User Manual

Revision 1.0

FWA-6172

2U Network Appliance

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1. How To Use This Manual

Copyright and Trademarks

The documentation and the software included with this product are copyrighted by Advantech Co., Ltd.

Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable.

Conventions used in this manual (Warnings & Cautions)

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

AVERTISSEMENT! *Les avertissements indiquent des conditions qui, si elles ne sont pas observées, peuvent provoquer des blessures.*

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

ATTENTION! *Des précautions sont incluses pour vous aider à éviter d'endommager le matériel ou de perdre des données.*

Note! *Notes provide additional information.*

Remarque! *Les notes fournissent des informations supplémentaires.*

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Product Warranty

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.

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Product Configuration That This Manual Covers

Part Number	Processor	DDR5	PCH	QAT	NMC Slot	PCIe Slot	Storage Bay	USB3.0	IPMI Port	Console Port	LAN Port			System Fan	PSU
											1G RJ45	1G SFP	10G SFP+		
FWA-6172-00A1R	Dual socket for 4th Gen. Intenl Xeon scalable processors	16	C741	By CPU SKU	8	2	2	2	1	1	2	0	0	4	2

Figure 0-1 Product Configuration

Revision History

Table 0-1 Revision List

Date	Revision	Modifications
2024-02-20	1.0	Initial version

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Related Manuals & Quick Start Image

If you are unable to locate the desired information or require more in-depth details on a specific topic, kindly consult the supplementary documents and alternative sources of information listed below.

- Advantech Node Explorer User Manual

  https://www.advantech.com/en/support/details/manual?id=1-1MU1KB1
- BIOS Common User Manual

  https://www.advantech.com/zh-tw/support/details/manual?id=1-2F8TKW5
- IPMI Common User Manual

  https://www.advantech.com/zh-tw/support/details/manual?id=1-2FZXUHT
- Redfish User Guide

  (Please refer to Section 4.4.1.1 to obtain or configure the BMC_IP. Subsequently, navigate to https://BMC_IP/redfish/v1 using a web browser. Search for the term 'RedfishSoftwareVersion' and note the version information that follows this term. Then proceed to the URL provided below to download the Redfish user guide that corresponds to the major version number (the first digit of the version information.)

  https://www.advantech.com/emt/support/details/manual?id=1-27WSW6T
- Advantech FWA-6172 Linux Platform Software Guide

  https://www.advantech.com/zh-tw/support/details/manual?id=1-2F9HOFL

- Advantech QuickStart Linux Image Getting Started Guide
- Quick Start Linux Image

Please reach out to your Advantech representative if you need to refer to the mentioned document and image.

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2. Getting Started

2.1 Safety Precautions

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. This product is intended to be supplied by an UL certified power supply or dc source suitable for use at operation temperature 0-40 degree C output rated 12Vdc, rated 80.5-97A (AC input rated 100Vac-240Vac, 12A-7A, 50Hz-60Hz). If need further assistance, please contact Advantech for further information.
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
10. The power outlet socket should have grounded connection.
11. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
12. Before powering on the equipment, connect the frame of the equipment to earth. For the earthing wire, green and yellow insulation is required and the cross-sectional area of the conductor must be more than 0.75mm^2 or 18 AWG.
13. All cautions and warnings on the equipment should be noted.
14. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
15. Never pour any liquid into an opening. This may cause fire or electrical shock.
16. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
17. 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.

18. Do not leave this equipment in an environment where the storage temperature may go below -40° C (-40° F) or above 70° C (158° F). This could damage the equipment. The equipment should be in a controlled environment.
19. 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.
20. If optical transceivers are used to be connected to SFP+ connectors, only CDRH certified laser class I optical transceivers shall be used. (UL certificate request).
21. Suitable for installation in Information technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
22. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.
23. DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all

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responsibility for the accuracy of any statements contained herein.

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French:

1. Lisez ces instructions de sécurité attentivement.
2. Conservez ce manuel d'utilisation pour référence ultérieure.
3. Ce produit est destiné à être alimenté par une alimentation électrique certifiée UL ou une source CC adaptée à une utilisation à une température de fonctionnement de 0 à 40 degrés C (minimum) avec une sortie nominale de 12 V CC, 80.5 à 97A. Si vous avez besoin d'aide supplémentaire, veuillez contacter Advantech pour plus d'informations.
4. Débranchez cet équipement de toute prise secteur avant de le nettoyer. Utilisez un chiffon humide. N'utilisez pas de détergent liquide ou pulvérisé pour le nettoyage.
5. Pour les équipements enfichables, la prise de courant doit être située près de l'équipement et doit être facilement accessible.
6. Gardez cet équipement à l'abri de l'humidité.
7. Placez cet équipement sur une surface fiable pendant l'installation. Le laisser tomber ou le laisser tomber peut causer des dommages.
8. Les ouvertures sur l'enceinte servent à la convection de l'air. Protégez l'équipement contre la surchauffe. NE COUVREZ PAS LES OUVERTURES.
9. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
10. La prise de courant doit être reliée à la terre.
11. Placez le cordon d'alimentation de manière à ce que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
12. Avant de mettre l'équipement sous tension, connectez le châssis de l'équipement à la terre. Pour le fil de mise à la terre, une isolation verte et jaune est requise et la section transversale du conducteur doit être supérieure à 0,75 mm^2 ou 18 AWG.
13. Toutes les mises en garde et les avertissements sur l'équipement doivent être notés.
14. Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout dommage dû à une surtension transitoire.
15. Ne versez jamais de liquide dans une ouverture. Cela pourrait provoquer un incendie ou un choc électrique.
16. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, l'équipement doit être ouvert uniquement par du personnel qualifié.
17. Si l'une des situations suivantes se présente, faites vérifier l'équipement par le personnel de service:

• Le cordon d'alimentation ou la prise est endommagé.

• Le 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 a été échappé et endommagé.

• L'équipement présente des signes évidents de rupture.

18. Ne laissez pas cet appareil dans un environnement où la température de stockage peut être inférieure à -40 ° C ou supérieure à 70 ° C. Cela pourrait endommager l'équipement. L'équipement devrait être dans un environnement contrôlé.
19. Attention: Danger d'explosion si la batterie est incorrectement remplacée. Remplacez uniquement par le même type ou un type équivalent recommandé par le fabricant, jetez les piles usagées conformément aux instructions du fabricant.
20. Si des émetteurs-récepteurs optiques sont utilisés pour être connectés à des connecteurs SFP+, seuls des émetteurs-récepteurs optiques de classe I laser certifiés CDRH doivent être utilisés. (Demande de certificat UL).
21. Convient pour une installation dans des salles informatiques conformément à l'article 645 du Code national de l'électricité et à la norme NFPA 75.

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22. ZONE D'ACCES RESTREINTE: L'équipement ne doit être installé que dans une zone d'accès restreint.
23. AVERTISSEMENT: Cet ensemble d'instructions est donné conformément à la CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans ce document.

2.2 Declaration of Conformity

2.2.1 FCC Class A

This device complies with part 15 of the FCC rules: Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
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.

Cet appareil est conforme à la partie 15 des règles de la FCC: Le fonctionnement est soumis aux deux conditions suivantes:
1. Cet appareil ne doit pas provoquer d'interférences nuisibles.
2. Cet appareil doit accepter toute interférence reçue, y compris les interférences susceptibles de provoquer un fonctionnement indésirable.
Remarque: Cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe A, conformément à la partie 15 des règles de la FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles lorsque l'équipement est utilisé dans un environnement commercial. Cet équipement génère, utilise et peut émettre de l'énergie radiofréquence et, s'il n'est pas installé et utilisé conformément au manuel d'instructions, peut causer des interférences nuisibles aux communications radio. L'utilisation de cet équipement dans une zone résidentielle est susceptible de provoquer des interférences nuisibles, auquel cas l'utilisateur devra corriger les interférences à ses frais.

2.2.2 CCC

警告使用者：这是甲类资讯产品，在居住的环境中使用，可能会造成射频干扰，在这种情况下，使用者会被要求采取某些适当的对抗。

声明：此为A级产品，在生活环境中，可能会造成无线干扰，在这种情况下，可能需要用户对其干扰采取切实可行的措施。

安全指令

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. 本產品旨在由適用於工作溫度 0-40 攝氏度（最低）、額定輸出 12Vdc、80.5-97A 的 UL 認證電源或直流電源供電。如果需要進一步的幫助，請聯繫研華以獲取更多信息。
4. 用濕抹布清洗設備前，請從插座拔下電源線。請不要使用液體或去汙噴霧劑清洗設備。
5. 對於使用電源線的設備，設備周圍必須有容易連接到的電源插座。
6. 請讓設備遠離潮濕環境。
7. 請在安裝前確保設備放置在可靠的平面上，意外跌落可能會導致設備損壞。

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8. 設備外殼的開口是用於空氣對流，從而防止設備過熱。請不要覆蓋這些開口。
9. 當您連接設備到電源插座上前，請確認電源插座的電壓是否符合要求。
10. 電源插座應接地。
11. 請將電源線安置在人們不易絆到的位置，並不要在電源線上覆蓋任何雜物。
12. 設備上電前，將設備框架接地。對於接地線，需要綠色和黃色絕緣，導體的橫截面積必須大於 0.75mm^2 或 18 AWG。
13. 請注意設備上的所有警告和注意標語。
14. 如果長時間不使用設備，請將設備與電源插座間的電線斷開，避免設備被超目標電壓波動損壞
15. 請不要讓任何液體流入通風口，以免引起火災或者電路短路。
16. 請不要自行打開設備。為了確保您的安全，請由經過認證的工程師來打開設備。
17. 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。

18. 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-40°C(-40° F) 或高於 70°C(158° F)，否則可能會損壞設備。
19. 注意：如果電池放置不正確，將有爆炸的危險，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已使用過的電池。
20. 如果使用光收發器連接到 SFP+ 連接器，則只能使用 CDRH 認證的 I 類激光光收發器。（UL 證書請求）。
21. 根據國家電氣規範第 645 條和 NFPA 75，適合安裝在信息技術室。
22. 根據 IEC 704-1:1982 規定，設備產生的音量不高於 70 分貝。
23. 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。

安全指令

1. 请仔细阅读此安全操作说明。
2. 请妥善保存此用户手册供日后参考。
3. 本产品旨在由适用于工作温度 0-40 摄氏度（最低）、额定输出 12Vdc、80.5-97A 的 UL 认证电源或直流电源供电。如果需要进一步的帮助，请联系研华以获取更多信息。
4. 用湿抹布清洗设备前，请从插座拔下电源线。请不要使用液体或去污喷雾剂清洗设备。
5. 对于使用电源线的设备，设备周围必须有容易连接到的电源插座。
6. 请让设备远离潮湿环境。
7. 请在安装前确保设备放置在可靠的平面上，意外跌落可能会导致设备损坏。
8. 设备外壳的开口是用于空气对流，从而防止设备过热。请不要覆盖这些开口。
9. 当您连接设备到电源插座上前，请确认电源插座的电压是否符合要求。
10. 电源插座应接地。
11. 请将电源线安置在人们不易绊到的位置，并不要在电源在线覆盖任何杂物。
12. 设备上电前，将设备框架接地。对于接地线，需要绿色和黄色绝缘，导体的横截面积必须大于 0.75mm2 或 18 AWG。
13. 请注意设备上的所有警告和注意标语。
14. 如果长时间不使用设备，请将设备与电源插座间的电线断开，避免设备被超目标电压波动损坏
15. 请不要让任何液体流入通风口，以免引起火灾或者电路短路。
16. 请不要自行打开设备。为了确保您的安全，请由经过认证的工程师来打开设备。
17. 如遇下列情况，请由专业人员来维修：

- 电源线或者插头损坏；
- 设备内部有液体流入；
- 设备曾暴露在于于潮湿的环境中使用；
- 设备无法正常工作，或您无法通过用户手册来使其正常工作；
- 设备跌落或者损坏；
- 设备有明显的外观破损。

18. 请不要把设备放置在超出我们建议的温度范围的环境，即不要低于-40°C(-40° F) 或高于

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70°C(158° F)，否则可能会损坏设备。

19. 注意：如果电池放置不正确，将有爆炸的危险，因此，只可以使用制造商推荐的同一种或者同等型号的电池进行替换。请按照制造商的指示处理已使用过的电池。
20. 如果使用光收发器连接到 SFP+ 连接器，则只能使用 CDRH 认证的 I 类激光光收发器。（UL 证书请求）
21. 根据国家电气规范第 645 条和 NFPA 75，适合安装在信息技术室。
22. 根据 IEC 704-1:1982 规定，设备产生的音量不高于 70 分贝。
23. 免责声明：请安全训示符合 IEC 704-1 要求。研华公司对其内容之准确性不承担任何法律责任。

2.2.3 CE Mark

The CE marking on this product indicates that it is in compliance with the European Union EMC Directive 2014/30/EU, Safety Directive 2014/35/EU.

Le marquage CE sur ce produit indique qu'il est conforme à la Directive européenne sur la compatibilité électromagnétique 2014/30 / UE, Directive sur la sécurité 2014/35 / UE.

Note! The equipment is operated and maintained only by professionals

Remarque!L'équipement est exploité et entretenu uniquement par des professionnels

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2.3 Unpacking

The FWA-6172 is packaged within a double carton, collectively referred to as the "box" in the subsequent sections of this document.
Upon opening the box, you will discover the FWA-6172 nestled in protective foam, with the accessory box similarly embedded within the foam. Begin by removing the accessory box first, followed by pulling out the top foam. Subsequently, lift the system and place it on a suitable surface before removing the plastic sleeve from the unit. Refer to Figure 2.3-1 for visual guidance.
After unpacking the unit, carefully inspect it for any visible damage. Should you encounter any issues, please promptly contact your Advantech representative.
Kindly note that, unless otherwise agreed upon, power cords need to be ordered separately.

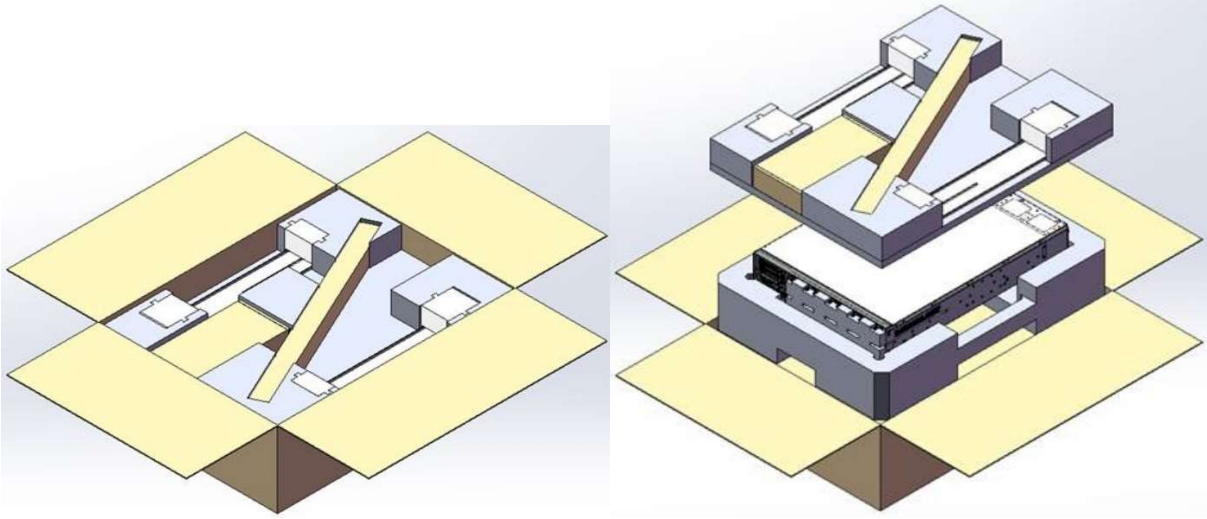
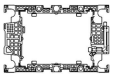
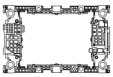


Figure 2.3-1 Open-box Illustration

As you carefully open the carton, please ensure to check the delivery for completeness. If any of the items listed in Table 2.3-1 are missing or damaged, kindly reach out to your Advantech representative for prompt assistance.

Table 2.3-1 Packaging List (Mandatory)

Item	Qty.	Image	Description
FWA-6172	1		2U Network Appliance with 4th/5th gen intel® Xeon® scalable platform
Rack Mount Accessory	2		Rack mount bracket and handle
Socket Carrier	2		IC SKT LGA 4677 SKT E EGS Carrier Assy, E1A
Socket Carrier	2		IC SKT LGA 4677 SKT E EGS Carrier Assy, E1B
Screw	8		Screw M3x4L S/S D=4.8 H= 1
Screw	8		Screw M2x6L RF/S D=4 H= 1.5
Screw	4		Screw M3x4L R/S D=5.5 H= 2
Screw	4		Screw M4x4L F/S D=8.5 H= 1.5

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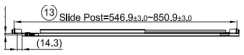
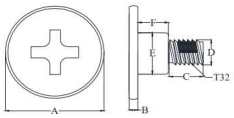
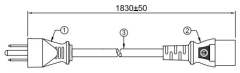
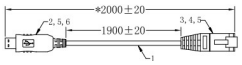
Item	Qty.	Image	Description
Cable Tie	2		Cable-tie
Console cable	1		M CABLE D-SUB 9P(F)/RJ45

Table 2.3-2 ***Optional Accessories****.*

Item	Qty.	Image	Description
Slide Rail	1		Slide rail for post to post dimension 546.9 - 850.9mm
Slide Rail Screw	10		Screws for slide rail installation (Order 10 pieces per system)
Power Cord	1		Power cord 3P 180 cm
Console Cable	1		USB for RJ45 console cable

2.4 Installation and Configuration

The FWA-6172 is supplied as a pre-configured system without the scalable processors installed. If you intend to install additional components in the FWA-6172 for any other purpose, please refer to the relevant sections from 3.2.3 to 3.2.6 for detailed guidance and instructions. For information on ordering other peripherals, kindly refer to the datasheet order information to ensure the correct component(s) are selected and ordered.

2.4.1 Installation via Monitor, Keyboard and Mouse

If you intend to install an operating system with a graphical user interface, such as Windows or Linux with GUI, it is strongly advised to follow the instructions in this section for guidance. Moreover, these guidelines are applicable for the installation of text-based operating systems as well.
The FWA-6172 provides support for 1x VGA port and 2x USB ports to facilitate the connection of a monitor, keyboard, and mouse. Refer to Figure 2.4-1 for precise information on the location of these connectors. If you are planning to install the operating system from a USB thumb drive, it is advisable to use a USB hub. Connect the USB-type keyboard and mouse to the USB hub, and it is highly recommended to insert the USB thumb drive into one of the USB ports.

Figure 2.4-1 Location of The VGA and USB Ports

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2.4.2 Installation via Serial Console

Note: The serial console port is specifically designed for the installation of TEXT MODE OS exclusively.

It is imperative for the OS installation engineer to possess expertise in text-based OS installation and be acquainted with serial console client operations.

The box includes an RS232-to-RJ45 console cable; if misplaced or additional cables are needed, ensure the use of the appropriate serial console cable to connect the engineer's PC to the RJ45 serial port (refer to Figure 2.4-2).

For detailed information on the cable's pin configuration, please consult Section 5.2, ensuring the use of a well-shielded cable, or reach out to your Advantech representative.

If your PC lacks an RS232 port, consider acquiring a USB-to-RS232 cable (Figure 2.4-3). Note that for the two RS232 ends of the cables, one should be male and the other female.

The FWA-6172 also supports operation via a serial console port, suitable for situations without a connected monitor.

In this configuration, both BIOS and OS outputs are directed through a serial terminal connection. Please note that only TEXT MODE OS can be installed when using the serial console port.

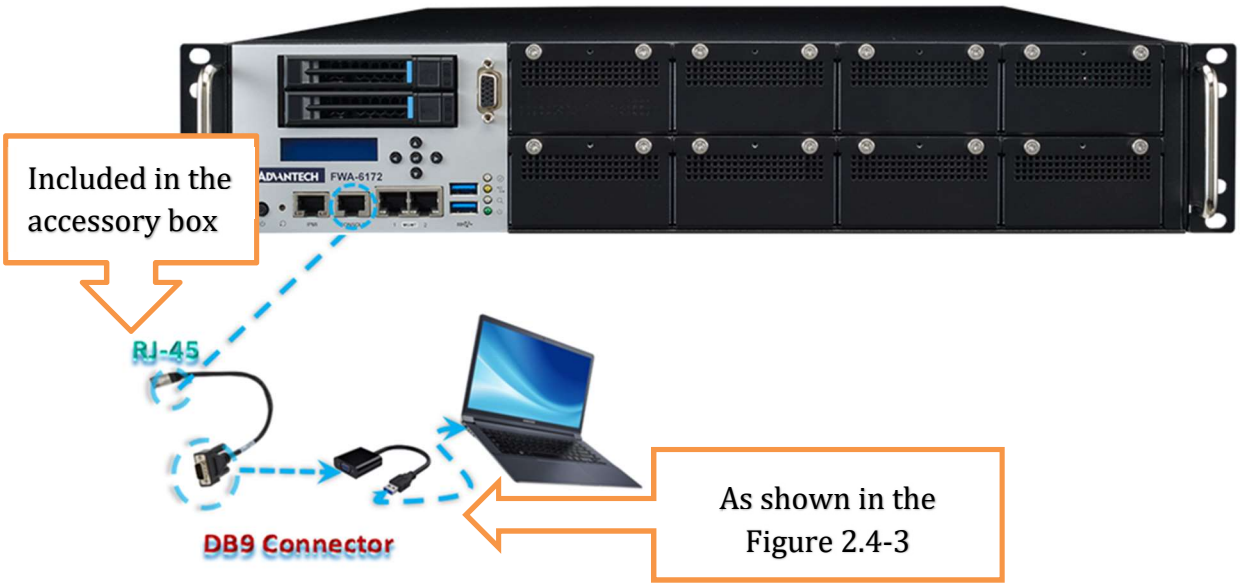

Figure 2.4-2 Access the Server through Serial Console Port

Figure 2.4-3 The diagram for the USB to 232 Cable

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There are various methods to connect to the serial console port.

For those utilizing Windows OS on their working PC, a commonly used tool is PuTTY. Follow the steps below to establish a connection using PuTTY.

If you are not familiar with PuTTY or have not installed it yet, you can download it from https://www.putty.org/ .

For users intending to use PuTTY on a PC running Windows OS, the subsequent section outlines how to configure PuTTY on a Windows platform for connecting to the FWA-6172 serial console.

Feel free to skip these steps if you have another preferred method, as other terminal programs can be used similarly.

Open PuTTY and initiate the configuration as detailed below. Instead of "COMx," use the actual COM port number from your client machine. The "COMx" designation will vary based on what you observe in your Windows Device Manager (refer to Figure 2.4-6).

In this guide, "COM1" is used as an example, as you might see it listed in the Device Manager.

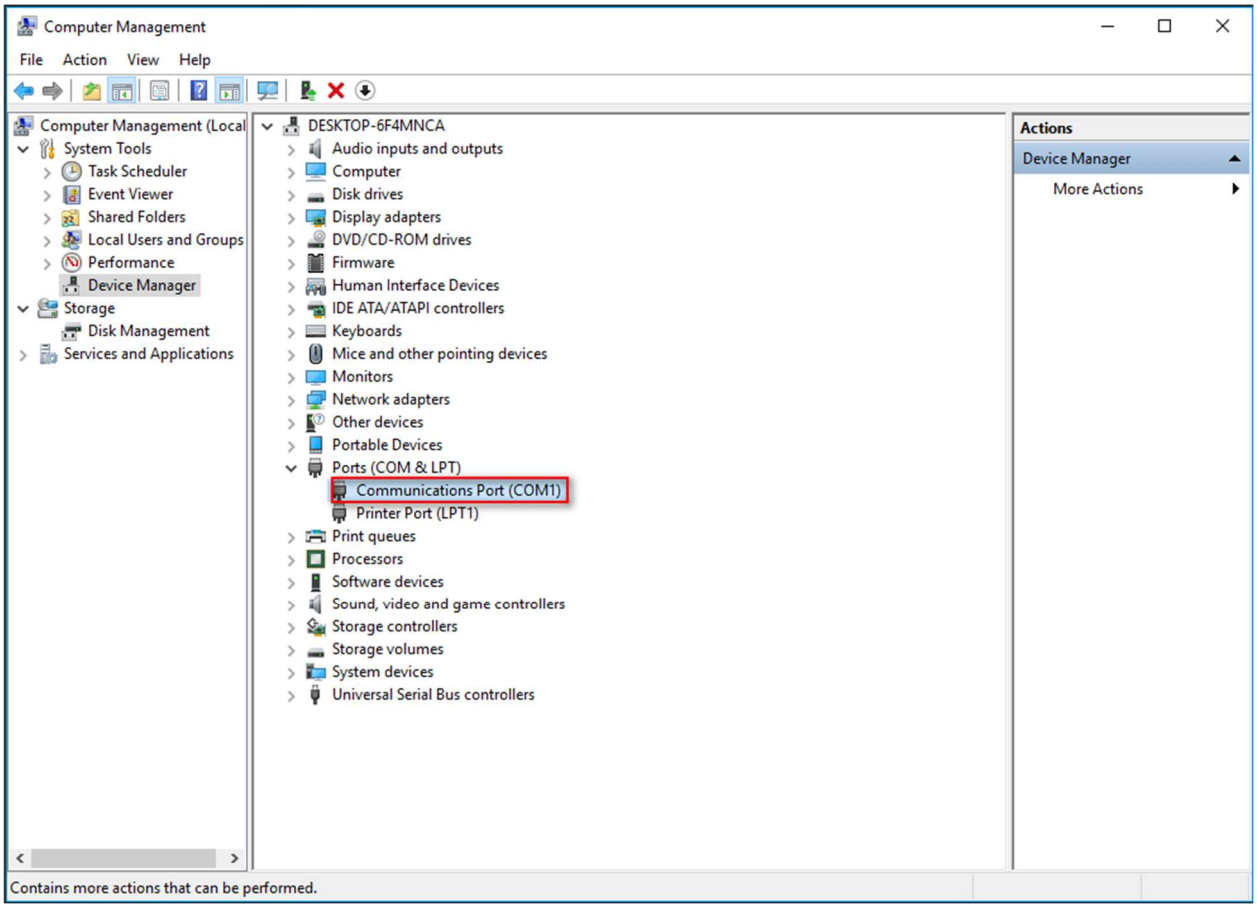

Figure 2.4-4 Windows Device Management COM Number Example

A. Under "serial line", specify "COM1" and set the speed to "115200". Choose "no parity" and "no flow control". The default baud rate for the COM port is 115200 with no parity and no flow control.
B. If you have previously modified these settings, please use the baud rate you configured in the BIOS; refer to the "Common BIOS User Manual (Section 1.2.2.1)." It's important to note that the BIOS and OS may have different serial console configurations.

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C. To ensure a smooth installation process, confirm that both the BIOS and OS share the same serial console port configuration. Also, verify that the OS can output to the serial console port.

D. If you are using a Linux system, consult the "Common IPMI User Manual (Section 2.3)" for specific instructions.

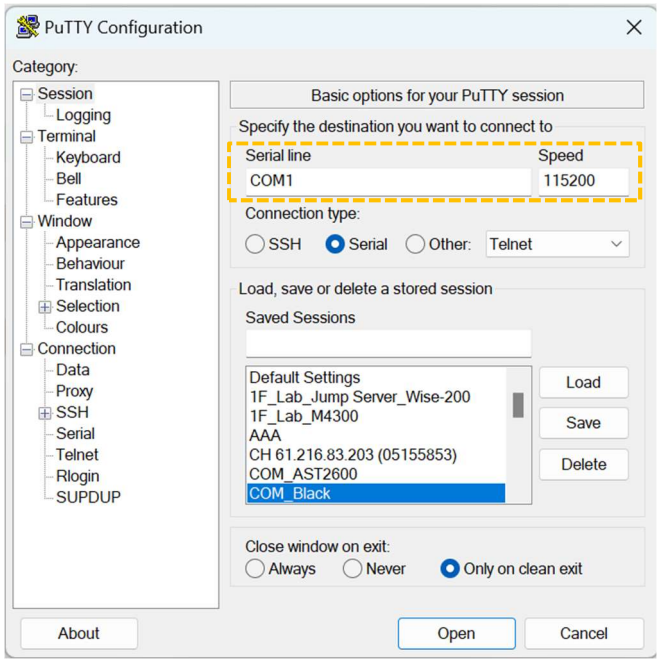

Figure 2.4-5 PuTTY Session Configuration

E. Select “Serial” for the connection type.

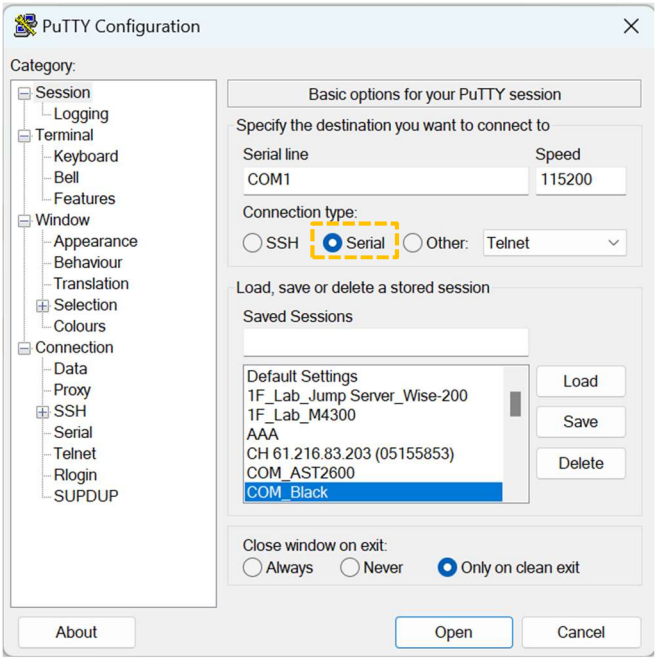

Figure 2.4-6 PuTTY Serial Configuration

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F. In the keyboard submenu, ensure that "VT100+" is selected for the keypad.

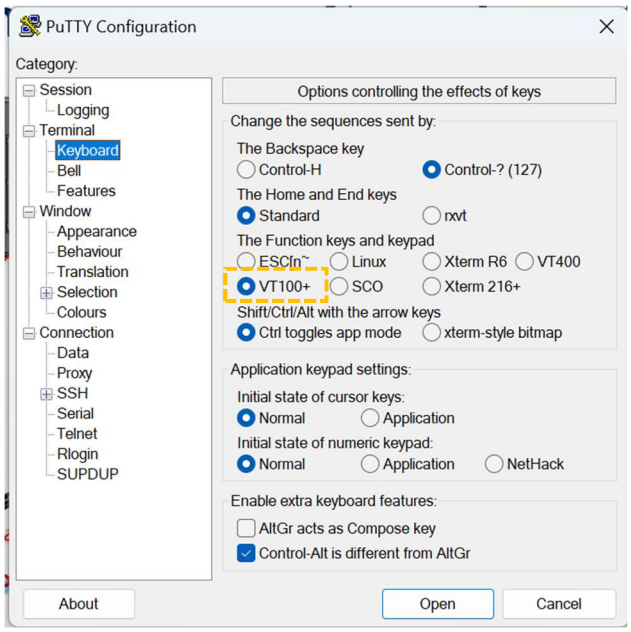

Figure 2.4-7 PuTTY Keyboard Settings

G. Click the "Open" button, and a PuTTY terminal screen will be displayed. If you want to save the configuration for future use, click the "Save" button.

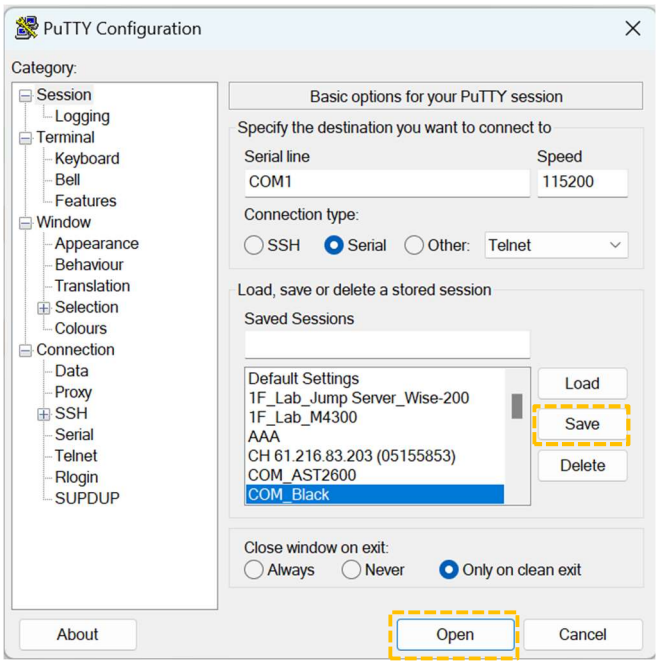

Figure 2.4-8 PuTTY Keyboard Settings

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H. If the connection is successful, upon powering on the unit, you should be able to view the BIOS Power-On-Self-Test (POST) screen in the PuTTY terminal as illustrated below:

Figure 2.4-9 BIOS POST Screen

Note:

Please be aware that during the initial startup phase, the BIOS may be performing tasks even if the console appears inactive. It might take a moment for the BIOS POST screen to show up. However, the BIOS has been optimized for a swift boot time. It will progress through the POST rapidly and then attempt to boot an OS based on the boot options selected in the BIOS.

If you find the need to extend the time during which the BIOS displays the POST screen and waits for a key press to enter the setup menu, you can achieve this through the BIOS setup menu. Refer to *Section 4.2* for detailed instructions.

2.4.3 Installation via iKVM

The FWA-6172 is equipped with an Out-of-band (OOB) BMC that incorporates a Web UI, offering a broad spectrum of configuration options, including iKVM for graphic OS installations.

To commence, configure the BMC IP within the BIOS (refer to Section 4.3.1) and then access it using https://<IP>. Once connected, you gain the ability to remotely install either a text-based or GUI-based OS onto your PC.

For a comprehensive guide on iKVM features, please consult the "Node Explorer user manual (Section 3.5.3)".

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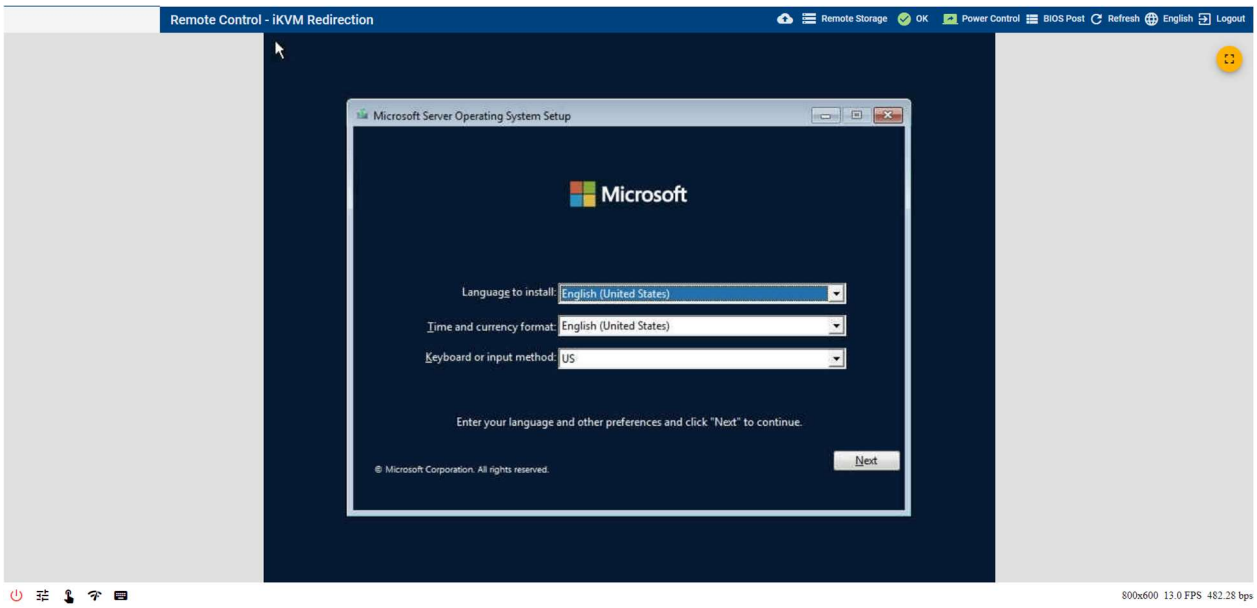
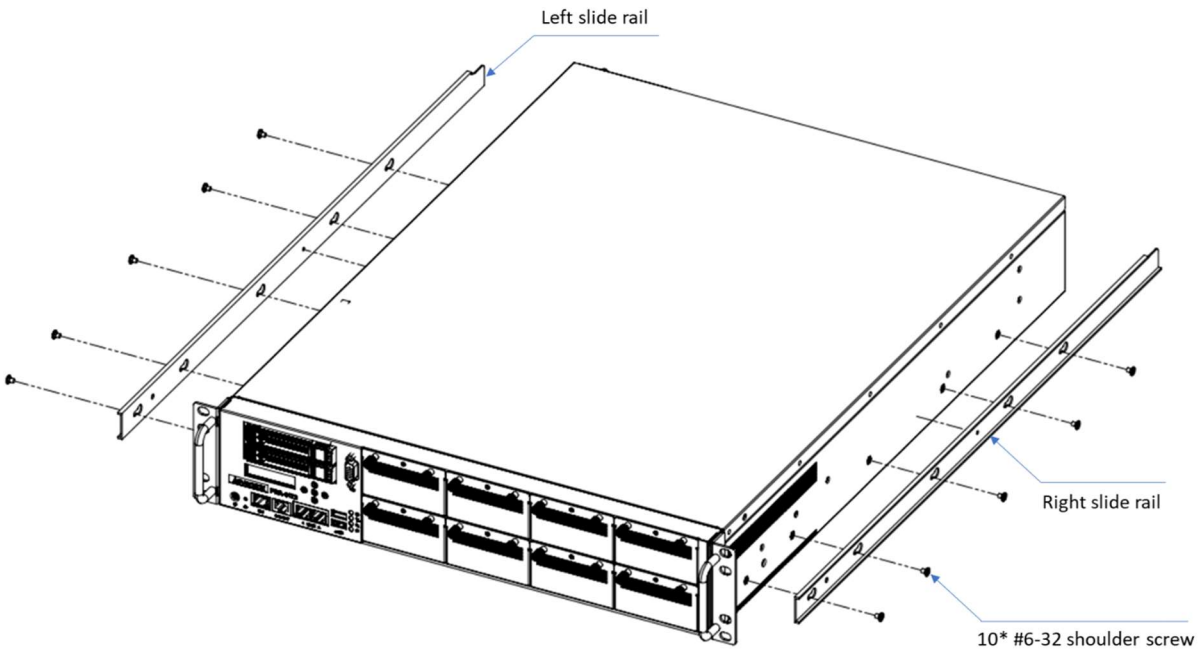


Figure 2.4-10 GUI-based OS (Windows) through iKVM

2.4.4 Rackmount Kit Installation

Slide rails installation instructions:

1. Align the holes on the slide rails with the holes on the sides of the FWA-6172.
2. Insert screws through the holes in the slide rails and into the corresponding holes on the appliance.
3. Utilize a screwdriver or power drill with the appropriate bit to tighten the screws.
4. Exercise caution not to overtighten, as this may result in damage to the appliance.



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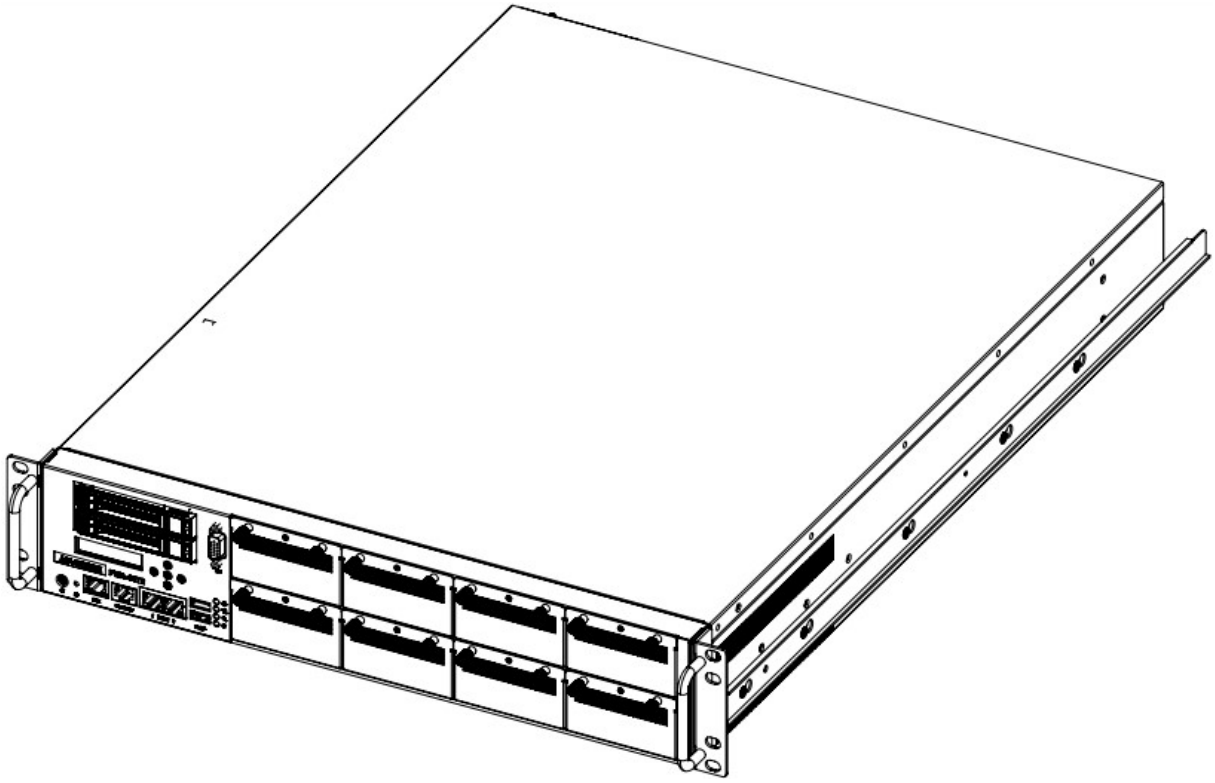

Figure 2.4-11 Slide Rails Installation

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2.4.5 Powering On

Caution!

Before connecting the FWA-6172 to the power outlet, please verify that the power rating of the outlet matches that of the FWA-6172 PSU. Additionally, ensure that the primary circuit and all power distribution are not overloaded. Inrush current and steady state power specifications for the FWA-6172 can be found at the label at the side of the unit.

Connect the power cords to the Power supply units (refer to Section 3.4.6 for details) first, and then connect them to the power outlets. There are 2 power supply units located at the rear panel of the appliance.

Figure 2.4-12 Location of the Power Inputs

The unit will automatically power on once power is supplied. Confirm the presence of a lit green LED on the front panel, indicating that the unit is powered
Please refer to Section 3.2.1 for the location of front and rear panel elements.

For guidance on OS installation based on specific environmental constraints, refer to Sections 2.4.1 to 2.4.3. Choose the method that best suits your requirements.

2.5 Getting Help: Technical Support and Assistance

1. Visit the Advantech web site at https://www.advantech.com/support for the latest product information.

2. If you require additional assistance, contact your distributor, sales representative, or Advantech's customer service center for technical support. Worldwide contact information is available on www.advantech.com. Please have the following information ready before contacting:

- Product name and serial number
- Description of your peripheral attachments
- Description of firmware and software versions installed on the product
- A complete description of the problem
- The exact wording of any error messages

3. For further information, please reach out to regional sales or visit the PRODUCT SPECIFICATION section on the website.

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3. Product Specification

3.1 Overview

The FWA-6172 is a 2U rackmount network appliance powered by the 4th/5th Generation Intel® Xeon® Scalable platform.

The 4th/5th Generation Intel® Xeon® Scalable Processors are equipped with Intel Quick Assist Technology (QAT Gen 4), enhancing encrypted packet throughput.
The FWA-6172 platform features two integrated 1GbE wired networking ports, one dedicated IPMI port, and supports up to eight NMC expansion slots. Storage options encompass two M.2 2280 SSDs and two 2.5” SSDs.

For more information related to the FWA-6172, please refer to the following section:

3.2 Introduction

3.2.1 Features

- CPU: 4th/5th Generation Intel® Xeon® Scalable Processors
- Memory: 16 DDR5 memory sockets with up to 1TB capacity (RDIMM)
- NMC: Up to 8 slots, each 200GbE bandwidth
- Storage: 2 hot-swappable 2.5” SSD and 2 M.2 2280 SSD
- System Fan: 4 hot-swappable 80mm fans
- Power Supply Unit: 1200W Redundant PSU

Figure 3.2-1 System Front Panel

Figure 3.2-2 System Rear Panel

Table 3.2-1 Indications on Front and Rear Panels

A	Power Button	H	Graphic mode LCM
B	SW-defined Button	I	2 x hot-swap 2.5” drive bays
C	1 x GbE LAN (dedicated for IPMI)	J	4 x Advantech NMC slots (CPU-0)
D	RJ45 console port	K	4 x Advantech NMC slots (CPU-1)
E	2 x GbE RJ45 ports for MGMT	L	4 x 8038 fan modules (hot-swap)
F	2 x USB 3.0 ports	M	1200W Redundant PSU
G	System LEDs	N	VGA port

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The FWA-6172 features a variety of status LEDs on the front panel of the system.

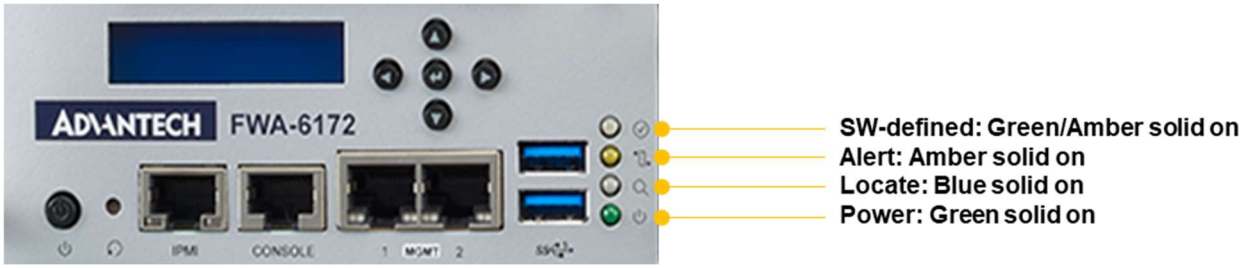

Figure 3.2-3 Front LEDs

Table 3.2-2 Status LEDs

No. or Icon (Up to Down)	LED Name	LED Color	Description	Software Controllable
	SW_DEF LED	Green/Amber	Solid On/Blinking	Yes
	Alert LED	Amber	Solid On	BMC control
	ID/Locate LED	Blue	Solid On	Yes
	Power LED	Green	Solid On	No

The FWA-6172 is equipped with two buttons on the front panel of the system.

Figure 3.2-4 Front Buttons

Table 3.2-3 Front Buttons

No. or Icon (Up to Down)	Button Name	Description
	Power Button	Power button to power on and off the unit
	SW-defined Button	SW-defined Button's Application can do specific things depending on customer's design.

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3.2.2 System Memory

The FWA-6172 supports a total of 16 DDR5 DIMMs. Each processor socket accommodates one DIMM socket per DDR5 channel, and a total of 8 DDR5 channels are supported by each processor socket. The system supports up to 64GB of DDR5 RDIMM per socket, allowing for a total capacity of up to 1TB (4800/5600 MHz).

Optimal memory performance can be achieved by populating these DIMM modules with pairs of memory modules of the same type and size, resulting in interleaved memory configuration.

3.2.3 Memory Installation Procedures

Each memory channel supports 1 DIMM socket, totaling 16 DIMM sockets for the FWA-6172. Please refer to the following table for guidance on installing DRAM in the system DIMM sockets. For specific DIMM slot locations, refer to Appendix 5.1 for detailed mapping. It is crucial to follow the recommended DIMM populations, as failure to do so may result in the CPU being unable to utilize (initiate) the installed memory modules.

DIMM Qty	iMC1		iMC0			iMC2		iMC3		iMC1		iMC0			iMC2		iMC3	
	D1	C1	B1	A1		E1	F1	G1	H1	L1	K1	J1	I1		M1	N1	Q1	P1
	CN8	CN6	CN4	CN2		CN10	CN12	CN14	CN16	CN83	CN82	CN81	CN80		CN84	CN85	CN86	CN87
2				DIMM									DIMM					
						DIMM									DIMM			
		DIMM					DIMM				DIMM							
																	DIMM	
4				DIMM	CPU0			DIMM					DIMM	CPU1			DIMM	
		DIMM				DIMM					DIMM				DIMM			
8		DIMM		DIMM		DIMM		DIMM			DIMM		DIMM		DIMM		DIMM	
12	DIMM	DIMM		DIMM		DIMM	DIMM	DIMM		DIMM	DIMM		DIMM		DIMM	DIMM	DIMM	
		DIMM	DIMM	DIMM		DIMM		DIMM	DIMM		DIMM	DIMM	DIMM		DIMM		DIMM	DIMM
	DIMM	DIMM	DIMM			DIMM	DIMM	DIMM		DIMM	DIMM	DIMM			DIMM	DIMM	DIMM	
		DIMM	DIMM	DIMM			DIMM	DIMM	DIMM		DIMM	DIMM	DIMM			DIMM	DIMM	DIMM
16	DIMM	DIMM	DIMM	DIMM		DIMM	DIMM	DIMM	DIMM	DIMM	DIMM	DIMM	DIMM		DIMM	DIMM	DIMM	DIMM

Figure 3.2-5 DIMM populations

1. Double-check that the installation of DIMMs aligns with the requirements outlined in Section 4.4 and ensure adherence to the DIMM population rules specified in that section.
2. Open the latches on the left and right sides of the DIMMs by turning them outward, following the arrows' indications below.

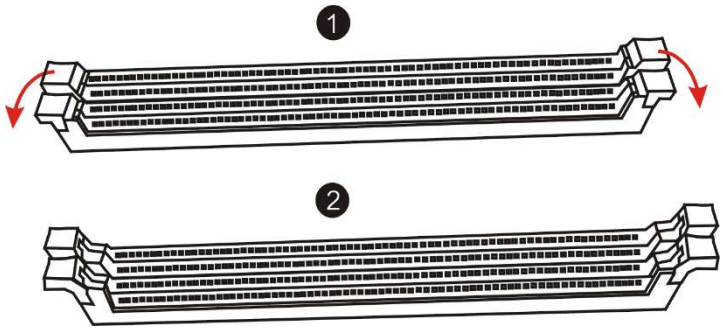

Figure 3.2-6 Opening DIMM Latches

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3. Select the DIMM orientation so that the keys in the DIMM module and socket match.

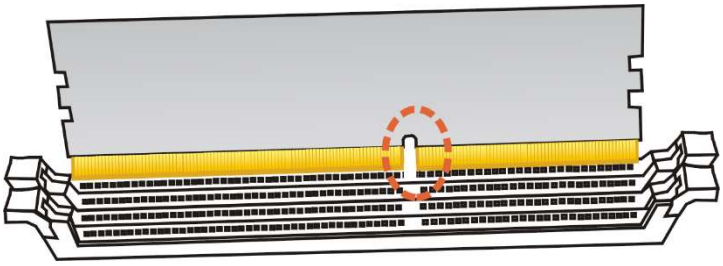

Figure 3.2-7 DIMM Key Alignment

4. Insert the DIMM from the top using the guide rails on the left and right of the DIMM sockets.

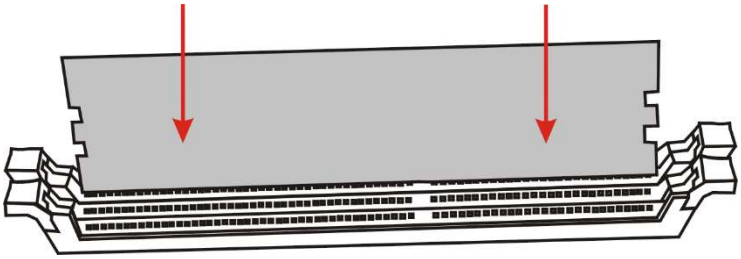

Figure 3.2-8 DIMM Insertion Into Socket

5. Place your thumbs near the right and left ends of the DIMM and evenly press down until the white latches fully close with a click.

Figure 3.2-9 Seating the DIMM in the Socket

6. If you intent to install additional DIMMs, repeat steps 1 to 5 accordingly.

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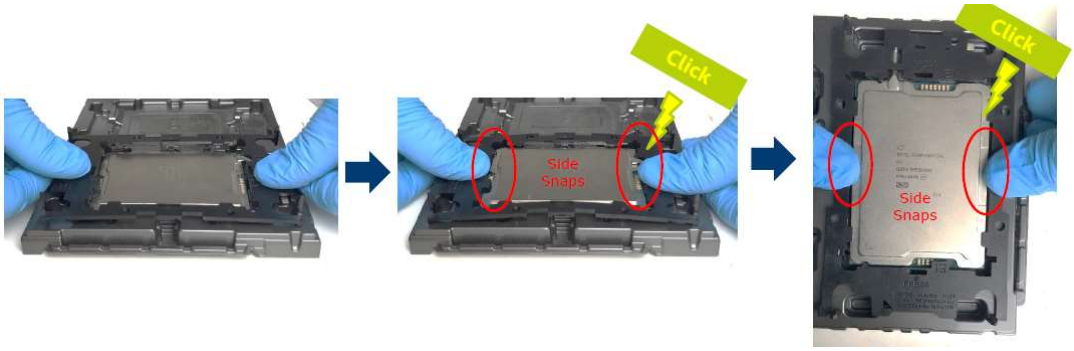
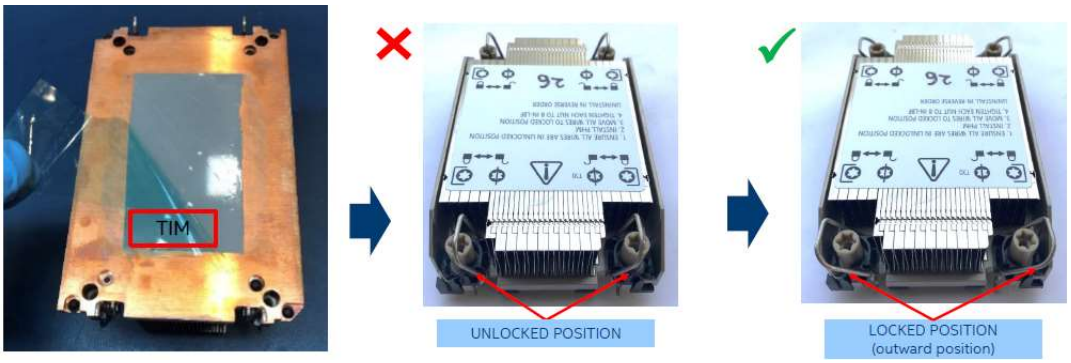
3.2.4 CPU Installation Procedures

The FWA-6172 supports dual Xeon Scalable processors. This section provides the necessary information for planning the installation of CPUs.

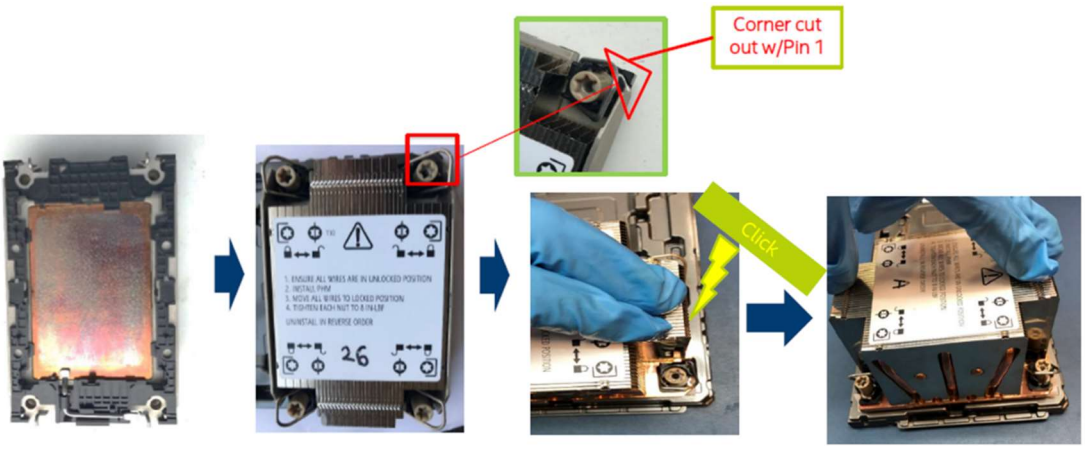
Step 1: Assemble processor and carrier together. Ensure processor carrier codes are matched. (e.g. E1A/E1B/E1C code marking on processor and carrier)



Step 2: If there is TIM (Thermal Interface Material) protective film on the base of heatsink, remove it. Turn the heatsink over and set the anti-tilt wires to the locked position (outward posiiton).



Step 3: Assemble processor carrier to heatsink. Align pin 1 indicator of processor carrier and the corner cut out of heatsink. If there are two corners cut out, either orientation is fine. Press heatsink down firmly to engage carrier latching features to the heatsink at four corners.



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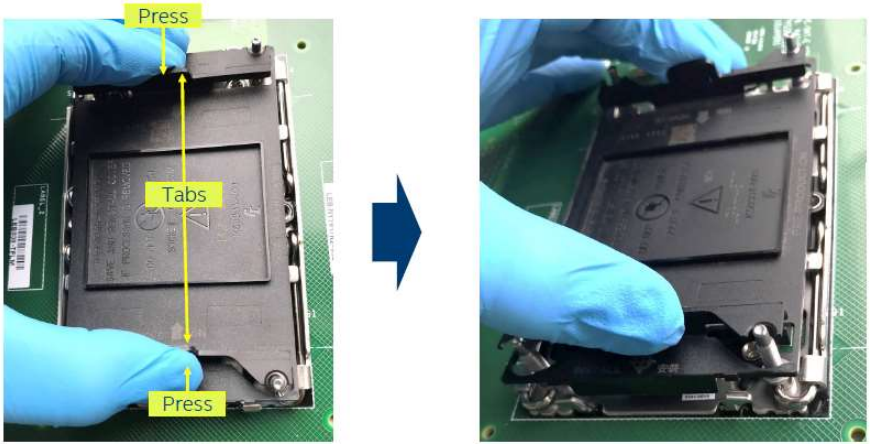
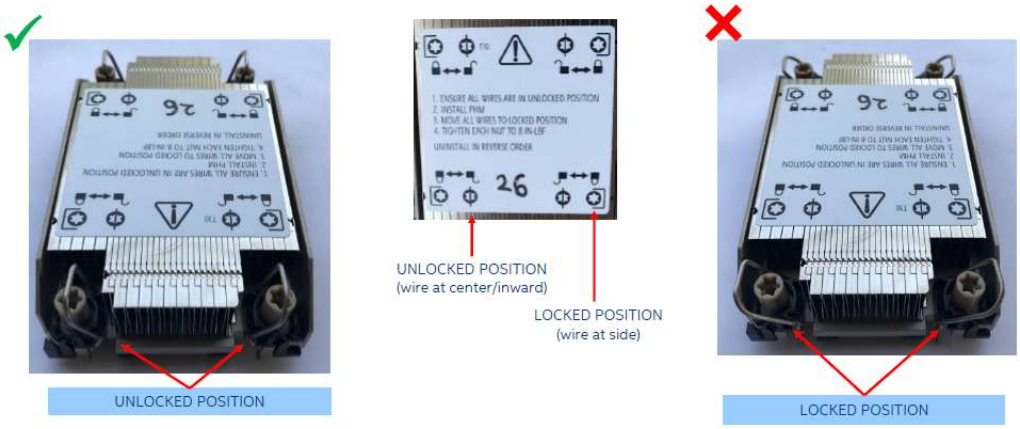
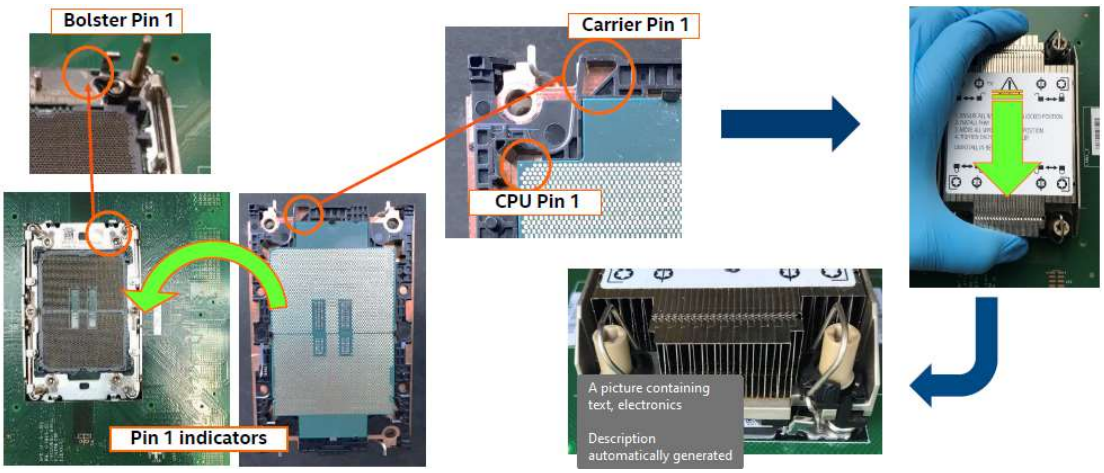
Step 4: Press down on the socket cover tabs and then pull the cover up and off vertically to remove.



Step 5: Ensure that all four anti-tilt wires are in the unlocked positions on the heatsink.



Step 6: Align pin 1 indicators on processor/carrier to bolster plate and verify PHM (Processor Heatsink Module) is sitting horizontally over bolster plate assembly.



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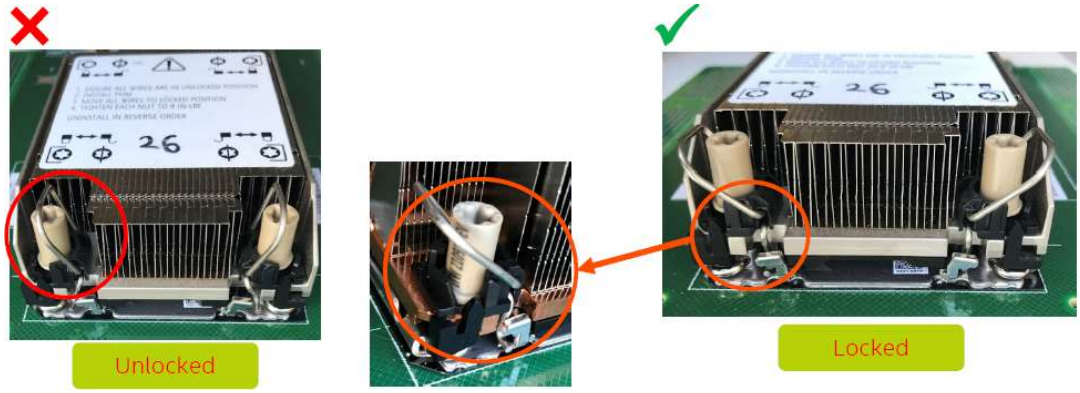
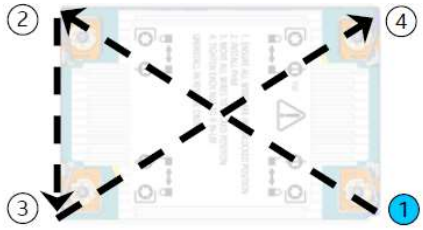
Step 7: Set all four anti-tilt wires into the locked position (outward position) before tightening screws.



Step 8: Tighten all nuts on heatsink using a torque driver with a T30 bit to 8 in-lbf ± 10%. Diagonal tightening sequence is recommended.

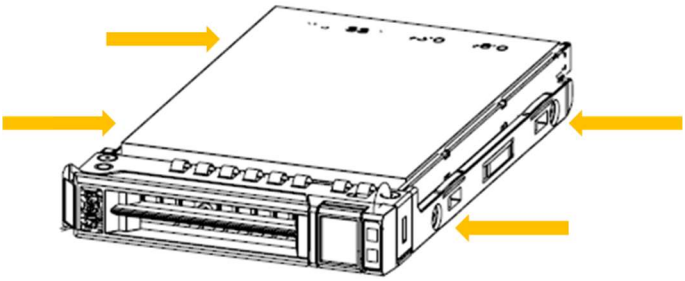


Example of Diagonal Heatsink Nut Screw Sequence (First nut driven highlighted in blue)

3.2.5 2.5" SSD Installation Procedures

FWA-6172 supports two hot-swappable 2.5" SATA and NVMe SSDs. Both 2.5" SSDs are accessible from the front panel.

Step 1: Place the 2.5" SSD in the storage carrier, aligning the screw holes, and secure it with 4 screws.



Step 2: Insert the assembly of the SSD and storage carrier into the storage bay.

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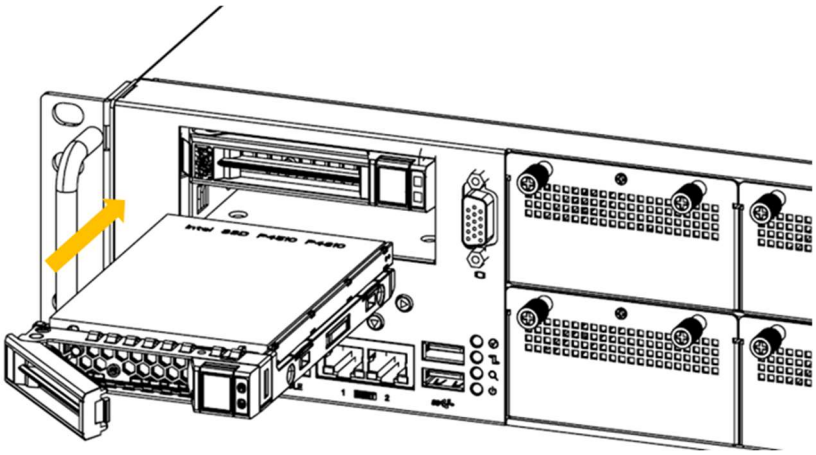
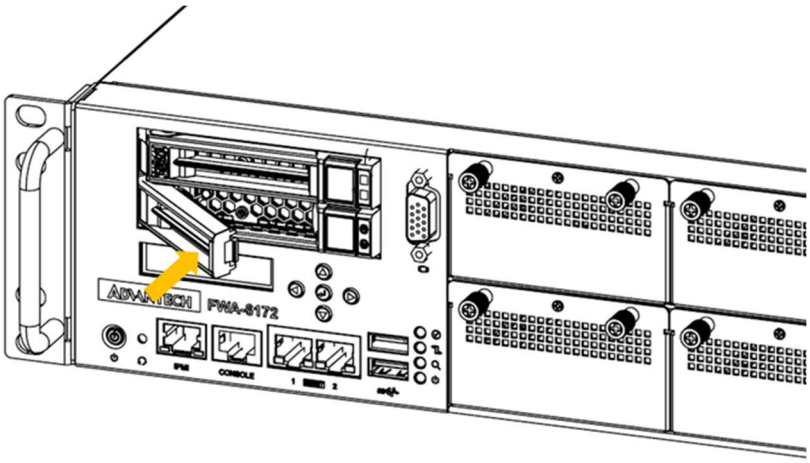


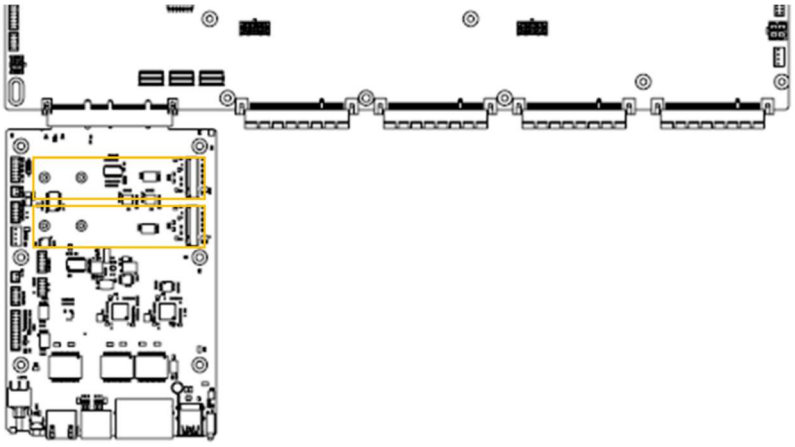
Step 3: Press the carrier latch until the click sound is heard.



3.2.6 M.2 SSD Installation Procedures

The FWA-6172 supports two M.2 2280 SATA and NVMe SSDs. Both M.2 slots are accessible on the management board.

Step 1: Open the top cover, remove the 2.5” storage cage, and identify the locations of the M.2 slots on the management board.



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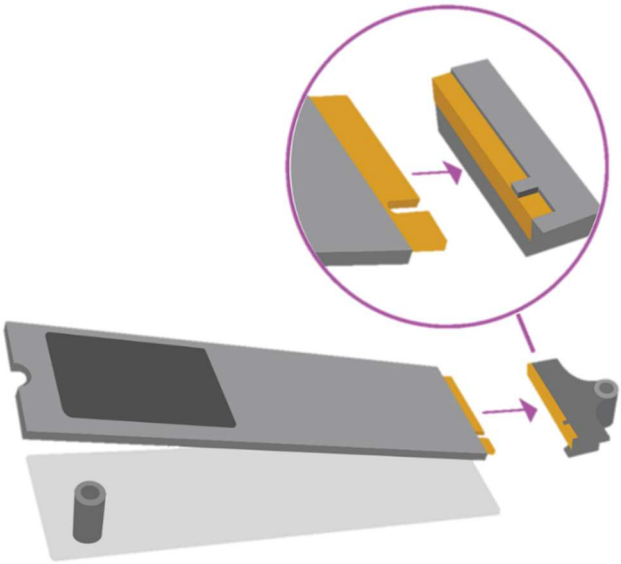
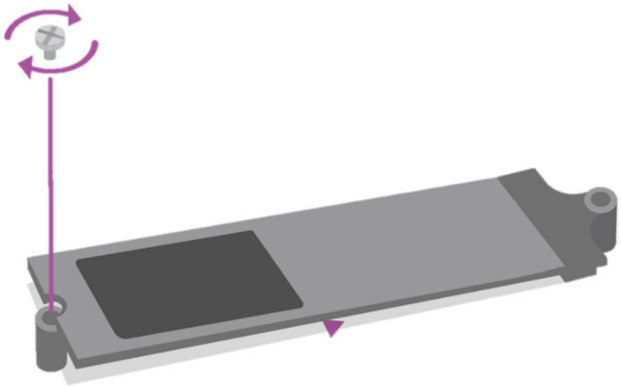
Step 2: Insert M.2 SSD into the slot, ensuring the groove position of the M.2 SSD plug matches the foolproof protrusion of the slot.



Step 3: Secure it with one screw properly.



3.3 Product Version/Ordering Information

The FWA-6172 is offered in the following standard configurations.

Table 3.3-1 Available Product Version

Model Name	Configurations	Peripherals	Power Supply Unit
FWA-6172-00A1R	-2U form factor -Dual socket for 4th/5th Gen Intel Xeon scalable processors -8 x NMC slots	-16 x DDR5 sockets - 2 x 2.5” bays for SATA/NVMe SSD -2 x M.2 2280 slots for SATA/NVMe SSD	1200W redundant PSU

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3.4 Technical Specifications

Table 3.4-1 Datasheet

System P/N		FWA-6172-00A1R
Form Factor		2U Rack Mount
Processor System	Processor	4th & 5th Generation Intel® Xeon® Scalable Processors
	Core Count	Up to 52C
	Base Frequency	Up to 3.7 GHz
	Chipset	C741
	BIOS	AMI UEFI
Virtualization		Intel® VT-Redirect Protection, Intel® S-IOV
Memory	Technology	DDR5
	Max. Capacity	1024 GB (64 GB per slot)
	Socket	16 x 288-pin DIMM
	ECC Support	RDIMM
Networking	Controller	2 x Intel i210
	1GbE	2 x 1GbE RJ45
Expansion Slot	PCIe x16	1 x PCIe Gen5 x16 double-deck 10.5" or 2 x PCIe Gen5/Gen4 x16 FH/HL
	NMC	8 x PCIe Gen5 x8
IPMI		IPMI 2.0 and Redfish compliant
Storage	2.5" Bay	2 x External 2.5" HDD/SSD
	M.2	2 x M.2 2280 M-Key for SATA SSD or PCIe Gen3 x4 NVMe
I/O	Console	1 x RJ45 type console
	USB	2 x USB 3.0
	LED Indicator	1 x Power LED, 1 x Alert LED, 1 x Locate LED, 1 x Software-defined LED
	Display	1 x VGA port
	Button	1 x Power button, 1 x Software-defined button
	Others	1x dedicated 1GbE LAN for IPMI
TPM		TPM 2.0
LCD Module		16 x 2 graphic display, 5 buttons
Power Supply	Power Type	AC Redundant CRPS (Option: DC Redundant CRPS)
	Watts	1200 W
	Input	AC: 100-240V~, 8-4A, 50-60Hz (Option: DC -48V)
	Connector	AC 3pin plug
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F), 60 °C@95% Non-Condensing Humidity
	Vibration Resistance (Operation)	5-500 Hz, 0.3 Grms, 3 axes, 1 hr/per axis
	Shock Protection (Operation)	10 G, 11 ms
Cooling		4 x Hot swap 8038 mm fan
Mechanical	Construction	SECC
	Mounting	Rackmount
	Dimensions (W x H x D)	438 x 88 x 600 mm (17.2" x 3.4" x 23.6")
	Weight (G.W.)	21.5 kg (47.4 lbs)
OS Support		Linux (CentOS, Red Hat, Ubuntu, Fedora)
Advantech S/W Packages		1. ALBPCU 2. APOECU 3. ipmitool 4. Server iManager (Linux base) - Health Guard - Diagnostic Framework - Network device identifier (NDI) 5. Quick Start Linux Image
Certification	EMC/Safety	CE, FCC, CB, UL, CCC

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3.4.1 Processor(s)

The FWA-6172 supports dual 4th/5th Gen Intel Xeon Scalable processors. The table below provides an overview of the processor SKUs suitable for this network appliance.

Table 3.4-2 Processors Supported List (4th & 5th Gen)

SKU	Die Type	Cores	Base Freq. (GHz)	Cache (MB)	TDP (Watts)	DDR5 Memory Speed (MHz)	UPI Links Enabled	Default QAT Devices	Long Life Use (up to 10 years)
2S PERFORMANCE GENERAL PURPOSE (4th Gen)									
8460Y+	XCC	40	2.0	105	300	4800	4	1	
8462Y+	MCC	32	2.8	60	300	4800	3	1	V
6448Y	MCC	32	2.1	60	225	4800	3	0	V
6442Y	MCC	24	2.6	60	225	4800	3	0	
6444Y	MCC	16	3.6	45	270	4800	3	0	
6426Y	MCC	16	2.5	37.5	185	4800	3	0	V
2S MAINLINE GENERAL PURPOSE (4th Gen)									
8452Y	XCC	36	2.0	67.5	300	4800	4	0	V
6438Y+	MCC	32	2.0	60	205	4800	3	1	
6430	XCC	32	2.1	60	270	4400	3	0	V
5420+	MCC	28	2.0	52.5	205	4400	3	1	V
5418Y	MCC	24	2.0	45	185	4400	3	0	V
4416+	MCC	20	2.0	37.5	165	4400	2	1	V
4410Y	MCC	12	2.0	30	150	4400	2	0	V
5G / NETWORKING OPTIMIZED (4th Gen)									
8470N	XCC	52	1.7	97.5	300	4800	3	4	V
6438N	MCC	32	2.0	60	205	4800	3	2	V
6428N	MCC	32	1.8	60	185	4000	3	2	V
5418N	MCC	24	1.8	45	165	4000	3	2	V
SKU	**Die Type**	**Cores**	**Base Freq. (GHz)**	**Cache (MB)**	**TDP (Watts)**	**DDR5 Memory Speed (MHz)**	**UPI Links Enabled**	**Default QAT Devices**	**Long Life Use (up to 10 years)**
2S PERFORMANCE GENERAL PURPOSE (5th Gen)									
8562Y+	MCC	32	2.8	60	300	5600	3	1	
6548Y+	MCC	32	2.5	60	250	5200	3	0	V
6542Y	MCC	24	2.9	60	250	5200	3	0	
6544Y	MCC	16	3.6	45	270	5200	3	0	
6526Y	MCC	16	2.8	37.5	195	5200	3	0	V
2S MAINLINE GENERAL PURPOSE (5th Gen)									
6538Y+	MCC	32	2.2	60	225	5200	3	1	
6530	XCC	32	2.1	160	270	4800	3	0	V
5520+	MCC	28	2.2	52.5	205	4800	3	1	V
4516Y+	MCC	24	2.2	45	185	4400	2	1	V
4514Y	MCC	16	2.0	30	150	4400	2	0	V
5G / NETWORKING OPTIMIZED (5th Gen)									
6548N	MCC	32	2.8	60	250	5200	3	2	V
6538N	MCC	32	2.1	60	205	5200	3	2	V

3.4.2 SPI TPM 2.0

The FWA-6172 supports a 2.0 Trusted Platform Module (TPM).

Trusted Platform Module (TPM): A TPM is a dedicated hardware component or microcontroller that provides secure storage and cryptographic functions. It is designed to enhance the security of a computing platform by securely storing encryption keys, performing cryptographic operations, and verifying the integrity of the system.

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3.4.3 Internal Storage

Two M.2 2280 SATA/NVMe SSDs are supported and located on the management board. For socket location details, please refer to Appendix 5.1.

3.4.4 BIOS

FWA-6172 BIOS is based on AMI's APTIO BIOS and compliant to the UEFI, SMBIOS and ACPI specifications.

The BIOS performs probing, initialization and configuration of the FWA-6172 and initializes the OS boot process at the end of POST (Power-On-Self-Test).

Regular BIOS output as well as the setup menu are displayed via console port and please note that the FWA-6172 does not have any on-board POST Code LEDs. A special POST code adapter is required to retrieve BIOS error codes.

All BIOS configuration parameters bare stored in NVRAM, a dedicated section of the BIOS flash chip. Parameters are no longer stored in legacy CMOS RAM by the platform BIOS. i.e. BIOS configuration parameters will not be lost due to an empty battery.

3.4.5 Advanced Platform Management

Advanced Platform Management is supported via an integrated BMC running IPMI2.0 compliant system management firmware. Several enhancements have been implemented in the standard white box server management code to improve the reliability and serviceability of the system including but not limited to:

- Improved thermal management to cover special scenarios as well as fan degradation / failure
- Chassis intrusion and FRU presence detection
- Redundant BMC and BIOS flashes for maximum reliability
- Fail safe BMC and BIOS upgrades using industry standard HPM.1 mechanisms and tools including automatic rollback on an upgrade failure
- Remote update firmware as long as power is connected to the unit
- BIOS Watchdog for reliable POST process and improved POST code sensor
- Time synchronization between the BMC and x86 host at startup for consistent event logs
- System FRU Information synchronization to the host via standard DMI tables
- Large system event log for efficient troubleshooting
- Capability to log system events from the x86 host
- Enhanced security (more information available under NDA)

For a comprehensive description of Advanced Platform Management features, please directly contact Advantech representative to obtain the FWA-6172 BMC specification.

Additionally, appendix 5.5 offers the FWA-6172 sensor list and information on Threshold-based sensors.

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3.4.6 Power Supply Unit(s)

The FWA-6172 supports 1200W 1+1 redundant PSU. Power-rating and technical specifications for the power supply can be found in Appendix 5.4.

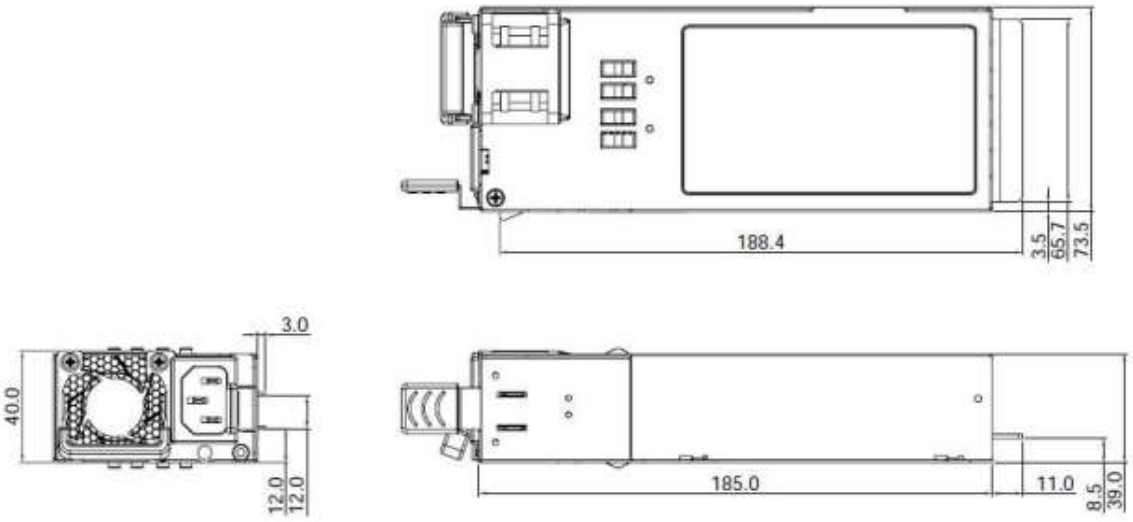

Figure 3.4-1 Redundant Power Supply Unit

Caution!

1. *DO NOT remove the PSU before unplugging the power cable (power cord).*
2. *For 1+1 redundant system power, only ONE PSU is allowed to be extracted at one time.*
3. *DO NOT leave the slot empty when extracting the PSU, the alternative PSU MUST be inserted immediately for safety purpose.*

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3.5 Advanced Platform Features

The FWA-6172 supports intrusion detection by default. Removing or lifting the top cover will trigger an intrusion detection event. The BMC event will remain active even if the top cover is reinstalled. Please login in to the OS to run the following command:

Re-arm Command:

```
# ipmitool raw 0x04 0x2a 0x08 0x80 0x01 0x00 0x01 0x00
```

Event:

Physical Security CASE_INTRUSION | General Chassis intrusion | **Asserted**

After command be executed.

Physical Security CASE_INTRUSION | General Chassis intrusion | **Deasserted**

3.6 Available Accessories and Related Products

The following accessories are available for ordering. Please contact your Advantech representative for a list of available and supported peripherals.

Table 3.6-1 Accessories

Order Number	Description
1702002600	Power cable 3P 180 cm, USA
1702002605	Power cable 3P 180 cm, Europe
1702031801	Power cable 3P 180 cm, UK
1700000237	Power cable 3P 180 cm, JP
1700009652	Power cord 3P 180 cm, China
1930008928	Screws for slide rail installation (Order 10 pieces per system)
968DE00026	Slide rail for post to post dimension 546.9 - 850.9mm
FWA-3050-800WPSU	800W DC Power kit
1700027334-01	USB for RJ45 console cable, 190cm

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4. Configuration and Service

4.1 Jumper Settings

Table 4.1-1 Jumper List

Location	PIN	Function
JP1	1-2 (DEFAULT)	Normal RTC Reset
	2-3	Clear RTC Registers

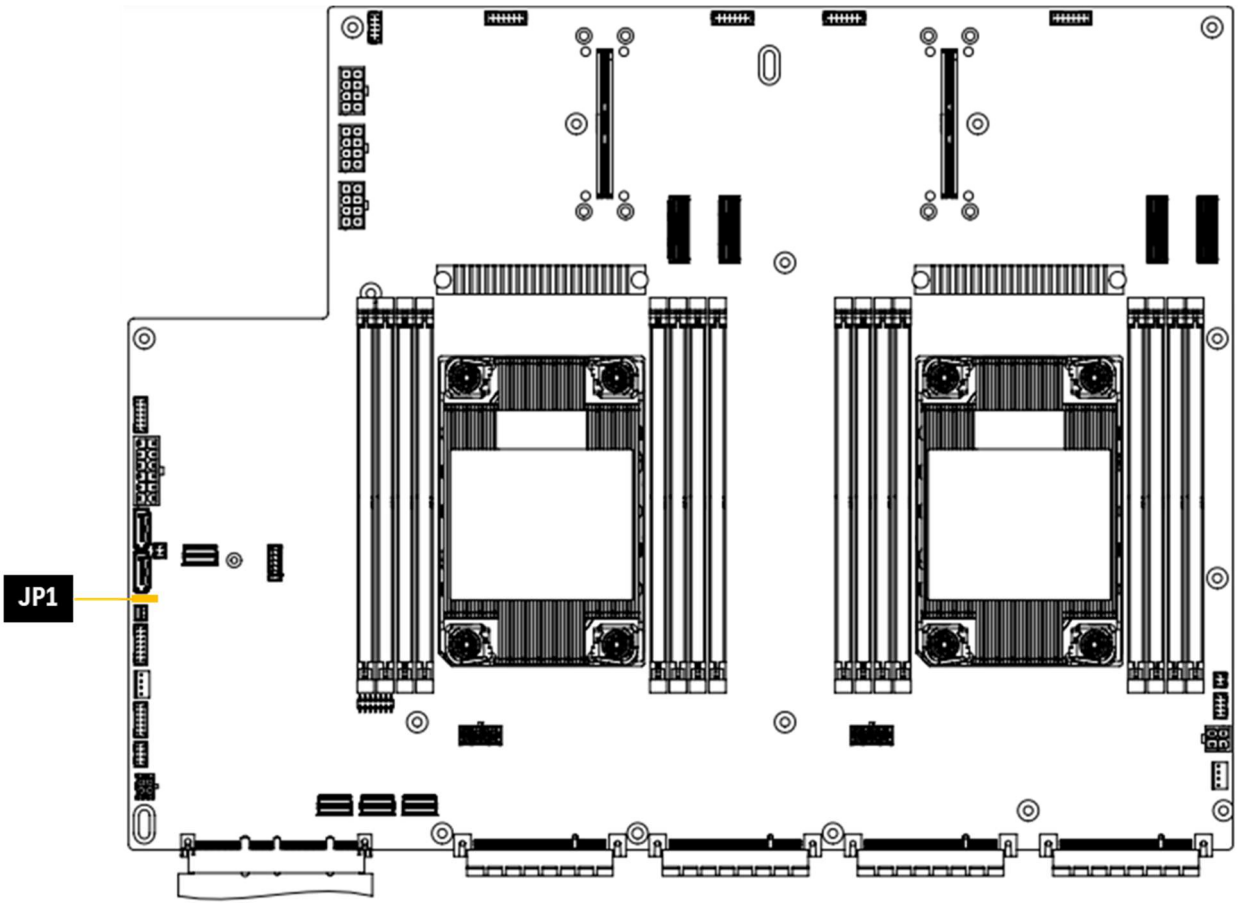

Figure 4.1-1 Jumper Location

4.2 BIOS Setup Menu

4.2.1 BIOS Defaults

The BIOS comes with a set of configuration parameters when shipped by Advantech referred to as “Optimized Defaults” or “factory defaults”. Users have the ability to modify BIOS settings via the setup menu either temporarily or permanently by saving the changes as “User defaults”.

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The BIOS loads Optimized Defaults with the option “Restore Defaults” and loads User defaults with the option “Restore User Defaults”. If no User defaults have been defined, the BIOS will not take any action.

4.2.2 BIOS Setup Menu

This section provides information on the FWA-6172’s UEFI BIOS based on AMI’s APTIO BIOS.

Users can adjust BIOS settings and manage the special features of the FWA-6172 using the BIOS setup menu.

It's important to note that Advantech supports shipping the FWA-6172 with custom BIOS defaults to simplify the deployment and integration for our customers. Please reach out to your Advantech representative for more information about this service.

The BIOS Setup Menu can be accessed through the BIOS POST screen displayed on the console interface:

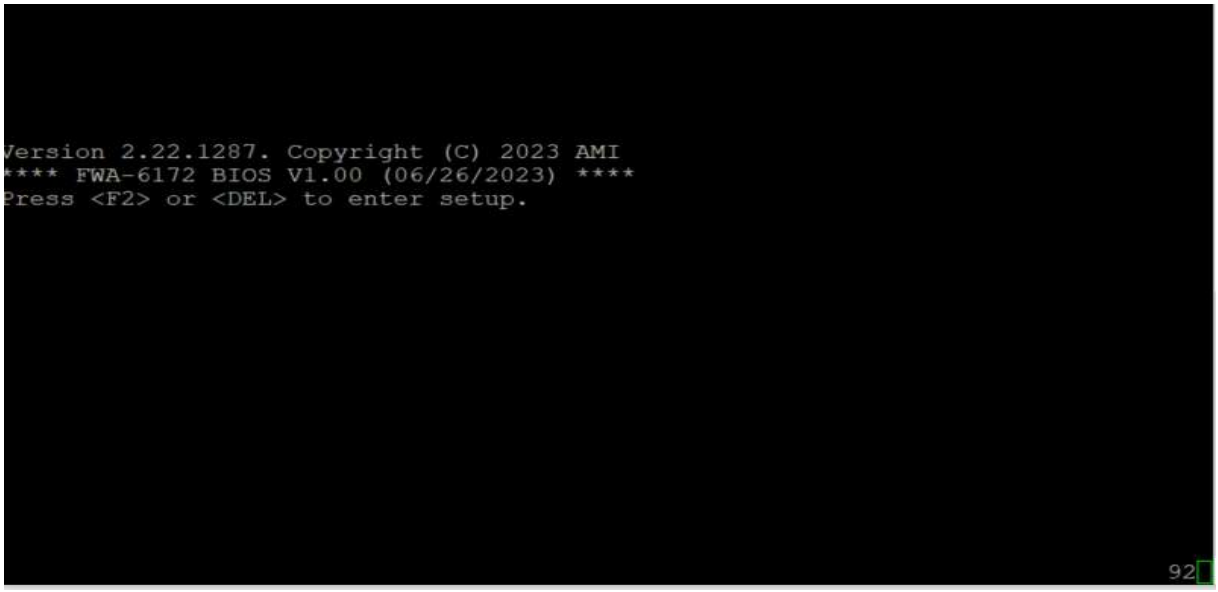

Figure 4.2-1 BIOS POST Screen (Example)

BIOS Setup can be accessed by pressing <DEL> or <F2> keys during POST.

The BIOS setup menu screens consist of several main elements, as illustrated in Figure 4.2-2. The menu bar exhibits selectable menu pages as tabs. The parameter window displays and enables configuration of the settings available in a given MENU PAGE OR A SUBMENU. Auxiliary text providing information about the selected setup item is displayed in the top right corner.

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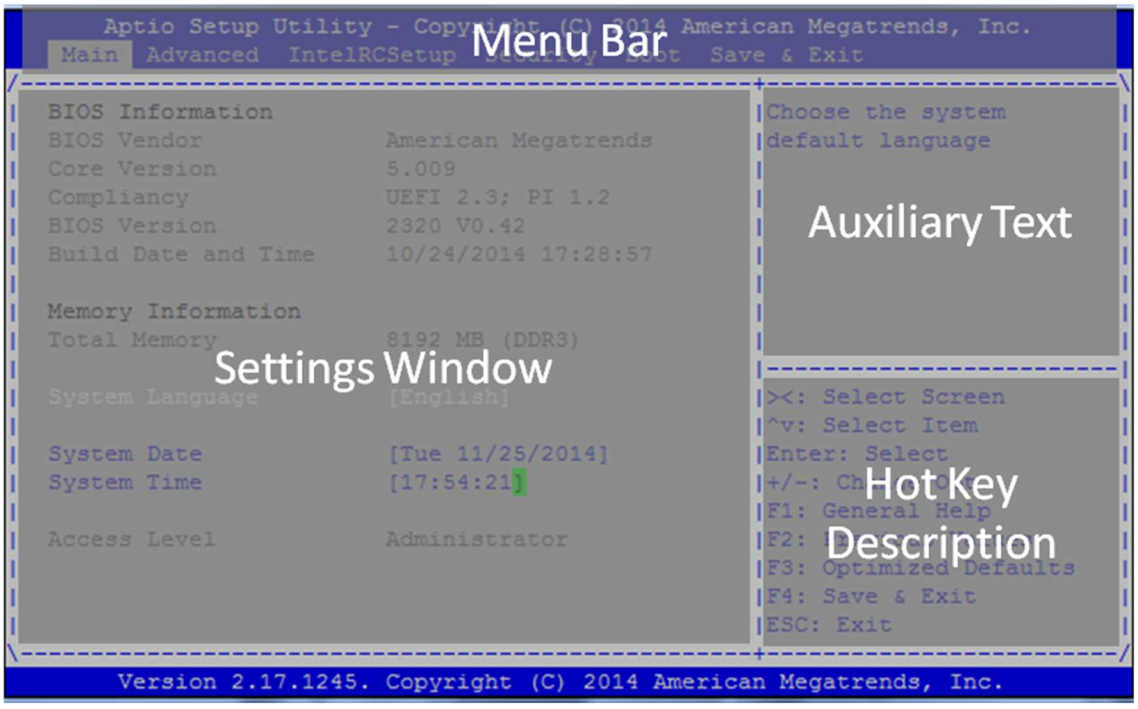

Figure 4.2-2 BIOS Setup Screen Organization

4.2.3 Main Setup Menu

Please refer to the “Common BIOS User Manual” for further guidance.

https://www.advantech.com/zh-tw/support/details/manual?id=1-2F8TKW5

4.2.4 Platform Setup Menu

Here, only "SW Button Configuration" and "SW GPIO Configuration" are described. For additional information, please refer to the "Common BIOS User Manual."

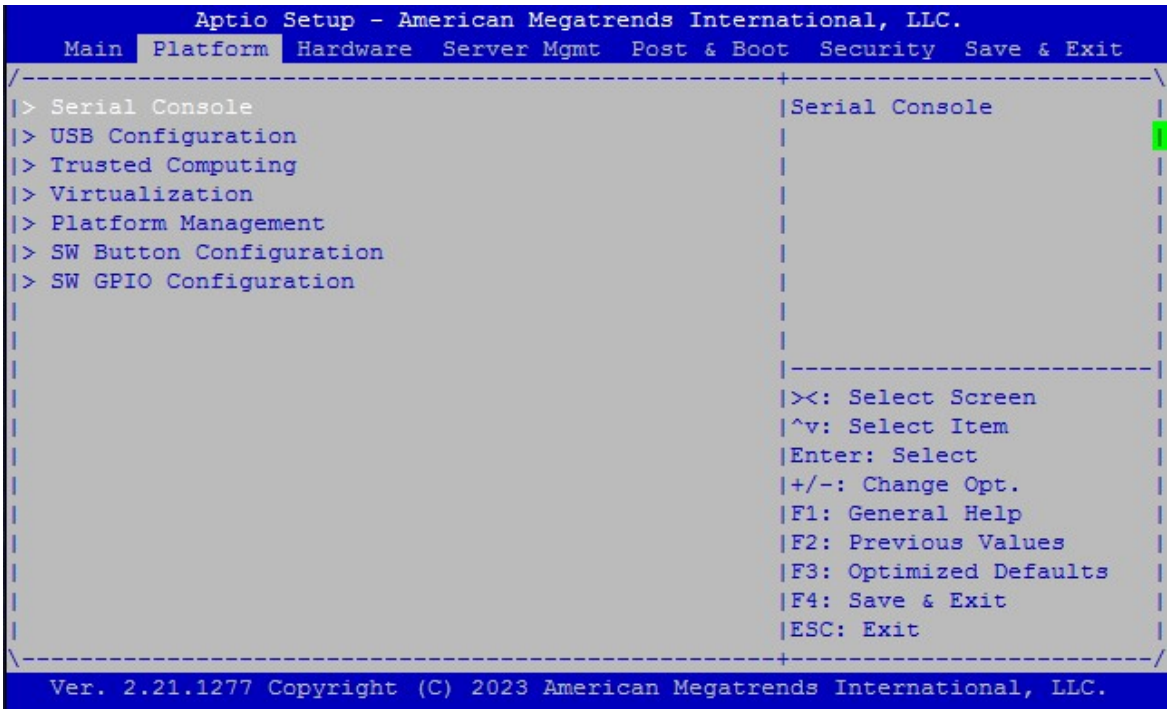

Figure 4.2-3 Platform Setup Main Screen

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4.2.4.1 SW Button Configuration

This submenu enables you to modify the settings used for the SW Button Mode.

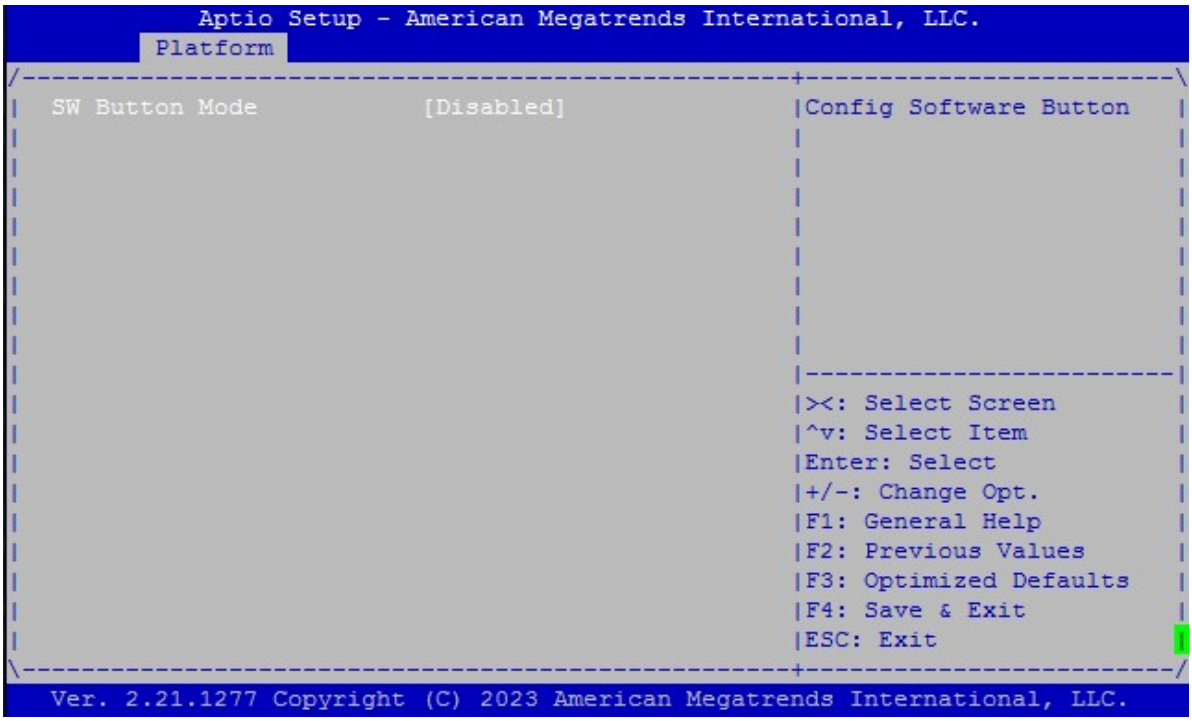

Figure 4.2-4 Platform Setup: SW Button Configuration Menu

The settings for SW Button can be accessed in this menu.

This submenu allows you to modify the settings used for the SW Button. For instance, users can define the SW Button Mode as Sleep Button or other options.

Table 4.2-1 Platform Setup: SW Button Configuration Menu Items

Setup item	Access / Options	Description
SW Button Mode	Sleep Button / Driver / **Disabled**	Set the SW Button as Sleep Button or Driver mode or disable it.

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4.2.4.2 **SW GPIO Configuration**

This submenu enables you to modify the settings used for SW GPIO.

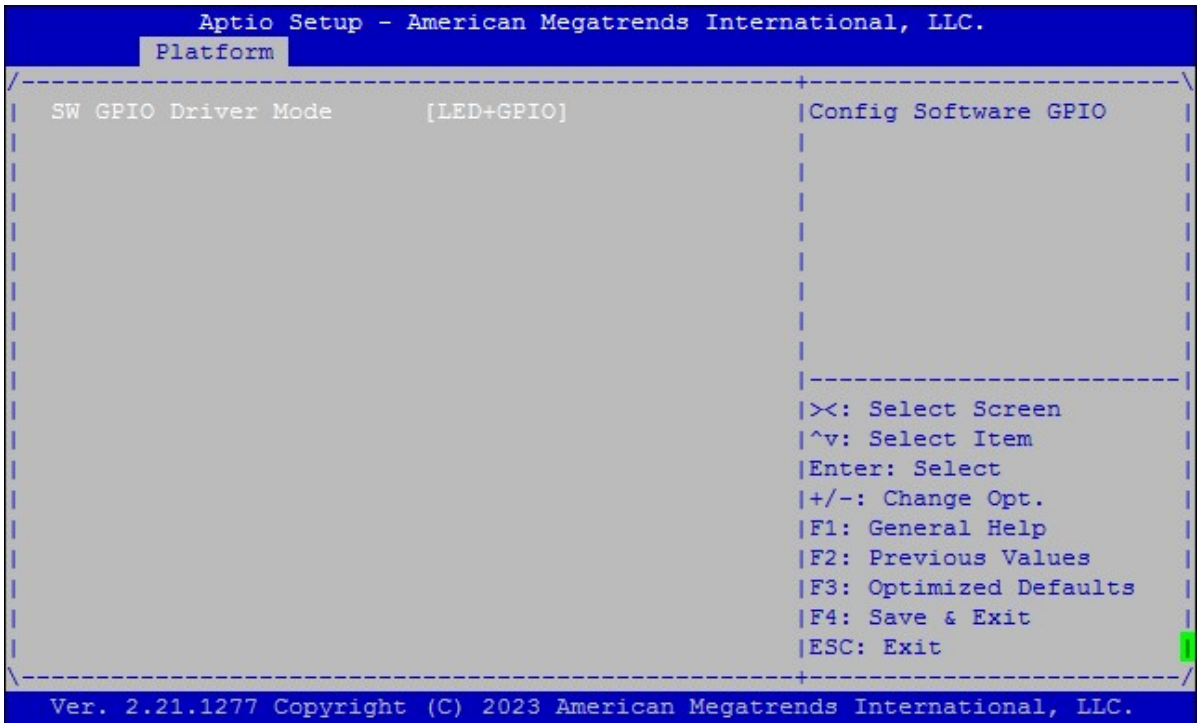

Figure 4.2-5 Platform Setup: SW GPIO Configuration Menu

Table 4.2-2 SW GPIO Configuration Menu

Setup item	Access / Options	Description
SW GPIO Driver Mode	GPIO Only **LED+GPIO**	Set SW GPIO Driver mode to GPIO Only or both LED and GPIO.

4.2.5 Hardware Setup Menu

This submenu enables you to modify the settings of the Intel chipset. It's important to note that "chipset" is a legacy term, and the related functionality is divided between the CPU and PCH portions. Similarly, the terms "South Bridge" and "North Bridge" are legacy terms and do not represent the silicon implementation anymore. However, these terms are maintained for consistency with previous products to facilitate easier navigation for users.

The submenus are described on the following pages.

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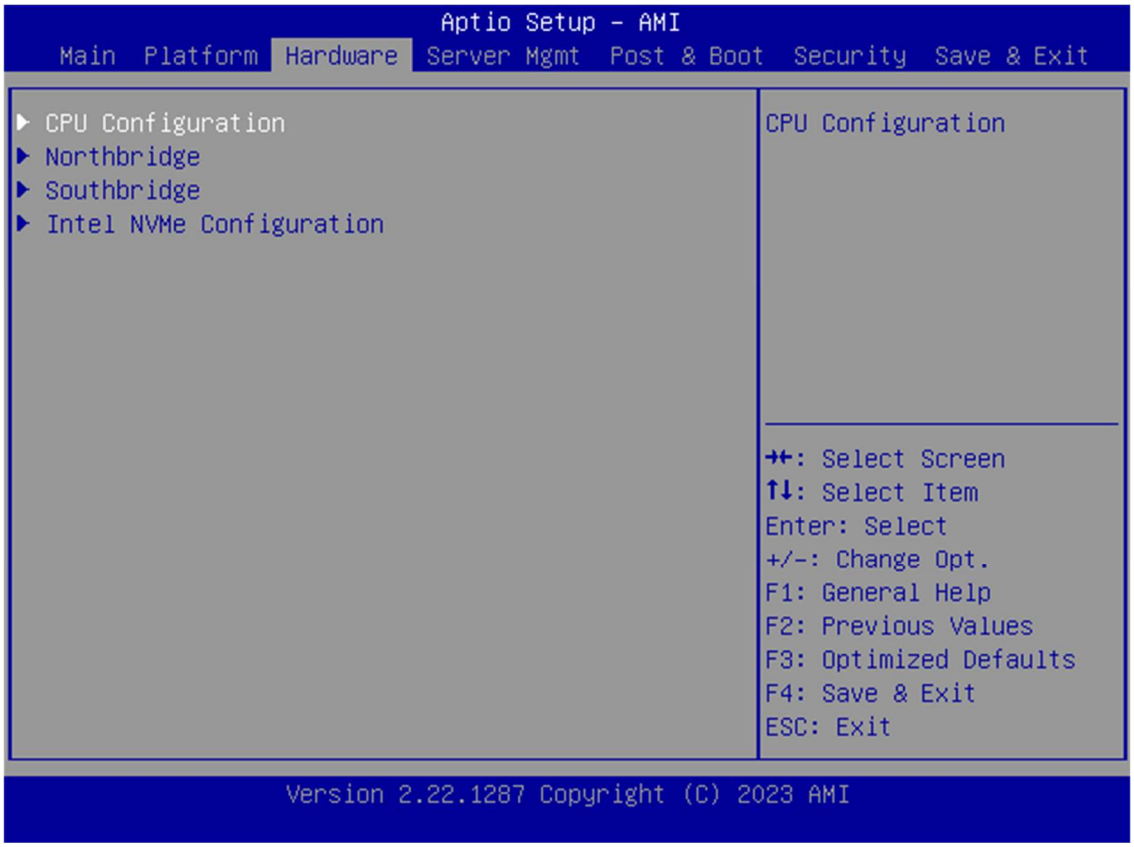

Figure 4.2-6 Hardware Configuration Menu

4.2.5.1 Hardware Setup: CPU Configuration

This menu provides an example of Eagle Stream CPU configuration.

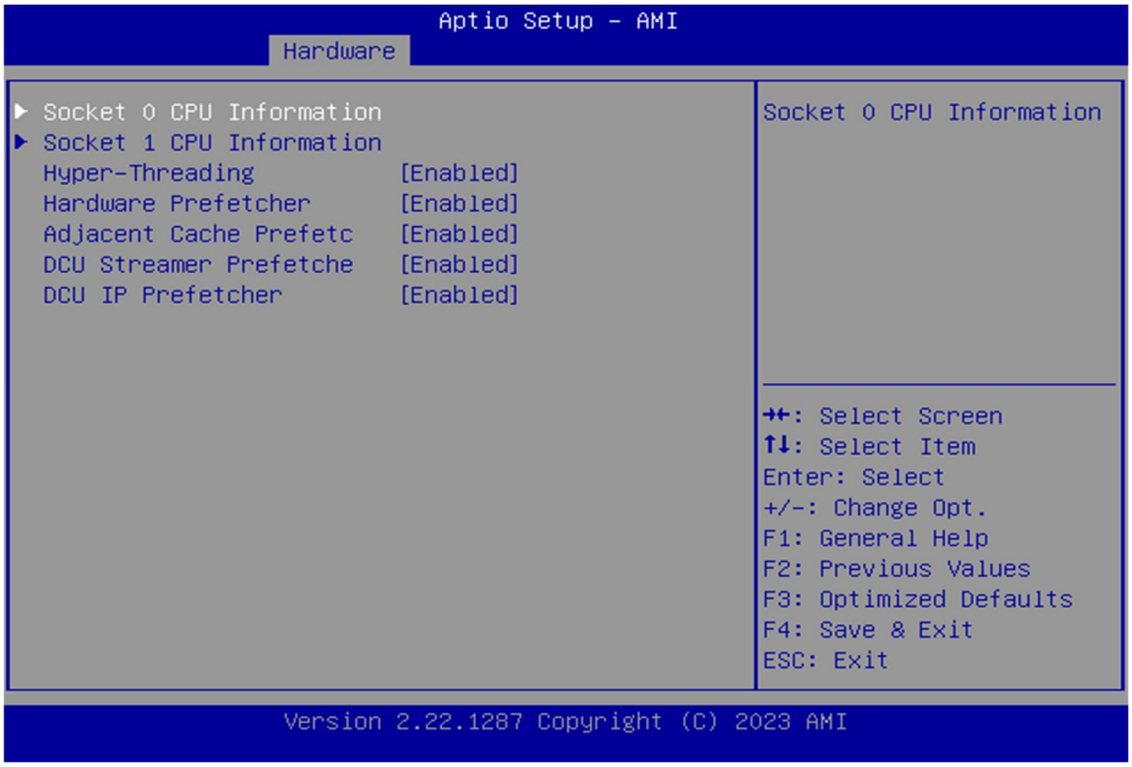

Figure 4.2-7 Chipset: Processor Configuration Menu

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Table 4.2-3 CPU configuration

Group	Setup item	Access / Options	Description
Socket0/1 CPU information	CPU signature	Display only	Displays information on the processor installed
	Microcode Patch		
	CPU Frequency		
	Processor Cores		
	Intel VT-x Technology		
	L1 code Cache		
	L2 Cache		
	L3 Cache		
Hardware	Hyper-Threading	Enable Disable	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
	Hardware Prefetcher	Enable Disable	Enable or disable Hardware Prefetcher feature. = MLC Streamer Prefetcher (MSR 1A4h Bit[0])
	Adjacent Cache Prefetch	Enable Disable	Enable or disable Adjacent Cache Prefetch feature. = MLC Spatial Prefetcher (MSR 1A4h Bit[1])
	DCU Streamer Prefetch	Enable Disable	Enable or disable DCU Streamer Prefetcher feature. DCU streamer prefetcher is an L1 data cache prefetcher (MSR 1A4h [2]).
	DCU IP Prefetcher	Enable Disable	Enable or disable DCU IP Prefetcher feature. DCU IP prefetcher is an L1 data cache prefetcher (MSR 1A4h [3]).

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4.2.5.2 **Hardware Setup: North Bridge Configuration**

This menu facilitates the configuration of the memory controller and related features of the processors.

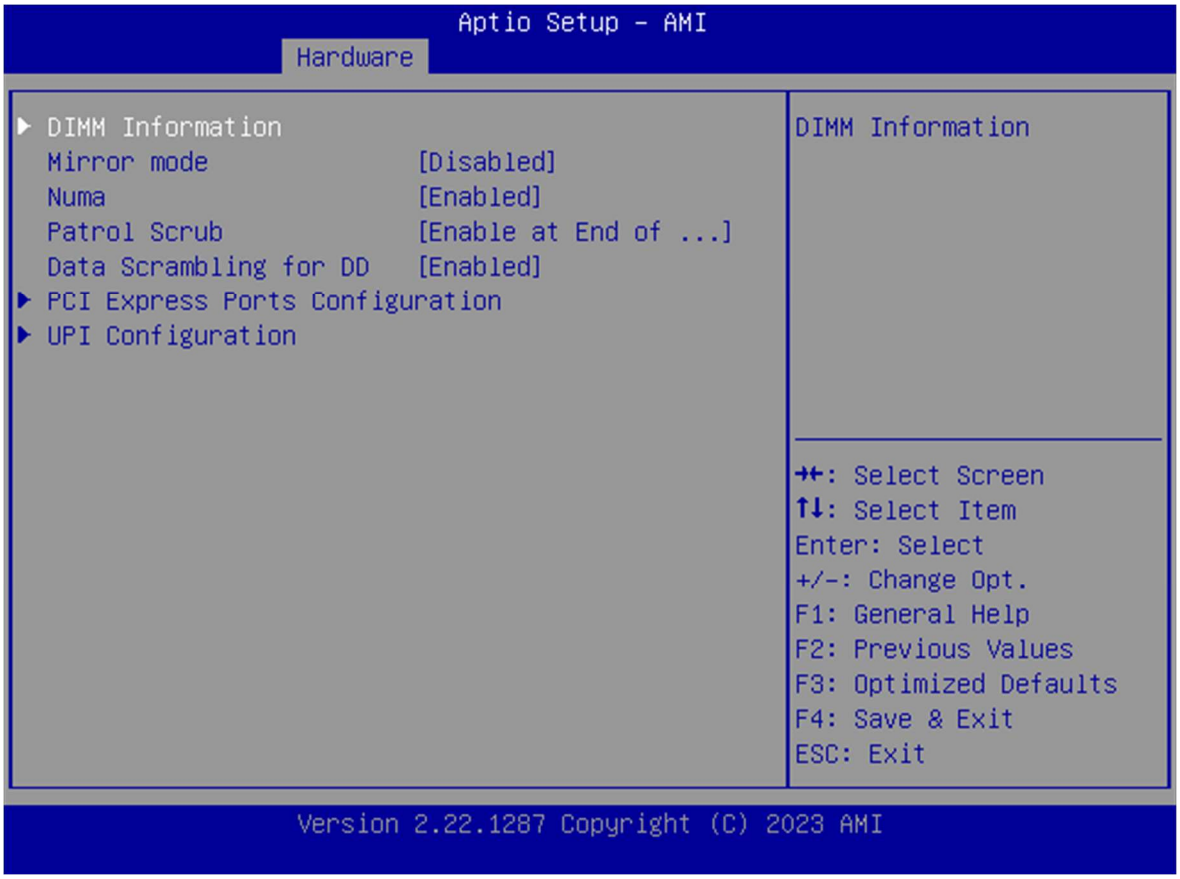

Figure 4.2-8 North Bridge Configuration Menu

Table 4.2-4 North Bridge Configuration Menu

Group	Setup item	Access / Options	Description
DIMM Information	DIMM Information	Display only	Displays information.
	Mirror mode	Disable Full Mirror Mode	Full Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Partial Mirror Mode will enable the required size of memory to be mirrored. If rank sparing is enabled partial mirroring will not take effect. Enabling any type of Mirror Mode will disable XPT Prefetch."
	Numa	Enable Disable	Enable or Disable Non uniform Memory Access (NUMA).

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Group	Setup item	Access / Options	Description
	Patrol Scrub	Enable Disable Enable at End of POST	Select to enable / disable Patrol Scrub Support
	Data Scrambling for DDR4/5	Enable Disable	Select to auto to enable the Scrambler

4.2.5.3 **Hardware Setup: South Bridge Configuration**

This menu contains settings for the South Bridge, including related SATA, USB, ACPI settings, etc.

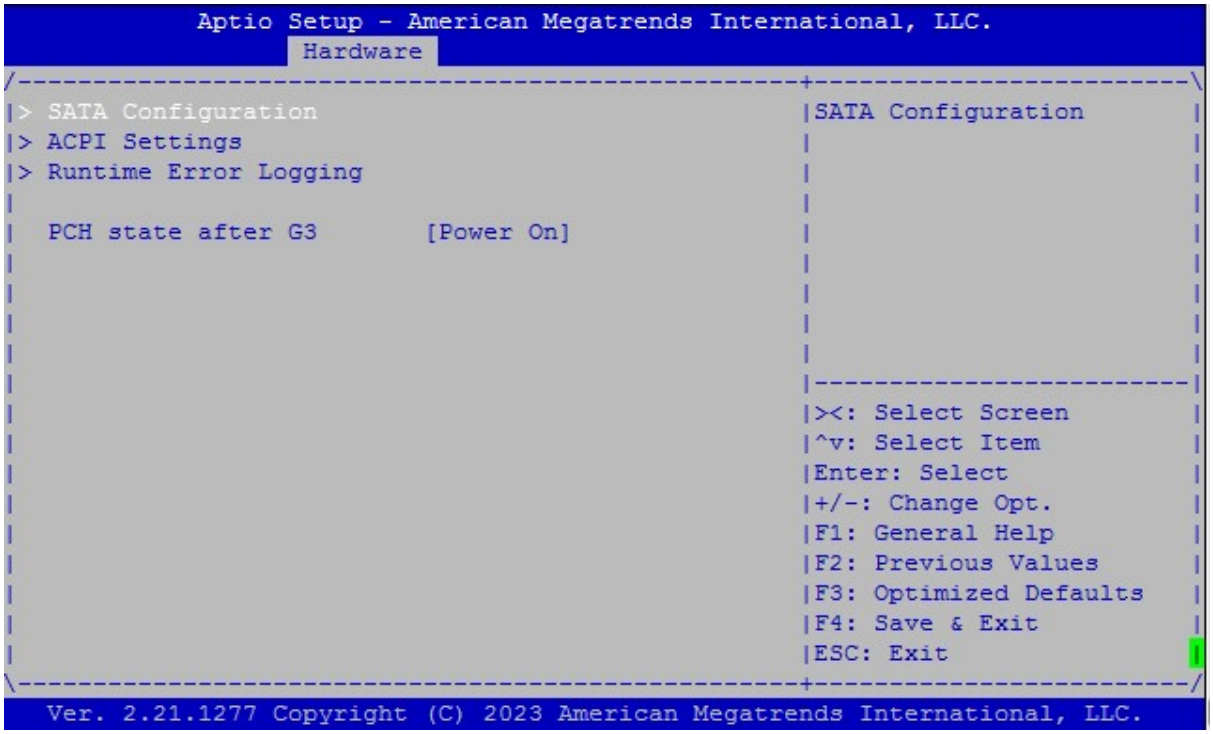

Figure 4.2-9 Hardware Setup: South Bridge Configuration

Table 4.2-5 Hardware Setup: South Bridge Configuration Menu Items

Group	Setup item	Access / Options	Description
Hardware	SATA Configuration	N/A	Select sub-menu.
	ACPI Settings	N/A	Select sub-menu.
	Runtime Error Logging	N/A	Select sub-menu.

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Group	Setup item	Access / Options	Description
	PCH state after G3	Power on/Power Off/Last State	Select S0/S5 for ACPI state after a G3

4.2.5.3.1 South Bridge Configuration: SATA Configuration

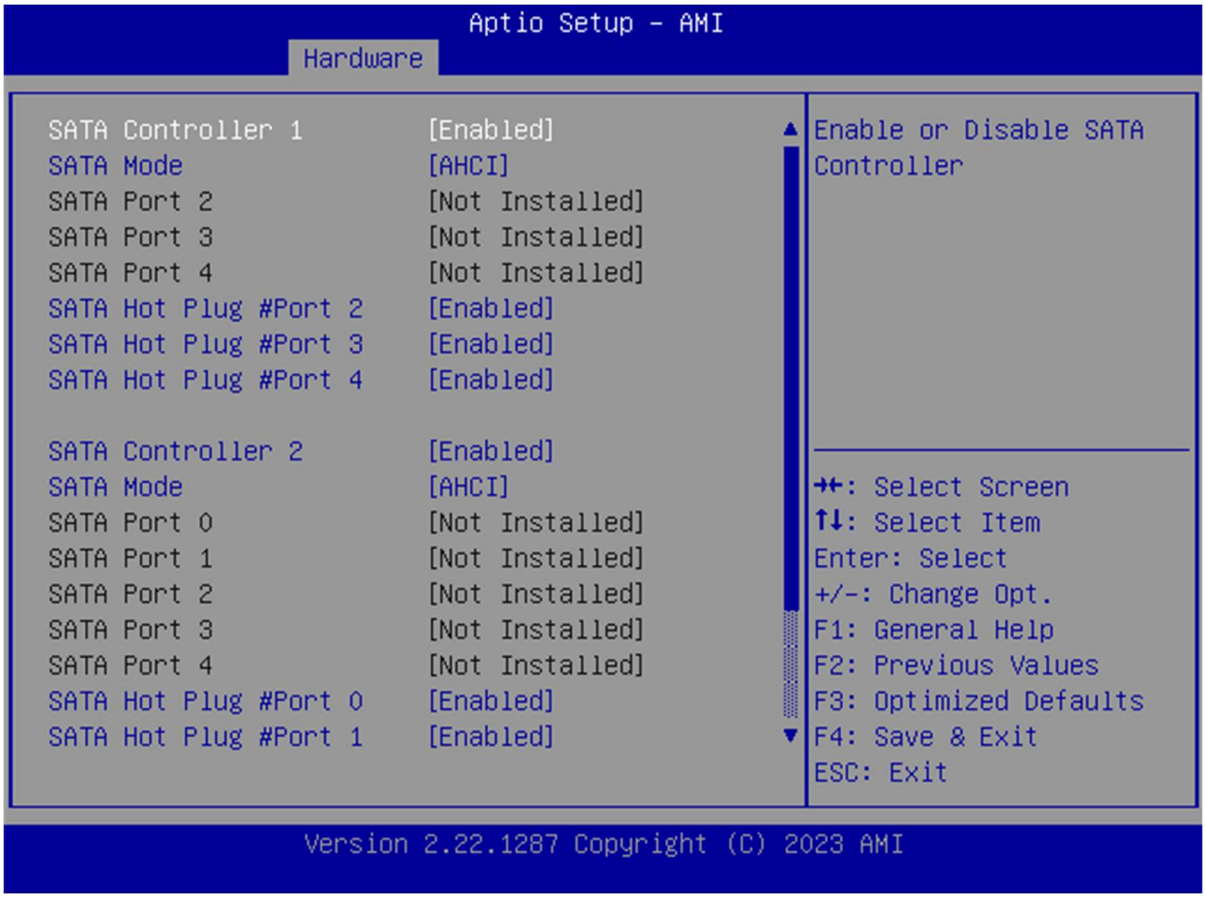

Figure 4.2-10 Hardware Setup: SATA Configuration

Table 4.2-6 Hardware Setup: SATA configuration Menu Items

Feature	Default	Description
SATA Controller 1	Enabled Disabled	To enable the SATA controller
SATA Mode	AHCI RAID	This will configure SATA as RAID or AHCI
SATA Port 2	Display only	Show current SATA devices in use on the FWA-6172
SATA Port 3	Display only	
SATA Port 4	Display only	

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SATA Hot Plug #Port 2	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 3	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 4	Enabled Disabled	Designates this port as Hot Pluggable
SATA Controller 2	Enabled Disabled	To enable the SATA controller
SATA Mode	AHCI RAID	This will configure SATA as RAID or AHCI
SATA Port 0	Display only	Show current SATA devices in use on the FWA-6172
SATA Port 1	Display only	
SATA Port 2	Display only	
SATA Port 3	Display only	
SATA Port 4	Display only	
SATA Hot Plug #Port 0	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 1	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 2	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 3	Enabled Disabled	Designates this port as Hot Pluggable
SATA Hot Plug #Port 4	Enabled Disabled	Designates this port as Hot Pluggable

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4.2.5.4 **ACPI Setting**

This menu contains settings for the ACPI configuration.

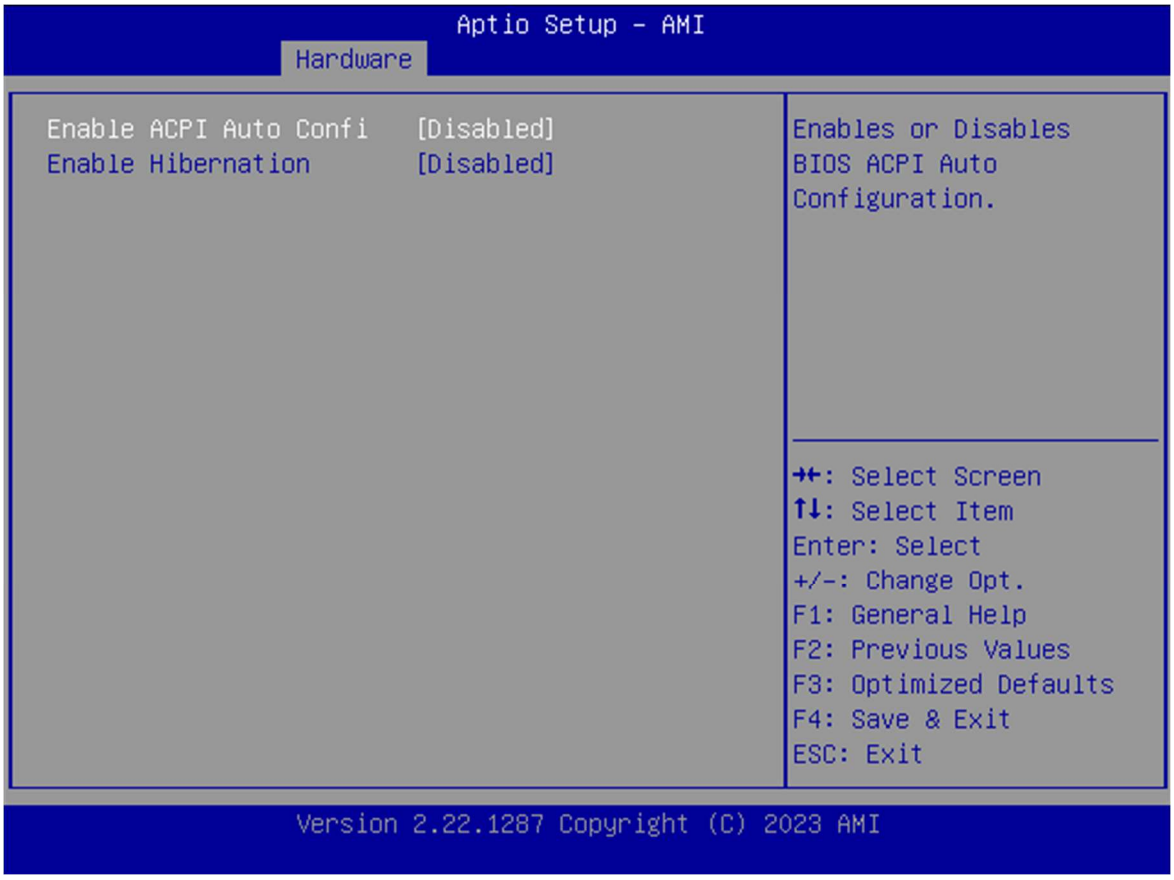

Figure 4.2-11 Hardware Setup: ACPI Configuration

Table 4.2-7 Hardware Setup: ACPI Configuration Menu Items

Group	Setup item	Access / Options	Description
ACPI Settings	Enable ACPI Auto Configuration	Enabled Disabled	Enable or disable BIOS ACPI auto configuration

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4.2.5.5 **Runtime Error Logging**

This submenu contains settings for the Runtime error logging configuration.

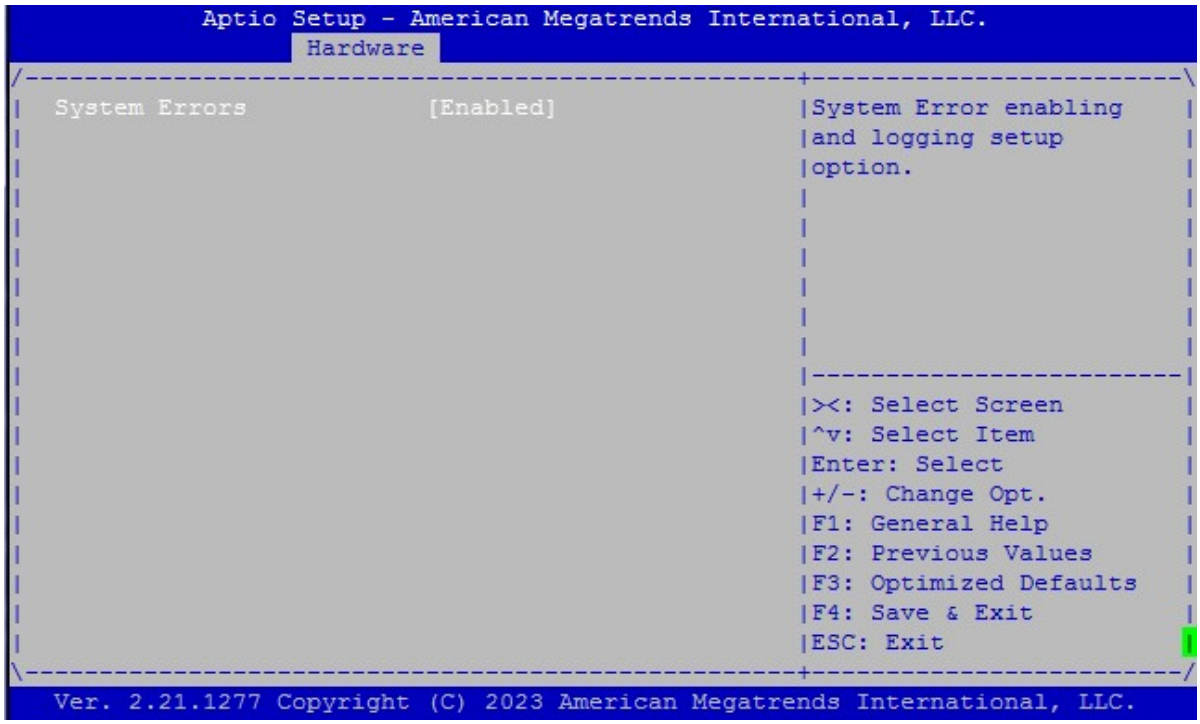

Figure 4.2-12 Hardware Setup: Runtime Error Logging Configuration

Table 4.2-8 Hardware Setup: Runtime Error Logging Menu Items

Group	Setup item	Access / Options	Description
Runtime Error Logging	System Errors	Enabled Disabled Auto	System error enabling and logging setup option

4.2.6 Server Mgmt Setup Menu

The Server MGMT menu supports the configuration of BMC-related features, such as the OS Watchdog Timer, etc. For further details, please refer to the “Common BIOS User Manual”.

4.2.7 Setup POST & Boot Menu

Users can configure the system boot priority settings via the boot page.

Please reference “Common BIOS User Manual”. (Note: FWA-6172 supports UEFI mode only; there is no legacy mode. CSM is not supported in FWA-6172 series)

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4.2.8 Security Setup

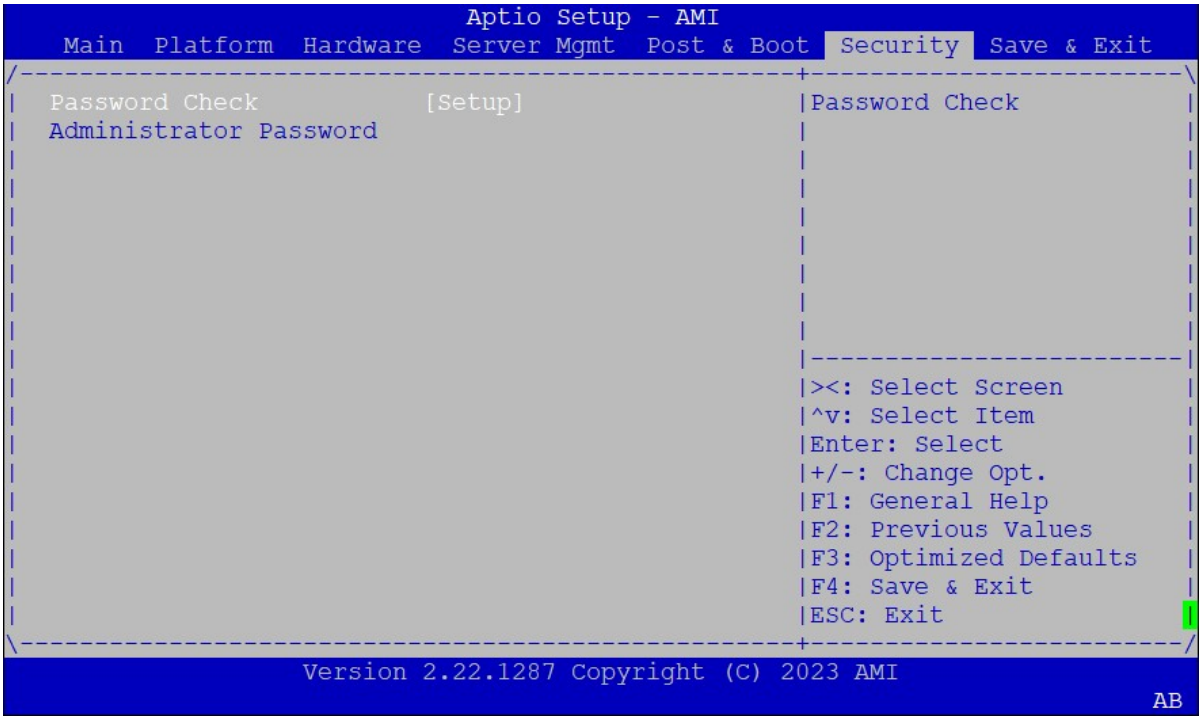

Figure 4.2-13 Security

Allows users to configure the system password.

Please refer to the “Common BIOS User Manual”.

4.2.9 Save & Exit Menu

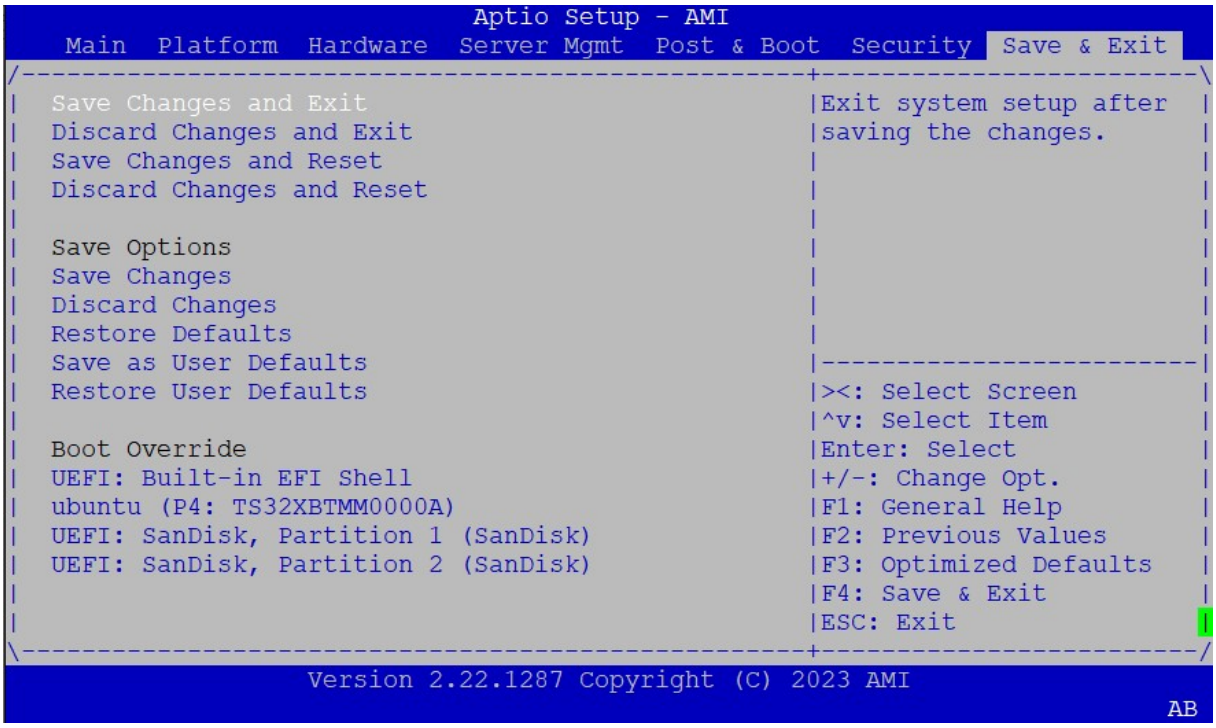

Figure 4.2-14 Save & Exit

Allows users to save BIOS configuration results and exit.

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Please refer to the “Common BIOS User Manual”.

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4.3 Firmware Upgrades

The FWA-6172 is equipped with BMC (Baseboard Management Controller) functionality. Firmware upgrades can be performed through BMC. First, you need to set the BMC IP address. The firmware can be upgraded using either the BMC Web interface or the ipmitool utility. Here are the instructions:

4.3.1 BMC Network Configuration

Configure the BMC's IP as desired (by default, it is set as a static address 0.0.0.0).

First, please refer to Section 3.2 introduction and Figure 3.2-1 system front panel to confirm the location of the IPMI port.

1. During the boot process, press DEL (or F2) to enter BIOS, select "**Server Mgmt page".**

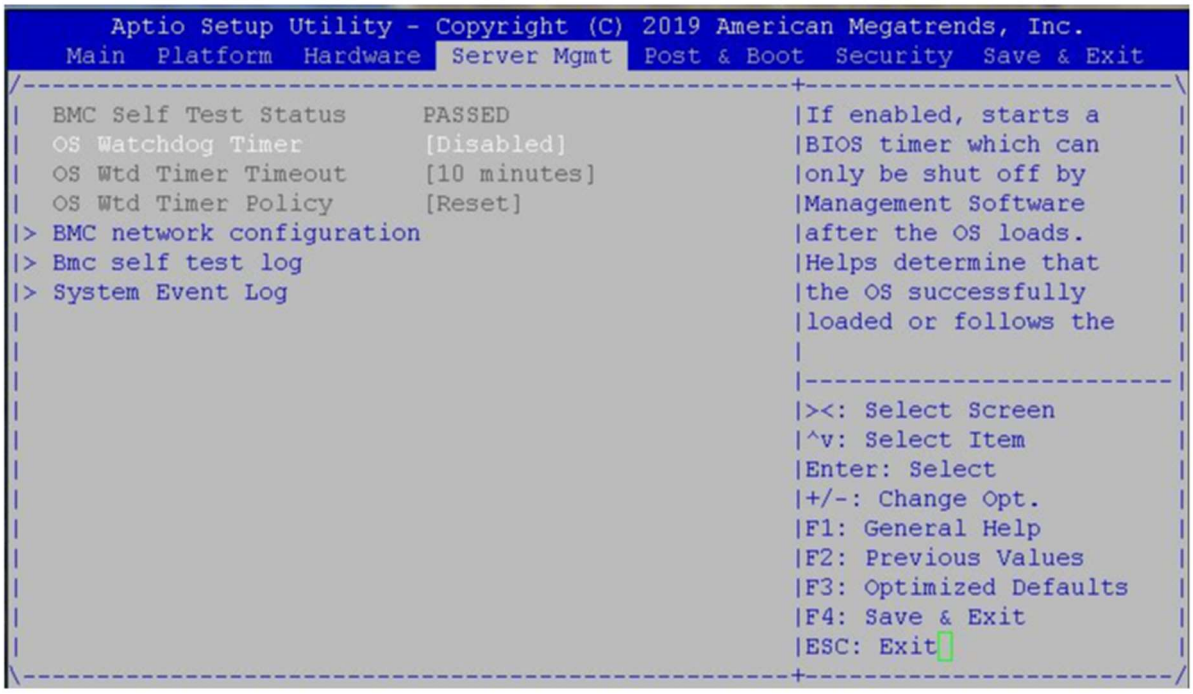

Figure 4.3-1 Server Mgmt

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2. Choose "BMC network configuration".

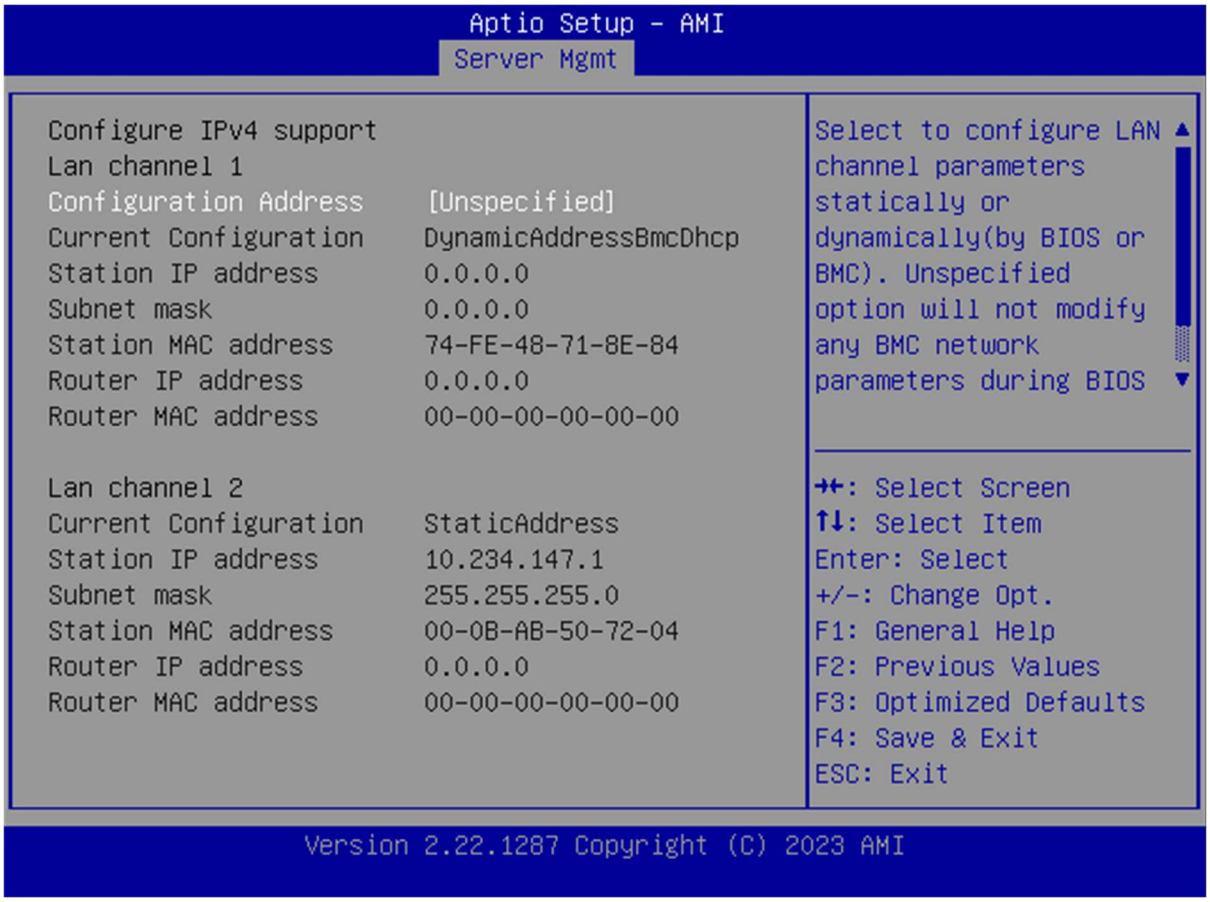

Figure 4.3-2 BMC network configuration

3. Set "Configuration Address" to "Static", and then enter the IP address, subnet mask, gateway and other relevant network information.

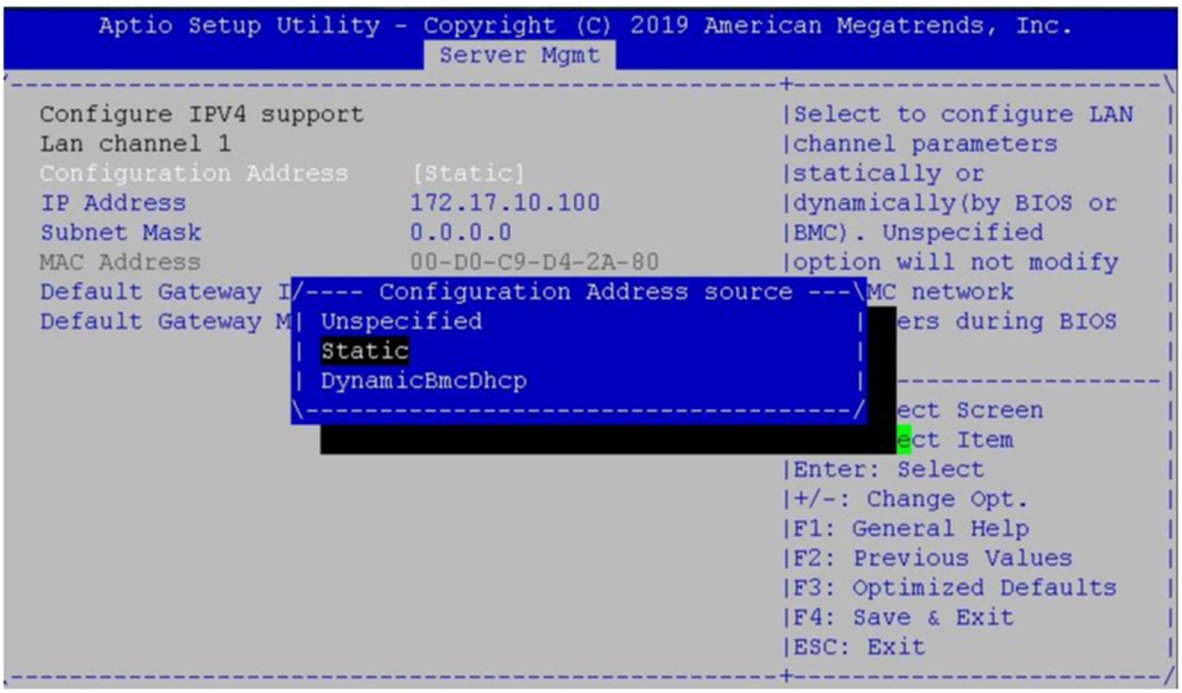

Figure 4.3-3 Configuration Address

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PS: Set "**Configuration Address" to "DHCP**" if obtaining an IP address from the DHCP server.

4.3.2 How to Upgrade the Firmware via BMC WEB (Node Explorer)?

For more details, please refer to the “Node Explorer User Manual (Section 2 & 3.4.4)”.

https://www.advantech.com/en/support/details/manual?id=1-1MU1KB1

4.3.3 How to Upgrade the Firmware via IPMI?

For more details, please refer to the “Common IPMI User Manual (Section 3)”.

https://www.advantech.com/zh-tw/support/details/manual?id=1-2FZXUHT

4.4 DIMMs Population

With regard to memory insertion order, please refer to Section 3.2.3 for better efficiency and performance.

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5.1 Connector and Pinout Information

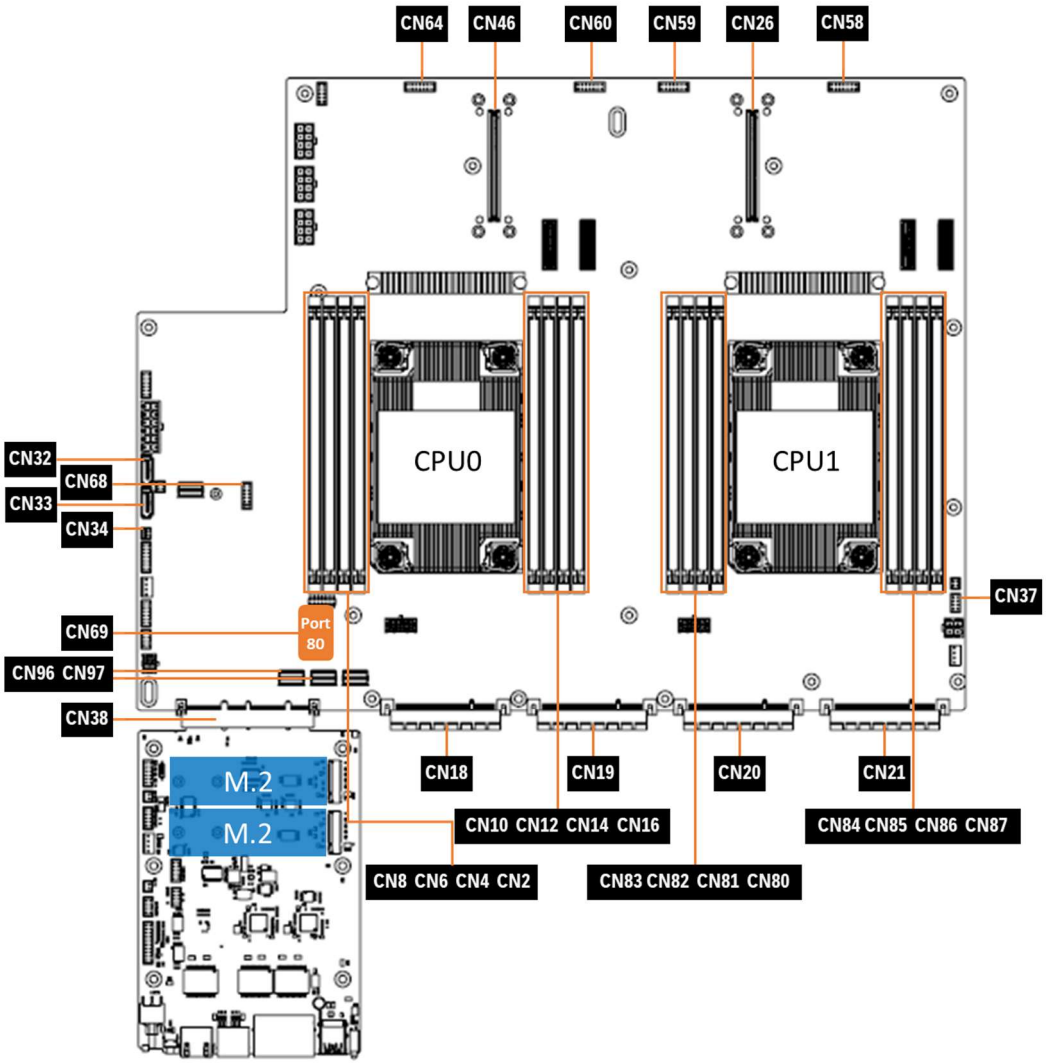

Figure 5.1-1 Connector Location

Table 5.1-1 Connector List

Connector Name	Function
CN2, CN4, CN6, CN8, CN10, CN12, CN14, CN16 CN80, CN81, CN82, CN83, CN84, CN85, CN86, CN87	DDR5 DIMM Socket
CN18, CN19, CN20, CN21	PCIe Gen5 x8 Straddle Connector for Advantech NMC
CN38	GenZ 4C+ Connector for Management Board
CN58	FAN Connector #1
CN59	FAN Connector #2
CN60	FAN Connector #3
CN64	FAN Connector #4

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Connector Name	Function
CN69	80-port Connector reserved for Advantech Service
CN46	GenZ 4C Connector with Gen5 x16 Signal from CPU0
CN26	GenZ 4C Connector with Gen5 x16 Signal from CPU1
CN34	Chassis Intrusion Connector
CN96, CN97	SlimSAS x4 connector for 2.5” NVMe
CN32, CN33	SATA 7P Connector
CN37	POE connector
CN68	TPM module connector

5.2 Serial Console Cable Pin Configuration

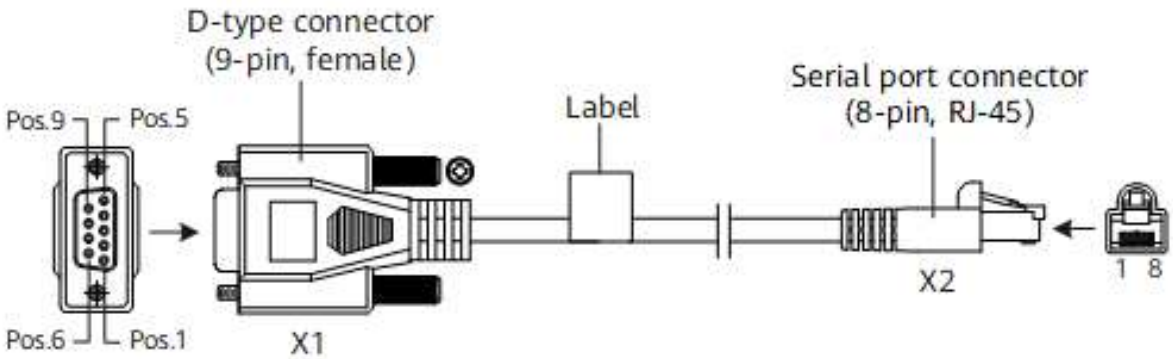

Figure 5.2-1 Serial Console Cable Overview

Table 5.2-1 Serial Console Cable Pin Assignment

Connector	X1 (DB9)	X2(RJ45)
Pin assignment	**2**	3
	3	6
	5	5

5.3 BIOS Post Code

Please refer to the BIOS POST Codes Table in the document linked below:

https://www.advantech.com/zh-tw/support/details/manual?id=1-2F8TKW5

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5.4 Power Supply Specification

The FWA-6172 is available with a redundant power supply solution. The specifications for the available power supply on the standard product SKU are listed below. Please consult your Advantech representative if you have further questions.

Table 5.4-1 1200W AC Power Supply Specification

Item	Specification	Comment / Conditions
Input Voltage	Rated: 100Vrms-240Vrms AC @ 50/60Hz Min/Max: 90Vrms-264V rms AC @ 47Hz-63Hz	
Rating	1200W	
Input Current	14A~5.2A	
Inrush Current	Shall not exceed 35A peak shall be less than the ratings of its critical components (including input fuse, bulk rectifiers, and surge limiting device)	
Efficiency	90% @ 20% load (12V is 19.4A,12vsb is 0.6A) 94% @ 50% load (12V is 48.5A,12vsb is 1.5A) 91% @ 100% load (12V is 97A,12vsb is 3A)	
MTBF	250,000 hours at 75% load and 55°C	calculated by Telcordia SR-332 Issues 2
Environment	Temperature: - Operation[Normal]: 0-55°C (Max at 5000m above sea level) - Operation[Stand-by]: -5-55°C (Max at 5000m above sea level) - Non-Operation: -40-70°C	
	Humidity: - Operation: 5~90%RH - Non-Operation: 5~95%RH storage.	
	Altitude: - Operation: sea level to 5000m - Non-Operation: sea level to 15000m	
	Vibration: - Operating, 0.01g2/Hz at 5Hz slopping to 0.02g2/Hz at 20Hz, and maintaining 0.02g2/Hz from 20Hz ~ 500H	PSD=3.13grms, 20 minutes/axis Force Direction X, Y, Z

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Item	Specification	Comment / Conditions
Regulatory/ Certifications	Safety: - UL 62368-1/CSA 62368-1 Edition 2 - EN62368-1 Edition 2 (Europe) - IEC62368-1 Edition 2 (International) - CB Certificate & Report, IEC62368-1 Edition 2 (report to include all country national deviations) - CE – Low Voltage Directive 2006/95/EC (Europe) - GB4943-CBCA Certification (China) EMC: - FCC / ICES-003 Emission (USA/Canada) Verification - CRISP 22 – Emission (International) - EN55032 – Emission (Europe) - EN55024 – Immunity (Europe) EN61000-4-2; EN61000-4-3; EN61000-4-4; EN61000-4-5; EN61000-4-6; EN61000-4-8; EN61000-4-11; - EN61000-3-2 – Harmonics (Europe) - EN61000-3-3 – Voltage Flicker (Europe) - CE – EMC Directive 2004/108/EEC (Europe) - JEIDA (Japan) - AS/NZS CISPR 22 (Australia / New Zealand) - GB 9254 2008 (EMC) Certification (China) - GB 17625.1 – (Harmonics) CNCA Certification (China)	Class A Compliance
Protection	Input brown out Input surge Input transient Output over voltage Output over current & short circuit Thermal Fan failure	

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5.5 Sensors

The BMC uses Sensor Data Records (SDRs) to describe the sensors and their capabilities.

5.5.1 Sensor List

The following table lists the sensors provided by the BMC:

Table 5.5-1 BMC Sensor List

No	Sensor ID	Sensor Type	Event Reading Type	Entity ID	Payld. Power only?	Description
0	FWA-6172	-	-		-	IPMI Mgmt. Contr. Device Locator
1	BMC_HEALTH	28h	6Fh	07h	-	IPMI Mgmt. Subsystem Health
2	VERSION_CHANGE	2Bh	6Fh	07h	-	IPMI Version Change sensor
3	BMC_WATCHDOG	23h	6Fh	07h	-	IPMI BMC Watchdog sensor
4	ACPI_STATE	22h	6Fh	07h	-	IPMI System ACPI Power State
5	PROC_STATE	07h	6Fh	03h	-	IPMI Processor sensor
6	SYSTEM_RESET	1Dh	6Fh	07h	-	Payload system reset indication
7	FW_PROGRESS	0Fh	6Fh	07h	-	IPMI System FW Progress sensor
8	CASE_INTRUSION	05h	6Fh	17h	-	IPMI Physical Security sensor
9	SESSION_AUDIT	2Ah	6Fh	07h	-	IPMI Session Audit sensor
10	C0_DIMM_A1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
11	C0_DIMM_B1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
12	C0_DIMM_C1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
13	C0_DIMM_D1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
14	C0_DIMM_E1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
15	C0_DIMM_F1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
16	C0_DIMM_G1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
17	C0_DIMM_H1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
18	C1_DIMM_I1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
19	C1_DIMM_J1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor

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20	C1_DIMM_K1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
21	C1_DIMM_L1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
22	C1_DIMM_M1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
23	C1_DIMM_N1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
24	C1_DIMM_O1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
25	C1_DIMM_P1_PRSNT	0Ch	08h	20h	-	DIMM module presence sensor
26	PCIE_CR_INT	13h	06h	31h	-	IPMI Critical Interrupt sensor
27	POWER_GOOD	08h	6Fh	07h	-	IPMI Power Good sensor (MB voltage)
28	POWER_OFF	12h	0Ah	07h	-	DCMI Power Off Event sensor
29	THERMAL_LIMIT	01h	05h	37h	-	DCMI Thermal Limit Event sensor
30	POWER_LIMIT	09h	05h	13h	-	DCMI Power Threshold Event sensor
31	SYSTEM_EVENT_LOG	10h	6Fh	07h	-	IPMI Event Logging Disabled sensor
32	INTEGRITY	C0h	70h	07h	-	Advantech Integrity OEM sensor
33	BIOS_POST	0Fh	70h	22h	-	BIOS POST Code OEM sensor
34	BOARD-POWER	0Bh	01h	07h	-	Board Power Consumption sensor
35	CONFIG_MODE	C0h	03h	07h	-	BMC Configuration Mode OEM sensor
36	PAY_12-VOL	02h	01h	14h	Yes	Payload Power voltage 12V
37	SB_12-VOL	02h	01h	14h	No	Standby Power voltage 12V
38	PAY_5-VOL	02h	01h	14h	Yes	Payload Power voltage 5V
39	SB_5-VOL	02h	01h	14h	No	Standby Power voltage 5V
40	PAY_3_3-VOL	02h	01h	14h	Yes	Payload Power voltage 3.3V
41	SB_3_3-VOL	02h	01h	14h	No	Standby Power voltage 3.3V
42	SB_3_3_PCH-VOL	02h	01h	14h	Yes	Standby PCH voltage 3.3V
43	BAT_3_0-VOL	02h	01h	14h	No	Battery Backup voltage 3.3V
44	PAY_3_3_EXT-VOL	02h	01h	14h	Yes	Payload Power voltage 3.3V
45	C0_PVCCIN-VOL	02h	01h	14h	Yes	CPU PVCCIN voltage 1.83V
46	C1_PVCCIN-VOL	02h	01h	14h	Yes	CPU PVCCIN voltage 1.83V
47	C0_PVCC_FIVR-VOL	02h	01h	03h	Yes	CPU PVCCFA_EHV_FIVRA voltage 1.8V

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48	C1_PVCC_FIVR-VOL	02h	01h	03h	Yes	CPU PVCCFA_EHV_FIVRA voltage 1.8V
49	C0_PVCC_EHV-VOL	02h	01h	03h	Yes	CPU PVCCFA_EHV voltage 1.8V
50	C1_PVCC_EHV-VOL	02h	01h	03h	Yes	CPU PVCCFA_EHV voltage 1.8V
51	SB_1_8_PCH-VOL	02h	01h	14h	Yes	Standby PCH voltage 1.8V
52	C0_PVCCD_HV-VOL	02h	01h	14h	No	CPU PVCCD voltage 1.1V
53	C1_PVCCD_HV-VOL	02h	01h	14h	Yes	CPU PVCCD voltage 1.1V
54	SB_1_05_PCH-VOL	02h	01h	14h	Yes	Standby PCH voltage 1.05V
55	C0_PVCCNFAON-VOL	02h	01h	03h	Yes	CPU PVCCINFAON voltage 1.0V
56	C1_PVCCNFAON-VOL	02h	01h	03h	Yes	CPU PVCCINFAON voltage 1.0V
57	C0_PVCCVNN-VOL	02h	01h	03h	Yes	CPU VNN voltage 1.0V
58	C1_PVCCVNN-VOL	02h	01h	03h	Yes	CPU VNN voltage 1.0V
59	SB_PVNN_PCH-VOL	02h	01h	14h	No	Standby PCH voltage 0.9V
60	CPU0_PRSNT	07h	6Fh	03h	No	CPU 0 presence sensor
61	CPU1_PRSNT	07h	6Fh	03h	No	CPU 1 presence sensor
62	INLET-TMP	01h	01h	37h	No	Intake Temperature
63	OUTLET-TMP	01h	01h	07h	No	Outlet Temperature
64	CPU0-TMP	01h	01h	03h	Yes	CPU Internal Temperature
65	CPU1-TMP	01h	01h	03h	Yes	CPU Internal Temperature
66	PCH-TMP	01h	01h	07h	Yes	PCH Internal Temperature
67	C0_DIMM_A1-TMP	01h	01h	20h	Yes	DIMM Module A1 Temperature
68	C0_DIMM_B1-TMP	01h	01h	20h	Yes	DIMM Module A2 Temperature
69	C0_DIMM_C1-TMP	01h	01h	20h	Yes	DIMM Module B1 Temperature
70	C0_DIMM_D1-TMP	01h	01h	20h	Yes	DIMM Module B2 Temperature
71	C0_DIMM_E1-TMP	01h	01h	20h	Yes	DIMM Module C1 Temperature
72	C0_DIMM_F1-TMP	01h	01h	20h	Yes	DIMM Module C2 Temperature
73	C0_DIMM_G1-TMP	01h	01h	20h	Yes	DIMM Module D1 Temperature
74	C0_DIMM_H1-TMP	01h	01h	20h	Yes	DIMM Module D2 Temperature
75	C1_DIMM_I1-TMP	01h	01h	20h	Yes	DIMM Module E1 Temperature

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76	C1_DIMM_J1-TMP	01h	01h	20h	Yes	DIMM Module E2 Temperature
77	C1_DIMM_K-TMP	01h	01h	20h	Yes	DIMM Module F1 Temperature
78	C1_DIMM_L1-TMP	01h	01h	20h	Yes	DIMM Module F2 Temperature
79	C1_DIMM_M1-TMP	01h	01h	20h	Yes	DIMM Module G1 Temperature
80	C1_DIMM_N1-TMP	01h	01h	20h	Yes	DIMM Module G2 Temperature
81	C1_DIMM_O1-TMP	01h	01h	20h	Yes	DIMM Module H1 Temperature
82	C1_DIMM_P1-TMP	01h	01h	20h	Yes	DIMM Module H2 Temperature
83	M2_1-TMP	01h	01h	37h	No	IPMI Drive Slot 1 Temperature
84	M2_2-TMP	01h	01h	37h	No	IPMI Drive Slot 2 Temperature
85	M2_1_PRSNT	0Dh	6Fh	1Ah	-	IPMI Drive Slot 1 sensor (MB)
86	M2_2_PRSNT	0Dh	6Fh	1Ah	-	IPMI Drive Slot 2 sensor (MB)
87	NMC1_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
88	NMC1-FRU	-	-	-	-	NMC FRU Device Locator 1
89	NMC2_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
90	NMC2-FRU	-	-	-	-	NMC FRU Device Locator 2
91	NMC3_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
92	NMC3-FRU	-	-	-	-	NMC FRU Device Locator 3
93	NMC4_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
94	NMC4-FRU	-	-	-	-	NMC FRU Device Locator 4
95	NMC5_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
96	NMC5-FRU	-	-	-	-	NMC FRU Device Locator 5
97	NMC6_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
98	NMC6-FRU	-	-	-	-	NMC FRU Device Locator 6
99	NMC7_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
100	NMC7-FRU	-	-	-	-	NMC FRU Device Locator 7
101	NMC8_PRSNT	17h	01h	0Bh	Yes	IPMI Entity Presence sensor
102	NMC8-FRU	-	-	-	-	NMC FRU Device Locator 8
103	RISER1_PRSNT	17h	01h	0Bh		IPMI Entity Presence sensor

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104	RISER1-TMP	01h	01h	0Bh		Riser card temperature sensor
105	RIS1_PCIE1_PRSNT	17h	01h	0Bh		IPMI Entity Presence sensor
106	RISER2_PRSNT	17h	01h	0Bh		IPMI Entity Presence sensor
107	RISER2-TMP	01h	01h	0Bh		Riser card temperature sensor
108	RIS2_PCIE1_PRSNT	17h	01h	0Bh		IPMI Entity Presence sensor
109	FAN1_PRSNT	04h	08h	1Dh	No	Fan (Module) 1 presence sensor
110	FAN1-SPEED	04h	01h	1Dh	Yes	Single FAN Speed sensor
111	FAN2_PRSNT	04h	08h	1Dh	No	Fan (Module) 2 presence sensor
112	FAN2-SPEED	04h	01h	1Dh	Yes	Single FAN Speed sensor
113	FAN3_PRSNT	04h	08h	1Dh	No	Fan (Module) 3 presence sensor
114	FAN3-SPEED	04h	01h	1Dh	Yes	Single FAN Speed sensor
115	FAN4_PRSNT	04h	08h	1Dh	No	Fan (Module) 4 presence sensor
116	FAN4-SPEED	04h	01h	1Dh	Yes	Single FAN Speed sensor
117	PSU1	08h	01h	0Ah	-	IPMI Power Supply sensor
118	PSU2	08h	01h	0Ah	-	IPMI Power Supply sensor
119	PSU1-FRU	-	-	-	-	PSU FRU Device Locator 9
120	PSU1_IN-POWER	0Bh	01h	0Ah	No	PSU1 input power sensor
121	PSU1_OUT-POWER	0Bh	01h	0Ah	No	PSU1 output power sensor
122	PSU1_IN-CUR	03h	01h	0Ah	No	PSU1 input current sensor
123	PSU1_OUT-CUR	03h	01h	0Ah	No	PSU1 output current sensor
124	PSU1_IN-VOL	02h	01h	0Ah	No	PSU1 input voltage sensor
125	PSU1_OUT-VOL	02h	01h	0Ah	Yes	PSU1 output voltage sensor
126	PSU1_INTAKE-TMP	01h	01h	0Ah	No	PSU1 intake temperature
127	PSU1_HOTSPOT-TMP	01h	01h	0Ah	No	PSU1 hot spot temperature
128	PSU1_FAN-SPEED	04h	01h	0Ah	Yes	PSU1 FAN Speed sensor
129	PSU2-FRU	-	-	-	-	PSU FRU Device Locator 10
130	PSU2_IN-POWER	0Bh	01h	0Ah	No	PSU2 input power sensor
131	PSU2_OUT-POWER	0Bh	01h	0Ah	No	PSU2 output power sensor

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132	PSU2_IN-CUR	03h	01h	0Ah	No	PSU2 input current sensor
133	PSU2_OUT-CUR	03h	01h	0Ah	No	PSU2 output current sensor
134	PSU2_IN-VOL	02h	01h	0Ah	No	PSU2 input voltage sensor
135	PSU2_OUT-VOL	02h	01h	0Ah	Yes	PSU2 output voltage sensor
136	PSU2_INTAKE-TMP	01h	01h	0Ah	No	PSU2 intake temperature
137	PSU2_HOTSPOT-TMP	01h	01h	0Ah	No	PSU2 hot spot temperature
138	PSU2_FAN-SPEED	04h	01h	0Ah	Yes	PSU2 FAN Speed sensor

5.5.2 Threshold Based Sensors

Sensor event thresholds are classified as Non-critical (NC), Critical (CR), or Non-recoverable (NR). This classification is possible in both directions (lower and upper).

The threshold-based sensor event data format follows the IPMI specification. All defined sensors in this subsection will use the event data bytes 1 – 3 as described below:

Table 5.5-2 Threshold Based Sensor Event Data Format

Event Data 1	Event Data 2	Event Data 3
[7:6] = 01b (Trigger reading in byte 2), **[5:4] = 01b (Trigger threshold in byte 3),** **[3:0] = Offset (threshold event)**	Reading that triggered the event generation	Threshold value that was crossed

All specified thresholds will generate events (assertion and de-assertion event direction). Unused thresholds have the event generation disabled (event mask bits in SDR data not set).

Table 5.5-3 Threshold Based Sensor Supported Events

Sensor Types	Type Codes	Generic Offset	Event
Temperature, **Voltage,** **Current,** **Fan Speed,** **Power**	01h, 02h, 03h, 0Bh	00h	Lower Non-critical - going low
		01h	Lower Non-critical - going high
		02h	Lower Critical - going low
		03h	Lower Critical - going high
		04h	Lower Non-recoverable - going low

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		05h	Lower Non-recoverable - going high
		06h	Upper Non-critical - going low
		07h	Upper Non-critical - going high
		08h	Upper Critical - going low
		09h	Upper Critical - going high
		0Ah	Upper Non-recoverable - going low
		0Bh	Upper Non-recoverable - going high

Following subchapters will use the usual abbreviations for the different thresholds (LNR, LCR, LNC and UNC, UCR, UNR).

5.5.2.1 Voltage Sensors

The input, standby and most payload power voltages are monitored by BMC.
All sensors use a hysteresis for event generation. For all sensors, the hysteresis is 1.5% of the nominal sensor voltage plus ripple from the voltage regulator.

Table 5.5-4 Voltage Sensor List

Sensor Name	Nominal	LNR	LCR	LNC	UNC	UCR	UNR
PAY_12-VOL	12.0	-	11.165	-	-	12.474	-
SB_12-VOL	12.0	-	10.703	-	-	12.474	-
PAY_5-VOL	5.0	-	4.714	-	-	5.246	-
SB_5-VOL	5.0	-	4.714	-	-	5.246	-
PAY_3_3-VOL	3.3	-	3.080	-	-	3.476	-
SB_3_3-VOL	3.3	-	3.080	-	-	3.476	-
SB_3_3_PCH-VOL	3.3	-	3.080	-	-	3.476	-
BAT_3_0-VOL	3.0	-	1.920	-	-	3.228	-
PAY_3_3_EXT-VOL	3.3	-	3.080	-	-	3.476	-
C0_PVCCIN-VOL	1.83	-	1.549	-	-	1.912	-

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C1_PVCCIN-VOL	1.83	-	1.549	-	-	1.912	-
C0_PVCC_FIVR-VOL	1.8	-	1.554	-	-	2.0	-
C1_PVCC_FIVR-VOL	1.8	-	1.554	-	-	2.0	-
C0_PVCC_EHV-VOL	1.8	-	1.554	-	-	2.0	-
C1_PVCC_EHV-VOL	1.8	-	1.554	-	-	2.0	-
SB_1_8_PCH-VOL	1.8	-	1.670	-	-	1.912	-
C0_PVCCD_HV-VOL	1.1	-	1.029	-	-	1.218	-
C1_PVCCD_HV-VOL	1.1	-	1.029	-	-	1.218	-
SB_1_05_PCH-VOL	1.05	-	0.945	-	-	1.113	-
C0_PVCCNFAON-VOL	1.0	-	0.861	-	-	1.119	-
C1_PVCCNFAON-VOL	1.0	-	0.861	-	-	1.119	-
C0_PVCCVNN-VOL	1.0	-	0.861	-	-	1.119	-
C1_PVCCVNN-VOL	1.0	-	0.861	-	-	1.119	-
SB_PVNN_PCH-VOL	0.9	-	0.805	-	-	0.973	-

5.5.2.2 Temperature Sensors

Several temperature sensors are supported, either via board-populated IC's (e.g. TMP75) or Intel PECI readings from the CPU.
All temperature sensors use a hysteresis of about 3°C for the event generation.
To prevent false temperature sensor events caused by a single incorrect reading, a mechanism is implemented to ignore those readings. Each new reading is compared to the previous reading, and if the difference is more than 10°C, the reading is ignored.
This only applies to one reading. If there are more false readings in a row, the reading will be treated as correct reading, and a temperature sensor event might be generated. This avoids stuck temperature sensors.
The same mechanism is implemented for "0xFF" and "0x00" temperature value readings.

Table 5.5-5 Temperature Sensor List

Sensor Name	Nominal	LNR	LCR	LNC	UNC	UCR	UNR
INLET-TMP	40	-	-	-	55	65	75
OUTLET-TMP	40	-	-	-	65	75	85

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CPU0-TMP	40	-	-	-	90	100	-
CPU1-TMP	40	-	-	-	90	100	
PCH-TMP	40	-	-	-	90	100	-
C0_DIMM_A1-TMP	40	-	-	-	85	95	-
C0_DIMM_B1-TMP	40	-	-	-	85	95	-
C0_DIMM_C1-TMP	40	-	-	-	85	95	-
C0_DIMM_D1-TMP	40	-	-	-	85	95	-
C0_DIMM_E1-TMP	40	-	-	-	85	95	-
C0_DIMM_F1-TMP	40	-	-	-	85	95	-
C0_DIMM_G1-TMP	40	-	-	-	85	95	-
C0_DIMM_H1-TMP	40	-	-	-	85	95	-
C1_DIMM_I1-TMP	40	-	-	-	85	95	-
C1_DIMM_J1-TMP	40	-	-	-	85	95	-
C1_DIMM_K1-TMP	40	-	-	-	85	95	-
C1_DIMM_L1-TMP	40	-	-	-	85	95	-
C1_DIMM_M1-TMP	40	-	-	-	85	95	-
C1_DIMM_N1-TMP	40	-	-	-	85	95	-
C1_DIMM_O1-TMP	40	-	-	-	85	95	-
C1_DIMM_P1-TMP	40	-	-	-	85	95	-
M2_1-TMP	40	-	-	-	55	65	75
M2_2-TMP	40	-	-	-	55	65	75
RISER1-TMP	40				65	70	75
RISER2-TMP	40				65	70	75

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5.5.2.3 PSU

The used system power supply (PSU) provides an input and output current draw reading. Both power values are available to read and are supported by BMC as PSU current sensors.

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