BOXER-6619-TWL

Compact Fanless Embedded Box PC

User's Manual 1st Ed

Last Updated: January 15, 2026

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
● BOXER-6619-TWL	1
● Wall Mount Kit	1
● Screw Package	1
● 4 Pin DC Terminal Block	1
● Remote Power On/Off 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

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.

Table of Contents

Chapter 1

Product Specifications

1.1 Specifications

System	
CPU	Intel® Core™ Processor N-series & Intel® Processor N-series (formerly Twin Lake): Intel® Core™ 3 Processor N355 Intel® Processor N150
Chipset	Intel® SoC
System Memory	DDR5 4800MHz SODIMM x 1, up to 32GB
Display Interface	HDMI x 2 (4K @60Hz) VGA x 1 (FHD)
Storage Device	2.5" SATA 6Gb/s Drive Bay x 1
Ethernet	RJ-45 x 4 (IEEE 802.3af/at PoE support, providing a total power budget of 80W across all ports): Intel® Ethernet Controller I226-LM, 2.5 GbE × 3 Intel® Ethernet Controller I210-IT, 1GbE × 1 (optional OOB support by request)

Note: When the input voltage is ≤10 V, the system supports PoE with a maximum combined output of 20 W (≈5 W per port).

I/O	USB 3.2 Gen 1 (Type-A) x 2 USB 2.0 x 2 (additional USB 2.0 x 2 via Wafer, optional) DB-9 x 6 for RS-232/422/485 DB-15 Male x 1 for DIO 8-bit Mic-in / Line-out x 1 Antenna Opening x 6 Power Button with Power LED x 1 Remote Power On/Off x 1

System

I/O (Cont.)	Reset Button x 1
Expansion	M.2 2230 E-Key x 1 (PCIe [x1], USB 2.0)
	M.2 3052 B-Key x 1 (USB 3.2)
	Nano SIM Slot x 1
	NCSI Header x 1 for OOB function (Power Button/Reset/5V/UART)
Indicator	-
OS Support	Windows 11 IoT
	Linux Ubuntu 24.04 (Kernel 6.8 or later)

Power Supply

Power Requirement	DC9 V – 36V via 4-pin Terminal Block (ATX mode)
	Power protection features:
	OCP (Overcurrent), OVP (Overvoltage), UVP (Undervoltage), SCP (Short-circuit), RVP (Reverse voltage)

Mechanical

Mounting	Wall Mount (default)
	DIN Rail
Dimensions (W x D x H)	8.4" x 4.5" x 2.5" (214mm x 116mm x 65mm) w/o Bracket
	9.9" x 4.5" x 2.8" (253mm x 116mm x 72mm) w/ Bracket
Gross Weight	6.2 lb (2.8 kg)
Net Weight	4.4 lb (2 kg)

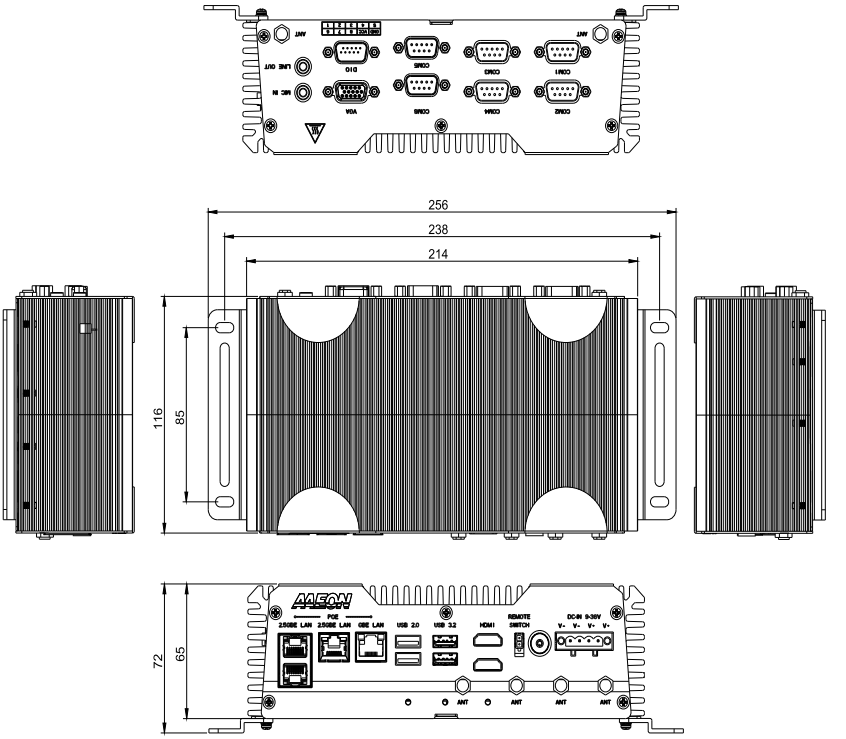
Environmental

Operating Temperature	-4°F – 113°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
Vibration	Random, 3 Grms, 5~500Hz, with SSD
Shock	With SSD: 50 G, IEC 60068-2-27, half sine, 11 ms duration
Drop	76 cm (1 Corner, 3 Edge, 6 Surface)
Certification	CE/FCC Class A

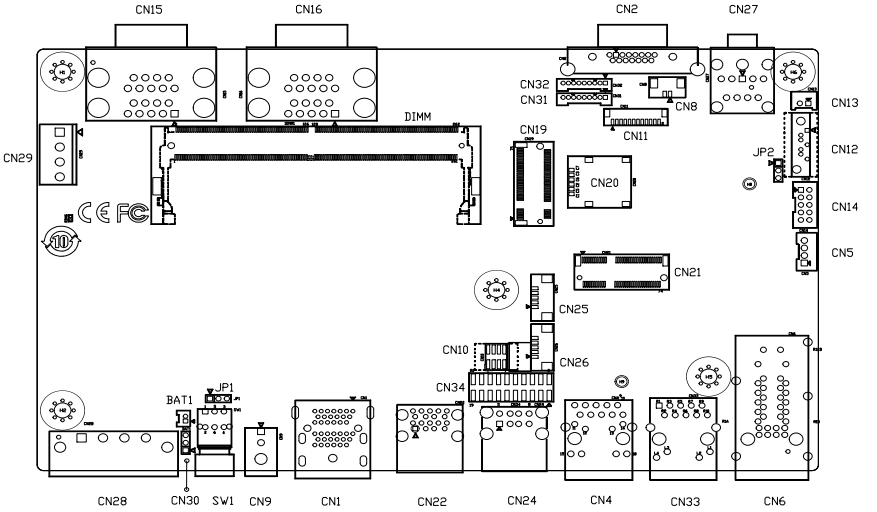
Chapter 2

Hardware Information

2.1 Dimensions

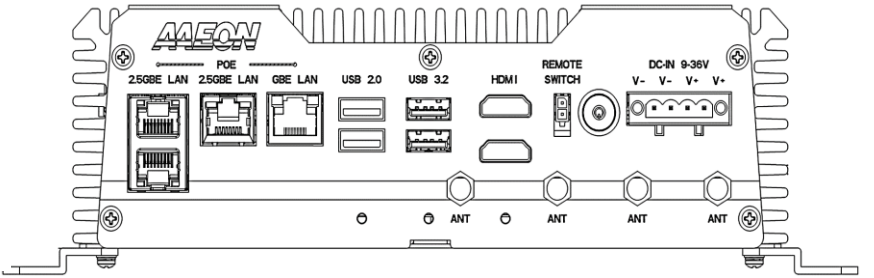


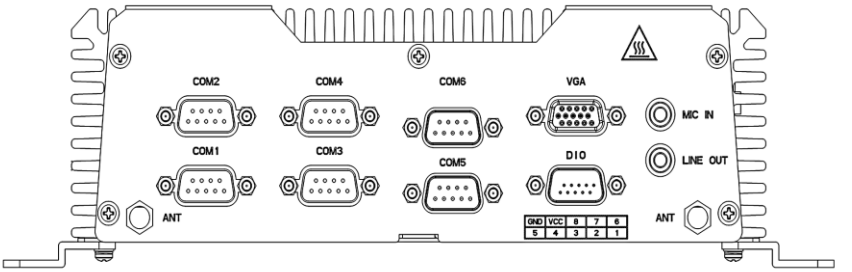
2.2 Jumpers and Connectors



Note: Board dimensions are 185mm x 112mm x 1.8mm.

Physical I/O Ports





2.3 List of Jumpers

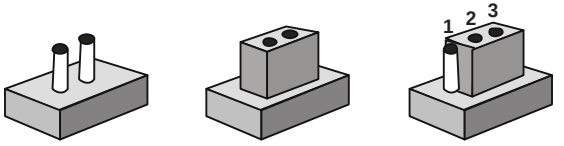
Please refer to the table below for all of the system's jumpers that you can configure for your application.

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

2.3.1 Setting Jumpers

The BOXER-6619-TWL 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.

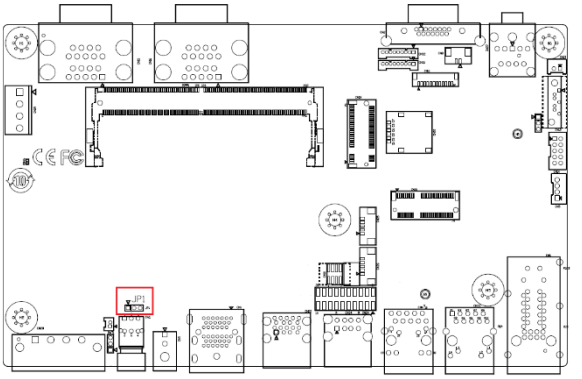
For jumpers with multiple pins, this guide uses "pins A-B" to notate which pins should be connected by a jumper clip. For example, "pins 1-2" means you should connect pins 1 and 2, while "pins 2-3" means you should connect pins 2 and 3.

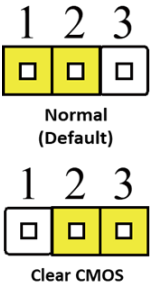


A pair of needle-nose pliers may be helpful when working with jumpers.

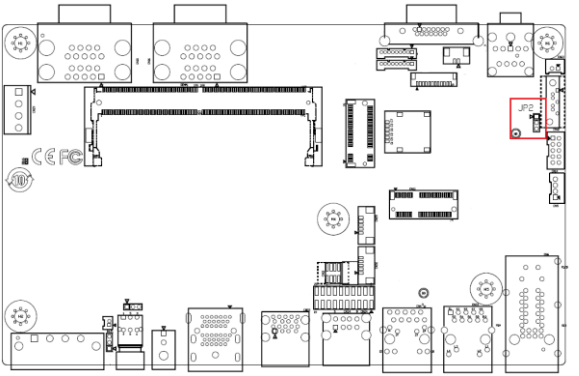
If you have any questions about how best to configure the system for your application, contact your AAEON representative or visit our website to talk with our support team.

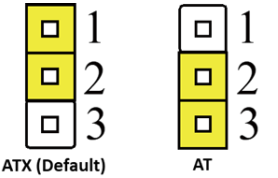
2.3.2 CMOS Control Selection (JP1)





2.3.3 ATX/AT Mode Selection (JP2)



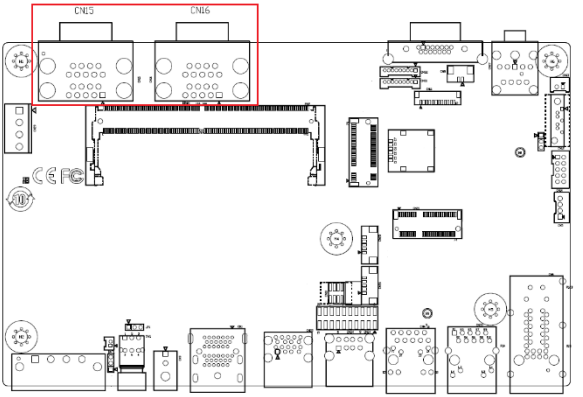


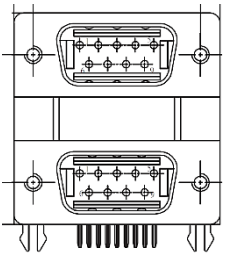
2.4 List of Connectors

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

Label	Function
CN4	1GbE LAN Port
CN6	Dual 2.5GbE LAN Port
CN33	2.5GbE LAN Port
CN15/CN16	COM 1 ~ COM 4 (RS-232/422/485)
CN1	Dual HDMI Port
CN8	Reset Switch Wafer Box
CN31/CN32	COM 5/COM 6 Wafer Box (RS-232/422/485)
CN2	VGA Port
CN28	Phoenix Connector Power Input
CN14	DIO Wafer Box
CN12	SATA HDD Connector
CN13	SATA HDD Power Connector
CN21	M.2 2230 E-Key Slot
BAT1	RTC Battery
SW1	Power Button
CN9	Remote Button Connector
CN25/CN26	USB 2.0 x 2 Wafer Box
CN19	M.2 3052 B-Key Slot
CN22	Dual USB 3.2 Port
CN24	Dual USB 2.0 Port
CN27	Audio Connector (Standard Audio Jack)
CN10	SPI Flash Header
CN20	Nano SIM Slot
DIMM1	DDR5 SODIMM Slot
CN29	12V Power Output Connector (to P32D Power Board)
CN5	52V Power Input Connector (from P32D Power Board)
CN34	LAN NCSI OOB Board Pin Header

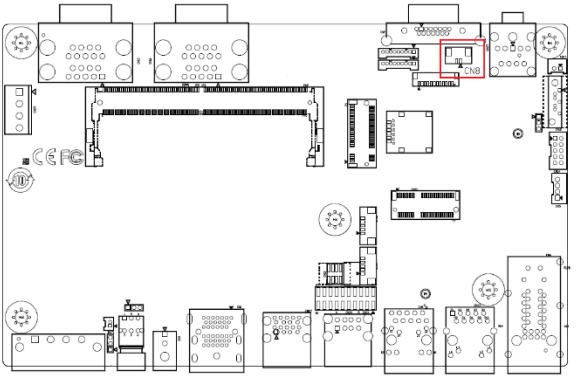
2.4.1 COM 1 ~ COM 4 (RS-232/422/485) (CN15/CN16)

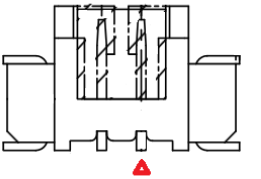




Pin	RS-232 (Default)	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	RX	IN	RS422_TX+	RS485_D+
3	TX	OUT	RS422_RX+	
4	DTR	OUT	RS422_RX-	
5	GND	GND		
6	DSR	IN		
7	RTS	OUT		
8	CTS	IN		
9	RI1	IN		

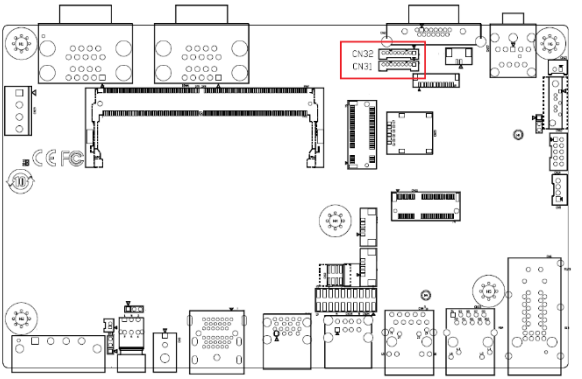
2.4.2 Reset Switch Wafer Box (CN8)

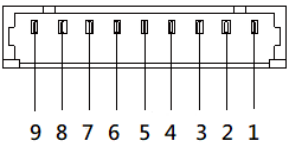




Pin	Pin Name	Signal Type	Signal Level
1	HWRST#	IN	
2	GND		

2.4.3 COM 5/COM 6 Wafer Box (RS-232/422/485) (CN31/CN32)

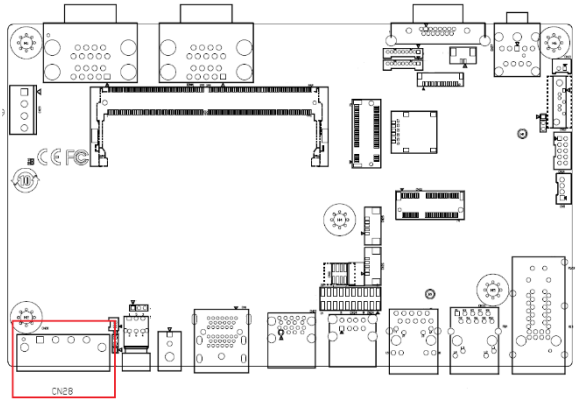


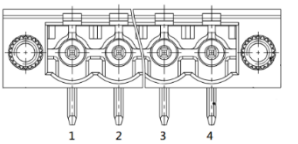


Pin	RS-232 (Default)	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		

Pin	RS-232 (Default)	Signal Type	RS-422	RS-485
7	DTR	OUT	RS422_RX-	
8	RI (Default: Disable)	IN		
9	GND	GND		

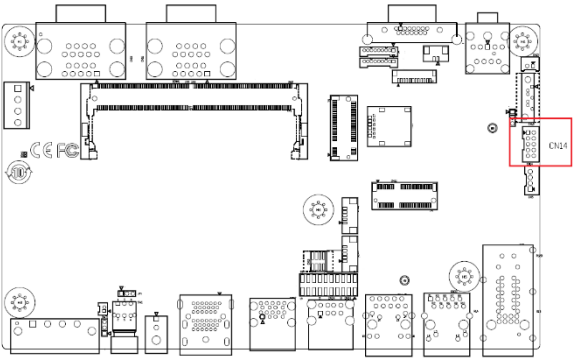
2.4.4 Phoenix Connector Power Input (CN28)

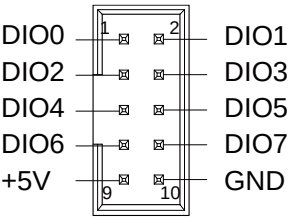




Pin	Pin Name	Signal Type	Signal Level
1	VIN	PWR	+9V ~ +36V
2	VIN	PWR	+9V ~ +36V
3	GND	GND	
4	GND	GND	

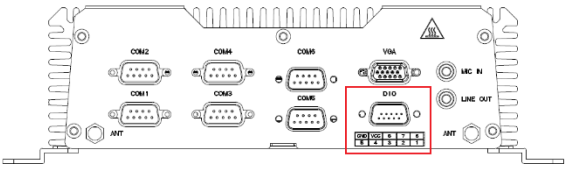
2.4.5 DIO Wafer Box (M/B Side) (CN14)

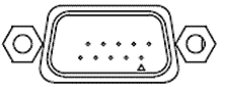




Pin	Pin Name	Signal Type	Signal Level
1	DIO0	I/O	+5V / 12mA
2	DIO1	I/O	+5V / 12mA
3	DIO2	I/O	+5V / 12mA
4	DIO3	I/O	+5V / 12mA
5	DIO4	I/O	+5V / 12mA
6	DIO5	I/O	+5V / 12mA
7	DIO6	I/O	+5V / 12mA
8	DIO7	I/O	+5V / 12mA
9	+5V	PWR	+5V / 650mA
10	GND	GND	

DIO Port (Chassis Side)

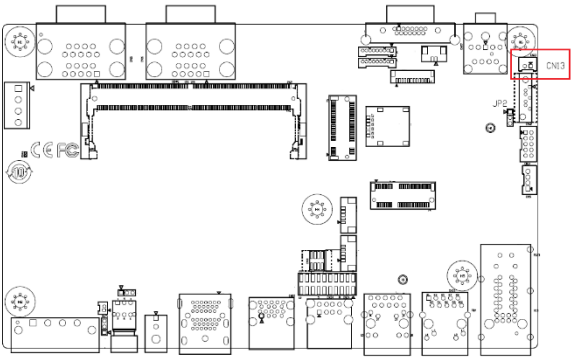


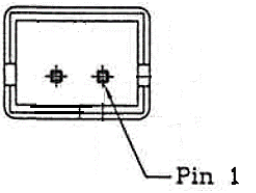


Pin	Pin Name	Signal Type	Signal Level
1	DIO0	I/O	+5V / 12mA
2	DIO1	I/O	+5V / 12mA
3	DIO2	I/O	+5V / 12mA
4	DIO3	I/O	+5V / 12mA
5	DIO4	I/O	+5V / 12mA

Pin	Pin Name	Signal Type	Signal Level
6	DIO5	I/O	+5V / 12mA
7	DIO6	I/O	+5V / 12mA
8	DIO7	I/O	+5V / 12mA
9	+5V	PWR	+5V / 650mA
10	GND	GND	

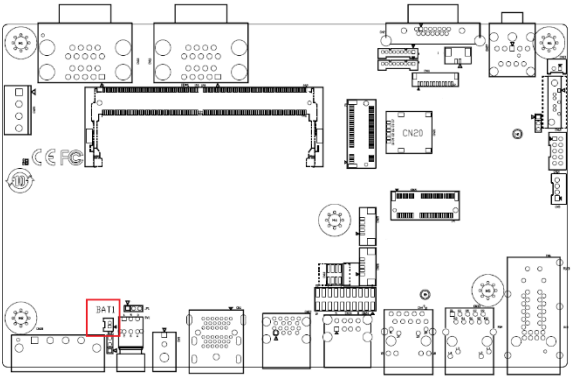
2.4.6 SATA HDD Power Connector (CN13)

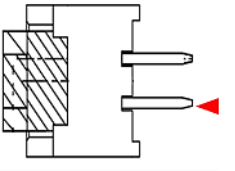




Pin	Pin Name	Signal Type	Signal Level
1	+V5S	PWR	+5V
2	GND	GND	

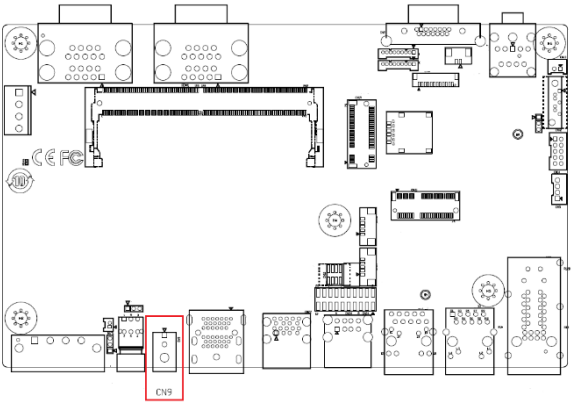
2.4.7 RTC Battery (BAT1)

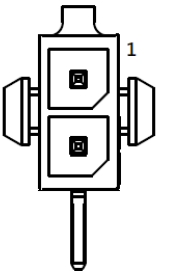




Pin	Pin Name	Signal Type	Signal Level
1	+V3P3A_RTC	PWR	+3.3V
2	GND	GND	

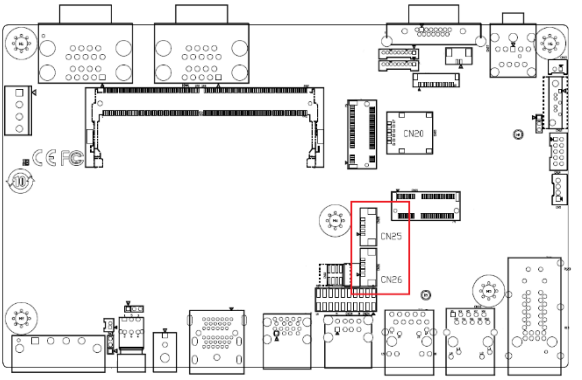
2.4.8 Remote Button Connector (CN9)

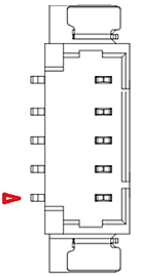




Pin	Pin Name	Signal Type	Signal Level
1	PWR_BUTTON#	IN	
2	GND		

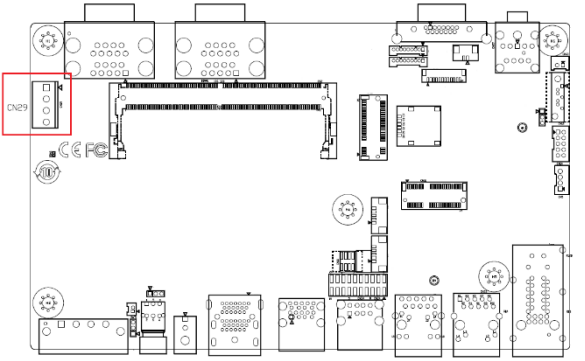
2.4.9 USB 2.0 x 2 Wafer Box (CN25/CN26)

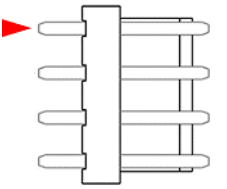




Pin	Pin Name	Signal Type	Signal Level
1	+5V	GND	+5V
2	USBD-	DIFF	
3	USBD+	DIFF	
4	GND	GND	
5	GND	GND	

2.4.10 12V Power Output Connector (to P32D Power Board) (CN29)

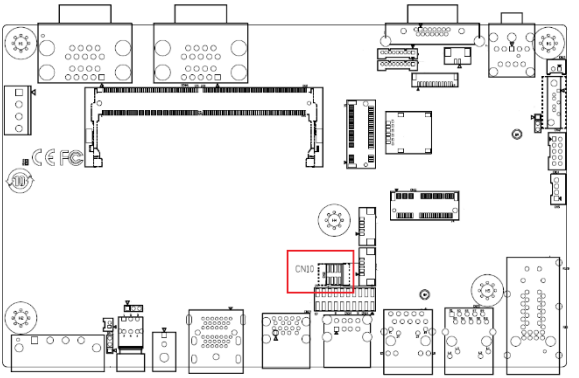


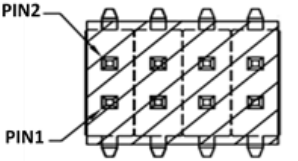


Pin	Pin Name	Signal Type	Signal Level
1	+V12_EXT	PWR	+12V
2	+V12_EXT	PWR	+12V
3	GND	GND	GND

Pin	Pin Name	Signal Type	Signal Level
4	GND	GND	GND

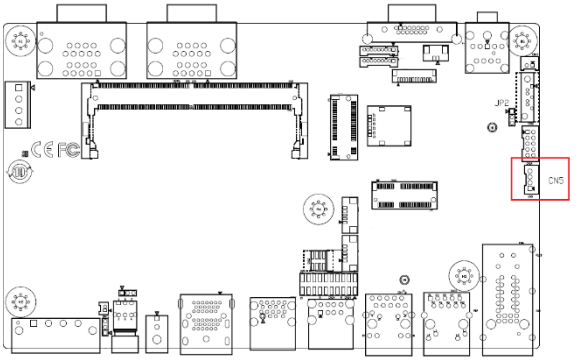
2.4.11 SPI Flash Header (CN10)

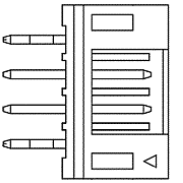




Pin	Pin Name	Signal Type	Signal Level
1	+V3P3M_SPI	PWR	+3.3V
2	GND	GND	
3	SPI_CE0#_CON	IN	
4	SPI_CLK_CON	IN	
5	SPI_SO_CON	IN	
6	SPI_SI_CON	IN	
7	NC		
8	NC		

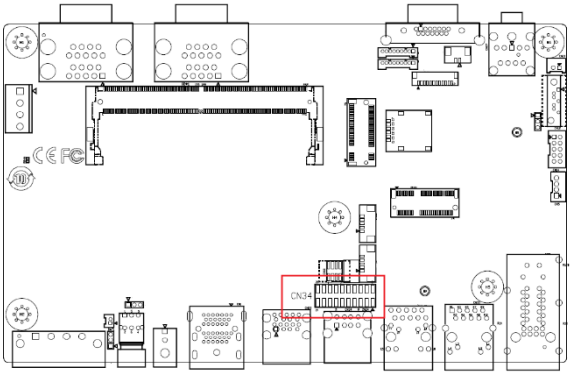
2.4.12 52V Power Input Connector (From P32D Power Board) (CN5)

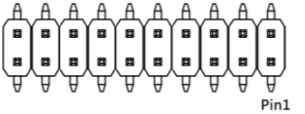




Pin	Pin Name	Signal Type	Signal Level
1	+52V_POE	PWR	+52V
2	+52V_POE	PWR	+52V
3	GND	GND	GND
5	GND	GND	GND

2.4.13 LAN NCSI OOB Board Pin Header (CN34)



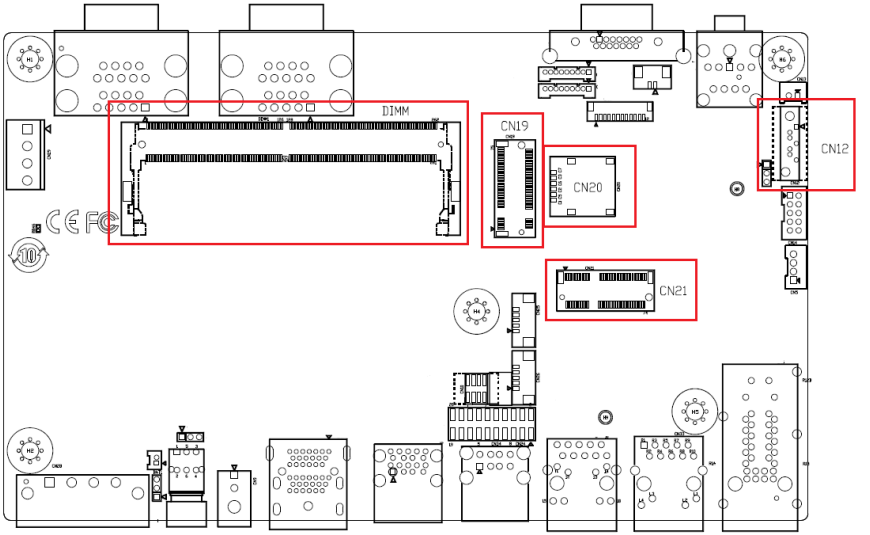


Pin	Pin Name	Signal Type	Signal Level
1	+3.3A_PWRGD	IN	+3.3V
2	+3P3_LAN1	PWR	+3.3V
3	UART1_TXD	IN	
4	NC1_SI_TXD0	IN	

Pin	Pin Name	Signal Type	Signal Level
5	UART1_RXD	OUT	
6	NC1_SI_TXD1	IN	
7	I2C0_SCL	IN	
8	NC1_SI_RXD0	OUT	
9	I2C0_SDA		
10	NC1_SI_RXD1	OUT	
11	PCH_SYSRST#	OUT	
12	NC1_SI_CLK	OUT	
13	GND	GND	GND
14	NC1_SI_CRB_DV	OUT	
15	PM_PWRBTN#	OUT	
16	NC1_SI_TX_EN	OUT	
17	GND	GND	GND
18	UART0_TXD	IN	
19	NC		
20	UART0_RXD	OUT	

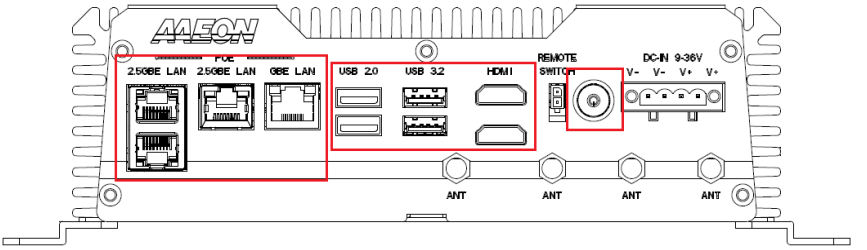
2.5 Standard Specification Connectors & System I/O

2.5.1 Board-Side Standard Connectors



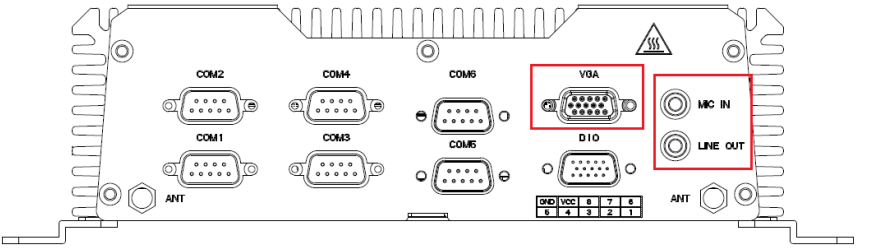
Label	Function
CN12	SATA HDD Connector
CN21	M.2 2230 E-Key Slot
CN19	M.2 3052 B-Key Slot
CN20	Nano SIM Slot
DIMM1	DDR5 SO-DIMM Slot

2.5.2 Standard I/O System Front Side



I/O Port
2.5GbE RJ-45 LAN with PoE
1GbE RJ-45 LAN with PoE
Dual USB 2.0
Dual USB 3.2
Dual HDMI
Power Button

2.5.3 Standard I/O System Rear Side

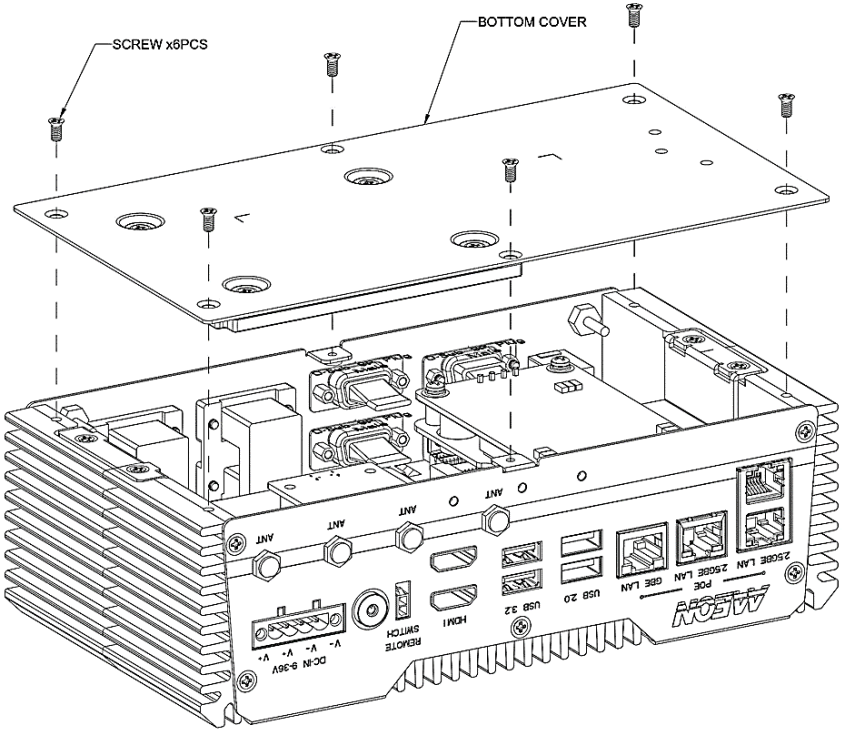


I/O Port
Single VGA
Audio Line-out & Mic-in

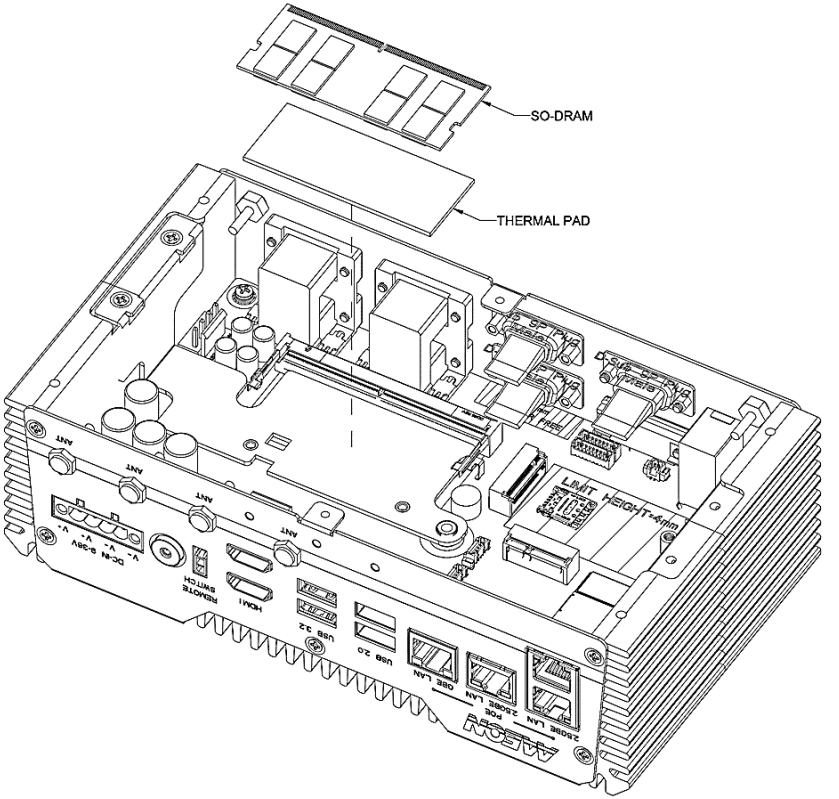
2.6 RAM Module Installation

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

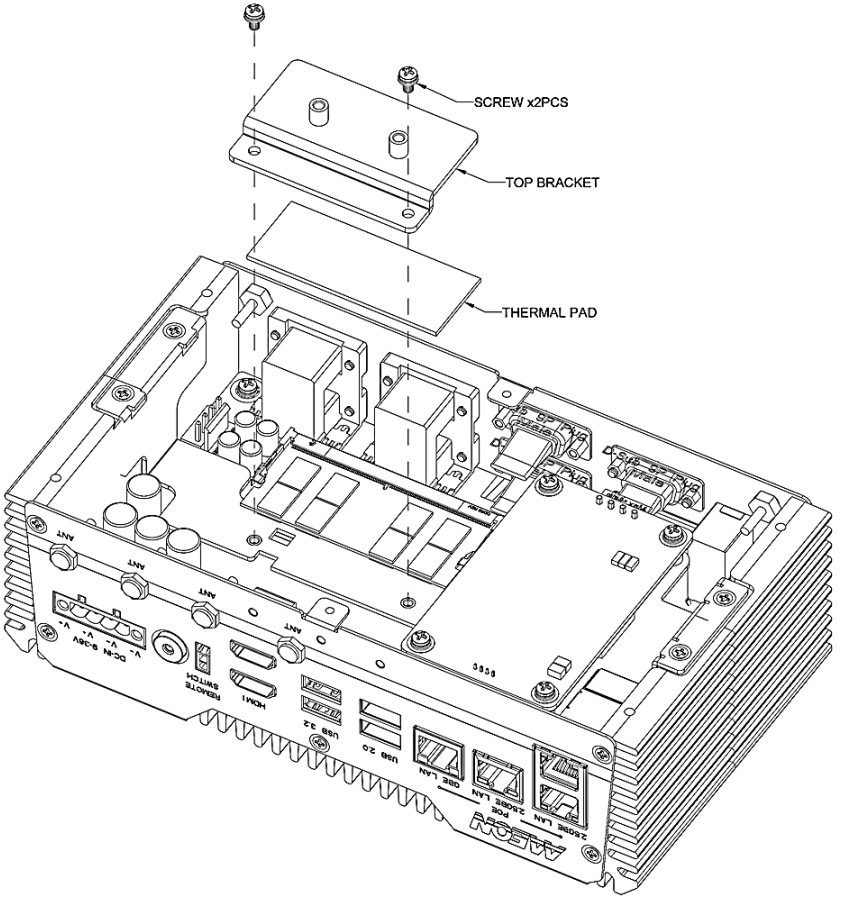
- Remove the six (6) screws from the bottom of the BOXER-6619-TWL as shown in the figure below. Remove the bottom panel from the system.



- When inserting the module into the SODIMM slot, first insert at an angle (~30°), then gently push down until secure. Note the figure below for placement of the required thermal pad.



- Place an additional thermal pad atop the RAM module, then secure the installed components with the top bracket using the two screws, as shown.

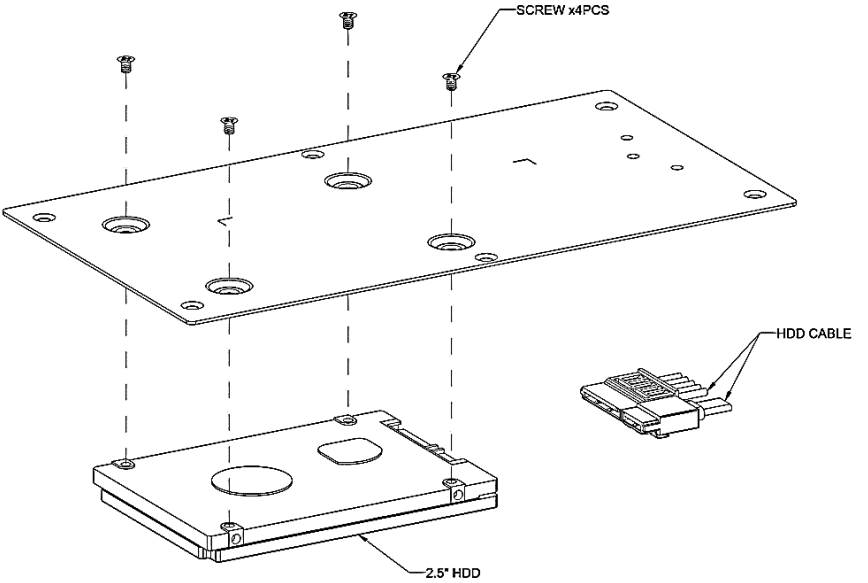


- RAM installation is complete. If you also need to install the 2.5" SATA Drive, continue to the next section. If not, replace the bottom panel and secure with the six (6) screws you removed in Step 1 of this section.

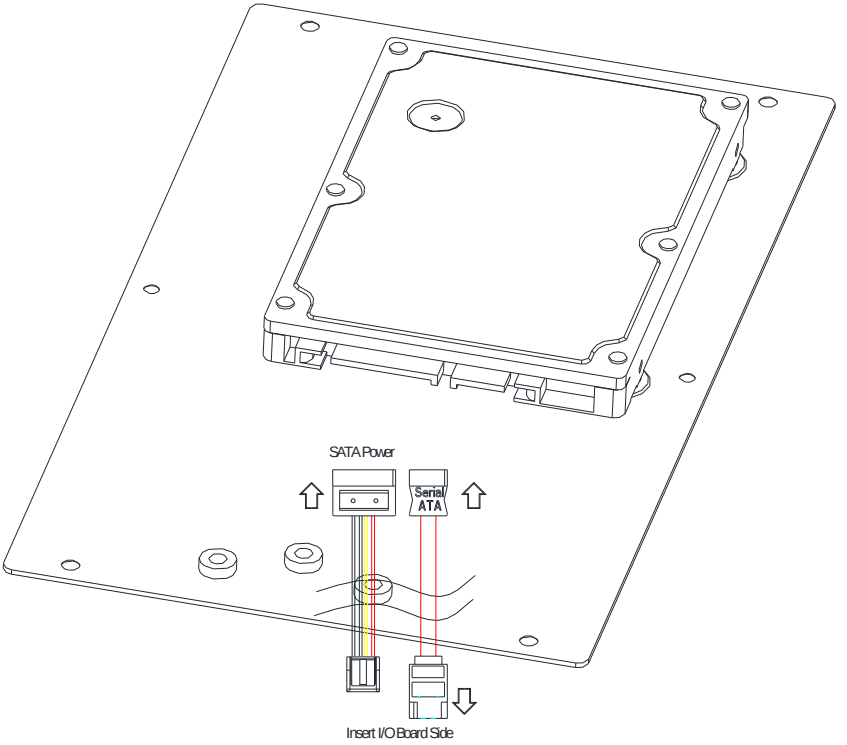
2.7 2.5″ SATA Drive Installation

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

- Attach the SATA drive and cables to the HDD Bracket using the four (4) screws provided.



- Attach the HDD Bracket to the bottom panel using four screws as shown in the figure below. Attach the SATA and SATA Power cables to the board and the SATA drive.

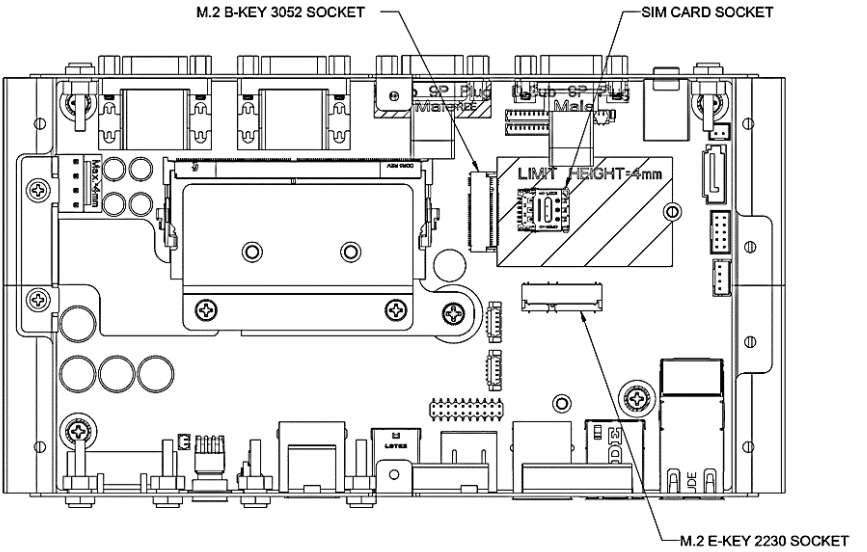


- Replace the bottom panel and secure with the six (6) screws you removed in Step 1.

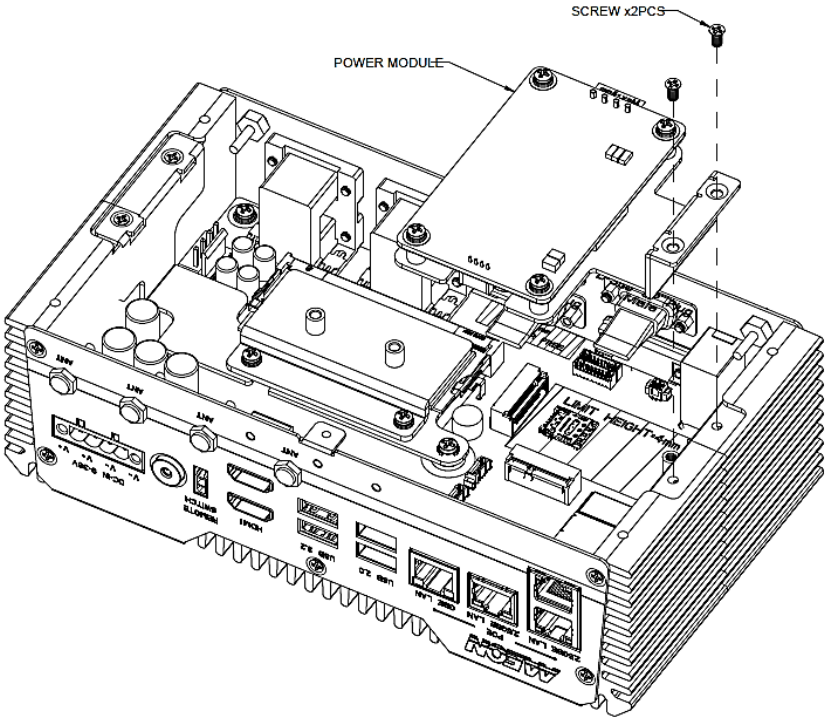
2.8 Expansion Card Installation

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

The BOXER-6619-TWL contains one M.2 2230 E-Key, one M.2 3052 B-Key, and one Nano SIM Slot. Note the locations of each slot below.

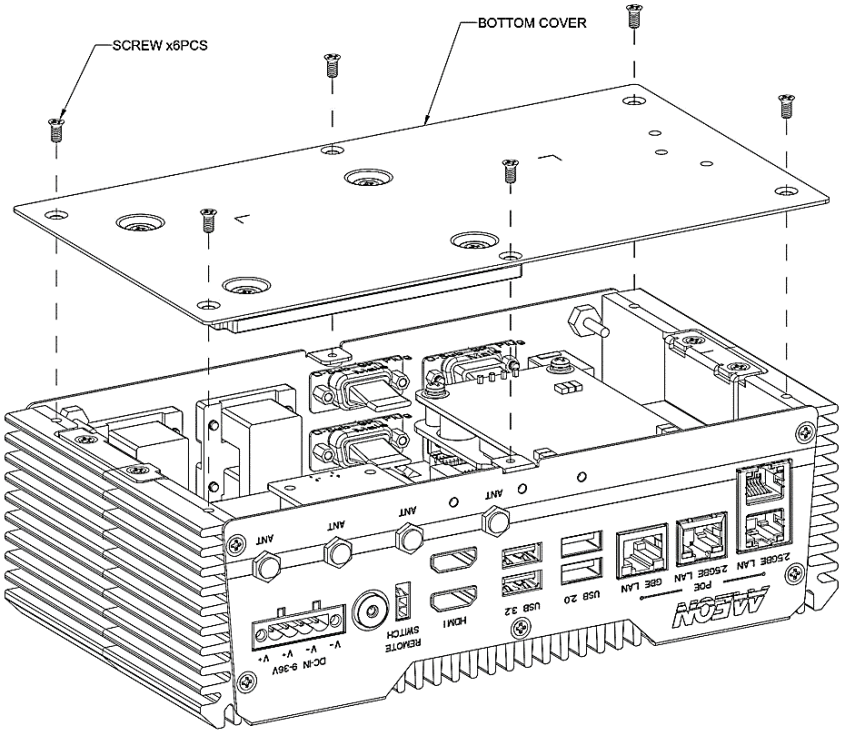


- Prior to installing the M.2 and SIM card(s), make sure to remove the power module via the two screws, as shown below.



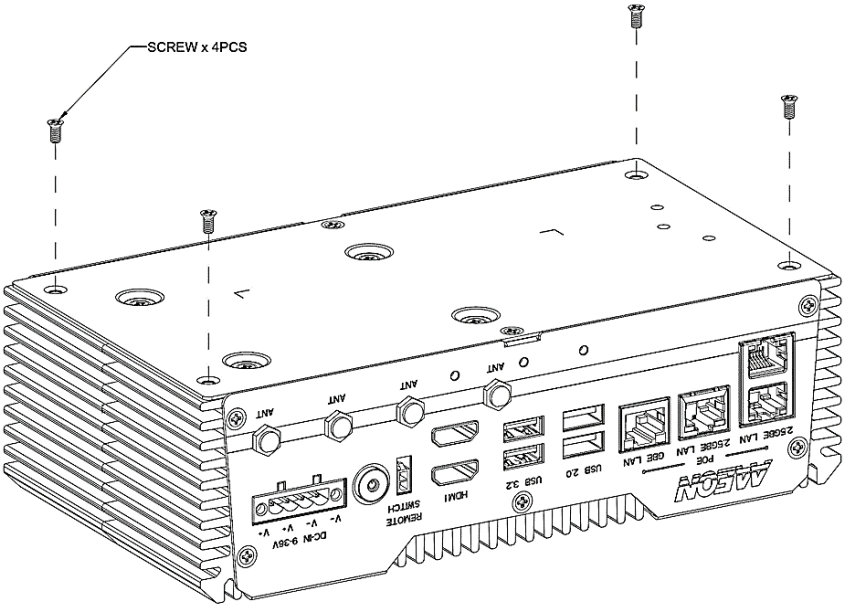
- Insert modules as required, following standard M.2 and SIM card installation methods, and reaffix the power module.

- Once installation is complete, reassemble the system by reattaching the bottom panel using the six (6) screws as shown below.

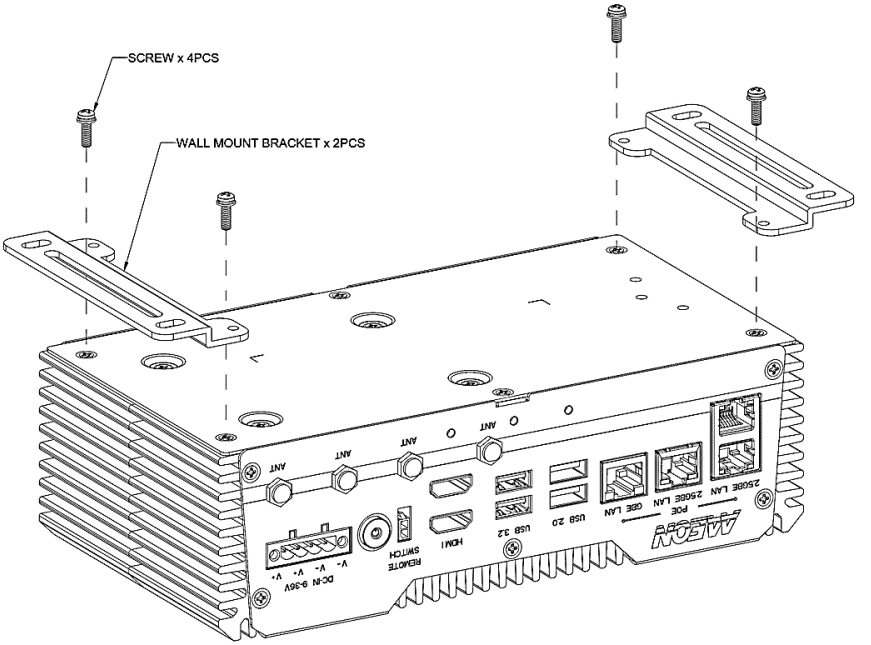


2.9 Wall Mount Bracket Installation

- Remove the four (4) screws located in each corner of the system's bottom panel.



- Place the two wall mount brackets on each side of the bottom panel, securing them to the bottom panel with the same four (4) screws.



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 <Del> or <F2> immediately while your computer is powering up.

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

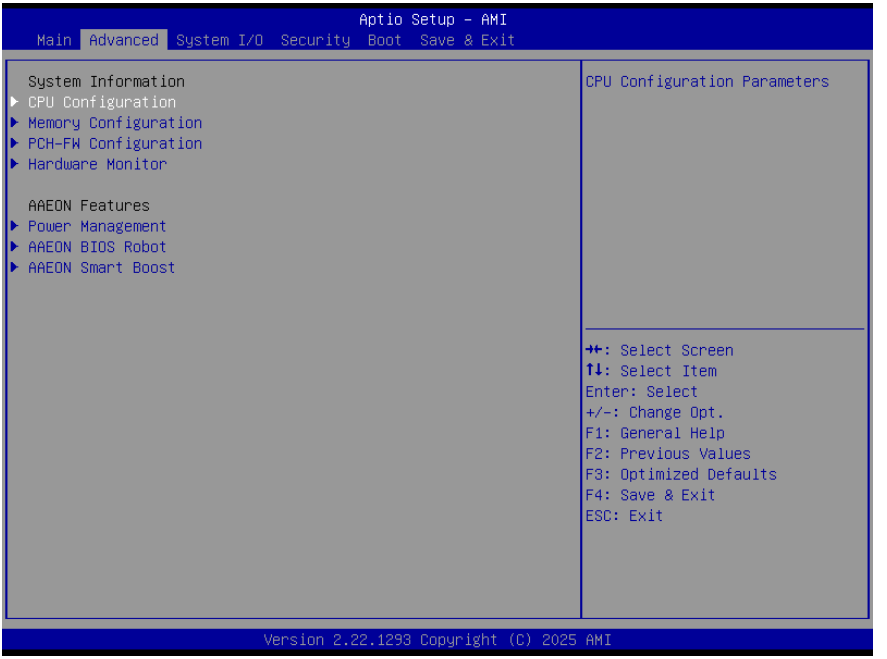
Boot – Enable/Disable quiet Boot Option

Security – The setup administrator password can be set here

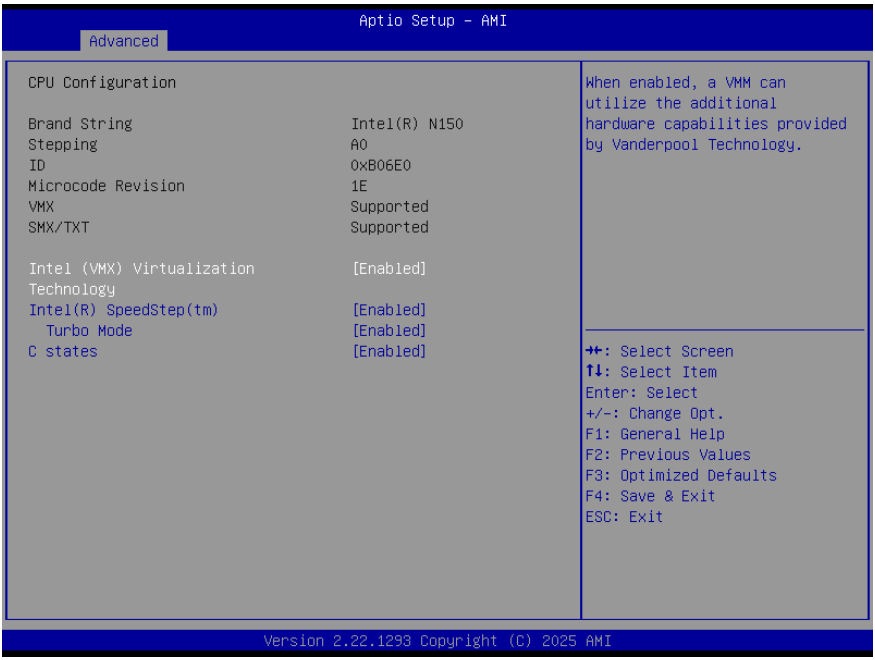
Save & Exit – Save your changes and exit the program

3.3 Setup Submenu: Main

3.4 Setup Submenu: Advanced

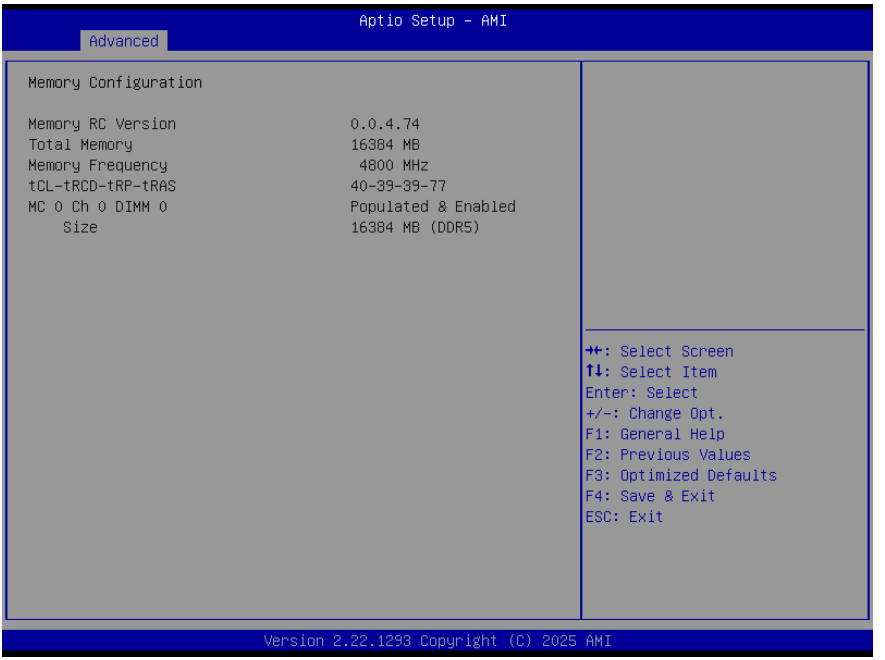


3.4.1 CPU Configuration

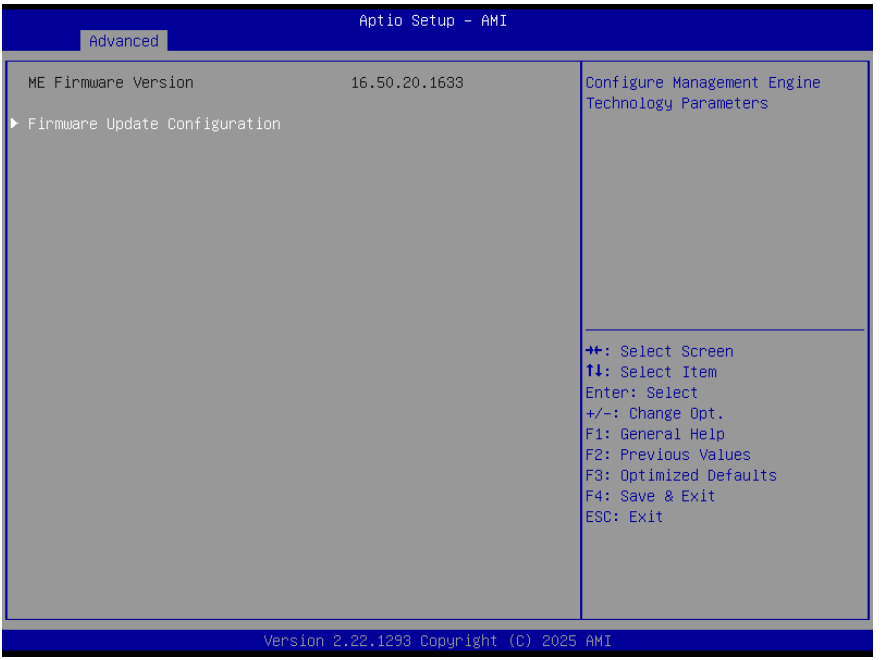


Options Summary		
Intel (VMX) Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Intel(R) SpeedStep(tm)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported.		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.		
C states	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized		

3.4.2 Memory Configuration



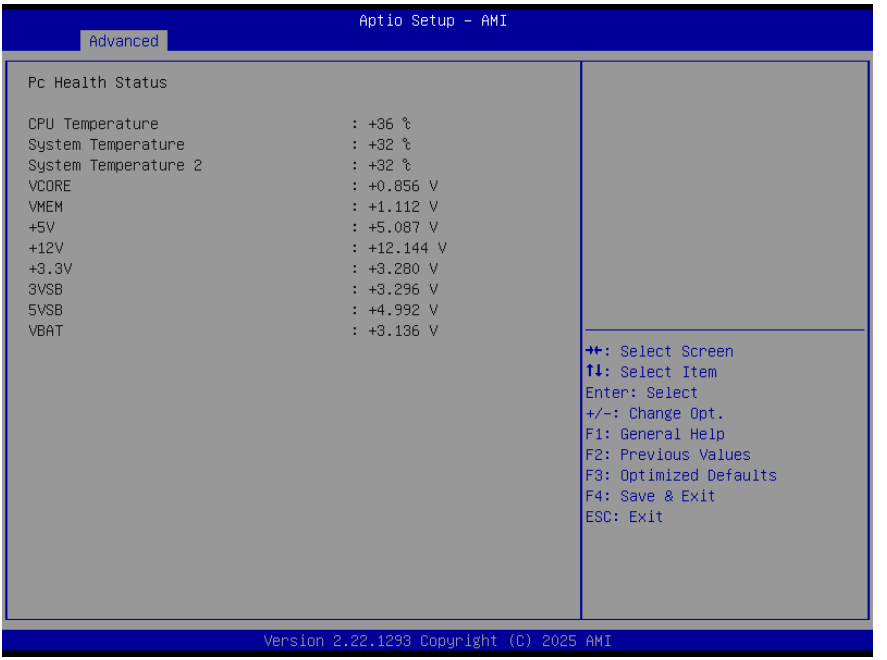
3.4.3 PCH-FW Configuration



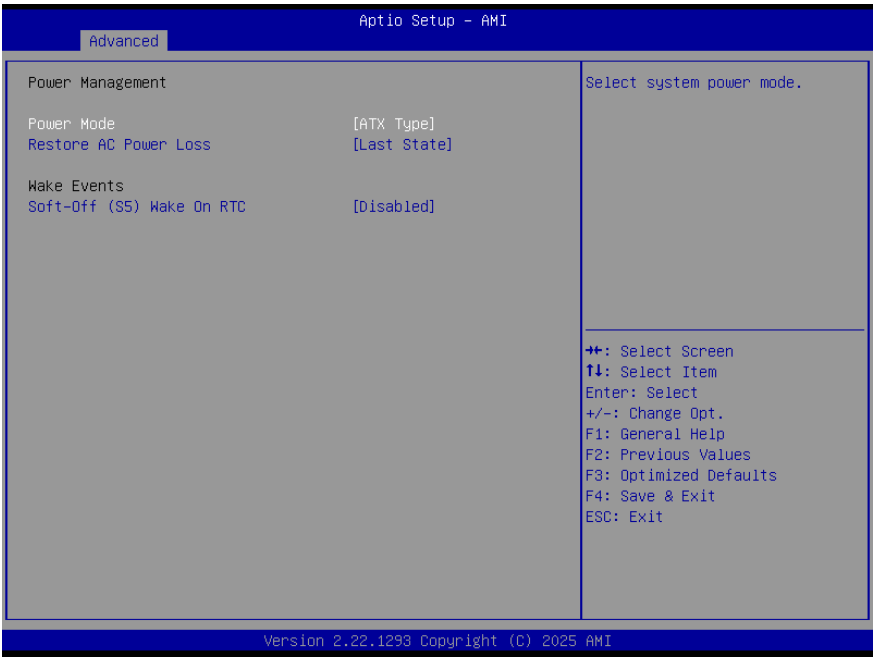
3.4.3.1 Firmware Update Configuration

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

3.4.4 Hardware Monitor

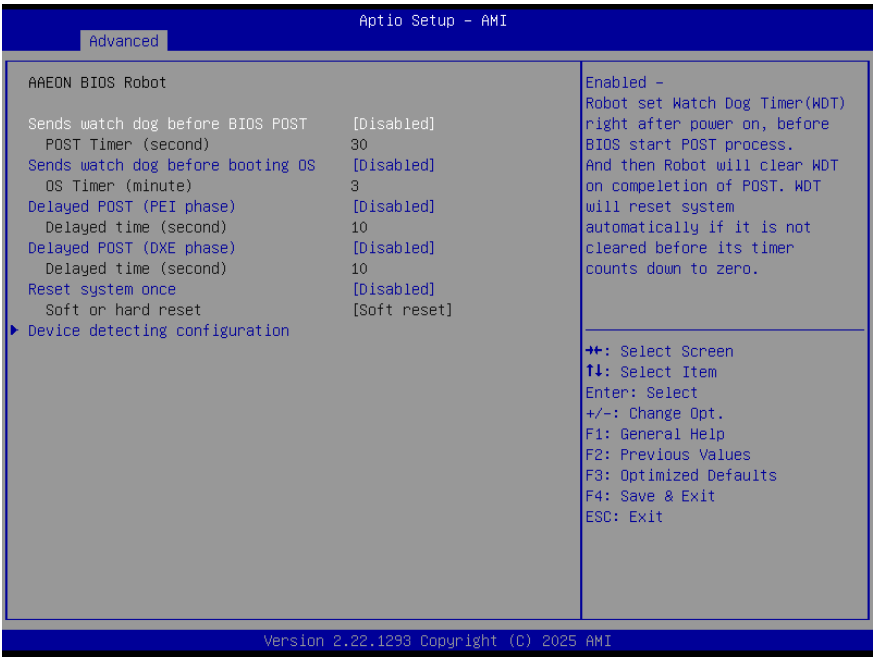


3.4.5 Power Management



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	
System Wake On RTC	Disabled	Optimal Default, Failsafe Default
	By Date	
	By Weekday	
	Bypass	
By Date: System will wake on the day with hr::min::sec specified. **By Weekday**: System will wake on the enabled weekday with hr::min::sec specified. **Bypass**: BIOS will not control RTC wake function.		

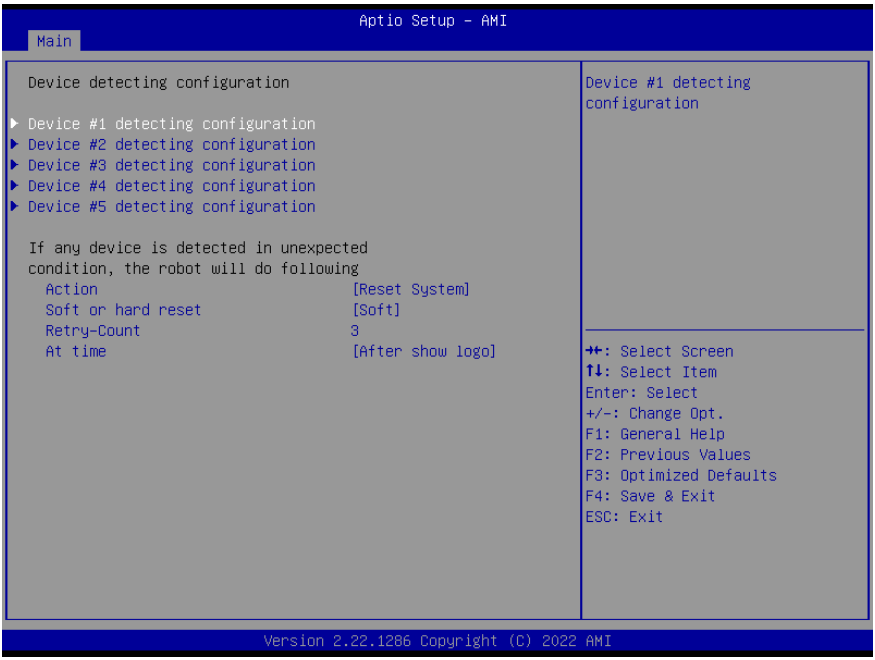
3.4.6 AAEON BIOS Robot



Options Summary		
Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The system sets the Watchdog Timer (WDT) immediately after power-on, before the BIOS begins the POST process. The WDT is cleared upon completion of POST. If the WDT is not cleared before the timer expires, the system will automatically reset.		
Sends watch dog before booting OS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The system sets the Watchdog Timer (WDT) after POST completes, before the BIOS transfers control to the operating system. **Warning:** Before enabling this feature, ensure that an OS program is responsible for clearing the WDT. This function should be disabled if the OS is performing an update.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	

Options Summary		
Enabled – The system delays the start of BIOS POST immediately after power-on. This allows POST to begin with stable power or after the system has physically warmed up. **Note:** This delay occurs before the Watchdog Timer is activated.		
Delayed POST (DXE phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The system delays BIOS POST before its completion, allowing POST to proceed with stable power or after the system has physically warmed up. **Note:** This delay occurs after the Watchdog Timer is activated before BIOS POST.		

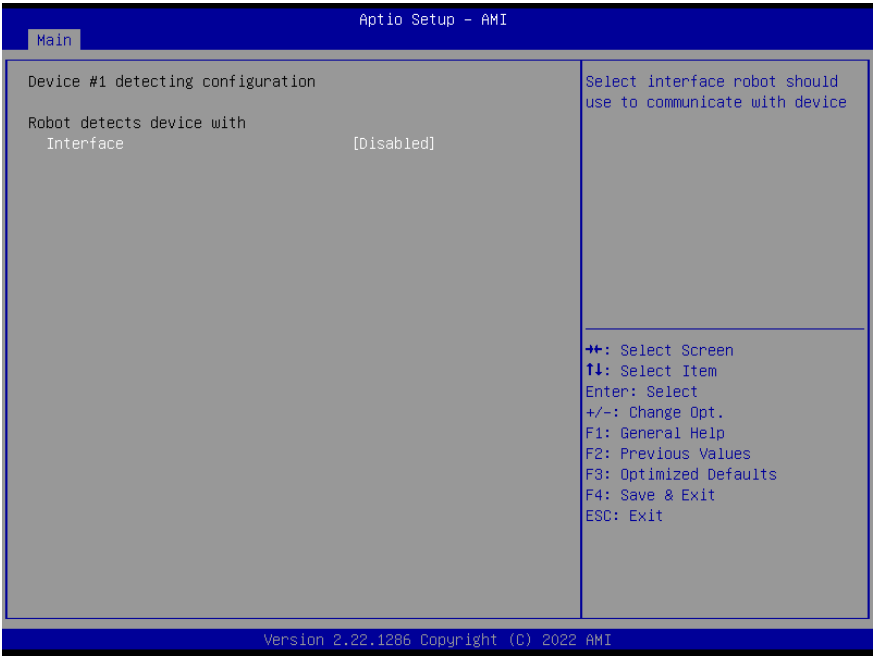
3.4.6.1 Device Detecting Configuration



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
Specify the retry counter. The system will perform a reset up to this number of times before allowing POST to continue.		
At time	After shoe logo	Optimal Default, Failsafe Default
	Before show logo	
Select the time at which the system should perform the action: After Show Logo – The action is performed after the logo is displayed, when most system devices are initialized and ready.		

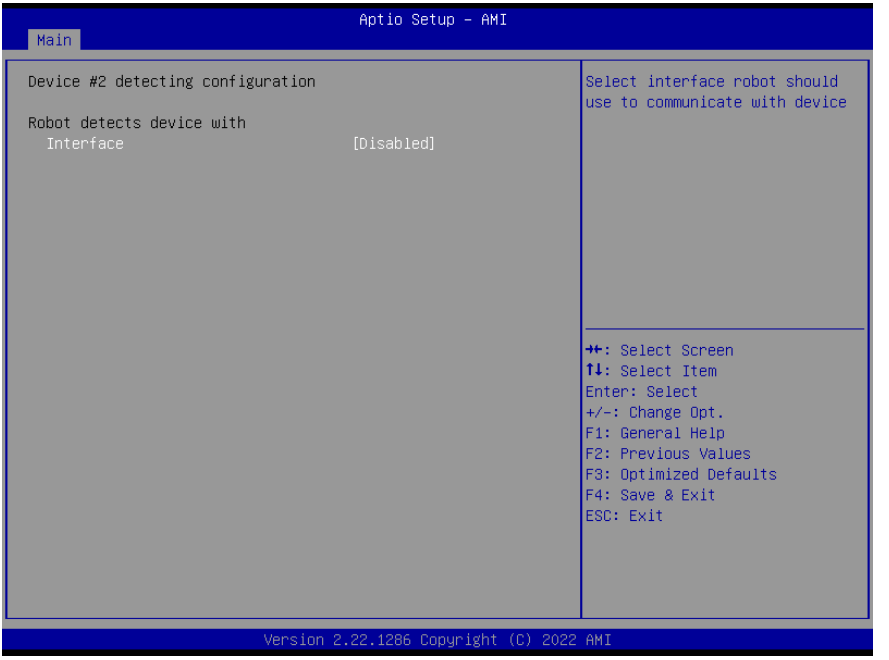
Options Summary
Before Show Logo – The action is performed earlier, before the logo is displayed; some devices may not yet be ready.

3.4.6.1.1 Device #1 Detecting Configuration



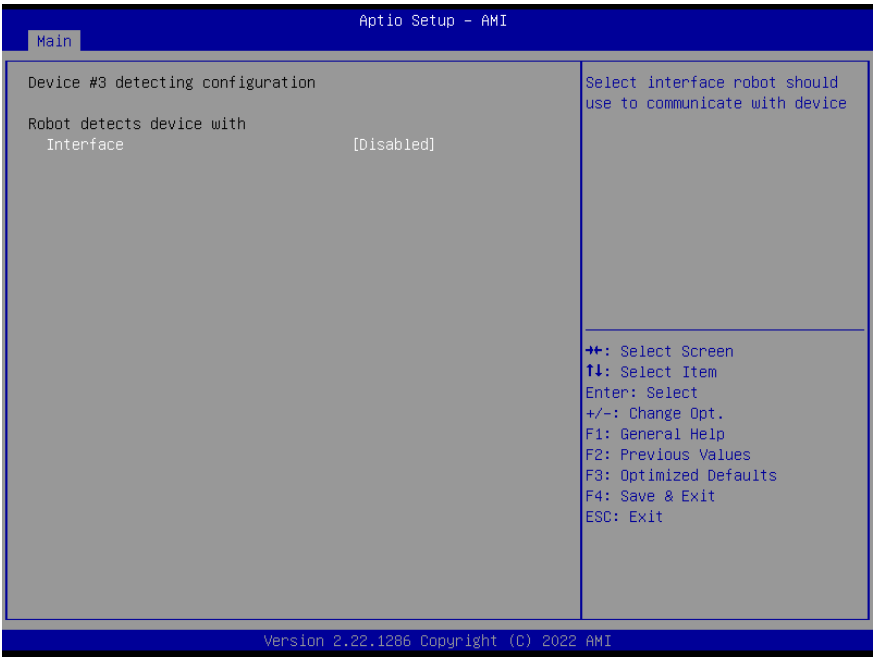
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.1.2 Device #2 Detecting Configuration



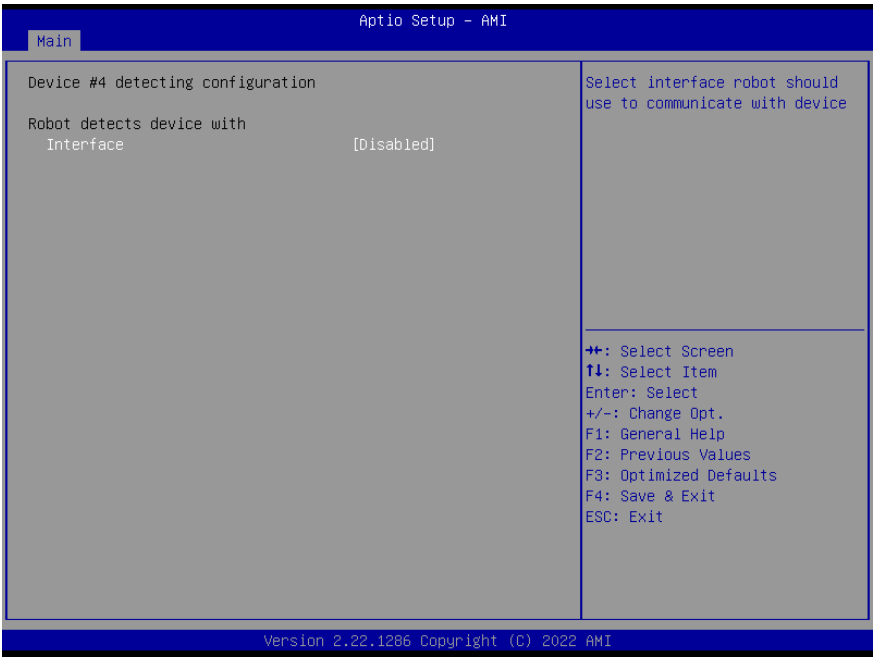
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.1.3 Device #3 Detecting Configuration



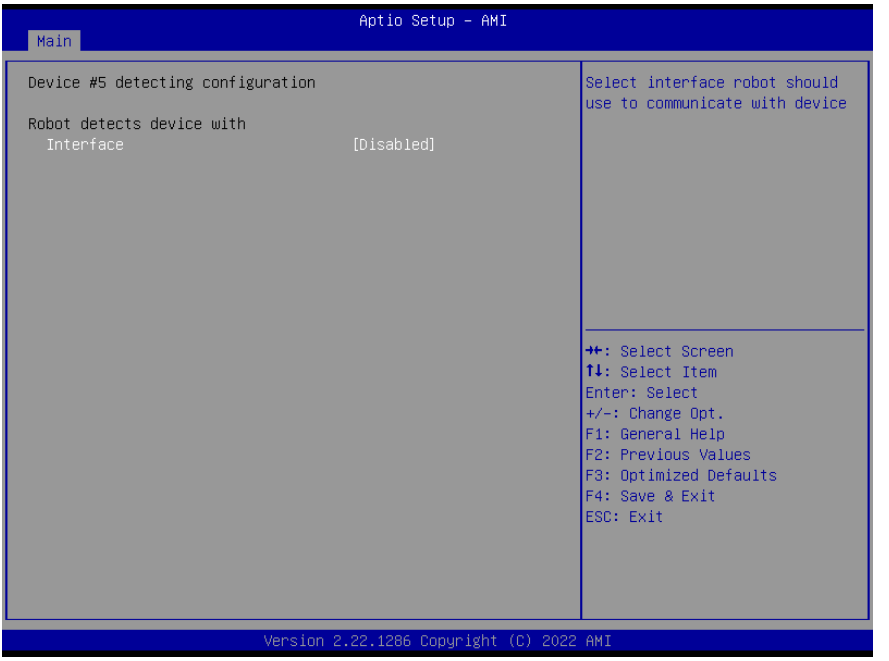
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.1.4 Device #4 Detecting Configuration



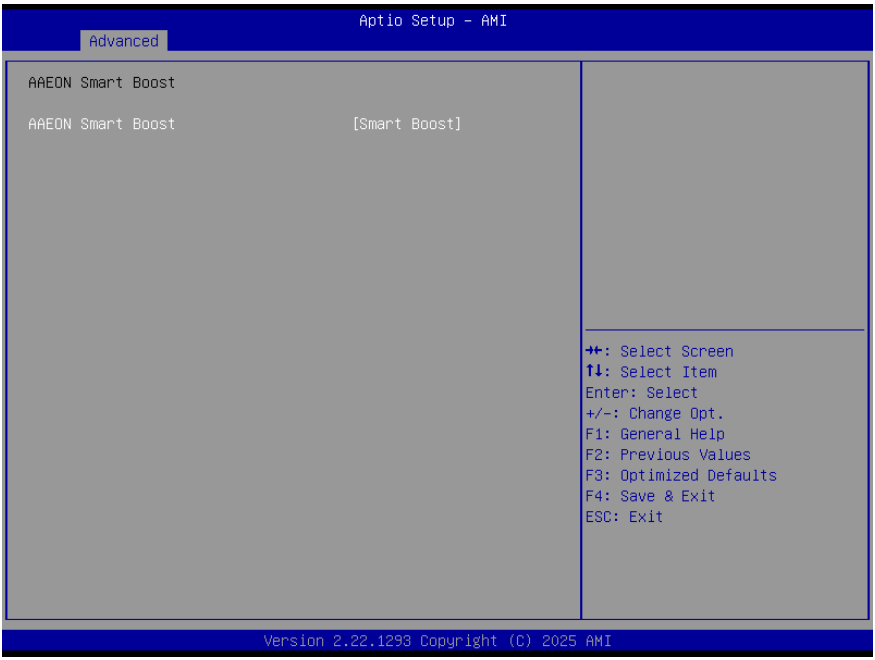
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.6.1.5 Device #5 Detecting Configuration



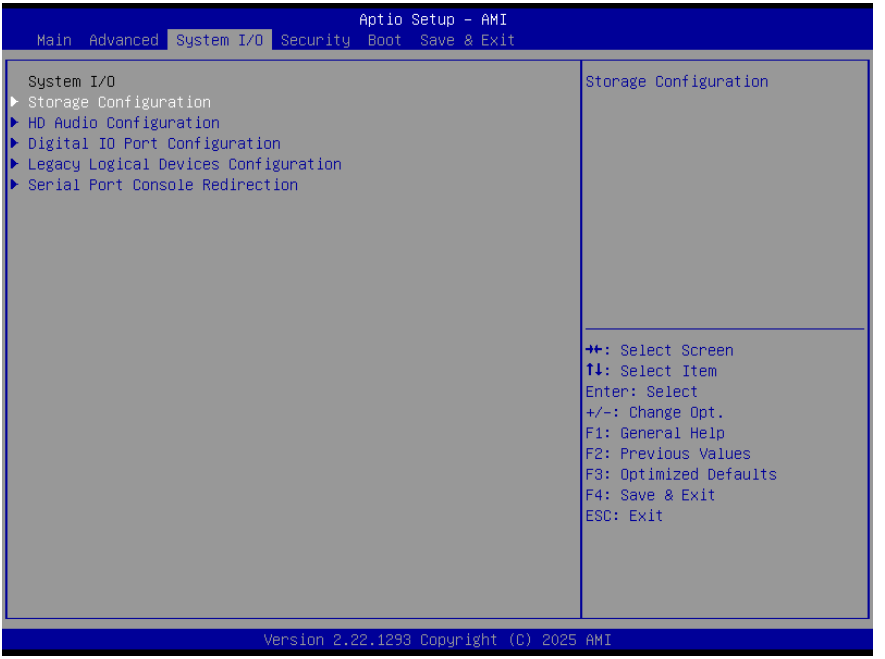
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

3.4.7 AAEON Smart Boost

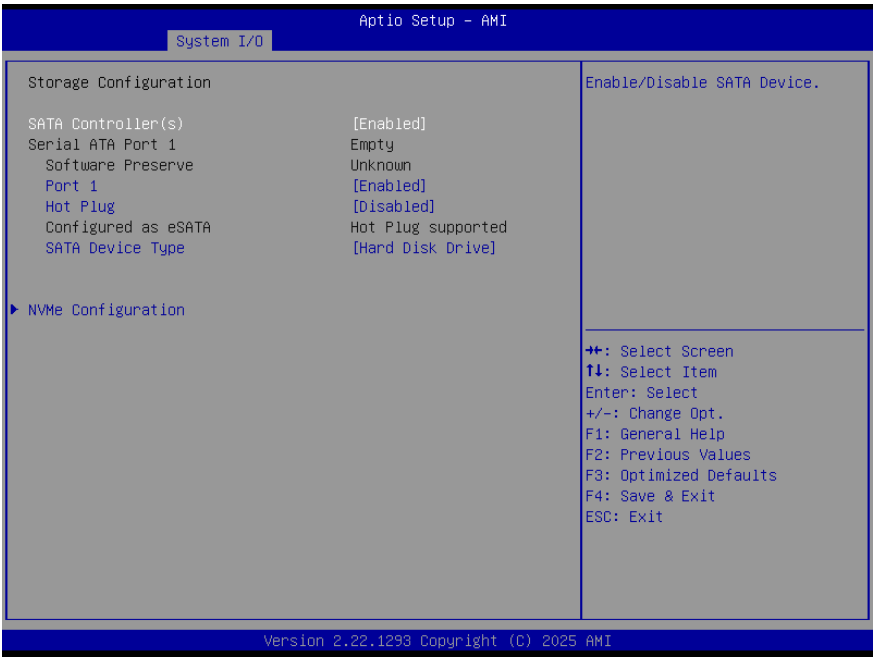


Options Summary		
AAEON Smart Boost	Smart Boost	Optimal Default, Failsafe Default
	Maximum Performance	
	Good Stability	
	Disabled	

3.5 Setup Submenu: System I/O



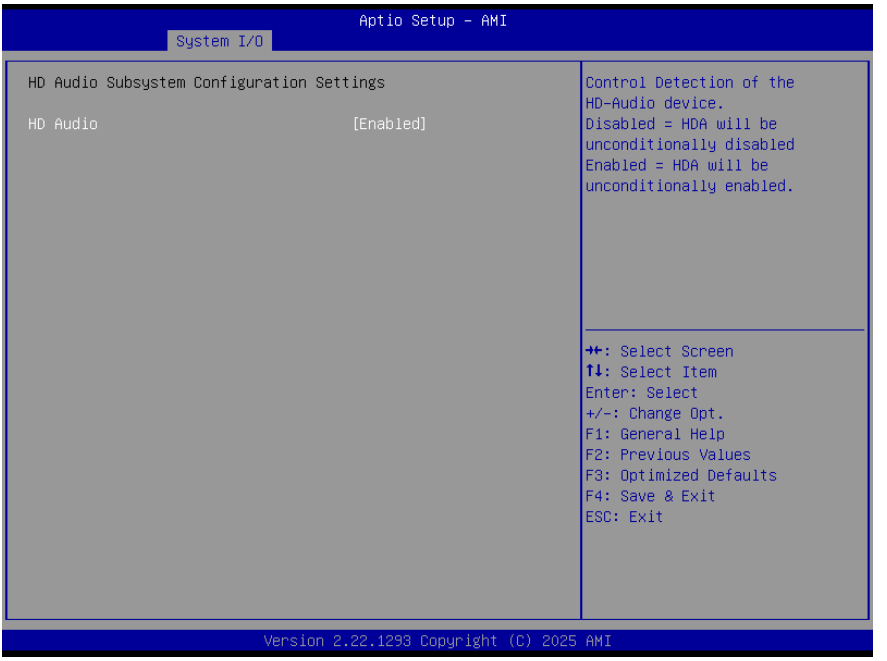
3.5.1 Storage Configuration



Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable SATA Device		
Port 1	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port		
Hot Plug	Enabled	Optimal Default, Failsafe Default
	Disabled	
Designates this port as Hot Pluggable		
SATA Device Type	Hard Disk Drive	Optimal Default, Failsafe Default
	Solid State Drive	
Identify whether the SATA port is connected to Solid State Drive or Hard Disk Drive		

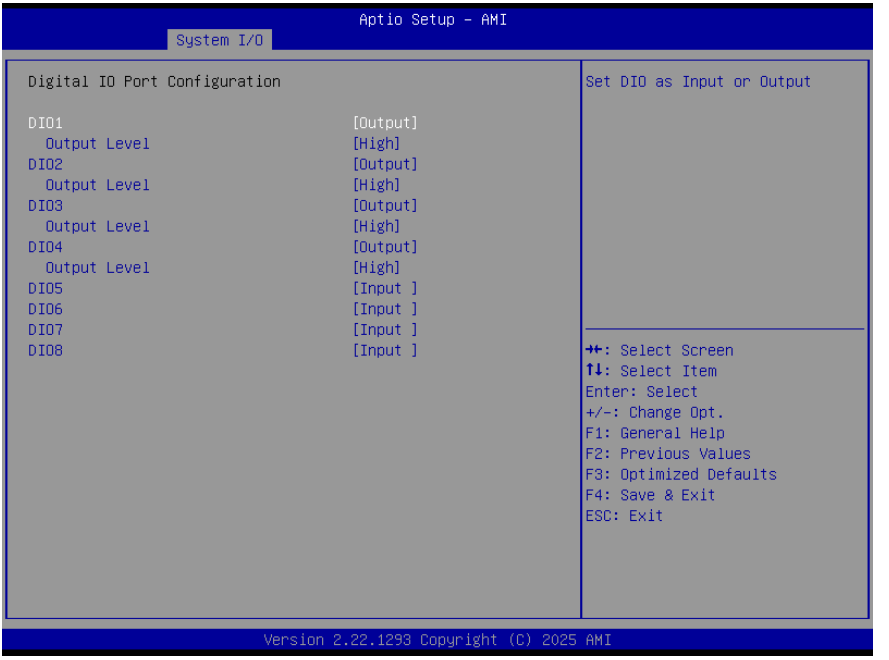
3.5.1.1 NVMe Configuration

3.5.2 HD Audio Configuration



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

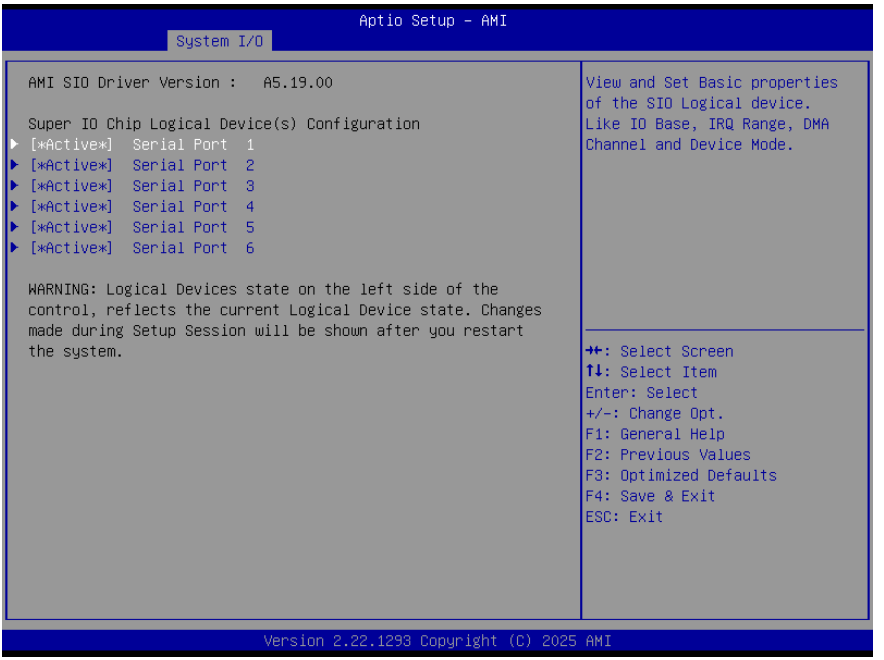
3.5.3 Digital IO Port Configuration



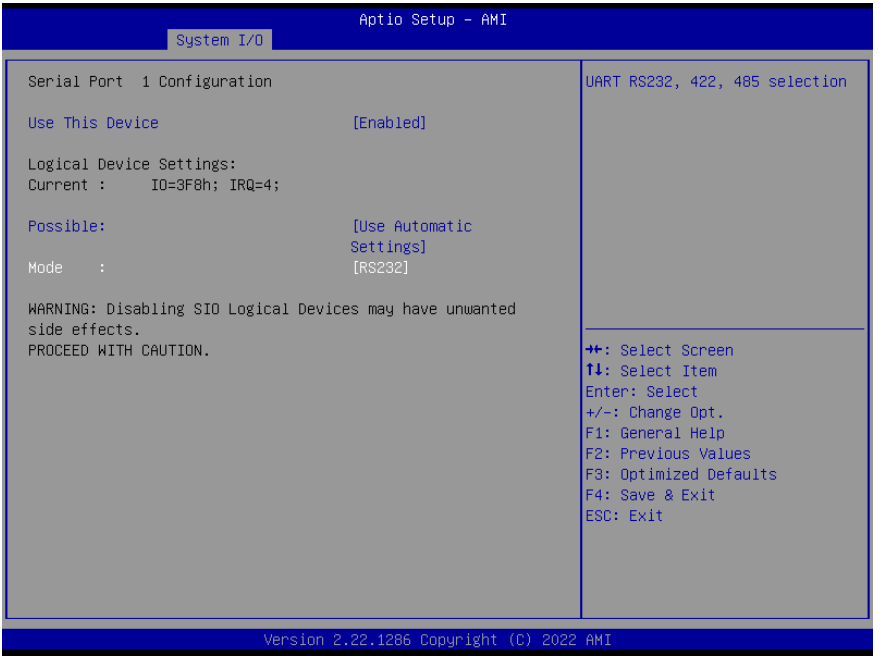
Options Summary		
DIO1	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output.		
DIO2	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output.		
Output Level	Low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

Options Summary		
Output Level	Low	
	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

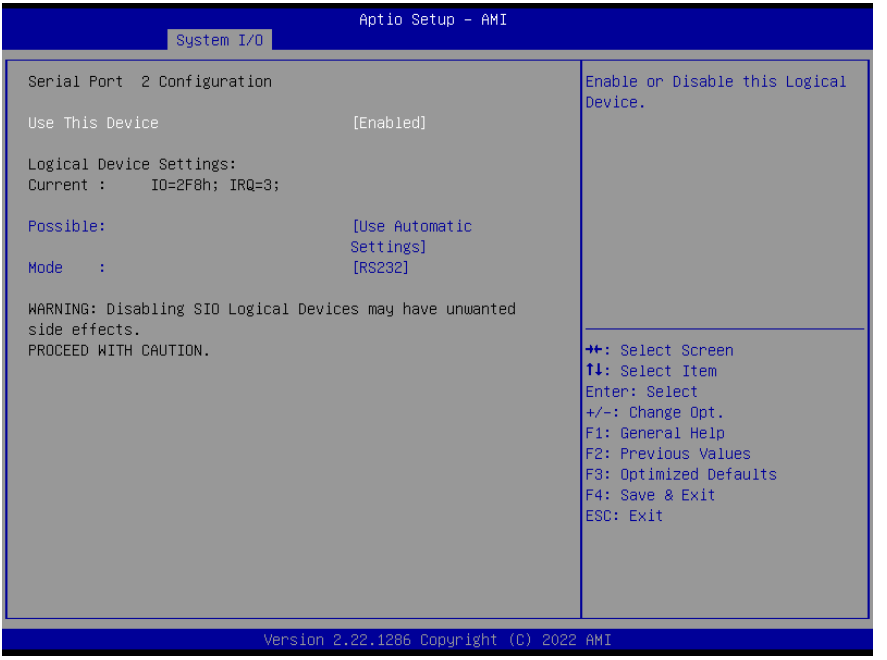


3.5.4.1 Serial Port 1



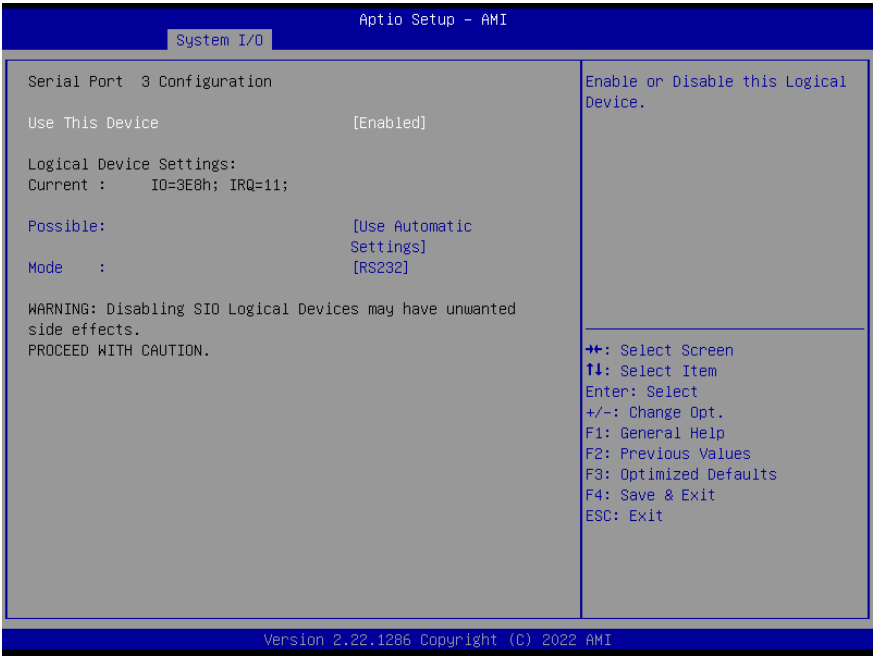
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Allows the user to change the device resource settings. New settings will 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



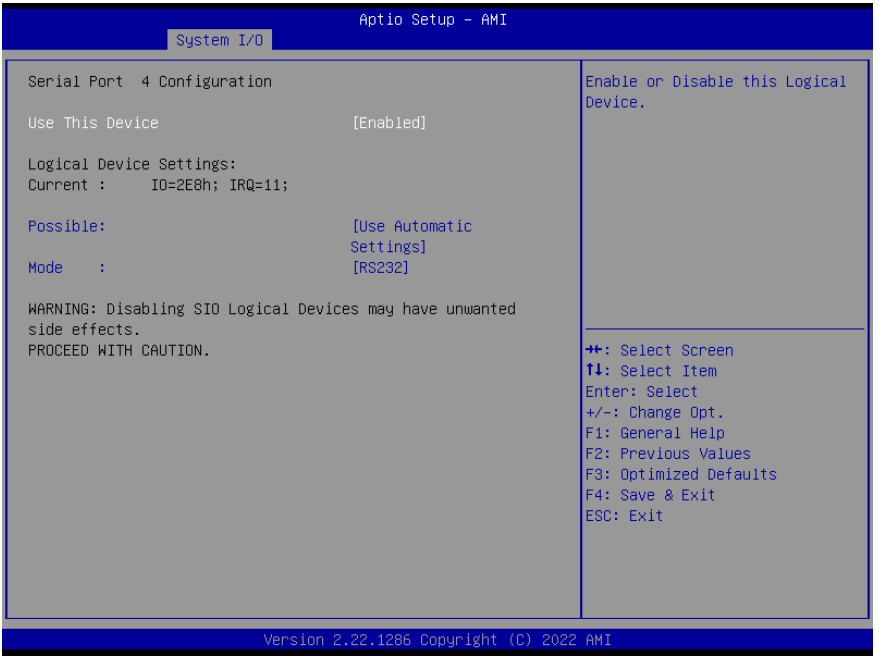
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Allows the user to change the device resource settings. New settings will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

3.5.4.3 Serial Port 3



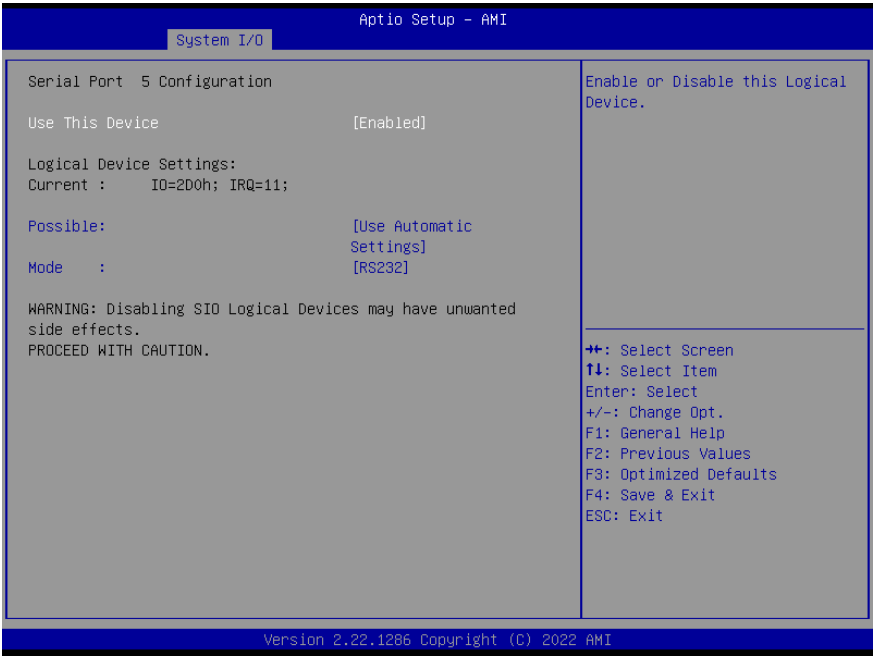
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3E8; IRQ=11;	
	IO=2E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection.		

3.5.4.4 Serial Port 4



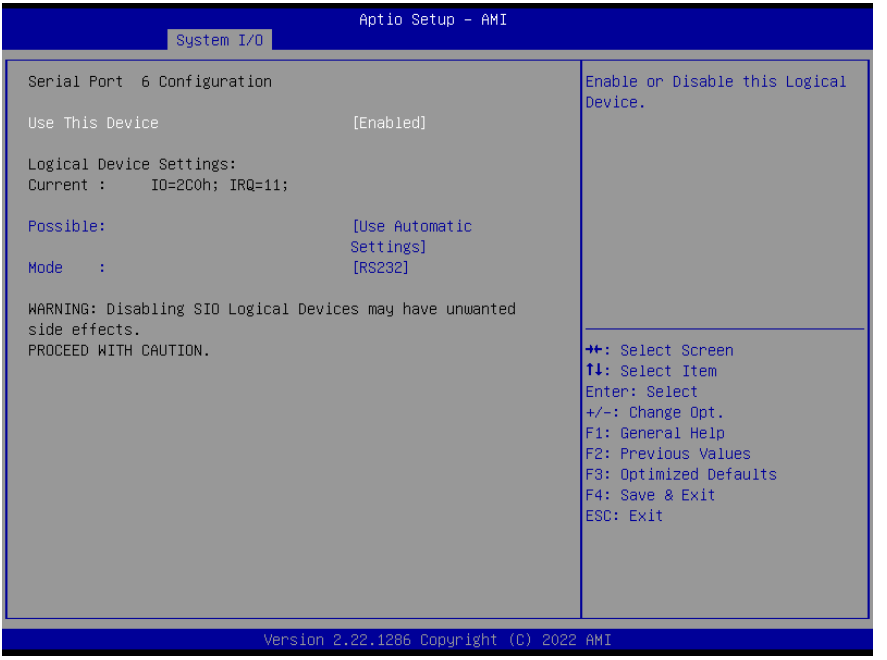
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection.		

3.5.4.5 Serial Port 5



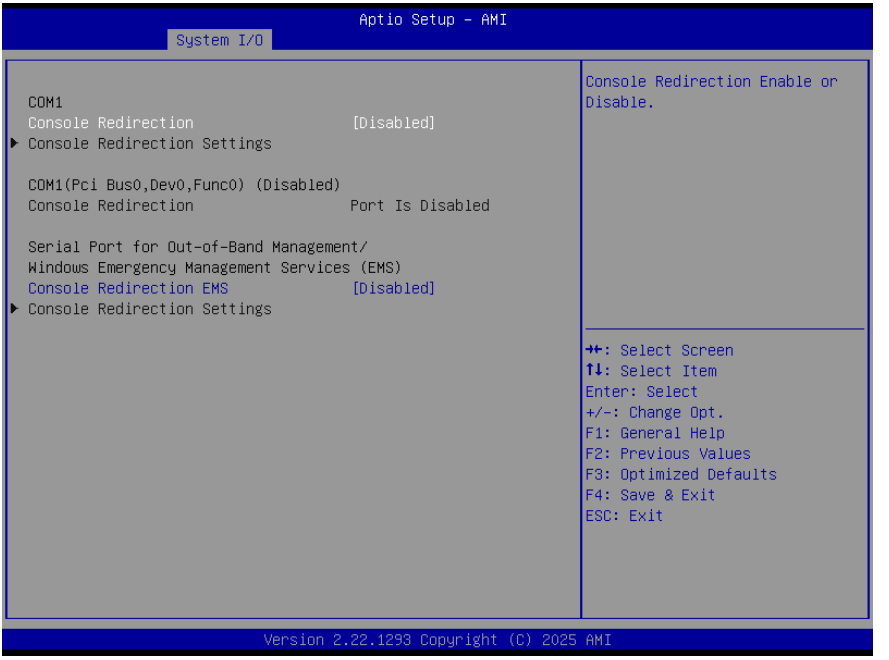
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2D0; IRQ=11;	
	IO=2C0; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection.		

3.5.4.6 Serial Port 6



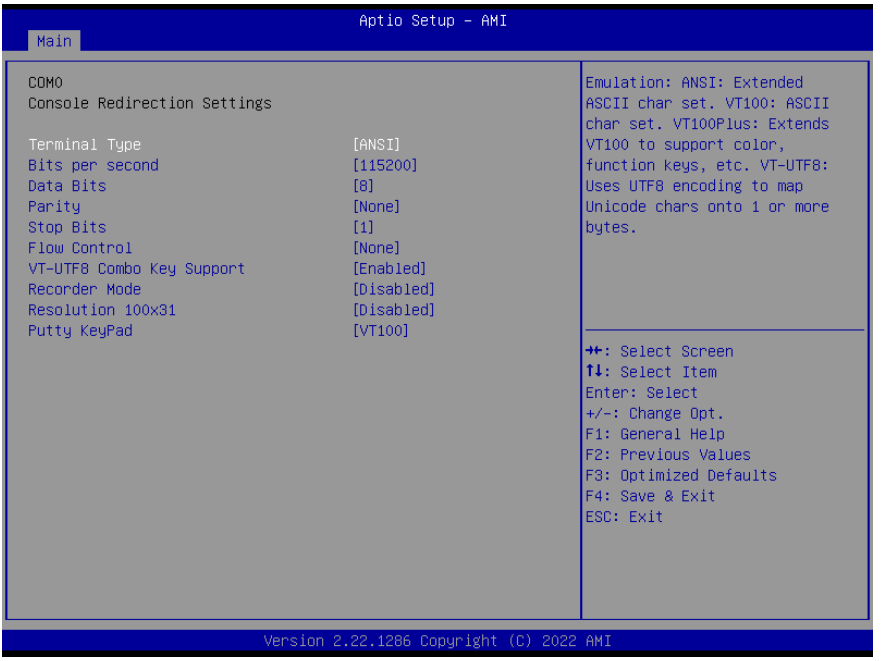
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2C0; IRQ=11;	
	IO=2D0; IRQ=11;	
Allows the user to change the device resource settings. New settings will 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.		

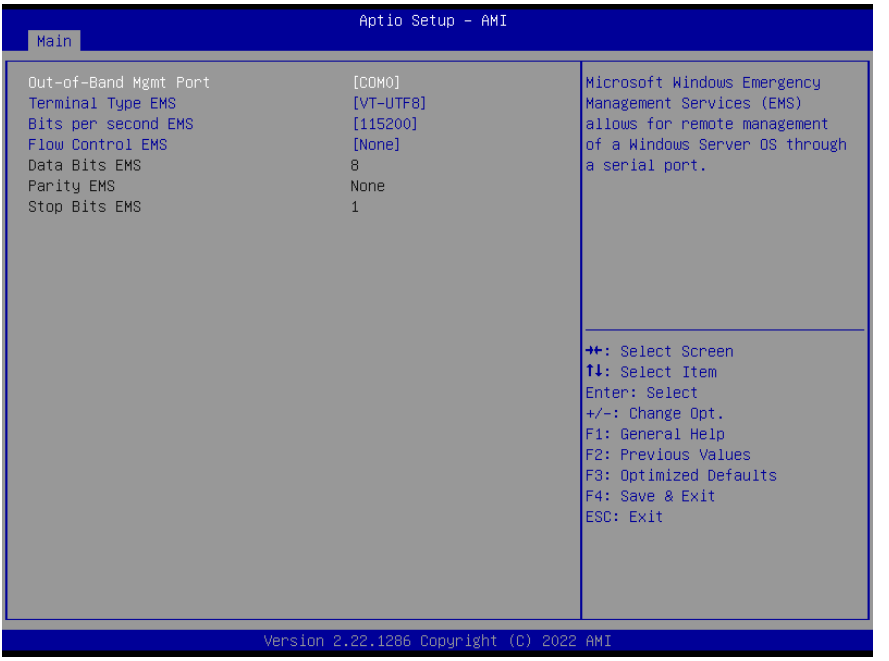
3.5.5.1 Console Redirection Settings (COM0)



Options Summary		
Terminal Type	VT100	
	VT100Plus	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation: ANSI: Extended ASCII char set. **VT100:** ASCII char set. **VT100Plus:** Extends VT100 to support color, function keys, etc. **VT-UTF8:** Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.		
Bits per second	9600	
	19200	
	38400	
	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.		

Options Summary		
Data Bits	7	
	8	Optimal Default, Failsafe Default
Data Bits.		
Parity	None	Optimal Default, Failsafe Default
	Even	
	Odd	
	Mark	
	Space	
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity: do not allow for error detection. They can be used as an additional data bit.		
Stop Bits	1	Optimal Default, Failsafe Default
	2	
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.		
Flow Control	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.		
VT-UTF8 Combo Key Support	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.		
Recorder Mode	Disabled	Optimal Default, Failsafe Default
	Enabled	
With this mode enabled only text will be sent. This is to capture Terminal data.		
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.		

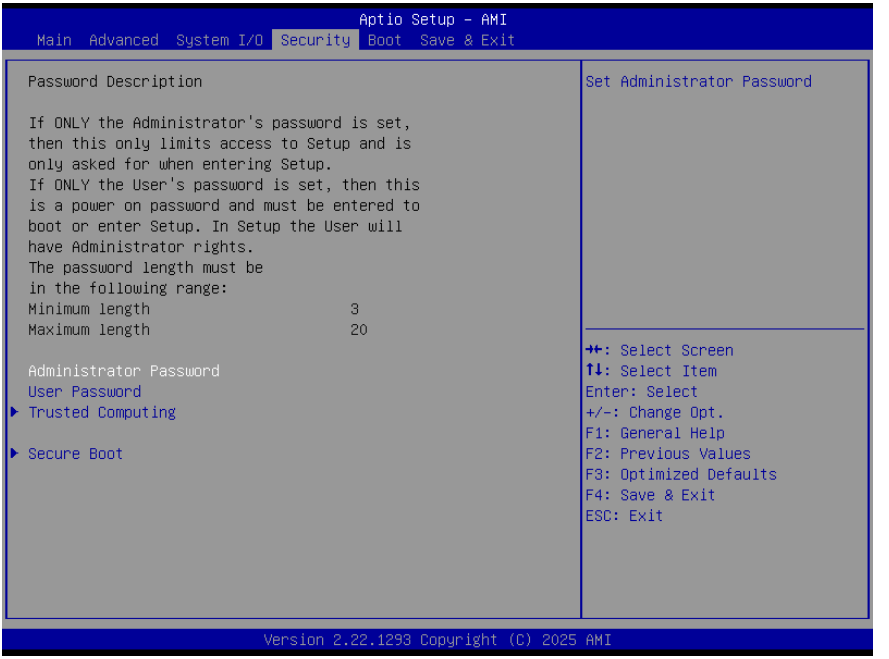
3.5.5.2 Console Redirection Settings (Out-of-Band Mgmt)



Options Summary		
Out-of-Band Mgmt Port	COM0	Optimal Default, Failsafe Default
	COM1(Pci Bus0, Dev0, Func0) (Disabled)	
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.		
Terminal Type EMS	VT100	
	VT100Plus	
	VT-UTF8	Optimal Default, Failsafe Default
	ANSI	
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is **VT100+** and then **VT100**. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.		

Options Summary		
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 can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/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

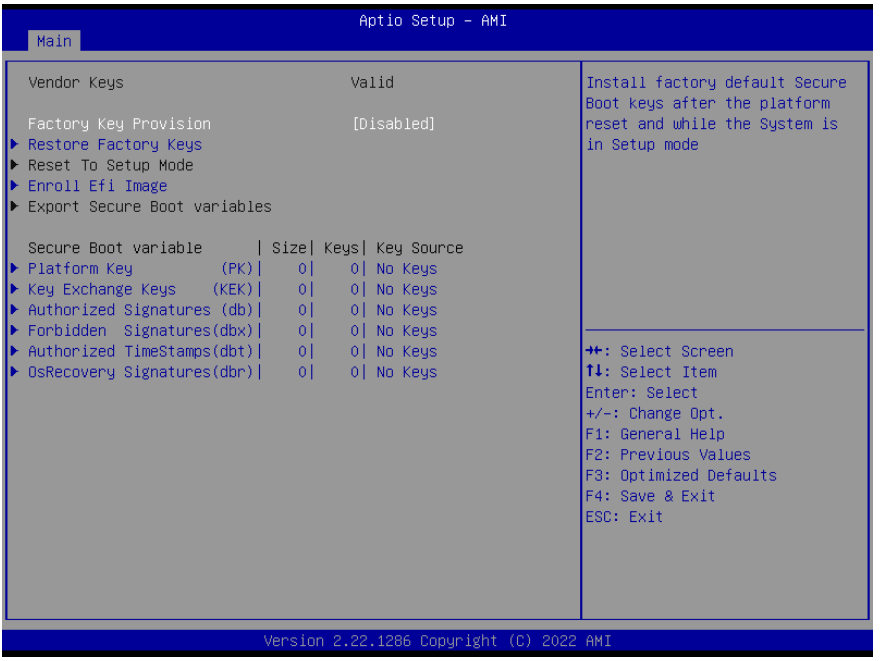
Options Summary		
Security Device Support	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA256 PCR Bank	Disabled	
	Enabled	Optimal Default, Failsafe 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.		

Options Summary		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
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 1.2 will restrict support to TPM 1.2 devices. **TPM 2.0** will restrict support to TPM 2.0 devices. **Auto** will support both with the default set to TPM 2.0 devices if not found. **TPM 1.2** devices will be enumerated.		

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 after the platform reset and while the System is in Setup mode.		
Restore Factory Keys	Yes	
	No	
Force System to User Mode. Install factory default Secure Boot key databases.		
Enroll Efi Image		
Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).		
Platform Key (PK)	Update	
Key Exchange Keys (KEK)	Update	
	Append	
Authorized Signatures (db)	Update	
	Append	

Options Summary		
Forbidden Signatures (dbx)	Update	
	Append	
Authorized TimeStamps (dbt)	Update	
	Append	
OsRecovery Signatures (dbr)	Update	
	Append	

Enroll Factory Defaults or load certificates from a file:

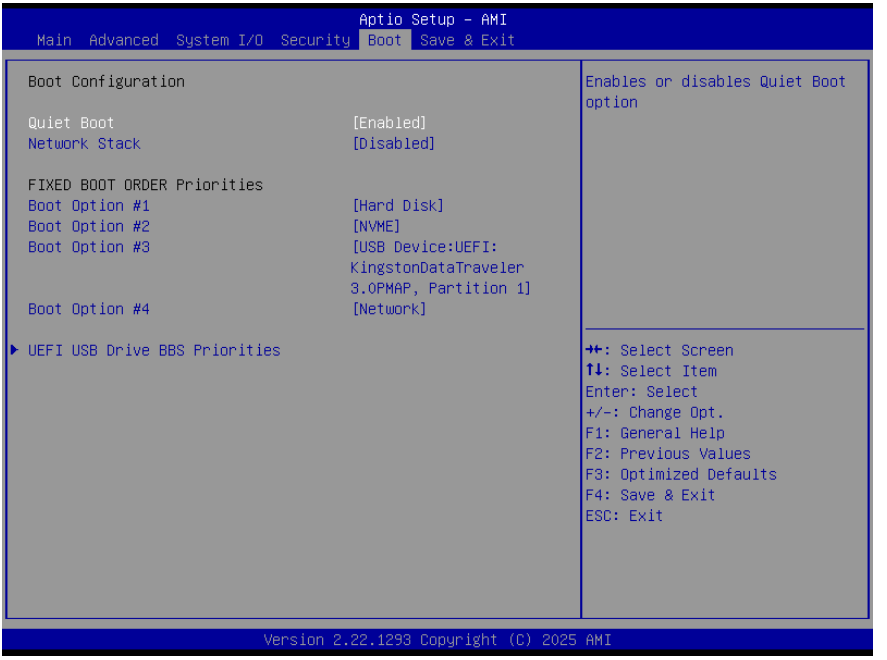
1. Public Key Certificate:
   a) EFI_SIGNATURE_LIST
   b) EFI_CERT_X509 (DER)
   c) EFI_CERT_RSA2048 (bin)
   d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image (SHA256)

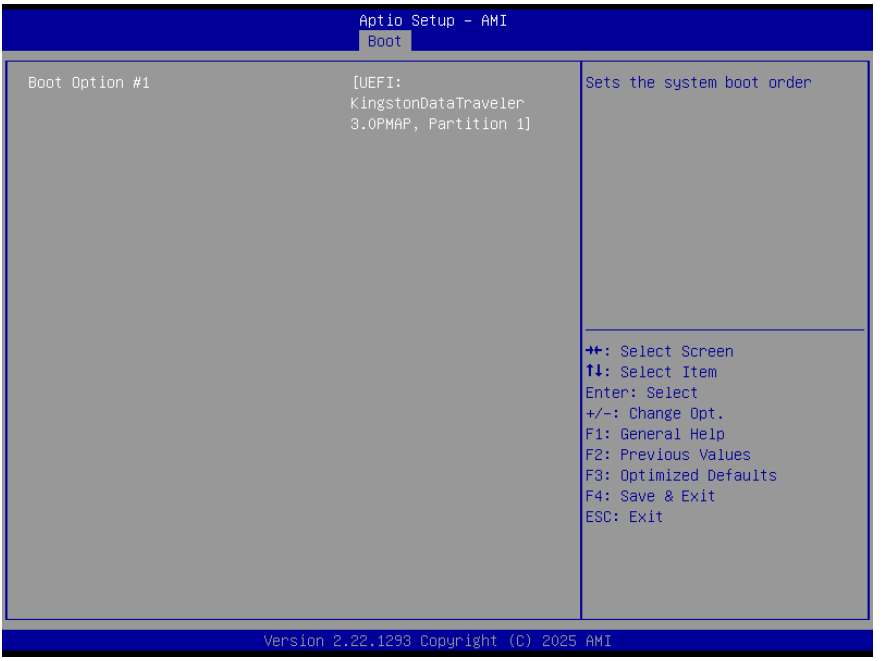
4. Key Source: Factory, External, Mixed.

3.7 Setup Submenu: Boot



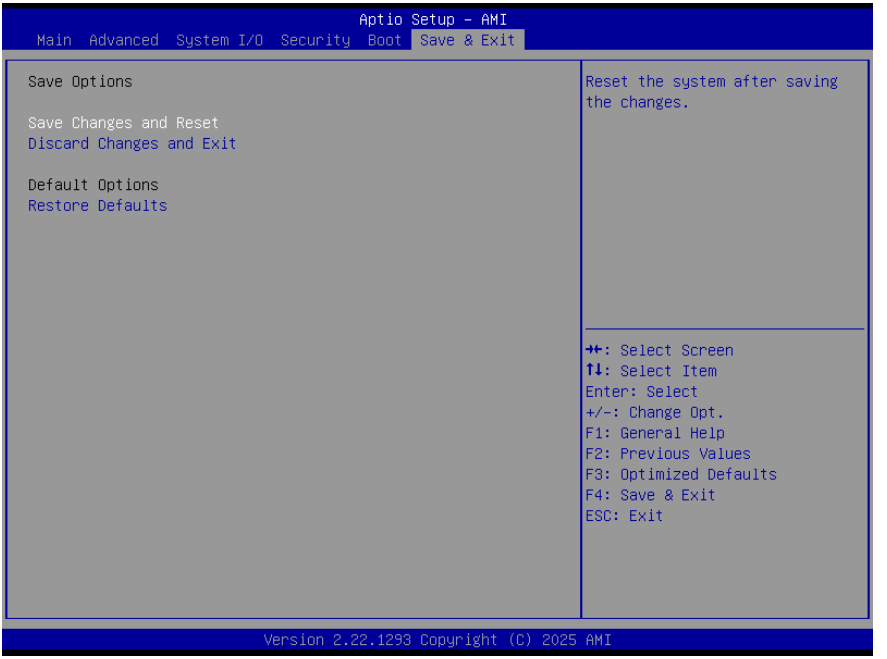
Options Summary		
Quiet Boot	Disabled	
	Enabled	Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	Default
	Enabled	
Enable/Disable UEFI Network Stack.		
Boot Option #1	Hard Disk	
Boot Option #2	NVME	
Boot Option #3	USB Device	
Boot Option #4	Network	
Sets the system boot order.		

3.7.1 UEFI BBS Priorities



Options Summary		
Quiet Boot	Disabled	
	Enabled	Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	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.		

3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

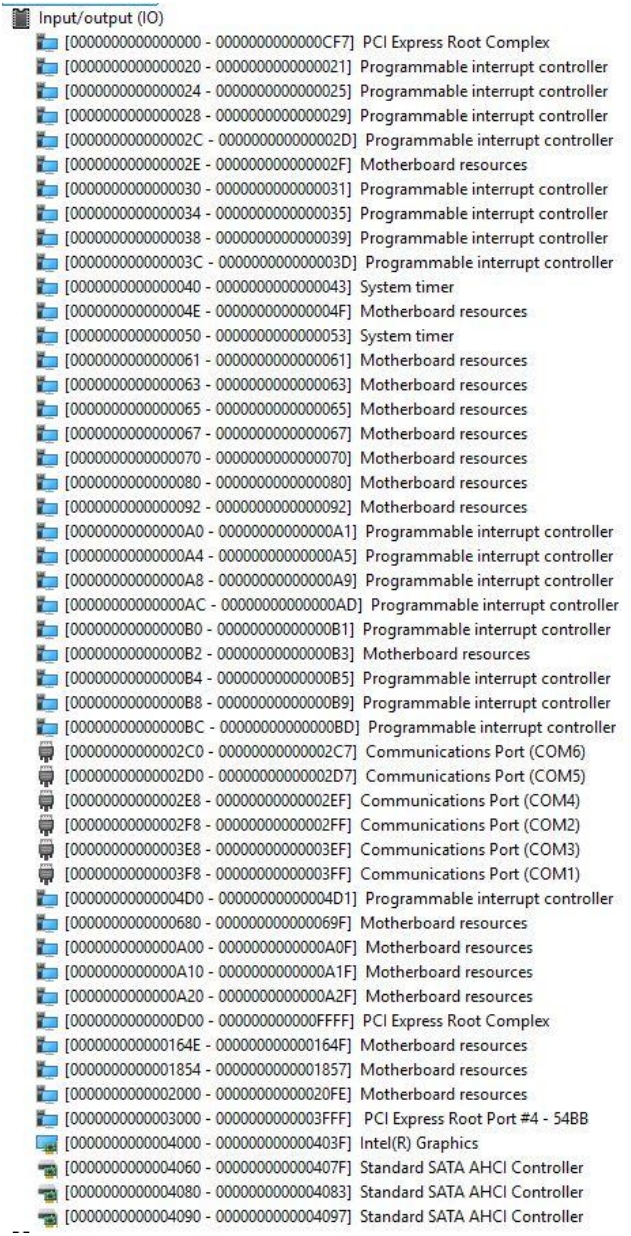
Drivers for the BOXER-6619-TWL can be downloaded from the product page on the AAEON website by following this link:

https://www.aaeon.com/en/product/detail/compact-fanless-box-pc-solutions-boxer-6619-twl/download

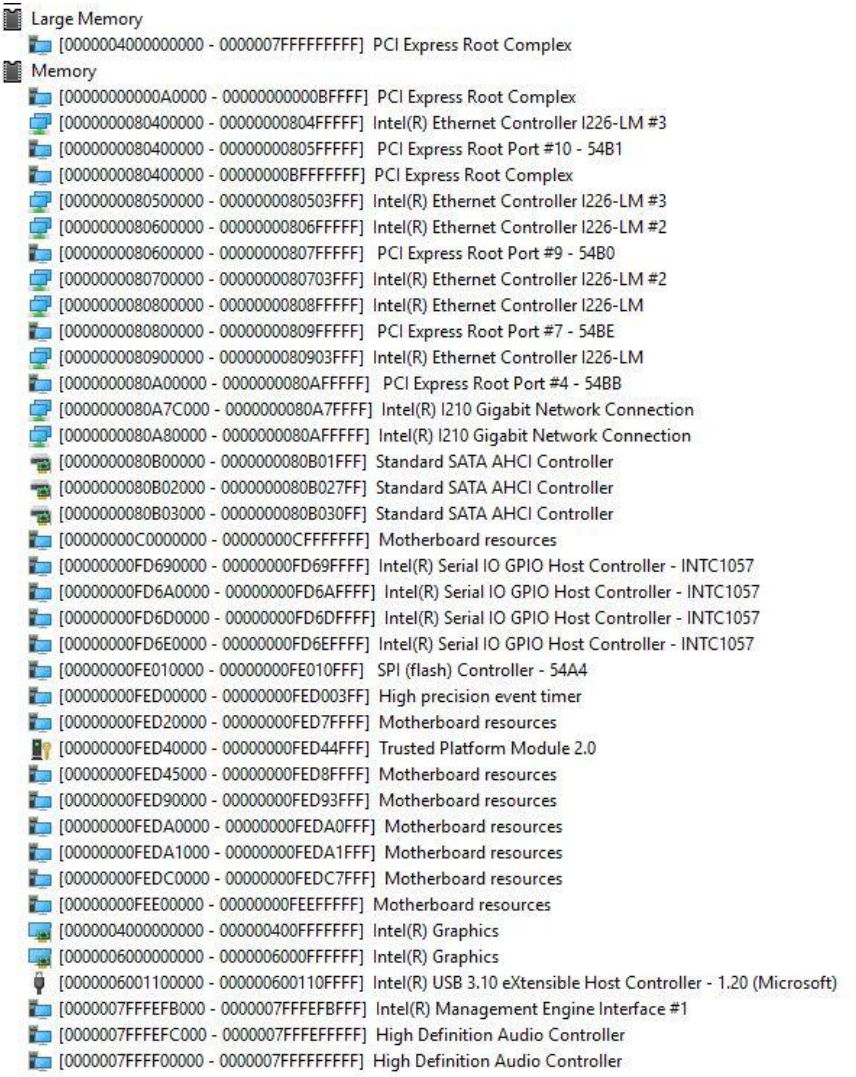
Appendix A

I/O Information

A.1 I/O Address Map



A.2 Memory Address Map



A.3 IRQ Mapping Chart