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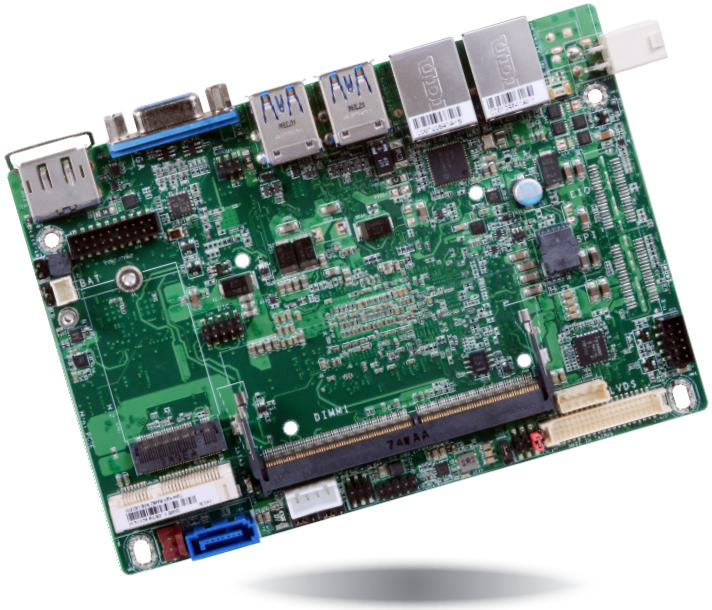

KU551

Embedded SBC 3.5”

User’s Manual

A45510827

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Trademarks

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Notice:

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

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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 consequencial 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.

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 KU551 board
- 1 COM port cable (Length: 300mm, 2 x COM ports)
- 1 Serial ATA data cable (Length: 500mm)
- 1 Serial ATA power cable (Length: 250mm)
- 1 Heat sink (Height: 25.8mm)

Optional Items

- USB port cable (Length: 200mm)
- Power adapter (60W, 12V)
- Heat spreader (Height: 11mm)
- Audio cable (Length: 160mm)

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

Before Using the System Board

Before using the system board, prepare basic system components.
If you are installing the system board in a new system, you will need at least the following internal components.

- Storage devices such as hard disk drive, etc.

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

Chapter 1 - Introduction

Specifications

SYSTEM	Processor	7th Generation Intel® Core™ Processors, BGA 1356 Intel® Core™ i7-7600U Processor, Dual Core, 4M Cache, 2.8GHz (3.9GHz), 15W Intel® Core™ i5-7300U Processor, Dual Core, 3M Cache, 2.6GHz (3.5GHz), 15W Intel® Core™ i3-7100U Processor, Dual Core, 3M Cache, 2.4GHz, 15W Intel® Celeron® Processor 3965U, Dual Core, 2M Cache, 2.2GHz, 15W
	Memory	One 260-pin SODIMM up to 16GB Single Channel DDR4 1866/2133MHz
	BIOS	Insyde SPI 128Mbit
GRAPHICS	Controller	Intel® HD Graphics GT Series
	Feature	OpenGL 5.0, DirectX 12, OpenCL 2.1 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
	Display	1 x VGA/DDI 1 x LVDS/eDP 1 x DP++/DDI VGA: resolution up to 1920x1200 @ 60Hz LVDS: dual channel 48-bit, resolution up to 1920x1200 @ 60Hz DP++: resolution up to 4096x2304 @ 60Hz
	Triple Displays	VGA + LVDS + DP++
EXPANSION	Interface	1 x Full-size Mini PCIe (PCIe/USB) 1 x M.2 B key 2242 (PCIe/USB2.0/SATA3.0) 1 x Extension I/O connector (available upon request)
AUDIO	Audio Codec	Realtek ALC888
ETHERNET	Controller/ Phy	1 x Intel® I210AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM PCIe with iAMT11.6 (10/100/1000Mbps)
REAR I/O	Ethernet	2 x GbE (RJ-45)
	USB	4 x USB 3.0
	Display	1 x VGA 1 x DP++

INTERNAL I/O	Serial	2 x RS-232/422/485 (2.0mm pitch)
	USB	2 x USB 2.0 (2.0mm pitch)
	Display	1 x LVDS LCD Panel Connector 1 x LCD/Inverter Power
	Audio	1 x Audio (Line-out/Mic-in)
	SATA	1 x SATA 3.0 (up to 6Gb/s) 1 x SATA Power
	DIO	1 x 8-bit DIO
	SMBus	1 x SMBus
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	TPM	fTPM 2.0
POWER	Type	Single 12V +/-5% DC
	Connector	Right Angle Connector (4-pin) DC Jack (available upon request) Vertical Type Connector (4-pin) (available upon request)
	Consumption	Idle: i7-7600U:12V @ 0.9A (10.8Watt) Max.: i7-7600U:12V @ 3.2A (38.5Watt)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	Microsoft	Windows 10 IoT Enterprise 64-bit
	Linux	Ubuntu 16.04 Yocto
ENVIRONMENT	Temperature	Operating: 0 to 60°C (Opt. -20 to 70 °C) Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	477,146 hrs @ 25°C; 277,228 hrs @ 45°C; 172,875 hrs @ 60°C
MECHANICAL	Dimensions	3.5" SBC Form Factor 146mm (5.75") x 102mm (4.02")
	Height	PCB: 1.6mm Top Side: 16.3mm, Bottom Side: 4.0mm
CERTIFICATIONS		CE, FCC, RoHS

Features

• Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

• DDR4

DDR4 delivers increased system bandwidth and improves performance. The advantages of DDR4 provide an extended battery life and improve the performance at a lower power than DDR3/DDR2.

• Graphics

The integrated Intel® HD graphics engine delivers an excellent blend of graphics performance and features to meet business needs. It provides excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. Supports 1 VGA/DDI, 1 LVDS/eDP and 1 DP++/DDI interfaces for triple display outputs.

• Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 6Gb/s (SATA 3.0), it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

• Gigabit LAN

Intel® I210AT PCI Express Gigabit Ethernet controller and Intel® I219LM PCI Express Gigabit Ethernet controller with iAMT11.6 support up to 1Gbps data transmission.

• Audio

The Realtek ALC888 audio codec provides 2.1-channel High Definition audio output.

• Power Failure Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

• USB

The system board supports the new USB 3.0. It is capable of running at a maximum transmission speed of up to 5 Gbit/s (625 MB/s) and is faster than USB 2.0 (480 Mbit/s, or 60 MB/s) and USB 1.1 (12Mb/s). USB 3.0 reduces the time required for data transmission, reduces power consumption, and is backward compatible with USB 2.0. It is a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

• Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

Important:
The 5V_standby power source of your power supply must support ≥720mA.

• Wake-On-USB (Optional)

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

• ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enable PCs to implement power management and plug-and-play with operating systems that support power management features.

With ACPI, the system can further utilize the Ethernet adapter's wake-on-LAN (WOL) capability that enables remote wake-up if the Ethernet adapter supports such feature.

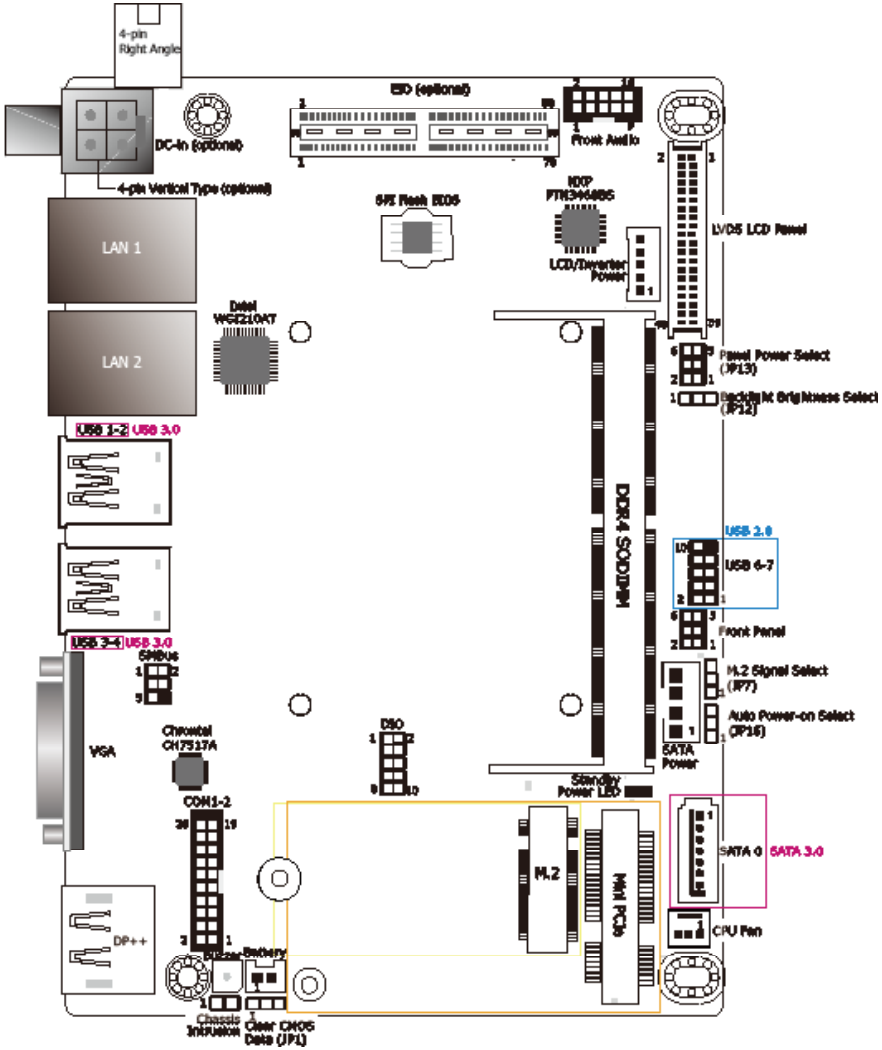
Important:
The 5V_standby power source of your power supply must support ≥720mA.

• RTC Timer

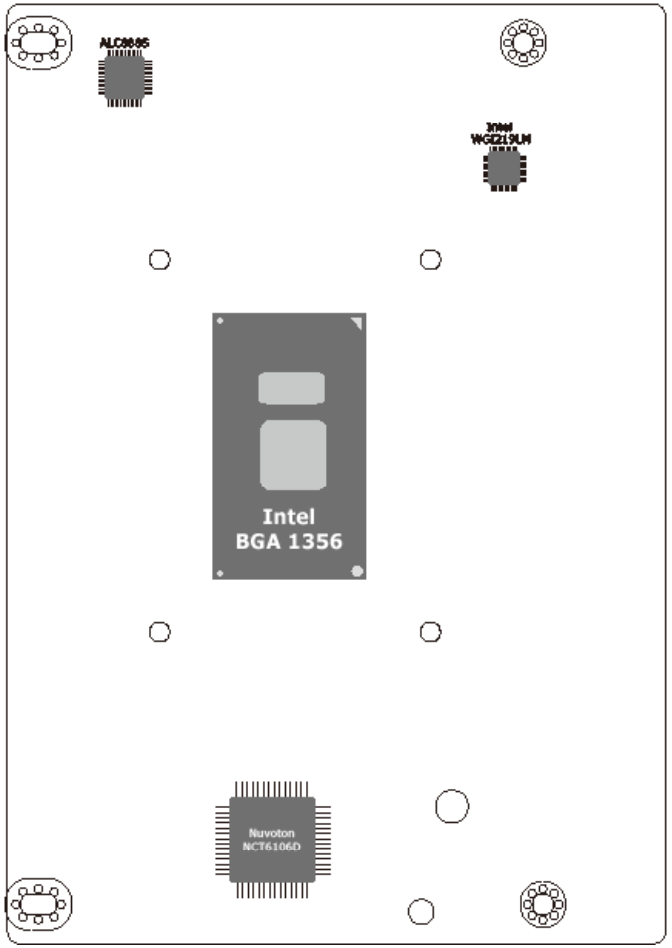
The RTC installed on the system board allows your system to automatically power-on on the set date and time.

Chapter 2 - Hardware Installation

Board Layout



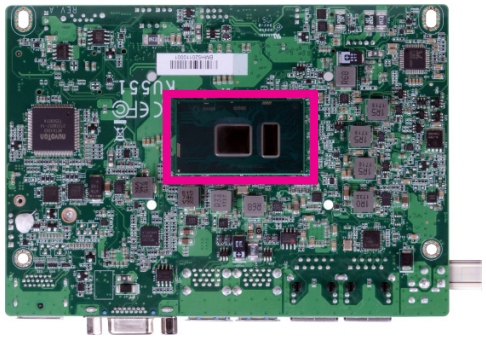
Top View



Bottom View

System CPU

The system board is equipped with a Kabylake-U microprocessor in socket BGA compatible package 1356.



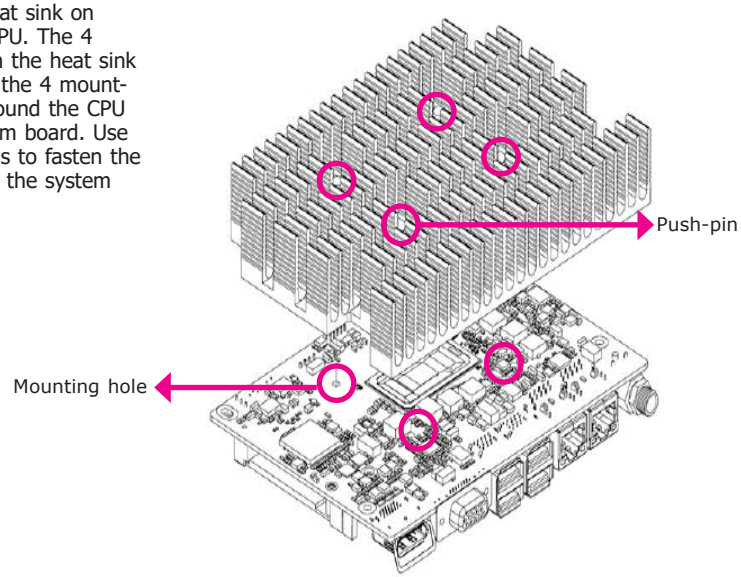
Installing the Thermal Solution

The CPU must be kept cool by using a heat sink or a heat spreader. Otherwise, the CPU will overheat damaging both the CPU and system board.

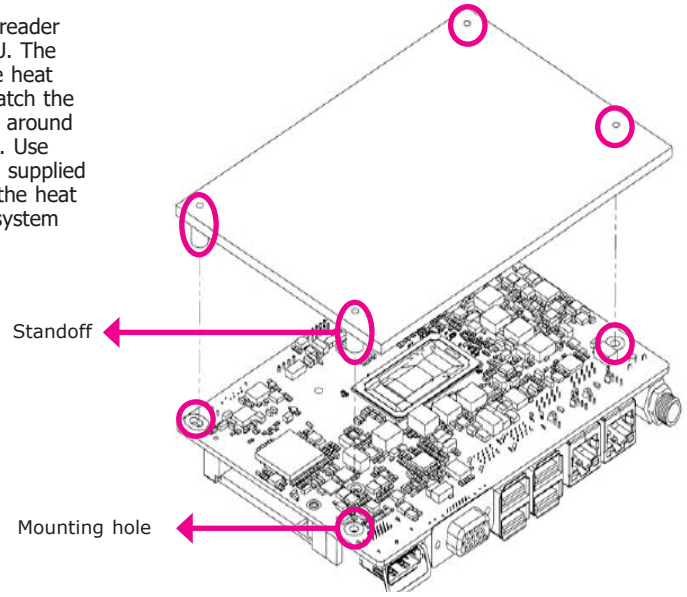
1. Before you install the heat sink/heat spreader, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied. Do not spread the paste all over the surface. When you later place the heat sink/heat spreader on top of the CPU, the compound will disperse evenly.

   Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal paste if the heat sink/heat spreader already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the heat sink/heat spreader on top of the CPU.

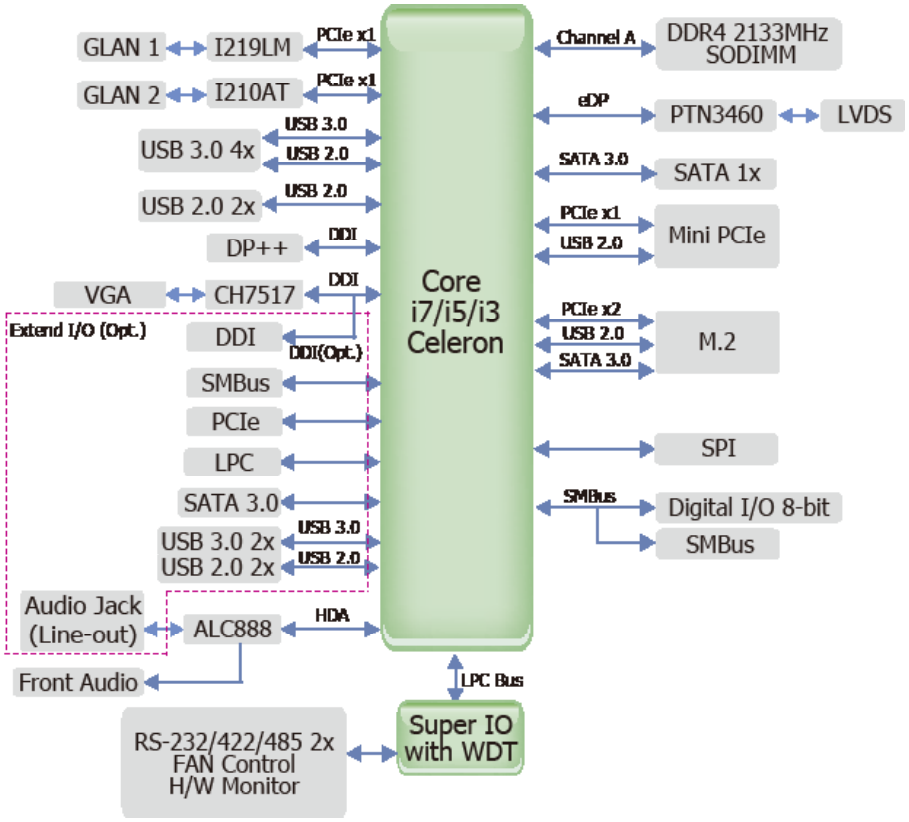
2A. Place the heat sink on top of the CPU. The 4 push-pins on the heat sink must match the 4 mounting holes around the CPU on the system board. Use the push-pins to fasten the heat sink on the system board.



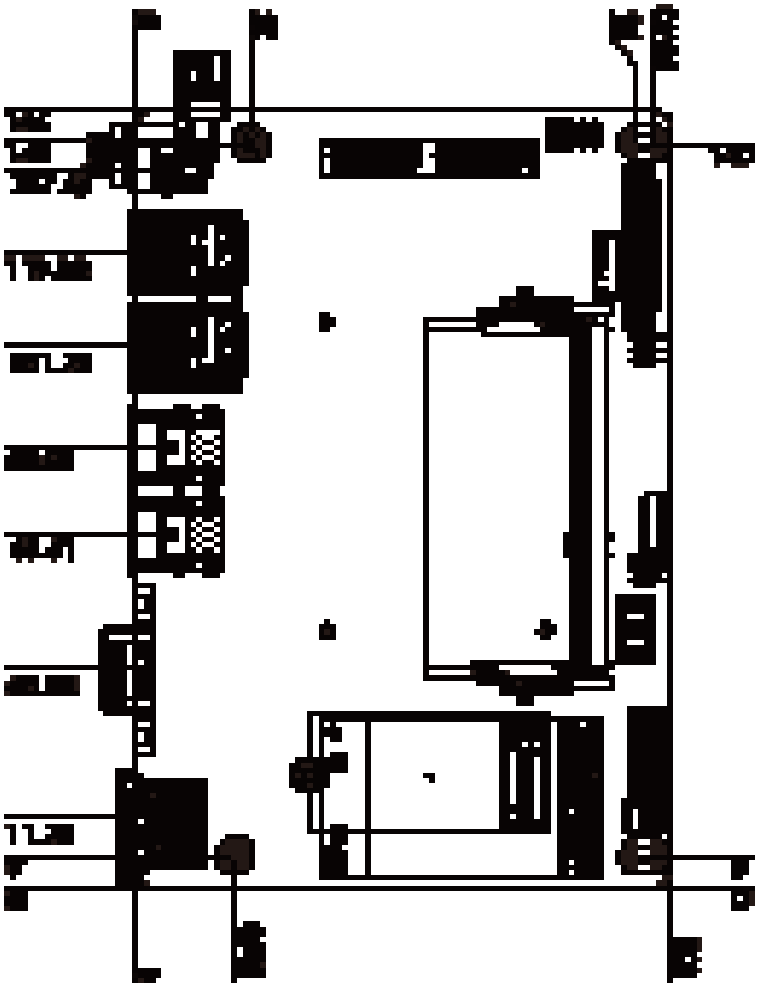
2B. Place the heat spreader on top of the CPU. The 4 standoffs of the heat spreader must match the 4 mounting holes around the system board. Use the standoffs and supplied screws to fasten the heat spreader on the system board.



Block Diagram



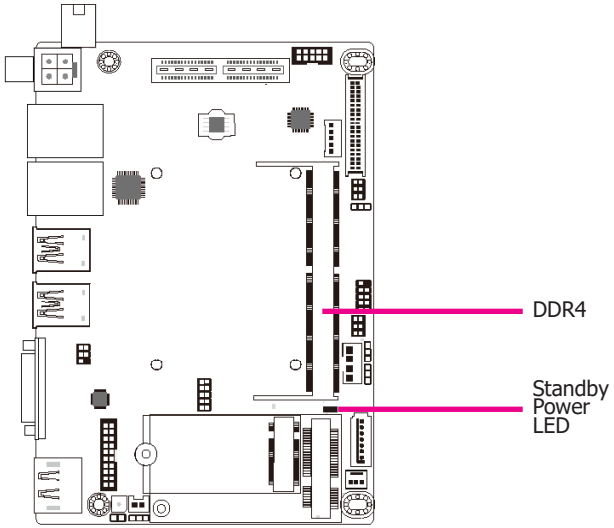
Mechanical Diagram



Important:
Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures 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.

System Memory

Important:
When the Standby Power LED is red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



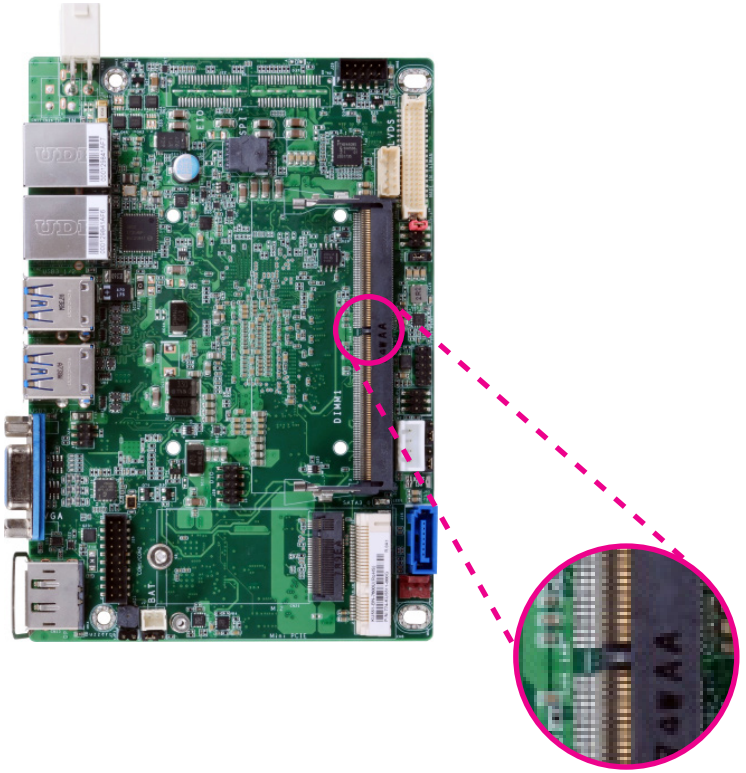
Features

- One 260-pin SODIMM up to 16GB
- Single Channel DDR4 1866/2133MHz

Installing the DIMM Module

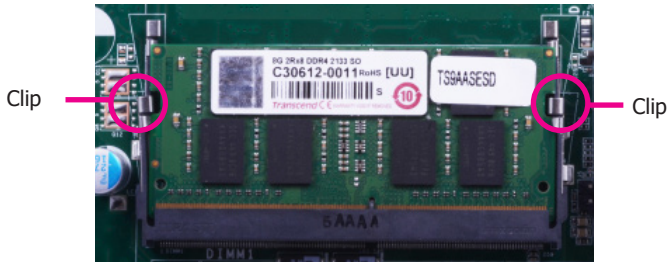
Note:
The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the SODIMM socket on the system board.
4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one direction.



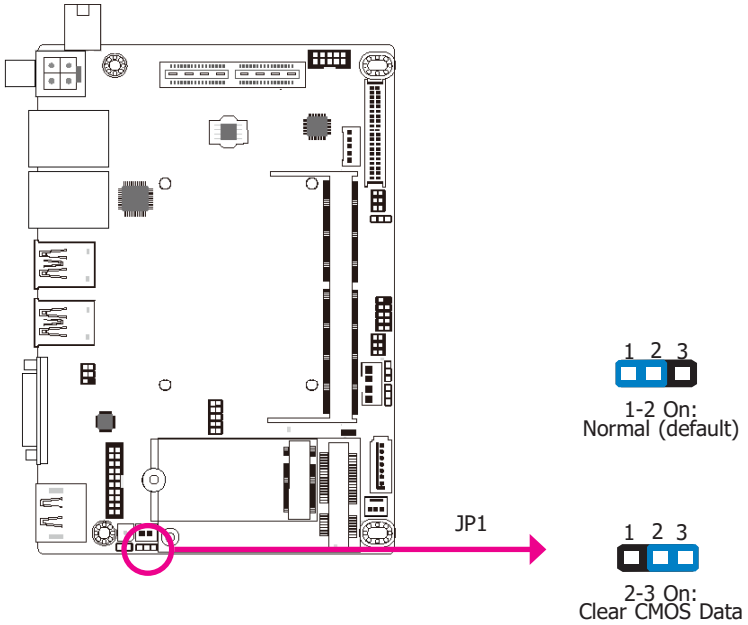
5. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

6. Push down the module until the clips at each end of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.



Jumper Settings

Clear CMOS Data



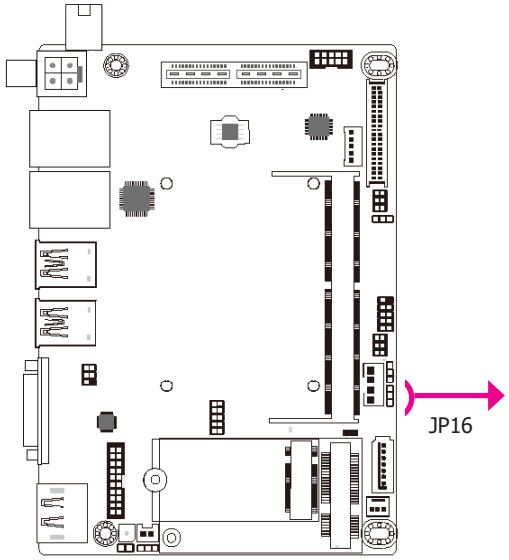
If you encounter the following conditions, you can reconfigure the system with the default values stored in the ROM BIOS.

a) CMOS data becomes corrupted.
b) You forgot the supervisor or user password.

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

1. Power-off the system and unplug the power cord.
2. Set JP1 pins 2 and 3 to On. Wait for a few seconds and set JP1 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.

Auto Power-on Select



JP16

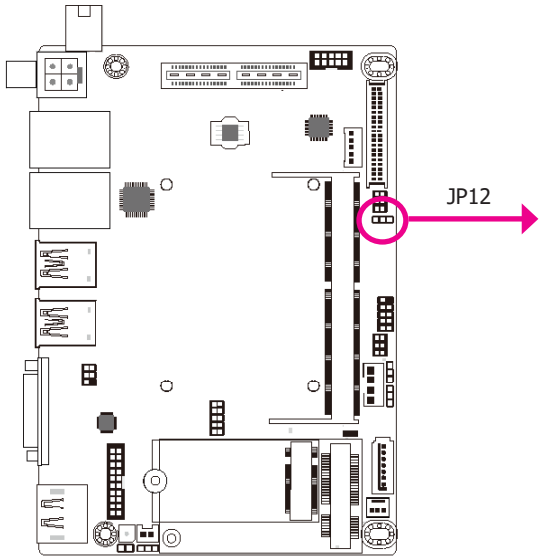
1-2 On:
Power-on via power button
(default)

2-3 On:
Power-on via AC power

JP16 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP16 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP16 "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).

Backlight Brightness Select



JP12

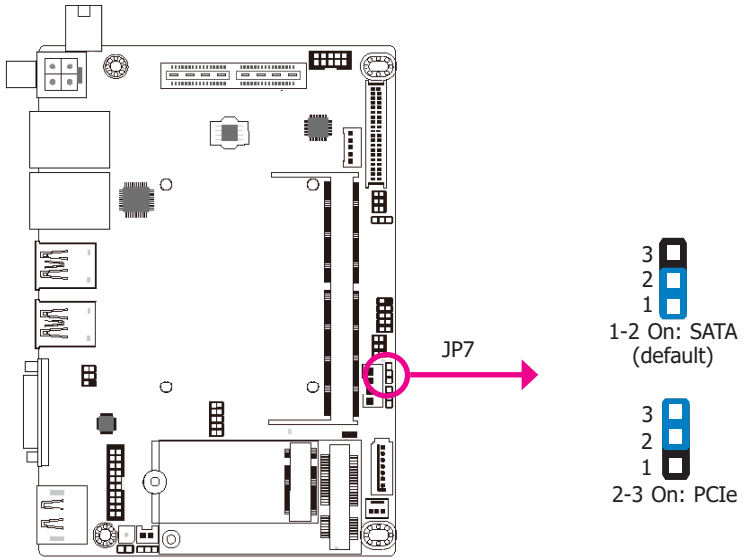
1-2 On: +3.3V
(default)

2-3 On: +5V

JP12 is used to select the power level of backlight brightness control: +3.3V or +5V.

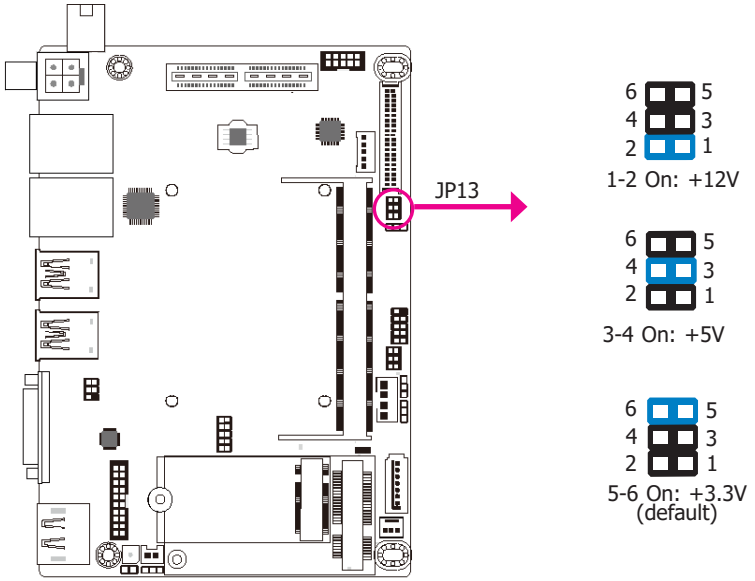
Important:
Before powering-on the system, make sure that the power settings of JP12 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.

M.2 Signal Select



JP7 is used to select the M.2 signal: PCIe or SATA (default).

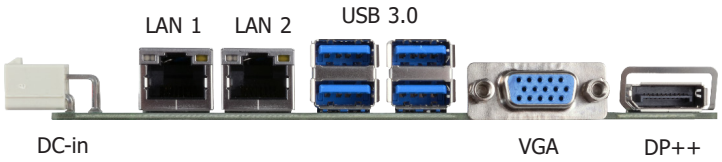
Panel Power Select



JP13 is used to select the power supplied with the LCD panel.

Important:
Before powering-on the system, make sure that the power settings of JP13 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

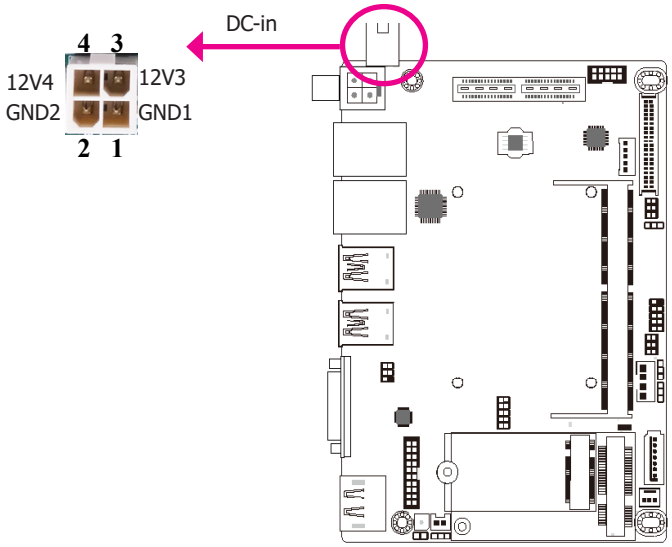
Rear Panel I/O Ports



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

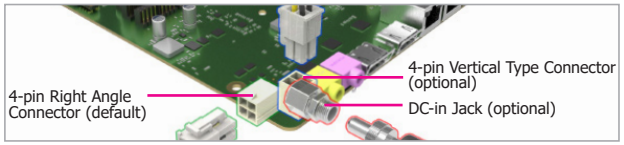
- 1 12V DC-in connector
- 2 GbE (RJ-45)
- 4 USB 3.0
- 1 VGA
- 1 DP++

12V DC-in



This 4-pin right angle connector is considered a low power solution. Connect a DC power cord to this connector. Using a voltage more than the recommended range may fail to boot the system or cause damage to the system board.

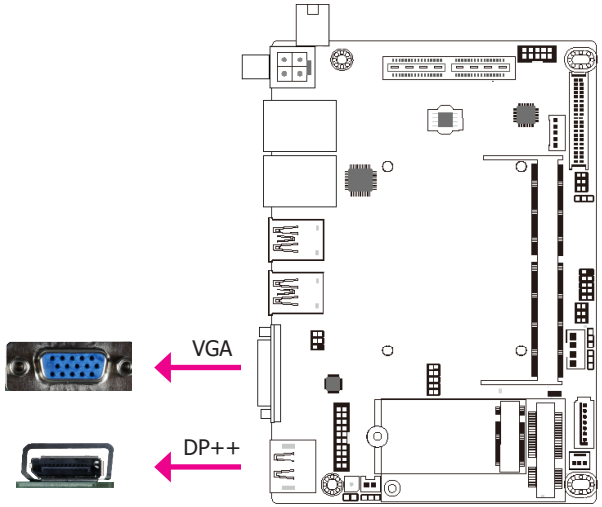
The 4-pin right-angle connector on the system board co-lays with a DC-in jack (optional) or 4-pin vertical type connector (optional) as the photo displayed below.



Graphics Interfaces

The display ports consist of the following:

- 1 VGA port
- 1 DP++ port



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.

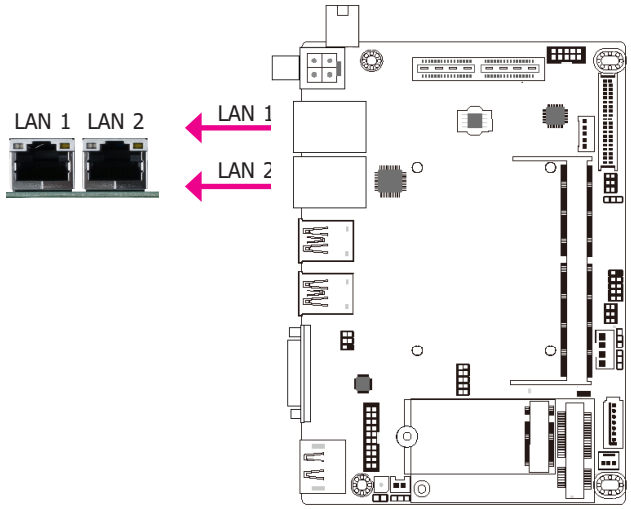
DP++ Port

The DP++ port is a digital display interface used to connect a display device such as a computer monitor. It is used to transmit audio and video simultaneously. The interface, which is developed by VESA, delivers higher performance features than any other digital interfaces.

Driver Installation

Install the graphics driver. Refer to Chapter 4 for more information.

RJ45 LAN Ports



Features

- 1 Intel® I210AT PCI Express Gigabit Ethernet controller
- 1 Intel® I219LM PCIe with iAMT11.6

The LAN ports allow the system board to connect to a local area network with a network hub.

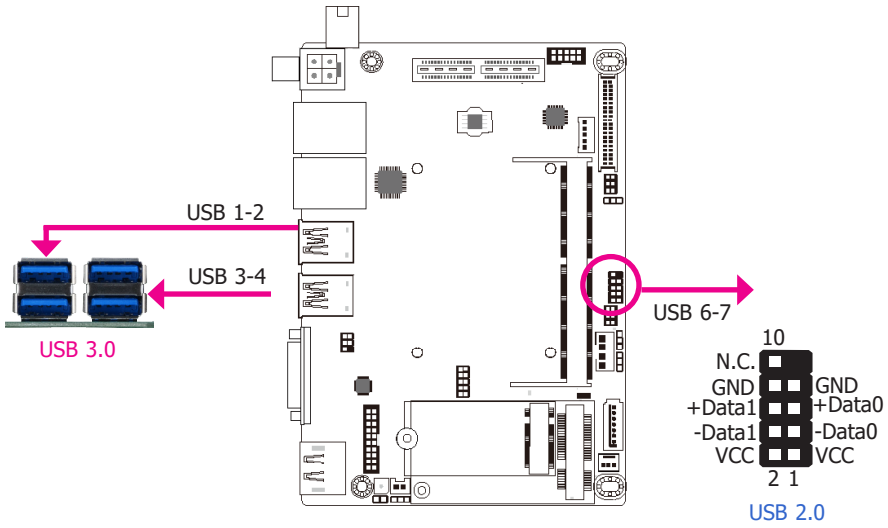
BIOS Setting

Configure the onboard LAN in the Advanced menu (the "ACPI Configuration" submenu) of the BIOS. Refer to Chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to Chapter 4 for more information.

USB Ports



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

The system board is equipped with 4 onboard USB 3.0 port (USB 1-2/3-4). The 10-pin connector allows you to connect 2 additional USB 2.0 ports (USB 6-7). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

Configure the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to Chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to Chapter 4 for more information.

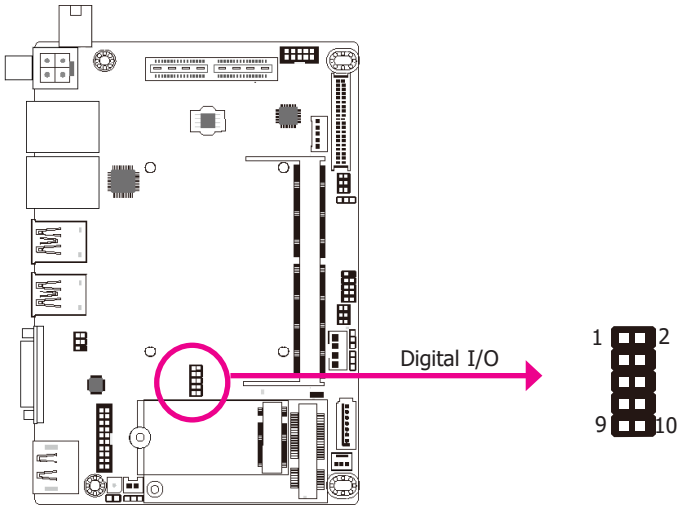
Wake-On-USB Keyboard/Mouse (optional)

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

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥2A.

I/O Connectors

Digital I/O Connector

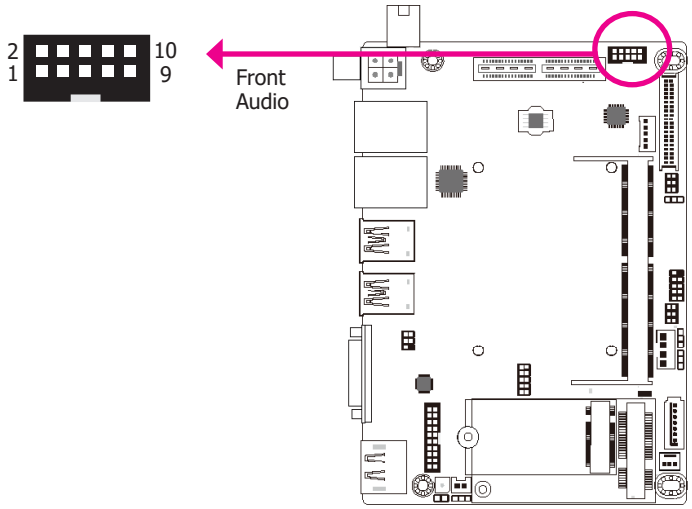


The 8-bit Digital I/O connector provides monitoring and control functions to the connected external devices.

Digital I/O Connector

Pins	Function
1	DIO7
2	DIO6
3	DIO5
4	DIO4
5	DIO3
6	DIO2
7	DIO1
8	DIO0
9	5VSB
10	GND

Front Audio Connector



Front Audio

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

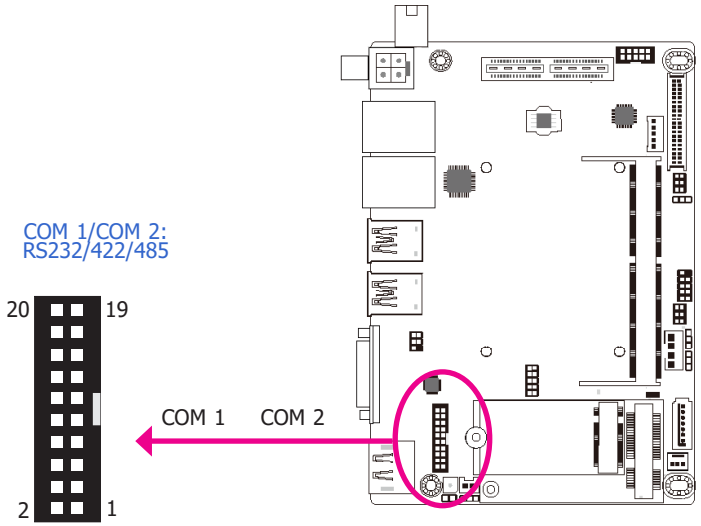
Driver Installation

Install the audio driver. Refer to the Chapter 4 for more information.

Front Audio Connector

Pins	Function
1	Mic-L
2	GND
3	Mic-R
4	NC
5	Line-R
6	Mic-JD
7	GND
8	NC
9	Line-L
10	Line-JD

COM (Serial) Ports



COM 1 and COM 2 can be selected among RS232, RS422 and RS485.

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

Connecting External Serial Ports

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

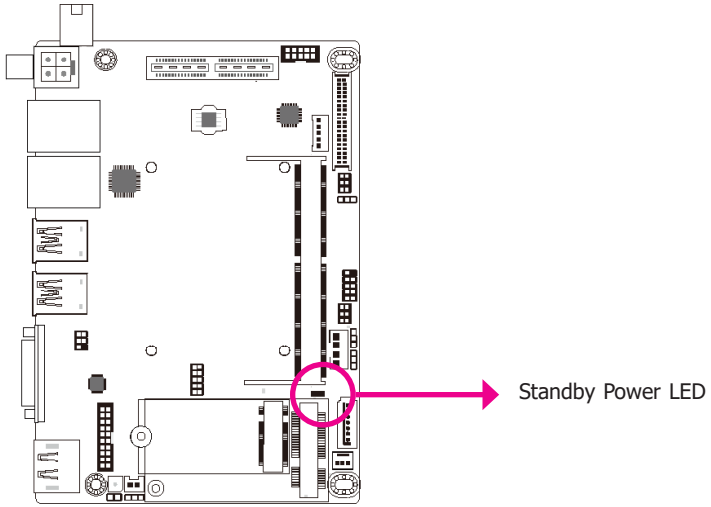
BIOS Setting

Configure the serial COM ports in the Advanced menu ("SIO NUVOTON6101D" submenu) of the BIOS. Refer to Chapter 3 for more information.

COM Port Connector

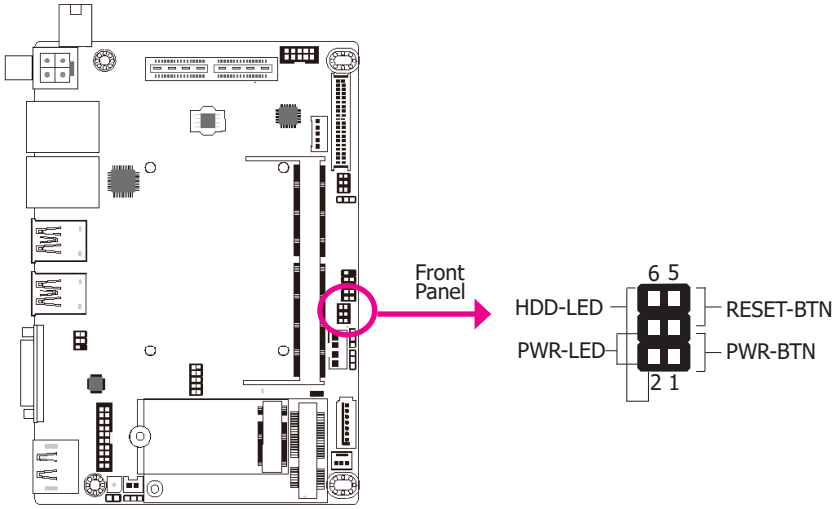
Pin	RS232	RS422	RS485
1	DCD_1	TX(B)_1	RX(B)/TX(B)_1
2	DSR_1	NC	NC
3	SIN_1	TX(A)_1	RX(A)/TX(A)_1
4	RTS_1	NC	NC
5	SO_1	RX(A)_1	NC
6	CTS_1	NC	NC
7	DTR_1	RX(B)_1	NC
8	RI_1	NC	NC
9	GND	GND	GND
10	GND	GND	GND
11	DCD_2	TX(B)_2	RX(B)/TX(B)_2
12	DSR_2	NC	NC
13	SIN_2	TX(A)_2	RX(A)/TX(A)_2
14	RTS_2	NC	NC
15	SO_2	RX(A)_2	NC
16	CTS_2	NC	NC
17	DTR_2	RX(B)_2	NC
18	RI_2	NC	NC
19	GND	GND	GND
20	GND	GND	GND

Standby Power LED



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

Front Panel Connector



HDD-LED - Hard Drive LED

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

PWR-LED - Power/Standby 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.

RESET-BTN - Reset Button

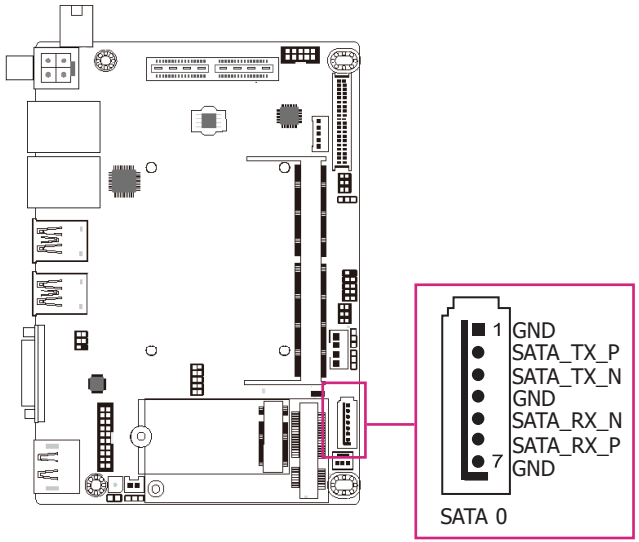
This button allows you to reboot without having to power off the system.

PWR-BTN - Power Button

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

	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	6	HD_LED	PWR-BTN	1	Power Button
	2	LED Power		3	Ground
RESET-BTN	3	Ground	PWR-LED	2	LED Power
	5	Reset Button		4	SUS_LED

SATA (Serial ATA) Connector



SATA 3.0 6Gb/s

Features

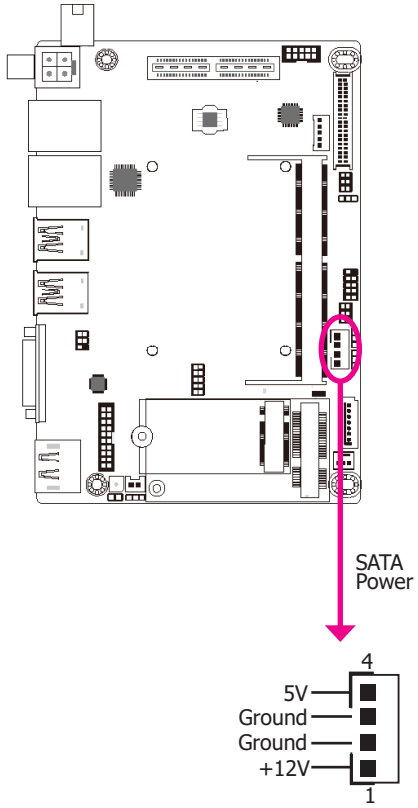
- 1 Serial ATA 3.0 port with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

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.

BIOS Setting

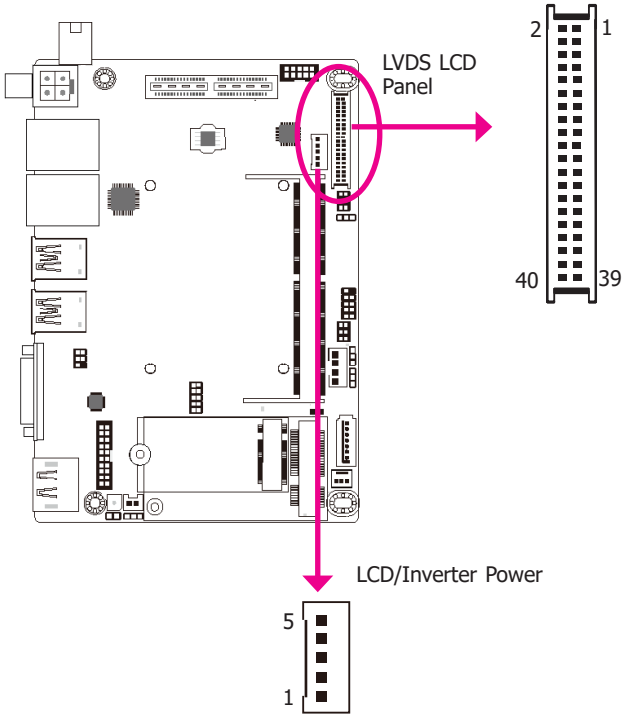
Configure the Serial ATA drive in the Advanced menu ("SATA Configuration" submenu) of the BIOS. Refer to Chapter 3 for more information.

SATA (Serial ATA) Power Connector



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.

LVDS LCD Panel Connector
LCD/Inverter Power Connector



The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD panel.

Refer to the table on the right side for the pin functions of these connectors.

BIOS Setting

Configure the system graphics and the LCD panel in the Advanced menu (the "Video Configuration" submenu) of the BIOS. Refer to Chapter 3 for more information.

Note:
DFI board's LVDS connector: Hirose DF13-40DP-1.25V(91)/40P/1.25mm; cable side connector: Hirose DF13-40DS-1.25C.

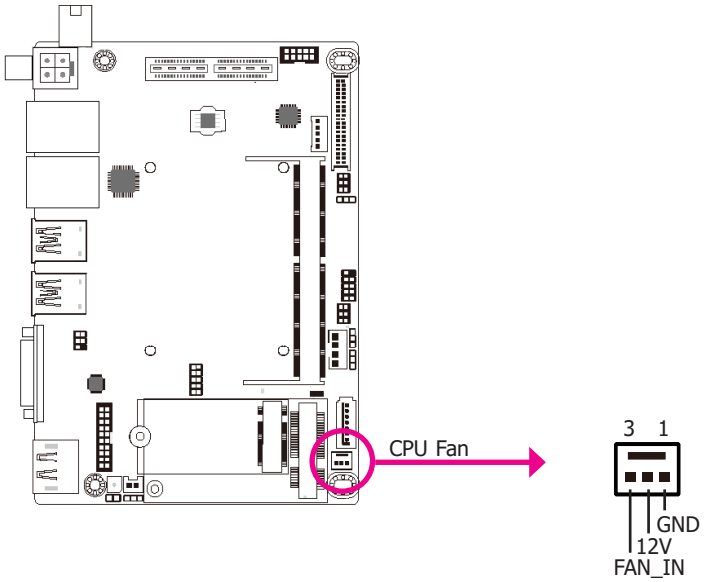
LVDS LCD Panel Connector

Pin	Function	Pins	Function
1	GND	2	GND
3	LVDS_Out3+ (Odd_3+)	4	LVDS_Out7+ (Even_3+)
5	LVDS_Out3- (Odd_3-)	6	LVDS_Out7- (Even_3-)
7	GND	8	GND
9	LVDS_Out2+ (Odd_2+)	10	LVDS_Out6+ (Even_2+)
11	LVDS_Out2- (Odd_2-)	12	LVDS_Out6- (Even_2-)
13	GND	14	GND
15	LVDS_Out1+ (Odd_1+)	16	LVDS_Out5+ (Even_1+)
17	LVDS_Out1- (Odd_1-)	18	LVDS_Out5- (Even_1-)
19	GND	20	GND
21	LVDS_Out0+ (Odd_0+)	22	LVDS_Out4+ (Even_0+)
23	LVDS_Out0- (Odd_0-)	24	LVDS_Out4- (Even_0-)
25	GND	26	GND
27	LVDS_CLK1+ (Odd_CLK+)	28	LVDS_CLK2+ (Even_CLK+)
29	LVDS_CLK1- (Odd_CLK-)	30	LVDS_CLK2- (Even_CLK-)
31	GND	32	GND
33	DDC_CLK	34	NC
35	DDC_DATA	36	+3.3V
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

Pin	Function
1	+12V
2	GND
3	Panel Backlight On/Off Control
4	Dimming Control
5	+5V

Cooling Fan Connector

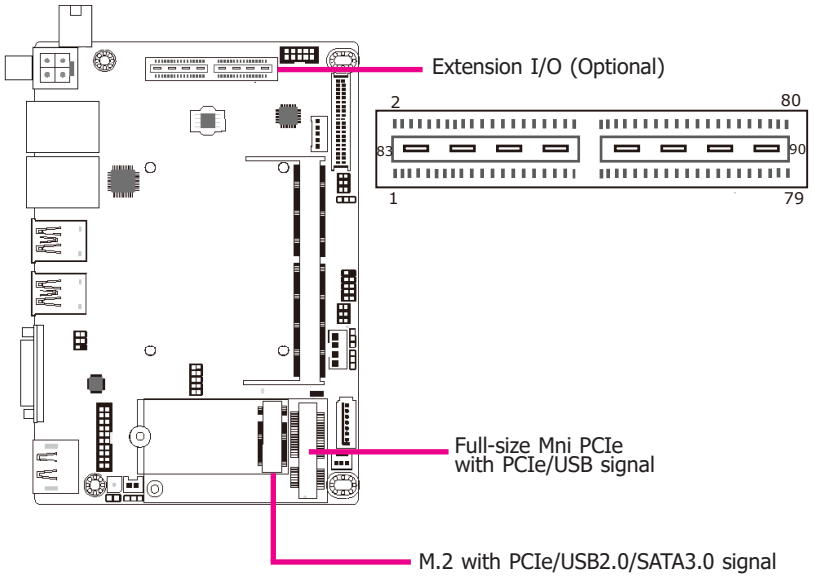


The fan connector is used to connect the cooling fan. The cooling fan will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("PC Health Status" of the SIO NOVOTON6106D submenu) of the BIOS will display the current speed of the cooling fans. Refer to Chapter 3 for more information.

Expansion Slots



Extension I/O Connector (Optional)

The Extension I/O connector supports a multitude of signals such as PCIe, DDI, USB, LPC, and SMBus. It can expand the system's internal I/O connectivity. Please refer to the following table for pin assignment.

Mini PCI Express Slot

The full-size Mini PCIe socket supports PCIe x1 and USB 2.0 signals and is used to install a Mini PCIe card.

M.2 B Key 2242 Socket

The M.2 B key 2242 socket is the Next Generation Form Factor (NGFF) which is designed to support multiple modules and make the M.2 more suitable in application for solid-state storage.

E I/O Connector

Pin	Pin Name	Pin	Pin Name
1	PCIE_RX0+	2	PCIE_TX0+
3	PCIE_RX0-	4	PCIE_TX0-
5	GND	6	GND
7	PCIE_RX1+	8	PCIE_TX1+
9	PCIE_RX1-	10	PCIE_TX1-
11	GND	12	GND
13	PCIE_CLK+	14	USB_SSRX1+
15	PCIE_CLK-	16	USB_SSRX1-
17	GND	18	GND
19	USB_SSRX0+	20	USB_SSTX1+
21	USB_SSRX0-	22	USB_SSTX1-
23	GND	24	GND
25	USB_SSTX0+	26	USB1+
27	USB_SSTX0-	28	USB1-
29	GND	30	USB0+
31	SATA0_RX+	32	USB0-
33	SATA0_RX-	34	GND
35	GND	36	PCIE_WAKE#
37	SATA0_TX+	38	USB01_OC#
39	SATA0_TX-	40	USB23_OC#
41	GND	42	SMB_STB_CK
43	DDI0_CTRLCLK_AUX+	44	SMB_STB_DAT
45	DDI0_CTRLCLK_AUX-	46	GND
47	GND	48	CLK33M
49	DDI0_PAIR0+	50	LPC_AD0
51	DDI0_PAIR0-	52	LPC_AD1
53	GND	54	LPC_AD2
55	DDI0_PAIR1+	56	LPC_AD3
57	DDI0_PAIR1-	58	LPC_SERIRQ
59	GND	60	LPC_FRAME#
61	DDI0_PAIR2+	62	DDI0_HPD
63	DDI0_PAIR2-	64	DDI0_AUX_Detect
65	GND	66	GND
67	DDI0_PAIR3+	68	GPIO_STB (INT)
69	DDI0_PAIR3-	70	PLT_RESET#
71	GND	72	12VSB
73	3V3SB_1	74	12VSB
75	3V3SB_2	76	PS_ON
77	AUD_GND	78	LINE_JD
79	LINE1_L	80	LINE1_R
83	GND	84	GND
85	GND	86	GND
87	5VSB	88	5VSB
89	5VSB	90	5VSB

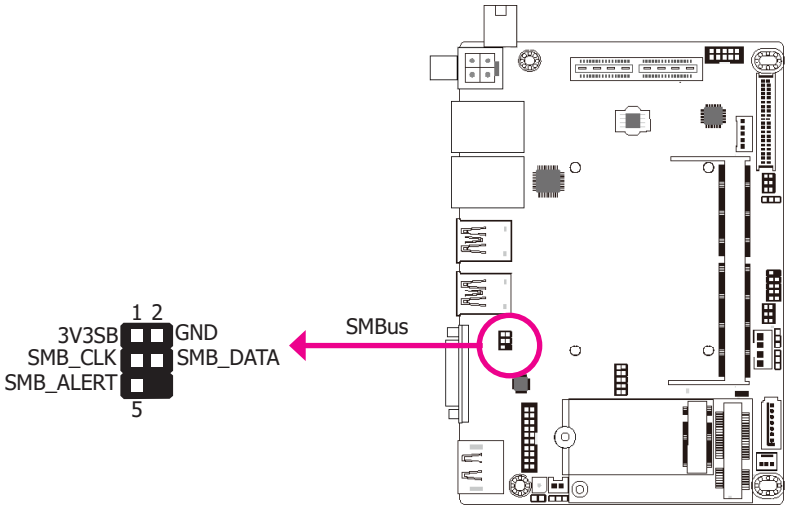
Note:
DFI board's E I/O connector:

Manufacturer: Samtec

Part No: QSE-040-01-L-D-A-K-TR

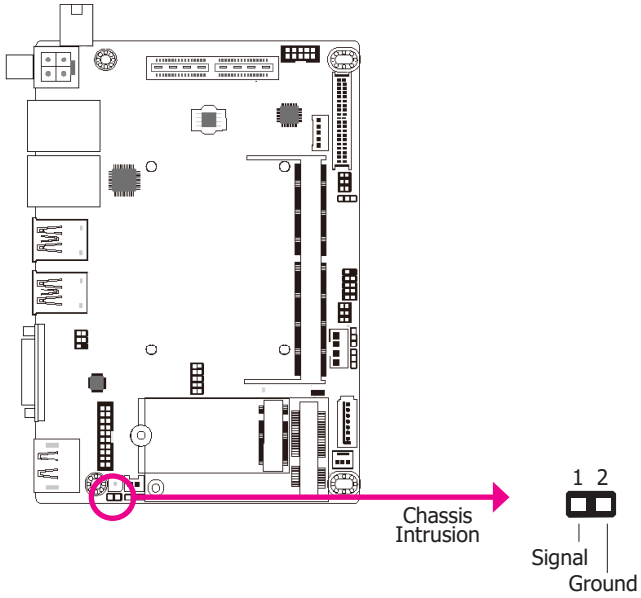
Description: Board-to-board connector, 80 pin, 0.8mm (pitch), 3.25mm (height), SMT type, 180 degree

SMBus Connector



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

Chassis Intrusion Connector

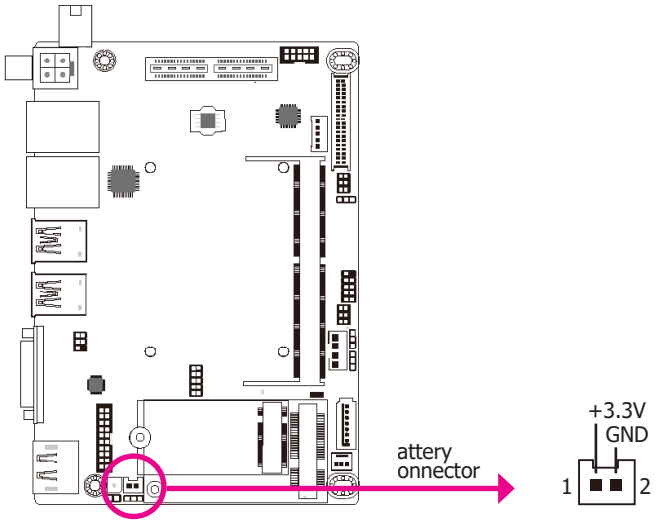


The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

BIOS Setting

Configure the chassis intrusion detection function in the Advanced menu ("SIO NUVOTON6106D" submenu) of the BIOS. Refer to Chapter 3 for more information.

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 recommended by the manufacturer.
- Dispose of used batteries according to local ordinance.

Chapter 3 - BIOS Setup

Overview

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

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

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the hightlight up or down between submenu or fields.
<Esc>	Exit to the BIOS Setup Utility.
+/<F5> (plus key)	Scrolls forward through the values or options of the highlighted field.
-/<F6> (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Select a field.
<F1>	Displays general help
<F9>	Optimized defaults
<F10>	Saves and resets the setup program.
<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.

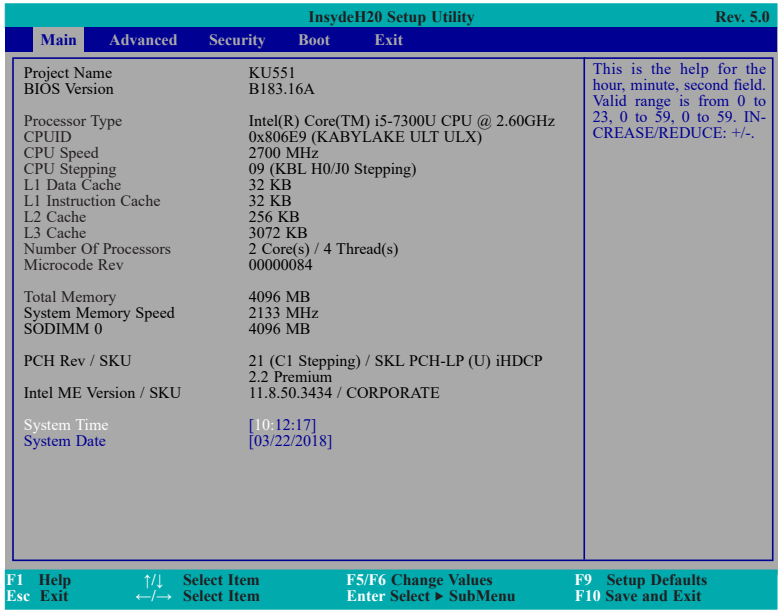
Submenu

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.

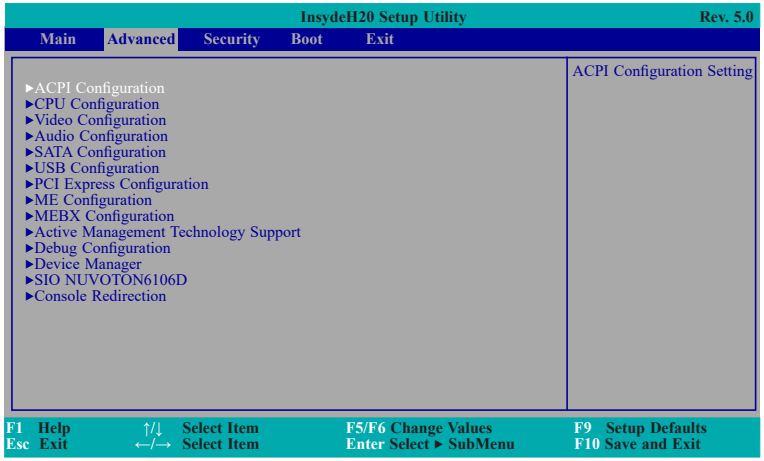
System Date

The date format is <month>, <date>, <year>. Month displays the month, from 01 to 12. Date displays the date, from 01 to 31. Year displays the year, from 2000 to 2099.

Advanced

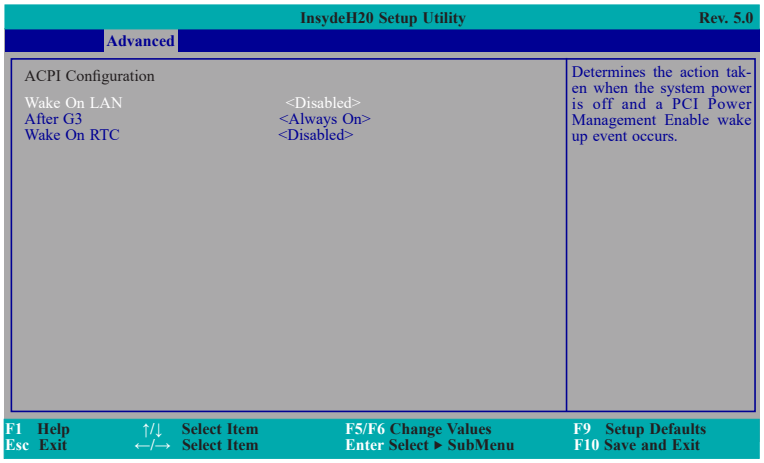
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Important:
Setting incorrect field values may cause the system to malfunction.



ACPI Configuration

This section is used to configure the system ACPI parameters.



Wake On LAN

This field use to enable or disable the LAN signal to wake up the system.

After G3

This field is to specify what state to go when power is re-applied after a power failue (G3 state).

Always On The system working state.

Always Off Off, except for trickle current to devices such as the power button.

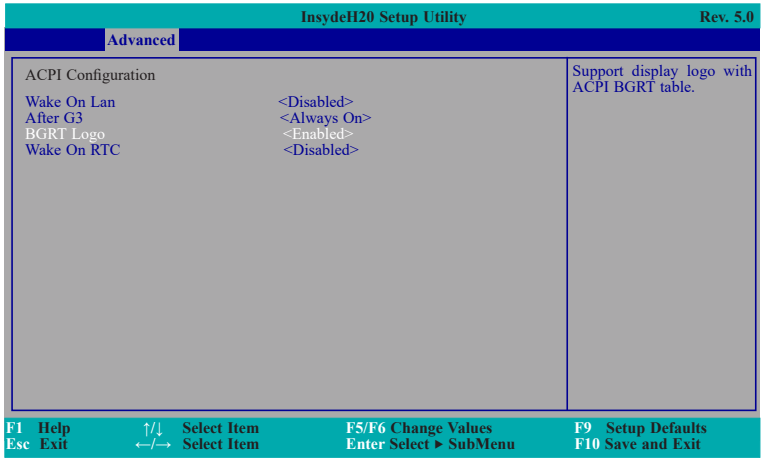
Wake On RTC

Automatically power the system on at a particular time every day from the Real-time clock battery.

Wake up time

When Wake On RTC is set to enabled, specify the wake up time of the day: <hour> (00~23), <minute> (00~59), <second> (00~59).

Note:
Under Dual Boot Type or UEFI Boot Type mode, if Quiet Boot is set to enabled, BGRT Logo field will appear for configuration. Refer to the Boot menu in this chapter for more information.

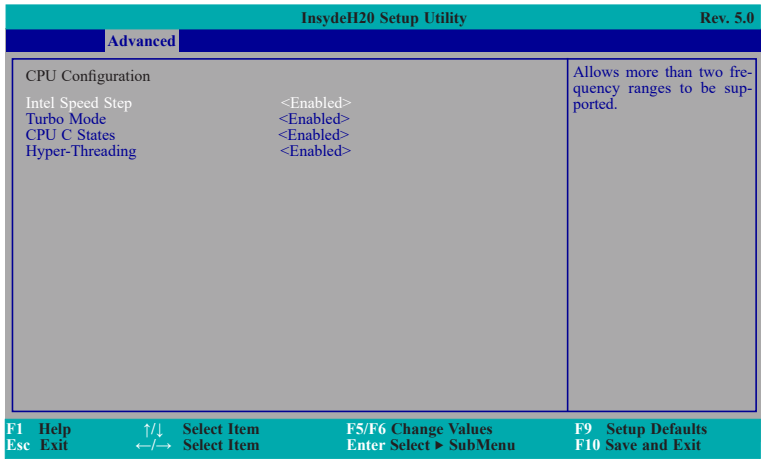


BGRT Logo

This field use to enable or disable to support display logo with ACPI BGRT table.

CPU Configuration

This section is used to configure the CPU.



Intel Speed Step

This field is used to enable or disable the Intel Enhanced SpeedStep Technology.

Turbo Mode

Enable or disable the turbo mode.

CPU C States

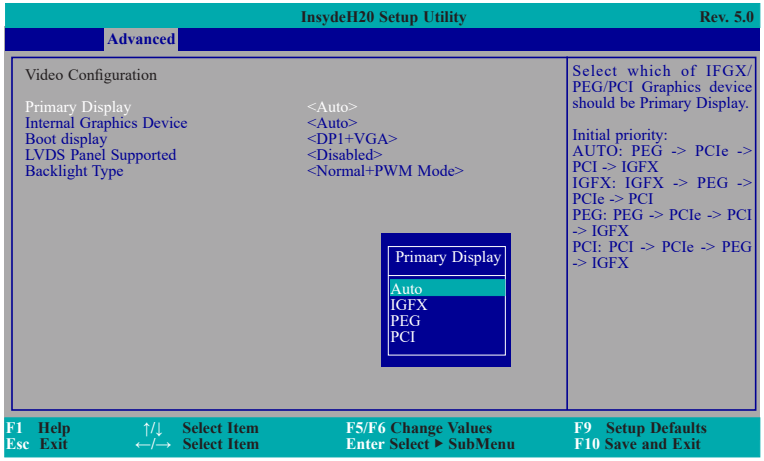
Enable or disable the CPU Power Management.

Hyper-Threading

Enables this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

Video Configuration

This section configures the video settings.



Primary display

Set the initial priority.

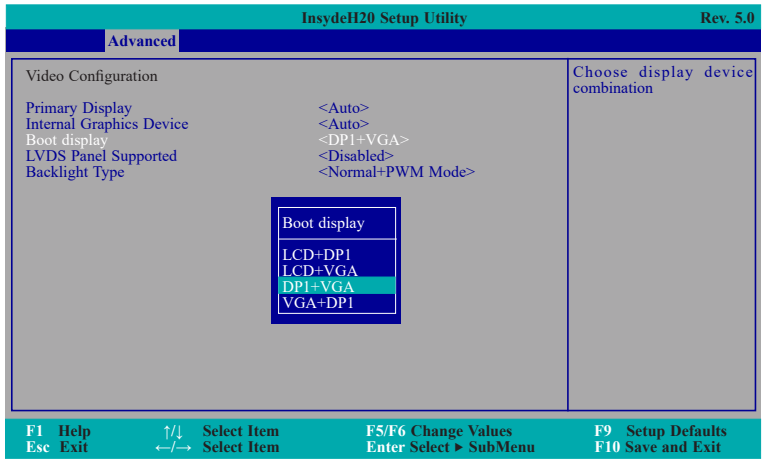
Internal Graphics Device

Keep IGFX enabled or disabled based on the setup options.

Boot display

Set the display device combination.

Note:
To control "Primary Display" & "Boot Display", first go to "Boot" menu and select different "Boot Type".
Boot Type : Legacy Boot Type -> Hide Primary Display & Show Boot display
Boot Type : UEFI Boot Type -> Show Primary Display & Hide Boot display
Boot Type : Dual Boot Type -> Show Primary Display & Show Boot display



LVDS Panel Supported

This field is used to enable or disable the PTN3460 function for LVDS Panel. If enabled, PTN3460 Configuration and LCD Panel Type fields will appear for configuration.

PTN3460 Configuration

Select PTN3460 color depth configuration: 18 Bit, 24 Bit, 36 Bit or 48 Bit.

LCD Panel Type

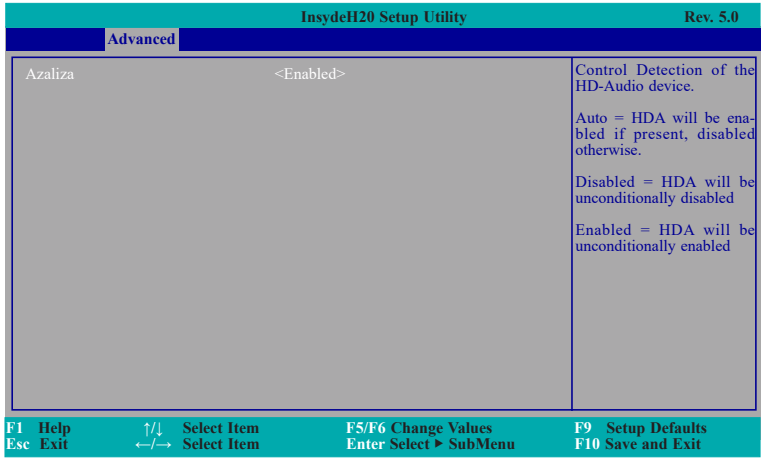
Select LCD Panel Type: 800x480, 800x600, 1024x768, 1366x768, 1280x1024, 1920x1080 or 1920x1200.

Backlight Type

Select Backlight Type: Normal+PWM Mode, Normal+DC Mode, Invert+PWM Mode or Invert+DC Mode.

Audio Configuration

This section is used to configure the audio settings.



Azaliza

Control the detection of the Azaliza device.

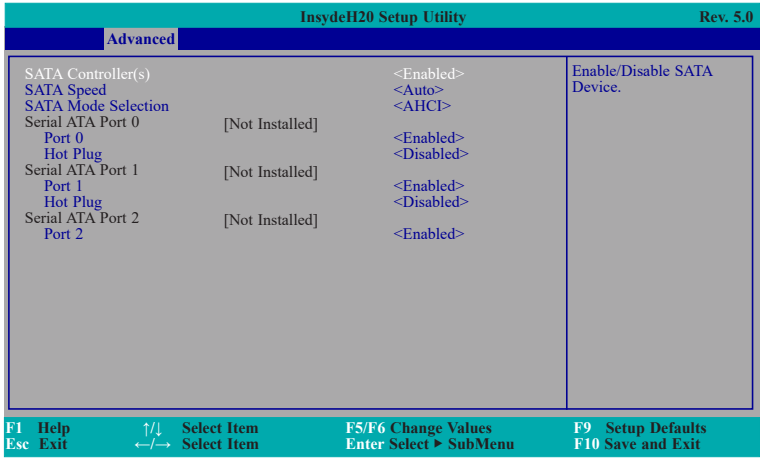
Disabled
HDA will be unconditionally disabled.

Enabled
HDA will be unconditionally enabled.

Auto
HDA will be enabled if present, disabled otherwise.

SATA Configuration

This section is designed to select the SATA controller and the type of hard disk drive which are installed in your system unit.



SATA Controller(s)

This field is used to enable or disable Serial ATA devices.

SATA Speed

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

SATA Mode Selection

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

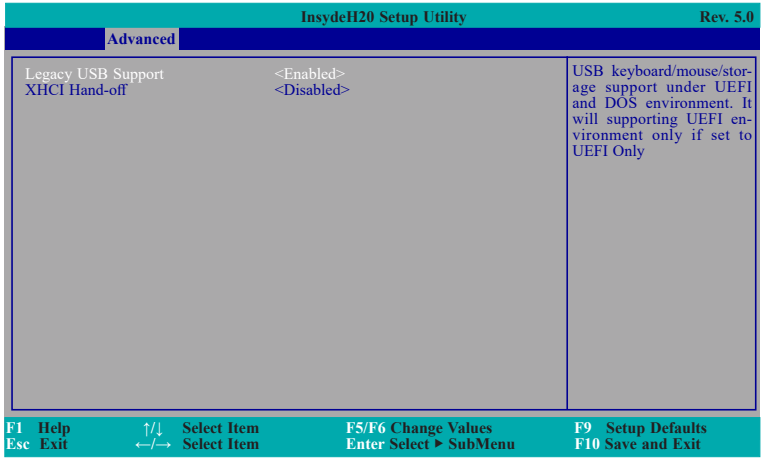
AHCI Mode
This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).

Serial ATA Port 0, 1, 2 and Hot Plug

These fields are used to enable or disable the serial ATA port and its hot plug.

USB Configuration

This section is used to configure the parameters of the USB device.



Legacy USB Support

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

Enabled

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

UEFI Only

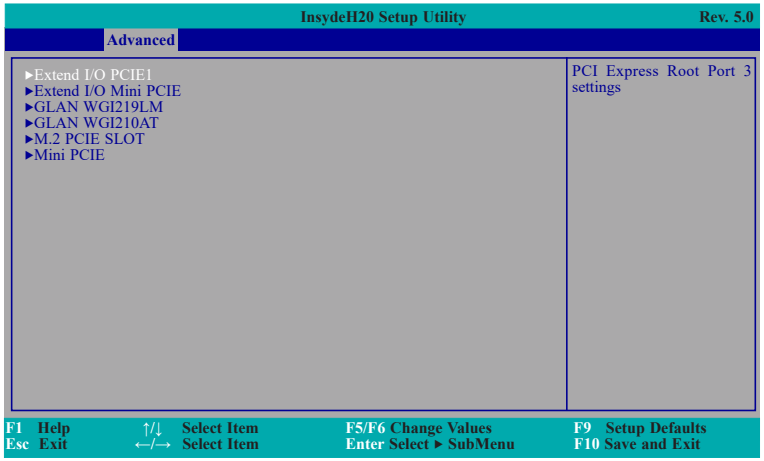
Enable USB keyboard/mouse/storage support under UEFI environment.

XHCI Hand-off

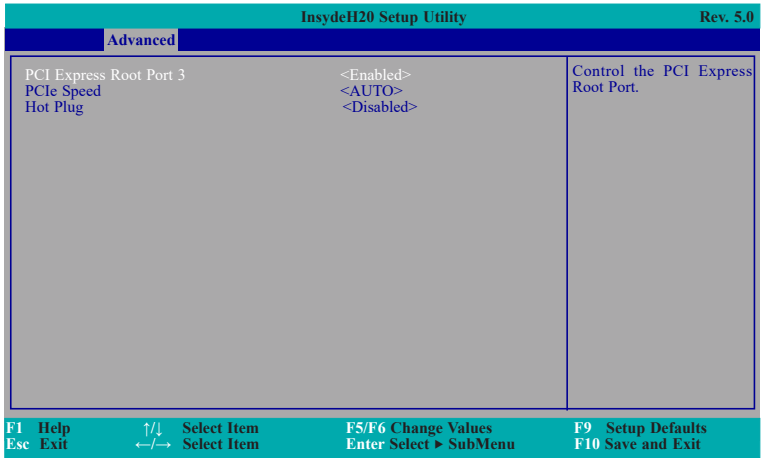
Enable or disable to clear USB Legacy SMI bit for XHCI and EHCI.

PCI Express Configuration

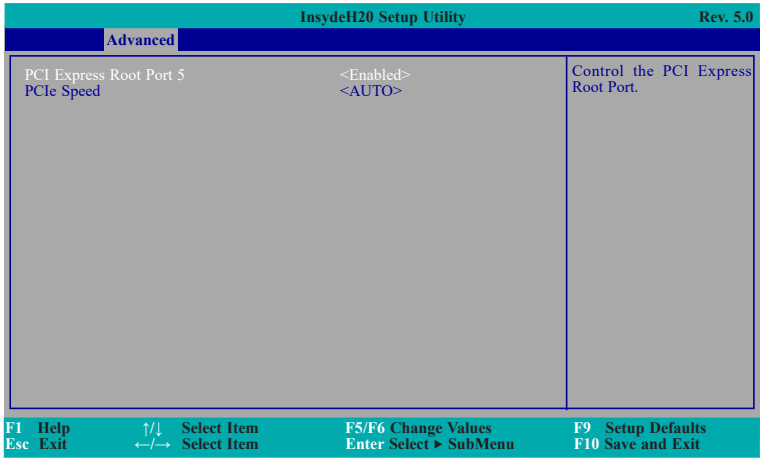
This section configures settings relevant to PCI Express root ports.



Extend I/O PCIE1, Extend I/O Mini PCIE, M.2 PCIE SLOT and Mini PCIE



GLAN WGI219LM and GLAN WGI210AT



PCI Express Root Port 3/4/5/6/9/12

This field is used to enable or disable the PCI Express Root Port.

PCIe Speed

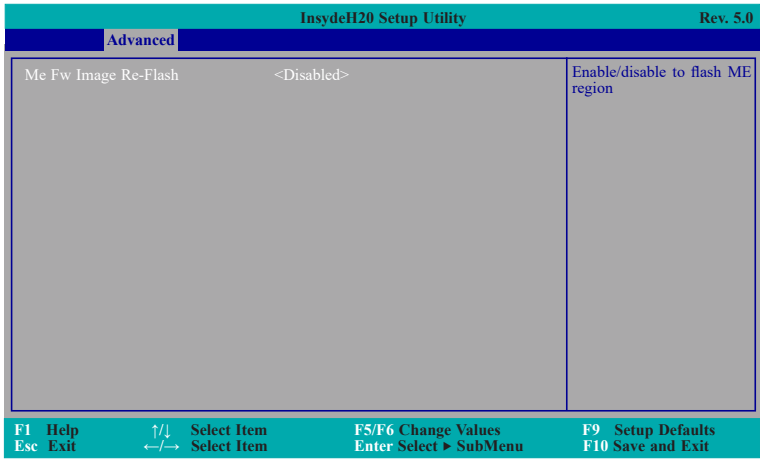
Select the speed of the PCI Express Root Port: Auto, Gen1, Gen2 or Gen3.

Hot Plug

This field is used to enable or disable the PCI Express Hot Plug.

ME Configuration

This section configures settings relevant to flash ME region.



Me Fw Image Re-Flash

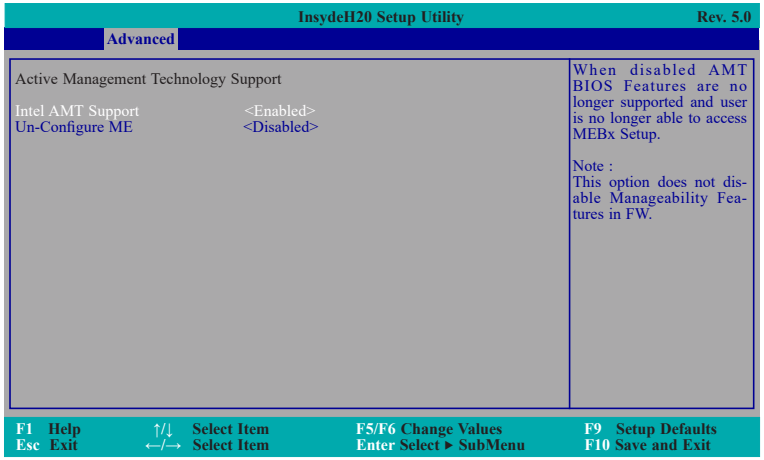
This field is used to enable or disable the flash ME region.

MEBX Configuration

This section configures MEBX setting. Please refer to **Chapter 5** for more information.

Active Management Technology Support

The section allows users to enable or disable the Intel® Active Management Technology (Intel® AMT) BIOS extension. Please refer to **Chapter 5** for more information.



Intel AMT Support

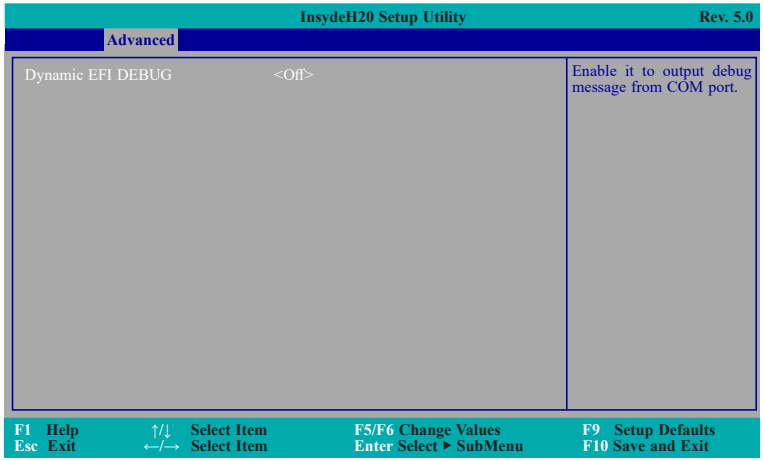
This field is used to enable or disable Intel® Active Management Technology BIOS Extension.

Un-Configure ME

This field is used to enable or disable un-figuring ME without password.

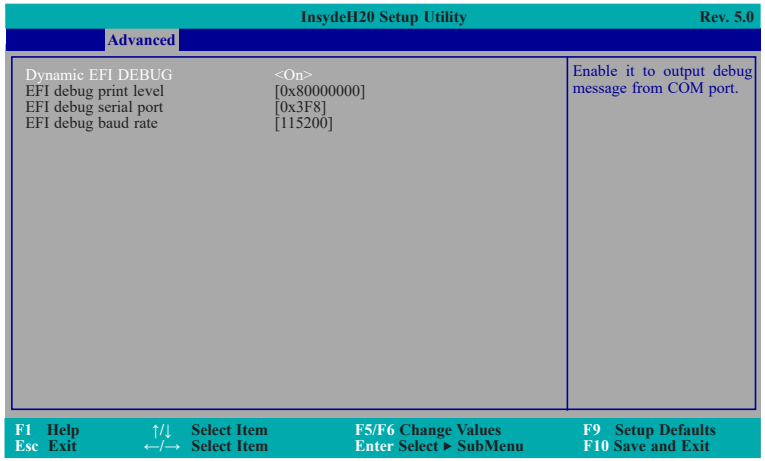
Debug Configuration

This section configures debug setting.



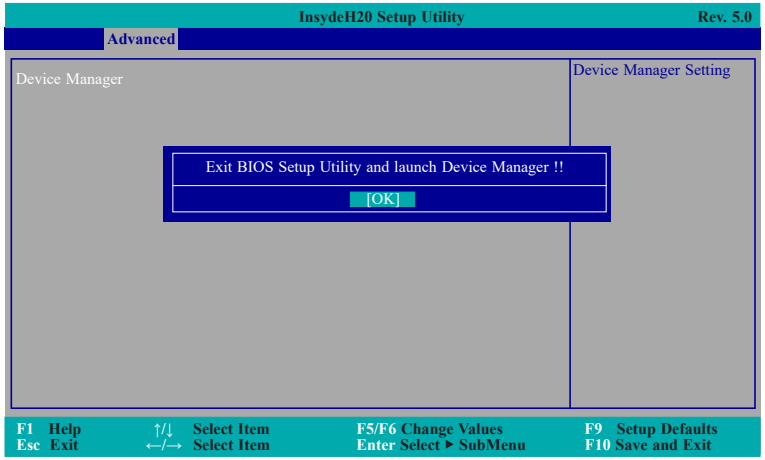
Dynamic EFI DEBUG

This field is used to turn on or off the function to output debug message from COM port. When set to on, relevant EFI debug information will display as below.



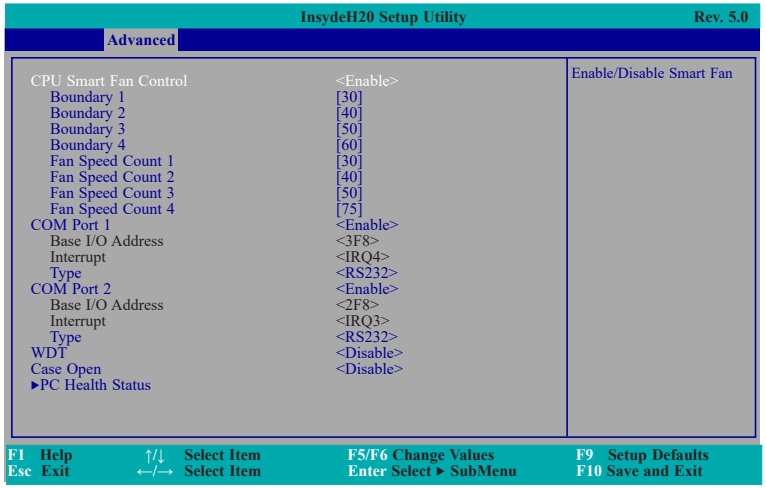
Device Manager

The section configures UEFI device with option ROM, such as LAN card, etc.



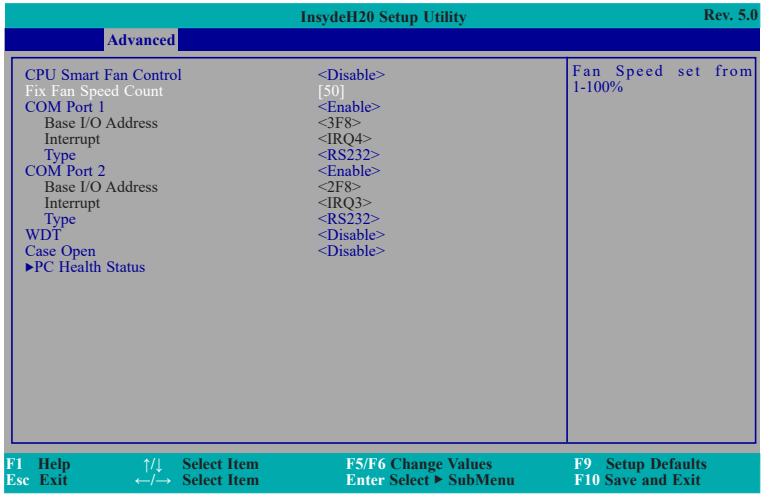
SIO NUVONTON6106D

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



CPU Smart Fan Control

Enable or disable the CPU smart fan. When disabled, Fix Fan Speed Count field will appear for configuration.



Fix Fan Speed Count

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

Boundary 1 to Boundary 4

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

Fan Speed Count 1 to Fan Speed Count 4

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

COM Port 1 to COM Port 2

Configure the settings to use the serial port.

Disable No configuration
Enable User configuration

Type

Choose RS232/RS485/RS422 (Peer-to-Peer) for COM type.

WDT

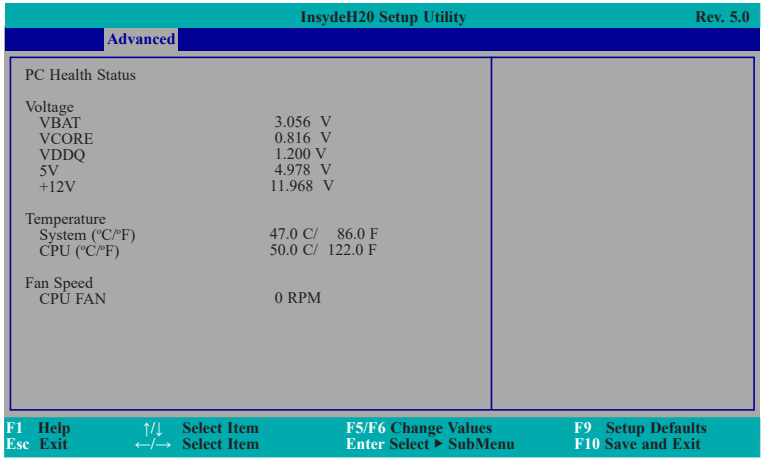
Enable or disable the watchdog function. A counter will appear if you select to enable WDT. Input any value between 1 to 255 seconds.

Case Open

Enable or disable the case open detection.

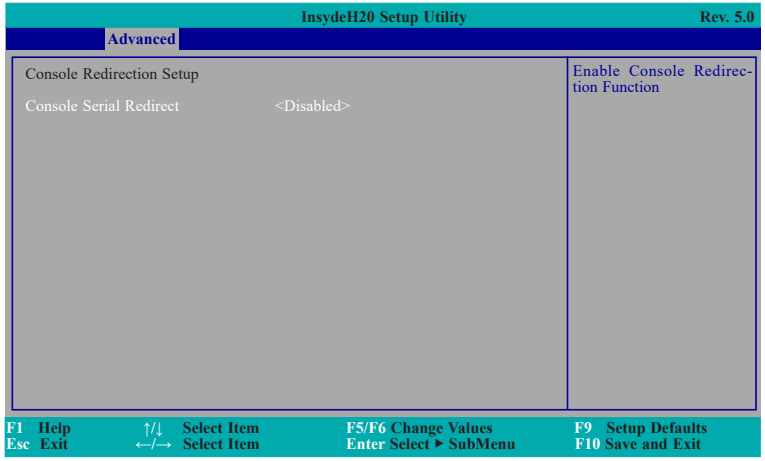
PC Health Status

This section displays the PC health status.



Console Redirection

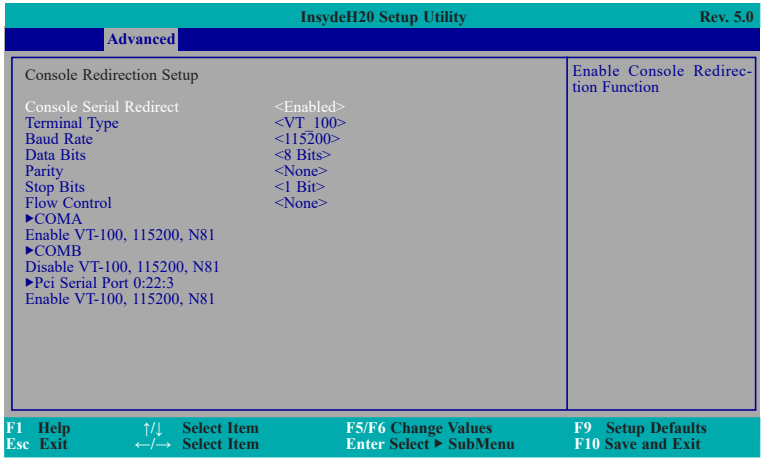
This section configures settings relevant to console redirection.



Console Serial Redirect

This field is used to enable or disable the console serial redirection function.

When Console Serial Redirect is set to enabled, the screen will appear like below:



Terminal Type

Select terminal type: VT_100, VT_100+, VT_UTF8 or PC_ANSI.

Baud Rate

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

Data Bits

Select data bits: 7 Bits or 8 Bits.

Parity

Select parity bits: None, Even or Odd.

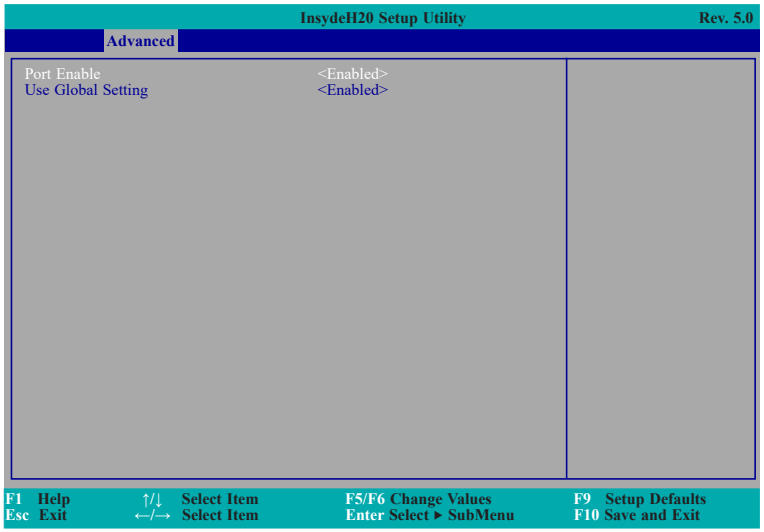
Stop Bits

Select stop bits: 1 Bit or 2 Bits.

Flow Control

Select flow control type: none, RTS/CTS or XON/XOFF.

COMA to COMB and Pci Serial Port 0:22:3



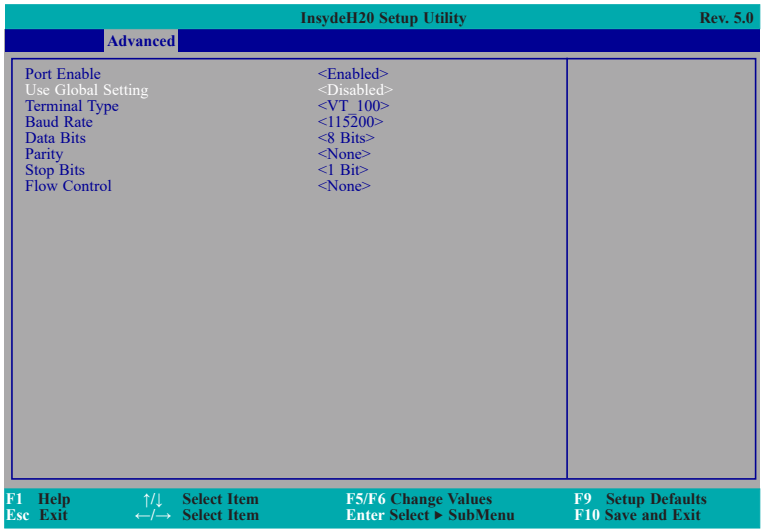
Port Enable

This field is used to enable or disable the COM port to redirect the console.

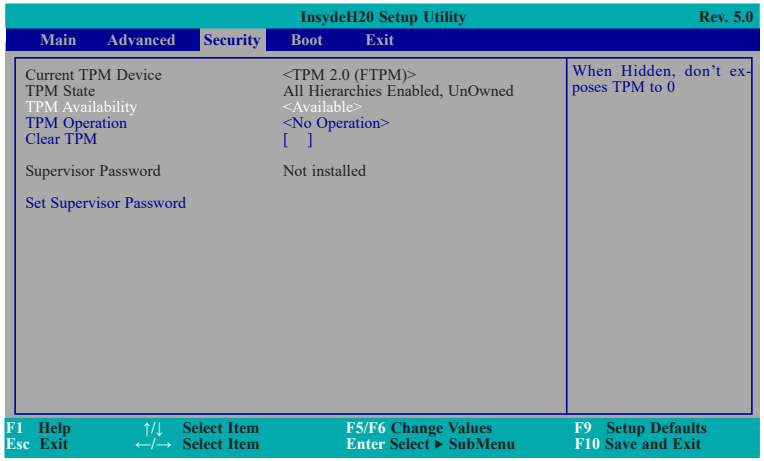
Use Global Setting

This field is to enable or disable to use global setting. When enabled the global setting, setting of the COM port will be the same as those in Console Redirection section. When disabled the global setting, setting of the COM port can be configured independently in this section.

When Use Global Setting is set to disabled, the screen will appear like below:



Security



TPM Availability

Show or hide the TPM availability and its configurations.

TPM Operation

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

No Operation No changes to current state.

Enable Enable and activate TPM.

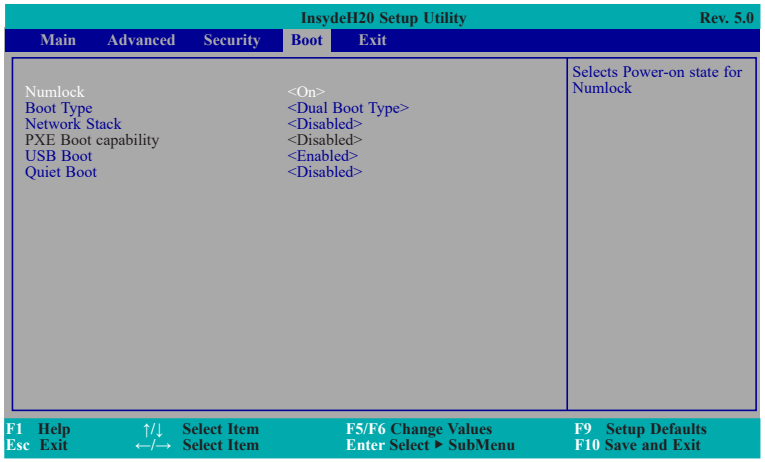
Clear TPM

Remove all TPM context associated with a specific owner.

Set Supervisor Password

Set the supervisor's password and the length of the password must be greater than one character.

Boot



Numlock

Select the power-on state for numlock.

Boot Type

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

If you select "Dual Boot Type" or "UEFI Boot Type", the "Network Stack", "PXE Boot capability", "USB Boot" and "Quiet Boot" will show up.

If you select "Legacy Boot Type", "PXE Boot to LAN", "USB Boot" and "Quiet Boot" will show up.

Network Stack

This field is used to enable or disable network stack.

PXE Boot capability

Disabled Suppoort Network Stack
UEFI IPv4/IPv6
Legacy Legacy PXE OPROM only

PXE Boot to LAN

Disables or enables PXE boot to LAN.

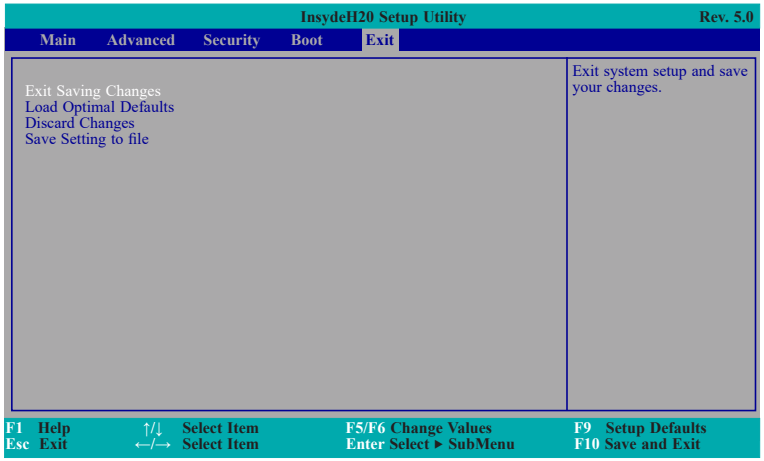
USB Boot

Enable or disable to change USB boot devices boot order.

Quiet Boot

Enable or disable booting in text mode.

Exit



Exit Saving Changes

Select Yes and press <Enter> to exit the system setup and save your changes.

Load Optimal Defaults

Select YES and press <Enter> to load optimal defaults.

Discard Changes

Select YES and press <Enter> to exit the system setup without saving your changes.

Save Setting to file

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

Restore Setting from file

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

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files. You may refer to how-to-video at our website for updating the BIOS steps.

Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.

2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.

3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.

Note:

a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.

b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.

Chapter 4 - Supported Software

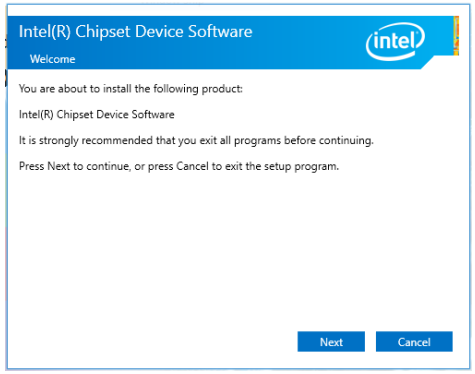
Please download drivers, utilities and software applications required to enhance the performance of the system board at https://www.dfi.com/DownloadCenter .

Intel Chipset Software Installation Utility

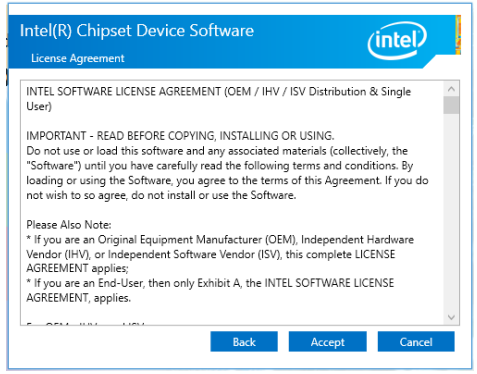
The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, download "KU551 Chipset Driver" zip file at our website.

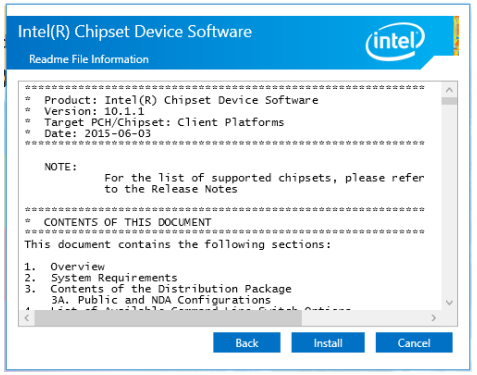
1. Setup is ready to install the utility. Click "Next".



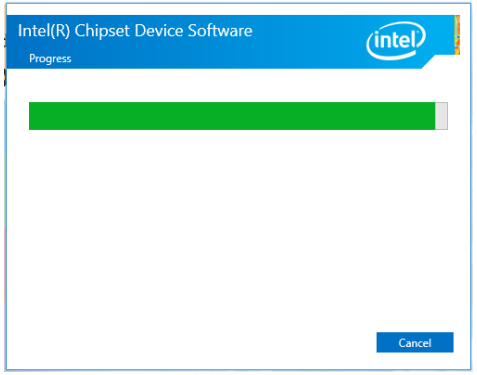
2. Read the license agreement then click "Accept".



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



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



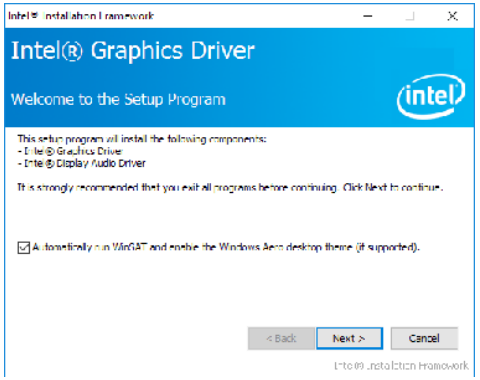
5. After completing installation, click "Restart Now" to exit setup.

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

Intel Graphics Drivers

To install the driver, download "KU551 Graphics Driver" zip file at our website.

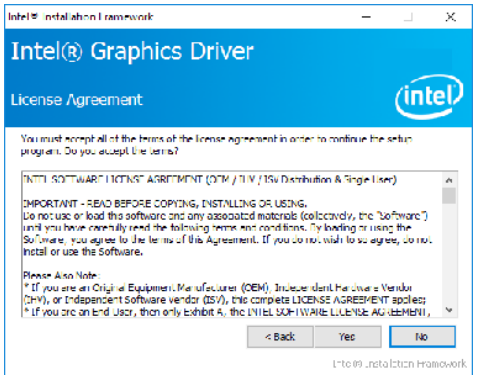
1. Setup is now ready to install the graphics driver. Click "Next".



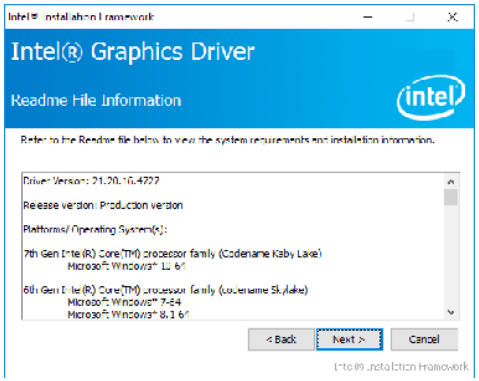
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 10 desktop appears. The "blank screen"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

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

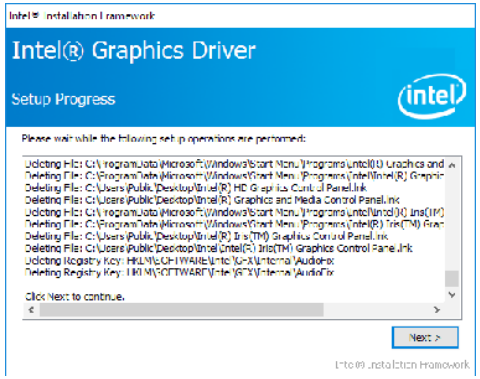
2. Read the license agreement then click "Yes".



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

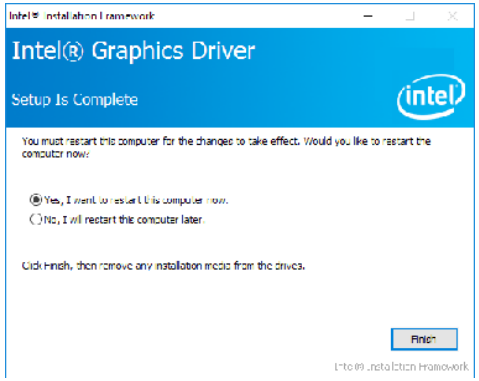


4. Setup is now installing the driver. Click "Next" to continue.



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

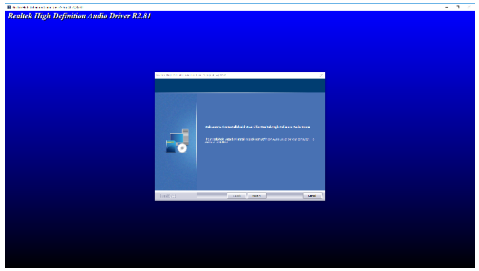
   Restarting the system will allow the new software installation to take effect.



Audio Drivers

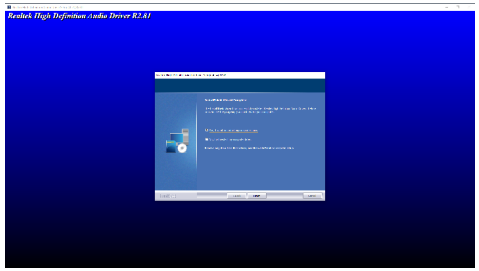
To install the driver, download "KU551 Audio Driver" zip file at our website.

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



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

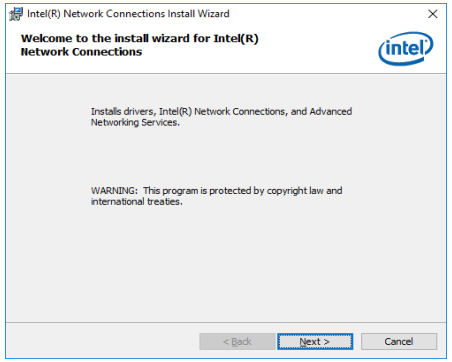
   Restarting the system will allow the new software installation to take effect.



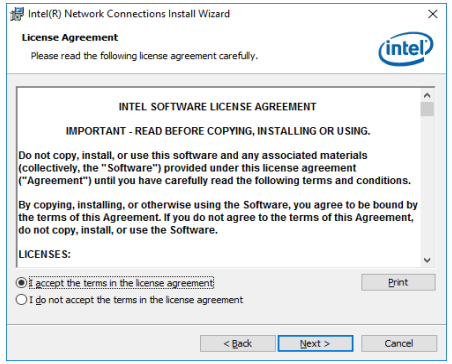
Intel LAN Drivers

To install the driver, download "KU551 LAN Driver" zip file at our website.

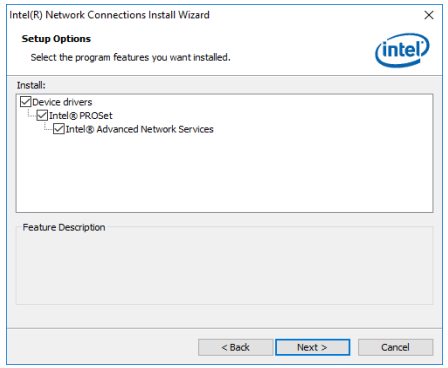
1. Setup is ready to install the driver. Click "Next".



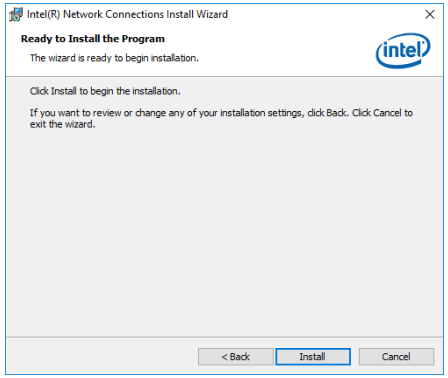
2. Click "I accept the terms in the license agreement" then click "Next".



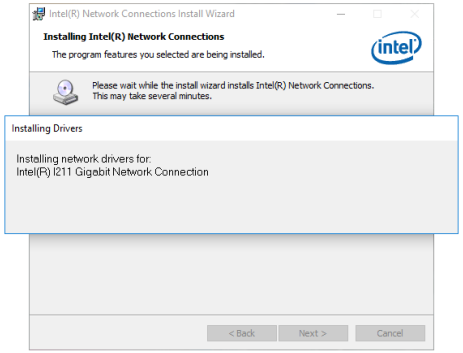
3. Select the program features you want installed then click "Next".



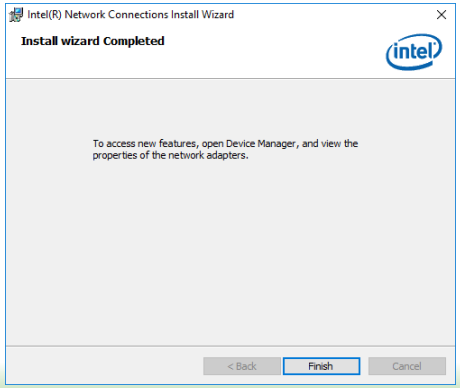
4. Click "Install" to begin the installation.



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



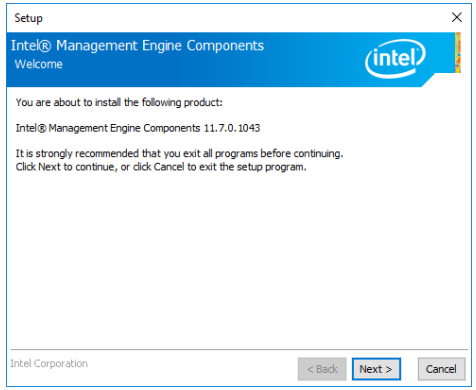
6. After completing installation, click "Finish".



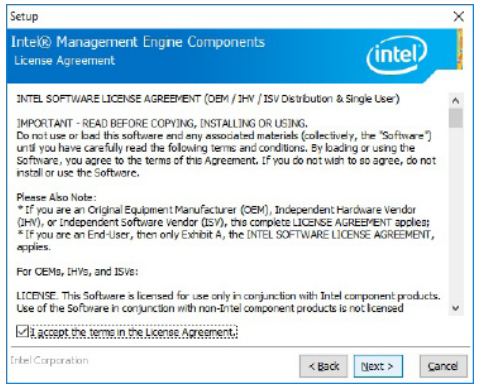
Intel Management Engine Drivers

To install the driver, download "KU551 ME Driver" zip file at our website.

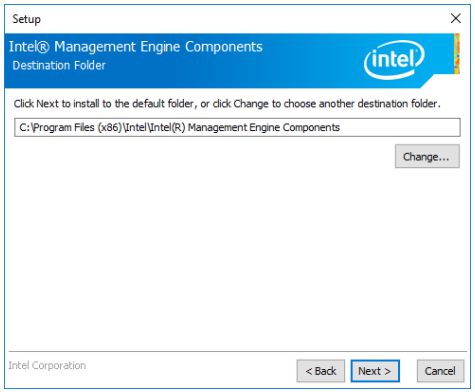
1. Setup is ready to install the driver. Click "Next".



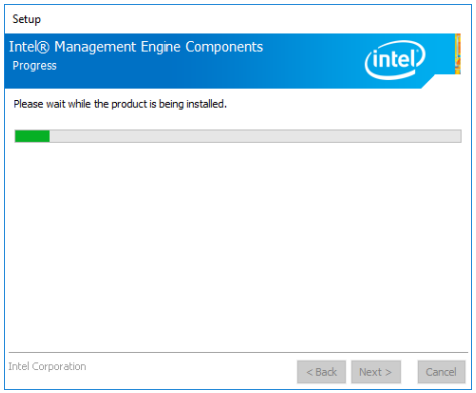
2. Read the license agreement then tick "I accept the terms in the License Agreement". Click "Next".



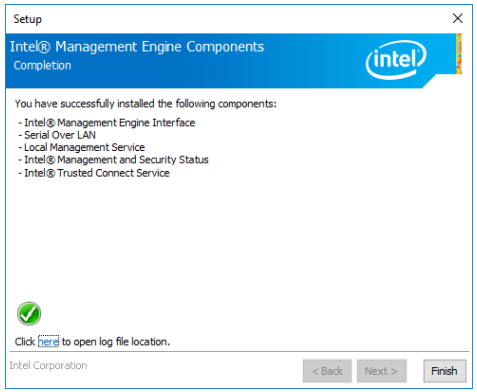
3. Click “Next” to install to the default folder, or click “Change” to choose another destination folder.



4. Please wait while the product is being installed.



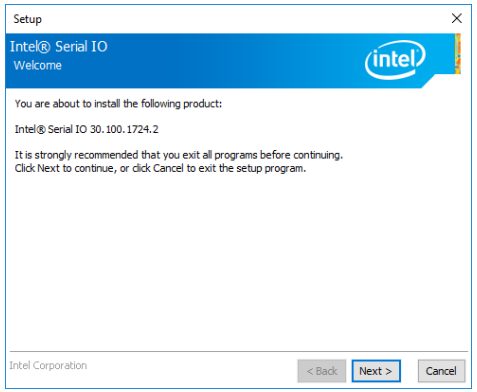
4. After completing installation, click “Finish”.



IO Driver

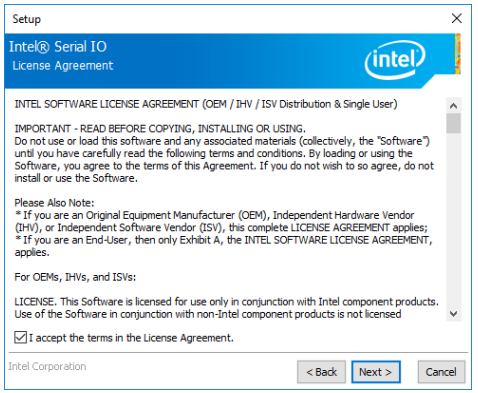
To install the driver, download “KU551 IO Driver” zip file at our website.

1. Setup is ready to install the driver. Click “Next”.

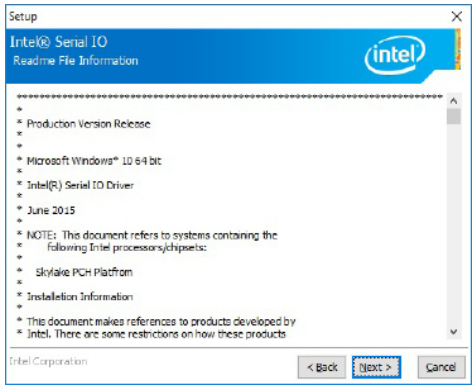


2. Read the license agreement carefully.

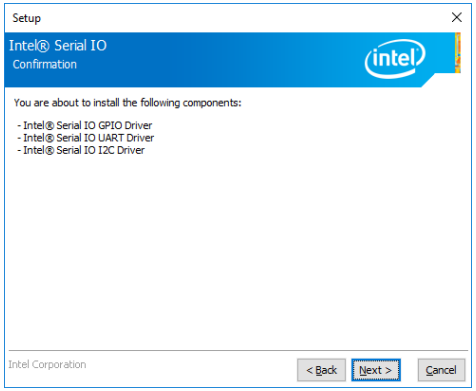
   Tick “I accept the terms in the License Agreement” then click “Next”.



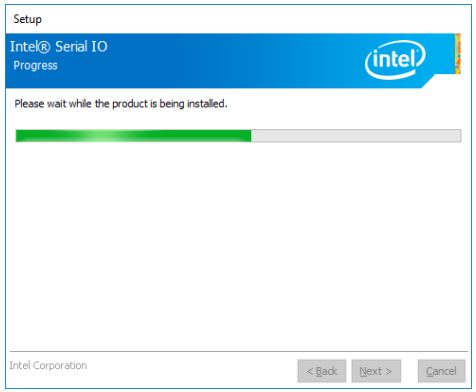
3. Go through the readme document for system requirements and installation tips then click "Next".



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

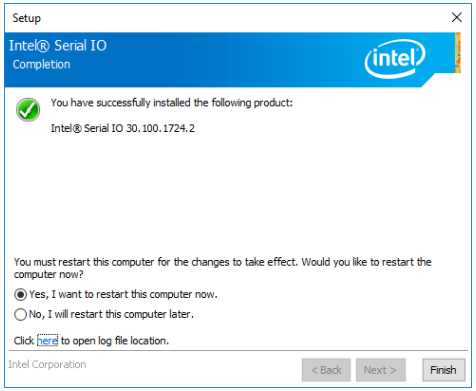


5. Setup is now installing the driver.



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

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

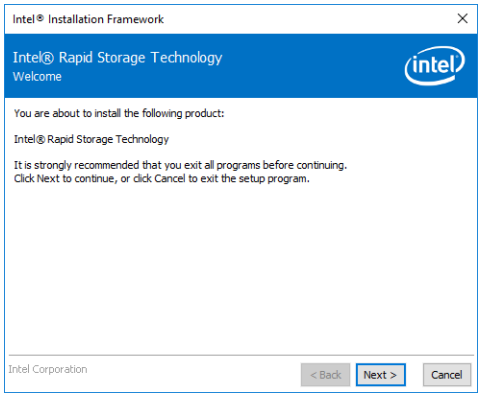


Intel® Rapid Storage Technology

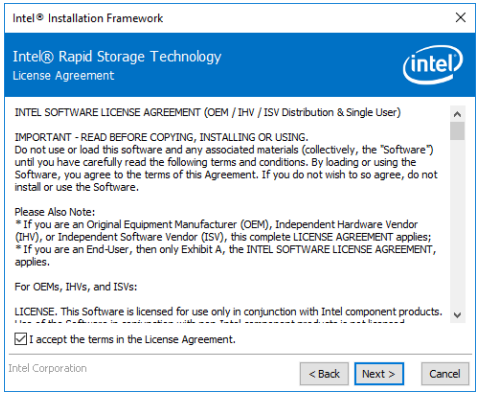
The Intel Rapid Storage Technology is a utility that allows you to monitor the current status of the SATA drives. It enables enhanced performance and power management for the storage subsystem.

To install the driver, download "KU551 Intel Rapid Storage Driver" zip file at our website.

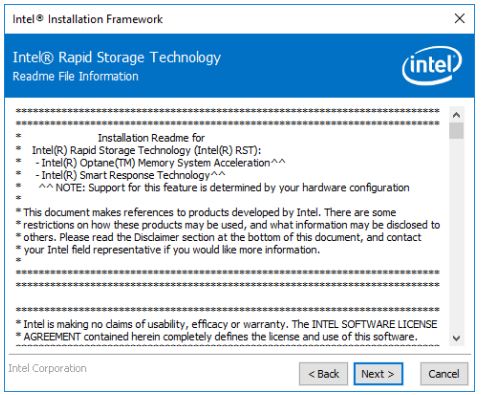
1. Setup is ready to install the utility. Click "Next".



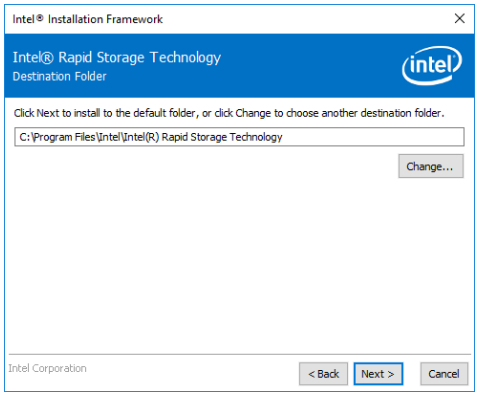
2. Read the license agreement and click "I accept the terms in the License Agreement". Then, click "Next".



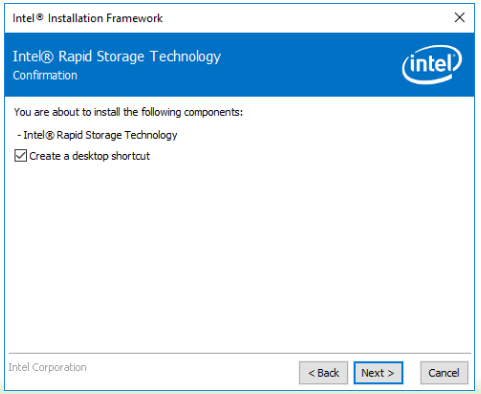
3. Go through the readme document to view system requirements and installation information then click "Next".



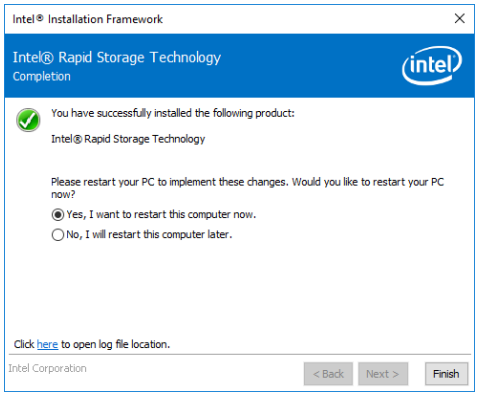
4. Click "Next" to install to the default folder or click "change to choose another destination folder".



5. Confirm the installation and click "Next".



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



Chapter 5 - Intel AMT Settings

Overview

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

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

- ### Discover

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

- ### Repair

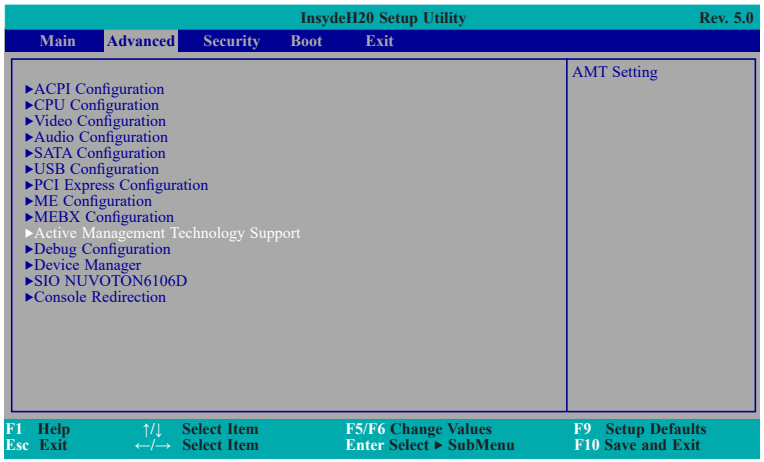
Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

- ### Protect

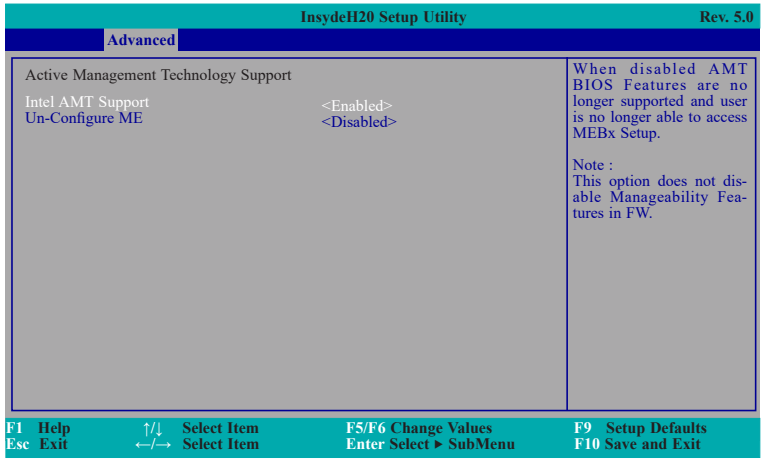
Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical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

Enable Intel® AMT in the Insyde BIOS

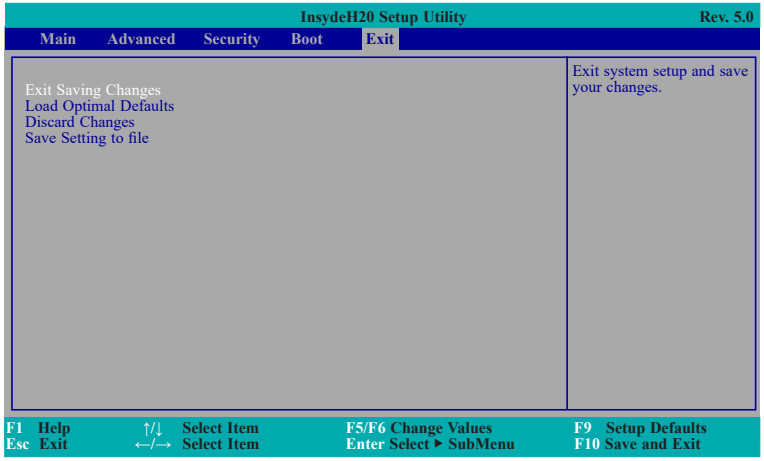
1. Power-on the system then press <Del> to enter the main menu of the Insyde BIOS.
2. In the **Advanced** menu, select **Active Management Technology Support**.



3. Select **Enabled** in the **Intel AMT Support** field.

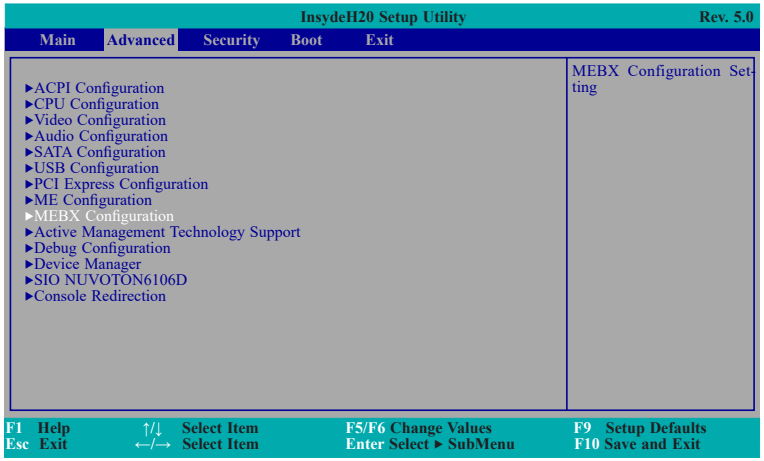


4. In the **Exit** menu, select **Exit Saving Changes** then select **Yes** and press Enter.

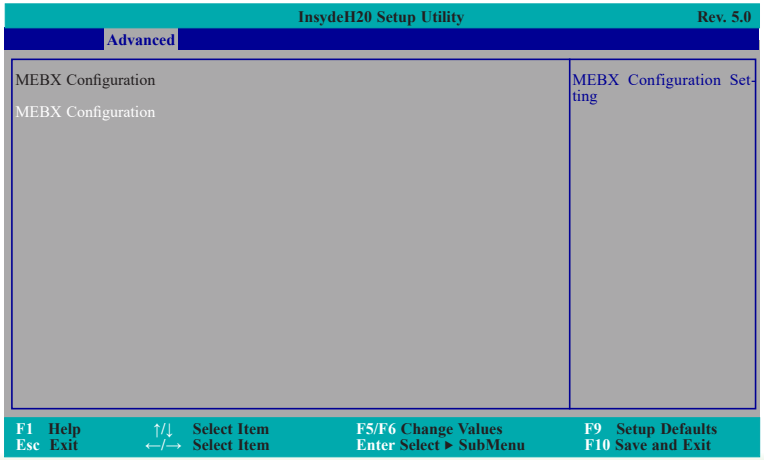


Enable Intel® AMT in the Intel® Management Engine BIOS Extension (MEBX) Screen

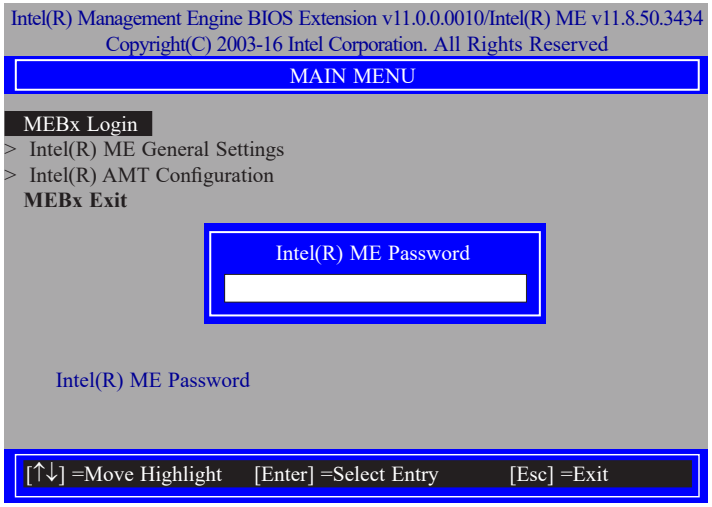
1. After the system reboots, press <Del> to enter the main menu of the Insyde BIOS.
2. In the **Advanced** menu, select **MEBX Configuration**.



3. Select **MEBX Configuration** and press Enter.

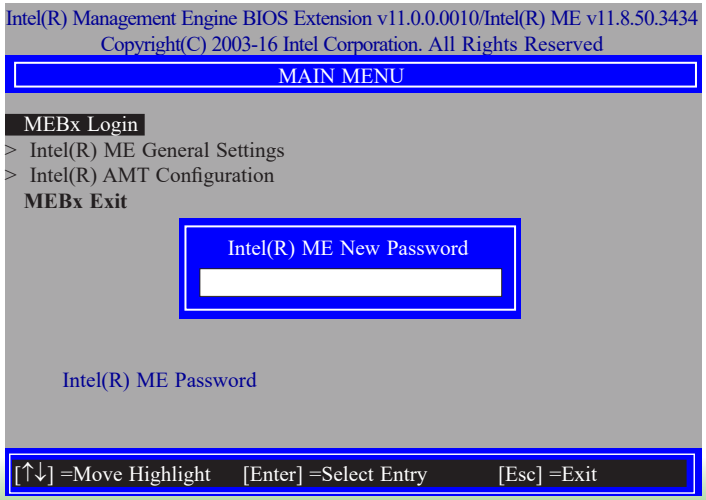


4. Select **MEBx Login** and press Enter. You will be prompted for a password. The default password is "**admin**". Enter the default password in the space provided under Intel(R) ME Password then press Enter.

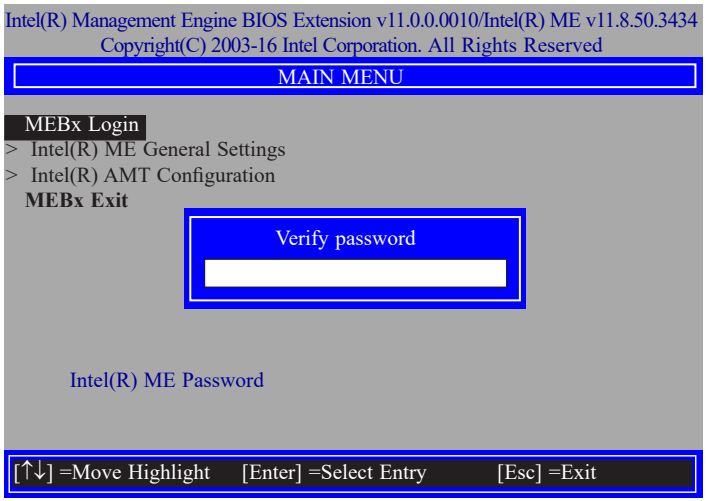


5. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:

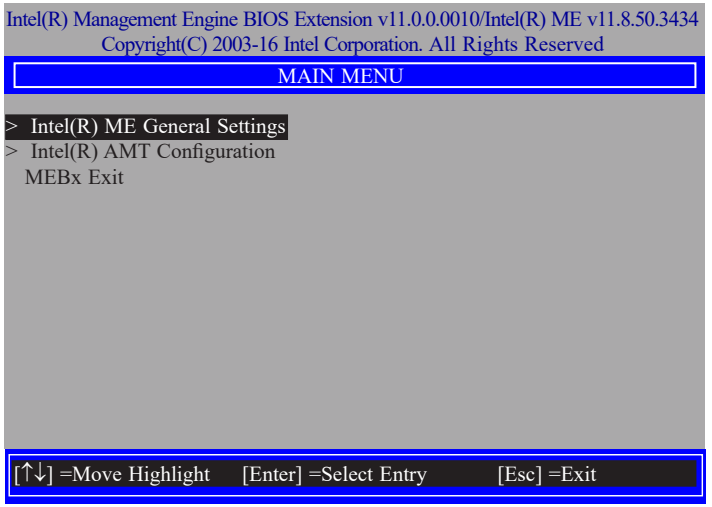
- 8-32 characters
- Strong 7-bit ASCII characters excluding **: ,** and **"** characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
- Both lower case and upper case characters



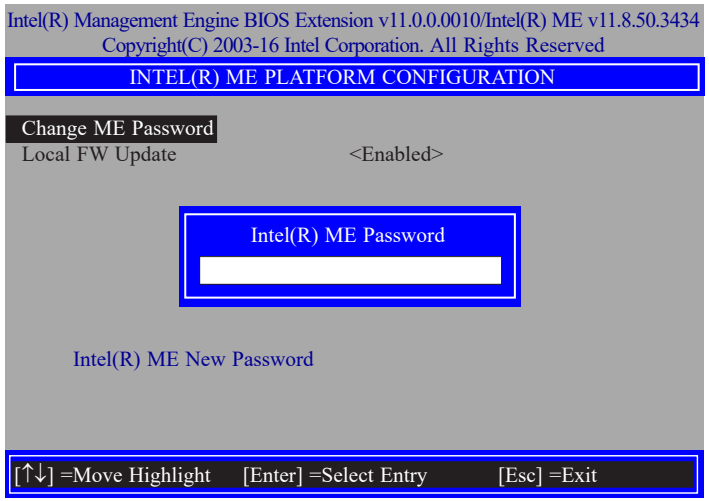
6. You will be asked to verify the new password. Enter the same new password in the space provided under Verify Password then press Enter.



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

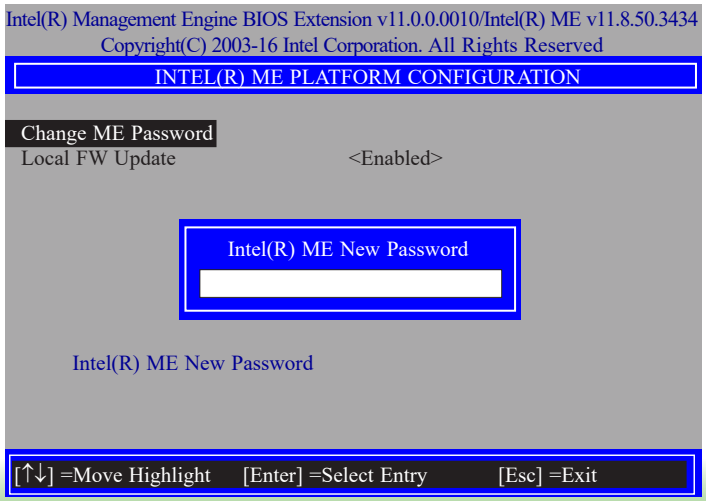


8. If you want to change ME password, select **Change ME Password** then press Enter. Enter the current password in the space provided under Intel(R) ME Password then press Enter.

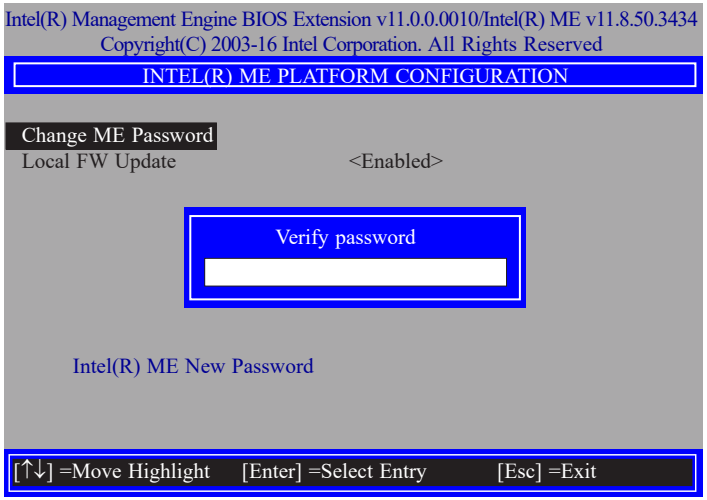


9. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:

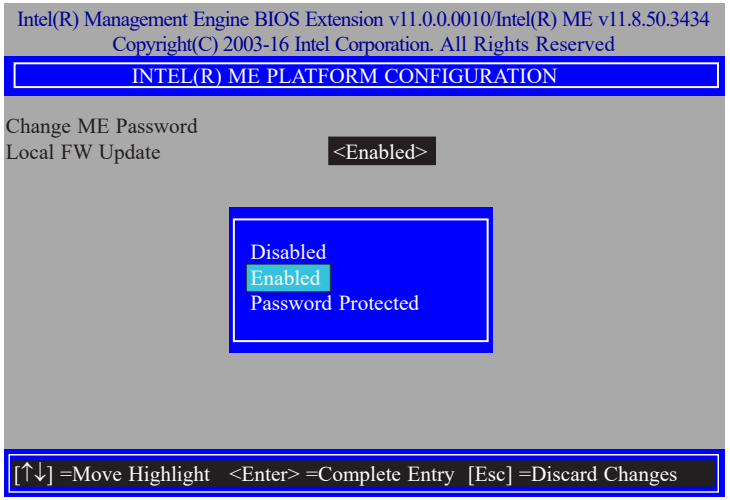
- 8-32 characters
- Strong 7-bit ASCII characters excluding **: ,** and **"** characters
- At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
- Both lower case and upper case characters



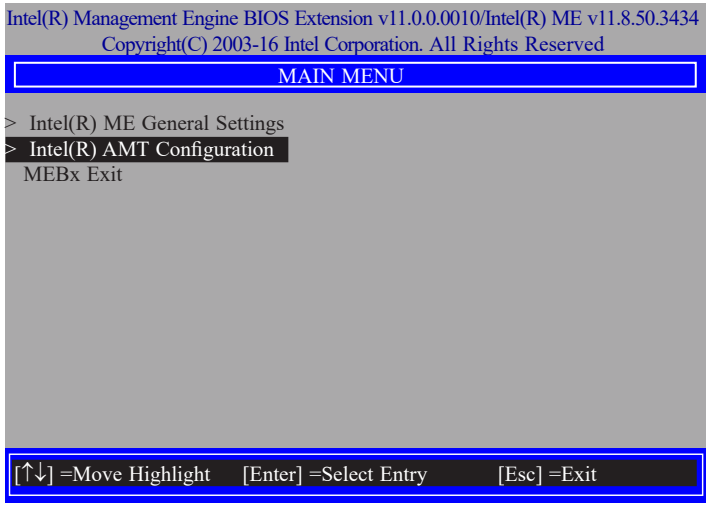
10. You will be asked to verify the new password. Enter the same new password in the space provided under Verify Password then press Enter.



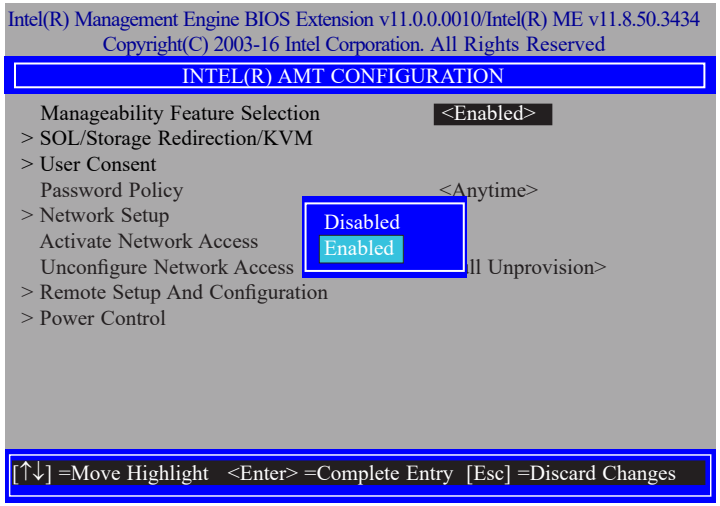
11. Select **Local FW Update** then press Enter. Select **Enabled** or **Disabled** or **Password Protected** then press Enter.



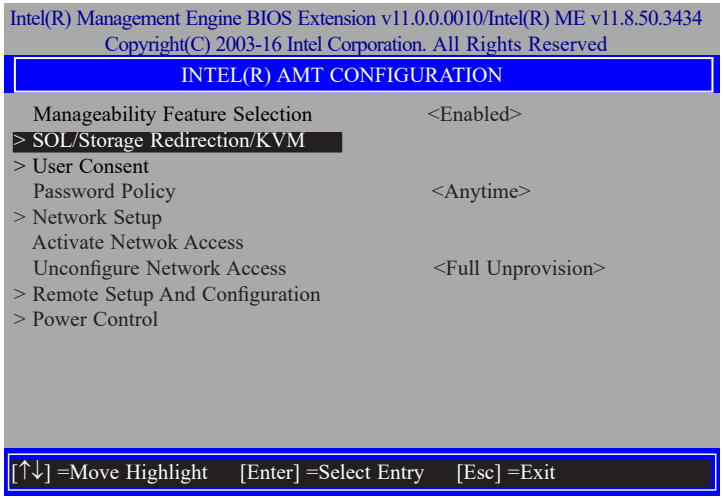
12. Press Esc until you return to the **Main Menu**. Select **Intel(R) AMT Configuration** then press Enter.



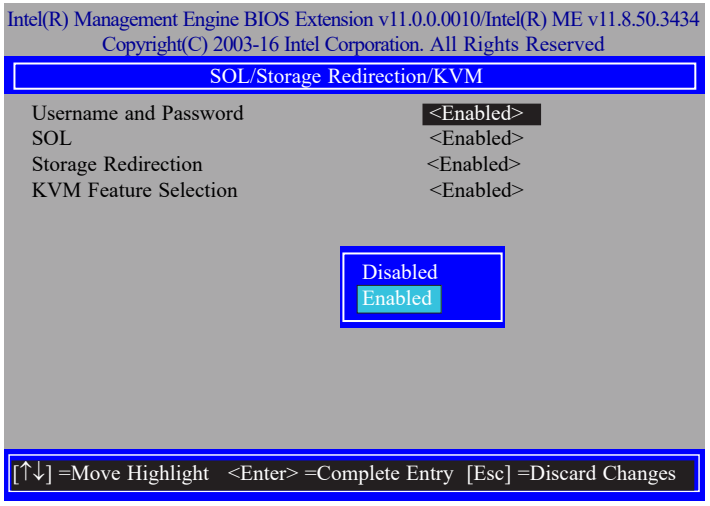
13. In the **Intel(R) AMT Configuration** menu**,** select **Manageability Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



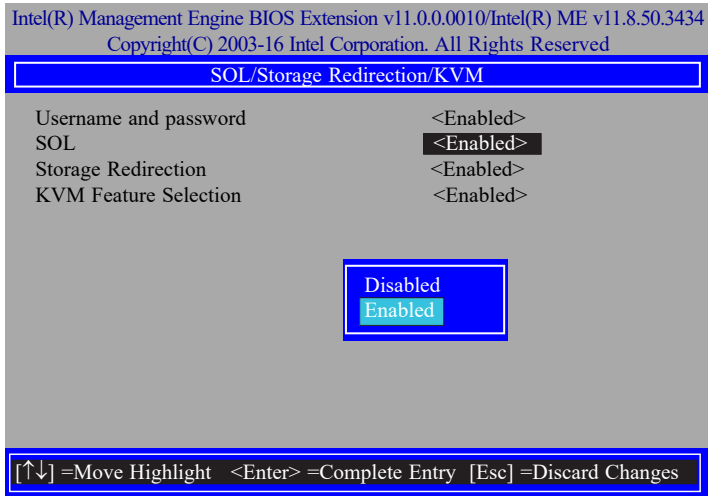
14. In the **Intel(R) AMT Configuration** menu, select **SOL/Storage Redirection/KVM** then press Enter.



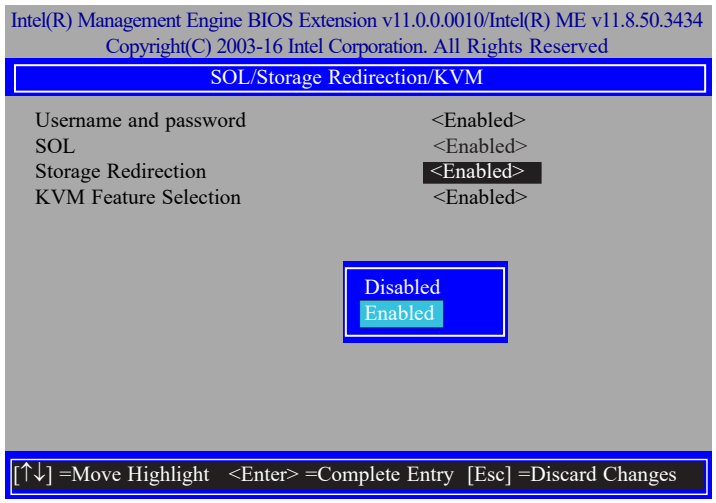
15. In the **SOL/Storage Redirection/KVM** menu**,** select **Username and Password** then press Enter. Select **Enabled** or **Disabled** then press Enter.



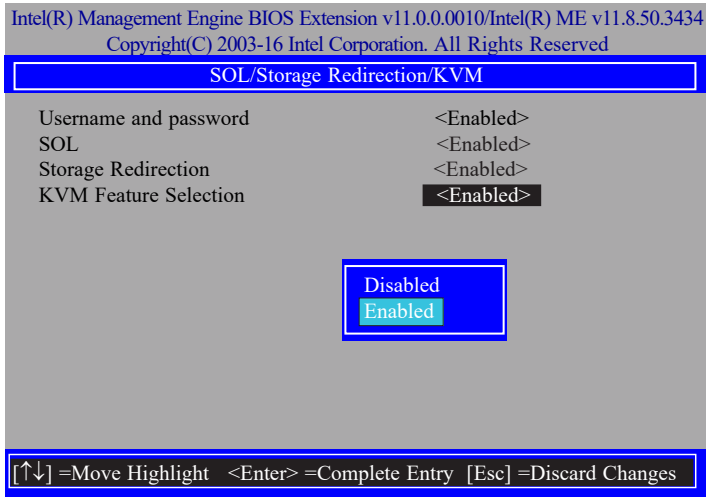
16. In the **SOL/Storage Redirection/KVM** menu**,** select **SOL** then press Enter. Select **Enabled** or **Disabled** then press Enter.



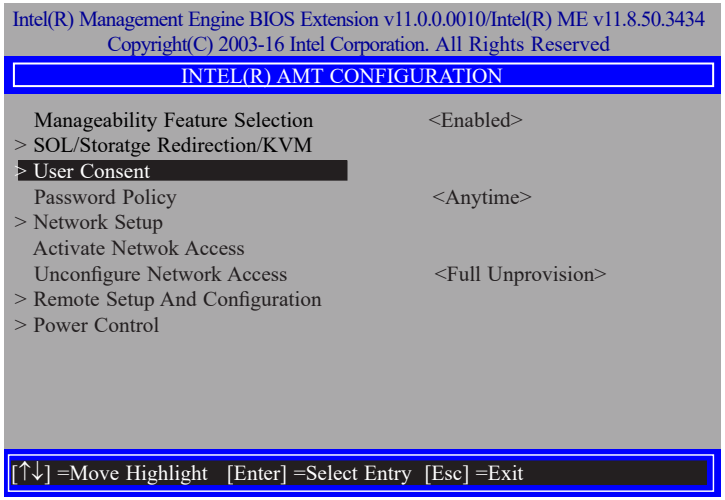
17. In the **SOL/Storage Redirection/KVM** menu**,** select **Storage Redirection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



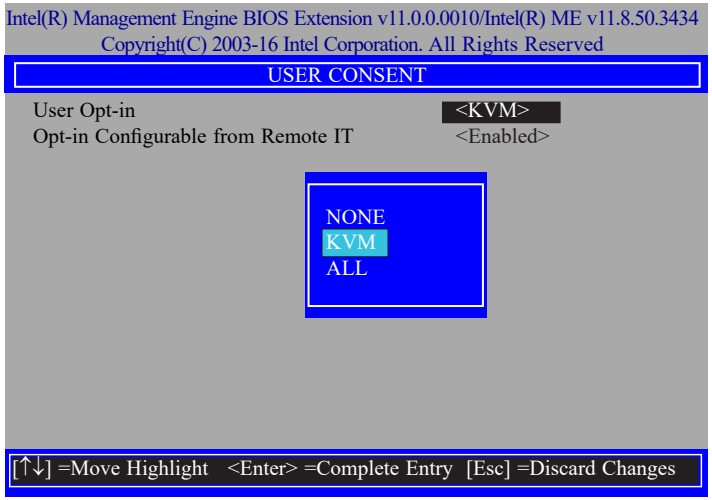
18. In the **SOL/Storage Redirection/KVM** menu**,** select **KVM Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



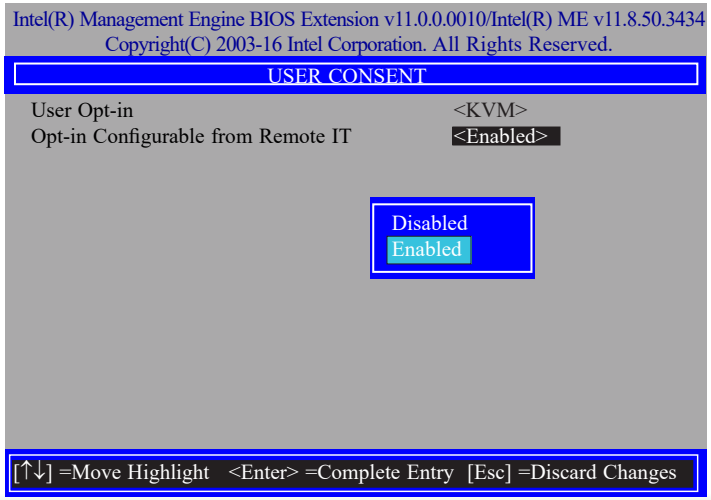
19. Press Esc until you return to the **Intel(R) AMT Configuration** menu. Select **User Consent** then press Enter.



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

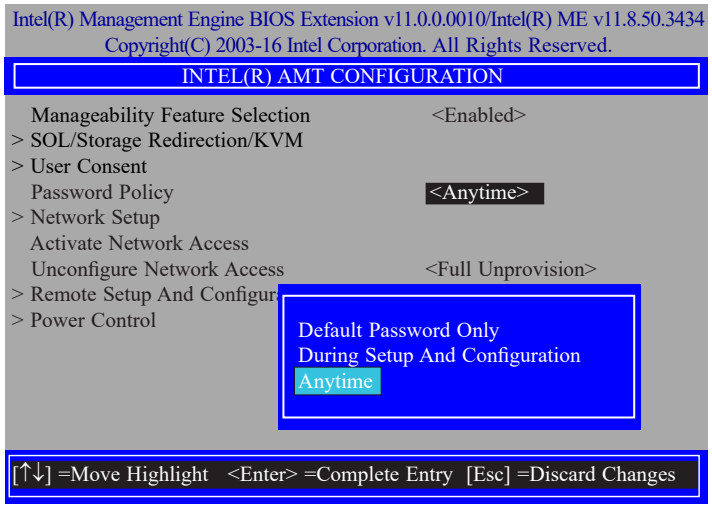


21. In the **User Consent** menu, select **Opt-in Configurable from Remote IT** then press Enter. Select **Enabled** or **Disabled** then press Enter.

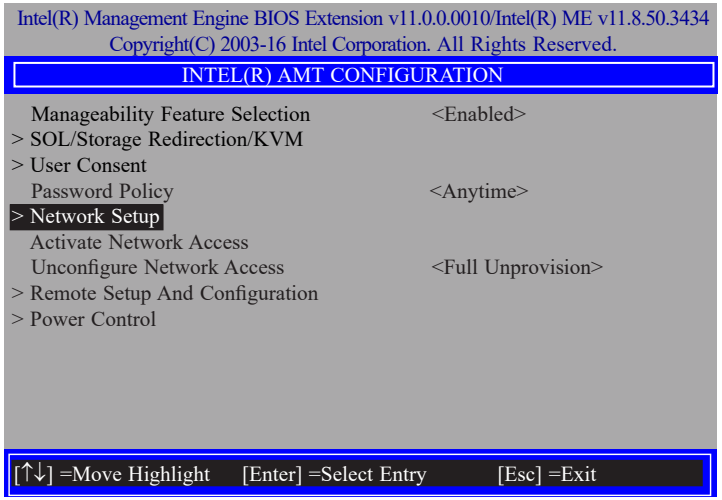


22. Press Esc until you return to the **Intel(R) AMT Configuration** menu. Select **Password Policy** then press Enter.

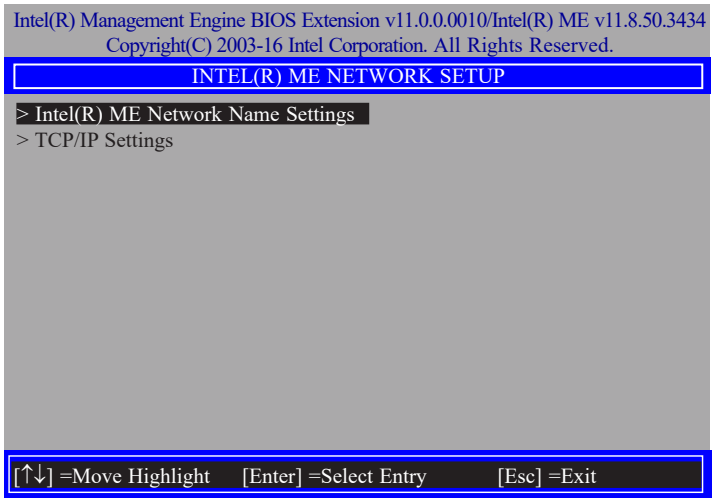
You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



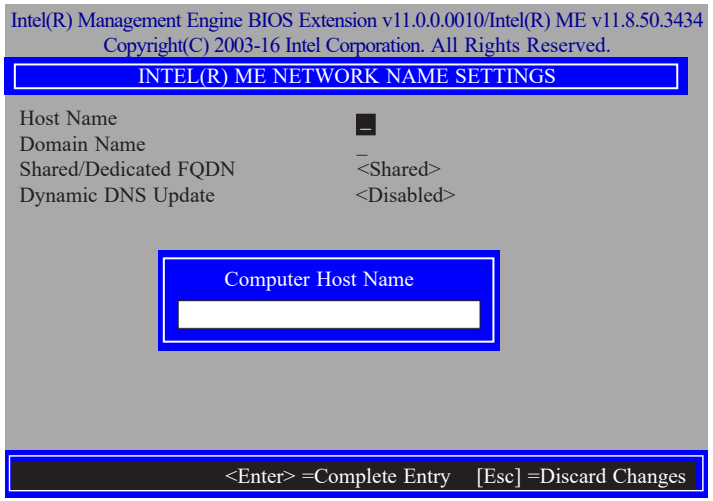
23. In the **Intel(R) AMT Configuration** menu, select **Network Setup** then press Enter.



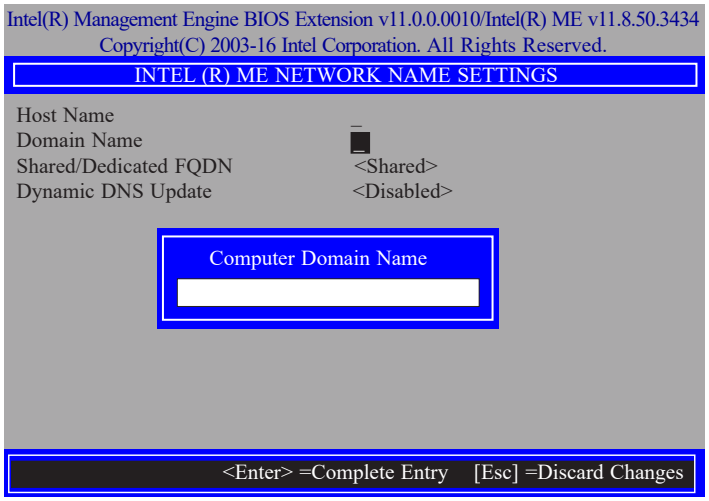
24. In the **Intel(R) ME Network Setup** menu, select **Intel(R) ME Network Name Settings** then press Enter.



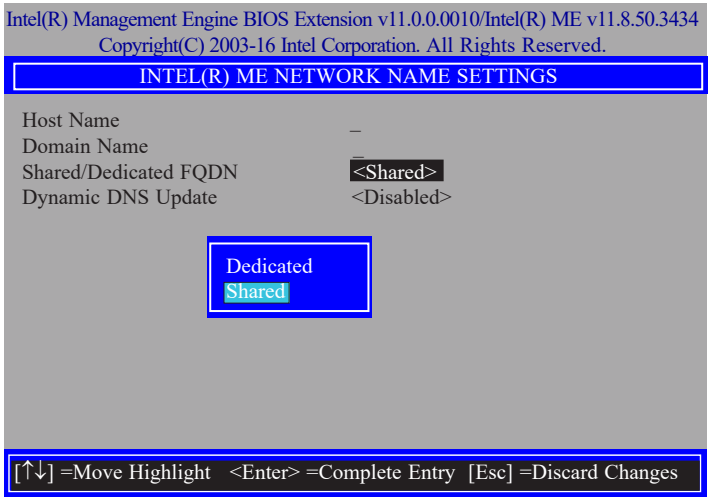
25. In the **Intel(R) ME Network Name Settings** menu, select **Host Name** then press Enter. Enter the computer's host name then press Enter.



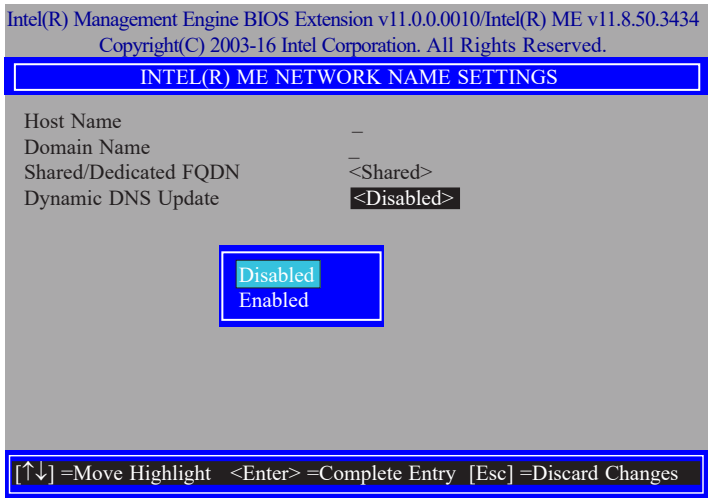
26. Select **Domain Name** then press Enter. Enter the computer's domain name then press Enter.



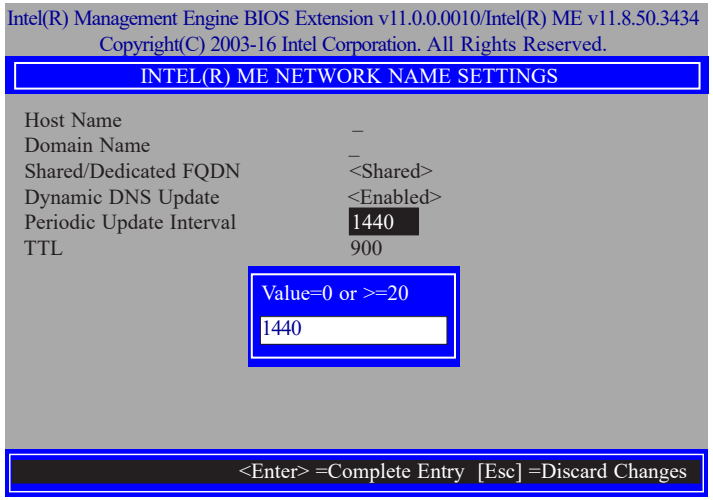
27. Select **Shared/Dedicated FQDN** then press Enter. Select **Shared** or **Dedicated** then press Enter.



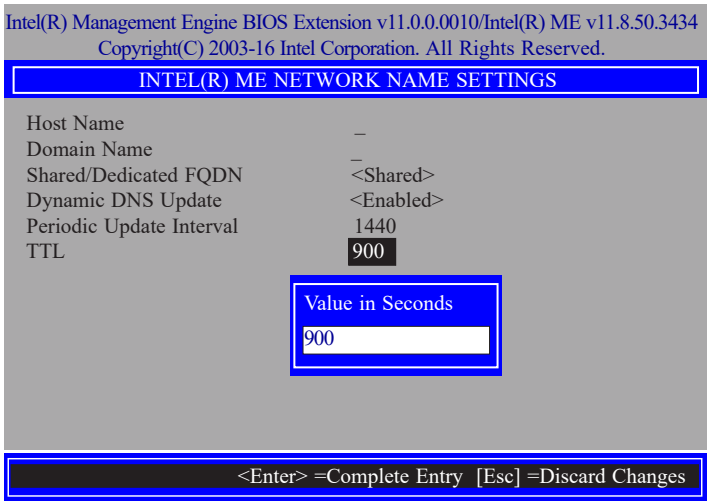
28. Select **Dynamic DNS Update** then press Enter. Select **Enabled** or **Disabled** then press Enter. If **Dynamic DNS Update** is set to **Enabled**, **Periodic Update Interval** and **TTL** fields will show up.



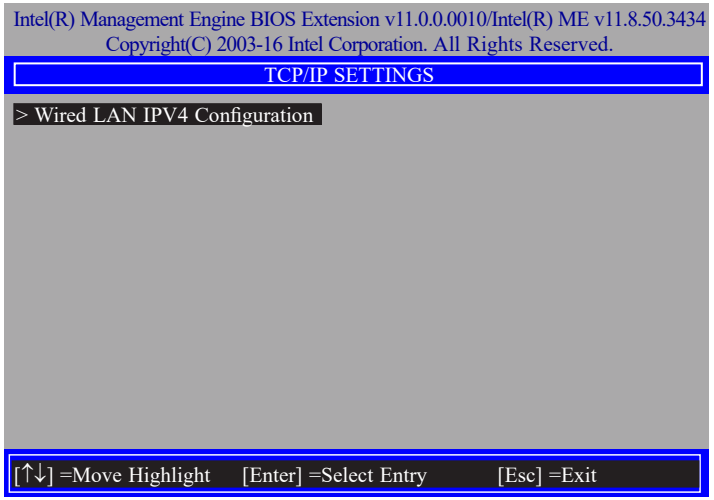
29. Select **Periodic Update Interval** then press Enter. Enter value then press Enter.



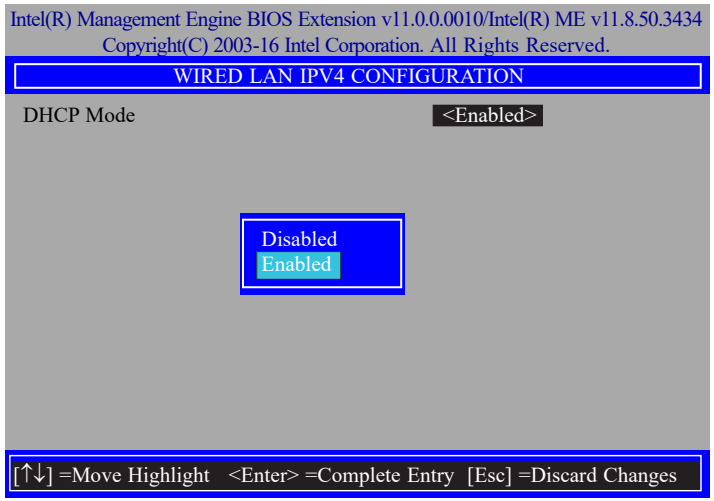
30. Select **TTL** then press Enter. Enter value then press Enter.



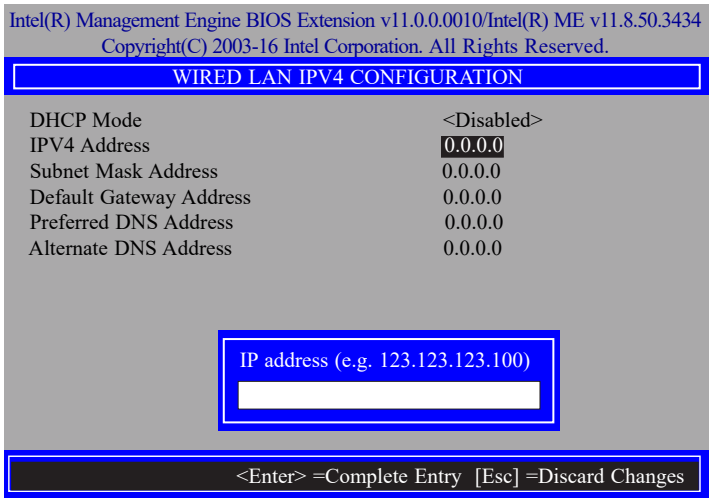
31. Press Esc until you return to the **Intel(R) ME Network Setup** menu. Select **TCP/IP Settings** then press Enter. In the **TCP/IP Settings** menu, select **Wired LAN IPV4 Configuration** then press Enter.



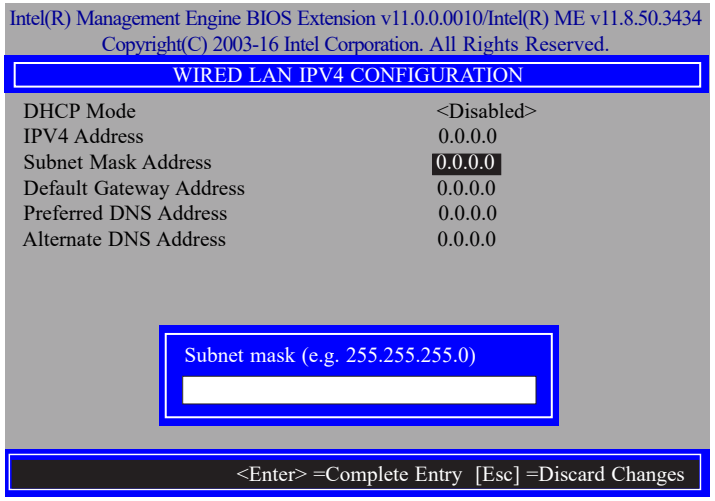
32. In the **Wired LAN IPV4 Configuration** menu, select **DHCP Mode** then press Enter. Select **Enabled** or **Disabled** then press Enter. If set to **Disabled**, **IPV4 Address**, **Subnet Mask Address**, **Default Gateway Address**, **Preferred DNS Address** and **Alternate DNS Address** will show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



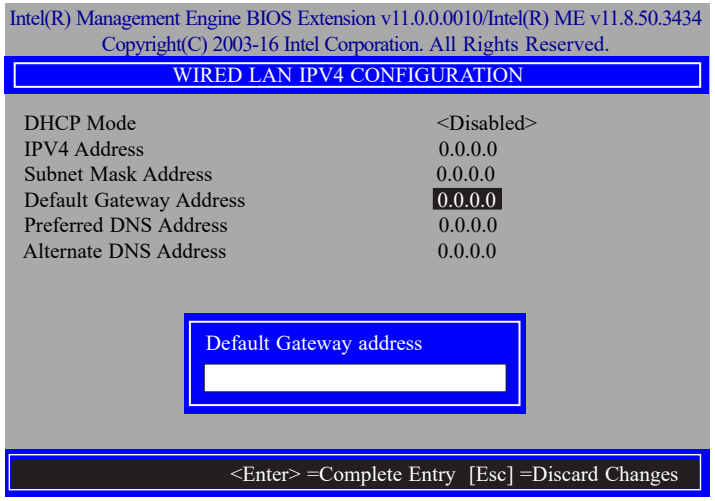
33. Select **IPV4 Address** then press Enter. Enter address then press Enter.



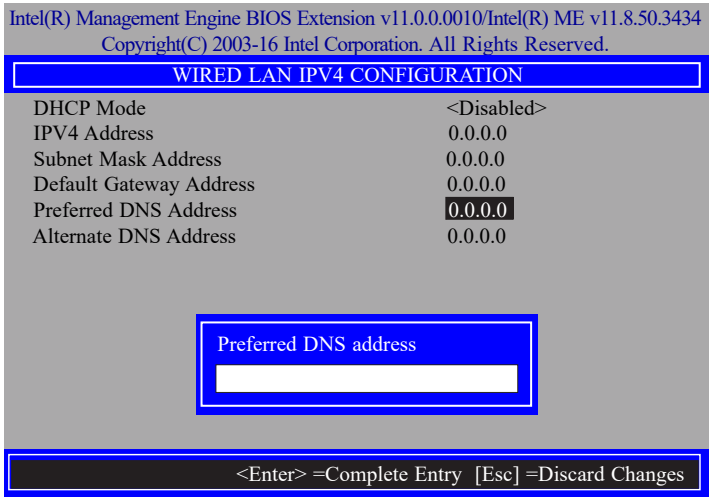
34. Select **Subnet Mask Address** then press Enter. Enter address then press Enter.



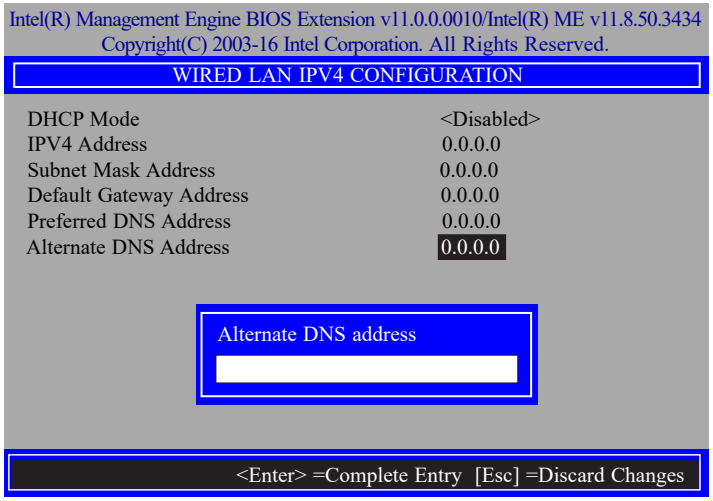
35. Select **Default Gateway Address** then press Enter. Enter address then press Enter.



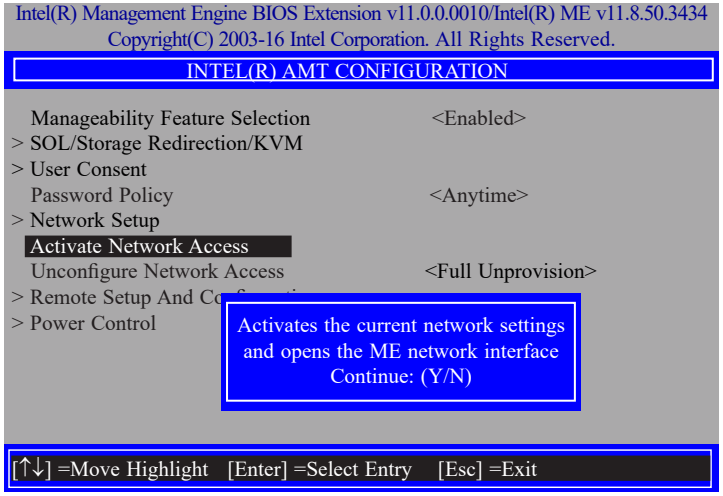
36. Select **Preferred DNS Address** then press Enter. Enter address then press Enter.



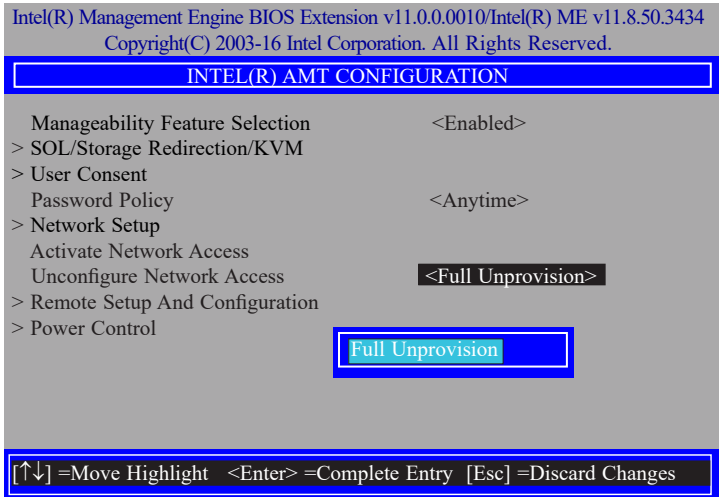
37. Select **Alternate DNS Address** then press Enter. Enter address then press Enter.



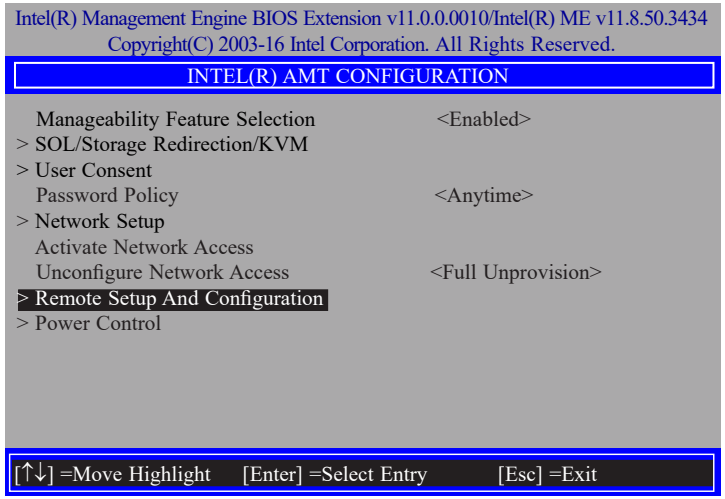
38. Press Esc until you return to the **Intel(R) AMT Configuration** menu. If you want to activate the current network settings and open the ME network inferface, select **Activate Network Access**, press Enter, then press Y.



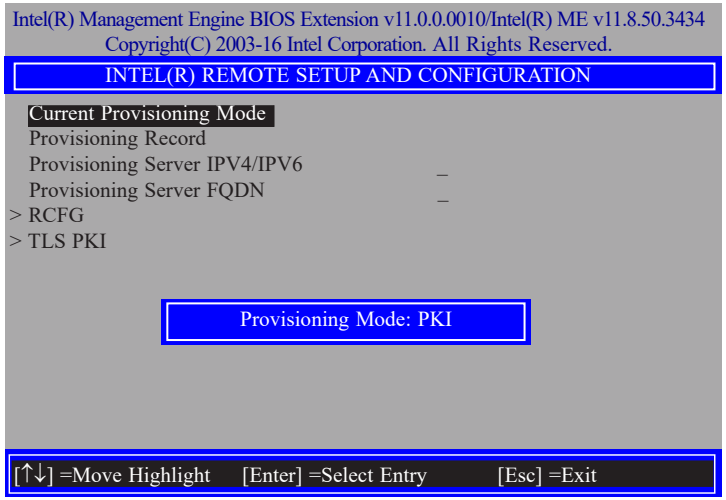
39. In the **Intel(R) AMT Configuration** menu, select **Unconfigure Network Access** then press Enter.



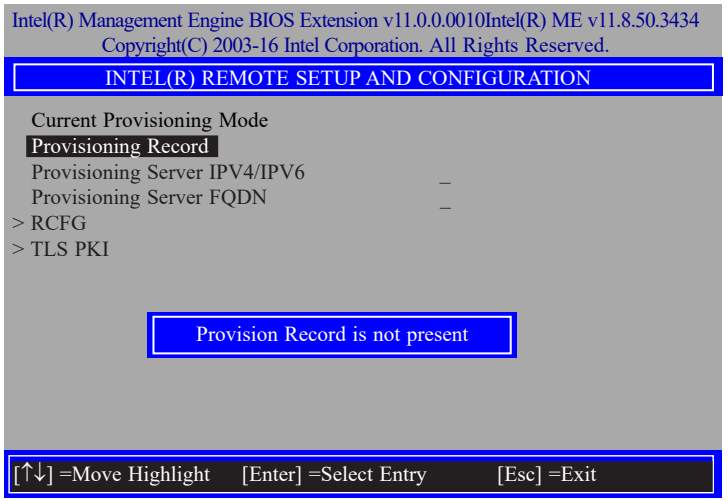
40. In the **Intel(R) AMT Configuration** menu, select **Remote Setup And Configuration** then press Enter.



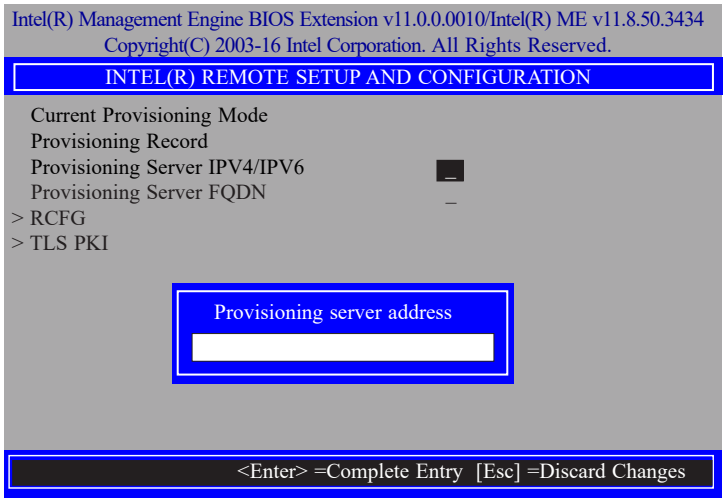
41. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Current Provisioning Mode** then press Enter.



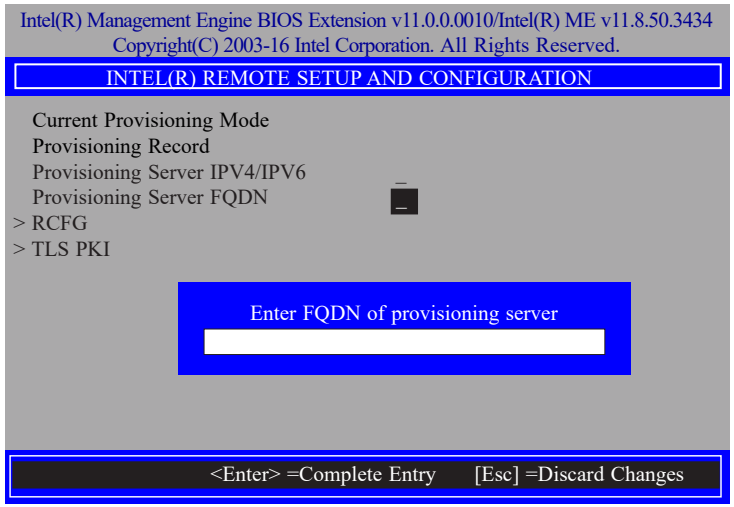
42. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Provisioning Record** then press Enter.



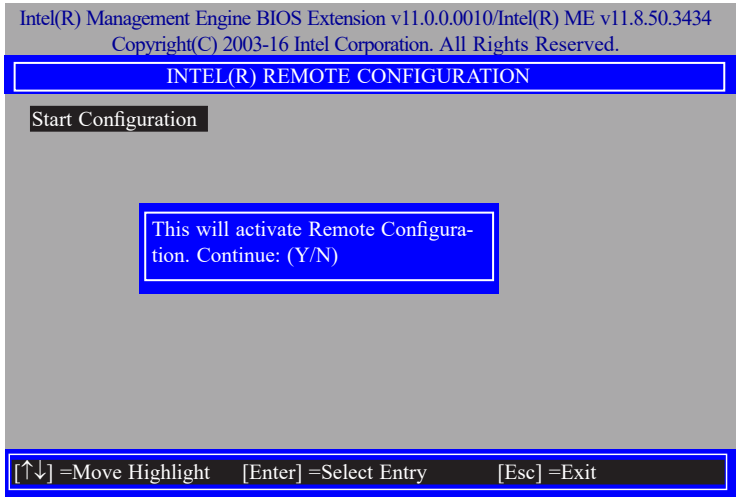
43. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Provisioning Server IPV4/IPV6** then press Enter. Enter the address then press Enter.



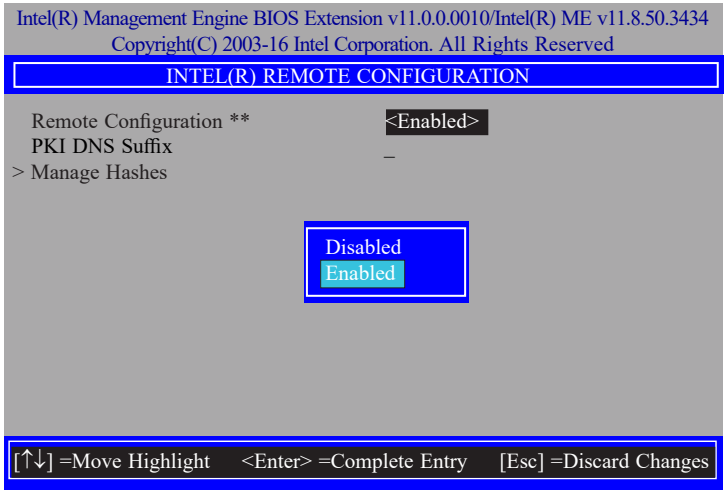
44. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Provisioning Server FQDN** then press Enter. Enter the FQDN then press Enter.



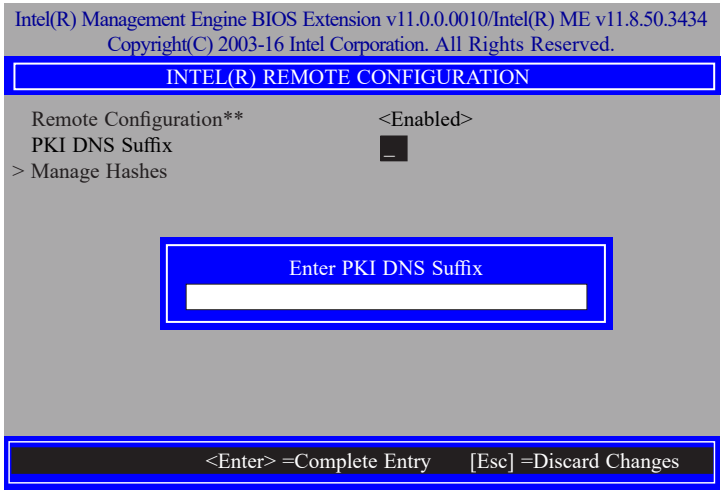
45. If you want to activate remote configuration, in the **Intel(R) Remote Setup And Configuration** menu**,** select **RCFG** then press Enter. Select **Start Configuration** then press Enter. Press **Y** to activate.



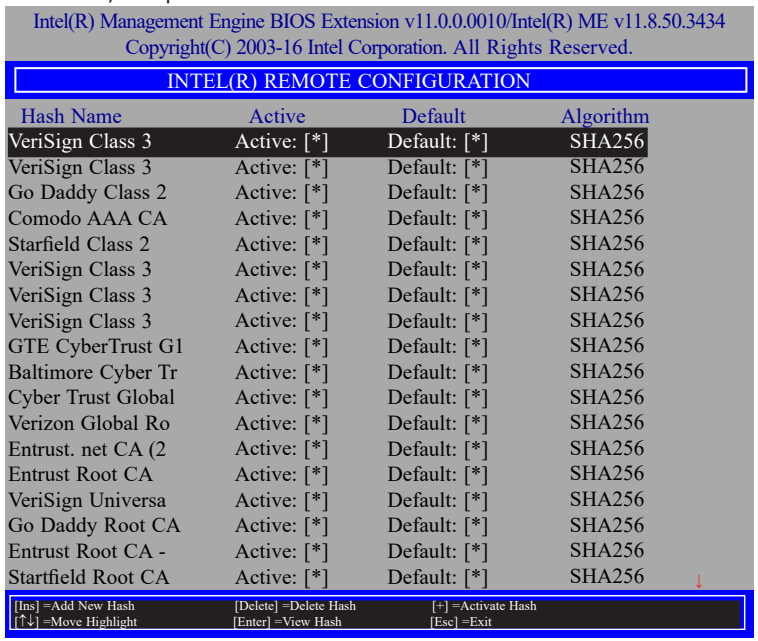
46. Press Esc until you return to the **Intel(R) Remote Setup And Configuration** menu**.** Select **TLS PKI** then press Enter. Select **Remote Configuration **** then press Enter. Select **Enabled** or **Disabled** then press Enter.



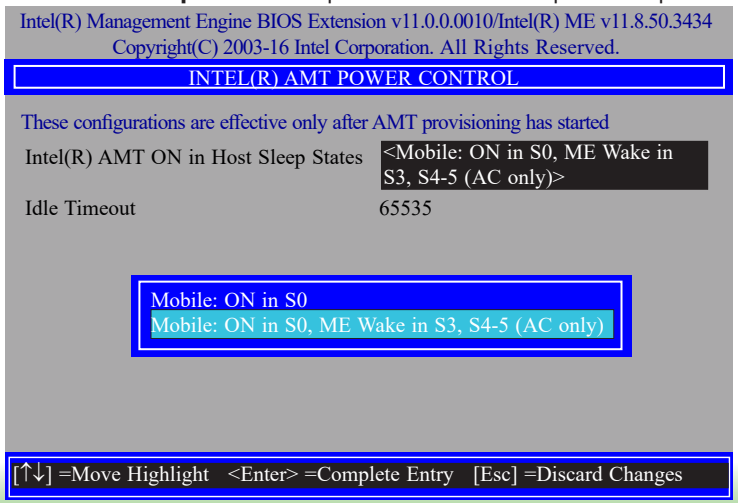
47. Select **PKI DNS Suffix** and press Enter. Enter the PKI DNS Suffix then press Enter.



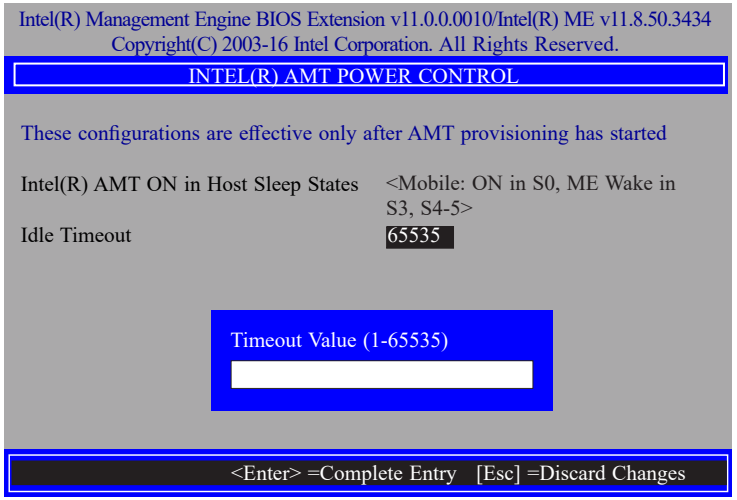
48. In the **Intel(R) Remote Configuration** menu, select **Manage Hashes** then press Enter. Select the hash name then press Insert to enter custom hash certificate name, press Delete to delete hash, press Enter to view hash information, press + to activate or deactivate hash, and press Esc to exit.



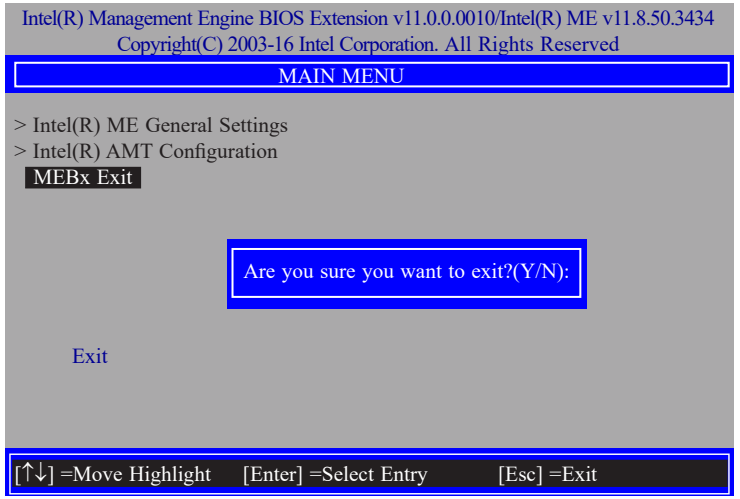
49. Press Esc until you return to the **Intel(R) AMT Configuration** menu, select **Power Control** then press Enter. In the **Intel(R) AMT Power Control** menu, select **Intel(R) AMT ON in Host Sleep States** then press Enter. Select an option then press Enter.



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



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



Appendix A - Troubleshooting Checklist

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.
3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.