



MODEL:
UPC-F12C(M)-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



Revision



Date	Version	Changes
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！在將系統連接到電源之前，請仔細閱讀使用手冊。
-

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

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

- 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.

Table of Contents

1 INTRODUCTION.....	1
1.1 OVERVIEW.....	2
1.2 MODEL VARIATIONS	3
1.3 FEATURES.....	3
1.4 FRONT PANEL	4
1.5 REAR PANEL.....	4
1.6 BOTTOM PANEL	5
1.7 SYSTEM SPECIFICATIONS.....	6
1.8 DIMENSIONS.....	8
2 UNPACKING	10
2.1 UNPACKING.....	11
2.2 PACKING LIST.....	11
2.3 OPTIONAL ITEMS.....	13
3 INSTALLATION	15
3.1 ANTI-STATIC PRECAUTIONS.....	16
3.2 INSTALLATION PRECAUTIONS	17
3.3 HDD INSTALLATION.....	18
3.4 EXTERNAL I/O CONNECTORS – M12 TYPE.....	20
3.4.1 M12–RS-232 Serial Port Connection	20
3.4.2 M12–RS-232/422/485 Serial Port Connection	21
3.4.3 M12–LAN Port Connection	23
3.4.4 M12–USB Port Connection	24
3.4.5 M12–Power Input Connection.....	25
3.5 EXTERNAL I/O CONNECTORS – STANDARD TYPE.....	26
3.5.1 External RS-232 Connector (COM1).....	26
3.5.2 External RS-232/422/485 Connector (COM2)	26
3.5.3 Clear CMOS.....	27
3.5.4 AT/ATX Mode Selection	28
3.6 FERRITE CORE INSTALLATION	28

3.7 PROTECTION GROMMET INSTALLATION (C MODELS ONLY)	29
3.8 MOUNTING THE SYSTEM	32
3.9 POWERING ON THE SYSTEM	33
3.9.1 M12 Type	33
3.9.2 Standard Type	34
3.10 SOFTWARE INSTALLATION	35
3.11 INSTALLING WINDOWS 7 FROM USB 3.0 DRIVES	35
4 BIOS SETUP	37
4.1 INTRODUCTION	38
4.1.1 Starting Setup	38
4.1.2 Using Setup	38
4.1.3 Getting Help	39
4.1.4 BIOS Menu Bar	39
4.2 MAIN	40
4.3 ADVANCED	41
4.3.1 ACPI Settings	42
4.3.2 Super IO Configuration	43
4.3.2.1 Serial Port n Configuration	43
4.3.2.1.1 Serial Port 1 Configuration	44
4.3.2.1.2 Serial Port 2 Configuration	45
4.3.3 iWDD H/W Monitor	46
4.3.4 RTC Wake Settings	47
4.3.5 Serial Port Console Redirection	48
4.3.5.1 Legacy Console Redirection Settings	49
4.3.5.2 Console Redirection Settings	50
4.3.6 CPU Configuration	52
4.3.7 SATA Configuration	54
4.3.8 USB Configuration	56
4.3.9 IEI Feature	57
4.4 CHIPSET	58
4.4.1 System Agent (SA) Configuration	58
4.4.1.1 Graphics Configuration	59
4.4.1.1.1 LCD Control	60
4.4.1.2 Memory Configuration	61

UPC-F12C(M)-ULT3 Panel PC

4.4.2 PCH-IO Configuration	62
4.4.2.1 PCI Express Configuration	63
4.5 SECURITY	64
4.6 BOOT	65
4.7 SAVE & EXIT	67
5 INTERFACE CONNECTORS	69
5.1 PERIPHERAL INTERFACE CONNECTORS	70
5.2 INTERNAL PERIPHERAL CONNECTORS	71
5.2.1 Audio Connector (AUDIO1)	73
5.2.2 Battery Connector (BAT1)	73
5.2.3 Debug Port (DBG_PORT1)	73
5.2.4 Debug Port, EC (LPT_DB1)	74
5.2.5 Digital I/O Connector (DIO1)	74
5.2.6 Fan Connector, CPU (CPU_FAN1)	74
5.2.7 Heater Power Output Connectors (H_CN1, H_CN2)	75
5.2.8 Keyboard/Mouse Connector (KB_MS1)	75
5.2.9 K-type Thermocouple Connectors (K_TYPE1, K_TYPE2)	75
5.2.10 LAN 1 LED Connector (JP2)	75
5.2.11 LAN 2 LED Connector (JP3)	76
5.2.12 LCD Inverter Connector (INVERTER1)	76
5.2.13 LED Indicator Connector (CN1)	76
5.2.14 LVDS Connector (LVDS1)	77
5.2.15 M.2 Slot (M_2_BKEY1)	77
5.2.16 PCIe Mini Slot (MINI_PCIE1)	79
5.2.17 RS-232 Connectors (COM3, COM4)	80
5.2.18 RS-232/422/485 Connector (COM5)	80
5.2.19 SATA 6Gb/s Connector (SATA1)	81
5.2.20 SMBus Connector (SMBUS1)	81
5.2.21 Power Button Connector (PWR_BTN1)	81
5.2.22 Reset Button Connector (RST_BTN1)	82
5.2.23 SPI Flash Connector, BIOS (JSPI1)	82
5.2.24 SPI Flash Connector, EC (JSPI2)	82
5.2.25 Touchscreen Connector (TOUCH1)	83
5.2.26 USB 2.0 Connector for Touch (USB1)	83

5.2.27 USB 2.0 Connectors (USB2, USB3)	83
5.2.28 U72 FW Programming Connector (JP1).....	84
5.3 EXTERNAL INTERFACE PANEL CONNECTORS	84
5.3.1 HDMI Connector (HDMI1).....	85
5.3.2 Ethernet Connectors (LAN1, LAN2).....	85
5.3.3 USB 2.0 Connectors (USB2_CON1).....	85
5.3.4 USB 3.0 Connectors (USB3_CON1).....	86
5.3.5 VGA Connector (VGA1).....	86
5.4 PRECONFIGURED JUMPER SETTINGS.....	87
5.4.1 LVDS Panel Voltage Selection Jumper (JLCD_PWR1).....	87
5.4.2 LVDS Panel Resolution Selection Jumper (SW1).....	87
A REGULATORY COMPLIANCE	89
B SAFETY PRECAUTIONS	95
B.1 SAFETY PRECAUTIONS.....	96
B.1.1 General Safety Precautions.....	96
B.1.2 Anti-static Precautions	97
B.1.3 Product Disposal	98
B.2 MAINTENANCE AND CLEANING PRECAUTIONS	99
B.2.1 Maintenance and Cleaning.....	99
B.2.2 Cleaning Tools.....	99
C BIOS MENU OPTIONS.....	101
D WATCHDOG TIMER	104
E HAZARDOUS MATERIALS DISCLOSURE	107

List of Figures

Figure 1-1: UPC-F12C(M)-ULT3 Panel PC	2
Figure 1-2: Front View	4
Figure 1-3: Rear Panel	4
Figure 1-4: I/O Panel – CM Model	5
Figure 1-5: I/O Panel – C Model	5
Figure 1-6: Dimensions (mm) – CM Model	8
Figure 1-7: Dimensions (mm) – C Model	9
Figure 3-1: HDD Slot Cover Retention Screws	18
Figure 3-2: Remove HDD Bracket	18
Figure 3-3: Secure HDD to the Bracket	19
Figure 3-4: HDD Installation	19
Figure 3-5: RS-232 Connector (COM1)	20
Figure 3-6: RS-232/422/485 Connector (COM2)	21
Figure 3-7: DB-9 COM Port Cable	22
Figure 3-8: LAN Connector	23
Figure 3-9: RJ-45 LAN Cable	23
Figure 3-10: USB 2.0 Connector	24
Figure 3-11: Power Input Connector	25
Figure 3-12: Clear CMOS Button Location	27
Figure 3-13: AT/ATX Switch Location	28
Figure 3-14: Open Ferrite Core	28
Figure 3-15: Wrapping Cable around the Core	29
Figure 3-16: Cable Installed with Ferrite Core	29
Figure 3-17: I/O Cover Retention Screws	30
Figure 3-18: Connect Cable to Connector	30
Figure 3-19: Installing Grommet	31
Figure 3-20: Installing Grommet with Blind Hole	31
Figure 3-21: VESA Mounting Retention Screw Holes	32
Figure 3-22: Power Input Connection – M12 Type	33
Figure 3-23: Power Input Jack Pinouts	34
Figure 3-24: Power Input Terminal Block Pinouts	34



UPC-F12C(M)-ULT3 Panel PC

Figure 5-1: Jumper and Connector Locations (Front Side)70
Figure 5-2: Jumper and Connector Locations (Solder Side)71



List of Tables

Table 1-1: Model Variations	3
Table 1-2: System Specifications.....	7
Table 3-1: RS-232 Connector Pinouts	20
Table 3-2: RS-232/422/485 Connector Pinouts	21
Table 3-3: RS-232/422/485 Serial Port Pinouts	22
Table 3-4: LAN Connector Pinouts	23
Table 3-5: USB 2.0 Connector Pinouts	24
Table 3-6: Power Input Connector Pinouts	25
Table 3-7: External RS-232 Connector (COM1) Pinouts	26
Table 3-8: External RS-232/422/485 Connector (COM2) Pinouts	26
Table 3-9: DB-9 RS-232/422/485 Pinouts	27
Table 5-1: Peripheral Interface Connectors	73
Table 5-2: Audio Connector (AUDIO1) Pinouts	73
Table 5-3: Battery Connector (BAT1) Pinouts	73
Table 5-4: Debug Port (DBG_PORT1) Pinouts.....	73
Table 5-5: Debug Port, EC (LPT_DB1) Pinouts.....	74
Table 5-6: Digital I/O Connector (DIO1) Pinouts	74
Table 5-7: CPU Fan Connector (CPU_FAN1) Pinouts	74
Table 5-8: Heater Power Output Connectors (H_CN1, H_CN2) Pinouts	75
Table 5-9: Keyboard/Mouse Connector (KB_MS1) Pinouts	75
Table 5-10: K-type Thermocouple Connectors (K_TYPE1, K_TYPE2) Pinouts.....	75
Table 5-11: LAN 1 LED Connector (JP2) Pinouts	75
Table 5-12: LAN 2 LED Connector (JP3) Pinouts	76
Table 5-13: LCD Inverter Connector (INVERTER1) Pinouts	76
Table 5-14: LED Indicator Connector (CN1) Pinouts	76
Table 5-15: LVDS Connector (LVDS1) Pinouts	77
Table 5-16: M.2 Slot (M_2_BKEY1) Pinouts	79
Table 5-17: PCIe Mini Slot (MINI_PCIE1) Pinouts	80
Table 5-18: RS-232 Connector (COM3, COM4) Pinouts	80
Table 5-19: RS-232/422/485 Connector (COM5) Pinouts	80
Table 5-20: SATA 6Gb/s Connector (SATA1) Pinouts	81



Table 5-21: SMBus Connector (SMBUS1) Pinouts.....81

Table 5-22: Power Button Connector (PWR_BTN1) Pinouts.....81

Table 5-23: Reset Button Connector (RST_BTN1) Pinouts82

Table 5-24: SPI Flash Connector (JSPI1) Pinouts82

Table 5-25: SPI Flash Connector (JSPI2) Pinouts82

Table 5-26: Touchscreen Connector (TOUCH1) Pinouts.....83

Table 5-27: USB 2.0 Connector (USB1) Pinouts.....83

Table 5-28: USB 2.0 Connector (USB2, USB3) Pinouts83

Table 5-29: U72 FW Programming Connector (JP1) Pinouts.....84

Table 5-30: Peripheral Interface Connectors84

Table 5-31: HDMI Connector (HDMI1) Pinouts.....85

Table 5-32: Ethernet Connectors (LAN1, LAN2) Pinouts.....85

Table 5-33: USB 2.0 Connectors (USB2_CON1) Pinouts.....85

Table 5-34: USB 3.0 Connectors (USB3_CON1) Pinouts.....86

Table 5-35: VGA Connector (VGA1) Pinouts86

Table 5-36: Preconfigured Jumpers87

Table 5-37: LVDS Voltage Selection Jumper (JLCD_PWR1) Settings87

Table 5-38: LVDS Resolution Selection Jumper (SW1) Settings.....88

List of BIOS Menus

BIOS Menu 1: Main	40
BIOS Menu 2: Advanced	41
BIOS Menu 3: ACPI Settings	42
BIOS Menu 4: Super IO Configuration.....	43
BIOS Menu 5: Serial Port n Configuration	43
BIOS Menu 6: iWDD H/W Monitor	46
BIOS Menu 7: RTC Wake Settings	47
BIOS Menu 8: Serial Port Console Redirection	48
BIOS Menu 9: Legacy Console Redirection Settings	49
BIOS Menu 10: Console Redirection Settings.....	50
BIOS Menu 11: CPU Configuration	52
BIOS Menu 12: SATA Configuration	54
BIOS Menu 13: USB Configuration	56
BIOS Menu 14: IEI Feature	57
BIOS Menu 15: Chipset	58
BIOS Menu 16: System Agent (SA) Configuration	58
BIOS Menu 17: Graphics Configuration	59
BIOS Menu 18: LCD Control	60
BIOS Menu 19: Memory Configuration.....	61
BIOS Menu 20: PCH-IO Configuration	62
BIOS Menu 21: PCI Express Configuration	63
BIOS Menu 22: Security	64
BIOS Menu 23: Boot	65
BIOS Menu 24: Save & Exit.....	67

Chapter

1

Introduction

1.1 Overview



Figure 1-1: UPC-F12C(M)-ULT3 Panel PC

The UPC-F12C(M)-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(M)-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.

UPC-F12C(M)-ULT3 Panel PC

1.2 Model Variations

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

Model	Processor	Touchscreen	Connectors
UPC-F12CM-ULT3-C/R/4G	Intel® Celeron® 3955U	Resistive	M12
UPC-F12CM-ULT3-C/PC/4G	Intel® Celeron® 3955U	Projected capacitive	M12
UPC-F12CM-ULT3-i5/R/4G	Intel® Core™ i5-6300U	Resistive	M12
UPC-F12CM-ULT3-i5/PC/4G	Intel® Core™ i5-6300U	Projected capacitive	M12
UPC-F12C-ULT3-C/R/4G	Intel® Celeron® 3955U	Resistive	Standard
UPC-F12C-ULT3-C/PC/4G	Intel® Celeron® 3955U	Projected capacitive	Standard
UPC-F12C-ULT3-i5/R/4G	Intel® Core™ i5-6300U	Resistive	Standard
UPC-F12C-ULT3-i5/PC/4G	Intel® Core™ i5-6300U	Projected capacitive	Standard

Table 1-1: Model Variations

1.3 Features

The UPC-F12C(M)-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
- SKUs with M12 connector: 6-side IP66 protection
SKUs with standard connector: 5-side IP66 protection
- 12 V–36 V wide range DC power input

1.4 Front Panel

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

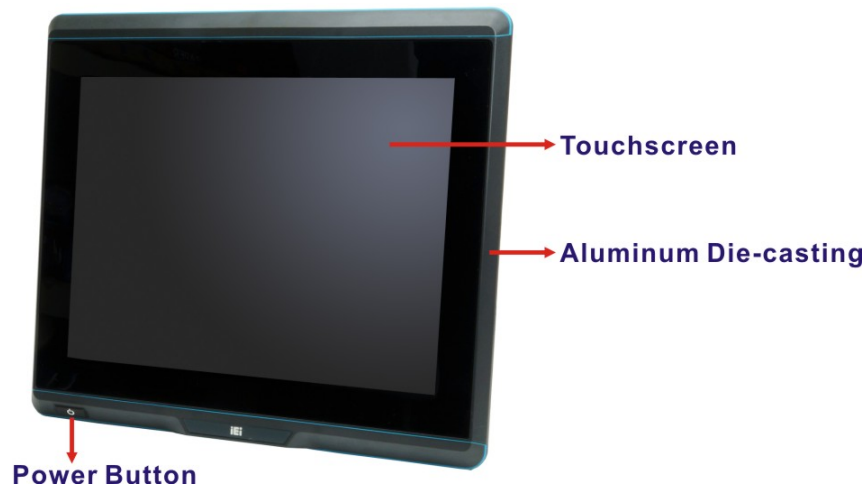


Figure 1-2: Front View

1.5 Rear Panel

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

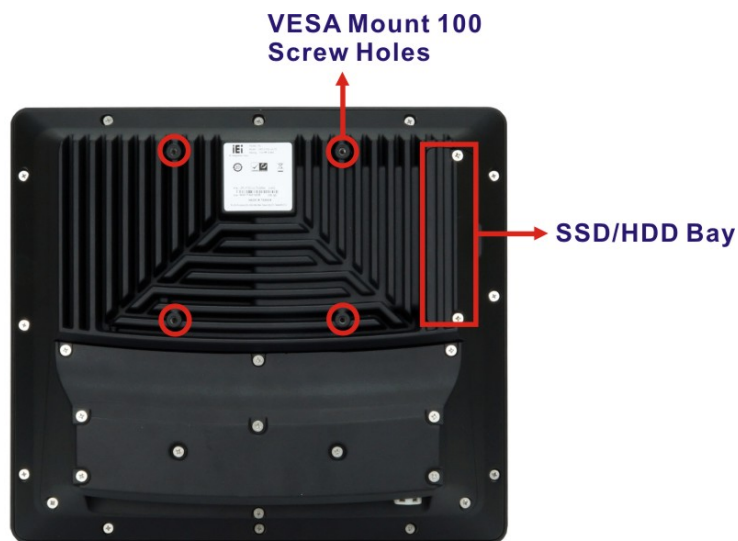


Figure 1-3: Rear Panel

UPC-F12C(M)-ULT3 Panel PC

1.6 Bottom Panel

The bottom panel of the UPC-F12C(M)-ULT3 has several I/O interfaces, which vary between models. The CM models have M12 connectors while the C models have standard connectors. For the C models, the I/O cover must be removed to access the I/O interfaces.

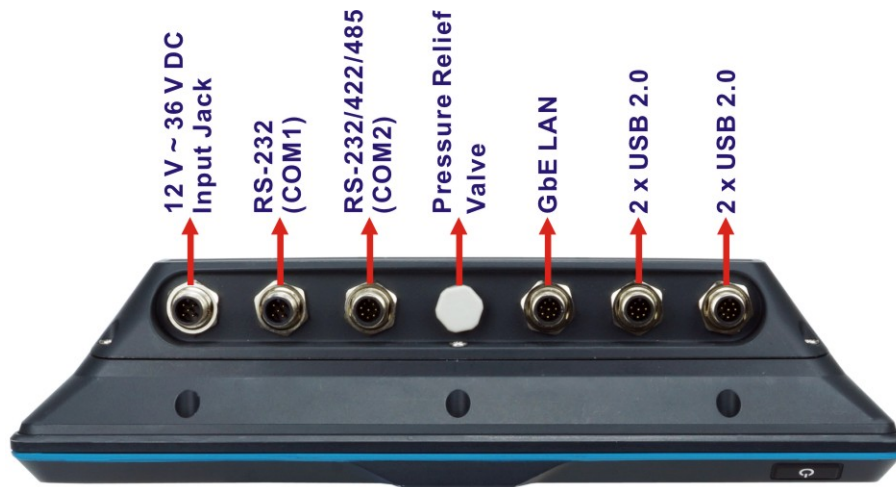


Figure 1-4: I/O Panel – CM Model

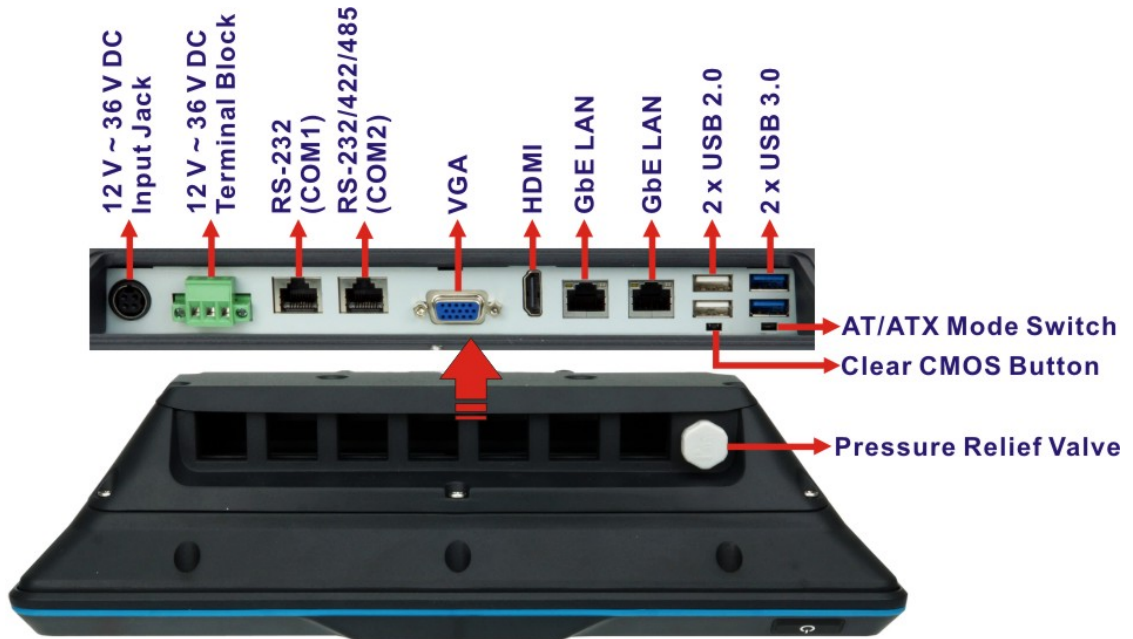


Figure 1-5: I/O Panel – C Model



1.7 System Specifications

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

Specification	UPC-F12CM-ULT3	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)	160° / 140°	
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 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 ALC892 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	



UPC-F12C(M)-ULT3 Panel PC

VESA Mount	100 mm x 100 mm	
Net/Gross Weight	4.95 kg / 7.62 kg	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	-20°C ~ 60°C 0°C~40°C with FSP adapter (P/N: 63040-010096-100-RS on Page 14)	
Storage Temperature	-20°C ~ 70°C	
Humidity	10% ~ 95% (non-condensing)	
IP Level	6-side IP66	5-side IP66 (IP65 I/O panel)
Safety/EMC	CE, FCC Class A	
Power Input	12 V ~ 36 V DC 100 W waterproof power adapter (optional)	12 V ~ 36 V DC
Power Consumption	12 V @ 5 A; 36 V @ 1.6 A	
I/O Ports and Switches	M12 connectors: 1 x RS-232 (8-pin, COM1) 1 x RS-232/422/485 (8-pin, COM2) 1 x GbE LAN (8-pin) 2 x USB 2.0 (8-pin, each supports two USB) 1 x 12 V ~ 36 V DC input jack (5-pin)	Standard connectors: 1 x 12 V ~ 36 V DC input jack 1 x 12 V ~ 36 V DC-in terminal block 1 x HDMI 1 x VGA 1 x RS-232 (COM1, RJ-45) 1 x RS-232/422/485 (COM2, RJ-45) 2 x GbE LAN 2 x USB 2.0 2 x USB 3.0

Table 1-2: System Specifications



1.8 Dimensions

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

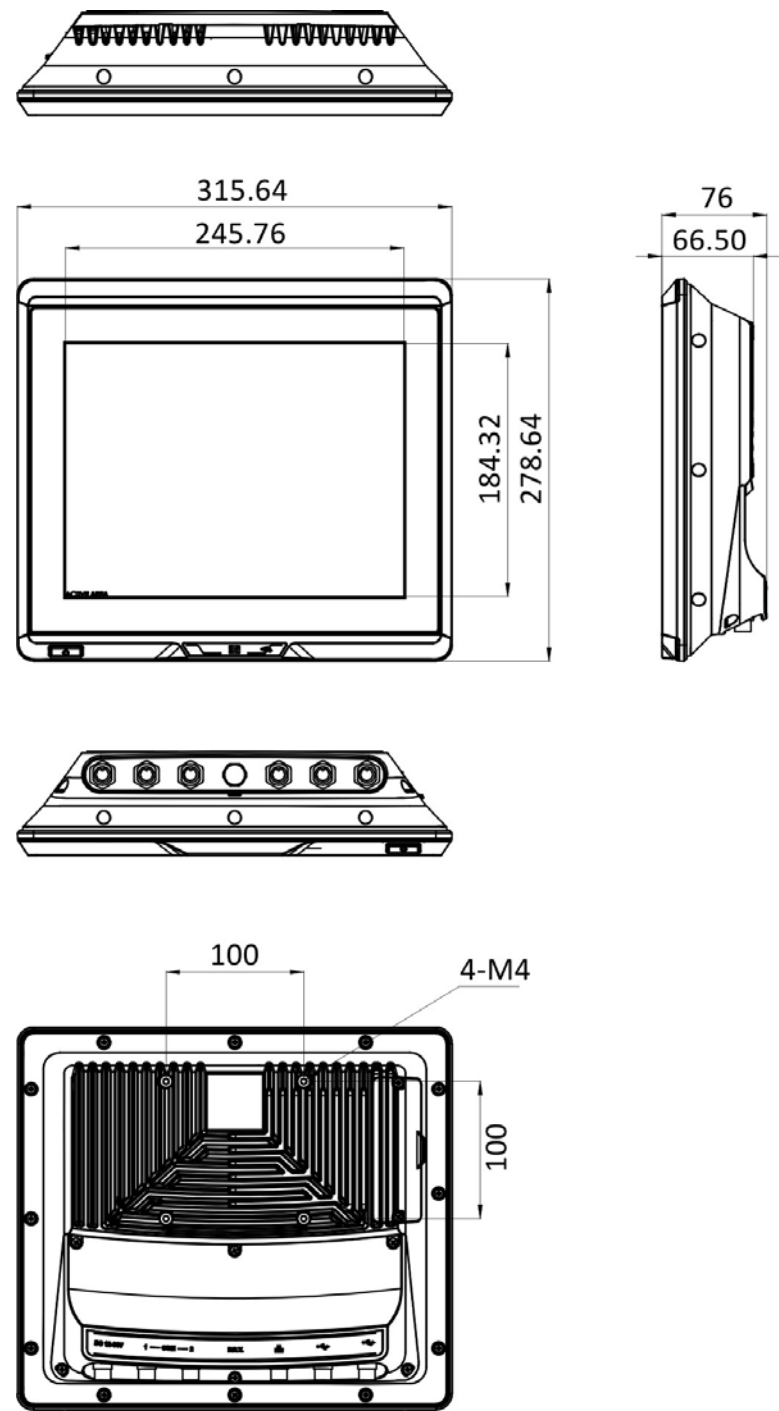


Figure 1-6: Dimensions (mm) – CM Model

UPC-F12C(M)-ULT3 Panel PC

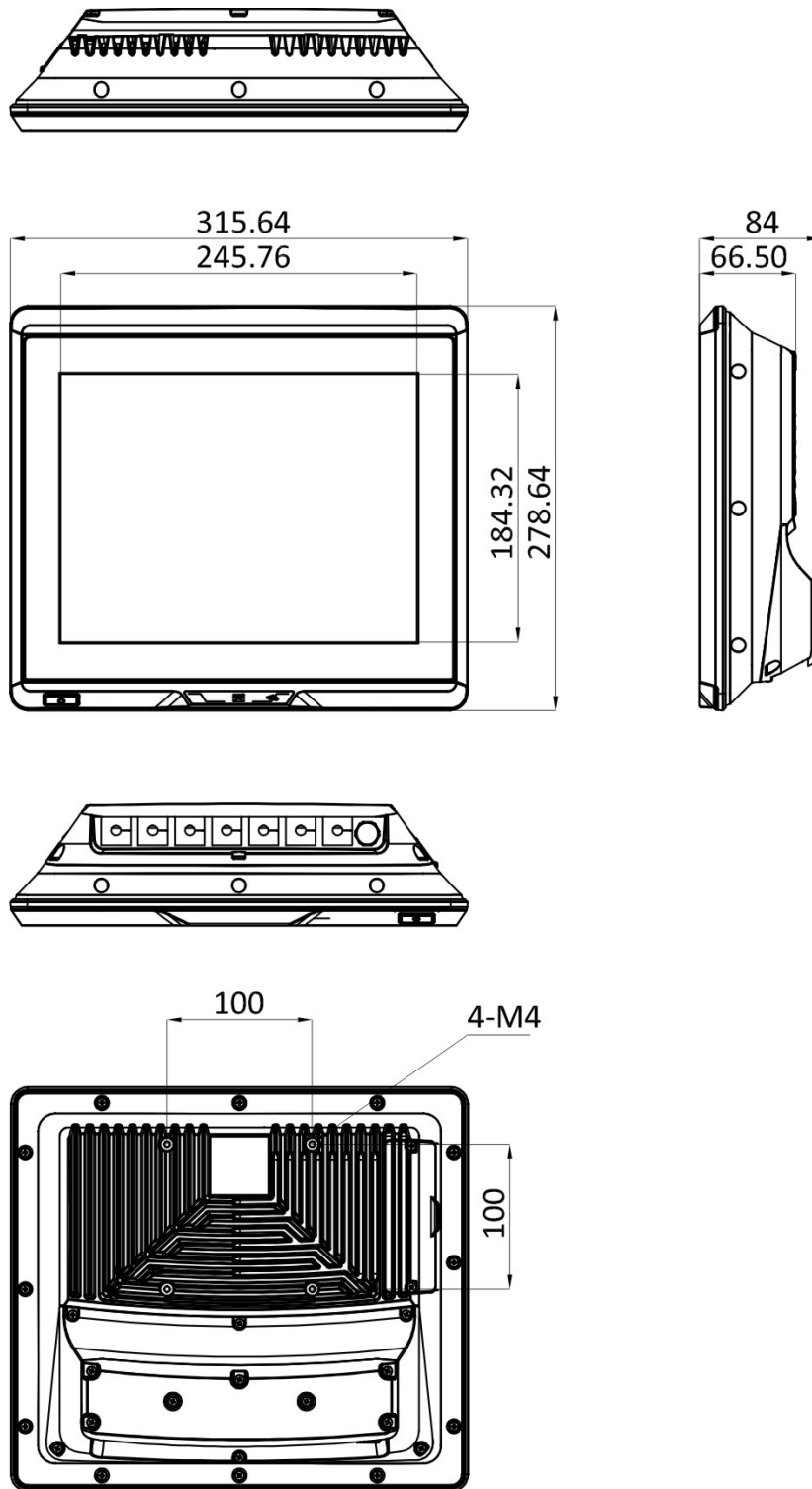


Figure 1-7: Dimensions (mm) – C Model

Chapter

2

Unpacking

UPC-F12C(M)-ULT3 Panel PC

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(M)-ULT3 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.



UPC-F12C(M)-ULT3 Panel PC

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

Quantity	Item	Image
1	UPC-F12C(M)-ULT3 panel PC	
4	Flat-head screw (M3*4) for HDD installation	
1	Utility CD	
1	One Key Recovery CD	
1	Touch pen (resistive type only)	
CM Series (with M12 connectors)		
1	Power cable	
1	USB cable	
C Series (with standard connectors)		
2	RJ-45 to DB-9 serial port cable	



UPC-F12C(M)-ULT3 Panel PC

2	Ferrite core for USB cable and LAN cable	
10	Protection grommet (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 (P/N: ARM-11-RS)	
Stand for VESA 100 (P/N: STAND-A12-RS)	
Stand for VESA 75/VESA 100 (P/N: STAND-C12-R10)	
Mifare RFID kit (ATO only) (P/N: UPC-F-MF-RFID-KIT01-R10)	

Item and Part Number	Image
CM Series (with M12 connectors)	
M12 to USB cable (P/N: CB-M12USB02-R20)	
M12 to RJ-45 LAN cable (P/N: CB-M12RJ45-R20)	
M12 to DB-9 COM port cable (P/N: CB-M12COM-R20)	
100 W waterproof power adapter with M12 connector (P/N: 63040-030080-000-RS)	
C Series (with standard connectors)	
96 W power adapter with 4-pin DIN connector, (operating temperature: 0°C~40°C) (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(M)-ULT3 may result in permanent damage to the UPC-F12C(M)-ULT3 and severe injury to the user.

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

UPC-F12C(M)-ULT3 Panel PC

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

UPC-F12C(M)-ULT3 Panel PC

- 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**).

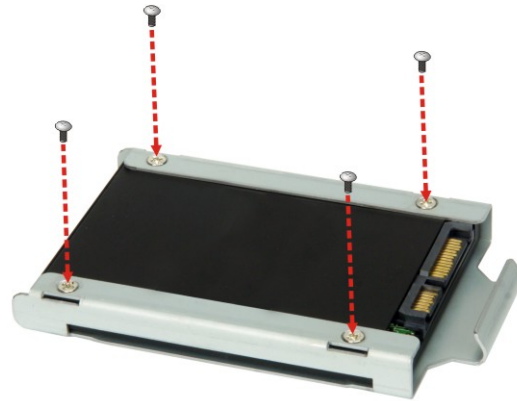


Figure 3-3: Secure HDD to the Bracket

- 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(M)-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 – M12 Type

The UPC-F12CM-ULT3 series is equipped with several M12 connectors for I/O interface connection. These M12 connectors are all protected with metal/plastic dust caps. Please remove the dust cap before connection.

3.4.1 M12–RS-232 Serial Port Connection

The UPC-F12CM-ULT3 has one 8-pin M12 connector for RS-232 serial port connection. The pinouts for the RS-232 connector are listed in the figure and table below.



Figure 3-5: RS-232 Connector (COM1)

PIN NO.	DESCRIPTION
1	DCD
2	SIN+
3	SOUT
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Table 3-1: RS-232 Connector Pinouts

UPC-F12C(M)-ULT3 Panel PC

3.4.2 M12-RS-232/422/485 Serial Port Connection

The UPC-F12CM-ULT3 has one 8-pin M12 connector for RS-232/422/485 serial port connection. The pinouts for the RS-232/422/485 connector are listed in the figure and table below.



Figure 3-6: RS-232/422/485 Connector (COM2)

PIN NO.	DESCRIPTION
1	DCD
2	SIN+
3	SOUT
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Table 3-2: RS-232/422/485 Connector Pinouts

[Optional Choice]

The DB-9 COM port cable (**Figure 3-7**) can be purchased separately. The user can use the cable to connect the UPC-F12CM-ULT3 with serial devices. The COM port cable should be installed with a ferrite core to reduce EMI. To install the ferrite core, please refer to **Section 0**.



Figure 3-7: DB-9 COM Port Cable

The DB-9 connector pinouts of the COM port cable are listed below.

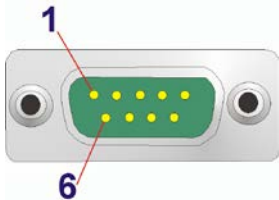
PIN NO.	RS-232	RS-422	RS-485	
1	DCD	TXD422-	TXD485-	
2	RXD	TXD422+	TXD485+	
3	TXD	RXD422+	--	
4	DTR	RXD422-	--	
5	GND	--	--	
6	DSR	--	--	
7	RTS	--	--	
8	CTS	--	--	
9	--	--	--	

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

UPC-F12C(M)-ULT3 Panel PC

3.4.3 M12-LAN Port Connection

The UPC-F12CM-ULT3 has one 8-pin M12 connector for GbE LAN connection. The pinouts for the LAN connector are listed in the figure and table below.



Figure 3-8: LAN Connector

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

Table 3-4: LAN Connector Pinouts

The RJ-45 LAN cable (**Figure 3-7**) can be purchased separately. The user can use the cable to connect the UPC-F12CM-ULT3 with network. The LAN cable should be installed with a ferrite core to reduce EMI. To install the ferrite core, please refer to **Section 0**.



Figure 3-9: RJ-45 LAN Cable

3.4.4 M12–USB Port Connection

The UPC-F12CM-ULT3 has two 8-pin M12 connectors for USB 2.0 connection. Each M12 connector supports two USB 2.0 ports connection. The pinouts for the USB 2.0 connectors are listed in the figure and table below.



Figure 3-10: USB 2.0 Connector

PIN NO.	DESCRIPTION
1	USB POWER
2	SUSB POWER
3	2-
4	2+
5	GND
6	1+
7	1-
8	GND

Table 3-5: USB 2.0 Connector Pinouts

One M12 to USB cable is shipped with the UPC-F12CM-ULT3. The cable should be installed with a ferrite core to reduce EMI. To install the ferrite core, please refer to **Section 3.6**.

UPC-F12C(M)-ULT3 Panel PC

3.4.5 M12–Power Input Connection

The UPC-F12CM-ULT3 has one 5-pin M12 connector that supports 12 V ~ 36 V power input connection. The pinouts for the power input connector are listed in the figure and table below.



Figure 3-11: Power Input Connector

PIN NO.	DESCRIPTION
1	DC IN
2	DC IN
3	GND
4	GND
5	ACC

Table 3-6: Power Input Connector Pinouts

3.5 External I/O Connectors – Standard Type

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**.

3.5.1 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



Pin 1

Table 3-7: External RS-232 Connector (COM1) Pinouts

3.5.2 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		



Pin 1

Table 3-8: External RS-232/422/485 Connector (COM2) Pinouts

UPC-F12C(M)-ULT3 Panel PC

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	--	--

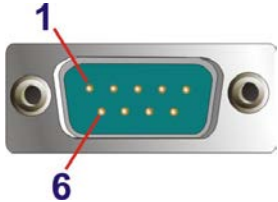


Table 3-9: DB-9 RS-232/422/485 Pinouts

3.5.3 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 3-12**. The I/O cover must be removed to be able to access the clear CMOS button.



Figure 3-12: Clear CMOS Button Location

3.5.4 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 3-13**). The I/O cover must be removed to be able to access the AT/ATX switch.



Figure 3-13: AT/ATX Switch Location

3.6 Ferrite Core Installation

The cables to be connected with the UPC-F12C(M)-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.

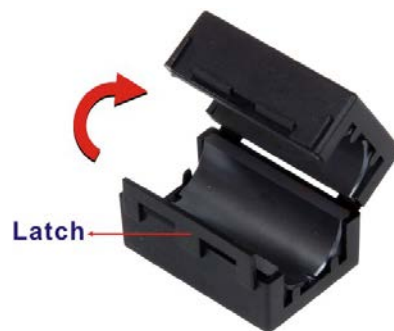


Figure 3-14: Open Ferrite Core

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.

UPC-F12C(M)-ULT3 Panel PC



Figure 3-15: 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 3-16: Cable Installed with Ferrite Core

3.7 Protection Grommet Installation (C Models Only)

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.

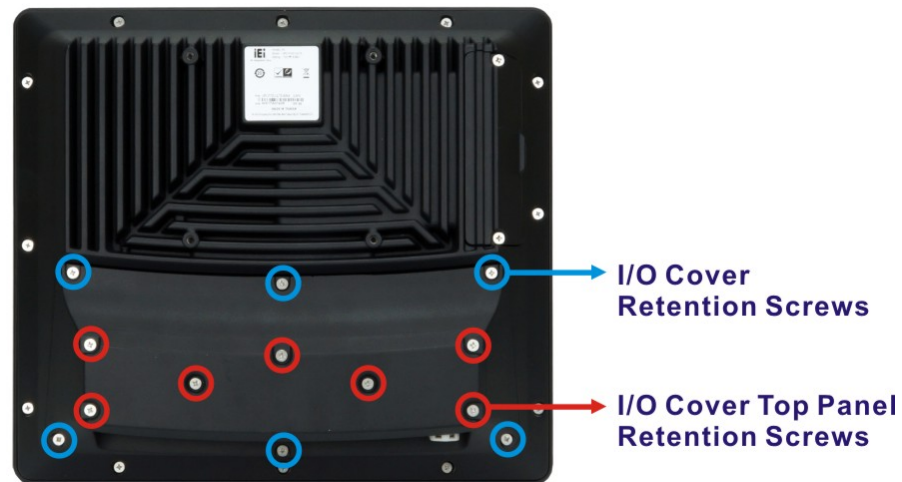


Figure 3-17: I/O Cover Retention Screws

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 3-18: 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 = $\Phi 3\text{mm}$.

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.



UPC-F12C(M)-ULT3 Panel PC



Figure 3-19: 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.

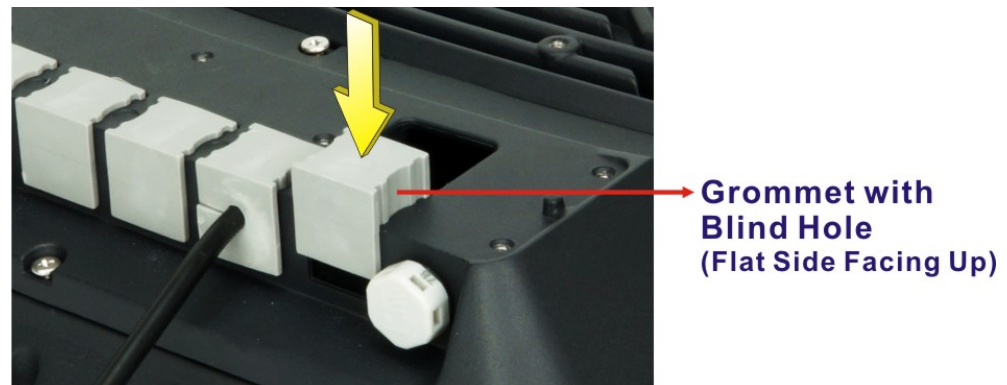


Figure 3-20: Installing Grommet with Blind Hole

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

3.8 Mounting the System

The UPC-F12C(M)-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(M)-ULT3 VESA mount retention screw holes are shown in **Figure 3-21**. Refer to the installation guide that came with the mounting device to mount the UPC-F12C(M)-ULT3.

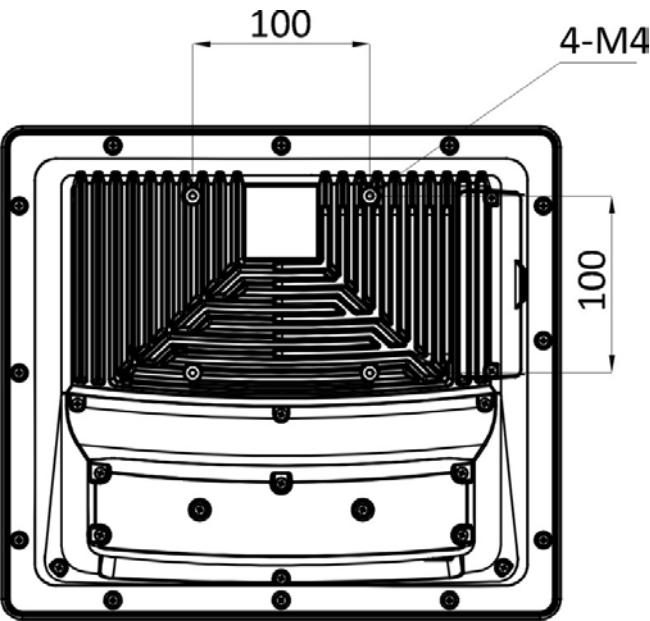


Figure 3-21: VESA Mounting Retention Screw Holes



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(M)-ULT3 panel PC.

UPC-F12C(M)-ULT3 Panel PC

3.9 Powering On the System

3.9.1 M12 Type

To power on the UPC-F12CM-ULT3 panel PC, follow the steps below:

Step 1: Connect the M12 connector of the power cable to the UPC-F12CM-ULT3.

Connect the terminal block of the power cable to a power source. The terminal block pinouts are shown below.



Figure 3-22: Power Input Connection – M12 Type

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.

3.9.2 Standard Type

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.

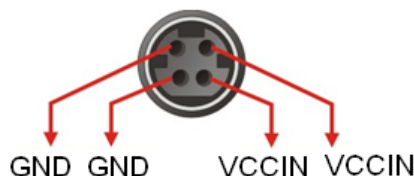


Figure 3-23: Power Input Jack Pinouts

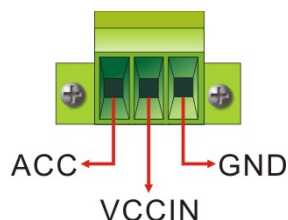


Figure 3-24: Power Input Terminal Block Pinouts

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.

3.10 Software Installation

**NOTE:**

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

All the drivers for the UPC-F12C(M)-ULT3 are on the utility CD that came with the system. The utility CD contains drivers for Windows 8.1 (64-bit) and Windows 10 (64-bit) operating systems. If the drivers are not installed automatically, please install the following drivers manually.

- Chipset
- VGA
- LAN
- Intel® Serial IO
- ME (Intel® AMT)
- Touchscreen

3.11 Installing Windows 7 from USB 3.0 Drives

Microsoft Windows 7 installation media does not include native driver support for USB 3.0, so during installation, a keyboard/mouse connected to a USB 3.0 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 3.0 drivers. To install Windows 7 from a USB drive onto the UPC-F12C(M)-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



UPC-F12C(M)-ULT3 Panel PC

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 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.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Main	Advanced	Chipset Security Boot Save & Exit
BIOS Information		Set the Date. Use Tab to switch between Data elements.
BIOS Vendor	American Megatrends	
Core Version	5.11	
Compliancy	UEFI 2.4; PI 1.3	
Project Version	Z364AR11.ROM	
Build Date and Time	08/23/2017 09:34:43	
iWDD Vender	iEi	
iWDD Version	Z364ER10.bin	
Processor Information		
Name	SkyLake	
Brand String	Intel(R) Core(TM)	
	i5-6300U CPU @ 2.40GHz	
Frequency	2300 MHz	-----
Processor ID	406E3	
Stepping	D0/K0	←→: Select Screen
Number of Processors	2Core(s) / 4Thread(s)	↑ ↓: Select Item
Microcode Revision	BA	EnterSelect
GT Info	GT2	+/-: Change Opt.
IGFX VBIOS Version	1036	F1: General Help
Memory RC Version	1.9.0.0	F2: Previous Values
Total Memory	4096 MB	F3: Optimized Defaults
Memory Frequency	2133 MHz	F4: Save & Exit
		ESC: Exit
PCH Information		
Name	SKL PCH-LP	
PCH SKU	PCH-LP Mobile (U)	
	Premium SKU	
Stepping	21/C1	
LAN PHY Revision	N/A	
ME FW Version	11.0.0.1202	
ME Firmware SKU	Consumer SKU	
SPI Clock Frequency		
D0FR Support	Unsupported	
Read Status Clock Frequency	17 MHz	
Write Status Clock Frequency	17 MHz	
Fast Read Status Clock Frequency	17 MHz	
System Date	[Fri 01/01/2010]	
System Time	[00:18:35]	
Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.		

BIOS Menu 1: Main

UPC-F12C(M)-ULT3 Panel PC

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.

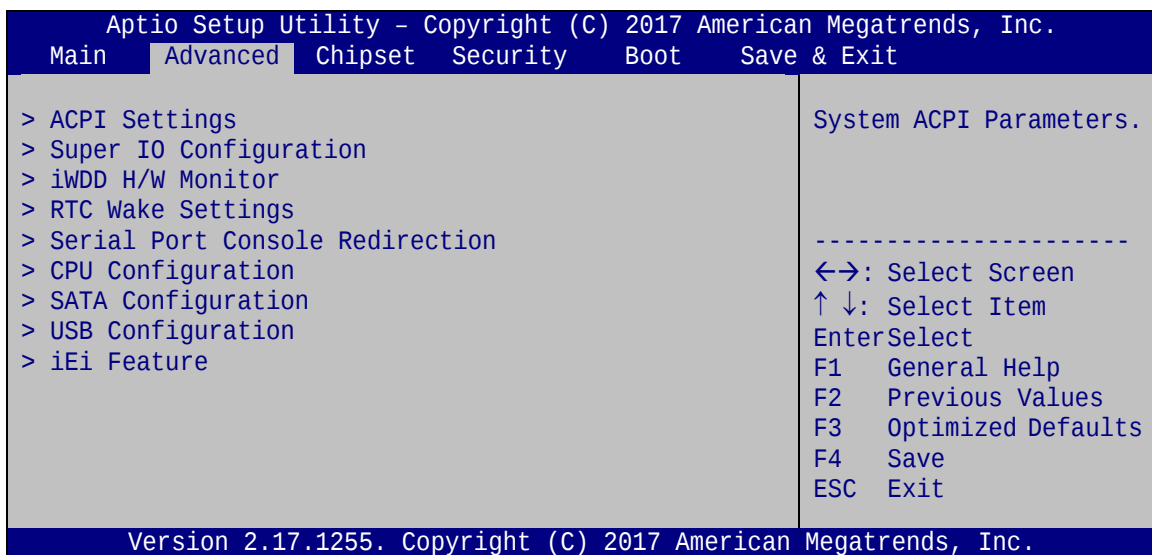
4.3 Advanced

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.

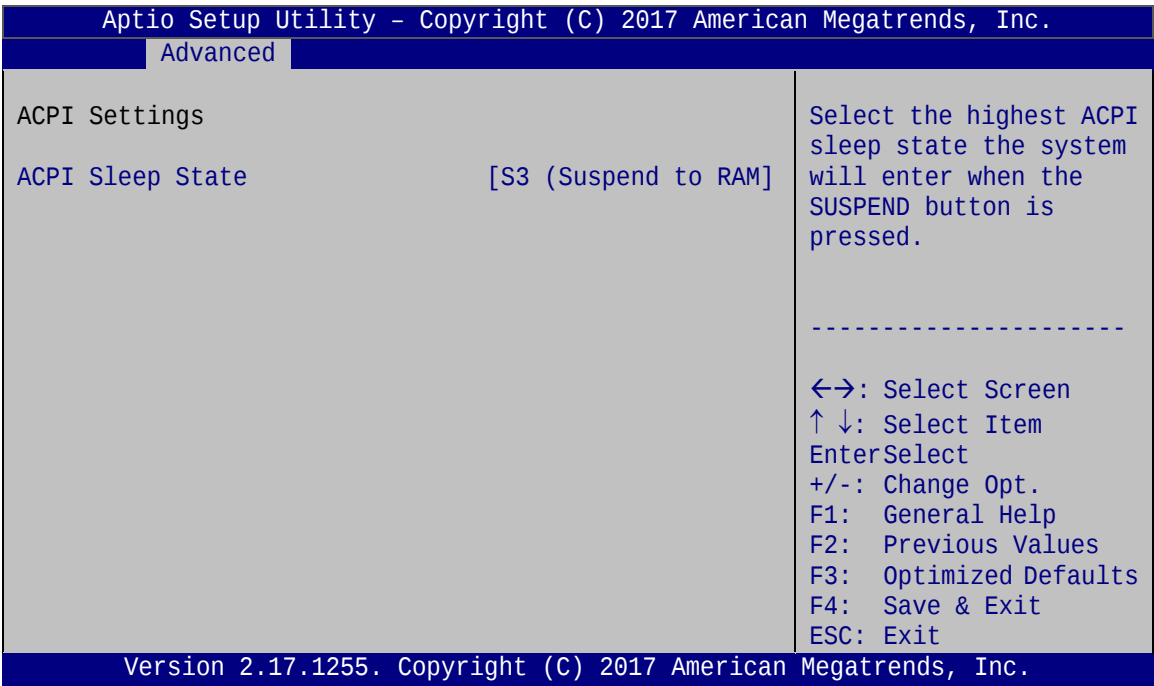


BIOS Menu 2: Advanced



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.

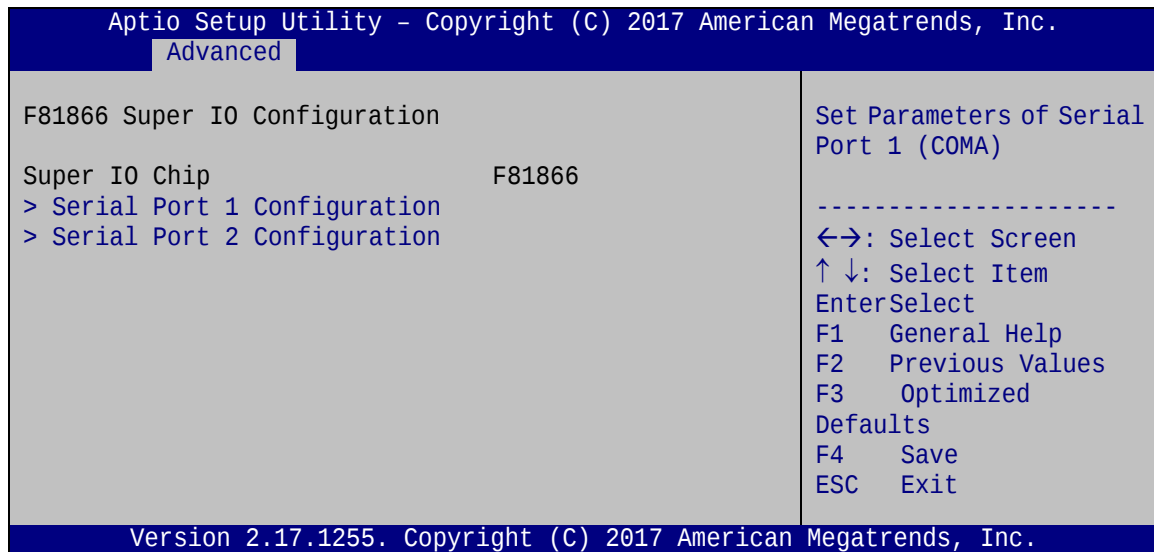
- ➔ **S3 (Suspend to DEFAULT RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.



UPC-F12C(M)-ULT3 Panel PC

4.3.2 Super IO Configuration

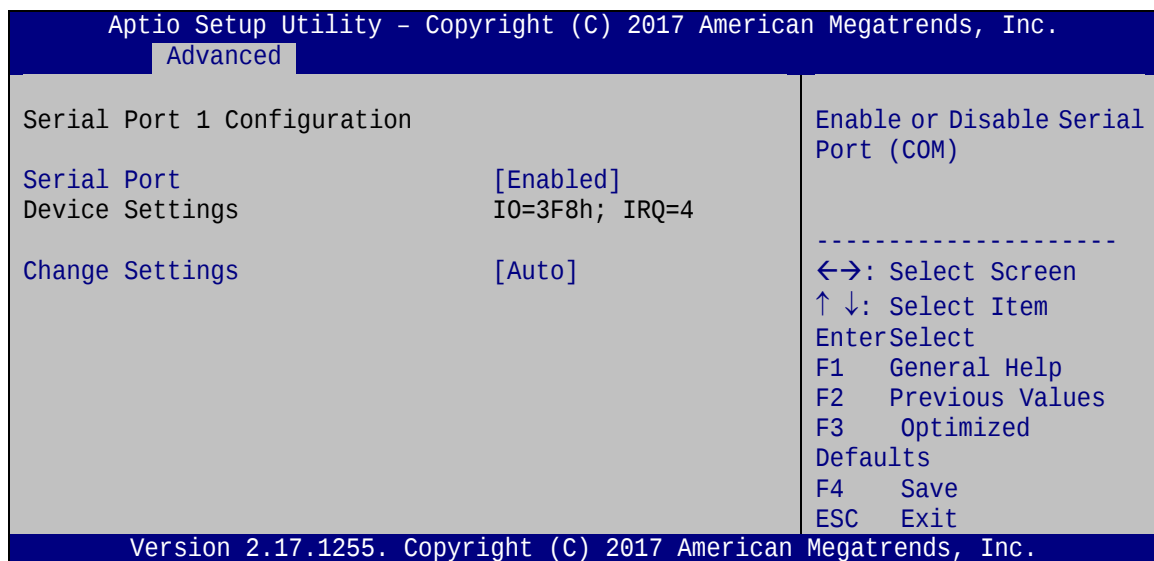
Use the **Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



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 |



UPC-F12C(M)-ULT3 Panel PC

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 |

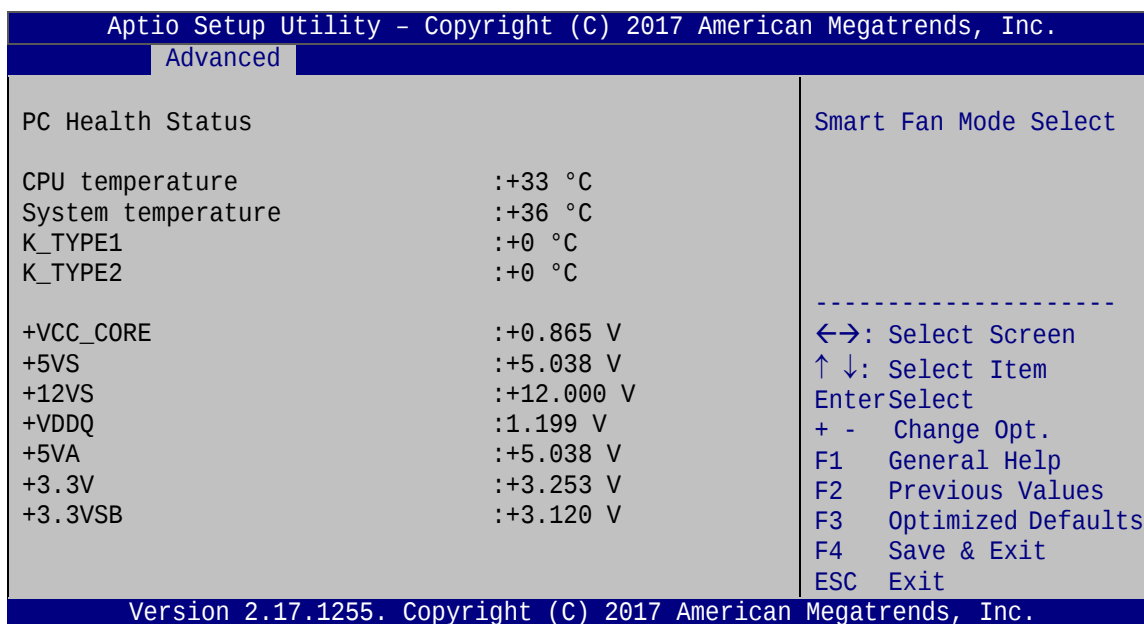
➔ Transfer Mode [RS232]

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.



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:

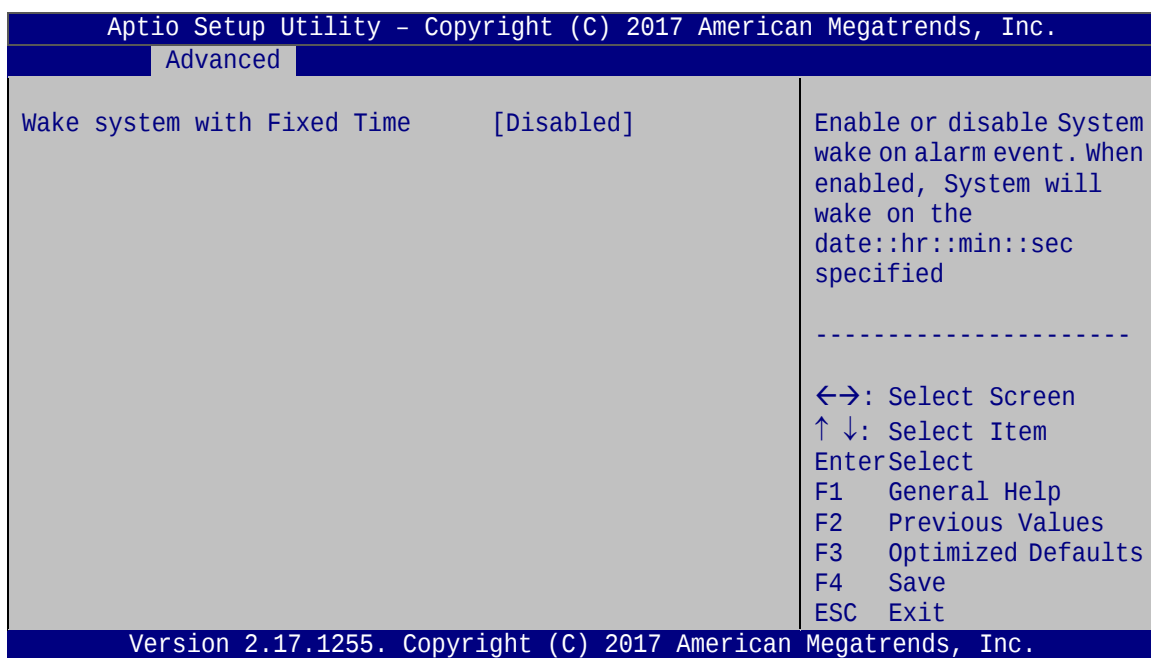
- System Temperatures:
 - CPU Temperature

UPC-F12C(M)-ULT3 Panel PC

- ☐ 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

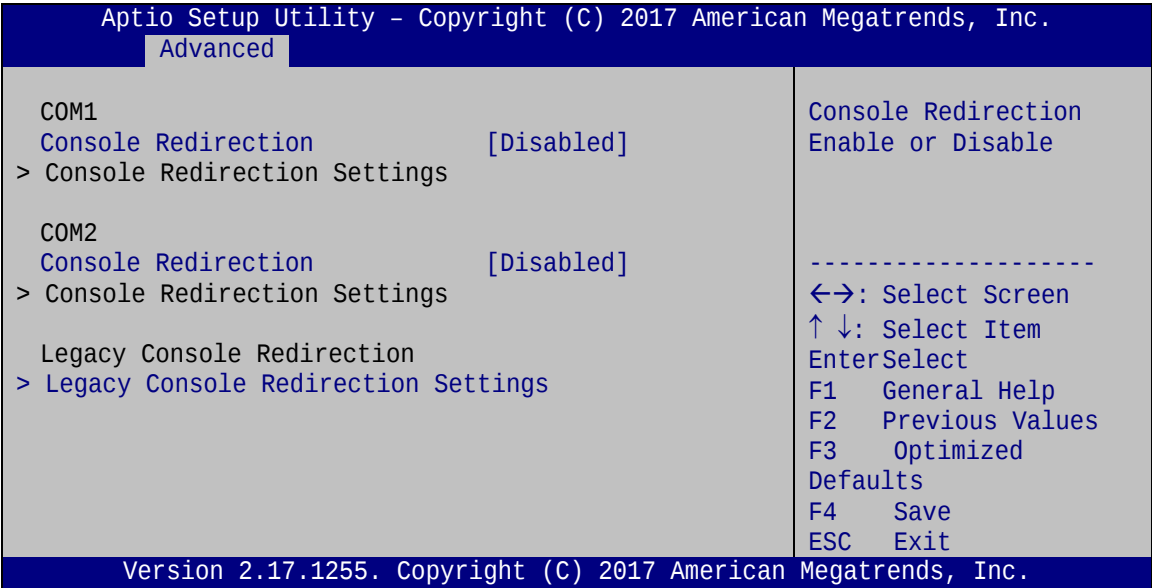
Wake up minute

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



UPC-F12C(M)-ULT3 Panel PC

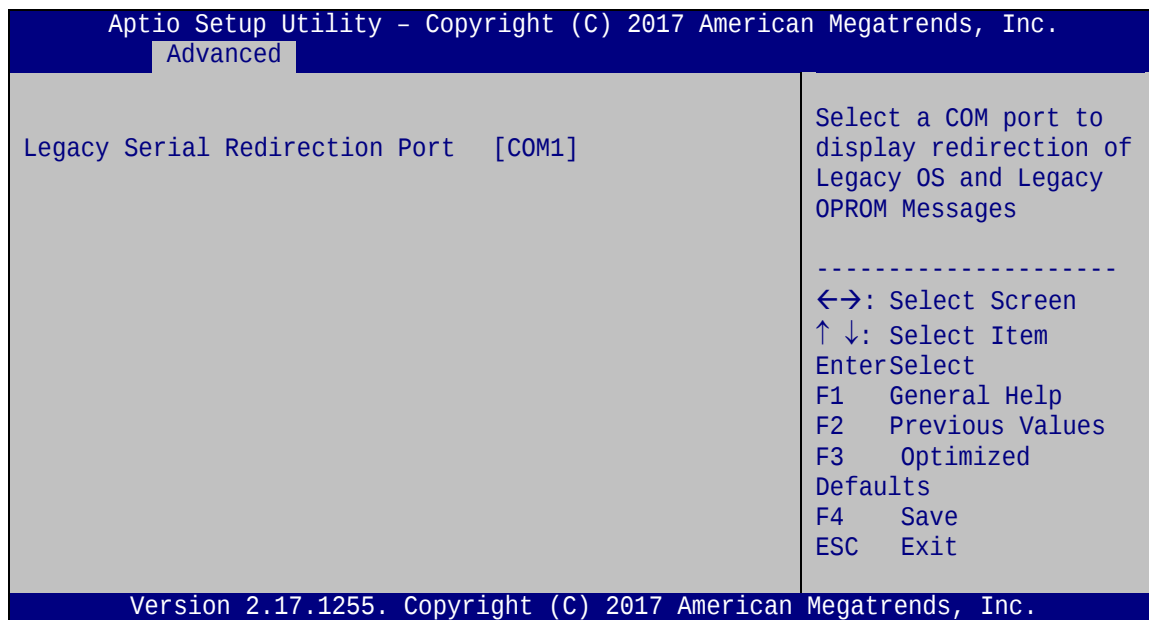
➔ Console Redirection [Disabled]

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

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

4.3.5.1 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

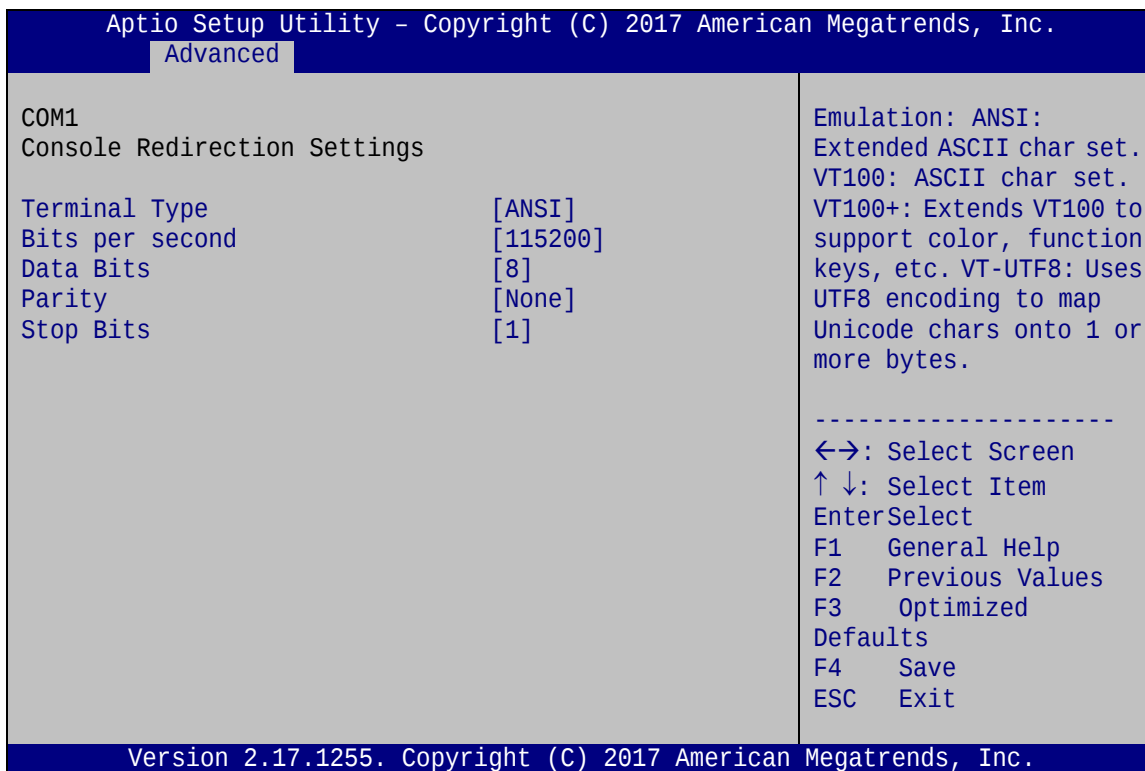
➔ Legacy Serial Redirection Port [COM1]

Use the **Legacy Serial Redirection Port** option to specify a COM port to display redirection of legacy OS and legacy OPRM 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 |

UPC-F12C(M)-ULT3 Panel PC

→ 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 for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz		
CPU Signature	406E3	
Microcode Patch	BA	
Max CPU Speed	2400 MHz	
Min CPU Speed	400 MHz	
CPU Speed	2300 MHz	
Processor Cores	2	
Hyper Threading Technology	Supported	
Intel VT-x Technology	Supported	
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	
L3 Cache	3 MB	
Hyper-Threading	[Enabled]	
Active Processor Cores	[All]	
Intel Virtualization Technology	[Disabled]	
Intel(R) SpeedStep(tm)	[Enabled]	
CPU C states	[Disabled]	

		←→: Select Screen
		↑ ↓: Select Item
		Enter Select
		F1 General Help
		F2 Previous Values
		F3 Optimized Defaults
		F4 Save
		ESC Exit
Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.		

BIOS Menu 11: CPU Configuration

UPC-F12C(M)-ULT3 Panel PC

→ **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. |



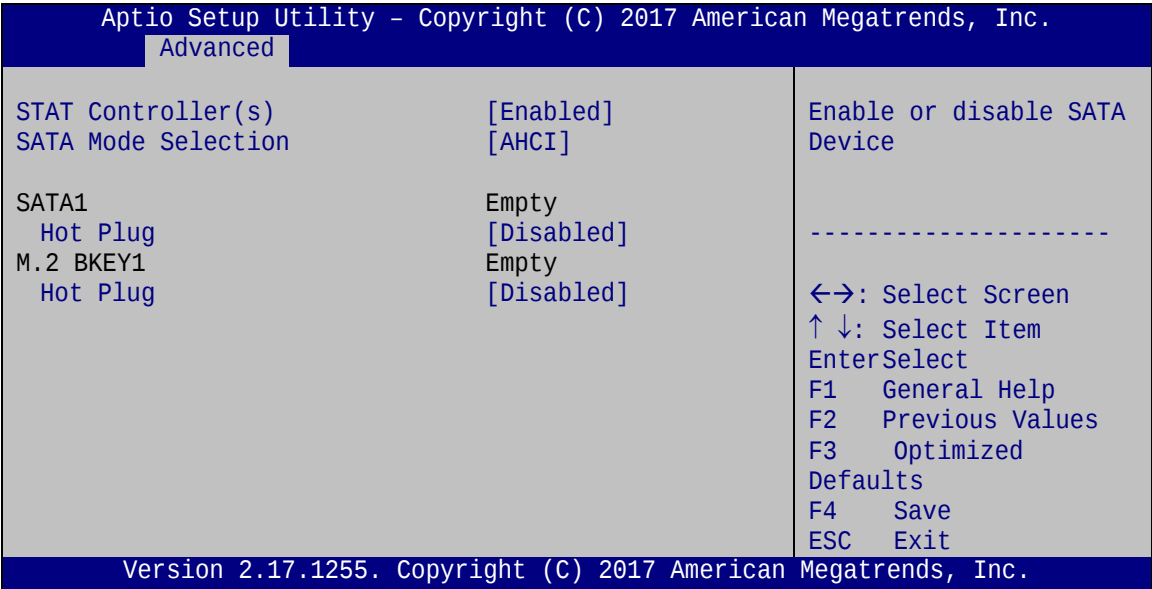
➔ CPU C State [Disabled]

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.



UPC-F12C(M)-ULT3 Panel PC

→ 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]

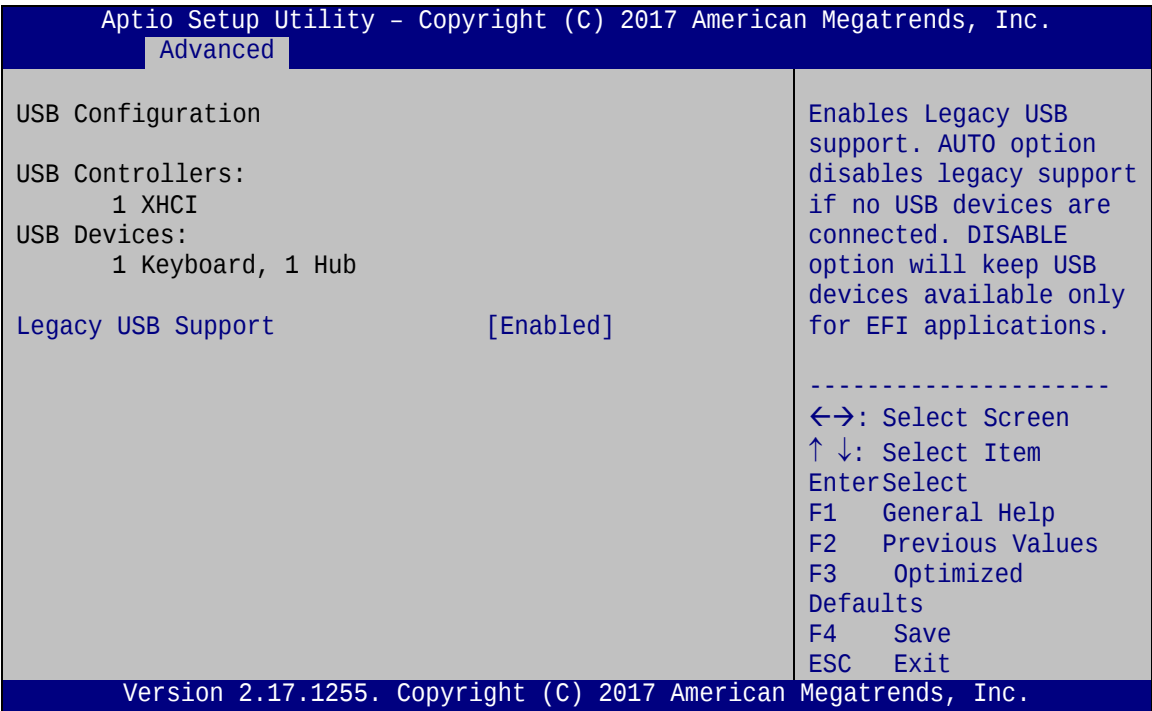
Use the **Hot Plug** option to enable or disable the SATA device hot plug.

- | | | | |
|---|----------|---------|------------------------------------|
| → | 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.

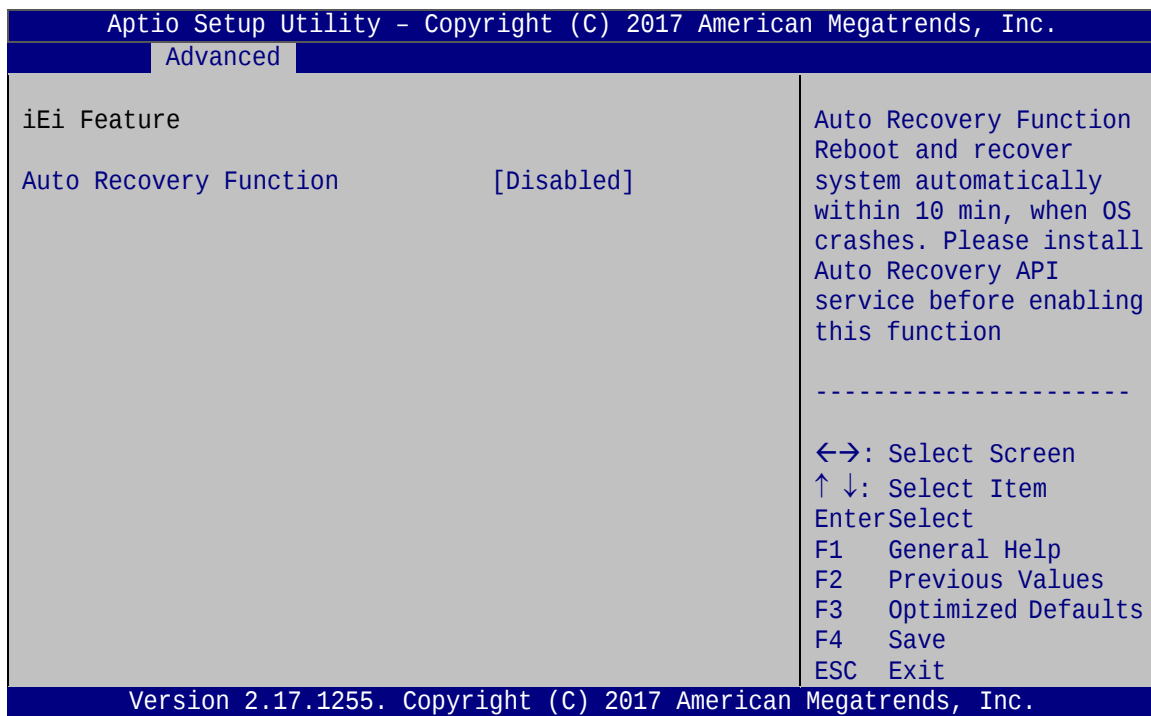


UPC-F12C(M)-ULT3 Panel PC

- | | | | |
|---|-----------------|----------------|---|
| ➔ | 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]**

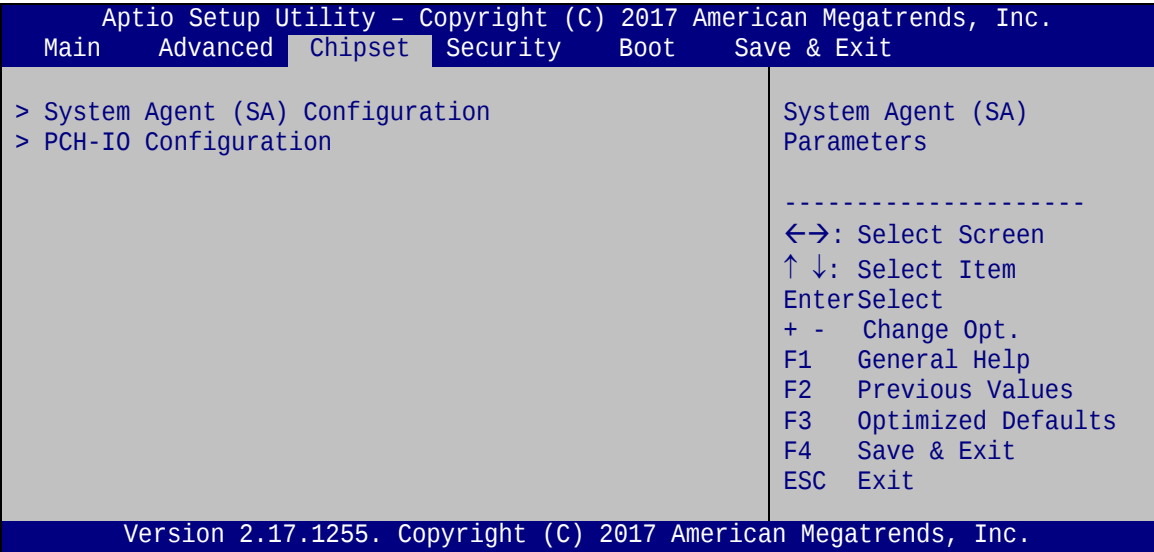
Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

- | | | | |
|---|-----------------|----------------|---------------------------------|
| ➔ | Disabled | DEFAULT | Auto recovery function disabled |
| ➔ | Enabled | | Auto recovery function enabled |



4.4 Chipset

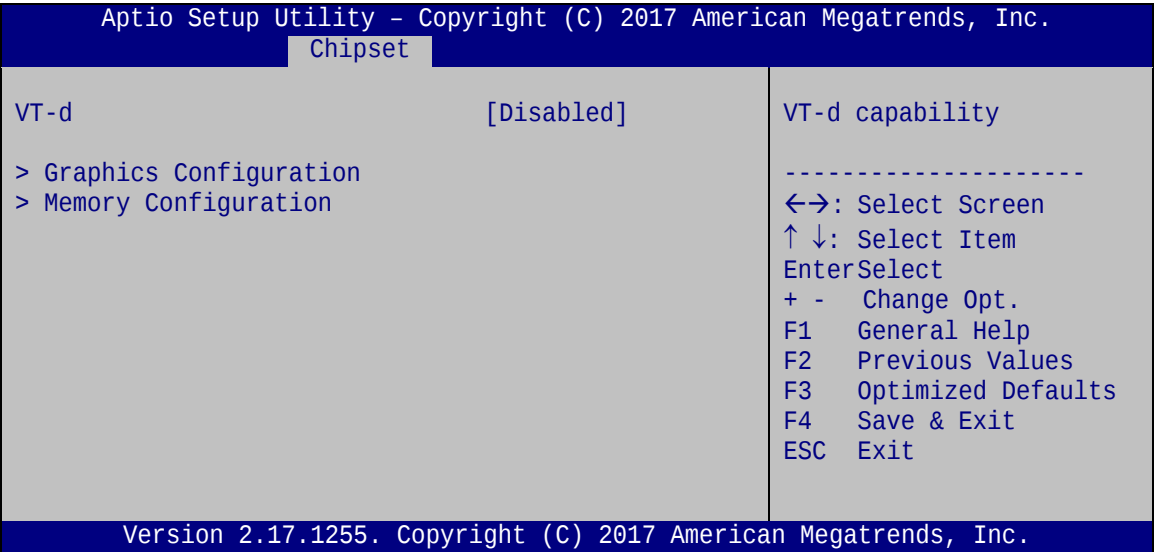
Use the **Chipset** menu (**BIOS Menu 15**) to configure the system chipset.



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



UPC-F12C(M)-ULT3 Panel PC

→ VT-d [Disabled]

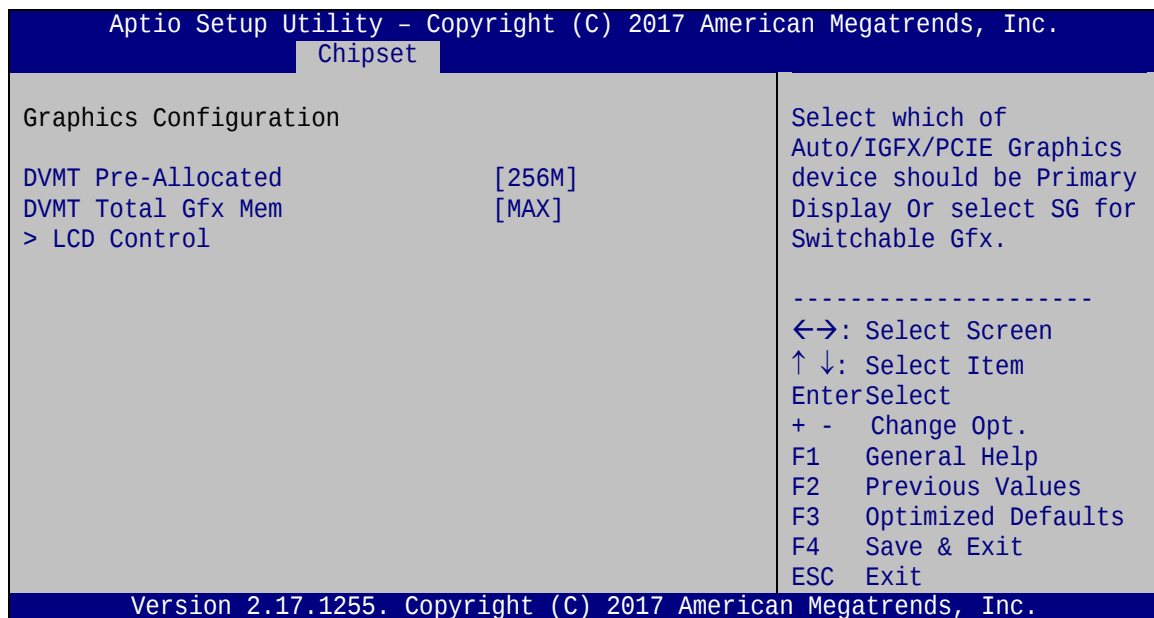
Use the **VT-d** option to enable or disable VT-d support.

→ **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**

→ DVM T Pre-Allocated [256M]

Use the **DVM T 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.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Chipset

LCD Control

Primary IGFX Boot Display [VBIOS Default]

On board LVDS [Enabled]

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

↔: Select Screen

↑ ↓: Select Item

EnterSelect

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

ESC: Exit

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BIOS Menu 18: LCD Control



UPC-F12C(M)-ULT3 Panel PC

→ 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

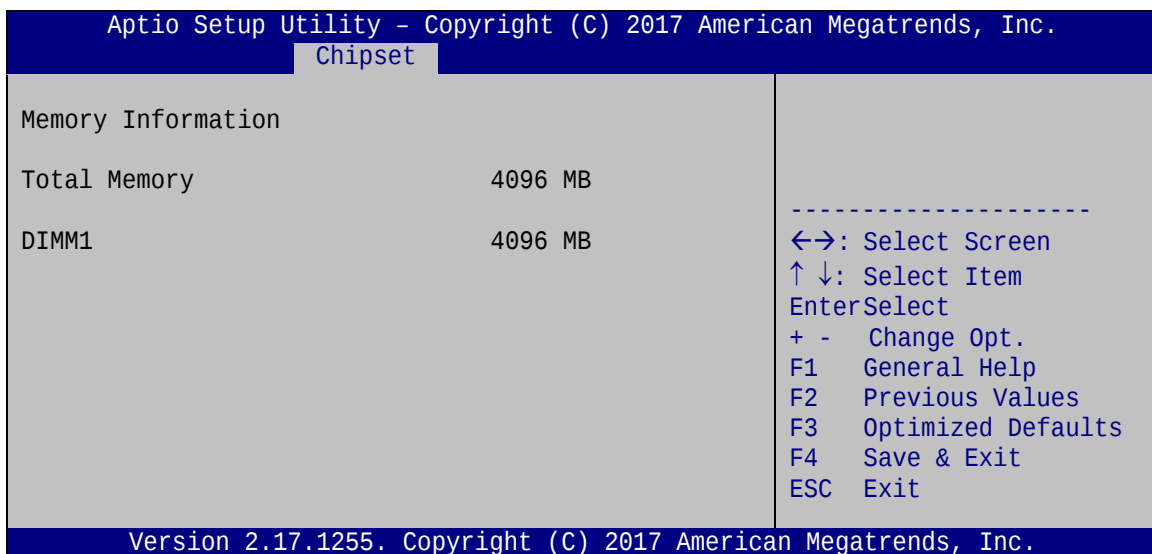
→ On board LVDS [Enabled]

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.

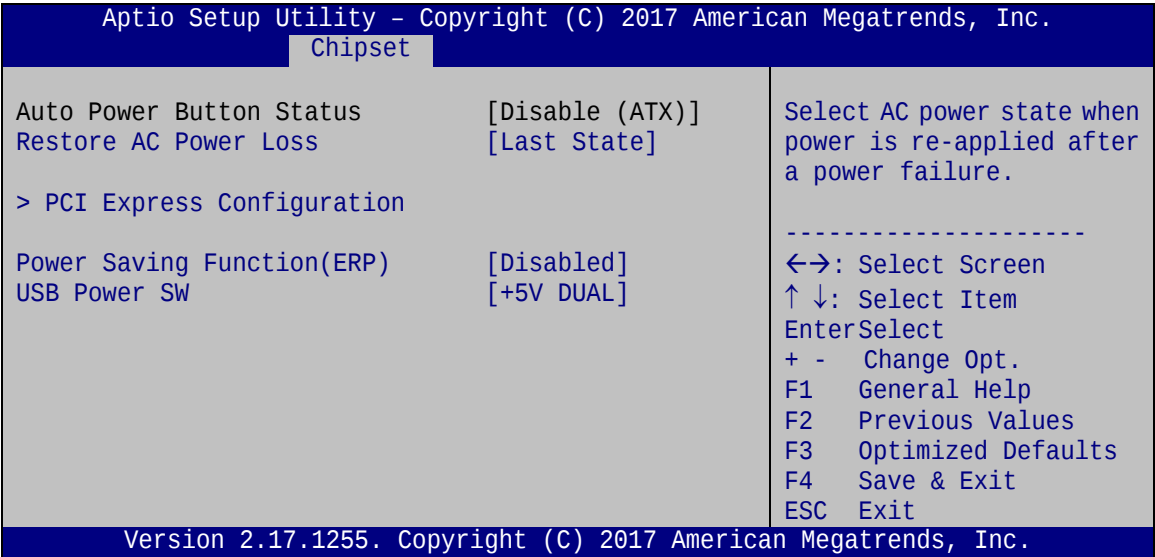


BIOS Menu 19: Memory Configuration



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.



UPC-F12C(M)-ULT3 Panel PC

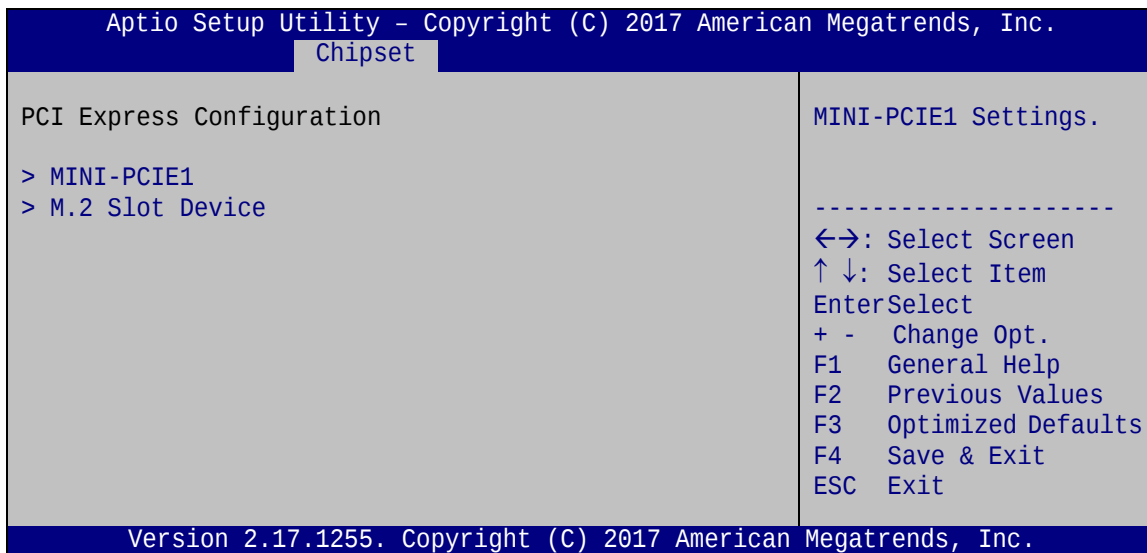
→ USB Power SW [+5V DUAL]

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

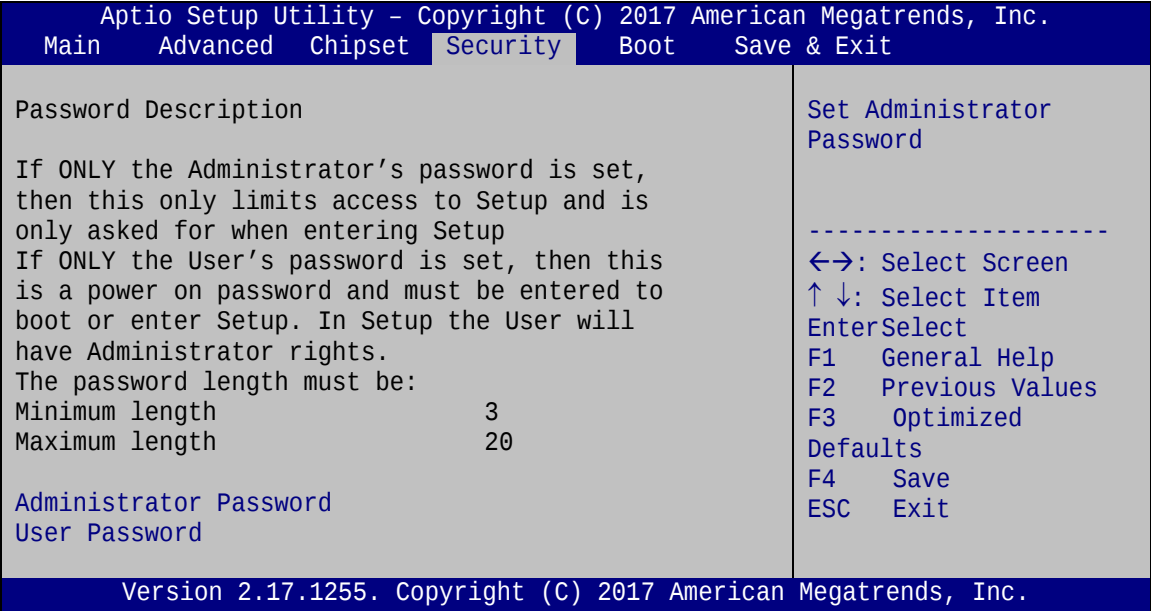
Disables to detect if a non-compliance PCI Express device is connected to the PCI Express slot.
- ➔

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**

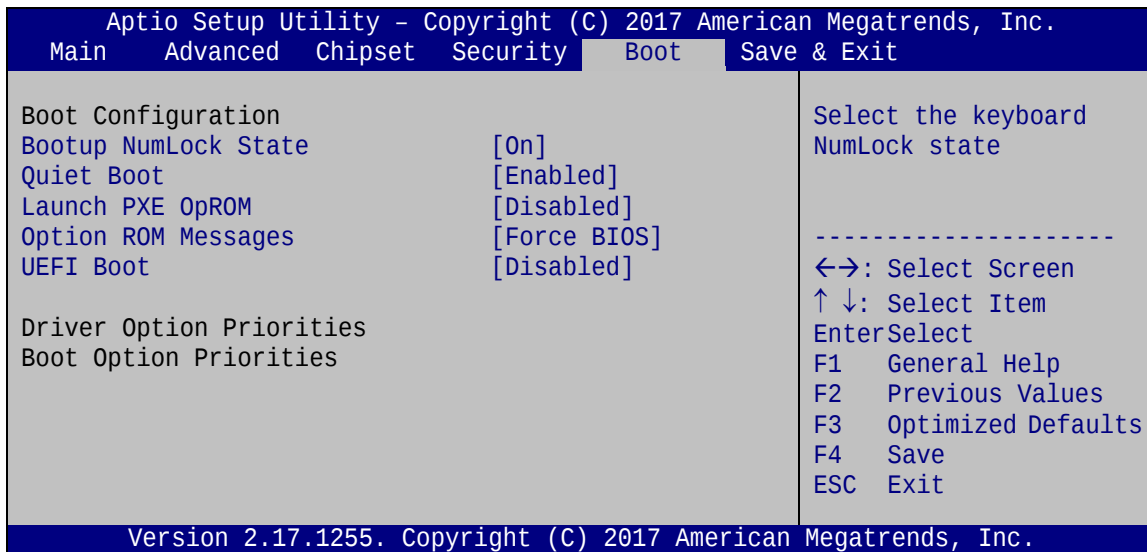
Use the **User Password** to set or change a user password.



UPC-F12C(M)-ULT3 Panel PC

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. |

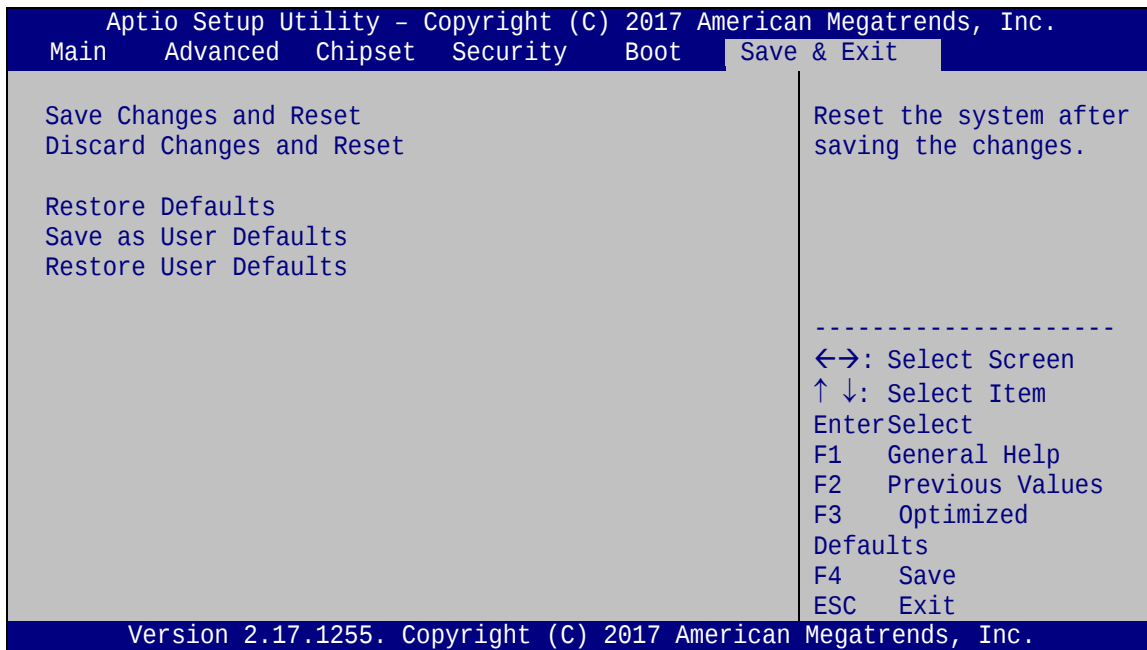
→ Boot Option Priority

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.

UPC-F12C(M)-ULT3 Panel PC

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(M)-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.

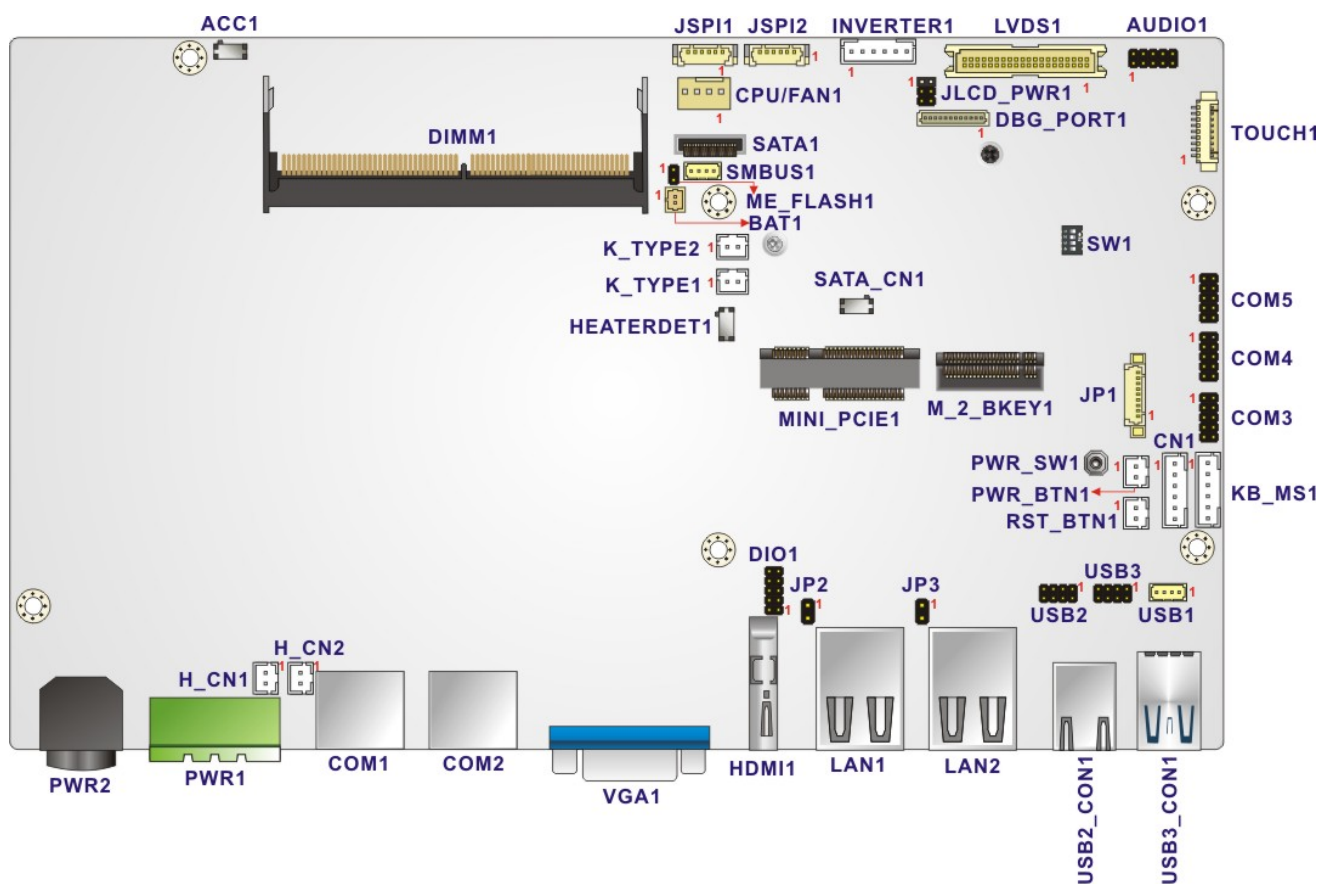


Figure 5-1: Jumper and Connector Locations (Front Side)

UPC-F12C(M)-ULT3 Panel PC



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(M)-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



UPC-F12C(M)-ULT3 Panel PC

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



UPC-F12C(M)-ULT3 Panel PC

U72 FW programming connector	9-pin wafer	JP1
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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

UPC-F12C(M)-ULT3 Panel PC

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



UPC-F12C(M)-ULT3 Panel PC

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



UPC-F12C(M)-ULT3 Panel PC

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



UPC-F12C(M)-ULT3 Panel PC

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

UPC-F12C(M)-ULT3 Panel PC**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



UPC-F12C(M)-ULT3 Panel PC

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 2.0	USB2_CON1
USB 3.0 connectors	USB 3.0	USB3_CON1
VGA connector	DB-15	VGA1

Table 5-30: Peripheral Interface Connectors

UPC-F12C(M)-ULT3 Panel PC

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)

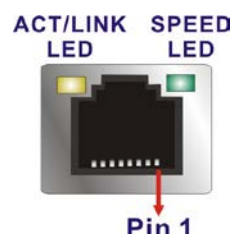
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	MDI0+	5	MDI2-	
2	MDI0-	6	MDI1-	
3	MDI1+	7	MDI3+	
4	MDI2+	8	MDI3-	

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

5.3.3 USB 2.0 Connectors (USB2_CON1)

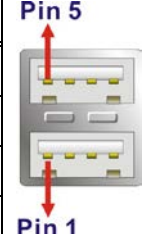
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	+5V	5	+5V	
2	USB2P0_DM2_L	6	USB2P0_DM3_L	
3	USB2P0_DP2_L	7	USB2P0_DP3_L	
4	GND	8	GND	

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

5.3.4 USB 3.0 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

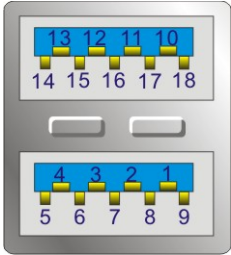


Table 5-34: USB 3.0 Connectors (USB3_CON1) Pinouts

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		

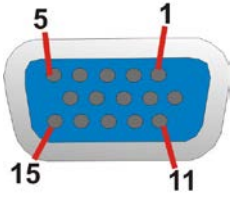


Table 5-35: VGA Connector (VGA1) Pinouts

UPC-F12C(M)-ULT3 Panel PC

5.4 Preconfigured Jumper Settings

**CAUTION:**

The following jumpers are preconfigured for the UPC-F12C(M)-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



This equipment is in conformity with the following EU directives:

- EMC Directive (2004/108/EC, 2014/30/EU)
- Low-Voltage Directive (2006/95/EC, 2014/35/EU)
- RoHS II Directive (2011/65/EU, 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 Radio Equipment Directive 2014/53/EU.

English

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

Български [Bulgarian]

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

Česky [Czech]

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

Dansk [Danish]

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

Deutsch [German]

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

Eesti [Estonian]

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

UPC-F12C(M)-ULT3 Panel PC

Español [Spanish]

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

Ελληνική [Greek]

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

Français [French]

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

Italiano [Italian]

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

Latviski [Latvian]

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

Lietuvių [Lithuanian]

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

Nederlands [Dutch]

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

Malti [Maltese]

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

Magyar [Hungarian]

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

Polski [Polish]

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

Português [Portuguese]

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

Româna [Romanian]

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

Slovensko [Slovenian]

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

Slovensky [Slovak]

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

Suomi [Finnish]

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

Svenska [Swedish]

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

UPC-F12C(M)-ULT3 Panel PC**FCC WARNING**

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

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

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

Federal Communication Commission Interference Statement

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

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

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(M)-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(M)-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(M)-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(M)-ULT3.

UPC-F12C(M)-ULT3 Panel PC

- **If considerable amounts of dust, water, or fluids enter the device**, turn off the power supply immediately, unplug the power cord, and contact the UPC-F12C(M)-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(M)-ULT3 may result in permanent damage to the UPC-F12C(M)-ULT3 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the UPC-F12C(M)-ULT3. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the UPC-F12C(M)-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.

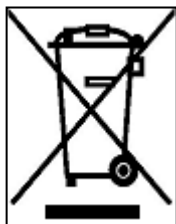
B.1.3 Product Disposal

**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.

UPC-F12C(M)-ULT3 Panel PC

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the UPC-F12C(M)-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(M)-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(M)-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(M)-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 swabs 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

➔ System Date [xx/xx/xx]	41
➔ System Time [xx:xx:xx]	41
➔ ACPI Sleep State [S3 (Suspend to RAM)]	42
➔ Serial Port [Enabled]	44
➔ Change Settings [Auto]	44
➔ Serial Port [Enabled]	45
➔ Change Settings [Auto]	45
➔ Transfer Mode [RS232]	46
➔ PC Health Status	46
➔ Wake system with Fixed Time [Disabled]	47
➔ Console Redirection [Disabled]	49
➔ Legacy Serial Redirection Port [COM1]	49
➔ Terminal Type [ANSI]	50
➔ Bits per second [115200]	51
➔ Data Bits [8]	51
➔ Parity [None]	51
➔ Stop Bits [1]	52
➔ Hyper Threading Function [Enabled]	53
➔ Active Processor Cores [All]	53
➔ Intel Virtualization Technology [Disabled]	53
➔ Intel® SpeedStep™ [Enabled]	53
➔ CPU C State [Disabled]	54
➔ STAT Controller(s) [Enabled]	54
➔ SATA Mode Selection [AHCI]	55
➔ Hot Plug [Disabled]	55
➔ USB Devices	56
➔ Legacy USB Support [Enabled]	56
➔ Auto Recovery Function [Disabled]	57
➔ VT-d [Disabled]	59
➔ DVMT Pre-Allocated [256M]	59
➔ DVMT Total Gfx Mem [MAX]	60
➔ Primary IGFX Boot Display [VBIOS Default]	61
➔ On board LVDS [Enabled]	61
➔ Restore AC Power Loss [Last State]	62

UPC-F12C(M)-ULT3 Panel PC

➔ Power Saving Function(ERP) [Disabled].....	62
➔ USB Power SW [+5V DUAL].....	63
➔ PCIe Speed [Auto].....	63
➔ Detect Non-Compliance Device [Disabled]	64
➔ Administrator Password	64
➔ User Password	64
➔ Bootup NumLock State [On].....	65
➔ Quiet Boot [Enabled]	66
➔ Launch PXE OpROM [Disabled]	66
➔ Option ROM Messages [Force BIOS].....	66
➔ UEFI Boot [Disabled]	66
➔ Boot Option Priority.....	66
➔ Save Changes and Reset	67
➔ Discard Changes and Reset	67
➔ Restore Defaults	67
➔ Save as User Defaults	68
➔ Restore User Defaults	68

Appendix

D

Watchdog Timer

UPC-F12C(M)-ULT3 Panel PC

**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



UPC-F12C(M)-ULT3 Panel PC

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

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

Please refer to the following table.

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



UPC-F12C(M)-ULT3 Panel PC

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

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

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