IEI Integration Corp.

MODEL:

# UPC-F12C-ULT3

**12.1” Fanless Panel PC with Intel® Core™ i5-6300U / Celeron® 3955U CPU, Touchscreen, USB, GbE LAN, RS-232/422/485, IP 66/65 and RoHS**

# User Manual

**Rev. 1.10 - July 7, 2021**

RoHS Lead Free

# Revision

| Date | Version | Changes |
|---|---|---|
| July 7, 2021 | 1.10 | Updated for R11 version (deleted CM SKU) |
| March 8, 2018 | 1.01 | Modified Section 2.2 and Table 1-2 |
| February 12, 2018 | 1.00 | Initial release |

# Safety Instructions

en Warning! Read the user manual before connecting the system to the power source.

de Vorsicht! Bitte lesen Sie die Bedienungsanleitung, bevor Sie das System an eine Stromquelle anschließen.

fr Attention! Avant de brancher le système à la source d'alimentation, consultez le mode d'emploi.

it Avvertenza! Consultare il manuale utente prima di collegare il sistema all'alimentatore.

es Atención! Lea atentamente este manual del usuario antes de operar la fuente de alimentación.

zh 警告！在將系統連接到電源之前，請仔細閱讀使用手冊。

cn 警告！在将系统连接到电源之前，请仔细阅读使用手冊。

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en Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.

de Vorsicht! Um eine Überhitzung des Systems zu vermeiden, betreiben Sie es ausschließlich im zulässigen Betriebstemperaturbereich. Dieser ist in der Bedienungsanleitung vermerkt.

fr Attention! Pour éviter la surchauffe du système, ne l'utilisez pas dans une zone dont la température dépasse les limites décrits dans le mode d'emploi.

it Avvertenza! Per evitare che il sistema si surriscaldi, non utilizzarlo in aree che superino la temperatura massima d'esercizio descritta nel manuale utente.

es Atención! Para evitar el excesivo calentamiento del sistema, no opere en las condiciones de temperatura superior a lo recomendado en este manual del usuario.

zh 警告！為防止系統過熱，不要在使用手冊上記載的產品工作溫度範圍之外操作此系統。

cn 警告！为防止系统过热，不要在使用手冊上记载的产品工作温度范围之外操作此系统。

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en Warning! Use only the adapter and power cord approved for this system. Use of another type of adapter may risk fire or explosion. Please refer to the user manual for the power adapter specifications.

de Vorsicht! Nur zugelassene Netzteile und Netzkabel dürfen verwendet werden. Die Benutzung von anderen Netzteilen kann einen Brand oder eine Explosion zur Folge haben. Prüfen Sie die jeweiligen Spezifikationen in der Bedienungsanleitung.

fr Attention! Utilisez exclusivement le câble d'alimentation et l'adaptateur homologués pour ce système. L'utilisation d'un autre type d'adaptateur risquerait de provoquer un incendie ou une explosion. Veuillez référer au mode d'emploi pour les spécifications de l'adaptateur d'alimentation.

it Avvertenza! Utilizzare solo l'adattatore e il cavo di alimentazione approvati per questo sistema. L'uso di un altro tipo di adattatore può causare rischio d'incendio o esplosione. Si prega di fare riferimento al manuale utente per le specifiche sull'alimentazione.

es Atención! Utilice solamente el adaptador de corriente alterna (CA) con Marcas Conformidad otorgadas. Cualquier otro adaptador no otorgado aumenta el riesgo de explosión o incendio. Por favor consulte el manual del usuario para las especificaciones del adaptador de alimentación.

zh 警告！只能使用經過認證、適用於本系統的電源變壓器與電源線。使用不適用的電源變壓器將可能導致火災或爆炸。電源變壓器規格請參考使用手冊。

cn 警告！只能使用经过认证，适用于本系统的电源适配器与电源线。使用不适用的电源适配器将可能导致火灾或爆炸。电源适配器规格请参考使用手册。

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en Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

de Vorsicht! Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

fr Attention! La mise au rebut ou le recyclage de ce produit sont généralement soumis aux lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

it Avvertenza! Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e i regolamenti locali.

es Atención! La disposición final de residuos de este producto se debe cumplir con las normativas y leyes del país.

zh 警告！本產品的廢棄處理應根據該國家的法律和規章進行。

cn 警告！本产品的废弃处理应根据该国家的法律和规章进行。

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# Manual Conventions

**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.

**RISK OF ELECTRIC SHOCK**

This symbol is to identify equipment, for example, the welding power source, that has risk of electric shock.

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Chapter

1

# Introduction

## 1.1 Overview

**Figure 1-1: UPC-F12C-ULT3 Panel PC**

The UPC-F12C-ULT3 series is a quad-core Intel® Core™ i5-6300U or Intel® Celeron® 3955U powered panel PC with a rich variety of functions and peripherals.

The aluminum die-casting design and the IP66 enclosure make the UPC-F12C-ULT3 an ideal system for use in harsh environment.

The Intel® Core™ i5-6300U / Celeron® 3955U is a System-on-Chip (SoC) that ensures optimal memory, graphics, and peripheral I/O support. The system comes with 4.0 GB of DDR4 SO-DIMM memory ensuring smooth data throughputs with reduced bottlenecks and fast system access.

Multiple connectors ensure simplified connectivity to a variety of external peripheral devices, including GbE LAN, RS-232/422/485 and USB ports.

## 1.2 Model Variations

There are several models in the UPC-F12C-ULT3 series. The model numbers and model variations are listed below.

| Model | Processor | Touchscreen |
|---|---|---|
| **UPC-F12C-ULT3-C/R/4G** | Intel® Celeron® 3955U | Resistive |
| **UPC-F12C-ULT3-C/PC/4G** | Intel® Celeron® 3955U | Projected capacitive |
| **UPC-F12C-ULT3-i5/R/4G** | Intel® Core™ i5-6300U | Resistive |
| **UPC-F12C-ULT3-i5/PC/4G** | Intel® Core™ i5-6300U | Projected capacitive |

**Table 1-1: Model Variations**

## 1.3 Features

The UPC-F12C-ULT3 features are listed below:

- 12.1" LCD with LED backlight
- Flat display screen made of toughened glass with 6H hardness
- Resistive type or projected capacitive type touchscreen
- Intel® Core™ i5-6300U or Intel® Celeron® 3955U processor
- Preinstalled with 4 GB of DDR4 memory (system max. 32 GB)
- Built-in Wi-Fi 802.11a/b/g/n/ac and Bluetooth v4.0
- Fanless design
- 5-side IP66 protection
- 12 V–36 V wide range DC power input

## 1.4 Front Panel

The front side of the UPC-F12C-ULT3 is a panel with a TFT LCD touchscreen surrounded by an aluminum die-casting frame (**Figure 1-2**).

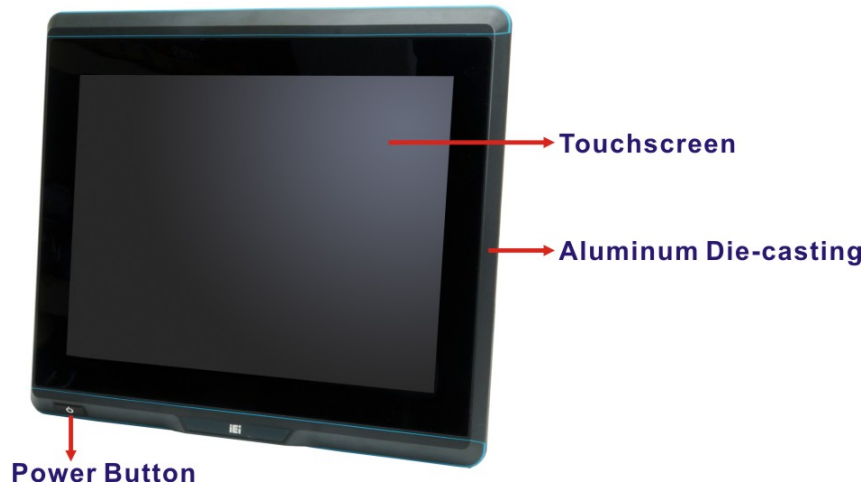



**Figure 1-2: Front View**

## 1.5 Rear Panel

The rear panel of the UPC-F12C-ULT3 contains VESA mount screw holes. The rear panel also provides access for installing a 2.5" SATA SSD.

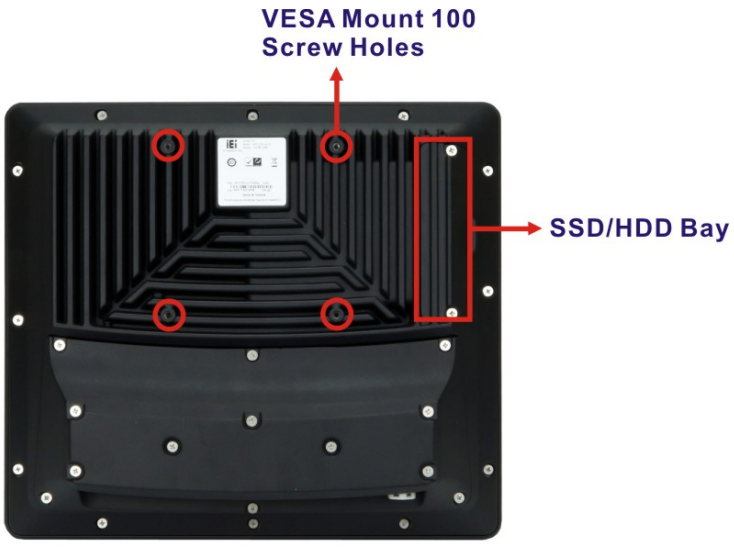



**Figure 1-3: Rear Panel**

## 1.6 Bottom Panel

The bottom panel of the UPC-F12C-ULT3 has several I/O interfaces. The I/O cover must be removed to access the I/O interfaces.

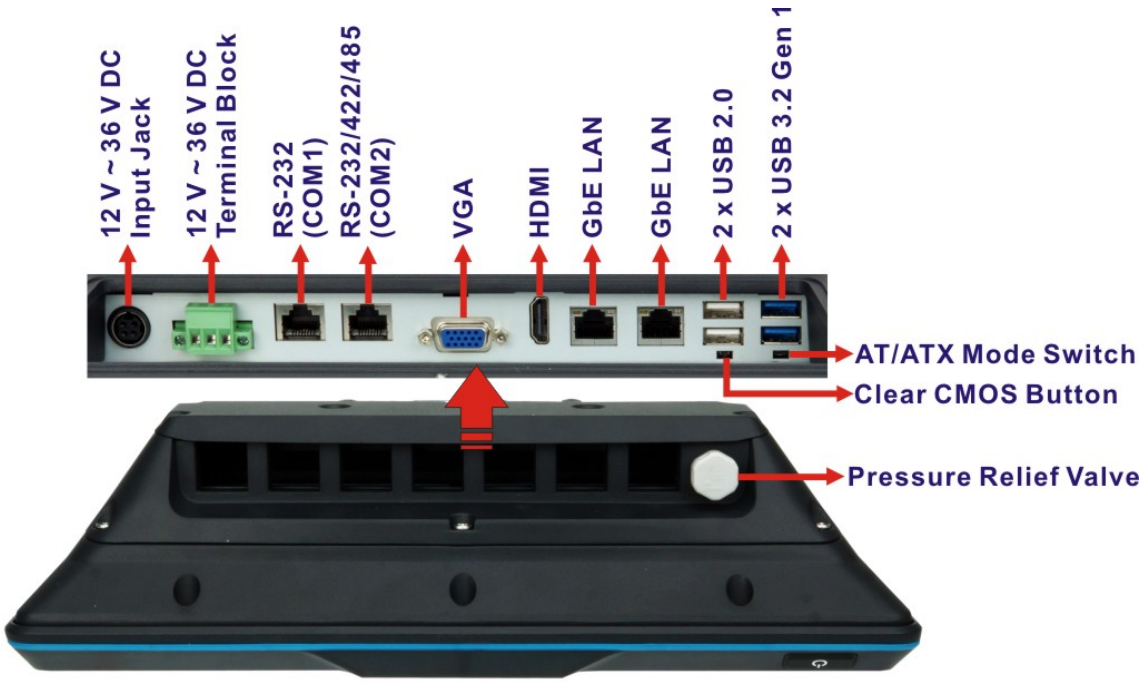



**Figure 1-4: I/O Panel**

## 1.7 System Specifications

The technical specifications for the UPC-F12C-ULT3 systems are listed in **Table 1-2**.

| Specification | UPC-F12C-ULT3 |
|---|---|
| LCD Size | 12.1" |
| Max. Resolution | 1024 (W) x 768 (H) |
| Brightness (cd/m$^2$) | 600 |
| Contrast Ratio | 700:1 |
| LCD Color | 16.2M |
| Pixel Pitch (H x V) (mm) | 0.24 x 0.24 |
| Viewing Angle (H-V) | 178° / 178° |
| Backlight MTBF | 50,000 hrs |
| Backlight | LED |
| Touchscreen | Resistive type / Projected capacitive type |
| CPU (SoC) | Intel® Core™ i5-6300U or Intel® Celeron® 3955U |
| Memory | One 260-pin 2133/1867 MHz single-channel DDR4 SO-DIMM slot preinstalled with 4 GB SDRAM (system max. 32 GB) |
| Ethernet | LAN1: Intel® I210 PCIe GbE controller<br>LAN2: Intel® I211 PCIe GbE controller |
| Wi-Fi & Bluetooth | 802.11a/b/g/n/ac + Bluetooth v4.0 (PCIe Mini module) |
| RFID (Optional) | Reserved RFID antenna area |
| Audio | Realtek ALC888S HD Audio codec |
| Storage | 1 x 2.5" SATA 6Gb/s SSD/HDD bay |
| Expansions | 1 x M.2 2242 B-key slot supporting USB 2.0 and SATA signals |
| Construction Material | Aluminum die-casting |
| Thermal Design | Fanless |
| VESA Mount | 100 mm x 100 mm |

| | |
|---|---|
| **Net/Gross Weight** | 5.02 kg / 7.40 kg |
| **Dimensions (W x H x D)** | 316.0 mm x 279.0 mm x 67.0 mm |
| **Operating Temperature** | -20ºC ~ 60ºC<br>0ºC~40ºC with FSP adapter (P/N: 63040-010096-100-RS on Page 14) |
| **Storage Temperature** | -20ºC ~ 70ºC |
| **Humidity** | 10% ~ 95% (non-condensing) |
| **IP Level** | 5-side IP66 (IP65 I/O panel) |
| **Safety/EMC** | CE, FCC Class A |
| **Power Input** | 12 V ~ 36 V DC |
| **Power Consumption** | 12 V @ 5 A; 36 V @ 1.6 A |
| **I/O Ports and Switches** | 1 x 12 V ~ 36 V DC input jack<br>1 x 12 V ~ 36 V DC-in terminal block<br>1 x HDMI<br>1 x VGA<br>1 x RS-232 (COM1, RJ-45)<br>1 x RS-232/422/485 (COM2, RJ-45)<br>2 x GbE LAN<br>2 x USB 2.0<br>2 x USB 3.2 Gen 1 (5Gb/s) |

**Table 1-2: System Specifications**

## 1.8 Dimensions

The dimensions of the UPC-F12C-ULT3 are shown below.

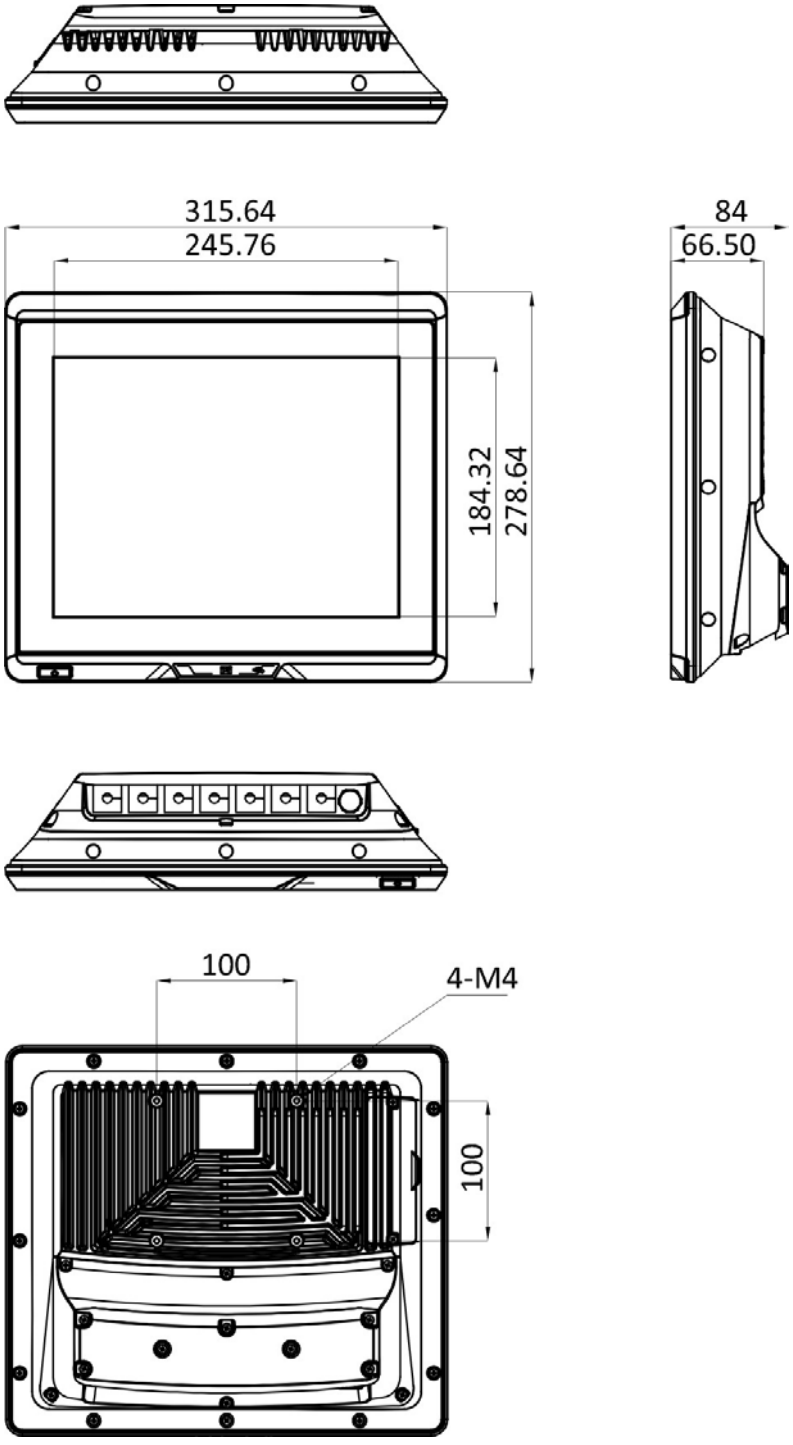



**Figure 1-5: Dimensions (mm)**

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:** Carefully cut the tape sealing the box. Only cut deep enough to break the tape.

**Step 2:** Open the outside box.

**Step 3:** Carefully cut the tape sealing the box. Only cut deep enough to break the tape.

**Step 4:** Open the inside box.

**Step 5:** Lift the panel PC out of the boxes.

**Step 6:** Remove the peripheral parts box from the main box.

## 2.2 Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the UPC-F12C-ULT3 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The UPC-F12C-ULT3 panel PC is shipped with the following components:

| Quantity | Item | Image |
|---|---|---|
| 1 | UPC-F12C-ULT3 panel PC |  |
| 4 | Flat-head screw (M3*4) for HDD installation |  |
| 1 | Touch pen (resistive type only) |  |
| 2 | RJ-45 to DB-9 serial port cable |  |
| 2 | Ferrite core for USB cable and LAN cable |  |
| 10 | Protection grommet<br>(six w/ blind hole; twoΦ3; oneΦ4; oneΦ5) |  |

## 2.3 Optional Items

The following are optional components which may be separately purchased:

| Item and Part Number | Image |
|---|---|
| Arm<br>(**P/N**: ARM-11-RS) |  |

| Item and Part Number | Image |
|---|---|
| Stand for VESA 100<br>(**P/N**: STAND-A12-RS) |  |
| Stand for VESA 75/VESA 100<br>(**P/N**: STAND-C12-R10) |  |
| Mifare RFID kit (ATO only)<br>(**P/N**: UPC-F-MF-RFID-KIT01-R10) | |
| 96 W power adapter with 4-pin DIN connector,<br>(operating temperature: 0ºC~40ºC)<br>(**P/N**: 63040-010096-100-RS) |  |

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

Chapter

3

# Installation

## 3.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the maintenance of the UPC-F12C-ULT3 may result in permanent damage to the UPC-F12C-ULT3 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the UPC-F12C-ULT3. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the UPC-F12C-ULT3 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 UPC-F12C-ULT3, place it on an anti-static pad. This reduces the possibility of ESD damaging the UPC-F12C-ULT3.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

## 3.2 Installation Precautions

**CAUTION:**

The UPC-F12C-ULT3 series has more than one power supply connection point.

To reduce the risk of electric shock, disconnect all power sources before installing or servicing the UPC-F12C-ULT3 series.

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.
- **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 HDD Installation

To install the HDD into the system, please follow the steps below:

**Step 1:** Remove the HDD slot cover located on the rear panel by removing the two retention screws.

**Figure 3-1: HDD Slot Cover Retention Screws**

**Step 2:** Pull out the HDD bracket for installing HDD from the system.

**Figure 3-2: Remove HDD Bracket**

**Step 3:** Attach an HDD to the HDD brackets. To do this, align the four retention screw holes on the bottom side of the HDD with the retention screw holes in the HDD brackets. Insert four M3*4 retention screws shipped with the package into the HDD bracket (**Figure 3-4**).

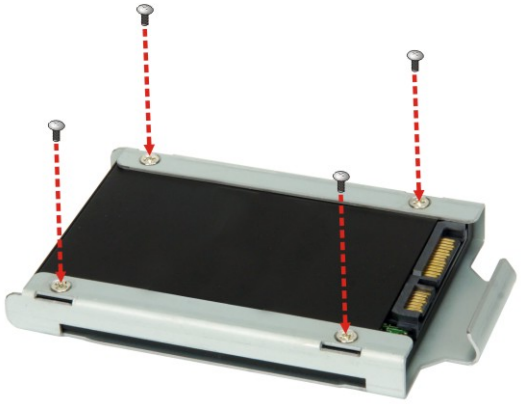


**Figure 3-3: Secure HDD to the Bracket**

**Step 4:** Insert the HDD bracket into the slot carefully until the bracket reach the end of the slot.

**Step 5:** Connect the pre-installed SATA cable from the UPC-F12C-ULT3 to the rear of the HDD.

**Figure 3-4: HDD Installation**

**Step 6:** Re-install the HDD slot cover and secure it with two retention screws.

## 3.4 External I/O Connectors

The UPC-F12C-ULT3 series is equipped with several I/O connectors for peripheral device connection. The pinouts of some of the external connectors are listed below. The pinouts of other external connectors are described in **Section 5.3**.

### 3.4.1 External RS-232 Connector (COM1)

The pinouts for the RS-232 connector (COM1) are listed in the figure and table below.

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | -NDCD | 5 | NSOUT |
| 2 | -NDSR | 6 | -NCTS |
| 3 | NSIN | 7 | -NDTR |
| 4 | -NRTS | 8 | -XRI |

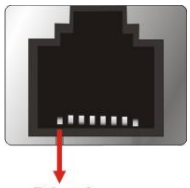



**Table 3-1: External RS-232 Connector (COM1) Pinouts**

### 3.4.2 External RS-232/422/485 Connector (COM2)

The pinouts for the RS-232/422/485 connector (COM2) are listed in the figure and table below. The RS-232/422/485 mode can be configured through BIOS; the default setting is RS-232 mode (refer to **Section 4.3.2.1.2**).

| Pin | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| 1 | -NDCD | TX- | D- |
| 2 | -NDSR | | |
| 3 | NSIN | TX+ | D+ |
| 4 | -NRTS | | |
| 5 | NSOUT | RX+ | |
| 6 | -NCTS | | |
| 7 | -NDTR | RX- | |
| 8 | -XRI | | |

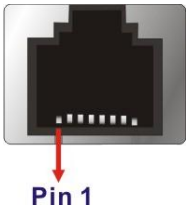



**Table 3-2: External RS-232/422/485 Connector (COM2) Pinouts**

Use the RJ-45 to DB-9 serial port cable shipped with the UPC-F12C-ULT3 to connect to a serial device. The pinouts of the RJ-45 to DB-9 serial port cable are listed below.

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

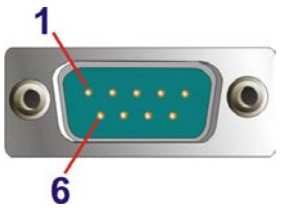



**Table 3-3: DB-9 RS-232/422/485 Pinouts**

### 3.4.3 Clear CMOS

If the UPC-F12C-ULT3 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. The clear CMOS button location is shown in **Figure 3-5**. The I/O cover must be removed to be able to access the clear CMOS button.


**Figure 3-5: Clear CMOS Button Location**

### 3.4.4 AT/ATX Mode Selection

AT or ATX power mode can be used on the UPC-F12C-ULT3. The selection is made through an AT/ATX switch located on the bottom panel (**Figure 3-6**). The I/O cover must be removed to be able to access the AT/ATX switch.


**Figure 3-6: AT/ATX Switch Location**

## 3.5 Ferrite Core Installation

The cables to be connected with the UPC-F12C-ULT3 should be installed with a ferrite core to reduce EMI. To install the ferrite core, follow the steps below.

**Step 1:** Open the ferrite core by unsnapping the latch.

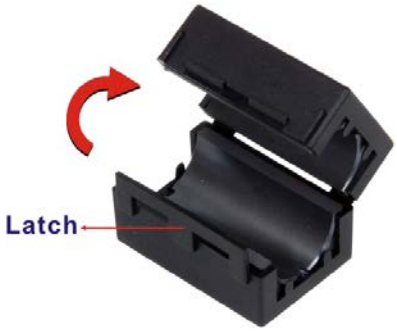



**Figure 3-7: Open Ferrite Core**

**Step 2:** Gently wrap the cable around the ferrite core. The cable should pass through the core twice as shown below. The ferrite core must be installed as close to the connector as possible.

**Figure 3-8: Wrapping Cable around the Core**

**Step 3:** Close the ferrite core and snap the latch back together. Then, pull both ends of the cable in opposite direction to tighten the loop.

**Figure 3-9: Cable Installed with Ferrite Core**

## 3.6 Protection Grommet Installation

The UPC-F12C-ULT3 panel PC is shipped with several protection grommets which can be used to protect the I/O panel from water intrusion. To install the grommet, follow the steps below.

**Step 1:** Remove the top panel of the I/O cover by removing the seven retention screws as shown below.

**Step 2:** Remove the I/O cover by removing the six retention screws as shown below.

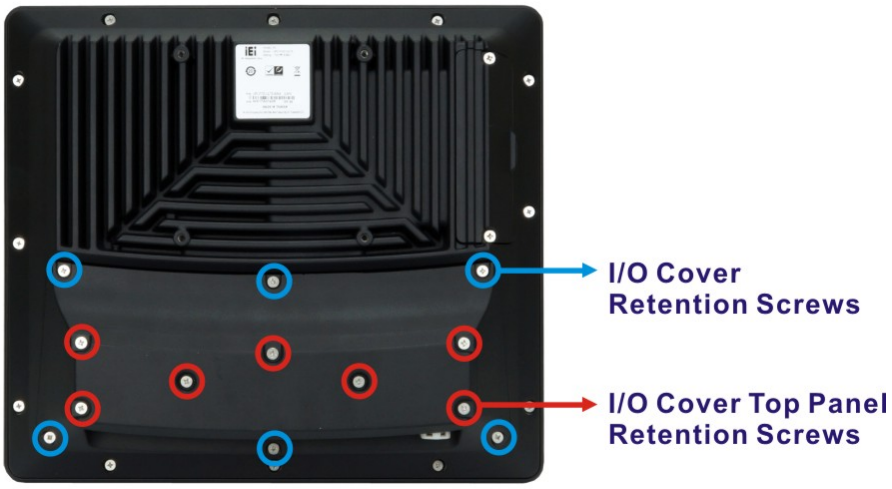



**Figure 3-10: I/O Cover Retention Screws**

**Step 3:** Insert a cable into a hole of the I/O cover corresponding to the system connector to be connected with. Connect the cable to the connector on the UPC-F12C-ULT3.

**Figure 3-11: Connect Cable to Connector**

**Step 4:** Put the cable into a grommet with suitable hole size. The number on the grommet indicates the hole diameter, e.g. 3 =Φ3mm.

**Step 5:** With the flat side facing upward, push the grommet into the hole of the I/O cover as shown below until the grommet is fully seated in the hole.

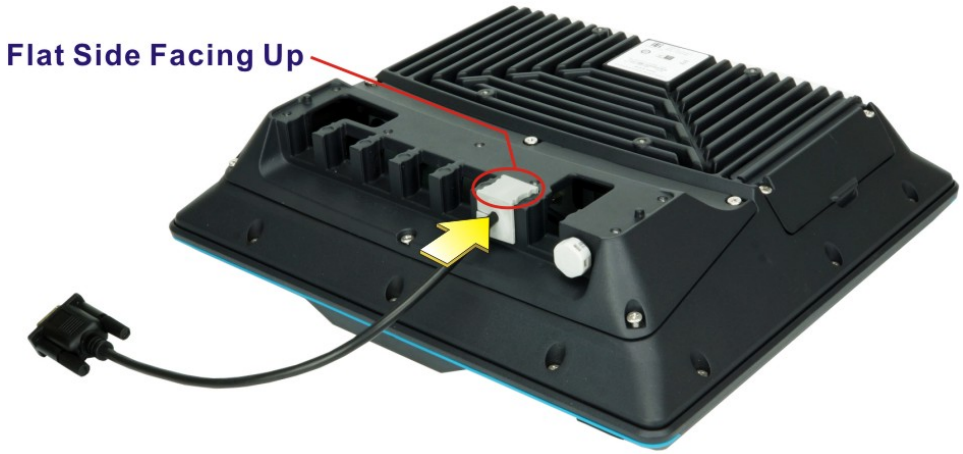



**Figure 3-12: Installing Grommet**

**Step 6:** Repeat **Step 3 ~ Step 5** to connect necessary cables and install grommets.

**Step 7:** Re-install the I/O cover onto the rear panel of the UPC-F12C-ULT3 by using six previously removed screws.

**Step 8:** With the flat side facing upward, insert grommets with blind hole into those holes with no cables installed.

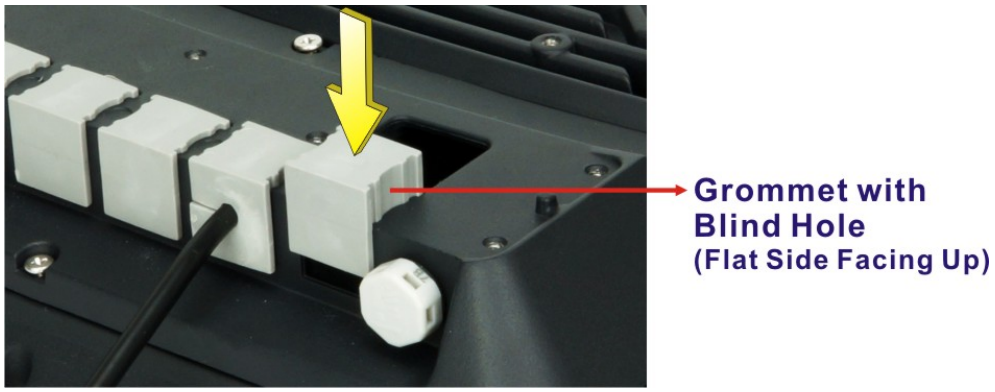



**Figure 3-13: Installing Grommet with Blind Hole**

**Step 9:** Re-install the top panel of the I/O cover by using seven previously removed screws.

## 3.7 Mounting the System

The UPC-F12C-ULT3 is VESA (Video Electronics Standards Association) compliant and can be mounted on a mounting device with a 100 mm interface pad. The UPC-F12C-ULT3 VESA mount retention screw holes are shown in **Figure 3-14**. Refer to the installation guide that came with the mounting device to mount the UPC-F12C-ULT3.

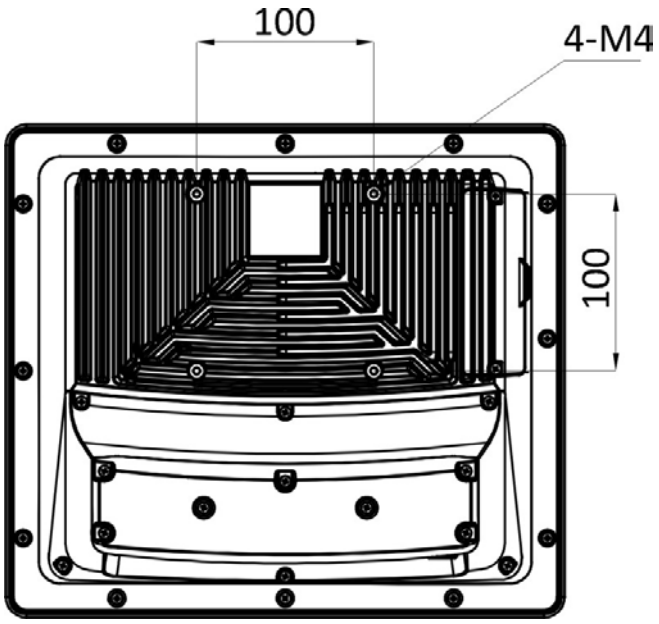



**Figure 3-14: VESA Mounting Retention Screw Holes**

**NOTE:**

When purchasing the mounting device, please ensure that it is VESA compliant and that the device has a 100 mm interface pad. If the mounting device is not VESA compliant, it cannot be used to support the UPC-F12C-ULT3 panel PC.

## 3.8 Powering On the System

To power on the UPC-F12C-ULT3 panel PC, follow the steps below:

**Step 1:** Connect either the DC jack or the terminal block of the system to a power source. The two power connector pinouts are shown below.

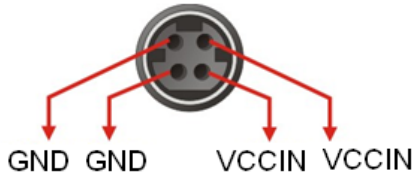



**Figure 3-15: Power Input Jack Pinouts**

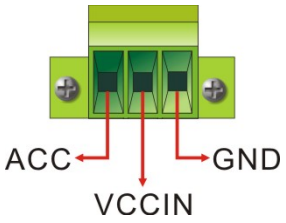



**Figure 3-16: Power Input Terminal Block Pinouts**

**Step 2:** In ATX mode, long press the power button on the front panel for around five seconds until the LED lights up in green to power up the system.

In AT mode, the UPC-F12C-ULT3 will turn on automatically once power is connected to the power connector; short press the power button to turn off/on the system.

**NOTE:**

The UPC-F12C-ULT3 has the capability to support ACC power mode. For more details about this function, please contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

## 3.9 Available Drivers

All the drivers for the UPC-F12C-ULT3 are available on IEI Resource Download Center (https://download.ieiworld.com). Type UPC-F12C-ULT3 and press Enter to find all the relevant software, utilities, and documentation.

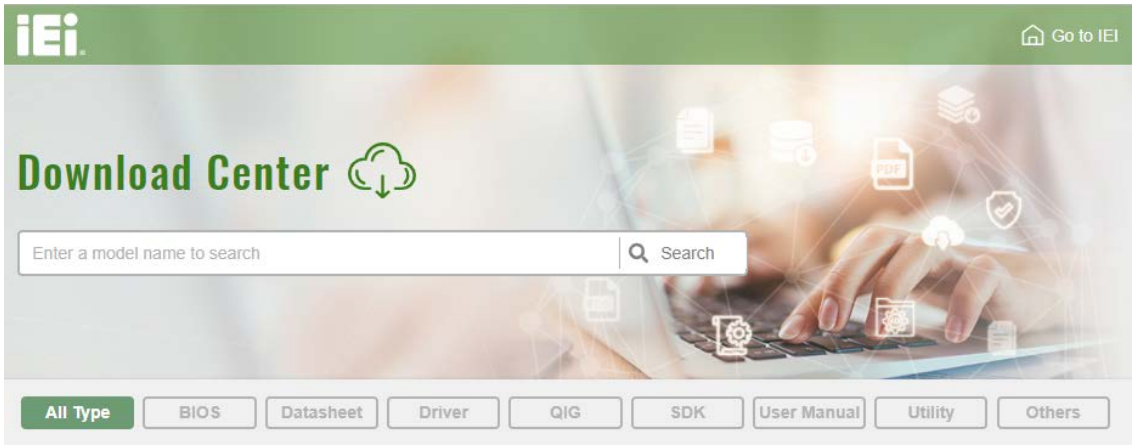
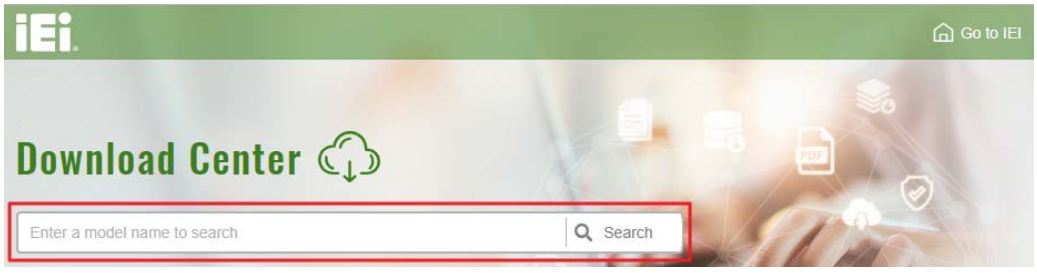



**Figure 3-17: IEI Resource Download Center**

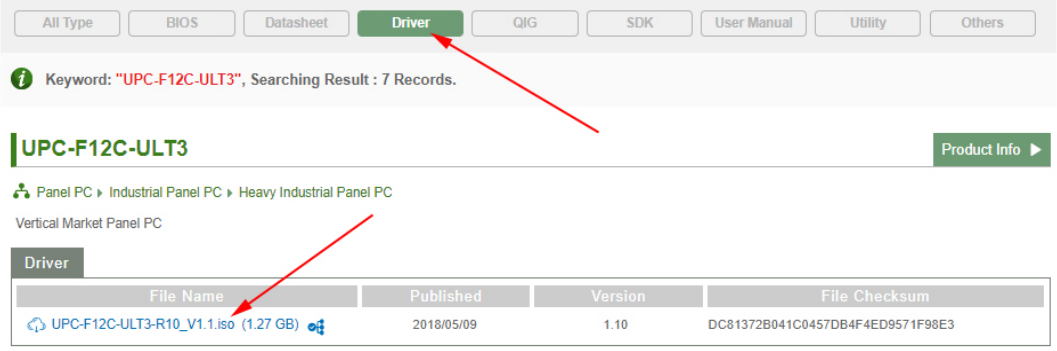
### 3.9.1 Driver Download

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

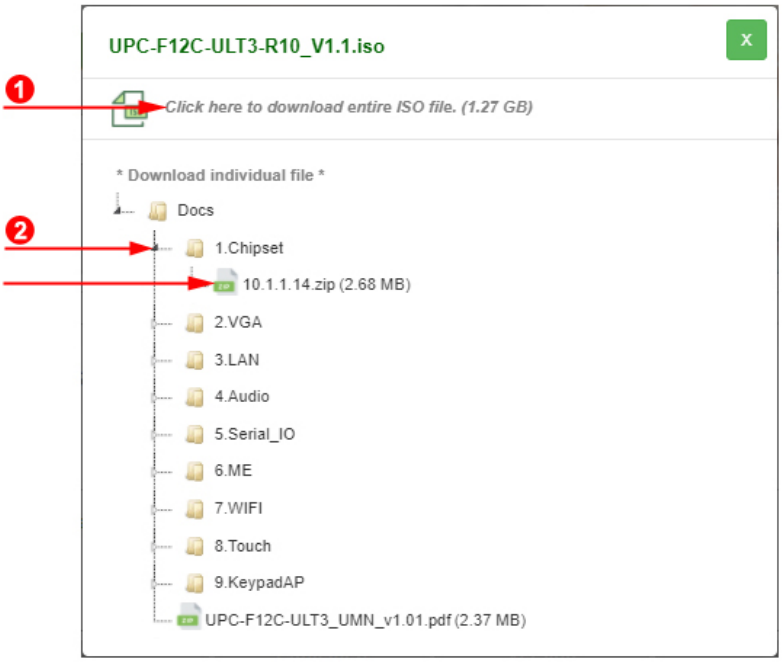
**Step 1:** Go to https://download.ieiworld.com. Type UPC-F12C-ULT3 and press Enter.




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




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




**NOTE:**

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

## 3.10 Installing Windows 7 from USB 3.2 Gen 1 Drives

Microsoft Windows 7 installation media does not include native driver support for USB 3.2 Gen 1, so during installation, a keyboard/mouse connected to a USB 3.2 Gen 1 port does not respond. The Windows 7 USB 3.0 Creator Utility automates the steps to update a Windows 7 installation image so that it contains USB 3.2 Gen 1 drivers. To install Windows 7 from a USB drive onto the UPC-F12C-ULT3, please follow the steps described below.

**Step 1:** Create a USB flash drive installer. Use your Windows 7 DVD or ISO image to create a bootable USB flash drive. Instructions on how to do are found on Microsoft's website.

**Step 2:** Download and unzip the Windows 7 USB 3.0 Creator utility to a temporary folder on the Admin system.

**Step 3:** Connect the USB device containing the Windows 7 image to the Admin system.

**Step 4:** Right-click the file "Installer_Creator.exe" and select Run as administrator.

**Step 5:** Browse to the root of the USB drive.

**Step 6:** Click "Create Image" to begin the creation process.

**Step 7:** Wait for the process to finish. It can take up to 15 minutes.

**Step 8:** Using the updated installer, proceed with the Windows 7 installation as you normally would.

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 Del 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.

| Key | Function |
|---|---|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |
| Left arrow | Move to the item on the left hand side |
| Right arrow | Move to the item on the right hand side |
| + | Increase the numeric value or make changes |

| Key | Function |
|---|---|
| - | Decrease the numeric value or make changes |
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 key | Load previous values. |
| F3 key | Load optimized defaults |
| F4 key | Save changes and Exit BIOS |
| Esc key | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |

### 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 BIOS Menu Bar

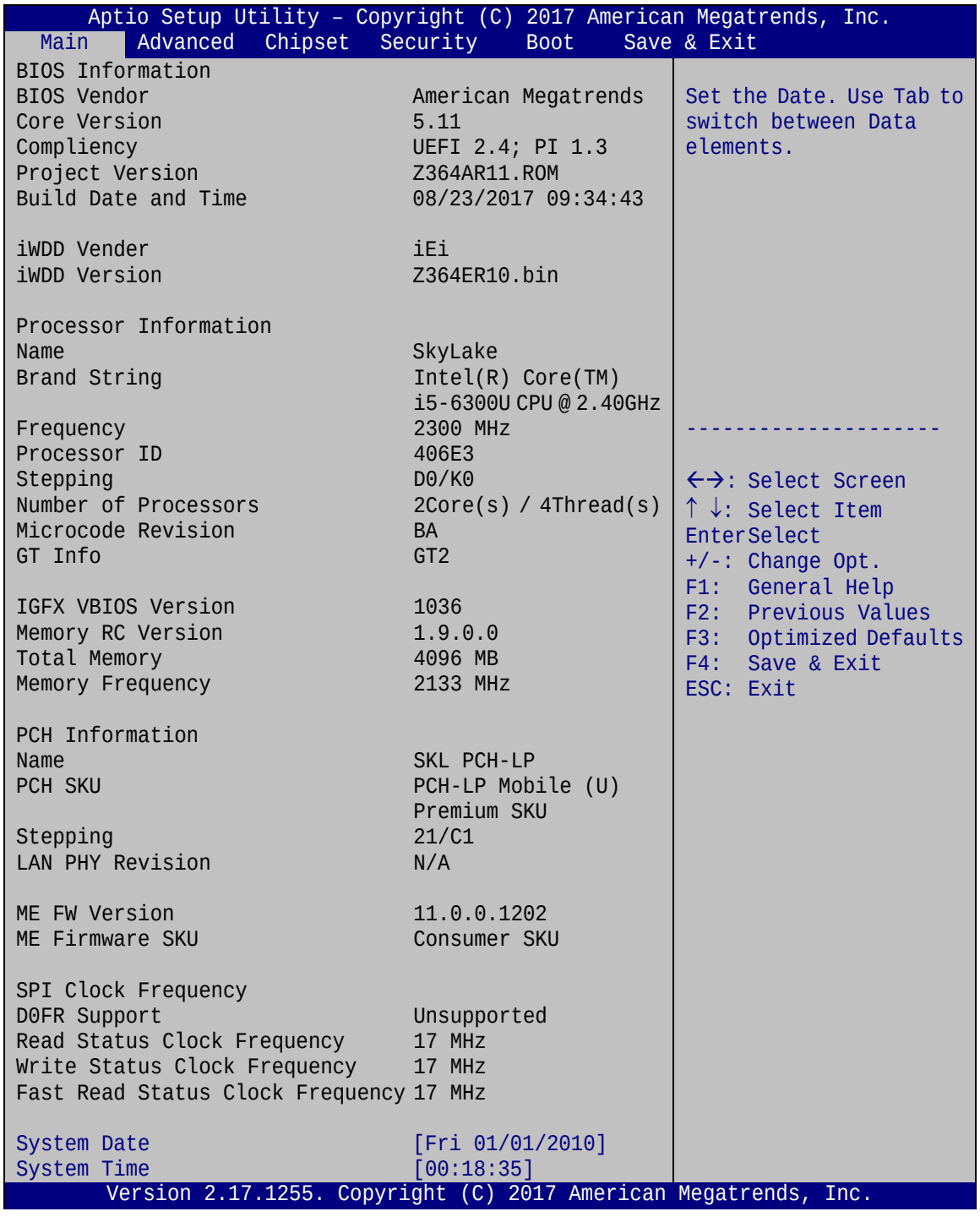
The **menu bar** on top of the BIOS screen has the following main items:

- 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.




**BIOS Menu 1: Main**

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

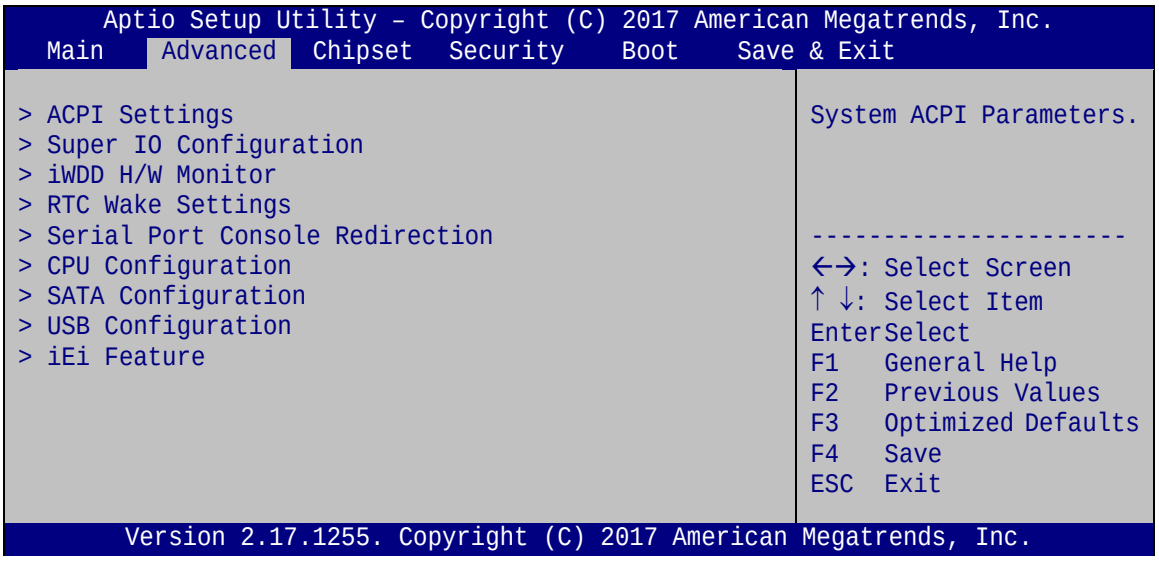
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

## 4.3 Advanced

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

**WARNING!**

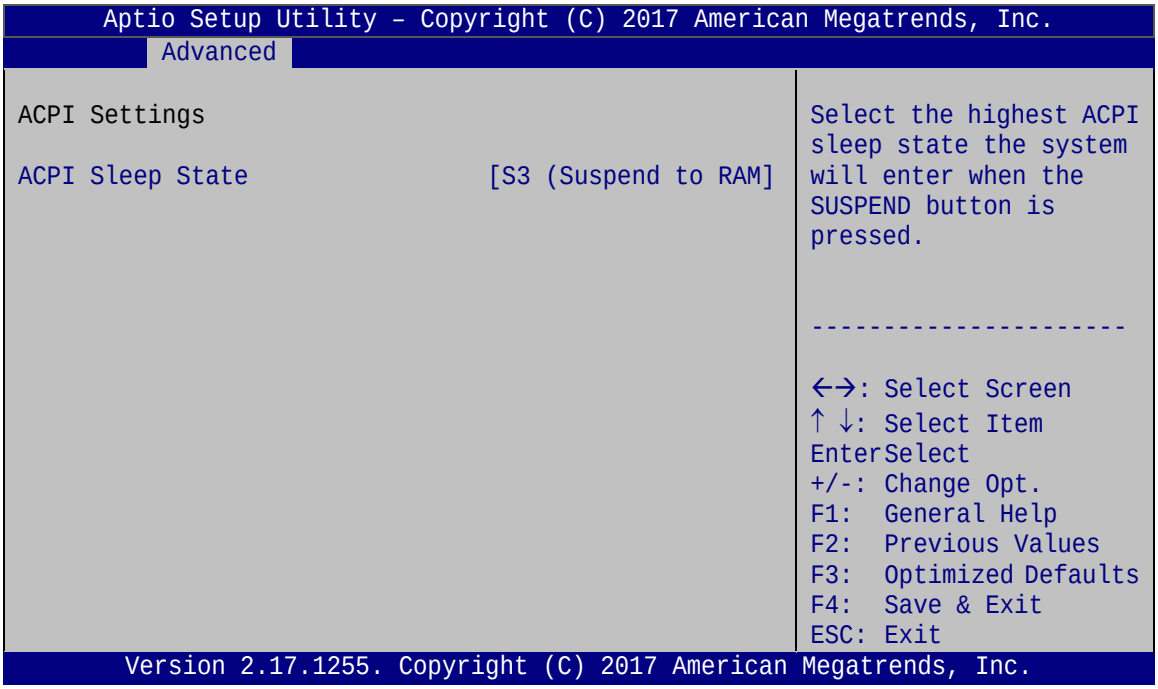
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.




**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**

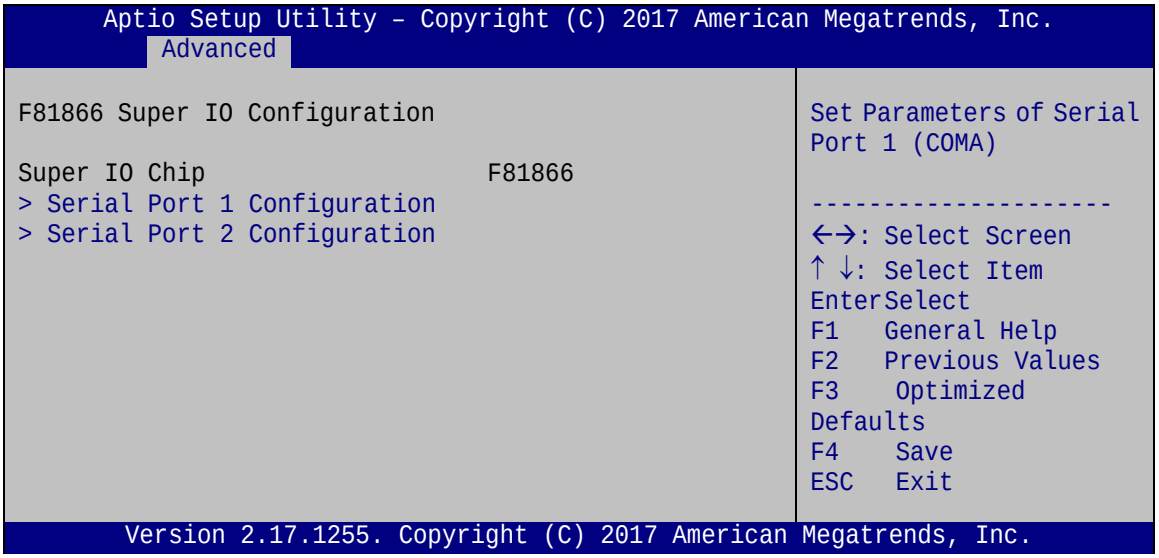
➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

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

➔ **S3 (Suspend to RAM)** **DEFAULT** 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 Super IO Configuration

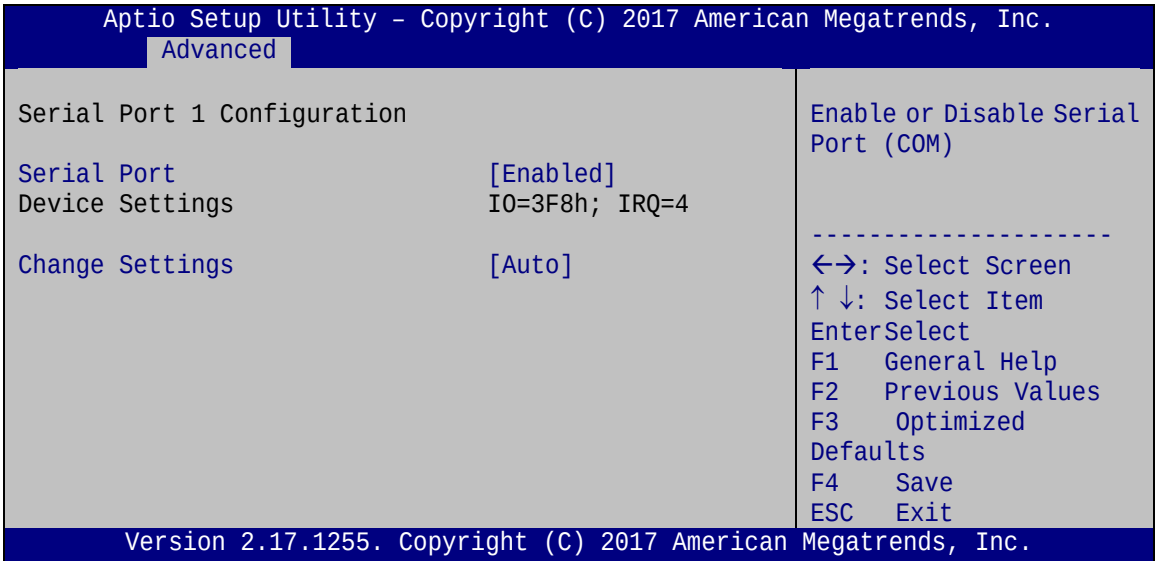
Use the **Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.




**BIOS Menu 4: 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**

#### 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 |
| ➔ **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 |

➔ **Transfer Mode [RS232]**

Use the **Transfer Mode** option to select the Serial Port 2 signaling mode.

| | | |
|---|---|---|
| ➔ **RS422** | | Serial Port 2 signaling mode is RS-422 |
| ➔ **RS232** | **DEFAULT** | Serial Port 2 signaling mode is RS-232 |
| ➔ **RS485** | | Serial Port 2 signaling mode is RS-485 |

### 4.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 6**) displays operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
        Advanced
PC Health Status                                  Smart Fan Mode Select

CPU temperature                 :+33 °C
System temperature              :+36 °C
K_TYPE1                         :+0 °C
K_TYPE2                         :+0 °C

+VCC_CORE                       :+0.865 V         ---------------------
+5VS                            :+5.038 V         ←→: Select Screen
+12VS                           :+12.000 V        ↑ ↓: Select Item
+VDDQ                           :1.199 V          EnterSelect
+5VA                            :+5.038 V         + -   Change Opt.
+3.3V                           :+3.253 V         F1    General Help
+3.3VSB                         :+3.120 V         F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.
```

**BIOS Menu 6: iWDD H/W Monitor**

➔ **PC Health Status**

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

- System Temperatures:
  - CPU Temperature

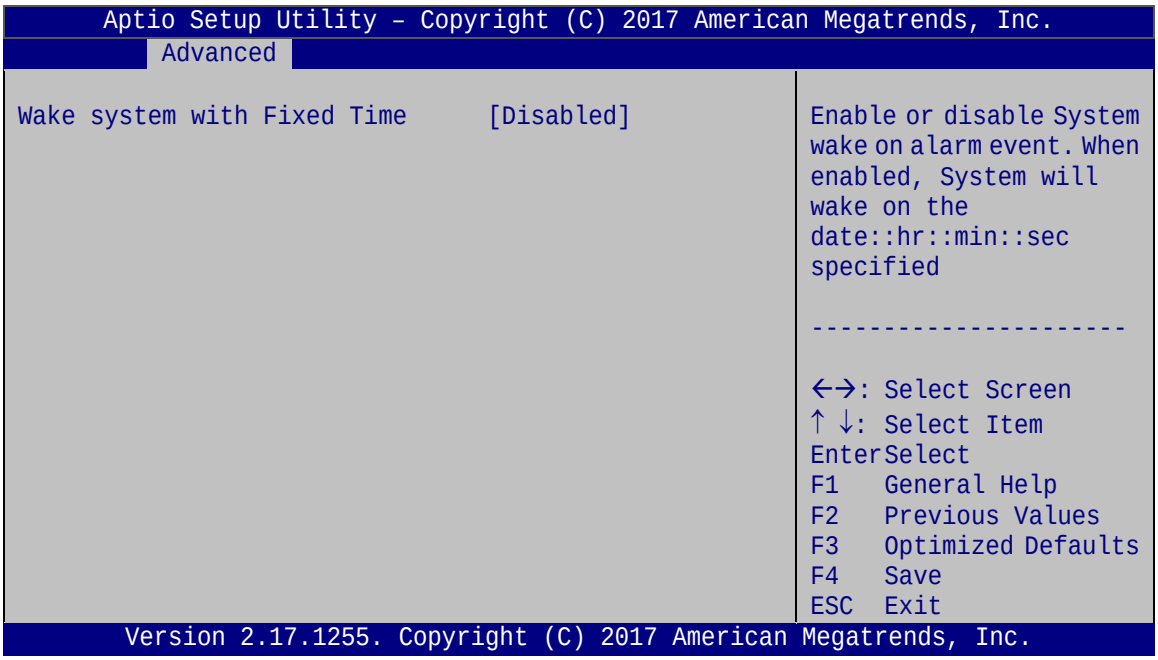
- System temperature
- K type 1
- K type 2

▪ Voltages

- +VCC_CORE
- +5VS
- +12VS
- +VDDQ
- +5VA
- +3.3V
- +3.3VSB

### 4.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 7**) configures RTC wake event.




**BIOS Menu 7: RTC Wake Settings**

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

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

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

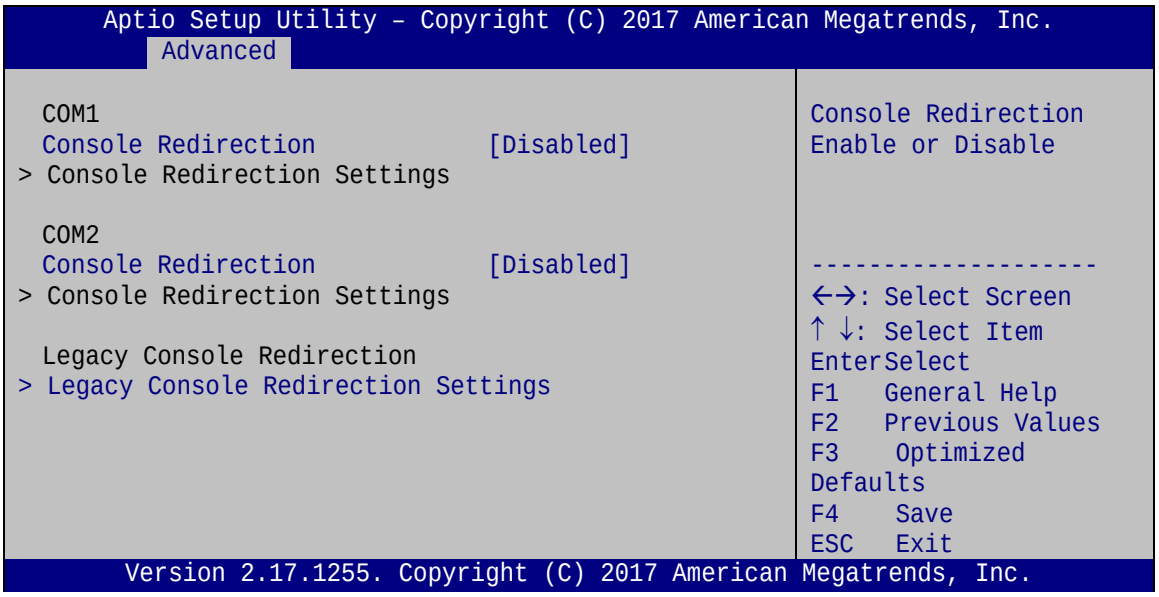
➔ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

- Wake up date
- Wake up hour
- Wake up minute
- Wake up second

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

### 4.3.5 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 8**) 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 8: Serial Port Console Redirection**

➔ **Console Redirection [Disabled]**

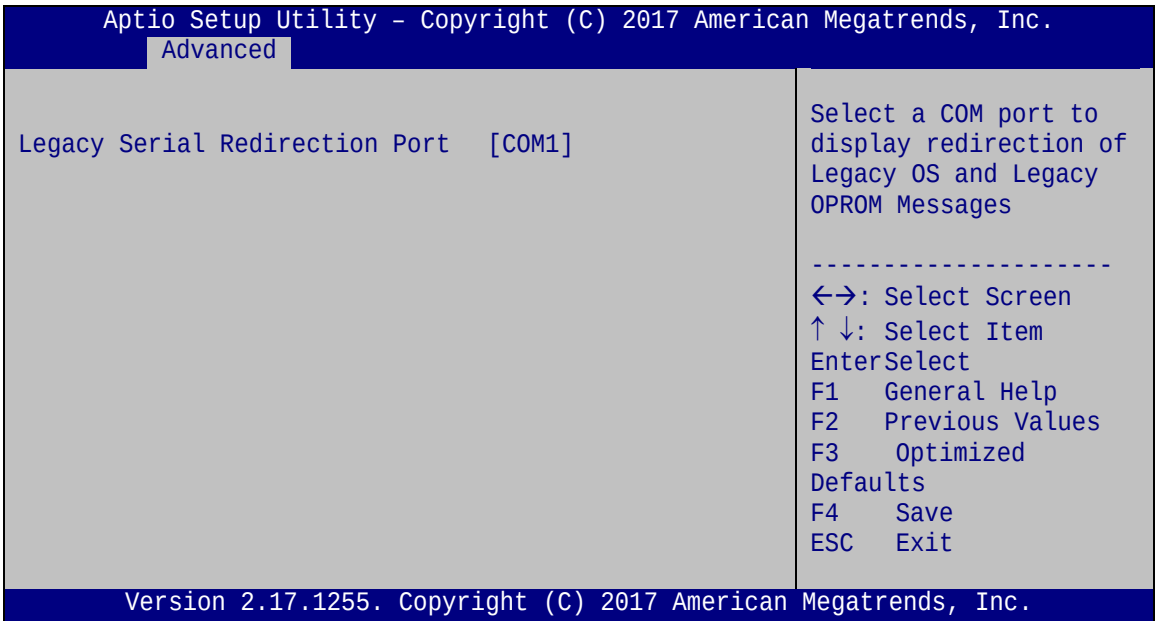
Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled** **DEFAULT** Disabled the console redirection function

➔ **Enabled** Enabled the console redirection function

### 4.3.5.1 Legacy Console Redirection Settings

The **Legacy Console Redirection Settings** menu (**BIOS Menu 9**) allows the legacy console redirection options to be configured.




**BIOS Menu 9: Legacy Console Redirection Settings**

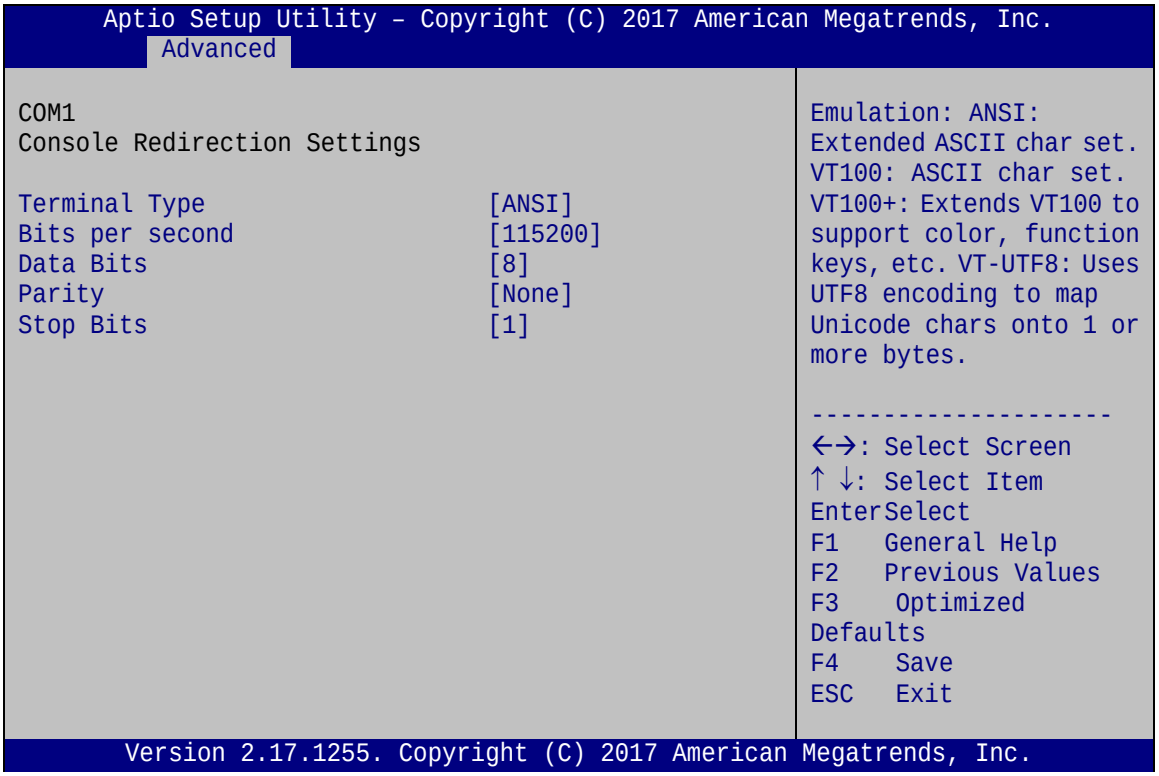
➔ **Legacy Serial Redirection Port [COM1]**

Use the **Legacy Serial Redirection Port** option to specify a COM port to display redirection of legacy OS and legacy OPROM messages. The options include:

- COM1 **DEFAULT**
- COM2

### 4.3.5.2 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 10**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.




**BIOS Menu 10: Console Redirection Settings**

➔ **Terminal Type [ANSI]**

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

- ➔ **VT100** The target terminal type is VT100
- ➔ **VT100+** The target terminal type is VT100+
- ➔ **VT-UTF8** The target terminal type is VT-UTF8
- ➔ **ANSI** **DEFAULT** The target terminal type is ANSI

➔ **Bits per second [115200]**

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

| | | |
|---|---|---|
| ➔ **9600** | | Sets the serial port transmission speed at 9600. |
| ➔ **19200** | | Sets the serial port transmission speed at 19200. |
| ➔ **57600** | | Sets the serial port transmission speed at 57600. |
| ➔ **115200** | **DEFAULT** | Sets the serial port transmission speed at 115200. |

➔ **Data Bits [8]**

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

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

➔ **Parity [None]**

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

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

➔ **Stop Bits [1]**

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

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

### 4.3.6 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 11**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
   Advanced

CPU Configuration                                  Enabled for Windows XP
                                                   and Linux (OS optimized
Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz           for Hyper-Threading
CPU Signature                  406E3               Technology) and Disabled
Microcode Patch                BA                  for other OS (OS not
Max CPU Speed                  2400 MHz            optimized for
Min CPU Speed                  400 MHz             Hyper-Threading
CPU Speed                      2300 MHz            Technology). When
Processor Cores                2                   Disabled only one thread
Hyper Threading Technology     Supported           per enabled core is
Intel VT-x Technology          Supported           enabled.
Intel SMX Technology           Supported
64-bit                         Supported
EIST Technology                Supported

L1 Data Cache                  32 KB x 2           ----------------------
L1 Code Cache                  32 KB x 2
L2 Cache                       256 KB x 2          ←→: Select Screen
L3 Cache                       3 MB                ↑ ↓: Select Item
                                                   EnterSelect
Hyper-Threading                [Enabled]           F1   General Help
Active Processor Cores         [All]               F2   Previous Values
Intel Virtualization Technology [Disabled]         F3    Optimized
Intel(R) SpeedStep(tm)         [Enabled]           Defaults
CPU C states                   [Disabled]          F4    Save
                                                   ESC   Exit
Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.
```

**BIOS Menu 11: CPU Configuration**

➔ **Hyper Threading Function [Enabled]**

Use the Hyper Threading function to enable or disable the CPU hyper threading function.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | | Disables the use of hyper threading technology |
| ➔ | **Enabled** | **DEFAULT** | Enables the use of hyper threading technology |

➔ **Active Processor Cores [All]**

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

| | | | |
|---|---|---|---|
| ➔ | **All** | **DEFAULT** | Enable all cores in the processor package. |
| ➔ | **1** | | Enable one core in the processor package. |

➔ **Intel Virtualization Technology [Disabled]**

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

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

➔ **Intel® SpeedStep™ [Enabled]**

Use the **Intel® SpeedStep™** option to enable or disable the Intel® SpeedStep™ Technology.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | | Disables the Intel® SpeedStep™ Technology. |
| ➔ | **Enabled** | **DEFAULT** | Enables the Intel® SpeedStep™ Technology. |

➔ **CPU C State [Disabled]**

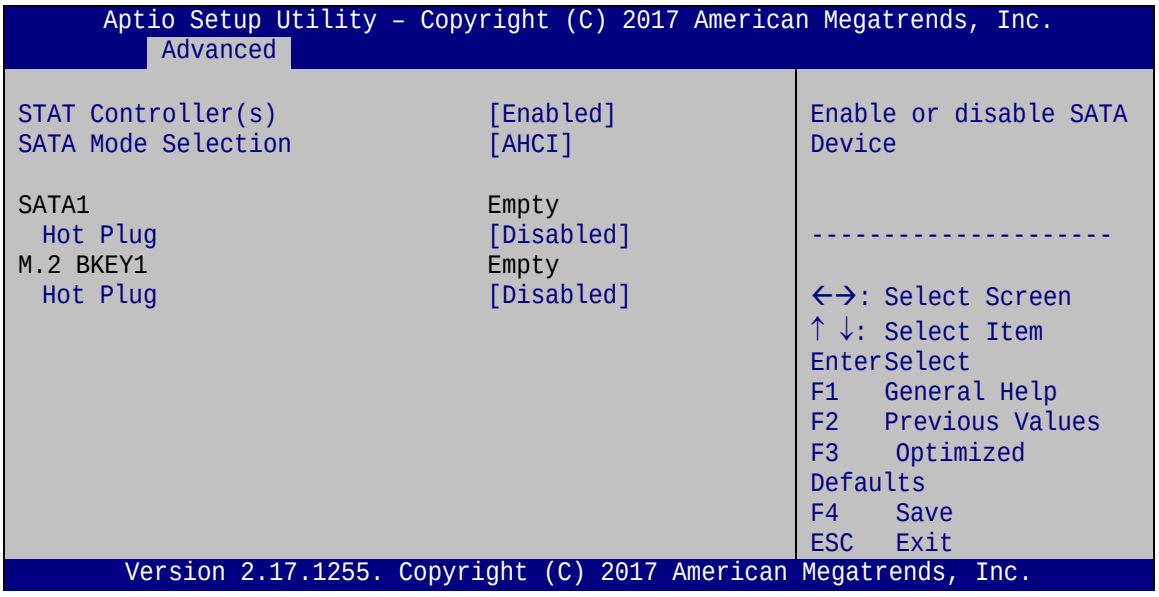
Use the **CPU C State** option to enable or disable CPU C state.

➔ **Disabled** **DEFAULT** Disables CPU C state.

➔ **Enabled** Enables CPU C state.

### 4.3.7 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 12**) to change and/or set the configuration of the SATA devices installed in the system.




**BIOS Menu 12: SATA Configuration**

➔ **STAT Controller(s) [Enabled]**

Use the **STAT Controller(s)** option to enable or disable the SATA device.

➔ **Enabled** **DEFAULT** Enables the SATA device.

➔ **Disabled** Disables the SATA device.

➔ **SATA Mode Selection [AHCI]**

Use the **SATA Mode Selection** option to configure SATA devices as AHCI devices.

| | | |
|---|---|---|
| ➔ **AHCI** | **DEFAULT** | Configures SATA devices as AHCI device. |
| ➔ **RAID** | | Configures SATA devices as RAID device. |

**NOTE:**

Before accessing the RAID configuration utility, ensure to set the **Option ROM Messages** BIOS option in the **Boot** menu to **Force BIOS**. This is to allow the "Press <CTRL+I> to enter Configuration Utility……" message to appear during POST. Press Ctrl+I when prompted to enter the RAID configuration utility.

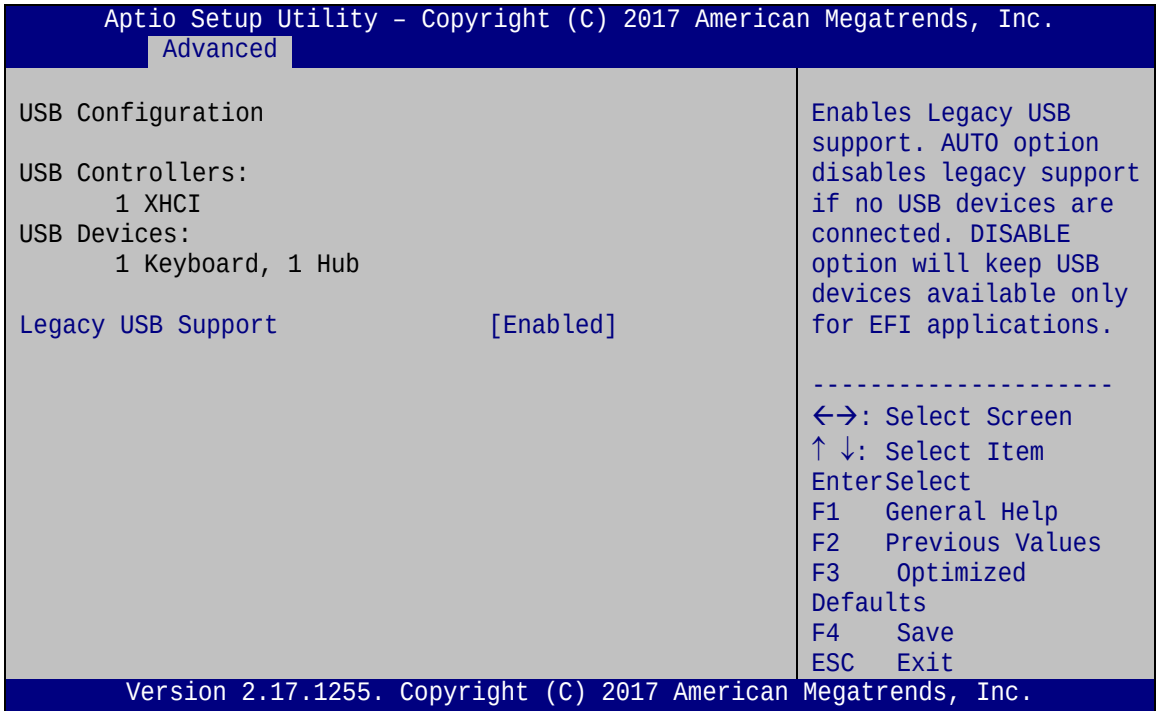
➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the SATA device hot plug.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | Disables the SATA device hot plug. |
| ➔ **Enabled** | | Enables the SATA device hot plug |

### 4.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.




**BIOS Menu 13: 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.

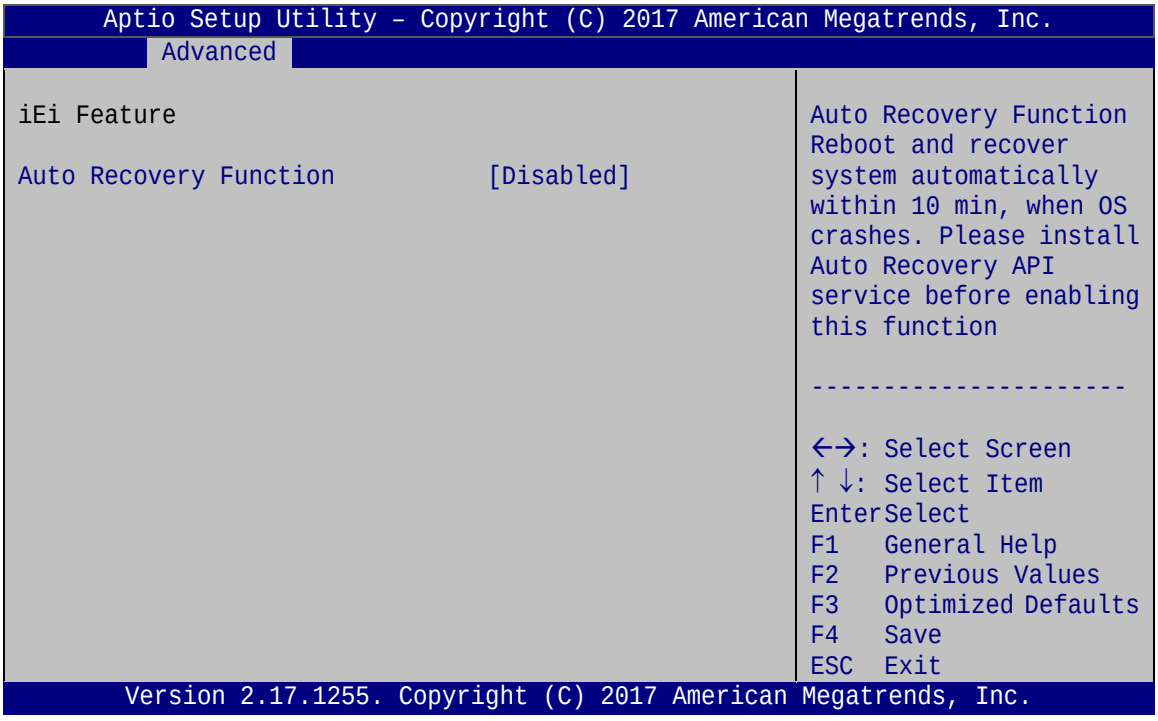
➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **Disabled** Legacy USB support disabled

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

### 4.3.9 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 14**) to configure One Key Recovery function.




**BIOS Menu 14: IEI Feature**

➔ **Auto Recovery Function [Disabled]**

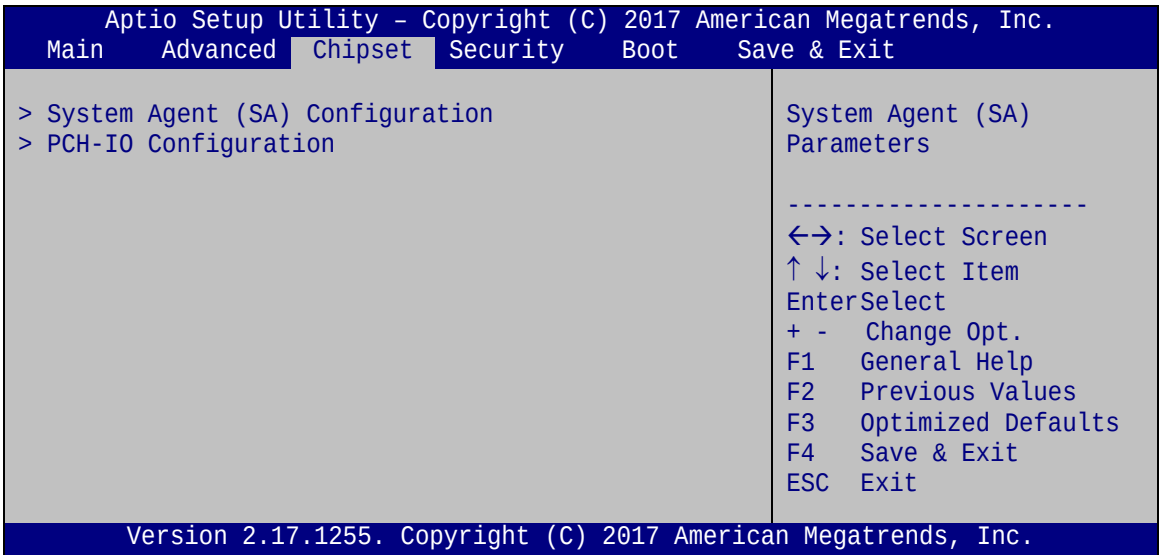
Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

➔ **Disabled** **DEFAULT** Auto recovery function disabled

➔ **Enabled** Auto recovery function enabled

## 4.4 Chipset

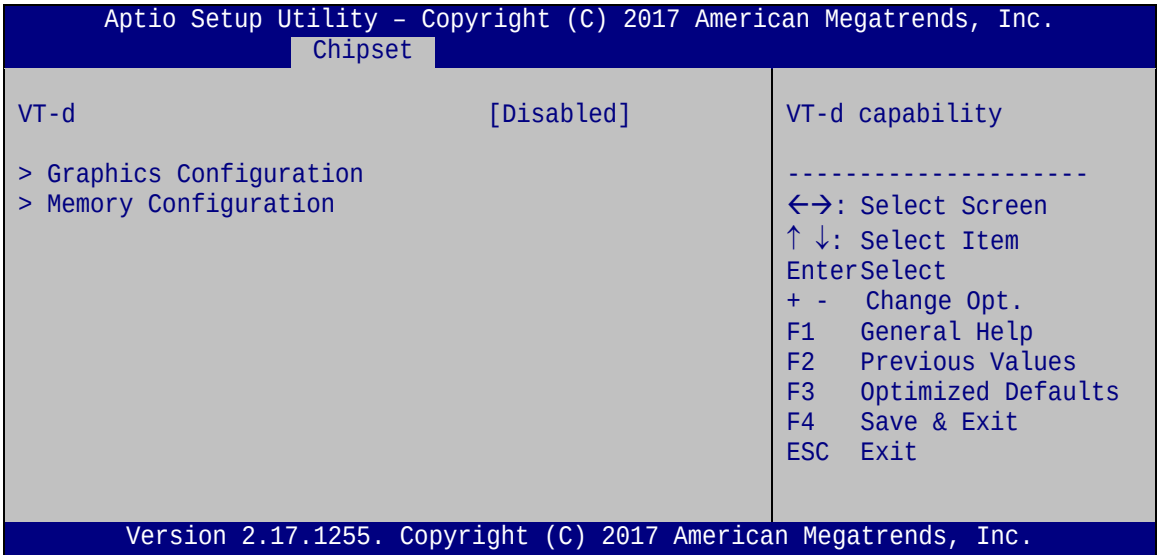
Use the **Chipset** menu (**BIOS Menu 15**) to configure the system chipset.




**BIOS Menu 15: Chipset**

### 4.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 16**) to configure the System Agent (SA) parameters.




**BIOS Menu 16: System Agent (SA) Configuration**

➔ **VT-d [Disabled]**

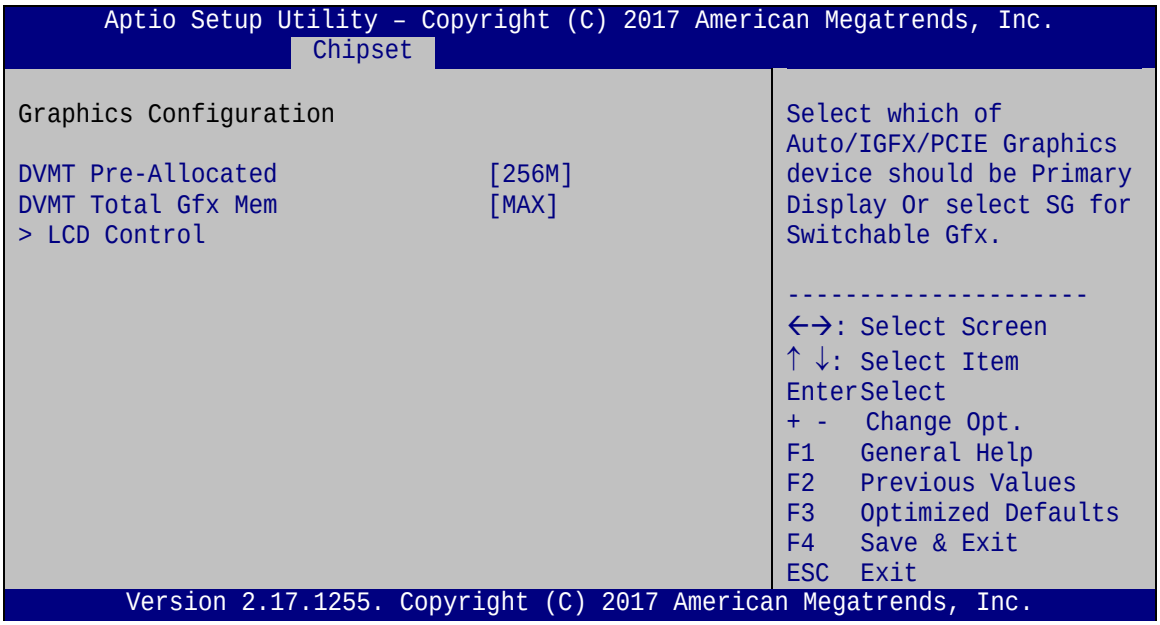
Use the **VT-d** option to enable or disable VT-d support.

➔ **Disabled** **DEFAULT** Disable VT-d support.

➔ **Enabled** Enable VT-d support.

### 4.4.1.1 Graphics Configuration

Use the **Graphics Configuration** menu (**BIOS Menu 17**) to configure the graphics settings.




**BIOS Menu 17: Graphics Configuration**

➔ **DVMT Pre-Allocated [256M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 128M

- 256M **DEFAULT**
- 512M

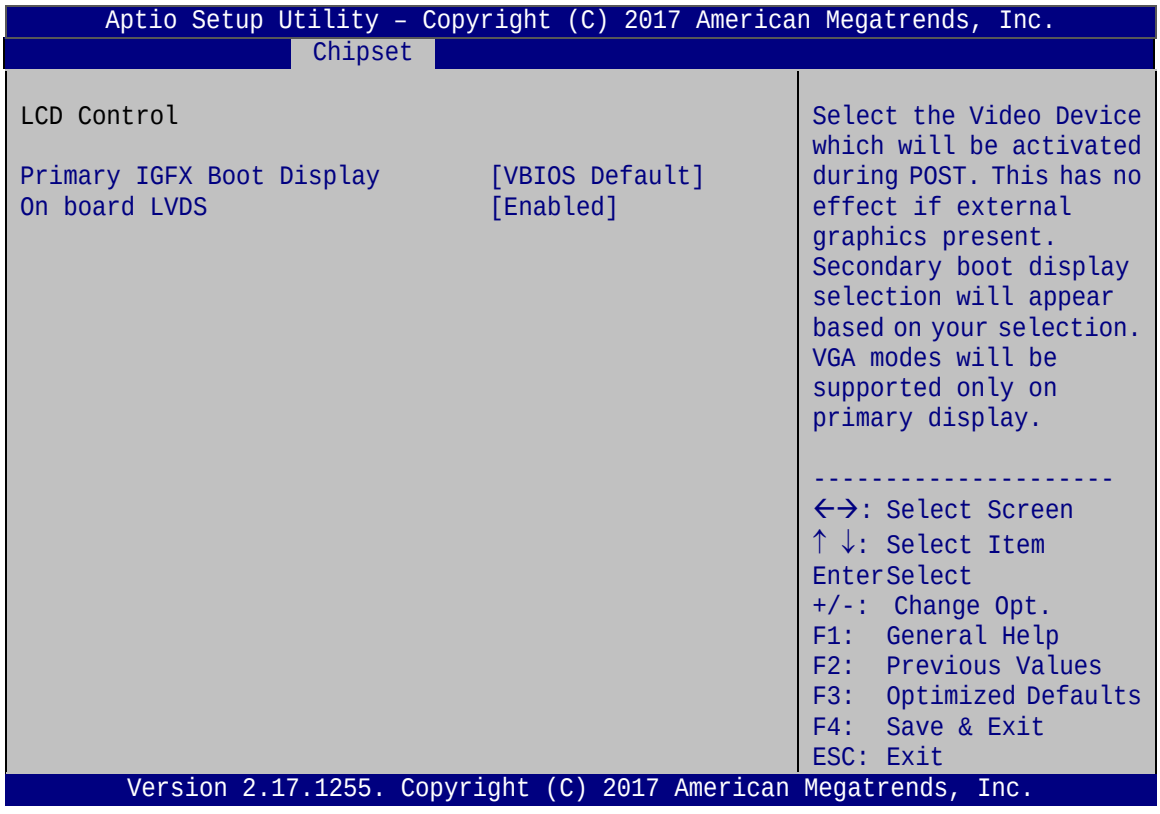
➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT 5.0 total graphic memory size used by the internal graphics device. The following options are available:

- 128M
- 256M
- MAX **DEFAULT**

### 4.4.1.1.1 LCD Control

Use the **LCD Control** submenu (**BIOS Menu 18**) to select a display device which will be activated during POST.




**BIOS Menu 18: LCD Control**

➔ **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.

- VBIOS Default **DEFAULT**
- LVDS
- CRT
- HDMI

➔ **On board LVDS [Enabled]**

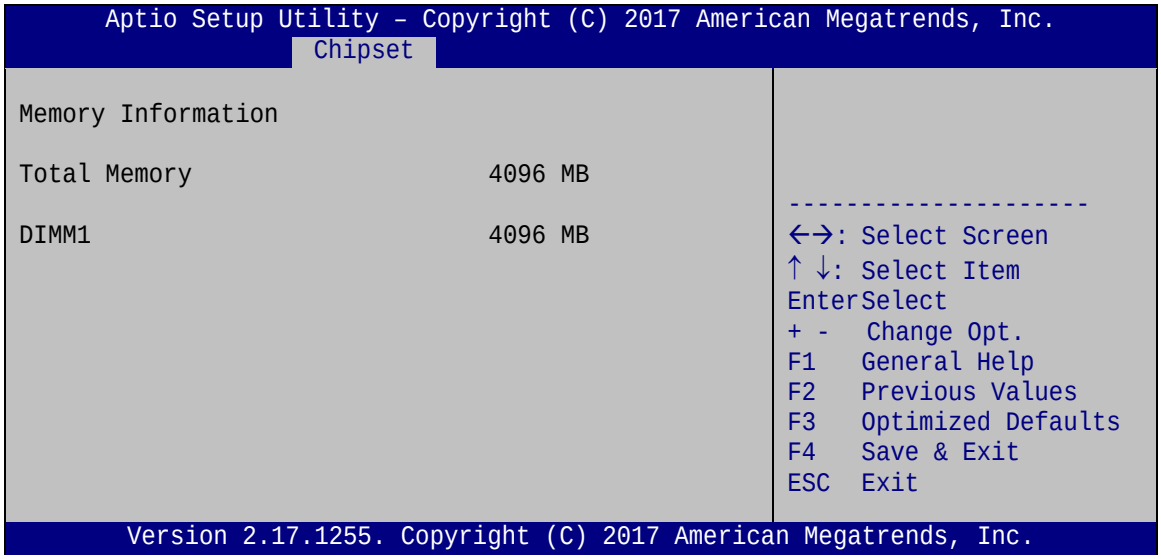
Use the **On board LVDS** option to enable or disable the on-board LVDS connector.

➔ **Disabled** Disable the on-board LVDS connector.

➔ **Enabled** **DEFAULT** Enable the on-board LVDS connector.

### 4.4.1.2 Memory Configuration

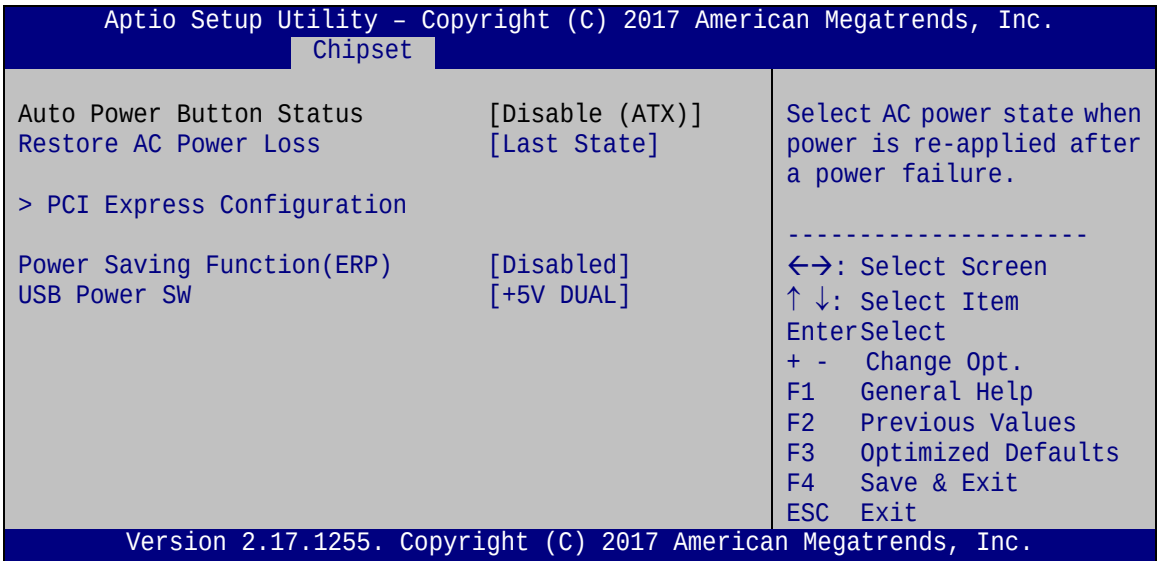
Use the **Memory Configuration** submenu (**BIOS Menu 19**) to display the memory information.




**BIOS Menu 19: Memory Configuration**

### 4.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 20**) to configure the PCH-IO chipset.




**BIOS Menu 20: PCH-IO Configuration**

➔ **Restore AC Power Loss [Last State]**

Use the **Restore AC Power** 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.

➔ **Power Saving Function(ERP) [Disabled]**

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

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

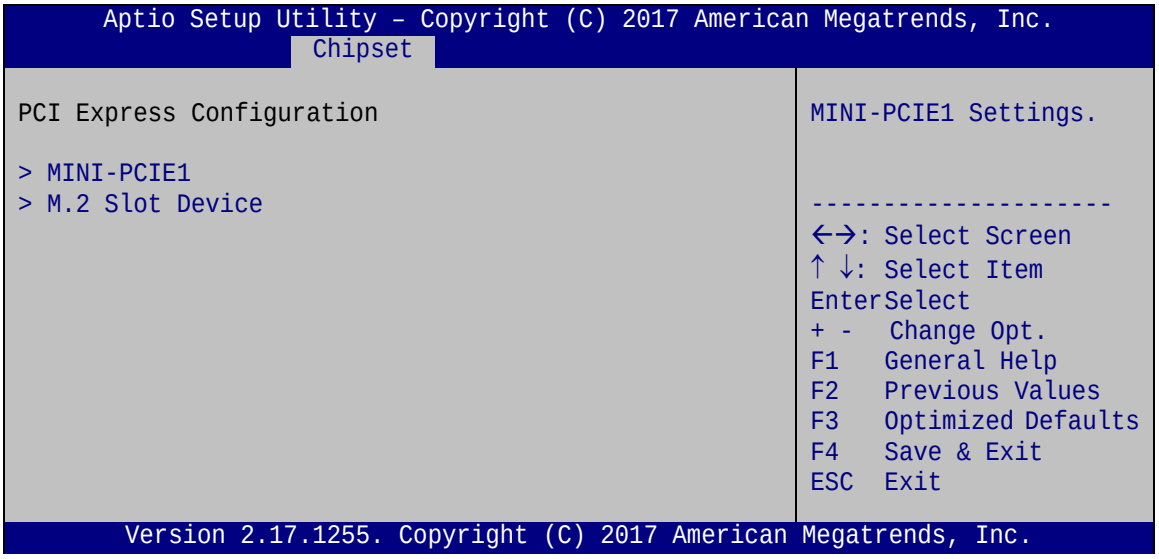
➔ **USB Power SW [+5V DUAL]**

Use the **USB Power SW** BIOS option to configure the USB power source for the corresponding USB connector.

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

### 4.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 21**) to configure the PCI Express slots.




**BIOS Menu 21: PCI Express Configuration**

The PCIe slot submenus all contain the following options:

➔ **PCIe Speed [Auto]**

Use the **PCIe Speed** option to configure the PCIe interface speed.

- Auto **DEFAULT**
- Gen 1
- Gen 2
- Gen 3

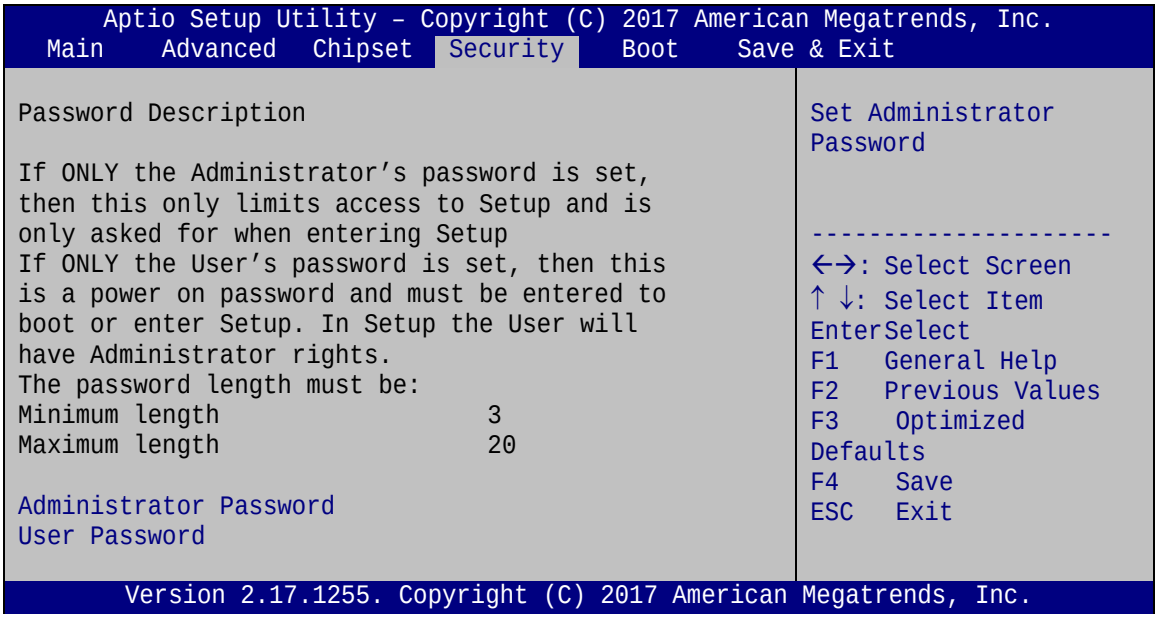
➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to enable or disable detecting if a non-compliance PCI Express device is connected to the PCI Express slot.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | Disables to detect if a non-compliance PCI Express device is connected to the PCI Express slot. |
| ➔ **Enabled** | | Enables to detect if a non-compliance PCI Express device is connected to the PCI Express slot. |

## 4.5 Security

Use the **Security** menu (**BIOS Menu 22**) to set system and user passwords.




**BIOS Menu 22: Security**

➔ **Administrator Password**

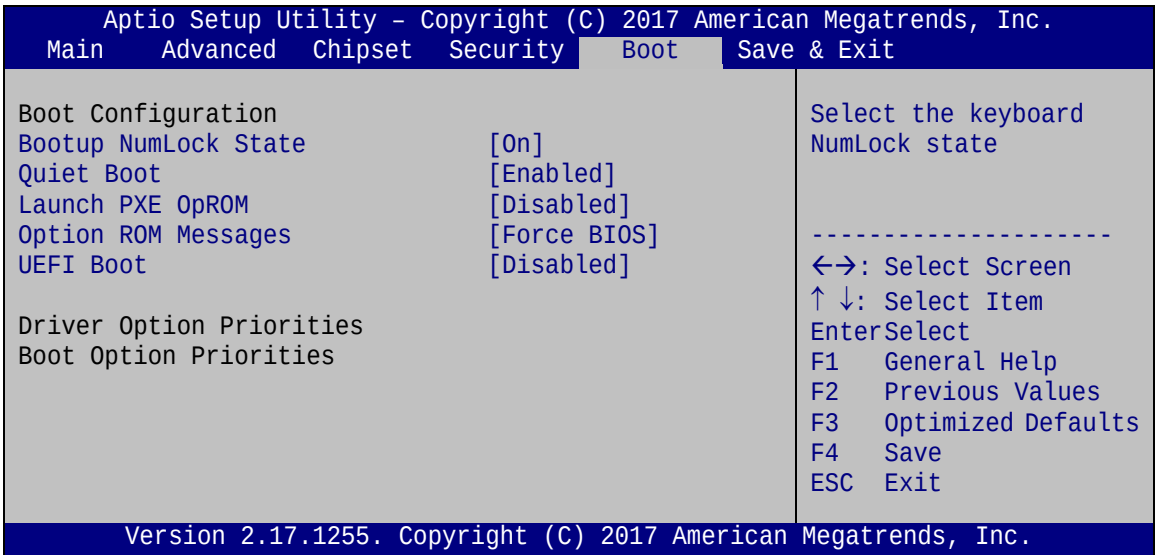
Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

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

## 4.6 Boot

Use the **Boot** menu (**BIOS Menu 23**) to configure system boot options.




**BIOS Menu 23: 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.

➔ **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 |

➔ **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. |

➔ **UEFI Boot [Disabled]**

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

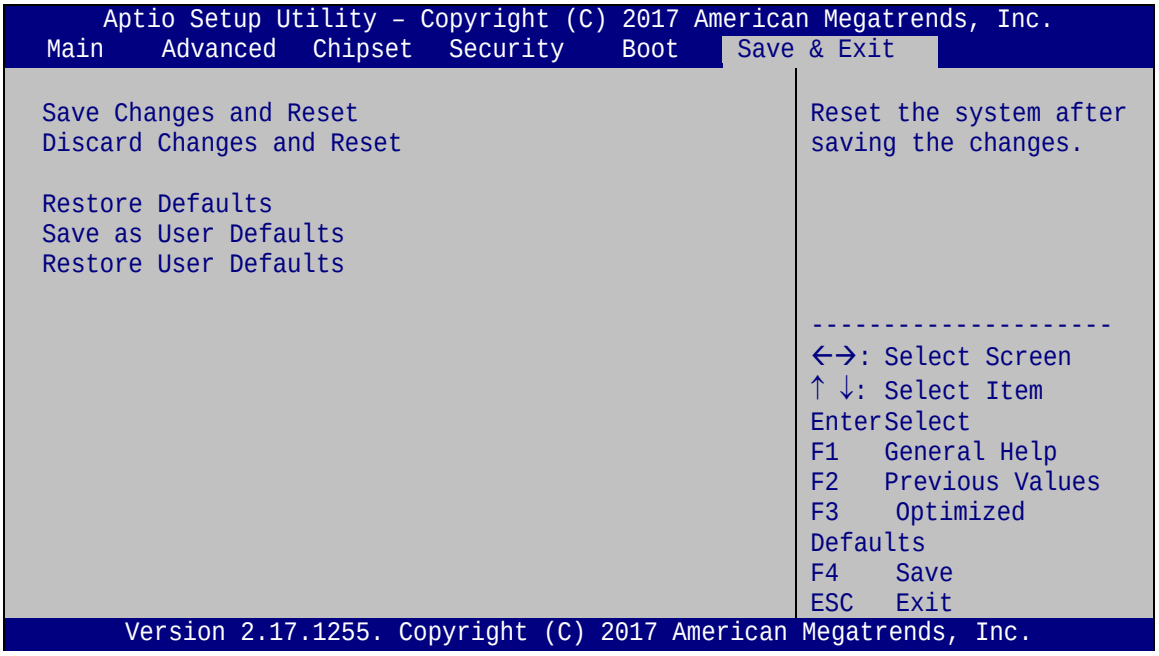
| | | | |
|---|---|---|---|
| ➔ | **Enabled** | | Boot from UEFI devices is enabled. |
| ➔ | **Disabled** | **DEFAULT** | Boot from UEFI devices is disabled. |

➔ **Boot Option Priority**

Use the **Boot Option Priority** function to set the system boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

## 4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.




**BIOS Menu 24: Save & Exit**

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Reset**

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

➔ **Restore Defaults**

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

➔ **Save as User Defaults**

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

➔ **Restore User Defaults**

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

Chapter

5

# Interface Connectors

## 5.1 Peripheral Interface Connectors

The UPC-F12C-ULT3 medical box PC motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 5-1**. 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.

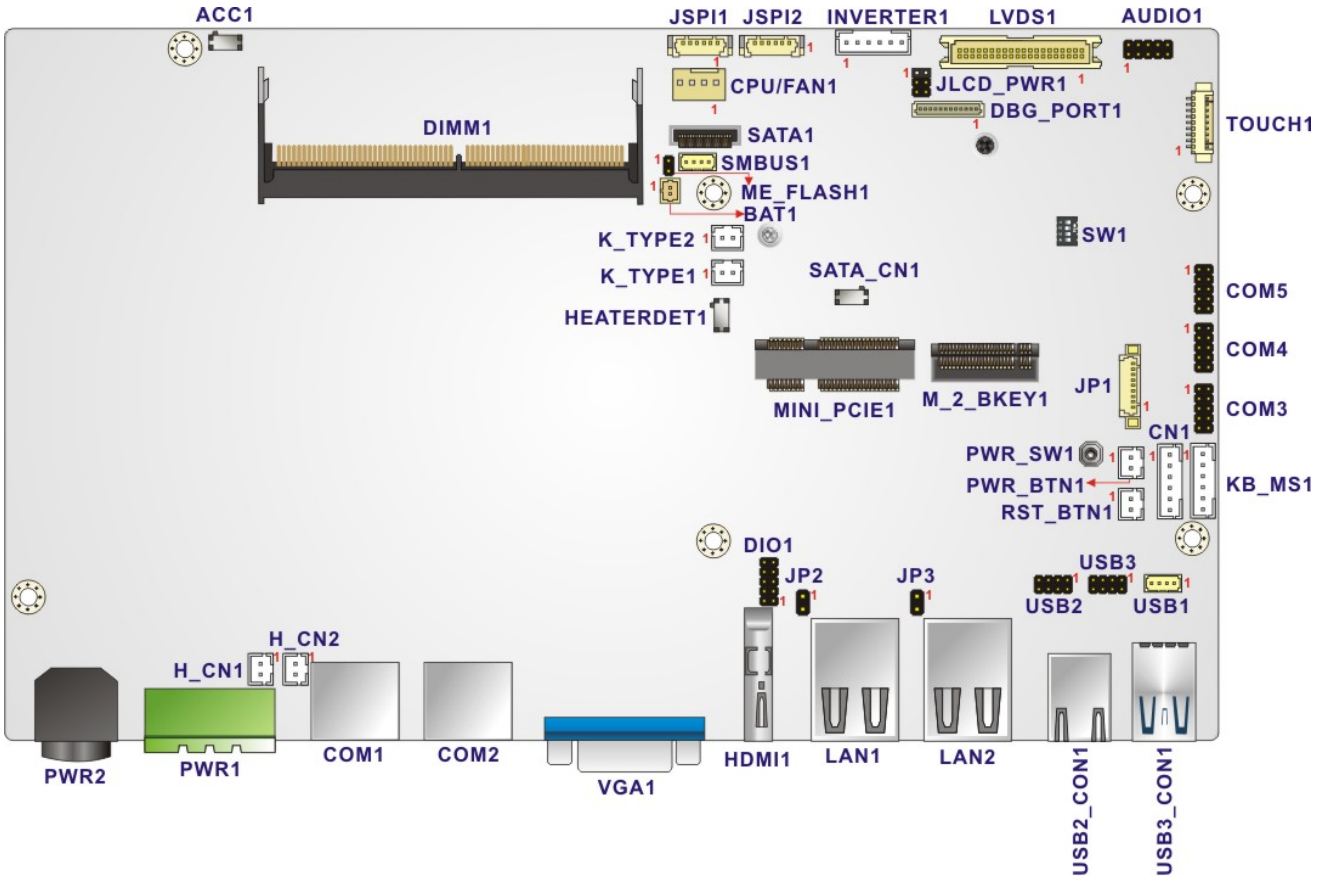



**Figure 5-1: Jumper and Connector Locations (Front Side)**

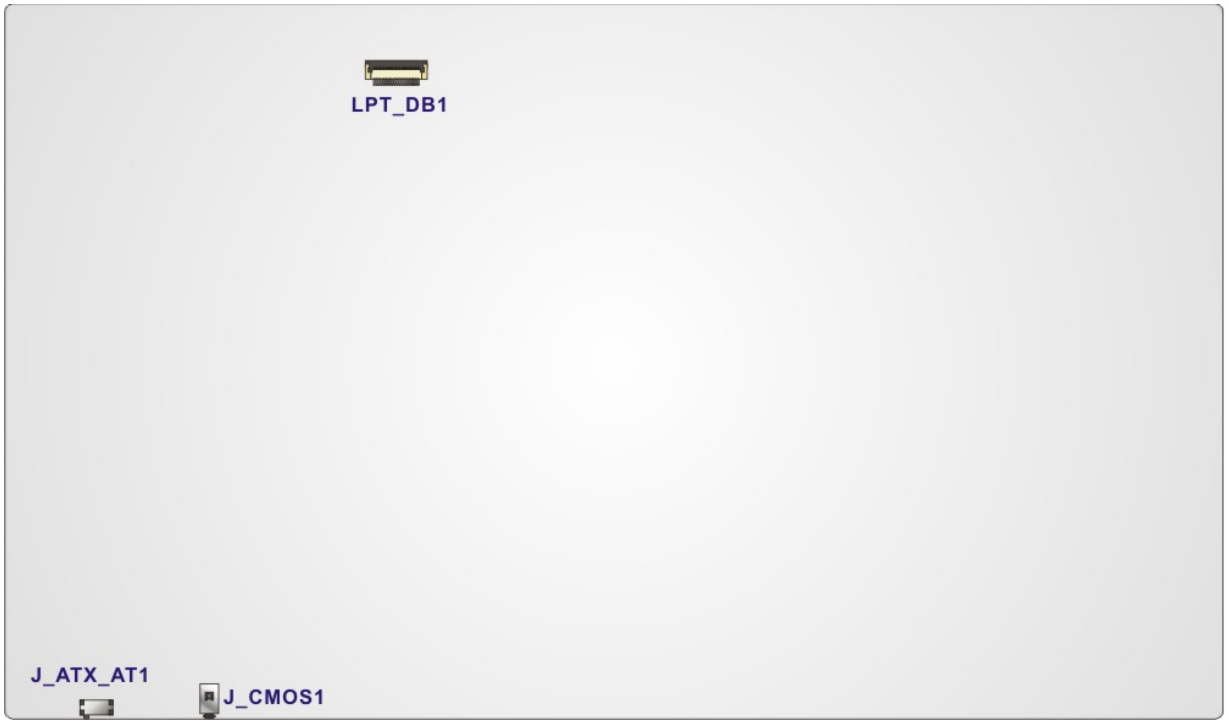



**Figure 5-2: Jumper and Connector Locations (Solder Side)**

## 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 UPC-F12C-ULT3's motherboard. Pinouts of these connectors can be found in the following sections.

| Connector | Type | Label |
|---|---|---|
| Audio connector | 10-pin header | AUDIO1 |
| Battery connector | 2-pin wafer | BAT1 |
| DDR4 SO-DIMM slot | DDR4 SO-DIMM slot | DIMM1 |
| Debug port | 12-pin wafer | DBG_PORT1 |
| Debug port (EC) | 20-pin FPC | LPT_DB1 |

| | | |
|---|---|---|
| Digital I/O connector | 10-pin header | DIO1 |
| Fan connector (CPU) | 4-pin wafer | CPU_FAN1 |
| Heater power output connectors | 2-pin wafer | H_CN1, H_CN2 |
| Keyboard/Mouse connector | 6-pin wafer | KB_MS1 |
| K-type thermocouple connectors | 2-pin wafer | K_TYPE1, K_TYPE2 |
| LAN 1 LED connector | 2-pin header | JP2 |
| LAN 2 LED connector | 2-pin header | JP3 |
| LCD inverter connector | 6-pin wafer | INVERTER1 |
| LED indicator connector | 6-pin wafer | CN1 |
| LVDS connector | 40-pin crimp | LVDS1 |
| M.2 slot | M.2 B-key slot | M_2_BKEY1 |
| PCIe Mini card slot | Full-size/Half-size PCIe Mini card slot | MINI_PCIE1 |
| RS-232 connectors | 10-pin header | COM3, COM4 |
| RS-232/422/485 connector | 10-pin header | COM5 |
| SATA 6Gb/s drive connectors | 20-pin connector | SATA1 |
| SMBus connector | 4-pin wafer | SMBUS1 |
| Power button connector | 2-pin wafer | PWR_BTN1 |
| Reset button connector | 2-pin wafer | RST_BTN1 |
| SPI flash connector (BIOS) | 6-pin wafer | JSPI1 |
| SPI flash connector (EC) | 6-pin wafer | JSPI2 |
| Touchscreen connector | 9-pin wafer | TOUCH1 |
| USB 2.0 connector (for touch) | 4-pin wafer | USB1 |
| USB 2.0 connectors | 8-pin header | USB2. USB3 |

| | | |
|---|---|---|
| U72 FW programming connector | 9-pin wafer | JP1 |

**Table 5-1: Peripheral Interface Connectors**

### 5.2.1 Audio Connector (AUDIO1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | SPK_OUT-R | 2 | LINE_IN-R |
| 3 | GND | 4 | GND |
| 5 | SPK_OUT-L | 6 | LINE_IN-L |
| 7 | GND | 8 | GND |
| 9 | MIC-R | 10 | MIC-L |


**Table 5-2: Audio Connector (AUDIO1) Pinouts**

### 5.2.2 Battery Connector (BAT1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | VBATT | 2 | GND |

**Table 5-3: Battery Connector (BAT1) Pinouts**

### 5.2.3 Debug Port (DBG_PORT1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | CLK_PCI_TPM |
| 3 | PLTRST_N | 4 | LPC_FRAME# |
| 5 | LPC_AD0 | 6 | LPC_AD1 |
| 7 | LPC_AD2 | 8 | LPC_AD3 |
| 9 | INT_SERIRQ | 10 | GND |
| 11 | +3.3V | 12 | -- |

**Table 5-4: Debug Port (DBG_PORT1) Pinouts**

### 5.2.4 Debug Port, EC (LPT_DB1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | EC_EPP_STB# | 2 | EC_EPP_AFD# |
| 3 | EC_EPP_PD0 | 4 | NC |
| 5 | EC_EPP_PD1 | 6 | EC_EPP_INIT# |
| 7 | EC_EPP_PD2 | 8 | EC_EPP_SLIN# |
| 9 | EC_EPP_PD3 | 10 | GND |
| 11 | EC_EPP_PD4 | 12 | NC |
| 13 | EC_EPP_PD5 | 14 | EC_EPP_BUSY |
| 15 | EC_EPP_PD6 | 16 | EC_EPP_KSI5 |
| 17 | EC_EPP_PD7 | 18 | EC_EPP_KSI4 |

**Table 5-5: Debug Port, EC (LPT_DB1) Pinouts**

### 5.2.5 Digital I/O Connector (DIO1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | +5V |
| 3 | DOUT3 | 4 | DOUT2 |
| 5 | DOUT1 | 6 | DOUT0 |
| 7 | DIN3 | 8 | DIN2 |
| 9 | DIN1 | 10 | DIN0 |


**Table 5-6: Digital I/O Connector (DIO1) Pinouts**

### 5.2.6 Fan Connector, CPU (CPU_FAN1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | +12V |
| 3 | FANIO |
| 4 | PWM |

**Table 5-7: CPU Fan Connector (CPU_FAN1) Pinouts**

### 5.2.7 Heater Power Output Connectors (H_CN1, H_CN2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 12 V ~ 36 V | 2 | GND |

**Table 5-8: Heater Power Output Connectors (H_CN1, H_CN2) Pinouts**

### 5.2.8 Keyboard/Mouse Connector (KB_MS1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VCC5_KBMS |
| 2 | MSDATA |
| 3 | MSCLK |
| 4 | KBDATA |
| 5 | KBCLOCK |
| 6 | GND |

**Table 5-9: Keyboard/Mouse Connector (KB_MS1) Pinouts**

### 5.2.9 K-type Thermocouple Connectors (K_TYPE1, K_TYPE2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | D- | 2 | D+ |

**Table 5-10: K-type Thermocouple Connectors (K_TYPE1, K_TYPE2) Pinouts**

### 5.2.10 LAN 1 LED Connector (JP2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +V3.3A | 2 | LAN1_LINK_ACT- |

**Table 5-11: LAN 1 LED Connector (JP2) Pinouts**

### 5.2.11 LAN 2 LED Connector (JP3)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +V3.3A | 2 | LAN2_LINK_ACT- |

**Table 5-12: LAN 2 LED Connector (JP3) Pinouts**

### 5.2.12 LCD Inverter Connector (INVERTER1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +12V |
| 2 | +12V |
| 3 | Backlight ON/OFF |
| 4 | Backlight Brightness Control |
| 5 | GND |
| 6 | GND |

**Table 5-13: LCD Inverter Connector (INVERTER1) Pinouts**

### 5.2.13 LED Indicator Connector (CN1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +5V |
| 2 | GND |
| 3 | PWR_LED+ |
| 4 | PWR_LED- |
| 5 | HDD_LED+ |
| 6 | HDD_LED- |

**Table 5-14: LED Indicator Connector (CN1) Pinouts**

### 5.2.14 LVDS Connector (LVDS1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GROUND | 2 | GROUND |
| 3 | LVDS_A_TX0-N | 4 | LVDS_A_TX1-N |
| 5 | LVDS_A_TX0-P | 6 | LVDS_A_TX1-P |
| 7 | GROUND | 8 | GROUND |
| 9 | LVDS_A_TX2-N | 10 | LVDS_A_TXCLK-N |
| 11 | LVDS_A_TX2-P | 12 | LVDS_A_TXCLK-P |
| 13 | GROUND | 14 | GROUND |
| 15 | LVDS_A_TX3-N | 16 | LVDS_B_TX0-N |
| 17 | LVDS_A_TX3-P | 18 | LVDS_B_TX0-P |
| 19 | GROUND | 20 | GROUND |
| 21 | LVDS_B_TX1-N | 22 | LVDS_B_TX2-N |
| 23 | LVDS_B_TX1-P | 24 | LVDS_B_TX2-P |
| 25 | GROUND | 26 | GROUND |
| 27 | LVDS_B_TXCLK-N | 28 | LVDS_B_TX3-N |
| 29 | LVDS_B_TXCLK-P | 30 | LVDS_B_TX3-P |
| 31 | GROUND | 32 | GROUND |
| 33 | GROUND | 34 | GROUND |
| 35 | +LCD VCC | 36 | +LCD VCC |
| 37 | +LCD VCC | 38 | +LCD VCC |
| 39 | +LCD VCC | 40 | +LCD VCC |

**Table 5-15: LVDS Connector (LVDS1) Pinouts**

### 5.2.15 M.2 Slot (M_2_BKEY1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | +V3.3S |
| 3 | GND | 4 | +V3.3S |
| 5 | GND | 6 | CARD_PWR_OFF# |
| 7 | USB+ | 8 | W_DISABLE# |
| 9 | USB- | 10 | NC |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 11 | GND | 12 | Module Key |
| 13 | Module Key | 14 | Module Key |
| 15 | Module Key | 16 | Module Key |
| 17 | Module Key | 18 | Module Key |
| 19 | Module Key | 20 | NC |
| 21 | NC | 22 | NC |
| 23 | NC | 24 | NC |
| 25 | NC | 26 | GNSS_DISABLE# |
| 27 | GND | 28 | NC |
| 29 | USB3_RX- | 30 | NC |
| 31 | USB3_RX+ | 32 | NC |
| 33 | GND | 34 | NC |
| 35 | USB3_TX- | 36 | NC |
| 37 | USB3_TX+ | 38 | NC |
| 39 | GND | 40 | NC |
| 41 | PCIE_RX-/SATA_RX+ | 42 | NC |
| 43 | PCIE_RX+/SATA_RX- | 44 | NC |
| 45 | GND | 46 | NC |
| 47 | PCIE_TX-/SATA_TX- | 48 | NC |
| 49 | PCIE_TX+/SATA_TX+ | 50 | NC |
| 51 | GND | 52 | NC |
| 53 | CLK_PCIE- | 54 | PCIE_WAKE# |
| 55 | CLK_PCIE+ | 56 | NC |
| 57 | GND | 58 | NC |
| 59 | NC | 60 | NC |
| 61 | NC | 62 | NC |
| 63 | NC | 64 | NC |
| 65 | NC | 66 | NC |
| 67 | BUF_PLT_RST# | 68 | NC |
| 69 | GND | 70 | +V3.3S |
| 71 | GND | 72 | +V3.3S |
| 73 | GND | 74 | +V3.3S |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 75 | GND | | |

**Table 5-16: M.2 Slot (M_2_BKEY1) Pinouts**

## 5.2.16 PCIe Mini Slot (MINI_PCIE1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | PCIE_WAKE# | 2 | +3.3V |
| 3 | N/C | 4 | GND |
| 5 | N/C | 6 | +1.5V |
| 7 | N/C | 8 | N/C |
| 9 | GND | 10 | N/C |
| 11 | CLK- | 12 | N/C |
| 13 | CLK+ | 14 | N/C |
| 15 | GND | 16 | N/C |
| 17 | PCIRST# | 18 | GND |
| 19 | N/C | 20 | +3.3V |
| 21 | GND | 22 | PCIRST# |
| 23 | PERN | 24 | +3VDual |
| 25 | PERP | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMBCLK |
| 31 | PETN | 32 | SMBDATA |
| 33 | PETP | 34 | GND |
| 35 | GND | 36 | USBD- |
| 37 | N/C | 38 | USBD+ |
| 39 | N/C | 40 | GND |
| 41 | N/C | 42 | N/C |
| 43 | N/C | 44 | N/C |
| 45 | N/C | 46 | N/C |
| 47 | N/C | 48 | +1.5V |
| 49 | N/C | 50 | GND |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 51 | MSATA_SEL# | 52 | +3.3V |

**Table 5-17: PCIe Mini Slot (MINI_PCIE1) Pinouts**

## 5.2.17 RS-232 Connectors (COM3, COM4)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | -NDCD | 2 | -NDSR |
| 3 | NSIN | 4 | -NRTS |
| 5 | NSOUT | 6 | -NCTS |
| 7 | -NDTR | 8 | -XRI |
| 9 | GND | 10 | GND |


**Table 5-18: RS-232 Connector (COM3, COM4) Pinouts**

## 5.2.18 RS-232/422/485 Connector (COM5)

| Pin | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| 1 | -NDCD | TX- | D- |
| 2 | -NDSR | | |
| 3 | NSIN | TX+ | D+ |
| 4 | -NRTS | | |
| 5 | NSOUT | RX+ | |
| 6 | -NCTS | | |
| 7 | -NDTR | RX- | |
| 8 | -XRI | | |
| 9 | GND | | |
| 10 | GND | | |


**Table 5-19: RS-232/422/485 Connector (COM5) Pinouts**

### 5.2.19 SATA 6Gb/s Connector (SATA1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| S1 | GND | P1 | NC |
| S2 | SATA_TX+ | P2 | +5V |
| S3 | SATA_TX- | P3 | +5V |
| S4 | GND | P4 | NC |
| S5 | SATA_RX- | P5 | GND |
| S6 | SATA RX+ | P6 | GND |
| S7 | GND | | |

**Table 5-20: SATA 6Gb/s Connector (SATA1) Pinouts**

### 5.2.20 SMBus Connector (SMBUS1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | SMBUS DATA |
| 3 | SMBUS CLOCK |
| 4 | +5 V |

**Table 5-21: SMBus Connector (SMBUS1) Pinouts**

### 5.2.21 Power Button Connector (PWR_BTN1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | PWR_BTN+ |
| 2 | PWR_BTN- |

**Table 5-22: Power Button Connector (PWR_BTN1) Pinouts**

### 5.2.22 Reset Button Connector (RST_BTN1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | RESET+ |
| 2 | RESET- |

**Table 5-23: Reset Button Connector (RST_BTN1) Pinouts**

### 5.2.23 SPI Flash Connector, BIOS (JSPI1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +V3.3M_SPI_CON |
| 2 | SPI_CS |
| 3 | SPI_SO_SW |
| 4 | SPI_CLK_SW |
| 5 | SPI_SI_SW |
| 6 | GND |

**Table 5-24: SPI Flash Connector (JSPI1) Pinouts**

### 5.2.24 SPI Flash Connector, EC (JSPI2)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +V3.3M_SPI_CON |
| 2 | SPI_CS |
| 3 | SPI_SO_SW |
| 4 | SPI_CLK_SW |
| 5 | SPI_SI_SW |
| 6 | GND |

**Table 5-25: SPI Flash Connector (JSPI2) Pinouts**

### 5.2.25 Touchscreen Connector (TOUCH1)

| PIN NO. | 8-wire | 4-wire | 5-wire |
|---|---|---|---|
| 1 | Right Sense | N/A | N/A |
| 2 | Left Sense | N/A | N/A |
| 3 | Bottom Sense | N/A | N/A |
| 4 | Top Sense | N/A | Sense (S) |
| 5 | Right Excite | Right | LR (X) |
| 6 | Left Excite | Left | LL (L) |
| 7 | Bottom Excite | Bottom | UR (H) |
| 8 | Top Excite | Top | UL (Y) |
| 9 | GND | GND | GND |

**Table 5-26: Touchscreen Connector (TOUCH1) Pinouts**

### 5.2.26 USB 2.0 Connector for Touch (USB1)

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

**Table 5-27: USB 2.0 Connector (USB1) Pinouts**

### 5.2.27 USB 2.0 Connectors (USB2, USB3)

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



**Table 5-28: USB 2.0 Connector (USB2, USB3) Pinouts**

### 5.2.28 U72 FW Programming Connector (JP1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | MCLR |
| 2 | VCC5_MCU |
| 3 | GND |
| 4 | ICSPCLK |
| 5 | ICSPDAT |
| 6 | GND |
| 7 | MCU_IR |
| 8 | AUTO_CLK |
| 9 | AUTO_DATA |

**Table 5-29: U72 FW Programming Connector (JP1) Pinouts**

## 5.3 External Interface Panel Connectors

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

| Connector | Type | Label |
|---|---|---|
| HDMI connector | HDMI | HDMI1 |
| LAN connectors | RJ-45 | LAN1, LAN2 |
| Power input terminal block | 3-pin terminal block | PWR1 |
| Power input connector | 4-pin DIN | PWR2 |
| RS-232 port | RJ-45 | COM1 |
| RS-232/422/485 port | RJ-45 | COM2 |
| USB 2.0 connectors | USB Type-A | USB2_CON1 |
| USB 3.2 Gen 1 connectors | USB Type-A | USB3_CON1 |
| VGA connector | DB-15 | VGA1 |

**Table 5-30: Peripheral Interface Connectors**

### 5.3.1 HDMI Connector (HDMI1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | HDMI_DATA2+ | 11 | GND |
| 2 | GND | 12 | HDMI_CLK# |
| 3 | HDMI_DATA2#- | 13 | N/C |
| 4 | HDMI_DATA1+ | 14 | N/C |
| 5 | GND | 15 | HDMI_SCL |
| 6 | HDMI_DATA1#- | 16 | HDMI_SDA |
| 7 | HDMI_DATA0+ | 17 | GND |
| 8 | GND | 18 | +5VCC |
| 9 | HDMI_DATA0#- | 19 | HDMI_HPD |
| 10 | HDMI_CLK+ | | |

**Table 5-31: HDMI Connector (HDMI1) Pinouts**

### 5.3.2 Ethernet Connectors (LAN1, LAN2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | MDI0+ | 5 | MDI2- |
| 2 | MDI0- | 6 | MDI1- |
| 3 | MDI1+ | 7 | MDI3+ |
| 4 | MDI2+ | 8 | MDI3- |

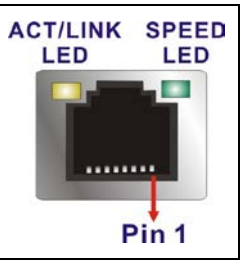



**Table 5-32: Ethernet Connectors (LAN1, LAN2) Pinouts**

### 5.3.3 USB 2.0 Connectors (USB2_CON1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +5V | 5 | +5V |
| 2 | USB2P0_DM2_L | 6 | USB2P0_DM3_L |
| 3 | USB2P0_DP2_L | 7 | USB2P0_DP3_L |
| 4 | GND | 8 | GND |


**Table 5-33: USB 2.0 Connectors (USB2_CON1) Pinouts**

### 5.3.4 USB 3.2 Gen 1 Connectors (USB3_CON1)

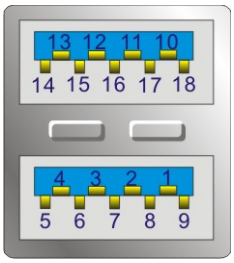
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION | |
|---|---|---|---|---|
| 1 | +5V | 10 | +5V |  |
| 2 | USB2P0_DM0 | 11 | USB2P0_DM1 | |
| 3 | USB2P0_DP0 | 12 | USB2P0_DP1 | |
| 4 | GND | 13 | GND | |
| 5 | USB3P0_RXDN0 | 14 | USB3P0_RXDN1 | |
| 6 | USB3P0_RXDP0 | 15 | USB3P0_RXDP1 | |
| 7 | GND | 16 | GND | |
| 8 | USB3P0_TXDN0 | 17 | USB3P0_TXDN1 | |
| 9 | USB3P0_TXDP0 | 18 | USB3P0_TXDP1 | |

**Table 5-34: USB 3.2 Gen 1 Connectors (USB3_CON1) Pinouts**

### 5.3.5 VGA Connector (VGA1)

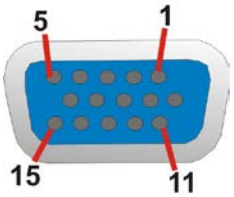
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION | |
|---|---|---|---|---|
| 1 | Red | 2 | Green |  |
| 3 | Blue | 4 | NC | |
| 5 | GND | 6 | GND | |
| 7 | GND | 8 | GND | |
| 9 | VGAVCC | 10 | HOTPLUG | |
| 11 | NC | 12 | DDCDAT | |
| 13 | HSYNC | 14 | VSYNC | |
| 15 | DDCCLK | | | |

**Table 5-35: VGA Connector (VGA1) Pinouts**

## 5.4 Preconfigured Jumper Settings

**CAUTION:**

The following jumpers are preconfigured for the UPC-F12C-ULT3. Users should not change these jumpers (**Table 5-36**).

| Jumper Name | Type | Label |
|---|---|---|
| LVDS voltage selection | 6-pin header | JLCD_PWR1 |
| LVDS panel resolution selection | Switch | SW1 |

**Table 5-36: Preconfigured Jumpers**

### 5.4.1 LVDS Panel Voltage Selection Jumper (JLCD_PWR1)

| Setting | Description |
|---|---|
| Short 1-2 | +3.3 V (Default) |
| Short 3-4 | +5 V |
| Short 5-6 | +12 V |

**Table 5-37: LVDS Voltage Selection Jumper (JLCD_PWR1) Settings**

### 5.4.2 LVDS Panel Resolution Selection Jumper (SW1)

* ON=0, OFF=1; Single=S, Dual=D

| SW1 (4-3-2-1) | Description |
|---|---|
| 0000 | 800x600 18bit S |
| 0001 | 1024x768 18bit S |
| 0010 | 1024x768 24bit S (Default) |
| 0011 | 1280x768 18bit S |
| 0100 | 1280x800 18bit S |
| 0101 | 1280x960 18bit S |

| SW1 (4-3-2-1) | Description |
|---|---|
| 0110 | 1280x1024 24bit D |
| 0111 | 1366x768 18bit S |
| 1000 | 1366x768 24bit S |
| 1001 | 1440x960 24bit D |
| 1010 | 1400x1050 24bit D |
| 1011 | 1600x900 24bit D |
| 1100 | 1680x1050 24bit D |
| 1101 | 1600x1200 24bit D |
| 1110 | 1920x1080 24bit D |
| 1111 | 1920x1200 24bit D |

**Table 5-38: LVDS Resolution Selection Jumper (SW1) Settings**

Appendix

A

# Regulatory Compliance

## DECLARATION OF CONFORMITY

CE

This equipment is in conformity with the following EU directives:

- EMC Directive 2014/30/EU
- Low-Voltage Directive 2014/35/EU
- RoHS II Directive 2015/863/EU

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<br>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]<br>IEI Integration Corp. декларира, че този оборудване е в съответст□ие със съществените изисквания и другите приложими правила на Директива 1999/5/EC. |
| Česky [Czech]<br>IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/□S. |
| Dansk [Danish]<br>IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav c øvrige relevante krav i direktiv 1999/5/EF. |
| Deutsch [German]<br>IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU. |
| Eesti [Estonian]<br>IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele. |

| |
|---|
| Español [Spanish]<br>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]<br>IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ. |
| Français [French]<br>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]<br>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]<br>IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK. |
| Lietuvių [Lithuanian]<br>IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas. |
| Nederlands [Dutch]<br>IEI In□egration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. |
| Malti [Maltese]<br>IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC. |
| Magyar [Hungarian]<br>IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak. |
| Polski [Polish]<br>IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC. |
| Português [Portuguese]<br>IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras□disposições da Directiva 1999/5/CE. |

| |
|---|
| Româna [Romanian]<br>IEI Integration Corp declară că acest echipament este in conformitate cu cerinţele esenţiale şi cu celelalte prevederi relevante ale Directivei 1999/5/CE. |
| Slovensko [Slovenian]<br>IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES. |
| Slovensky [Slovak]<br>IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 199□/5/ES. |
| Suomi [Finnish]<br>IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen. |
| Svenska [Swedish]<br>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. |

## ROHS STATEMENT

The label on the product indicates this product complies to European (EU) Restriction of Hazardous Substances (RoHS) that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

## 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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.

## CHINA ROHS

The label on the product indicates 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.

Appendix

B

# Safety Precautions

**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the UPC-F12C-ULT3.

## B.1 Safety Precautions

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

### B.1.1 General Safety Precautions

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

- ***Follow the electrostatic precautions*** outlined below whenever the device is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the UPC-F12C-ULT3 is being installed, moved or modified.
- ***To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.*** To fully disengage the power to the unit, please disconnect the power cord from the AC outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
- ***Electric shocks can occur*** if the UPC-F12C-ULT3 chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
- ***Do not drop or insert any objects*** into the ventilation openings of the UPC-F12C-ULT3.

- ***If considerable amounts of dust, water, or fluids enter the* device**, turn off the power supply immediately, unplug the power cord, and contact the UPC-F12C-ULT3 vendor.
- **DO NOT**:
  - Drop the device against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

### B.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the UPC-F12C-ULT3 may result in permanent damage to the UPC-F12C-ULT3 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the UPC-F12C-ULT3. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the UPC-F12C-ULT3 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

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

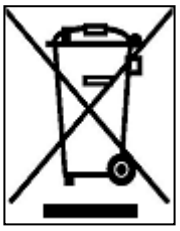
### B.1.3 Product Disposal

**CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

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



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

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

## B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the UPC-F12C-ULT3, please follow the guidelines below.

**WARNING:**

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

### B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the UPC-F12C-ULT3, please read the details below.

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

### B.2.2 Cleaning Tools

Some components in the UPC-F12C-ULT3 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 UPC-F12C-ULT3.

- ***Cloth***– Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the device.

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

Appendix

C

# BIOS Menu Options

Appendix

D

# Watchdog Timer

**NOTE:**

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

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. When 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.

**NOTE:**

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

## EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 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     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

E

# Hazardous Materials Disclosure

## E.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

| Part Name | Toxic or Hazardous Substances and Elements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (CR(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) | Bis(2-ethylhexyl) phthalate (DEHP) | Butyl benzyl phthalate (BBP) | Dibutyl phthalate (DBP) | Diisobutyl phthalate (DIBP) |
| Housing | O | O | O | O | O | O | O | O | O | O |
| Display | O | O | O | O | O | O | O | O | O | O |
| Printed Circuit Board | O | O | O | O | O | O | O | O | O | O |
| Metal Fasteners | O | O | O | O | O | O | O | O | O | O |
| Cable Assembly | O | O | O | O | O | O | O | O | O | O |
| Fan Assembly | O | O | O | O | O | O | O | O | O | O |
| Power Supply Assemblies | O | O | O | O | O | O | O | O | O | O |
| Battery | O | O | O | O | 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 Directive (EU) 2015/863.

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 Directive (EU) 2015/863.

## E.2 China RoHS

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/T11364-2014與GB/T26572-2011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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。