programming 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

```

## [www.advantech.com](http://www.advantech.com)

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

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