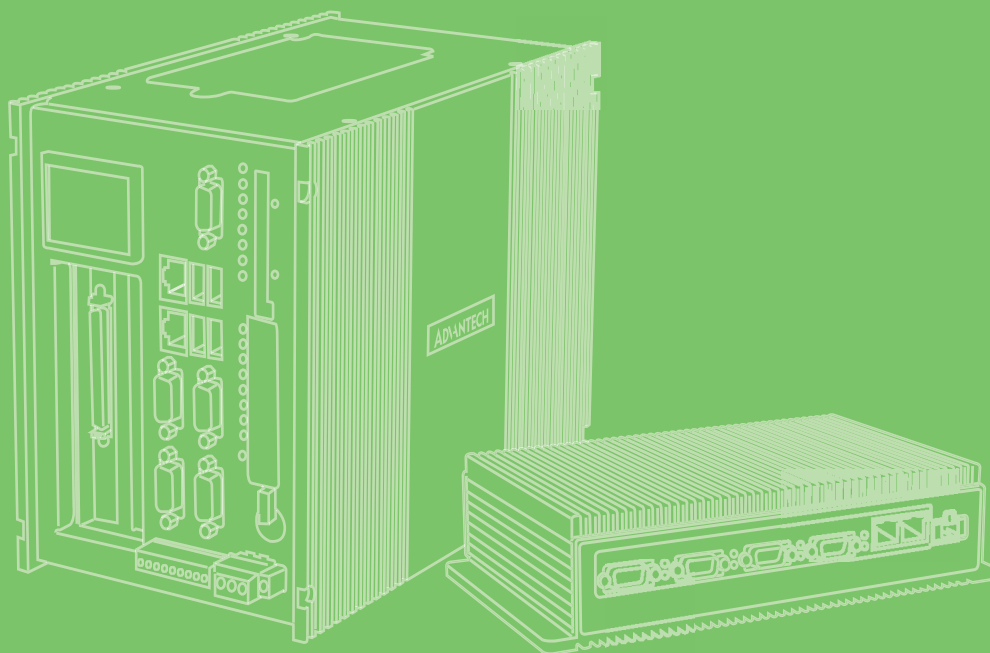




UNO-430 電腦

UNO-430-E1H
Intel® Atom Waterproof Data
Gateway with
IP66 Rating and Explosion
Protection

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 applies to the below model which is abbreviated as UNO-430 products in this article.

*Model number: UNO-430

*Part number:

UNO-430xxxxxxxxxxxxxxxxxx,

UNO430xxxxxxxxxxxxxxxxxx

(Where "X" may be any alphanumeric character or blank or "-")

Address: ADVANTECH Co., Ltd.
No. 1 Alley 20 Lane 26, Rueiguang Rd., Neihu District, Taipei City, 114
Taiwan

Part No. 2003043060
Printed in Taiwan

Edition 1
March 2022

Product Warranty (2 years)

Advantech warrants to you, 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 which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which 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 of our 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, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

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 you get 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 an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is 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 kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: 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.

警告使用者

這是甲類測試產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
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 you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install 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 the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
6. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
7. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
8. All cautions and warnings on the equipment should be noted.
9. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
10. For safety reasons, the equipment should be opened only by qualified service personnel.
11. If any of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment is malfunctioning, or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -40° C (-40° F) OR ABOVE 85° C (185° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
13. Batteries are 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. (This does not apply to C1D2/IECEX/ATEX)
14. Danger d'explosion si la batterie est mal remplacée. Remplacer uniquement par le même type ou équivalent recommandé par le fabricant. Jeter les piles usagées selon les instructions du fabricant. (Ceci ne s'applique pas à C1D2/IECEX/ATEX)
15. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
16. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. The power outlet socket should have grounded connection.
17. The equipment is not suitable for use in locations where children are likely to be present.
18. The equipment can only be used as in fixed position with antenna facing upward when in outdoor environment.
19. This product is intended to be supplied by an UL certified power supply or DC source suitable for use at minimum Tma 70 degree C and output meets SELV or ES1, rated 10-36Vdc, 3-0.83A minimum to match the unit rating, if need further assistance, please contact Advantech for further information.

20. For safe installation purpose, when installing this product, please pay attention to the nearby area to see if there is a possibility of objects falling and hitting the product, reducing the risk of mechanical danger.
21. Operators should wear electrostatic wrist or heel straps when they touch UNO-430.

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

Safety Instructions (IECEx / ATEX)

1. The equipment shall only be used in areas with at least pollution degree 2, as defined in IEC 60664-1.
2. Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
3. The equipment was evaluated in low mechanical impact conditions. The devices should be mounted in vertical position and installed in a low risk environment.
4. The enclosure has a non-metallic coating so installation/operation must minimize the risk from electrostatic discharge. Operators should wear electrostatic wrist or heel straps when they touch equipment.

Safety Instructions (C1D2 Only)

1. This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.
2. Ambient temperature range as indicated under “Environment Ratings”.
3. Temperature Class (T-Code): T4
4. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
5. This equipment is intended to be mounted on a pole with the mounting bracket, wall mounting or DIN mounting; the mounting should always let water proof connectors down to bottom position.” or similar.
6. This equipment should be installed with suitable Listed conduits in accordance with Article 501.10(B)(2) of the National Electrical Code (ANSI/NFPA 70). Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ).” or similar.

Field wiring, Earthing, Bonding information

1. The input terminal block (CN25) should be installed to 12-22AWG wires with 8 mm conductor insulation stripped.
2. The COM terminal blocks (CN18, CN19, CN20, CN21) should be installed to 14-26AWG wire with 10 mm solid conductor insulation stripped.
3. The internal earth connection should be installed to a conductor equal to input terminal block 12-22AWG.
4. The external bonding conductor should be installed to a conductor with at least 4 mm² cross-sectional area.
5. The field wiring cable should be rated $\geq 90^{\circ}\text{C}$.

Safety Instructions

1. Lire attentivement les instructions de sécurité.
2. Conserver ce manuel pour utilisation ultérieure.
3. Débranchez cet équipement de toute prise secteur avant de le nettoyer. Utilisez seulement un chiffon humide. N'utilisez pas de détergent liquide ou pulvérisé pour le nettoyage.
4. Placez cet équipement sur une surface fiable pendant l'installation. Le faire ou bien le laisser tomber peut causer des dégâts.
5. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à l'alimentation.
6. Placez le câble d'alimentation de manière à ce que personne ne puisse marcher dessus. Ne placez rien sur le câble d'alimentation.
7. Toutes les mises en garde et tous les avertissements sur l'équipement doivent être notés.
8. Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout endommagement dû à une surtension transitoire.
9. Pour des raisons de sécurité, l'équipement doit être ouvert uniquement par du personnel qualifié.
10. Si l'une des situations suivantes se présente, faites vérifier l'équipement par le personnel de service:
 - Un liquide a pénétré dans l'équipement.
 - L'équipement ne fonctionne pas bien, ou vous ne pouvez pas le faire fonctionner selon le manuel de l'utilisateur.
 - L'équipement est tombé et endommagé.
 - L'équipement présente des signes évidents de rupture.
11. NE LAISSEZ PAS CET ÉQUIPEMENT DANS UN ENVIRONNEMENT OU LA TEMPÉRATURE DE STOCKAGE PEUT ÊTRE INFÉRIEURE À -40° C (-40° F) OU BIEN SUPÉRIEURE À 85° C (185° F). CECI POURRAIT ENDOMMAGER L'EQUIPEMENT. L'ÉQUIPEMENT DEVRAIT ÊTRE DANS UN ENVIRONNEMENT CONTRÔLÉ.
12. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
13. L'équipement n'est pas adapté à une utilisation dans des endroits où des enfants sont susceptibles d'être présents.

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。
6. 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。
7. 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。
8. 請注意設備上所有的警告標示。
9. 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。
10. 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。
11. 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；
12. 請勿將設備放置在超出建議溫度範圍的環境，即不要低於 -40°C (-40°F) 或高於 85°C (185°F)，否則可能會造成設備損壞。
13. 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。
14. 本產品於國內裝置使用時，其電源僅限使用機架電源模組所提供直流電源輸入，不得使用交流電源及附加其他電源轉換裝置提供電源，其電源輸入電壓及電流請依說明書規定使用。
15. 根據 IEC 704 - 1:1982 規定，操作員所在位置音量不可高於 70 分貝。
16. 限制區域：請勿將設備安裝於限制區域使用。
17. 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。

Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Caution! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer, discard used batteries according to the manufacturer's instructions.



Attention! Danger d'explosion si la batterie est inexactement remplacée. Remplacez seulement avec la même chose ou le type équivalent recommandé par le fabricant, jettent les batteries utilisées instructions de s selon fabricant des'.



Note! Notes provide optional additional information.



Caution! The earthing wire of the protective earthing conductor shall be green-and-yellow, 14AWG.



Attention! Le fil de terre du conducteur de protection doit être vert et jaune, 14AWG.



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Chapter 1

Overview

This chapter provides an overview of UNO-430 specifications.

Sections include:

- Introduction
- Hardware specification
- Chassis dimensions

1.1 Introduction

Designed for use in harsh industrial environments, UNO-430 features all-around IP69K/68-rated ingress protection and cable gland I/O connectors to provide a truly watertight solution that can withstand the most demanding applications. The waterproof enclosure features a front door for easy access and maintenance as well as a cable gland that offers further ingress protection, reducing the need for waterproof cables and wiring. This comprehensive protection also eliminates the need for a waterproof cabinet, allowing customers to use the UNO-430 gateway as a stand-alone data acquisition gateway. Moreover, with the provision of standard M.2 2230 Wi-Fi and M.2 3052/3042 5G/LTE sockets, the UNO-430 gateway offers expandable wireless connectivity for remote communications and data transfers.

1.2 Safety Precautions

Below are a few safety precautions for preventing injury when making connections. In most cases, users can use a standard cable for connection.

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-430. 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-430. 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 Packing List

Please refer to below packing list:

- UNO-430
- 1 x 1x3 Plug-in block for power wiring
- 2 x Mounting Kit
- 4 x M4x6L screws for mounting kit installation
- Quick Start Guide
- Simplified Chinese manual
- China RoHs sheet
- Warranty card

If anything is missing or damaged, contact your distributor or sales representative immediately.

1.4 Hardware Specifications

1.4.1 General

- **CPU:** Intel® Atom E3950 2.0GHz processor
- **Memory:** Built-in 8GB DDR3L 1333 MHz
- **Storage:**
 - Supports 1 x M.2 2242 B-key (SATA signal)
- **TPM:** TPM2.0
- **Watchdog Timer:** Programmable 255 levels timer interval, from 1 to 255sec
- **I/O Interface:**
 - 2 x RS-422/485(isolated),
 - 1 x RS-232(console)
 - 1 x Power Connector
 - 2 x RJ45
- **Internal maintenance I/O:**
 - 1 x DisplayPort
 - 1 x USB2.0
 - 1 x USB3.0
- **LED Indicators:** Power, Storage, LTE, WIFI, Programmable LED
- **Communication**
 - 5G/LTE: 1 x M.2 (Type 3052/3042) key B support
 - WIFI/Bluetooth: 1 x M.2 (Type 2230) key E support
 - LTE: 1 x micro USB support (for MultiTech Dragonfly™ card support)
- **Cable Gland**
 - 4 x Cable Gland 1/2"NPT, OD 6.5~14 mm, IP66

1.5 Chipset

1.5.1 Functional Specification

1.5.1.1 Processor

Processor	Intel® Atom Quad Core E3950 2GHz processor
------------------	--

1.5.1.2 Chipset

Memory	■ Supports DDR3L 1600 MHz (without ECC) ■ SODIMM Socket – 260-pin SODIMM socket
Processor Graphics	■ Intel® HD Graphics 505
M.2 Interface	■ 1 x M.2 (Type 2242) key B supports (OS storage and boot) ■ 1 x M.2 (Type 3052/3042) key B supports (5G/LTE) ■ 1 x M.2 (Type 2230) key E supports (WIFI/Bluetooth)
USB Interface	■ USB host interface for 1 x USB2.0 port /1 x USB3.0 port ■ Supports legacy keyboard/mouse software
Display Interface	■ DP 1.2, up to 4096x2160@60Hz
Power Management	■ +10V~+36V DC Input Duel from 3pin plug connector ■ Power Connector: Plug-in block 3Px1
BIOS	■ AMI UEFI64 Mbit

1.5.1.3 Others

Serial Ports	2 x RS-422/485 (isolated), 50 ~115.2 kbps 1 x RS-232 (console), 50 ~115.2 kbps Serial ports connector: Terminal connector
LAN	Intel® i210-IT ■ Compliant with IEEE 802.1Qav, IEEE1588/802.1as,802.3az ■ Supports 10/100/1000 Mbps ■ Supports Wake on LAN
Battery backup	■ CR2032 3V/200mAh

1.6 Mechanical Specifications

1.6.1 Dimensions

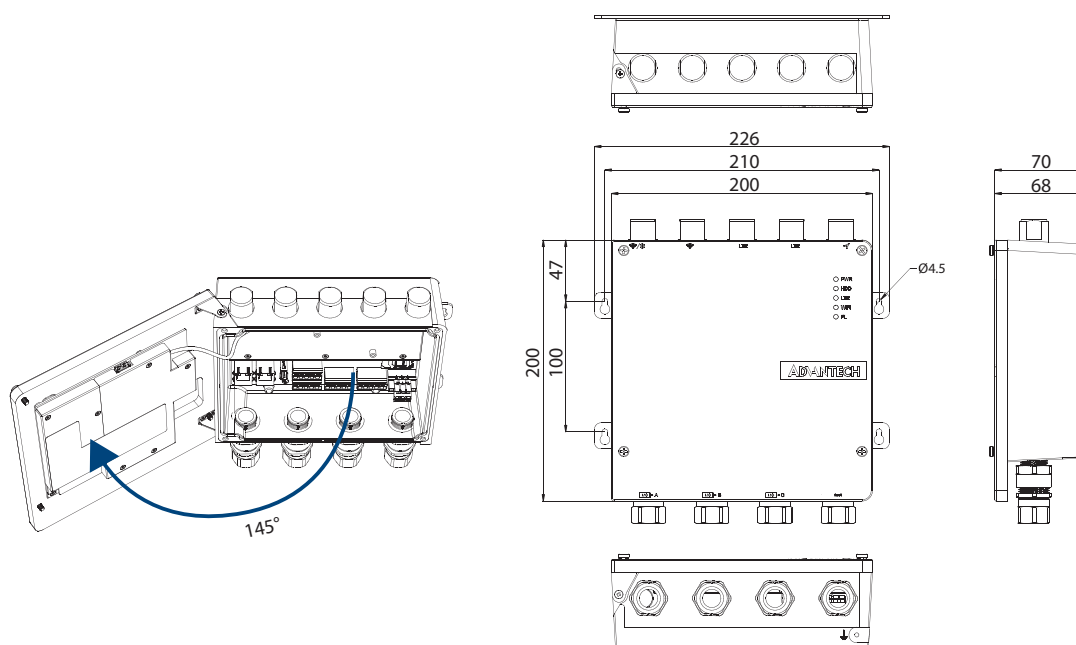


Figure 1.1 Dimensions

1.6.2 Weight

3.0 kg

1.7 Power Requirements

1.7.1 System power

DC 10-36VDC

1.7.2 RTC battery

CR2032 3V/200 mAh

1.8 Environment Specification

1.8.1 Operating temperature

-40 ~ 70°C (-40 ~ 158°F) @ 5 ~ 85% RH with 0.7 m/s airflow

1.8.2 System safety certification test temperature

-40 ~ 70°C with M.2 SSD

1.8.3 Relative humidity

10 ~ 95% RH @ 40°C, non-condensing

1.8.4 Storage temperature

-40 ~ 85°C (-40 ~ 185°F)

1.8.5 Vibration during operation

Operating, IEC 60068-2-64, 2Grms, random, 5 ~ 500Hz, 1hr/axis

1.8.6 Shock during operation

Operating, IEC 60068-2-27, 50G, half sine, 11ms

1.8.7 Safety

UL, CB, C1D2, ATEX, IECEx

ATEX certificate number: UL 21 ATEX 2466X

IECEx certificate number: IECEx UL 21.0061X

Standard information:

- IEC 60079-0 Edition 7
- IEC 60079-7 Edition 5.1
- IEC 60079-31 Edition 2
- IEC EN 60079-0:2018
- IEC EN 60079-7:2015+A1:2018
- EN 60079-31:2014

Ex marking string:



II 3 G Ex ec IIC T4 Gc IP65

II 3 D Ex tc IIIC T90°C DC IP65

1.8.8 EMC

CE, FCC

Chapter 2

H/W Installation

This chapter introduces external IO and the installation of UNO-430 hardware.

2.1 Introduction

The following sections show the internal jumper settings and the external connectors and pin assignments.

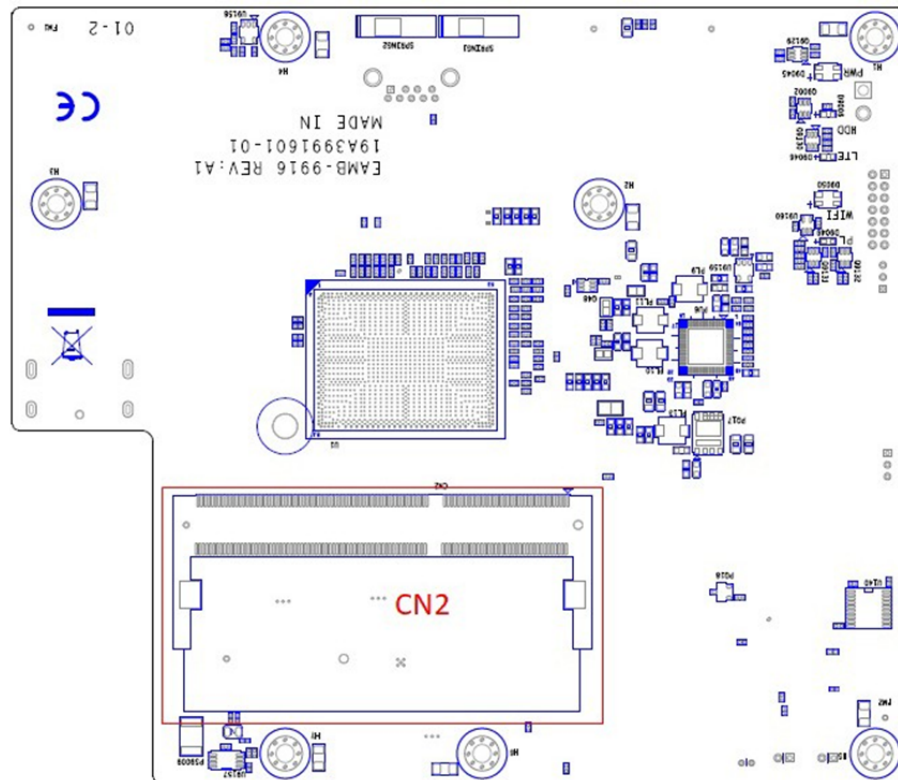


Figure 2.1 Motherboard Connector and jumper locations (top side)

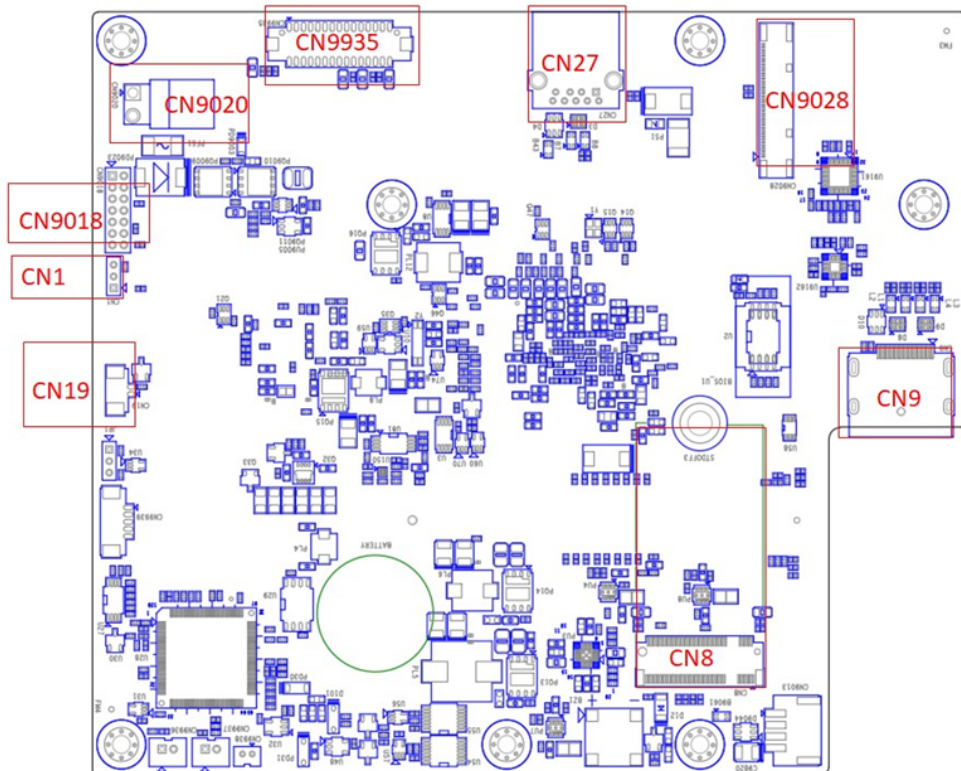
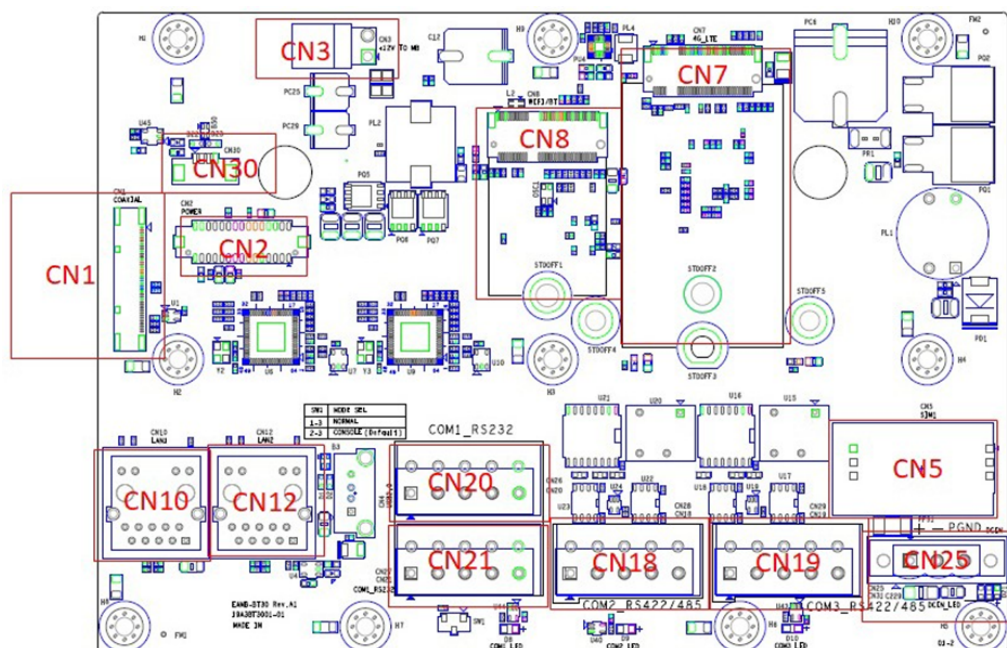


Figure 2.2 Motherboard Connector and jumper locations (rear side)

Table 2.1: Motherboard Connector

Location	Function	Location	Function
CN2	Memory slot	CN9018	Debug port
CN9	Displayport	CN9020	12V DC Input
CN27	USB3.0	CN9935	DC Output
CN8	M.2 B key for 2242 storage	CN9028	Coaxial PCIe signal
CN19	RTC		

**Figure 2.3 IO board connector locations****Table 2.2: IO Board Connector**

Location	Function	Location	Function
CN1	Coaxial PCIe signal	CN20/21	RS-232
CN2	MB DC Input	CN18	RS-422/485
CN3	12V DC Output	CN19	RS-422/485
CN10	LAN	CN5	SIM slot
CN12	LAN	CN7	M.2 B key 3042/3052 for LTE/5G
CN30	Internal USB (reserved for MultiTech module)	CN8	M.2 E key 2230 for WiFi
CN25	DC Power Input		

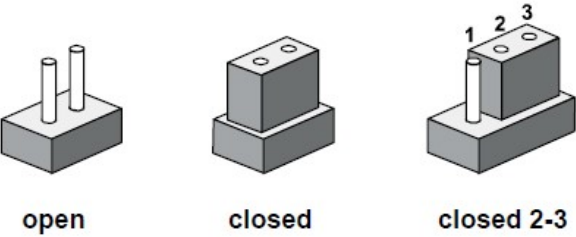
2.2 Jumper and Switch

Table 2.3: Jumper and Switch List

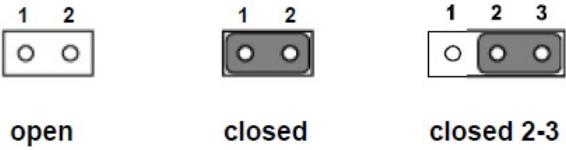
Location	Function
CN1(motherboard)	Clear CMOS
SW1 (I/O board)	RS-232 console mode function setting

2.2.1 Clear CMOS

Configure the UNO-430 to match the needs of your application by setting jumpers. To close a jumper, you connect the pins with the clip. To open a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically depicted in this manual as follows.

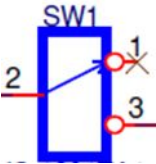


A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

UNO-430 mainboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

CMOS1	Clear CMOS
Footprint	3x1 Pin
Setting Function	Function
(1-2)	Normal (default)
(2-3)	Clear CMOS

2.2.2 RS-232 console mode function (IO board)



SW1	
Footprint	3x1 Pin
Setting Function	console
(1-2)	Normal
(2-3)	Console mode (default)

2.3 Connectors

2.3.1 I/O Connectors

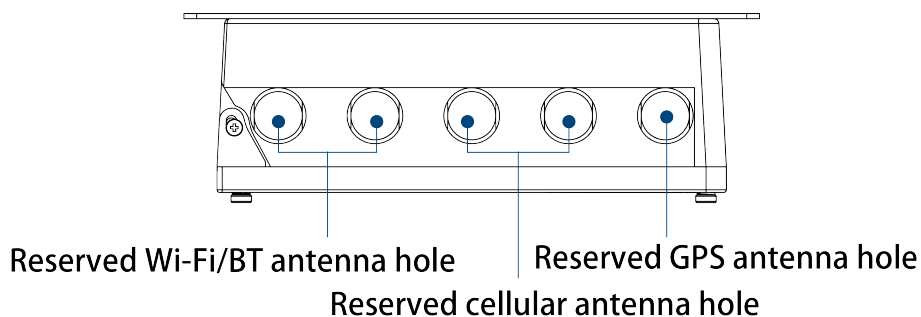


Figure 2.4 UNO-430 Top I/O View

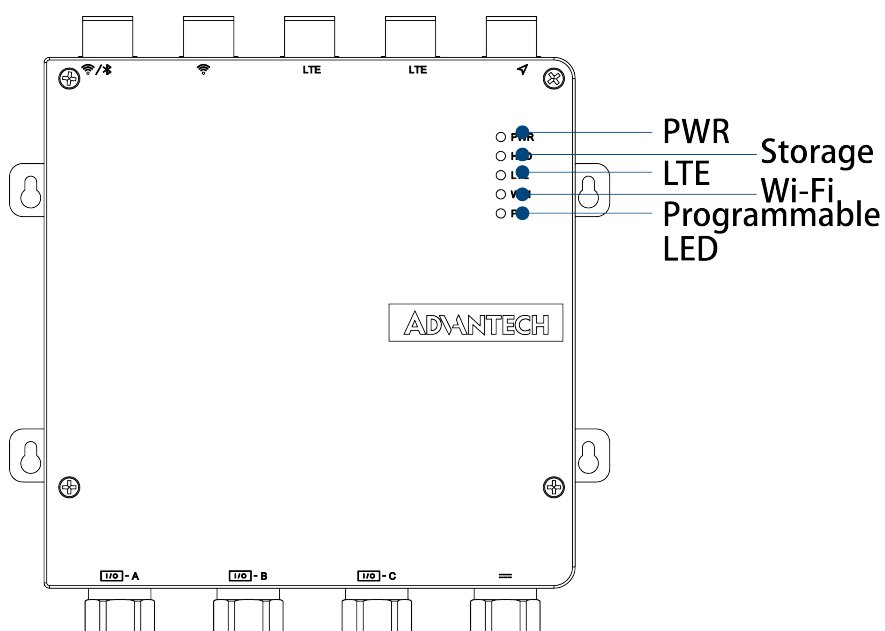


Figure 2.5 UNO-430 Front LED View

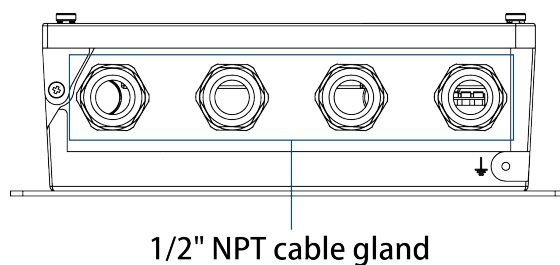


Figure 2.6 UNO-430 Bottom I/O View

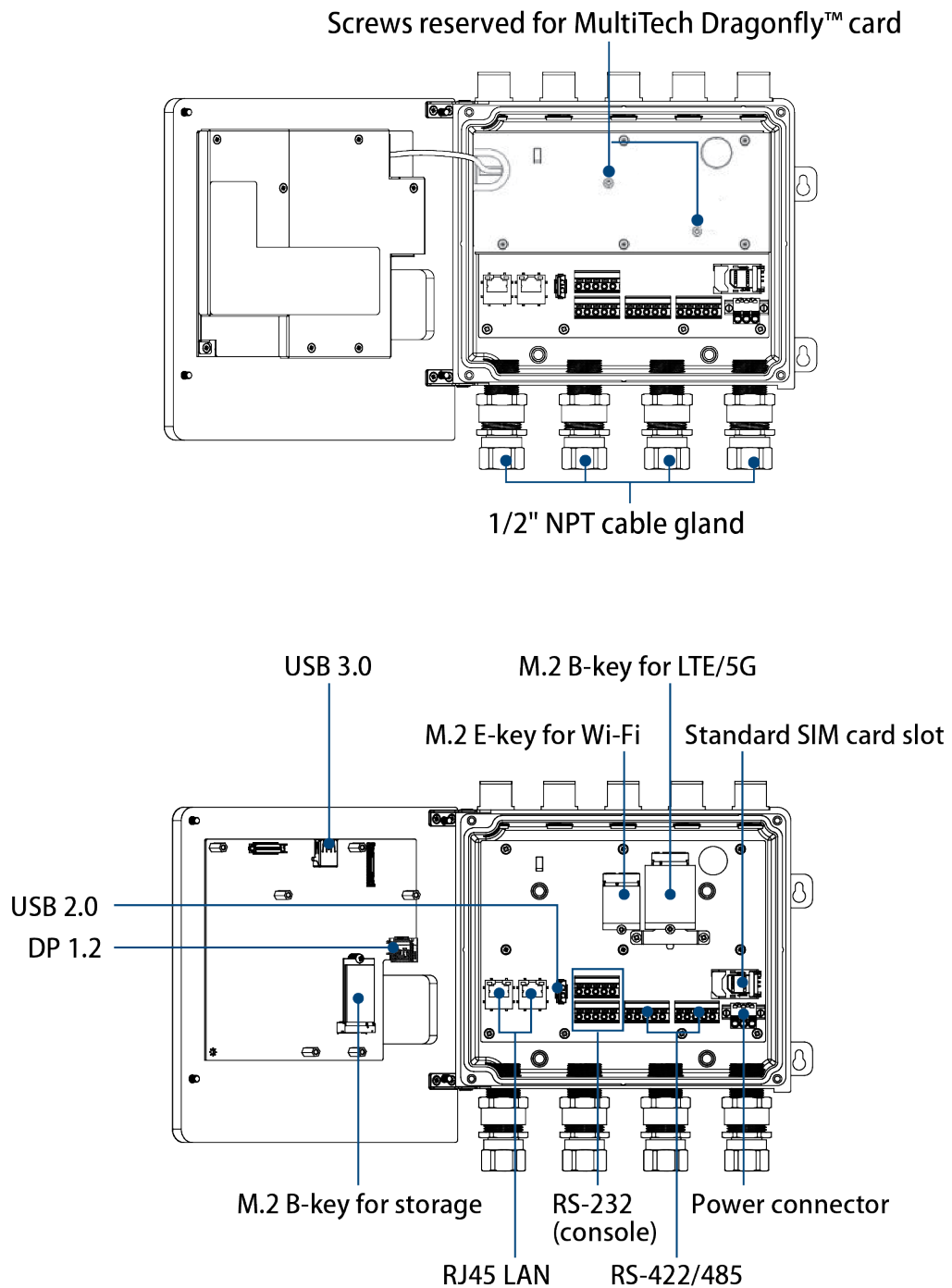


Figure 2.7 UNO-430 Box open I/O View

2.3.1.1 Cable Gland

UNO-430 provides four 1/2"NPT cable glands (I/O-A / I/O-B / I/O-C / Power) to support easy wiring/connecting to the inner terminal block and RJ45 connectors.

I/O-A is use for RJ45 LAN cable. I/O-B is use for CN20/CN21 to offer RS-232 (console). I/O-C is use for CN18/CN19 to offer RS-422/485 (isolated) serial communication interface ports. The cable gland on the far right is use for CN25 to support DC power source. You can find detailed cable gland installation in Chapter 2.5.1.

2.3.1.2 COM Connector

The UNO-430 features 1 x RS232 (console) and 2 x 422/485 (isolated) ports in terminal block type, RS-232 (console) can enable/disable remote control function by switch. You can find detailed setting methods in Chapter 2.2.2.

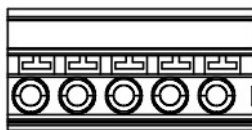


Figure 2.8 COM Connector

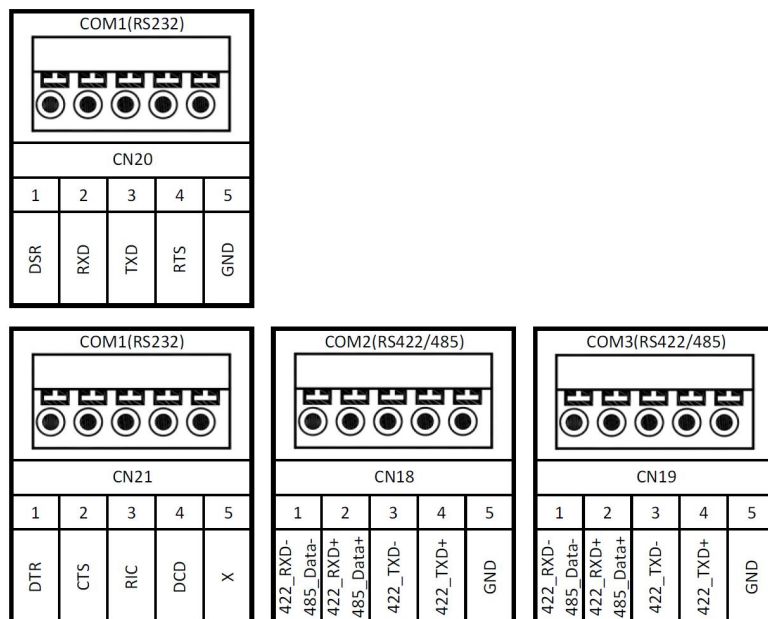


Figure 2.9 COM Connector Pin Assignments

2.3.1.3 Power Connector

UNO-430 comes with a Phoenix connector that carries 10 ~ 36 VDC external power input, and features reversed wiring protection. Therefore, it will not cause any damage to the system by reversed wiring of ground and power lines.

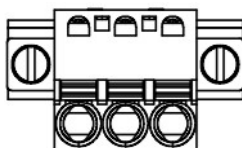


Figure 2.10 Power Connector

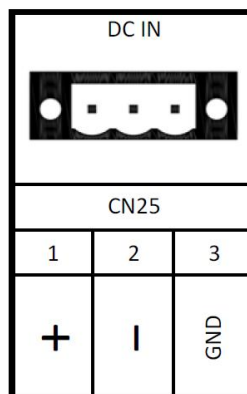


Figure 2.11 Power Connector Pin Assignments

2.3.1.4 LAN Connector

UNO-430 is equipped with two Gigabit LAN controllers. An Intel® i210 Ethernet controller that complies with IEEE 802.3u 10/100/1000 Base-T is used as the controller chip. The Ethernet port is a standard RJ-45 jack. Additionally, LED indicators are provided on the front of the device to indicate the system's Link (off/green/orange) and Active (green) status.

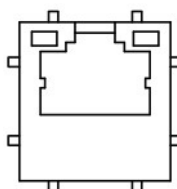


Figure 2.12 LAN Connector

Table 2.4: Ethernet Connector Pin Assignments		
Pin	Signal Name	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+/-. ■ 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.
2	MDI0-	
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+/-. ■ 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	MDI1-	
5	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+/-. ■ 100BASE-TX: Unused. ■ 10BASE-T: Unused.
6	MDI2-	
7	MDI3+	
8	MDI3-	

Table 2.5: LED Indicators

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

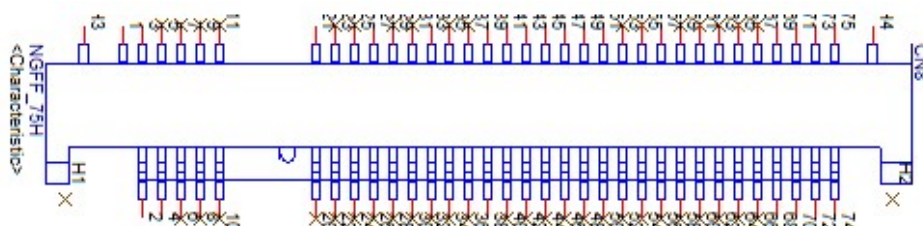
2.3.1.5 SIM Slot

There's one standard SIM Slot for supporting LTE function, labeled "CN5" on I/O board. In addition to install SIM card on "CN5", users are required to install a LTE Module on "CN7" M.2 B Key to enable the functionality.

2.3.1.6 M.2 Connector

There are 3 x M.2 connector for M.2 cards including M.2 (Type 2242) key B (storage) labeled "CN8" on motherboard, M.2 (Type 3052/3042) key B (5G/LTE) labeled "CN7" on I/O board and M.2 (Type 2230) key E (WIFI/Bluetooth) labeled "CN8" on I/O board.

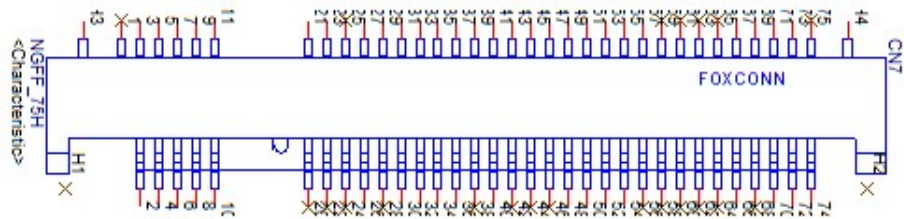
You can find detailed installation in Chapter 2.4.3.

MB M.2 B-Key 2242 Storage Connector (CN8)**Table 2.6: M.2 B Key Connector Pin Assignments**

Pin	Signal Name	Pin	Signal Name
1	GND	2	+V3.3
3	GND	4	+V3.3
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	GND	12	Mechanical notch B
13	Mechanical notch B	14	Mechanical notch B
15	Mechanical notch B	16	Mechanical notch B
17	Mechanical notch B	18	Mechanical notch B
19	Mechanical notch B	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	DEVSLP

Table 2.6: M.2 B Key Connector Pin Assignments

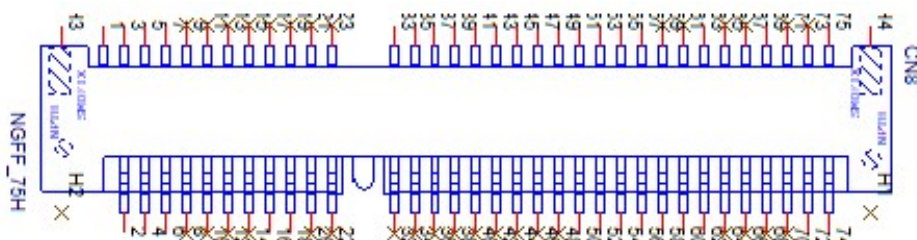
39	GND	40	NC
41	SATA1_RX+	42	NC
43	SATA1_RX-	44	NC
45	GND	46	NC
47	SATA1_C_TX-	48	NC
49	SATA1_C_TX+	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	PMU_SUSCLK
69	GND	70	+V3.3
71	GND	72	+V3.3
73	GND	74	+V3.3
75	GND		

IO board M.2 B-key 3042/3052 LTE Connector (CN7)**Table 2.7: M.2 B Key Connector Pin Assignments**

Pin	Signal Name	Pin	Signal Name
1	NC	2	3V_LTE
3	GND	4	3V_LTE
5	GND	6	M2_LTE_PWR_ON
7	M2_LTE_USB_DP	8	M2_LTE_W1_DISABLE_N
9	M2_LTE_USB_DN	10	M2_LTE_LED_WWAN#
11	GND	12	Mechanical notch B
13	Mechanical notch B	14	Mechanical notch B
15	Mechanical notch B	16	Mechanical notch B
17	Mechanical notch B	18	Mechanical notch B
19	Mechanical notch B	20	NC
21	GND	22	NC
23	WAKE_ON_WAN#	24	NC
25	NC	26	M2_LTE_W2_DISABLE_N
27	GND	28	NC
29	USB_Z_SSRX1-	30	M2_SIM1_RESET

Table 2.7: M.2 B Key Connector Pin Assignments

31	USB_Z_SSRX1+	32	M2_SIM1_CLK
33	GND	34	M2_SIM1_DATA
35	USB_Z_SSTX1-	36	M2_SIM1_PWR
37	USB_Z_SSTX1+	38	NC
39	GND	40	M2_SIM2_DET
41	PCIE_A_X_RX3-	42	NC
43	PCIE_A_X_RX3+	44	NC
45	GND	46	NC
47	PCIE_A_X_TX3-	48	M2_SIM2_PWR
49	PCIE_A_X_TX3+	50	LTE_RST_GPIO#
51	GND	52	MPCIE_CLKREQ#
53	CLK_LAN1_PCIE	54	PCIE_WAKE#
55	CLK_LAN1_PCIE+	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	M2_SIM1_DET
67	LTE_RST_GPIO#	68	NC
69	GND	70	3V_LTE
71	GND	72	3V_LTE
73	GND	74	3V_LTE
75	NC		

IO board M.2 E-key 2230 WiFi Connector (CN8)**Table 2.8: M.2 E Key Connector Pin Assignments**

Pin	Signal Name	Pin	Signal Name
1	GND	2	+V3.3_MINI
3	USB3_B_P+	4	+V3.3_MINI
5	USB3_B_P	6	WIFI_LED#
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	BT_LED#
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC

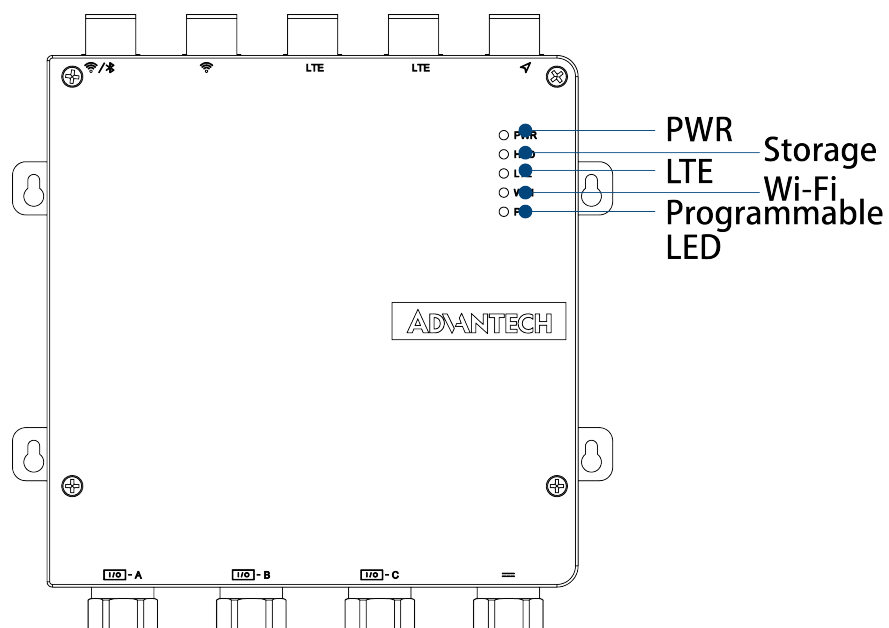
Table 2.8: M.2 E Key Connector Pin Assignments

23	NC	24	Mechanical notch E
25	Mechanical notch E	26	Mechanical notch E
27	Mechanical notch E	28	Mechanical notch E
29	Mechanical notch E	30	Mechanical notch E
31	Mechanical notch E	32	NC
33	GND	34	NC
35	USB_Z_SSTX1-	36	NC
37	USB_Z_SSTX1+	38	NC
39	GND	40	NC
41	PCIE_A_X_RX3-	42	NC
43	PCIE_A_X_RX3+	44	NC
45	GND	46	NC
47	PCIE_A_X_TX3-	48	NC
49	PCIE_A_X_TX3+	50	M2_SYCLK
51	GND	52	WIFI_PLTRST#
53	CLK_LAN1_PCIE	54	BT_DISABLE_L
55	CLK_LAN1_PCIE+	56	WLAN_DISABLE
57	GND	58	SMB_DATA
59	NC	60	SMB_CLK
61	NC	62	ALERT#
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+V3.3_MINI
73	NC	74	+V3.3_MINI
75	GND		

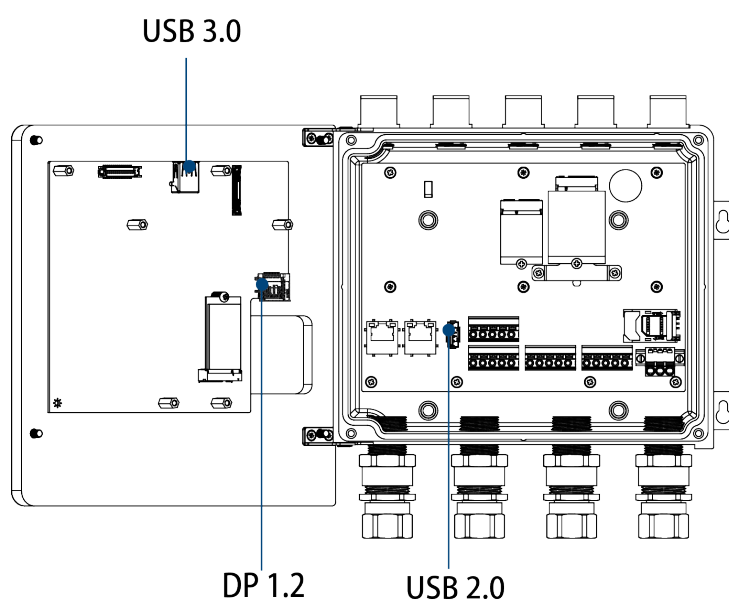
2.3.1.7 LED Indicators

There are five LEDs to indicate the status of the system power, HDD, LTE, WIFI and PL programmable LED for user's configurations.

- PWR(Power): Green means normal, orange means standby.
- HDD: Flashing green means normal
- LTE: Flashing green means normal
- WIFI: Flashing yellow and green alternately means normal
- PL: Programmable LED



2.3.2 Internal maintenance I/O



2.3.2.1 USB connector

UNO-430 provides 1 x USB 3.0 and 1 x USB2.0 interface connectors, which give complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB XHCI, Rev. 3.0. Please refer to the table below for pin assignments.

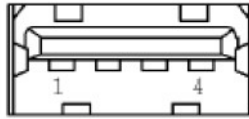


Figure 2.13 USB 2.0 Connector

Table 2.9: USB 2.0 Connector Pin Assignments

1	VCC
2	DATA-
3	DATA+
4	GND

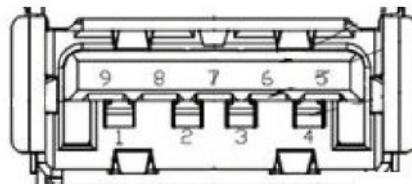


Figure 2.14 USB 3.0 Connector

Table 2.10: USB 3.0 Connector Pin Assignments

1	VCC
2	USB Data-
3	USB Data+
4	GND
5	SSRX-
6	SSRX+
7	GND
8	SSTX-
9	SSTX+

2.3.2.2 DisplayPort Connector

UNO-430 provides a high resolution DisplayPort, It supports display resolution of up to 4096x2160@60Hz.

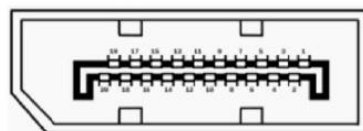


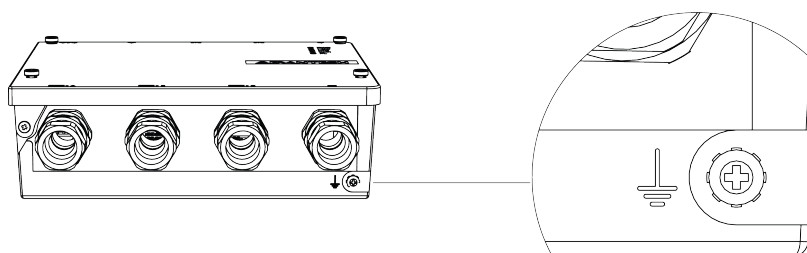
Figure 2.15 DisplayPort Connector

Table 2.11: DisplayPort Adaptor Cable Pin Assignments

Pin	Signal Name
1	ML_Lane 0 (p)
2	GND
3	ML_Lane 0 (n)
4	ML_Lane 1 (p)
5	GND
6	ML_Lane 1 (n)
7	ML_Lane 2 (p)
8	GND
9	ML_Lane2 (2)
10	ML_Lane 3 (p)
11	GND
12	ML_Lane 3 (n)
13	CONFIG1
14	CONFIG2
15	AUX CH (p)
16	GND
17	AUX CH (n)
18	Hot Plug
19	Return
20	DP_PWR

2.4 Chassis Grounding

The UNO-430 provides good EMI protection and a stable grounding base. There is an easy-to-connect chassis grounding point (M4 screw) to use.



Note:

1. When fix M4 grounding screw, please pay attention to the required torque value is 5 ± 0.5 kgf.cm
2. We suggest using an earth-ground cable (14 AWG) to connect the chassis ground with the earth ground.

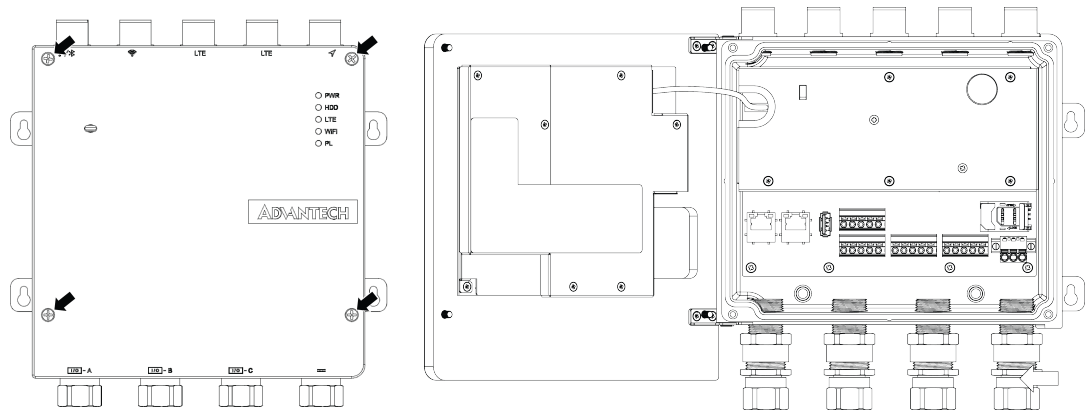
2.5 Installation

2.5.1 Cable gland installation

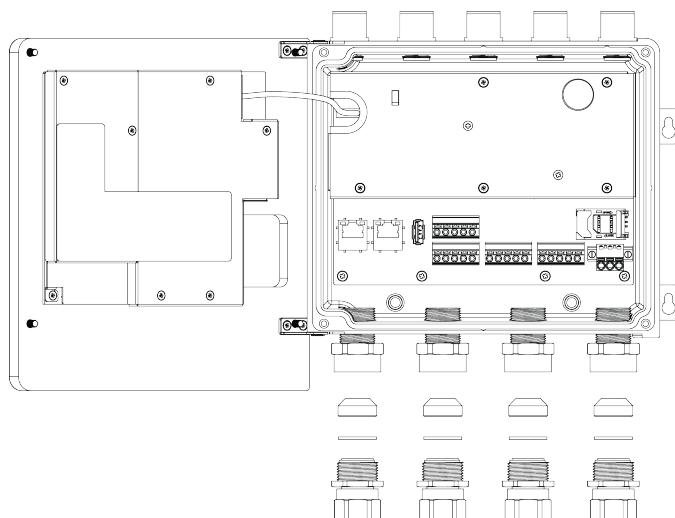
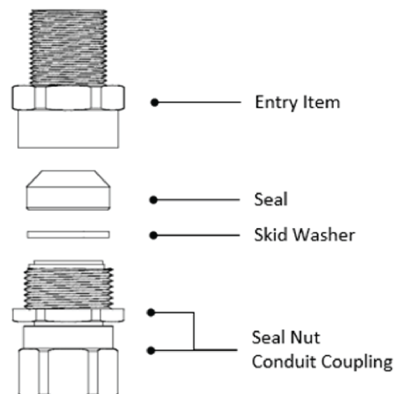
UNO-430 provides four 1/2"NPT cable glands (I/O-A / I/O-B / I/O-C / Power) to support easy wiring/connecting to the inner terminal block and RJ45 connectors.

UNO-430 supports four 1/2"NPT cable glands installation. The following steps demonstrate how to install / connect to the inner terminal block and RJ45 connectors.

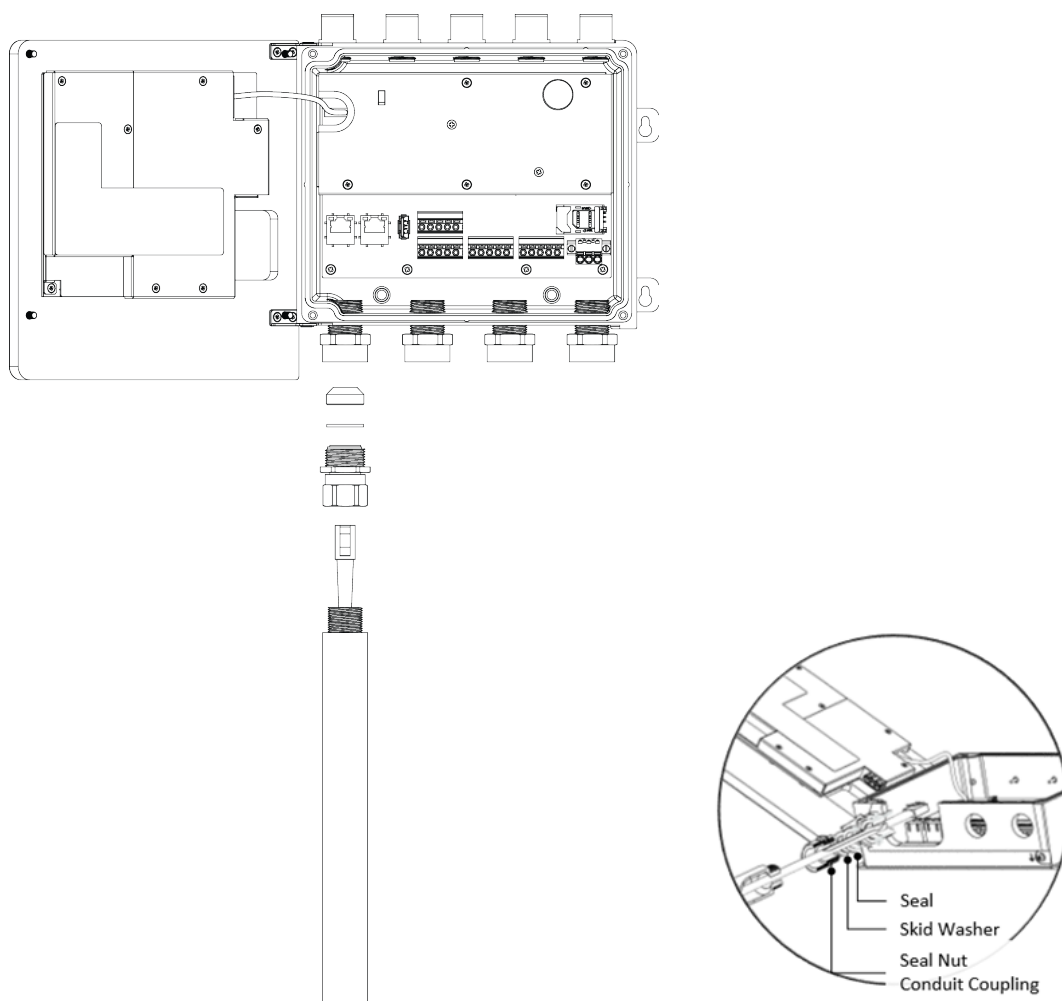
1. Remove 4 screws from top cover of UNO-430 to open it.



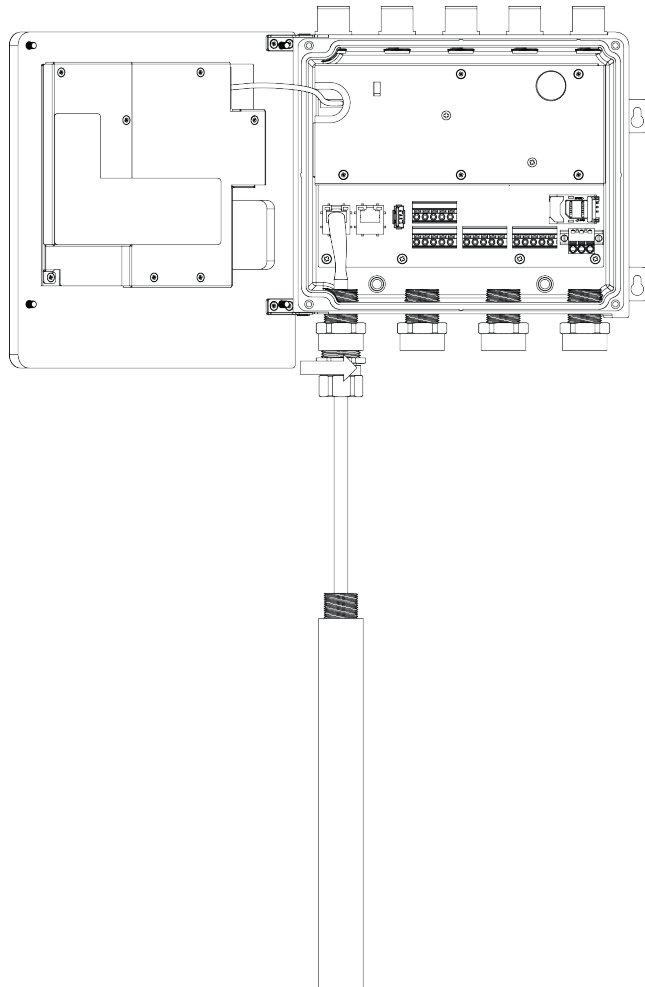
2. 1/2"NPT cable gland include seal, skid washer and seal nut with conduit coupling. Simply slacken the seal nut to relax the seal and no need to dismantle the cable gland prior to installation.



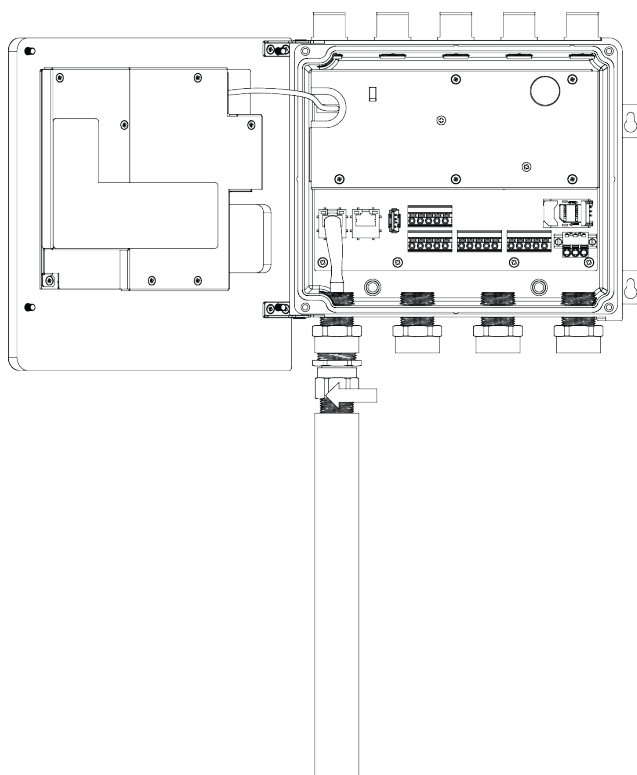
3. Pass the LAN cable through the seal nut with conduit coupling and then go through the skid washer and seal. Lastly, connect the LAN cable to the I/O board through the UNO-430 bottom hole. (Metal conduit is only for C1D2 usage)



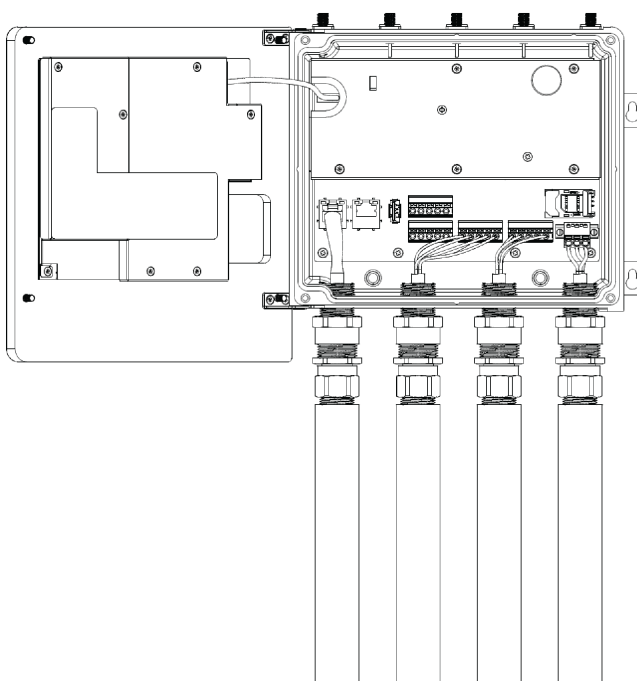
4. Tighten the seal nut by hand until resistance is felt (when the seal contacts the cable). Tighten with a wrench one further turn. (Metal conduit is only for C1D2 usage)

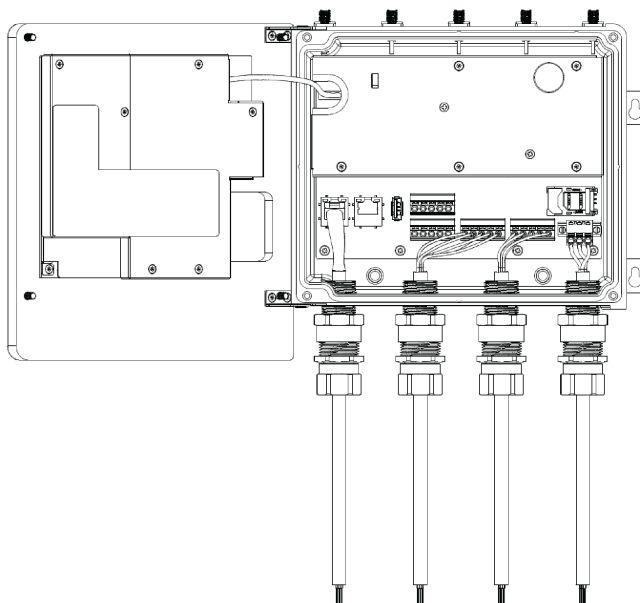


5. This step is only for C1D2 usage, you will need to use wrench to tighten the conduit coupling.



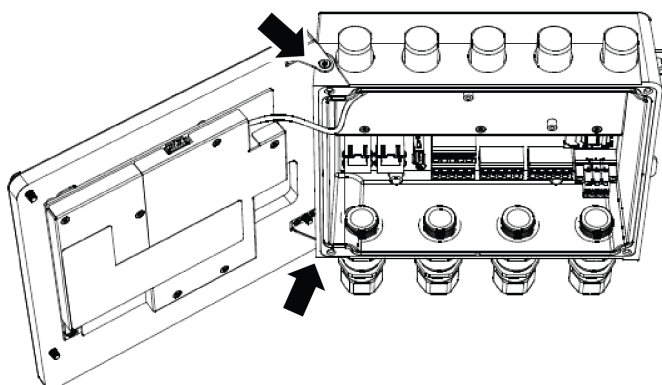
6. Follow step 2 to step 5 to finish the other cable glands assembling if needed.
(Metal Conduit is only for C1D2 usage)





Note:

1. 1/2"NPT cable gland model name is A2FRC that defined torque value is 20 ± 0.5 kgf.cm
2. When wiring, the overall cable diameter (OD) used for A2FRC should meet Minimum 6.5mm to Maximum 14mm
3. 1/2"NPT cable gland also has a rotating female-threaded coupling (conduit coupling) at the rear of the gland to allow the metal conduit.
4. If one of the four cable glands is not used, please use a certified stopper plug like OSSP-H or others IECEx / ATEX certified stopper plug to replace. (OSSP-H defined torque value is 20 ± 0.5 kgf.cm)
5. Metal Conduit is only for C1D2 usage
6. When resealing back the top cover with 4 screws, please pay attention to the required torque value is 8~10 kgf.cm
7. As shown below, the two screws for hinge of top cove defined torque value is 4~4.5 kgf.cm

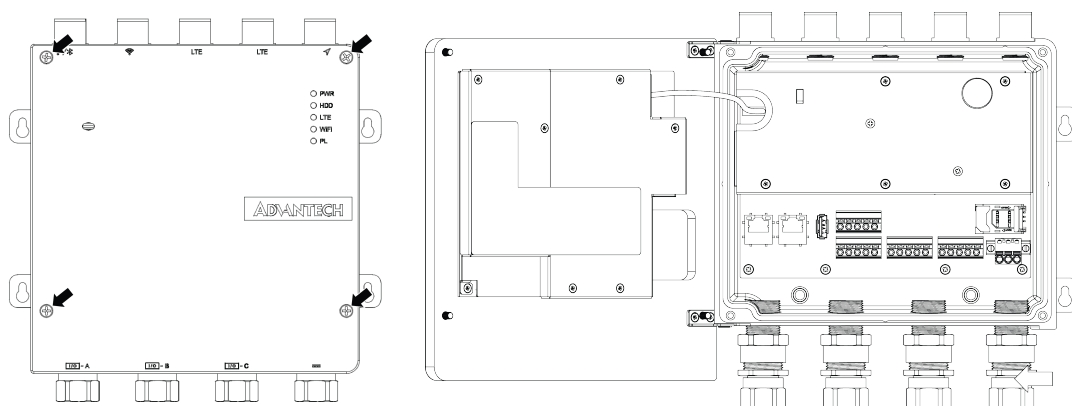


8. For cable gland installation shall be compliant with IEC 60079-14 requirements, providing and maintaining degree of protection at least IP65 according to IEC 60079-0 requirements.

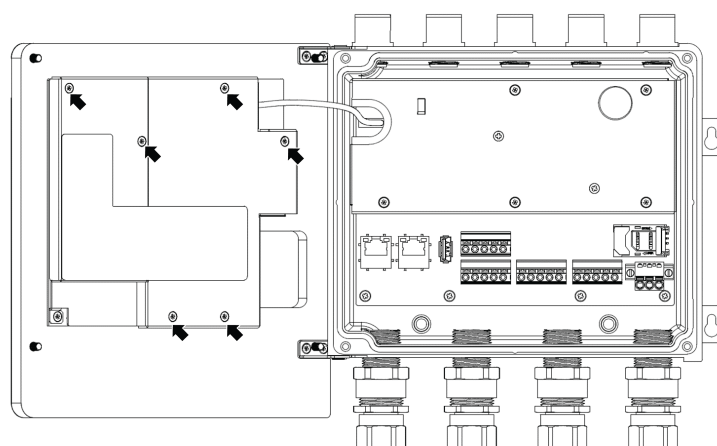
2.5.2 M.2 Storage installation (Optional)

UNO-430 supports 1 M.2 (Type 2242) B key storage installation. The following steps demonstrate how to install M.2 storage.

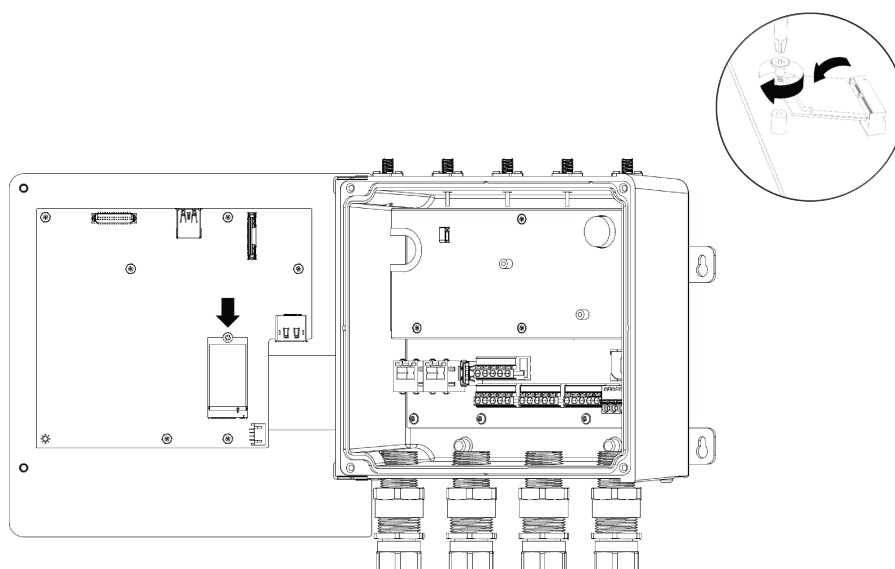
1. Remove 4 screws from top cover of UNO-430 then you can open it.



2. Remove 6 screws from the shielding case on the main board.



3. Install the M.2 storage and fix the screw.



- Recover the shielding case on main board and top cover and fix the screws.

Note:

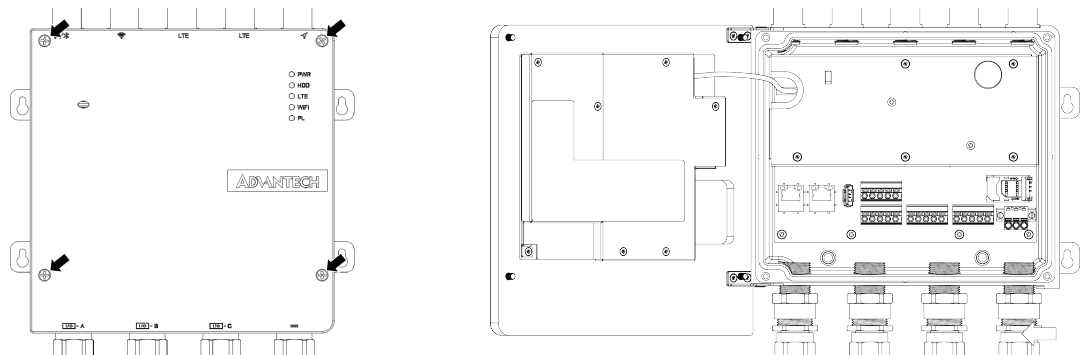
If you need to purchase an M.2 storage, you have to select the following models that have been C1D2 and IECEx/ATEX certified with Advantech UNO-430.

P/N	Description
SQF-SM4M1-16G-SBE	SQF SATA M.2 2242 640 16G MLC (-40~85°C)
SQF-SM4M2-32G-SBE	SQF SATA M.2 2242 640 32G MLC (-40~85°C)
SQF-SM4M2-64G-SBE	SQF SATA M.2 2242 640 64G MLC (-40~85°C)
SQF-SM4M2-128G-SBE	SQF SATA M.2 2242 640 128G MLC (-40~85°C)
SQF-SM4M2-256G-SBE	SQF SATA M.2 2242 640 256G MLC (-40~85°C)

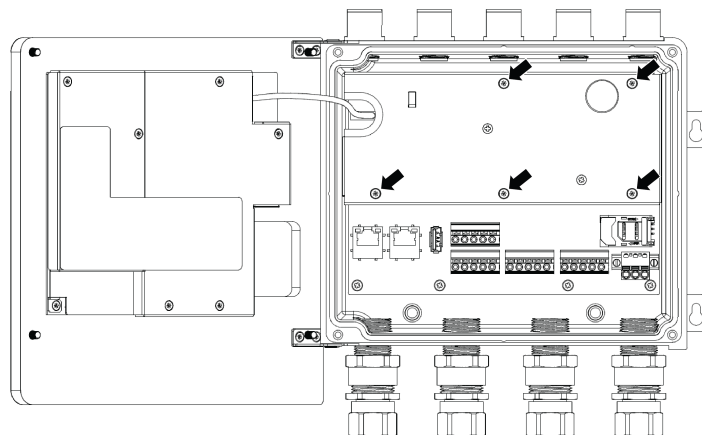
2.5.3 M.2 WIFI/LTE Module Installation (Optional)

UNO-430 supports 1 M.2 (Type 3052/3042) key B for 5G/LTE module installation and M.2 (Type 2230) key E for WIFI/Bluetooth module installation. The following steps demonstrate how to install M.2 WIFI/LTE/Bluetooth modules.

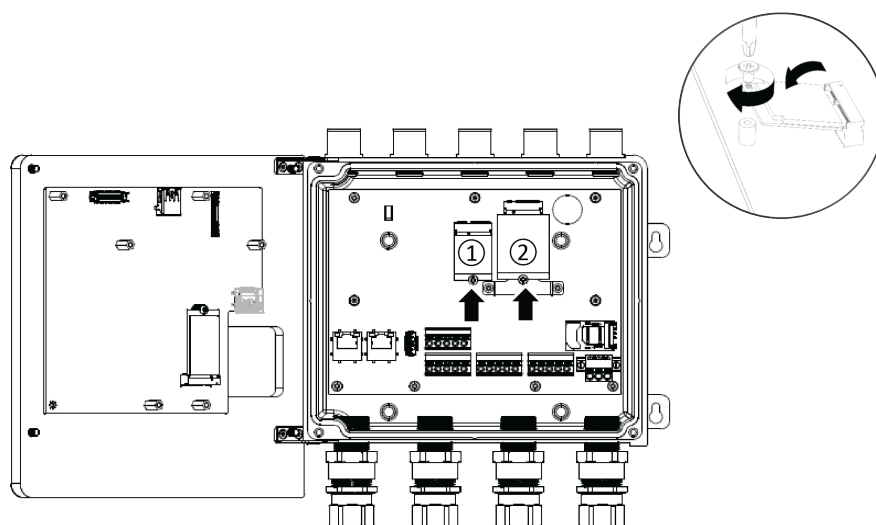
- Remove the 4 screws from top cover of UNO-430 to open it.



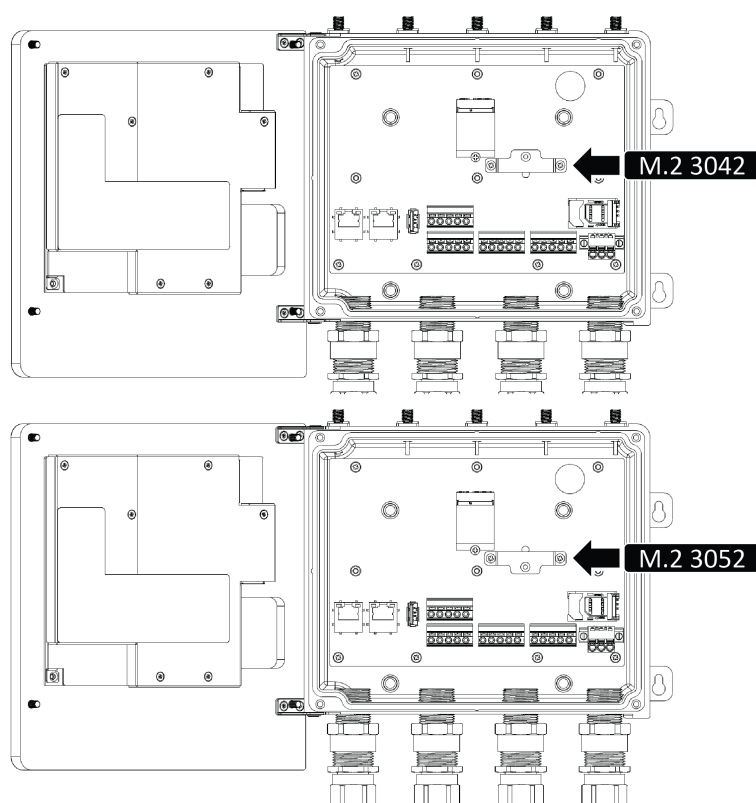
- Remove 5 screws from the shielding case on I/O board.



3. Install the M.2 2230 WIFI and ? M.2 3042 LTE / 3052 5G module and then fix the screw.



Note! Please adjust the right placement to fix the bracket for M.2 3042/3052 module.



4. Recover the shielding case on I/O board and top cover and fix the screws.

Note:

If you need to purchase an M.2 WIFI/LTE Module, you have to select the following models that have been C1D2 and IECEX/ATEX certified with Advantech UNO-430.

IECEX/ATEX certified

P/N	Description
EWM-W195M201E	802.11 a/b/g/n/ac with BT4.2
968AD00590 (Quectel EM06-E)	Quectel EM06 LTE module 4G (Cat.6)

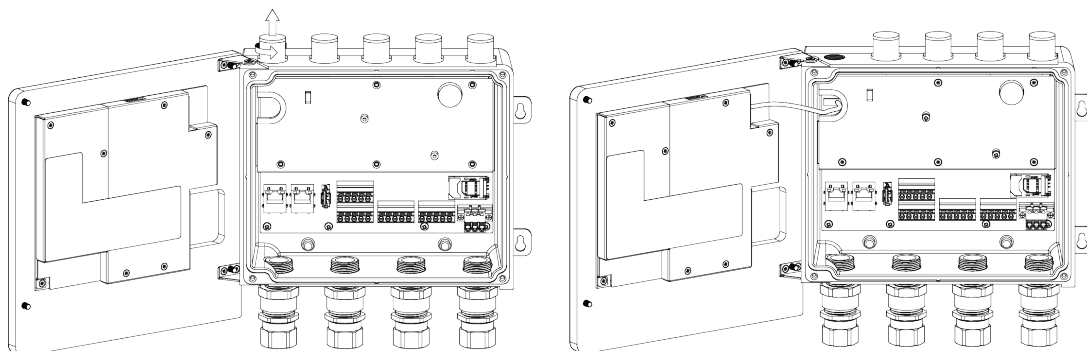
C1D2 certified

P/N	Description
EWM-W195M201E	802.11 a/b/g/n/ac with BT4.2
968AD00426 (Sierra EM7565)	Global band Cat-12 M.2 module.
MTQ-LNA7-B02-SP	LTE Cat 4 ECM W/Fallback & GNSS AT&T/Verizon
MTQ-LAT3-B02.R2-SP	LTE Cat 1 ECM With Fallback AT&T Single Pack
MTQ-LVW3-B02.R2-SP	LTE Cat 1 ECM Without Fallback Verizon Single Pack
MTQ-MNA1-B02-SP	LTE Cat M1 Modem W/GNSS (AT&T/Verizon) Single Pack

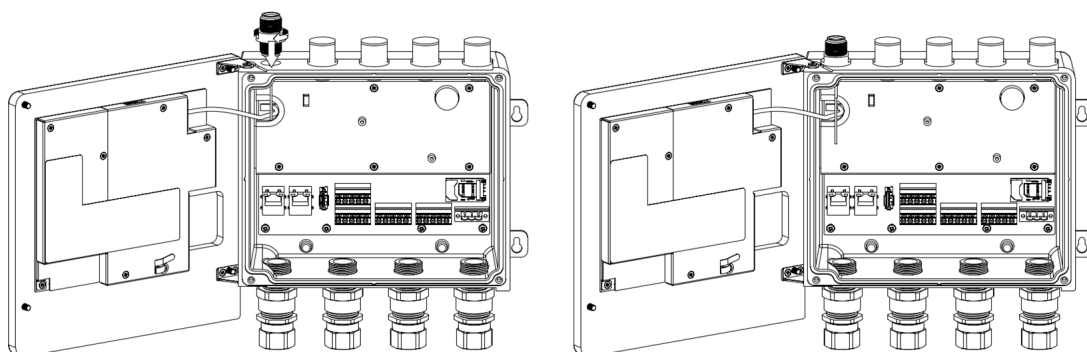
2.5.4 Antenna Installation (IECEX / ATEX)

When using wireless module, please install an N type plug Antenna. The following steps demonstrate how to install the WIFI/Bluetooth, LTE and GPS Antenna.

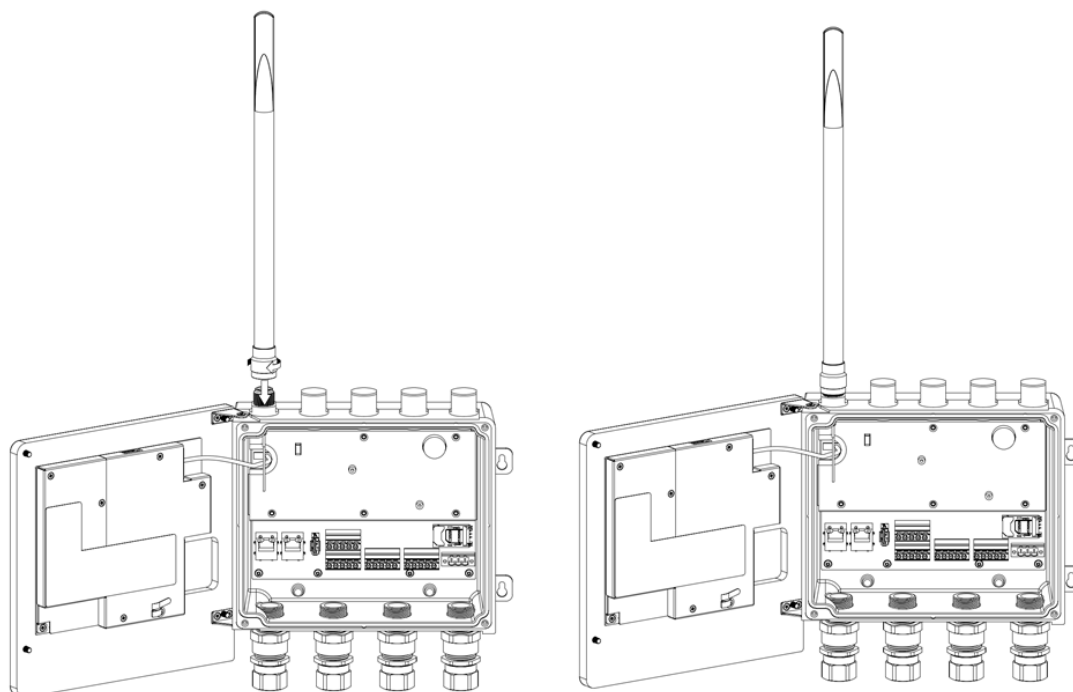
1. Remove the stopper plug of Antenna from bottom cover of UNO-430.



2. Install a specific N jack component (N jack with MHF4 connector cable) and connect with module by MHF4 connector.



3. Install an N type plug Antenna of WIFI/Bluetooth, LTE and GPS.



Note:

1. Please use the IECEx/ATEX certified N type plug Antenna. And those Antenna should meet $-40 \sim 70^{\circ}\text{C}$ ambient temperature requirements follow the defined torque value $20 \pm 0.5 \text{ kgf.cm}$ for installation. (The defined torque value of N jack installation is $20 \pm 0.5 \text{ kgf.cm}$)
2. For N jack and N type plug Antenna installation shall be compliant with IEC 60079-0 requirements, providing and maintaining degree of protection at least IP65
3. Wireless Module, Antenna are optional, please contact Advantech for further information. The P/N of specific N jack with MHF4 connector cable is shown in the Table 2.12.

Table 2.12: IECEx/ATEX usage N jack P/N

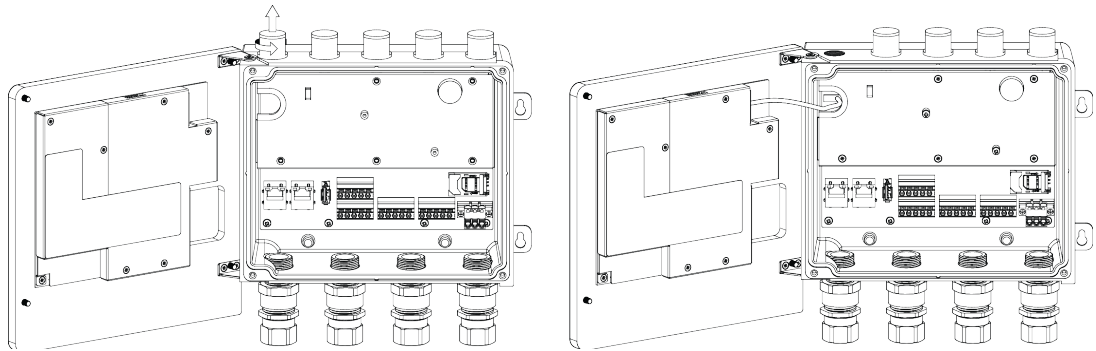
Item	PN	MPN
N jack to MHF4	1751000228-01	00NFN8-3150B-40X00I

2.5.5 Antenna Installation (C1D2)

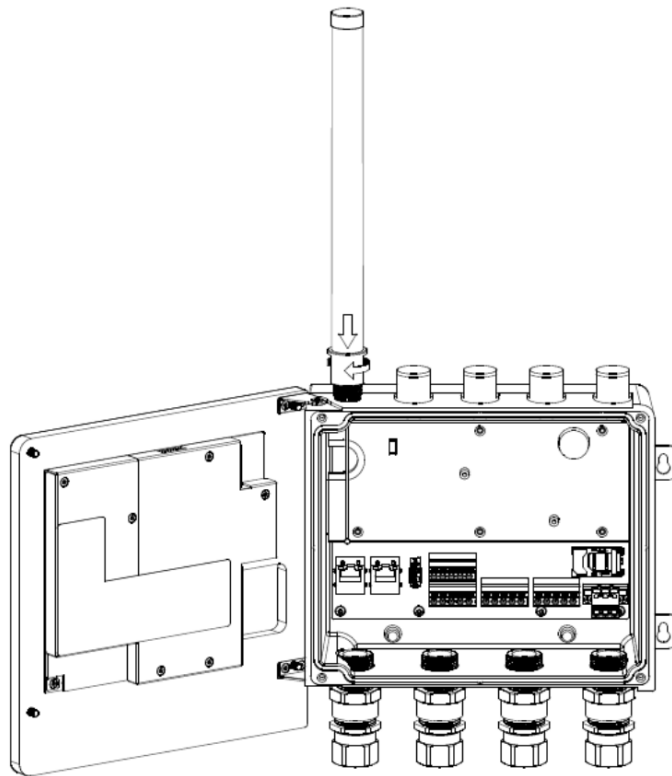
When using wireless module, please install an N type plug Antenna with MHF connector cable that C1D2 certified with UNO-430. (As below list shown for C1D2 usage Antenna certified with UNO-430)

The following steps demonstrate how to install the WIFI/Bluetooth, LTE and GPS Antenna.

1. Remove the stopper plug of Antenna from bottom cover of UNO-430.



2. Install an N type plug Antenna (of WIFI/Bluetooth, LTE and GPS) with MHF connector cable and connect with module by MHF4 connector.



Note:

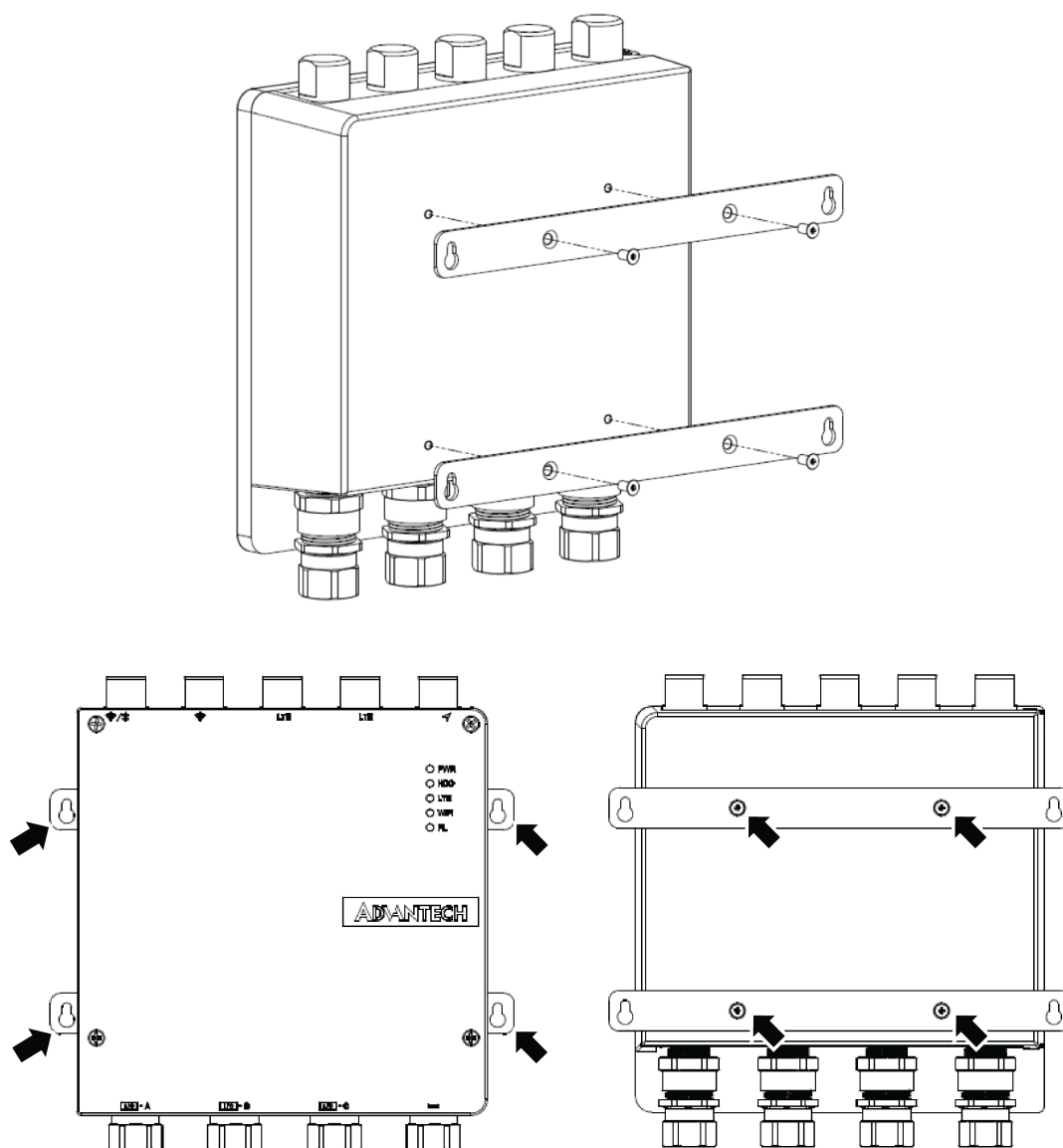
1. Please use the C1D2 certified with UNO-430 N type plug Antenna. And those Antenna should meet $-40 \sim 70^{\circ}\text{C}$ ambient temperature requirements follow the defined torque value $20 \pm 0.5 \text{ kgf.cm}$ for installation.
2. For N type plug Antenna installation shall be compliant with IEC 60079-0 requirements, providing and maintaining degree of protection at least IP65
3. Wireless Module, Antenna are optional, please contact Advantech for further information. The P/N of C1D2 certified N type plug Antennas with MHF connector cable are shown in the Table 2.13 below.

Table 2.13: C1D2 usage Antenna certified with UNO-430 P/N

Item	PN	MPN
LTE	1751000172-01	DS0727-0716WBX
WiFi	1751000173-01	DS2450-0717WBX
GPS	1751000174-01	DS1575-0718WBX

2.5.6 Mounting kit Installation (Optional)

Wall Mounting



Fix the mounting kits with 4 (M4x6L) screws

Mounting kit P/N: 1960095178N001

Note! Can only be used in fixed position with antenna facing upward when in outdoor environments.



Appendix **A**

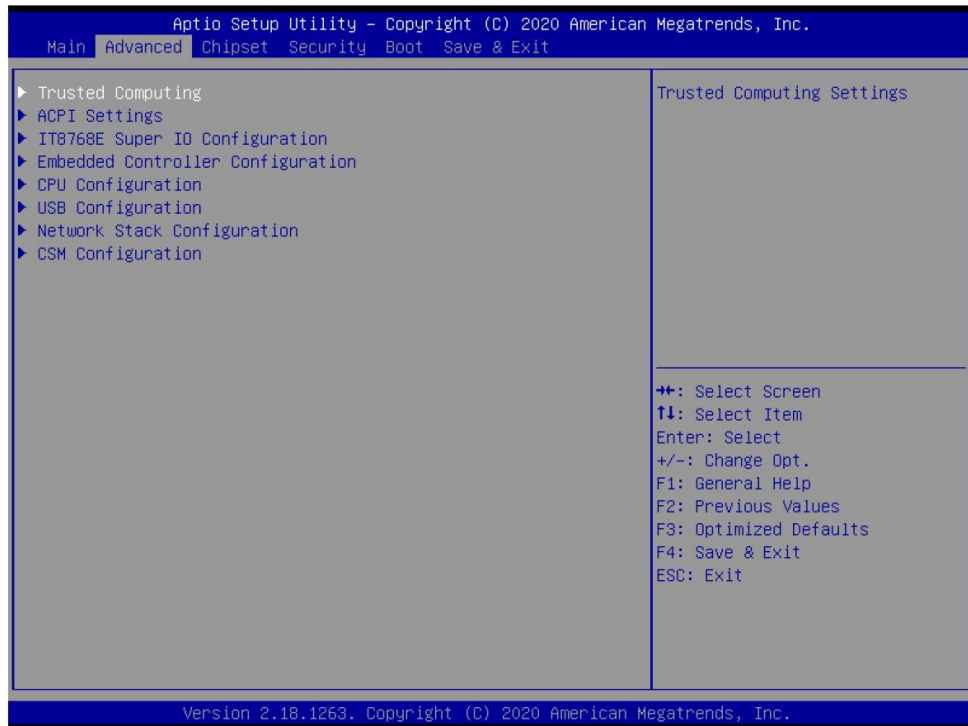
AMI BIOS Setup

This chapter introduces how to set BIOS configuration data.

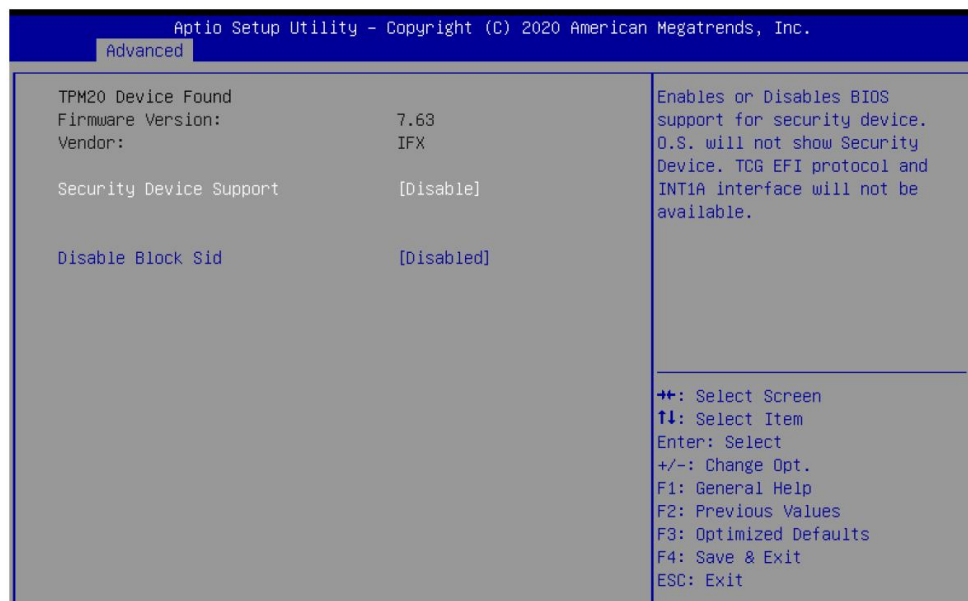
A.1 TPM 2.0 BIOS Setting

The UNO-430 systems support TPM2.0 functionality. This can be enabled or disabled in the BIOS menu by following the instructions provided below.

1. Power on the UNO-430 system and press "Delete" to enter the BIOS configuration menu.
2. On the "Advanced" tab, select the "Trusted Computing" item.



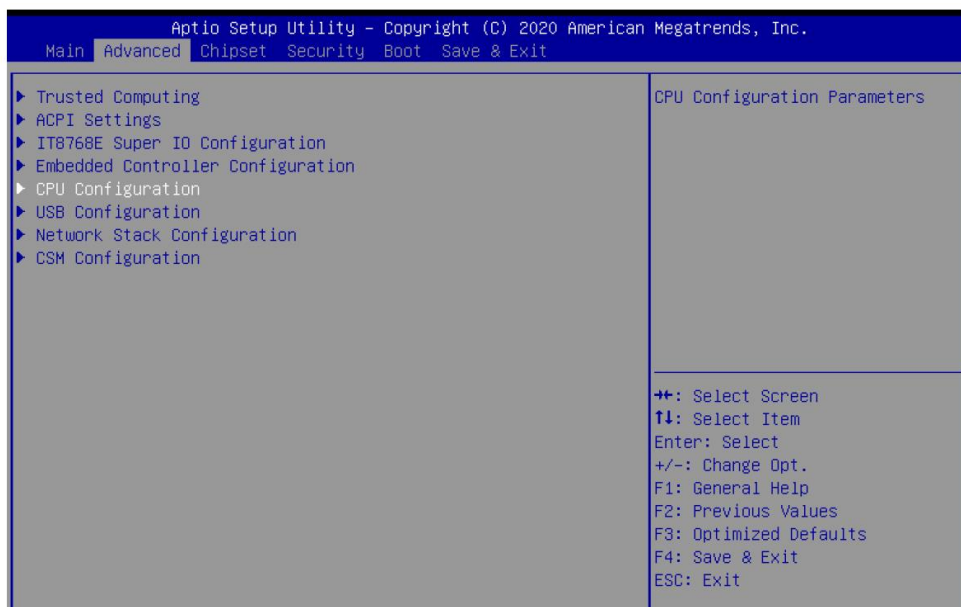
3. Then select the "Security Device Support" item.
4. Choose "enable/disable" to enable or disable the TPM2.0 function (The default setting is to disable this function).



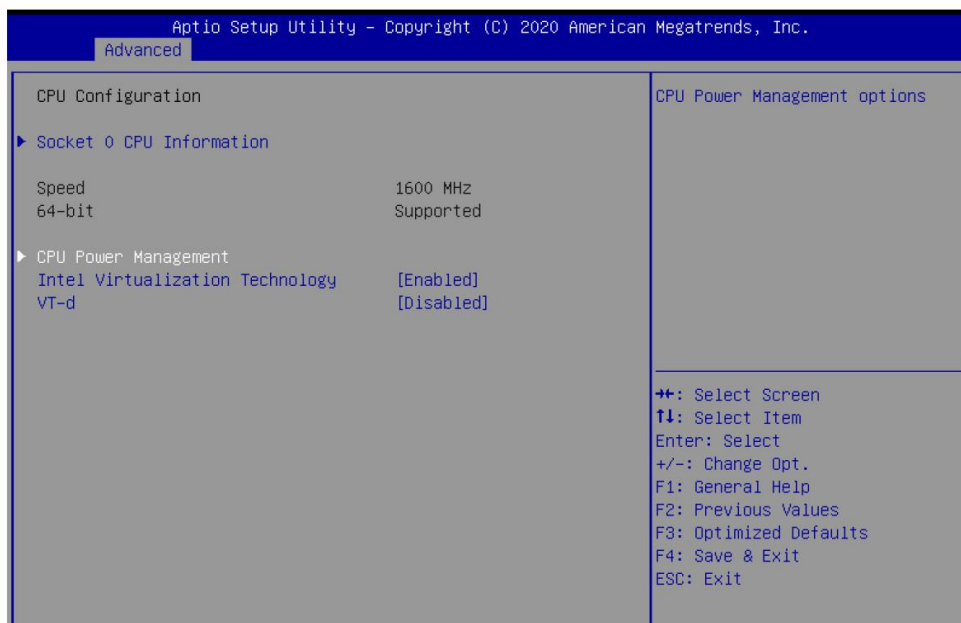
A.2 CPU Turbo mode BIOS Setting

The UNO-430 systems support CPU Turbo mode. This can be enabled or disabled in the BIOS menu by following the instructions provided below.

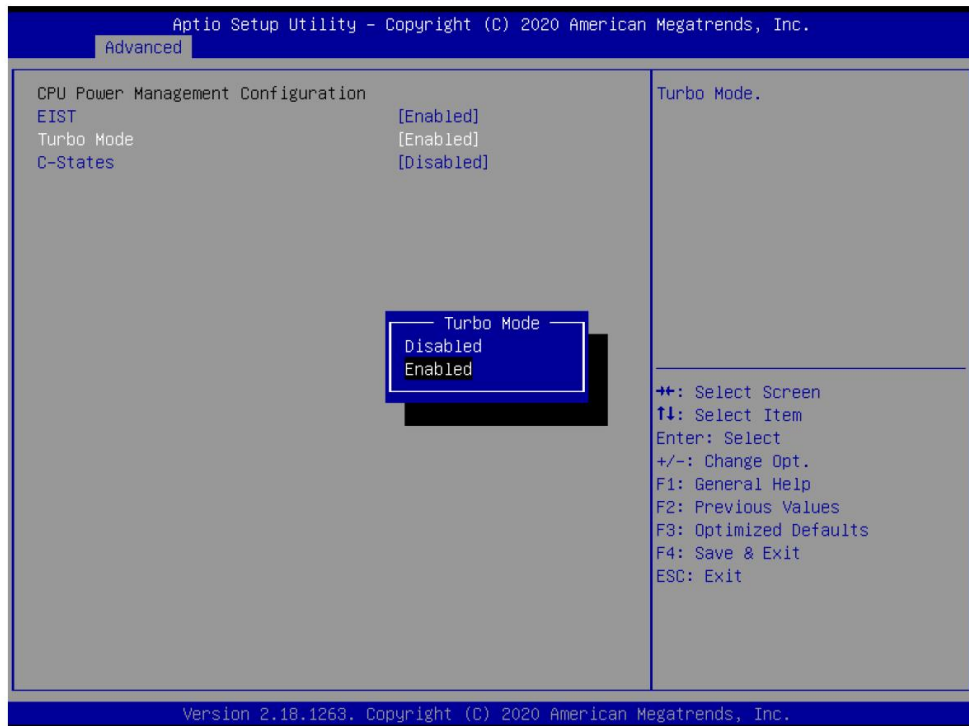
1. Power on the UNO-430 system and press "Delete" to enter the BIOS configuration menu.
2. On the "Advanced" tab, select the "CPU Configuration" item.



3. Then select the "CPU Power Management" item.



4. Choose "enable/disable" to enable or disable the CPU Turbo mode (The default setting is to disable this function).

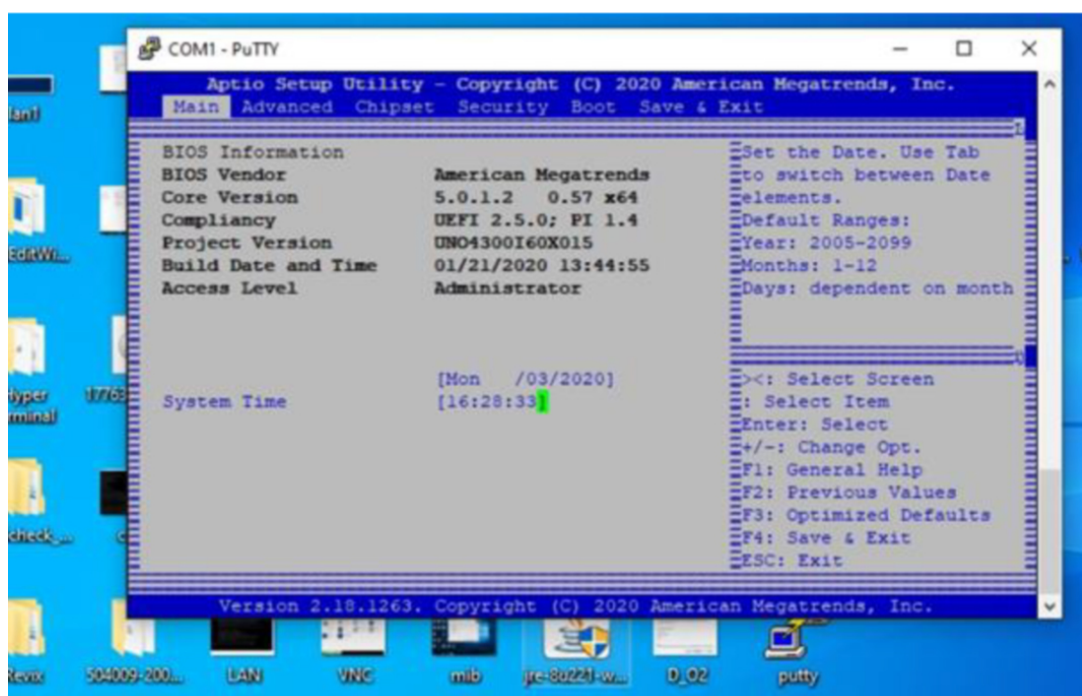
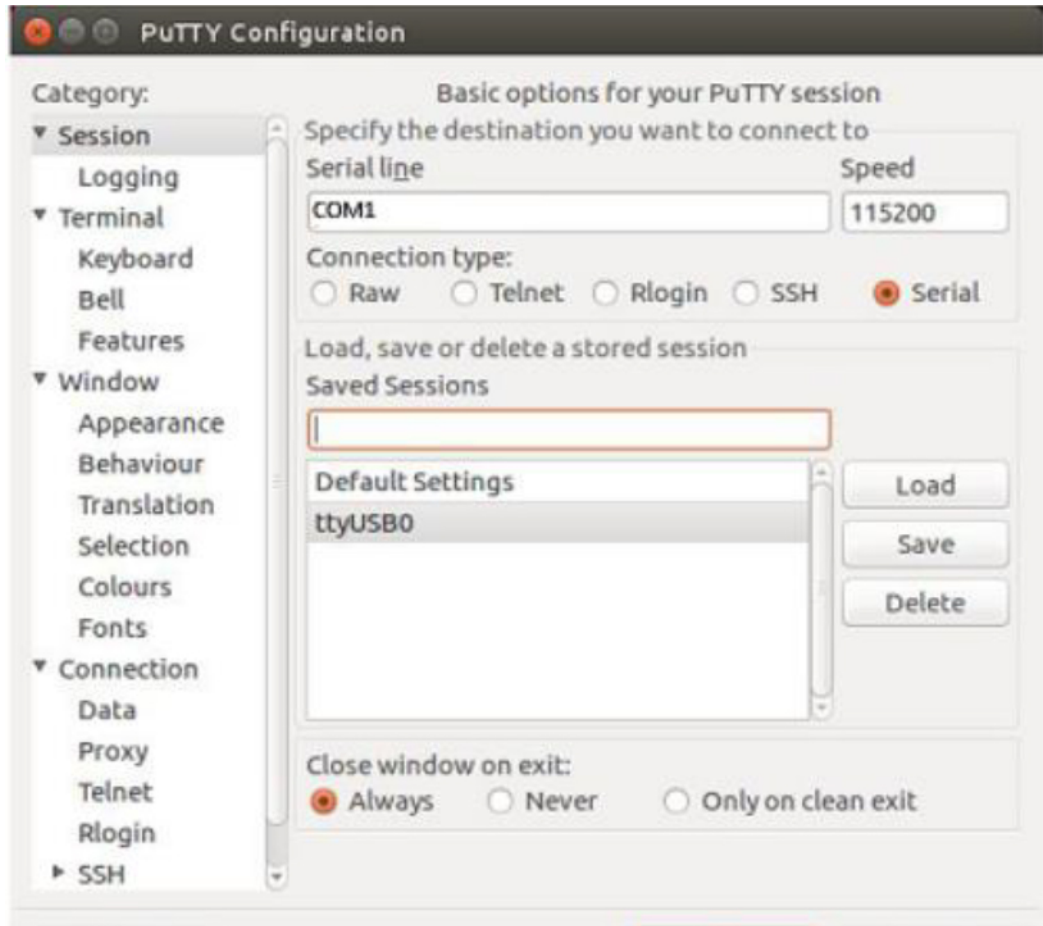


Appendix **B**

RS-232 Console Port Setting

The RS-232 console redirection has already been enabled in the BIOS by default. User can easily connect to UNO-430 by using “PUTTY” or other SSH tool.

1. Download and install PUTTY <https://www.putty.org/> in your device.
2. Connect the RS-232 cable to UNO-430 COM1.
3. Open PUTTY, set COM 1 and 115200.



Note! The console port over serial port is not enabled in some Linux distribution, user has to manually enable it.



We take ubuntu18.04 as example, ubuntu18.04 is already installed in UNO-430, but console port is not enabled.

- Change GRUB terminal to console and ttyS0. This will provide one GRUB to a monitor display and serial console.
 - Then, change linux kernel console to tty1 and ttyS0. This setting will be taken over to user land, and there will be two login prompt for tty1 and ttyS0.
1. Open terminal. (You will need a root account to complete all the processes).
 2. "cat <<EOF | sudo tee /etc/default/grub".

```
GRUB_DEFAULT=0
GRUB_TIMEOUT=1
GRUB_DISTRIBUTOR=\`lsb_release -i -s 2> /dev/null || echo Debian\`
GRUB_CMDLINE_LINUX_DEFAULT=""
GRUB_CMDLINE_LINUX="console=tty1 console=ttyS0,115200"
GRUB_TERMINAL="console serial"
GRUB_SERIAL_COMMAND="serial --speed=115200 --unit=0 --word=8 --parity=no --
stop=1"
EOF
```

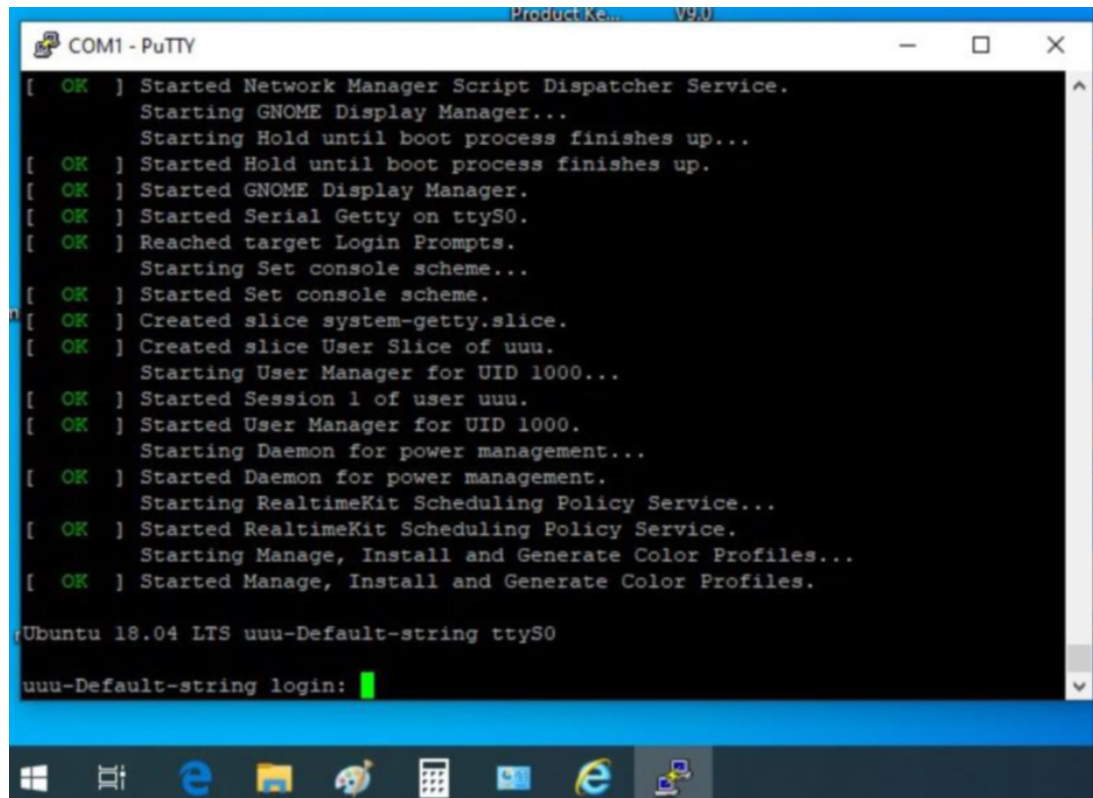
3. Update /boot/grub/grub.cfg with grub-mkconfig.

```
sudo grub-mkconfig -o /boot/grub/grub.cfg
```

4. Reboot system

```
sudo reboot
```

5. Execution result



```
COM1 - PuTTY
[ OK ] Started Network Manager Script Dispatcher Service.
Starting GNOME Display Manager...
Starting Hold until boot process finishes up...
[ OK ] Started Hold until boot process finishes up.
[ OK ] Started GNOME Display Manager.
[ OK ] Started Serial Getty on ttyS0.
[ OK ] Reached target Login Prompts.
Starting Set console scheme...
[ OK ] Started Set console scheme.
[ OK ] Created slice system-getty.slice.
[ OK ] Created slice User Slice of uu.
Starting User Manager for UID 1000...
[ OK ] Started Session 1 of user uu.
[ OK ] Started User Manager for UID 1000.
Starting Daemon for power management...
[ OK ] Started Daemon for power management.
Starting RealtimeKit Scheduling Policy Service...
[ OK ] Started RealtimeKit Scheduling Policy Service.
Starting Manage, Install and Generate Color Profiles...
[ OK ] Started Manage, Install and Generate Color Profiles.

Ubuntu 18.04 LTS uu-Default-string ttyS0
uu-Default-string login: █
```


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