



# THOR100-X4



MIL-STD-810 Military Computer  
1U 1/2 Size Intel Xeon E-2276ML  
processor, MIL-STD-461 EMI 18-  
36V DC-In

## **Safety information**

### **Electrical safety**

- ▶ To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- ▶ When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
  - ▶ Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
  - ▶ Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- ▶ Make sure that your power supply is set to the correct voltage in your area.
  - ▶ If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
  - ▶ If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

### **Operation safety**

- ▶ Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- ▶ Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- ▶ To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- ▶ Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- ▶ Place the product on a stable surface.
- ▶ If you encounter any technical problems with the product, contact your local distributor

### **Statement**

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- ▶ All trademarks are the properties of the respective owners.
- ▶ All product specifications are subject to change without prior notice

## Revision History

Revision	Date (yyyy/mm/dd)	Changes
Version 1.0	2022/03/21	Initial release

## Packing list

- ▶ THOR100-X4 1U 1/2 Rugged Military System
- ▶ CD (Driver + Quick Installation Guide)

## Ordering information

Model Number	[Scription]
<b>THOR100X4-D10</b>	MIL-STD Fanless Rugged Computer with Intel® 9th Gen Xeon® E-2276ML, IP65, with 10 MIL-DTL-D38999 Connectors, Operating Temp. -40 to 70°C
<b>THOR100X4-D9</b>	MIL-STD Fanless Rugged Computer with Intel® 9th Gen Intel® Core i7-9850HL, IP65, with 10 MIL-DTL-D38999 Connectors, Operating Temp. -40 to 70°C



If any of the above items is damaged or missing, please contact your local distributor.

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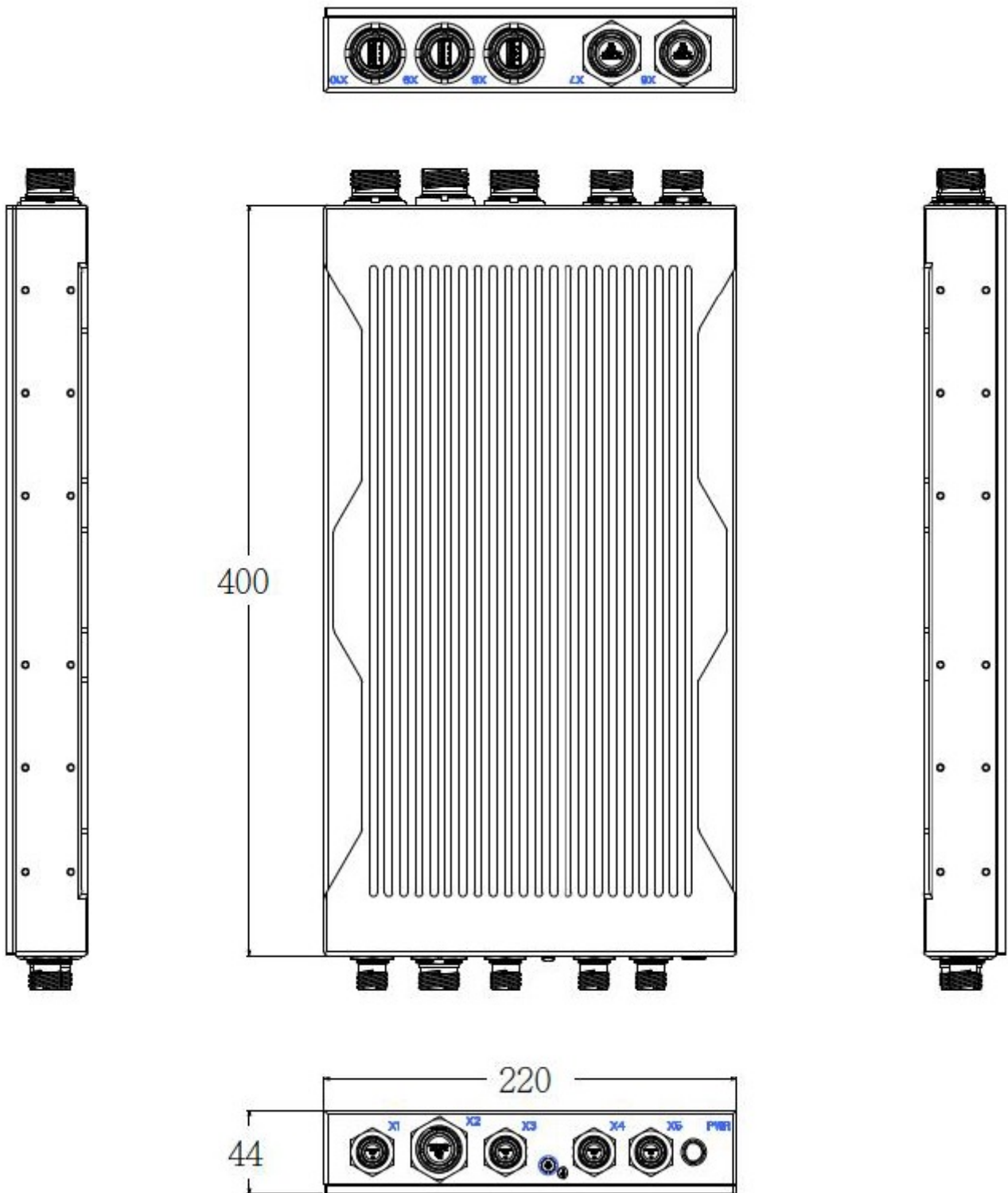
## Chapter 1: Product Introduction

### ● Key Features

System	
CPU	Intel® 9 <sup>th</sup> Gen. XEON E-2276ML Processor (12M Cache, Base Frequency 20GHz; Max Turbo Frequency 4.2GHz)
Memory Type	4 x DDR4 2666MHz up to 128GB
Processor Graphics	Intel® UHD Graphics P630
BIOS	AMI® BIOS
Storage Device	1x M.2 2280 NVMe up to 2TB
Digital Input/Output	8 bit digital I/O, split into 2 groups of 4. Programmable I/O
Front I/O	
DC In	1 x Amphenol TV06RW-09-98P
DIO	1 x 3 DIO Mic-In/Line Out Amphenol TV07RW-13-35SD
LAN	1 x Amphenol TV07RW-09-09S
LAN	1 x Amphenol TV07RW-09-09S
LAN	1 x Amphenol TV07RW-09-09S
Power Button with LED backlight	
Rear I/O	
DVI	1 x Amphenol TV07RW-13-35S
DVI	1 x Amphenol TV07RW-13-35S
USB 3.0	1 x Amphenol USB3FTV7AZNF312
USB 3.0	1 x Amphenol USB3FTV7AZNF312
USB 3.0	1 x Amphenol USB3FTV7AZNF312
Applications	
Applications	1U Half Size Rugged Mission MIL-STD 810 Computer is built to meet strict size, weight, and power (SWaP) requirements and to withstand harsh environments, including temperature extremes, shock/vibe, sand/dust, and salt/fog.
Operation System	
OS Support	Windows 10 64bit, Windows server 2019 64bit, Windows 2016 64bit, Hyper-V Server 2016 R2, Ubuntu 16.04.3 LTS/17.10/18.04.1 LTS, Fedora 25/26, RedHat Linux EL 6.8/6.9/7.3/7.4/7.6, VMware ESXi6.5u1, VMware ESXi6.7u2
Mechanical & Environment	
Chassis	Aluminum Alloy, Corrosion design
Finish	Anodic aluminum oxide
Cooling	Natural Passive Convection/Conduction. No Moving Parts
Ingress Protection	IP65
Power Requirements	MIL-STD-461 EMI Power Supply, 18-36V DC In
Dimension (W x D x H)	220 x 400 x 44mm (8.6" x 15.7" x 1.7")
Operating Temp.	-40 to 70°C
Storage Temp.	-40 to 85°C
Relative Humidity	5% to 95%, non-condensing

\* Specifications are subject to change without notice\*

- Dimensions



- Panel Component

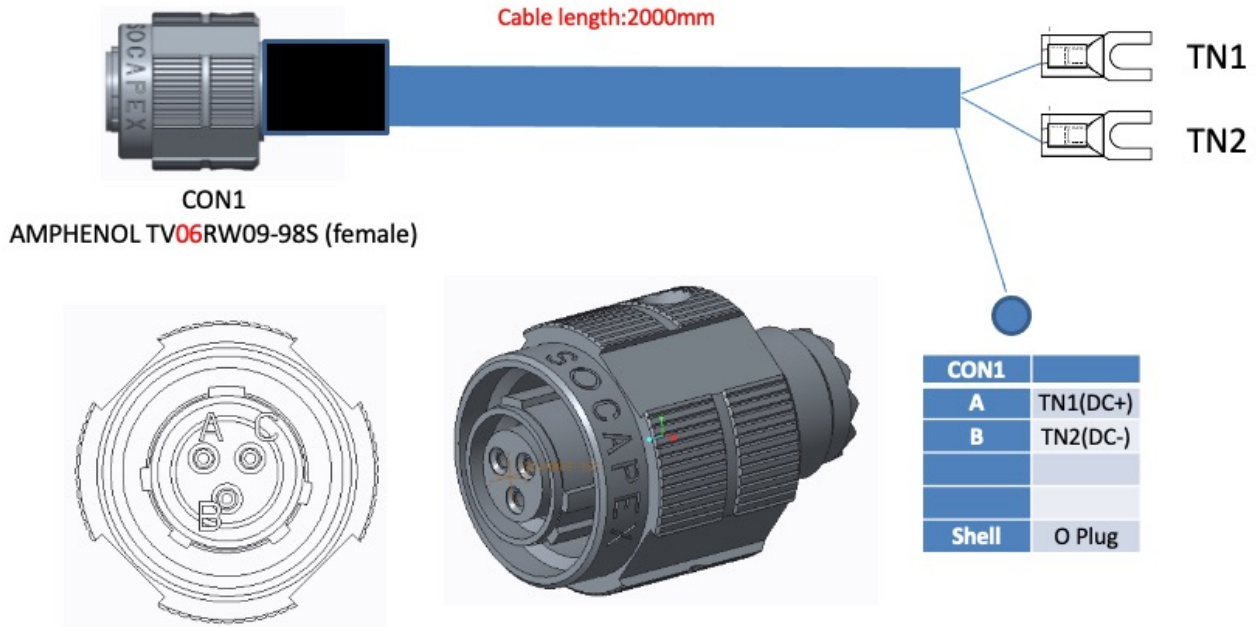


1	DC In label (X1)
2	DIO, label (X2)
3	LAN, label (X3)
4	LAN, label (X4)
5	LAN, label (X5)
6	DVI, label (X6)
7	DVI, label (X7)
8	USB 3.0, label (X8)
9	USB 3.0, label (X9)
10	USB 3.0, label (X10)

## Chapter 2: Jumpers and Connectors Locations

### ● D38999 Connector Pin Definitions

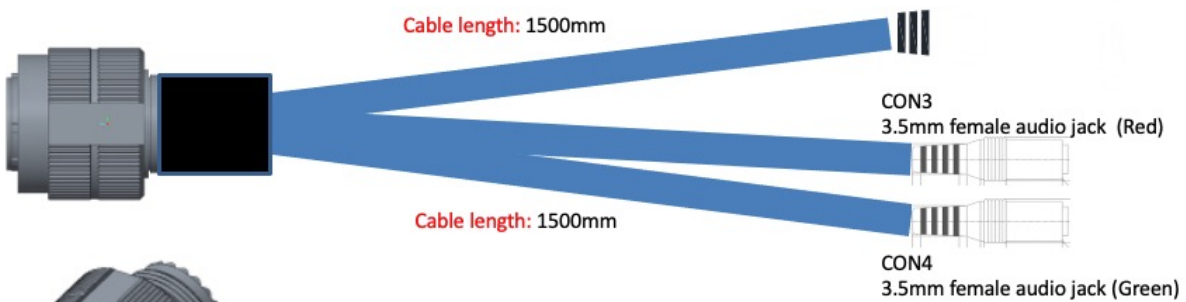
#### X1:DC-In



#### X2: DIO

CON1  
AMPHENOL TV06RW-13-35PD (male)

CON2



CON1	CON2		CON1	CON3	CON4	
1	1	DIO0	11	GND	GND	AUDIO_GND
2	2	DIO1	12			
3	3	DIO2	13	MIC Right		MIC_R
4	4	DIO3	14	MIC Left		MIC_L
5	5	DIO4	15			
6	6	DIO5			Right Audio	AUD_R
7	7	DIO6			Left Audio	AUD_L
8	8	DIO7	16			
9	9	DIO_3.3V				
10	10	DIO_GND	17			



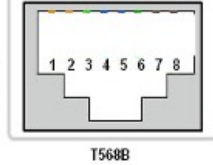
**X3, X4, X5: LAN**

**CON1**  
AMPHENOL TV06RW-9-09P (male)

**CON2**  
RJ45 female socket



Cable length:1500mm

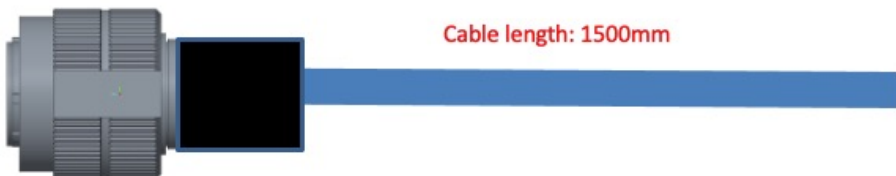


CON1	CON2	
1	1	WHITE / ORANGE
2	2	ORANG
3	3	WHITE / GREEN
4	4	BLUE
5	5	WHITE / BLUE
6	6	GREEN
7	7	WHITE / BROWN
8	8	BROWN
Shell	Shell	

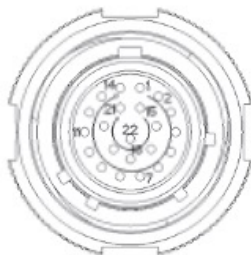
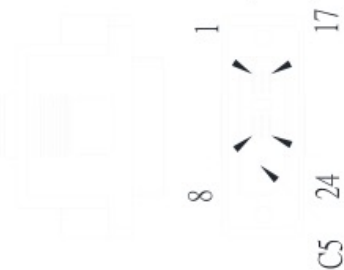
**X6, X7 DVI**

**CON1**  
AMPHENOL TV06RW-13-35P (male)

**CON2**  
DVI CONNECTOR (male)



Cable length: 1500mm


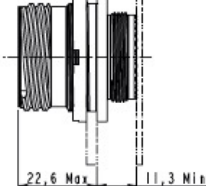
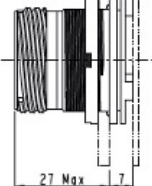
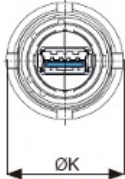
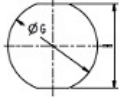


CON1	CON2		CON1	CON2	
1	1	DPA_TN0	14	18	DPA_TP2
2	2	DPA_TP0	15	19	GND
3	3	GND	16	22	CLOCK Shield
4	6	DPA_AUXP_CLK(p)	17	23	DPA_TP3
5	7	DPA_AUXP_CLK(n)	18	24	DPA_TN3
6		GND	19	shell	GND
7	9	DPA_TN1	20		
8	10	DPA_TP1	21		
9	11	GND	22		
10	14	DPA_PWR	23		
11	15	Return GND	24		
12	16	DPA_DET	C5		
13	17	DPA_TN2	SHELL		

X8, X9, X10 USB 3.0

CON1

AMPHENOL USB3FTV7AZNF312 (Female)

Product	Length (mm)		Footprint (mm)	Panel dimension
<b>Reduced Flange USB3F TV</b> 	<b>Reduced Flange USB3F TV (F312)</b> 	<b>Stand off Reduced Flange USB3F TV (F059)</b> 	<b>Reduced Flange USB3F TV</b> 	<b>Reduced Flange USB3F TV</b> 

Pin assignments:

USB 3.0 Standard A front coupling side connector to USB 3.0 Standard A back side connector					
Pin number	Signal name	Description	Sequence	Pin number	Signal name
1	VBUS	Power	Second	1	VBUS
2	D-	USB 2.0 differential pair	Third	2	D-
3	D+			3	D+
4	GND	Ground for power return	Second	4	GND
5	StdA_SSRX-	Superspeed receiver differential pair	Last	8	StdB_SSTX-
6	StdA_SSRX+			9	StdB_SSTX+
7	GND_DRAIN	Ground for signal return		7	GND_DRAIN
8	StdA_SSTX-	Superspeed transmitter differential pair		5	StdB_SSRX-
9	StdA_SSTX+		6	StdB_SSRX+	
Shell	Shield	Connector metal shell	First	Shell	Shield

← Always crossed ←

## 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

### 3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

### 3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.



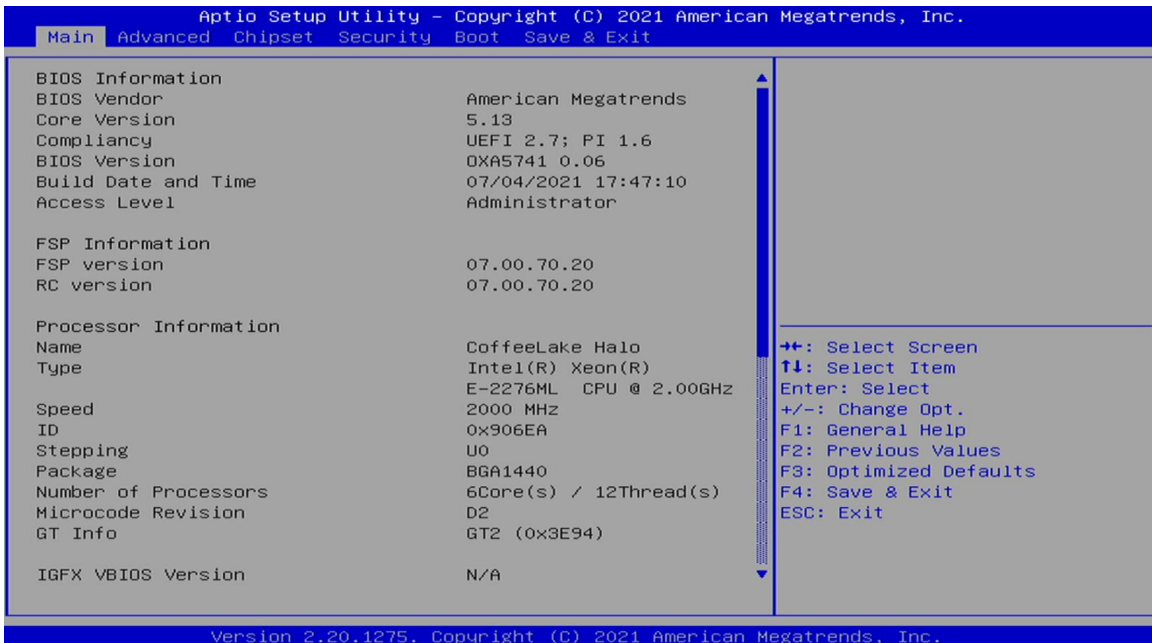
Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

### 3.3 Main Menu

The Main menu is the screen that first displays when BIOS Setup is entered, unless an error has occurred.

When you first enter the BIOS Setup Utility, you will encounter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



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

- **System Date**

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

- **System Time**

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

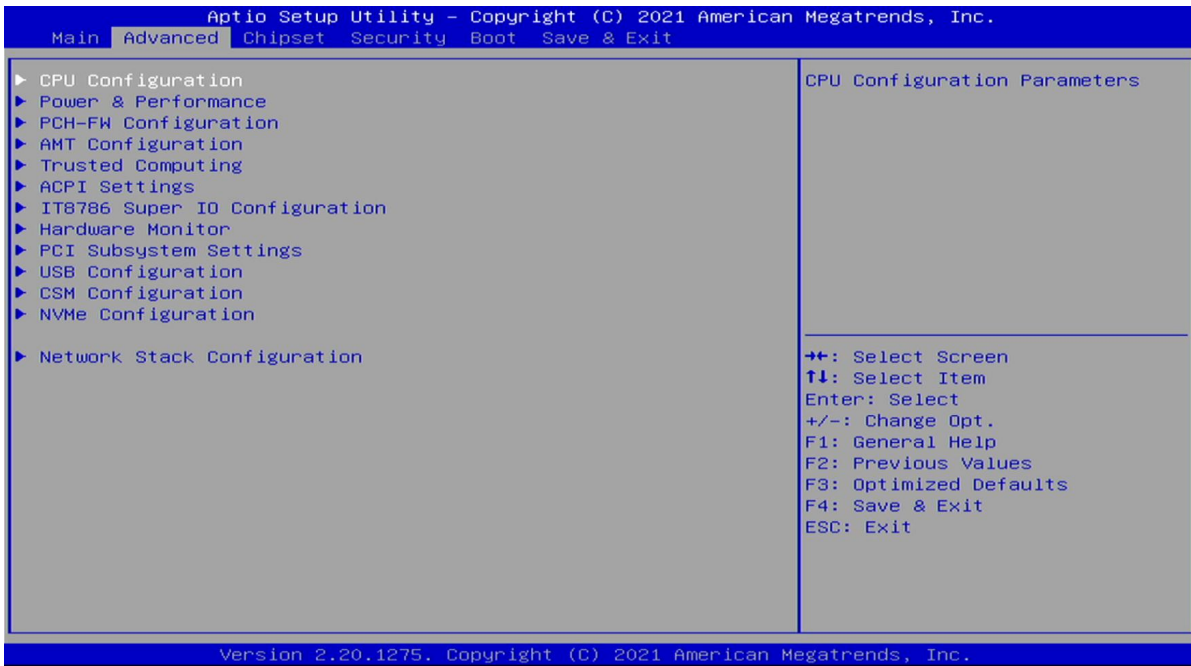
**Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

- **Access Level**

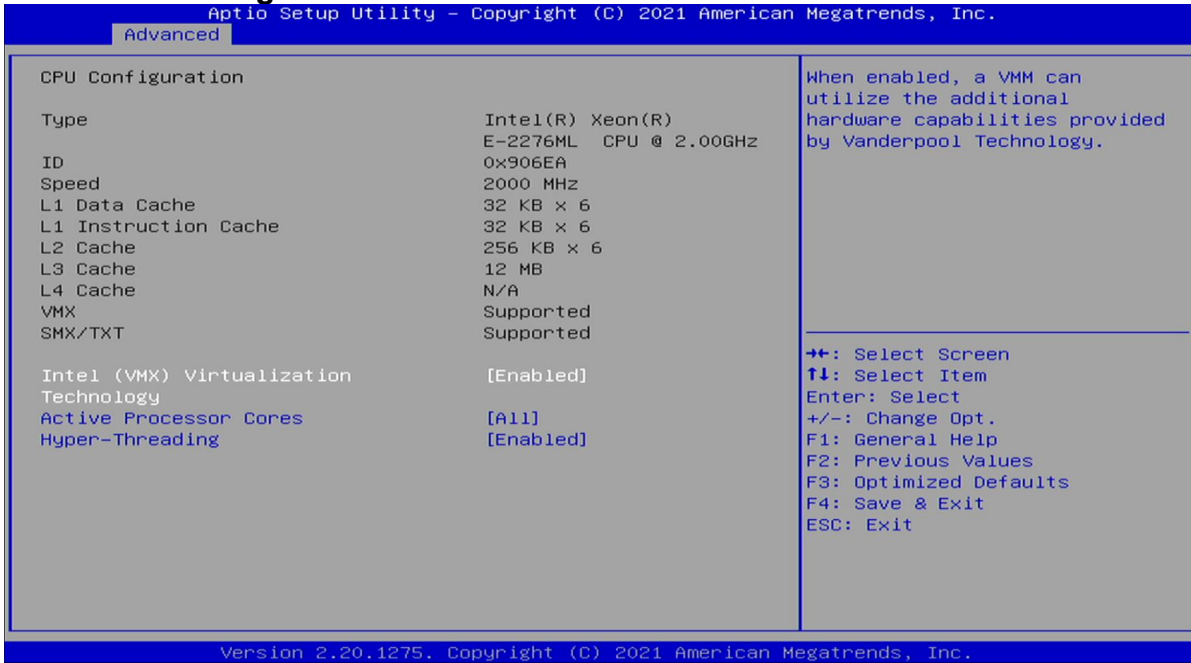
Display the access level of the current user in the BIOS.

### 3.4 Advanced Menu

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. **Setting incorrect field values may cause the system to malfunction.**



### 3.4.1 CPU Configuration

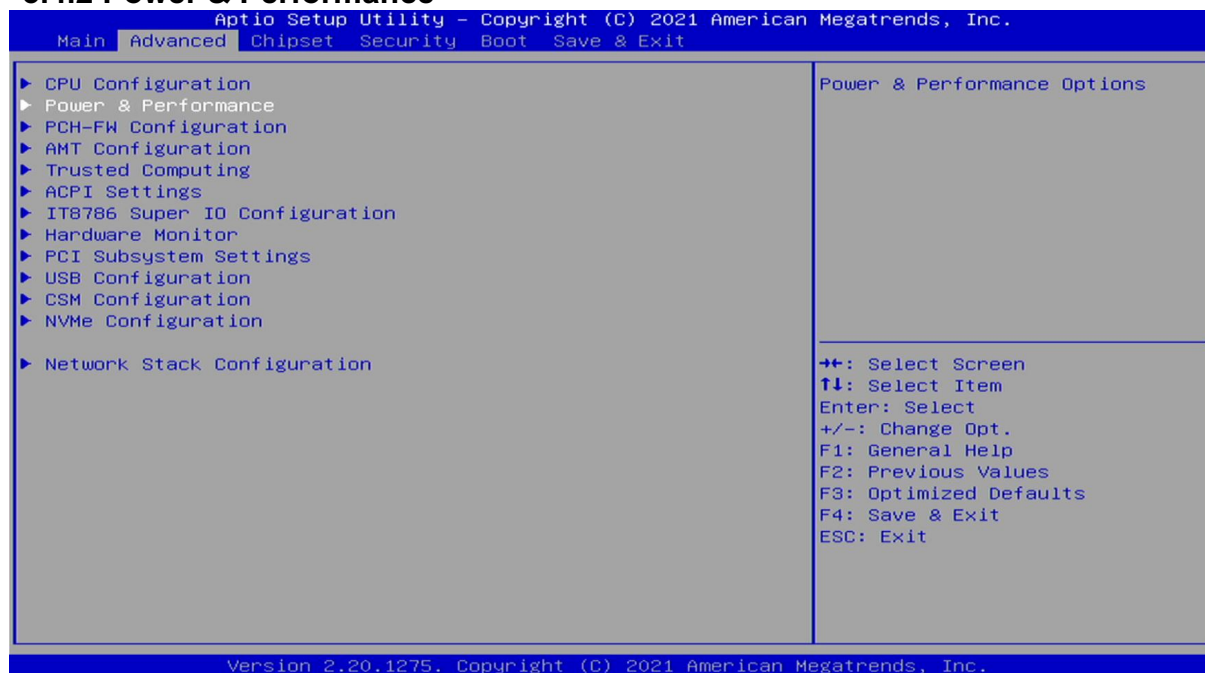


<b>Field Name</b>	<b>Intel (VMX) Virtualization Technology</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Active Processor Cores</b>
Default Value	[A11]
Possible Value	A11 1 2 3 4 5

<b>Field Name</b>	<b>Hyper-Threading</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

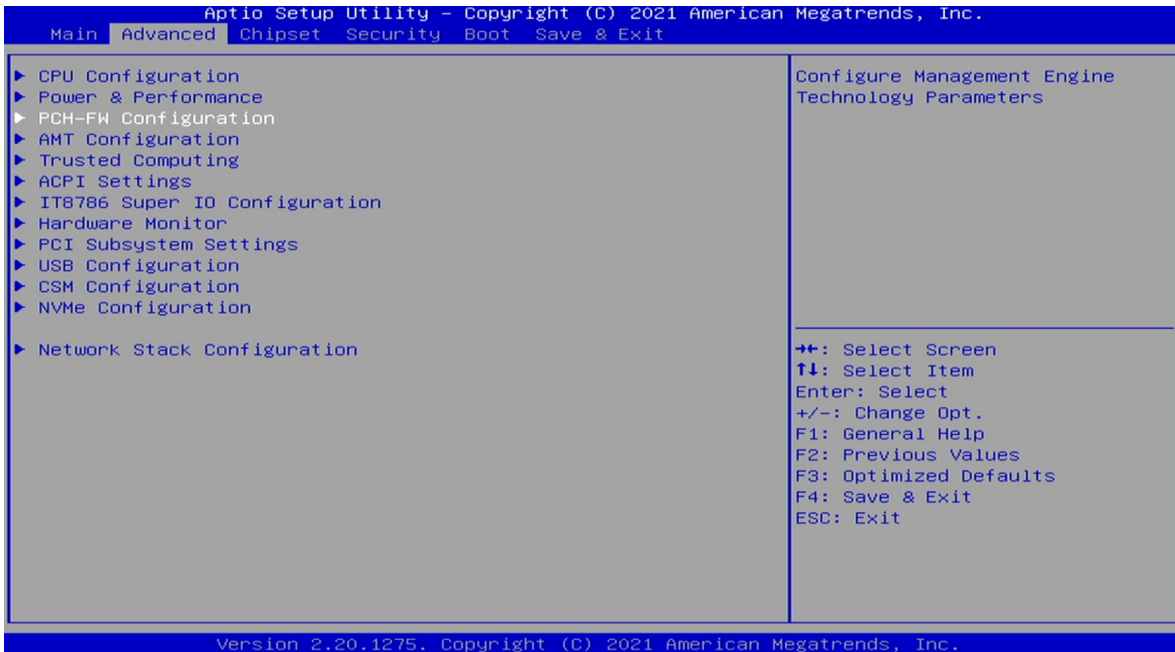
### 3.4.2 Power & Performance



<b>Field Name</b>	<b>Intel (R) SpeedStep(tm)</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Turbo Mode</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>C states</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

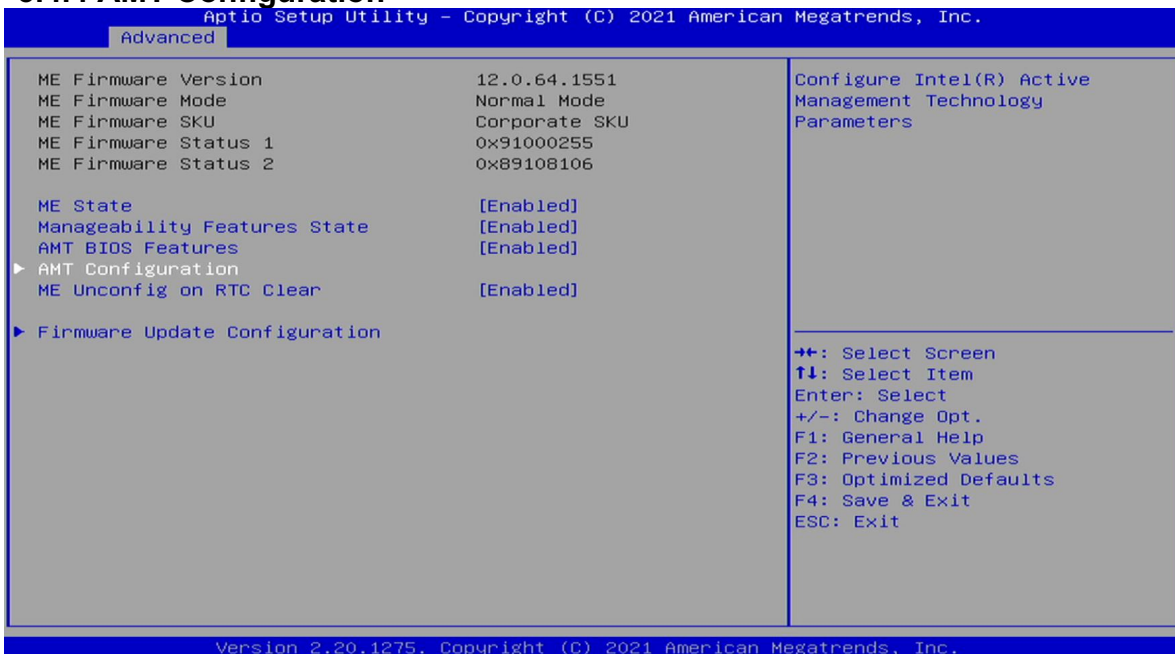


<b>Field Name</b>	<b>ME State</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Manageability Features State</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>AMT BIOS Features</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

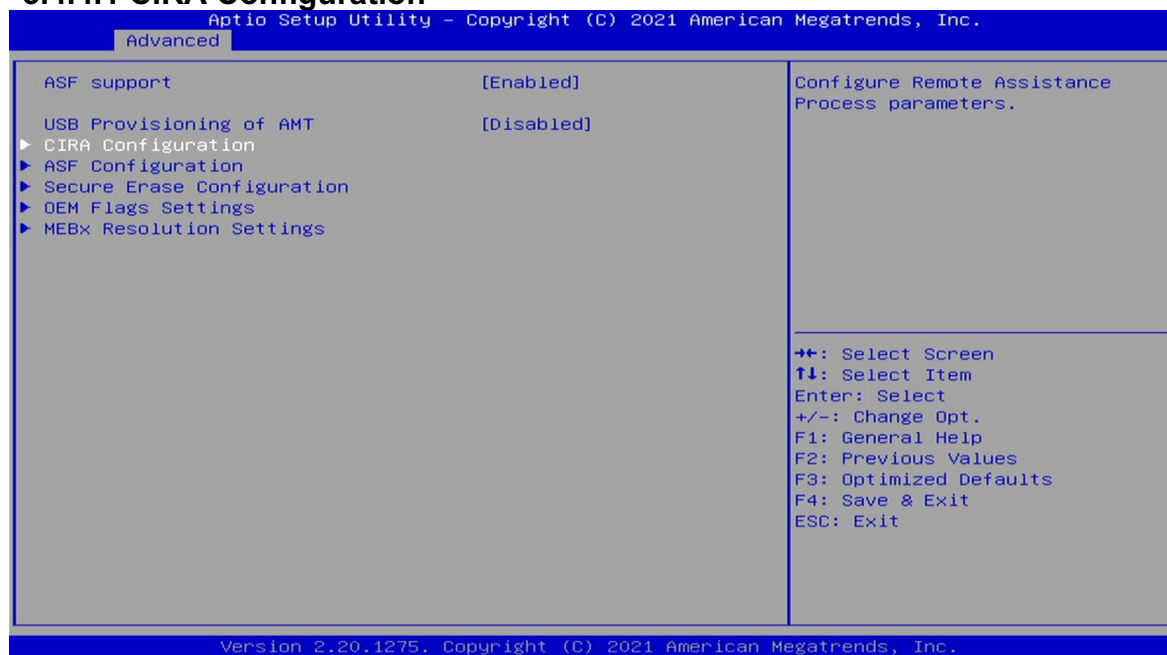
### 3.4.4 AMT Configuration



<b>Field Name</b>	<b>ASF support</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>USB Provisioning of AMT</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

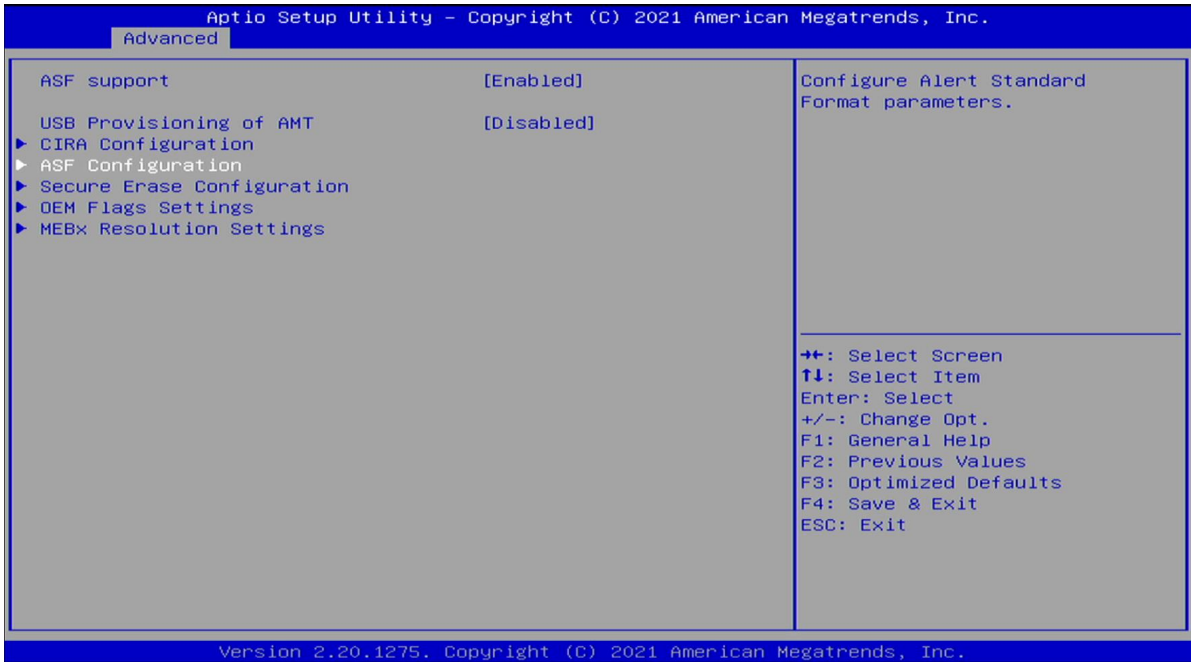
### 3.4.4.1 CIRA Configuration



<b>Field Name</b>	<b>Activate Remote Assistance Process</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.4.4.2 ASF Configuration



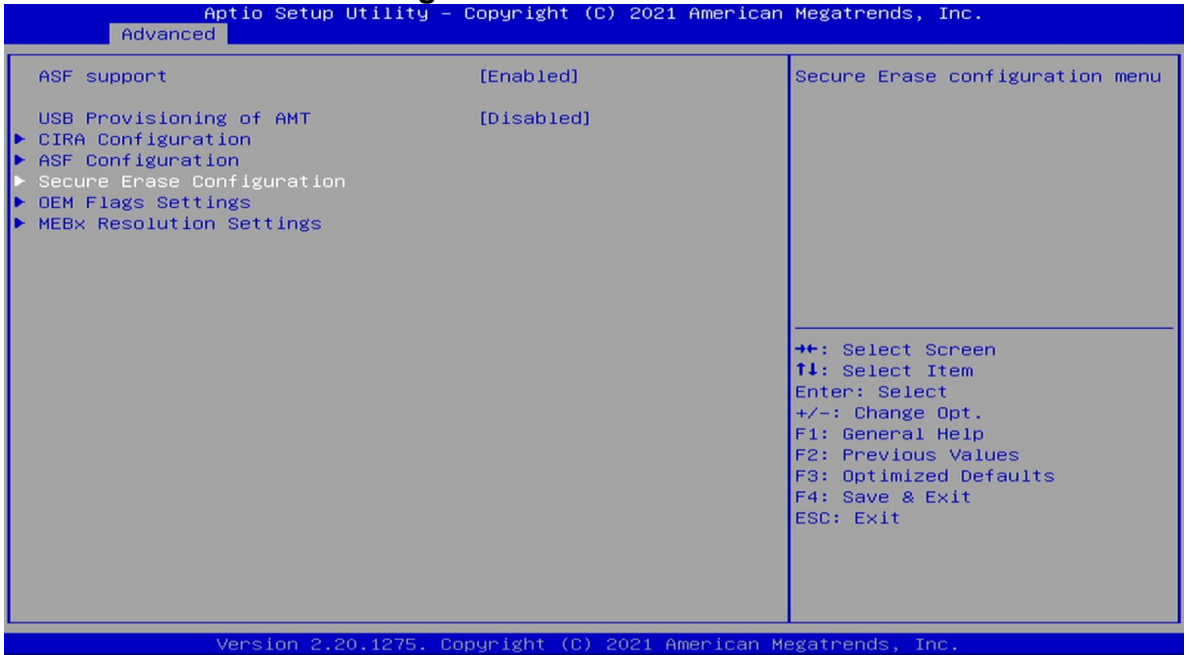


<b>Field Name</b>	<b>PET Progress</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>WatchDog</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>ASF Sensors Table</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

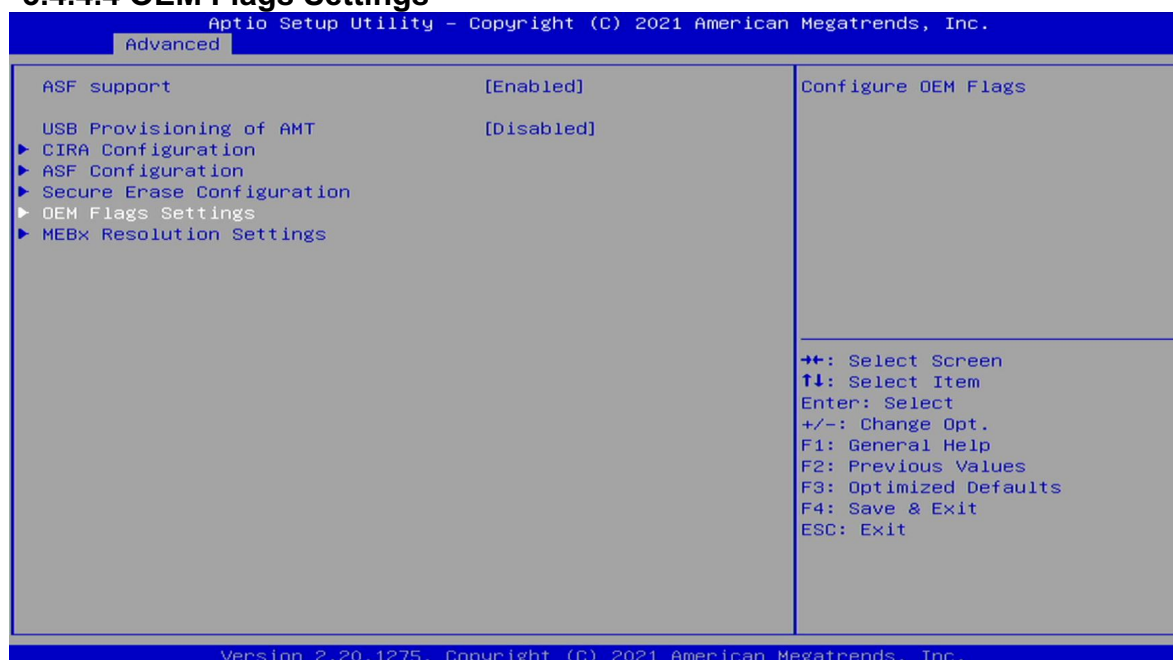
### 3.4.4.3 Secure Erase Configuration



<b>Field Name</b>	<b>Secure Erase mode</b>
Default Value	[Simulated]
Possible Value	Simulated Real

<b>Field Name</b>	<b>Force Secure Erase</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.4.4.4 OEM Flags Settings



<b>Field Name</b>	<b>MEBx hotkey Pressed</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

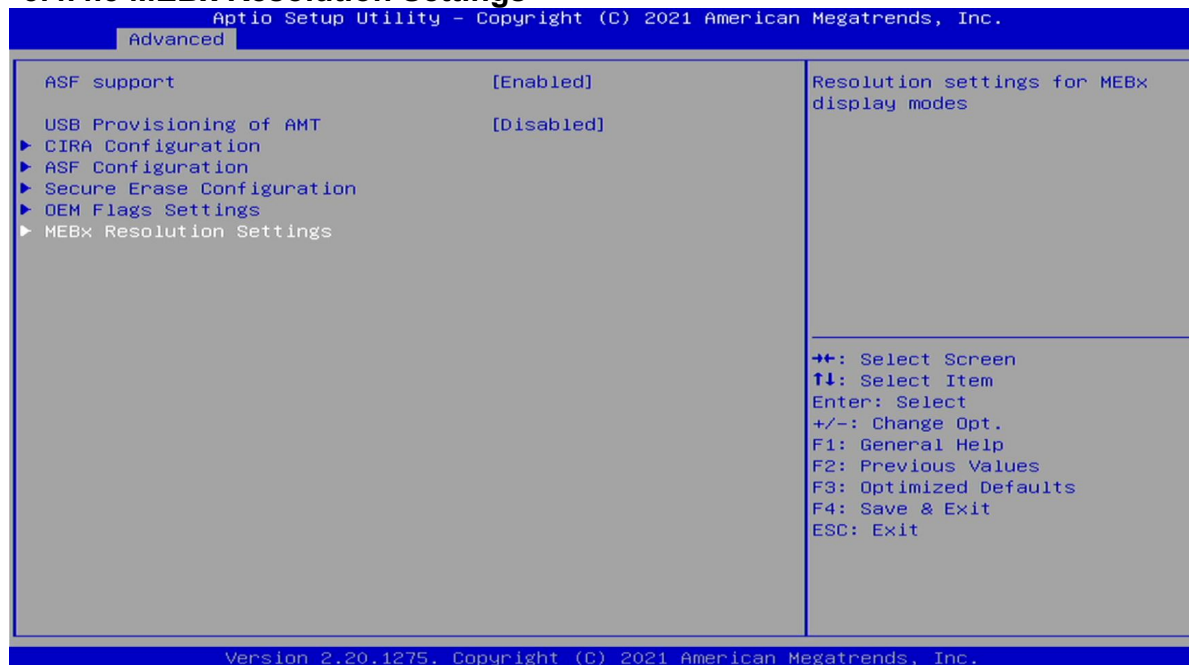
<b>Field Name</b>	<b>MEBx Selection Screen</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Hide Unconfigure ME Confirmation Prompt</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>MEBx OEM Debug Menu Enable</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Unconfigure ME</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

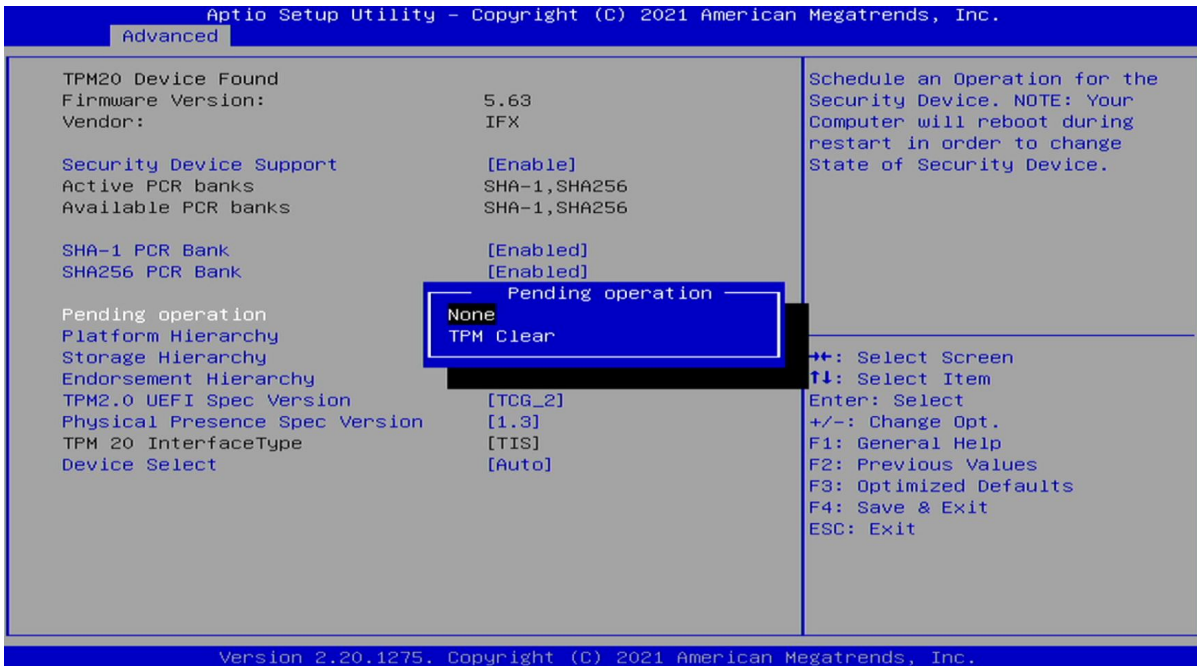
### 3.4.4.5 MEBx Resolution Settings



<b>Field Name</b>	<b>Non-UI Mode Resoultion</b>
Default Value	[Auto]
Possible Value	Auto 80x25 100x31

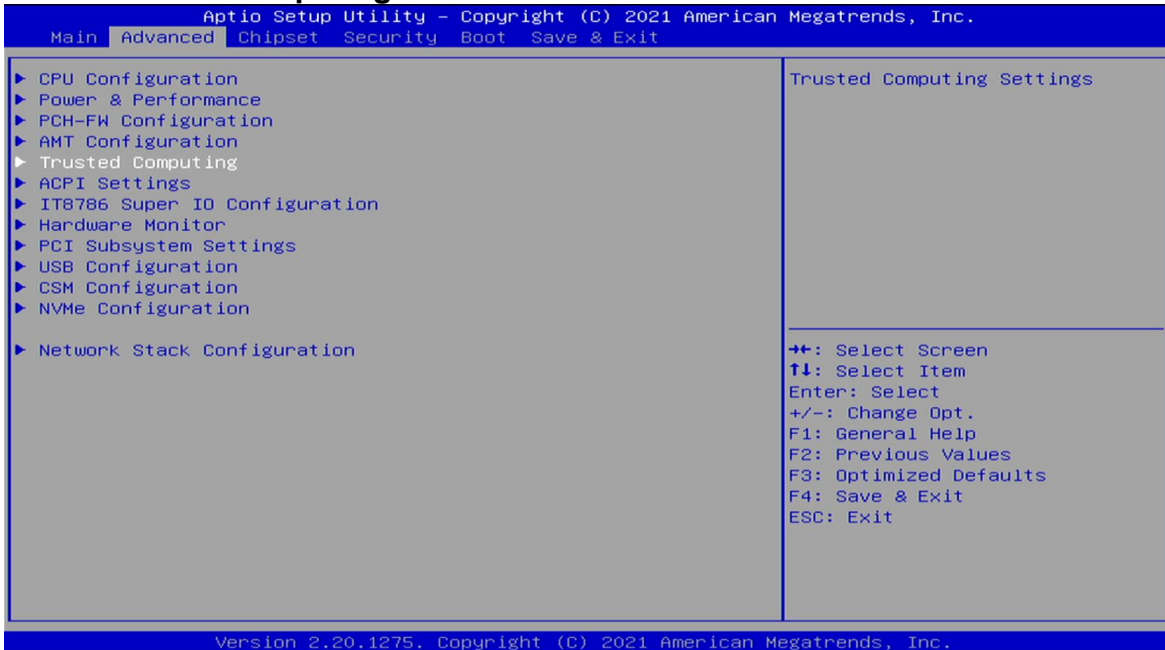
<b>Field Name</b>	<b>UI Mode Resolution</b>
Default Value	[Auto]
Possible Value	Auto 80x25 100x31

<b>Field Name</b>	<b>Graphics Mode Resoultion</b>
Default Value	[Auto]
Possible Value	Auto 640x480 800x600 1024x768



<b>Field Name</b>	<b>Pending operation</b>
Default Value	[None]
Possible Value	None TPM Clear

### 3.4.5 Trusted Computing



<b>Field Name</b>	<b>Security Device Support</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>SHA-1 PCR Bank</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>SHA256 PCR Bank</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Pending operation</b>
Default Value	[None]
Possible Value	None TPM Clear

<b>Field Name</b>	<b>Platform Hierarchy</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Storage Hierarchy</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

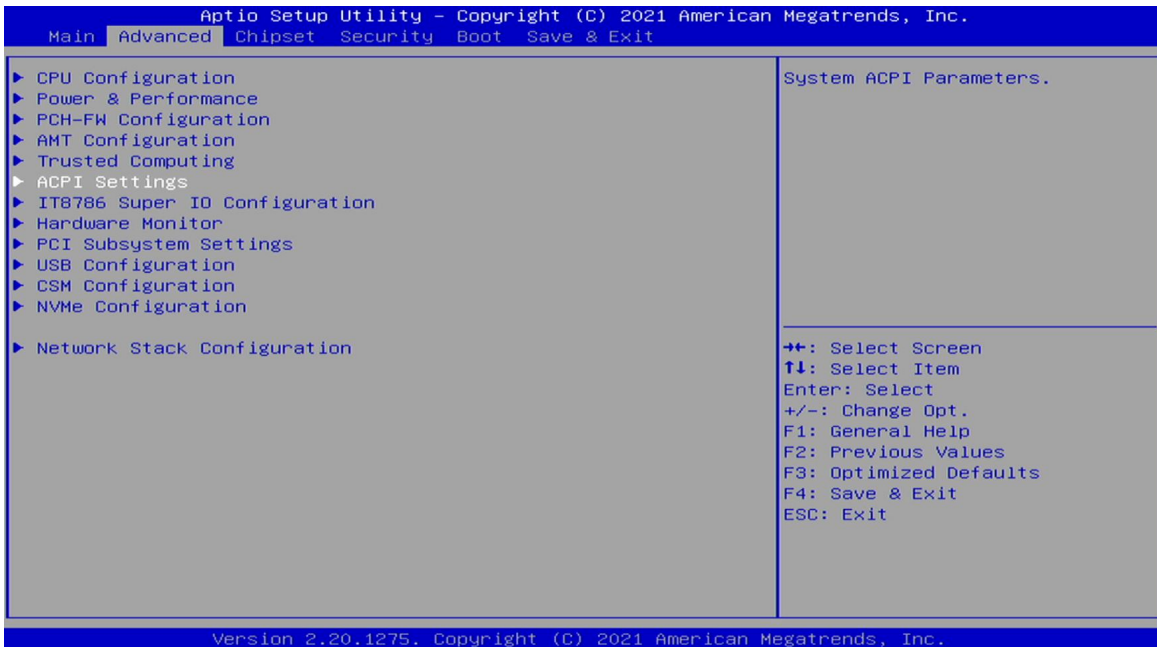
<b>Field Name</b>	<b>Endorsement Hierarchy</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>TPM2.0 UEFI Spec Version</b>
Default Value	[TCG_2]
Possible Value	TCG_1_2 TCG_2

<b>Field Name</b>	<b>Physical Presence Spec Version</b>
Default Value	[1.3]
Possible Value	1.2 1.3

<b>Field Name</b>	<b>Device Select</b>
Default Value	[Auto]
Possible Value	TPM 1.2 TPM 2.0 Auto

### 3.4.6 ACPI Settings



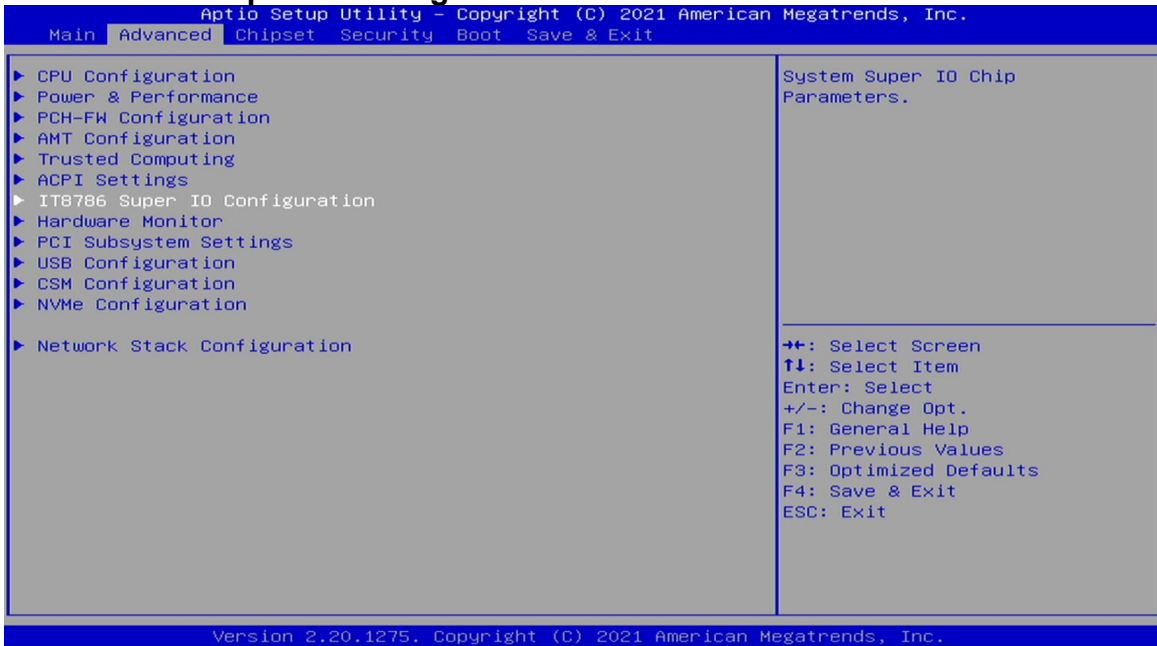
<b>Field Name</b>	<b>Enable ACPI Auto Configuration</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Enable Hibernation</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>ACPI Sleep State</b>
Default Value	[S3 (Suspend to RAM)]
Possible Value	Suspend Disabled S3 (Suspend to RAM)

<b>Field Name</b>	<b>Lock Legacy Resources</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.4.7 IT8786 Super IO Configuration



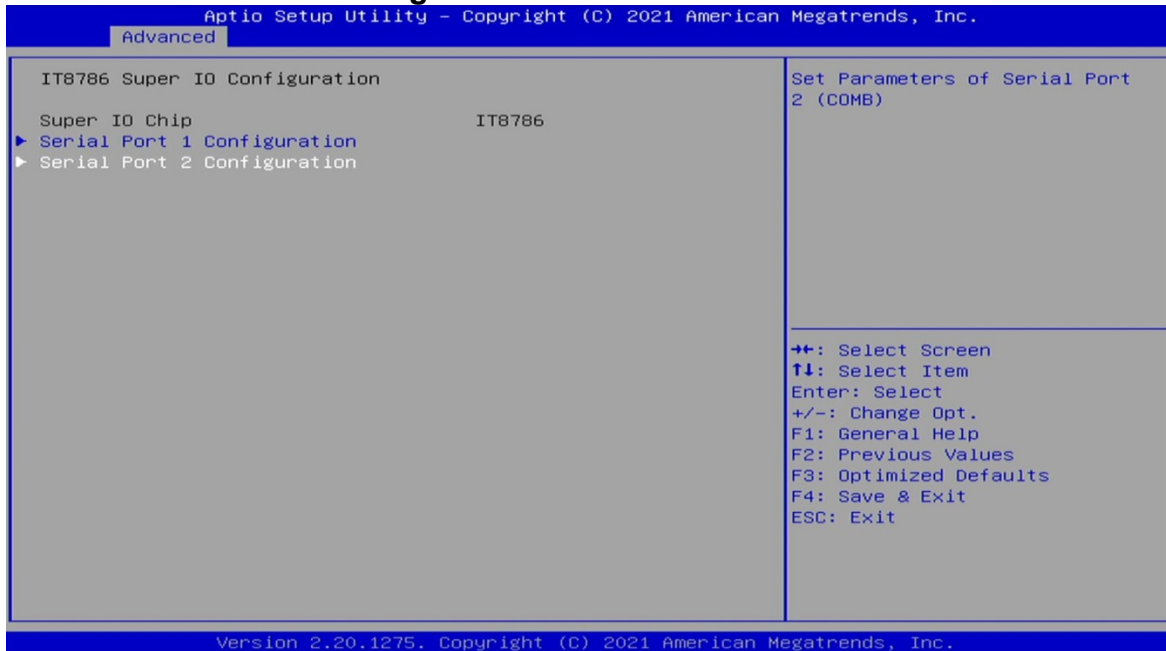
#### 3.4.7.1 Social Port 1 Configuration



Field Name	Serial Port
Default Value	[Enabled]
Possible Value	Disabled Enabled

Field Name	COM1 Control
Default Value	[RS-232]
Possible Value	Loopback RS-232 RS-485 Half Duplex RS-485/422 Full Duplex

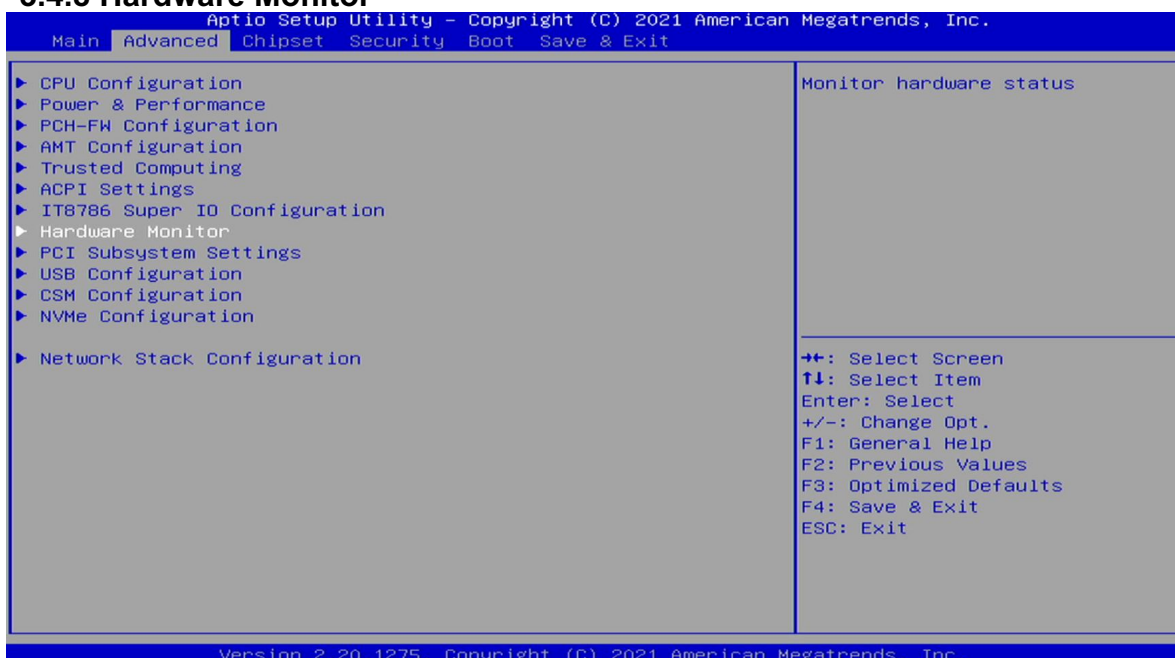
### 3.4.7.2 Social Port 2 Configuration



Field Name	Serial Port
Default Value	[Enabled]
Possible Value	Disabled Enabled

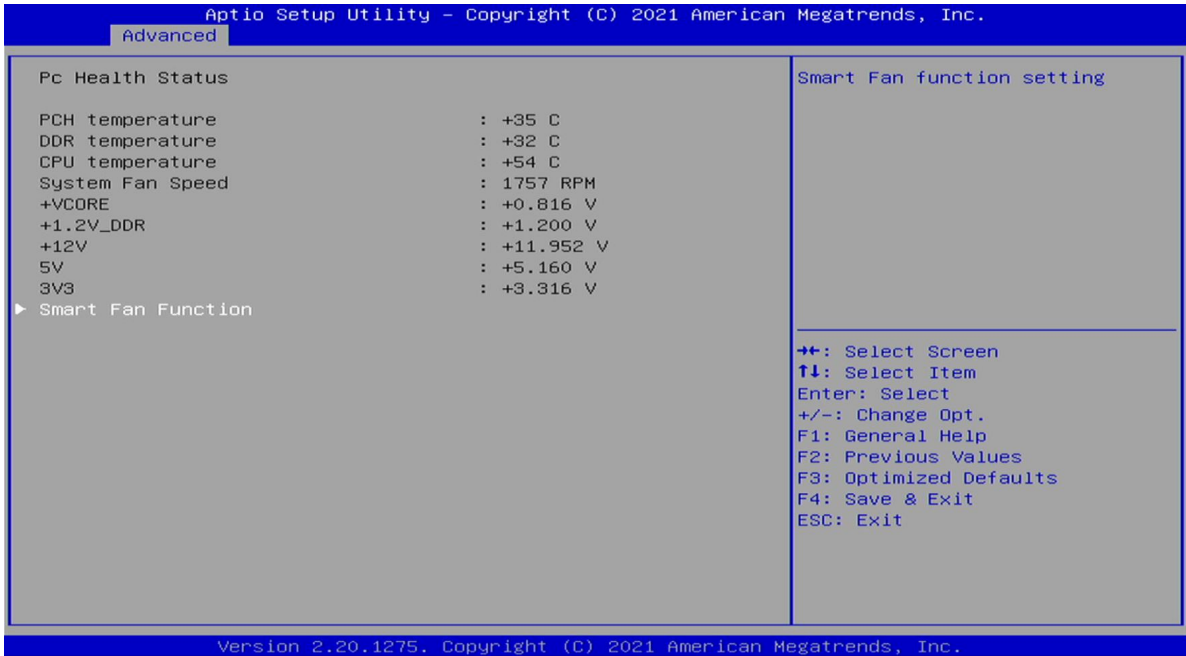
Field Name	COM2 Control
Default Value	[RS-232]
Possible Value	Loopback RS-232 RS-485 Half Duplex RS-485/422 Full Duplex

### 3.4.8 Hardware Monitor



#### 3.4.8.1 Smart Fan Function

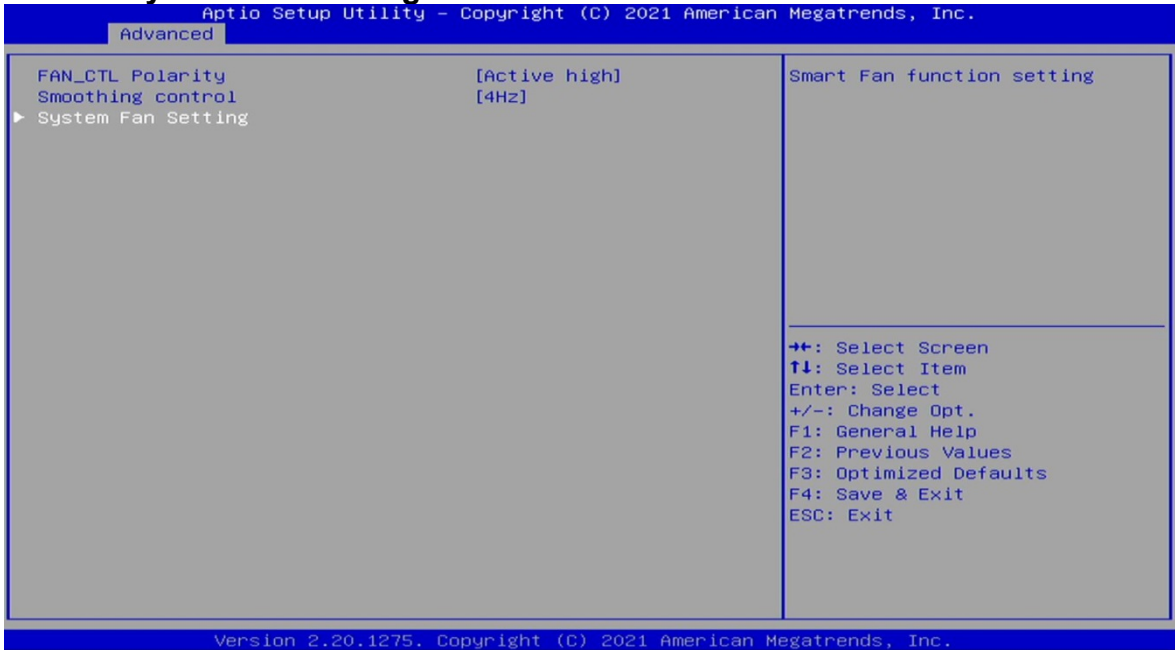




<b>Field Name</b>	<b>FAN_CTL Polarity</b>
Default Value	[Active high]
Possible Value	Active low Active high

<b>Field Name</b>	<b>Smoothing control</b>
Default Value	[4Hz]
Possible Value	1Hz 16Hz 8Hz 4Hz

### 3.4.8.2 System Fan Setting



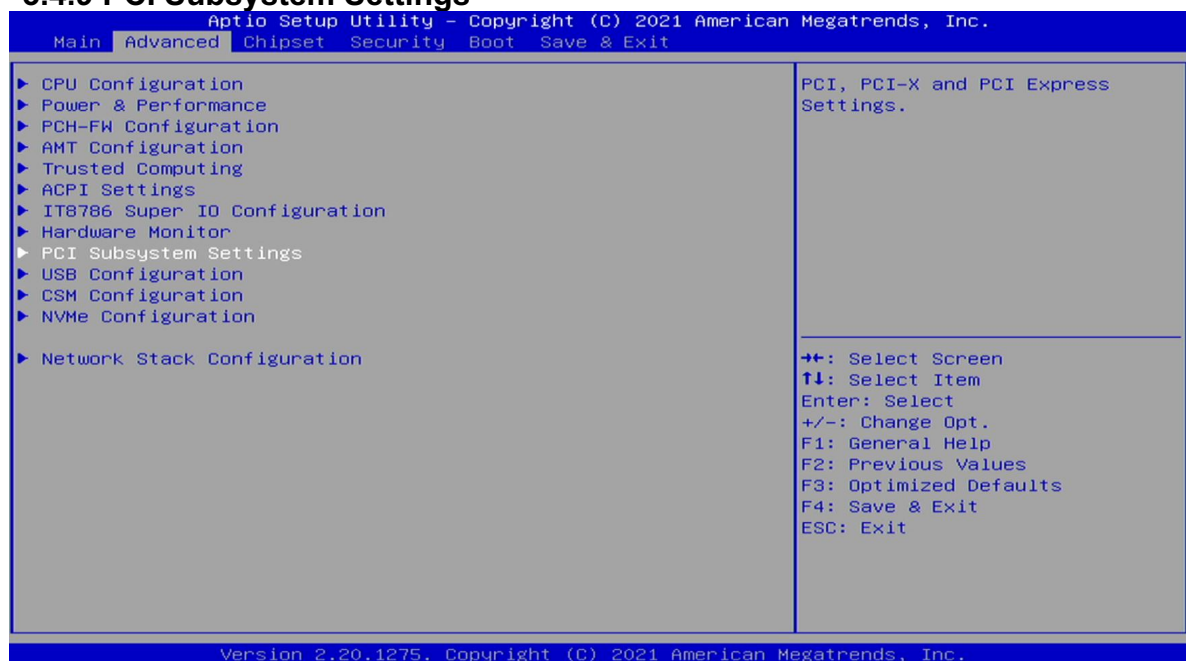
<b>Field Name</b>	<b>Smart Fan Mode</b>
Default Value	[Automatic Mode]
Possible Value	Software Mode Automatic Mode

<b>Field Name</b>	<b>Smart Fan Mode</b>
Default Value	[Automatic Mode]
Possible Value	Software Mode Automatic Mode

<b>Field Name</b>	<b>System Fan Type</b>
Default Value	[PWM]
Possible Value	PWM RPM

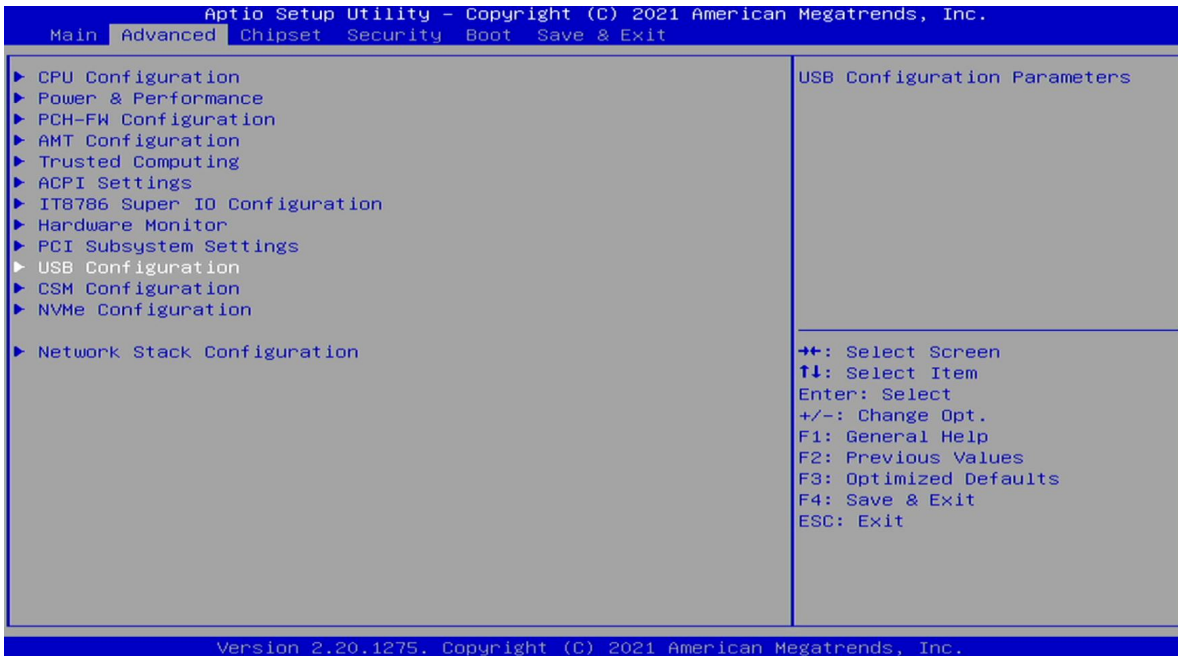
<b>Field Name</b>	<b>Temperature select</b>
Default Value	[TMP IN3]
Possible Value	TMP IN1 TMP IN2 TMP IN3

### 3.4.9 PCI Subsystem Settings



<b>Field Name</b>	<b>Above 4G Decoding</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.4.10 USB Configuration



<b>Field Name</b>	<b>Legacy USB Support</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled Auto

<b>Field Name</b>	<b>XHCI Hand-off</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled

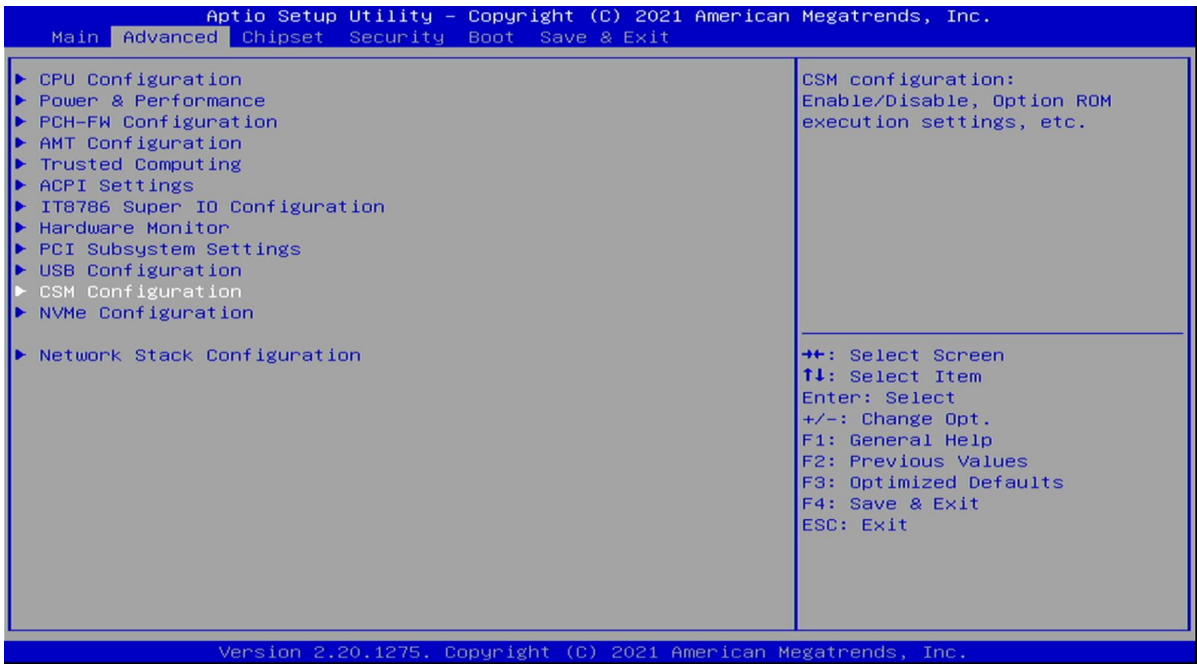
<b>Field Name</b>	<b>USB Mass Storage Driver Support</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>USB transfer time-out</b>
Default Value	[20 sec]
Possible Value	1 sec 5 sec 10 sec 20 sec

<b>Field Name</b>	<b>Device reset time-out</b>
Default Value	[20 sec]
Possible Value	10 sec 20 sec 30 sec 40 sec

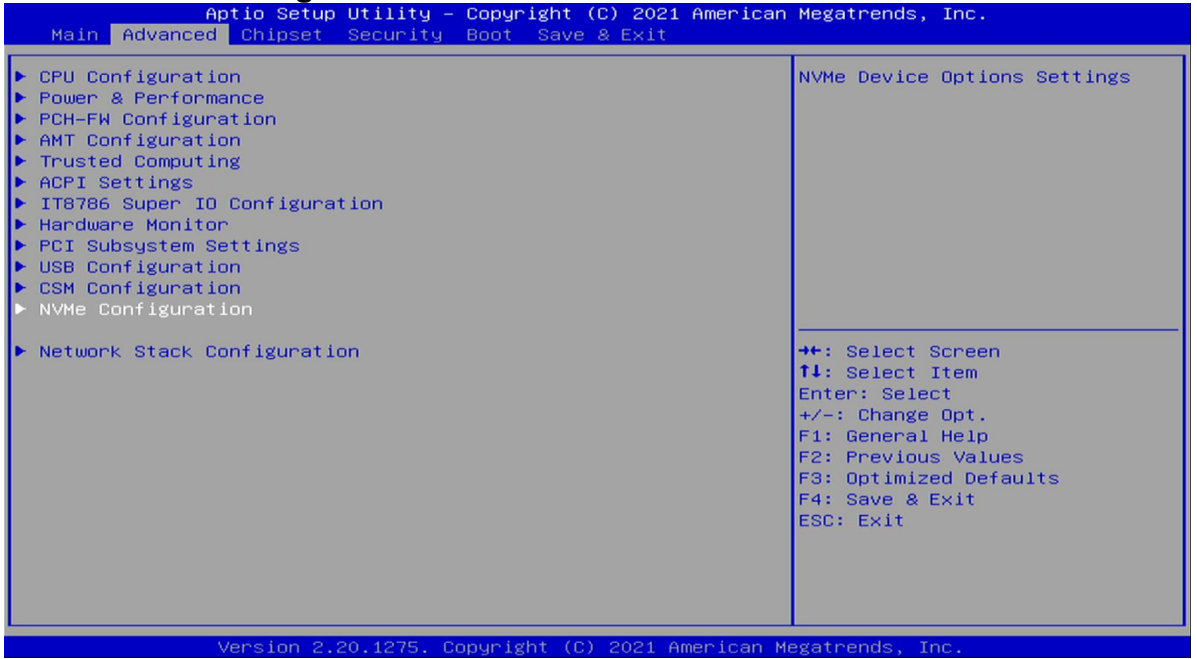
<b>Field Name</b>	<b>Device power-up delay</b>
Default Value	[Auto]
Possible Value	Auto Manual

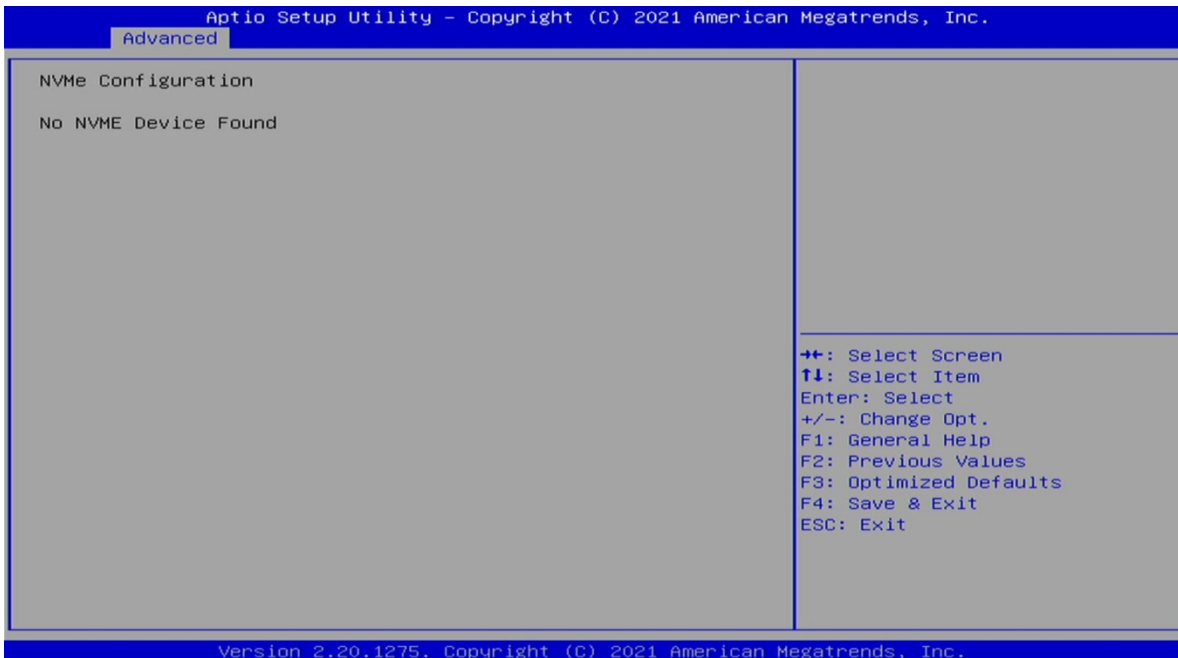
### 3.4.11 CSM Configuration



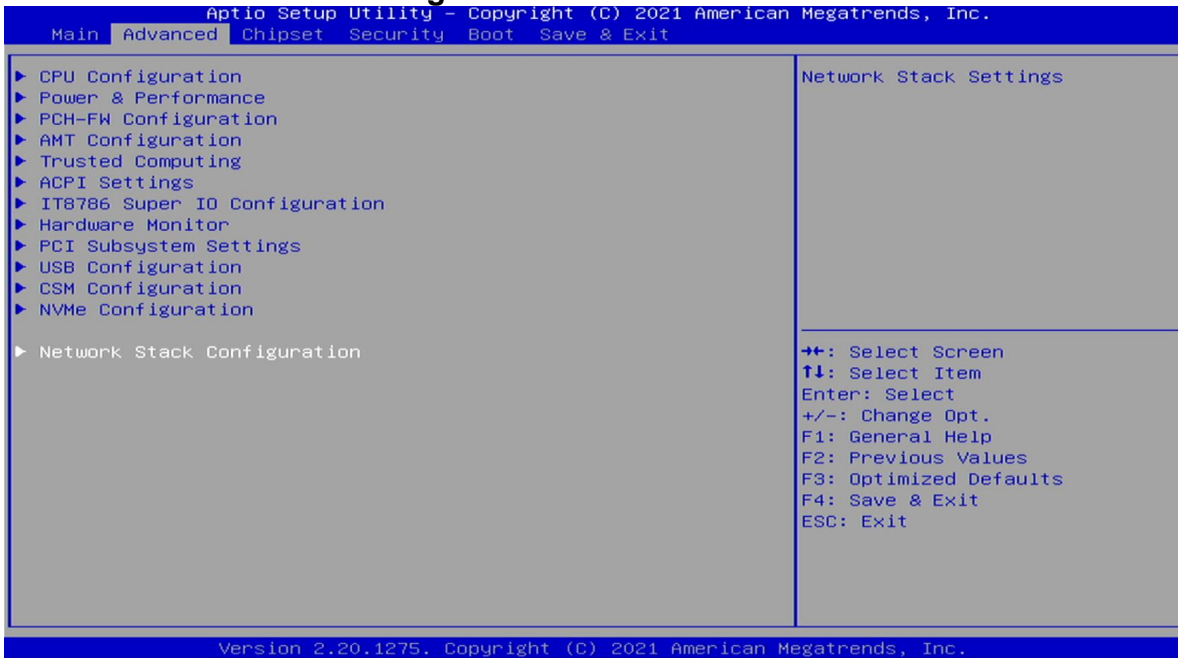
<b>Field Name</b>	<b>CSM Support</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.4.12 NVMe Configuration





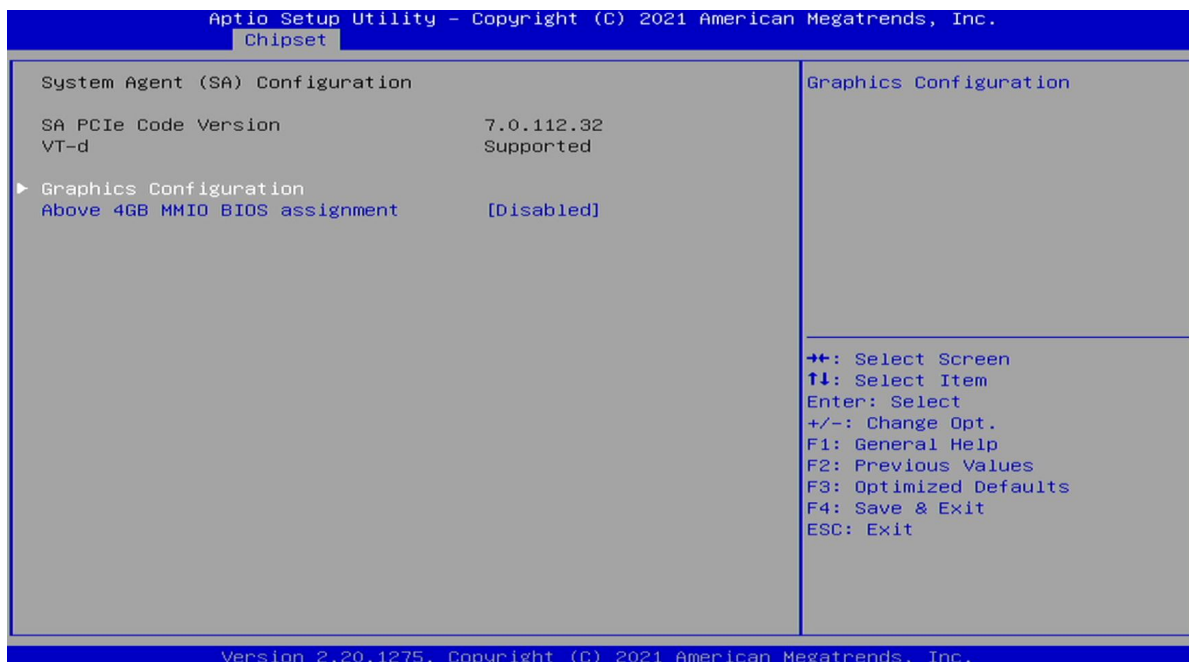
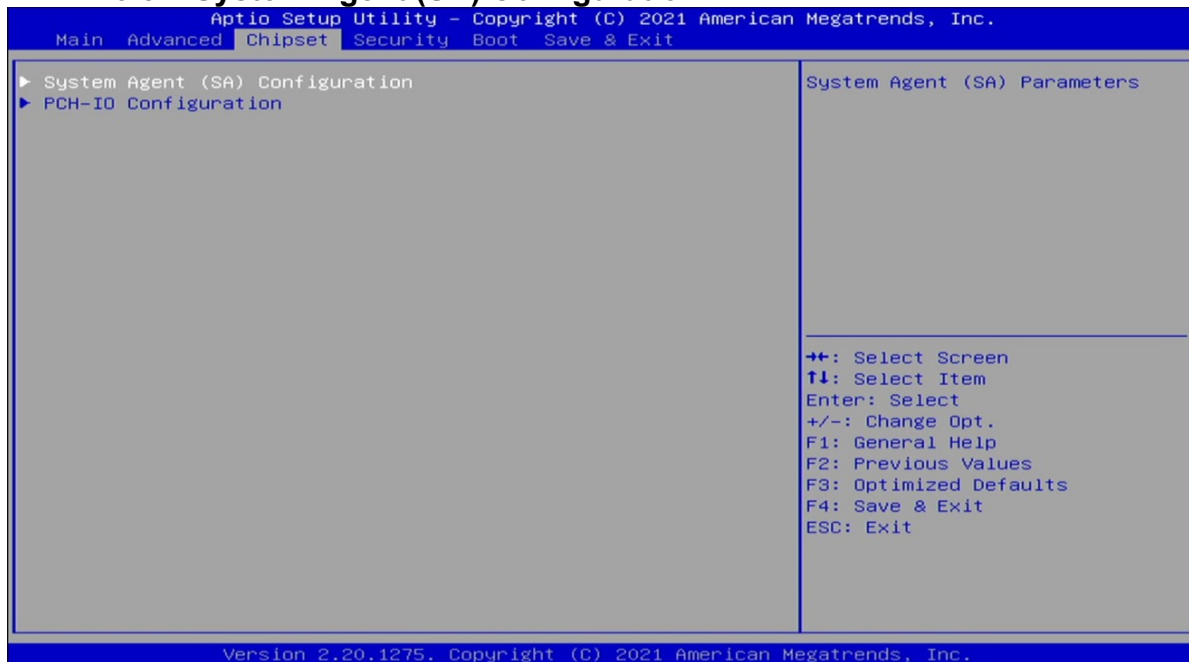
### 3.4.13 Network Stack Configuration



Field Name	Network Stack
Default Value	[Disabled]
Possible Value	Disabled Enabled

## 3.5 Chipset

### 3.5.1 System Agent (SA) Configuration



Field Name	Primary Display
Default Value	[Auto]
Possible Value	Auto IGFX PEG PCI SG

<b>Field Name</b>	<b>Internal Graphics</b>
Default Value	[Auto]
Possible Value	Auto Disabled Enabled

<b>Field Name</b>	<b>GTT Size</b>
Default Value	[8MB]
Possible Value	2MB 4MB 8MB

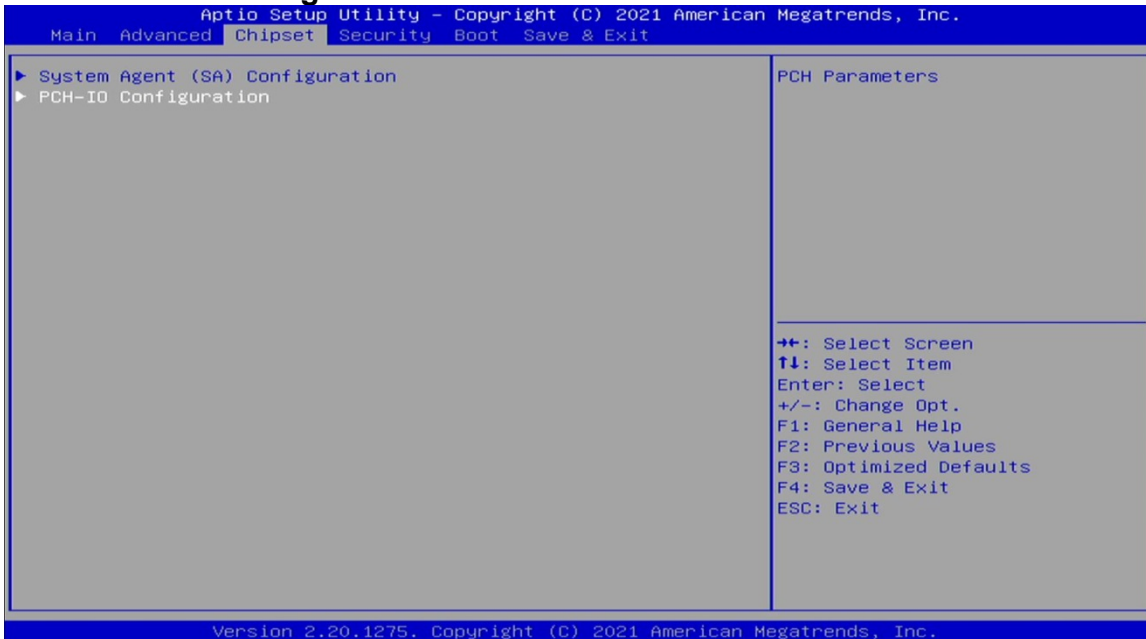
<b>Field Name</b>	<b>Aperture Size</b>
Default Value	[256MB]
Possible Value	128MB 256MB 512MB 1024MB 2048MB

<b>Field Name</b>	<b>DVMT Pre-Allocated</b>
Default Value	[32M]
Possible Value	0M 32M 64M 4M 8M 12M 16M 20M 24M 28M 32M/F7 36M 40M 44M 48M 52M 56M 60M

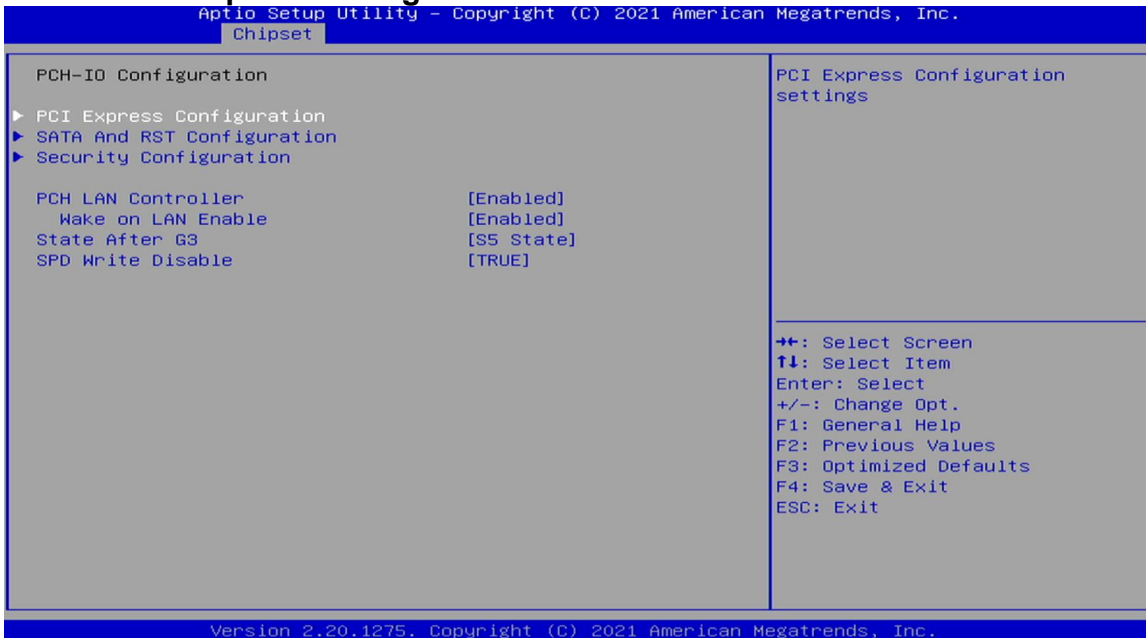
<b>Field Name</b>	<b>DVMT Total Gfx Mem</b>
Default Value	[128M]
Possible Value	128M 256M MAX

<b>Field Name</b>	<b>Above 4GB MMIO BIOS assignment</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled

### 3.5.2 PCH-IO Configuration

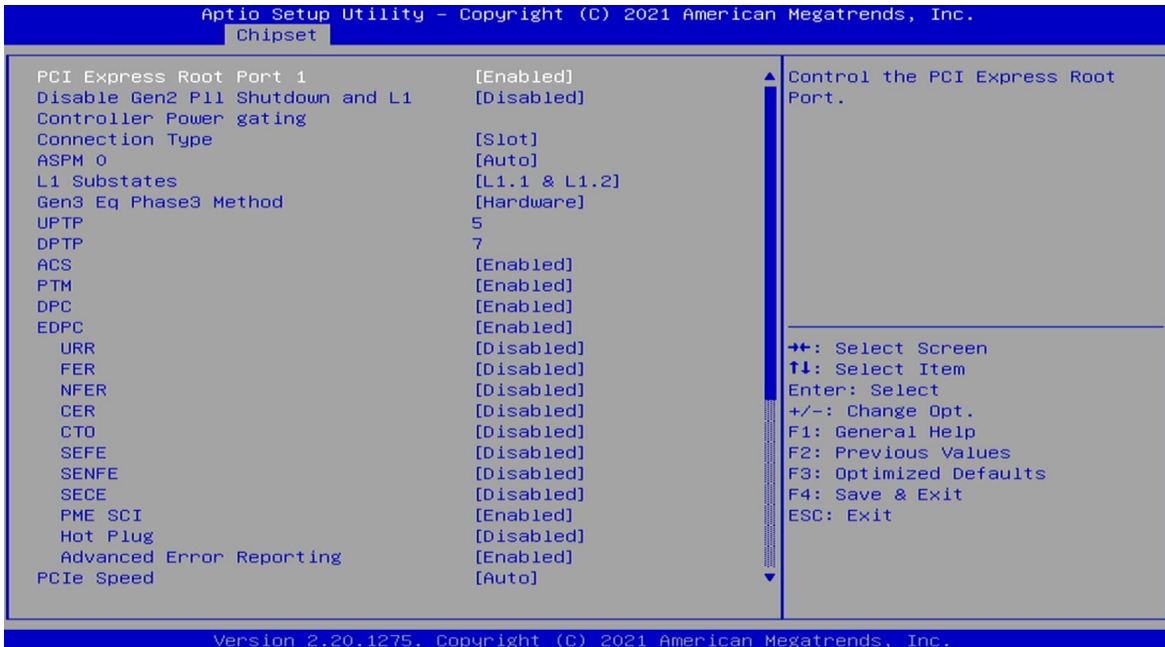
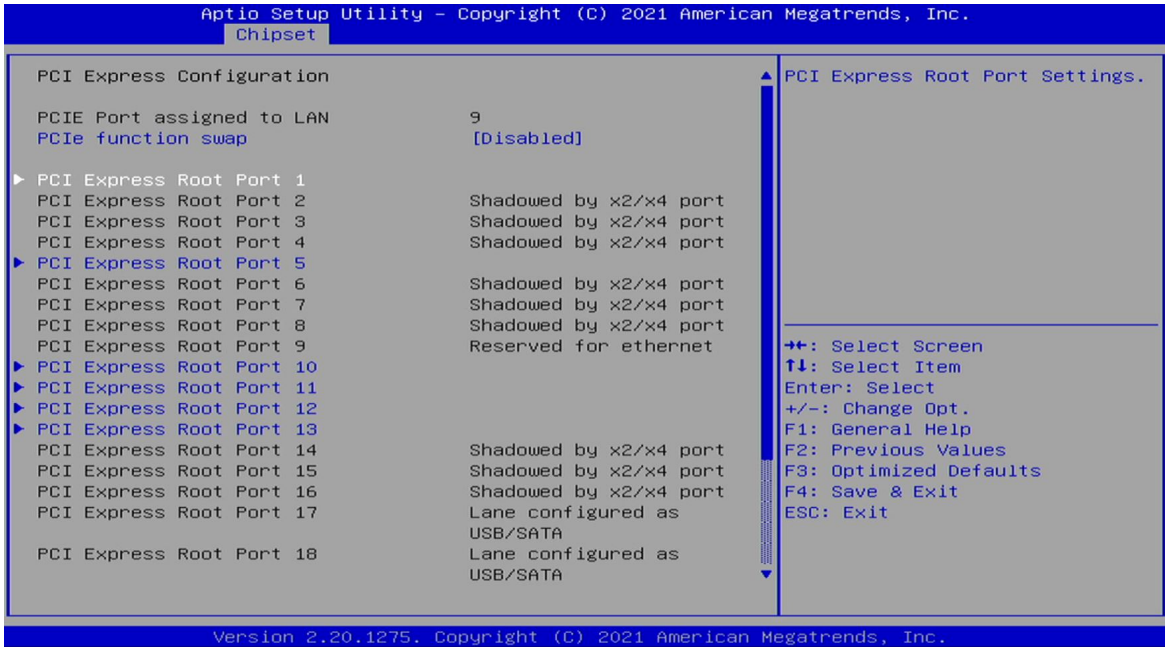


#### 3.5.2.1 PCI Express Configuration



Field Name	PCIe function swap
Default Value	[Disabled]
Possible Value	Disabled Enabled





<b>Field Name</b>	<b>PCI Express Root Port 1</b>
Default Value	[Enabled]

<b>Field Name</b>	<b>PCI Express Root Port 5</b>
Default Value	[Enabled]

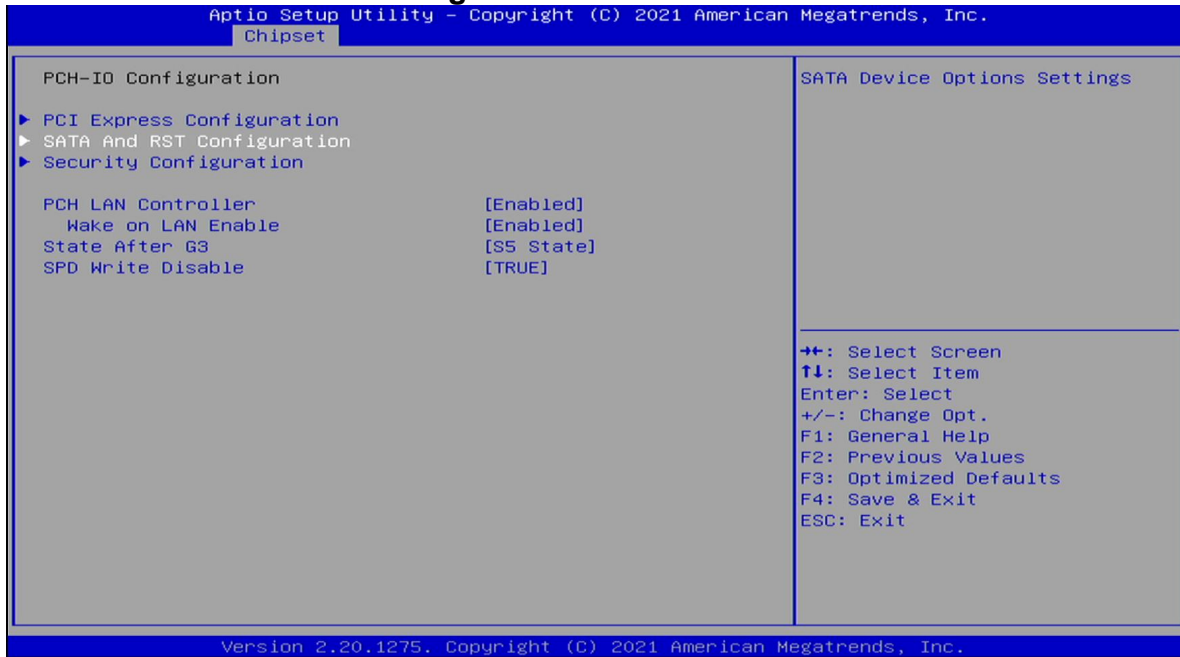
<b>Field Name</b>	<b>PCI Express Root Port 10</b>
Default Value	[Enabled]

<b>Field Name</b>	<b>PCI Express Root Port 11</b>
Default Value	[Enabled]

<b>Field Name</b>	<b>PCI Express Root Port 12</b>
Default Value	[Enabled]

<b>Field Name</b>	<b>PCI Express Root Port 13</b>
Default Value	[Enabled]

### 3.5.2.2 SATA And RST Configuration



<b>Field Name</b>	<b>SATA Controller(s)</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled

<b>Field Name</b>	<b>SATA Mode Selection</b>
Default Value	[AHCI]
Possible Value	AHCI Intel RST Premium With Intel Optane System Acceleration

<b>Field Name</b>	<b>M.2 Port</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

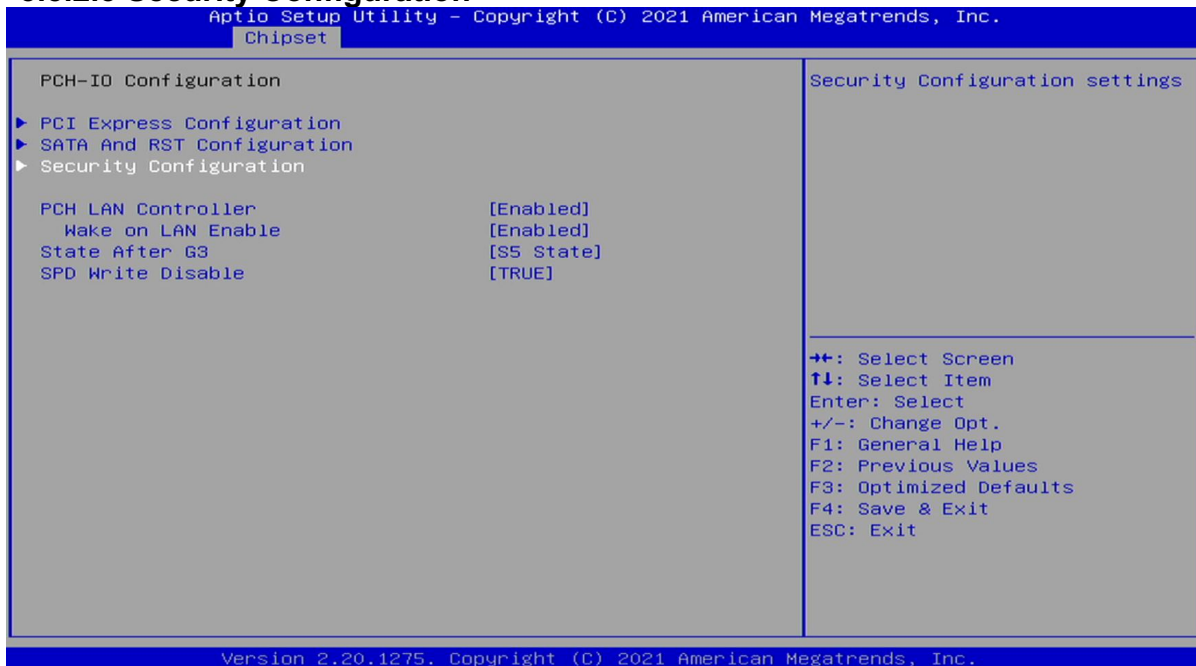
<b>Field Name</b>	<b>Port 1</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Port 2</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Port 3</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Port 4</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

### 3.5.2.3 Security Configuration



<b>Field Name</b>	<b>RTC Memory Lock</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>BIOS Lock</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>Force unlock on all GPIO pads</b>
Default Value	[Disabled]
Possible Value	Disabled Enabled

<b>Field Name</b>	<b>PCH LAN Controller</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled

<b>Field Name</b>	<b>Wake on LAN Enable</b>
Default Value	[Enabled]
Possible Value	Enabled Disabled

<b>Field Name</b>	<b>State After G3</b>
Default Value	[S5 State]
Possible Value	S0 State S5 State

<b>Field Name</b>	<b>SPD Write Disable</b>
Default Value	[TRUE]
Possible Value	TRUE FALSE

## 3.6 Security

### 3.6.1 Administrator Password

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Main Advanced Chipset Security Boot Save & Exit

<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length 3 Maximum length 20</p> <p>Administrator Password User Password</p> <p>HDD Security Configuration: P4:TS128GSSD230S</p> <p>► Secure Boot</p>	<p>Set Administrator Password</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>
---	---

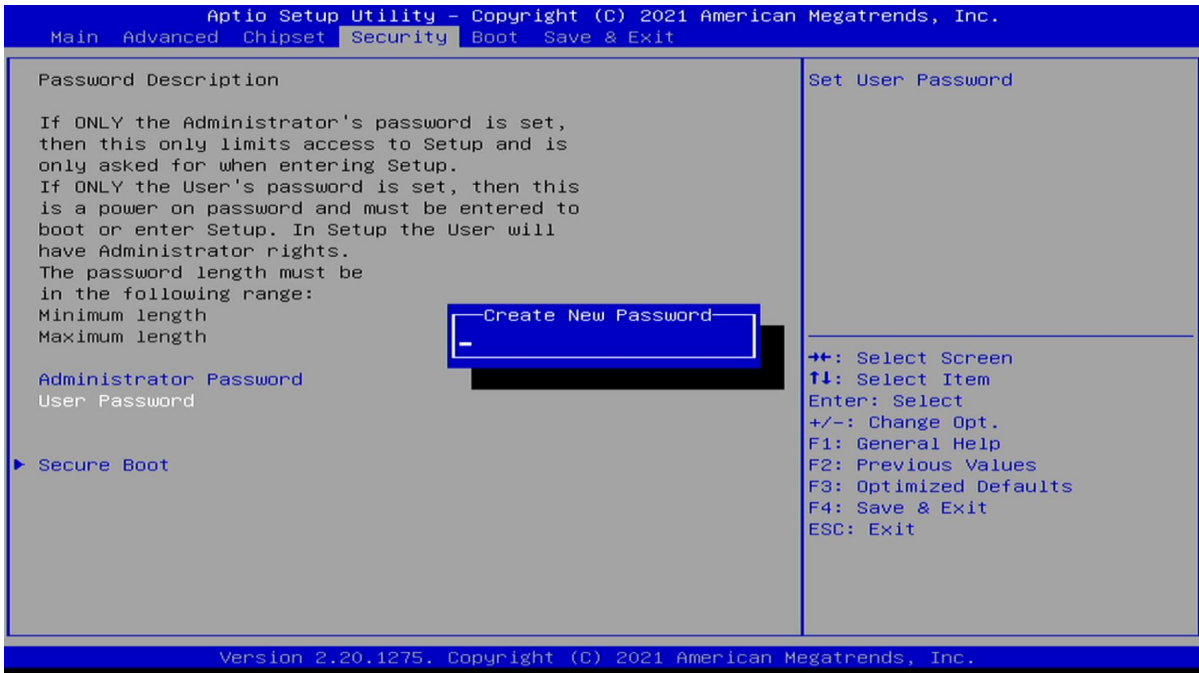
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Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.  
Main Advanced Chipset Security Boot Save & Exit

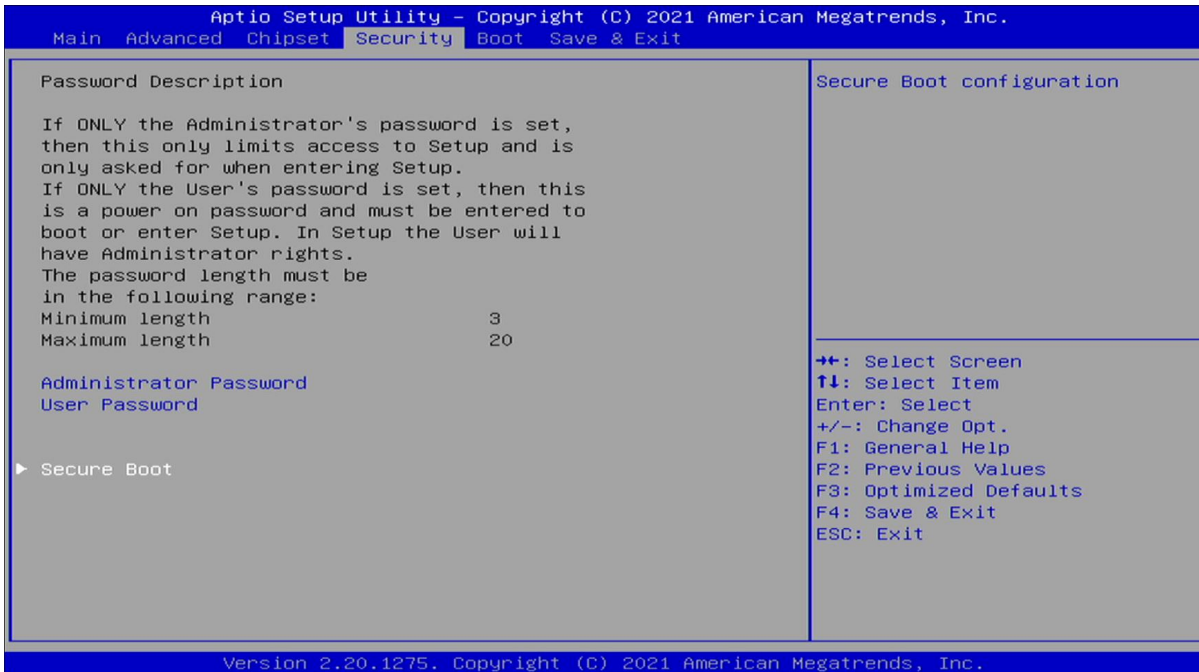
<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length Maximum length</p> <p>Administrator Password User Password</p> <p>► Secure Boot</p>	<p>Set Administrator Password</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>
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### 3.6.2 User Password



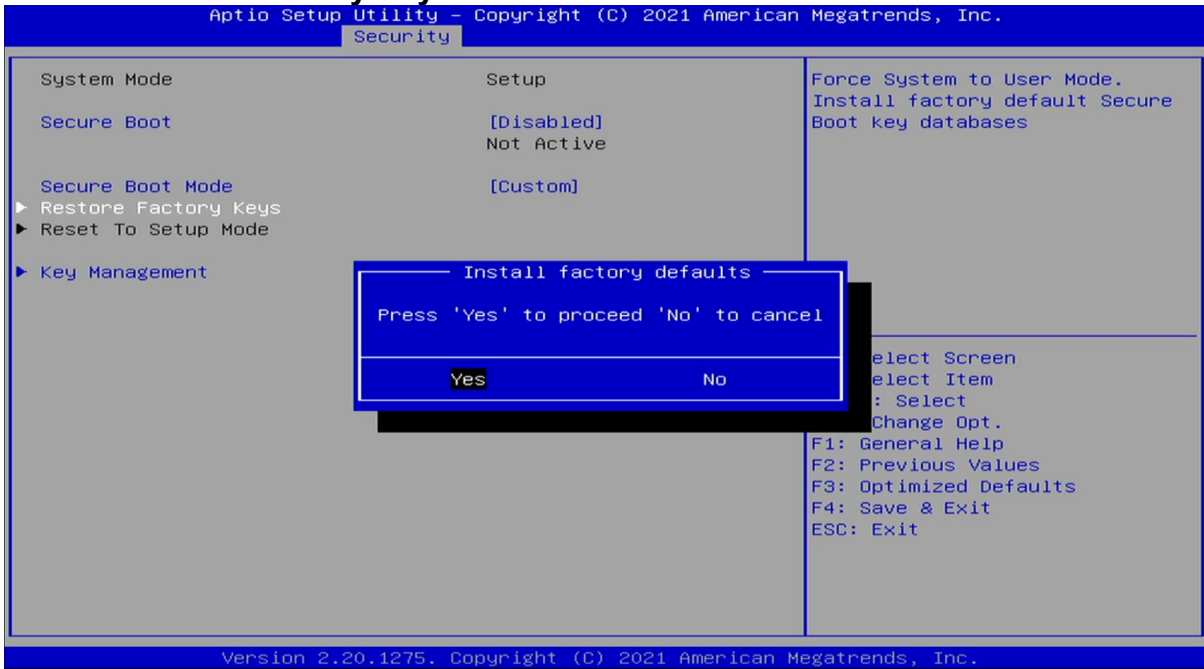
### 3.6.3 Secure Boot



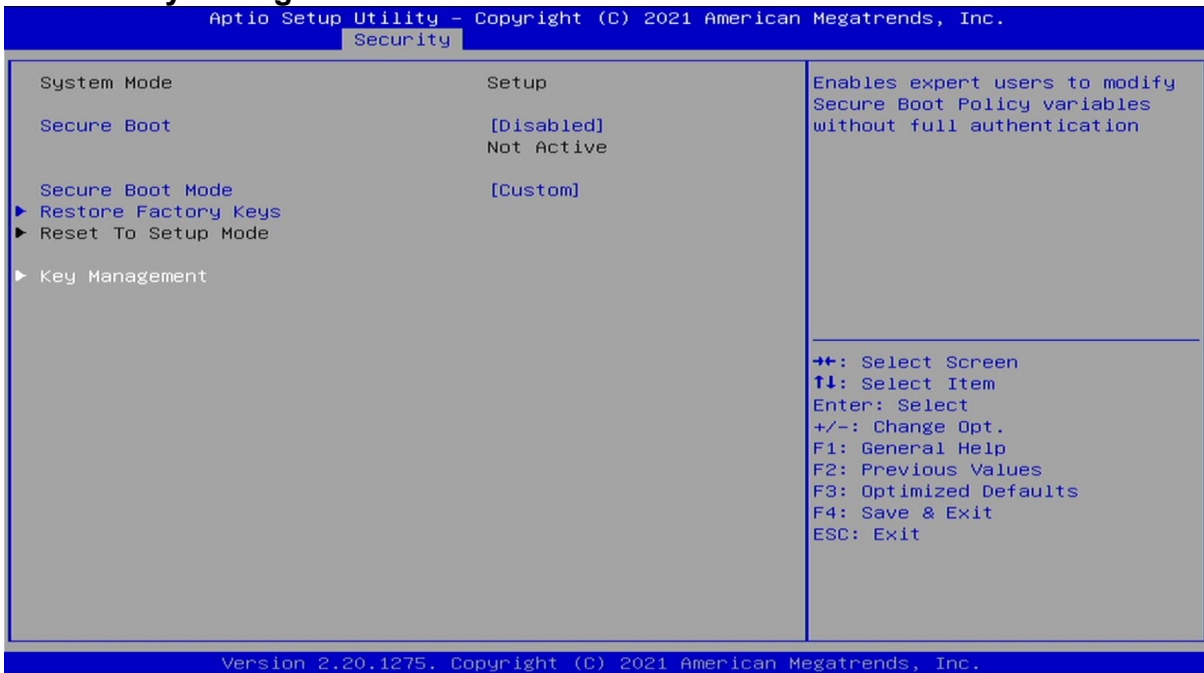
Field Name	Secure Boot
Default Value	[Disabled]
Possible Value	Disabled Enabled

Field Name	Secure Boot Mode
Default Value	[Custom]
Possible Value	Standard Custom

### 3.6.3.1 Restore Factory Keys

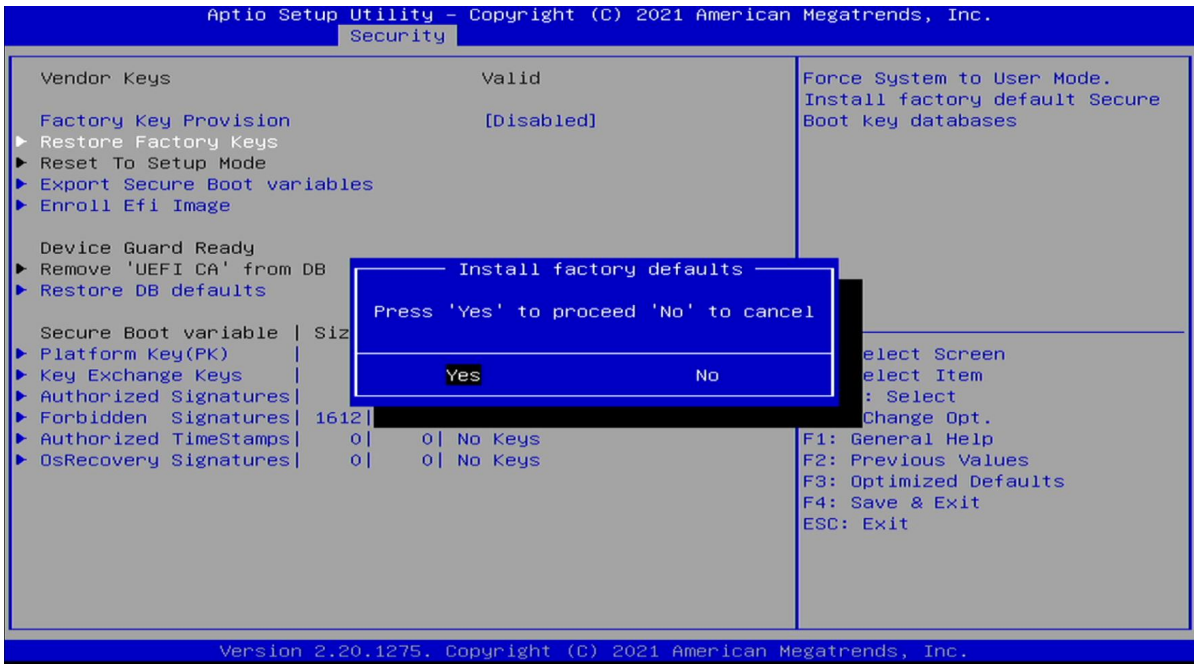


### 3.6.3.2 Key Management



Field Name	Factory Key Provision
Default Value	[Disabled]
Possible Value	Disabled Enabled

### 3.6.3.3 Install factory defaults



### 3.6.3.4 File System



### 3.6.3.5 File System

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Security

Vendor Keys Valid

Factory Key Provision [Disabled]

▶ Restore Factory Keys

▶ Reset To Setup Mode

▶ Export Secure Boot variables

▶ Enroll Efi Image

Device Guard Ready

▶ Remove 'UEFI CA' from DB

▶ Restore DB defaults

Secure Boot variable | Size | Keys

▶ Platform Key(PK) | 0 | 0

▶ Key Exchange Keys | 0 | 0

▶ Authorized Signatures | 0 | 0

▶ Forbidden Signatures | 1612 | 3

▶ Authorized TimeStamps | 0 | 0 | No Keys

▶ OsRecovery Signatures | 0 | 0 | No Keys

File System

No Valid File System Available

Ok

Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

: Select Screen

: Select Item

: Select

-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

ESC: Exit

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### 3.6.3.6 Restore DB defaults

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Security

Vendor Keys Valid

Factory Key Provision [Disabled]

▶ Restore Factory Keys

▶ Reset To Setup Mode

▶ Export Secure Boot variables

▶ Enroll Efi Image

Device Guard Ready

▶ Remove 'UEFI CA' from DB

▶ Restore DB defaults

Secure Boot variable | Size | Keys

▶ Platform Key(PK) | 0 | 0

▶ Key Exchange Keys | 0 | 0

▶ Authorized Signatures | 0 | 0

▶ Forbidden Signatures | 1612 | 3

▶ Authorized TimeStamps | 0 | 0 | No Keys

▶ OsRecovery Signatures | 0 | 0 | No Keys

Restore DB defaults

Press 'Yes' to proceed 'No' to cancel

Yes No

Restore DB variable to factory defaults

: Select Screen

: Select Item

: Select

-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

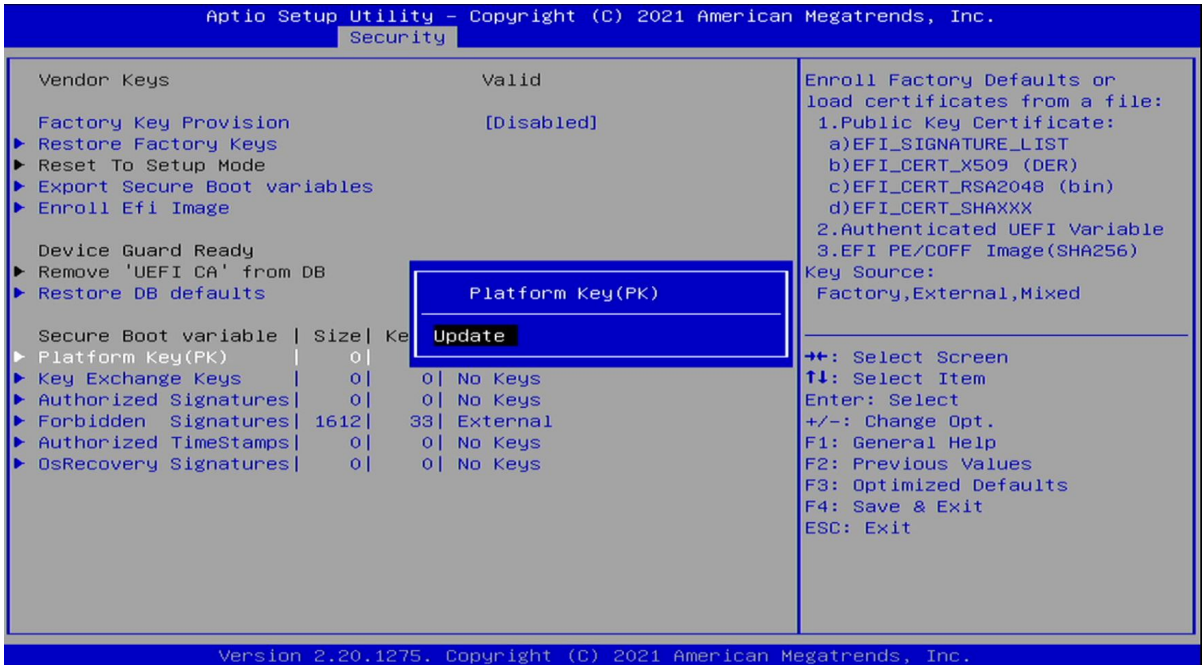
F4: Save & Exit

ESC: Exit

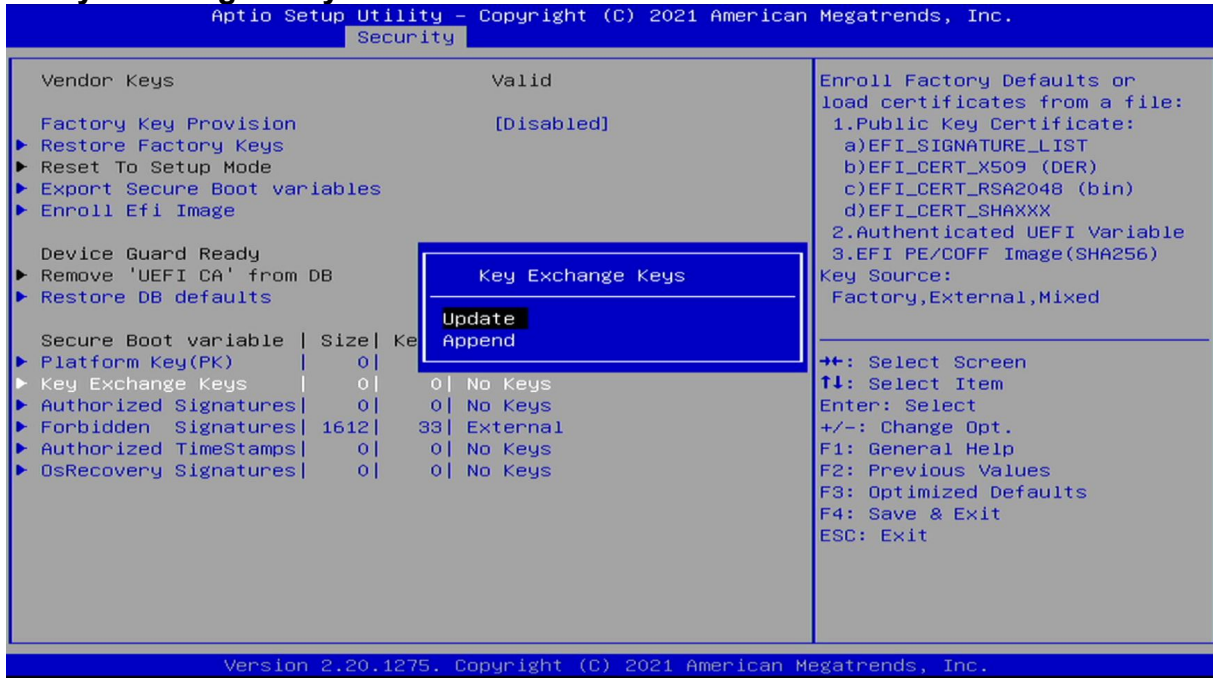
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### 3.6.3.7 Platform Key(PK)





### 3.6.3.8 Key Exchange Kesys



### 3.6.3.9 Authorized Signatures

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Security

Vendor Keys	Valid	Enroll Factory Defaults or load certificates from a file:
Factory Key Provision	[Disabled]	1.Public Key Certificate:
▶ Restore Factory Keys		a)EFI_SIGNATURE_LIST
▶ Reset To Setup Mode		b)EFI_CERT_X509 (DER)
▶ Export Secure Boot variables		c)EFI_CERT_RSA2048 (bin)
▶ Enroll Efi Image		d)EFI_CERT_SHAXXX
Device Guard Ready		2.Authenticated UEFI Variable
▶ Remove 'UEFI CA' from DB		3.EFI PE/COFF Image(SHA256)
▶ Restore DB defaults		Key Source:
		Factory,External,Mixed
Secure Boot variable   Size   Ke		
▶ Platform Key(PK)   0		⇄: Select Screen
▶ Key Exchange Keys   0   0   No Keys		↑↓: Select Item
▶ Authorized Signatures   0   0   No Keys		Enter: Select
▶ Forbidden Signatures   1612   33   External		+/-: Change Opt.
▶ Authorized TimeStamps   0   0   No Keys		F1: General Help
▶ OsRecovery Signatures   0   0   No Keys		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Authorized Signatures

Update

Append

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### 3.6.3.10 Forbidden Signatures

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Security

Vendor Keys	Valid	Enroll Factory Defaults or load certificates from a file:
Factory Key Provision	[Disabled]	1.Public Key Certificate:
▶ Restore Factory Keys		a)EFI_SIGNATURE_LIST
▶ Reset To Setup Mode		b)EFI_CERT_X509 (DER)
▶ Export Secure Boot variables		c)EFI_CERT_RSA2048 (bin)
▶ Enroll Efi Image		d)EFI_CERT_SHAXXX
Device Guard Ready		2.Authenticated UEFI Variable
▶ Remove 'UEFI CA' from DB		3.EFI PE/COFF Image(SHA256)
▶ Restore DB defaults		Key Source:
		Factory,External,Mixed
Secure Boot variable   Size   Ke		
▶ Platform Key(PK)   0		⇄: Select Screen
▶ Key Exchange Keys   0		↑↓: Select Item
▶ Authorized Signatures   0		Enter: Select
▶ Forbidden Signatures   1612   33   External		+/-: Change Opt.
▶ Authorized TimeStamps   0   0   No Keys		F1: General Help
▶ OsRecovery Signatures   0   0   No Keys		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Forbidden Signatures

Details

Export

Update

Append

Delete

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### 3.6.3.11 Authorized TimeStamps

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Security

<p>Vendor Keys Valid</p> <p>Factory Key Provision [Disabled]</p> <ul style="list-style-type: none"> <li>▶ Restore Factory Keys</li> <li>▶ Reset To Setup Mode</li> <li>▶ Export Secure Boot variables</li> <li>▶ Enroll Efi Image</li> </ul> <p>Device Guard Ready</p> <ul style="list-style-type: none"> <li>▶ Remove 'UEFI CA' from DB</li> <li>▶ Restore DB defaults</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Secure Boot variable</th> <th>Size</th> <th>Keys</th> </tr> </thead> <tbody> <tr> <td>▶ Platform Key(PK)</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Key Exchange Keys</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Authorized Signatures</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Forbidden Signatures</td> <td>1612</td> <td>33   External</td> </tr> <tr> <td>▶ Authorized TimeStamps</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ OsRecovery Signatures</td> <td>0</td> <td>0   No Keys</td> </tr> </tbody> </table>	Secure Boot variable	Size	Keys	▶ Platform Key(PK)	0	0   No Keys	▶ Key Exchange Keys	0	0   No Keys	▶ Authorized Signatures	0	0   No Keys	▶ Forbidden Signatures	1612	33   External	▶ Authorized TimeStamps	0	0   No Keys	▶ OsRecovery Signatures	0	0   No Keys	<p>Enroll Factory Defaults or load certificates from a file:</p> <ol style="list-style-type: none"> <li>1.Public Key Certificate:             <ol style="list-style-type: none"> <li>a)EFI_SIGNATURE_LIST</li> <li>b)EFI_CERT_X509 (DER)</li> <li>c)EFI_CERT_RSA2048 (bin)</li> <li>d)EFI_CERT_SHAXXX</li> </ol> </li> <li>2.Authenticated UEFI Variable</li> <li>3.EFI PE/COFF Image(SHA256)</li> </ol> <p>Key Source: Factory,External,Mixed</p> <hr/> <p>             →+: Select Screen              ↑↓: Select Item              Enter: Select              +/-: Change Opt.              F1: General Help              F2: Previous Values              F3: Optimized Defaults              F4: Save &amp; Exit              ESC: Exit           </p>
Secure Boot variable	Size	Keys																				
▶ Platform Key(PK)	0	0   No Keys																				
▶ Key Exchange Keys	0	0   No Keys																				
▶ Authorized Signatures	0	0   No Keys																				
▶ Forbidden Signatures	1612	33   External																				
▶ Authorized TimeStamps	0	0   No Keys																				
▶ OsRecovery Signatures	0	0   No Keys																				

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### 3.6.3.12 OsRecovery Signatures

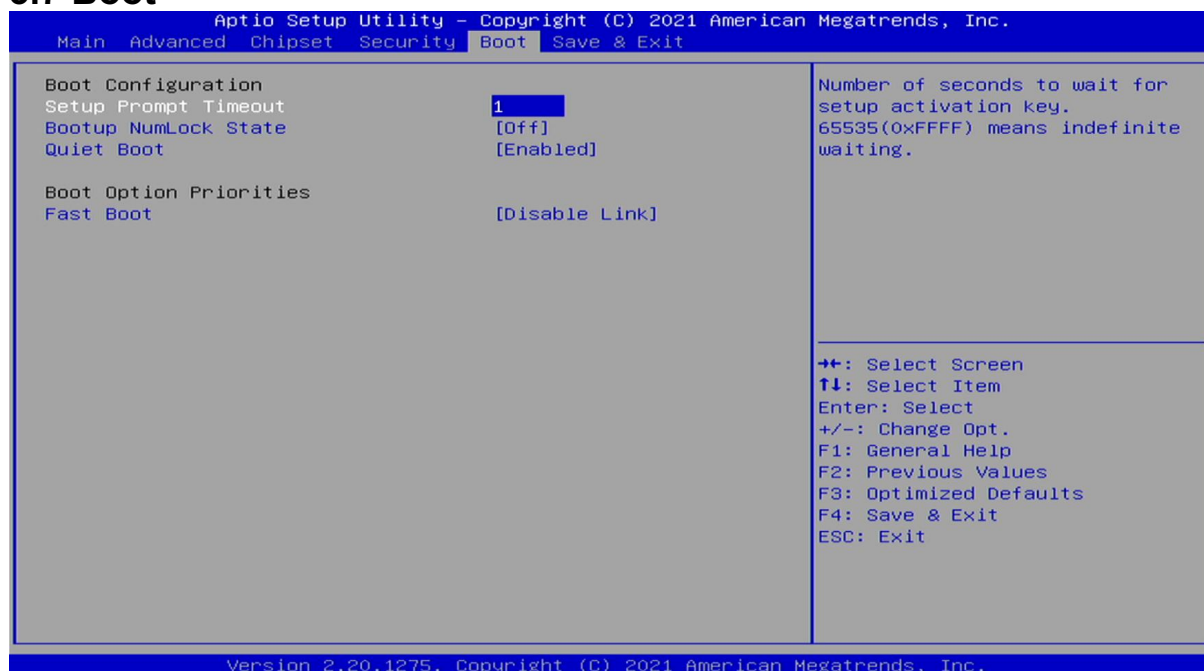
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Security

<p>Vendor Keys Valid</p> <p>Factory Key Provision [Disabled]</p> <ul style="list-style-type: none"> <li>▶ Restore Factory Keys</li> <li>▶ Reset To Setup Mode</li> <li>▶ Export Secure Boot variables</li> <li>▶ Enroll Efi Image</li> </ul> <p>Device Guard Ready</p> <ul style="list-style-type: none"> <li>▶ Remove 'UEFI CA' from DB</li> <li>▶ Restore DB defaults</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Secure Boot variable</th> <th>Size</th> <th>Keys</th> </tr> </thead> <tbody> <tr> <td>▶ Platform Key(PK)</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Key Exchange Keys</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Authorized Signatures</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ Forbidden Signatures</td> <td>1612</td> <td>33   External</td> </tr> <tr> <td>▶ Authorized TimeStamps</td> <td>0</td> <td>0   No Keys</td> </tr> <tr> <td>▶ OsRecovery Signatures</td> <td>0</td> <td>0   No Keys</td> </tr> </tbody> </table>	Secure Boot variable	Size	Keys	▶ Platform Key(PK)	0	0   No Keys	▶ Key Exchange Keys	0	0   No Keys	▶ Authorized Signatures	0	0   No Keys	▶ Forbidden Signatures	1612	33   External	▶ Authorized TimeStamps	0	0   No Keys	▶ OsRecovery Signatures	0	0   No Keys	<p>Enroll Factory Defaults or load certificates from a file:</p> <ol style="list-style-type: none"> <li>1.Public Key Certificate:             <ol style="list-style-type: none"> <li>a)EFI_SIGNATURE_LIST</li> <li>b)EFI_CERT_X509 (DER)</li> <li>c)EFI_CERT_RSA2048 (bin)</li> <li>d)EFI_CERT_SHAXXX</li> </ol> </li> <li>2.Authenticated UEFI Variable</li> <li>3.EFI PE/COFF Image(SHA256)</li> </ol> <p>Key Source: Factory,External,Mixed</p> <hr/> <p>             →+: Select Screen              ↑↓: Select Item              Enter: Select              +/-: Change Opt.              F1: General Help              F2: Previous Values              F3: Optimized Defaults              F4: Save &amp; Exit              ESC: Exit           </p>
Secure Boot variable	Size	Keys																				
▶ Platform Key(PK)	0	0   No Keys																				
▶ Key Exchange Keys	0	0   No Keys																				
▶ Authorized Signatures	0	0   No Keys																				
▶ Forbidden Signatures	1612	33   External																				
▶ Authorized TimeStamps	0	0   No Keys																				
▶ OsRecovery Signatures	0	0   No Keys																				

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### 3.7 Boot



<b>Field Name</b>	<b>Bootup NumLock State</b>
Default Value	[Off]
Possible Value	On Off

<b>Field Name</b>	<b>Quiet Boot</b>
Default Value	[Enabled]
Possible Value	Disabled Enabled

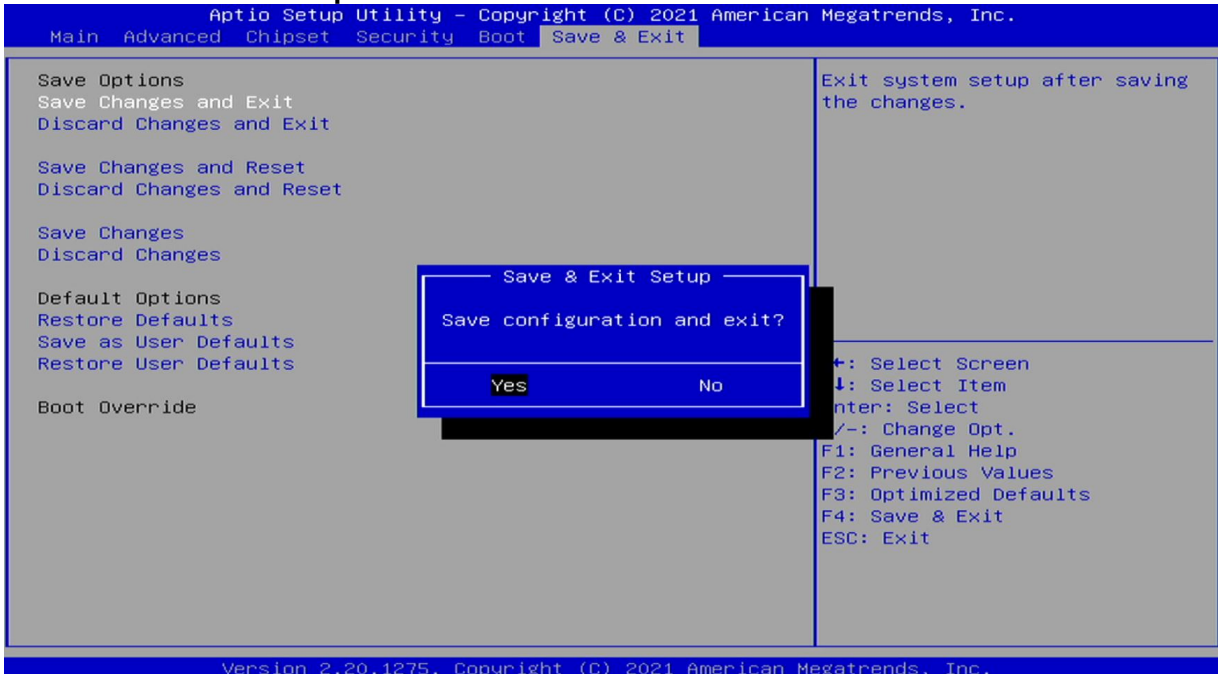
<b>Field Name</b>	<b>Fast Boot</b>
Default Value	[Disable Link]
Possible Value	Disable Link Enabled

## 3.8 Save & Exit

### 3.8.1 Save Changes and Exit



#### 3.8.1.1 Save & Exit Setup



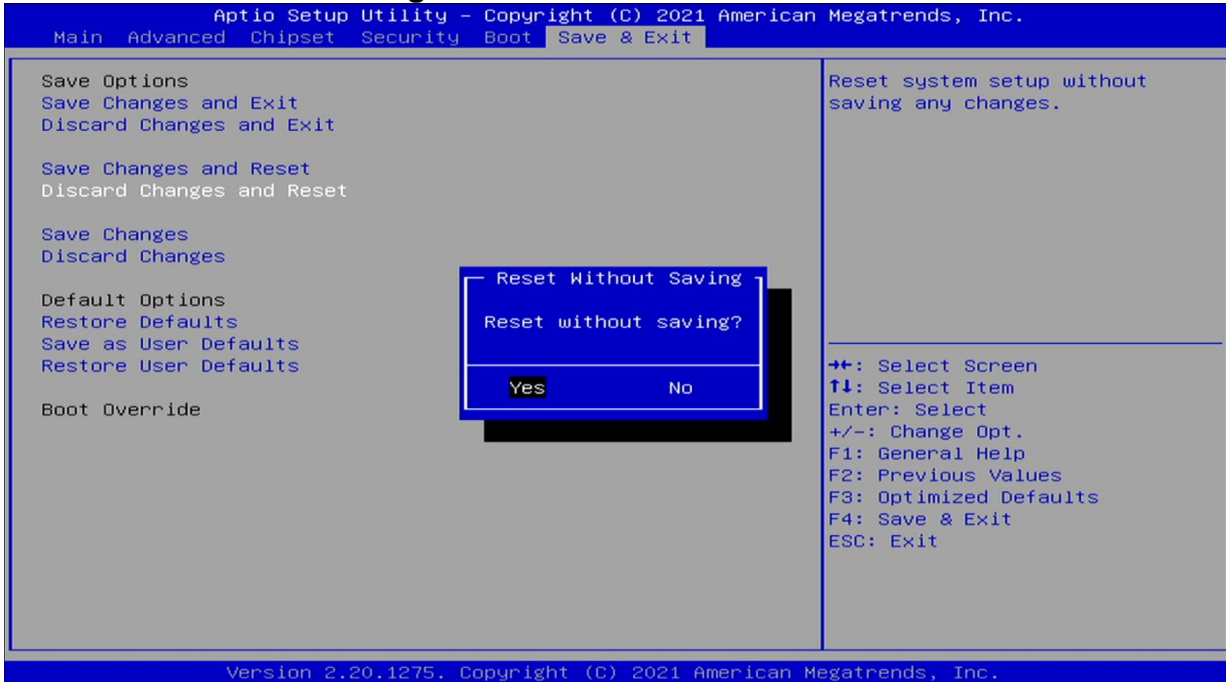
### 3.8.2 Exit Without Saving

The screenshot shows the 'Save & Exit' menu in the Aptio Setup Utility. The menu options are: Save Options (Save Changes and Exit, Discard Changes and Exit), Save Changes and Reset (Discard Changes and Reset), Save Changes (Discard Changes), Default Options (Restore Defaults, Save as User Defaults, Restore User Defaults), and Boot Override. A confirmation dialog titled 'Exit Without Saving' is displayed in the center, asking 'Quit without saving?' with 'Yes' and 'No' options. The right side of the screen contains a list of keyboard shortcuts: F4: Select Screen, F5: Select Item, Enter: Select, +/-: Change Opt., F1: General Help, F2: Previous Values, F3: Optimized Defaults, F4: Save & Exit, and ESC: Exit. The footer text reads 'Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.'

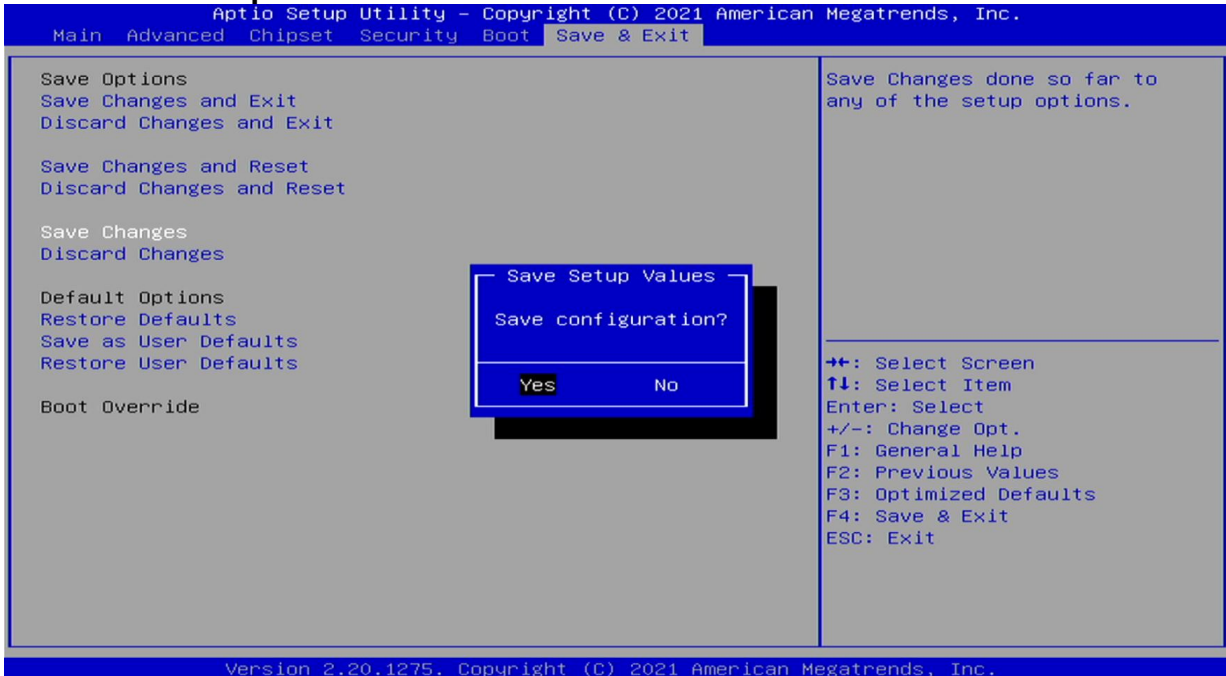
### 3.8.3 Save & reset

The screenshot shows the 'Save & Exit' menu in the Aptio Setup Utility. The menu options are: Save Options (Save Changes and Exit, Discard Changes and Exit), Save Changes and Reset (Discard Changes and Reset), Save Changes (Discard Changes), Default Options (Restore Defaults, Save as User Defaults, Restore User Defaults), and Boot Override. A confirmation dialog titled 'Save & reset' is displayed in the center, asking 'Save configuration and reset?' with 'Yes' and 'No' options. The right side of the screen contains a list of keyboard shortcuts: F4: Select Screen, F5: Select Item, Enter: Select, +/-: Change Opt., F1: General Help, F2: Previous Values, F3: Optimized Defaults, F4: Save & Exit, and ESC: Exit. The footer text reads 'Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.'

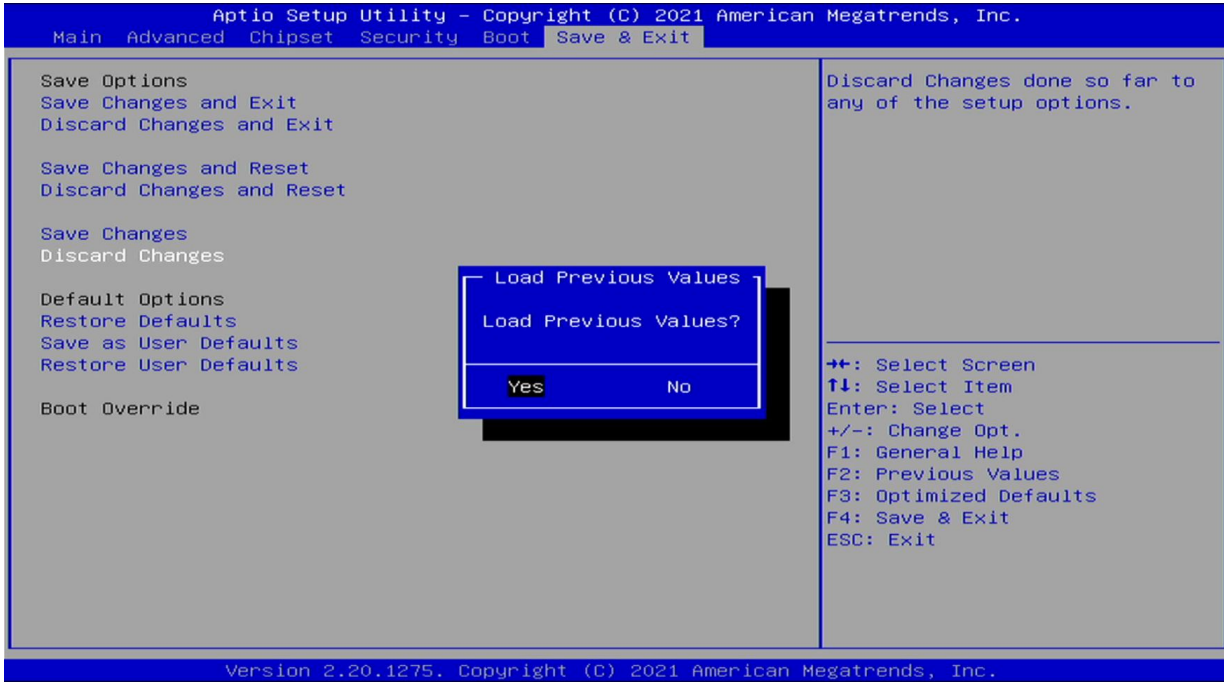
### 3.8.4 Reset Without Saving



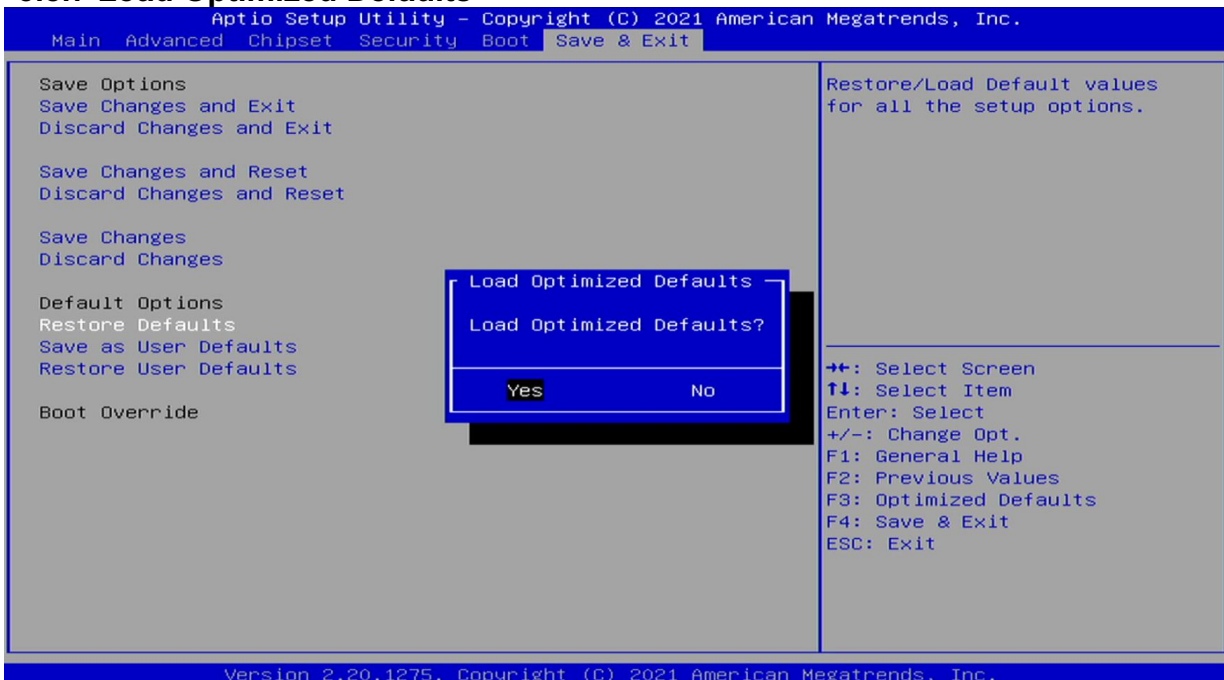
### 3.8.5 Save Setup Values



### 3.8.6 Load Previous Values

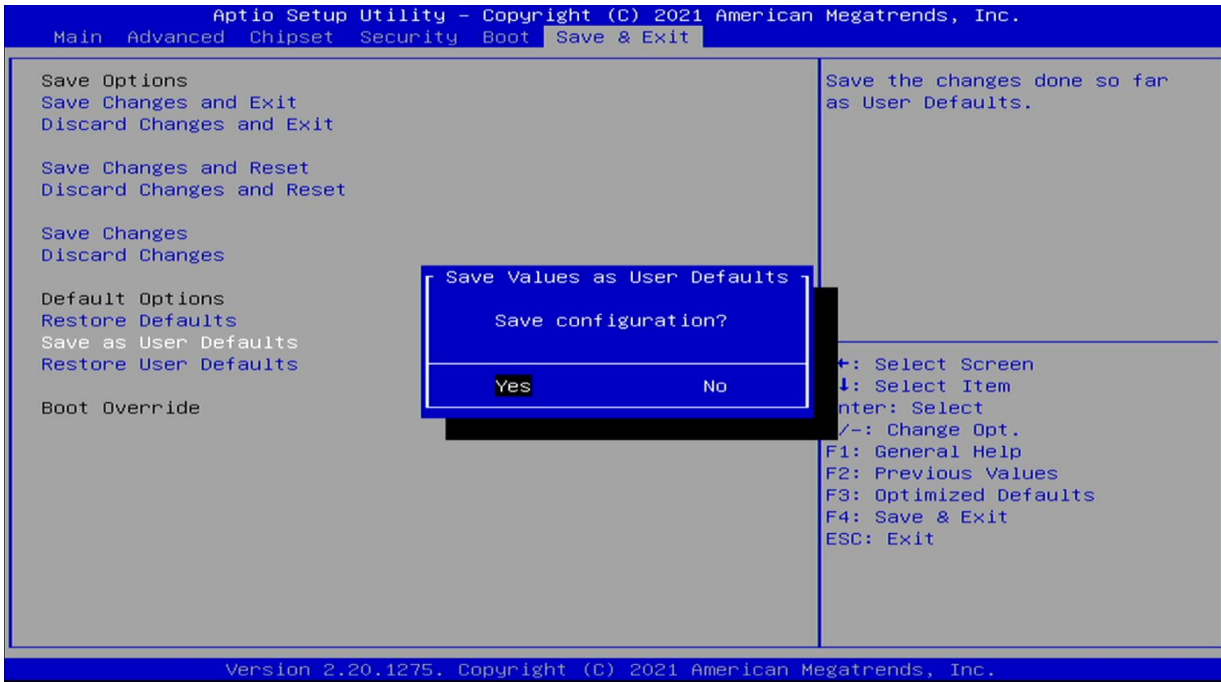


### 3.8.7 Load Optimized Defaults





### 3.8.8 Save Values as User Defaults



### 3.8.9 Restore User Defaults

