



**12.1" 600cd/m² XGA Fanless Panel PC with
Intel® Core™ Raptor Lake-P i3-1315URE CPU, 8GB LPDDR4x
RAM, PCAP touch, M12 I/O**

User Manual

Revision

Date	Version	Changes
January 16, 2025	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。
-

UPC-F12M1-RPLP

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

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

- en** Warning! Operation of this equipment in a residential environment could cause radio interference.
- de** Vorsicht! Der Betrieb dieses Geräts in einer Wohnumgebung kann zu Funkstörungen führen.
- fr** Warning! L'utilisation de cet équipement dans un environnement résidentiel peut provoquer des interférences radio.
- it** Avvertenza! Il funzionamento di questa apparecchiatura in un ambiente residenziale potrebbe causare interferenze radio.
- es** Atención! El funcionamiento de este equipo en un entorno residencial podría causar interferencias de radio.
- zh** 警告！在住宅環境中操作該設備可能會造成無線電干擾。
- cn** 警告！在住宅环境中操作该设备可能会造成无线电干扰。
-

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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

REVISION.....	II
SAFETY INSTRUCTIONS	III
COPYRIGHT	VI
MANUAL CONVENTIONS	VII
TABLE OF CONTENTS.....	VIII
LIST OF FIGURES	XI
LIST OF TABLES.....	XII
1 INTRODUCTION.....	1
1.1 OVERVIEW.....	2
1.2 MODEL VARIATIONS	3
1.3 FEATURES.....	3
1.4 FRONT VIEW	4
1.5 REAR VIEW	4
1.6 SYSTEM SPECIFICATIONS.....	5
1.7 DIMENSIONS.....	8
2 UNPACKING	9
2.1 UNPACKING.....	10
2.2 PACKING LIST.....	10
2.3 OPTIONAL ITEMS	11
3 INSTALLATION	13
3.1 ANTI-STATIC PRECAUTIONS	14
3.2 INSTALLATION PRECAUTIONS	15
3.3 SSD INSTALLATION	16
3.4 M12 I/O CONNECTORS.....	18
3.4.1 M12 DC-in Power Connector	18
3.4.2 M12 CANBUS Connector	19
3.4.3 M12 COM Connector	19

UPC-F12M1-RPLP

3.4.4 M12 Lan Connector	20
3.4.5 M12 USB Connector	20
3.5 INTERNAL I/O CONNECTORS	21
3.5.1 Internal RS-232 Connector (COM1)	22
3.5.2 Internal RS-232/422/485 Connector (COM2)	22
3.5.3 Internal LAN Connector	23
3.5.4 Internal CANBUS Connector	23
3.5.5 Internal Power Connector	24
3.6 MOUNTING THE SYSTEM	25
3.7 POWERING ON THE SYSTEM	26
3.8 POWER SWITCH	28
3.9 ACC POWER MODE	28
3.10 AVAILABLE DRIVERS	30
3.10.1 Driver Download	30
4 MOTHERBOARD INTERFACE	錯誤! 尚未定義書籤。
4.1 PERIPHERAL INTERFACE CONNECTORS	33
4.2 INTERNAL PERIPHERAL CONNECTORS	34
4.2.1 BIOS Programmer Connector (J_SPI1)	35
4.2.2 Debug Connector (DBG_PORT1)	36
4.2.3 EC Programmer Connector (EC_FLASH1)	36
4.2.4 Flash Descriptor Security Override (ME_FLASH1)	36
4.2.5 EC Debug Connector (EC_DEBUG1)	36
4.2.6 Reset BTN Connector (RST1)	37
4.2.7 HDD LED Connector (HDD_LED11)	37
4.2.8 CPU FAN Connector (CPU_FAN1)	37
4.2.9 Panel Inverter Connector (J_INV1)	37
4.2.10 Power LED / Power BTN Connector (PWR_BTN1)	38
4.2.11 Heater Power Connector Connector (J_HEATER1)	38
4.2.12 RFID Connector (J_RFID1)	38
4.2.13 Touch Panel Connector (J_TOUCH1)	38
4.3 EXTERNAL INTERFACE PANEL CONNECTORS	39
4.3.1 Power input Connector (PWR1)	39
4.3.2 Power input Connectors (PWR2)	40
4.3.3 CAN BUS Connector RJ45(CAN1)	40

UPC-F12M1-RPLP

<i>4.3.4 CAN BUS Connector RJ45(CAN2).....</i>	<i>41</i>
<i>4.3.5 LAN Connector (LAN1/LAN2).....</i>	<i>41</i>
<i>4.3.6 Dual USB2.0 Connector (USB1)</i>	<i>41</i>
<i>4.3.7 Dual USB 3.2 gen2 Connector (USB2).....</i>	<i>42</i>
<i>4.3.8 Single USB 3.2 gen1 Connector (USB3).....</i>	<i>42</i>
<i>4.3.9 RS232 Connector (RJ45 COM1).....</i>	<i>43</i>
<i>4.3.10 RS232/422/485 Connector (RJ45 COM2).....</i>	<i>43</i>

List of Figures

Figure 1-1: UPC-F12M1-RPLP Panel PC	2
Figure 1-2: Front View	4
Figure 1-3: Rear View	錯誤! 尚未定義書籤。
Figure 1-4: Dimensions (mm)	8
Figure 3-1: SSD Slot Cover Retention Screws	16
Figure 3-2: Remove SSD Bracket	16
Figure 3-3: Secure the M.2 Module	17
Figure 3-4: Cable Cover Screw	21
Figure 3-5: Internal Connector Definition	21
Figure 3-6: VESA Mounting Retention Screw Holes	24
Figure 3-7: VESA Mounting Retention Screw Holes	錯誤! 尚未定義書籤。
Figure 3-8: M12 Power Connector Location	26
Figure 3-9: Power Cable	26
Figure 3-10: Power Switch Location	28
Figure 3-11: IEI Resource Download Center	30
Figure 4-1: Jumper and Connector Locations (Front Side)	33
Figure 4-2: Jumper and Connector Locations (Solder Side)	34

List of Tables

Table 1-1: Model Variations	3
Table 1-2: System Specifications	6
Table 3-1: M12 Power Connector Pinouts	18
Table 3-2: M12 CANBUS Connector Pinouts	19
Table 3-3: M12 COM Connector Pinouts	19
Table 3-4: M12 Lan Connector Pinouts	20
Table 3-5: M12 USB Connector Pinouts	20
Table 3-6: Internal RS-232 Connector (COM1) Pinouts	22
Table 3-7: Internal RS-232/422/485 Connector (COM2) Pinouts	22
Table 3-8: Internal Lan1/2 Connector (RJ45) Pinouts	23
Table 3-9: Internal CAN1 Connector (RJ45) Pinouts	23
Table 3-10: Internal CAN2 Connector (RJ45) Pinouts	23
Table 3-11: Power Cable Pinouts	27
Table 3-12: Power Light Instruction	27
Table 3-13: ACC Switch Definition	28
Table 4-1: Peripheral Interface Connectors	35
Table 4-2: BIOS Programmer Connector (J_SPI1)	35
Table 4-3: Debug Connector (DBG_PORT1)	36
Table 4-4: EC Programmer Connector (EC_FLASH1)	36
Table 4-5: Flash Descriptor Security Override (ME_FLASH1)	36
Table 4-6: EC Debug Connector (EC_DEBUG1)	36
Table 4-7: Reset BTN Connector (RST1)	37
Table 4-8: HDD LED Connector (HDD_LED11)	37
Table 4-9: CPU FAN Connector (CPU_FAN1)	37
Table 4-10: Panel Inverter Connector (J_INV1)	37
Table 4-11: Power LED / Power BTN Connector (PWR_BTN1)	38
Table 4-12: Heater Power Connector Connector (J_HEATER1)	38
Table 4-13: RFID Connector (J_RFID1)	38
Table 4-14: Touch Panel Connector (J_TOUCH1)	38
Table 4-15: Peripheral Interface Connectors	39
Table 4-16: PWR Connector (PWR1) Pinouts	40

UPC-F12M1-RPLP

Table 4-17: Power input Connectors (PWR2) Pinouts	40
Table 4-18: CAN BUS Connector RJ45 (CAN1)	40
Table 4-19: CAN BUS Connector RJ45 (CAN2)	41
Table 4-20: RJ45 LAN Connector (LAN1/LAN2)	41
Table 4-21: USB 2.0 Connector(USB 2.0)	42
Table 4-22: USB 3.2 gen2 Connector (USB2).....	42
Table 4-23: Single USB 3.2 gen1 Connector (USB 3).....	42
Table 4-24: RS232 Connector (RJ45 COM1)	43
Table 4-25: RS232/422/485 Connector (RJ45 COM2)	43

Chapter

1

Introduction

UPC-F12M1-RPLP

1.1 Overview



Figure 1-1: UPC-F12M1-RPLP Panel PC

The UPC-F12M1-RPLP series is a quad-core Intel® Raptor Lake-P powered panel PC with a rich variety of functions and peripherals.

The aluminum die-casting design and the IP66 enclosure make the UPC-F12M1-RPLP an ideal system for use in harsh environment.

The Intel® Raptor Lake-P Core™ i3-1315URE is a System-on-Chip (SoC) that ensures optimal memory, graphics, and peripheral I/O support. The system comes with 8.0 GB of LPDDR4 onboard 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-F12M1-RPLP

1.2 Model Variations

There are several models in the UPC-F12M1-RPLP series. The model numbers and model variations are listed below.

Model	Processor	Touchscreen
UPC-F12M1-RPLP-i3/PC/8G-R10	Intel® Raptor Lake-P Core™ i3-1315URE	Projected capacitive

Table 1-1: Model Variations

1.3 Features

The UPC-F12M1-RPLP features are listed below:

- 12.1" LCD with LED backlight
- Flat display screen made of toughened glass with 6H hardness
- Projected capacitive type touchscreen
- Intel® Raptor Lake-P Core™ i3-1315URE processor
- Preinstalled with dual channel 8GB LPDDR4x on board
- Built-in Wi-Fi 802.11a/b/g/n/ax and Bluetooth v5.2
- Fanless design
- 6-sides IP66 protection
- 9V–36V wide range DC power input

UPC-F12M1-RPLP

1.4 Front View

The front side of the UPC-F12M1-RPLP is a panel with a TFT LCD touchscreen surrounded by an aluminum die-casting frame (**Figure 1-2**).

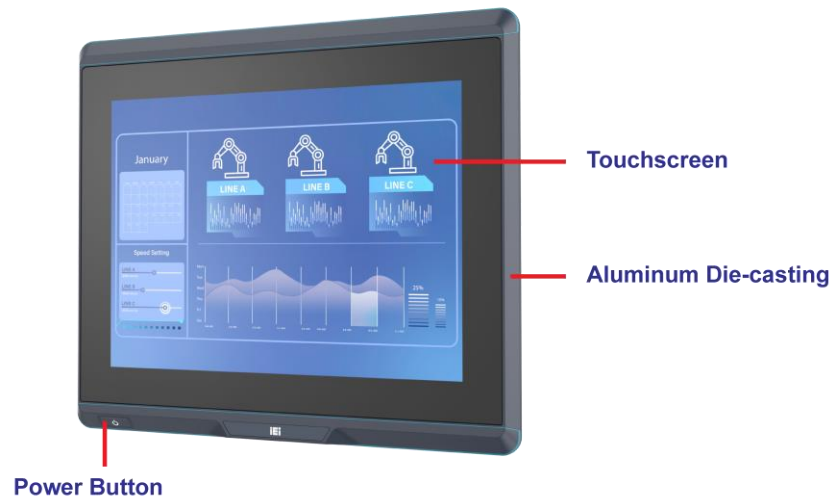


Figure 1-2: Front View

1.5 Rear View

The rear side of the UPC-F12M1-RPLP contains VESA mount screw holes. The rear view also provides access for installing M.2 SSD.

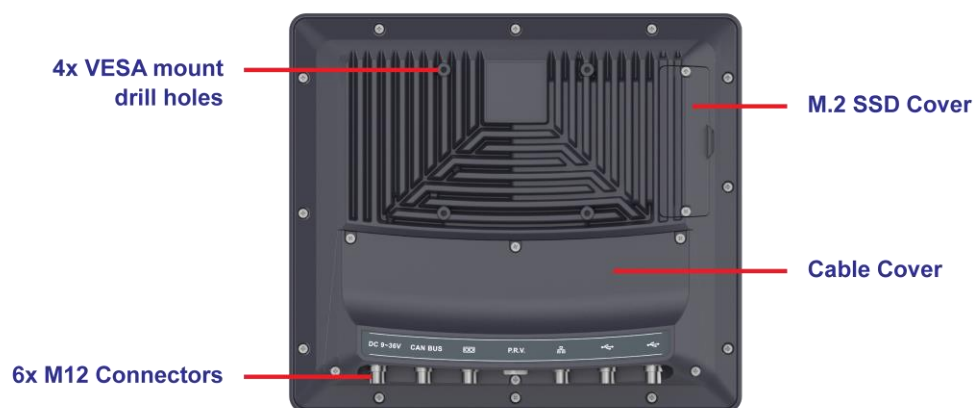


Figure 1-3: Rear View

UPC-F12M1-RPLP

1.6 System Specifications

The technical specifications for the UPC-F12M1-RPLP systems are listed in **Table 1-2**.

Specification	UPC-F12M1-RPLP
LCD Size	12.1"
Max. Resolution	1024 (W) x 768 (H)
Brightness (cd/m²)	600
Contrast Ratio	1000:1
LCD Color	16.7M
Pixel Pitch (H x V) (mm)	0.24 x 0.24
Viewing Angle (H-V)	178° / 178°
Backlight MTBF	50,000 hours
Backlight	LED
Touchscreen	Projected Capacitive touch panel (anti-UV/AG coating)
CPU (SoC)	Intel® Raptor Lake-P Core™ i3-1315URE
Memory	Dual channel 8GB LPDDR4x on board
Ethernet	LAN1: Intel® I226IT 2.5GbE controller LAN2: Intel® I226IT 2.5GbE controller
Wi-Fi & Bluetooth (Optional)	IEEE 802.11 a/b/g/n/ax + Bluetooth V5.2
RFID (Optional)	Reserved RFID antenna area
Storage	1 x M.2 M key 2280 (PCIe Gen3 x4)
Expansions	1 x M.2 B key 3042/3052/3080 (SATA & PCIe Gen3 x1 & USB 3.0) 1 x M.2 M key 2280 (PCIe Gen3 x4)
Construction Material	Aluminum die-casting
Thermal Design	Fanless
VESA Mount	100 mm x 100 mm
Net Weight	5.02 kg
Dimensions (W x H x D)	316.0 mm x 279.0 mm x 67.0 mm

UPC-F12M1-RPLP

Operating Temperature	-20°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Humidity	10% to 95%@40°C (non-condensing)
IP Level	Full body IP66
Safety/EMC	CE/FCC/UKCA
Power Input	9 ~ 36 V
Internal I/O Ports	1 x 9V ~ 36 V DC input jack 1 x 3-pin Terminal block 2 x CANBUS 2 x 2.5GbE LAN 1 x USB 3.2 Gen1 2 x USB 3.2 Gen2 2 x USB 2.0 1 x HDMI 1x RJ45 with RS232 1x RJ45 with RS232/422/485
External M12 I/O	1 x 5pin M12A MALE connector for Terminal block (9V~36V DC) 1 x 8pin M12A MALE connector for CANBUS 1 x 8pin M12A MALE connector for COM (RS-232/422/485) 1 x 8pin M12X MALE connector for GbE LAN (2.5G) 2 x 8pin M12A MALE connector for USB 2.0

Table 1-2: System Specifications

UPC-F12M1-RPLP



WARNING!

This equipment complies with CE radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

5G WiFi alerts and restricted country codes

The device is restricted to indoor use only when operating in the 5150 to 5350 MHz frequency range.

UPC-F12M1-RPLP

1.7 Dimensions

The dimensions of the UPC-F12M1-RPLP are shown below.

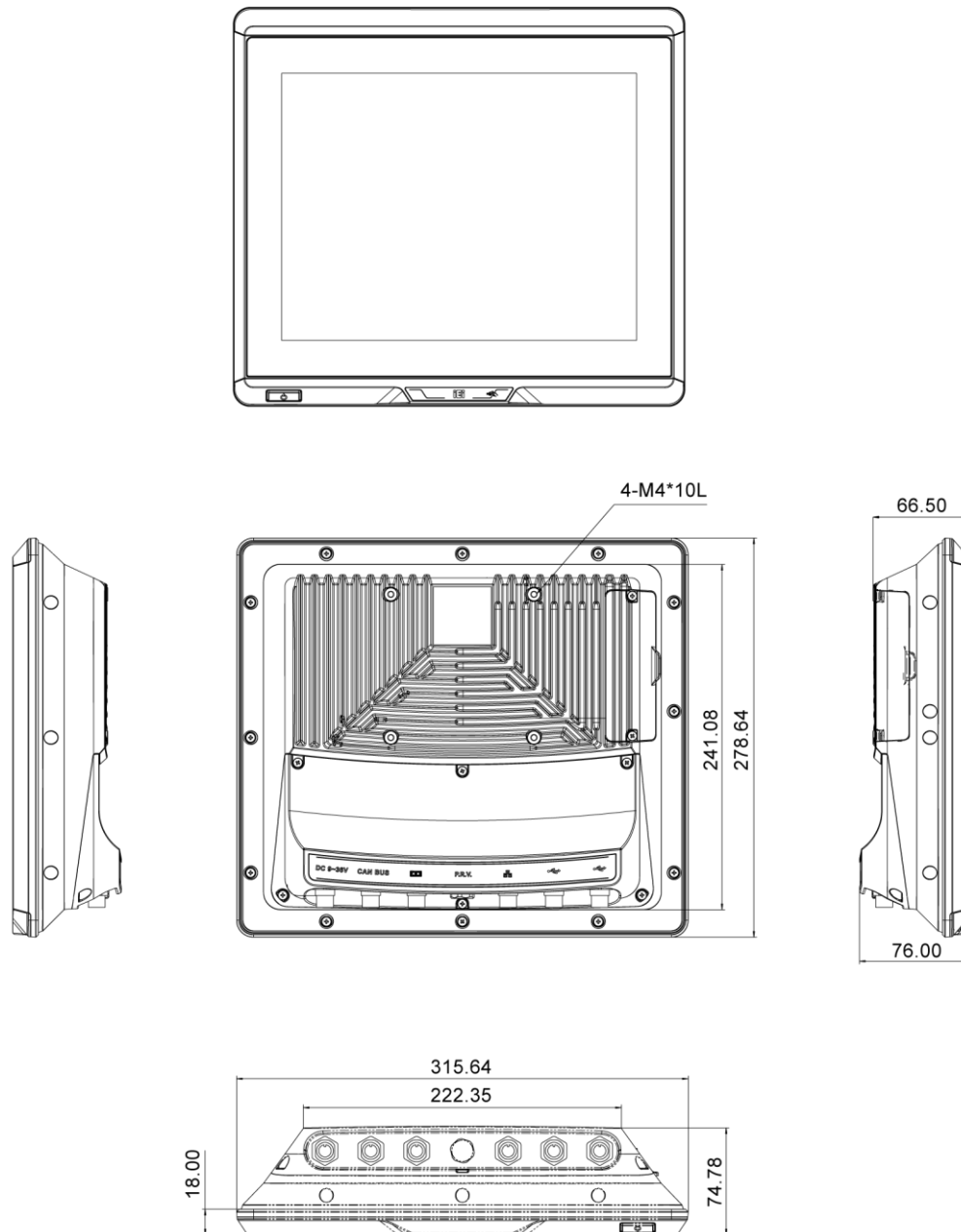


Figure 1-4: Dimensions (mm)

Chapter

2

Unpacking

UPC-F12M1-RPLP

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.

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-F12M1-RPLP was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

UPC-F12M1-RPLP

The UPC-F12M1-RPLP panel PC is shipped with the following components:

Quantity	Item	Image
1	UPC-F12M1-RPLP panel PC	
1	2 meter M12 power cable	
1	3 meter M12 to USBx2 cable	

2.3 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Wi-Fi Module (P/N: UPC-F-WIFI-KIT01-R10)	
RFID Module (P/N: UPC-F-MF-RFID-KIT02-R10)	

UPC-F12M1-RPLP

Item and Part Number	Image
CANBUS M12 cable (P/N: 32005-006600-100-RS)	
COM M12 cable (P/N: 32005-006500-100-RS)	
LAN M12 cable (P/N: 32013-007400-100-RS)	
Wall Mount Kit (P/N: AFLWK-19B)	
Stand for VESA 75/VESA 100 (P/N: STAND-C12-R10)	

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

Chapter

3

Installation

UPC-F12M1-RPLP

3.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the maintenance of the UPC-F12M1-RPLP may result in permanent damage to the UPC-F12M1-RPLP and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the UPC-F12M1-RPLP. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the UPC-F12M1-RPLP 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-F12M1-RPLP, place it on an anti-static pad. This reduces the possibility of ESD damaging the UPC-F12M1-RPLP.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

3.2 Installation Precautions

**CAUTION:**

The UPC-F12M1-RPLP 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-F12M1-RPLP 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.

UPC-F12M1-RPLP

3.3 SSD Installation

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

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

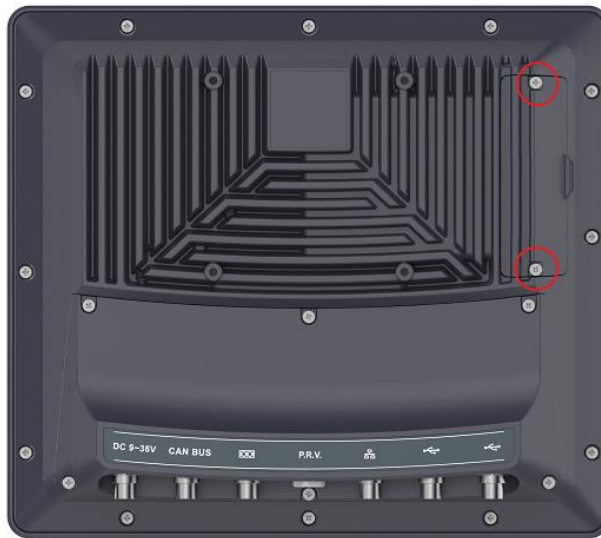


Figure 3-1: SSD Slot Cover Retention Screws

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



Figure 3-2: Remove SSD Bracket

UPC-F12M1-RPLP

Step 3: Remove the M.2 retention screw. Slide the M.2 module into the socket at an angle of about 20°. Push the M.2 module down and secure it with a screw.

(Figure 3-3).

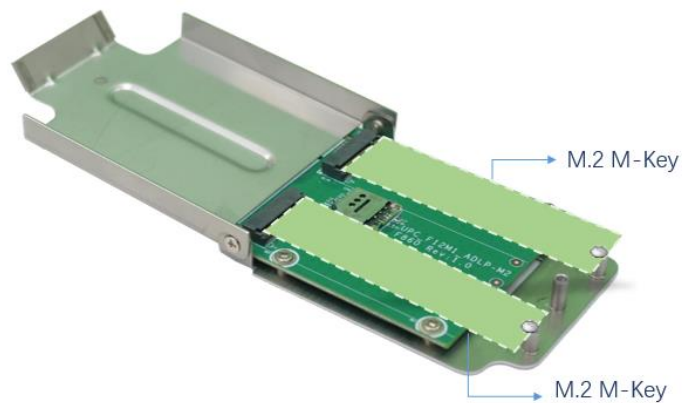


Figure 3-3: Secure the M.2 Module

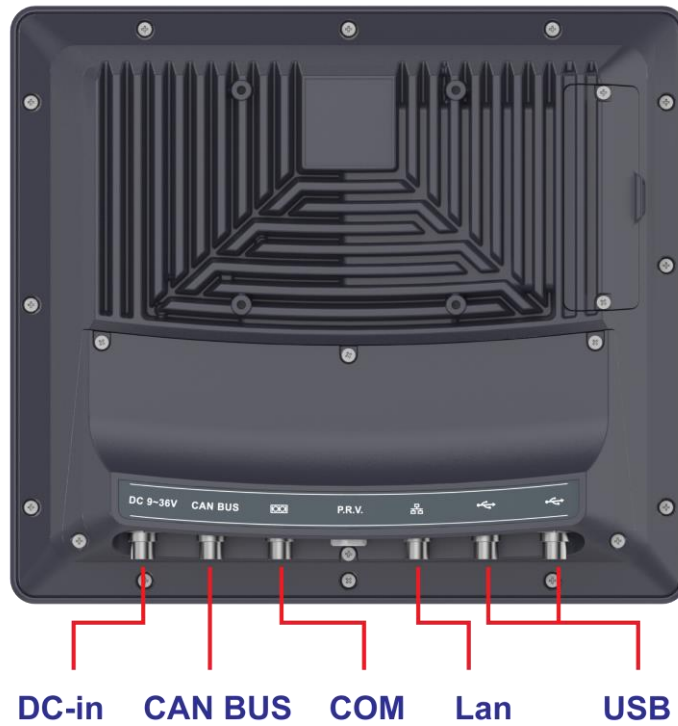
Step 4: Insert the SSD bracket into the slot carefully until the bracket reach the end of the slot.

Step 5: Re-install the SSD slot cover and secure it with two retention screws.

UPC-F12M1-RPLP

3.4 M12 I/O Connectors

Take off M12 connector nut, you can find Pin define of each M12 connector as below.



3.4.1 M12 DC-in Power Connector

M12 power connector is 5 pins M12A MALE connector, pin definitions are described in the table below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	V+ (Red)	4	GND (Black)	
2	V+ (Red)	5	ACC (White)	
3	GND (Black)			

Table 3-1: M12 Power Connector Pinouts

UPC-F12M1-RPLP

3.4.2 M12 CANBUS Connector

M12 CANBUS connector is 8 pins M12A MALE connector, pin definitions are described in the table below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	5	GND
2	CAN_L	6	GND
3	GND	7	CAN_H
4	DIO OUT5	8	NC

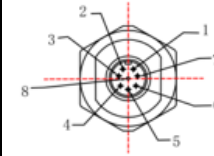


Table 3-2: M12 CANBUS Connector Pinouts

3.4.3 M12 COM Connector

M12 COM connector is 8 pins M12A MALE connector, pin definitions are described in the table below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	5	GND
2	RX	6	DSR
3	TX	7	RTS
4	DTR	8	CTS

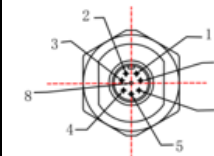


Table 3-3: M12 COM Connector Pinouts

UPC-F12M1-RPLP

3.4.4 M12 Lan Connector

M12 Lan connector is 8 pins M12X MALE connector, pin definitions are described in the table below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDX0+	5	MDX3+
2	MDX0-	6	MDX3-
3	MDX1+	7	MDX2-
4	MDX1-	8	MDX2+

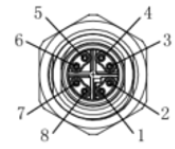


Table 3-4: M12 Lan Connector Pinouts

3.4.5 M12 USB Connector

M12 USB connector is 8 pins M12A MALE connector, pin definitions are described in the table below.

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

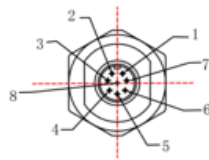


Table 3-5: M12 USB Connector Pinouts

UPC-F12M1-RPLP

3.5 Internal I/O Connectors

First remove six screws on the cable cover, then take off the cable cover and you will see the internal connectors.

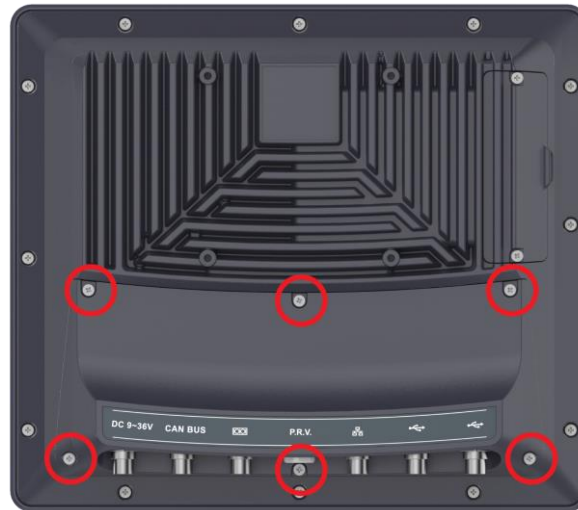


Figure 3-4: Cable Cover Screw

The UPC-F12M1-RPLP series is equipped with several I/O connectors for peripheral device connection. The pinouts of some of the internal connectors are listed below.

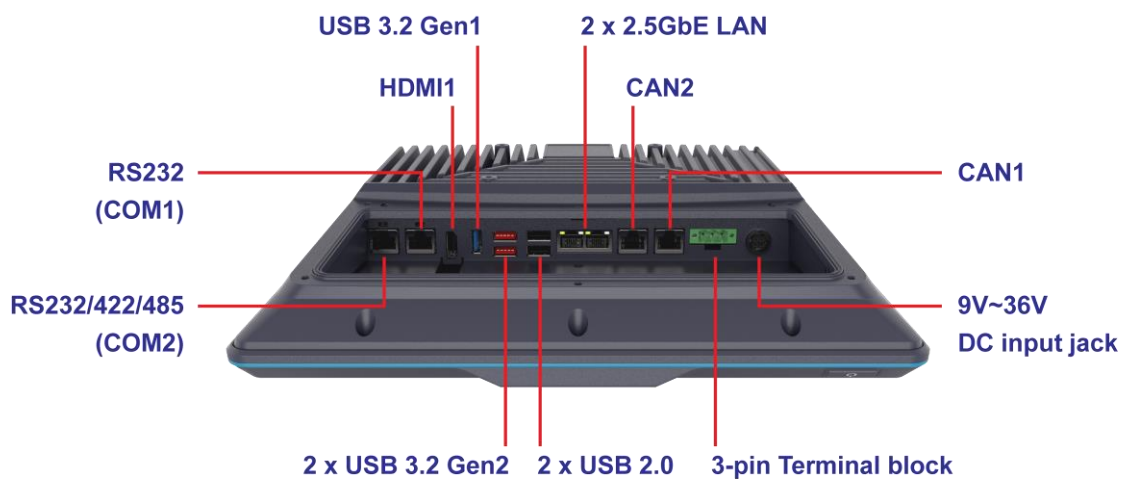


Figure 3-5: Internal Connector Definition

UPC-F12M1-RPLP

3.5.1 Internal RS-232 Connector (COM1)

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

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

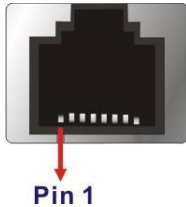


Table 3-6: Internal RS-232 Connector (COM1) Pinouts

3.5.2 Internal 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.

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

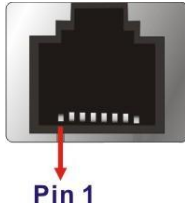


Table 3-7: Internal RS-232/422/485 Connector (COM2) Pinouts

UPC-F12M1-RPLP

3.5.3 Internal LAN Connector

The pinouts for the Lan1/2 connector (RJ45) are listed in the figure and table below.

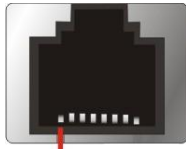
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	 Pin 1
1	MDI3-	5	MDI1-	
2	MDI3+	6	MDI1+	
3	MDI2-	7	MDI0-	
4	MDI2+	8	MDI0+	

Table 3-8: Internal Lan1/2 Connector (RJ45) Pinouts

3.5.4 Internal CANBUS Connector

The pinouts for the CANBUS connector (RJ45) are listed in the figure and table below.

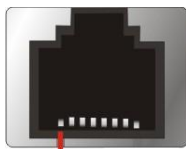
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	 Pin 1
1	NC	5	GND	
2	GND	6	NC	
3	CAN_L	7	DIO OUT5	
4	CAN_H	8	VCC5V	

Table 3-9: Internal CAN1 Connector (RJ45) Pinouts

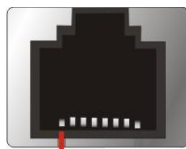
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	 Pin 1
1	NC	5	GND	
2	GND	6	NC	
3	CAN_L	7	DIO_IN6	
4	CAN_H	8	DIO_IN5	

Table 3-10: Internal CAN2 Connector (RJ45) Pinouts

UPC-F12M1-RPLP

3.5.5 Internal Power Connector

The pinouts for the power terminal pinout is showed in the figure.



Figure 3-6: VESA Mounting Retention Screw Holes

UPC-F12M1-RPLP

3.6 Mounting the System

The UPC-F12M1-RPLP is VESA (Video Electronics Standards Association) compliant and can be mounted on a mounting device with a 100 mm interface pad. The UPC-F12M1-RPLP VESA mount retention screw holes are shown in 錯誤! 找不到參照來源。 . Refer to the installation guide that came with the mounting device to mount the UPC-F12M1-RPLP.

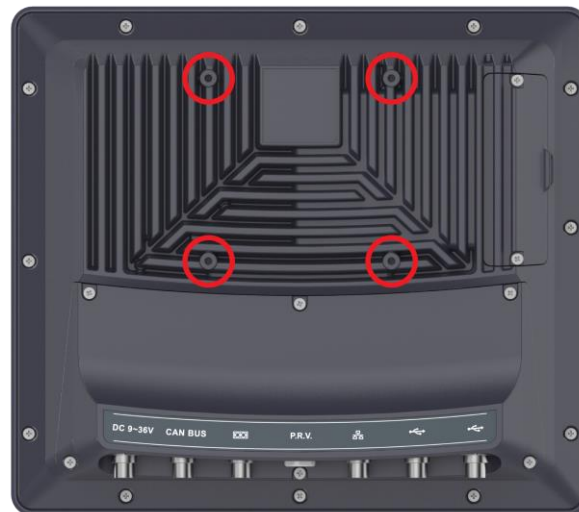


Figure 3-7: VESA Mounting Retention Screw Holes



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-F12M1-RPLP panel PC.

UPC-F12M1-RPLP

3.7 Powering On the System

To power on the UPC-F12M1-RPLP panel PC, follow the steps below:

- Step 1:** Use the attached M12 power cable to connect the M12 power connector to the power source.



Figure 3-8: M12 Power Connector Location

- Step 2:** According to the power cable pinouts are shown below, connect the wire to your DC source.



Figure 3-9: Power Cable

UPC-F12M1-RPLP

PIN NO.	DESCRIPTION
White	ACC
Red	VCC IN
Black	GND

Table 3-11: Power Cable Pinouts

Step 3: In ATX mode(default), 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-F12M1-RPLP will turn on automatically once power is connected to the power connector; short press the power button to turn off/on the system.



Power Light.	DESCRIPTION
Green	On
Orange	Standby
Light off	Off

Table 3-12: Power Light Instruction

UPC-F12M1-RPLP

3.8 Power Switch

AT or ATX power mode can be selected in UPC. The selection is made through an AT/ATX switch located on the bottom panel. The cable cover have to removed to be able to access the AT/ATX switch.



Figure 3-10: Power Switch Location

3.9 ACC Power Mode

In ACC disable mode, UPC is standard AT/ATX DC-in

In ACC enable mode, UPC will delay boot up / shut down automatically

1. ACC ON Turn on the PC Power source (x86 Standby Power) after 10 seconds
2. ACC OFF Shut down the PC Power Source after 2 seconds

PIN NO.↕	DESCRIPTION↕
A-B↕	normal ACC mode ↕
B-C↕	Forced Adapter mode(default)↕

Table 3-13: ACC Switch Definition



NOTE:

Since the ACC switch is not commonly used, it is off by default. If you need to turn it on, you need to remove the back cover and manually setup the ACC switch, or contact your dealer.



NOTE:

When the car key is turned to ACC, power has been started. When the engine is started, the power will be cut off and then re-supplied. This simple step of starting the engine has already caused the equipment originally connected to the car to be powered on to be started twice.

Electronic equipment usually cannot withstand short-term start-up and shutdown. At the same time, the voltage at the moment when the engine is started may even soar. Many equipment are damaged in this situation.

UPC-F12M1-RPLP

3.10 Available Drivers

All the drivers for the UPC-F12M1-RPLP are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type UPC-F12M1-RPLP and press Enter to find all the relevant software, utilities, and documentation.

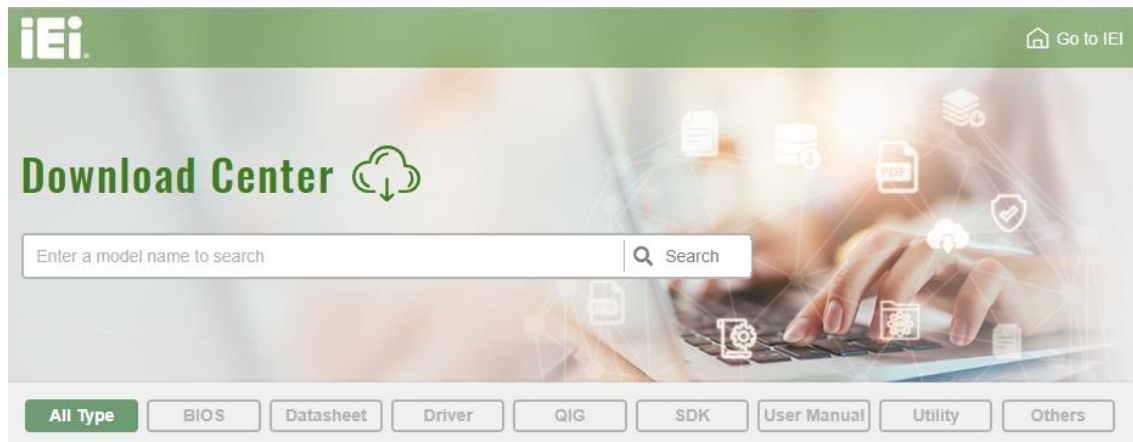


Figure 3-11: IEI Resource Download Center

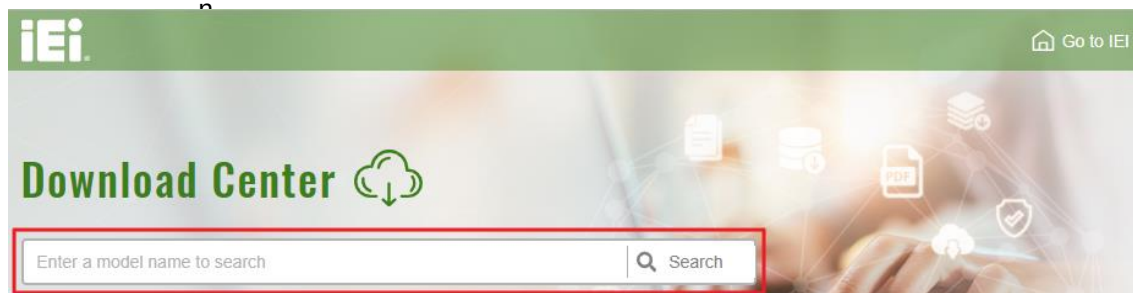
3.10.1 Driver Download

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

Step 1: Go to <https://download.ieiworld.com>. Type UPC-F12M1-RPLP and press

E

n



UPC-F12M1-RPLP

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

Step 3: Click the driver file name “UPC-xxx-RPLP” on the page and you will be prompted with the following window. You can download the entire ISO file, or double click an individual item to find its driver file and click the file name to download.

**NOTE:**

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

Chapter

4

Motherboard Interface

UPC-F12M1-RPLP

4.1 Peripheral Interface Connectors

The UPC-F12M1-RPLP panel PC motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 4-1**. 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.

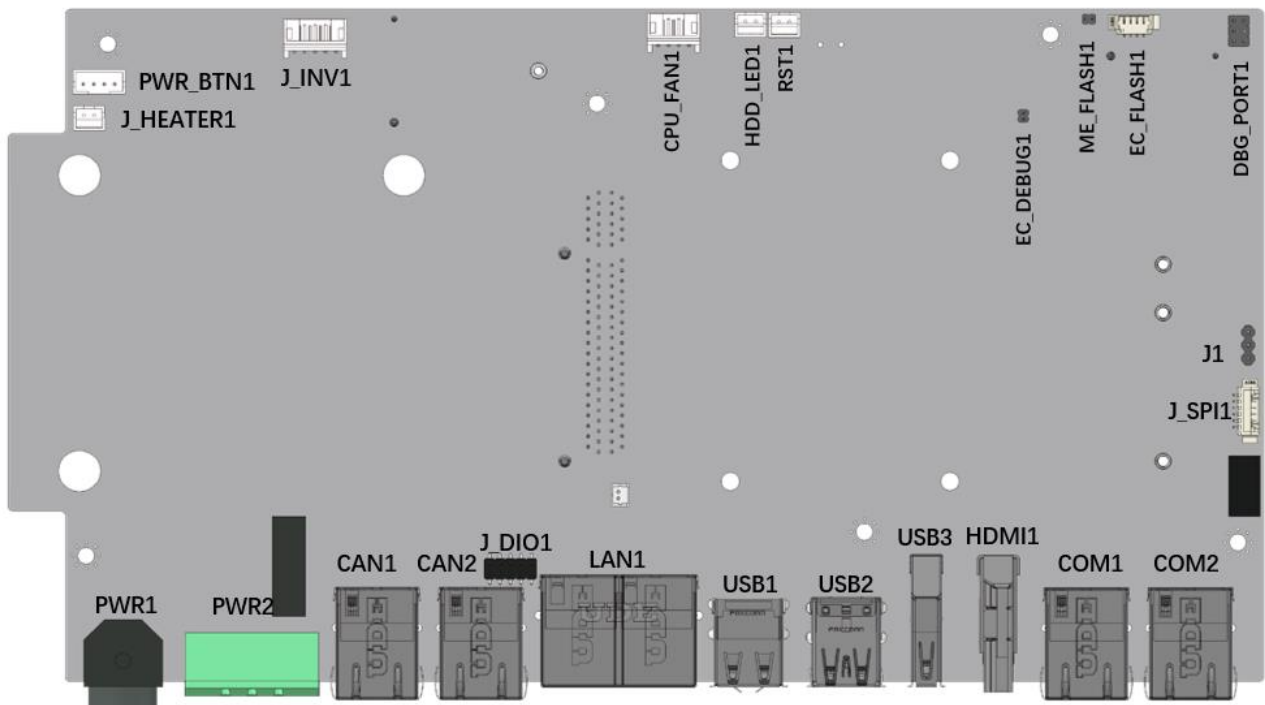


Figure 4-1: Jumper and Connector Locations (Front Side)

UPC-F12M1-RPLP

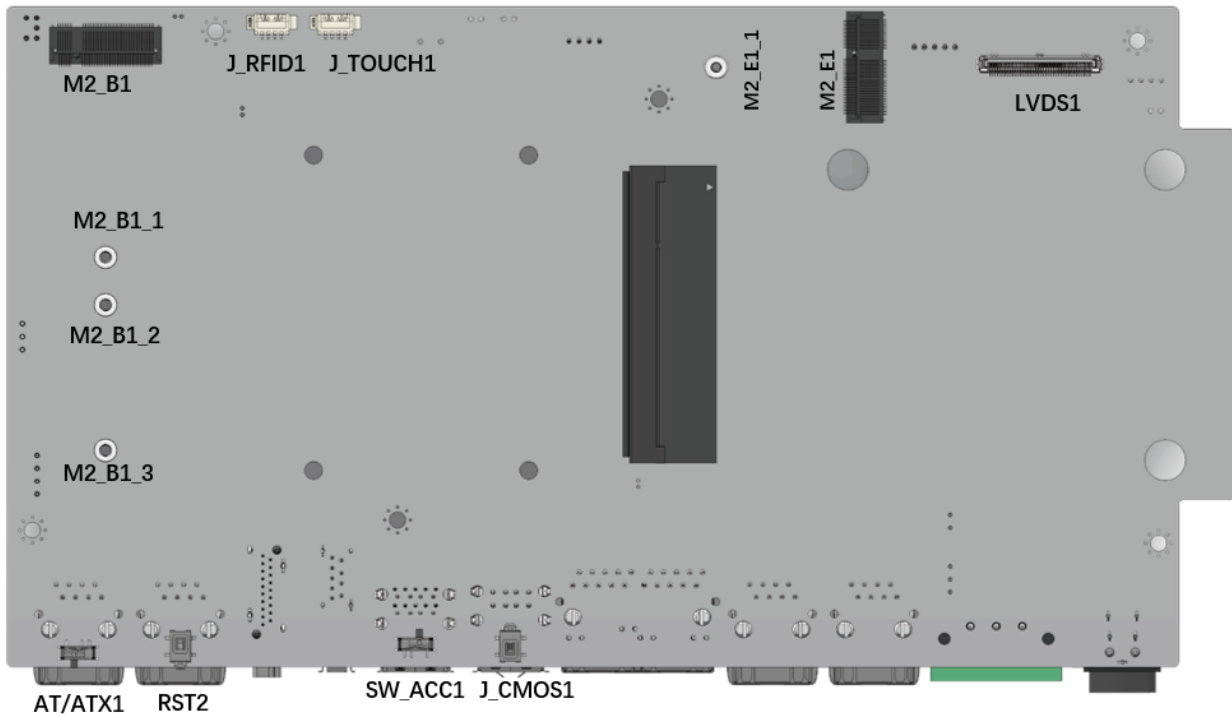


Figure 4-2: Jumper and Connector Locations (Solder Side)

4.2 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-F12M1-RPLP's motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
BIOS Programmer Connector	6-pin wafer	J_SPI1
Debug Connector	6-pin header	DBG_PORT1
Flash SPI ROM	4-pin wafer	EC_FLASH1
Flash Descriptor Security Override	2-pin header	ME_FLASH1
EC Debug Connector	2-pin header	EC_DEBUG1

UPC-F12M1-RPLP

Reset BTN Connector	2-pin wafer	RST1
HDD LED Connector	2-pin wafer	HDD_LED1
CPU FAN Connector	4-pin wafer	CPU_FAN1
Panel Inverter Connector	5-pin wafer	J_INV1
Power LED / Power BTN Connector	5-pin wafer	PWR_BTN1
Heater Power Connector	2-pin wafer	J_HEATER1
B Key Connector	75-pin wafer	M2_B1
RFID Connector	4-pin wafer	J_RFID1
Touch Panel Connector	4-pin wafer	J_TOUCH1
E Key Connector	75-pin wafer	M2_E1
LVDS Panel Connector	40-pin wafer	LVDS1

Table 4-1: Peripheral Interface Connectors

4.2.1 BIOS Programmer Connector (J_SPI1)

PIN NO.	DESCRIPTION
1	VCC3.3V
2	CS
3	MISO
4	CLK
5	MOSI
6	GND

Table 4-2: BIOS Programmer Connector (J_SPI1)

UPC-F12M1-RPLP

4.2.2 Debug Connector (DBG_PORT1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC5V	2	SMCLK_EC
3	NC	4	SMDAT_EC
5	GND	6	RST#

Table 4-3: Debug Connector (DBG_PORT1)

4.2.3 EC Programmer Connector (EC_FLASH1)

PIN NO.	DESCRIPTION
1	GND
2	EC_FLASH_DAT
3	EC_FLASH_CLK
4	NC

Table 4-4: EC Programmer Connector (EC_FLASH1)

4.2.4 Flash Descriptor Security Override (ME_FLASH1)

PIN NO.	DESCRIPTION
Open	No override (Default)
Short	Override

Table 4-5: Flash Descriptor Security Override (ME_FLASH1)

4.2.5 EC Debug Connector (EC_DEBUG1)

PIN NO.	DESCRIPTION
1	SCL
2	SDA

Table 4-6: EC Debug Connector (EC_DEBUG1)

4.2.6 Reset BTN Connector (RST1)

PIN NO.	DESCRIPTION
1	RST+
2	GND

Table 4-7: Reset BTN Connector (RST1)

4.2.7 HDD LED Connector (HDD_LED11)

PIN NO.	DESCRIPTION
1	HDD_LED+
2	HDD_LED-

Table 4-8: HDD LED Connector (HDD_LED11)

4.2.8 CPU FAN Connector (CPU_FAN1)

PIN NO.	DESCRIPTION
1	GND
2	VCC12V
3	FANIO
4	PWM

Table 4-9: CPU FAN Connector (CPU_FAN1)

4.2.9 Panel Inverter Connector (J_INV1)

PIN NO.	DESCRIPTION
1	PWM
2	GND
3	VCC12V
4	GND
5	ENABLE

Table 4-10: Panel Inverter Connector (J_INV1)

UPC-F12M1-RPLP

4.2.10 Power LED / Power BTN Connector (PWR_BTN1)

PIN NO.	DESCRIPTION
1	PW_LED+
2	GND
3	PWR_BTN
4	GND

Table 4-11: Power LED / Power BTN Connector (PWR_BTN1)**4.2.11 Heater Power Connector Connector (J_HEATER1)**

PIN NO.	DESCRIPTION
1	VCC
2	GND

Table 4-12: Heater Power Connector Connector (J_HEATER1)**4.2.12 RFID Connector (J_RFID1)**

PIN NO.	DESCRIPTION
1	VCC5V
2	DATA-
3	DATA+
4	GND

Table 4-13: RFID Connector (J_RFID1)**4.2.13 Touch Panel Connector (J_TOUCH1)**

PIN NO.	DESCRIPTION
1	VCC5V
2	DATA-
3	DATA+
4	GND

Table 4-14: Touch Panel Connector (J_TOUCH1)

UPC-F12M1-RPLP

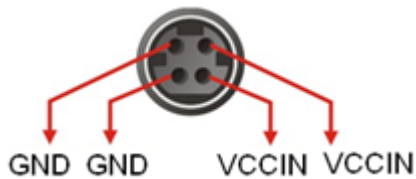
4.3 External Interface Panel Connectors

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
Power input Connector	DC Jack	PWR1
Power input Connector	3-pin Terminal block	PWR2
CAN BUS Connector (RJ45)	8-pin RJ45	CAN1
CAN BUS Connector (RJ45)	8-pin RJ45	CAN2
2.5GbE connector	RJ-45	LAN1/LAN2
Dual USB2.0 Connector	USB 2.0 port	USB1
Dual USB3.2 Connector	USB 3.2 gen2 port	USB2
Single USB3.2Connector	USB 3.2 gen1 port	USB3
HDMI Connector	HDMI	HDMI1
RS232 Connector	RJ45	COM1
RS232/422/485 Connector	RJ45	COM2

Table 4-15: Peripheral Interface Connectors

4.3.1 Power input Connector (PWR1)



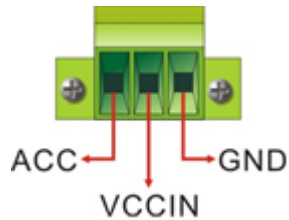
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	3	GND

UPC-F12M1-RPLP

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	VCC	4	GND

Table 4-16: PWR Connector (PWR1) Pinouts

4.3.2 Power input Connectors (PWR2)



PIN NO.	DESCRIPTION
1	ACC
2	VCCIN
3	GND

Table 4-17: Power input Connectors (PWR2) Pinouts

4.3.3 CAN BUS Connector RJ45 (CAN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC5V	5	CAN_H
2	DIO OUT5	6	CAN_L
3	NC	7	GND
4	GND	8	NC

Table 4-18: CAN BUS Connector RJ45 (CAN1)

4.3.4 CAN BUS Connector RJ45 (CAN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DIO_IN5	5	CAN_H
2	DIO_IN6	6	CAN_L
3	NC	7	GND
4	GND	8	NC

Table 4-19: CAN BUS Connector RJ45 (CAN2)**4.3.5 LAN Connector (LAN1/LAN2)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINK 1000 +3.3V sus	6	MDI3+
2	MDI0+	7	MDI3-
3	MDI0-	8	MDI4+
4	MDI1+	9	MDI4-
5	MDI1-	10	
11	+3.3V sus	12	ACT-1
13	LINK 1000 +3.3V sus	14	LINK 1000 +3.3V sus
15	GND	16	GND
17	N/A	18	N/A

Table 4-20:RJ45 LAN Connector (LAN1/LAN2)**4.3.6 Dual USB2.0 Connector (USB1)**

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

Table 4-21: USB 2.0 Connector(USB 2.0)

4.3.7 Dual USB 3.2 gen2 Connector (USB2)

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

Table 4-22: USB 3.2 gen2 Connector (USB2)

4.3.8 Single USB 3.2 gen1 Connector (USB3)

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

Table 4-23: Single USB 3.2 gen1 Connector (USB 3)

4.3.9 RS232 Connector (RJ45 COM1)

PIN NO.	DESCRIPTION
1	RI
2	DTR
3	CTS
4	TX
5	RTS
6	RX
7	DSR
8	DCD

Table 4-24: RS232 Connector (RJ45 COM1)

4.3.10 RS232/422/485 Connector (RJ45 COM2)

PIN NO.	DESCRIPTION
1	RI
2	DTR
3	CTS
4	TX
5	RTS
6	RX
7	DSR
8	DCD

Table 4-25: RS232/422/485 Connector (RJ45 COM2)

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment is in conformity with the following EU directives:

- EMC Directive 2014/53/EU
- Low-Voltage Directive 2014/35/EU
- RoHS II Directive 2015/863/EU

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

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

English

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

Български [Bulgarian]

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

Česky [Czech]

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

Dansk [Danish]

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

Deutsch [German]

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

Eesti [Estonian]

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

Español [Spanish]

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

UPC-F12M1-RPLP

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-Dirrettiva 2014/53/EU.

Magyar [Hungarian]

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

Polski [Polish]

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

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da 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.

UPC-F12M1-RPLP

Slovensko [Slovenian]

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

Slovensky [Slovak]

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

Suomi [Finnish]

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

Svenska [Swedish]

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

ROHS STATEMENT



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

FCC WARNING



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

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

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a

UPC-F12M1-RPLP

commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

CHINA ROHS



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

UKCA



This product has been tested and found in conformity with Radio Equipment Regulations 2017. It is possible to use UKCA marking to demonstrate the conformity with this Regulations.

Appendix

A

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-F12M1-RPLP.

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-F12M1-RPLP is being installed, moved or modified.
- ***To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.***
- ***Do not apply voltage levels that exceed the specified voltage range.***
Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the UPC-F12M1-RPLP chassis is opened when it is running.
- ***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-F12M1-RPLP 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

UPC-F12M1-RPLP

B.1.2 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the UPC-F12M1-RPLP may result in permanent damage to the UPC-F12M1-RPLP and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the UPC-F12M1-RPLP. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the UPC-F12M1-RPLP 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.

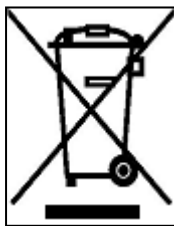
B.1.3 Product Disposal

**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-F12M1-RPLP

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the UPC-F12M1-RPLP, 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-F12M1-RPLP, 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-F12M1-RPLP 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-F12M1-RPLP.

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

UPC-F12M1-RPLP

- **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

Hazardous Materials Disclosure

C.1 RoHS II Directive (2015/863/EU)

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

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Display	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863. X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.										

UPC-F12M1-RPLP

C.2 China RoHS

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

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

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○
○: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。						