ELIT-1930

Fanless Signage Player with 8th Gen. Intel® Core™ i7/i5/i3 Processor

User's Manual

Version 1.1

P/N: 4016193000110P

2019.12

Revision History

Version	Date	Description
1.0	2019.08	Initial release
1.1	2019.12	Add Nano SIM card socket information to the following section: 1.1. Features 1.3. Specifications 3.2.2. Connectors

Revision History ..... **II**
Contents ..... **i**
Preface ..... **iii**
Copyright Notice iii
Declaration of Conformity iii
CE iii
FCC Class A iii
RoHS iv
SVHC / REACH iv
Important Safety Instructions v
Warning vi
Lithium Battery Replacement vi
Technical Support vi
Warranty vii
Chapter 1 - Introduction **1**
1.1. Features 2
1.2. About this Manual 2
1.3. Specifications 3
1.4. Inside the Package 5
1.5. Ordering Information 5
1.6. Accessories 5
1.6.1 Standard Accessories 5
1.6.2 Optional Accessories 5
1.6.3 Optional Configuration (CTOS* Kit) 6
Chapter 2 - Getting Started **7**
2.1. Dimensions 8
2.2. Tour the Computer 9
2.3. Power Button & LED Status 10
2.4. HDD LED Status 10
2.5. Driver Installation Note 10
Chapter 3 - Engine of the Computer **11**
3.1. Board Layout 12
3.2. Jumpers and Connectors 14
3.2.1. Jumpers 14
3.2.2. Connectors 16
Chapter 4 - Installation and Maintenance **23**
4.1. Access the Inside of the Computer 24
4.1.1. Disassemble the Computer 24
4.1.2. Reassemble the Computer 25

4.2. Install Hardware 26
4.2.1. Install the CPU 26
4.2.2. Install M.2 Module 28
4.2.3. Install Antenna 29
4.2.4. Install Memory Module 31
4.2.5. Wire DC-in Power Source 32
4.3. Wall Mounting 34
Chapter 5 - BIOS 35
5.1. Main 38
5.2. Advanced 39
5.2.1. CPU Configuration 40
5.2.2. Power & Performance 41
5.2.3. PCH-FW Configuration 43
5.2.4. ACPI Settings 44
5.2.5. F81866 Super IO Configuration 45
5.2.6. Hardware Monitor 46
5.2.7. S5 RTC Wake Settings 47
5.2.8. Serial Port Console Configuration 48
5.2.9. USB Configuration 49
5.2.10 Network Stack Configuration 51
5.2.11. CSM Configuration 52
5.2.12. NVME Configuration 53
5.3. Chipset 54
5.3.1. System Agent (SA) Configuration 55
5.3.2. PCH-IO Configuration 57
5.4. Security 59
5.5. Boot 60
5.6. Save & Exit 61

Copyright Notice

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Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

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Declaration of Conformity

CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

Important Safety Instructions

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. DO NOT COVER THE OPENINGS.
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
10. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped or damaged.
    f. The equipment has obvious signs of breakage.
11. Keep this User's Manual for later reference.

Warning

The Box PC and its components contain very delicately Integrated Circuits (IC). To protect the Box PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Box PC from the power source when you want to work on the inside.
2. Use a grounded wrist strap when handling computer components.
3. Place components on a grounded antistatic pad or on the bag that came with the Box PC, whenever components are separated from the system.

Lithium Battery Replacement

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash can. It must be disposed of in accordance with local regulations concerning special waste.

Technical Support

If you have any technical difficulties, please consult the user's manual first at: http://www.arbor.com.tw

Please do not hesitate to call or e-mail our customer service when you still cannot find out the answer.

http://www.arbor-technology.com

E-mail:info@arbor.com.tw

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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Chapter 1

Introduction

1.1. Features

- Support triple-display for 1 x HDMI, 1 x DVI- D and 1 x DP
- Support one channel 4K (UHD) Display
- Support 3 x COM, 4 x USB3.1 with Type A, 1 x Nano SIM
- Support DirectX 12
- Support iAMT Function
- Support RAID Function
- One NGFF connector for wireless
- RTC wakeup supported
- Operating temperature : -15 ~ 60°C

1.2. About this Manual

This manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about the description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

1.3. Specifications

System	
CPU	Socket LGA1151 for Max.35W TDP (CFLS) Intel® Core™ i7-8700T Intel® Core™ i5-8500T Intel® Core™ i3-8100T
Memory	2 x 260-pin DDR4 SO-DIM M sockets, supporting 2400/2666MHz SDRAM up to 32GB
Chipset	Intel Q370
Graphics	Intel® UHD Graphic s 630
LAN Chipset	1 x Intel® i219LM (LAN1)(/iAMT for i5/i7) 1 x Intel® i210IT (LAN2)
Watchdog Timer	1~255 levels reset
I/O	
PS/2	1 x keyboard and mouse connector
Serial Port	3 x RS-232/485 port w/1 x DB-9 / 2x RJ-45
USB Port	4 x USB 3.1 with Type A connectors
LAN	2 x RJ-45 ports for GbE
Video Port	1 x DP 1.2, up to 3840x2160@60Hz
	1 x HDMI, up to 3840x2160@60H
	1 x DVI-D, up to 1920x1080@60Hz
	Support one channel 4K(UHD) display output
Expansion Bus / Storage	1 x M.2 M-Key 2280 socket (standard M-key) BIOS default: SATA+PCIex4 (for storage)
	1 x M.2 E-Key 2230 socket (standard E-key) BIOS default: PCIe x1+USB 2.0 (for WiFi /BT)
	1 x M.2 B-Key 2242 socket (standard B-key except HSIC) BIOS default: PCIe x1+ USB3.0 BIOS option: SATA + USB3.0 (for RAID)
	1 x Nano SIM socket
Environmental	
Operating Temp.	-15 ~ 60°C (5 ~ 140°F), ambient w/ air flow
Storage Temp.	-20 ~ 70°C (-4 ~ 158°F)
Operating Humidity	10 ~ 95% @ 50°C (non-condensing)
Vibration	3 Grms/5~500Hz/random operation
Shock	Operating 40G (11ms), non-operating 80G with M.2 PCIe SSD

Qualification	
Certification	CE, FCC Class A
Power Requirement	
Power Input	DC 12~24V input
Power Consumption	Max. 60W (w/o I/O card)
Power Management	RTC wakeup timer configurable
Mechanical	
Construction	Aluminum alloy
Mounting	Wall-mount
Weight	3 kg
Dimensions (W x H x D)	210 x 190 x 70 mm (7.60” x 1.96” x 6.69”)
OS Support	
Windows 10 IoT/Linux (Kernel: 4.X)	

1.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:

1 x ELIT-1930

1 x **Accessory Box** that contains the following items:

- User's manual
- Screws
- 2-pin plug for terminal block

1.5. Ordering Information

ELIT-1930	Digital Signage Player with Intel® Q370 w/o CPU, memory and storage (CPU-RAM-SSD-OS by CTOS)

1.6. Accessories

1.6.1 Standard Accessories

Bracket	ELIT-1930 bracket	

1.6.2 Optional Accessories

PAC-180W6C-FSP	180W AC/DC 24V ADAPTER KIT with 2pin/3pin/4pin Block	

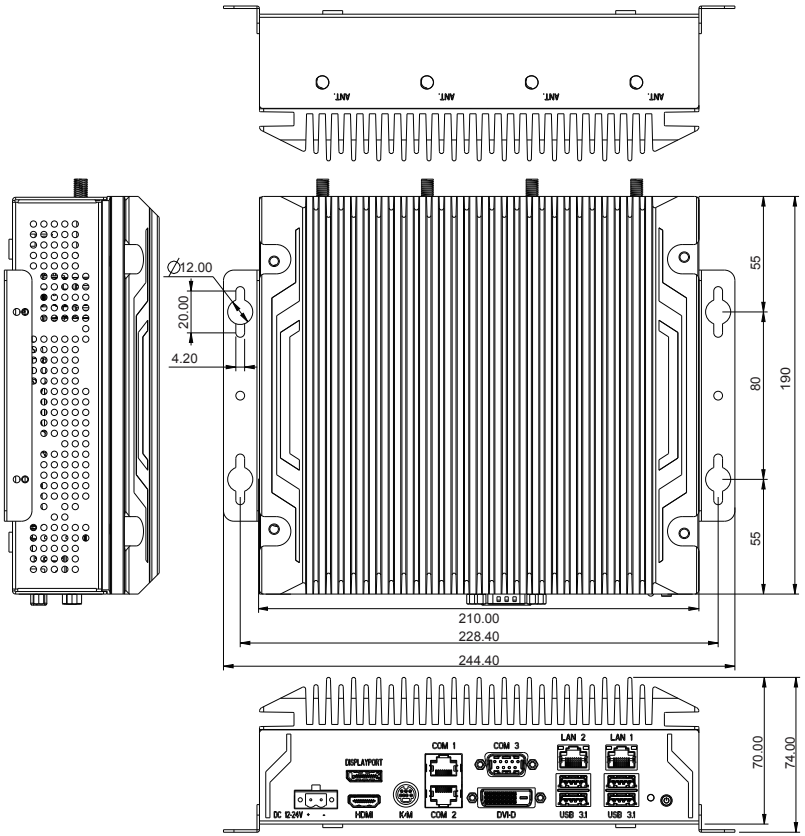
1.6.3 Optional Configuration (CTOS* Kit)

Core™ i7-8700T	Intel® 8th Gen. Core™ i7-8700T processor, L2/12M, 4.0G	
Core™ i5-8500T	Intel® 8th Gen. Core™ i5-8500T processor, L2/9M, 3.5G	
Core™ i3-8100T	Intel® 8th Gen. Core™ i3-8100T processor, L2/6M, 3.1G	
64 GB SSD	M.2 SSD,INNODISK,DEM24-64GM41BC1DC-24	
MK-4C-4G	260-pin DDR4-2133 4GB SO-DIMM	
MK-4C-8G	260-pin DDR4-2133 8GB SO-DIMM	
MK-4C-16G	260-pin DDR4-2133 16GB SO-DIMM	
WiFi-AT3550	Atheros QCNFA364A M.2 WiFi module w/ 2x30cm internal wiring	
LTE-3550	LTE M.2 module kit w/ 25cm internal wiring	
ANT-D11	1 x Wi-Fi dual-band 2.4G/5G antenna	
ANT-H11	1 x 2dBi HSUPA Antenna Kit	

Chapter 2

Getting Started

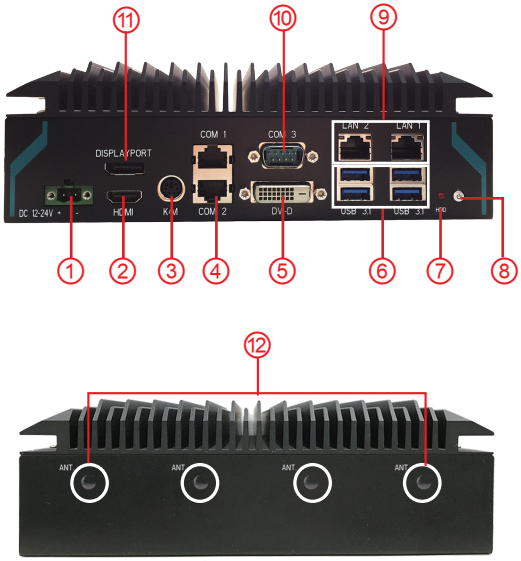
2.1. Dimensions



Unit: mm

2.2. Tour the Computer

Take a look around the computer and find the external controls and connectors.



No.	Description
①	DC 12-24V input (2-PIN Terminal Block)
②	HDMI video output connector
③	PS/2 interface keyboard and mouse connector
④	COM1, 2: RS-232/485 RJ-45 connector
⑤	DVI-D connector
⑥	USB1, 2: Double-stacked USB 3.1 Type-A ports
⑦	HDD LED indicator
⑧	Power button with LED
⑨	LAN1, 2: GbE RJ-45 connector supporting 10/100/1000Mbps fast Ethernet
⑩	COM3: RS-232/485 connector
⑪	DisplayPort video output Connector
⑫	Antenna Holes

2.3. Power Button & LED Status

Power button:

- When in the OS, press the power button to enter standby mode.
- To force the computer to shut down, press and hold the button for about 4 seconds.

Power LED

- **Green:** The computer is in turned on.
- **Red:** The computer is shut down or in standby mode.

2.4. HDD LED Status

Color	Description
Blinking	HDD read/write operations are in progress.
Solid	There is no HDD activity.

2.5. Driver Installation Note

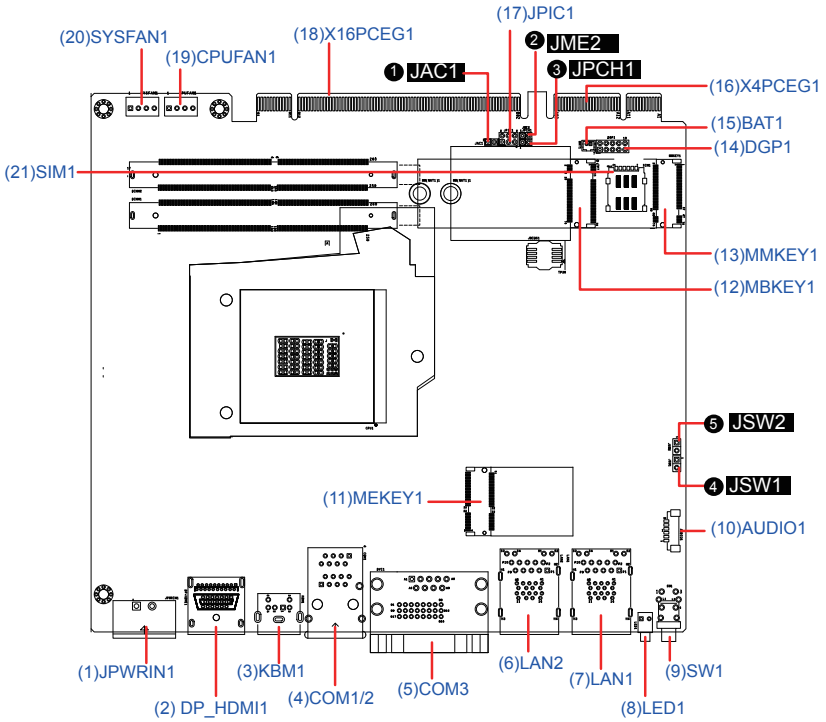
The computer supports Windows 10 IoT. To install the drivers, please go to our website at **www.arbor-technology.com** and download the driver pack from the product page.

Chapter 3

Engine of the Computer

3.1. Board Layout

Main Board - FMB-i911B



Jumpers

Label	Description
❶JAC1	AC-On Selection
❷JME2	SRTC Reset Selection
❸JPCH1	Clear CMOS Selection
❹JSW1	Power Button
❺JSW2	Reset Button

Connectors

Label		Description
(1)	JPWRIN1	DC IN 12-24V Power Connector
(2)	DP_HDMI1	DisplayPort & HDMI Connector
(3)	KBMS1	PS/2 Interface Keyboard and Mouse Connector
(4)	COM1/2	RS-232/485 RJ-45 Connector
(5)	COM3	Stacked RS-232/485 & DVI-D Connectors
(6)(7)	LAN2, 1	Stacked GbE RJ-45 & USB 3.1 Connectors
(8)	LED1	SATA LED Output
(9)	SW1	Power Button
(10)	AUDIO1	Audio Connector
(11)	MEKEY1	M.2 E-Key Socket (w/ PCIe + USB 2.0) for optional Wi-Fi/BT
(12)	MBKEY1	M.2 B-Key Socket (w/ PCIe x1+ USB3.0 or SATA + USB3.0)
(13)	MMKEY1	M.2 M-Key Socket (w/ PCIe x4 + SATA 3.0 for storage)
(14)	DGP1	External 80 Port Pin Header
(15)	BAT1	RTC Battery Connector
(16)	X4PCEG1	PCIe x4 Slot for Add-on Card (Reserved)
(17)	JPIC1	PIC Programming Connector
(18)	X16PCEG1	PCIe x16 Slot for Add-on Card (Reserved)
(19)	CPUFAN1	CPU Fan Power Connector (Reserved)
(20)	SYSFAN1	System Fan Power Connector (Reserved)
(21)	SIM1	Nano SIM Card Socket

3.2. Jumpers and Connectors

3.2.1. Jumpers

❶JAC1

Function: AC-On Selection
Jumper Type: 2.54mm pitch, 1x2-pin header
Setting:

Pin	Description	
Short	AC-On (Default)	
Open	AC-Off	

❷ JME2

Function: SRTC Reset Selection
Jumper Type: 2.54mm pitch, 1x2-pin header
Setting:

Pin	Description	
Short	Clear ME RTC	
Open	Normal (Default)	

❸ JPCH1

Function: Clear CMOS Selection
Jumper Type: 2.54mm pitch, 1x2-pin header
Setting:

Pin	Description	
Short	Clear CMOS	
Open	Keep CMOS (default)	

❹ JSW1

Function: Power Button
Connector Type: 2.00 mm pitch 1x2-pin header
Setting:

Pin	Desc.
1	Power Button
2	GND

❺ JSW2

Function: Reset Button
Connector Type: 2.00 mm pitch 1x2-pin header
Setting:

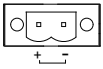
Pin	Desc.
1	Reset Button
2	GND

3.2.2. Connectors

(1) JPWRIN1

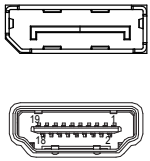
Function: DC IN 12-24V Power Connector
Connector Type: 2-pin power terminal block
Pin Assignment:

Pin	Description
1	VIN+
2	VIN-



(2) DP_HDMI1

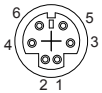
Function: DisplayPort & HDMI Connector
Connector Type: DisplayPort 1.2 & 19-pin HDMI 2.0 connector with flange
Pin Assignment: The pin assignments conform to the industry standard.



(3) KBMS1

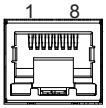
Function: PS/2 Interface Keyboard and Mouse Connector
Connector Type: 6-pin Mini-DIN Connector
Pin Assignment:

Pin	Desc.
1	KB_CLK
2	MS_DATA
3	GND
4	PS2_VCC
5	KB_CLK
6	MS_CLK



(4) COM1, 2

Function: RS-232/485 RJ-45 Connector
Connector Type: RJ-45 Connector
Pin Assignment: The pin assignments conform to the industry standard.

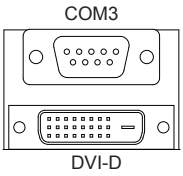


(5) COM3

Function: Stacked RS-232/485 & DVI-D Connectors
Connector Type: Male type 9-pin D-SUB connector+female type DVI-D connector

COM3 Pin Assignment:

Pin	Desc.	Pin	Desc.
1	DCD /(RS485-)	6	DSR
2	RXD / (RS485+)	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	NC

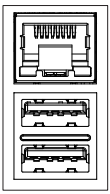


DVI-D:

The pin assignments conform to the industry standard.

(6)(7) LAN2, 1

Function: Stacked GbE RJ-45 & USB 3.1 Connectors
Connector Type: RJ-45 connector that supports 10/100/1000Mbps fast Ethernet
USB: USB 3.1 Type A connectors
Pin Assignment: The pin assignments conform to the industry standard.



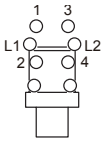
(8) LED1

Function: SATA LED Output

(9) SW1

Function Power Button
Connector Type: LED tact switch with green and red colors
Pin Assignment:

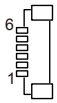
Pin	Description	Pin	Description
1	GND	2	N/A
3	BTN	4	N/A
L1	SW1_LED_N	L2	SW1_LED_P



(10) AUDIO1

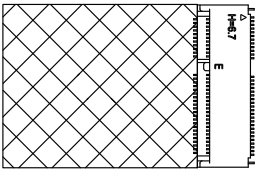
Function: Audio Connector
Connector Type: Onboard 6-pin wafer connector
Pin Assignment:

Pin	Desc.
1	MICL
2	MICR
3	GND
4	GND
5	LOUT-L
6	LOUT-R



(11) MEKEY1

Function: M.2 E-Key socket (w/ PCIe + USB 2.0) for optional Wi-Fi/BT
Connector Type: M.2 E-Key 2230 Socket
Pin Assignment: The pin assignments conform to the industry standard.



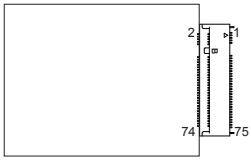
(12) MBKEY1

Function: M.2 B-Key socket (w/ PCIe x1+ USB3.0 or SATA + USB3.0)(either one)*

* With the default BIOS, the socket signals support PCIe x1 + USB3.0. For socket to support SATA 3.0 + USB 3.0, please contact ARBOR Technology for optional BIOS.

Connector Type: M.2 B-Key 2242 Socket

Pin Assignment: The pin assignments conform to the industry standard.



(13) MMKEY1

Function: M.2 M-Key socket (w/ PCIe x4 + SATA 3.0 for storage)

Connector Type: M.2 M-Key 2280 Socket

Pin Assignment: The pin assignments conform to the industry standard.

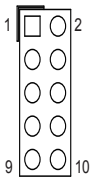
(14) DGP1

Function: External 80 port pin header

Connector Type: 2.00mm-pitch 2x5-pin header

Pin Assignment:

Pin	Description	Pin	Description
1	CLK	2	GND
3	FRAME#	4	LAD0
5	PLTRST#	6	NC
7	LAD3	8	LAD2
9	VCC3	10	LAD1



(15) BAT1

Function: RTC Battery Connector
Connector Type: 2.00 mm pitch 1x2-pin box header
Setting:

Pin	Desc.
1	BAT+
2	BAT-

(16) X4PCEG1

Function: PCIe x4 slot for add-on card (Reserved)
Connector Type: PCIe x4 slot (w/ 2 x PCIe x1 + 1 x USB2.0 + LPC lanes + 1 x SATA 3.0)
Pin Assignment: The pin assignments conform to the industry standard.

(17) JPIC1

Function PIC Programming Connector
Connector Type: Onboard 2.0mm pitch 6-pin header
Pin Assignment:

Pin	Description	Pin	Description
1	PIC_TX	2	ICSP-CLK
3	ICSP-DAT	4	GND
5	VCC5	6	MCU_RST

(18) X16PCEG1

Function: PCIe x16 slot (standard) for add-on card (Reserved)
Connector Type: PCIe x16 slot (standard)
Pin Assignment: The pin assignments conform to the industry standard.

(19)(20) CPU/SYSFAN1

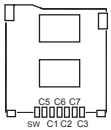
Function: CPU/SYS Fan Power Connector (Reserved)
Connector Type: 2.54 mm pitch 1x4 one-wall wafer connector
Pin Assignment:

Pin	Desc.
1	GND
2	+12V
3	RPM
4	CTRL

(21) SIM1

Function: Nano SIM Card Socket
Connector Type: 6-pin SIM card socket
Pin Assignment:

Pin	Desc.	Pin	Desc
C1	VCC	C2	RST
C3	CLK	C5	GND
C6	VPP	C7	I/O



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Chapter 4

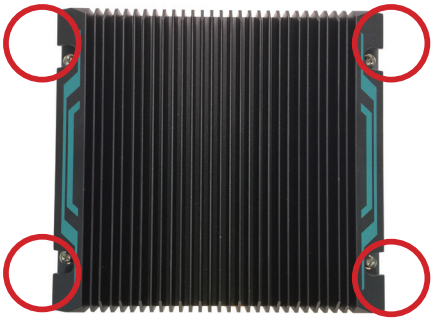
Installation & Maintenance

4.1. Access the Inside of the Computer

To use onboard jumpers/connectors or to install/remove internal components, you will need to open the computer to access the inside of the computer. Follow through the guide below to access the inside of the computer.

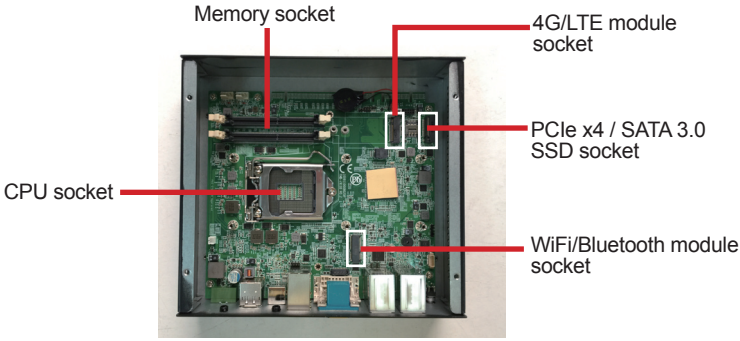
4.1.1. Disassemble the Computer

1. Remove the 4 screws on the top case as shown below.



2. Remove the top case from the computer. If you find it difficult to lift the top case, use a flat bladed prying tool to pry the case up.

3. Then you are ready to access the components of the main board.



4.1.2. Reassemble the Computer

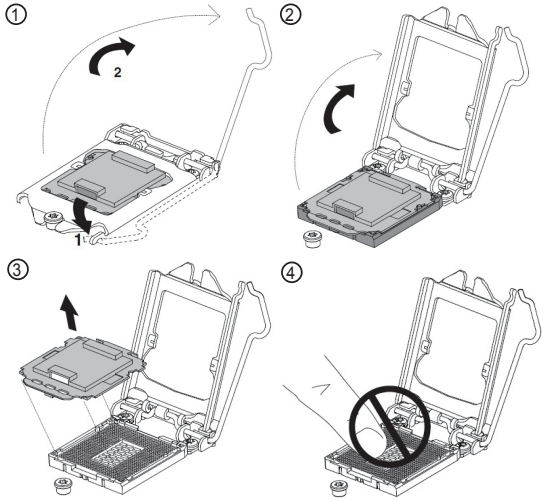
After you make required jumper settings and connections, replace the top case and then fasten the 4 screws you removed at Step 1 to reassemble the computer.

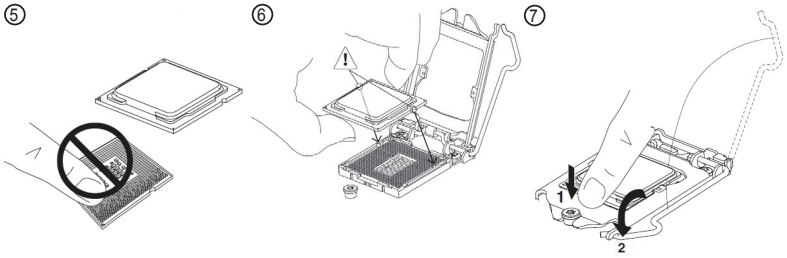
4.2. Install Hardware

4.2.1. Install the CPU

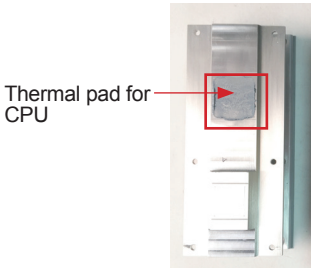
1. Locate the CPU socket on the main board

The processor socket comes with a lever to secure the processor. Please refer to the pictures step by step as below and note that the cover of the socket must always be installed during transportation to avoid damage to the socket.

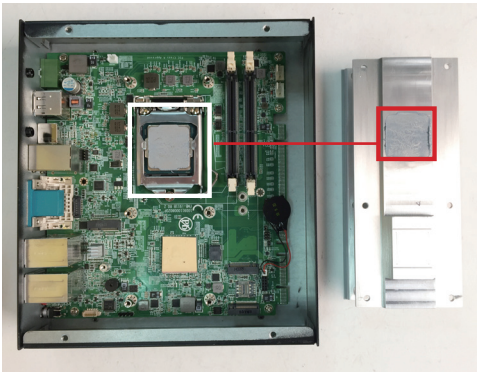




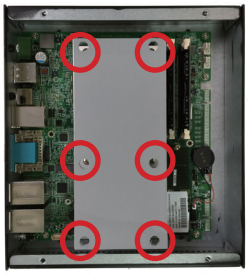
2. Find the heat sink and the thermal paste tube in the accessory box. Apply the thermal paste to the CPU area.



3. Place the heat sink on the CPU and PCH. Make sure that the thermal pad is in complete contact with the CPU.

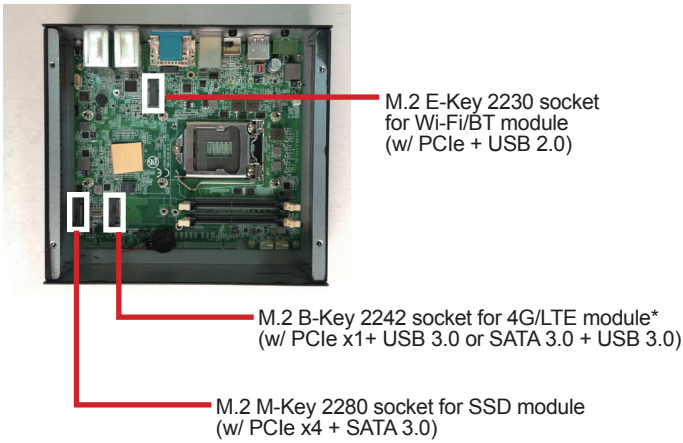


4. Secure the heat sink with 6 screws.



4.2.2. Install M.2 Module

The computer comes with three **M.2** sockets to load the computer with modules like Wi-Fi, Bluetooth, LTE or SATA SSD module as shown below:

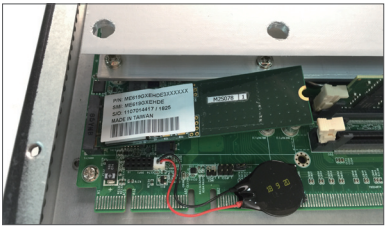


* With the default BIOS, the socket signals support PCIe x1 + USB3.0. For socket to support SATA 3.0 + USB 3.0, please contact ARBOR Technology for optional BIOS.

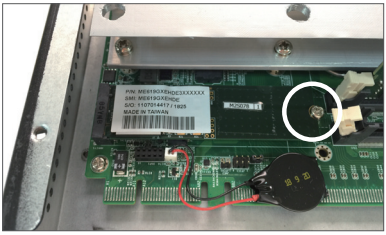
The installation methods are basically the same. The following section will use the M.2 M-Key 2280 socket as the example.

1. Locate the M.2 socket for your intended module.

2. Plug the M.2 module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the module should meet the break of the connector.



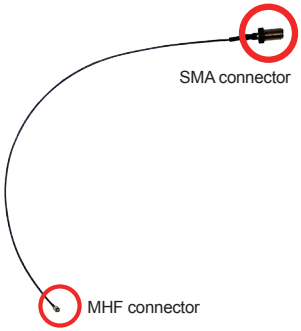
3. Press the module down and fix the module in place using one screw.



4.2.3. Install Antenna

To install the antenna for the wireless modules,

1. Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.

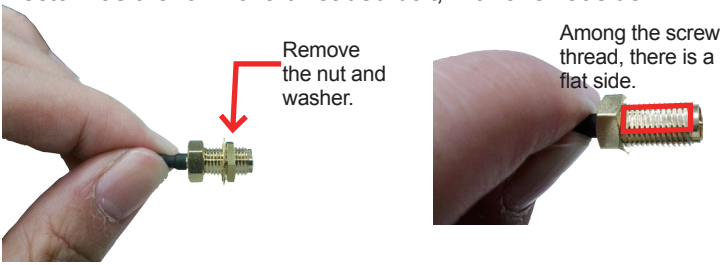


2. Connect the RF antenna's MHF connector to the wireless module.

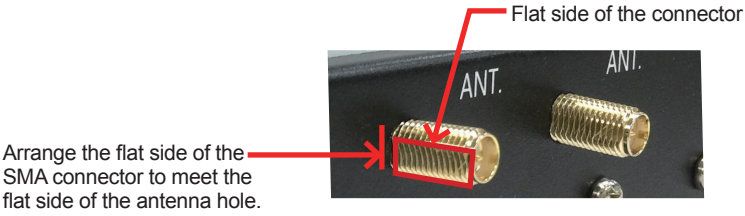
3. Remove the plastic plug(s) from the antenna hole(s). Keep the plastic plug

for any possible restoration in the future.

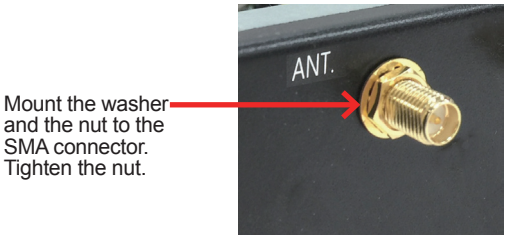
4. From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flat side.



5. Pull the SMA connector through the above mentioned antenna hole. Note to meet the aforesaid flattened side with the antenna hole's flat side.



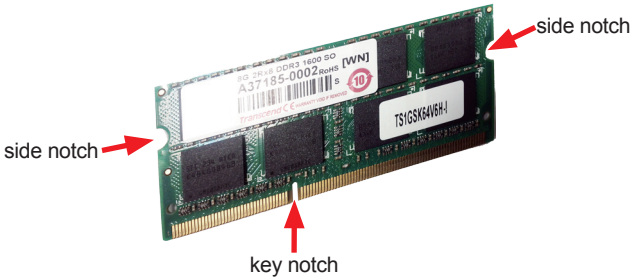
6. Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.



7. Have the external antenna(s). Screw and tightly fasten the antenna(s) to the SMA connector(s).

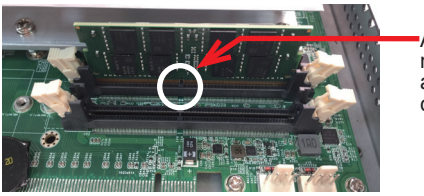
4.2.4. Install Memory Module

The main board has two dual inline memory module (DIMM) sockets. Load the computer with a memory module to make the computer run programs. The memory module for the computer's SO-DIMM socket should be a 260-pin DDR4 with a "key notch" off the centre among the pins, which enables the memory module for particular applications. There are another two notches at each left and right side of the memory module to help fix the module in the socket.

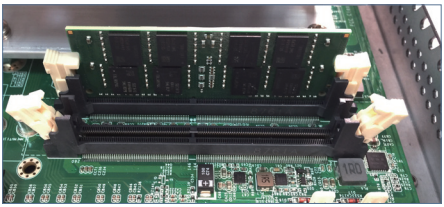


To install a memory module:

1. Confront the memory module's edge connector with the SO-DIMM slot connector. Align the memory module's key notch at the break on the SO-DIMM slot connector. By a slanted angle, fully plug the memory module until it cannot be plugged any more.



2. Press down the memory module until it is auto-locked in place.

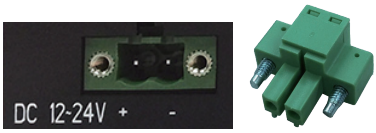


4.2.5. Wire DC-in Power Source

> **Warning** Only trained and qualified personnel are allowed to install or replace this equipment.

1. Before wiring, make sure the power source is disconnected.
2. Find the terminal block in the accessory box.
3. Use the wire-stripping tool to strip a short insulation segment from the output wires of the DC power source.
4. Identify the positive and negative feed positions for the terminal block connection. See the symbols printed on the front panel indicating the polarities and DC-input power range in voltage.
5. Insert the exposed wires into the terminal block plugs. Only wires with insulation should extend from the terminal block plugs. Note that the polarities between the wires and the terminal block plugs must be positive to positive and negative to negative.

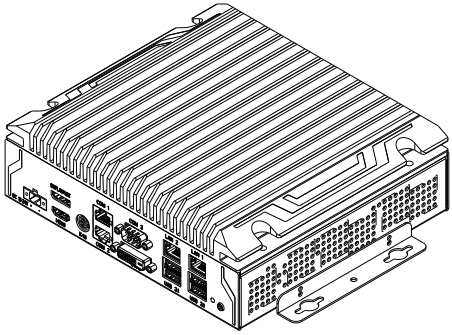
6. Use a slotted screwdriver to tighten the captive screws. Plug the terminal block firmly, which wired, into the receptacle on the front panel.



4.3. Wall Mounting

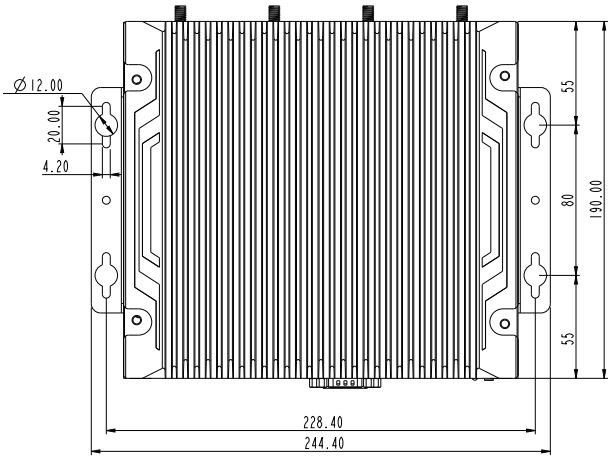
Prepare the wall mount kit and a screwdriver for wall mounting. Follow the instructions below:

1. Align the screw holes of the wall mount bracket with the ones of the main unit. Using the M3 screws included in the wall mount kit, fasten the wall mount bracket to the computer's case.



2. Repeat the step above to secure another wall mount bracket.

3. When the bracket is attached, the computer can be hanged on the wall as the way you want. The wall mount bracket dimension is shown as below:

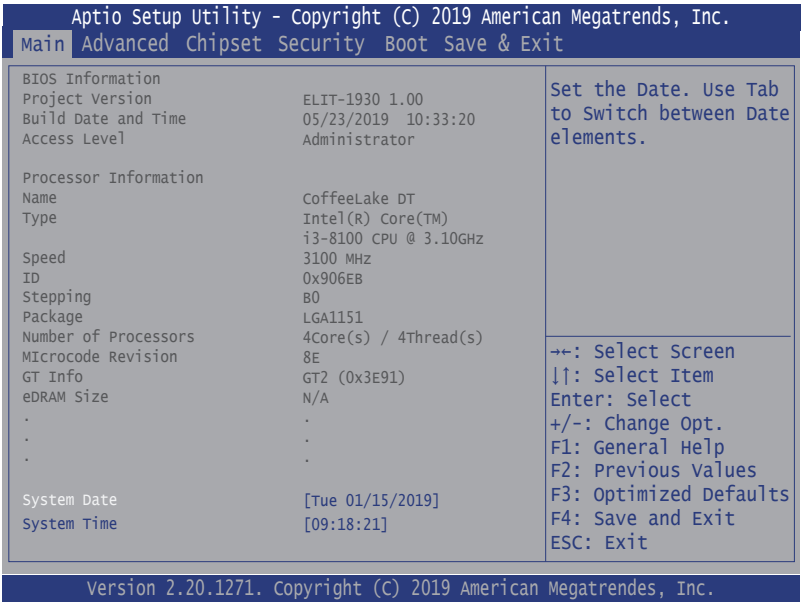


Chapter 5

BIOS

The BIOS Setup utility is featured by American Megatrends Inc to configure the system settings stored in the system's BIOS ROM. The BIOS is activated once the computer powers on. When the computer is off, the battery on the main board supplies power to BIOS RAM.

To enter the BIOS Setup utility, keep hitting the "Delete" key upon powering on the computer.



Menu	Description
Main	See 5.1. Main on page 38
Advanced	See 5.2. Advanced on page 39
Chipset	See 5.3. Chipset on page 54
Security	See 5.4. Security on page 59
Boot	See 5.5. Boot on page 60
Save & Exit	See 5.6. Save & Exit on page 61

Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and use the utility.

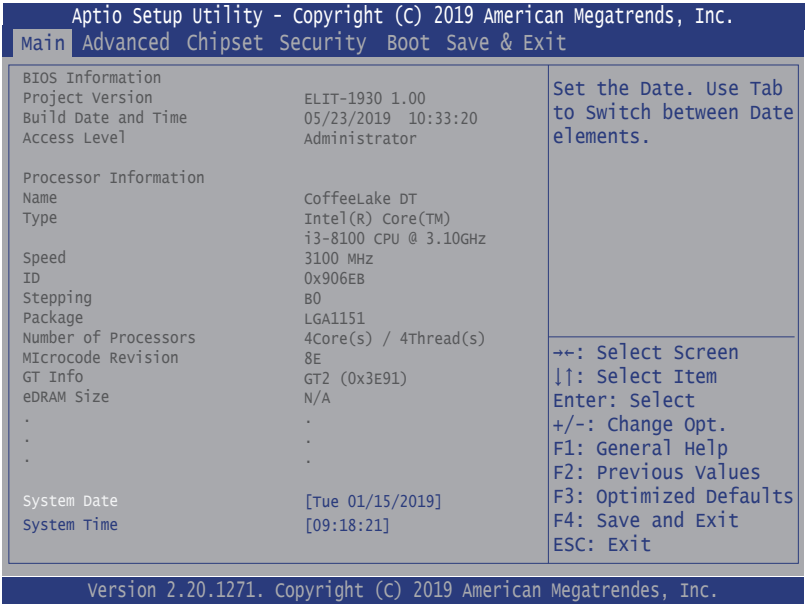
Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
Enter	Selects an highlighted item/field.
Esc	► On the top menus: Use **Esc** to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select **OK** or **Cancel** to exit discarding changes. ► On the submenus: Use **Esc** to quit current screen and return to the top menu.
Page Up / +	Increases current value to the next higher value or switches between available options.
Page Down / -	Decreases current value to the next lower value or switches between available options.
F1	Opens the **Help** of the BIOS Setup utility.
F10	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select **OK** or **Cancel** to exit saving changes.)

Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have onscreen.

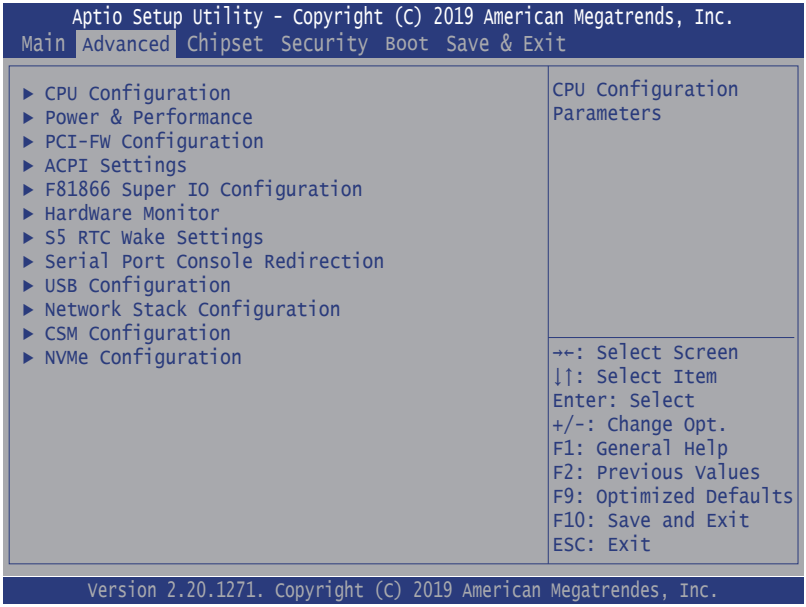
5.1. Main

The **Main** menu features the settings of **System Date** and **System Time** and displays some BIOS info.



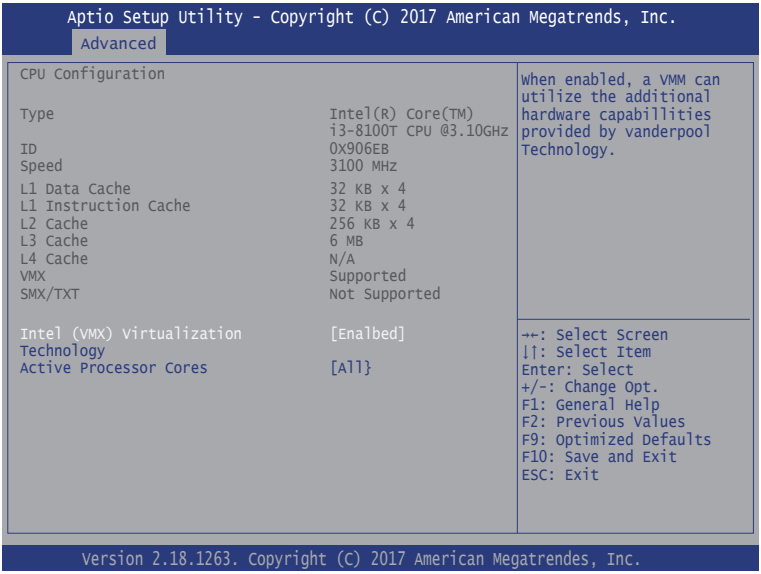
Setting	Description
Project Name	Delivers the model name of the computer.
BIOS Version	Delivers the computer's BIOS version.
Build Date and Time	Delivers the date and time when the BIOS Setup utility was made/ updated.
Access Level	Delivers the level that the BIOS is being accessed at the moment.
System Date	Sets system date.
System Time	Sets system time.

5.2. Advanced



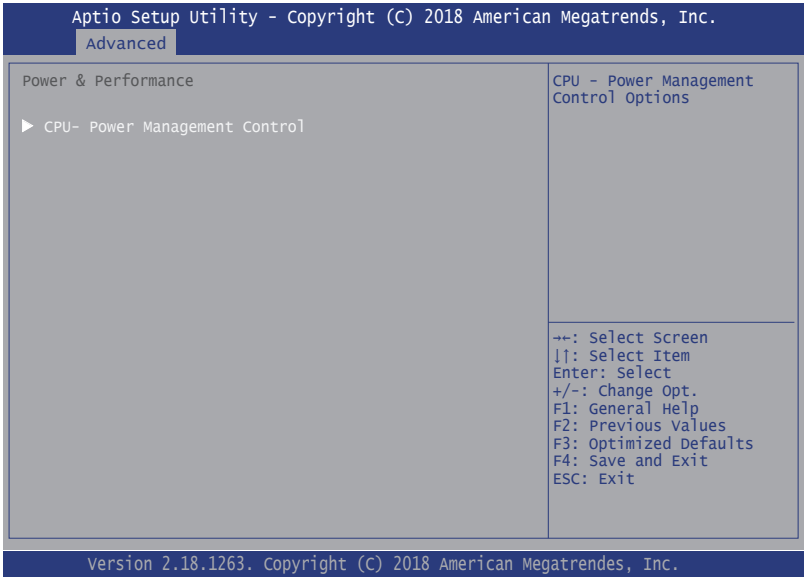
Setting	Description
CPU Configuration	See 5.2.1. CPU Configuration on page 40
Power & Performance	See 5.2.2. Power & Performance on page 41
PCI-FW Configuration	See 5.2.3. PCH-FW Configuration on page 43
ACPI Configuration	See 5.2.4. ACPI Settings on page 44
F841866 Super IO Configuration	See 5.2.5. F81866 Super IO Configuration on page 45
Hardware Monitor	See 5.2.6. Hardware Monitor on page 46
S5 RTC Wake Settings	See 5.2.7. S5 RTC Wake Settings on page 47
Serial Port Console Redirection	See 5.2.8. Serial Port Console Configuration on page 48
USB Configuration	See 5.2.9. USB Configuration on page 49
Network Stack Configuration	See 5.2.10 Network Stack Configuration on page 51
CSM Configuration	See 5.2.11. CSM Configuration on page 52
NVMe Configuration	See 5.2.12. NVME Configuration on page 53

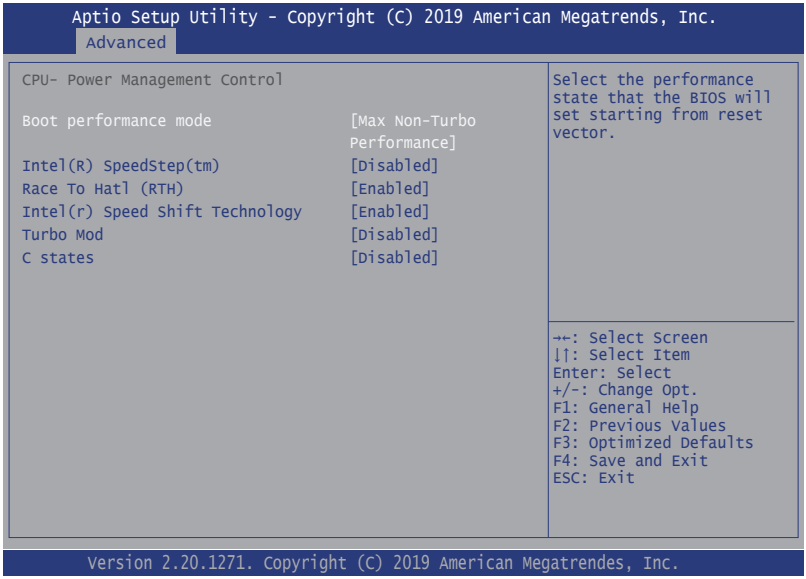
5.2.1. CPU Configuration



Setting	Description
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology ► Options: **Enabled** (default) or **Disabled**
Active Processor Cores	Number of cores to enable in each processor package. ► Options: **All** (default) and **1**
Hyper-threading	**Enabled** (default) for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and **Disabled** for other OS (OS not optimized or Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.
Boot performance Mode	Set the performance state that the BIOS will set before the OS handoff. ► Options: **Max Battery, Max Non-Turbo Performance** (default)and **Turbo Performance**
Intel (R) Speed Step (tm)	**Enable** (default)/**Disable** Intel SpeedStep
Turbo Mode	Only available when Intel Speed Step is **Enabled**. **Enable** (default)/**Disable** Turbo Mode
CPU C States	**Enable** (default)/**Disable**CPU C States
Enhanced C-states	Only available when CPU C States is **Enabled**. **Enable** (default)/**Disable** C1E. When enabled, CPU will switch to minium speed when all cores enter C-State.

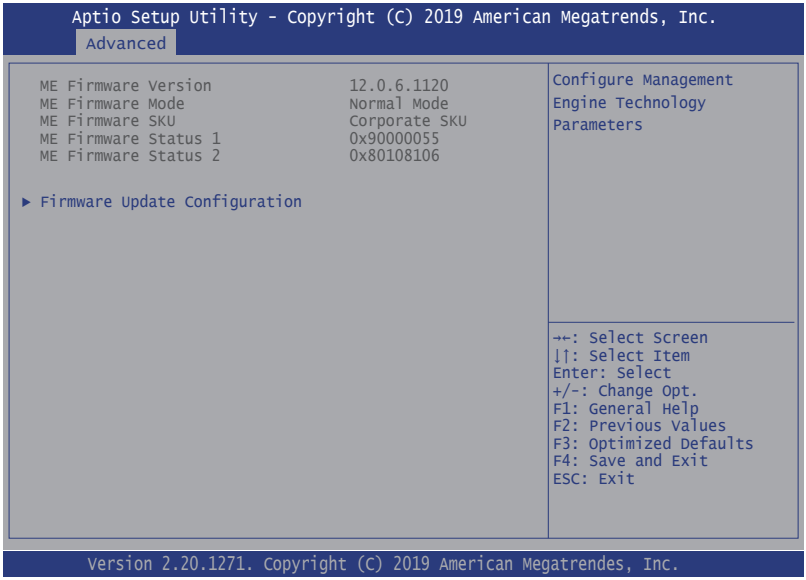
5.2.2. Power & Performance





Setting	Description
Boot performance Mode	Set the performance state that the BIOS will set before the OS handoff. ► Options: **Max Non-Turbo Performance** (default), **Max Battery** and **Turbo Performance**
Intel (R) Speed Step (tm)	**Enable** / **Disable** (default) Intel SpeedStep
Race to Halt (RTH)	**Enable** (default) / **Disable** Race To Halt feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. (RTH is controlled through MSR 1FC bit 20)
Intel (R) Speed Shift Technology	**Enable** (default) / **Disable** Intel Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Only available when Intel Speed Step is **Enabled**. **Enable** / **Disable** (default) Turbo Mode. Note: This item is not available for ARES-1973H-2WD8F.
CPU C States	**Enable** / **Disable** (default) CPU C States

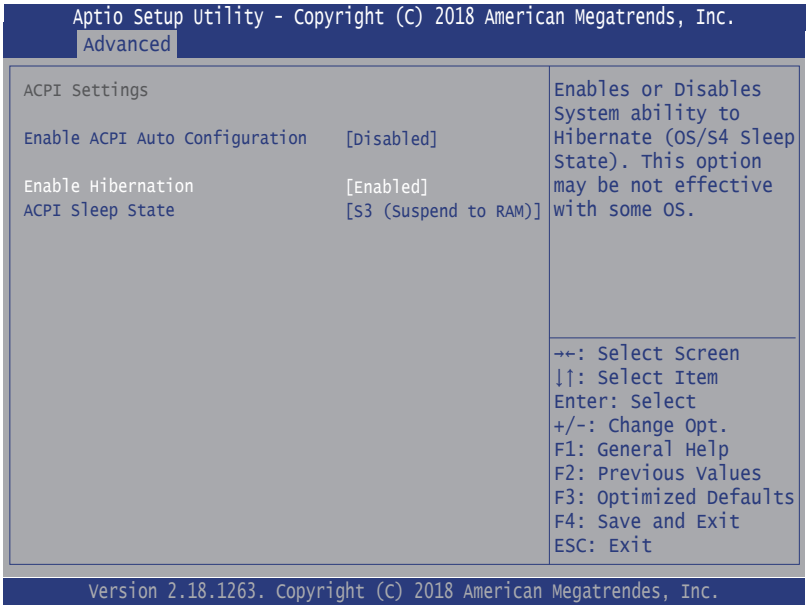
5.2.3. PCH-FW Configuration



Select this submenu to view the ME firmware related information.

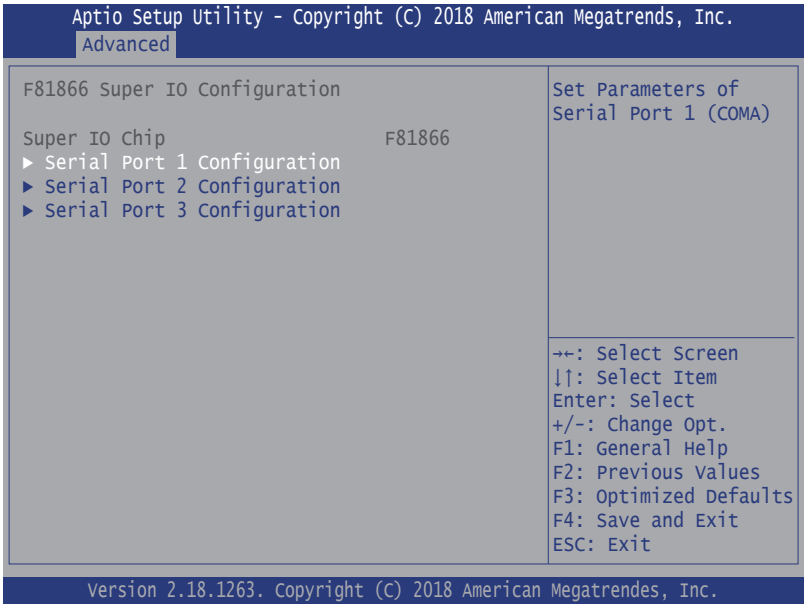
Setting	Description
Firmware Update Configuration > Me FW Image Re-Flash	**Enable** / **Disable** (Default) Me FW Image Re-Flash function.

5.2.4. ACPI Settings



Setting	Description
Enable ACPI Auto Configuration	**Enable** or **Disable** (default) BIOS ACPI Auto Configuration
Enable Hibernation	Only available when BIOS ACPI Auto Configuration is enabled. **Enables** (default) or **Disables** System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Only available when BIOS ACPI Auto Configuration is enabled. Select ACPI sleep state the system will enter when the SUSPEND button is pressed. ► **Options: Suspend Disabled** and **S3 (Suspend to RAM)** (default)

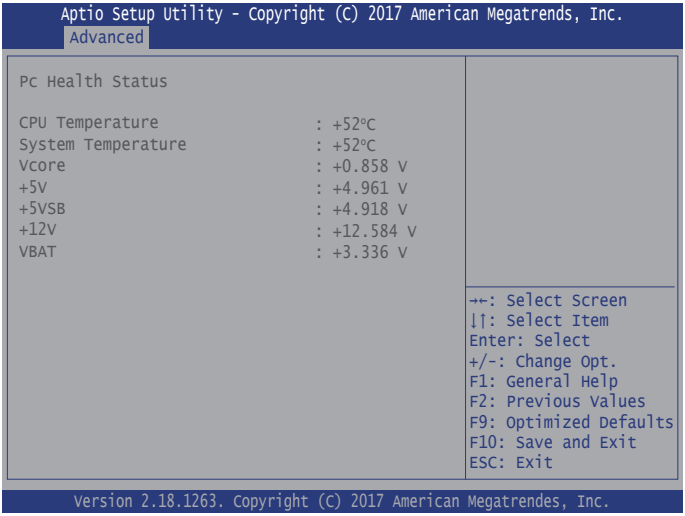
5.2.5. F81866 Super IO Configuration



Note: The quantity of serial ports varies according to your model.

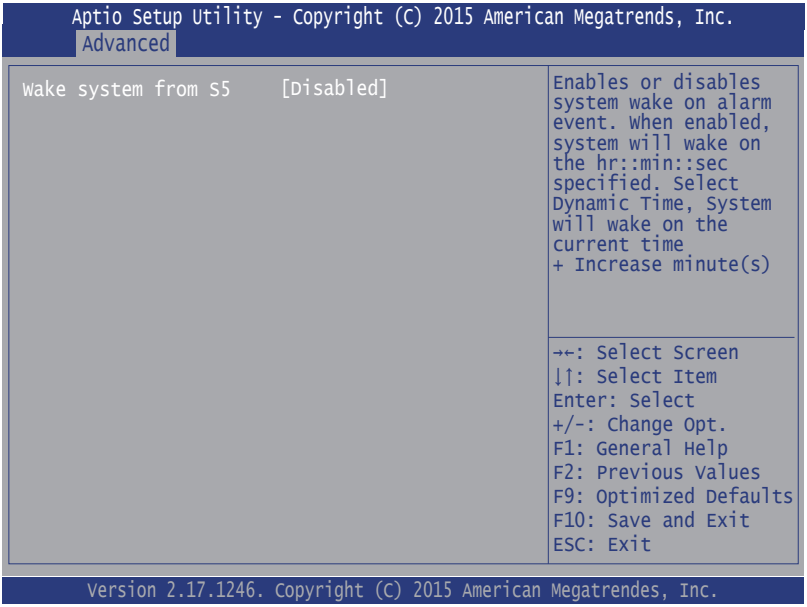
Setting	Description
Serial Port 1/2/3 Configuration	To configure each COM port settings. Note: The quantity of serial ports varies according to your model.
Serial Port	**Enable** (default) or **Disable** the Serial Port (COM).
Change Settings	**Select an optimal settins for Super IO device.**
COM1/2/3 Mode Select	For Serial Port 1/2/3: Select **RS-232** (default), **RS-485**.

5.2.6. Hardware Monitor



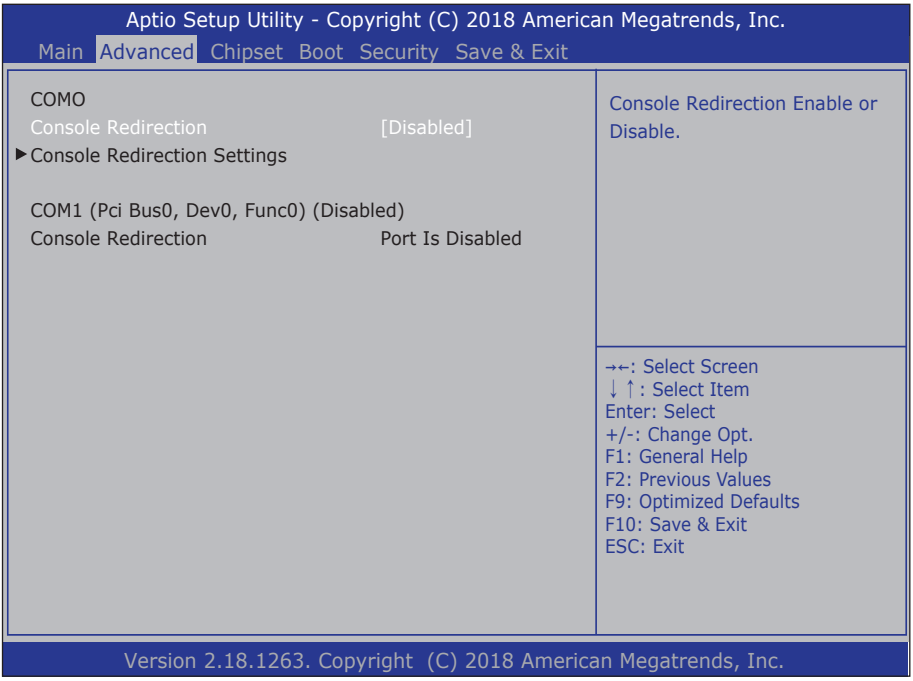
Select this submenu to view the hardware related information.

5.2.7. S5 RTC Wake Settings



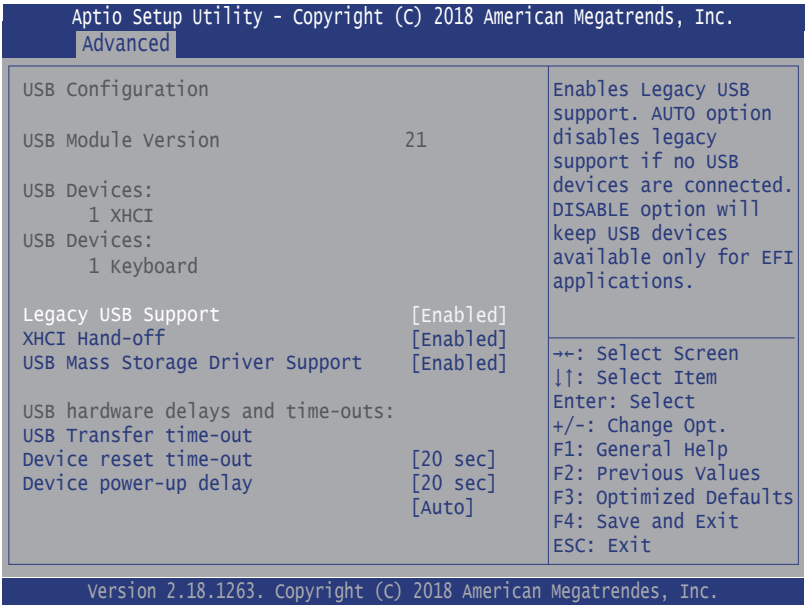
Setting	Description
Wake System from S5	**Enable** or **Disable** (default) system wake on alarm event. ► Options available are: **Disabled** (default): **Fixed Time:** System will wake on the hr::min::sec specified. **DynamicTime:** If selected, you need to set **Wake up minute increase** from 1 - 5. System will wake on the current time + increase minute(s).

5.2.8. Serial Port Console Configuration



Setting	Description
Console Serial Redirection	**Enable** or **Disable** (default) the Console Serial Redirection

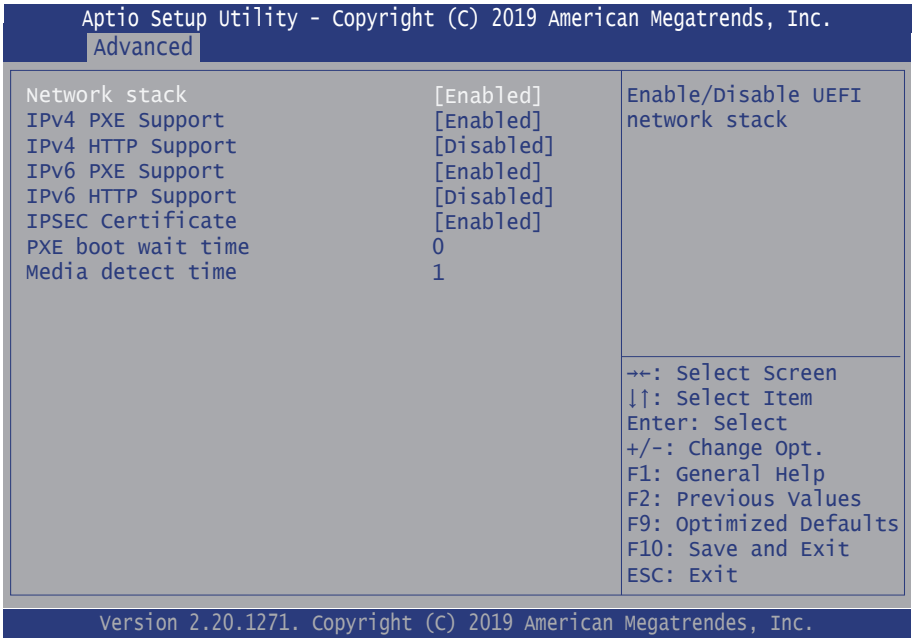
5.2.9. USB Configuration



Setting	Description
Legacy USB Support	Enables/disables legacy USB support. ► Options available are **Enabled** (default), **Disabled** and **Auto**. ► Select **Auto** to disable legacy support if no USB device are connected. ► Select **Disabled** to keep USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. ► The optional settings are: **Enabled** (default) **/ Disabled**.
USB Mass Storage Driver Support	Enables/disables USB Mass Storage Driver Support. ► The optional settings are: **Enabled** (default) **/ Disabled**.
USB hardware delay and time-out	
USB transfer time-out	Use this item to set the time-out value for control, bulk, and interrupt transfers. ► Options: **1 sec, 5 sec, 10 sec, 20 sec** (default)

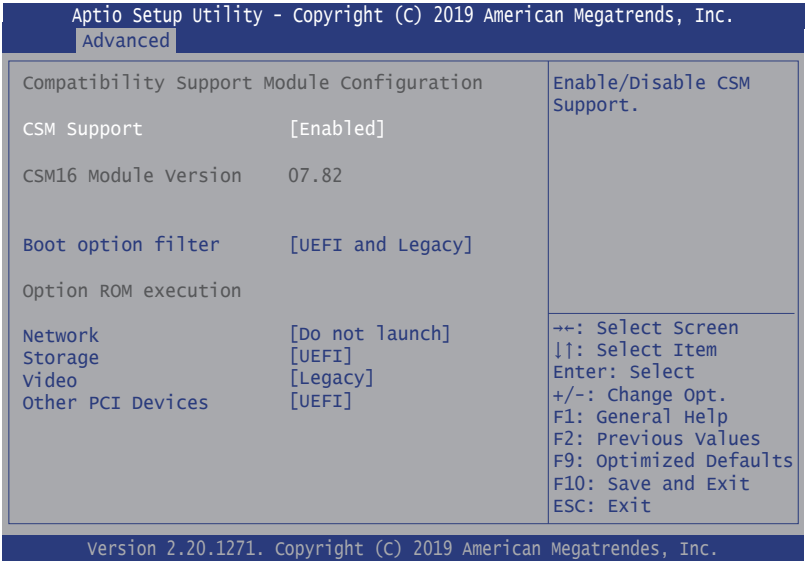
Device reset time-out	Use this item to set USB mass storage device start unit command time-out. ► Options available are: **10 sec, 20 sec** (default)., **30 sec, 40 sec**
Device power-up delay	Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. ► Options available are: **Auto**: Default **Manual**: Select **Manual** you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.

5.2.10 Network Stack Configuration



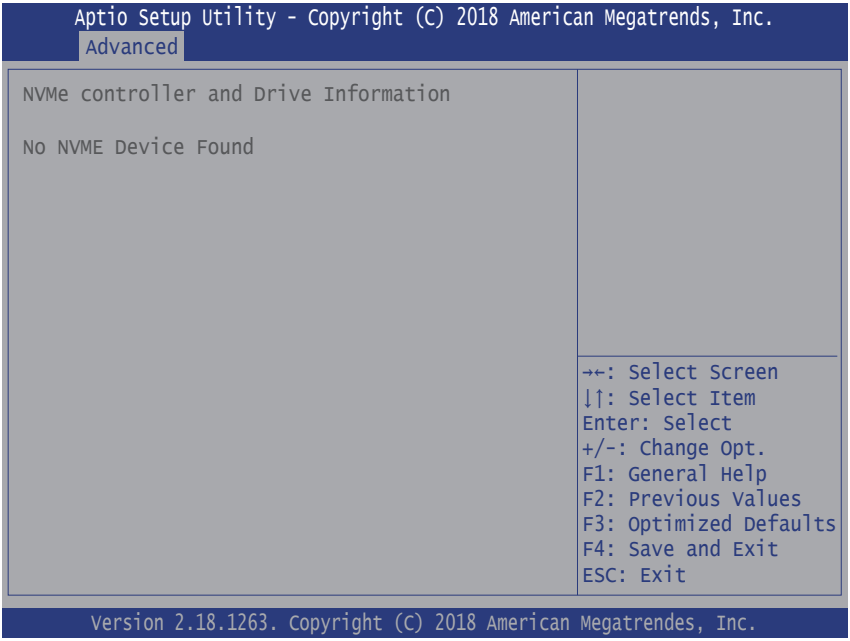
Setting	Description
Network Stack	**Enable** or **Disable** (default) UEFI network stack.
IPv4 PXE Support	**Enable** (default) or **Disable** IPv4 PXE boot Support.
IPv4 HTTP Support	**Enable** or **Disable** (default) IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	Enables/disables IPv6 PXE boot Support. ► **Enabled** is the default.
IPv6 HTTP Support	**Enable** or **Disable** (default) IPv6 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPSEC Certificate	Support to **Enable** (default) or **Disable**IPSEC certificate for Ikev.
PXE boot wait time	Set the wait time in seconds to press ESC key to abort the PXE boot. Default: 0
Media detect time	Setup wait time in sec to detect the presence of media.

5.2.11. CSM Configuration



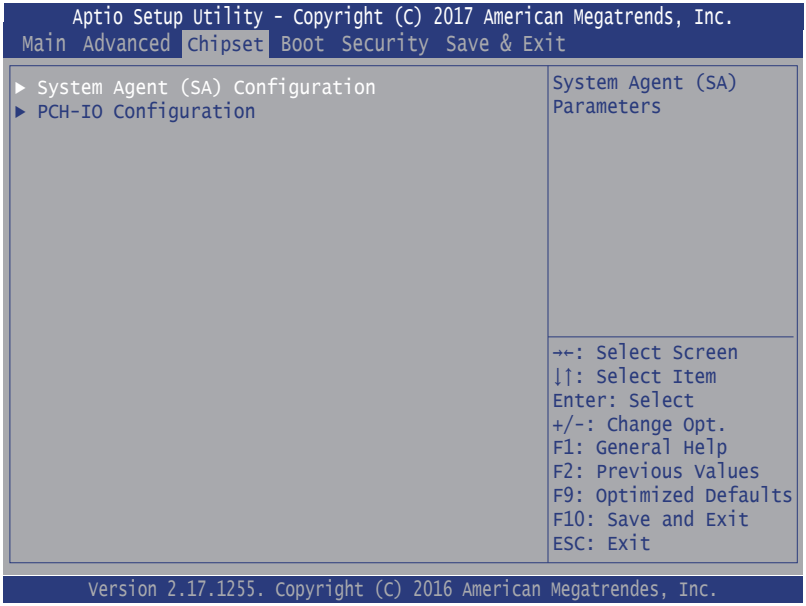
Setting	Description
CSM Support	**Enable** (default) or **Disable** CSM Support.
Boot option filter	Control the Legacy/UEFI ROMs priority. ► Options: **UEFI and Legacy** (default), **Legacy only**, **UEFI only**
Network	Control the execution of UEFI and Legacy PXE OpROM ► Options: **Do not launch** (default) **UEFI** and **Legacy**
Storage	Control the execution of UEFI and Legacy Storage OpROM ► Options: **Do not launch**, **UEFI** (default) and **Legacy**
Video	Control the execution of UEFI and Legacy Video OpROM ► Options: **Do not launch**, **UEFI** and **Legacy** (default)
Other PCI devices	Determines OpROM execution policy for devices other than Network, Storage or Video. ► Options: **Do not launch**, **UEFI** (default) and **Legacy**

5.2.12. NVME Configuration



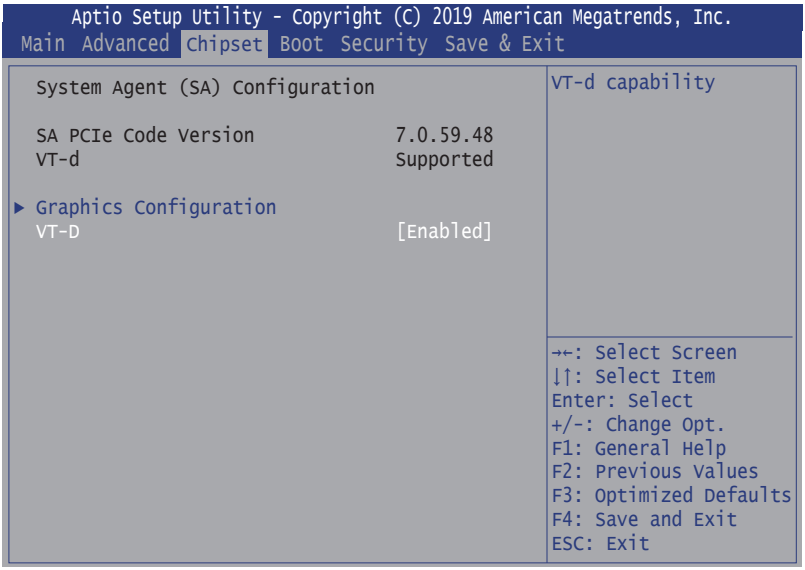
Access this submenu to view the NVMe controller and driver information.

5.3. Chipset



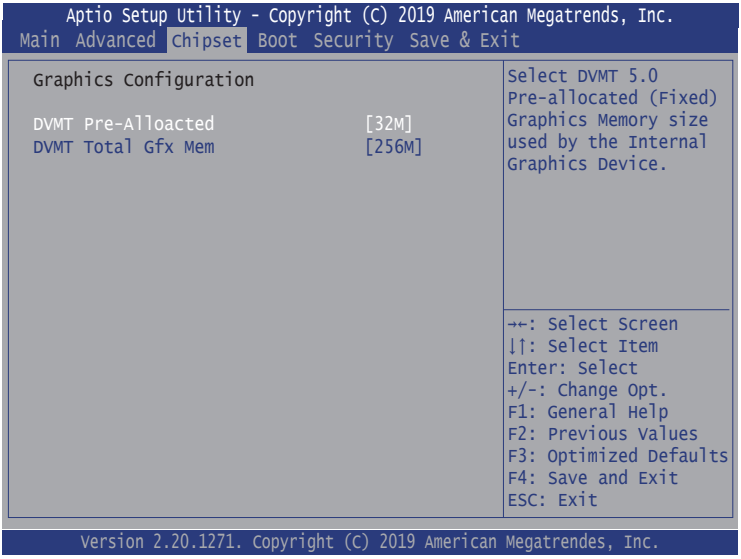
Submenu	Description
System Agent (SA) Configuration	See 5.3.1. System Agent (SA) Configuration on page 55
PCH-IO Configuration	See 5.3.2. PCH-IO Configuration on page 57

5.3.1. System Agent (SA) Configuration



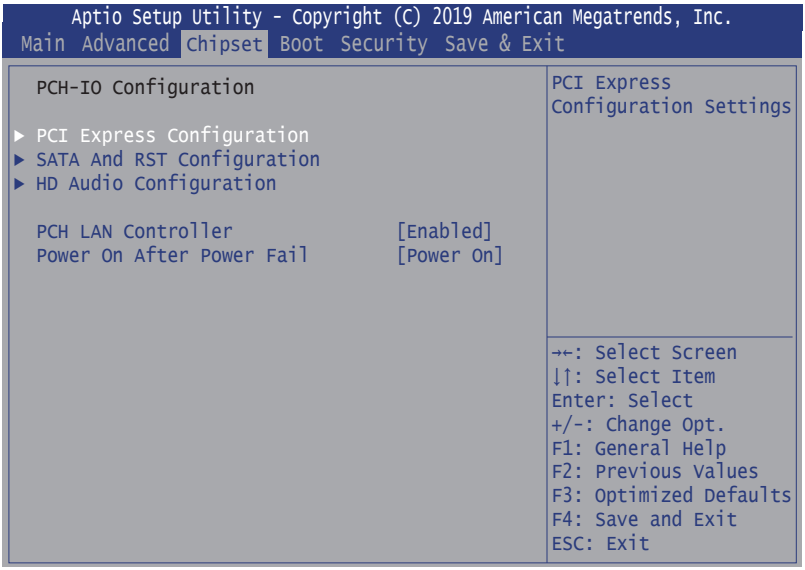
Submenu	Description
System Agent (SA) Configuration	
Graphics Configuration	See 5.3.1.2. Graphics Configuration on page 56
VT-d	**Enable** (default) or **Disable** VT-d function

5.3.1.2. Graphics Configuration



Setting	Description
DVMT Pre-Allocated	Select the DVMT 5.0 Pre-allocated (Fixed) Graphic Memory size used by the Internal Graphic Device. ► 32M is the default.
DVMT Total Gfx Mem	Select the DVMT 5.0 Total Graphic Memory size used by the Internal Graphic Device. ► Options: **128MB, 256MB** (default) and **Max.**

5.3.2. PCH-IO Configuration



Setting	Description
PCI Express Configuration	See 5.3.2.1. PCI Express Configuration on page 58
SATA And RST Configuration	See 5.3.2.2. SATA And RST Configuration on page 58
HD Audio Configuration	See 5.3.2.3. HD Audio Configuration on page 58
PCH LAN Controller	**Enable** (default) or **Disable** onboard NIC.
Power On After Power Fail	Specify what state to go to when power is re-applied after a power failure (G3 state). ► Options available are **Power On** (default), **Power Off** and **Last State**.

5.3.2.1. PCI Express Configuration

Setting	Description
DMI Link ASPM Control	**Enable** or disable (default) the control of Active State Power Management of the DMI Link.
LAN i210AT/ M.2 E-Key / M.2 B-Key / M.2 M-Key PCIe x4	**PCI Express Root Port Settings.** **Enable** (default) or disable the PCI Express Port.
ASPM 5/6/17/20	Set the ASPM level. Force L0s will force all inks to L0s state. "Auto" will allow BIOS to auto configure."Disable" will disable ASPM. ► Options: **Disabled** (default), **L0s**, **L1**, **L0sL1** and **Auto**.
PCIe Speed	Select PCI Express port speed. ► Options: **Auto** (default), **Gen1**, **Gen2** and **Gen3**
Detect Timeout	The number of millisconds reference code will wait for enabled ports before assuming there is no device an potentially disabling the port. ► Deafault: 0

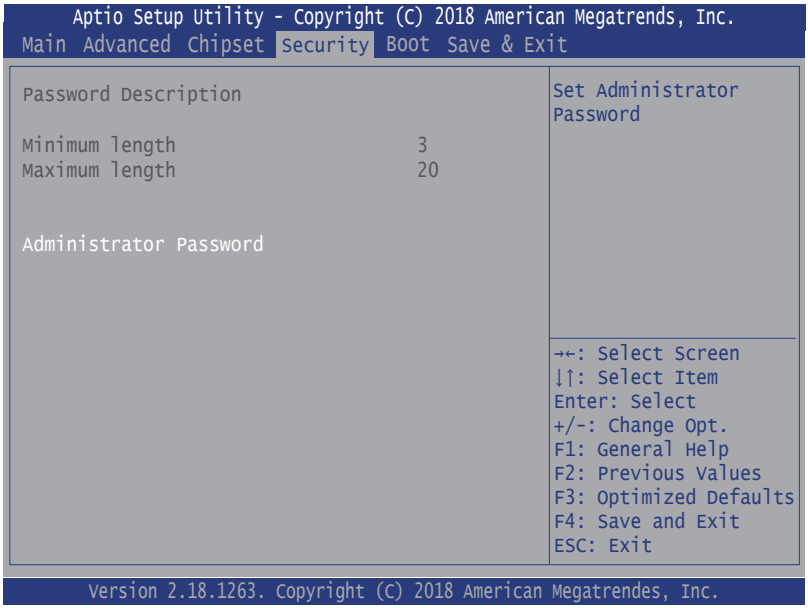
5.3.2.2. SATA And RST Configuration

Setting	Description
SATA Controller(s)	**Enables** (default) / **disables** SATA device(s).
SATA Mode Selection	Configures how SATA controller(s) operate. ► Options: **AHCI** (default)

5.3.2.3. HD Audio Configuration

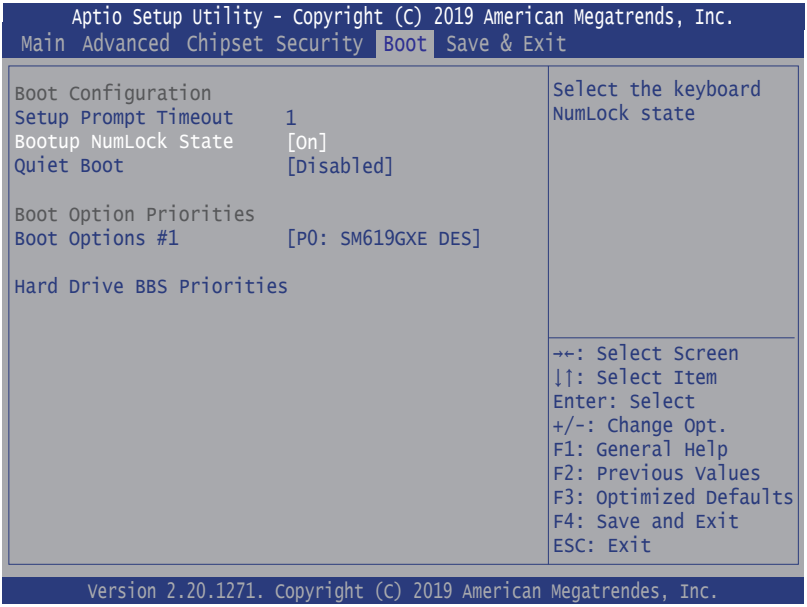
Setting	Description
HD Audio	Control detection of the HD-Audio device. ► **Disabled:** HDA wil lbe unconditionally disabled ► **Enabled** (default): HDA will unditionally enabled.

5.4. Security



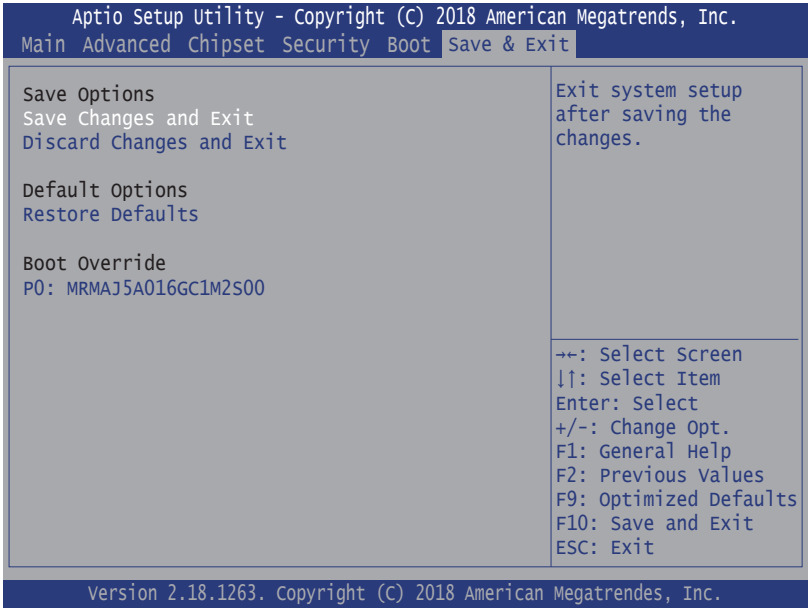
Setting	Description
Administrator Password	To set up an administrator password: 1. Select **Administrator Password**. 2. An **Create New Password** dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Hit [Enter] key to submit.

5.5. Boot



Setting	Description
Setup Prompt Timeout	Set how long to wait for the prompt to show for entering BIOS Setup. ► The default setting is **2** (sec). ► Set it to **65535** to wait indefinitely.
Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. ► Options available are **On** (default) and **Off**.
Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. ► Select **Disabled** (default) to display the normal POST message, which is the default.
Boot Option #1	Set the system boot priorities.
Hard Drive BBS Priorities	Sets the order of the legacy devices in this group. BBS means "BIOS Boot Specification".

5.6. Save & Exit



Setting	Description
Save Changes and Reset	Saves the changes and quits the BIOS Setup utility.
Discard Changes and Exit	Quits the BIOS Setup utility without saving the change(s).
Restore Defaults	Restores all settings to defaults. ► This is a command to launch an action from the BIOS Setup utility.
Boot Override	**Boot Override** presents a list in context with the boot devices in the system. ► **P0:** Select the device to boot up the system regardless of the currently configured boot priority. ► **Launch EFI Shell from filesystem device:** Attempts to launch EFI Shell Application (Shell.efi) from one of the available filesystem devices.