WEBS-45H1

Fan-less Embedded System

AS5-3627

User's Manual

Version 1.3

Table of Contents

How to Use This Manual

The manual describes how to configure your WEBS-45H1 system to meet various operating requirements. It is divided into four chapters, with each chapter addressing a basic concept and operation of Fan-less Embedded System.

Chapter 1: System Overview. Present what you have in the box and give you an overview of the product specifications and basic system architecture for this fan-less embedded system.

Chapter 2: System Installation. Show the definitions and locations of all the interfaces and describe a proper installation guide so that you can easily configure your system.

Chapter 3: BIOS Setup Information. Specify the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of troubleshooting.

Chapter 4: Important Instructions. Indicate some instructions which must be carefully followed when the fan-less embedded system is used.

Chapter 5: Frequent asked questions. Provide the answers for the most frequently asked questions.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Revision History

Revision	Date	Details of Change(s)
V1.0	2022/05/27	Initial Release
V1.1	2022/10/13	Updated Operation temperature condition in product specification
V1.2	2022/10/13	Update system dimension
V1.3	2022/10/27	Added warning for installation/uninstallation and maintenance process
V1.4	2023/1/30	Modified GPIO pin define wording

Chapter 1 System Overview

1.1 Introduction

Portwell announces WEBS-45H1, a high-performance fan-less Box PC. The WEBS-45H1 builds on Intel® Q470E chipset and takes advantages of 10th Generation Intel® Core™ i3/i5/i7/i9 processors technologies that can support dual DDR4 memory and 2x 2.5" SSD for storage. the WEBS-45H1 system supports high-resolution triple-display output, serving as an ideal platform for performance and graphics-demanding applications.

Portwell's WEBS-45H1 is designed to be power-optimized and value-optimized. WEBS-45H1 utilizes a 35W Intel Embedded CPU and Intel Q470E chipset, which is more economical compared to its mobile counterpart and provides great efficacy as well as low power consumption. The system further takes advantage of the 10th generation Intel Core processor technologies supporting dual-channel DDR4 memory up to 64GB.

Furthermore, the WEBS-45H1 Box PC includes rich I/O interfaces and fast connectivity with three independent display (DisplayPort/HDMI/VGA) interfaces with resolution up to 4K, two Gigabit Ethernet ports, two RS-232/422/485 ports, three RS-232 ports, four USB 2.0 and four USB 3.2 Gen1 ports, one 8 bits GPIO port, and Mic-in/ Line-out. Optional wireless, 4G /5G can be added via a M.2 E key socket and LTE modules can be added via a M.2 B key socket.

The rugged, fan-less design makes the WEBS-45H1 durable in harsh environment applications, such as factory automation and industrial automation. Portwell's WEBS-45H1 has already passed a vibration test of 1Grms/ 10~500Hz and a shock test of 50G, assuring its solidity and reliability.

In addition, the system accepts a wide input voltage range from DC 12V to 36V. This power-source flexibility enables product usage in a variety of situations. Moreover, the WEBS-45H1 is more than a robust and dependable embedded system with high performance and graphics efficacy, its stylish mechanical design enhances the system's artistry. Potential applications include kiosk, intelligent digital security, factory automation and surveillance applications, and many more.

1.2 Check List

The WEBS-45H1 package should cover the following basic items:

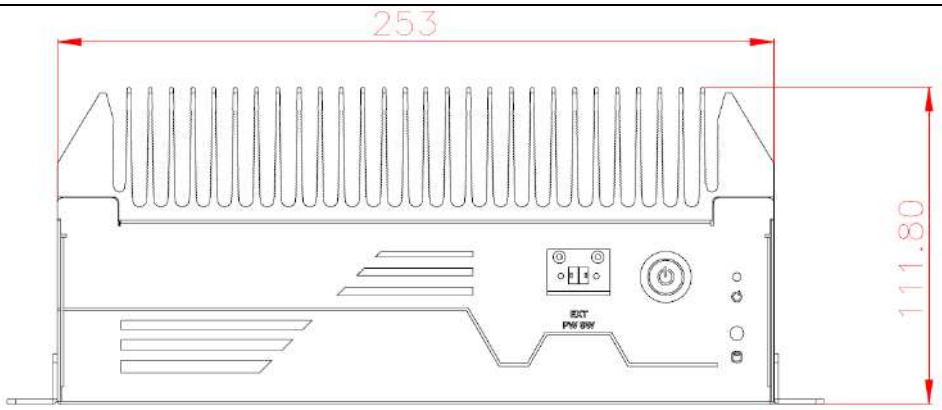
- ✓ One WEBS-45H1 Fan-less Embedded System
- ✓ One Wall Mount Kit
- ✓ Other Accessories

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

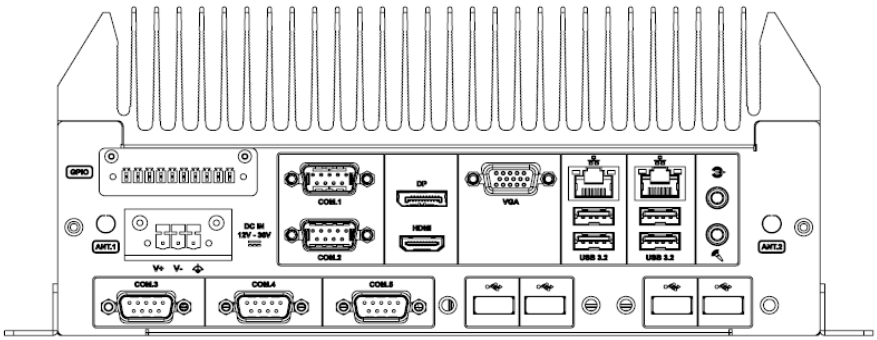
1.3 Product Specification

System	
M/B	WADE-8212
System Chipset	Intel® Q470E chipset
CPU	10th Gen Intel® Core ™ Processors CPU in LGA1200 package (35W TDP)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	Up to 64GB DDR4 2400/2666 Non-ECC SDRAM on two SO-DIMM sockets
Storage	2x 2.5” SSD Slots
Watchdog Timer	Programmable by embedded controller
H/W Status Monitor	System monitor (Voltage, Temperature)
Expansion	1x M.2 E Key2230 with PCIe x1, CNVI and USB2.0 for Wireless 1x M.2 M Key 2242/2260/2280 with PCIe x4 and SATA3 for SSD 1x M.2 B Key 3042/3052 with USB 3.0 Signal 1x SIM Card socket
External I/O	
Series Ports	5 x COM ports (2 x RS- 232/422/485)
Display	1x HDMI 2.0a, resolution up to 4096x2160 @60Hz 1x DisplayPort 1.2, resolution up to 4096x2160 @60Hz 1x VGA, resolution up to 1920x1200 @60Hz
USB	4x USB 3.2 Gen 1, 4x USB 2.0
Audio	Audio Jack with Line-out / Mic-in with Realtek ALC887 Audio controller
LAN	Intel® I219LM and Intel® I225LM Ethernet controller ,2x RJ45 connectors
GPIO	1x Programmable 8-bit Digital I/O
Other	2x Antenna hole for Wi-Fi or 4G/GPS module - 1x EXT Power Switch
Power Supply Unit	
Power Supply	DC 12~36V with 3-pin terminal block connector
Environment	
Operating Temperature	-20°C ~ 40°C with Adapter -20°C ~ 60°C with DC Source
Storage Temperature	-40°C ~ 80°C
Relative Humidity	40°C, 95%RH non-condensing
Operating Vibration	1Grms/10-500Hz, IEC 60068-2-6
Operating Shock	50G, 11 msec, IEC 60068-2-27
Mechanical	
Dimension (W x D x H)	253 (W) * 201.2 (D) *111.8 (H) mm
Weight	5.5 Kg
Mounting	Wall mounting

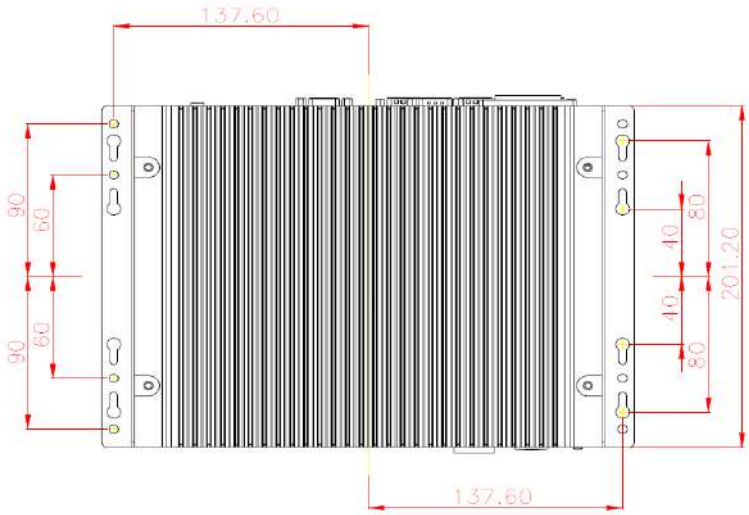
1.4 Mechanical Dimension



Front view of the WEBS-45H1 system



Rear view of the WEBS-45H1 system



Top view of the WEBS-45H1 system

Chapter 2 System Installation

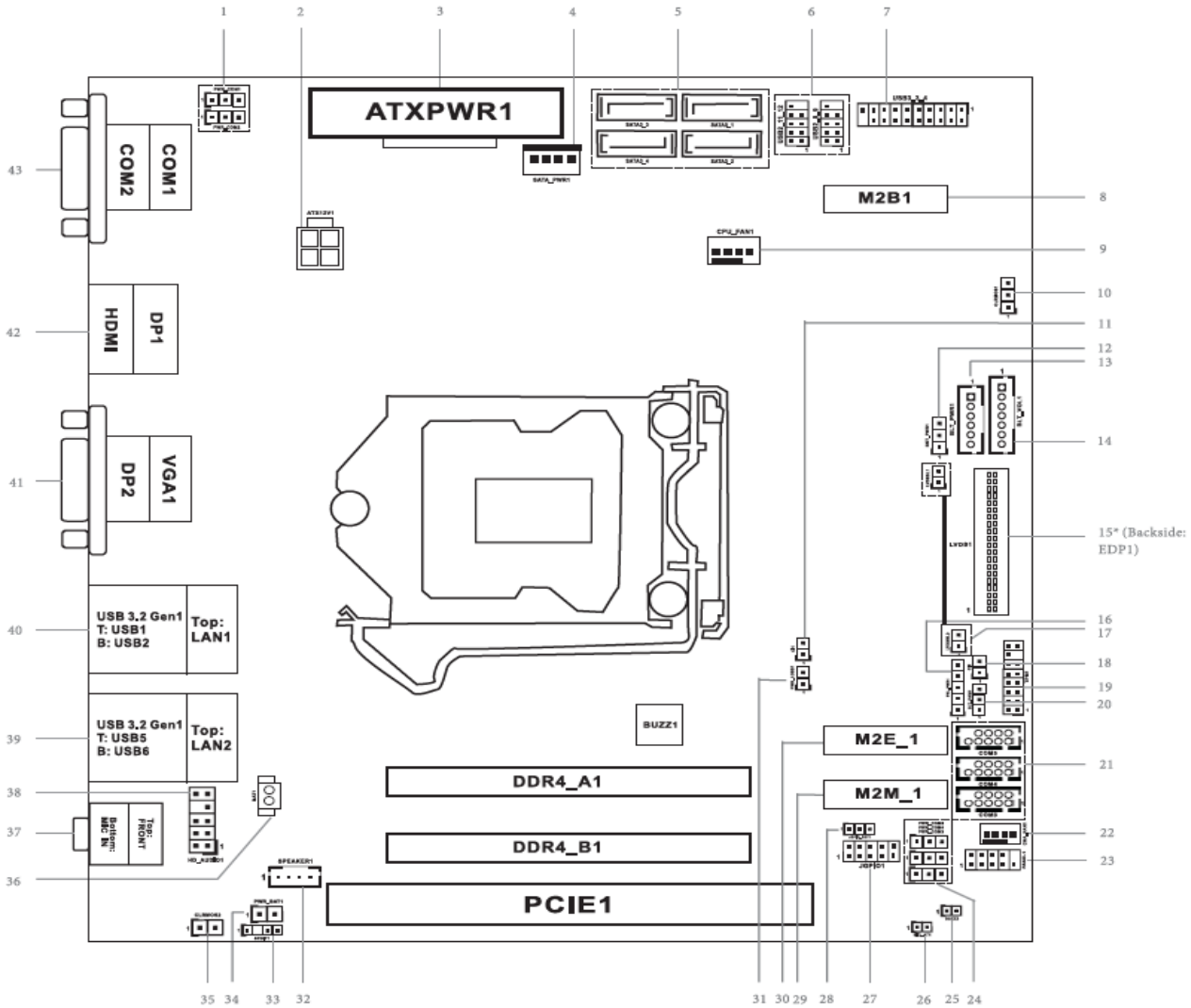
This chapter provides you with instructions to set up your system. Definitions and locations of all the interfaces are described so that you can easily configure your system. For more detailed PIN assignment and jumper setting, please refer to user's manual of WADE-8212.

Important:

- Turn off the power of your IPC BOX PC and allow it to cool for at least 10 minutes before performing any installation/uninstallation and maintenance process.
- Professionals (Skilled person) are required for maintenance, assembly or disassembly, and the pluggable 2.5" SSD can be replaced by end user.

2.1 Embedded Board H/W Jumper Setting Introduction

2.1.1 M/B Block overview



2.1.2 M/B Jumper setting

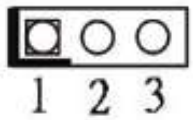
Jumper Function List	
No	Description
1	COM Port PWR Setting Jumpers (COM 1~2)
2	4-Pin ATX Power Input/Output Connector
3	24-Pin ATX Power Input Connector
4	SATA Power Output Connector
5	SATA Connector (SATA3_1~4)
6	USB 2.0 Headers
7	USB 3.2(Gen1) Headers (USB3_3_4)
8	M.2 B key Socket
9	4 Pin CPU Fan Connector(+12V)
10	Clear CMOS Header (CLRMOS1)
11	Chassis Intrusion Headers (CI1)
12	Backlight Power Select
13	Inverter Power Control Wafer (BLT_PWR1)
14	Backlight Volume Control (BLT_VOL1)
15	LVDS Panel Connector
16	Panel Power Select
17	LVDSBL1
18	Chassis Intrusion Headers (CI2)
19	TPM Header
20	Backlight Control Level
21	COM Port Headers (COM 3~5_RS232)
22	4 Pin Chassis Fan Connector(+12V)
23	System Panel Header
24	COM Port PWR Setting Jumpers (COM 3~5)
25	Buzzer
26	SIO_AT1
27	Digital Input/Output Pin Header (JGPIO1)
28	Digital Input/Output Default Value Setting (JGPIO_SET1)
29	M.2 M key Socket
30	M.2 E key Socket
31	PWR LOSS Header (PWR_LOSS1)
32	3W Audio AMP Output Wafer
33	SPDIF Header
34	PWR_BAT1
35	Clear CMOS Header (CLRMOS2)
36	Battery Connector
37	Audio Output
38	Front Panel Audio Header
39	Top: RJ45 LAN port (LAN2) / Bottom: USB 3.1 Ports (USB3_5_6)
40	Top: RJ45 LAN port (LAN1) / Bottom: USB 3.1 Ports (USB3_1_2)
41	Top: D-Sub Port (VGA)
42	Top: Display Port (DP2) / Bottom: HDMI Port (HDMI)
43	Top: COM Port 1(RS232/422/485) * / Bottom: COM Port 2(RS232/422/485) *

Back Side：

SIM Card Socket (SIM1)
MCU Connector (MCU_CON1)

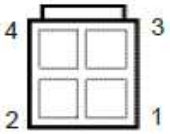
■ Jumper setting description:

1: COM Port PWR Setting Jumpers (COM 1~2)
PWR_COM1 (For COM Port1)
PWR_COM2 (For COM Port2)

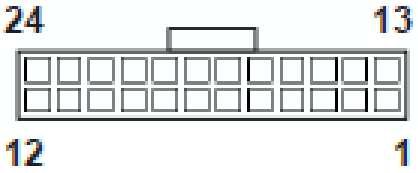


1-2：+5V
2-3：+12V

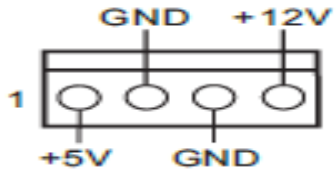
2: 4-pin ATX Power Input/Output Connector



3: 24-pin ATX Power Input Connector

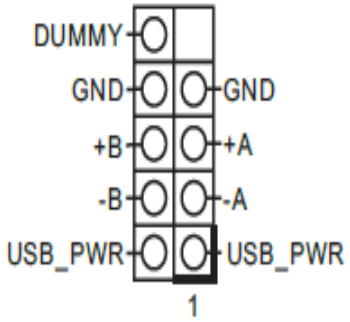


4: SATA Power Output Connector

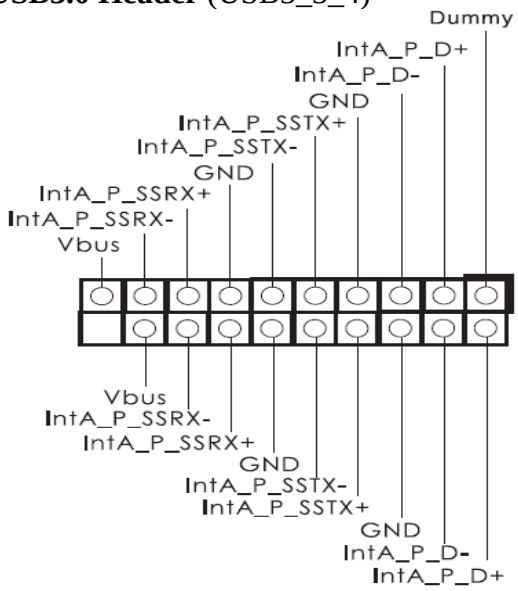


5: SATA3 Connectors (SATA3_1~4)

6: USB2.0 Headers (USB2_8_9, USB2_11_12)

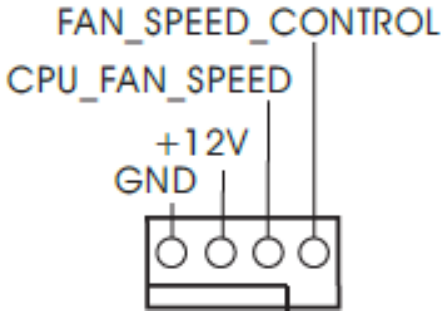


7: USB3.0 Header (USB3_3_4)



8: M.2 Key-B Socket (M2B1)

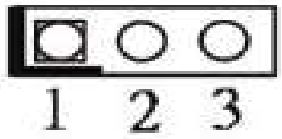
9: 4-Pin CPU FAN Connector (+12V)
(CPU_FAN1)



10: Clear CMOS Header (CLRMOS1)

1-2：Normal

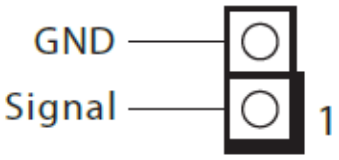
2-3：Clear CMOS



11: Chassis Intrusion Headers (CI1)

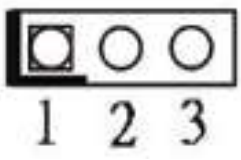
CI1：Close：Active Case Open

Open：Normal



12: Backlight Power Select

(LCD_BLT_VCC) (BKT_PWR1)
1-2：LCD_BLT_VCC：+5V
2-3：LCD_BLT_VCC：+12V



13: Inverter Power Control Wafer (BLT_PWR1)

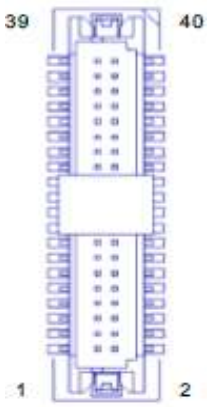
PIN	Signal Name
1	GND
2	GND
3	CON_LBKLT_CTL
4	CON_LBKLT_EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC

14: Backlight Volume Control (BLT_VOL1)

PIN	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	BLT_UP
5	BLT_DW
6	GND
7	GND

15: LVDS Panel Connector

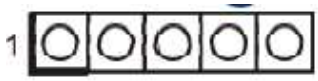
* PD (Panel Detection): Connect this pin to LVDS Panel's Ground pin to detect Panel detection.



PIN	Signal Name	PIN	Signal Name
39	LCD_BLT_VCC	40	LCD_BLT_VCC
37	CON_LBKLT_CTL	38	LCD_BLT_VCC
35	GND	36	CON_LBKLT_EN
33	LVDS_B_CLK#	34	LVDS_B_CLK
31	LVDS_B_DATA3	32	GND
29	DPLVDD_EN	30	LVDS_B_DATA3#
27	LVDS_B_DATA2#	28	LVDS_B_DATA2
25	LVDS_B_DATA1	26	GND
23	GND	24	LVDS_B_DATA1#
21	LVDS_B_DATA0#	22	LVDS_B_DATA0
19	LVDS_A_CLK	20	GND
17	GND	18	LVDS_A_CLK#
15	LVDS_A_DATA3#	16	LVDS_A_DATA3
13	LVDS_A_DATA2	14	GND
11	GND	12	LVDS_A_DATA2#
9	LVDS_A_DATA1#	10	LVDS_A_DATA1
7	LVDS_A_DATA0	8	PD (Panel Detection)
5	LDDC_DATA	6	LVDS_A_DATA0#
3	+3.3V	4	LDDC_CLK
1	LCD_VCC	2	LCD_VCC

16: Panel Power Select

(LCD_VCC) (PNL_PWR1)
1-2：LCD_VCC：+3V
2-3：LCD_VCC：+5V
4-5：LCD_VCC：+12V

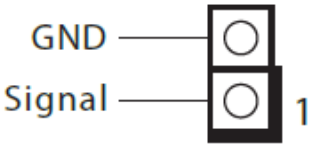


17: LVDSBL1

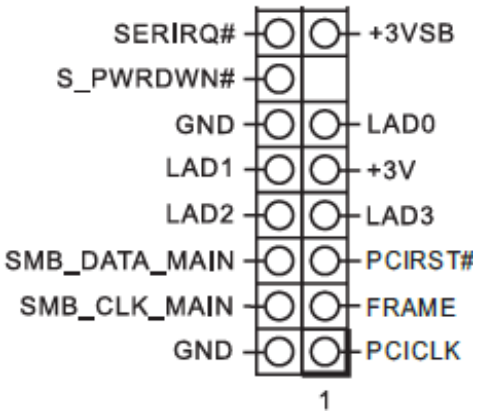
Open: Protect LCD_VCC
Short: No Protect LCD_VCC
LVDSBL2
Open: Protect LCD_BLT_VCC
Short: No Protect LCD_BLT_VCC

18: Chassis Intrusion Headers (CI2)

CI2：
Close：Active Case Open
Open：Normal

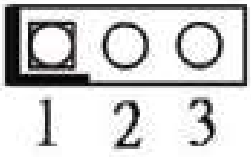


19: TPM Header



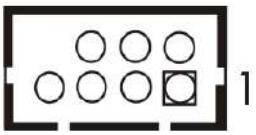
20: Backlight Control Level

(CON_LBKLT_CTL) (BLT_PWM1)
1-2: From eDP PWM to CON_LBKLT_CTL
2-3: From LVDS PWM to CON_LBKLT_CTL



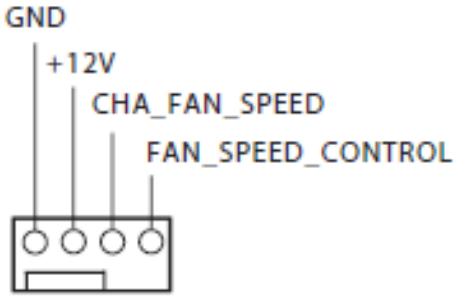
21: COM Port Headers

(COM3, 4, 5) (RS232)

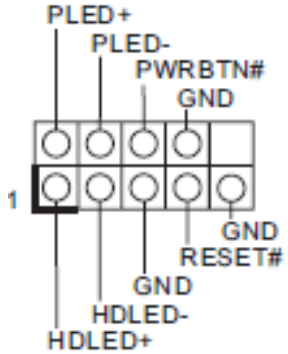


PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
10	N/A	8	CCTS#	6	DDSR#	4	DDTR#	2	RRXD
9	PWR	7	RRTS#	5	GND	3	TTXD	1	DDCD#

22: 4-Pin Chassis FAN Connector (+12V)

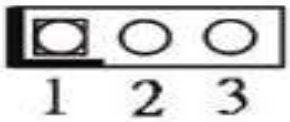


23: System Panel Header



24: COM Port PWR Setting Jumpers (COM 3~4)

PWR_COM3 (For COM Port3)
PWR_COM4 (For COM Port4)
PWR_COM5 (For COM Port5)



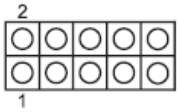
1-2：+5V
2-3：+12V

25: Buzzer

26: SIO_AT1

Open：ATX Mode
Short：AT Mode

27: Digital Input/Output Pin Header (JGPIO1)



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
2	SIO_ GP71	4	SIO_ GP72	6	SIO_ GP73	8	SIO_ GP74	10	GND
1	SIO_ GP75	3	SIO_ GP76	5	SIO_ GP77	7	SIO_ GP80	9	JGPIO_ PWR

Note: Board level and system level pin define are different for Pin 9 and Pin10.

28: Digital Input / Output Default Value Setting (JGPIO_SET1)

1-2：Pull-High
2-3：Pull-Low

29: M.2 Key-M Socket (M2M1)

30: M.2 Key-E Socket (M2E1)

31: PWR LOSS Header (PWR_LOSS1)

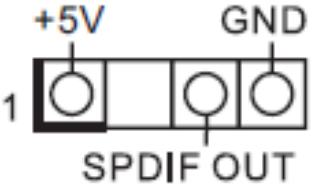
Short：Power Loss

Open：no Power Loss

32: 3W Audio AMP Output Wafer

PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	OUTLN	2	OUTLP	3	OUTRP	4	OUTRN

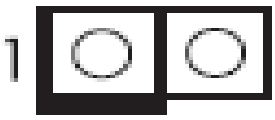
33: SPDIF Header



34: PWR_BAT1

Open：Normal

Short：Charge Battery



35: Clear CMOS Header (CLRMOS2)

Open：Normal

Short： Auto Clear CMOS (Power Off)

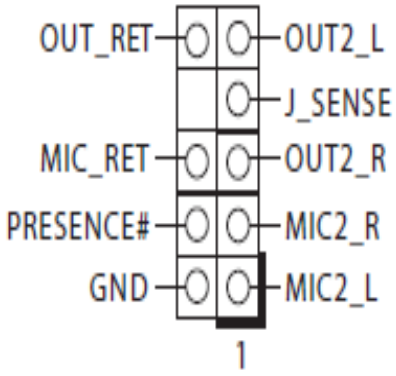
36: Battery Connector

37: Audio Output

Green - Line Out

Pink - Mic In

38: Front Panel Audio Header



39: Top: RJ45 LAN Port (LAN2)
Bottom: USB3.0 Ports (USB_5_6)

40: Top: RJ45 LAN Port (LAN1)
Bottom: USB3.0 Ports (USB_1_2)

41: Top: D-Sub Port (VGA1)

42: Top: DisplayPort (DP2)
Bottom: HDMI Port (HDMI)

43: Top: COM Port (COM1) (RS232/422/485)*
Bottom: COM Port (COM2) (RS232/422/485)*

* Please refer to below table for the pin definition. In addition, they can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

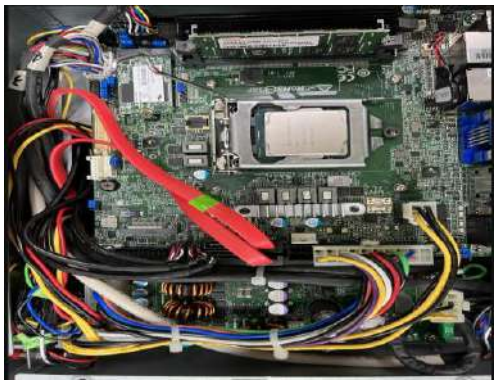
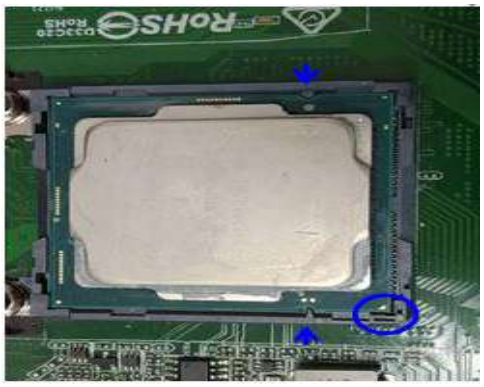
PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	+5V / +12V	N/A	N/A

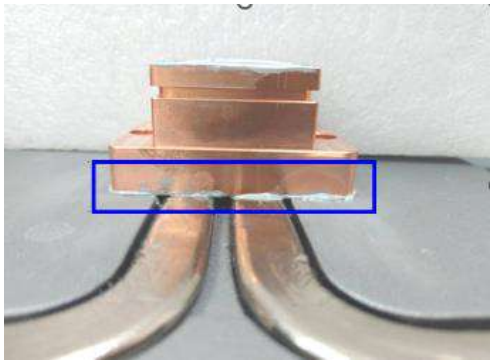
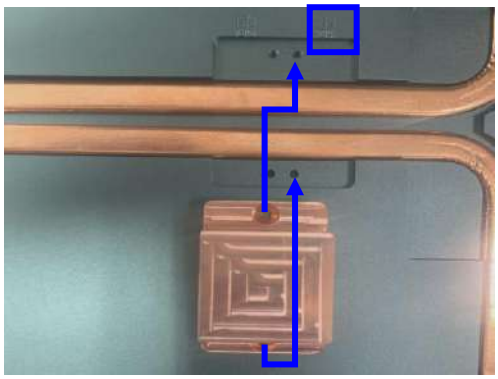
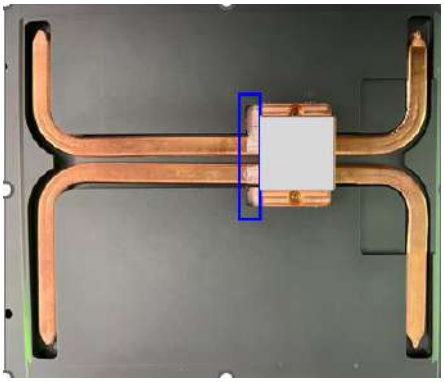
2.2 CPU and Memory module Installation

Important:

- Turn off the power of your IPC BOX PC and allow it to cool for at least 10 minutes before performing any installation/uninstallation and maintenance process.
- Professionals (Skilled person) are required for maintenance, assembly or disassembly, and the pluggable 2.5″ SSD can be replaced by end user.

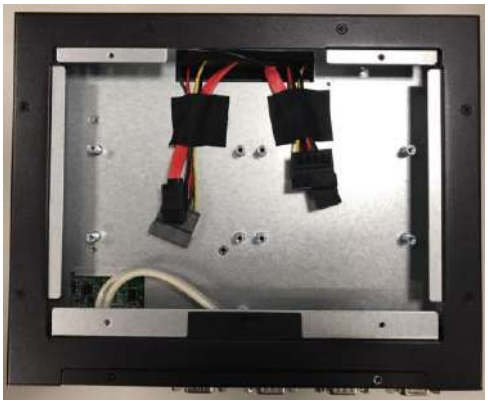
Equipped with CPU and Memory module by yourself if you purchase CPU or Memory module locally.

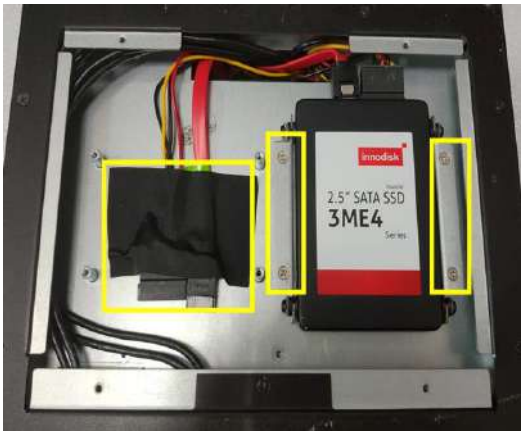
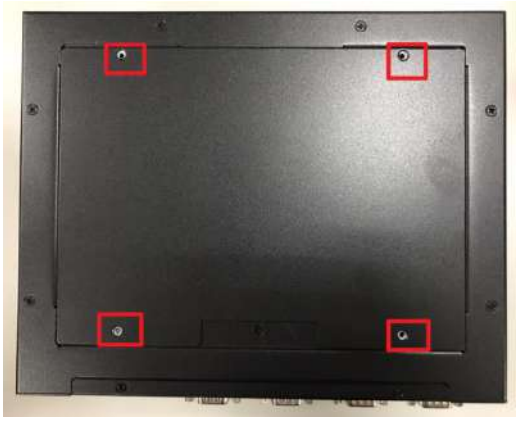
Step 1. Loosen the screws of top heatsink (4 screws)	Step 2. Check system inside
	
Step 3. Open CPU Socket before installing CPU.	Step 4. Remove CPU socket protection cover
	
Step 5. Install CPU. Please locate notches on both side and pin one of CPU first	Step 6. Install CPU successfully
	

Step 7. Install DDR4 SO DIMM Memory Module on the system	Step 8. Make sure the thermal paste can be applied uniformly between heat spreader and top cover.
	
Step 9. Make sure the heat spreader places at the right position (H1 mark) and fixed the screw on the inside of top cover.	Step 10. Ready to system assembly.1. make sure thermal paste can be applied uniformly on the heat spreader 2. After assemble heat spreader and top cover, you can find a space (Blue block) on the left side of heat spreader.
	
Step 11. Assemble top cover with chassis.	Step 12. Fixed the screws of top cover (there are 4 screws need to be fixed)
	

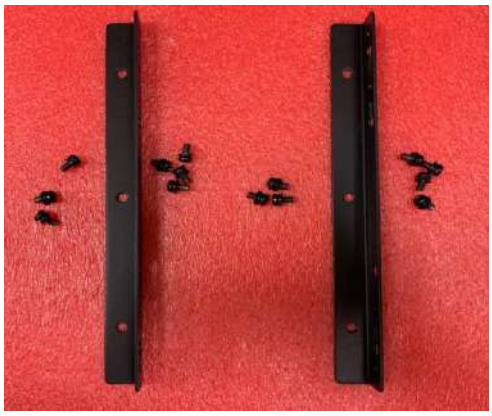
2.3 2.5” SDD Installation

Unique design of the SDD tray allows easy installation and maintenance of 2.5” SSD. RAID function is supported with dual SSD design. (The height must be less than 10mm)

Step 1. Take out SDD screw and plastic washer from accessory bag	Step 2. Integrate SDD screw with plastic washer
	
Step 3. Take out SDD bracket from accessory bag	Step 4. Using SSD screw to fix SSD bracket with HDD together
	
Step 5. Loosen the screws from bottom plate	Step 6. Two set SATA power and SATA data cable shown on system inside
	

Step 7. Plug SATA power and SATA data cable into 2.5" SSD	Step 8. Take out countersunk head screws (M3 x 4L) from accessory bag
	
Step 9. Using countersunk head screws (M3 x 4L) to be fixed SDD Kit on bottom of system	Step 10. Fixed the screws (M3x4L) from bottom plate
	
Step 11. Finish SDD assembly.	Step 12. Final system
	

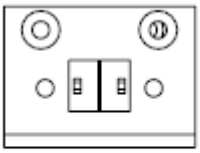
2.4 Wall Mount Installation

Step 1. Prepare wall mount kit and screws. 1. Screw size (M4x8L): for system side. 2. Screw size (M4 x 8L): for wall mount side	Step 2. System is ready for assembling.
	
Step 3. Assemble the desk mount kit with system and fasten it using 3 screws. (M4 x 8 L).	Step 4. Final picture.
	

2.5 I/O Interfaces

2.5.1 Front View

Ext Power Switch:
It is for remote system ON/OFF control.



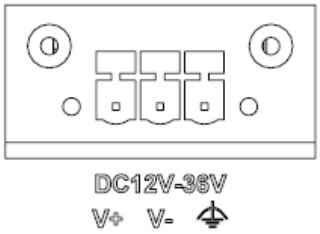
Power Button:
Press the power button to turn ON/OFF the system
Blue color LED means Power on

Reset Button:
Press the power button to reset the system

SSD LED:
It demonstrates SSD working status of the system.

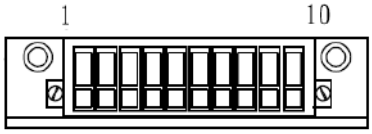
2.5.2 Rear View

DC in 12-36V via 3-pin terminal block connector:
Provide power connection of the system to the main power source via DC power cable or AC/DC power adapter.



ANT1 & ANT2 hole:
Antenna holes for WiFi or 4G LTE/GPS module

GPIO:



Pin	Signal	Pin	Signal
1	SIO_GP75	2	SIO_GP71
3	SIO_GP76	4	SIO_GP72
5	SIO_GP76	6	SIO_GP73
7	SIO_GP80	8	SIO_GP74
9	GND	10	JGPIO-PWR

Note: Board level and system level pin define are different for Pin 9 and Pin10.

Audio:
Connectors for Mic-In, Line-Out

LAN:
Two Gigabit Ethernet (10/100/1000 M bits/sec) LAN ports by using Intel® I219-LM & Intel® I225-LM GbE Ethernet Controller.

USB3.2 & USB 2.0:
4x USB 3.2 Gen 1, 4x USB 2.0

VGA:
VGA display output

DP:
DP (Display Port) display output

HDMI:
Type A HDMI display output

COM port:

- RS-232

Pin	RS-232 Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	+5V/+12V

- RS-232/4222/485
  *Note: RS-232/422/485 configuration is determined by BIOS setting. Check BIOS setting for details.

Pin	RS-422 Signal	RS-485 Signal
1	TX-	RTX-
2	RX+	N/A
3	TX+	RTX+
4	RX-	N/A
5	GND	GND
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A
9	N/A	N/A

2.6 Getting Started

It is easy to get the system started.

Step 1. Make sure the power supply (DC12~36V) is connected properly	Step 2. Press the power button to turn on the system
	

Chapter 3 BIOS Setup Information

WEBS-45H1 system adopts WADE-8212 mother board. WADE-8212 is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8212 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

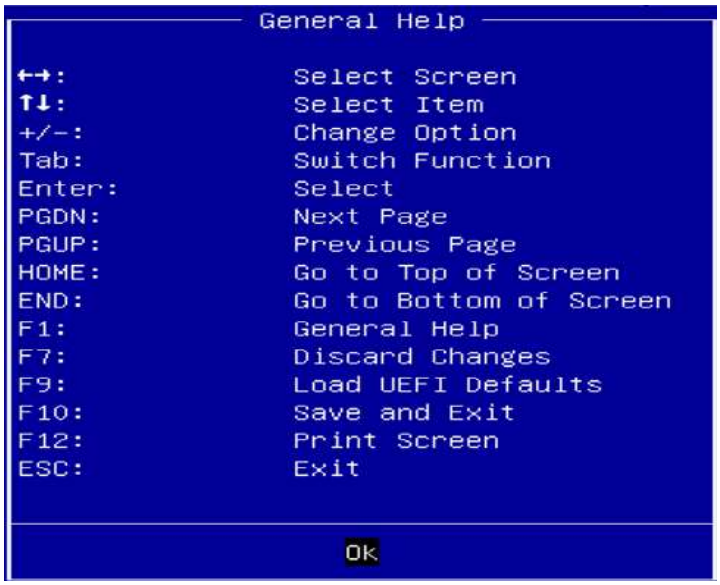
The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

3.1 Entering Setup

Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press<Delete> or <ESC> to enter SETUP
If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

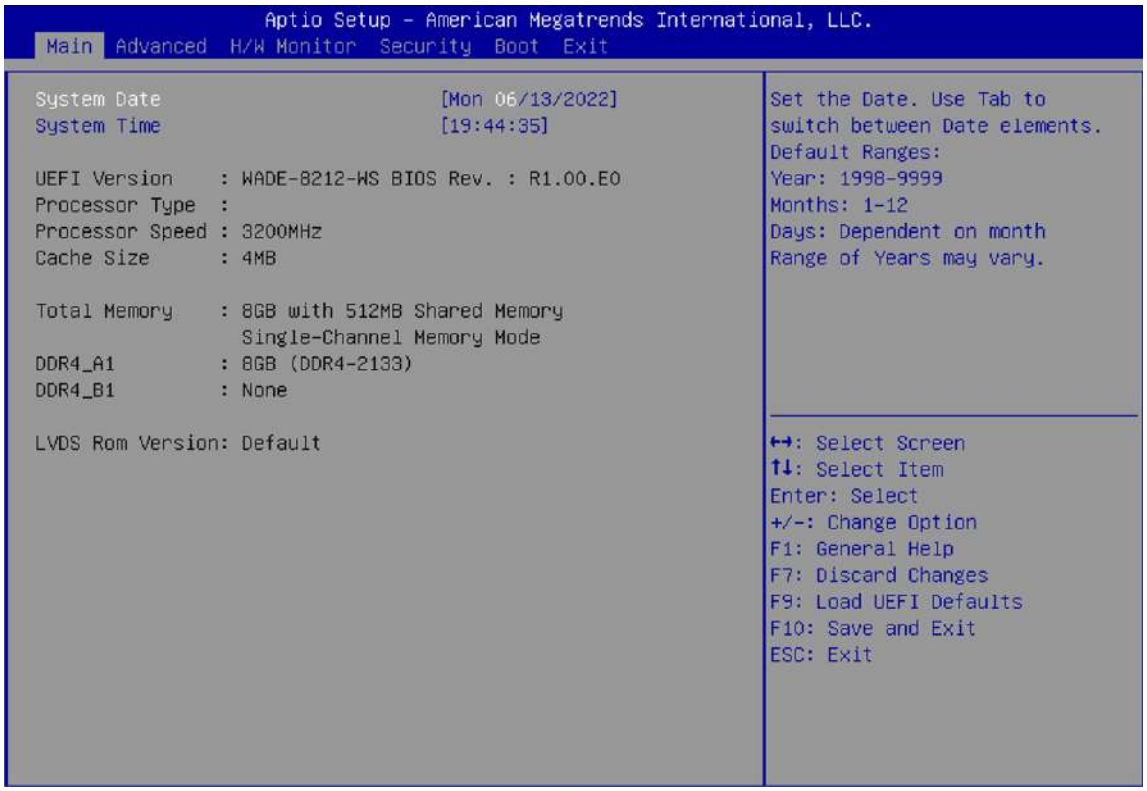
Press <F1> to Run General Help or Resume
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



3.2 Main

3.2.1 Main

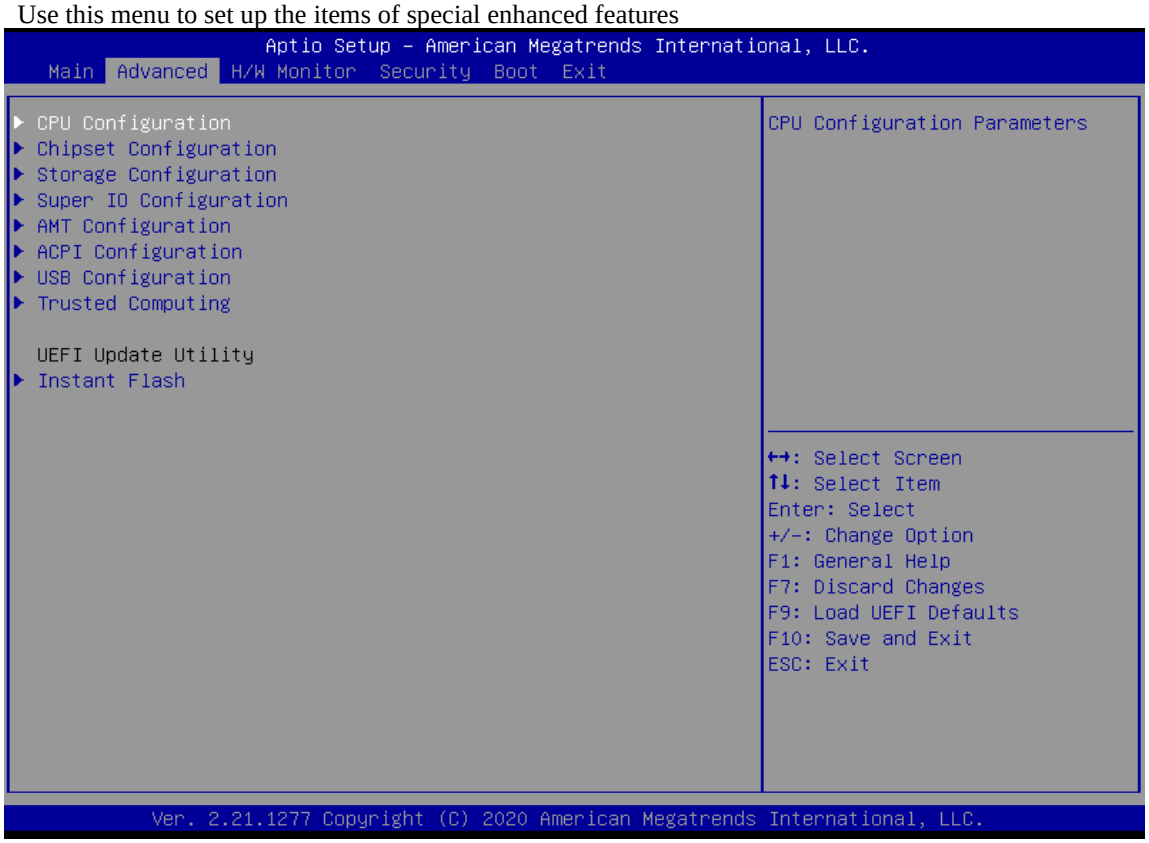
Use this menu for basic system configurations, such as time, date etc.



Feature	Description	Options
System Date	The date format is <Day>, <Month> <Date> <Year>. Use [＋] or [－] to configure system Date.	
System Time	The time format is <Hour> <Minute> <Second>. Use [＋] or [－] to configure system Time.	

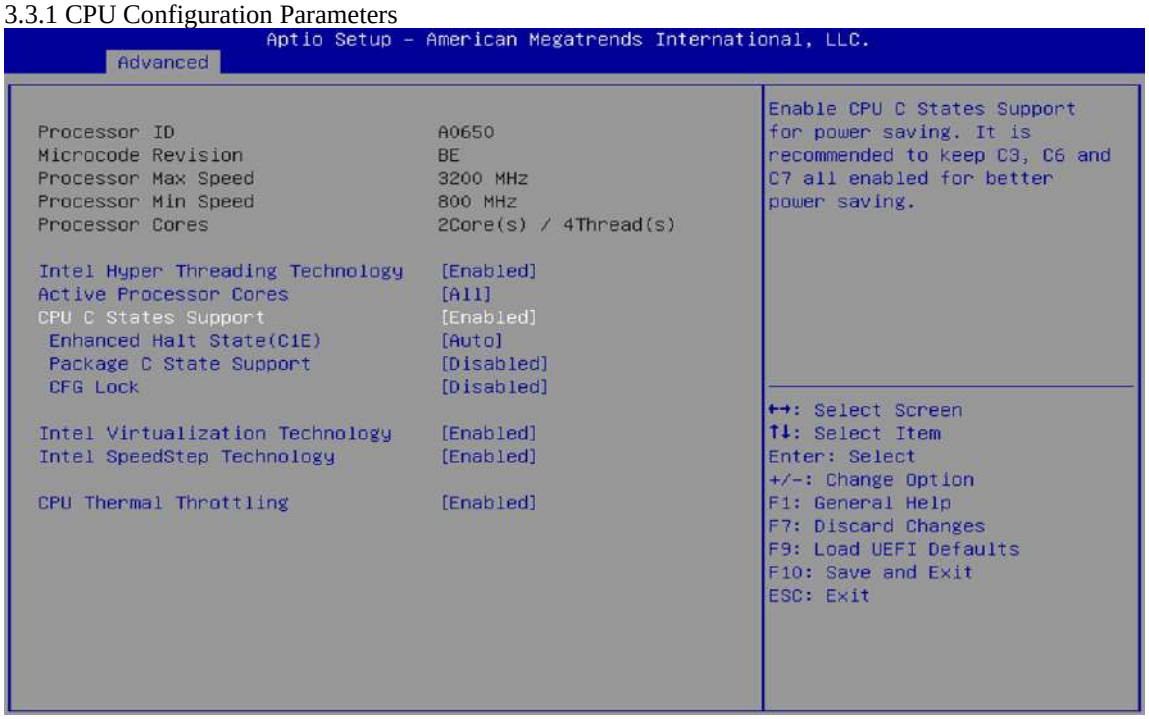
3.2.2 Advanced

Use this menu to set up the items of special enhanced features



3.3 Configuration

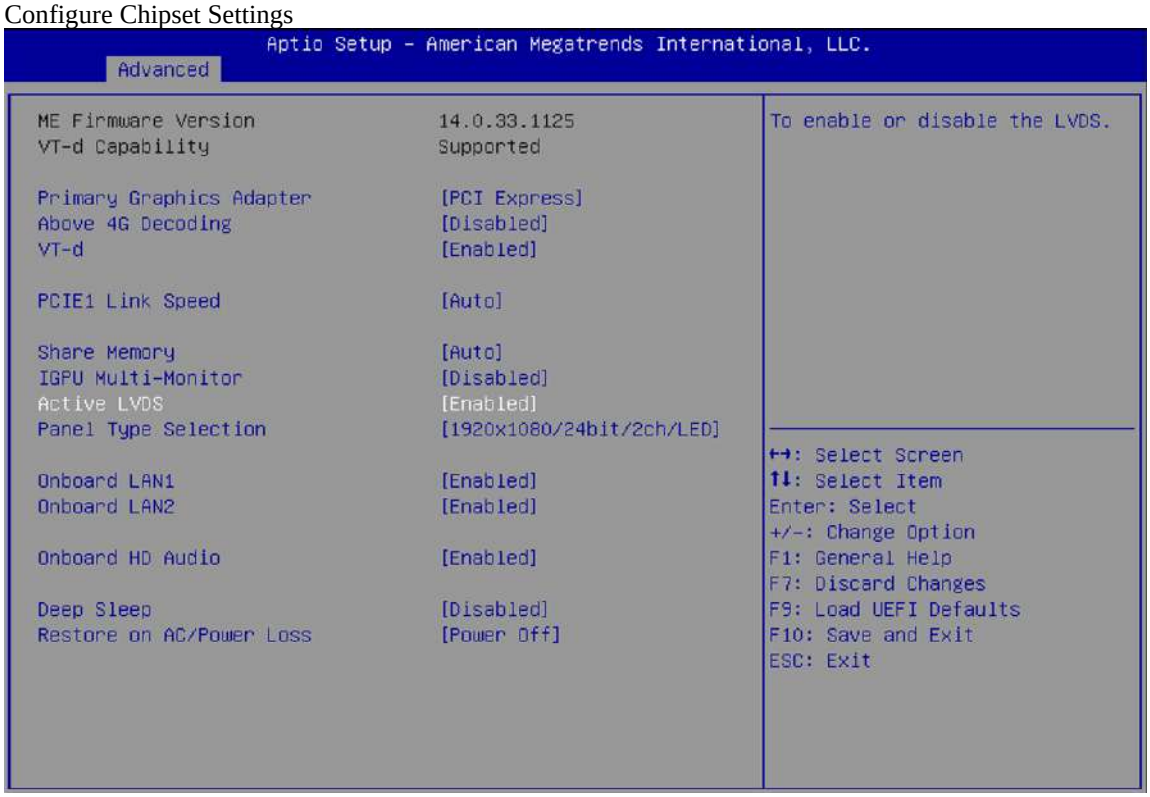
3.3.1 CPU Configuration Parameters



Feature	Description	Options
Intel Hyper Threading Technology	Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.	★Enabled, Disabled
Active Processor Cores	Select the number of cores to enable in each processor package.	★All, 1
CPU C states Support	Enable CPU C states Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.	★Disabled, Enabled
CPU C states Support [Enabled]		
Enhanced Halt State(C1E)	Enable Enhanced Halt State (C1E) for lower power consumption.	★Auto, Disabled, Enabled
Package C State Support	Enable CPU, PCIe, Memory, Graphics C State Support for power saving.	★Disabled, Auto, Enabled
CFG Lock	This item allows you to disable or enable the CFG Lock.	★Disabled, Enabled
Intel Virtualization Technology	Intel Virtualization Technology allows a platform to run multiple operating systems and application in independent partitions, so that one computer system can function as multiple virtual systems.	★Enabled, Disabled
Intel SpeedStep Technology	Allows more than two frequency ranges to be supported.	★Enabled, Disabled
CPU Thermal Throttling	Enable CPU internal thermal control mechanisms to keep the CPU from overheating.	★Enabled, Disabled

3.3.2 Chipset Configuration

Configure Chipset Settings

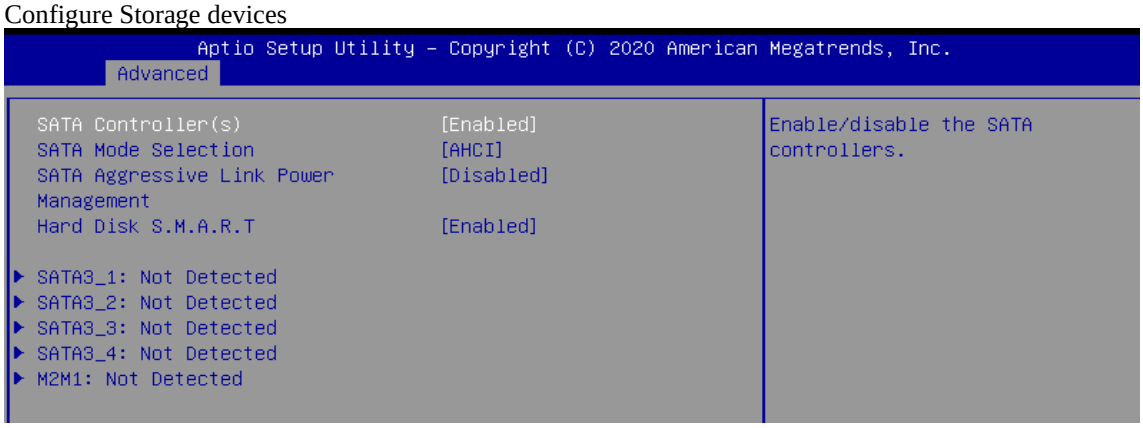


Feature	Description	Options
Primary Graphics Adapter	Select a primary VGA.	★PCI Express, Onboard
Above 4GB Decoding	Enable/Disable above 4G Memory Mapped IO decoding. This is disabled automatically when Aperture Size is set to 2048MB.	★Disabled, Enabled
VT-d	VT-d Capability	★Enabled, Disabled
PCIE1 Link Speed	Control PCIE1 Slot Link Speed. Auto mode is optimizing for over clocking.	★Auto, Gen1, Gen2, Gen3
Share Memory	Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.	★Auto,32M,64M,128M,256M,512M,1024M
IGPU Multi-Monitor	Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enable at all times.	★Disabled, Enabled
Active LVDS	To enable or disable the LVDS.	★Disabled, Enabled
Panel Type Selection	Selection Panel Type	★1920x1080/24bit/2ch/LED, 1440 x 900/24bit/2ch/LED, 1024x768/24bit/1ch/CCFL 1280x1024/24bit/2ch/CCFL, 1366x768/24bit/1ch/CCFL, 1440x900/24bit/2ch/CCFL, 1024 x 600/18bit/1ch/LED, 800x600/18-bit/1-ch/CCFL 1280 x 1024/24bit/2ch/LED, 1024 x 768/24bit/1ch/LED, 1600 x 900/18bit/2ch/LED, 1366 x 768/24bit/1ch/LED, 1366 x 768/18bit/1ch/LED,

		800 x 600/24bit/1ch/LED, 640 x 480/24bit/1ch/LED, 1024 x 768/18bit/1ch/LED,
Onboard LAN1	Enable or disable the onboard LAN1 network interface controller.	★Enabled, Disabled
Onboard LAN2	Enable or disable the onboard LAN2 network interface controller.	★Enabled, Disabled
Onboard HD Audio	Enable/disable onboard HD audio.	★Enabled, Disabled
Deep Sleep	Configure deep sleep mode for power saving when the computer is shut down. We recommend disabling Deep Sleep for better system compatibility and stability.	★Disabled, Enabled in S4-S5
Restore on AC/Power Loss	Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.	★Power Off, Power On

3.3.3 Storage Configuration

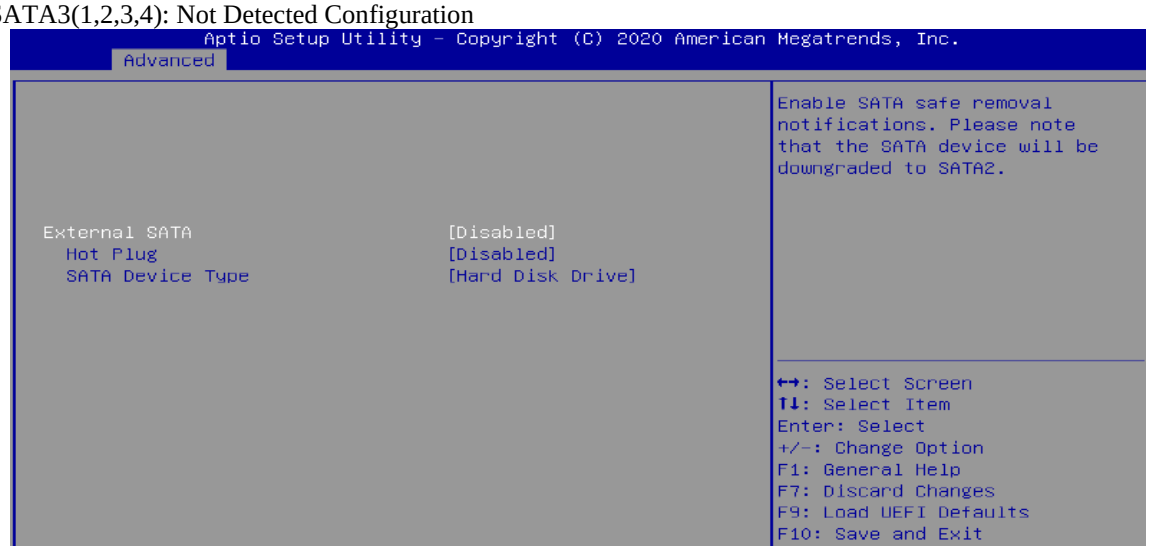
Configure Storage devices



Feature	Description	Options
SATA Controller(s)	Enable/disable the SATA controllers.	★Enabled, Disabled
SATA Mode Selection	AHCI: Supports new features that improve performance. Intel RST Premium (RAID): Combine multiple disk drives into a logical unit. Please press<CTRL-I>to enter RAID ROM during UEFI POST process.	★AHCI, RAID
SATA Aggressive Link Power Management	SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode.	★Disabled, Enabled
Hard Disk S.M.A.R.T	S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.	★Enabled, Disabled

3.3.4 SATA3_1,2,3,4: Not Detected Configuration

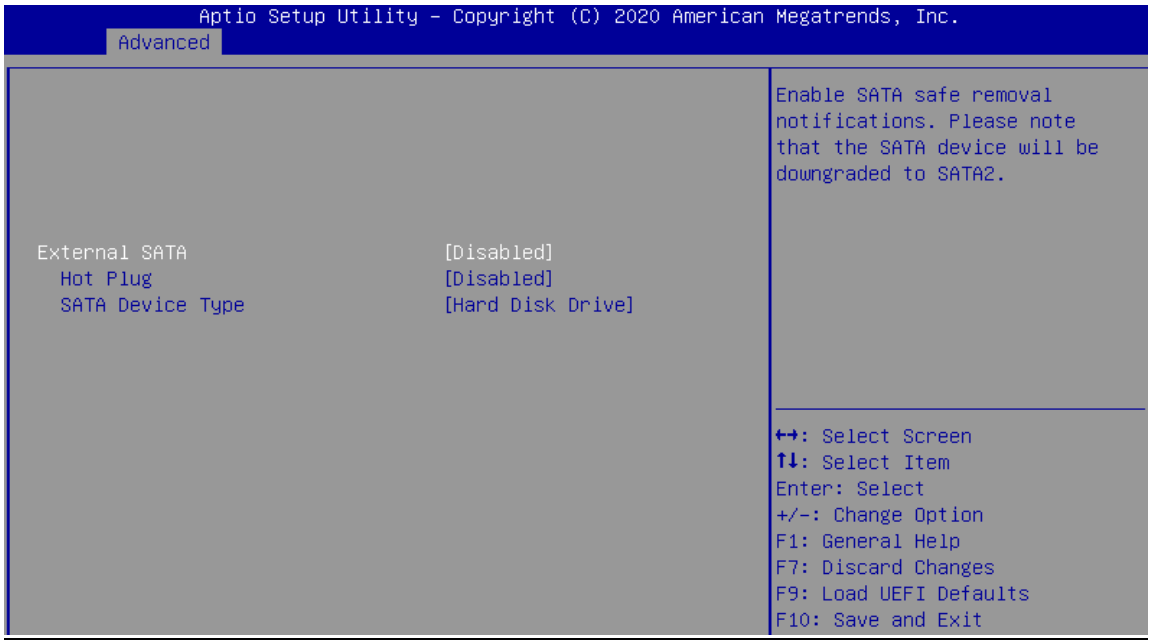
SATA3(1,2,3,4): Not Detected Configuration



Feature	Description	Options
External SATA	Enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.	★Disabled, Enabled
Hot Plug	Enable or disable Hot Plug for this port.	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★Hard Disk Drive, Solid State Drive

3.3.5 M2M1: Not Detected Configuration

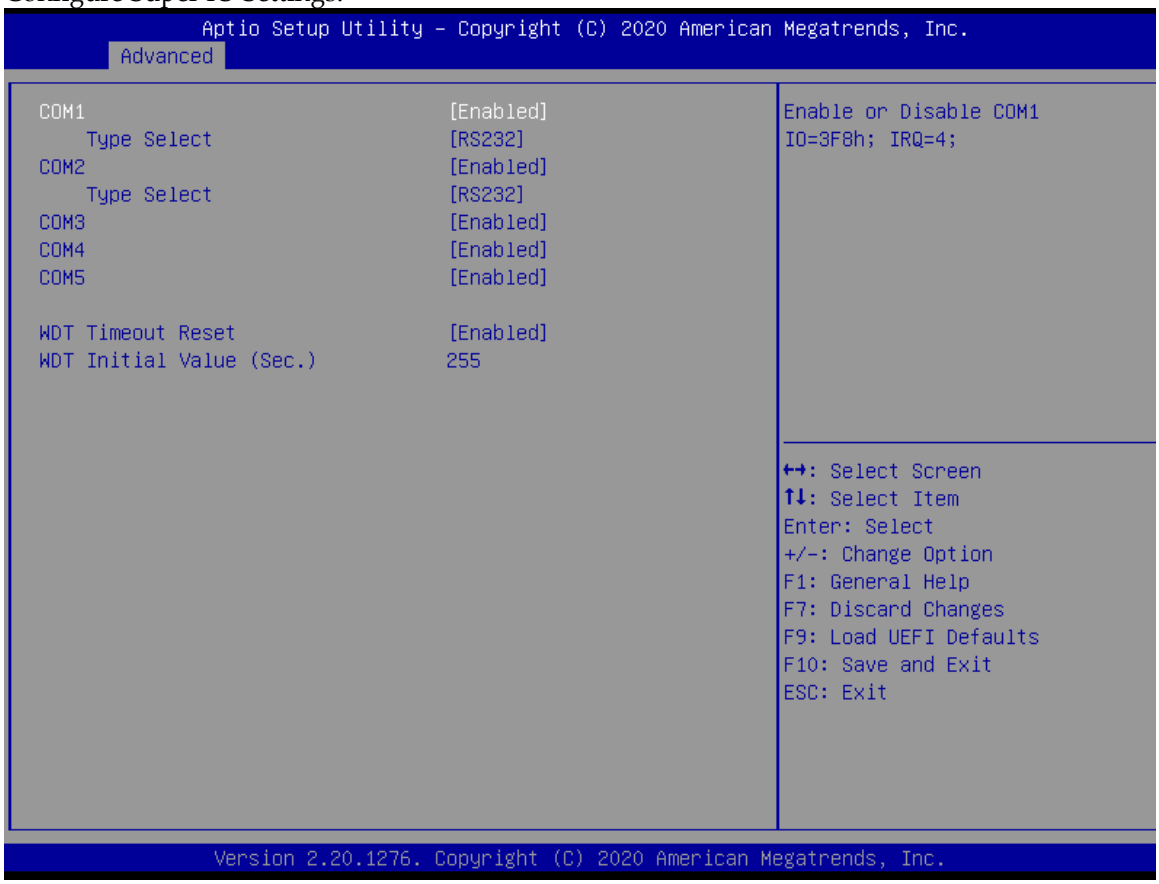
M2M1: Not Detected Configuration



Feature	Description	Options
External SATA	Enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.	★Disabled, Enabled
Hot Plug	Enable or disable Hot Plug for this port.	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★Hard Disk Drive, Solid State Drive

3.3.6 Super IO Configuration

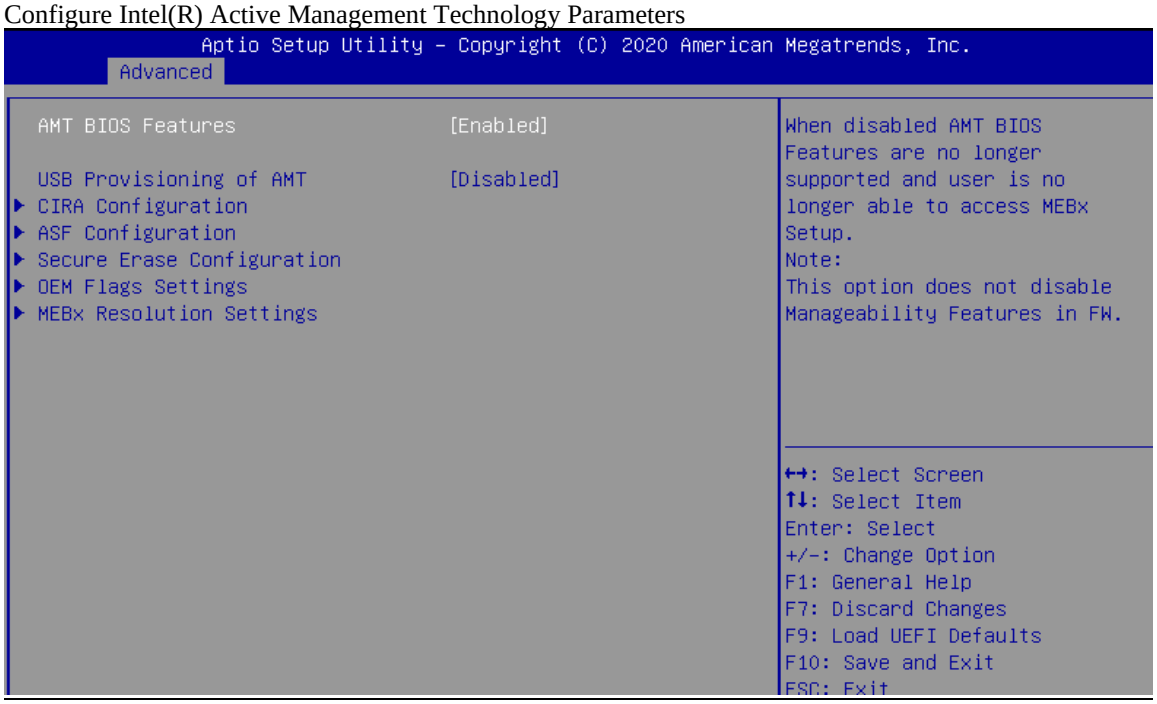
Configure Super IO Settings.



Feature	Description	Options
COM1	Enable or Disable COM1, IO=3F8h; IRQ=4;	★Enabled, Disabled
Type Select	Set COM Type	★RS232, RS422, RS485
COM2	Enable or Disable COM2, IO=2F8h; IRQ=3;	★Enabled, Disabled
Type Select	Set COM Type	★RS232, RS422, RS485
COM3	Enable or Disable COM3, IO=3E8h; IRQ=7	★Enabled, Disabled
COM4	Enable or Disable COM4, IO=2E8h; IRQ=7;	★Enabled, Disabled
COM5	Enable or Disable COM4, IO=2E0h; IRQ=10;	★Enabled, Disabled
WDT Timeout Reset	Enable/Disable Watch Dog Timer timeout to reset system.	★Disabled, Enabled
WDT Timeout Reset [Enabled]		
WDT Initial Value (Sec.)	Watch Dog Timer Initial Value to count down.	★255

3.3.7 AMT Configuration

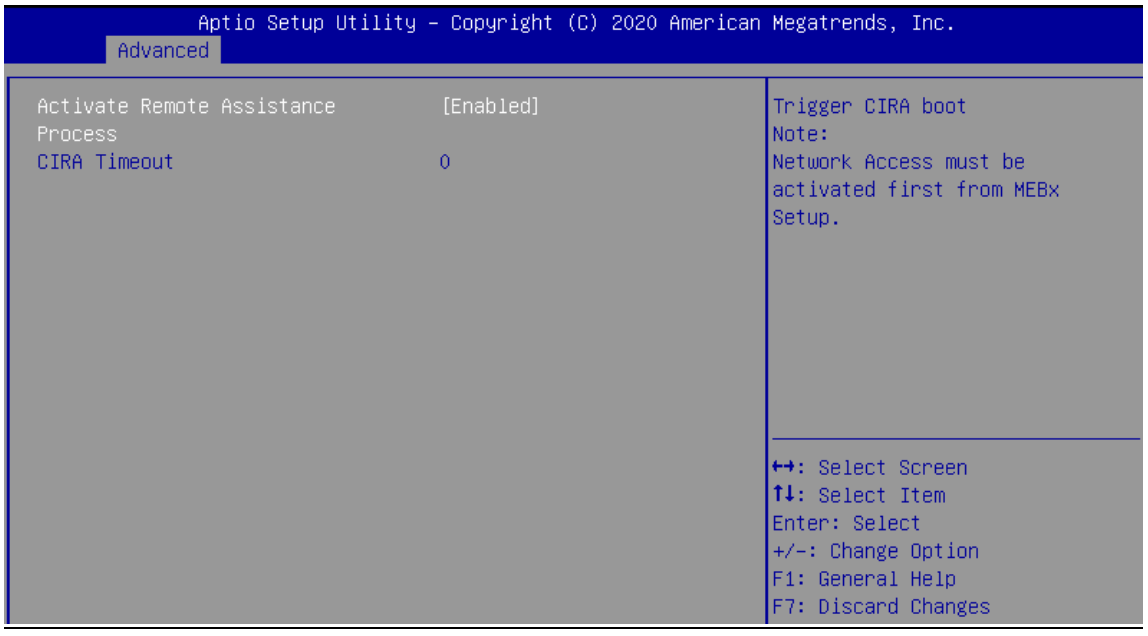
Configure Intel(R) Active Management Technology Parameters



Feature	Description	Options
AMT BIOS Features	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.	★Enable, Disabled
USB Provisioning of AMT	Enable/Disable of AMT USB Provisioning.	★Disabled, Enable

3.3.8 CIRA Configuration

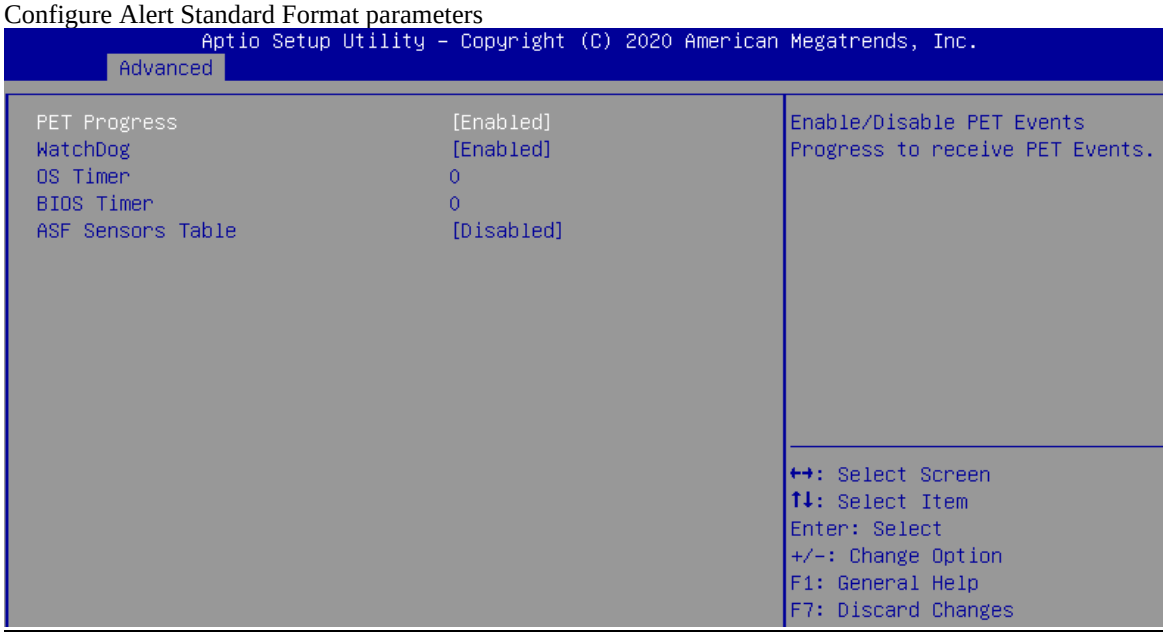
Configure Remote Assistance Process parameters



Feature	Description	Options
Activate Remote Assistance Process	Trigger CIRA boot. Note: Network Access must be activated first from MEBx Setup.	★Disabled, Enable
Activate Remote Assistance Process [Enable]		
CIRA Timeout	OEM defined timeout for MPS connection to be established. 0-use the default timeout value of 60 seconds. 255- MEBx waits until the connection succeeds	★0

3.3.9 ASF Configuration

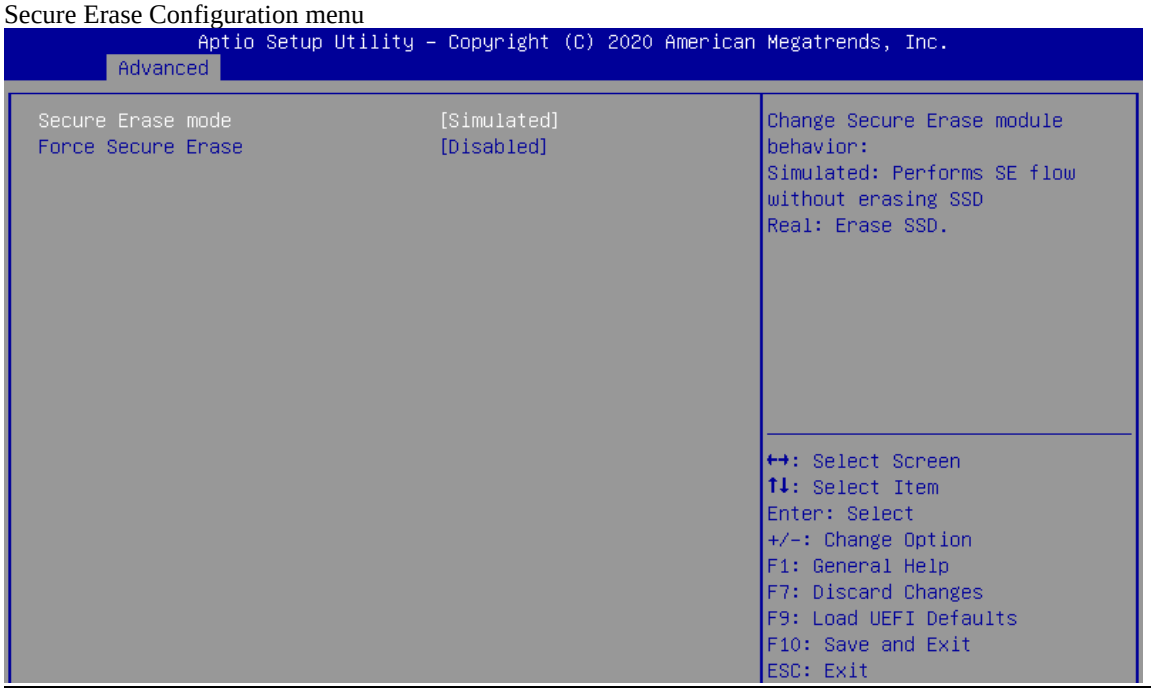
Configure Alert Standard Format parameters



Feature	Description	Options
PET Process	Enable/Disable PET Events Progress to receive PET Events.	★Enable, Disabled
WatchDog	Enable/Disable Watch Dog Timer.	★Disabled, Enable
WatchDog [Enabled]		
OS Timer	Set OS watchdog timer	★0
BIOS Timer	Set BIOS watchdog timer	★0
ASF Sensors Table	Adds ASF Sensor Table into ASF! ACPI Table	★Disabled, Enable

3.3.10 Secure Erase Configuration

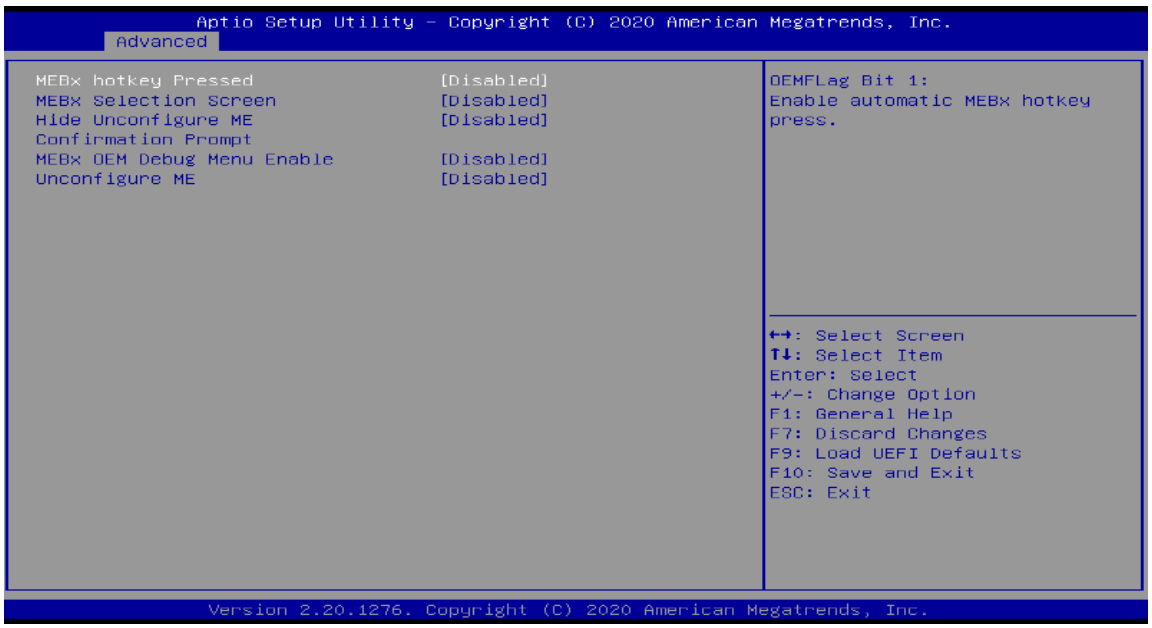
Secure Erase Configuration menu



Feature	Description	Options
Secure Erase mode	Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD Real: Erase SSD.	★Simulation, Real
Force Secure Erase	Force Secure Erase on next boot	★Disabled, Enable

OEM Flags Settings

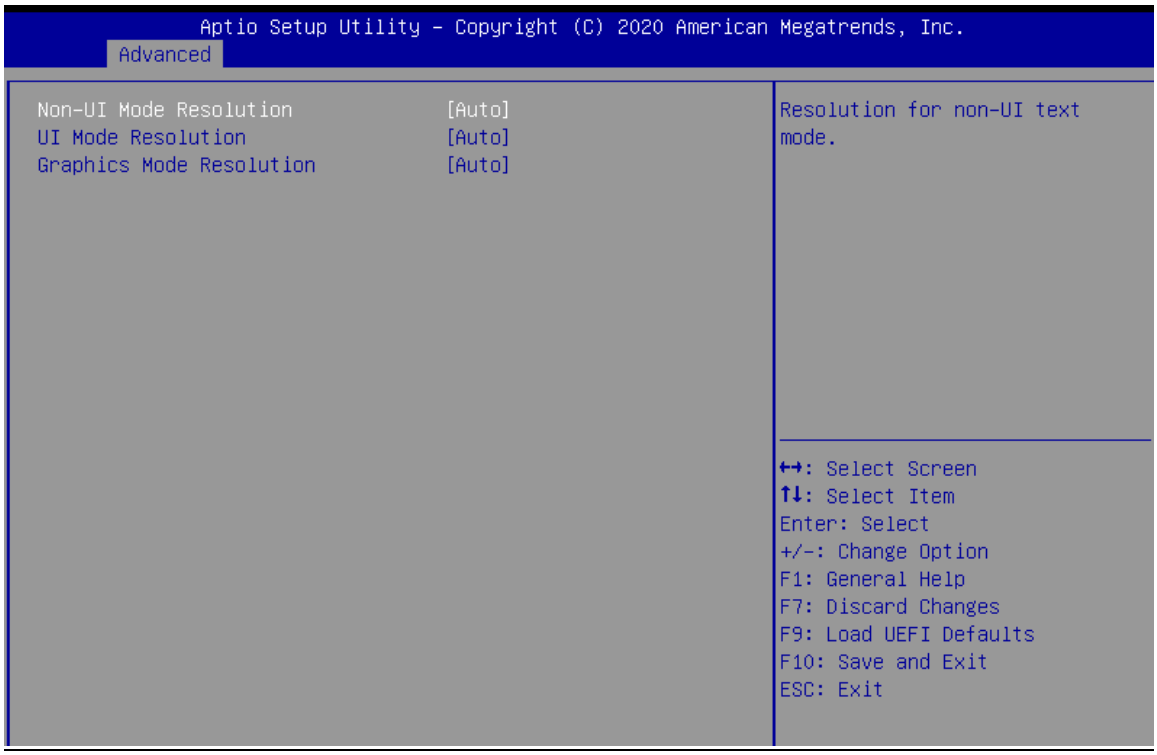
Configure OEM Flags



Feature	Description	Options
MEBx hotkey Pressed	OEMFLag Bit 1: Enable automatic MEBx hotkey press.	★Disabled, Enable
MEBx Selection Screen	OEMFLag Bit 2: Enable MEBx selection screen with 2 options: Press 1 to enter ME Configuration Screens Press 2 to initiate a remote connection Note: Network Access must be activated from MEBx Setup for this screen to be displayed.	★Disabled, Enable
Hide Unconfigure ME Confirmation Prompt	OEMFlag Bit 6: Hide Unconfigure ME confirmation prompt when attempting ME unconfiguration.	★Disabled, Enable
MEBx OEM Debug Menu Enable	OEMFlag Bit 14: Enable OEM debug menu in MEBx.	★Disabled, Enable
Unconfigure ME	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.	★Disabled, Enable

MEBx Resolution Settings

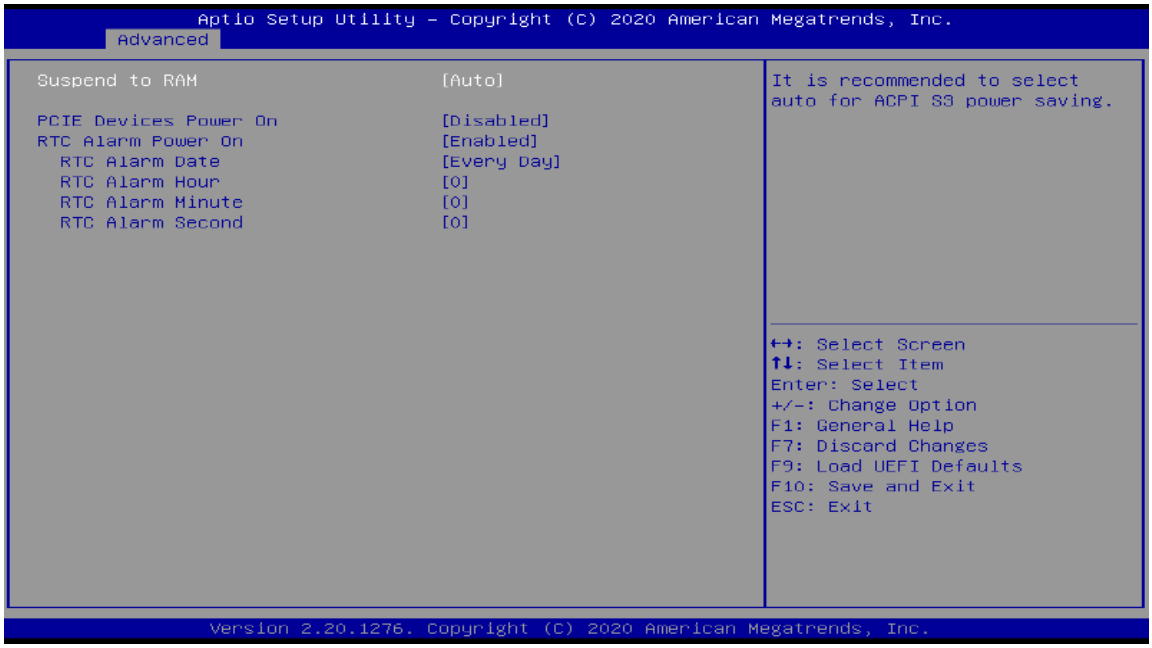
Resolution settings for MEBx display modes



Feature	Description	Options
Non-UI Mode Resolution	Resolution for non-UI text mode.	★Auto, 80x25,100x31
UI Mode Resolution	Resolution for UI text mode.	★Auto, 80x25,100x31
Graphics Mode Resolution	Resolution for graphic mode.	★Auto, 640x480,800x600,1024x768

3.3.11 ACPI Configuration

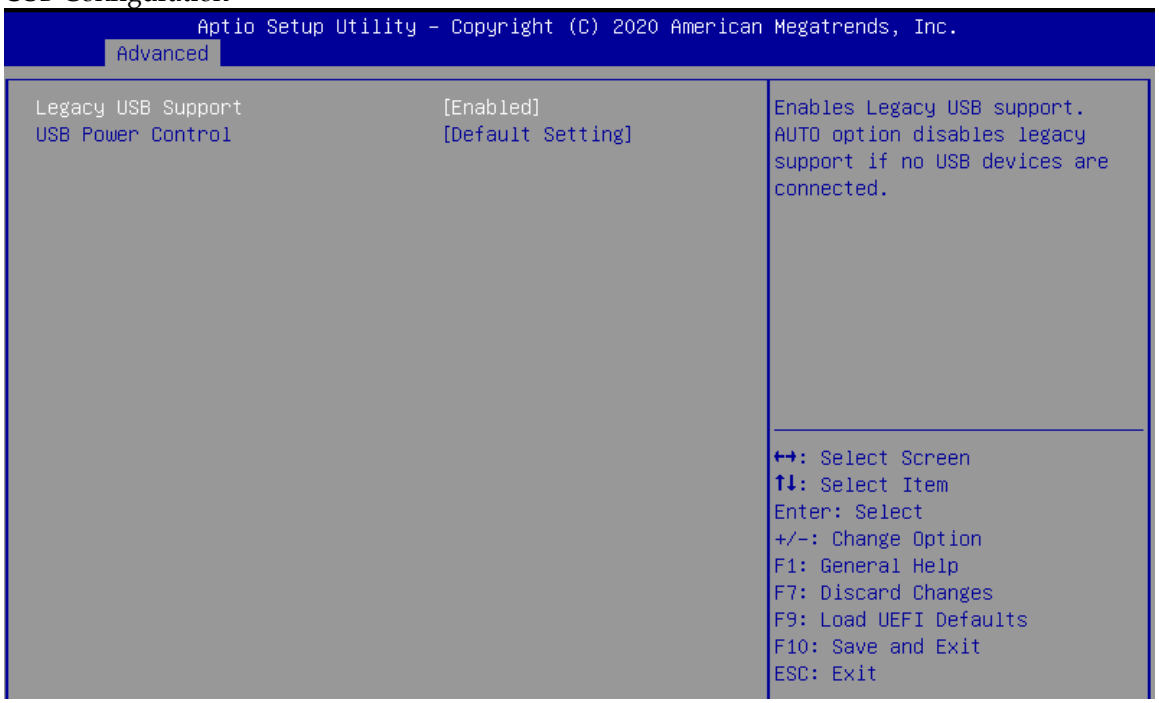
ACPI Parameters.



Feature	Description	Options
Suspend to RAM	It is recommended to select auto for ACPI S3 power saving.	★Auto, Disabled
PCIE Devices Power On	Allow the system to be waked up by a PCIE device and enable wake on LAN.	★Disabled, Enable
RTC Alarm Power On	Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.	★By OS, Disabled, Enable
RTC Alarm Power On [Enabled]		
RTC Alarm Date	Set Date of RTC power on feature.	★EveryDay,1,2,3,4,5,6,7,8,9,10, 11,12,13,14,15,16,17,18,19,20, 21,22,23,24,25,26,27,28,29,30,31
RTC Alarm Hour	Set Hour of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22,23,
RTC Alarm Minute	Set Minute of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22, 23,24,25,26,27,28,20,30,31,32, 33,34,35,36,37,38,39,40,41,42, 43,44,45,46,47,48,49,50,51,52, 53,54,55,56,57,58,59
RTC Alarm Second	Set Second of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22, 23,24,25,26,27,28,20,30,31,32, 33,34,35,36,37,38,39,40,41,42, 43,44,45,46,47,48,49,50,51,52, 53,54,55,56,57,58,59

3.3.12 USB Configuration

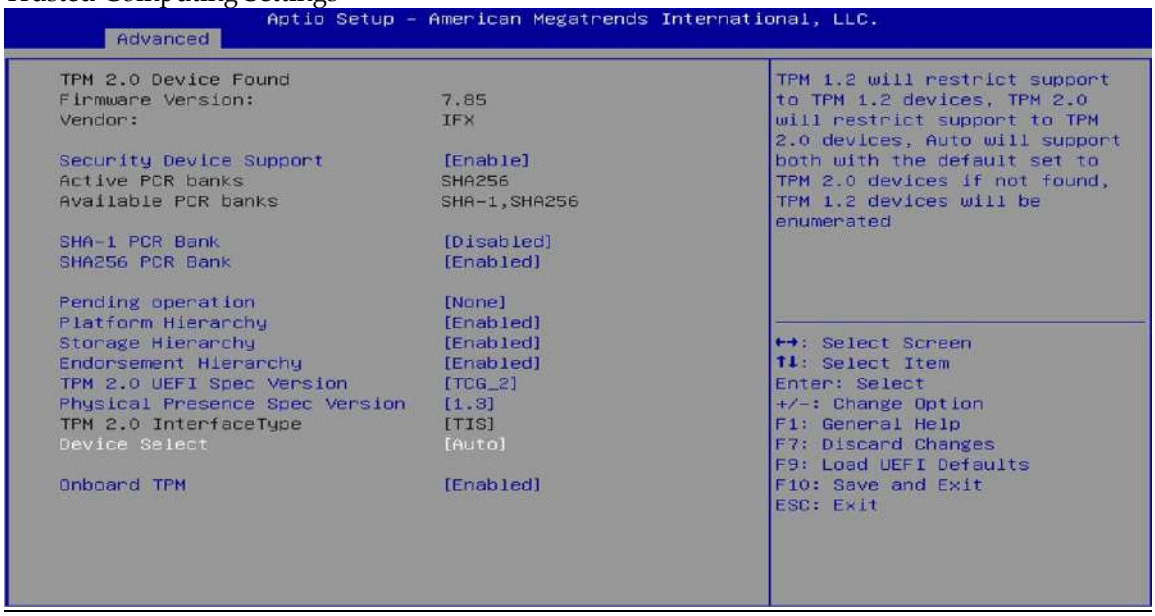
USB Configuration



Feature	Description	Options
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected.	★Enabled, UEFI Setup only
USB Power Control	Always enabled: Enable USB power in S0/S3/S4/S5, Default setting: Enable USB power in S0/S3, disable USB power in S4/S5.	★Default setting, Always Enabled

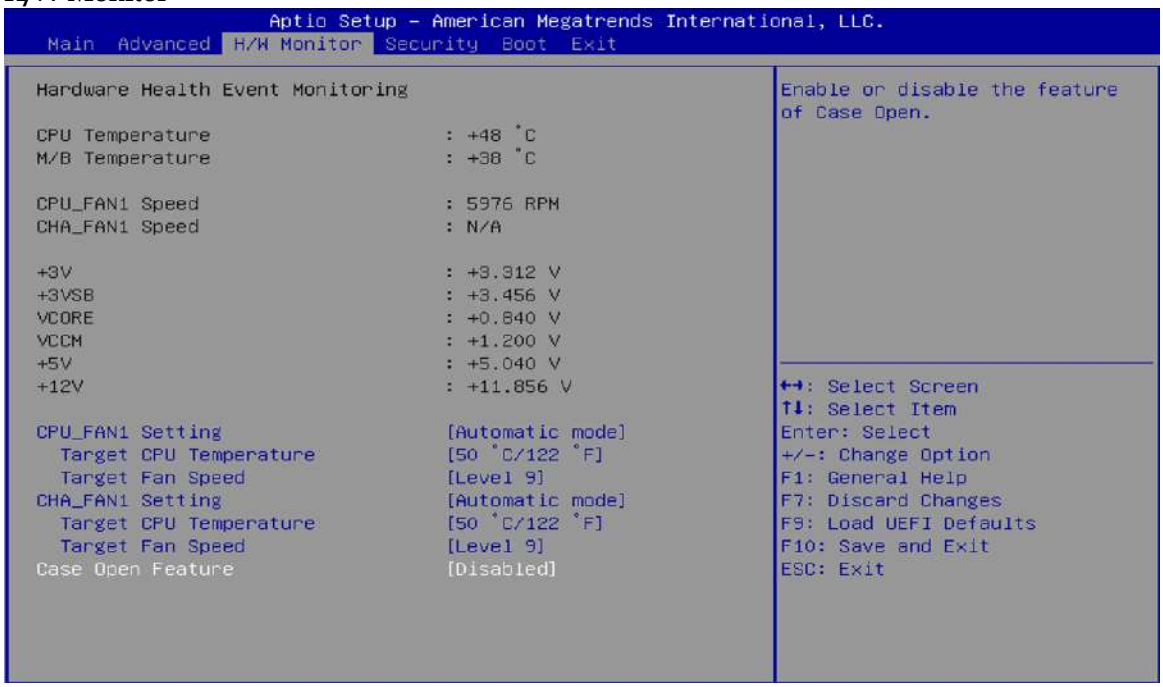
Trusted Computing

Trusted Computing Settings



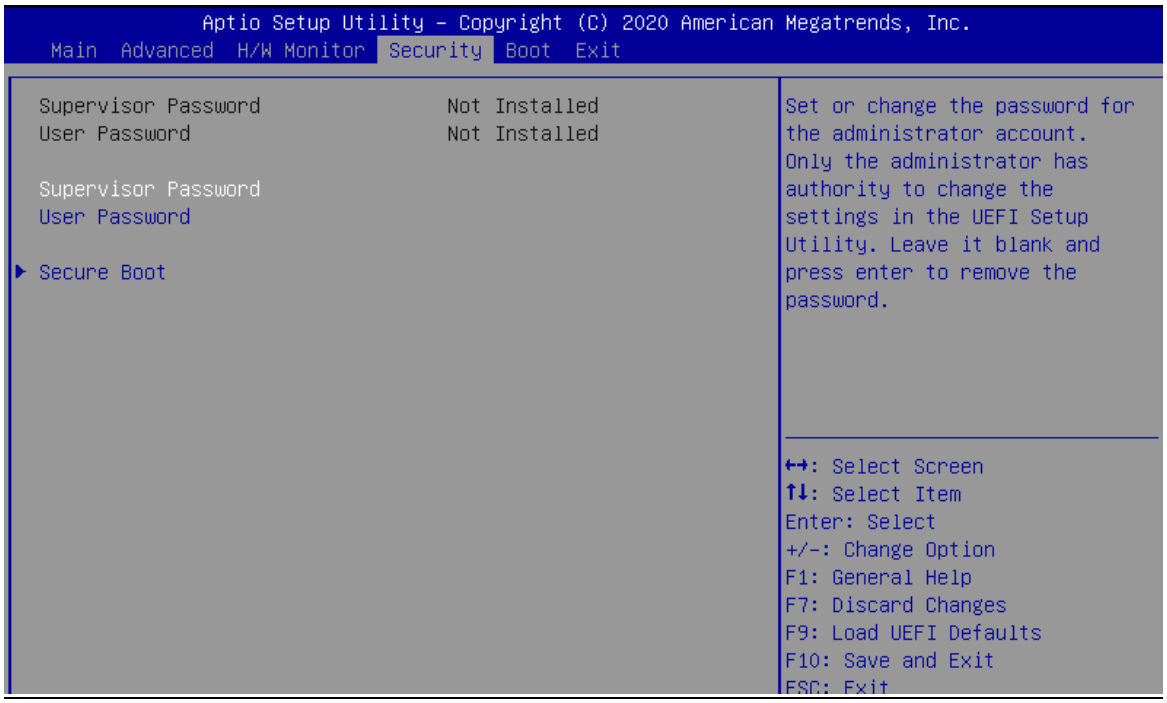
Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.	★Enable, Disable
SHA-1 PCR Bank	Enable or Disable SHA-1 PCR Bank	★Disable, Enable
SHA256 PCR Bank	Enable or Disable SHA256 PCR Bank	★Enable, Disable
Pending operation	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.	★None, TPM Clear
Platform Hierarchy	Enable or Disable Platform Hierarchy	★Enable, Disable
Storage Hierarchy	Enable or Disable Storage Hierarchy	★Enable, Disable
Endorsement Hierarchy	Enable or Disable Endorsement Hierarchy	★Enable, Disable
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support, TCG_1_2: the Compatible mode for Win8/Win10, TCG_2: Support new TCG2 protocol and event format for Win10 or later.	★TCG_2, TCG_1_2
Physical Presence Spec Version	Select to Tell O.S.to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.	★1.3,1.2
Device Select	TPM1.2 will restrict support to TPM1.2 devices, TPM2.0 will restrict support to TPM2.0 devices, Auto will support both with the default set to TPM2.0 devices if not found, TPM1.2 devices will be enumerated	★Auto, TPM1.2, TPM2.0
Onboard TPM	Enable or disable the onboard TPM interface controller.	★Enable, Disable

H/W Monitor



Feature	Description	Options
CPU_FAN1 Setting	Quiet Fan Function Control	★Full On, Automatic Mode
CPU_FAN1 Setting [Automatic Mode]		
Target CPU Temperature	Target CPU Temperature Value.	★50°C/122°F,45°C/113°F, 46°C/114°F, 47°C/116°F, 48°C/118°F, 49°C/120°F, 51°C/123°F, 52°C/125°F, 53°C/12°F, 54°C/129°F, 55°C/131°F, 56°C/13°F, 57°C/134°F, 58°C/136°F, 59°C/138°F, 60°C/140°F, 61°C/141°F, 62°C/143°F, 63°C/145°F, 64°C/147°F, 65°C/149°F
Target Fan Speed	The higher the level, the higher the fan speed.	★Level 9, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6,Level 7, Level 8
CHA_FAN1 Setting	Quiet Fan Function Control	★Full On, Automatic Mode
CHA_FAN1 Setting [Automatic Mode]		
Target CPU Temperature	Target CPU Temperature Value.	★50°C/122°F,45°C/113°F, 46°C/114°F, 47°C/116°F, 48°C/118°F, 49°C/120°F, 51°C/123°F, 52°C/125°F, 53°C/12°F,54°C/129°F, 55°C/131°F, 56°C/132°F,57°C/134°F, 58°C/136°F, 59°C/138°F, 60°C/140°F, 61°C/141°F, 62°C/143°F, 63°C/145°F, 64°C/147°F, 65°C/149°F
Target Fan Speed	The higher the level, the higher the fan speed. Enable or disable the feature of Case Open	★Level 9Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8,
Case Open Feature	Enable or disable the feature of Case Open.	★Disabled, Enabled

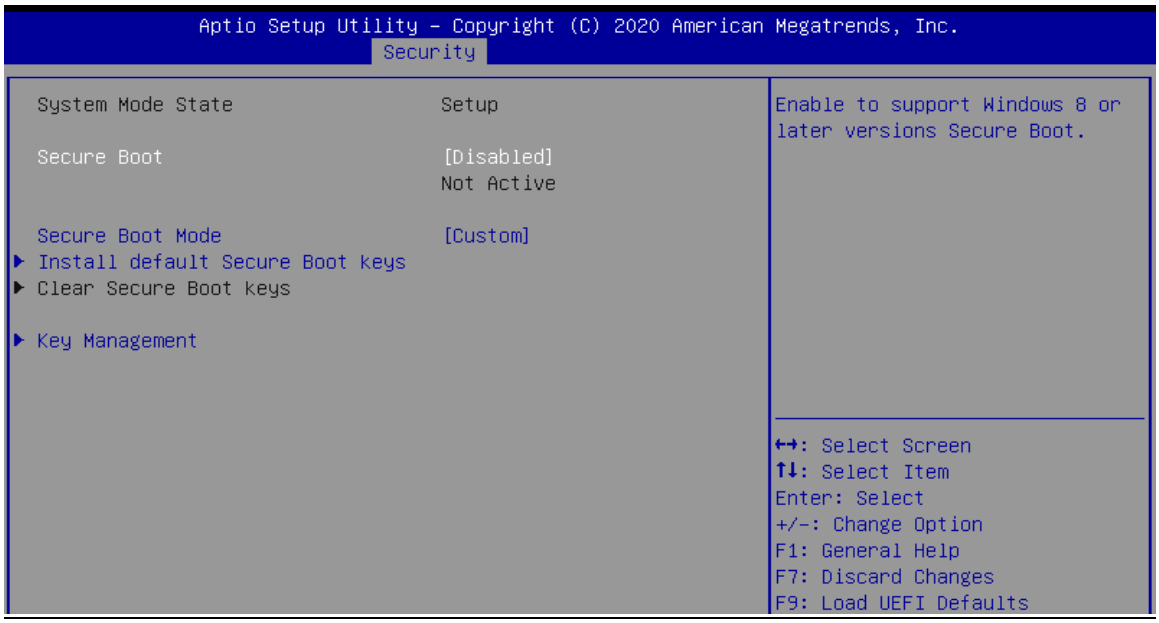
3.4 Security



Feature	Description	Options
Supervisor Password	Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.	
User Password	Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.	

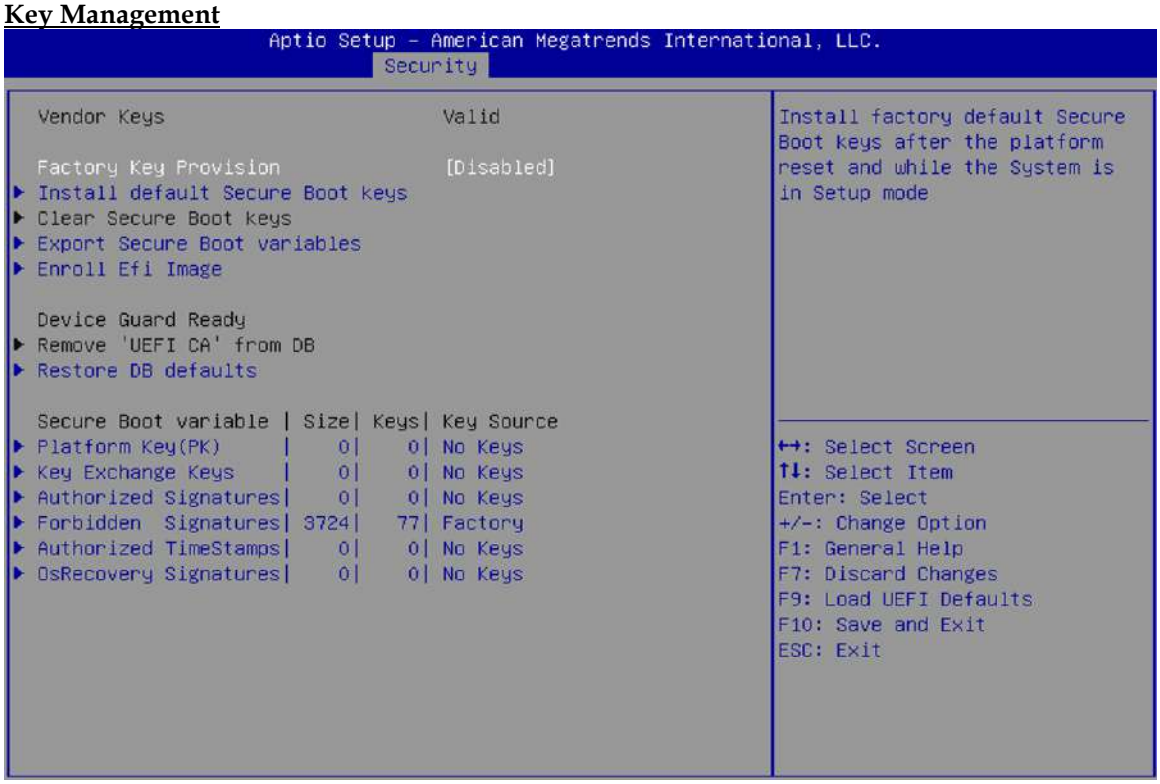
Secure Boot

Secure Boot configuration



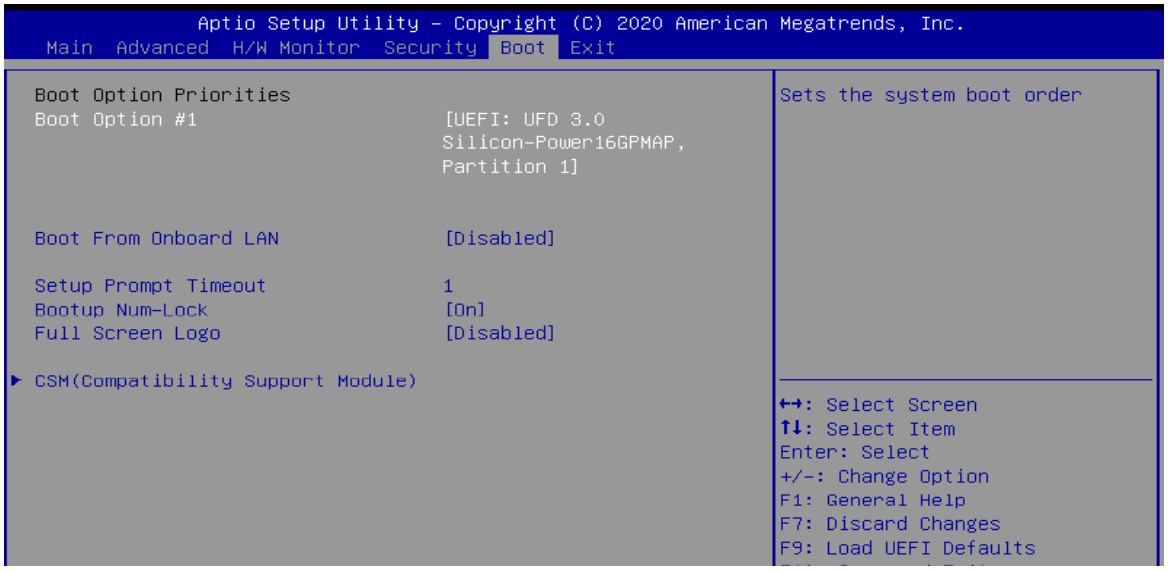
Feature	Description	Options
Secure Boot	Enable to support Windows 8 or later versions Secure Boot.	★Disabled, Enabled
Secure Boot Mode	Secure Boot Mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication	★Custom, Standard
Install default Secure Boot keys	Please install default secure boot keys if it's the first time you use secure boot.	
Clear Secure Boot Keys	Force System to Setup Mode- clear all Secure Boot Variables. Change takes effect after reboot	

Key Management



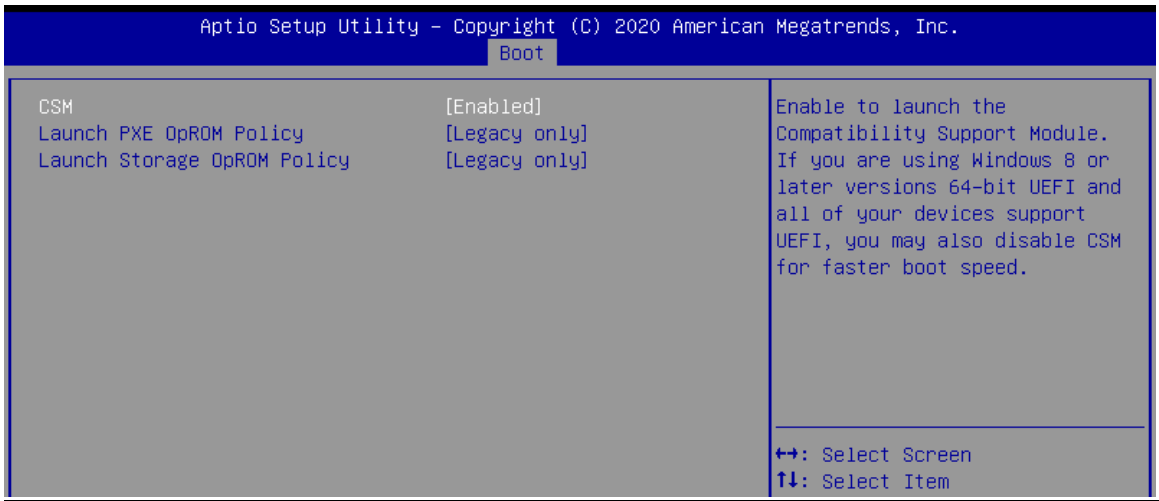
Feature	Description	Options
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.	★Disabled, Enabled
Install default Secure Boot keys	Please install default secure boot keys if it's the first time you use secure boot.	
Export Secure Boot variables	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.	
Enroll Efi Image	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)	
Restore DB defaults	Restore DB variable to factory defaults	
Platform Key (PK)	Enroll Factory Defaults or load certificates from a file:	
Key Exchange Keys	1.Publuc Key Certificate:	
Authorized Signatures	a)EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX	
Forbidden Signatures	2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory, External, Mixed	

3.5Boot



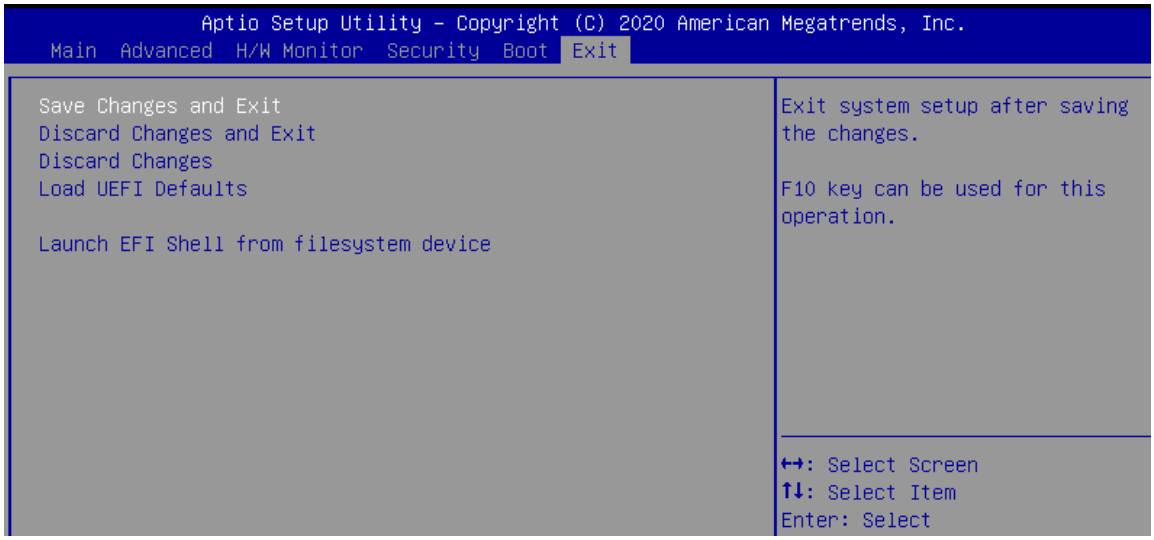
Feature	Description	Options
Boot Option #1	Sets the system boot order	★Disabled, Enabled
Boot From Onboard LAN	Boot From Onboard LAN	★Disabled, Enabled
Setup Prompt Timeout	Configure the number of seconds to wait for the UEFI setup utility.	★1
Bootup Num-Lock	Select whether Num Lock should be turned on or off when the system boots up.	★On, Off
Full Screen Logo	Enable to display the boot logo or disable to show normal POST messages.	★Enabled, Disabled

CSM (Compatibility Support Module)



Feature	Description	Options
CSM	Enable to launch the Compatibility Support Module. If you are using Windows 8 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.	★Disable, Enabled
CSM[Enable]		
Launch PXE OpROM Policy	Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.	★Legacy only, Do not launch, UEFI only,
Launch Storage OpROM Policy	Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.	★Legacy only ,Do not launch, UEFI only

3.6 Save & Exit



Feature	Description	Options
Save Changes and Exit	Exit system setup after saving the changes. F10 key can be used for this operation.	
Discard Changes and Exit	Exit system setup without saving any changes. Esc key can be used for this operation.	
Discard Changes	Discard Changes done so far to any of setup options. F7 key can be used for this operation.	
Load UEFI Defaults	Load UEFI Default values for all the setup question. F9 key can be used for this operation.	
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

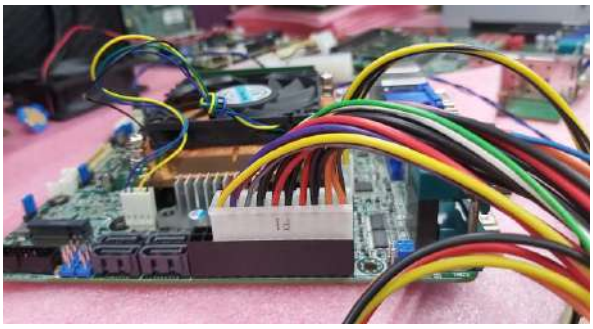
3.7 Troubleshooting

This section provides a few useful tips to quickly get WADE-8212 running with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

- Hardware Quick Installation

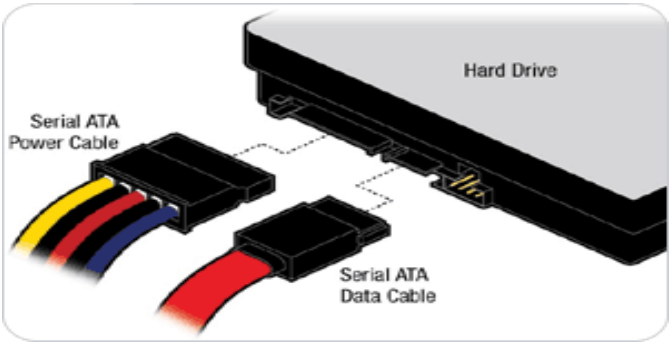
ATX Power Setting

Unlike other Single board computer, WADE-8212 supports ATX only. Therefore, there is no other setting that needs to be set up. However, there are only two connectors that must be connected—J2 (4 pins ATX power connector) & J3 (20 pins ATX Power Connector) on the WADE-8212 board.



Serial ATA

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.



WADE-8212 can support four SATA interface (SATAIII, 6.0Gb/s) on board. It has J5 SATA ports on board.

- BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR4 SO-DIMM Memory, keyboard, mouse, SATA hard disk, VGA connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8212, it is recommended, when going with the boot-up sequence, to hit "delete" or" Esc" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “Restore Defaults”, press “Enter” and select “Yes” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

■ FAQ

Information & Support
Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the J10 on the WADE-8212 board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

J10：CMOS Setting

	Jumper Setting Describe
*1-2	Default
2-3	Clean CMOS

Chapter 4 Important Instructions

This chapter includes instructions which must be carefully followed when the fan-less embedded system is used.

4.1 Note on the Warranty

Due to their limited-service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

Portwell, Inc. shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), Portwell, Inc. shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

EMC

CE/FCC Class A
This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

Applicable Standards:
EN 55032: 2015 + A11: 2020
EN 55035: 2017 + A11: 2020
EN IEC 61000-3-2: 2019
EN IEC 62368-1:2020+A11:2020
EN 61000-3-3: 2013 + A1: 2019
BS EN 55032: 2015+A11:2020
BS EN 55035: 2017+A11:2020
BS EN IEC 61000-3-2:2019
BS EN IEC 62368-1:2020+A11:2020
BS EN 61000-3-3:2013+A1:2019
FCC 47 CFR PART 15 SUBPART B ANSI C63.4 : 2014
IECS-003: Issue 7
ANSI C63.4-2014 amended as per ANSI C63.4a-2017

Chapter 5 Frequent Asked Questions

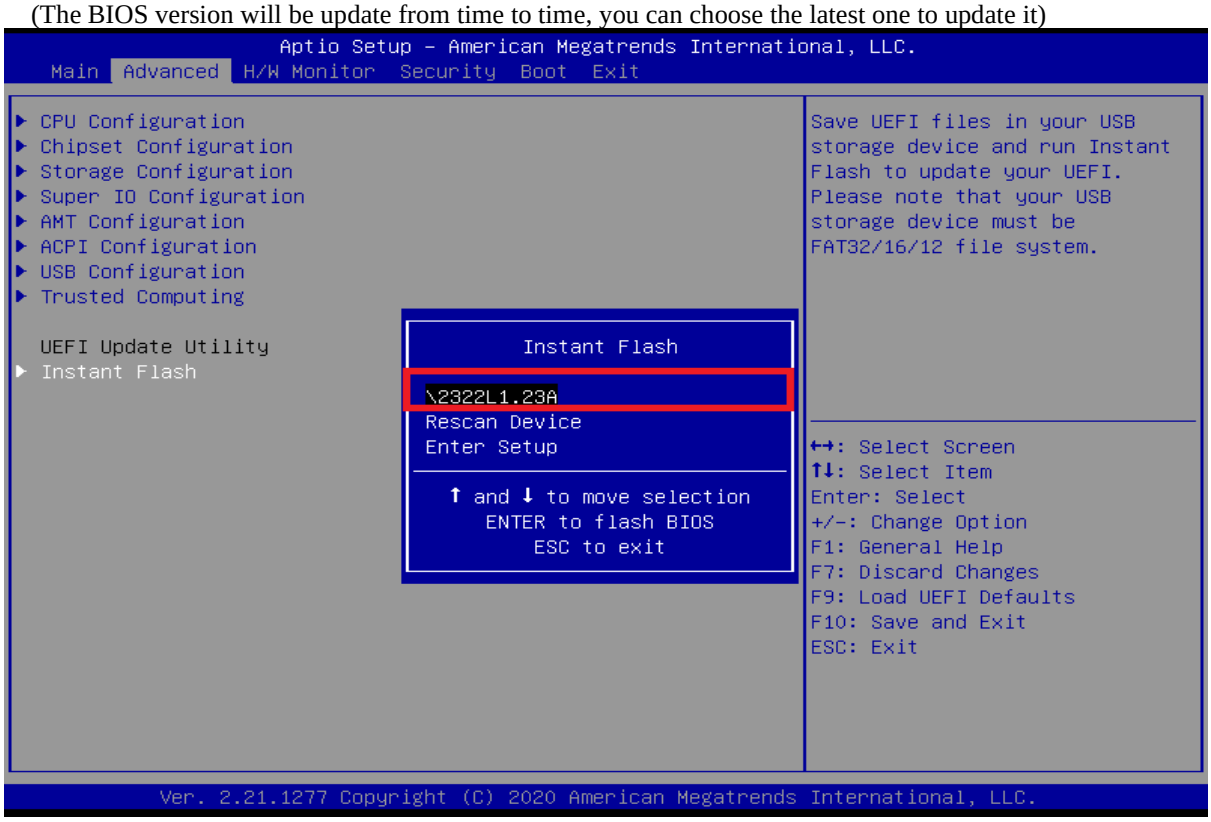
Question: How to update the BIOS file?

Answer:

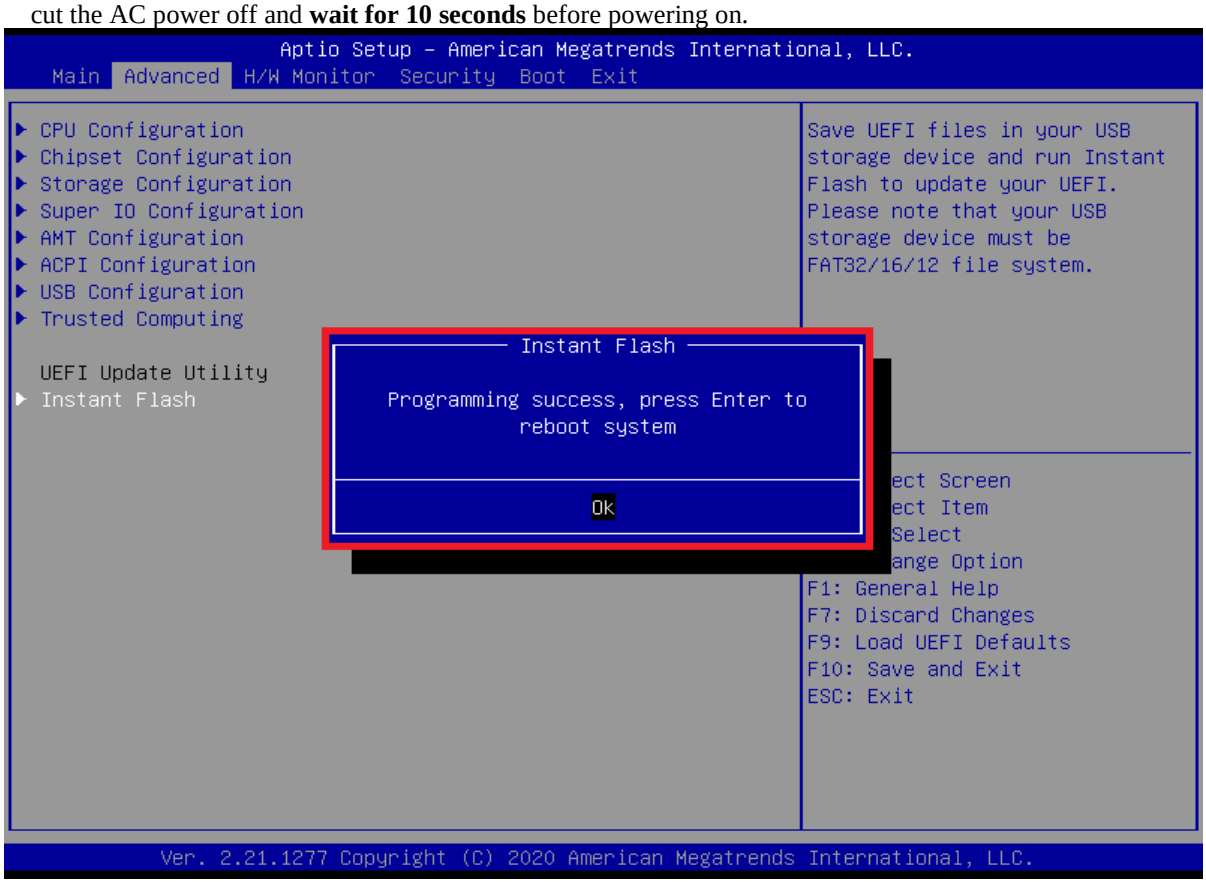
1. Please visit web site of Portwell download center as below hyperlink
   https://www.portwell.com.tw/support-center/download-center/
   Registering an account in advance is a must. (The E-Mail box should be an existing Company email address that you check regularly.)
   http://www.portwell.com.tw/member/newmember.php
2. Type in your Username and password and log in the download center.
3. Select “Search download” and type the keyword “WADE-8212-WS”.
4. Find the “BIOS “page and download the ROM file and unzip file to USB flash drive (FAT 32 / 16 format).

5. Boot into BIOS and switch to “Advanced” page then select” Instant Flash”.

6. Select “xxxx.23A” file then start updating BIOS.
   (The BIOS version will be update from time to time, you can choose the latest one to update it)



7. When you see the “Programming success” message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.



Question: What are the display options while using WEBS-45H1?
Answer: - The WEBS-45H1 supports VGA、HDMI and DP display output.
Note:

Please visit our Download Center to get the Catalog, User manual, BIOS, and driver files.
https://www.portwell.com.tw/support-center/download-center/
If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.
https://www.portwell.com.tw/support-center/technical-request/
We will do our best to provide a suggestion or solution for you.

■ Portwell Software Service

1. If you have customized requirements of BIOS, you can contact person of our company or branch.
2. If you have requirements of WDT、GPIO APP, you can contact our headquarter or branch, and we can render your assistance on developing.

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American Portwell Technology	E-mail: info@portwell.com
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