



MODEL:

# PPC2-Cxxx-EHL Series

Panel PC equips Intel® Celeron® J6412 processor, on-board 8GB memory, dual 2.5G Ethernet port, one M.2 M key & one M.2 B key & one M.2 A key expansion slots, 12~24V DC input, anti-glare and anti-UV 10-point touchscreen

## User Manual



# Revision

| Date              | Version | Changes                                       |
|-------------------|---------|-----------------------------------------------|
| November 10, 2022 | 1.00    | Initial release                               |
| October 24, 2023  | 1.01    | Modified Section 1.8: Expansion               |
| July 2, 2024      | 1.02    | Modified Section 1.7 Dimensions               |
| July 29, 2025     | 1.03    | Modified Section 1.8: SBC Model and Expansion |





# Safety Instructions

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- en** Warning! Read the user manual before connecting the system to the power source.
- de** Vorsicht! Bitte lesen Sie die Bedienungsanleitung, bevor Sie das System an eine Stromquelle anschließen.
- fr** Attention! Avant de brancher le système à la source d'alimentation, consultez le mode d'emploi.
- it** Avvertenza! Consultare il manuale utente prima di collegare il sistema all'alimentatore.
- es** Atención! Lea atentamente este manual del usuario antes de operar la fuente de alimentación.
- zh** 警告! 在將系統連接到電源之前, 請仔細閱讀使用手冊。
- cn** 警告! 在將系統連接到電源之前, 請仔細閱讀使用手冊。
- 

- en** Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.
- de** Vorsicht! Um eine Überhitzung des Systems zu vermeiden, betreiben Sie es ausschließlich im zulässigen Betriebstemperaturbereich. Dieser ist in der Bedienungsanleitung vermerkt.
- fr** Attention! Pour éviter la surchauffe du système, ne l'utilisez pas dans une zone dont la température dépasse les limites décrits dans le mode d'emploi.
- it** Avvertenza! Per evitare che il sistema si surriscaldi, non utilizzarlo in aree che superino la temperatura massima d'esercizio descritta nel manuale utente.
- es** Atención! Para evitar el excesivo calentamiento del sistema, no opere en las condiciones de temperatura superior a lo recomendado en este manual del usuario.
- zh** 警告! 為防止系統過熱, 不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
- cn** 警告! 為防止系統過熱, 不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
-

- en** Warning! Use only the adapter and power cord approved for this system. Use of another type of adapter may risk fire or explosion. Please refer to the user manual for the power adapter specifications.
- de** Vorsicht! Nur zugelassene Netzteile und Netzkabel dürfen verwendet werden. Die Benutzung von anderen Netzteilen kann einen Brand oder eine Explosion zur Folge haben. Prüfen Sie die jeweiligen Spezifikationen in der Bedienungsanleitung.
- fr** Attention! Utilisez exclusivement le câble d'alimentation et l'adaptateur homologués pour ce système. L'utilisation d'un autre type d'adaptateur risquerait de provoquer un incendie ou une explosion. Veuillez référer au mode d'emploi pour les spécifications de l'adaptateur d'alimentation.
- it** Avvertenza! Utilizzare solo l'adattatore e il cavo di alimentazione approvati per questo sistema. L'uso di un altro tipo di adattatore può causare rischio d'incendio o esplosione. Si prega di fare riferimento al manuale utente per le specifiche sull'alimentazione.
- es** Atención! Utilice solamente el adaptador de corriente alterna (CA) con Marcas Conformidad otorgadas. Cualquier otro adaptador no otorgado aumenta el riesgo de explosión o incendio. Por favor consulte el manual del usuario para las especificaciones del adaptador de alimentación.
- zh** 警告! 只能使用經過認證、適用於本系統的電源變壓器與電源線。使用不適用的電源變壓器將可能導致火災或爆炸。電源變壓器規格請參考使用手冊。
- cn** 警告! 只能使用经过认证, 适用于本系统的电源适配器与电源线。使用不适用的电源适配器将可能导致火灾或爆炸。电源适配器规格请参考使用手册。
- 

- en** Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.
- de** Vorsicht! Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
- fr** Attention! La mise au rebut ou le recyclage de ce produit sont généralement soumis aux lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.
- it** Avvertenza! Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e i regolamenti locali.
- es** Atención! La disposición final de residuos de este producto se debe cumplir con las normativas y leyes del país.
- zh** 警告! 本產品的廢棄處理應根據該國家的法律和規章進行。
- cn** 警告! 本产品的废弃处理应根据该国家的法律和规章进行。
-



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# Manual Conventions

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## **WARNING**

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



## **CAUTION**

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



## **NOTE**

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.



## **HOT SURFACE**

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter

1

# Introduction

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## 1.1 Overview



**Figure 1-1: PPC2-Cxxx-EHL Series Panel PC**

The PPC2-Cxxx-EHL series is a quad-core Intel® Celeron® processor J6412 powered flat bezel panel PC with a rich variety of functions and peripherals. The rugged and trendy design can be applied in harsh industrial environments and enriches aesthetic experience at the same time.

The Intel® Celeron® processor J6412 is a SoC (System-on-Chip) that ensures optimal memory, graphics, and peripheral I/O support.

The major external device connections include USB 3.2 Gen 1, USB 2.0, serial port, Lan port and HDMI connectors. Furthermore, the PPC2-Cxxx-EHL Series has two M.2 (1 x M.2 M key, 1 x M.2 B key) slots, Allows installation of M.2 interface memory cards and AI accelerator cards.



## PPC2-Cxxx-EHL Series Panel PC

### 1.2 Model Variation

The PPC2-Cxxx-EHL Series is preinstalled with Intel® Celeron® processor J6412, which has a 10 W TDP. The model numbers and model variations are listed below.

| Model                   | Size  | I/O Port         |
|-------------------------|-------|------------------|
| PPC2-C08-EHL-J1/8G-R10  | 8"    | 4 x USB, 2 x COM |
| PPC2-C10-EHL-J1/8G-R10  | 10.4" | 4 x USB, 3 x COM |
| PPC2-C12-EHL-J1/8G-R10  | 12.1" | 6 x USB, 4 x COM |
| PPC2-C15-EHL-J1/8G-R10  | 15"   | 6 x USB, 5 x COM |
| PPC2-CW15-EHL-J1/8G-R10 | 15.6" |                  |
| PPC2-C17-EHL-J1/8G-R10  | 17"   |                  |
| PPC2-C19-EHL-J1/8G-R10  | 19"   |                  |
| PPC2-CW19-EHL-J1/8G-R10 | 18.5" |                  |
| PPC2-CW22-EHL-J1/8G-R10 | 21.5" |                  |

**Table 1-1: Model Variation**

### 1.3 Features

Some of the features of the PPC2-Cxxx-EHL Series panel PC include:

- Equipped Intel® Celeron® processor J6412
- Robust aluminum IP 65 compliant front panel
- IP2EHL\_XC Expansion Interface
- M.2 B Key & M.2 M Key & M.2 A Key
- Anti-glare and anti-UV touchscreen
- Support gloved and wet hand operation
- Newly designed panel mount kit
- New graphical BIOS Interface
- Supports dual 2.5G Ethernet port
- Pre-installed with 8 GB of LPDDR4x memory
- HDMI output
- RoHS compliant

## 1.4 Front Panel

The front side of the PPC2-Cxxx-EHL Series (**Figure 1-2**) is a flat panel LCD touchscreen surrounded by an aluminum frame.

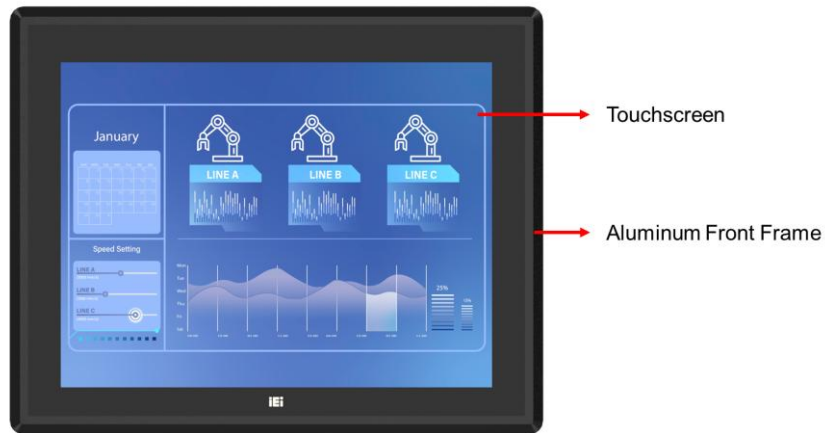


Figure 1-2: Front View

## 1.5 Rear Panel

The rear panel has a fan vent, four VESA 75/100 mounting holes and several retention screws. The VESA 75/100 mounting holes are circled in **Figure 1-3**.

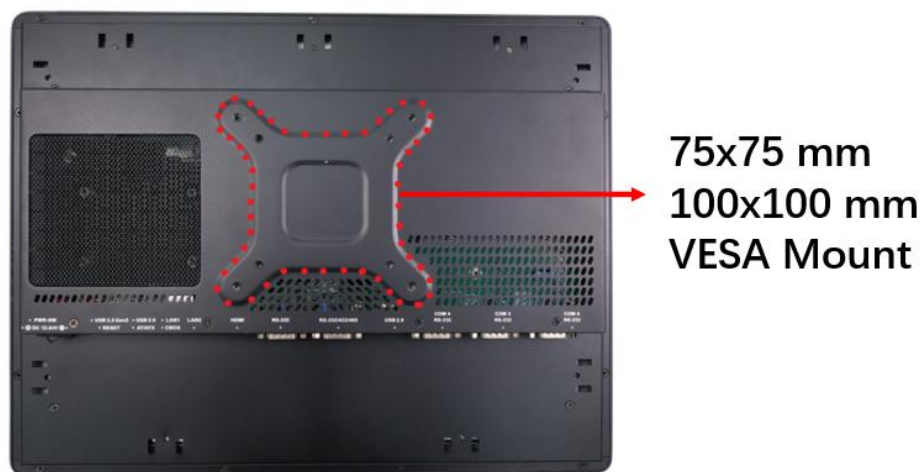
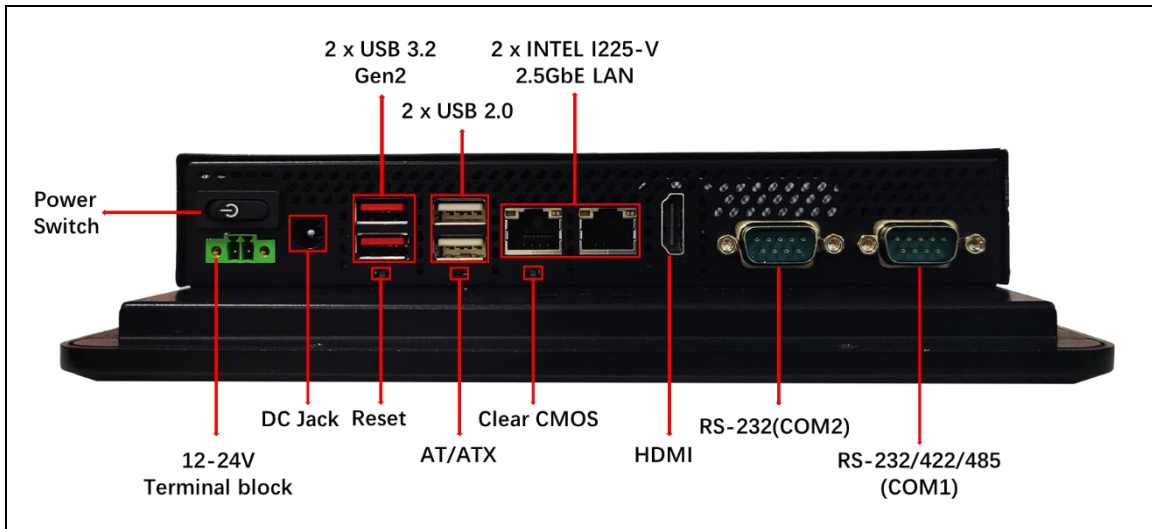


Figure 1-3: PPC2-Cxxx-EHL Series Rear View

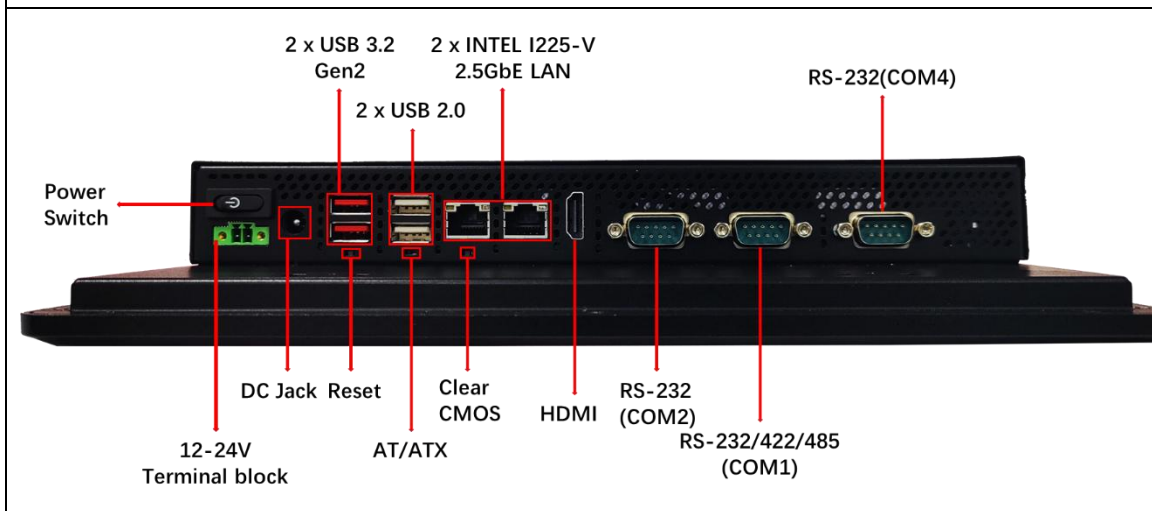
## PPC2-Cxxx-EHL Series Panel PC

### 1.6 Bottom Panel

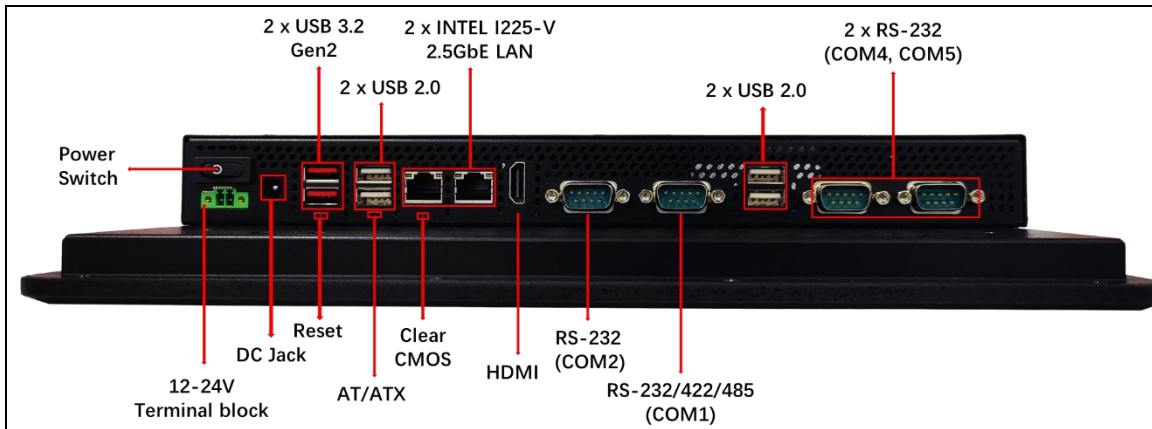
The bottom panel has the following interfaces:



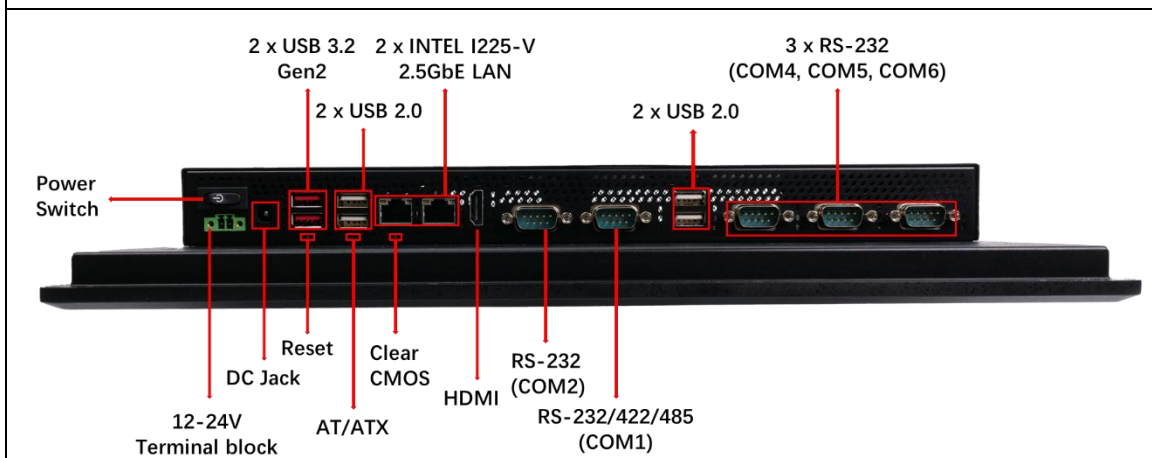
**Figure 1-4: PPC2-C08-EHL Bottom View**



**Figure 1-5: PPC2-C10-EHL Bottom View**



**Figure 1-6: PPC2-C12-EHL Bottom View**



**Figure 1-7: PPC2-C15/CW15/C17/C19/CW19/CW22-EHL Bottom View**



**WARNING:**

Before installing the operating system, the user must enter the **Boot** BIOS menu first and choose which operating system will be installed. Otherwise, the USB 2.0 and USB 3.2 Gen 1 ports may not be detected.



## PPC2-Cxxx-EHL Series Panel PC

### 1.7 Dimensions

#### 1.7.1 PPC2-C08-EHL Dimensions

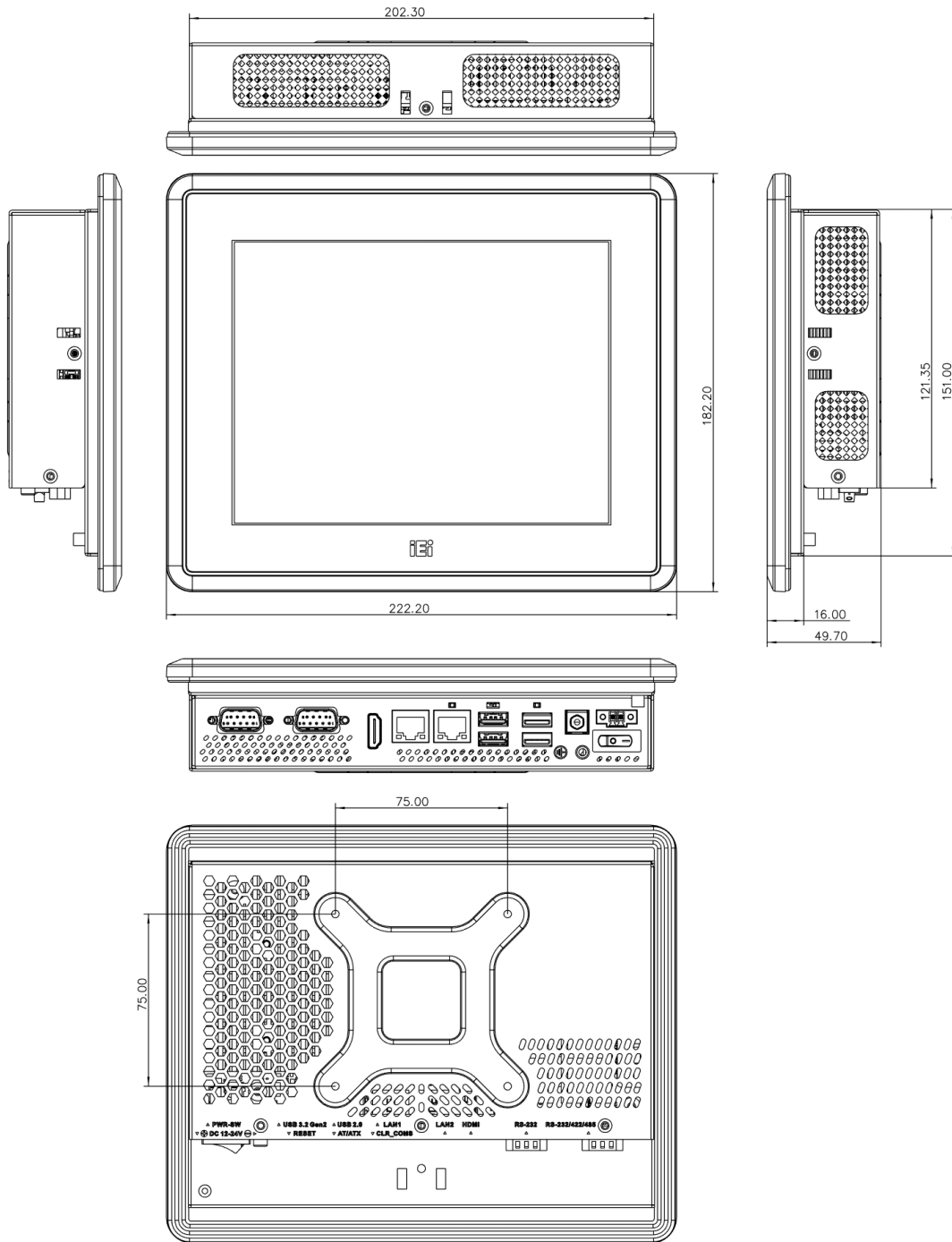


Figure 1-8: PPC2-C08-EHL Dimensions (Unit: mm)





1.7.2 PPC2-C10-EHL Dimensions

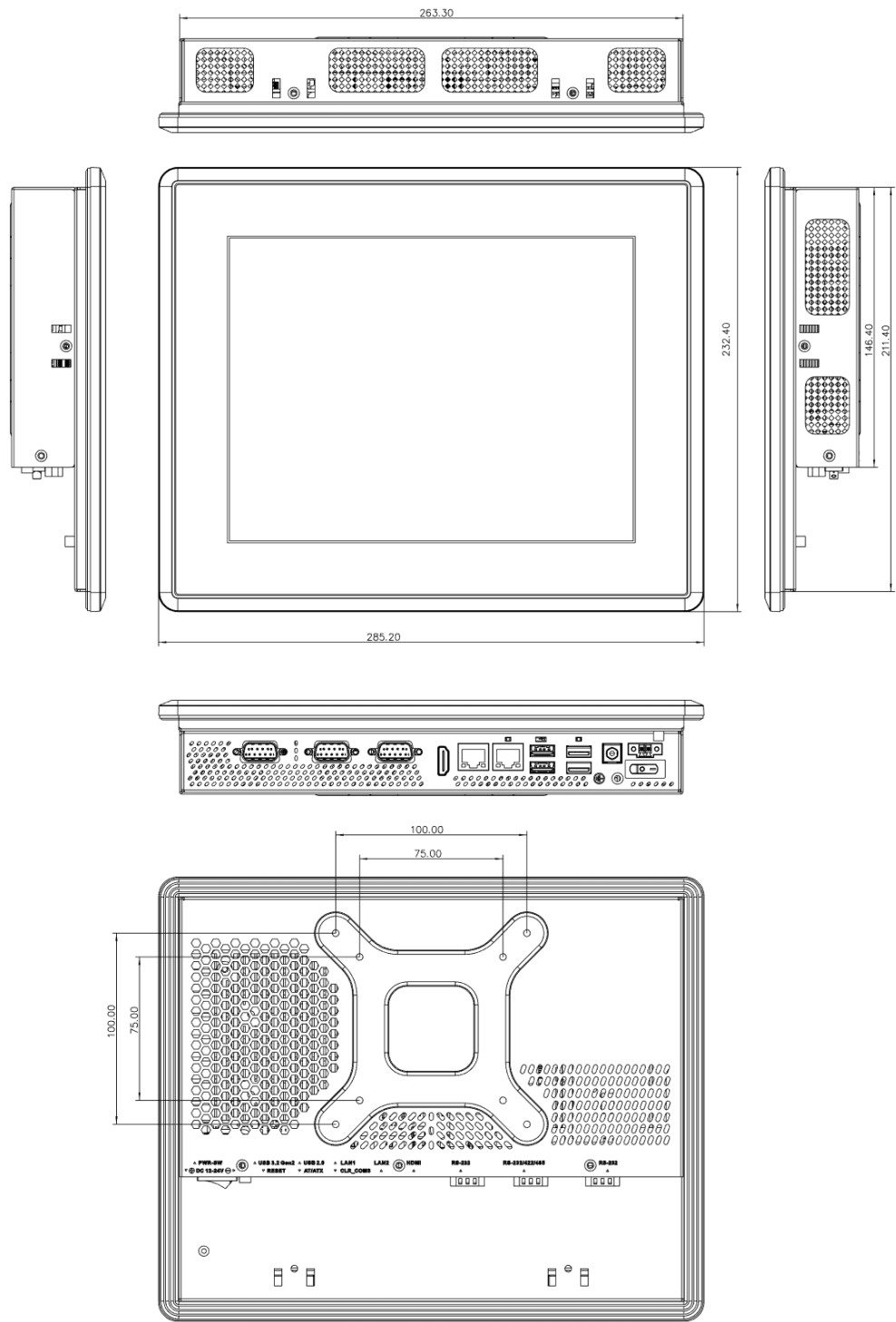
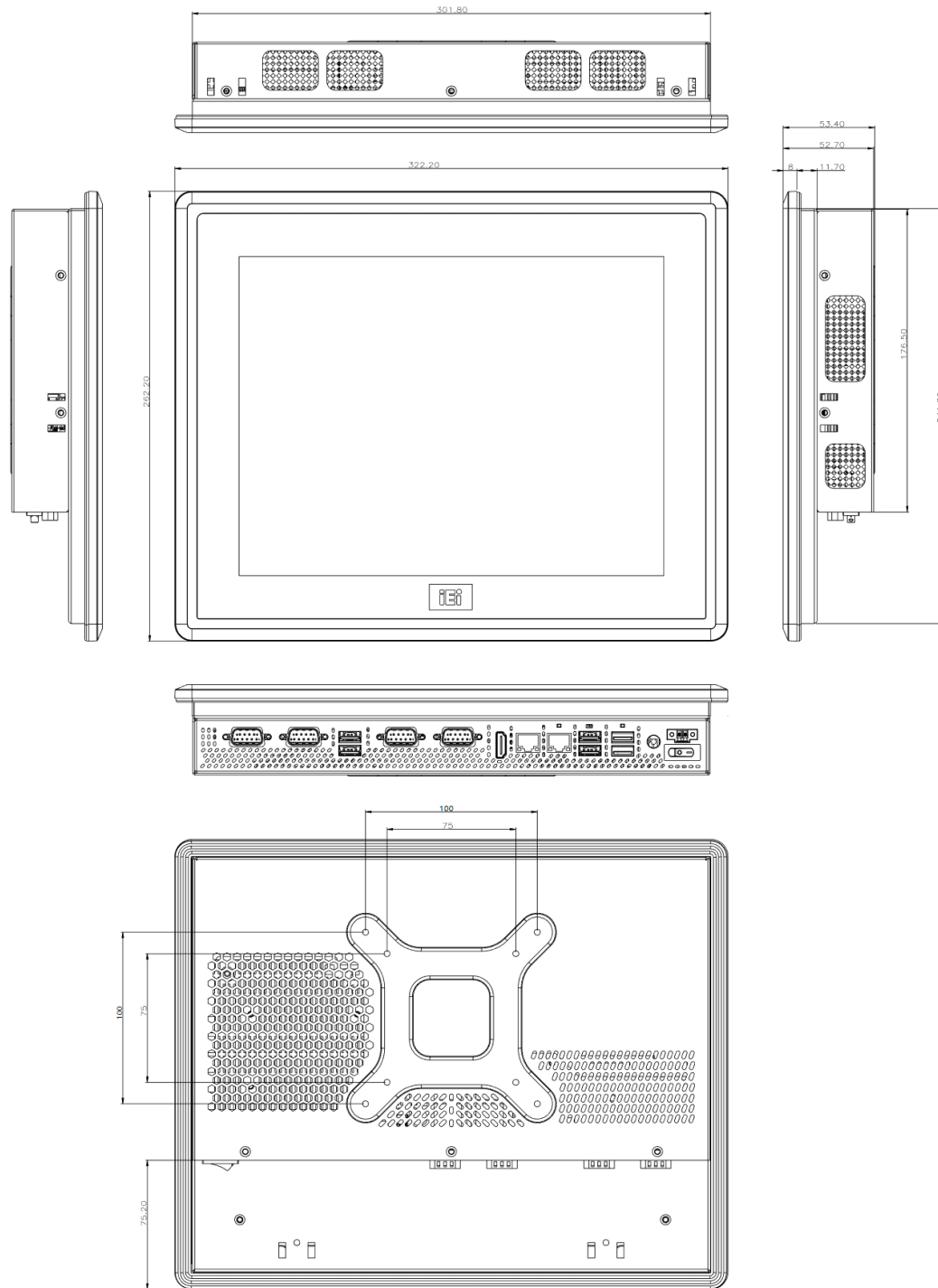


Figure 1-9: PPC2-C10-EHL Dimensions (mm)

## PPC2-Cxxx-EHL Series Panel PC

### 1.7.3 PPC2-C12-EHL Dimensions



**Figure 1-10: PPC2-C12-EHL Dimensions (mm)**



1.7.4 PPC2-C15-EHL Dimensions

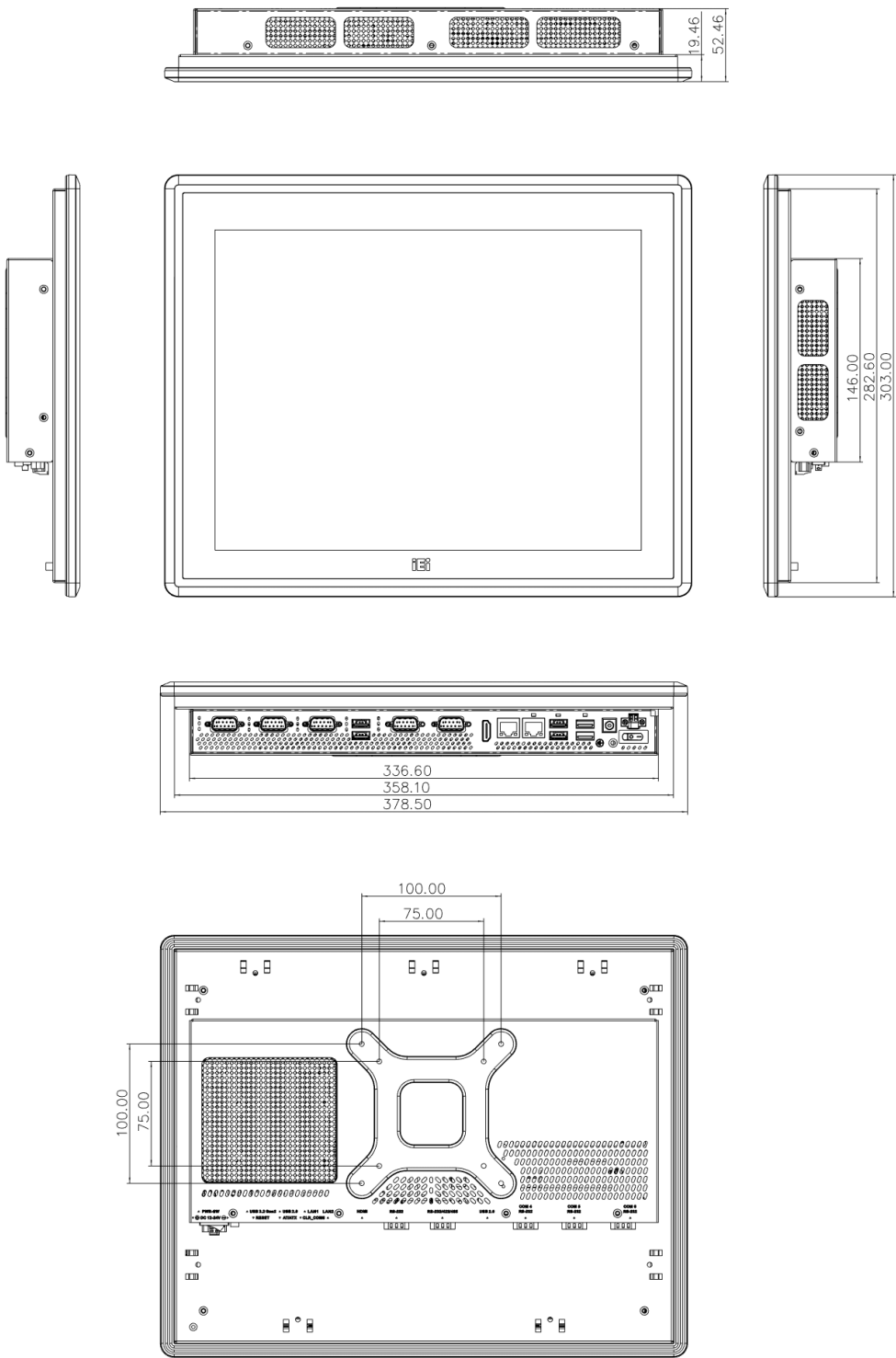


Figure 1-11: PPC2-C15-EHL Dimensions (mm)

## PPC2-Cxxx-EHL Series Panel PC

### 1.7.5 PPC2-CW15-EHL Dimensions

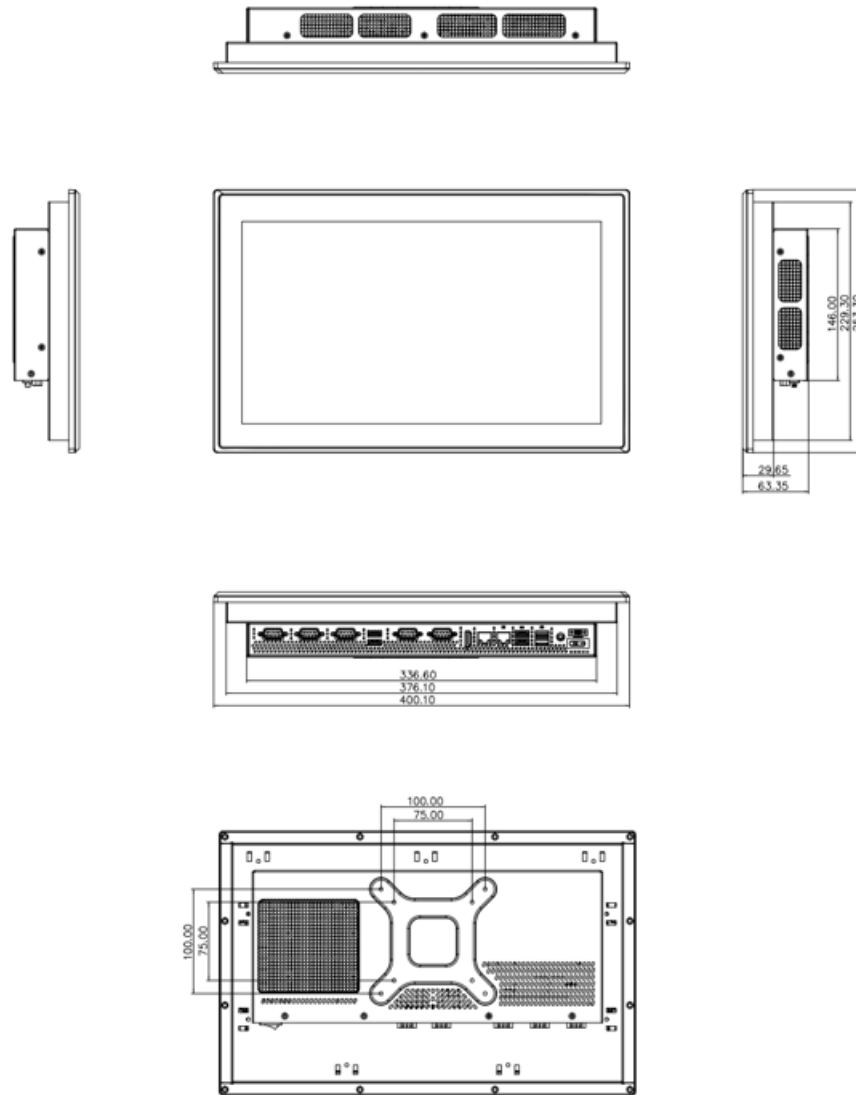
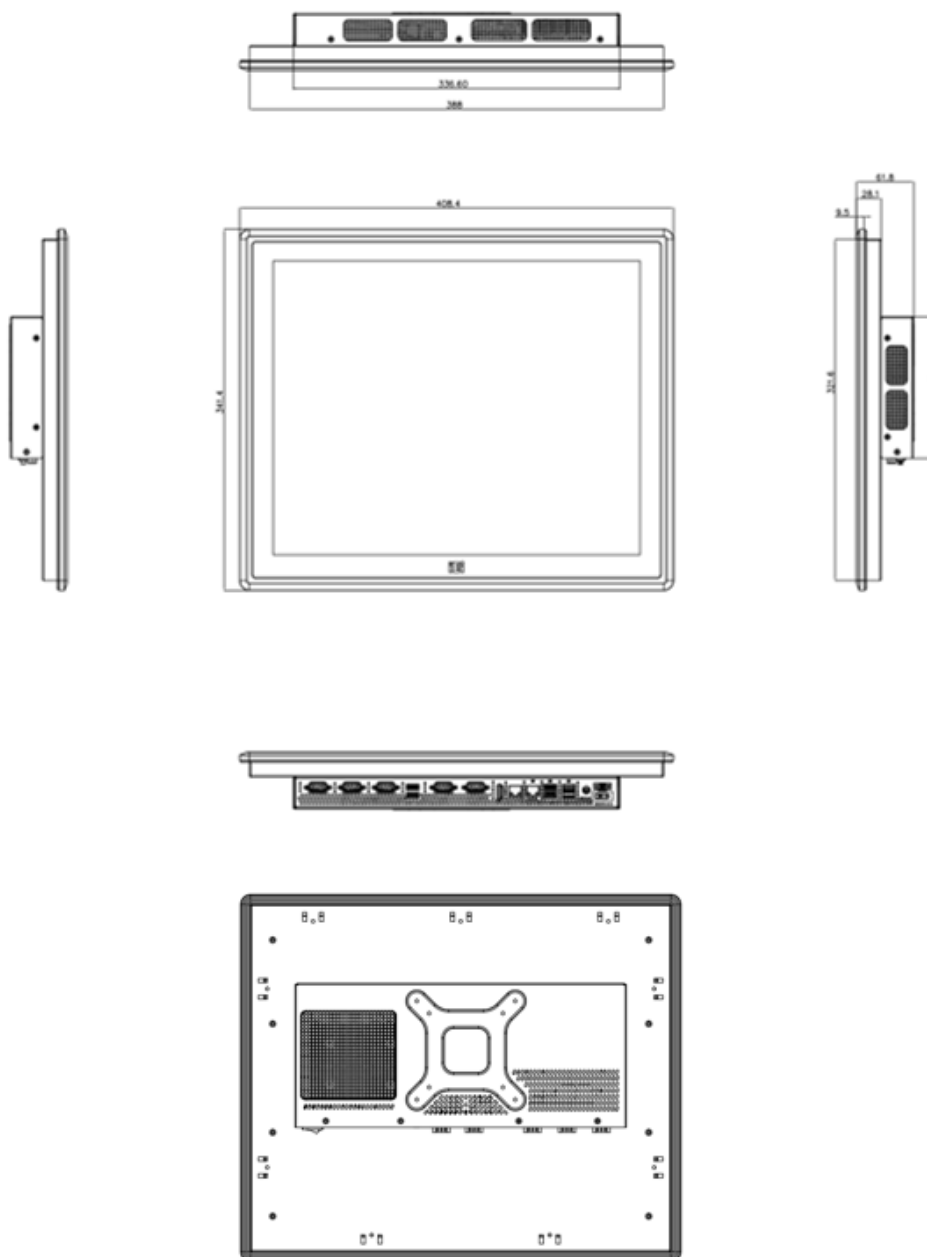


Figure 1-12: PPC2-CW15-EHL Dimensions (mm)

### 1.7.6 PPC2-C17-EHL Dimensions



**Figure 1-13: PPC2-C17-EHL Dimensions (mm)**



## PPC2-Cxxx-EHL Series Panel PC

### 1.7.7 PPC2-C19-EHL Dimensions

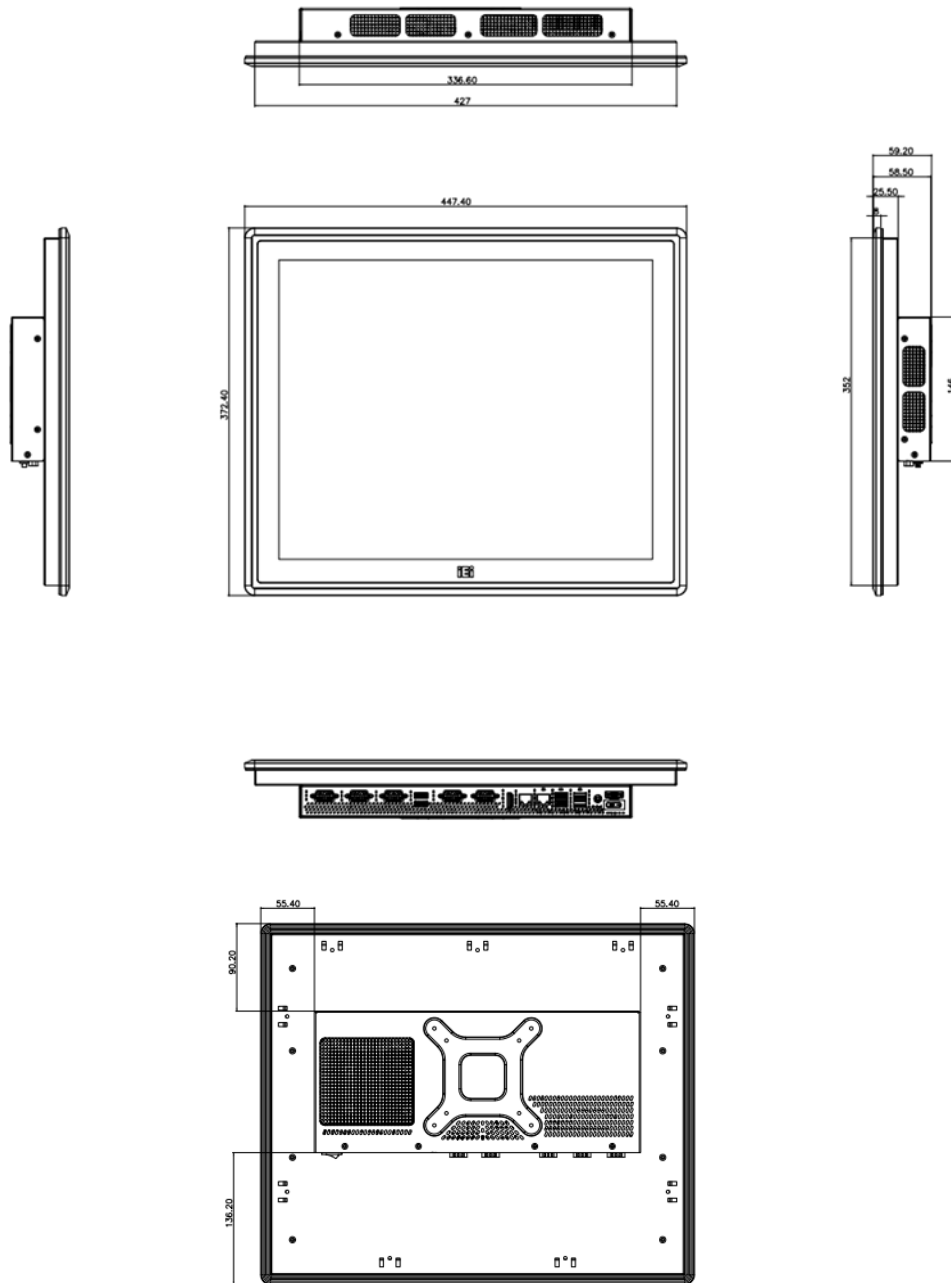


Figure 1-14: PPC2-C19-EHL Dimensions (mm)

1.7.8 PPC2-CW19-EHL Dimensions

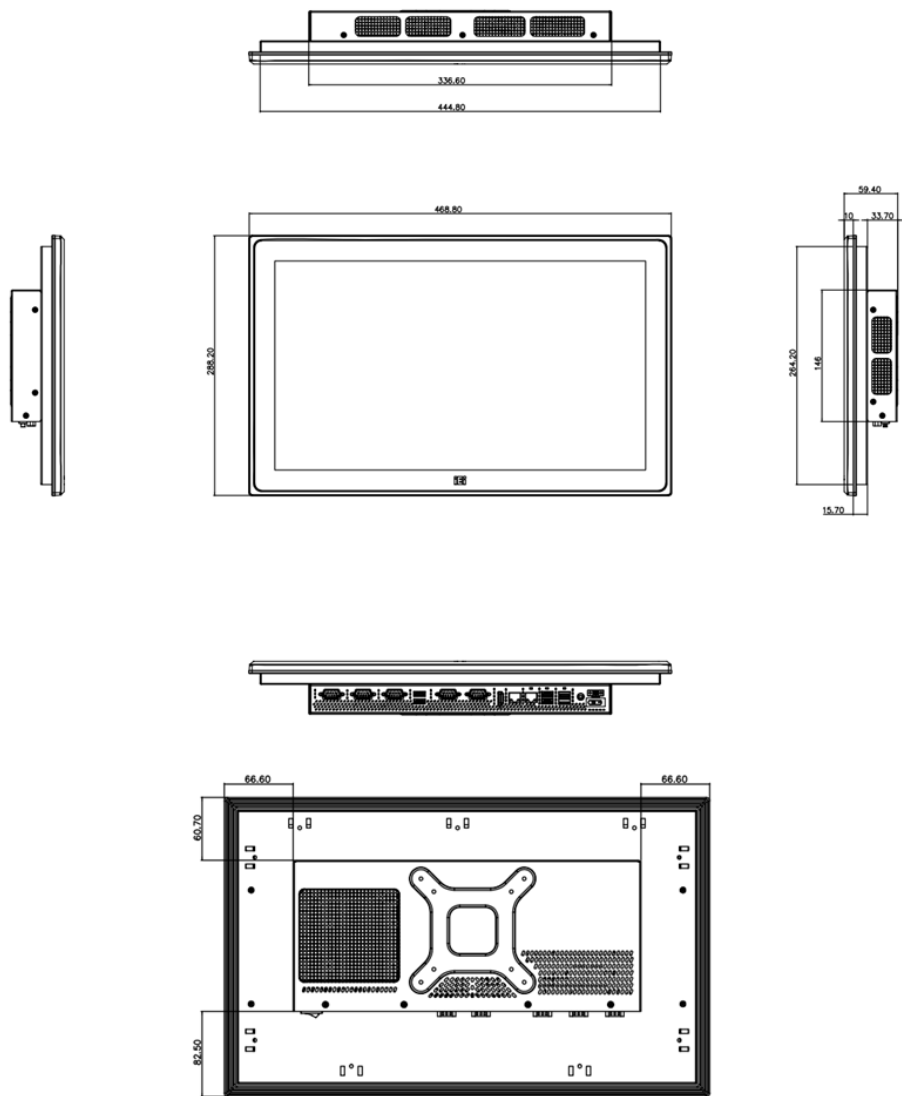


Figure 1-15: PPC2-CW19-EHL Dimensions (mm)

## PPC2-Cxxx-EHL Series Panel PC

### 1.7.9 PPC2-CW22-EHL Dimensions

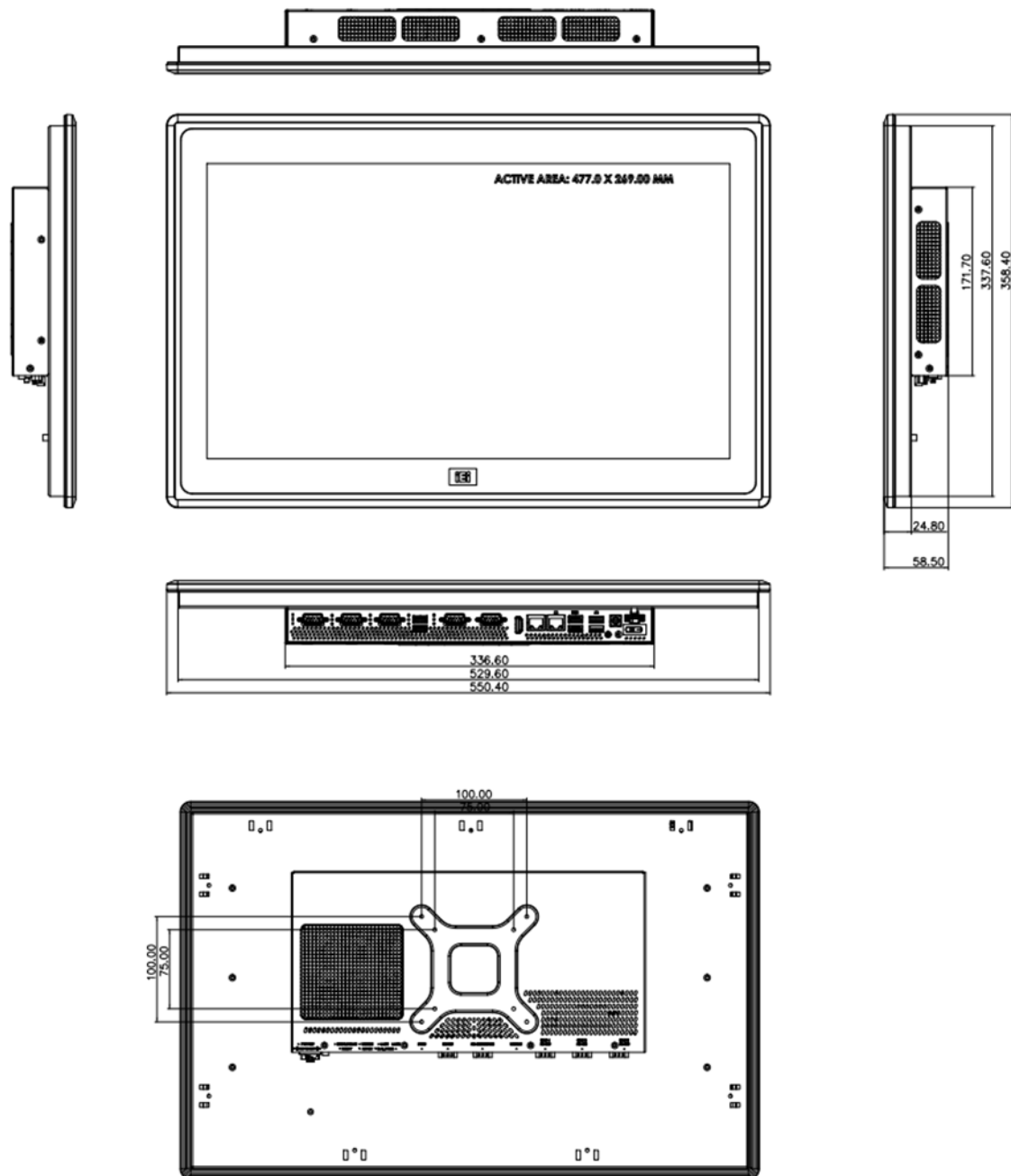


Figure 1-16: PPC2-CW22-EHL Dimensions (mm)

## 1.8 Specifications

The technical specifications are listed in **Table 1-2** & **Table 1-3** & **Table 1-4** .

|                                       | PPC2-C08                                                                             | PPC2-C10                                      | PPC2-C12                   |
|---------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------|
| LCD Display                           | 8" (4:3)                                                                             | 10.4" (4:3)                                   | 12" (4:3)                  |
| Max. Resolution                       | 800 (W) x 600 (H)                                                                    | 800 (W) x 600 (H)                             | 1024 (W) x 768 (H)         |
| Brightness                            | 500 cd/m²                                                                            | 400 cd/m2                                     | 500 cd/m2                  |
| Contrast Ratio                        | 500:1                                                                                | 700:1                                         | 1000:1                     |
| LCD Color                             | 262K                                                                                 | 16.2M                                         | 16.2M                      |
| Pixel Pitch (Unit: mm)                | 0.2025 x 0.0675                                                                      | 0.264 x 0.264                                 | 0.24 x 0.24                |
| Viewing Angle (H-V)                   | 140°/120°                                                                            | 160°/140°                                     | 178°/178°                  |
| Backlight MTBF                        | 50,000 hours                                                                         | 30,000 hours                                  | 30,000 hours               |
| SBC Model                             | PPC2-EHL-MB                                                                          | PPC2-EHL-MB+PPC2-XIO-03                       | PPC2-EHL-MB+PPC2-XIO-01    |
| CPU (SoC)                             | Intel® Celeron® Processor J6412 1.5M Cache, up to 2.60 GHz / TDP 10W                 |                                               |                            |
| Memory                                | Dual channel LPDDR4x 8GB on board (up to 16GB)                                       |                                               |                            |
| Touchscreen                           | Multi-point projected capacitive type (anti-UV / anti-glare coating, support gloves) |                                               |                            |
|                                       | Surface hardness: ≥7H                                                                |                                               |                            |
| Touch Controller                      | Projected capacitive type: EETI 80                                                   |                                               |                            |
| Drive Bay                             | N/A                                                                                  |                                               | 1 x 2.5" HDD/SSD drive bay |
| Ethernet                              | 2 x 2.5GbE LAN via Intel I225-V/I226-V                                               |                                               |                            |
| Expansion                             | 1 x M.2 2242/2280 B key (PCIe Gen3 x1 + USB 3.0)                                     |                                               |                            |
|                                       | 1 x M.2 2280 M key (PCIe Gen3 x2)                                                    |                                               |                            |
| Mounting                              | Panel, Wall, Stand and Arm, VESA 75                                                  | Panel, Wall, Rack, Stand and Arm, VESA 75/100 |                            |
| Construction Material                 | Aluminum front cover and sheet metal rear cover                                      |                                               |                            |
| Enclosure Color                       | Black                                                                                |                                               |                            |
| Power Input                           | 12 V ~ 24 V DC                                                                       |                                               |                            |
| Power Adapter                         | 60W power adapter                                                                    |                                               | 60W power adapter          |
| Thermal Solution                      | Fanless                                                                              |                                               |                            |
| TPM                                   | Intel® Platform Trust Technology                                                     |                                               |                            |
| Watchdog Timer                        | Software Programmable support 1~255 sec. system reset                                |                                               |                            |
| Operating Temperature (With air flow) | -10°C ~ 60°C                                                                         |                                               |                            |
| Storage Temperature                   | -20°C ~ 60°C                                                                         |                                               |                            |
| Humidity                              | 10% ~ 90%, non-condensing                                                            |                                               |                            |
| Safety and EMC                        | CE, FCC Class A                                                                      |                                               |                            |

## PPC2-Cxxx-EHL Series Panel PC

|                                                  | PPC2-C08                                                                                                                                                                                                                                                                            | PPC2-C10                                                                                                                                                                                                                                                                                                                                                                        | PPC2-C12                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ErP</b>                                       | ErP 2009/125/EC                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Dimensions<br/>(H x W x D) (Unit:<br/>mm)</b> | 222.2 x 182.2 x 49.7                                                                                                                                                                                                                                                                | 285.2 x 232.4 x 49.9                                                                                                                                                                                                                                                                                                                                                            | 322.2 x 262.2x 53                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Net Weight</b>                                | 1.610kg                                                                                                                                                                                                                                                                             | 2.355kg                                                                                                                                                                                                                                                                                                                                                                         | 3.095kg                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>I/O Ports, Switches<br/>and Buttons</b>       | 1 x HDMI output<br>2 x 2.5GbE RJ-45<br>2 x USB 3.2 Gen 2x1<br>(10Gb/s)<br>2 x USB 2.0<br>1 x RS-232/422/485<br>1 x RS-232<br>1 x 12V-24V power<br>jack<br>1 x Power terminal<br>block (2-pin)<br>1 x AT/ATX switch<br>1 x Power button<br>1 x Reset button<br>1 x Clear CMOS button | 1 x HDMI output<br>2 x 2.5GbE RJ-45<br>2 x USB 3.2 Gen 2x1<br>(10Gb/s)<br>2 x USB 2.0<br>1 x RS-232/422/485<br>1 x RS-232<br>1 x 12V-24V power jack<br>1 x Power terminal block (2-<br>pin)<br>1 x AT/ATX switch<br>1 x Power button<br>1 x Reset button<br>1 x Clear CMOS button<br>PPC2-XIO-03-R10:<br>1 x RS-232 DB9<br>1 x M.2 B key 2242/2280<br>(PCIe Gen3 x 2 + USB 2.0) | 1 x HDMI output<br>2 x 2.5GbE RJ-45<br>2 x USB 3.2 Gen 2x1<br>(10Gb/s)<br>2 x USB 2.0<br>1 x RS-232/422/485<br>1 x RS-232<br>1 x 12V-24V power jack<br>1 x Power terminal block (2-<br>pin)<br>1 x AT/ATX switch<br>1 x Power button<br>1 x Reset button<br>1 x Clear CMOS button<br>PPC2-XIO-01-R10:<br>2 x USB 2.0<br>2 x RS-232 DB9<br>1 x M.2 B key 2242/2280<br>(PCIe Gen3 x 2 + USB 2.0) |

**Table 1-2: PPC2-C08/C10/C12 Specifications**

|                        | PPC2-C15           | PPC2-CW15         | PPC2-C17            |
|------------------------|--------------------|-------------------|---------------------|
| <b>LCD Display</b>     | 15" (4:3)          | 15.6" (16:9)      | 17" (5:4)           |
| <b>Max. Resolution</b> | 1024 (W) x 768 (H) | 1920(W)x 1080 (H) | 1280 (W) x 1024 (H) |
| <b>Brightness</b>      | 400 cd/m2          | 400 cd/m2         | 350cd/m2            |
| <b>Contrast Ratio</b>  | 800:1              | 500:1             | 800:1               |



|                                              | PPC2-C15                                                                             | PPC2-CW15               | PPC2-C17            |
|----------------------------------------------|--------------------------------------------------------------------------------------|-------------------------|---------------------|
| <b>LCD Color</b>                             | 16.2M                                                                                | 16.2M                   | 16.7M               |
| <b>Pixel Pitch (Unit: mm)</b>                | 0.297 x 0.297                                                                        | 0.252x0.252             | 0.26x0.26           |
| <b>Viewing Angle (H-V)</b>                   | 176°/176°                                                                            | 170°/160°               | 160°/140°           |
| <b>Backlight MTBF</b>                        | 70,000 hours                                                                         | 50000 hours             | 50,000 hours        |
| <b>SBC Model</b>                             | PPC2-EHL-MB+PPC2-XIO-04                                                              |                         |                     |
| <b>CPU (SoC)</b>                             | Intel® Celeron® Processor J6412 1.5M Cache, up to 2.60 GHz / TDP 10W                 |                         |                     |
| <b>Memory</b>                                | Dual channel LPDDR4x 8GB on board (up to 16GB)                                       |                         |                     |
| <b>Touchscreen</b>                           | Multi-point projected capacitive type (anti-UV / anti-glare coating, support gloves) |                         |                     |
|                                              | Surface hardness: ≥7H                                                                |                         |                     |
| <b>Touch Controller</b>                      | Projected capacitive type: EETI 80                                                   |                         |                     |
| <b>Drive Bay</b>                             | 1 x 2.5" HDD/SSD drive bay                                                           |                         |                     |
| <b>Ethernet</b>                              | 2 x 2.5GbE LAN via Intel I225-V/I226-V                                               |                         |                     |
| <b>Expansion</b>                             | 1 x M.2 2242/2280 B key (PCIe Gen3 x1 + USB 3.0)                                     |                         |                     |
|                                              | 1 x M.2 2280 M key (PCIe Gen3 x2)                                                    |                         |                     |
| <b>Mounting</b>                              | Panel, Wall, Rack, Stand and Arm, VESA 75/100                                        |                         |                     |
| <b>Construction Material</b>                 | Aluminum front cover and sheet metal rear cover                                      |                         |                     |
| <b>Enclosure Color</b>                       | Black                                                                                |                         |                     |
| <b>Power Input</b>                           | 12 V ~ 24 V DC                                                                       |                         |                     |
| <b>Power Adapter</b>                         | 90W power adapter                                                                    |                         |                     |
| <b>Thermal Solution</b>                      | Fanless                                                                              |                         |                     |
| <b>TPM</b>                                   | Intel® Platform Trust Technology                                                     |                         |                     |
| <b>Watchdog Timer</b>                        | Software Programmable support 1~255 sec. system reset                                |                         |                     |
| <b>Operating Temperature (With air flow)</b> | -10°C ~ 60°C                                                                         |                         |                     |
| <b>Storage Temperature</b>                   | -20°C ~ 60°C                                                                         |                         |                     |
| <b>Humidity</b>                              | 10% ~ 95%, non-condensing                                                            |                         |                     |
| <b>Safety and EMC</b>                        | CE, FCC Class A                                                                      |                         |                     |
| <b>ErP</b>                                   | ErP 2009/125/EC                                                                      |                         |                     |
| <b>Dimensions (H x W x D) (Unit: mm)</b>     | 378.5 x 303 x 53.2                                                                   | 400.10 x 253.30 x 58.45 | 408.4x 341.4 x 61.8 |
| <b>Net Weight</b>                            | 3.8950kg                                                                             | 3.86kg                  | 4.830kg             |

## PPC2-Cxxx-EHL Series Panel PC

|                                                | PPC2-C15                         | PPC2-CW15 | PPC2-C17 |
|------------------------------------------------|----------------------------------|-----------|----------|
| <b>I/O Ports, Switches<br/>and Buttons</b>     | 1 x HDMI output                  |           |          |
|                                                | 2 x 2.5GbE RJ-45                 |           |          |
|                                                | 2 x USB 3.2 Gen 2x1 (10Gb/s)     |           |          |
|                                                | 2 x USB 2.0                      |           |          |
|                                                | 1 x RS-232/422/485               |           |          |
|                                                | 1 x RS-232                       |           |          |
|                                                | 1 x 12V-24V power jack           |           |          |
|                                                | 1 x Power terminal block (2-pin) |           |          |
|                                                | 1 x AT/ATX switch                |           |          |
|                                                | 1 x Power button                 |           |          |
|                                                | 1 x Reset button                 |           |          |
|                                                | 1 x Clear CMOS button            |           |          |
|                                                | PPC2-XIO-04-R10:                 |           |          |
|                                                | 2 x USB 2.0                      |           |          |
|                                                | 3 x RS-232                       |           |          |
| 1 x M.2 A Key 2230<br>(PCIe gen3 x 2 + USB2.0) |                                  |           |          |
| Table 1-3: PPC2-C15/CW15/C17 Specifications    |                                  |           |          |

|                               | PPC2-C19                                                             | PPC2-CW19            | PPC2-CW22            |
|-------------------------------|----------------------------------------------------------------------|----------------------|----------------------|
| <b>LCD Display</b>            | 19" (5:4)                                                            | 18.5" (16:9)         | 21.5" (16:9)         |
| <b>Max. Resolution</b>        | 1280 (W) x 1024 (H)                                                  | 1920 (W) x 1080 (H)  | 1920 (W) x 1080 (H)  |
| <b>Brightness</b>             | 450cd/m <sup>2</sup>                                                 | 350cd/m <sup>2</sup> | 350cd/m <sup>2</sup> |
| <b>Contrast Ratio</b>         | 1000:1                                                               | 1200:1               | 1000:1               |
| <b>LCD Color</b>              | 16.7M                                                                | 16.7M                | 16.7M                |
| <b>Pixel Pitch (Unit: mm)</b> | 0.294 x 0.294                                                        | 0.213 x 0.213        | 0.248 x 0.248        |
| <b>Viewing Angle (H-V)</b>    | 178°/178°                                                            | 170°/170°            | 178°/178°            |
| <b>Backlight MTBF</b>         | 50,000 hours                                                         | 50,000 hours         | 50,000 hours         |
| <b>SBC Model</b>              | PPC2-EHL-MB+PPC2-XIO-04                                              |                      |                      |
| <b>CPU (SoC)</b>              | Intel® Celeron® Processor J6412 1.5M Cache, up to 2.60 GHz / TDP 10W |                      |                      |
| <b>Memory</b>                 | Dual channel LPDDR4x 8GB on board (up to 16GB)                       |                      |                      |



PPC2-Cxxx-EHL Series Panel PC

|                                          | PPC2-C19                                                                                                                                                                                                  | PPC2-CW19               | PPC2-CW22               |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|
| Touchscreen                              | Multi-point projected capacitive type (anti-UV / anti-glare coating, support gloves)                                                                                                                      |                         |                         |
|                                          | Surface hardness: ≥7H                                                                                                                                                                                     |                         |                         |
| Touch Controller                         | Projected capacitive type: EETI 80                                                                                                                                                                        |                         |                         |
| Drive Bay                                | 1 x 2.5" HDD/SSD drive bay                                                                                                                                                                                |                         |                         |
| Ethernet                                 | 2 x 2.5GbE LAN via Intel I225-V/I226-V                                                                                                                                                                    |                         |                         |
| Expansion                                | 1 x M.2 2242/2280 B key (PCIe Gen3 x1 + USB 3.0)                                                                                                                                                          |                         |                         |
|                                          | 1 x M.2 2280 M key (PCIe Gen3 x2)                                                                                                                                                                         |                         |                         |
| Mounting                                 | Panel, Wall, Rack, Stand and Arm, VESA 75/100                                                                                                                                                             |                         |                         |
| Construction Material                    | Aluminum front cover and sheet metal rear cover                                                                                                                                                           |                         |                         |
| Enclosure Color                          | Black                                                                                                                                                                                                     |                         |                         |
| Power Input                              | 12 V ~ 24 V DC                                                                                                                                                                                            |                         |                         |
| Power Adapter                            | 90W power adapter                                                                                                                                                                                         |                         |                         |
| Thermal Solution                         | Fanless                                                                                                                                                                                                   |                         |                         |
| TPM                                      | Intel® Platform Trust Technology                                                                                                                                                                          |                         |                         |
| Watchdog Timer                           | Software Programmable support 1~255 sec. system reset                                                                                                                                                     |                         |                         |
| Operating Temperature<br>(With air flow) | -10°C ~ 50°C                                                                                                                                                                                              | -10°C ~ 60°C            | -10°C ~ 50°C            |
| Storage Temperature                      | -20°C ~ 60°C                                                                                                                                                                                              |                         |                         |
| Humidity                                 | 10% ~ 80%, non-condensing                                                                                                                                                                                 |                         |                         |
| Safety and EMC                           | CE, FCC Class A                                                                                                                                                                                           |                         |                         |
| ErP                                      | ErP 2009/125/EC                                                                                                                                                                                           |                         |                         |
| Dimensions<br>(H x W x D) (Unit: mm)     | 447.40 x 372.40 x 59.20                                                                                                                                                                                   | 468.80 x 288.20 x 59.40 | 550.40 x 358.40 x 58.50 |
| Net Weight                               | 5.745kg                                                                                                                                                                                                   | 5.096kg                 | 6.330kg                 |
| I/O Ports, Switches<br>and Buttons       | 1 x HDMI output<br>2 x 2.5GbE RJ-45<br>2 x USB 3.2 Gen 2x1 (10Gb/s)<br>2 x USB 2.0<br>1 x RS-232/422/485<br>1 x RS-232<br>1 x 12V-24V power jack<br>1 x Power terminal block (2-pin)<br>1 x AT/ATX switch |                         |                         |



**PPC2-Cxxx-EHL Series Panel PC**

|                                              | PPC2-C19                                                                                                                                                         | PPC2-CW19 | PPC2-CW22 |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
|                                              | 1 x Power button<br>1 x Reset button<br>1 x Clear CMOS button<br>PPC2-XIO-04-R10:<br>2 x USB 2.0<br>3 x RS-232<br>1 x M.2 A Key 2230<br>(PCIe gen3 x 2 + USB2.0) |           |           |
| Table 1-4: PPC2-C19/CW19/CW22 Specifications |                                                                                                                                                                  |           |           |

## Chapter

## 2

# Unpacking

---

## 2.1 Unpacking

To unpack the panel PC, follow the steps below:

**WARNING!**

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the panel PC has been properly installed. This ensures the screen is protected during the installation process.

**Step 1:** Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

**Step 2:** Open the external (second) box.

**Step 3:** Use box cutters, a knife or a sharp pair of scissors that seals the top side of the



## PPC2-Cxxx-EHL Series Panel PC

internal (first) box.

**Step 4:** Lift the monitor out of the boxes.

**Step 5:** Remove both polystyrene ends, one from each side.

**Step 6:** Pull the plastic cover off the panel PC.

**Step 7:** Make sure all the components listed in the packing list are present.

### 2.2 Packing List

The PPC2-Cxxx-EHL Series panel PC is shipped with the following components:

| Quantity | Item                                          | Image                                                                                |
|----------|-----------------------------------------------|--------------------------------------------------------------------------------------|
| 1        | PPC2-Cxxx-EHL Series panel PC                 |   |
| 1        | Power cord<br>(part number varies by regions) |    |
| 1        | Power adapter                                 |    |
| 1        | Screw pack                                    |   |
| 1        | Panel mount kit pack                          |  |

**Table 2-1: Packing List**

If any of the above items are missing or damaged, contact the distributor or sales representative immediately.

### 2.3 Optional Items

The following items are optional accessories for the PPC2-Cxxx-EHL Series:

| Item         | PPC2-C08      | PPC2-C10      | PPC2-C12      | PPC2-C15~CW22 |
|--------------|---------------|---------------|---------------|---------------|
| <b>Arm</b>   | ARM-11-RS     | ARM-11-RS     | ARM-31-RS     | ARM-31-RS     |
| <b>Stand</b> | STAND-C12-R10 | STAND-C12-R10 | STAND-C12-R10 | STAND-C19-R10 |
| <b>Wall</b>  | AFLWK-12      | AFLWK-12      | AFLWK-19B     | AFLWK-19B     |

**Table 2-2: Optional Items**

Chapter

3

# Installation

---

### 3.1 Anti-static Precautions

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**WARNING:**

Failure to take ESD precautions during the maintenance of the panel PC may result in permanent damage to the panel PC and severe injury to the user.

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Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PPC2-Cxxx-EHL Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PPC2-Cxxx-EHL Series is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the PPC2-Cxxx-EHL Series, place it on an anti-static pad. This reduces the possibility of ESD damaging the PPC2-Cxxx-EHL Series.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

### 3.2 Installation Precautions

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**CAUTION:**

The PPC2-Cxxx-EHL Series has more than one power supply connection point.

To reduce the risk of electric shock, disconnect all power sources before installing or servicing the PPC2-Cxxx-EHL Series.

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## PPC2-Cxxx-EHL Series Panel PC

When installing the panel PC, please follow the precautions listed below:

- **Power turned off:** When installing the panel PC, make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
- **Certified Engineers:** Only certified engineers should install and modify onboard functionalities.
- **Mounting:** The PPC2-Cxxx-EHL Series is a heavy device. When mounting the system onto a rack, panel, wall or arm, please make sure that at least two people are assisting with the procedure.
- **Anti-static Discharge:** If a user open the rear panel of the panel PC, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear an anti-static wristband.

### 3.3 Preinstalled Components

The following components are all preinstalled.

- Motherboard
- TFT LCD
- Touchscreen

Preinstalled OEM customizations may include the following.

- CPU
- Memory module
- HDD

### 3.4 Installation and Configuration Steps

The following installation steps must be followed.

**Step 1:** Unpack the panel PC.

**Step 2:** Install an additional storage card (if necessary).

**Step 3:** Mount the panel PC.

**Step 4:** Connect peripheral devices to the bottom panel of the panel PC.



**Step 5:** Configure the system.

### 3.5 Removing the Back Cover

Remove the back cover retention screws on the back cover. Lift the cover up to remove.



#### NOTE:

The number of retention screws on the chassis varies by models.



Figure 3-1: PPC2-Cxxx-EHL Back Cover Retention Screws

## PPC2-Cxxx-EHL Series Panel PC

### 3.6 HDD Installation (Optional)

To install a 2.5" HDD into the PPC2-Cxxx-EHL Series (model of 12" or above), please follow the steps below:

**Step 1:** Remove the back cover. See Section 3.5.

**Step 2:** Remove the HDD bracket from the PPC2-Cxxx-EHL Series. The HDD bracket is secured on the panel PC with four retention screws (**Figure 3-2**). Remove the four retention screws and disconnect the SATA and SATA power cables. Lift the bracket off the panel PC.

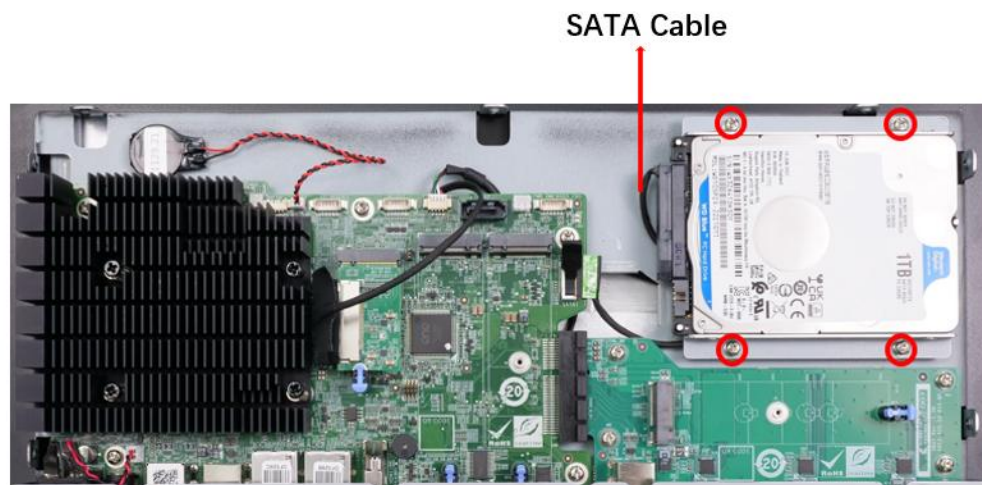


Figure 3-2: PPC2-Cxxx-EHL HDD Bracket Retention Screws

**Step 3:** Secure the hard drive to the bracket. Secure the hard drive to the bracket with four retention screws (**Figure 3-3: HDD Retention Screws**).

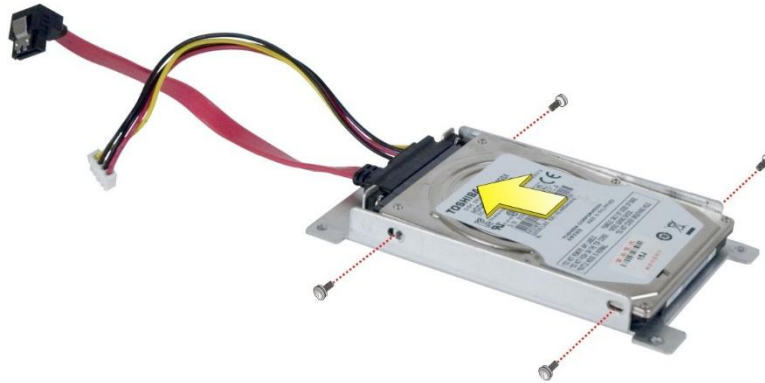


Figure 3-3: HDD Retention Screws

**Step 4:** Reinstall the HDD bracket into the PPC2-Cxxx-EHL Series and fasten the four hard drive bracket screws (**Figure 3-4**). Connect the SATA and SATA power cables.

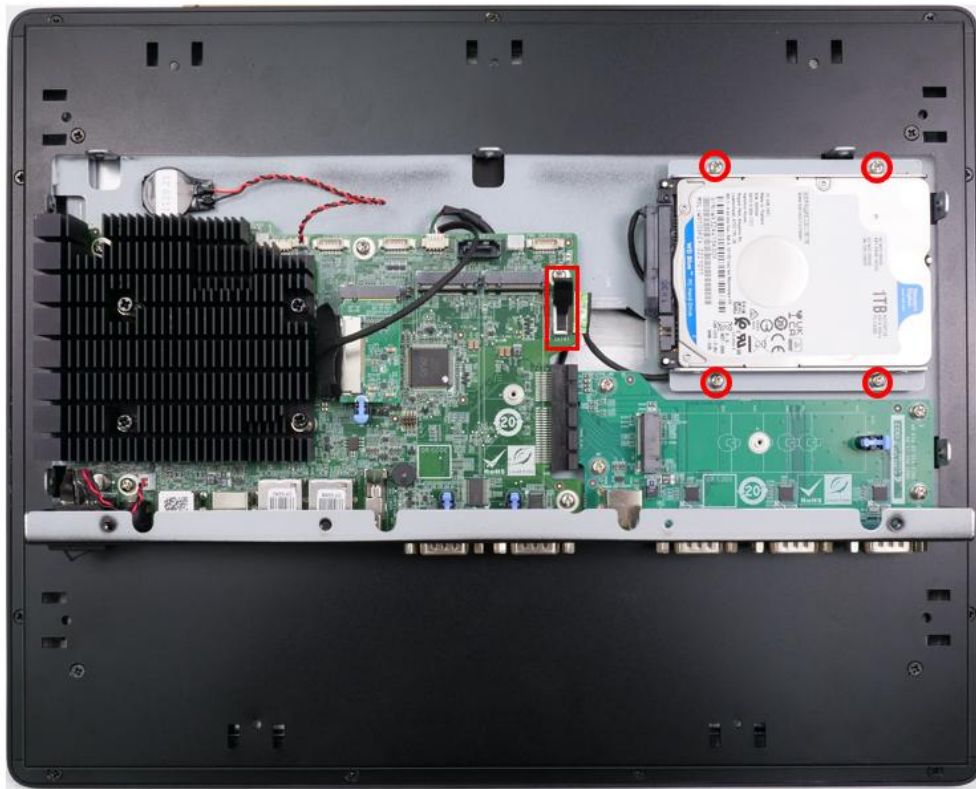


Figure 3-4: PPC2-Cxxx-EHL HDD Installation



## PPC2-Cxxx-EHL Series Panel PC

### 3.7 M.2 Module Installation (Optional)

The M.2 M-key slot allows installation of M.2 2280 cards. To install an M.2 card, please follow the steps below.

**Step 1:** Remove the back cover. See **Section 3.5**.

**Step 2:** Locate the M.2 slot as shown in **Figure 3-5**.

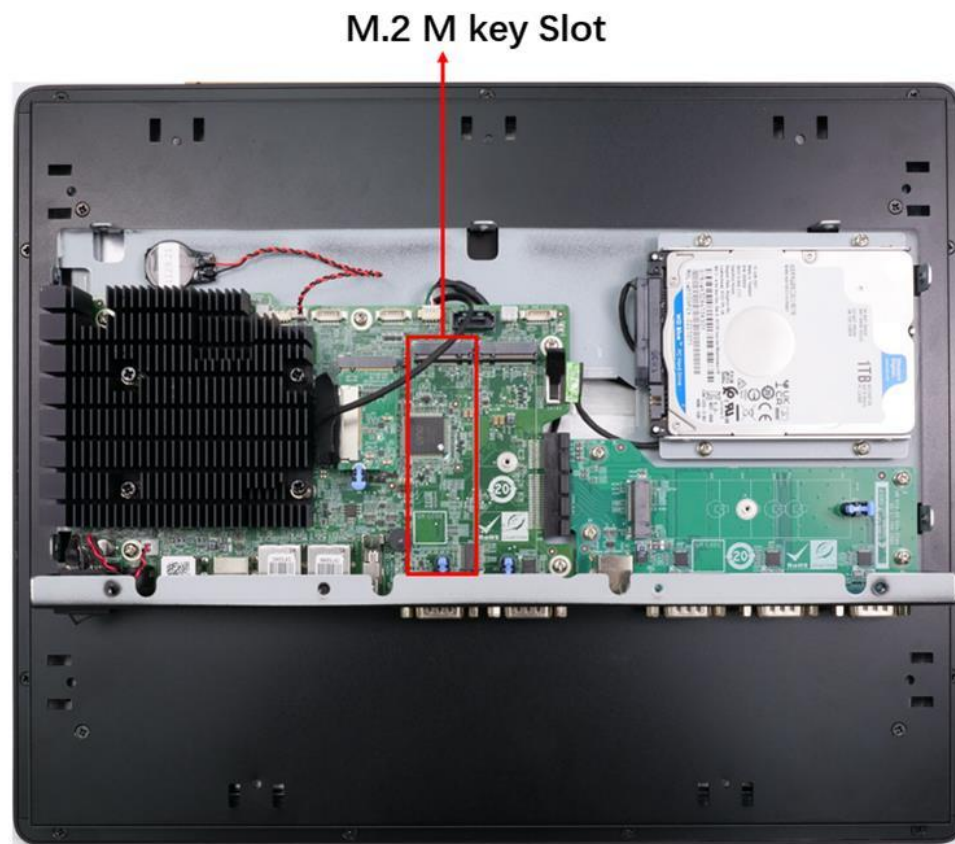
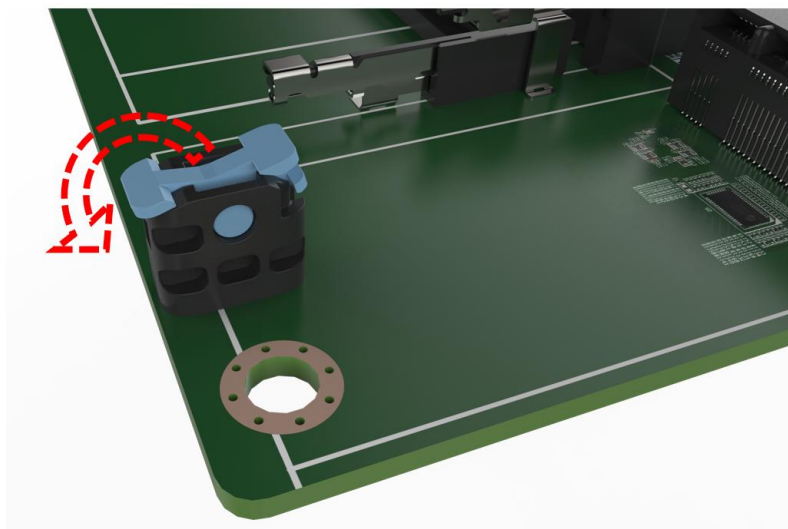


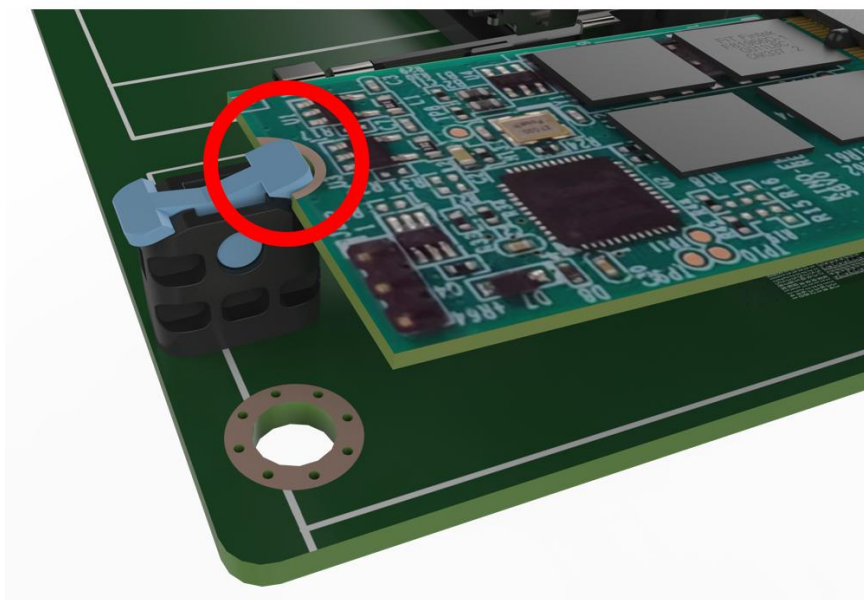
Figure 3-5: M.2 Slot Location

**Step 3:** Press the end of the M.2 retaining clip. As shown in **Figure 3-6**.



**Figure 3-6: Press the end of the M.2 retaining clip**

**Step 4: Insert M.2 card.** The notch at the end of the M.2 card needs to be aligned with the notch of the fixed buckle (**Figure 3-7**).



**Figure 3-7: Insert M.2 Card**

**Step 5: Secure the M.2 card.** Press down the M.2 card to fix it (**Figure 3-8**).



## PPC2-Cxxx-EHL Series Panel PC

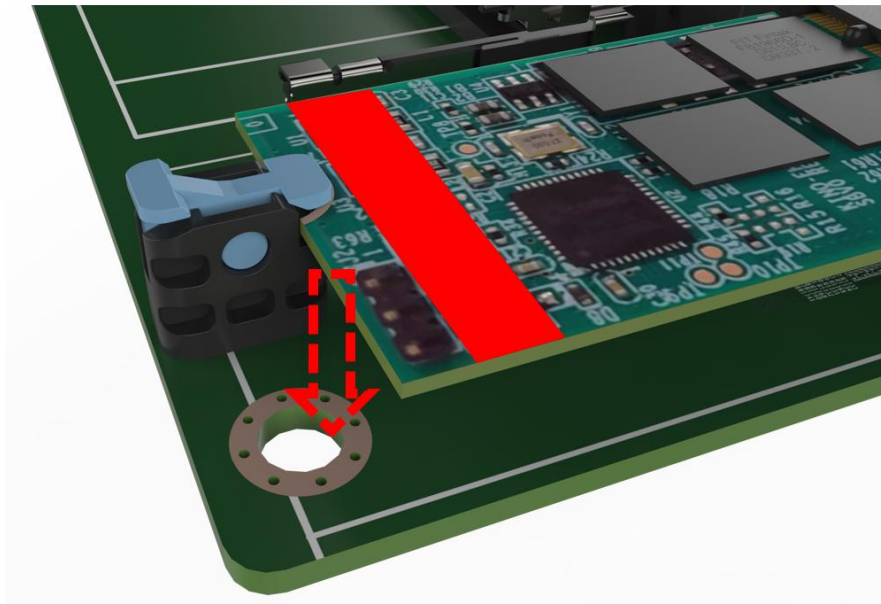


Figure 3-8: Securing the M.2 card

### 3.8 AT/ATX Mode Selection

AT and ATX power modes can both be used on the PPC2-Cxxx-EHL Series panel PC. The selection is made through an AT/ATX switch on the I/O interface panel. The system is set to ATX mode by default. The switch is shown below.



Figure 3-9: AT/ATX Mode Selection

|                       |         | AT/ATX Switch                                |                                                                                |
|-----------------------|---------|----------------------------------------------|--------------------------------------------------------------------------------|
|                       |         | AT                                           | ATX (Default)                                                                  |
| Power Switch Position | Off (O) | The system remains off.                      | The system remains off.                                                        |
|                       | On (I)  | The system turns on once power is connected. | Depends on the state selected in the <b>Restore AC Power Loss</b> BIOS option. |

Table 3-1: AT/ATX Mode Selection

### 3.9 Mounting the System



#### **WARNING!**

When mounting the PPC2-Cxxx-EHL Series panel PC, it is advisable to have more than one person help with the installation to prevent accidental damage to the panel and avoid personal injury.

The methods of mounting the PPC2-Cxxx-EHL Series are:

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

The mounting methods are described in the following sections.

#### **3.9.1 Wall Mounting**

To mount the PPC2-Cxxx-EHL Series panel PC onto a wall, please follow the steps below.

**Step 1:** Select the location on the wall for the wall-mounting bracket.

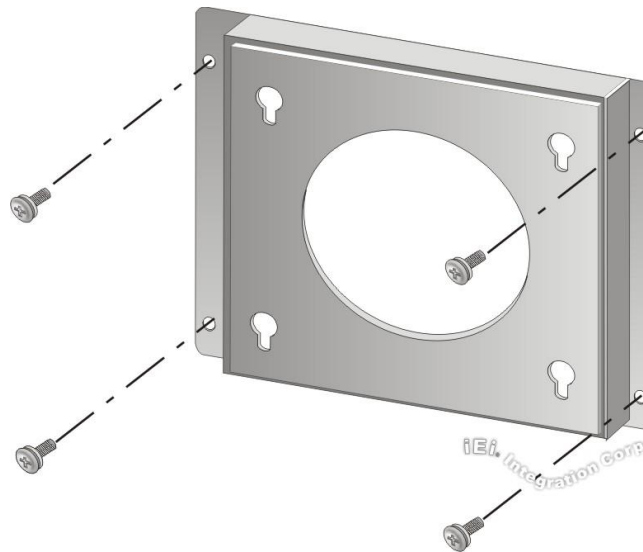
**Step 2:** Carefully mark the locations of the four bracket screw holes on the wall.

**Step 3:** Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

**Step 4:** Align the wall-mounting bracket screw holes with the pilot holes.

**Step 5:** Secure the mounting bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 3-10**).

## PPC2-Cxxx-EHL Series Panel PC



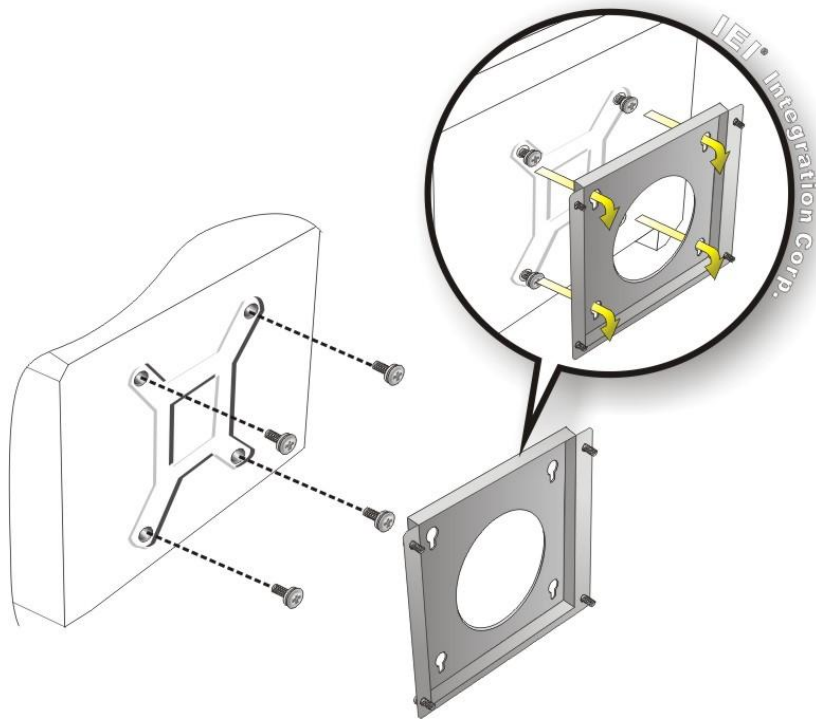
**Figure 3-10: Wall-mounting Bracket**

- Step 6:** Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the rear panel of the monitor and tighten until the screw shank is secured against the rear panel (**Figure 3-11**).
- Step 7:** Align the mounting screws on the monitor rear panel with the mounting holes on the bracket.
- Step 8:** Carefully insert the screws through the holes and gently pull the monitor downwards until the monitor rests securely in the slotted holes (**Figure 3-11**). Ensure that all four of the mounting screws fit snugly into their respective slotted holes.



**NOTE:**

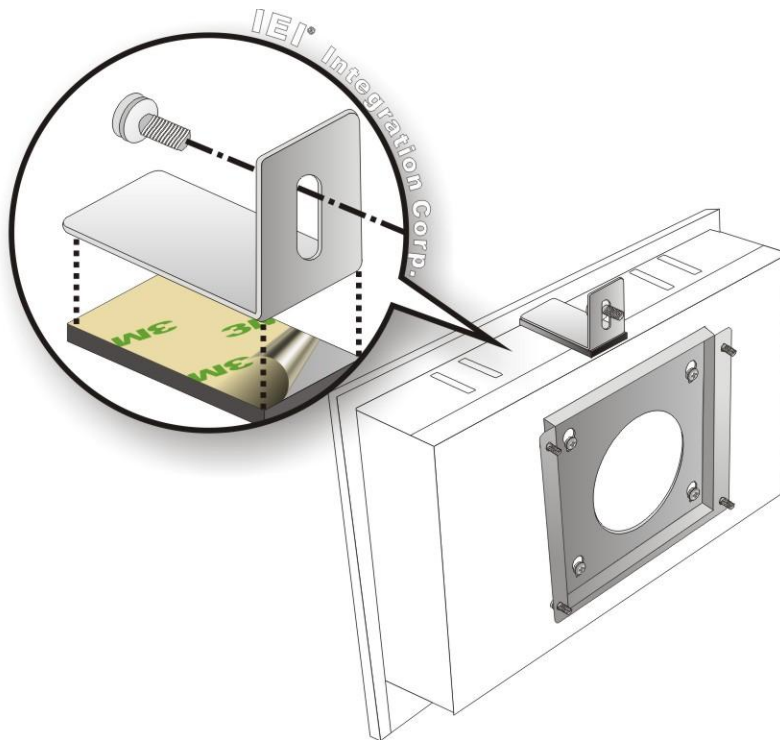
In the diagram below the bracket is already installed on the wall.



**Figure 3-11: Mount the Chassis**

**Step 9:** Secure the panel PC with the wall-mounting kit. To do this, stick the protective cushion to the wall-mounting kit first. Then, put the wall-mounting kit on the top panel of the panel PC. Carefully mark the location of the wall-mounting kit screw holes on the wall. Drill a pilot hole at the marked location on the wall. Secure the wall-mounting kit to the wall by inserting a retention screw into the pilot hole on the wall (**Figure 3-12**). This step is to avoid the panel PC being pushed apart from the wall-mounting bracket accidentally.

**PPC2-Cxxx-EHL Series Panel PC**



**Figure 3-12: Secure the Chassis**



### 3.9.2 Panel, Rack and Cabinet Installation

To mount the PPC2-Cxxx-EHL Series panel PC into a panel, please follow steps 1-5.

For rack and cabinet installation, please follow Steps 1-7.

**NOTE:**

For the PPC-XXX-EHL Series panel PC, all mounting kit must be installed (**Figure 3-13**).

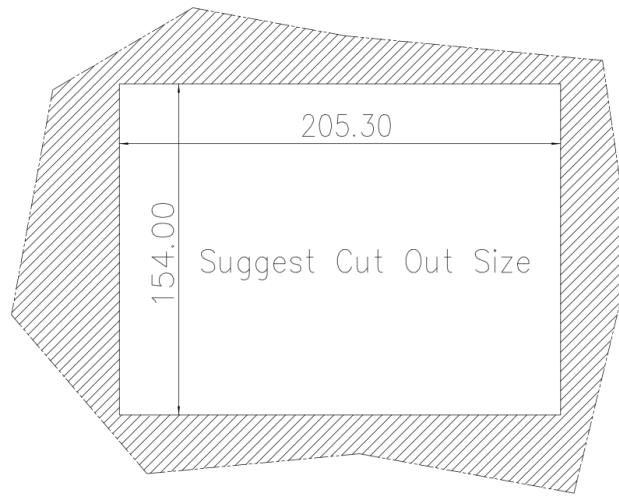
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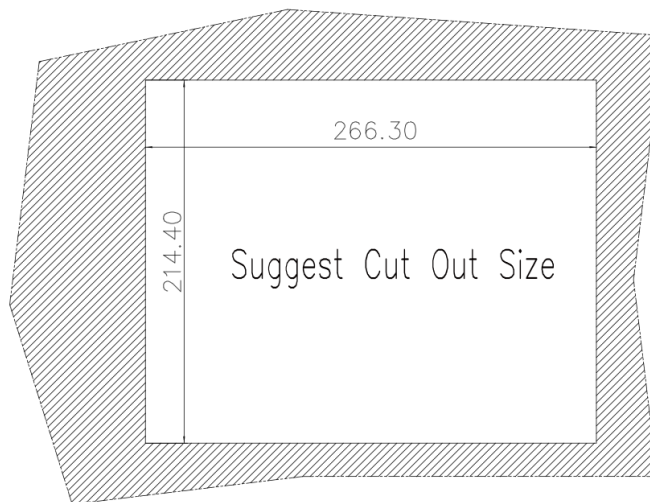
**Figure 3-13: PPC2-Cxxx-EHL Series Panel Mount Kit Installation**

- Step 1:** Select the position on the panel to mount the PPC2-Cxxx-EHL Series.
- Step 2:** Cut out a section of the panel that corresponds to the rear panel dimensions of the PPC2-Cxxx-EHL Series. The recommended cutout sizes are shown below (**Figure 3-14**, **Figure 3-15**, **Figure 3-16**, **Figure 3-17**, **Figure 3-18**, **Figure 3-19**, **Figure 3-20**, **Figure 3-21**, **Figure 3-22**).

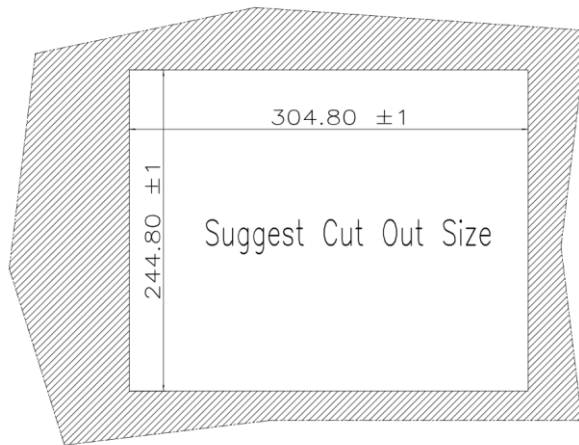
**PPC2-Cxxx-EHL Series Panel PC**



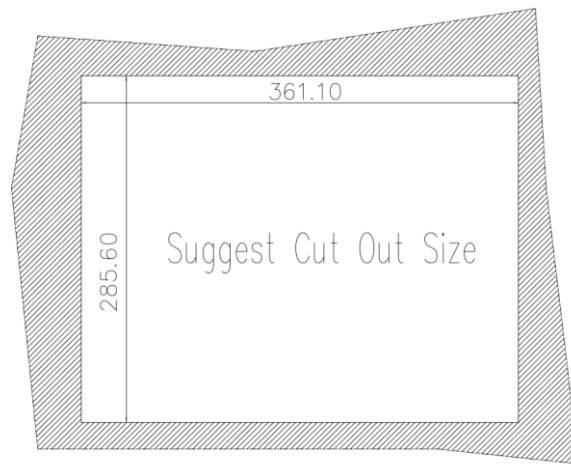
**Figure 3-14: PPC2-C08-EHL Panel Cutout Dimensions**



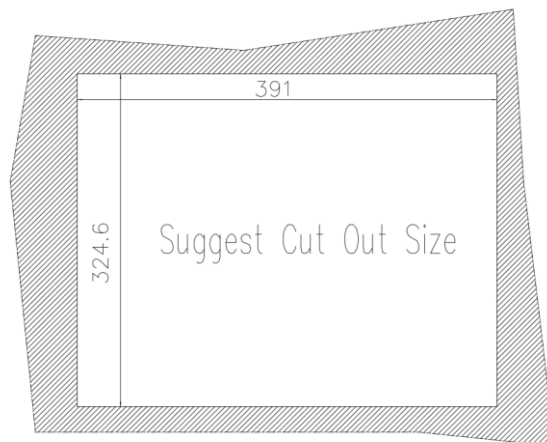
**Figure 3-15: PPC2-C10-EHL Panel Cutout Dimensions**



**Figure 3-16: PPC2-C12-EHL Panel Cutout Dimensions**

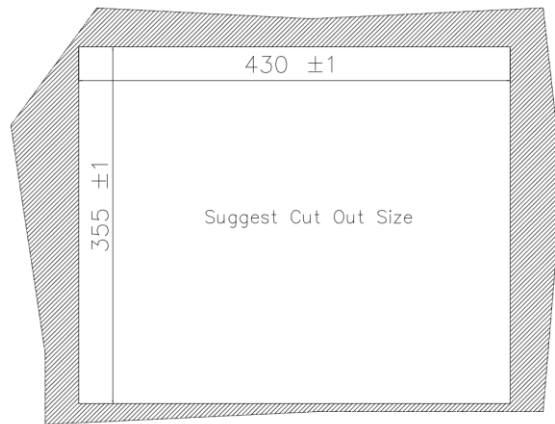


**Figure 3-17: PPC2-C15-EHL Panel Cutout Dimensions**

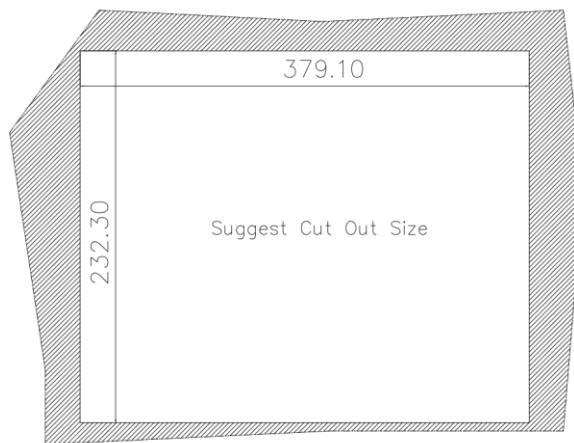


**Figure 3-18: PPC2-C17-EHL Panel Cutout Dimensions**

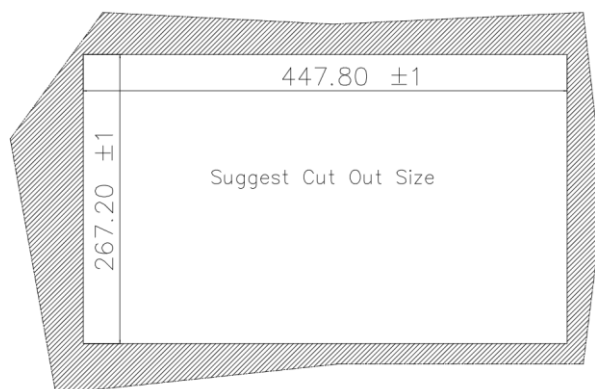
## PPC2-Cxxx-EHL Series Panel PC



**Figure 3-19: PPC2-C19-EHL Panel Cutout Dimensions**

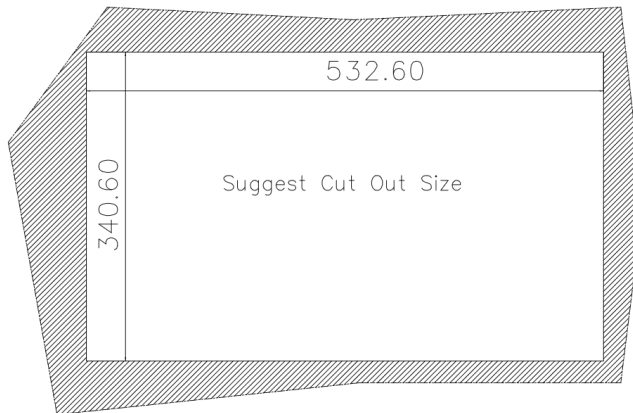


**Figure 3-20: PPC2-CW15-EHL Panel Cutout Dimensions**



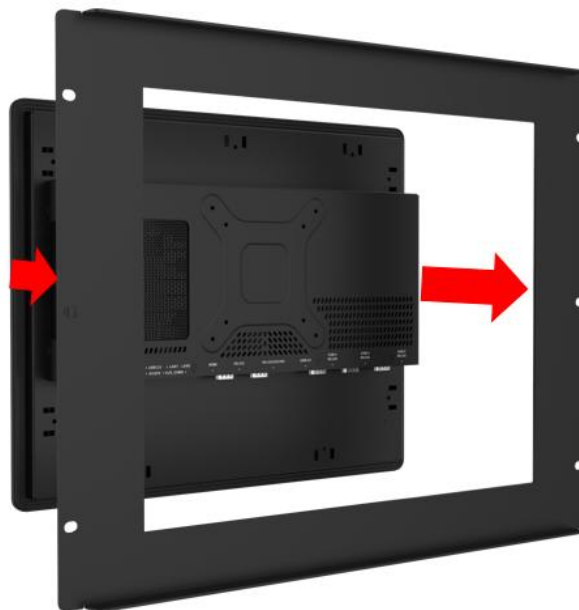
**Figure 3-21: PPC2-CW19-EHL Panel Cutout Dimensions**





**Figure 3-22: PPC2-CW22-EHL Panel Cutout Dimensions**

**Step 3:** Slide the PPC2-Cxxx-EHL Series through the hole until the aluminum frame is flush against the panel (**Figure 3-23**).



**Figure 3-23: Machine mounted to panel**

**Step 4:** Insert the panel mount kit into the prefabricated holes along the rear edge of the PPC2-Cxxx-EHL series (**Figure 3-24**). The required number of mounting clamps may vary by models.



## PPC2-Cxxx-EHL Series Panel PC

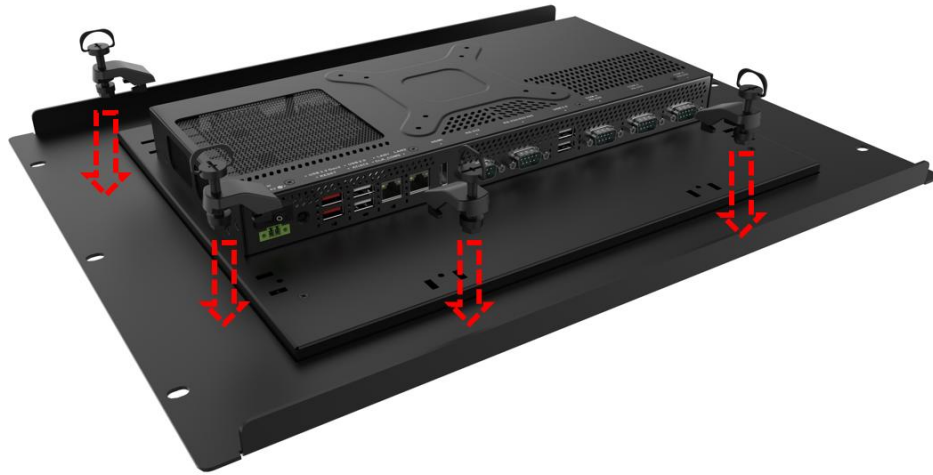


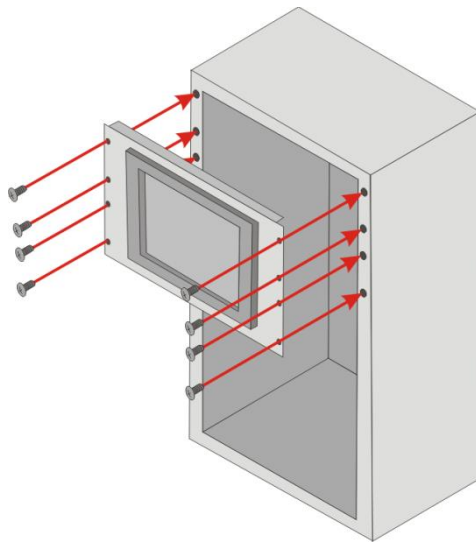
Figure 3-24: Installation Panel Mount Kit

**Step 5:** Tighten the screws that pass through the mounting clamps until the plastic caps at the front of all the screws are firmly secured to the panel (**Figure 3-25**).



Figure 3-25: Tighten the Mounting Screws

**Step 6:** Slide the PPC2-Cxxx-EHL series with the attached rack/cabinet bracket into a rack or cabinet (**Figure 3-26**).



**Figure 3-26: Install into a Rack/Cabinet**

**Step 7:** Once the flat panel PC with the attached rack/cabinet bracket has been properly inserted into the rack or cabinet, secure the front of the rack/cabinet bracket to the front of the rack or cabinet (**Figure 3-26**).

### 3.9.3 Arm Mounting

The PPC2-Cxxx-EHL Series is VESA (Video Electronics Standards Association) compliant and can be mounted on an arm with a 75/100 mm interface pad. To mount the PPC2-Cxxx-EHL Series on an arm, please follow the steps below.

**Step 1:** The arm is a separately purchased item. Please correctly mount the arm onto the surface it uses as a base. To do this, refer to the installation documentation that came with the mounting arm.

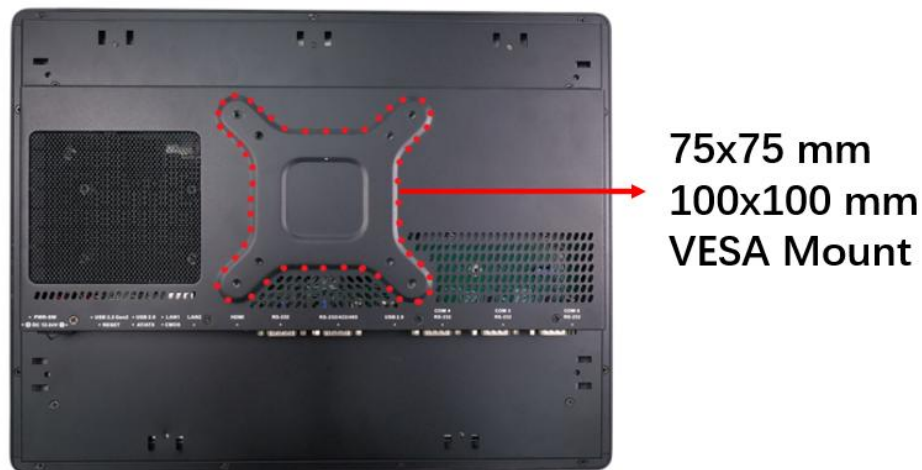


#### **NOTE:**

When purchasing the arm please ensure that it is VESA compliant and that the arm has a 75/100 mm interface pad. If the mounting arm is not VESA compliant, it cannot be used to support the PPC2-Cxxx-EHL Series panel PC.

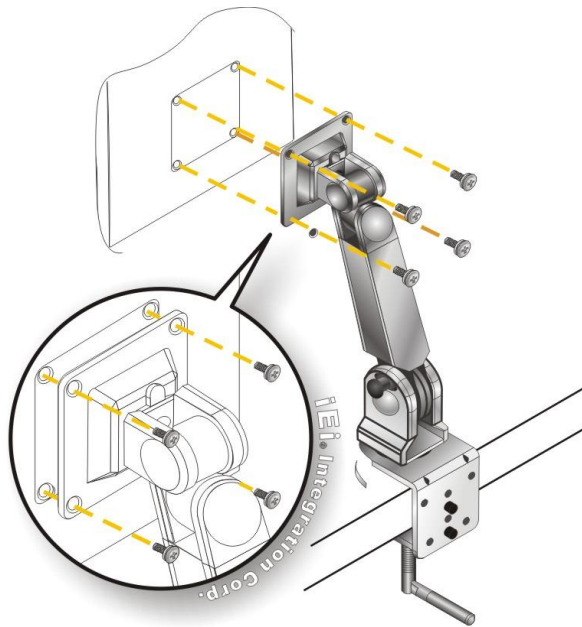
## PPC2-Cxxx-EHL Series Panel PC

- Step 2:** Once the mounting arm has been firmly attached to its surface, lift the PPC2-Cxxx-EHL Series panel PC onto the interface pad of the mounting arm.
- Step 3:** Align the retention screw holes on the mounting arm interface with those in the PPC2-Cxxx-EHL Series panel PC. The arm mounting retention screw holes of the PPC2-Cxxx-EHL Series panel PC are shown in **Figure 3-27**.



**Figure 3-27: Arm Mounting Retention Screw Holes**

- Step 4:** Secure the PPC2-Cxxx-EHL Series to the interface pad by inserting four retention screws through the mounting arm interface pad and into the PPC2-Cxxx-EHL Series panel PC.



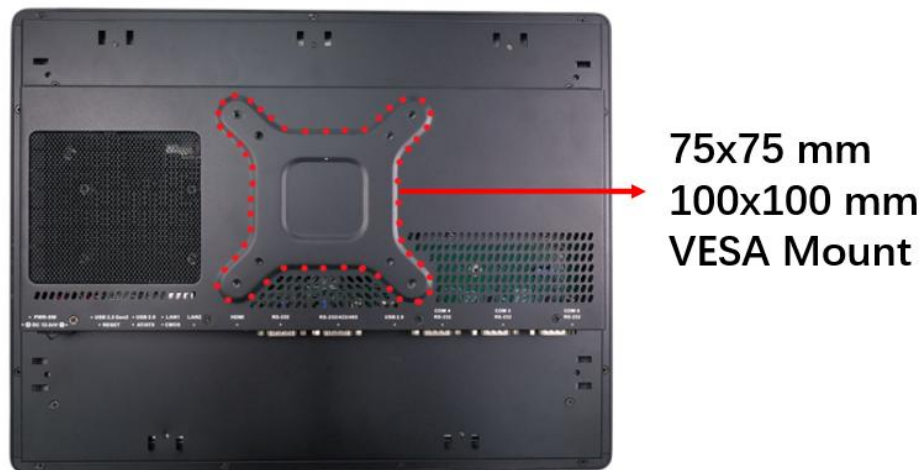
**Figure 3-28: Arm Mounting (ARM-XX-RS)**

### **3.9.4 Stand Mounting**

To mount the PPC2-Cxxx-EHL Series using the stand mounting kit, please follow the steps below.

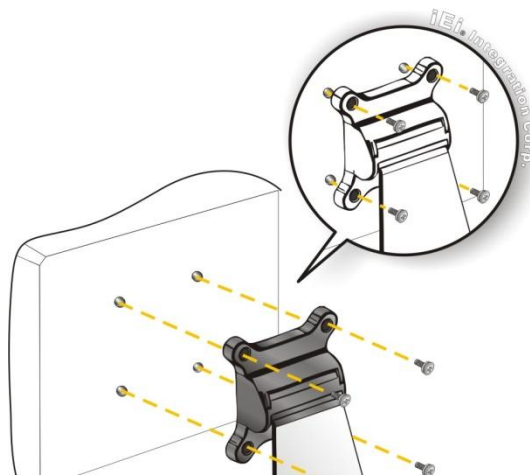
**Step 1:** Locate the screw holes on the rear of the PPC2-Cxxx-EHL Series. This is where the bracket will be attached.



**PPC2-Cxxx-EHL Series Panel PC****Figure 3-29: Stand Mounting Retention Screw Holes**

**Step 2:** Align the bracket with the screw holes.

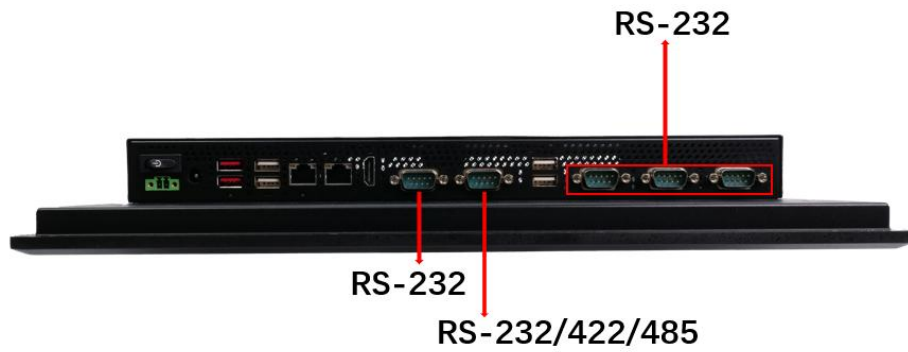
**Step 3:** To secure the bracket to the PPC2-Cxxx-EHL Series, insert the retention screws into the screw holes and tighten them.

**Figure 3-30: Stand Mounting (Stand-Cxx)**

### 3.10 Serial Device Connection

The PPC2-Cxxx-EHL Series has RS-232/422/484 and RS-232 ports. See **Section 1.6** for the port locations of each model. The pinouts of the serial ports are listed in the following sections.



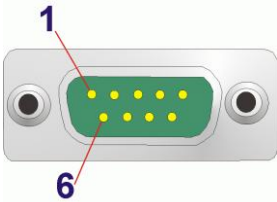


**Figure 3-31: Serial Port Locations of PPC2-C15/CW15/C17/C19/CW19/CW22-EHL**

### 3.10.1 RS-232 Serial Ports

The pinouts of the RS-232 serial ports are listed in the following table.

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | DCD         | 2       | RXD         |
| 3       | TXD         | 4       | DTR         |
| 5       | GND         | 6       | DSR         |
| 7       | RTS         | 8       | CTS         |
| 9       | RI          |         |             |



**Table 3-2: RS-232 Serial Port Pinouts**

## PPC2-Cxxx-EHL Series Panel PC

## 3.10.2 RS-232/422/485 Serial Port

The pinouts of the RS-232/422/485 serial ports are listed in the following table.

| PIN NO. | RS-232 | RS-422  | RS-485  |
|---------|--------|---------|---------|
| 1       | DCD    | TXD422- | TXD485- |
| 2       | RXD    | TXD422+ | TXD485+ |
| 3       | TXD    | RXD422+ | --      |
| 4       | DTR    | RXD422- | --      |
| 5       | GND    | --      | --      |
| 6       | DSR    | --      | --      |
| 7       | RTS    | --      | --      |
| 8       | CTS    | --      | --      |
| 9       | RI     | --      | --      |

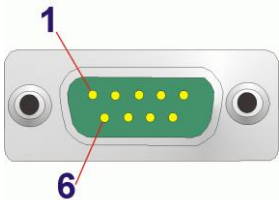


Table 3-3: RS-232/422/485 Serial Port (COM1) Pinouts

## 3.11 Powering On the System

To power on the system, follow the steps below:

**Step 1:** Either connect the power adapter to the power jack or connect the power cable to the 2-pin power input terminal block. **DO NOT** connect both power connectors to a power source at the same time. The pinouts of the power input connectors are shown below.

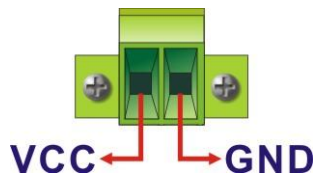


Figure 3-32: Power Input Connector Pinouts

**Step 2:** Toggle the power switch on the I/O panel to the constant on position (I) to power on the system.



Figure 3-33: Power Connectors and Power Switch

### 3.12 Reset the System

The reset button enables users to reboot the system when the system is turned on. The reset button location is shown in **Figure 3-34**. Press the reset button to reboot the system.



Figure 3-34: Reset Button Location

### 3.13 Clear CMOS

If the PPC2-Cxxx-EHL Series fails to boot due to improper BIOS settings, the clear CMOS button clears the CMOS data and resets the system BIOS information. To do this, push the clear CMOS button for three seconds, and then restart the system. The clear CMOS button location is shown in **Figure 3-35**.



Figure 3-35: Clear CMOS Button Location

## PPC2-Cxxx-EHL Series Panel PC

### 3.14 Available Drivers

All the drivers for the PPC2-Cxxx-EHL Series are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type PPC2-Cxxx-EHL Series and press Enter to find all the relevant software, utilities, and documentation.

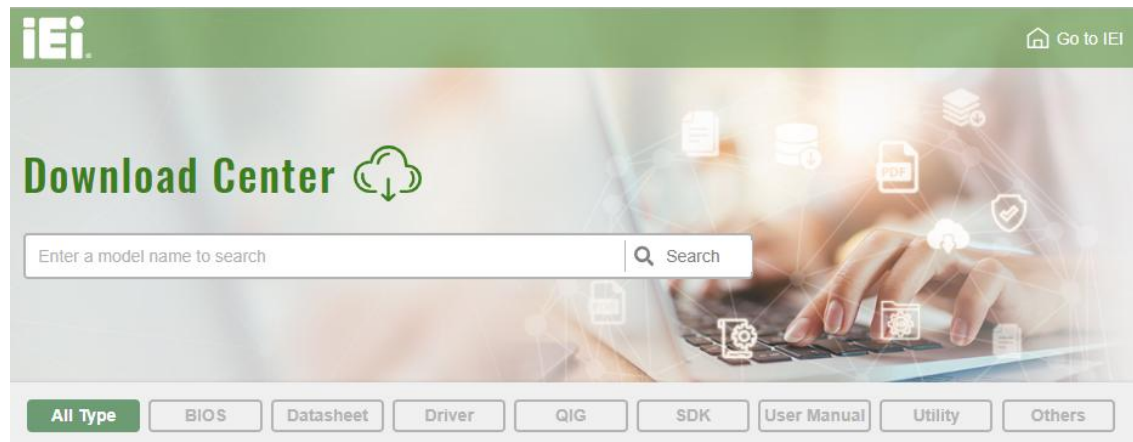


Figure 3-36: IEI Resource Download Center

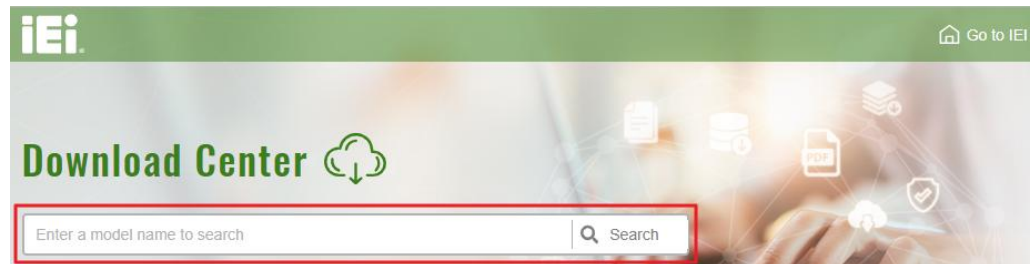
The following drivers can be installed on the **Windows 10/11** operating system:

- Chipset
- Serial I/O driver
- Graphics (Intel® EMGD)
- TXE
- HID
- LAN
- Audio

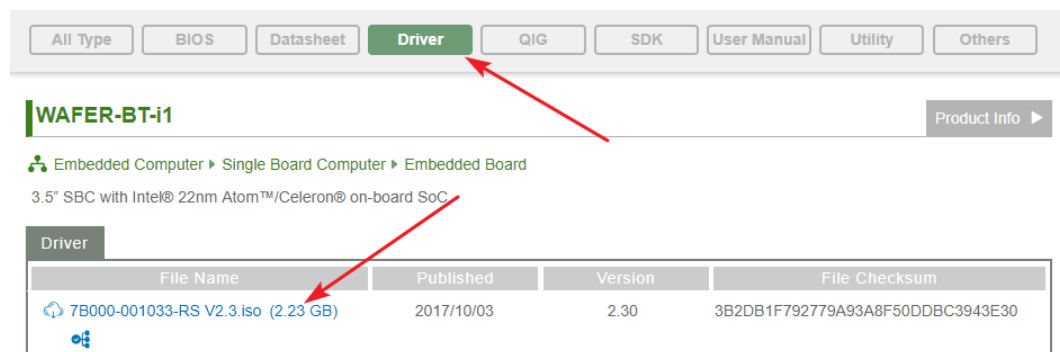
### 3.14.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

**Step 1:** Go to <https://download.ieiworld.com>. Type PPC2-Cxxx-EHL Series and press Enter.



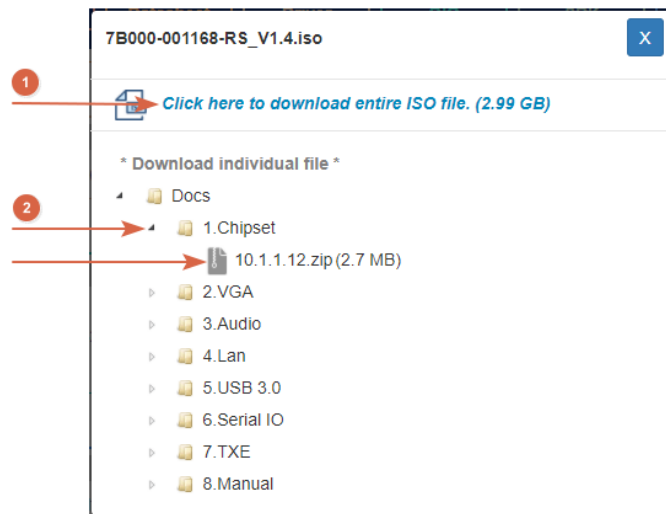
**Step 2:** All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



**Step 3:** Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



## PPC2-Cxxx-EHL Series Panel PC

**NOTE:**

To install software from the downloaded ISO image file in Windows 10 or 11, double-click the ISO file to mount it as a virtual drive to view its content.

Chapter

**4**

# System Maintenance

---

## PPC2-Cxxx-EHL Series Panel PC

### 4.1 System Maintenance Introduction

The following system components may require maintenance.

- Motherboard
- Storage module

If these components fail, they must be replaced. Please contact the system reseller or vendor to purchase replacement parts. Replacement instructions for the above listed components are described below.

### 4.2 Motherboard Replacement

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to IEI to be replaced. If the system motherboard has failed, please contact the system vendor, reseller or an IEI sales person directly.

Chapter

**5**

# BIOS

---

## PPC2-Cxxx-EHL Series Panel PC

### 5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.



#### NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

#### 5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. **Using keyboard:** Press the **DEL** or **F2** as soon as the system is turned on.
2. **Using touchscreen:** Press the **Setup** button on the upper right corner of the BIOS Starting Menu.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again, then the BIOS Starting Menu will appear. Select "Setup" and press Enter to get into the BIOS Setup.

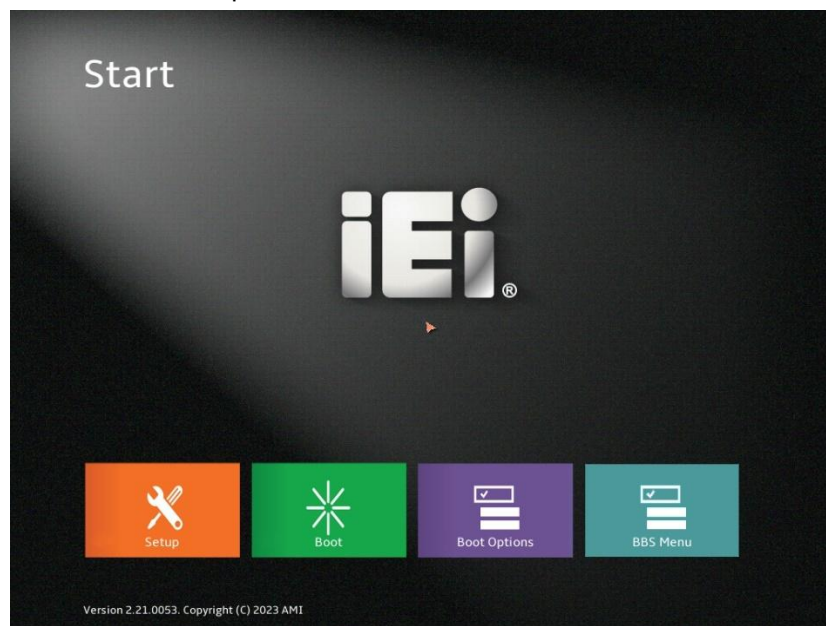


Figure 5-1: BIOS Starting Menu



### 5.1.1.1 Using Setup

The BIOS Setup menu can be navigated by using a keyboard or a touchscreen.

### 5.1.1.2 Keyboard Navigation

For keyboard navigation, use the navigation keys shown in **Table 5-1**.

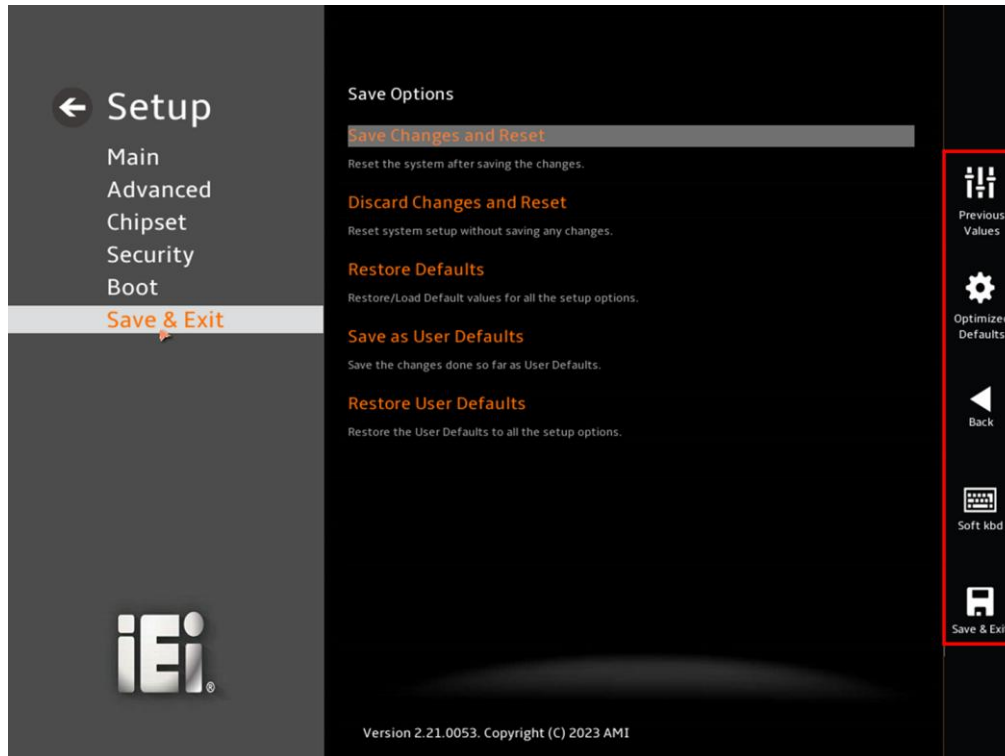
| Key         | Function                                                                                                                                             |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Up arrow    | Move to previous item                                                                                                                                |
| Down arrow  | Move to next item                                                                                                                                    |
| Left arrow  | Move to the item on the left hand side                                                                                                               |
| Right arrow | Move to the item on the right hand side                                                                                                              |
| +           | Increase the numeric value or make changes                                                                                                           |
| -           | Decrease the numeric value or make changes                                                                                                           |
| Page Up     | Move to the previous page                                                                                                                            |
| Page Dn     | Move to the next page                                                                                                                                |
| Esc         | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu --<br>Exit current page and return to Main Menu |
| F1          | General help, only for Status Page Setup Menu and<br>Option Page Setup Menu                                                                          |
| F2          | Load previous values                                                                                                                                 |
| F3          | Load optimized defaults                                                                                                                              |
| F4          | Save changes and Exit BIOS                                                                                                                           |
| <K>         | Scroll help area upwards                                                                                                                             |
| <M>         | Scroll help area downwards                                                                                                                           |

**Table 5-1: BIOS Navigation Keys**

## PPC2-Cxxx-EHL Series Panel PC

## 5.1.1.3 Touch Navigation

For touchscreen navigation, use the on-screen navigation keys shown below.



| On-screen Button   | Function                                                                  |
|--------------------|---------------------------------------------------------------------------|
| Previous Values    | Load the last value you set.                                              |
| Optimized Defaults | Load the factory default values in order to achieve the best performance. |
| Back               | Return to the previous menu.                                              |
| Soft kbd           | Display the on-screen keyboard.                                           |
| Save & Exit        | Save the changes made to the BIOS options and reset the system.           |

Table 5-2: BIOS On-screen Navigation Keys

### 5.1.2 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window, press the **Esc** key.

### 5.1.3 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the clear CMOS button described in **Chapter 3.13**.

### 5.1.4 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

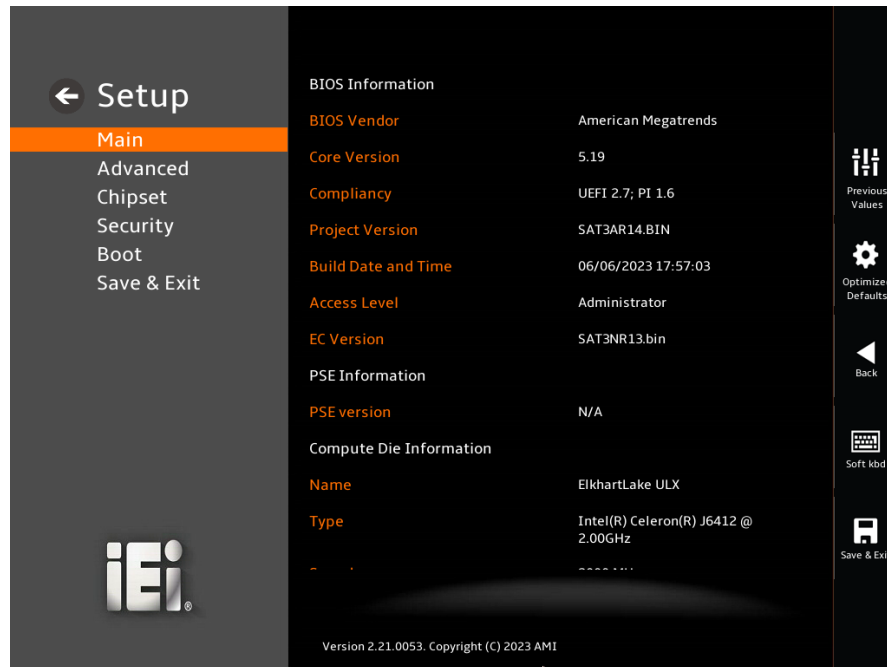
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

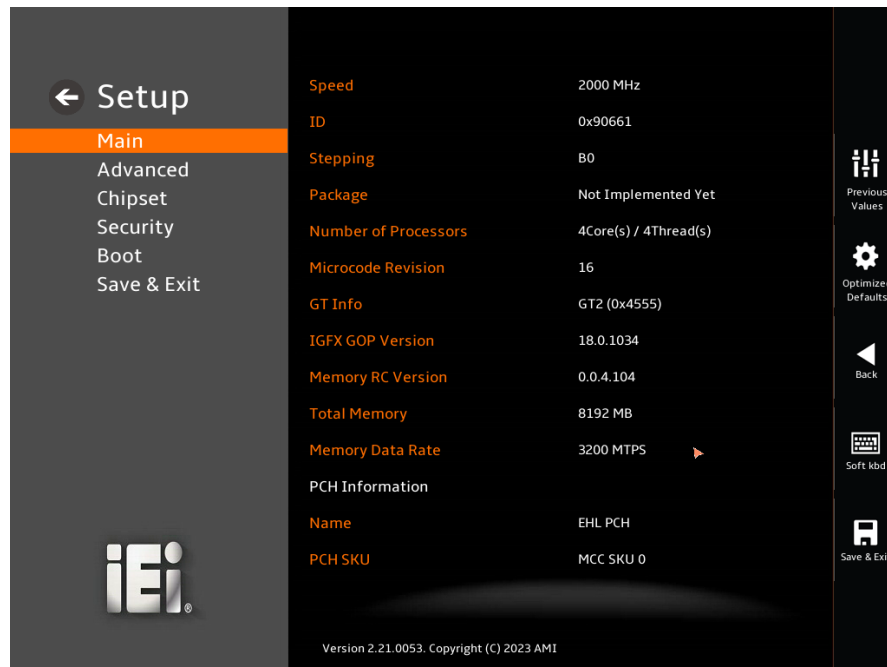
## PPC2-Cxxx-EHL Series Panel PC

### 5.2 Main

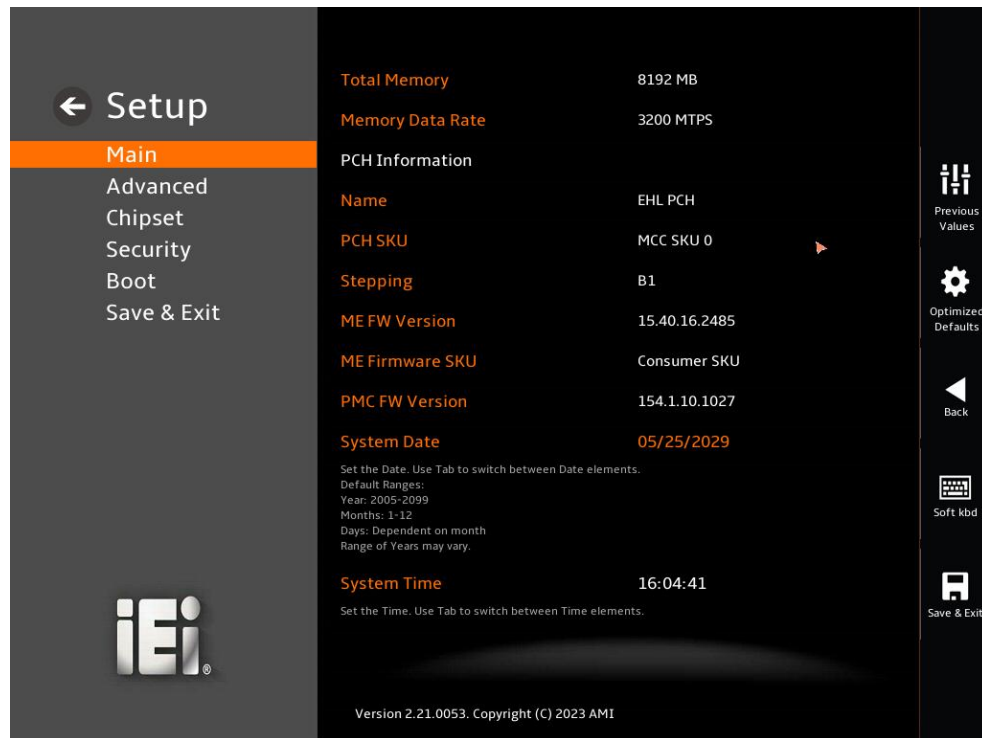
The **Main** BIOS menu (**BIOS Menu 1&BIOS Menu 2&BIOS Menu 3**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main (1/3)



BIOS Menu 2: Main (2/3)



### BIOS Menu 3: Main (3/3)

#### ➔ BIOS Information

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliance:** Current UEFI & PI version
- **Project Version:** the board version
- **Build Date and Time:** Date the current BIOS version was made
- **Access Level:** Administrator
- **EC Version:** Current EC version

#### ➔ Compute Die Information

The **Compute Die Information** lists a brief summary of the Processor. The fields in **Processor Information** cannot be changed. The items shown in the system overview include:



## PPC2-Cxxx-EHL Series Panel PC

- **Name:** Displays the Processor Details
- **Type:** Displays the Processor Type
- **Speed:** Displays the Processor Speed
- **ID:** Displays the Processor ID
- **Stepping:** Displays the Processor Stepping
- **Number of Processors:** Displays number of CPU cores
- **Microcode Revision:** CPU Microcode Revision
- **IGFX GOP Version:** Displays the IGFX GOP Version
- **Total Memory:** Total Memory in the System
- **Memory Data Rate:** Displays the Rate of Memory Data

### ➔ PCH Information

The **PCH Information** lists a brief summary of the PCH. The fields in **PCH Information** cannot be changed. The items shown in the system overview include:

- **Name:** Displays the PCH Name
- **Stepping:** Displays the PCH Stepping
- **ME FW Version:** Displays the ME Firmware Version
- **ME Firmware SKU:** Displays the ME Firmware SKU
- **System Date [xx/xx/xx]:** Use the **System Date** option to set the system date. Manually enter the day, month and year.
- **System Time [xx:xx:xx]:** Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

## 5.3 Advanced

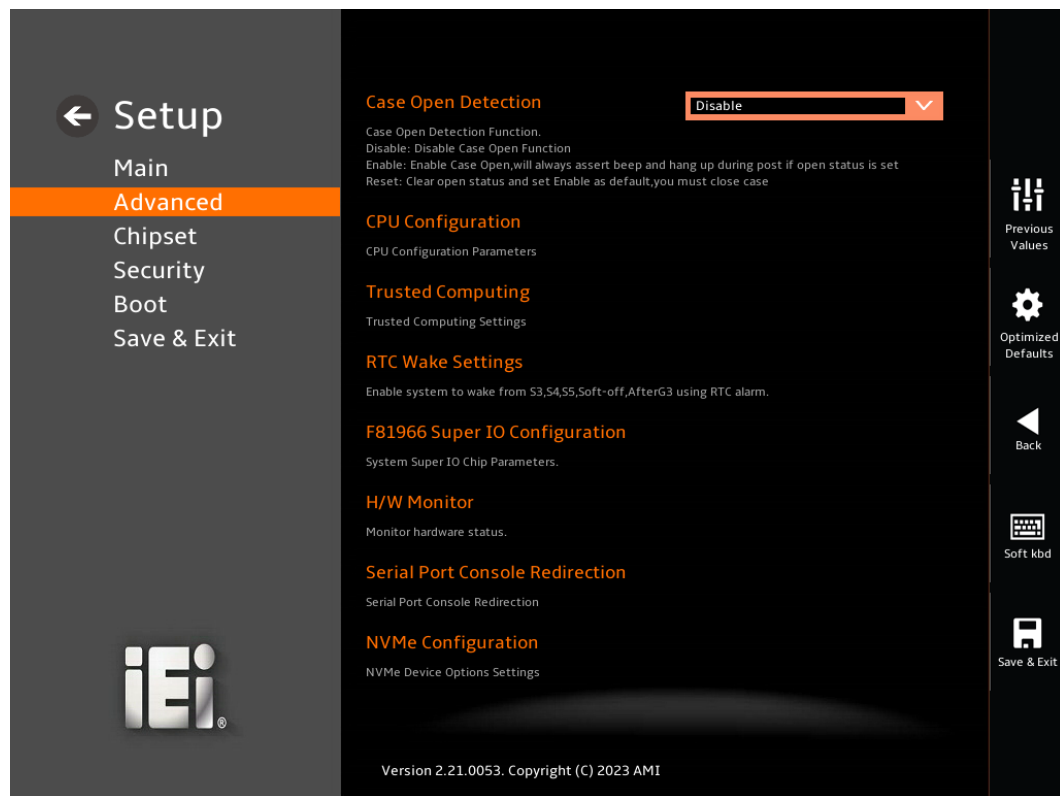
Use the **Advanced** menu (**BIOS Menu 4**) to configure the CPU and peripheral devices through the following sub-menus:



### **WARNING!**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

---



#### BIOS Menu 4: Advanced

### 5.3.1 Case Open Detection

#### → Case Open Detection [Disabled]

When the **Case Open Detection** is enabled, if anyone opens the computer's chassis, or case, Windows will notify the user with a pop-up message the next time he turns on his computer.

- |            |         |                               |
|------------|---------|-------------------------------|
| → Disabled | DEFAULT | Disables Case Open Detection. |
| → Enabled  |         | Enables Case Open Detection.  |

## PPC2-Cxxx-EHL Series Panel PC

### 5.3.2 CPU Configuration

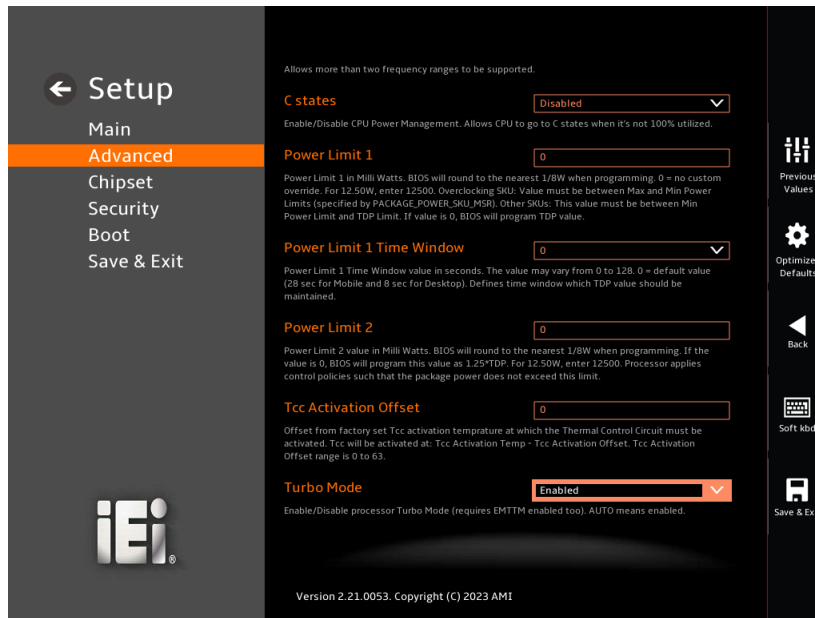
Use the **CPU Configuration** menu (**BIOS Menu 5 & BIOS Menu 6 & BIOS Menu 7**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



#### BIOS Menu 5: CPU Configuration (1/3)



#### BIOS Menu 6: CPU Configuration (2/3)



**BIOS Menu 7: CPU Configuration (3/3)**

### ➔ Intel (VMX) Virtualization Technology [Enabled]

Use the **Intel (VMX) Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

- |   |                 |                |                                           |
|---|-----------------|----------------|-------------------------------------------|
| ➔ | <b>Disabled</b> |                | Disables Intel Virtualization Technology. |
| ➔ | <b>Enabled</b>  | <b>DEFAULT</b> | Enables Intel Virtualization Technology.  |

### ➔ Active Processor Cores [All]

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

- |   |            |                |                                              |
|---|------------|----------------|----------------------------------------------|
| ➔ | <b>All</b> | <b>DEFAULT</b> | Enable all cores in the processor package.   |
| ➔ | <b>1</b>   |                | Enable one core in the processor package.    |
| ➔ | <b>2</b>   |                | Enable two cores in the processor package.   |
| ➔ | <b>3</b>   |                | Enable three cores in the processor package. |

## PPC2-Cxxx-EHL Series Panel PC

### → EIST [Enable]

Use the **EIST** option to enable more than two frequency ranges to be supported.

- |   |                 |                |                                         |
|---|-----------------|----------------|-----------------------------------------|
| → | <b>Disabled</b> |                | Disables more than two frequency ranges |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enables more than two frequency ranges  |

### → C states [Disabled]

Use the **C states** option to enable or disable the CPU Power Management.

- |   |                 |                |                                                             |
|---|-----------------|----------------|-------------------------------------------------------------|
| → | <b>Disabled</b> | <b>DEFAULT</b> | Disables CPU to go to C states when it's not 100% utilized. |
| → | <b>Enabled</b>  |                | Enables CPU to go to C states when it's not 100% utilized.  |

### → Power Limit 1

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

### → Power Limit 1 Time Window

Power Limit 1 Time Window value in second. The value may vary from 0 to 128.0, 0 = default value (28 sec for mobile and 8 sec for desktop). Defines time window which TDP value should be maintained.

### → Power Limit 2

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



**→ Tcc Activation Offset [Enabled]**

Use the **Tcc Activation** option to set Tcc activation temperature at which the Thermal Control Circuit must be activated. Tcc will be activated at: Tcc Activation Temp-Tcc Activation Offset. Tcc Activation Offset range is 0 to 63.

**→ Turbo Mode [Enabled]**

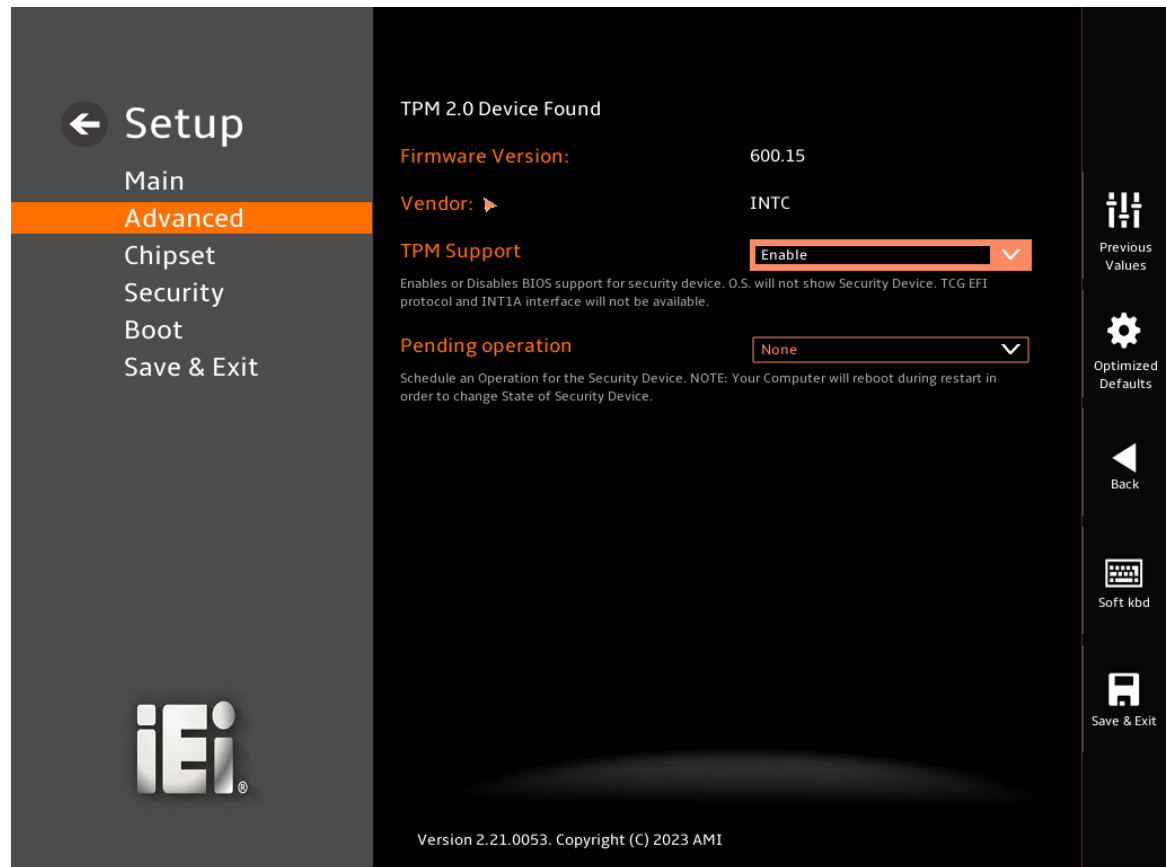
Use the **Turbo Mode** option to enable or disable Turbo Mode which requires Intel Speed Step or Intel Speed Shift to be available and enabled.

- |   |                 |                |                                |
|---|-----------------|----------------|--------------------------------|
| → | <b>Disabled</b> |                | Disables Turbo Mode Technology |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enables Turbo Mode Technology  |

## PPC2-Cxxx-EHL Series Panel PC

## 5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 8**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



## BIOS Menu 8: Trusted Computing

## ➔ TPM Support [Enable]

Use the **TPM Support** option to enable or disable BIOS support for security device.

- ➔ **Disable**                      TPM support is disabled.
- ➔ **Enable**                      **DEFAULT**      TPM support is enabled.

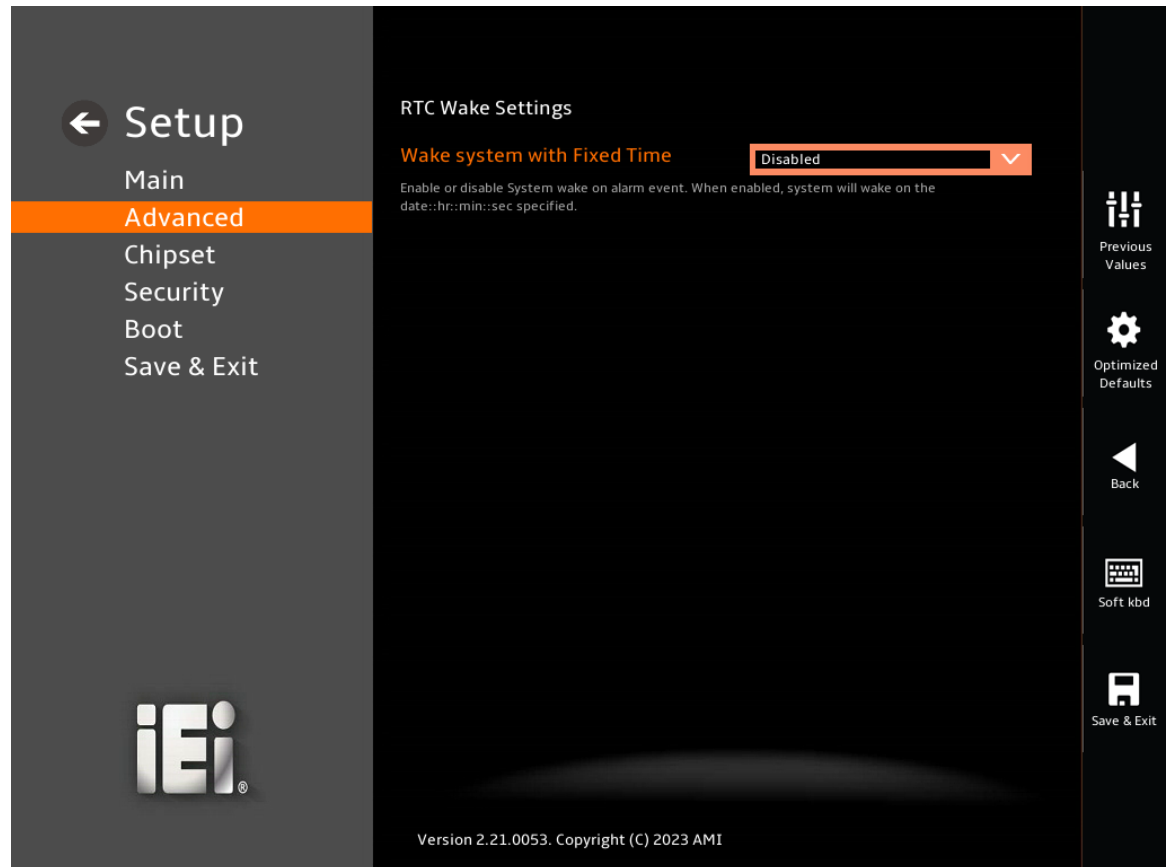
## ➔ Pending Operation [None]

Use the **Pending Operation** option to schedule an operation for the security device.

- |   |           |         |                               |
|---|-----------|---------|-------------------------------|
| ➔ | None      | DEFAULT | TPM information is previous.S |
| ➔ | TPM Clear |         | TPM information is cleared    |

### 5.3.4 RTC Wake Setting

The **RTC Wake Settings** menu (**BIOS Menu 9**) configures RTC wake event.



#### BIOS Menu 9: RTC Wake Settings

##### ➔ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

- |   |          |         |                                                        |
|---|----------|---------|--------------------------------------------------------|
| ➔ | Disabled | DEFAULT | The real time clock (RTC) cannot generate a wake event |
|---|----------|---------|--------------------------------------------------------|

## PPC2-Cxxx-EHL Series Panel PC

### ➔ Enabled

If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

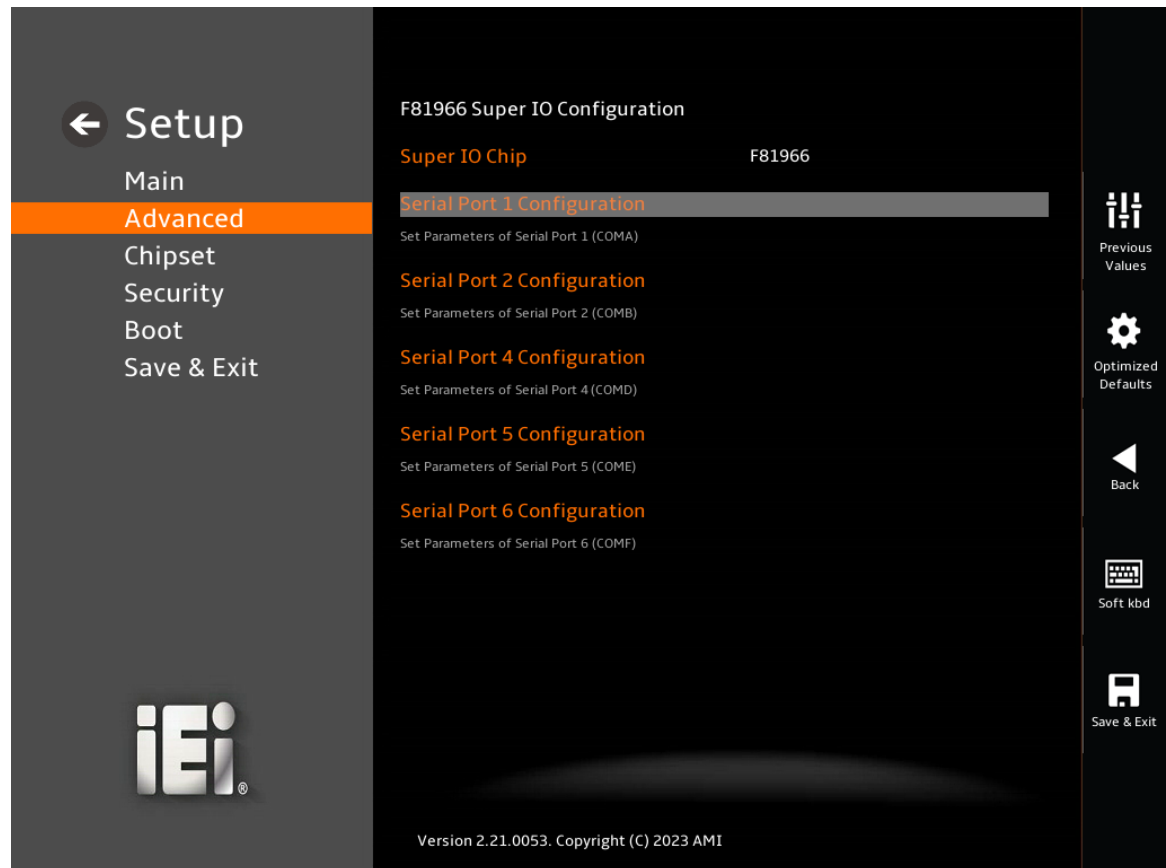
Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

### 5.3.5 F81966 Super IO Configuration

Use the **F81966 Super IO Configuration** menu (**BIOS Menu 10**) to set or change the configurations for serial ports.



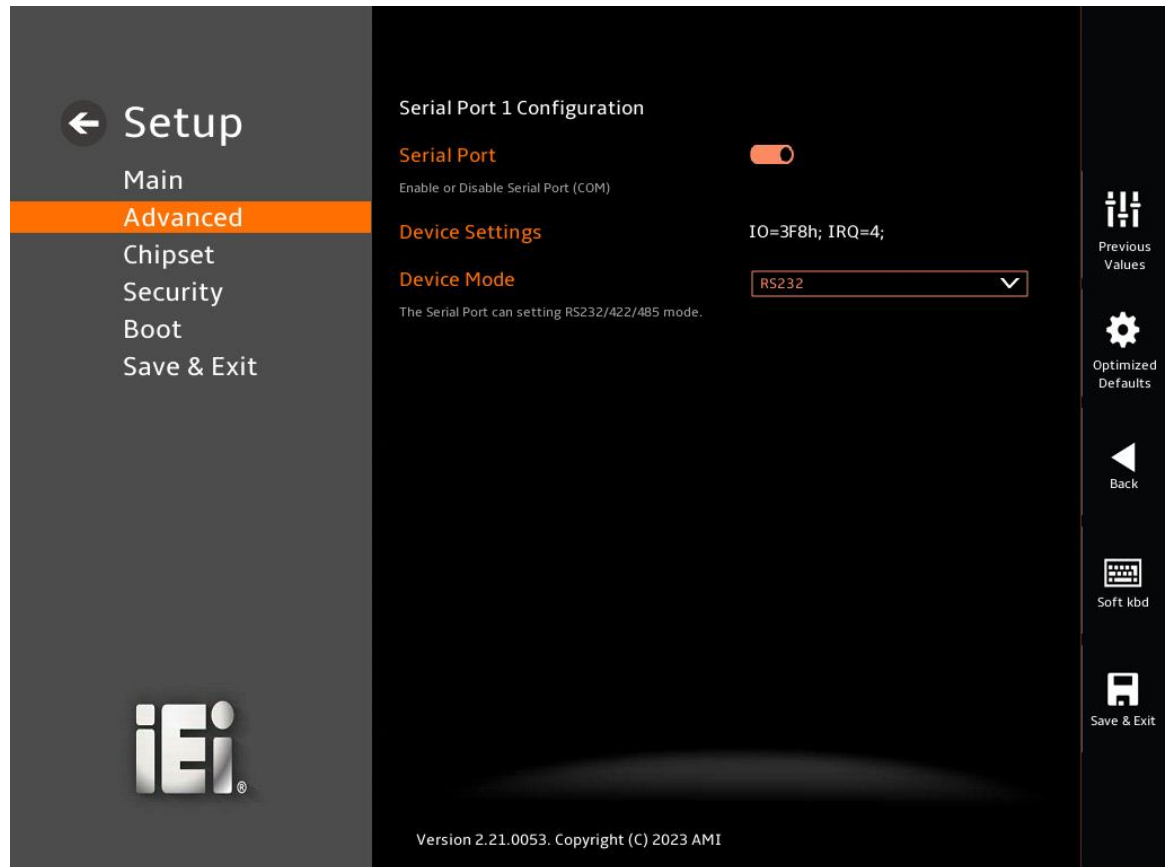
BIOS Menu 10: F81966 Super IO Configuration



## PPC2-Cxxx-EHL Series Panel PC

## 5.3.5.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 11**) to configure the serial port.



## BIOS Menu 11: Serial Port 1 Configuration Menu

## ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

## ➔ Device Settings

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔

IO=3F8h;  
 IRQ=4

Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

➔ **Device Mode [RS232]**

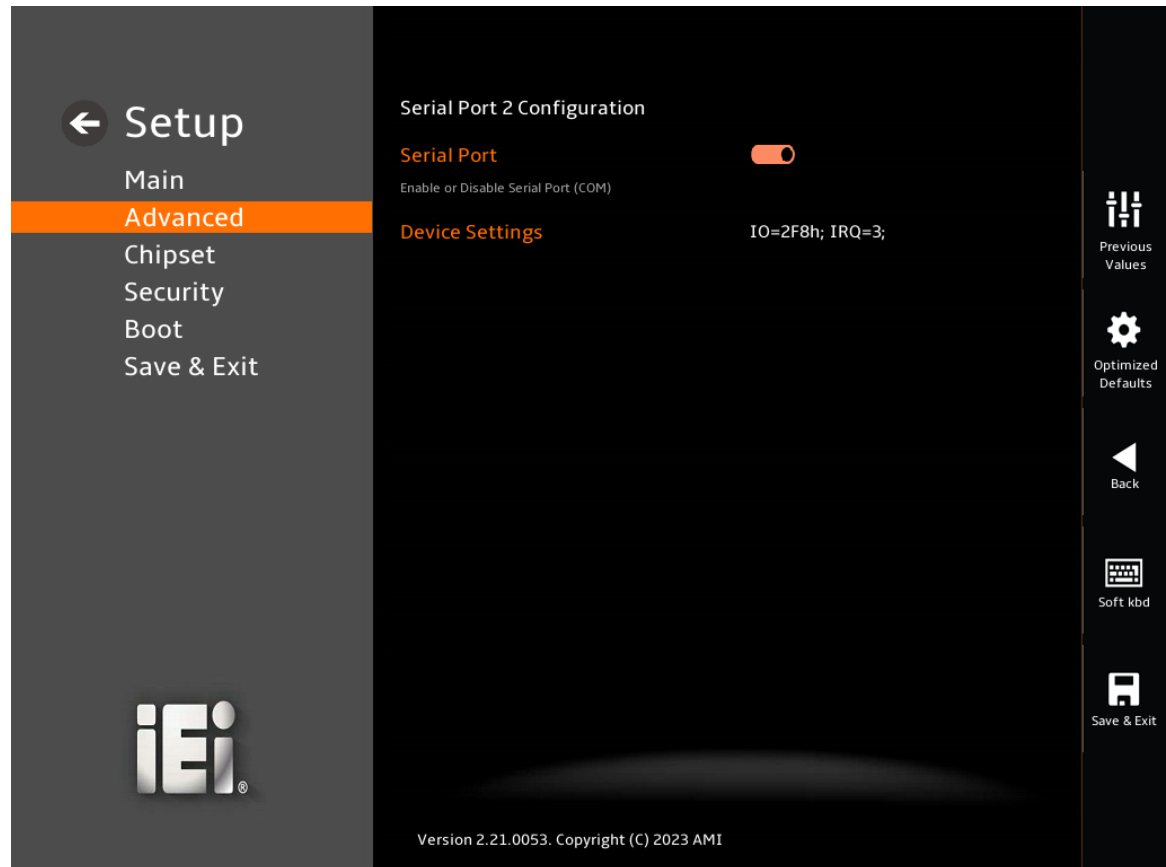
Use the **Device Mode** option to change the serial port mode.

|   |                            |                |                                |
|---|----------------------------|----------------|--------------------------------|
| ➔ | <b>RS232</b>               | <b>DEFAULT</b> | The serial port mode is RS-232 |
|   | <b>RS422 with Register</b> |                | The serial port mode is RS-422 |
|   | <b>RS485 with Register</b> |                | The serial port mode is RS-485 |

## PPC2-Cxxx-EHL Series Panel PC

## 5.3.5.2 Serial Port 2 Configuration

Use the **Serial Port 2 Configuration** menu (**BIOS Menu 12**) to configure the serial port.



## BIOS Menu 12: Serial Port 2 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

➔ **Device Settings**

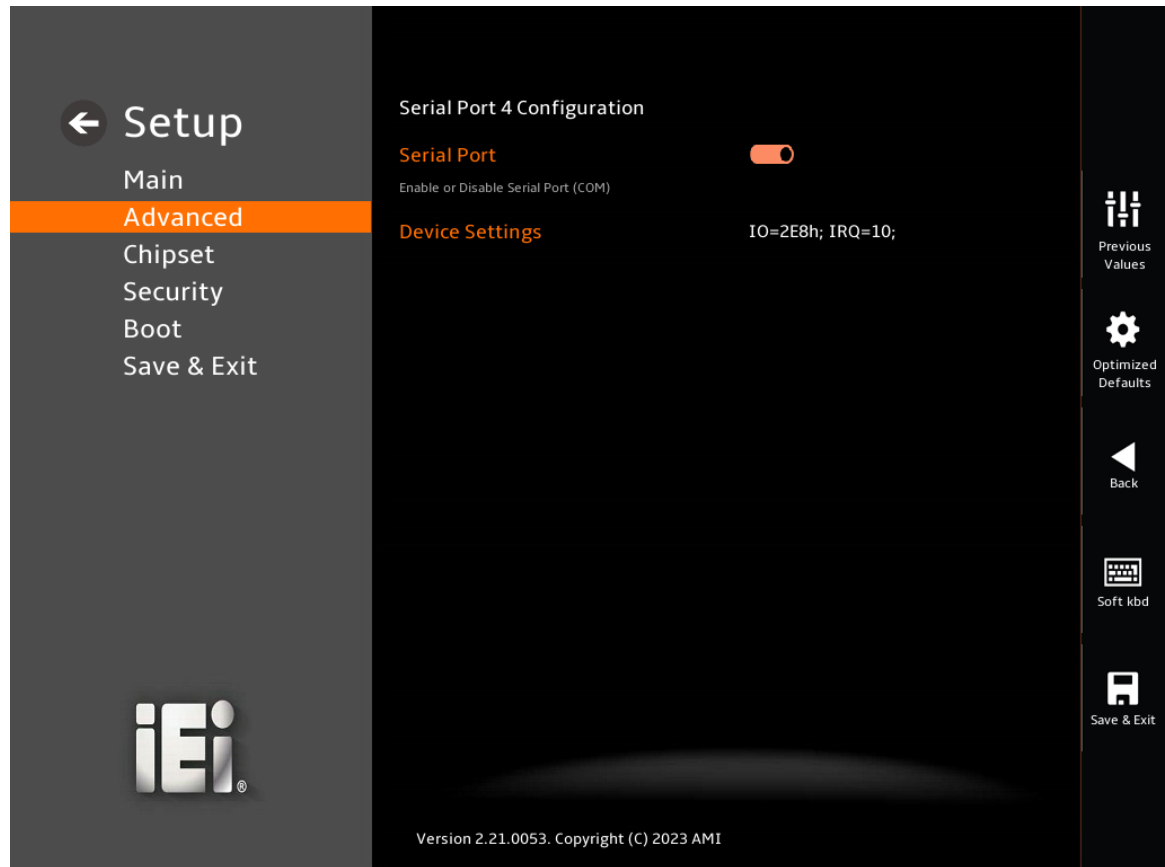
The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ IO=2F8h;  
IRQ=3

Serial Port I/O port address is 2F8h and the interrupt address is IRQ3

### 5.3.5.3 Serial Port 4 Configuration

Use the **Serial Port 4 Configuration** menu (**BIOS Menu 13**) to configure the serial port.



#### BIOS Menu 13: Serial Port 4 Configuration Menu

##### ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**      **DEFAULT**      Enable the serial port

## PPC2-Cxxx-EHL Series Panel PC

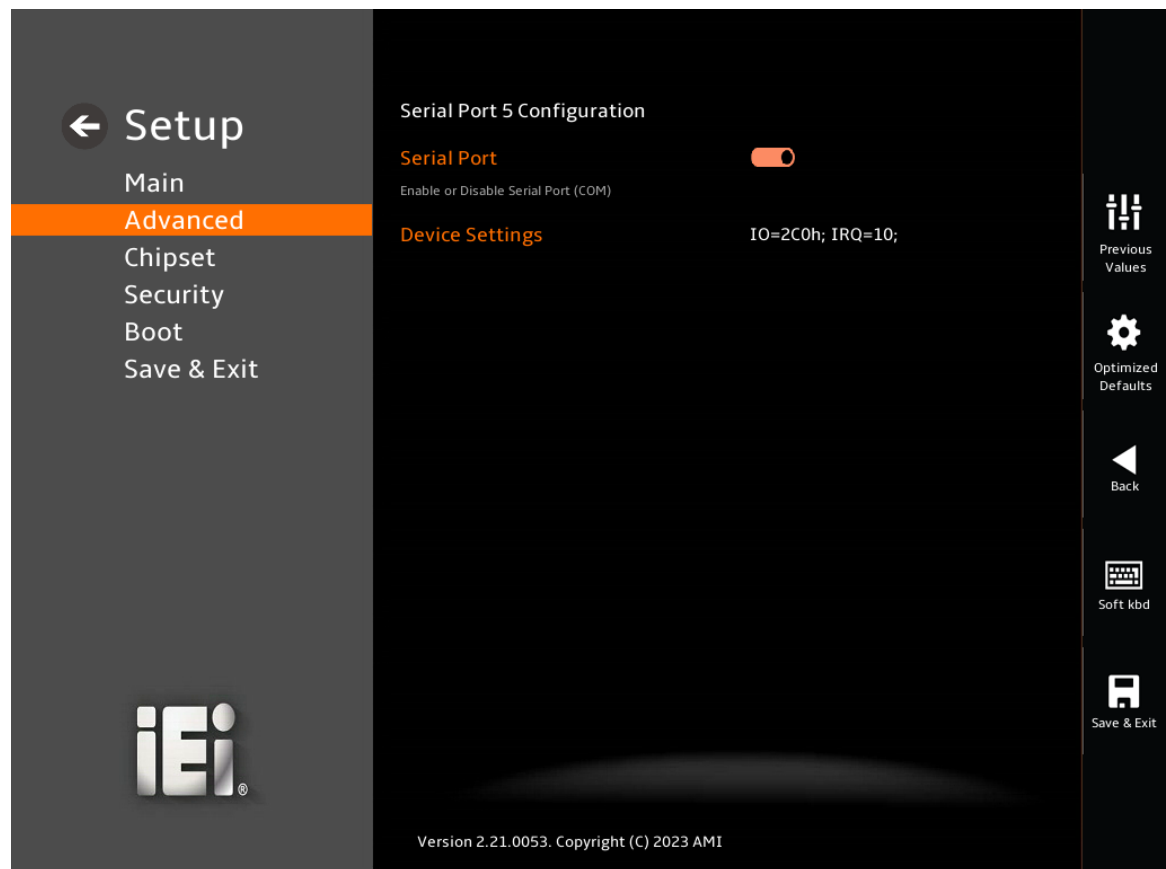
### → Device Settings

The **Device Settings** option shows the serial port IO port address and interrupt address.

- **IO=2E8h;**                      Serial Port I/O port address is 2E8h and the interrupt
- IRQ=10**                      address is IRQ10

### 5.3.5.4 Serial Port 5 Configuration

Use the **Serial Port 5 Configuration** menu (**BIOS Menu 14**) to configure the serial port.



### BIOS Menu 14: Serial Port 5 Configuration Menu

### → Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled**                      Disable the serial port



➔ **Enabled**      **DEFAULT**      Enable the serial port

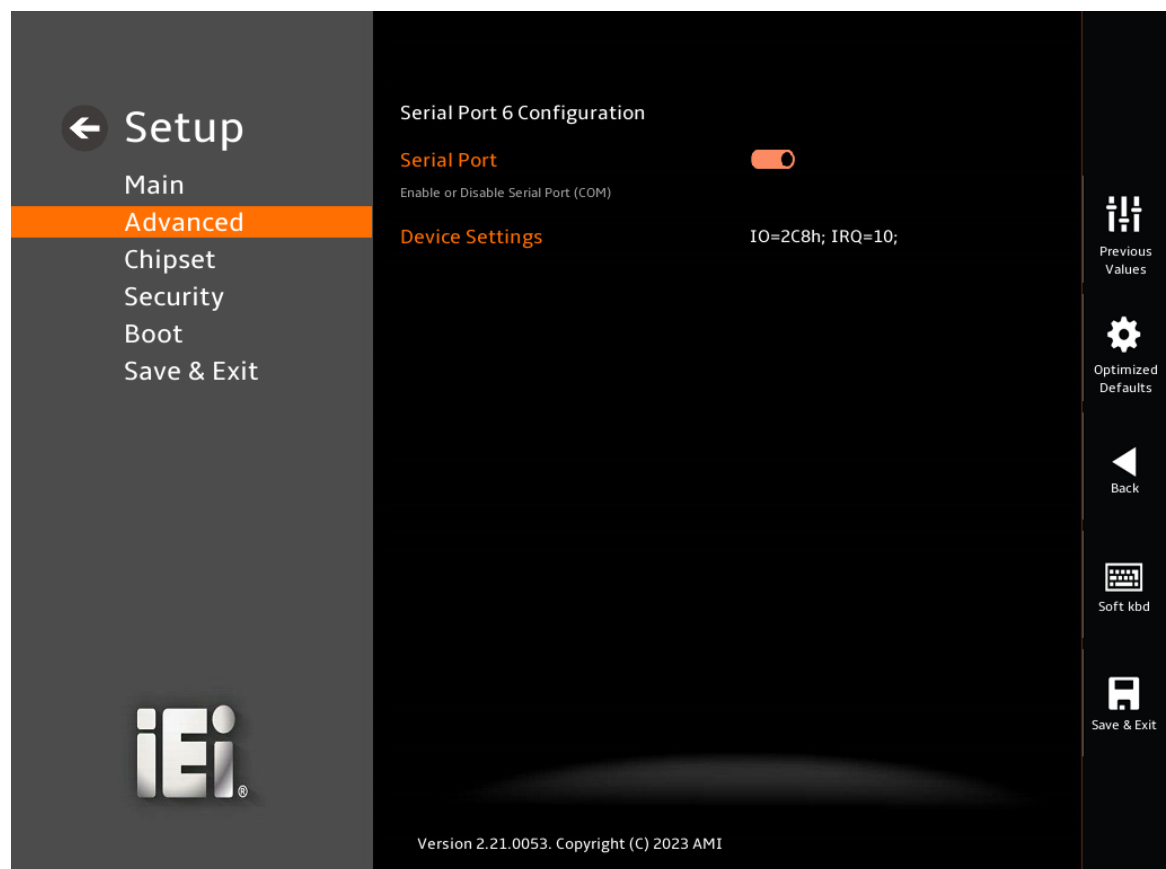
#### ➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔      **IO=2C0h;**      Serial Port I/O port address is 2C0h and the interrupt  
          **IRQ=10**      address is IRQ10

### 5.3.5.5 Serial Port 6 Configuration

Use the **Serial Port 6 Configuration** menu (**BIOS Menu 15**) to configure the serial port.



#### BIOS Menu 15: Serial Port 6 Configuration Menu

#### ➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

## PPC2-Cxxx-EHL Series Panel PC

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

### ➔ Device Settings

The **Device Settings** option shows the serial port IO port address and interrupt address.

- ➔ **IO=2C8h;**                      Serial Port I/O port address is 2C8h and the interrupt  
**IRQ=10**                      address is IRQ10

## 5.3.6 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 16**) contains the smart fan mode configuration submenu and shows the state of H/W real-time operating temperature, fan speeds and system voltages.



**BIOS Menu 16: H/W Monitor**

**➔ PC Health Status**

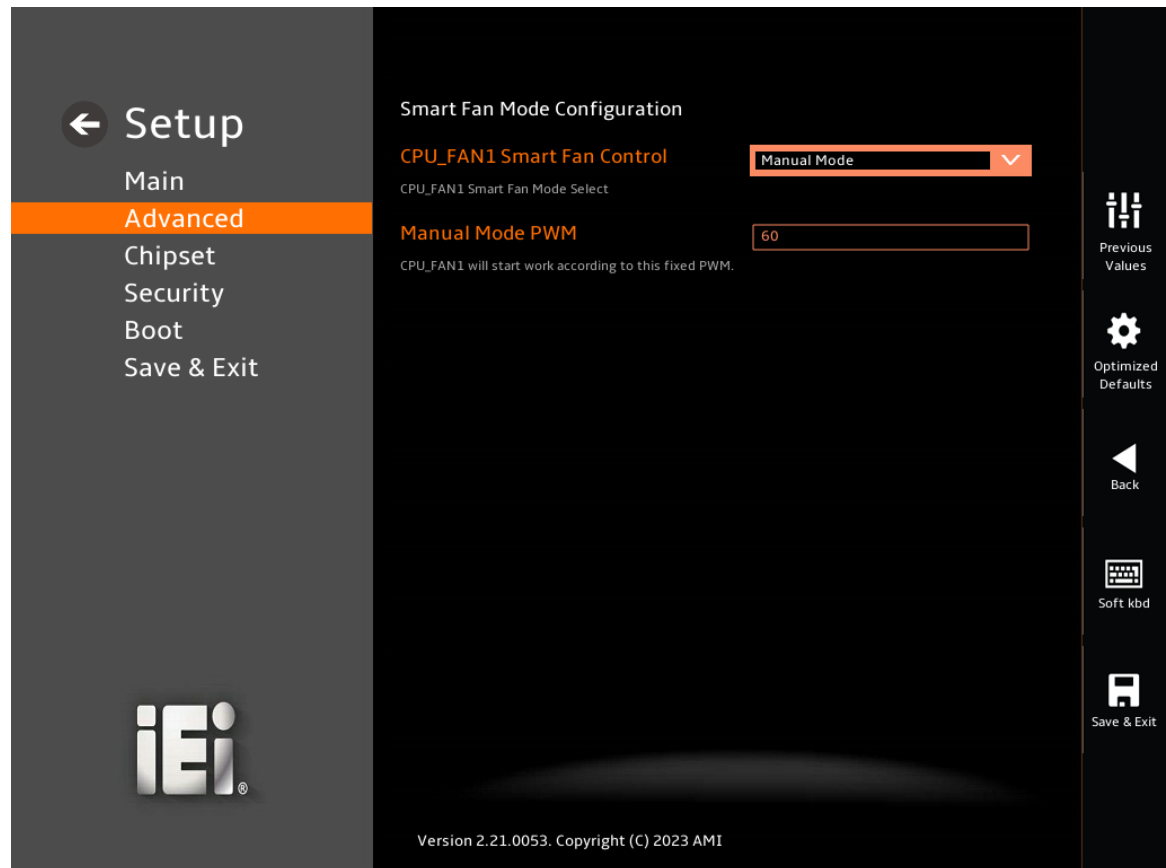
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - Fan1 Speed
- Voltages:
  - CPU\_CORE
  - +12V
  - DDR
  - +5VSB
  - +3.3VSB

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## 5.3.6.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 17**) to configure the CPU/system fan start/off temperature and control mode.



## BIOS Menu 17: Smart Fan Mode Configuration

## → CPU\_FAN1 Smart Fan Control [Manual Mode]

Use the **Smart Fan Control** option to configure the CPU Smart Fan.

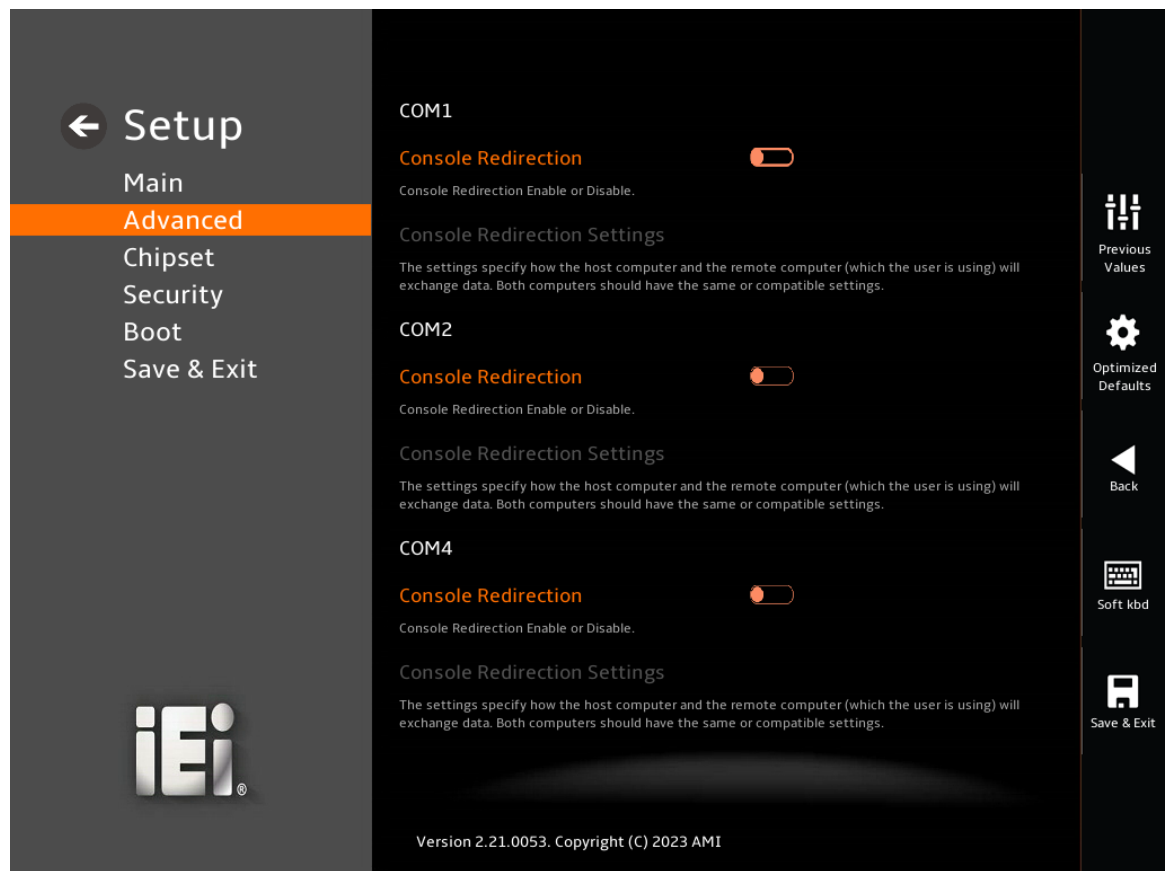
- **Manual Mode**    **DEFAULT**    The fan spins at the speed set in Manual Mode settings.
- **Auto Mode**                      The fan adjusts its speed using Auto Mode settings.

**→ Manual Mode PWM**

Use the **Manual Mode PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

**5.3.7 Serial Port Console Redirection**

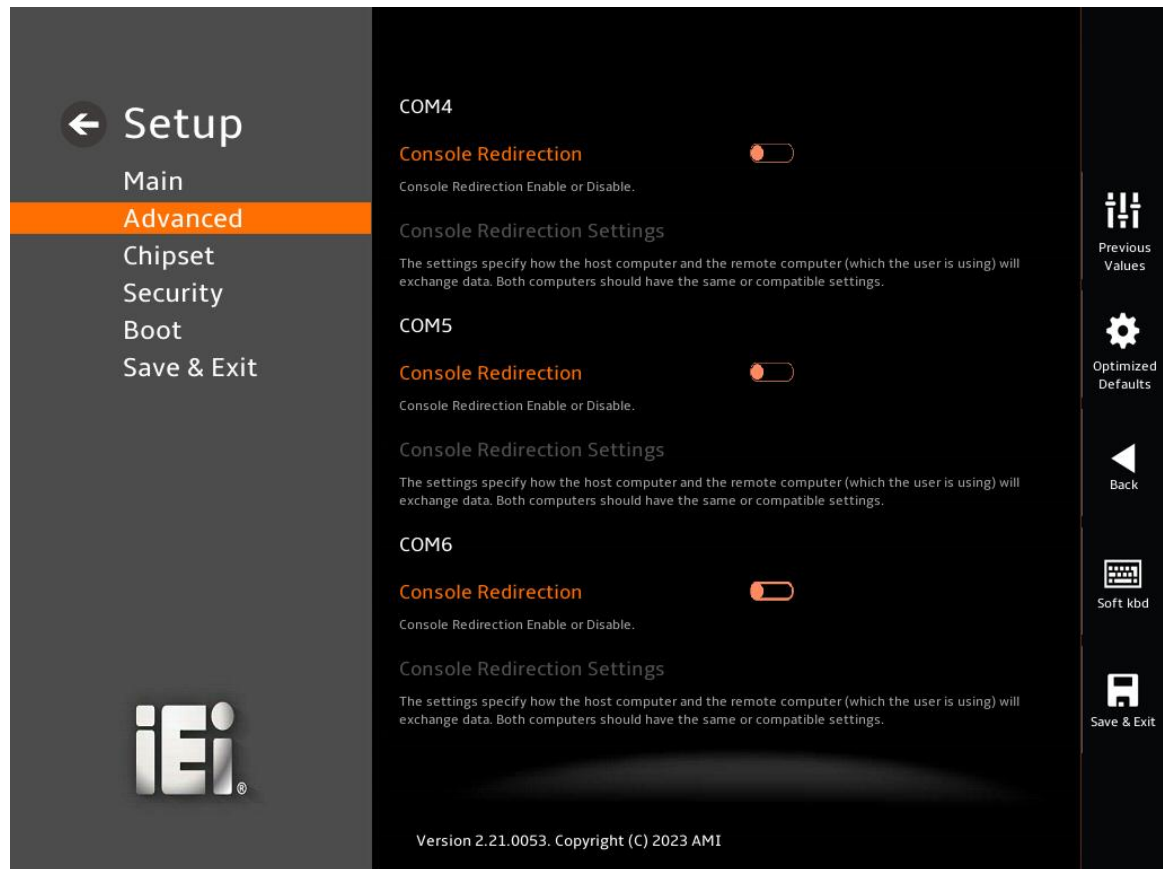
The **Serial Port Console Redirection** menu (**BIOS Menu 18 & BIOS Menu 19**) allows the console redirection options to be configured. Console Redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



**BIOS Menu 18: Serial Port Console Redirection (1/2)**



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## BIOS Menu 19: Serial Port Console Redirection (2/2)

## → Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

- **Disabled**      **DEFAULT**      Disabled the console redirection function
- **Enabled**                      Enabled the console redirection function

The **Console Redirection Settings** submenu will be available when the **Console Redirection** option is enabled.

## 5.3.7.1 Console Redirection Settings

The following options are available in the **Console Redirection Settings** submenu (**BIOS Menu 20**) when the **COM Console Redirection** (for COM1 to COM6) option is enabled.



## BIOS Menu 20: COM Console Redirection Settings

### → Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type.

- |   |                |                |                                     |
|---|----------------|----------------|-------------------------------------|
| → | <b>VT100</b>   |                | The target terminal type is VT100   |
| → | <b>VT100+</b>  |                | The target terminal type is VT100+  |
| → | <b>VT-UTF8</b> |                | The target terminal type is VT-UTF8 |
| → | <b>ANSI</b>    | <b>DEFAULT</b> | The target terminal type is ANSI    |

### → Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match on the other side. Long or noisy lines may require lower speeds.

- |   |             |                                                  |
|---|-------------|--------------------------------------------------|
| → | <b>9600</b> | Sets the serial port transmission speed at 9600. |
|---|-------------|--------------------------------------------------|

## PPC2-Cxxx-EHL Series Panel PC

- ➔ **19200** Sets the serial port transmission speed at 19200.
- ➔ **38400** Sets the serial port transmission speed at 38400.
- ➔ **57600** Sets the serial port transmission speed at 57600.
- ➔ **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

- ➔ **7** Sets the data bits at 7.
- ➔ **8** **DEFAULT** Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- ➔ **None** **DEFAULT** No parity bit is sent with the data bits.
- ➔ **Even** The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- ➔ **Mark** The parity bit is always 1. This option does not allow for error detection.
- ➔ **Space** The parity bit is always 0. This option does not allow for error detection.

➔ **Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- ➔ **1** **DEFAULT** Sets the number of stop bits at 1.
- ➔ **2** Sets the number of stop bits at 2.

### 5.3.8 NVMe Configuration

Use the **NVMe Configuration (BIOS Menu 21)** menu to display the NVMe controller and device information.



#### BIOS Menu 21: NVMe Configuration

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 22**) to access the PCH IO and System Agent (SA) configuration menus.



### WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

## PPC2-Cxxx-EHL Series Panel PC

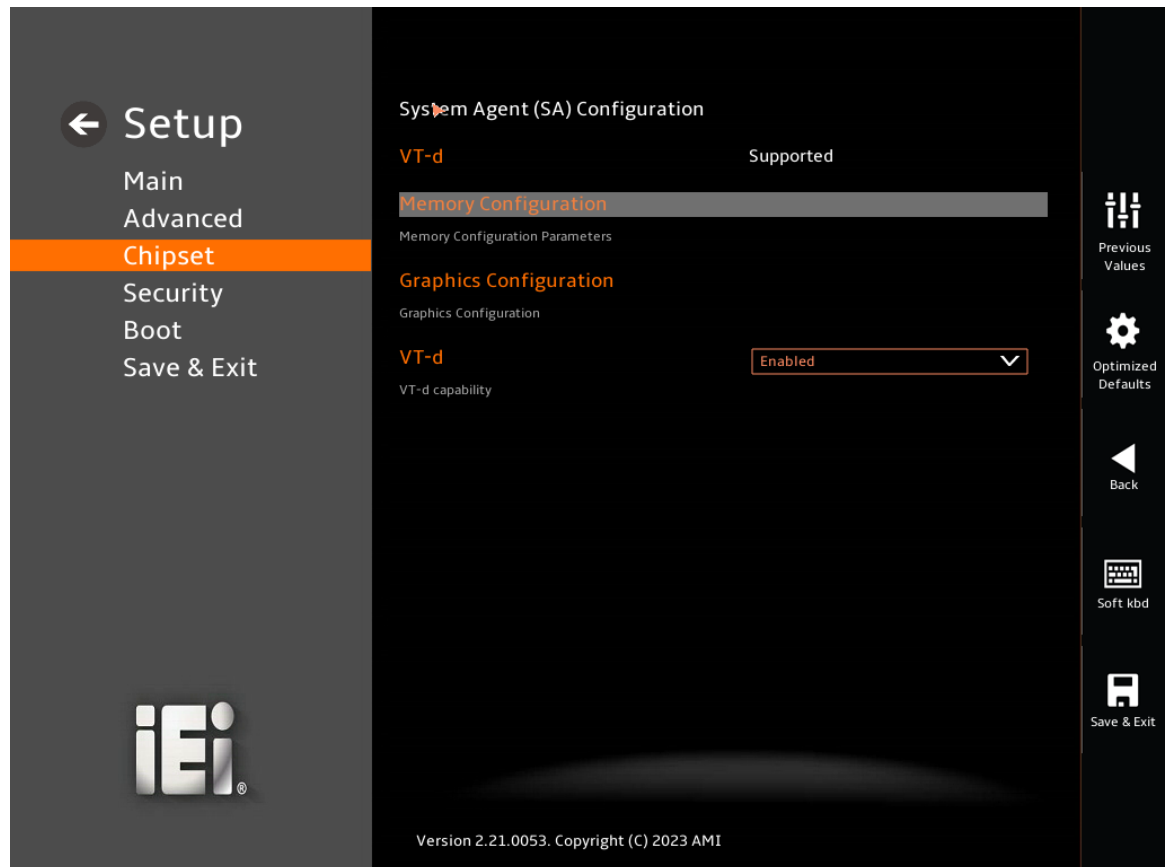


BIOS Menu 22: Chipset



### 5.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 23**) to configure the System Agent (SA) parameters.



#### BIOS Menu 23: System Agent (SA) Configuration

##### → VT-d [Enabled]

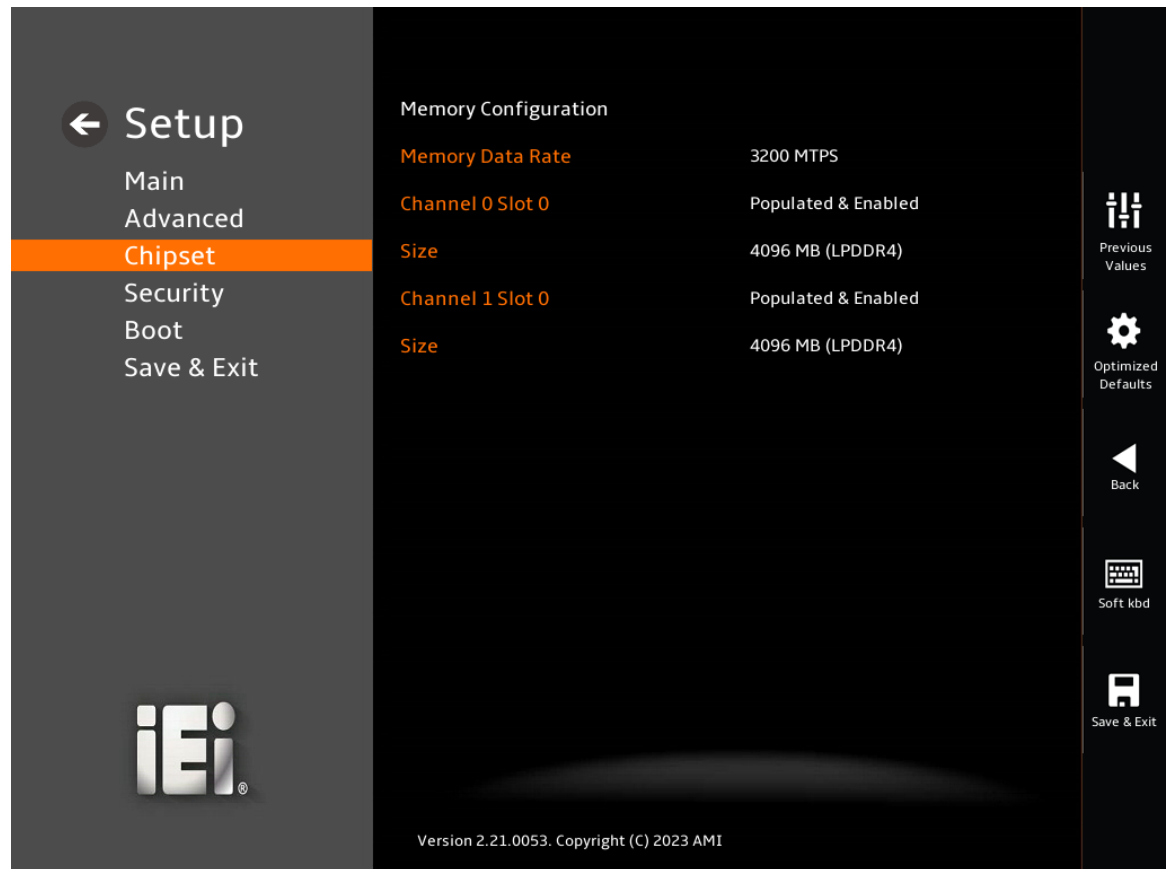
Use the **VT-d** option to enable or disable the VT-d capability.

- |   |                 |                |                             |
|---|-----------------|----------------|-----------------------------|
| → | <b>Disabled</b> |                | Disable the VT-d capability |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enable the VT-d capability  |

## PPC2-Cxxx-EHL Series Panel PC

## 5.4.1.1 Memory Configuration

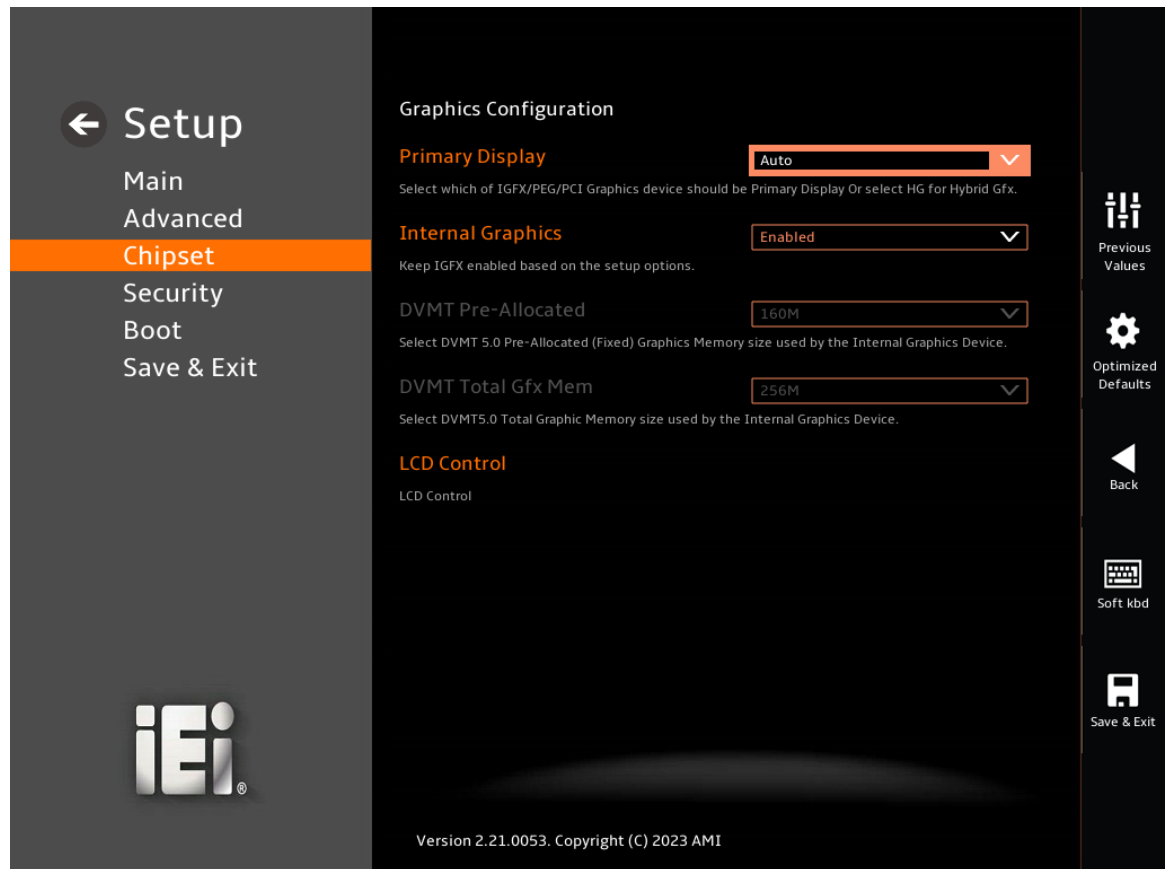
Use the **Memory Configuration** submenu (**BIOS Menu 24**) to view memory information.



BIOS Menu 24: Memory Configuration

## 5.4.1.2 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 25**) menu to configure the video device connected to the system.



### BIOS Menu 25: Graphics Configuration

#### → Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto                      **Default**
- IGFX
- PEG
- PCI
- SG

#### → Internal Graphics [Enabled]

Use the **Internal Graphics** option to configure whether to keep IGFX enabled. If user wants to support dual display by internal graphics and external graphics, this Internal Graphics

## PPC2-Cxxx-EHL Series Panel PC

option should be set to Enabled and the above Primary Display option should be set to IGFX.

- |   |                 |                |                |
|---|-----------------|----------------|----------------|
| ➔ | <b>Auto</b>     |                | Auto mode      |
| ➔ | <b>Disabled</b> |                | Disables IGFX. |
| ➔ | <b>Enabled</b>  | <b>Default</b> | Enables IGFX.  |

### ➔ LCD Control



### BIOS Menu 26: LCD Control

#### ➔ Primary IGFX Boot Display

Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

- ➔ **VBIOS Default**      **DEFAULT**
- ➔ **EFP**
- ➔ **LFP**
- ➔ **EFP3**
- ➔ **EFP2**
- ➔ **EFP4**

## ➔ **LCD Panel Type**

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

- ➔ **VBIOS Default**      **DEFAULT**
- ➔ **640x480**    **LVDS**
- ➔ **800x600**    **LVDS**
- ➔ **1024x768**   **LVDS**
- ➔ **1280x1024**   **LVDS**
- ➔ **1400x1050**   **LVDS1**
- ➔ **1400x1050**   **LVDS2**
- ➔ **1600x1200**   **LVDS**
- ➔ **1280x768**   **LVDS**
- ➔ **1680x1050**   **LVDS**

## ➔ **Backlight Control**

Use the LVDS Backlight PWM Mode option to specify a PWM mode for LVDS backlight control.

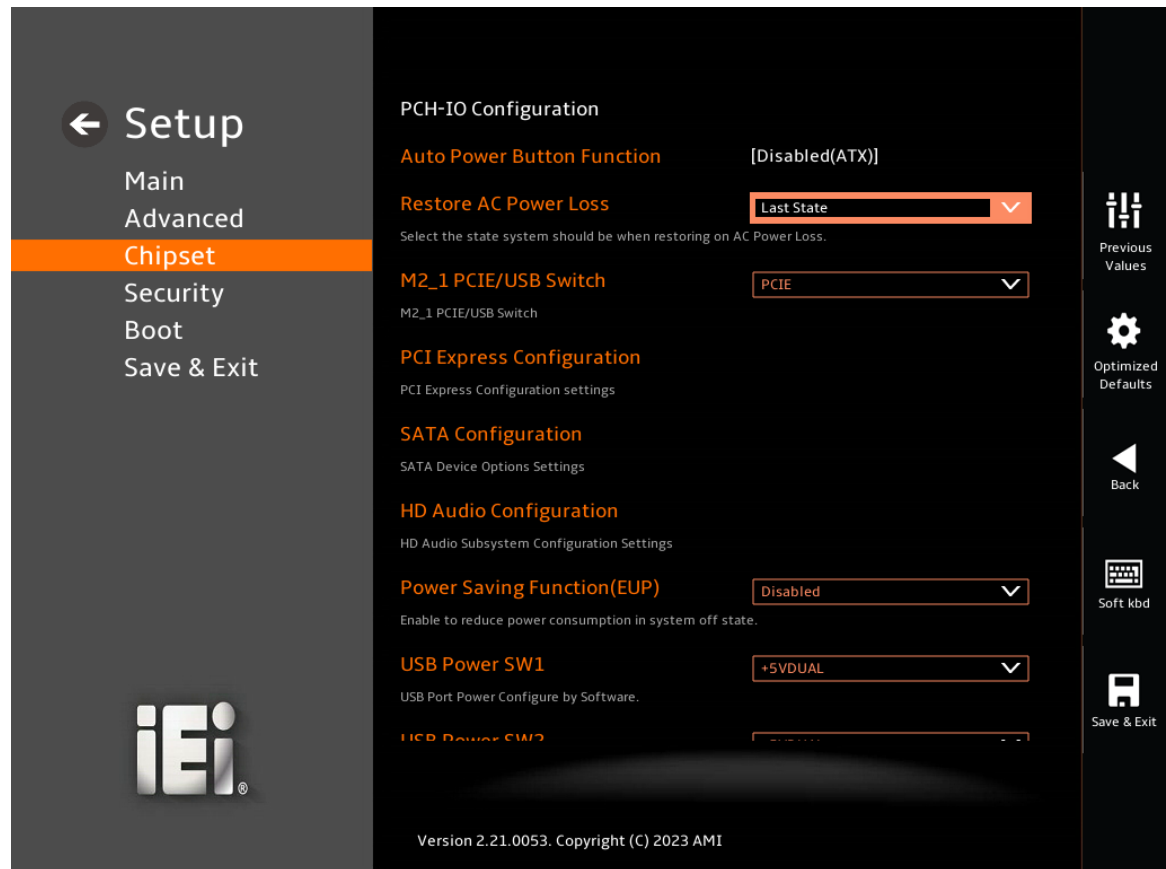
- ➔ **Invert**      **DEFAULT**    Set to invert LVDS Backlight.
- ➔ **Normal**                   Set to normal LVDS Backlight.



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## 5.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 27**) to configure the PCH parameters.



## BIOS Menu 27: PCH-IO Configuration

➔ **Auto Power Button Function [Disabled (AT)]**

Use the **Auto Power Button Function** BIOS option to show the power mode state. Use the **J\_ATX\_AT1** to switch the AT/ATX power mode.

- |   |                       |                |                               |
|---|-----------------------|----------------|-------------------------------|
| ➔ | <b>Enabled (AT)</b>   | <b>DEFAULT</b> | The system power mode is AT.  |
| ➔ | <b>Disabled (ATX)</b> |                | The system power mode is ATX. |

### → Restore AC Power Loss [Last State]

Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system when the power mode is ATX.

- **Power Off**                      The system remains turned off
- **Power On**                      The system turns on
- **Last State      DEFAULT**      The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

### → M2\_1 PCIE/USB Switch [PCIE]

Use the **M2\_1 PCIE/USB Switch** to select the M.2 A key's signal.

- **PCIE              DEFAULT**      Set the M.2 A key signal to PCle.
- **USB**                      Set the M.2 A key signal to USB.

### → Power Saving Function (EUP) [Disabled]

Use the **Power Saving Function (EUP)** BIOS option to enable or disable the power saving function.

- **Disabled      DEFAULT**      Power saving function is disabled.
- **Enabled**                      Power saving function is enabled. It will reduce power consumption when the system is off.

### → USB Power SW1 [+5V DUAL]

Use the **USB Power SW1** BIOS option to configure the USB power source for the corresponding USB connectors.

- **+5V DUAL      DEFAULT**      Sets the USB power source to +5V dual
- **+5V**                      Sets the USB power source to +5V

### → USB Power SW2 [+5V DUAL]

Use the **USB Power SW2** BIOS option to configure the USB power source for the corresponding USB connectors.

## PPC2-Cxxx-EHL Series Panel PC

- ➔ **+5V DUAL**    **DEFAULT**    Sets the USB power source to +5V dual
- ➔ **+5V**                                Sets the USB power source to +5V

### 5.4.2.1 PCI Express Configuration

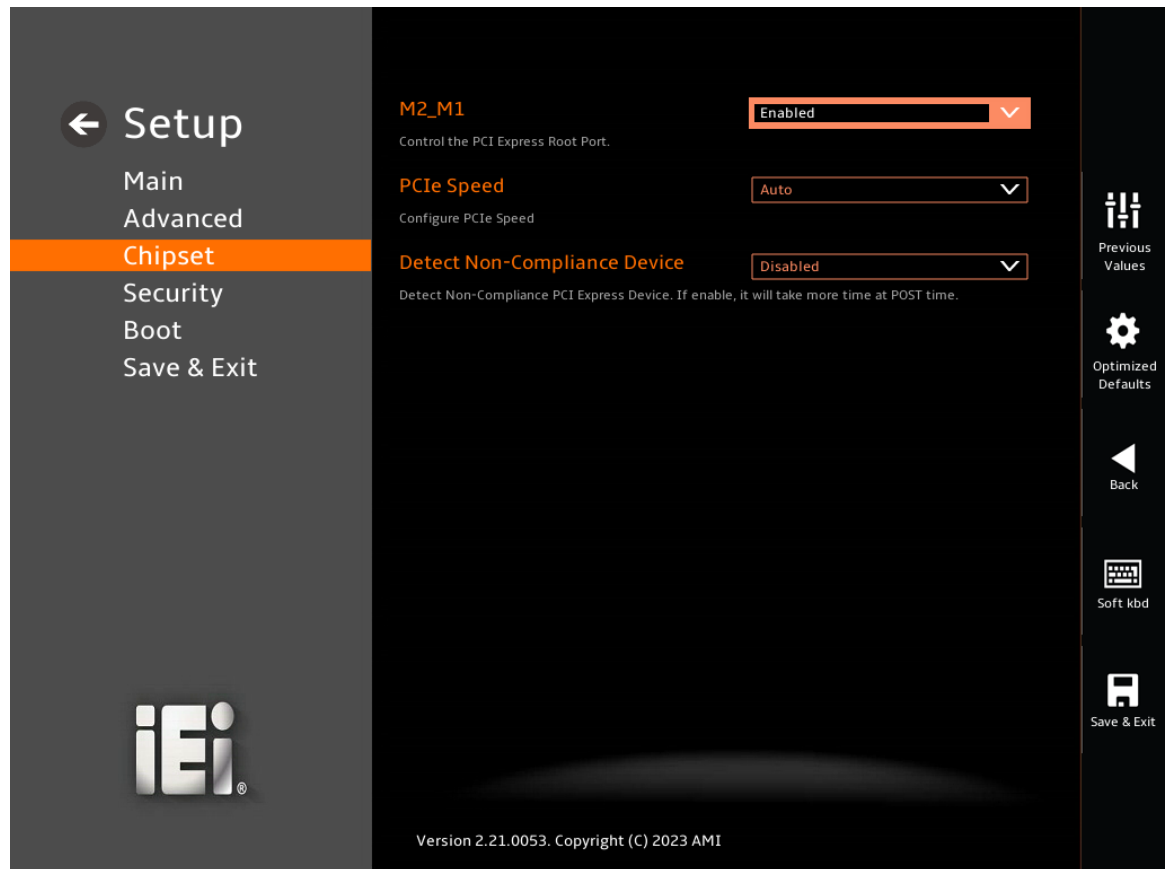
Use the **PCI Express Configuration** submenu (**BIOS Menu 28**) to configure the PCI Express slots.



### BIOS Menu 28: HD Audio Configuration

#### 5.4.2.1.1 PCIe Root Port Setting

Use the **M2\_1 / M2\_M1 / M2\_1 (for Card)** submenu (**BIOS Menu 29**) to configure the PCIe Root Port Setting.



### BIOS Menu 29: PCIe Slot Configuration Submenu

#### → PCIe Speed [Auto]

Use the **PCIe Speed** option to specify the PCI Express port speed. Configuration options are listed below.

- |   |             |                |                               |
|---|-------------|----------------|-------------------------------|
| → | <b>Auto</b> | <b>DEFAULT</b> | Auto mode.                    |
| → | <b>Gen1</b> |                | Configure PCIe Speed to Gen1. |
| → | <b>Gen2</b> |                | Configure PCIe Speed to Gen2. |
| → | <b>Gen3</b> |                | Configure PCIe Speed to Gen3. |

#### → Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to configure whether to detect if a non-compliance PCI Express device is connected to the PCI Express port.

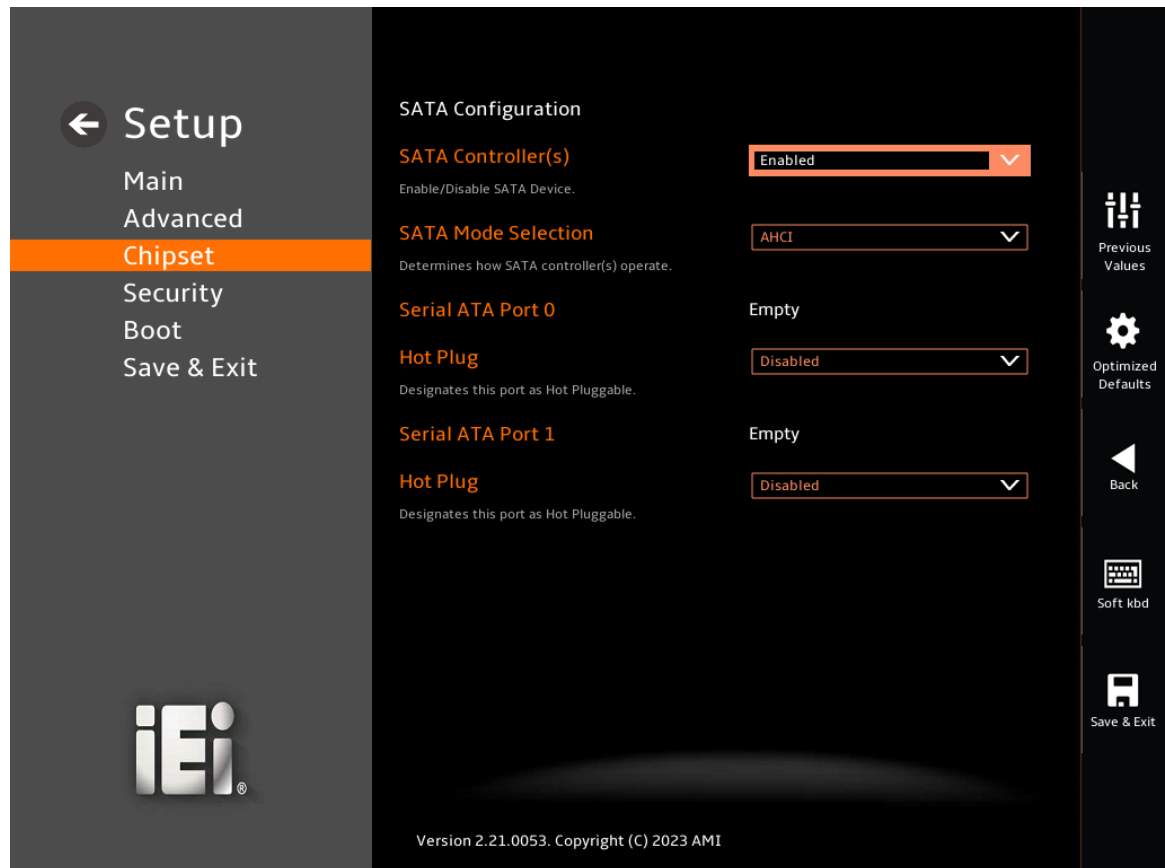
## PPC2-Cxxx-EHL Series Panel PC

- |   |                 |                |                                                                                            |
|---|-----------------|----------------|--------------------------------------------------------------------------------------------|
| ➔ | <b>Disabled</b> | <b>DEFAULT</b> | Do not detect if a non-compliance PCI Express device is connected to the PCI Express port. |
| ➔ | <b>Enabled</b>  |                | Detect if a non-compliance PCI Express device is connected to the PCI Express port.        |



### 5.4.2.2 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 30**) to change and/or set the configuration of the SATA devices installed in the system.



#### BIOS Menu 30: SATA Configuration

##### ➔ SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to configure the SATA controller(s).

- ➔ **Enabled**      **DEFAULT**      Enables the on-board SATA controller(s).
- ➔ **Disabled**                      Disables the on-board SATA controller(s).

##### ➔ SATA Mode Selection [AHCI]

Use the **SATA Mode Selection** option to determine how the SATA devices operate.

## PPC2-Cxxx-EHL Series Panel PC

- |   |                                                                        |                |                                                                                              |
|---|------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------|
| ➔ | <b>AHCI</b>                                                            | <b>DEFAULT</b> | Configures SATA devices as AHCI device.                                                      |
| ➔ | <b>Intel RST Premium<br/>With Intel Optane<br/>System Acceleration</b> |                | Configures SATA devices to the Intel RST Premium With Intel Optane System Acceleration mode. |

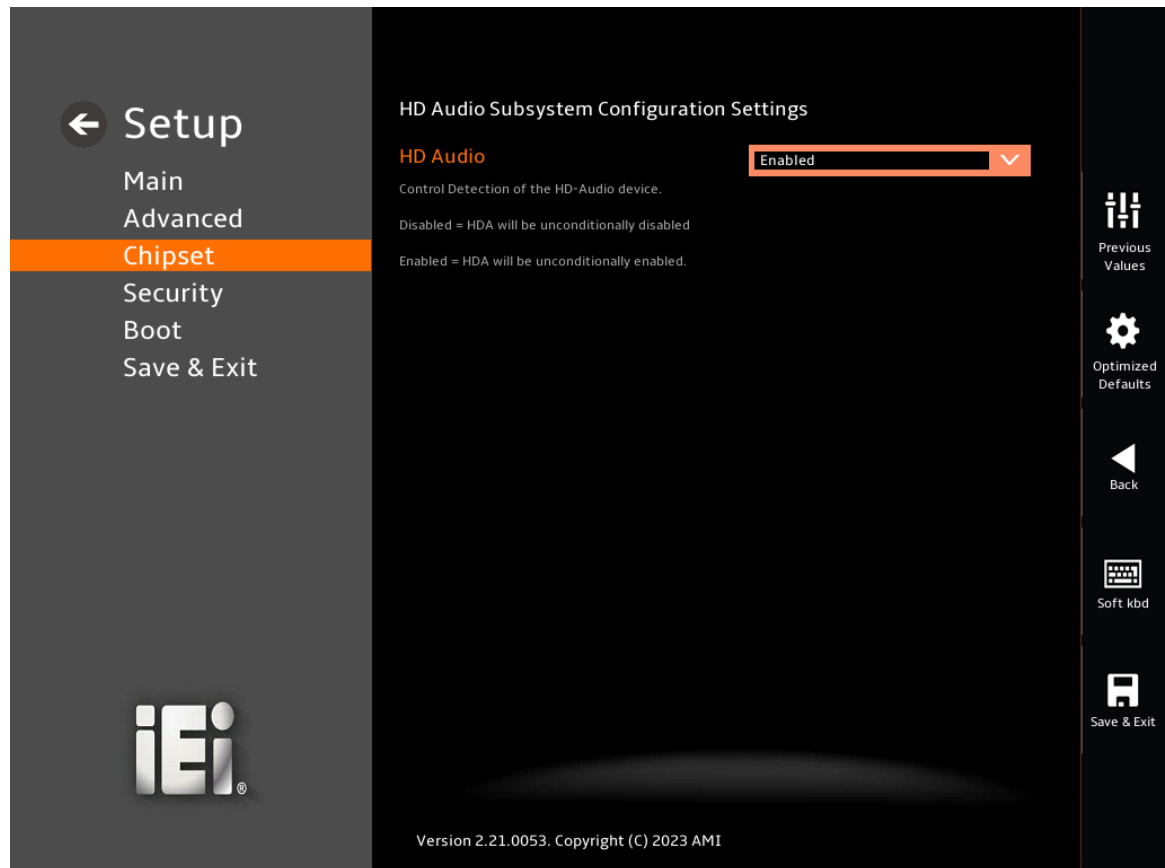
➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to designate the correspondent port as hot-pluggable.

- |   |                 |                |                                                       |
|---|-----------------|----------------|-------------------------------------------------------|
| ➔ | <b>Disabled</b> | <b>DEFAULT</b> | Disables the hot-pluggable function of the SATA port. |
| ➔ | <b>Enabled</b>  |                | Designates the SATA port as hot-pluggable.            |

### 5.4.2.3 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 31**) to configure the PCH Azalia settings.



### BIOS Menu 31: HD Audio Configuration

#### → HD Audio [Enabled]

Use the **HD Audio** option to enable or disable the High Definition Audio controller.

- **Disabled**                      The onboard High Definition Audio controller is disabled.
- **Enabled    DEFAULT**        The onboard High Definition Audio controller is enabled.

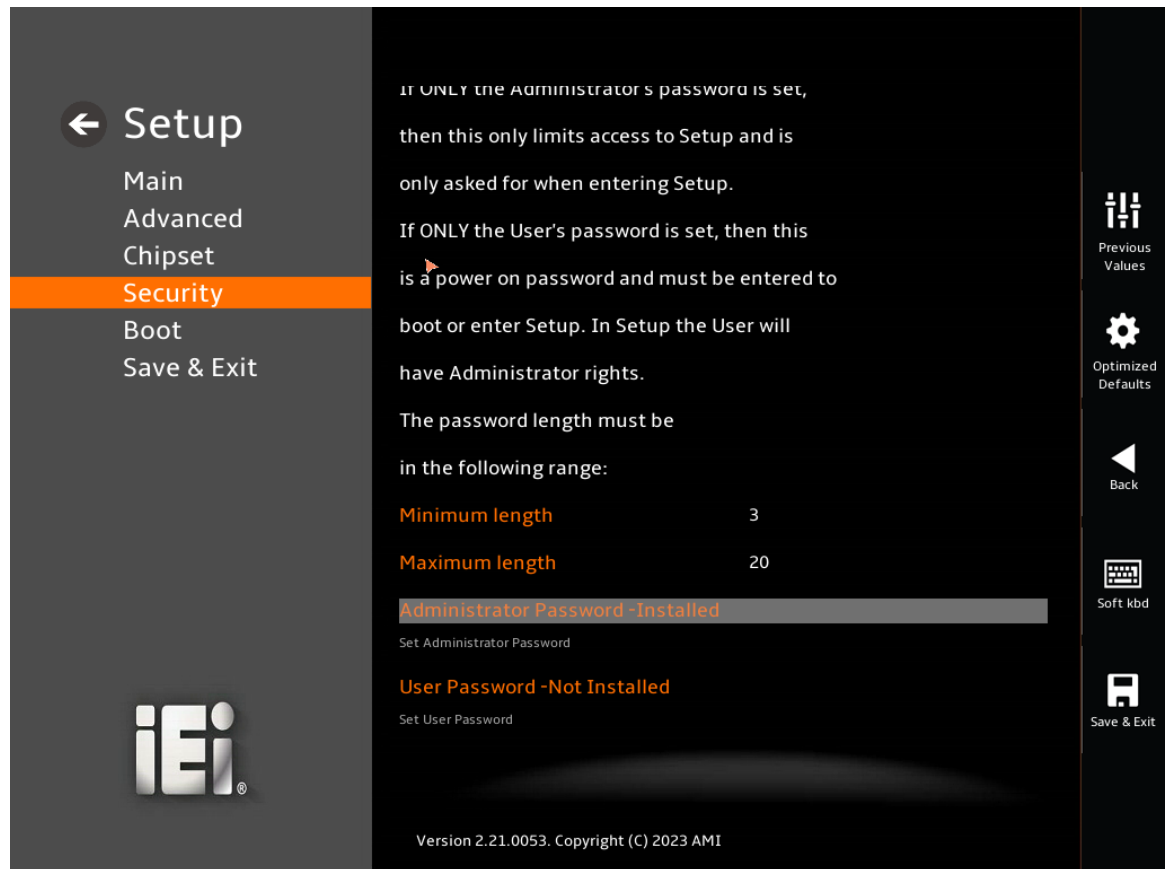
## PPC2-Cxxx-EHL Series Panel PC

## 5.5 Security

Use the **Security** menu (**BIOS Menu 32 & BIOS Menu 33**) to set system and user passwords.



### BIOS Menu 32: Security (1/2)



### BIOS Menu 33: Security (2/2)

#### ➔ Administrator Password

Use the **Administrator Password** to set or change an administrator password.

#### ➔ User Password

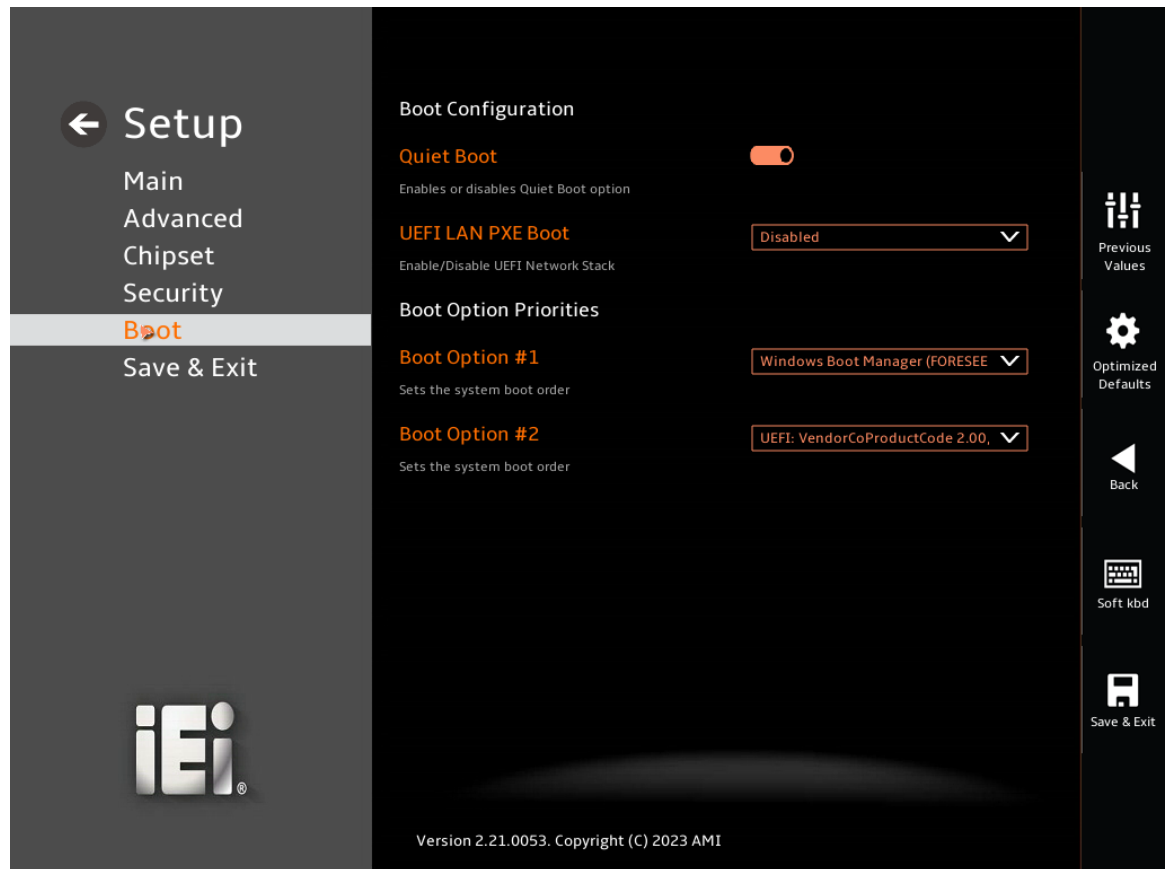
Use the **User Password** to set or change a user password.



## PPC2-Cxxx-EHL Series Panel PC

## 5.6 Boot

Use the **Boot** menu (BIOS Menu 34) to configure system boot options.



## BIOS Menu 34: Boot

## 5.6.1 Boot Configuration

## ➔ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- |   |                 |                |                                             |
|---|-----------------|----------------|---------------------------------------------|
| ➔ | <b>Disabled</b> |                | Normal POST messages displayed              |
| ➔ | <b>Enabled</b>  | <b>DEFAULT</b> | OEM Logo displayed instead of POST messages |

**→ UEFI LAN PXE Boot [Disabled]**

Use the **UEFI LAN PXE Boot** option to enable or disable boot option for legacy network devices.

- Disabled      DEFAULT      Disabled the lan pxe**
- Enabled                      Enable the lan pxe**

**5.6.2 Boot Option Priorities**

Use the Boot Option # N to choose the system boots from the peripherals you selected. The following Boot Options are listed as an example.

**→ Boot Option #1**

Sets the system boot order **ADATA SP580** as the first priority.

- Windows Boot Manager (P1: ADATA SSD SP580 240GB)**
- Disabled**

**→ Boot Option #2**

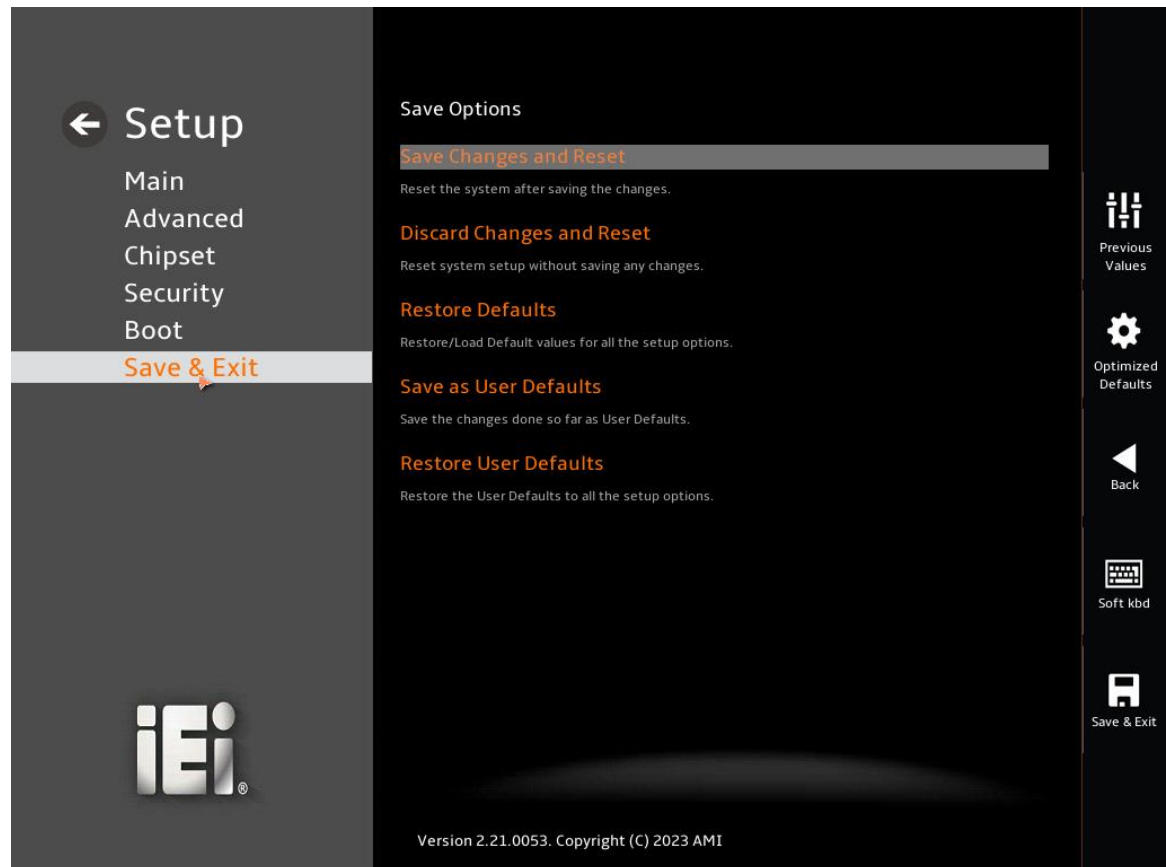
Sets the system boot order **USB Partition 1** as the second priority.

- UEFI: USB, Partition 1**
- Disabled**

## PPC2-Cxxx-EHL Series Panel PC

## 5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 35**) to load default BIOS values, optimal failsafe values and to save configuration changes.



### BIOS Menu 35: Save & Exit

#### ➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

#### ➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

**6**

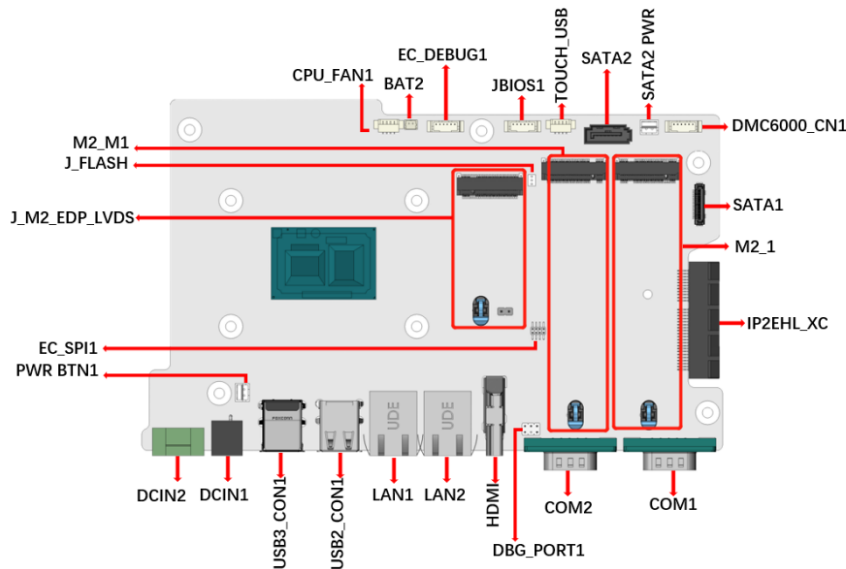
# Interface Connectors

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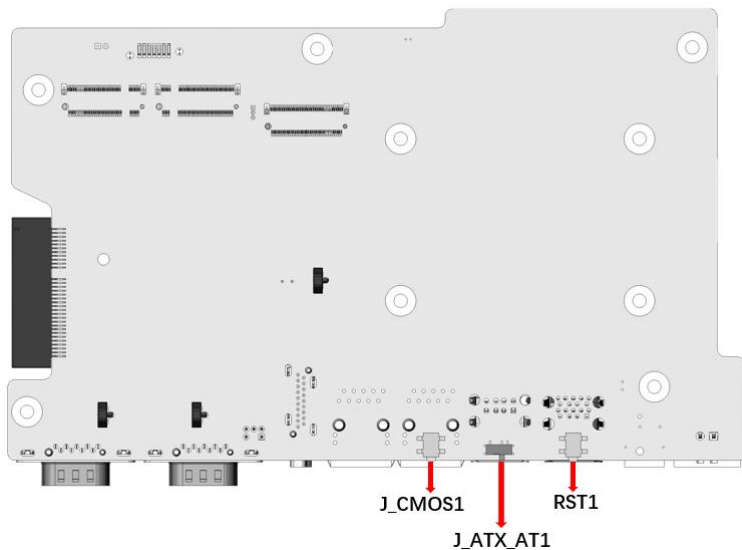


## 6.1 Peripheral Interface Connectors

The PPC2-Cxxx-EHL Series panel PC motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1** and **Figure 6-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams. The connector pinouts for these connectors are listed in the following sections.



**Figure 6-1: Main Board Layout Diagram (Front Side)**



**Figure 6-2: Main Board Layout Diagram (Solder Side)**

## PPC2-Cxxx-EHL Series Panel PC

### 6.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the PPC2-Cxxx-EHL Series motherboard. Pinouts of these connectors can be found in the following sections.

| Connector                | Type             | Label         |
|--------------------------|------------------|---------------|
| Fan connector (CPU)      | 4-pin wafer      | CPU_FAN1      |
| Battery connector        | 2-pin wafer      | BAT2          |
| EC debug port            | 6-pin wafer      | EC_DEBUG1     |
| SPI flash connector      | 6-pin wafer      | JBIO1         |
| Capacitive touch port    | 4-pin wafer      | TOUCH_USB     |
| SATA III connectors      | 7-pin connector  | SATA2         |
| SATA power connectors    | 2-pin wafer      | SATA2_PWR     |
| Resistive touch port     | 6-pin wafer      | DMC6000_CN1*  |
| ISATA connector          | 20-pin connector | SATA1         |
| M.2 B-Key slot           | B-key slot       | M2_1          |
| M.2 M-Key slot           | M-key slot       | M2_M1         |
| IDPM slot                | B-key slot       | J_M2_EDP_LVDS |
| Flash mode header        | 3-pin header     | J_FLASH1      |
| SPI flash (EC) header    | 8-pin header     | EC_SPI1       |
| Chassis intrusion header | 2-pin header     | CHASSIS1      |
| Debug port               | 5-pin header     | DBG_PORT1     |
| Power button connector   | 2-pin wafer      | PWR_BTN1      |

**Table 6-1: Peripheral Interface Connectors**

\* DMC6000\_CN1 signal from COM3 PORT

6.2.1 Fan connector (CPU\_FAN1)

| PIN NO. | DESCRIPTION     | PIN NO. | DESCRIPTION        |
|---------|-----------------|---------|--------------------|
| 1       | GND             | 2       | +12V               |
| 3       | Rotation Signal | 4       | PWM Control Signal |

Table 6-2: Fan connector (CPU\_FAN1) Pinouts

6.2.2 Battery connector (BAT2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | +V3.3A_DSW  | 2       | GND         |

Table 6-3: Battery connector (BAT2) Pinouts

6.2.3 EC debug port (EC\_DEBUG1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | NC          | 2       | EDICS       |
| 3       | EDIDO       | 4       | EDICLK      |
| 5       | EDIDI       | 6       | GND         |

Table 6-4: EC debug port (EC\_DEBUG1)

6.2.4 SPI flash connector (JBIOS1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | +3.3V       | 2       | SPI_CS#0_N  |
| 3       | SPI_SO_N    | 4       | SPI_CLK_N   |
| 5       | SPI_SI_N    | 6       | GND         |

Table 6-5: SPI flash connector (JBIOS1) Pinouts

## PPC2-Cxxx-EHL Series Panel PC

## 6.2.5 Capacitive touch port (TOUCH\_USB)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | USB_VCC     | 3       | DATA5+      |
| 2       | DATA5-      | 4       | GND         |

Table 6-6: Capacitive touch port (TOUCH\_USB) Pinouts

## 6.2.6 SATA 6Gb/s connectors (SATA2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | GND         | 2       | SATA_TX+    |
| 3       | SATA_TX-    | 4       | GND         |
| 5       | SATA_RX-    | 6       | SATA_RX+    |
| 7       | GND         |         |             |

Table 6-7: SATA 6Gb/s connectors (SATA2) Pinouts

## 6.2.7 SATA power connectors (SATA2\_PWR)

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1       | +5V         |
| 2       | GND         |

Table 6-8: SATA power connectors (SATA2\_PWR) Pinouts

## 6.2.8 Resistive touch port (DMC6000\_CN1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | +V5S        | 2       | SOU3        |
| 3       | SIN3        | 4       | RTS-3       |
| 5       | +V3.3S      | 6       | GND         |

Table 6-9: Resistive touch port (DMC6000\_CN1) Pinouts



6.2.9 ISATA connector (SATA1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | GND         | 2       | GND         |
| 3       | GND         | 4       | GND         |
| 5       | GND         | 6       | GND         |
| 7       | +5V         | 8       | +5V         |
| 9       | +5V         | 10      | +5V         |
| 11      | +5V         | 12      | NC          |
| 13      | NC          | 14      | GND         |
| 15      | SATA_RX+    | 16      | SATA_RX-    |
| 17      | GND         | 18      | SATA_TX+    |
| 19      | SATA_TX-    | 20      | GND         |

Table 6-10: ISATA connector (SATA1) Pinouts





## **PPC2-Cxxx-EHL Series Panel PC**

### **6.2.10 M.2 B-Key slot (M2\_1)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | NC          | 2       | +3.3V       |
| 3       | GND         | 4       | +3.3V       |
| 5       | GND         | 6       | NC          |
| 7       | USB_D+      | 8       | NC          |
| 9       | USB_D-      | 10      | NC          |
| 11      | GND         | 12      | Module Key  |
| 13      | Module Key  | 14      | Module Key  |
| 15      | Module Key  | 16      | Module Key  |
| 17      | Module Key  | 18      | Module Key  |
| 19      | Module Key  | 20      | NC          |
| 21      | NC          | 22      | NC          |
| 23      | NC          | 24      | NC          |
| 25      | NC          | 26      | NC          |
| 27      | GND         | 28      | NC          |
| 29      | USB3_RX_N   | 30      | NC          |
| 31      | USB3_RX_P   | 32      | NC          |
| 33      | GND         | 34      | NC          |
| 35      | USB3_TX_N   | 36      | NC          |
| 37      | USB3_TX_P   | 38      | DEVSLP      |
| 39      | GND         | 40      | NC          |
| 41      | PCIE_RXN    | 42      | NC          |
| 43      | PCIE_RXP    | 44      | NC          |
| 45      | GND         | 46      | NC          |
| 47      | PCIE_TXN    | 48      | NC          |
| 49      | PCIE_TXP    | 50      | PERST#      |
| 51      | GND         | 52      | CLKREQ_N    |
| 53      | CLKN        | 54      | PCIE_WAKE#  |
| 55      | CLKP        | 56      | NC          |
| 57      | GND         | 58      | NC          |
| 59      | NC          | 60      | NC          |
| 61      | NC          | 62      | NC          |

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|    |     |    |        |
|----|-----|----|--------|
| 63 | NC  | 64 | NC     |
| 65 | NC  | 66 | SUSCLK |
| 67 | GND | 68 | TP5    |
| 69 | GND | 70 | +3.3V  |
| 71 | GND | 72 | +3.3V  |
| 73 | GND | 74 | +3.3V  |
| 75 | GND |    |        |

Table 6-11: M.2 B-Key slot (M2\_1) Pinouts

## 6.2.11 M.2 M-Key slot (M2\_M1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | GND         | 2       | +3.3V       |
| 3       | GND         | 4       | +3.3V       |
| 5       | NC          | 6       | NC          |
| 7       | NC          | 8       | NC          |
| 9       | GND         | 10      | DAS/DSS#    |
| 11      | NC          | 12      | +3.3V       |
| 13      | NC          | 14      | +3.3V       |
| 15      | GND         | 16      | +3.3V       |
| 17      | NC          | 18      | +3.3V       |
| 19      | NC          | 20      | NC          |
| 21      | GND         | 22      | NC          |
| 23      | NC          | 24      | NC          |
| 25      | NC          | 26      | NC          |
| 27      | GND         | 28      | NC          |
| 29      | PCIE_RXN5   | 30      | NC          |
| 31      | PCIE_RXP5   | 32      | NC          |
| 33      | GND         | 34      | NC          |
| 35      | PCIE_TXN5   | 36      | NC          |
| 37      | PCIE_TXP5   | 38      | DEVSLP      |
| 39      | GND         | 40      | I2C_CLK     |

|    |            |    |            |
|----|------------|----|------------|
| 41 | PCIE_RXN4  | 42 | I2C_DAT    |
| 43 | PCIE_RXP4  | 44 | NC         |
| 45 | GND        | 46 | NC         |
| 47 | PCIE_TXN4  | 48 | NC         |
| 49 | PCIE_TXP4  | 50 | PERST#     |
| 51 | GND        | 52 | TP6        |
| 53 | CLKN       | 54 | PCIE_WAKE# |
| 55 | CLKP       | 56 | TP4        |
| 57 | GND        | 58 | TP3        |
| 59 | Module Key | 60 | Module Key |
| 61 | Module Key | 62 | Module Key |
| 63 | Module Key | 64 | Module Key |
| 65 | Module Key | 66 | Module Key |
| 67 | NC         | 68 | NC         |
| 69 | +3.3V      | 70 | +3.3V      |
| 71 | GND        | 72 | +3.3V      |
| 73 | GND        | 74 | +3.3V      |
| 75 | GND        |    |            |

**Table 6-12: M.2 M-Key slot (M2\_M1) Pinouts**

### 6.2.12 IDPM connector (J\_M2\_EDP\_LVDS)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | GND         | 2       | +V3.3A      |
| 3       | GND         | 4       | +V3.3A      |
| 5       | GND         | 6       | +V3.3A      |
| 7       | GND         | 8       | +V3.3A      |
| 9       | GND         | 10      | +V3.3A      |
| 11      | +5V         | 12      | Module Key  |
| 13      | Module Key  | 14      | Module Key  |
| 15      | Module Key  | 16      | Module Key  |
| 17      | Module Key  | 18      | Module Key  |

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|    |                    |    |                |
|----|--------------------|----|----------------|
| 19 | Module Key         | 20 | +V3.3S         |
| 21 | Display Detect PIN | 22 | +V3.3S         |
| 23 | Display Detect PIN | 24 | +V3.3S         |
| 25 | GND                | 26 | +V3.3S         |
| 27 | GND                | 28 | GND            |
| 29 | EDP_TX3_DN         | 30 | +V12S          |
| 31 | EDP_TX3_DP         | 32 | +V12S          |
| 33 | GND                | 34 | +V12S          |
| 35 | EDP_TX2_DN         | 36 | +V12S          |
| 37 | EDP_TX2_DP         | 38 | GND            |
| 39 | GND                | 40 | CLK            |
| 41 | EDP_TX1_DN         | 42 | DATA           |
| 43 | EDP_TX1_DP         | 44 | GND            |
| 45 | GND                | 46 | EC_BKLT_CTRL   |
| 47 | EDP_TX0_DN         | 48 | EDP1_BKLT_CTRL |
| 49 | EDP_TX0_DP         | 50 | EDP1_BKLT_EN   |
| 51 | GND                | 52 | EDP1_VDD_EN    |
| 53 | EDP_AUX_DN         | 54 | EDP_HPD        |
| 55 | EDP_AUX_DP         | 56 | RST#           |
| 57 | GND                | 58 | LVDS_EN        |
| 59 | GND                | 60 | +V5S           |
| 61 | GND                | 62 | +V5S           |
| 63 | GND                | 64 | +V5S           |
| 65 | GND                | 66 | +V5S           |
| 67 | GND                | 68 | +V12A          |
| 69 | GND                | 70 | +V12A          |
| 71 | GND                | 72 | +V12A          |
| 73 | GND                | 74 | +V12A          |
| 75 | GND                |    |                |

**Table 6-13: IDPM connector (J\_M2\_EDP\_LVDS) Pinouts**



**6.2.13 Flash mode connector (J\_FLASH1)**

| PIN NO. | DESCRIPTION                          |
|---------|--------------------------------------|
| 1-2     | LOW = Disabled (No override) Default |
| 2-3     | High = Enabled (OVERRIDE)            |

**Table 6-14: Flash mode connector (J\_FLASH1) Pinouts****6.2.14 SPI flash (EC) connector (EC\_SPI1)**

| PIN NO. | DESCRIPTION  | PIN NO. | DESCRIPTION |
|---------|--------------|---------|-------------|
| 1       | CS_EC        | 2       | +3.3V       |
| 3       | SO_EC        | 4       | HOLD_EC     |
| 5       | EC_DET_FLASH | 6       | SCK_EC      |
| 7       | GND          | 8       | SIO_EC      |

**Table 6-15: SPI flash (EC) connector (EC\_SPI1) Pinouts****6.2.15 Chassis intrusion (CHASSIS1)**

| PIN NO. | DESCRIPTION   |
|---------|---------------|
| open    | Chassis close |
| short   | Chassis open  |

**Table 6-16: Chassis intrusion (CHASSIS1) Pinouts****6.2.16 Debug port (DBG\_PORT1)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | +V5A        | 2       | SMCLK1_EC   |
| 3       | NC          | 4       | SMDAT1_EC   |
| 5       | GND         | 6       | PLT_RST_N   |

**Table 6-17: Debug port (DBG\_PORT1) Pinouts**

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## 6.2.17 Power button connector (PWR\_BTN1)

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1       | +3V         |
| 2       | GND         |

Table 6-18: Reset Button Connector (RST\_BTN2) Pinouts

## 6.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the PPC2-Cxxx-EHL Series motherboard. Pinouts of these connectors can be found in the following sections.

| Connector                   | Type               | Label      |
|-----------------------------|--------------------|------------|
| ATX/AT mode switch          | Switch             | J_ATX_AT1  |
| Clear CMOS button           | Push button        | J_CMOS1    |
| Reset button                | Push button        | RST_BTN1   |
| RS-232/422/485 serial ports | DB-9               | COM1       |
| RS-232 serial port          | DB-9               | COM2       |
| HDMI connector              | HDMI               | HDMI1      |
| 2.5GbE connector            | RJ-45              | LAN1, LAN2 |
| USB 2.0 connectors          | USB 2.0 port       | USB_CON1   |
| USB 3.2 Gen 1 connectors    | USB 3.1 Gen 1 port | USB3_CON1  |

Table 6-19: Rear Panel Connectors

## 6.3.1 HDMI Connector (HDMI1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | HDMI_DATA2  | 2       | GND         |
| 3       | HDMI_DATA2# | 4       | HDMI_DATA1  |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 5       | GND         | 6       | HDMI_DATA1# |
| 7       | HDMI_DATA0  | 8       | GND         |
| 9       | HDMI_DATA0# | 10      | HDMI_CLK    |
| 11      | GND         | 12      | HDMI_CLK#   |
| 13      | N/C         | 14      | N/C         |
| 15      | HDMI_SCL    | 16      | HDMI_SDA    |
| 17      | GND         | 18      | +5V         |
| 19      | HDMI_HPD    |         |             |

**Table 6-20: HDMI Connector (HDMI1) Pinouts**

### 6.3.2 2.5GbE Connector (LAN1, LAN2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | MDIA0-      | 5       | MDIA2+      |
| 2       | MDIA0+      | 6       | MDIA1+      |
| 3       | MDIA1-      | 7       | MDIA3-      |
| 4       | MDIA2-      | 8       | MDIA3+      |

**Table 6-21: 2.5GbE Connector (LAN1, LAN2) Pinouts**

### 6.3.3 USB 2.0 Connectors (USB2\_CON1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | USB_VCC     | 5       | USB_VCC     |
| 2       | DATA-       | 6       | DATA-       |
| 3       | DATA+       | 7       | DATA+       |
| 4       | GND         | 8       | GND         |

**Table 6-22: USB 2.0 Connectors (USB2\_CON1) Pinouts**

### 6.3.4 USB 3.2 Gen 1 Connector (USB3\_CON1)

## PPC2-Cxxx-EHL Series Panel PC

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | VCC         | 10      | VCC         |
| 2       | USB_DATA-   | 11      | USB_DATA-   |
| 3       | USB_DATA+   | 12      | USB_DATA+   |
| 4       | GND         | 13      | GND         |
| 5       | USB3_RX-    | 14      | USB3_RX-    |
| 6       | USB3_RX+    | 15      | USB3_RX+    |
| 7       | GND         | 16      | GND         |
| 8       | USB3_TX-    | 17      | USB3_TX-    |
| 9       | USB3_TX+    | 18      | USB3_TX+    |

**Table 6-23: USB 3.2 Gen 1 Connector (USB3\_CON1)  
Pinouts**

**Appendix**

**A**

# **Regulatory Compliance**

---



**DECLARATION OF CONFORMITY**

This equipment is in conformity with the following EU directives:

- EMC Directive (2014/30/EU)
- Low-Voltage Directive (2014/35/EU)
- RoHS II Directive (2011/65/EU, 2015/863/EU)
- Ecodesign Directive 2009/125/EC

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the Radio Equipment Directive 2014/53/EU.

---

**English**

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

---

**Български [Bulgarian]**

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 2014/53/EU.

---

**Česky [Czech]**

IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/EU.

---

**Dansk [Danish]**

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EU.

---

**Deutsch [German]**

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.

---

**Eesti [Estonian]**

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

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**Español [Spanish]**

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU.

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**Ελληνική [Greek]**

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 2014/53/EU.

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**Français [French]**

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU.

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**Italiano [Italian]**

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU.

---

**Latviski [Latvian]**

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 2014/53/EU.

---

**Lietuvių [Lithuanian]**

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 2014/53/EU Direktyvos nuostatas.

---

**Nederlands [Dutch]**

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU.

---

**Malti [Maltese]**

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 2014/53/EU.

---

**Magyar [Hungarian]**

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 2014/53/EU irányelv egyéb előírásainak.

---

**Polski [Polish]**

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EU.

---

**Português [Portuguese]**

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Diretiva 2014/53/EU.

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## PPC2-Cxxx-EHL Series Panel PC

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### Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 2014/53/EU.

---

### Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/EU.

---

### Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/EU.

---

### Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

---

### Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU.

---

**FCC WARNING**

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 which case the user will be required to correct the interference at his own expense.

**Federal Communication Commission Interference Statement**

This equipment has been assembled with components that comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

Appendix

**B**

# Safety Precautions

---



**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the PPC2-Cxxx-EHL Series.

## B.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

### B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the device is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the PPC2-Cxxx-EHL Series is being installed, moved or modified.
- ***To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.*** To fully disengage the power to the unit, please disconnect the power cord from the AC outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
- ***Do not apply voltage levels that exceed the specified voltage range.*** Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
- ***Electric shocks can occur*** if the PPC2-Cxxx-EHL Series chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
- ***Do not drop or insert any objects*** into the ventilation openings of the PPC2-Cxxx-EHL Series.

## PPC2-Cxxx-EHL Series Panel PC

- ***If considerable amounts of dust, water, or fluids enter the device***, turn off the power supply immediately, unplug the power cord, and contact the PPC2-Cxxx-EHL Series vendor.
- **DO NOT:**
  - Drop the device against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

### B.1.2 Anti-static Precautions



#### **WARNING:**

Failure to take ESD precautions during the installation of the PPC2-Cxxx-EHL Series may result in permanent damage to the PPC2-Cxxx-EHL Series and severe injury to the user.

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Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PPC2-Cxxx-EHL Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PPC2-Cxxx-EHL Series is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding:*** Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component:*** When handling the electrical component, hold the electrical component by its edges.

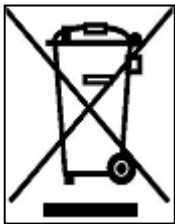
### B.1.3 Product Disposal

**CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union—If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union—The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

## PPC2-Cxxx-EHL Series Panel PC

### B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the PPC2-Cxxx-EHL Series, please follow the guidelines below.



#### **WARNING:**

- For safety reasons, turn-off the power and unplug the panel PC before cleaning.
  - If you dropped any material or liquid such as water onto the panel PC when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.
- 

#### B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the PPC2-Cxxx-EHL Series, please read the details below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the device does not require cleaning. Keep fluids away from the device interior.
- Be cautious of all small removable components when vacuuming the device.
- Never drop any objects or liquids through the openings of the device.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the device.
- Avoid eating, drinking and smoking within vicinity of the device.

#### B.2.2 Cleaning Tools

Some components in the PPC2-Cxxx-EHL Series may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the PPC2-Cxxx-EHL Series.

- **Cloth**— Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the device.
- **Water or rubbing alcohol**—A cloth moistened with water or rubbing alcohol can be used to clean the device.
- **Using solvents**—The use of solvents is not recommended when cleaning the device as they may damage the plastic parts.
- **Vacuum cleaner**—Using a vacuum specifically designed for computers is one of the best methods of cleaning the device. Dust and dirt can restrict the airflow in the device and cause its circuitry to corrode.
- **Cotton swabs**—Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- **Foam swabs**—Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.



Appendix

**C**

# Watchdog Timer

---

**NOTE:**

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

**INT 15H:**

| AH – 6FH Sub-function: |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| AL – 2:                | Sets the Watchdog Timer's period.                                                                     |
| BL:                    | Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup). |

**Table C-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

## PPC2-Cxxx-EHL Series Panel PC

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

**Example program:**

**; INITIAL TIMER PERIOD COUNTER**

;

W\_LOOP:

```

MOV    AX, 6F02H    ;setting the time-out value
MOV    BX, 05        ;time-out value is 5 seconds
INT     15H

```

;

**; ADD THE APPLICATION PROGRAM HERE**

;

```

CMP     EXIT_AP, 1    ;is the application over?
JNE     W_LOOP        ;No, restart the application

```

```

MOV     AX, 6F02H     ;disable Watchdog Timer
MOV     BX, 0         ;
INT     15H

```

;

**; EXIT ;**

**Appendix**

**D**

# **Hazardous Materials Disclosure**

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## PPC2-Cxxx-EHL Series Panel PC

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

| Part Name                                                                                                                                                                                                                                                                                                                                                                                             | Toxic or Hazardous Substances and Elements |              |              |                              |                                |                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                       | Lead (Pb)                                  | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (CR(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| Housing                                                                                                                                                                                                                                                                                                                                                                                               | O                                          | O            | O            | O                            | O                              | O                                     |
| Display                                                                                                                                                                                                                                                                                                                                                                                               | O                                          | O            | O            | O                            | O                              | O                                     |
| Printed Circuit Board                                                                                                                                                                                                                                                                                                                                                                                 | O                                          | O            | O            | O                            | O                              | O                                     |
| Metal Fasteners                                                                                                                                                                                                                                                                                                                                                                                       | O                                          | O            | O            | O                            | O                              | O                                     |
| Cable Assembly                                                                                                                                                                                                                                                                                                                                                                                        | O                                          | O            | O            | O                            | O                              | O                                     |
| Fan Assembly                                                                                                                                                                                                                                                                                                                                                                                          | O                                          | O            | O            | O                            | O                              | O                                     |
| Power Supply Assemblies                                                                                                                                                                                                                                                                                                                                                                               | O                                          | O            | O            | O                            | O                              | O                                     |
| Battery                                                                                                                                                                                                                                                                                                                                                                                               | O                                          | O            | O            | O                            | O                              | O                                     |
| <p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).</p> |                                            |              |              |                              |                                |                                       |



此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

| 部件名称                                                                                                                                                                               | 有毒有害物质或元素 |           |           |                 |               |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------------|---------------|---------------------|
|                                                                                                                                                                                    | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(CR(VI)) | 多溴联苯<br>(PBB) | 多溴二苯<br>醚<br>(PBDE) |
| 壳体                                                                                                                                                                                 | O         | O         | O         | O               | O             | O                   |
| 显示                                                                                                                                                                                 | O         | O         | O         | O               | O             | O                   |
| 印刷电路板                                                                                                                                                                              | O         | O         | O         | O               | O             | O                   |
| 金属螺帽                                                                                                                                                                               | O         | O         | O         | O               | O             | O                   |
| 电缆组装                                                                                                                                                                               | O         | O         | O         | O               | O             | O                   |
| 风扇组装                                                                                                                                                                               | O         | O         | O         | O               | O             | O                   |
| 电力供应组装                                                                                                                                                                             | O         | O         | O         | O               | O             | O                   |
| 电池                                                                                                                                                                                 | O         | O         | O         | O               | O             | O                   |
| <p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。</p> |           |           |           |                 |               |                     |

