



# **GM831-CSF**

## **Gaming Computing System**

### **User's Manual**

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## FCC and DOC Statement on Class A

This equipment has been tested and found to comply with the limits for a Class B 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 residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

### Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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## About this Manual

An electronic file of this manual can be obtained from the DFI website at [www.dfi.com](http://www.dfi.com). To download the user's manual from our website, please go to Support > Download Center. On the Download Center page, select your product or type the model name and click "Search" to find all technical documents including the user's manual for a specific product.

## Warranty

1. Warranty does not cover damages or failures that arises from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

## Static Electricity Precautions

It is easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



### Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## Safety Measures

To avoid damage to the system:

- Use the correct DC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## Safety Precautions

- Keep this system away from humidity.
- Place the system on a stable surface. Dropping it or letting it fall may cause damage.
- The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.
- Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.
- If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- If one of the following occurs, consult a service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated the system.
  - The system has been exposed to moisture.
  - The system is not working properly.
  - The system dropped or is damaged.
  - The system has obvious signs of breakage.
- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.
- Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

## About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- GM831-CSF system unit
- Power Supply (PSU)
- CD disk includes
  - Manual
  - Drivers
- Quick Installation Guide

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

## Before Using the System

Before powering-on the system, prepare the basic system components.

If you are installing the system for the first time, you will need at least one of the following internal components.

- Storage devices such as SATA HDD or M.2 modules.

You will also need external system peripherals, which will normally include at least a keyboard, a mouse and a video display.

## Chapter 1 - Introduction

### Overview



Front View



Front View  
(with Power Supply)

### Key Features

<b>Model Name</b>	<b>GM831-CSF</b>
<b>Processor</b>	9th/8th Generation Intel® Core™ LGA 1151 Socket Processors
<b>Audio</b>	Realtek ALC888
<b>LAN</b>	Two RJ45 LAN ports
<b>COM</b>	COM1 : RS-232/422/485 DB9 (RS-232 w/ power) COM3: RS-232 COM4: RS-232
<b>Display</b>	One HDMI One DVI-I (DVI-D signal) One DP++
<b>USB</b>	Two USB 3.1 Gen 2 Two USB 3.1 Gen 1 Six USB 2.0

### Gaming Section Features

<b>Card Name</b>	<b>GM901</b>
<b>Intrusion Detection</b>	6 x Intrusion Dections (one is already applied to PC BOX) Operates with and without AC power Logs Date/ Time of latest 64 events 5 Years data retention during AC off
<b>NVRAM</b>	Supports up to 16Mbyte Coin Battery backup to Retain Data for 5 years during AC off Support Battery voltage monitoring & Warning
<b>DI/DO</b>	32-bit Digital Input/OC Output

## Specifications

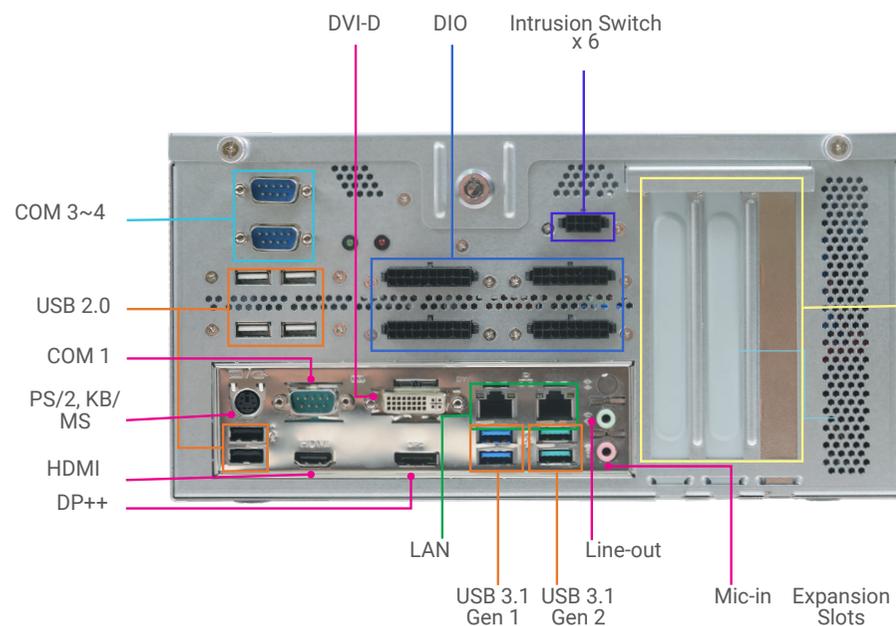
<b>System</b>	<b>Processor</b>	9th/8th Generation Intel® Core™ LGA 1151 Socket Processors: Intel® Core™ i5-9500E (6 Cores, 9M Cache, up to 4.2 GHz); 65W Intel® Core™ i5-9500TE (6 Cores, 9M Cache, up to 3.6 GHz); 35W Intel® Core™ i3-9100E (4 Cores, 6M Cache, 3.7 GHz); 65W Intel® Core™ i3-9100TE (4 Cores, 6M Cache, to 3.2 GHz); 35W Intel® Core™ i7-8700 (6 Cores, 12M Cache, up to 4.6 GHz); 65W Intel® Core™ i7-8700T (6 Cores, 12M Cache, up to 4.0 GHz); 35W Intel® Core™ i5-8500 (6 Cores, 9M Cache, up to 4.1 GHz); 65W Intel® Core™ i5-8500T (6 Cores, 9M Cache, up to 3.5 GHz); 35W Intel® Core™ i3-8100 (4 Cores, 6M Cache, 3.6 GHz); 65W Intel® Core™ i3-8100T (4 Cores, 6M Cache, to 3.1 GHz); 35W Intel® Pentium® G5400 (2 Cores, 4M Cache, 3.7 GHz); 58W Intel® Pentium® G5400T (2 Cores, 4M Cache, 3.1 GHz); 35W Intel® Celeron® G4900 (2 Cores, 2M Cache, 3.1 GHz); 54W Intel® Celeron® G4900T (2 Cores, 2M Cache, 2.9 GHz); 35W
	<b>Chipset</b>	Intel® Q370/H310 Chipset
	<b>Memory</b>	Four 288-pin DIMM up to 64GB Dual Channel DDR4 2400/2666 MHz
	<b>BIOS</b>	Insyde or AMI UEFI (Supports hash and public key validation)
<b>Graphics</b>	<b>Controller</b>	Intel® HD Gen 9 Graphics
	<b>Feature</b>	OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9
	<b>Display</b>	1 x HDMI 1 x DVI-I (DVI-D signal) 1 x DP++ HDMI 2.0a: resolution up to 4096x2160 @ 60Hz DVI-D: resolution up to 1920x1200 @ 60Hz DP++: resolution up to 4096x2106 @ 60Hz
	<b>Triple Displays</b>	DVI-D + HDMI + DP++
<b>Storage</b>	<b>Interface</b>	5 x SATA 3.0 1 x 2.5" SSD Bay
<b>Expansion</b>	<b>Interface</b>	1 x PCIe x16 (Gen 3) 2 x PCIe x4 (Gen 3) 1 x mini PCIe (PCIe/mSATA/USB2.0) 1 x M.2 2242/2260/2280 M key (PCIe Gen3 x4 NVMe) Support AMD E9260 Graphic card 180(L) x115(H)mm; up to 75W

<b>Audio</b>	<b>Audio Codec</b>	Realtek ALC888
<b>Ethernet</b>	<b>Controller</b>	1x Intel i219LM PCIe (10/100/1000Mbps) with iAMT 12.0 (only Core i7/ i5 supports iAMT) 1x Intel I211at PCIe (10/100/1000 Mbps)
<b>LED</b>	<b>Indicators</b>	1 x Power LED 1 x HDD LED
<b>I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)
	<b>Serial</b>	COM1 : RS-232/422/485 DB9 (RS-232 w/ power) COM3: RS-232 COM4: RS-232
	<b>USB</b>	2 x USB 3.1 Gen 2 2 x USB 3.1 Gen 1 6 x USB 2.0
	<b>Display</b>	1 x HDMI 1 x DVI-I (DVI-D signal) 1 x DP++
	<b>Audio</b>	1x Line-out 1x Line-in (colay,opt. by request, MOQ required) 1xMic-in
	<b>PS/S</b>	1x PS/2 (mini-DIN-6)
<b>Gaming</b>	<b>Intrusion Detection</b>	7 x Intrusion Dections (one is already applied to PC BOX) Operates with and without AC power Logs Date/Time of latest 64 events 5 Years data retention during AC off
	<b>NVRAM</b>	Supports up to 16Mbyte Coin Battery backup to Retain Data for 5 years during AC off Support Battery voltage monitoring & Warning
	<b>DI/DO</b>	32-bit Digital Input 32-bit OC output (29-bit x 500mA, disconnect detection for up to 8 meters; 3-bit x 3A)
<b>Watchdog Timer</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds
<b>Security</b>	<b>TPM</b>	Infineon TPM 1.2/ 2.0 (Available upon request, MOQ required)
<b>Power</b>	<b>Type</b>	Flex-ATX 250W (optional )
	<b>Connector</b>	12V DC-in , 24-pin ATX power
<b>OS &amp; Software Support</b>	<b>OS Support</b>	Windows 10(64bit) Ubuntu 18.04 LTS 64bit
	<b>Software</b>	Supplied with gaming function SDK
<b>Environment</b>	<b>Operating Temperature</b>	0~45°C
	<b>Storage Temperature</b>	-20~85°C
	<b>Relative Humidity</b>	5%~90%

<b>Mechanism</b>	<b>Mounting</b>	Wall Mount
	<b>Dimensions (W x H x D)</b>	275x146.3x296.43mm (without PSU & mounting kits) 365x145.3x296.43mm (with PSU & without mounting kits)
	<b>Weight</b>	TBD
<b>Standards and certificates</b>	<b>Shock</b>	Operation: IEC 60068-2-64 Test Fh: Vibration board-band random test Half-sine, 3G @ 11ms, 18 Shock $\pm X$ , $\pm Y$ , $\pm Z$ (each axis 3 times) Non-Operation: IEC 60068-2-27 Test Ea: Shock test Half-sine, 5G @ 11ms, 18 Shock $\pm X$ , $\pm Y$ , $\pm Z$ (each axis 3 times)
	<b>Vibration</b>	Operation: IEC 60068-2-64 Test Fh: Vibration Board-Band Random Test Random, 1Grms @ 5~500 Hz, 30min. Non-Operation: IEC 60068-2-6 Test Fc: Vibration Sinusoidal Test Sweep sine, 2Grms @ 10~500Hz, 30min
	<b>Certifications</b>	CE, FCC class A

## Getting to Know the GM831-CSF

### Front View



#### DVI-I (DVI-D Signal) Port

The DVI-I port is used to connect a LCD monitor. This port supports DVI-D signal only. Connect the display device's cable connector to the DVI-I port. After plugging the cable connector into the port, gently tighten the cable screws to hold the connector in place.

#### COM ports

**COM1 (DB-9)**: connects RS232/RS422/RS485 devices.

**COM3**: connects RS232 devices.

**COM4**: connects RS232 devices.

#### USB 2.0 & 3.1 Ports

6 USB 2.0 ports, 2 USB 3.1 Gen 1 ports and 2 USB 3.1 Gen 2 ports.

#### PS/2 KB/Mouse

Connects a PS/2 keyboard and mouse.

#### HDMI

Connects the HDMI connector of an LCD monitor.

#### DP++ Port

Connects the DisplayPort of an LCD monitor.

#### RJ45 LAN Ports

Connect the system to a local area network.

#### Line-out

Connects an external speaker.

#### Mic-in

Connects an external microphone.

#### Expansion slots

Provides PCIe or PCI expansion connectivity.

### Gaming Section - GM901

The system that are from GM901.

#### Digital Input/Output

Provides 8-bit digital input/output.

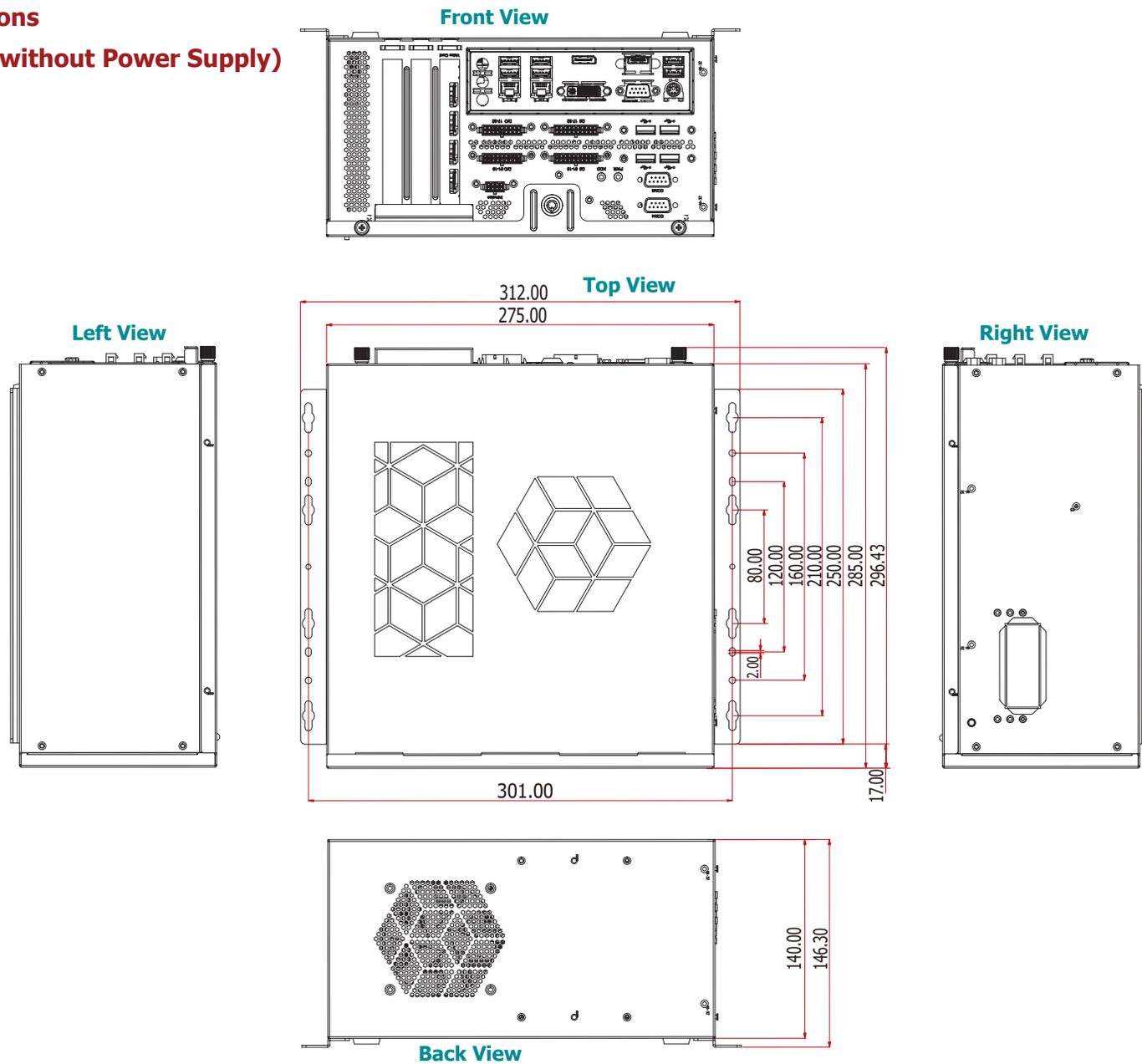
#### Instrusion Switch x6

Provides 6 via 2x4 micro-fit connector.

#### NVRAM

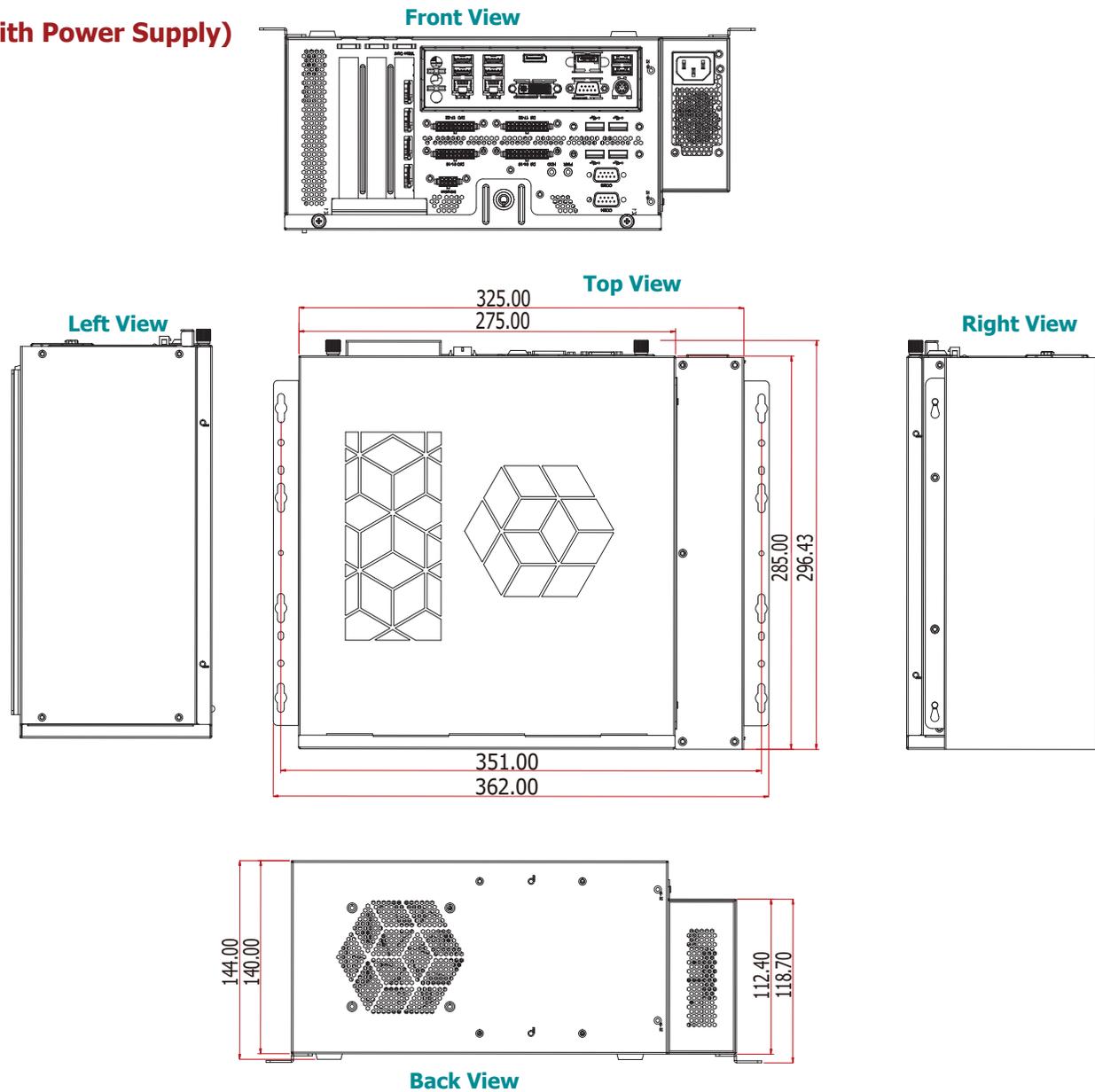
NVRAM has longer lifecycle of data-stored due to the SRAM+ battery on FPGA.

**Mechanical Dimensions**  
**Chassis Dimension (without Power Supply)**



## Mechanical Dimensions

### Chassis Dimension (with Power Supply)



## Chapter 2 - Getting Started

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### Preparing the System

Before you start using the system, you might need the following items:

- Power Supply (PSU)

### Installing Device

The following devices should be installed in the system.

- Power Supply (PSU)

### Configuring the BIOS

To get you started, you may need to change configurations such as the date, time and the priority of boot devices.

1. Power on the system.
2. After the memory test, the message "Press DEL to run setup" will appear on the screen. Press the Delete key to enter the BIOS setup utility.

### Installing a Operating System

Please refer to your operating system manual for instructions on installing an operating system.

### Installing the Drivers

The system comes with a software package including drivers. These drivers must be installed to provide the best system performance. Refer to the Supported Software Chapter for instructions on installing drivers.

## Chapter 3 - Installing Devices

### Removing the Chassis Cover

Please observe the following guidelines before opening the chassis cover:

1. Make sure the system and all other peripherals connected to it have been powered off.
2. Disconnect all power cords and cables.
3. The mounting screw on the rear side of the system compartment is used to secure the cover to the chassis. Remove this screw and put it in a safe place for later use.
4. Use the key (push it down slightly and turn it counterclockwise) to unlock the system compartment cover.
5. Slide the cover backward to open the chassis cover.



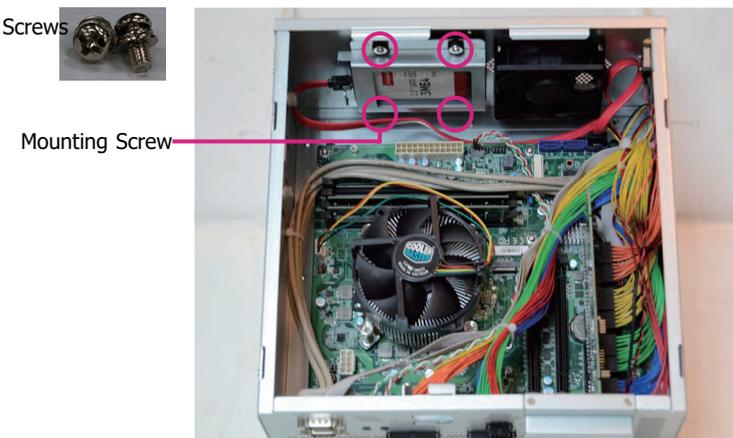
### Installing a 2.5" SATA Drive

The system can accommodate one 2.5" HDDs.

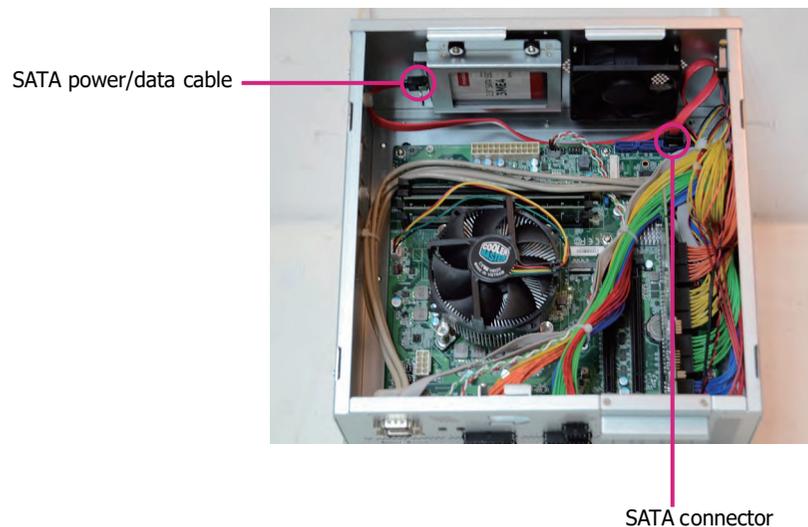
1. To install a 2.5" HDD, use the 2.5" HDD bracket as shown below. Align the mounting holes on the SATA drive with the mounting holes on the HDD bracket and use the mounting screws provided in the drive bay kit to secure the drive in place.



2. Place the HDD bracket with the installed SATA drives back into the chassis and use the provided mounting screws to attach the HDD bracket to the drive bay. Use the provided mounting screws to attach the HDD bracket to the drive bay.



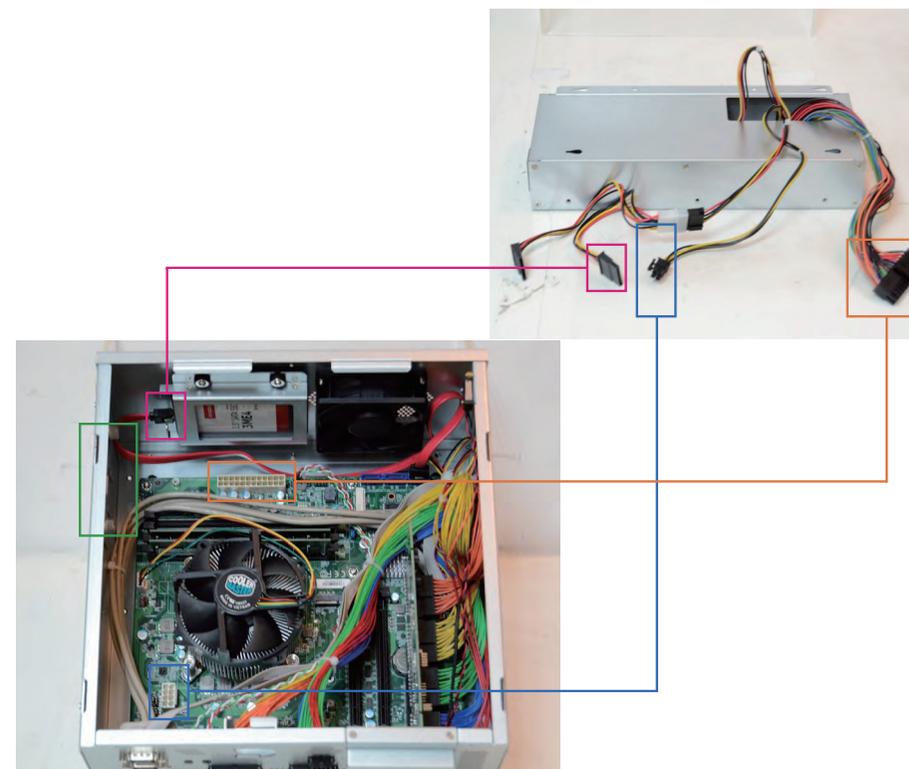
3. Connect the SATA data cable to the SATA drive.



## Connecting the PSU

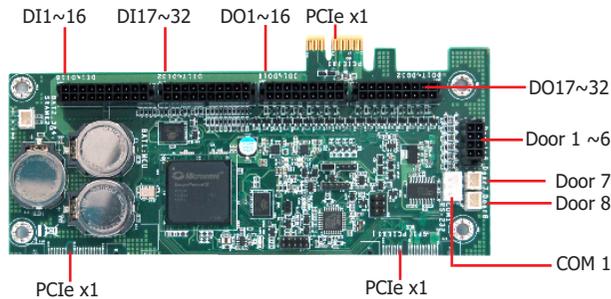
The PSU is an optional item of GM831-CSF for the power supply solution. The instruction below is to demonstrate the process to connect the PSU to GM831-CSF.

1. Make sure the system and all other peripherals connected to it have been powered off.
2. Disconnect all power cords and cables.
3. Remove the mounting screw on the side and take off the cover to unveil the hole. (Green label)
4. Put all the cables from the PSU into GM831-CSF through the hole.
5. Connect the PSU to GM831-CSF's port using the multi-color cable. (Orange label)
6. Connect the PSU to GM831-CSF's port using the small cable. (Blue label)
7. Connect the PSU to GM831-CSF's port using the SATA power cable. (Pink label)



## Chapter 4 - Gaming I/O Board

### Gaming I/O Board - GM901



### Features

EXPANSION CONNECTOR	2 PCIe x1
INTERFACE 1	PCIe x1 gold finger
INTERFACE 2 (optional)	PCIe connector (36 pin)
SECURITY	Security-ROM Intrusion detection (8 doors)
VOLTAGE WATCHER	Voltage monitoring and warning via MCU

### Features

#### Expansion Slots

- 2 x PCIe x1 connector
- 1 x PCIe x1 connector/PCIe x1 via 36-pin connector (opt.)

#### COM Port

- RS232 via box header

#### Gaming IO

- Intrusion switch inputs:
  - 6 via 2x4 micro-fit connector
  - 2 via 2-pin box headers

#### Digital I/O

- 32 ESD-protected inputs
- 32 ESD-protected outputs

#### Security ROM

- 2 x SRAM (BGA type): 64K x16, 512K x16, 1M x16, 2M x16, 4M x16

#### Battery

- Battery for MCU:
  - 1 x CR2032 Lithium 3V/220mAh batteries
- Battery for SRAM:
  - 2 x CR2032 Lithium 3V/220mAh batteries
  - 1 x 2-pin box header

#### Environmental

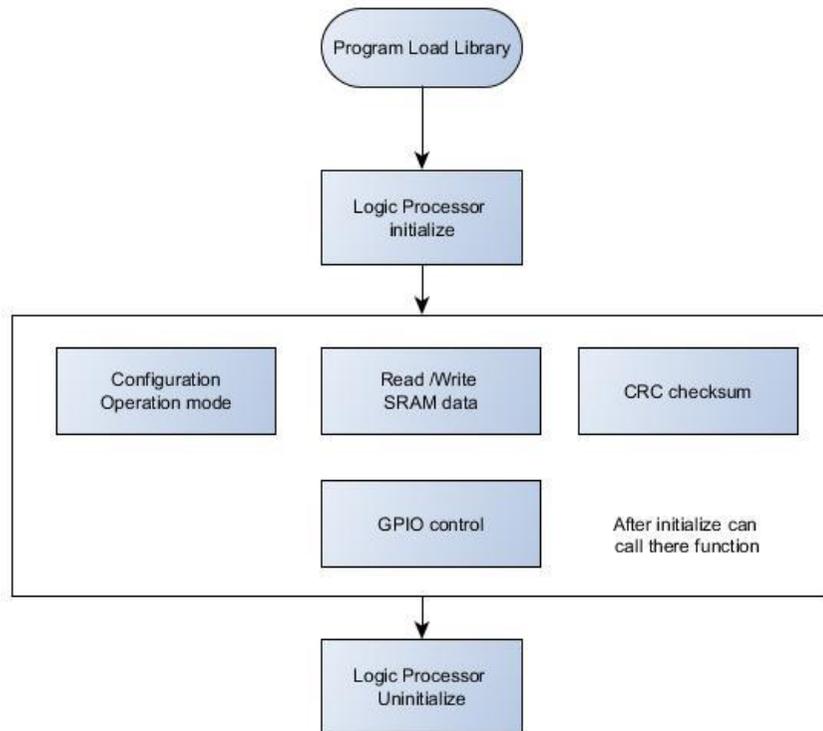
- Operating temperature:
  - Operating: 0 ~ 60°C
  - Storage: -40 ~ 85°C
- Operating humidity:
  - Operating: 5 ~ 90% RH
  - Storage: 5 ~ 90% RH

#### Dimension

- 170mm\* 80mm

## FPGA

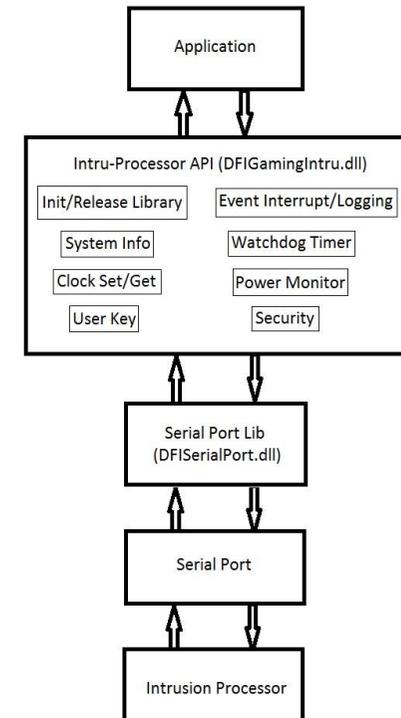
This section gives a high level overview the functionalities and process flow of the APIs. The following table outlines the names of the APIs and their usage.



DFI Logic Processor API	Description
Configuration Operation mode	Provides two operations mode: Normal mode, and Multi-mirror mode.
Read/Write SRAM data	Supports four different access: BYTE (1 byte), WORD (2 bytes), DWORD (4 bytes), multi-bytes read/write.
CRC checksum	Provides calculate specify address range of data with CRC32.
GPIO control	Provides to control GPIO output level and input interrupt detect feature.

## MCU

The set of APIs can be categorized into 8 groups:

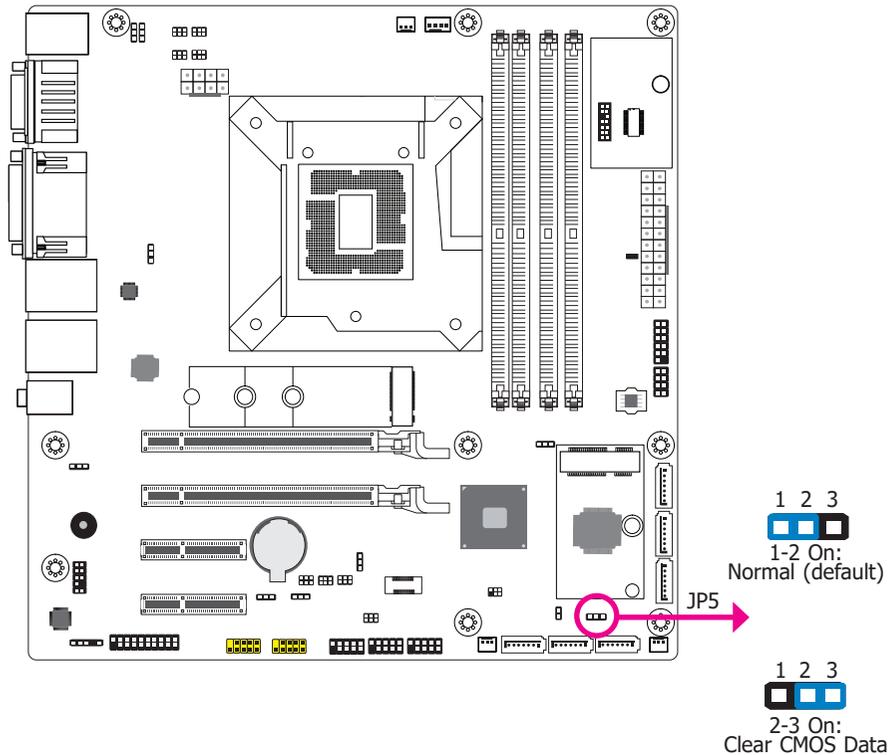


In Windows, the Intru-Processor API is called DFIGamingIntru.dll which accesses the serial port with the library DFISerialPort.dll. Both of the libraries have to be together with AP in the same folder.

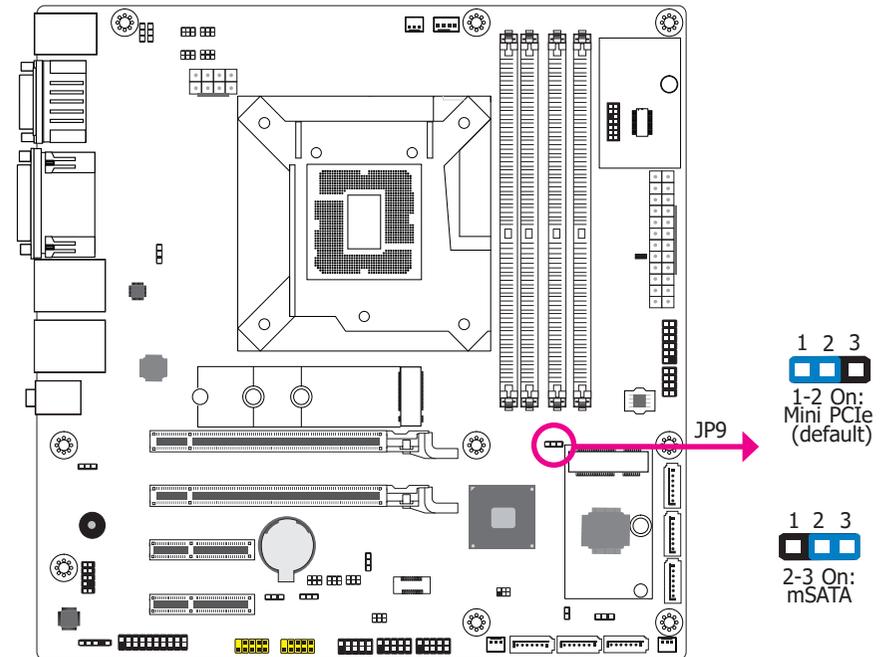
In Linux, the Intru-Processor API is called DFIGamingIntru.so which accesses the serial port with the library DFISerialPort.so. Both of the libraries have to be put to /usr/lib.

## Chapter 5 - Jumper Settings

### Clear CMOS Data



### Mini PCIe/mSATA Signal Select



If any anomaly of the followings is encountered —

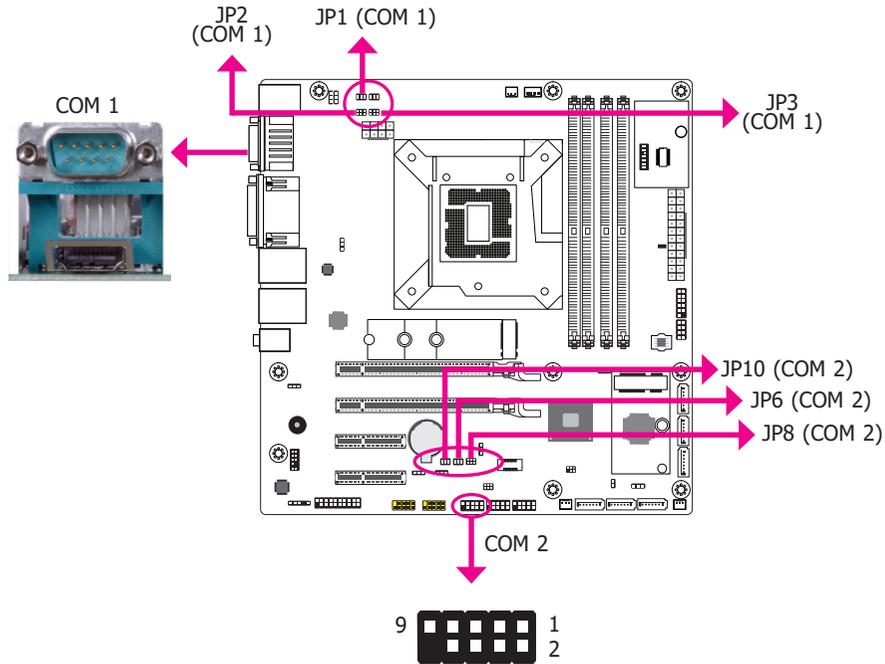
- CMOS data is corrupted;
- you forgot the supervisor or user password;
- failure to start the system due to BIOS mis-configuration

— it is suggested that the system be reconfigured with default values stored in the ROM BIOS. To load the default values stored in the ROM BIOS, please follow the steps below.

- Power-off the system and unplug the power cord.
- Put a jumper cap on JP9's pin 2 and pin 3. Wait for a few seconds and set JP9 back to its default setting, i.e. jumper cap on pin 1 and pin 2.
- Plug the power cord and power-on the system.

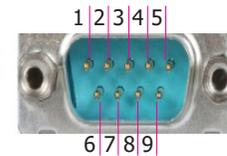
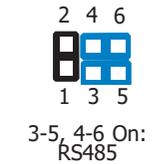
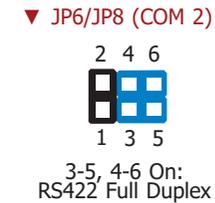
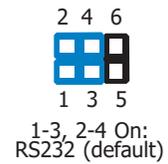
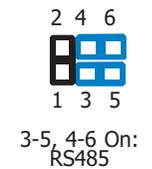
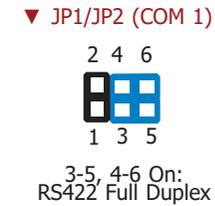
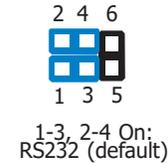
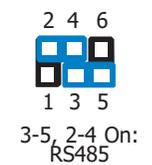
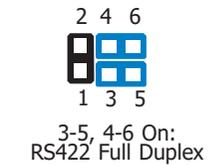
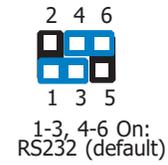
JP9 is used to select the Mini PCIe signal: Mini PCIe (default) or mSATA.

### COM1/COM2 RS232/422/485 Select



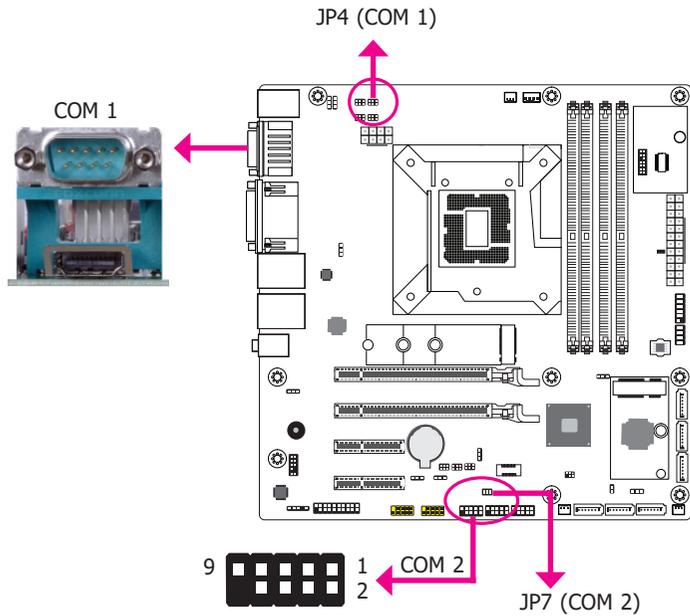
JP1/JP2/JP3 (for COM 1) and JP6/JP8/JP10 (for COM 2) are used to configure the COM ports to RS232, RS422 (Full Duplex) or RS485. When COM 1 RS232/422/485 is selected, JP1 and JP2 must be set in accordance to JP3.

When COM 2 RS232/422/485 is selected, JP6 and JP8 must be set in accordance to JP10. The pin functions of the COM ports will vary according to the jumpers' setting.



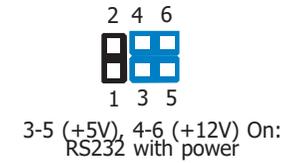
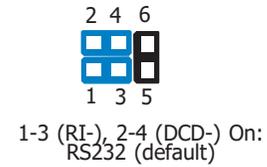
Pins	RS232	RS422	RS485
1	DCD-	RX+	DATA+
2	SIN-	RX-	DATA-
3	SO-	TX+	NC
4	DTR-	TX-	NC
5	GND	GND	GND
6	DSR-	NC	NC
7	RTS-	NC	NC
8	CTS-	NC	NC
9	RI-	NC	NC

## COM1/COM2 RS232 Power Select

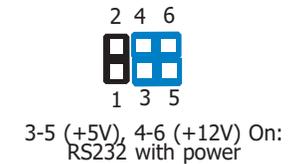
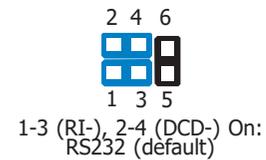


JP4 (for COM 1) and JP7 (for COM 2) are used to configure Serial COM ports to pure RS232 or RS232 with power. The pin functions of COM 1 and COM 2 will vary according to JP4's and JP7's setting respectively.

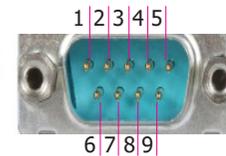
### ▼ JP4 (COM 1)



### ▼ JP7 (COM 2)

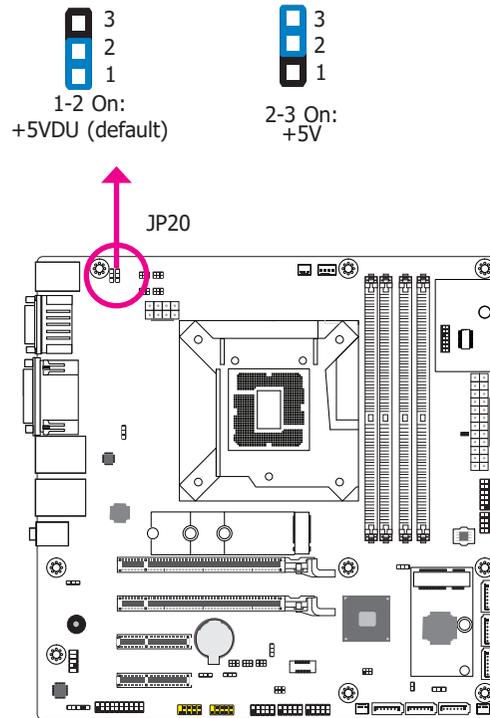


## COM1/COM2 RS232 Power Select



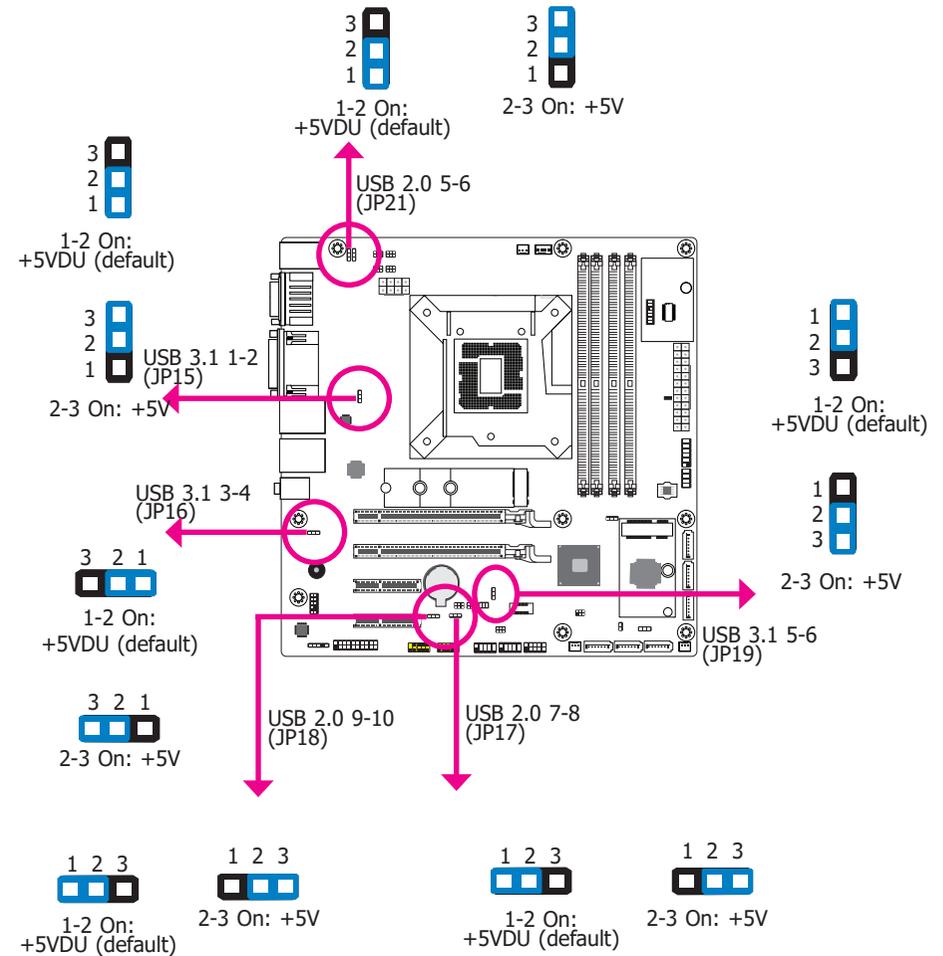
Pins	RS232	RS232 with power
1	DCD-	+12V
2	SIN-	SIN-
3	SO-	SO-
4	DTR-	DTR-
5	GND	GND
6	DSR-	DSR-
7	RTS-	RTS-
8	CTS-	CTS-
9	RI-	+5V

### PS/2 Power Select



JP20 is designed to select the PS/2 power: +5VDU (default) or +5V.

### USB Power Select



JP15, JP16, JP17, JP18, JP19 and JP21 are used to select the power of the USB ports. Selecting +5VDU will allow you to use a USB device to wake up the system.

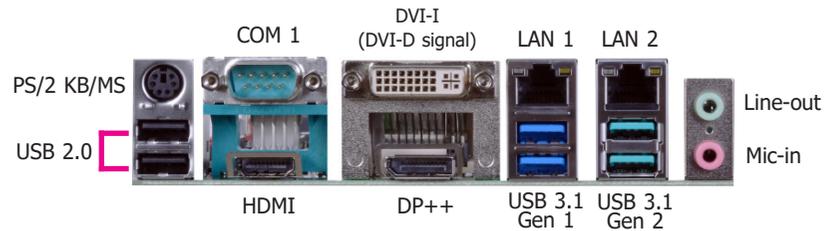


**Important:**

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V\_standby power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the +5V\_standby power source of your power supply must support  $\geq 2A$ .

## Chapter 6 - Ports and Connectors

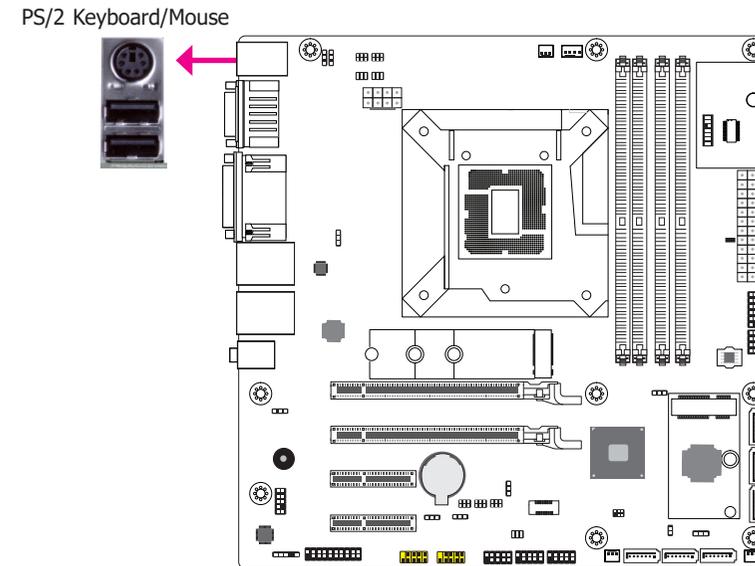
### Overview



The rear panel I/O ports consist of the following:

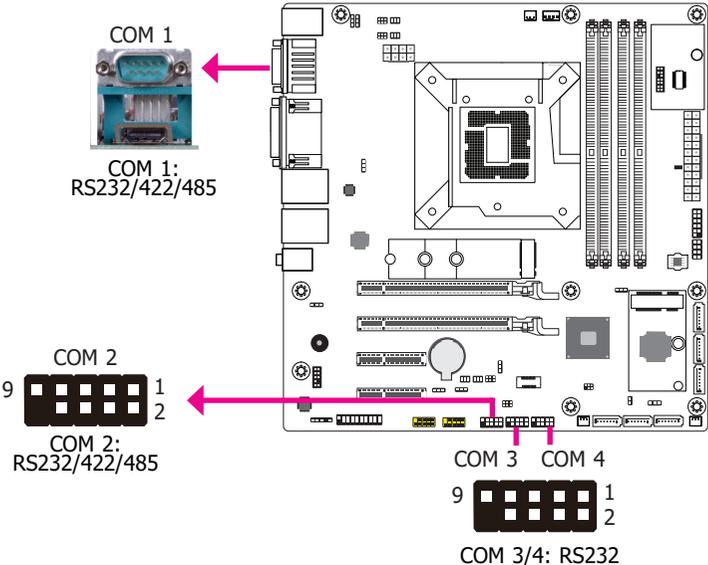
- 1 PS/2 Keyboard/Mouse port
- 2 USB 2.0 ports
- 1 Serial COM port
- 1 HDMI port
- 1 DVI-I (DVI-D signal) port
- 1 DP++ port
- 2 RJ45 LAN ports
- 2 USB 3.1 Gen 1 ports
- 2 USB 3.1 Gen 2 ports
- 1 Line-in jack (optional)
- 1 Line-out jack
- 1 Mic-in jack

### PS/2 Keyboard/Mouse Port



This rear I/O port is used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12.

COM (Serial) Ports



COM 3/4: RS232

Pins	Pin Assignment
1	DCD-
2	SIN-
3	SO-
4	DTR-
5	GND
6	DSR-
7	RTS-
8	CTS-
9	RI-

The pin functions of COM 1 port will vary according to setting of JP1, JP2, JP3 and JP4. Refer to "COM1/COM2 RS232/422/485 Select" and "COM1/COM2 RS232/Power Select" in this chapter for more information.

The pin functions of COM 2 port will vary according to setting of JP6, JP7, JP8 and JP10. Refer to "COM1/COM2 RS232/422/485 Select" and "COM1/COM2 RS232/Power Select" in this chapter for more information.

COM 3 and COM 4 are fixed at RS232. The pin functions are listed at right.

The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

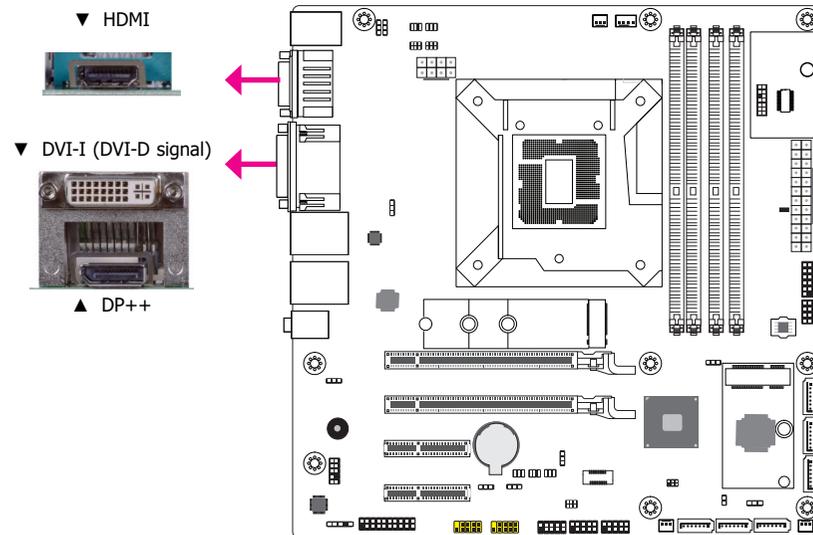
Connecting External Serial Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

## Graphics Interfaces

The display ports consist of the following:

- 1 HDMI port
- 1 DVI-I (DVI-D signal) port
- 1 DP++ port



### HDMI Port

The HDMI port which carries both digital audio and video signals is used to connect a LCD monitor or digital TV that has the HDMI port.

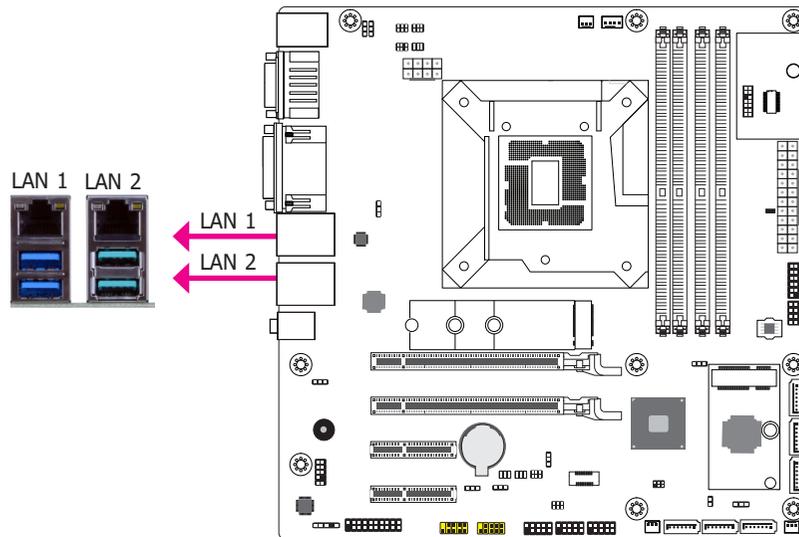
### DVI-I (DVI-D Signal) Port

The DVI-I port is used to connect a LCD monitor. This port supports DVI-D signal only. Connect the display device's cable connector to the DVI-I port. After plugging the cable connector into the port, gently tighten the cable screws to hold the connector in place.

### DP++ Port

The DP++ port which carries both digital audio and video signals is used to connect a LCD monitor or a digital TV that has the DP++ port.

## RJ45 LAN Ports

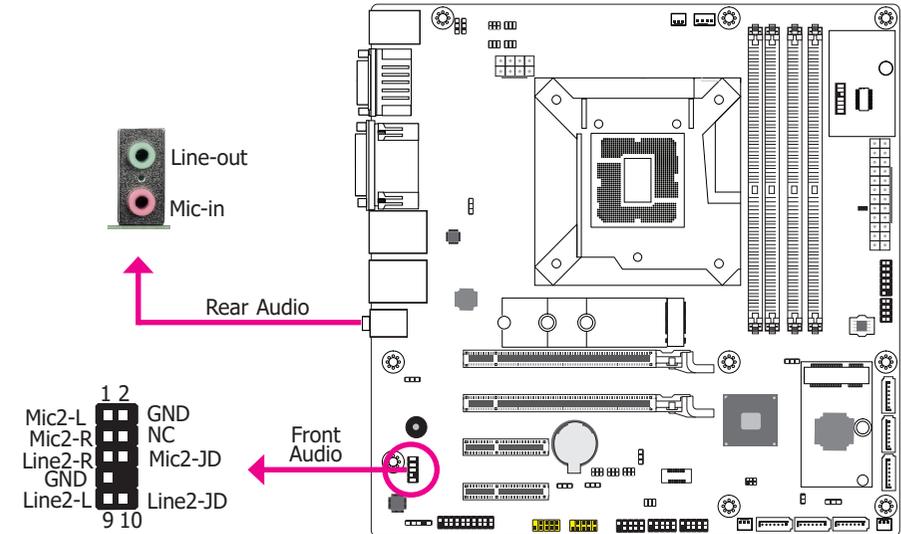


## Features

- 1 Intel® I211AT PCIe
- 1 Intel® I219LM PCIe with iAMT12.0

The LAN ports allow the system board to connect to a local area network by means of a network hub.

## Audio



### Rear Audio

The system board is equipped with 2 audio jacks (Line-out and Mic-in). Line-in jack is available upon request. A jack is a one-hole connecting interface for inserting a plug.

- Optional Line-in Jack (Light Blue)

This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

- Line-out Jack (Lime)

This jack is used to connect a headphone or external speakers.

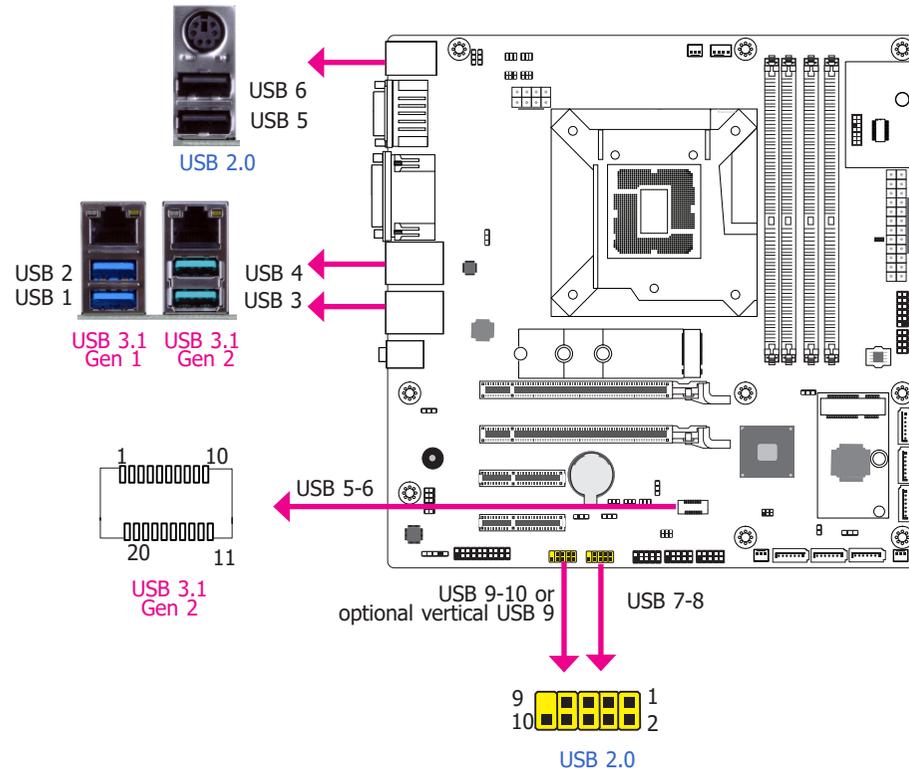
- Mic-in Jack (Pink)

This jack is used to connect an external microphone.

### Front Audio

The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.

## USB Ports



The USB device allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with 2 onboard USB 2.0 ports (USB 5-6), 2 onboard USB 3.1 Gen 1 ports (USB 1-2) and 4 onboard USB 3.1 Gen 2 ports (USB 3-4/5-6). The 10-pin connectors allow you to connect 4 additional USB 2.0 ports (USB 7-8/9-10). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

## Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.



### Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V<sub>standby</sub> power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the +5V<sub>standby</sub> power source of your power supply must support  $\geq 2A$ .

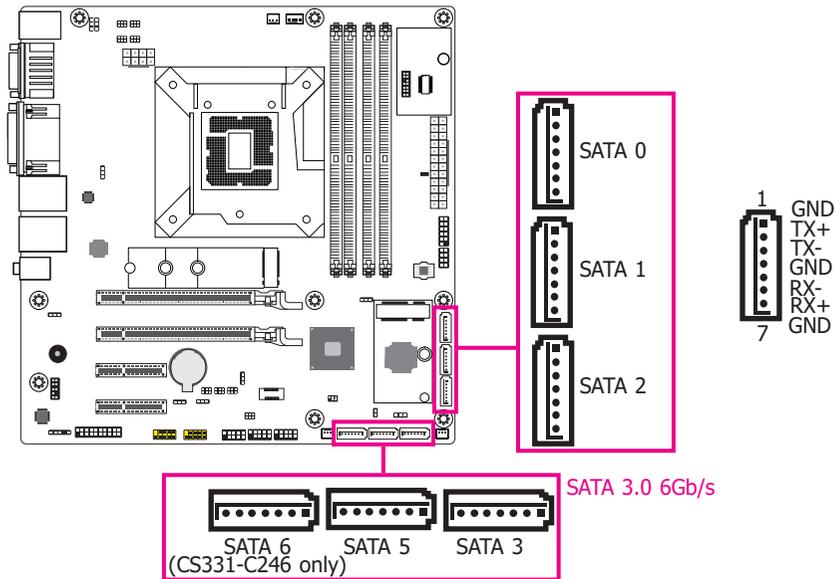
## USB 3.1 Gen 2 5-6 Header

Pins	Assignment	Pins	Assignment
1	GND	20	PWR
2	TX+	19	DATA-
3	TX-	18	DATA+
4	GND	17	GND
5	RX+	16	RX+
6	RX-	15	RX-
7	GND	14	GND
8	DATA+	13	TX+
9	DATA-	12	TX-
10	PWR	11	GND

## USB 2.0 7-8/9-10 Headers

Pins	Assignment	Pins	Assignment
1	PWR	2	PWR
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND
9	---	10	NC

## SATA (Serial ATA) Connectors

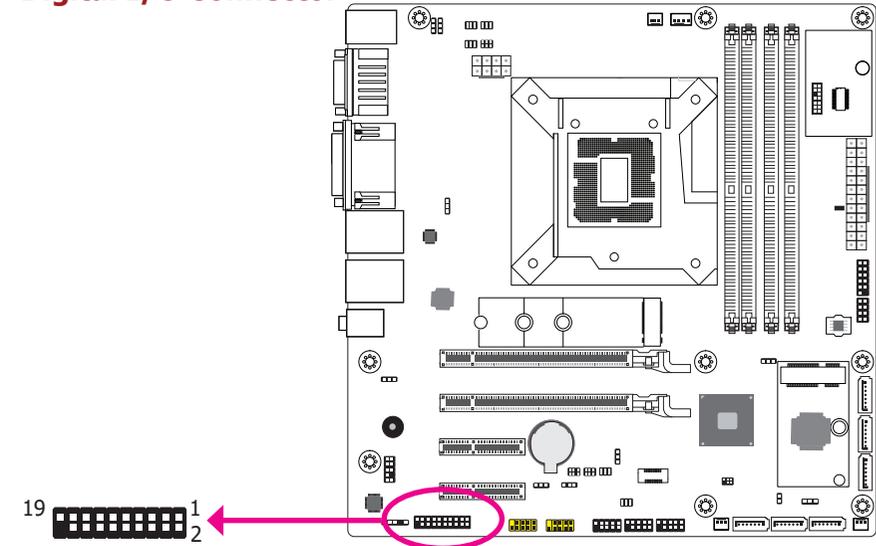


### Features

- 5 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (CS331-Q370)
- 6 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (CS331-C246)
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0, RAID 1, RAID 5, RAID 10

The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA data cable to a SATA connector and the other end to your Serial ATA device.

## Digital I/O Connector

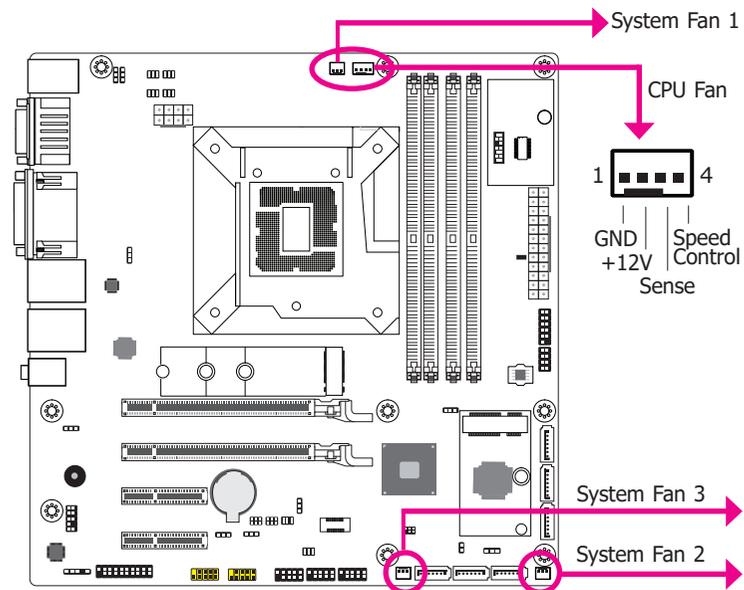


The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors. The pin functions of the 8-bit digital I/O connector are listed below.

### Digital I/O Connector

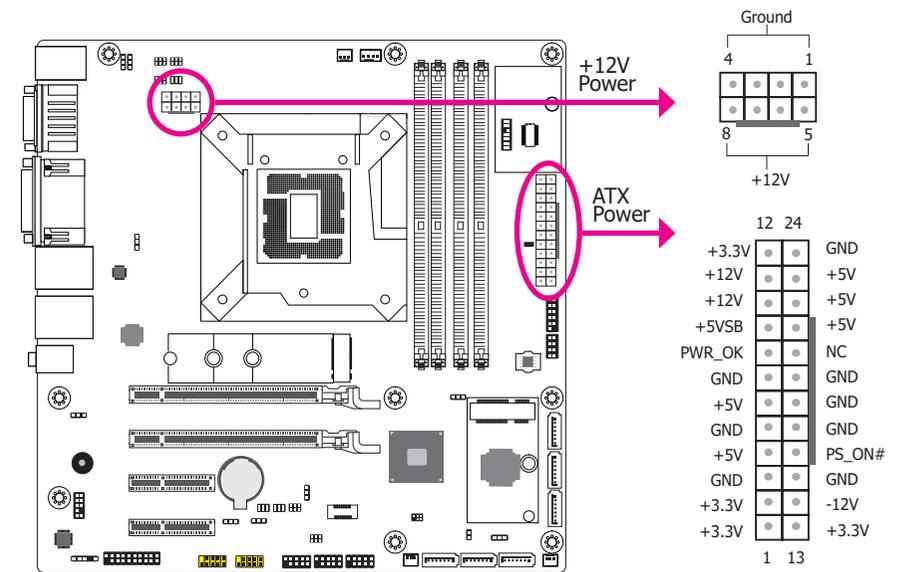
Pins	Pin Assignment	Pins	Pin Assignment
1	GND	2	+12V
3	DIO7	4	+12V
5	DIO6	6	GND
7	DIO5	8	+5V
9	DIO4	10	+5V
11	DIO3	12	GND
13	DIO2	14	+5V <sub>DU</sub>
15	DIO1	16	+5V <sub>DU</sub>
17	DIO0	18	GND
19	GND	20	---

## Cooling Fan Connectors



These fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

## Power Connectors



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

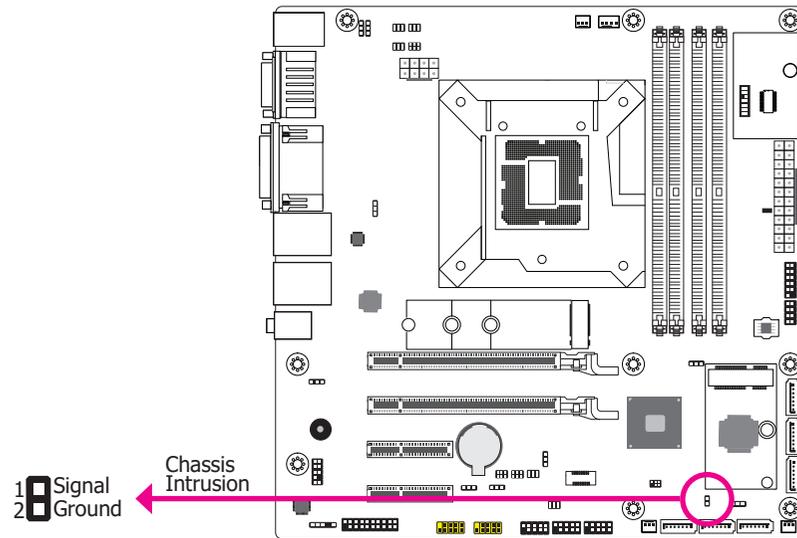
The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.



### Important:

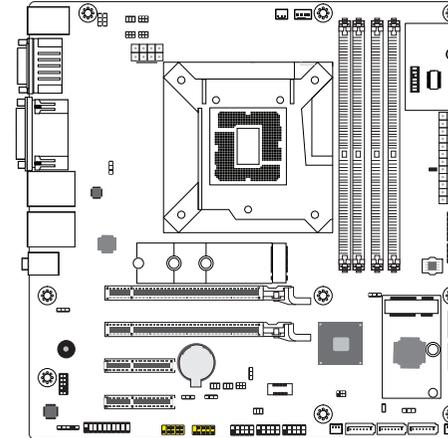
Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

## Chassis Intrusion Connector



The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will sound only when the system restarts.

## Front Panel Connector



### HDD-LED - Hard Disk Drive LED

Lighting of the LED indicates that the hard drive is being accessed.

### RESET - Reset Switch

This switch allows you to reboot without having to power off the system.

### PWR-LED - Power/Standby LED

When the system's power is on, this LED will light up. When the system is in the S1 (POS - Power On Suspend) state, it will blink at 1-second intervals. When the system is in the S3 (STR - Suspend To RAM) state, it will blink at 4-second intervals.

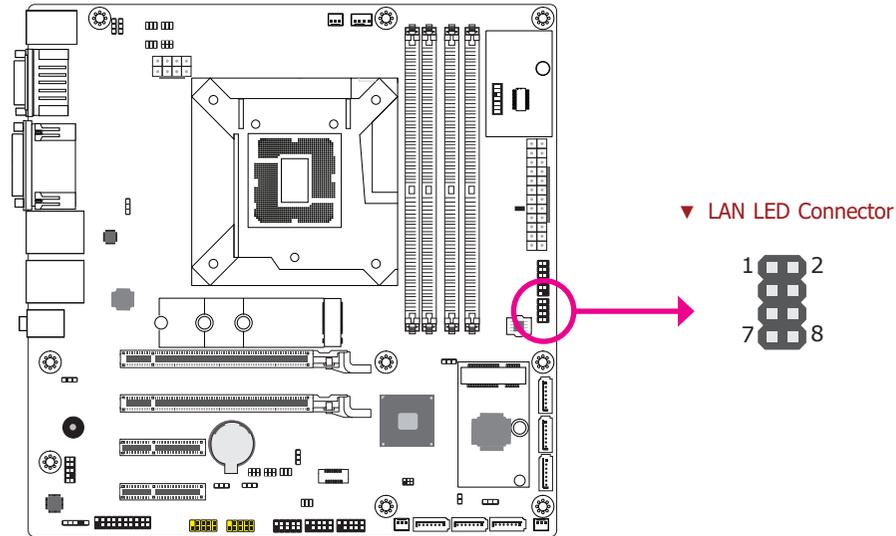
### ATX-SW - ATX Power Switch

This switch is used to power on or off the system.

## Front Panel Pin Assignment

	Pins	Assignment		Pins	Assignment
	1	N.C.	HDD-LED	2	LED Power
	3	HDD Power		4	LED Power
	5	Signal		6	Signal
RESET	7	Ground	ATX-SW	8	Ground
	9	Signal		10	Signal
	11	N.C.		12	---

## LAN LED Connector

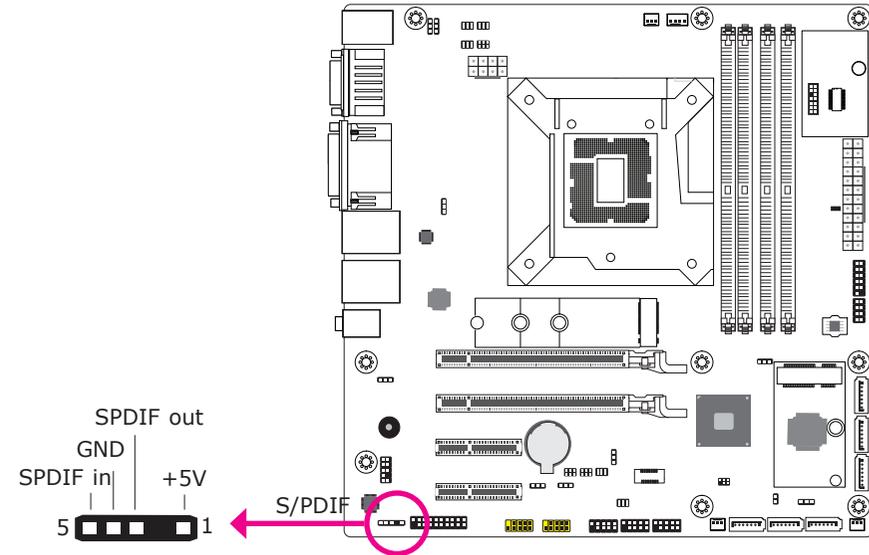


The LAN LED connector is used to detect the connection state of RJ45 LAN ports when the connection is made to an active network via a cable. The pin functions of the LAN LED connector are listed below.

### LAN LED Pin Assignment

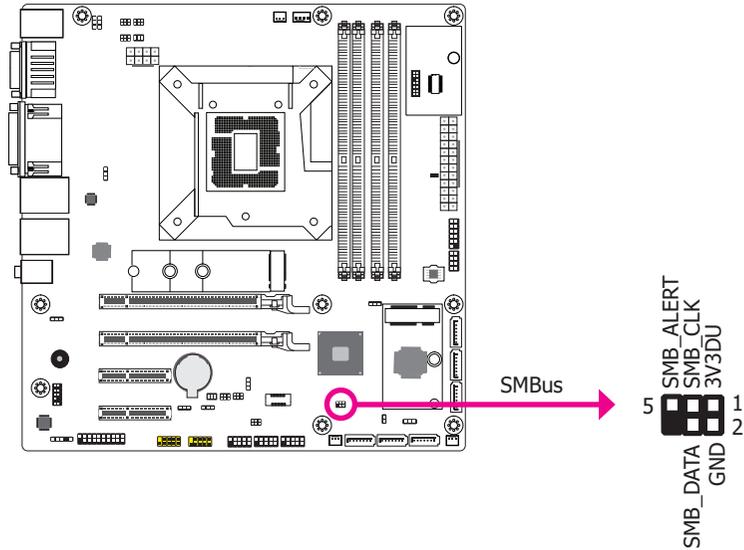
Pins	Assignment	Pins	Assignment
1	GBE_1000-	2	GBE_LED_100-
3	GBE_LED_LINK_ACT-	4	3V3DU
5	LINK_1000_4	6	LINK_100_4
7	LINK_ACTIVITY_4	8	3V3DU

## S/PDIF Connector



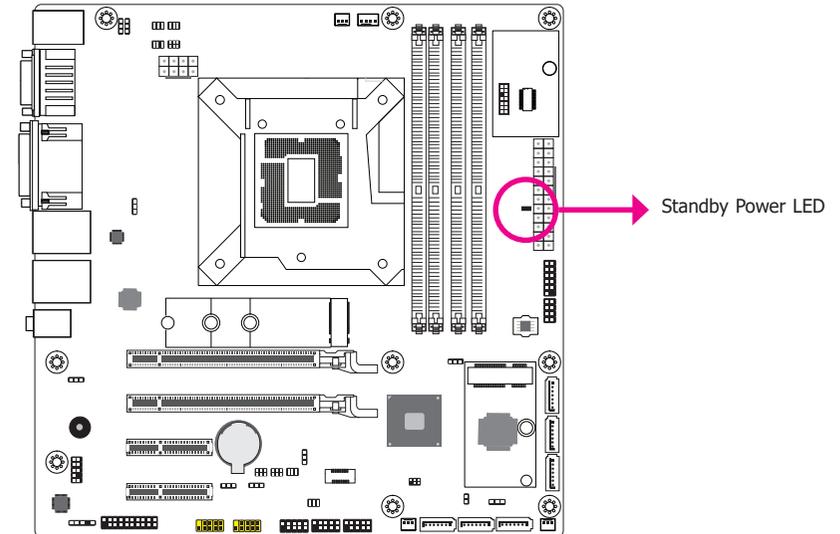
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

## SMBus Connector



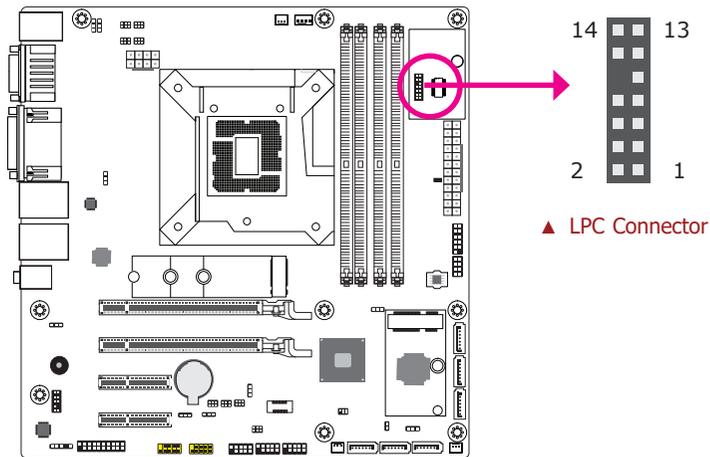
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

## Standby Power LED



This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

## LPC Connector



▲ LPC Connector

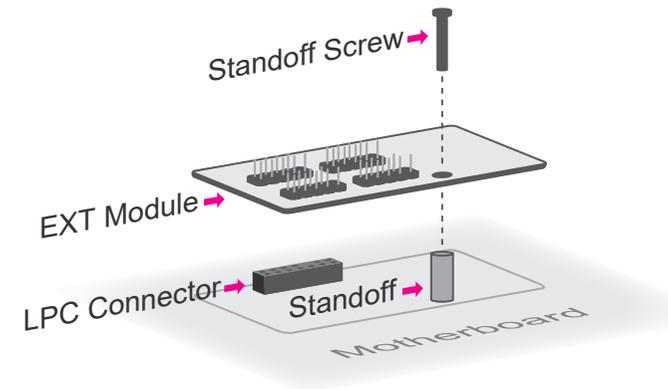
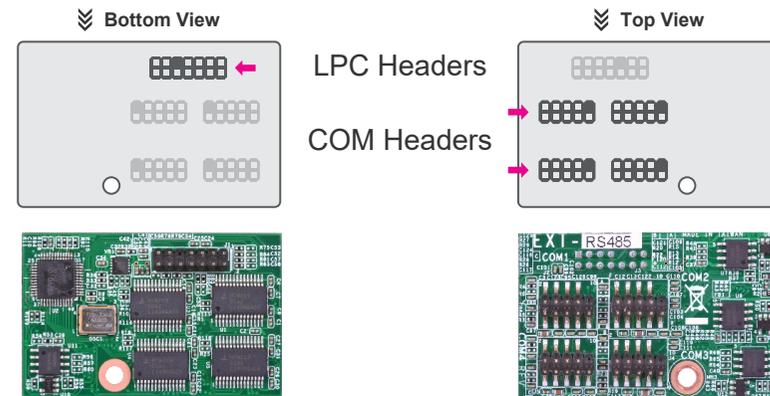
The Low Pin Count Interface was defined by Intel® Corporation to facilitate the industry's transition towards legacy free systems. It allows the integration of low-bandwidth legacy I/O components within the system, which are typically provided by a Super I/O controller. Furthermore, it can be used to interface firmware hubs, Trusted Platform Module (TPM) devices and embedded controller solutions. Data transfer on the LPC bus is implemented over a 4 bit serialized data interface, which uses a 33MHz LPC bus clock. For more information about LPC bus refer to the Intel® Low Pin Count Interface Specification Revision 1.1'. The table below indicates the pin functions of the LPC connector.

### LPC Pin Assignment

Pins	Assignment	Pins	Assignment
1	CLK	2	LAD1
3	RST#	4	LAD0
5	FRAME#	6	3V3
7	LAD3	8	GND
9	LAD2	10	---
11	INT_SERIRQ	12	GND
13	5VDU	14	5V

## External COM Port Module

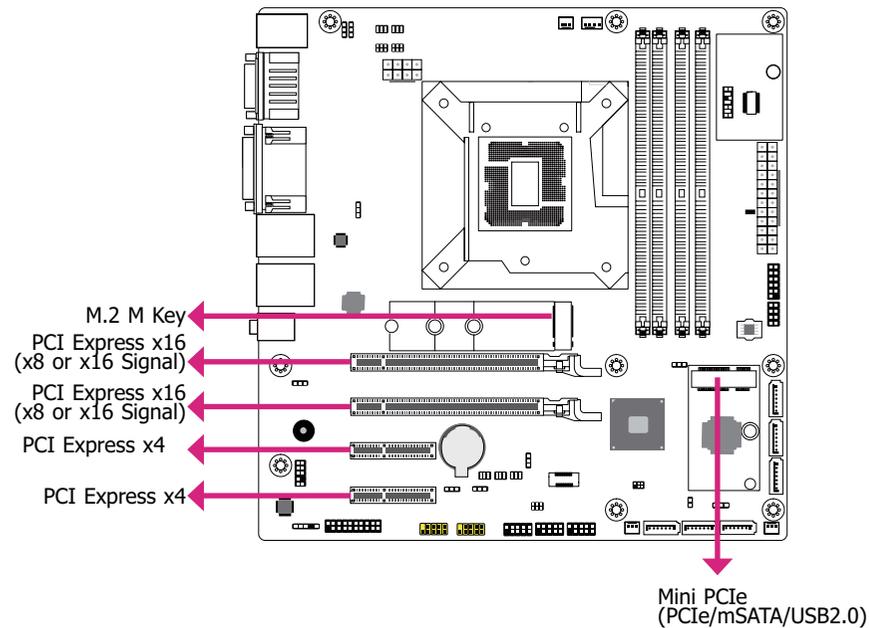
The external COM port modules — EXT-RS232 and EXT-RS485 — are designed by DFI's proprietary technology, and support four additional COM ports per module. The EXT-RS232/RS485 card is connected to the motherboard via the LPC connector and secured by a standoff as illustrated below.



**Note:**

The EXT-RS232/RS485 modules are optional peripherals that are not included in the standard package. For more information, please contact DFI sales representatives or visit [go.dfi.com/EXT-RS232](http://go.dfi.com/EXT-RS232), and [go.dfi.com/EXT-RS485](http://go.dfi.com/EXT-RS485).

## Expansion Slots



### M.2 (M Key) Socket

The M.2 socket is the Next Generation Form Factor (NGFF) which is designed to support multiple modules and make the M.2 more suitable in application for solid-state storage.

### PCI Express x16 Slot

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place.

### PCI Express x4 Slot

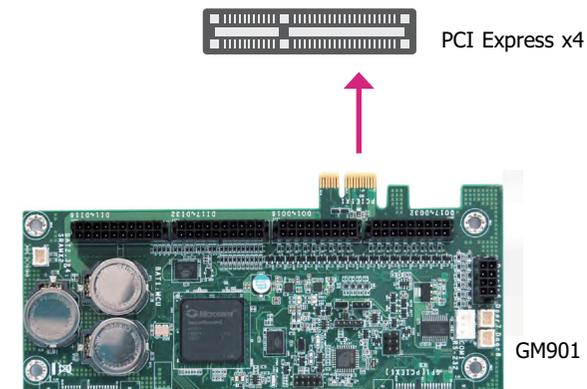
Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

### Mini PCIe Socket

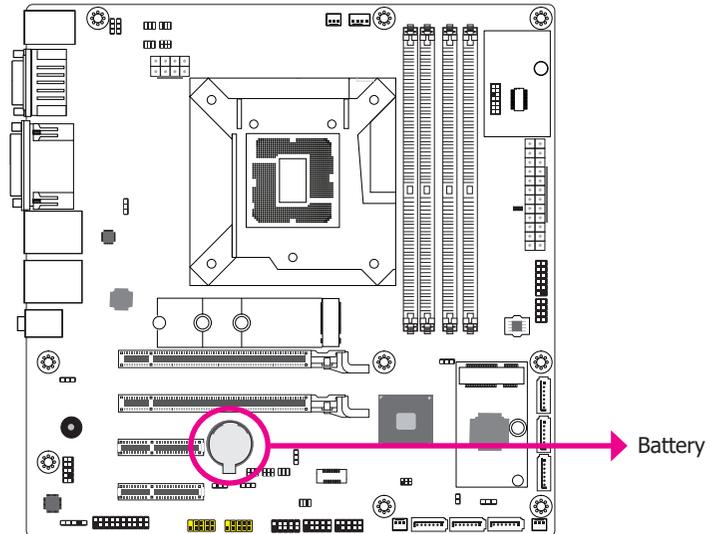
The full-size Mini PCIe socket supports USB/Mini PCIe/mSATA signals and is used to install a Mini PCIe card. Mini PCIe and mSATA signals can be switched with the jumper JP9.

## Gaming I/O Board - GM901

The GM901 card is connected to the motherboard via the PCI Express x4 Slot.



## Battery



The lithium ion battery addendum supplies power to the real-time clock and CMOS memory as an auxiliary source of power when the main power is shut off.

### Safety Measures

- There exists explosion hazard if the battery is incorrectly installed.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to local ordinances.

## Chapter 7 - Mounting



**Note:**

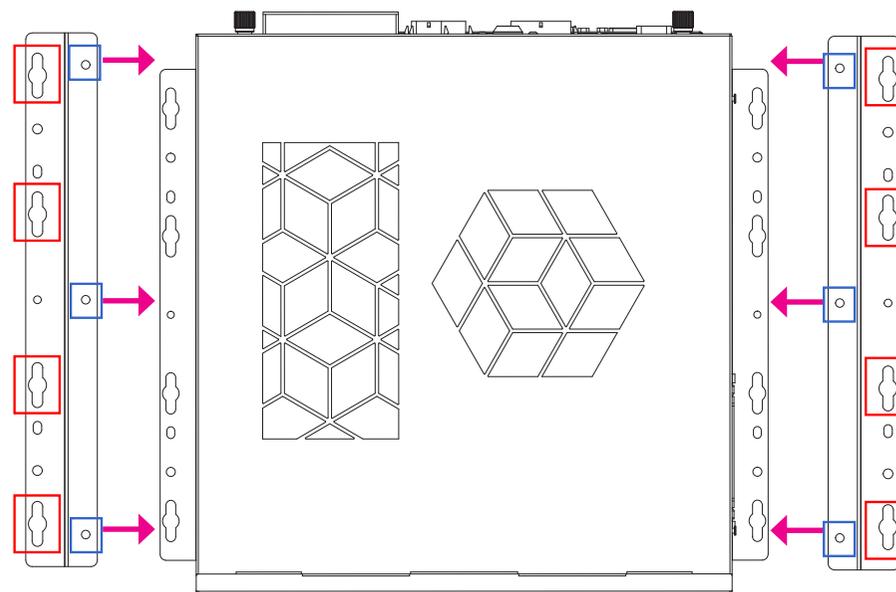
The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

### Wall Mount

The system has screw holes on the bottom of the chassis to support wall mount.

1. Screw 2 mount rails (Blue part) into the holes on the bottom part of GM831-CSF.
2. Drill 8 holes in the wall and insert screw bolts into the holes (Red part).
3. Drill the screws into the screw anchors.
4. Hang the device on the wall.

The diagram on the right shows the screw holes and dimensions of wall mount (in millimeter).



## Chapter 8 - BIOS Setup

### ► Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.



#### Note:

The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

### Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

### Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

### Legends

Keys	Function
<b>Right / Left arrow</b>	Move the highlight left or right to select a menu
<b>Up / Down arrow</b>	Move the highlight up or down between submenus or fields
<b>&lt;Enter&gt;</b>	Enter the highlighted submenu
<b>+ (plus key)</b>	Scroll forward through the values or options of the highlighted field
<b>- (minus key)</b>	Scroll backward through the values or options of the highlighted field
<b>&lt;F1&gt;</b>	Display general help
<b>&lt;F2&gt;</b>	Display previous values
<b>&lt;F9&gt;</b>	Optimized defaults
<b>&lt;F10&gt;</b>	Save and reset the setup program
<b>&lt;Esc&gt;</b>	Exit to the BIOS Setup Utility

### Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

### Submenu

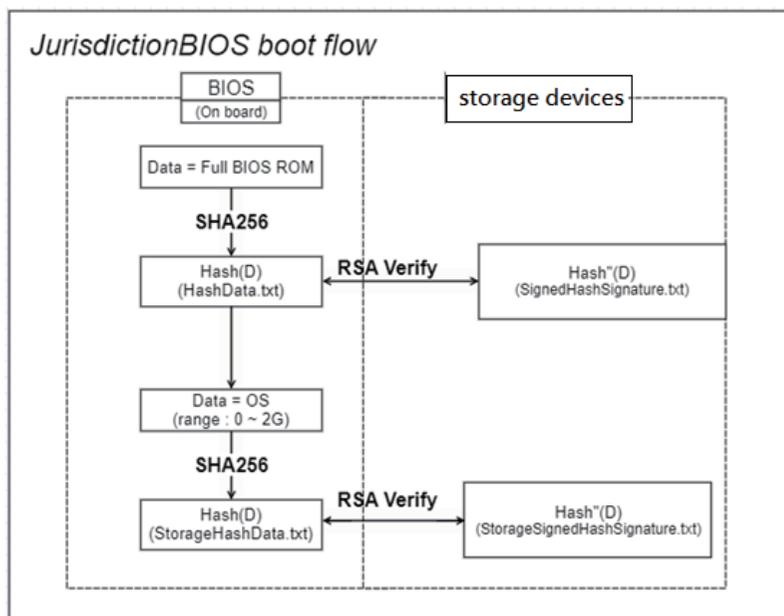
When "►" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

► **Introduction**

DFI's "Jurisdiction BIOS" technology is a gaming-oriented security boot which can prevent from unauthorized logging in the system and is verified by GLI as a

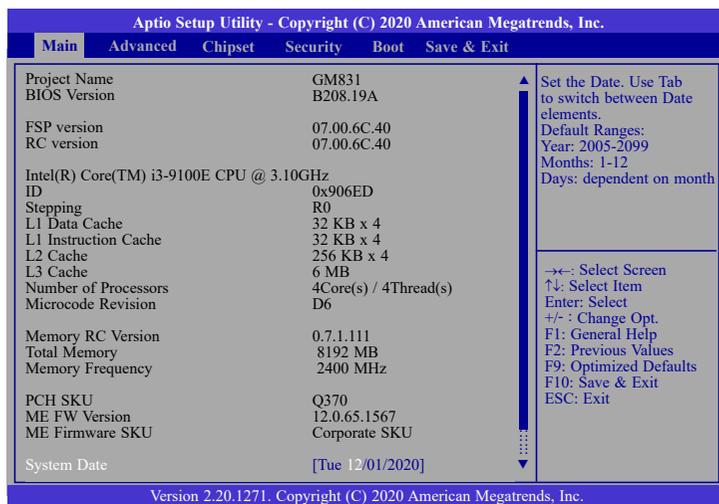
valid security mechanism. Jurisdiction BIOS implements a hash and public key mechanism to verify the integrity of BIOS and storage media device. Pls refer to the following boot flow of Jurisdiction BIOS.

GLI File Number: CS-00-DFF-18-01



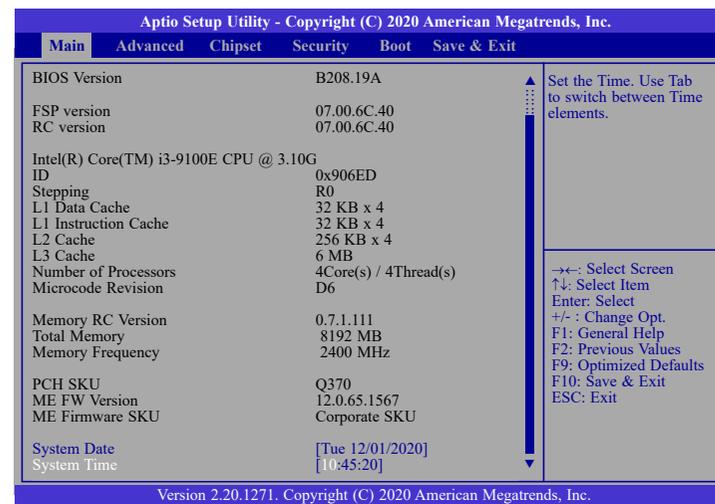
## ► Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



### System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from 01 to 12. Date displays the date, from 01 to 31. Year displays the year, from 2005 to 2099.



### System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

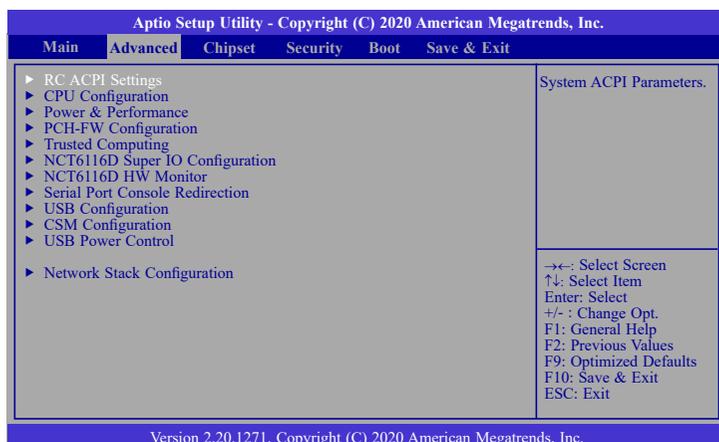
## ► Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.



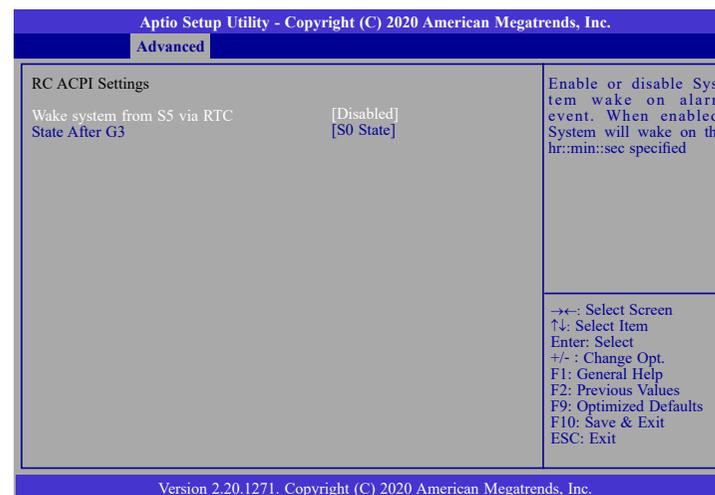
### Important:

Setting incorrect field values may cause the system to malfunction.



## RC ACPI Settings

This section is used to configure the system ACPI parameters.



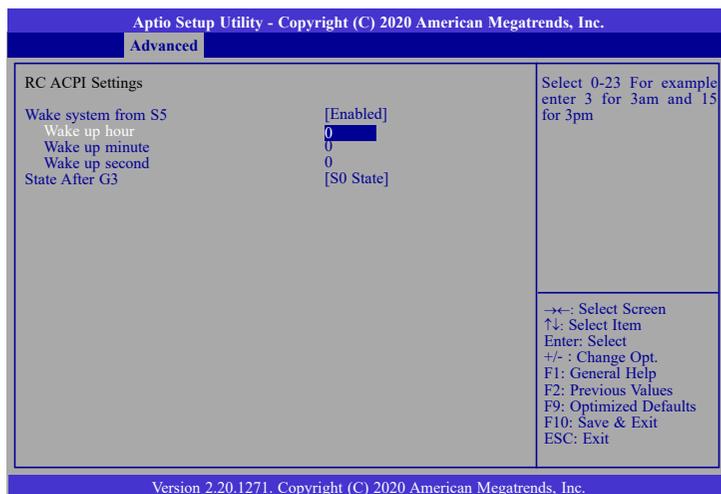
### Wake system from S5 via RTC

When Enabled, the system will automatically power up at a designated time every day from the Real-time clock (RTC) battery. More settings will be displayed once it's switched to [Enabled] as detailed in the next page.

### State After G3

Select between S0 State, Last State, and S5 State. This field is used to specify what state the system is set to return to when power is re-applied after a power failure (G3 state).

► **Advanced** ► **RC ACPI Settings**



**Wake up hour**

Select hour from 0 to 23.

**Wake up minute**

Select minute from 0 to 59.

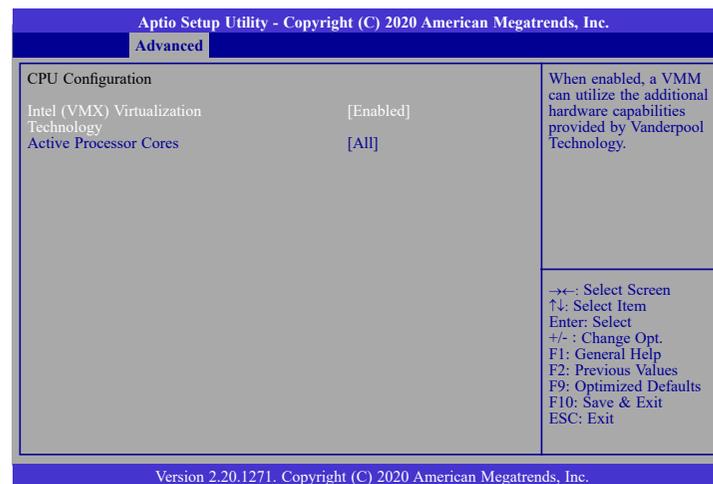
**Wake up second**

Select second from 0 to 59.

► **Advanced**

**CPU Configuration**

This section is used to configure the CPU.



**Intel (VMX) Virtualization Technology**

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

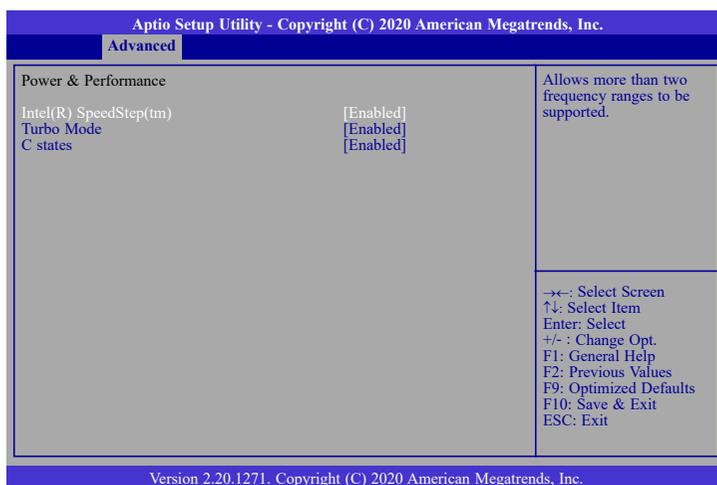
**Active Processor Cores**

Select number of cores to enable in each processor package.

► **Advanced**

**Power & Performance**

This section is used to configure the power & performance options.



**Intel(R) SpeedStep(tm)**

This field is used to enable or disable the Intel Enhanced SpeedStep Technology. If enabled, Turbo Mode will appear for configuration.

**Turbo Mode**

This field is used to enable or disable processor turbo mode (requires that Intel(R) SpeedStep(tm) is enabled too), which allows the processor core to automatically run faster than the base frequency when the processor’s power, temperature, and specification are within the limits of TDP.

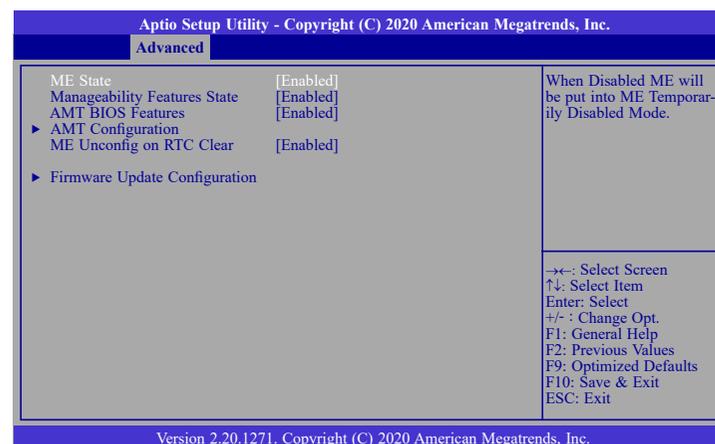
**C states**

Enable or disable CPU Power Management. It allows CPU to go to C states when it’s not 100% utilized.

► **Advanced**

**PCH-FW Configuration**

This section configures the parameters of Management Engine Technology.



**ME State**

When this field is set to Disabled, ME will be put into ME Temporarily Disabled Mode.

**Manageability Features State**

Enable or disable Intel(R) Manageability features. This option disables/enables Manageability Features support in FW. To disable, support platform must be in an unprovisioned state first.

**AMT BIOS Features**

When disabled, AMT BIOS features are no longer supported and user is no longer able to access MEBx Setup. This option does not disable manageability features in FW.

**AMT Configuration**

This section is used to configure Intel(R) Active Management Technology Parameters.

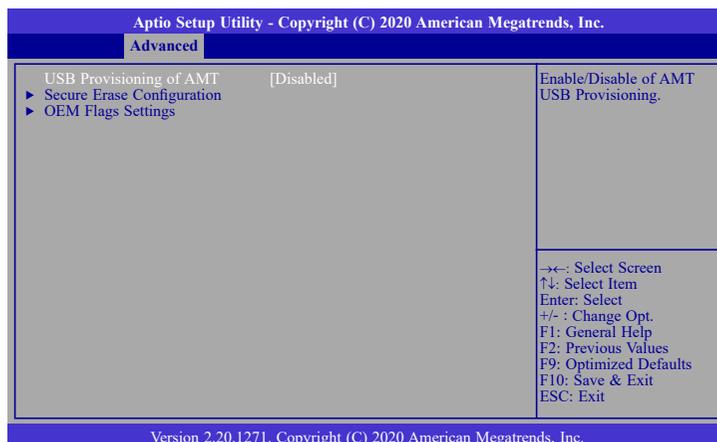
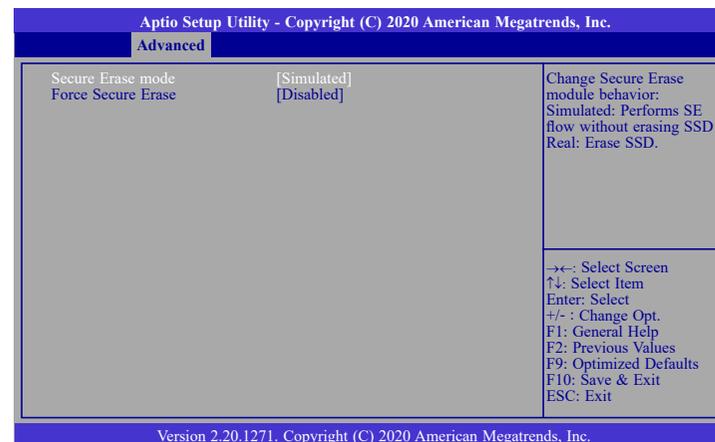
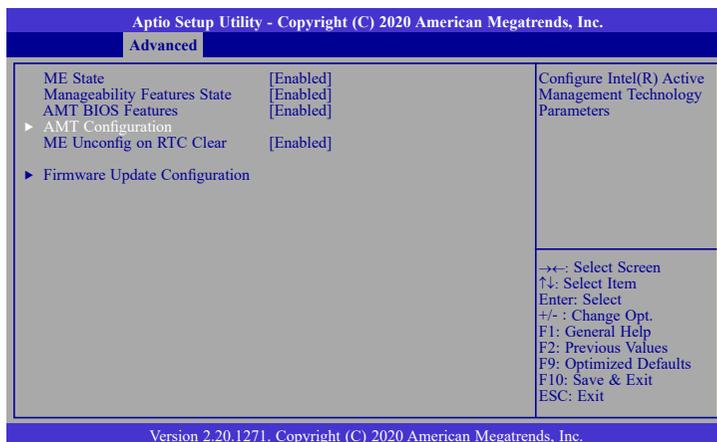
**ME Unconfig on RTC Clear**

When disabled, ME will not be unconfigured on RTC Clear.

**Firmware Update Configuration**

This section is used to configure Management Engine Technology Parameters.

► **Advanced** ► **PCH-FW Configuration**



**USB Provisioning of AMT**

Enable or disable AMT USB Provisioning.

**Secure Erase Configuration**

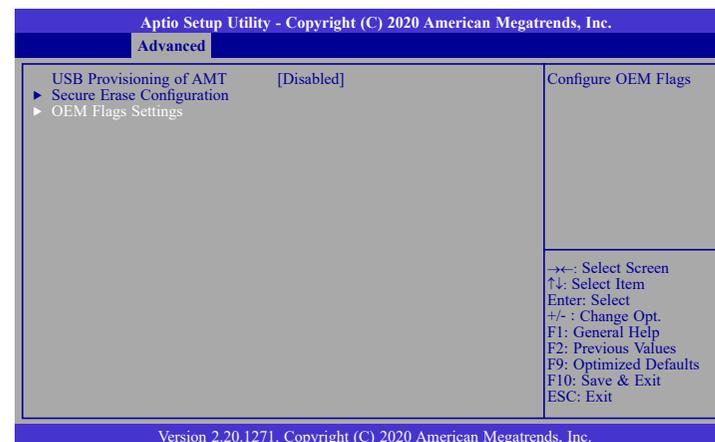
This section is used to configure Secure Erase.

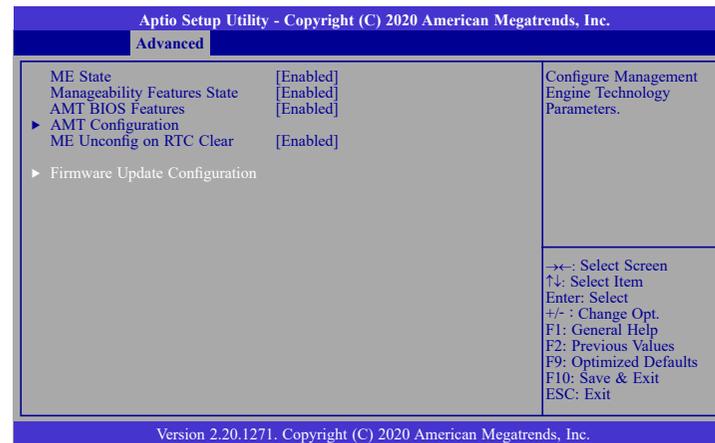
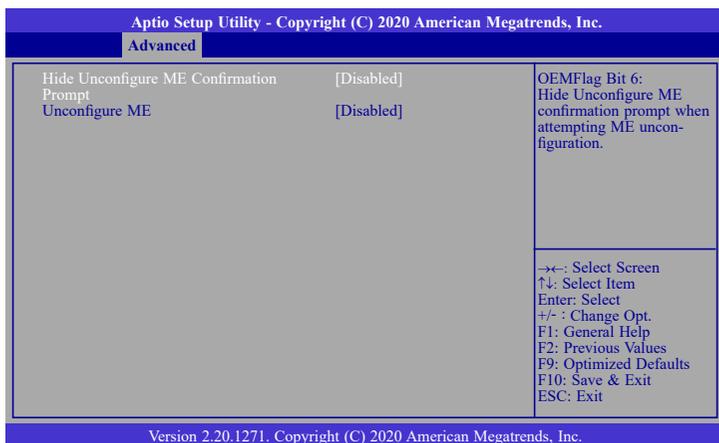
**Secure Erase Mode**

Select Secure Erase module behavior: Simulated or Real.

**Force Secure Erase**

Enable or disable Force Secure Erase on next boot.





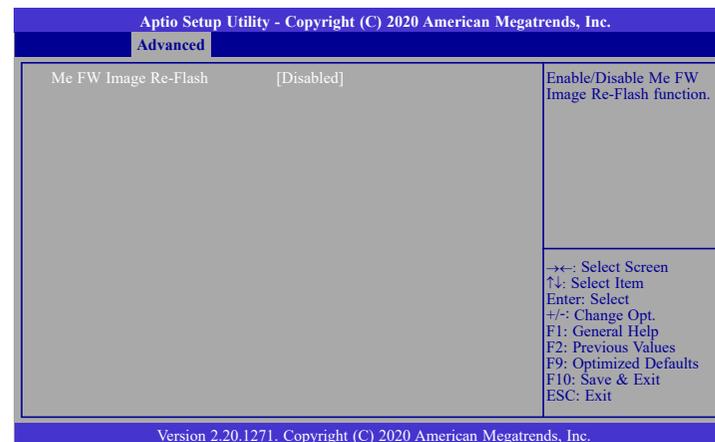
### OEM Flags Settings-

#### Hide Unconfigure ME Confirmation Prompt

Enable or disable to hide unconfigure ME confirmation prompt when attempting ME unconfiguration.

#### Unconfigure ME

Enable or disable to unconfigure ME with resetting MEBx password to default.



### Firmware Update Configuration-

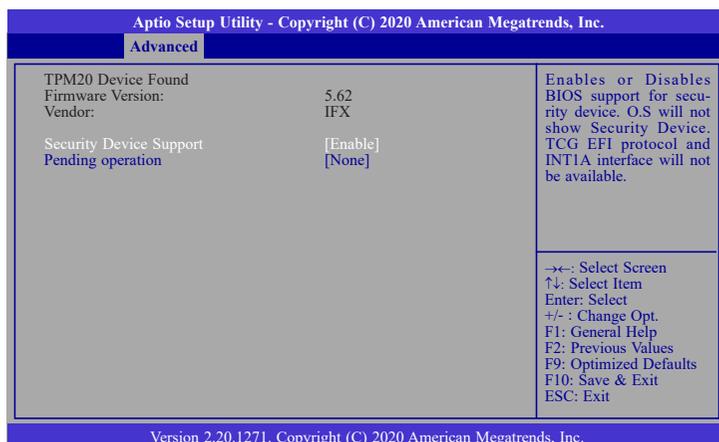
#### Me FW Image Re-Flash

This field is used to enable or disable the Me FW Image Re-Flash function.

► **Advanced**

### Trusted Computing

This section configures settings relevant to Trusted Computing innovations.



#### Security Device Support

This field is used to enable or disable BIOS support for the security device. O.S will not show the security device. TCG EFI protocol and INT1A interface will not be available.

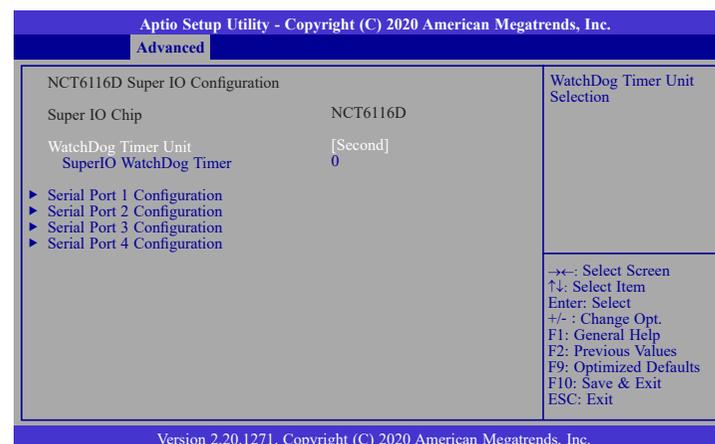
#### Pending operation

To clear the existing TPM encryption, select "TPM Clear" and restart the system. This field is not available when "Security Device Support" is disabled.

► **Advanced**

### NCT6116D Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.



#### WatchDog Timer Unit

Select WatchDog Timer Unit: Second or Minute.

#### SuperIO WatchDog Timer

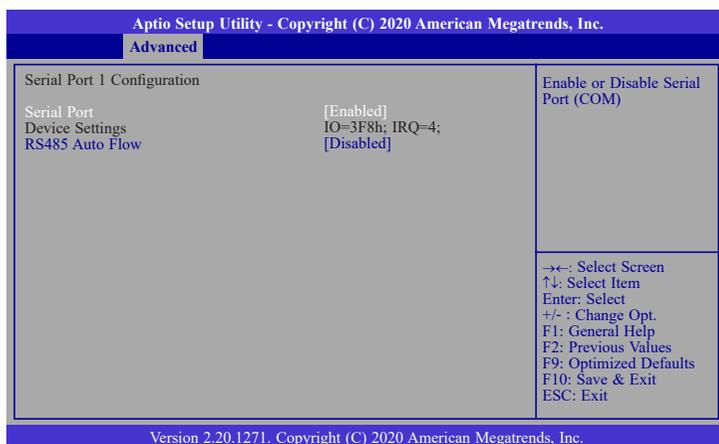
Set SuperIO WatchDog Timer Timeout value. The range is from 0 (disabled) to 255.

#### Serial Port 1 Configuration to Serial Port 4 Configuration

Set the parameters of serial port 1 (COM 1) to serial port 4 (COM 4).

### Serial Port 1 to 4 Configuration

Set the parameters of serial port 1 (COM 1) to serial port 4 (COM 4).



### Serial Port

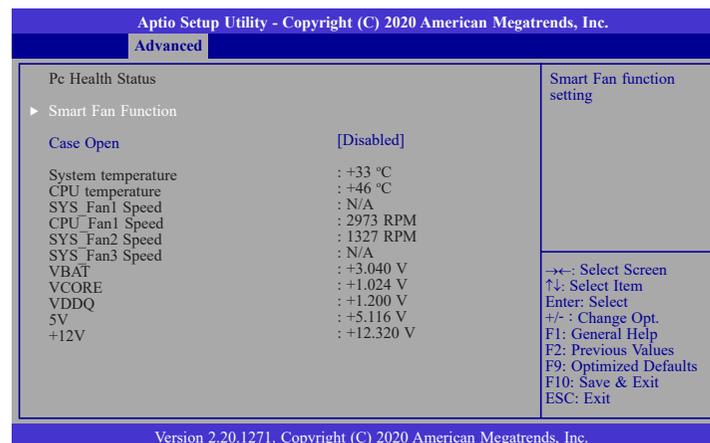
Enable or disable the serial COM port.

### RS485 Auto Flow

Enable or disable RS485 auto flow. This field is only available for COM ports that support RS485 mode.

### NCT6116D HW Monitor

This section displays the hardware health monitor and also configures smart fan and case open functions. Multiple aspects of the real-time physical status of the board are displayed.

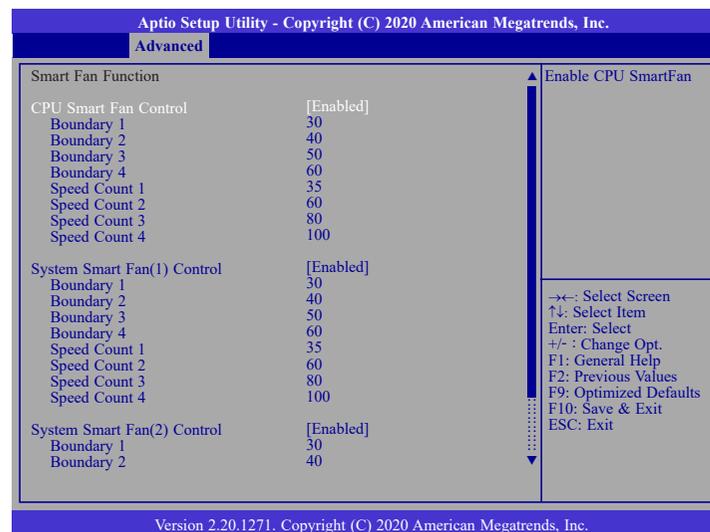


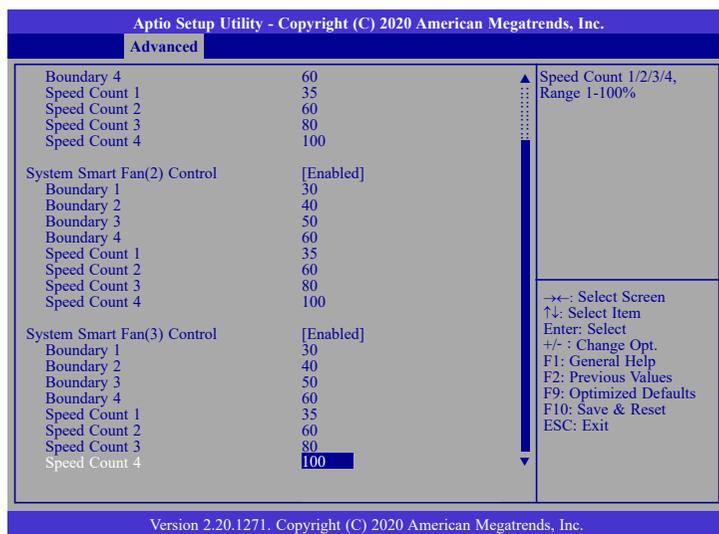
### Smart Fan Function

Press Enter to enter the sub-menu of Smart Fan Function as shown below.

### Case Open

Enable or disable the case open detection function.





### CPU Smart Fan, System Smart Fan(1)/(2)/(3) Control

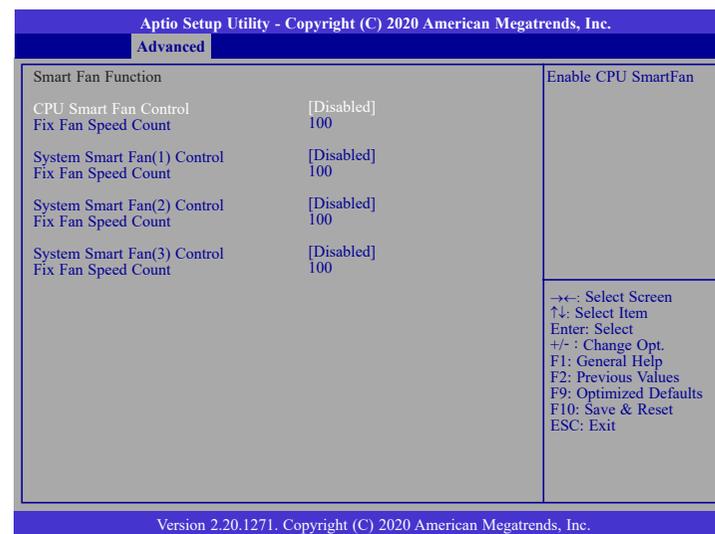
Enable or disable the CPU smart fan and system smart fan(1)/(2)/(3).

#### Boundary 1 to Boundary 4

Set the boundary temperatures that determine the operation of the fan with different fan speeds accordingly. For example, when the system or the CPU temperature reaches boundary temperature 1, the system or CPU fan should be turned on and operate at the designated speed. The range is from 0-127°C.

#### Speed Count 1 to Speed Count 4

Set the fan speed. The range is from 1-100% (full speed).



By disabling CPU Smart Fan Control, System Smart Fan(1)/(2)/(3) Control, the fan will be operating at a fixed rate configurable in the field "Fix Fan Speed Count".

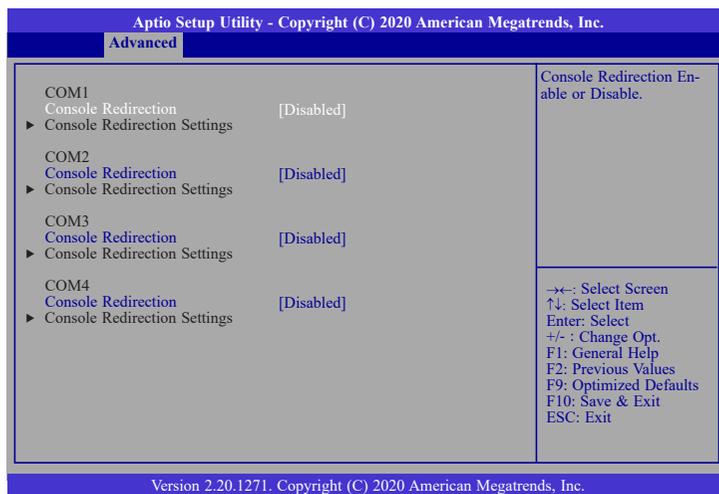
#### Fix Fan Speed Count

Set the fix fan speed. The range is from 1-100% (full speed).

► **Advanced**

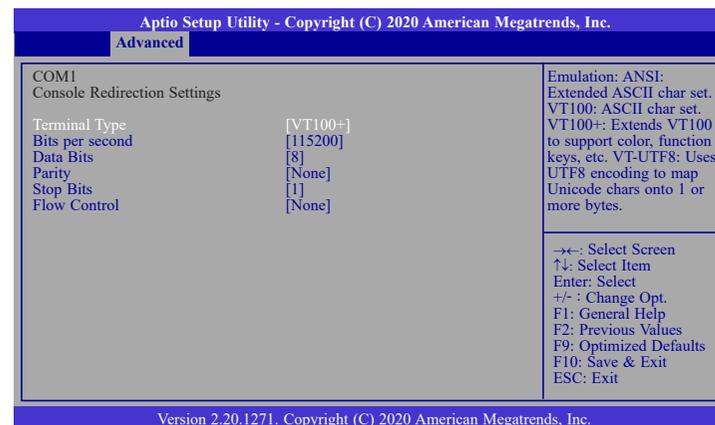
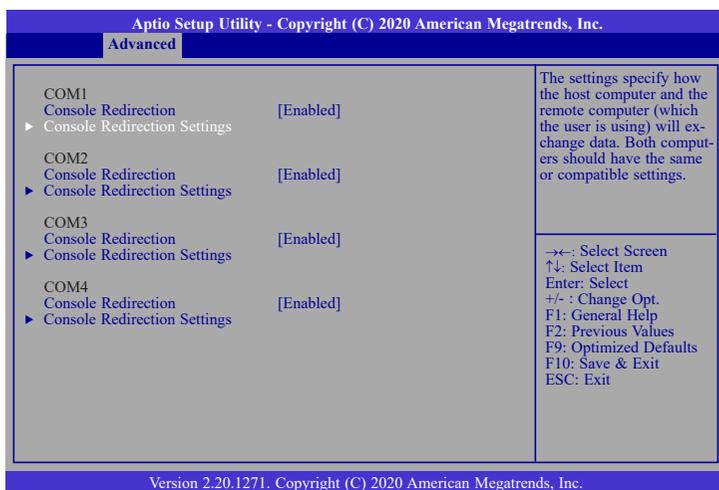
## Serial Port Console Redirection

This section configures settings relevant to serial port console redirection.



### Console Redirection

By enabling Console Redirection of a COM port, the sub-menu of console redirection settings will become available for configuration as shown below.



### Terminal Type

Select terminal type: VT100, VT100+, VT-UTF8 or ANSI.

### Bits per second

Select serial port transmission speed: 9600, 19200, 38400, 57600 or 115200.

### Data Bits

Select data bits: 7 bits or 8 bits.

### Parity

Select parity bits: None, Even, Odd, Mark or Space.

### Stop Bits

Select stop bits: 1 bit or 2 bits.

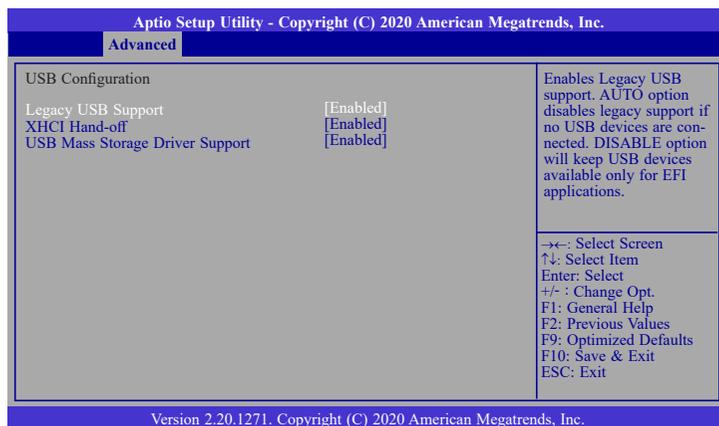
### Flow Control

Select flow control type: None or Hardware RTS/CTS.

► **Advanced**

## USB Configuration

This section is used to configure the USB settings.



### Legacy USB Support

- Enabled      Enable Legacy USB support.
- Disabled     Keep USB devices available only for EFI applications.
- Auto        Disable Legacy support if no USB devices are connected.

### XHCI Hand-off

Enable or disable XHCI Hand-off.

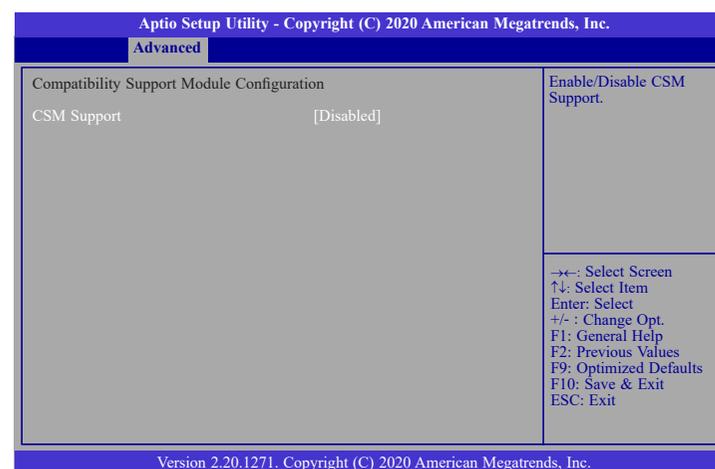
### USB Mass Storage Driver Support

Enable or disable USB Mass Storage Driver Support.

► **Advanced**

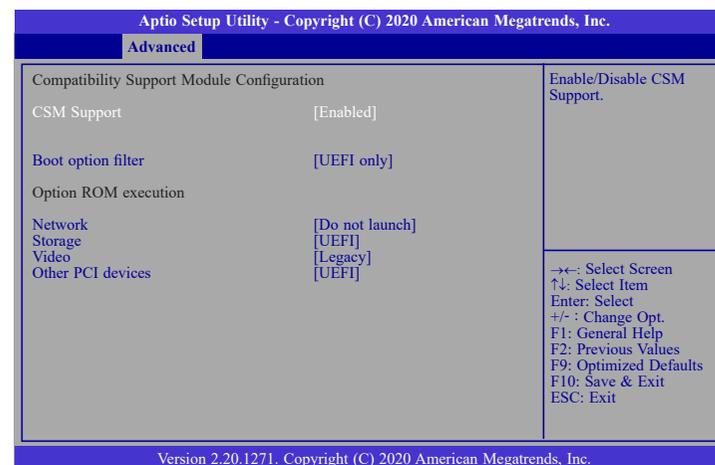
## CSM Configuration

This section is used to configure the CSM settings.



### CSM Support

This section is used to enable or disable CSM Support. When CSM Support is set to enabled, several options will appear for configuration.



► **Advanced** ► **CSM Configuration**

**Boot option filter**

This field controls Legacy/UEFI ROMs priority.

**Network**

This field controls the execution of UEFI and Legacy Network OpROM.

**Storage**

This field controls the execution of UEFI and Legacy Storage OpROM.

**Video**

This field controls the execution of UEFI and Legacy Video OpROM.

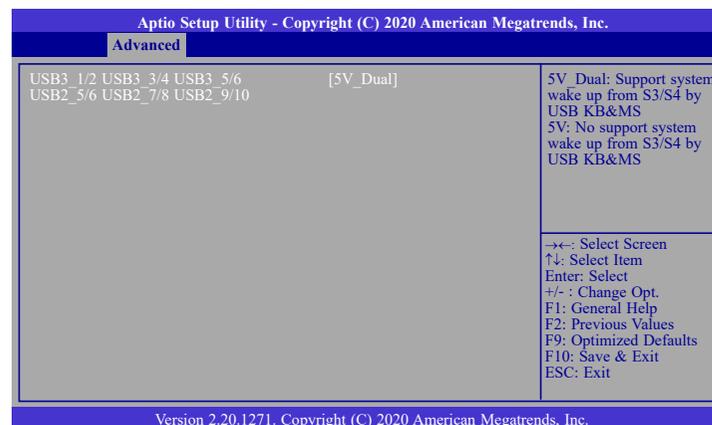
**Other PCI devices**

This field determines OpROM execution policy for devices other than Network, Storage or Video.

► **Advanced**

**USB Power Control**

USB 3.0 ports (USB 1-6) and USB 2.0 ports (USB 5-10) support system wakeup from S3 or S4 state via keyboard and mouse signal input. To enable S3/S4 wakeup, select 5V\_Dual. To disable S3/S4 wakeup, select 5V.



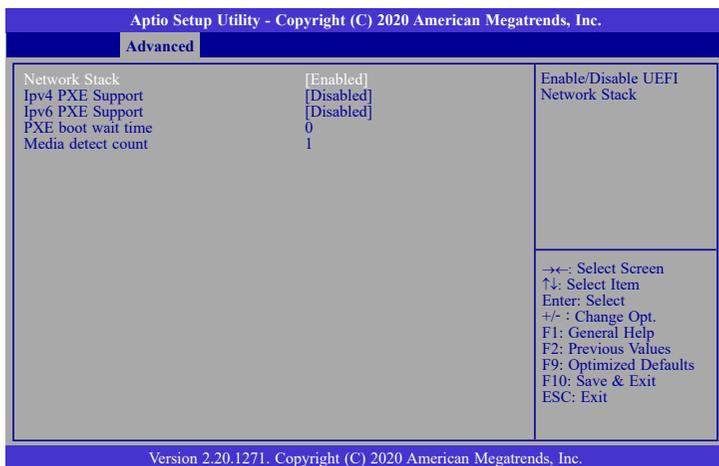
► **Advanced**

**Network Stack Configuration**

This section is used to configure the Network Stack settings.

**Network Stack**

This section is used to enable or disable UEFI network stack. When Network Stack is set to enabled, several options will appear for configuration.



**Ipv4 PXE Support**

Enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

**Ipv6 PXE Support**

Enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

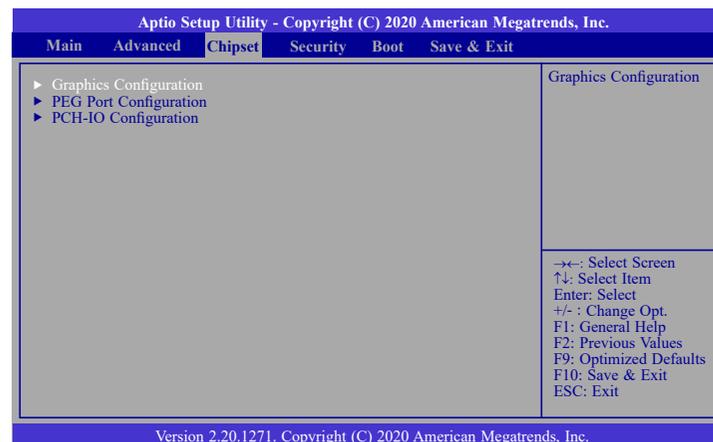
**PXE boot wait time**

Set the wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

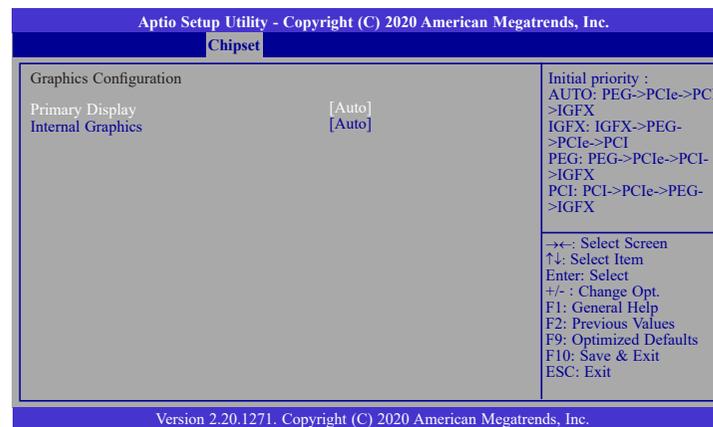
**Media detect count**

Set the number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

► **Chipset**



**Graphics Configuration**



**Primary Display**

Select which of IGFX/PEG/PCI Graphics device to be the primary display.

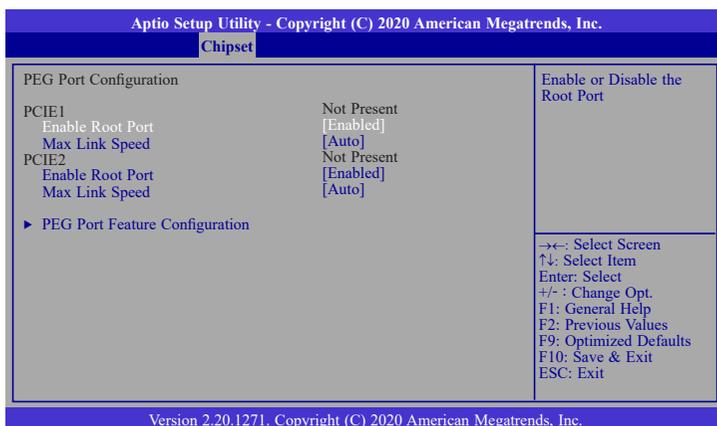
**Internal Graphics**

Keep IGFX enabled based on the setup options.

► **Chipset**

**PEG Port Configuration**

This section configures the PCIe Graphics (PEG) function available for PCIE1 and PCIE2.



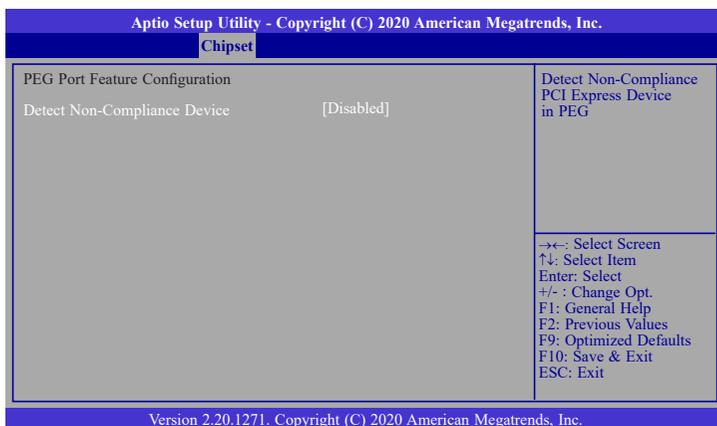
**Enable Root Port**

Enable or disable the root port.

**Max Link Speed**

Configure PCIE1/PCIE2 port's Max Speed: Auto, Gen1, Gen2 or Gen3.

► **PEG Port Feature Configuration**



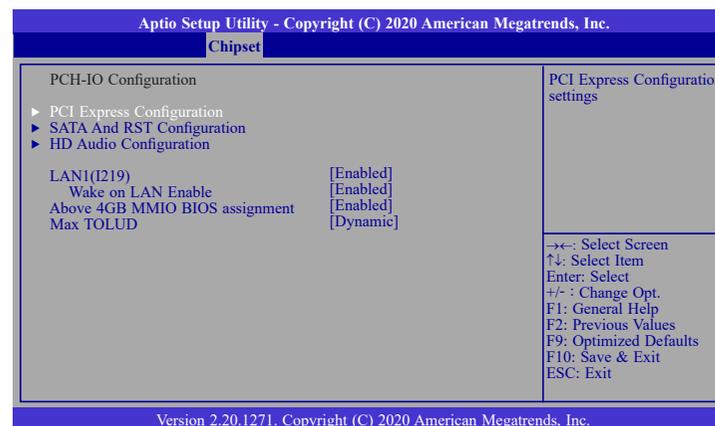
**Detect Non-Compliance Device**

Enable or disable function of detecting non-compliant devices.

► **Chipset**

**PCH-IO Configuration**

This section illustrates the PCH parameters.



**PCI Express Configuration**

This section configures PCI Express settings. Refer to following sections for more information.

**SATA And RST Configuration**

This section configures SATA Device Options settings. Refer to following sections for more information.

**HD Audio Configuration**

This section configures HD Audio Subsystem settings. Refer to following sections more information.

**LAN1(I219)**

Enable or disable onboard NIC.

**Wake on LAN Enable**

Enable or disable integrated LAN to wake the system.

**Above 4GB MMIO BIOS assignment**

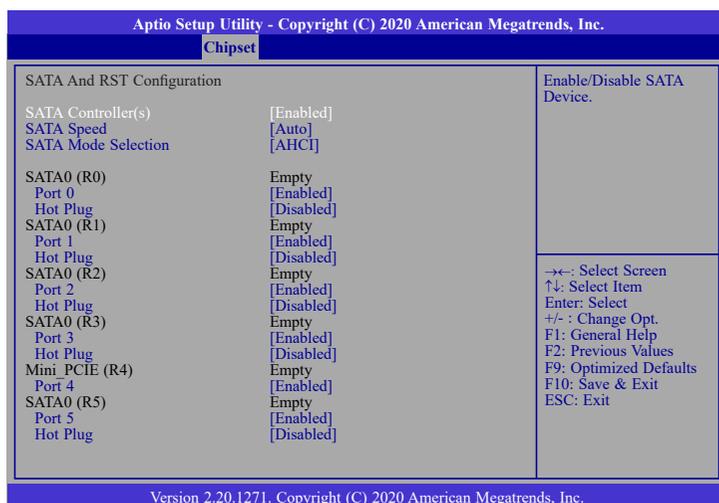
Switch MemoryMappedIO BIOS assignment above 4GB.

**Max TOLUD**

Assign a value or set "Dynamic" to automatically adjust TOLUD based on largest MMIO length.



► Chipset ► PCH-IO Configuration  
► **SATA And RST Configuration**



**SATA Controller(s)**

This field is used to enable or disable the Serial ATA controller.

**SATA Speed**

This field is used to select SATA speed generation limit: Auto, Gen1, Gen2 or Gen3.

**SATA Mode Selection**

The mode selection determines how the SATA controller(s) operates.

**AHCI** This option allows the Serial ATA controller(s) to use AHCI (Advanced Host Controller Interface).

**Intel** RST Premium With Intel Optane System Acceleration (for CS331-Q370 only) This option allows you to create RAID or Intel Rapid Storage configuration with Intel® Optane™ system acceleration on Serial ATA devices.

**Use RST Legacy OROM**

This field shows up when SATA Mode Selection is set to Intel RST Premium With Intel Optane System Acceleration. Enable or disable to use RST Legacy OROM when CSM is enabled.

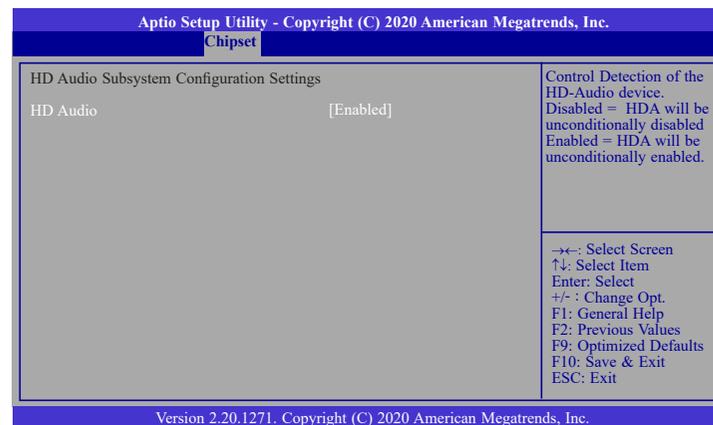
**Port 0/1/2/3/4/5 and Hot Plug**

Enable or disable the Serial ATA port and its hot plug function.

► Chipset ► PCH-IO Configuration

 **Note:**  
Number of SATA ports differ according to the chipset that is installed on the board, i.e. C246 or Q370.

► **HD Audio Configuration**



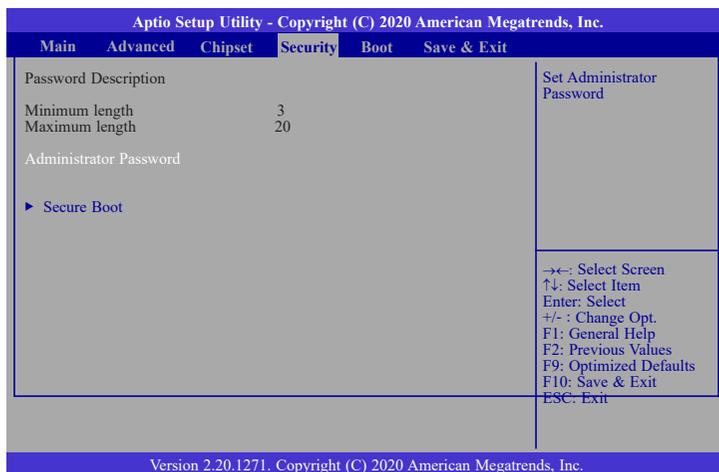
**HD Audio**

Control the detection of the HD Audio device.

Disabled      HDA will be unconditionally disabled.

Enabled        HDA will be unconditionally enabled.

## ► Security

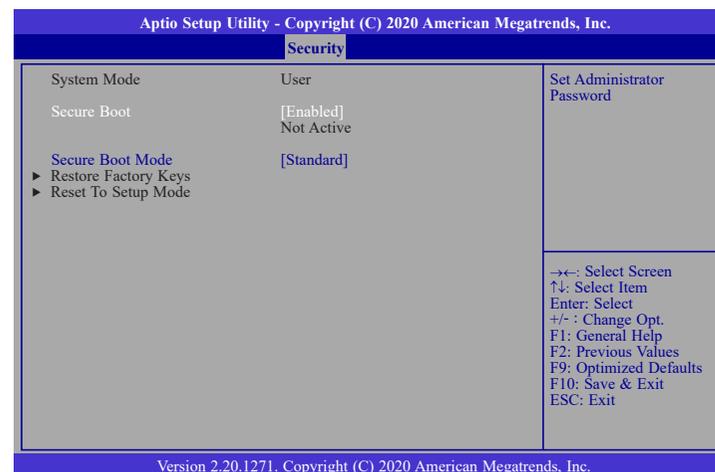


### Administrator Password

Set the administrator password. Input the password, press Enter, and then input the same character string again to confirm. To remove the password, input no character.

### Secure Boot

Secure Boot is used to verify that your boot loader is not tampered by malware.



### System Mode

This field displays whether the system is in User or Setup mode.

### Secure Boot

Enable or disable Secure Boot. Please reset the platform after changing the setting.

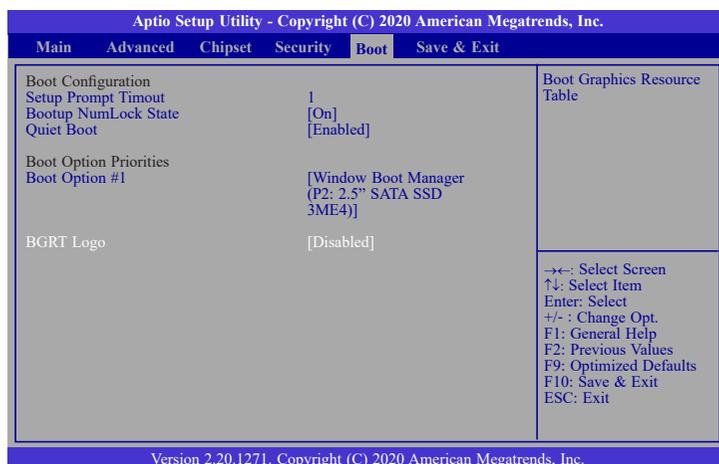
### Restore Factory Keys

Force System to User Mode and install factory default Secure Boot key databases.

### Return to Setup Mode

This command is only available when the system mode is in User mode and Secure Boot Mode is set to Custom.

## ► Boot



### Setup Prompt Timeout

Set the number of seconds to wait for the setup activation key. 65535 (0xFFFF) denotes indefinite waiting.

### Bootup NumLock State

Select the keyboard NumLock state: On or Off.

### Quiet Boot

This section is used to enable or disable quiet boot option.

### Boot Option Priorities

Select the system boot order.

### BGRT Logo

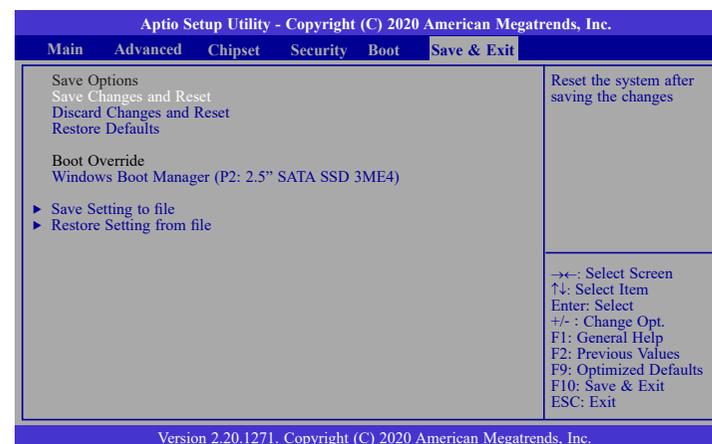
It is used to enable or disable to support display logo with ACPI BGRT table.



#### Note:

If "Boot option filter" of "CSM Configuration" is set to "UEFI and Legacy" or "UEFI only" and "Quiet Boot" is set to enabled, "BGRT Logo" will show up for configuration. Refer to the Advanced > CSM Configuration for more information.

## ► Save & Exit



### Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

### Discard Changes and Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

### Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values of all the setup options.

### Boot Override

Move the cursor to an available boot device and press Enter, and then the system will immediately boot from the selected boot device. The Boot Override function will only be effective for the current boot. The "Boot Option Priorities" configured in the Boot menu will not be changed.

### Save Setting to file

Select this option to save BIOS configuration settings to a USB flash device.

### Restore Setting from file

This field will appear only when a USB flash device is detected. Select this field to restore setting from the USB flash device.

### ► Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files. You may refer to the how-to video "How to update AMI BIOS in UEFI mode on DFI products?" at <https://www.dfi.com/Knowledge/Video/5> for updating the BIOS steps.

### ► Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.
2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.
3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.



**Note:**

- a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.
- b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.

## Chapter 9 - RAID

The system board allows configuring RAID on Serial ATA drives. It supports RAID 0, RAID 1, RAID 5 and RAID 10.

### ► RAID Levels

#### RAID 0 (Striped Disk Array without Fault Tolerance)

RAID 0 uses two new identical hard disk drives to read and write data in parallel, interleaved stacks. Data is divided into stripes and each stripe is written alternately between two disk drives. This improves the I/O performance of the drives at different channel; however it is not fault tolerant. A failed disk will result in data loss in the disk array.

#### RAID 1 (Mirroring Disk Array with Fault Tolerance)

RAID 1 copies and maintains an identical image of the data from one drive to the other drive. If a drive fails to function, the disk array management software directs all applications to the other drive since it contains a complete copy of the drive's data. This enhances data protection and increases fault tolerance to the entire system. Use two new drives or an existing drive and a new drive but the size of the new drive must be the same or larger than the existing drive.

#### RAID 5

RAID 5 stripes data and parity information across hard drives. It is fault tolerant and provides better hard drive performance and more storage capacity.

#### RAID 10 (Mirroring and Striping)

RAID 10 is a combination of data striping and data mirroring providing the benefits of both RAID 0 and RAID 1. Use four new drives or an existing drive and three new drives for this configuration.

RAID Level	Min. Drives	Protection	Description
RAID 0	2	None	Data striping without redundancy
RAID 1	2	Single Drive Failure	Disk mirroring
RAID 5	3	Single Drive Failure	Block-level data striping with distributed parity
RAID 10	4	1 Disk Per Mirrored Stripe (not same mirror)	Combination of RAID 0 (data striping) and RAID 1 (mirroring)

### ► Settings

To enable the RAID function, the steps below are required and elaborated in following sections.

1. Connect the Serial ATA drives.
2. Enable RAID in the AMI BIOS.
3. Create a RAID volume.
4. Install the Intel Rapid Storage Technology Utility.

#### Step 1: Connect the Serial ATA Drives

Refer to chapter 2 for details on connecting the Serial ATA drives.



#### Important:

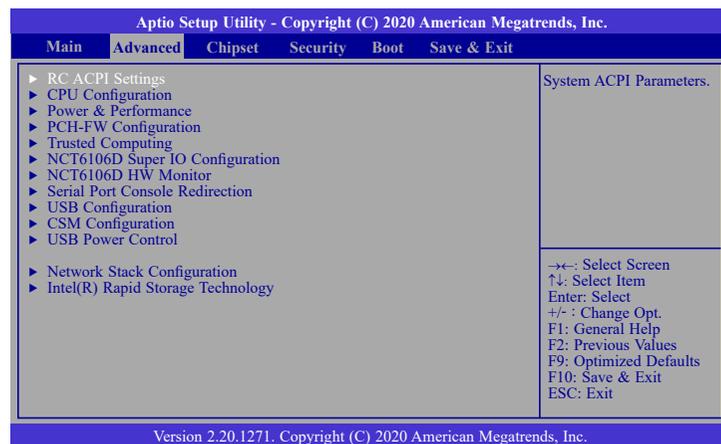
1. Make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.
2. Treat the cables with extreme caution especially while creating RAID. A damaged cable will ruin the entire installation process and operating system. The system will not boot and you will lose all data in the hard drives. Please give special attention to this warning because there is no way of recovering back the data.

#### Step 2: Enable RAID in the AMI BIOS

1. Power-on the system then press <Del> to enter the main menu of the AMI BIOS.
2. Go to "Chipset" menu and select the "PCH-IO Configuration" menu then "SATA And RST Configuration" menu.
3. Change the "SATA Mode Selection" to "Intel RST Premium With Intel Optane System Acceleration" mode.
4. Press F10 to save the changes.
5. Reboot the system.

### Step 3: Create a RAID Volume

1. Go to the "Advanced" menu of the AMI BIOS and select "Intel(R) Rapid Storage Technology".



2. The screen displays all available drives. Select "Create RAID volume" to create a RAID volume".
3. Use the up or down arrow keys to select the RAID level and press <Enter>.
4. Use the up or down arrow keys to scroll through the list of hard drives and press <Enter> to select the drive.
5. Press <Enter>.
6. Use the up or down arrow keys to select the strip size and press <Enter>.
7. Enter the volume size and press <Enter>.
8. At the prompt, press <Y> to confirm volume creation.

### Step 4: Install the Intel Rapid Storage Technology Utility

The Intel Rapid Storage Technology Utility can be installed from within Windows. It allows RAID volume management (create, delete, migrate) from within the operating system. It will also display useful SATA device and RAID volume information. The user interface, tray icon service and monitor service allow you to monitor the current status of the RAID volume and/or SATA drives. It enables enhanced performance and power management for the storage sub-system.

## Chapter 10 - Intel AMT Settings

### ► Overview

Intel Active Management Technology (Intel® AMT) combines hardware and software solution to provide maximum system defense and protection to networked systems.

The hardware and software information are stored in non-volatile memory. With its built-in manageability and latest security applications, Intel® AMT provides the following functions.

### Discover

Allows remote access and management of networked systems even while PCs are powered off; significantly reducing desk-side visits.

### Repair

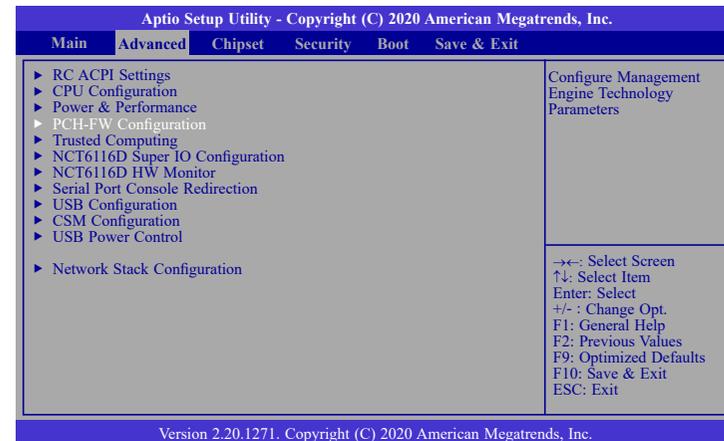
Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

### Protect

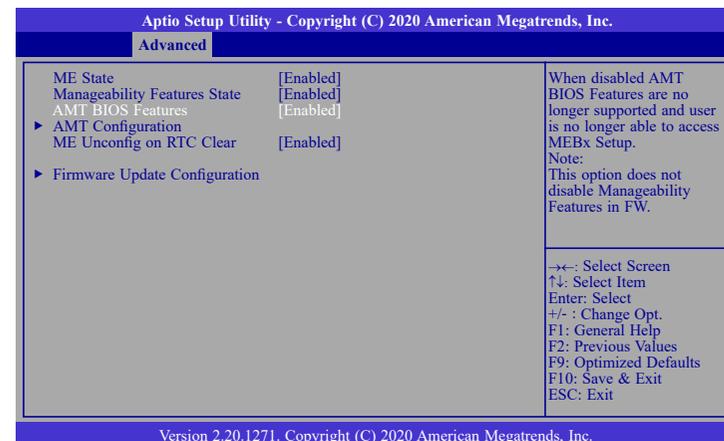
Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical software agents are removed.

### Enable Intel® AMT in the AMI BIOS

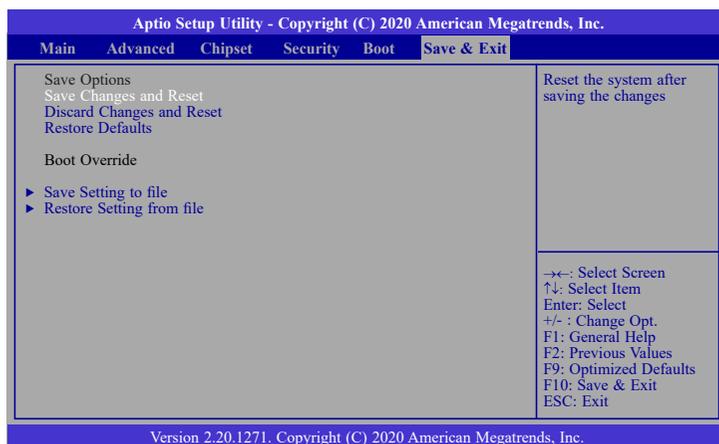
1. Power-on the system then press <Del> to enter the main menu of the AMI BIOS.
2. In the **Advanced** menu, select **PCH-FW Configuration**.



3. Select Enabled in the AMT BIOS Features field.



- In the **Save & Exit** menu, select **Save Changes and Reset** and then press <Enter>. A dialog box will appear. Select **Yes** and press Enter to reset the system after saving all changes made.

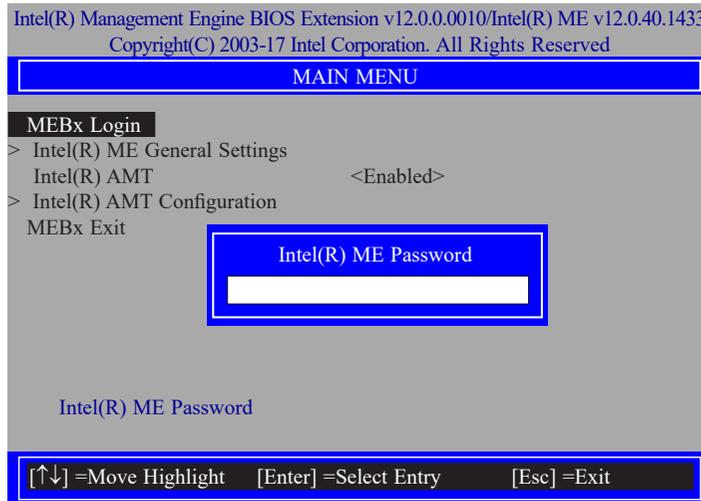


### Configure Intel® AMT in the Intel® Management Engine BIOS Extension (MEBX)

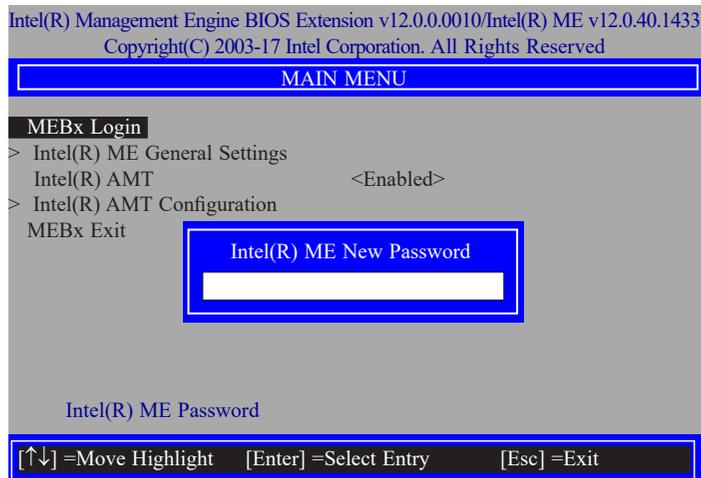
- When the system reboots, the following message will be displayed. Press <Ctrl + P> as soon as the message is displayed. This message will only be displayed very briefly.



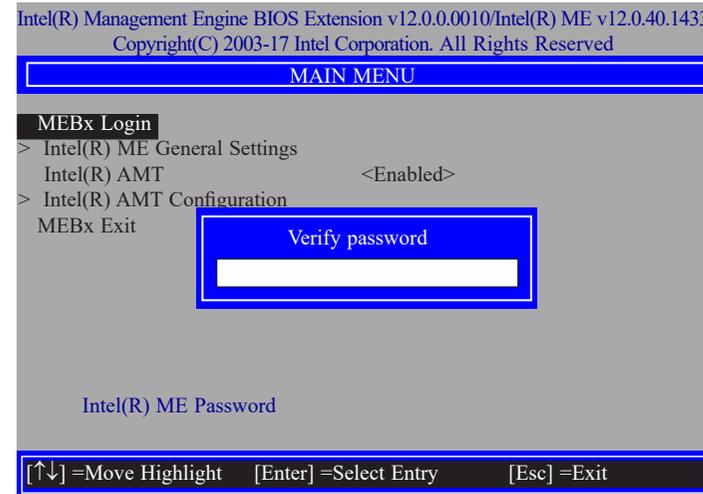
2. Select **MEBx Login** and press Enter. You will be prompted for a password. The default password is "admin". Enter the default password in the space provided under Intel(R) ME Password then press Enter.



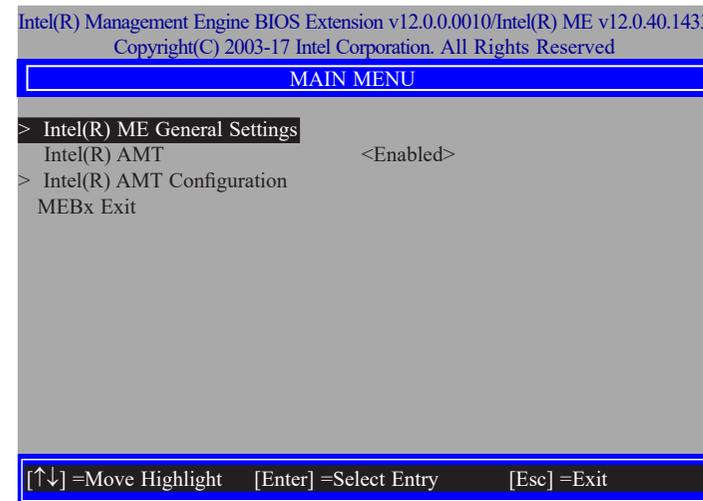
3. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:
  - 8-32 characters
  - Strong 7-bit ASCII characters excluding : , and " characters
  - At least one digit character (0, 1, ...9)
  - At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
  - Both lower case and upper case characters



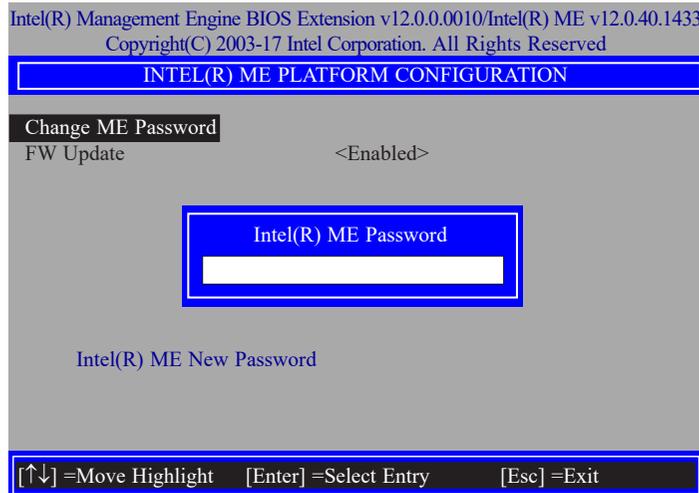
4. You will be asked to verify the new password. Enter the same new password in the space provided under Verify Password then press Enter.



5. Select **Intel(R) ME General Settings** then press Enter.

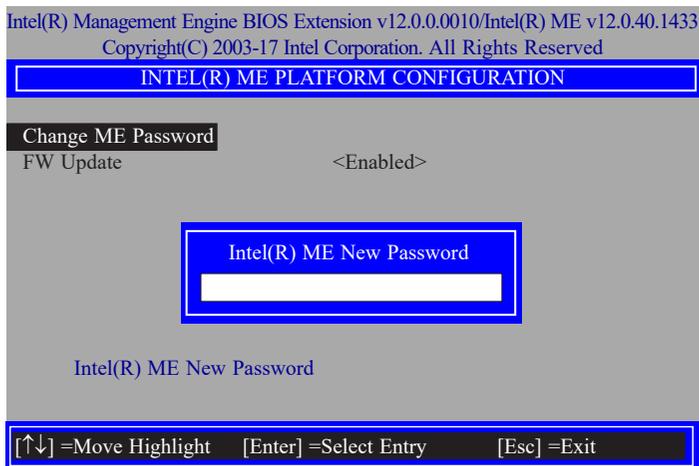


6. If you want to change ME password, select **Change ME Password** then press Enter. Enter the current password in the space provided under Intel(R) ME Password then press Enter.

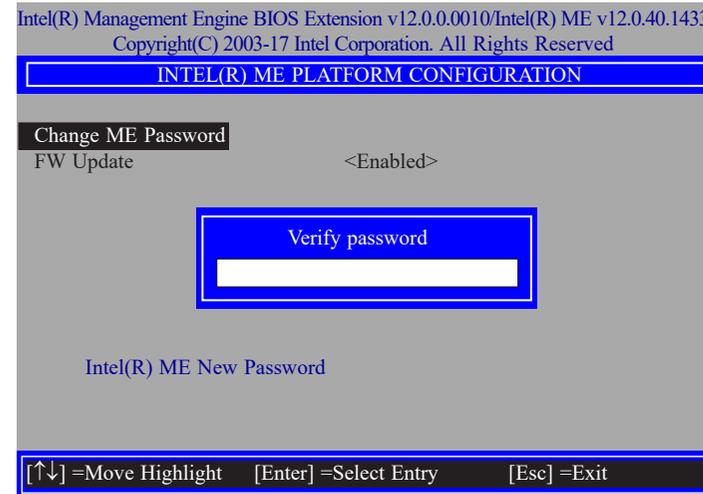


7. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:

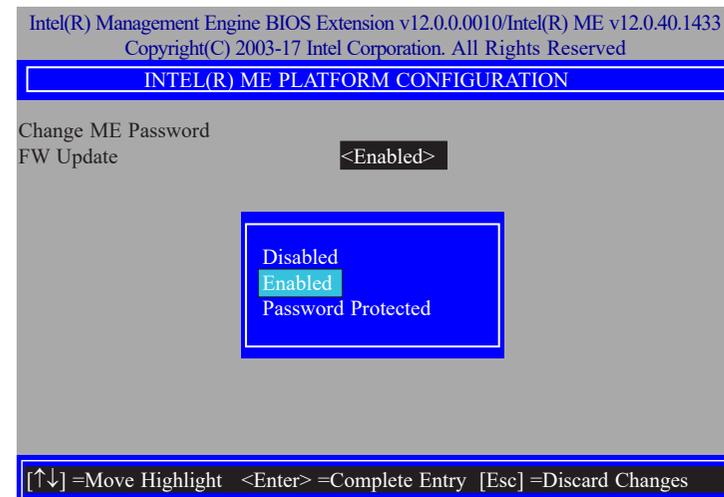
- 8-32 characters
- Strong 7-bit ASCII characters excluding : , and " characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
- Both lower case and upper case characters



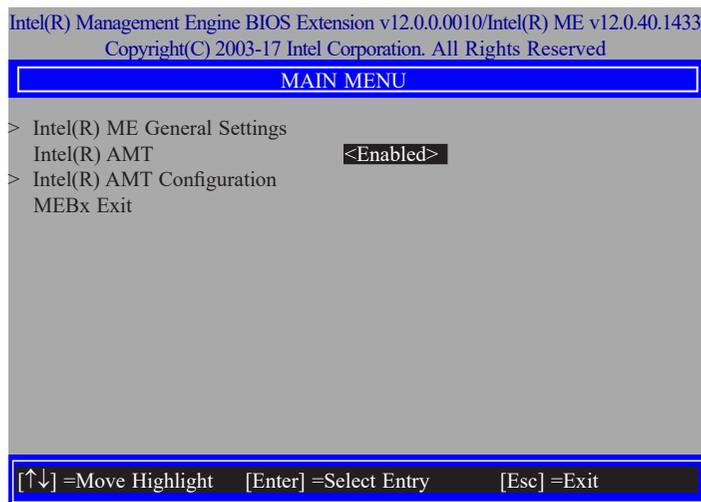
8. You will be asked to verify the new password. Enter the same new password in the space provided under Verify Password then press Enter.



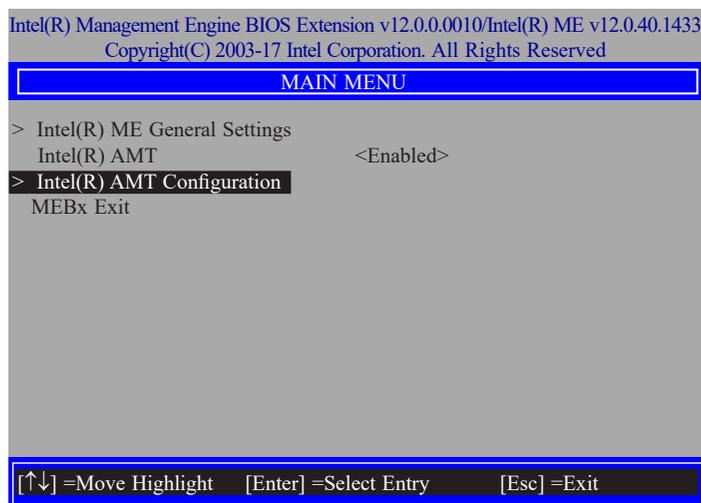
9. Select **FW Update** then press Enter. Select **Enabled** or **Disabled** or **Password Protected** then press Enter.



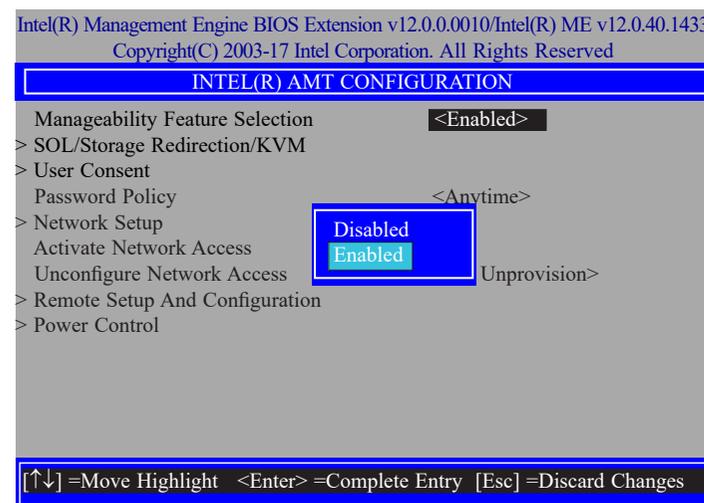
10. Press Esc until you return to the **Main Menu**. Select **Intel(R) AMT** then press Enter. Select **Enabled** or **Disabled** then press Enter.



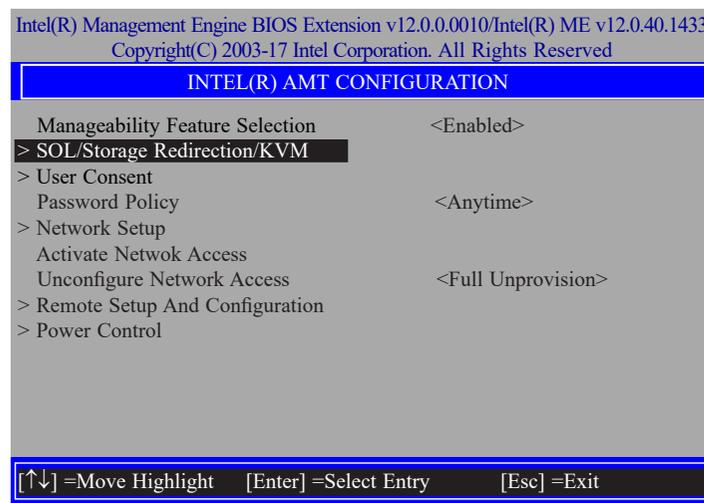
11. Select **Intel(R) AMT Configuration** then press Enter.



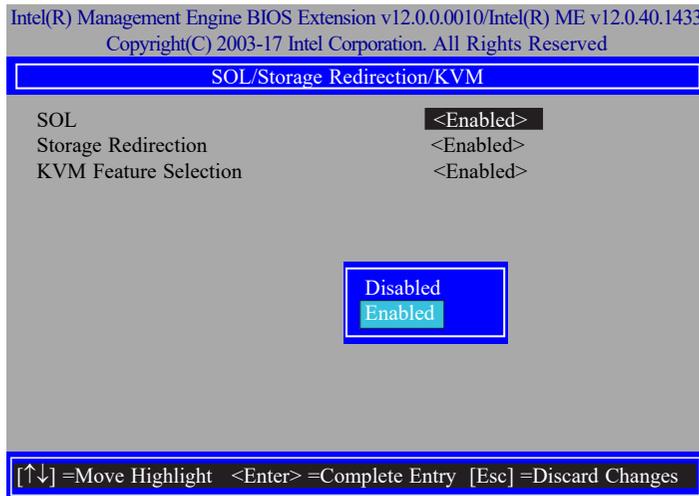
12. In the **Intel(R) AMT Configuration** menu, select **Manageability Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



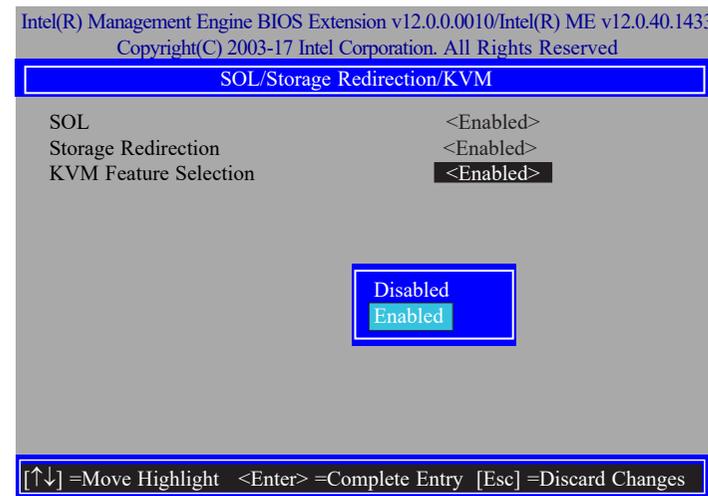
13. In the **Intel(R) AMT Configuration** menu, select **SOL/Storage Redirection/KVM** then press Enter.



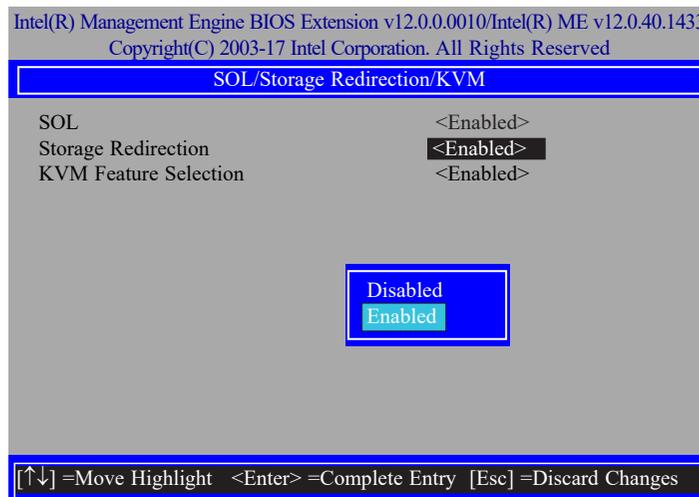
14. Select **SOL** then press Enter. Select **Enabled** or **Disabled** then press Enter.



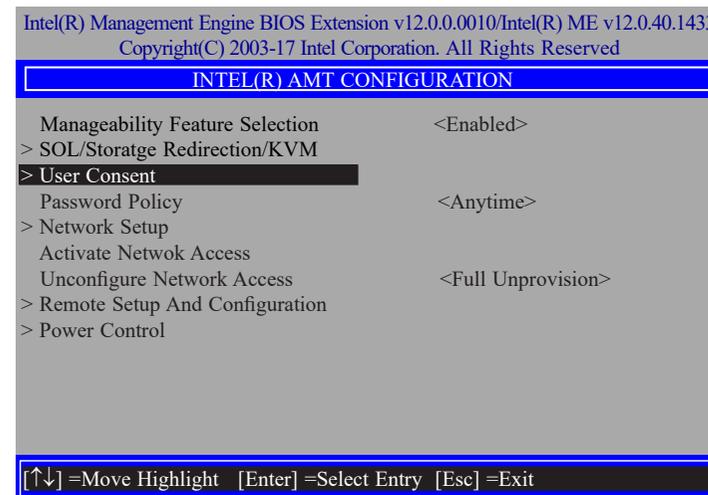
16. Select **KVM Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



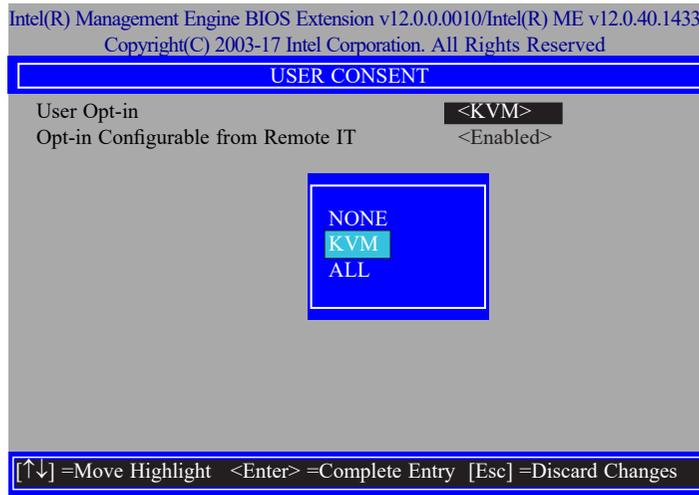
15. Select **Storage Redirection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



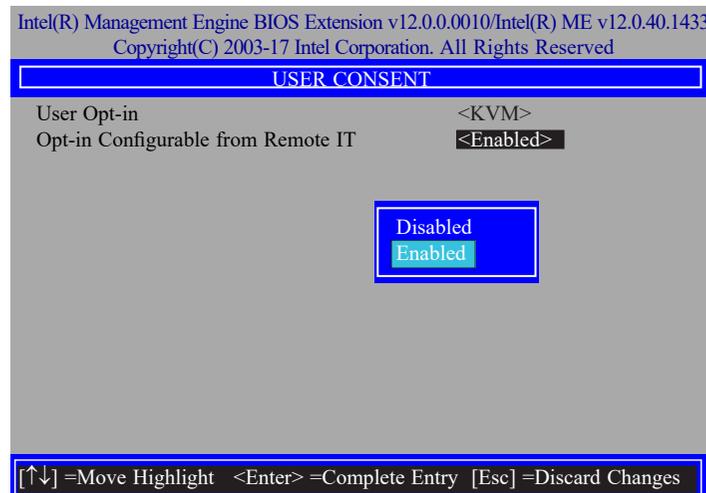
17. Press Esc until you return to the **Intel(R) AMT Configuration** menu. Select **User Consent** then press Enter.



18. In the **User Consent** menu, select **User Opt-in** then press Enter. Select **NONE** or **KVM** or **ALL** then press Enter.

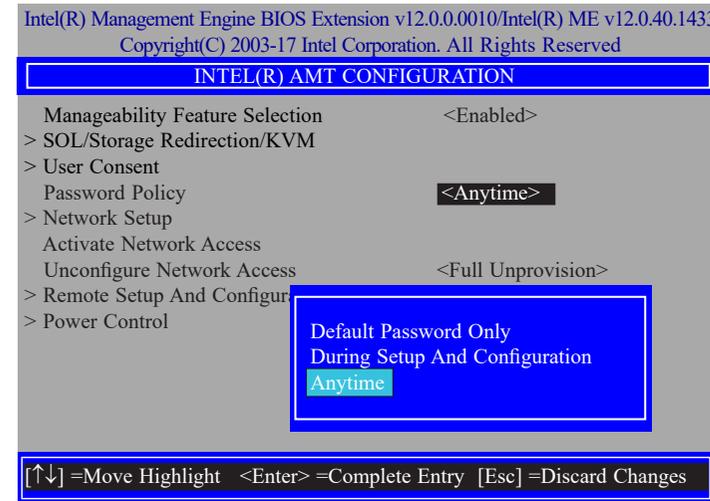


19. Select **Opt-in Configurable from Remote IT** then press Enter. Select **Enabled** or **Disabled** then press Enter.

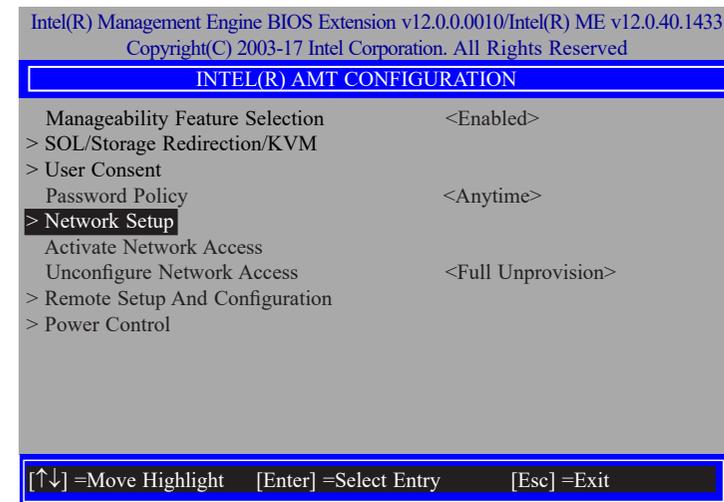


20. Press Esc until you return to the **Intel(R) AMT Configuration** menu. Select **Password Policy** then press Enter.

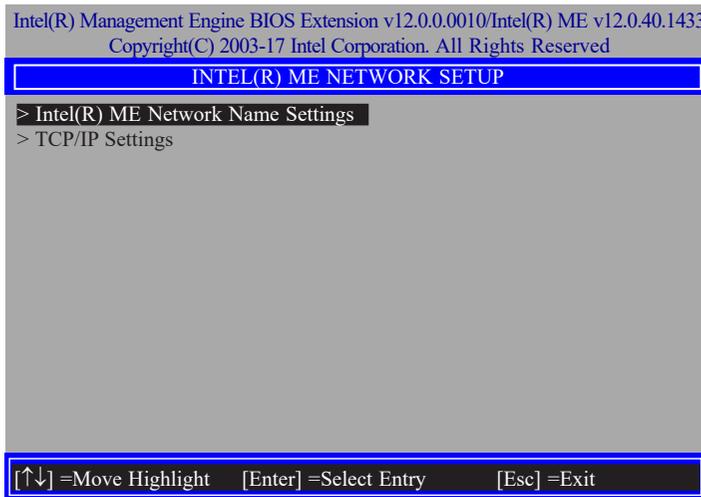
You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



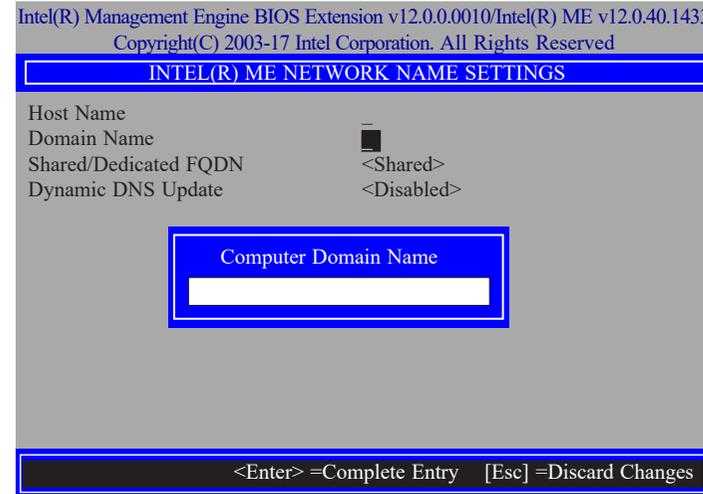
21. In the **Intel(R) AMT Configuration** menu, select **Network Setup** then press Enter.



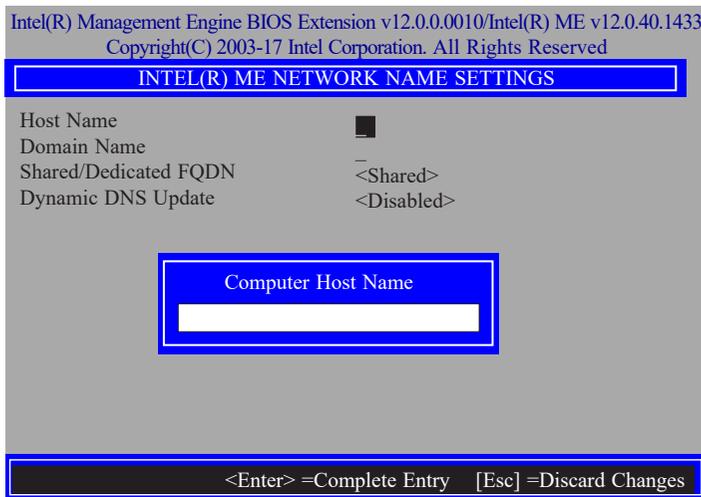
22. In the **Intel(R) ME Network Setup** menu, select **Intel(R) ME Network Name Settings** then press Enter.



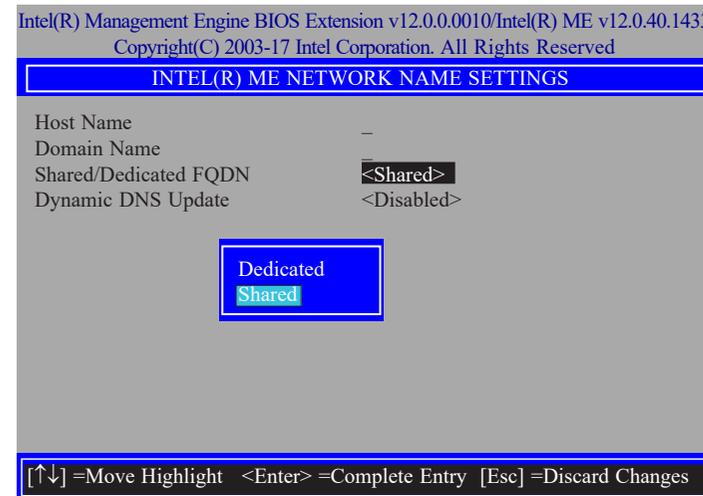
24. Select **Domain Name** then press Enter. Enter the computer's domain name then press Enter.



23. In the **Intel(R) ME Network Name Settings** menu, select **Host Name** then press Enter. Enter the computer's host name then press Enter.

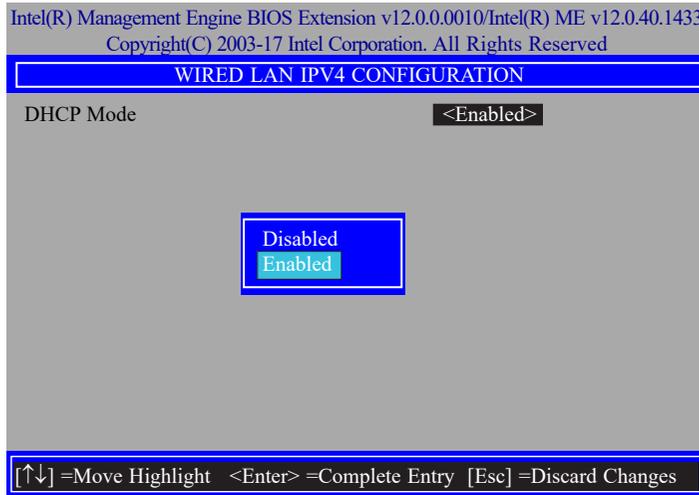


25. Select **Shared/Dedicated FQDN** then press Enter. Select **Shared** or **Dedicated** then press Enter.

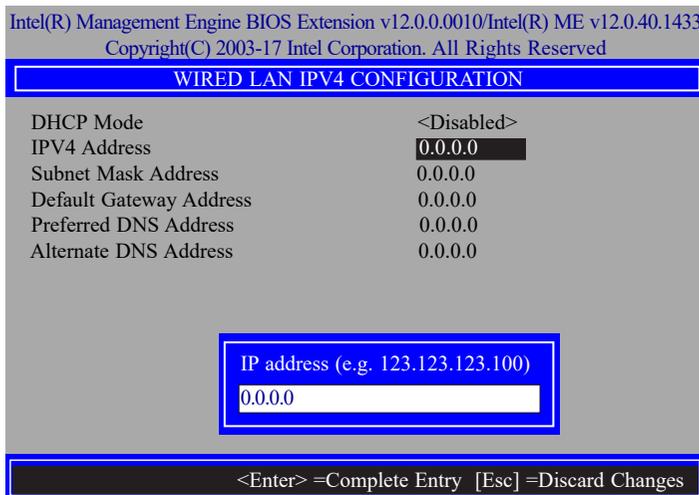




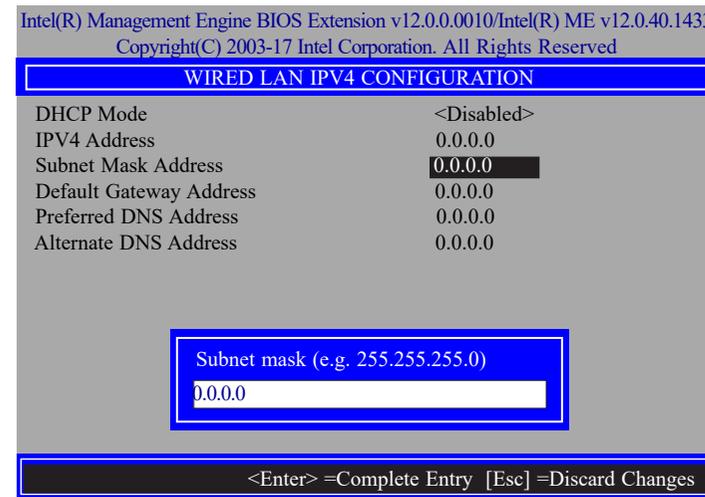
30. In the **Wired LAN IPv4 Configuration** menu, select **DHCP Mode** then press Enter. Select **Enabled** or **Disabled** then press Enter. If set to **Disabled**, **IPV4 Address**, **Subnet Mask Address**, **Default Gateway Address**, **Preferred DNS Address** and **Alternate DNS Address** will show up.



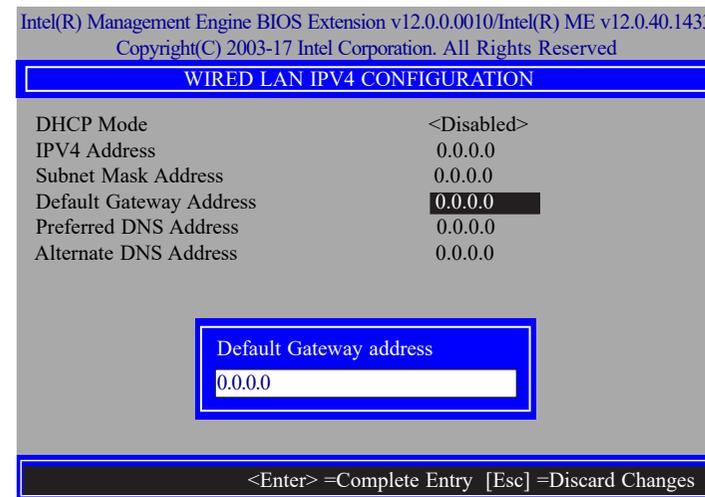
31. Select **IPV4 Address** then press Enter. Enter address then press Enter.



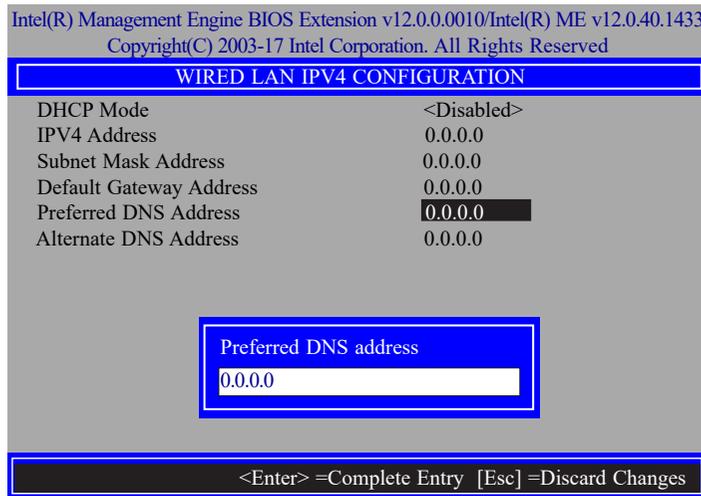
32. Select **Subnet Mask Address** then press Enter. Enter address then press Enter.



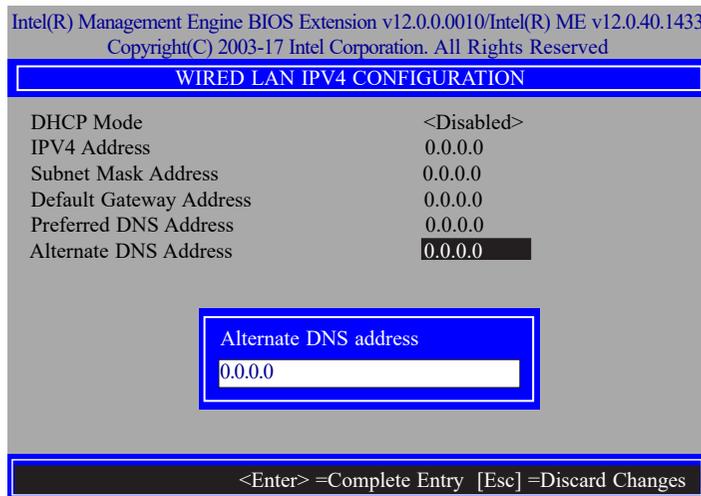
33. Select **Default Gateway Address** then press Enter. Enter address then press Enter.



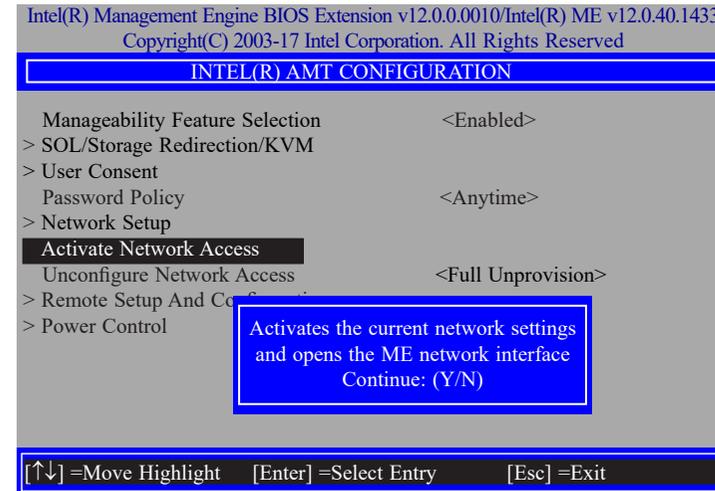
34. Select **Preferred DNS Address** then press Enter. Enter address then press Enter.



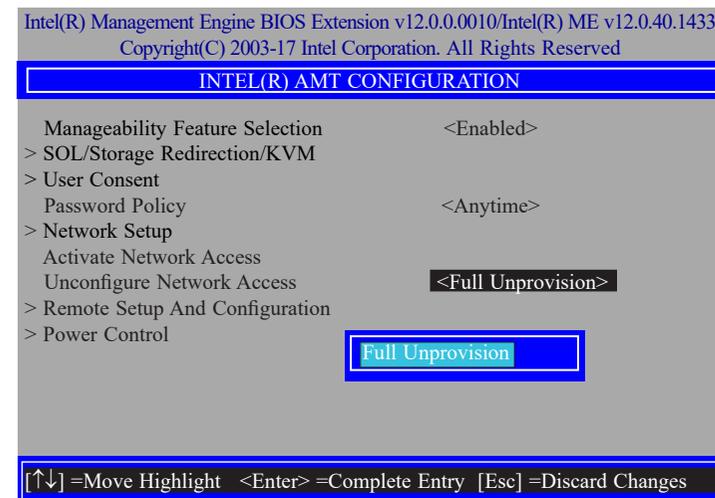
35. Select **Alternate DNS Address** then press Enter. Enter address then press Enter.



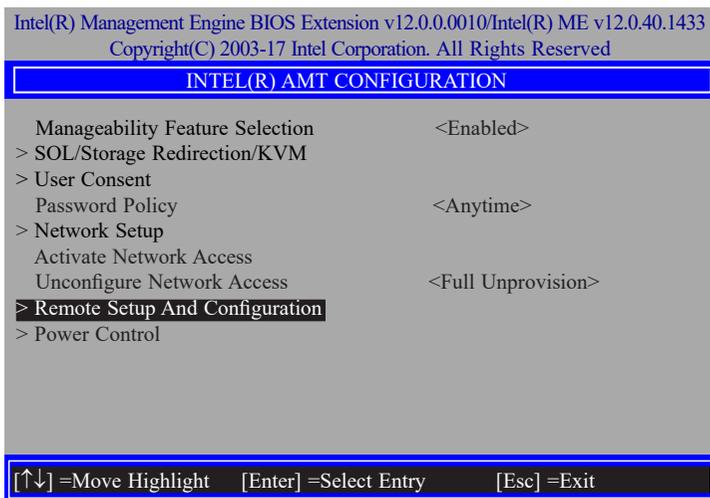
36. Press Esc until you return to the **Intel(R) AMT Configuration** menu. If you want to activate the current network settings and open the ME network interface, select **Activate Network Access**, press Enter, then press Y.



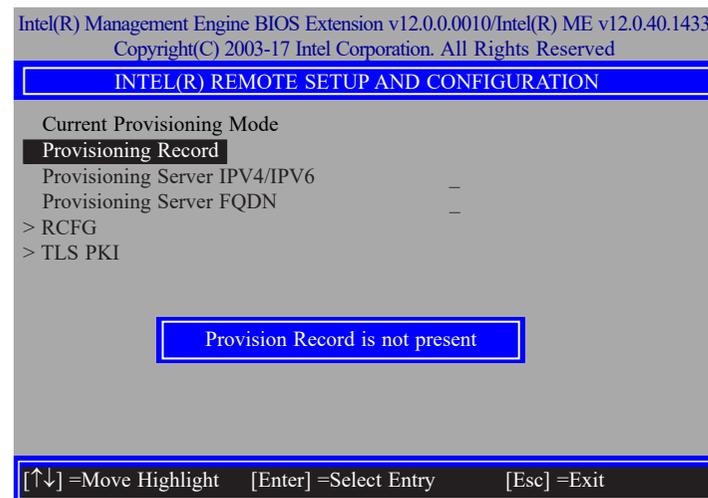
37. In the **Intel(R) AMT Configuration** menu, select **Unconfigure Network Access** then press Enter.



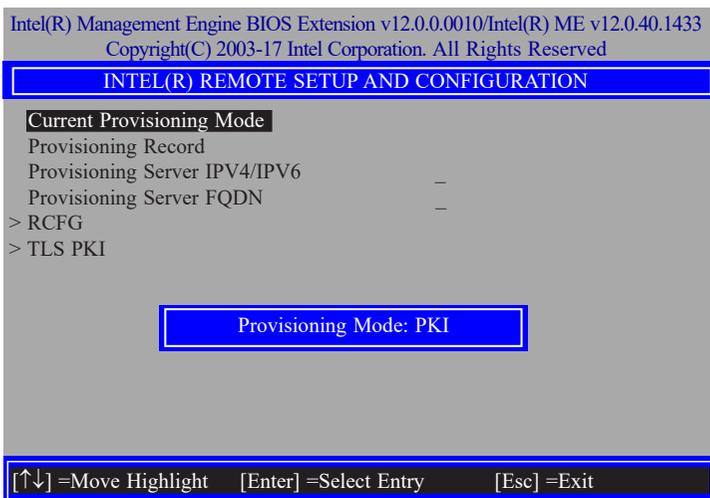
38. In the **Intel(R) AMT Configuration** menu, select **Remote Setup And Configuration** then press Enter.



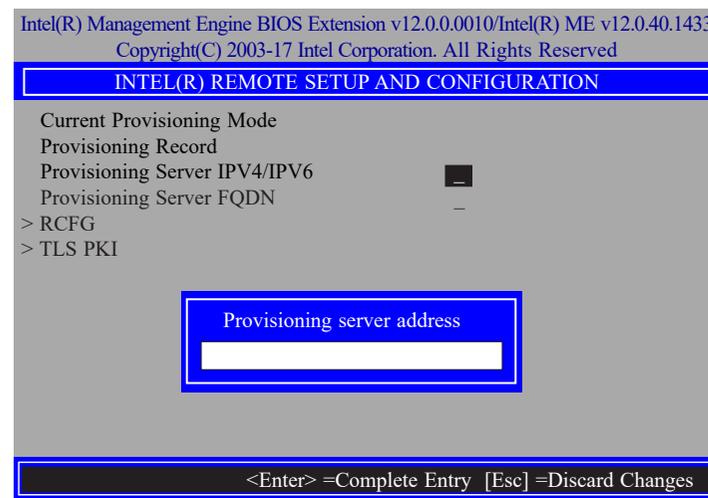
40. In the **Intel(R) Remote Setup And Configuration** menu, select **Provisioning Record** then press Enter.



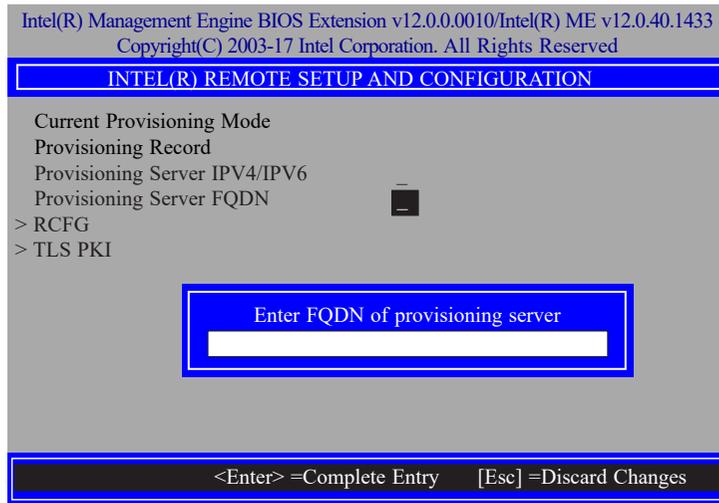
39. In the **Intel(R) Remote Setup And Configuration** menu, select **Current Provisioning Mode** then press Enter.



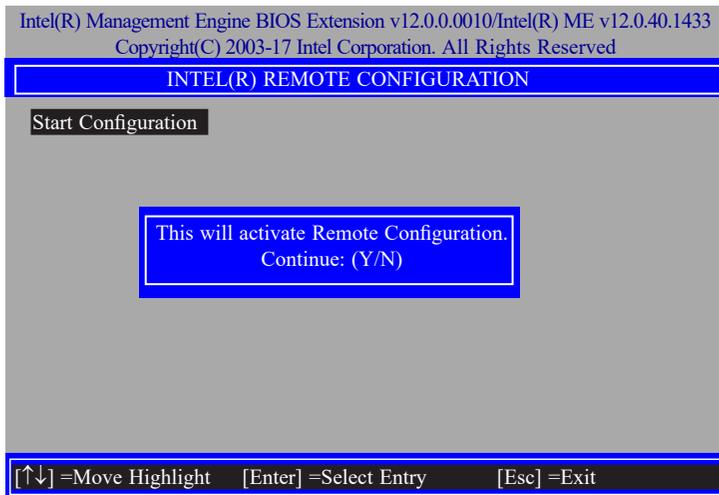
41. In the **Intel(R) Remote Setup And Configuration** menu, select **Provisioning Server IPV4/IPV6** then press Enter. Enter the address then press Enter.



42. In the **Intel(R) Remote Setup And Configuration** menu, select **Provisioning Server FQDN** then press Enter. Enter the FQDN then press Enter.



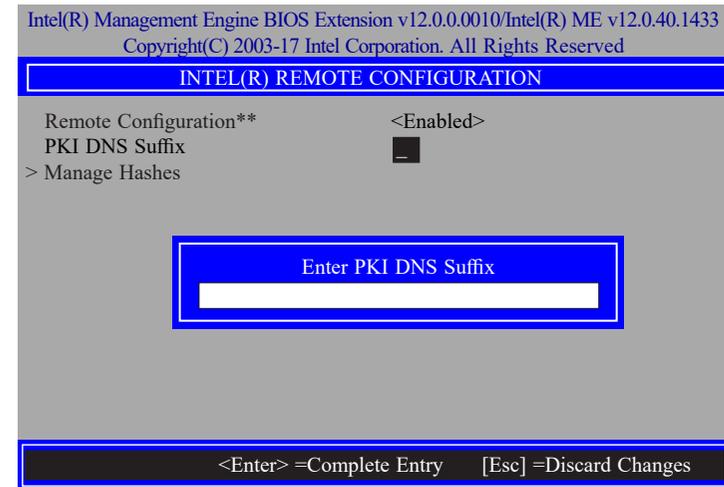
43. If you want to activate remote configuration, in the **Intel(R) Remote Setup And Configuration** menu, select **RCFG** then press Enter. Select **Start Configuration** then press Enter. Press Y to activate.



44. Press Esc until you return to the **Intel(R) Remote Setup And Configuration** menu. Select **TLS PKI** then press Enter. Select **Remote Configuration \*\*** then press Enter. Select **Enabled** or **Disabled** then press Enter.



45. Select **PKI DNS Suffix** then press Enter. Enter the PKI DNS Suffix then press Enter.



46. In the Intel(R) Remote Configuration menu, select **Manage Hashes** then press Enter. Select the hash name then press Insert to enter custom hash certificate name, press Delete to delete hash, press Enter to view hash information, press + to activate or deactivate hash, and press Esc to exit.

Intel(R) Management Engine BIOS Extension v12.0.0.0010/Intel(R) ME v12.0.40.1433  
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**INTEL(R) REMOTE CONFIGURATION**

Hash Name	Active	Default	Algorithm
VeriSign Class 3	Active: [*]	Default: [*]	SHA256
VeriSign Class 3	Active: [*]	Default: [*]	SHA256
Go Daddy Class 2	Active: [*]	Default: [*]	SHA256
Comodo AAA CA	Active: [*]	Default: [*]	SHA256
Starfield Class 2	Active: [*]	Default: [*]	SHA256
VeriSign Class 3	Active: [*]	Default: [*]	SHA256
VeriSign Class 3	Active: [*]	Default: [*]	SHA256
VeriSign Class 3	Active: [*]	Default: [*]	SHA256
GTE CyberTrust G1	Active: [*]	Default: [*]	SHA256
Baltimore Cyber Tr	Active: [*]	Default: [*]	SHA256
Cybertrust Global	Active: [*]	Default: [*]	SHA256
Verizon Global Ro	Active: [*]	Default: [*]	SHA256
Entrust.net CA (2	Active: [*]	Default: [*]	SHA256
Entrust Root CA	Active: [*]	Default: [*]	SHA256
VeriSign Universa	Active: [*]	Default: [*]	SHA256
Go Daddy Root CA	Active: [*]	Default: [*]	SHA256
Entrust Root CA -	Active: [*]	Default: [*]	SHA256
Startfield Root CA	Active: [*]	Default: [*]	SHA256

[Ins] =Add New Hash      [Delete] =Delete Hash      [+] =Activate Hash  
[↑↓] =Move Highlight      [Enter] =View Hash      [Esc] =Exit

47. Press Esc until you return to the **Intel(R) AMT Configuration** menu, select **Power Control** then press Enter. In the **Intel(R) AMT Power Control** menu, select **Intel(R) AMT ON in Host Sleep States** then press Enter. Select an option then press Enter.

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**INTEL(R) AMT POWER CONTROL**

These configurations are effective only after AMT provisioning has started

Intel(R) AMT ON in Host Sleep States <Desktop: ON in S0, ME Wake in S3, S4-5>

Idle Timeout 65535

Desktop: ON in S0  
Desktop: ON in S0, ME Wake in S3, S4-5

[↑↓] =Move Highlight <Enter> =Complete Entry [Esc] =Discard Changes

48. In the **Intel(R) AMT Power Control** menu, select **Idle Timeout** then press Enter. Enter the timeout value and press Enter.

Intel(R) Management Engine BIOS Extension v12.0.0.0010/Intel(R) ME v12.0.40.1433  
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**INTEL(R) AMT POWER CONTROL**

This configurations are effective only after AMT provisioning has started

Intel(R) AMT ON in Host Sleep States <Desktop: ON in S0, ME Wake in S3, S4-5>

Idle Timeout 65535

Timeout Value (1-65535)  
65535

<Enter> =Complete Entry [Esc] =Discard Changes

49. Press Esc until you return to the **Main Menu**. Select **MEBx Exit** then press Enter. Press Y to exit.

Intel(R) Management Engine BIOS Extension v12.0.0.0010/Intel(R) ME v12.0.40.1433  
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**MAIN MENU**

> Intel(R) ME General Settings  
> Intel(R) AMT Configuration  
**MEBx Exit**

Are you sure you want to exit?(Y/N):

Exit

[↑↓] =Move Highlight [Enter] =Select Entry [Esc] =Exit

## Chapter 11 - Supported Software

You may acquire your software from your sales representatives or from the website download page at <https://www.dfi.com/DownloadCenter>.

### ► Auto-run Menu

After inserting your DVD-ROM into your optical drive, the System Utility auto-run menu may pop up. Click on the utility or driver that is to be installed on the system. Please refer to the following sections that correspond to your selection for more information.

Click "More >>" on the lower right to view go to the next page of the auto-run menu, and click "<< Previous" to return to the previous menu.



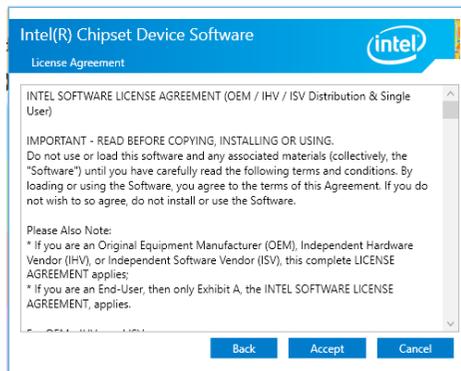
## ► Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

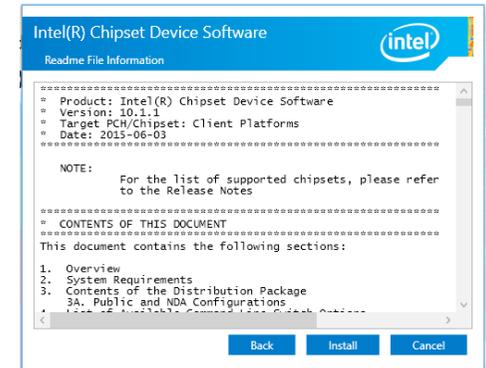
1. Setup is ready to install the utility. Click "Next".



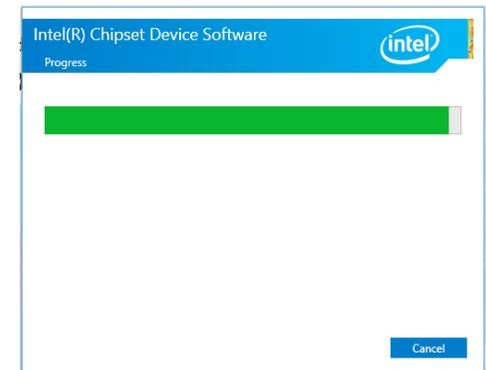
2. Read the license agreement then click "Accept".



3. Go through the readme document for more installation tips then click "Install".



4. The step displays the installing status in the progress.



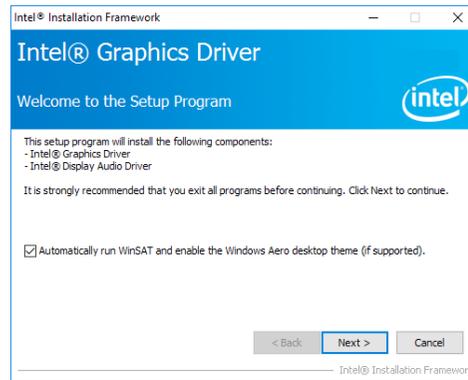
5. After completing installation, click "Restart Now" to exit setup.

Restarting the system will allow the new software installation to take effect.



## ► Intel HD Graphics Drivers

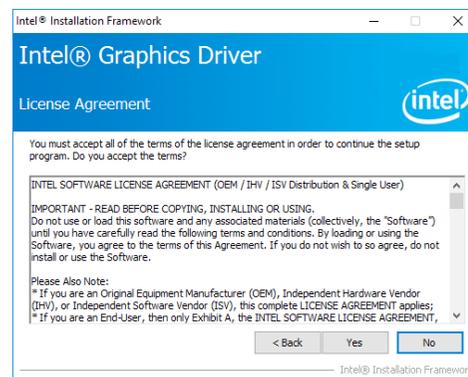
1. Setup is now ready to install the graphics driver. Click "Next".



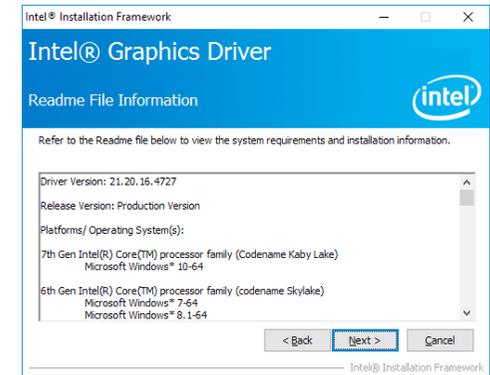
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 10 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

We recommend that you skip this process by disabling this function then click "Next".

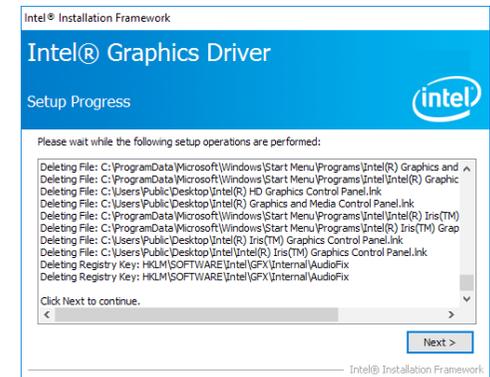
2. Read the license agreement then click "Yes".



3. Go through the readme document for system requirements and installation tips then click "Next".

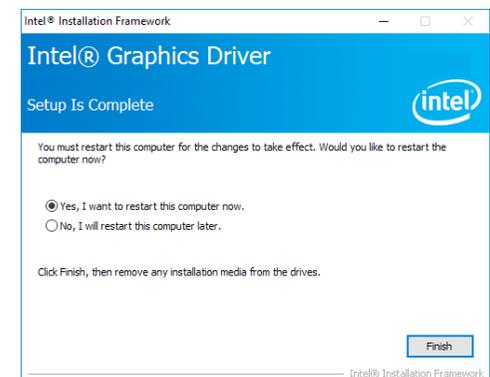


4. Setup is now installing the driver. Click "Next" to continue.



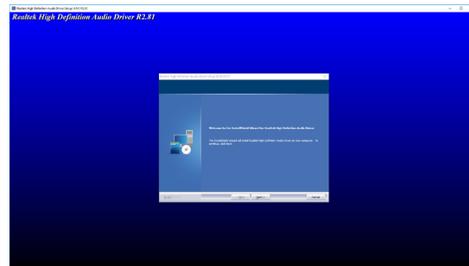
5. Click "Yes, I want to restart this computer now" then click "Finish".

Restarting the system will allow the new software installation to take effect.



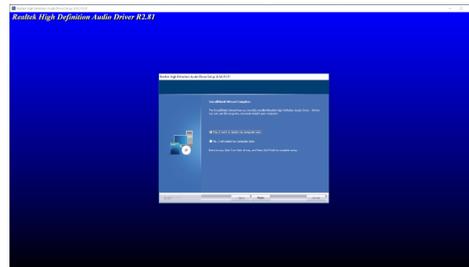
## ► Realtek Audio Drivers

1. Setup is ready to install the driver. Click "Next".



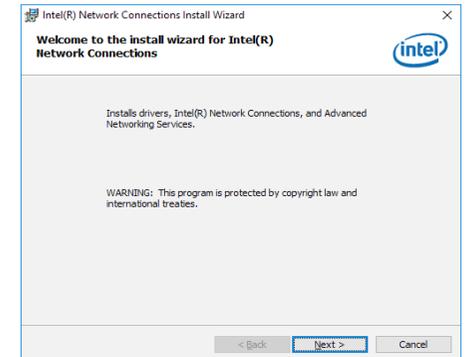
2. Click "Yes, I want to restart my computer now" then click "Finish".

Restarting the system will allow the new software installation to take effect.

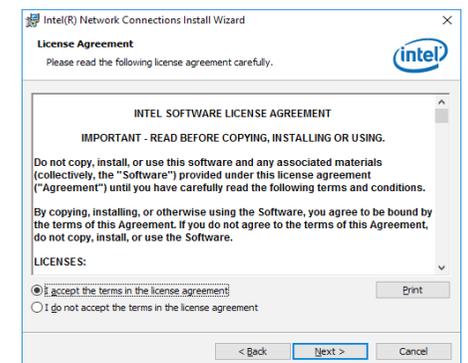


## ► Intel LAN Drivers

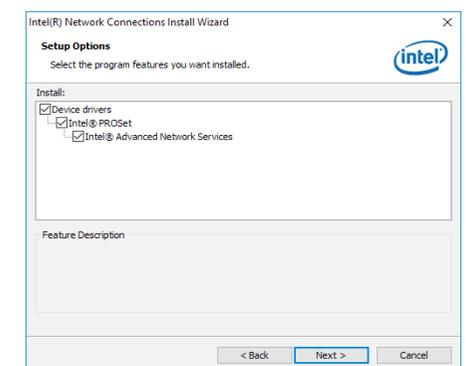
1. Setup is ready to install the driver. Click "Next".



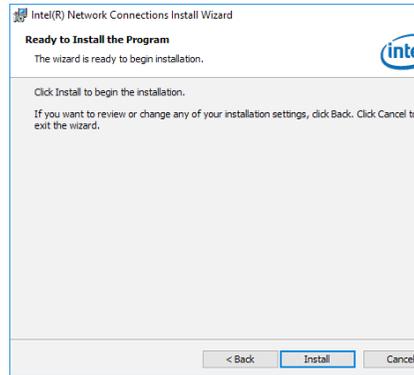
2. Click "I accept the terms in the license agreement" then click "Next".



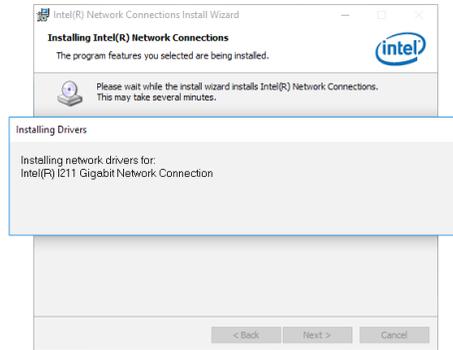
3. Select the program features you want installed then click "Next".



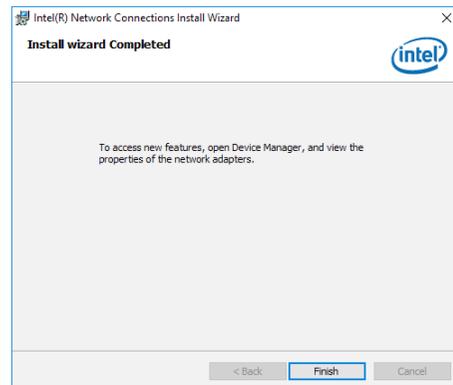
- Click "Install" to begin the installation.



- The step displays the installing status in the progress.

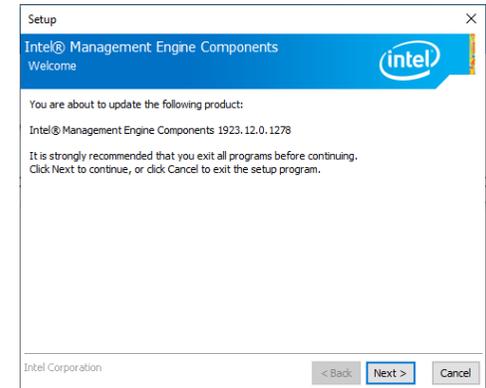


- After completing installation, click "Finish".

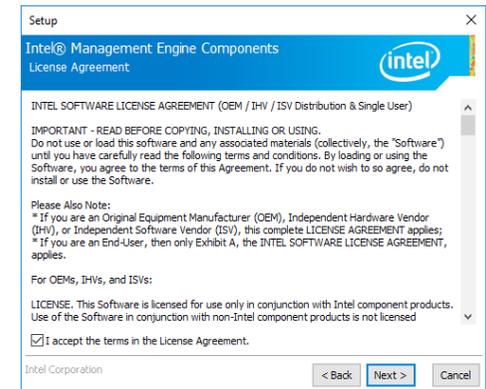


## ▶ Intel ME Drivers

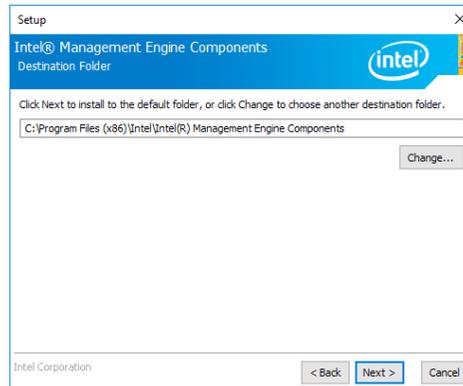
- Setup is ready to install the driver. Click "Next".



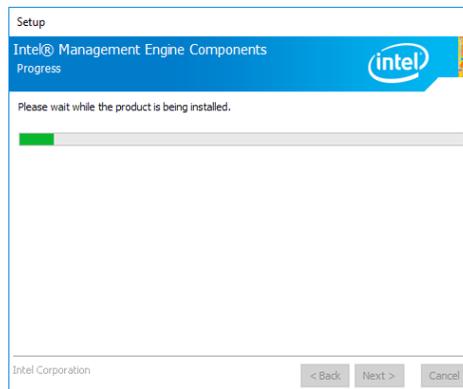
- Read the license agreement then tick "I accept the terms in the License Agreement". Click "Next".



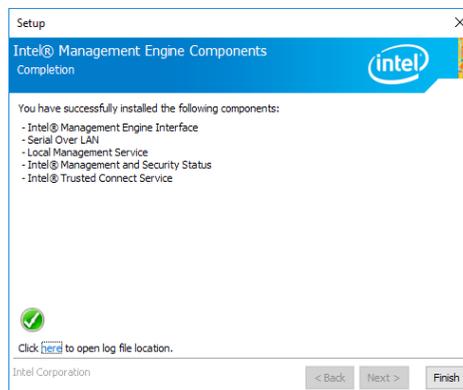
- Click "Next" to install to the default folder, or click "Change" to choose another destination folder.



- Please wait while the product is being installed.

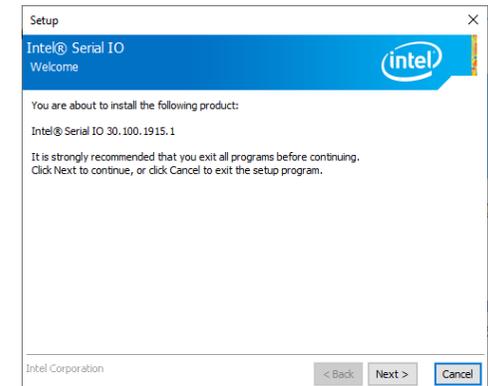


- After completing installation, click "Finish".



## ► Intel Serial IO Drivers

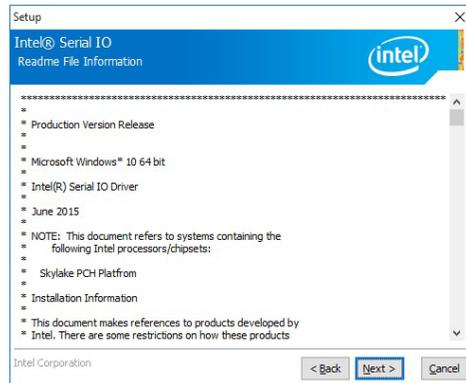
- Setup is ready to install the driver. Click "Next".



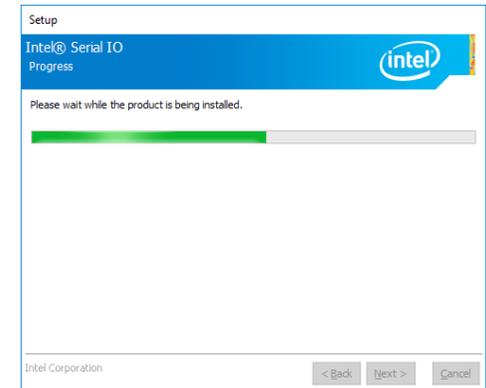
- Read the license agreement carefully. Tick "I accept the terms in the License Agreement" then click "Next".



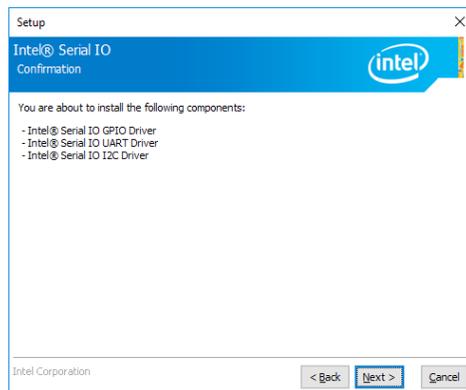
3. Go through the readme document for system requirements and installation tips then click "Next".



5. Setup is now installing the driver.

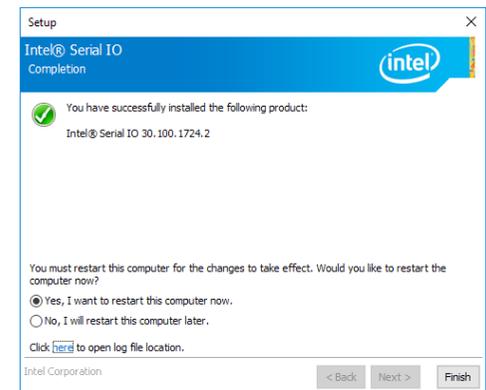


4. Setup is ready to install the driver. Click "Next".



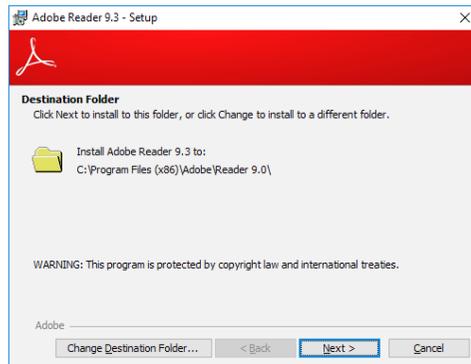
6. Click "Yes, I want to restart this computer now" then click "Finish".

Restarting the system will allow the new software installation to take effect.

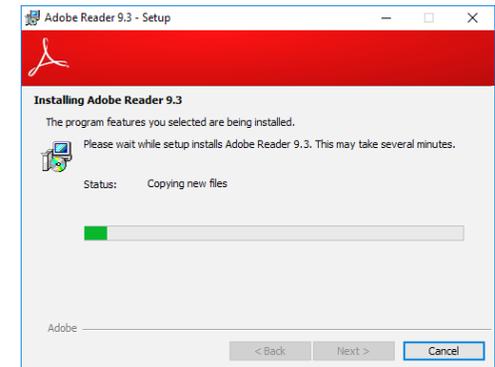


## ► Adobe Acrobat Reader 9.3

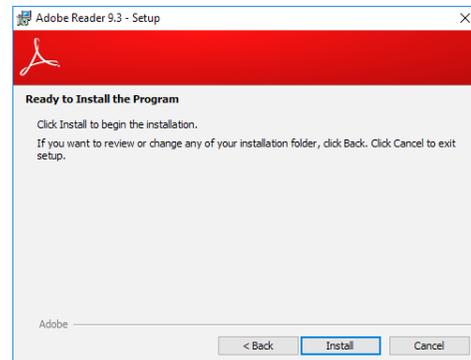
1. Click "Next" to install or click "Change Destination Folder" to select another folder.



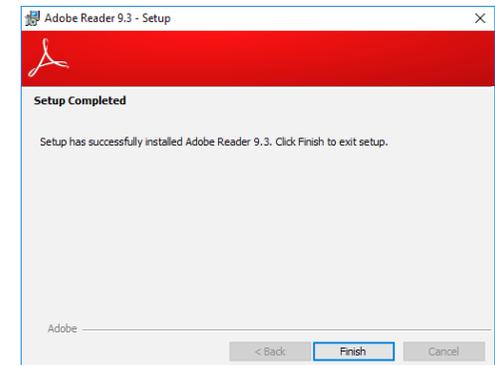
3. Setup is now installing the driver.



2. Click "Install" to begin installation.



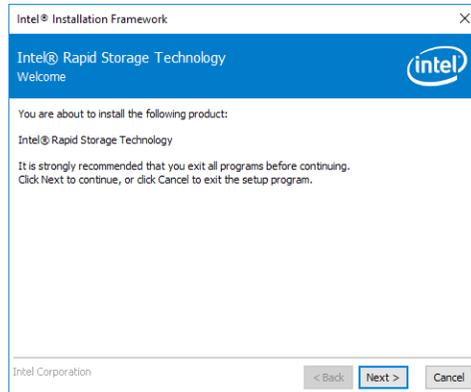
4. Click "Finish" to exit installation.



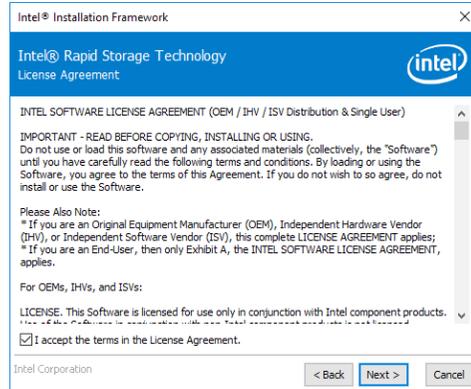
## ► Intel Rapid Storage Technology

The Intel Rapid Storage Technology is a utility that allows you to monitor the current status of the SATA drives. It enables enhanced performance and power management for the storage subsystem.

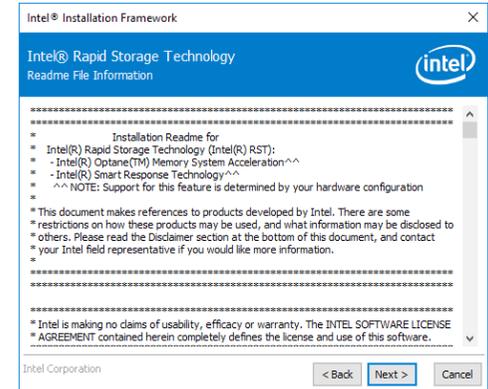
1. Setup is ready to install the utility. Click "Next".



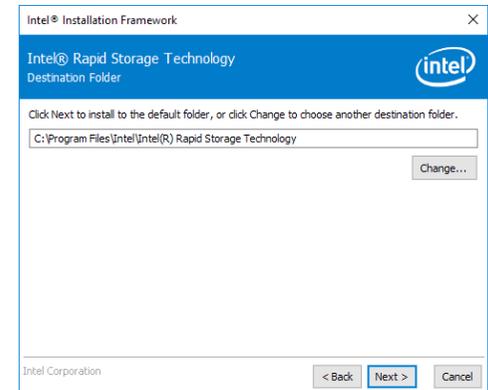
2. Read the license agreement and click "I accept the terms in the License Agreement". Then, click "Next".



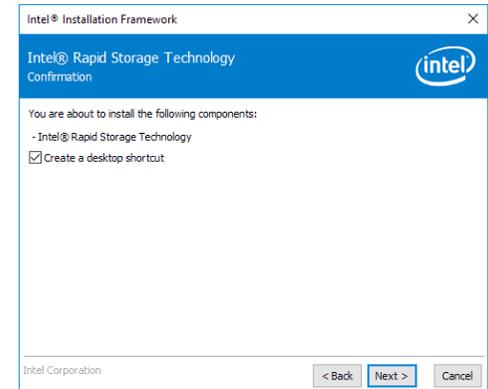
3. Go through the readme document to view system requirements and installation information then click "Next".



4. Click "Next" to install to the default folder or click "Change" to choose another destination folder".



5. Confirm the installation and click "Next".



6. Click "Yes, I want to restart this computer now" to complete the installation and then click "Finish".

