



VC70B-KU

User's Manual

Copyright

This publication contains information that is protected by copyright. No part of it may be reproduced in any form or by any means or used to make any transformation/adaptation without the prior written permission from the copyright holders.

This publication is provided for informational purposes only. The manufacturer makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. The user will assume the entire risk of the use or the results of the use of this document. Further, the manufacturer reserves the right to revise this publication and make changes to its contents at any time, without obligation to notify any person or entity of such revisions or changes.

Changes after the publication's first release will be based on the product's revision. The website will always provide the most updated information.

© 2019. All Rights Reserved.

Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

FCC and DOC Statement on Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a 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.

Table of Contents

Copyright	2	Front Panel I/O Ports	16
Trademarks	2	Rear Panel I/O Ports.....	16
FCC and DOC Statement on Class A.....	2	Display Interfaces	17
About this Manual	4	USB Ports	18
Warranty	4	COM (Serial) Ports.....	19
Static Electricity Precautions.....	4	RJ45 LAN Ports	20
Safety Measures.....	4	Audio	20
Safety Precautions	5	I/O Connectors	21
About the Package	5	Serial ATA Connector & Serial ATA Power Connector	21
Chapter 1 - Introduction	6	Expansion Slots	21
Overview.....	6	Front Panel Connector.....	22
Key Features	6	Standby Power LED	23
Specifications	7	Battery.....	23
Getting to Know the VC70B-KU	8	Chapter 6 - Mounting Options	25
Mechanical Dimensions	9	Chapter 7 - BIOS Setup	28
Chapter 2 - Getting Started.....	10	Main.....	29
Chapter 3 - Installing the Devices.....	11	Advanced	29
Removing the Chassis Cover.....	11	UEFI Device Manager	35
Installing a SATA Drive.....	11	Security.....	41
Installing a Mini PCIe Card.....	12	Boot	42
Chapter 4 - Jumper Settings.....	14	Exit.....	43
Clear CMOS Data	14	Chapter 8 - Supported Software	45
Auto Power-on Select	14	Chapter 9 - Intel AMT Settings	52
Mini PCIe/SATA Signal Select	15		
COM4/DIO Select.....	15		
Chapter 5 - Ports and Connectors	16		

About this Manual

An electronic file of this manual can be obtained from the DFI website at 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 arised 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 damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite 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 AC 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

- Use the correct DC input voltage range.
- 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.
- 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.
- 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.

- 1 VC70B-KU system unit
- 4 Mounting screws for Mini PCIe module
- 1 Power Connector

Optional Items

- Wall Mount kit
- Power Cord
- Power Adapter: 120W, 19V/6.31A or 60W, 19V/3.15A

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.

Chapter 1 - Introduction

Overview



Front View



Rear View

Key Features

Model Name	VC70B-KU
Processor	7th Generation Intel® Core™ processors, BGA 1356
LAN	Two LAN ports
COM	Six COM ports
Display	VGA & HDMI
Audio	Microphone and Line-out
USB	Four USB 3.0 & two USB 2.0 Type A ports
Power	9~36V DC-in
DIO/CAN bus	8-bit DIO or CAN bus with a DB9 connector (selection via jumper settings)
Power Switch	Power-on button

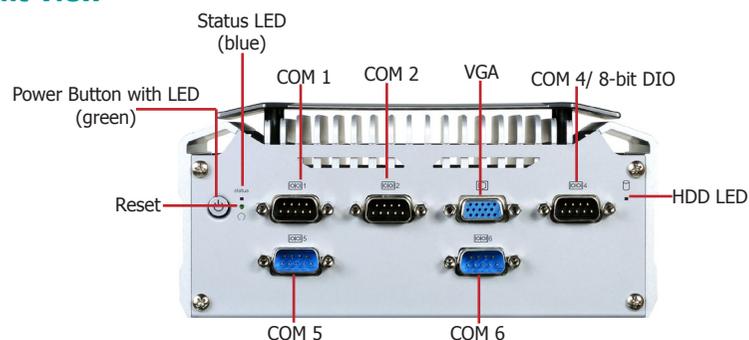
Specifications

Processor	7th Generation Intel® Core™ Processors, BGA 1356 Intel® Core™ i7-7600U Processor, Dual Core, 4M Cache, 2.8 GHz, 15W Intel® Core™ i5-7300U Processor, Dual Core, 3M Cache, 2.6 GHz, 15W Intel® Core™ i3-7100U Processor, Dual Core, 3M Cache, 2.4 GHz, 15W
Memory	<ul style="list-style-type: none"> • Supports dual-channel DDR4 2133MHz • Supports 4GB/8GB memory onboard
Graphics	Intel® HD Graphics GT Series OpenGL 5.0, DirectX 12, OpenCL 2.1 <ul style="list-style-type: none"> • Supports these codecs: HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: AVC/H.264, MPEG2, JPEG, HEVC/H265, VP8, VP9 • Output displays: VGA: resolution up to 1920x1200 @ 60Hz HDMI: resolution up to 4096x2160 @ 24Hz • Dual display: VGA + HDMI
Audio	<ul style="list-style-type: none"> • Realtek ALC888 5.1-channel • Audio ports: Mic-in and Line-out
Storage	<ul style="list-style-type: none"> • Full-size Mini PCIe (PCIe/USB) • Half-size Mini PCIe (PCIe/USB/SATA)
Ethernet	1 x Intel® I210IT PCIe (10/100/1000Mbps) 1 x Intel® I219LM with iAMT11.0 PCIe (10/100/1000Mbps) (only Core i7/i5 supports iAMT)
Expansion	One full-size Mini PCIe (PCIe/USB) One half-size Mini PCIe (PCIe/USB/SATA)
Front Panel I/O Ports	<ul style="list-style-type: none"> • Front Panel <ul style="list-style-type: none"> - Power button with LED - Reset button - Status LED - HDD LED - VGA Port - Five (two support RS232/422/485; two support only RS232; one supports RS232 or 8-bit DIO or CAN bus)

Rear Panel I/O Ports	<ul style="list-style-type: none"> • Rear Panel <ul style="list-style-type: none"> - One RS-232 (DB-9) - Line-out and Mic-in ports - One HDMI port - Four USB 3.0 Type A ports - Two USB 2.0 Type A ports - Two RJ45 LAN ports - One 9~36V terminal block - Five wireless module antenna holes
Power	<ul style="list-style-type: none"> • Power input voltage: 9~36V DC-in (terminal block with ignition control)
Cooling System	<ul style="list-style-type: none"> • Fanless with heatsink
Environment	<ul style="list-style-type: none"> • Operating Temperature: -20 to 60°C (wide temperature SSD or mSATA mini) • Storage Temperature: -20 to 85°C • Relative Humidity: 5 to 95% RH (non-condensing)
Construction	<ul style="list-style-type: none"> • Aluminum + Sheet Metal
Mounting	<ul style="list-style-type: none"> • Wall/VESA/DIN-rail Mount
Dimensions	<ul style="list-style-type: none"> • 184mm x 82mm x 118.4mm (W x H x D)
Weight	<ul style="list-style-type: none"> • 1.6 Kg
OS Support	<ul style="list-style-type: none"> • Windows 10 (64-bit) • Windows 10 IoT Enterprise (64-bit) • Ubuntu 16.04 LTS
Other Features	System Reset, Programmable via Software from 1 to 255 Seconds
Standards and Certifications	Shock: MIL-STD 810G 516.6 Operating: 10G, 11ms Non-Operating: 40G, 11ms Vibration: MIL-STD 810G 514.6C-3 Certifications: CE, FCC Class A, RoHS

Getting to Know the VC70B-KU

Front View



Power button with LED (Green)

Press to power on or power off the system.

Status LED (Blue)

Indicates system status.

Status LED			
Suspend Mode	S0	Sleep	S4, S5
LED Behavior	ON	Blinks	Off

Reset Button

Press to reset the system.

COM Ports

Connect serial devices. COM 1 and COM 2 support RS232/422/485; COM 4 can be selected among RS232, 8-bit digital IO and CAN bus port via jumper settings; COM 5 and COM 6 support only RS232.

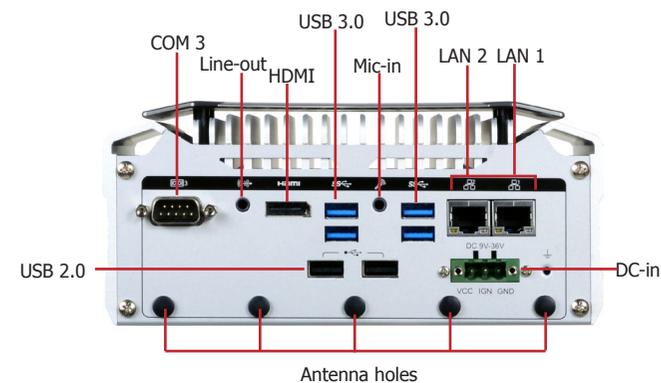
VGA

Connects the VGA connector of a monitor.

HDD LED (Blue)

Indicates the status of the hard drive.

HDD LED		
HDD State	Disk access activity	HDD present or HDD not present
LED Behavior	Blink	Off



COM Port

Connects serial devices; COM 3 supports only RS232.

Microphone/Line-out Ports

Connect audio devices such as microphones and speakers.

HDMI*

Connects the HDMI connector of an LCD monitor.

USB 3.0/2.0 Ports

Connect USB 3.0 and 2.0 devices as well as devices based on previous USB versions.

Gigabit LAN Ports

Connect the system to a local area network.

DC-in

DC 9~36V power input via a DC-in jack.

Antenna Holes

Connect a wireless module's antennas.

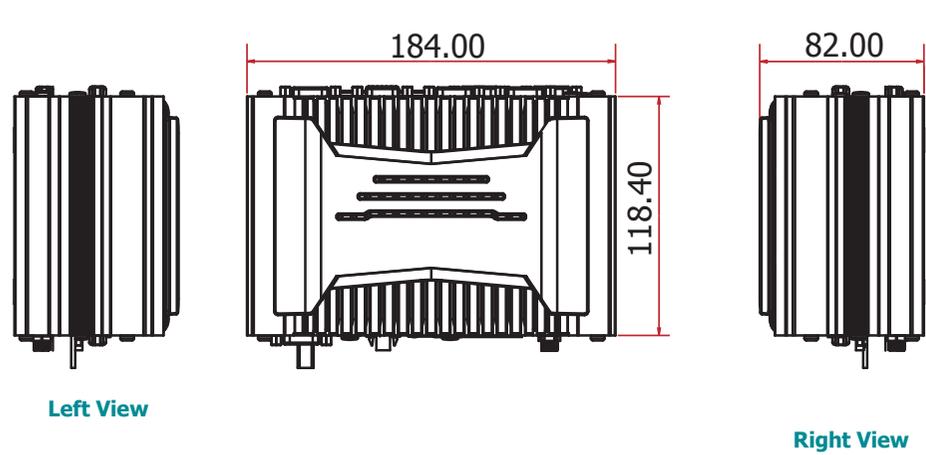
Notes:

The HDMI is a DP++/HDMI combo port but can only transmit HDMI signals (unless wired as a DP++ port). Please plug in an HDMI cable with the right orientation and alignment to avoid damage to the connector. You should feel resistance (due to a pin on the right) if the cable is not inserted correctly. Please see a video at <https://youtu.be/SUj07rfN5I8> for detailed instructions.

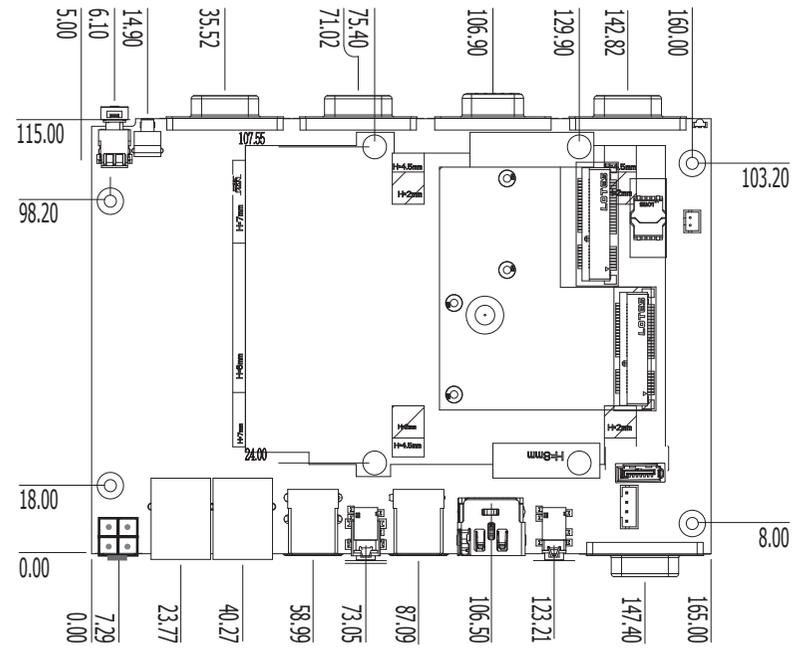
Aligning side (left) — Angled-corner pin — Angled-corner (up) — Align this edge with the left side of the connector

Mechanical Dimensions

Chassis Dimensions



Motherboard Dimensions



Chapter 2 - Getting Started

Preparing the System

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

- SATA hard drive
- AC power adapter and other means of power supply
- CD-ROM drive (for installing software/drivers)

Installing Devices

The following devices can be installed in the system.

- SATA drives
- Mini PCIe card
- mSATA card

Configuring the BIOS

To get you started, you may need to change configurations such as the date, time and the type of hard disk drive.

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

Most operating system software can be installed using a DVD (and DVD burner) or bootable USB drive.

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

Installing the Drivers

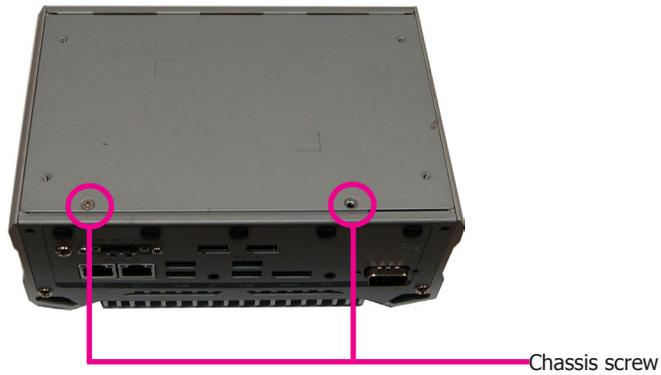
The system requires you to install drivers for some devices to operate properly. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing the Devices

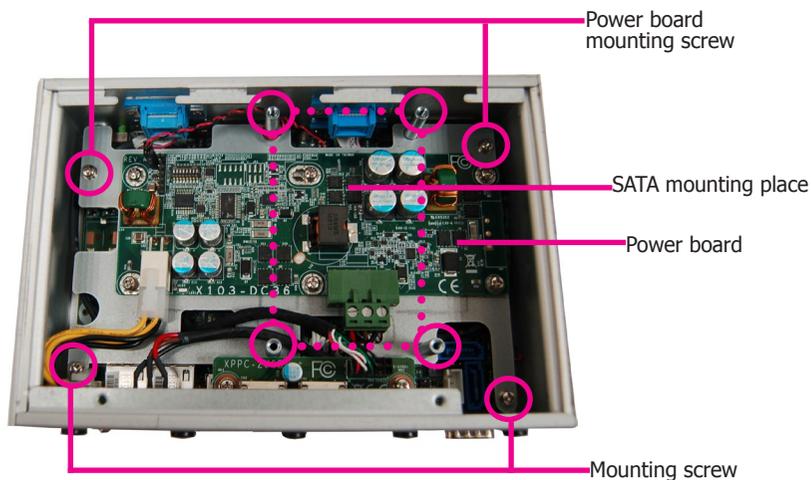
Removing the Chassis Cover

Please observe the following guidelines and follow the procedure to open the system.

1. Make sure the system and all other peripheral devices connected to it have been powered off.
2. Disconnect all power cords and cables.
3. The 2 mounting screws on the bottom side of the system are used to secure the cover to the chassis. Remove these screws and put them in a safe place for later use.



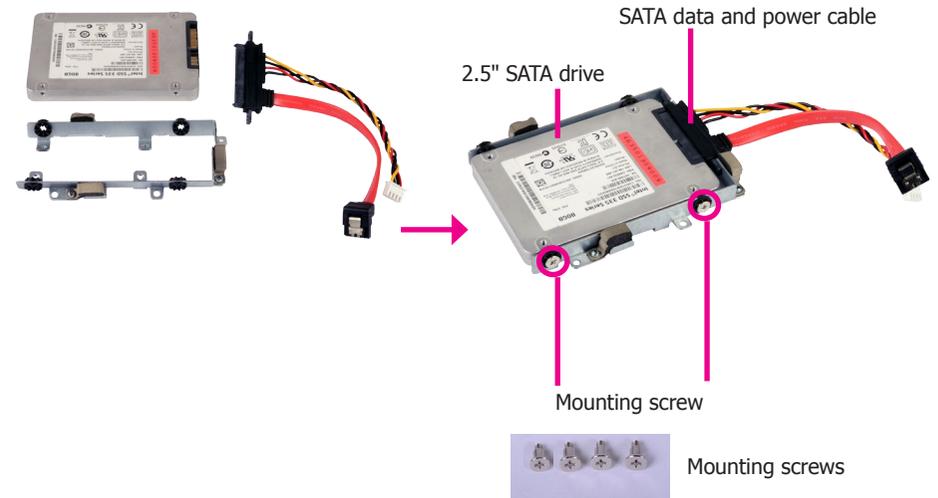
4. After removing the chassis screws, lift the bottom chassis cover to open the system. The HDD mounting posts are accessible after removing the bottom cover. To access the main board, please remove the power board first.



Installing a SATA Drive

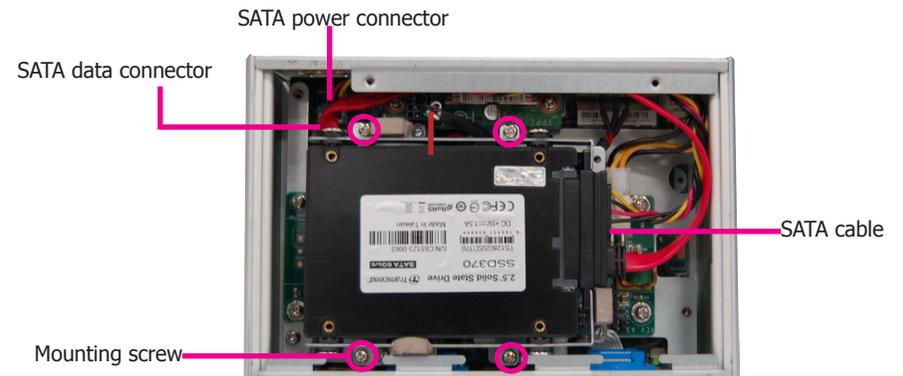
The system can accommodate one SATA drive installation.

1. Use the SATA HDD brackets included in the product package to install a SATA HDD in the system.



Note: Please connect the SATA cable first before installing the HDD on the HDD bracket. The HDD bracket might block the access to the SATA connectors on the HDD.

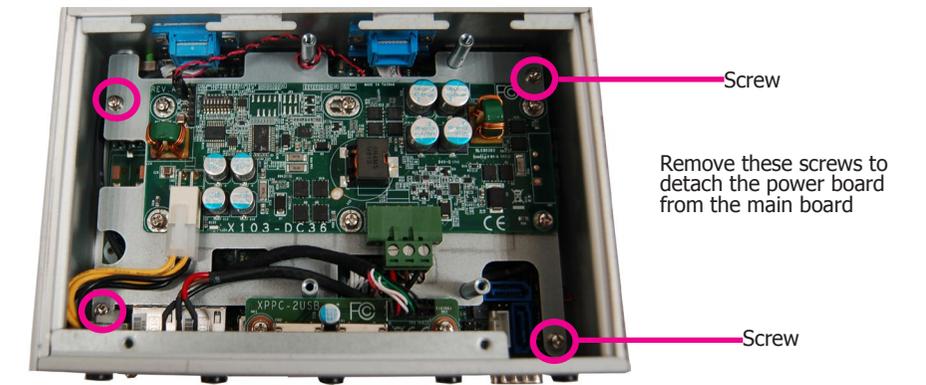
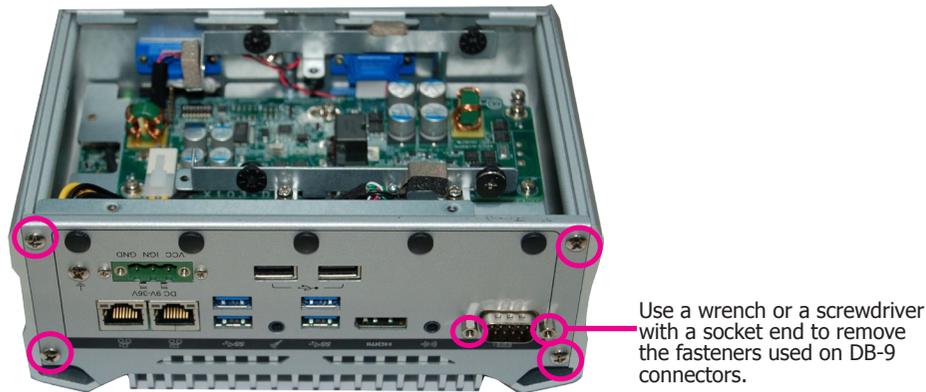
2. Place the SATA drive bay with the installed HDD back to the system and connect the SATA cable to the SATA connectors on the system board.



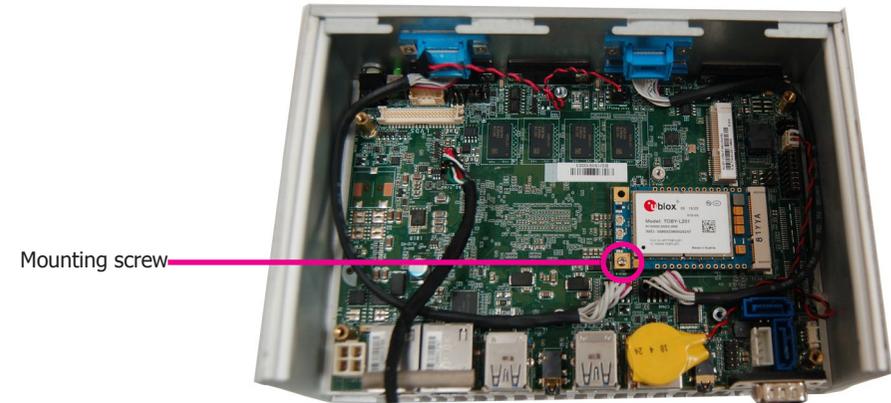
Installing a Mini PCIe Card

The system board is equipped with 2 Mini PCIe slots: one full-size and one half-size slot. Here we will demonstrate the installation of a full-size Mini PCIe card.

The Mini PCIe sockets are located on the main board; to access the main board, detach the power board on top of it. Remove the screws that affix the rear bezel as shown in the following picture to access the power board and uninstall it from the system.



1. Grasp the Mini PCIe card by its edges and align the notch of the PCIe card with the key in the connector on the system board.
2. Push the Mini PCIe card down and use the provided mounting screw to secure the card on the system board.

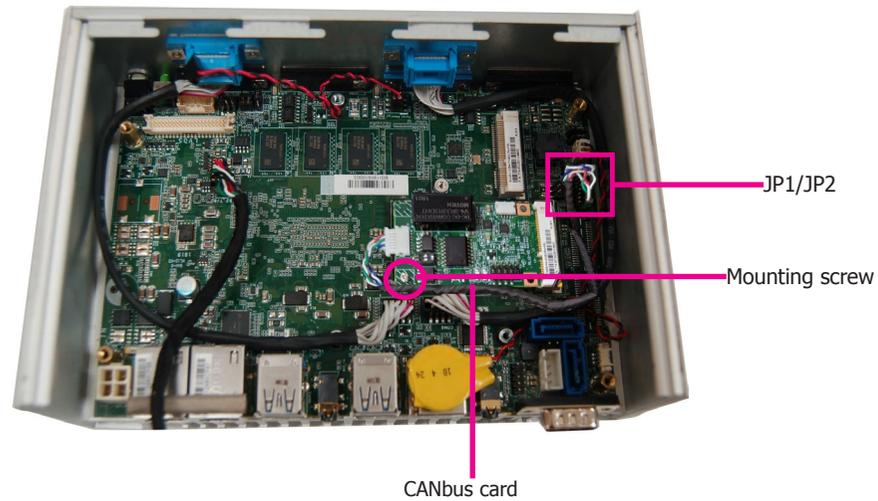


Notes:

1. The system also has a half-size Mini PCIe slot that can accommodate either a Mini PCIe or an mSATA card. Refer to jumper settings for signal selection for this slot.
2. The power board connects to the mainboard with a 4-pin power cable, please reconnect this cable if it is removed during installation.

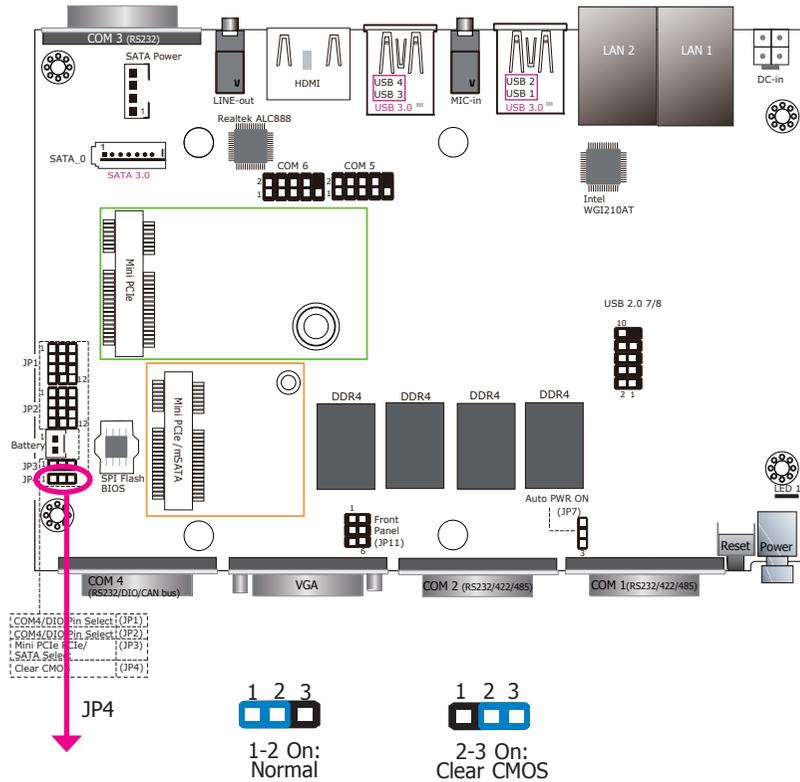
Installing a CANbus card in the Mini PCIe slot

To install a CANbus card, connect the cable between the card the pin headers (JP1 and JP2), then you can use COM 4 as a CANbus port. For pin assignments of this port, refer to Chapter 5 – Ports and Connectors. To switch signals for COM 4, refer to Chapter 4 – Jumper Settings.



Chapter 4 - Jumper Settings

Clear CMOS Data



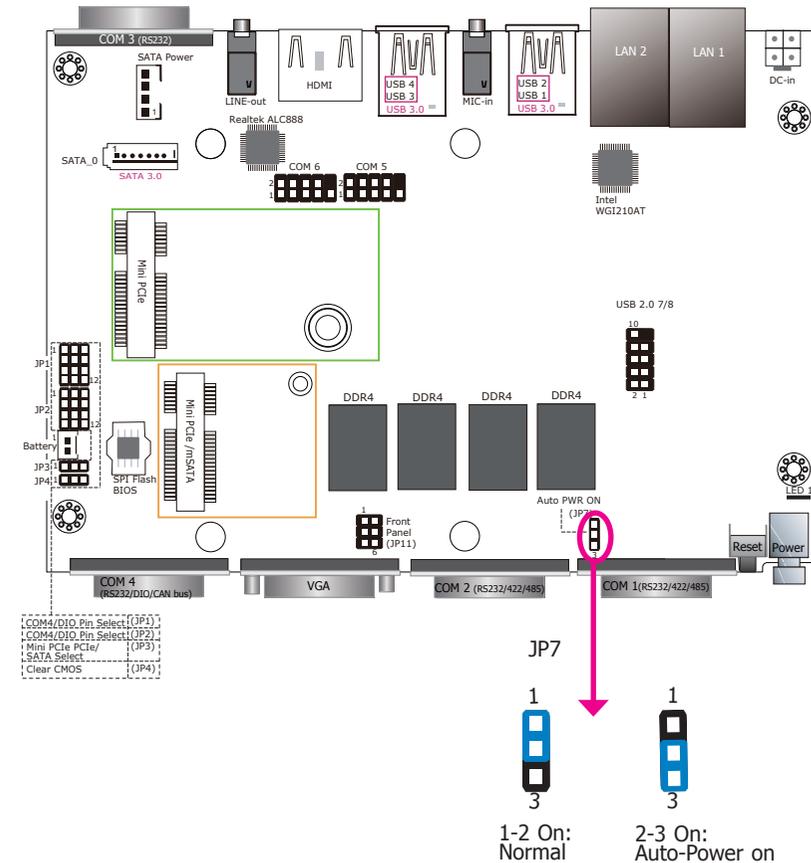
You can reconfigure the system with the default values stored in the ROM BIOS if you encounter the following situations:

- CMOS data becomes corrupted.
- You forgot the supervisor or user password.

To load the default values stored in the ROM BIOS, please follow these steps below.

- Power off the system and unplug the power cord.
- Set jumper pins 2 and 3 to On. Wait for a few seconds and set the jumper back to its default setting, pins 1 and 2 On.
- Now plug the power cord and power on the system.

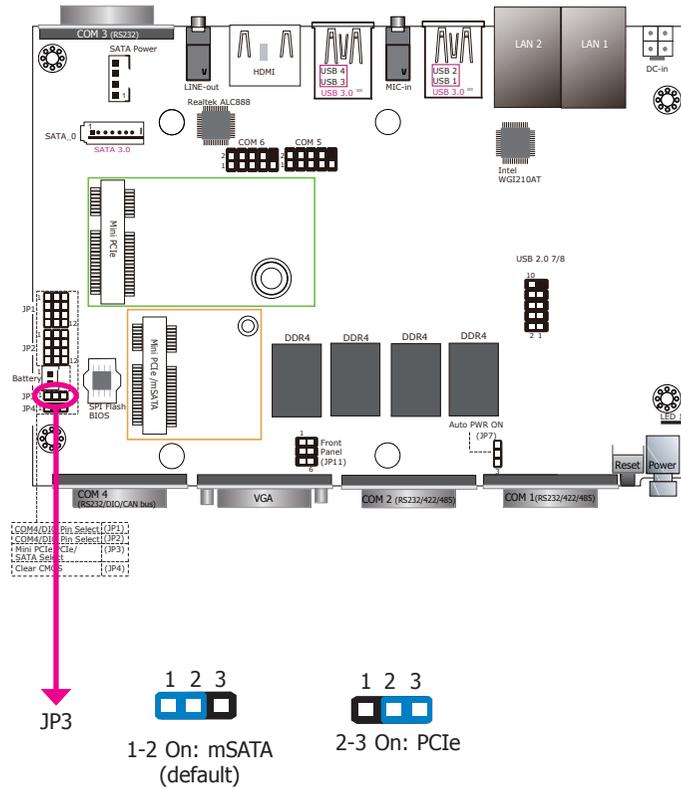
Auto Power-on Select



JP7 is used to select the method of powering on the system. If you want the system to power on whenever ignition signal comes in, set JP7 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

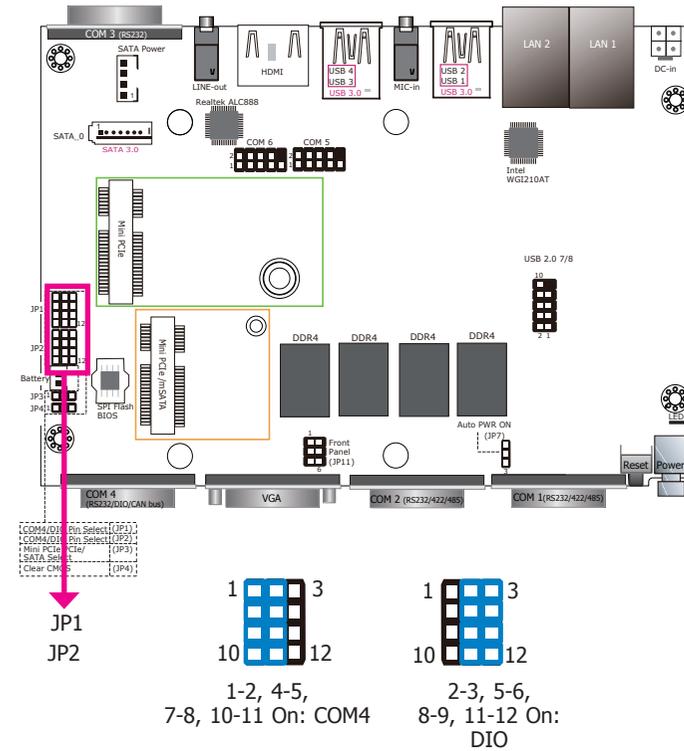
When using the JP7 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

Mini PCIe/SATA Signal Select



JP3 is used to select the signal for the half-size Mini PCIe slot: PCIe or mSATA (default).

COM4/DIO Select



The system board uses JP1 and JP2 to select between RS232 serial communication or 8-bit digital I/O for the DB-9 connector (COM 4) on the front panel.

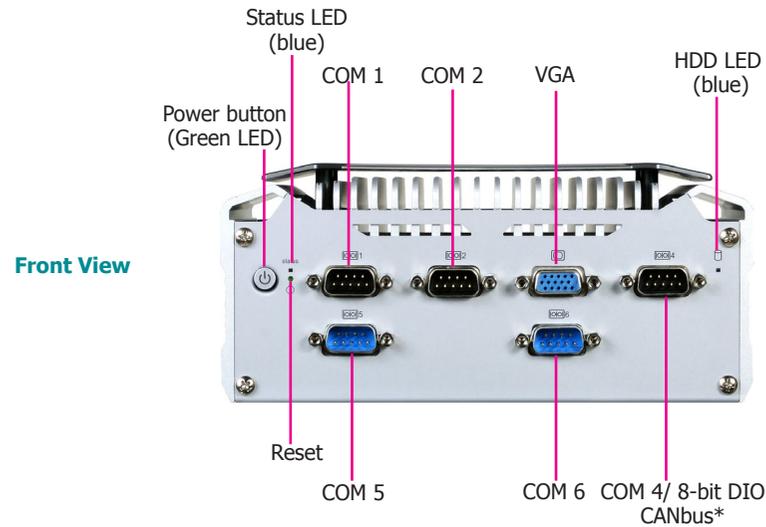


Important:

You cannot use COM 4 and DIO at the same time. Please set JP1 and JP2 together.

Chapter 5 - Ports and Connectors

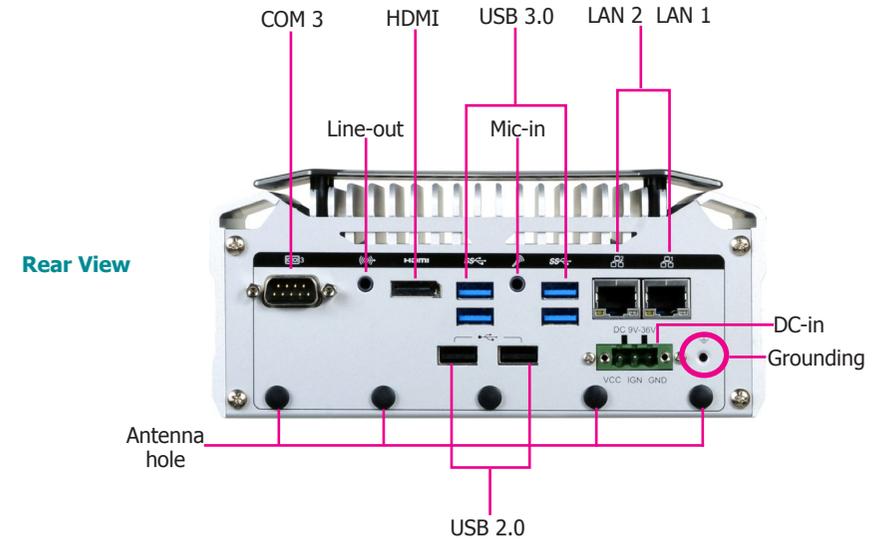
Front Panel I/O Ports



The front panel I/O consists of the following ports:

- Power button with LED (green)
- Reset button
- Status and HDD LEDs (blue)
- VGA port
- Five RS232 serial COM ports:
 - COM 1 & COM 2 are RS232/422/485 ports
 - COM 4 can be an RS232, an 8-bit DIO or a CANbus port
 - COM 5 & COM 6 are RS232 ports

Rear Panel I/O Ports



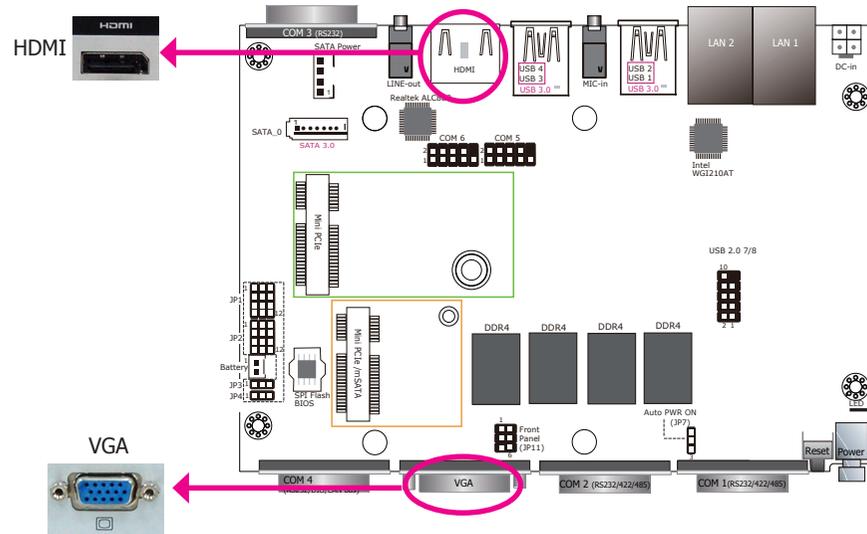
The rear panel I/O consists of the following ports:

- 3-pole DC-in connector
- Line-out and mic-in ports
- Two Ethernet ports
- Four USB 3.0 ports
- Two USB 2.0 ports
- One HDMI port
- One serial COM port:
 - COM 3 is an RS232 port

Display Interfaces

The display ports consist of the following:

- 1 HDMI
- 1 VGA



VGA Port

The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

HDMI Port

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

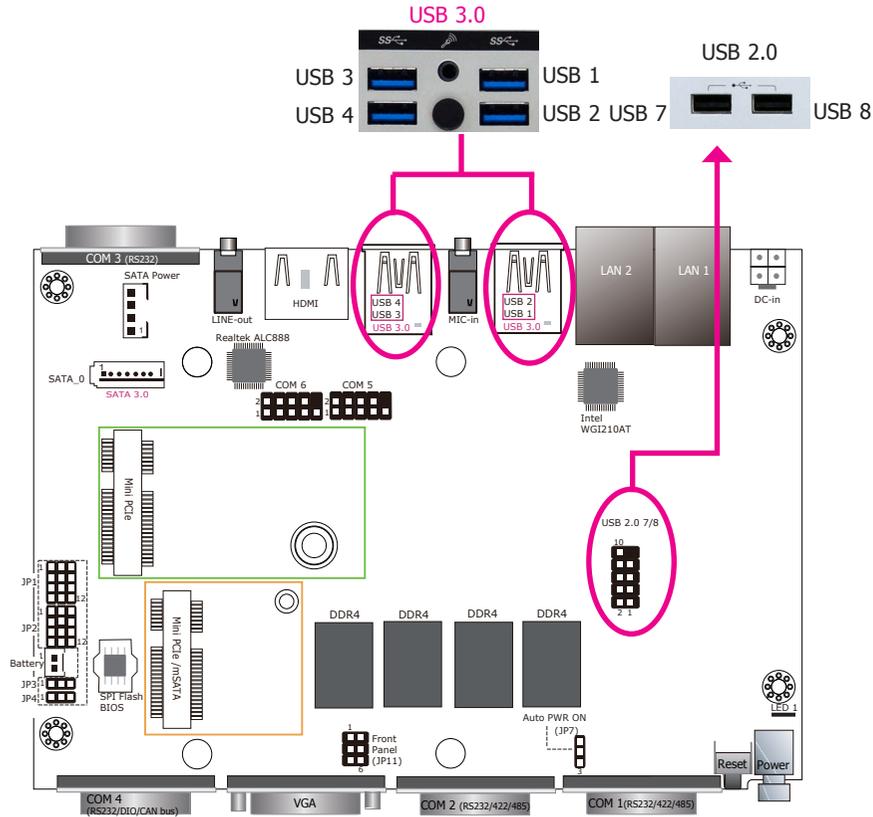
BIOS Setting

Configure the display devices in the Advanced menu ("Video Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

Driver Installation

Install the graphics driver. Refer to Chapter 8 for more information.

USB Ports



The system board is equipped with four onboard USB 3.0 ports (USB 1-4). USB devices allow data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

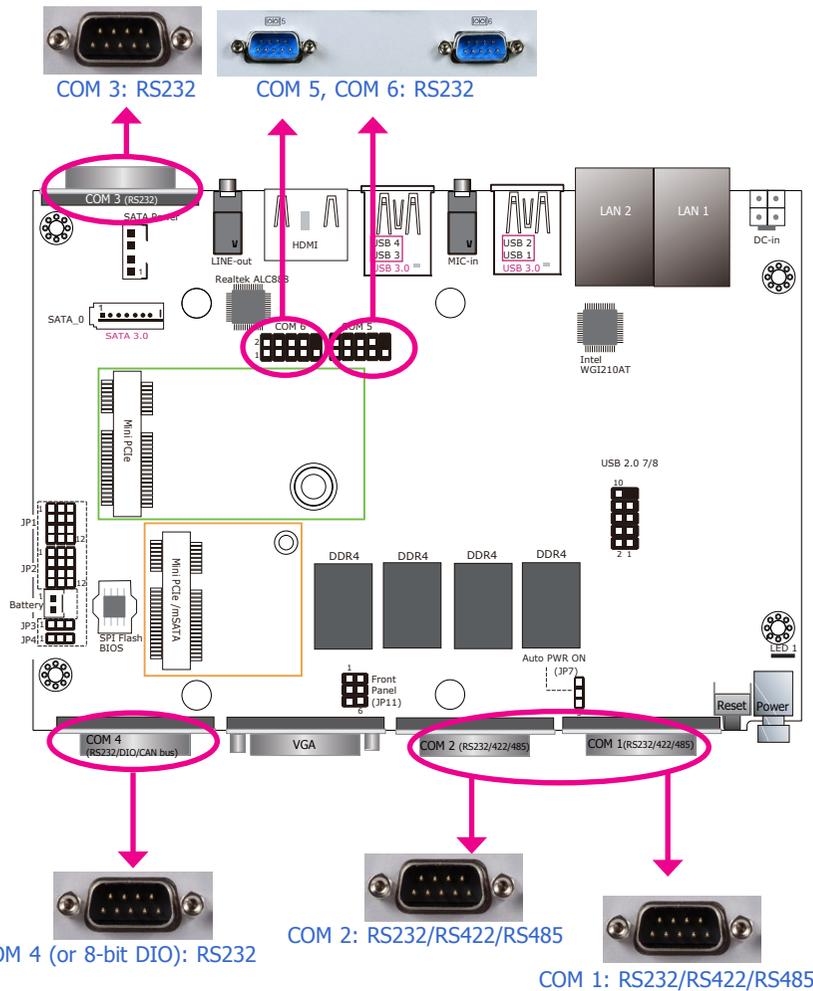
BIOS Setting

Configure the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use USB devices. Refer to Chapter 8 for more information.

COM (Serial) Ports

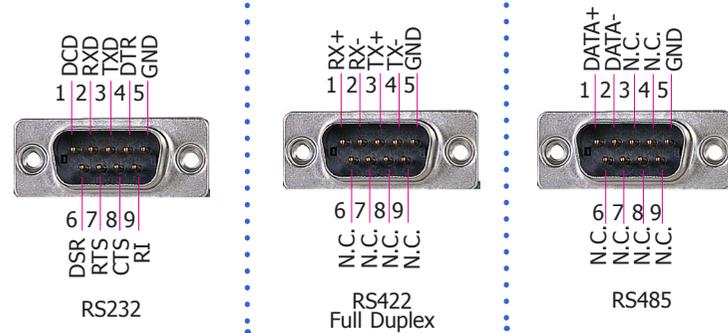


COM 1 and COM 2 can be selected among RS232, RS422 and RS485 whereas COM 3 and COM 4 are fixed at RS232. Use the BIOS configuration utility to select the communication mode for COM 1 and COM 2.

BIOS Setting

Configure the serial ports including the communication mode in the "Advanced" menu (Super I/O submenu) of the BIOS. Refer to Chapter 7 for more information.

COM 1 (RS232/422/485) / COM 2 (RS232/422/485) / COM 3 (RS232 only)



COM 4 (Serial) Port

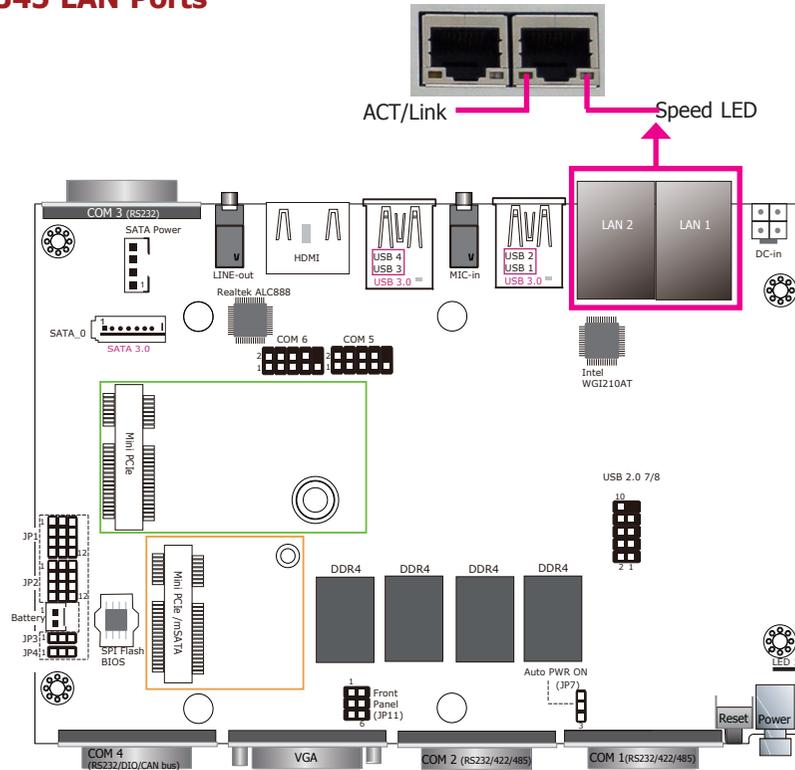
This DB-9 serial port can be configured as an RS232 serial port or as an 8-bit DIO connector via jumper settings. Refer to "COM4/DIO Select" in Chapter 4 for its respective configuration.

8-bit Digital IO/CANbus

The 8-bit Digital I/O connector provides monitoring and control functions to the connected external devices. We have built support software called EAPI that enables the functionality of hardware components. Please contact our tech support or sales representatives for the support software package. In addition, you can configure this port to be CANbus compatible; please refer to "Installing a CANbus card in the Mini PCIe slot" in Chapter 3.

Pins	COM 4 Function		
	RS232	DIO	CANbus
1	DCD	DIO0	CAN1-L
2	RXD	DIO1	CAN1-H
3	TXD	DIO2	CAN2-L
4	DTR	DIO3	CAN2-H
5	GND	GND	GND
6	DSR	DIO4	J1708-L
7	RTS	DIO5	J1708-H
8	CTS	DIO6	N/C
9	RI	DIO7	N/C

RJ45 LAN Ports



LAN Ports

- LAN 1 is built on the Intel® I219LM PCI Express Gigabit Ethernet controller with iAMT11.0 PCIe (10/100/1000Mbps) (only Core i7/i5 supports iAMT)
- LAN 2 is built on the Intel® I210IT PCI Express Gigabit Ethernet controller

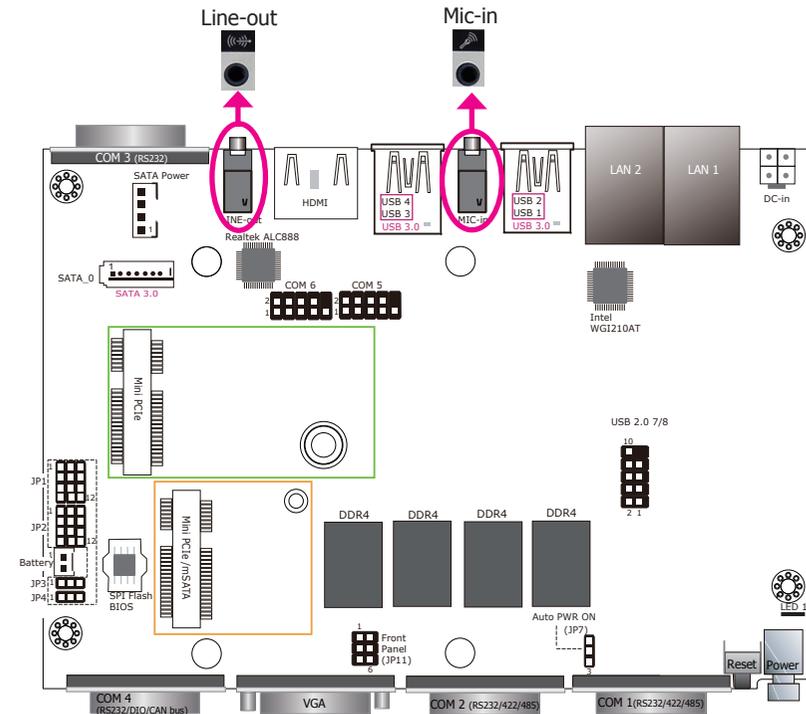
The LAN ports allow the system board to connect to a local area network with a network hub and the their LED indication is as follows:

Activity/Link LED		Speed LED	
LED Behavior	Description	LED Behavior	Description
Off	No link	Off	10Mbps connection
Blinking	Data Activity	Green	100Mbps connection
On	Link	Orange	1Gbps connection

Driver Installation

Install the LAN drivers. Refer to Chapter 8 for more information.

Audio



Audio Ports

The system board is equipped with 2 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

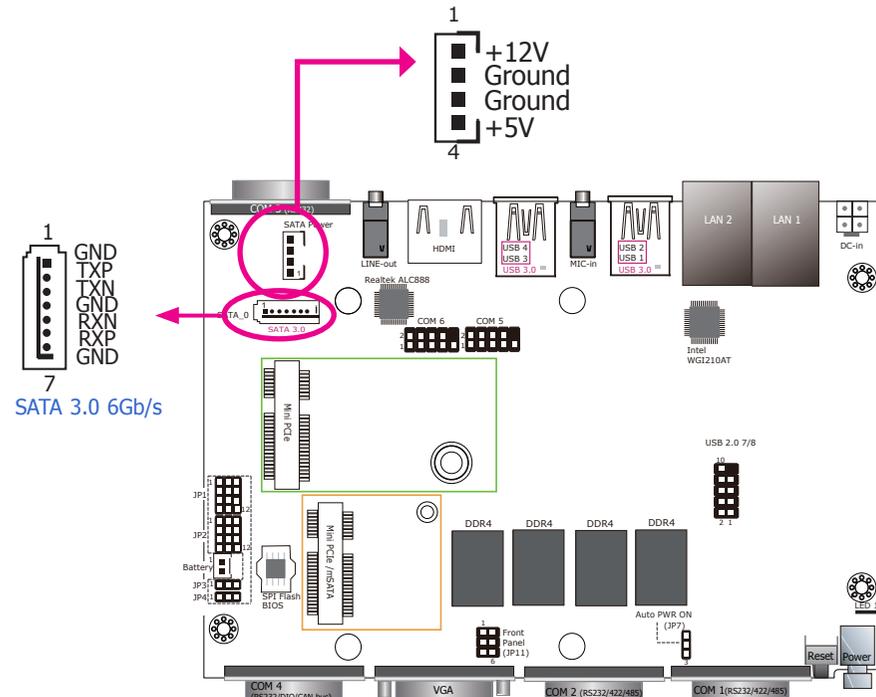
- Line-out Jack
This jack is used to connect a headphone or external speakers.
- Mic-in Jack
This jack is used to connect an external microphone.

Driver Installation

Install the audio driver. Refer to the Chapter 8 for more information.

I/O Connectors

Serial ATA Connector & Serial ATA Power Connector



Features

- 1 Serial ATA 3.0 port with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

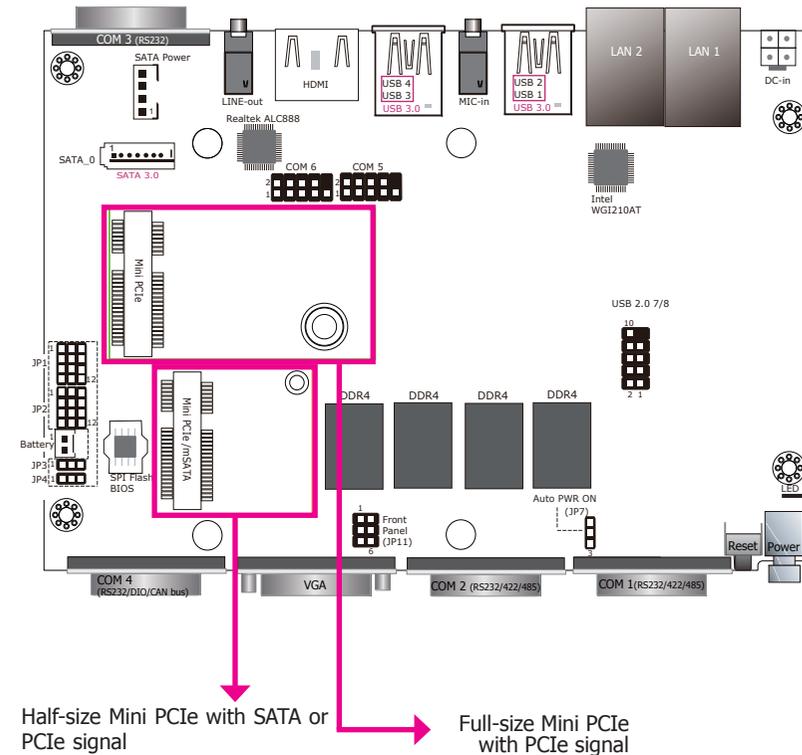
The Serial ATA connector is used to connect the Serial ATA device. Connect one end of the Serial ATA data cable to a SATA connector and the other end to your Serial ATA device.

The SATA power connector supplies power to the SATA drive. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device.

BIOS Setting

Configure the Serial ATA drives in the Advanced menu ("SATA Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

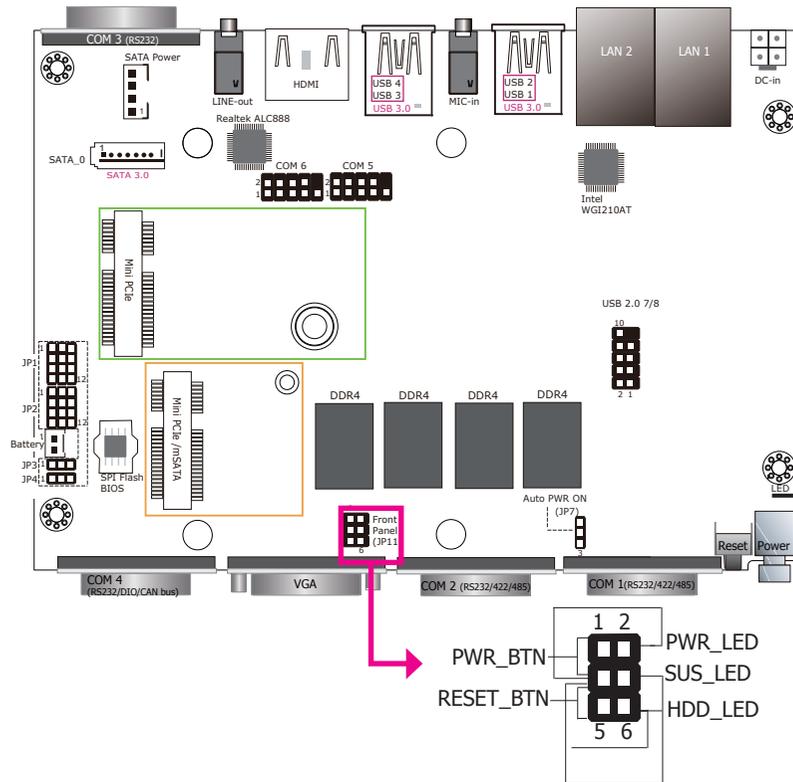
Expansion Slots



Mini PCI Express Slots

The Mini PCI Express slots on the system board are used to install one half-size and full-size Mini PCIe card. The half-size Mini PCIe slot can be inserted with either an mSATA card or a Mini PCIe card; please refer to "Mini PCIe/SATA Signal Select" in Chapter 4 for more information on jumper settings for signal selection and Chapter 7 for the designated SATA port of this slot.

Front Panel Connector



HDD_LED (HDD_LED)

This LED will be lit when the hard drive is being accessed.

Reset Button (RESET_BTN)

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

Power Button (PWR_BTN)

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

Status LED (SUS_LED)

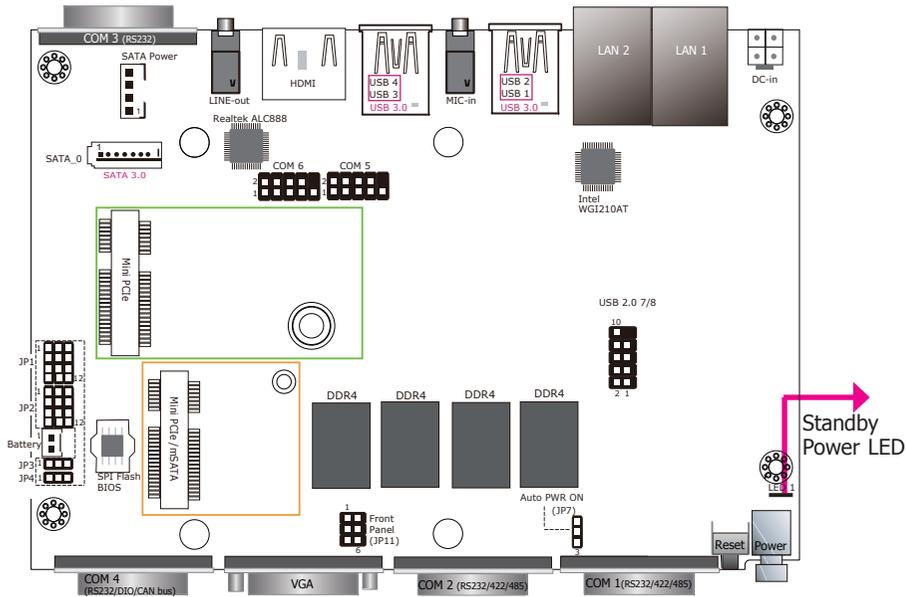
When the system's power is on, this LED will be lit. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

Power/Standby LED (PWR_LED)

This LED will blink when the system is in the standby mode. It indicates that there is power on the system board.

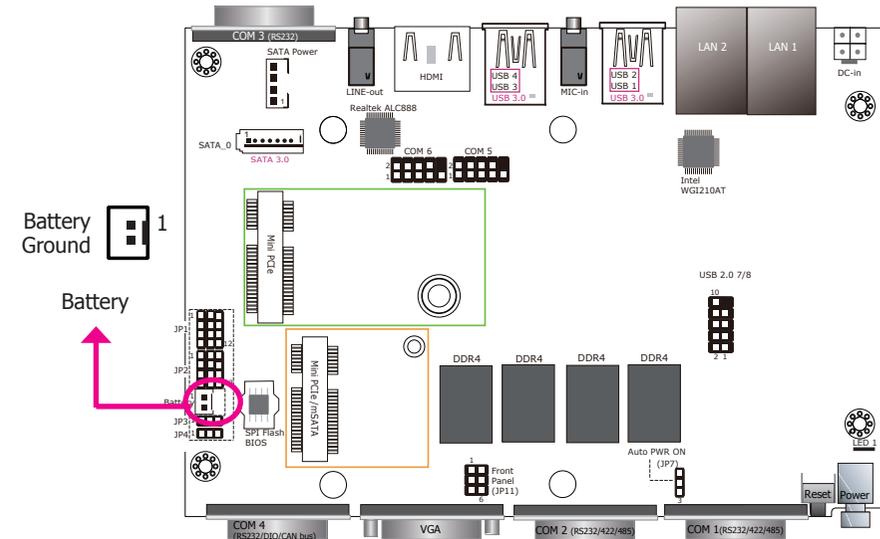
	Pin	Pin Assignment		Pin	Pin Assignment
HDD_LED	6	HDD Power	PWR_BTN	1	Power Button
	3	Ground		3	Ground
RESET_BTN	3	Ground	PWR_LED	2	Power LED
	5	RST Signal		3	Ground
			SUS_LED	3	Ground
				4	SUS LED

Standby Power LED



This LED will blink 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.

Battery

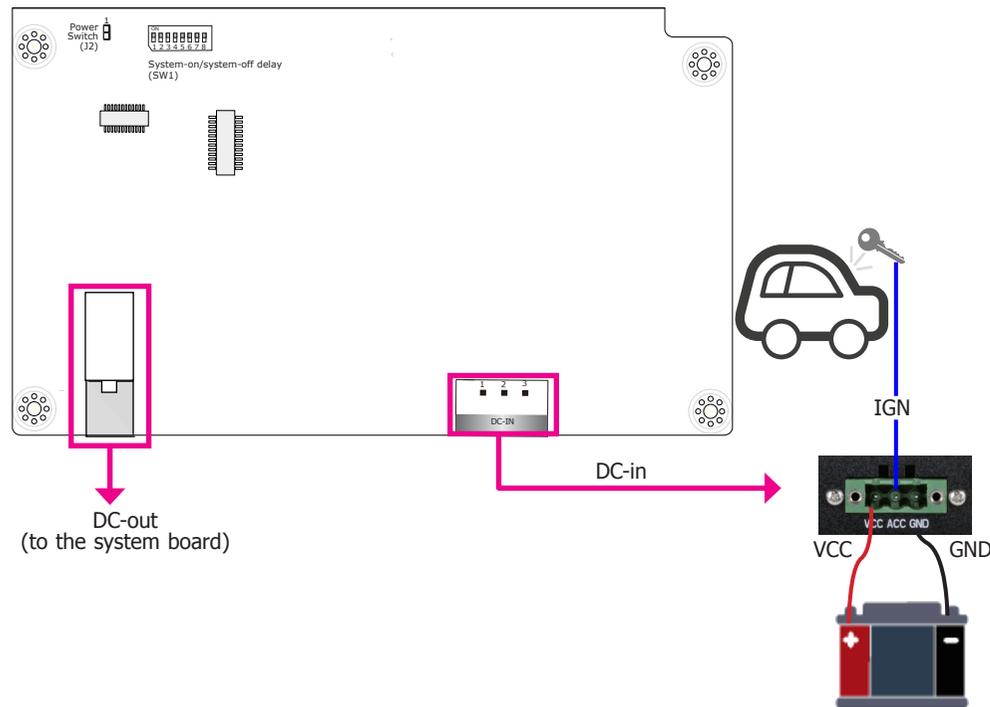


The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

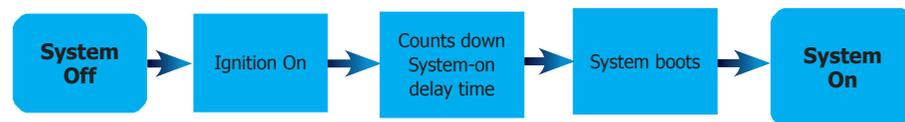
Safety Measures

- 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.

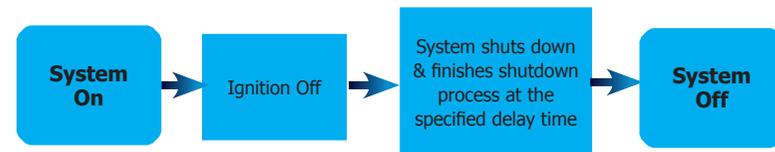
Power Connector (power board)



System startup process with in-vehicle power control



System shutdown process with in-vehicle power control



The 3-pole power connector connects to a car battery for power supply. Note that the system accepts a wide power range of 9 to 36V with in-vehicle power management that includes ignition on/off and system on/off delay time control; please refer to the table on the right for more information.

System-on/off Delay Switch

The DIP switch (SW1) on the **power board (X103-DC36)** can be used to turn on or off the system at a specific on/off delay time via car ignition. Note that this table shows that same information as the one in Chapter 4 - Jumper Settings.

SW1-2: System-on delay enable/disable				
	On (Default)		Enable (delay time setting adjustable by SW1-4 and 1-5 as shown in the table below)	
	Off		Disable (System-on delay = 3 sec)	
SW1-4 and 1-5: System-on delay time setting				
	4	5	Time	
	On	On	10 sec (default)	
	Off	On	30 sec	
	On	Off	1 min	
Off	Off	5 min		
SW1-3: System-off delay enable/disable				
	On (Default)		Enable (delay time setting adjustable by SW1-6, 1-7 and 1-8 as shown in the table below)	
	Off		Disable (System-off delay = 0 sec)	
SW1-6, 1-7 and 1-8: System-off delay time setting				
	6	7	8	Time
	On	On	On	30 sec (default)
	Off	On	On	1 min
	On	Off	On	3 min
	Off	Off	On	5 min
	On	On	Off	10 min
	Off	On	Off	15 min
	On	Off	Off	30 min
Off	Off	Off	1 hr	



Note:

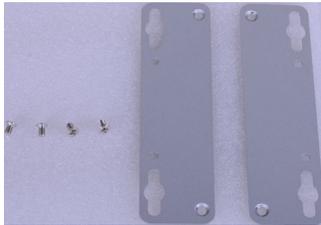
The OS will start the shut-down procedure after the car ignition switches off and will complete the shutdown procedure within the specified system-off delay time. Please make sure that system-off delay time is sufficient to allow the OS to shut down completely.

Chapter 6 - Mounting Options

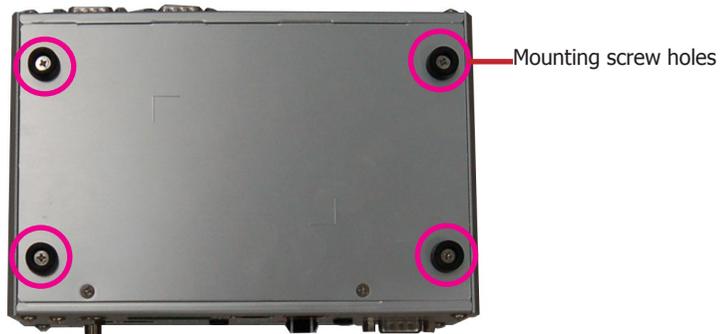
Wall Mount

The wall mount kit includes the following:

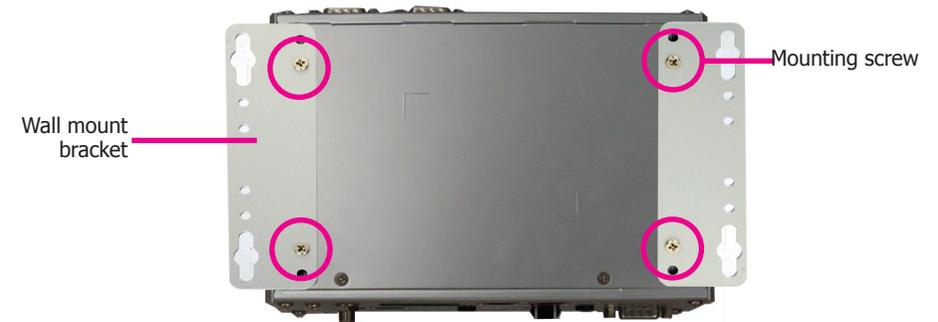
- 2 Wall mount brackets
- Bracket screws



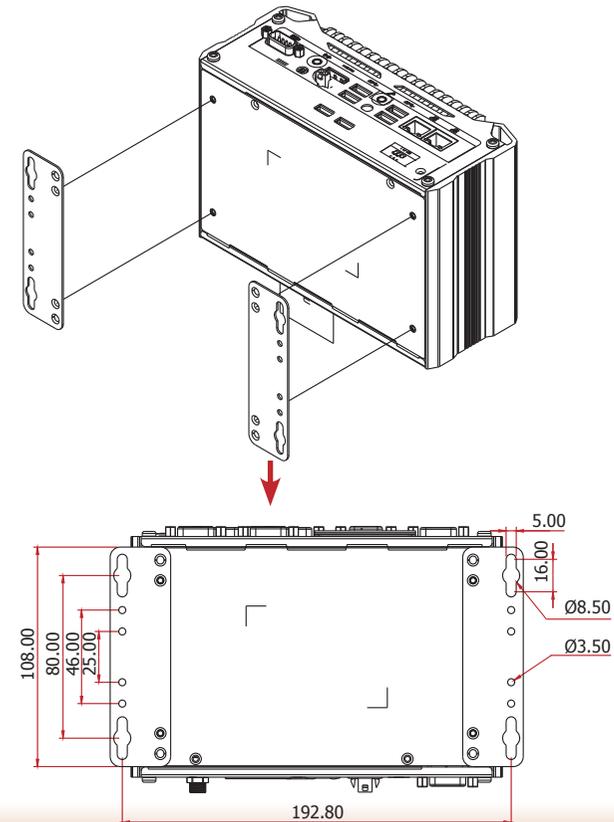
1. Remove the rubber feet from the bottom cover chassis. Or if the rubber feet are not attached to the chassis, use these screw holes to mount wall brackets.



2. Use the provided mounting screws to attach the wall mount brackets to both sides on the bottom of the system.



The following diagrams show the location and dimension of the wall mounting holes.



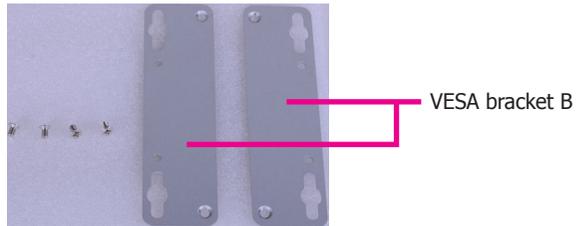
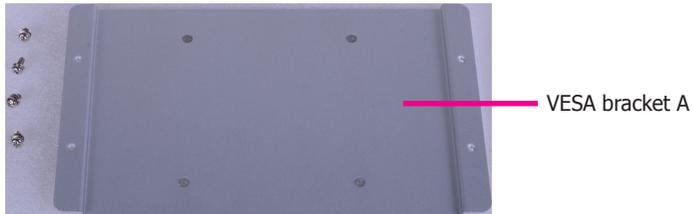
VESA Mount



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

The vesa mount kit includes the following:

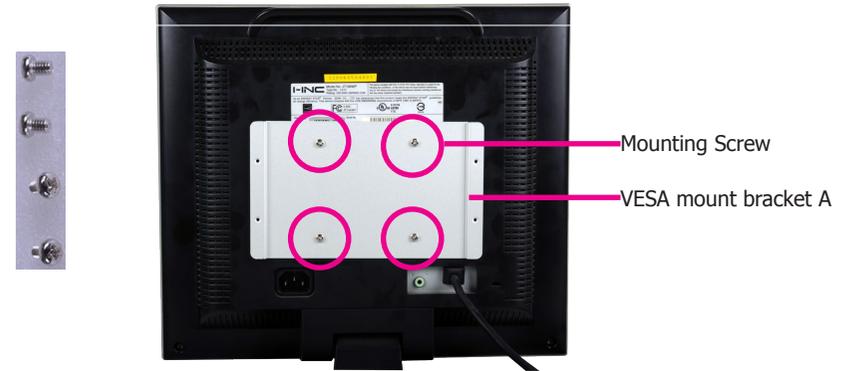
- 1 VESA mount bracket A
- 2 VESA mount bracket B
- Bracket screws



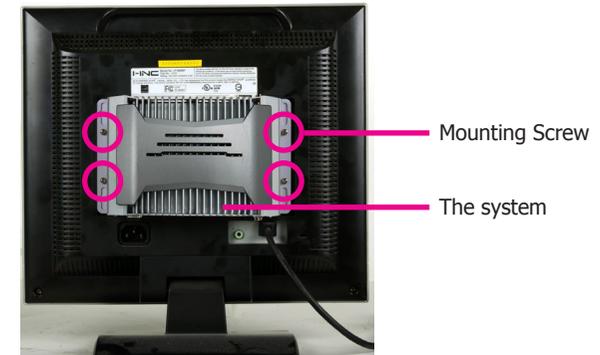
1. Attach the VESA mount bracket B to the left and right sides on the bottom of the system.



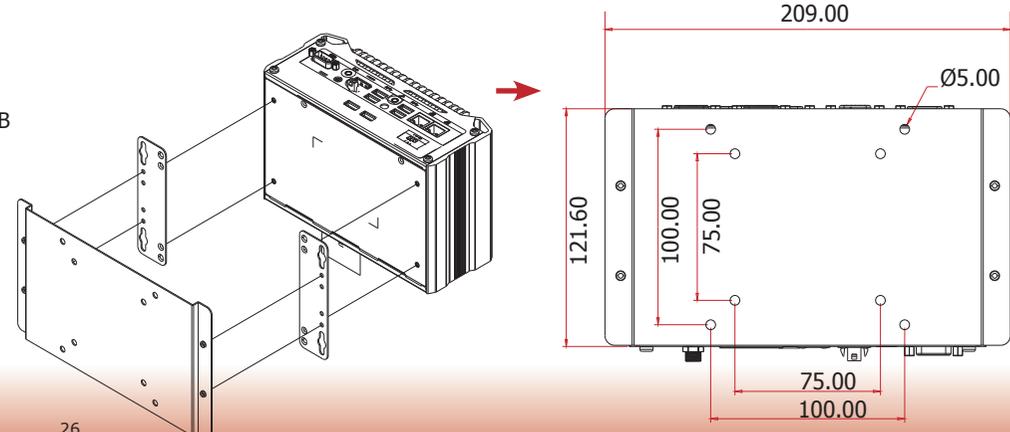
2. Attach the VESA mount bracket A to the back of your display using four screws as shown in the picture below.



3. Align VESA bracket A with VESA bracket B, and then use the provided mounting screws to attach both brackets to secure the system in place.



The following diagrams show the location and dimension of the vesa mounting holes.



DIN Rail Mount

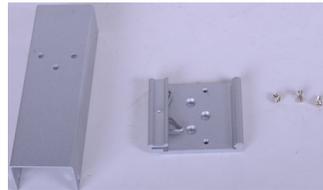


Note:

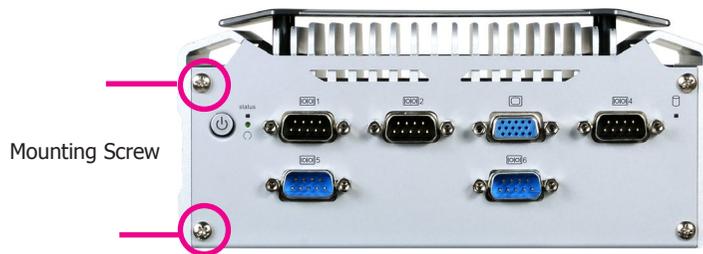
The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

The DIN Rail mount kit includes the following:

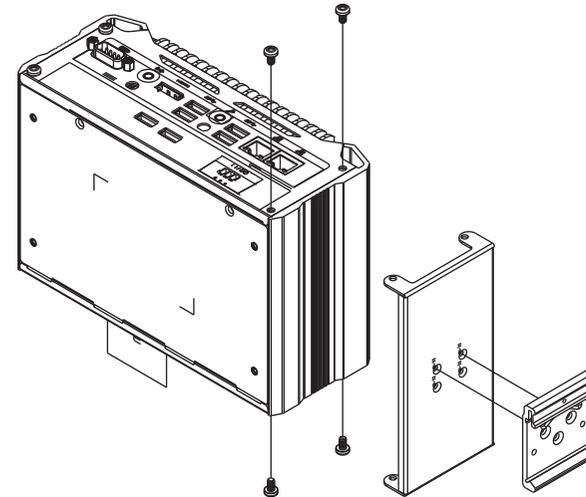
- 1 DIN-rail mount clip
- 1 bracket
- Bracket screws



1. Locate the mounting screws for mounting the din-rail bracket on the chassis cover. Remove these screws and put them in a safe place for later use.



2. Align the mounting holes on the system and the mounting holes on the bracket, and then use the screws removed in step 1 to secure the bracket in place.
3. The 3 mounting holes on the bracket are used to affix the DIN-rail mount clip to the bracket.



Chapter 7 - 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 keys simultaneously.

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenu or fields.
<Esc>	Exit to the BIOS Setup Utility.
<F1>	Help
<F5>	Change values
<F6>	Change values
<F9>	Setup Defaults
<F10>	Save and Exit
<Enter>	Press <Enter> to enter the highlighted submenu.

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.

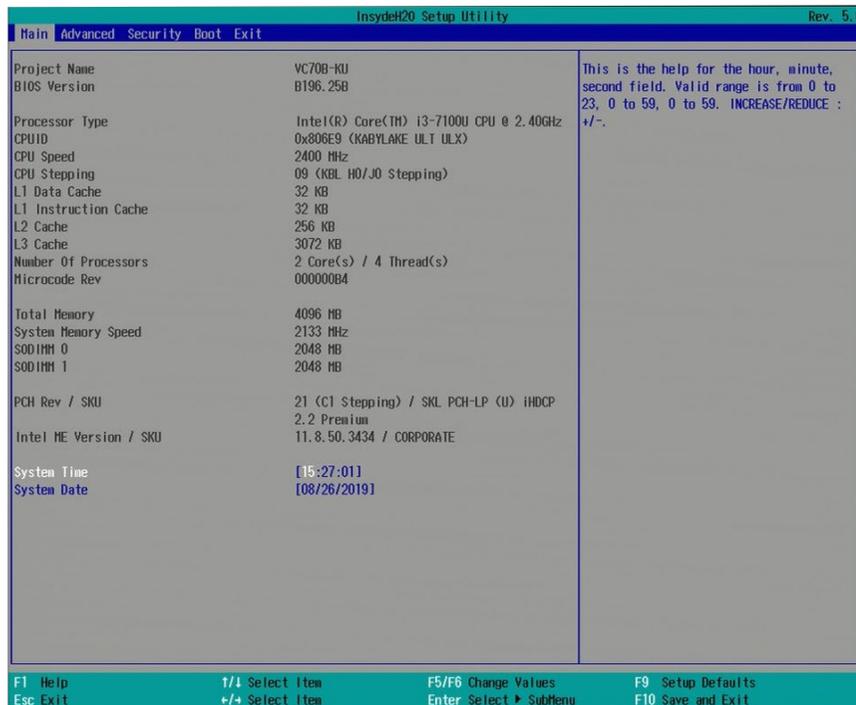
Submenu

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>.

Insyde BIOS Setup Utility

Main

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



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.

System Date

The date format is <month>, <date>, <year>. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

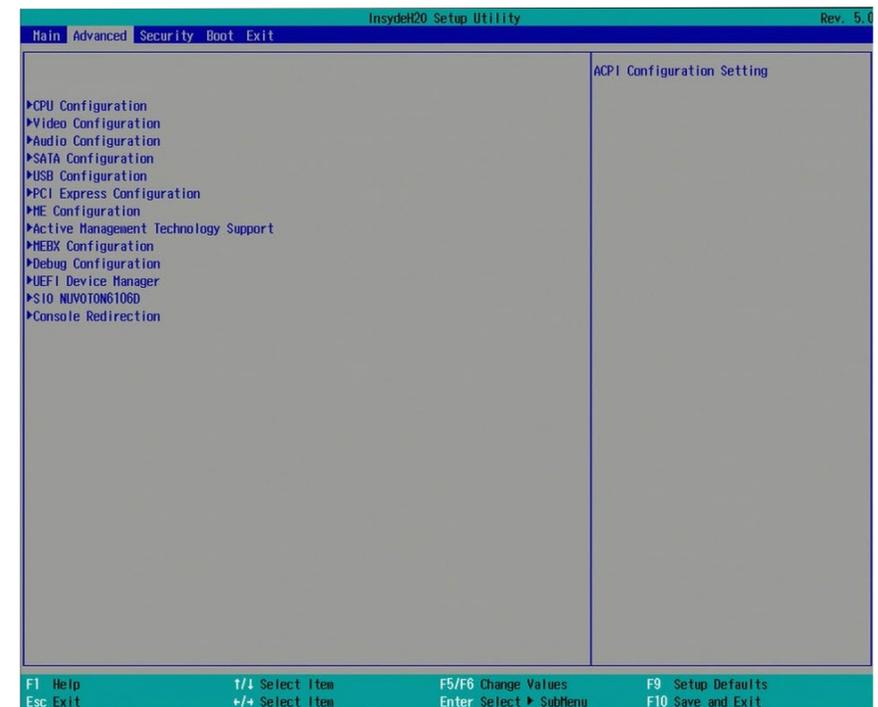
Advanced

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.



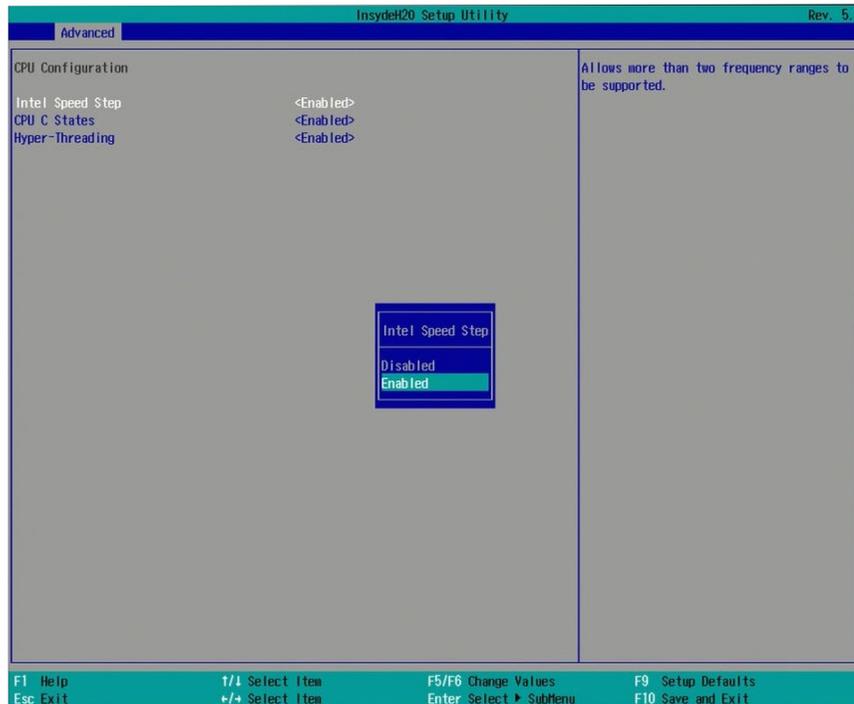
Important:

Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section configures the CPU.



Intel® SpeedStep™

Enable or disable the Enhanced Intel SpeedStep® Technology, which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, you can enable the EIST feature using the operating system's power management feature.

CPU C States

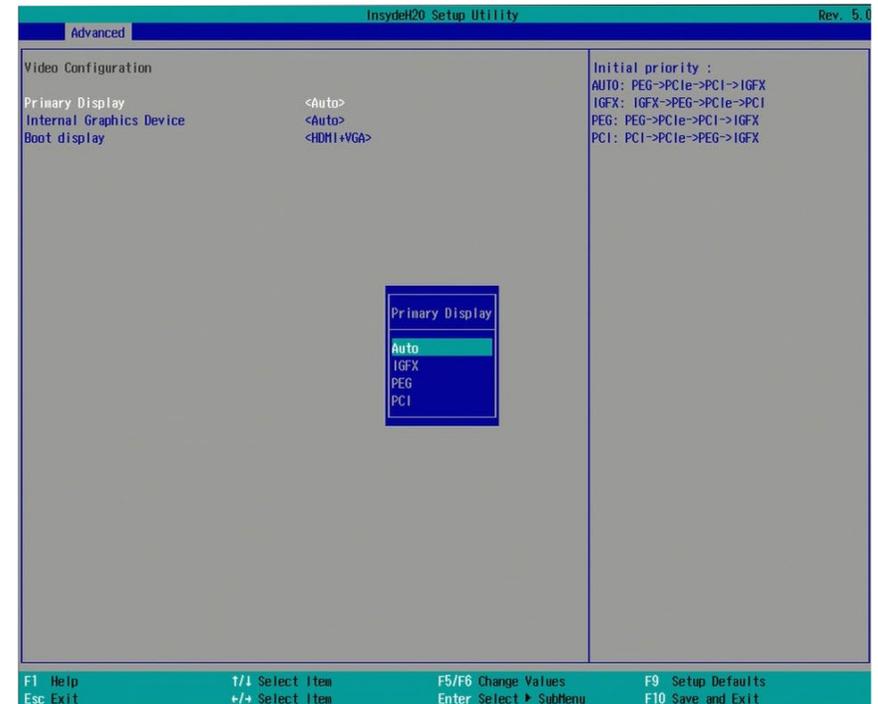
Enable or disable CPU Power Management. It allows the CPU to go to C states when it's not 100% utilized.

Hyper-Threading

Enable Intel® Hyper-Threading Technology (HT) on the processor to improve performance of operating systems and software that are optimized for hyper-threading technology. Please check the software specifications to determine if enabling HT can be advantageous to the overall system performance.

Video Configuration

This section configures the video settings. Note that the configuration options may vary depending on the "Boot type" selected in the "Boot" menu.



Primary Display

Note that this configuration is only shown if the "Boot Type" is set to "Dual" or "UEFI". Select the primary display for the system from the following options:

Auto mode: Automatic selection

PCI: PCI graphics devices

IGFX: IGFX (internal graphics) devices

PEG: PCIe graphics device

Internal Graphics Device

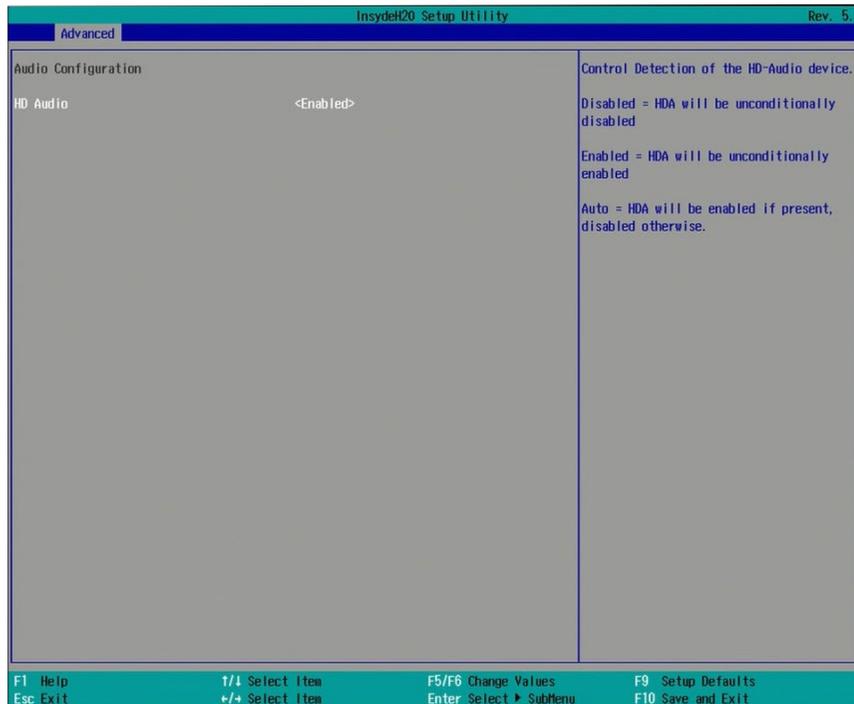
Enable, disable or automatically detect the internal graphics device.

Boot Display

Note that this configuration is only shown when the "Boot Type" is set to "Legacy Boot Type" or "Dual". Select the combination of the display at boot: Auto, HDMI+VGA or VGA+HDMI.

Audio Configuration

This section configures the audio settings.



HD Audio

Control the detection of the high-definition audio devices.

Disabled

High-definition audio devices will be unconditionally disabled.

Enabled

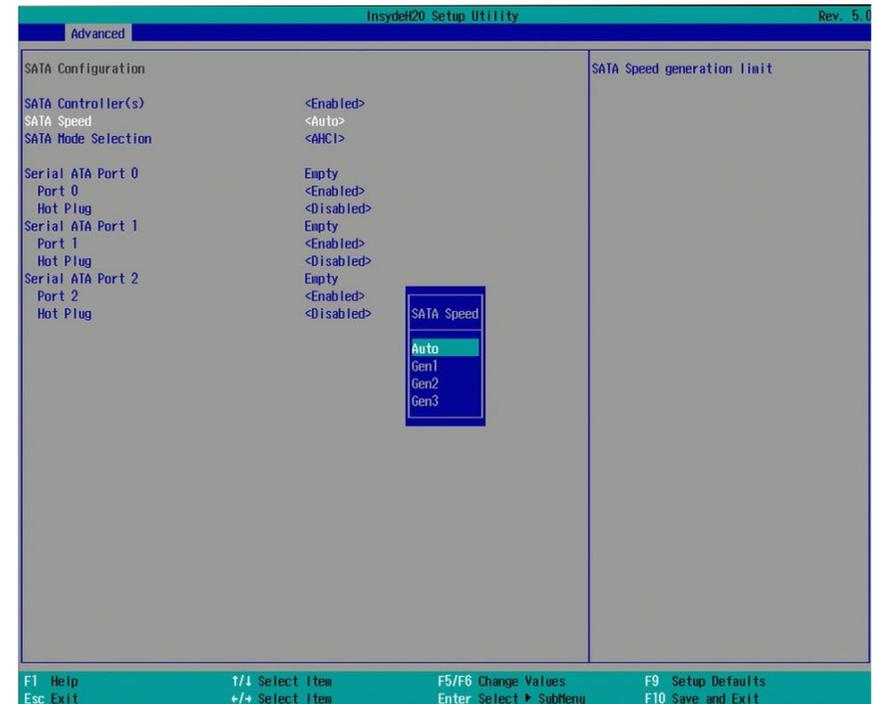
High-definition audio devices will be unconditionally enabled.

Auto

High-definition audio devices will be enabled if present and disabled otherwise.

SATA Configuration

This section configures the SATA controllers and hard disks.

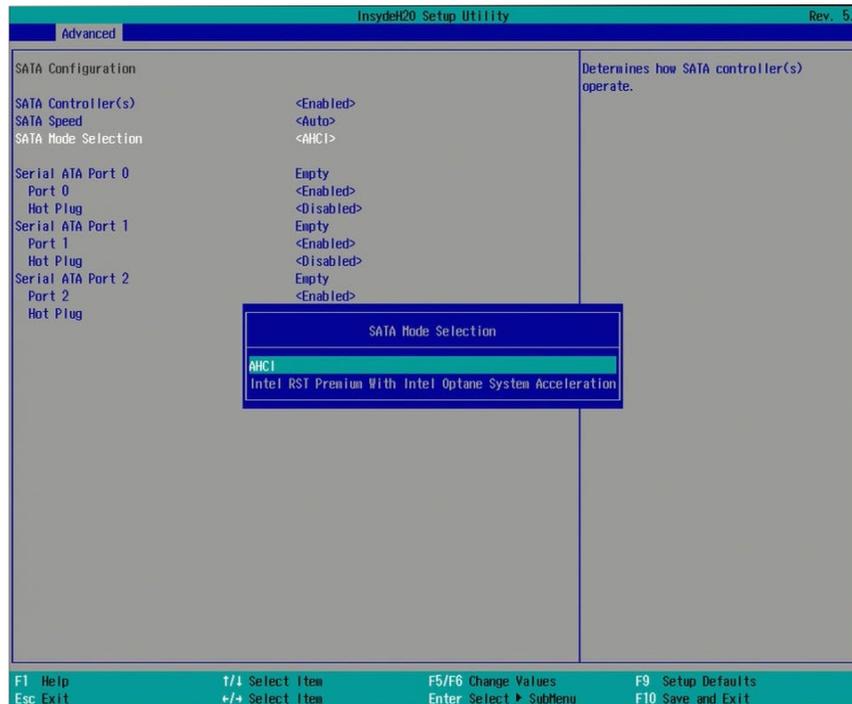


SATA Controller(s)

Enable or disable Serial ATA controllers.

SATA Speed

Select Serial ATA device speed: Gen1 (1.5 Gbit/s), Gen2 (3 Gbit/s), Gen 3 (6 Gbit/s) or auto.



SATA Mode

The mode option shows how the SATA controller(s) operates.

AHCI Mode

This allows the Serial ATA devices to operate in the AHCI (Advanced Host Controller Interface) mode.

Serial ATA Port 0 and 1 and Hot Plug

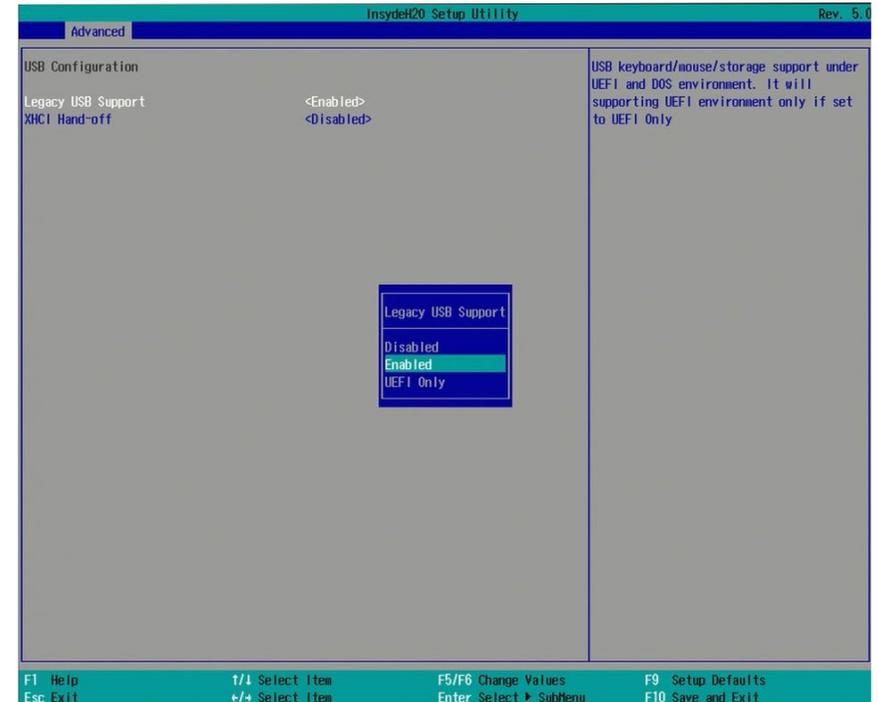
Enable or disable each serial ATA port and its hot plug function.

SATA Port 0: Controls the SATA signal of the SATA port on the system board.

SATA Port 1: Controls the SATA signal of the half-size mini PCIe slot.

USB Configuration

This section configures the parameters of the USB devices.



Legacy USB Support

Disabled

Disable USB keyboard/mouse/storage support.

Enabled

Enable USB keyboard/mouse/storage support under UEFI and DOS environment.

UEFI Only

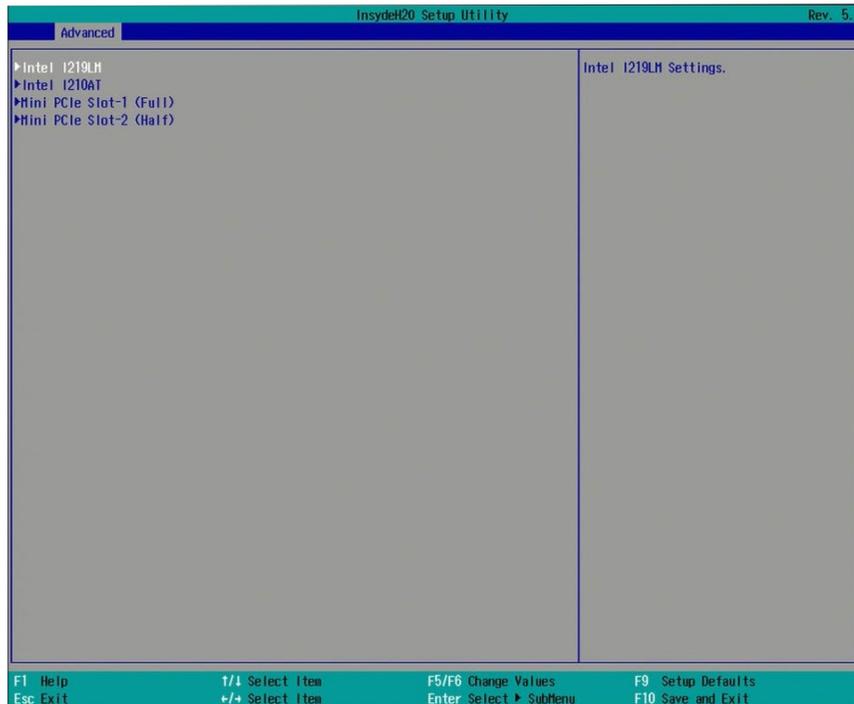
Enable USB keyboard/mouse/storage support only under the UEFI environment.

XHCI Hand-off

Enable this function for operating systems that do not support xHCI Hand-off. The XHCI ownership change will be claimed by the XHCI driver.

PCI Express Configuration

This section configures the settings of PCI Express root ports.



Intel I210AT/I219LM

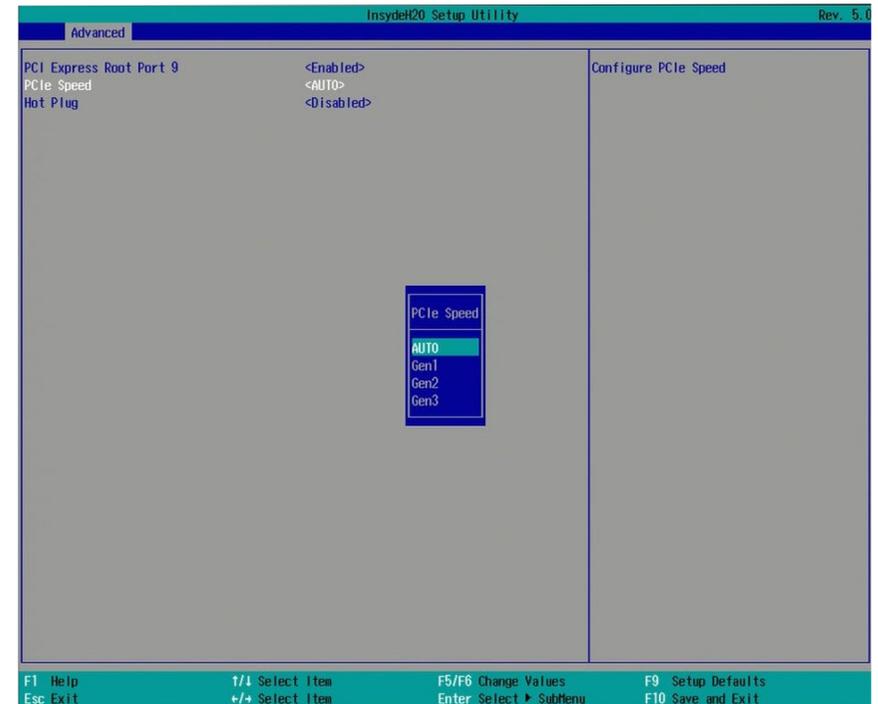
Controls the PCIe signal of the Intel I210AT/I219LM controllers.

Mini PCIe Slot-1 (Full)

Controls the PCIe signal of the full-size Mini PCIe slot.

Mini PCIe Slot-2 (half)

Controls the PCIe signal of the half-size Mini PCIe slot.



PCI Express Root Port

Enable or disable each PCI Express root port.

PCIe Speed

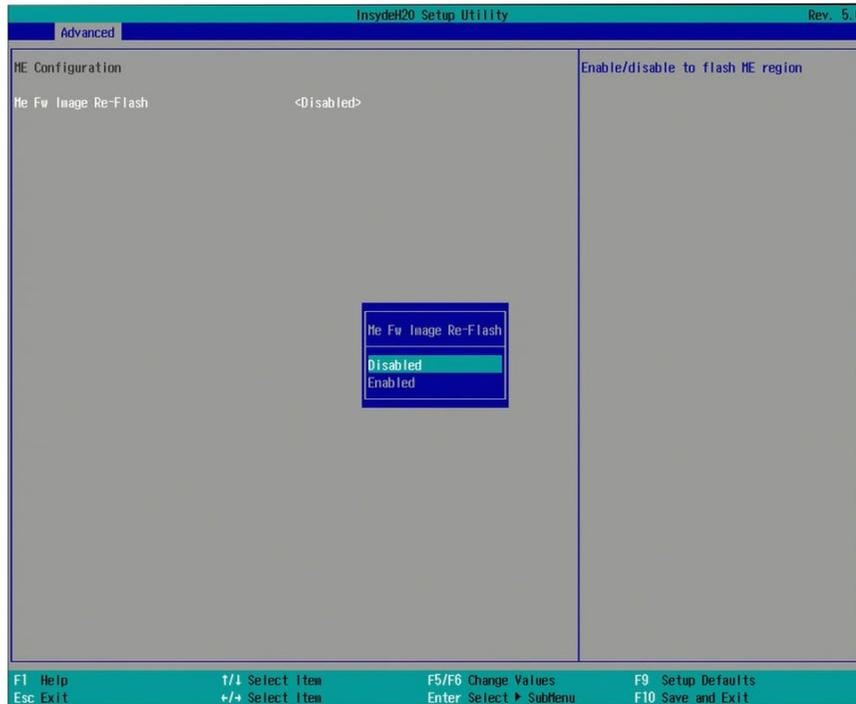
Select the speed of the PCI Express Root Port: Auto, Gen1 (2.5 GT/s), Gen2 (5 GT/s) or Gen3 (8 GT/s).

Hot Plug

Enable or disable the hot plug function of each serial ATA port.

ME Configuration

This section configures flashing of the Intel® Management Engine.

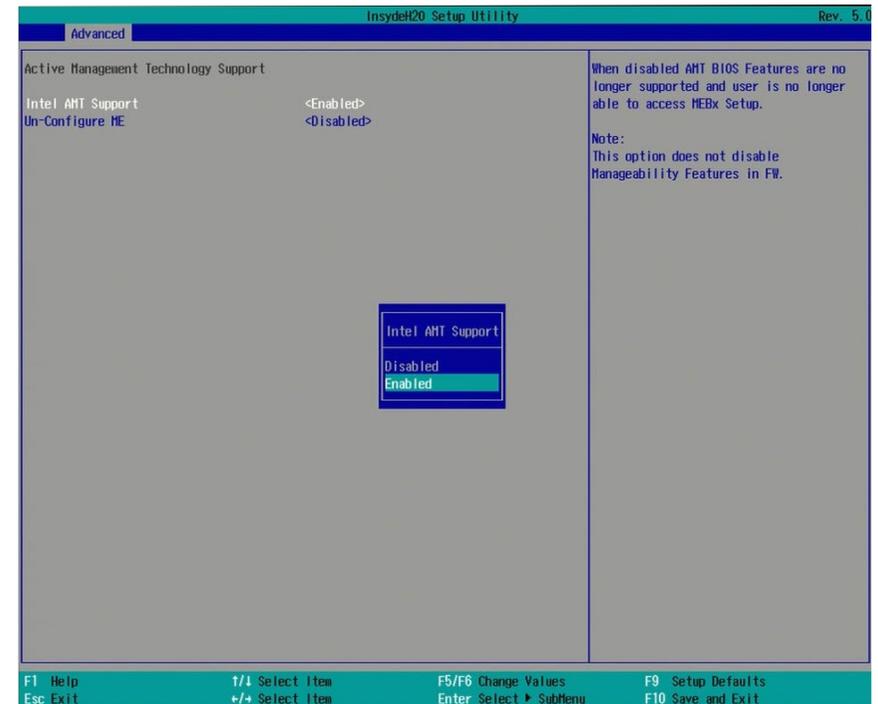


Me Fw Image Re-Flash

Enable or disable flashing of the Intel® Management Engine (ME) region.

Active Management Technology Support

The section allows you to enable or disable the Intel® Active Management Technology (Intel® AMT) BIOS extension. Refer to Chapter 9 - Intel AMT Settings for more information.



Intel AMT Support

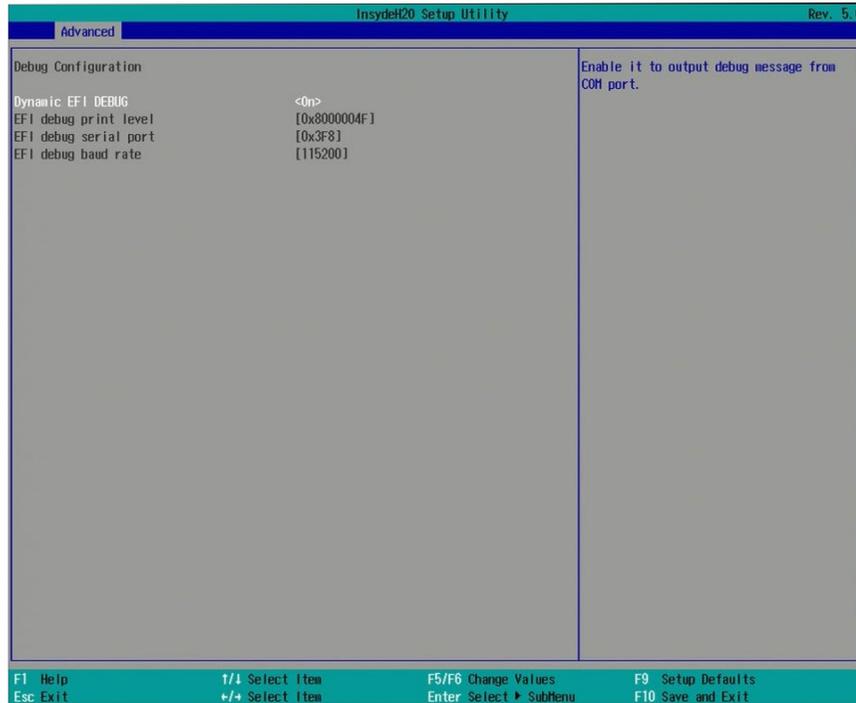
Enable or disable Intel® Active Management Technology BIOS extension.

Un-Configure ME

Clears all ME related configurations without requiring a password on the next boot.

Debug Configuration

This section configures the debug function.

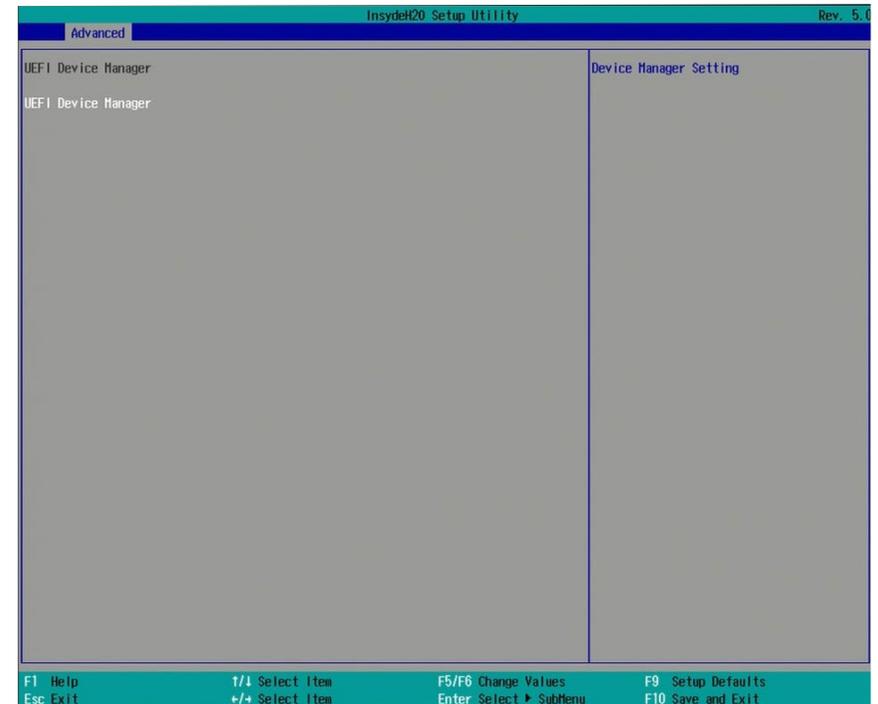


Dynamic EFI Debug

Enable or disable output of the debugging messages through a serial port.

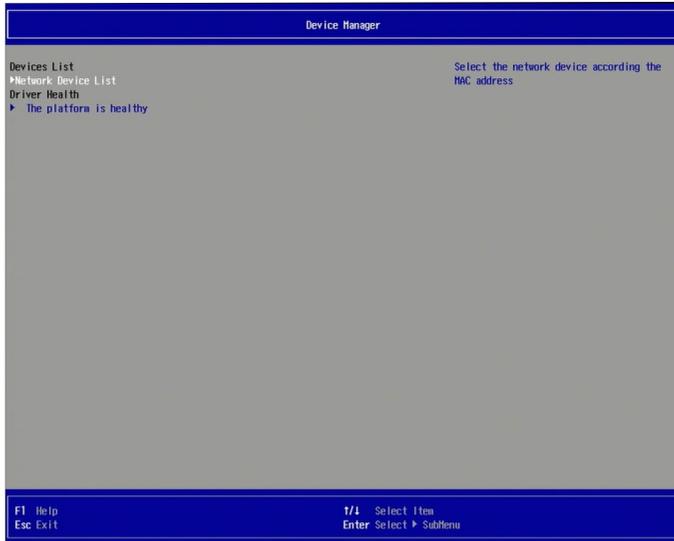
UEFI Device Manager

This Device Manager menu is used to configure UEFI network settings when the "Network Stack" is enabled in the "Dual" or "UEFI" boot mode. Refer to the "Boot" section in this chapter. When this function is selected, the screen will warn you that you are going to exit the BIOS setup utility.



Network Device List

The "Device Manager" screen is displayed. And if the "Network Stack" or the "PXE Boot to LAN" option is enabled from the "Boot" menu, the "Network Device List" should be shown in the "Device list". Select "Network Device List" to view all of the detected network devices. For each network device, you can select to view and configure its settings. In addition, you can select either the IPv4 or IPv6 network settings for UEFI network configuration.



NIC Configuration Menu

This screen shows hardware information for the Ethernet controllers and configures their operation.



Blink LEDs

Enter the duration (seconds) for the Ethernet's speed LED to blink to indicate its presence.

NIC Configuration

This screen configures the Ethernet controller. Select the link speed from the following options: Auto Negotiated, 10Mbps Half, 10Mbps Full, 100Mbps Half, and 100Mbps Full.

IPv4 Network Configuration

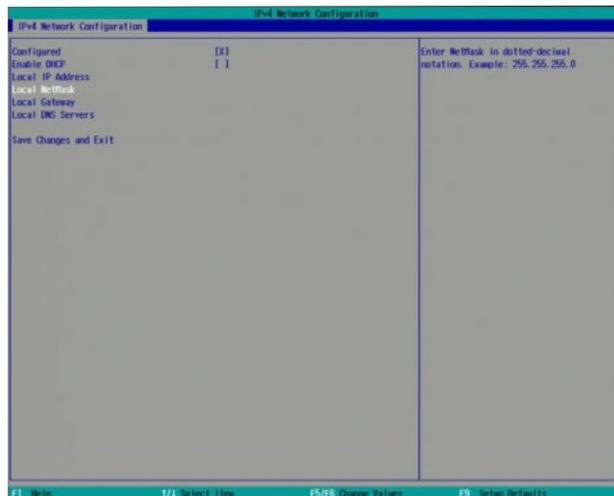
This screen configures the IP addressing method (DHCP or static IP). For static IP addressing, configure the following:

Local IP address and subnet mask: Enter the IP address in the IPv4 format:

x . x . x . x (x must be a decimal value between 0 and 255).

Local Gateway: Enter the gateway address in the IPv4 format.

Local DNS (Domain Name System) Servers: Enter DNS (Domain Name System) server IP addresses in the IPv4 format.



IPv6 Network Configuration

If you select to use IPv6 network settings, enter the Interface ID (64 bit). Policy: Select either automatic or manual. And select "Advanced Configuration" to configure IPv6 network address manually if the manual option is selected.

New IPv6 address: Enter the IP address in the IPv6 format:

x : x : x : x : x : x : x : x (x can be any hexadecimal value between 0 and FFFF). Place a space to separate each IP address to enter more than one address.

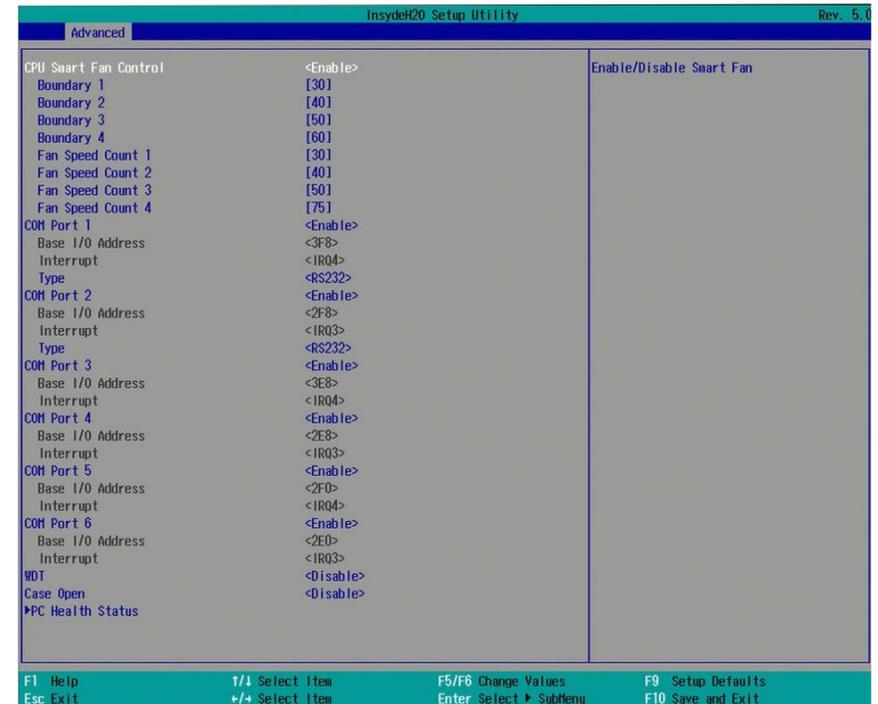
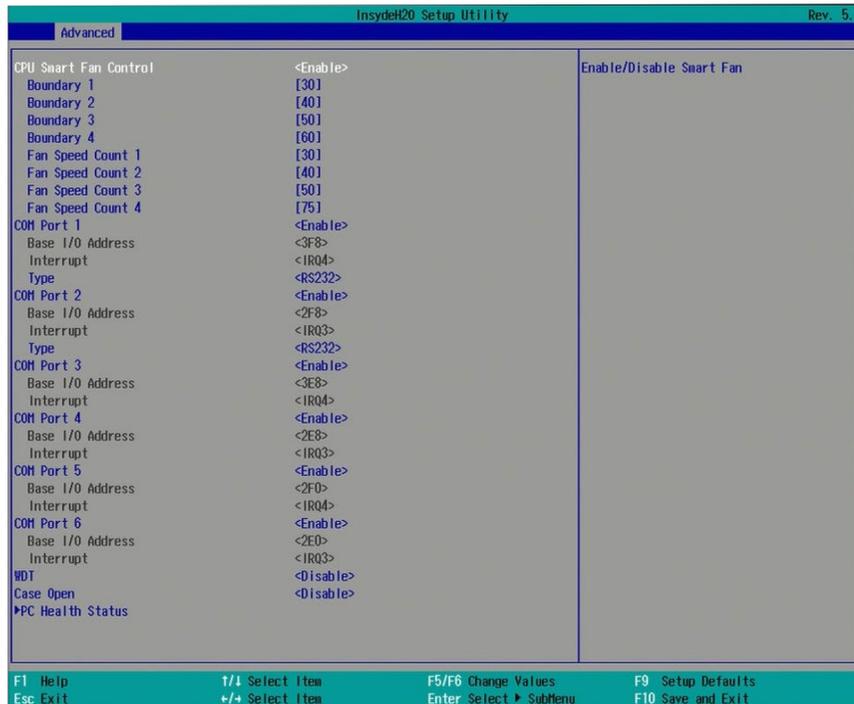
New Gateway addresses: Enter gateway addresses in the IPv6 format.

New DNS addresses: Enter DNS (Domain Name System) server IP addresses in the IPv6 format.



SIO NUVOTON6106D

This section configures the system super I/O chip parameters.

**CPU Smart Fan Control**

Enable or disable the system or CPU smart fan.

Boundary 1 to Boundary 4

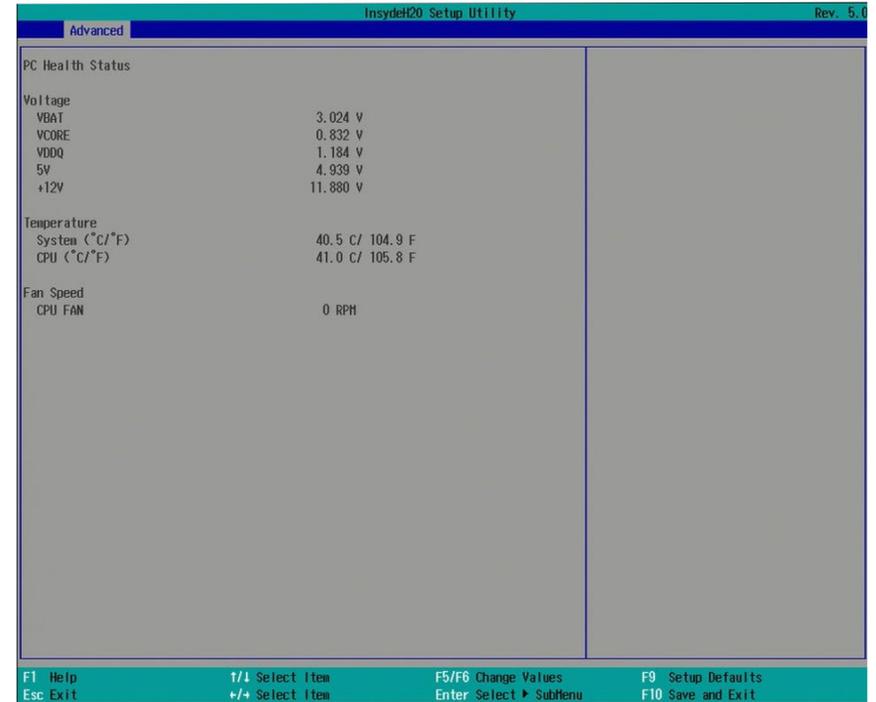
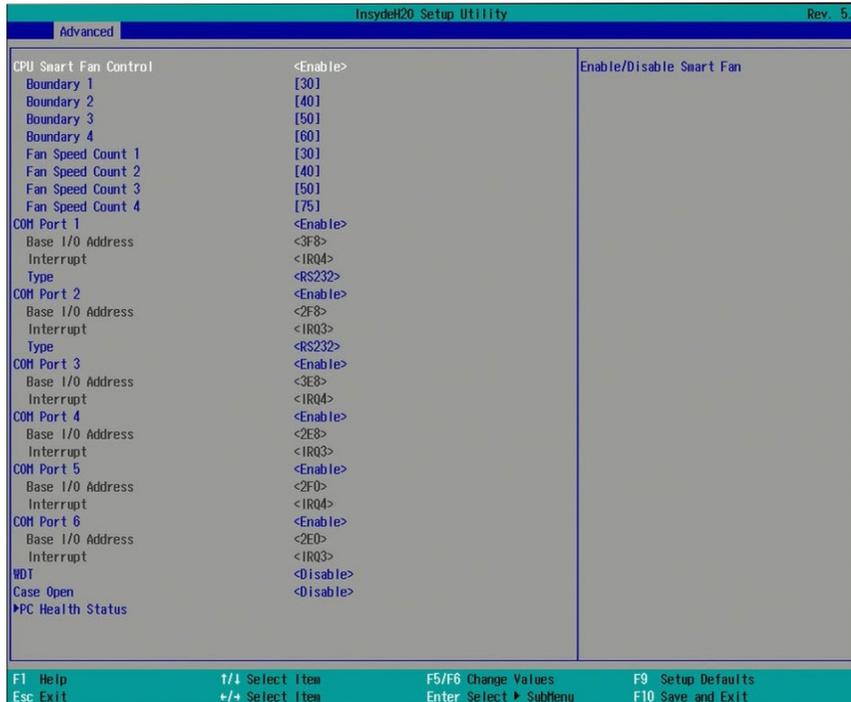
Set the boundary temperatures that determine the operation of the fan with different fan speeds accordingly. For example, when the system or the CPU temperature reaches boundary temperature 1, the system or CPU fan should be turned on and operate at the designated speed. The range of the temperature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

Fan Speed Count 1 to Fan Speed Count 4

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

PC Health Status

This section displays PC health status.



WDT

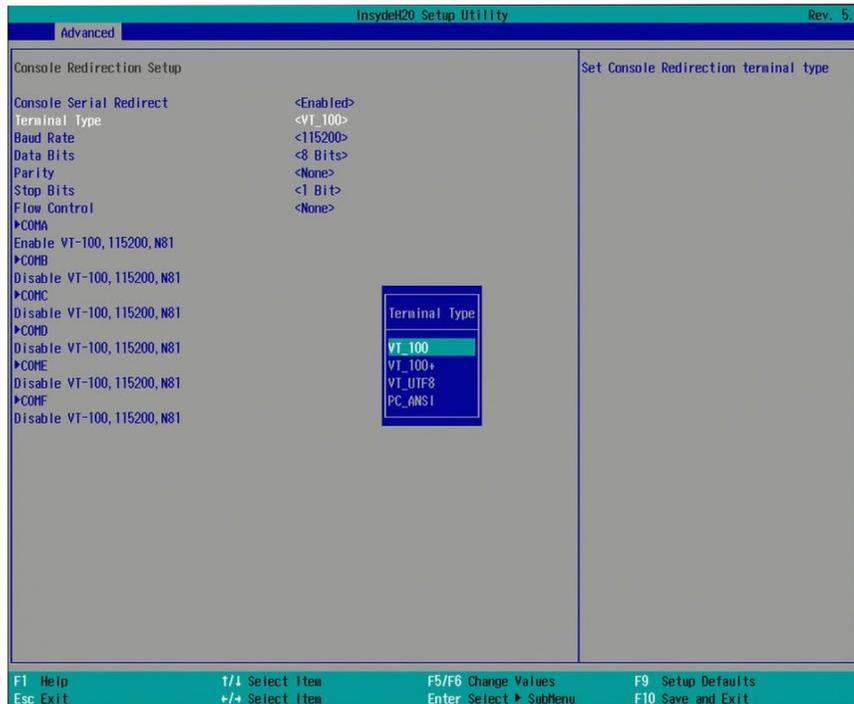
Enable or disable the watchdog function. A counter will appear if you select to enable WDT. Input any value between 1 and 255.

Case Open

Enable or disable the case open function.

Console Redirection

Console redirection lets you monitor and control the system from a remote station by re-directing the host screen output through a serial port.



Console Serial Redirect

Enable or disable the console redirection function. (The default is disabled.) If you select to enable it, please configure the following parameters for serial communication between the system and a remote station:

Terminal type: VT_100, VT_100+, VT_UTF8, or PC_ANSI.

Baud rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200.

Data bits: 8 bits or 7 bits.

Parity: None, Even or Odd.

Stop bits: 1 bit or 2 bits.

Flow control: None, RTS/CTS or XON/XOFF

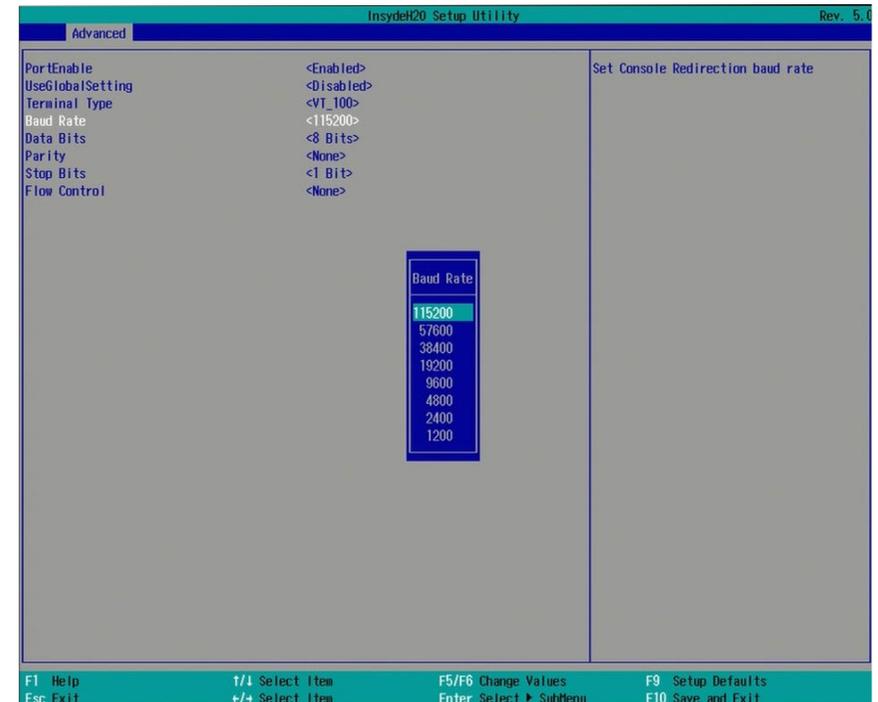
This is the global setting for all of the designated serial ports for the console redirection function.

COM1 to COM6

Enable or disable the serial redirection function for each of the serial ports on the system. And configure the serial communication parameters to be used between the system and a remote station.

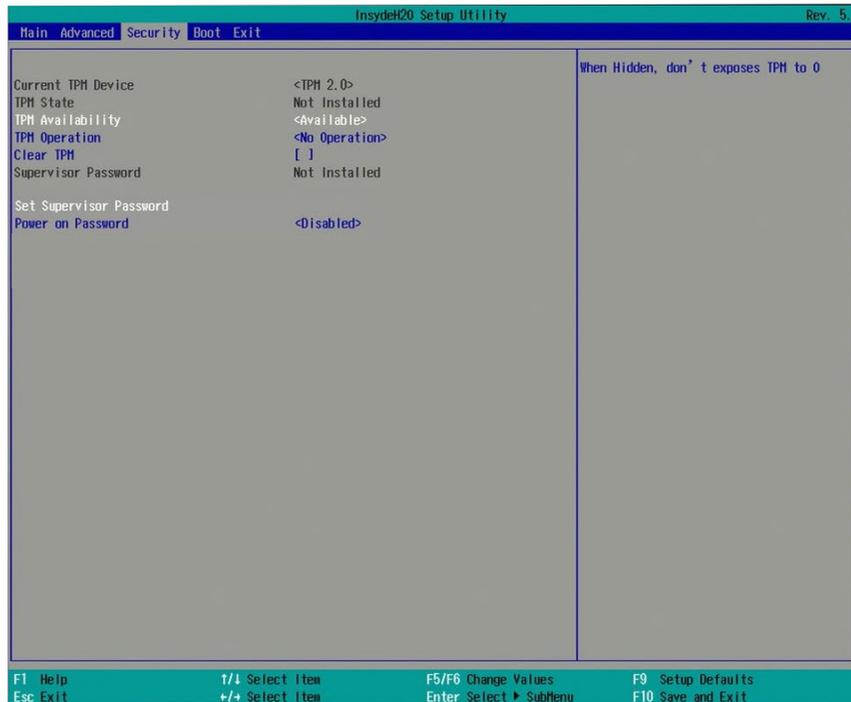
UseGlobalSetting

Choose to use the pre-configured global settings from the previous menu or configure a different setting for each serial port.



Security

This section configures the optional Trusted Platform Module (TPM) function and the HDD security.



TPM Availability

Show or hide TPM availability and its configurations.

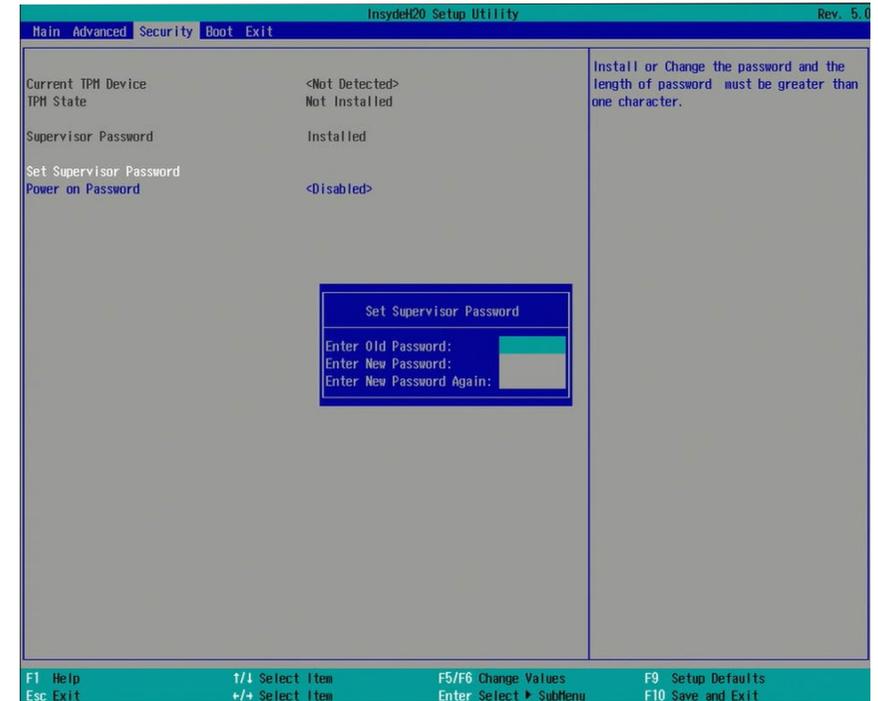
TPM Operation

Enable or disable the TPM function. It displays the following options:

- No Operation: No changes to the current state.
- Disable: Disable and deactivate TPM.
- Enable: Enable and activate TPM.

Clear TPM

Remove all TPM ownership contents.



Set Supervisor Password

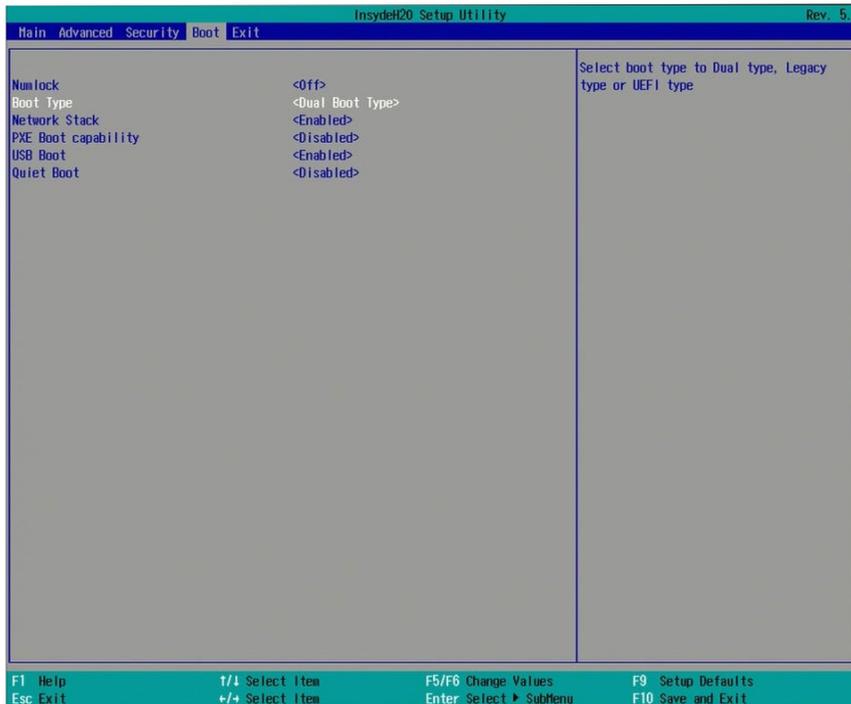
Set the administrative password for entering the BIOS utility or upon the entering of the power-on self-test (POST) process. The length of the password must be greater than 1 character and less than or equal to 10 characters.

Power-on Password

If you select to set the supervisor password, this option will be shown. Enable or disable the system to require password at boot.

Boot

This section configures boot options.



Numlock

Select the power-on state for the Numlock key.

Boot Type

Select the boot type. The options are Dual Boot Type, Legacy Boot Type or UEFI Boot Type.

Network Stack

This option is shown only when the boot type is set to Dual or UEFI. Enable or disable UEFI network stack. It supports the operation of these functions or software: Windows 8 BitLocker Network Unlock, UEFI IPv4/IPv6 PXE and legacy PXE option ROM.

PXE Boot to LAN (Legacy Boot Type)/PXE Boot Capability (Dual Boot Type)

Enable or disable Preboot eXecution Environment (PXE) boot to LAN.

USB Boot

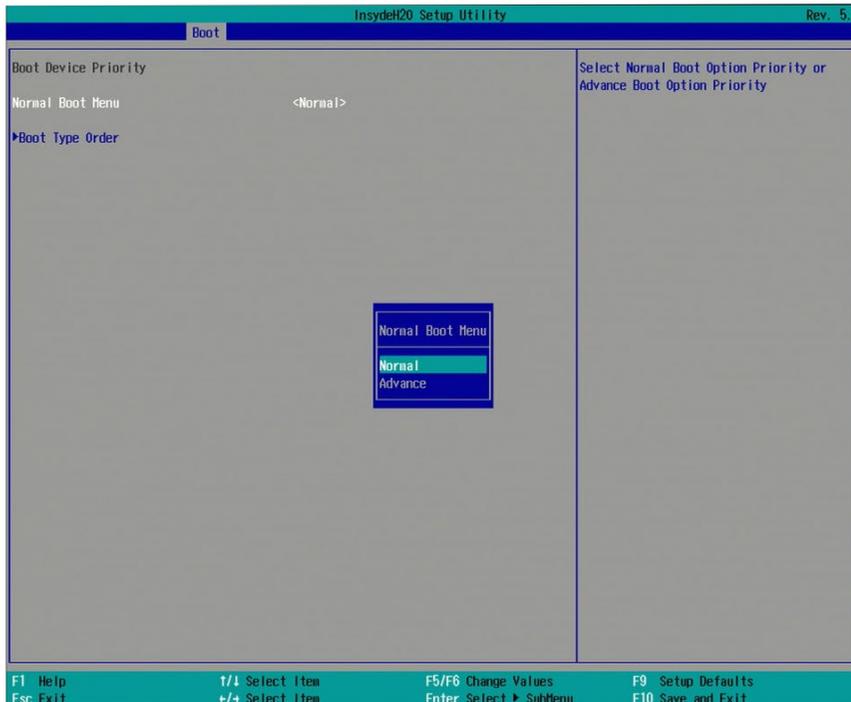
Enable or disable booting to USB boot devices.

Quiet Boot

Enable or disable the quiet boot function to configure the screen's display between POST messages or the OEM logo at startup. Select "Disabled (default)" to display the POST messages and select Enabled to display the OEM logo.

Boot Device Priority

This section configures legacy boot order. This menu is shown only when the boot type is set to "Legacy" or "Dual".



Boot Menu

Normal

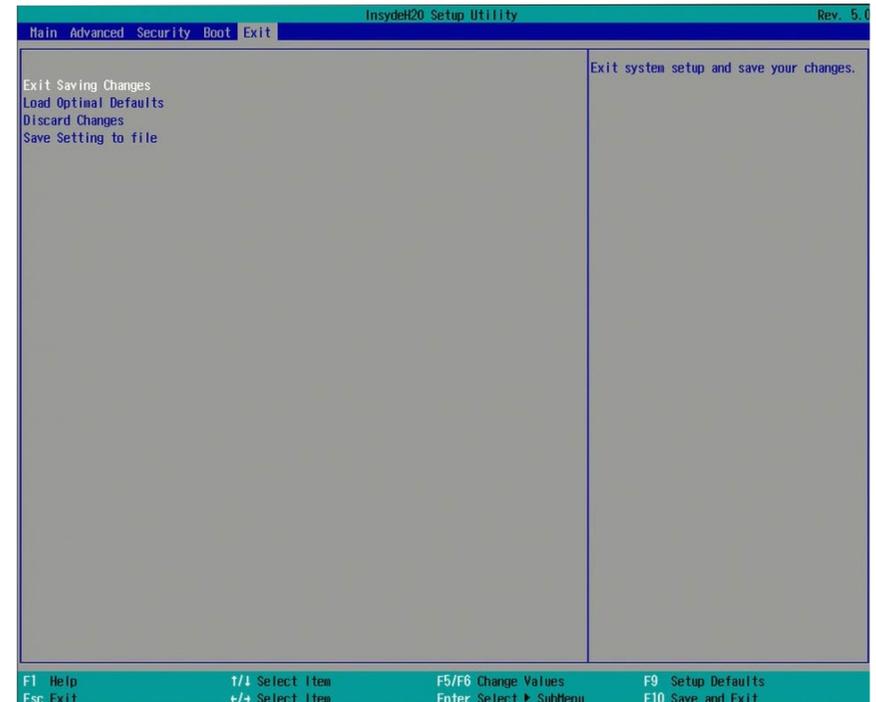
For this option, determine the boot order for the devices within each category. Use + and - keys to arrange the priority of the boot devices in the list. The first device in the list has the highest boot priority.

Advance

For this option, determine the boot order for all bootable devices. Use + and - keys to arrange the priority of the detected boot devices in the list. The first device in the list has the highest boot priority.

Exit

This section configures the parameters for exiting BIOS setup utility.



Exit Saving Changes

Select this field and press <Enter> to exit BIOS setup and save your changes.

Load Optimal Defaults

Select this field and press <Enter> to load the optimal defaults.

Discard Changes

Select this field and press <Enter> to exit the BIOS setup without saving your changes.

Save Setting to file

Select this option to save BIOS configuration settings to a USB drive. The operation will fail if there aren't any USB devices detected on the system. The saved configuration will have the DSF file extension and can be used for restoration.

Restore Setting from file

Select this option to restore BIOS configuration settings from a USB drive. Note that this option will not be available if there aren't any USB devices detected on the system.

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 latest BIOS file and the firmware update utility. For instructions on how to update BIOS with the flash utility, please see <https://www.dfi.com/Knowledge/Video/31> from the Knowledge Base of the DFI website.

```

Read file successfully. (path= "platform.ini")

Information
Please do not remove the AC power

Insyde H20FFT (Flash Firmware Tool) Version (SEG) 100.00.08.10
Copyright(c) 2012 - 2016, Insyde Software Corp. All Rights Reserved.

Initializing
Current BIOS Model name: VC70B-KU
New BIOS Model name: VC70B-KU

Current BIOS version: 65.05A
New BIOS version: 65.05A

Updating Block at FFFF000h
0%      25%      50%      75%      100%
|-----|-----|-----|-----|
C:\VC70B-KU>

```

Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to 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 8 - Supported Software

The system requires you to install drivers for some devices to operate properly. To download the latest driver, please go to the DFI Download Center:

<http://www.dfi.com/DownloadCenter>

Once you are in the Download Center page, select your product or type the model name and click "Search" to find product-related resources such as documentation and drivers.

Drivers are available for the following devices in Windows 10:

- Intel® Chipset Device Software
- Intel® Graphics Driver
- Intel® LAN Driver
- Intel® ME Driver
- Audio Driver
- Intel® Serial IO Driver

Intel Chipset Device Software

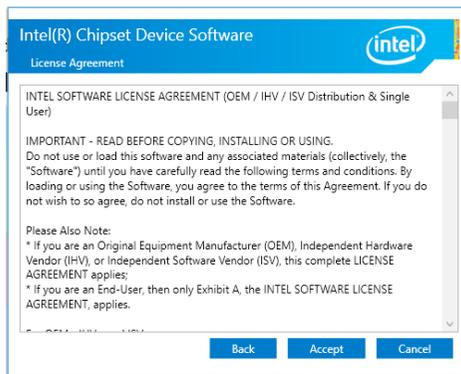
The Intel® Chipset Device Software is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, follow these steps:

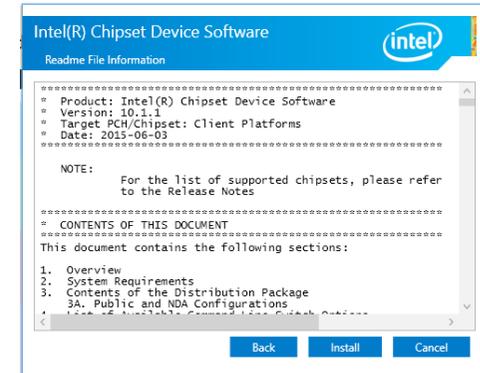
1. Setup is ready to install the utility. Click "Next".



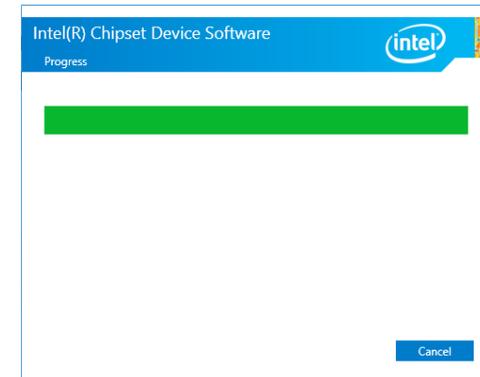
2. Read the license agreement, and then click "Yes".



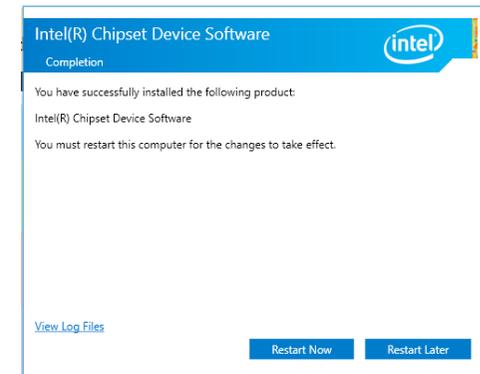
3. Go through the readme document for system requirements and installation tips, and then click "Next". Please wait while the installation is in progress.



4. Please wait while the installation is in progress.



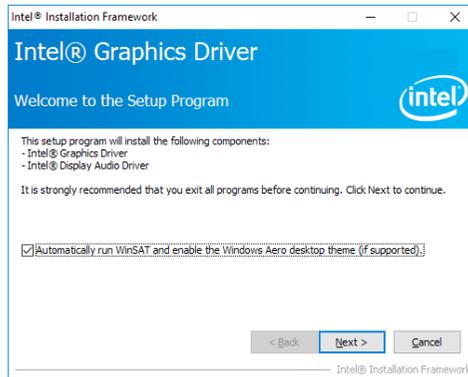
5. Click "Restart Now" to allow the new software installation to take effect.



Intel Graphics Driver

To install this driver, follow these steps:

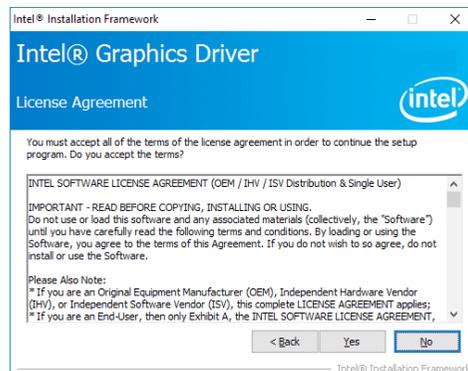
1. Setup is now ready to install the graphics driver. Click "Next".



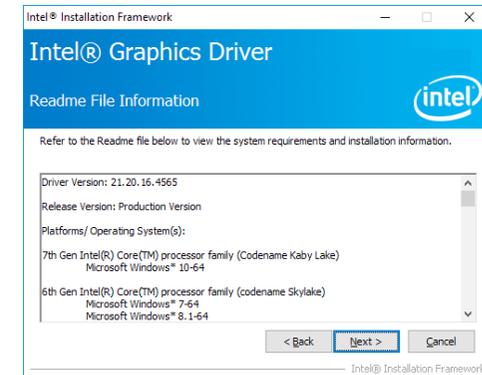
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. When this is enabled and after the system reboots, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/ Windows 8.1/ Windows 10 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

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

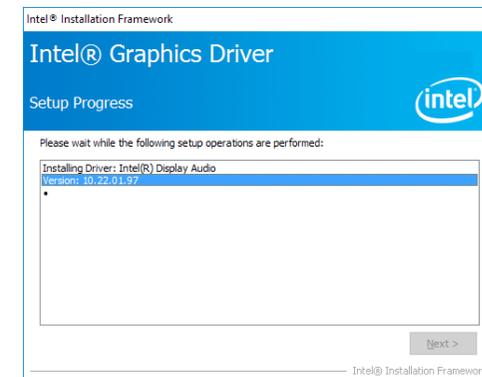
2. Read the license agreement, and then click "Yes".



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

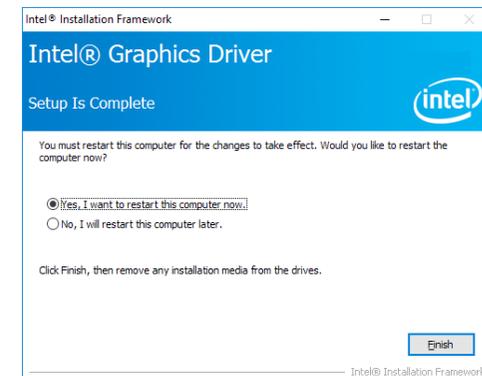


4. Setup is now installing the driver. Click "Next" to continue.



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

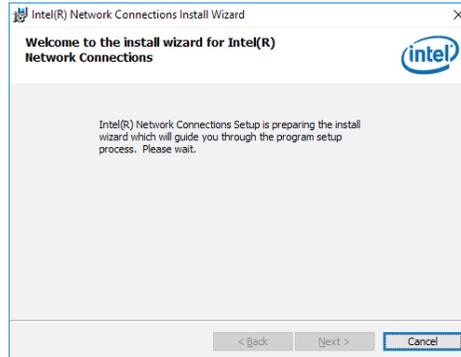
Restarting the system will allow the new software installation to take effect.



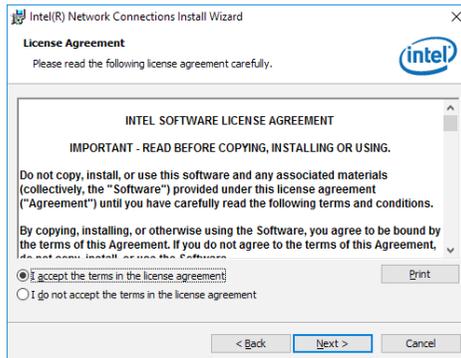
Intel LAN Driver

To install this driver, follow these steps:

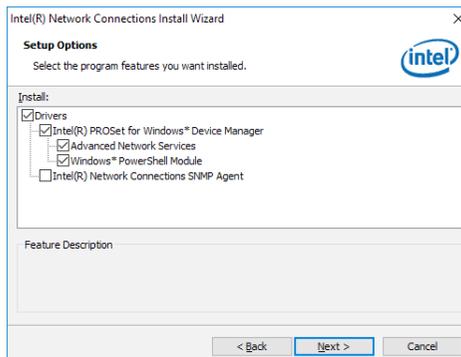
1. Setup is preparing to install the driver. Click "Next" to continue.



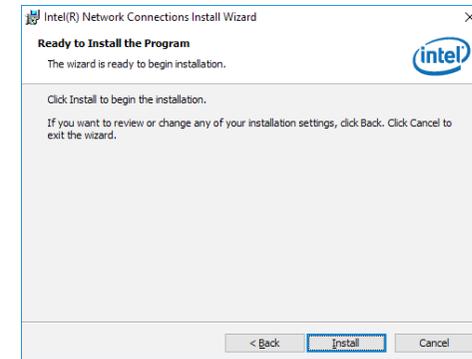
2. Click "I accept the terms in the license agreement" if you accept the agreement, and then click "Next".



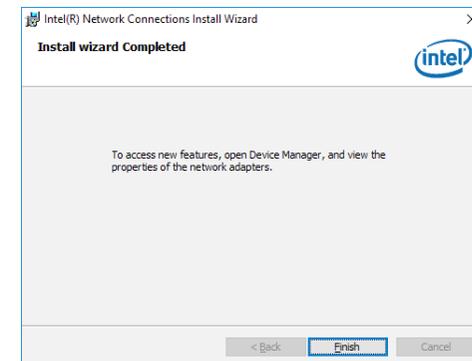
3. Select the program features you want to install, and then click "Next".



4. Click "Install" to begin the installation.



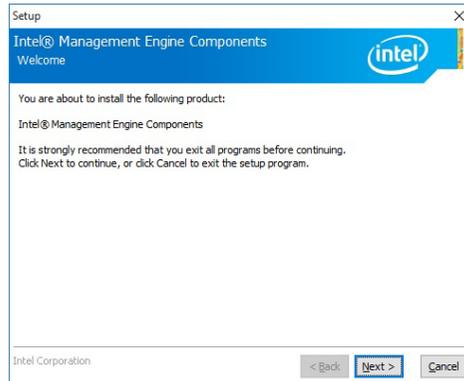
5. After the installation is complete, click "Finish".



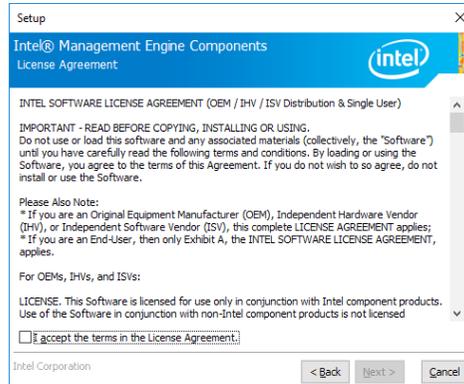
Intel ME Driver

To install the Intel® Management Engine (Intel® ME) Driver, follow these steps:

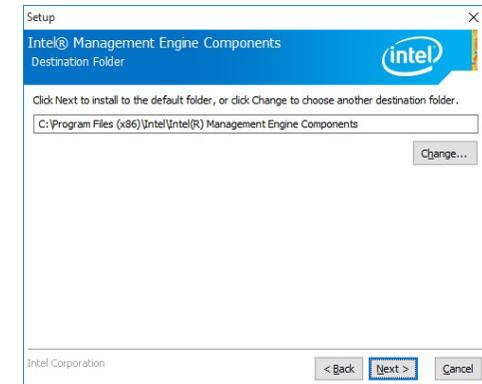
1. You are about to install the driver. Click "Next" to continue.



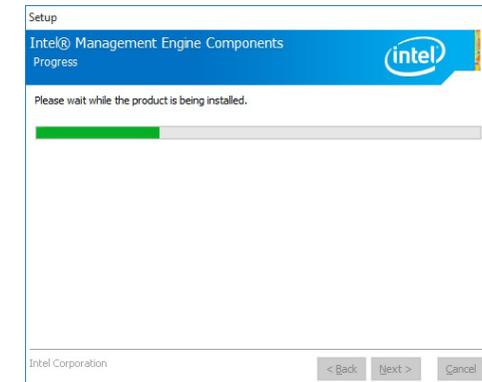
2. Read the license agreement, and then click "Next".



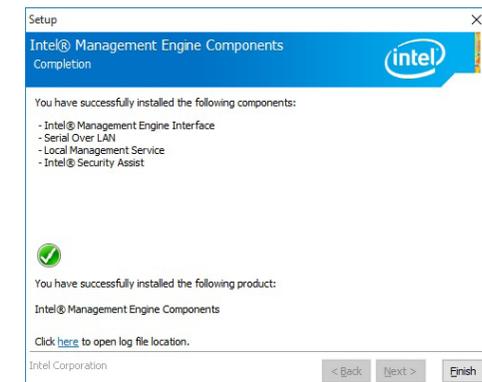
3. Setup is currently installing the driver. After the installation is complete, click "Next."



4. Please wait while the product is being installed.



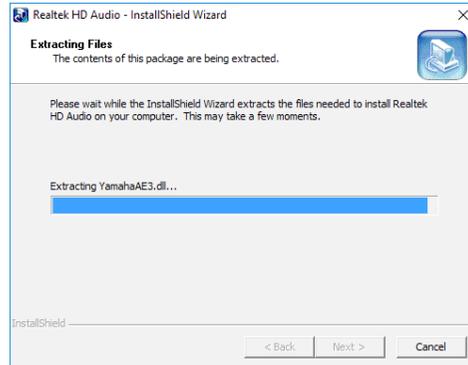
5. After the installation is complete, click "Finish".



Audio Driver

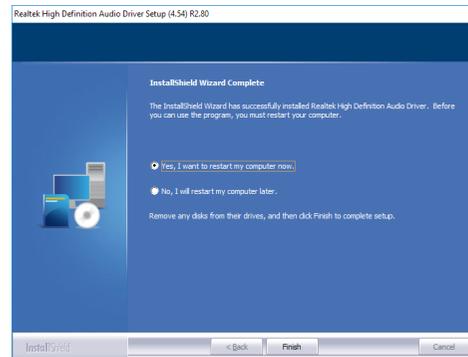
To install this driver, follow these steps:

1. Setup is now ready to install the audio driver. Click "Next".
2. Follow the steps of the on-screen instructions; click "Next" each time you finish a step.



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

Restart the system to allow the new software installation to take effect.



Serial IO Driver

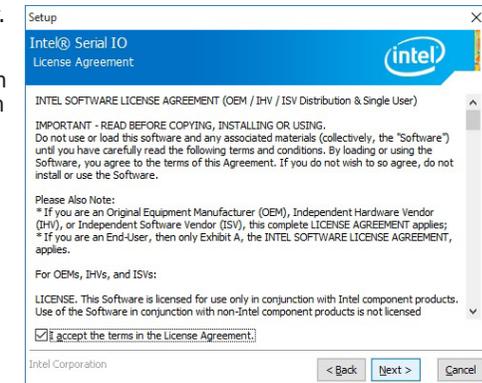
To install this driver, follow these steps:

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

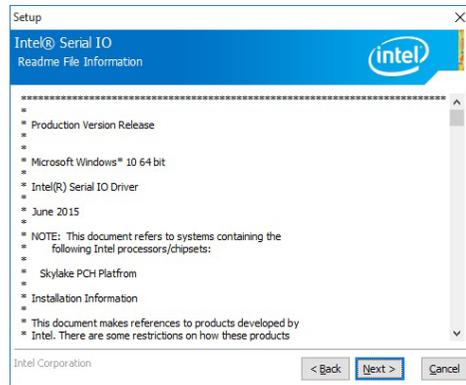


2. Read the license agreement carefully.

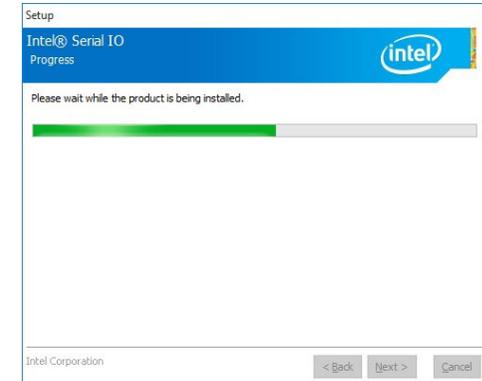
Click "I accept the terms in the License Agreement" if you agree with the terms in the agreement and then click "Next".



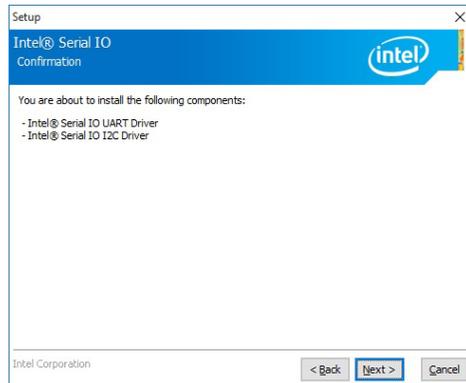
3. Read the file information and then click "Next".



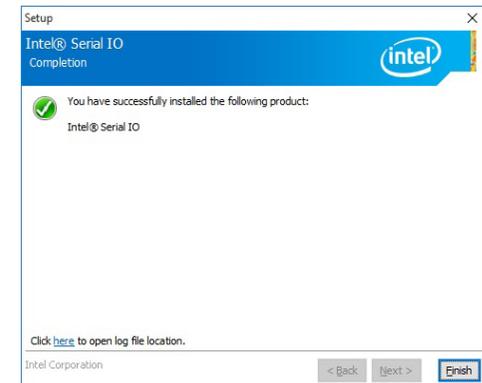
5. Setup is now installing the driver.



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



6. Click "Finish" to exit the setup.



Chapter 9 - Intel AMT Settings

Overview

Intel Active Management Technology (Intel® AMT) combines hardware and software solutions 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 the 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**

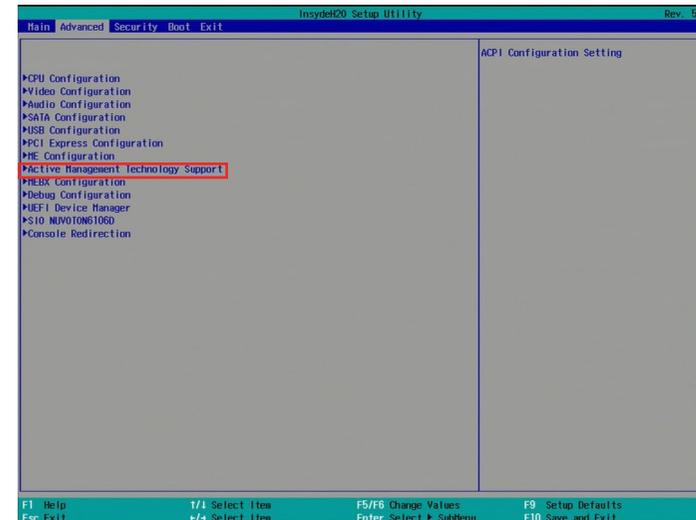
Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

- **Protect**

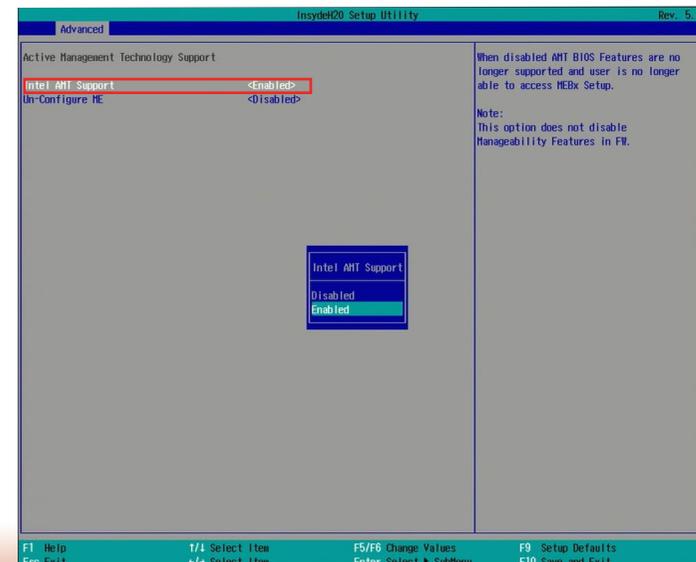
Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical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

Enable Intel® AMT in the BIOS

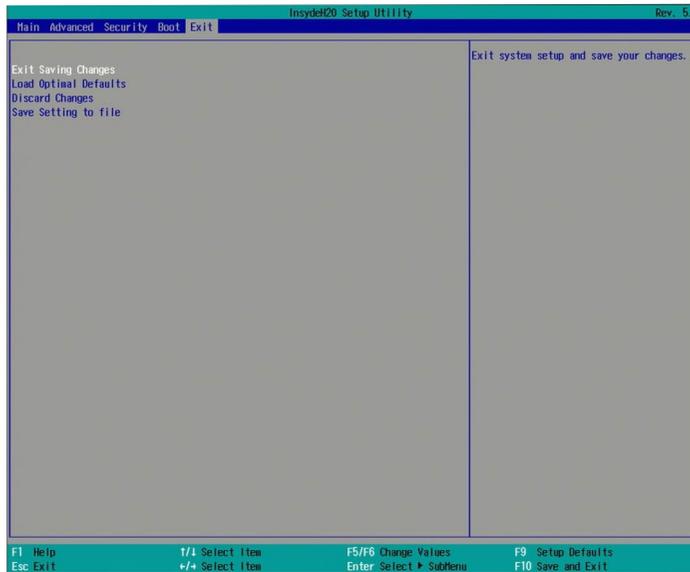
1. Power on the system then press to enter the main menu of the BIOS setup utility.
2. In the "Advanced" menu, select "Active Management Technology Support".



3. In the "Active Management Technology Support" menu, select "Enabled" for "Intel AMT Support".

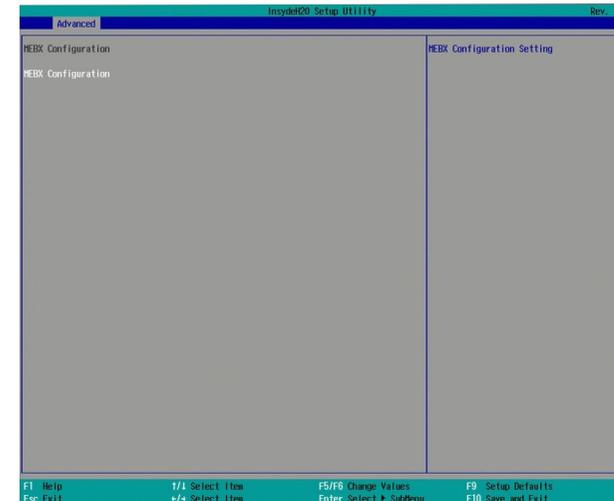


- In the "Exit" menu, select "Exit Saving Changes" and then select "OK".

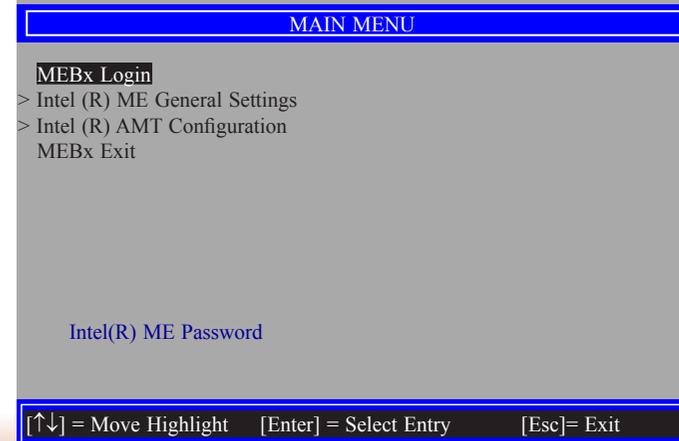


Set up Intel® AMT using the Intel® Management Engine BIOS Extension (MEBX)

- After the system reboots, press to enter the BIOS menu again.
- In the "Advanced" menu, select "MEBX Configuration" to enter the Manageability Engine BIOS Extension (MEBx) Setup.
- When the system reboots, 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".

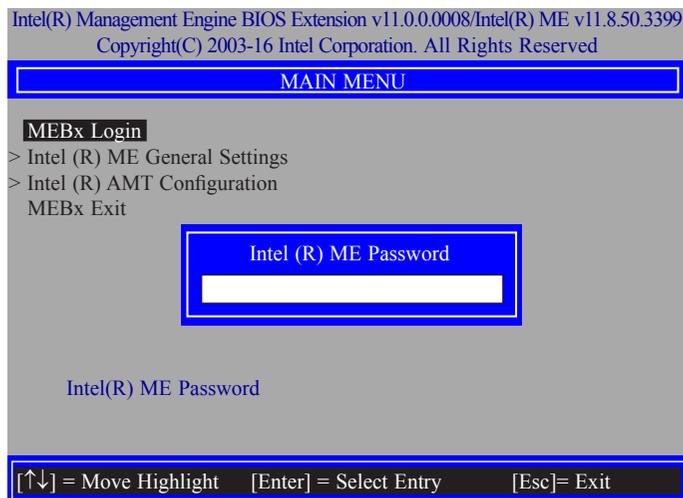


Intel(R) Management Engine BIOS Extension v11.0.0.0008/Intel(R) ME v11.8.50.3399
Copyright(C) 2003-16 Intel Corporation. All Rights Reserved

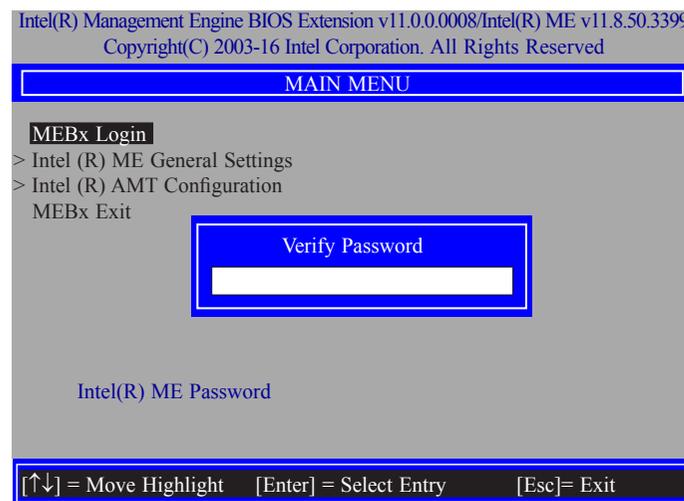


4. Enter a password in the space provided under "Intel(R) ME Password" and then press "Enter". The password must include:

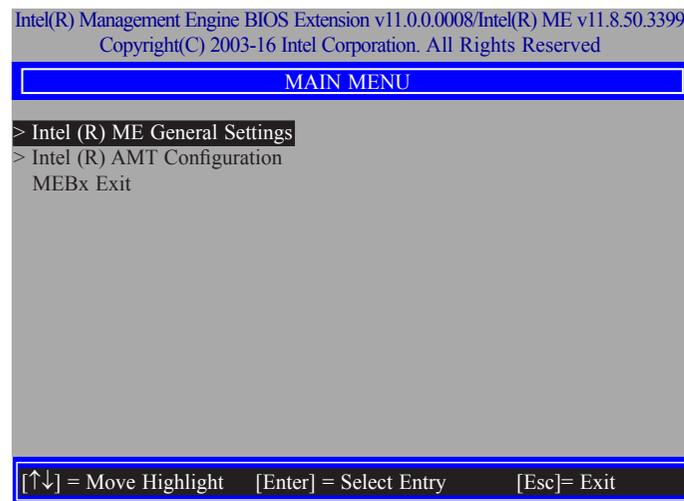
- 8-32 characters
- Strong 7-bit ASCII characters excluding : , and " characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
- Both lower case and upper case characters



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



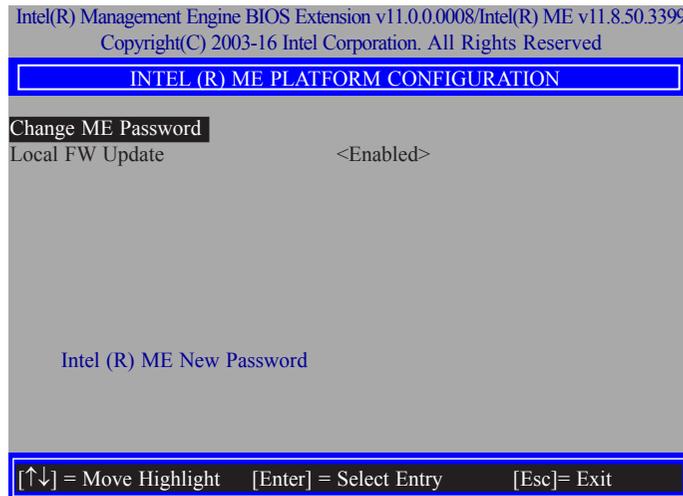
6. Select "Intel(R) ME General Settings" and then press "Enter".



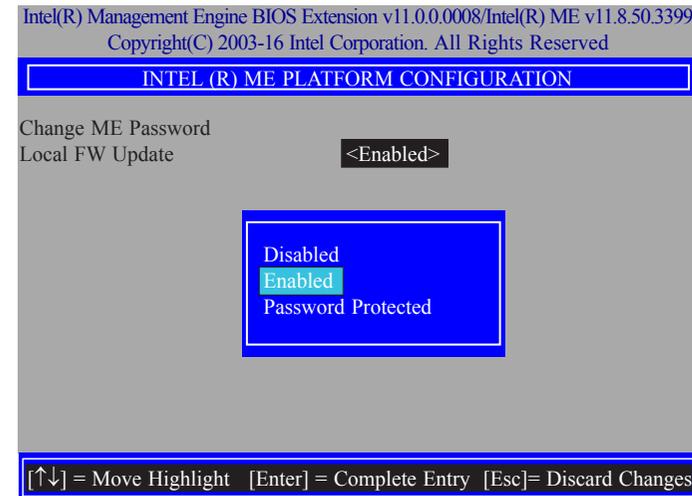
7. Select "Change Intel(R) ME Password" and then press "Enter".

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

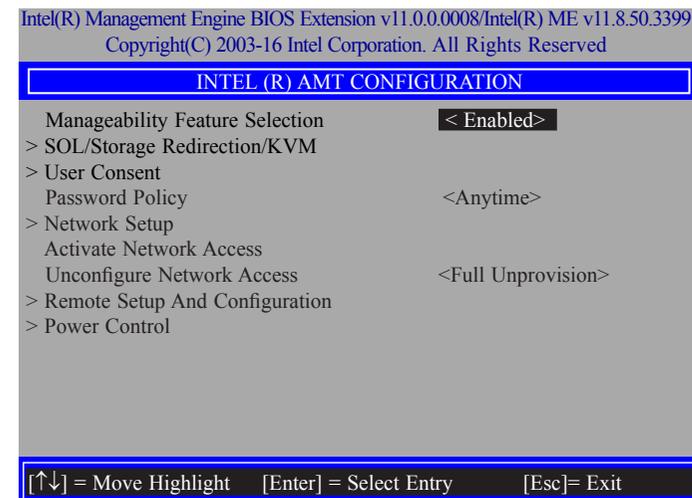
- 8-32 characters
- Strong 7-bit ASCII characters excluding : , and " characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
- Both lower case and upper case characters



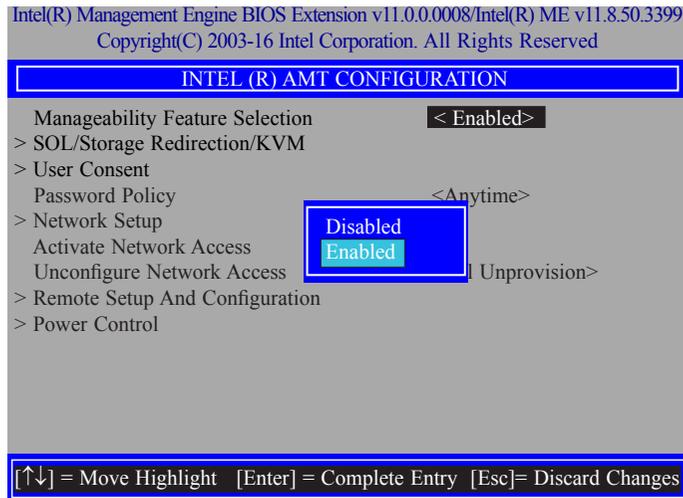
8. Select "Local FW Update" and then press "Enter". Select "Enabled" or "Disabled" or "Password Protected" and then press "Enter".



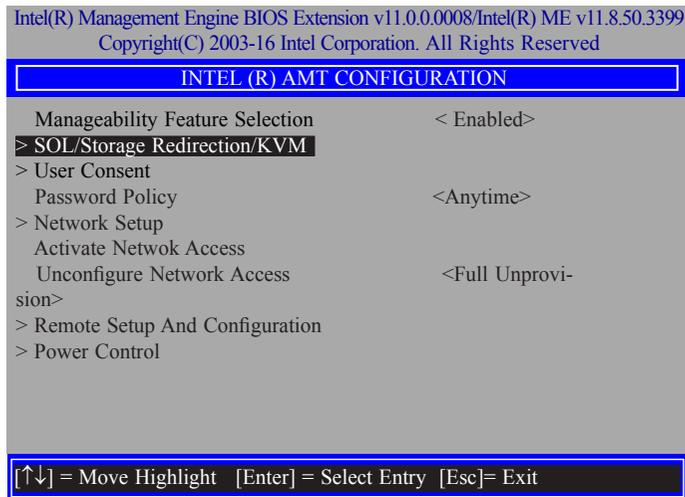
9. Select Previous Menu until you return to the "Main Menu". Select "Intel(R) AMT Configuration" and then press "Enter".



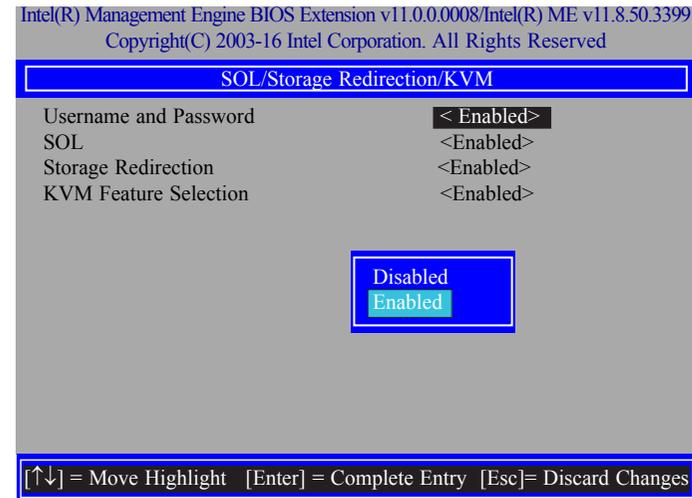
10. In the "Intel(R) AMT Configuration" menu, select "Manageability Feature Selection" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



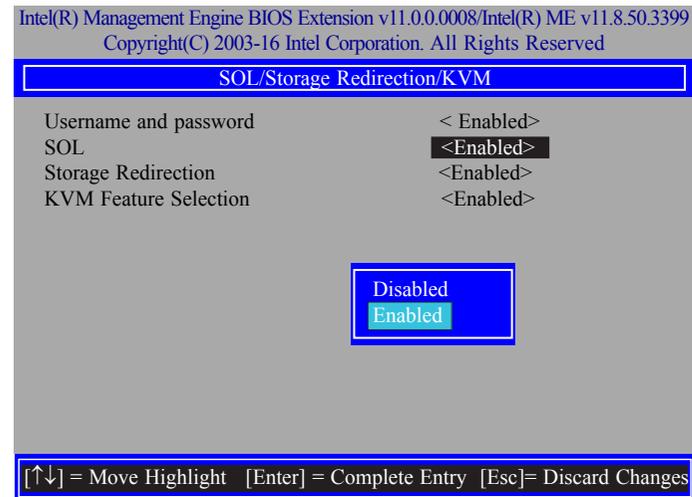
11. In the "Intel(R) AMT Configuration" menu, select "SOL/Storage Redirection/KVM" and then press "Enter".



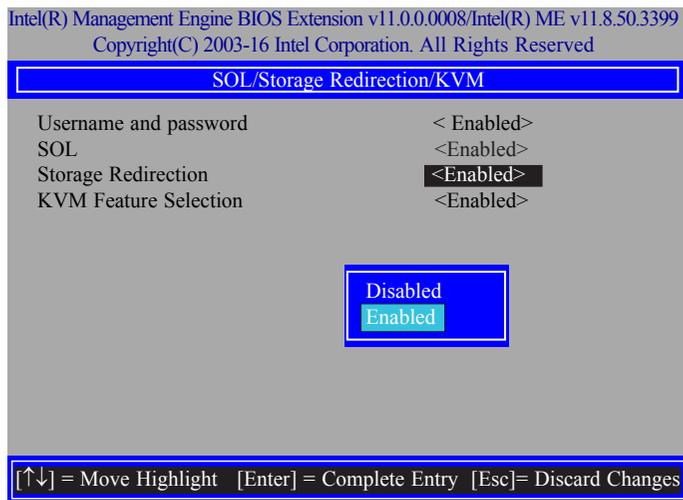
12. In the "SOL/Storage Redirection/KVM" menu, select "Username and Password" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



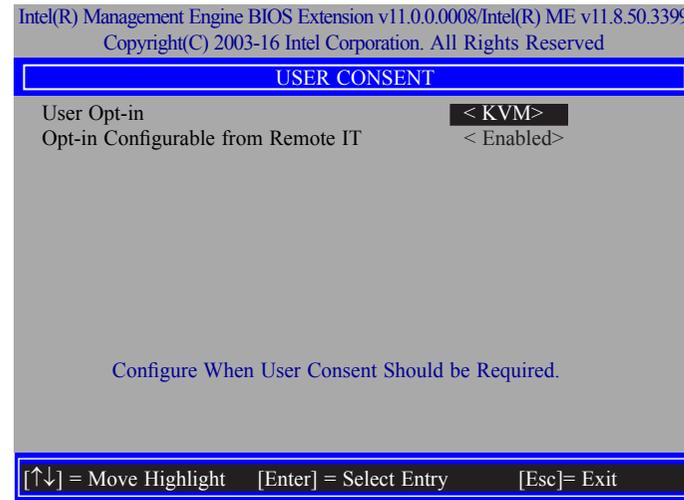
13. In the "SOL/Storage Redirection/KVM" menu, select "SOL" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



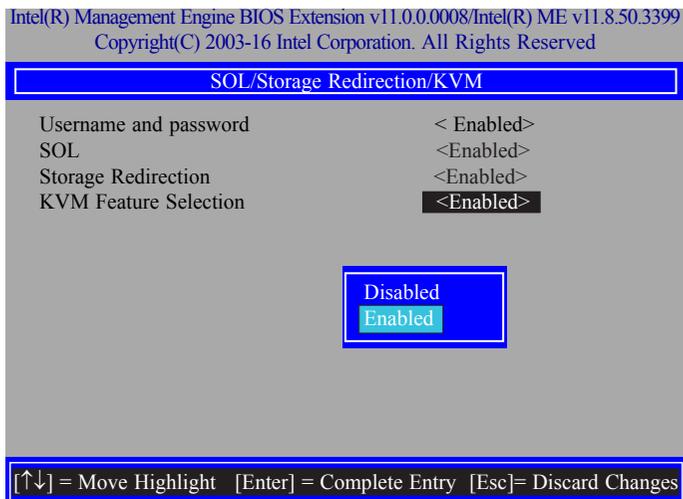
14. In the "SOL/Storage Redirection/KVM" menu, select "Storage Redirection" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



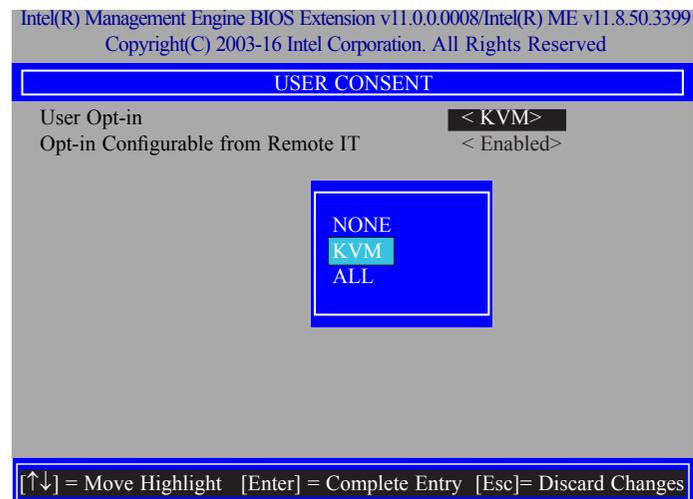
16. Select Previous Menu until you return to the "Intel(R) AMT Configuration" menu. Select "User Consent" and then press "Enter".



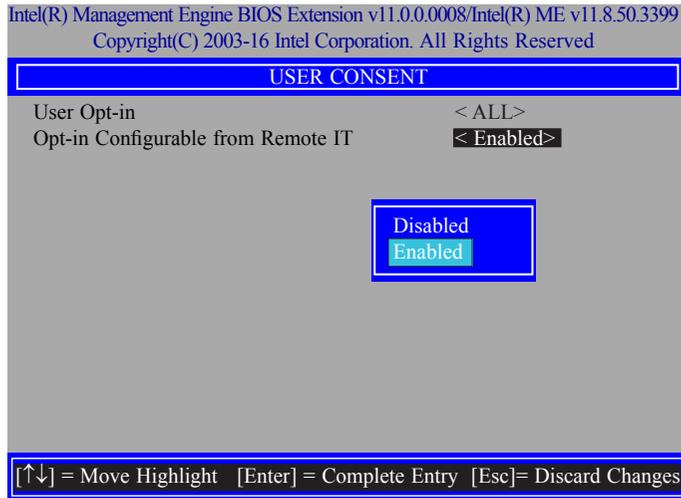
15. In the "SOL/IDER/KVM" menu, select "KVM Feature Selection" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



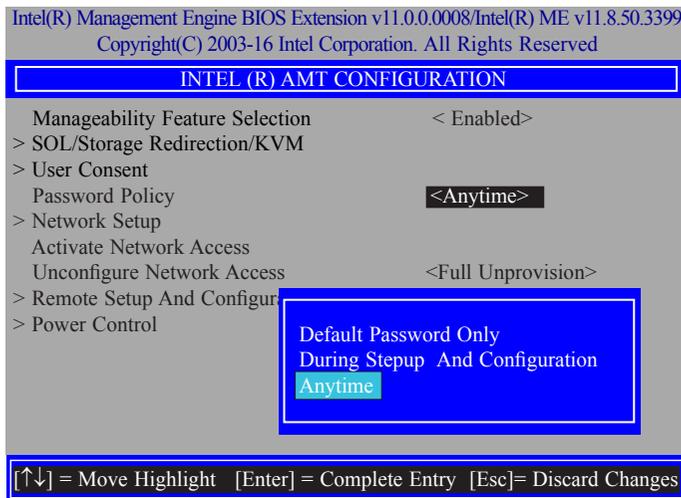
17. In the "User Consent" menu, select "User Opt-in" and then press "Enter". Select "None" or "KVM" or "ALL" and then press "Enter".



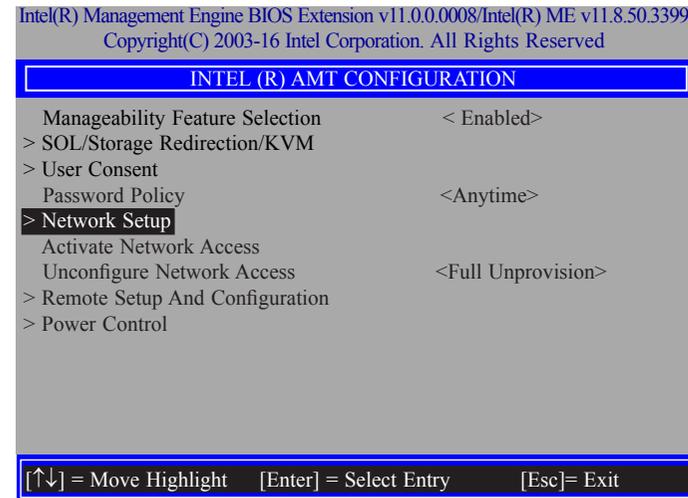
18. In the "User Consent" menu, select "Opt-in Configurable from Remote IT" and then press "Enter". Select "Enabled" or "Disable Remote Control of KVM Opt-in Policy" and then press "Enter".



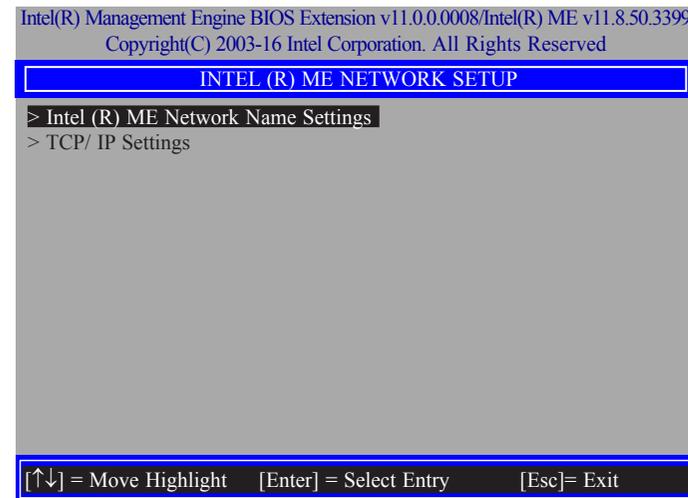
19. Select Previous Menu until you return to the "Intel(R) AMT Configuration" menu. Select "Password Policy" and then press "Enter". You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



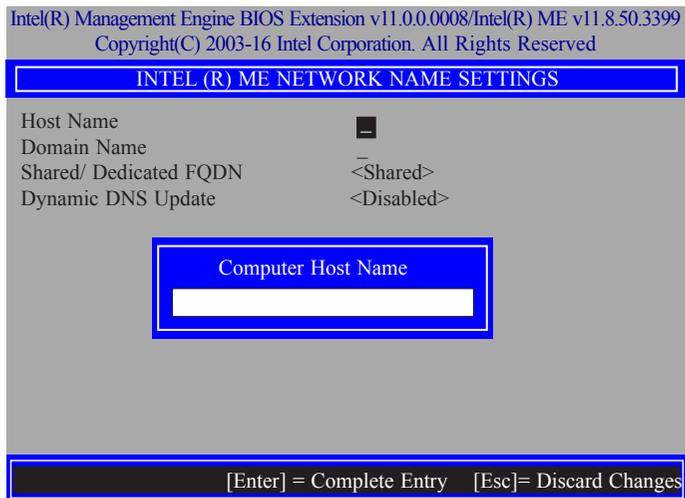
20. In the "Intel(R) AMT Configuration" menu, select "Network Setup" and then press "Enter".



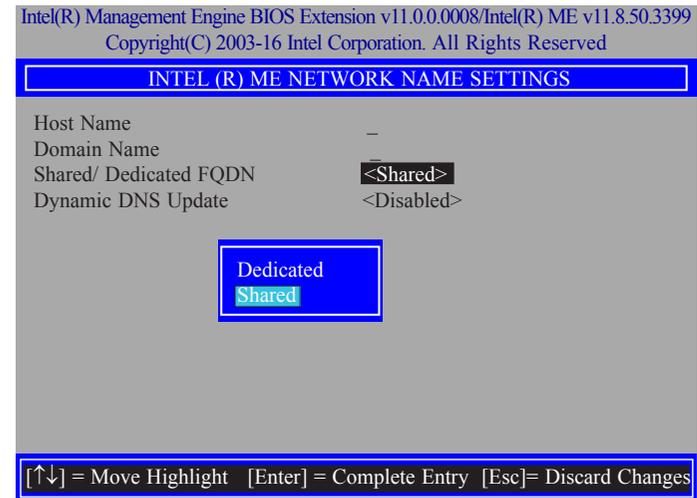
21. In the "Intel(R) ME Network Setup" menu, select "Intel(R) ME Network Name Settings" and then press "Enter".



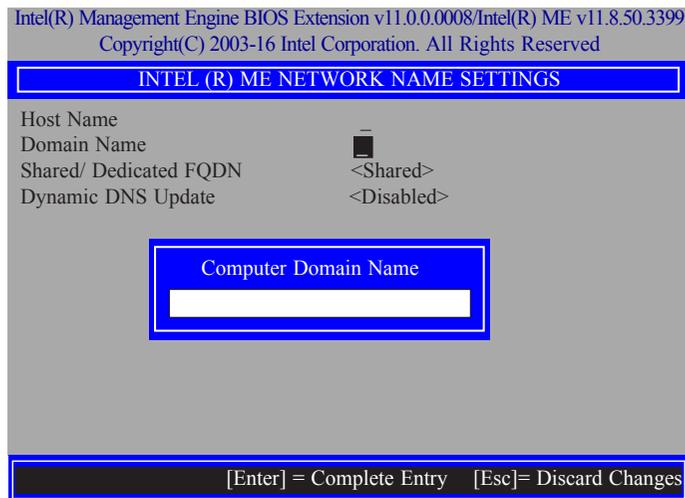
22. In the "Intel(R) ME Network Name Settings" menu, select "Host Name" and then press "Enter". Enter the computer's host name and then press "Enter".



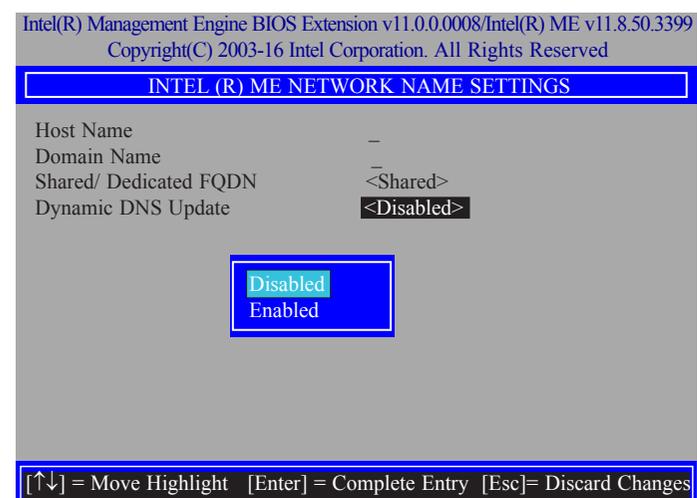
24. Select "Shared/Dedicated FQDN" and then press "Enter". Select "Shared" or "Dedicated" and then press "Enter".



23. Select "Domain Name" and then press "Enter". Enter the computer's domain name and then press "Enter".



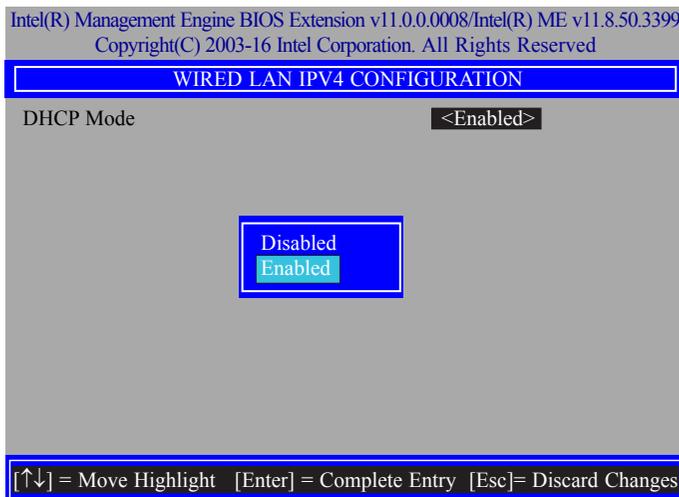
25. Select "Dynamic DNS Update" and then press "Enter". Select "Enabled" or "Disabled" and then press "Enter".



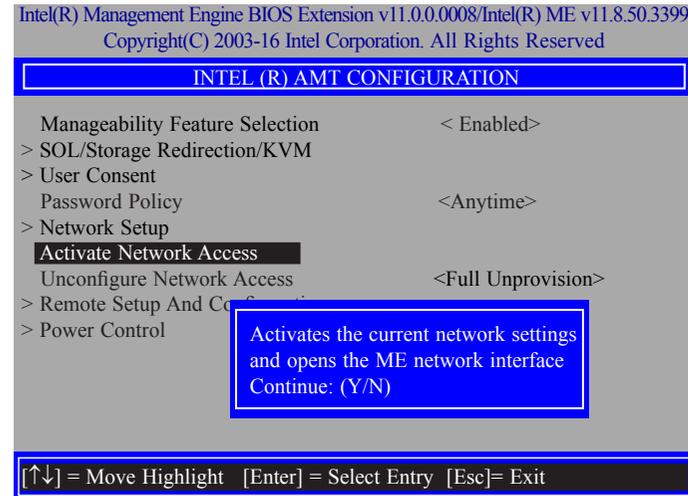
26. Select Previous Menu until you return to the "Intel(R) ME Network Setup" menu. Select "TCP/IP Settings" and then press "Enter".



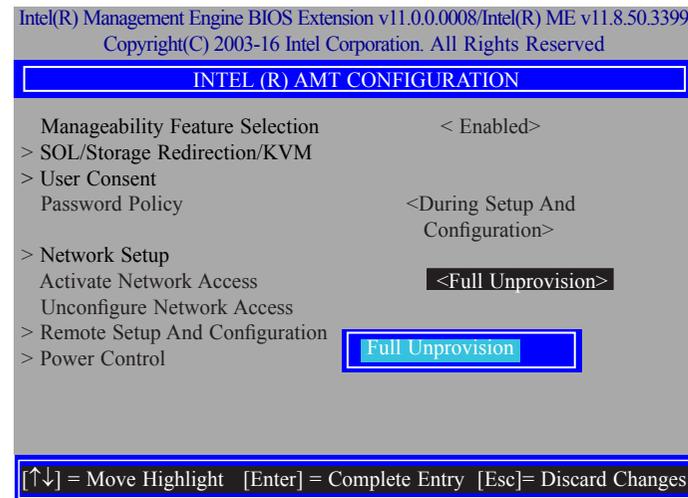
27. In the "TCP/IP Settings" menu, select "Wired LAN IPV4 Configuration" and then press "Enter".



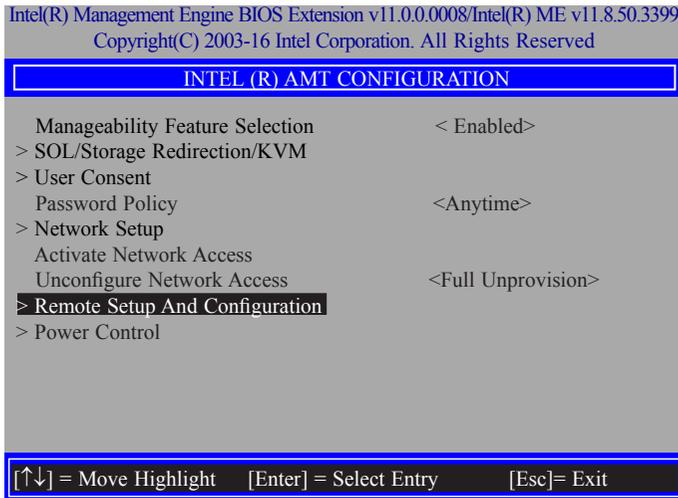
28. In the "Intel(R) AMT Configuration" menu, select "Activate Network Access" and then select "Yes/No" and press "Enter".



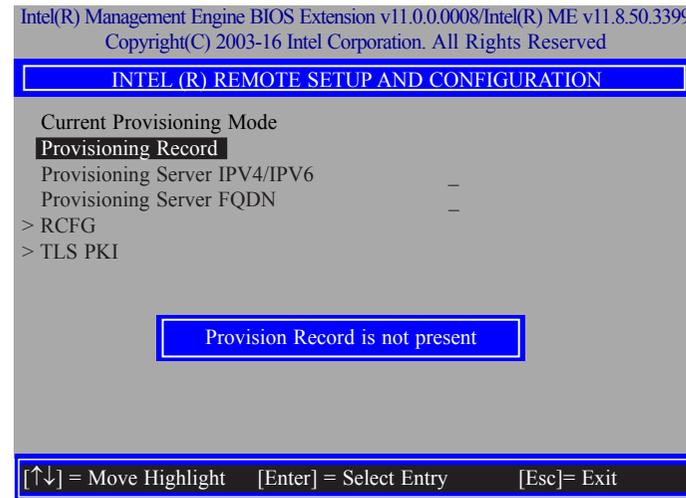
29. In the "Intel(R) AMT Configuration" menu, select "Unconfigure Network Access" and then press "Enter".



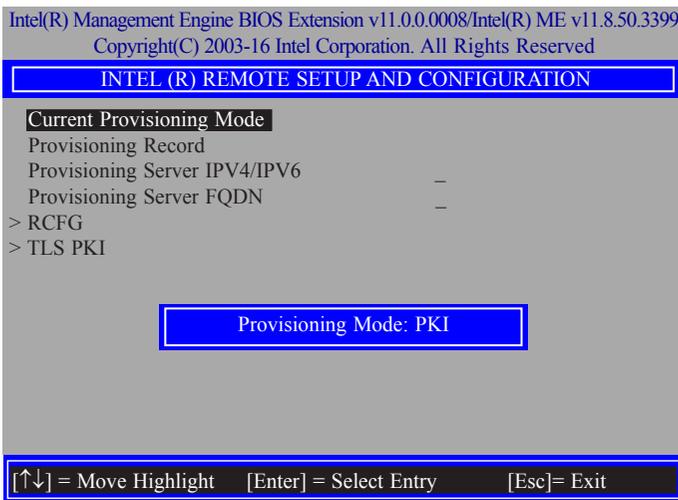
30. In the "Intel(R) AMT Configuration" menu, select "Remote Setup And Configuration" and then press "Enter".



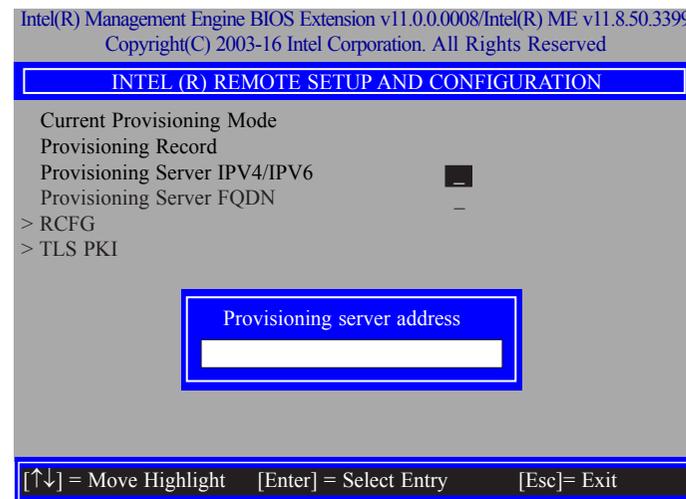
32. In the "Intel(R) Remote Setup And Configuration" menu, select "Provisioning Record" and then press "Enter".



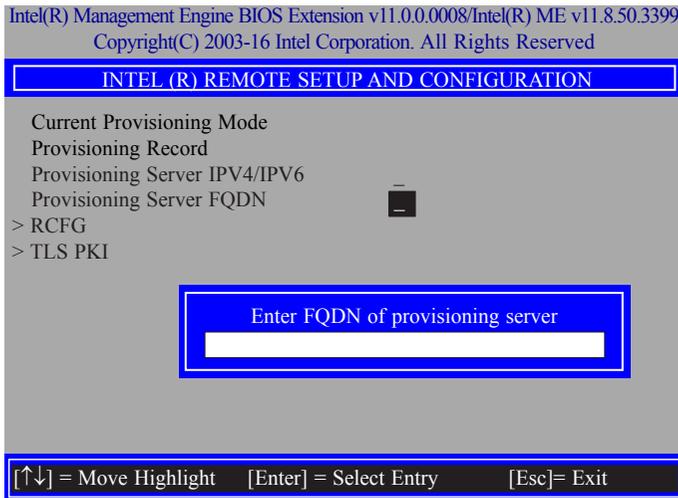
31. In the "Intel(R) Remote Setup And Configuration" menu, select "Current Provisioning Mode" and then press "Enter".



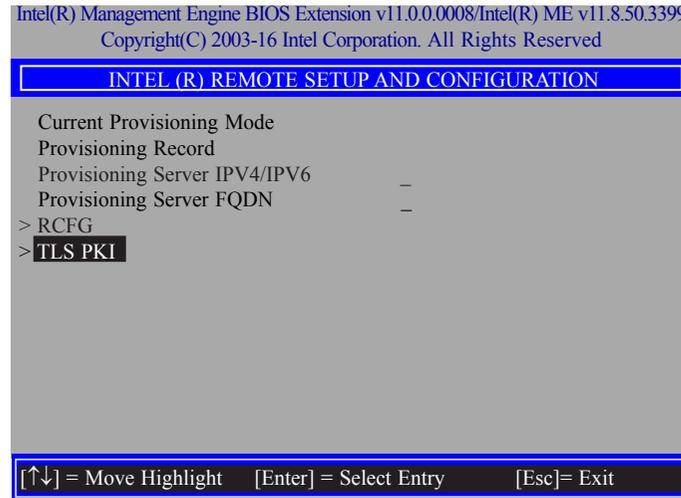
33. In the "Intel(R) Remote Setup And Configuration" menu, select "Provisioning server IPV4/IPV6", enter "Provisioning server address" and then press "Enter".



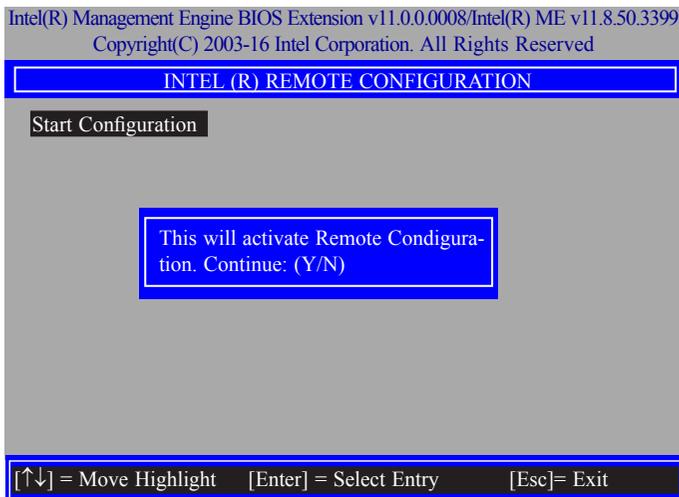
34. In the "Intel(R) Remote Setup And Configuration" menu, select "Provisioning server FQDN", enter the FQDN of Provisioning server, and then press "Enter".



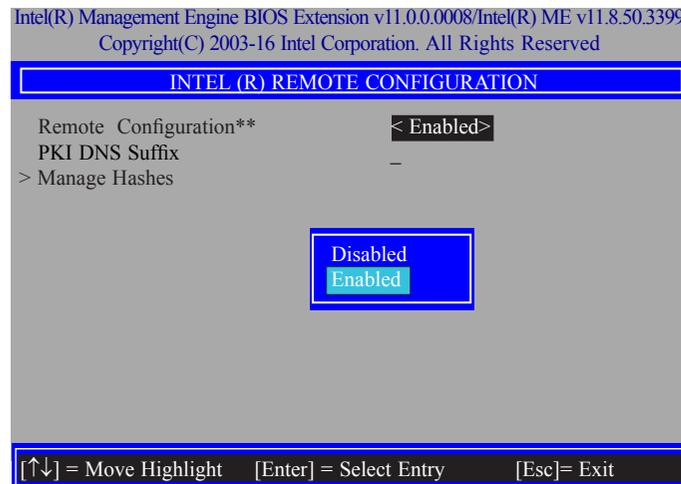
36. In the "Intel(R) Remote Setup And Configuration" menu, select "TLS PKI" and then press "Enter".



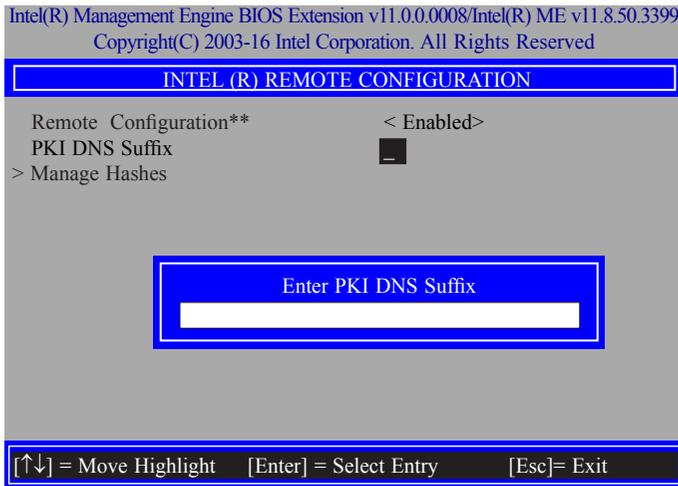
35. In the "Intel(R) Remote Setup And Configuration" menu, select "RCFG" and press "Enter", and then select "Start Configuration Y/N" and press "enter".



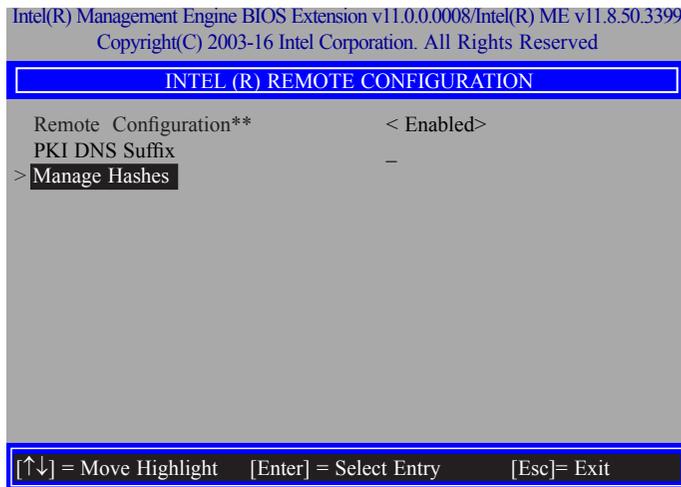
37. In the "Intel(R) Remote Configuration" menu, select "Remote Configuration**" and press "Enter", and then select "Enabled" or "Disabled" and press "Enter".



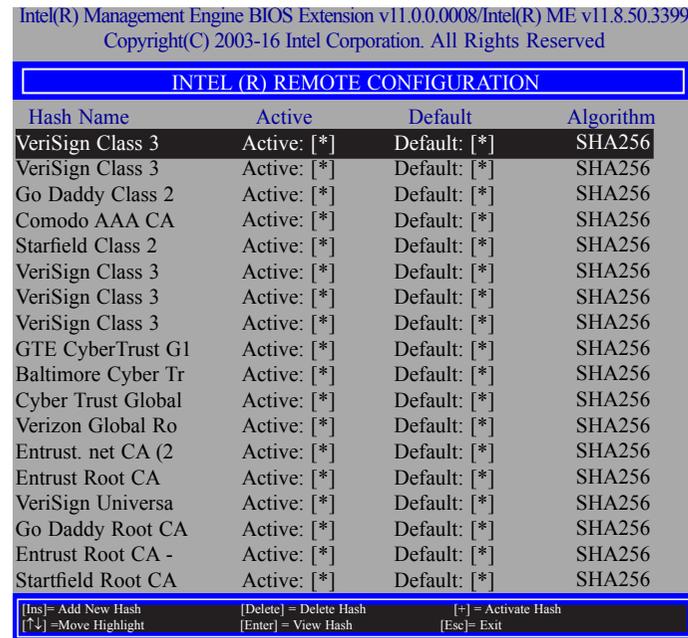
38. Select "PKI DNS Suffix", enter the "PKI DNS Suffix", and then press "Enter".



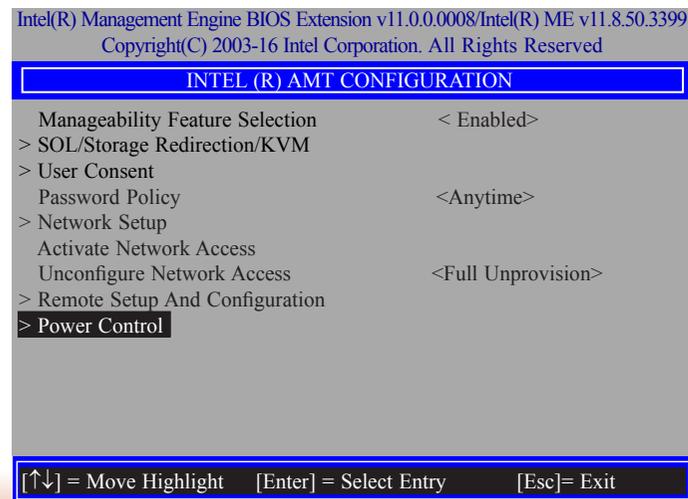
39. Select "Manage Hashes" and press "Enter", and then select one of the hash names.



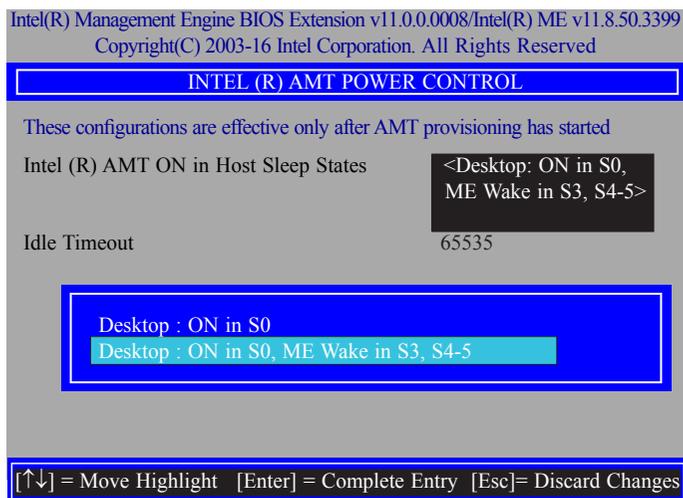
40. In the "Intel(R) AMT Configuration" menu, select Power Control, and then press "Enter".



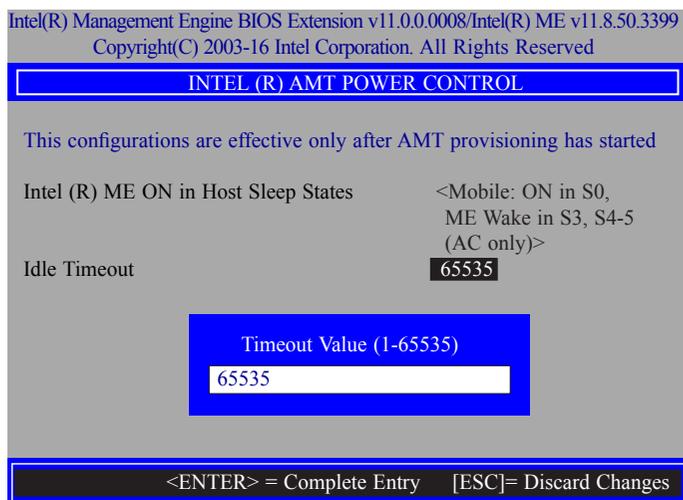
41. In the "Intel(R) AMT Power Control" menu, select "Intel(R) AMT ON in Host Sleep States" and then press "Enter". Select an option and then press "Enter".



42. In the "Intel(R) AMT Power Control" menu, select "Idle Timeout" and then press "Enter". Enter the timeout value (1-65535).



43. In the "Intel(R) AMT Power Control" menu, select "Idle Timeout" and then press "Enter". Enter the timeout value (1-65535).



44. Select Previous Menu until you return to the "Main Menu". Select "Exit" and then press "Enter". Type "Y" and then press "Enter".

