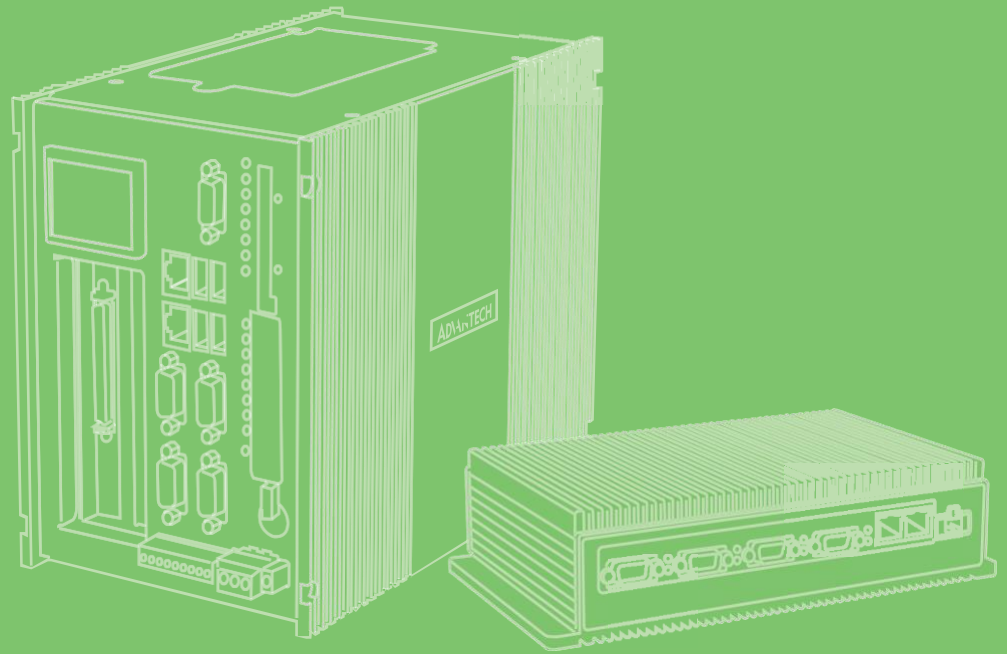


User Manual



AMAX-5570 Industrial PC

Ultra Compact Control Platform with Intel Atom Processor, 64GB eMMC, 2 x LAN, 2 x USB, 2 x CAN, 2 x COM, and Slice IO expansion

ADVANTECH

Enabling an Intelligent Planet

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This manual applies to the AMAX-5570 related models. Below list are general abbreviated as AMAX-5570 expanded products especially for BSMI certificate in TW, others extended product number like CTOS PN also included in this article.

*Model name

AMAX-5570

*Part number:

AMAX-5570	AMAX-5570-E2200A	AMAX-5570-E2300A
AMAX5570E22301-T	AMAX5570E22401-T	AMAX5570E22501-T
AMAX5570E22302-T	AMAX5570E22402-T	AMAX5570E22502-T
AMAX5570E22303-T	AMAX5570E22403-T	AMAX5570E22503-T
AMAX5570E22304-T	AMAX5570E22404-T	AMAX5570E22504-T
AMAX5570E22305-T	AMAX5570E22405-T	AMAX5570E22505-T
AMAX5570E22306-T	AMAX5570E22406-T	AMAX5570E22506-T
AMAX5570E22307-T	AMAX5570E22407-T	AMAX5570E22507-T
AMAX5570E22308-T	AMAX5570E22408-T	AMAX5570E22508-T
AMAX5570E22309-T	AMAX5570E22409-T	AMAX5570E22509-T
AMAX5570E222601-T	AMAX5570E222701-T	AMAX5570E232301-T
AMAX5570E222602-T	AMAX5570E222702-T	AMAX5570E232302-T
AMAX5570E222603-T	AMAX5570E222703-T	AMAX5570E232303-T
AMAX5570E222604-T	AMAX5570E222704-T	AMAX5570E232304-T
AMAX5570E222605-T	AMAX5570E222705-T	AMAX5570E232305-T
AMAX5570E222606-T	AMAX5570E222706-T	AMAX5570E232306-T

AMAX5570E222607-T
AMAX5570E222608-T
AMAX5570E222609-T

AMAX5570E222707-T
AMAX5570E222708-T
AMAX5570E222709-T

AMAX5570E232307-T
AMAX5570E232308-T
AMAX5570E232309-T

AMAX5570E232401-T
AMAX5570E232402-T
AMAX5570E232403-T
AMAX5570E232404-T
AMAX5570E232405-T
AMAX5570E232406-T
AMAX5570E232407-T
AMAX5570E232408-T
AMAX5570E232409-T

AMAX5570E232501-T
AMAX5570E232502-T
AMAX5570E232503-T
AMAX5570E232504-T
AMAX5570E232505-T
AMAX5570E232506-T
AMAX5570E232507-T
AMAX5570E232508-T
AMAX5570E232509-T

AMAX5570E232601-T
AMAX5570E232602-T
AMAX5570E232603-T
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AMAX5570E232702-T
AMAX5570E232703-T
AMAX5570E232704-T
AMAX5570E232705-T
AMAX5570E232706-T
AMAX5570E232707-T
AMAX5570E232708-T
AMAX5570E232709-T

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限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking.

證書號碼／受理編號：(No.)⁺

Certificate No./Application No..

商品標籤及商品檢驗標識：(Picture)⁺

Product Label and Commodity Inspection Mark..

樣張及其標示位置：(Description and Picture)⁺

Sample and its location..

設備名稱： ⁺ Equipment name ⁺	自動化控制平台 ⁺	型號(型式)： ⁺ Type designation (Type) ⁺	AMAX-5570-E2200A.			
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 ⁺ (滑鼠、鍵盤、電源線、排 線、傳輸線、網路線...等) ⁺	○ ⁺	○ ⁺	○ ⁺	○ ⁺	○ ⁺	○ ⁺
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. ⁺						

茲切結保證所提供之商品限用物質含有情況標示內容係經執行測試作業或採適當之品質管理措施，並備置前述相關文件，確認正確無誤後提供貴局。並同意配合貴局執行後市場管理作業所需，依商品檢驗法第49條之規定，於限期28個工作天內提供相關證明文件以供審查。⁺

I hereby ensure that "the presence conditions of the restricted substance" provided above have been proved by testing or appropriate quality control measures, and make sure the relevant documents provided are correct and ready. Also, I agree to cooperate with BSMI, as the Article 49 of the Commodity Inspection Act stipulates, to provide the relevant documents, if needed, for verification within 28 working days when BSMI carries out the market surveillance activities.⁺

此致 to⁺經濟部標準檢驗局 The Bureau of Standards, Metrology and Inspection⁺申請人：
Applicant.

負責人：

Person in charge.

(簽章)⁺
(Signature).中華民國
DATE.年
(year).月
(month).日
(day).

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.

甲類資訊技術設備

甲類設備為其他符合甲類設備限制值之資訊技術設備，而非符合乙類資訊技術設備的限制值；雖然不可限制此類設備之行銷，但使用場所必須被限制，不得進行居住的環境中，且應於其機器本體及使用說明書中含有下列警語：

****CNS 15936甲類警語：為避免電磁干擾，本產品不應安裝或使用於住宅環境。**

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 electric 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. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it

- 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. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
 9. Position the power cord so that people cannot step on it. 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 by transient over-voltage.
 12. Never pour any 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 situations arises, get 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. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
 18. This product is intended to be supplied by an UL certified power supply or dc source with SELV output, rated 24 Vdc, 3A minimum and Tmax 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 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 oublier le laisser tomber peut causer des dégâts.
6. Les ouvertures sur l'enceinte servent à la convection de l'air. Protégez l'équipement contre 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 une prise de courant. La prise de courant doit avoir une connexion à la terre.
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.
 - The equipment does not work well, or you cannot get it to work according to the user's manual
 - 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'ÉQUIPEMENT. 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 SELV et dont la puissance nominale est de 24 Vdc, 3 A, en cas de besoin. contactez Advant-ech pour plus d'informations.
16. Pour une utilisation dans des environnements non polluants 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 altérée

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. 請勿在潮濕環境中試用設備。
6. 請在安裝前確保設備放置在可靠的平面上，意外摔落可能會導致設備損壞。
7. 設備機殼的開孔適用於空氣對，從而防止設備過熱。請勿覆蓋開孔。
8. 當您連接設備到電源插座前，請確認電源插座的電壓符合要求。
9. 請將電源線佈置在人們不易絆倒的位置，請勿在電源線上覆蓋任何雜物。
10. 請注意設備上所有的警告標示。
11. 如果長時間不使用設備，請拔除與電源插座的連結，避免設備被超標的電壓波動損壞。
12. 請勿讓任何液體流入通風口，以免引起火災或短路。
13. 請勿自行打開設備。為了確保您的安全，請透過經認證的工程師來打開設備。
14. 如遇下列情況，請由專業人員維修：
 - 電源線或插頭損壞；
 - 設備內部有液體流入；
 - 設備曾暴露在過度潮濕環境中使用；
 - 設備無法正常工作，或您無法透過用戶手冊來正常工作；
 - 設備摔落或損壞；
 - 設備有明顯外觀損；
15. 請勿將設備放置在超出建議溫度範圍的環境，即不要低於 -20°C (-4°F) 或高於 60°C (140°F)，否則可能會造成設備損壞。
16. 注意：若電池更換不正確，將有爆炸危險。因此，只可以使用製造商推薦的同一種或者同等型號的電池進行替換。請按照製造商的指示處理舊電池。
17. 根據 IEC 704-1:1982 規定，操作員所在位置音量不可高於 70 分貝。
18. 限制區域：請勿將設備安裝於限制區域使用。
19. 免責聲明：請安全訓示符合 IEC 704-1 要求。研華公司對其內容之準確性不承擔任何法律責任。
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电源适配器。

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Chapter 1

Overview

This chapter overviews specifications for AMAX-5570.

- Introduction
- Safety Precautions
- Accessories
- Hardware Specifications
- Dimensions

1.1 Introduction

AMAX-5570 is specially designed for machine and equipment builders, with efficient Intel Atom® 4 core CPU series processors and optimized local expansion slots for general IT and OT applications. On board eMMC storage and Memory design minimizes the overall size and allows scalable local expansion with mPCIe and M.2 B key ports for further storage or wireless communication requirements. Extra Wi-Fi or cellular modules can be installed for uploading data to cloud servers.

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 AMAX-5570. 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 AMAX-5570. 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:

- AMAX-5570 (with din-rail mount)
- 1 x 2 PIN Plug-in block for Power
- 1 x 12 PIN Plug-in block for IO expansion
- 1 x Thermal PAD for M.2 B key modules(1990038939N000)

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

1.4 Hardware Specifications

1.4.1 General

Dimensions (W x D x H)	48.8 x 70 x 100 mm
Weight (Net)	0.5 kg
Mounting	DIN-rail
Power Requirement	24V _{DC}
Power consumption	15.8W (typical), 35W (Max)

1.4.2 System Hardware

BIOS	AMI EFI X64
Watchdog Timer	Programmable 255 levels timer interval, from 1 to 255 sec
Hardware Security	TPM 2.0
Processor	Intel® Atom® Quad core x6413E, 1.5GHz
Memory	4 GB DDR4 2666 MHz onboard(4 slots SMT)
Graphics Engine	Intel® UHD Graphics
Ethernet	3 x Realtek 8119i(2 x External, 1 x Slice IO)
LED Indicators	LEDs for Power, RUN (Programmable), LAN (Active, Status)
Storage	Onboard 64GB eMMC Optional mSATA shared with mPCIe slot Optional 2242 SATA SSD shared with M.2 B key slot
Expansion	1 x Full-size mPCIe slot (SATA/PCIe/USB2.0 signal) 1 x M.2 B key slot (SATA/USB3 signal) Local AMAX-5000 Slice IO module(1A supply without power module)

1.4.3 I/O Interfaces

LAN Ports	2 x RJ45, 1 x SliceIO,
Speed	2 x 10/100/1000 Mbps 1 x 10/100 Mbps
USB Ports	2 x USB 3.2 Gen1
Displays	1 x HDMI (1920 x 1080 @60Hz)
Power Connector	1 x 2 Pin (terminal block)

1.4.4 Environment

Operating Temperature*	-20 ~ 60 °C (-4 ~ 140 °F) with 0.7m/s airflow (without expansion) -20 ~ 55 °C (-4 ~ 131 °F) with 0.7 m/s airflow (with mPCIe +M.2 Bey key+ AMAX-5000 expansion)
Storage Temperature	- 40 ~ 85 °C (-40 ~ 185 °F)
Relative Humidity	Operating, 10~95% RH @ 40 °C/104 °F, non-condensing Non-Operating, 10~95% RH @ 60 °C/140 °F, non-condensing
Shock Protection	Operating, IEC 60068-2-27, 50G, half sine, 11ms
Vibration Protection	Operating, IEC 60068-2-64, 2 Grms, random, 5 ~ 500 Hz, 1hr/axis

1.4.5 Certifications

Certification	CE, FCC, CB, UL 61010-2-201, BSMI
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1.5 Dimensions

48.8 x 70 x 100 mm (W x D x H mm)

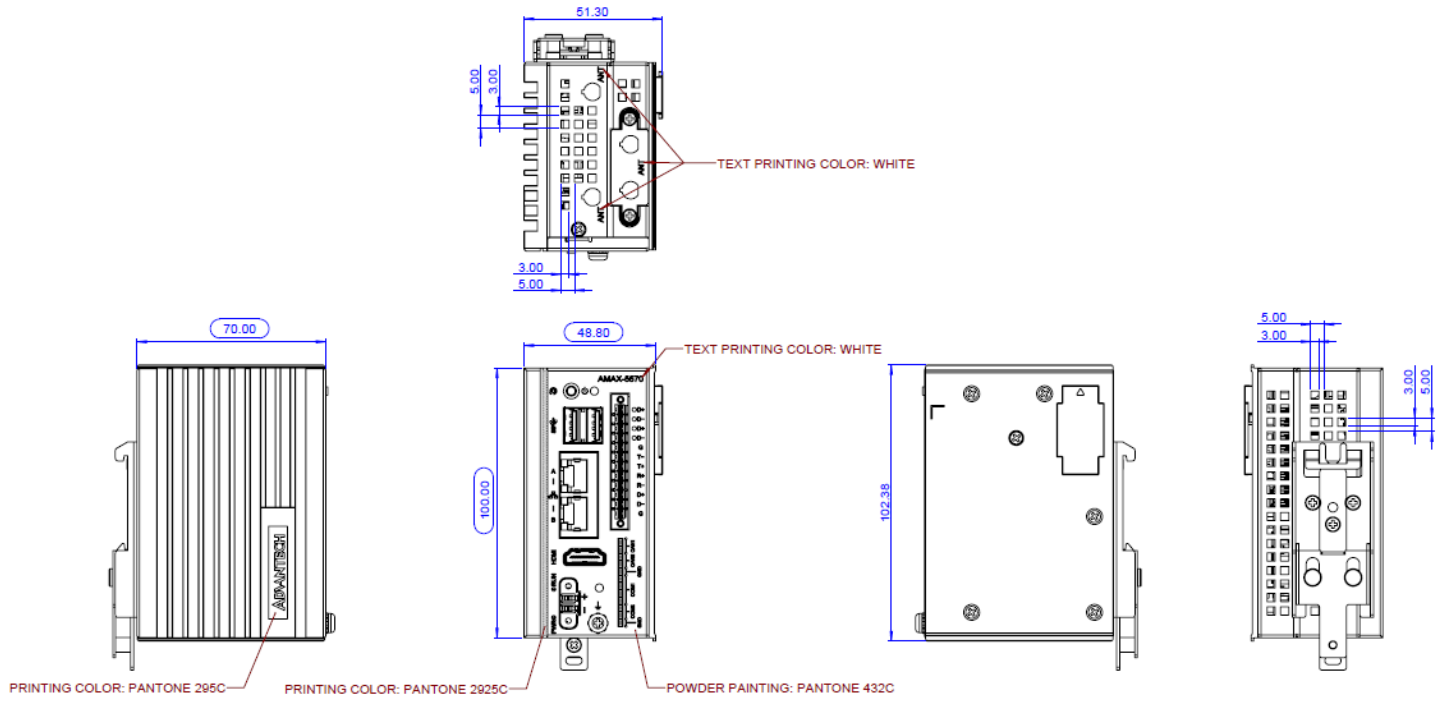


Figure 1.1 AMAX-5570 Dimensions

Chapter

2

Hardware Functionality

This chapter details setup instructions for AMAX-5570's hardware functions. It includes connecting peripherals and indicators.

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

2.1 Introduction

The following diagram demonstrates the location of AMAX-5570's motherboard's key components and internal/external connectors.

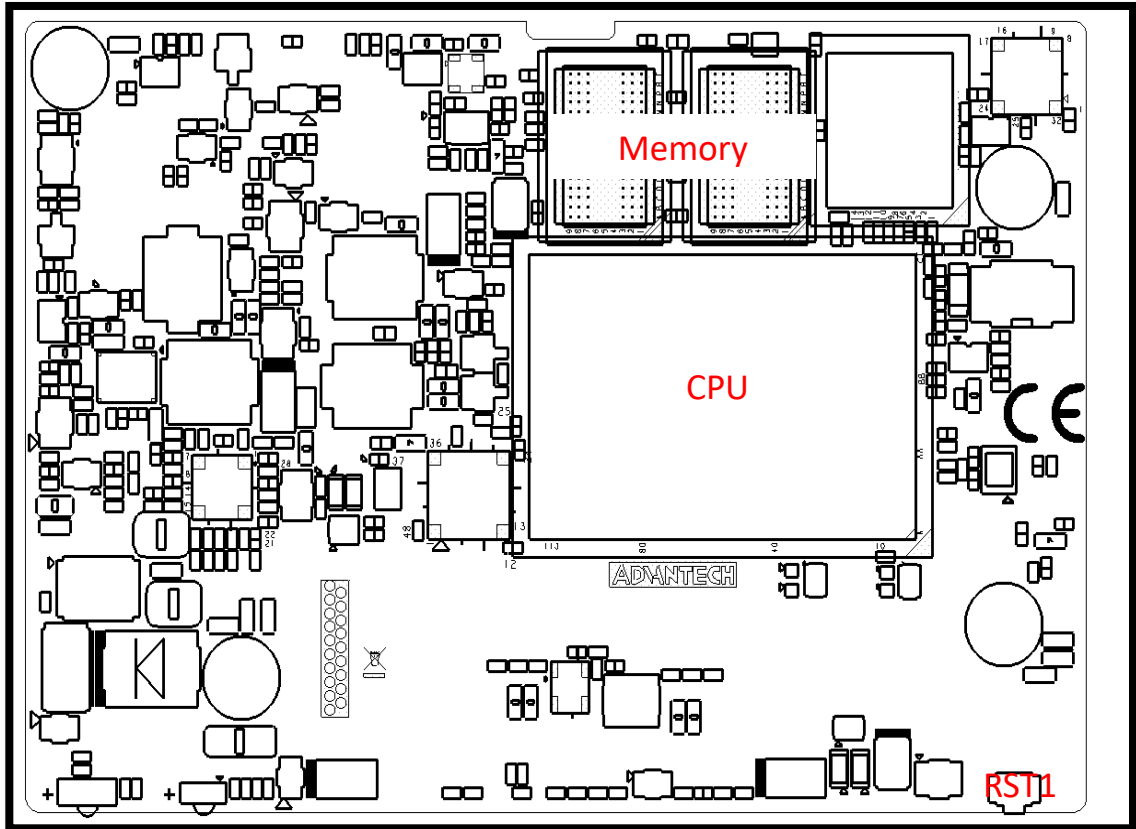


Figure 2.1 Diagram of Connector Locations on AMAX-5570 MB (Top Side)

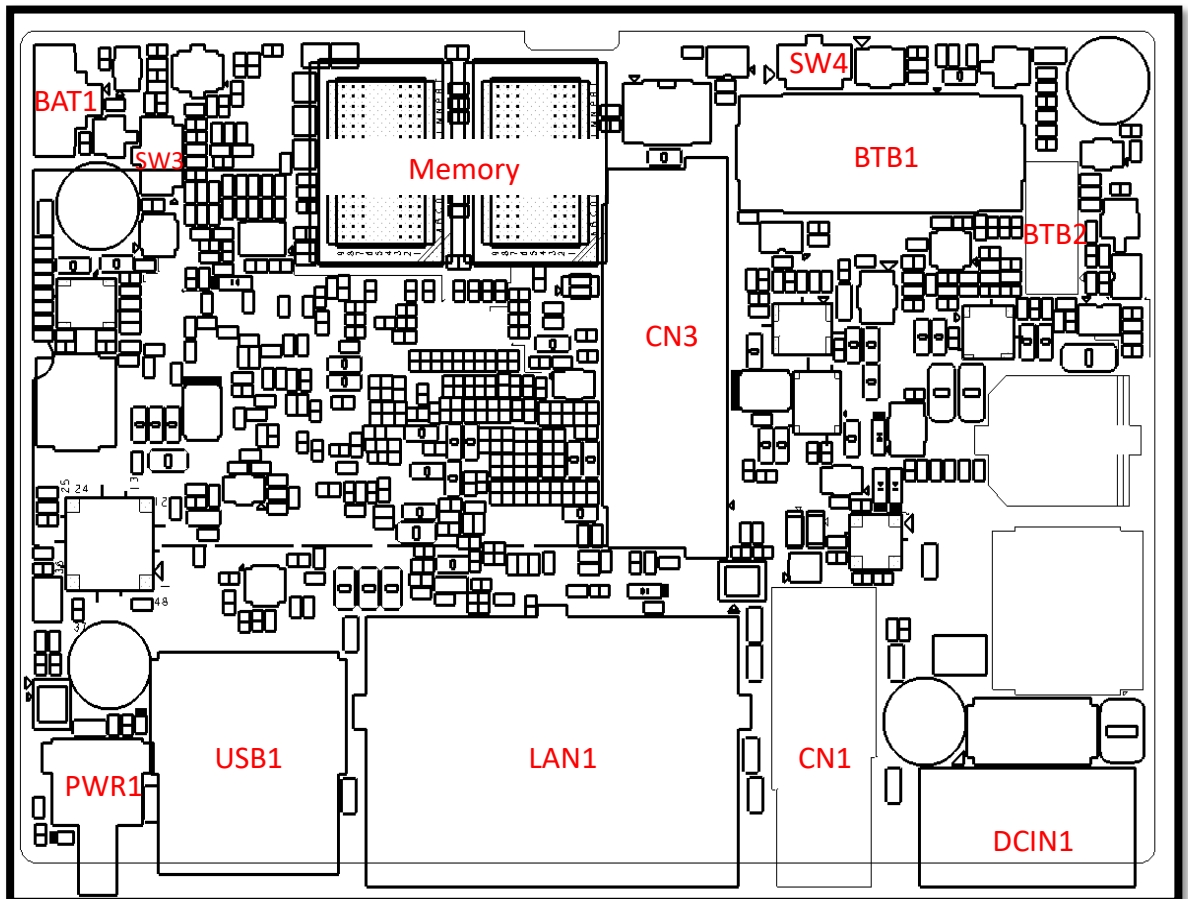


Figure 2.2 Diagram of Key Components Location on AMAX-5570 MB (Bottom Side)

Table 2.1: Key components, Connectors on Mother Board

Category	Label	Function
External	DCIN1	Power Connector
	CN1	HDMI Connector
	LAN1	LAN Connector x2
	USB1	USB 3.2 Connector x2
	RST1	Reset Button
	PWR1	Power Button
Internal	BAT1	RTC Battery
	CN3	MiniPCIe Connector
	BTB1	Riser Connector 1
	BTB2	Riser Connector 2
	CPU	CPU
	SW3	Clean CMOS Pin1-2 Normally Pin2-3 Clean CMOS
	SW4	AT/ATX mode setup PIN 1-2 AT(Default) PIN 2-3 ATX

The next diagram demonstrates the location of AMAX-5570's Daughter board's key components and internal/external connectors.

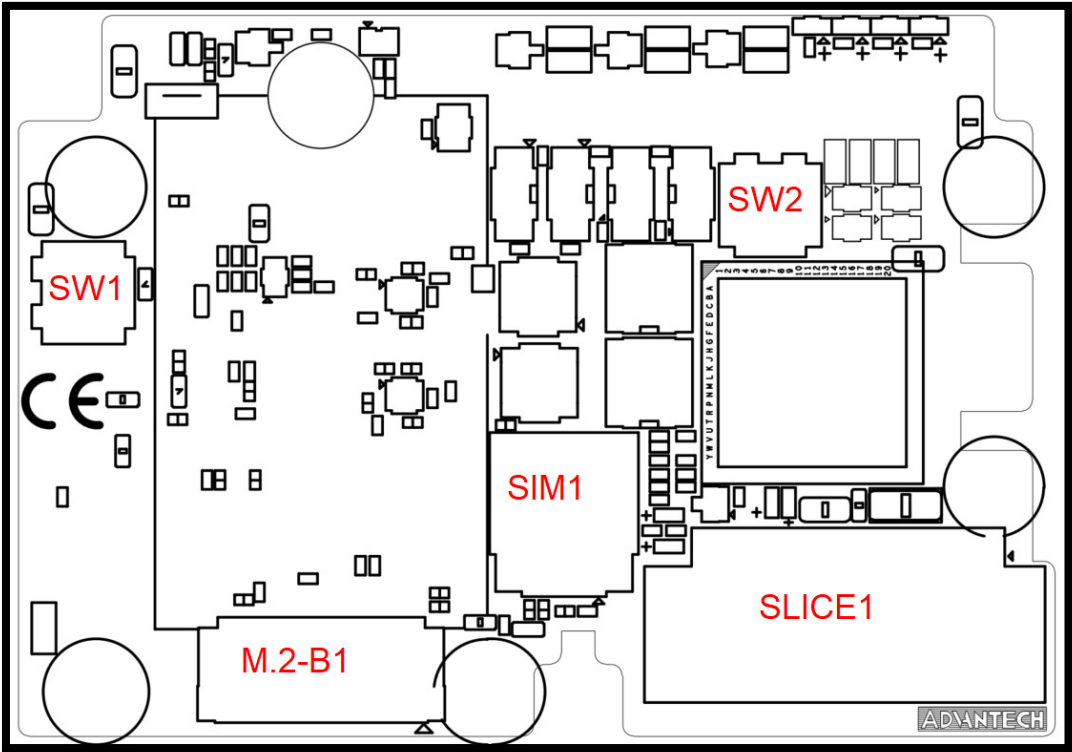


Figure 2.3 Diagram of Key Components Location on AMAX-5570 DB01(Top Side)

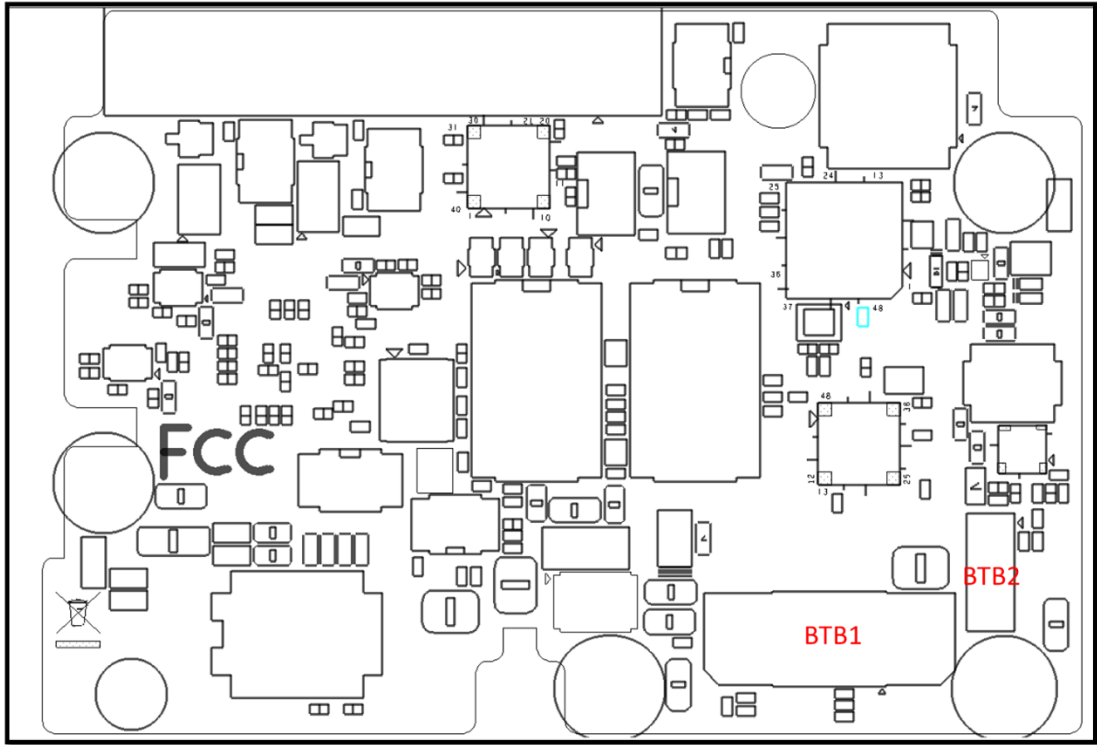


Figure 2.4 Diagram of Key Components Location on AMAX-5570 DB01(Bottom Side)

Table 2.2: Key components, Connectors on DB01 Board		
Category	Label	Function
Top	M.2-B1	M.2 B Key
	SIM1	SIM Card
	SW1	M.2 B Key PIN configuration
	SW2	Serial Port 1 configuration(232/422/485) CAN bus terminal configuration
	SLICE1	AMAX-5000 Series IO expansion
Bottom	BTB1	Riser Connector 1
	BTB2	Riser Connector 2

2.2 External I/O Connector

AMAX-5570 Base Unit

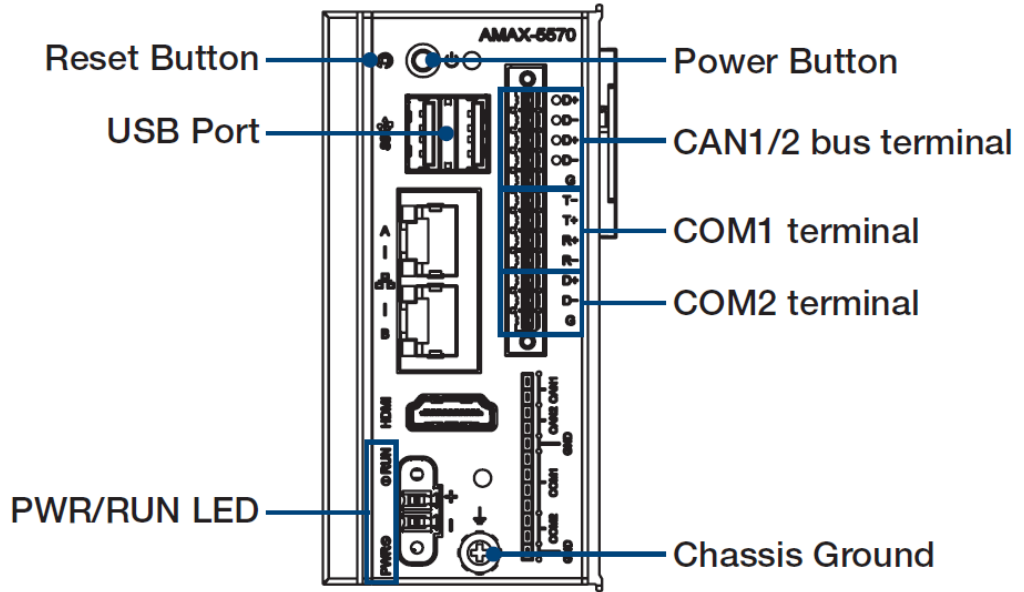


Figure 2.5 Front Panel of AMAX-5570

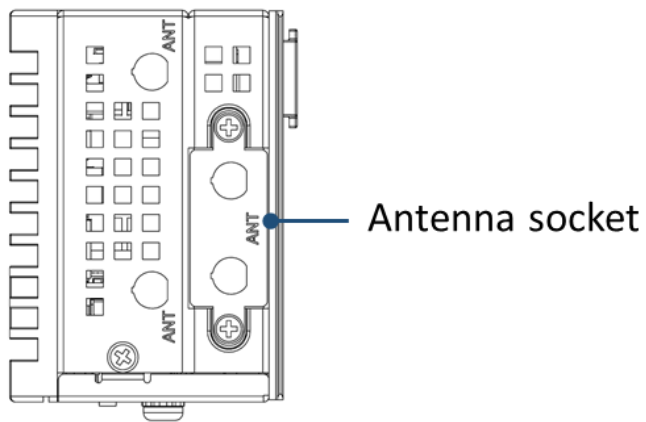


Figure 2.6 Top View of AMAX-5570

Power Connector

AMAX-5570 comes with a screw connector that carries 24 V_{DC} external power input, and features reversed wiring protection. Therefore, the system will not cause damage from reversed polarity of ground lines and power lines. (Please refer to UserManual - Appendix A.1 for pin assignments)

LAN: Ethernet Connector

AMAX-5570 is equipped with 2 x 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. (Please refer to User Manual- Appendix A.2 for pin assignments.)

USB Connector

AMAX-5570 features 2 x USB ports that comply with USB EHCI, 3 for Rev. 3.2 specifications. The USB connectors support plug-and-play and hot-swapping functionality for external devices. Additionally, this can be enabled/disabled in the BIOS menu. (Please refer to User Manual- Appendix A.3 for pin assignments.)

Display Connector

The AMAX-5570 provides 1 x HDMI connector for resolution interface 1920 x 1080 @ 60Hz. (Please refer to User Manual- Appendix A.4 for pin assignments.)

CAN bus and Serial Port Connector

AMAX-5570 has 2 x CAN bus ports, 1 x COM RS232/422/485 port and 1 x COM RS-485 port of terminal block type. They offer transmission speeds of 50 ~115.2 kbps. The default mode for COM1 is RS-485 Mode. Settings can be adjusted via an on-board switch (SW1).

(Please refer to User Manual- Appendix A.8 for RS232/422/485 settings).

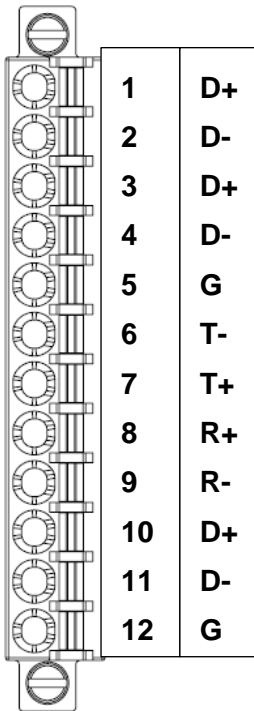


Table 2.2: CAN bus/COM port Connector Pin Assignments			
Pin	CAN Pin define	PIN mark	Signal Name
1	CAN1	D+	CAN H
2		D-	CAN L
3	CAN2	D+	CAN H
4		D-	CAN L
5	CAN GND	G	GND
Pin	COM1 Mode	PIN mark	Signal Name
6	RS232	T-	CTS
	RS422		T-
	RS485		D-
7	RS232	T+	RXD
	RS422		T+
	RS485		D+
8	RS232	R+	TXD
	RS422		R+
9	RS232	R-	RTS
	RS422		R-
Pin	COM2 Mode	PIN Mark	Signal Name
10	RS485	D+	D+
11		D-	D-
12	GND	G	GND

2.3 Internal I/O Connectors and Switches

The following figure demonstrates the locations of internal connectors and switches on the AMAX-5570's motherboard(MB) and daughterboard(DB01).

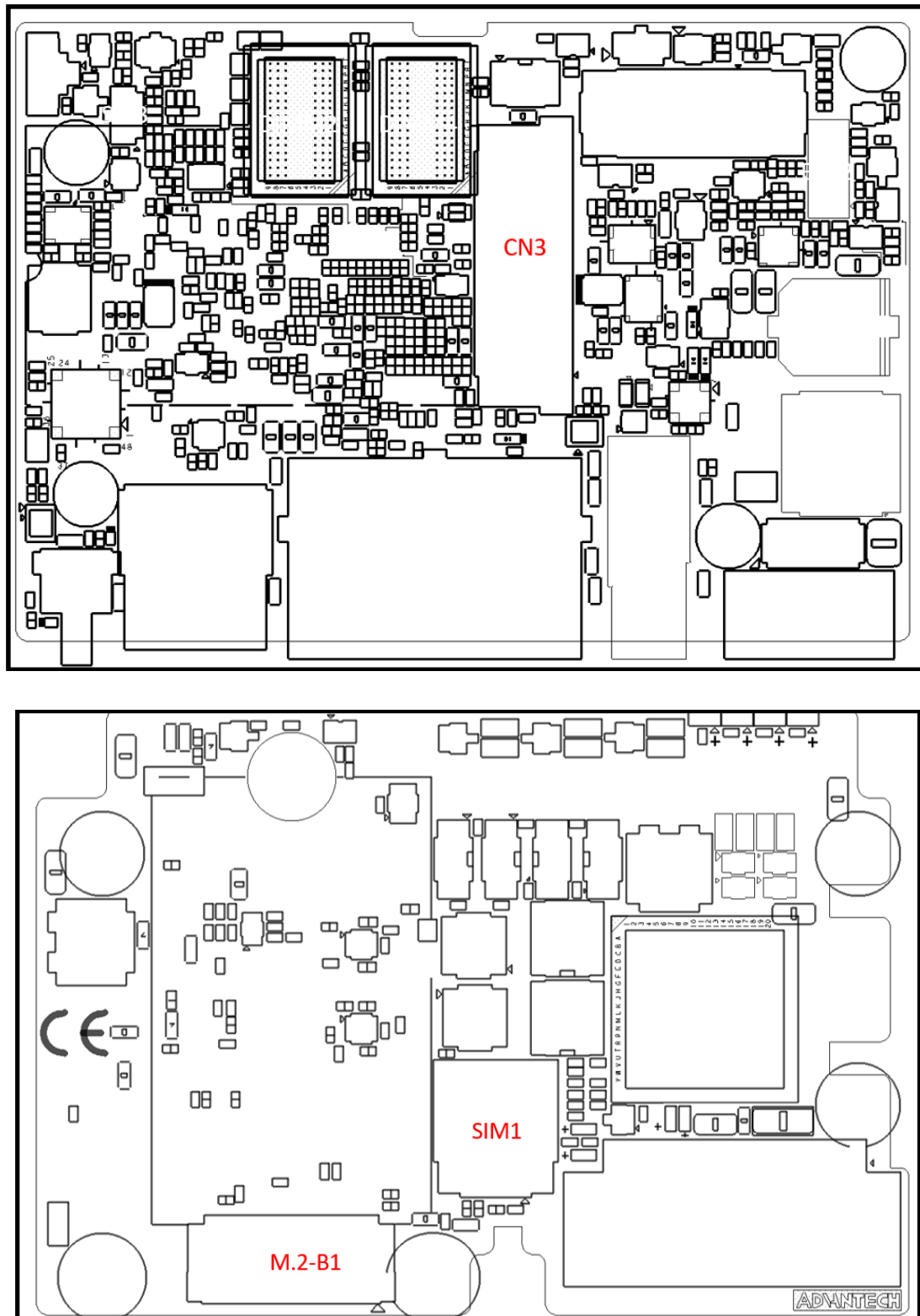


Figure 2.7 Internal I/O Connectors & Switches in AMAX-5570

Note! *This power is from DC Power inputs



2.3.1 mPCIe Connector(CN3)

There's one sockets for full size PCI Express mini cards, labeled "MINI1" on the board. It supports iDoor module for diversified applications such as isolated COM port, Pro-fibus, WLAN GPRS, LTE, and MRAM. Users can install the iDoor easily with optional extension kit.

(Please refer to User Manual- Chapter 3.4.3 for extension kit installation details and UserManual-Appendix A.6 for pin assignments.)

2.3.2 M.2 Connector(M.2-B1)

There is one M.2 B Key connector for M.2 cards, This M.2 interface is a SATA signal co-lay with a USB signal. It will automatically detect which device you installed and determine the appropriate SATA or USB signal to use. Therefore, it supports the installation of M.2 2242 (w/SATA signal) or 3042/3052 mod-ule (w/ USB Signal).

(Please refer to User Manual- Chapter 3.4.2 for installation details and User Manual-Appendix A.7 for pin assignments.)

2.3.3 Nano SIM Slot(SIM1)

There's one Nano SIM Slot for supporting LTE function, labeled "SIM1" on board. In addition to install SIM card on "SIM1", users are required to install a LTE Module on "M.2-B1" M.2 B Key to enable the functionality.

2.4 Others

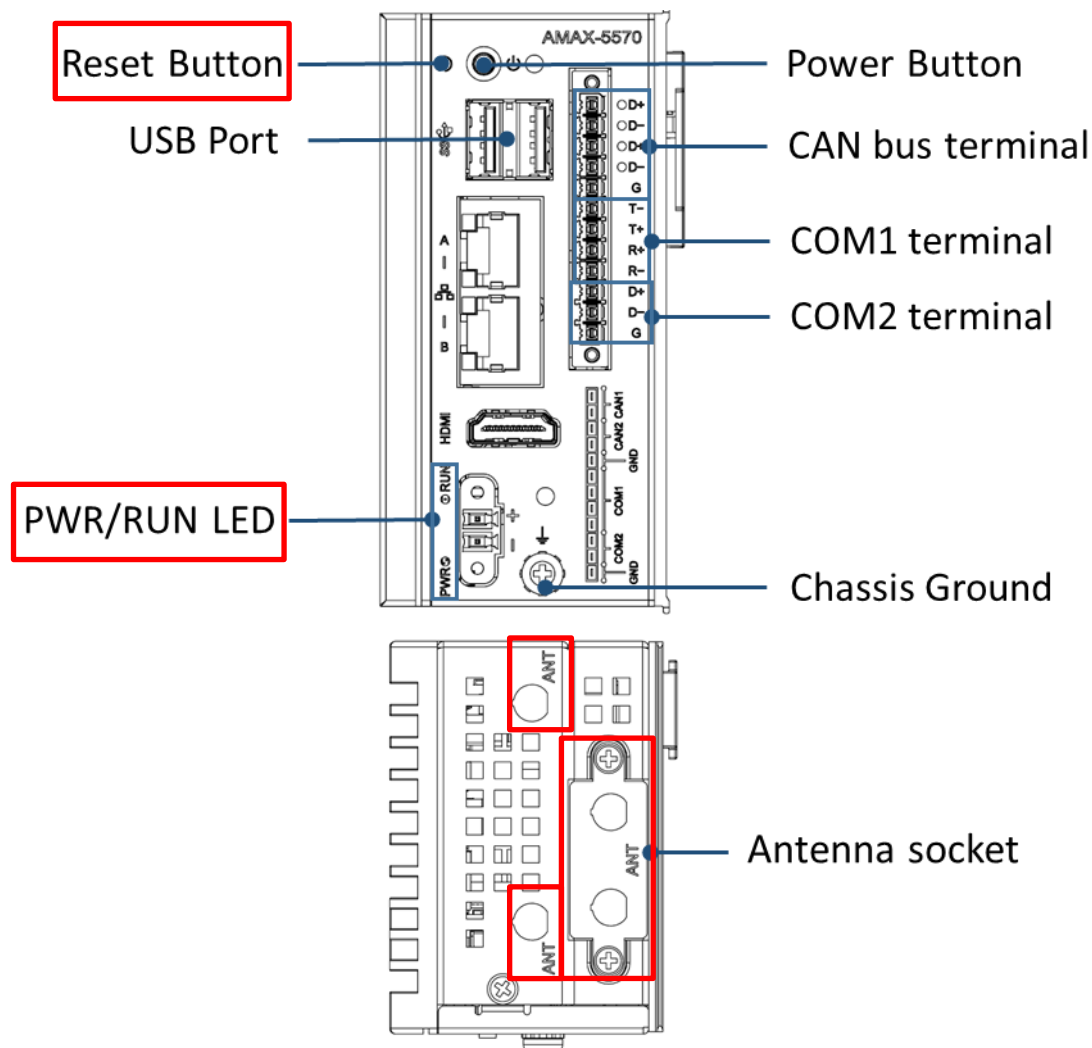


Figure 2.8 LED Indicators, Reset Buttons, and Antenna Hole

2.4.1 LED Indicators

Two LEDs indicate the status of the system's power and programmable LED for user's configurations.

- PWR(Power): Green indicates "normal" and orange indicates "standby".
- RUN(Programmable): Users can configure the LED indicator's behavior through GPIO signal controls. Green indicates under programming.

2.4.2 Reset Buttons

Press the "Reset" button to initiate a hardware reset.

2.4.3 Antenna Socket

There are total 4 antenna sockets in AMAX-5570, see chapter 3.4 Wireless Module installation for assembly detail.

Chapter

3

Initial Setup

This chapter explains how to initialize the AMAX-5570

- Chassis Grounding
- Connecting Power
- Mounting instruction
- Installation instruction
- Extension Module Installation (Optional)
- Wireless Module Installation (Optional)
- BIOS Settings

3.1 Chassis Grounding

The AMAX-5570 provides good EMI protection and a stable grounding base. There is an easy-to-connect chassis grounding point.

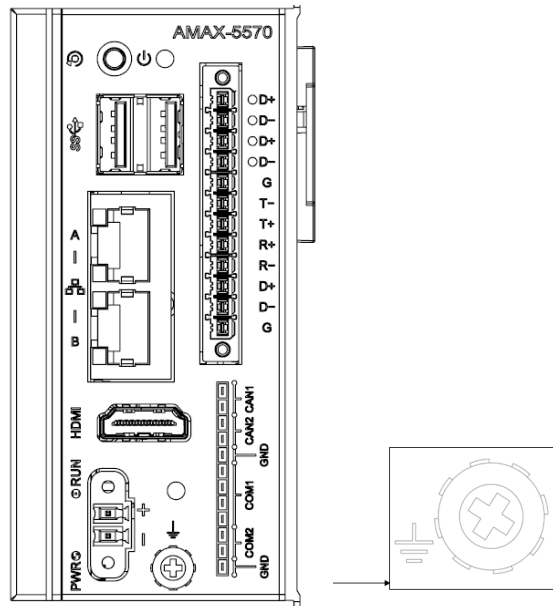


Figure 3.1 Chassis Grounding Connection Diagram

Earth terminal shall be used 16 AWG minimum size with green and yellow conductor to connector to earth.

Note! When installed mPCIe interface, due to screw contact the chassis of base unit, the chassis ground functionality would be invalid.



3.2 Connecting Power



Caution!

This product is intended to be supplied by an approved power adapter or DC power source. Supplied by SELV or double insulation source evaluated by UL60950 or UL62368-1 or UL 61010-1 or 61010-2-201 power supply only. This adapter is rated at 24Vdc, 3A and has a Tmax of 60 °C (140°F). If you need further assistance or information, please contact Advantech.

Follow the following instructions:

1. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.
2. Tighten the wire-clamps' screws to prevent the DC wires from coming loose.

Take the following guidelines into consideration before wiring the device:

1. The terminal block is suitable for 12-18 AWG. Torque value 7 lb-in. Use copper conductors only.
2. The temperature rating of the input connection cable should higher than 95 °C (203 °F)

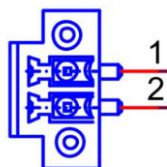


Figure 3.2 Power connector

Connexion de l'alimentation



Caution!

Ce produit est destiné à être alimenté par une source d'alimentation SELV ou à double isolation évaluée par UL60950 ou UL62368-1 ou UL 61010-1 ou 61010-2-201 ou une source d'alimentation CC. Cet adaptateur est évalué à 24Vdc, 3A et a un Tmax de 60 °C (140 °F). Si vous avez besoin d'aide ou d'informations supplémentaires, veuillez contacter Advantech.

Suivez les instructions suivantes : 1. Insérez les fils positif et négatif dans les contacts V+ et V- du connecteur du bornier. 2. Serrez les vis des serre-câbles pour éviter que les câbles CC ne se desserrent. Tenez compte des consignes suivantes avant de câbler l'appareil : 1. Le bornier est adapté pour 12-18 AWG. Valeur de couple 7 lb-in. Utilisez uniquement des conducteurs en cuivre. 2. La température nominale du câble de connexion d'entrée doit être supérieure à 95 °C (203 °F)

3.3 Power Switching Off



Caution!

It's not recommended to switch off power when IPC is during operation, data on SSD/HDD storages or other hard disks might be lost.

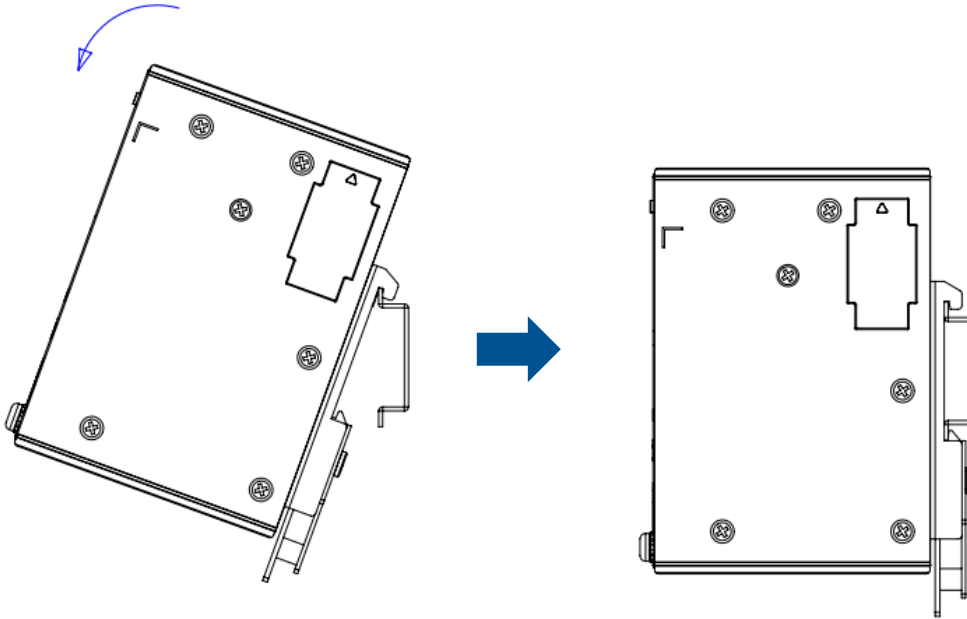
For protecting your system, we recommended user following below procedure to switch off your IPC :

1. Stop or close all running services or programs properly.
2. Shut Down the operating system
3. After system turn to stand-by status so that operators could disconnect power input.

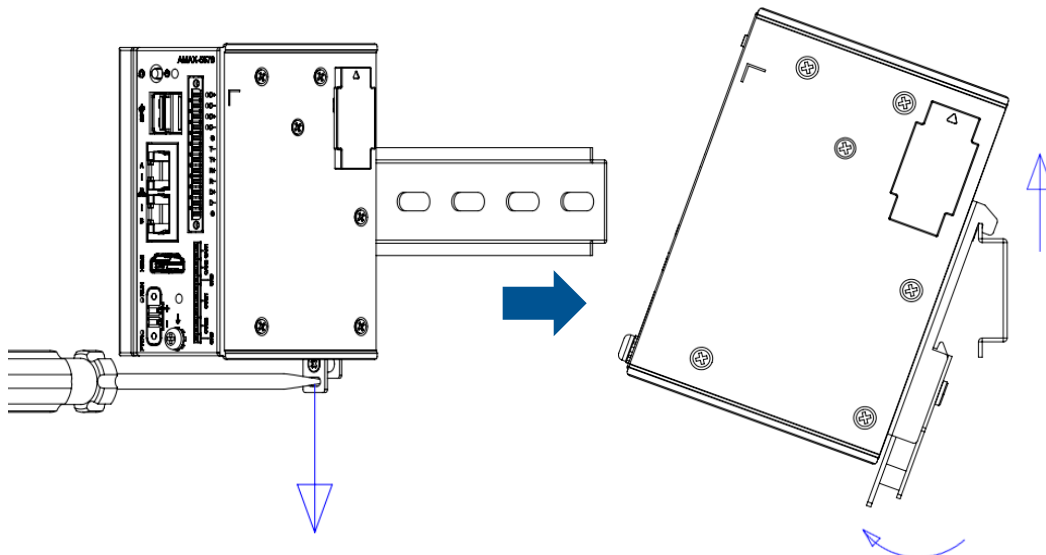
3.4 Mounting Instruction

AMAX-5570 come with DIN rail kit accessory, in general all system components can be securely installed onto a DIN-rail (35 mm)

1. Installed the system onto the DIN-rail.

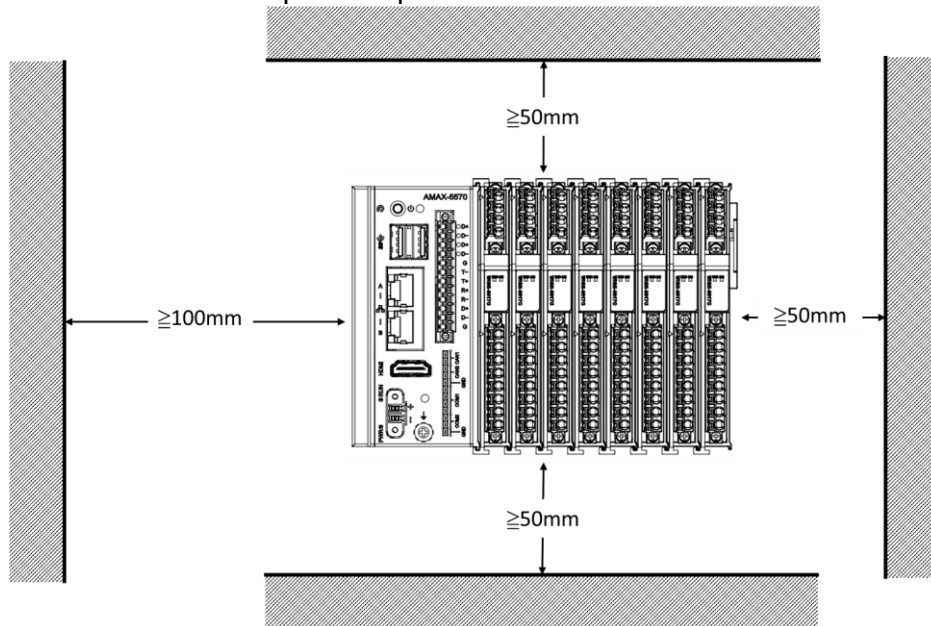


2. Released the system off the DIN-rail



3.5 Installation Instruction

Please follow below installation direction to ensure system dissipation. The left side of system was main heat shrink position for CPU dissipation, strong recommended to keep more space for better nature air flow.



Note! AMAX-5570 is designed with ruggedized fanless thermal solution. The heat generated from the motherboard dissipates thru the heat conduction through metal chassis. It is normal that the metal chassis reaches to higher temperature during operation to keep internal heat dissipating outside the chassis. Its design quality is proven by reliability tests to ensure stable and reliable operation both in low and high operating temperature.

- The chassis surface temperature will go high when the system is operating, we suggest user wear gloves or touch the system while it cools down.
- If the external ambient temperature exceeds the maximum operating temperature shown on the UNO specification sheet, further thermal testing is required to ensure components will not exceed the maximum claimed operating temperature in such circumstance.
- All responsibility for determining the adequacy of any thermal or system design remains solely with the system integrator. Advantech makes no warranties or representations that merely following the instructions presented in this document will result in a system with adequate thermal performance.

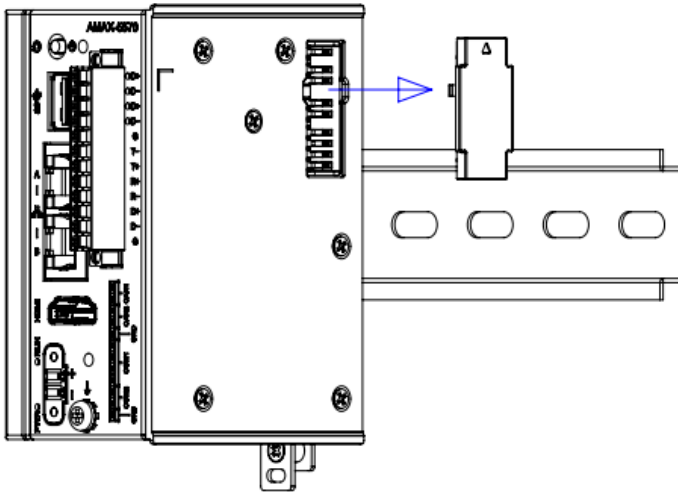
3.6 Expansion Slots Installation (optional)

AMAX-5570 supports the installation of AMAX-5000 series EtherCAT Slice IO modules on the right side. And provided local M.2 B key and mPCIe expansion capability.

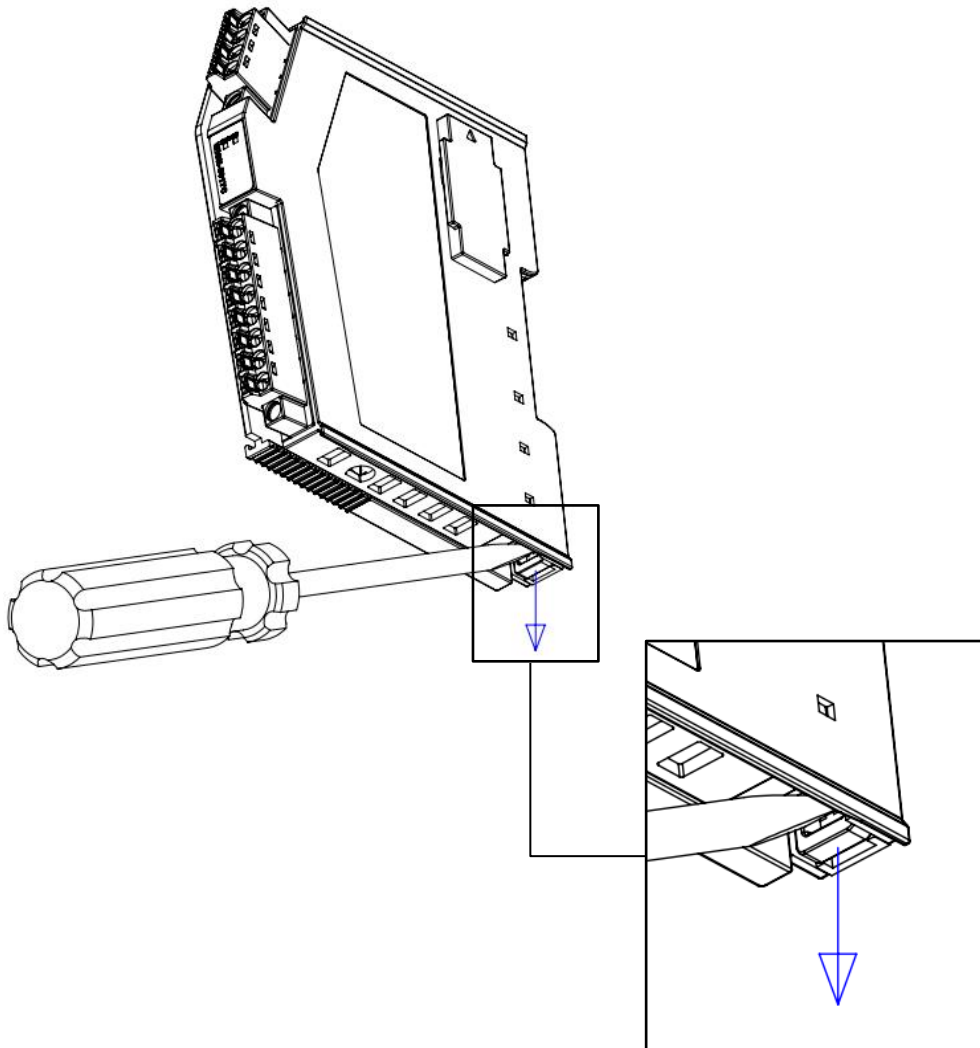
The installation demonstrate in the following steps.

3.5.1 Installing AMAX-5000 Slice IO module

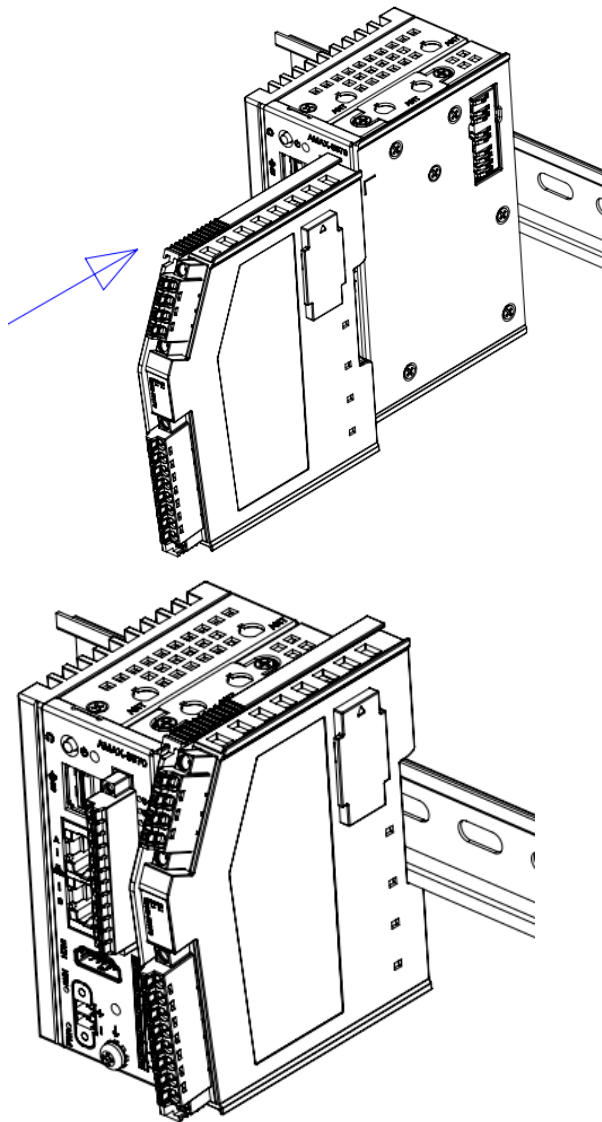
1. Removed dust cover



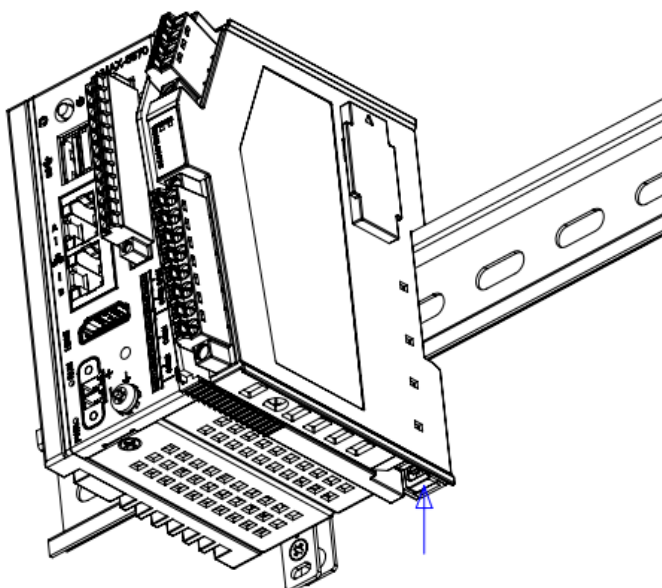
2. Use tool to pull-out the hook of module



3. Follow the edge slot and install slice IO module until the module arrived the end point.

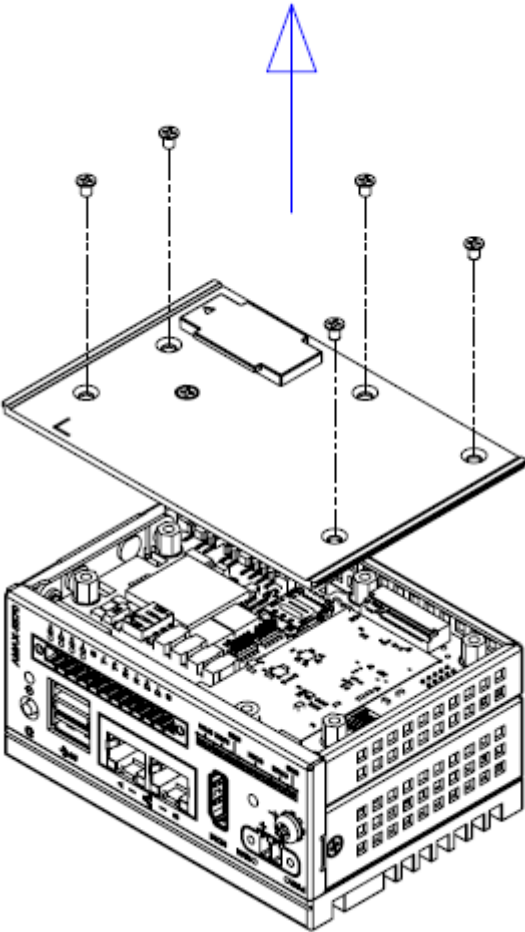


4. Push the hook back to original position to snap the rail.



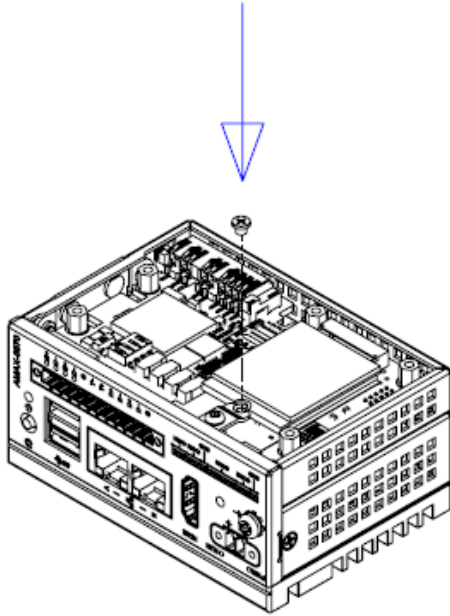
3.5.2 Installing M.2 B key expansion module

- 1. Remove 5 screws from device's back cover.

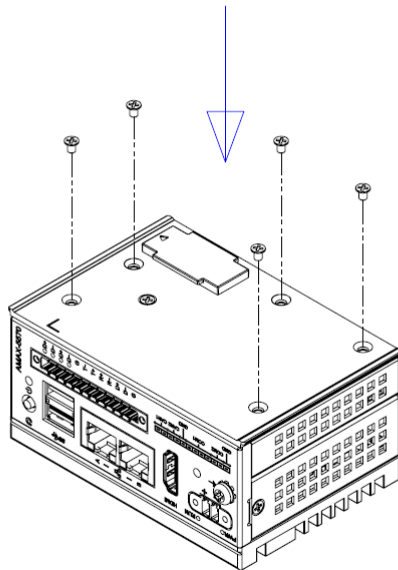


2. Remove the provided screws from the board, and Insert the M.2 B key module(2242) on the expansion slot location. Secure it with the provided screw.

Note! M.2 B key 3052 can also be installed by removing the 3052 bracket.

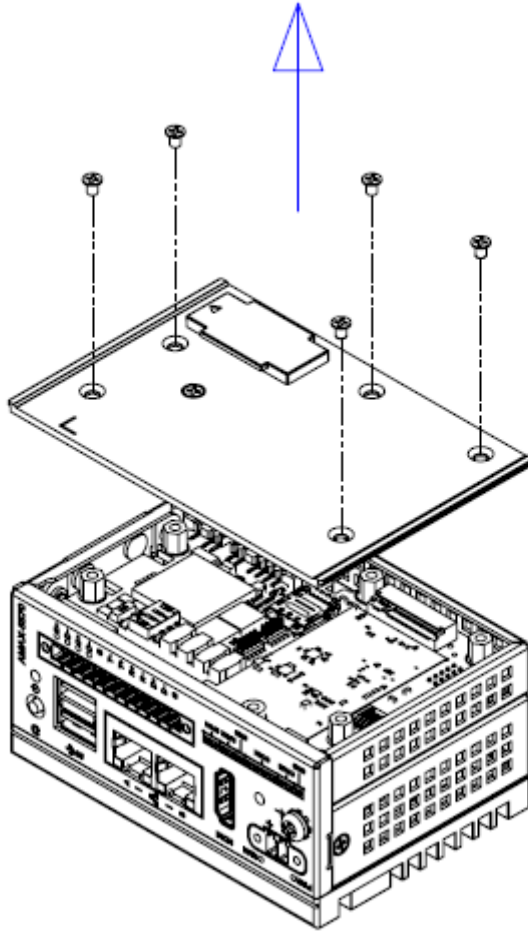


3. Installed 5 screws back with device's back cover.

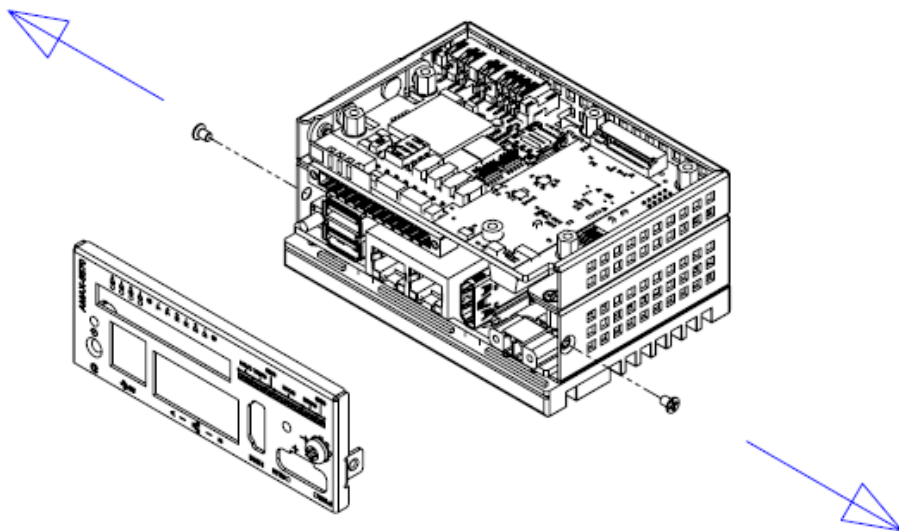


3.5.3 Installing mPCIe expansion module

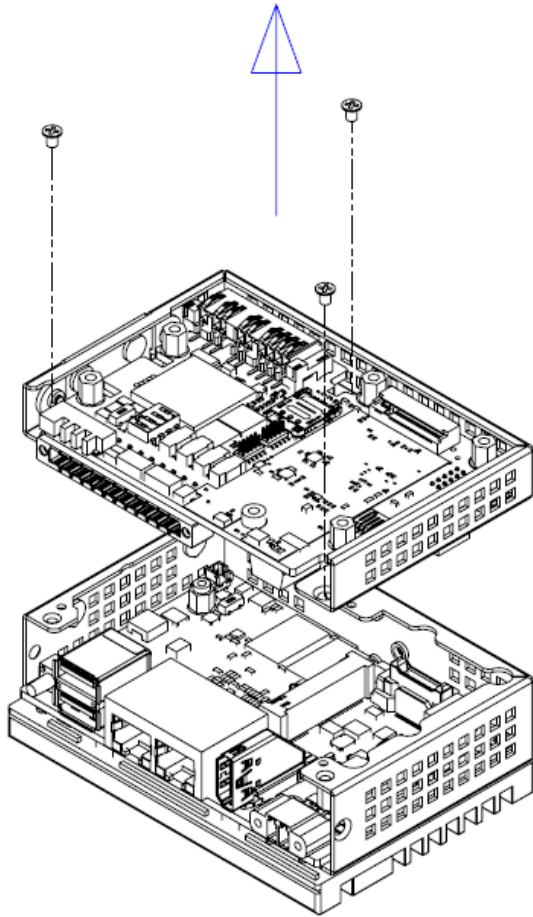
1. Remove 5 screws from device's back cover.



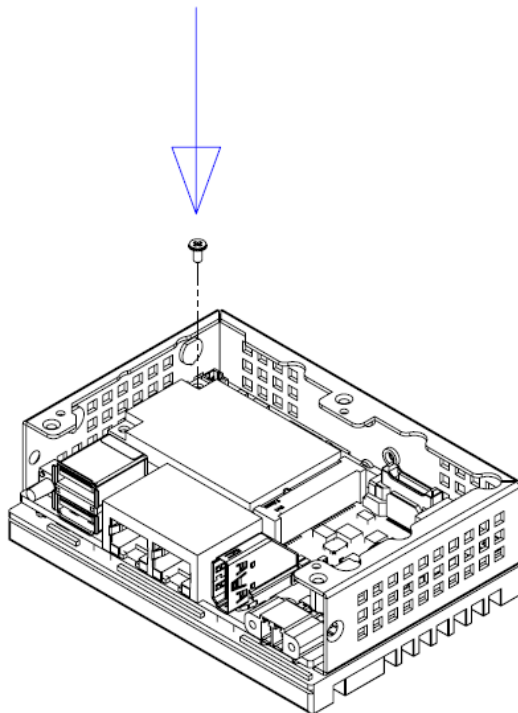
2. Removed 2 screws from device's top/bottom side, and disassemble the front cover.



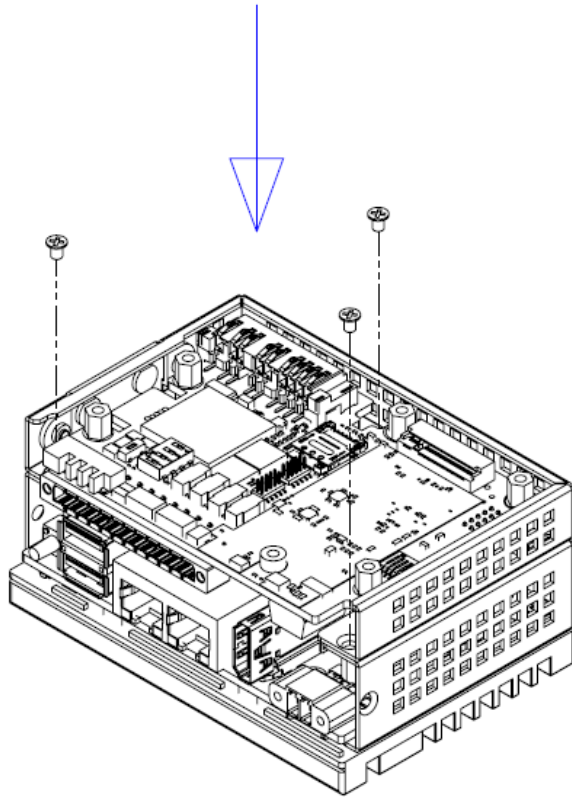
3. Removed 3 screws between two layers and disassemble the IO board layer.



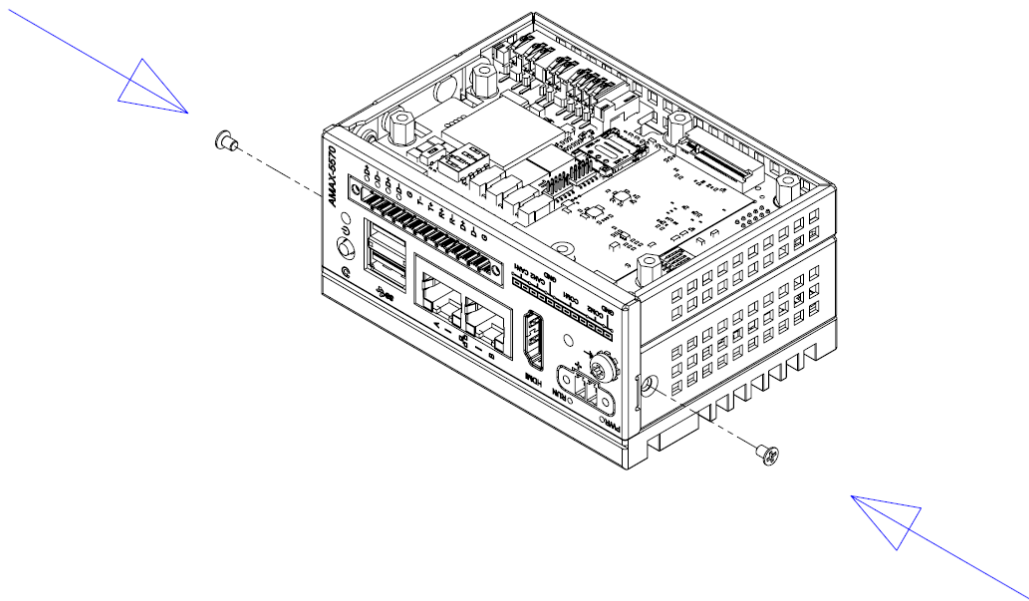
4. Removed the screw on the stud of MB and installed mPCIe expansion module, then secure back the screw.



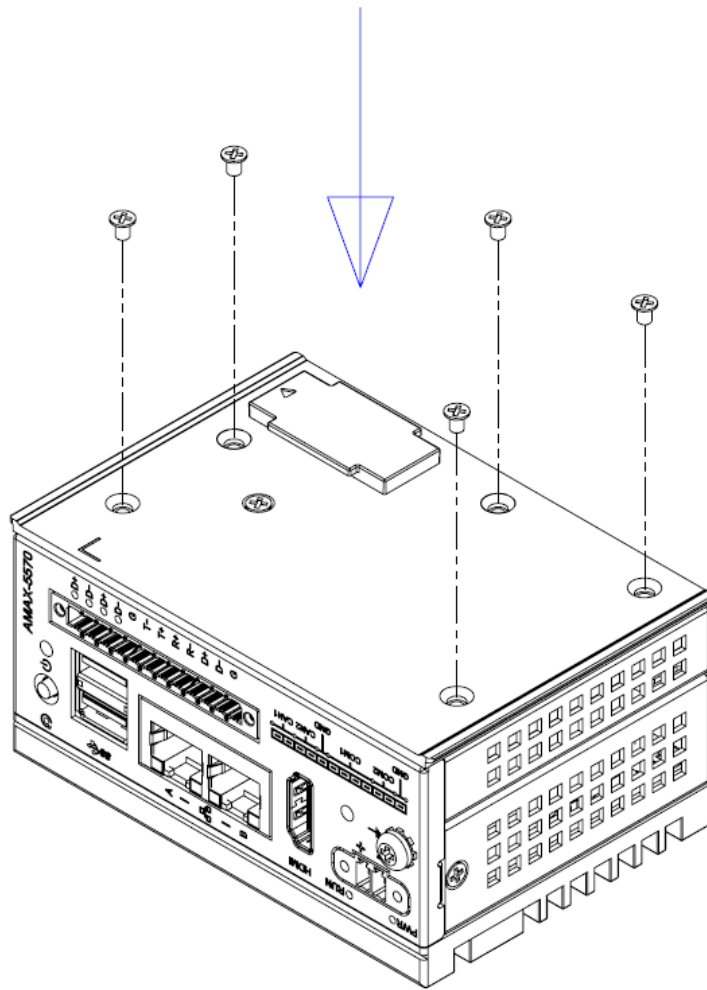
5. Assembly two boards together and then secure back 3 screws for chassis.



6. Assembly front cover back and secure 2 screws for it.



7. Secure back cover with 5 screws

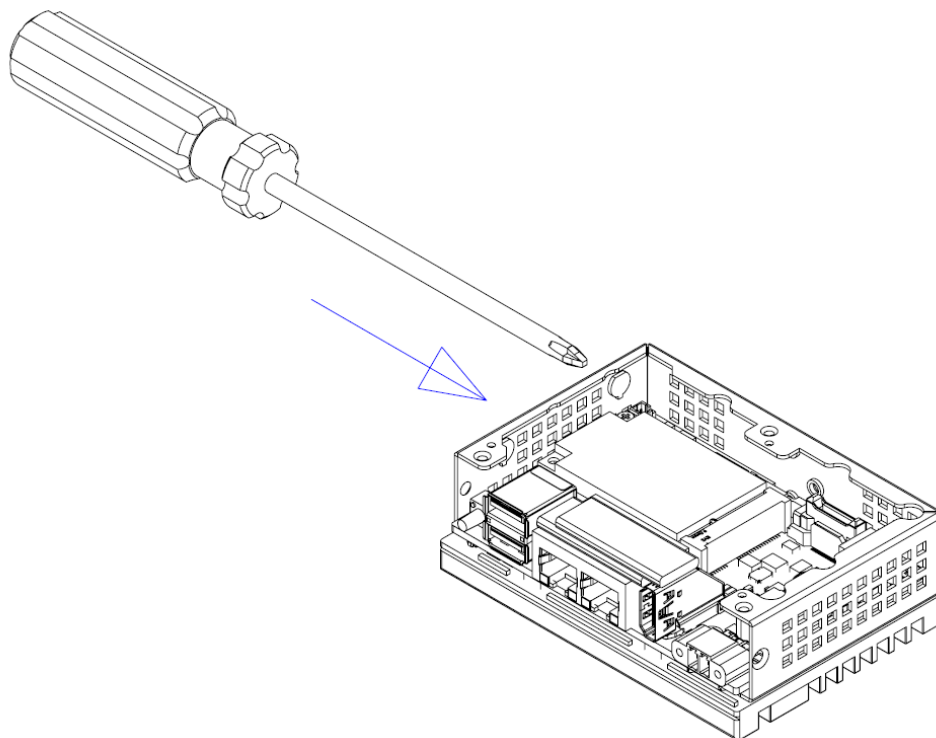


3.7 Wireless Module Installation (Optional)

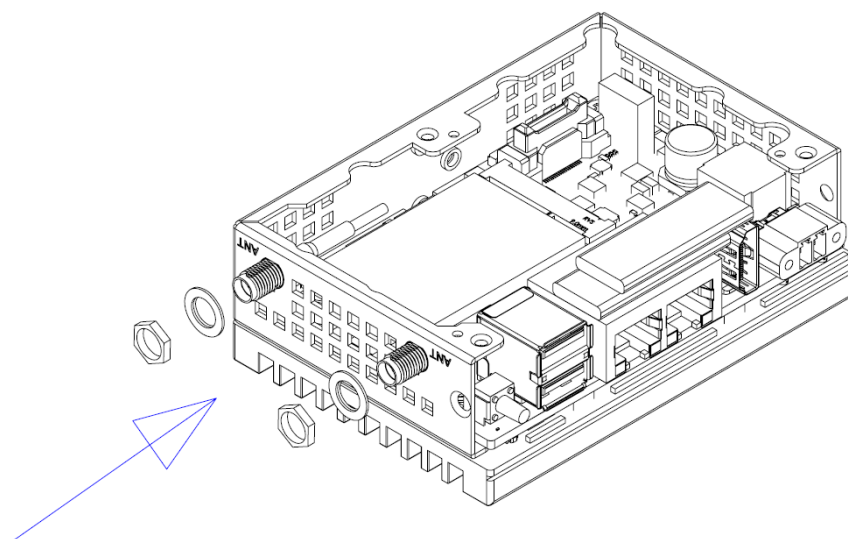
AMAX-5570 supports to install Wireless module which come with antenna installation. There are total 4 antenna sockets and distributed into first layer and second layer. Follow the steps below for these antenna installation:

3.7.1 First Layer Antenna

1. Followed previous steps to disassemble the device until it comes with first layer with MB only, used the screwdriver to drill through the antenna holes.

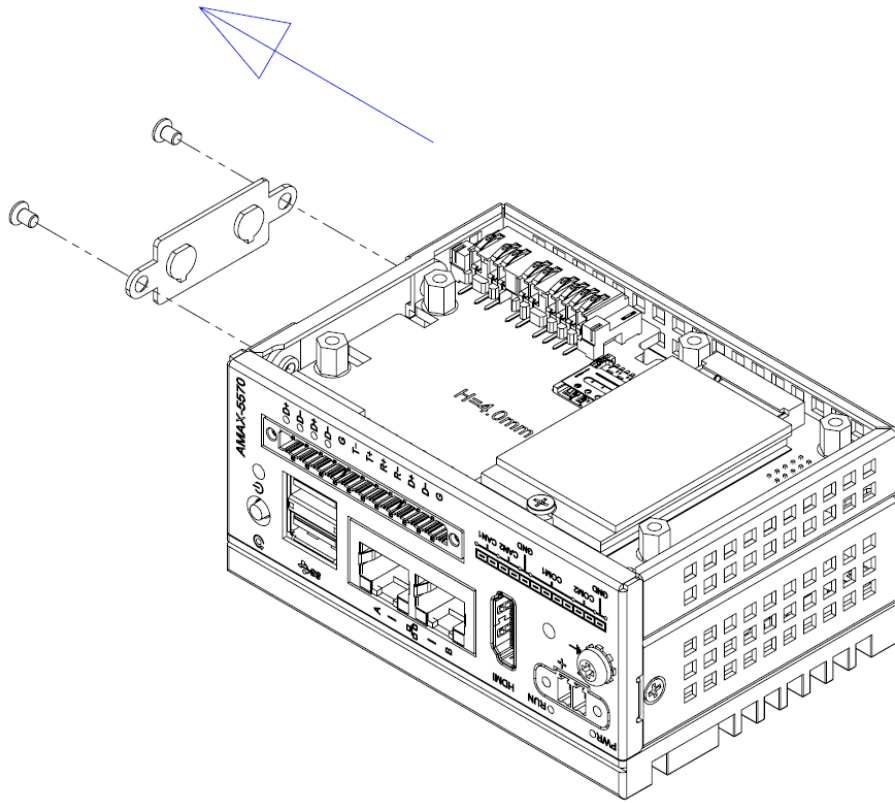


2. Selected suitable SMA cables and antennas which compatible with your wireless module.

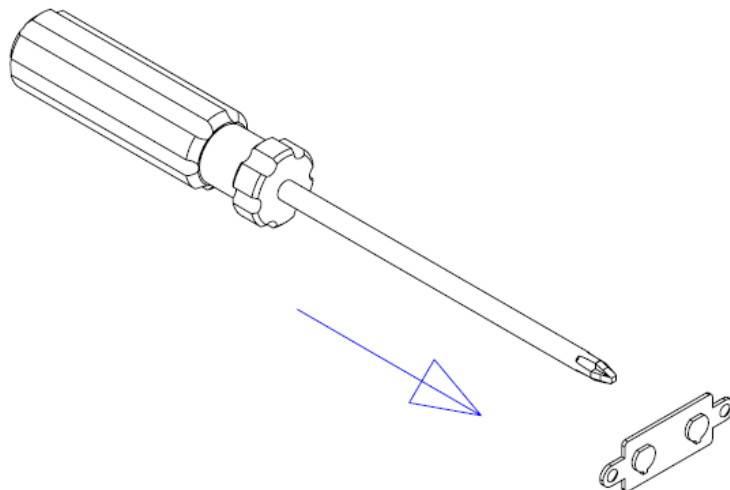


3.7.2 Second Layer antenna

1. Followed previous steps to disassemble the back cover, then removed 2 screws at the second layer chassis which with 2 antenna holes, take off the antenna bracket.

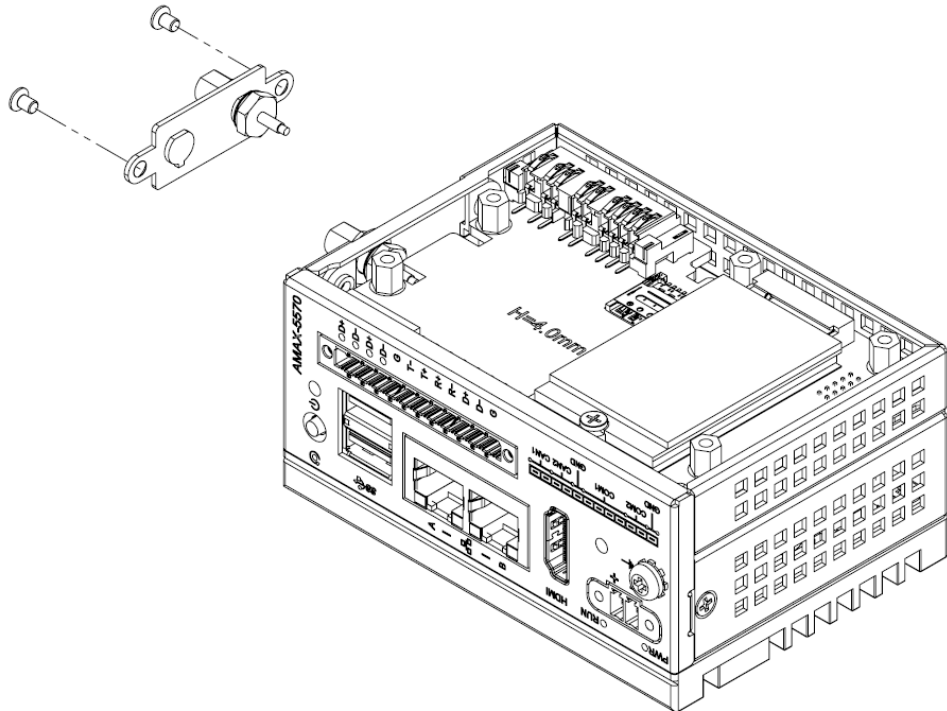


2. Use screwdriver to drill though the holes on the bracket.



3. Install suitable SMA cable and antenna on the socket, then install back the antenna socket on the machine.

Note! The SMA cable come with longer Heat-shrink tubing might get interference with the board edge.



3.8 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, after 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- from Appendix A.13 and following chapter for more content)

Appendix **A**

System Settings/Pin
Assignments

A.1 Power Connector (DCIN1)

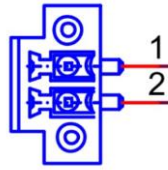


Table A.1: Power Connector Pin Assignments

Pin	Signal	Description
1	Power IN V+	24 V _{DC}
2	Power IN V- (GND)	

A.2 LAN: Ethernet Connector (LAN1)

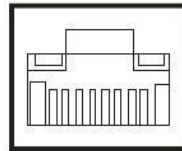


Table A.2: Ethernet Connector Pin Assignments

RJ45 Pin	Signal	Description
1	MDI0+	<ul style="list-style-type: none"> ■ 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+	<ul style="list-style-type: none"> ■ 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.
6	MDI1-	
4	MDI2+	<ul style="list-style-type: none"> ■ 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.
5	MDI2-	
7	MDI3+	
8	MDI3-	

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

A.3 USB Connector (USB1)

A.3.1 USB 3.0 Connector

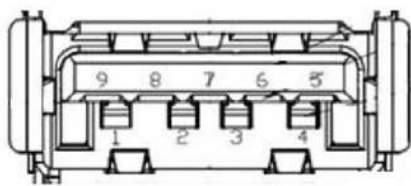


Table A.4: USB 3.0 Connector Pin Assignments

Pin	Signal Name	Description
1	VBUS	Power
2	D-	USB 2.0 differential pair
3	D+	
4	GND	Ground for power return
5	StdA_SSRX-	SuperSpeed receiver differential pair
6	StdA_SSRX+	
7	GND_DRIAN	Ground for signal return
8	StdA_SSTX-	SuperSpeed transmitter differential pair
9	StdA_SSTX+	

A.4 HDMI Connector (CN1)

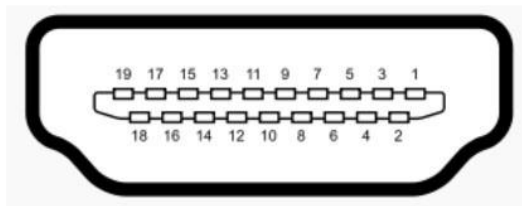


Table A.5: Display Port Adapter cable Pin Assignments

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

A.5 M.2 Connector(M.2-B1)

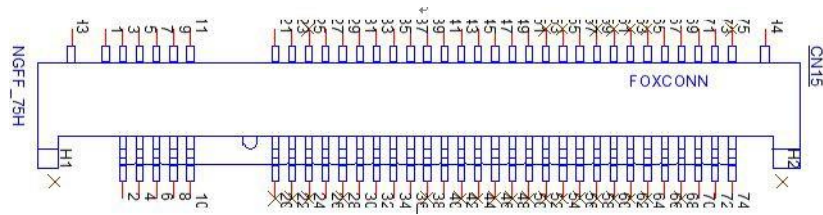


Table A.8: M.2 B Key Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	M2_SATA1_DET	2	+V3.3_M2
3	GND	4	+V3.3_M2
5	GND	6	M2_LTE_PWR_OFF#
7	M2_LTE_USB_DP	8	M2_LTE_W1_DISABLE_N
9	M2_LTE_USB_DN	10	+V3.3_M2
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	NC	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
31	USB_Z_SSRX1+	32	M2_SIM1_CLK
33	GND	34	M2_SIM1_DATA
35	USB_C_SSTX1-	36	M2_SIM1_PWR
37	USB_C_SSTX1+	38	NC
39	GND	40	M2_SIM2_DET
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	M2_SIM1_DET
67	LTE_RST#_P67	68	NC
69	NC	70	+V3.3_M2
71	GND	72	+V3.3_M2
73	GND	74	+V3.3_M2
75	NC		

A.6 mPCIe Connector (CN3)

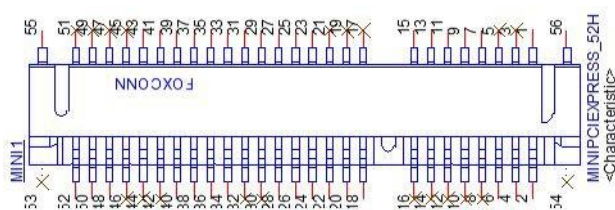


Table A.9: mPCIe Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	PCIE_WAKE#	2	+V3.3_MINI
3	NC	4	GND
5	NC	6	+V1.5
7	PCIEX1_CLKREQ0#	8	NC
9	GND	10	NC
11	CLK100M_PCIEX1_D0-	12	NC
13	CLK100M_PCIEX1_D0+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	WIFI_DISABLE#
21	NC	22	MINI_PLTRST#
23	SATA0_RX+	24	+V3.3_MINI
25	SATA0_RX-	26	GND
27	GND	28	+V1.5
29	GND	30	NC
31	SATA0_TX-	32	NC
33	SATA0_TX+	34	GND
35	GND	36	USB_Z_P8-
37	GND	38	USB_Z_P8+
39	+V3.3_MINI	40	GND
41	+V3.3_MINI	42	NC
43	MPCIE_PWRSEL	44	NC
45	NC	46	NC
47	NC	48	+V1.5
49	NC	50	GND
51	MSATA#_z_PCIE_SEL	52	+V3.3_MINI

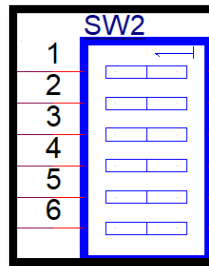
A.7 M.2 B key PIN Configuration (SW1)

When M.2 B key installed Wireless module, these modules got individual PIN configuration which AMAX-5570 provided for configuring.

SW1	OFF	ON
Pin1(M.2_pin20)	High(1.8V)	NC
Pin2(M.2_pin22)		NC
Pin3(M.2_pin38)		NC
Pin4(M.2_Pin68)		NC
Pin5	NA	NA
Pin6	NA	NA

A.8 COM1 RS232/422/485 mode & COM1,COM2 Terminal Setting(SW2)

The default setting for the COM1 port is RS-232. This can be switched to RS-422 or RS-485 mode with PIN1&PIN2 of SW2. And COM1/COM2 terminal can be configured by adjusting PIN5&PIN6. (CAN bus terminal described at A.8)



SW2			
Description	This switch is used to select RS232(default)/RS422/RS485 mode \ terminal resistor (120 ohm) setting		
COM1 Port Mode (Pin1,Pin2)		SW2(Pin1)	SW2(Pin2)
	RS-232(default)	ON	OFF
	RS-422	ON	ON
	RS-485	OFF	ON
COM1/COM2 Terminal Resistor (120 ohm) (Pin5,Pin6)		COM1(Pin5)	COM2(Pin6)
	Terminal(ON)	ON	ON
	Terminal(OFF)	OFF	OFF

A.9 CAN terminal Setting(SW2)

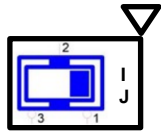
Continuing description regarding PIN3&PIN4 of SW2.

SW2			
Description	This switch is used to select CAN terminal resistor (120 ohm) setting		
CAN1(Pin3). CAN2(Pin4) Terminal		CAN1(Pin3)	CAN2(Pin4)
	Terminal(ON)	ON	ON
	Terminal(OFF)	OFF	OFF

A.10 Clean CMOS Setting (SW3)

SW3 using jumper for cleaning CMOS setup.

Default

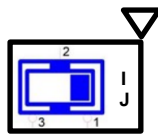


Description	Instruction
Normally	switch to 1-2
Clean CMOS	switch to 2-3

A.11 AT/ATX Setting (SW4)

SW4 using jumper for setting AT/ATX mode. The default setting is AT mode. See the follow table for jumper installation for mode.

Default



Description	Instruction
ATX Mode	Closed 2-3
AT Mode (Default)	Closed 1-2

A.12 Riser Connector (BTB1)

Table A.11: Expansion Board to Board Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	ESPI_CLK	2	ESPI_ALERT0#
3	ESPI_IO0	4	ESPI_IO1
5	ESPI_IO2	6	ESPI_IO3
7	ESPI_CS0#	8	ESPI_RST0#
9	PMC_SUSCLK	10	PMC_SLP_S3#
11	GP_H00	12	PCIE_WAKE#
13	PLTRST_M.2#	14	M2B1_CLKREQ2#
15	GND	16	USB2_P0+
17	USB2_P0-	18	GND
19	USB2_P4+	20	USB2_P4-
21	CLK100M_M2E1_D2+	22	CLK100M_M2E1_D2-
23	GND	24	PCIE4_TX+
25	PCIE4_TX-	26	GND
27	PCIE4_RX+	28	PCIE4_RX-
29	GND	30	SATA1_TX+
31	SATA1_TX-	32	GND
33	SATA1_RX+	34	SATA1_RX-
35	GND	36	USB31_P2_TX+
37	USB31_P2_TX-	38	GND
39	USB31_P2_RX+	40	USB31_P2_RX-

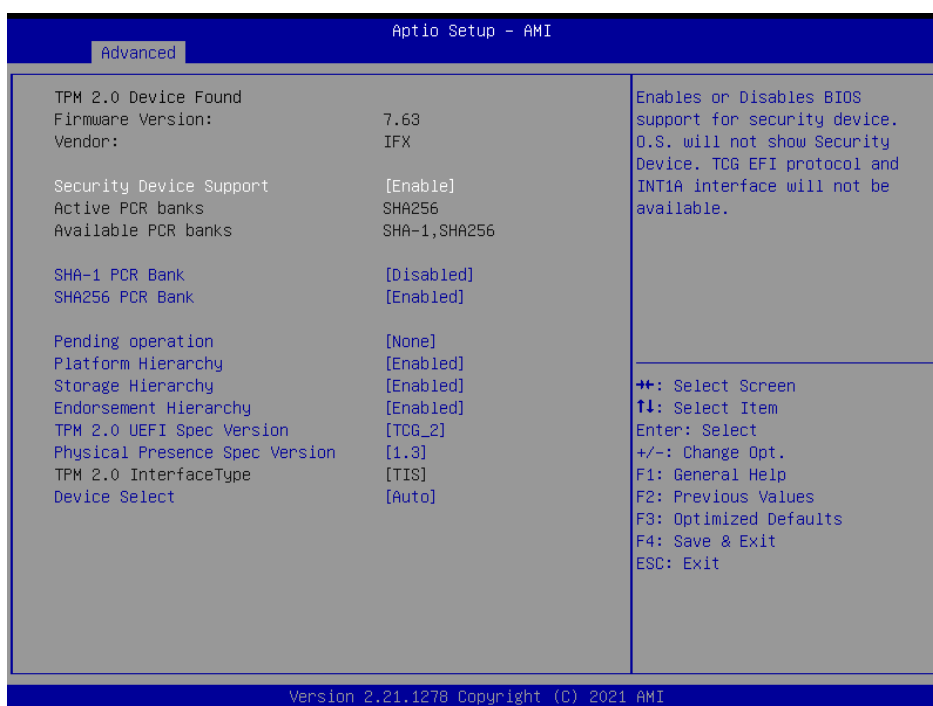
A.13 TPM 2.0 BIOS Setting

The AMAX-5570 systems support TPM 2.0 functionality. This can be enabled or disabled in the BIOS menu by following the instructions provided below:

1. Power on the AMAX-5570 system and press “Delete” to enter the BIOS configuration menu.
2. On the “Advanced” tab, select the “Trusted Computing” item.



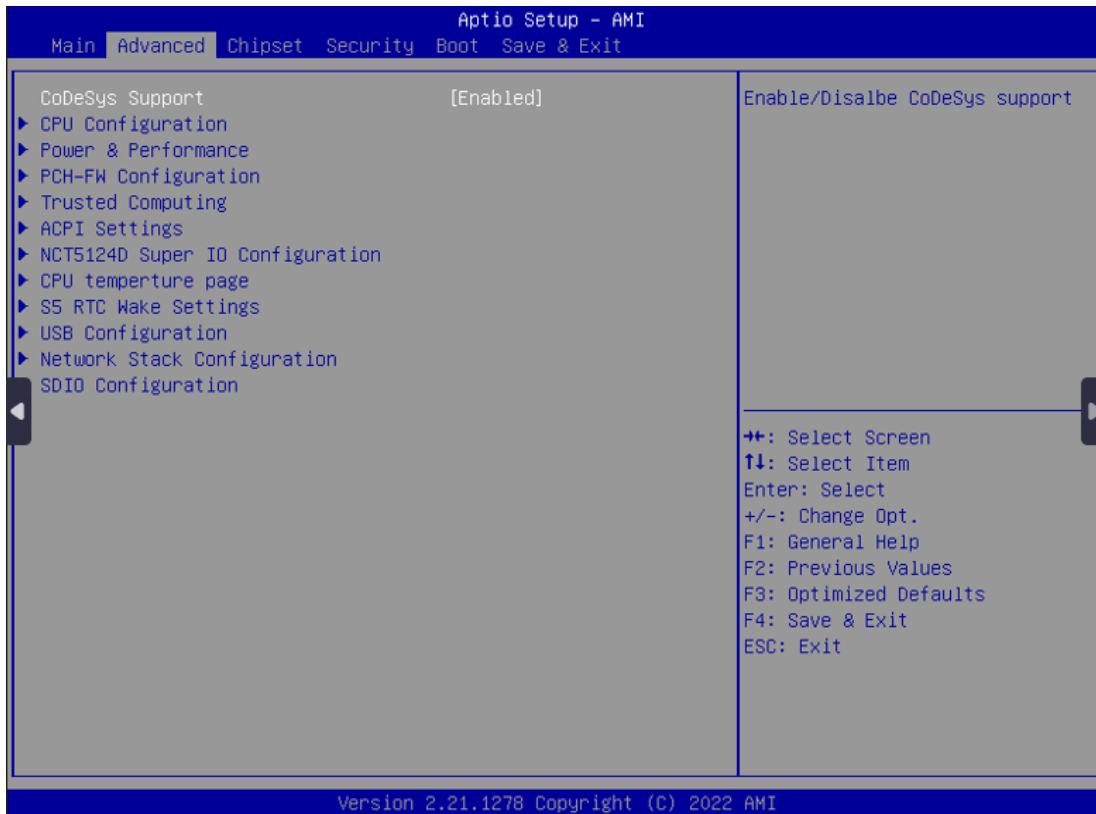
3. Then select the “Security Device Support” item.
4. Choose “enable/disable” to enable or disable the TPM 2.0 function (The default setting is to enable this function)



A.14 Real-time feature(CODESYS Support)

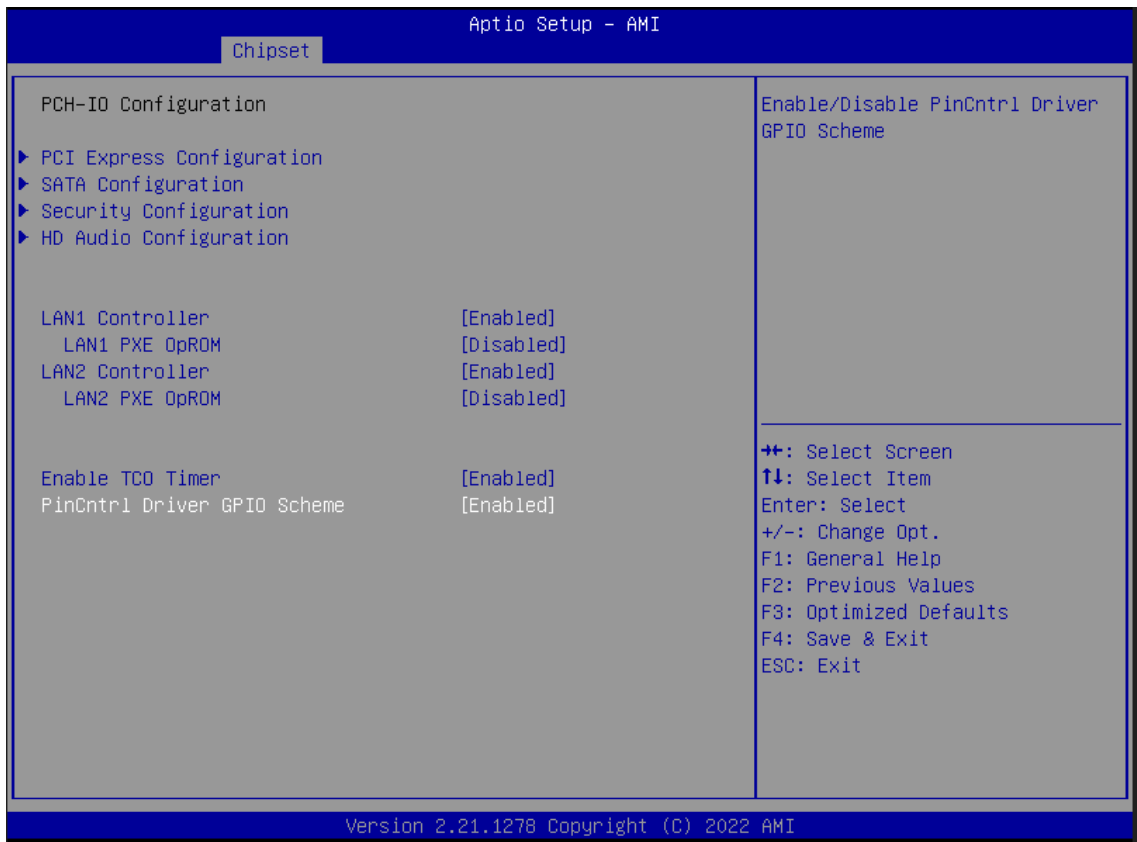
The AMAX-5570 systems default come with “CODESYS Enabled” so that support real-time application which followed CODESYS real time engine(RTE) recommendation, which would keep CPU in more stable way to make sure accurate timing for control application task.

For general used or user who need full CPU performance, it could set to be “CODESYS disabled” to bring back all standard CPU configuration.



A.15 Ctrl Driver GPIO Scheme

For Linux environment, we recommend user to enable this item to make sure all drivers worked properly with the OS. Disabled this item would cause Linux OS operation slow or shutdown error.



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