FWS-7851

Rackmount Network Appliance

User's Manual 1st Ed

Last Updated: January 31, 2024

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Packing List

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

Item	Quantity
● FWS-7851	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. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. 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.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. 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.

18. 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

19. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.

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.

产品中有毒有害物质或元素名称及含量

AAEON System QO4-381 Rev.A0

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。

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)

Hazardous and Toxic Materials List

AAEON System QO4-381 Rev.A0

Component Name	Hazardous or Toxic Materials or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBBs)	Polybrominated diphenyl ethers (PBDEs)
PCB and Components	X	O	O	O	O	O
Wires & Connectors for Ext.Connections	X	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU & RAM	X	O	O	O	O	O
HDD Drive	X	O	O	O	O	O
LCD Module	X	X	O	O	O	O
Optical Drive	X	O	O	O	O	O
Touch Control Module	X	O	O	O	O	O
PSU	X	O	O	O	O	O
Battery	X	O	O	O	O	O

This form is prepared in compliance with the provisions of SJ/T 11364.

O: The level of toxic or hazardous materials present in this component and its parts is below the limit specified by GB/T 26572.

X: The level of toxic of hazardous materials present in the component exceed the limits specified by GB/T 26572, but is still in compliance with EU Directive 2011/65/EU (RoHS 2).

Notes:

1. The Environment Friendly Use Period indicated by labelling on this product is applicable only to use under normal conditions.
2. Individual components including the CPU, RAM/memory, HDD, optical drive, and PSU are optional.
3. LCD Module and Touch Control Module only applies to certain products which feature these components.

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Chapter 1

Product Specifications

1.1 Specifications

System	
Form Factor	1U Rackmount Network Appliance
Processor	12th/13th Generation Intel® Core™ Processors
Chipset	Intel® W680 Chipset (Project Base: Intel® Q670/H610)
System Memory	DDR5 SODIMM Slot x 2

Network	
Ethernet	Intel® I226-V 2.5GbE RJ-45 x 10 (Including 2 pairs Bypass) + Intel® I210-IS GbE SFP x 2 Optional: 10GbE SFP+ x 2 (PCIe[x4] via PER-T639) Note: Intel® H610 Chipset SKU limited to 2.5GbE RJ-45 x 8
Bypass	2 Pairs LAN Bypass 3.1 (LAN 3-4, LAN 5-6)
NIM Slot	NIM Slot x 1, supports PCIe [x4] x 2 interface, optional PCIe [x8] x 1 by BOM SKU

Display	
Graphic Controller	-
Connector	HDMI x 1

Storage	
HDD	2.5" HDD x 2 (default) or 3.5" HDD x 1 (If no NIM module present)
CF/CFast/mSATA	-

Internal/Expansion Interface

PCIe Slot	-
Mini-PCIe Slot	M.2 2242 M-Key x 1 (PCIe [x4])
IPMI	-
Keyboard and Mouse	-
USB	USB 3.2 Gen 1 x 2

Miscellaneous

RTC	Internal RTC
Watchdog Timer	1 ~ 255
Software Button	1
TPM	TPM 2.0 SPI
GPIO	Internal pin header 8-bit Digital I/O interface (4-in/4-out)
Fan	System Fan x 2
MTBF (Hours)	TBD
Color	Black

Environmental Parameters and Dimension

Power Requirement	220W Power
Operating Temperature	32°F ~ 104°F (0°C ~ 40°C)
Storage Temperature	-4°F~ 140°F (-20°C ~ 60°C)
Operating Humidity	10% ~ 80% relative humidity, non-condensing
Storage Humidity	0% ~ 80% @40°C; non-condensing
Vibration	0.5 grms/ 5 ~ 500Hz / operation (2.5" Hard Disk Drive) 1.5 grms/ 5 ~ 500Hz / non-operation

Environmental Parameters and Dimension

Shock	10 G peak acceleration (11 m sec. duration), operation 20 G peak acceleration (11 m sec. duration), non-operation
Dimension (W x D x H)	16.93" x 7.87" x 1.73" (430mm x 200mm x 44mm)

I/O

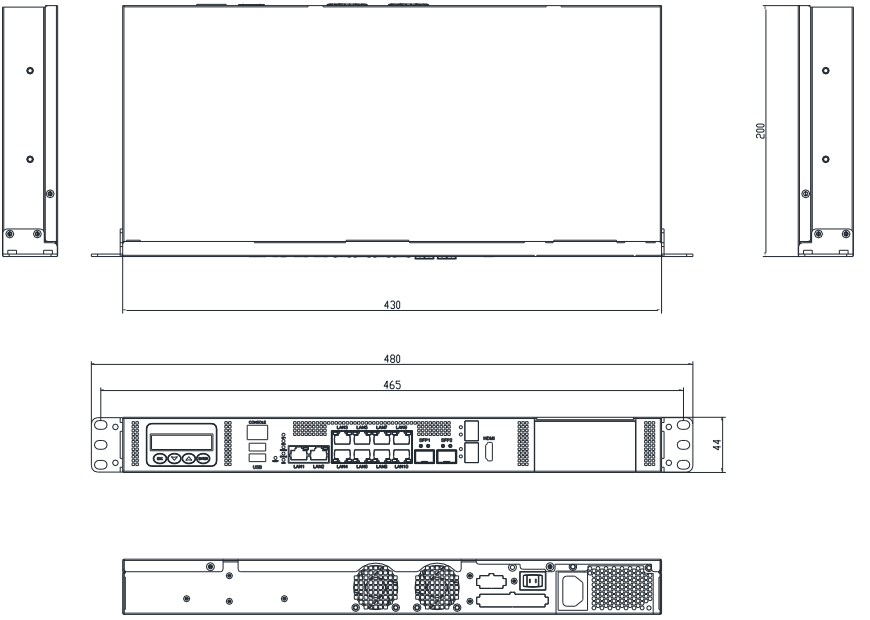
Front Panel	Intel® I226-V 2.5GbE RJ-45 x 10 (Including 2 pairs Bypass) + Intel® I210-IS GbE SFP x 2 (Optional: 10GbE SFP+ x 2 (PCIe[x4] via PER-T639) Power LED x 1 Status LED x 1 HDD Active LED x 1 USB 3.2 Gen 1 x 2 HDMI x 1 RJ-45 Console x 1 LCM Display with Keypad x 1 Software Programmable Button x 1 NIM Slot x 1
Rear Panel	AC Power Input x 1 Power Switch x 1

Chapter 2

Hardware Information

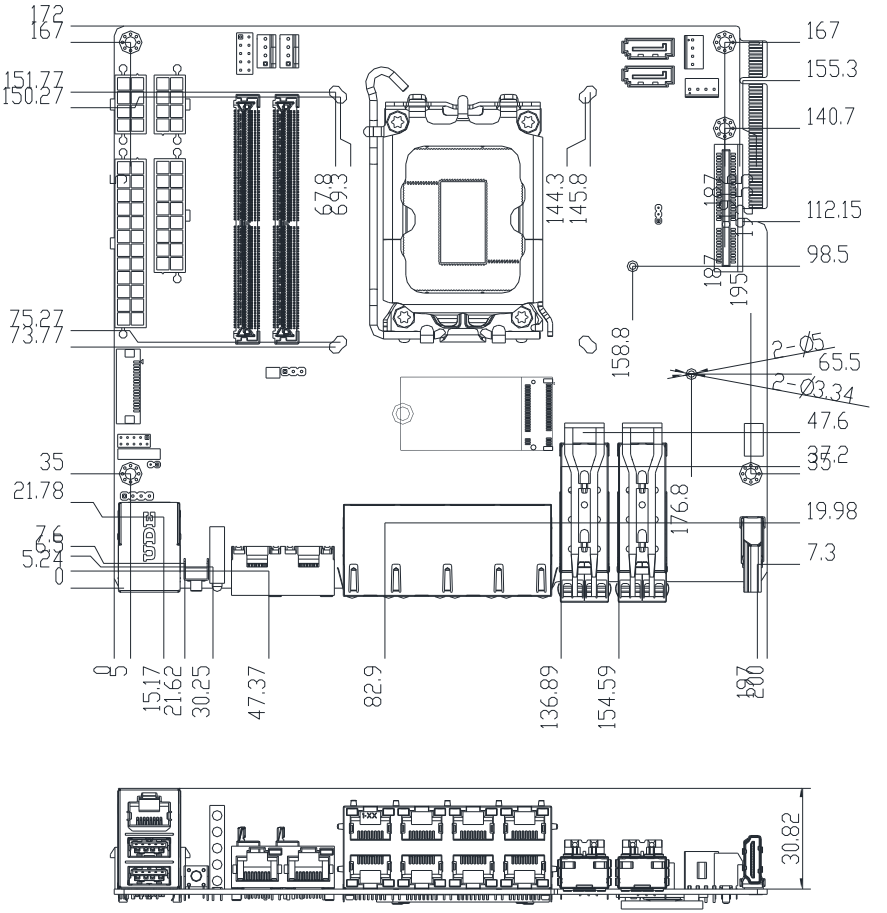
2.1 Dimensions

2.1.1 FWS-7851 System

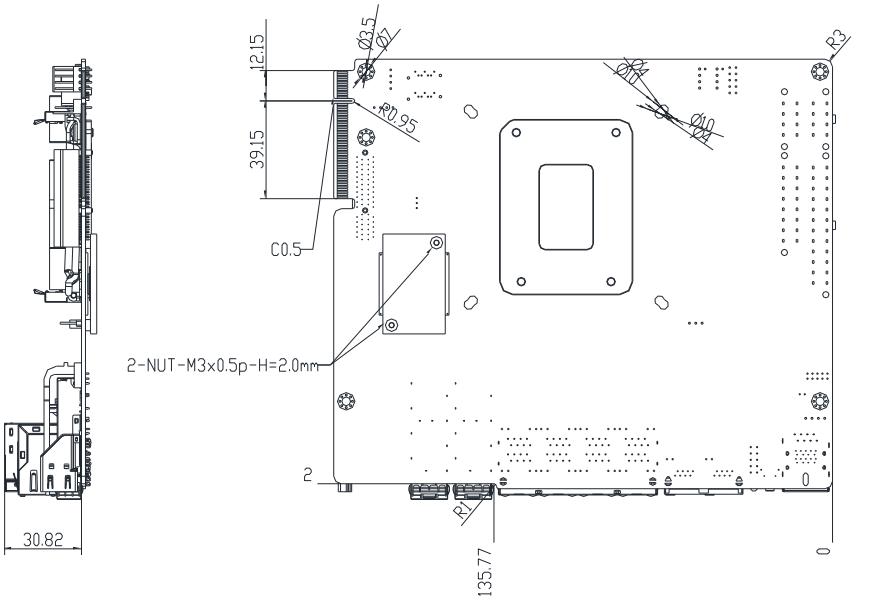


2.1.2 FWS-7851 Main Board

Component Side

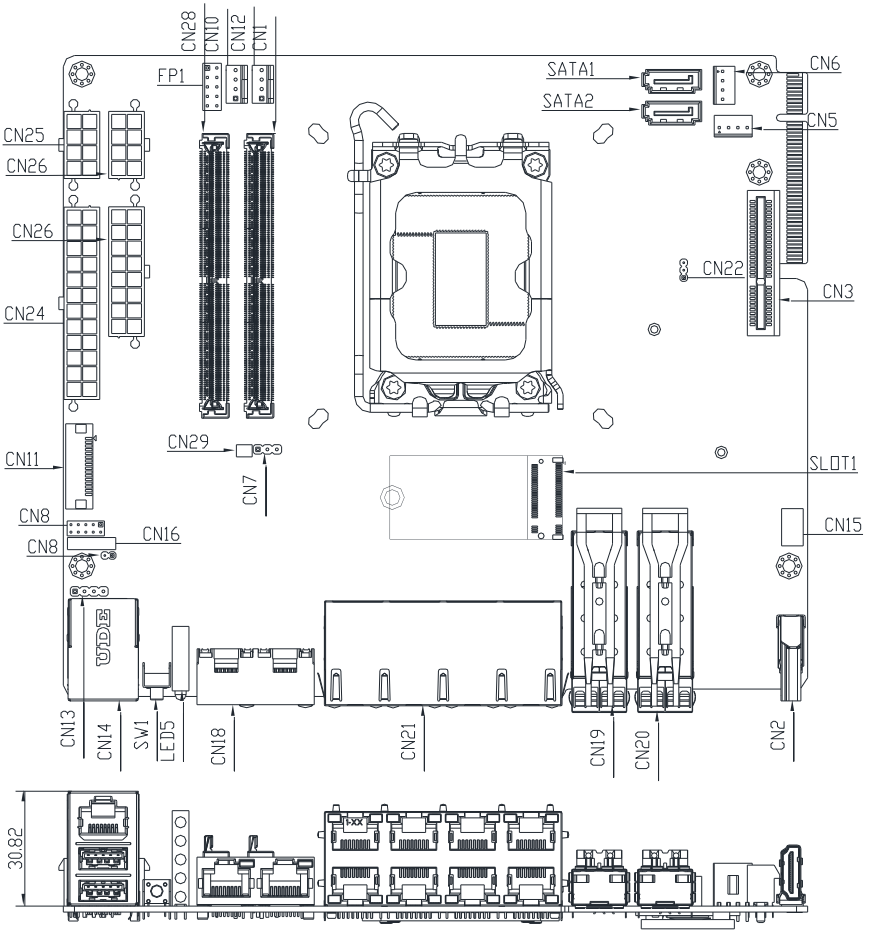


Main Board Solder Side

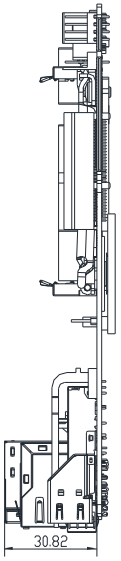


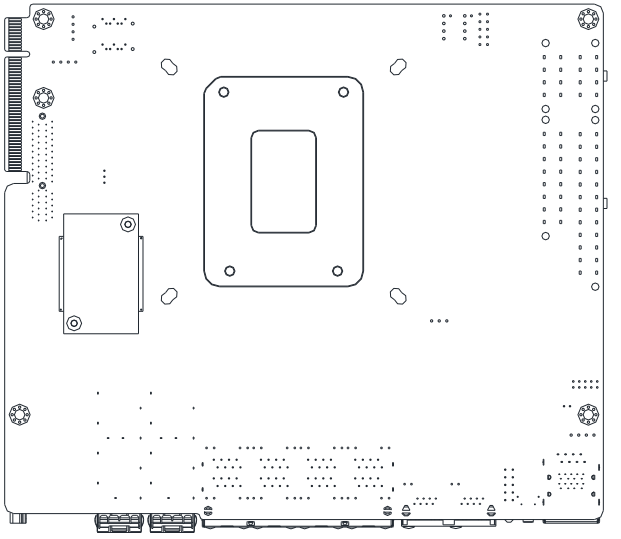
2.2 Jumpers and Connectors

Component Side



Solder Side



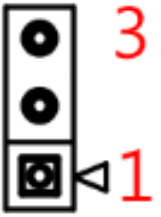


2.3 List of Jumpers

The FWS-7851 system board is equipped with a number of jumpers which can be configured for your application. This section details those jumpers and their settings.

Label	Function
CN7	Clear ME & Clear CMOS

2.3.1 Clear CMOS



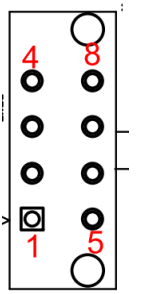
Normal	1-x
Clear CMOS	2-3
Clear ME	

2.4 List of Connectors

The FWS-7851 system board is equipped with a number of connectors which can be used for configuring your system and connecting with external modules. This section details those connectors and settings.

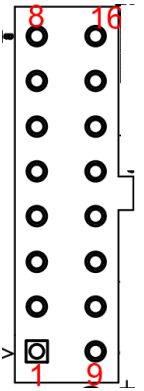
Label	Function
CN25/CN24	24+8-Pin STD ATX Connector
CN27/CN26	16+8-Pin ATX Connector (Special)
CN23	MCU Download Header
FP1	Front panel Header
CN10/12	4-Pin CPU Fan Header
CN39	Redundant Indicator LED Header
CN28/CN1	262-Pin DDR5 SODIMM Slot
CN11	LCM Connector
CN8	DIO Connector
CN16	9-Pin Serial Port Connector
CN13	4-Pin Keypad Header
CN14	Dual USB 3.0 + Single RJ-45 (Console) Connector
CN29	Battery Header
CN18	Dual RJ-45 Port
CN21	Octa RJ-45 Port
SLOT1	M.2 2242 M-Key Slot
M1/M2	SFP Connector
CN2	HDMI Connector
CN3	PCIe [x4] Slot
SATA1/SATA2	SATA Connector
CN5/CN6	SATA Power Connector
GF1	PCIe Gold Finger
SW1	SW Programable Button
LED5	LED Indicator LED (Bypass/PWR/SATA/Status)

2.4.1 8-Pin ATX Connector (CN27)



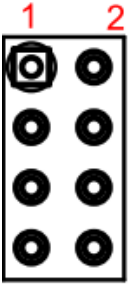
Pin	Net Name
1	GND
2	GND
3	GND
4	GND
5	+V12S_CPU_V2
6	+V12S_CPU_V2
7	+V12S_CPU_V2
8	+V12S_CPU_V2

2.4.2 16-Pin ATX Connector (CN27)



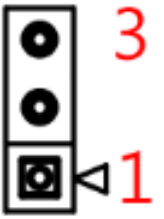
Pin	Net Name
1	+V5S_V2
2	GND
3	ATX_V2_PG
4	+V3P3S_V2
5	GND
6	ATX_V2_PSON#
7	+5VSB_V2
8	-V12S_V2
9	+V5S_V2
10	+V5S_V2
11	+V3P3S_V2
12	+V3P3S_V2
13	GND
14	GND
15	+V12S_V2
16	+V12S_V2

2.4.3 Front Panel Header (FP1)



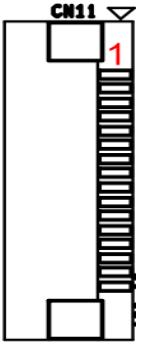
Pin	Net Name
1	PWR_Button+
2	PWR_Button-
3	HW_RESET+
4	HW_RESET-
5	PWRLED+
6	PWRLED-
7	SATALED+
8	SATALED-

2.4.4 Redundant Indicator LED Header (CN39)



Pin	Net Name
1	V1LED#
2	+3.3VDUAL
3	V2LED#

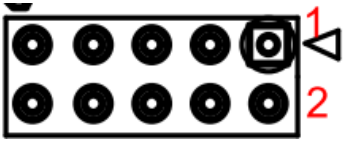
2.4.5 LCM Connector (CN11)



Pin	Net Name
1	LCM_GND
2	LCM_VCC
3	LCM_VEE

Pin	Net Name
4	SLIN-
5	INIT-
6	AFD-
7	PTD0
8	PTD1
9	PTD2
10	PTD3
11	PTD4
12	PTD5
13	PTD6
14	PTD7
15	+V5S
16	LCM_LCD-
17	
18	

2.4.6 DIO Connector (CN8)



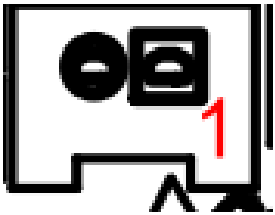
Pin	Net Name
1	DII1
2	DIO1
3	DII2
4	DIO2
5	DII3

Pin	Net Name
6	DIO3
7	DII4
8	DIO4
9	+V5S
10	GND

2.4.7 9-Pin Serial Port Connector (CN16)

Pin	Net Name
1	DCD2
2	DSR2
3	RXD2
4	RTS2
5	TXD2
6	CTS2
7	DTR2
8	RI2
9	GND

2.4.8 Battery Header (CN29)

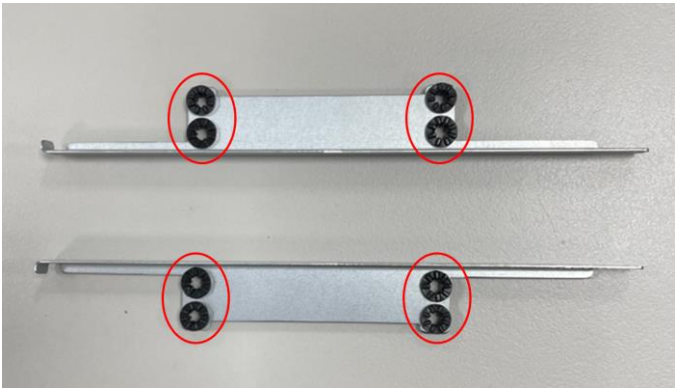


Pin	Net Name
1	BAT+
2	BAT-

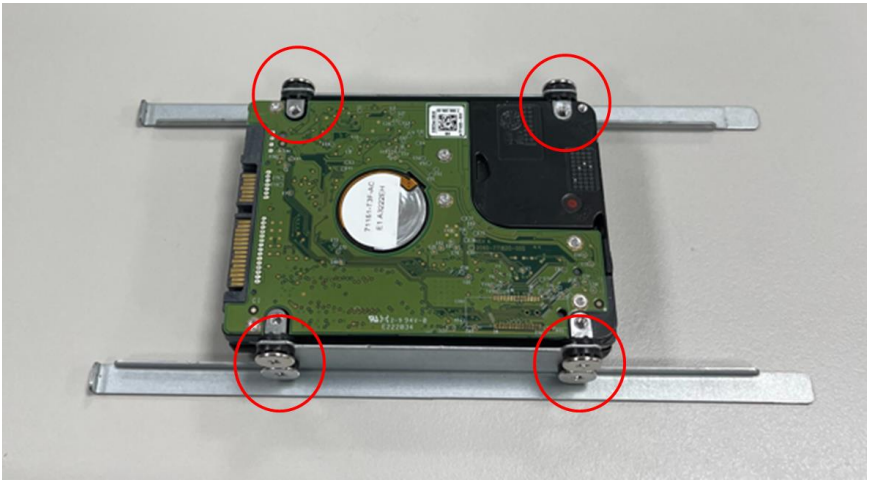
2.5 2.5″ HDD Installation

Step 1: Unscrew the upper lid of the chassis.

Step 2: Place the bracket cushions on the drive brackets as shown.



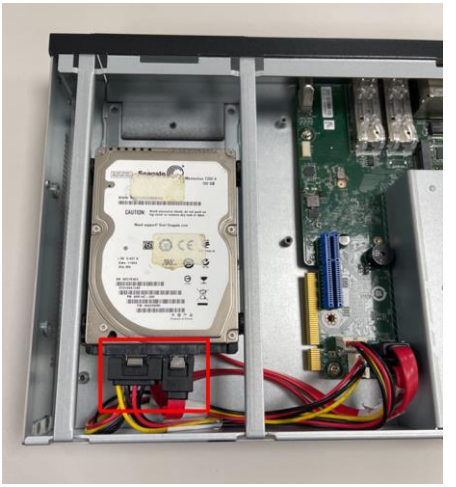
Step 3: Affix the HDD to the cushions using the eight (8) screws.



Step 4: Connect the SATA cable and power cable into the main board.

Step 5: Put hard drive bracket on the chassis.

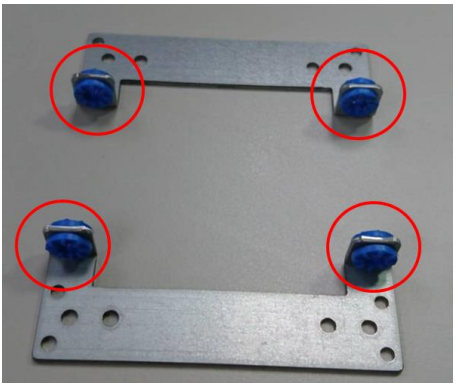
Step 6: Connect the SATA cable and power cable to the Hard Disk.



2.6 3.5″ HDD Installation

Step 1: Unscrew the upper lid of the chassis.

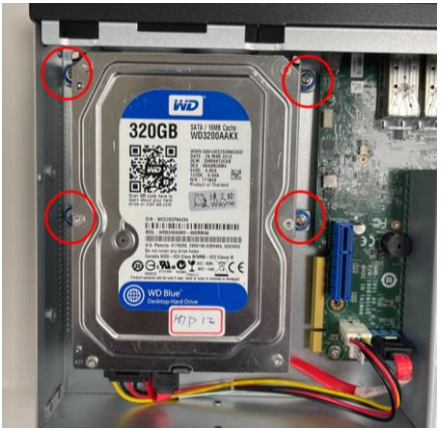
Step 2: Put assembled cushions on the hard disk drive bracket.



Step 3: Affix the HDD to the cushions using the four (4) screws.

Step 4: Connect the SATA cable and power cable into the Hard Disk.

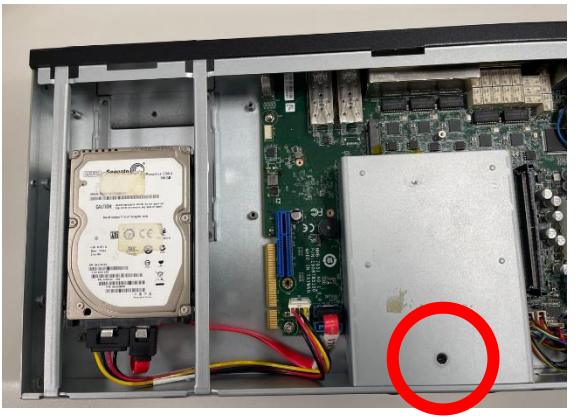
Step 5: Affix the hard drive bracket to the chassis with four (4) screws.



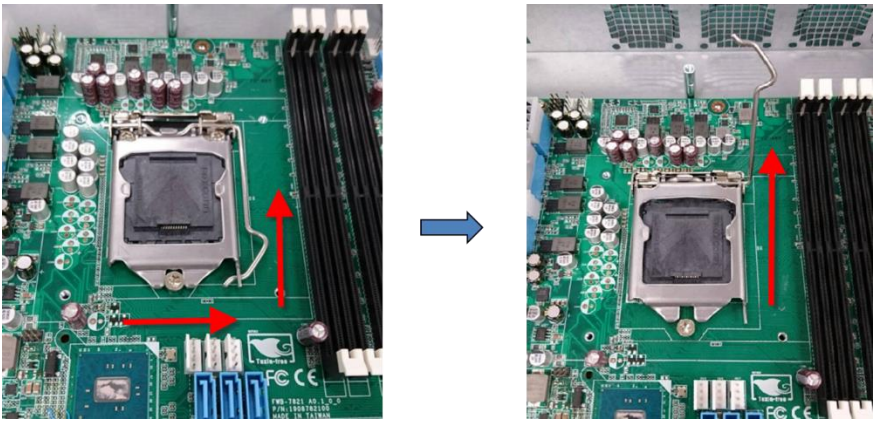
2.7 CPU & Heatsink Installation

This section details the steps of how to install the CPU and heatsink for the FWS-7851. Before beginning installation make sure the system is powered down and the power sources are disconnected. Make sure you have your CPU and heatsink ready to install.

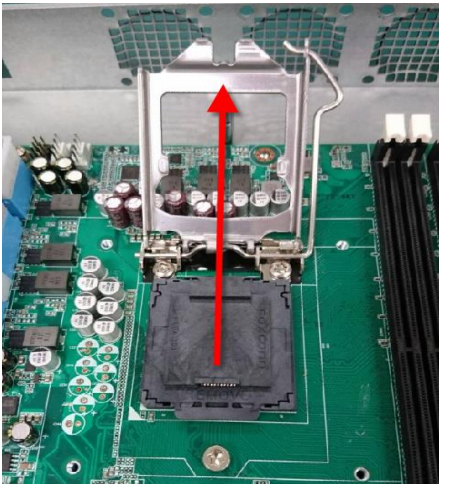
Step 1: Loosen the screw and remove the fan duct.



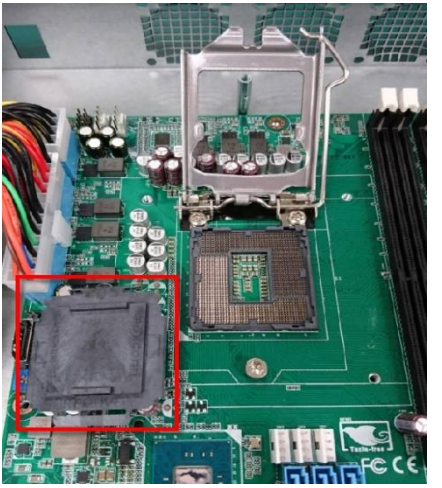
Step 2: Release the lock pole of the CPU bracket.



Step 3: Lift up the CPU bracket.

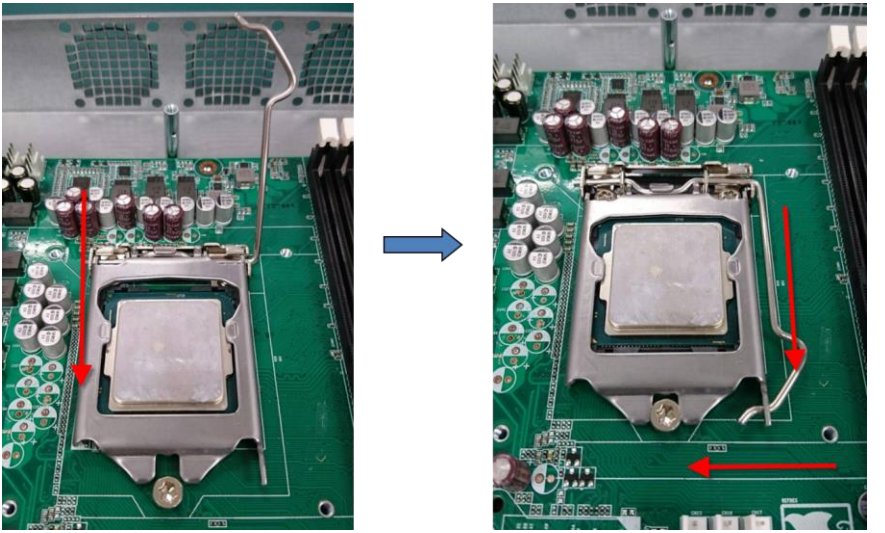


Step 4: Lift up the CPU cover.

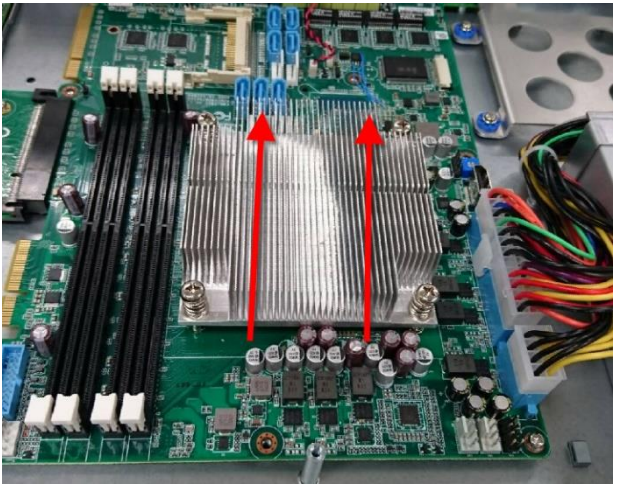


Step 5: Place the CPU to the socket and have the two fillister planes locked properly

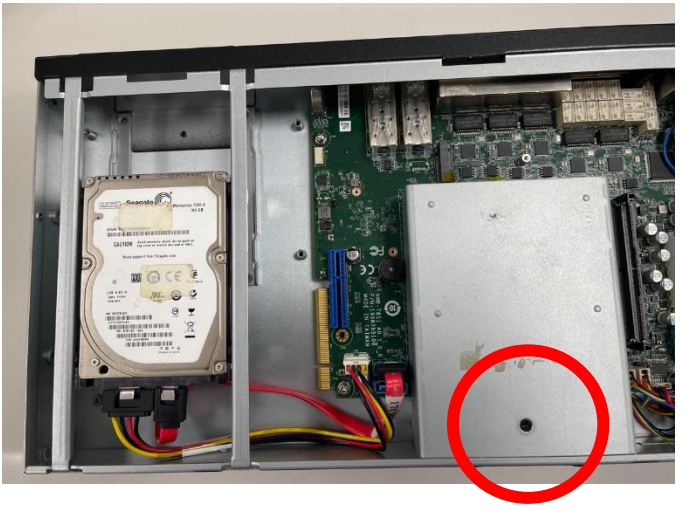
Step 6: Close the CPU bracket and lock the pole to the position.



Step 7: Cover the Heatsink on the CPU and ensure the direction of the Heatsink is not against the airflow.



Step 8: Fasten the screw to lock the air duct



2.8 Installing NIM Modules

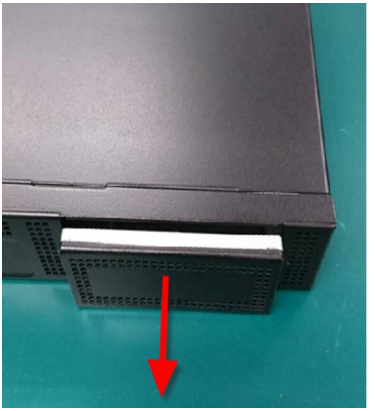
This section details the steps of how to install NIM module for the FWS-7851. This applies for new installation, or removal/replacement of modules. Before beginning installation make sure the system is powered down and the power sources are disconnected.

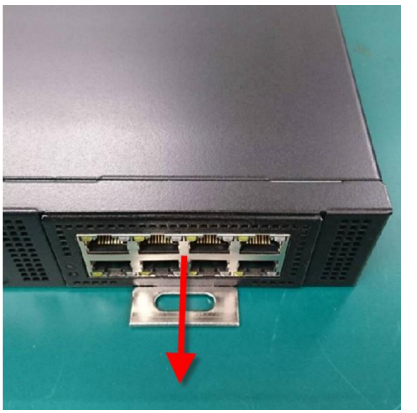
Step 1: Loosen the retaining screw on the bottom of the chassis.

No NIM Module

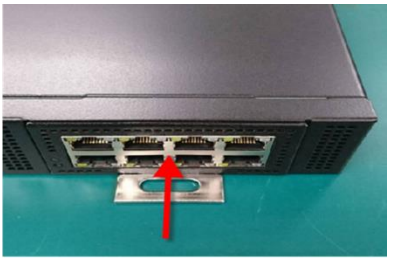
Replacing NIM Module

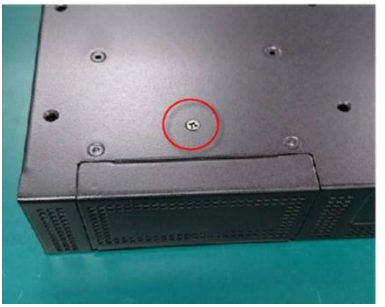
Step 2: Remove the null module cover or existing LAN module.





Step 3: Insert the new NIM Module (or cover) and secure with a screw on the bottom of the chassis.

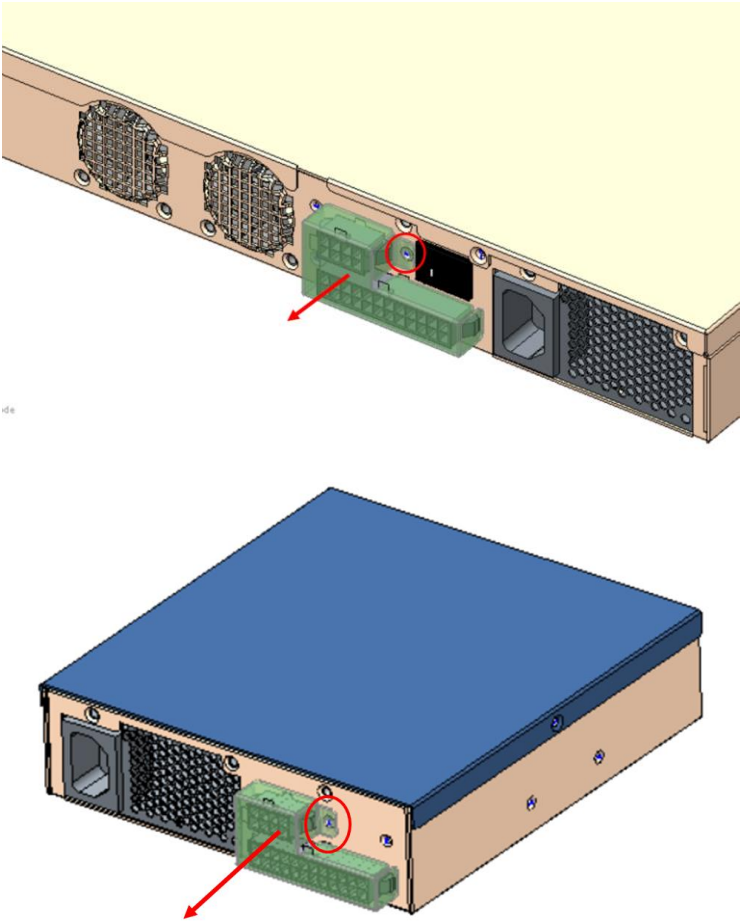




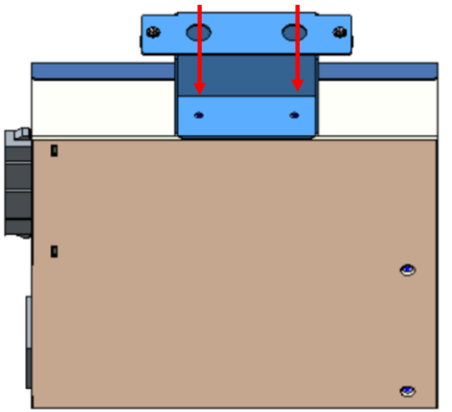
2.9 Redundant PSU Kit Installation

This section details the steps of how to install the Redundant PSU Kit for the FWS-7840. Before beginning installation make sure the system is powered down and the power sources are disconnected.

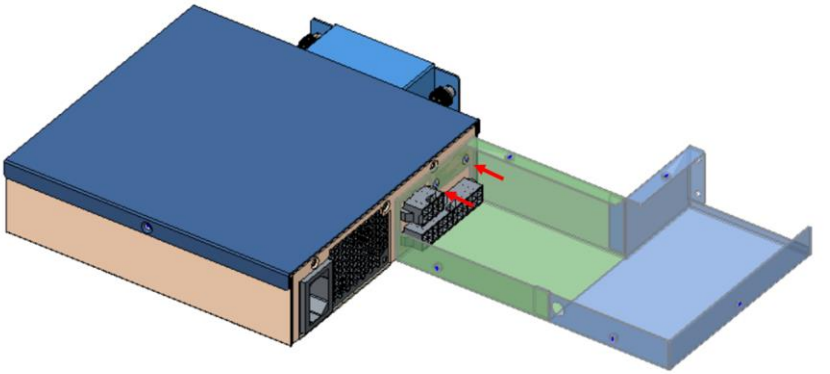
Step 1: Unscrew and remove the cover on both sides of the chassis.



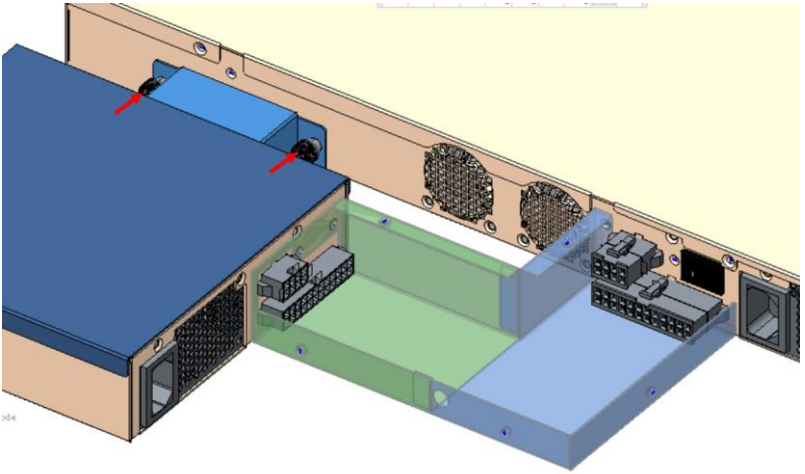
Step 2: Affix the PSU Bridge Bracket to the PSU bot case using two (2) screws.



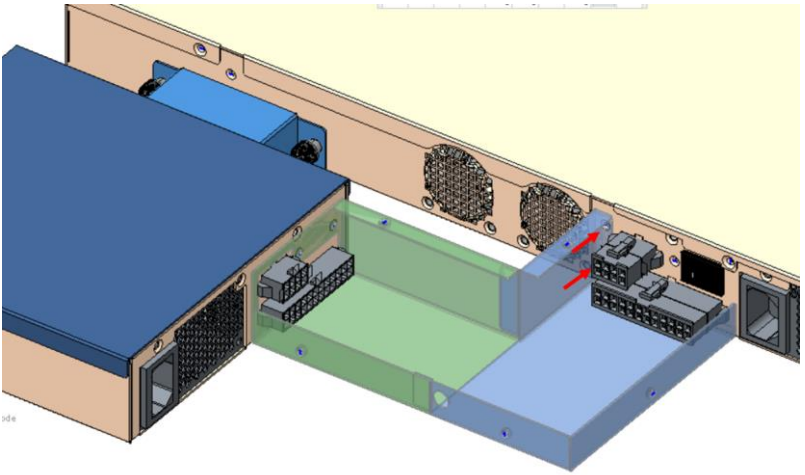
Step 3: Lock the ATX Cable Cover-Bot on the PSU BOT case with two (2) screws.



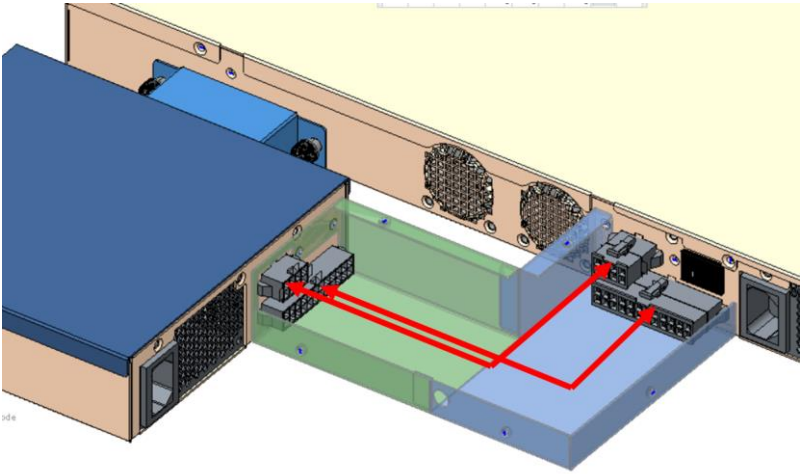
Step 4: Affix the PSU Bridge Bracket to the bot case with two (2) screws.



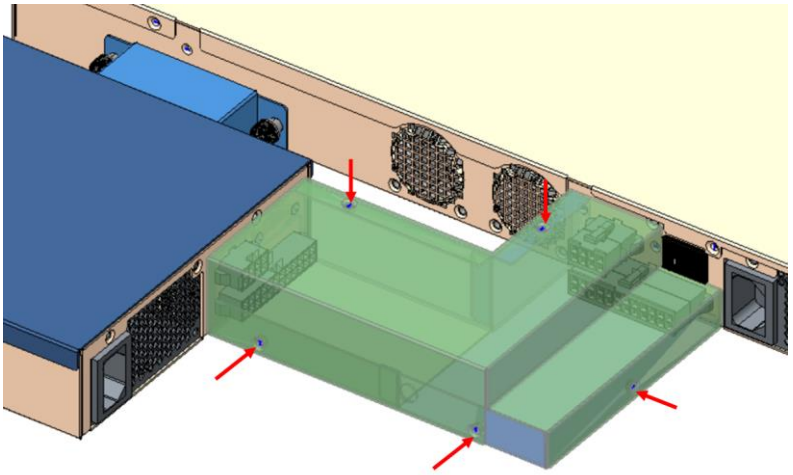
Step 5: Affix the ATX Cable Cover-Bot to the bot case with two (2) screws.



Step 6: Connect the 24P/8P PSU cable to the ATX Connector.



Step 7: Affix the ATX Cable Cover-top to the ATX Cable Cover-bot with five (5) 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
- System configuration was reset by Clear CMOS jumper
- 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

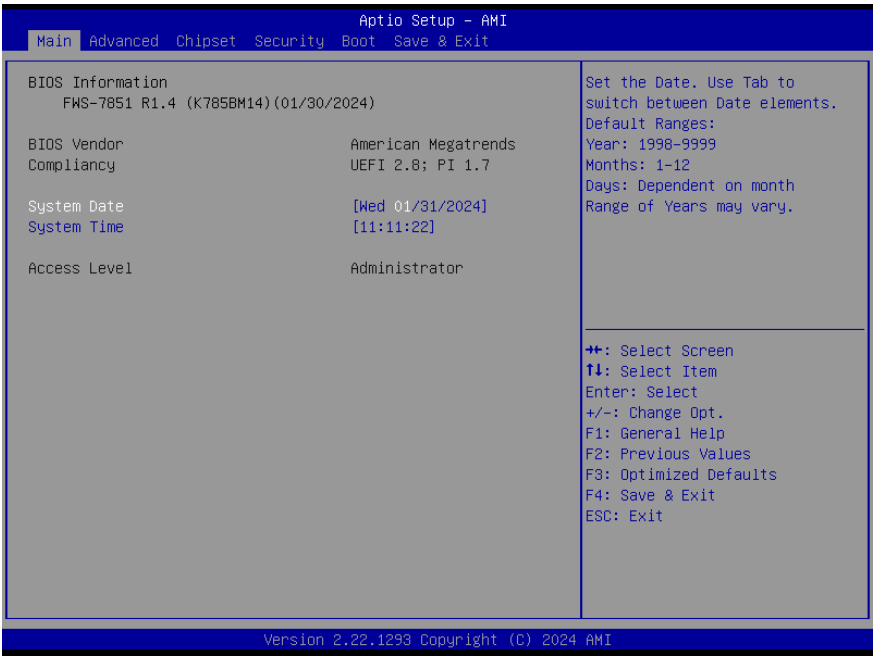
Chipset - Host bridge parameters.

Security – The setup administrator password can be set here

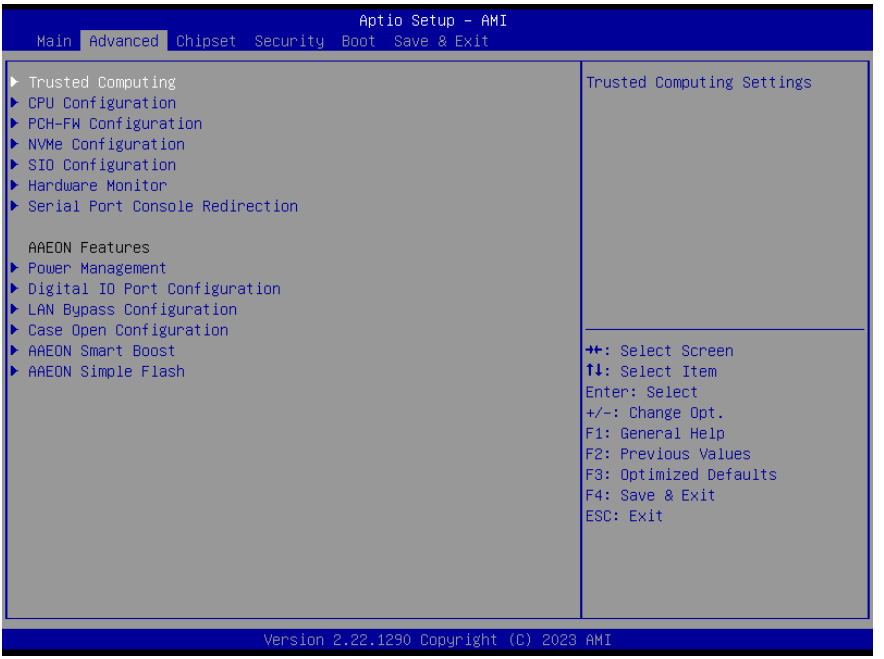
Boot – Enable/ Disable quiet Boot Option

Save & Exit –Save your changes and exit the program

3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



3.4.1 Trusted Computing

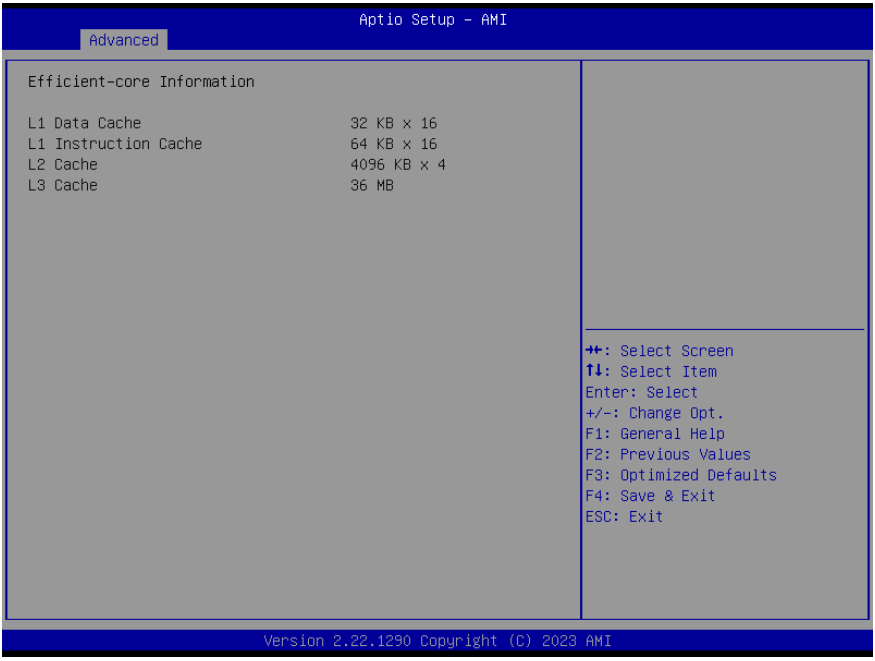
Options Summary	
Security Device Support	Disabled
	Enabled
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.	
SHA256 PCR Bank	Disabled
	Enabled
Enable or Disable SHA256 PCR Bank.	
SHA384 PCR Bank	Disabled
	Enabled
Enable or Disable SHA384 PCR Bank.	
Pending operation	None
	TPM Clear
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.	

Options Summary	
Platform Hierarchy	Disabled
	Enabled
Enable or Disable Platform Hierarchy.	
Storage Hierarchy	Disabled
	Enabled
Enable or Disable Storage Hierarchy.	
Endorsement Hierarchy	Disabled
	Enabled
Enable or Disable Endorsement Hierarchy.	
Physical Presence Spec Version	1.2
	1.3
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.	
TPM 2.0 InterfaceType	CRB
	TIS
Select the Communication Interface to TPM 20 Device.	
Device Select	TPM 1.2
	TPM 2.0
	Auto
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.	

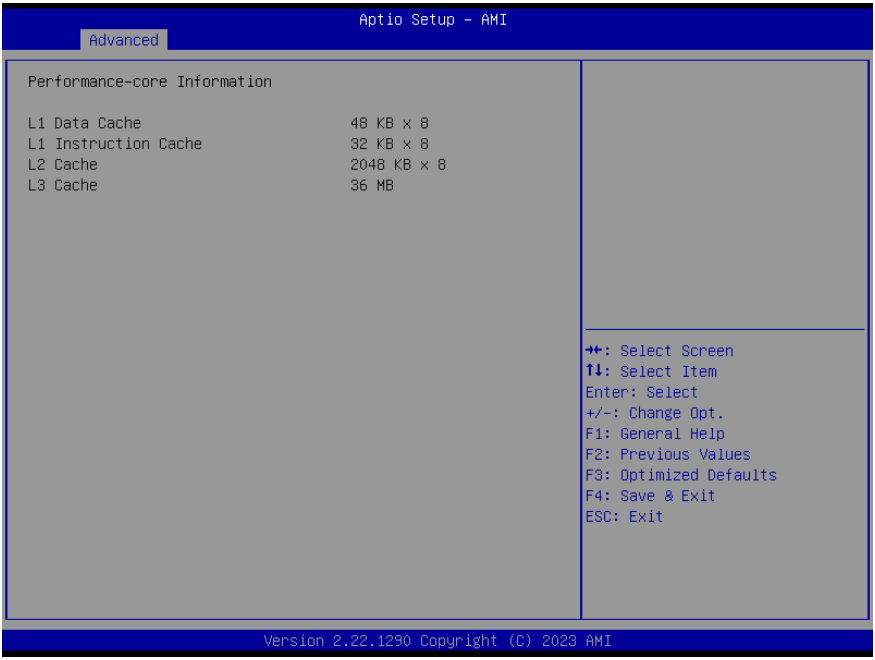
3.4.2 CPU Configuration

Options Summary	
Intel (VMX) Virtualization	Disabled
	Enabled
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.	
Hyper-Threading	Disabled
	Enabled
Enable or Disable Hyper-Threading Technology.	

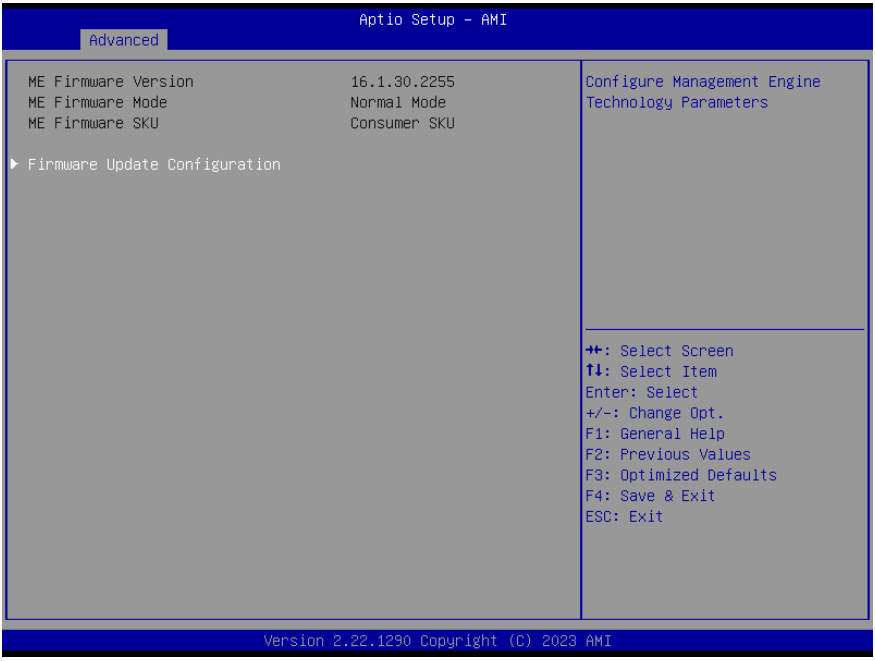
3.4.2.1 Efficient-core information



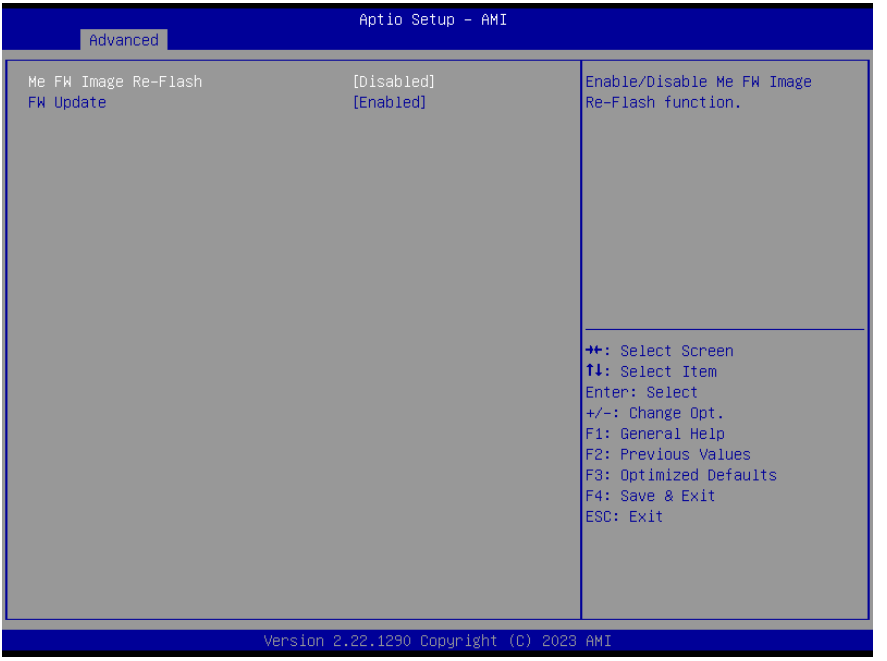
3.4.2.2 Performance-core information



3.4.3 PCH-FW Configuration

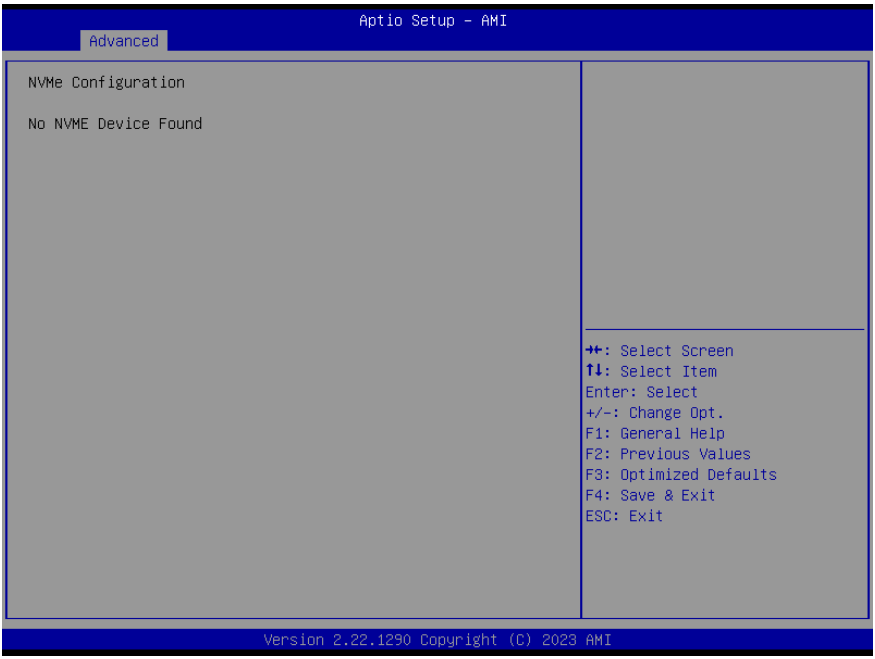


3.4.3.1 Firmware Update Configuration



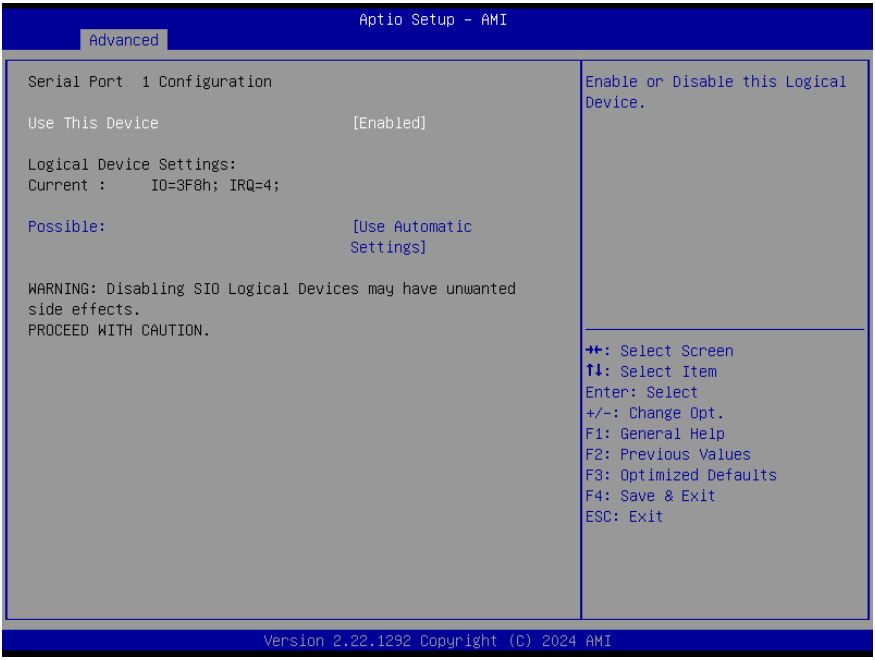
Options Summary	
Me FW Image Re-Flash	**Disabled**
	Enabled
Enable/Disable Me FW Image Re-Flash function.	
FW Update	Disabled
	Enabled
Enable/Disable ME FW update function.	

3.4.4 NVMe Configuration



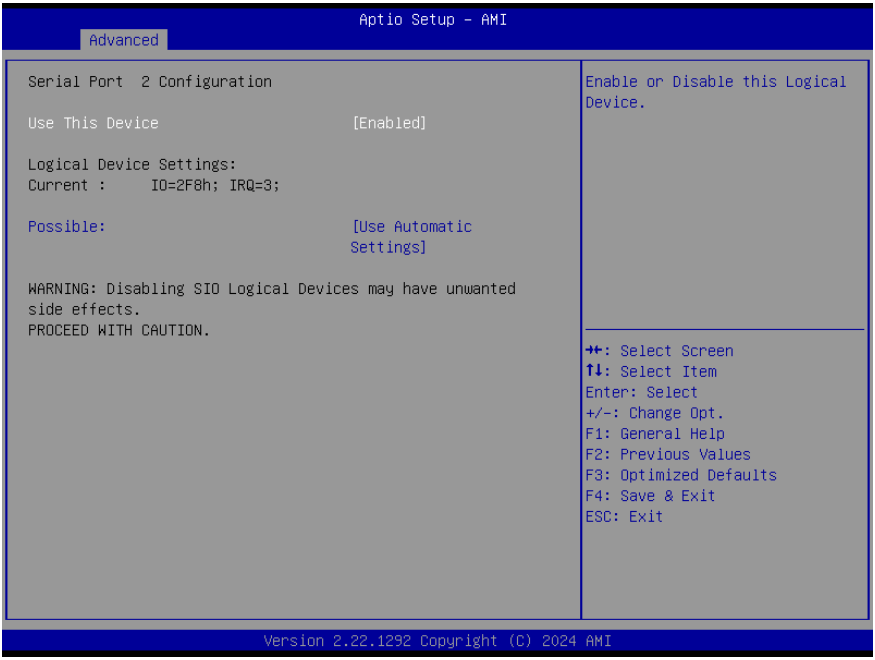
3.4.5 SIO Configuration

3.4.5.1 Serial Port 1 Configuration



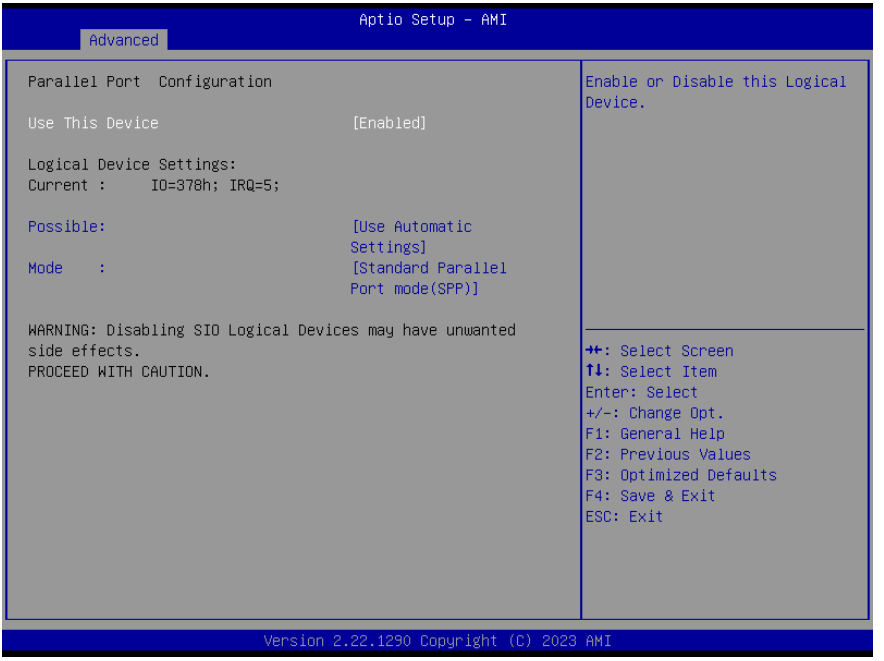
Options Summary	
Use This Device	Disabled
	Enabled
Enable or Disable this Logical Device.	
Possible:	**Use Automatic Settings**
	IO=3F8h; IRQ=4;
	IO=2F8h; IRQ=3;
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.	

3.4.5.2 Serial Port 2 Configuration



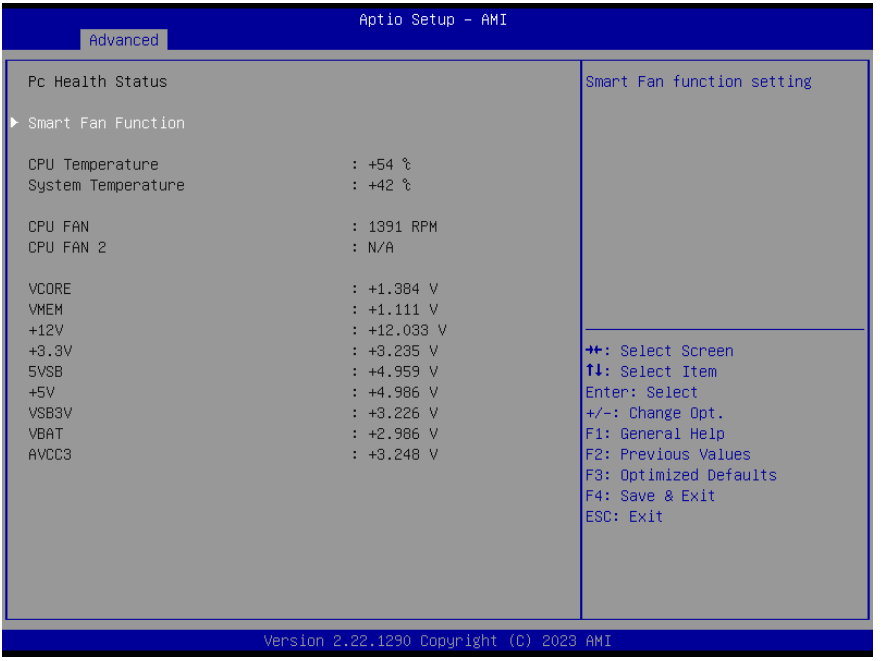
Options Summary	
Use This Device	Disabled
	Enabled
Enable or Disable this Logical Device.	
Possible:	**Use Automatic Settings**
	IO=2F8h; IRQ=3;
	IO=3F8h; IRQ=4;
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.	

3.4.5.3 Parallel Port Configuration

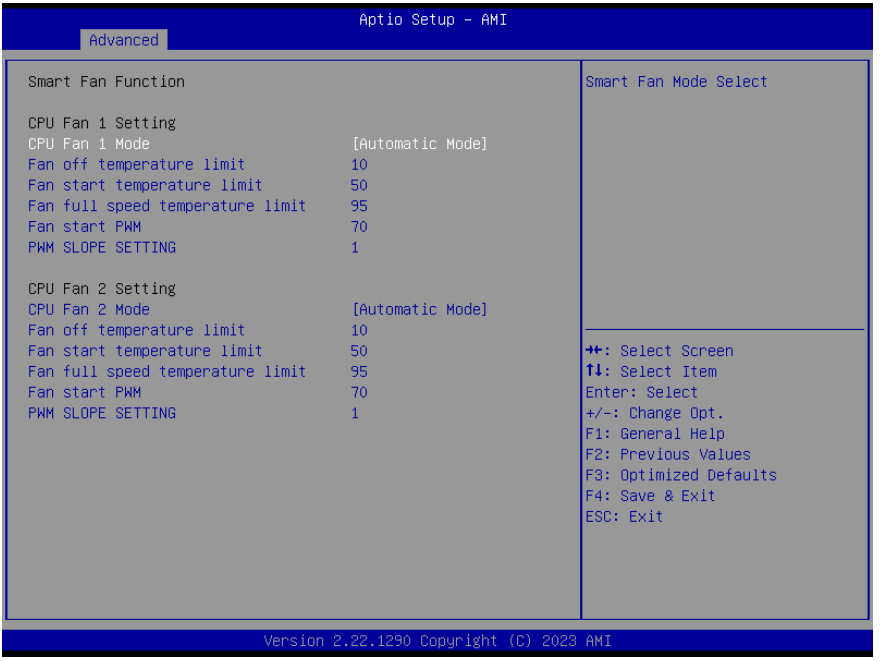


Options Summary	
Use This Device	Disabled
	Enabled
Enable or Disable this Logical Device.	
Possible:	**Use Automatic Settings**
	IO=378h; IRQ=5;
	IO=378h; IRQ=5,6,7,10,11,12;
	IO=278h; IRQ=5,6,7,10,11,12;
	IO=3BCh; IRQ=5,6,7,10,11,12;
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.	
Mode:	**Standard Parallel Port mode (SPP)**
	EPP mode
	ECP Mode
	EPP mode & ECP mode
Change Parallel Port mode. Some of the Modes required a DMA resource. After Mode changing, Reset the System to reflect actual device settings.	

3.4.6 Hardware Monitor



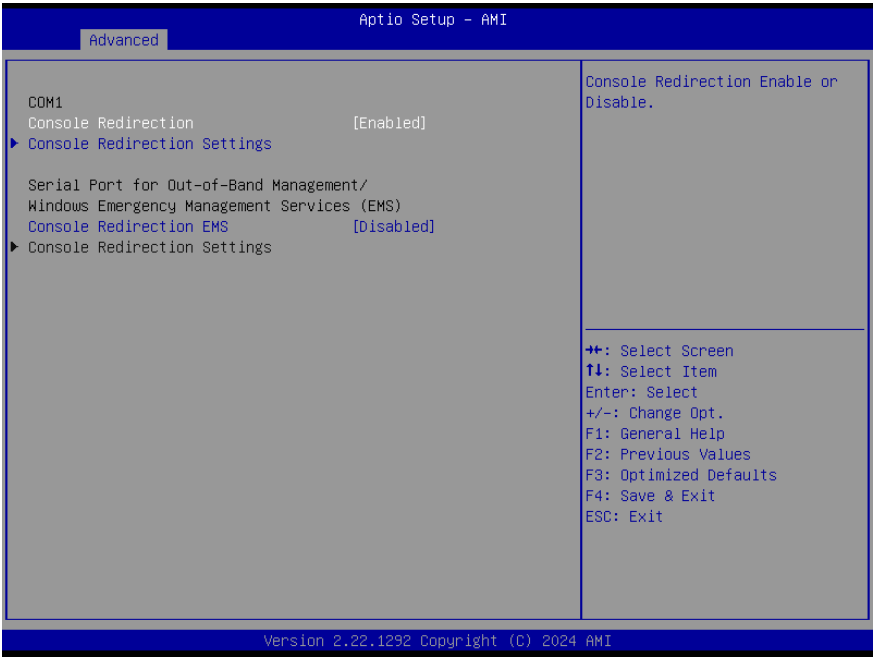
3.4.6.1 Smart Fan Function



Options Summary		
CPU Fan 1 Mode	Software Mode	
	Automatic Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select.		
Manual PWM Setting	127	Optimal Default, Failsafe Default
	0~255	
Manual Mode: Fan will work with this Manual PWM Value.		
Fan off temperature limit	10	Optimal Default, Failsafe Default
Fan will off when temperature lower than this limit.		
Fan start temperature limit	50	Optimal Default, Failsafe Default
Fan will work when temperature higher than this limit.		
Fan full Speed Temperature limit	95	Optimal Default, Failsafe Default
Fan will full speed when temperature higher than this limit.		
Fan start PWM	70	Optimal Default, Failsafe Default
Fan will start with this PWM value.		

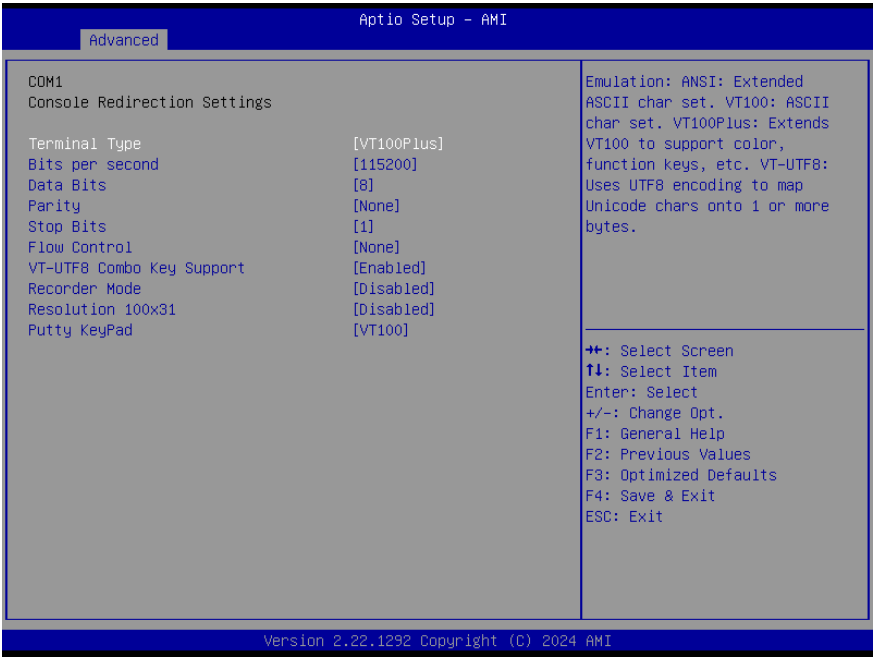
Options Summary		
PWM SLOPE SETTING	1	Optimal Default, Failsafe Default
PWM SLOPE Selection Slope = PWM value/℃.		
CPU Fan 2 Mode	Software Mode	
	Automatic Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select.		
Manual PWM Setting	127	Optimal Default, Failsafe Default
	0~255	
Manual Mode: Fan will work with this Manual PWM Value.		
Fan off temperature limit	10	Optimal Default, Failsafe Default
Fan will off when temperature lower than this limit.		
Fan start temperature limit	50	Optimal Default, Failsafe Default
Fan will work when temperature higher than this limit.		
Fan full Speed Temperature limit	95	Optimal Default, Failsafe Default
Fan will full speed when temperature higher than this limit.		
Fan start PWM	70	Optimal Default, Failsafe Default
Fan will start with this PWM value.		
PWM SLOPE SETTING	1	Optimal Default, Failsafe Default
PWM SLOPE Selection Slope = PWM value/℃.		

3.4.7 Serial Port Console Redirection



Options Summary		
Console Redirection	Enabled	Optimal Default, Failsafe Default
	Disabled	
Console Redirection Enable or Disable.		
Console Redirection Settings		
The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.		
Console Redirection EMS	Enabled	
	Disabled	Optimal Default, Failsafe Default
Console Redirection Enable or Disable.		

3.4.7.1 COM1 Console Redirection Settings

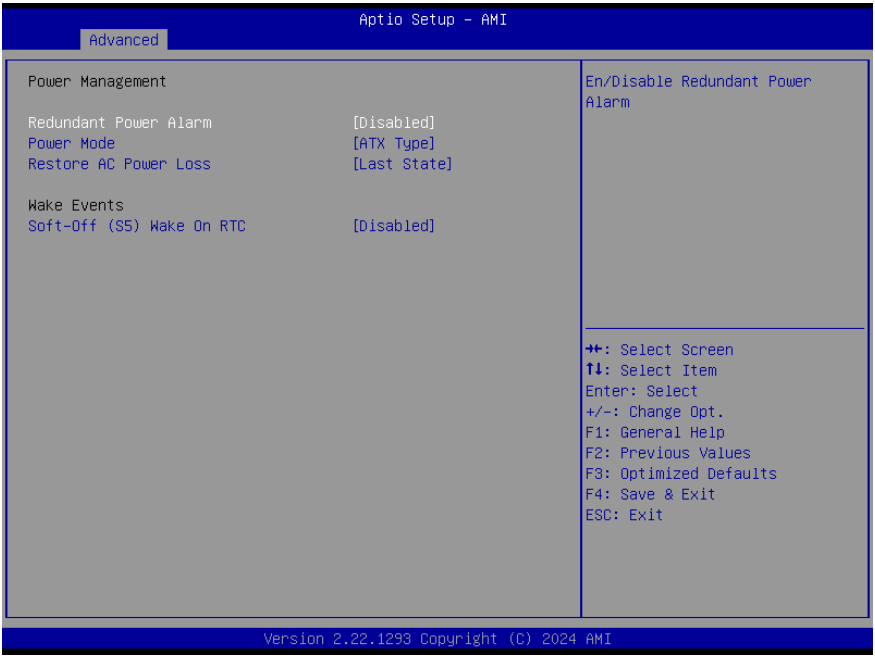


Options Summary		
Terminal Type	VT100	
	VT100Plus	Optimal Default, Failsafe Default
	VT-UTF8	
	ANSI	
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode.		
Bits per second	9600	
	19200	
	38400	
	57600	
	115200	Optimal Default, Failsafe Default

Options Summary		
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.		
Data bit	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 the 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.		
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	Enabled	Optimal Default, Failsafe Default
	Disabled	
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	

Options Summary		
Putty KeyPad (cont.)	ESCN	
	VT400	
Select FunctionKey and KeyPad on Putty.		

3.4.8 Power Management



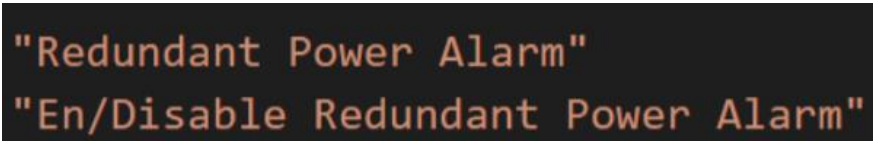
Options Summary	
Redundant Power Alarm	**Disabled**
	Enabled
En/Disable Redundant Power Alarm.	
Power Mode	**ATX Type**
	AT Type
Select Power Supply Mode.	
Restore AC Power Loss	Power Off
	Power On
	Last State
Select AC power state when power is re-applied after a power failure.	
Soft-Off (S5) Wake On RTC	**Disabled**
	By Date
	By Weekday
	Bypass

Options Summary
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

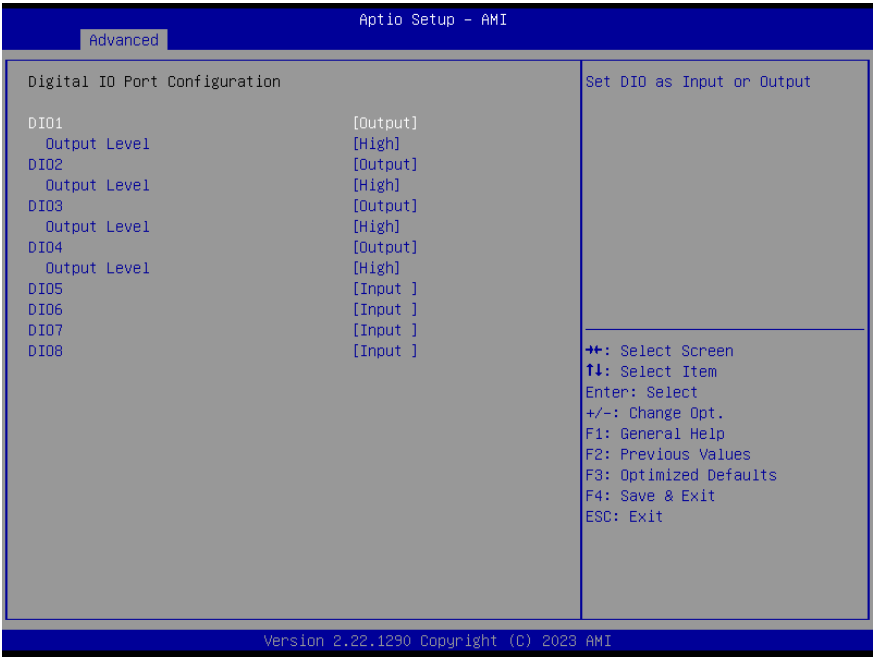
When the Redundant Power Alarm (Buzzer) is activated, it indicates that the machine is configured to utilize two PSUs simultaneously; otherwise, a noise alert will be triggered. If there is an issue with the external primary PSU, a noise alert will also be triggered to prompt replacement.

When the Redundant Power Alarm (Buzzer) is deactivated, it signifies that the machine is set by default to have only a single internal PSU. Even if an external PSU is assembled without altering this setting, there will be no noise alert if there is a problem with the external primary PSU. However, detection of faults can be performed through the SDK in the operating system.

Note: User can open/close Redundant Power Alarm as below.

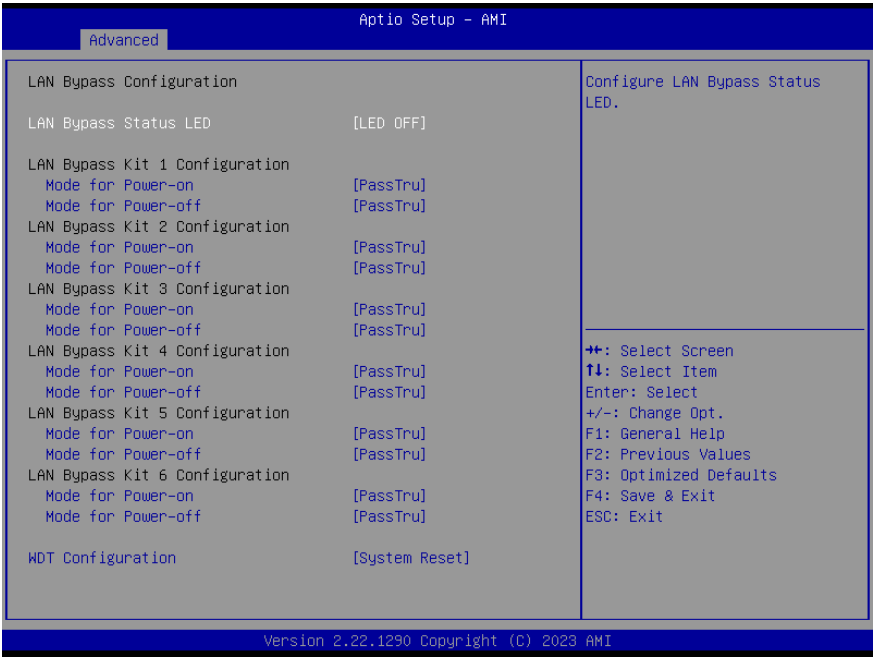


3.4.9 Digital IO Port Configuration



Options Summary		
DIO Port1~4	Output	Optimal Default, Failsafe Default
	Input	
Set DIO as Input or Output.		
Output Level	High	Optimal Default, Failsafe Default
	Low	
Set output level when DIO pin is output.		
DIO Port5~8	Output	
	Input	Optimal Default, Failsafe Default
Set DIO as Input or Output.		

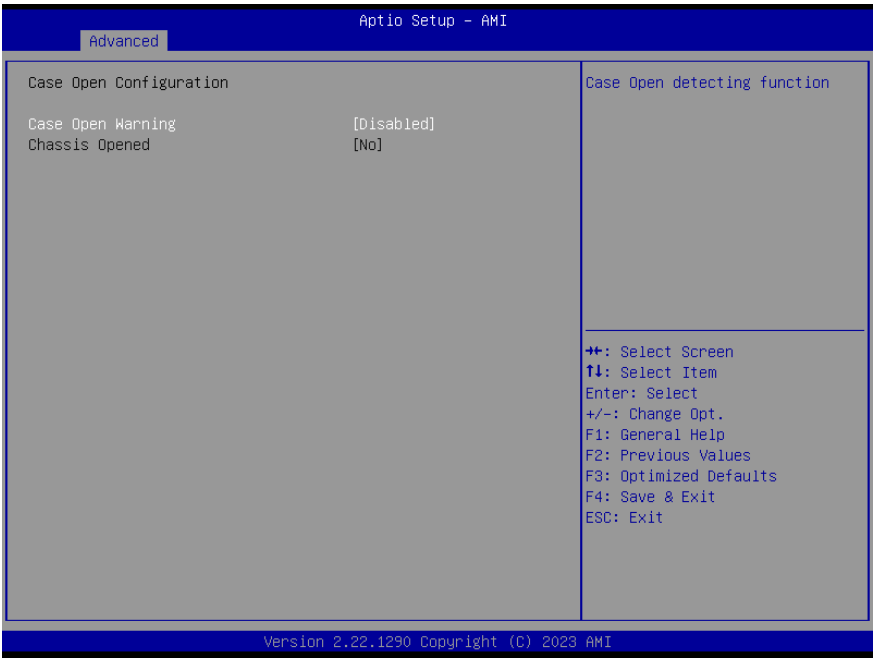
3.4.10 LAN Bypass Configuration



Options Summary		
Configure LAN Bypass Status LED	LED OFF	Optimal Default, Failsafe Default
	RED LED ON	
	RED LED BLINK	
	RED LED FAST BLINK	
	GREEN LED ON	
	GREEN LED BLINK	
	GREEN LED FAST BLINK	
Configure LAN Bypass Status LED.		
Mode for Power-on	ByPass	
	PassTru	Optimal Default, Failsafe Default
Configure LAN kit behavior when system in power-on state. (Bypass/Pass Through).		
Mode for Power-off	ByPass	
	PassTru	Optimal Default, Failsafe Default
Configure LAN kit behavior when system in power-off state. (Bypass/Pass Through).		

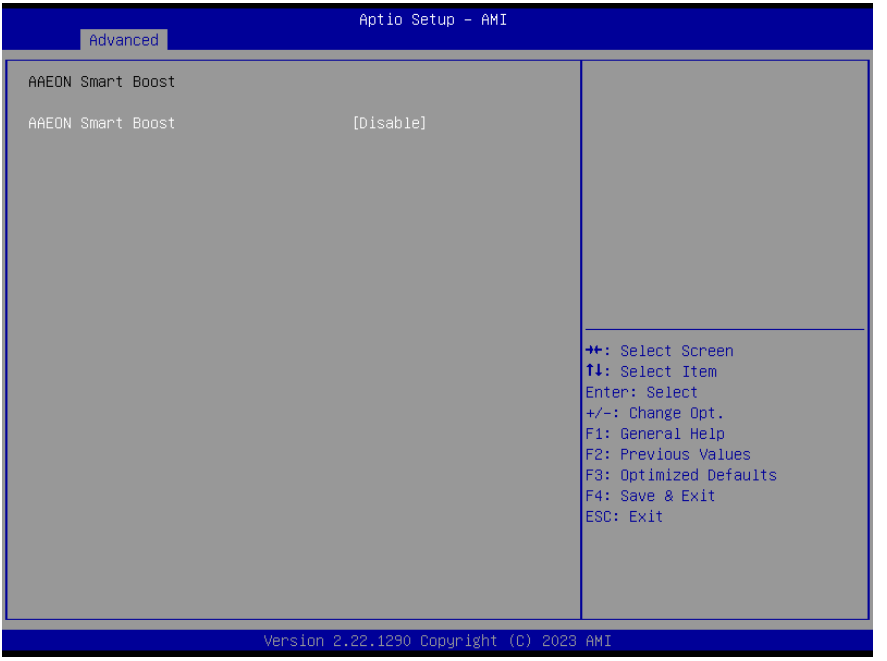
Options Summary		
WDT Configuration	System Reset	Optimal Default, Failsafe Default
	Force ByPass	
Configure WDT behavior, System Reset or Force Bypass.		

3.4.11 Case Open Configuration



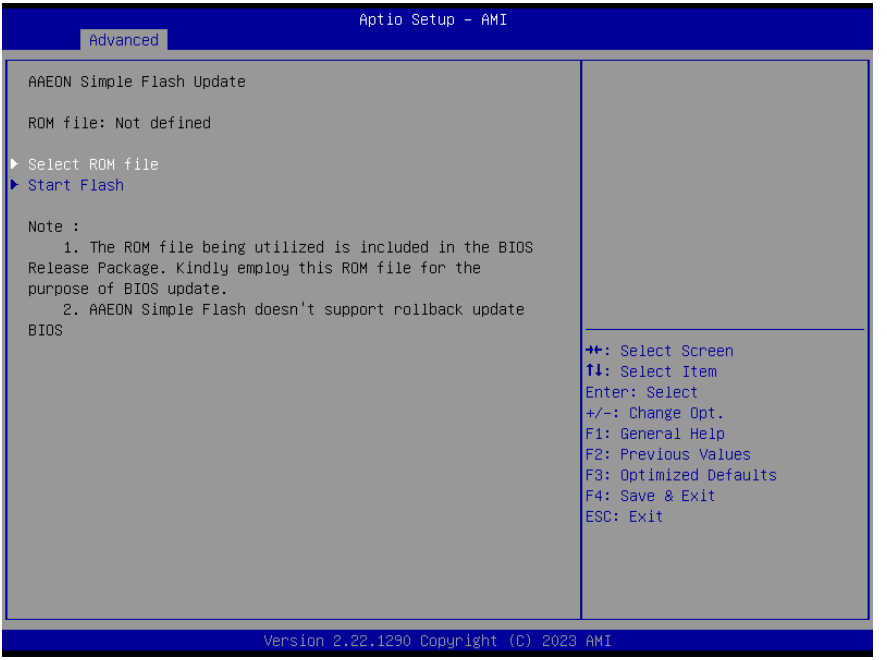
Options Summary		
Case Open Warning	Disabled	Optimal Default, Failsafe Default
	Enabled	
	Clear	
Case Open detecting function.		

3.4.12 AAEON Smart Boost



Options Summary		
AAEON Smart Boost	Smart Boost	
	Maximum Performance	
	Good Stability	
	Disable	Optimal Default, Failsafe Default
Select the policy of AAEON Smart Boost feature.		

3.4.13 AAEON Simple Flash



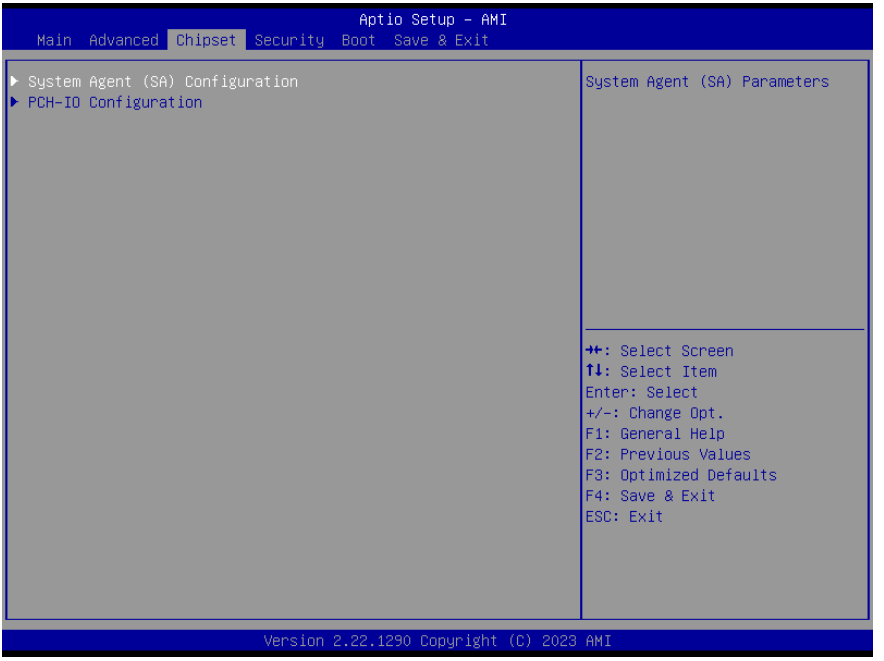
Select ROM file

Select the BIOS ROM file to update.

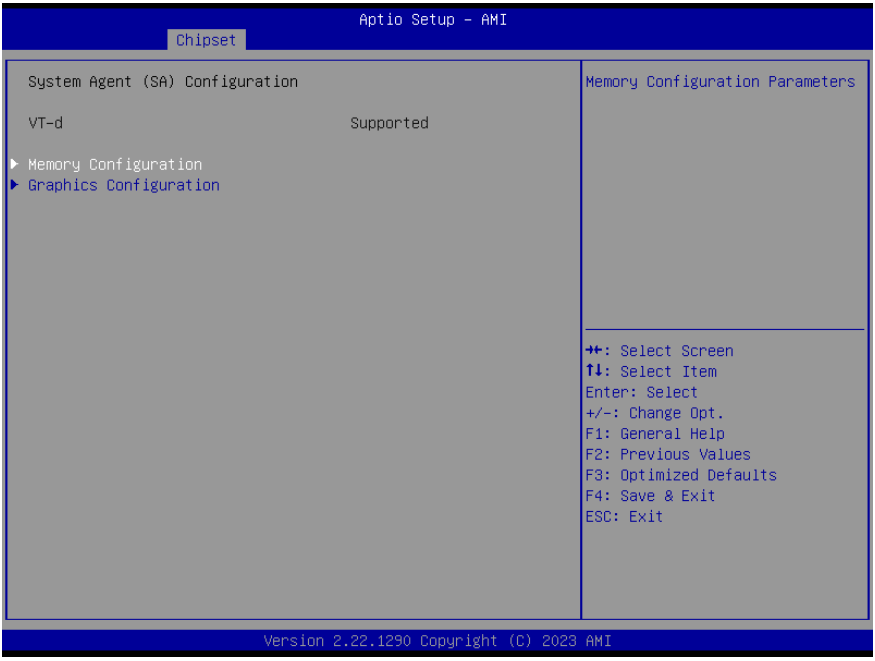
Start Flash

To start the BIOS ROM update process.

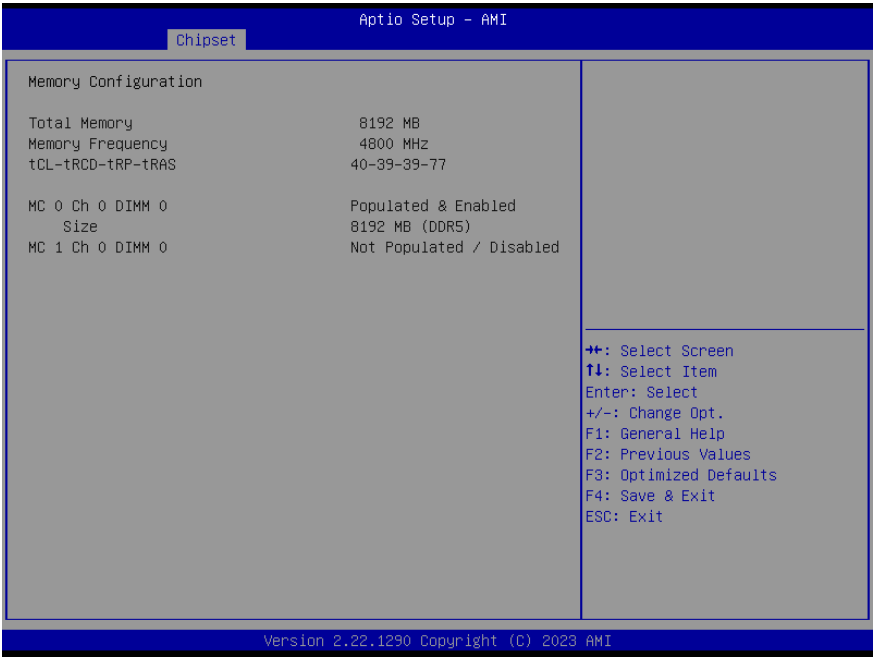
3.5 Setup Submenu: Chipset



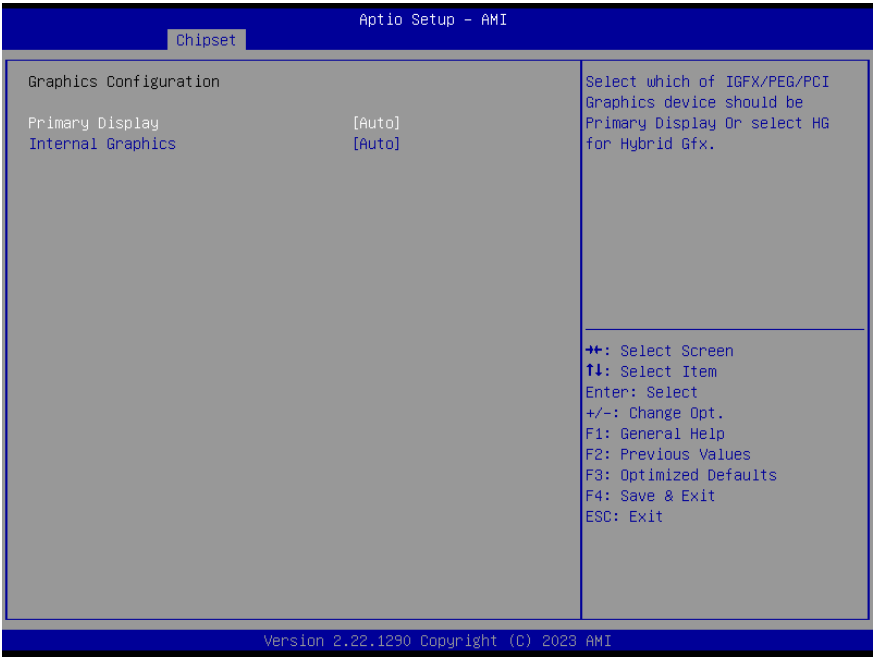
3.5.1 System Agent (SA) Configuration



3.5.2 Memory Configuration

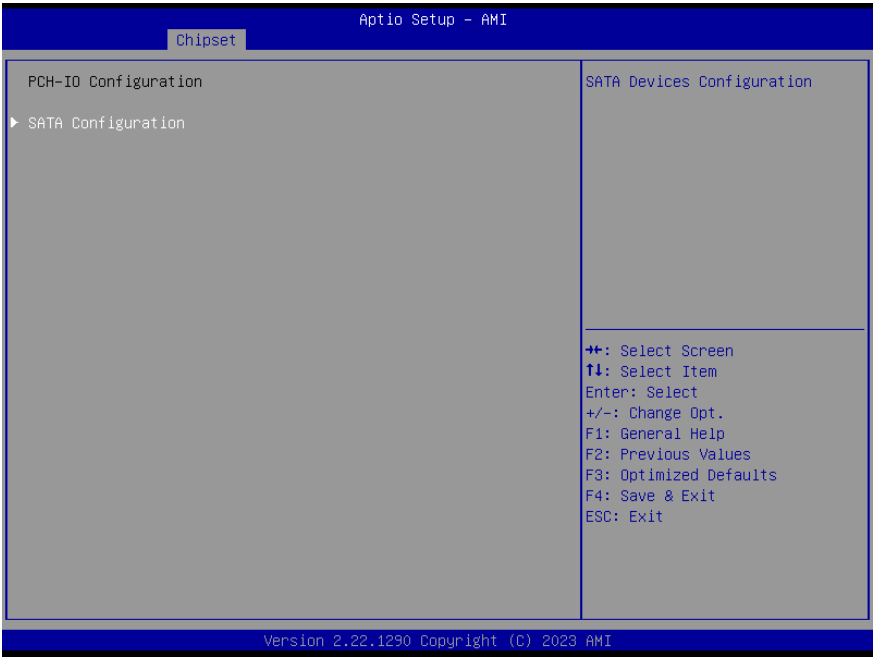


3.5.3 Graphics Configuration

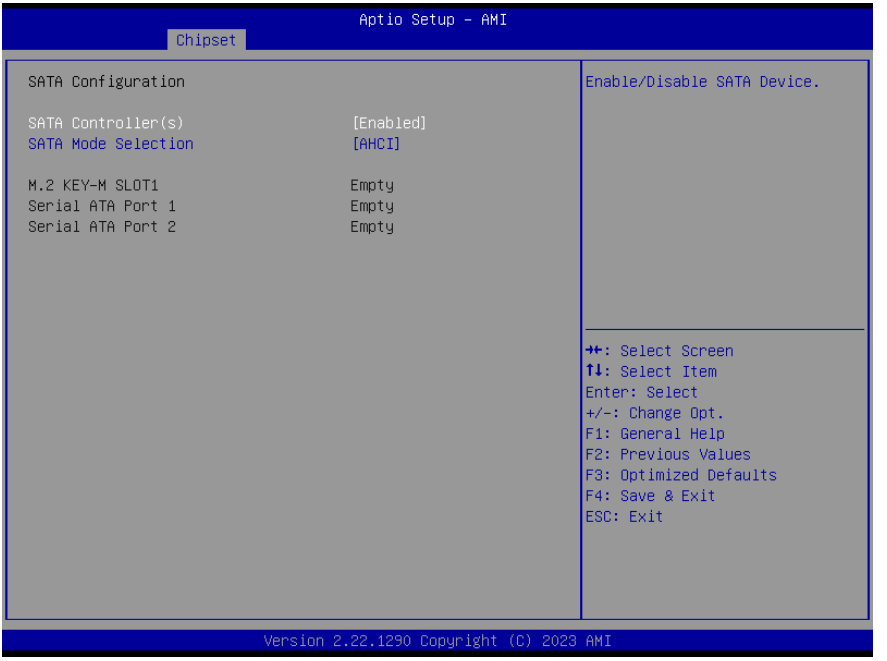


Options Summary		
Primary Display	Auto	Optimal Default, Failsafe Default
	IGFX	
	PCH PCI	
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.		
Internal Graphics	Auto	Optimal Default, Failsafe Default
	Disabled	
	Enabled	
Keep IGFX enabled based on the setup options.		

3.5.4 PCH-IO Configuration

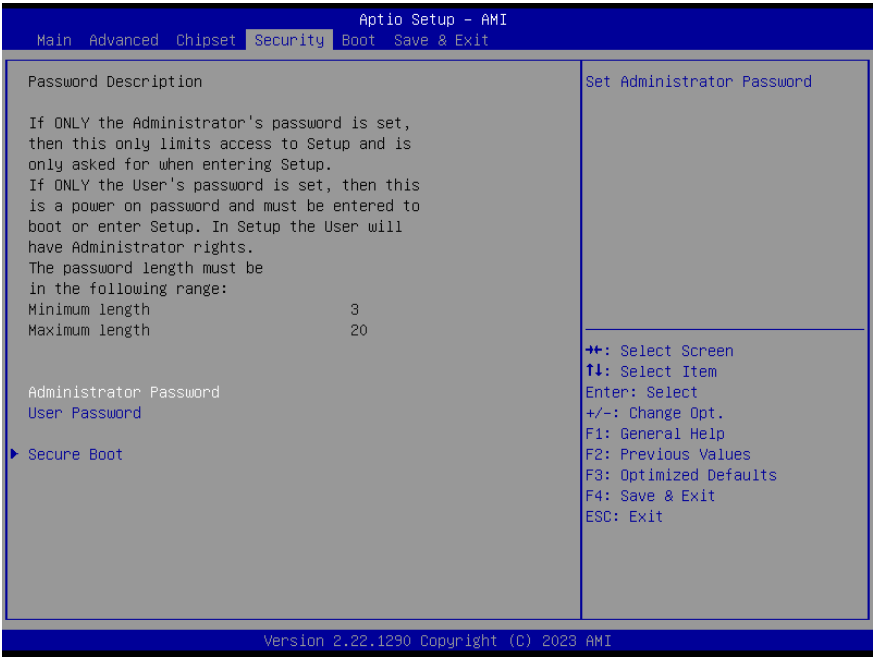


3.5.5 SATA Configuration



Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable SATA Device.		
SATA Mode Selection	AHCI	Optimal Default, Failsafe Default
Determines how SATA controller(s) operate.		

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

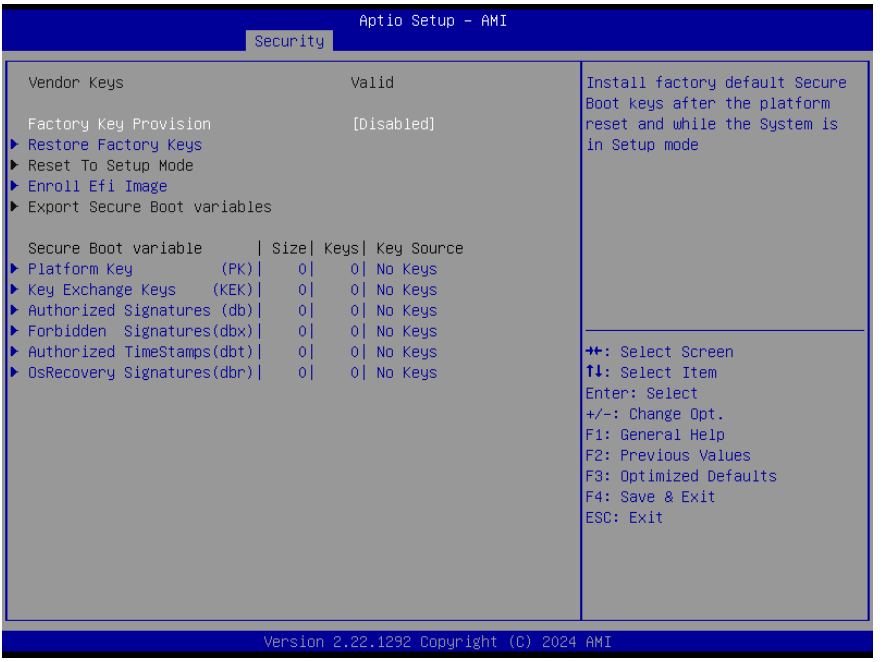
Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Secure Boot

Options Summary	
Secure Boot	Disabled
	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
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.	

Options Summary	
Reset to Setup Mode	Yes
	No
Delete all Secure Boot key databases from NVRAM.	

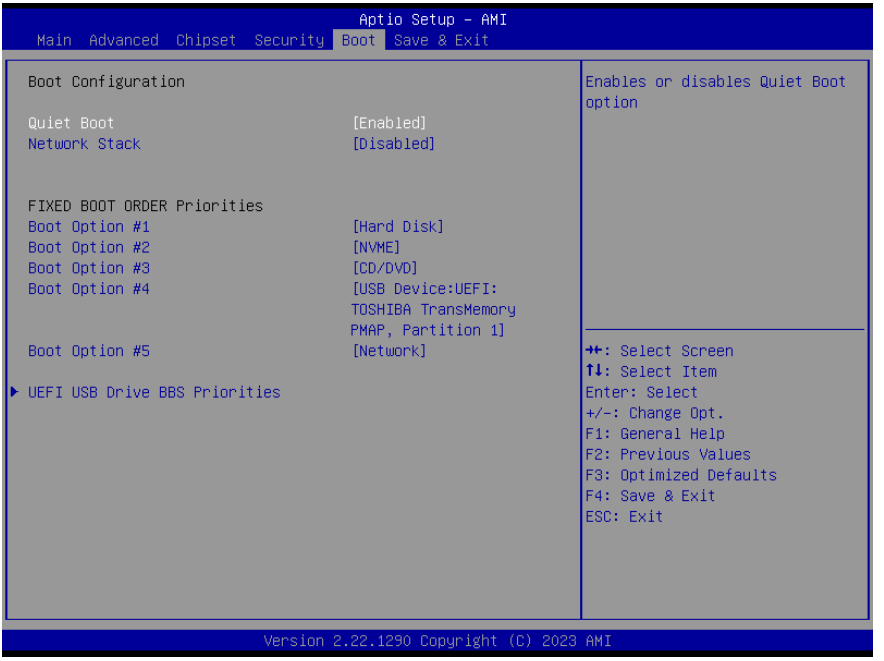
3.6.1.1 Key Management



Options Summary	
Factory Key Provision	Disabled
	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.	
Reset to Setup Mode	Yes
	No

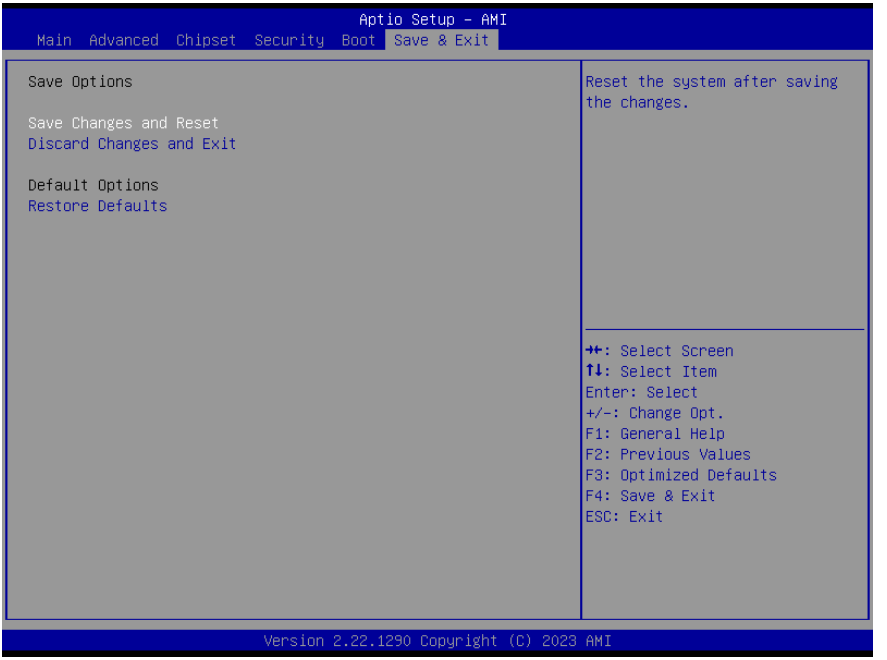
Options Summary	
Delete all Secure Boot key databases from NVRAM.	
Enroll Efi Image	OK
Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).	
Export Secure Boot variables	OK
Save NVRAM content of Secure Boot variable to a file.	
Secure Boot Variables	
Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate in: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER encoded) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2. Authenticated UEFI Variable 3. EFI PE/COFF Image (SHA256) Key Source: Default, External, Mixed.	

3.7 Setup Submenu: Boot



Options Summary	
Quite Boot	Disabled
	Enabled
Enables or disables Quiet Boot option.	
Network Stack	**Disabled**
	Enabled
Enable/Disable UEFI Network Stack	
FIXED BOOT ORDER Priorities	
Sets the system boot order.	

3.8 Setup Submenu: Save & Exit



Options Summary	
Save Changes and Reset	Reset the system after saving the changes.
Discard Changes and Exit	Exit system setup without saving any changes.
Restore Defaults	Restore/Load Default values for all the setup options.

Appendix A

Software Development Kit Information

A.1 Software Development Kit Support List

The FWS-7851 is available with a software development kit (SDK) supporting a range of additional functions and interfaces.

Function	SDK Support
Watchdog Timer	Yes
Software Programming Button	Yes
LCM	Yes
Status LED	Yes
LAN Bypass	Yes
DIO	Yes
HW Monitor	Yes

For more information regarding the above SDK support list, please contact your AAEON or visit https://www.aaeon.com/en/contacts/ for more information.