User Manual

UNO-2271G

電腦

Intel® Atom™ Pocket-Sized Automation Computer with 2 x GbE, 1 x mPCIe, 1 x HDMI, and eMMC

ADVANTECH

Enabling an Intelligent Planet

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Support

For more information on this and other Advantech products, please visit our websites at: http://www.advantech.com

For technical support and service, please visit our support website at:

http://support.advantech.com/

This manual is applicable to all of the following product models:

UNO-2271G, UNO-2271G-E21AE, UNO-2271G-E22AE, UNO-2271G-E23AE,
UNO-2271G-E021AE, UNO-2271G-E022AE, UNO-2271G-E023AE,
UNO-2271GE211601E-T, UNO-2271GE211602E-T, UNO-2271GE211603E-T,
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Product Warranty (2 years)

Advantech warrants to the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, customers are billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you suspect that your product is defective, follow the steps outlined below:

1. Collect all the information about the problem encountered (for example, CPU speed, Advantech products used, other hardware and software used, etc.). Note anything abnormal and list any onscreen messages displayed when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain a return merchandize authorization (RMA) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a completed Repair and Replacement Order Card and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without proof of purchase date are not eligible for warranty service.

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

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

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

Technical Support and Assistance

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

Safety Precaution - Static Electricity

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

■ To avoid electrical shock, always disconnect the power from your PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.

■ Disconnect the power before making any configuration changes. A sudden rush of power after connecting the jumper or installing a card may damage sensitive electronic components.

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect this equipment from humidity.
6. Put this equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating and do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by service personnel:
    – The power cord or plug is damaged.
    – Liquid has penetrated the equipment.
    – The equipment has been exposed to moisture.
    – The equipment is malfunctioning or does not operate according to the user manual.
    – The equipment has been dropped and damaged.
    – The equipment has obvious signs of breakage.
15. Do not store this equipment in an environment where the temperature fluctuates below 0 °C (32 °F) or above 50 °C (122 °F).
16. The battery is at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type, as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. Danger d'explosion si la batterie est mal remplace. Remplacer uniquement par le meme type ou equivalent recommandé par le fabricant. Jeter les piles usagées selon les instructions du fabricant.
18. IN accordance with the IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).

DISCLAIMER: These instructions are provided according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

安全指示

1. 請仔細閱讀此安全操作說明。
2. 請妥善保存此用戶手冊供日後參考。
3. 用濕抹布清洗設備前,請確認拔除電源線。請勿使用液體或去污噴霧劑清洗設備。
4. 對於使用電源線的設備,設備周圍必須有容易接觸到的電源插座。
5. 請勿在潮濕環境中試用設備。
6. 請在安裝前確保設備放置在可靠的平面上,意外摔落可能會導致設備損壞。
7. 設備機殼的開孔適用於空氣對,從而防止設備過熱。請勿覆蓋開孔。
8. 當您連接設備到電源插座前,請確認電源插座的電壓符合要求。
9. 請將電源線佈置在人們不易絆倒的位置,請勿在電源線上覆蓋任何雜物。
10. 請注意設備上所有的警告標示。
11. 如果長時間不使用設備,請拔除與電源插座的連結,避免設備被超標的電壓波動損壞。
12. 請勿讓任何液體流入通風口,以免引起火災或短路。
13. 請勿自行打開設備。為了確保您的安全,請透過經認證的工程師來打開設備。
14. 如遇下列情況,請由專業人員維修:
    - 電源線或插頭損壞;
    - 設備內部有液體流入;
    - 設備曾暴露在過度潮濕環境中使用;
    - 設備無法正常工作,或您無法透過用戶手冊來正常工作;
    - 設備摔落或損壞;
    - 設備有明顯外觀損;
15. 請勿將設備放置在超出建議溫度範圍的環境,即不要低於 0 ℃ (32 ℉)或高於 50 ℃ (122 ℉),否則可能會造成設備損壞。
16. 注意:若電池更換不正確,將有爆炸危險。因此,只可以使用製造商推薦的同一種或者同等型號的電池進行替換。請按照製造商的指示處理舊電池。
17. 根據 IEC 704‐1:1982 規定,操作員所在位置音量不可高於 70 分貝。
18. 限制區域:請勿將設備安裝於限制區域使用。
19. 免責聲明:請安全訓示符合 IEC 704‐1 要求。研華公司對其內容之準確性不承擔任何法律責任。

Contents

Chapter 1

Overview

This chapter provides an overview of the UNO-2271G specifications.

- Introduction
- Safety Precautions
- Accessories

1.1 Introduction

UNO-2271G is an embedded hardware-ready platform that supports HDMI displays and features a wide range of networking interfaces, including up to 2 x GbE LAN and 1 x USB 3.0, to satisfy the needs of diverse applications. Designed to shorten development time, UNO-2271G is equipped with an Intel® Atom™ processor and 4G of DDR3L RAM to deliver high-performance computing under heavy loads.

UNO-2271G can withstand wide operating temperatures (0 ~ 50 °C (32 ~ 122 °F). With the provision of 1 x mini PCIe port and support for Advantech's iDoor technology, UNO-2271G can be easily integrated with Wi-Fi, 3G, and I/O expansion modules, as well as various industrial protocols. Furthermore, UNO-2271G supports multiple operating systems, including Windows 7, Windows 10, and embedded Linux, to ensure easy installation and deployment by providing a versatile yet reliable application-ready platform.

1.2 Safety Precautions

A few safety precautions for connecting the chassis and power source are provided below to prevent injury. However, for most cases, users will simply need to connect a standard cable.

Warning! *Always disconnect the power cord from the chassis before manual handling.Do not connect the chassis while the system power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis.*

Warning! *Toujours à la terre pour éliminer toute charge d'électricité statique avant toucher UNO-2271G. Appareils électroniques modernes sont très sensibles à charges d'électricité statique. Utilisez un bracelet antistatique à tout moment. Placez tous composants électroniques sur une surface antistatique ou dans un statique-sac blindé.*

Caution! *Always ground yourself to remove any static electric charge before touching UNO-2271G. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static shielded bag.*

Caution! *Toujours débrancher le cordon d'alimentation de votre boîtier lorsque vous êtes travailler. Ne branchez pas lorsque l'appareil est allumé. Un afflux soudain de puissance peut endommager les composants électroniques sensibles. Seulement connu personnel de l'électronique devraient ouvrir le châssis.*

1.3 Accessories

The following items should be included with your shipment:

- 1 x Pin connector for power wiring (Advantech P/N: 1652002209)
- 1 x Driver DVD
- 1 x Warranty card

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

- Operating Temperature: 0 ~ 50 °C (32 ~ 122 °F)
- Power Requirements:10 ~ 30 V_{DC}
- Power Consumption: 12 W (typical), 24 W (max.)
- System Hardware:
  - CPU: Intel® Atom™ single-core E3815/dual-core E3825, 1.46/1.33 GHz
  - Memory: Onboard 4GB DDR3L 1066 MHz RAM
  - Graphics Engine: Intel® HD Graphics
  - Ethernet: Realtek RTL8111E GbE, 802.10av, IEEE1588/802.1AS, 803.3az
  - Storage:
    32 GB eMMC onboard
    1 x full-size mSATA (supports mPCIe)
  - Expansion: 1 x Full-size mPCIe slot
  - Display:1 x HDMI that supports 1920 x 1080 @60 Hz 24bpp

Applicable Models:
UNO-2271G-E21AE
UNO-2271G-E22AE
UNO-2271G-E23AE
UNO-2271G-E021AE
UNO-2271G-E022AE
UNO-2271G-E023AE

Chapter 2

Hardware Functionality

This chapter explains how to setup the UNO-2271G's hardware functions, including connecting peripherals and setting switches and indicators.

- Introduction
- UNO-2271G Interface
- LAN/Ethernet Connector
- Power Connector
- USB Connector
- RTC Battery
- Power Button/Power Management
- Reset Button
- PCI Express Mini Card Socket

2.1 Introduction

The UNO-2271G connectors are shown in Figures 2.1, 2.2, and 2.3. A description of each peripheral is provided in the following sections.
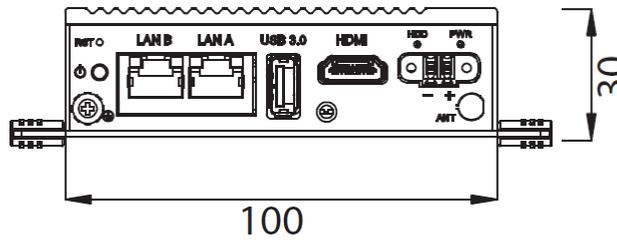
Figure 2.1 Front panel of the UNO-2271G-E21AE/021AE single-stack model (which supports the UNO-2271G-EKAE extension kit)
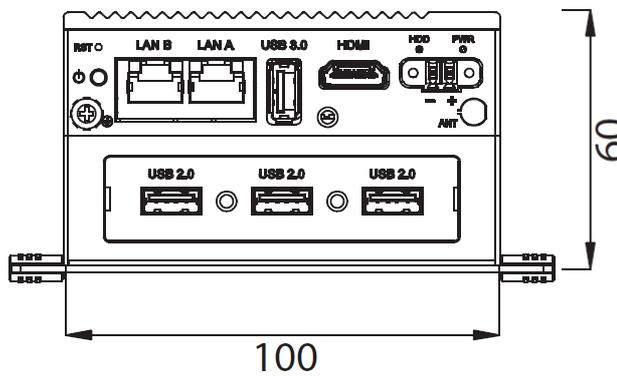
Figure 2.2 Front panel of the UNO-2271G-E22AE/E022AE double-stack model (which supports an additional 3 x USB and 1 x iDoor module)
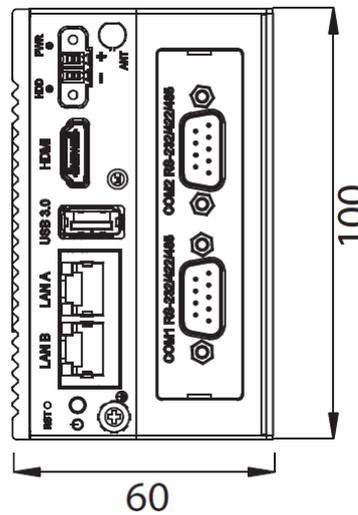
Figure 2.3 Front panel of the UNO-2271G-E23AE/E023AE double-stack model (which supports an additional 2 x COM and 1 x iDoor module)

2.2 Serial Communication Ports

UNO-2271G is equipped with two standard COM serial communication ports – COM1 and COM2. The driver is installed automatically during OS installation, and the settings can be adjusted via the BIOS menu.

2.2.1 COM Port Interface (COM 1, COM 2)

UNO-2271G-E23AE/E023AE: 2 x RS-232/422/485, DB9, 50 ~ 115.2 kbps.

2.3 LAN: Ethernet Connector

UNO-2271G is equipped with two Gigabit LAN controllers. The controller chip installed is a Realtek RTL8111E Ethernet controller that is fully compliant with IEEE 802.3u 10/100/1000 Base-T. The Ethernet port is a standard RJ-45 jack, Meanwhile, the LED indicators located on the front are included to indicate the system's Link (green) and Active (green) status.

2.4 Power Connector

UNO-2271G features a Phoenix connector that is compatible with 10 ~ 30 VDC input power. With the added inclusion of reversed wiring protection means, reversed wiring of the ground line and power line wiring will not damage the system. Following a forced shutdown, wait 4 seconds before powering on the system. The power connector must then be reconnected.

2.5 USB Connector

The USB interface supports plug-and-play functionality, which enables users to connector disconnect a device without turning off the computer. UNO-2271G features one USB connector (UNO-2271G-E22AE/E022AE has extra support for 3 x USB 2.0 ports), which supports plug-and-play and hot-swapping functionality for up to 127 external devices. The USB interface can be enabled/disabled in the system BIOS. The UNO-2271G-E21AE/E021AE and UNO-2271G-E23AE/E023AE models feature one USB port that is compliant with USB XHCI, Rev. 1.0, specifications.

Meanwhile, the UNO-2271G-E22AE/E022AE models feature four USB ports, three of which comply with USB EHCI, Rev. 2.0, specifications and one that complies with USB XHCI, Rev. 1.0.

Refer to Appendix A.5 for its pin assignments.

2.6 RTC Battery Specification

UNO-2271G is equipped with an RTC Battery to ensure that the BIOS and system clock settings are retained even when the power is disconnected.

- **Type:** Panasonic BR2032
- **Output Voltage:** 3 V, 195mA

2.7 Power Button/Power Management

Press the "PWR" button to power on or off the UNO-2271G system (ATX type). UNO-2271G supports the Advanced Configuration and Power Interface (ACPI). In addition to power on/off control, ACPI supports multiple suspend modes, including Power on Suspend (S1), Suspend to RAM (S3), and Suspend to Disk (S4). In the S3 and S4 suspend modes, power consumption is less than 2W, which meets the ENERGY STAR criteria.

2.8 Reset Button

Press the "Reset" button to activate the hardware reset function.

2.9 PCI Express Mini Card Socket

UNO-2271G supports one full-size PCI Express mini card socket. The Mini 1 interface is primarily included to support Advantech's iDoor expansion modules, such as an isolated COM, Profibus, WLAN GPRS, 3G, and mRAM modules. The optional kit ensures easy card installation.

> **Note!** *The additional SIM card slot is set as disabled by default. Please note that a 3G mini PCIe SIM card module must be installed to enable 3G functionality (applicable to all models produced before June 2015).*
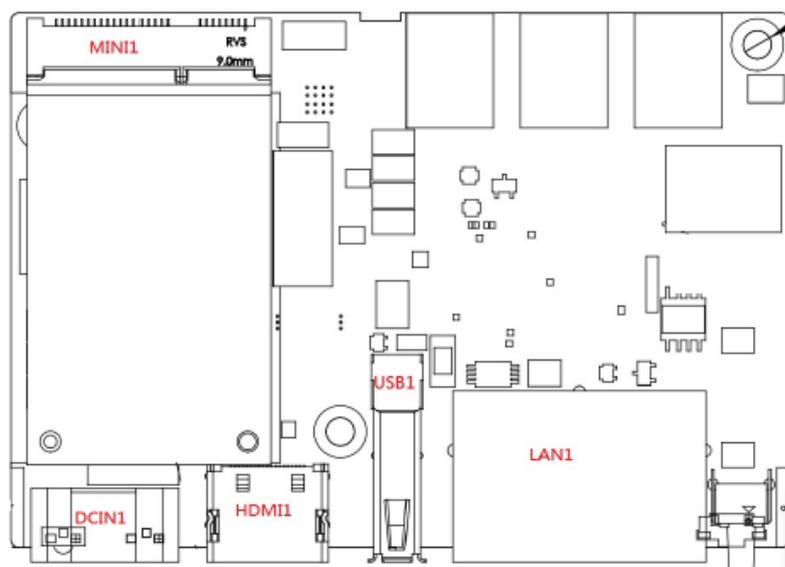
UNO-2271G supports one full-size mini PCI Express card socket.

Chapter 3

Initial Setup

This chapter introduces how to initialize the UNO-2271G.

■ Chassis Grounding

■ Power Supply

■ Open and Close Bottom Cover

■ Installing 2nd Stack Extension Kit

3.1 Chassis Grounding

UNO-2271G is equipped with a stable grounding base, EMI protection, and an easy-to-connect chassis grounding point.
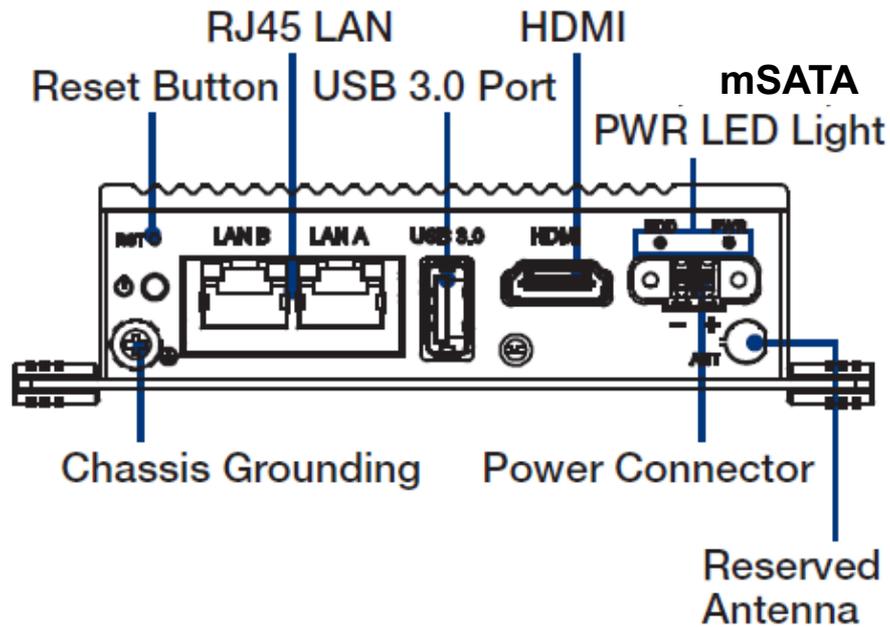

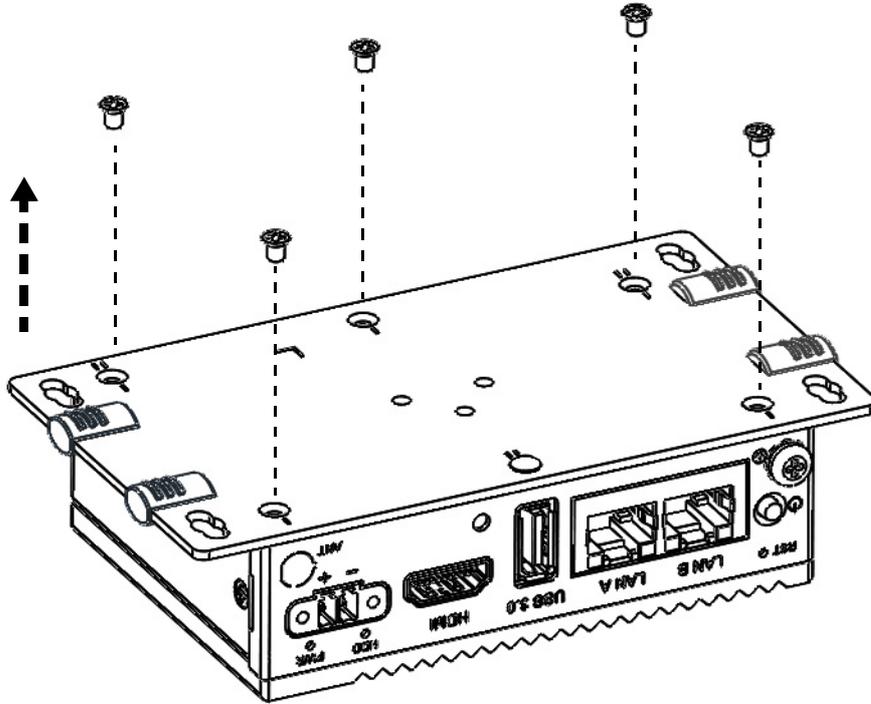**Figure 3.1 Chassis grounding connection**

3.2 Power Supply

This product is intended to be supplied by a listed power adapter or DC power source rated 10 ~ 30 V_{DC}, 2A, and TMA 50 °C. If you need further assistance, please contact Advantech.

3.3 Open and Close Bottom Cover

UNO-2271G-E21AE
Open Bottom Cover

1. Remove 5 screws on the bottom cover.

2. Lift to open bottom cover.
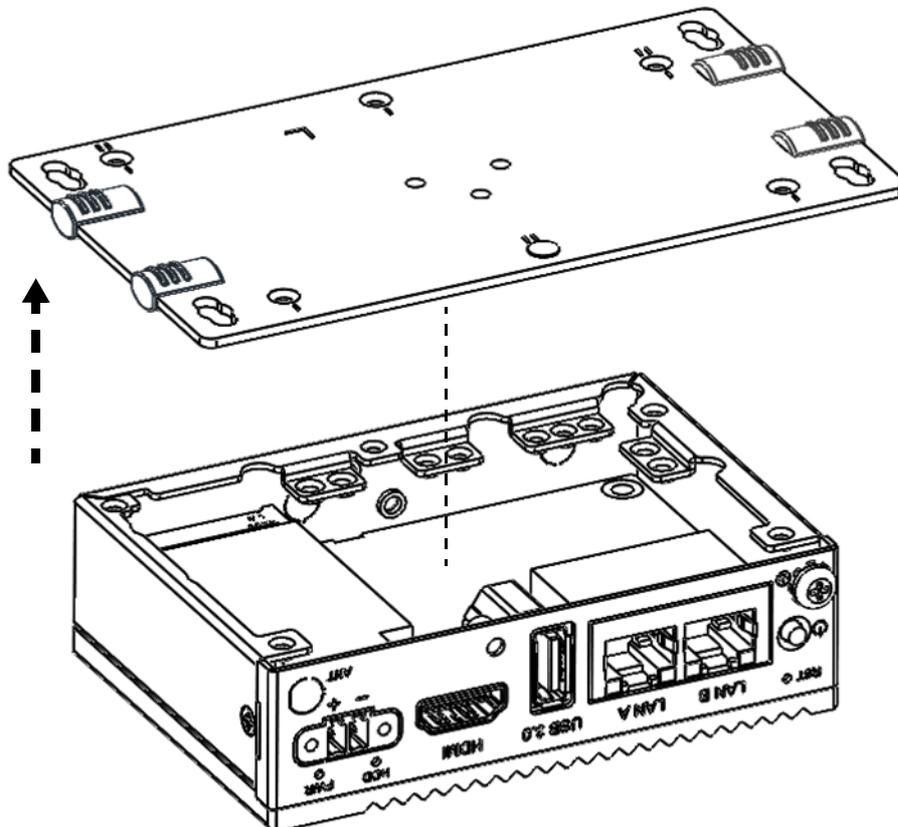
Close Bottom Cover

1. Close the bottom cover with right side.

Remark: Rubber on the bottom
cover towards the IO side

IO side
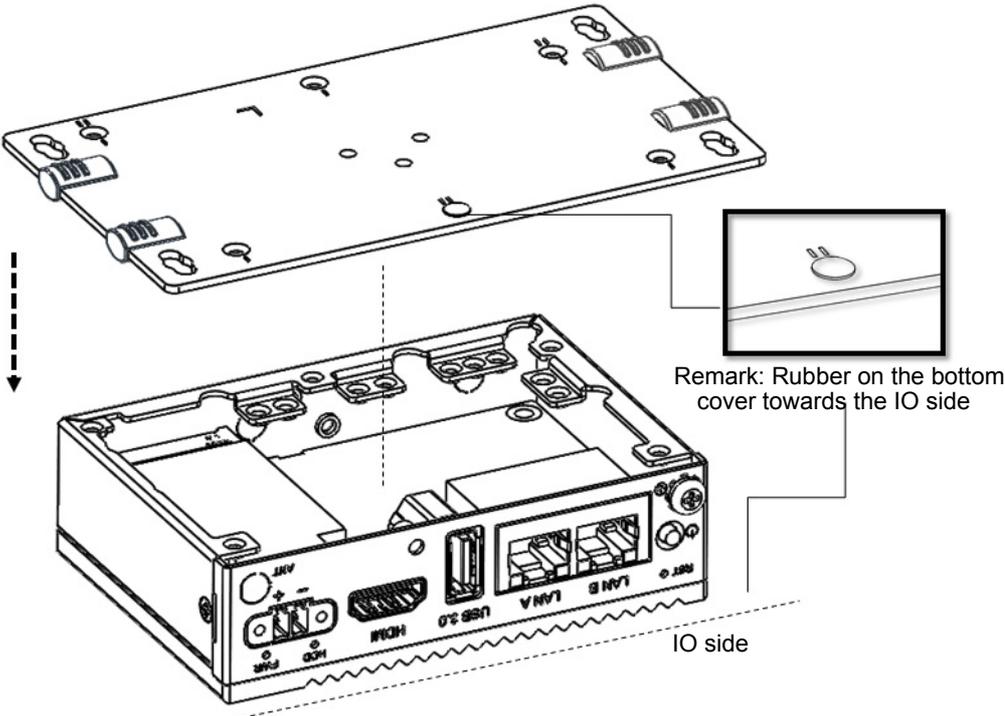
2. Lock the bottom cover with 5 screws.
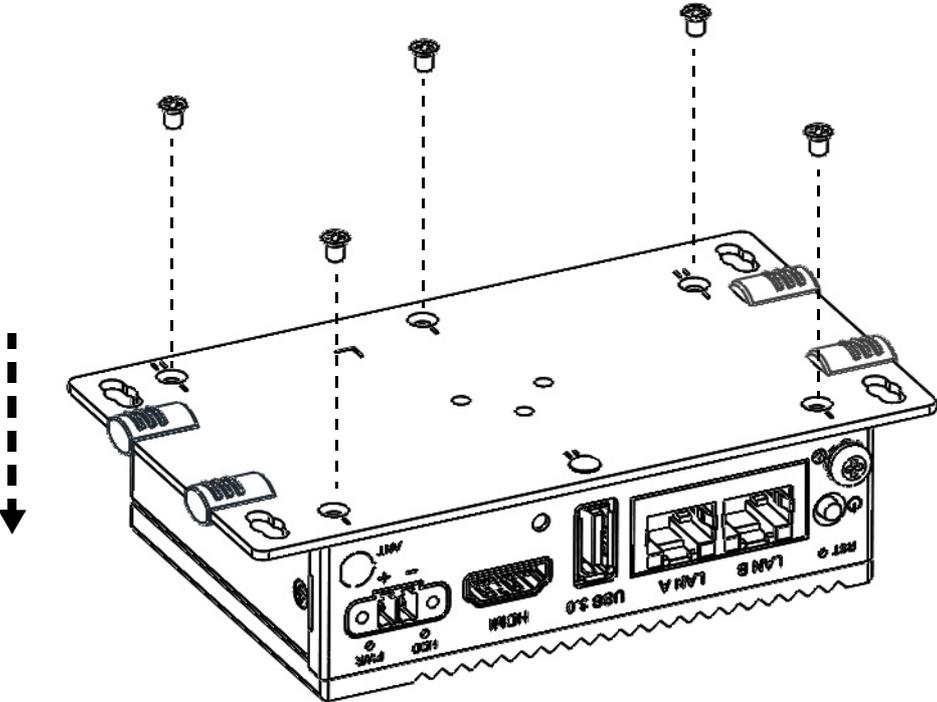
3.4 Installing 2nd Stack Extension Kit

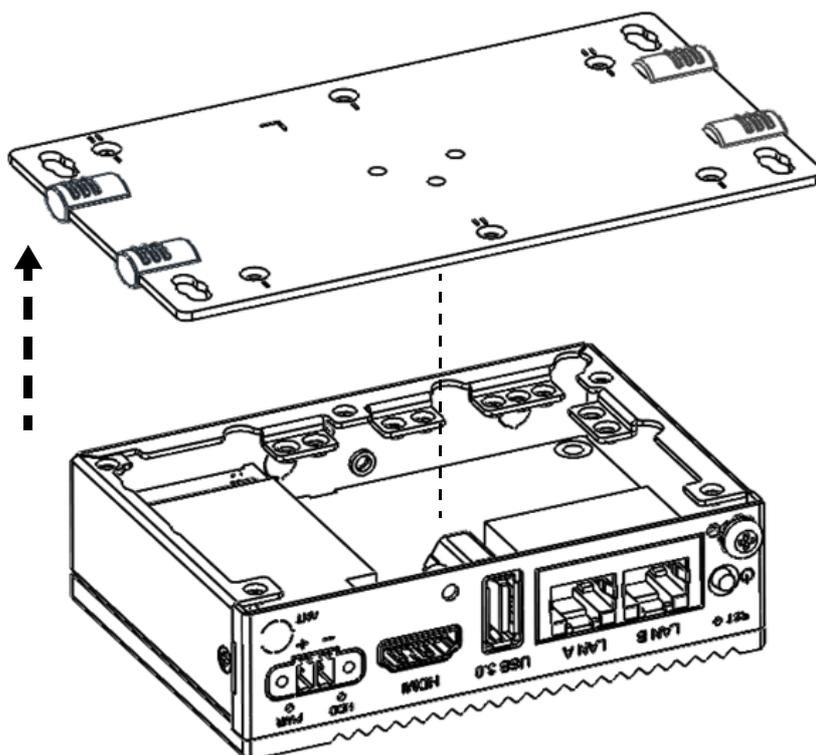UNO-2271G-E21AE+UNO-2271G-EKAE (iDOOR)
UNO-2281G-E21AE+UNO-2271G-R2AE (COM)
UNO-2281G-E21AE+UNO-2271G-U3AE (USB)

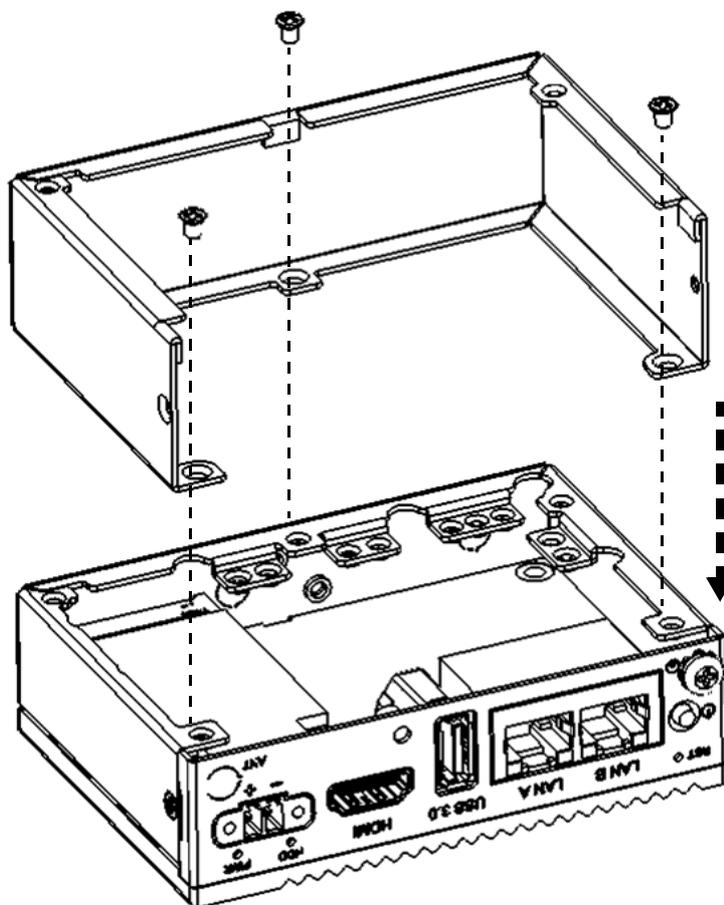**Installing 2nd stack extension kit**

1. Remove 5 screws and 1 rubber.
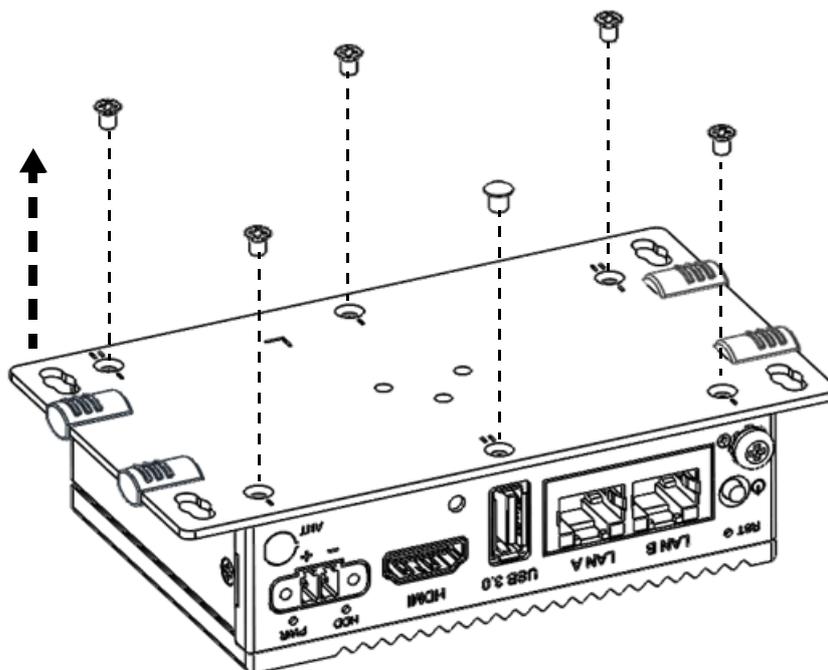
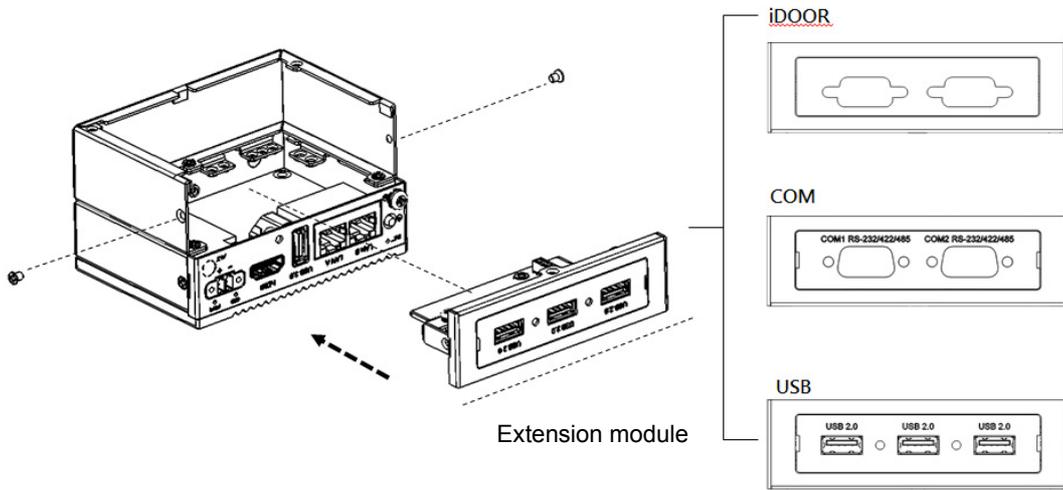
2. Remove bottom cover.

3. Install cable for 2nd stack, align the spot on cable connector to the triangle sign on PCBA.
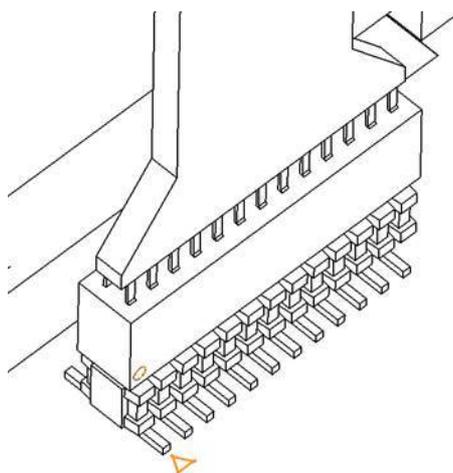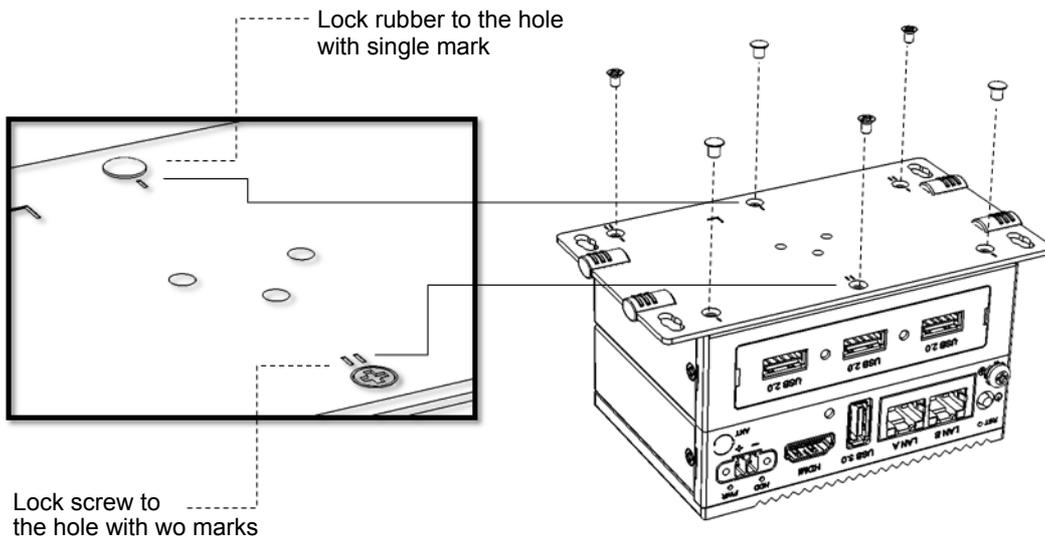

4. Lock 2nd stack bracket with 3 screws.

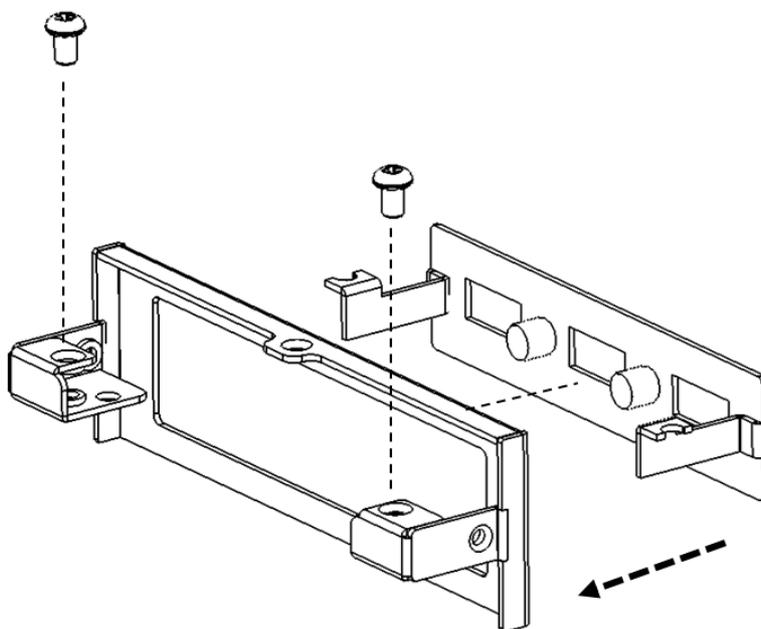5. Lock bracket and extension module with 2 screws.

iDOOR

COM

COM1 RS-232/422/485   COM2 RS-232/422/485

USB

USB 2.0   USB 2.0   USB 2.0

Extension module

6. Lock bottom cover with 3 screws and 3 rubbers.

Lock rubber to the hole
with single mark

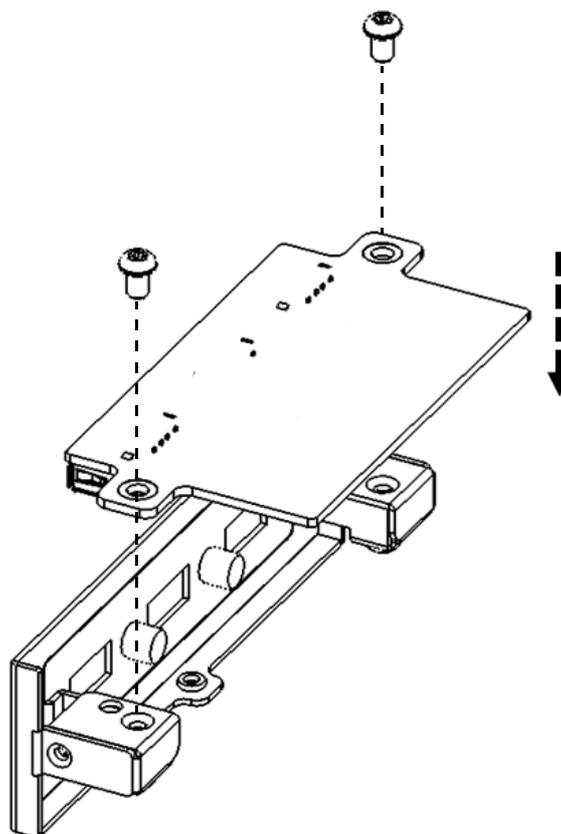Lock screw to
the hole with wo marks
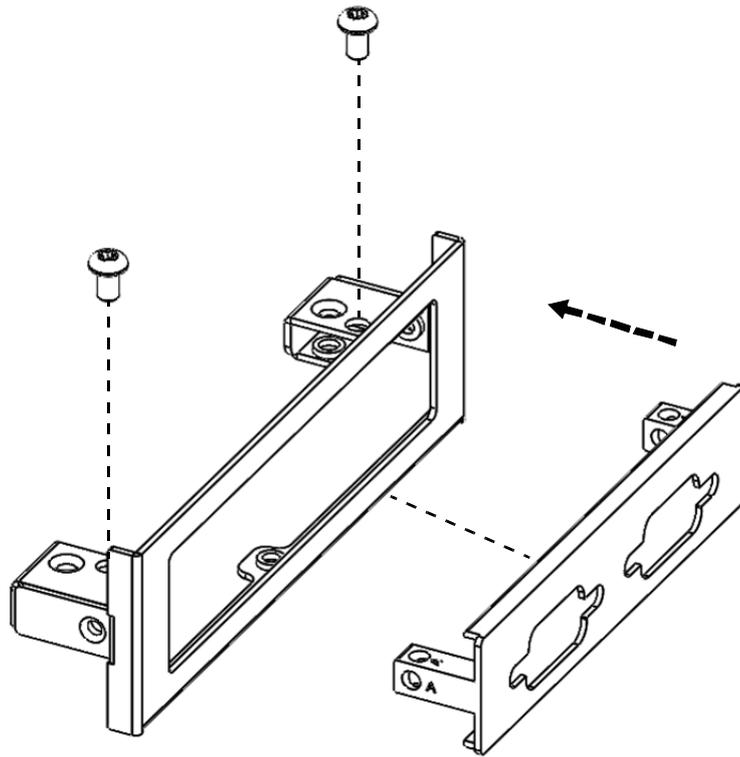
Installing 2nd stack UNO-2271G-U3AE

1.   Lock front plate with 2 screws.

2.   Lock circuit board with 2 screws.

3.   Lock iDoor module front plate with 2 screws.

Appendix A

System Settings & Pin Assign

A.1 System I/O Address and Interrupt Assignments

Table A.1: Interrupt Assignments

Interrupt No.	Interrupt Source
NMI	Parity error detected
IRQ0	System timer
IRQ1	Standard 101/102-key or Microsoft Natural PS/2Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	Communications port (COM2)
IRQ4	Communications port (COM1)
IRQ6	Available
IRQ8	System CMOS/real-time clock
IRQ9	Microsoft ACPI-compliant system
IRQ12	PS/2 compatible mouse
IRQ13	Numeric data processor
IRQ14	Reserved
IRQ15	Reserved

A.2 Board Connectors and Jumpers

The UNO-2271G board features several connectors and jumpers (as shown in Figure A.1). The following sections provide instructions for configuring the UNO-2271G hardware.
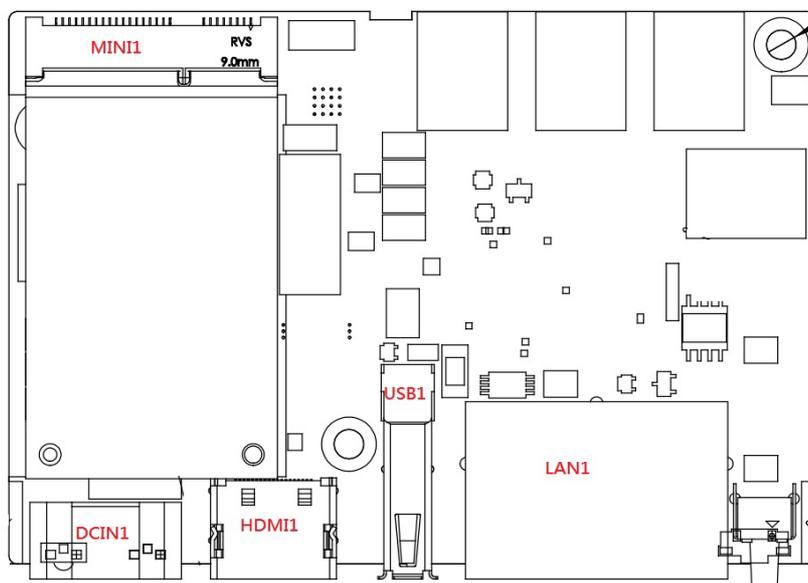

Figure A.1 Connector and jumper locations on UNO-2271G-N2AE (front)

Table A.2: Connectors and Jumpers

Label	Function
MINI1	PCI Express mini card/mSATA
DCIN1	Power in connector
HDMI1	HDMI connector
USB1	USB 3.0 connector
LAN1	2-port RJ45 connector

A.3 Power Connector (PWR)
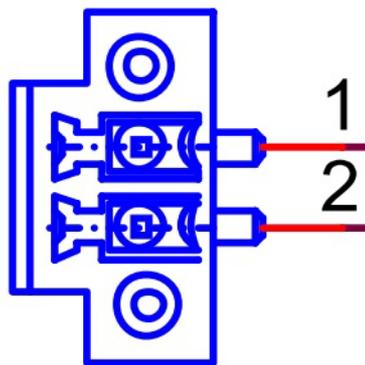
Table A.3: Power Connector Pin Assignments

Pin	Signal	Description
1	Power IN V+	10 ~ 30 V_{DC}
2	Power IN V- (GND)	

A.4 USB Connector
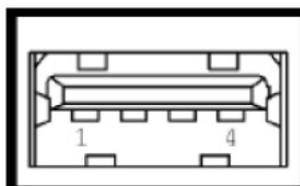
Table A.4: USB 2.0 Connector Pin Assignments

Pin	Signal Name	Cable Color
1	VCC	Red
2	DATA-	White
3	DATA+	Green
4	GND	Black
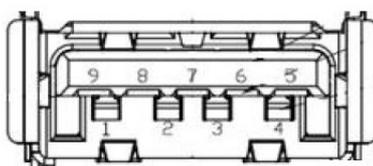
Table A.5: USB 3.0 Connector Pin Assignments

Pin	Signal Name	Description
1	VBUS	Power
2	D-	USB2.0 differential pair
3	D+	
4	GND	Ground for power return

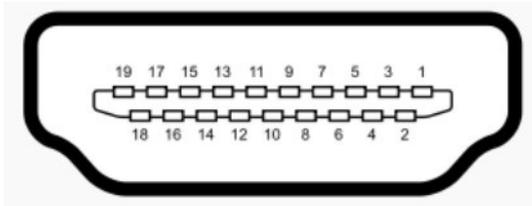| Table A.5: USB 3.0 Connector Pin Assignments		
5	StdA_SSRX-	SuperSpeed receiver differential pair
6	StdA_SSRX+	
7	GND_DRIAN	Ground for signal return
8	StdA_SSTX-	SuperSpeed transmitter differential pair
9	StdA_SSTX+	

A.5 HDMI Display Connector

Table A.6: HDMI Display Connector			
Pin	**Signal**	**Pin**	**Signal**
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2-	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1-
7	TMDS Data0+	8	TMDS Data0 Shield
9	TMDS Data0-	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock-
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC/HEC Ground	18	+5 V Power (max 50 mA)
19	Hot plug detect		

A.6 COM1/COM2 RS232/422/485 Connector

Pin	RS232	RS422	RS485
1	DCD	TX-	D-
2	RX	TX+	D+
3	TX	RX+	
4	DTR	RX-	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		
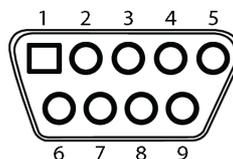
A.7 Mini PCIE Slot (MINIPCIE)

Supports PCI 1.1, PCI 1.2 power definition

Pin	Signal	Description	Pin	Signal	Description
52	+3.3Vaux / +3.3V	PCI1.1 was +3.3 V, PCI1.2 was +3.3 V aux	51	Reserved	NC
50	GND		49	Reserved	NC
48	+1.5V		47	Reserved	NC
46	NC	NC	45	Reserved	NC
44	NC	NC	43	PIN43_MPCIE_PWRSEL	The pin to select the Pin 2, 52 power output for +3.3 V aux or +3.3 V (PCI1.1 was reserved and PIC1.2 was GND
42	NC	NC	41	+3.3Vaux	
40	GND		39	+3.3Vaux	
38	USB_D+	USB serial data interface compliant to the USB 2.0 specification	37	GND	
36	USB_D-		35	GND	
34	GND		33	PETp0	PCI Express differential transmit pair
32	SMB_DATA	SMBus data signal compliant with SMBus 2.0 specifications	31	PETn0	
30	SMB_CLK		29	GND	
28	+1.5V		27	GND	
26	GND		25	PERp0	PCI Express differential receive pair
24	+3.3Vaux		23	PERn0	
22	PERST#	Functional reset to the card	21	GND	
20	W_DISABLE#	Active low signal. This signal is used by the system to disable radio operation on add-in cards that implement radio frequency applications. When implemented, this signal requires a pull-up resistor on the card.	19	Reserved	NC
18	GND		17	Reserved	NC
	Key	Key		Key	Key
16	NC	NC	15	GND	
14	NC	NC	13	REFCLK+	
12	NC	NC	11	REFCLK-	
10	NC	NC	9	GND	
8	NC	NC	7	CLKREQ#	Reference clock request signal
6	1.5V		5	NC	NC
4	GND		3	NC	NC
2	+3.3Vaux / +3.3V	PCI1.1 was +3.3 V, PCI1.2 was +3.3 V aux	1	WAKE#	Open drain active low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.

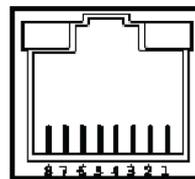* +3.3V aux was in the suspend state; power out to device +3.3 V/1.1A

* +3.3V was core power

* +1.5V was core power; power out to device +1.5V/0.5A

A.8 LAN RJ45 Connector

RJ45 Pin	Signal	Description
1	MDI0+	■ In BASE-T: Media-dependent interface[0]: ■ 1000BASE-T: In MDI configuration, MDI[0]+/- corresponds to BI_DA+/- and in MDI-X configuration MDI[0]+/- corresponds to BI_DB+/-
2	MDI0-	■ 10BASE-T and 100BASE-TX: In MDI configuration, MDI[0]+/- is used for the transmit pair and in MDIX configuration MDI[0]+/- is used for the receive pair
3	MDI1+	■ In BASE-T: Media-dependent interface[1]: ■ 1000BASE-T: In MDI configuration, MDI[1]+/- corresponds to BI_DB+ and in MDI-X configuration MDI[1]+/- corresponds to BI_DA+/-.
6	MDI1-	■ 10BASE-T and 100BASE-TX: In MDI configuration, MDI[1]+/- is used for the receive pair and in MDI-X configuration MDI[1]+/- is used for the transmit pair
4	MDI2+	■ In BASE-T: Media-dependent interface[3:2]: ■ 1000BASE-T: In MDI and in MDI-X configuration, MDI[2]+/- corresponds to BI_DC+/- and MDI[3]+/- corresponds to BI_DD+/-.
5	MDI2-	■ 100BASE-TX: Unused.
7	MDI3+	■ 10BASE-T: Unused
8	MDI3-	

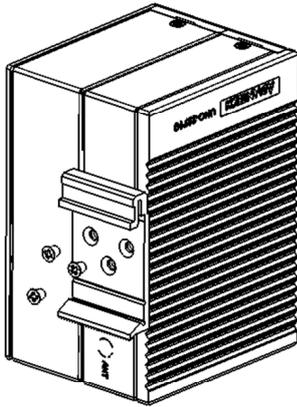|	Right LED		Left LED
10Link	**100Link**	**1000 Link**	**Active**
Off	Orange	Green	Green

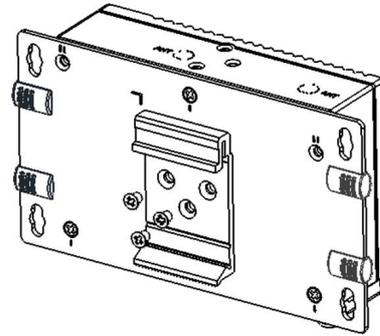## A.9 Screw Type and Quantity for Mounting Module
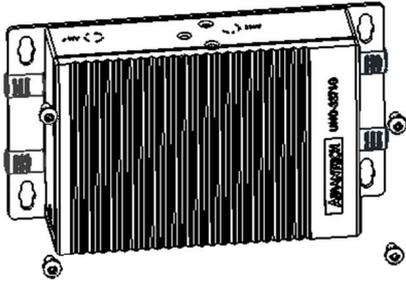
Screw: M3*P0.5*6L
Quantity: 4 pieces
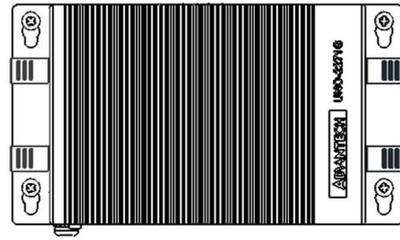
Head diameter: 5 ~ 5.3 mm

Screw: M3*P0.5*4L

Quantity: 3 pieces

To integrate the UNO-2271G with a DIN-rail kit, align the DIN-rail plate with the screw holes on the underside of the device.

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