

# EFC-D201

高性能紧凑型无风扇整机

## 用户手册

## **User Manual**

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## 安全须知

### 警告：

1. 产品使用前，务必仔细阅读产品说明书。
2. 对未准备安装的板卡，应将其保存在防静电保护袋中。
3. 在从包装袋中拿板卡前，应将手先置于接地金属物体上一会儿，以释放身体及手中的静电。
4. 在拿板卡时，需佩戴静电保护手套，并且应该养成只触及其边缘部份的习惯。
5. 主板与电源连接时，请确认电源电压。
6. 为避免人本被电击或产品被损坏，在每次对主板、板卡进行拔插或生新配置时，须先关闭交流电源或将交流电源线从电源插座中拔掉。
7. 在对板卡进行搬动前，先将交流电源线从电源插座中拔掉。
8. 当您需连接或拔除任何设备前，须确定所有的电源线事先已被拔掉。
9. 为避免频繁开关机对产品造成不必要的损伤，关机后，应至少等待 30 秒后再开机。
10. 设备在使用过程时出现异常情况，请找专业人员处理。

## 第一章 产品介绍

### 1.1 产品简介

本系列产品是一款搭载 Intel® 第六代酷睿系列处理器、紧凑型无风扇整机，紧凑的 I/O 接口、体积精巧的智能无风扇设计，是一款低功耗仅 15W 左右整机。可应用工业平板/控制、驾考指引、环境监测、设备仪器、电弓监测、人机协作、安防识别、智能工厂，产线 MES、广告显示，广告机、自助设备，无人售卖机等。

本系列产品外壳全用铁灰铝合金材质结构，大幅度增加散热面积，让热量从内部快速导出。

### 1.2 产品规格

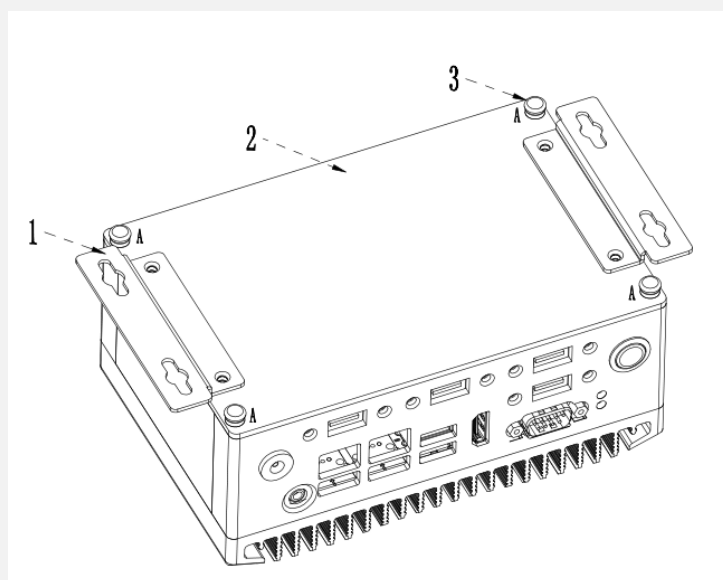
处理器	■支持 Intel Skylake/KabyLake U 系列 I3/I5/I7 处理器
BIOS	■64Mbit AMI EFI BIOS。
显示	■核显：HDMI
系统内存	■1 个 SO-DIMM DDR4 内存插槽 ■最高支持 32G DDR4 2133 MHZ
存储	■支持M-key 2280 兼容 NVME & SATA 协议
LAN 功能	■支持 2 个 Intel® i211AT 千兆以太网接口。
WLAN 功能	■支持一个 B-key 2260 4G/5G 标准模块
USB 接口	■支持 6 个 USB 2.0 ■支持 2个USB 3.0
串口	■支持2个DB9, RS232/RS485/RS422复合功能串口 ■支持4个DB9, RS232功能串口
音频	■支持1个复合功能音频，包含MIC和Speak
电源支持	■支持 9-36V 宽压供电（DC 插头） 外置电源适配器 60W
指示灯	■支持 1 x 电源指示灯 ,1 x 硬盘指示灯
开关	■支持 1 x 金属电源开关
工作环境	■支持工作温度：-20~70℃ ■支持工作湿度：0~95%无凝露



## 第二章 安装说明

### 2.1 配件安装

装配箱体支架（配件）、脚垫、M.2 硬盘、4G 模块、内存、4G 卡示意图



1) 名称：1. 箱体支架（配件） 2. 底盖 3. 脚垫

2) 拆下 4PCS 脚垫，用一字螺丝刀拆下 4PCS 螺柱，取下底盖后，可装配 4G 模块、M.2 硬盘、4G 卡、内存

### 2.2 硬件安装

**⚠注意：**操作时，请戴上防静电手套，因为静电有可能会损坏部件。

本主板关键元器件都是集成电路，而这些元件很容易因为遭受静电的影响而损坏。因此，请在正式安装主板之前，请先做好以下的准备：

1. 拿主板时手握板边，尽可能不触及元器件和插头插座的引脚。
2. 接触集成路元件（如 CPU、RAM 等）时，最好戴上防静电手环/手套。
3. 在集成电路元件未按装前，需将元件放在防静电垫或防静电袋内。
4. 在确认电源的开关处于断开位置后，再插上电源插头。

## 2.3 跳线功能设置

在进行硬件设备安装之前请按照您的需要对相应的跳线进行设置。

提示：如何识别跳线、接口的第 1 针脚，观察插头插座旁边的文字标记，会用“1”或加粗的线条或三角符号表示；看看背面的焊盘，方型焊盘为第 1 针脚；所有跳线的针脚 1 旁都有 1 个白色箭头。

### 2.3.1 清 CMOS 跳线设置，2.0mm\_1x2pin，位置：CLR\_CMOS1



设置	功能
1-2 开路	正常工作状态(Default)
1-2 短路	清除 CMOS 内容，所有 BIOS 设置恢复成出厂值

### 2.3.2 AT/ATX 模式选择，2mm\_1x3pin，位置：J\_AT1

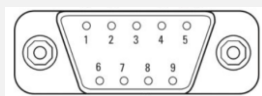


设置	功能
1-2 短路	ATX 模式 (Default)
2-3 短路	AT 模式

## 2.4 插针定义说明

### 2.4.1 串行通讯口

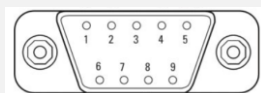
RS232/RS485/RS422 复合功能串口，DB9 接口，COM1~COM2:



管脚	信号名称		
	RS-232	RS-422	RS-485
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	NC
4	DTR#	RXD-	NC
5	GND	GND	GND
6	DSR#	NC	NC
7	RTS#	NC	NC
8	CTS#	NC	NC
9	RI#	NC	NC
10	NA	NA	NA



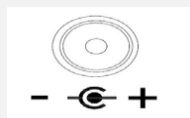
RS232 功能串口，DB9 接口，COM3~COM6:



管脚	信号名称
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

#### 2.4.2 DC 供电接口

2pin 圆头端子:



管脚	信号名称
-	GND
+	VCC

## 第三章 BIOS 程序设置

### BIOS 描述

开机时，BIOS 会对主板上的硬件进行自我诊断，设定硬件时序参数等工作，最后才将系统控制权交给操作系统。BIOS 是硬件和软件的沟通桥梁，如何正确的设定 BIOS 参数对系统是否稳定的工作及系统是否工作在最佳状态至关重要。

### BIOS 基础操作规范

电脑开机，在完成自我诊断后，屏幕上会显示出如下信息：Del->SETUP，此时您点击一下 Del 键，则 BIOS 在完成 IDE 等设备的侦测后会自动转入 SETUP 设置画面。

1. 打开系统电源或重新启动系统，显示器屏幕将出现自我测试的信息；
2. 当屏幕中间出现“Press<Del>to enter setup”提示时，按下<Del>键，就可以进入 BIOS 设定程序；
3. 以方向键移动至你要修改的选项，按下<Enter>键即可进入该选项的子画面；
4. 使用方向键及<Enter>键即可修改所选项目的值，按回车键选择 BIOS 选项并修改；
5. 任何时候按下<Esc>键即可回到上一画面。

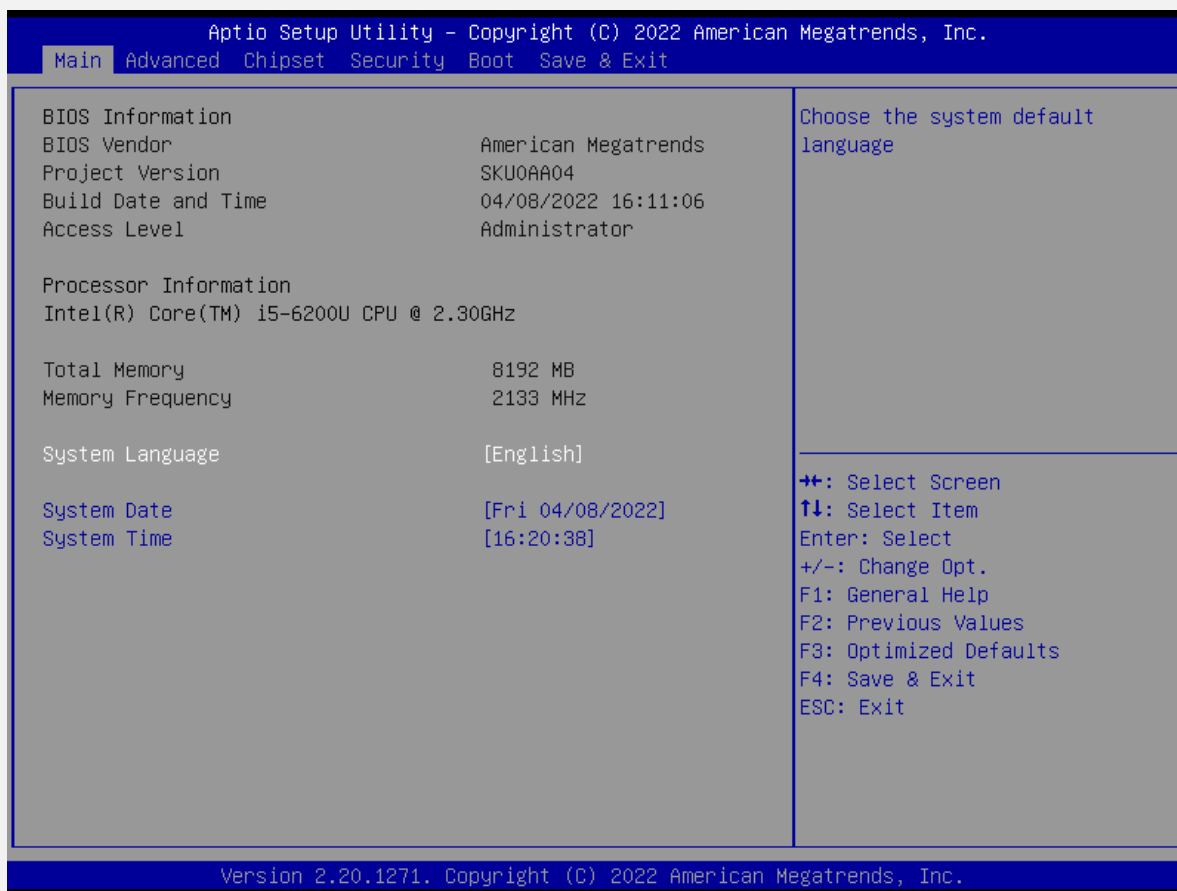
### BIOS 详细参数设置

## Setup Utility User Interface

This document describes BIOS Setup Utility user interface.

### 3.1 Main Screen

The Main screen is the first screen that is displayed when the BIOS Setup is entered.

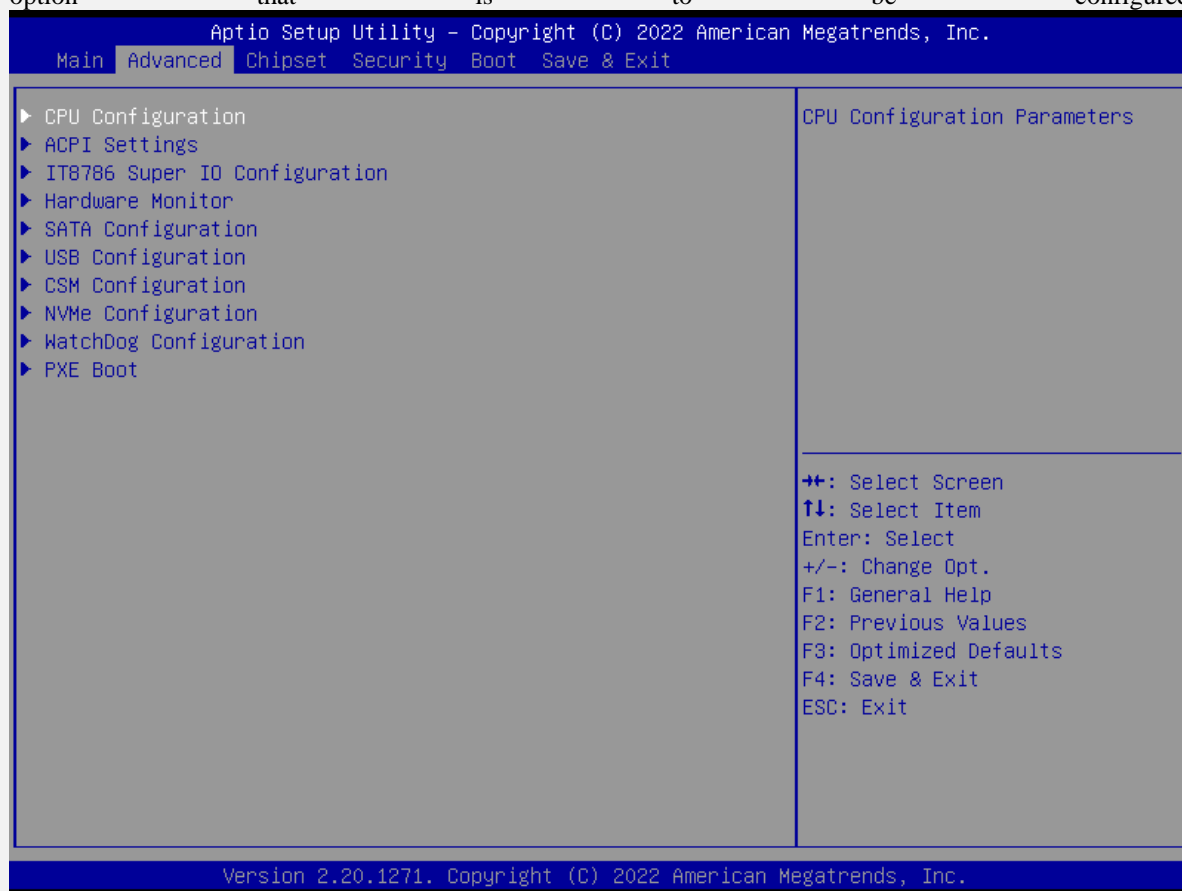


Setup Item	Options	Help Text	Comments
BIOS Information			
BIOS Vendor			Displays BIOS vendor
Project Version			Displays the current BIOS version: Format: AAAABBC <b>AAAAA = Project name</b> <b>BB = BIOS revision</b> <b>C = Customer number</b>
Build Date and Time			Displays the current BIOS build date.
Access Level			Displays password level that setup is running in: Administrator or User. With no passwords set, Administrator is the default mode.
Process Information			

Setup Item	Options	Help Text	Comments
CPU XXXXX			Displays the CPU BrandString installed in the system
Memory Information			
Total Memory			Displays the total physical memory installed in the system, MB Unit
Memory Frequency			
System Language	<b>English</b>	Choose the system default language	
System Date	[Day of week MM/DD/YYYY]	Set and display the Date..	
System Time	[HH:MM:SS]	Set and display the Time.	

### 3.2 Advanced Screen

The Advanced screen provides an access point to configure several options. On this screen, the user selects the option that is to be configured.

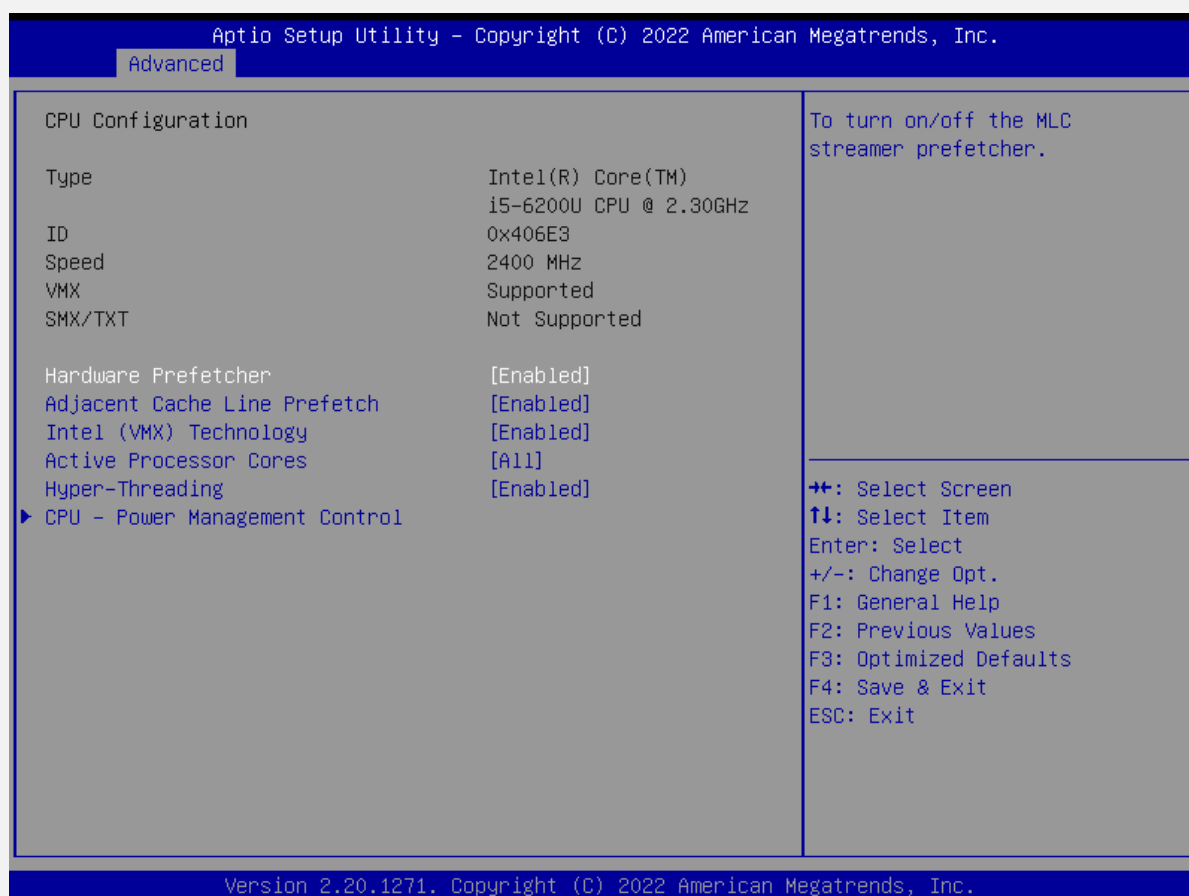


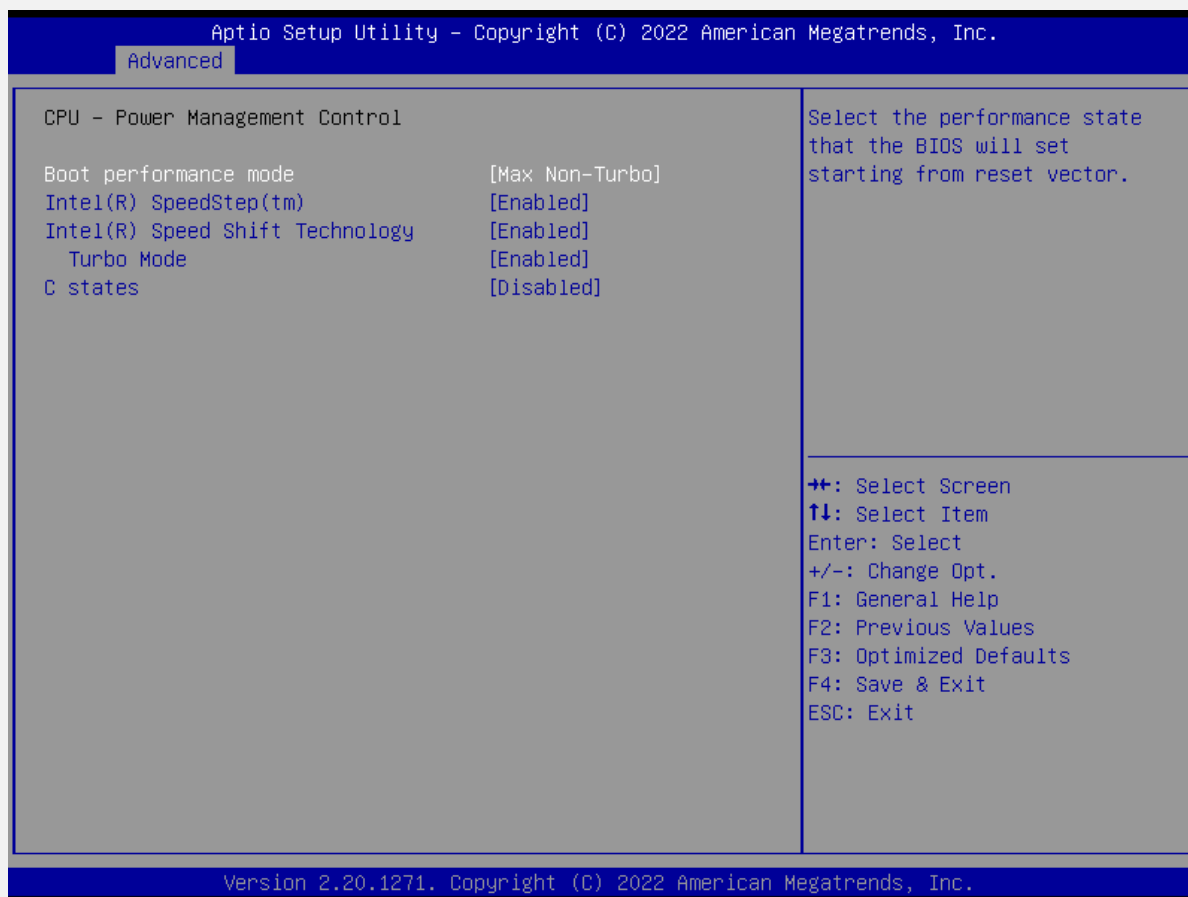
Setup Item	Options	Help Text	Comments
CPU Configuration		CPU Configuration Parameters	

ACPI Settings		System ACPI Parameters	
Super IO Configuration		System Super IO chip Parameters	
HW Monitor		Monitor hardware stats	
SATA Configuration		SATA Devices Configuration	
USB Configuration		USB Configuration Parameters.	
CSM Configuration		CSM configuration: Enable/Disable, Option ROM execution settings, etc.	
NVMe Configuratioin		NVMe Device Options Settings	
Watchdog configuration		Set System WatchDog Parameters.	
PXE Boot		Legacy PXE Support Control	

### 3.2.1 CPU Configuration Screen

The CPU Configuration screen allows the user to view the processor information, and to enable or disable processor options. To access this screen from the Main screen, choose **Advanced > CPU Configuration**.





Setup Item	Options	Help Text	Comments
CPU Configuration			
CPU Speed			
VMX			
SMX/TXT			
Hardware Prefetcher	<b>Enabled</b> Disabled	To turn on/off the MLC streamer prefetcher	
Adjacent Cache line Prefetch	<b>Enabled</b> Disabled	To turn on/off prefetching of adjacent cache lines	
Intel(VMX) Technology	<b>Enabled</b> Disabled	When enabled,a VMM can utilize the additional hardware capabilities provided by vanderpool technology	
Active Processor Cores	<b>All</b> 1 2 3	Number of cores to enable in each processor package	
CPU Power Management control			

Setup Item	Options	Help Text	Comments
Boot performance mode	<b>Max Non-Turbo</b> Max battery Turbo Performance	Select the performace state that the BIOS will set starting from reset vector	
Intel® speedStep™	<b>Enabled</b> Disabled	Allows more than two frequency ranges to be supported	
Intel® speed shift technology	<b>Enabled</b> Disabled	Enable/Disable Intel® speed shift technology support	
C states	Enabled <b>Disabled</b>	Enable/Disable CPU Power Management. Allows CPU to go to Cstates when it's not 100% utilized.	

### 3.2.2 ACPI Settings Screen

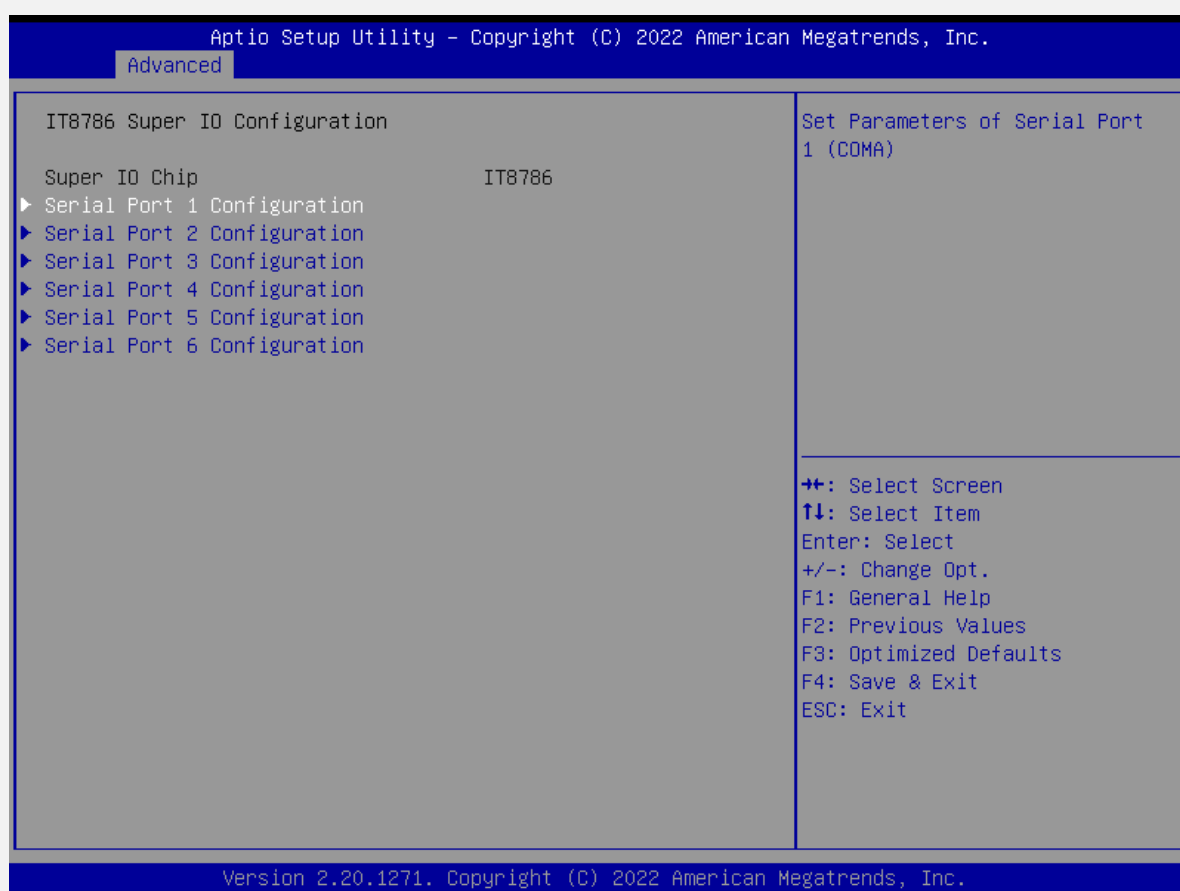
The ACPI Settings screen allows the user to set the system ACPI parameters. To access this screen from the Main screen, choose **Advanced > ACPI Settings**.



Setup Item	Options	Help Text	Comments
ACPI Sleep State	Suspend Disabled <b>S3 (Suspend to RAM)</b>	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	Sleep supported optionally.

### 3.2.3 Super IO Configuration

The Super IO Configuration screen allows the user to view the super IO information, and to enable or disable super IO options. To access this screen from the Advanced screen, choose **Advanced > Super IO Configuration**.

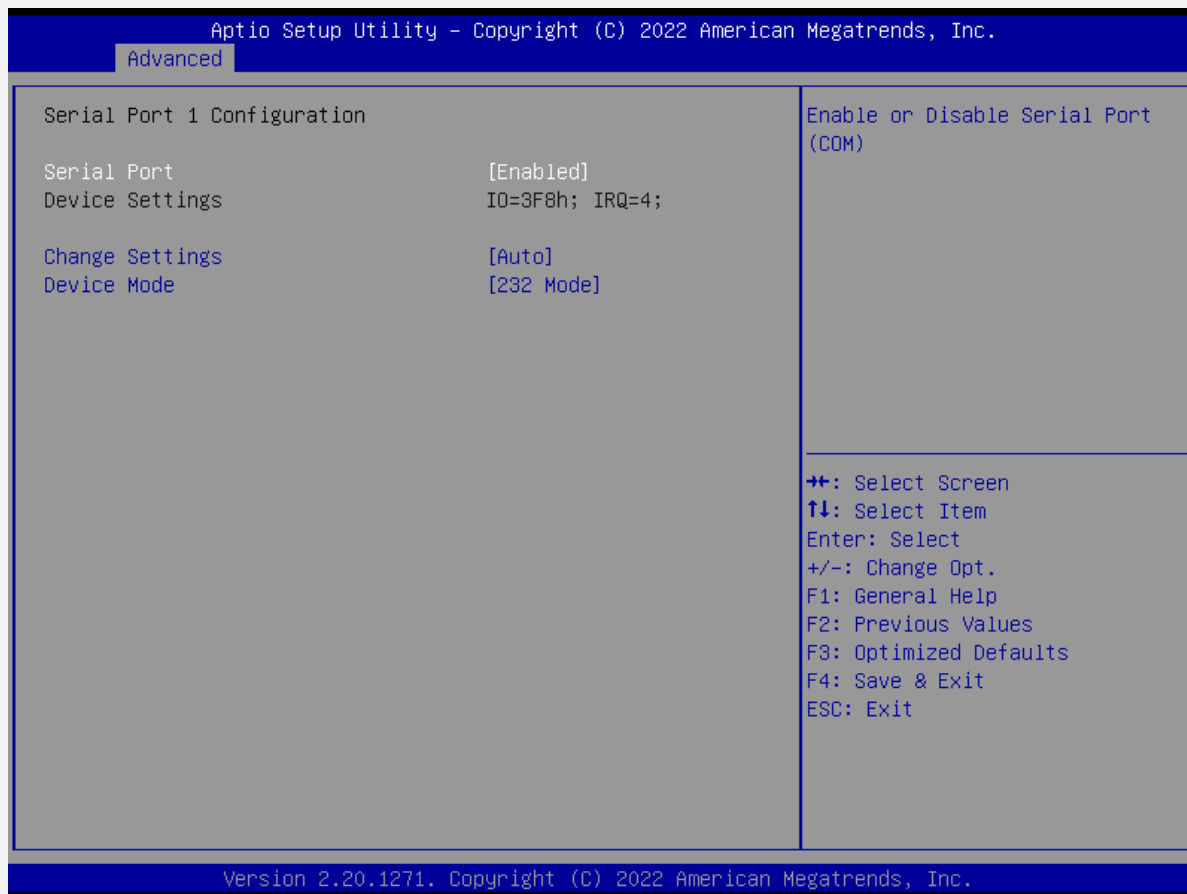


Setup Item	Options	Help Text	Comments
Serial Port 1 Configuration			Set Parameters of Serial Port 1 (COM1)

#### 3.2.3.1 Serial PortX Configuration

The Super IO Configuration screen allows the user to view the super IO information, and to enable or disable serial port options. To access this screen from the Advanced screen, choose **Advanced-> Super IO Configuration->Serial PortX Configuration**

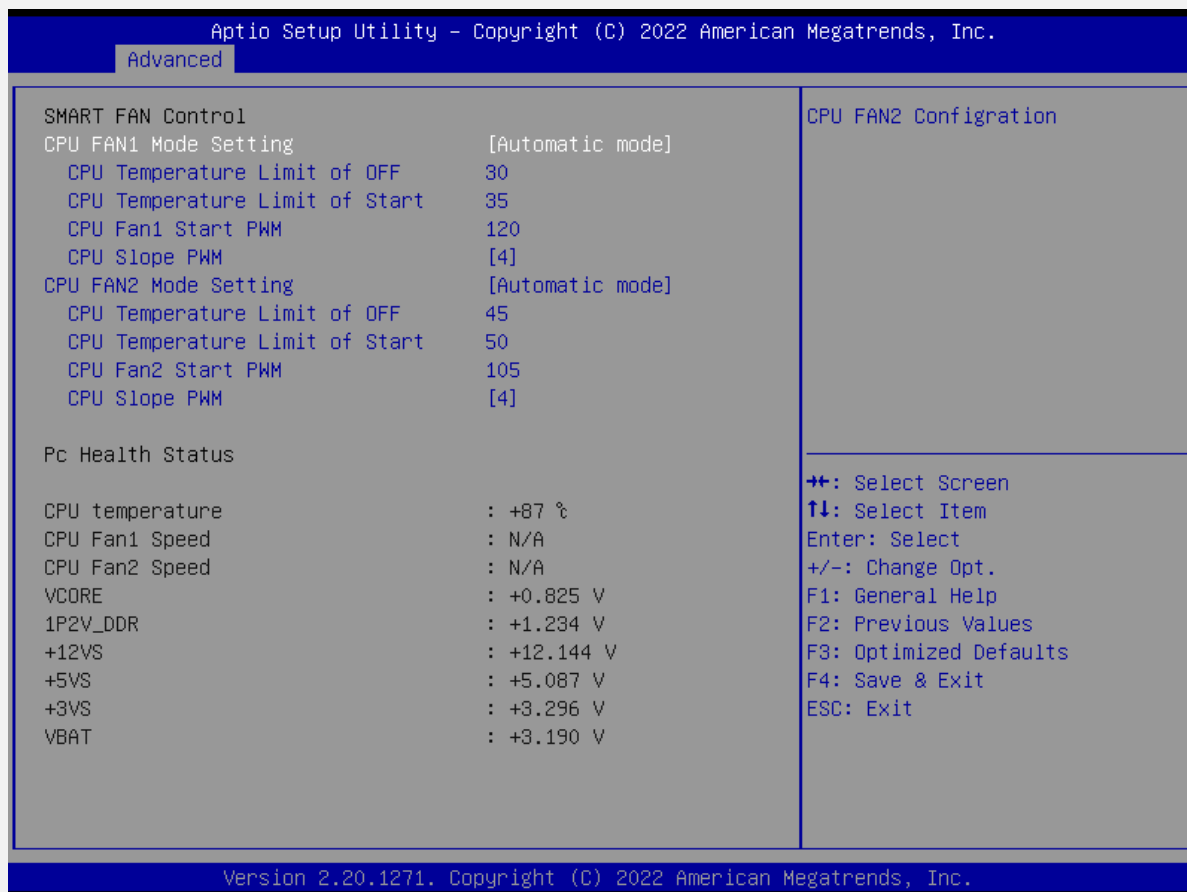




Setup Item	Options	Help Text	Comments
Serial Port	<b>Enabled</b> /Disabled	Enable or Disable Serial Port (COM)	
Change Settings	<b>Auto</b> IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select an optimal settings for Super IO Device	

### 3.2.4 Hardware Monitor

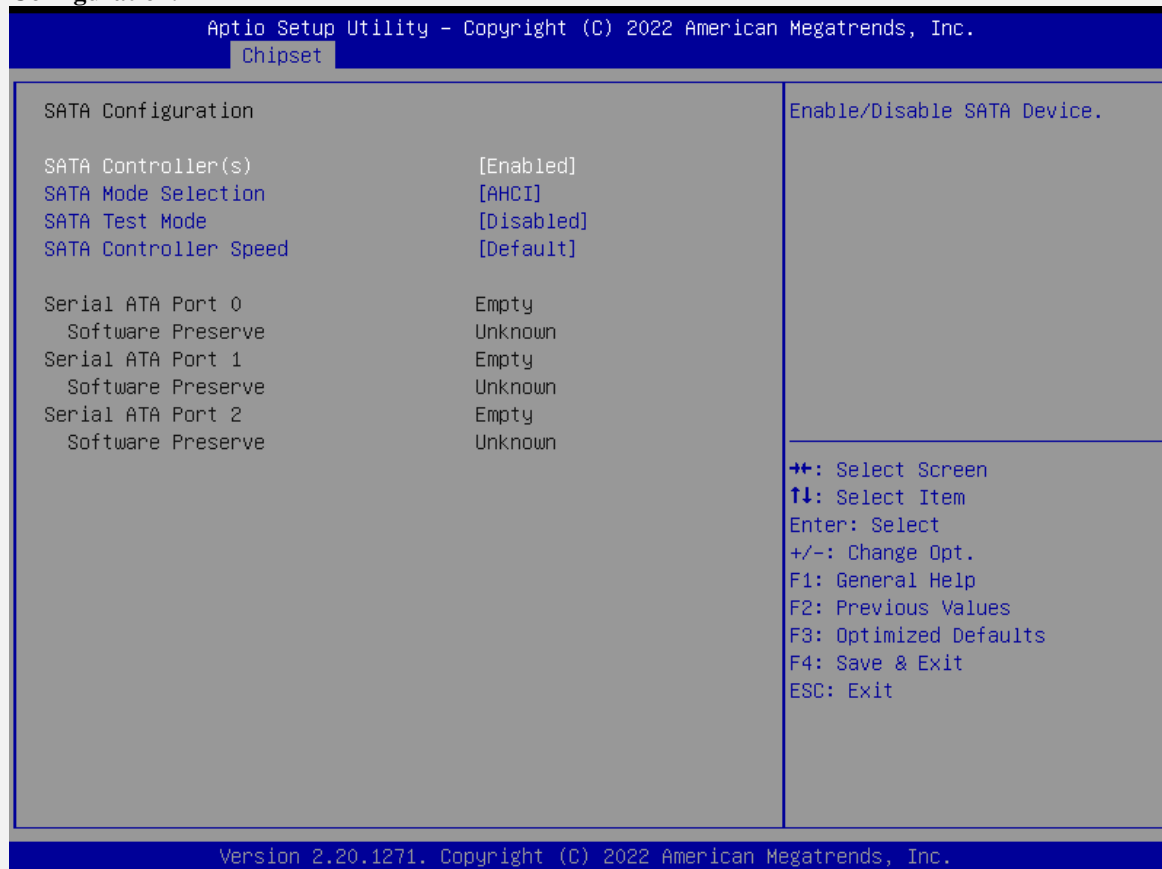
The hardware monitor screen allows the user to view the hardware information. To access this screen from the Advanced screen, choose **Advanced**-> **Hardware Monitor**



Setup Item	Options	Help Text	Comments
PC Health Status			
CPU Fan1 Mode Setting	<b>Automatic mode</b> Manual mode	CPU Fan control mode select.	When Manual mode selected, Manual PWM Setting shows to set FAN PWM Duty.
CPU Fan2 Mode Setting	<b>Automatic mode</b> Manual mode	SYS Fan control mode select.	When Manual mode selected, Manual PWM Setting shows to set FAN PWM Duty.
CPU temperature		Shows Current CPU temperature.	<b>NOTE1:</b> Sometimes not the actual temperature value, just indicates temperature tolerance limitation.
CPU Fan1 Speed			HW Information.
CPU Fan2 Speed			
VCORE			
DIMM VCORE			
12VCC			
5VCC			
3VCC			
VBAT			

### 3.2.5 SATA Configuration

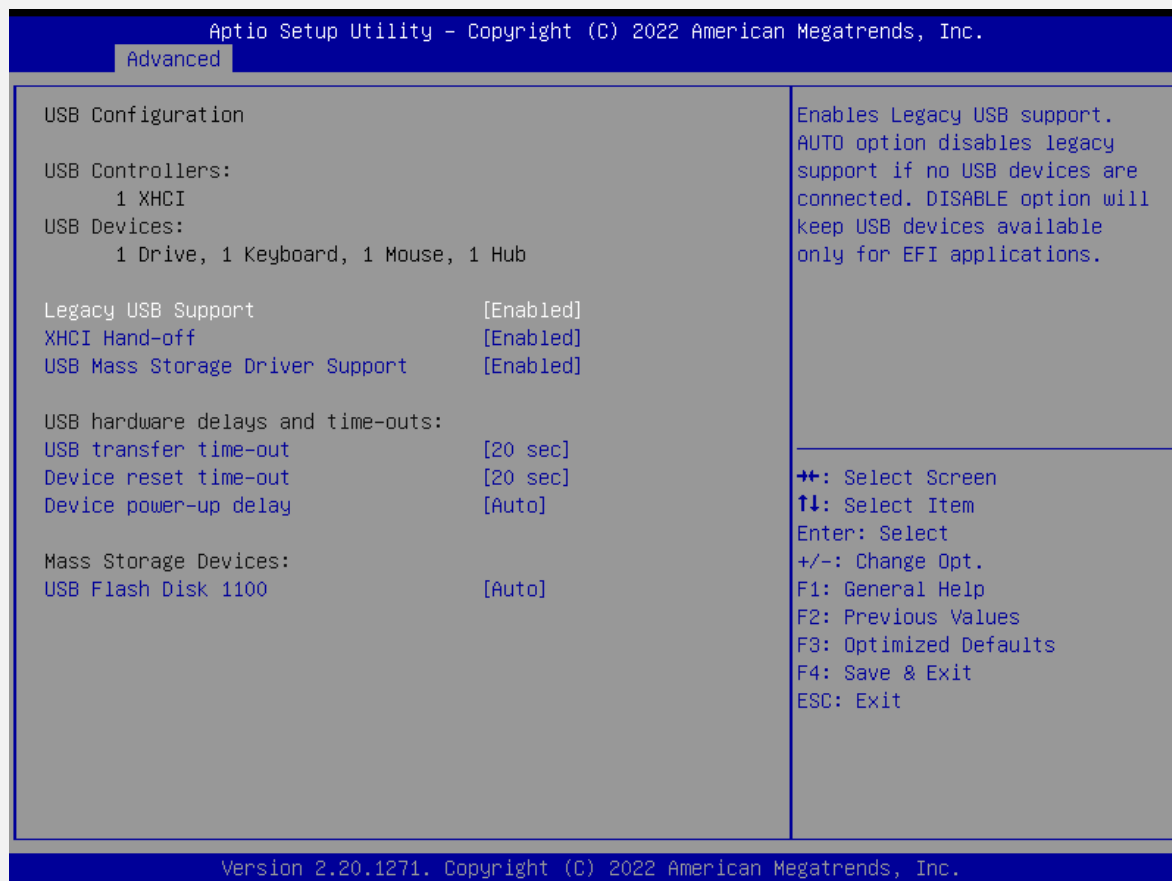
The SATA Configuration screen allows the user to view the SATA Controller information, and to enable or disable SATA Controller options. To access this screen from the Main screen, choose **Advanced > SATA Configuration**.



Setup Item	Options	Help Text	Comments
SATA Configuration			
SATA Controller(s)	Enabled Disabled	Enable / Disable SATA Device.	
SATA Mode	AHCI Mode	Select AHCI	
SATA Controller Speed	Default Gen1 Gen2 Gen3	SATA port speed settings.	
Serial ATA Port 0			Show HDD information connected.
Serial ATA Port 1			
Serial ATA Port 2			

### 3.2.6 USB Configuration

The USB Configuration screen allows the user to view the USB Configuration information, and to enable or disable options. To access this screen from the Main screen, choose **Advanced > USB Configuration**.

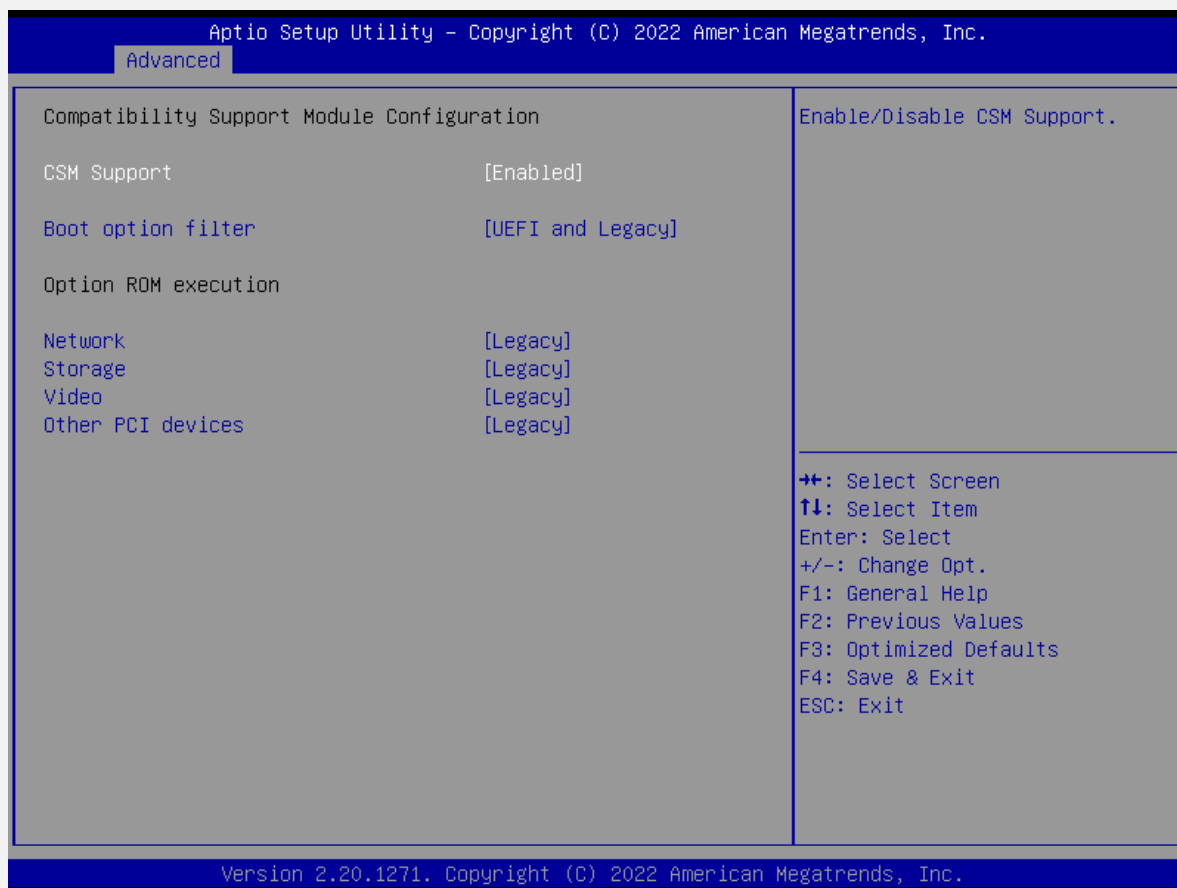


Setup Item	Options	Help Text	Comments
Legacy USB Support	Enabled Disabled	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.	
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.	
USB MASS Storage Driver	Enabled Disabled	Enable/Disable USB Mass Storage Driver Support.	

USB hardware delays and time-outs:			
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers.	
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out.	
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.	

### 3.2.7 CSM Configuration

The CSM Configuration screen allows the user to view the CSM information, and to enable or disable CSM options. To access this screen from the Main screen, choose **Advanced > CSM Configuration**.

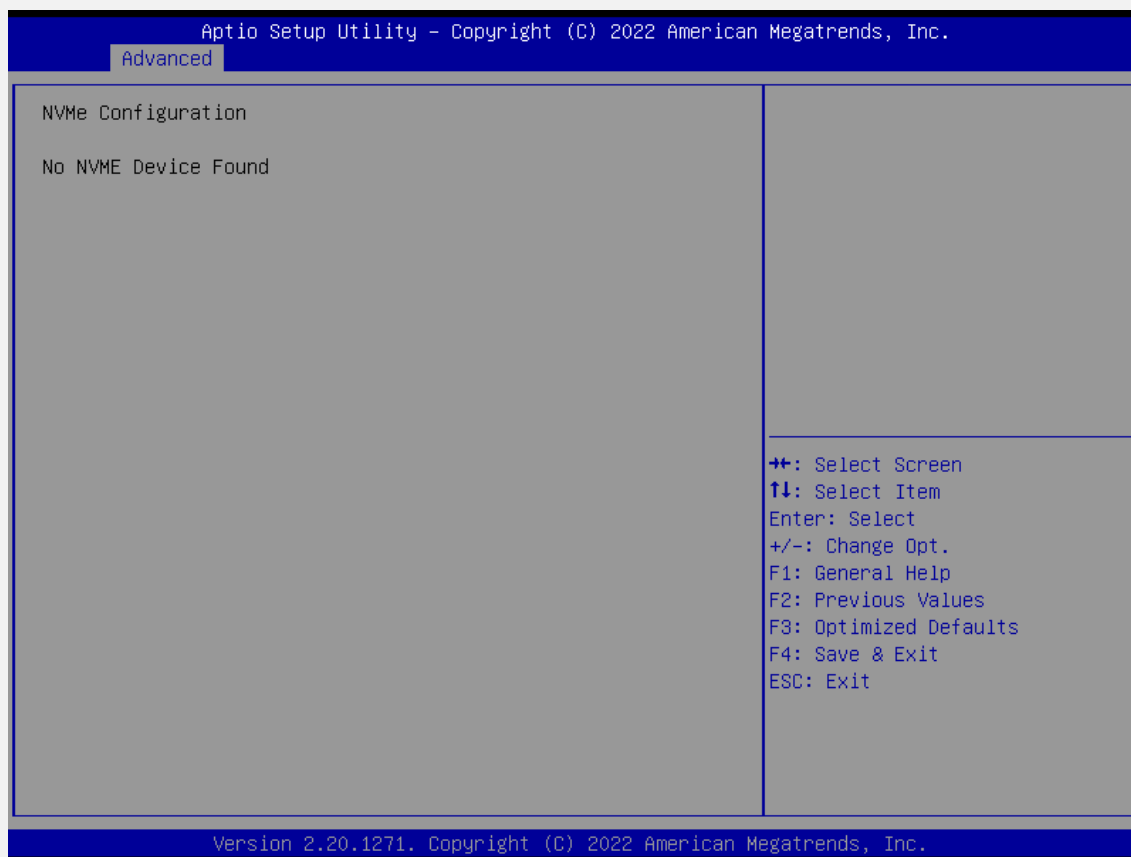


Setup Item	Options	Help Text	Comments
CSM Configuration			
CSM Support	<b>Enabled</b> Disabled	Enable / Disable CSM support	
Boot option filter	<b>UEFI and Legacy</b> Legacy only UEFI only	This option control Legacy/UEFI ROMs priority	
Network	<b>Legacy</b> UEFI Do not lunch	Control the execution of UEFI and Legacy PXE OpROM	
Storage	<b>Legacy</b> UEFI Do not lunch	Control the execution of UEFI and Legacy Storage OpROM	
Video	<b>Legacy</b> UEFI Do not lunch	Control the execution of UEFI and Legacy video OpROM	

Other PCI devices	<b>Legacy</b> UEFI Do not lunch	Determines OpROM execution policy for devices other than Network,Storage or video	
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### 3.2.8 NVMe Configuration

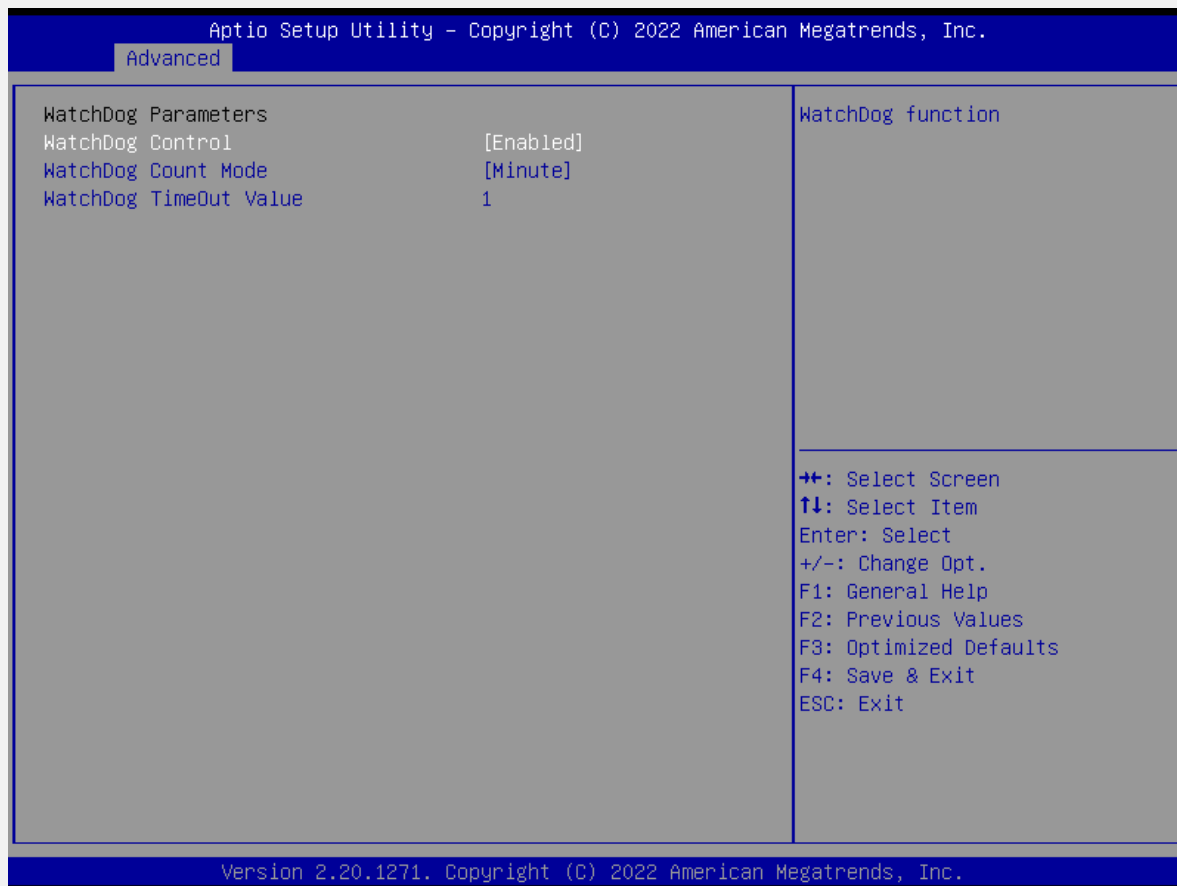
The NVMe Configuration screen allows the user to view the NVMe device information. To access this screen from the Main screen, choose **Advanced > NVMe Configuration**.



Setup Item	Options	Help Text	Comments
Controller 0			Show NVMe device information connected.

### 3.2.9 Watchdog Configuration

The Watchdog Configuration screen allows the user to Set System WatchDog Parameters. To access this screen from the Main screen, choose **Advanced > Watchdog Configuration**.

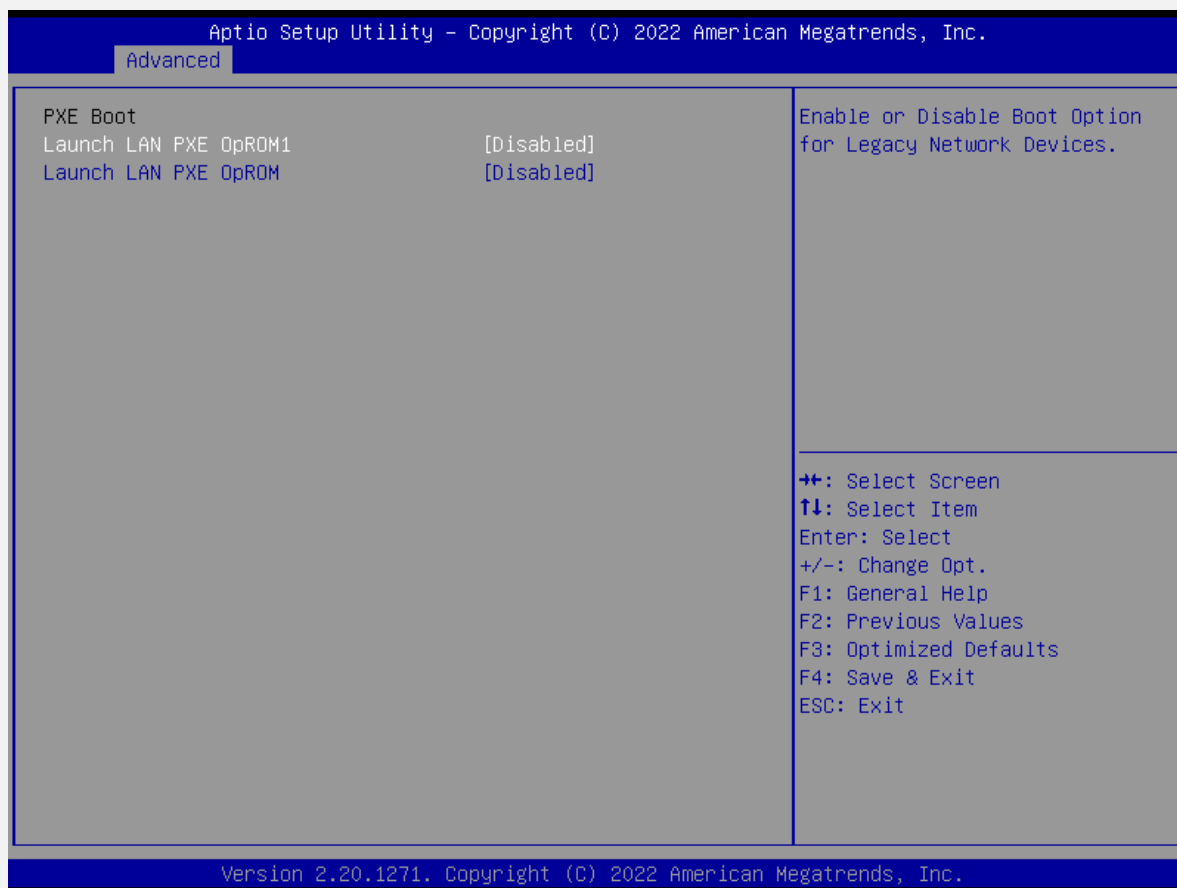


Setup Item	Options	Help Text	Comments
WatchDog Control	<b>Disabled</b> Enabled		WatchDog function
WatchDog Count Mode	<b>Minute</b> Second		WatchDog Count Mode Selection
WatchDog TimeOut Value	<b>1</b>		Fill WatchDog TimeOut (0~255),0 means function disabled

### 3.2.10 PXE Boot

The PXE Boot screen allows the user to Enable or Disable Boot Option for Legacy Network Devices. To access this screen from the Main screen, choose **Advanced > PXE Boot**.





Setup Item	Options	Help Text	Comments
Launch LAN PXE Oprom1	<b>Disabled</b> Enabled		Legacy PXE Support Control .LAN1
Launch LAN PXE Oprom	<b>Disabled</b> Enabled		Legacy PXE Support Control .LAN2

### 3.3 Chipset Screen

The Chipset screen provides an access point to configure North Bridge and South Bridge. To access this screen from the Main screen, press the right arrow until the **Chipset** screen is chosen.

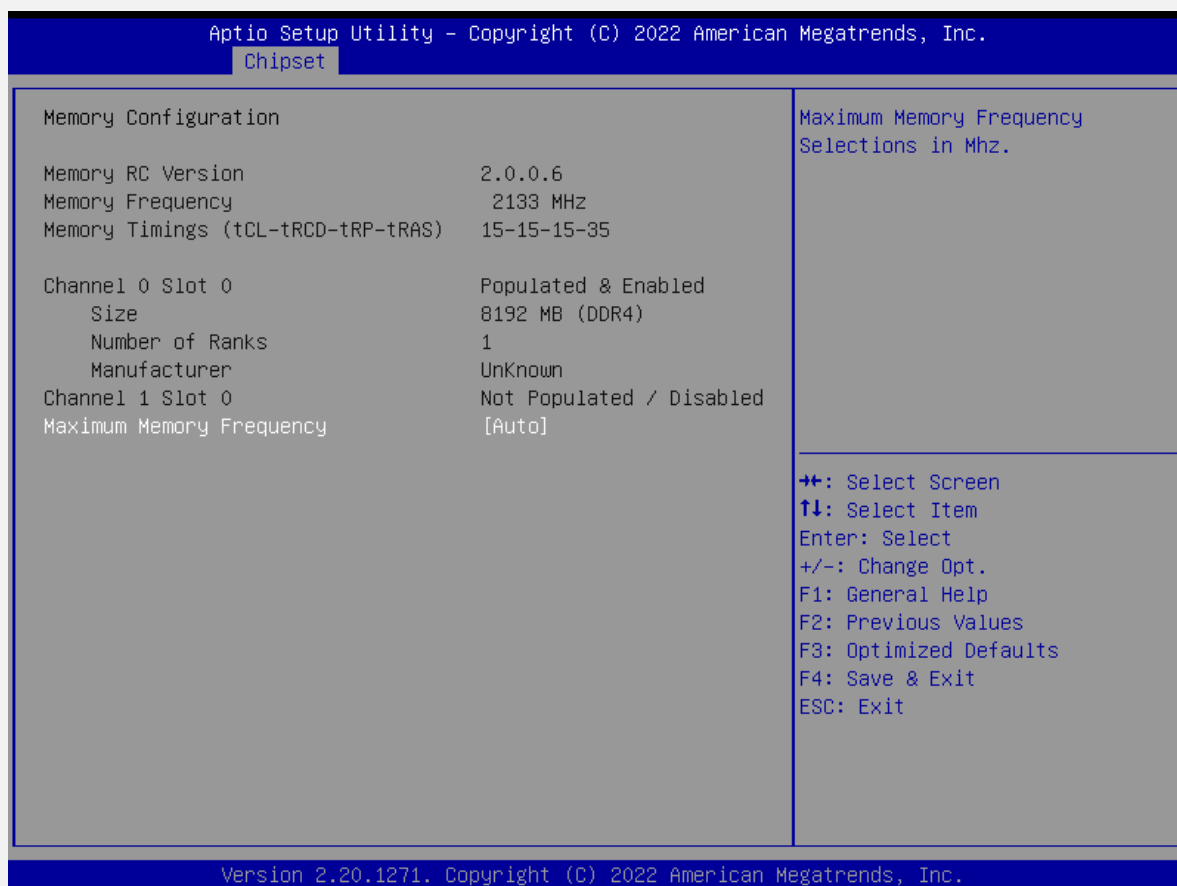


Setup Item	Options	Help Text	Comments
System Agent (SA) Configuration		System Agent (SA) Parameters	
PCH-IO Configuration		PCH Parameters	

### 3.3.1 System Agent (SA) Configuration

The North Bridge Screen allows user to set NB chipset configuration.

To access this screen, form the Main screen, choose **Chipset> System Agent (SA) Configuration**

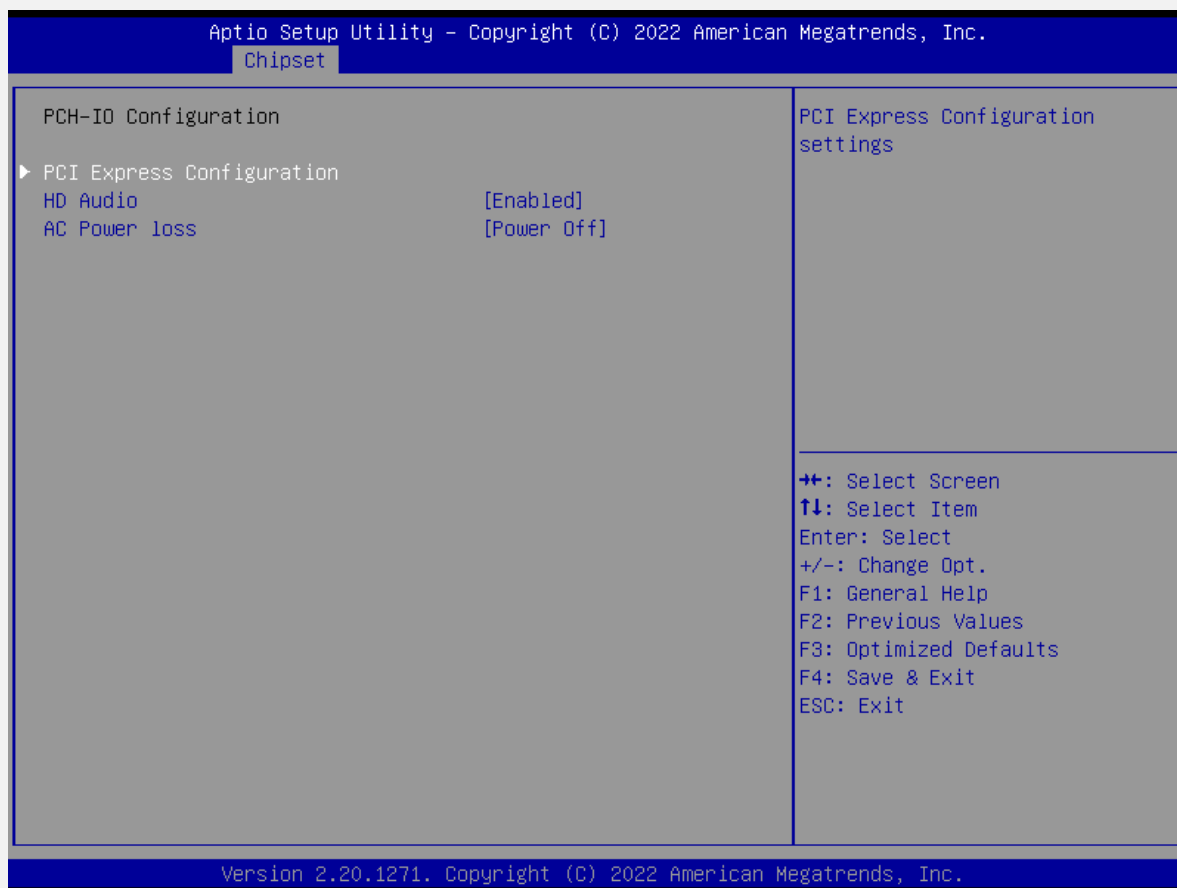




Setup Item	Options	Help Text	Comments
System Agent (SA) Configuration			
Memory Information		Show Memory information	
Internal Graphics	<b>Auto</b> Disabled Enabled	Keep IGFX enabled based on the setup options.	
GTT Size	2MB 4MB <b>8MB</b>	Select the GTT Size	
Aperture Size	128MB <b>256MB</b> 512MB 1024MB 2048MB	Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.	
DVMT Total Gfx Mem	128M <b>256M</b> MAX	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.	
Primary IGFX Boot Display	<b>VBIOS Default</b> HDMI EXT DP EXT HDMI DP	Select the Video Device which will be activated during POST. This has no effect if external graphics present.	

### 3.3.2 PCH-IO Configuration

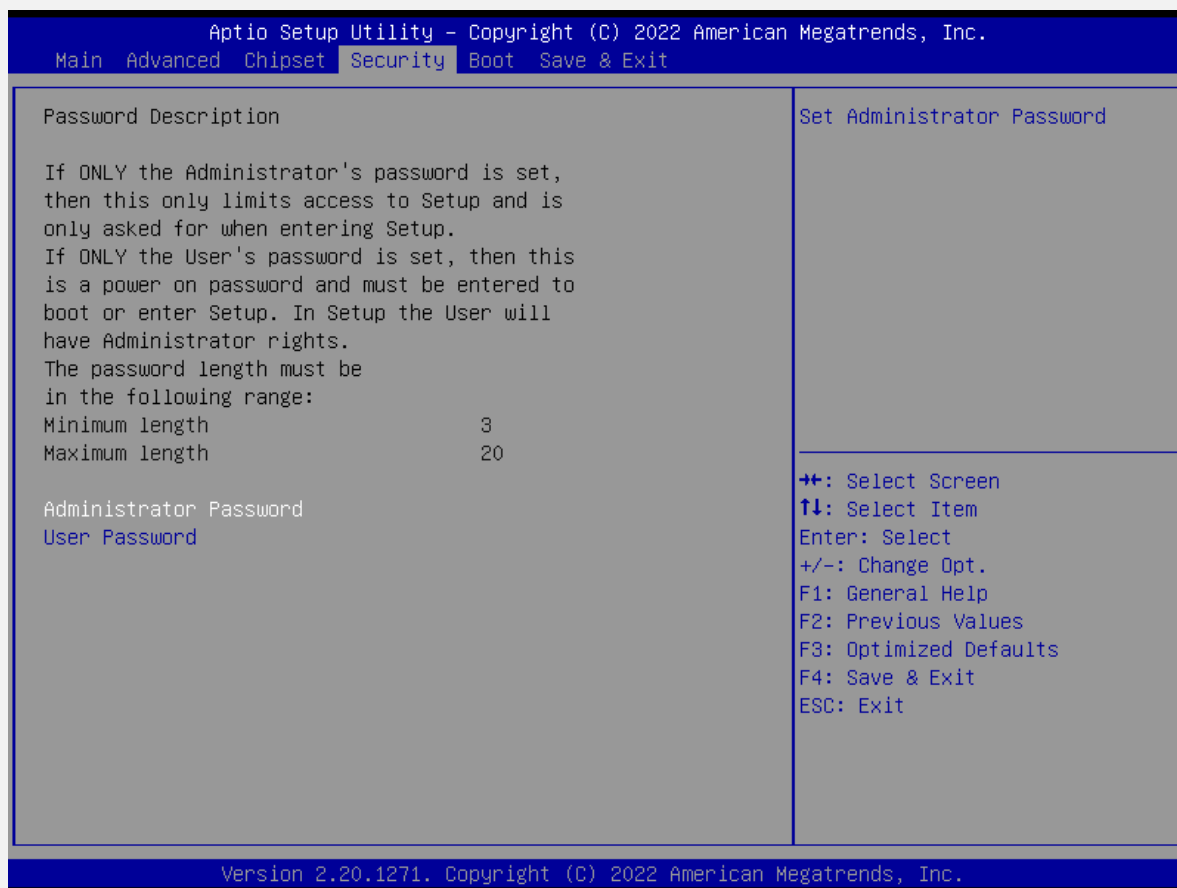
The South Bridge Screen allows user to set SB chipset configuration.  
 To access this screen from the Main screen, choose **Chipset> PCH-IO Configuration**



Setup Item	Options	Help Text	Comments
AC Power Loss	Power off Power on	Select AC power state when power is re-applied after a power failure	

### 3.4 Security

To access this screen form the Main screen, choose **Security**



Setup Item	Options	Help Text	Comments
Administrator Password		Set Administrator Password	
User Password		Set User Password	

### 3.5 Boot Screen

The Boot screen displays any bootable media encountered during POST, and allows the user to configure desired boot device.

To access this screen from the Main screen, choose **Boot**.

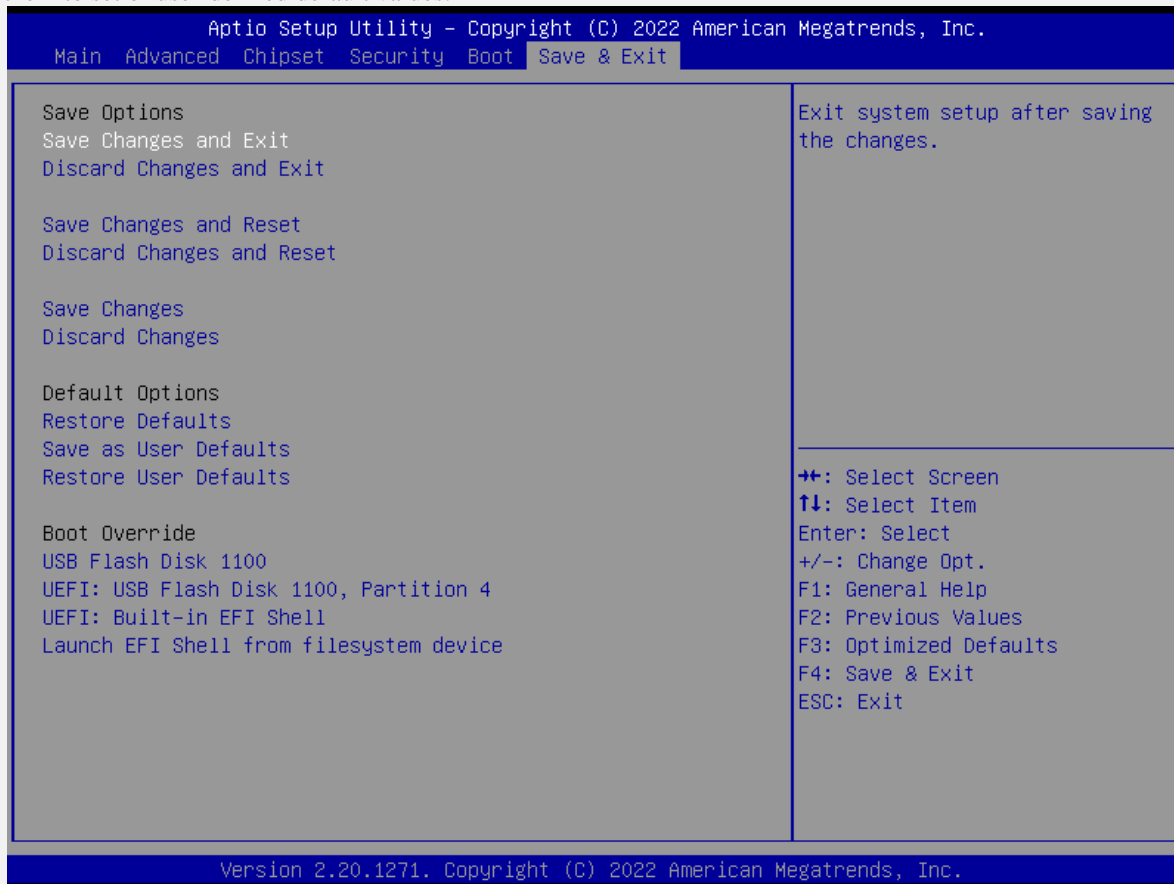


Setup Item	Options	Help Text	Comments
<b>Boot Configuration</b>			
Setup Prompt Timeout	1~65535	Number of seconds to wait for setup activation key.65535(0xFFFF) means indefinite waiting.	
Bootup NumLock State	<b>On</b> off	Select the keyboard Number state.	
Quiet Boot	<b>Disabled</b> Enabled	Enables or disables Quiet Boot option	
<b>Boot Option Priorities</b>			
Boot Option #1		Sets the system boot order	<b>Note:</b> Showed When boot devices existed.
Boot Option #2		Sets the system boot order	
Boot Option #3		Sets the system boot order	
Hard Drive BBS Priorities		Set the order of the legacy devices in this group	Set boot order in each group of the same kind, such as HDD, network.



### 3.6 Save & Exit Screen

The Save & Exit screen allows the user to choose whether to save or discard the configuration changes made on the other screens. It also allows the user to restore the server to the factory defaults or to save or restore them to set of user-defined default values.



Setup Item	Options	Help Text	Comments
Save Changes and Exit		Exit system setup after saving the changes.	User is prompted for confirmation only if any of the setup fields were modified.
Discard Changes and Exit		Exit system setup without saving any changes.	
Save Changes and Reset		Reset the system after saving the changes..	
Discard Changes and Reset		Reset system setup without saving and changes.	
Save Changes		Save Changes done so far to any of the setup options.	
Discard Changes		Discard Changes done so far to any or the setup options.	
Default Options			
Restore Defaults		Restore/Load Default values for all the setup options.	

Setup Item	Options	Help Text	Comments
Save as User Defaults		Save the changes done so far as User Defaults.	
Restore User Defaults		Restore the User Defaults to all the setup options.	
Boot Override			
Shows the Device can boot.			<b>Note:</b> Shown When boot devices existed.

## 附录

### 术语表

#### ACPI

高级配置和电源管理。ACPI 规范允许操作系统控制计算机及其附加设备的大部份电能。

#### BIOS

基本输入/输出系统。是在 PC 中包含所有的输入/输出控制代码界面的软件。它在系统启动时进行硬件检测，开始操作系统的运作，在操作系统和硬件之间提供一个界面。BIOS 是存储在一个只读存储器芯片内。

#### BUS

总线。在计算机系统中，不同部件之间交换数据的通道，是一组硬件线路。我们所指的 BUS 通常是 CPU 和主内存元件内部的局部线路。

#### Chipset

芯片组。是为执行一个或多个相关功能而设计的集成芯片。我们指的是由南桥和北桥组成的系统级芯片组，他决定了主板的架构和主要功能。

#### CMOS

互补金属-氧化物半导体。是一种被广泛应用的半导体类型。它具有高速、低功耗的特点。我们指的 CMOS 是在主板上的 CMOS RAM 中预留的一部份空间，用来保存日期、时间、系统信息和系统参数设定信息等。

#### COM

串口。一种通用的串行通信接口，一般采用标准 DB9 公头接口连接方式。

#### DIMM

双列直插式内存模块。是一个带有内存芯片组的小电路板。提供 64bit 的内存总线宽度。

#### DRAM

动态随机存取存储器。是一个普通计算机的通用内存类型。通常用一个晶体管和一个电容来存储一个位。随着技术的发展，DRAM 的类型和规格已经在计算机应用中变得越来越多样化。例如现在常用的就有 SDRAM、DDR SDRAM 和 RDRAM。

#### I2c

Inter-Integrated Circuit 总线是一种由 PHILIPS 公司开发的两线式串行总线，用于连接微控制器及其外围设备。

#### LAN

局域网络接口。一个小区域内相互关联的计算机组成的一个计算机网络，一般是在一个企事业单位或一栋建筑物。局域网一般由服务器、工作站、一些通信链接组成，一个终端可以通过电线访问数据和设备的任何地方，许多用户可以共享昂贵的设备和资源。

#### LED

发光二极管，一种半导体设备，当电流流过时它会被点亮，通常用来把信息非常直观地表示出来，例如表示电源已经导通或硬盘驱动器正在工作等。

#### PnP

即插即用。允许 PC 对外接设备进行自动配置，不用用户手动操作系统就可以自己工作的一种规格。为实现这个特点，BIOS 支持 PnP 和一个 PnP 扩展卡都是必需的。

#### POST

上电自检。在启动系统期间，BIOS 会对系统执行一个连续的检测操作，包括检测 RAM，键盘，硬盘驱动器等，看它们是否正确连接和是否正常工作。

#### PS/2

由 IBM 发展的一种键盘和鼠标连接的接口规范。PS/2 是一个仅有 6PIN 的 DIN 接口，也可以用以连接其他的设备，比如调制解调器。

#### USB

通用串行总线。一种适合低速外围设备的硬件接口，一般用来连接键盘、鼠标等。一台 PC 最多可以连接 127 个 USB 设备，提供一个 12Mbit/s 的传输带宽；USB 支持热插拔和多数数据流功能即在系统工作时可以插入 USB 设备，系统可以自动识别并让插入的设备正常。