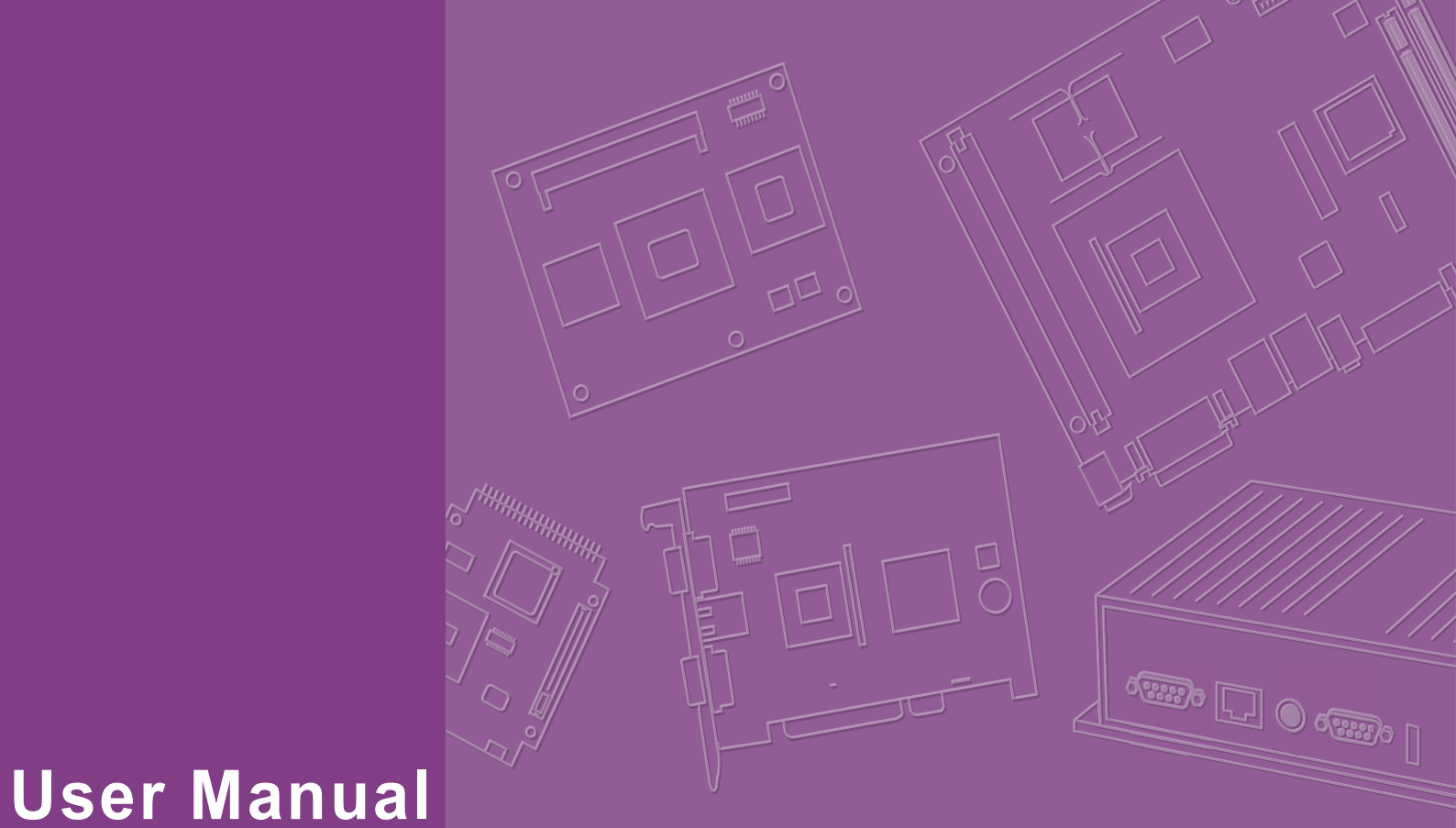




User Manual

AIR-410

Edge AI System

ADVANTECH

Enabling an Intelligent Planet

Attention!

This product contains a hard copy of the Chinese user manual for China CCC certification purposes. A PDF of the English user manual is included on the accompanying CD. Please disregard the hard copy Chinese user manual if the product is not sold and/or installed in China.

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Product Warranty (2 years)

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

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

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Declaration of Conformity

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
 - 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

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions that if not observed can cause personal injury!*



Caution! *Cautions are included to help prevent hardware damage and data losses. For example,*



“Batteries are at risk of exploding if incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide additional optional information.*



Document Feedback

To assist us with improving this manual, we welcome all comments and constructive criticism. Please send all feedback in writing to support@advantech.com.

Packing List*

Before system installation, check that the items listed below are included and in good condition. If any item does not accord with the list, contact your dealer immediately.

- 1 x AIR-410 unit
- 2 x Deskmount
- 1 x User manual (Simplified Chinese)
- 1 x WISE-DeviceOn Package
- 1 x PCIe Card fixed bracket
- 1 x SSD Outside Door

* In case of any changes, the actual packaging shall prevail.

Ordering Information

Model Number	Description
AIR-4100-S8A1E	AMD Ryzen 8845HS Edge AI system
AIR-4100-S3A1E	AMD Ryzen 8645HS Edge AI system
AIR-4100-S8A1U	AMD Ryzen 8845HS Edge AI system, TW
AIR-4100-S3A1U	AMD Ryzen 8645HS Edge AI system, TW

Optional Accessories

Part Number	Description
1702002600-03	Power Cord UL 3P 10A 125V 183cm, USA type
1700018705	Power Cord EU 3P 10A 250V 183cm, EU type
1700032693-11	Power Cord BSI 3P 10A 250V 183cm, UK type
1700000237	Power Cord PSE 3P 12A 125V 183cm, PSE special connector
1700036020-01	DB9 Cable for DIO, 40cm
1751000182-01	System Fan 8038, G55H2087DHR, 8pin PWM
1700036177-01	1 to 2 90C power cable for PCIe card (2x6P-3.0+1x4P-2.0)/2x4P-4.2x2
1700035539-01	1 to 4 90C power cable for PCIe card (2x6P-3.0+1x4P-2.0)/2x4P-4.2x2

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. By means of a power cord connected to a socket-outlet with a grounded connection.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If any of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the equipment.
 - The equipment has been exposed to moisture.
 - The equipment is malfunctioning, or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.
15. Do not leave the equipment in an environment with a storage temperature of below -40 °C (-40 °F) or above 85 °C (185 °F) as this may damage the components. The equipment should be kept in a controlled environment.
16. Any unverified component may cause unexpected damage. To ensure correct installation, always use the components (e.g., screws) provided in the accessory box.
17. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
18. Always disconnect the power cord from the chassis before manually handling the hardware. Do not implement connections or configuration changes while the device is powered on. Sudden power surges may damage sensitive electronic components.
19. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).
20. The equipment should only be installed in a restricted access area.
21. This model is intended to be supplied by an UL-certified power supply suitable for use at Tma 45°C (113 °F) Min., and the output is ES1. If you need further assistance, contact Advantech for additional information.

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

Consignes de Sécurité

1. Veuillez lire attentivement ces instructions de sécurité.
2. Veuillez conserver ce manuel de l'utilisateur pour référence ultérieure.
3. Veuillez débrancher cet équipement de la prise secteur avant le nettoyage. Utilisez un chiffon humide. Ne pas utiliser de détergent liquide ou pulvérisé pour le nettoyage. Utilisez une feuille ou un chiffon humide pour le nettoyage.
4. Pour les équipements enfichables, la prise de courant doit être à proximité de l'équipement et doit être facilement accessible.
5. S'il vous plaît garder cet équipement de l'humidité.
6. Posez cet équipement sur une surface fiable lors de l'installation. Une chute ou une chute pourrait causer des blessures.
7. Les ouvertures sur le boîtier sont destinées à la convection d'air, protégeant ainsi l'équipement de la surchauffe. **NE COUVREZ PAS LES OUVERTURES.**
8. Au moyen d'un cordon d'alimentation connecté à une prise de courant avec mise à la terre.
9. Placez le cordon d'alimentation de sorte que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
10. Tous les avertissements et mises en garde sur l'équipement doivent être notés.
11. Si l'appareil n'est pas utilisé pendant une longue période, débranchez-le du secteur pour ne pas être endommagé par une surtension transitoire.
12. Ne jamais verser de liquide dans les ouvertures de ventilation; Cela pourrait provoquer un incendie ou un choc électrique.
13. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, seul le personnel de maintenance qualifié doit ouvrir l'équipement.
14. Si l'une des situations suivantes se présente, faites vérifier le matériel par le personnel de service:
 - Le cordon d'alimentation ou la fiche est endommagé
 - Un liquide a pénétré dans l'appareil
 - L'équipement a été exposé à l'humidité
 - L'équipement ne fonctionne pas bien ou vous ne pouvez pas le faire fonctionner conformément au manuel d'utilisation
 - Equipment L'équipement est tombé et a été endommagé
 - Equipment L'équipement présente des signes évidents de rupture
15. Ne laissez pas cet équipement dans un environnement où la température de stockage peut être inférieure à -40 °C (-40 °F) ou supérieure à 85 °C (185 °F). Cela pourrait endommager l'équipement. L'équipement doit être dans un environnement contrôlé.
16. Tout composant non vérifié peut causer des dommages inattendus. Pour garantir une installation correcte, veuillez toujours utiliser les composants (ex. Vis) fournis avec la boîte d'accessoires.
17. **ATTENTION:** L'ordinateur est équipé d'un circuit d'horloge temps réel alimenté par batterie. Il y a un risque d'explosion si la batterie est remplacée de manière incorrecte. Remplacez uniquement avec le même type ou un type équivalent recommandé par le fabricant. Jetez les piles usagées conformément aux instructions du fabricant.
18. Débranchez toujours complètement le cordon d'alimentation de votre châssis lorsque vous utilisez du matériel. Ne faites pas de connexion quand l'appareil

est sous tension. Les composants électroniques sensibles peuvent être endommagés par des surtensions soudaines.

19. Niveau de pression acoustique au poste de l'opérateur selon la norme CEI 704-1: 1982 n'est pas supérieur à 70 dB (A).
20. L'équipement ne doit être installé que dans une zone d'accès restreint.
21. Ce modèle est conçu pour être alimenté par une alimentation certifiée UL, compatible avec une température ambiante minimale de 45 °C (113 °F), et dont la sortie est ES1. Pour toute assistance supplémentaire, contactez Advantech.
22. **AVERTISSEMENT:** Cet ensemble d'instructions est donné conformément à la norme CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans ce.

Safety Precaution - Static Electricity

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

- To avoid electrical shock, always disconnect the power from the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.
- Disconnect the power before making any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

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Chapter 1

General Introduction

This chapter gives background information on the AIR-410 series.

1.1 Introduction

High-Performance AMD Ryzen™ Embedded 8000 Platform with DDR5 ECC Memory

Powered by the AMD Ryzen™ Embedded 8000 Series processor, the AIR-410 delivers up to 39 TOPS of AI computing performance in a compact, fanless form factor—ideal for edge inference workloads requiring both high efficiency and robust processing. It supports Ryzen™ 7 Pro and Ryzen™ 5 Pro CPUs and accommodates up to 96 GB of single-channel DDR5 5600 MT/s ECC memory via dual SODIMM slots, ensuring stability for compute-intensive edge applications.

Low - Noise, Compact Size, and Versatile I/O

Engineered for silent operation (< 38 dBA under typical load) and compact dimensions (240 × 190 × 380.7 mm), the AIR-410 integrates a rich array of I/O interfaces—including 3 × 2.5 GbE ports, 4 × COM ports, 6 × USB ports, triple M.2 slots, and dual 2.5" SATA bays—within a space-efficient chassis. Its three PCIe expansion slots support high-performance GPUs or additional add-on cards, making it a highly versatile solution for compute-intensive edge AI applications such as medical imaging, automated optical inspection (AOI), and on-premise LLM inference.

Ready-to-Deploy Software Stack for Edge AI

The AIR-410 comes pre-validated with Windows 11 LTSC, Ubuntu 24.04 LTS, and Advantech's Edge AI SDK, enabling out-of-the-box deployment of vision and LLM inference applications on day one. This turnkey software environment accelerates time-to-market for AI solution developers.

1.2 Product Features

1.2.1 General

- **CPU:**
 - Ryzen® 7 Pro 8845HS
 - Ryzen® 5 Pro 8645HS
- **BIOS:** AMI 256 Mbit Flash BIOS
- **System Memory:**
 - 2x Channel DDR5 5600 MHz 262 pin SO-DIMM
 - Max. capacity 96GB
- **Serial Port:** 3 x RS-232 port(COM2/3/4), 1x RS-232/485 (COM1, by jumper)
- **USB Type A:** 4 x USB 3.2 (rear) & 2 x USB 2.0 (front)
- **Audio:** High-definition (HD) audio, Mic-in & Line-out
- **Storage:** 2 x 2.5" SATA SSD(Max Height 7mm)/1 x M.2 M-key 2280 (PCIe Gen4 x4)/1 x B key 2242 (PCIe Gen4 x2)
- **Expansion Interface:**
 - 1 x M.2 2280 M key
 - 1 x M.2 2242 B key
 - 1 x M.2 2230 E key
 - 2 x 8-bit DIO (optional)
 - 3 x LAN (2.5 GbE)

1.2.2 Display

- **Controller:** AMD RDNA 3 Radeon Graphics
- **Resolution:**
 - 1 x HDMI 2.1, up to 3840 x 2160@120Hz (60Hz for Ubuntu)
 - 1 x DP 1.4a, up to 3840x2160@60Hz
- **Dual Display:** 1 x HDMI 2.1, 1 x DP 1.4a

1.2.3 Ethernet

- **Chipset:**
 - LAN1 Intel® i226V, 2.5GbE
 - LAN2/3 Intel® i226LM, 2.5GbE
- **LAN1/2/3 Speed:** 10/100/1000/2500 Mbps
- **Interface:** 3 x RJ45
- **Standard:** Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3y, IEEE 802.ab.

1.3 Chipset

1.3.1 Functional Specifications

1.3.1.1 Processor

Table 1.1: Processor	
Processor	Ryzen® 7 Pro 8845HS Ryzen® 5 Pro 8645HS
Memory	Single Channel DDR5 5600 MHz 262 pin SO-DIMM Max. capacity 96GB

1.3.1.2 Chipset

Table 1.2: Chipset	Table 1.3:
Internal Graphics Features	Direct X 12.1, OpenGL 4.6 1 x HDMI 2.1, 1 x DP1.4a
Video Accelerator	H/W accelerated video encoding/decoding Video decoder: Support H.265/HEVC, H.264/AVC, VP9 Video encoder: Support H.265/HEVC, H.264/AVC, VP9
SATA Interface	Supports several optional sections of Serial SATA III: Extensions to Serial ATA 1.0 specification, Revision 1.0 Supports SATA transfers to 300 Mbytes/sec.
USB Interface	USB host interface with support for 4 x USB 3.2 and 2 x USB 2.0 port All ports are High-Speed, Full-Speed, and Low-Speed capable
BIOS	AMI 256 Mbit Flash BIOS

1.3.1.3 Others

Table 1.4: Other

Serial Ports	3 x RS-232(COM2/3/4) 1 x RS-232/RS-485(COM1,by Jumper) supports auto-flow control
DIO	2 x 8 bit DIO (optional)
USB	4 x USB 3.2, 2 x USB 2.0
Ethernet	LAN1 Intel i226v, LAN2/3 Intel i226LM ■ Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3y, and IEEE 802.ab ■ LAN1 Supports 10/100/1000/2500 Mbps ■ LAN2/3 Supports 10/100/1000/2500 Mbps LAN Connectors: Phone Jack RJ45 8P 90D(F)
Audio	Audio Codec: Realtek ALC888S: ■ Compliant with HD audio specifications ■ Supports 16/20/24-bit DAC and 16/20/24-bit ADC resolution ■ Supports Line Out and Mic In audio Connectors: 2 x Earphone jack
Battery	1 x 3V/220 mAh battery with wire

1.4 Mechanical Specifications

1.4.1 System Dimensions

W240mm x H190mm x D380.7mm

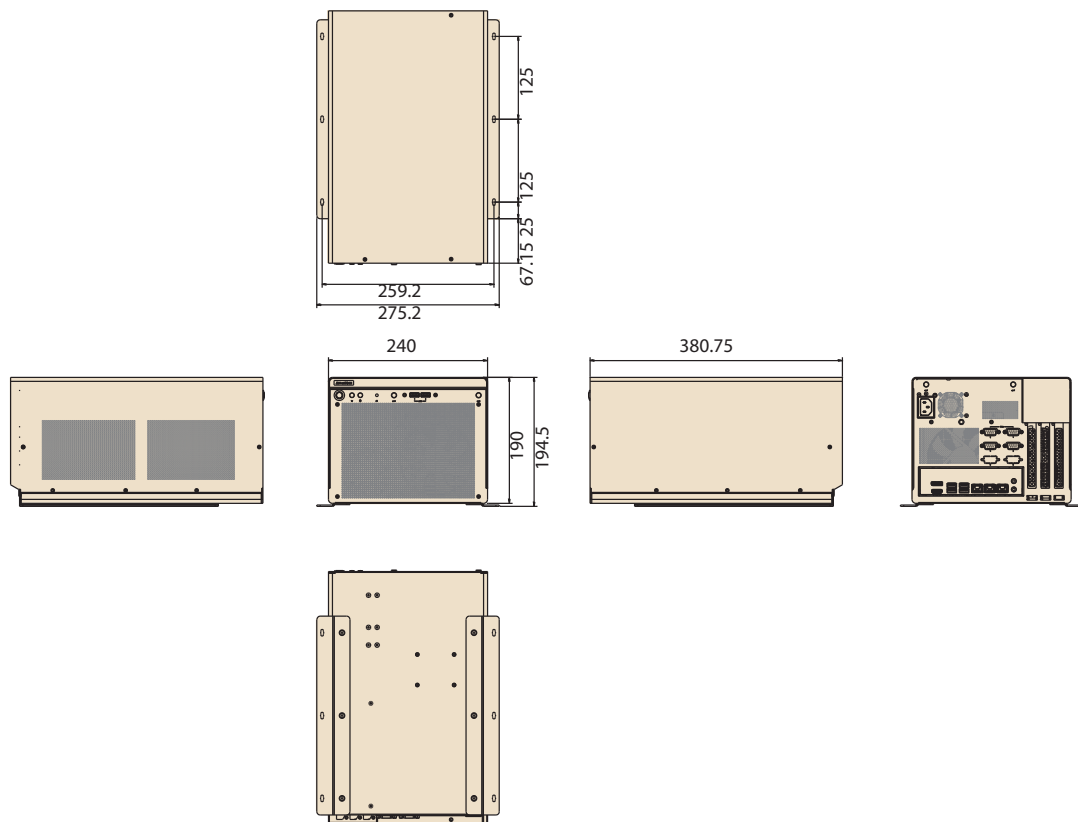


Figure 1.1 AIR-410 Mechanical Dimensions

1.4.2 Weight

- 6.9 Kg

1.5 Power Requirements

1.5.1 System Power

- **Power Input:** AC In 100V~240V

1.5.2 RTC Battery

- **Lithium:** 3V/220mAH

1.6 Environmental Specifications

1.6.1 Operating Temperature

- 0 ~ 45°C (w/o PCIe Card), 0~ 40°C (w/ PCIe Card)
PS: Operating temperature varies by PCIe card; no universal guarantee applies.

1.6.2 Relative Humidity

- 95% @ 40°C (104°F) (non-condensing)

1.6.3 Storage Temperature

- -40 ~ 85°C (-40 ~ 185°F)

1.6.4 Vibration Tolerance

- With SSD: 3 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr/axis
- With SSD/GPU: 0.3 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr/axis

1.6.5 Shock Tolerance

- With SSD: 10 G, IEC 60068-2-27, half sine, 11 ms duration, 3 times/per faces
- With SSD/GPU: 10 G, IEC 60068-2-27, half sine, 11 ms duration, 3 times/per faces

1.6.6 Safety Certification

- UL, CB, CCC, BSMI

1.6.7 EMC Certification

- CE/FCC Class B, CCC, BSMI

Chapter 2

Hardware Installation

This chapter details instructions for installing AIR-410 hardware and external I/O.

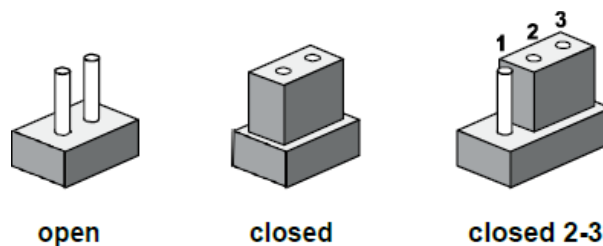
2.1 Introduction

The following sections demonstrate the internal jumper settings and the external connector pin assignments.

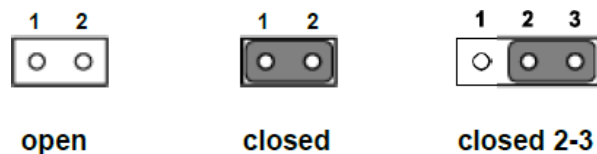
2.2 Jumpers

2.2.1 Jumper Description

AIR-410 can be configured to satisfy specific application requirements by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, connect the pins with the clip. To open a jumper, remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. For these jumpers, connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically diagrammed in this manual as follows:



A pair of needle-nose pliers may be necessary when working with jumpers. Users with concerns regarding the ideal hardware configuration for your application should contact your local distributor or sales representative before making any changes. Usually, only a standard cable is required to make most connections.

2.2.2 Jumper List

Table 2.1: Jumper List

Location	Function
JSETCOM1	COM1 RS232/RS485 selection pin header
JFP1	PWRBTN#/ RESET#/HDD LED/Serial bus from HW monitor IC/ Internal Buzzer/External Speaker header
PSON1	AT/ATX Mode selection
JCMOS1	CMOS Clear Jumper

2.2.3 Jumper Location

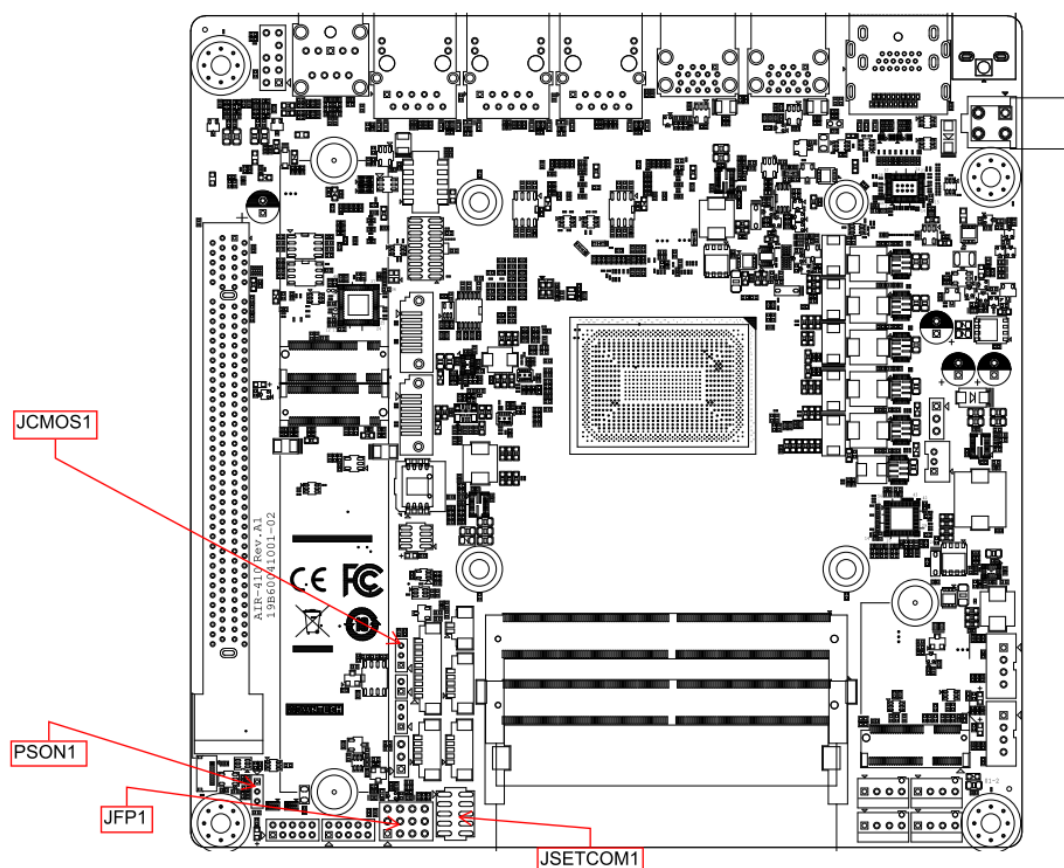


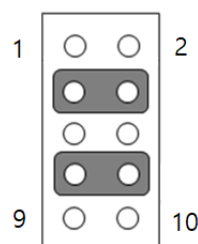
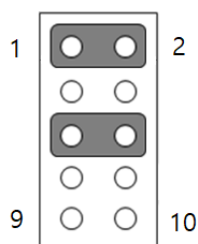
Figure 2.1 Jumper Location

2.2.4 Jumper Settings

2.2.4.1 COM1 RS232/RS485 Selection Pin Header (JSETCOM1)

Table 2.2:1.COM1 RS232/RS485 selection pin header (JSETCOM1)

Function	Switch Settings
Jumper position for RS232 (default setting)	
Jumper position for RS485	



2.2.4.2 PWRBTN#/RESET#/HDD LED/Internal Buzzer/External Speaker Header (JFP1)

Table 2.3: External Speaker Header (JFP1)

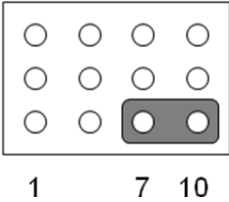
Function	Switch Settings
Internal Buzzer (default setting)	 Diagram showing a 3x4 pin header. The pins are arranged in three rows and four columns. The top row has pins 3 and 12. The bottom row has pins 1, 7, and 10. The middle row has pins 4, 5, 6, and 8. The pins 1, 3, 7, and 10 are highlighted with a grey background.

Table 2.4: PWRBTN#/RESET#/HDD LED/Internal Buzzer/External Speaker

Pin	Signal	Pin	Signal
1	+5V	2	HDD LED+
3	Power Button+	4	SPK_P2
5	HDD LED-	6	Power Button-
7	SPK_P3	8	SMB_DATA
9	System Reset+	10	SPK_P4
11	SMB_CLK	12	System Reset-

2.2.4.3 AT/ATX Mode Selection (PSON1)

Table 2.5: AT/ATX Mode Selection (PSON1)

Function	Switch Settings
ATX Mode (default setting) PSON1(2-3)	 Diagram showing a 3-pin header. The pins are arranged in a single row. The pins 2 and 3 are highlighted with a grey background.
AT Mode PSON1(1-2)	 Diagram showing a 3-pin header. The pins are arranged in a single row. The pins 1 and 2 are highlighted with a grey background.

2.2.4.4 CMOS Clear Jumper (JCMOS1)

Table 2.6: CMOS Clear Jumper (JCMOS1)

Function	Switch Settings
Normal (default setting) JCOMS1(1-2)	 Diagram showing a 3-pin header. The pins are arranged in a single row. The pins 1 and 2 are highlighted with a grey background.
Clear CMOS JCOMS1(2-3)	 Diagram showing a 3-pin header. The pins are arranged in a single row. The pins 2 and 3 are highlighted with a grey background.

2.3 System I/O

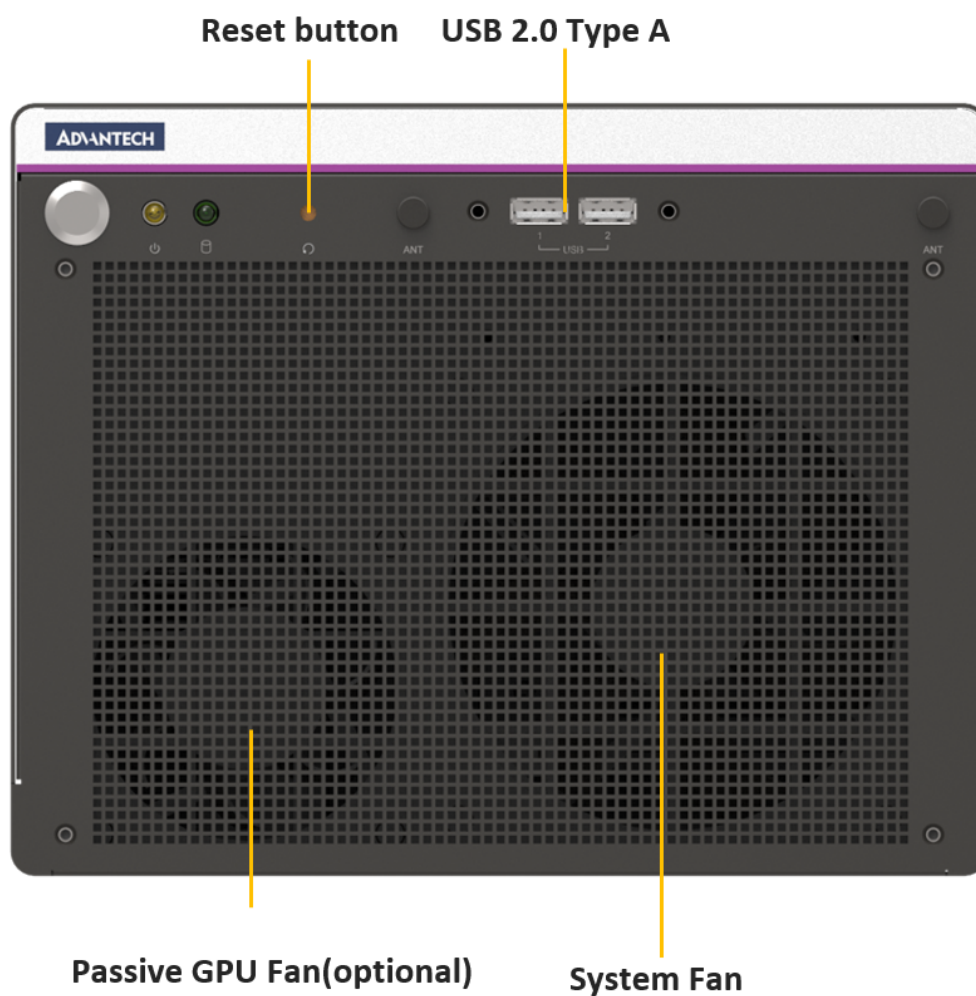


Figure 2.2 Front View

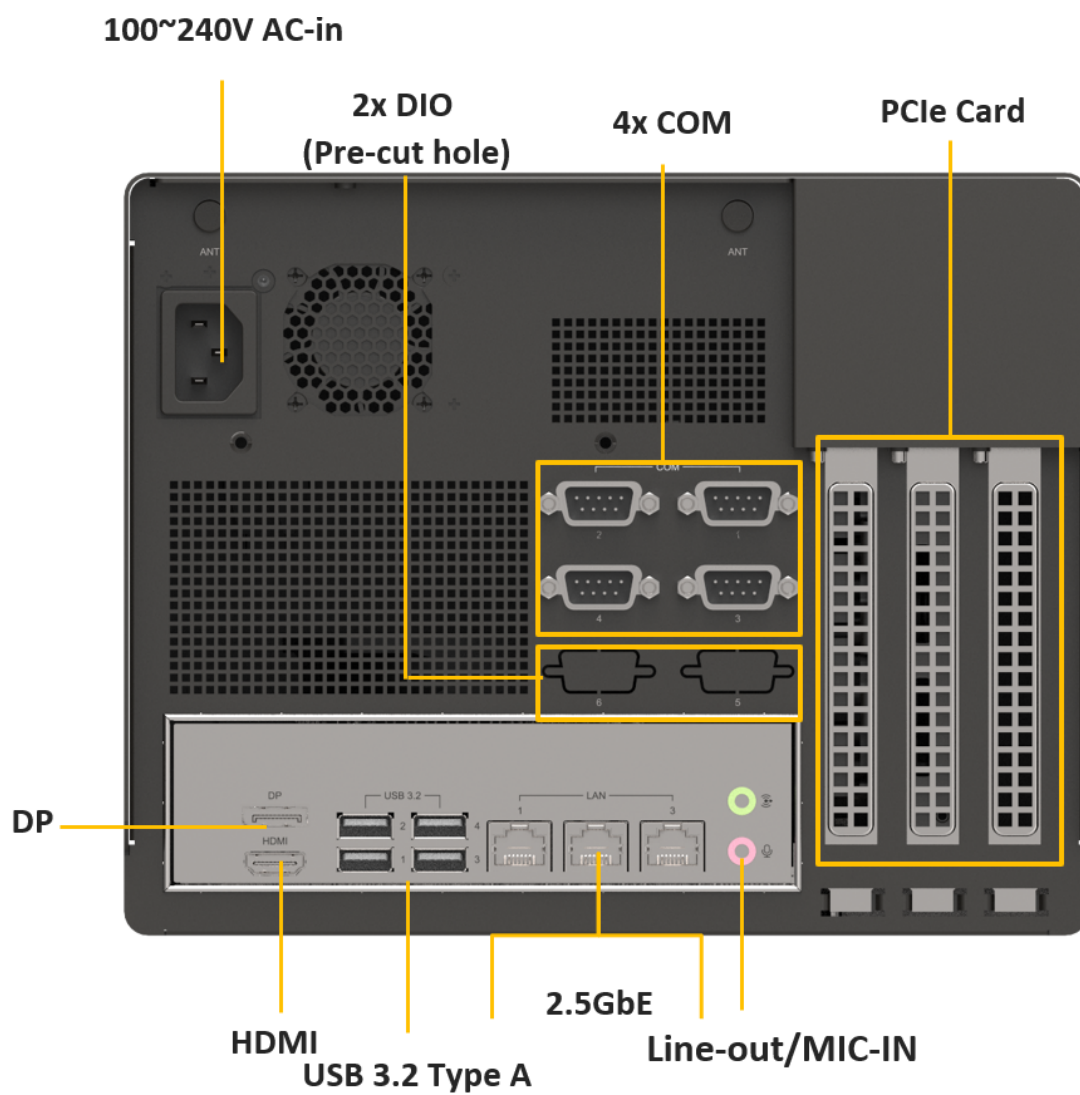


Figure 2.3 Rear View

2.4 External I/O

2.4.1 Power On/Off Button

AIR-410 features a Power On/Off button with an LED indicators on the top side that show On status (Green LED).



Figure 2.4 Power On/Off Button

2.4.2 Power Input Connector

AIR-410 features a single 100–240 V_{AC} input connector for power supply.



Figure 2.5 Power Input Connector

2.4.3 Ethernet Connector (LAN1/2/3)

AIR-410 is equipped with 3x Intel® I226 Ethernet that are fully compliant with IEEE 802.3u and 802.3bz 10/100/1000/2500 Mbps CSMA/CD standards and connected to LAN1/LAN2/LAN3. The Ethernet port provides a standard RJ45 jack connector with LED indicators on the front side to show its Active/Link status (Green LED) and Speed status (Orange/Yellow LED).

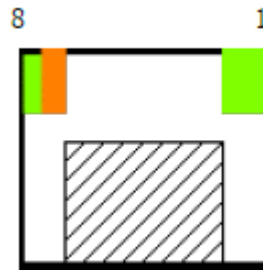


Figure 2.6 Ethernet Connector (LAN1/2/3)

Table 2.7: Ethernet Connector Pin Assignments

Pin	100/1000/2500 BaseT Signal Name
1	BI_DA+(GHz)
2	BI_DA-(GHz)
3	BI_DB+(GHz)
4	BI_DC+(GHz)
5	BI_DC-(GHz)
6	BI_DB-(GHz)
7	BI_DD+(GHz)
8	BI_DD-(GHz)
H3	GND
H4	GND

2.4.4 USB 3.2 Gen1 Connector

AIR-410 supports 4x USB 3.2 interfaces, which support Plug-and-Play functionality and hot swapping for up to 127 external devices. The USB interfaces comply with USB UHCI, Rev. 3.2. USB 3.2 connectors contain legacy pins to interface to USB 2.0 devices and a new set of pins for USB 3.2 connectivity.



Figure 2.7 USB 3.2 Connector

Table 2.8: USB Connector Pin Definition

Pin	Signal Name
1	+5V
2	D-_0
3	D+_0
4	GND
5	USB0_SSRX-
6	USB0_SSRX+
7	GND
8	USB0_SSTX-
9	USB0_SSTX+

2.4.5 USB 2.0 Connector

AIR-410 supports two USB 2.0 interfaces, which support Plug-and-Play functionality.

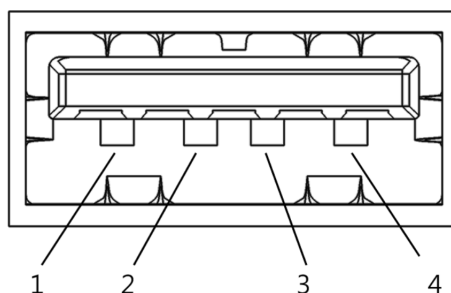


Figure 2.8 USB 2.0 Connector

Table 2.9: USB 2.0 Pin Definition

Pin	Signal Name
1	VCC
2	USB_data
3	USB_data+
4	GND

2.4.6 Audio Connector

AIR-410 features two phone jack connectors that support stereo Line Out and Mic In audio ports. The audio chip is controlled by ALC888S and compliant with the Azalea standard.



Figure 2.9 Audio Connector

2.4.7 COM1 Connector

AIR-410 provides two 9-pin COM connector, which supports RS232/485 serial communication interface ports. The default setting is RS-232, if you want to use RS485, you need to use jumper settings.

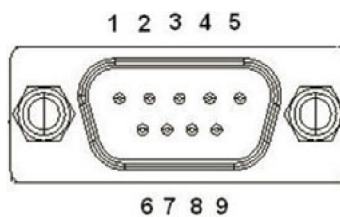


Figure 2.10 COM1 Connector

Table 2.10: COM1 Connector Pin Definition

Pin	RS-232	RS-485
1	NC	DATA-
2	RxD	DATA+
3	TxD	NC
4	NC	NC
5	GND	GND
6	NC	NC
7	RTS	NC
8	CTS	NC
9	NC	NC
NC represents "No Connection".		

2.4.8 COM2/3/4 Connector

AIR-410 provides 3x 9-pin COM connector, which supports RS232 serial communication interface ports.

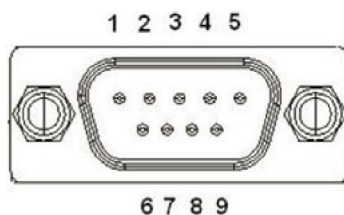


Figure 2.11 COM2/3/4 Connector

Table 2.11: COM2/3/4 Connector Pin Definition

Pin	Signal Name
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	RTS#
8	CTS#
9	NC

NC represents "No Connection".

2.4.9 DP Connector

AIR-410 offers one DP interfaces. The DP link supports resolutions up to 4096 x 2304 @ 60 Hz.

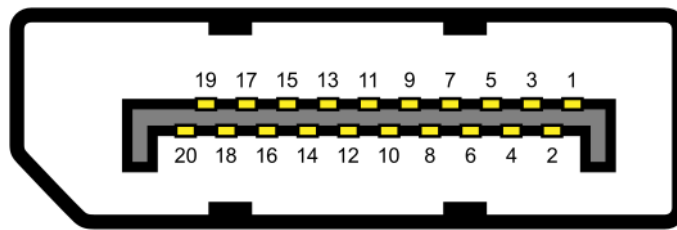


Figure 2.12 DP Connector

Table 2.12: DP Connector Pin Definition

Pin	Signal Name
1	D0+
2	GND
3	D0-
4	D1+
5	GND
6	D1-
7	D2+
8	GND
9	D2-
10	D3+
11	GND
12	D3-
13	DP_AUX_E#
14	GND
15	AUX+
16	GND
17	AUX-
18	HPD
19	GND
20	+3.3V

2.4.10 Antenna Socket

AIR-410 reserves four antenna sockets for installing wireless/LTE device antennas.



Figure 2.13 Antenna Socket

2.4.11 HDMI Connector

AIR-410 offers one integrated 19-pin receptacle connector HDMI 2.0b interfaces. The HDMI link supports resolutions up to 3840 x 2160 @ 120Hz

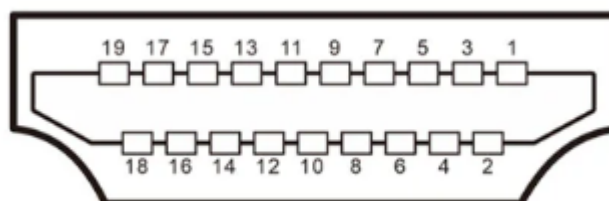


Figure 2.14 HDMI Connector

Table 2.13: HDMI Connector Pin Definition

Pin	Signal Name
1	HDMI_TX2+
2	GND
3	HDMI_TX2-
4	HDMI_TX1+
5	GND
6	HDMI_TX1-
7	HDMI_TX0+
8	GND
9	HDMI_TX0-
10	HDMI_CLK+
11	GND
12	HDMI_CLK-
13	NC
14	NC
15	HDMI_DCLK
16	HDMI_DDAT
17	GND
18	+V5_HDMI-HPD
19	DDP0_HPD

NC represents "No Connection".

2.4.12 DIO Connector (optional)

AIR-410 offers 8-bit DI/O and pin definition as shown below.

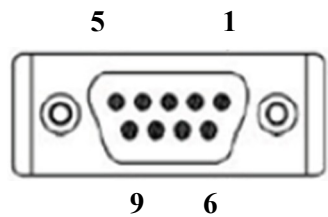


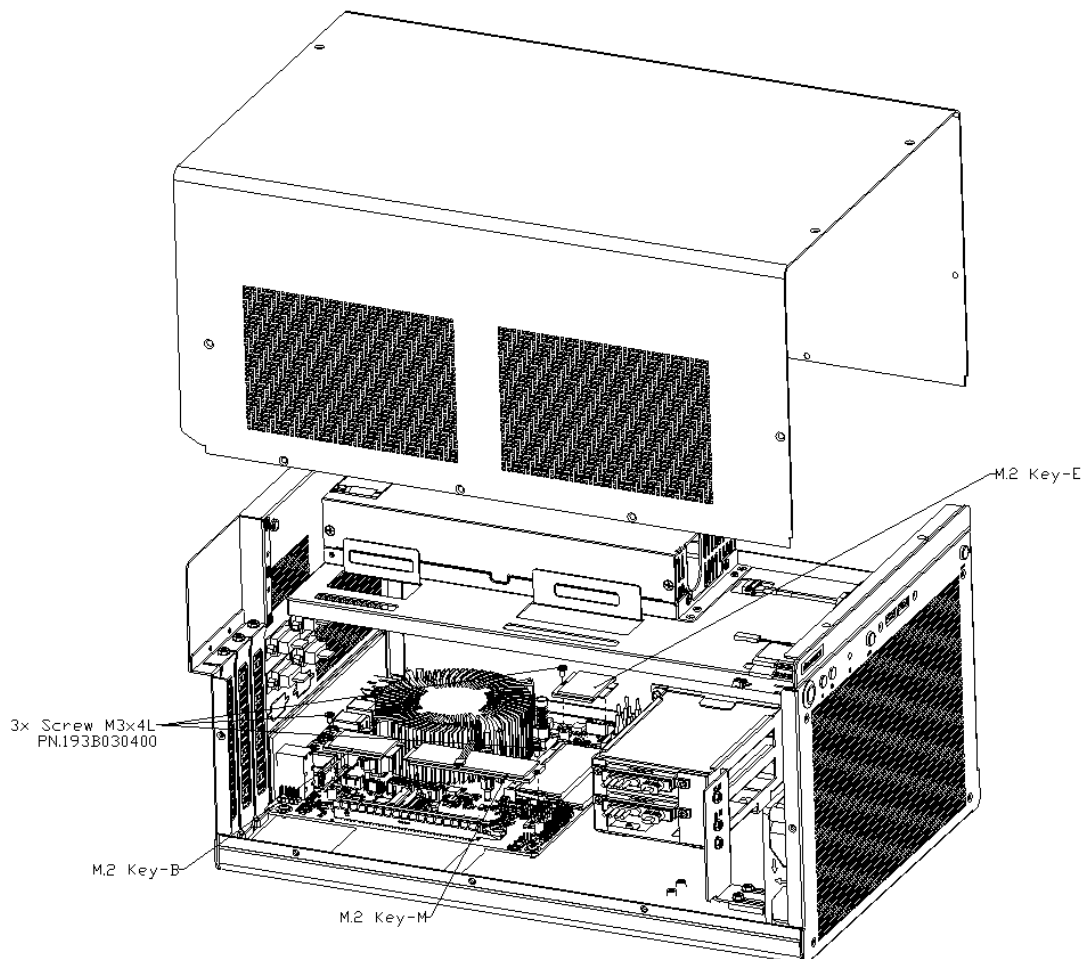
Figure 2.15 DIO Connector

Table 2.14: DIO Connector and Pin Definition	
Pin	Signal Name
1	DIO bit 0
2	DIO bit 1
3	DIO bit 2
4	DIO bit 3
5	DIO bit 4
6	DIO bit 5
7	DIO bit 6
8	DIO bit 7
9	GND

2.5 Installation

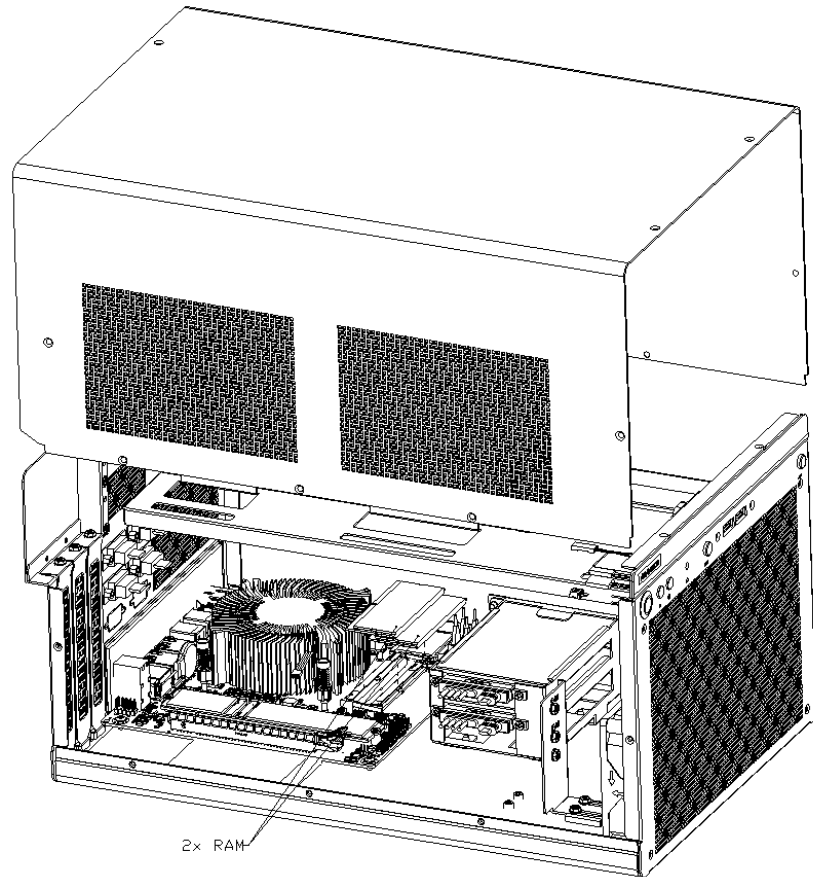
2.5.1 M.2 B Key/E Key/M Key Installation

1. Loosen the 13 screws affixing the top cover, then remove the top cover.
2. Install the M.2 2280 M-key, 2230 E-key, or 2242 B-key module.



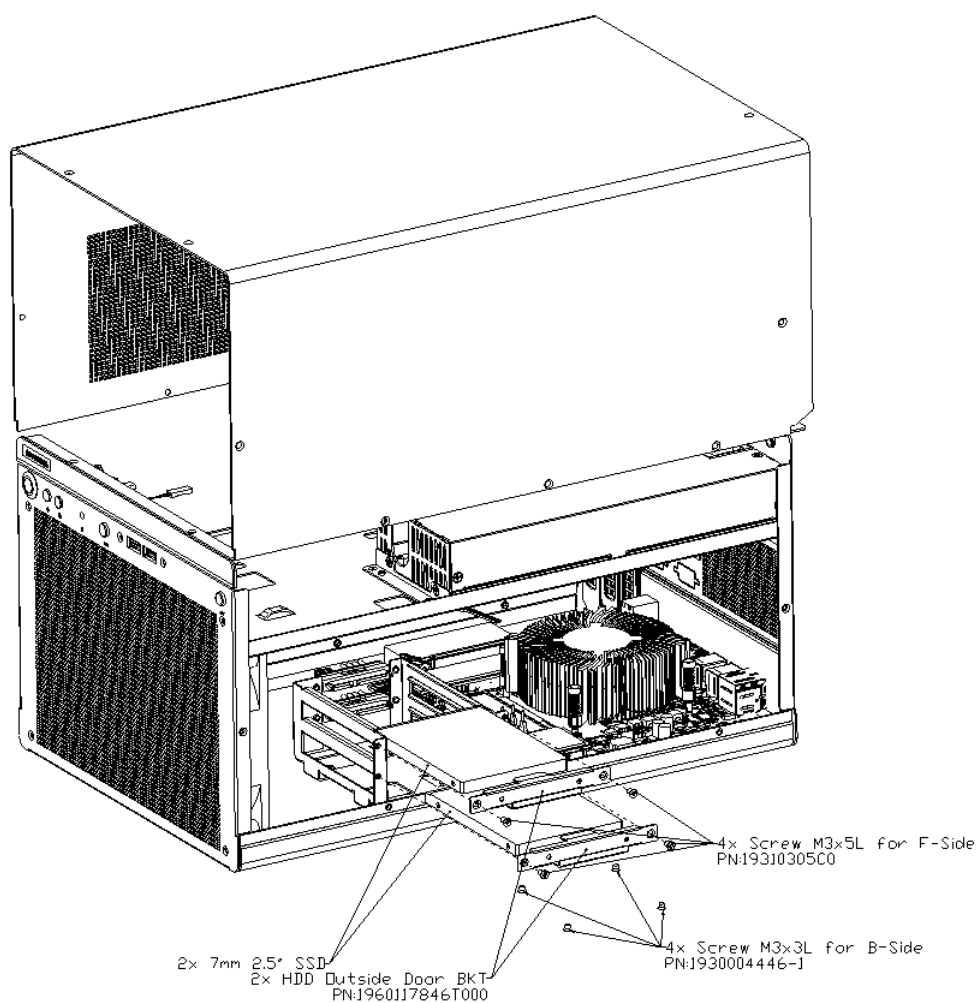
2.5.2 Memory Installation

1. Loosen the 13 screws affixing the top cover, then remove the top cover.
2. Install both memory module.



2.5.3 2.5" SATA SSD Installation

1. Loosen the 13 screws affixing the top cover, then remove the top cover.
2. Place the 2.5-inch SATA SSD and fasten six screws onto the bottom cover.
3. Insert the SATA cable into the SATA SSD.



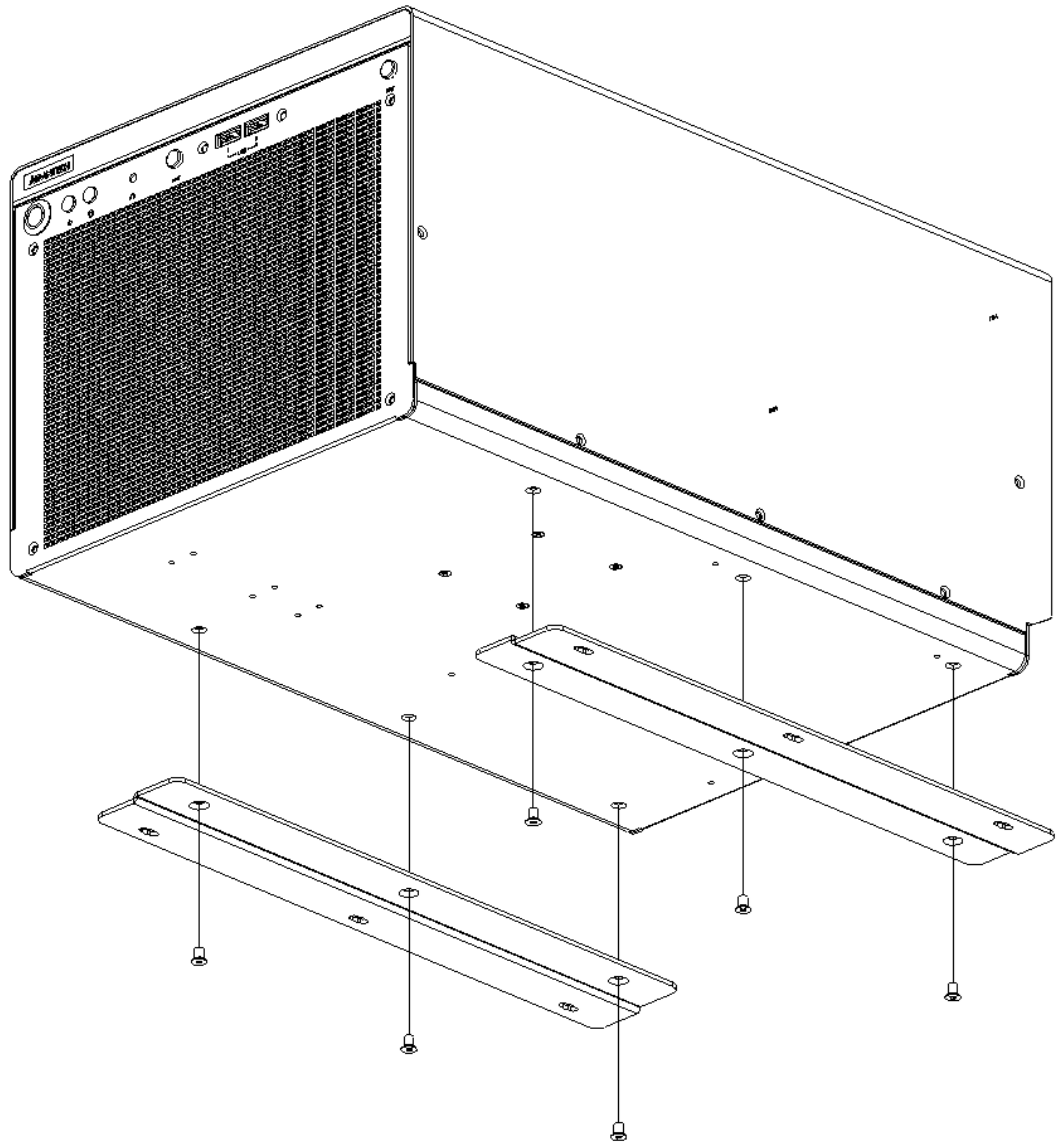
Screw PN:1930006101-01



Screw PN:1930006101-01

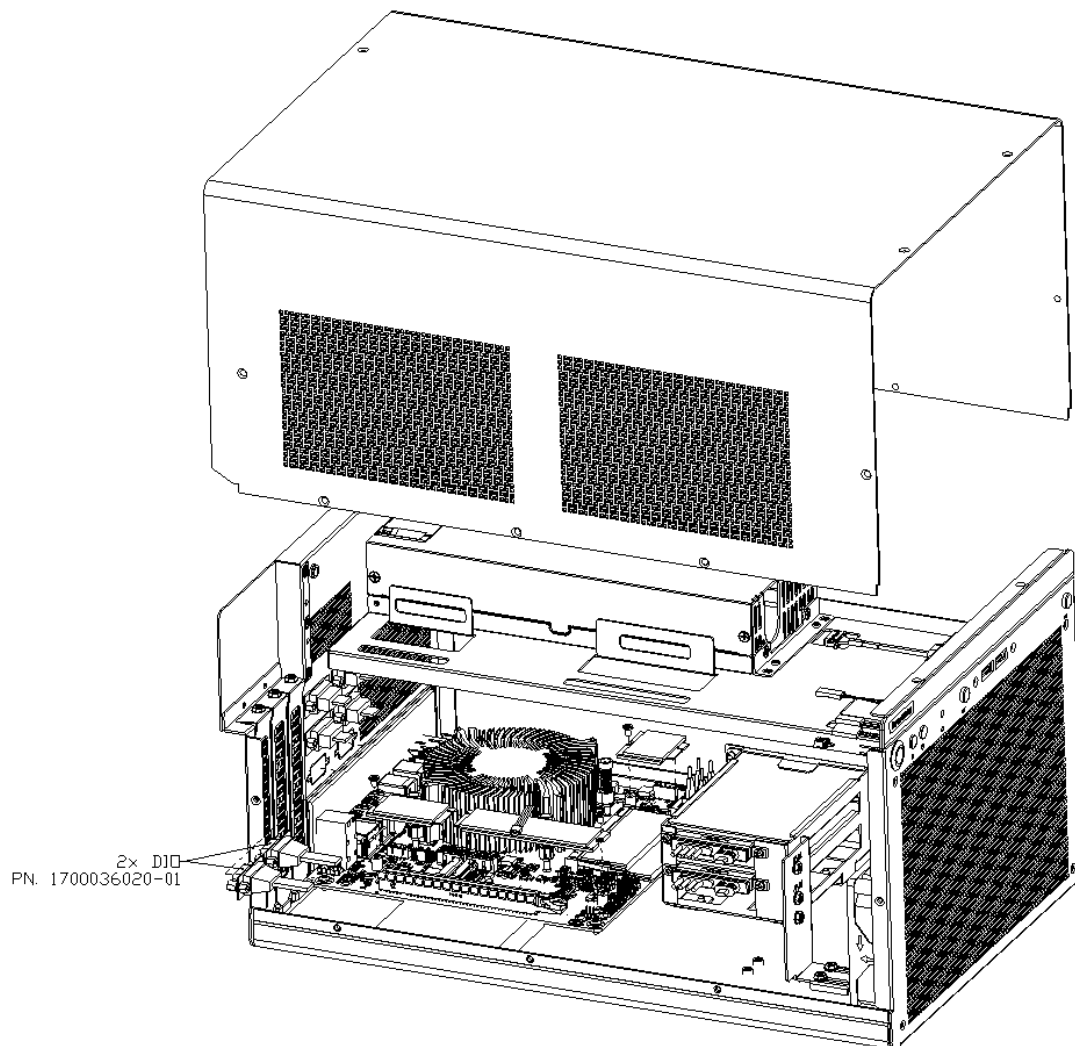
2.5.4 Desk Mount Installation

1. The AIR-410 supports desk mounting by using the two wings on the bottom cover.
2. Use six existing flat-head screws to install.

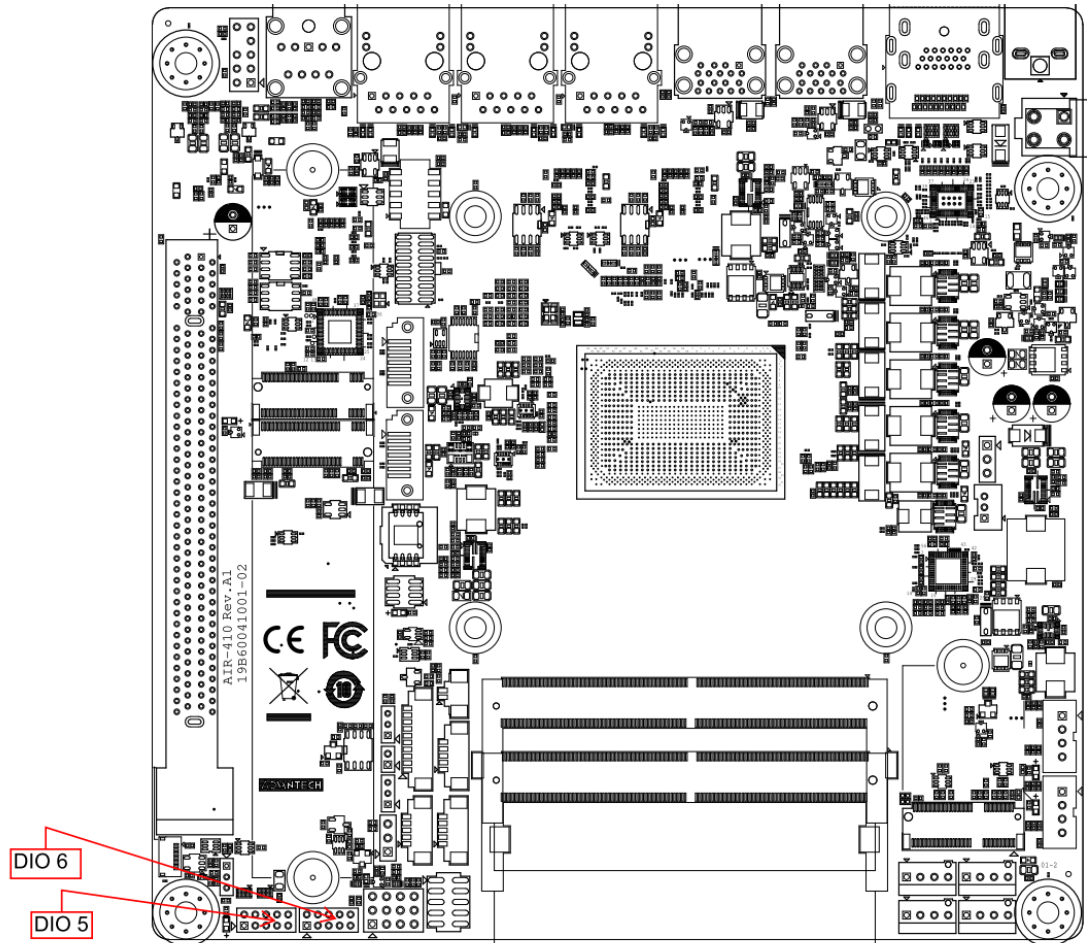


2.5.5 Optional Cables Installation (DIO)

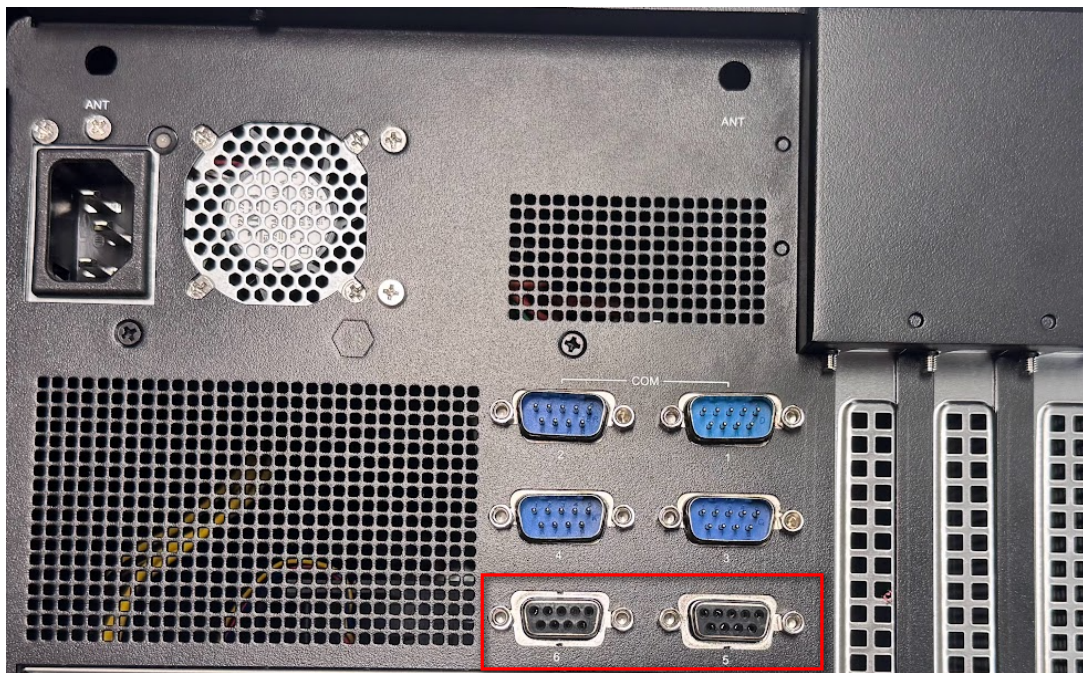
1. The AIR-410 supports an optional DIO module (P/N: 1700036020-01).
2. Loosen the 13 screws affixing the top cover, then remove the top cover.



3. Locate the reserved connector position on the board and connect the cable.



4. Remove the pre-cut knockout on the panel and use the two copper standoff screws for installation.



Chapter 3

BIOS Settings

This chapter details the BIOS configuration instructions.

3.1 Introduction

The AMI BIOS ROM has a built-in setup program - the BIOS Setup Utility - that allows users to modify the basic system configuration. All configuration data is stored in battery-backed CMOS to ensure the setup information is retained when the power is turned off.

This chapter describes the basic navigation of the AIR-410 BIOS setup screens.



3.1.1 Main Menu

Press to enter the AMI BIOS CMOS Setup Utility. The Main Menu will appear on the screen. Use the arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



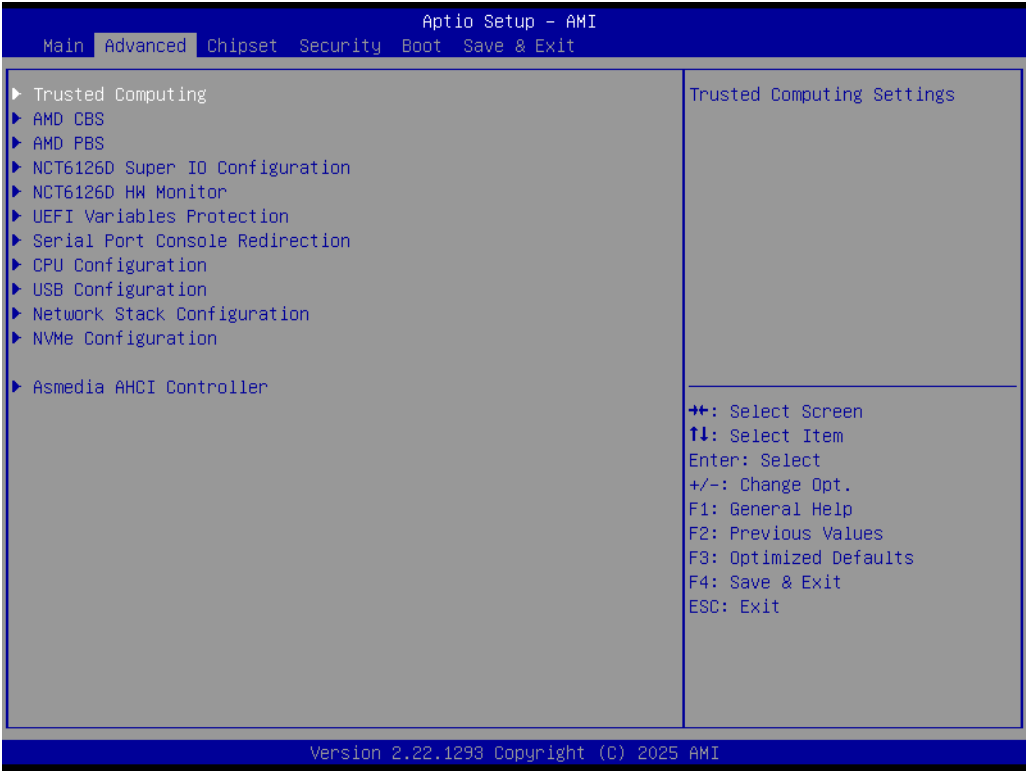
The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the legend. Above the legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System Time/System Data

Use this option to change the system time and date. Highlight the System Time or System Date using the keys. Enter new values via the keyboard. Press the <arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.1.2 Advanced BIOS Features

Select the Advanced tab from the AIR-410 setup menu to enter the Advanced BIOS setup page. Users can select any item in the left frame of the screen, such as CPU configuration. Select an Advanced BIOS setup option by highlighting the text using the keys. All Advanced BIOS setup options are described in this section. The Advanced BIOS setup menu screen is shown below. The sub-menus are described on the following pages.



3.1.2.1 Trust Computing

Advanced → Trust Computing

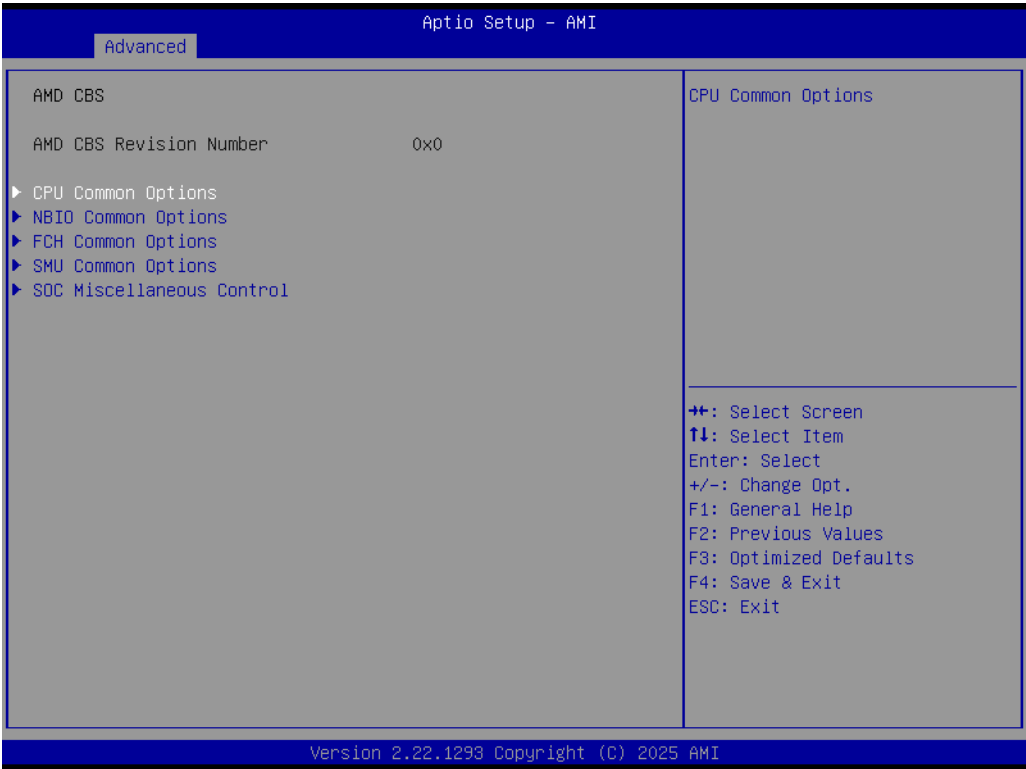
Configure security features related to Trusted Platform Module (TPM) and system trust settings.



3.1.2.2 AMD CBS

Advanced → AMD CBS

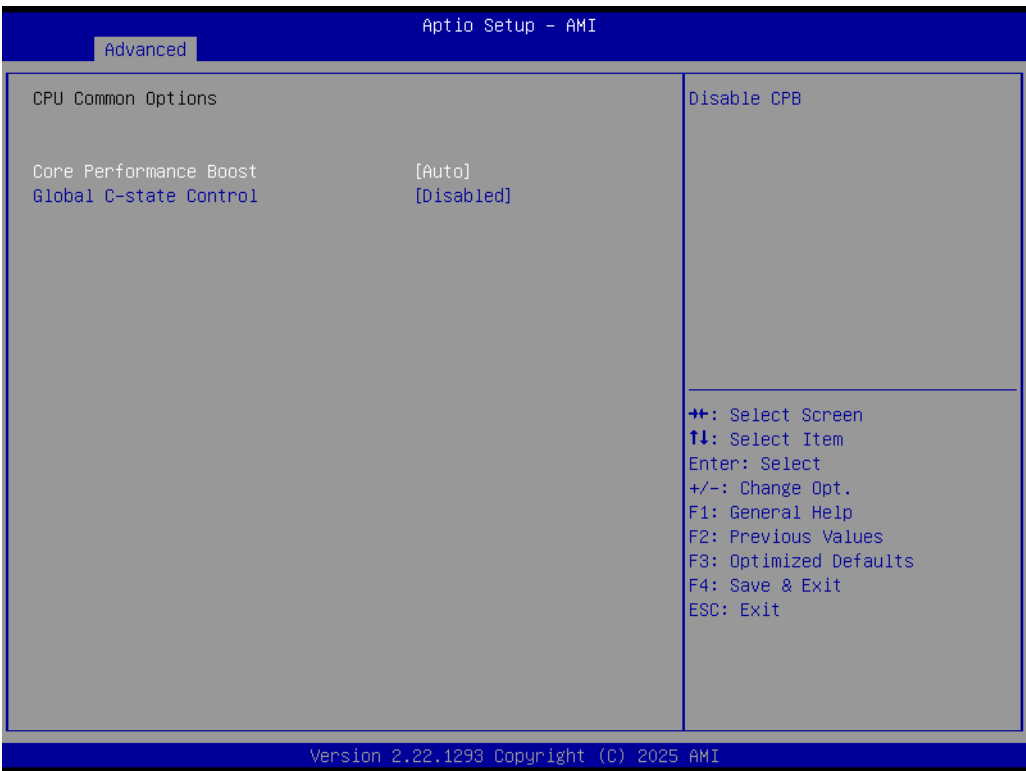
Configure advanced settings for AMD Common BIOS Settings (CBS).



CPU Common Options

Advanced → AMD CBS → CPU Common Options

Configure common CPU performance and power management options.



NBIO Common Options

Advanced → AMD CBS → NBIO Common Options

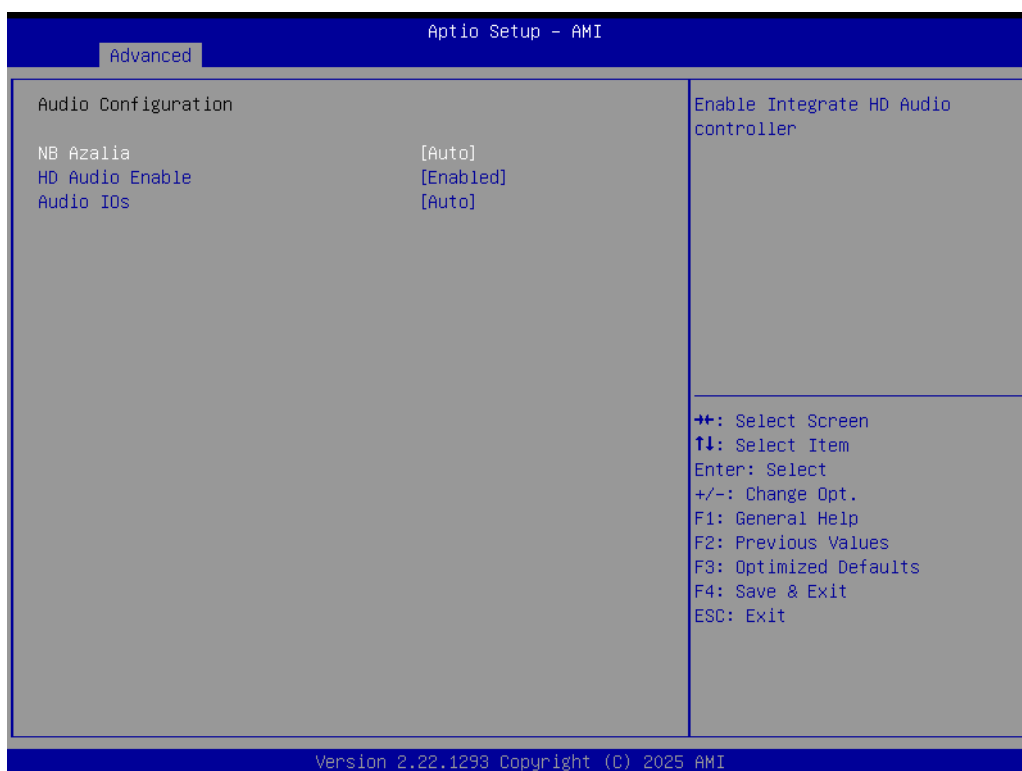
Configure common settings for AMD NBIO (North Bridge I/O) options.



Audio Configuration

Advanced → AMD CBS → NBIO Common Options → Audio Configuration

Configure onboard audio settings and features



FCH Common Options

Advanced → AMD CBS → FCH Common Options

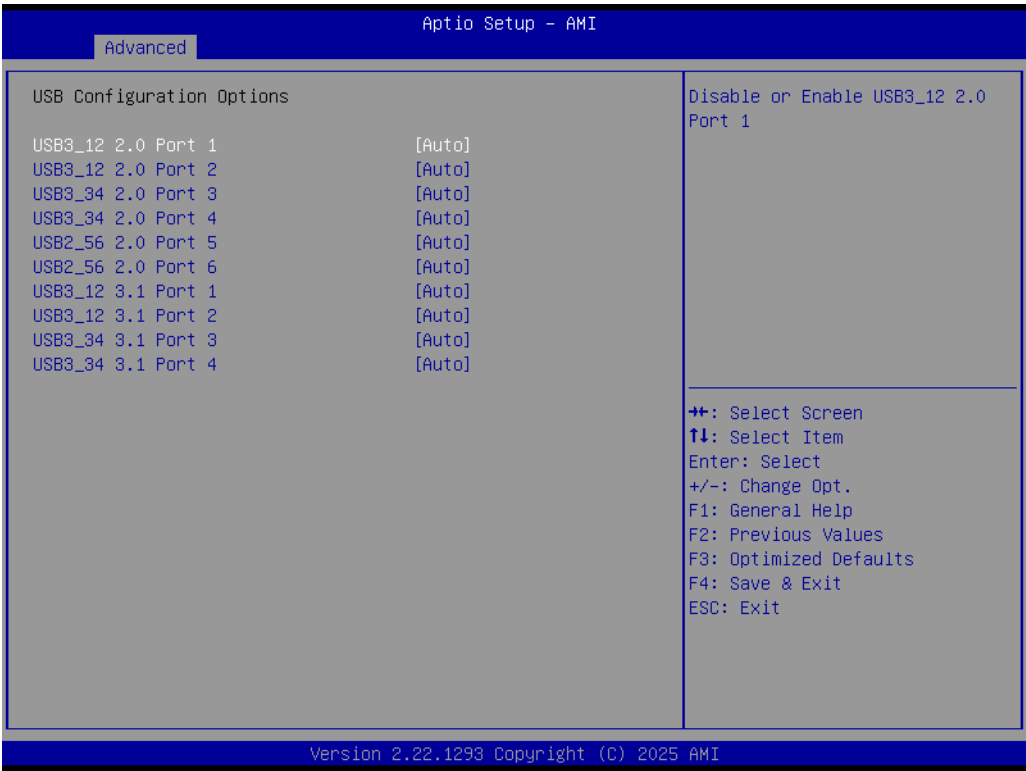
Configure common settings for AMD FCH (Fusion Controller Hub).



I3C/I2C Configuration Options

Advanced → AMD CBS → FCH Common Options → USB Configuration Options

Configure settings for I3C/I2C interfaces and related devices.



SOC Miscellaneous Control

Advanced → AMD CBS → SOC Miscellaneous Control

Configure miscellaneous controls and features for AMD SoC.



3.1.2.3 AMD PBS

Advanced → AMD PBS

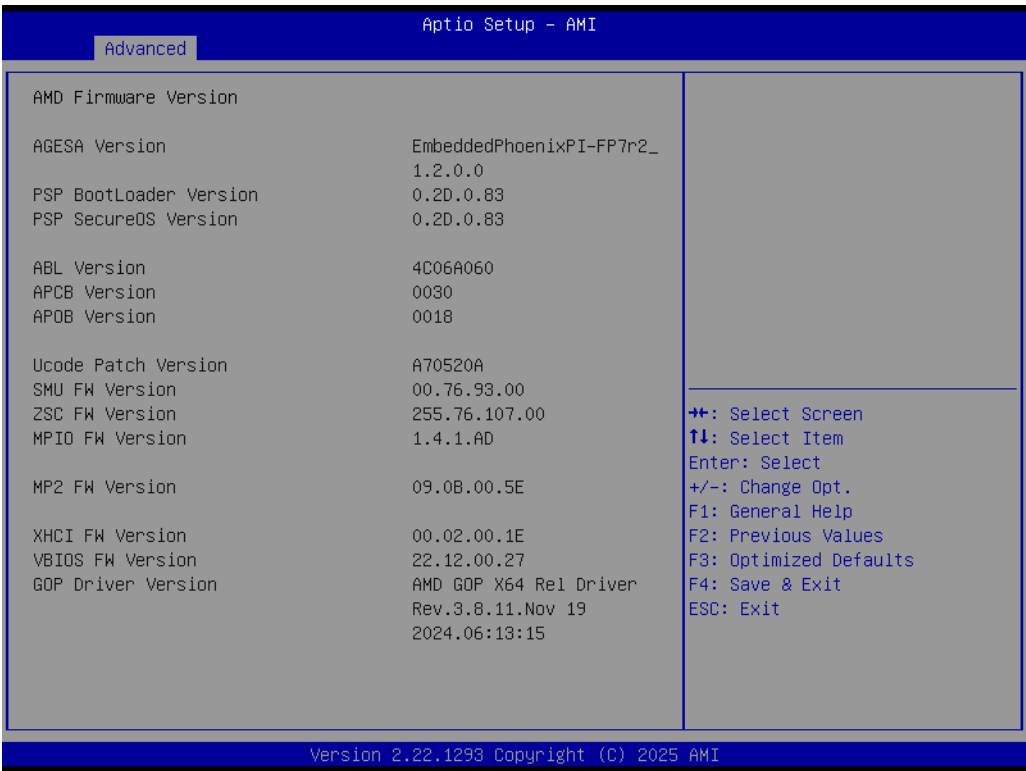
Configure platform-level BIOS settings such as PCIe, integrated graphics, and power-management features



AMD Firmware Version

Advanced → AMD PBS → AMD Firmware Version

Displays the AMD firmware version information, including AGESA



PCI Express Configurations

Advanced → AMD PBS → AMD Firmware Version → PCI Express Configurations

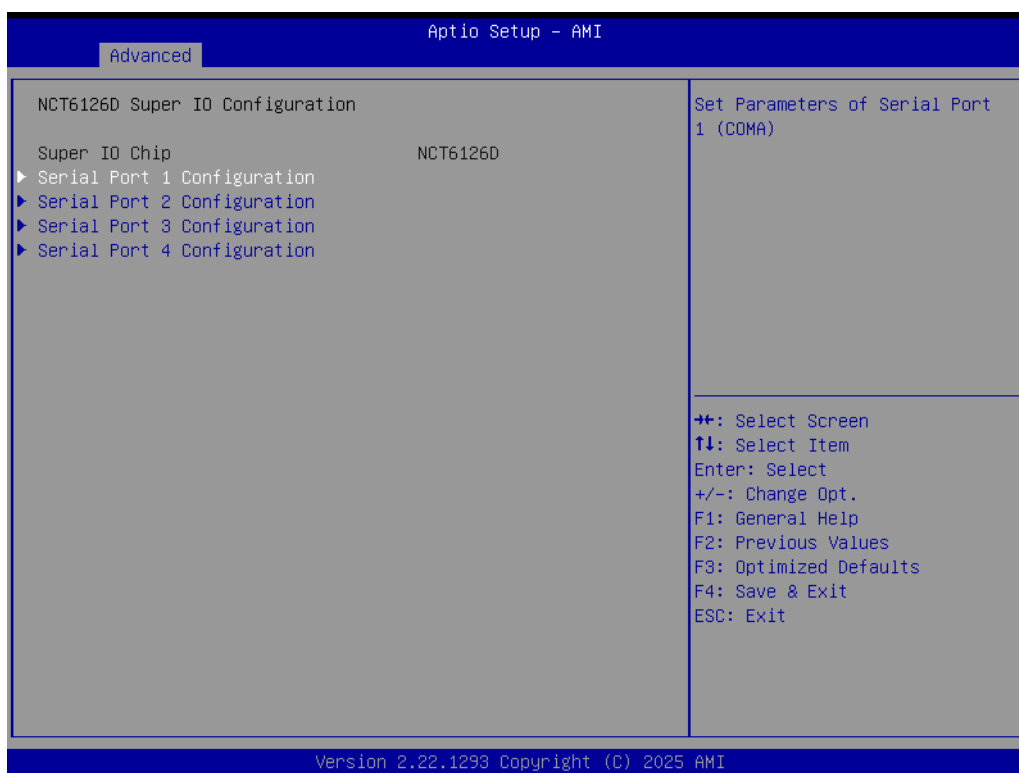
Configure PCI Express port settings such as link speed, lane width, and enable/disable status.



3.1.2.4 NCT6126D Super IO Configuration

Advanced → NCT6126D Super IO Configuration

Configure settings for the NCT6126D Super I/O chip, including serial ports and hardware monitoring.



Serial Port 1 Configuration

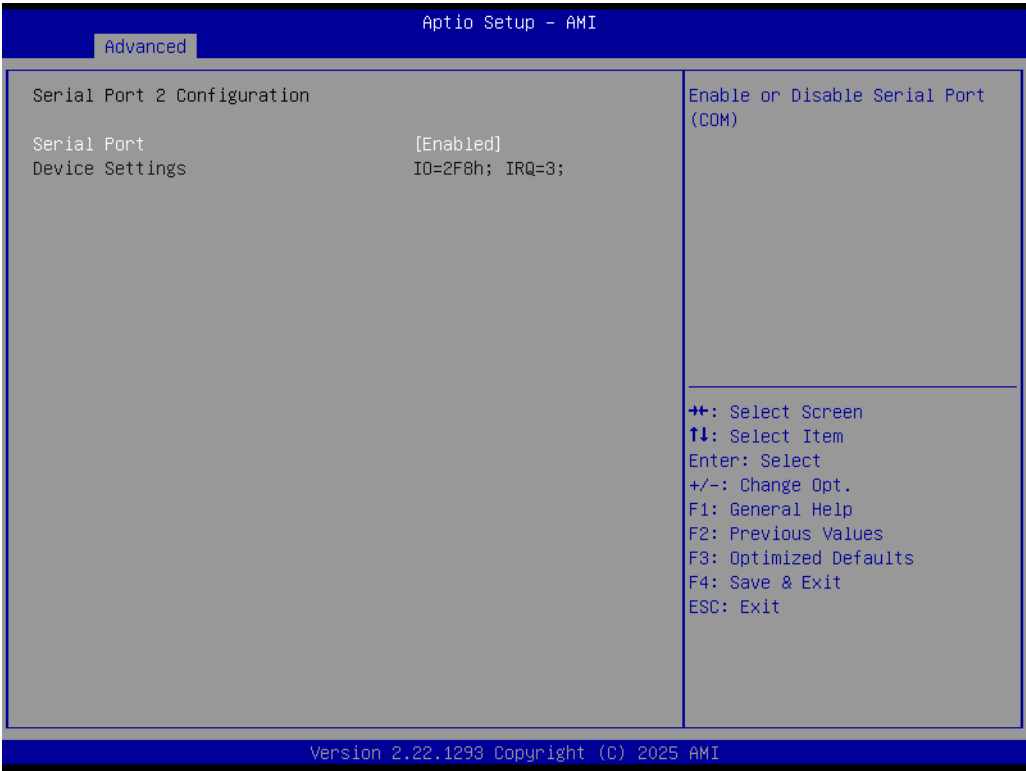
Advanced → NCT6126D Super IO Configuration → Serial Port 1 Configuration

Enable/disable Serial Port 1 and configure its I/O port and IRQ settings.



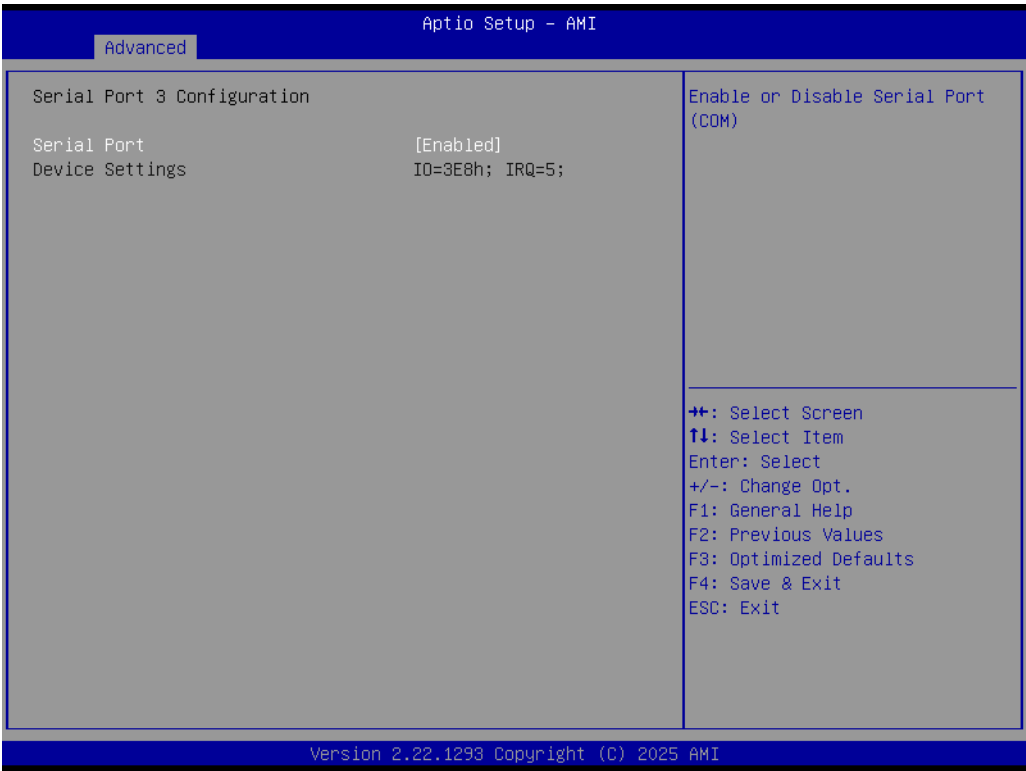
Serial Port 2 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 2 Configuration
Enable or disable Serial Port 2 (or SOL), and configure its base I/O address and interrupt request (IRQ) settings



Serial Port 3 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 3 Configuration
Enable or disable Serial Port 3 and configure its base I/O address and IRQ settings.



Serial Port 4 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 4 Configuration

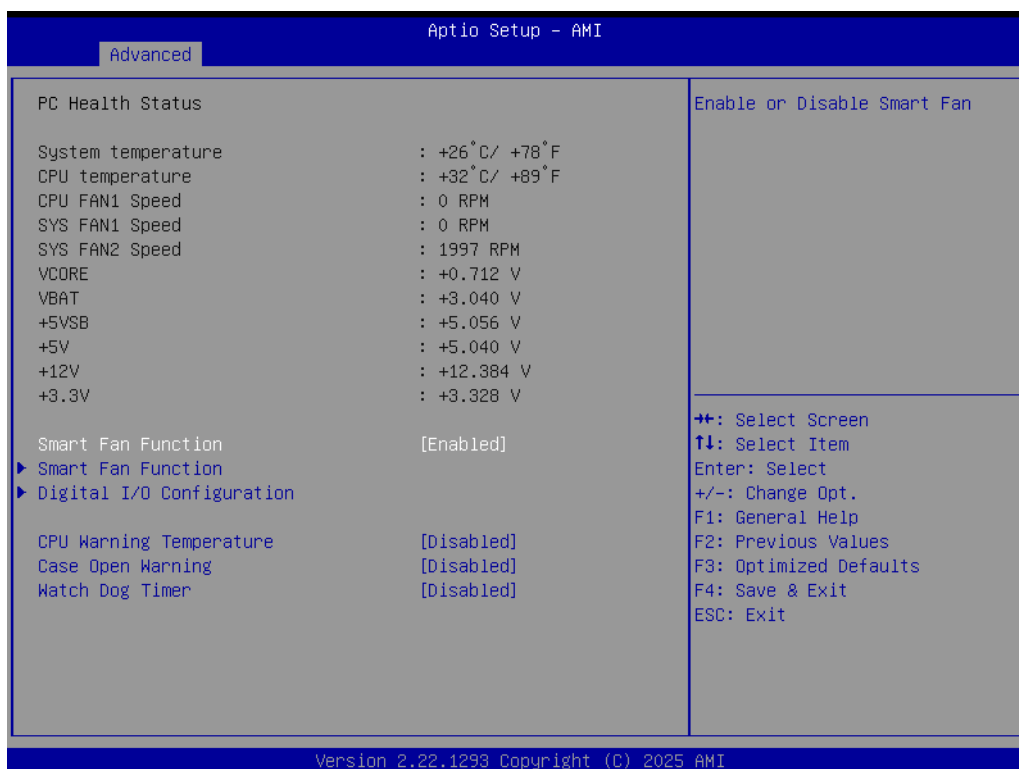
Enable or disable Serial Port 4 and configure its base I/O address and IRQ settings



3.1.2.5 NCT6126D HW Monitor

Advanced → NCT6126D HW Monitor

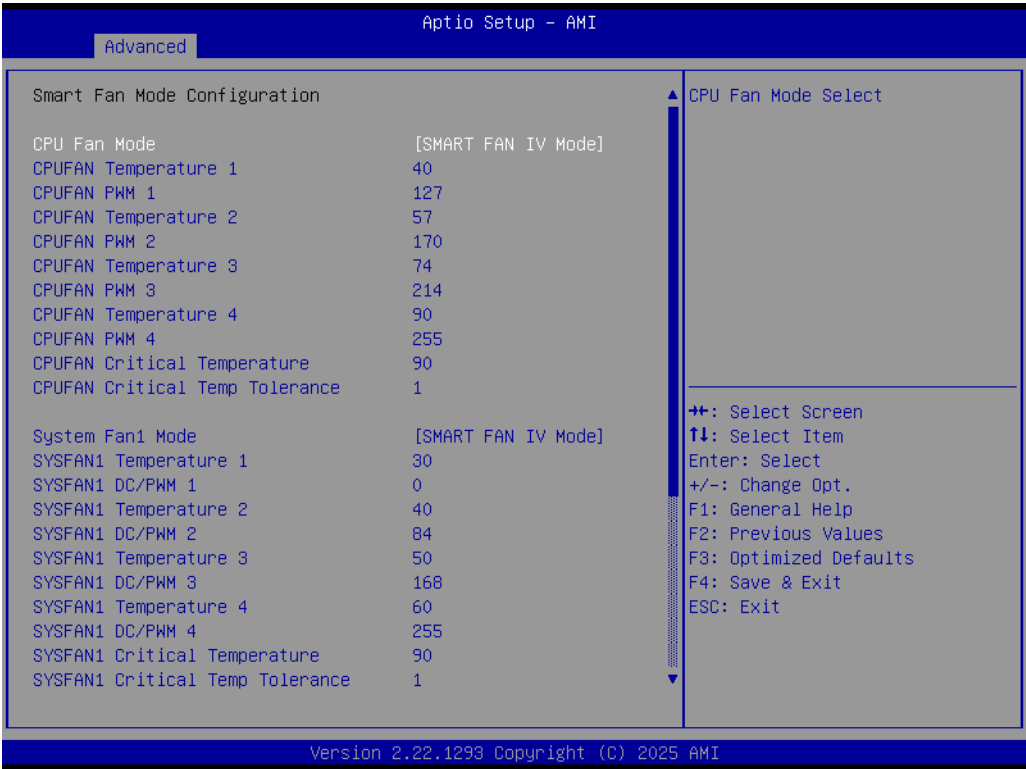
System health monitoring (voltage, temperature, fan)



Smart Fan Function

Advanced → NCT6126D HW Monitor → Smart Fan Function

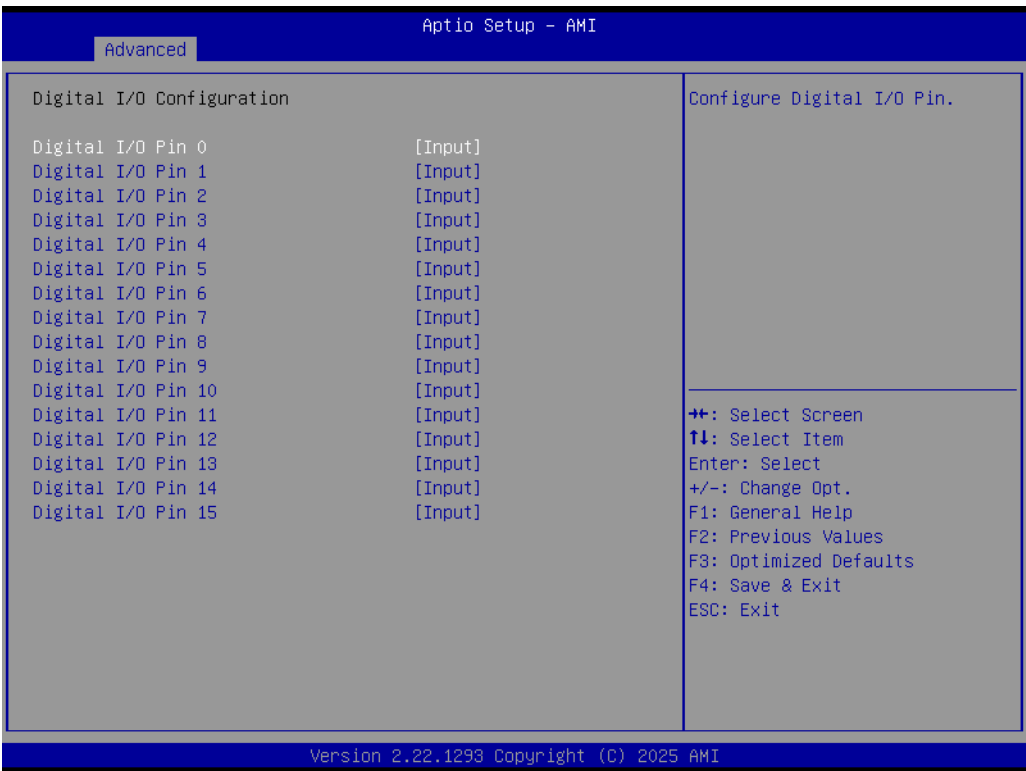
Enable temperature-responsive fan control using Nuvoton’s SMART FAN algorithms



Digital I/O Configuration

Advanced → NCT6126D HW Monitor → Digital I/O Configuration

Configure General-Purpose Digital I/O pins for system control tasks.



3.1.2.6 UEFI Variables Protection

Advanced → UEFI Variables Protection

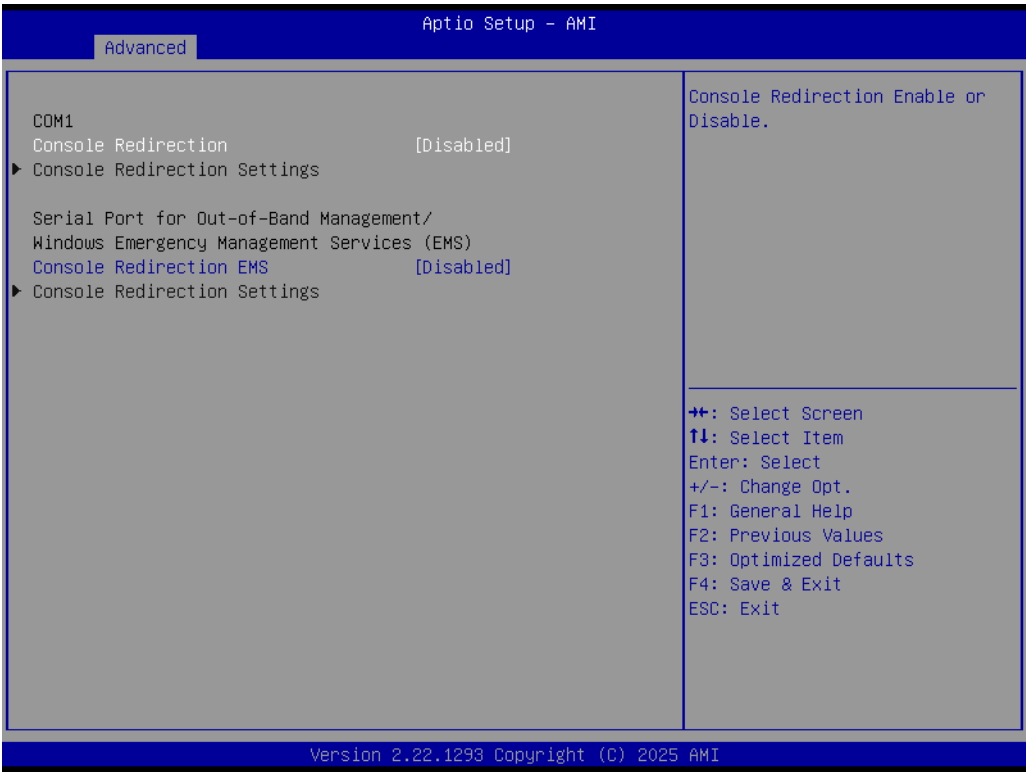
Enable or disable password-based protection for UEFI runtime variables stored in NVRAM.



3.1.2.7 Serial Port Console Redirection

Advanced → Serial Port Console Redirection

Enable or disable BIOS output redirection through the serial port for remote console access.



3.1.2.8 CPU Configuration

Advanced → CPU Configuration

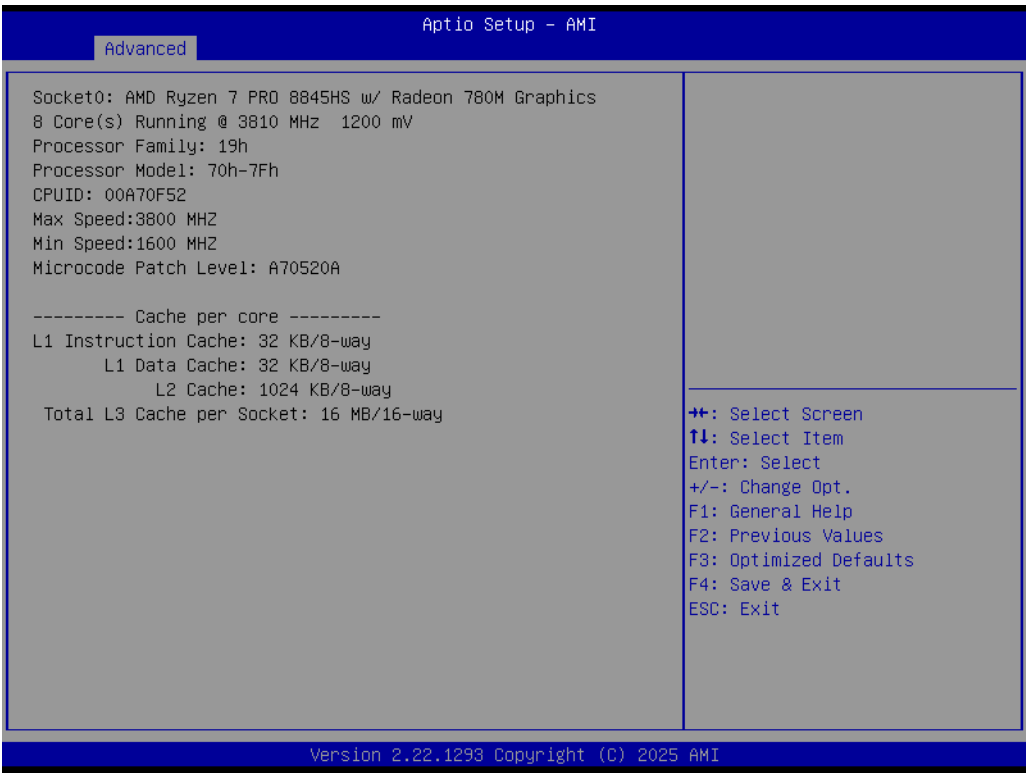
Access and configure CPU-related features such as core count, virtualization, power management, and hyper-threading



Node 0 Information

Advanced → CPU Configuration → Node 0 Information

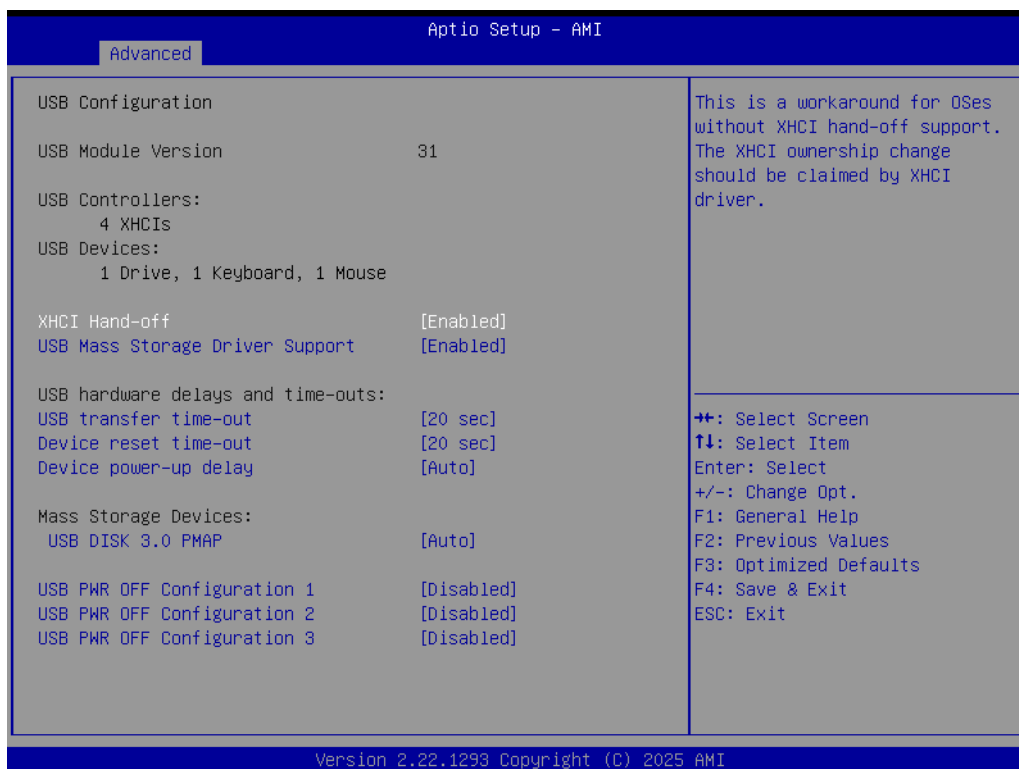
Display information for NUMA node 0, including CPU and memory assignment details



3.1.2.9 USB Configuration

Advanced → USB Configuration

Configure USB controller behavior and legacy support options.



3.1.2.10 Network Stack Configuration

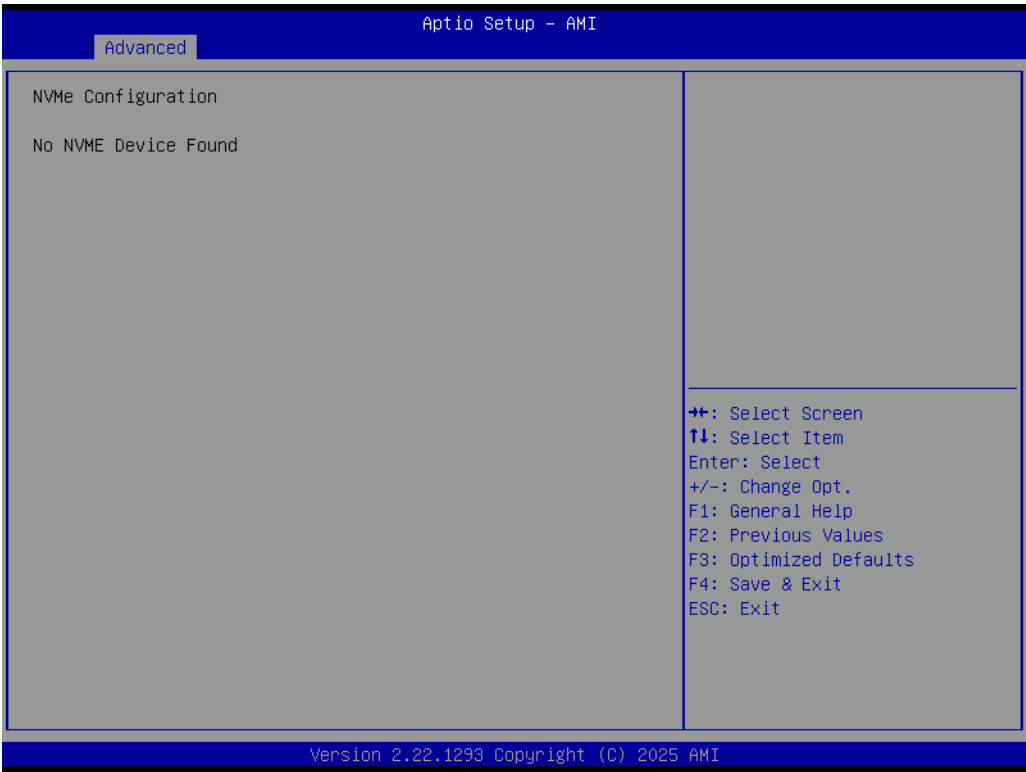
Advanced → Network Stack Configuration

Enable or disable network booting functionality (e.g., PXE) by initializing the UEFI network stack



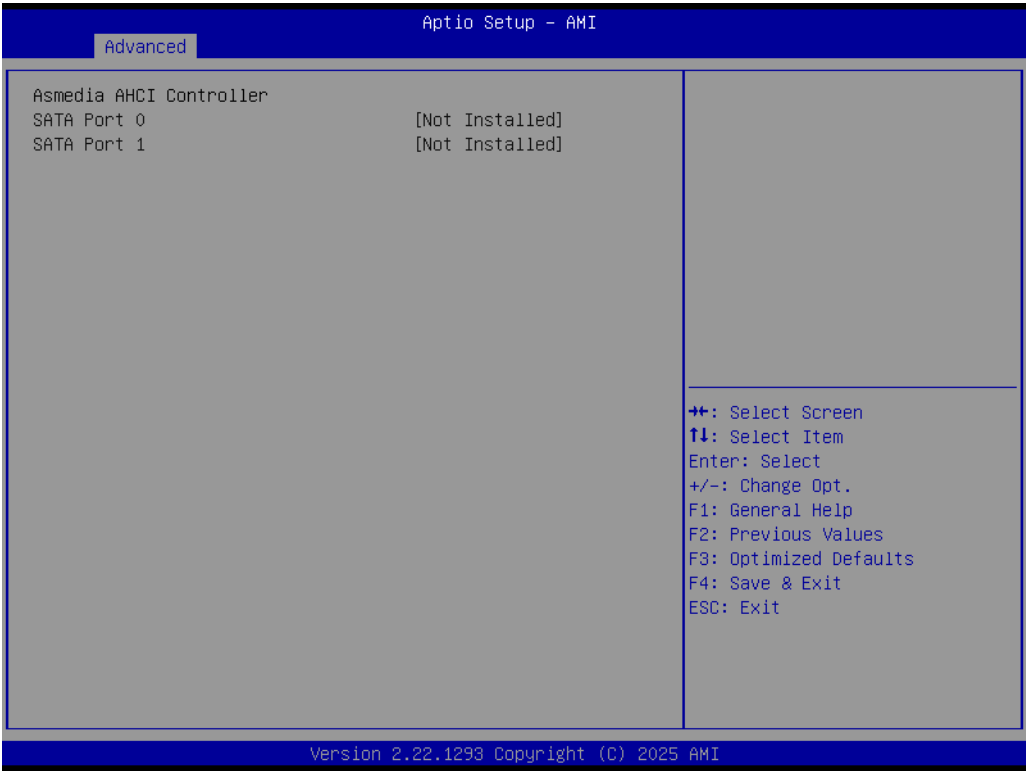
3.1.2.11 NVMe Configuration

Advanced → NVMe Configuration
Enable and configure NVMe SSD settings, such as PCIe link mode and M.2 slot bandwidth.



3.1.2.12 Asmedia AHCI Controller

Advanced → Asmedia AHCI Controller
Display connected SATA devices managed by the onboard ASMedia AHCI controller.



3.1.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI Express Configuration, to go to the sub-menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub-menus are described on the following pages.

3.1.3.1 South Bridge

Chipset → South Bridge

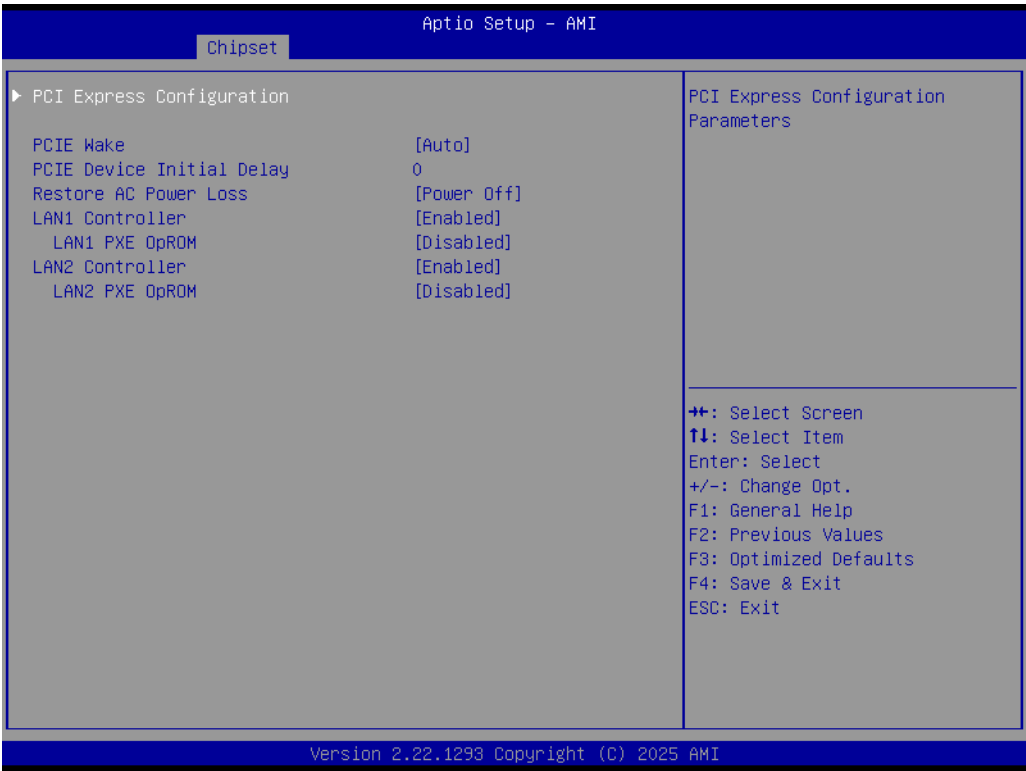
Manage various motherboard I/O functions—such as USB, SATA, audio, and firmware—handled by the South Bridge chip



PCI Express Configuration

Chipset → South Bridge → PCI Express Configuration

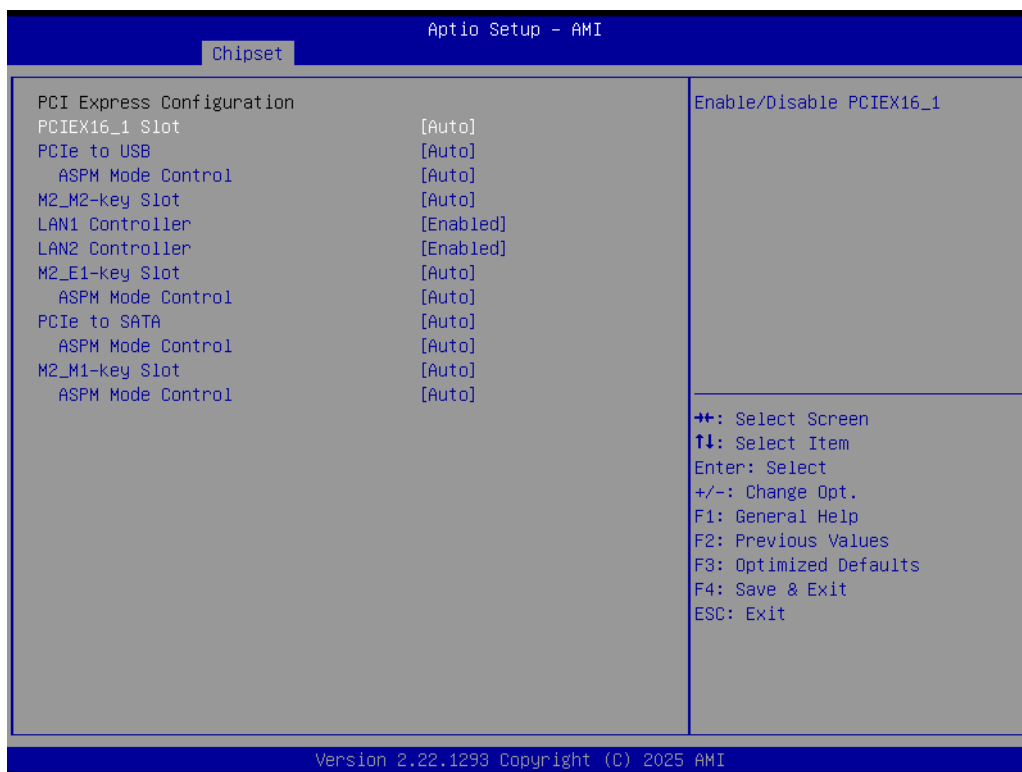
Configure South Bridge–managed PCIe port settings like enable/disable, link speed, lane configuration, and de-emphasis.



PCIEX16_1 Slot

Chipset → South Bridge → PCI Express Configuration → PCIEX16_1 Slot

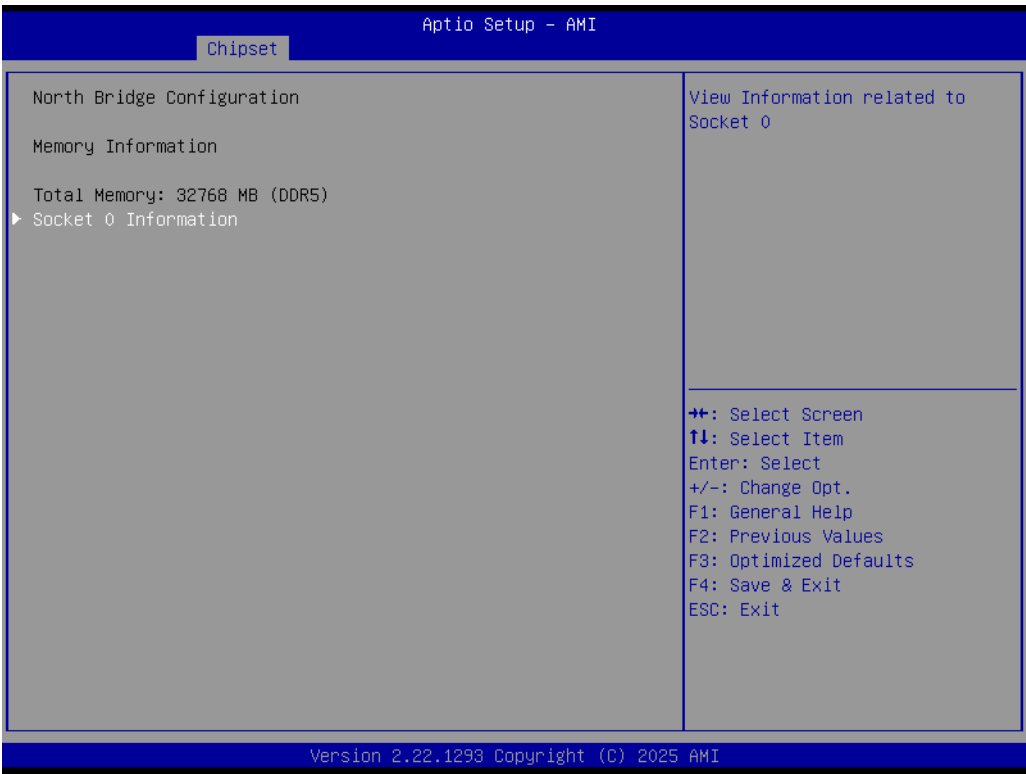
Display and configure the properties of the PCIEX16_1 slot, such as slot type, lane allocation, and link status



3.1.3.2 North Bridge

Chipset → North Bridge

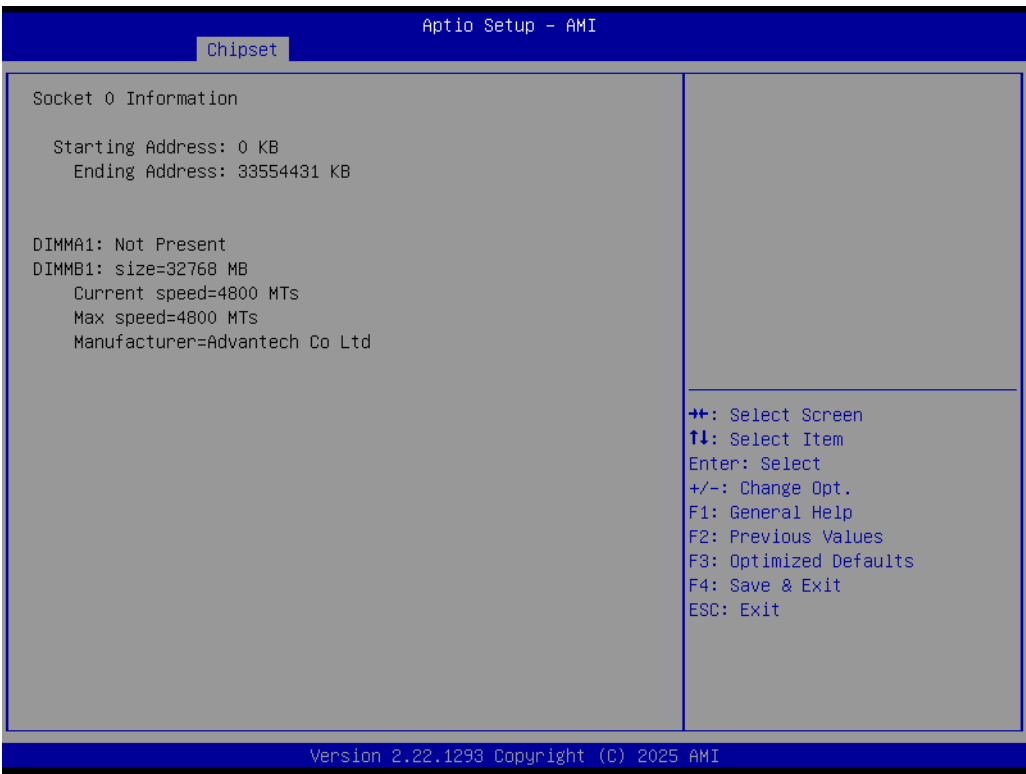
Configure key high-speed pathways managed by the North Bridge, including memory and graphics interfaces



Socket 0 Information

Chipset → North Bridge → Socket 0 Information

Display memory information for the module installed in socket 0



3.1.4 Security

Manage firmware-level protections such as BIOS passwords, user access control.



3.1.4.1 Secure Boot

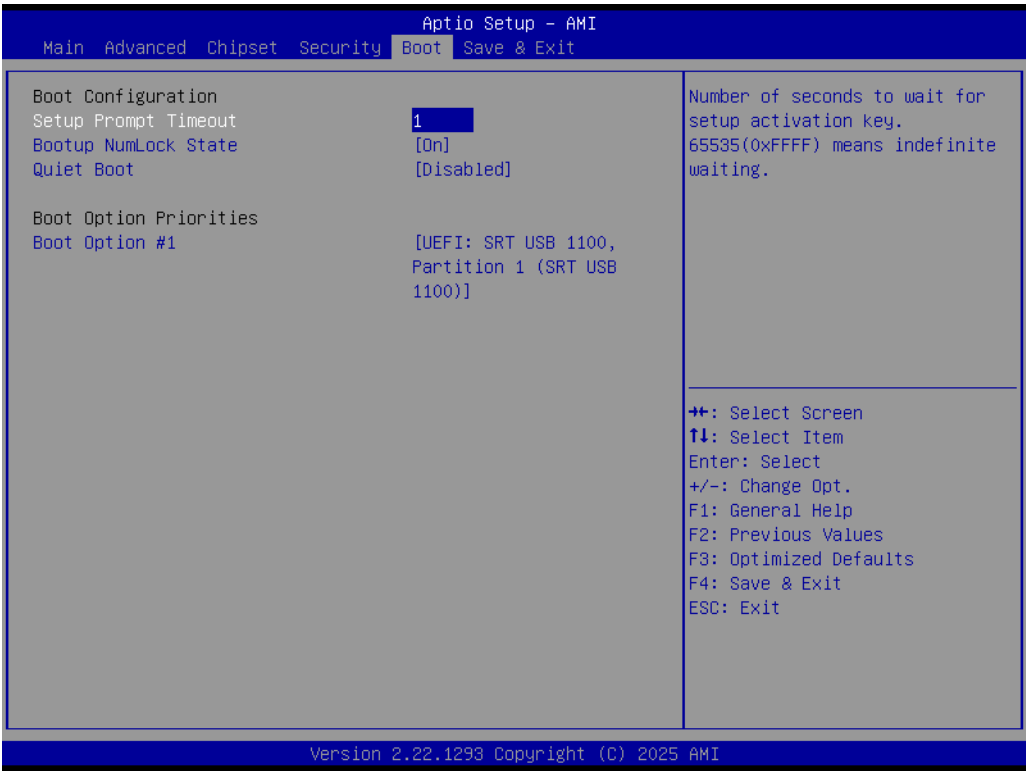
Security → Secure Boot

Enable or disable UEFI Secure Boot to ensure only digitally signed, trusted software can execute during system startup



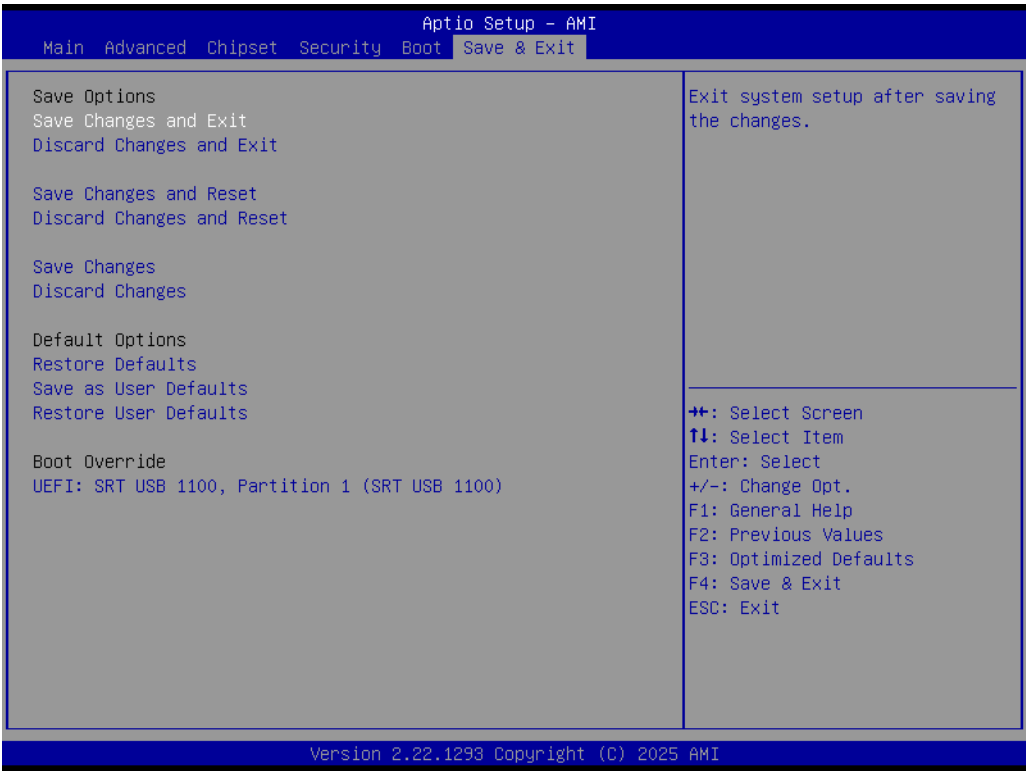
3.1.5 Boot Settings

Configure the system’s startup behavior, including boot device priority, NumLock state, and quiet boot settings.



3.1.6 Save & Exit Configuration

Save your BIOS configuration changes and exit setup (with optional reboot).





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