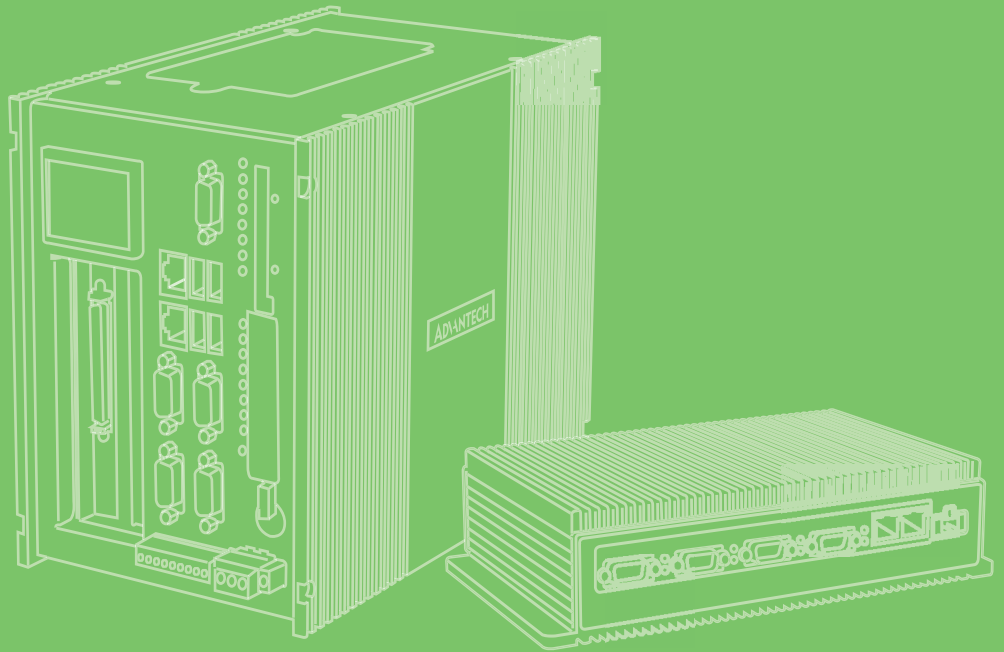


User Manual



UNO-238 電腦

Intel® Whiskey Lake processor
IoT Edge Computer, with 2x LAN,
2x COM, 4x USB, 1x DP, 1x HDMI,
1x GPIO, 1x Audio, 2x M.2

申請商：研華股份有限公司

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Enabling an Intelligent Planet

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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-238 products in this article

*Model name UNO-238

*Part number:

UNO-238-83N1AE

UNO23883N2001-T, UNO23883N2002-T, UNO23883N2101-T,
UNO23883N2102-T, UNO23883N2103-T, UNO23883N2104-T,
UNO23883N2201-T, UNO23883N2202-T, UNO23883N2203-T,
UNO23883N2204-T, UNO23883N2301-T, UNO23883N2302-T,
UNO23883N2303-T, UNO23883N2304-T, UNO23883N2401-T,
UNO23883N2402-T, UNO23883N2403-T, UNO23883N2404-T,
UNO23883N2501-T, UNO23883N2502-T, UNO23883N2503-T,
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UNO23885N2303-T, UNO23885N2304-T, UNO23885N2401-T,
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UNO23887N2504-T, UNO23887N2601-T, UNO23887N2602-T,
UNO23887N2603-T, UNO23887N2604-T

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name		型號（型式）：UNO-238（系列型號請參見手冊載明型號） Type designation (Type)				
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
內外殼（外殼、內部框架…等）	○	○	○	○	○	○
其它固定組件（螺絲、夾具、卡榫）	—	○	○	○	○	○
配件（排線、傳輸線、網路線…等）	—	○	○	○	○	○
電源供應器	—	○	○	○	○	○
備考 1. “超出 0.1 wt %” 及 “超出 0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。 Note 1. “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.						
備考 2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2. “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.						
備考 3. “—” 係指該項限用物質為排除項目。 Note 3. The “—” indicates that the restricted substance corresponds to the exemption.						

Product Warranty (2 years)

Advantech warrants the original purchaser that all 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 products 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 product, 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 merchandise 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 a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the packaging, and ship the package 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.

警告使用者：這是甲類資訊產品，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對策。

Technical Support and Assistance

1. Visit the Advantech web site at support.advantech.com/ 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 this equipment from any AC outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For plug-gable equipment, the power outlet socket should be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the 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. Do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a 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 into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT
 16. 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.
 17. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).
 18. This product is intended to be supplied by an UL certified power supply or dc source with ES1 output, rated 12 Vdc, 4.5A minimum and Tma 60 degree. If you need further assistance, please contact Advantech for further information.
 19. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. The power outlet socket should have a grounded connection.
 20. For use in pollution free environments and indoor use.
 21. This equipment is not suitable for use in locations where children are likely to be present.
 22. If the equipment is used in a manner not specified by the Advantech, the protection provided by the equipment may be impaired.
 23. The equipment contains no user-serviceable parts. Do not open, Return to manufacturer for servicing.
 24. Do not block air ventilation holes.
 25. This is open type equipment and should be installed in a suitable enclosure.
- DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Consignes de sécurité

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. Gardez cet équipement à l'abri de l'humidité.
5. Placez cet équipement sur une surface fiable pendant l'installation. Le faire ou bien le laisser tomber peut causer des dégâts.
6. Les ouvertures sur l'enceinte servent à la convection de l'air. Protégez l'équipement contre la surchauffe. **NE COUVREZ PAS LES OUVERTURES.**
7. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à l'alimentation.
8. Placez le câble d'alimentation de manière à ce que personne ne puisse marcher dessus. Ne placez rien sur le câble d'alimentation.
9. Toutes les mises en garde et tous les avertissements sur l'équipement doivent être notés.

10. 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.
11. Ne jamais verser de liquide dans une ouverture. Cela pourrait provoquer un incendie ou un choc électrique.
12. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, l'équipement doit être ouvert uniquement par du personnel qualifié.
13. 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 a été exposé à l'humidité.
 - 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.
14. **NE LAISSEZ PAS CET ÉQUIPEMENT DANS UN ENVIRONNEMENT OU LA TEMPÉRATURE DE STOCKAGE PEUT ÊTRE INFÉRIEURE À -20 ° C (-4 ° F) OU BIEN SUPÉRIEURE À 60 ° C (140 ° F). CECI POURRAIT ENDOMMAGER L'EQUIPEMENT. L'ÉQUIPEMENT DEVRAIT ÊTRE DANS UN ENVIRONNEMENT CONTRÔLÉ.**
15. Ce produit est destiné à être alimenté par une source d'alimentation certifiée UL ou par une source cc convenant à une utilisation à une température minimale de 60 degrés Celsius, dont la sortie est conforme à la norme ES1 et dont la puissance nominale est de 12 Vdc, 4.5 A, en cas de besoin. contactez Advantech pour plus d'informations.
16. Pour une utilisation dans des environnements non polluant et à l'intérieur.
17. C'est appareil ne doit pas être utilisé dans des endroits où se trouvent des enfants.
18. Si l'équipement est utilisé d'une manière non spécifiée par le fabricant, la protection fournie par l'équipement peut être altéré
19. L'équipement ne contient aucune pièce réparable par l'utilisateur. Ne pas ouvrir, retourner au fabricant pour réparation.
20. Ne bloquez pas les ou es de ventilation.
21. Il s'agit d'un équipement de type ouvert et doit être installé dans un boîtier approprié

ATTENTION: 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.

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. 請勿在潮濕環境中使用設備。
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，請由專業人員來維修：
 - 電源線或者插頭損壞；
 - 設備內部有液體流入；
 - 設備曾暴露在過於潮濕的環境中使用；
 - 設備無法正常工作，或您無法通過用戶手冊來使其正常工作；
 - 設備跌落或者損壞；
 - 設備有明顯的外觀破損。
15. 請不要把設備放置在超出我們建議的溫度範圍的環境，即不要低於 $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$) 或高於 $60\text{ }^{\circ}\text{C}$ ($140\text{ }^{\circ}\text{F}$)，否則可能會損壞設備。
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。
20. 消費者若使用电源适配器供电，则应购买配套使用获得 CCC 认证并满足标准要求的电源适配器。

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Chapter 1

Overview

This chapter provides an overview of the UNO-238 specifications.

Sections include:

- Introduction
- Safety precautions
- Accessories
- Hardware Specifications
- Dimensions

1.1 Introduction

Advantech's new UNO-200 series focuses on IT level applications which only require semi-industrial design and cost efficiency.

New UNO-238 model aims to provide an optimized design with the 8th generation CPU Intel® Core™ U-Series processor. UNO-238 is IT-oriented, fanless, with IoT edge computing features and sufficient connectivity including 2 x LAN, 2 x RS-232/422/485, 1 x GPIO, 4 x USB 3.2, 1 x DP 1.2, 1 x HDMI 1.4 and 1 x Audio. It also supports 2 x M.2 and 1x Nano SIM card slot for expansion to fulfill various requirements for industrial applications.

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-238. 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-238. 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

Please refer to below packing list:

- UNO-238
- 1 x 60W power adapter (Advantech P/N: 96PSA-A60W12W7-3)
- 1 x Thermal grease for CPU (Advantech P/N: 2170000093-01)
- 1 x Earth-ground cable (Advantech P/N: 1703011001-11)
- 1 x Bracket for 3042/3052 LTE module (Advantech P/N: 1960098471N000)
- 2 x Screws for attaching 3042/3052 bracket (Advantech P/N: 1930001782)
- 1 x Thermal pad for NVMe/SATA storage (Advantech P/N: 1990036489N010)
- 1 x Thermal pad for 2nd DDR (Advantech P/N: 1990026184N010)
- Quick Start Guide
- Simplified Chinese manual
- China RoHs sheet
- Warranty card

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

1.4 Hardware Specifications

1.4.1 General

Dimensions (W x D x H)	150 x107 x 60 mm (5.9" x 4.2" x 2.3")
Weight (Net)	1.8 kg (3.9lbs)
Mounting	Stand, DIN rail (optional)
Power Requirement	12VDC
Power Consumption	31W (typical), 54W (Max)

1.4.2 System Hardware

BIOS	AMI UEFI 128Mbit
Watchdog Timer	Programmable 255 levels timer interval, from 1 to 255 sec
Hardware Security	TPM2.0
Processor	Intel® i7-8665UE quad core, 1.7 GHz (up to 4.4 GHz)
	Intel® i5-8365UE quad core, 1.6 GHz (up to 4.1 GHz)
	Intel® i3-8145UE dual core, 2.2 GHz (up to 3.9 GHz)
Memory	2 socket DDR4 2400 (up to 32 GB max.)
Graphics Engine	Intel® UHD Graphics 620
Ethernet	10/100/1000 Mbps (LAN1: Intel® i219; LAN2: Intel®i210-IT)
LED Indicators	Power and HDD status
Storage	32GB of eMMC 5.1 (Onboard)
	1 x M.2 B Key 2280 (SATA or NVMe PCIe x2), shared with expansion
Expansion	1 x M.2 B Key 3042/3052 (For LTE/5G module, supports USB 2.0 only), shared with storage 1 x M.2 E Key 2230 (for WiFi module, supports PCIe and USB 2.0).

1.4.3 I/O Interfaces

Serial Ports	2 x RS-232/422/485
LAN Ports	2 x 10/100/1000 Mbps IEEE 802.3u 1000BASE-T Fast Ethernet (RJ-45)
USB Ports	4 x USB 3.2
Displays	1 x DP 1.2 (up to 4096 x 2160 @60 Hz) 1 x HDMI 1.4 (up to 4096 x 2160 @30/24 Hz)
Power Connector	1 x Lockable DC jack
Audio	1 x Line out
Others	1 x GPIO (8 bit) (CAN bus 2.0 is available upon request)

1.4.4 Environment

Operating Temperature*	-20 ~ 60 °C (-4 ~ 140 °F) with 0.7m/s airflow and extended temperature peripherals
Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)
Relative Humidity	10 ~ 95% RH @ 40 °C/104 °F, non-condensing
Shock Protection	Operating, IEC 60068-2-27, 50G, half sine, 11ms
Vibration Protection	Operating, IEC 60068-2-64, 3Grms, random, 5 ~ 500Hz, 1hr/axis

1.4.5 Certification

Certification	CE/FCC, CB/UL, CCC, BSMI
---------------	--------------------------

1.5 Mechanical Specifications

1.5.1 Dimensions

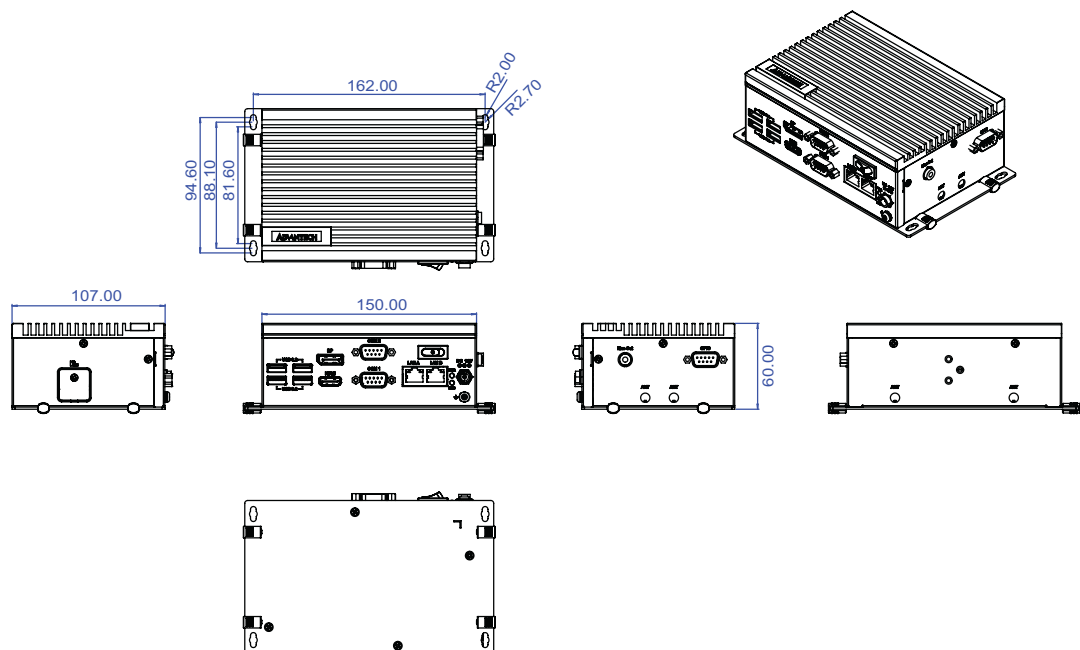


Figure 1.1 UNO-238 Dimensions

Chapter 2

Hardware Functionality

This chapter explains how to setup the UNO-238's hardware functions, including connecting peripherals and indicators.

Sections include:

- Introduction
- External I/O Connector
- Internal I/O Connector
- LED Indicators
- Reset Buttons
- Antenna Hole

2.1 Introduction

The following figure shows the locations of key components, internal and the external connectors on motherboard of UNO-238.

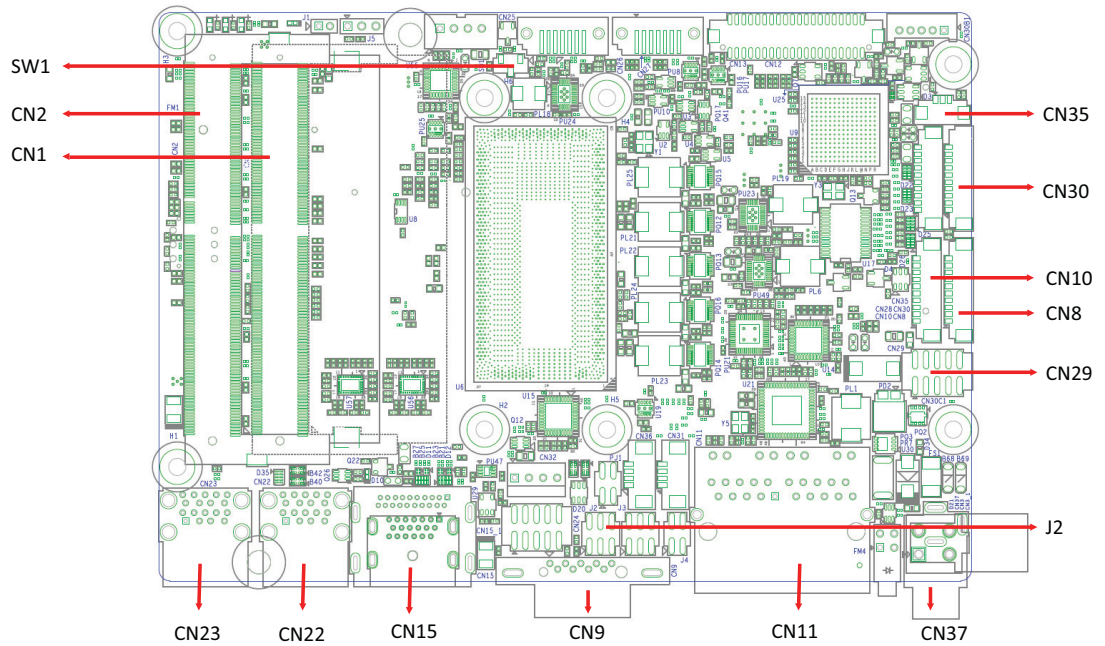


Figure 2.1 Key components locations of UNO-238 (Top Side)

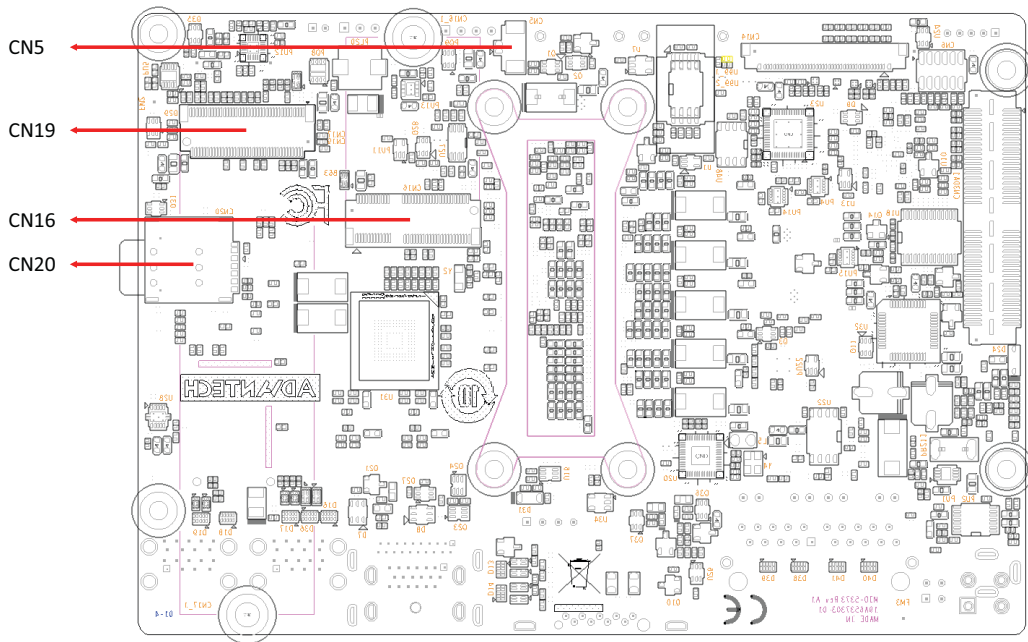
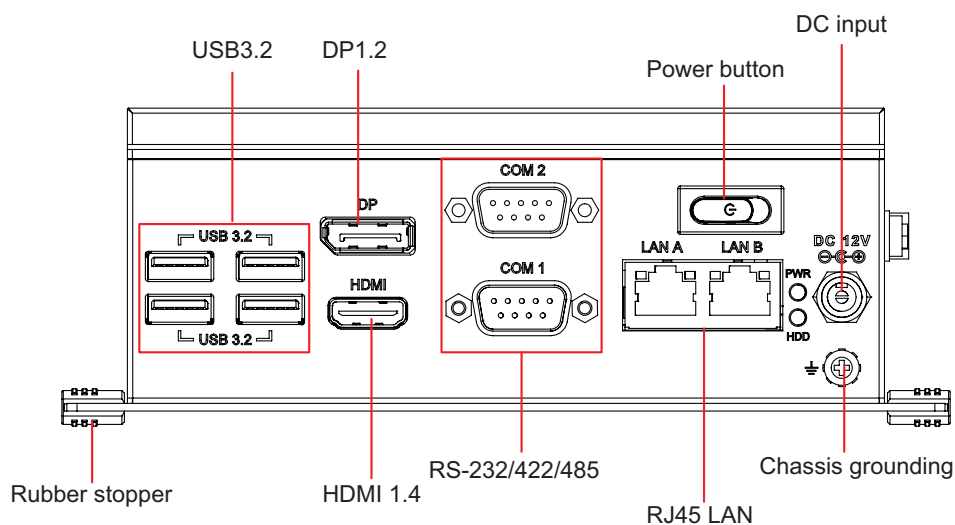


Figure 2.2 Key components locations of UNO-238 (Bottom Side)

Table 2.1: Key components, Connectors on Board

Category	Label	Function
External	CN37	DC input Connector (Adapter)
	CN11	RJ45 Connector (2 port)
	CN9	COM port Connector (RS232/RS422/RS485)
	CN15	HDMI and DP++ Connector
	CN22	USB3.2 Connector (2 ports)
	CN23	USB3.2 Connector (2 ports)
Internal	CN29	Audio Line out Connector (Convert to external I/O by cable)
	CN8	Power Button Connector (Convert to external I/O by cable)
	CN10	RS232/RS422/RS485 COM port Connector (Convert to external I/O by cable)
	CN30	GPIO 8bit Connector (Convert to external I/O by cable)
	CN35	CANBus Connector (Convert to external I/O by cable)
	CN20	Nano SIM slot Connector
	CN16	M.2 Key E Connector for Wi-Fi
	CN19	M.2 Key B Connector for Storage or LTE

2.2 External I/O Connectors

**Figure 2.3 Front I/O of UNO-238**

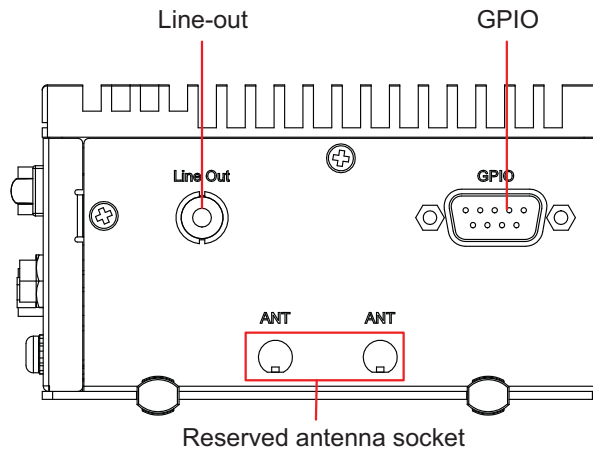


Figure 2.4 Right I/O of UNO-238

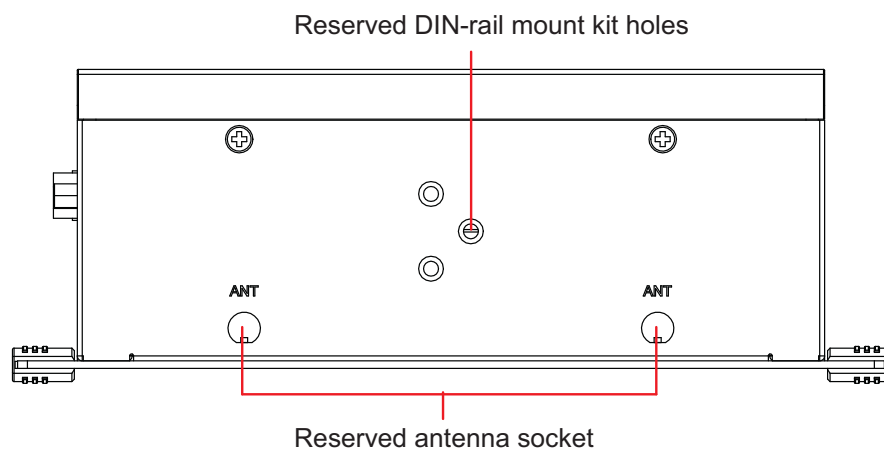


Figure 2.5 Rear I/O of UNO-238

2.2.1 Power Connector

UNO-238 comes with a Lockable DC jack that carries 12 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.

2.2.2 LAN: Ethernet Connector

UNO-238 is equipped with two Gigabit LAN controllers. (LAN1: Intel® i219; LAN2: Intel® i210-IT) that complies with IEEE 802.3u 10/100/1000 Base-T is used as the controller chip.

2.2.3 USB Connector

UNO-238 features 4 USB ports that comply with USB 3.2 specifications. The USB connectors support plug-and-play and hot-swapping functionality for external devices without turning off the computer. It can also be enabled/disabled in the BIOS menu as well.

2.2.4 DisplayPort Connector

The UNO-238 provides 1 x DP 1.2 connector for a high resolution interface up to 4096 x 2160 @ 60Hz, It also supports DP++ that is compatible with passive adapters.

2.2.5 HDMI Connector

The UNO-238 provides 1 x HDMI 1.4 connector for a high resolution interface up to 4096 x 2160 @30/24 Hz.

2.2.6 COM Connector

The UNO-238 features 2 x RS232/422/485 ports. (COM2 are extend from CN10 function through cable)

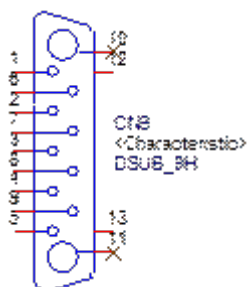


Table 2.2: COM Connector Pin Assignments

Pin	Signal Pin Definition
1	422TX-/485D-/DCD#
2	422TX+/485D+/RXD
3	422RX+/TXD
4	422RX-/DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

2.2.7 GPIO Connector

The UNO-238 features 1 x GPIO port extender from CN30 function through a cable.

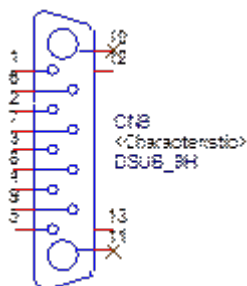


Table 2.3: GPIO Connector Pin Assignments

Pin	Signal Pin Definition
1	+V5
2	GPIO0
3	GPIO1
4	GPIO2
5	GPIO3

Table 2.3: GPIO Connector Pin Assignments

6	GPIO4
7	GPIO5
8	GPIO6
9	GPIO7

2.2.8 Audio Connector

The UNO-238 features 1 x Audio connector extender from CN29 function through a cable for line out function.



Table 2.4: Audio Connector Pin Assignments

Pin	Signal Pin Definition
1	LOUTL
2	LOUTR
3	GND

2.3 Internal I/O Connector and Switch

The following figure shows the locations of internal connectors and switches on the mother board of UNO-238.

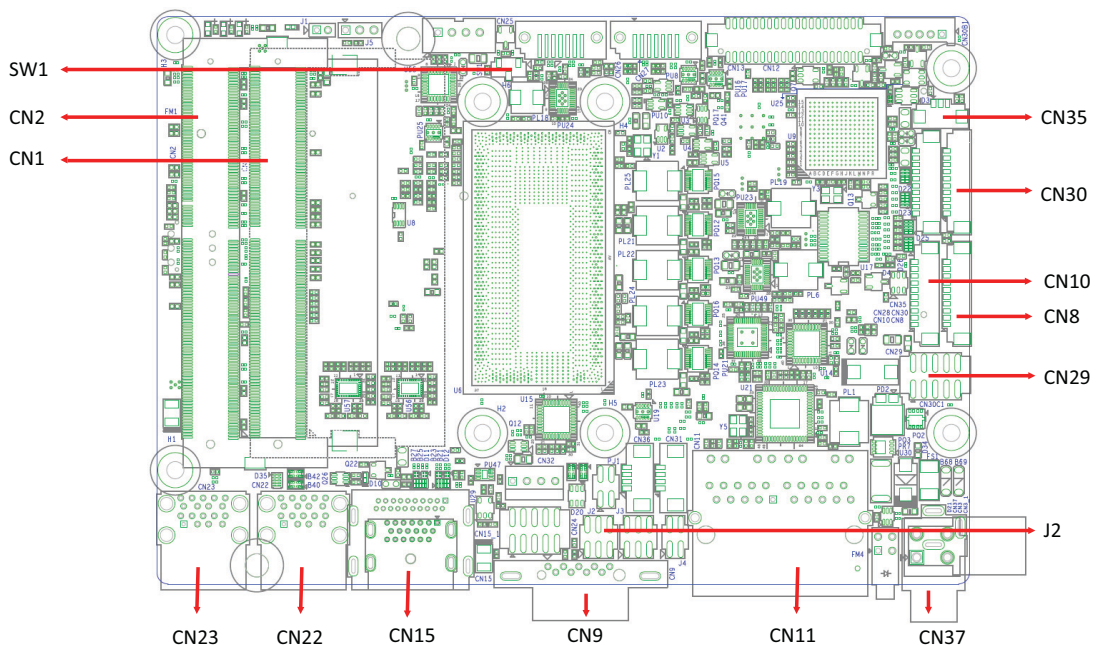


Figure 2.6 Key components locations of UNO-238 (Top Side)

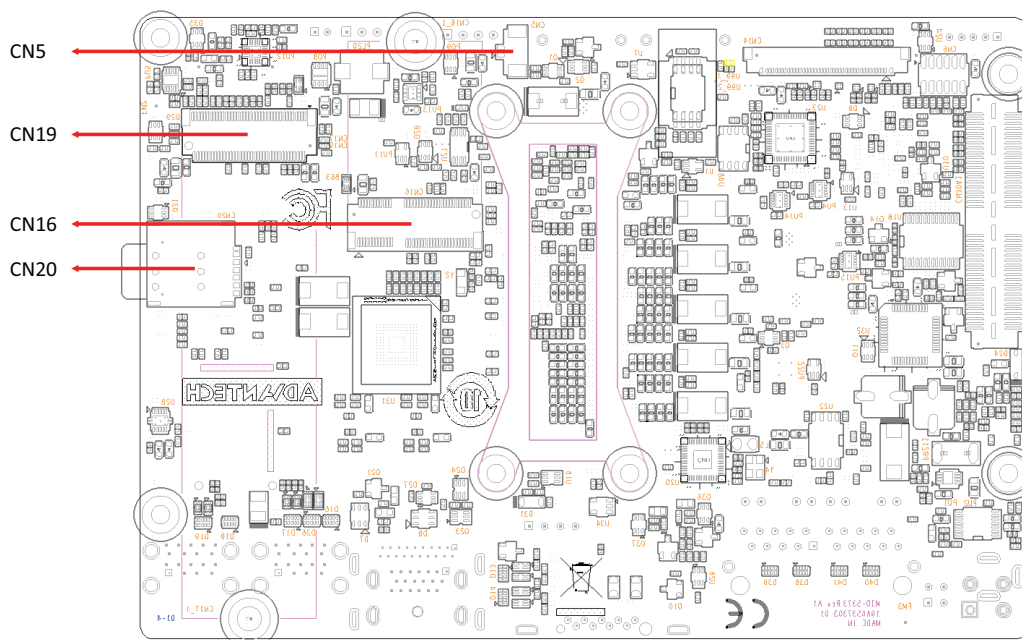


Figure 2.7 Key components locations of UNO-238 (Bottom Side)

Table 2.5: Key components, Connectors on Board

Category	Label	Function
External	CN37	DC input Connector (Adapter)
	CN11	RJ45 Connector (2 port)
	CN9	COM port Connector (RS232/RS422/RS485)
	CN15	HDMI and DP++ Connector
	CN22	USB3.2 Connector (2 ports)
	CN23	USB3.2 Connector (2 ports)
Internal	CN29	Audio Line out Connector (Convert to external I/O by cable)
	CN8	Power Button Connector (Convert to external I/O by cable)
	CN10	RS232/RS422/RS485 COM port Connector (Convert to external I/O by cable)
	CN30	GPIO 8bit Connector (Convert to external I/O by cable)
	CN35	CANBus Connector (Convert to external I/O by cable)
	CN20	Nano SIM slot Connector
	CN16	M.2 Key E Connector for WiFi
	CN19	M.2 Key B Connector for Storage or LTE

2.3.1 M.2 Connector

The UNO-238 provides 1 x M.2 B Key 2280/3042 connector and 1 x M.2 E Key 2230 connector. M.2 B key 2280 connector is for storage (supports SATA or NVMe PCIe), shared with M.2 B Key 3042 connector is for LTE module (supports USB 2.0 only). M.2 E Key 2230 connector is for WiFi module (supports PCIe and USB 2.0).

2.3.2 Nano SIM Slot

There's one Nano SIM Slot for supporting LTE function, labeled "CN20" on board. In addition to install SIM card on "CN20", users are required to install a LTE Module on "CN17" M.2 B Key to enable functionality.

2.4 Others

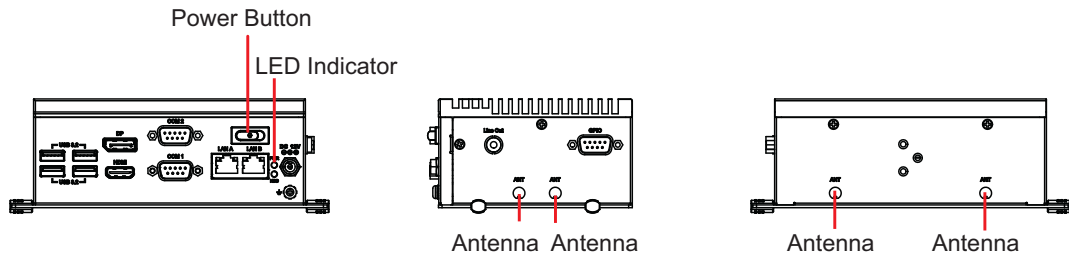


Figure 2.8 LED Indicator, Power Button, and Antenna Hole

2.4.1 LED Indicators

There are two LEDs to indicate the status of the system power and HDD.

- PWR (Power): Green means normal. Light off means standby or power off.
- HDD: Yellow flash means M.2 SATA normal R/W. (Note: When eMMC and NVMe normal R/W, LED indicator will not light up)

2.4.2 Power button

The UNO-238 features 1 x power button extend from CN8 function through cable. Press the power button to activate the hardware power on and shut down function.



2.4.3 Antenna Hole

This product offers four antenna mounting holes covered by pre-cut holes for users to install with an antenna kit if they need LTE or wireless functions.

Chapter 3

Initial Setup

This chapter explains how to Initialize the UNO-238.

Sections include:

- Chassis Grounding
- Connecting Power
- Storage Installation (Optional)

3.1 Chassis Grounding

The UNO-238 provides good EMI protection and a stable grounding base. There is an easy-to-connect chassis grounding point to use.

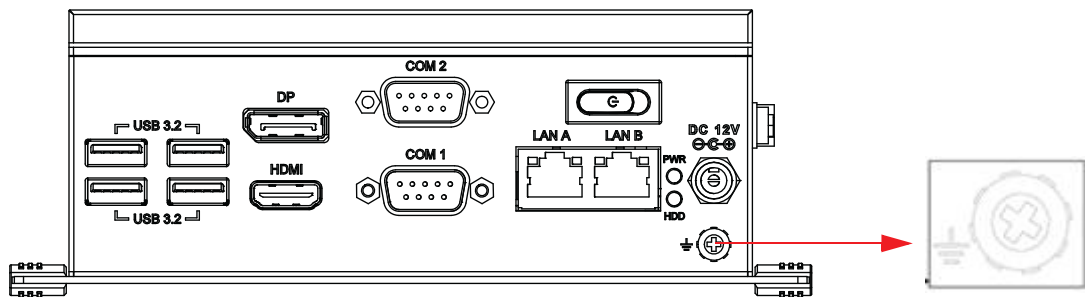


Figure 3.1 Chassis Grounding Connection

Use the Earth-Ground cable (16 AWG) from accessory bag to connect the chassis ground with the Earth ground.

3.2 Connecting Power

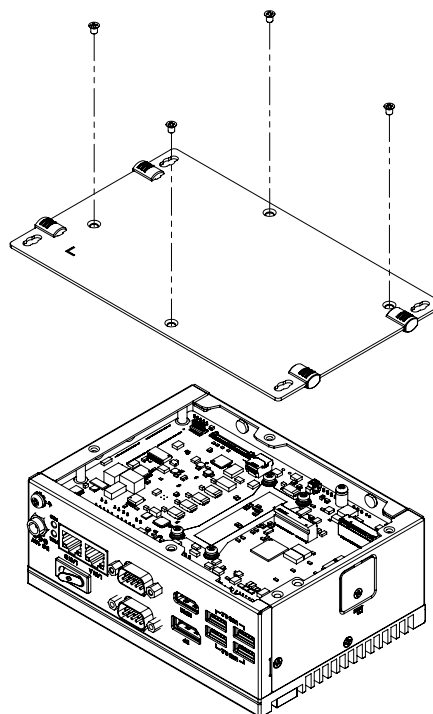
This product is intended to be supplied by an approved power adapter rated at 12Vdc, 4.5A and Tmax 60 degree C, if you need further assistance, please contact Advantech for further information.

3.3 M.2 Storage Installation (optional)

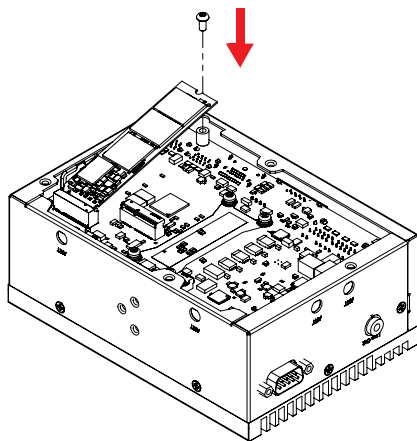
UNO-238 supports 32GB eMMC 5.1 onboard and also support to install 1 x M.2 B Key 2280 (SATA or NVMe PCIe2), shared with expansion.

The following steps demonstrate the installation.

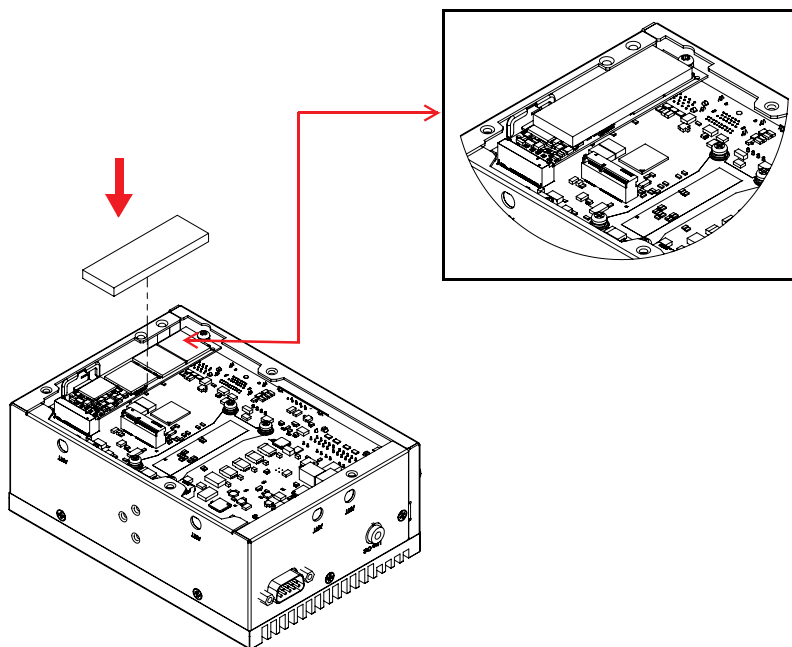
1. Remove 4 screws from the back cover of UNO-238.



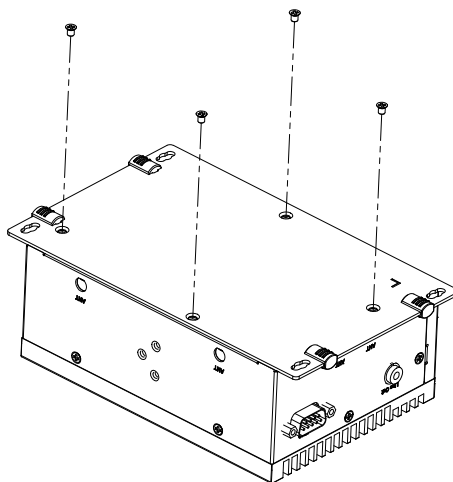
2. Install the M.2 B Key 2280 module and fix it with M3x6 screws



3. Paste thermal pad for M.2 B Key 2280 module



4. Restore and fix screws for back cover

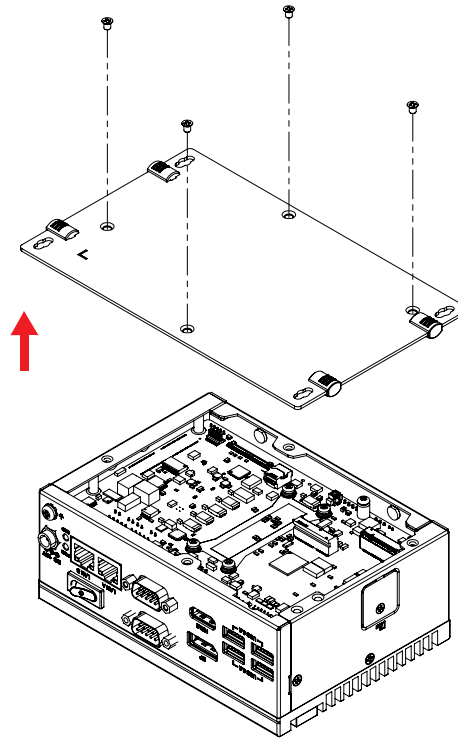


3.4 M.2 LTE/5G Module Installation (Optional)

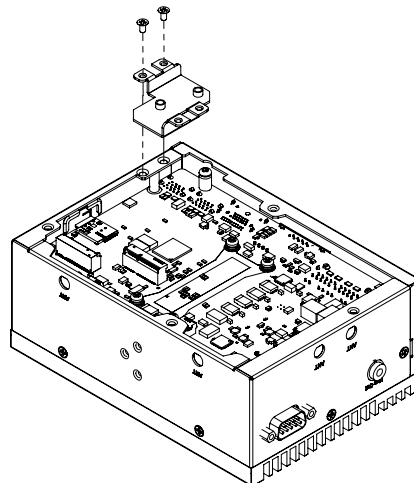
UNO-238 support to install 1 x M.2 B Key 3042 LTE or 3052 5G module shared with storage.

The following steps demonstrates the installation.

1. Remove 4 screws from back cover of UNO-238



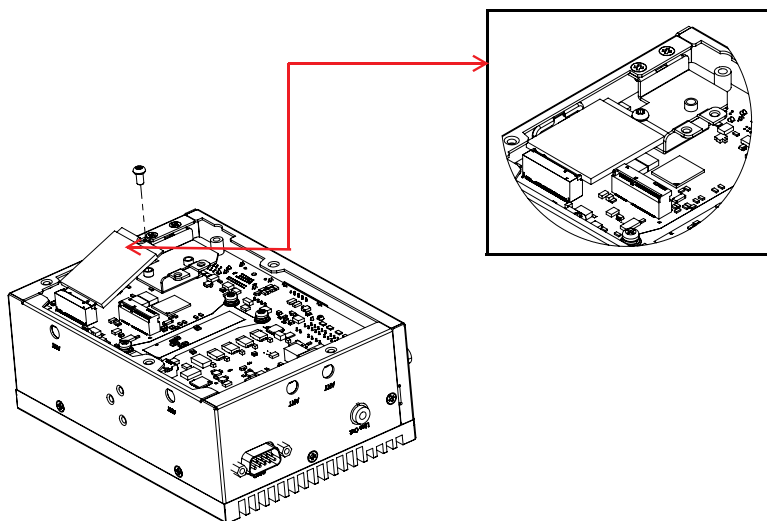
2. Install the specific bracket onto the main board and fix it with two M2.5X4 screws.



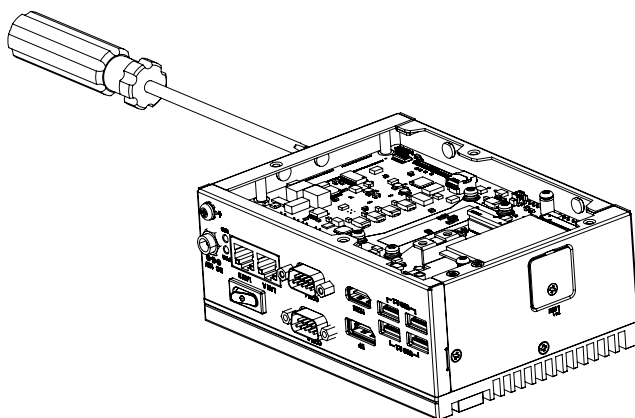
Note! As shown in the figure below, there will be a different direction that a specific bracket fixes on the motherboard, depends on the 3042 or 3052 modules installation.



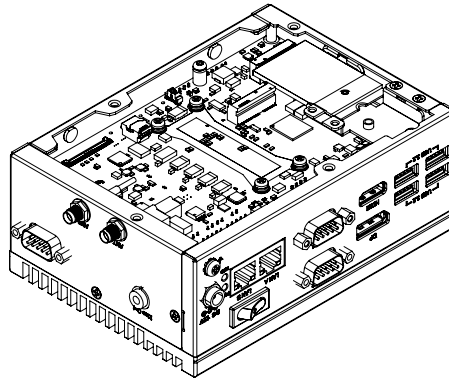
3. Install the M.2 B Key 3042 or 3052 module and fix it with M3x6 screws



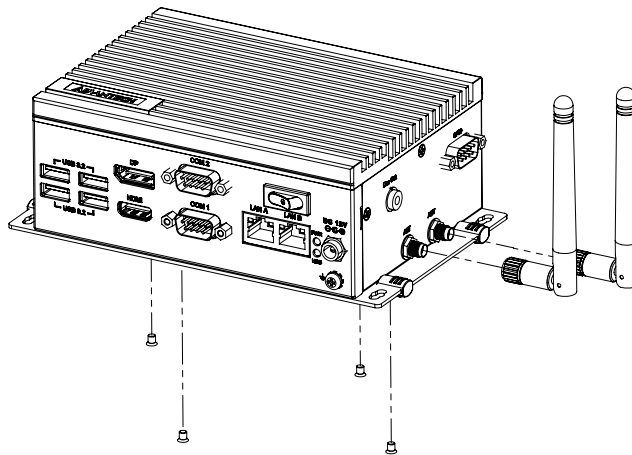
4. Pierce the antenna hole on the side with a device and break the hole.



5. Assemble the antenna hole and arrange the wire to connect to the board



6. Restore and fix screws for back cover and lock the external antenna.

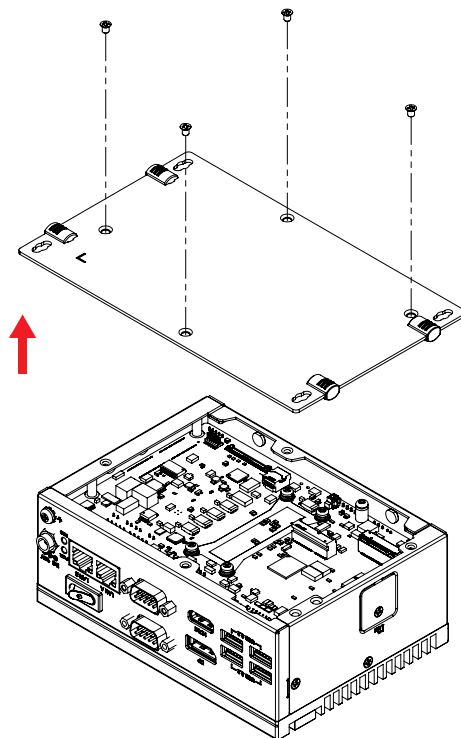


3.5 M.2 WiFi Module Installation (Optional)

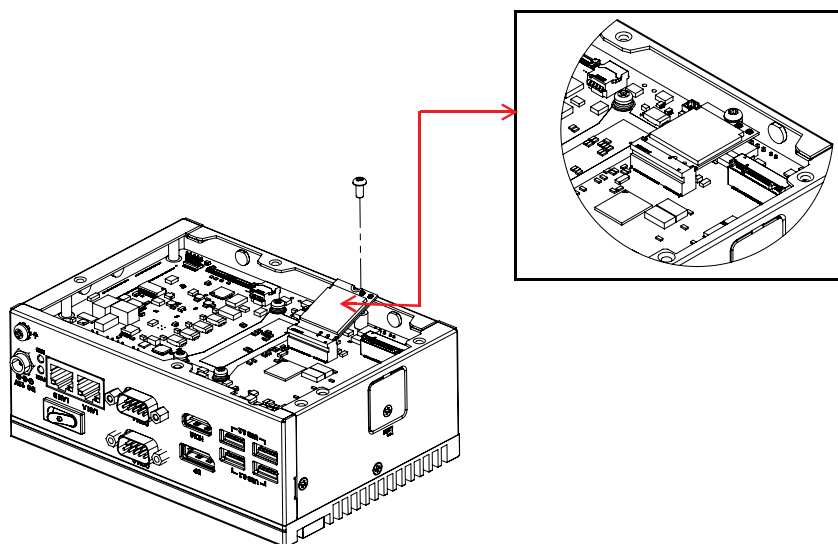
UNO-238 supports 1 x M.2 E Key 2230 WiFi module.

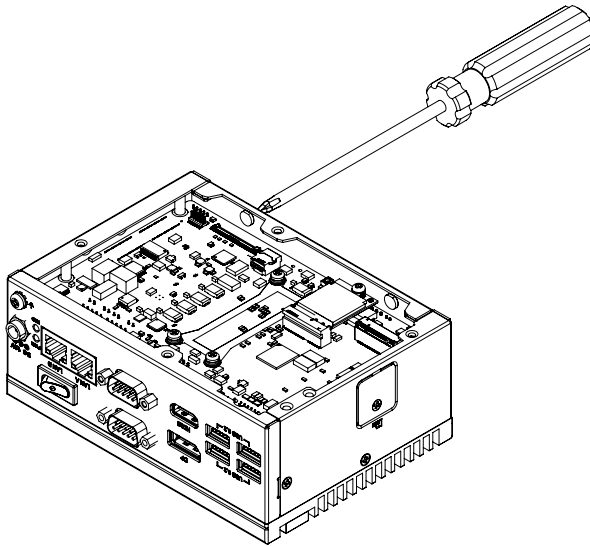
The following steps demonstrate the installation.

1. Remove 4 screws from back cover of UNO-238

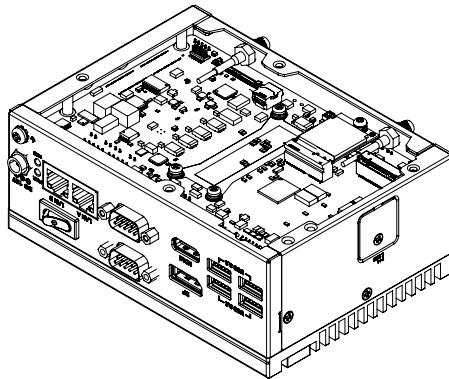


2. Install the M.2 E Key 2230 module and fix it with M3x6 screws

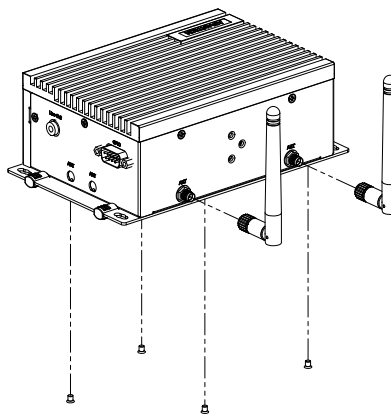




3. Pierce the antenna hole on the back with a device and break the hole



4. Assemble the antenna hole and arrange the wire to connect to the board



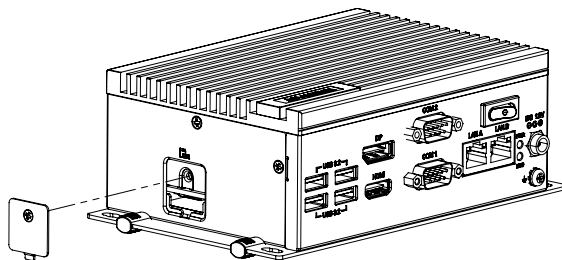
5. Restore and fix screws for back cover and lock the external antenna.

Note! *Wireless Module, Antenna cable, and Antenna are **optional**. Please contact Advantech for further information.*

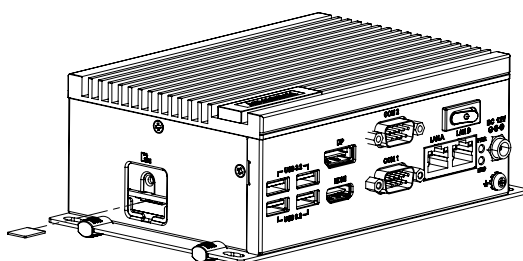


3.6 SIM Card Installation

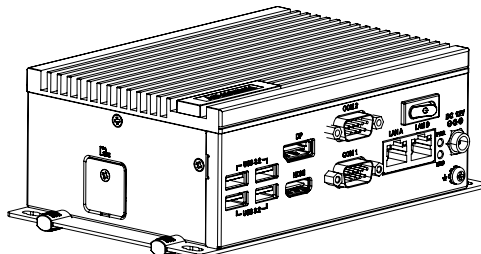
1. Remove SIM COVER



2. Insert the SIM Card

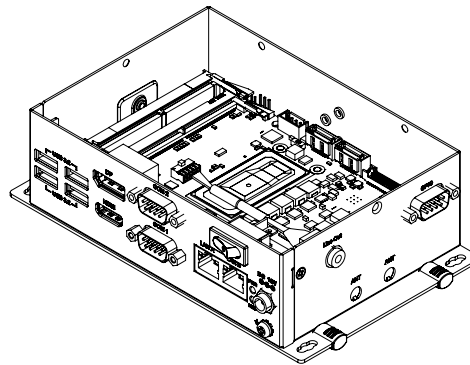
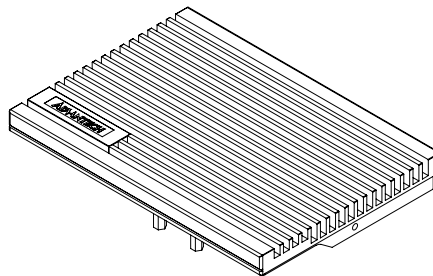
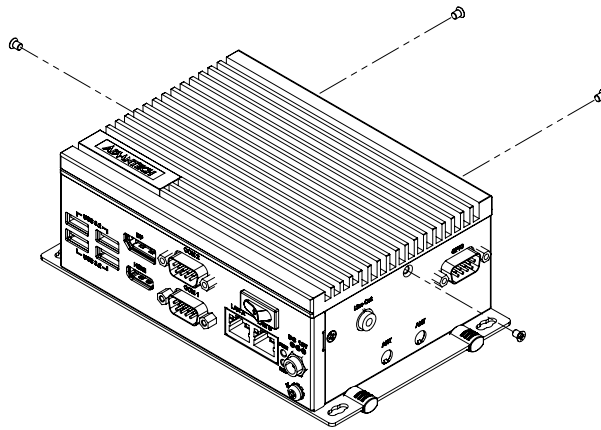


3. Replace and lock the SIM Card

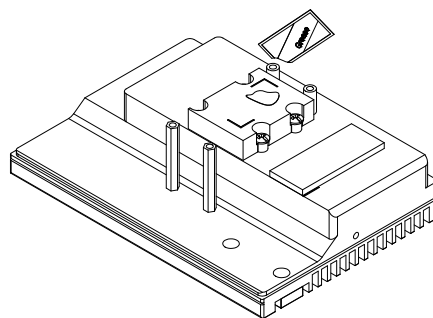


3.7 DDR and CPU Thermal grease Installation

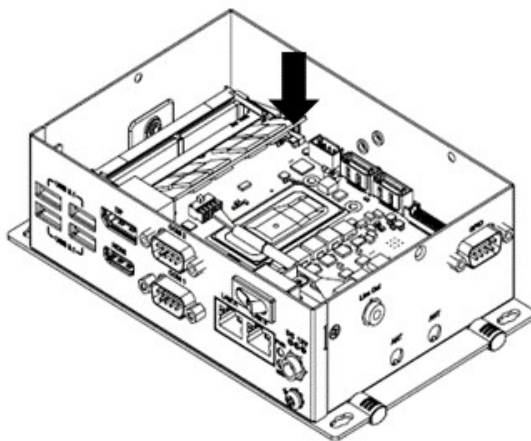
1. Remove the 4 M3x4 screws pre-locked on the side and then remove the top cover.



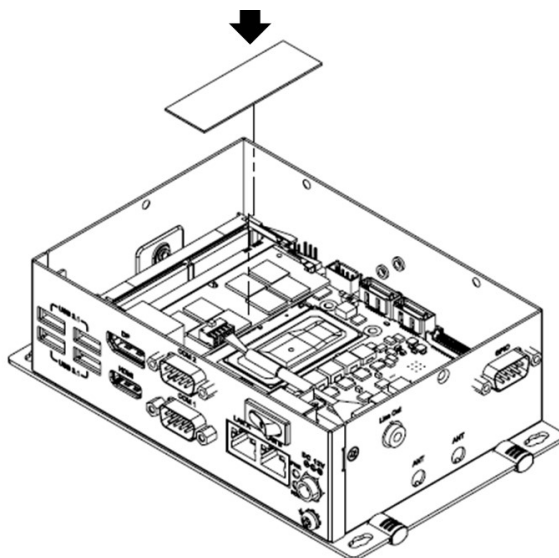
2. Apply thermal grease on the aluminum part of the top cover.



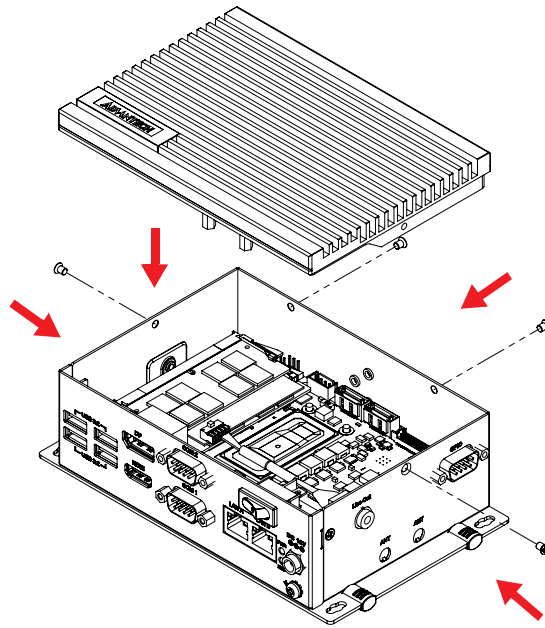
3. Install lower level DDR.



4. Paste thermal pad for lower level DDR.



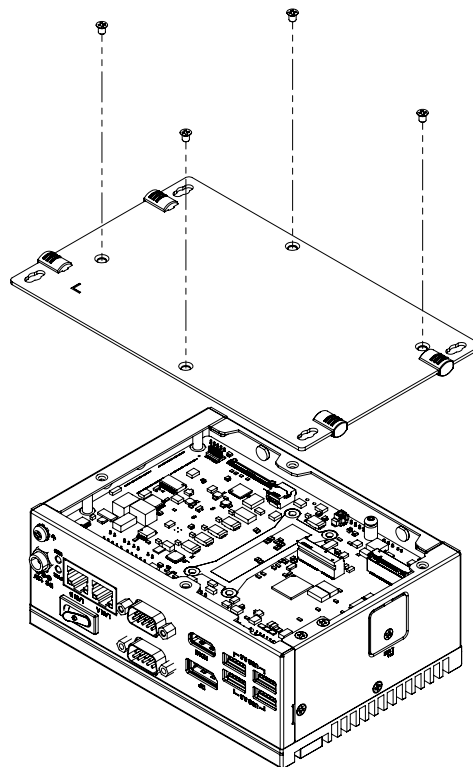
5. Install upper level DDR and fix M3x4 screws to restore top cover.



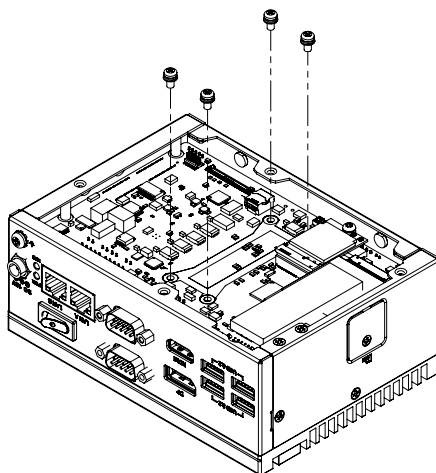
Note! If you only need to install one DDR, please install the upper level DDR directly.



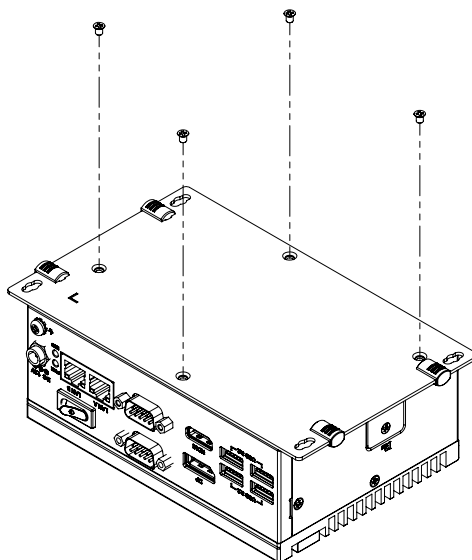
6. Remove 4 screws from the back cover.



7. Fix 4 M3x6 screws to the motherboard in order. (Torque=5kgf).

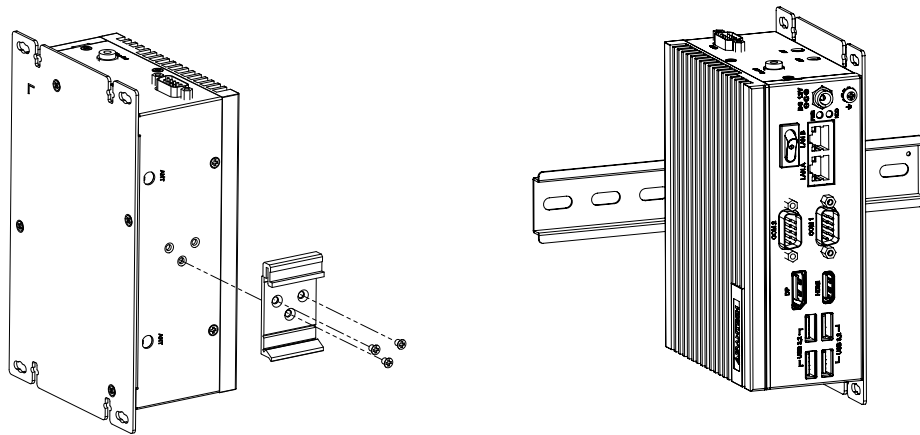


8. Restore and fix screws for the back cover.



3.8 Din-Rail Installation Mounting

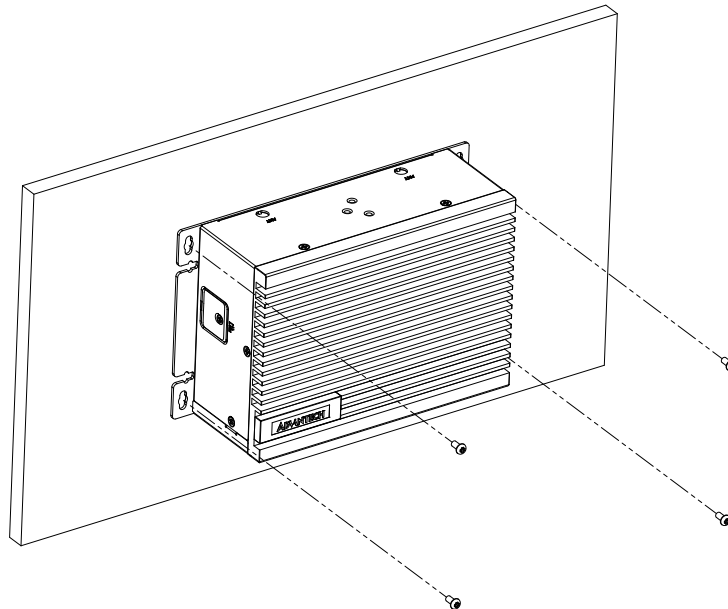
3.8.1 Din-Rail Installation



- Note!**
- 1 x Din-Rail kit (Advantech P/N: 1960018849T100)
 - 3 x screws (recommended to use M3x4L) for attaching Din-Rail kit (Advantech P/N: 1930008390)



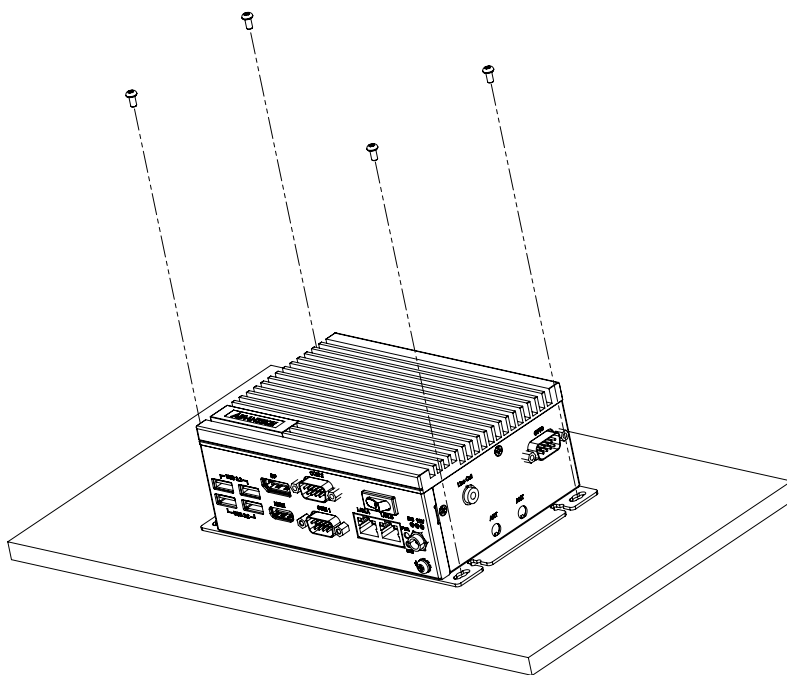
3.8.2 Wall Mount



- Note!** It is recommended to use M4x6L screws *4pcs.



3.8.3 Stand Mount



Note! Recommend to use M4x6L screws*4pcs.



3.9 BIOS Setting

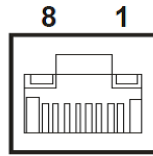
With the BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning special features on or off. Press the "ESC" key upon the first boot up to enter the BIOS setup screen, then, press the "Del" key during the Power On Self Test (POST) process to enter the BIOS setup screen, otherwise the system will continue the POST process.

(Please refer to User Manual- Appendix for more settings)

Appendix **A**

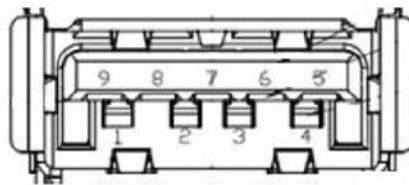
System Settings/Pin
Assignments

A.1 LAN: Ethernet Connector (CN11)



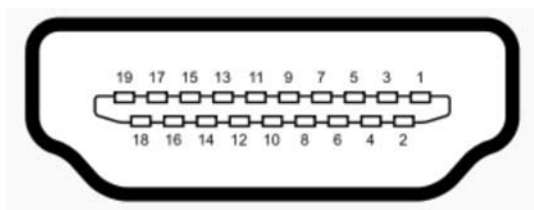
Pin	Signal Pin Definition
A1	LAN1_MDIO+
A2	LAN1_MDIO-
A3	LAN1_MDI1+
A4	LAN1_MDI1-
A5	LAN1CONN
A6	LAN1_GND
A7	LAN1_MDI2+
A8	LAN1_MDI2-
A9	LAN1 MDI3+
A10	LAN1_MDI3-
A11	LAN1_ACT#
A12	LAN1_A_ACT#
A13	LAN1_A_LINK100#
A14	LAN1_A_LINK1000#

A.2 USB 3.2 Connector (CN22,CN23)



Pin	Signal Pin Definition
1	+V5
2	USB1_P-
3	USB1_P+
4	GND
5	USB1_SSRX-
6	USB1_SSRX+
7	GND
8	USB1_SSTX-
9	USB1_SSTX+

A.3 HDMI + DP Connector (CN15)



Pin	Signal Pin Definition
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2-
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMND Data1-
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0-
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock-
13	NL
14	Reserved
15	SCL
16	SDA
17	DDC/CEC/HEC Ground
18	+5V Power (max 50mA)
19	Hot Plug Detect

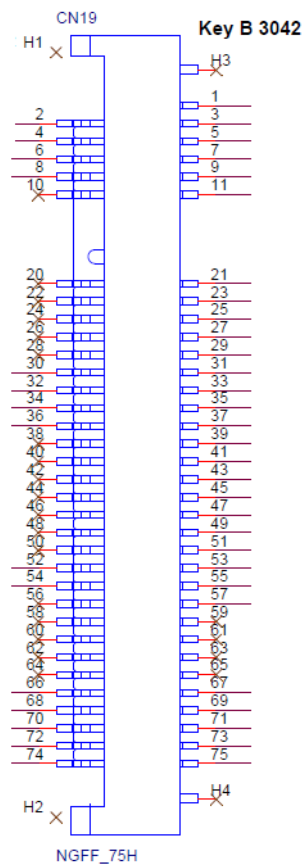


Pin	Signal Pin Definition
P1	DP_TX0+
P2	GND
P3	DP_TX0-
P4	DP_TX1+
P5	GND
P6	DP_TX1-
P7	DP_TX2+
P8	GND
P9	DP_TX2-

P10	DP_TX3+
P11	GND
P12	DP_TX3-
P13	DP_AUX_EN#
P14	GND
P15	DP_AUX+
P16	GND
P17	DP1_AUX-
P18	DDP2_DP_HPD
P19	GND
P20	+V3.3_DP

A.4 M.2 Connector

A.4.1 M.2 B Key 2280/3042/3052 (CN17)

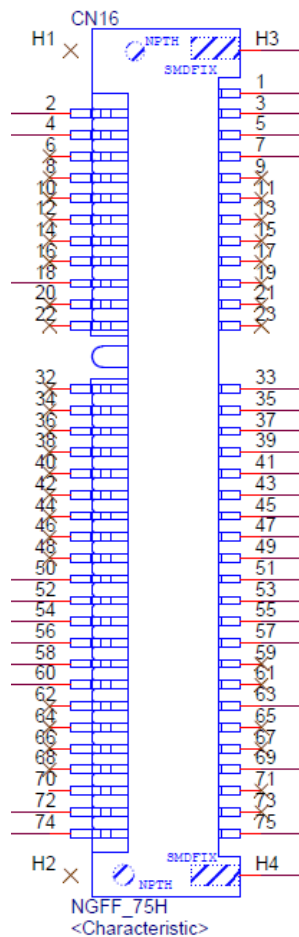


Pin	Signal Pin Definition (Key B)
1	M.2_CONFIG_3
2	+V3.3_M.2
3	GND
4	+V3.3_M.2
5	GND
6	NC

7	USB7_P+
8	WWAN_DISABLE#
9	USB7_KEYB_P-
10	NC
11	GND
12	
13	
14	
15	B Key NC
16	
17	
18	
19	
20	NC
21	M.2_CONFIG_0
22	NC
23	PCIE_A_PCH_TXN2
24	NC
25	PCIE_A_PCH_TXP2
26	NC
27	GND
28	NC
29	PCIE_KEY-M_RX7-
30	UIM_A_RESET
31	PCIE_KEY-M_RX7+
32	UIM_A_CLK
33	GND
34	UIM_A_DATA
35	PCIE_A_PCH_TXN1
36	+VUIM_A_PWR
37	PCIE_A_PCH_TXP1
38	NC
39	GND
40	NC
41	MPCIE_MSATA_RX+
42	NC
43	MPCIE_MSATA_RX-
44	NC
45	GND
46	NC
47	MPCIE_MSATA_TX-
48	NC
49	MPCIE_MSATA_TX+
50	NC
51	GND
52	CLK2_M2MB_A_PCIE_REQ#
53	CK_100M_A_MKEY_N
54	M.2_PCIE_WAKE#

55	CK_100M_A_MKEY_P
56	NC
57	GND
58	NC
59	NC
60	NC
61	NC
62	NC
63	NC
64	NC
65	NC
66	SIM_KEYB_DET
67	M.2_RESET#_R
68	PCH_SUSCLK_R_MKEY
69	M2_SSD_PEDET
70	+V3.3_M.2
71	GND
72	+V3.3_M.2
73	GND
74	+V3.3_M.2
75	GND

A.4.2 M.2 E Key 2230 (CN16)



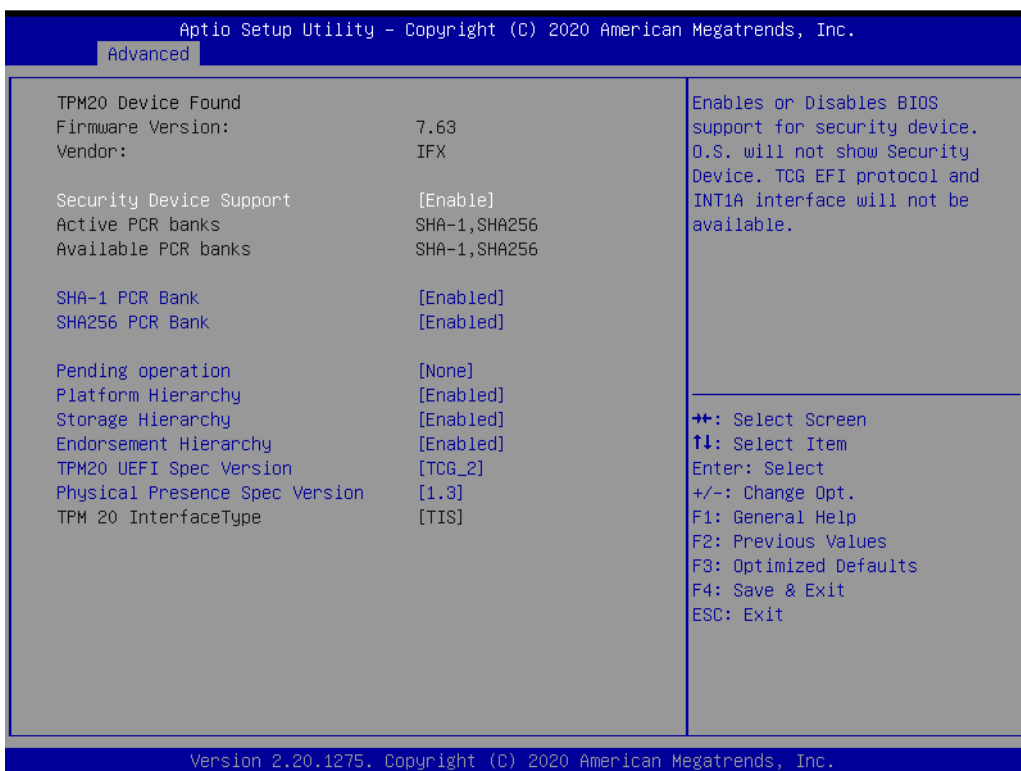
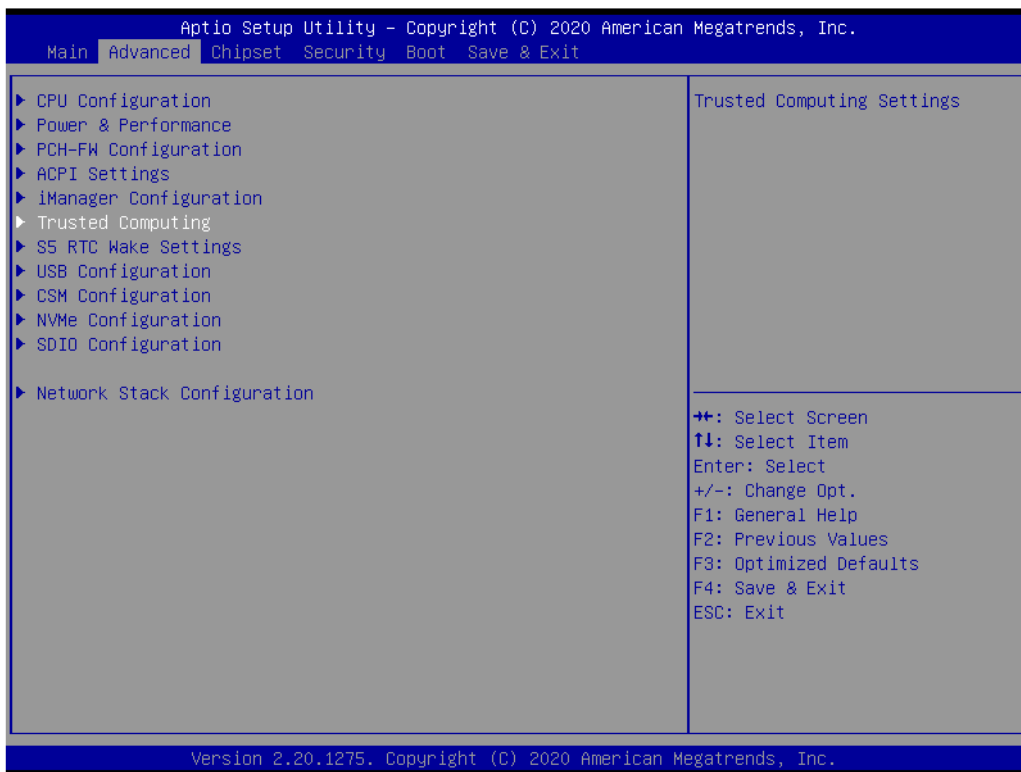
Pin	Signal Pin Definition (Key E)
1	GND
2	+V3.3SB_M.2_E
3	USB6_Z_P+
4	+V3.3SB_M.2_E
5	USB6_Z_P-
6	NC
7	GND
8	NC
9	NC
10	NC
11	NC
12	NC
13	NC
14	NC
15	NC
16	NC
17	NC
18	GND
19	NC
20	NC
21	NC
22	NC
23	
24	
25	
26	
27	E Key NC
28	
29	
30	
31	
32	NC
33	GND
34	NC
35	PCIE_M2_Z_TX7+
36	NC
37	PCIE_M2_Z_TX7-
38	NC
39	GND
40	NC
41	PCIE_M2_RX7+
42	NC
43	PCIE_M2_RX7-
44	NC
45	GND
46	NC

47	CLK_M2E_Z_PCIE+
48	NC
49	CLK_M2E_Z_PCIE-
50	SUSCLK_Z_EKEY
51	GND
52	PLTRST_BUFFER#
53	PCIE_A_CLKREQ2#
54	BT_DISABLE#
55	PCIE_WAKE#
56	WIFI_DISABLE#
57	GND
58	I2C0_KEYE_DAT
59	NC
60	I2C0_KEYE_CLK
61	NC
62	NC
63	GND
64	NC
65	NC
66	NC
67	NC
68	NC
69	GND
70	NC
71	NC
72	+V3.3SB_M.2_E
73	NC
74	+V3.3SB_M.2_E
75	GND

A.5 TPM 2.0 BIOS Setting

The UNO-238 systems support TPM2.0 functionality. This can be enabled or disabled in the BIOS menu by following the instructions provided below

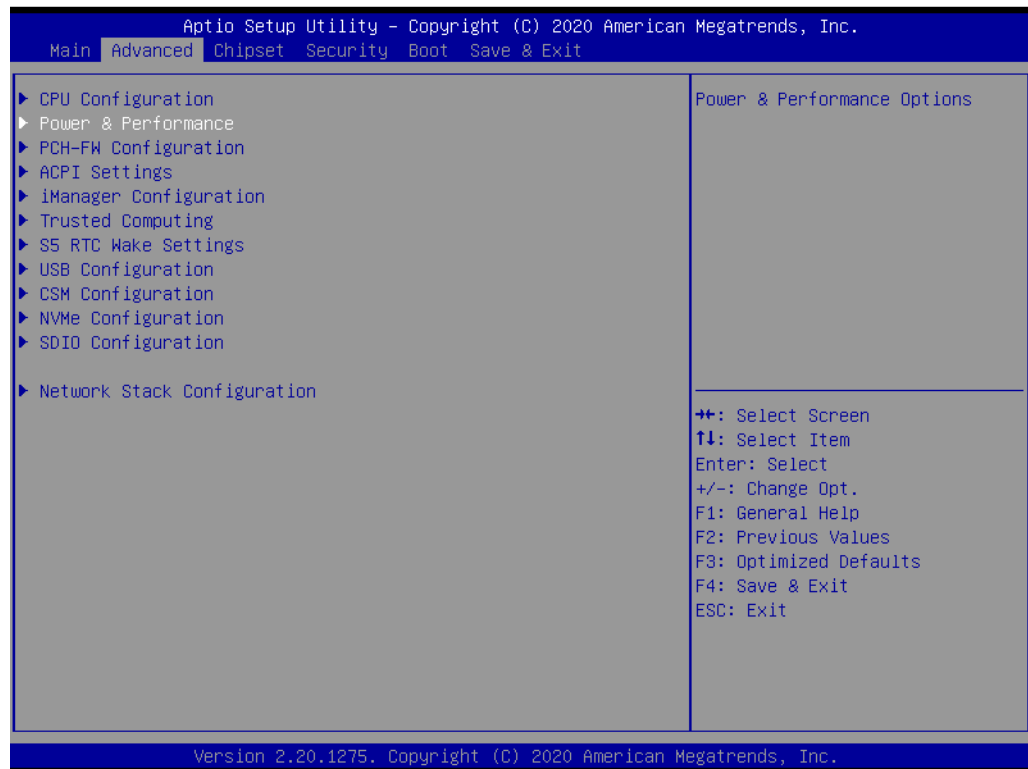
1. Power on the UNO-238 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “Trusted Computing” item.

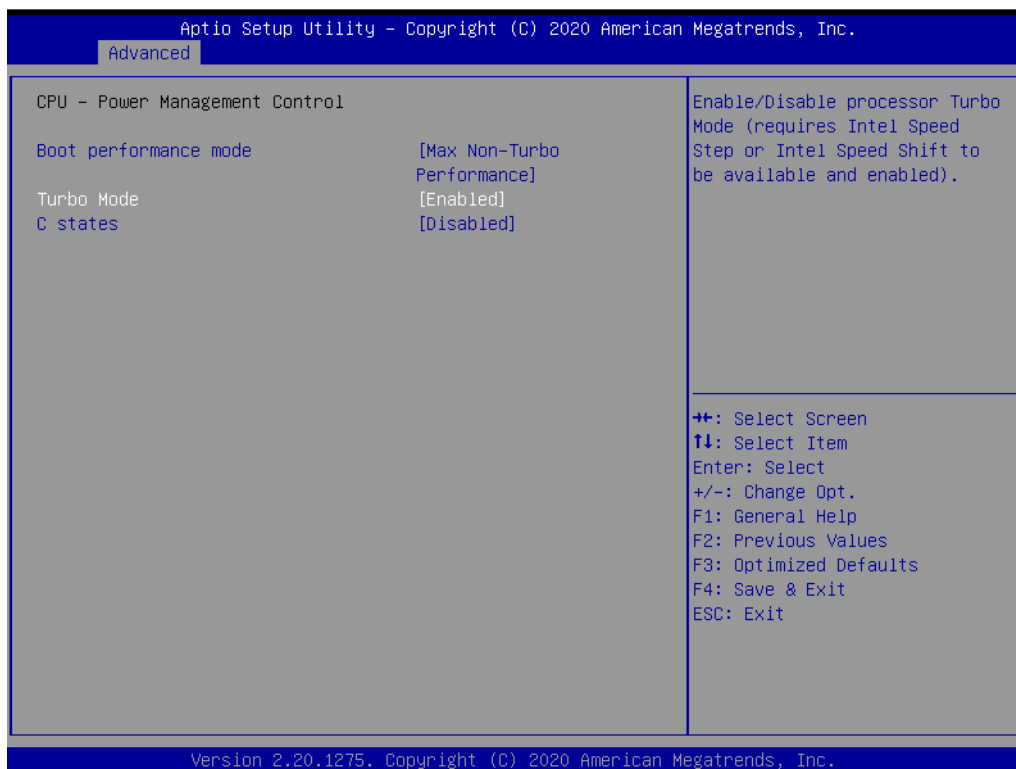


A.6 CPU Turbo mode BIOS Setting

The UNO-238 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-238 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “Power & Performance”.
3. Then select the CPU - Power Management Control
4. Choose “enable/disable” to enable or disable the CPU Turbo mode

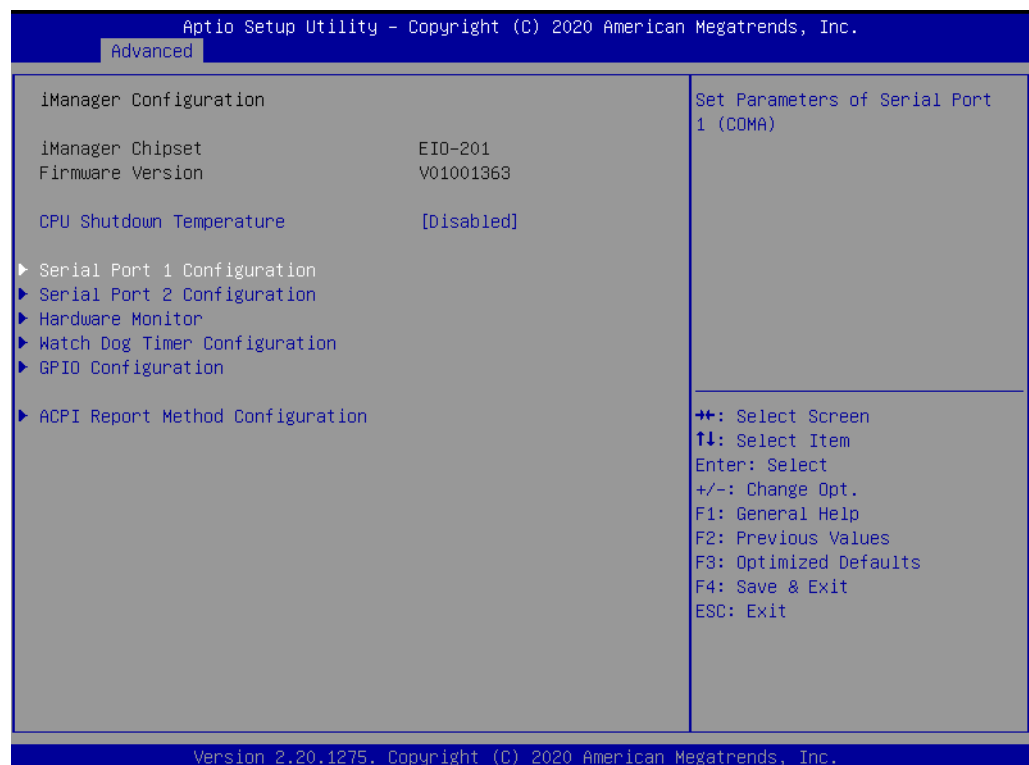
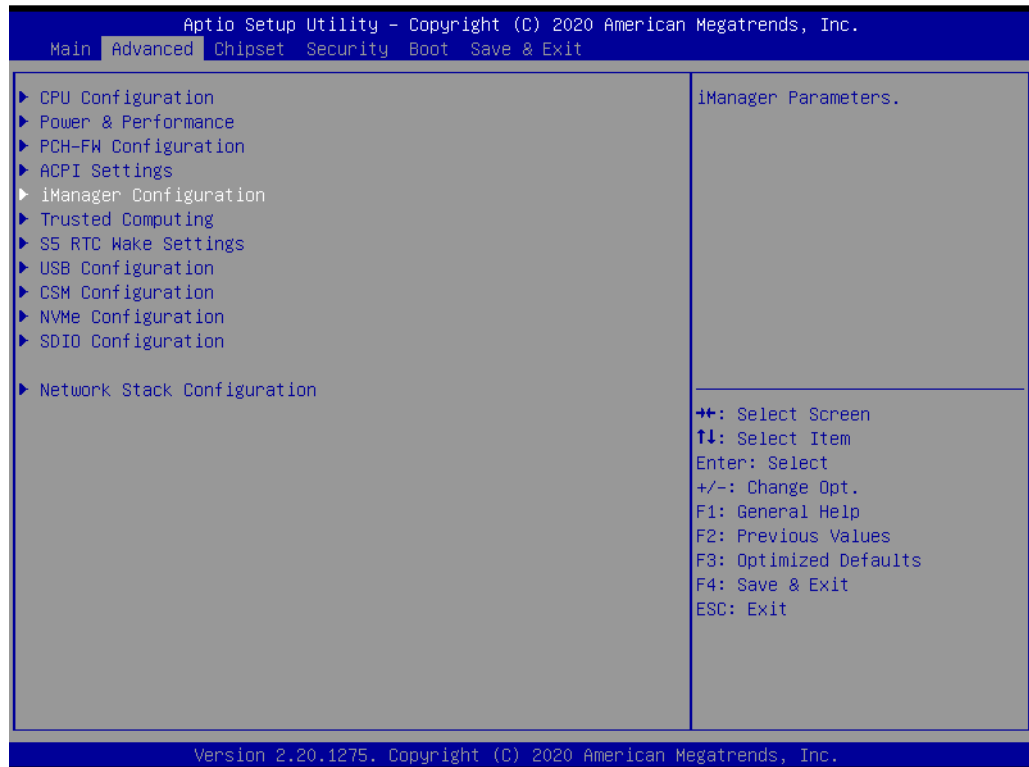


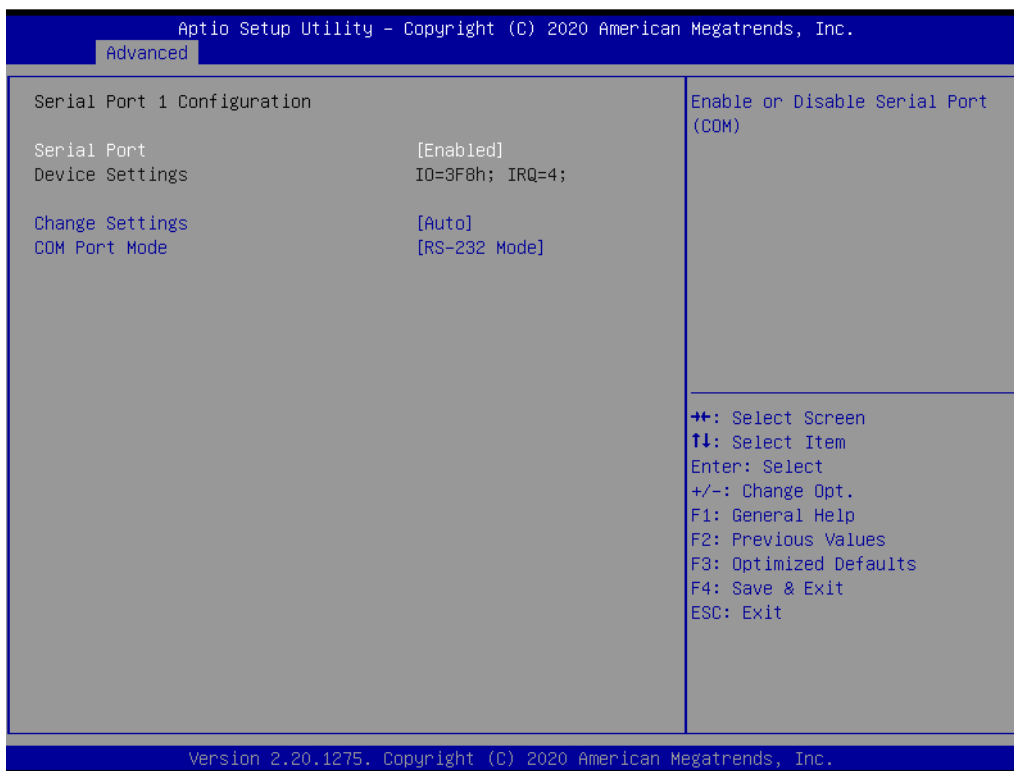


A.7 Serial Port 1 Configuration

The UNO-238 systems support Serial port 1 RS-232/RS-422/RS-485 mode.

1. Power on the UNO-238 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “Serial Port 1 Configuration”.
3. Choose “RS-232 mode / RS-422 mode / RS-485 mode” to COM Port Mode

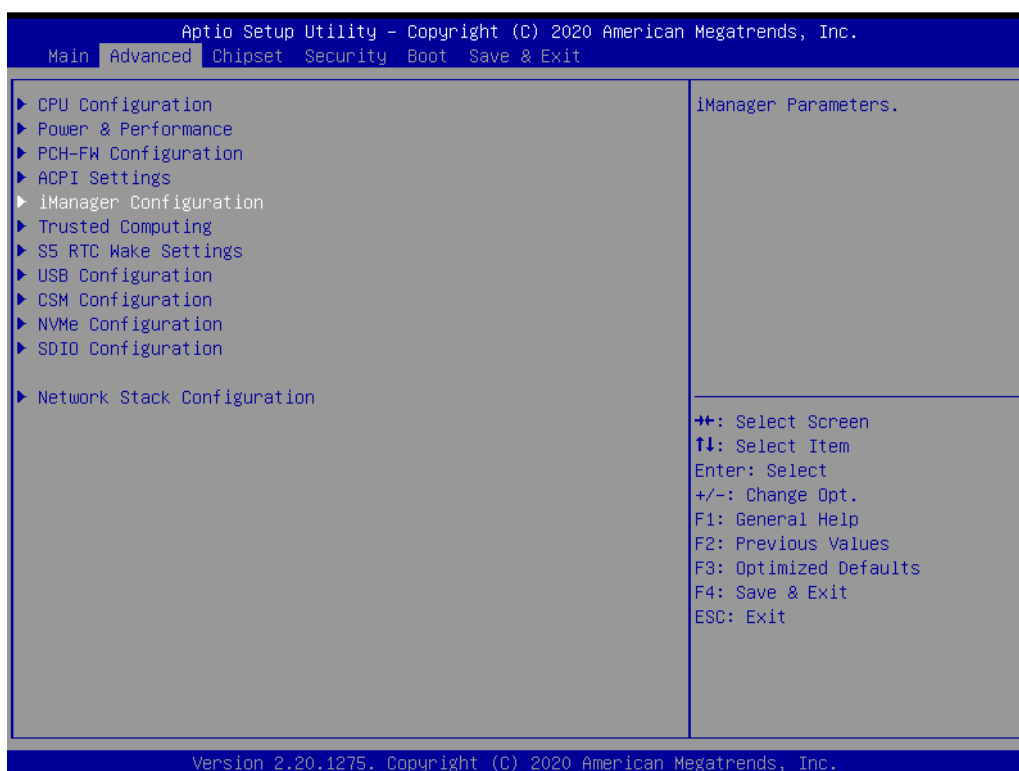


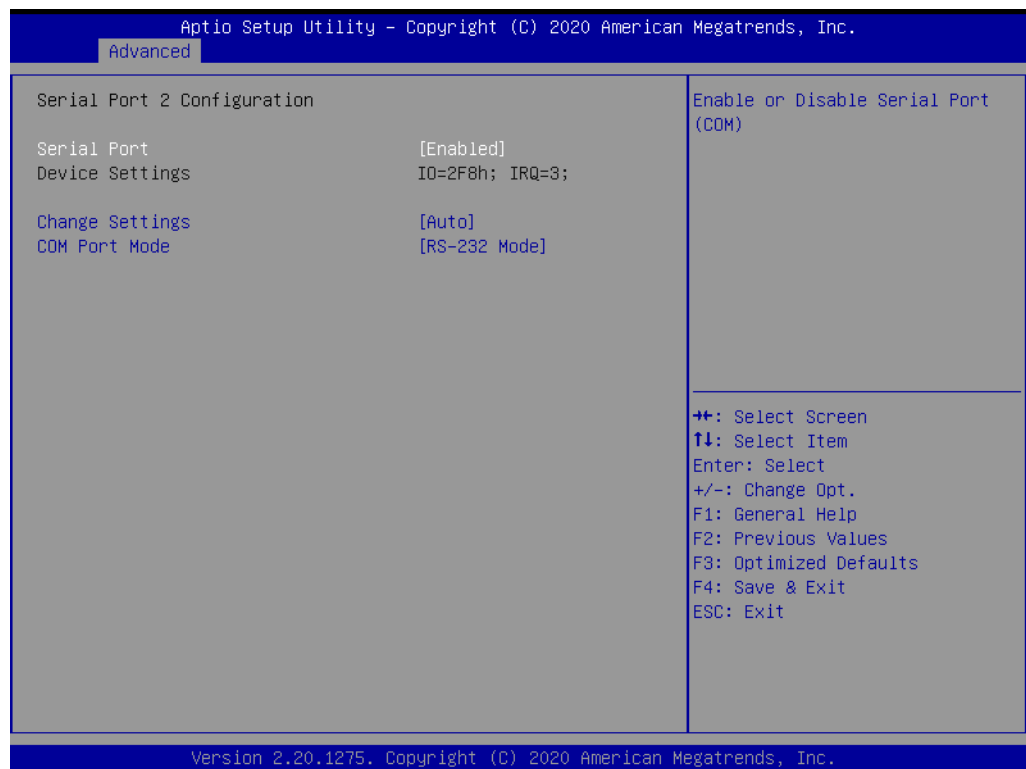
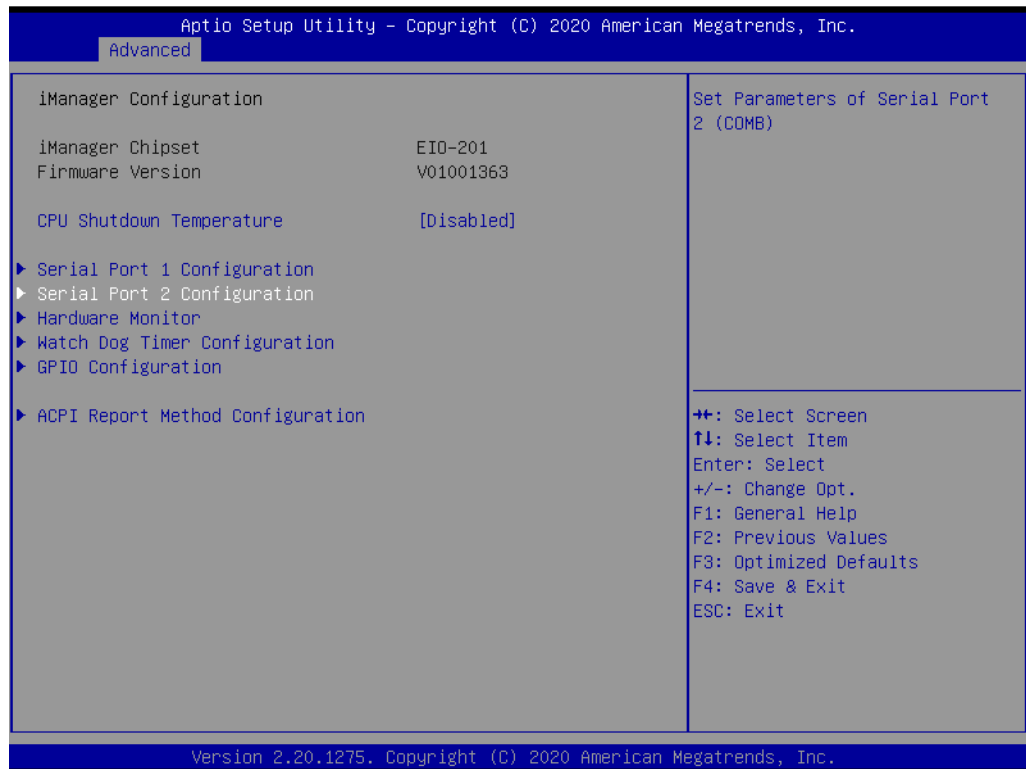


A.8 Serial Port 2 Configuration

The UNO-238 systems support Serial port 2 RS-232/RS-422/RS-485 mode.

1. Power on the UNO-238 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “Serial Port 1 Configuration”.
3. Choose “RS-232 mode / RS-422 mode / RS-485 mode” to COM Port Mode.

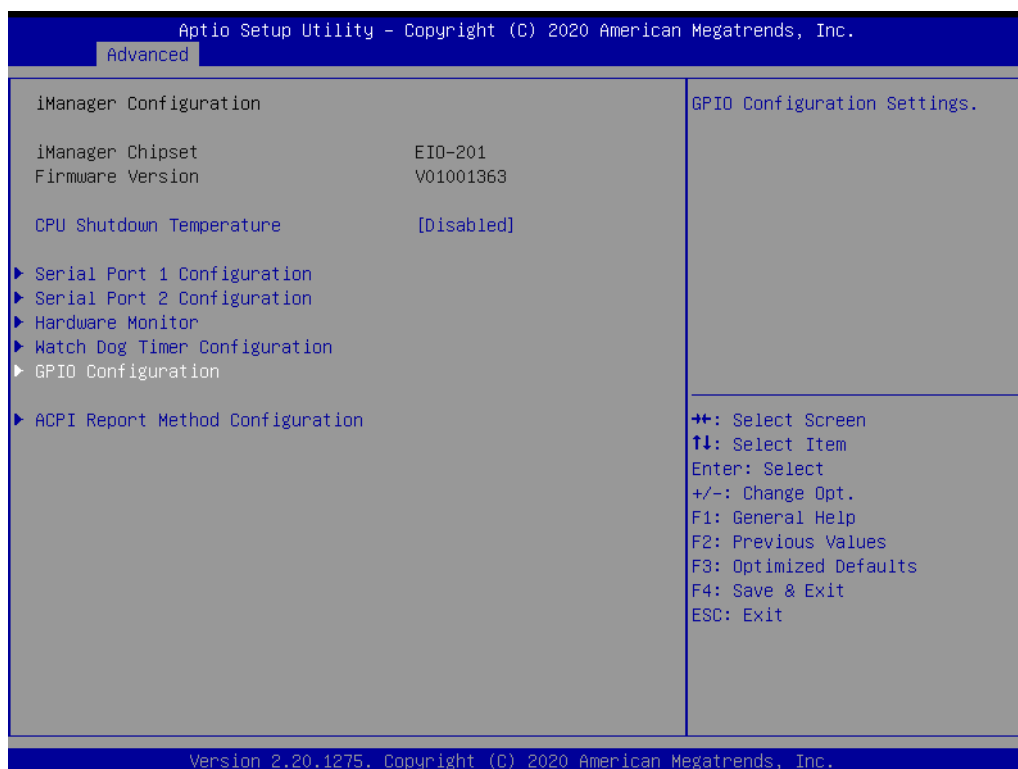
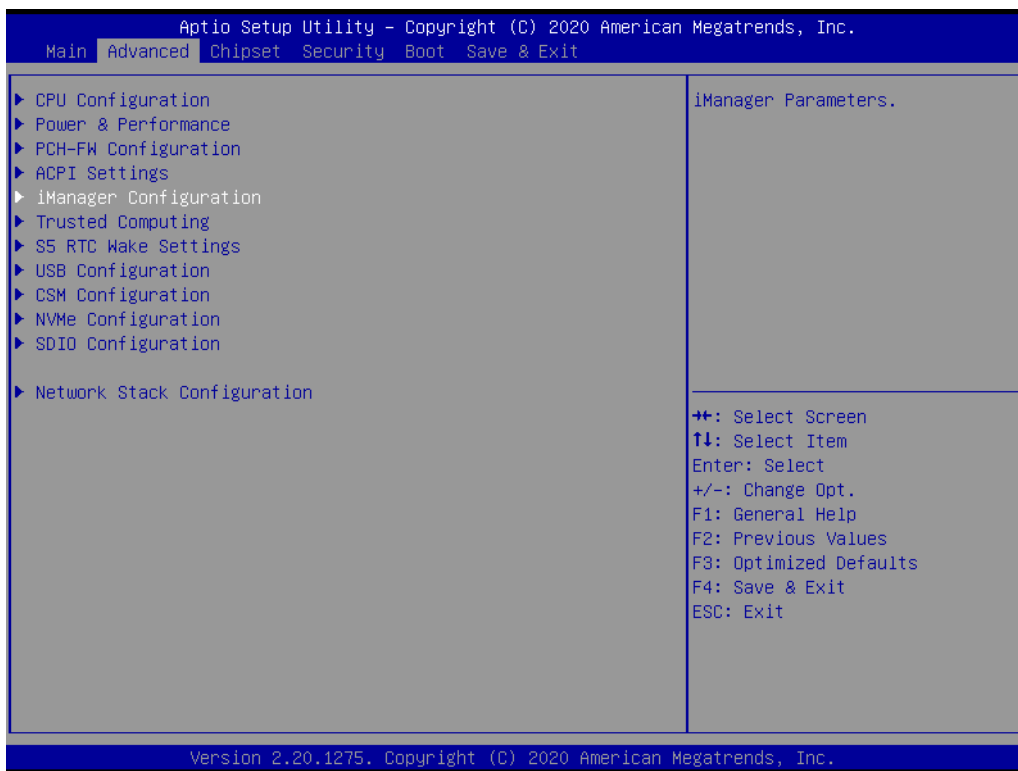


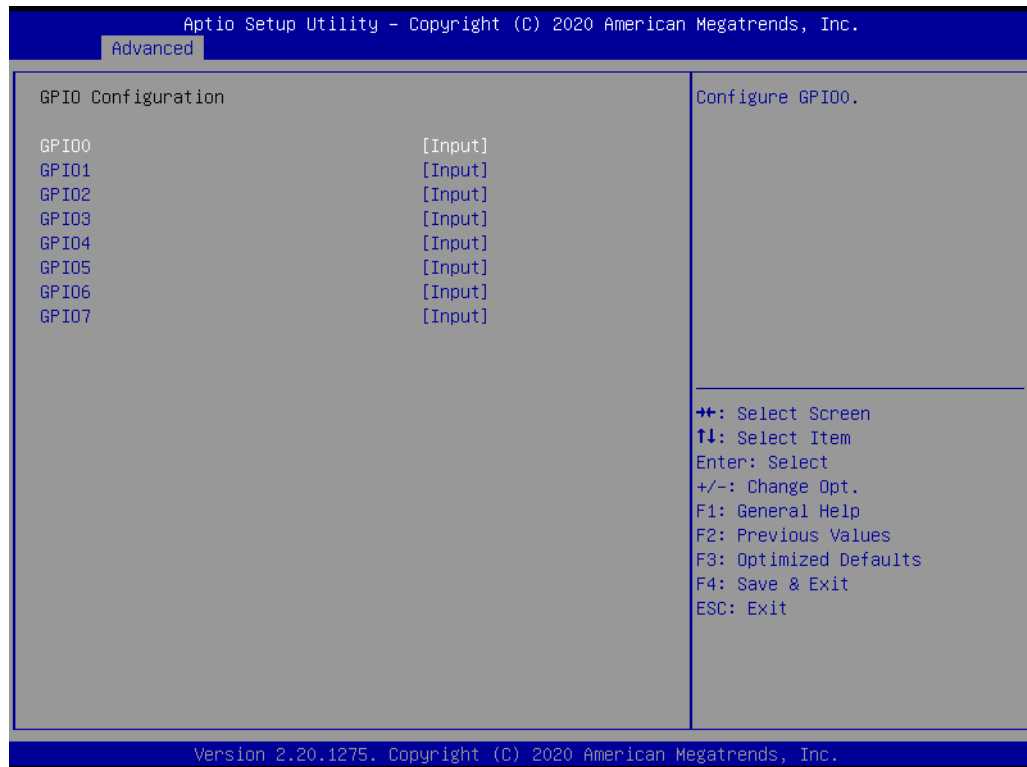


A.9 GPIO Configuration

The UNO-238 systems support GPIO 0~7.

1. Power on the UNO-238 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “GPIO Configuration”.
3. Choose “Input / Output” to GPIO 0~7.

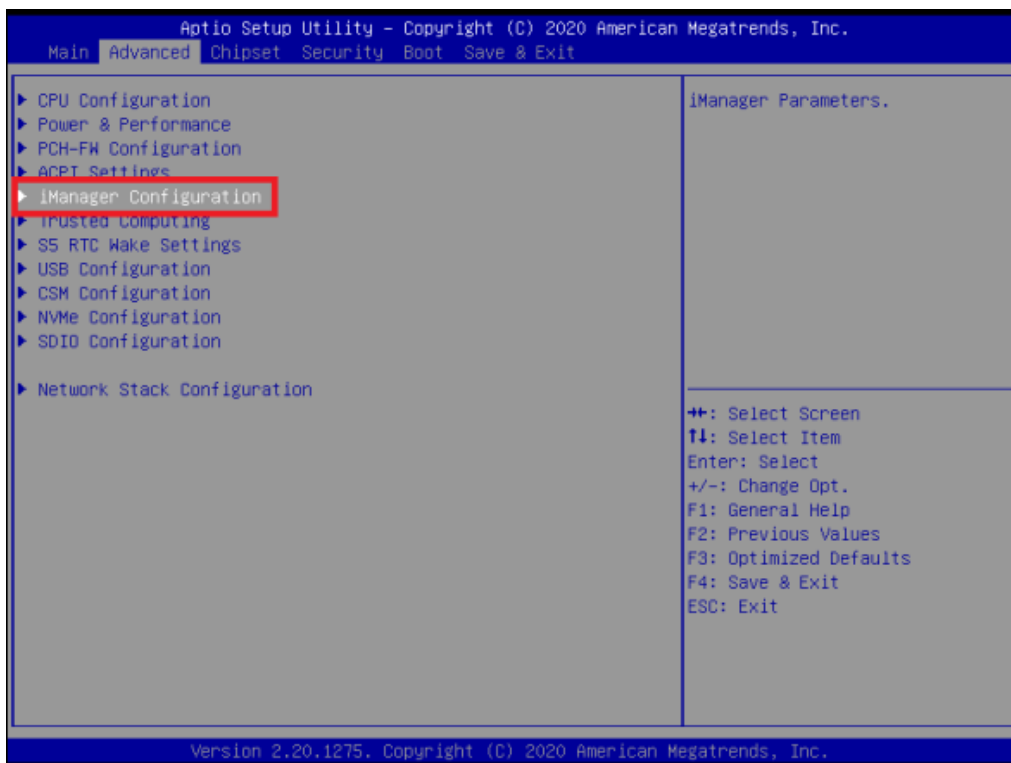


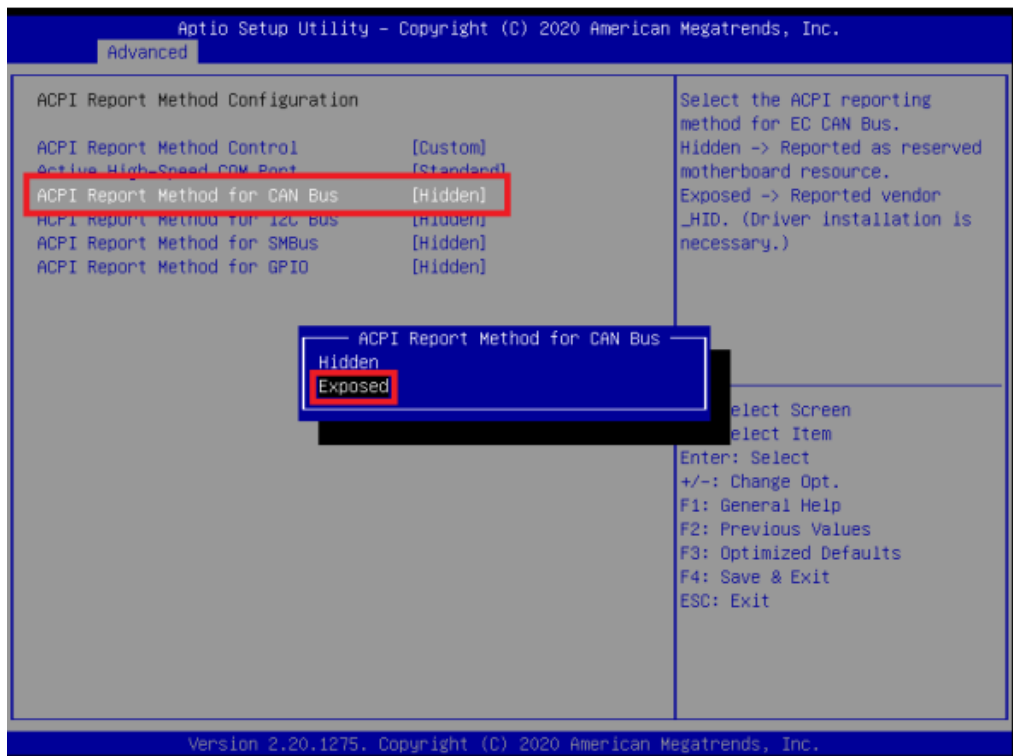
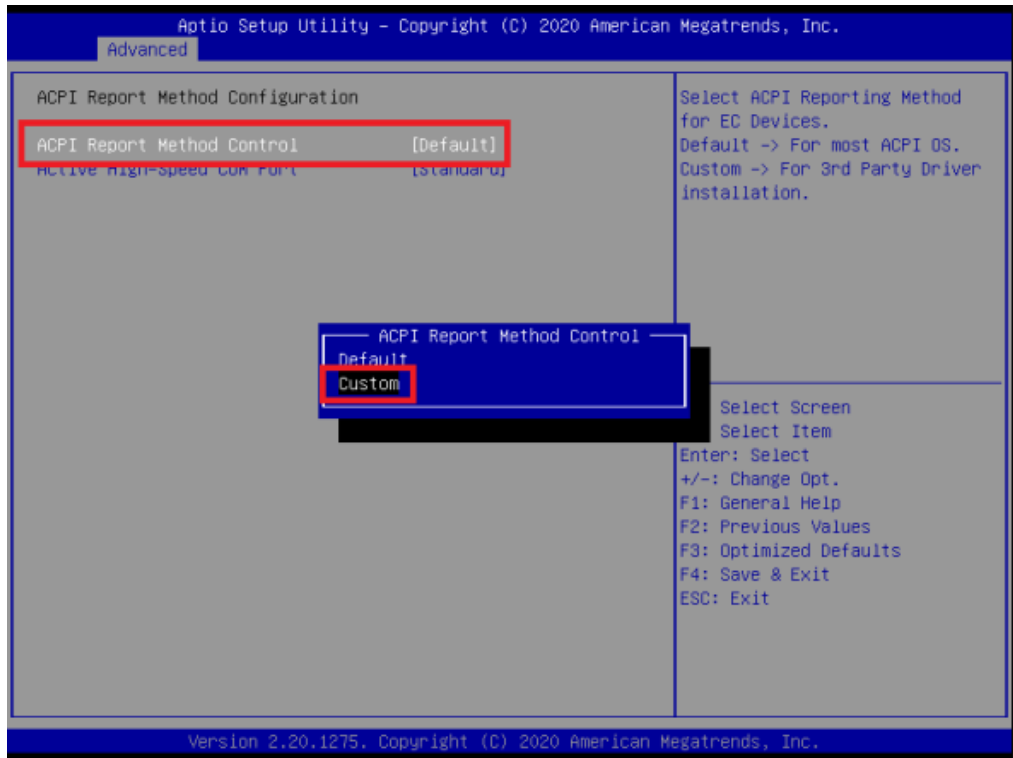


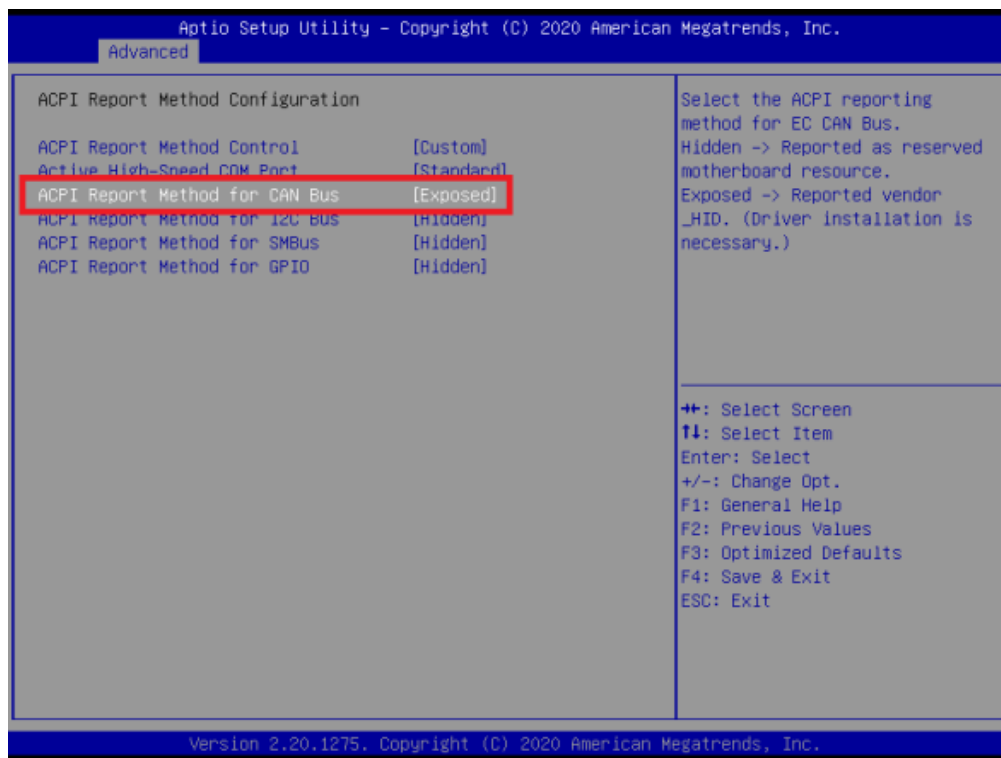
A.10 CANBus Configuration

The UNO-238 systems support CANBus (Optional).

1. Power on the UNO-238 system and press "Delete" to enter the BIOS configuration menu.
2. On the "Advanced" tab, select the "iManager Configuration".
3. Select "ACPI Report Method Configuration"
4. Select "ACPI Report Method Control", choose "Custom"
5. Select "ACPI Report Method for CANBus", choose "Exposed"







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