SU551
Embedded SBC 3.5"
User's Manual

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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.

Table of Contents

About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

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 SU551 board
- 1 COM port cable
- 1 Serial ATA data cable
- 1 Serial ATA power cable
- 1 Audio cable
- 1 DVD
- 1 QR (Quick Reference)
- 1 Heat sink

Optional Items

- USB port cable
- COM port cable
- Serial ATA data cable
- Serial ATA power cable
- Power adapter (60W, 12V, Level 6)
- Heat spreader
- 1 Audio cable
- Front Panel cable

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, CD-ROM, 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	6th Generation Intel® Core™ Processors, BGA 1356 Intel® Core™ i7-6600U Processor, Dual Core, 4M Cache, 2.6GHz (3.4GHz), 15W Intel® Core™ i5-6300U Processor, Dual Core, 3M Cache, 2.4GHz (3.0GHz), 15W Intel® Core™ i3-6100U Processor, Dual Core, 3M Cache, 2.3GHz, 15W Intel® Celeron® Processor 3955U, Dual Core, 2M Cache, 2.0GHz, 15W
	Memory	One 204-pin SODIMM up to 8GB Single Channel DDR3L 1600MHz
	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 1 x LVDS 1 x DP++ VGA: resolution up to 2560x1600 @ 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/SATA, SATA by default) 1 x Half-size Mini PCIe (PCIe/USB) 1 x SIM (Optional)
AUDIO	Audio Codec	Realtek ALC888S-VD2-GR
ETHERNET	Controller	1 x Intel® I210AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM PCIe with iAMT11.0 (10/100/1000Mbps) (only Core i7/i5 supports iAMT)
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) 2 x RS-232 (2.0mm pitch)
	USB	2 x USB 2.0 (2.00mm pitch)
	Display	1 x LVDS LCD Panel Connector 1 x LCD/Inverter Power
	Audio	1 x Audio (Line-out/Mic-in)
	SATA	2 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
POWER	Type	Single 12V +/-10% DC
	Connector	Right Angle Connector (4-pin) DC Jack (available upon request) Vertical Type Connector (4-pin) (available upon request)
	Consumption	Typical: 6300U:12V @ 0.40A (4.80Watt) Max.: 6300U:12V @ 2.08A (24.96Watt)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	Microsoft	Windows 7 (32/64-bit) WES 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 IoT Enterprise 64-bit
	Linux	Debian 8 (with VESA graphic driver) CentOS 7 (with VESA graphic driver) Ubuntu 15.10 (Intel graphic driver available)
ENVIRONMENT	Temperature	Operating: 0 to 60°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
MECHANICAL	Dimensions	3.5" SBC Form Factor 146mm (5.75") x 102mm (4.02")
	Height	PCB: 1.6mm Top Side: 15.5mm, Bottom Side: 4.0mm

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.

- ### DDR3L

DDR3L SDRAM provides backward compatibility to DDR3 memory modules but can operate at the same or at a lower power level.

- ### 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 1VGA, 1 LVDS and 1 DP++ interfaces for 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 iAMT11.0 support up to 1Gbps data transmission.

- ### Audio

The Realtek ALC888S-VD2-GR 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
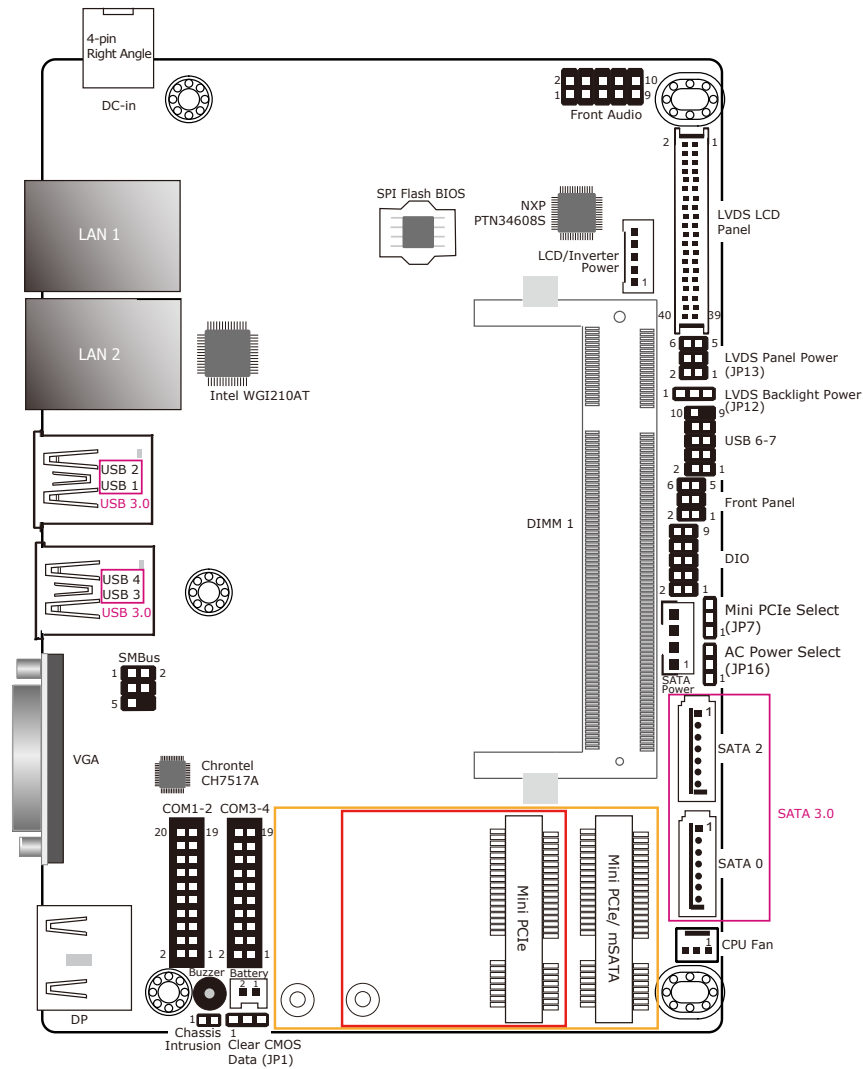
Top View
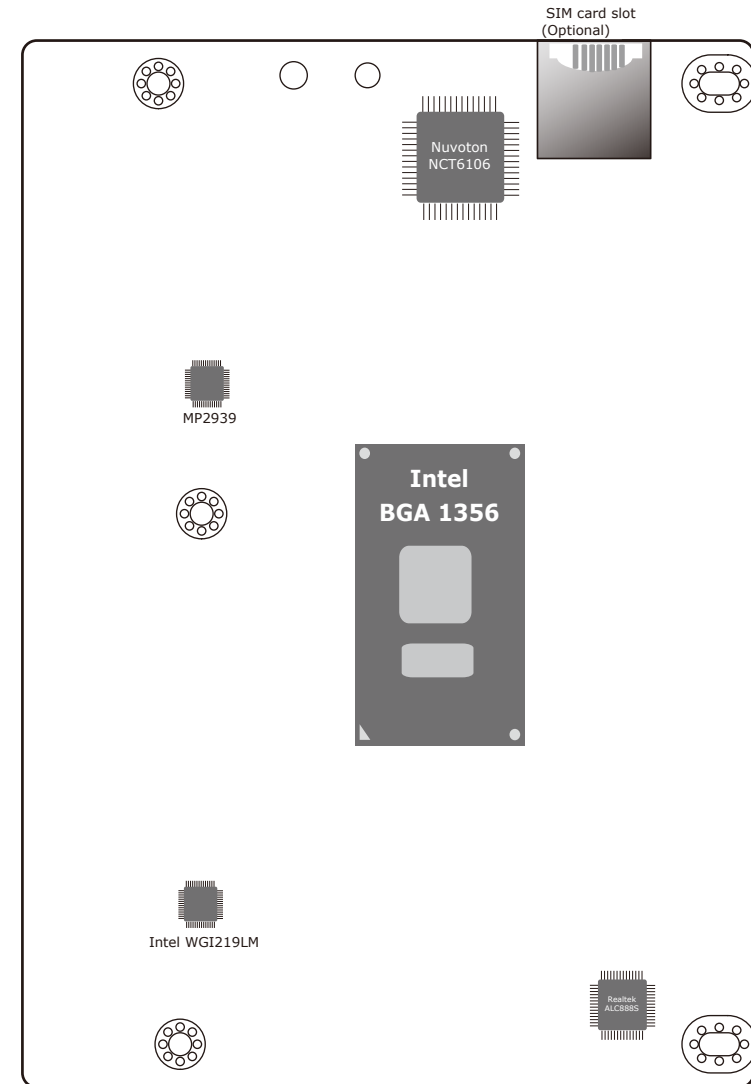
Bottom View

Block Diagram
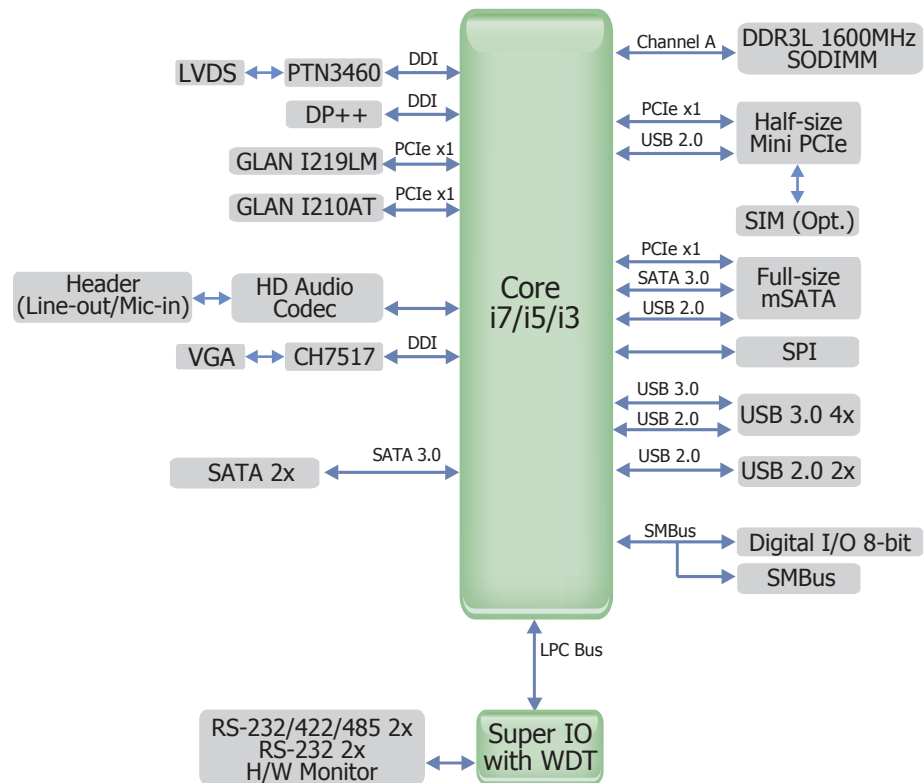
Mechanical Diagram
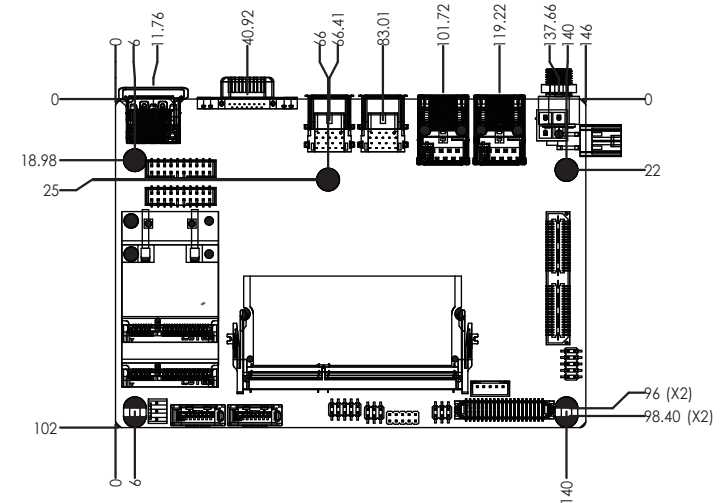
Important:
Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching 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.

DIMM 1
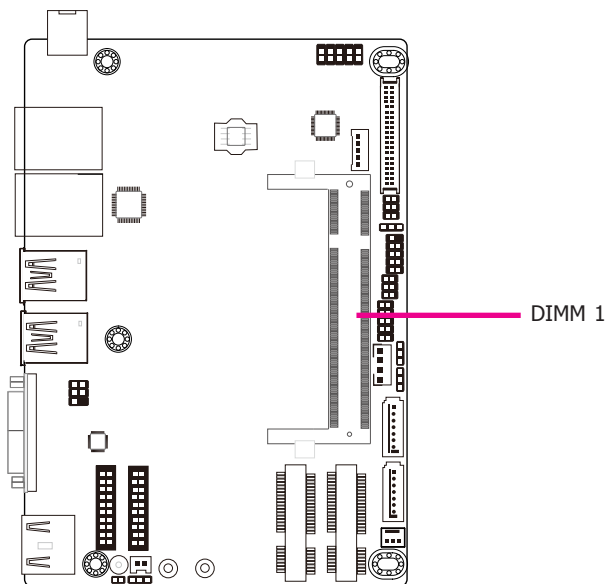
Features

- One 204-pin SODIMM up to 8GB

- Single Channel DDR3L 1600MHz

Jumper Settings

Clear CMOS Data

1 2 3

1-2 On:
Normal (default)

JP1

1 2 3

2-3 On:
Clear CMOS Data
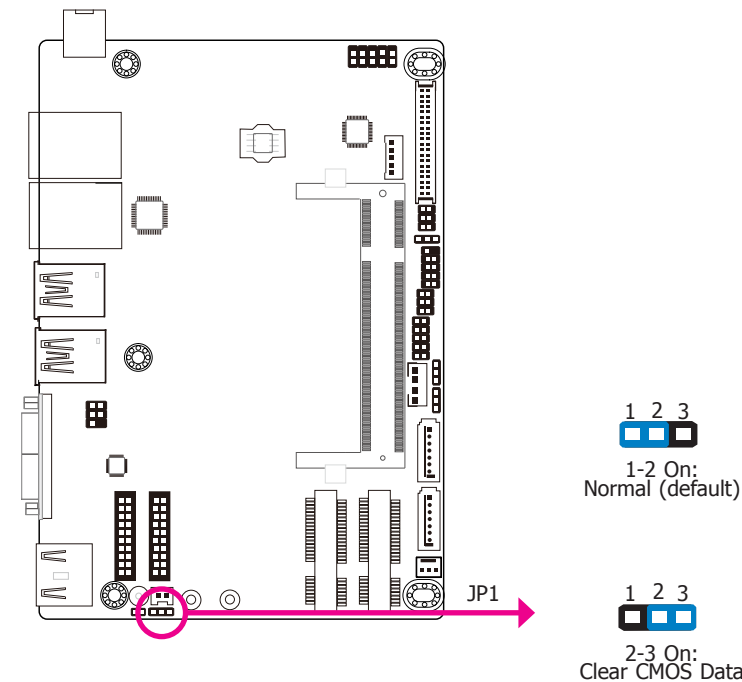
If you encounter the following conditions, you can reconfigure the system with the default values stored in the ROM BIOS.

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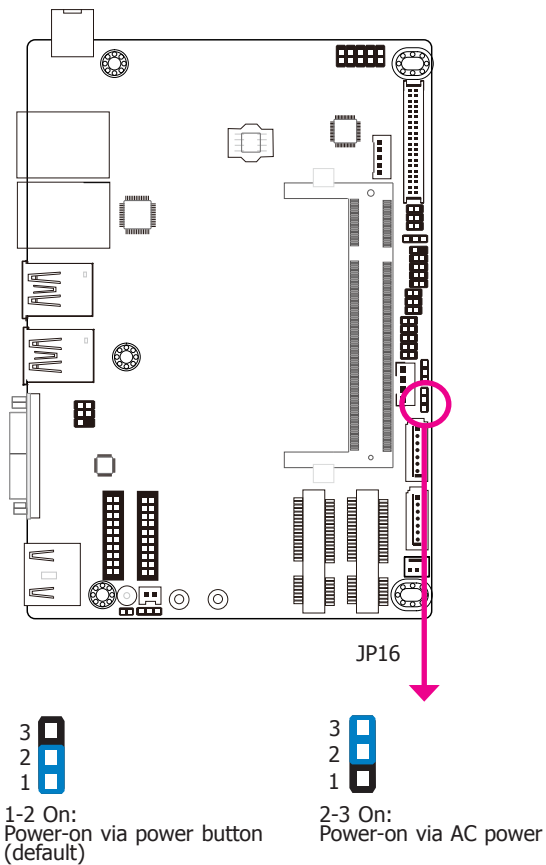
JP16 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP16 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

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).

LVDS Backlight Voltage Select

JP12

1-2 On: +3V3
(default)

2-3 On: +5V
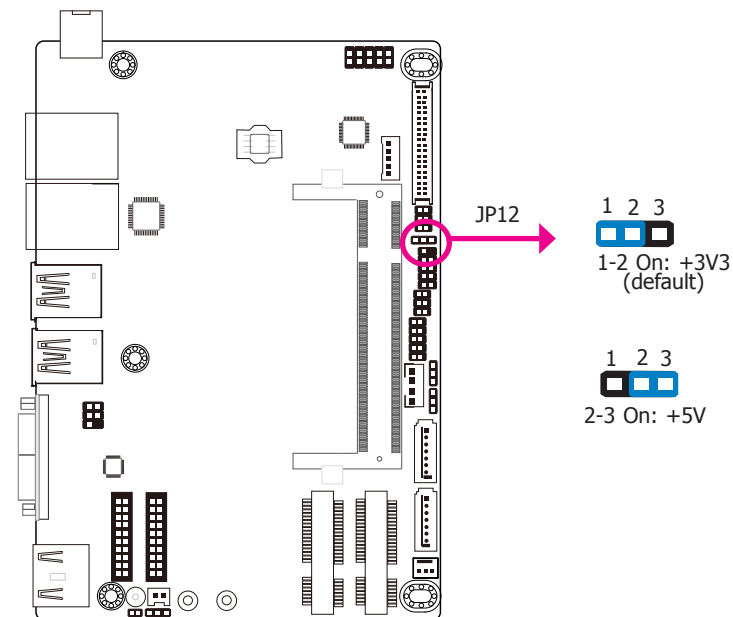
JP12 is used to select the power level of backlight brightness control: +3.3V or +5V.

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.

11

Mini PCIe Signal Select

JP7

3
2
1

1-2 On: mSATA

3
2
1

2-3 On: PCIe
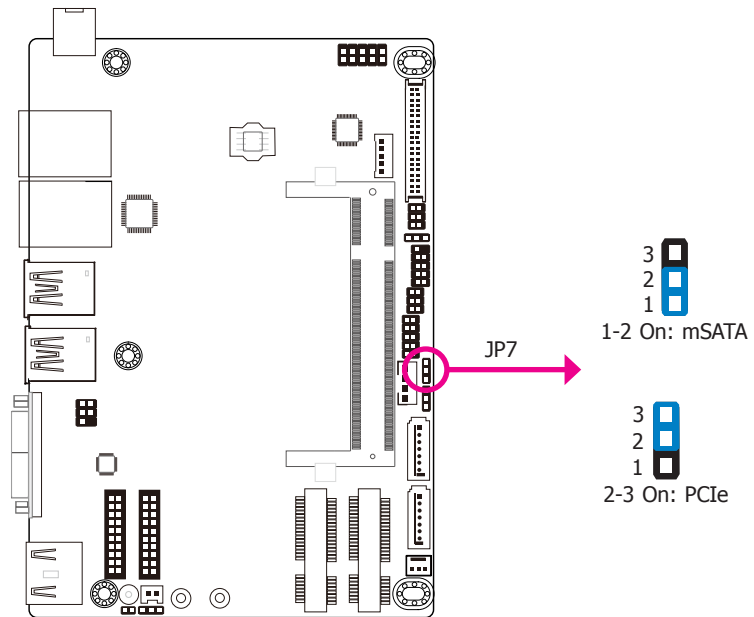
JP7 is used to select the Mini PCIe slot (full-size) signal: PCIe or mSATA (default).

LVDS Panel Voltage Select

JP13

6 5
4 3
2 1

1-2 On: +12V

6 5
4 3
2 1

3-4 On:+5V

6 5
4 3
2 1

5-6 On: +3.3V
(default)
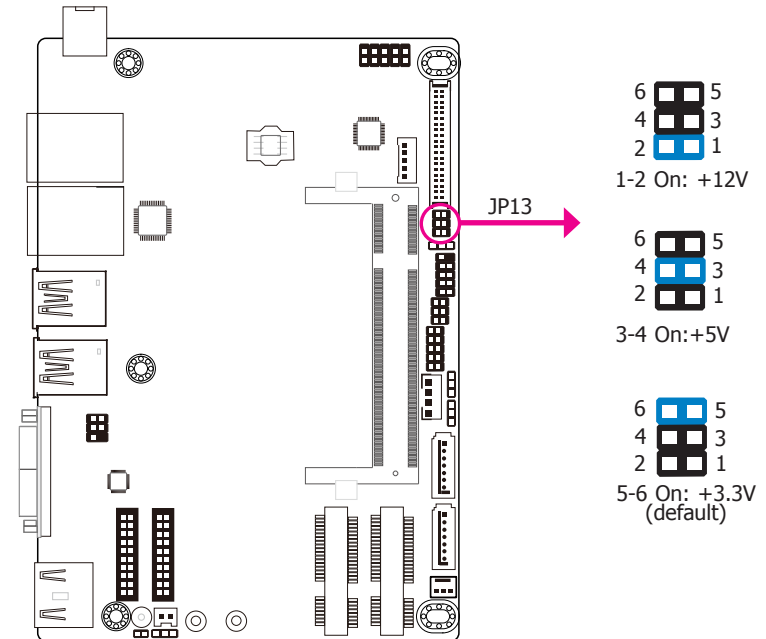
JP13 is used to select the power supplied with the LCD panel.

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

LAN 1   LAN 2   USB 3.0

DC-in   VGA   DP++

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

• 2 GbE (RJ-45)
• 4 USB 3.0
• 1 VGA
• 1 DP++

12V DC-in

DC-in

GND1 1 3 12V2
GND2   12V1
      2 4
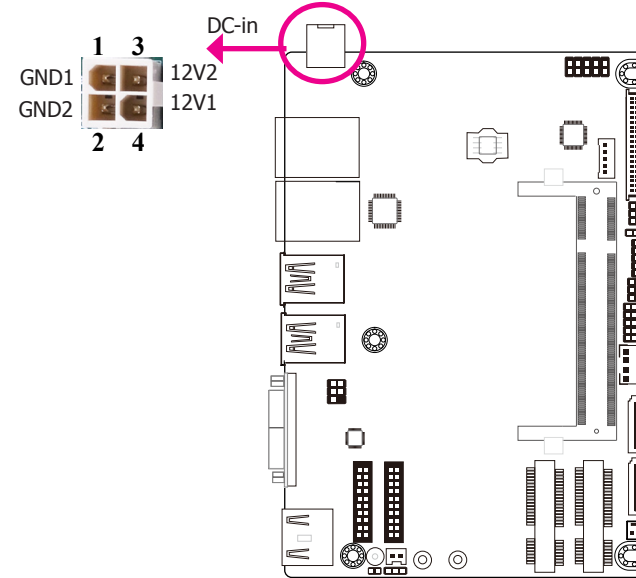
The DC-in jack on the system board co-lays with a 4-pin right angle connector (optional) or 4-pin vertical Type connector (optional) as the photo displayed below.

4-pin Vertical Type (optional)

4-pin Right Angle
(DC-in default)
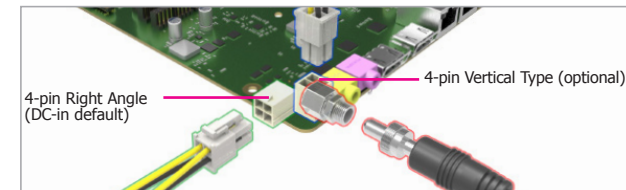
Graphics Interfaces

The display ports consist of the following:

- 1 DP port
- 1 VGA port
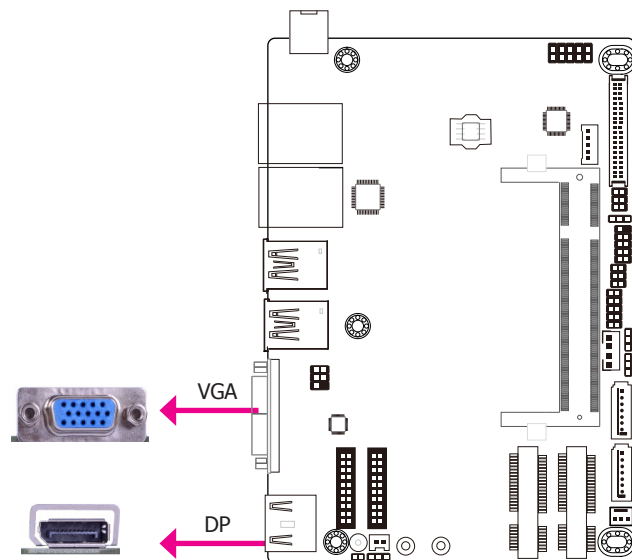
VGA Port

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 DisplayPort 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
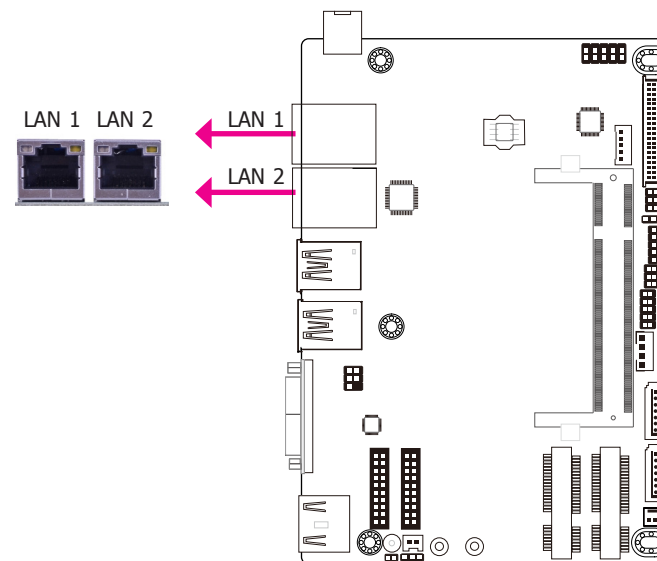
Features

- Intel® I210AT PCI Express Gigabit Ethernet controllers

- Intel® I219LM PCIe with iAMT11.0

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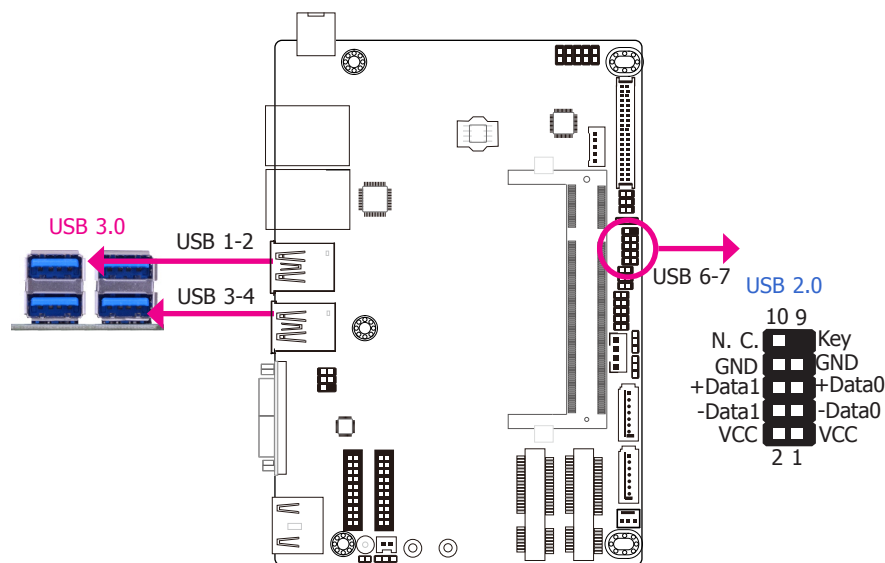
The USB device allows data exchange between your computer and a wide range of simultane-ously accessible external plug and play peripherals.

The system board is equipped with four onboard USB 3.0 port (USB 1-2/3-4). The 10-pin con-nector 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:**
> 1. 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

Digital I/O Power Connector

Digital I/O

10 9

2 1
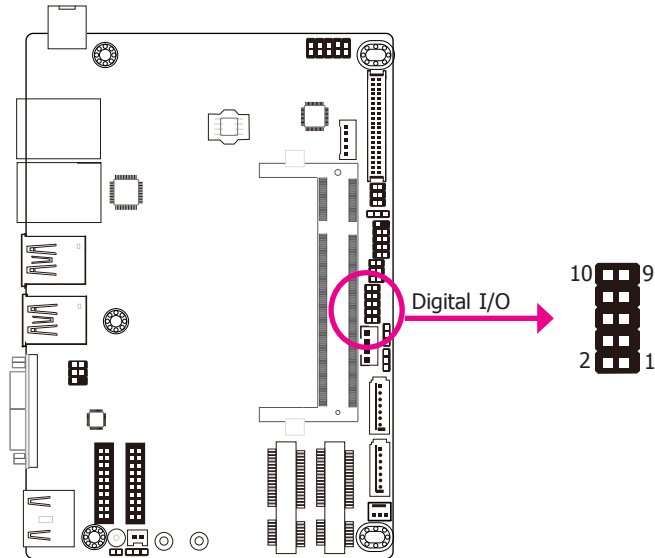
The 10-bit Digital I/O connector provides monitoring and control functions to the connected external devices.

Digital I/O Connector

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

Front Audio Connector

GND NC Mic-JD NC Line-JD

Front Audio

2   10
1   9

Mic-L Mic-R Line-R GND Line-L
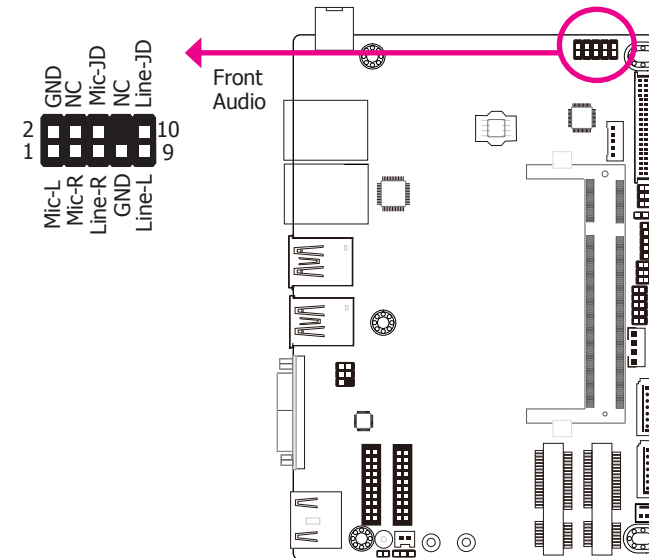
Front Audio

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.

COM (Serial) Ports

COM 3/COM 4: RS232   COM 1/COM 2: RS232/422/485

20   19

COM 1 COM 2
COM 3 COM 4

2   1
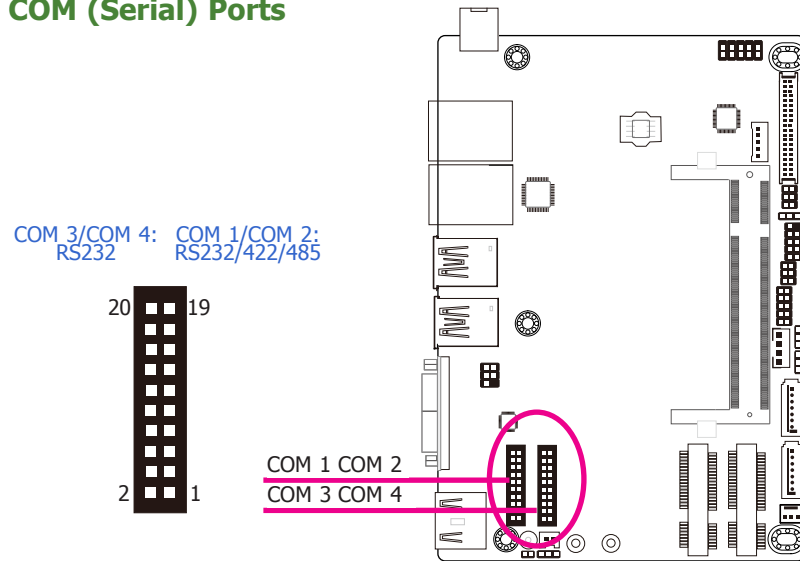
COM 1 and COM 2 can be selected among RS232, 422 and 485. COM 3 and COM 4 are fixed at RS232. Configure COM 1 and COM 2 serial communication mode in the BIOS (the "SIO NU-TOTON6106D" submenu of the Advanced menu). The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that 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 "Super IO Configuration" (SIO NUVOTON6106D) submenu of the Advanced menu in the BIOS. Refer to Chapter 3 for more information.

COM Port Connector

Pins	Function	Pins	Function
1	DCD_1	11	DCD_2
2	DSR_1	12	DSR_2
3	RD_1	13	RD_2
4	RTS_1	14	RTS_2
5	TD_1	15	TD_2
6	CTS_1	16	CTS_2
7	DTR_1	17	DTR_2
8	RI_1	18	RI_2
9	GND	19	GND
10	GND	20	GND

Front Panel Connector

Front Panel

6 5
HDD_LED — Reset Button
Power_LED — Power Button
2 1
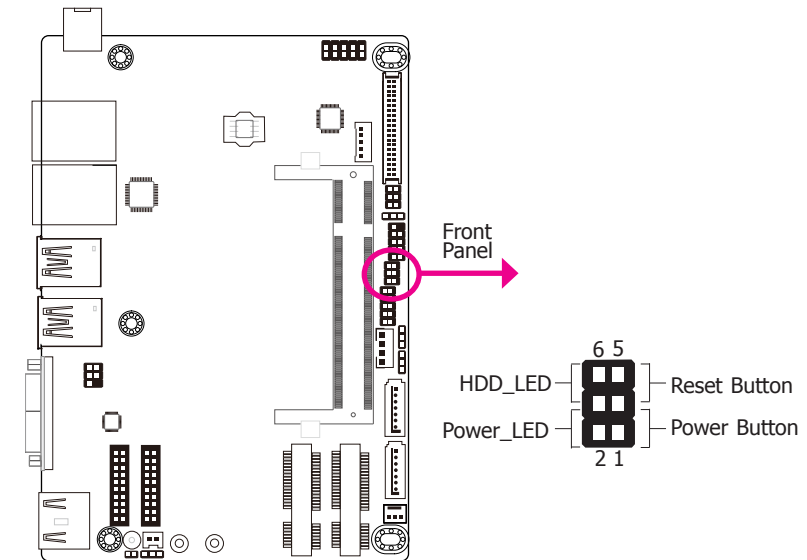
HDD-LED - HDD LED

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

RESET-SW - Reset Switch

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

PWR-BTN - Power Switch

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

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.

	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	6	HDD Power	PWR Button	1	Power Button
	4	SUS_LED		3	Ground
RESET-SW	3	Ground	PWR LED	2	LED Power
	5	RST Signal		4	SUS_LED

SATA (Serial ATA) Connector

1 GND
SATA_TX_P
SATA_TX_N
GND
SATA_RX_N
SATA_RX_P
7 GND

SATA 0   SATA 2
SATA 3.0 6Gb/s
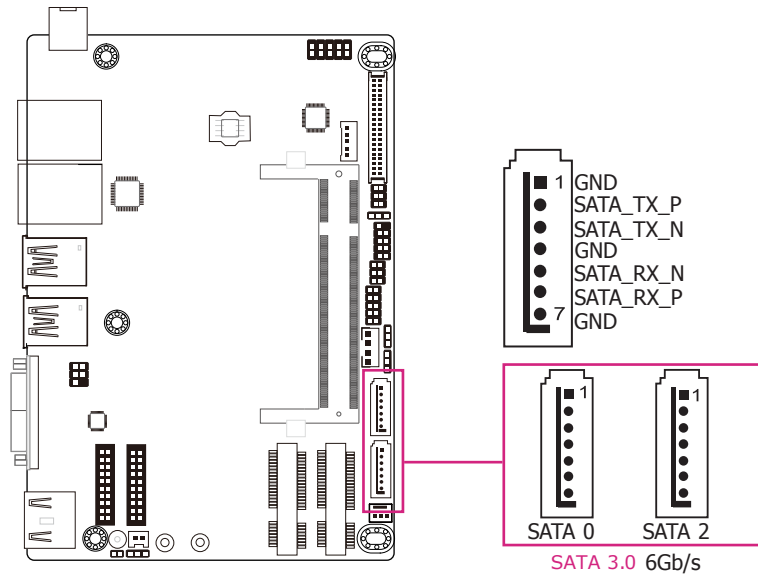
Features

• 2 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s

• Integrated Advanced Host Controller Interface (AHCI) controller with RAID mode

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

SATA (Serial ATA) Power Connector

SATA
Power

4
5V
Ground
Ground
+12V
1
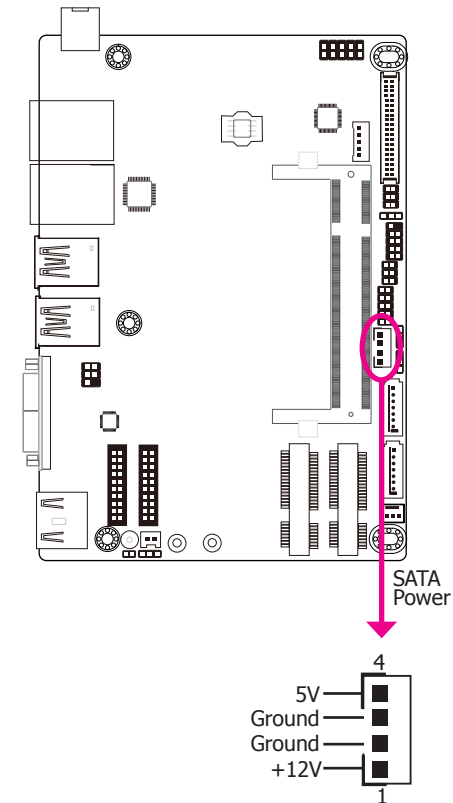
The SATA power connector supplies power to the SATA drive. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device.

LVDS LCD Panel Connector

LCD/Inverter Power Connector

LVDS LC Panel
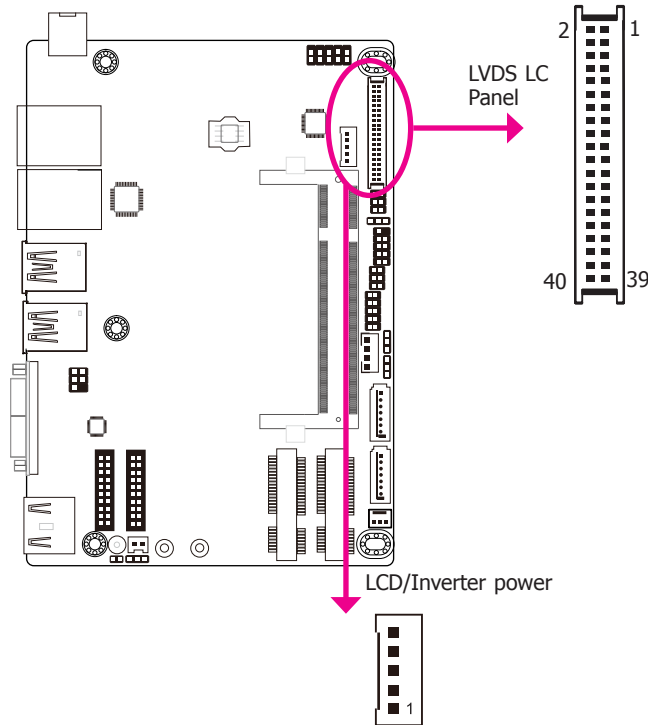
LCD/Inverter power

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

Pins	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

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

Expansion Slot

SIM Slot

Full-size Mni PCIe with
PCIe/USB/SATA signal

Half-size Mini PCIe
with PCIe/USB signal
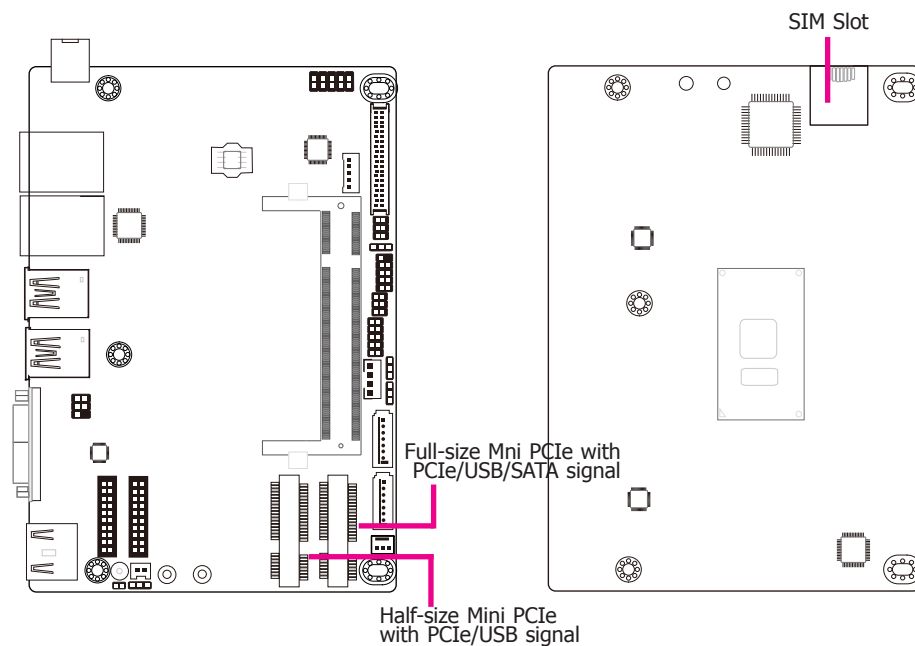
Mini PCI Express Slot

These two Mini PCIe sockets support PCIe x1 and USB 2.0 signals and can be used to install Mini PCIe cards.

mSATA Port

The full-size Mini PCIe socket supports the installation of a Mini PCIe card or an mSATA card. To switch between these two signals, use JP7. Refer to the previous section for more information.

SIM Slot (optional)

The SIM slot on the system board is used to insert a SIM card.

Cooling Fan Connector

FAN_IN
12V
GND

CPU Fan

3   1
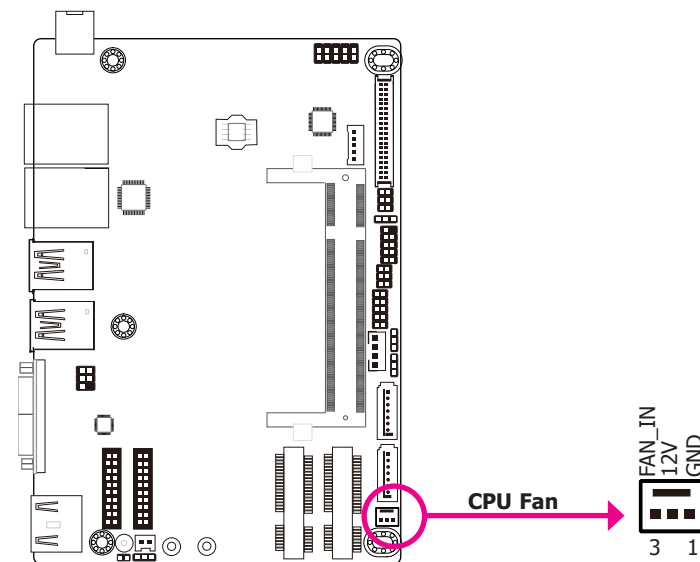
The fan connector is used to connect the cooling fan. The cooling fan will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

SMBus Connector

3V3SB 1 2 GND
SMB_CLK SMB_DATA
SMB_ALERT
5 6
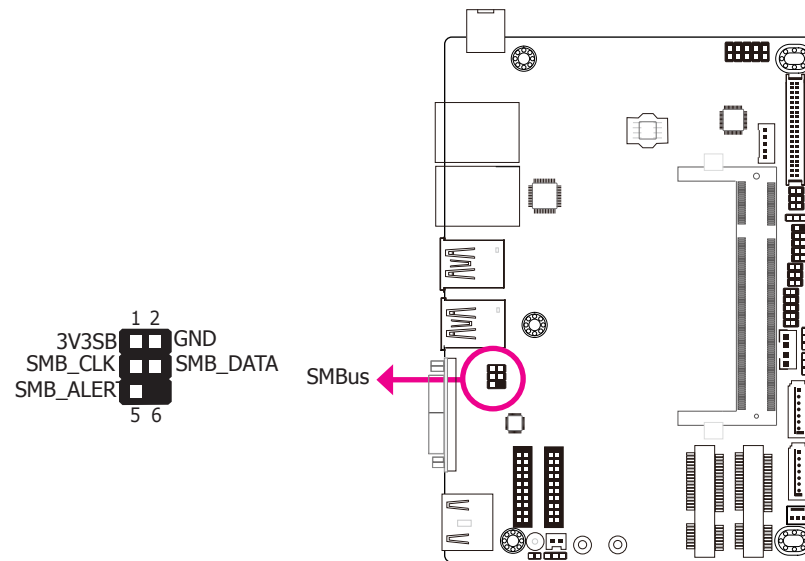
SMBus

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

1 2

Chassis
Intrusion

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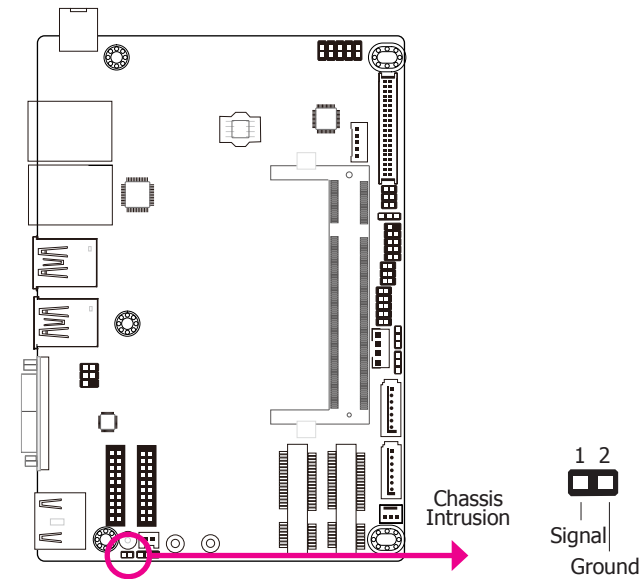
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

Battery

Battery

2 1

GND
+3.3V

Battery

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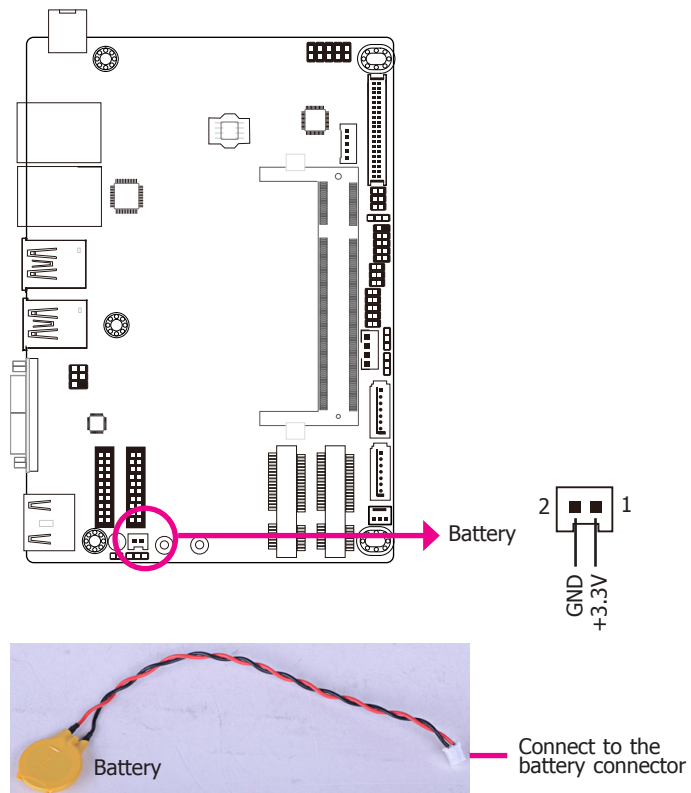
The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

• Danger of explosion if battery incorrectly replaced.

• Replace only with the same or equivalent type recommend by the manufacturer.

• Dispose of used batteries according to local ordinance.

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.
<F1>	Help
<F5>	Change values
<F6>	Change values
<F9>	Setup Defaults
<F10>	Save and Exit
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

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

Submenu

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

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Insyde BIOS Setup Utility

Main

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

```
                        InsydeH20 Setup Utility                    Rev. 5.0
   Main    Advanced    Security    Boot    Exit

   Project Name              SU551                      This is the help for the
   BIOS Version              66.27A                     hour, minute, second
                                                        field. Valid range is from
   Processor Type            Intel(R) Core(TM) i7-6600U CPU @ 2.60GHz   0 to 23, 0 to 59, 0 to 59.
   CPUID:                    0x406E3 (SKYLAKE ULT ULX)  INCREASE/REDUCE:
   CPU Speed:                2800 MHz                   +/-.
   CPU Stepping:             03 (D0/K0 Stepping)
   L1 Data Cache:            32 KB
   L1 Instruction Cache:     32 KB
   L2 Cache:                 256 KB
   L3 Cache:                 4096 KB
   Number of Processors:     2 Core(s) / 4 Thread(s)
   Microcode Rev:            0000006A

   Total Memory              4096 MB
   System Memory Speed       1600 MHz
   SODIMM 0                  4096 MB

   PCH Rev / SKU             21 (C1 Stepping) / SKL PCH-LP (U) Premium
                              SKU
   Intel ME Version / SKU    11.0.0. 1205 / CORPORATE

   System Time               [12:09:14]
   System Date               [07/15/2016]



   F1   Help          ↑/↓    Select Item      F5/F6 Change Values     F9   Setup Defaults
   Esc  Exit          ←/→    Select Item      Enter Select ▶ SubMenu  F10  Save and Exit
```

System Date

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

System Time

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

Advanced

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

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

```
                        InsydeH20 Setup Utility                    Rev. 5.0
   Main    Advanced    Security    Boot    Exit

                                                        ACPI Configuration Setting
   ▶  ACPI Configuration
   ▶  CPU Configuration
   ▶  Video Configuration
   ▶  Audio Configuration
   ▶  SATA Configuration
   ▶  USB Configuration
   ▶  PCI Express Configuration
   ▶  ME Configuration
   MEBX Configuration
   ▶  Active Management Technology Support
   ▶  SIO NUVOTON6106D



   F1   Help          ↑/↓    Select Item      F5/F6 Change Values     F9   Setup Defaults
   Esc  Exit          ←/→    Select Item      Enter Select ▶ SubMenu  F10  Save and Exit
```

ACPI Settings

This section configures the system ACPI parameters.

```
                    InsydeH20 Setup Utility                    Rev. 5.0
      Advanced

 ACPI Configuration                                    Determines the action tak-
                                                       en when the system power
 Wake on LAN                   <Enabled>               is off and a PCI Power
 State After G3                <S0 State>              Management Enable wake
                                                       up event occurs.

                        ┌─────────────────┐
                        │ Wake on PME     │
                        │                 │
                        │ Disabled        │
                        │ Enabled         │
                        │                 │
                        └─────────────────┘


 F1  Help         ↑/↓   Select Item      F5/F6 Change Values     F9   Setup Defaults
 Esc Exit         ←/→   Select Item      Enter Select ▶ SubMenu  F10  Save and Exit
```
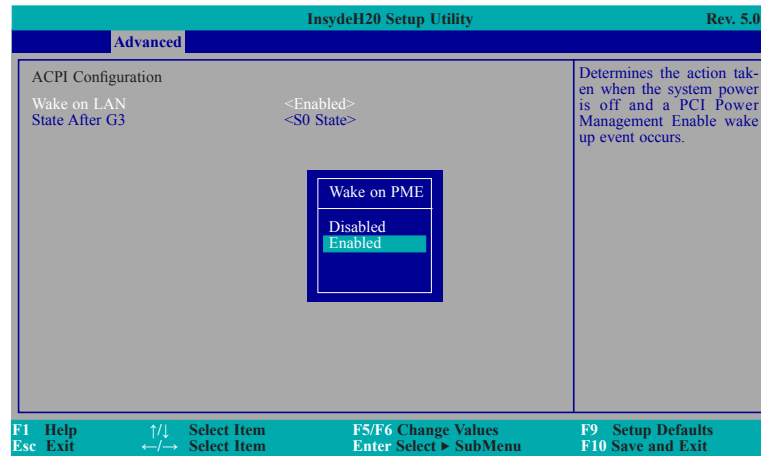
Wake on LAN

Enable or disable WOL (wake-on-LAN) to wake the system through the Ethernet adapter.

State After G3

This field is to specify what state the system should be in when power is re-applied after a power failure (G3 state).

S0 State   The system is in working state

S5 State   The system is in soft-off state.

> **Note**:
> For the "State After G3" setting to take effect, make sure that the "AC Power Loss" option is set to "Always on" in "SIO NUVOTON6106D " of the "Advanced" menu.

CPU Configuration

This section configures the CPU.

```
                    InsydeH20 Setup Utility                    Rev. 5.0
      Advanced

 CPU Configuration                                     Allows more than two fre-
                                                       quency ranges to be sup-
 Intel(R) SpeedStep(tm)        <Enabled>               ported.
    Turbo Mode                 <Enabled>

                    ┌─────────────────────┐
                    │ Intel(R) SpeedStep(tm)│
                    │                     │
                    │ Disabled            │
                    │ Enabled             │
                    │                     │
                    └─────────────────────┘


 F1  Help         ↑/↓   Select Item      F5/F6 Change Values     F9   Setup Defaults
 Esc Exit         ←/→   Select Item      Enter Select ▶ SubMenu  F10  Save and Exit
```
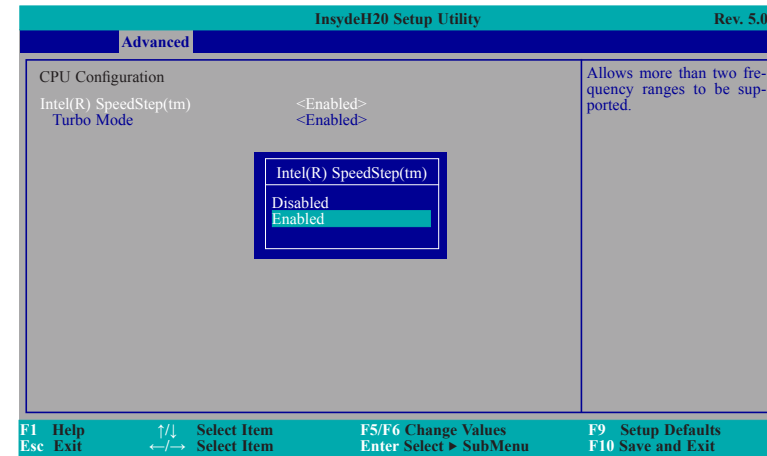
Intel SpeedStep®

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

Turbo Mode

Enable or disable processor turbo mode (requires that EMTTM is enabled too), which allows the processor core to automatically run faster than the base frequency when the processor's power, temperature, and specification are within the limits of TDP.

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Video Configuration

This section configures the video settings.

Internal Graphics

Keep IGFX enabled or disabled based on the setup options.

```
                    InsydeH20 Setup Utility                    Rev. 5.0
        Advanced

  Video Configuration                                    Keep IGFX enabled based
                                                         on the setup options.
  Internal Graphics              <Auto>
  Always Enabled PEG             <Disabled>
  Boot display                   <VGA+DP>
  Backlight Control              <Normal+PWM Mode>
  Panel Color Depth              <18 Bit>
  LVDS Mode                      <PWM Mode>
  LCD Panel Type                 <1024x768>

                            Internal Graphics
                            Auto
                            Disabled
                            Enabled


  F1  Help        ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

Always Enabled PEG

Enable or disable the PCIe graphics function.

Boot display

Select the video device that will be activated during system booting

```
                    InsydeH20 Setup Utility                    Rev. 5.0
        Advanced

  Video Configuration                                    Chose display device com-
                                                         bination
  Internal Graphics              <Auto>
  Always Enabled PEG             <Disabled>
  Boot display                   <VGA+DP>
  Backlight Control              <Normal+PWM Mode>
  Panel Color Depth              <18 Bit>
  LVDS Mode                      <PWM Mode>
  LCD Panel Type                 <1024x768>
                              Boot display

                            LCD+DP
                            LCD+VGA
                            VGA+DP
                            DP+VGA


  F1  Help        ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

Backlight Control

Select the backlight type from normal (default) or inverted.

```
                    InsydeH20 Setup Utility                    Rev. 5.0
        Advanced

  Video Configuration                                    Backlight Type Setting.

  Internal Graphics              <Auto>
  Always Enabled PEG             <Disabled>
  Boot display                   <VGA+DP>
  Backlight Control              <Normal+PWM Mode>
  Panel Color Depth              <18 Bit>
  LVDS Mode                      <PWM Mode>
  LCD Panel Type                 <1024x768>



  F1  Help        ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```
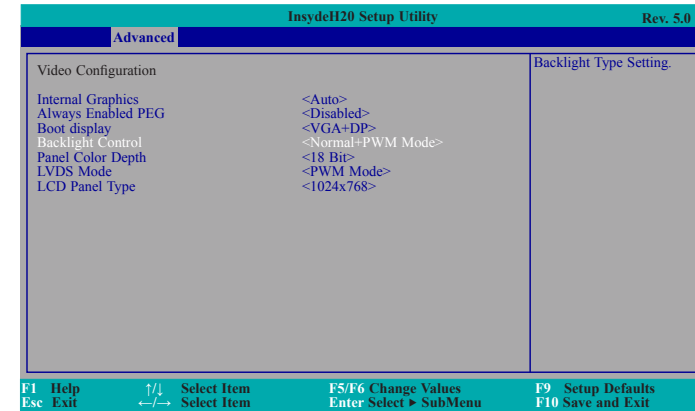
Panel Color Depth

Select the LFP panel color depth: 18 bit, 24 bit, 36 bit, and 48 bit.

LVDS Mode

Select PTN3460 LVDS Mode: PWM Mode or DC Mode.

LCD Panel Type

Select the type of LCD panel connected to the system's LCD connector. Please check the specifications of your LCD monitor.

```
                    InsydeH20 Setup Utility                    Rev. 5.0
        Advanced

  Video Configuration                                    Select LCD panel used by
                                                         Internal Graphics Device
  Internal Graphics              <Auto>                  by selecting the appropri-
  Always Enabled PEG             <Disabled>              ate setup item.
  Boot display                   <VGA+DP>
  Backlight Control              <Normal+PWM Mode>
  Panel Color Depth              <18 Bit>
  LVDS Mode                      <PWM Mode>
  LCD Panel Type                 <1024x768>
                              LCD Panel Type
                            800x480
                            800x600
                            1024x768
                            1366x768
                            1280x1024
                            1920x1080


  F1  Help        ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

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Audio Configuration

This section configures the audio settings.

```
                        InsydeH20 Setup Utility                    Rev. 5.0
        Advanced
   HD Audio                      <Enabled>              Control Detection of the
                                                        HD-Audio device.

                                                        Disabled = HDA will be
                                                        unconditionally disabled

                                                        Enabled = HDA will be
                                                        unconditionally enabled

                                                        Auto = HDA will be ena-
                                                        bled if present, disabled
                                                        otherwise.




   F1  Help        ↑/↓   Select Item      F5/F6 Change Values    F9  Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu F10 Save and Exit
```
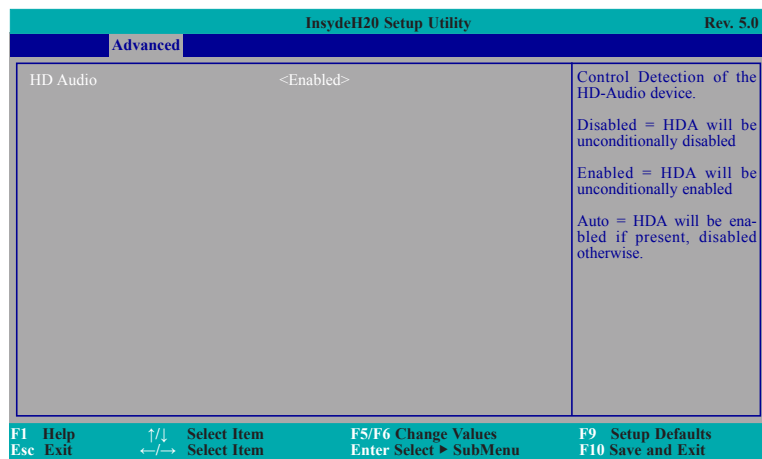
HD Audio

Control the detection of the high-definition audio device.

Disabled
HD Audio will be unconditionally disabled.
Enabled
HD Audio will be unconditionally enabled.
Auto
HD Audio will be enabled if present and 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.

```
                        InsydeH20 Setup Utility                    Rev. 5.0
        Advanced
   SATA Controller(s)                    <Enabled>         Enable/Disable SATA
   SATA Mode Selection                   <AHCI>            Device.
   Serial ATA Port 0        [Not Installed]
     Port 0                              <Enabled>
   Serial ATA Port 1        [Not Installed]
     Port 1                              <Enabled>
   Serial ATA Port 2        [Not Installed]
     Port 2                              <Enabled>

                        ┌─────────────────────┐
                        │ SATA Controller(s)  │
                        ├─────────────────────┤
                        │ Enabled             │
                        │ Disabled            │
                        └─────────────────────┘




   F1  Help        ↑/↓   Select Item      F5/F6 Change Values    F9  Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu F10 Save and Exit
```

SATA Controller(s)

Enable or disable Serial ATA devices.

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).
RAID Mode
This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

Serial ATA Port 0, 1 and 2

Enable or disable the serial ATA port.

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USB Configuration

This section configures the parameters of the USB device.

```
                    InsydeH20 Setup Utility                   Rev. 5.0
      Advanced

   USB BIOS Support              <Enabled>            USB keyboard/mouse/stor-
                                                      age support under UEFI
                                                      and DOS environment. It
                                                      will supporting UEFI en-
                                                      vironment only if set to
                                                      UEFI Only

                        ┌─────────────────────┐
                        │ USB BIOS Support     │
                        │ Disabled             │
                        │ Enabled              │
                        │ UEFI Only            │
                        └─────────────────────┘




   F1  Help        ↑/↓   Select Item      F5/F6 Change Values    F9   Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu F10  Save and Exit
```
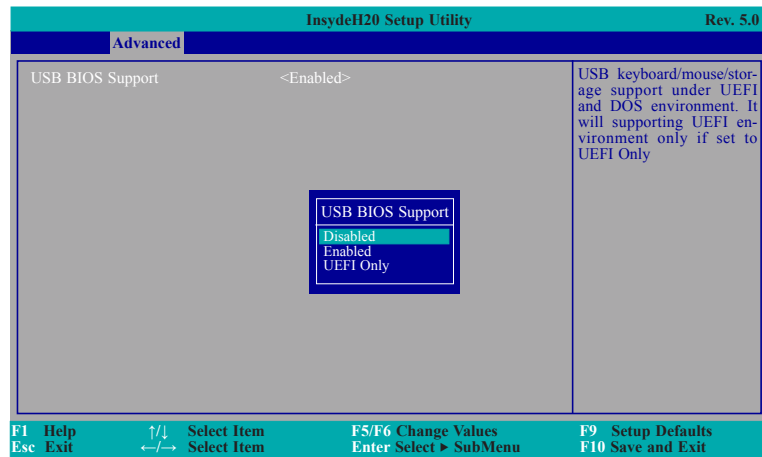
USB BIOS Support

Disabled
Disable USB keyboard/mouse/storage support.

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

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

PCI Express Configuration

This section configures settings relevant to PCI Express root ports.

```
                    InsydeH20 Setup Utility                   Rev. 5.0
      Advanced

   ▶  PCI Express Root Port 3                         PCI Express Root Port 3
   ▶  PCI Express Root Port 4                         Settings.
   ▶  PCI Express Root Port 6
   ▶  PCI Express Root Port 8
   ▶  PCI Express Root Port 9






   F1  Help        ↑/↓   Select Item      F5/F6 Change Values    F9   Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu F10  Save and Exit
```

```
                          InsydeH20 Setup Utility                        Rev. 5.0
       Advanced
   PCI Express Root Port 3              <Enabled>              Control the PCI Express
   PCIe Speed                          <AUTO>                 Root Port.


                       ┌──────────────────────────────┐
                       │ PCI Express Root Port 3       │
                       │ Disabled                      │
                       │ Enabled                       │
                       └──────────────────────────────┘




   F1  Help        ↑/↓   Select Item       F5/F6 Change Values       F9   Setup Defaults
   Esc Exit        ←/→   Select Item       Enter Select ▶ SubMenu    F10 Save and Exit
```

PCI Express Root Port

Enable or disable the PCI Express Root Port.

PCIe Speed

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

ME Configuration

This section configures settings of Intel ME flashing.

```
                          InsydeH20 Setup Utility                        Rev. 5.0
       Advanced
   Me Fw Image Re-Flash              <Disabled>              Enable/disable to flash ME
                                                            region


                       ┌──────────────────────────────┐
                       │ Me Fw Image Re-Flash          │
                       │ Disabled                      │
                       │ Enabled                       │
                       └──────────────────────────────┘




   F1  Help        ↑/↓   Select Item       F5/F6 Change Values       F9   Setup Defaults
   Esc Exit        ←/→   Select Item       Enter Select ▶ SubMenu    F10 Save and Exit
```
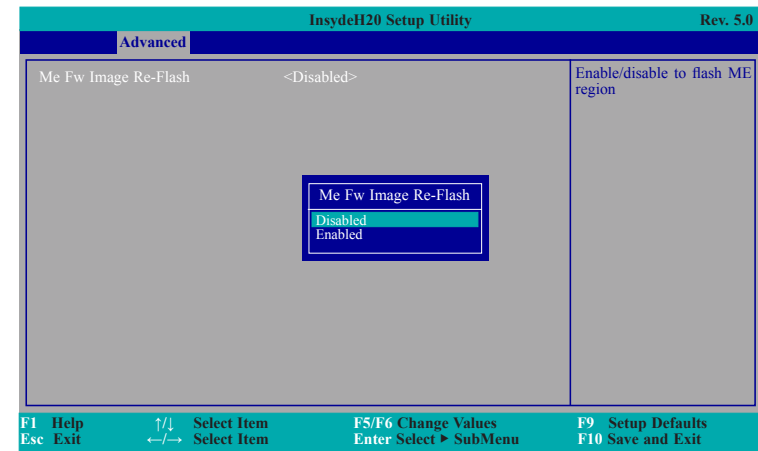
Me Fw Image Re-Flash

Enable or disable Intel ME Intel® Management Engine firmware flashing.

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Active Management Technology Support

The section allows users to enable or disable the Intel® Active Management Technology (Intel® AMT) BIOS extension. Refer to Chapter 6 for more information.

```
                        InsydeH20 Setup Utility              Rev. 5.0
          Advanced
                                                        Enable/Disable Intel (R)
                                                        Active Management Tech-
     Active Management Technology Support               nology BIOS Extension.
                                                        Note : iAMT H/W is al-
     Intel AMT Support              <Enabled>           ways enabled. This Option
     Un-Configure ME                <Disabled>          Just controls the BIOS
                                                        extension execution.

                          Intel AMT Support
                          Disabled
                          Enabled


    F1  Help        ↑/↓  Select Item   F5/F6 Change Values   F9  Setup Defaults
    Esc Exit        ←/→  Select Item   Enter Select ▶ SubMenu F10 Save and Exit
```

Intel AMT Support

Enable or disable Intel® Active Management Technology BIOS extension.

Un-Configure ME

Enable or disable the ability to unconfigure the management settings for AMT without requiring a password.

SIO NUVOTON6106D

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

```
                        InsydeH20 Setup Utility              Rev. 5.0
          Advanced
    CPU Smart Fan Control              <Enable>         Enable/Disable Smart Fan
       Boundary 1                      [30]
       Boundary 2                      [40]
       Boundary 3                      [50]
       Boundary 4                      [60]
       Fan Speed Count 1               [30]
       Fan Speed Count 2               [40]
       Fan Speed Count 3               [50]
       Fan Speed Count 4               [75]
    COM Port 1                         <Enable>
       Base I/O Address                <3F8>
       Interrupt                       <IRQ4>
       Type                            <RS232>
    COM Port 2                         <Enable>
       Base I/O Address                <2F8>
       Interrupt                       <IRQ3>
       Type                            <RS232>  CPU Smart Fan Control
    COM Port 3                         <Enable>  Disable
       Base I/O Address                <3E8>     Enable
       Interrupt                       <IRQ4>
    COM Port 4                         <Enable>
       Base I/O Address                <2E8>
       Interrupt                       <IRQ3>
    WDT                                <Disable>
    Case Open                          <Disable>
    AC Power Loss                      <Always off>
    ▶PC Health Status

    F1  Help        ↑/↓  Select Item   F5/F6 Change Values   F9  Setup Defaults
    Esc Exit        ←/→  Select Item   Enter Select ▶ SubMenu F10 Save and Exit
```

CPU Smart Fan Control

Enable or disable the system/CPU smart fan/fan 2.

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 1 temperature, 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 0 (fan stop)-100% (full speed).

InsydeH20 Setup Utility | Rev. 5.0

Advanced

CPU Smart Fan Control	<Enable>
Boundary 1	[30]
Boundary 2	[40]
Boundary 3	[50]
Boundary 4	[60]
Fan Speed Count 1	[30]
Fan Speed Count 2	[40]
Fan Speed Count 3	[50]
Fan Speed Count 4	[75]
COM Port 1	<Enable>
Base I/O Address	<3F8>
Interrupt	<IRQ4>
Type	<RS232>
COM Port 2	<Enable>
Base I/O Address	<2F8>
Interrupt	<IRQ3>
Type	<RS232>
COM Port 3	<Enable>
Base I/O Address	<3E8>
Interrupt	<IRQ4>
COM Port 4	<Enable>
Base I/O Address	<2E8>
Interrupt	<IRQ3>
WDT	<Disable>
Case Open	<Disable>
AC Power Loss	<Always off>
▶PC Health Status	

Configure Serial port using options: [Disable] No Configuration [Enable] User Configuration [Auto] EFI/OS chooses configuration

COM Port 1
Disabled
Enabled

F1 Help ↑/↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ←/→ Select Item Enter Select ▶ SubMenu F10 Save and Exit

COM Port 1 to COM Port 4
Configure the settings to use the serial port.

Disable Disable this serial port.
Enable Enable this serial port.

Base I/O Address
Choose the input/output base address for each COM port.

Interrupt
Assign the IRQ number for each COM port.

Type
Choose among RS23, RS422 and RS485 (Peer-to-Peer) for the serial communication type for COM port 1 and COM port 2.

WDT
Enable or disable the watchdog function.

Case Open
Enable or disable the case open.

AC Power Loss
Set the AC power loss to Always off or on to indicate the system power on/off state after the power resumes.

PC Health Status
This section displays PC health status.

InsydeH20 Setup Utility | Rev. 5.0

Advanced

PC Health Status

Voltage
VCORE	0.960 V
5V	4.978 V
+12V	12.320 V
VDDQ	1.360 V
VBAT	3.056 V
3VSB	3.312 V

Temperature
System (ºC/ºF)	30.0 C/ 86.0 F
CPU (ºC/ºF)	38.5 C/ 101.3 F

Fan Speed
CPU FAN	7180 RPM

F1 Help ↑/↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ←/→ Select Item Enter Select ▶ SubMenu F10 Save and Exit

31
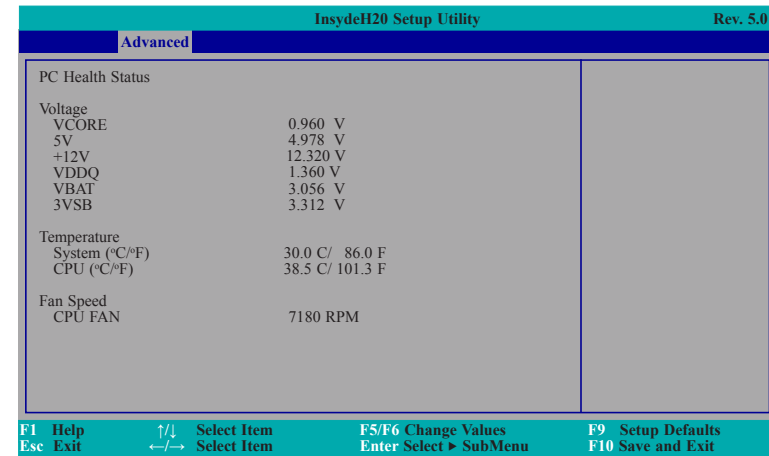
Security

This section configures the trusted platform module (TPM) function.

```
                    InsydeH20 Setup Utility                      Rev. 5.0
    Main     Advanced    Security    Boot     Exit

                                                        When Hidden, don't ex-
                                                        poses TPM to 0
    Current TPM Device         <TPM 2.0>
    TPM State                  Not Installed
    TPM Availability           <Available>
    TPM Operation              <No Operation>
    Clear TPM                  [ ]
    Supervisor Password        Not Installed

    Set Supervisor Password

                        ┌─────────────────────┐
                        │ TPM Availability     │
                        │ Available            │
                        │ Hidden               │
                        └─────────────────────┘

    F1   Help         ↑/↓   Select Item    F5/F6 Change Values      F9   Setup Defaults
    Esc  Exit         ←/→   Select Item    Enter Select ▶ SubMenu   F10  Save and Exit
```

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.
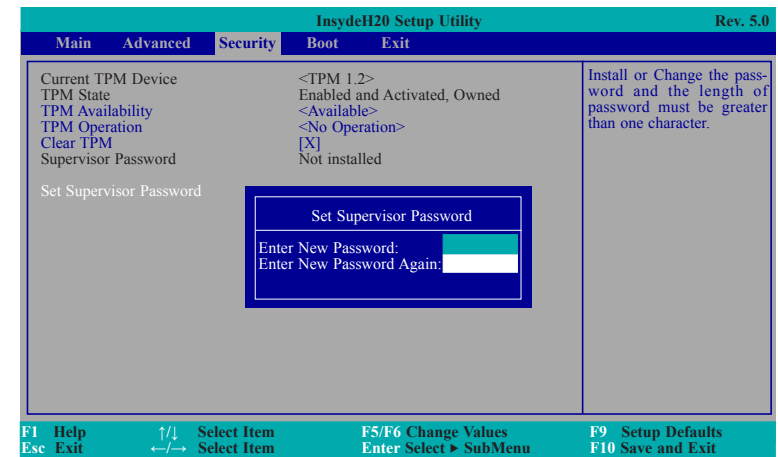Disable: Disable and deactivate TPM.
Enable: Enable and activate TPM.
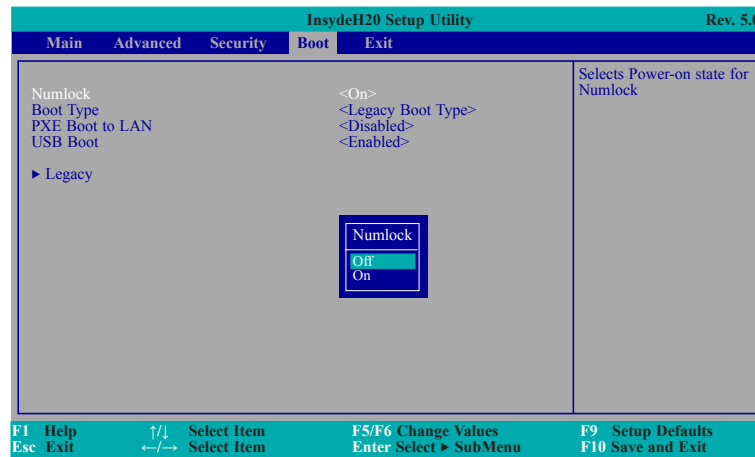
Clear TPM

Remove all TPM ownership contents.

Set Supervisor Password

Set the administrative password. The length of the password must be greater than one character.

```
                    InsydeH20 Setup Utility                      Rev. 5.0
    Main     Advanced    Security    Boot     Exit

                                                        Install or Change the pass-
                                                        word and the length of
    Current TPM Device         <TPM 1.2>                password must be greater
    TPM State                  Enabled and Activated, Owned  than one character.
    TPM Availability           <Available>
    TPM Operation              <No Operation>
    Clear TPM                  [X]
    Supervisor Password        Not installed

    Set Supervisor Password

                    ┌─────────────────────────────┐
                    │    Set Supervisor Password   │
                    │ Enter New Password:          │
                    │ Enter New Password Again:    │
                    └─────────────────────────────┘

    F1   Help         ↑/↓   Select Item    F5/F6 Change Values      F9   Setup Defaults
    Esc  Exit         ←/→   Select Item    Enter Select ▶ SubMenu   F10  Save and Exit
```

Boot

This section configures boot options.

InsydeH20 Setup Utility			**Rev. 5.0**

```
InsydeH20 Setup Utility                                    Rev. 5.0
 Main    Advanced    Security    Boot    Exit

                                                    Selects Power-on state for
                                                    Numlock
 Numlock                 <On>
 Boot Type               <Legacy Boot Type>
 PXE Boot to LAN         <Disabled>
 USB Boot                <Enabled>

 ▶ Legacy

                         ┌─────────────┐
                         │ Numlock     │
                         │ Off         │
                         │ On          │
                         └─────────────┘

 F1  Help        ↑/↓   Select Item     F5/F6 Change Values      F9   Setup Defaults
 Esc Exit        ←/→   Select Item     Enter Select ▶ SubMenu   F10  Save and Exit
```

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.

PXE Boot Capability

Disable or enable PXE boot to LAN.

USB Boot

Enable or disable the booting to USB boot devices.

> **Note:**
>
> If the boot type is set to UEFI, the method for RAID volume creation will be different. Please refer to Chapter 5 - RAID for more information.

Legacy

This section configures legacy boot order.

```
InsydeH20 Setup Utility                                    Rev. 5.0
                              Boot

 Boot Device Priority                                Select Normal Boot Option
                                                     Priority  or  Advance  Boot
 Normal Boot Menu           <Normal>                 Option Priority

 ▶ Boot Type Order

                         ┌──────────────────┐
                         │ Normal Boot Menu │
                         │ Normal           │
                         │ Advance          │
                         └──────────────────┘

 F1  Help        ↑/↓   Select Item     F5/F6 Change Values      F9   Setup Defaults
 Esc Exit        ←/→   Select Item     Enter Select ▶ SubMenu   F10  Save and Exit
```
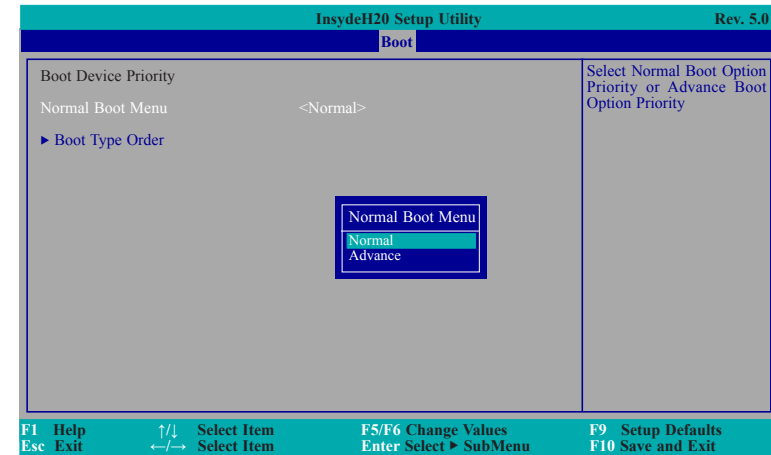
Normal Boot Menu

Normal

Based on the boot normal priority, it determines the EFI device first or the legacy device first.
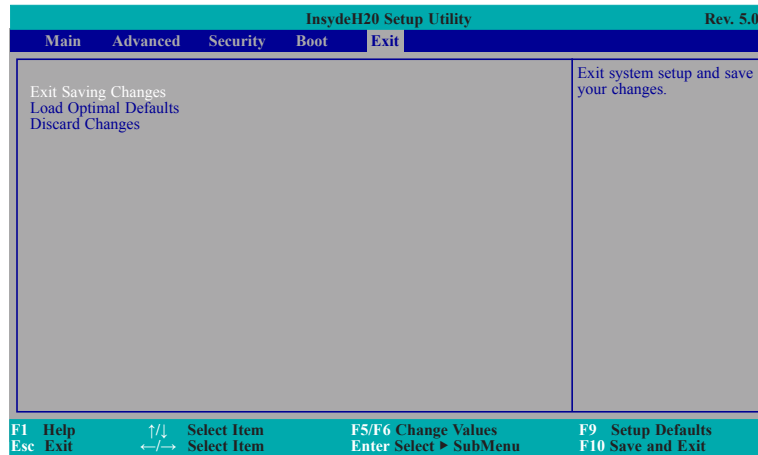
Advance

All boot devices follow the user's selection sequence.

Boot Type Order

Select the priority of boot type: Normal Boot or Advance Boot.

Exit

This section configures the parameters for exiting the BIOS menu.

```
                         InsydeH20 Setup Utility                    Rev. 5.0
     Main     Advanced    Security    Boot     Exit

                                                    Exit system setup and save
     Exit Saving Changes                            your changes.
     Load Optimal Defaults
     Discard Changes












F1   Help          ↑/↓    Select Item      F5/F6 Change Values        F9   Setup Defaults
Esc  Exit          ←/→    Select Item      Enter Select ▶ SubMenu     F10  Save and Exit
```

Exit Saving Changes

Select this field and then press <Enter> to exit the system setup and save your changes.

Load Optimal Defaults

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

Discard Changes

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

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 and specific instructions about how to update BIOS with the flash utility.

When you download the given BIOS file, you may find a BIOS flash utility attached with the BIOS file. This is the utility for performing BIOS updating procedure. For your convenience, we will also provide you with an auto-execution file in the BIOS file downloaded. This auto-execution file will bring you directly to the flash utility menu soon after system boots up and finishes running the boot files in your boot disk.

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

                              Information
                     Please do not remove the AC power



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

                 Initializing
                 Current BIOS Model name: SU551
                 New   BIOS Model name: SU551

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

                     Updating Block at FFFFF000h
        0%       25%          50%          75%           100%
                                                               100%
C:\SU551>_
```

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

The DVD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the DVD into a DVD-ROM drive. The autorun screen (Mainboard Utility DVD) will appear. If after inserting the DVD, "Autorun" did not automatically start (which is, the Mainboard Utility DVD screen did not appear), please go directly to the root directory of the DVD and double-click "Setup".

For Windows 10
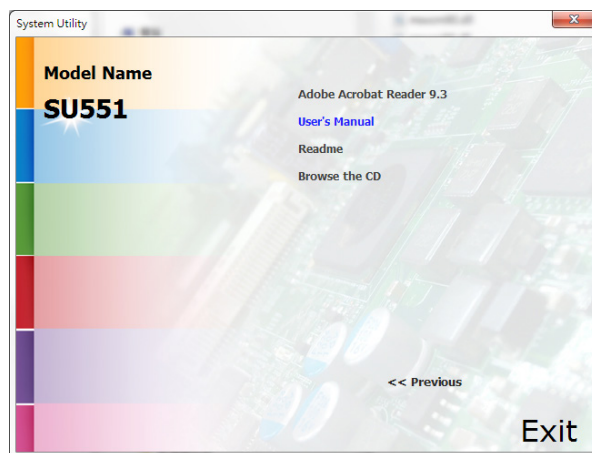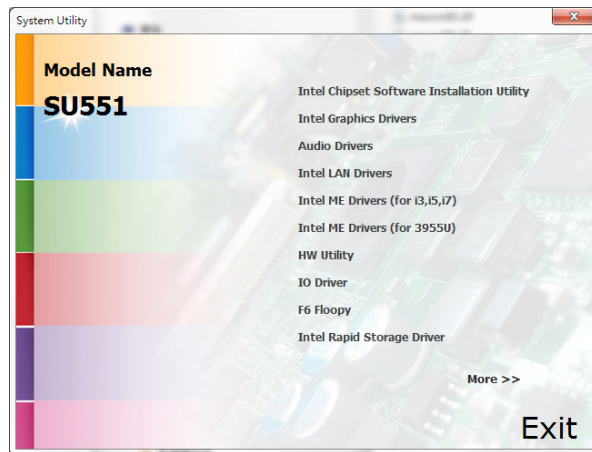
For Windows 8.1
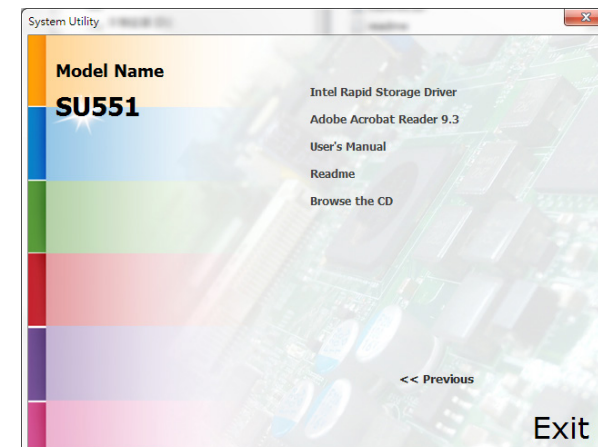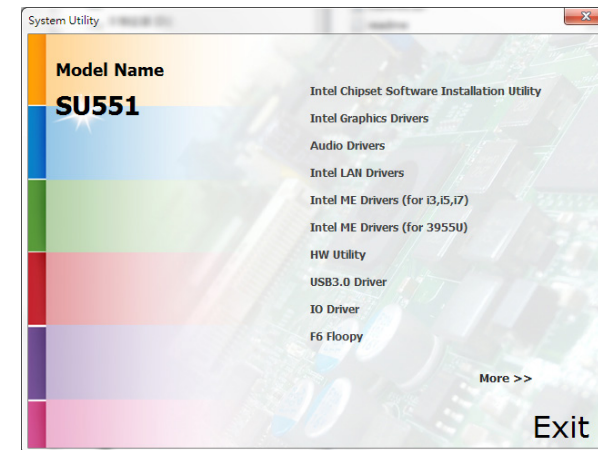
For Windows 7
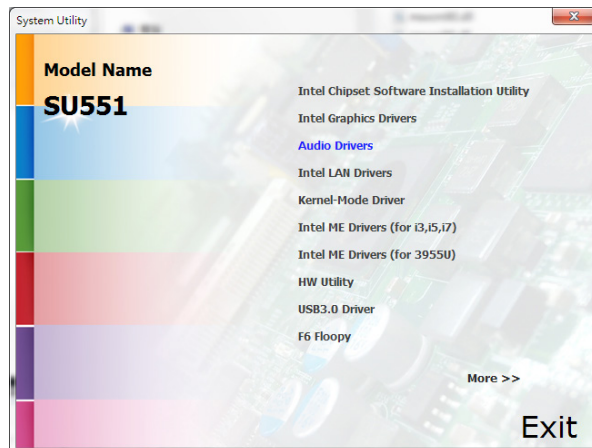
Intel Chipset Software Installation Utility

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, click "Intel Chipset Software Installation Utility" on the main menu.

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

2. Read the license agreement then click Yes.

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

4. Click Finish to exit setup.

Intel Graphics Drivers

To install the driver, click "Intel Graphics Drivers" on the main menu.

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 7/Windows 8.1/Windows 10 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.
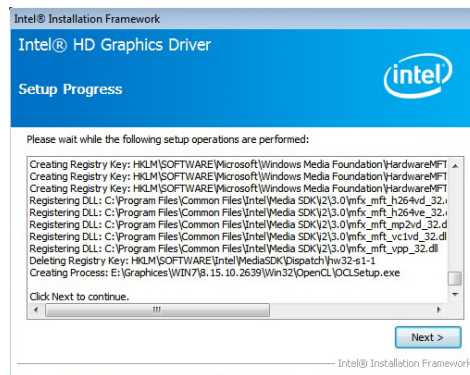
2. Read the license agreement then click Yes.

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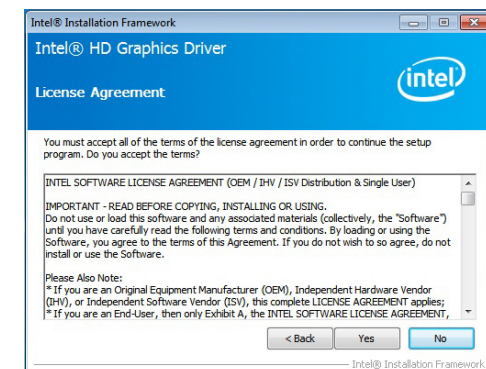
3. Go through the readme document for system requirements and installation tips then click Next.
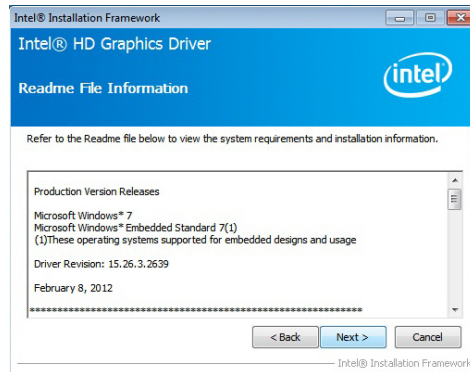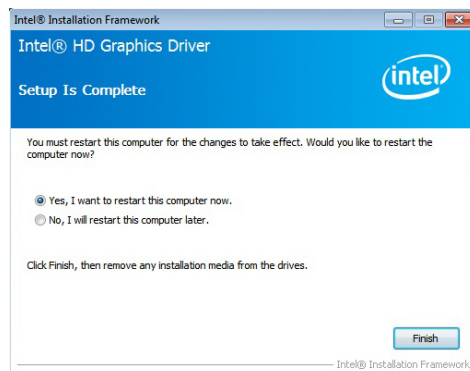

4. Setup is now installing the driver. Click Next to continue.

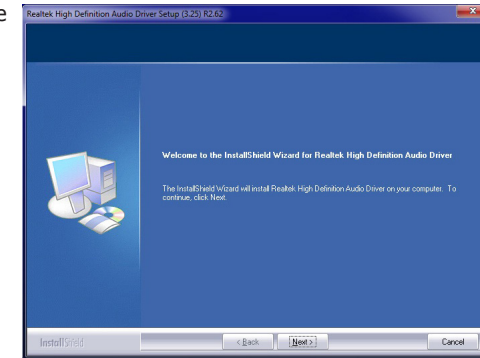5. Click "Yes, I want to restart this computer now" then click Finish.

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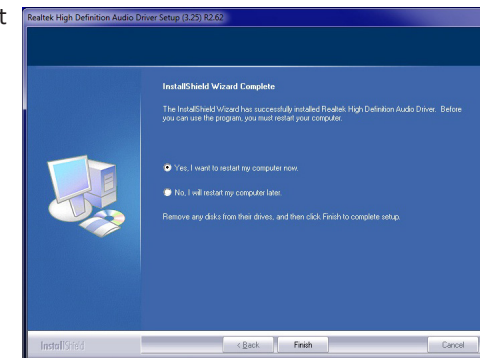

Audio Drivers

To install the driver, click "Audio Drivers" on the main menu.

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.
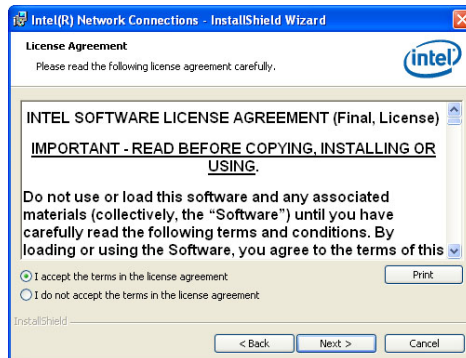
Intel LAN Drivers

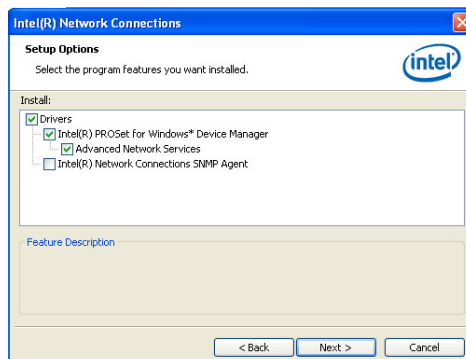To install the driver, click "Intel LAN Drivers" on the main menu.

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 featuers you want installed then click Next.

4. Click Install to begin the installation.

5. After completing installation, click Finish.

Kernel Mode Driver Framework (For Windows 7 only)

To install the driver, click "Kernel Mode Driver Framework" on the main menu.

1. Click "Yes" to install the update.
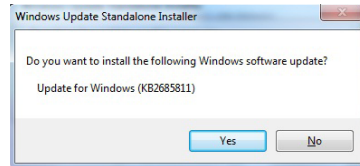
2. The update is installed now.
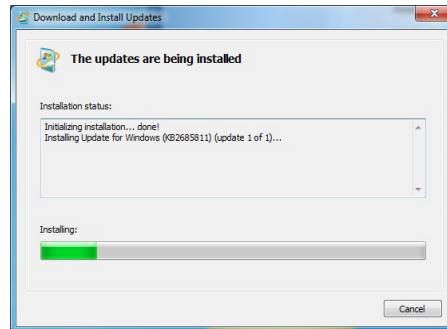
3. Click "Restart Now" to restart your computer when the installation is complete.
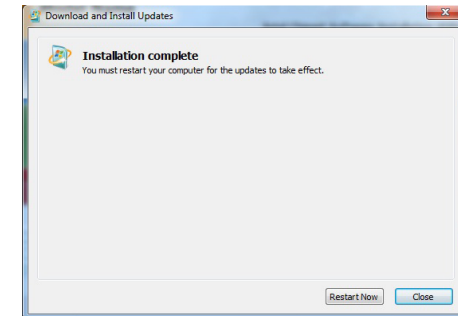
Intel Management Engine Drivers

To install the driver, click "Intel Management Engine Drivers" on the main menu.
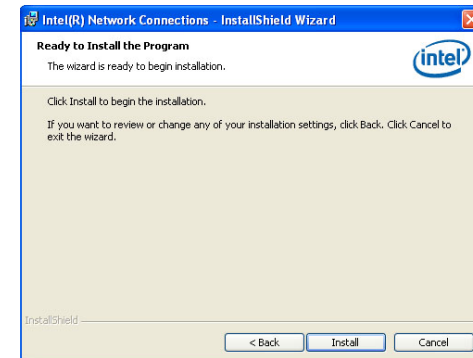
1. Setup is ready to install the driver. Click "Next".
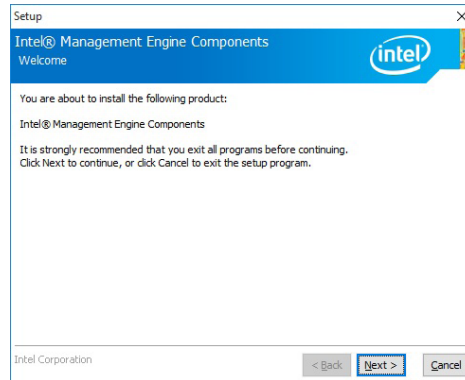
2. Read the license agreement then click "Next".
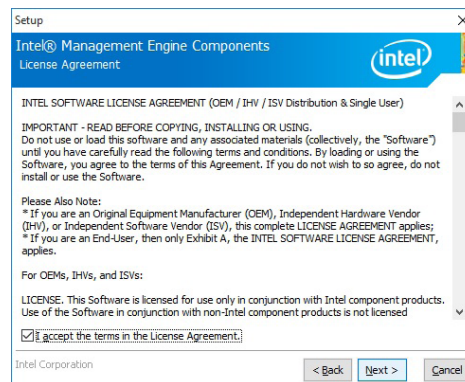
3. Setup is currently installing the driver. After installation has completed, click "Next".
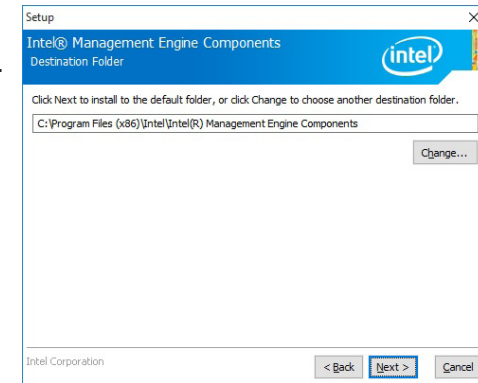
4. Please wait while the product is being installed.

5. After completing installation, click "Finish".
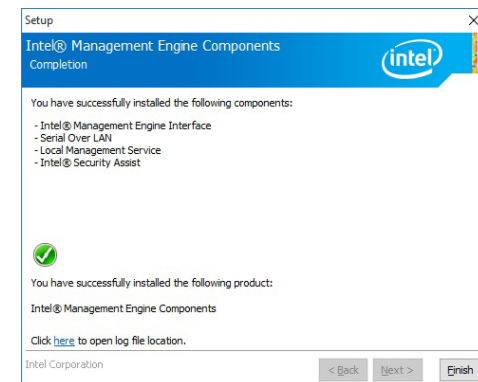
HW Utility

HW Utility provides information about the board, Watchdog, and DIO. To access the utility, click "HW Utility" on the main menu.

> **Note:**
> If you are using Windows 7 or later versions, you need to access the operating system as an administrator to be able to install the utility.

---

1. Setup is ready to install the driver.
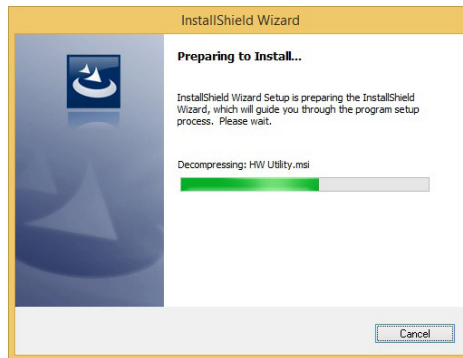
2. Click "Next" to continue.
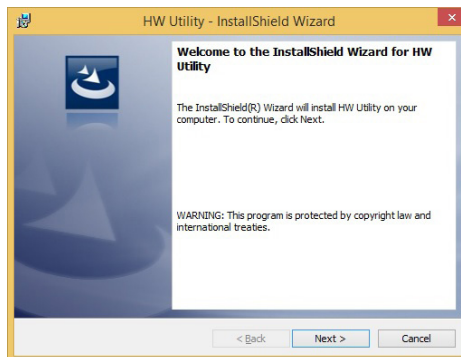
3. Read the license agreement then click "I accept the terms in the license agreement". Click "Next".
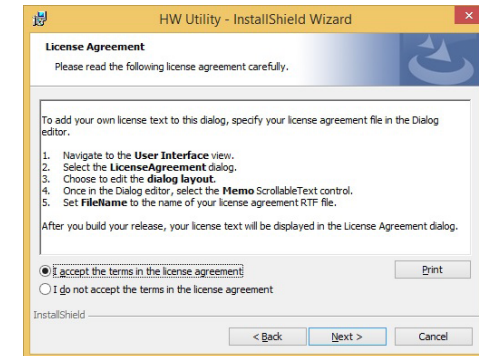
4. The wizard is ready to begin installation. Click "Install".
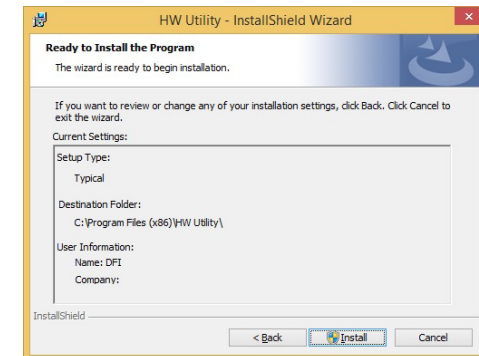
5. Please wait while the program features are being installed.

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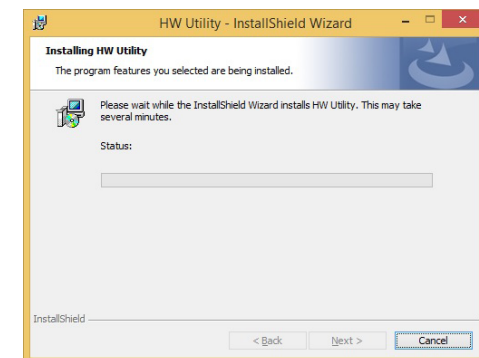
6. After completing installation, click "Finish".

The HW Utility icon will appear on the desktop. Double-click the icon to open the utility.
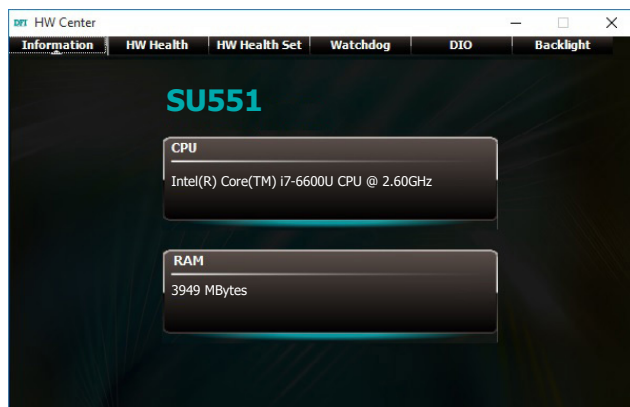
Information

> **Note:**
> The screenshot displayed above is for illustrative purpose only, and may not resemble the actual screen.

The SU551 HW Utility features the following tabs: Information, HW Health, HW Health set, Watchdog, DIO and Backlight. Click on the tabs to access information about the board.

Intel USB 3.0 Drivers (For Windows 7 and Windows 8.1)

To install the driver, click "Intel USB 3.0 Driver" on the main menu.
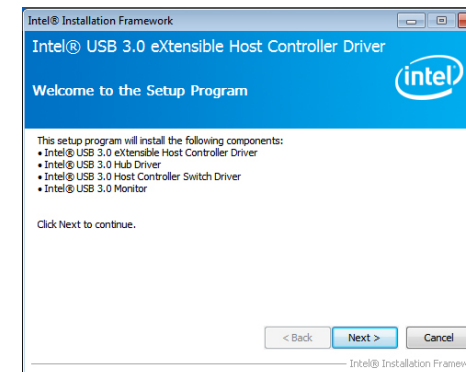
1. Setup is ready to install the driver. Click Next.

2. Read the license agreement then click Yes.
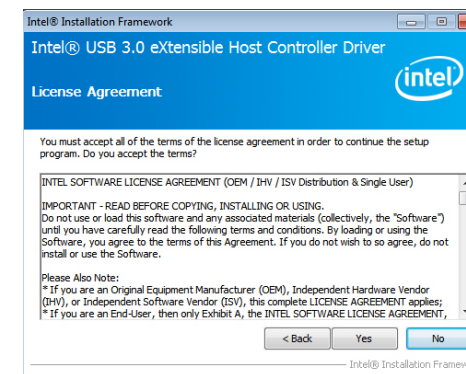
3. Go through the readme docu-
   ment for more installation tips
   then click Next.
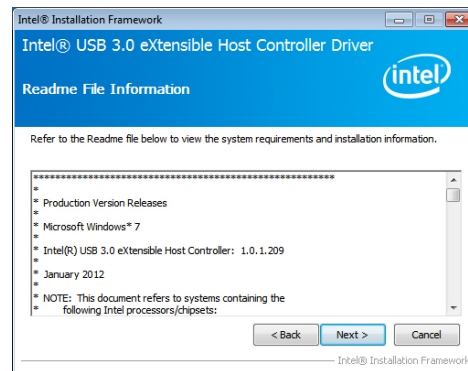
4. Setup is currently installing the
   driver. After installation has com-
   pleted, click Next.
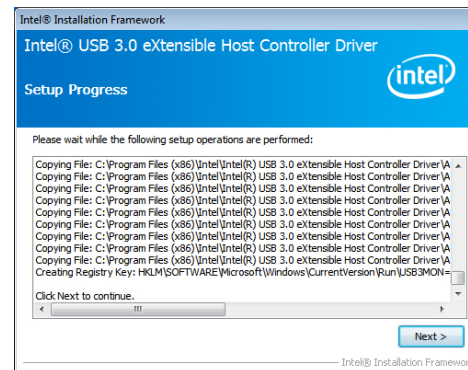
5. After completing installation, click
   Finish.
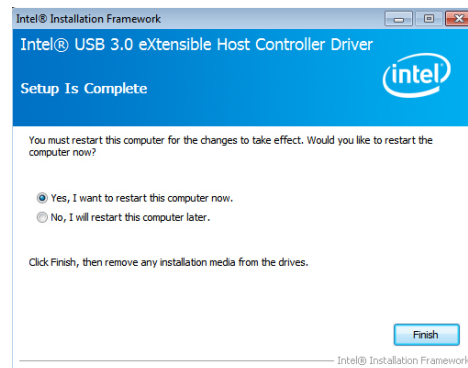
IO Driver (For Windows 10 and Windows 8.1)

To install the driver, click "Intel Serial IO Driver" on the main menu
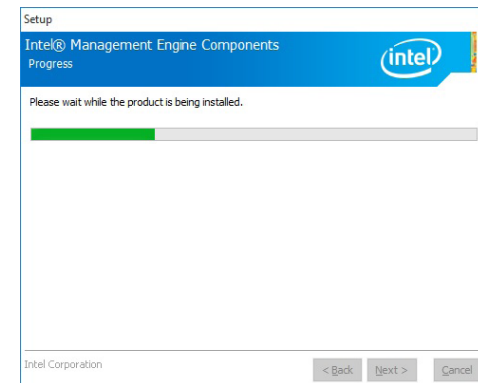
1. Setup is ready to install the driver.
   Click Next.
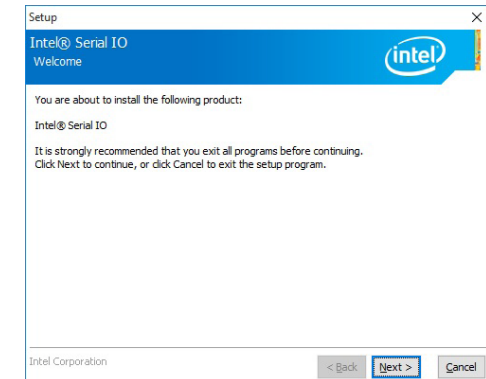
2. Read the license agreement care-
   fully. Click "I accept the terms in
   the   License Agreement" then
   click Next.

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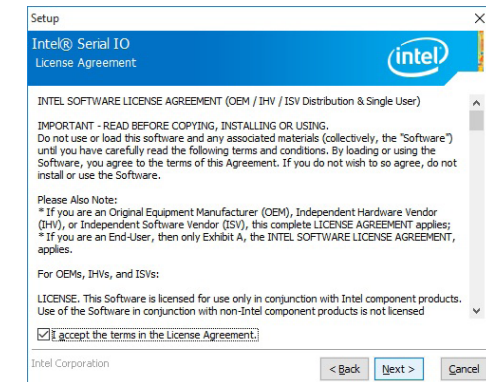
3. Read the file information then click Next.
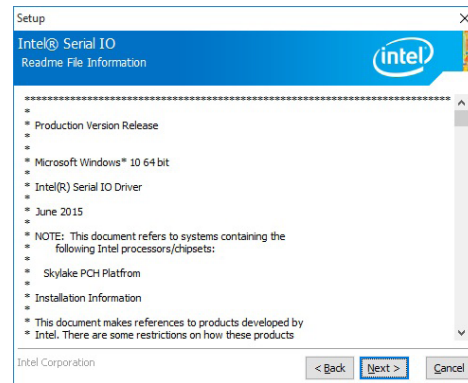
4. Setup is ready to install the driver. Click Next.
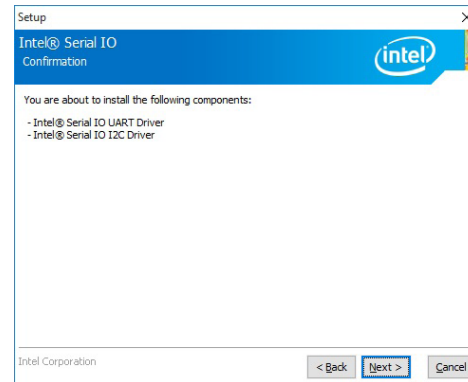
5. Setup is now installing the driver.
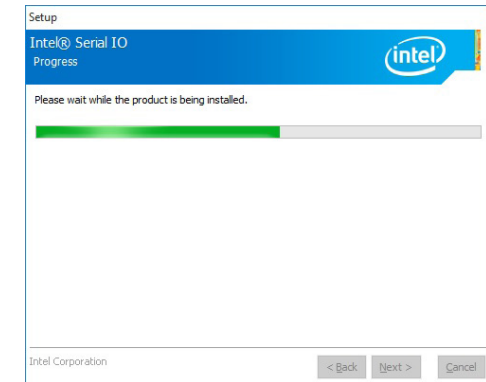
6. Click Finish.
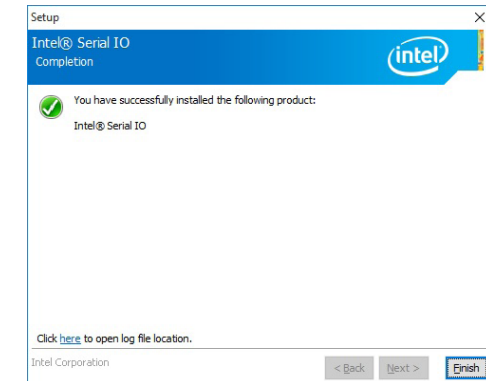
Microsoft Framework 4.5.2 (For Windows 7)

> **Note:**
> Before installing Microsoft Framework 4.5.2, make sure you have updated your Windows 7 operating system to Service Pack 1.

To install the driver, click "Microsoft Framework 4.5.2" on the main menu.

1. Setup is now extracting files.

3. Setup is now installing the driver.

4. Click "Finish".

2. Read the license agreement carefully.

   Click "I have read and accept the terms of the License Agreement" then click "Install".
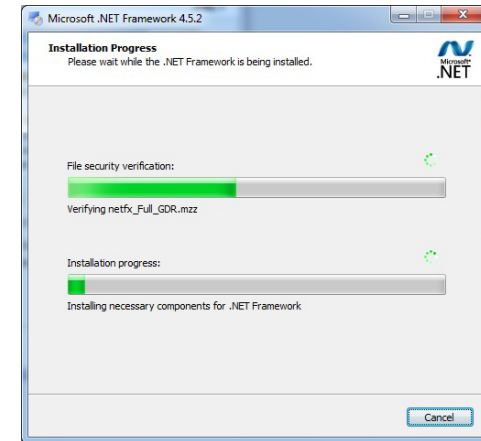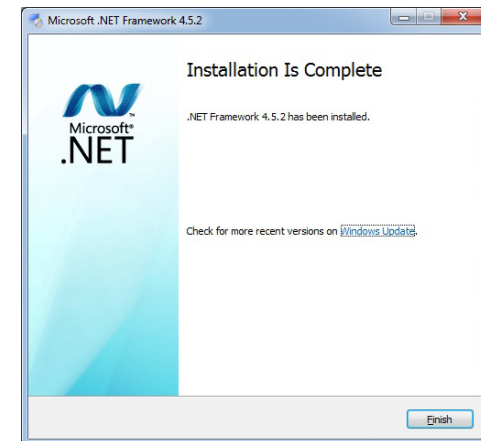
Intel Rapid Storage Technology

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, click "Intel Rapid Storage Technology" on the main menu. Please refer to **Chapter 5** for more information.

Infineon TPM 1.2 Driver and Tool (Optional)

To install the driver, click "Infineon TPM driver and tool (option)" on the main menu.

1. The setup program is preparing to install the driver.
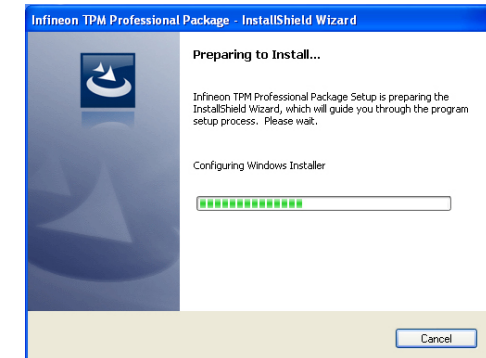
2. The setup program is now ready to install the utility. Click "Next".
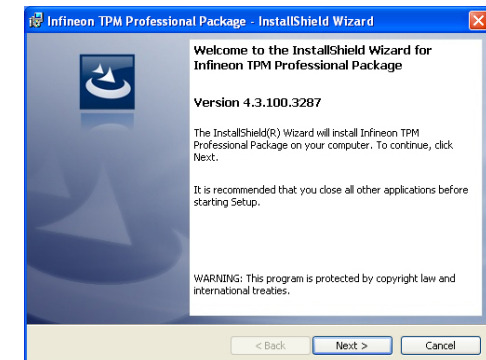
3. Click "I accept the terms in the license agreement" and then click "Next".
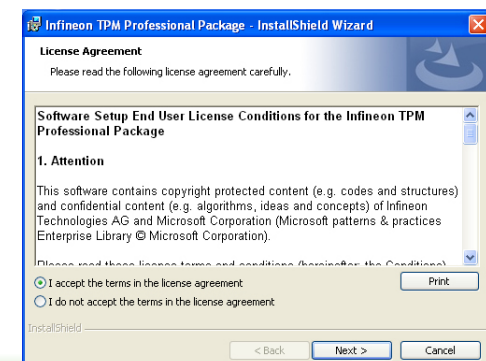
4. Enter the necessary information and then click "Next".

7. TPM requires installing the Microsoft Visual C++ package prior to installing the utility. Click "Install".
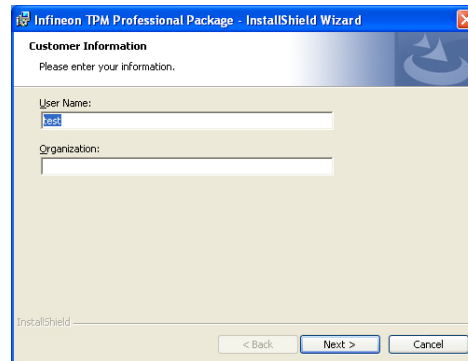
5. Select a setup type and then click "Next".
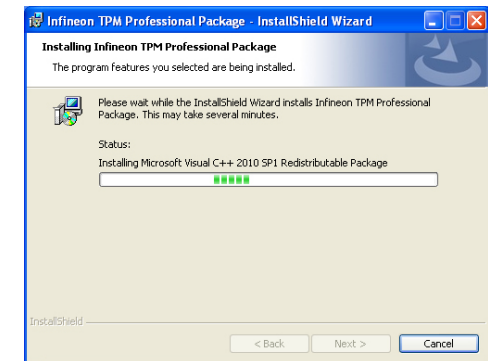
8. The setup program is currently installing the Microsoft Visual C++ package.

6. Click "Install".

9. Click "Finish".

49
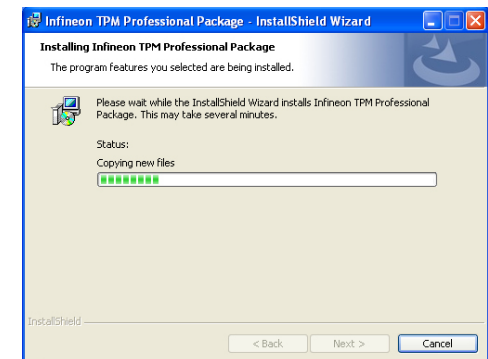
10. Click "Yes" to restart your system.
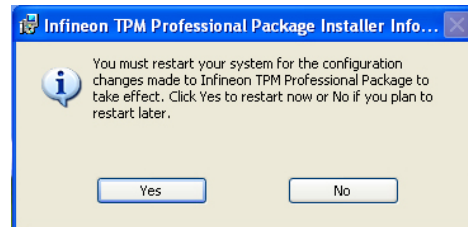
Adobe Acrobat Reader 9.3 (For Windows 7 and Windows 8.1)

To install the reader, click "Adobe Acrobat Reader 9.3" on the main menu.

1. Click Next to install or click Change Destination Folder to select another folder.
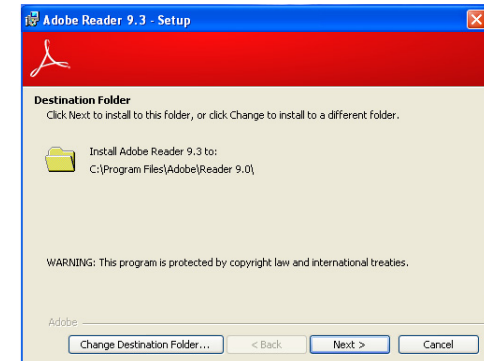
2. Click Install to begin installation.
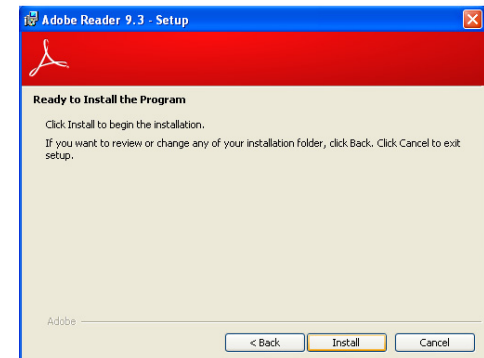
3. Click Finish to exit installation.
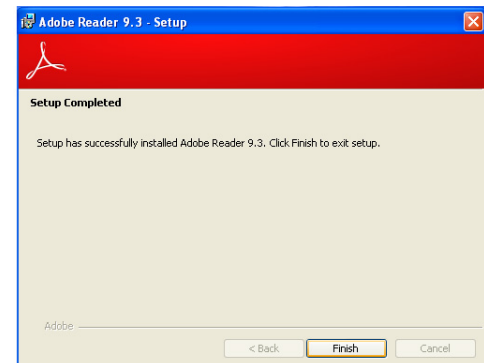
Chapter 5 - RAID

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

RAID Levels

RAID 0 (Striped Disk Array without Fault Tolerance)

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

RAID 1 (Mirroring Disk Array with Fault Tolerance)

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

RAID 5

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

Settings

To enable the RAID function, the following settings are required.

1. Connect the Serial ATA drives.

2. Enable Serial ATA in the Insyde BIOS.

3. Create a RAID volume.

4. Install the Intel Rapid Storage Technology Utility.

Step 1: Connect the Serial ATA Drives

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

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

Step 2: Enable RAID in the BIOS

1. Power-on the system then press <Del> to enter the main menu of the Insyde BIOS.

2. Go to "Advanced" menu, and select the "SATA Configuration" menu.

3. Change the "SATA Mode Selection" to "RAID" mode.

4. Save the changes in the "Save & Exit" menu.

5. Reboot the system.

Step 3: Create a RAID Volume

1. When the Intel® RST option ROM status screen displays during POST, press <Ctrl> and <I> simultaneously to enter the option ROM user interface.

2. Select 1: Create RAID Volume and press <Enter>.

3. Use the up or down arrow keys to select the RAID level and press <Enter>.

4. Use the up or down arrow keys to select the strip size and press <Enter>.

5. Press <Enter> to select the physical disks.

6. Use the up or down arrow keys to scroll through the list of hard drives and press <Space> to select the drive.

7. Press <Enter>.

8. Select the volume size and press <Enter>. You must select less than one hundred percent of the available volume space to leave space for the second volume.

9. Press <Enter> to create the volume.

10. At the prompt, press <Y> to confirm volume creation.

11. Select 4: Exit and press <Enter>.

12. Press <Y> to confirm exit.

> **Note:**
> These steps are cited from the Intel® Suppot site, "Set Up a System with Intel® Matrix RAID Technology" (Article ID: 000005789).
> http://www.intel.com/content/www/us/en/support/boards-and-kits/000005789.htm

Step 3-1: Create a RAID Volume if the boot type is UEFI

If the boot type is set to UEFI, RAID volume creation will be different. Please use the following steps to create RAID volumes. To set the boot type, enter the Insyde BIOS and go to "Boot" >"Boot type".

1. Go to the "Advanced" menu of the Insyde BIOS.

2. The "Intel® Rapid Storage Technology" menu appears. Enter this menu.
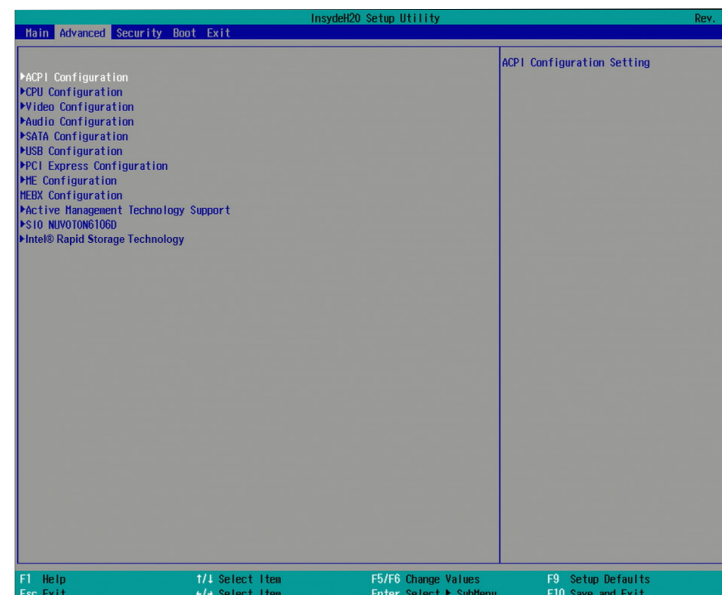
3. The screen displays all available drives. Select "Create RAID volume" to create a RAID volume".

4. Use the up or down arrow keys to select the RAID level and press <Enter>.

5. Use the up or down arrow keys to scroll through the list of hard drives and press <Space> to select the drive.

6. Press <Enter>.

7. Use the up or down arrow keys to select the strip size and press <Enter>.

8. Enter the volume size and press <Enter>.

9. At the prompt, press <Y> to confirm volume creation.

Step 4: Install the Intel Rapid Storage Technology Utility

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

1. Insert the provided DVD into an optical drive.

2. Click "Intel Rapid Storage Technology Utility" on the main menu.

3. Setup is ready to install the utility. Click Next.
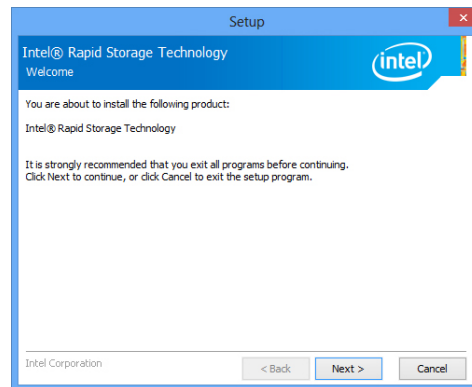
4. Read the license agreement and click "I accept the terms in the License Agreement." Then, click Next.
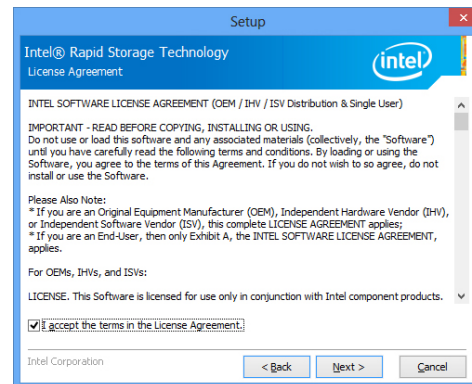
5. Go through the readme document to view system requirements and installation information then click Next.
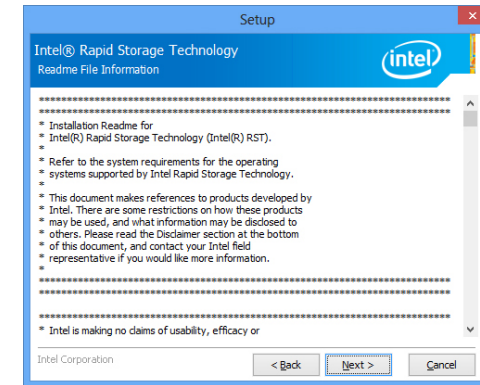
6. Click Next to install to the default folder or click change to choose another destination folder.
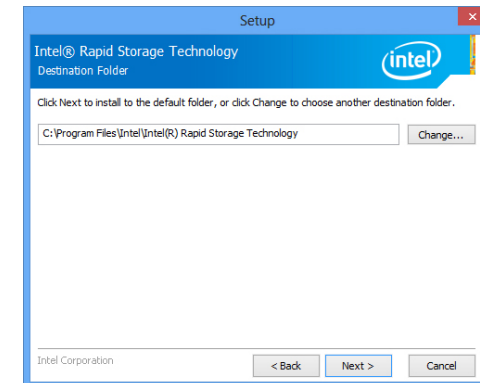
7. Confirm the installation and click Next.
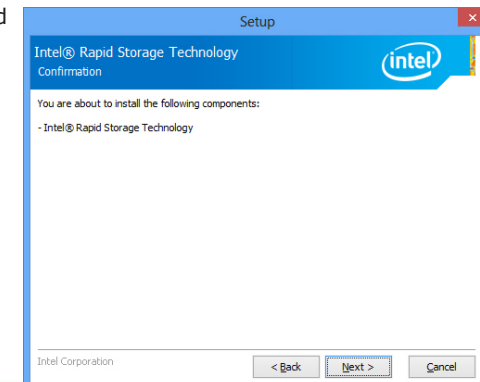
8. Click "Yes, I want to restart this computer now" to complete the installation and then click Finish.

Chapter 6 - 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 **Avtive Management Technology Support**.

```
                         InsydeH20 Setup Utility                    Rev. 5.0
    Main      Advanced     Security     Boot      Exit

                                                        AMT Configuration
   ▶ ACPI Configuration
   ▶ CPU Configuration
   ▶ Video Configuration
   ▶ Audio Configuration
   ▶ SATA Configuration
   ▶ USB Configuration
   ▶ PCI Express Configuration
   ▶ ME Configuration
   MEBX Configuration
   ▶ Active Management Technology Supoort
   ▶ SIO NUVOTON6106D




   F1  Help        ↑/↓   Select Item      F5/F6 Change Values     F9  Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu  F10 Save and Exit
```

3. In the **Advanced** menu, select **Enable** in the **AMT** field.

```
                         InsydeH20 Setup Utility                    Rev. 5.0
          Advanced

   Active Management Technology Support                 Enable/Disable Intel(R)
                                                        Active
   Intel AMT Support              <Enabled>             Management Technology
   Un-Configure ME               <Disabled>            BIOS Extension.
                                                        Note : iAMT H/W is al-
                                                        ways enabled. This Option
                                                        Just controls the BIOS ex-
                                                        tension execution









   F1  Help        ↑/↓   Select Item      F5/F6 Change Values     F9  Setup Defaults
   Esc Exit        ←/→   Select Item      Enter Select ▶ SubMenu  F10 Save and Exit
```

Un-Configure ME
Un-configure ME without password. You can select enabled or disabled.

4. In the **Exit** menu, select **Exit Saving Changes** then select **OK**.

```
                        InsydeH20 Setup Utility                    Rev. 5.0
     Main      Advanced    Security    Boot    Exit

                                               Exit system setup and save
                                               your changes.
   Exit Saving Changes
   Load Optimal Defaults
   Discard Changes




  F1   Help         ↑/↓   Select Item     F5/F6 Change Values      F9   Setup Defaults
  Esc  Exit         ←/→   Select Item     Enter Select ► SubMenu   F10  Save and Exit
```
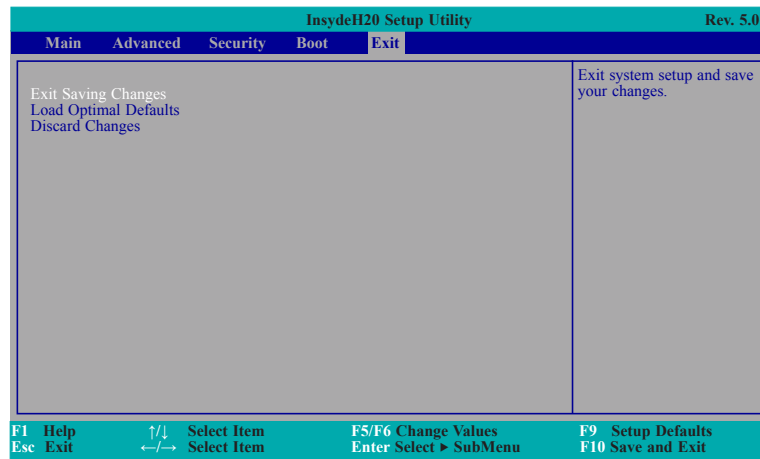
Enable Intel® AMT in the Intel® Management Engine BIOS Extension (MEBX) Screen

1. When the system reboots, you will be prompted for a password. The default password is "**admin**". Enter the default password in the space provided under Intel(R) ME Password then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
              Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
  ┌──────────────────────────────────────────────────────────────┐
  │                          MAIN MENU                             │
  └──────────────────────────────────────────────────────────────┘

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




             Intel(R) ME Password


  ┌──────────────────────────────────────────────────────────────┐
  │ [↑↓] = Move Highlight     [Enter] = Select Entry      [Esc]= Exit │
  └──────────────────────────────────────────────────────────────┘
```
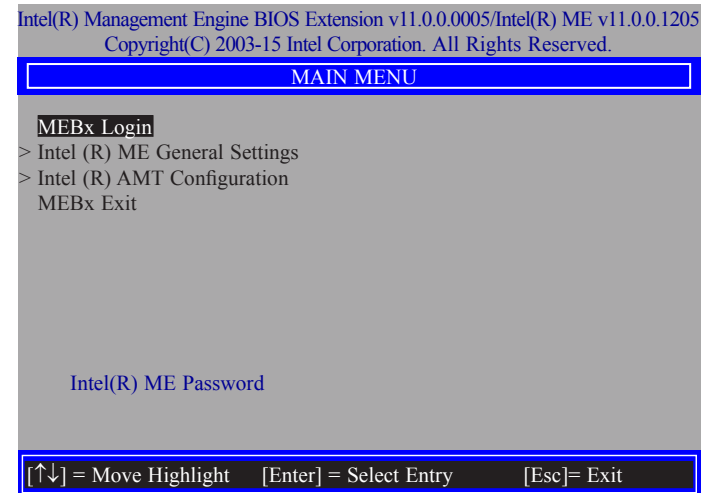
2. Enter a password in the space provided under Intel(R) ME Password then press Enter. The password must include:

- 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

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                              MAIN MENU

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

                    Intel (R) ME Password


            Intel(R) ME Password


[↑↓] = Move Highlight    [Enter] = Select Entry    [Esc]= Exit
```
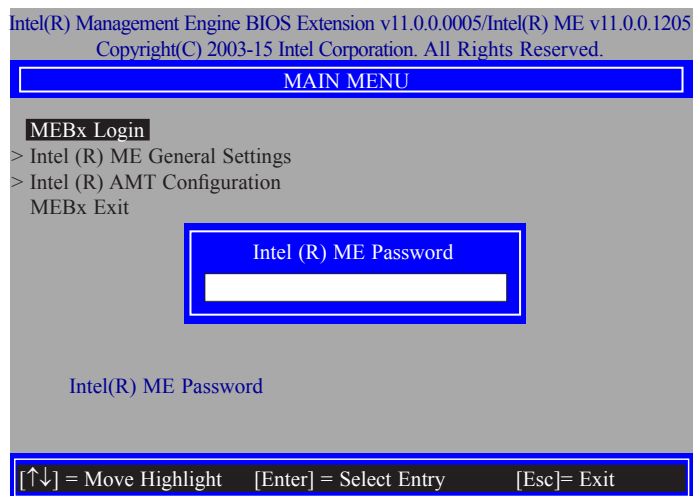
3. You will be asked to verify the password. Enter the same new password in the space provided under Verify Password then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                              MAIN MENU

  MEBx Login
> Intel (R) ME General Settings
> Intel (R) AMT Configuration
   MEBx Exit
                    Verify Password


            Intel(R) ME Password


[↑↓] = Move Highlight    [Enter] = Select Entry    [Esc]= Exit
```
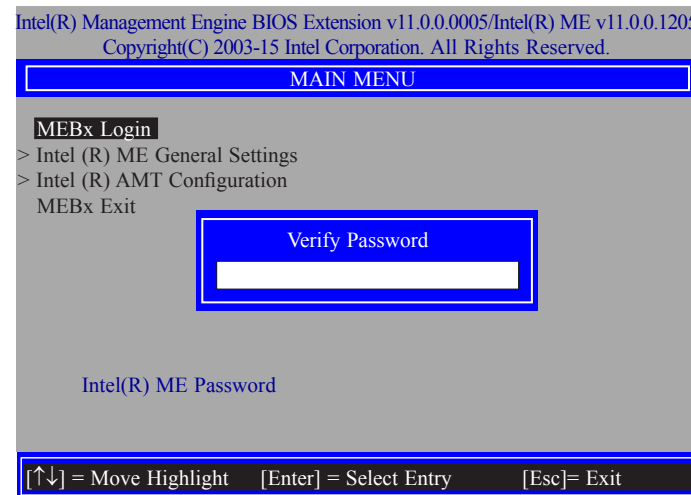
4. Select **Intel(R) ME General Settings** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                              MAIN MENU

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


[↑↓] = Move Highlight    [Enter] = Select Entry    [Esc]= Exit
```
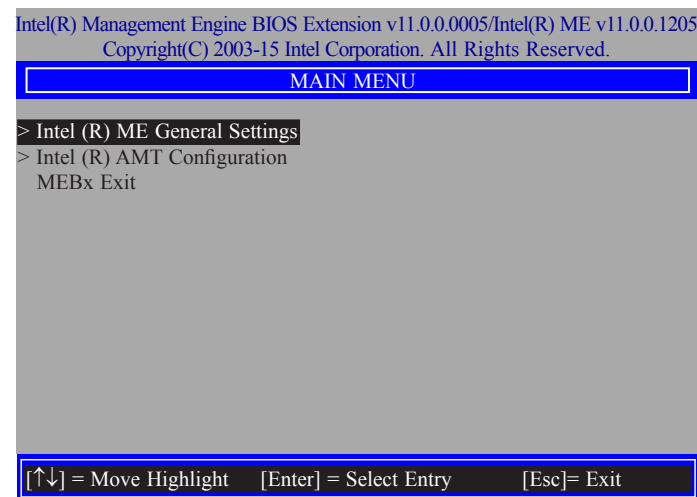
5. Select **Change Intel(R) ME Password** then press Enter.

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

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

    Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
    Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.

    INTEL (R) ME PLATFORM CONFIGURATION

    Change ME Password
    Local FW Update   <Enabled>

    Intel (R) ME New Password

    [↑↓] = Move Highlight   [Enter] = Select Entry   [Esc]= Exit
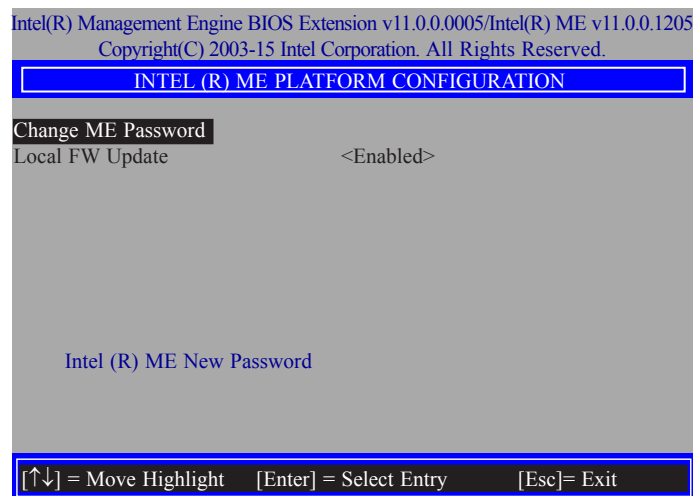
6. Select **Local FW Update** then press Enter. Select **Enabled** or **Disabled** or **password Protected** then press Enter.

    Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
    Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.

    INTEL (R) ME PLATFORM CONFIGURATION

    Change ME Password
    Local FW Update   <Enabled>

    Disabled
    Enabled
    Password Protected

    [↑↓] = Move Highlight   [Enter] = Complete Entry [Esc]= Discard Changes
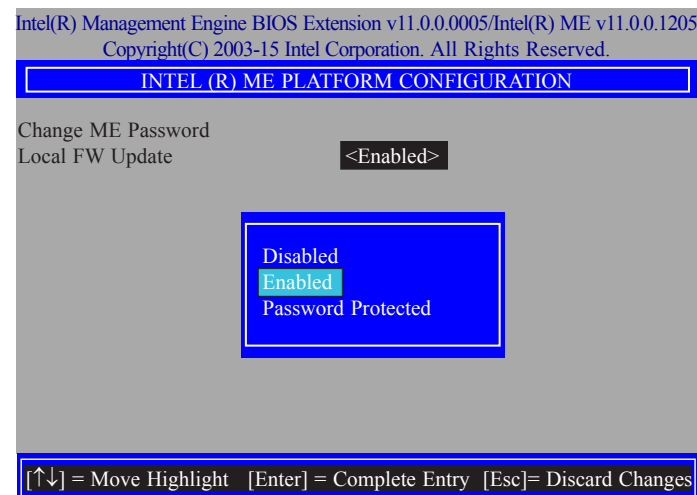
7. Select Previous Menu until you return to the **Main Menu**. Select **Intel(R) AMT Con-figuration** then press Enter.

    Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
    Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.

    INTEL (R) AMT CONFIGURATION

    Manageability Feature Selection   < Enabled>
    > SOL/Storage Redirection/KVM
    > User Consent
      Password Policy   <Anytime>
    > Network Setup
      Activate Network Access
      Unconfigure Network Access   <Full Unprovision>
    > Remote Setup And Configuration
    > Power Control

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

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.

INTEL (R) AMT CONFIGURATION

Manageability Feature Selection	< Enabled>
> SOL/Storage Redirection/KVM	
> User Consent	
Password Policy	<Anytime>
> Network Setup	Disabled
Activate Network Access	Enabled
Unconfigure Network Access	l Unprovision>
> Remote Setup And Configuration	
> Power Control	

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

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
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SOL/Storage Redirection/KVM

Username and Password	< Enabled>
SOL	<Enabled>
Storage Redirection	<Enabled>
KVM Feature Selection	<Enabled>

Menu for FW Redirection Configuration

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

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
Copyright(C) 2003-15 Intel Corporation. All Rights Reserved..

SOL/Storage Redirection/KVM

Username and Password	< Enabled>
SOL	<Enabled>
Storage Redirection	<Enabled>
KVM Feature Selection	<Enabled>
	Disabled
	Enabled

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

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.

SOL/Storage Redirection/KVM

Username and password	< Enabled>
SOL	<Enabled>
Storage Redirection	<Enabled>
KVM Feature Selection	<Enabled>
	Disabled
	Enabled

[↑↓] = Move Highlight   [Enter] = Complete Entry [Esc]= Discard Changes
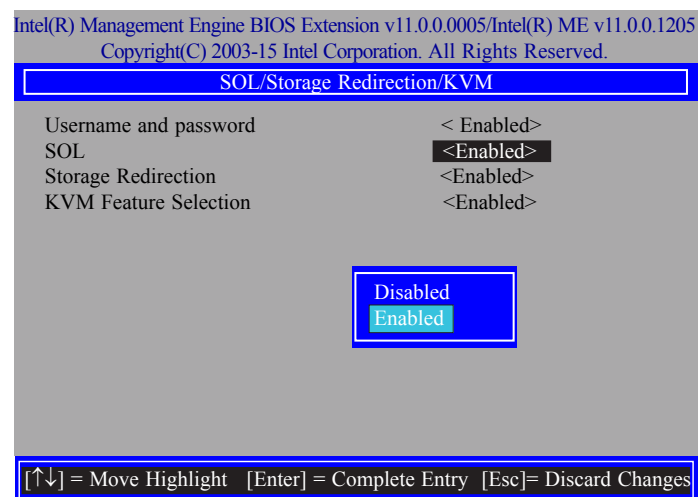
12. In the **SOL/Storage Redirection/KVM** menu, select **Storage Redirection** then press Enter. Select **Enabled** or **Disabled** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
┌──────────────────────────────────────────────────────────────────────┐
│                      SOL/Storage Redirection/KVM                       │
└──────────────────────────────────────────────────────────────────────┘

      Username and password              < Enabled>
      SOL                                <Enabled>
      Storage Redirection                <Enabled>
      KVM Feature Selection              <Enabled>

                          ┌──────────────┐
                          │  Disabled    │
                          │  Enabled     │
                          └──────────────┘


┌──────────────────────────────────────────────────────────────────────┐
│  [↑↓] = Move Highlight   [Enter] = Complete Entry  [Esc]= Discard Changes │
└──────────────────────────────────────────────────────────────────────┘
```
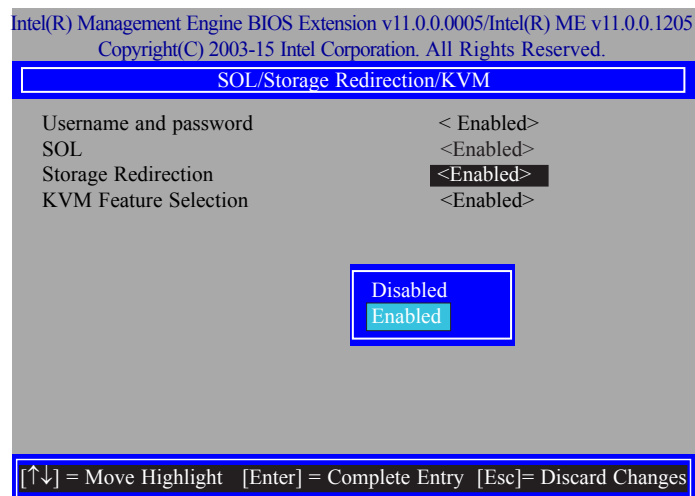
13. In the **SOL/IDER/KVM** menu, select **KVM Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
┌──────────────────────────────────────────────────────────────────────┐
│                      SOL/Storage Redirection/KVM                       │
└──────────────────────────────────────────────────────────────────────┘

      Username and password              < Enabled>
      SOL                                <Enabled>
      Storage Redirection                <Enabled>
      KVM Feature Selection              <Enabled>

                          ┌──────────────┐
                          │  Disabled    │
                          │  Enabled     │
                          └──────────────┘


┌──────────────────────────────────────────────────────────────────────┐
│  [↑↓] = Move Highlight   [Enter] = Complete Entry  [Esc]= Discard Changes │
└──────────────────────────────────────────────────────────────────────┘
```
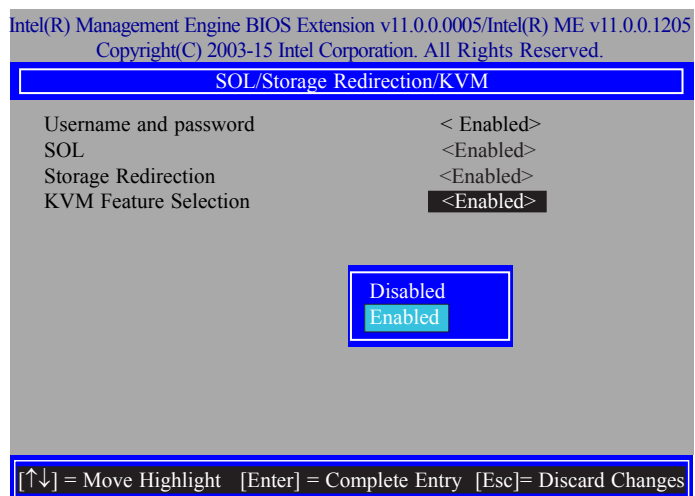
14. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **User Consent** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME 1205
         v11.0.0.Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
┌──────────────────────────────────────────────────────────────────────┐
│                             USER CONSENT                               │
└──────────────────────────────────────────────────────────────────────┘
      User Opt-in                        < KVM>
      Opt-in Configurable from Remote IT    < Enabled>




              Configure When User Consent Should be Required.


┌──────────────────────────────────────────────────────────────────────┐
│  [↑↓] = Move Highlight     [Enter] = Select Entry        [Esc]= Exit   │
└──────────────────────────────────────────────────────────────────────┘
```

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

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
            Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
┌──────────────────────────────────────────────────────────────────────┐
│                             USER CONSENT                               │
└──────────────────────────────────────────────────────────────────────┘
      User Opt-in                        < KVM>
      Opt-in Configurable from Remote IT    < Enabled>

                          ┌──────────────┐
                          │  NONE        │
                          │  KVM         │
                          │  ALL         │
                          └──────────────┘


┌──────────────────────────────────────────────────────────────────────┐
│  [↑↓] = Move Highlight   [Enter] = Complete Entry  [Esc]= Discard Changes │
└──────────────────────────────────────────────────────────────────────┘
```
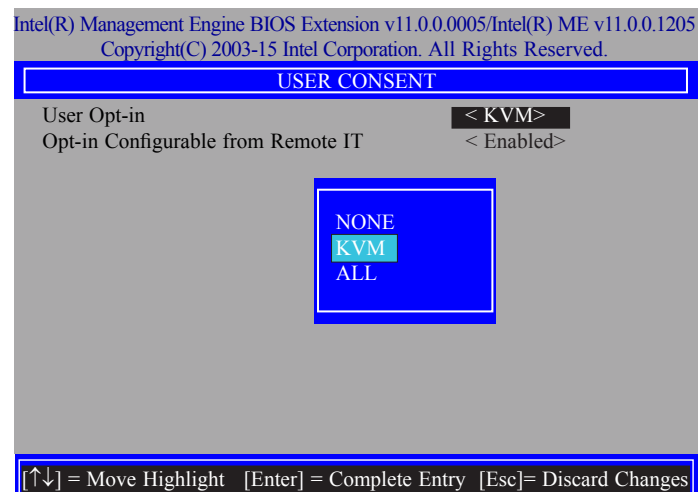
16. In the **User Consent** menu**,** select **Opt-in Configurable from Remote IT** then press Enter. Select **Enabled** or **Disable Remote Control of KVM Opt-in Policy** then press Enter.

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
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USER CONSENT

User Opt-in   < KVM>
Opt-in Configurable from Remote IT   < Enabled>

Disabled
Enabled

[↑↓] = Move Highlight   [Enter] = Complete Entry [Esc]= Discard Changes
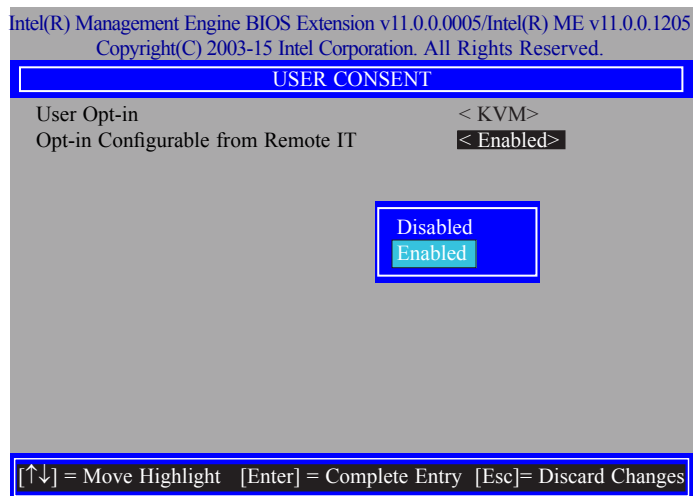
17. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **Password Policy** then press Enter.

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
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INTEL (R) AMT CONFIGURATION

Manageability Feature Selection   < Enabled>
> SOL/Storage Redirection/KVM
> User Consent
Password Policy   <Anytime>
> Network Setup
Activate Network Access
Unconfigure Network Access   <Full Unprovision>
> Remote Setup And Configur
> Power Control

Default Password Only
During Step And Configuration
Anytime

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

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

Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
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INTEL (R) AMT CONFIGURATION

Manageability Feature Selection   < Enabled>
> SOL/Storage Redirection/KVM
> User Consent
Password Policy   <Anytime>
> Network Setup
Activate Network Access
Unconfigure Network Access   <Full Unprovision>
> Remote Setup And Configuration
> Power Control

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

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

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INTEL (R) ME NETWORK SETUP

> Intel (R) ME Network Name Settings
> TCP/ IP Settings

[↑↓] = Move Highlight   [Enter] = Select Entry   [Esc]= Exit
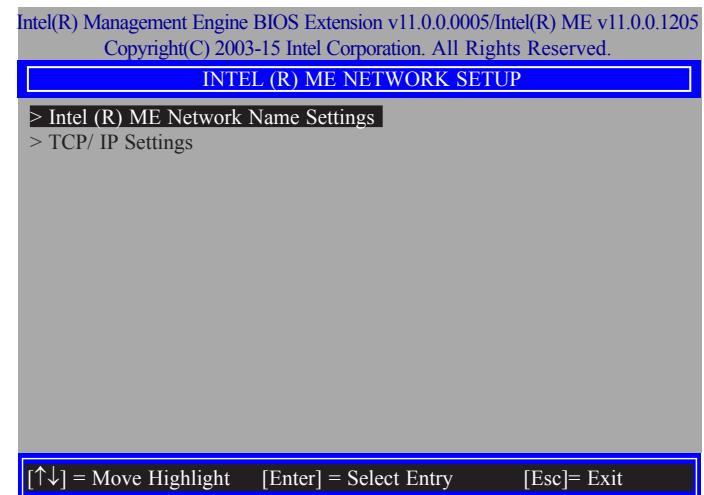
20. In the **Intel(R) ME Network Name Settings** menu, select **Host Name** then press Enter. Enter the computer's host name then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS

Host Name   _
Domain Name
Shared/ Dedicated FQDN   <Shared>
Dynamic DNS Update   <Disabled>

Computer Host Name

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

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

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INTEL (R) ME NETWORK NAME SETTINGS

Host Name   _
Domain Name   _
Shared/ Dedicated FQDN   <Shared>
Dynamic DNS Update   <Disabled>

Computer Domain Name

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

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

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INTEL (R) ME NETWORK NAME SETTINGS

Host Name   _
Domain Name   _
Shared/ Dedicated FQDN   <Shared>
Dynamic DNS Update   <Disabled>

Dedicated
Shared

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

23. Select **Dynamic DNS Update** then press Enter. Select **Enabled** or **Disabled** then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS

Host Name   _
Domain Name   _
Shared/ Dedicated FQDN   <Shared>
Dynamic DNS Update   <Disabled>

Disabled
Enabled

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

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

```
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           Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                          TCP/ IP SETTINGS
> Wired LAN IPV4 Configuration




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

25. In the **TCP/IP Settings** menu, select **Wired LAN IPV4 Configuration** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
           Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                     WIRED LAN IPV4 CONFIGURATION
DHCP Mode                          <Enabled>

                    Disabled
                    Enabled


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

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

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
           Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                      INTEL (R) AMT CONFIGURATION
  Manageability Feature Selection          < Enabled>
> SOL/Storage Redirection/KVM
> User Consent
  Password Policy                          <Anytime>
> Network Setup
  Activate Network Access
  Unconfigure Network Access              <Full Unprovision>
> Remote Setup And Configuration
> Power Control


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

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

```
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           Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                      INTEL (R) AMT CONFIGURATION
  Manageability Feature Selection          < Enabled>
> SOL/Storage Redirection/KVM
> User Consent
  Password Policy                          <Anytime>
> Network Setup
  Activate Network Access
  Unconfigure Network Access              <Full Unprovision>
> Remote Setup And Configuration
> Power Control
                                          Full Unprovision


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

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

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INTEL (R) AMT CONFIGURATION

```
   Manageability Feature Selection          < Enabled>
 > SOL/Storage Redirection/KVM
 > User Consent
   Password Policy                          <Anytime>
 > Network Setup
   Activate Network Access
   Unconfigure Network Access               <Full Unprovision>
 > Remote Setup And Configuration
 > Power Control
```

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

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

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INTEL (R) REMOTE SETUP AND CONFIGURATION

```
   Current Provisioning Mode
   Provisioning Record
   Provisioning Server IPV4/IPV6            _
   Provisioning Server FQDN                 _
 > RCFG
 > TLS PKI
```

Provisioning Mode:PKI

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

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

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INTEL (R) REMOTE SETUP AND CONFIGURATION

```
   Current Provisioning Mode
   Provisioning Record
   Provisioning Server IPV4/IPV6            _
   Provisioning Server FQDN                 _
 > RCFG
 > TLS PKI
```

Provision Record is not present

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

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

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INTEL (R) REMOTE SETUP AND CONFIGURATION

```
   Current Provisioning Mode
   Provisioning Record
   Provisioning Server IPV4/IPV6            _
   Provisioning Server FQDN                 _
 > RCFG
 > TLS PKI
```

Provisioning server address

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

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

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                INTEL (R) REMOTE SETUP AND CONFIGURATION

     Current Provisioning Mode
     Provisioning Record
     Provisioning Server IPV4/IPV6          _
     Provisioning Server FQDN               _
   > RCFG
   > TLS PKI

                   Enter FQDN of provisioning server
                   [                              ]


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

34. In the **Intel(R) Remote Setup And Configuration** menu**,** select **TLS PKI** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                INTEL (R) REMOTE SETUP AND CONFIGURATION

     Current Provisioning Mode
     Provisioning Record
     Provisioning Server IPV4/IPV6          _
     Provisioning Server FQDN               _
   > RCFG
   > TLS PKI


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

33. In the **Intel(R) Remote Setup And Configuration** menu**,** select **RCFG** then press Enter, and select **Start Configuration** then press enter.

```
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                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                INTEL (R) REMOTE CONFIGURATION

     Start Configuration


     [↑↓] = Move Highlight    [Enter] = Select Entry        [Esc]= Exit
```
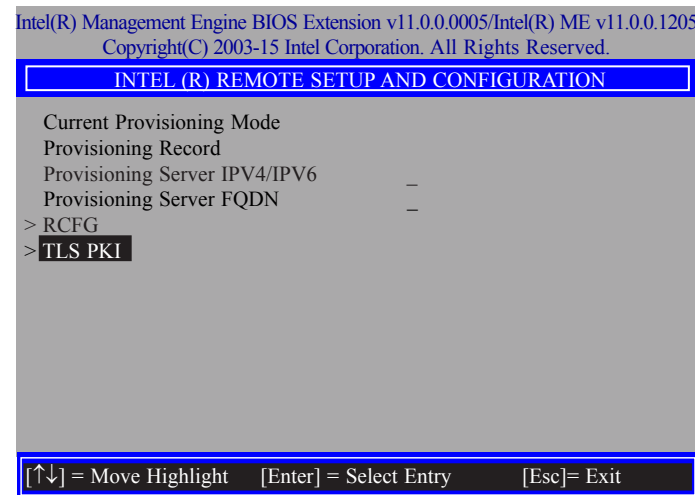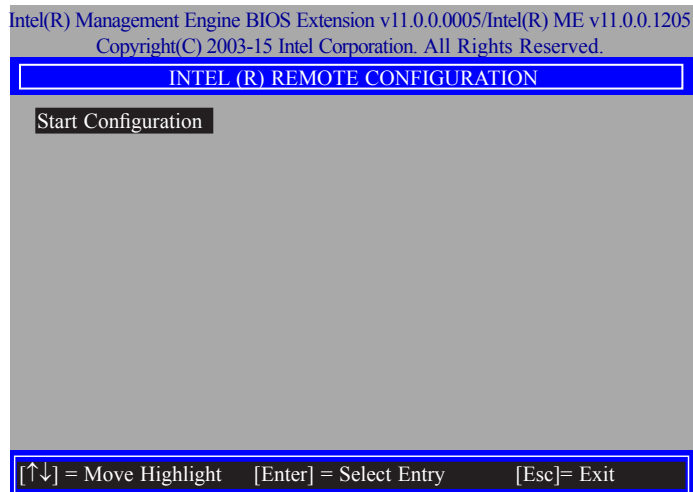
35. In the **Intel(R) Remote Configuration** menu**,** select **Remote Configuration**** then press Enter, select **Enabled** or **Disabled** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                INTEL (R) REMOTE CONFIGURATION

     Remote  Configuration**          < Enabled>
     PKI DNS Suffix                   _
   > Manage Hashes

                         Disabled
                         Enabled

     [↑↓] = Move Highlight    [Enter] = Select Entry        [Esc]= Exit
```
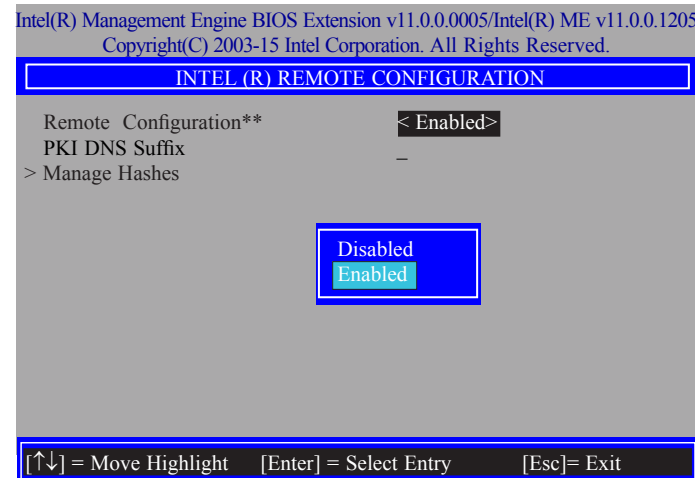
36. Select **PKI DNS Suffix,** Enter the PKI DNS Suffix then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                    INTEL (R) REMOTE CONFIGURATION

    Remote  Configuration**           < Enabled>
    PKI DNS Suffix                       _
  > Manage Hashes


                        Enter PKI DNS Suffix
                    ┌─────────────────────────────┐
                    │                             │
                    └─────────────────────────────┘




                [Enter] = Select Entry     [Esc]= Diacard Changes
```

37. Select **Manage Hashes** then press Enter, and select one of hash name.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                    INTEL (R) REMOTE CONFIGURATION

    Remote  Configuration**           < Enabled>
    PKI DNS Suffix                       _
  > Manage Hashes



                        Manage Hashes


    [↑↓] = Move Highlight     [Enter] = Select Entry        [Esc]= Exit
```
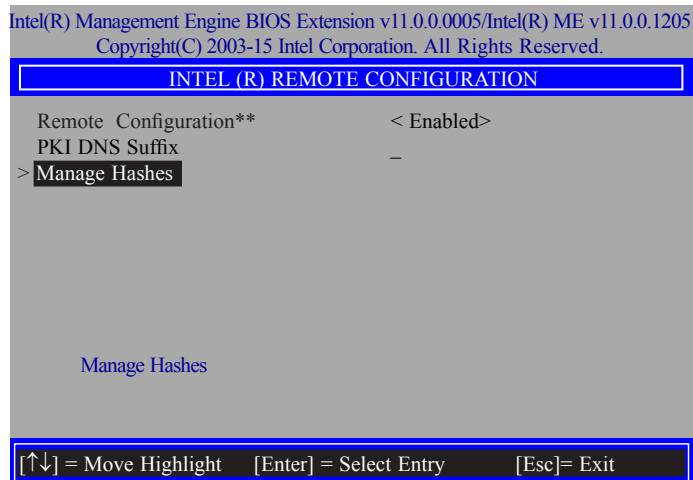
38. In the **Intel(R) AMT Configuration** menu, select **Power Control** then press Enter.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.0.1205
                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                    INTEL (R) AMT CONFIGURATION

    Manageability Feature Selection      < Enabled>
  > SOL/Storage Redirection/KVM
  > User Consent
    Password Policy                      <Anytime>
  > Network Setup
    Activate Network Access
    Unconfigure Network Access           <Full Unprovision>
  > Remote Setup And Configuration
  > Power Control



    [↑↓] = Move Highlight     [Enter] = Select Entry        [Esc]= Exit
```
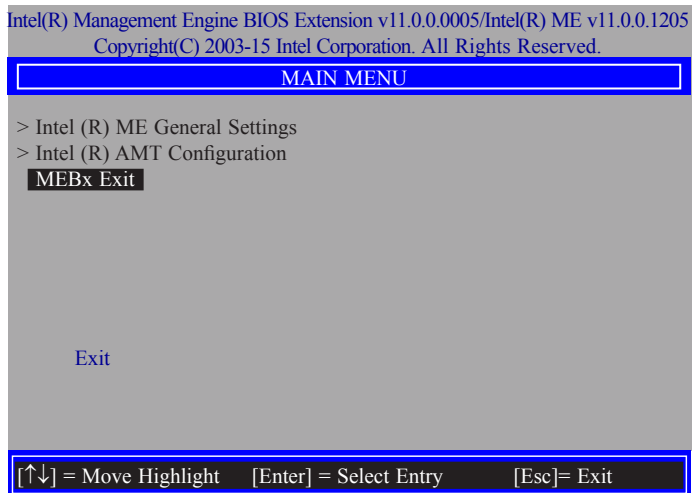
39. In the **Intel(R) AMT Power Control** menu, select **Intel(R) AMT ON in Host Sleep States** then press Enter. Select an option then press Enter.

```
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                Copyright(C) 2003-15 Intel Corporation. All Rights Reserved.
                    INTEL (R) AMT POWER CONTROL

    These configurations are effective only after AMT provisioning has started

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

    Idle Timeout                                65535

                    ┌─────────────────────────────────────────┐
                    │  Mobile: ON in S0                         │
                    │  Mobile: ON in S0, ME Wake in S3, S4-5 (AC only) │
                    └─────────────────────────────────────────┘

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

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

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INTEL (R) AMT POWER CONTROL

This configurations are effective only after AMT provisioning has started

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

Idle Timeout   65535

Timeout Value (1-65535)

65535

<ENTER> = Complete Entry   [ESC]= Discard Changes

41. Select Previous Menu until you return to the **Main Menu**. Select **Exit** then press Enter. Type **Y** then press Enter.

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MAIN MENU

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

Exit

[↑↓] = Move Highlight   [Enter] = Select Entry   [Esc]= 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 are 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.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.

2. The diskette may be write-protected. Use a diskette that is not write-protected.

3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.

4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

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.