

User Manual

AIIS-3411

Machine Vision System (Computer)

ADVANTECH

Enabling an Intelligent Planet

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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 A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In this event, users are required to correct the interference at their own expense.

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!*



Les avertissements indiquent des conditions qui, si elles ne sont pas respectées, peuvent blesser!

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.”

Des précautions sont incluses pour vous aider à éviter d'endommager le matériel ou de perdre

Les données. par exemple.:

Il y a un risque d'explosion d'une nouvelle batterie si elle n'est pas installée correctement. N'essayez pas de recharger, d'ouvrir de force ou de chauffer la batterie. Remplacez la batterie uniquement avec le même type ou un type équivalent recommandé par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

Note! *Notes provide optional additional information.*



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. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If 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 70°C (158°F) as this may damage the components. The equipment should be kept in a controlled environment.
16. **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.
17. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).
18. **RESTRICTED ACCESS AREA:** The equipment should only be installed in a Restricted Access Area.
19. The camera is only to be connected to PoE networks without routing to outside plants.
20. The power cord must be connected to a socket or outlet with a ground connection.
21. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
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. Lisez attentivement ces consignes de sécurité.
2. Conservez ce manuel d'utilisation pour référence ultérieure.
3. Débranchez cet équipement de toute prise secteur avant de le nettoyer. Utilisez un humide tissu. N'utilisez pas de détergents liquides ou en spray pour le nettoyage.
4. Pour les équipements enfichables, la prise de courant doit être située près de l'équipement et doit être facilement accessible.
5. Gardez cet équipement à l'abri de l'humidité.
6. Placez cet équipement sur une surface fiable pendant l'installation. Le laisser tomber ou le laisser sa chute peut provoquer des dommages.
7. Les ouvertures sur l'enceinte sont destinées à la convection d'air. Protégez l'équipement de surchauffe. **NE COUVREZ PAS LES OUVERTURES.**
8. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
9. Positionnez le cordon d'alimentation de sorte que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
10. Toutes les précautions et avertissements sur l'équipement doivent être notés.
11. Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter les dommages par surtension transitoire.
12. Ne versez jamais de liquide dans une ouverture de l'appareil. Cela peut provoquer un incendie ou des choc.
13. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, l'équipement doit être ouvert uniquement par un technicien qualifié.
14. Si l'une des situations suivantes se présente, faites vérifier l'équipement par le service personnel:
 - Le cordon d'alimentation ou la fiche est endommagé.
 - Du 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 le manuel de l'utilisateur.
 - L'équipement est tombé et a été endommagé.
 - L'équipement présente des signes évidents de rupture.
15. Ne laissez pas cet équipement dans un environnement où la température de stockage peut descendre en dessous de -40° C (-40° F) ou au-dessus de 70° C (158° F). Cela pourrait endommager l'équipement. L'équipement doit être dans un environnement contrôlé.
16. **ATTENTION:** Risque d'explosion si la batterie n'est pas remplacée correctement. Remplacer seulement de type identique ou équivalent recommandé par le fabricant, jeter piles usagées conformément aux instructions du fabricant.
17. Le niveau de pression acoustique au poste de l'opérateur selon CEI 704-1: 1982 ne dépasse pas 70 dB (A).
18. **ZONE D'ACCÈS RESTREINT:** l'équipement ne doit être installé que dans un Zone d'accès restreint.
19. La caméra ne doit être connectée qu'aux réseaux PoE sans acheminement vers des installations extérieures.
20. Le cordon d'alimentation doit être connecté à une prise ou une prise avec une connexion à la terre.
21. Convient pour une installation dans des salles de technologie de l'information conformément à l'article 645 du Code national de l'électricité et NFPA 75.

22. AVERTISSEMENT: Cet ensemble d'instructions est donné conformément à la CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues ici.

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.

- AIIIS-3411 Bare System x 1
- Startup Manual (EN/CN) x 1 PN: 2041341100
- Wallmount Bracket x 2 PN: 1960014487T006
- Rubber Foot x 4 PN: 1990006571S000
- CPU Cooler x 1 PN: 1960053207N001
- 2-pin Phoenix DC Power Connector x 1 PN: 1652002205
- 4-pin Phoenix Power Connector x 1 PN: 1652003234

Ordering information

Part Number	Camera Interface	Display	USB 3.0	COM 232/422/485
AIIIS-3411P-00A1	4-CH GigE PoE	VGA+HDMI	4	2
AIIIS-3411U-00A1	4-CH USB 3.0	VGA+HDMI	4	2

Optional accessories

Part Number	Description
AIIIS-1882-AE	4-ch Lighting Control with 32-ch Isolated 16 DI/16 DO PCI Express Card
96PSA-A230W24P4-3	230Watt 24Vdc Adapter, FSP230-AAAN3
1702002600	Power Cord UL 3P 10A 125V
1700022940-01	Power Cord PSE 3P 7A 125V
1702002605	Power Cord EU 3P 10A 250V
9691341010E	PCI riser card
PCIE-1674-AE	4-port PCI express GbE card
1700024858-01	A cable 2*2P-4.2/2*2P-4.2 15cm (for PCIE-1674)

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Chapter 1

General Introduction

This chapter gives background information on the AIIIS-3411 series.

1.1 Introduction

The AIIIS-3411 Box IPC is an ideal application-ready system platform solution. All electronics are protected in a compact, sealed case for easy embedding in the customer's own housing, or as a stand-alone unit where space is limited. Moreover, the AIIIS-3411 also supports lighting control via the optional AIIIS-1882 Digital I/O and additional 12 ~ 24 V_{DC} power input.

The AIIIS-3411P's self-contained PoE controller features performance computing with Power over Ethernet, multiple I/O interface, and extended product longevity, all in a compact form factor. These PoE boxes use the latest 10th generation Intel® Core™ processors to deliver improved computing power and graphics performance. Already fully verified and certified, they offer system integrators for a no-nonsense solution.

The AIIIS-3411U is designed with a dedicated USB 3.0 controller to ensure sufficient bandwidth so a single USB cable can carry both data and electrical power. Compliant with USB 3.0 SuperSpeed, it is capable of transferring data at up to 5 Gbps, whereas USB 2.0 can only provide up to 480 Mbps.

AIIIS-3411P utilizes a single RJ45 cable that carries both data and electrical power. Compliant with IEEE 802.3af, it can provide a maximum of 15 watts of power to each powered device up to a distance of 100 meters, whereas USB 2.0 can only provide up to 4.5 watts, with a maximum cable length of 5 meters.

The AIIIS-3411P offers plenty of I/O interfaces, including four PoE port channels and the AIIIS-3411U offers eight USB 3.0 ports (four of them are designed with dedicated controllers), max. 40-bit digital I/O, and two serial ports. Four USB 3.0 ports provide high-performance data transfer up to 5 Gbps. The two serial ports on the front panel can be configured as RS-232, RS-422 or RS-485 via BIOS setting. These interfaces can support various peripheral devices.

1.2 Product Features

- 10th gen. Intel Core i9/i7/i5/i3 CPU (LGA1200)
- **PoE, AIIIS-3411P**
 - Controller: CH1~CH4: Intel® i210 x 4
 - Compliant: IEEE 802.3af
 - Power Output: 15 W max. per channel/30 W max. for 1 & 2 channel
- **USB, AIIIS-3411U**
 - Controller: CH1~CH4: uPD720202 x4
 - Compliant: USB 3.0
 - Power output: 4.5 W per channel
- **Compact & Thoughtful Design**
 - Easier fan filter maintenance
 - Internal USB Type-A with locking design (Max. 49 mm length)
 - Wall or DIN-rail mounting kit (optional)
 - Built-in lighting control with additional 12 V ~ 24 V_{DC} input (optional AIIIS-1882)

1.3 Product Specifications

1.3.1 Processor System

- 10th Gen. Intel Core i9/i7/i5/i3 CPU (LGA1200)

Professor System	CPU	i9-10900E	i9-10900TE	i7-10700E	i7-10700TE	i5-10500E	i5-10500TE	i3-10100E	i3-10100TE	G6400E	G6400TE	G5900E	G5900TE
	Core	10	10	8	8	6	6	4	4	2	2	2	2
	Base Frequency	2.80 GHz	1.80 GHz	2.90 GHz	2.00 GHz	3.1 GHz	2.3 GHz	3.20 GHz	3.60 GHz	3.80 GHz	3.20 GHz	3.20 GHz	3.00 GHz
	L3 Cache	20MB	20MB	16MB	16MB	12MB	12MB	6MB	6MB	4MB	4MB	2 MB	2 MB
	Chipset	H420E											
	BIOS	AMI 128Mb SPI Flash											

1.3.2 Memory

- Supports dual channel DDR4 SODIMM-2933 MHz, 32GB per slot without ECC function; Max capacity: 64GB

1.3.3 Graphics

- **Chipset:** Intel® HD Graphics

1.3.4 PoE (Power Over Ethernet)

- **PoE, AIIS-3411P**
 - Controller: CH1~CH4: Intel i210 x 4
 - Compliant: IEEE 802.3af
 - Power Output: 15 W max. per channel/30 W max. for 1 & 2 channels (control by BIOS, and enable or disable PoE power setting at 3.2.3.2)
- **USB, AIIS-3411U**
 - Controller: CH1~CH4: uPD720202 x 4
 - Compliant: USB 3.0
 - Power output: 4.5 W per channel

1.3.5 Ethernet

- **Interface:** 10/100/1000 Mbps
- **Controller:**
 - LAN1: Intel i219LM, supports Wake on LAN
 - LAN2: Intel i210AT, supports Wake on LAN

1.3.6 Storage

- **Internal 2.5" HDD (max. 9.5 mm height):** 1
- **mSATA:** 1

1.3.7 Front I/O

- **Display:** 1 x VGA; 1 x HDMI: Up to resolution 4096x2160@24 Hz refresh rate, VGA: Up to 1920 x 1200 resolution @ 60 Hz refresh rate
- **USB:** 4 x USB 3.0
- **Serial:** 2 x RS-232/422/485
- **Audio:** Line-out/Mic-in

1.3.8 Watchdog Timer

- **Output:** System reset
- **Interval:** Programmable 1~255 sec/min

1.3.9 Power Requirement

- **Power type:** ATX/AT
- **Power input voltage:** 19 VDC - 24 VDC
- **Power Input:** 19 VDC - 24 VDC @ 11.28 - 9.02 A
- **Power adapter:** AC to DC, 24 VDC/9.58 A, 230 W, 96PSA-A230W24P4-3 (optional)

1.3.10 Cooling

- **System Fan:** 1 (8 cm/57 CFM) for AIIIS-3411

1.3.11 Miscellaneous

- **LED Indicators:** Power, HDD, temperature
- **Control:** Power on/off switch

1.3.12 Environment

- **Operating Temperature:** 0 ~ 50 °C (32 ~ 122 °F)*
- **Non-operating Temperature:** -40 ~ 70 °C (-40 ~ 158 °F)
- **Operating Humidity:** 10 ~ 95% @ 40 °C, non-condensing
- **Non-operating Humidity:** 10 ~ 95% @ 60 °C, non-condensing

1.3.13 Physical Characteristics

For AIIIS-3411P/U

- **Dimension:** 240 x 97 x 190 mm (9.45" x 3.82" x 7.48")
- **Weight:** 2.56 kg (5.64 lb, w/o CPU cooler)

1.3.14 EMC

CE, FCC, CCC, BSMI

1.3.15 Safety

UL, CB, CCC

1.4 Jumper Settings

1.4.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical 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” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

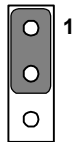
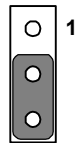
Table 1.1: PSON1: System AT/ATX Mode Selection	
Function	Jumper Setting
1-2	 AT Mode
2-3	 ATX Mode

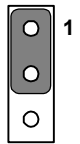
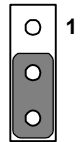
Table 1.2: Clear CMOS	
Function	Jumper Setting
1-2	 Normal (Default)
2-3	 Clear CMOS

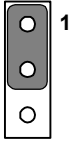
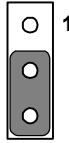
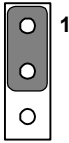
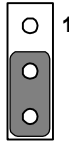
Table 1.3: JME1: Enable or Disable ME	
Function	Jumper Setting
1-2	 <p>ME enable (Default)</p>
2-3	 <p>ME disable</p>

Table 1.4: JWDT1: Watch Dog Timer	
Function	Jumper Setting
1-2	 <p>Reserved</p>
2-3	 <p>System reset (Default)</p>

Chapter 2

Hardware Installation

This chapter introduces external IO and the installation of AIIIS-3411 Hardware.

2.1 Front Panel Controls, Indicators & Connectors

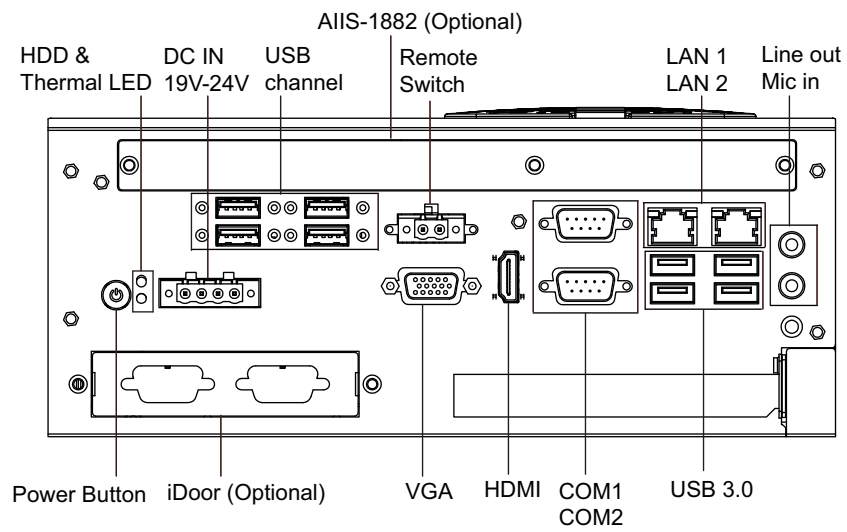


Figure 2.1 AIIS-3411U Front View

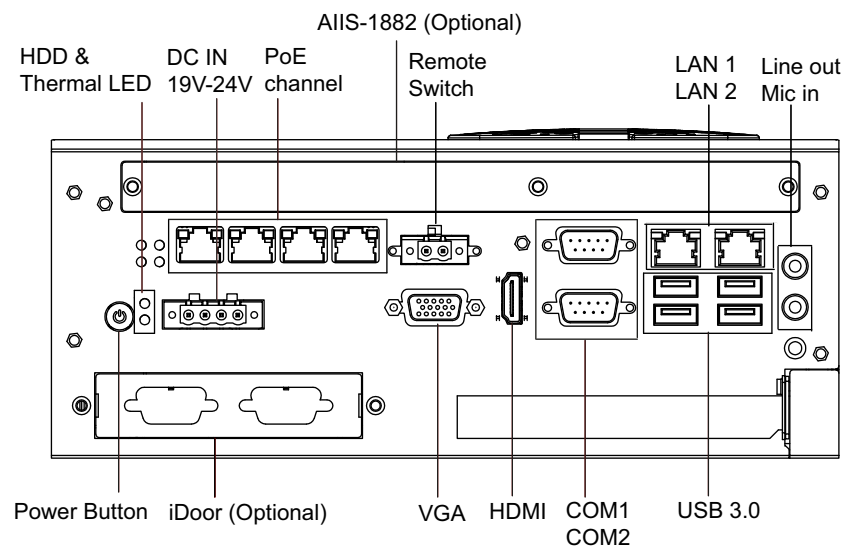


Figure 2.2 AIIS-3411P Front View

2.1.1 Power On/Off Button

The AIIIS-3411 has a Power On/Off button with LED indicators on the front side that show On status (green LED) and Off/Suspend status (orange LED). The Power button supports dual functions: Soft Power - On/Off (Instant off or Delay 4 Seconds then off), and Suspend.

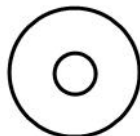


Figure 2.3 Power On/Off Button

Table 2.1: Power Button Connector Pin Assignment

LED color	Status
Green	Power ON
Amber	S1/S4/S5

2.1.2 LED Indicators

There are two LEDs on the front panel that indicate system status: The temperature LED is for system thermal alarm status; and HDD LED is for HDD and CFAST disk status. In addition, there are four LEDs to indicate the connection of powered device via PoE port.

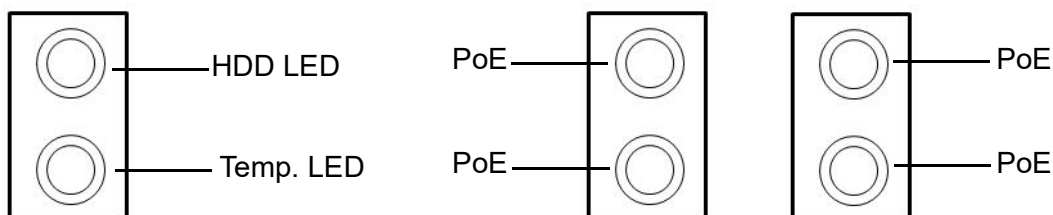


Figure 2.4 LED Indicators

Table 2.2: LED Indicators (Thermal & HDD)

LED color	Function
Red	Over heating LED
Amber	SATA LED

Table 2.3: LED Indicator (PoE)

LED color	Function
Red	Connected Powered Device

2.1.3 Power Input Connector

The AIIIS-3411 comes with a four-pin header that carries 19 VDC - 24 VDC external power input.

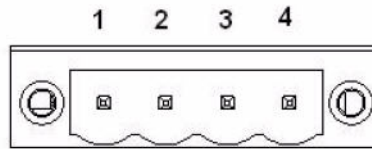


Figure 2.5 Power Input Connector

Table 2.4: Power Input Connector Pin Assignments

Pin	Signal
1	GND
2	19 VDC - 24 VDC
3	19 VDC - 24 VDC
4	GND

2.1.4 VGA+HDMI Connector

The AIIIS-3411 offers an integrated female HDMI connector and a D-sub 15-pin VGA; HDMI carries digital video signal. This supports high-speed, high-resolution digital displays and traditional analog displays.

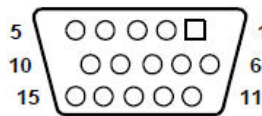


Figure 2.6 Figure 2.7 VGA Connector

Table 2.5: VGA Connector Pin Assignment

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	SDT
13	H-SYNC	14	V-SYNC
15	SCK		

2.1.5 HDMI Connector

An integrated, 19-pin receptacle connector HDMI Type A Interface is provided. The HDMI link supports resolutions up to 4096 x 2160@24 Hz.

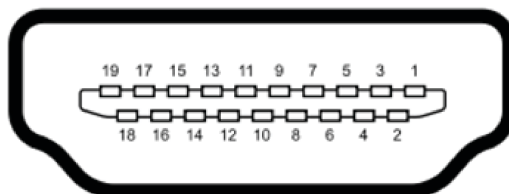


Figure 2.7 HDMI Connector

Table 2.6: HDMI Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	TMDS Data 2+	2	TMDS Data 2 shield
3	TMDS Data 2-	4	TMDS Data 1+
5	TMDS Data 1 shield	6	TMDS Data 1-
7	TMDS Data 0+	8	TMDS Data 0 shield
9	TMDS Data 0-	10	TMDS clock+
11	TMDS clock shield	12	TMDS clock-
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5 V
19	Hot Plug Detect		

2.1.6 COM Connectors

The AIIIS-3411 provides 2 D-sub 9-pin connectors that are serial communication interface ports. COM-1 & COM-2 support RS-232/422/485 mode by BIOS selection.

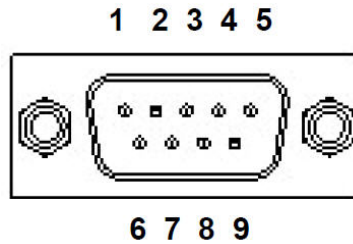


Figure 2.8 COM Connectors

Table 2.7: Front 2-COM Pin Assignment

Pin	RS-232	RS-422	RS-485
1	DCD	TXD -	DATA -
2	SIN#	TXD +	DATA +
3	SOUT#	RXD +	NC
4	DTR	RXD -	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.1.7 Ethernet Connectors (LANs)

The AIIIS-3411 provides six RJ45 connectors for Gigabit LAN interfaces; two of them are equipped with Intel® i219LM, i210AT Ethernet Controllers, and four of them are equipped with Intel® i210 Ethernet Controllers that are fully compliant with the IEEE 802.3af Power over Ethernet standard. The Ethernet ports provide standard RJ-45 jack connectors with LED indicators that show Active/Link status (Green LED) and Speed status (Yellow LED).

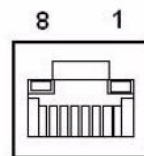


Figure 2.9 Ethernet Connector

Table 2.8: Ethernet Connector Pin Assignment

Pin	Signal	Pin	Signal
1	MDI0 +	2	MDI0 -
3	MDI1 +	4	MDI1 -
5	MDI2 +	6	MDI2 -
7	MDI3 +	8	MDI3 -

2.1.8 USB 3.0 Connectors

USB ports 1 ~ 4 support the USB 3.0 interface, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface is USB UHCI, Rev. 3.0 compliant. Please refer to the table below for pin assignments. USB 3.0 connectors contain legacy pins to interface with USB 2.0 devices, and a new set of pins for USB 3.0 connectivity (both sets reside in the same connector).

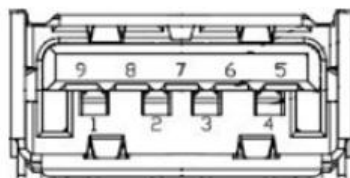


Figure 2.10 USB 3.0 Connectors

Table 2.9: USB3.0 Connector Pin Assignment

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

2.1.9 Audio Connector

The AIIIS-3411 offers stereo audio ports via two headphone jack connectors for Line_Out and Mic_In. The audio chip is controlled by ALC888s, and it is compliant with the Azalea standard.



Figure 2.11 Audio Connector

Table 2.10: Audio Connector Pin Assignments

Pin	Audio Signal Name
1	Line_Out
2	Mic_In

2.1.10 Remote Power Switch Connector

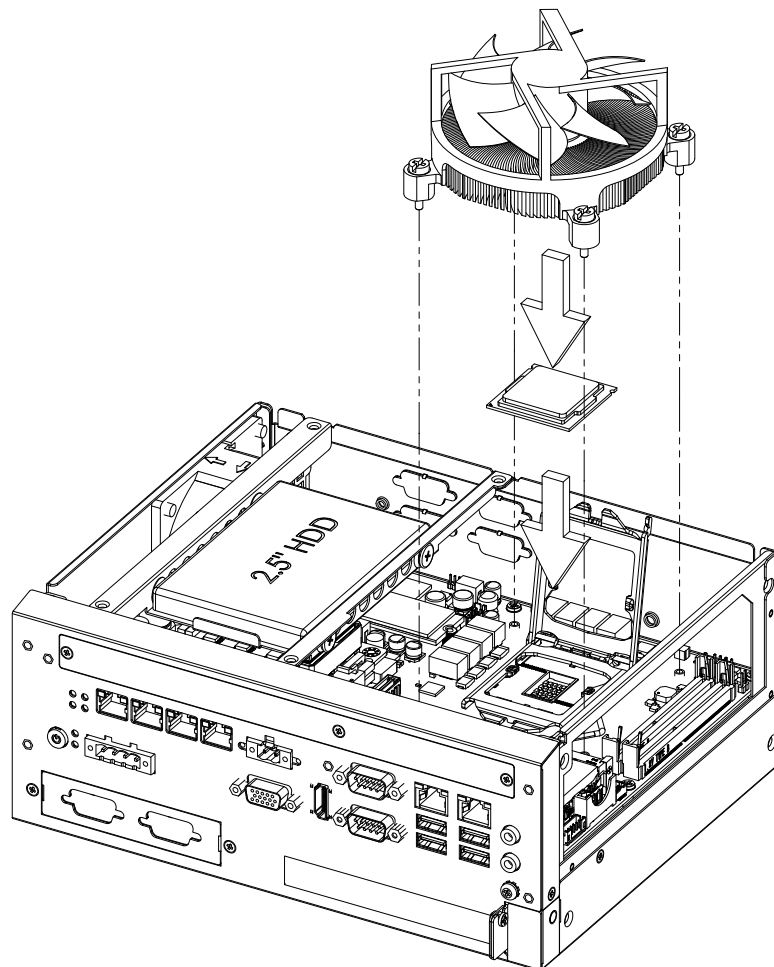
The AIIIS-3411 includes a 2-pin Phoenix DC power connector that provides for remote power control.

2.2 CPU Installation

1. Remove top cover.
2. Pull the handle beside the processor socket outward and lift it.
3. Remove the socket protection cap.
4. Align the notch or marked corner on the processor with the corresponding corner on the socket.
5. Replace the socket cap; lower the retainer handle and clip it shut.
6. Processor installation is complete.
7. Reinstall top cover.

Installation du processeur

1. Retirez le capot supérieur.
2. Tirez la poignée à côté du support du processeur vers l'extérieur et soulevez-la.
3. Retirez le capuchon de protection de la prise.
4. Alignez l'encoche ou le coin marqué du processeur avec le coin correspondant sur la prise.
5. Remplacez le capuchon de la prise; abaissez la poignée de retenue et fermez-la.
6. L'installation du processeur est terminée.
7. Réinstallez le capot supérieur.



2.3 CPU Cooler Installation

1. Remove top cover.
2. Attach the CPU cooler on the motherboard.
3. Fasten four screws on the cooler into the steel back-plate on the PCB.
4. Reinstall top cover.

Installation du refroidisseur de CPU

1. Retirez le capot supérieur.
2. Fixez le refroidisseur de processeur sur la carte mère.
3. Fixez quatre vis sur le refroidisseur dans la plaque arrière en acier sur le PCB.
4. Réinstallez le capot supérieur.

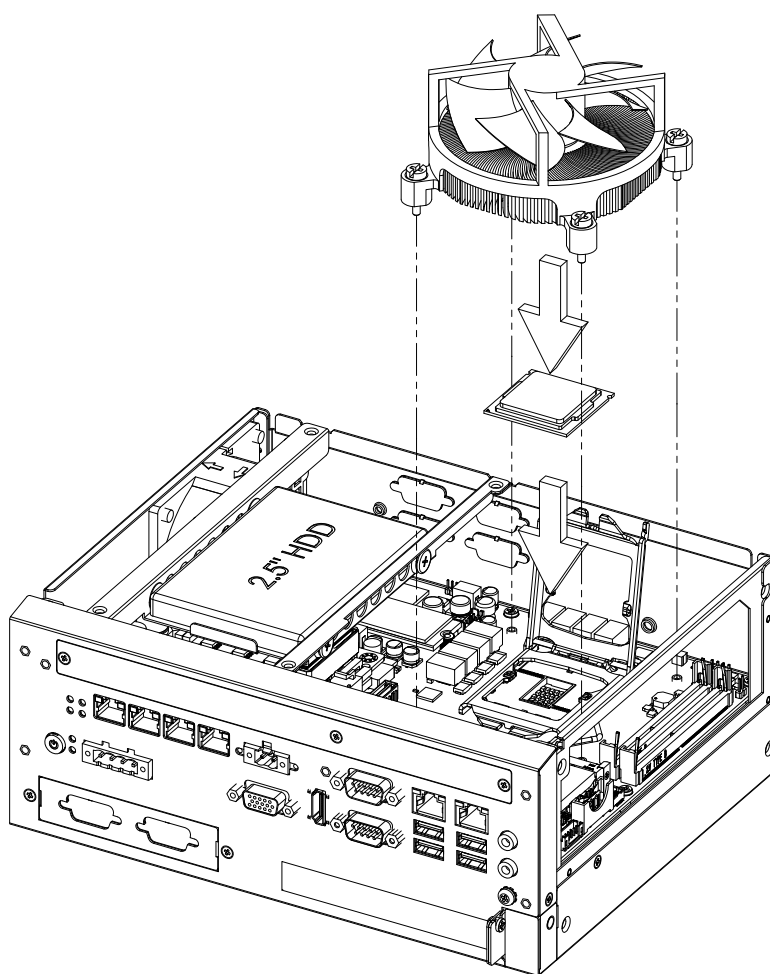


Figure 2.12 CPU & CPU Cooler Installation

2.4 Memory Installation

1. Remove top cover.
2. Insert the memory module into the SODIMM socket.
3. Reinstall top cover.

Installation de mémoire

1. Retirez le capot supérieur.
2. Insérez le module de mémoire dans le socket SODIMM.
3. Réinstallez le capot supérieur.

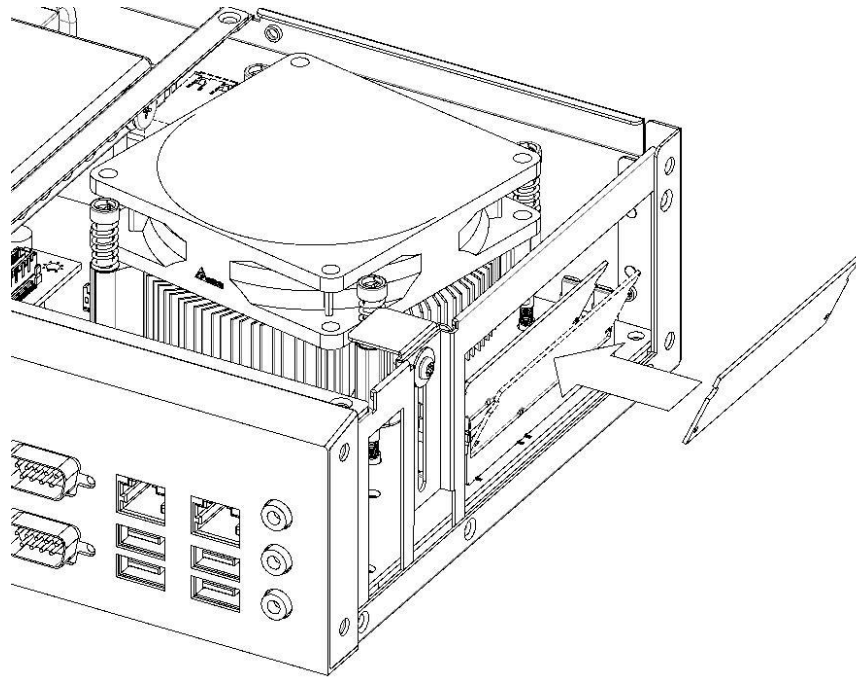


Figure 2.13 Memory Installation

2.5 HDD Installation

1. Remove top cover and HDD bracket by unscrewing the 4 screws.
2. Install the 2.5" SATA HDD with the 4 HDD mounting screws. Make sure the PCB side of the HDD will be facing the bottom cover.
3. Connect the SATA signal cable and power cable to the HDD.
4. Reinstall the HDD bracket and top cover.

Installation du disque dur

1. Retirez le capot supérieur et le support du disque dur en dévissant les 4 vis.
2. Installez le disque dur SATA 2,5 pouces avec les 4 vis de montage du disque dur. Assurez-vous que le PCB Le côté du disque dur fera face au capot inférieur.
3. Connectez le câble de signal SATA et le câble d'alimentation au disque dur.
4. Réinstallez le support du disque dur et le capot supérieur.

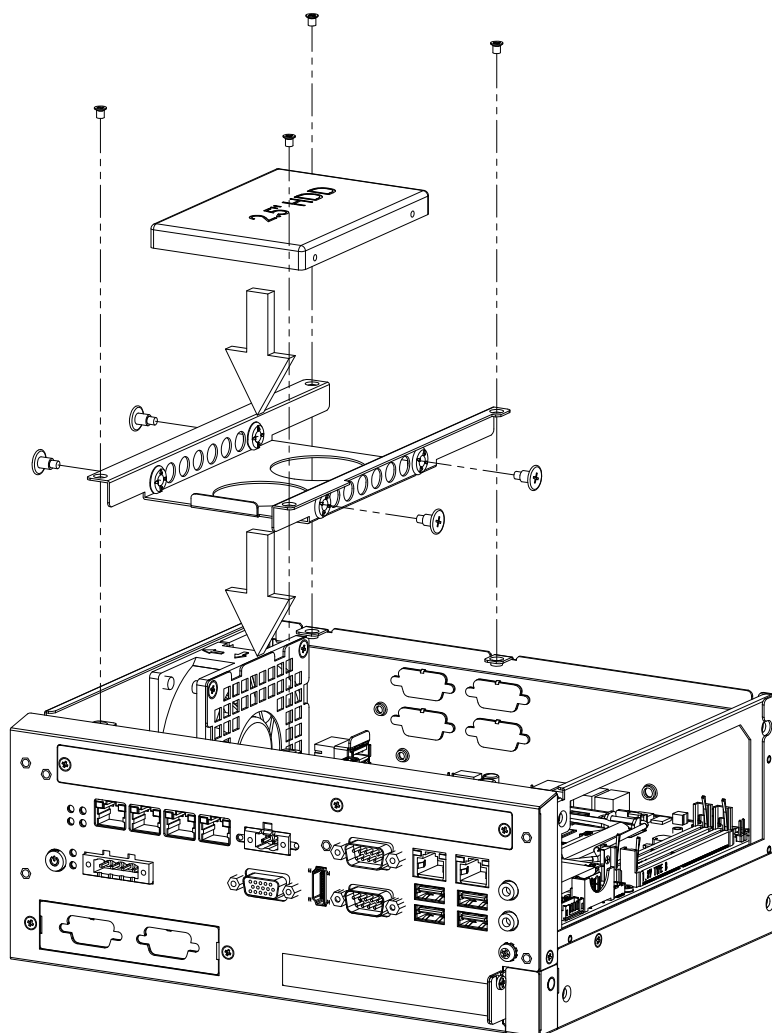


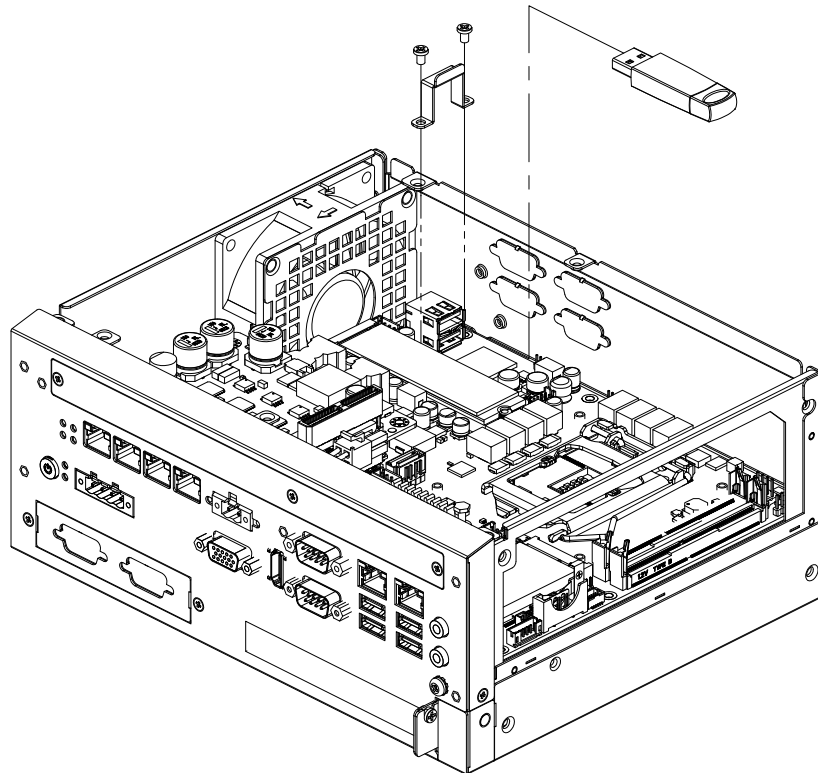
Figure 2.14 HDD Installation

2.6 Internal USB Lock Installation

1. Remove top cover and USB lock-kit by unscrewing the single screw.
2. Install the USB dongle and adjust the position of the lock-kit properly.
3. Reinstall the USB lock-kit and top cover.

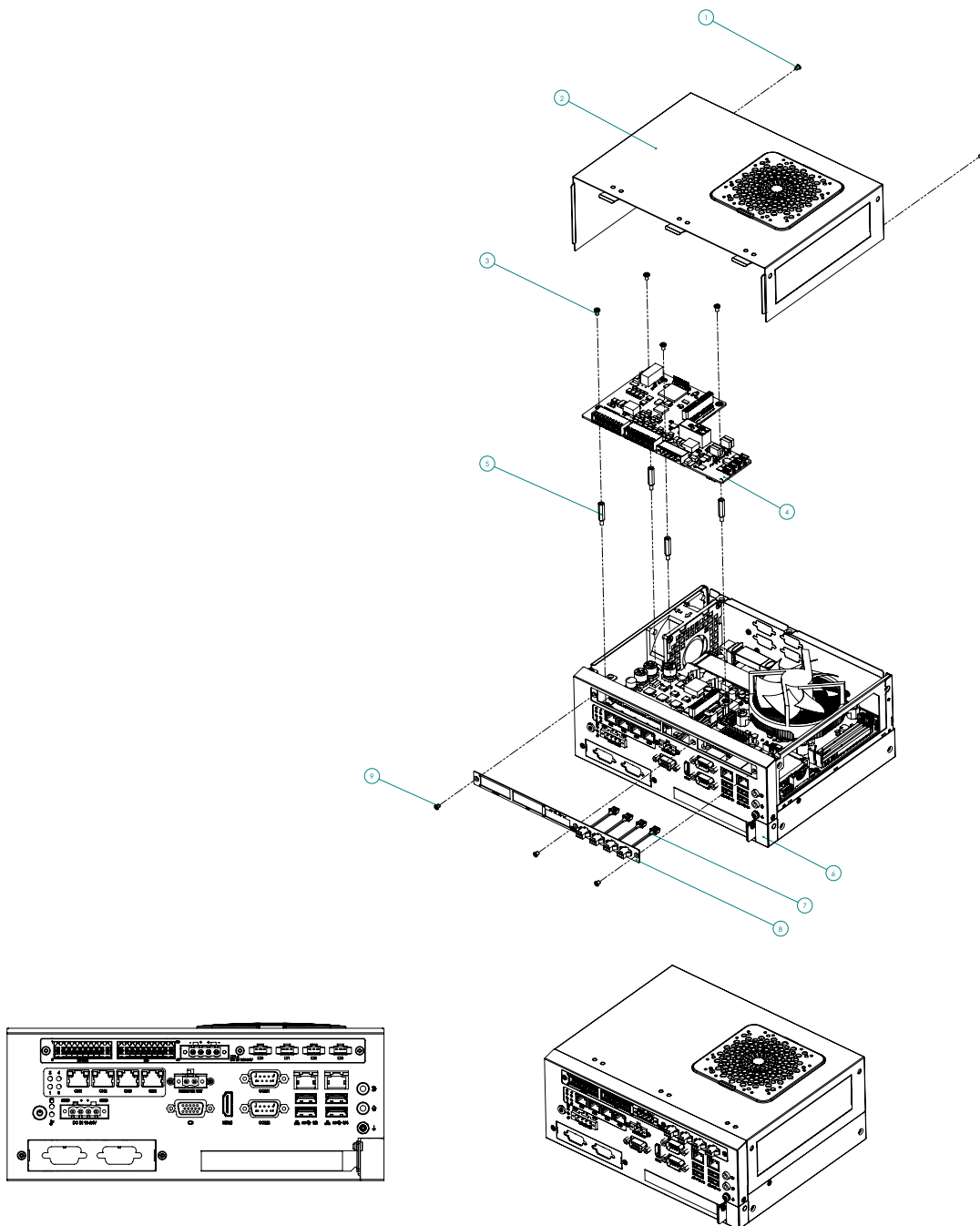
Installation du verrou USB interne

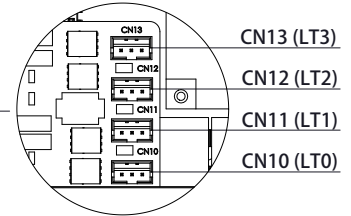
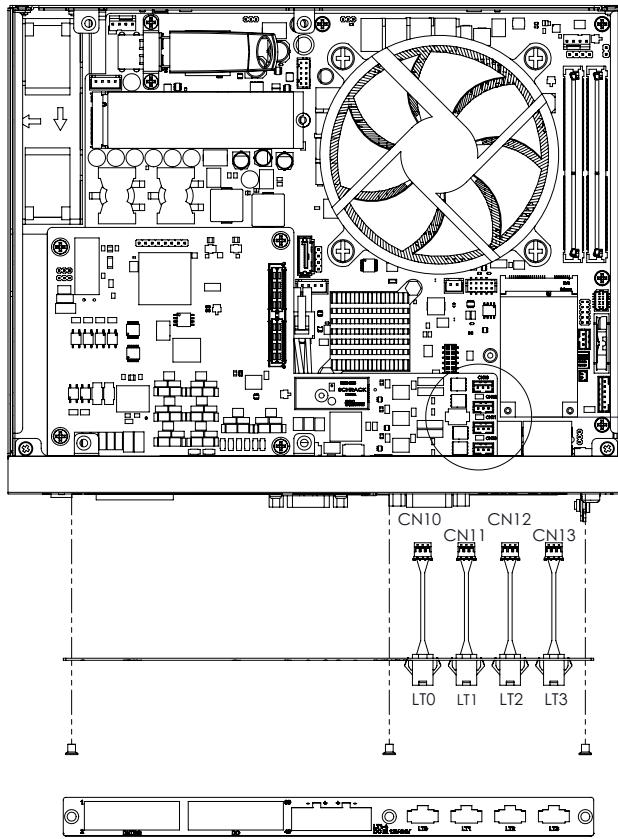
1. Retirez le capot supérieur et le kit de verrouillage USB en dévissant la vis unique.
2. Installez le dongle USB et ajustez correctement la position du kit de verrouillage.
3. Réinstallez le kit de verrouillage USB et le capot supérieur.



2.7 AIIS-1882 Installation

1. Remove top cover and I/O shield for AIIS-1882.
2. Connect AIIS-1882 with PoE or USB carrier board via board-to-board connector.
3. Attach I/O bracket for AIIS-1882 to front I/O panel with 2 screws.
4. Reinstall top cover.





AIIS-1882 DIO Board CNN

2.8 Wallmount Installation

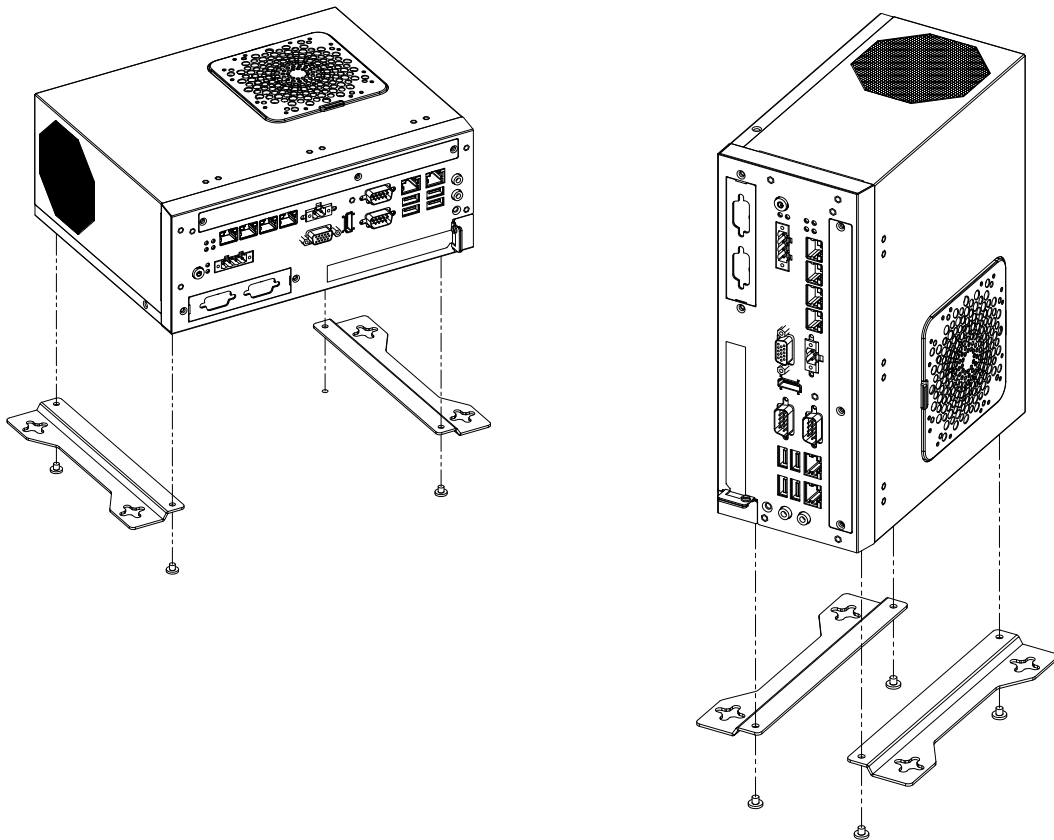


Figure 2.15 Wallmount Installation

Note!



1. *This pair of wallmount brackets is designed for use on the side of the chassis or the bottom. Reverse installation is not permitted.*
 2. *Screw holes that are not used for wallmount brackets should be kept filled with screws.*
-
1. *Cette paire de supports muraux est conçue pour être utilisée sur le côté du châssis ou le bas. L'installation inversée n'est pas autorisée.*
 2. *Les trous de vis qui ne sont pas utilisés pour les supports muraux doivent être conservés remplis de vis.*

2.9 DIN-Rail Installation

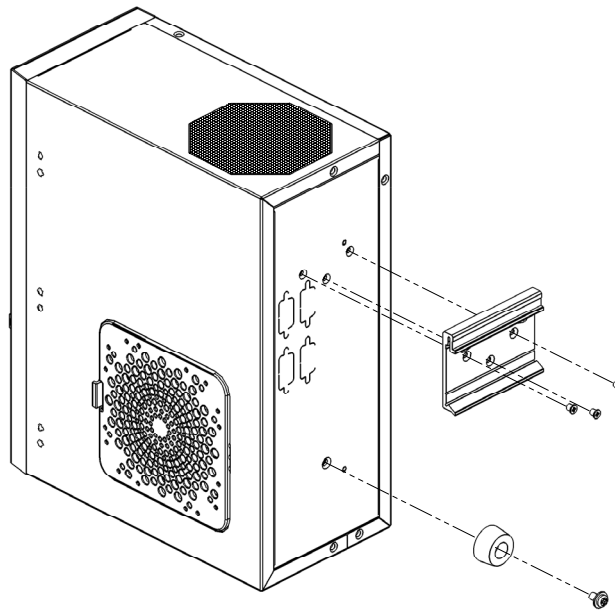


Figure 2.16 DIN-Rail Installation

- Note!**
- 1. *This DIN-rail bracket is designed for use on the rear side or the bottom. Reverse installation is not permitted.*
 - 2. *Screw holes that are not used for DIN-rail brackets should be kept filled with screws.*
1. *Ce support pour rail DIN est conçu pour être utilisé à l'arrière ou en bas. L'installation inversée n'est pas autorisée.*
2. *Les trous de vis qui ne sont pas utilisés pour les supports de rail DIN doivent être conservés remplis de vis.*

2.10 PCIE/PCI Card Installation

1. Turn AIIIS-3411 upside down.
2. Remove bottom cover.
3. Plug in PCIe module.
4. Fasten the bracket and bottom cover.

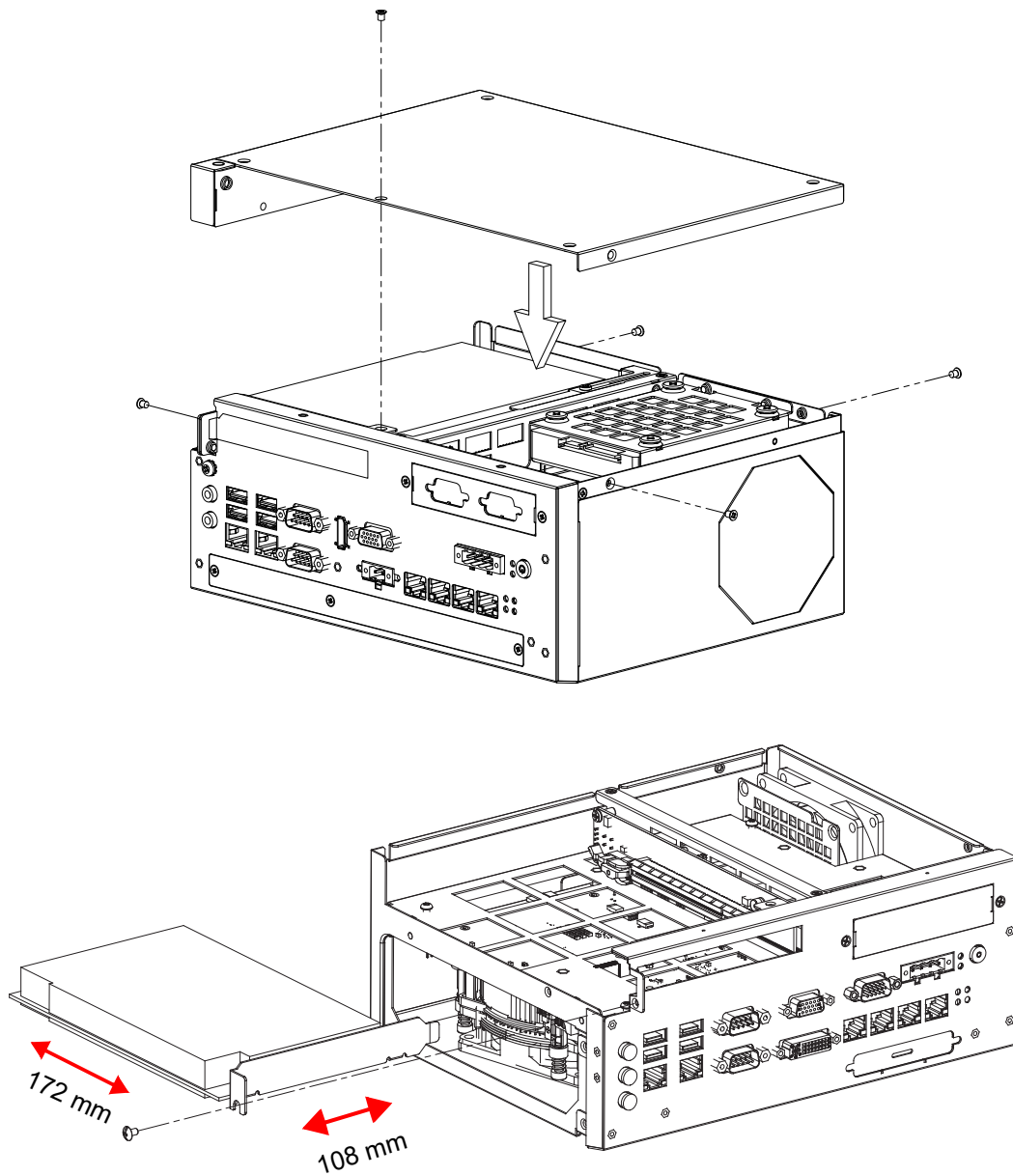


Figure 2.17 PCIE/PCI Card Installation

Chapter 3

AMI BIOS Setup

3.1 Introduction

With the AMI BIOS Setup Utility, you can modify BIOS settings and control the specific features of your computer. The Setup Utility uses a number of number of menus for making changes and turning specific features on or off. This chapter describes the basic navigation of the AIIIS-3411 setup screens.

AMI's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in NVRAM so setup information is retained even when the power is turned off.

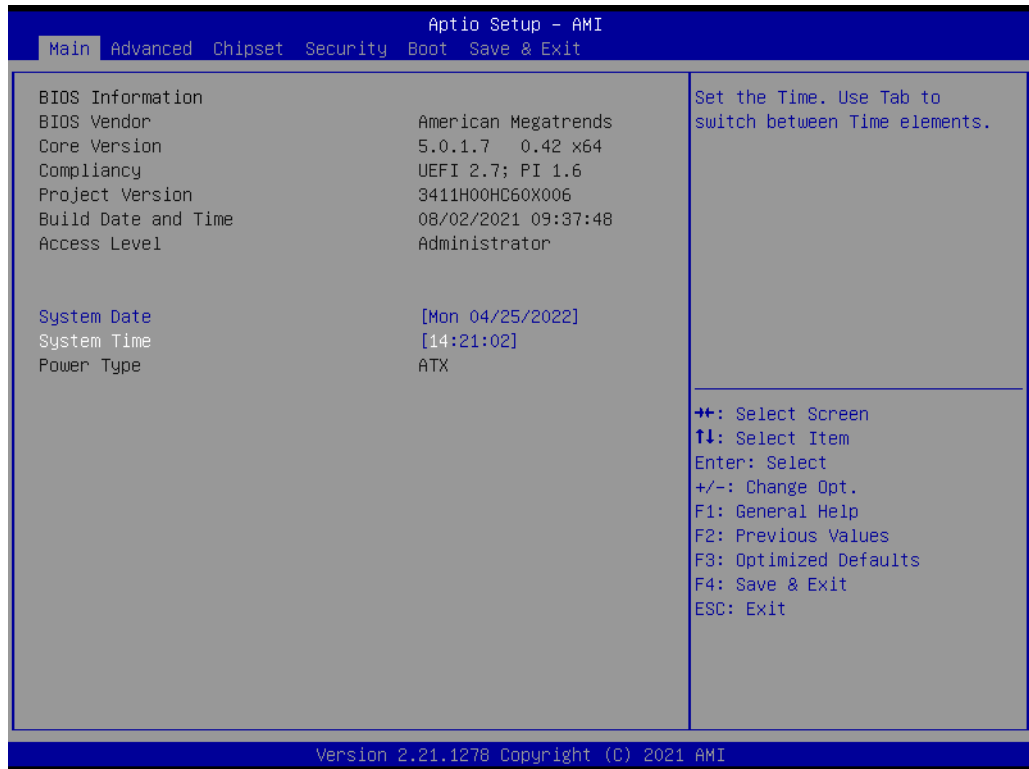


Figure 3.1 Main Setup Screen

3.2 Entering BIOS Setup

During bootup, press to enter AMI BIOS Setup Utility. When users first enter the BIOS Setup Utility, they enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab.

3.2.1 Main Menu

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



Figure 3.2 Main Setup Screen

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 be. The right frame displays the key legend.

The key legend above 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 Date

Use these options to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or 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.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the AIIIS-3411 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the submenu for that item. You can display an Advanced BIOS setup option by highlighting it using the <Arrow> keys. All Advanced BIOS setup options are described in this section. The Advanced BIOS setup screens are shown below. The submenus are described on the following pages.

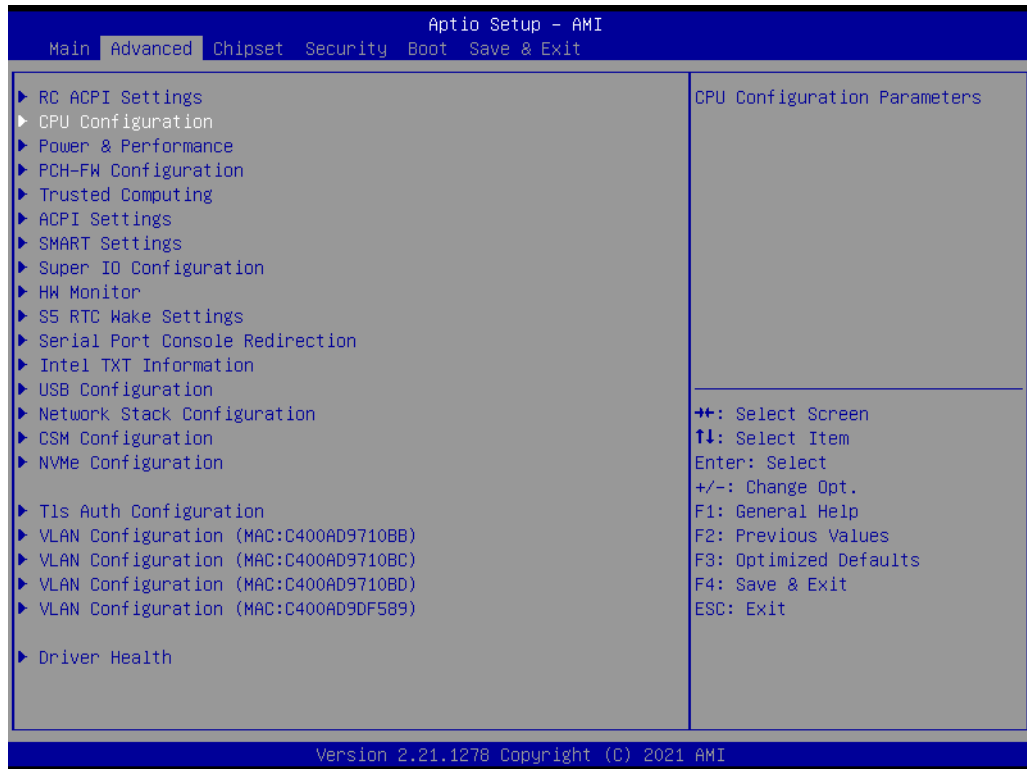


Figure 3.3 Advanced BIOS Features Setup Screen

3.2.2.1 RC ACPI Settings

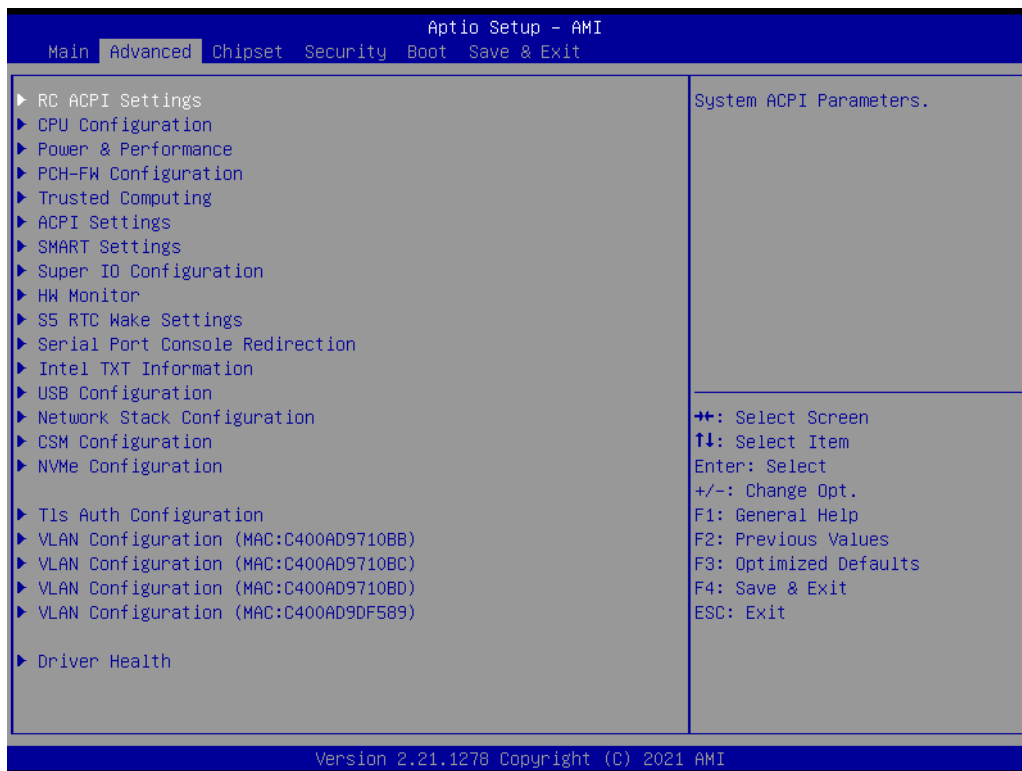


Figure 3.4 RC ACPI Settings

- **RC ACPI Settings**
 - **Native PCIE Enable**
PCI Express Native Support Enable/Disable.

3.2.2.2 CPU Configuration

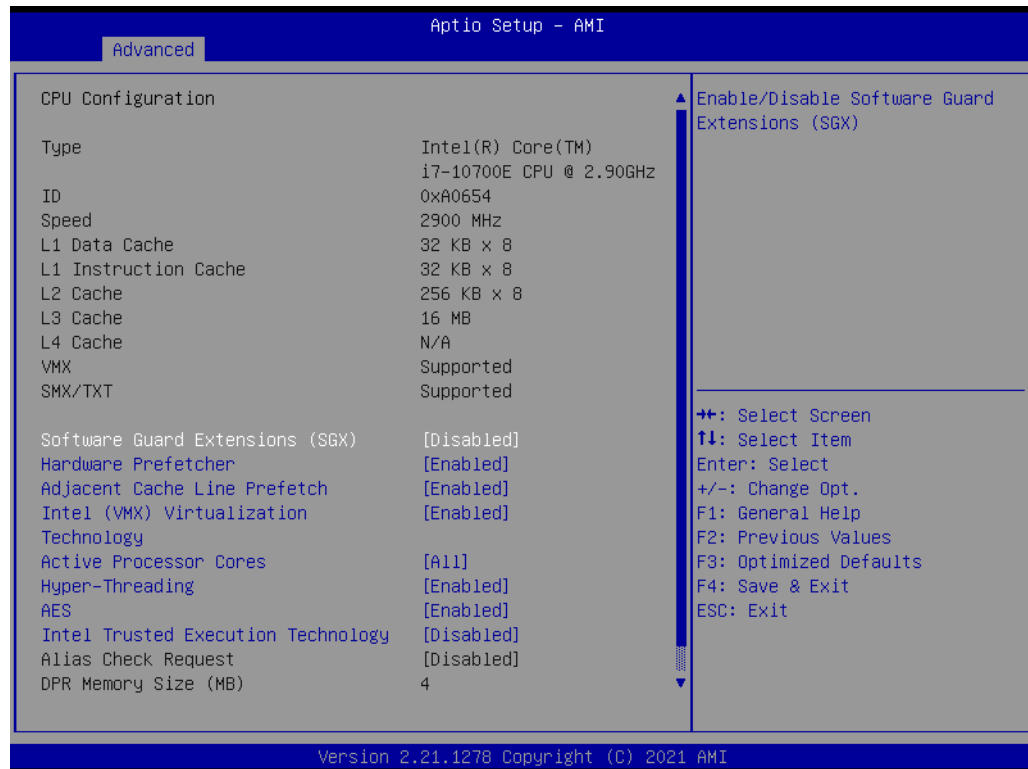


Figure 3.5 CPU Configuration

- **Software Guard Extensions (SGX)**

Intel® Software Guard Extensions (SGX) is a set of security-related instruction codes that are built into Intel central processing units (CPUs). They allow user-level as well as operating system code to define private regions of memory, called enclaves, whose contents are intended to be protected and unreadable by any process outside the enclave itself, including processes running at higher privilege levels.
- **Hardware Prefetcher**

Hardware Prefetching is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it to improve the load-to-use latency. You may choose to enable or disable it.
- **Adjacent Cache Line Prefetch**

The Adjacent Cache-Line Prefetch mechanism, like automatic hardware prefetch, operates without programmer intervention. When it is enabled through the BIOS, two 64-byte cache lines are fetched into a 128-byte sector, regardless of whether the additional cache line has been requested or not. You may choose to enable or disable it.
- **Intel® Virtualization Technology**

This feature is used to enable or disable the Intel® Virtualization Technology (IVT) extension. It allows multiple operating systems to run simultaneously on the same system by creating virtual machines, each running its own x86 operating system. When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
- **Active Processor Core**

Use this item to select the number of processor cores you want to activate when you are using a dual- or quad-core processor.

- **Hyper-Threading**
Intel's proprietary simultaneous multi-threading implementation is used to improve parallelization of computations performed on x86 microprocessors.
- **AES**
Enable or Disable CPA advanced encryption standard instruction.
- **Intel® Trusted Execution Technology**
Intel® TXT uses a Trusted Platform Module (TPM) and cryptographic techniques to provide measurements of software and platform components so that system software as well as local and remote management applications may use those measurements to make trust decisions.

3.2.2.3 Power & Performance

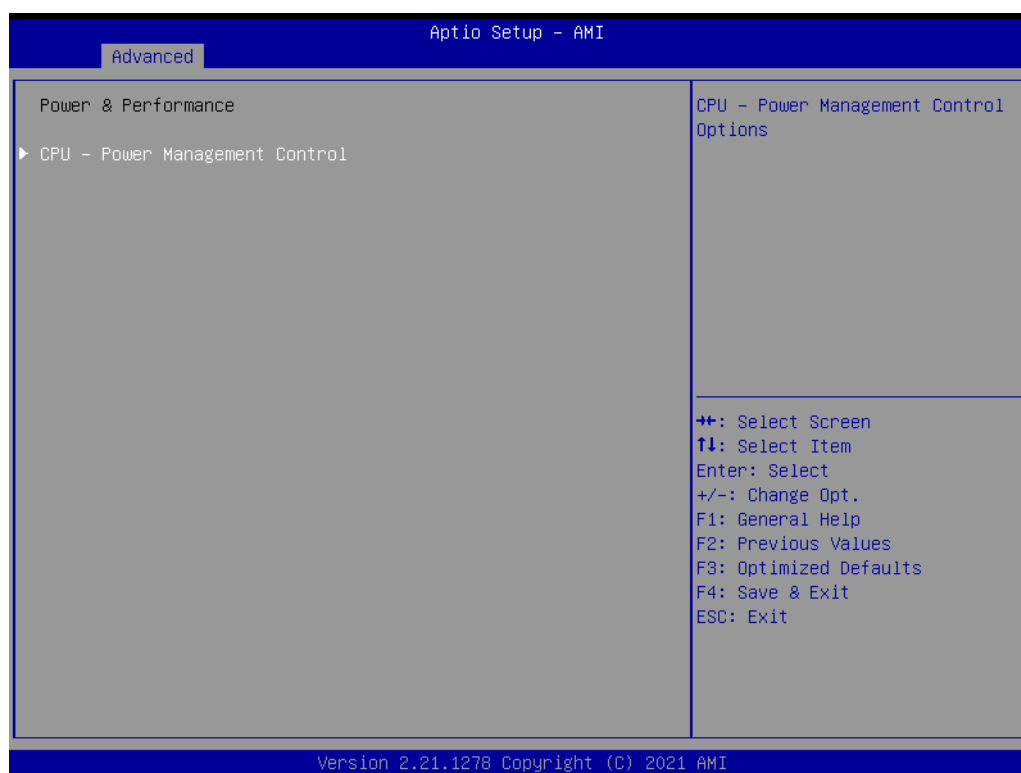


Figure 3.6 Power & Performance

- **Boot Performance**
Select the performance state that the BIOS will set before OS hand-off.
- **Intel® Speedstep(tm)**
Allows more than two frequency ranges to be supported.
- **Turbo Mode**
Turbo mode.
- **C states**
Intel® C states setting for power saving.

3.2.2.4 PCH-FW Configuration

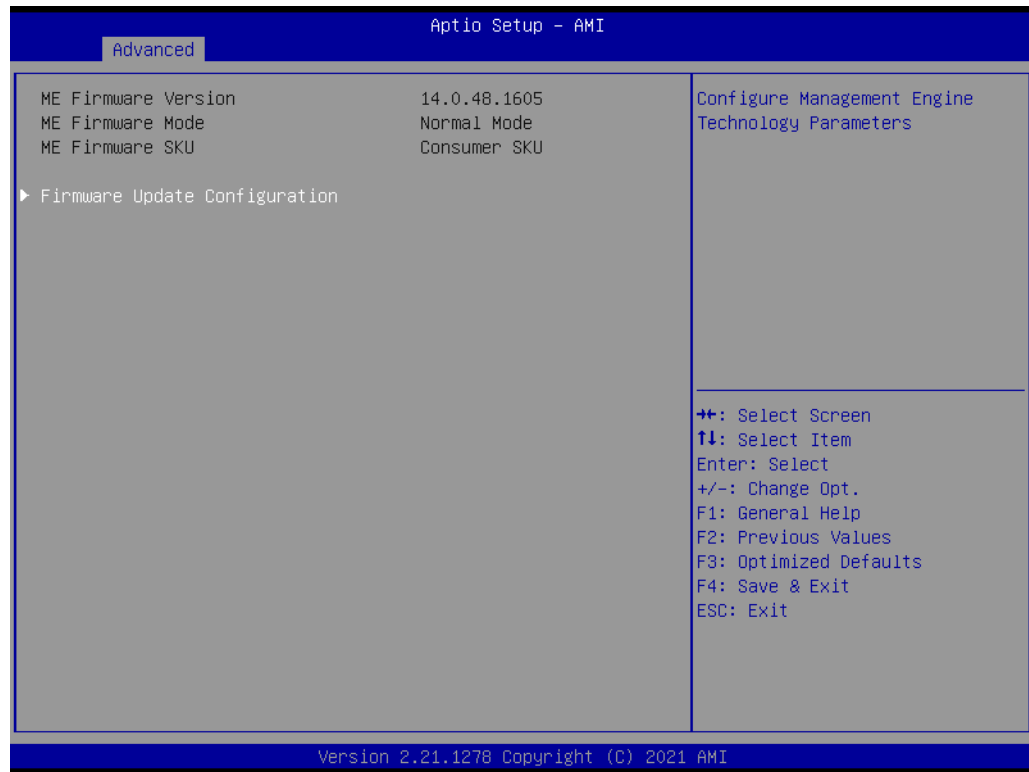


Figure 3.7 PCH-FW Configuration

- **PCH-FW Version**

PCH-FW page shows Intel® ME FW information.

3.2.2.5 Trusted Computing



Figure 3.8 Trusted Computing

- Security Device Support**
 Enable or Disable TPM Support. You can purchase the Advantech LPC TPM module to enable the TPM function. P/N: PCA-TPM-00B1E.

3.2.2.6 ACPI Settings

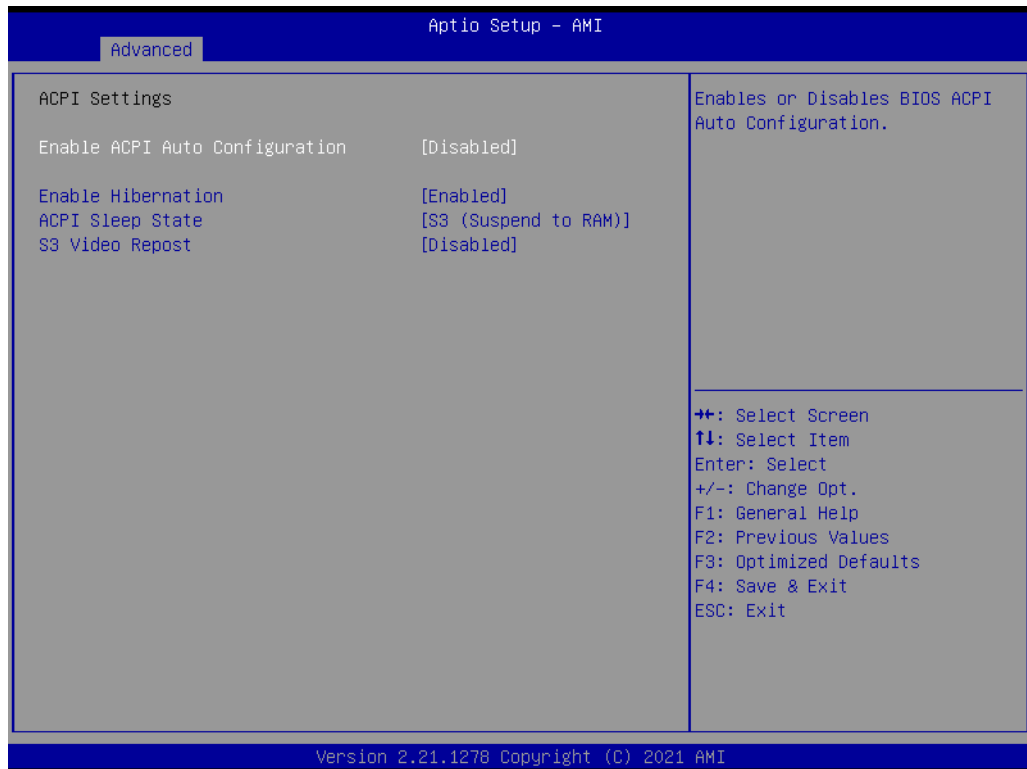


Figure 3.9 ACPI Settings

- **Enable Hibernation**
Enable or disable hibernation (OS/S4 sleep state). This option may not be active in some OSs.
- **ACPI Sleep State**
Select S3 or disable suspend.
- **S3 Video Repost**
Enable or disable S3 video repost.

3.2.2.7 SMART Settings

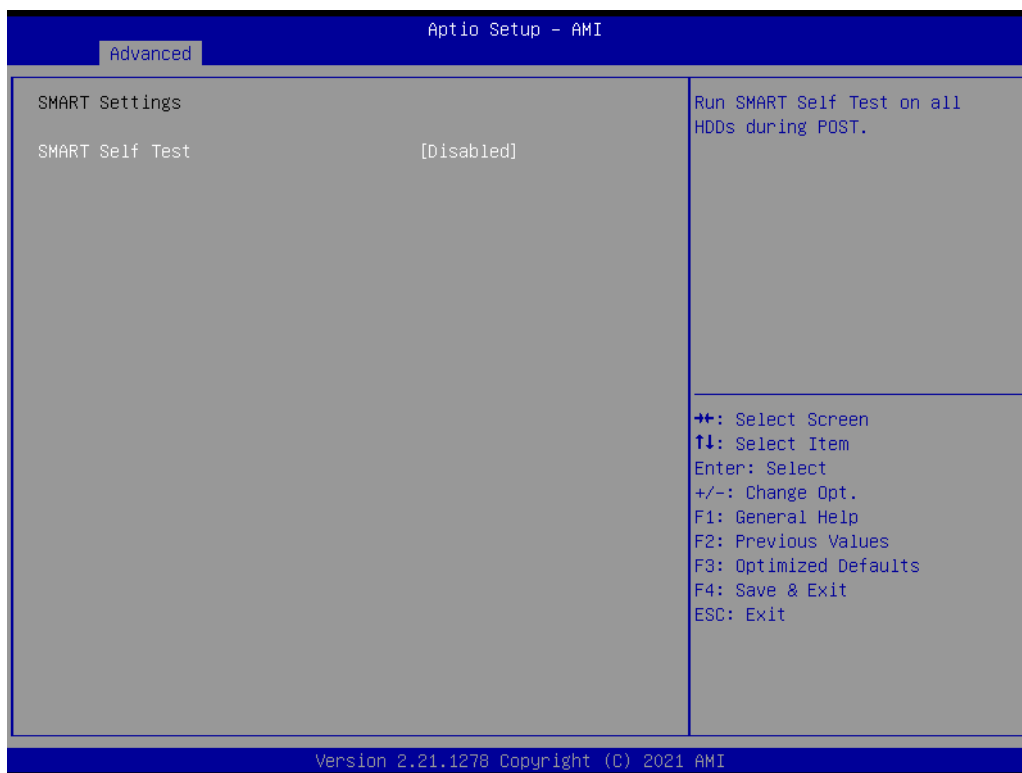


Figure 3.10 SMART Settings

- **SMART Self-Test**
Enable or disable SMART self-test on all HDDs during POST.

3.2.2.8 Super IO Configuration

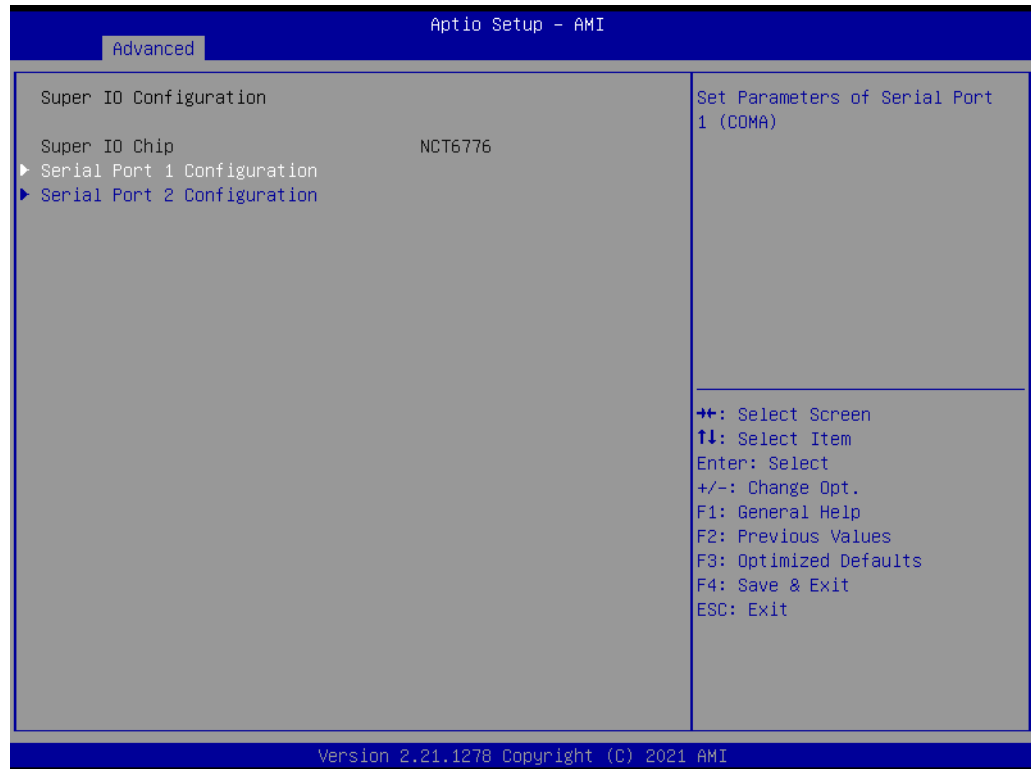


Figure 3.11 Super IO Configuration

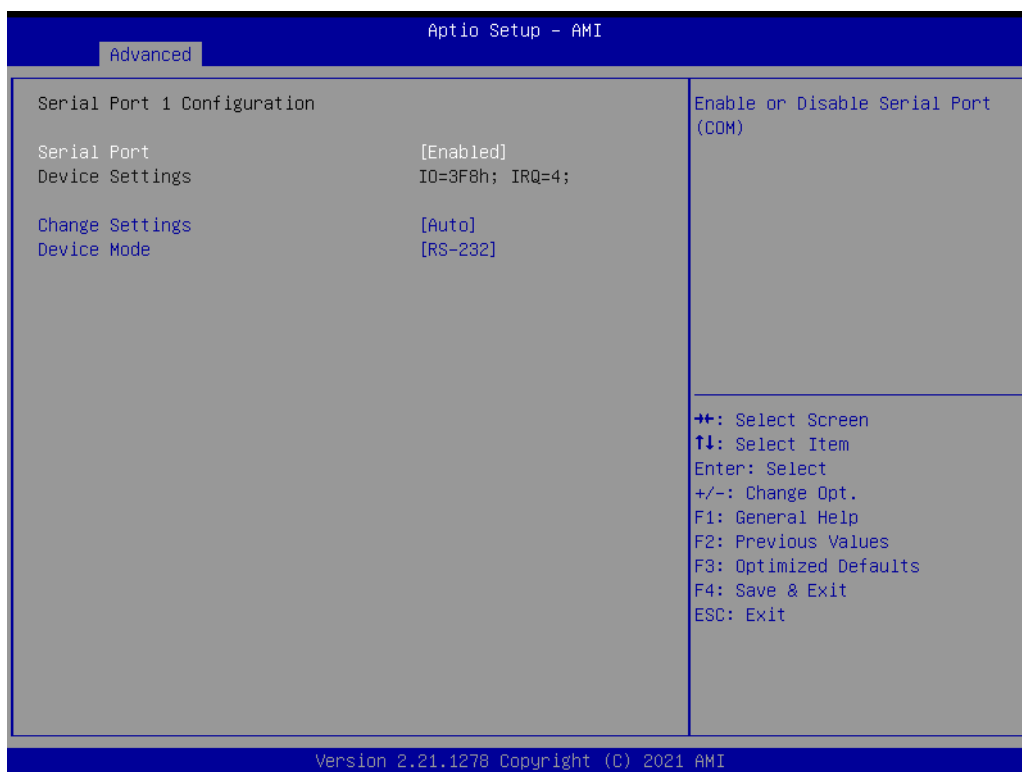


Figure 3.12 Super IO Configuration

- **Serial Port 1 Configuration**
 - **Serial Port**
Enable or disable Serial Port 1.
 - **Change Settings**
To select an optimal setting for serial port 1.
 - **Device Mode**
Select an optional settings RS232/422/485 for Super I/O Device.
- **Serial Port 2 Configuration**
 - **Serial Port**
Enable or disable Serial Port 2.
 - **Change Settings**
To select an optimal setting for Serial Port 2.
 - **Device Mode**
Serial Port 2 could be selected as standard serial port RS232/422/485.

3.2.2.9 H/W Monitor

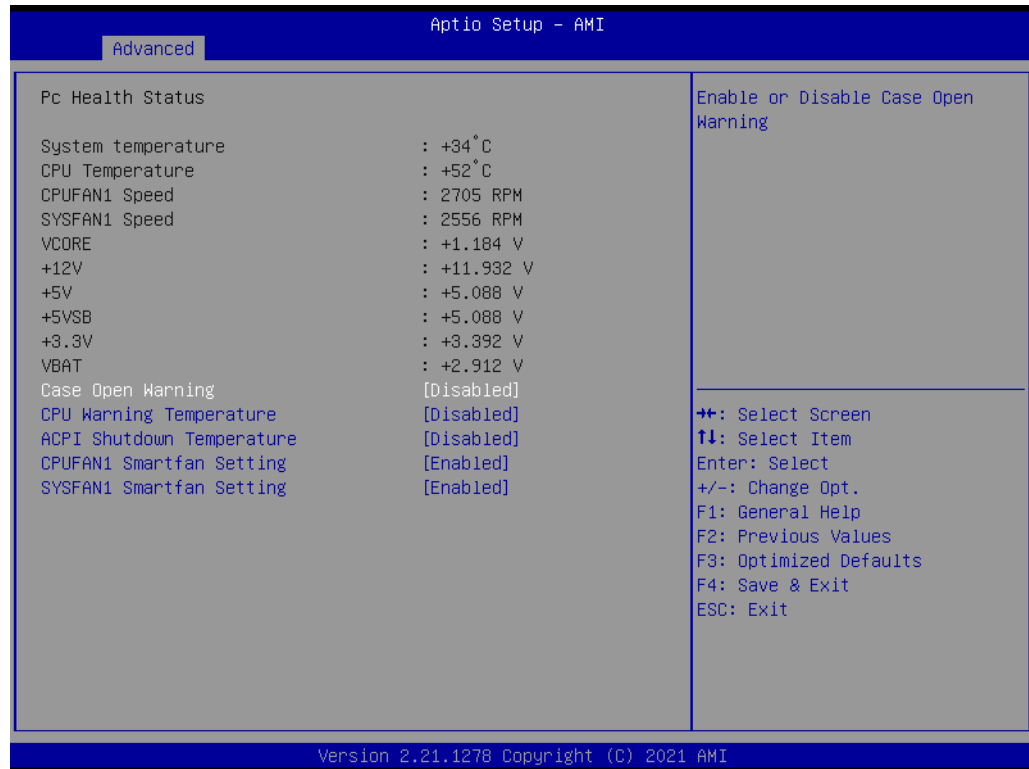


Figure 3.13 HW Monitor

- **“Case Open” Warning**
Enable or disable the chassis intrusion monitoring function. When it is enabled and the case is opened, the speaker beeps.
- **CPU Temperature Warning**
Use this item to set the CPU warning temperature. When the system reaches the warning temperature, the speaker will beep.
- **ACPI Shutdown Temperature**
Use this item to set the ACPI shutdown temperature. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheating damage.
- **CPUFAN1 Smartfan Setting**
Enable or disable CPUFAN Mode to Smartfan Setting.
- **SYSFAN1 Smartfan Setting**
Enable or disable SYSFAN Mode to Smartfan Setting.

3.2.2.10 S5 RTC Wake Settings



Figure 3.14 S5 RTC Wake Settings

- Wake System at Fixed Time**
 Enable or disable system wake at a set time. The system will wake at the hr:min:sec as specified.

3.2.2.11 Serial Port Console Redirection

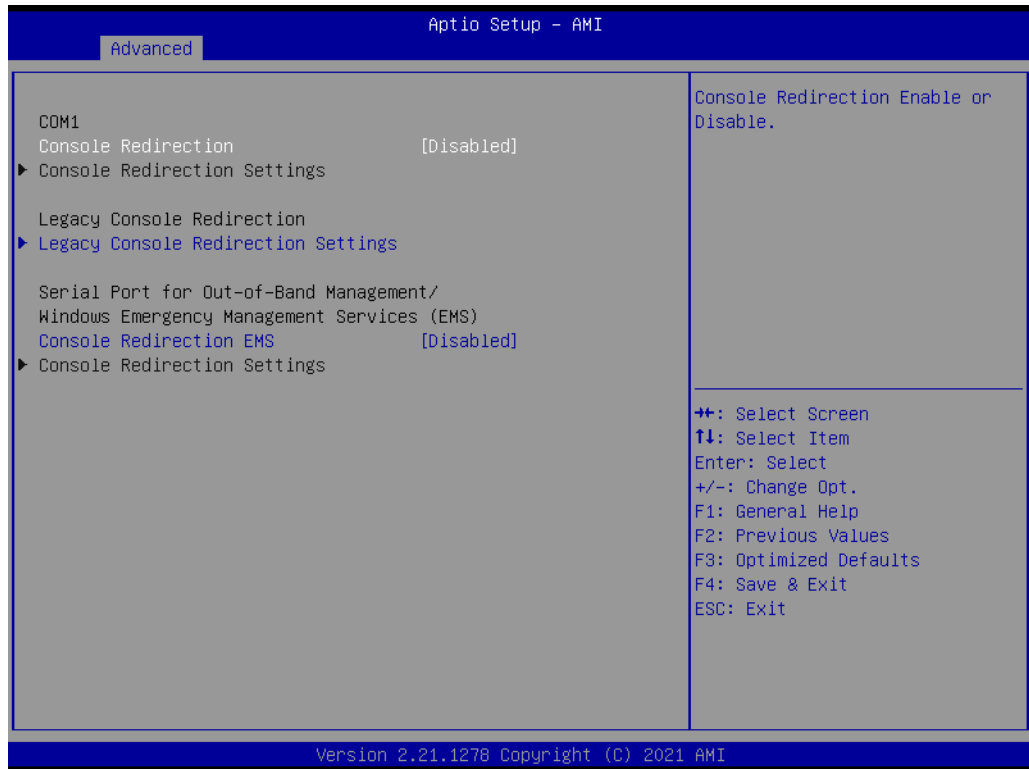


Figure 3.15 Serial Port Console Redirection

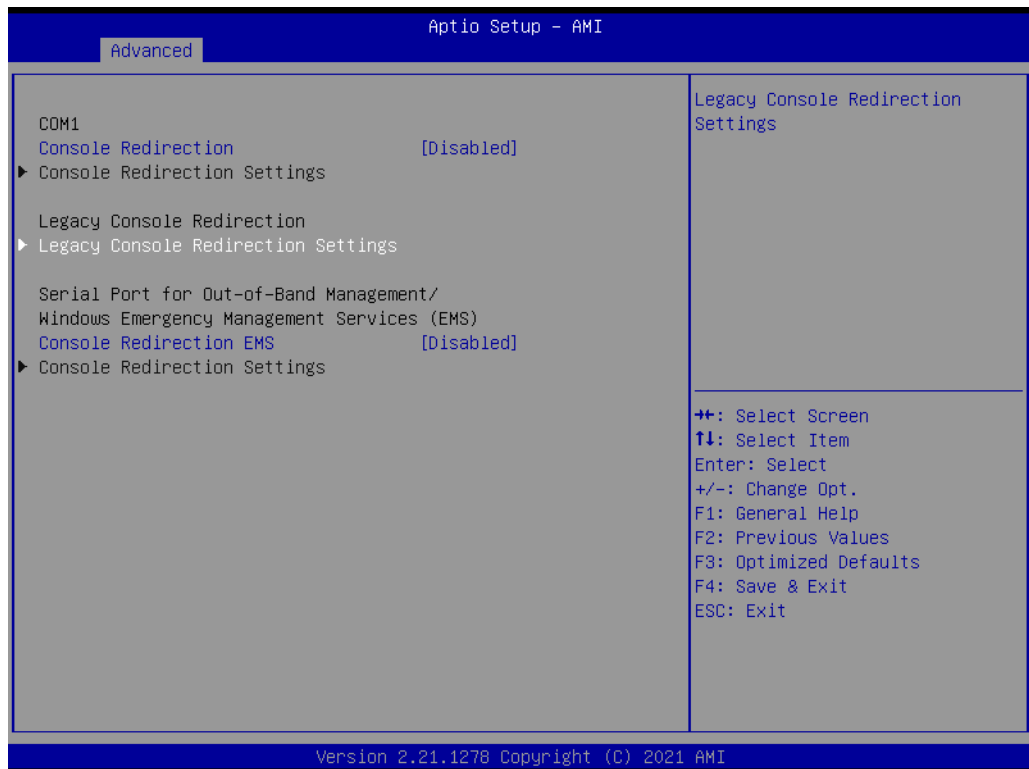


Figure 3.16 Serial Port Console Redirection

- **COM1**
 - **Console Redirection Settings**
 - Console Redirection Enable or Disable.

- **Legacy Console Redirection**
 - **Legacy Console Redirection Settings**
Select a COM port to display redirection of legacy OS and Legacy OPRM messages.
- **Serial Port for Out-of-Band Management/Windows Emergency Management services (EMS)**
 - **Console Redirection**
Enable or disable Console Redirection.

3.2.2.12 Intel® TXT Information



Figure 3.17 Intel® TXT Information

3.2.2.13 USB Configuration

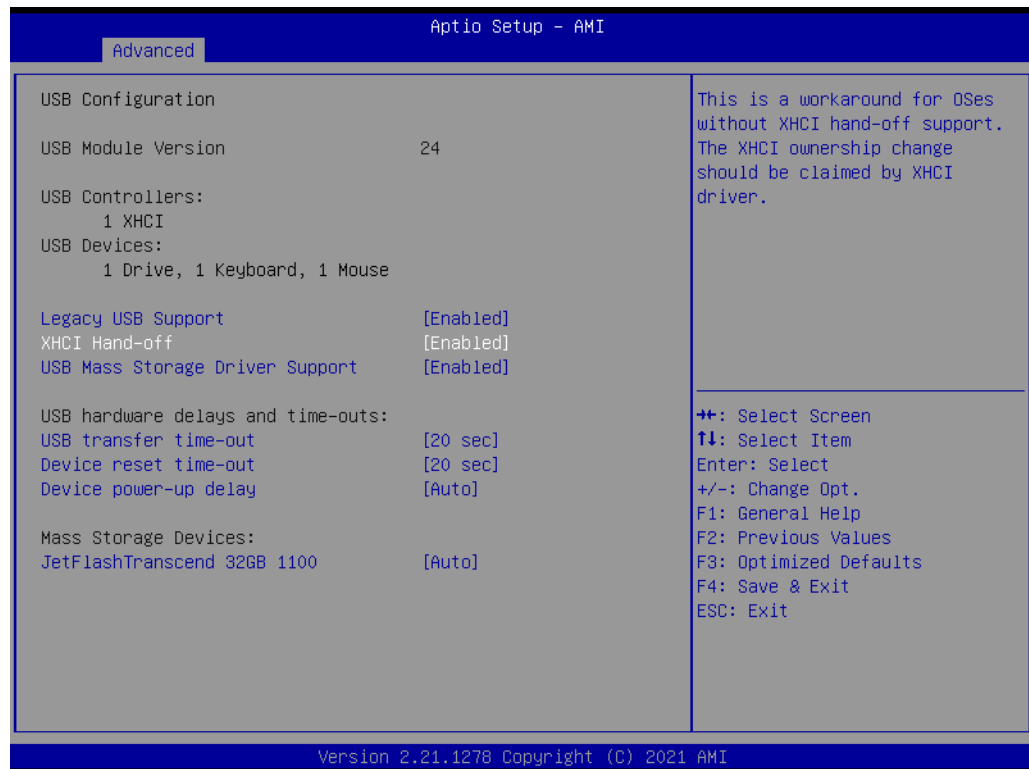


Figure 3.18 USB Configuration

- **XHCI Hand-off**
This is a workaround for OSs without XHCI hand-off support. The XHCI ownership change should be claimed by the XHCI driver.
- **USB Mass Storage Driver Support**
Enable or disable USB Mass Storage driver support.
- **USB transfer time-out**
Allows you to select the USB transfer time-out value. [1, 5,10 ,20 sec]
- **Device reset time-out**
Allows you to select the USB device reset time-out value. [10, 20, 30, 40 sec]
- **Device power-up delay**
Maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses a default value: for a Root port it is 100 ms, for a Hub port the delay is taken from the Hub descriptor.
- **Mass Storage Devices**
Mass storage device emulation type. "Auto" enumerates the device according to its media format. Optical drives are emulated as 'CDROM' and drives with no media will be emulated according to a drive type.
- **Network Stack**
"Enable or Disable" UEFI Network Stack.

3.2.2.14 CSM Configuration

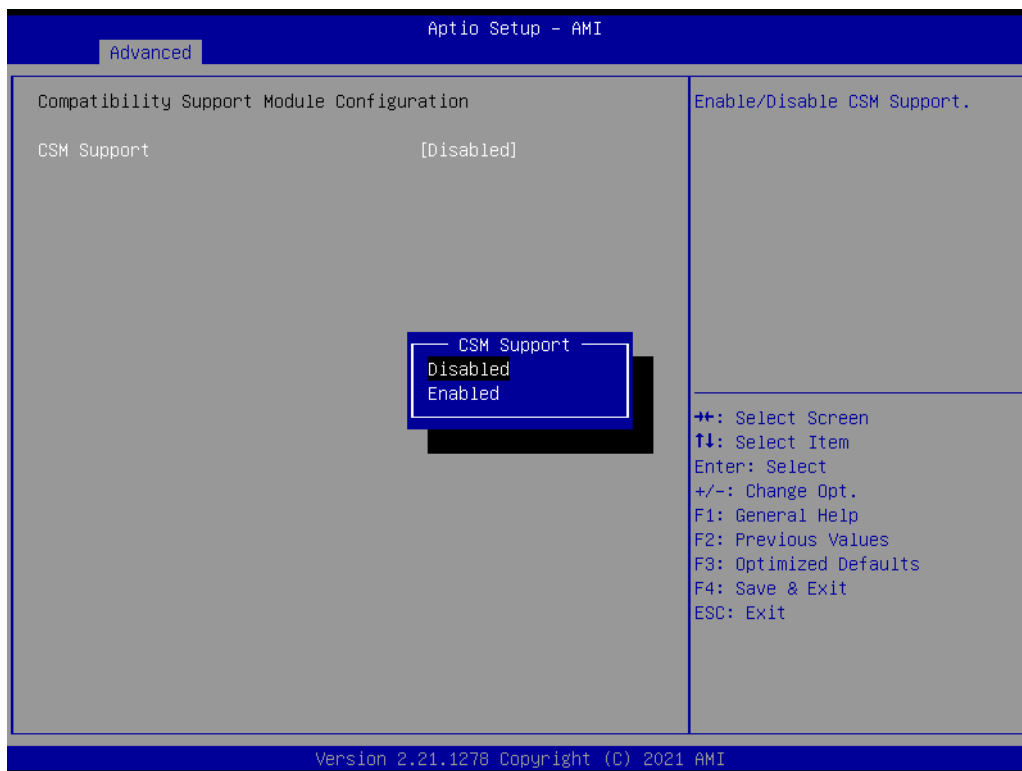


Figure 3.19 CSM Configuration

- **CSM Support**
Enable/Disable CSM support.

3.2.3 Chipset



Figure 3.20 Chipset

3.2.3.1 System Agent (SA) Configuration



Figure 3.21 System Agent (SA) Configuration

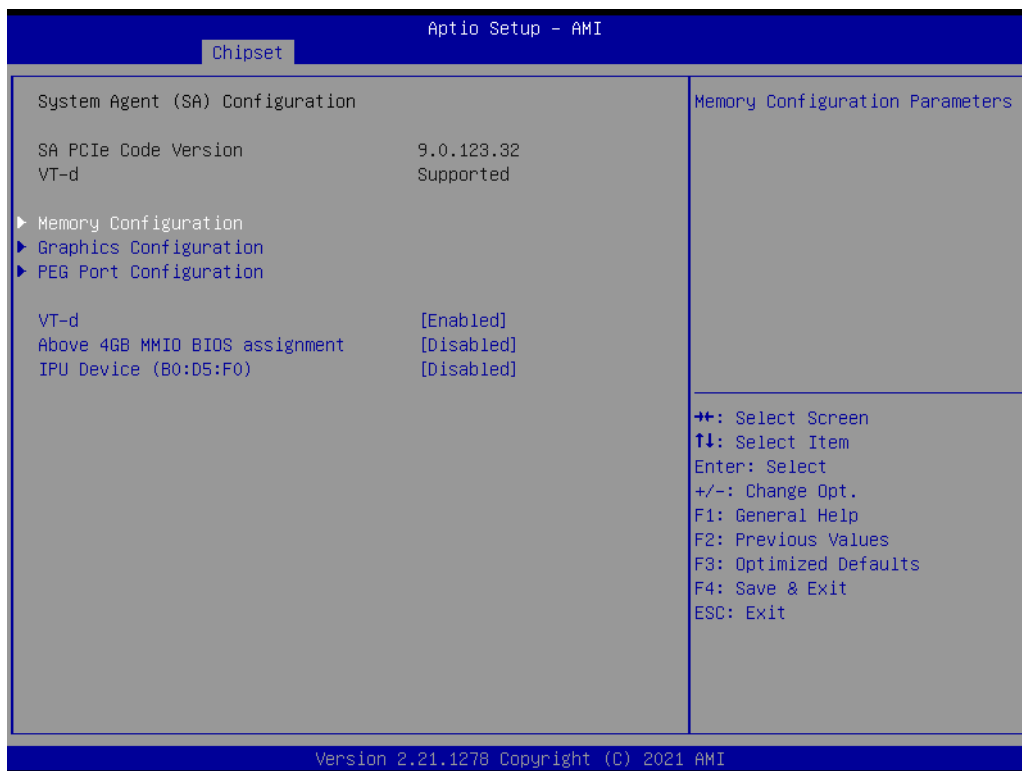


Figure 3.22 System Agent (SA) Configuration

- **VT-d**
Enable or disable VT-d function.
- **Above 4GB MMIO BIOS assignment**
Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.

■ Graphics Configuration



Figure 3.23 Graphics Configuration

- **Primary Display**
Auto or IGFX or PEG or PCI or SG optimal to Primary Display.
- **Internal Graphics**
Keep IGFX enabled based on the setup options.

3.2.3.2 PCH-IO Configuration

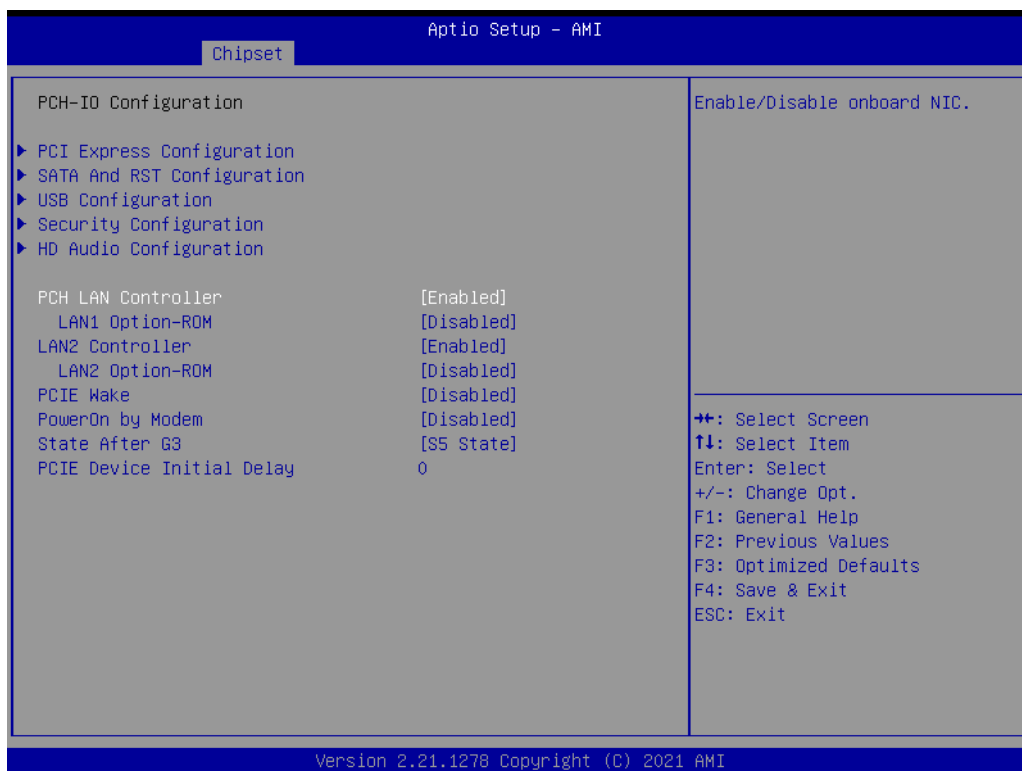


Figure 3.24 PCH-IO Configuration

- **PCI Express Configuration**
PCI Express Configuration settings.
- **SATA Configuration**
SATA Device Options Settings.
- **USB Configuration**
USB Configuration settings.
- **Security Configuration**
Security Configuration settings.
- **HD Audio Configuration**
HD Audio Subsystem Configuration Settings.
- **PCH LAN Controller**
Enable/Disable onboard NIC.
- **LAN1 Option-ROM**
Enable or Disable Boot Options for Legacy Network Devices.
- **LAN2 Controller**
Enable/Disable onboard NIC.
- **LAN2 Option-ROM**
Enable or Disable Boot Options for Legacy Network Devices.
- **PCIE wake**
Enable or disable PCIE to wake the system from S5.
- **PowerOn by modem**
Enable or Disable PowerOn by modem.
- **State After G3**
Configure state after G3.

PCIe Device Initial Delay

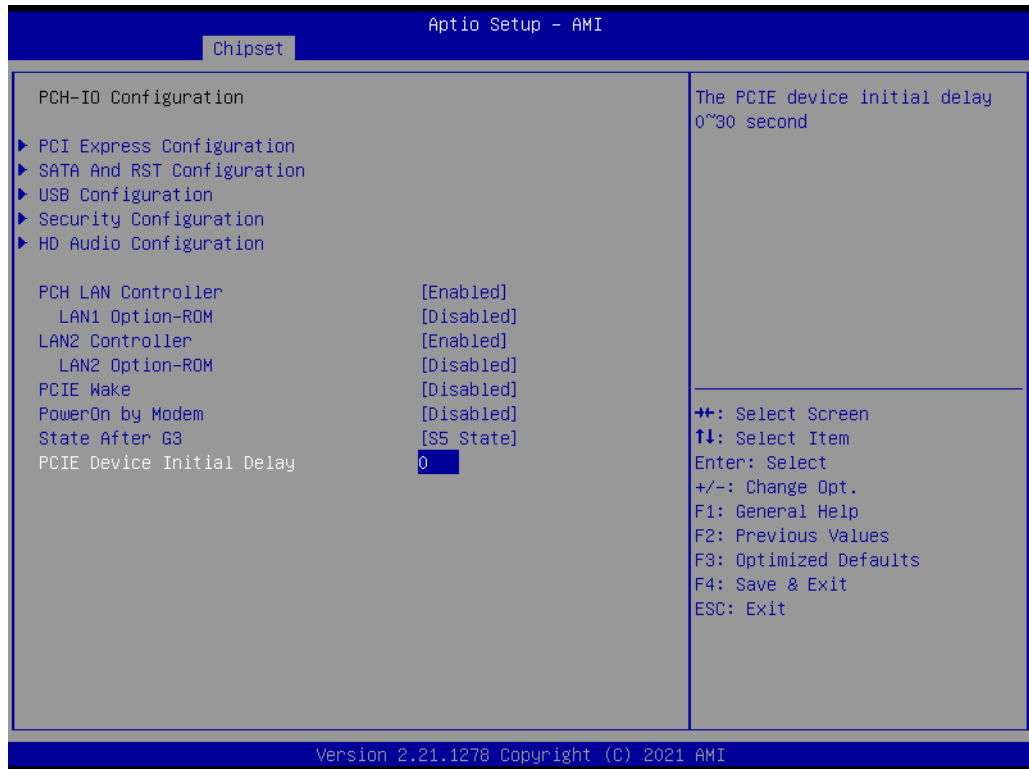


Figure 3.25 Configure PCIe Device Initial Delay Time

PoE Port Power Setting

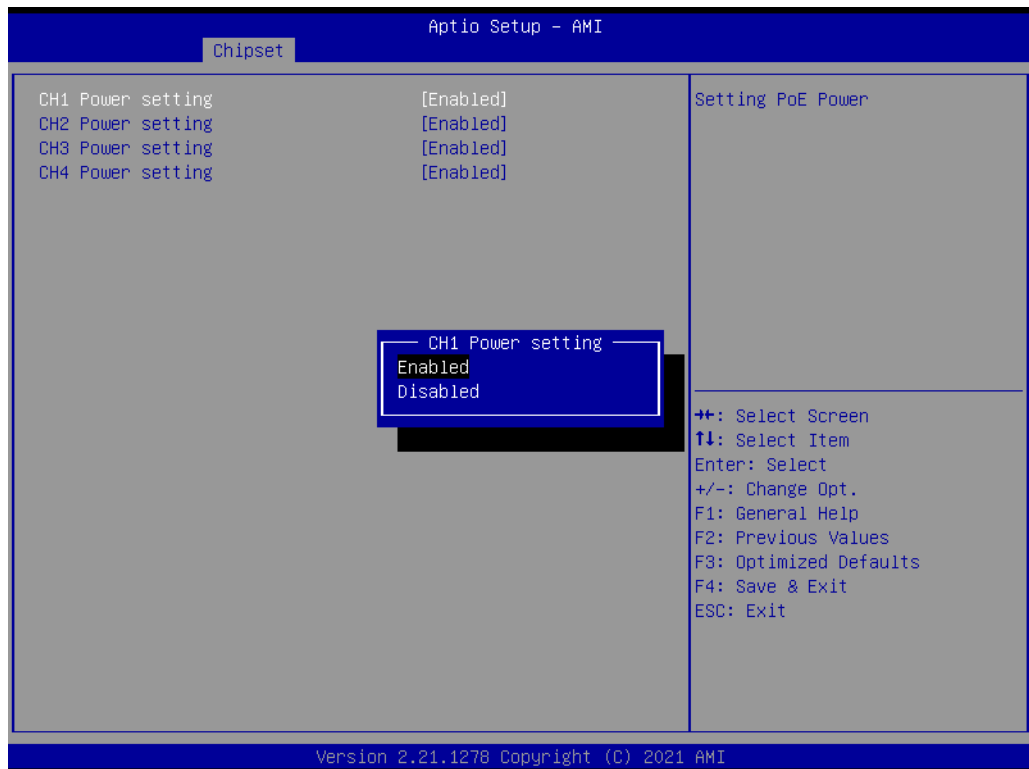


Figure 3.26 Configure PoE Power Setting

3.2.4 Security

Select Security Setup from the A1S-3411 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>.



Figure 3.27 Security

Select Security Setup from the A1S-3411 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>.

3.2.5 Boot

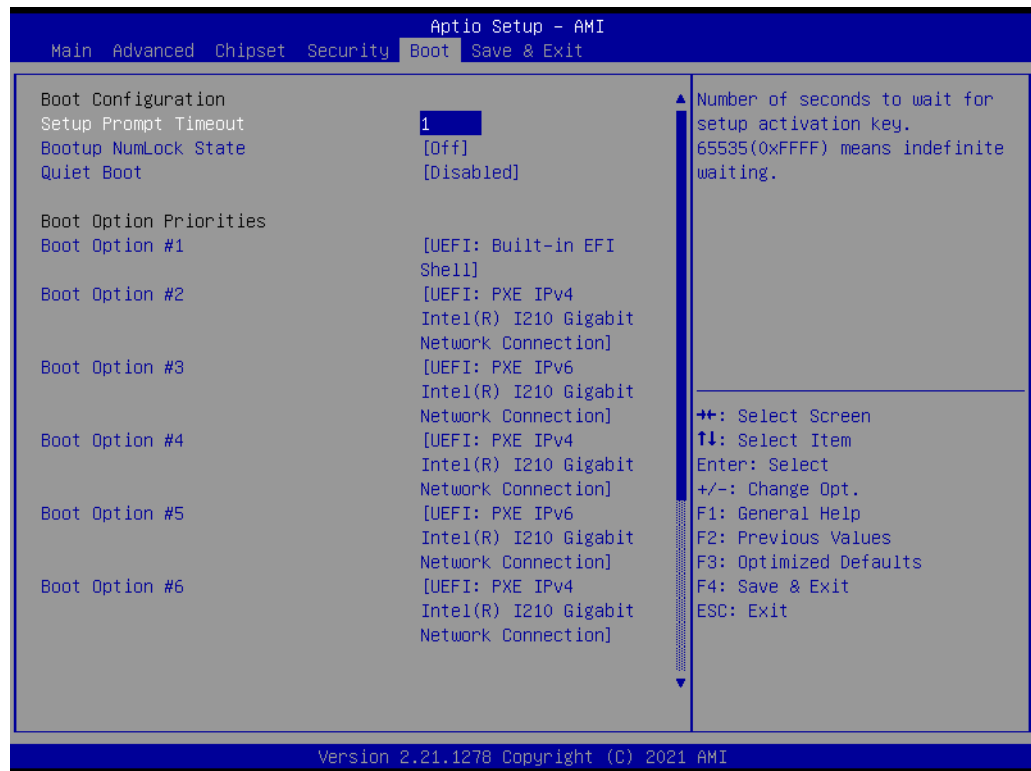


Figure 3.28 Boot

- **Setup Prompt Timeout**
Use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
On or Off power-on state for the NumLock.
- **Quiet Boot**
Enable or disable Quiet Boot option.
- **Boot Option Priorities**
Set the boot order #1 ~ 9.

3.2.6 Save & Exit

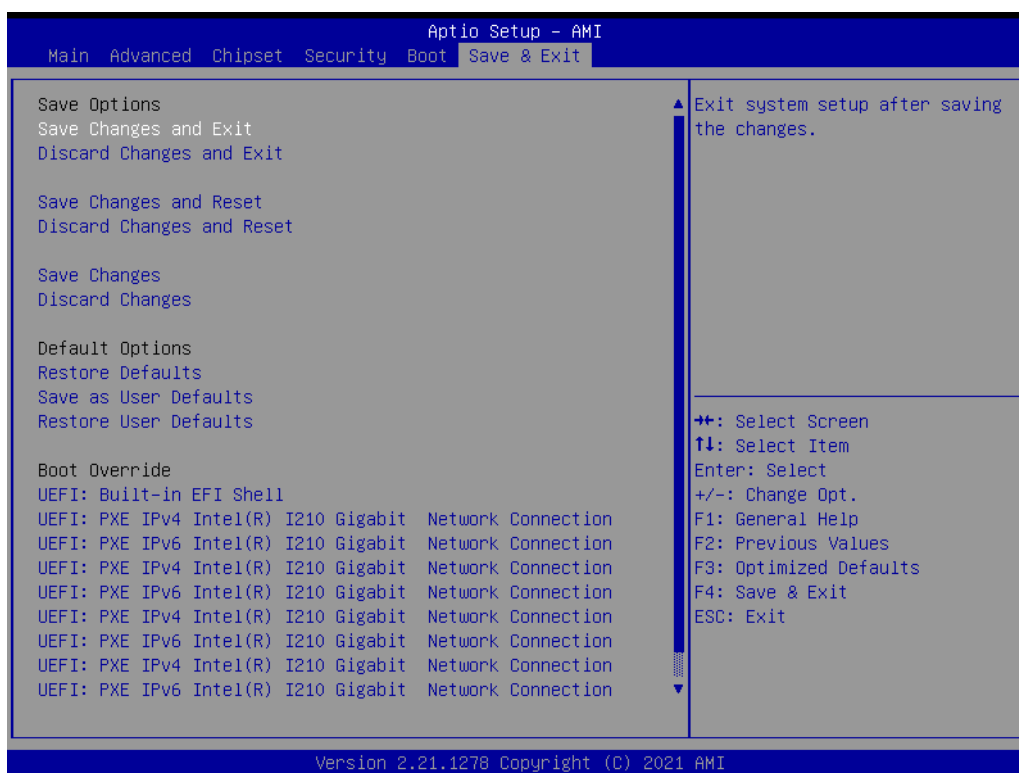


Figure 3.29 Save & Exit

- **Save Changes and Exit**

When you complete a system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. The following message appears:

```
Save Configuration Changes and Exit Now?
[Yes] [No]
```

2. Select Yes or No.

- **Discard Changes and Exit**

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears:

```
Quit without saving?
[Yes] [No]
```

2. Select [Yes] to discard changes and exit.

- **Discard Changes**

Select Discard Changes from the Exit menu and press <Enter>.

- **Default Options**

Configure default options.

- **Boot Override**

Select Boot Override device.

Chapter 4

Software Installation

This chapter introduces driver installation.

4.1 Chipset Software Installation Utility

4.1.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIIIS-3411 are located on the Advantech support website (<http://www.advantech.com/support>). Updates are provided via Service Packs from Microsoft.

Note! For system stability, installing the drivers in the following sequence is highly recommended:



- Chipset
- Graphics
- ME
- Other drivers

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed on the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

4.1.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI PnP services
- Serial ATA interface support
- Identification of Intel® chipset components in the Device Manager.

Note! The chipset driver is used for the following versions of Windows, and it has to be installed before installing all the other drivers:



- Windows 10 (64-bit)

4.1.3 Windows Driver Setup

Enter the Advantech support website, then search for product AIIIS-3411. You can see the "AIIIS-3411" driver inside.

4.2 Integrated Graphic Device Setup

4.2.1 Introduction

The Intel® processors are embedded with an integrated graphics controller. You need to install the VGA driver to enable this function, which provides the graphics, compute, media, and display capabilities.

4.2.2 Windows Driver Setup

Note! *Before installing this driver, make sure the INF driver has been installed in your system. See Chapter 4 for information on installing the INF driver.*



Enter the Advantech support website, then search for product AIS-3411. You can see the "Graphics" driver inside.

4.3 Intel® ME

4.3.1 Introduction

The Intel® ME software components that need to be installed depend on the system's specific hardware and firmware features. The installer detects the system's capabilities and installs the relevant drivers and applications.

4.3.2 Installation

Enter the Advantech support website, then search for product AIS-3411. You can see the "ME" driver inside.

4.4 LAN Configuration

4.4.1 Introduction

The AIS-3411 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel® I219LM (LAN1) and I210AT (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

4.4.2 Features

- 10/100/1000Base-T Ethernet controller
- 10/100/1000Base-T triple-speed MAC
- Full duplex at 10, 100, or 1000 Mbps and half duplex at 10 or 100 Mbps
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

4.4.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility have been installed on your system. See Chapter 4 for information on installing the CSI utility.*



The integrated Intel® Gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

4.4.4 Windows Driver Setup

Enter the Advantech support website, then search product AIIIS-3411. You can see the "LAN" driver inside.

4.5 HD Audio

4.5.1 Introduction

The AIIIS-3411 is equipped with a Realtek ALC888S Audio chip. It provides "Line-out" & "Microphone" ports for various applications.

4.5.2 Installation

Enter the Advantech support website, then search for product AIIIS-3411. You can see the "Audio" drivers inside.

Appendix **A**

Programming the Watchdog Timer

The AIIS-3411's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1 Watchdog Timer Overview

The watchdog timer is built in to the super I/O controller NCT6776D. It provides the following functions for user programming:

- Can be enabled and disabled by the user's program
- Timer can be set from 1 to 255 seconds
- Generates an interrupt or reset signal if the software fails to reset the timer before time-out

A.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

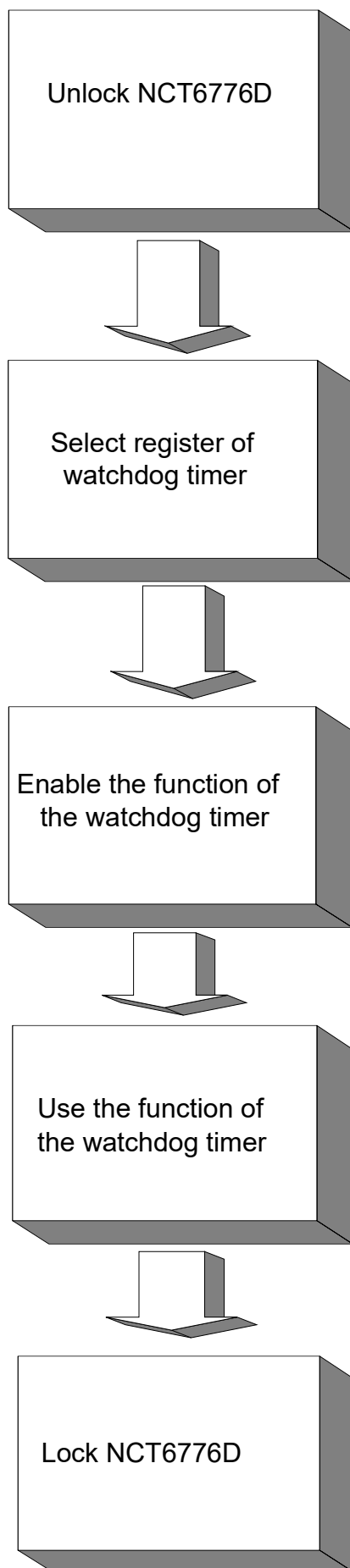


Table A.1: Watchdog Timer Registers

Address of register (2E)	Read/Write	Value (2F) & description
87 (hex)	-	Write this address to I/O address port 2E (hex) twice to unlock the NCT6776D
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as the default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set seconds as the counting unit. [default]. Write 1 to bit 3: set minutes as the counting unit. Write 1 to bit 4: Watchdog timer count mode is 1000 times faster. If bit 3 is 0, the count mode is 1/1000 second mode. If bit 3 is 1, the count mode is 1/1000 minute mode.
F6 (hex)	write	0: stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for the strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 6: Write 1 to enable the keyboard to reset the timer, 0 to disable. [default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-	Write this address to I/O port 2E (hex) to lock NCT6776D.

A.2.1 Example Programs

Enable watchdog timer and set 10 seconds as the timeout interval

```

;-----
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of the watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx; Enable the function of the watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Set seconds as the counting unit

```

```

Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;-----
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10; 10 seconds
Out dx,al
;-----
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
Enable watchdog timer and set 5 minutes as the timeout interval
;-----
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of the watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of the watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Set minute as the counting unit
Mov al,0f5h
Out dx, al
Inc dx
In al,dx
Or al, 08h
Out dx,al
;-----

```

```

Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5; 5 minutes
Out dx,al
;-----
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
Enable watchdog timer to be reset by mouse
;-----
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of the watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of the watchdog timer
Mov al,30h
Out dx,al
Inc dx
In al,dx
Or al,01h
Out dx,al
;-----
Dec dx ; Enable the watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;-----
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
Enable the watchdog timer to be reset by keyboard
;-----
Mov dx,2eh ; unlock NCT6776D

```

```

Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of the watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of the watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Enable the watchdog timer to be strobe reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
;-----
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
Generate a time-out signal without the timer counting
;-----
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select register of the watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of the watchdog timer
Mov al,30h
Out dx,al
Inc dx

```

```
In al,dx
Or al,01h
Out dx,al
;-----
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;-----
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```

Appendix **B**

32-bit DIO Signal Connections

B.1 Overview

Maintaining good signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly. A good signal connection can avoid unnecessary and costly damage to your PC and other hardware devices.

B.2 Isolated Digital I/O Connections

B.2.1 Dry/Wet Contact Support for Digital Input

Each digital input channel accepts either dry contact or 0 VDC - 5 VDC wet contact inputs. Dry contact capability allows the channel to respond to changes in external circuitry (e.g., the closing of a switch in the external circuitry) when no voltage is present in the external circuit. Figure C-1 shows external circuitry with both wet and dry contact components, connected as an input source to one of the card's digital input channels.

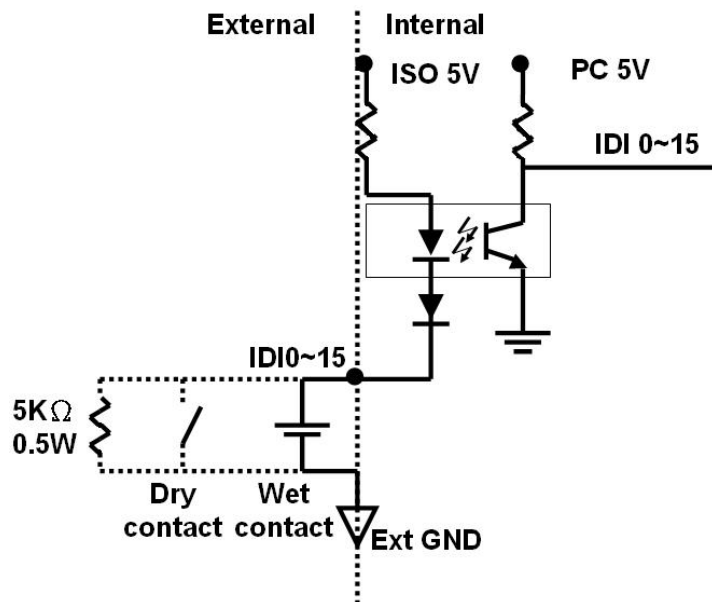


Figure B.1 Isolated Digital Input Connections

B.2.2 Isolated Digital Output Connections

Each of 8 isolated digital output channels comes equipped with a Darlington transistor. Groups of 8 output channels share common collectors and integral suppression diodes for inductive loads. Channels 0 ~ 7 use COM0, and channels 8 ~ 15 use COM1 as a common pin. If an external voltage (5 VDC - 40 VDC) is applied to an isolated output channel (IDO 0 ~ IDO 15) while it is being used as an output channel, the current will flow from the external voltage source to the card. Please ensure that the current through each GND pin does not exceed 100 mA.

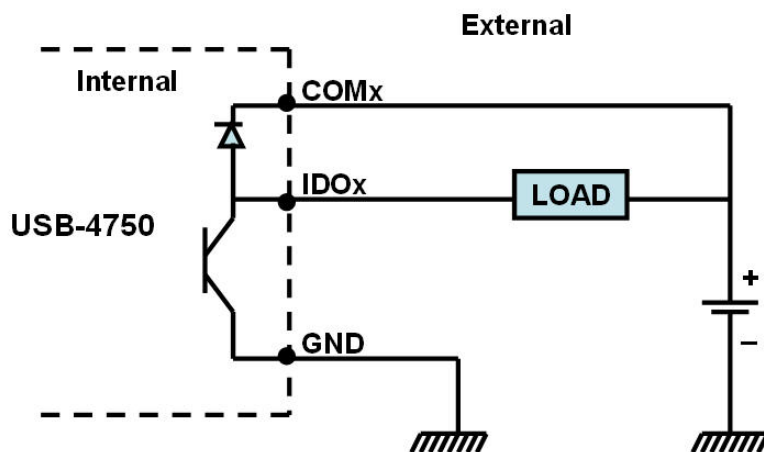


Figure B.2 Isolated Digital Output Connections

Appendix **C**

Exploded Diagram &
Parts List

C.1 Exploded Diagram

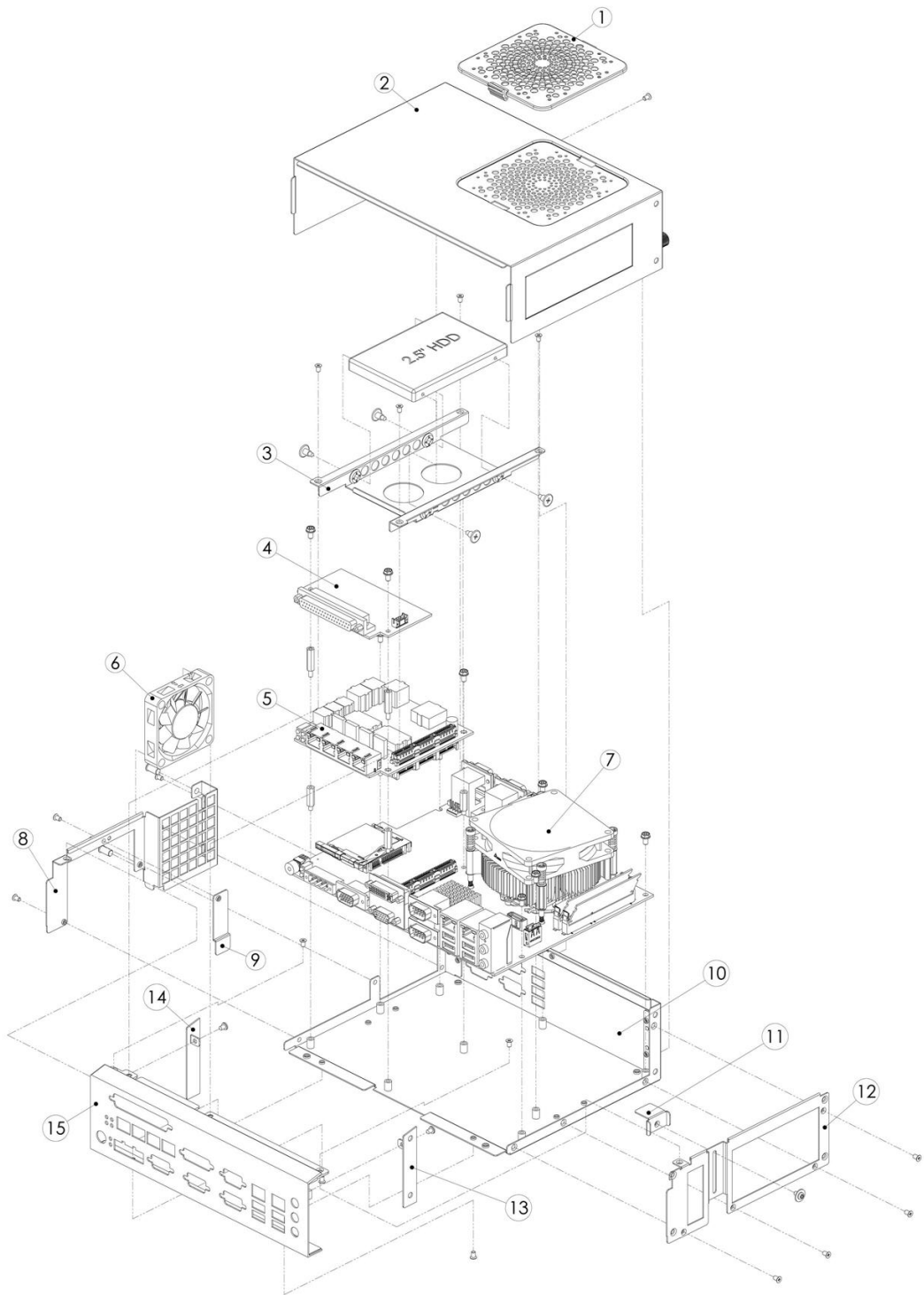


Figure C.1 Exploded Diagram

Table C.1: Parts List

1	Fan filter	9	CFAST card clamps bracket
2	Top cover	10	Chassis assy
3	HDD tray	11	USB clamps bracket
4	DIO board	12	Side bracket
5	PoE board	13	Side cover R
6	SYS fan	14	Side cover L
7	Main board	15	Front IO panel
8	Fan bracket		

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