



**MODEL:
PPC-F06B-BT**

**Industrial Panel PC with Intel® Celeron® Processor N2807,
Touchscreen, PCIe Mini, USB 3.0, USB 2.0, RS-232,
RS-422/485, Dual PCIe GbE, 9 V ~ 30 V DC-in
IP 65 Compliant Front Panel and RoHS Compliant**

User Manual



Revision



Date	Version	Changes
June 23, 2015	1.00	Initial release



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Manual Conventions



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.

Table of Contents

1 INTRODUCTION.....	1
1.1 OVERVIEW.....	2
1.2 FEATURES	3
1.3 FRONT PANEL	3
1.4 REAR PANEL.....	4
1.5 SIDE PANELS	4
1.6 BOTTOM PANEL	5
1.7 DIMENSIONS.....	6
1.8 SPECIFICATIONS	7
2 UNPACKING	9
2.1 UNPACKING.....	10
2.2 PACKING LIST.....	11
2.3 OPTIONAL ITEMS.....	12
3 INSTALLATION	13
3.1 ANTI-STATIC PRECAUTIONS.....	14
3.2 INSTALLATION PRECAUTIONS	14
3.3 PREINSTALLED COMPONENTS.....	15
3.4 INSTALLATION AND CONFIGURATION STEPS	15
3.5 REMOVING THE BACK COVER	16
3.6 mSATA MODULE INSTALLATION	16
3.7 SATA DOM INSTALLATION.....	18
3.8 SERIAL PORT CONFIGURATION AND CONNECTION.....	19
3.8.1 RS-232 Serial Port Pinouts (COM1)	20
3.8.2 RS-232 Serial Port Pin 9 Selection.....	20
3.8.3 RS-422/485 Serial Port Pinouts (COM2)	21
3.9 AT/ATX MODE SELECTION.....	21
3.9.1 AT Power Mode.....	21
3.9.2 ATX Power Mode	22
3.10 MOUNTING THE SYSTEM	22

3.10.1 Wall Mounting.....	22
3.10.2 Panel Mounting.....	25
3.10.3 Rack Mounting.....	26
3.10.4 Arm Mounting.....	28
3.10.5 Stand Mounting.....	30
3.11 POWERING ON THE SYSTEM.....	30
3.12 RESET THE SYSTEM.....	31
3.13 CLEAR CMOS.....	31
3.14 DRIVER INSTALLATION.....	32
3.14.1 Keypad AP.....	33
3.15 SYSTEM MAINTENANCE.....	33
4 BIOS SETUP	34
4.1 INTRODUCTION.....	35
4.1.1 Starting Setup.....	35
4.1.2 Using Setup.....	35
4.1.3 Getting Help.....	36
4.1.4 Unable to Reboot after Configuration Changes.....	36
4.1.5 BIOS Menu Bar.....	37
4.2 MAIN.....	37
4.3 ADVANCED.....	39
4.3.1 ACPI Settings.....	40
4.3.2 F81866 Super IO Configuration.....	41
4.3.2.1 Serial Port n Configuration.....	42
4.3.2.2 Touch Configuration.....	44
4.3.3 F81866 H/W Monitor.....	46
4.3.4 RTC Wake Settings.....	47
4.3.5 Serial Port Console Redirection.....	48
4.3.6 CPU Configuration.....	49
4.3.7 IDE Configuration.....	51
4.3.8 USB Configuration.....	52
4.4 CHIPSET.....	53
4.4.1 North Bridge Configuration.....	54
4.4.1.1 Internal IGD Configuration.....	54
4.4.2 South Bridge Configuration.....	56

PPC-F06B-BT Panel PC

4.4.2.1 PCI Express Configuration	58
4.5 SECURITY	59
4.6 BOOT	60
4.7 SAVE & EXIT	62
5 INTERFACE CONNECTORS	64
5.1 PERIPHERAL INTERFACE CONNECTORS	65
5.2 INTERNAL PERIPHERAL CONNECTORS	66
5.2.1 Audio Connector (AUDIO1)	67
5.2.2 Battery Connector (BAT2)	67
5.2.3 Inverter Connector (INV_CN1)	68
5.2.4 LCD Connector (PANEL1)	68
5.2.5 MCU Connector (JSPI2)	69
5.2.6 PCIe Mini Connector (M_PCIE1)	69
5.2.7 Power Input Connector (CN1)	70
5.2.8 Power LED Connector (PW_LED1)	70
5.2.9 SATA DOM Connector (SATA1)	70
5.2.10 SATA Power Connector (SATA_PWR1)	71
5.2.11 Serial Port Connector, RS-422/485 (COM2)	71
5.2.12 SPI Flash Connector (JSPI1)	71
5.2.13 Touch Panel Connector (TOUCH1)	72
5.2.14 USB 2.0 Connector (TOUCH_USB1)	72
5.2.15 USB 2.0 Connector (TOUCH_USB2)	72
5.2.16 VGA Connector (VGA_CON1)	73
5.3 EXTERNAL INTERFACE PANEL CONNECTORS	73
5.3.1 Ethernet Connectors (LAN1 & LAN2)	74
5.3.2 Power Connector (CN2)	74
5.3.3 RS-232 Serial Port (COM1)	74
5.3.4 USB 2.0 Connectors (USB1)	75
5.3.5 USB 3.0 Connectors (USB_CON1)	75
A REGULATORY COMPLIANCE	76
B BIOS CONFIGURATION OPTIONS	81
B.1 BIOS CONFIGURATION OPTIONS	82
C SAFETY PRECAUTIONS	84

C.1 SAFETY PRECAUTIONS.....	85
C.1.1 General Safety Precautions.....	85
C.1.2 Anti-static Precautions	86
C.1.3 Product Disposal.....	87
C.2 MAINTENANCE AND CLEANING PRECAUTIONS	87
C.2.1 Maintenance and Cleaning	87
C.2.2 Cleaning Tools.....	88
D WATCHDOG TIMER	89
E HAZARDOUS MATERIALS DISCLOSURE	92
E.1 HAZARDOUS MATERIAL DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY	93

List of Figures

Figure 1-1: PPC-F06B-BT Series Panel PC	2
Figure 1-2: Front View	3
Figure 1-3: Rear View	4
Figure 1-4: Side View	4
Figure 1-5: Bottom Panel	5
Figure 1-6: PPC-F06B-BT Dimensions (mm)	6
Figure 3-1: Back Cover Retention Screws	16
Figure 3-2: mSATA Module Slot Location	17
Figure 3-3: mSATA Module Installation	17
Figure 3-4: SATA Connector Location	18
Figure 3-5: SATA DOM Installation	19
Figure 3-6: Serial Port Locations	19
Figure 3-7: COM1 Serial Port Pin 9 Setting Jumper Location	20
Figure 3-8: AT/ATX Mode Selection	21
Figure 3-9: Attach Wall Mounting Kit to the Wall	23
Figure 3-10: Hook onto Wall Mounting Kit	23
Figure 3-11: Tighten Retention Screw	24
Figure 3-12: Panel Cutout Dimensions	25
Figure 3-13: Tighten the Mounting Clamp Screws	26
Figure 3-14: The Rack/Cabinet Bracket	27
Figure 3-15: Secure the Rack/Cabinet Bracket	27
Figure 3-16: Install into a Rack/Cabinet	28
Figure 3-17: Arm Mounting (ARM-11-RS)	29
Figure 3-18: Stand Mounting (Stand-B08)	30
Figure 3-19: Powering on the System	31
Figure 3-20: Reset Button Location	31
Figure 3-21: Clear CMOS Button Location	32
Figure 3-22: Keypad AP	33
Figure 5-1: Main Board Layout Diagram (Front Side)	65
Figure 5-2: Main Board Layout Diagram (Solder Side)	66



List of Tables

Table 1-1: System Specifications.....	8
Table 2-1: Packing List.....	11
Table 2-2: Optional Items	12
Table 3-1: RS-232 Serial Port (COM1) Pinouts	20
Table 3-2: COM1 Serial Port Pin 9 Setting Jumper Settings	20
Table 3-3: RS-422/485 Serial Port Pinouts	21
Table 4-1: BIOS Navigation Keys	36
Table 5-1: Peripheral Interface Connectors	67
Table 5-2: Audio Connector (AUDIO1) Pinouts	67
Table 5-3: Battery Connector (BAT2) Pinouts	67
Table 5-4: Inverter Connector (INV_CN1) Pinouts.....	68
Table 5-5: LCD Connector (PANEL1) Pinouts	68
Table 5-6: MCU Connector (JSPI2) Pinouts	69
Table 5-7: PCIe Mini Connector (M_PCIE1) Pinouts	70
Table 5-8: Power Input Connector (CN1) Pinouts	70
Table 5-9: Power LED Connector (PW_LED1) Pinouts	70
Table 5-10: SATA Connector (SATA1) Pinouts	71
Table 5-11: SATA Power Connector (SATA_PWR1) Pinouts	71
Table 5-12: Serial Port Connector (COM2) Pinouts.....	71
Table 5-13: SPI Flash Connector (JSPI1) Pinouts	71
Table 5-14: Touch Panel Connector (TOUCH1) Pinouts.....	72
Table 5-15: USB 2.0 Connector (TOUCH_USB1) Pinouts	72
Table 5-16: USB 2.0 Connector (TOUCH_USB2) Pinouts	72
Table 5-17: VGA Connector (VGA_CON1) Pinouts	73
Table 5-18: Rear Panel Connectors	73
Table 5-19: Ethernet Connectors (LAN1 & LAN2) Pinouts.....	74
Table 5-20: Power Connector (CN2) Pinouts	74
Table 5-21: RS-232 Serial Port (COM1) Pinouts	74
Table 5-22: USB 2.0 Connectors (USB1) Pinouts.....	75
Table 5-23: USB 3.0 Connectors (USB_CON1) Pinouts.....	75



List of BIOS Menus

BIOS Menu 1: Main	37
BIOS Menu 2: Advanced	40
BIOS Menu 3: ACPI Settings	40
BIOS Menu 4: F81866 Super IO Configuration	41
BIOS Menu 5: Serial Port n Configuration Menu	42
BIOS Menu 6: Touch Configuration Menu	44
BIOS Menu 7: F81866 H/W Monitor	46
BIOS Menu 8: RTC Wake Settings	47
BIOS Menu 9: Serial Port Console Redirection	48
BIOS Menu 10: CPU Configuration	49
BIOS Menu 11: IDE Configuration	51
BIOS Menu 12: USB Configuration	52
BIOS Menu 13: Chipset	53
BIOS Menu 14: North Bridge Configuration	54
BIOS Menu 15: Internal IGD Configuration	54
BIOS Menu 16: South Bridge Configuration	56
BIOS Menu 17: PCI Express Configuration	58
BIOS Menu 18: Security	59
BIOS Menu 19: Boot	60
BIOS Menu 20: Save & Exit	62

Chapter

1

Introduction

1.1 Overview



Figure 1-1: PPC-F06B-BT Series Panel PC

The PPC-F06B-BT series is a quad-core Intel® Celeron® processor N2807 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 N2807 is a SoC (System-on-Chip) that ensures optimal memory, graphics, and peripheral I/O support. The major external device connections include USB 3.0, USB 2.0, RS-232, RS-422/485, audio line-out jack and two GbE connectors. Furthermore, the PPC-F06B-BT has one full-size/half-size PCIe Mini card slots, allowing installation of a wide variety of PCIe Mini cards, such as Wi-Fi modules and mSATA modules.

PPC-F06B-BT Panel PC

1.2 Features

Some of the features of the PPC-F06B-BT panel PC include:

- Robust aluminum IP 65 compliant front bezel
- Compact and fanless design for easy installation
- Supports 1.58 GHz dual-core Intel® Celeron® processor N2807
- 2 GB 1600 MHz DDR3L on-board memory (system max. 4 GB)
- One full-size/half-size PCIe Mini card slot supports mSATA or Wireless LAN module
- Rich I/O interfaces, including two GbE, one RS-232, one RS-422/485, two USB 3.0, two USB 2.0 and audio line-out jack
- Optional wireless LAN module
- RoHS compliant

1.3 Front Panel

The front side of the PPC-F06B-BT (**Figure 1-2**) is a flat panel LCD screen surrounded by an aluminum frame.

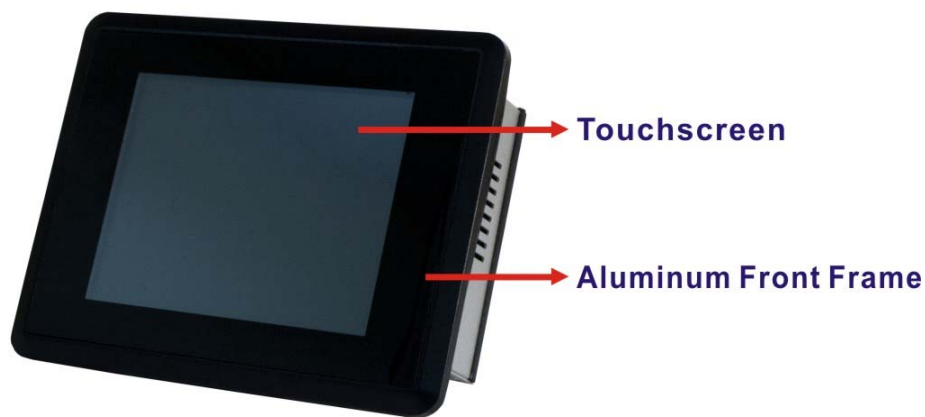


Figure 1-2: Front View

1.4 Rear Panel

The rear panel has four VESA mounting holes and several retention screws. The VESA mounting holes are circled in the following diagrams.

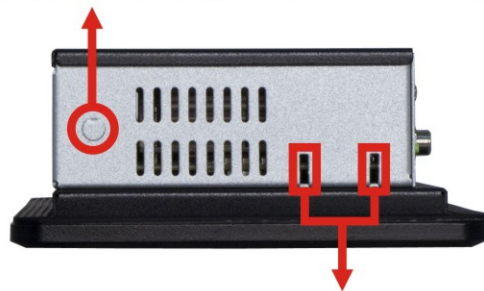


Figure 1-3: Rear View

1.5 Side Panels

Each side panel has one knockout hole for optional wireless LAN antenna and two pre-formed holes for panel/rack mounting clamps.

Knockout Hole for Wireless LAN Antenna



Pre-formed Holes for Mounting Clamps

Figure 1-4: Side View

PPC-F06B-BT Panel PC

1.6 Bottom Panel

The bottom panel has the following interfaces:

- 1 x Power input connector
- 1 x Power button
- 1 x Power LED indicator
- 2 x USB 3.0 connectors
- 2 x USB 2.0 connectors
- 1 x Reset button
- 2 x RJ-45 GbE connectors
- 1 x RS-232 connectors (COM1)
- 1 x RS-422/485 connector (COM2)
- 1 x Audio line-out jack
- 1 x AT/ATX switch

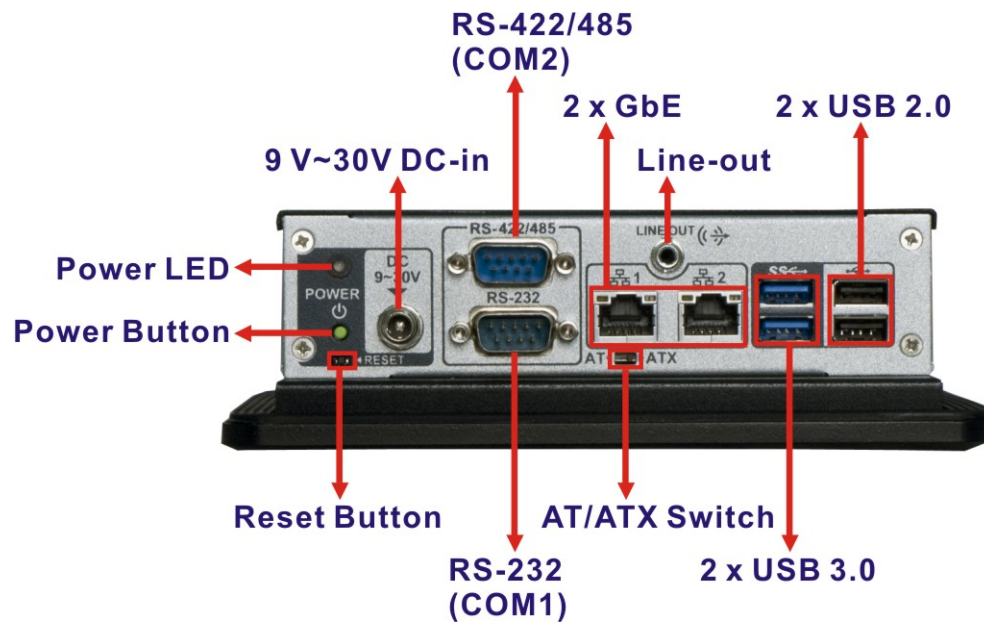


Figure 1-5: Bottom Panel

1.7 Dimensions

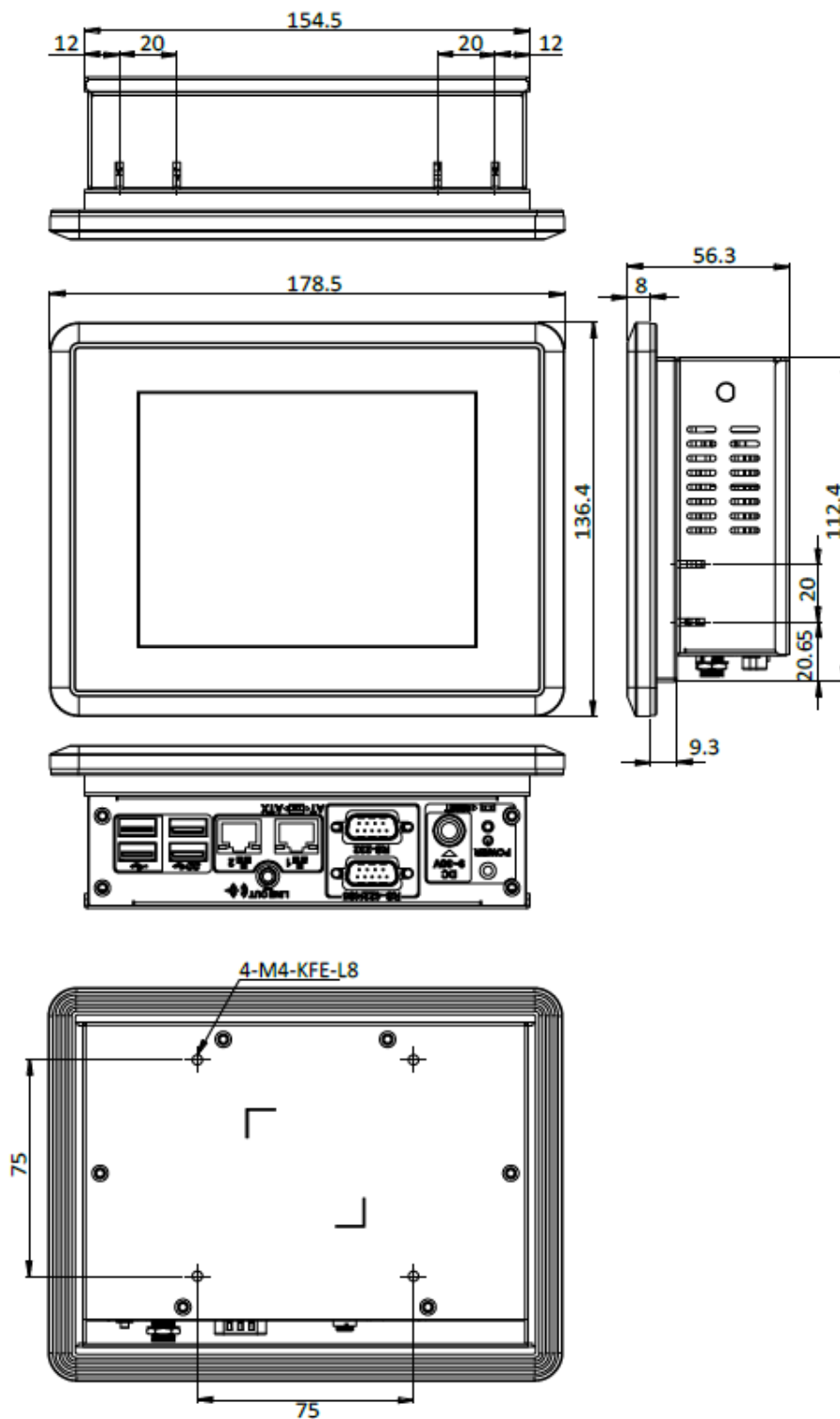


Figure 1-6: PPC-F06B-BT Dimensions (mm)

PPC-F06B-BT Panel PC

1.8 Specifications

The technical specifications for the PPC-F06B-BT system are listed in **Table 1-1**.

	PPC-F06B-BT
LCD Display	5.7" (4:3)
Max. Resolution	640 (W) x 480 (H)
Brightness	550 cd/m ²
Contrast Ratio	800:1
LCD Color	262K
Pixel Pitch (mm)	0.18 (H) x 0.18 (V)
Viewing Angle (H-V)	160°/140°
Backlight MTBF	50,000 hours
SBC Model	PPCMB2-BT-R10
CPU (SoC)	1.58 GHz dual-core Intel® Celeron® processor N2807
Memory	2 GB 1600 MHz DDR3L on-board memory (system max. 4 GB by MOQ=300 pcs)
Touchscreen	4-wire resistive type flat touchscreen Controller: PenMount DMC9000 Surface hardness: 3H
Storage	mSATA or SATA DOM (Disk on Module)
Expansion	One full-size/half-size PCIe Mini card slot supports mSATA module or wireless LAN module
Wireless LAN	Optional wireless LAN module with SMA antenna
Power Input	9 V – 30 V DC
Power Consumption	24 W

	PPC-F06B-BT
I/O Ports, Switches and Buttons	2 x GbE (RJ-45) 2 x USB 3.0 2 x USB 2.0 1 x RS-232 (DB-9) 1 x RS-422/485 (DB-9) 1 x Audio line-out jack 1 x Power jack (lockable) 1 x Power button 1 x Reset button 1 x AT/ATX switch
Mounting	VESA 75 mm x 75 mm Panel, wall, rack, stand and arm
Construction Material	Aluminum front cover and sheet metal rear cover
Enclosure Color	Black
Operating Temperature (with air flow)	-10°C – 50°C
Storage Temperature	-20°C – 60°C
Humidity	10% – 95%, non-condensing
IP Level	IP 65 compliant front panel
Safety and EMC	CE, FCC Class A
Dimensions (H x W x D)	136.4 mm x 178.5 mm x 56.3 mm
Net Weight	0.89 kg

Table 1-1: System 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 box.
 - Step 2:** Open the external box.
 - Step 3:** Lift the panel PC out of the box.
 - Step 4:** Remove both polystyrene ends, one from each side.
 - Step 5:** Pull the plastic cover off the panel PC.
 - Step 6:** Make sure all the components listed in the packing list are present.

PPC-F06B-BT Panel PC

2.2 Packing List

The PPC-F06B-BT panel PC is shipped with the following components:

Quantity	Item	Image
1	PPC-F06B-BT panel PC	
1	Power adapter (36 W, 12 V DC input)	
1	Power cord (part number varies by regions)	
4	Screws for VESA mounting	
2	Screws for mSATA module installation	
6	Screws	
1	Touch pen	
1	User manual and driver CD	
1	One Key Recovery CD	

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 are optional components which may be separately purchased:

Item and Part Number	Image
Arm (P/N: ARM-11-RS)	
Panel mount kit (P/N: FPK-07-R10)	
Stand (P/N: STAND-100-RS)	
Stand for VESA 75 (P/N: STAND-B08)	
VESA 75 wall mount kit (P/N: AFLWK-12)	
Wi-Fi kit (P/N: PPC-WL-KIT02-R11)	

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Anti-static Precautions

**WARNING:**

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PPC-F06B-BT. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PPC-F06B-BT 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 PPC-F06B-BT, place it on an anti-static pad. This reduces the possibility of ESD damaging the PPC-F06B-BT.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

3.2 Installation Precautions

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.

PPC-F06B-BT Panel PC

- **Mounting:** The PPC-F06B-BT 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.

- Wireless LAN module
- mSATA
- SATA DOM

3.4 Installation and Configuration Steps

The following installation steps must be followed.

Step 1: Unpack the PPC-F06B-BT.

Step 2: Install mSATA module/SATA DOM.

Step 3: Configure the system.

Step 4: Mount the PPC-F06B-BT panel PC.

Step 5: Connect peripheral devices to the bottom panel of the PPC-F06B-BT.

Step 6: Configure the system.

3.5 Removing the Back Cover

To remove the back cover, remove the back cover retention screws on the back cover. Lift the cover up to remove. The following diagrams show the back cover screw locations of the PPC-F06B-BT.



Figure 3-1: Back Cover Retention Screws

3.6 mSATA Module Installation

The PCIe Mini card slot on the motherboard of the PPC-F06B-BT supports mSATA module. To install an mSATA module, please follow the steps below.

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

Step 2: Locate the full-size PCIe Mini card slot. Remove the preinstalled retention screw on the screw pillar of the PCIe Mini card slot as shown in **Figure 3-2**.



NOTE:

In the model with wireless LAN function, this PCIe Mini slot is reserved for wireless LAN module installation. If the slot is installed with a wireless LAN module, please install a SATA DOM for system storage.

PPC-F06B-BT Panel PC

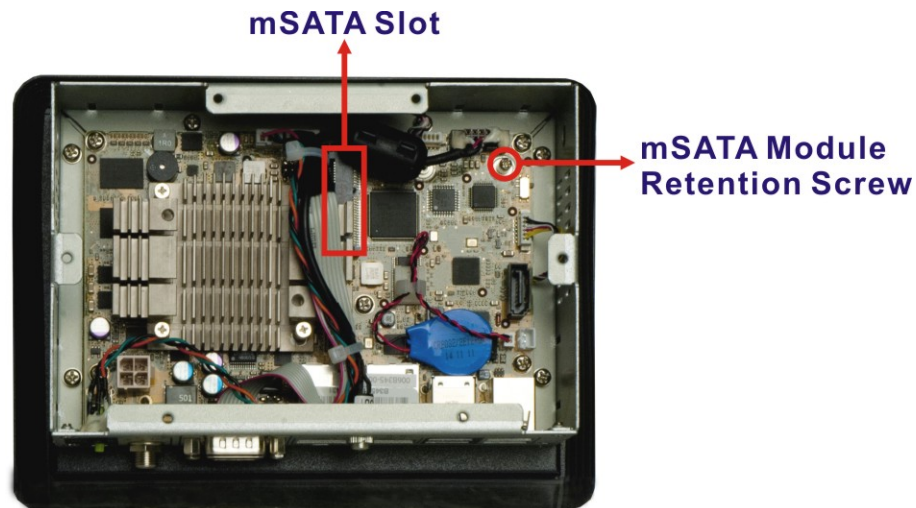


Figure 3-2: mSATA Module Slot Location

- Step 3:** Line up the notch on the mSATA module with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 4:** Secure the mSATA module with the retention screw. Push the other end of the mSATA module down and secure the module with the previously removed retention screw (**Figure 3-3**).

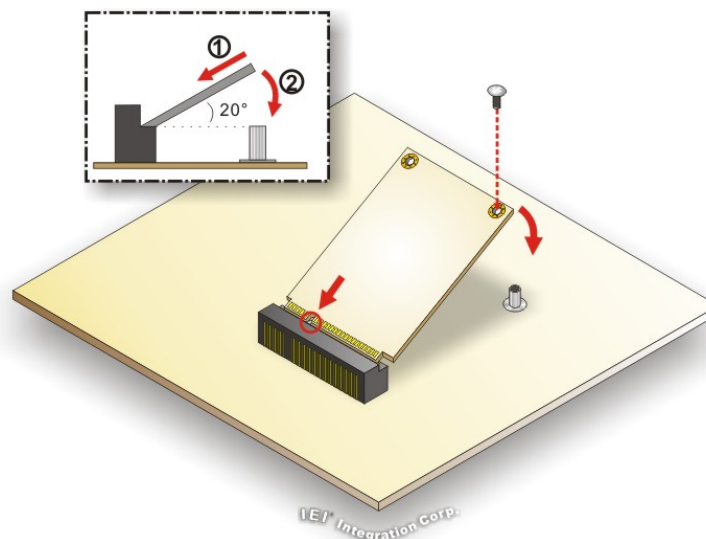


Figure 3-3: mSATA Module Installation

- Step 5:** Replace the back cover and secure it with retention screws.

3.7 SATA DOM Installation

The SATA connector on the motherboard of the PPC-F06B-BT supports SATA DOM. To install a SATA DOM, please follow the steps below.

**NOTE:**

When purchasing the SATA DOM, please ensure that it is in horizontal orientation. If the SATA DOM is not horizontal type, it cannot be installed into the PPC-F06B-BT panel PC.

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

Step 2: Locate the SATA connector as shown in **Figure 3-2**.

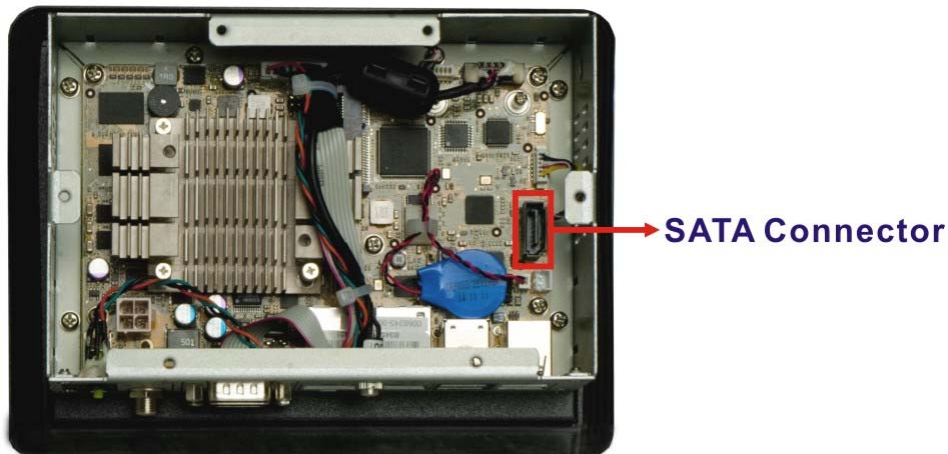


Figure 3-4: SATA Connector Location

Step 3: Connect the SATA DOM with the SATA connector on the motherboard to install it. Either high-profile or low-profile SATA DOM can be installed into the PPC-F06B-BT. **Figure 3-3** shows that the system is installed with a high-profile SATA DOM.

PPC-F06B-BT Panel PC



Figure 3-5: SATA DOM Installation

Step 4: Replace the back cover and secure it with retention screws.

3.8 Serial Port Configuration and Connection

The PPC-F06B-BT series has two serial ports, including one RS-232 port and one RS-422/484 port. The port locations are shown in **Figure 3-6**. The pinouts and jumper settings of the serial ports are listed in the following sections.

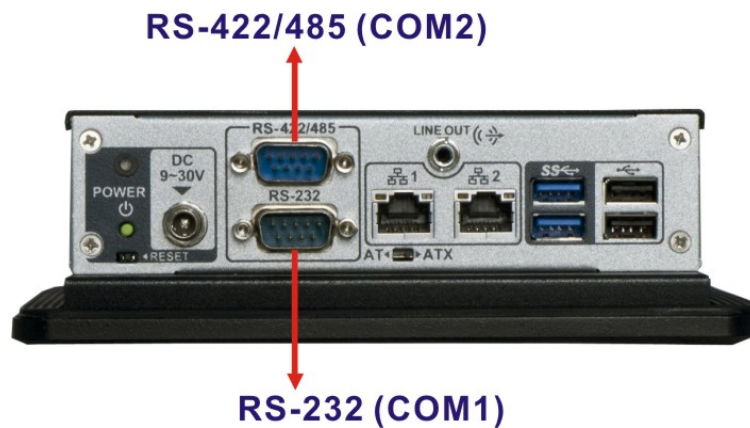


Figure 3-6: Serial Port Locations

3.8.1 RS-232 Serial Port Pinouts (COM1)

The pinouts of the RS-232 serial port (COM1) 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		

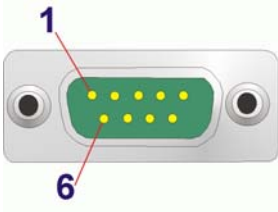


Table 3-1: RS-232 Serial Port (COM1) Pinouts

3.8.2 RS-232 Serial Port Pin 9 Selection

Pin 9 on the COM1 DB-9 connector can be set as the ring (RI) signal, +5 V or +12 V. The jumper selection options are shown in **Table 3-2**.

JP1	Description
Short 1-2	COM1 RI Pin use +12 V
Short 3-4	COM1 RI Pin use RI (Default)
Short 5-6	COM1 RI Pin use +5 V

Table 3-2: COM1 Serial Port Pin 9 Setting Jumper Settings

The COM1 Serial Port Pin 9 Setting jumper location is shown in **Figure 3-7** below.

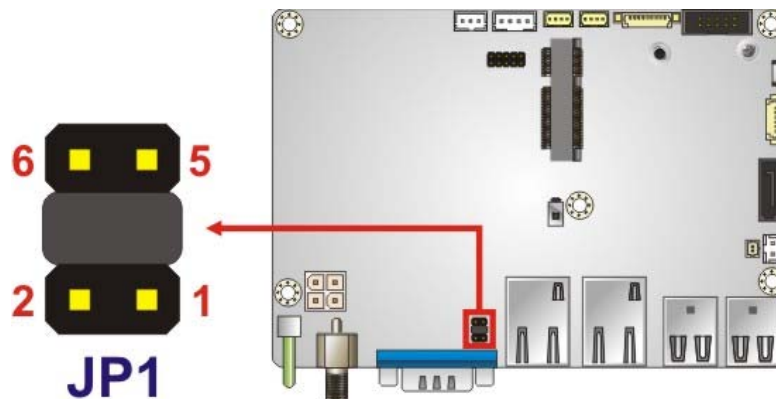


Figure 3-7: COM1 Serial Port Pin 9 Setting Jumper Location

PPC-F06B-BT Panel PC

3.8.3 RS-422/485 Serial Port Pinouts (COM2)

The RS-422/485 serial port (COM2) pinouts are listed in the following table.

Pin No.	RS-422	RS-485
1	TX-	TX-
2	TX+	TX+
3	RX+	--
4	RX-	--
5	--	--
6	--	--
7	--	--
8	--	--
9	--	--

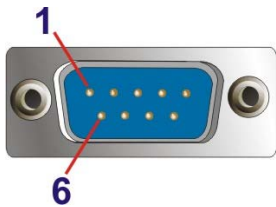


Table 3-3: RS-422/485 Serial Port Pinouts

3.9 AT/ATX Mode Selection

AT and ATX power modes can both be used on the PPC-F06B-BT panel PC. The selection is made through an AT/ATX switch on the I/O interface panel. The switch is shown below.

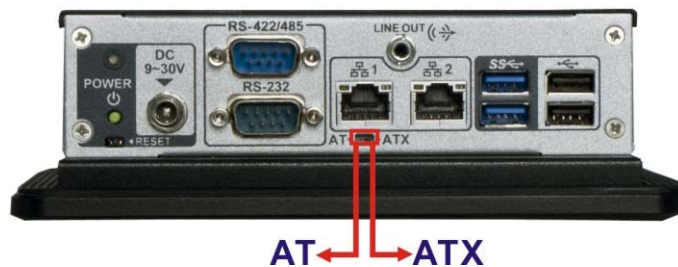


Figure 3-8: AT/ATX Mode Selection

3.9.1 AT Power Mode

With the AT mode selected, the power is controlled by a central power unit rather than a power switch. The PPC-F06B-BT panel PC turns on automatically when the power is connected. The AT mode benefits a production line to control multiple panel PCs from a central management center and other applications including:

- ATM
- Self-service kiosk
- Plant environment monitoring system
- Factory automation platform
- Manufacturing shop flow

3.9.2 ATX Power Mode

With the ATX mode selected, the PPC-F06B-BT panel PC goes in a standby mode when it is turned off. The panel PC can be easily turned on via network or a power switch in standby mode. Remote power control is perfect for advertising applications since the broadcasting time for each panel PC can be set individually and controlled remotely. Other possible application includes

- Security surveillance
- Point-of-Sale (POS)
- Advertising terminal

3.10 Mounting the System

The methods of mounting the PPC-F06B-BT are:

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

The mounting methods are described in the following sections.

3.10.1 Wall Mounting

To mount the PPC-F06B-BT panel PC onto a wall, please follow the steps below.

Step 1: Attach the wall mounting kit to the mounting surface with the included screws.
Make sure it is attached securely.

PPC-F06B-BT Panel PC

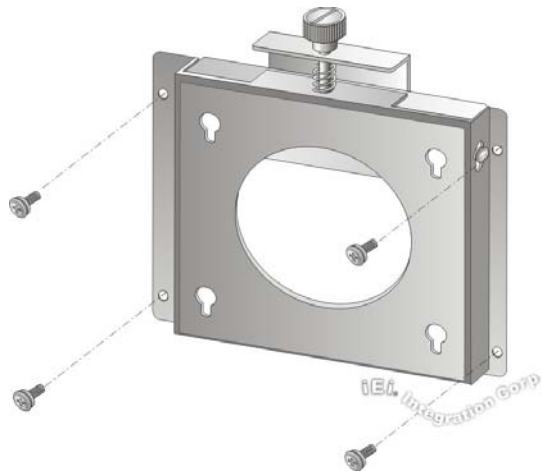


Figure 3-9: Attach Wall Mounting Kit to the Wall

Step 2: Screw the mounting screws to the mounting holes on the rear of the PPC-F06B-BT.

Step 3: Hook the PPC-F06B-BT into the mounting holes on the wall mounting kit.

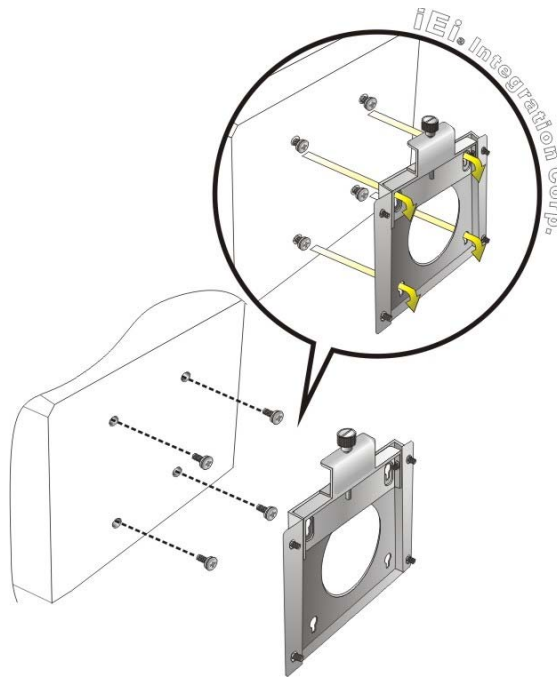
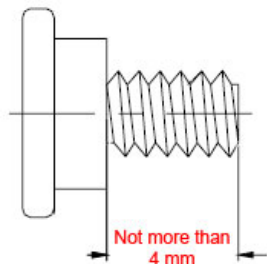


Figure 3-10: Hook onto Wall Mounting Kit

**WARNING:**

Please use the M4 screws provided in the package for the rear panel. If the screw is missing, the thread depth of the replacement screw should be not more than 4 mm.



Step 4: Tighten the top screw on the wall mounting kit to securely hold the PPC-F06B-BT in place. After this screw is tightened, the PPC-F06B-BT should not be able to move.

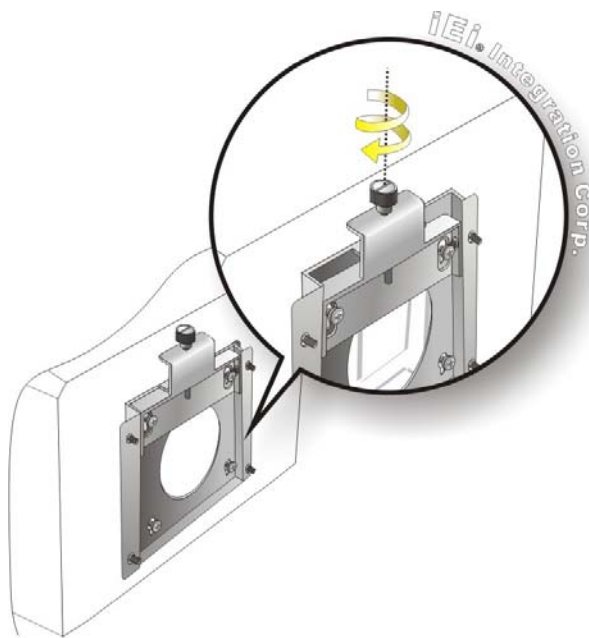


Figure 3-11: Tighten Retention Screw

PPC-F06B-BT Panel PC

3.10.2 Panel Mounting

To mount the PPC-F06B-BT panel PC into a panel, please follow the steps below.

- Step 1:** Select the position on the panel to mount the PPC-F06B-BT.
- Step 2:** Cut out a section of the panel that corresponds to the rear panel dimensions of the PPC-F06B-BT. The recommended cutout sizes are shown below (Figure 3-12).

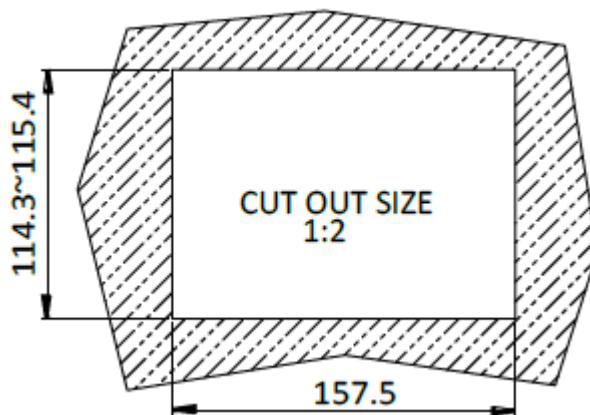


Figure 3-12: Panel Cutout Dimensions

- Step 3:** Slide the PPC-F06B-BT through the hole until the aluminum frame is flush against the panel.
- Step 4:** Insert the mounting clamps into the mounting brackets and pre-formed holes along the edges of the PPC-F06B-BT, behind the aluminum frame (Figure 3-13). There are a total of four mounting clamps required.
- 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 3-13).

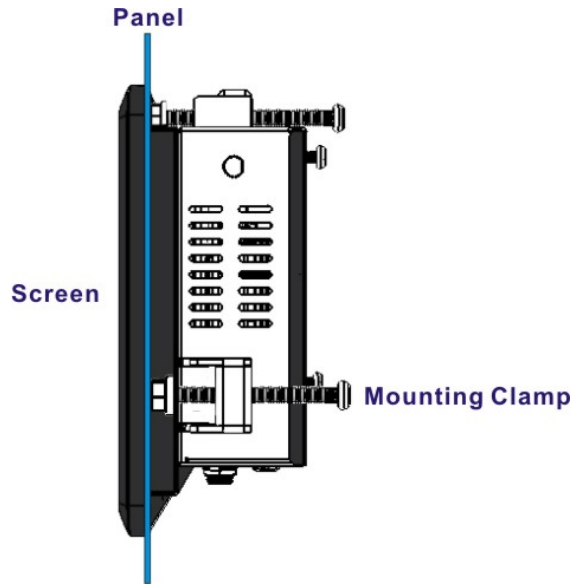


Figure 3-13: Tighten the Mounting Clamp Screws

3.10.3 Rack Mounting

The PPC-F06B-BT flat panel PC can be installed into a cabinet or rack. The installation procedures are similar to the panel mounting installation. To do this, please follow the steps below:



NOTE:

When purchasing the cabinet/rack installation bracket, make sure it is compatible with both the PPC-F06B-BT flat panel PC and the rack/cabinet into which the PPC-F06B-BT is installed.

-
- Step 1:** Slide the rear of the PPC-F06B-BT flat panel PC through the rack/cabinet bracket until the aluminum frame is flush against the front of the bracket (Figure 3-14).

PPC-F06B-BT Panel PC

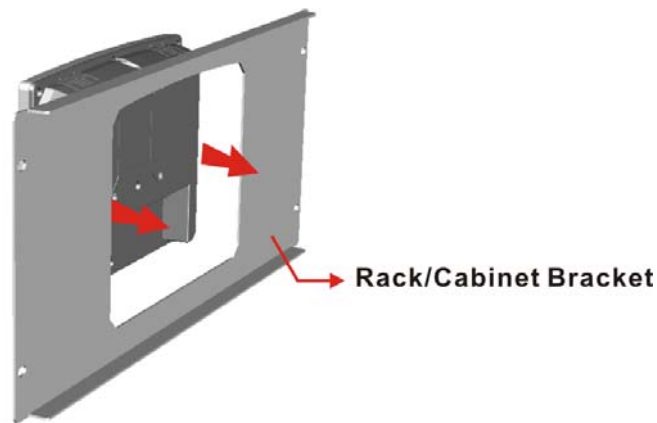


Figure 3-14: The Rack/Cabinet Bracket

- Step 2:** Insert the mounting clamps into the mounting brackets and pre-formed holes along the edges of the PPC-F06B-BT, behind the aluminum frame (**Figure 3-15**). There are a total of four mounting clamps required.
- Step 3:** 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 bracket (**Figure 3-15**).

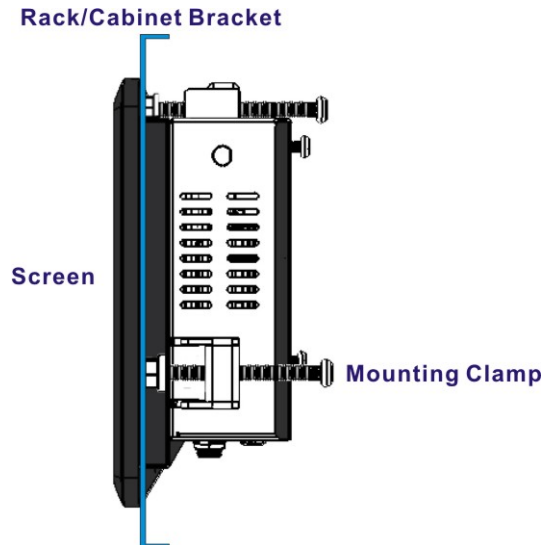


Figure 3-15: Secure the Rack/Cabinet Bracket

- Step 4:** Slide the PPC-F06B-BT with the attached rack/cabinet bracket into a rack or cabinet (**Figure 3-16**).

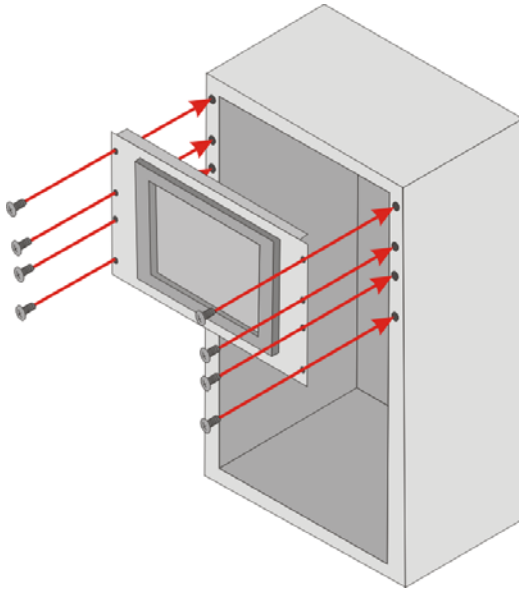


Figure 3-16: Install into a Rack/Cabinet

Step 5: 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 3-16**).

3.10.4 Arm Mounting

The PPC-F06B-BT is VESA (Video Electronics Standards Association) compliant and can be mounted on an arm with a 75 mm interface pad. To mount the PPC-F06B-BT 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.

PPC-F06B-BT Panel PC

**NOTE:**

When purchasing the arm please ensure that it is VESA compliant and that the arm has a 75 mm interface pad. If the mounting arm is not VESA compliant, it cannot be used to support the PPC-F06B-BT panel PC.

- Step 2:** Once the mounting arm has been firmly attached to its surface, lift the PPC-F06B-BT 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 PPC-F06B-BT panel PC. The arm mounting retention screw holes of the PPC-F06B-BT panel PC are shown in **Figure 1-3**.
- Step 4:** Secure the PPC-F06B-BT to the interface pad by inserting four retention screws through the mounting arm interface pad and into the PPC-F06B-BT panel PC.

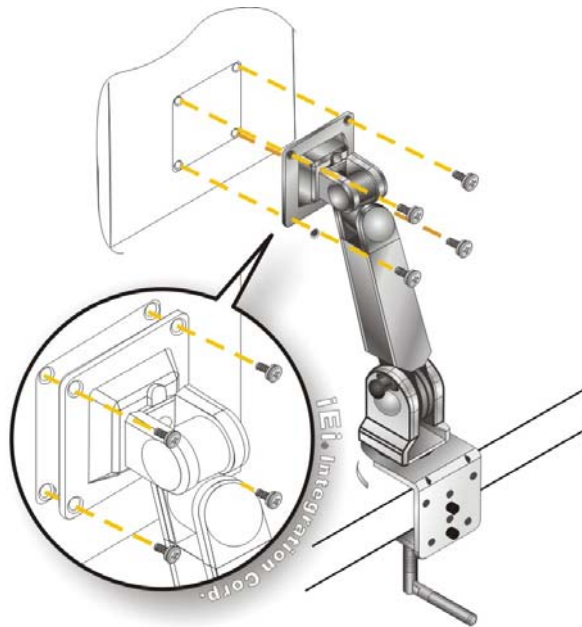


Figure 3-17: Arm Mounting (ARM-11-RS)

3.10.5 Stand Mounting

To mount the PPC-F06B-BT using the stand mounting kit, please follow the steps below.

Step 1: Locate the screw holes on the rear of the PPC-F06B-BT. This is where the bracket will be attached. The mounting screw holes of the PPC-F06B-BT panel PC are shown in **Figure 1-3**.

Step 2: Align the bracket with the screw holes.

Step 3: To secure the bracket to the PPC-F06B-BT, insert the retention screws into the screw holes and tighten them.

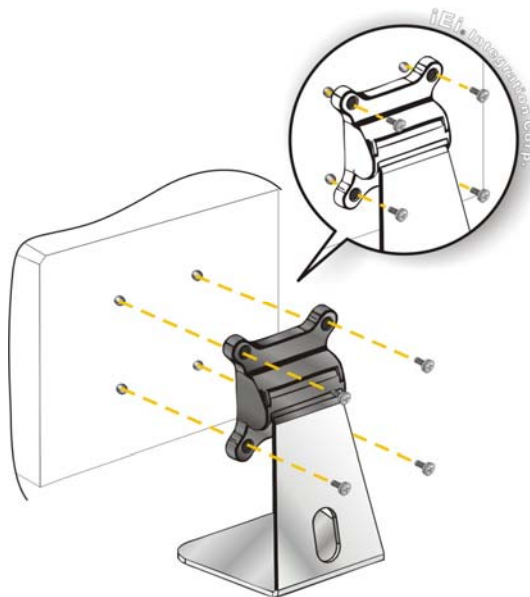


Figure 3-18: Stand Mounting (Stand-B08)

3.11 Powering On the System

To power on the system, follow the steps below:

Step 1: Connect the power cord to the power adapter. Connect the other end of the power cord to a power source.

Step 2: Connect the power adapter to the power connector of the PPC-F06B-BT.

PPC-F06B-BT Panel PC

Step 3: Locate the power button on the I/O panel.

Step 4: Hold down the power button until the power LED turns on in green.



Figure 3-19: Powering on the System

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 3-20**. Press the reset button to reboot the system.



Reset Button

Figure 3-20: Reset Button Location

3.13 Clear CMOS

If the PPC-F06B-BT fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, push the clear CMOS button for three seconds, then restart the system. To access the clear CMOS button, the back cover must be removed. Please refer to **Section 3.5** for back cover removal instruction. The clear CMOS button location is shown in **Figure 3-21**.

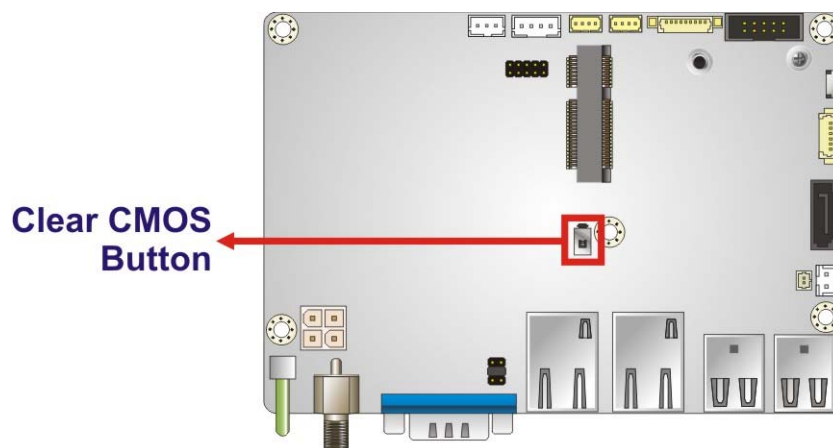


Figure 3-21: Clear CMOS Button Location

3.14 Driver Installation



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

All the drivers for the PPC-F06B-BT are on the utility CD that came with the system. The utility CD contains drivers for Windows 7 and Windows 8 operating systems. Please select the corresponding drivers for the system.

The following drivers can be installed on the **Windows 7** operating system:

- Chipset
- I/O driver
- Graphics (Intel® EMGD)
- TXE
- USB 3.0
- LAN
- Audio
- Keypad AP

PPC-F06B-BT Panel PC

The following drivers can be installed on the **Windows 8** operating system:

- Chipset
- Serial I/O driver (64-bit only)
- TXE
- Graphics
- LAN
- Audio
- Keypad AP

3.14.1 Keypad AP

Keypad AP is an OSD control tool developed by IEI. After the installation, the Keypad AP can be accessed by clicking the  icon on the notification area. It allows users to control screen brightness and audio volume.



Figure 3-22: Keypad AP

3.15 System Maintenance

If the components of the PPC-F06B-BT fail, they must be replaced. Please contact the system reseller or vendor to purchase the replacement parts.



NOTE:

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

Chapter

4

BIOS Setup

4.1 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.

4.1.1 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. Press the **DELETE** or **F2** key as soon as the system is turned on or
2. Press the **DELETE** or **F2** key when the “**Press DELETE or F2 to enter SETUP**” message appears on the screen.

If the message disappears before the **DELETE** or **F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side

Key	Function
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 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 **Esc** or the **F1** key again.

4.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, press the Clear CMOS button on the bottom panel to clear the CMOS data and reset the system BIOS information. The location of the CMOS button is shown in **Figure 3-21**.

PPC-F06B-BT Panel PC

4.1.5 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.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.		
Main	Advanced	Chipset Security Boot Save & Exit
BIOS Information BIOS Vendor American Megatrends Core Version 5.009 Compliancy UEFI 2.3; PI 1.2 Project Version B345AM10.ROM Build Date and Time 04/13/2015 17:06:55 CPU Configuration Microcode Patch 831 BayTrial SoC C0 Stepping Memory Information Total Memory 2048 MB (LPDDR3) TXE Information Sec RC Version 00.05.00.00 TXE FW Version 01.00.02.1060 System Date [Wed 01/08/2010] System Time [16:49:37] Access Level Administrator		Set the Date. Use Tab to switch between Data elements. ----- ←→: Select Screen ↑ ↓: Select Item EnterSelect +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 1: Main

➔ 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 compliant version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

➔ CPU Information

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

- **Microcode Patch:** Installed microcode patch
- **BayTrail SoC:** CPU stepping level

➔ Memory Information

The Memory Information lists the total memory of the system.

➔ TXE Information

The **TXE Information** lists a brief summary of Intel® Trusted Execution Engine (TXE). The fields in **TXE Information** cannot be changed. The items shown in the system overview include:

- **Sec RC Version:** Current sec reference code version
- **TXE FW Version:** Current Intel® TXE firmware version

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

PPC-F06B-BT Panel PC

→ System Time [xx:xx:xx]

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

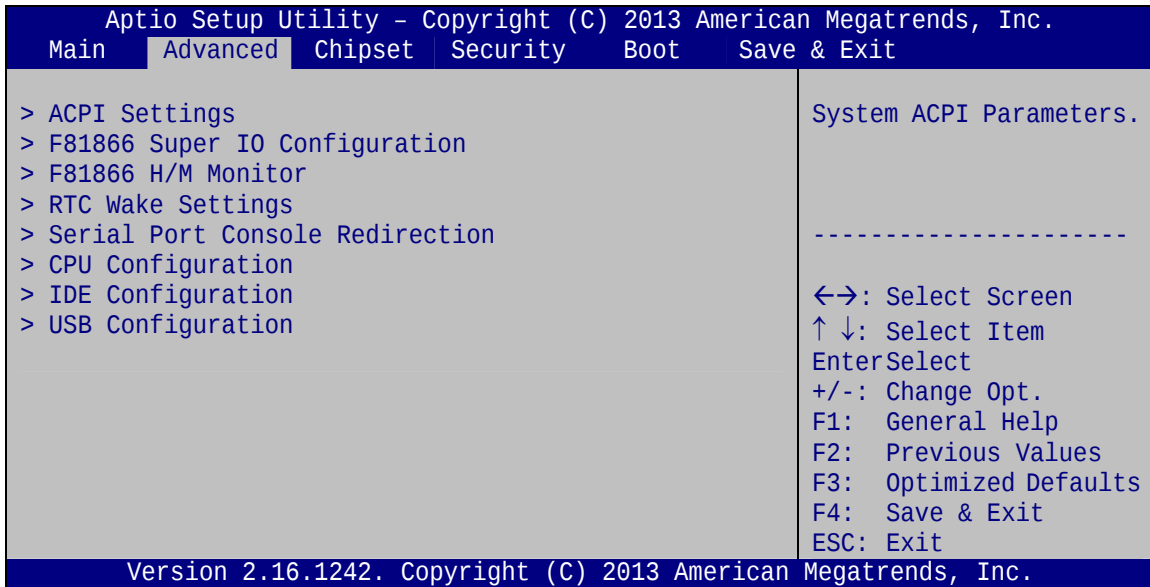
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:



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.

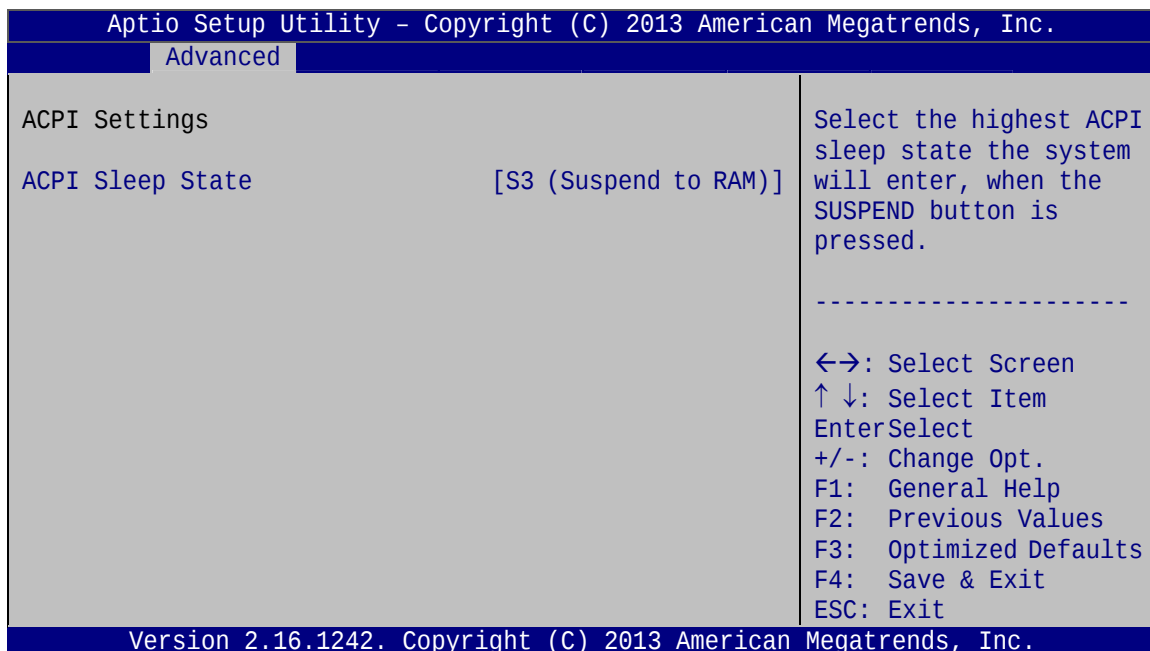
- ACPI Settings
- F81866 Super IO Configuration
- F81866 H/W Monitor
- RTC Wake Settings
- Serial Port Console Redirection
- CPU Configuration
- IDE Configuration
- USB Configuration



BIOS Menu 2: Advanced

4.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 3: ACPI Settings

PPC-F06B-BT Panel PC

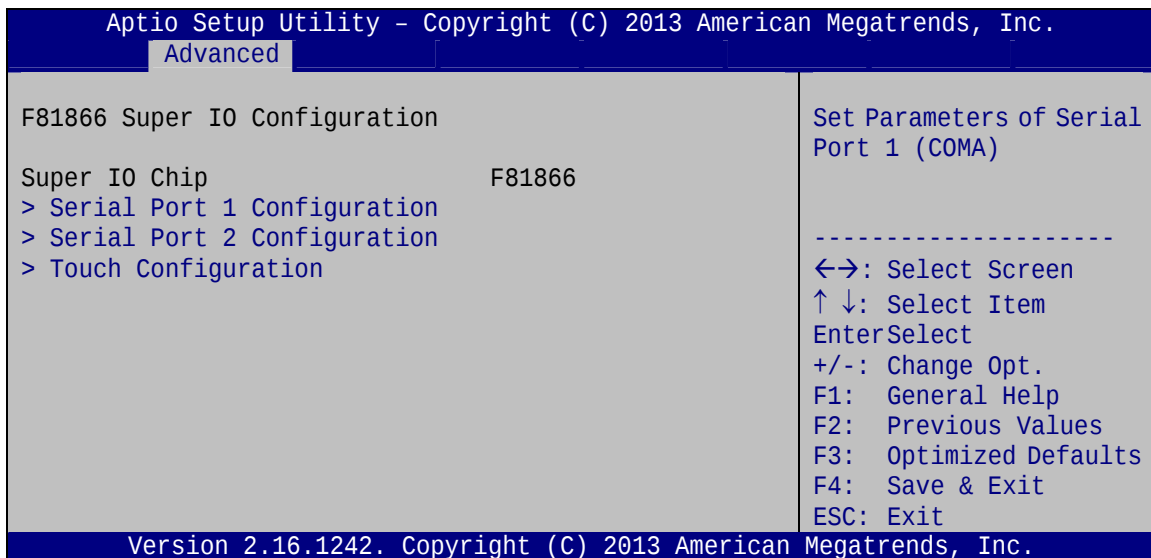
→ ACPI Sleep State [S3 (Suspend to RAM)]

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- **S3 (Suspend to DEFAULT RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.2 F81866 Super IO Configuration

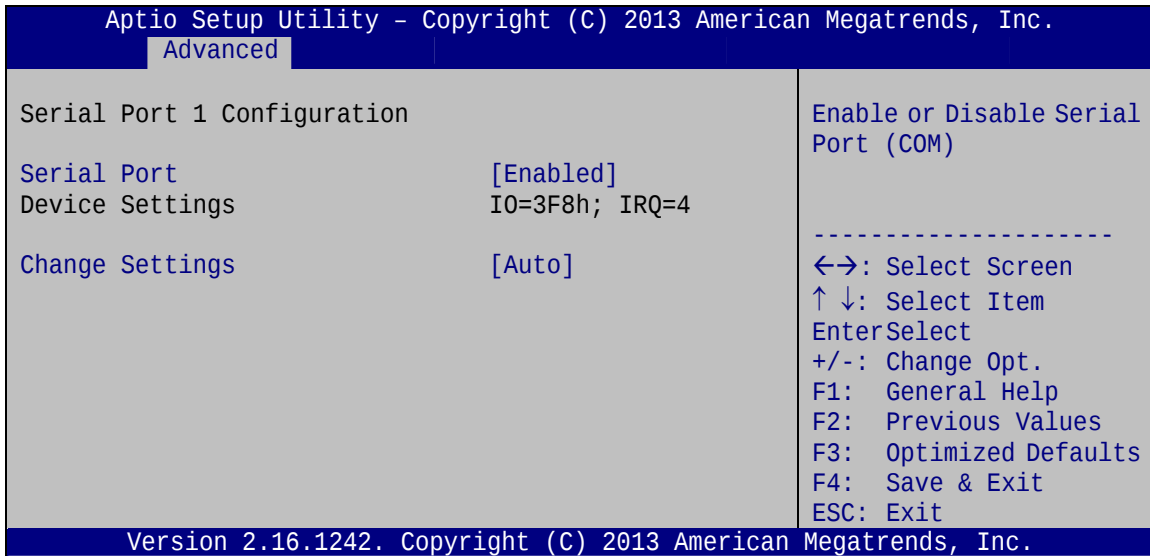
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



BIOS Menu 4: F81866 Super IO Configuration

4.3.2.1 Serial Port n Configuration

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



BIOS Menu 5: Serial Port n Configuration Menu

4.3.2.1.1 Serial Port 1 Configuration

➔ 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

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=3F8h; IRQ=4** Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

PPC-F06B-BT Panel PC

- | | |
|------------------------|---|
| ➔ IO=3F8h;
IRQ=3, 4 | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=2F8h;
IRQ=3, 4 | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=3E8h;
IRQ=3, 4 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| ➔ IO=2E8h;
IRQ=3, 4 | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |

4.3.2.1.2 Serial Port 2 Configuration

➔ 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 |

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

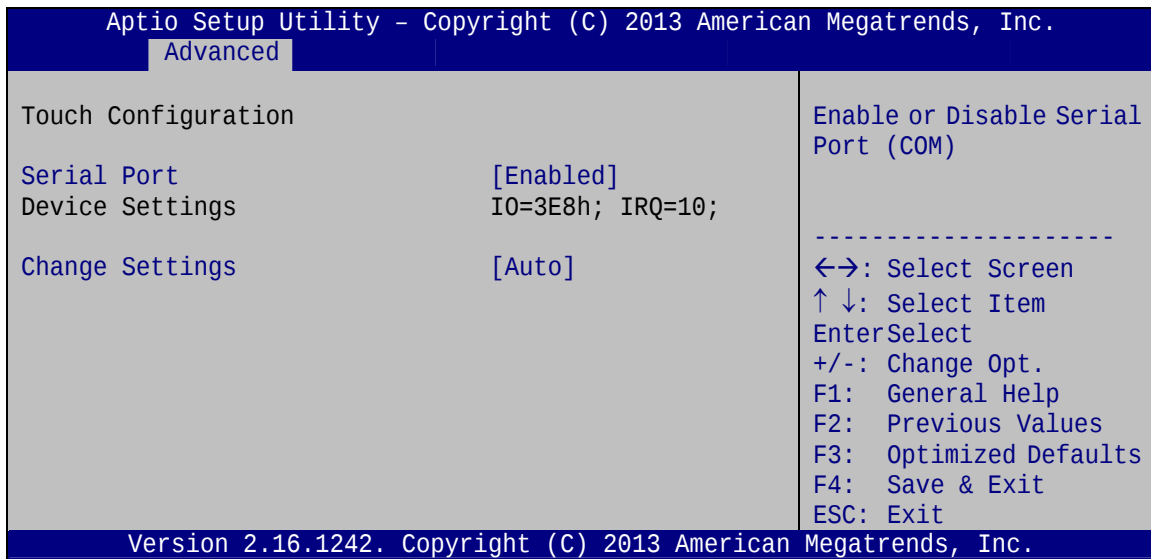
- | | |
|------------------------|---|
| ➔ Auto DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| ➔ IO=2F8h; IRQ=3 | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3 |
| ➔ IO=3F8h;
IRQ=3, 4 | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=2F8h;
IRQ=3, 4 | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=3E8h;
IRQ=3, 4 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |

➔ IO=2E8h;
IRQ=3, 4

Serial Port I/O port address is 2E8h and the
interrupt address is IRQ3, 4

4.3.2.2 Touch Configuration

Use the **Touch Configuration** menu (**BIOS Menu 6**) to configure the serial port for touchscreen.



BIOS Menu 6: Touch Configuration Menu

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

Use the **Change Settings** option to change the touchscreen serial port IO port address and interrupt address.

PPC-F06B-BT Panel PC

➔	Auto	DEFAULT	The touchscreen serial port IO port address and interrupt address are automatically detected.
➔	IO=3E8h; IRQ=10		Touchscreen serial Port I/O port address is 3E8h and the interrupt address is IRQ10
➔	IO=3F8h; IRQ=10, 11		Touchscreen serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
➔	IO=2F8h; IRQ=10, 11		Touchscreen serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
➔	IO=3E8h; IRQ=10, 11		Touchscreen serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔	IO=2E8h; IRQ=10, 11		Touchscreen serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
➔	IO=2F0h; IRQ=10, 11		Touchscreen serial Port I/O port address is 2F0h and the interrupt address is IRQ10, 11
➔	IO=2E0h; IRQ=10, 11		Touchscreen serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

4.3.3 F81866 H/W Monitor

The F81866 H/W Monitor menu (**BIOS Menu 7**) shows the operating temperatures and voltages.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
PC Health Status		
CPU temperature	:+53 °C	
System temperature	:+48 °C	

CPU_CORE	:+0.728 V	←→: Select Screen
+5V	:+5.003 V	↑ ↓: Select Item
+12V	:+12.232 V	EnterSelect
+DDR	:+1.372 V	+/-: Change Opt.
+5VSB	:+4.968 V	F1: General Help
+3.3V	:+3.344 V	F2: Previous Values
+3.3VSB	:+3.376 V	F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 7: F81866 H/W Monitor

→ Hardware Health Status

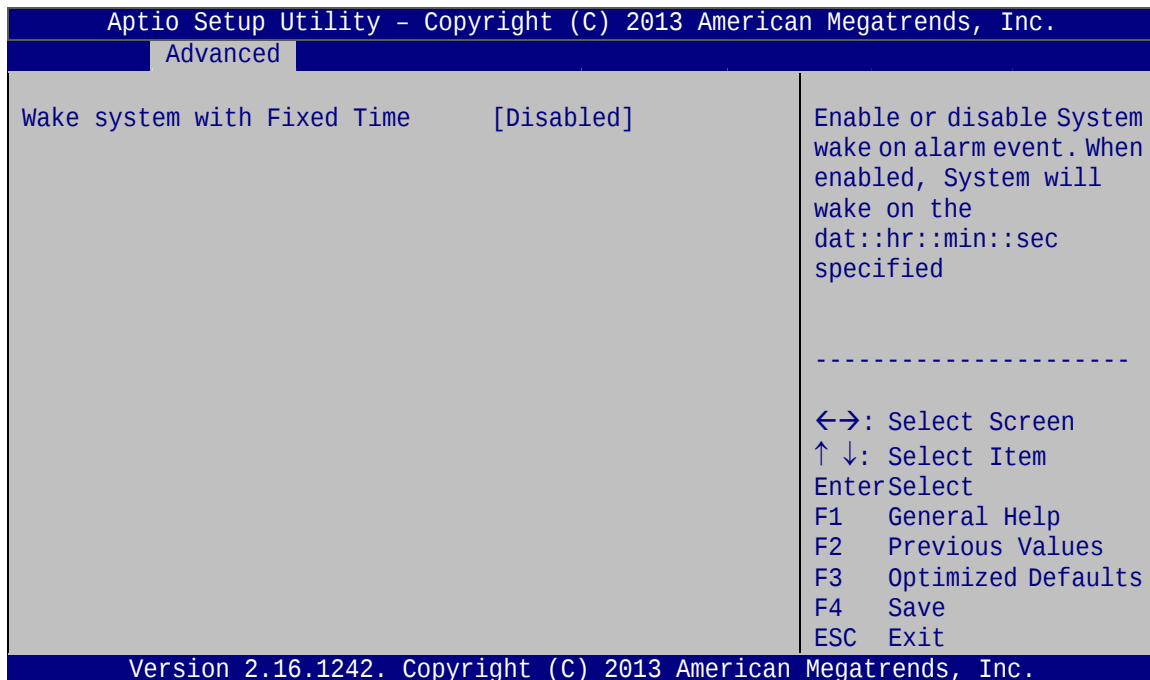
The following system parameters and values are shown. The system parameters that are monitored are:

- CPU Temperature
- System Temperature
- Voltages:
 - CPU_CORE
 - +5V
 - +12V
 - +DDR
 - +5VSB
 - +3.3V
 - +3.3VSB

PPC-F06B-BT Panel PC

4.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 8**) configures RTC wake event.



BIOS Menu 8: RTC Wake Settings

→ Wake System with Fixed Time [Disabled]

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

→ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ Enabled

If selected, the following appears with values that can be selected:

*Wake up every day

*Wake up date

*Wake up hour

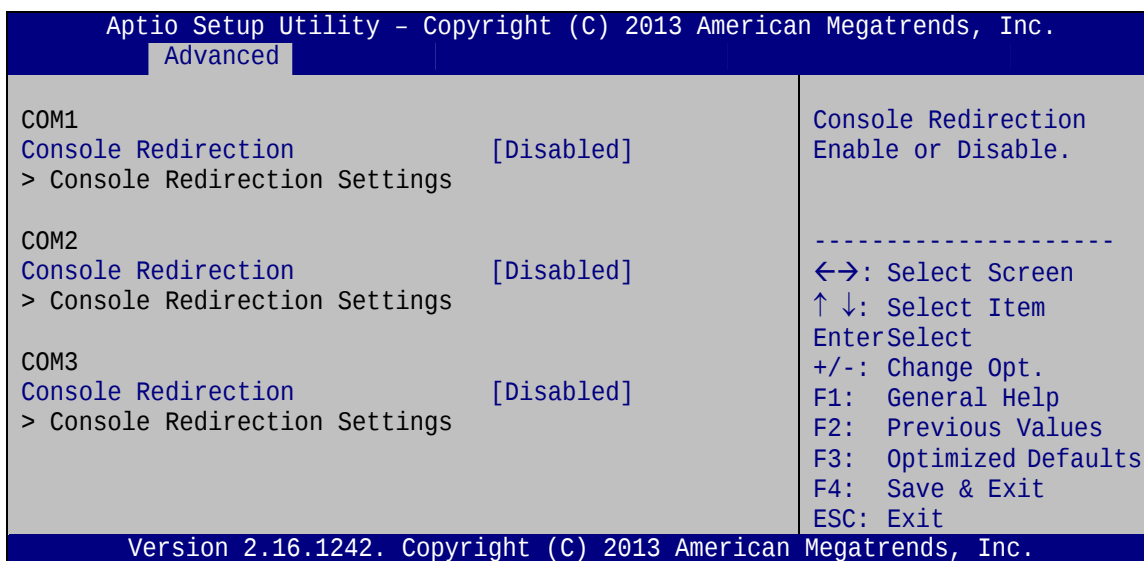
*Wake up minute

*Wake up second

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

4.3.5 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 9**) 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 9: Serial Port Console Redirection

PPC-F06B-BT Panel PC

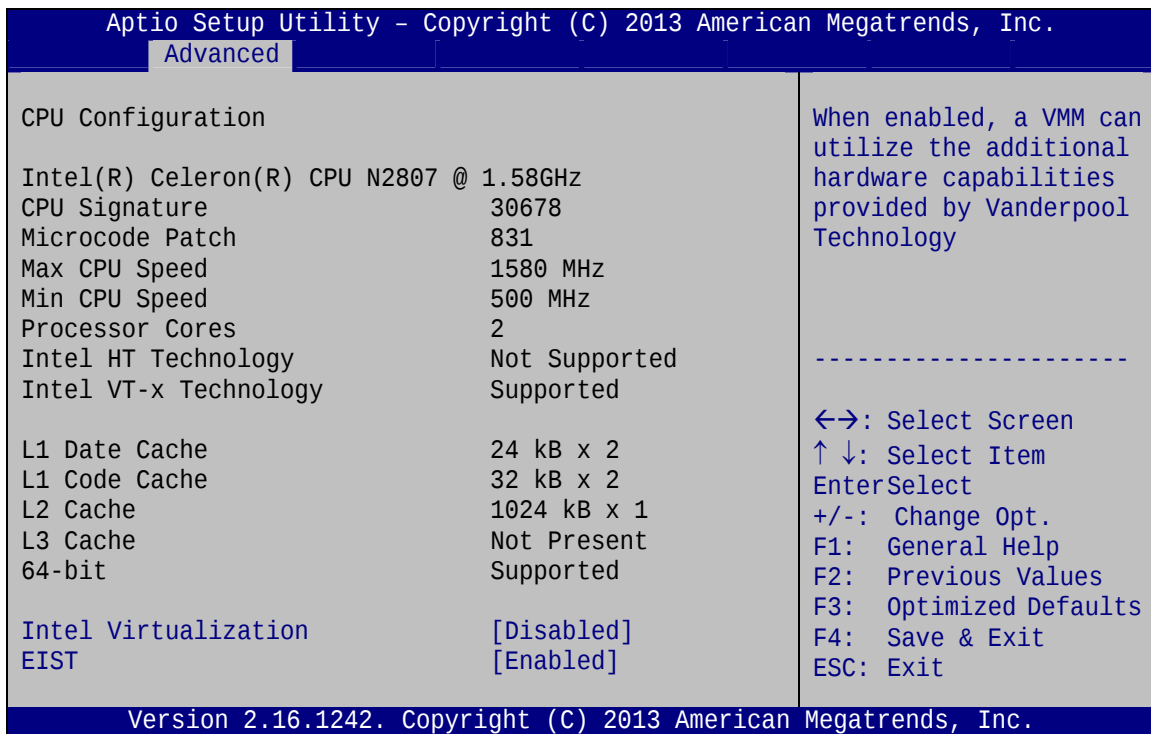
→ Console Redirection [Disabled]

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

4.3.6 CPU Configuration

Use the **CPU Configuration (BIOS Menu 10)** to view detailed CPU specifications and configure the CPU.



BIOS Menu 10: CPU Configuration

The CPU Configuration menu lists the following CPU details:

- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.

- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.
- 64-bit: Indicates if 64-bit OS is supported by the CPU.

➔ Intel Virtualization [Disabled]

Use the **Intel Virtualization** 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.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | DEFAULT | Disables Intel Virtualization Technology. |
| ➔ | Enabled | | Enables Intel Virtualization Technology. |

➔ EIST [Enabled]

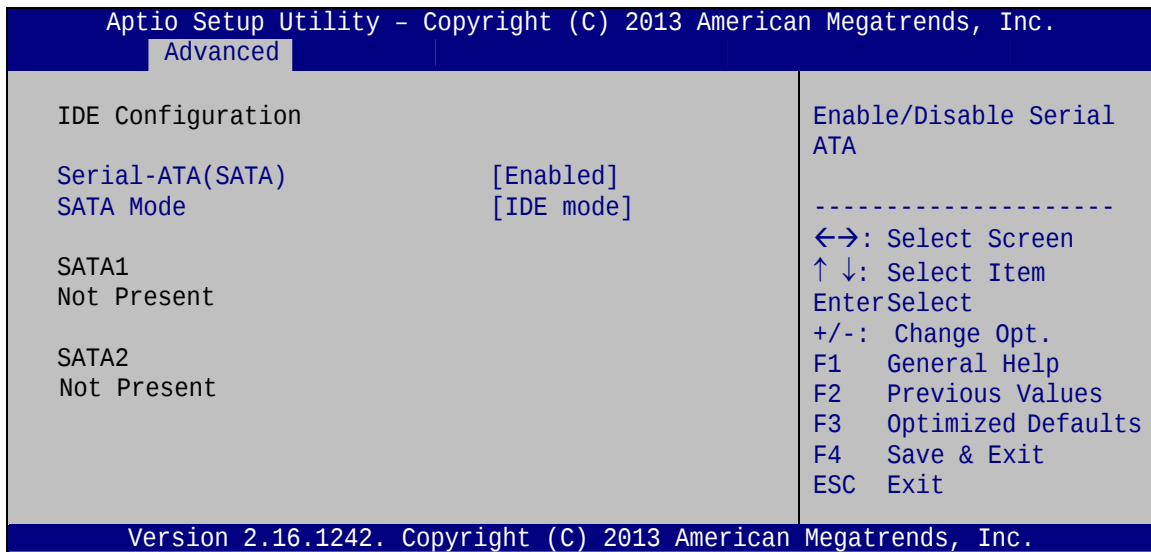
Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | | Disables Enhanced Intel SpeedStep® Techonology. |
| ➔ | Enabled | DEFAULT | Enables Enhanced Intel SpeedStep® Techonology. |

PPC-F06B-BT Panel PC

4.3.7 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 11**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 11: IDE Configuration

➔ **Serial-ATA (SATA) [Enabled]**

Use the **Serial-ATA (SATA)** option to enable or disable the serial ATA controller.

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

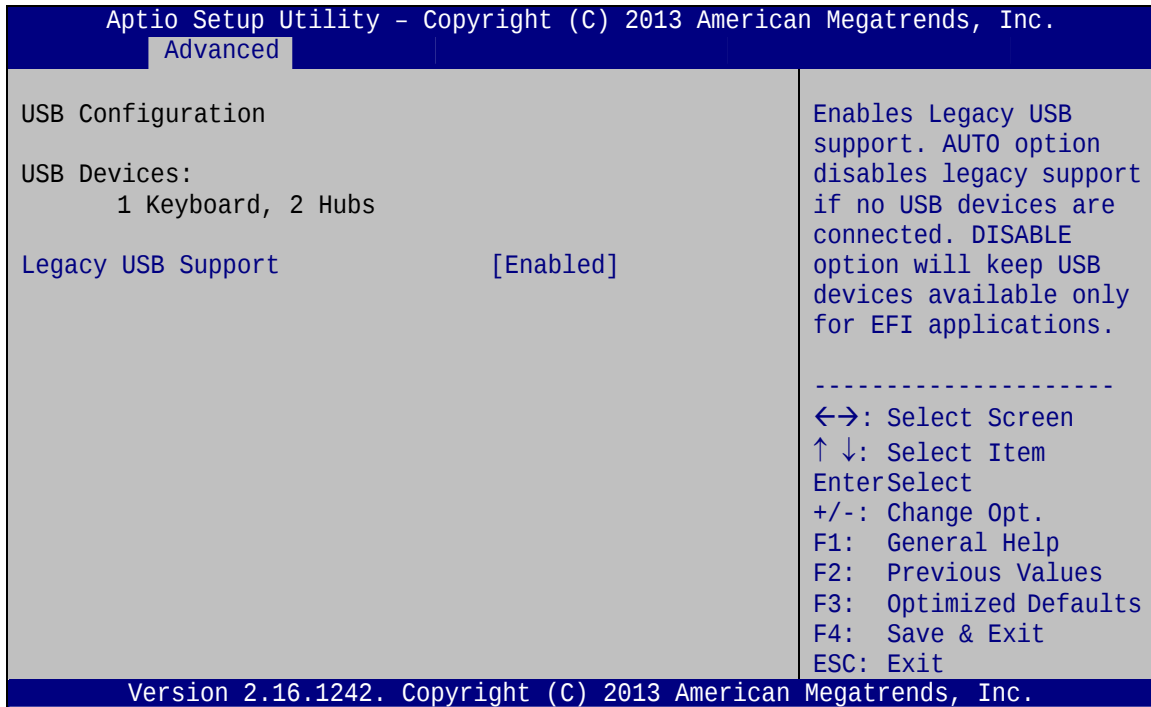
➔ **SATA Mode [IDE Mode]**

Use the **SATA Mode** option to configure SATA devices as normal IDE devices.

- ➔ **IDE Mode** **DEFAULT** Configures SATA devices as normal IDE device.
- ➔ **AHCI Mode** Configures SATA devices as AHCI device.

4.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

➔ USB Devices

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Enabled** **DEFAULT** Legacy USB support enabled

PPC-F06B-BT Panel PC

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

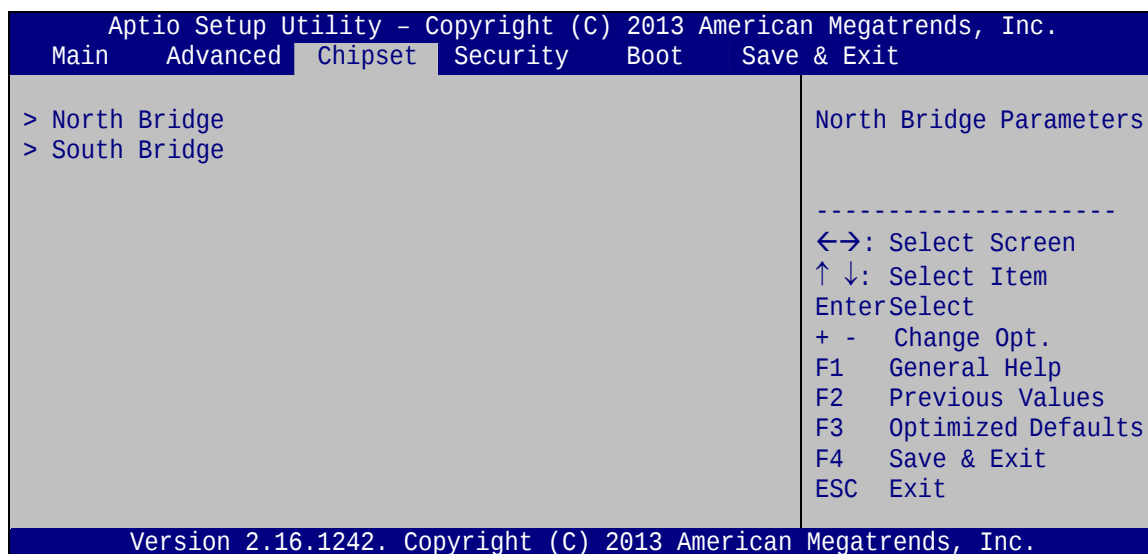
4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 13**) to access the North Bridge and South Bridge configuration menus.



WARNING!

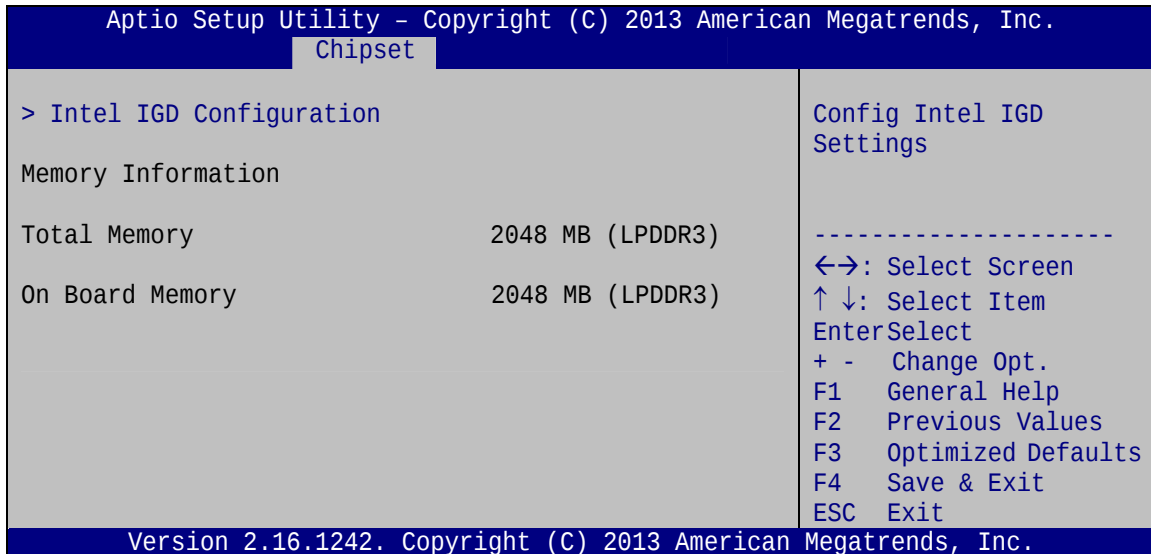
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 13: Chipset

4.4.1 North Bridge Configuration

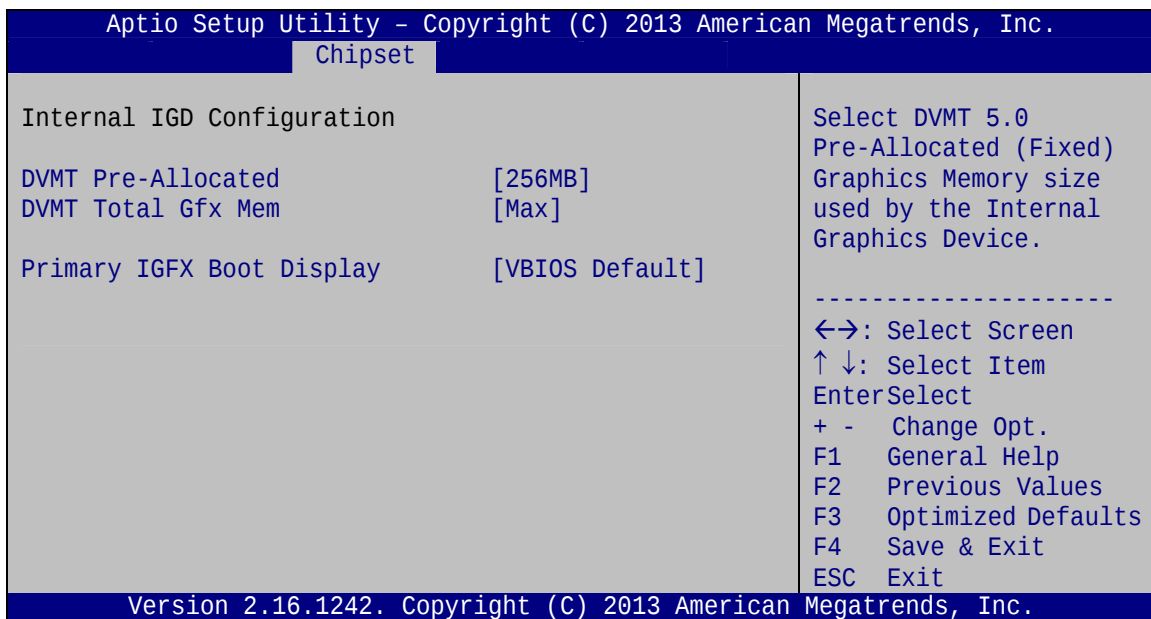
Use the **North Bridge** menu (**BIOS Menu 14**) to configure the north bridge chipset.



BIOS Menu 14: North Bridge Configuration

4.4.1.1 Internal IGD Configuration

Use the Internal IGD Configuration (**BIOS Menu 15**) menu to set the integrated graphics.



BIOS Menu 15: Internal IGD Configuration

PPC-F06B-BT Panel PC

➔ DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

➔	64M		64 MB of memory used by internal graphics device
➔	128M		128 MB of memory used by internal graphics device
➔	256M	DEFAULT	256 MB of memory used by internal graphics device
➔	512M		512 MB of memory used by internal graphics device

➔ DVMT Total Gfx Mem [Max]

Use the **DVMT Total Gfx Mem** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128MB
- 256MB
- Max DEFAULT

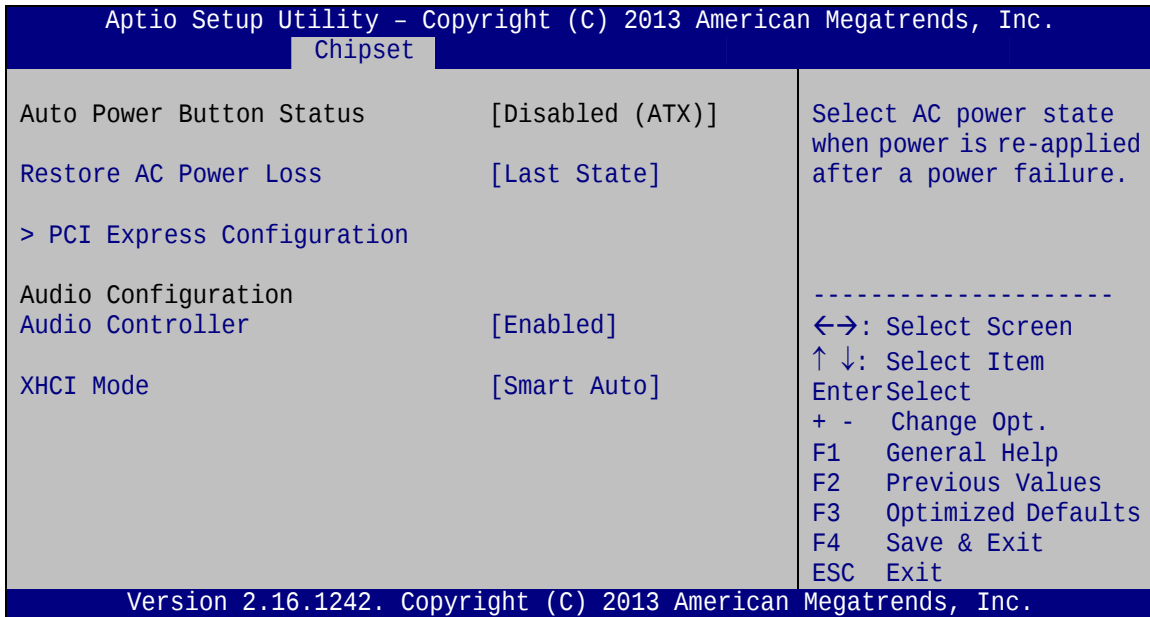
➔ Primary IGFX Boot Display [VBIOS Default]

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default DEFAULT
- CRT
- LFP

4.4.2 South Bridge Configuration

Use the **South Bridge** menu (**BIOS Menu 16**) to configure the south bridge chipset.



BIOS Menu 16: South Bridge Configuration

➔ Restore on AC Power Loss [Last State]

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

- ➔ **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.

➔ Audio Controller [Enabled]

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

- ➔ **Disabled** The High Definition Audio controller is disabled.

PPC-F06B-BT Panel PC

➔ **Enabled** **DEFAULT** The High Definition Audio controller is enabled.

➔ **XHCI Mode [Smart Auto]**

Use the **XHCI Mode** BIOS option to configure the USB xHCI (USB 3.0) controller.

➔ **Enabled** Enable the xHCI controller. USB 3.0 ports behave as USB 3.0 ports.

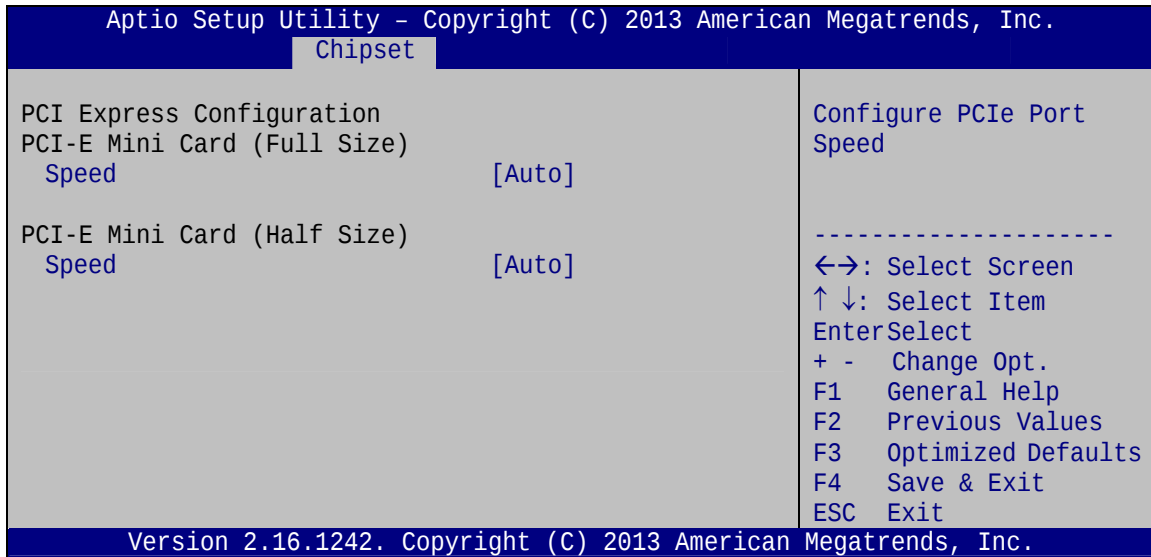
➔ **Smart** **DEFAULT** Allow the use of USB 3.0 devices prior to OS boot.
Auto USB 3.0 ports function as USB 3.0 ports even during a reboot.

**NOTE:**

If the system is running Windows 7 operating system, the USB 3.0 driver must be installed to support USB 3.0.

4.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 17**) to configure the PCI Express slots.



BIOS Menu 17: PCI Express Configuration

→ Speed [Auto]

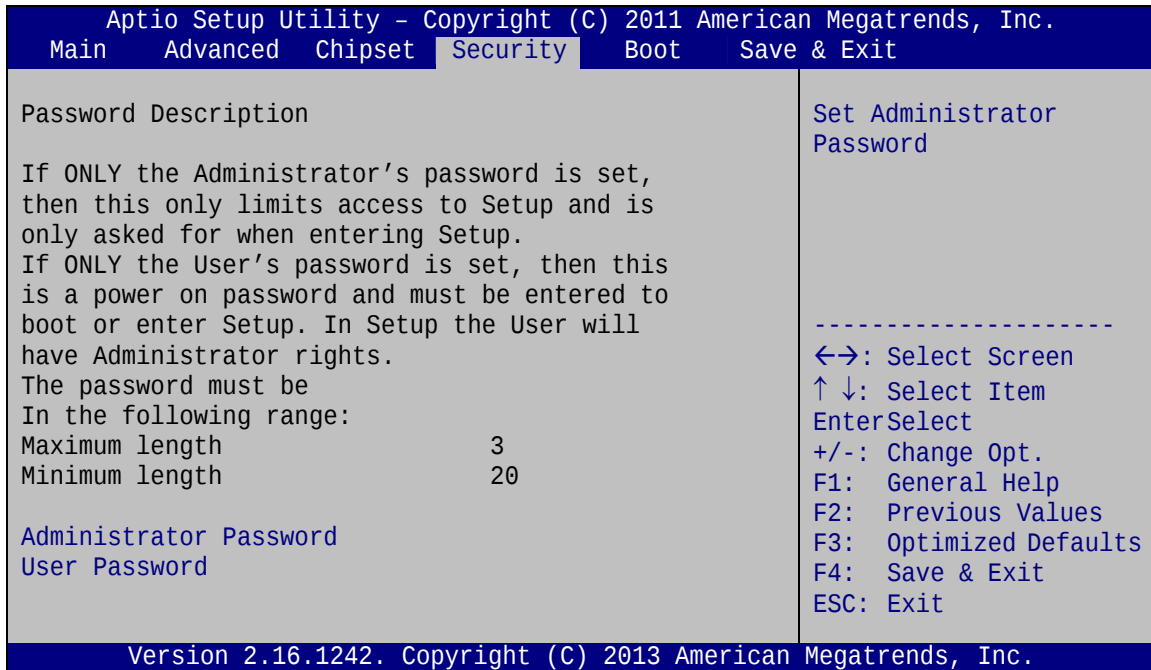
Use the **Speed** option to configure the PCIe Mini card slot speed.

- Auto **DEFAULT**
- Gen 2
- Gen 1

PPC-F06B-BT Panel PC

4.5 Security

Use the **Security** menu (**BIOS Menu 18**) to set system and user passwords.



BIOS Menu 18: Security

➔ Administrator Password

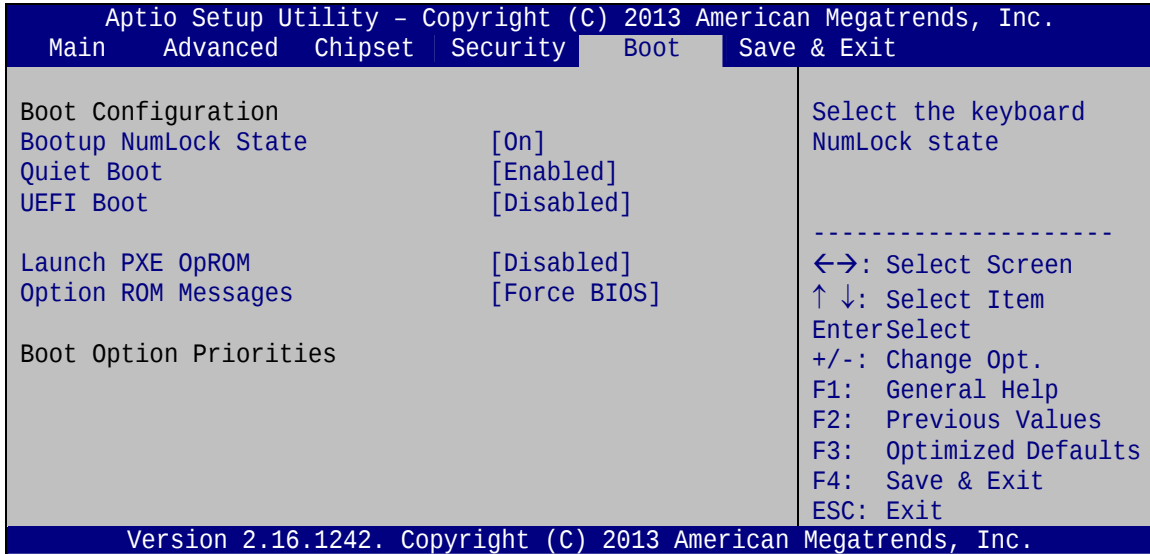
Use the **Administrator Password** field to set or change an administrator password.

➔ User Password

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

4.6 Boot

Use the **Boot** menu (**BIOS Menu 19**) to configure system boot options.



BIOS Menu 19: Boot

→ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

- | | | | |
|---|------------|----------------|--|
| → | On | DEFAULT | Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit. |
| → | Off | | Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged. |

PPC-F06B-BT Panel PC

→ **Quiet Boot [Enabled]**

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

- | | | | |
|---|-----------------|----------------|---|
| → | Disabled | | Normal POST messages displayed |
| → | Enabled | DEFAULT | OEM Logo displayed instead of POST messages |

→ **UEFI Boot [Disabled]**

Use the **UEFI Boot** BIOS option to enable or disable UEFI boot.

- | | | | |
|---|-----------------|----------------|---|
| → | Enabled | | Enable UEFI boot if the 1 st boot device is a GPT HDD. |
| → | Disabled | DEFAULT | Disable UEFI boot. |

→ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- | | | | |
|---|-----------------|----------------|----------------------------|
| → | Disabled | DEFAULT | Ignore all PXE Option ROMs |
| → | Enabled | | Load PXE Option ROMs |

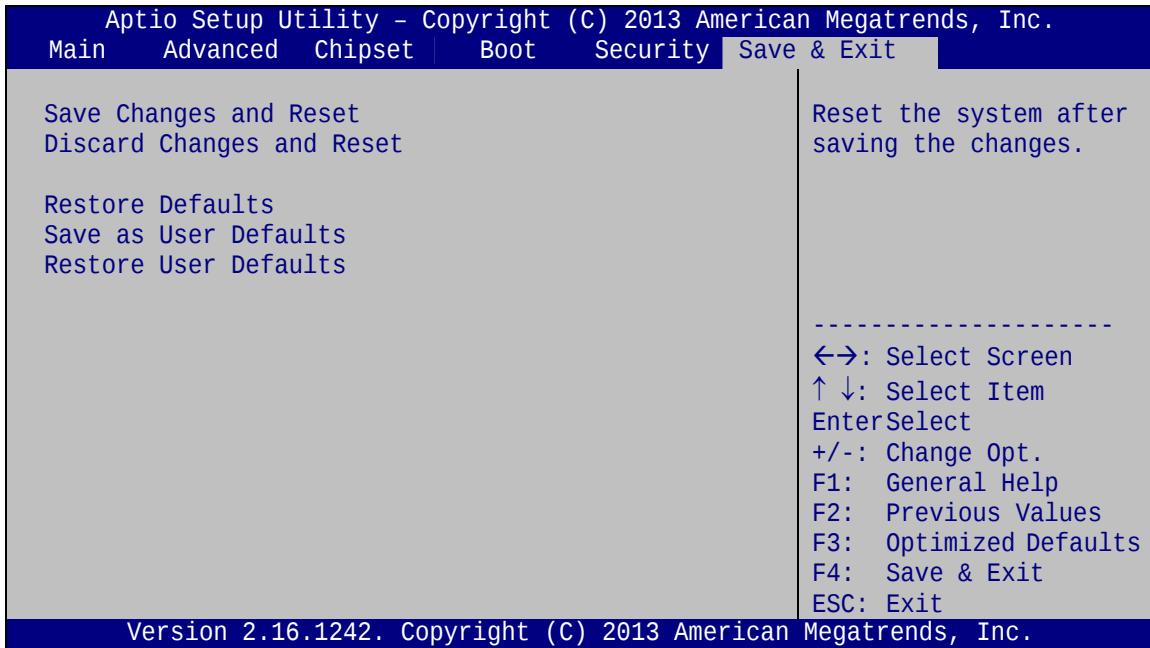
→ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

- | | | | |
|---|---------------------|----------------|----------------------------------|
| → | Force BIOS | DEFAULT | Sets display mode to force BIOS. |
| → | Keep Current | | Sets display mode to current. |

4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 20**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 20: 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.**

PPC-F06B-BT Panel PC

➔ 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

5

Interface Connectors

PPC-F06B-BT Panel PC

5.1 Peripheral Interface Connectors

The PPC-F06B-BT panel PC motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 5-1** and **Figure 5-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagram below. The connector pinouts for these connectors are listed in the following sections.

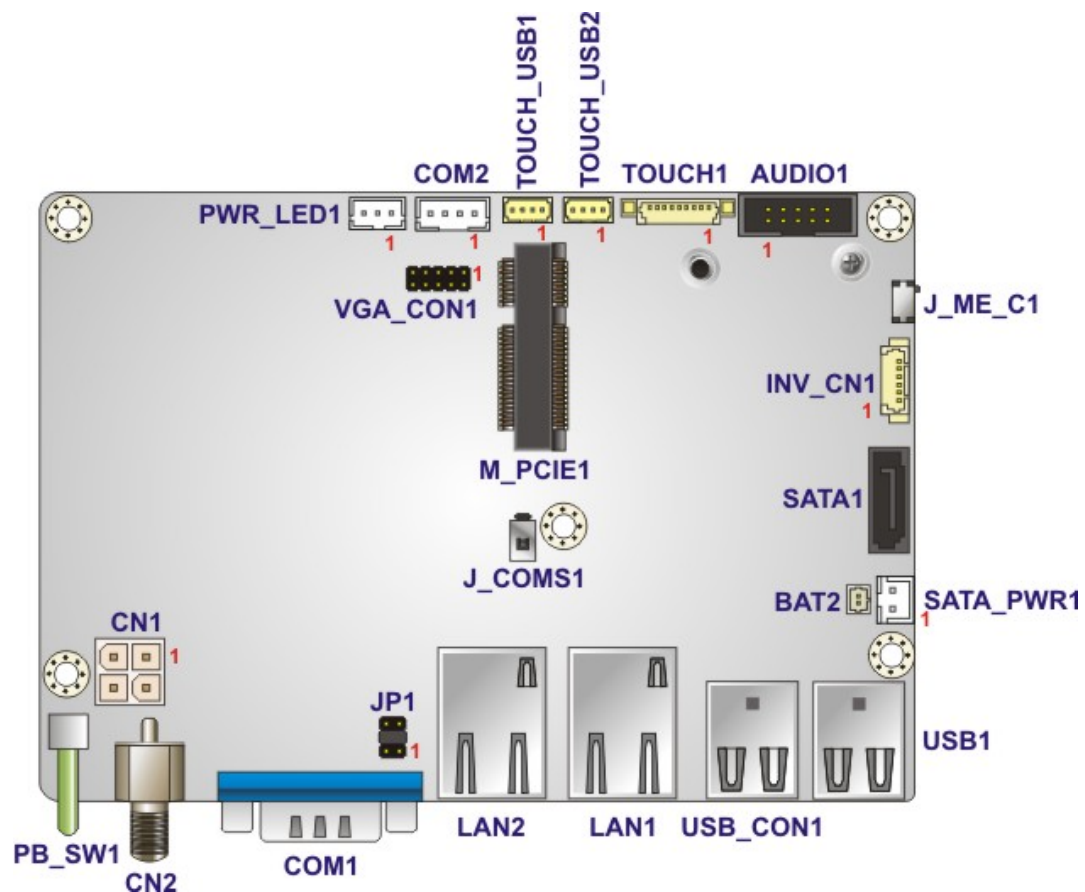


Figure 5-1: Main Board Layout Diagram (Front Side)

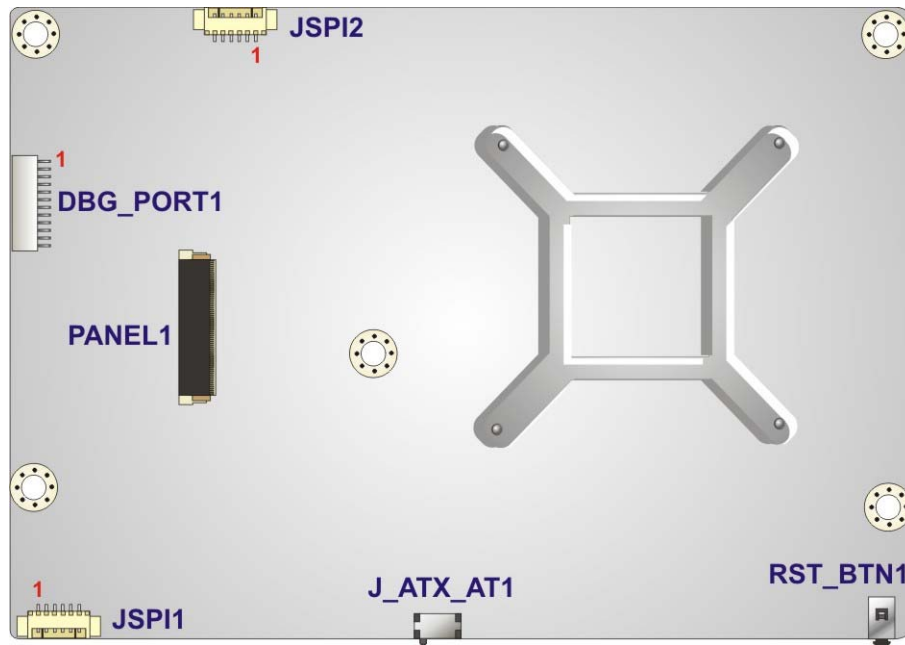


Figure 5-2: Main Board Layout Diagram (Solder Side)

5.2 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 AFL3MB2-BT. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Audio connector	10-pin box header	AUDIO1
Battery connector	2-pin wafer	BAT2
Inverter connector	6-pin wafer	INV_CN1
LCD connector	33-pin FPC	PANEL1
MCU connector	6-pin wafer	JSPI2
PCIe Mini card slot	Full-size PCIe Mini slot	M_PCIE1
Power input connector (+12 V)	4-pin Molex	CN1

PPC-F06B-BT Panel PC

Connector	Type	Label
Power LED connector	3-pin wafer	PW_LED1
SATA DOM connector	7-pin connector	SATA1
SATA power connector	2-pin wafer	SATA_PWR1
Serial port connector (RS-422/485)	4-pin wafer	COM2
SPI flash connector	6-pin wafer	JSPI1
Touch panel connector	9-pin wafer	TOUCH1
USB 2.0 connector	4-pin wafer	TOUCH_USB1
USB 2.0 connector	4-pin wafer	TOUCH_USB2
VGA connector	10-pin header	VGA_CON1

Table 5-1: Peripheral Interface Connectors

5.2.1 Audio Connector (AUDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE-OUT_R	2	LINE-IN_R
3	AUD_GND	4	AUD_GND
5	LINE-OUT_L	6	LINE-IN_L
7	AUD_GND	8	AUD_GND
9	MIC1_R	10	MIC1_L

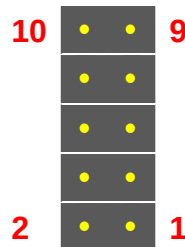


Table 5-2: Audio Connector (AUDIO1) Pinouts

5.2.2 Battery Connector (BAT2)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 5-3: Battery Connector (BAT2) Pinouts

5.2.3 Inverter Connector (INV_CN1)

PIN NO.	DESCRIPTION
1	+12V
2	+12V
3	BACKLIGHT ENABLE
4	LCD_BKLCTL
5	GND
6	GND

Table 5-4: Inverter Connector (INV_CN1) Pinouts

5.2.4 LCD Connector (PANEL1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	18	G3
2	N/C	19	G2
3	U/D	20	G1
4	R/L	21	G0
5	VDD	22	GND
6	VDD	23	R5
7	DE	24	R4
8	GND	25	R3
9	B5	26	R2
10	B4	27	R1
11	B3	28	R0
12	B2	29	GND
13	B1	30	VSUNC
14	B0	31	HSUNC
15	GND	32	DOTCLK
16	G5	33	GND
17	G4		

Table 5-5: LCD Connector (PANEL1) Pinouts

PPC-F06B-BT Panel PC

5.2.5 MCU Connector (JSPI2)

PIN NO.	DESCRIPTION
1	MCLR
2	+5V
3	GND
4	ICSPCLK
5	ICSPDAT
6	NC

Table 5-6: MCU Connector (JSPI2) Pinouts

5.2.6 PCIe Mini Connector (M_PCIE1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK#	12	N/C
13	PCIE_CLK	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	PCIRST#
23	PCIE_RXN(SATA_RX+)	24	VCC3
25	PCIE_RXP(SATA_RX-)	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PCIE_TXN(SATA_TX-)	32	SMBDATA
33	PCIE_TXP(SATA_TX+)	34	GND
35	GND	36	USBD-
37	GND	38	USBD+
39	VCC3	40	GND

41	VCC3	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 5-7: PCIe Mini Connector (M_PCIE1) Pinouts

5.2.7 Power Input Connector (CN1)

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 5-8: Power Input Connector (CN1) Pinouts

5.2.8 Power LED Connector (PW_LED1)

PIN NO.	DESCRIPTION
1	PW_LED +5V
2	GND
3	SUS PW LED +5V

Table 5-9: Power LED Connector (PW_LED1) Pinouts

5.2.9 SATA DOM Connector (SATA1)

The SATA1 connector only allows SATA DOM connection.

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-

PPC-F06B-BT Panel PC

6	RX+
7	GND

Table 5-10: SATA Connector (SATA1) Pinouts

5.2.10 SATA Power Connector (SATA_PWR1)

PIN NO.	DESCRIPTION
1	+5V
2	GND

Table 5-11: SATA Power Connector (SATA_PWR1) Pinouts

5.2.11 Serial Port Connector, RS-422/485 (COM2)

PIN NO.	DESCRIPTION
1	RXD422-
2	RXD422+
3	TXD422+ /TXD485+
4	TXD422- /TXD485-

Table 5-12: Serial Port Connector (COM2) Pinouts

5.2.12 SPI Flash Connector (JSPI1)

PIN NO.	DESCRIPTION
1	+1.8V
2	SPI_CS
3	SPI_SO
4	SPI_CLK
5	SPI_SI
6	GND

Table 5-13: SPI Flash Connector (JSPI1) Pinouts

5.2.13 Touch Panel Connector (TOUCH1)

PIN NO.	DESCRIPTION
1	X+
2	X-
3	Y+
4	SENSE
5	X+
6	X-
7	Y+
8	Y-
9	GND

Table 5-14: Touch Panel Connector (TOUCH1) Pinouts**5.2.14 USB 2.0 Connector (TOUCH_USB1)**

PIN NO.	DESCRIPTION
1	+5V
2	DATA1-
3	DATA1+
4	GND

Table 5-15: USB 2.0 Connector (TOUCH_USB1) Pinouts**5.2.15 USB 2.0 Connector (TOUCH_USB2)**

PIN NO.	DESCRIPTION
1	+5V
2	DATA4-
3	DATA4+
4	GND

Table 5-16: USB 2.0 Connector (TOUCH_USB2) Pinouts

PPC-F06B-BT Panel PC

5.2.16 VGA Connector (VGA_CON1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	DDCDA
3	GREEN	4	DDCLK
5	BLUE	6	GND
7	HSYNC	8	GND
9	VSYNC	10	GND

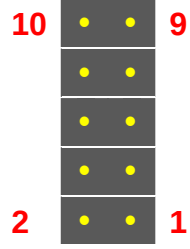


Table 5-17: VGA Connector (VGA_CON1) Pinouts

5.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the AFL2MB-15A motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
Power button	Push button	PB_SW1
Power connector	Power jack	CN2
RS-232 serial port	DB-9	COM1
USB 2.0 connectors	USB 2.0 port	USB1
USB 3.0 connectors	USB 3.0 port	USB_CON1

Table 5-18: Rear Panel Connectors

5.3.1 Ethernet Connectors (LAN1 & LAN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDI0+	10	MDI3-
2	MDI0-	11	+3.3Vsus
3	MDI1+	12	ACT-1
4	MDI1-	13	LINN1000 +3.3sus
5	N/A	14	LINN1000 +3.3sus
6	N/A	15	GND
7	MDI2+	16	GND
8	MDI2-	17	N/A
9	MDI3+	18	N/A

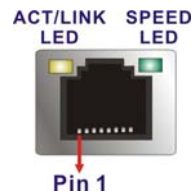


Table 5-19: Ethernet Connectors (LAN1 & LAN2) Pinouts

5.3.2 Power Connector (CN2)

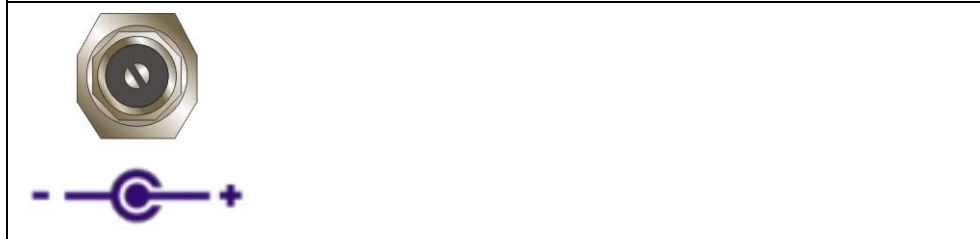


Table 5-20: Power Connector (CN2) Pinouts

5.3.3 RS-232 Serial Port (COM1)

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

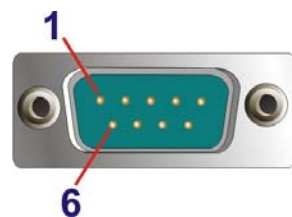


Table 5-21: RS-232 Serial Port (COM1) Pinouts

PPC-F06B-BT Panel PC

5.3.4 USB 2.0 Connectors (USB1)

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



Table 5-22: USB 2.0 Connectors (USB1) Pinouts

5.3.5 USB 3.0 Connectors (USB_CON1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V _{sus}	10	+5V _{sus}
2	DATA1-	11	DATA2-
3	DATA1+	12	DATA2+
4	GND	13	GND
5	SSRX1-	14	SSRX2-
6	SSRX1+	15	SSRX2+
7	GND	16	GND
8	SSTX1-	17	SSTX2-
9	SSTX1+	18	SSTX2+

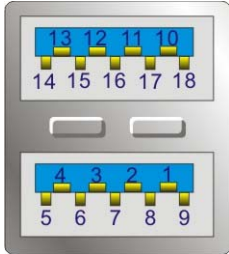


Table 5-23: USB 3.0 Connectors (USB_CON1) Pinouts

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment is in conformity with the following EU directives:

- EMC Directive 2004/108/EC
- Low-Voltage Directive 2006/95/EC
- RoHS II Directive 2011/65/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 R&TTE Directive 1999/5/EC.

English

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Български [Bulgarian]

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 1999/5/EC.

Česky [Czech]

IEI Integration Corp tímto prohlašuje, že tento zařazení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.

Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB 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 1999/5/EG.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.

Magyar [Hungarian]

IEI Integration Corp nyilatkozik, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

PPC-F06B-BT Panel PC

Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 1999/5/CE.

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 1999/5/EY 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 1999/5/EG.

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

BIOS Configuration Options

B.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 4**.

BIOS Information	38
CPU Information.....	38
Memory Information	38
TXE Information	38
System Date [xx/xx/xx]	38
System Time [xx:xx:xx]	39
ACPI Sleep State [S3 (Suspend to RAM)]	41
Serial Port [Enabled].....	42
Change Settings [Auto]	42
Serial Port [Enabled].....	43
Change Settings [Auto]	43
Serial Port [Enabled].....	44
Change Settings [Auto]	44
Hardware Health Status.....	46
Wake System with Fixed Time [Disabled]	47
Console Redirection [Disabled]	49
Intel Virtualization [Disabled].....	50
EIST [Enabled].....	50
Serial-ATA (SATA) [Enabled]	51
SATA Mode [IDE Mode]	51
USB Devices	52
Legacy USB Support [Enabled].....	52
DVMT Pre-Allocated [256M]	55
DVMT Total Gfx Mem [Max].....	55
Primary IGFX Boot Display [VBIOS Default]	55
Restore on AC Power Loss [Last State]	56
Audio Controller [Enabled]	56
XHCI Mode [Smart Auto]	57
Speed [Auto].....	58
Administrator Password	59
User Password	59

PPC-F06B-BT Panel PC

Bootup NumLock State [On].....	60
Quiet Boot [Enabled]	61
UEFI Boot [Disabled]	61
Launch PXE OpROM [Disabled]	61
Option ROM Messages [Force BIOS].....	61
Save Changes and Reset	62
Discard Changes and Reset	62
Restore Defaults	62
Save as User Defaults	63
Restore User Defaults	63

Appendix

C

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 EP series.

C.1 Safety Precautions

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

C.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 EP series is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the EP series is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range.***
Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the EP series chassis is opened when the EP series is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the EP series.
- ***If considerable amounts of dust, water, or fluids enter the EP series***, turn off the power supply immediately, unplug the power cord, and contact the EP series vendor.
- **DO NOT:**
 - Drop the EP series 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

C.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the EP series may result in permanent damage to the EP series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the EP series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the EP 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.

PPC-F06B-BT Panel PC

C.1.3 Product Disposal

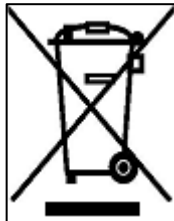


CAUTION:

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:



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.

C.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the EP series, please follow the guidelines below.

C.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the EP 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 EP series does not require cleaning. Keep fluids away from the EP series interior.
- Be cautious of all small removable components when vacuuming the EP series.
- Turn the EP series off before cleaning the EP series.
- Never drop any objects or liquids through the openings of the EP series.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the EP series.
- Avoid eating, drinking and smoking within vicinity of the EP series.

C.2.2 Cleaning Tools

Some components in the EP 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 EP series.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the EP series.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the EP series.
- **Using solvents** – The use of solvents is not recommended when cleaning the EP series 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 EP series. Dust and dirt can restrict the airflow in the EP series 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

D

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 D-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.

PPC-F06B-BT 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

E

Hazardous Materials Disclosure

E.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

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 table on the next page.

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
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 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						

PPC-F06B-BT Panel PC

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 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (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
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/T11363-2006 标准规定的限量要求以下。						
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/T11363-2006 标准规定的限量要求。						