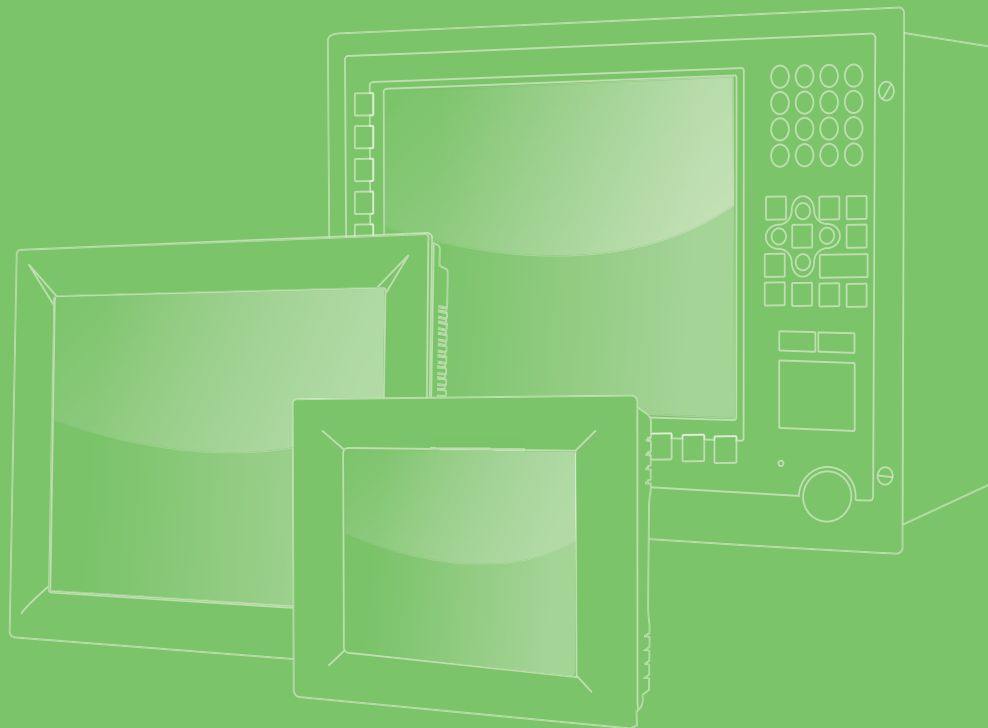


User Manual



# IPPC-6152A/6172A/ 6192A

15" XGA /17" SXGA/19" SXGA  
TFT LCD (with LED Backlight)  
Industrial Panel PC with Intel®  
Core™ i7/i5/i3 CPU and 2 x PCI  
Slots

**ADVANTECH**

**VICPAS**  
HMI Parts Center

*Enabling an Intelligent Planet*

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5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

## Declaration of Conformity

### CE

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

### FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In such cases, users are required to correct the interference at their own expense.

## Technical Support and Assistance

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

## Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the power source voltage is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by qualified service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is malfunctioning, or does not operate according to the user manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
15. Do not leave this equipment in an environment where the storage temperature fluctuates below  $-40^{\circ}\text{C}$  or above  $85^{\circ}\text{C}$  as this may cause damage. The equipment should be stored in a controlled environment.

## Safety Precautions - Static Electricity

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

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

## Battery Information

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



**Warning!** *Batteries are at risk of exploding if incorrectly replaced. Replace only with same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*





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# Chapter 1

## General Information

## 1.1 Introduction

The IPPC-6152A/6172A/6192A is an industrial panel PC equipped with a Gen 4 Intel® Core™ i7/i5/i3 processor, high-speed DDR3 memory (up to 32 GB), and two PCI expansion slots. The processor combined with an Intel® Q87 chipset provide a platform for the Intel® AMT 9.0 vPro management support system, offering remote out-of-band manageability, improved security, and energy-efficient performance. The panel PC also features two SATA 2.0 and 3.0 hard drive interfaces that support RAID 0 and RAID 1 to ensure data security. The flat-sealed front panel design allows liquid run off for easy cleaning and maintenance. Furthermore, the panel PC can be customized with additional features, such as a CFast port, PCI/PCIe slot, or DVD-ROM, according to specific application requirements.

### **Robust Structure**

The IPPC-6152A/6172A/6192A panel PC features a solid structure to ensure reliable operation. The front panel is made from aluminum and strengthened glass, and is shock resistant and IP65 rated for protection from water and dust ingress.

### **High Performance**

IPPC-6152A/6172A/6192A features an Intel® 1150P socket that supports a Gen 4 Intel® Core™ i7/i5/i3 processor (up to 3.1 GHz).

### **Easy Operation**

The IPPC-6152A/6172A/6192A series systems are equipped with a 15/17/19" LCD (with LED backlight) that supports high-resolution images and features touch control for easy operation. To further increase the ease of use, the systems are designed with a front-facing USB port and reset key for rapid access. .

## 1.2 Specifications

### 1.2.1 General

<b>Model</b>	IPPC-6152A	IPPC-6172A	IPPC-6192A
<b>LCD Size</b>	15"	17"	19"
<b>Display Type</b>	TFT (with LED backlight)	TFT (with LED backlight)	TFT (with LED backlight)
<b>Max. Resolution</b>	1024 x 768	1280 x 1024	1280 x 1024
<b>Max. Colors</b>	16.2 M/262 K	16.7 M RGB 6 bit + Hi-FRC data	16.7 M RGB 6 bit + Hi-FRC data
<b>Viewing Angle</b>	160/140	170/160	170/160
<b>Luminance</b>	400 cd/m <sup>2</sup>	350 cd/m <sup>2</sup>	350 cd/m <sup>2</sup>
<b>Contrast Ratio</b>	700	1000	1000
<b>Backlight Life</b>	50,000 hrs	50,000 hrs	50,000 hrs
<b>Weight</b>	13 kg (28.6lbs)	15 kg (33.04 lb)	16.6 kg (35.6 lbs)
<b>Dimensions</b>	449.92 x 315.63 x 126.4 mm (17.71 x 12.43 x 4.98 in)	481.93 x 355.87 x 132.5 mm (18.97 x 14.01 x 5.22 in)	481.93 x 384.6 x 135.5 mm (18.97 x 15.14 x 5.33 in)

### 1.2.2 Hardware

<b>CPU</b>	Intel® Core™ i7/i5/i3 (up to 3.1 GHz)
<b>Chipset</b>	Intel® Q87
<b>BIOS</b>	AMI 64 MB flash BIOS
<b>Memory</b>	4 x DDR3 (1600/1333 MHz) DIMM, up to 32 GB
<b>Storage 1</b>	2 x 2.5" SATA 2.0/3.0 HDDs (with Intel® RAID 0.1 function)
<b>Storage 2</b>	Supports CFAST (optional) Supports 8 x slim DVD +/- RW (optional)
<b>Network</b>	2 x Gigabit Ethernet, 10/100/1000 Mbps GbE LAN1: Intel® I217-LM GbE LAN2: Intel® I211
<b>I/O</b>	1 x GPIO 2 x Reserved ports (expansion COMs) 5 x USB (1 x USB 2.0 in front panel, 4 x USB 3.0) 1 x VGA 1 x DVI 1 x DP 1 x Line Out, 1 x Mic In 1 x Keyboard, 1 x Mouse
<b>Expansion Slots</b>	2 x PCI (standard) 2 x PCIe x1 (optional)
<b>OS</b>	Windows 7/Windows 8

### 1.2.3 Power

<b>Model Name</b>	IPPC-6152A	IPPC-6172A	IPPC-6192A
<b>Power Consumption</b>	110 W	120 W	128 W
<b>Output Power</b>	350 W (max.)		
<b>Input Voltage</b>	100 ~ 240 V <sub>AC</sub> @ 60 ~ 50 Hz, 7 ~ 3.5 A		

**Note!** The test conditions for the power consumption measurements are listed at the bottom of this page.



### 1.2.4 Touchscreen

<b>Type</b>	5-wire analog resistive
<b>Resolution</b>	2048 x 2048
<b>Light Transmission</b>	81% +/- 3%
<b>Lifespan</b>	36,000,000 touches

### 1.2.5 Environmental

<b>Operating Temperature</b>	0 ~ 50 °C (32 ~ 122 °F)
<b>Storage Temperature</b>	-20 ~ 60 °C (-4 ~ 140 °F)
<b>Relative Humidity</b>	5 ~ 85% @ 40 °C (non-condensing)
<b>Shock</b>	10 G peak acceleration (11 ms duration)
<b>Vibration</b>	5 ~ 500 Hz 1 Grms

### 1.2.6 Certifications

<b>EMC</b>	BSMI, CE, FCC Class A
<b>Safety</b>	CB, CCC, BSMI, UL

### 1.2.7 IP Rating

<b>Chassis</b>	Flat-sealed, aluminum, die-cast front panel with SGCC enclosure
<b>Front Bezel</b>	IP65 rating

Test Condition	Test Configuration	Test System
Burn In 8.1	RAM: 4 x 32 GB DDR3 HDD: 1 x 2.5" SATA 500 GB I/O: 4 x USB 2.0, 4 x loopback	Windows 7 (64 bit)

# 1.3 Dimensions

Unit: mm

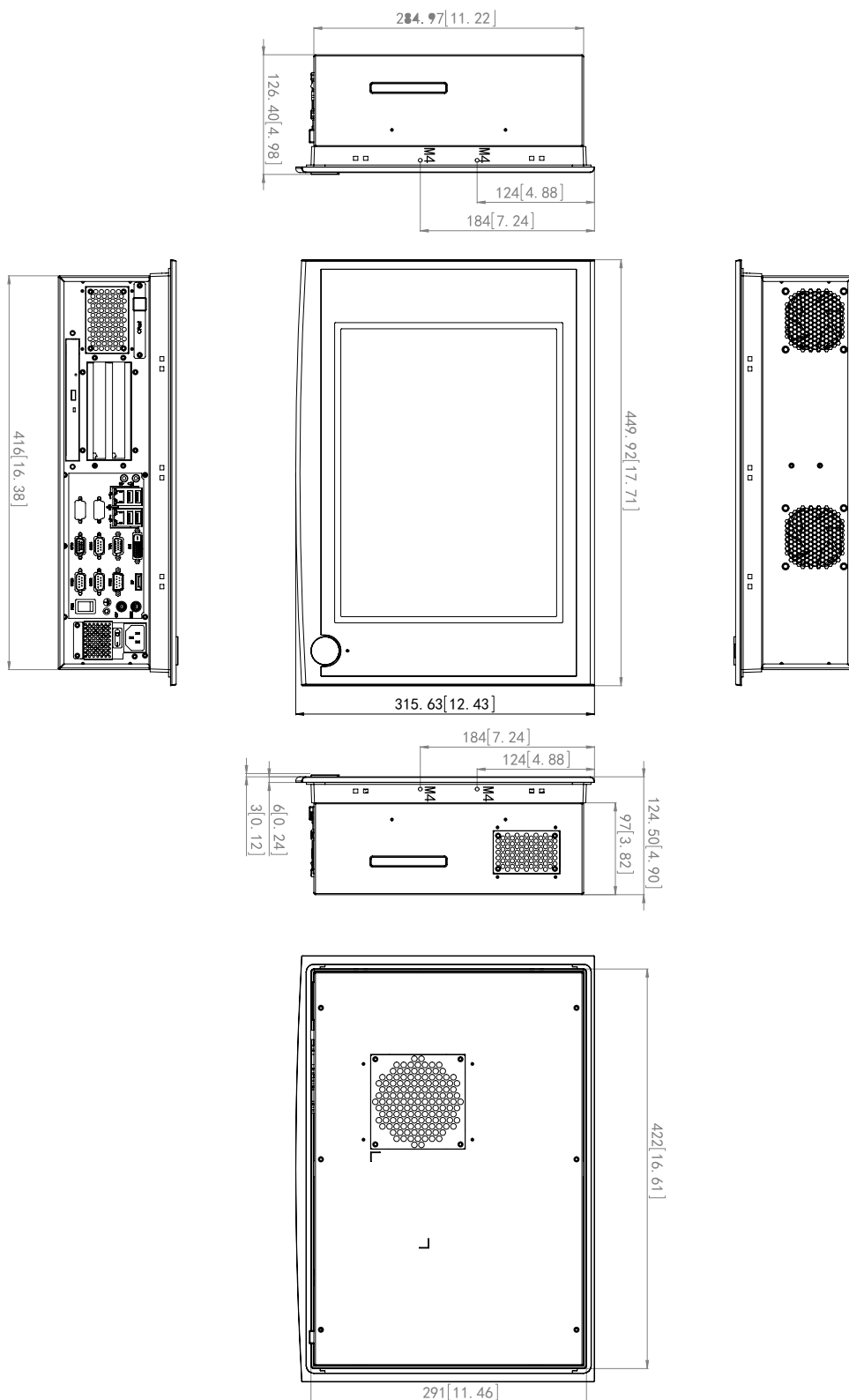
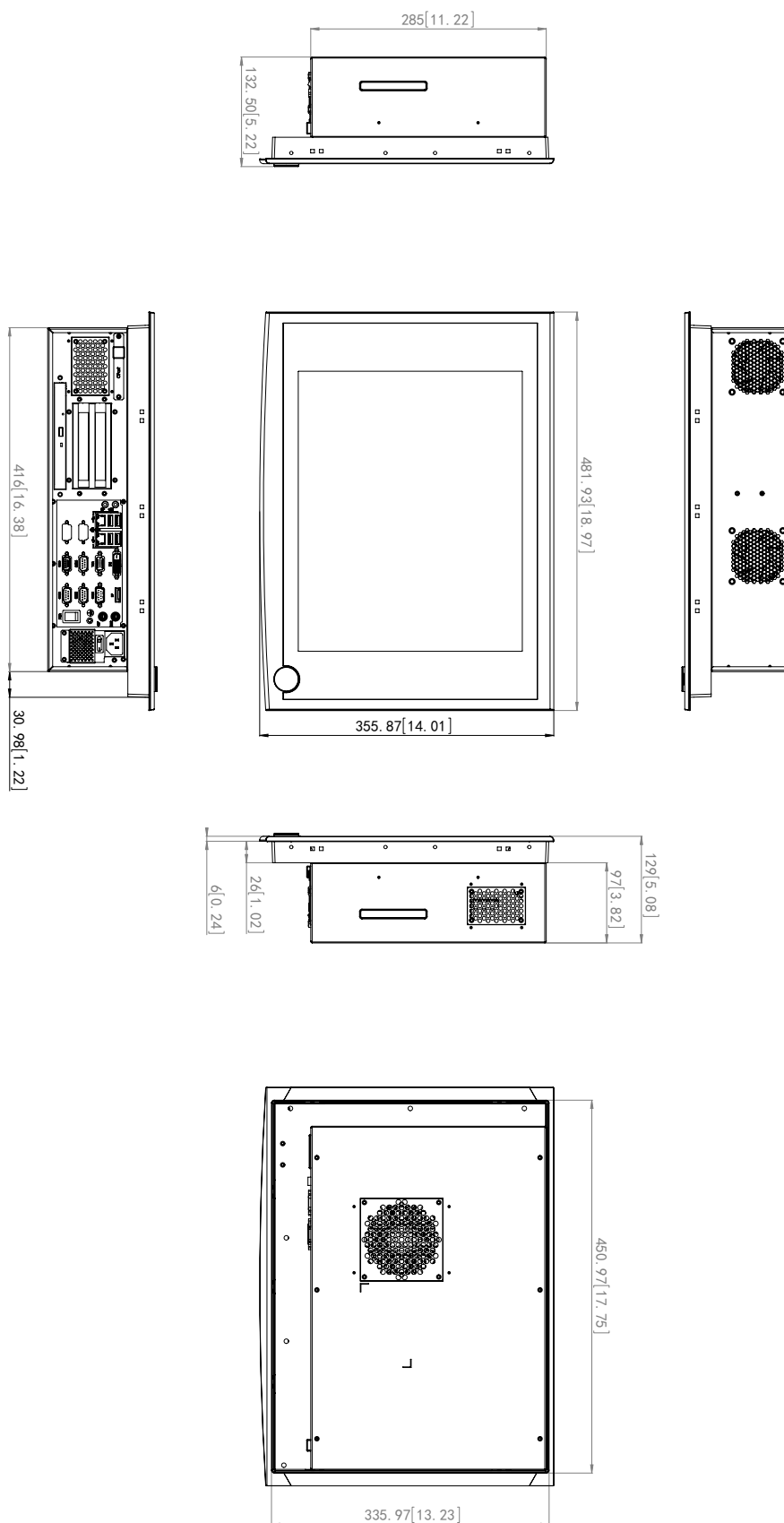


Figure 1.1 IPPC-6152A Dimensions

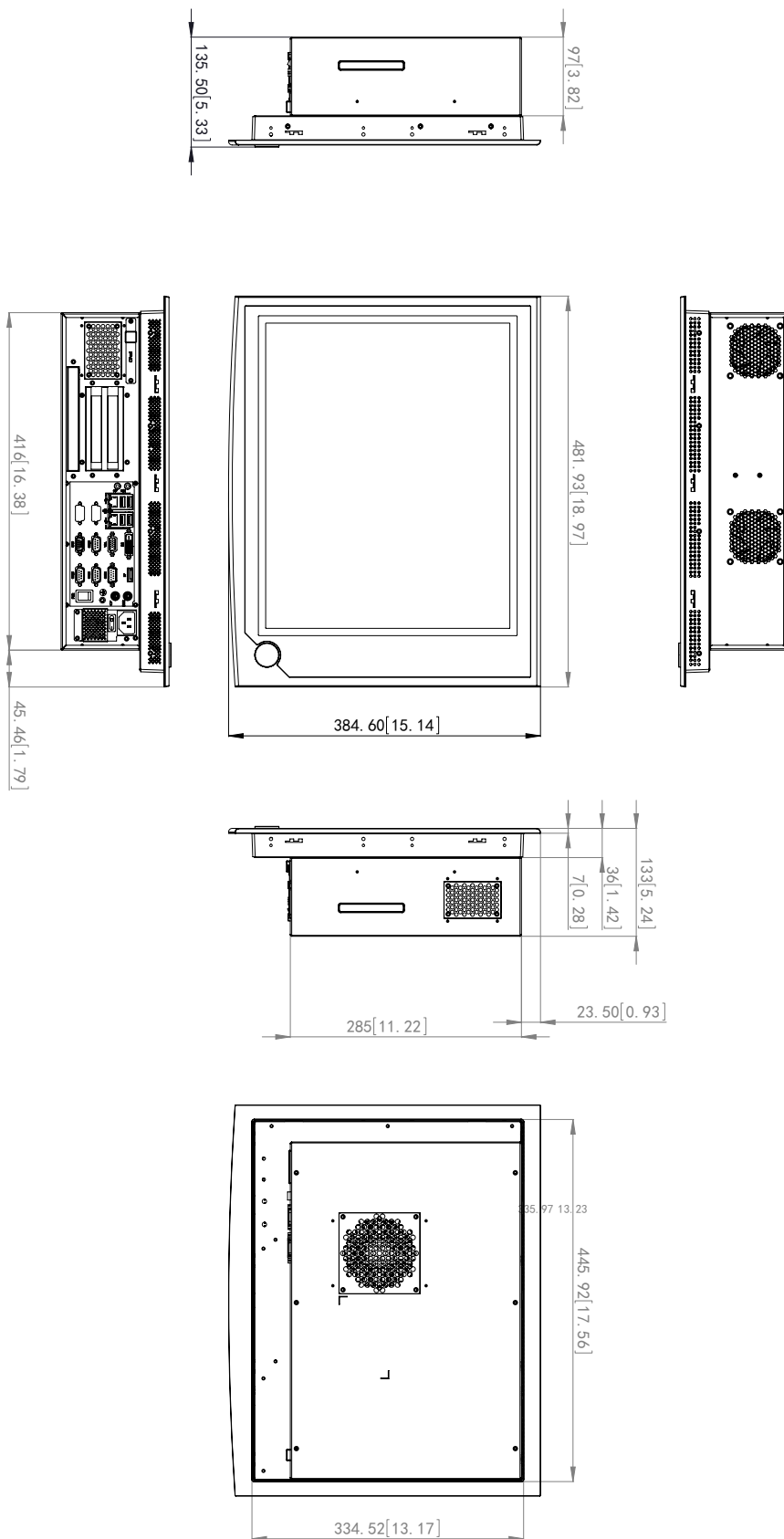
Unit: mm



Pabel Cut Dimensions: 454x338mm (17.87" x 13.31")

Figure 1.2 IPPC-6172A Dimensions

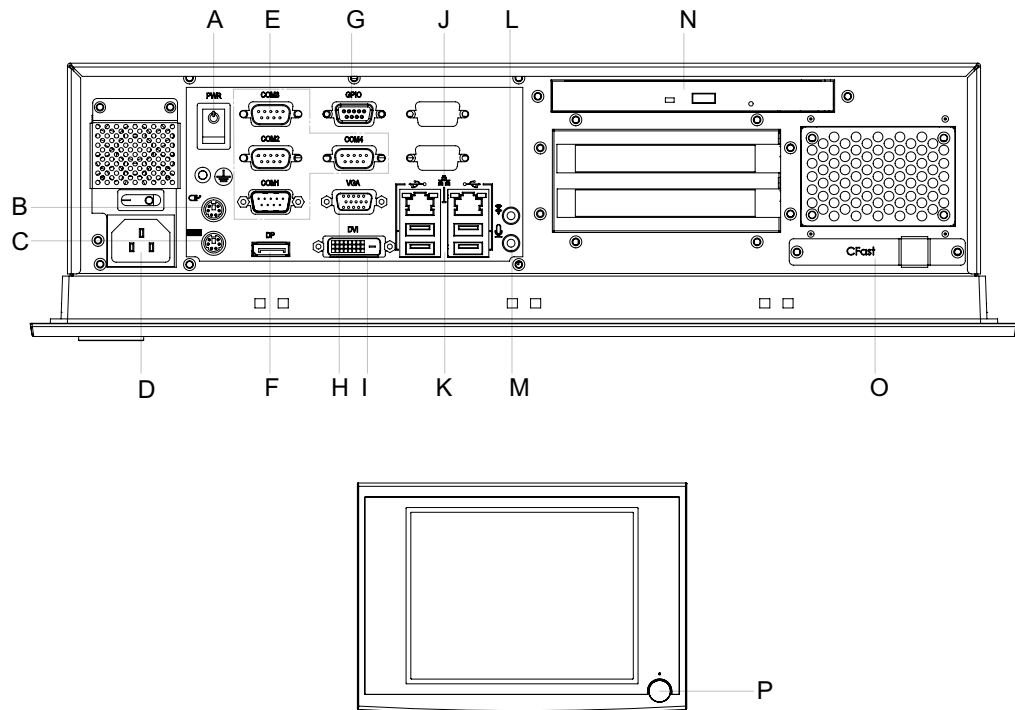
Unit: mm



Panel Out Dimension: 454x338mm(17.87"x13.31")

Figure 1.3 IPPC-6192A Dimensions

## 1.4 I/O Layout



- |                              |                |
|------------------------------|----------------|
| A. Power switch              | I. DVI         |
| B. Mouse                     | J. 2 x LAN     |
| C. Keyboard                  | K. 4 x USB 3.0 |
| D. AC In                     | L. Line Out    |
| E. COM1/2/4 (RS-232)         | M. Mic         |
| COM3 (RS-232 /RS-422/RS-485) | N. DVD ROM     |
| F. DP                        | O. CFast       |
| G. GPIO                      | P. USB 2.0     |
| H. VGA                       |                |



# Chapter 2

## System Setup

## 2.1 General

Please follow the procedures below to set up the device.

1. Check and adjust jumpers on the motherboard (see Chapter 3)
2. Install DDR3 SDRAM
3. Install a CPU
4. Install add-on cards
5. Connect the wires, cables, and accessories
6. Mount the computer
7. Adjust the BIOS settings
8. Install an operating system.

**Warning!**



1. *Power off the device and unplug the power cord before opening the device or touching any of the internal components.*
2. *The motherboard is composed of many delicate integrated circuits, chips, and other components that can be easily damaged by static shock.*

**When installing components**

- *Avoid touching the metal parts of the motherboard*
- *Use an anti-static ring when handling the CPU or SDRAM module*
- *Place the CPU and SDRAM module inside an anti-static bag before installation*

### 2.1.1 PS/2 Mouse and Keyboard

The panel PC can be equipped with a full-size keyboard and PS/2 mouse, simply follow the instructions below.

1. Power off the panel PC.
2. Attach the keyboard adapter to the 5-pin purple port at the bottom of the rear cover.
3. Attach the mouse adapter to the 5-pin green port at the bottom of the rear cover.

### 2.1.2 VGA Port

An external VGA-compatible device may be connected to the system via the 15-pin external port at the rear of the unit. The panel PC can support an additional external monitor.

### 2.1.3 Serial COM Ports

The panel PC can be equipped with serial devices, such as an external modem or mouse. Simply follow the instructions provided below.

1. Ensure that the panel PC and any connected peripheral devices are powered off.
2. Connect the interface cable of the serial device to the serial port of the panel PC. If necessary, attach the other end of the interface cable to the serial device. Fasten any retaining screws.
3. Power on any connected peripheral devices before powering on the panel PC.
4. Refer to the manual(s) accompanying the serial device(s) for instructions on how to configure the operating environment to recognize the device(s).
5. Run the BIOS setup program to set the I/O address and IRQ, and configure the jumper settings to change the COM port mode (refer to Section 3.1.2).

### 2.1.4 USB Ports

The panel PC can be equipped with an external USB device via the USB ports located at the rear of the unit.

1. Connect the external device to the panel PC.
2. The USB ports support hot swapping. However, the device driver must be installed before the device is operable.

### 2.1.5 Audio Port

The panel PC's Audio port comprises two plug holes for Mic In and Line Out.

- **Mic In:** Records sound using external microphones.
  - **Line Out:** Output sound signal to external devices (e.g., speaker or headset). Even when external audio devices are connected, the internal speaker is not disabled.
1. Connect audio devices to the panel PC.
  2. Install device drivers before using the audio devices.

### 2.1.6 Ethernet

The panel PC can be equipped with Ethernet, simply follow the instructions below.

1. Connect an Ethernet cable to the panel PC.
2. Power on the panel PC.
3. Run the Ethernet driver to allow the system to connect to the network.

### 2.1.7 DP Port

The panel PC features a DisplayPort for high connectivity.

### 2.1.8 DVI Port

The panel PC features a DVI port for high connectivity.

### 2.1.9 GPIO Port

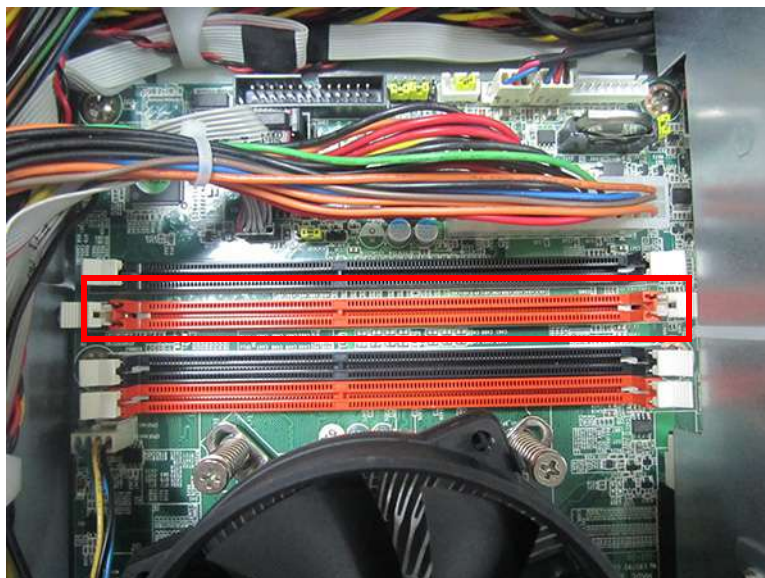
Reserved for user configuration. See Appendix A.1 for details.

### 2.1.10 PCI Ports

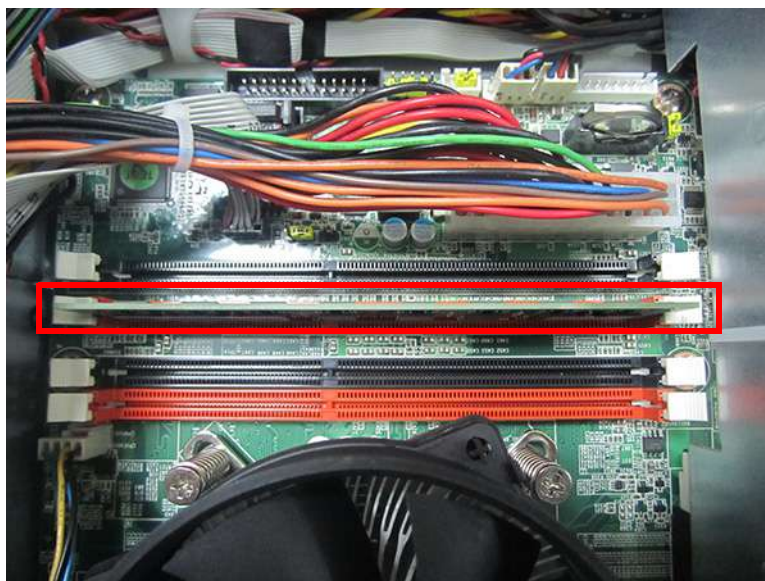
The panel PC provides two PCI ports for easy expansion. However, the dimensions of any external PCI cards must not exceed 167.65 x 96.4 x 18.7 mm (6.6 x 3.8 x 0.736 in).

## 2.2 Memory Installation

1. Loosen the six screws and remove the rear cover.
2. Push the lever of the memory slot outwards.



3. Insert the memory and then return the lever to its original position.

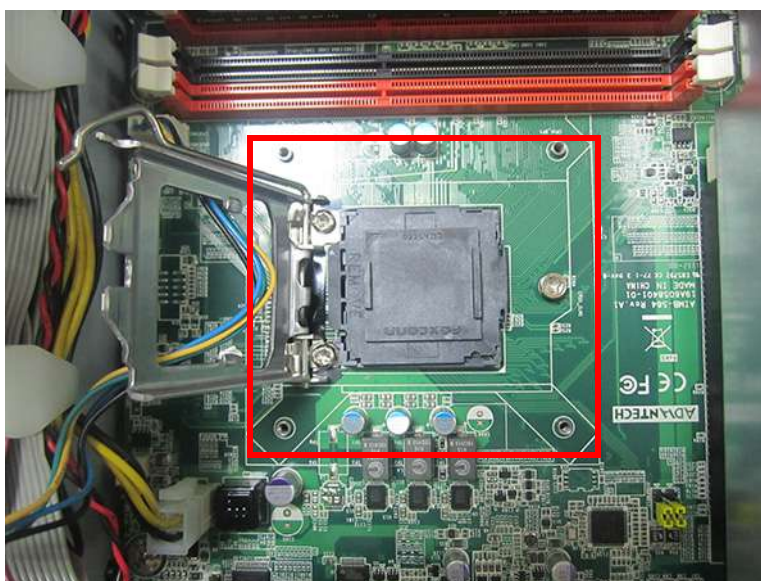


## 2.3 CPU Installation

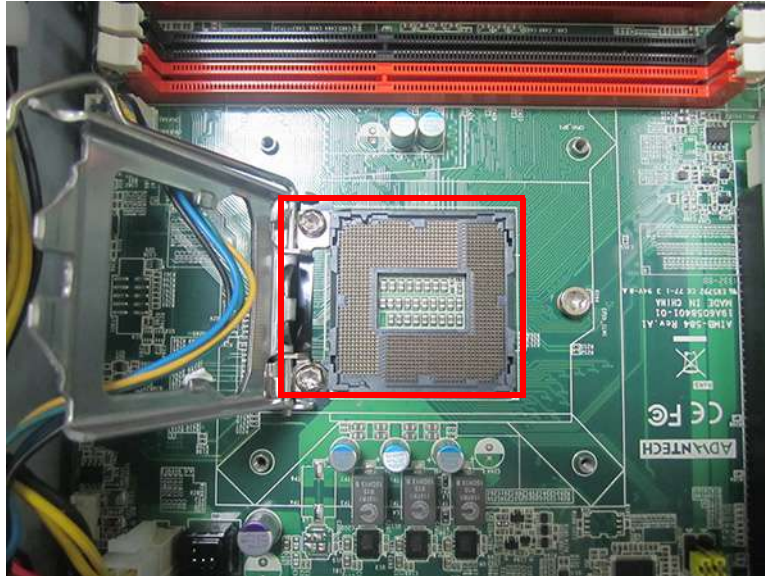
1. Remove the CPU fan.



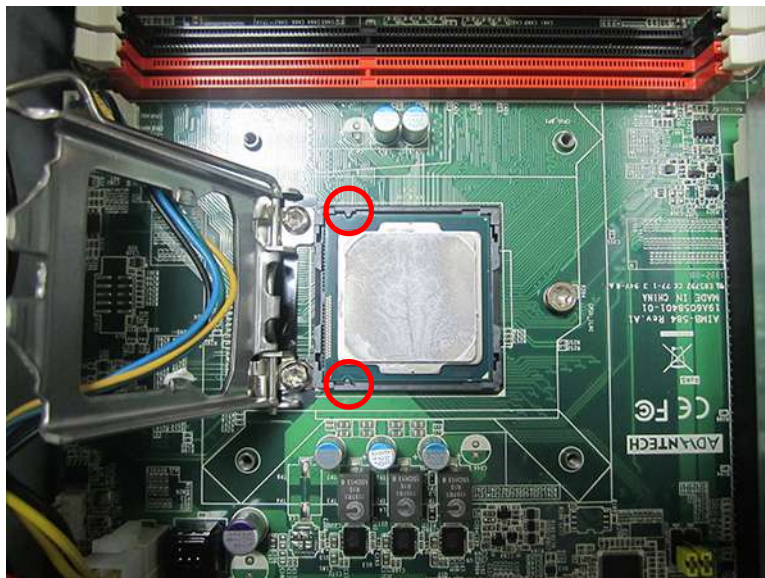
2. Push the CPU lever outwards.



3. Remove the CPU pin cap.



4. Install the CP, taking note of the direction of the notched corner.



- Return the CPU lever to its original position. Apply thermal grease (provided in the accessory box) to the CPU.

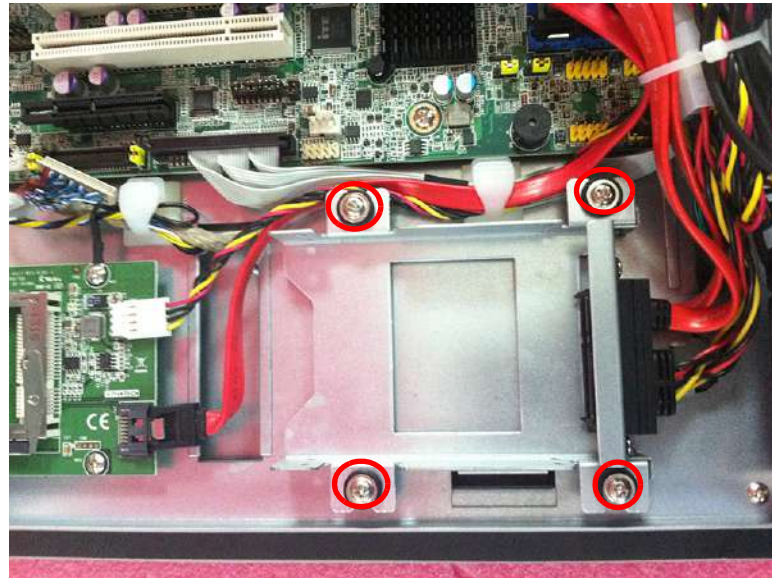


- Install the CPU fan and connect the CPU fan cable.



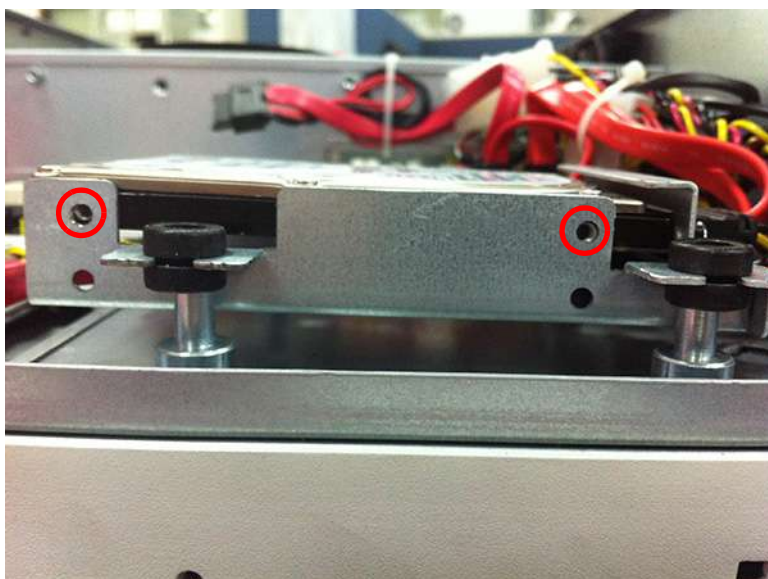
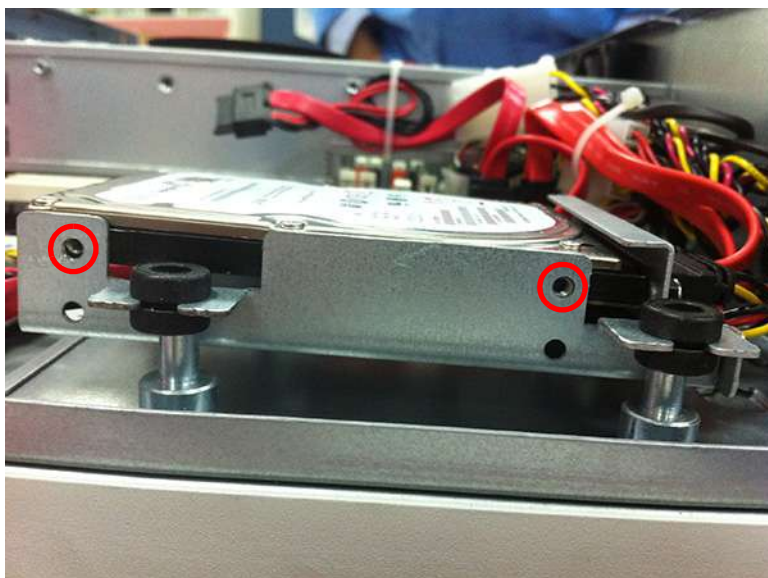
## 2.4 HDD Installation

1. Loosen the four screws on the HDD bracket.





2. Insert the HDD and tighten the affixing screws (provided in the accessory box).



3. Replace and fasten the four screws to secure the HDD bracket in place.



**Note!** *If installing two HDDs, insert them together and fasten the screws on the HDD bracket. The thickness of the HDD must not exceed 9.5 mm (0.37 in). Otherwise, only one HDD or SSD will be able to be installed.*



## 2.5 DVD ROM Installation

To install an optional DVD ROM (a DVD ROM is not provided with this product and must be purchased separately), first retrieve the DVD ROM bracket and screws from the accessory box.

1. Place the DVD ROM onto the bracket.



2. Affix the DVD ROM in place with screws on both sides of the bracket.



3. Remove the DVD ROM plate from the panel PC.



4. Install the assembled DVD ROM and affix in place with screws.

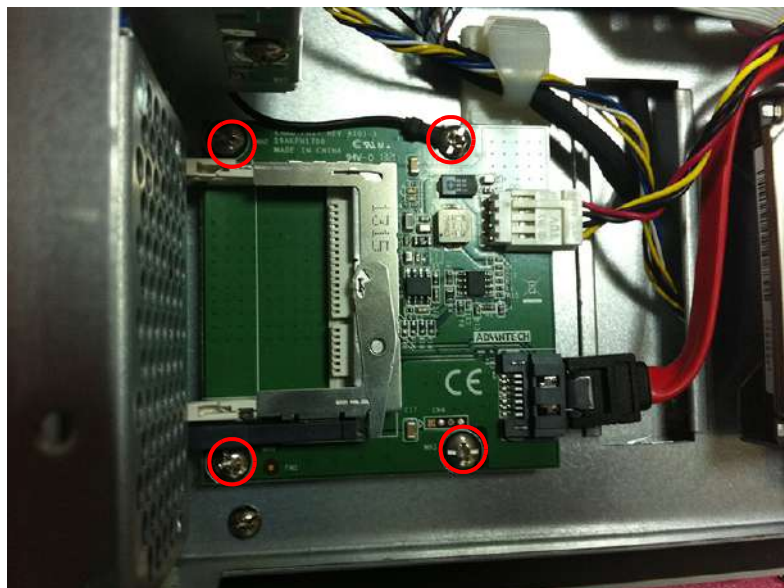


5. Connect the DVD ROM to 4-pin power connector using the power adapter provided in the accessory box.
6. Plug the data cable into the DVD ROM and connect the other end to the SATA 1 port of the main board.

## 2.6 CFast Riser Card Installation

To install an optional CFast riser card, a CFast module (part number: IPPC-6152-CFASTE) is required.

1. Insert a CFast riser card into the CFast module slot and affix it in place using four screws retrieved from the accessory box.



2. Plug the power cable into the CFast module and connect the other end to the 4-pin power connector.
3. Plug the data cable into the CFast module and connect the other end to the SATA4 port of the main board.

## 2.7 Mounting Instructions

IPPC-6152A/6172A/6192A supports two mount options - panel and rack mounting.

### 2.7.1 Panel Mounting

1. Retrieve the four mount brackets from the accessory box.
2. Attach the four mount brackets by inserting the screws into the keyhole slots on the panel PC cover.
3. Use the screws to secure the brackets to the cover. Tighten the screws to secure the display to the back panel.



## 2.7.2 Rack Mounting

For rack mounting, users will need to order the IPPC-6152A-RMKE, IPPC-6172A-RMKE, or IPPC-6192A-RMKE mount kit. These kits support mounting on a 19" industrial rack. For detailed installation instructions, please refer to the *IPPC-6152-6172-6192\_Series\_Mount\_Installation\_Guide (EN&CH)* installation guide provided with the panel PC.

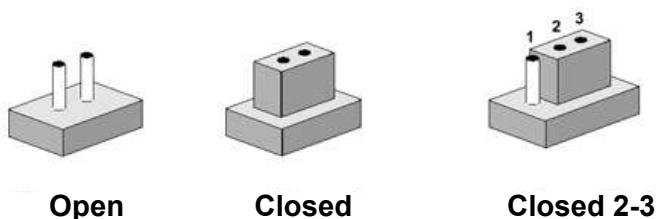
# Chapter 3

## Jumper Settings and Connectors

## 3.1 Jumper Settings

This chapter explains how to set jumpers and configure the IPPC-6152A/6172A/6192A panel PC.

A jumper is the simplest type of electric switch. It consists of two metal pins and a small metal cap (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, simply connect the pins with the cap. To “open” a jumper, simply remove the cap. Occasionally, a jumper will have three pins labeled 1, 2, and 3. For these types of jumpers, connect either pins 1 and 2 or pins 2 and 3.



The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any concerns about the optimum hardware configuration for your application, contact your local distributor or sales representative before making any changes. Generally, only a standard cable is required to make most connections.

### 3.1.1 Jumpers and Switches

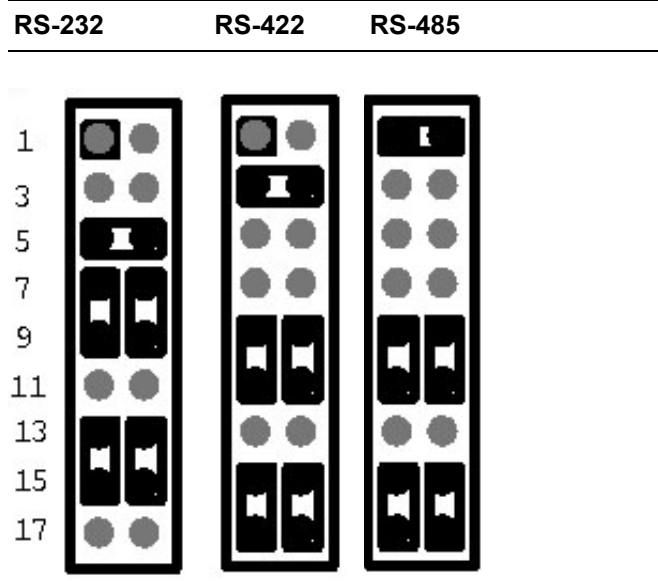
The IPPC-6152A/6172A/6192A motherboard features a number of jumpers that allow the system to be configured according to specific applications.



### 3.1.2 COM3 Settings

The COM3 jumper is used to select RS-232 (default), RS-422, or RS-485.

**Table 3.1: COM3 Settings**



Pin	Pin Name
1	UART_SIN
2	RXD485
3	UART_SIN
4	RXD422
5	UART_SIN
6	RXD232
7	DCD#
8	SOUT
9	COM3_DCD#
10	COM3_SOUT
11	COM3_TXD485N
12	COM3_RXD485P
13	SIN
14	DTR#
15	COM3_SIN
16	COM3_DTR#
17	COM3_TXD485P
18	COM3_RXD485N

### 3.1.3 Clear CMOS (JCMOS1)

The JCMOS1 jumper is used to erase CMOS data and reset the BIOS information. Follow the steps below to clear CMOS data.

1. Power off the system.
2. Remove the JCMOS1 jumper (1-2).
3. Close the JCMOS1 jumper (2-3).
4. Remove the JCMOS1 jumper (2-3).
5. Close JCMOS1 jumper (1-2).
6. Power on the system. CMOS data should be cleared.
7. Set the BIOS to default.



JCMOS1	Clear RTC/CMOS
	Reset the register bit in RTC (short 2-3) Normal operation (short 1-2)
Pin	Pin Name
1	NC
2	RTCST#
3	GND



# Chapter 4

Intel Chipset

## 4.1 Overview

The IPPC-6152A/6172A/6192A industrial panel PC is equipped with a CD-ROM and relevant utilities and drivers.

## 4.2 Utilities and Drivers

### Intel® Chipset Software Installation Utility

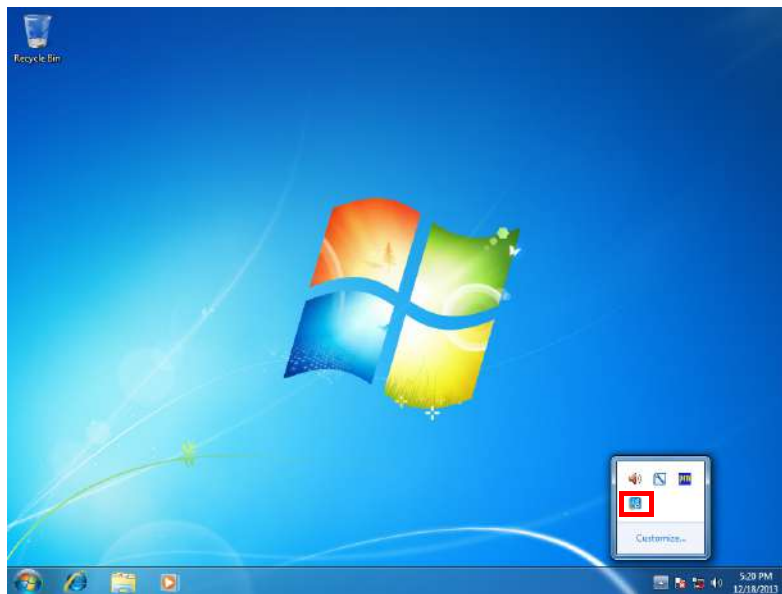
Path: \INF\

Available for the following operating systems:

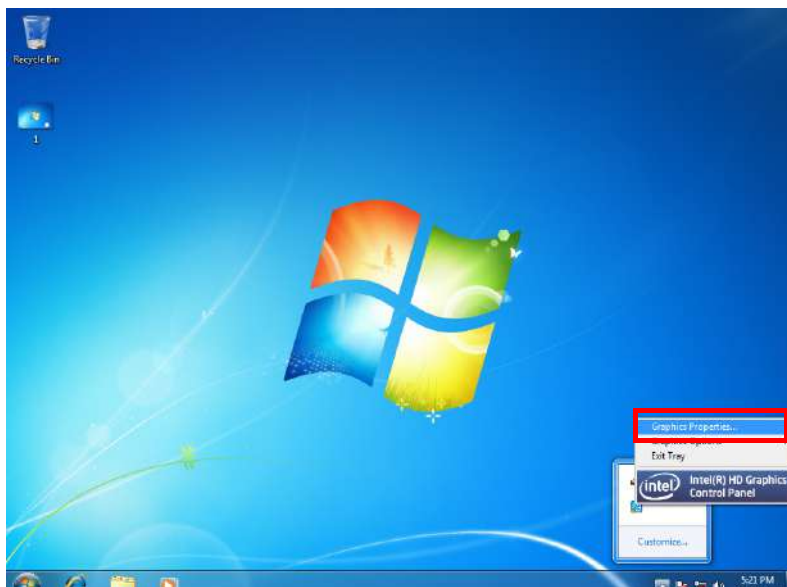
- Microsoft Windows 7
- Microsoft Windows 8

## 4.3 Dual/Triple Display

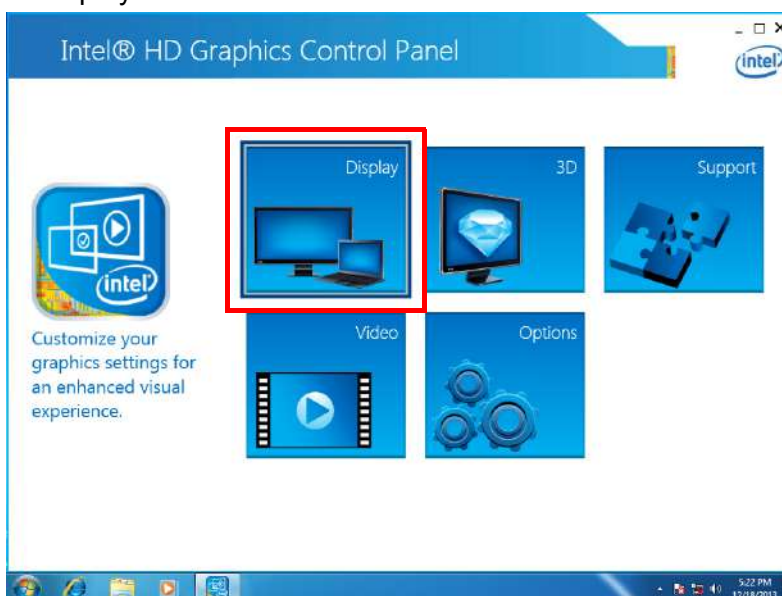
1. Click on the icon shown in the image below.



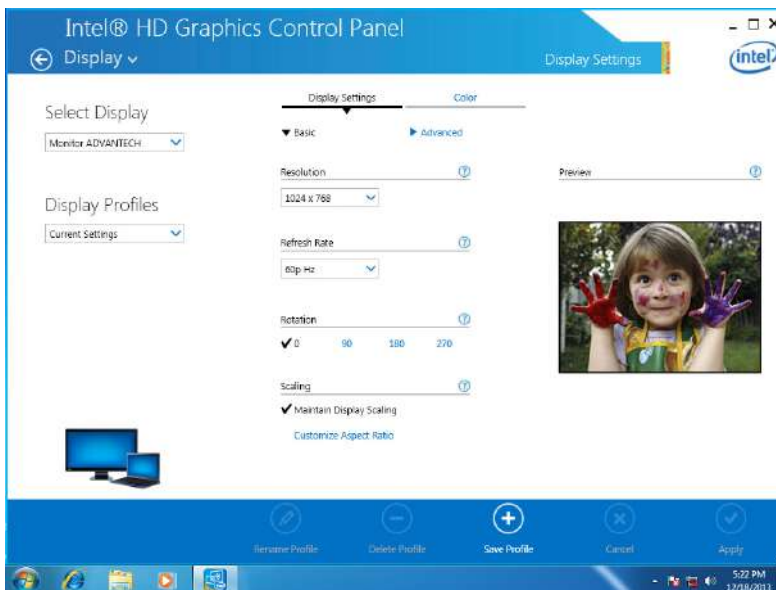
2. Select "Graphics Properties".



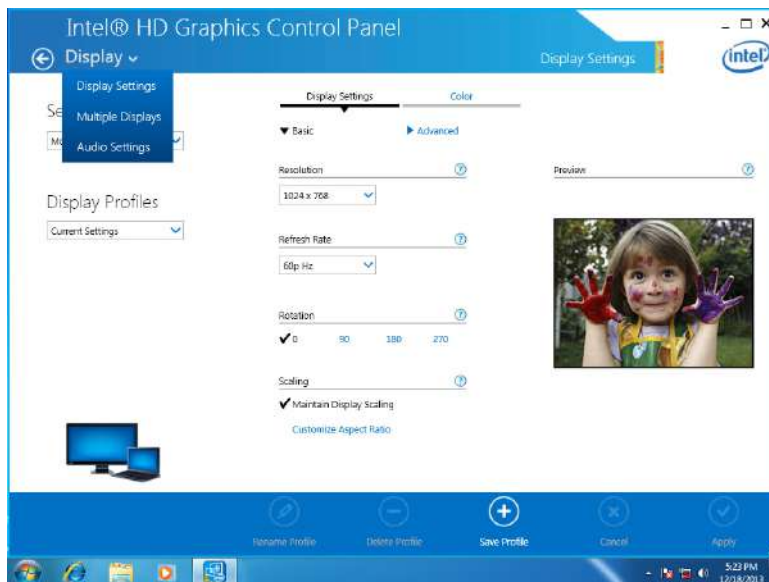
3. Click on "Display".



- Click on the down arrow next to Display to access the drop down menu.



- Select the “Multiple Displays” option and configure the parameters.



# Chapter 5

## AMI BIOS Setup

## 5.1 Introduction

Each option in the main BIOS Setup menu is described in this chapter.

The main BIOS Setup menu page features two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured, whereas options that are presented in blue can be configured. The right frame displays the key legend. Above the key legend is an area reserved for text. When selected, options are highlighted in white and may have an accompanying text message.

### 5.1.1 Key Legend

The BIOS Setup utility supports key-based navigation with the use of hot keys. Most of the BIOS Setup hot keys can be used at any time when navigating the BIOS Setup menu.

Keys	Function Description
←, → Left/Right	The left and right <Arrow> keys allow users to select a setup page. For example, the Main, Advanced, and Chipset setup pages.
↑, ↓ Up/Down	The up and down <Arrow> keys allow users to select a setup item or sub-menu.
+, - Plus/Minus	The plus and minus keys allow users to change the value of a specific setup item. For example, Date and Time.
F1	The <F1> key allows users to access the <i>General Help</i> page.
F2	The <F2> key allows users to revert to a previous settings configuration.
F3	The <F3> key allows users to restore the BIOS default settings
F4	The <F4> key allows users to save all changes and exit the BIOS setup program.
ESC	The <Esc> key allows users to discard all changes and exit the BIOS setup program.
Enter	The <Enter> key allows users to display or change the setup option listed for a particular setup item or access the item's sub-menus.

### 5.1.2 List Box

The list box appears only in the opening page. The box lists the configurable items in the menu selected.

### 5.1.3 Sub-Menus

A right pointer symbol (u) is displayed at the left of certain items. This pointer indicates that the item has a sub-menu. Sub-menus contain additional options for a n item parameter. To access a sub-menu, move the highlight to the item and press <Enter>. Use the legend keys to enter values and move from item to item within a sub-menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. While moving around the BIOS Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.



## 5.2 BIOS Configuration

### 5.2.1 Main Setup

Upon entering the BIOS Setup utility, the Main BIOS Setup menu appears on screen. Users can return to the Main setup page by selecting the Main tab. There are two configurable items in the Main Setup page. The Main BIOS Setup page is shown below.

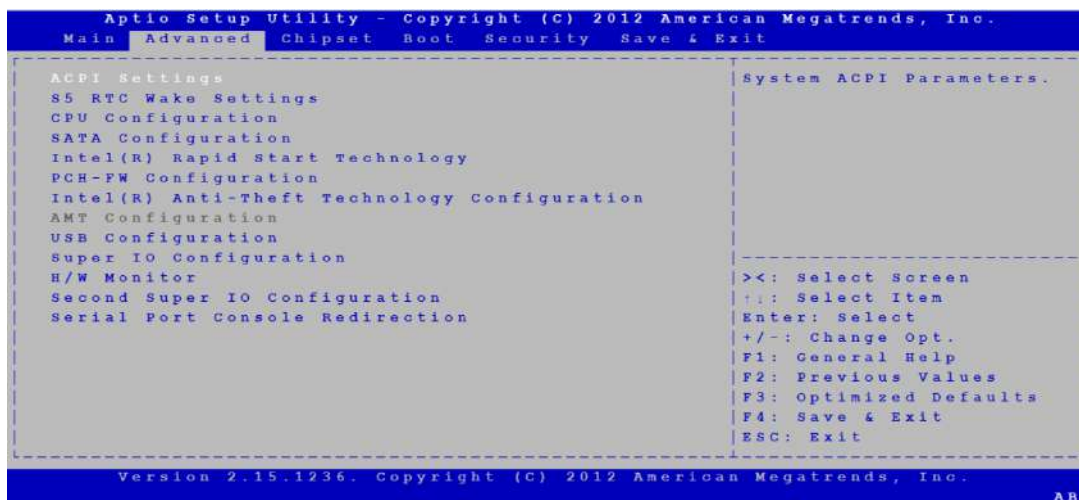


- **System Time/System Date**

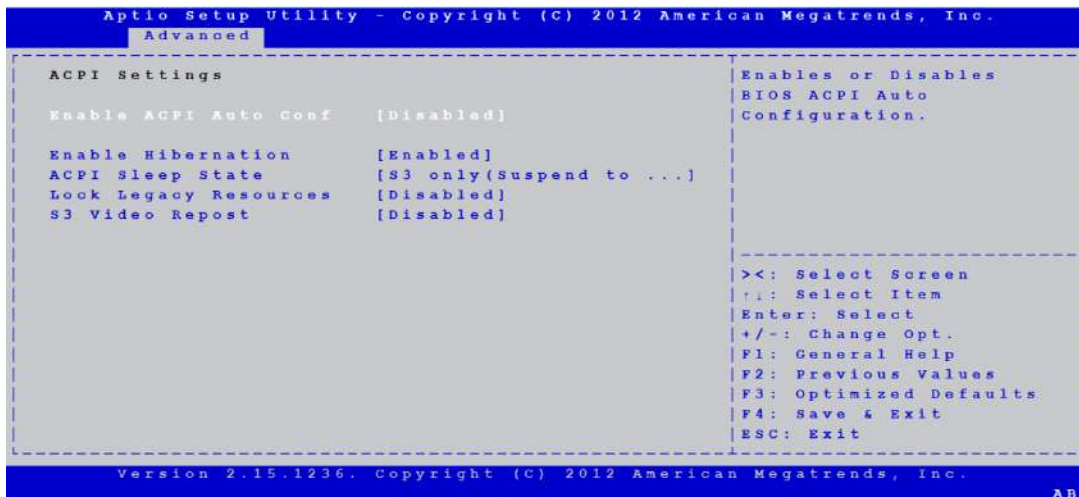
Use this item to set the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values via the keyboard. Press <Tab> or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

### 5.2.2 Advanced BIOS Setup

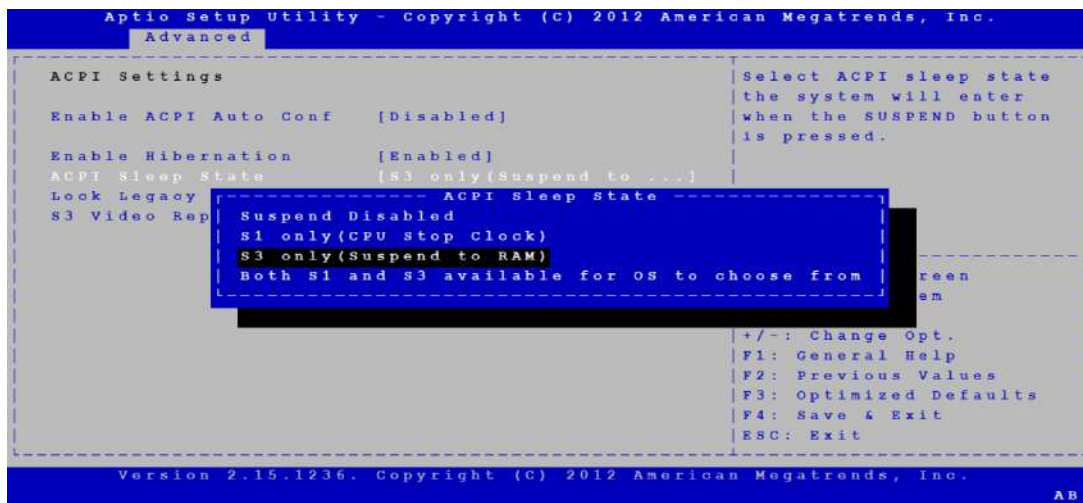
Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup menu. Users can select any of the items in the left frame of the screen, such as SuperIO Configuration, to access the sub menu for that item. To display the options for an Advanced BIOS Setup item, simply highlight the item using the <Arrow> keys. The Advanced BIOS Setup screen is shown below.



## 5.2.2.1 ACPI Settings



- **Enable ACPI Auto Configuration**  
The default configuration is [Disabled].
- **Enable Hibernation**  
The default configuration is [Enabled].
- **ACPI Sleep State**  
The default configuration is [S3 only]. Users can select other options.



- **Lock Legacy Resources**  
The default configuration is [Disabled].
- **S3 Video Repost**  
The default configuration is [Disabled].

### 5.2.2.2 S5 RTC Wake Settings

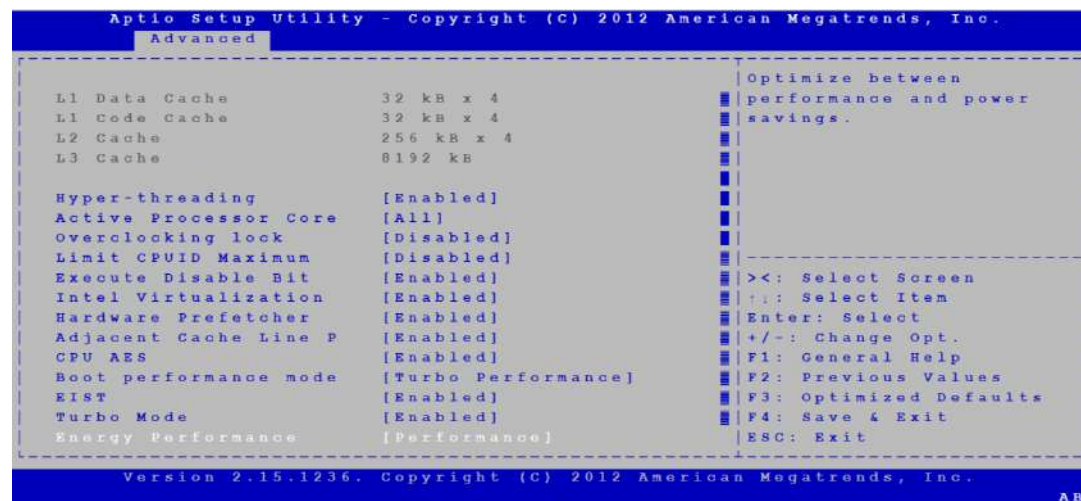
#### Wake System with Fixed Time

The default configuration is [Disabled].



### 5.2.2.3 CPU Configuration

This item displays the CPU parameters for reference. Users can configure the CPU parameters according to their preferences.



```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
Package power lim [Enabled]
Cpu Power Limit1 0
Cpu Power Limit1 0
Cpu Power Limit2 0
Platform power l1 [Enabled]
Cpu Power Limit3 0
Cpu Power Limit3 0
Cpu Power Limit3 0
DDR Power Limit1 0
DDR Power Limit1 0
DDR Power Limit2 0
1-Core Ratio Limi 0
2-Core Ratio Limi 0
3-Core Ratio Limi 0
4-Core Ratio Limi 0
VR Current value lock [Enabled]
VR Current value 0
CPU C states [Enabled]
Enhanced C1 state [Enabled]
Enhanced C1 state
-----
><: Select Screen
:: Select Item
Enter: Select
+/-: Change Opt..
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB

```

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
CPU C3 Report [Enabled]
CPU C6 report [Enabled]
C6 Latency [Short]
CPU C7 report [CPU C7s]
C7 Latency [Long]
C1 state auto demot [Enabled]
C3 state auto demot [Enabled]
Package C state dem [Disabled]
C1 state auto undem [Enabled]
C3 state auto undem [Enabled]
Package C state und [Disabled]
C state Pre-Wake [Enabled]
CFG lock [Enabled]
Package C State limit [AUTO]
LakeTiny Feature [Disabled]
TCC Activation Offset 0
Intel TXT(LT) Support [Disabled]
ACPI T State [Disabled]
CPU DTS [Disabled]
-----
Disabled: ACPI thermal
management uses EC
reported temperature
values.
Enabled: ACPI thermal
management uses DTS SMM
mechanism to obtain CPU
temperature values.
Out of Spec: ACPI
-----
><: Select Screen
:: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB

```

```

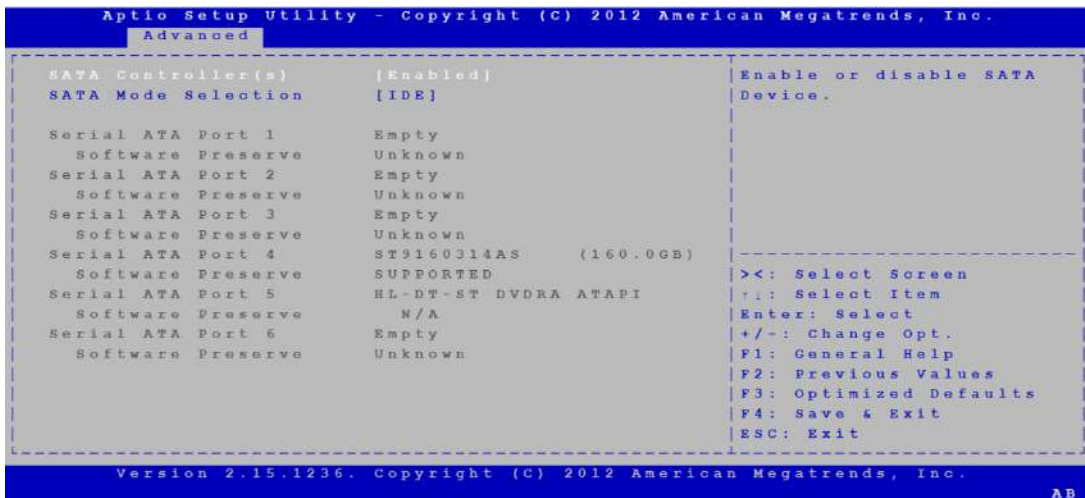
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
CPU C3 Report [Enabled]
CPU C6 report [Enabled]
C6 Latency [Short]
CPU C7 report [CPU C7s]
C7 Latency [Long]
C1 state auto demot [Enabled]
C3 state auto demot [Enabled]
Package C state dem [Disabled]
C1 state auto undem [Enabled]
C3 state auto undem [Enabled]
Package C state und [Disabled]
C state Pre-Wake [Enabled]
CFG lock [Enabled]
Package C State limit [AUTO]
LakeTiny Feature [Disabled]
TCC Activation Offset 0
Intel TXT(LT) Support [Disabled]
ACPI T State [Disabled]
CPU DTS [Disabled]
-----
Disabled: ACPI thermal
management uses EC
reported temperature
values.
Enabled: ACPI thermal
management uses DTS SMM
mechanism to obtain CPU
temperature values.
Out of Spec: ACPI
-----
><: Select Screen
:: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB

```

### 5.2.2.4 SATA Configuration

This page provides a list of the SATA-enabled devices installed in or connected to the system.



Users can also set the HDD mode to either IDE, AHCI, or RAID.



### 5.2.2.5 Intel® Rapid Start Technology

- **Intel® Rapid Start Technology**

The default configuration is [Disabled].

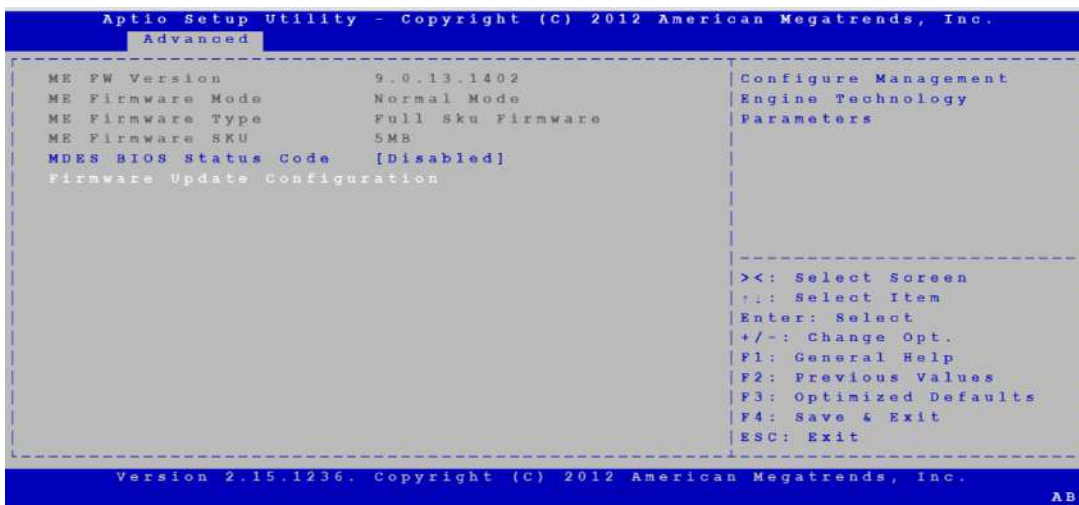


### 5.2.2.6 PCH-FW Configuration

This page displays ME version information.

- **MDES BIOS Status Code**

The default configuration is [Disabled].

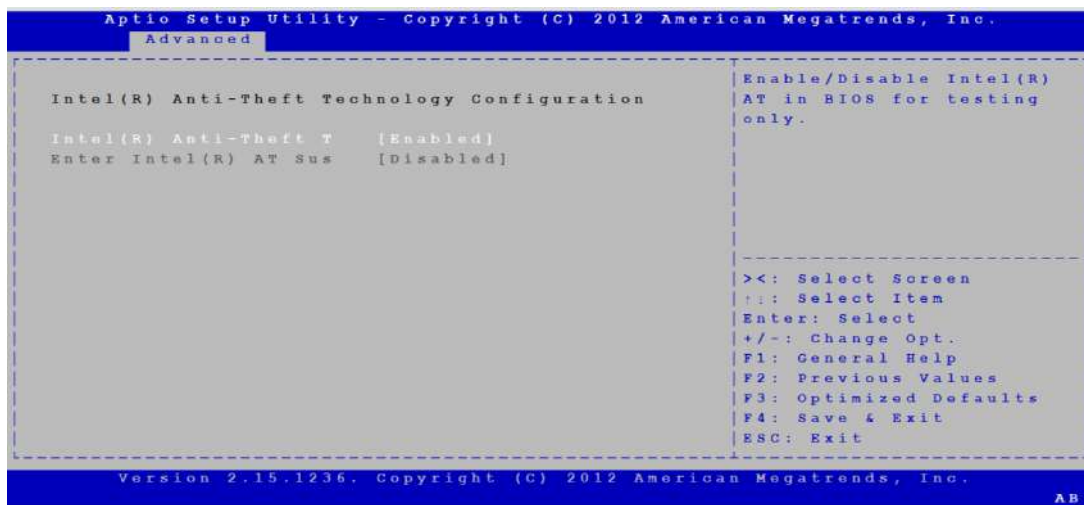


- **Me FW Image Re-Flash**  
The default configuration is [Disabled].

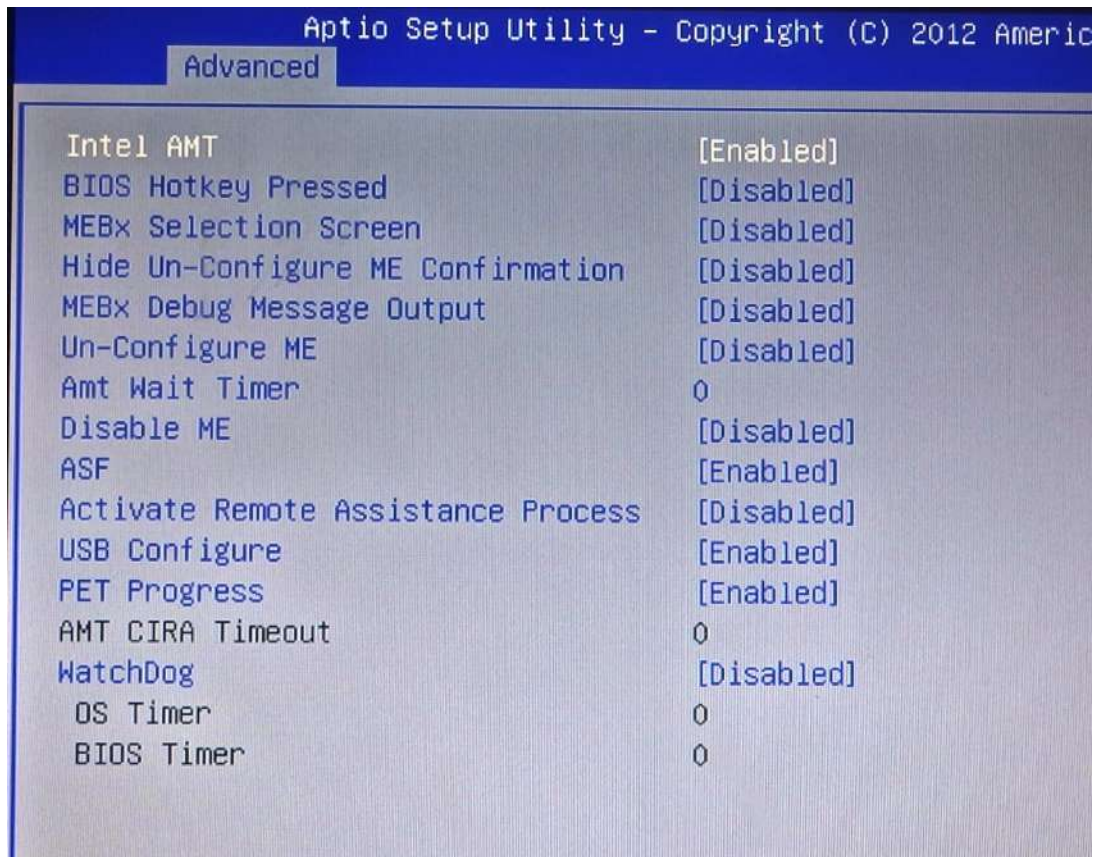


### 5.2.2.7 Intel® Anti-Theft Technology Configuration

- **Intel® Anti-Theft Technology**  
The default configuration is [Enabled].
- **Enter Intel® AT Suspend Mode**  
The default configuration is [Disabled].



### 5.2.2.8 Intel AMT

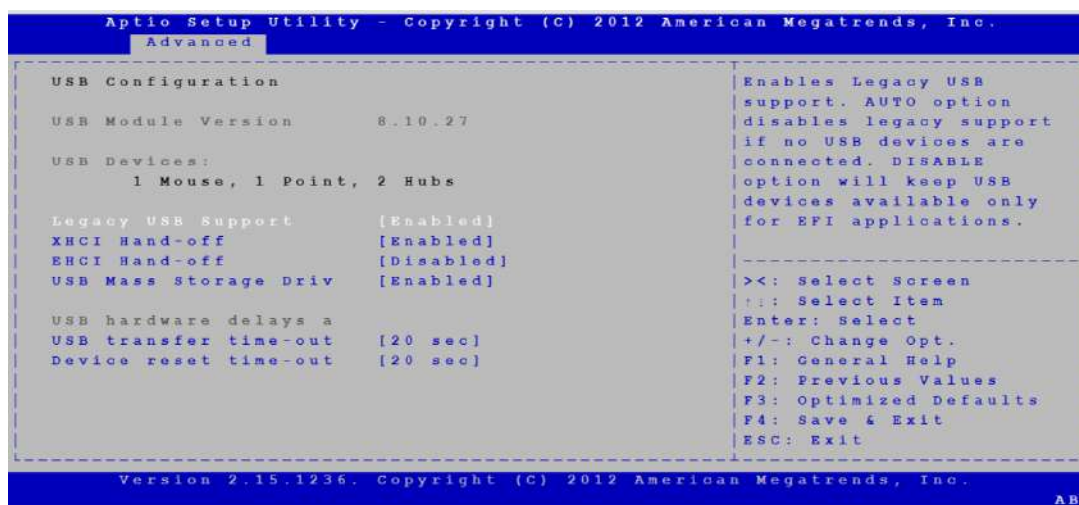


- **Intel AMT**  
The default configuration is [Enabled]. Intel Active Management Technology (AMT) is hardware based and supports remote management and out-band security.
- **BIOS Hotkey Pressed**  
The default configuration is [Disabled].
- **MEBx Selection Screen**  
The Intel Management Engine BIOS Extension (MEBx) item can be used to select screen function. The default configuration is [Disabled].
- **Hide Un-Configure ME Confirmation**  
The default configuration is [Disabled].
- **MEBx Debug Message Output**  
The default configuration is [Disabled].
- **Un-Configure ME**  
The default configuration is [Disabled].
- **AMT Wait Time**  
The wait time to enter AMT is set as 0 as a default.
- **Disable ME**  
The default configuration is [Disabled]. Users can enable this function if required.
- **ASF**  
The default configuration is [Enabled].
- **Activate Remote Assistance Process**  
The default configuration is [Disabled].



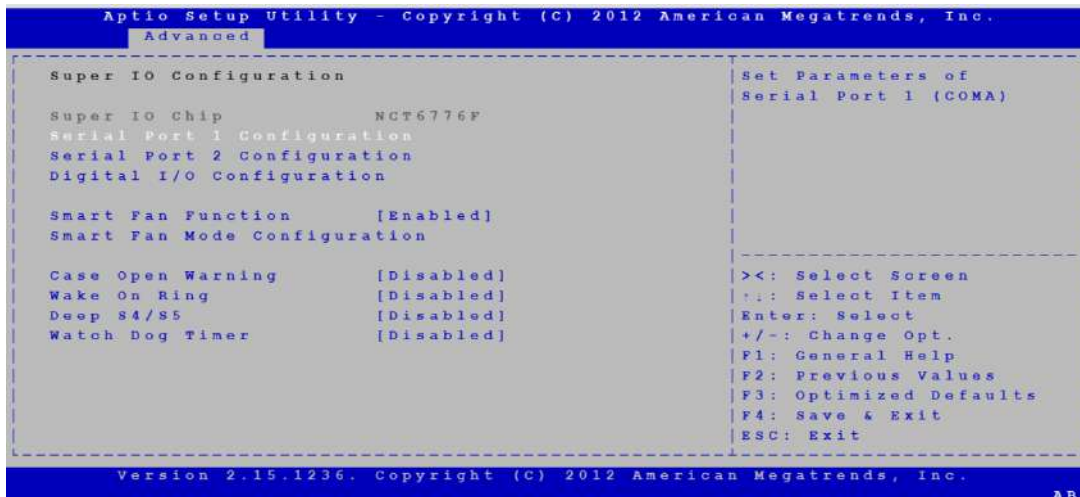
- **USB Configure**  
The default configuration is [Enabled].
- **PET Progress**  
The default configuration is [Enabled].
- **AMT CIRA Timeout**  
The value is set as 0 by default and cannot be modified.
- **Watchdog**  
The default configuration is [Disabled]. Users can enable this function if required. The OS timer and BIOS timer are only effective when the Watchdog function is enabled.

### 5.2.2.9 USB Configuration



- **Legacy USB Support**  
The default configuration is [Enabled].
- **XHCI Hand-Off**  
The default configuration is [Enabled].
- **EHCI Hand-Off]**  
The default configuration is [Disabled].
- **USB Mass Storage Driver Support**  
The default configuration is [Enabled].
- **USB Transfer Timeout**  
The default value for this parameter is [20 seconds]. The options are 1 sec, 5 sec, 10 sec, and 20 sec.
- **Device Reset Timeout**  
The default value for this parameter is [20 seconds]. The options are 10 sec, 20 sec, 30 sec, and 40 sec.
- **Device Power-Up Delay**  
The default configuration is [Auto]. Users can select between [Auto] and [Manual].

### 5.2.2.10 Super IO Configuration



- **Serial Port 1 Configuration**

The default configuration is [Auto]. Users can set the COM1 address according to their application requirements.



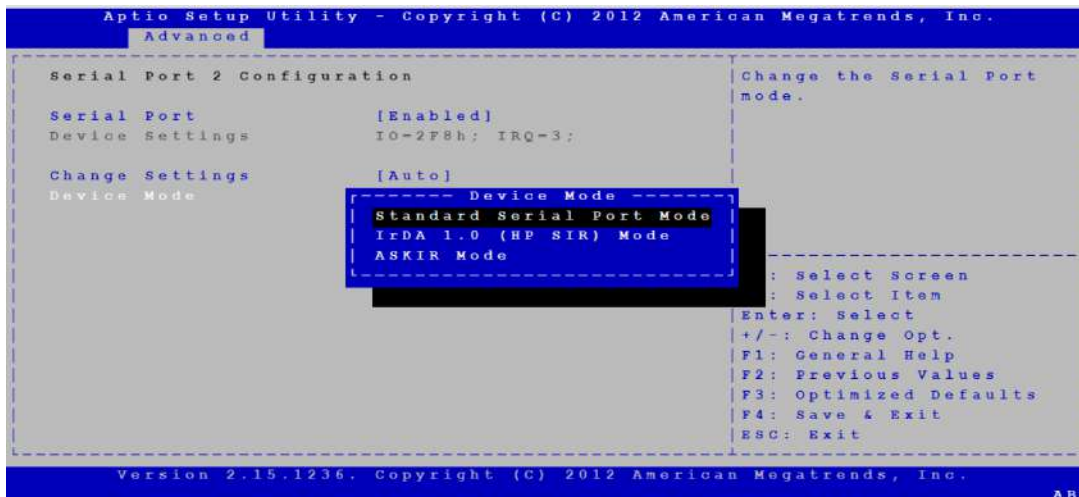
- **Serial Port 2 Configuration**

The default configuration is [Auto]. Users can set the COM2 address according to their application requirements.



### ■ Device Mode

The default configuration is [Standard Serial Port Mode]. Users can also configure this item as [IrDA 1.0(HP SIR) mode] or [ASKIR mode].



■ **Digital I/O Configuration**

The default configuration for the Digital I/O Pins is [Input]. Users can set these items as [Output High] or [Output Low] according to their usage requirements.

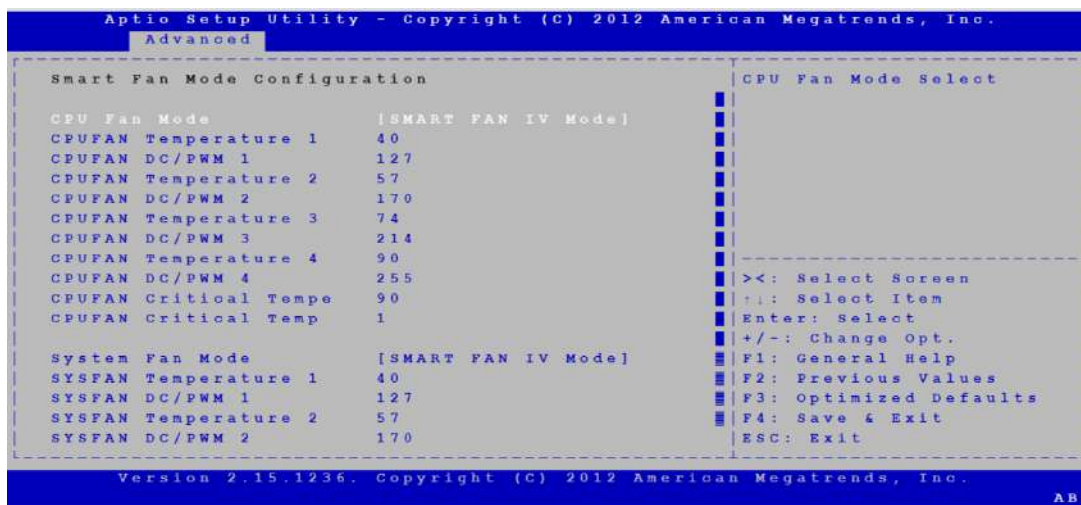


■ **Smart Fan Function**

The default configuration is [Enabled].

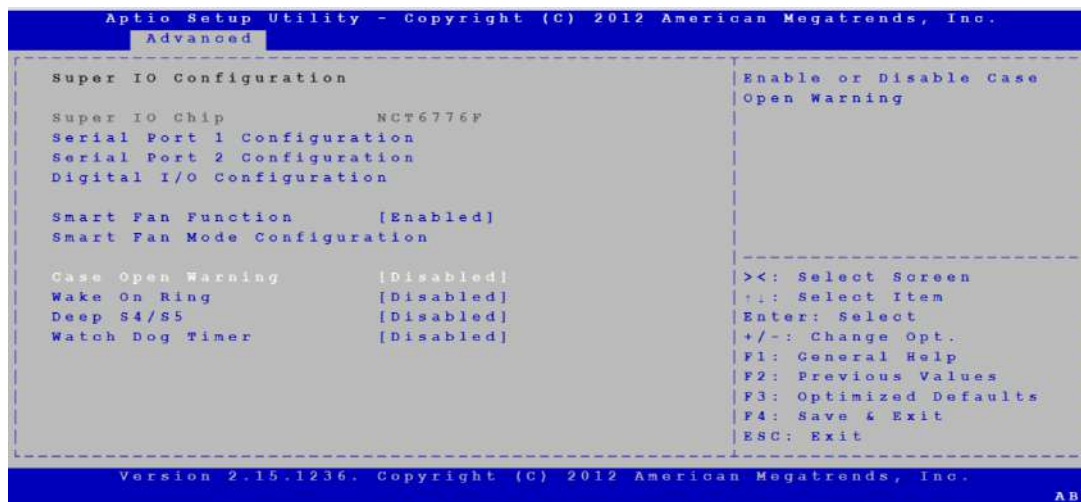
■ **Smart Fan Mode Configuration**

This item is used to configure the CPU fan and system fan mode.



■ **Case Open Warning**

The default configuration is [Disabled]. Users can enable this function if required.



■ **Wake On Ring**

The default configuration is [Disabled]. Users can enable this function if required.

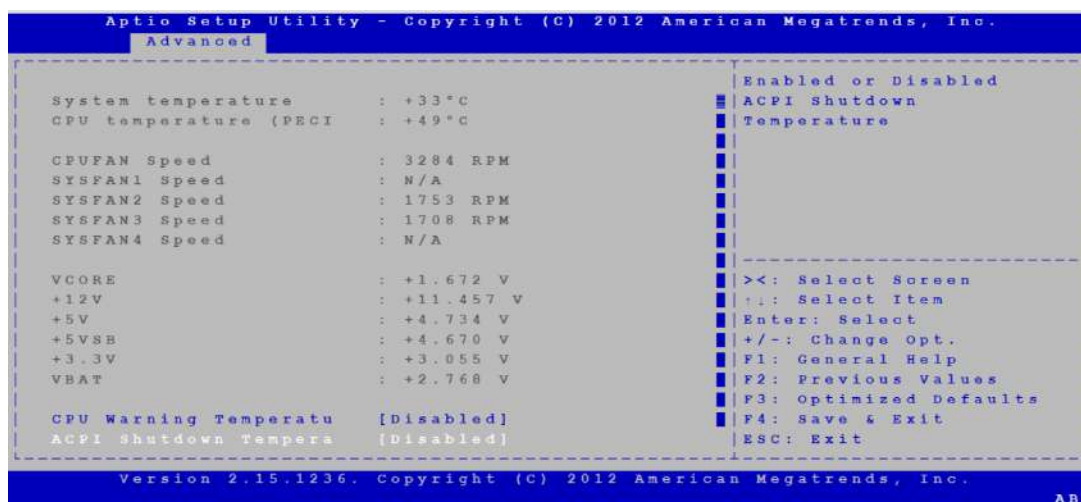
■ **Deep S4/S5**

The default configuration is [Disabled]. Users can enable this function if required.

■ **Watch Dog Timer**

The default configuration is [Disabled]. Users can enable this function if required.

**5.2.2.11 H/W Monitor**



■ **System Temperature**

This item shows the current temperature of the entire machine.

■ **CPU Temperature (PECI)**

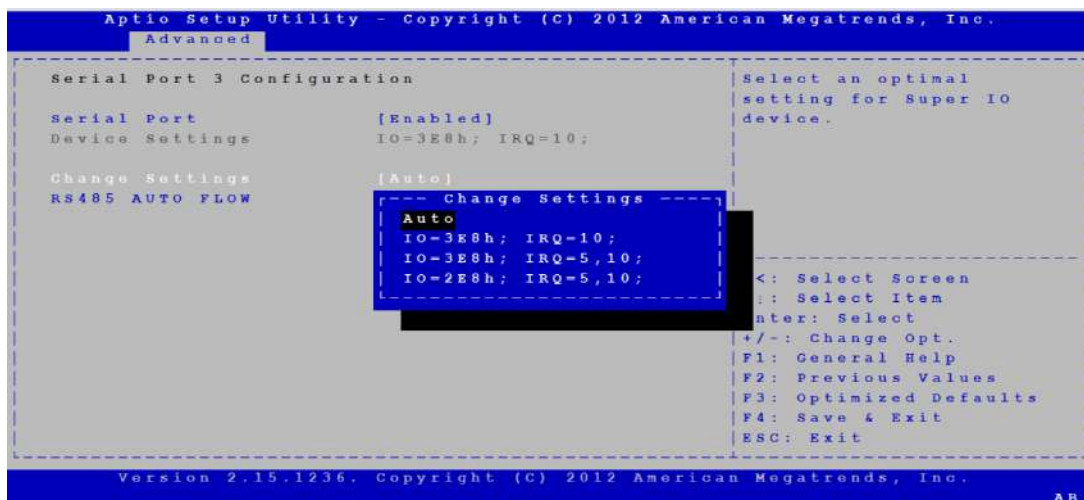
This item shows the current temperature of the CPU.

- **CPU Fan Speed**  
This item shows the current CPU fan speed.
- **SYSFAN 1 Speed**  
There is no SYSFAN1 installed, so no speed is displayed.
- **SYSFAN 2 Speed**  
This item shows the current speed of SYSFAN 2.
- **SYSFAN 3 Speed**  
This item shows the current speed of SYSFAN 3.
- **SYSFAN 4 Speed**  
There is no SYSFAN4 installed, so no speed is displayed.
- **CPU Warning Temperature**  
The default configuration is [Disabled]. Users can configure this item according to their usage requirements.
- **ACPI Shutdown Temperature**  
The default configuration is [Disabled]. Users can configure this item according to their usage requirements.

### 5.2.2.12 Second Super IO Configuration

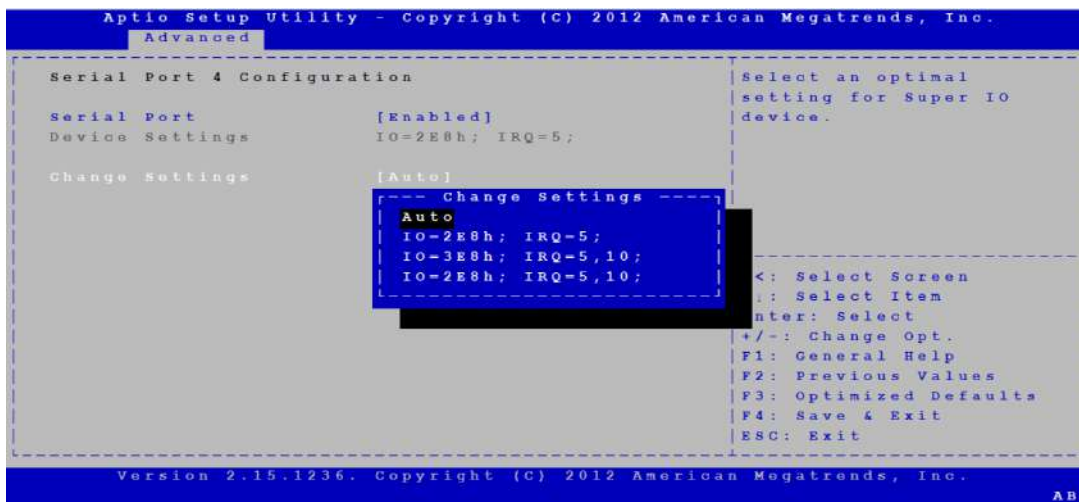


### Serial Port 3 Configuration



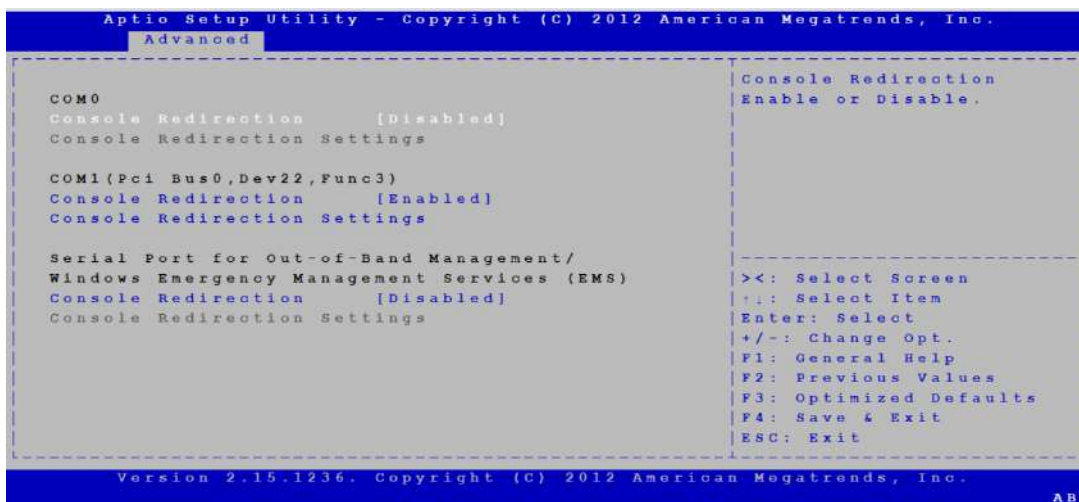
- **Serial Port**  
The default configuration is [Enabled].
- **Change Settings**  
The default configuration is [Auto]. Users can configure the COM3 address according to their application requirements.
- **RS485 Auto Flow**  
The default configuration is [Disabled].

### Serial Port 4 Configuration



- **Serial Port**  
The default configuration is [Enabled].
- **Change Settings**  
The default configuration is [Auto]. Users can configure the COM4 address according to their application requirements.

### 5.2.2.13 Serial Port Console Redirection



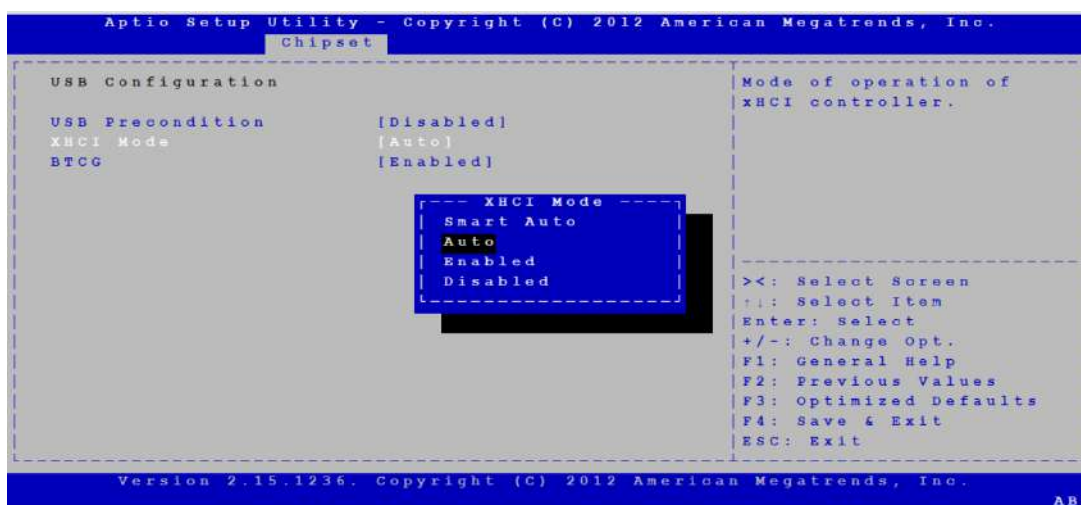
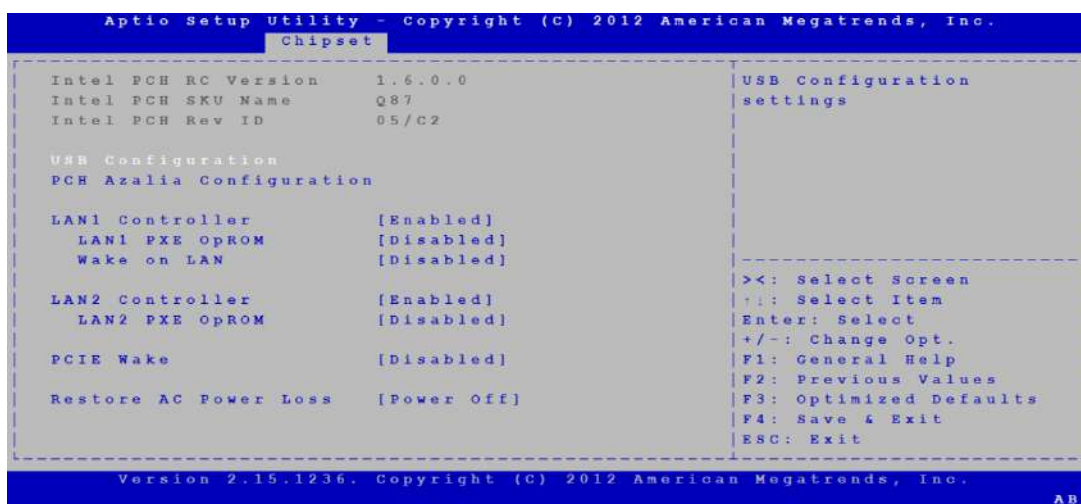
- **ConsoleRedirection**  
The default configuration is [Disabled]. Users can enable this function according to their usage requirements.

## 5.2.3 Chipset Setup

### 5.2.3.1 PCH-IO Configuration



### ■ USB Configuration





**- USB Precondition**

The default configuration is [Disabled]. Users can enable this function according to their usage requirements.

**- XHCI Mode**

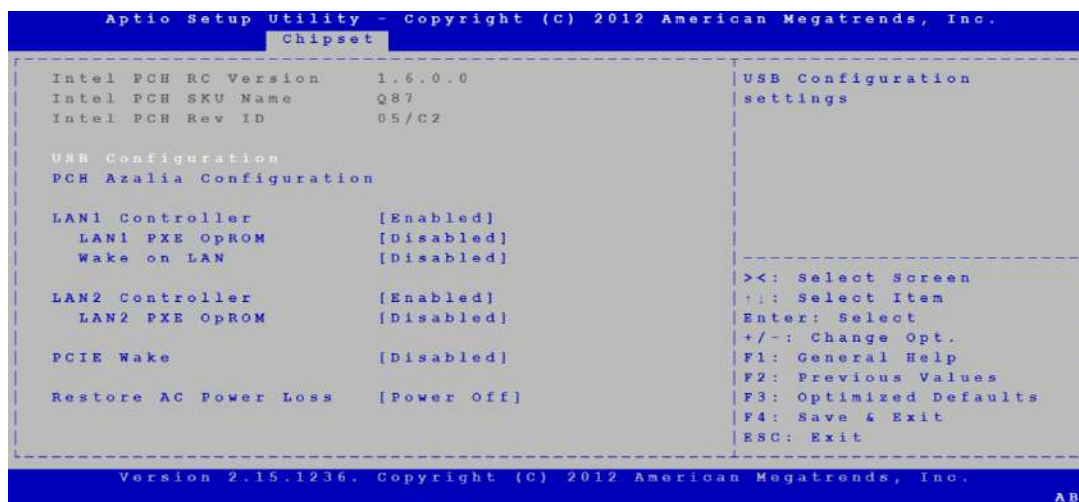
The default configuration is [Auto]. Users can enable or disable this function according to their usage requirements.

**- BTCCG**

The default configuration is [Enabled].

■ **PCH Azalia Configuration**

The default configuration is [Auto]. Users can enable or disable this function according to their usage requirements.



**- LAN1 Controller**

The default configuration is [Enabled].

**- LAN1 PXE OpROM**

The default configuration is [Disabled].

**- Wake On LAN**

The default configuration is [Disabled].

**- LAN2 Controller**

The default configuration is [Enabled].

**- LAN2 PXE OpROM**

The default configuration is [Disabled].

**- PCIE Wake**

The default configuration is [Disabled]. Users can enable this function according to their usage requirements.

**- Restore AC Power Loss**

The default configuration is [Power Off]. Users can configure this function as [Power On] or [Last State] according to their usage requirements.

### 5.2.3.2 System Agent (SA) Configuration

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
-----
System Agent Bridge N   Haswell
System Agent RC Versi  1.6.0.0
VT-d Capability         Supported

VT-d                   [Enabled]

Graphics Configuration
DMI Configuration
NB PCIe Configuration
Memory Configuration

Check to enable VT-d
function on MCH.

><: Select Screen
+: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB
  
```

### ■ Graphics Configuration

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
-----
Graphics Configuration
IGFX VBIOS Version     2173
IGfx Frequency         700 MHz
Graphics Turbo IMON C  31

Primary Display        [Auto]
Internal Graphics      [Auto]
Aperture Size          [256MB]
DVMT Pre-Allocated    [32M]
DVMT Total Gfx Mem    [256M]
Gfx Low Power Mode     [Enabled]
LCD Control

Graphics turbo IMON
current values
supported (14-31)

><: Select Screen
+: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB
  
```

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
-----
LCD Control
Primary IGFX Boot Dis  [LVDS/eDP]
Secondary IGFX Boot D  [CRT]
LVDS Panel Type        [1024x 768  single(2...)]

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.

><: Select Screen
+: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  AB
  
```



**- Primary IGFX Boot Display**

The default configuration is [LVDS/eDP]. Users can configure this item as [DVI], [CRT] or [DP] according to their usage requirements.

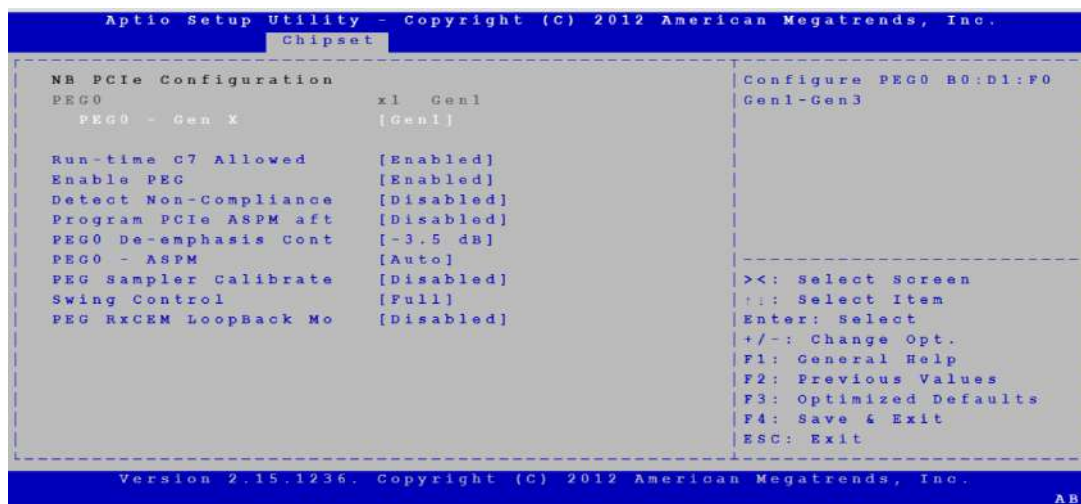
**- Secondary IGFX Boot Display**

The default configuration is [CRT]. Users can configure this item as [LVDS/eDP], [DVI], [DP], or [Off] according to their usage requirements.

**- LVDS Panel Type**

This item lists the LVDS panel resolution, which is 1024 x 768 for IPPC-6152 and 1280 x 1024 for IPPC-6172 and IPPC-6192.

■ **NB PCIe Configuration**



**- PEG0-Gen X**

The default configuration is [GEN1]. Users can configure this as [GEN2] if required.

**- Run-Time C7 Allowed**

The default configuration is [Enabled].

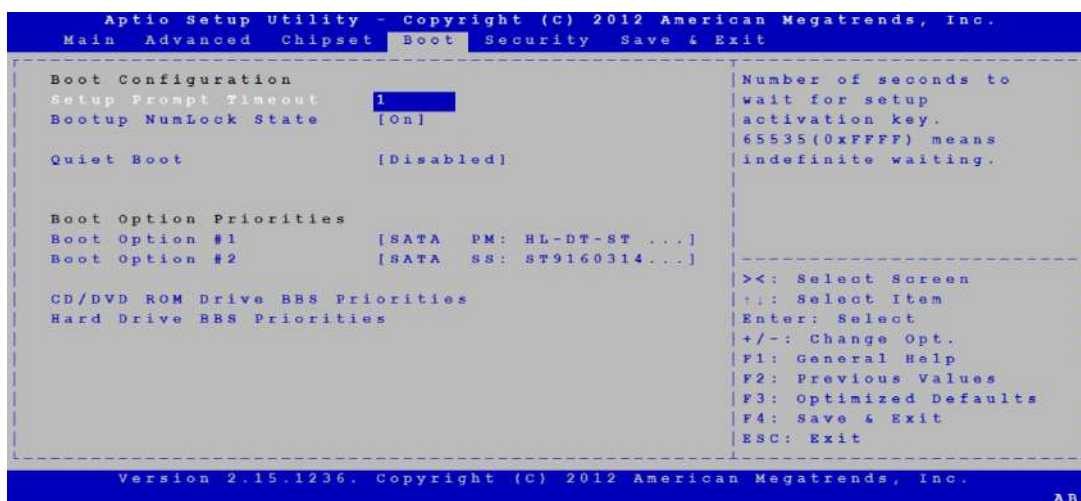
**- Enable PEG**

The default configuration is [Enabled].

**- Detect Non-Compliant Devices**

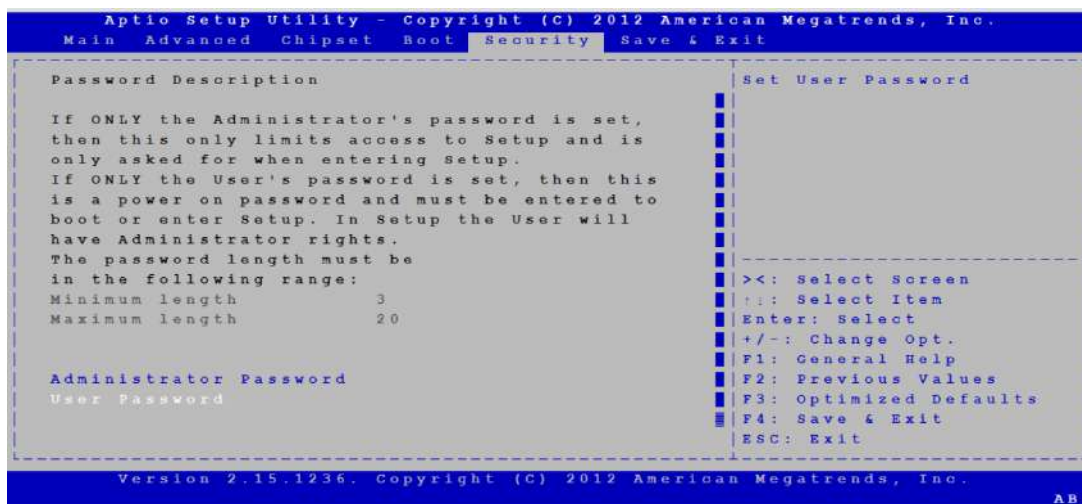
- The default configuration is [Disabled].
- **Program PCIe ASPM After OpROM**  
The default configuration is [Disabled].
- **PEG0 De-Emphasis Control**  
The default configuration is [-3.5 dB]. Users can configure this item as [-6 dB] if required.
- **PEG0 -ASPM**  
The default configuration is [Auto]. Users can configure this item as [ASPM L0s], [ASPM L1], or [ASPM L0sL1] if required.
- **PEG Sampler Calibrate**  
The default configuration is [Disabled]. Users can configure this item as [Auto] or [Enabled] if required.
- **Swing Control**  
The default configuration is [Full]. Users can an configure this item as [Half] if required.
- **PEG RxCEM Loopback Mode**  
The default configuration is [Disabled].

## 5.2.4 Boot Setting Configuration



- **Setup Prompt Timeout**  
The default configuration is [1 sec]. Users can configure this item according to their usage requirements. The higher the value, the longer the time the initial boot screen is displayed.
- **Bootup NumLock State**  
The default configuration is [On]. Users can an configure this item as [Off] if required.
- **Quiet Boot**  
The default configuration is [Disabled].
- **Boot Option #1/Boot Option #2**  
These items show the different hardware options.
- **Hard Drive BBS Priorities**  
This item allows users to set the priority for hard drive bootup.

## 5.2.5 Security Setup



- **Administrator Password**  
This item allows users to set administrator passwords.
- **User Password**  
This item allows users to set user passwords.

## 5.2.6 Exit Menu



- **Save Changes and Exit**  
This item allows users to save changes and exit the BIOS Setup utility.
- **Discard Changes and Exit**  
This item allows users to discard changes and exit the BIOS Setup utility.
- **Restore Default**  
This item allows users to restore the default BIOS configuration.
- **Save as User Defaults**  
This item allows users to save the current settings as user defaults.
- **Restore User Defaults**  
This item allows users to restore the user default configuration.



# Appendix **A**

## I/O and Connector Pin Assignments

## A.1 GPIO

Pin	Pin Name
1	GPIO0 from GP70 of SIO
2	GPIO1 from GP71 of SIO
3	GPIO2 from GP72 of SIO
4	GPIO3 from GP73 of SIO
5	GPIO4 from GP74 of SIO
6	GPIO5 from GP75 of SIO
7	GPIO6 from GP76 of SIO
8	GPIO7 from GP77 of SIO
9	GND



# Appendix **B**

## Watchdog Timer Programming

## B.1 Overview

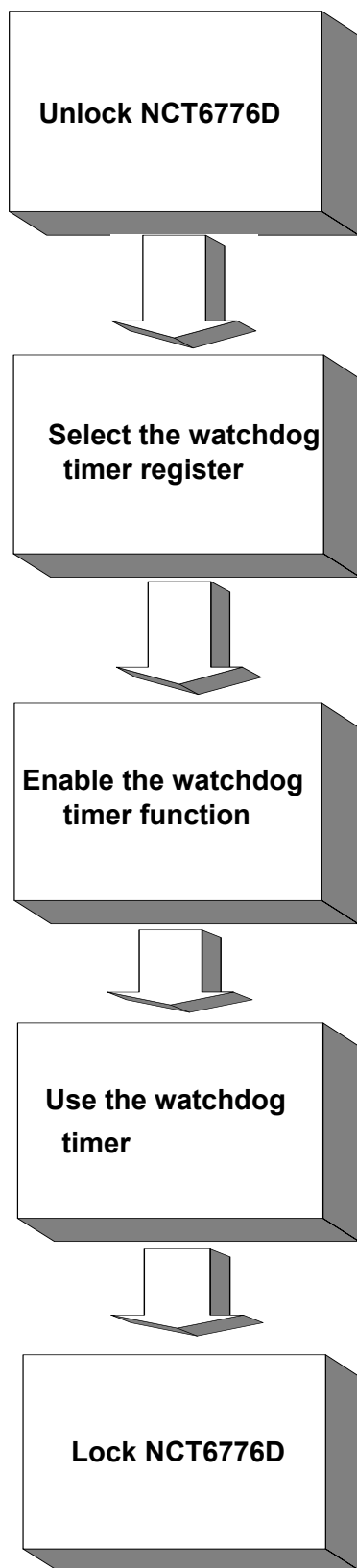
The IPPC-6152A/IPPC-6172A/IPPC-6192A card watchdog timer can be used to monitor the software operation and take corrective action after the predefined interval in the event of a software failure.

The watchdog timer is built into the NCT6776D I/O controller and provides the following functions for user programming:

1. Can be enabled/disabled via a software program
2. The timer interval can be set as 1 ~ 255 seconds
3. Generates an interrupt or reset signal if the software fails to reset the timer after the timeout period

## B.2 Watchdog Timer Programming

The watchdog timer's I/O port address is 2E (hex) and the data port address is 2F (hex).



**Table B.1: Watchdog Timer Registers**

Address of Register (2E)	Attribute	Value (2F) and description
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the NCT6776D.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. This is set as disabled by default.
F5 (hex)	write	Set seconds or minutes as the units for the timer. Write 0 to bit 3: Set seconds as the counting unit. [default] Write 1 to bit 3: Set minutes the as counting unit.
F6 (hex)	write	0: Stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 7: Write 1 to enable the mouse to reset the timer, 0 to disable. [default] Bit 6: Write 1 to enable the keyboard to reset the timer, 0 to disable. [default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default = 0] Bit 4: Read the status of the watchdog timer. 1 means the timer has "timed out".
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

## B.3 Example

1. Enable the watchdog timer and set the timeout interval as 10 seconds.

```

;-----
Mov dx,2eh; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx; Set seconds as the counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;-----
Dec dx; Set the timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;-----
Dec dx; Lock NCT6776D
Mov al,0aah
Out dx,al

```

2. Enable the watchdog timer and set the timeout interval as 5 minutes

```

;-----
Mov dx,2eh; Unlock NCT6776D
Mov al,87h
Out dx,al

```

```

Out dx,al
;-----
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx; Set minutes as the counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;-----
Dec dx; Set the timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;-----
Dec dx; Lock NCT6776D
Mov al,0aah
Out dx,al

3. Enable the watchdog timer to be reset by mouse
;-----
Mov dx,2eh; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h

```

```

Out dx,al
;-----
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx; Enable the watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;-----
Dec dx; Lock NCT6776D
Mov al,0aah
Out dx,al

4. Enable the watchdog timer to be reset by keyboard
;-----
Mov dx,2eh; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx; Enable the watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx

```

```

In al,dx
Or al,40h
Out dx,al
;-----
Dec dx; Lock NCT6776D
Mov al,0aah
Out dx,al

5.   Generate a timeout signal without the timer counting
;-----
Mov dx,2eh; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx; Generate a timeout signal
Mov al,0f7h
Out dx,al; Write 1 to bit 5 of the F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;-----
Dec dx; Lock NCT6776D
Mov al,0aah
Out dx,al

```





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