



BOXER-6801-RAP

Fanless Embedded Box PC

User's Manual 1st Ed

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item		Quantity
●	BOXER-6801-RAP	1
●	Wall Mount bracket	2
●	Screw Package	1
●	3 Pin DC-In Power Connector	1

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

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any power supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. Do not leave this device in an uncontrolled environment with temperatures beyond the device's permitted storage temperatures (see chapter 1) to prevent damage.
19. Do NOT disassemble the motherboard so as not to damage the system or void your warranty.
20. If the thermal pad had been damaged, please contact AAEON's salesperson to purchase a new one. Do NOT use those of other brands.
21. The Hex Cylinder Coppers on the front panel are not removable.
22. Repeatedly assemble and disassemble the system may cause damages to the exterior paint and surface and screw holes.
23. Use the right size screwdriver.
24. Use the screwdriver correctly to remove screws from the system.

FCC Statement

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON System

QO4-381 Rev.A2

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
液晶模块	×	○	○	○	○	○
光驱	×	○	○	○	○	○
触控模块	×	○	○	○	○	○
电源	×	○	○	○	○	○
电池	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
○：表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。
×：表示该有害物质的某一均质材料超出了 GB/T 26572 的限量要求，然而该部件仍符合欧盟指令 2011/65/EU 的规范。
环保使用期限(EFUP (Environmental Friendly Use Period))：10 年
备注：
一、此产品所标示之环保使用期限，系指在一般正常使用状况下。
二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。
三、上述部件物质液晶模块、触控模块仅一体机产品适用。

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON System

QO4-381 Rev.A2

Part Name	Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCB Assemblies	×	○	○	○	○	○
Connector and Cable	×	○	○	○	○	○
Chassis	○	○	○	○	○	○
CPU and Memory	×	○	○	○	○	○
Hard Disk	×	○	○	○	○	○
LCD Modules	×	○	○	○	○	○
CD-ROM/DVD-ROM	×	○	○	○	○	○
Touch Modules	×	○	○	○	○	○
Power	×	○	○	○	○	○
Battery	×	○	○	○	○	○

The table is prepared in accordance with the provisions of SJ/T 11364.

○ : Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.

× : Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).

EFUP (Environment Friendly Use Period) value: 10 years.

Notes:

1. This product defined period of use is under normal condition.
2. In above part, CPU/Memory/ Hard Disk/CD-ROM/DVD-ROM/ Power are optional.
3. In above part, LCD Modules/ Touch Modules are for all-in-one product model.

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Chapter 1

Product Specifications

1.1 Specifications

System

CPU	13th Generation Intel® Core™ Mobile Processors (formerly Raptor Lake-P), Max. 28W: Intel® Core™ i7-1370PE Processor Intel® Core™ i5-1340PE Processor Intel® Core™ i3-1320PE Processor
Chipset	Intel® SoC
System Memory	DDR5 SODIMM x 2, up to 96GB
Display Interface	HDMI x 2
Storage Device	2.5" SATA Drive Bay x 1 M.2 2280 M-Key x 1 (PCIe Gen 4 [x4])
Ethernet	2.5GbE x 5 (Intel® Ethernet Controller I226-LM)
I/O	2.5GbE x 4 (IEEE 802.3af/at PoE support, providing a total power budget of 60W across all ports) Note: When the input voltage is ≤12V, the system supports PoE with a maximum combined output of <20W. USB 3.2 Gen 2 (Type-A) x 2 USB 2.0 (Type-A) x 2 DB-9 x 2 for RS-232/422/485 DB-15 x 1 for DIO 8-bit Front-access SIM Slot x 1 3.5mm Jack x 1 for Line-out/Mic-in Antenna Opening x 6 Reset Button x 1 Power Button x 1

System	
Expansion	M.2 2280 M-Key x 1 M.2 2230 E-Key x 1 (PCIe) M.2 3052 B-Key x 1 (USB) with SIM slot PCIe [x1] Slot x 1 (Max size: 150mm x 110mm x 20mm) PCI Slot x 1 (Max size: 150mm x 110mm x 20mm)
Indicator	—
OS Support	Windows® 10 IoT 2021 LTSC Windows® 11 IoT LTSC Ubuntu 24.04 and later
Power Supply	
Power Requirement	9V–36V DC Input via 3-pin Terminal Block, with built-in protection circuit
Mechanical	
Mounting	Wall Mount (Optional: DIN Rail Mount)
Dimensions (W x H x D)	10.3" x 7" x 4.8" (264mm x 179mm x 124mm) w/o Brackets
Gross Weight	13.89 lb (6.3 kg)
Net Weight	10.80 lb (4.9 kg)
Environmental	
Operating Temperature	-4°F ~ 140°F (-20°C ~ 60°C) with 0.7 m/s airflow (with wide temp. memory/storage)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Storage Humidity	5 ~ 95% @ 40°C, non-condensing
Anti-Vibration	With SSD: Random, 3Grms, 5~500Hz

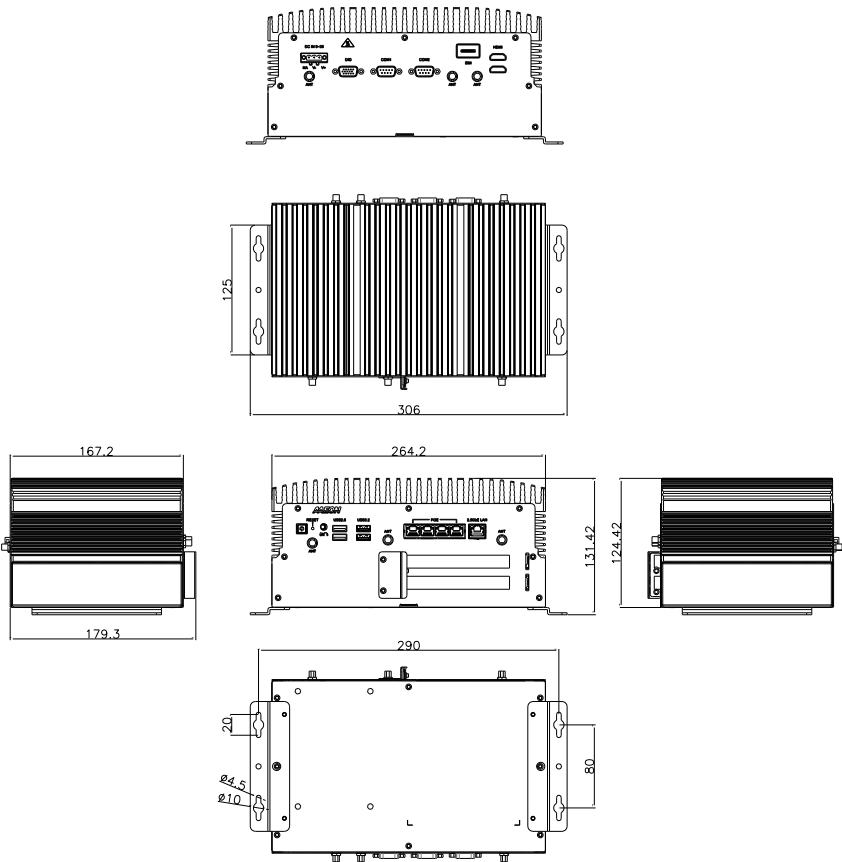
Environmental

Anti-Shock	With SSD: 50G @ wall mount, Half-sine, 11ms
Certification	CE/FCC Class A

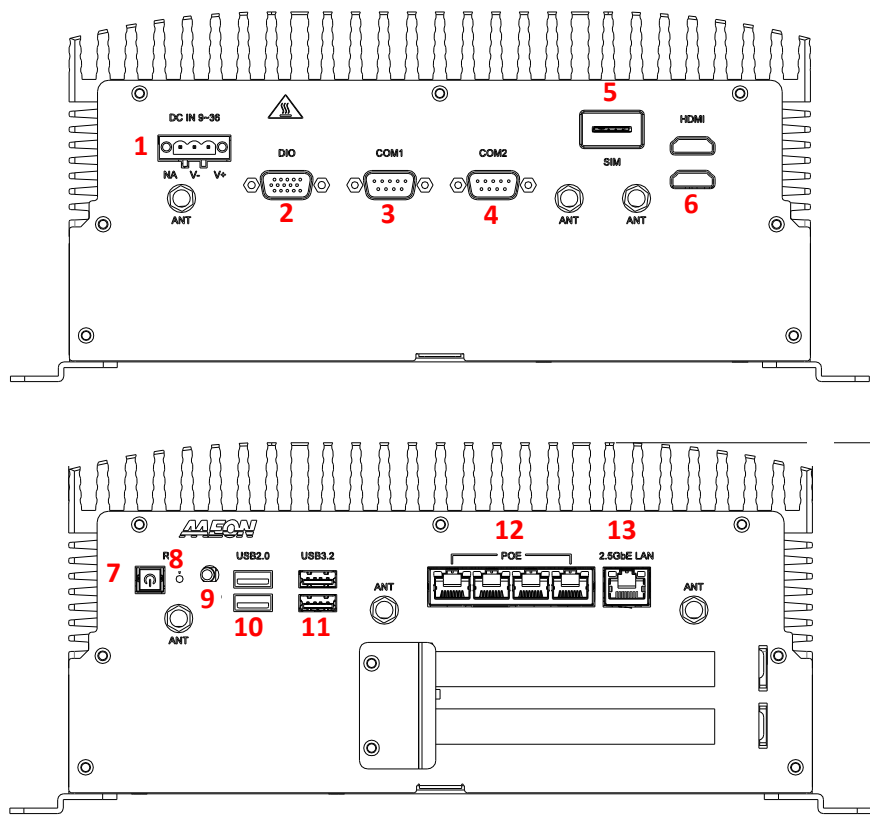
Chapter 2

Hardware Information

2.1 Dimensions



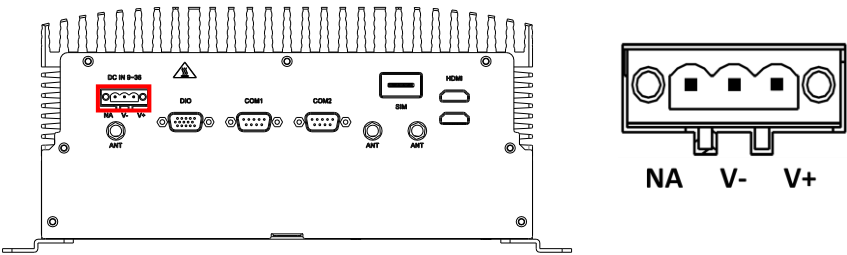
2.2 System Ports



Label	Function
1	DC-in (9V-36V)
2	DIO Port
3	COM Port 1 (RS-232/422/485)
4	COM Port 2 (RS-232/422/485)
5	Micro SIM Slot
6	Dual HDMI Port
7	System On/Off (with Green LED)
8	Reset Key
9	Audio Port (Line Out/Mic-in)

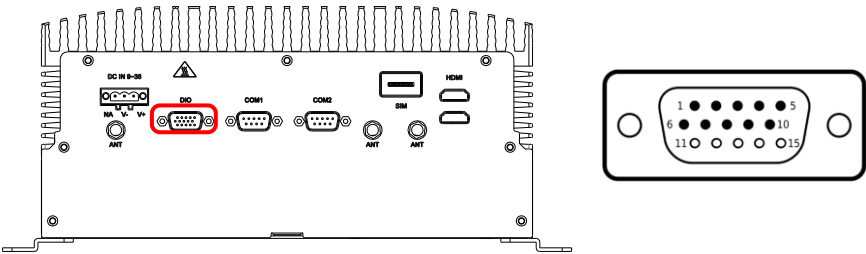
Label	Function
10	Dual USB 2.0 Port
11	Dual USB 3.2 Port
12	Quad 2.5GbE RJ-45 PoE Port
13	2.5GbE RJ-45 Port

2.2.1 DC-in (9V-36V) (1)



Pin	Signal	Signal Type	Signal Level
1	V+	PWR (Vin)	+9V ~ +36V
2	V-	GND	
3	NA	NA	

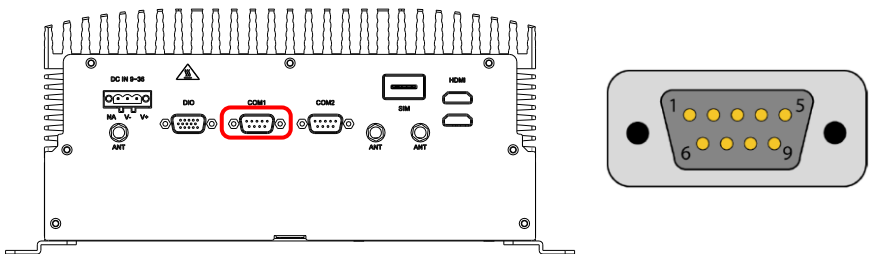
2.2.2 DIO Port (2)



Pin	Signal	Signal Type	Signal Level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V

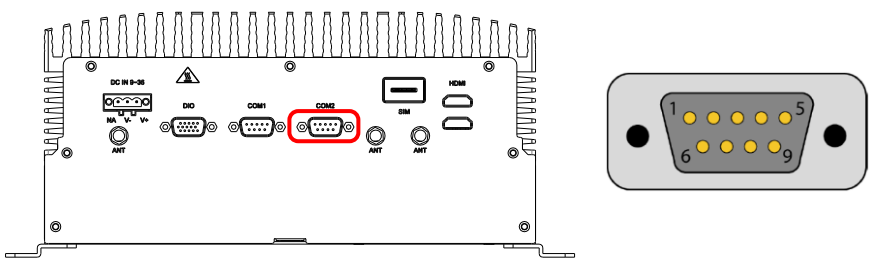
Pin	Signal	Signal Type	Signal Level
9	+5V	PWR (Vout)	+5V
10	GND	GND	
11	NA		
12	NA		
13	NA		
14	NA		
15	NA		

2.2.3 COM Port 1 (RS-232/422/485) (3)



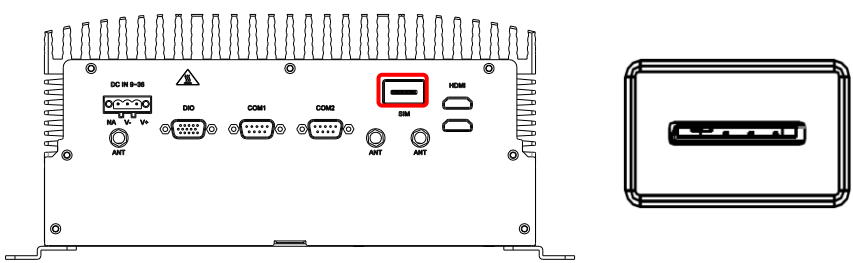
Pin	RS-232	RS-422	RS-485	Signal Type
1	DCD	RS422_TX-	RS485_D-	IN
2	RX	RS422_TX+	RS485_D+	IN
3	TX	RS422_RX+		OUT
4	DTR	RS422_RX-		OUT
5	GND			GND
6	DSR			IN
7	RTS			OUT
8	CTS			IN
9	RI (Default: Disable)			IN

2.2.4 COM Port 2 (RS-232/422/485) (4)



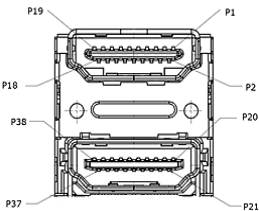
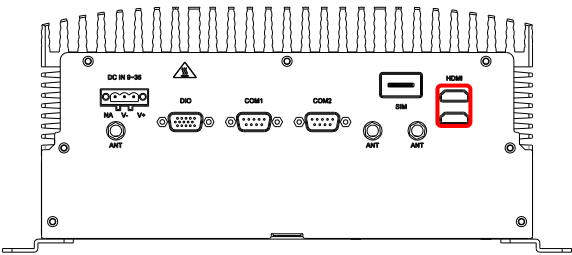
Pin	RS-232	RS-422	RS-485	Signal Type
1	DCD	RS422_TX-	RS485_D-	IN
2	RX	RS422_TX+	RS485_D+	IN
3	TX	RS422_RX+		OUT
4	DTR	RS422_RX-		OUT
5	GND			GND
6	DSR			IN
7	RTS			OUT
8	CTS			IN
9	RI (Default: Disable)			IN

2.2.5 Micro SIM Slot (5)



Note: The Micro SIM slot is intended for use with an M.2 3052 B-Key module.

2.2.6 Dual HDMI Port (6)

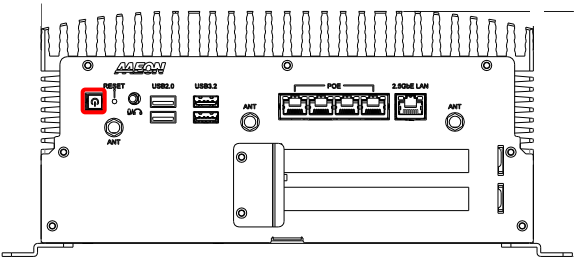


Port 1: Top			
Pin	Signal	Signal Type	Signal Level
P1	HDMI1_DATA2_P	DIFF	
P2	GND	GND	
P3	HDMI1_DATA2_N	DIFF	
P4	HDMI1_DATA1_P	DIFF	
P5	GND	GND	
P6	HDMI1_DATA1_N	DIFF	
P7	HDMI1_DATA0_P		
P8	GND	GND	
P9	HDMI1_DATA0_n		
P10	HDMI1_CLK_P	DIFF	
P11	GND	GND	
P12	HDMI1_CLK_N	DIFF	
P13	CEC		+3.3V
P14	NC		
P15	HDMI1_SCL		
P16	HDMI1_SDA		
P17	GND	GND	
P18	+V5S_HDMI_CON	PWR	+5V
P19	HDMI1_HPD		+5V

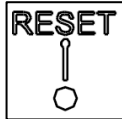
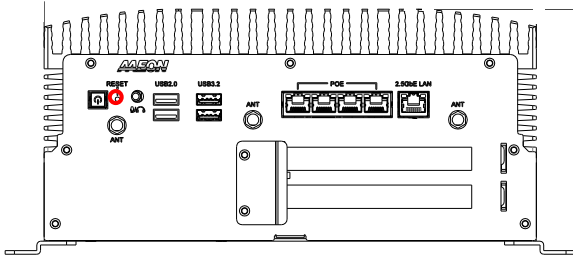
Port 2: Bottom			
Pin	Signal	Signal Type	Signal Level
P20	HDMI2_DATA2_P		
P21	GND	GND	
P22	HDMI2_DATA2_N		

Port 2: Bottom			
Pin	Signal	Signal Type	Signal Level
P23	HDMI2_DATA1_P		
P24	GND	GND	
P25	HDMI2_DATA1_N		
P26	HDMI2_DATA0_P		
P27	GND	GND	
P28	HDMI2_DATA0_N		
P29	HDMI2_CLK_P		
P30	GND	GND	
P31	HDMI2_CLK_N		
P32	CEC		+3.3V
P33	NC		
P34	HDMI2_SCL		
P35	HDMI2_SDA		
P36	GND	GND	
P37	+V5S_HDMI_CON		+5V
P38	HDMI2_HPD		+5V

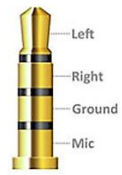
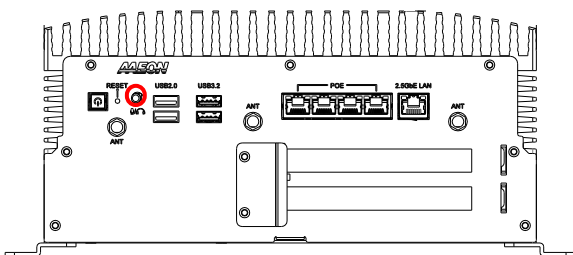
2.2.7 System On/Off (with Green LED) (7)



2.2.8 Reset Key (8)



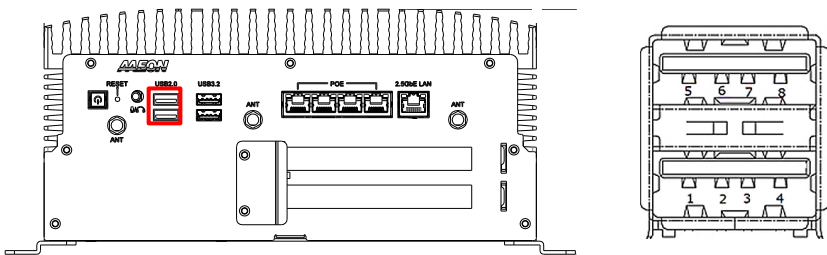
2.2.9 Audio Port (Line Out/Mic-in) (9)



TRRS
CTIA Standard
4 Pole

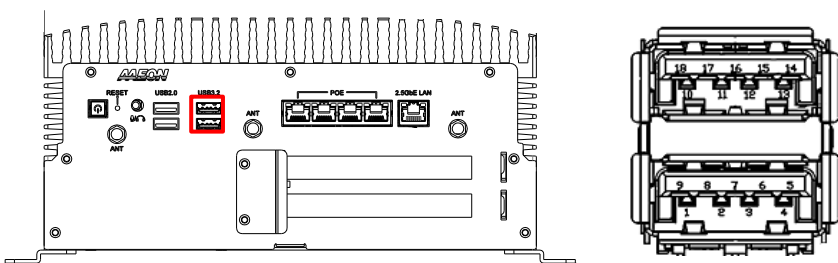
Note: Compatible with standard 3.5 mm male plug pins.

2.2.10 Dual USB 2.0 Port (10)



Pin	Signal	Signal Type	Signal Level
1	VCC_USB3	PWR	+5V
2	USB3-	DIFF	
3	USB3+	DIFF	
4	GND	GND	
5	VCC_USB4	PWR	+5V
6	USB4-	DIFF	
7	USB4+	DIFF	
8	GND	GND	

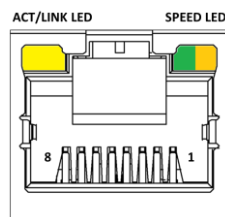
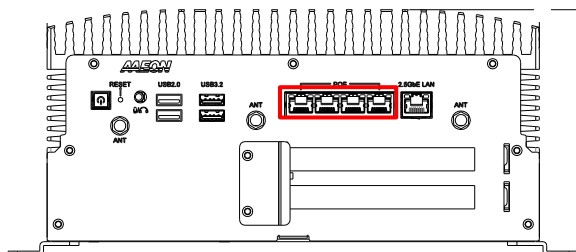
2.2.11 Dual USB 3.2 Port (11)



Pin	Signal	Signal Type	Signal Level
1	VCC_USB1	PWR	+5V
2	USB1-	DIFF	
3	USB1+	DIFF	

Pin	Signal	Signal Type	Signal Level
4	GND	GND	
5	USB3_RX1_N_C	DIFF	
6	USB3_RX1_P_C	DIFF	
7	GND	GND	
8	USB3_TX1_N_C	DIFF	
9	USB3_TX1_P_C	DIFF	
10	VCC_USB2	PWR	+5V
11	USB2-	DIFF	
12	USB2+	DIFF	
13	GND	GND	
14	USB3_RX2_N_C	DIFF	
15	USB3_RX2_P_C	DIFF	
16	GND	GND	
17	USB3_TX2_N_C	DIFF	
18	USB3_TX2_P_C	DIFF	

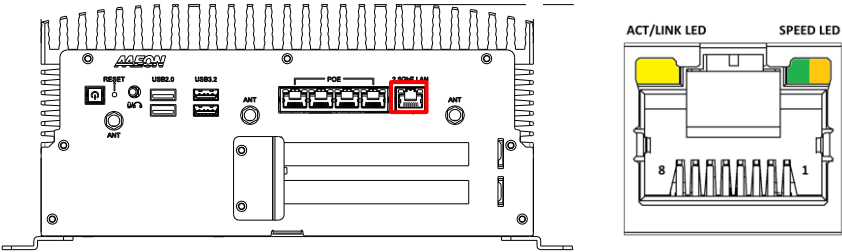
2.2.12 Quad 2.5GbE RJ-45 PoE Port (12)



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

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
-	-	Green	2.5Gbps Connection
OFF	No Link	Orange	1Gbps Connection
Yellow	Linked	Off	100Mbps Connection
Blinking	Data Activing	Off	10Mbps Connection

2.2.13 2.5GbE RJ-45 Port (13)

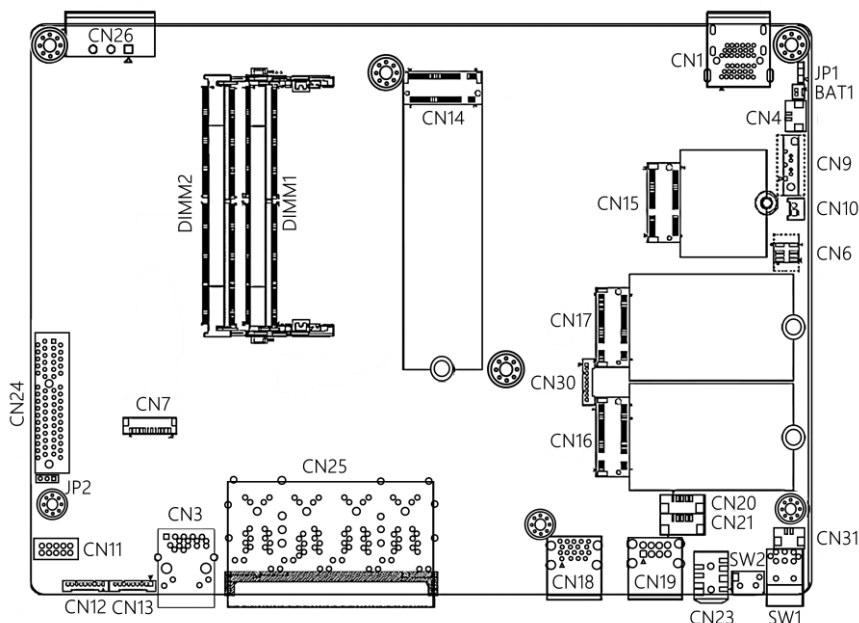


Pin	Signal	Signal Type
1	MDI0+	DIFF
2	MDI0-	DIFF
3	MDI1+	DIFF
4	MDI2+	DIFF
5	MDI2-	DIFF
6	MDI1-	DIFF
7	MDI3+	DIFF
8	MDI3-	DIFF

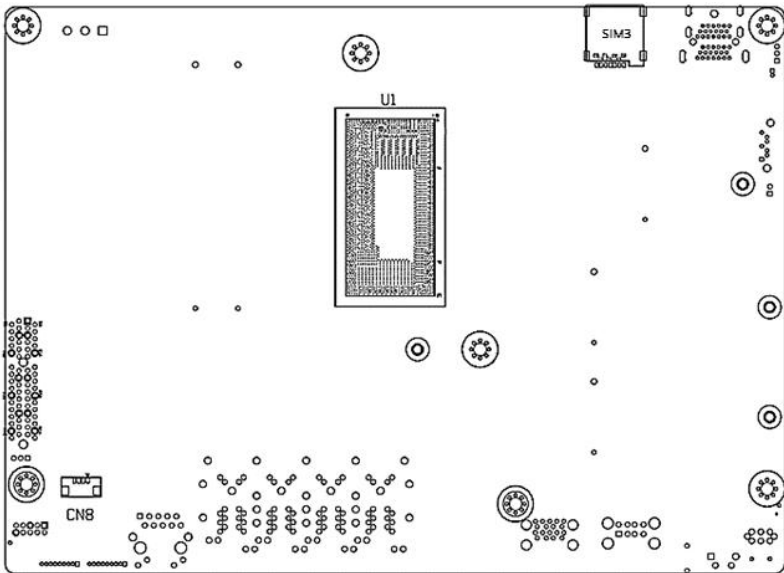
ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
-	-	Green	2.5Gbps Connection
OFF	No Link	Orange	1Gbps Connection
Yellow	Linked	Off	100Mbps Connection
Blinking	Data Activing	Off	10Mbps Connection

2.3 Main Board Jumpers and Connectors

Top Side View



Bottom Side View



2.4 Main Board List of Jumpers

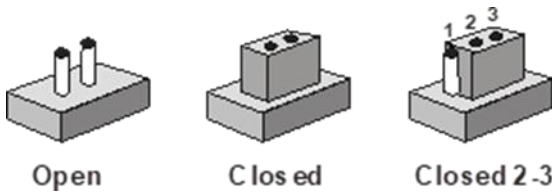
Please refer to the table below for all of the system's jumpers that you can configure for your application.

Label	Function
JP1	CMOS Control Selection
JP2	ATX/AT Mode Selection

2.4.1 Setting Jumpers

The BOXER-6801-RAP comes with several jumpers which allow you to configure the system by either setting the jumper to "open" or "closed"; or by selecting certain pins. A closed jumper has two pins connected with a jumper clip, while an open jumper has no pins connected.

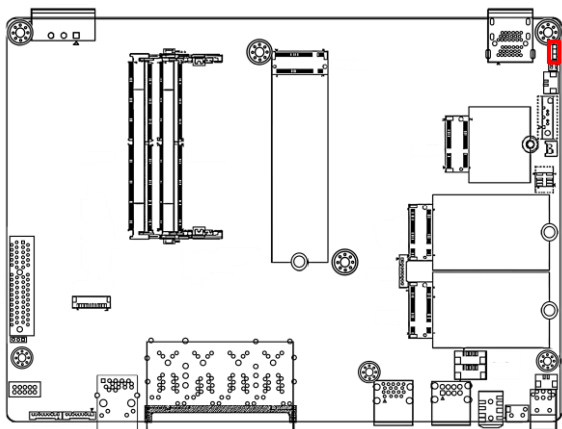
For jumpers with multiple pins, this guide uses "pins A-B" to notate which pins should be connected by a jumper clip. For example, "pins 1-2" means you should connect pins 1 and 2, while "pins 2-3" means you should connect pins 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

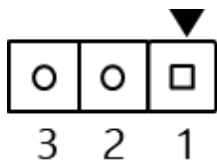
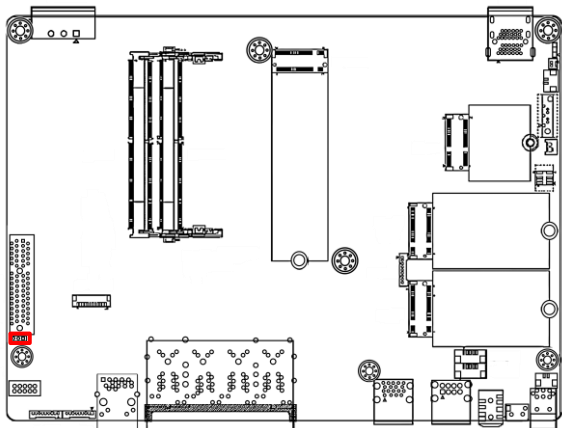
If you have any questions about how best to configure the system for your application, contact your AAEON representative or visit our website to talk with our support team.

2.4.2 CMOS Control Selection (JP1)



Function	Pin Configuration
Normal (Default)	1-2
Clear CMOS	2-3

2.4.3 ATX/AT Mode Selection (JP2)

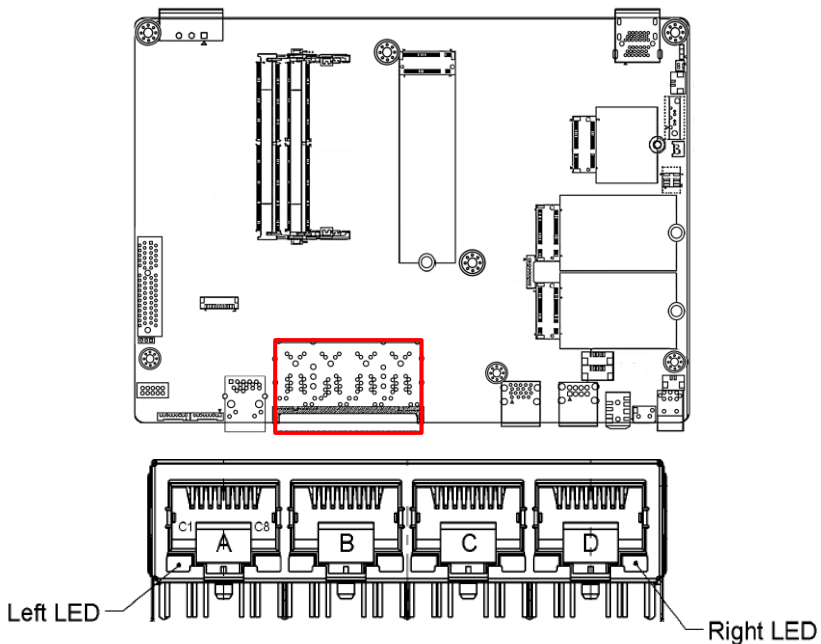


Function	Pin Configuration
ATX (Default)	1-2
AT	2-3

2.5.1 Main Board List of Connectors

Label	Function
CN1	Dual HDMI Port
CN14	M.2 2280 M-Key
CN26	Phoenix Power Input Connector
CN24	Board-to-Board I/O Connector
CN11	DIO Wafer Box
CN12	COM 1 Wafer Box (RS-232/422/485)
CN13	COM 2 Wafer Box (RS-232/422/485)
CN3	2.5GbE LAN
CN25	2.5GbE LAN PoE PSE Connector
CN18	USB 3.2 x 2 Connector
CN19	USB 2.0 x 2 Connector
CN23	Audio Jack Connector
SW2	Reset Button
SW1	Power Button
CN20/CN21	USB 2.0 x 2 Wafer Box
CN17	M.2 3052 B-Key
CN15	M.2 2230 E-Key
CN30	GPS & IMU Sensor Board Connector (NA)
CN10	2.5" SATA HDD Power Wafer Box
CN9	2.5" SATA HDD Connector
BAT1	RTC Battery
SIM3	Micro SIM Slot for M.2 3052 B-Key
DIMM1	DDR5 SODIMM Slot
DIMM2	DDR5 SODIMM Slot

2.5.1 2.5GbE LAN PoE PSE Connector (CN25)



Port A			
Pin	Pin Name	Signal Type	Signal Level
1R1	LAN2_MDI0P	DIFF	
1R2	LAN2_MDI0N	DIFF	
1R3	1TRCT1	GND	
1R4	LAN2_MDI1P	DIFF	
1R5	LAN2_MDI1N	DIFF	
1R6	1TRCT2	GND	
1R7	LAN2_MDI2P	DIFF	
1R8	LAN2_MDI2N	DIFF	
1R9	1TRCT3	GND	
1R10	LAN2_MDI3P	DIFF	
1R11	LAN2_MDI3N	DIFF	
1R12	1TRCT4	GND	
1R13	1VC3	PWR_PoE	+52V
1R14	1VC4	PWR_PoE	+52V
1R15	1VC2	PWR_PoE	+52V

Port A			
Pin	Pin Name	Signal Type	Signal Level
1R16	1VC1	PWR_PoE	+52V
1L1	LAN2_LED_LNK#_ACT	IN	+3.3V
1L2	LAN2_LED_Y	IN	+3.3V
1L3	LAN2_LED_1K	IN	+3.3V
1L4	LAN2_LED_2K5	IN	+3.3V

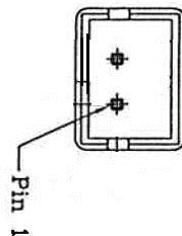
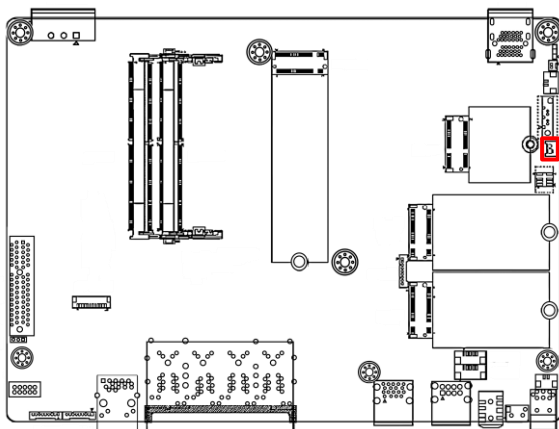
Port B			
Pin	Pin Name	Signal Type	Signal Level
2R1	LAN3_MDI0P	DIFF	
2R2	LAN3_MDI0N	DIFF	
2R3	2TRCT1	GND	
2R4	LAN3_MDI1P	DIFF	
2R5	LAN3_MDI1N	DIFF	
2R6	2TRCT2	GND	
2R7	LAN3_MDI2P	DIFF	
2R8	LAN3_MDI2N	DIFF	
2R9	2TRCT3	GND	
2R10	LAN3_MDI3P	DIFF	
2R11	LAN3_MDI3N	DIFF	
2R12	2TRCT4	GND	
2R13	2VC3	PWR_PoE	+52V
2R14	2VC4	PWR_PoE	+52V
2R15	2VC2	PWR_PoE	+52V
2R16	2VC1	PWR_PoE	+52V
2L1	LAN3_LED_LNK#_ACT	IN	+3.3V
2L2	LAN3_LED_Y	IN	+3.3V
2L3	LAN3_LED_1K	IN	+3.3V
2L4	LAN3_LED_2K5	IN	+3.3V

Port C			
Pin	Pin Name	Signal Type	Signal Level
3R1	LAN4_MDI0P	DIFF	
3R2	LAN4_MDI0N	DIFF	
3R3	3TRCT1	GND	
3R4	LAN4_MDI1P	DIFF	
3R5	LAN4_MDI1N	DIFF	
3R6	3TRCT2	GND	
3R7	LAN4_MDI2P	DIFF	

Port C			
Pin	Pin Name	Signal Type	Signal Level
3R8	LAN4_MDI2N	DIFF	
3R9	3TRCT3	GND	
3R10	LAN4_MDI3P	DIFF	
3R11	LAN4_MDI3N	DIFF	
3R12	3TRCT4	GND	
3R13	3VC3	PWR_PoE	+52V
3R14	3VC4	PWR_PoE	+52V
3R15	3VC2	PWR_PoE	+52V
3R16	3VC1	PWR_PoE	+52V
3L1	LAN4_LED_LNK#_ACT	IN	+3.3V
3L2	LAN4_LED_Y	IN	+3.3V
3L3	LAN4_LED_1K	IN	+3.3V
3L4	LAN4_LED_2K5	IN	+3.3V

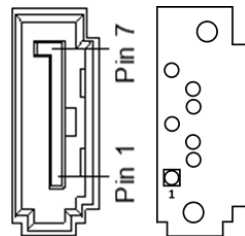
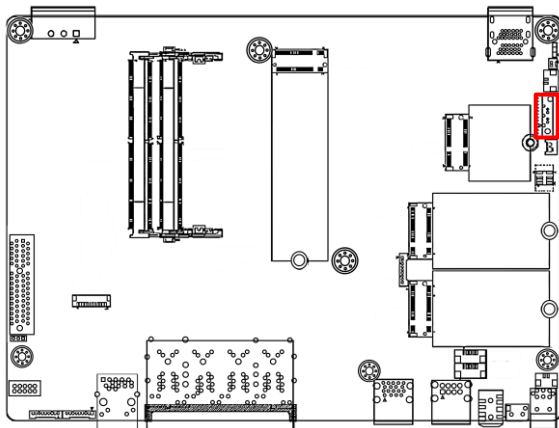
Port D			
Pin	Pin Name	Signal Type	Signal Level
4R1	LAN5_MDI0P	DIFF	
4R2	LAN5_MDI0N	DIFF	
4R3	4TRCT1	GND	
4R4	LAN5_MDI1P	DIFF	
4R5	LAN5_MDI1N	DIFF	
4R6	4TRCT2	GND	
4R7	LAN5_MDI2P	DIFF	
4R8	LAN5_MDI2N	DIFF	
4R9	4TRCT3	GND	
4R10	LAN5_MDI3P	DIFF	
4R11	LAN5_MDI3N	DIFF	
4R12	4TRCT4	GND	
4R13	4VC3	PWR_PoE	+52V
4R14	4VC4	PWR_PoE	+52V
4R15	4VC2	PWR_PoE	+52V
4R16	4VC1	PWR_PoE	+52V
4L1	LAN5_LED_LNK#_ACT	IN	+3.3V
4L2	LAN5_LED_Y	IN	+3.3V
4L3	LAN5_LED_1K	IN	+3.3V
4L4	LAN5_LED_2K5	IN	+3.3V

2.5.2 2.5" SATA HDD Power Wafer Box (CN10)



Pin	Pin Name	Signal Type	Signal Level
1	+V5S	PWR	+5V
2	GND	GND	

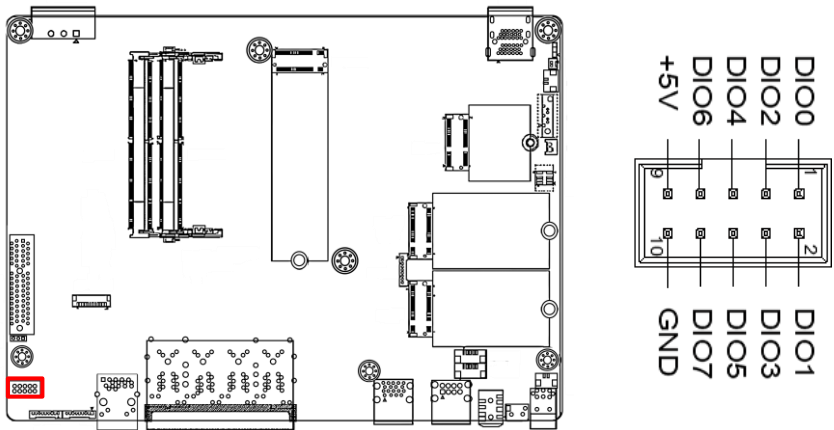
2.5.3 2.5" SATA HDD Connector (CN9)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
2	SATA0_TXP	DIFF	
3	SATA0_TXN	DIFF	
4	GND	GND	
5	SATA0_RXN	DIFF	
6	SATA0_RXP	DIFF	
7	GND	GND	

2.5.4 DIO Wafer Box (CN11)

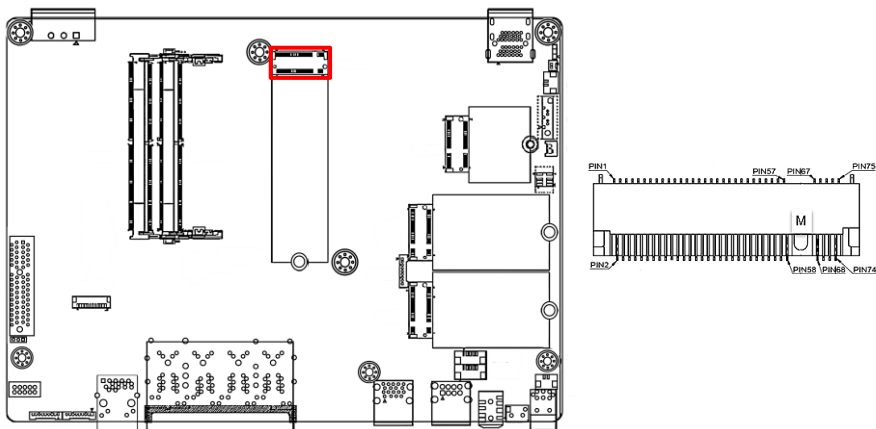


Pin	Pin Name	Signal Type	Signal Level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V
9	+5V	PWR	+5V
10	GND	GND	

Note:

- DIO0–DIO7 Signal Current: Maximum 12 mA
- +5V Output Voltage (Vout): Maximum 0.65 A

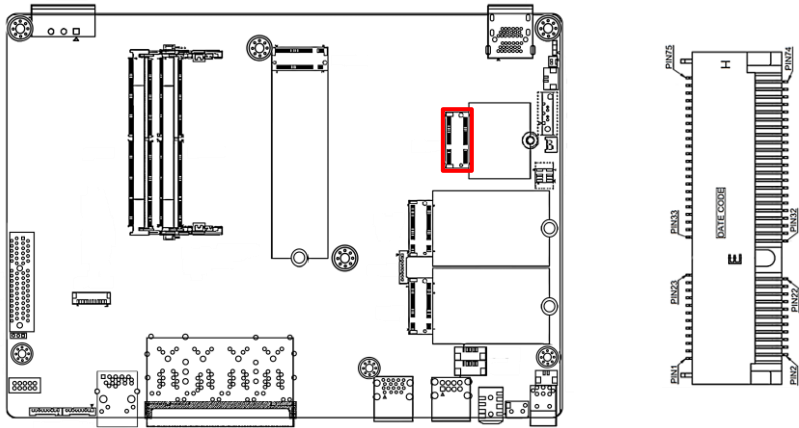
2.5.5 M.2 2280 M-Key (CN14)



Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	2	+V3P3_NGFF	PWR	+3.3V
3	GND	GND	4	+V3P3_NGFF	PWR	+3.3V
5	PCIE4_3_RXN	IN	6	CARD_PWR_OFF_N	OUT	+3.3V
7	PCIE4_3_RXP	IN	8	NC		
9	GND	GND	10	NC		
11	PCIE4_3_TXN	OUT	12	+V3P3_NGFF	PWR	+3.3V
13	PCIE4_3_TXP	OUT	14	+V3P3_NGFF	PWR	+3.3V
15	GND	PWR	16	+V3P3_NGFF	PWR	+3.3V
17	PCIE4_2_RXN	IN	18	+V3P3_NGFF	PWR	+3.3V
19	PCIE4_2_RXP	IN	20	NC		
21	GND	PWR	22	NC		
23	PCIE4_2_TXN	OUT	24	NC		
25	PCIE4_2_TXP	OUT	26	NC		
27	GND	PWR	28	NC		
29	PCIE4_1_RXN	IN	30	NC		
31	PCIE4_1_RXP	IN	32	NC		
33	GND	GND	34	NC		
35	PCIE4_1_TXN	OUT	36	NC		
37	PCIE4_1_TXP	OUT	38	DEV_SLP	IN	+3.3V
39	GND	GND	40	SMB_CLK_M2		+1.8V
41	PCIE4_0_RXP	IN	42	SMB_DATA_M2		+1.8V

Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
43	PCIE4_0_RXN	IN	44	NC		
45	GND	GND	46	NC		
47	PCIE4_0_TXN	OUT	48	NC		
49	PCIE4_0_TXP	OUT	50	BUF_PLT_RST_R	IN	+3.3V
51	GND	PWR	52	PCIE_CLKREQ#0	OUT	+3.3V
53	CLKOUT_PCIE_N0	OUT	54	M2_WAKE#	OUT	+3.3V
55	CLKOUT_PCIE_P0	OUT	56	NC		
57	GND	GND	58	NC		
67	NC		68	NC		
69	NC		70	+V3P3_NGFF	PWR	+3.3V
71	GND	GND	72	+V3P3_NGFF	PWR	+3.3V
73	GND	GND	74	+V3P3_NGFF	PWR	+3.3V
75	GND	GND				

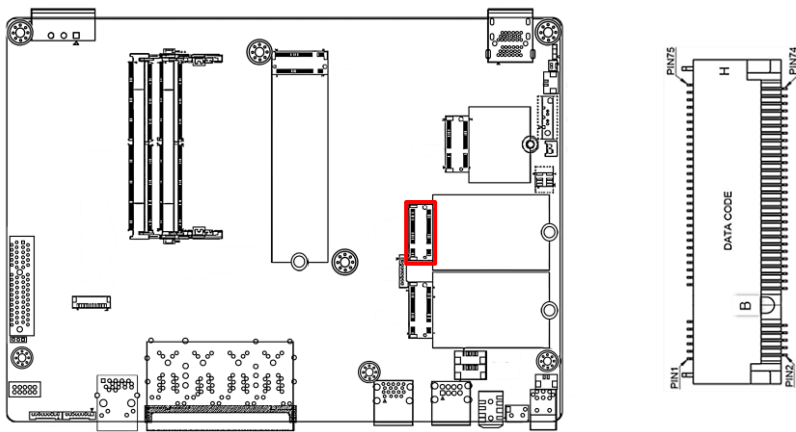
2.5.6 M.2 2230 E-Key (CN15)



Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	2	+V3P3_NGFF_E	PWR	+3.3V
3	USB_PP9	DIFF	4	+V3P3_NGFF_E	PWR	+3.3V
5	USB_PN9	DIFF	6	NC		
7	GND	GND	8	M.2_BT_PCMCLK_C	IN	+3.3V
9	NC		10	M.2_BT_PCMFRM_C	IN	+3.3V

Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
11	NC		12	M.2_BT_PCMIN_C	OUT	+3.3V
13	NC		14	M.2_BT_PCMOUT_C	IN	+3.3V
15	NC		16	NC		
17	NC		18	GND	GND	
19	NC		20	KEYE_UART_WAKE_N	OUT	+3.3V
21	NC		22	NC		
23	NC					
			32	NC		
33	GND	GND	34	NC		
35	PCIE5_TXP	DIFF	36	NC		
37	PCIE5_TXN	DIFF	38	CL_RST#	IN	+3.3V
39	GND	GND	40	CL_DATA		+3.3V
41	PCIE5_RXP	DIFF	42	CL_CLK	IN	+3.3V
43	PCIE5_RXN	DIFF	44	GPPC_F6_CNV_PA_	OUT	+3.3V
				BLANKING		
45	GND	GND	46	CNV_MFUART2_TXD	IN	+3.3V
47	CLKOUT_PCIE_P4	DIFF	48	CNV_MFUART2_RXD	OUT	+3.3V
49	CLKOUT_PCIE_N4	DIFF	50	SUSCLK	IN	+3.3V
51	GND	GND	52	BUF_PLT_RST#	IN	+3.3V
53	PCIE_CLKREQ#4	OUT	54	GPP_A13_PMC_I2C_SCL	IN	+3.3V
55	KEYE_WAKE_N	OUT	56	GPPC_E3_CPU_GP_0	IN	+3.3V
57	GND	GND	58	SMB_DATA		
59	NC		60	SMB_CLK	IN	
61	NC		62	SMB_ALERT	IN	
63	GND	GND	64	NC		
65	NC		66	NC		
67	NC		68	NC		
69	GND	GND	70	NC		
71	NC		72	+V3P3_NGFF_E	PWR	+3.3V
73	NC		74	+V3P3_NGFF_E	PWR	+3.3V
75	GND	GND				

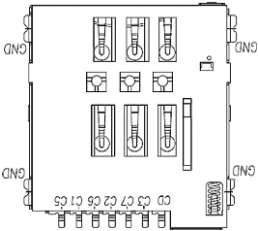
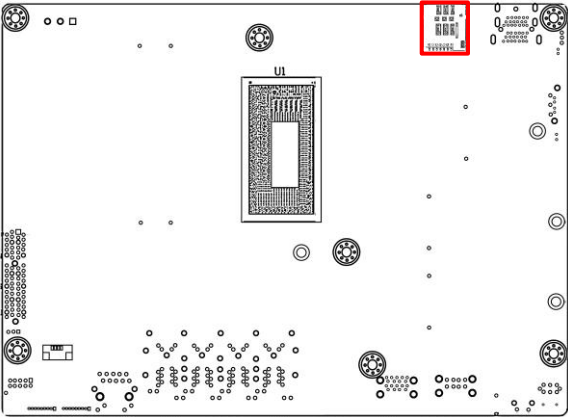
2.5.7 M.2 3052 B-Key (B) (CN17)



Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	NC		2	+3P3V_NGFF_3052	PWR	+3.3V
3	GND	GND	4	+3P3V_NGFF_3052	PWR	+3.3V
5	GND	GND	6	FULL_CARD_POWER_B	OUT	+3.3V
7	USB_PP4	DIFF	8	3GPW_EN_B	IN	+3.3V
9	USB_PN4	DIFF	10	NC		
11	GND	GND				
			20	NC		
21	NC		22	NC		
23	NC		24	NC		
25	NC		26	NC		
27	GND	GND	28	NC		
29	USB3_RX4_N	DIFF	30	UIM3_RESET	OUT	
31	USB3_RX4_P	DIFF	32	UIM3_CLK	OUT	
33	GND	GND	34	UIM3_DATA	I/O	
35	USB3_TX4_N	DIFF	36	UIM3_PWR3	PWR	+3.3V
37	USB3_TX4_P	DIFF	38	NC		
39	GND	GND	40	UIM4_DET	IN	
41	NC		42	UIM4_DATA	OUT	

Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
43	NC		44	UIM4_CLK	OUT	
45	GND	GND	46	UIM4_RESET	OUT	
47	NC		48	UIM4_PWR4	PWR	+3.3V
49	NC		50	BUF_PLT_3052B_RST#	IN	+3.3V
51	GND	GND	52	M3052B_PCIE_CLKREQ#		
53	NC	OUT	54	M2_3052B_WAKE#	OUT	+3.3V
55	NC	OUT	56	NC		
57	GND	GND	58	NC		
59	NC		60	NC		
61	NC		62	NC		
63	NC		64	NC		
65	NC		66	UIM3_DET	IN	
67	BUF_PLT_3052B_RST#		68	SUSCLK_3052B		
69	NC		70	+3P3V_NGFF_3052	PWR	+3.3V
71	GND	GND	72	+3P3V_NGFF_3052	PWR	+3.3V
73	GND	GND	74	+3P3V_NGFF_3052	PWR	+3.3V
75	GND	GND				

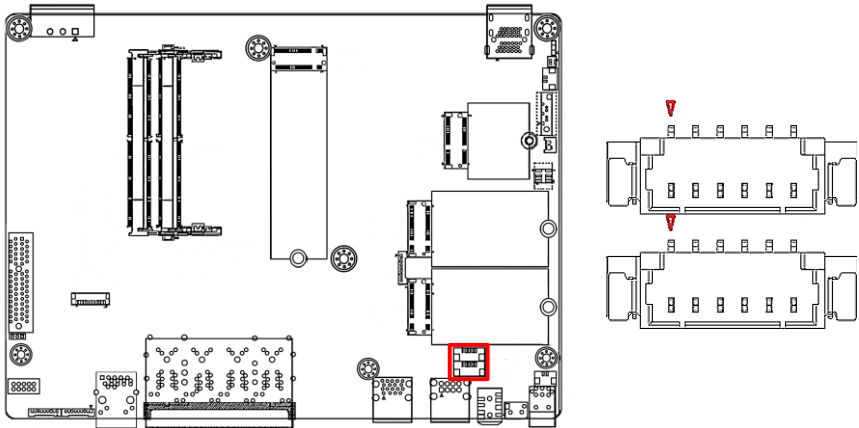
2.5.8 Micro SIM Slot for M.2 3052 B-Key (SIM3)



Pin	Pin Name	Signal Type	Signal Level
C1	UIM3_PWR	PWR	

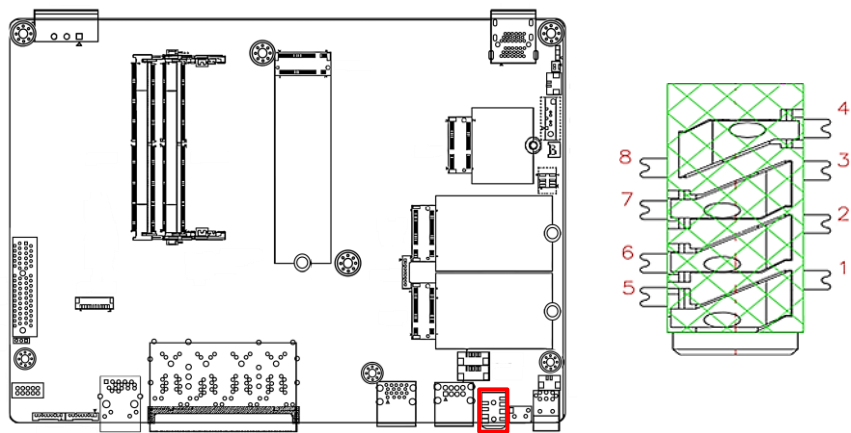
Pin	Pin Name	Signal Type	Signal Level
C2	UIM3_RESET	IN	
C3	UIM3_CLK	IN	
C5	GND	GND	
C6	NC		
C7	UIM3_DATA	I/O	
CD	UIM3_DET_CD	OUT	

2.5.9 USB 2.0 x 2 Wafer Box (CN20/CN21)



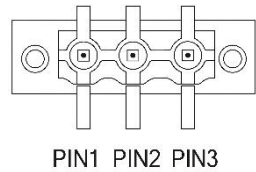
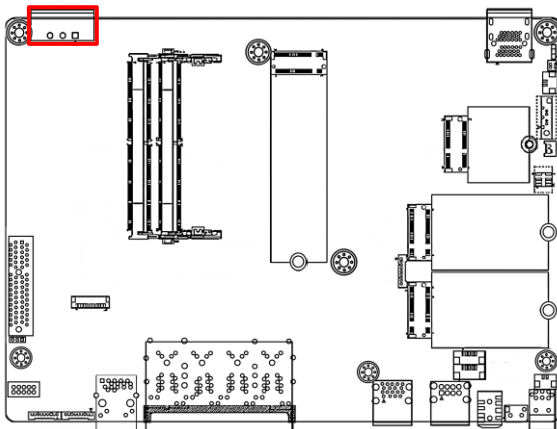
Pin	Pin Name	Signal Type	Signal Level
1	+5V	GND	+5V
2	USBD-	DIFF	
3	USBD+	DIFF	
4	GND	GND	
5	GND	GND	

2.5.10 Audio Jack Connector (CN23)



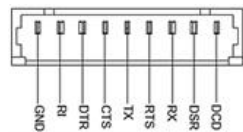
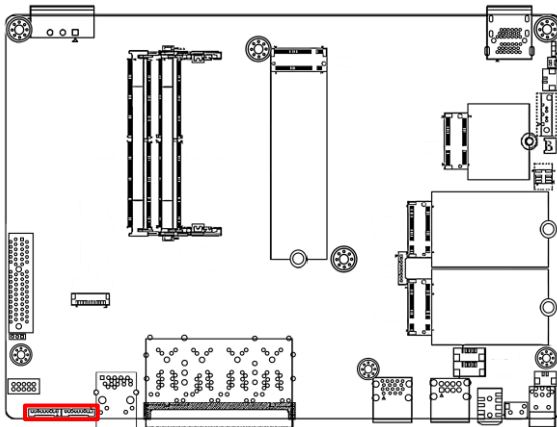
Pin	Pin Name	Signal Type	Signal Level
1	MIC_R	IN	
2	AUD_GND	AUD_GND	
3	LOUT_R	OUT	
4	NC		
5	NC		
6	HP_DET_3	IN	
7	NC		
8	LOUT_L	OUT	

2.5.11 Phoenix Power Input Connector (CN26)



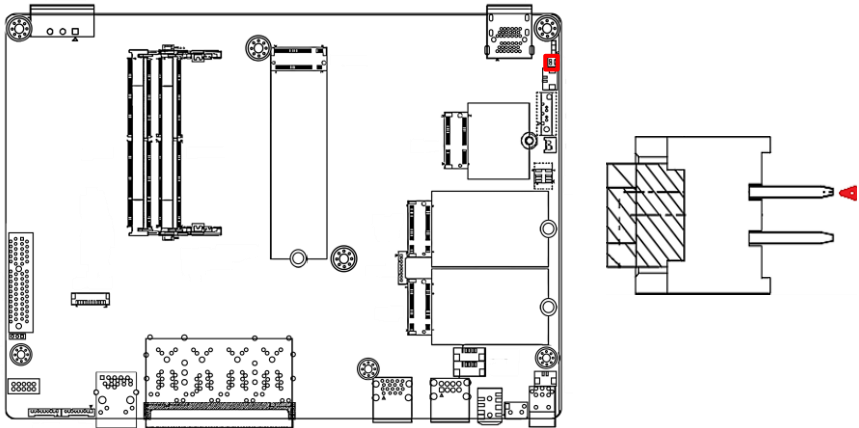
Pin	Pin Name	Signal Type	Signal Level
1	VIN	PWR	+9V ~ +36V
2	GND	GND	
3	NA		

2.5.12 COM 1/COM 2 Wafer Box (CN12/CN13)



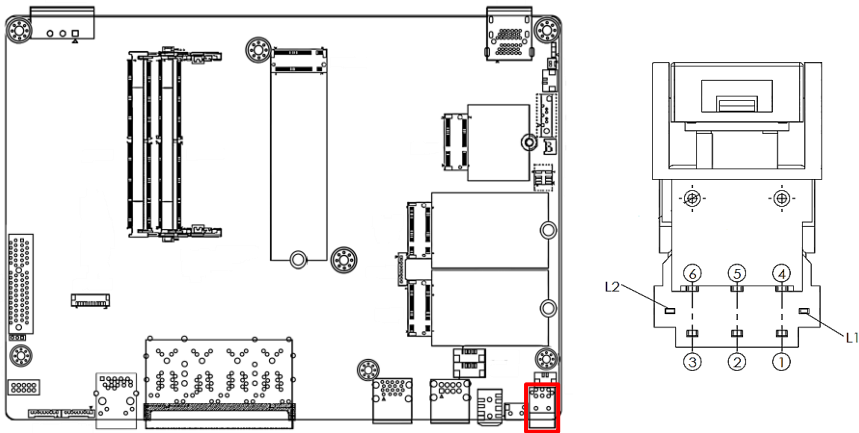
Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		
7	DTR	OUT	RS422_RX-	
8	RI (Default: Disable)	IN		
9	GND	GND		

2.5.13 RTC Battery (BAT1)



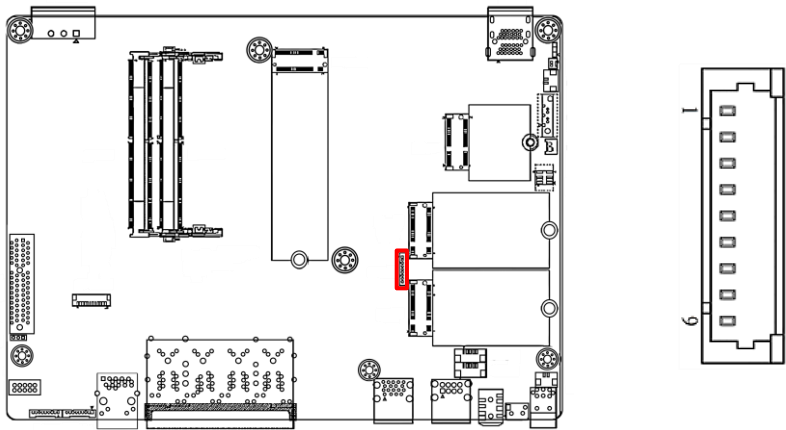
Pin	Pin Name	Signal Type	Signal Level
1	+V3P3A_RTC	PWR	+3.3V
2	GND	GND	

2.5.14 Power Button (SW1)



Pin	Pin Name	Signal Type	Signal Level
1	NC		
2	GND	GND	
3	PWR_BUTTON#	OUT	
4	NC		
5	GND	GND	
6	PWR_BUTTON#	OUT	
L1	+V5S	PWR	+5V
L2	GND	GND	

2.5.15 GPS & IMU Sensor Board Connector (CN30)

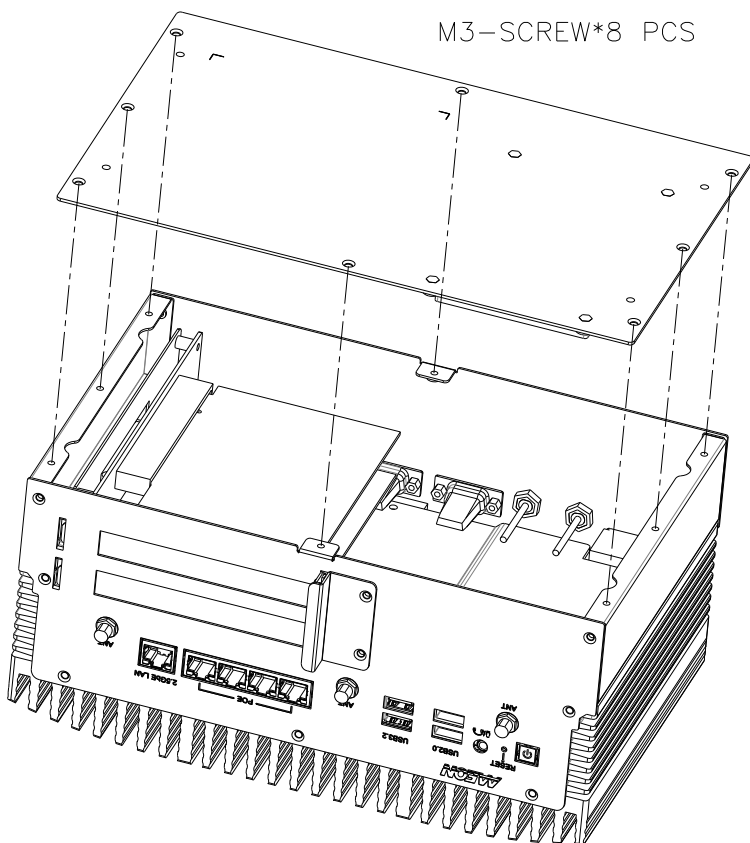


Pin	Pin Name	Signal Type	Signal Level
1	+V3P3S	PWR	+3.3V
2	+V3P3S	PWR	+3.3V
3	I2C0_SCL	IN	
4	I2C0_SDA	I/O	
5	IMU_INT	OUT	
6	UART0_TXD	IN	
7	UART0_RXD	OUT	
8	GND	GND	
9	GND	GND	

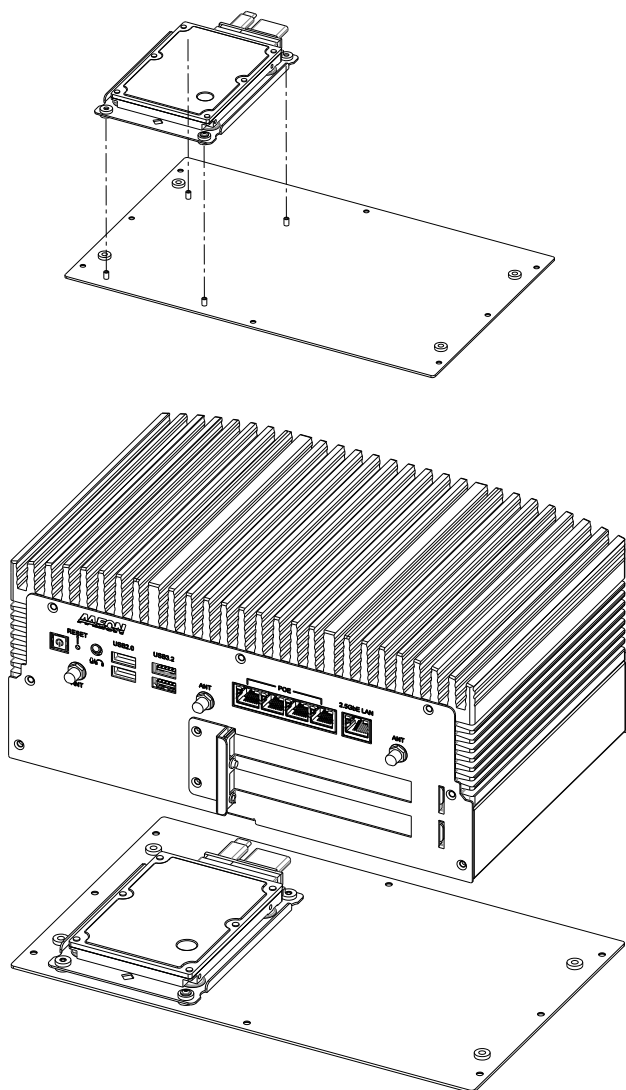
2.6 2.5" SATA Drive Installation

Before installing the 2.5" SATA drive, ensure the system is powered down and disconnect the power cord from the system. Make sure you have the 2.5" SATA drive ready to install. See Chapter 1 for 2.5" SATA drive requirements and specifications.

1. Using a Phillips screwdriver, remove the 8 × M3 screws securing the bottom panel, then remove the bottom panel to access the internal components.



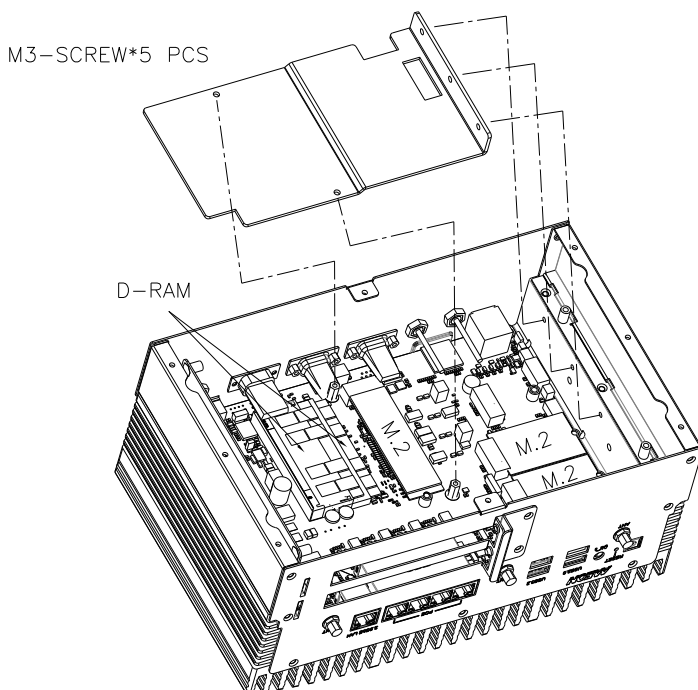
2. Align the SATA drive with the mounting holes on the bottom panel.
3. Secure the SATA drive to the bottom panel using the **4 × screws** provided.
4. Reinstall the bottom panel with the SATA drive attached by aligning it with the chassis and tightening the screws.
5. Connect the SATA power and data cables to the mainboard.



2.7 Expansion Card Installation

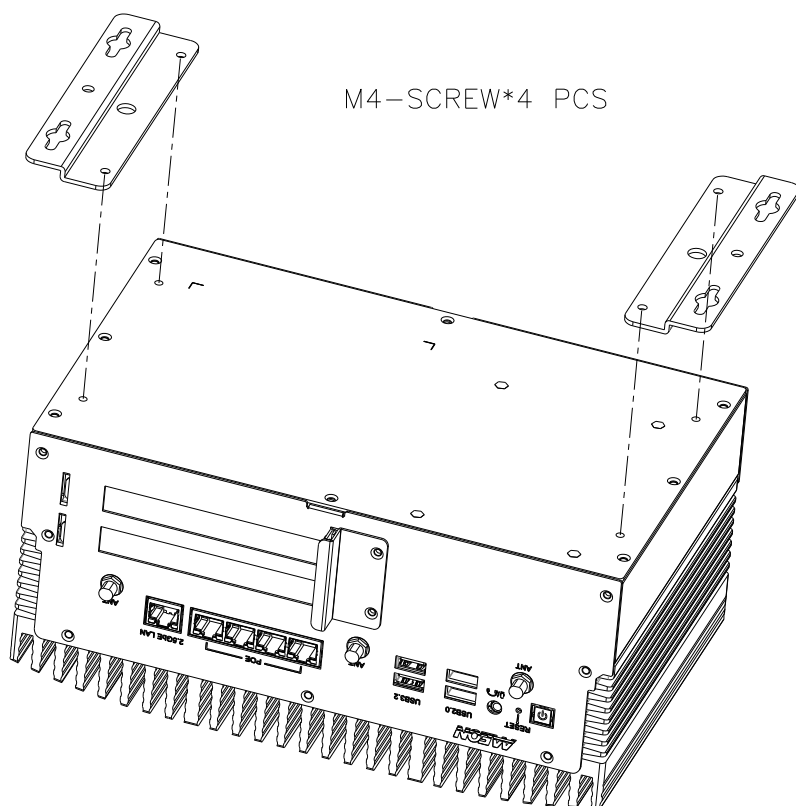
Before installing expansion cards, ensure the system is powered down and disconnect the power cord from the system. Make sure you have the expansion card ready to install. See Chapter 1 for expansion card requirements and specifications.

1. With the bottom panel removed, locate the M.2 slots and DRAM socket on the mainboard.
2. Insert the DRAM module into the DRAM slot at a 30° angle, then press down until it clicks into place.
3. Insert the M.2 module into the M.2 slot at a 30° angle.
4. Secure the M.2 module by pressing it down and fastening it with the screw provided.
5. Reinstall the inner cover plate using the 5 × M3 screws.



2.8 Wall Mount Assembly

1. Line up the wall mount brackets in the mounting kit with the holes as shown. The middle hole should line up with the bottom panel screw such that you can easily remove the screw from the bottom panel without having to remove the bracket



2. Use the four screws included with the wallmount kit to secure the wall mount brackets.

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The system uses certain routines to perform testing and initialization during the boot up sequence. If an error, fatal or non-fatal, is encountered, the system will output a few short beeps or an error message. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be output, and the BIOS setup program will need to be run to set the configuration information in memory.

There are three situations in which the CMOS settings will need to be set or changed:

- Starting the system for the first time
- The system hardware has been changed
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention. The battery must be replaced when it runs down.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

System I/O – Enable/ Disable system I/O device

Security – The setup administrator password can be set here

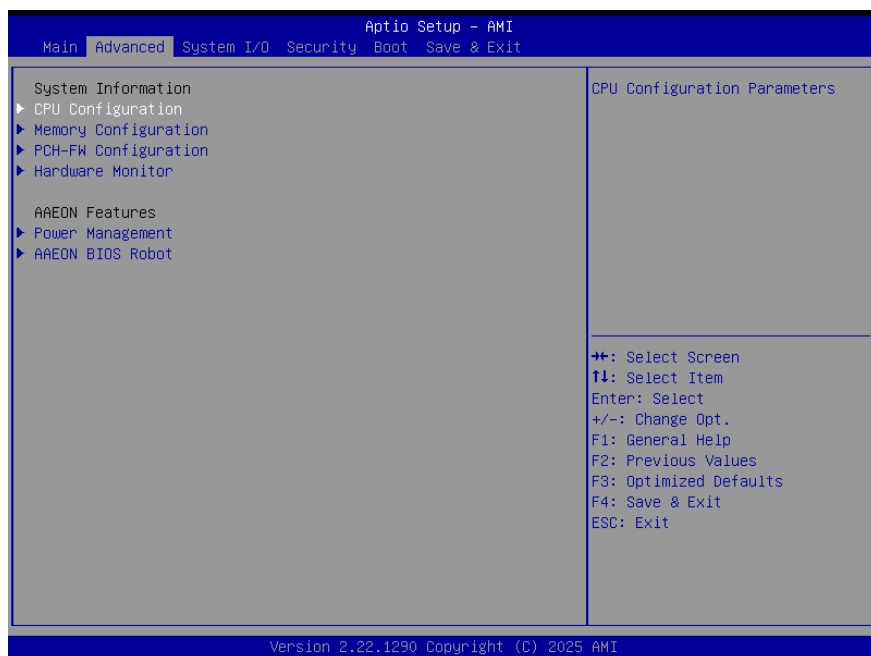
Boot – Enable/ Disable quiet Boot Option

Save & Exit – Save your changes and exit the program

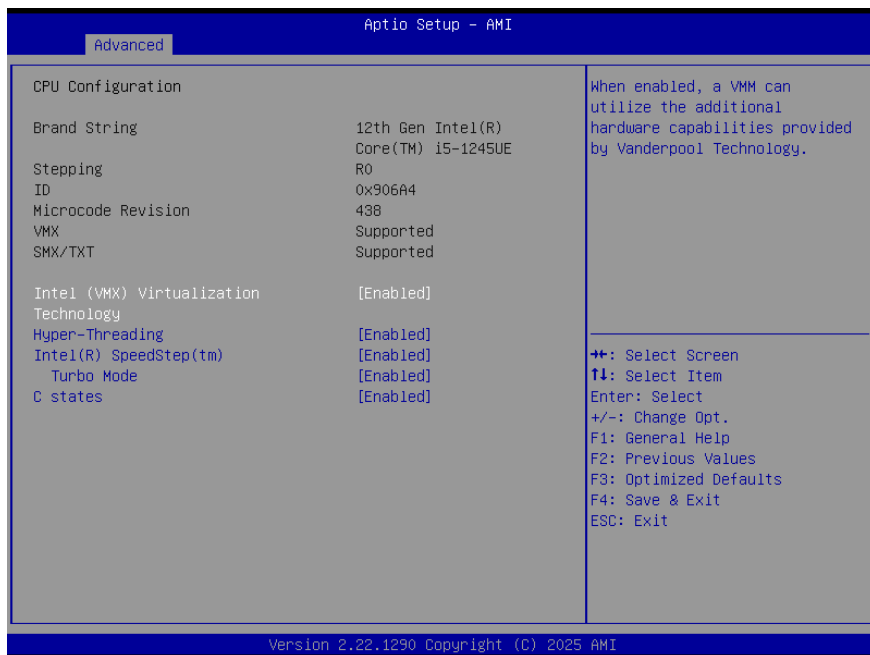
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



3.4.1 CPU Configuration

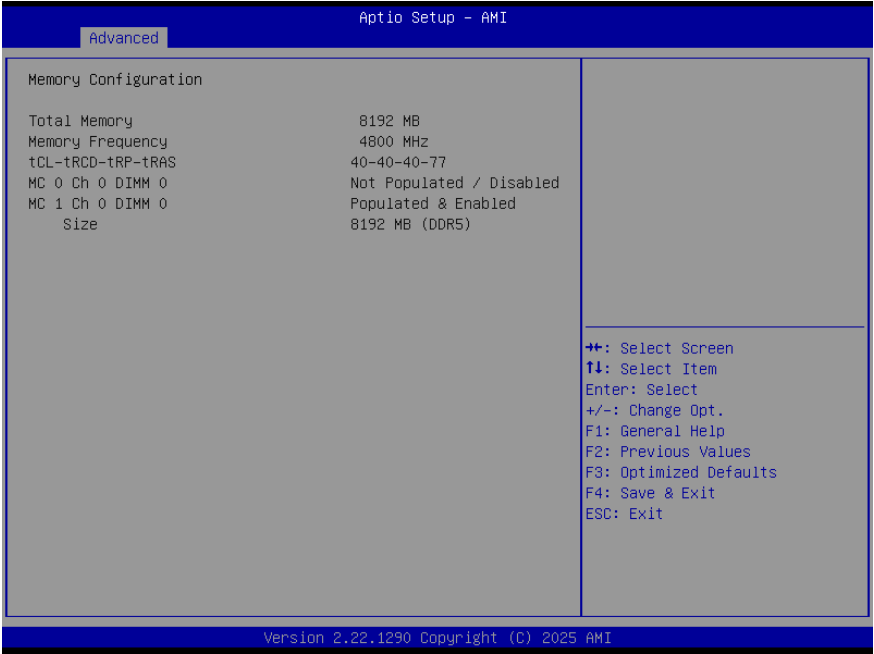


Options Summary		
Intel (VMX)Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Hyper-Threading	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Hyper-Threading Technology		
Intel® SpeedStep™	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.		
C states	Disabled	
	Enabled	Optimal Default, Failsafe Default

Options Summary

Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

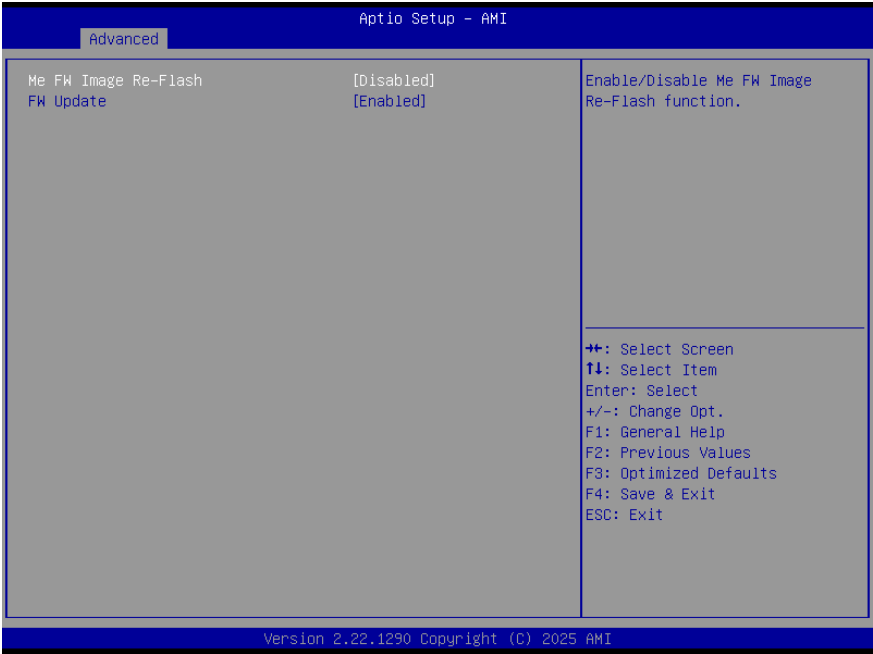
3.4.2 Memory Configuration



3.4.3 PCH-FW Configuration

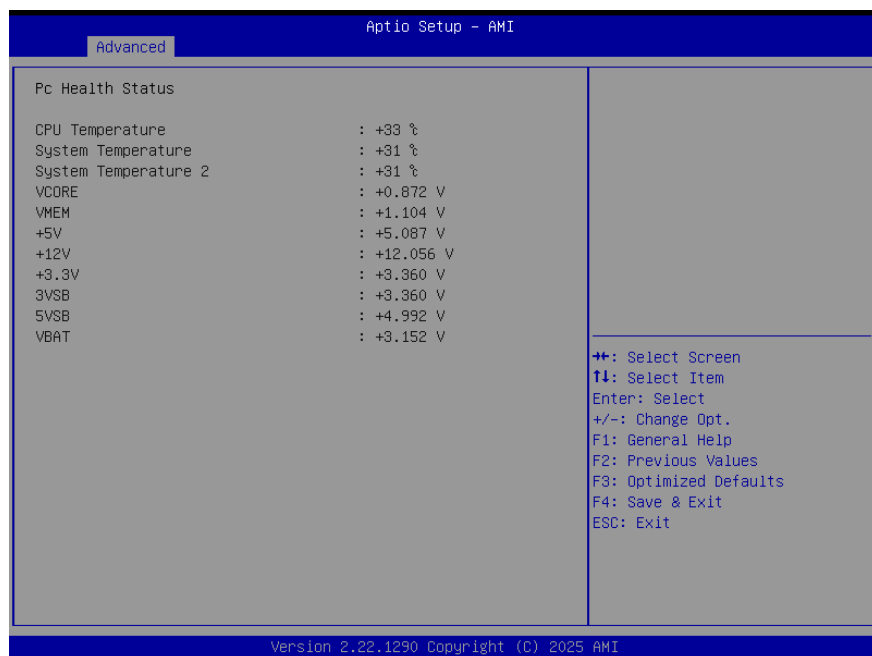


3.4.3.1 Firmware Update Configuration

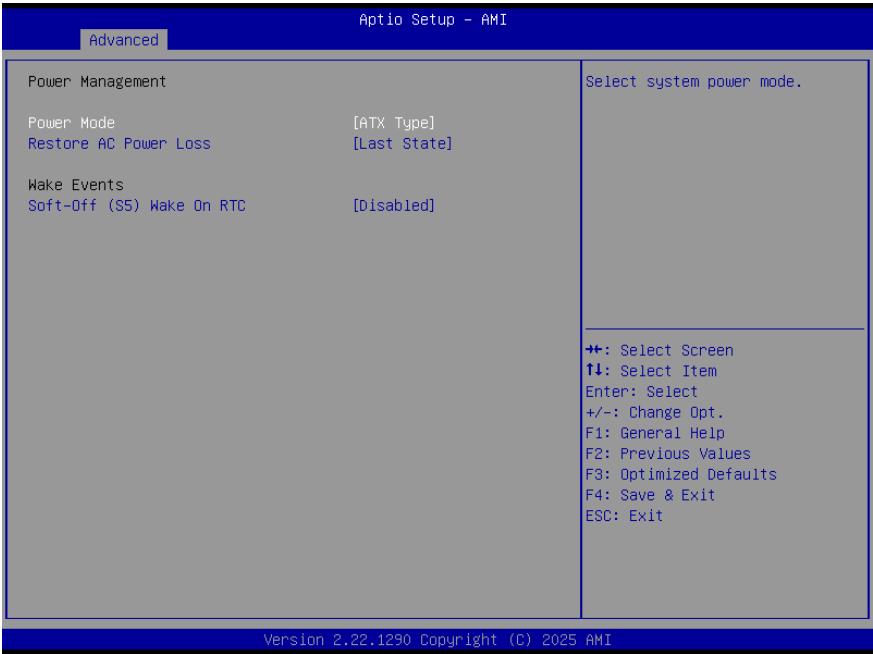


Options Summary		
Me FW Image Re-Flash	Enabled	
	Disabled	Optimal Default, Failsafe Default
Enable/Disable Me FW Image Re-Flash function.		
FW Update	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable Me FW Update function.		

3.4.4 Hardware Monitor



3.4.5 Power Management



Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode		
Restore AC Power Loss	Last State	Optimal Default, Failsafe Default
	Always On	
	Always Off	
SIO Restore AC Power Loss Specifies how the system responds when AC power is lost and then restored. Note: A CMOS battery must be installed for this feature to operate.		
System Wake On RTC	Disabled	Optimal Default, Failsafe Default
	By Date	
	By Weekday	
	Bypass	

Options Summary

RTC Wake-Up Function

By Date: The system powers on at the specified date and time (hh:mm:ss).

By Weekday: The system powers on at the specified weekday and time (hh:mm:ss).

Bypass: Disables BIOS control of the RTC wake function.

3.4.6 AAEON BIOS Robot

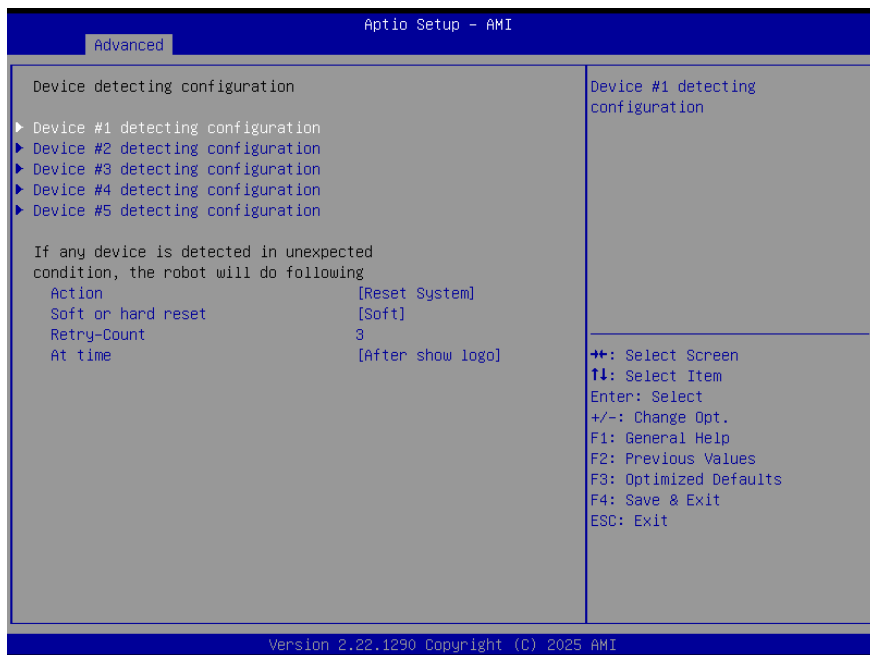


Options Summary

Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled - When enabled, the Robot sets the Watchdog Timer (WDT) immediately after power-on, before the BIOS begins the POST process. The WDT is cleared upon successful completion of POST. If the WDT is not cleared before its countdown reaches zero, the system will automatically reset.		
Sends watch dog before booting OS	Disabled	Optimal Default, Failsafe Default
	Enabled	

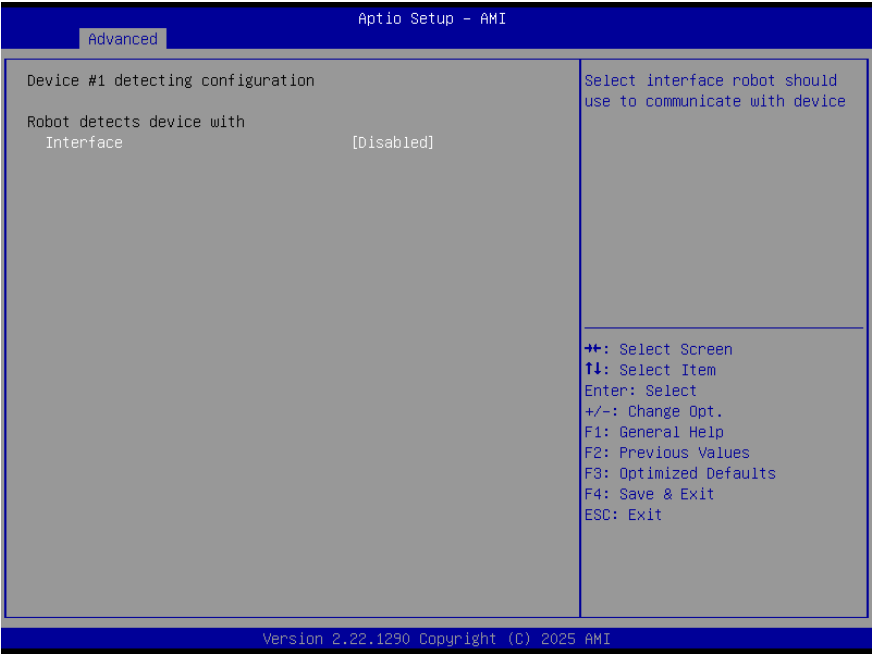
Options Summary		
Enabled - When enabled, the Robot sets the Watchdog Timer (WDT) after POST is completed, but before the BIOS hands control over to the operating system. Warning: An application within the operating system must be responsible for clearing the WDT; otherwise, the system will reset when the timer expires. This function should remain disabled if the operating system is undergoing an update.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled - When enabled, the Robot delays the start of BIOS POST immediately after power-on. This allows the system to begin POST only after power has stabilized or the hardware has warmed up. Note: This action occurs before the Robot sends the Watchdog signal.		
Delayed POST (DXE phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled - When enabled, the Robot pauses BIOS operation before POST completes. This ensures POST continues only after power has stabilized or the system has warmed up. Note: This action occurs after the Robot sends the Watchdog signal prior to BIOS POST.		
Reset system once	Disabled	Optimal Default, Failsafe Default
	Enabled	
When enabled, the Robot performs a one-time system reset during each boot. This reset, either soft or hard, is applied to onboard devices to help ensure a more stable operating state.		

3.4.6.1 Device Detecting Configuration



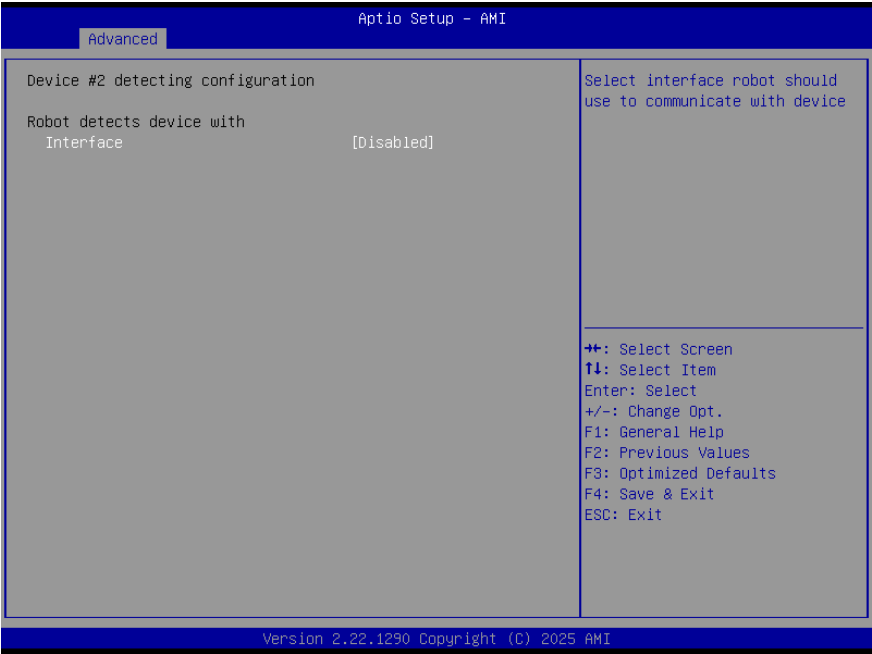
Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	3	Optimal Default, Failsafe Default
Fill Retry Counter - Specifies the maximum number of times the Robot will reset the system. Once the defined count is reached, the system will proceed with POST.		
At time	After show logo	Optimal Default, Failsafe Default
	Before show logo	
Select robot action time: After Show Logo: The Robot performs its action after the logo is displayed, when system devices are mostly initialized.		
Before Show Logo: The Robot performs its action before the logo appears; some system devices may not yet be ready.		

3.4.6.2 Device #1 Detecting Configuration



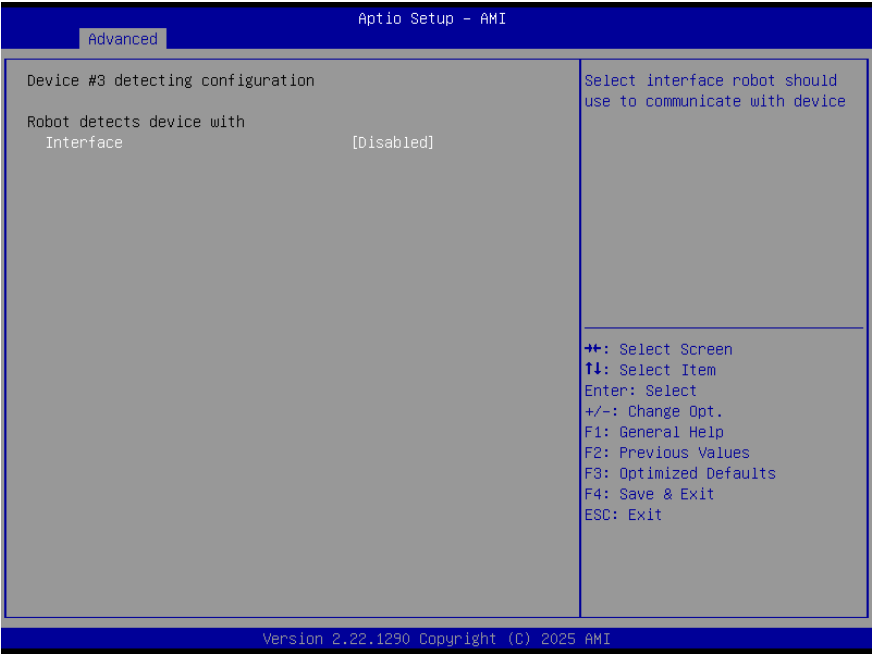
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.3 Device #2 Detecting Configuration



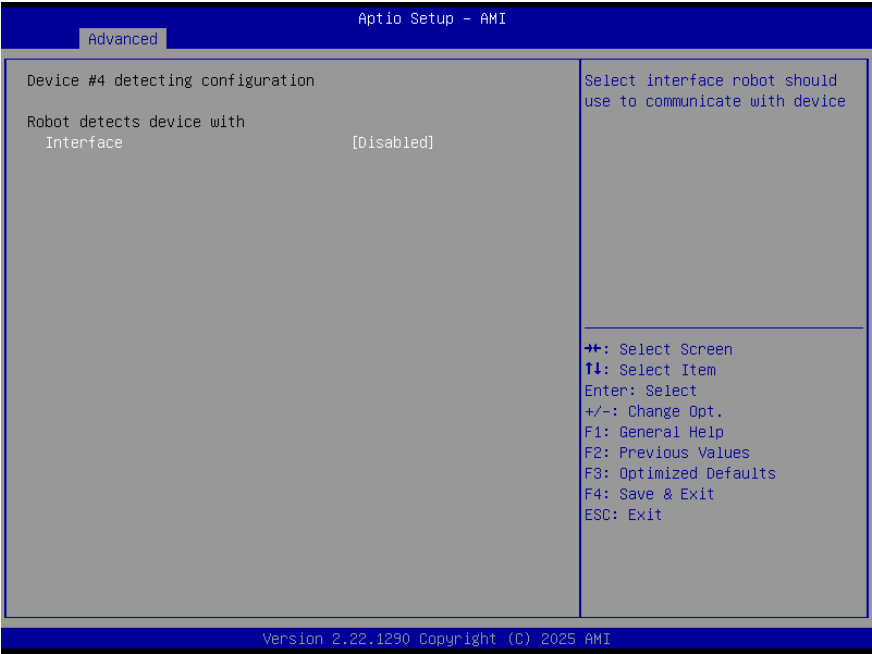
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.4 Device #3 Detecting Configuration



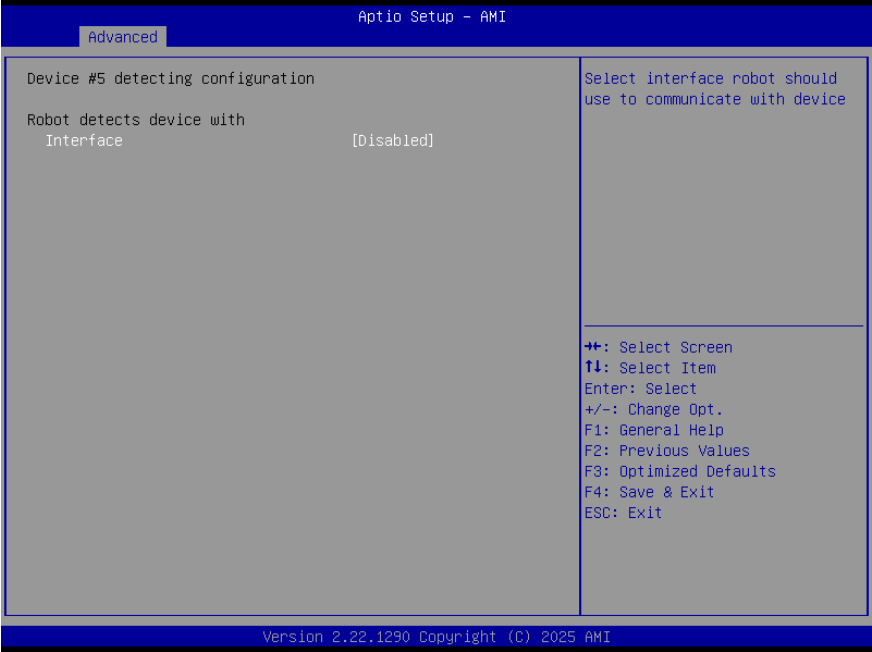
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.5 Device #4 Detecting Configuration



Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.6 Device #5 Detecting Configuration

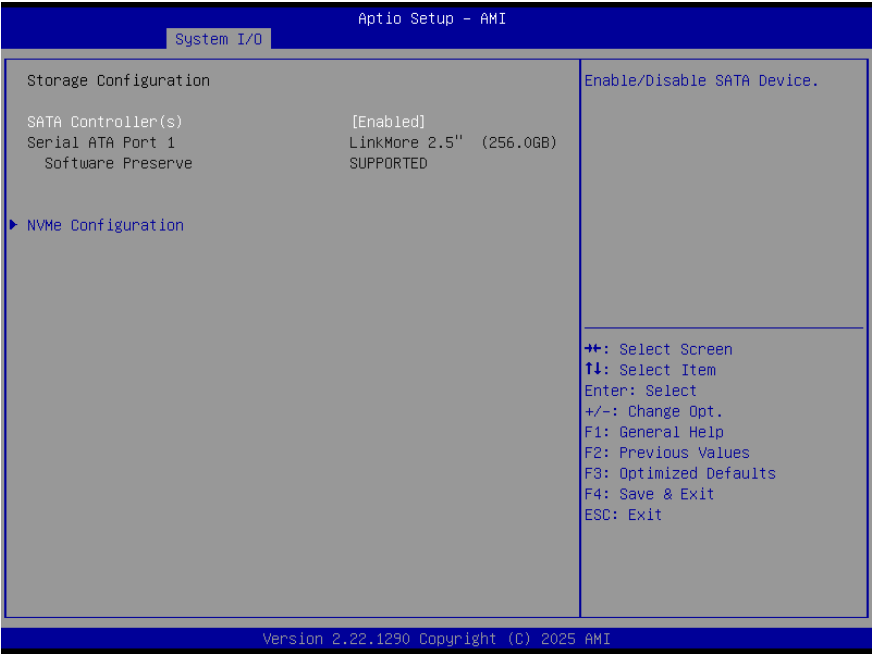


Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.5 Setup Submenu: System I/O



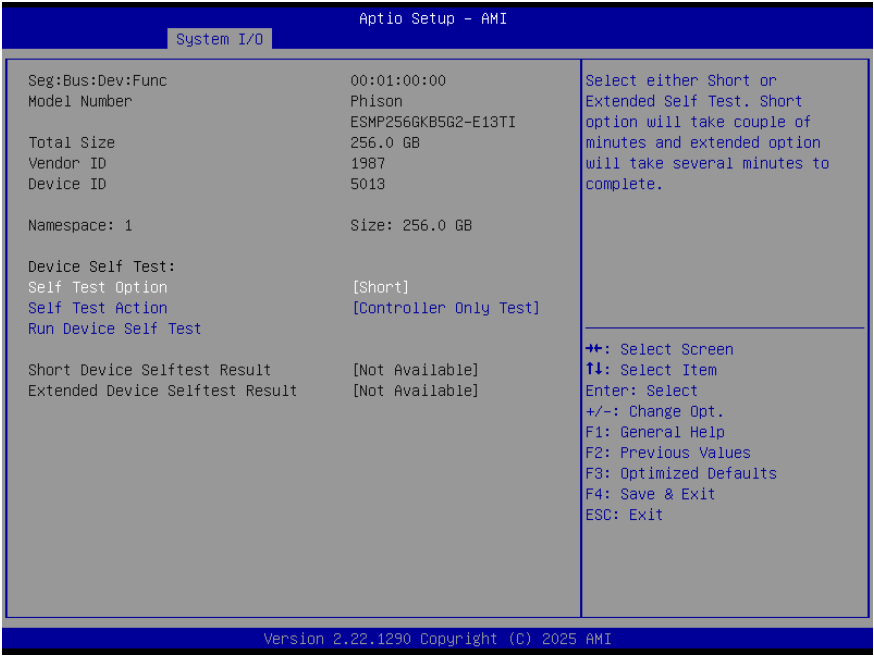
3.5.1 Storage Configuration



Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable to SATA Device.		

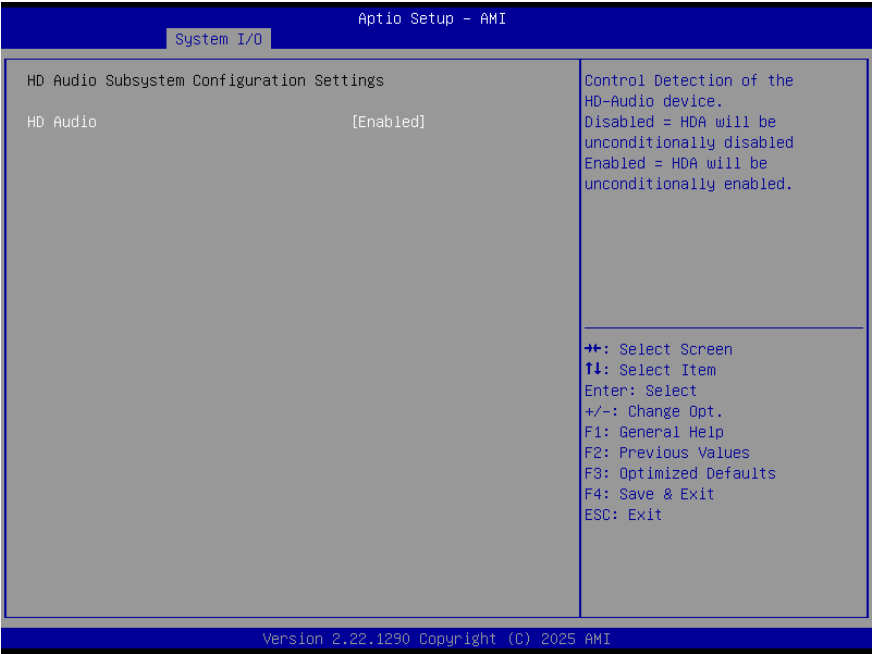
3.5.1.1 NVMe Configuration





Options Summary		
Self Test Option	Short	Optimal Default, Failsafe Default
	Extended	
The Short option takes a few minutes, while the Extended option takes several minutes to complete.		
Self Test Action	Controller Only Test	Optimal Default, Failsafe Default
	Controller and NameSpace Test	
Choose to test the Controller alone or both the Controller and NameSpace; the latter option extends test duration significantly.		
Run Device Self Test		
Perform a device self-test based on the user's selection; press 'Esc' to abort. The result displayed is the most recent logged in the device.		

3.5.2 HD Audio Configuration



Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled.		

3.5.3 Digital IO Port Configuration



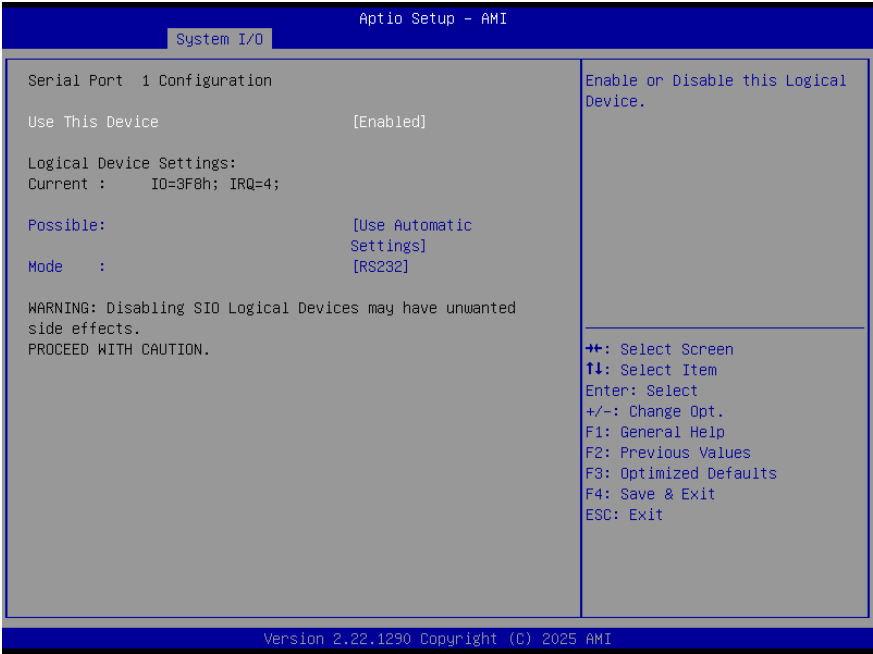
Options Summary		
DIO1	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output.		
DIO2	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output.		
DIO3	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low	

Options Summary		
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output.		
DIO4	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output.		
DIO5	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output.		
DIO6	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output.		
DIO7	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output.		
DIO8	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output.		

3.5.4 Legacy Logical Devices Configuration

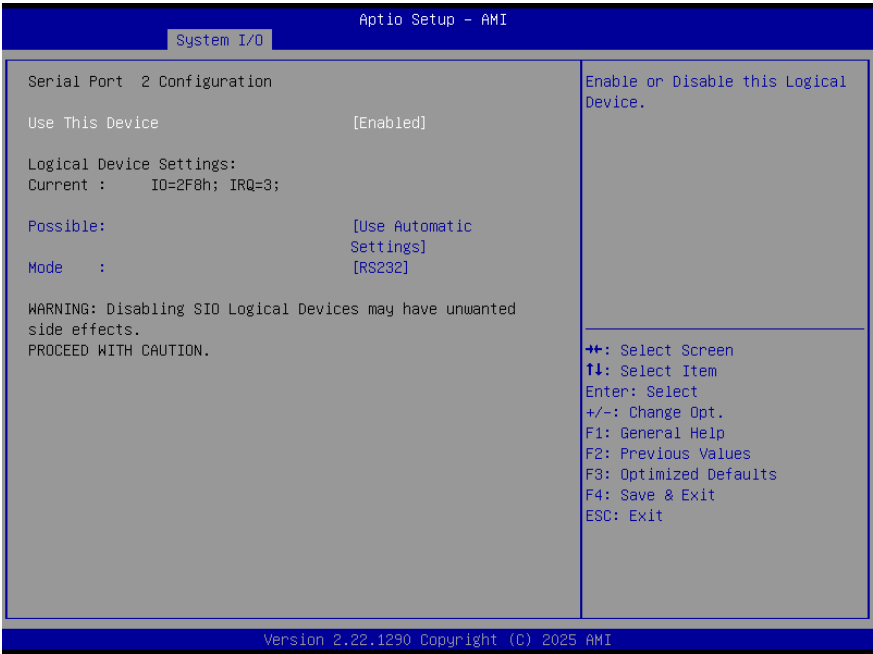


3.5.4.1 Serial Port 1



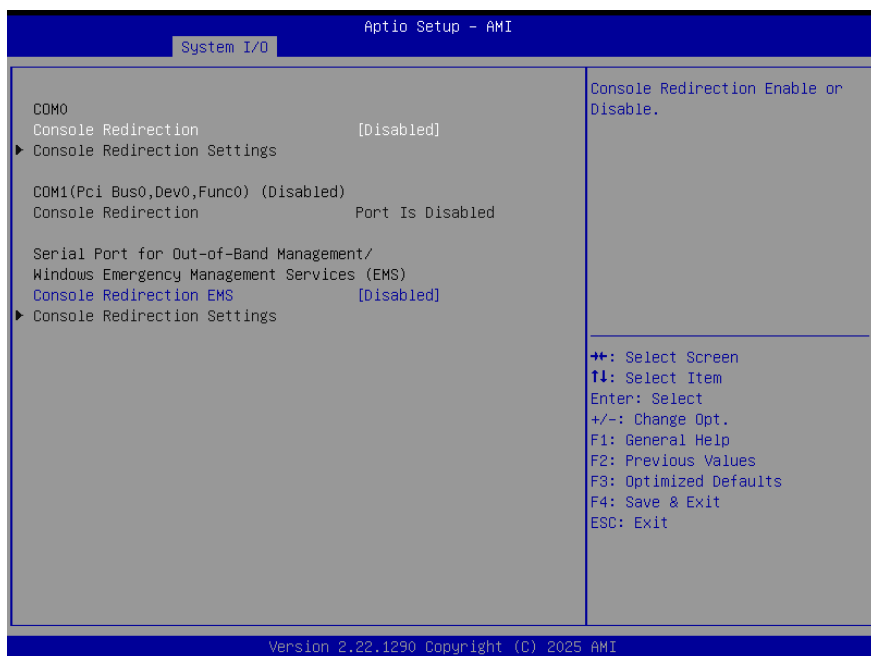
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection.		

3.5.4.2 Serial Port 2



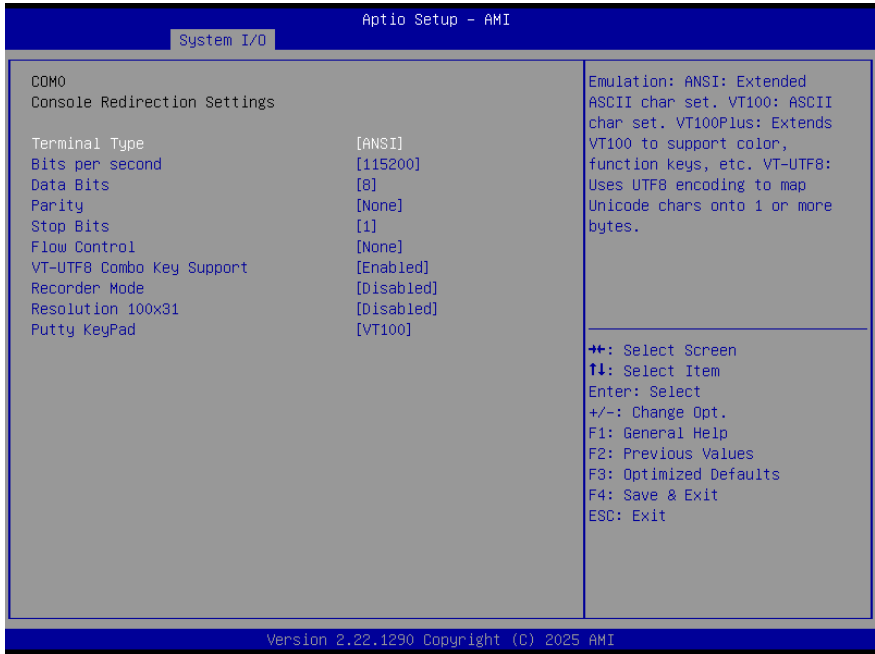
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection.		

3.5.5 Serial Port Console Redirection



Options Summary		
Console Redirection	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Console Redirection.		
Console Redirection EMS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Console Redirection.		

3.5.5.1 Console Redirection Settings (COM0)

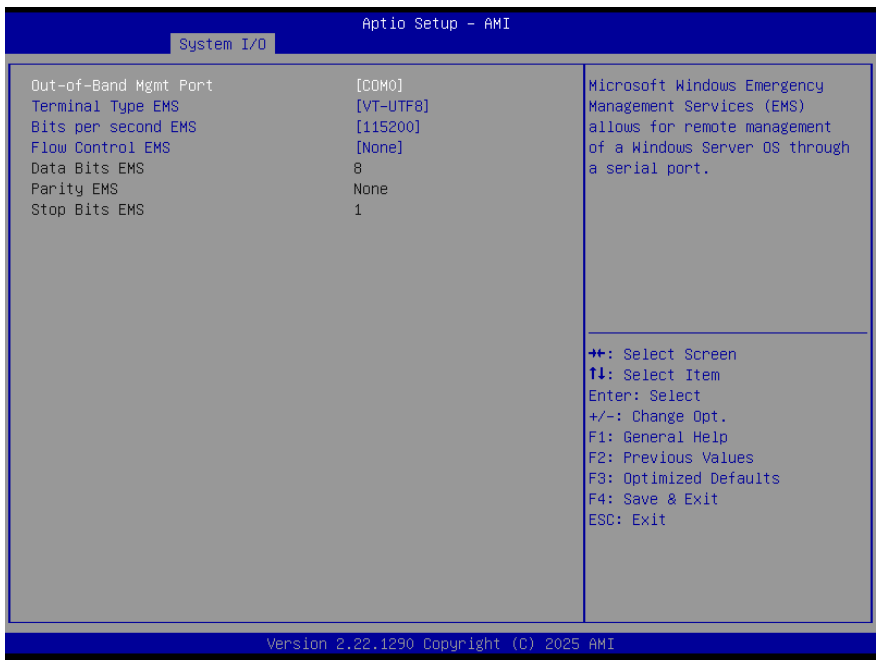


Options Summary		
Terminal Type	VT100	
	VT100Plus	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation Options		
ANSI: Supports the extended ASCII character set.		
VT100: Supports the standard ASCII character set.		
VT100Plus: Extends VT100 to support color, function keys, and additional features.		
VT-UTF8: Uses UTF-8 encoding to map Unicode characters onto one or more bytes.		
Bits per second	9600	
	19200	
	38400	
	57600	
	115200	Optimal Default, Failsafe Default

Options Summary		
Specifies the transmission speed of the serial port. The selected speed must match the device on the other end. For long or electrically noisy lines, lower speeds may be required to ensure reliable communication.		
Data Bits	7	
	8	Optimal Default, Failsafe Default
Data Bits.		
Parity	None	Optimal Default, Failsafe Default
	Even	
	Odd	
	Mark	
	Space	
Serial Port Parity		
A parity bit may be added to the data bits to help detect transmission errors:		
Even: Parity bit is 0 if the number of 1s in the data bits is even.		
Odd: Parity bit is 0 if the number of 1s in the data bits is odd.		
Mark: Parity bit is always 1.		
Space: Parity bit is always 0.		
Note: Mark and Space parity do not provide error detection; they can be used as an additional data bit.		
Stop Bits	1	Optimal Default, Failsafe Default
	2	
Stop bits mark the end of a serial data packet, while a start bit marks the beginning. The standard configuration is 1 stop bit. Devices with slower communication may require more than 1 stop bit.		
Flow Control	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
Flow control helps prevent data loss due to buffer overflow. When sending data, the receiving device can send a stop signal if its buffers are full and a start signal once buffers are available to resume data transmission.		
Hardware Flow Control: Uses dedicated wires to transmit start and stop signals.		
VT-UTF8 Combo Key Support	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enables VT-UTF8 combination key functionality for ANSI and VT100 terminal emulations.		
Recorder Mode	Disabled	Optimal Default, Failsafe Default
	Enabled	
When enabled, only text data is transmitted. This mode is intended for capturing terminal output.		

Options Summary		
Resolution 100x31	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enables or disables extended terminal resolution.		
Putty KeyPad	VT100	Optimal Default, Failsafe Default
	LINUX	
	XTERMR6	
	SCO	
	ESCN	
	VT400	
Select FunctionKey and KeyPad on Putty.		

3.5.5.2 Console Redirection Settings (OOB)



Options Summary		
Out-of-Band Mgmt Port	COM0	Optimal Default, Failsafe Default
	COM1(Pci Bus0, Dev0, Func0) (Disabled)	

Options Summary

Microsoft Windows Emergency Management Services (EMS)

EMS enables remote management of a Windows Server operating system via a serial port.

Terminal Type EMS	VT100	
	VT100Plus	
	VT-UTF8	Optimal Default, Failsafe Default
	ANSI	

For out-of-band management, VT-UTF8 is the recommended terminal type. VT100+ is the next preferred option, followed by VT100. For additional guidance, refer to the [Console Redirection Settings](#) page for help with terminal type and emulation.

Bits per second EMS	9600	
	19200	
	57600	
	115200	Optimal Default, Failsafe Default

Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

Flow Control EMS	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
	Software Xon/Xoff	

Flow control prevents data loss due to buffer overflow. When sending data, the receiving device can send a stop signal if its buffers are full and a start signal once buffers have space, resuming data transmission.

Hardware Flow Control: Uses dedicated wires to transmit start and stop signals.

3.6 Setup Submenu: Security



Change User/Administrator Password

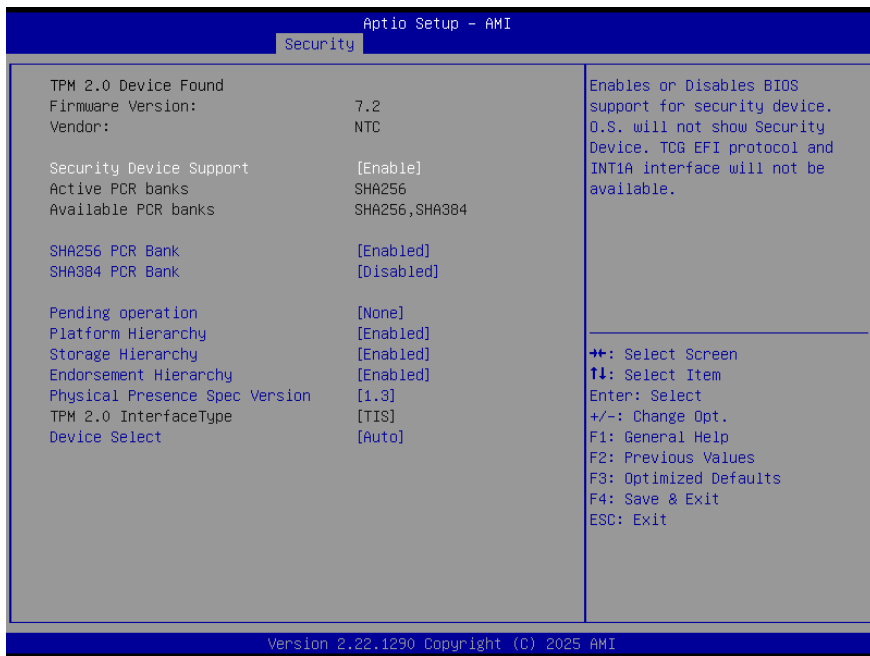
You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

Removing the Password

Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Trusted Computing



Options Summary		
Security Device Support	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA256 PCR Bank	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SHA256 PCR Bank.		
SHA384 PCR Bank	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable SHA384 PCR Bank.		
Pending operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default

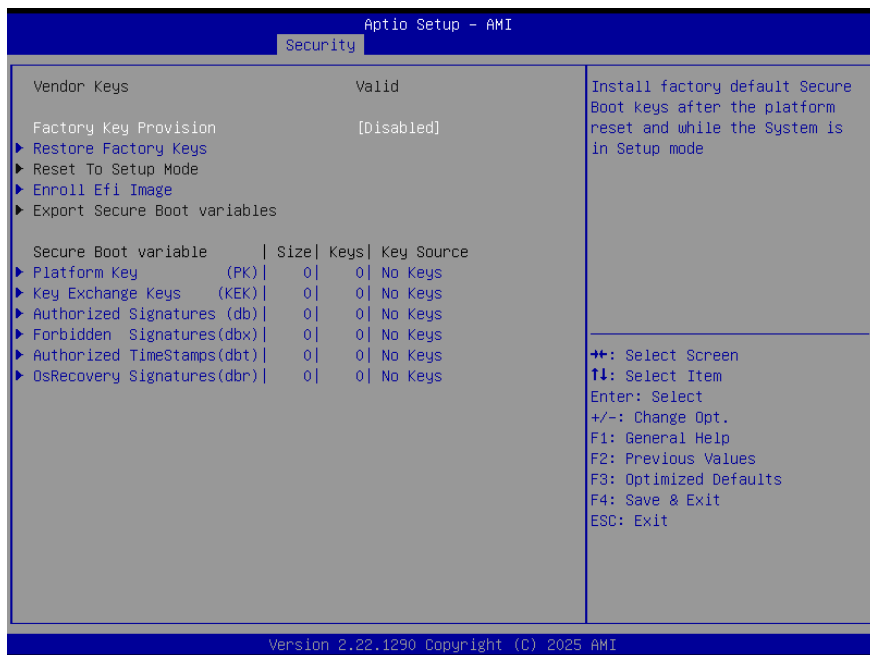
Options Summary		
Enable or Disable Platform Hierarchy.		
Storage Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Storage Hierarchy.		
Endorsement Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Endorsement Hierarchy.		
Physical Presence Spec Version	1.2	
	1.3	Optimal Default, Failsafe Default
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.		
Device Select	TPM 1.2	
	TPM 2.0	
	Auto	Optimal Default, Failsafe Default
TPM Support Mode TPM 1.2: Supports only TPM 1.2 devices. TPM 2.0: Supports only TPM 2.0 devices. Auto: Supports both TPM 2.0 and TPM 1.2 devices. If a TPM 2.0 device is not found, the system will enumerate TPM 1.2 devices by default.		

3.6.2 Secure Boot



Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset		
Secure Boot Mode	Standard	
	Custom	Optimal Default, Failsafe Default
Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication		
Restore Factory Keys	Yes	
	No	
Force System to User Mode. Install factory default Secure Boot key databases		

3.6.2.1 Key Management



Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
Install Factory Default Secure Boot Keys		
Installs the factory default Secure Boot keys after a platform reset while the system is in Setup mode.		
Restore Factory Keys	Yes	
	No	
Force System to User Mode		
Switches the system to User Mode and installs the factory default Secure Boot key databases.		
Enroll Efi Image		
Allow EFI Image Execution in Secure Boot Mode		
Permits an EFI image to run under Secure Boot. Adds the SHA256 hash of a PE image to the Authorized Signature Database (db).		

Options Summary		
Platform Key (PK)	Update	
Key Exchange Keys (KEK)	Update	
	Append	
Authorized Signatures (db)	Update	
	Append	
Forbidden Signatures (dbx)	Update	
	Append	
Authorized TimeStamps (dbt)	Update	
	Append	
OsRecovery Signatures (dbr)	Update	
	Append	

Enroll Certificates

Enroll factory default certificates or load certificates from an external file. Supported certificate types include:

1. Public Key Certificate

○ EFI_SIGNATURE_LIST

○ EFI_CERT_X509 (DER)

○ EFI_CERT_RSA2048 (BIN)

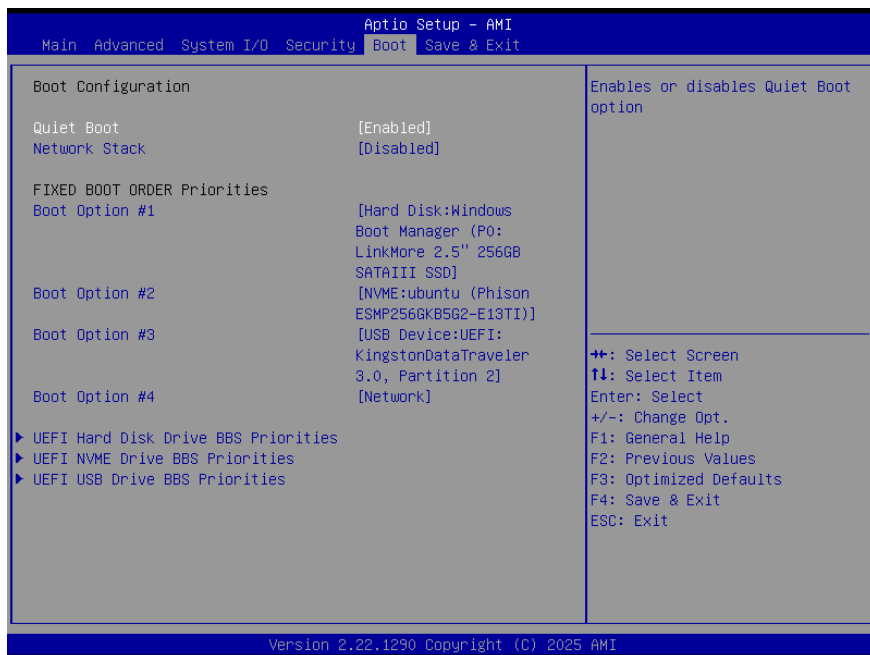
○ EFI_CERT_SHAxxx

2. Authenticated UEFI Variable

3. EFI PE/COFF Image (SHA256)

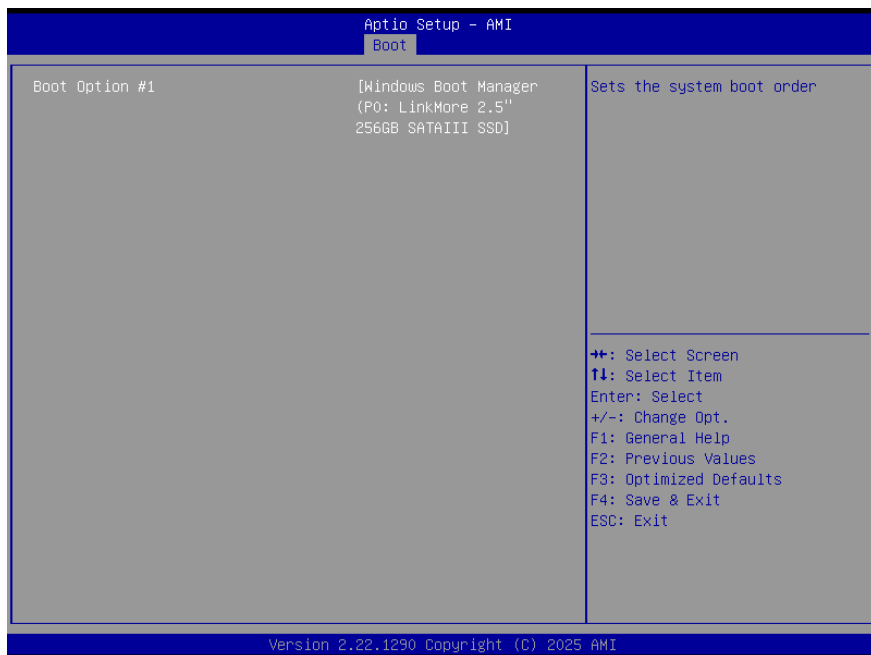
Key Source Options: Factory, External, or Mixed.

3.7 Setup Submenu: Boot



Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable UEFI Network Stack.		
Boot Option #1	Hard Disk	
Boot Option #2	NVME	
Boot Option #3	USB Device	
Boot Option #4	Network	
Sets the system boot order		

3.7.1 UEFI Hard Disk Drive BBS Priorities



3.7.2 UEFI NVME Drive BBS Priorities



3.7.3 UEFI USB Drive BBS Priorities



3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

Drivers for the BOXER-6801-RAP can be downloaded from the product page on the AAEON website by following this link: <https://www.aaeon.com/en>

Download the driver(s) you need and follow the steps below to install them.

Install Chipset Drivers

1. Open the **Chipset** folder
2. Run the **SetupChipset.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install Graphics Drivers

1. Open the **Graphics** folder
2. Run the **Installer.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install ME Drivers

1. Open the **ME** folder
2. Run the **SetupME.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install LAN Drivers

1. Open the **LAN** folder
2. Locate the appropriate installer for your adapter in the folder (for example, from **PRO1000**, **PRO2500**, **PROXGB**, or other model-specific folders).
3. Run the executable file (e.g., **DxSetup.exe** or **SetupBD.exe**) corresponding to your adapter and OS.
4. Drivers will be installed automatically

Install Audio Drivers

Install Intel® Smart Sound Technology (Intel® SST) Audio Driver

1. Open the **Audio** folder
2. Locate the installer or setup file in the folder (e.g., Setup.exe or equivalent package).
3. Run the executable file.
4. Drivers such as **IntcAudioBus**, **IntcSDW**, **IntcSST**, **IntcOED**, and others will be installed automatically.

Install RealTek Audio Driver

1. Open the **Audio** folder
2. Run the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install Serial Port Drivers (Optional)

1. Open the **Serial Port Driver (Optional)** folder
2. Run the **FintekSerial.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

I/O Information

A.1 I/O Address Map

▼	Input/output (IO)	
	[0000000000000000 - 000000000000CF7]	PCI Express Root Complex
	[0000000000000020 - 000000000000021]	Programmable interrupt controller
	[0000000000000024 - 000000000000025]	Programmable interrupt controller
	[0000000000000028 - 000000000000029]	Programmable interrupt controller
	[000000000000002C - 00000000000002D]	Programmable interrupt controller
	[000000000000002E - 00000000000002F]	Motherboard resources
	[0000000000000030 - 000000000000031]	Programmable interrupt controller
	[0000000000000034 - 000000000000035]	Programmable interrupt controller
	[0000000000000038 - 000000000000039]	Programmable interrupt controller
	[000000000000003C - 00000000000003D]	Programmable interrupt controller
	[0000000000000040 - 000000000000043]	System timer
	[000000000000004E - 00000000000004F]	Motherboard resources
	[0000000000000050 - 000000000000053]	System timer
	[0000000000000061 - 000000000000061]	Motherboard resources
	[0000000000000063 - 000000000000063]	Motherboard resources
	[0000000000000065 - 000000000000065]	Motherboard resources
	[0000000000000067 - 000000000000067]	Motherboard resources
	[0000000000000070 - 000000000000070]	Motherboard resources
	[0000000000000080 - 000000000000080]	Motherboard resources
	[0000000000000092 - 000000000000092]	Motherboard resources
	[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
	[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
	[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
	[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
	[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
	[00000000000000B2 - 00000000000000B3]	Motherboard resources
	[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
	[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller
	[00000000000000BC - 00000000000000BD]	Programmable interrupt controller
	[00000000000002F8 - 00000000000002FF]	Communications Port (COM2)
	[00000000000003F8 - 00000000000003FF]	Communications Port (COM1)
	[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
	[0000000000000680 - 000000000000069F]	Motherboard resources
	[0000000000000A00 - 0000000000000A0F]	Motherboard resources
	[0000000000000A10 - 0000000000000A1F]	Motherboard resources
	[0000000000000A20 - 0000000000000A2F]	Motherboard resources
	[0000000000000D00 - 000000000000FFFF]	PCI Express Root Complex
	[000000000000164E - 000000000000164F]	Motherboard resources
	[0000000000001854 - 0000000000001857]	Motherboard resources
	[0000000000002000 - 00000000000020FE]	Motherboard resources
	[0000000000003000 - 0000000000003FFF]	Intel(R) PCI Express Root Port #9 - 51B0
	[0000000000004000 - 000000000000403F]	Intel(R) UHD Graphics
	[0000000000004060 - 000000000000407F]	Standard SATA AHCI Controller
	[0000000000004080 - 0000000000004083]	Standard SATA AHCI Controller
	[0000000000004090 - 0000000000004097]	Standard SATA AHCI Controller
	[000000000000EFA0 - 000000000000EFBF]	Intel(R) SMBus - 51A3

A.2 IRQ Mapping Chart

▼		Interrupt request (IRQ)	
		(ISA) 0x00000000 (00)	System timer
		(ISA) 0x00000003 (03)	Communications Port (COM2)
		(ISA) 0x00000004 (04)	Communications Port (COM1)

A.3 Memory Address Map

▼	Large Memory
▼	Memory
	[0000004000000000 - 0000007FFFFFFF] PCI Express Root Complex
	[0000000000A0000 - 0000000000BFFFF] PCI Express Root Complex
	[0000000080400000 - 0000000080DFFFF] Intel(R) PCI Express Root Port #9 - 51B0
	[0000000080400000 - 00000000BFFFFFF] PCI Express Root Complex
	[0000000080E00000 - 0000000080FFFFFF] PCI-to-PCI Bridge
	[0000000080E00000 - 00000000811FFFF] Intel(R) PCI Express Root Port #12 - 51B3
	[0000000080E00000 - 00000000811FFFF] PCI-to-PCI Bridge
	[0000000080EFC000 - 0000000080EFFFF] Intel(R) Ethernet Controller I226-LM #4
	[0000000080F00000 - 0000000080FFFFFF] Intel(R) Ethernet Controller I226-LM #4
	[0000000081000000 - 00000000811FFFF] PCI-to-PCI Bridge
	[00000000810FC000 - 00000000810FFFF] Intel(R) Ethernet Controller I226-LM #5
	[0000000081100000 - 00000000811FFFF] Intel(R) Ethernet Controller I226-LM #5
	[0000000081200000 - 00000000813FFFF] Intel(R) PCI Express Root Port #8 - 51BF
	[00000000812FC000 - 00000000812FFFF] Intel(R) Ethernet Controller I226-LM #2
	[0000000081300000 - 00000000813FFFF] Intel(R) Ethernet Controller I226-LM #2
	[0000000081400000 - 00000000814FFFF] Intel(R) Ethernet Controller I226-LM #3
	[0000000081400000 - 00000000815FFFF] Intel(R) PCI Express Root Port #7 - 51BE
	[0000000081500000 - 0000000081503FFF] Intel(R) Ethernet Controller I226-LM #3
	[0000000081600000 - 00000000816FFFF] Intel(R) Ethernet Controller I226-LM
	[0000000081600000 - 00000000817FFFF] Intel(R) PCI Express Root Port #6 - 51BD
	[0000000081700000 - 0000000081703FFF] Intel(R) Ethernet Controller I226-LM
	[0000000081800000 - 0000000081801FFF] Standard SATA AHCI Controller
	[0000000081802000 - 00000000818027FF] Standard SATA AHCI Controller
	[0000000081803000 - 00000000818030FF] Standard SATA AHCI Controller
	[00000000C0000000 - 00000000CFFFFFF] Motherboard resources
	[00000000FE010000 - 00000000FE010FFF] Intel(R) SPI (flash) Controller - 51A4
	[00000000FED00000 - 00000000FED003FF] High precision event timer
	[00000000FED20000 - 00000000FED7FFFF] Motherboard resources
	[00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 2.0
	[00000000FED45000 - 00000000FED8FFFF] Motherboard resources
	[00000000FED90000 - 00000000FED93FFF] Motherboard resources
	[00000000FEDA0000 - 00000000FEDA0FFF] Motherboard resources
	[00000000FEDA1000 - 00000000FEDA1FFF] Motherboard resources
	[00000000FEDC0000 - 00000000FEDC7FFF] Motherboard resources
	[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
	[0000004000000000 - 000000400FFFFFF] Intel(R) UHD Graphics
	[0000006000000000 - 00000060009FFFF] Intel(R) PCI Express Root Port #9 - 51B0
	[0000006001000000 - 0000006001FFFFF] Intel(R) UHD Graphics
	[0000006002100000 - 000000600210FFFF] Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
	[0000006002118000 - 00000060021180FF] Intel(R) SMBus - 51A3
	[0000007FFFEFB000 - 0000007FFFEFBFFF] Intel(R) Management Engine Interface #1
	[0000007FFFEFC000 - 0000007FFFEFFFFF] High Definition Audio Controller
	[0000007FFFF00000 - 0000007FFFFFFFFF] High Definition Audio Controller

Appendix B

Glue Removal Procedure

B.1 Removing Glue from Your System

To protect components from damage and ensure proper operation out of the box, glue may have been applied to some cables or connectors to keep them in place during shipping. This glue must be removed before attempting to swap components or perform maintenance. This section details the steps needed to remove the glue.

Before performing any kind of system maintenance, ensure the system is shut down (not in sleep or hibernate mode) and the power cable has been removed. Follow steps in Chapter 2 to access the components inside.

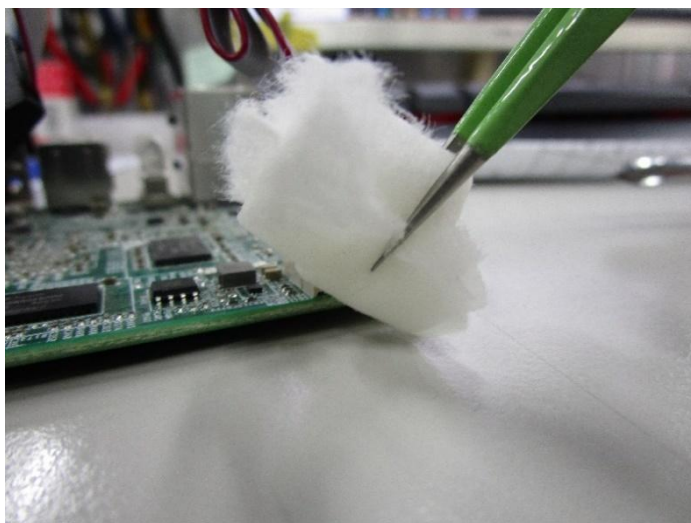
You will need the following items for this step:

- Cotton or cotton swab
- Anti-static tweezers
- An alcohol solution that is at least 99.5% alcohol (ethanol solution or denatured alcohol). AAEON recommends using an eye dropper or a bottle with a nozzle as in the picture below:

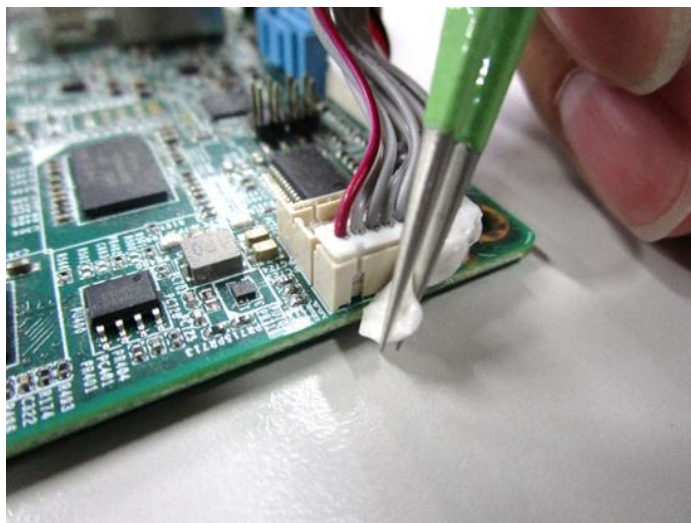


Step 1: Using an eyedropper or bottle as shown above, apply a few drops of alcohol to the glue.

Step 2: Allow the alcohol to soak for 10 seconds, then use a cotton swab or cotton with anti-static tweezers to evenly rub the alcohol over the glue.



Step 3: Let soak for 10 more seconds, then use anti-static tweezers to remove the glue.



If you encounter any issues or need support, please contact your AAEON representative or visit our [Support Page](#) at AAEON.com