DFI®

DT122-SD

Desktop Box PC
User's Manual

A45000711

Copyright

Trademarks

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

FCC and DOC Statement on Class A

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

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

Notice:

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

Table of Contents

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 con nectors by their ends.

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

Safety Measures

To avoid damage to the system:
- Use the correct AC input voltage range.

To reduce the risk of electric shock:
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

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

Safety Precautions

- Use the correct DC input voltage range.
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.
- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.
- Keep this system away from humidity.
- Place the system on a stable surface. Dropping it or letting it fall may cause damage.
- The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.
- Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.
- If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- If one of the following occurs, consult a service personnel:

  - The power cord or plug is damaged.
  - Liquid has penetrated the system.
  - The system has been exposed to moisture.
  - The system is not working properly.
  - The system dropped or is damaged.
  - The system has obvious signs of breakage.

- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.
- Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

About the Package

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

- 1 DT122-SD system unit
- 1 HDD drive bay kit
- 1 CD disk includes
  - Manual
  - Drivers
- 1 Quick Installation Guide

Optional Items

- Power Cord

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

Before Using the System

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

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

- Memory module
- 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

Overview

Front View

Rear View

Key Features

Model Name	**DT122-SD**
Processor	6th Generation Intel® Core™ processors
Chipset	Intel® H110/Q170 chipset
LAN	2 LAN ports
COM	1 COM port
Displays	1 DP++, 1 DVI-I, 1 VGA
USB	2 USB 2.0 ports 4 USB 3.0 ports
Audio	Mic-in, Line-out

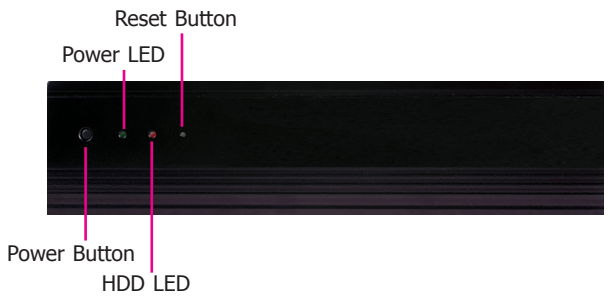
Specifications

Processor System	• Processors: 6th Generation Intel® Core™ Processors, LGA 1151 Socket Intel® Core™ i7-6700TE, Quad Core, 8M Cache, 2.4GHz (3.4GHz), 35W Intel® Core™ i5-6500TE, Quad Core, 6M Cache, 2.3GHz (3.3GHz), 35W Intel® Core™ i3-6100TE, Dual Core, 4M Cache, 2.7GHz, 35W Intel® Pentium® G4400TE, Dual Core, 3M Cache, 2.4GHz, 35W Intel® Celeron® Processor G3900TE, Dual Core, 2M Cache, 2.6GHz, 35W • Intel® Q170/H110 Express chipset
Memory	• 2 x 260-pin SODIMM up to 32GB • Dual Channel DDR4 1866/2133MHz
Graphics	• Intel® HD Gen 9 Graphics • OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9 • Displays: 1 x VGA (resolution up to 1920x1200@60Hz), 1 x DVI-I (DVI-D signal, resolution up to 1920x1200@60Hz), 1 x DP++ (resolution up to 4096x2304@60Hz) • Triple Displays: VGA + DVI-I (DVI-D signal) + DP++ (H110 supports dual displays)
Storage	1 x 3.5" or 2 x 2.5" SATA 3.0 Drive Bay (1 x 2.5" by default)
Ethernet	With Intel® Q170 chipset: 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) With Intel® H110 chipset: 1 x Intel® I211AT PCIe (10/100/1000Mbps) 1 x Intel® I219V PCIe (10/100/1000Mbps)
Expansion Slots	1 x PCIe x16 (Gen 3) or 1 x PCI (through optional riser card) Q170: 1 x full-size Mini PCIe (mSATA/PCIe, PCIe by default) H110: 1 x full-size Mini PCIe (PCIe only)
Audio	Realtek ALC888S-VD2-GR
Power	• Power type - Flex ATX 250W • DC-in External Power Adapter (available upon request)
Cooling System	1 x System Fan 1 x CPU Fan

I/O Ports	• Front Panel - 1 Power button - 1 Reset button - 2 LED indicators: Power, HDD • Rear Panel - 2 x GbE (RJ-45) - 1 x RS-232 (DB-9) - 4 x USB 3.0 2 x USB 2.0 - 1 x PS/2 (mini-DIN-6) - 1 x VGA - 1 x DVI-I (DVI-D signal) - 1 x DP++ - Mic-in and line-out jack
Environment	• Temperature - Operating: 0°C~45°C - Storage: -20°C~60°C • Humidity - 0 to 90% RH (non-condensing) • Operating Vibration - IEC68-2-64 • Operating Shock - Operating: 3G peak acceleration (11 msec. duration) - Non-operating: 5G peak acceleration (11 msec. duration)
Construction	• Front Bezel aluminum + Chassis Sheet Metal
Dimensions	• 300mm x 75mm x 217mm (W x H x D)
Mounting	Wall mount
Weight	• 3.7 kg
OS Support	Windows 7 (/WES7) 32/64-bit Windows 8.1 (64-bit) Windows 10 IoT Enterprise 64-bit Debian 8 (with VESA graphic driver) CentOS 7 (with VESA graphic driver) Ubuntu 15.10 (Intel graphic driver available)
STANDARDS AND CERTIFICATIONS	• Shock Operating: 3G Non-operating: 5G • Vibration Operating: Random 5~500Hz 1G Non-operating: Sweep Sine 10~500Hz 1.5G • Package Drop ISTA Project 1A • CE/FCC (to be applied)
Other Features	• Watchdog Timer function; System Reset, programmable via software from 1 to 255 Seconds

Getting to Know the DT122-SD

Front View



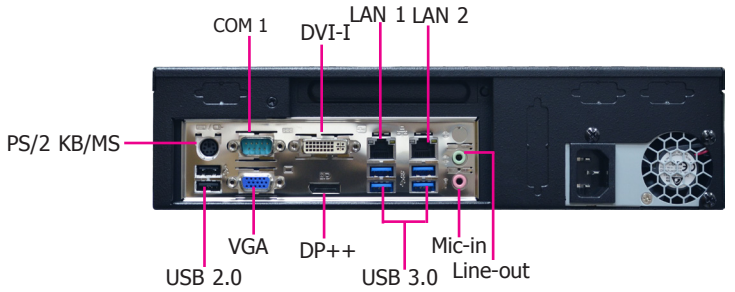
Power Button
Press to power on or power off the system.

Reset Button
Press to reset the system.

HDD LED
Indicates the status of the hard drive.

Power LED
Indicates the power status of the system.

Rear View



DVI-I Port (DVI-D signal)/VGA/DP++
Used to connect to the DVI-I connector/VGA connector/DisplayPort of an LCD monitor.

COM 1 Port
Used to connect serial devices.

USB Ports
Used to connect USB 3.0/2.0/1.1 devices.

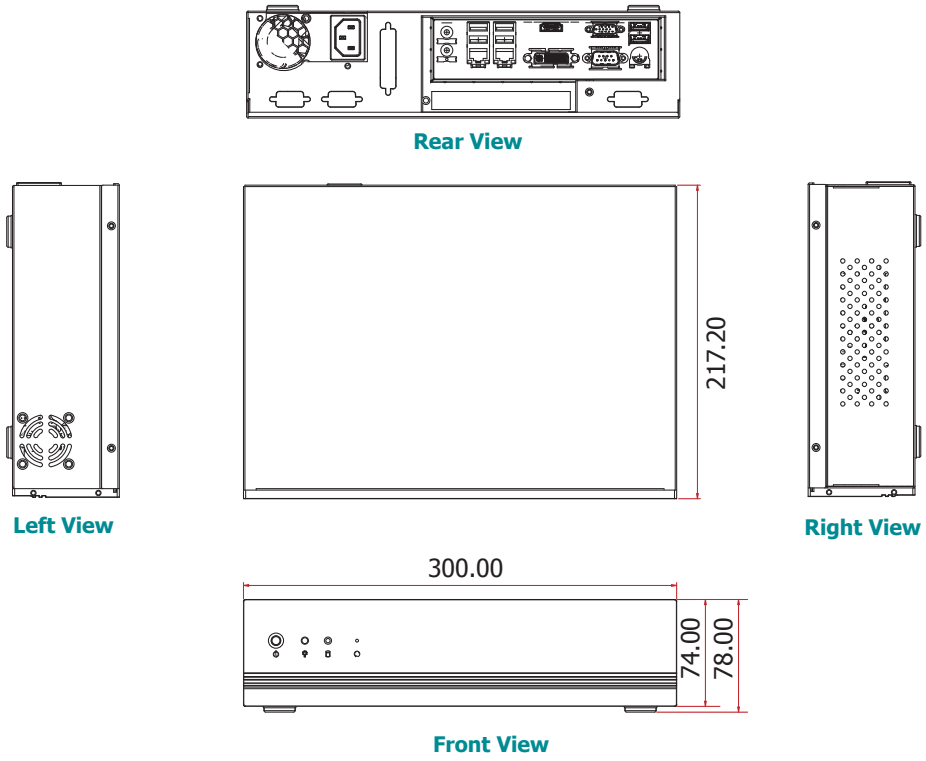
LAN Ports
Used to connect the system to a local area network.

Line-out
Used to connect a speaker.

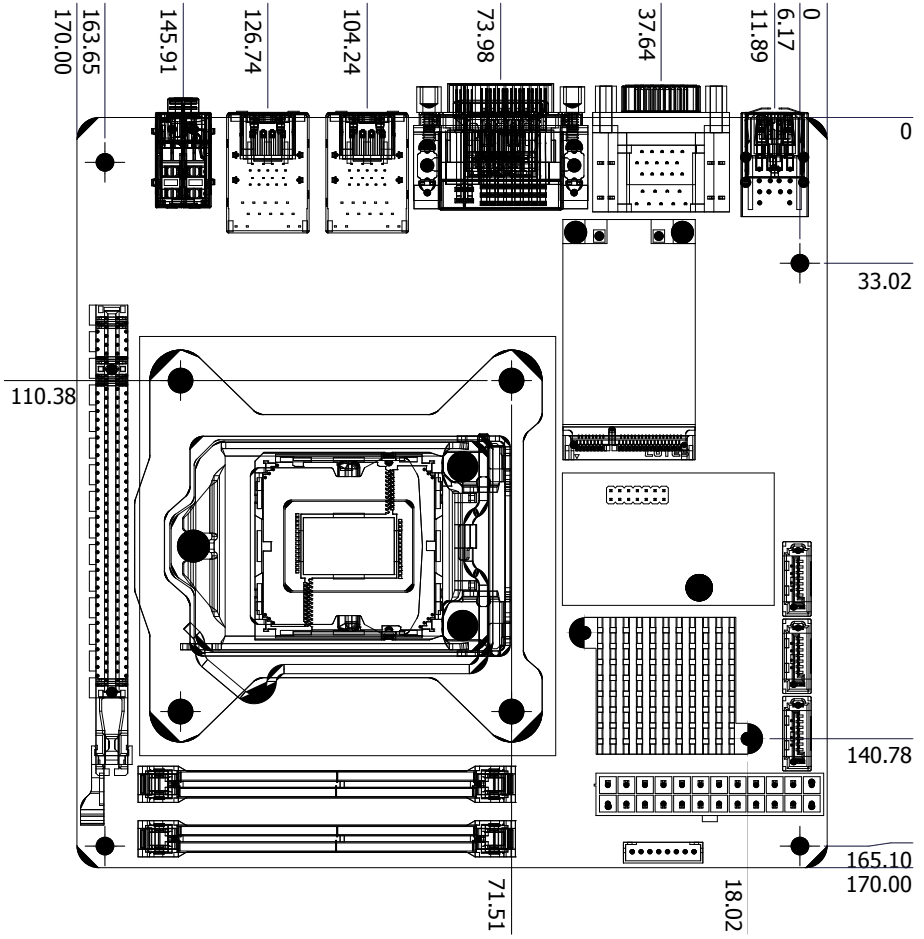
Mic-in
Used to connect an external microphone.

PS/2 KB/Mouse
Used to connect a PS/2 keyboard or a PS/2 mouse.

Mechanical Dimensions



Motherboard Dimensions



Chapter 2 - Getting Started

Preparing the System

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

- SATA hard drive
- AC power adapter
- PS/2 or USB keyboard
- PS/2 or USB mouse
- CD-ROM drive (for installing software/drivers)
- Screwdriver
- Memory module (optional)

Installing Devices

The following are devices that can be installed in the system.

- Memory module
- SATA hard drive

Configuring the BIOS

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

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

Installing the Operating System

Most operating system software are provided in a CD therefore you need to install a CD-ROM drive in order to use the CD.

Make sure a SATA drive is already installed.

1. Refer to the following chapters for information on connecting a CD-ROM drive and installing a SATA drive.
2. Refer to your operating system manual for instructions on installing the operating system.

Installing the Drivers

The system package includes a CD disk. The CD includes drivers that must be installed to provide the best system performance. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing Devices

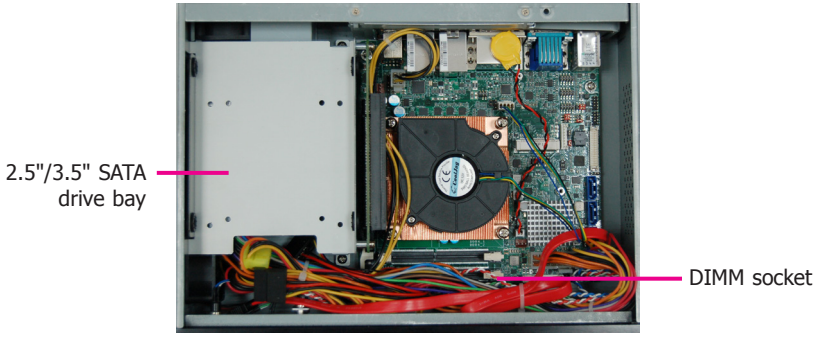
Import:
To prevent damage to the system board, power down the system and remove all AC power cords before opening the chassis cover.

Opening the chassis

1. Make sure the system and all other peripheral devices connected to it have been powered off.
2. Disconnect all power cords and cables.
3. The 4 mounting screws on the sides of the system are used to secure the cover to the chassis. Remove these screws and then put them in a safe place for later use.

4. Slide the cover backwards to open the system.

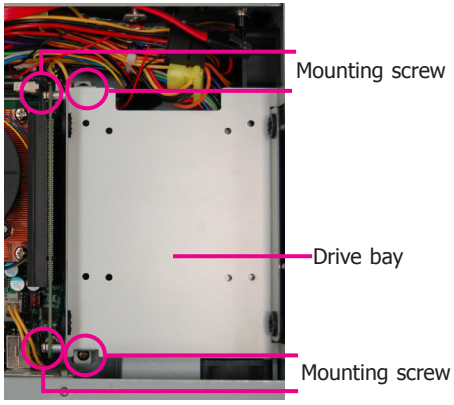
5. The DIMM sockets and SATA drive bay are readily accessible after removing the chassis cover.

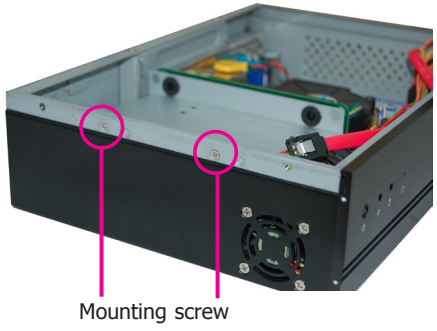


Installing a 2.5" or 3.5" SATA Drive

Installing a 2.5" SATA Drive

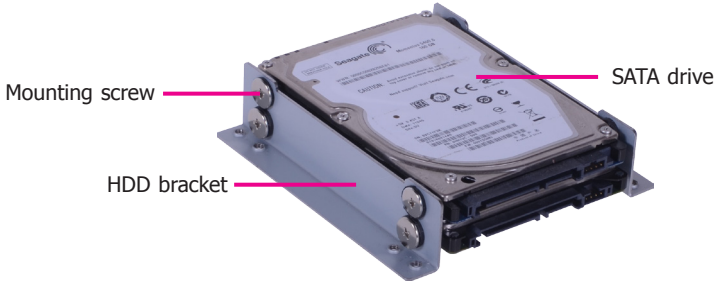
1. Remove the 6 mounting screws that secure the drive bay to the system.





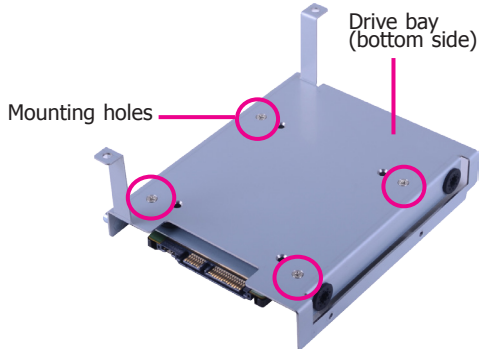
2. Align the mounting holes on the SATA drive with the mounting holes on the HDD bracket and use the mounting screws provided in the drive bay kit to secure the drive in place.

Mounting screws

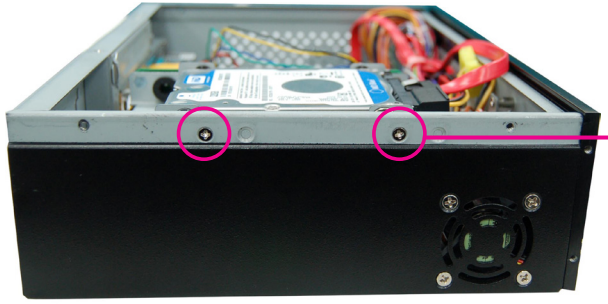


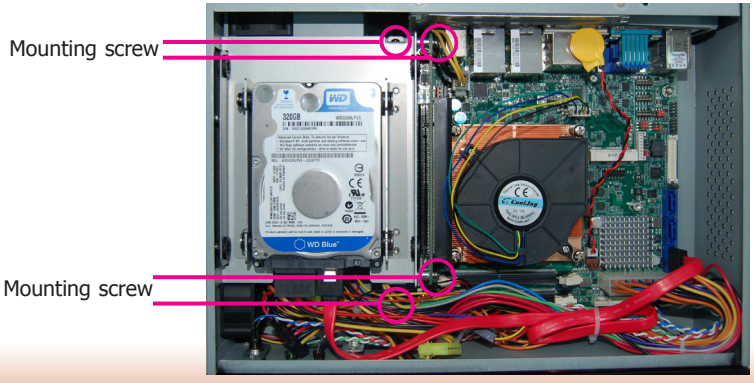
3. Use the provided mounting screws to attach the HDD bracket to the drive bay.

Mounting screws

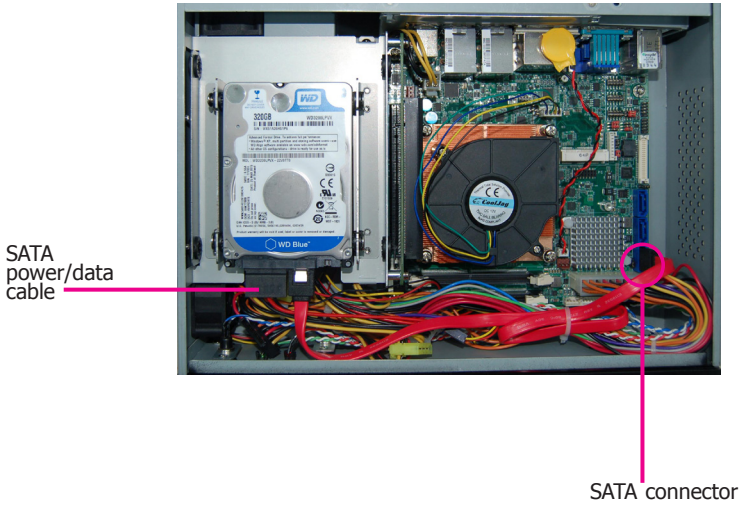


4. Place the SATA drive bay back in the chassis and install the SATA drive bay using the mounting screws you removed in step 1.



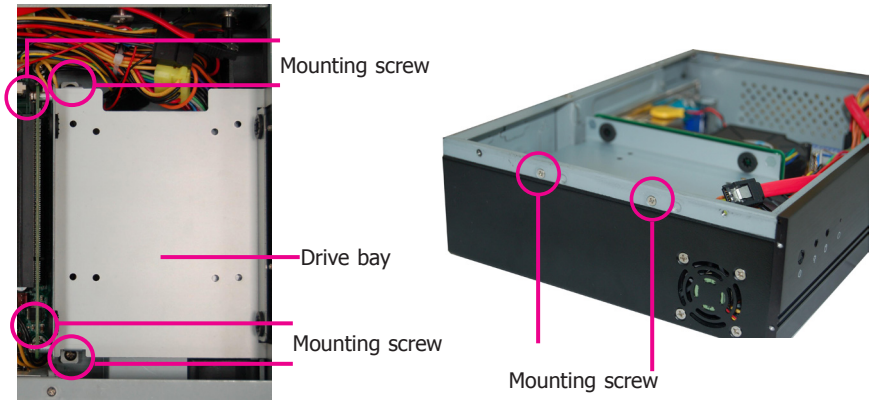


5. Connect the SATA data and power cable to the SATA drive.

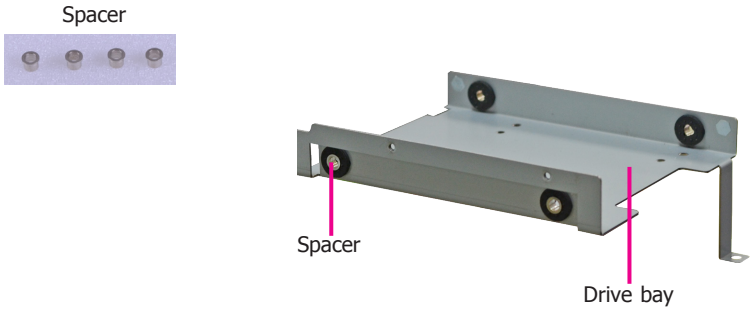


Installing a 3.5" SATA Drive

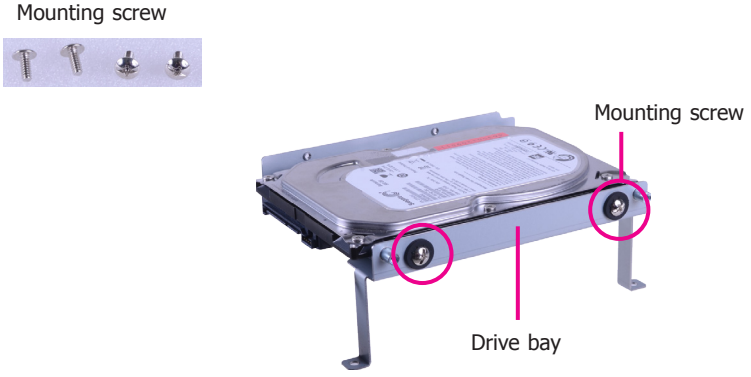
1. Remove the 6 mounting screws that secure the drive bay to the system.



2. Insert the spacers provided in HDD drive bay kit to the anti-shock bumper.



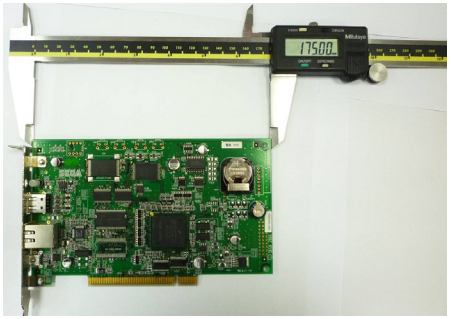
3. Align the mounting holes on the SATA drive with the mounting holes on the drive bay; then use the provided mounting screws to install the SATA drive on the drive bay.



4. Place the drive bay back in the chassis and install the drive bay using the mounting screws you removed in step 1.

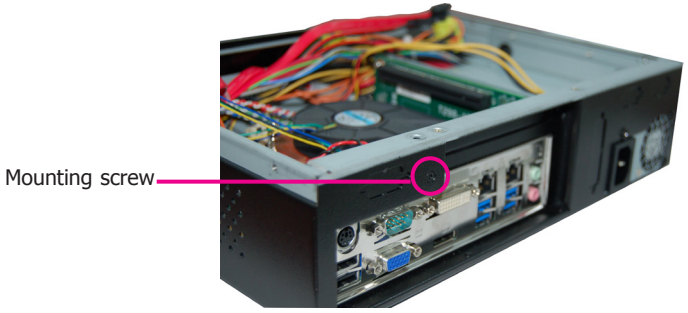
Installing a PCIe Expansion Card

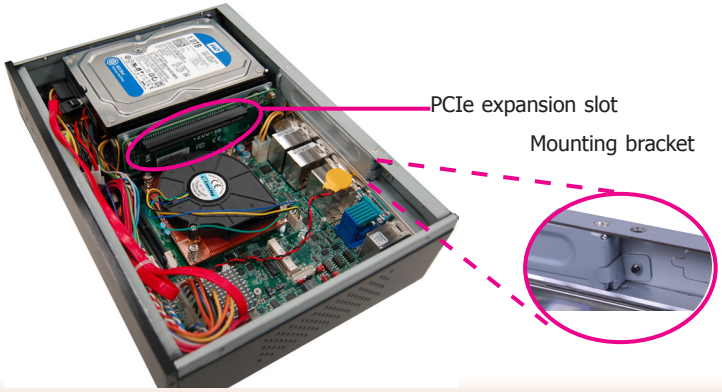
Important:
When inserting the riser card, please select a card within 175mm.



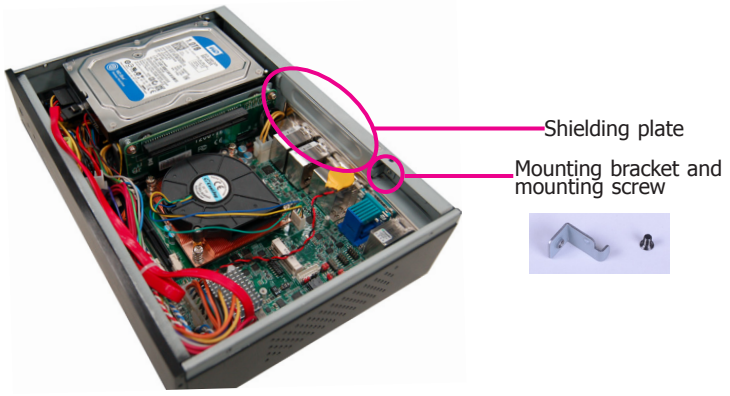
1. The PCIe x16 on the motherboard is used to insert a PCIe expansion card.

   To install an expansion card, you need to remove the mounting screw that secure the bracket to the chassis. Put the screw and the bracket in a safe place for later use.

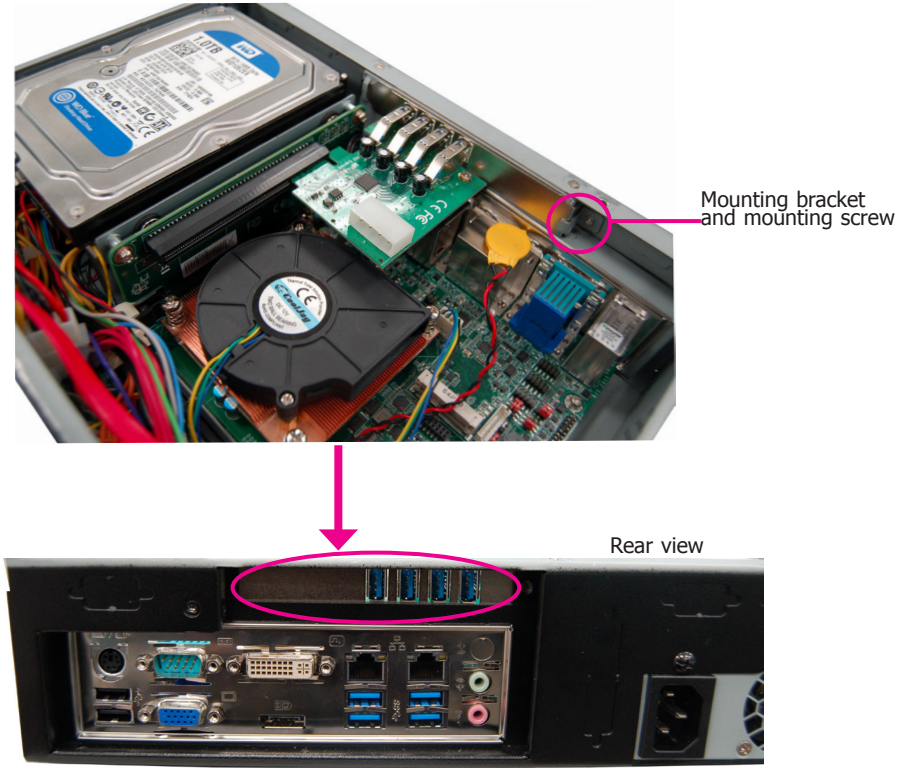




2. Take off the shielding plate.



3. Insert the expansion card and secure it in place using the mounting bracket and screw that you removed in step 1.

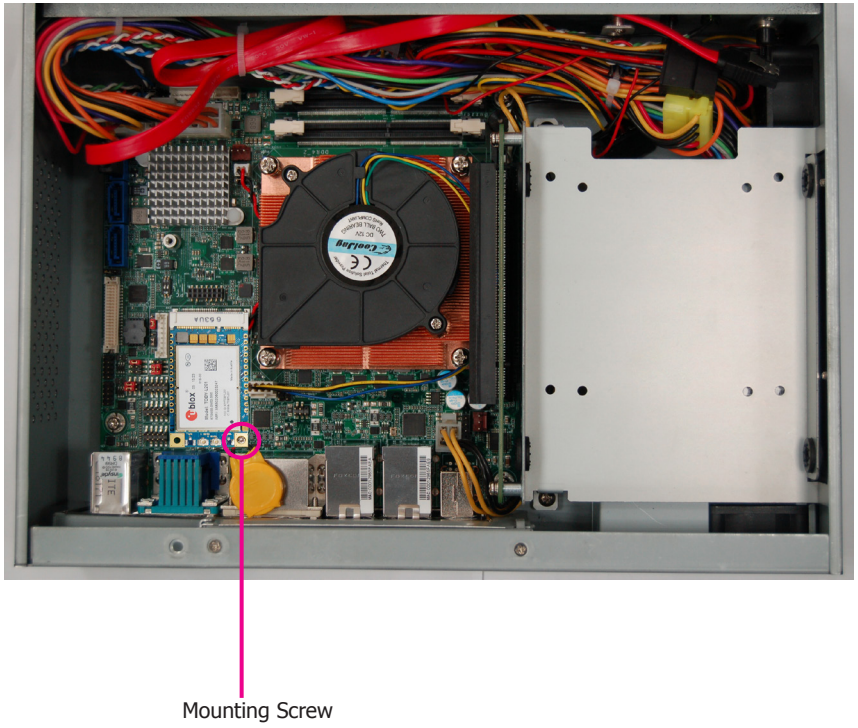


Note:
The expansion card used in the above illustrations may not resemble the actual cards. These illustrations are for reference only.

Installing a Mini PCI Expansion Card

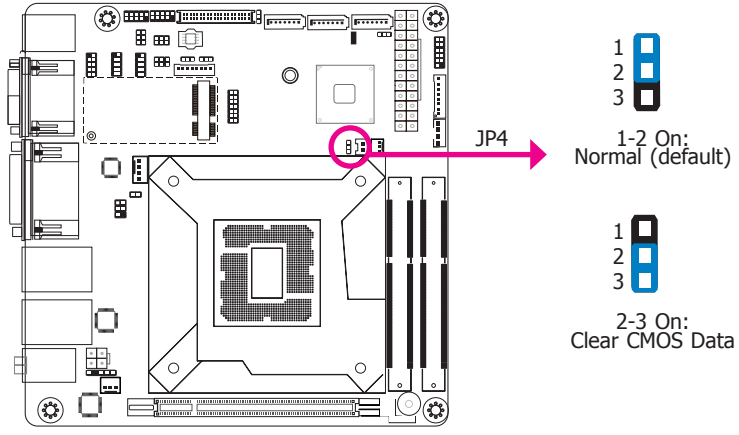
The system board is equipped with 1 full-size Mini PCIe slot that can accommodate a Mini PCIe card or an mSATA card depending on the model. Here we will demonstrate the installation of a full-size Mini PCIe card.

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



Chapter 4 - Jumper Settings

Clear CMOS Data



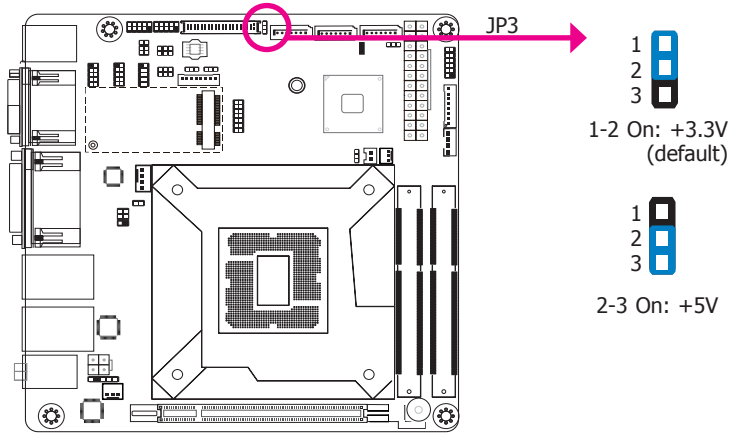
If you encounter the following situations, you can reconfigure the system with the default values stored in the ROM BIOS.

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 JP4 pins 2 and 3 to On. Wait for a few seconds and set JP4 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.

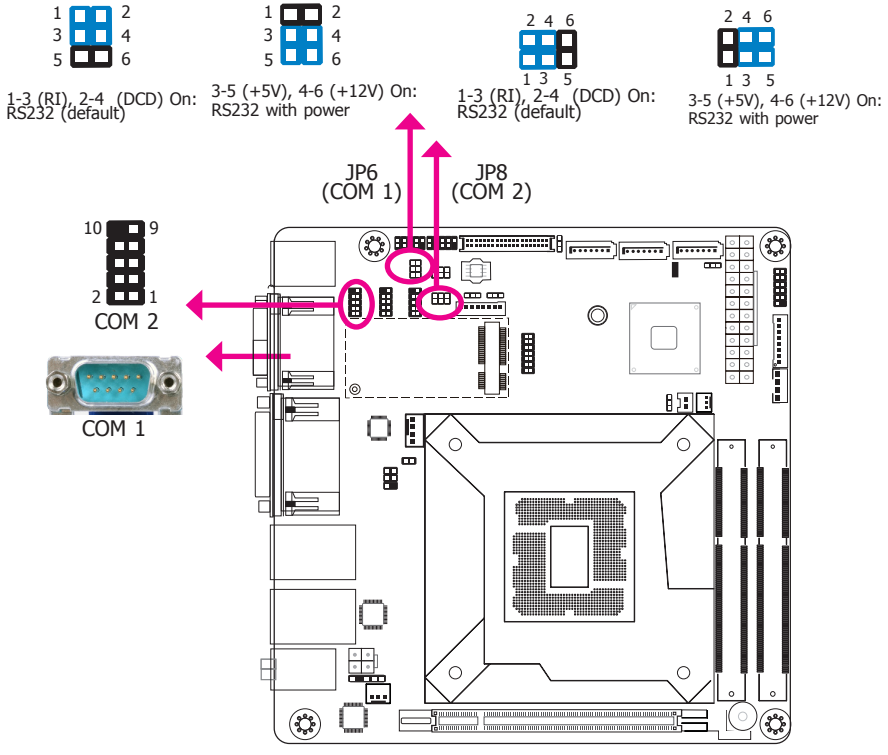
Backlight Power Select



JP3 is used to select the power level of backlight brightness control: +3.3V or +5V.

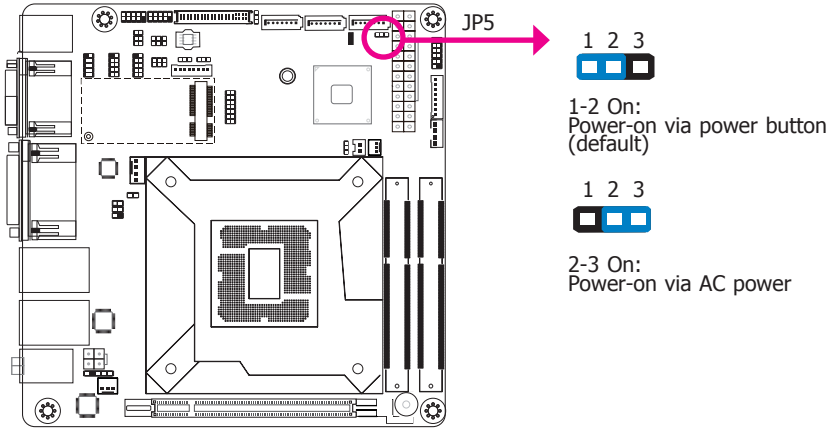
Important:
Before powering on the system, make sure that the power settings of JP3 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.

COM1/COM2 RS232/Power Select



JP6 (for COM 1) and JP8 (for COM 2) are used to configure the Serial COM ports to pure RS232 or RS232 with power. The pin functions of COM 1 and COM 2 will vary according to JP6's and JP8's settings respectively.

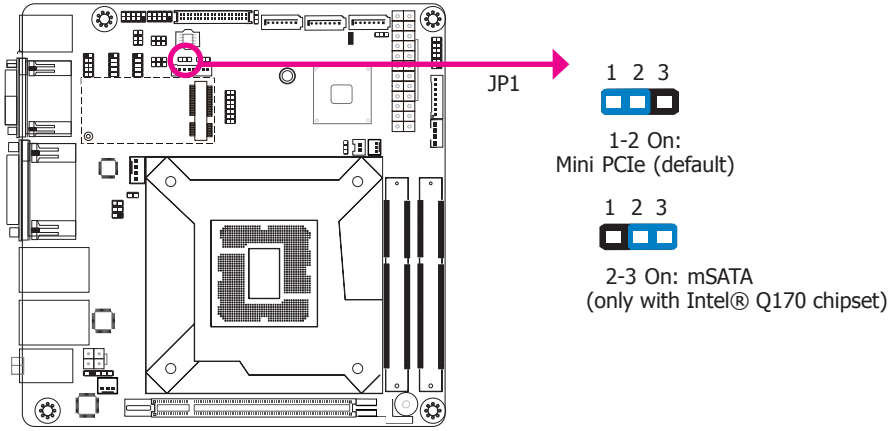
Power-on Select



JP5 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 JP5 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

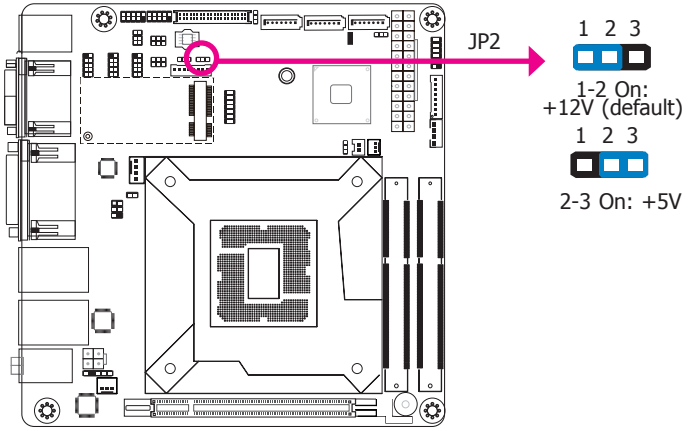
When using JP5 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

Mini PCIe Signal Select



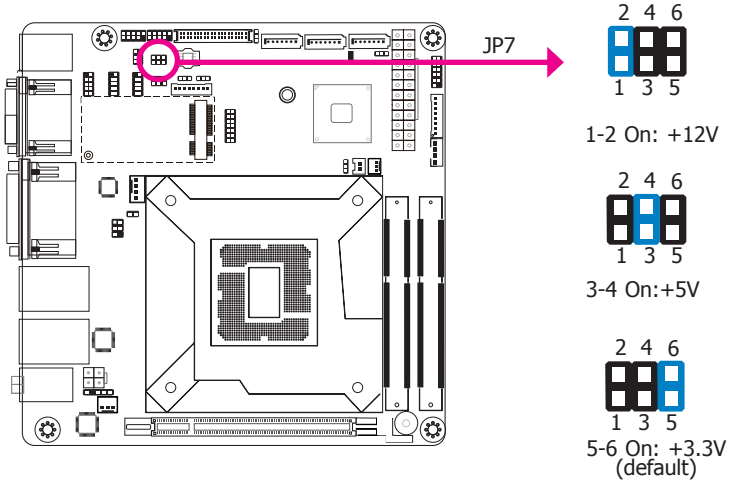
JP1 is used to select the Mini PCIe signal.

LCD/Inverter Power Select



JP2 is used to select the power level of LCD inverter connector.

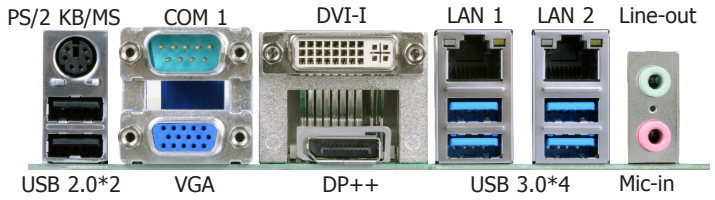
Panel Power Select



JP7 is used to select the power supplied with the LCD panel.

Important:
Before powering-on the system, make sure that the power settings of JP7 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

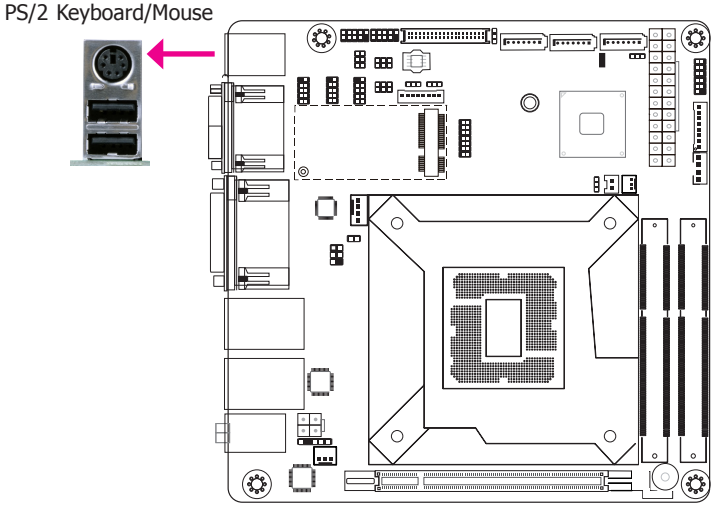
Chapter 5 - Ports and Connectors
Rear Panel I/O Ports



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

- 2 x GbE (RJ-45)
- 1 x RS-232 (DB-9)
- 4 x USB 3.0
- 2 x USB 2.0
- 1 x PS/2 Keyboard/Mouse port
- 1 x VGA
- 1 x DVI-I (DVI-D signal)
- 1 x DP++
- 1 x Line-out
- 1 x Mic-in

PS/2 Keyboard/Mouse Port



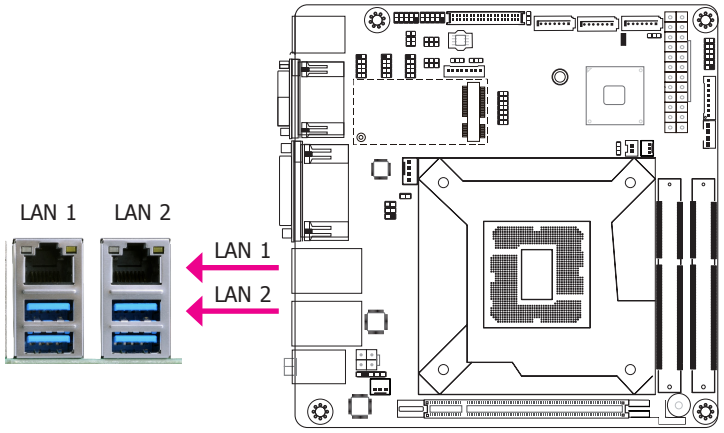
This rear I/O port is used to connect a PS/2 keyboard/mouse.

Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power on the system.

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

RJ45 LAN Ports



Features

For Intel® H110 Chipset :

- Intel® I211AT PCIe
- Intel® I219V PCIe

For Intel® Q170 Chipset:

- Intel® I210AT PCIe
- Intel® I219LM PCIe with iAMT11.0

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

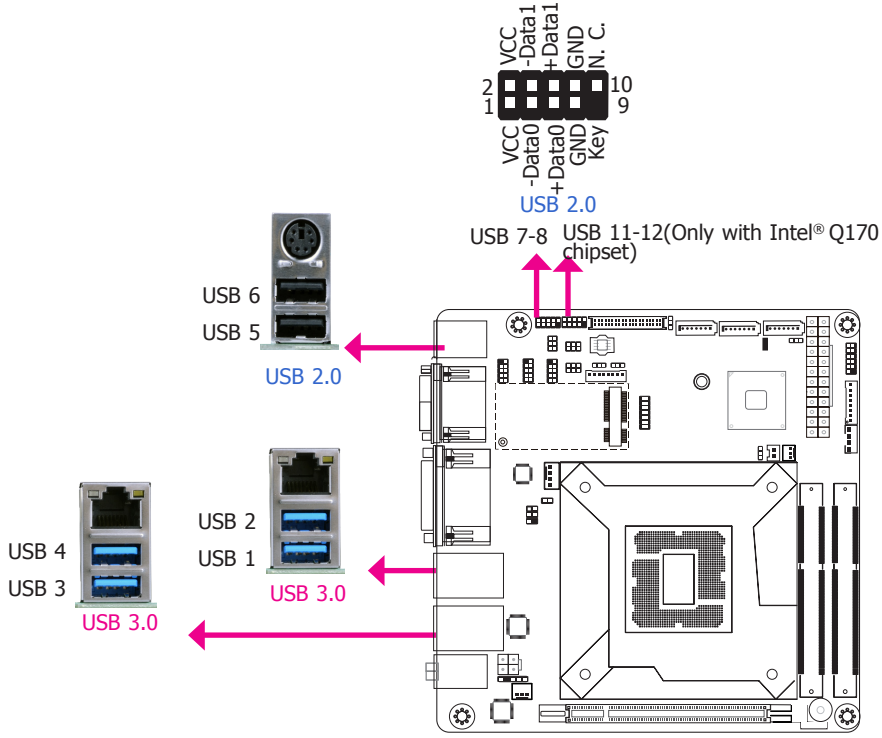
BIOS Setting

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

Driver Installation

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

USB Ports



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

The system board is equipped with four onboard USB 3.0 ports (USB 1-2/3-4) and two onboard USB 2.0 ports (USB 5-6). The 9-pin connector allows you to connect 2 additional USB 2.0/1.1 ports: USB 7-8 and USB 11-12 (Only with Intel® Q170 chipset).

BIOS Setting

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

Driver Installation

You may need to install the proper drivers in your system operation to use the USB device. Refer to your operating system's manual or documentation for more information.

Wake-On-USB Keyboard/Mouse

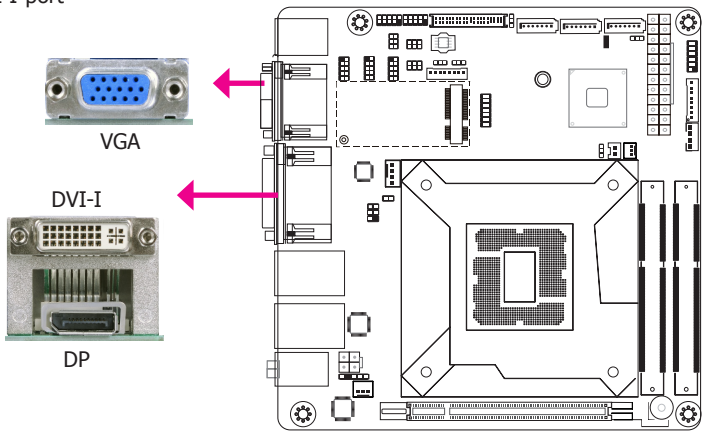
The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_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.

Graphics Interfaces

The display ports consist of the following:

- 1 VGA port
- 1 DP++ port
- 1 DVI-I 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.

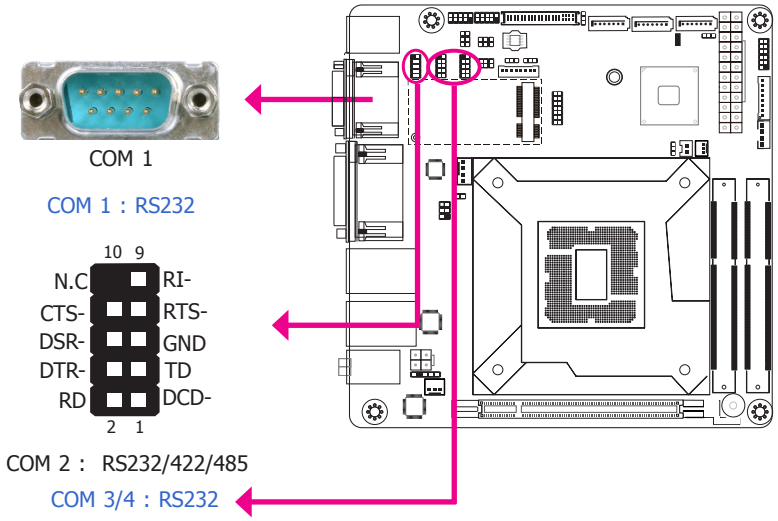
DVI-I Port

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

Driver Installation

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

COM (Serial) Ports



COM 1, COM 3 and COM 4 are fixed at RS232 whereas COM 2 can be selected among RS232/422/485 using the BIOS setup utility.

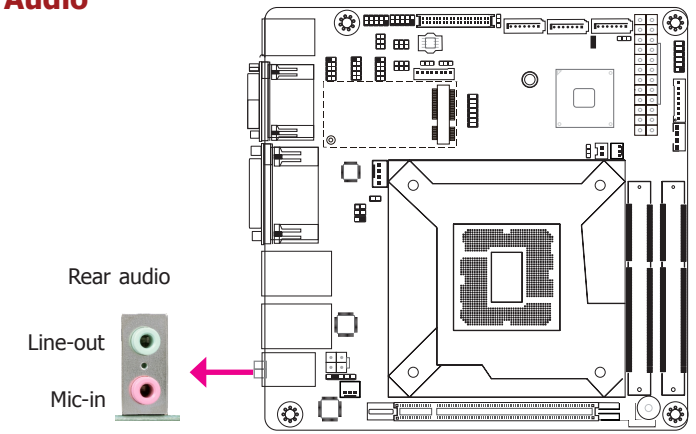
The pin functions of COM port 1 and 2 will vary according to JP6's and JP8's jumper settings respectively. JP6 and JP8 allow you to configure RS232 power voltage of COM port 1 and 2. Refer to "COM1/COM2 RS232 Power Select" in this chapter for more information.

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.

BIOS Setting

Configure the COM ports 1/2/3/4 in the Advanced menu ("SIO NUVOTON6106D" submenu) of the BIOS. Refer to Chapter 7 - BIOS for more information.

Audio



Rear Audio

The system board is equipped with 2 audio jacks.

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

BIOS Setting

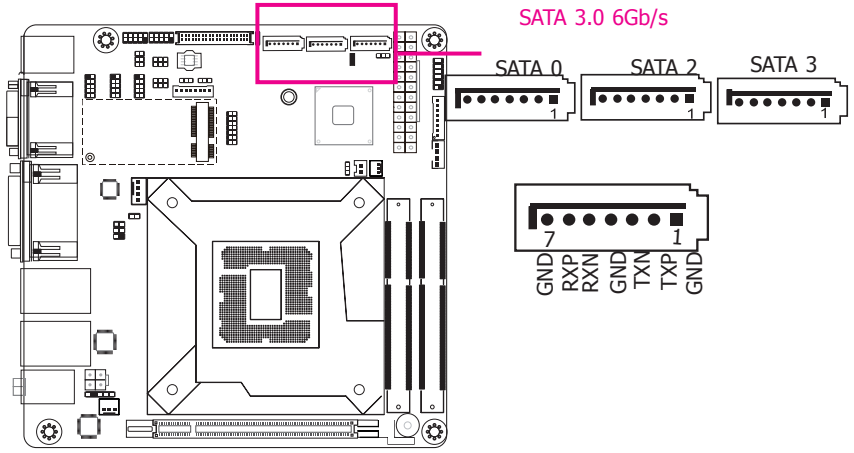
Configure the audio settings in the Advanced menu ("Audio Configuration" submenu) of the BIOS. Refer to Chapter 7 - BIOS for more information.

Driver Installation

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

I/O Connectors

SATA (Serial ATA) Connectors



Features

- 3 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (SATA 0, SATA 2 and SATA 3)
- Supports RAID 0/1 with Intel® Q170 chipset

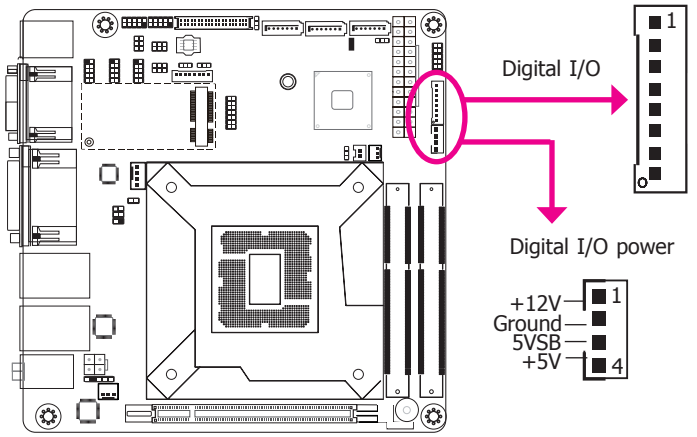
The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA data cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

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

Digital I/O Connector

Digital I/O Power Connector

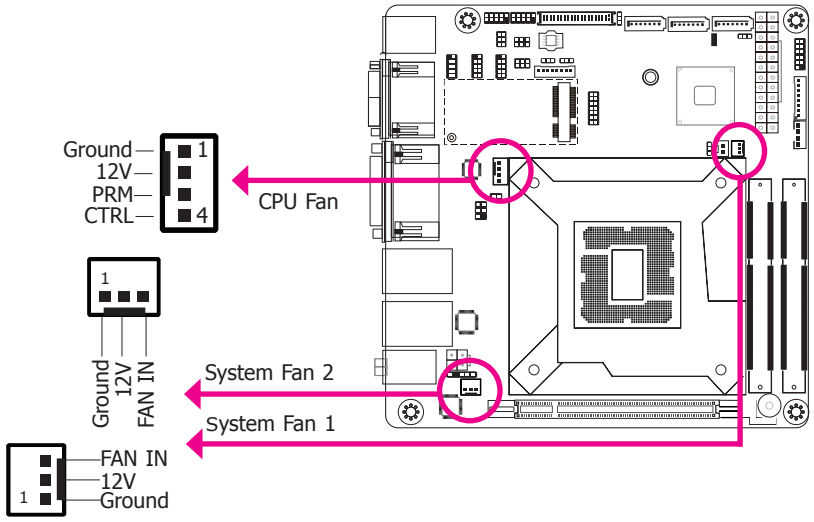


The 8-bit Digital I/O connector provides the ability of monitoring and control of the connected external devices.

Digital I/O Connector

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

Cooling Fan Connectors

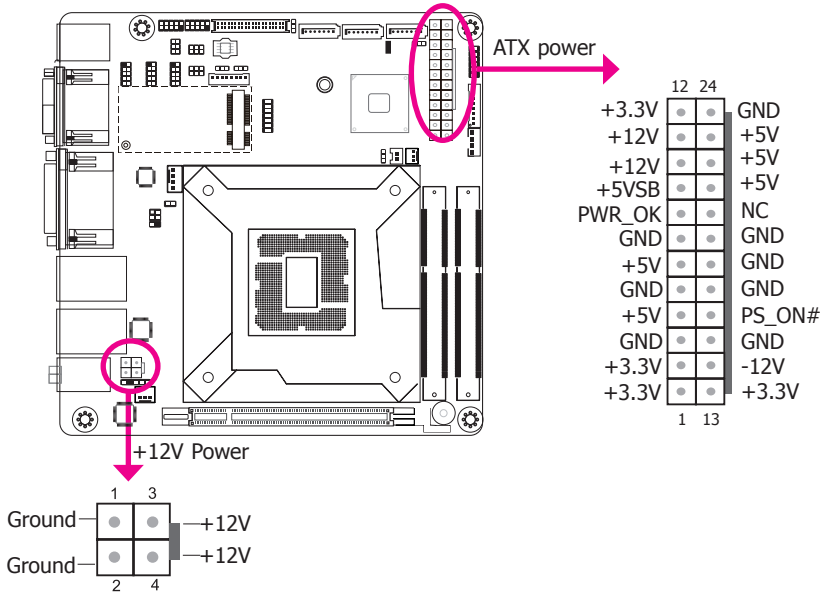


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("SIO NUVOTON6106D" submenu) of the BIOS will display the current speed of the cooling fans. Refer to Chapter 7 - BIOS for more information.

Power Connectors

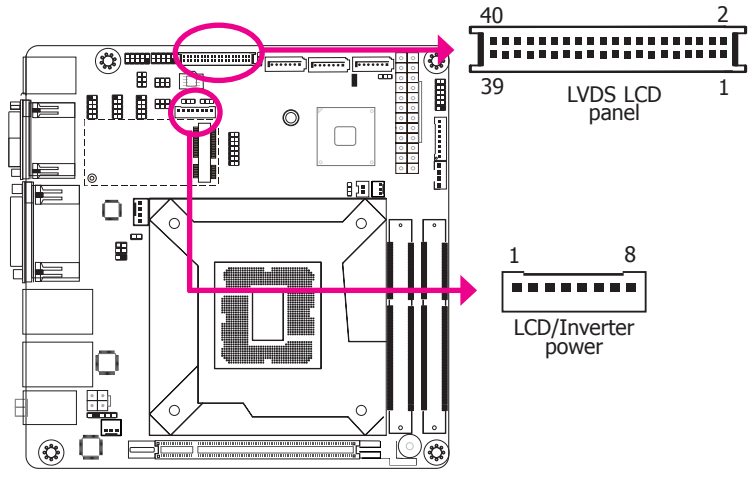


Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The power connectors from the power supply unit are designed to fit the 24-pin and 4-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

LVDS LCD Panel Connector

LCD/Inverter Power Connector



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

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

BIOS Setting

Configure the LCD panel in the Advanced menu ("Video Configuration" submenu) of the BIOS. Refer to Chapter 7 - BIOS 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.

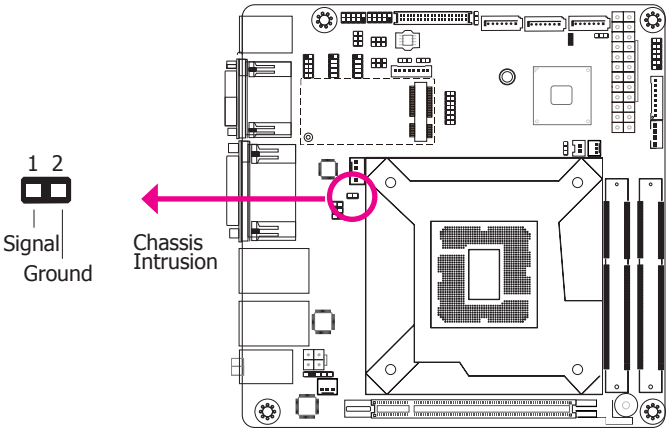
LVDS LCD Panel Connector

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	NC
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

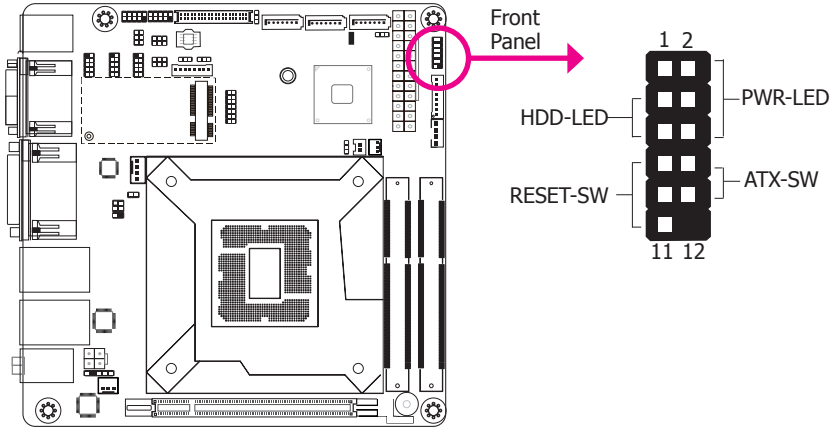
Pins	Function
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	+12V
8	+12V

Chassis Intrusion Connector



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

Front Panel Connector



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.

ATX-SW - ATX Power Switch

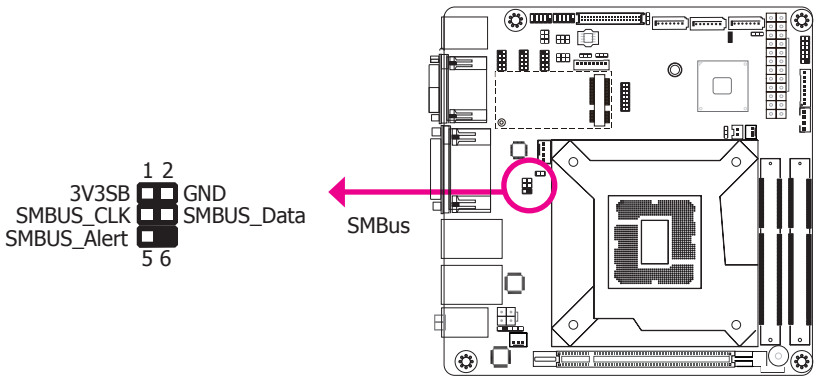
This switch is used to power on or off the system.

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.

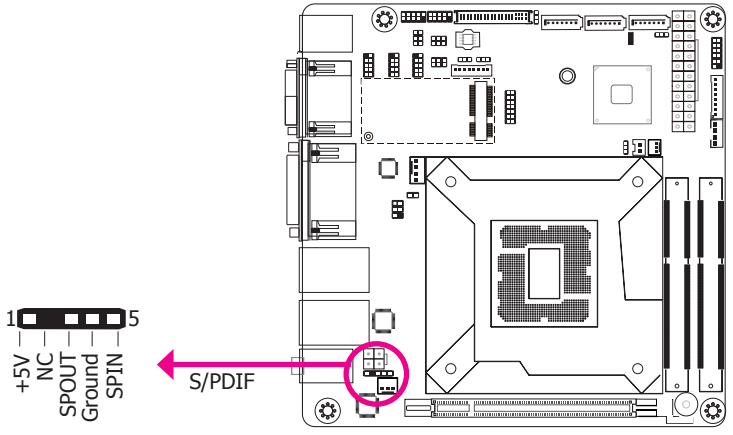
	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	3	HDD Power	PWR-LED	2	LED Power
	5	Signal		4	LED Power
RESET SW	7	Ground		6	Signal
	9	RST Signal	ATX-SW	8	Ground
	11	N.C.		10	Signal

SMBus Connector



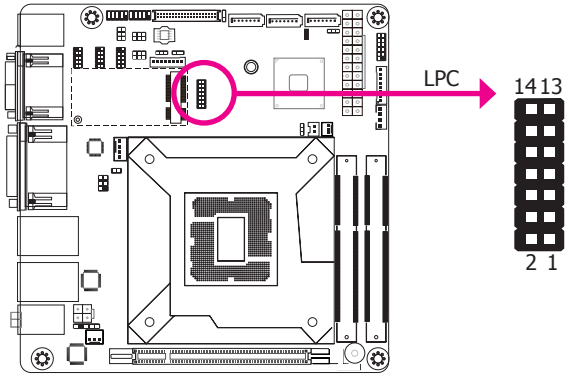
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

S/PDIF Connector



S/PDIF (Sony/Philips Digital Interface Format), a type of digital audio connector, is used for digital audio transmission or output.

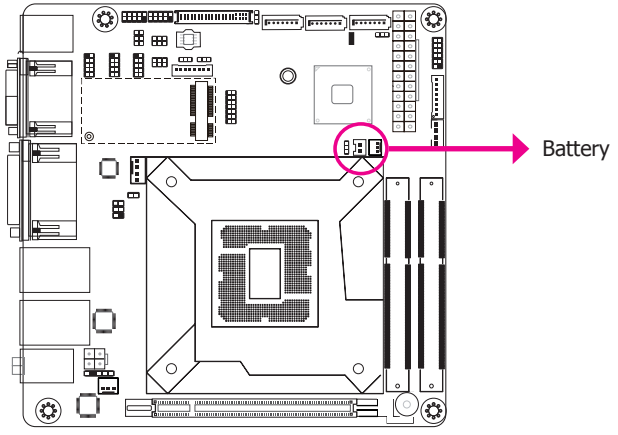
LPC Connector



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

Pins	Pin Assignment	Pins	Pin Assignment
1	L_CLK	2	L_AD1
3	L_RST#	4	L_AD0
5	L_FRAME#	6	3V3
7	L_AD3	8	GND
9	L_AD2	10	Kev
11	INT_SERIRQ	12	GND
13	5VSB	14	5V

Battery

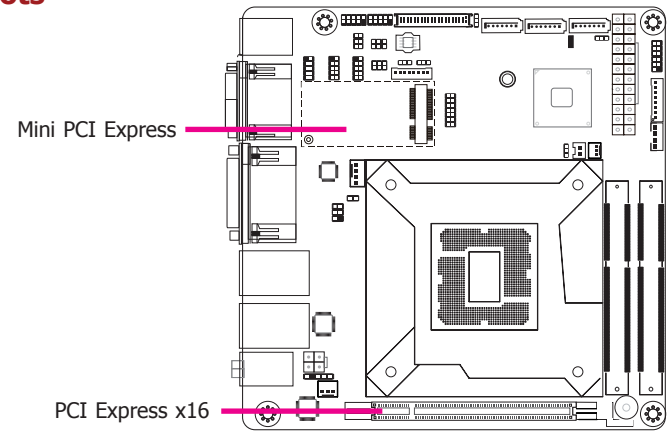


The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

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

Expansion Slots



PCI Express x16 (Gen 3) Slot

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

Mini PCI Express Slot

The Mini PCIe socket is used to install a Mini PCIe card. You can use JP1 to select the Mini PCIe signal between PCIe and mSATA (with Intel® Q170 chipset only). (Refer to Chapter 4 - Jumper Settings for more information.) When the mSATA signal is selected, this slot can be used for capacity expansion.

Chapter 6 - Mounting Options

Wall Mount

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

There are 2 types of wall mount brackets:

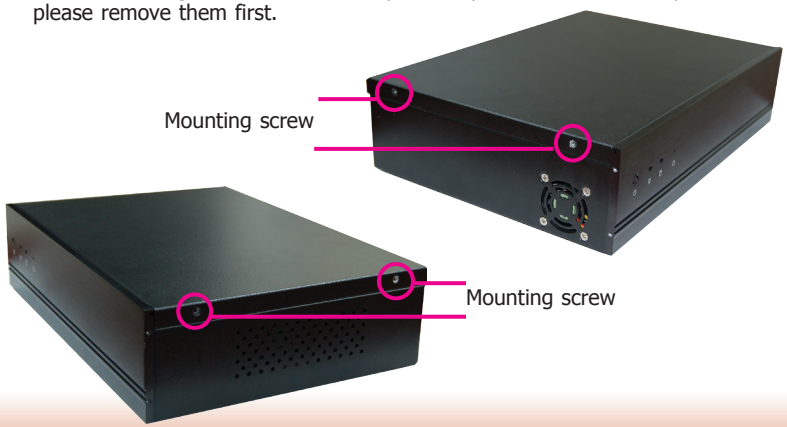
- Type A

- Type B

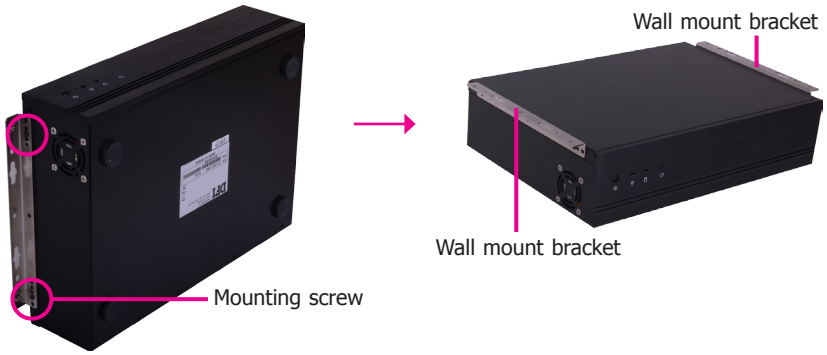
Type A wall mount kit includes:

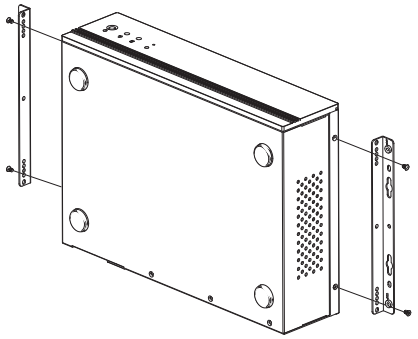
- 2 type A wall mount brackets

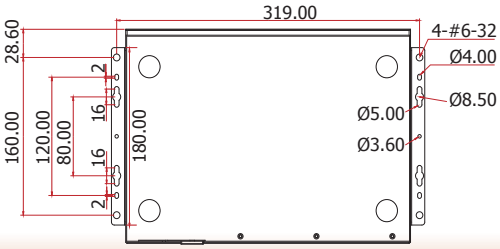
1. If the mounting screws have been previously attached to the top cover of the system, please remove them first.

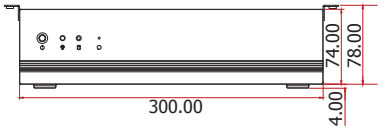


2. Use the mounting screws removed in step 1 to secure the wall mount brackets on each side of the system.







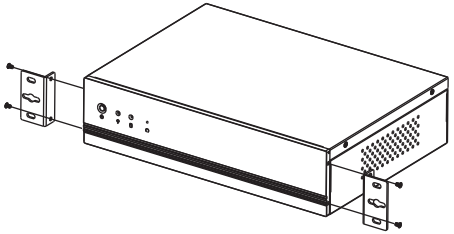


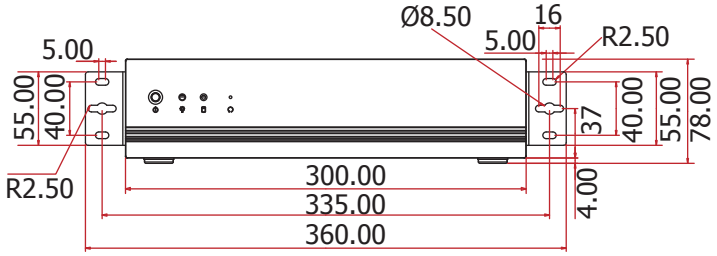
Type B wall mount kit includes:

- 2 type B wall mount brackets
- Bracket screws

1. The 4 mounting holes on the sides of the system are used to mount the wall mount brackets.

2. Use the provided mounting screws to secure the wall mount brackets on each side of the system.





Chapter 7 - BIOS Setup

Overview

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

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

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

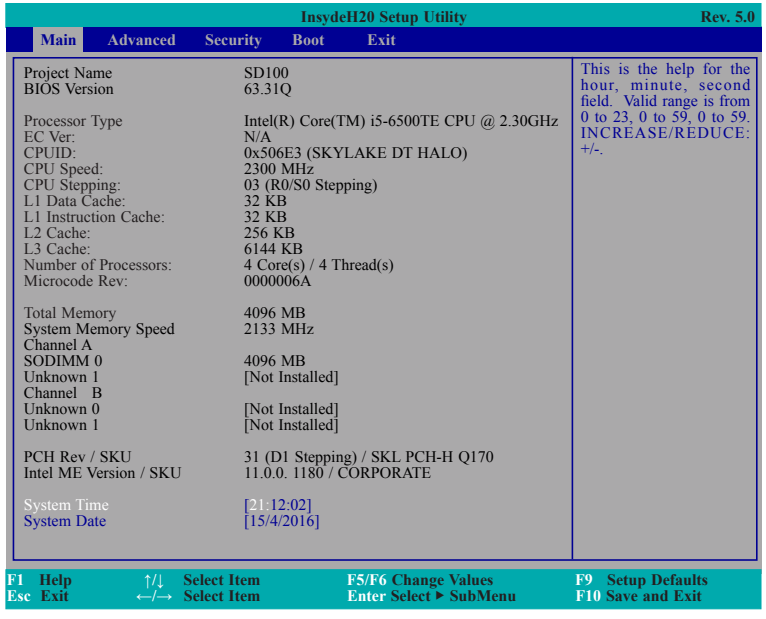
Submenu

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>.

Insyde BIOS Setup Utility

Main

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



System Date

The date format is <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.

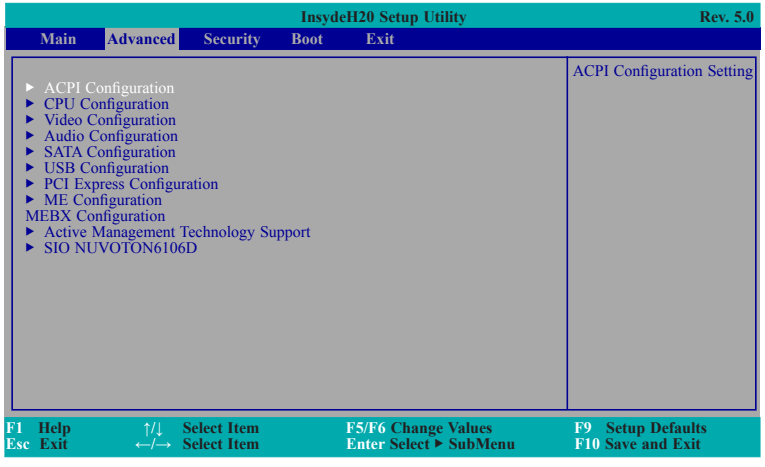
System Time

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

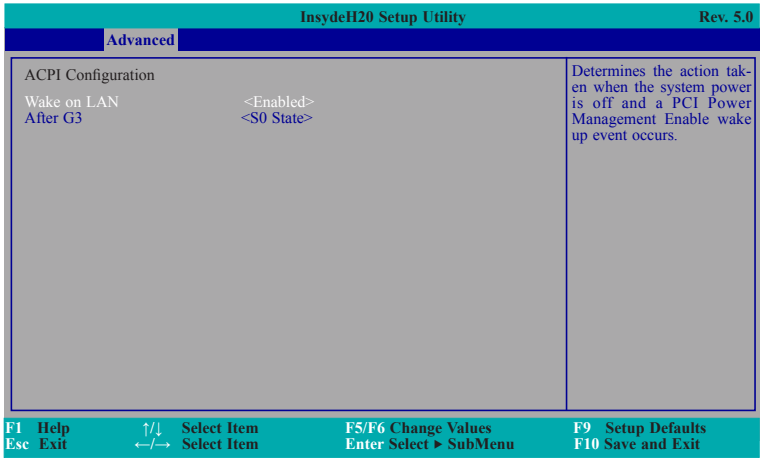
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

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



ACPI Settings

This section configures the system ACPI parameters.



Wake on LAN

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

After G3

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

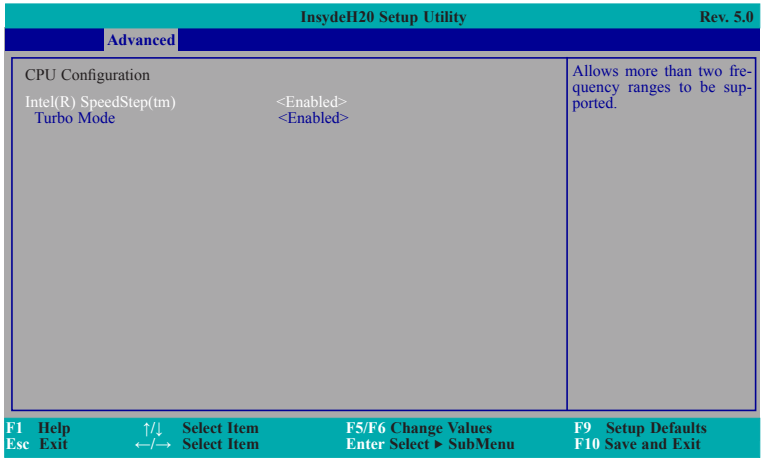
S0 State The system is in working state.

S5 State The system is in soft-off state.

Note:
For the "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.



Intel SpeedStep®

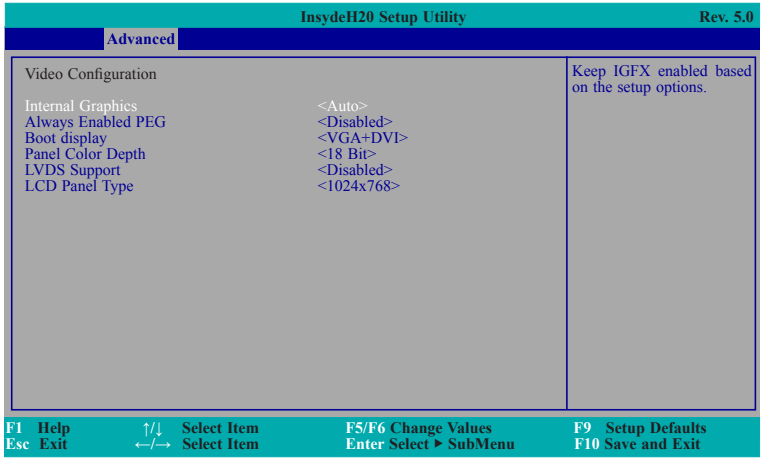
Enable or disable the Enhanced Intel SpeedStep® Technology, which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, you can enable the EIST feature using the operating system's power management.

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.

Video Configuration

This section configures the video settings.



Internal Graphics

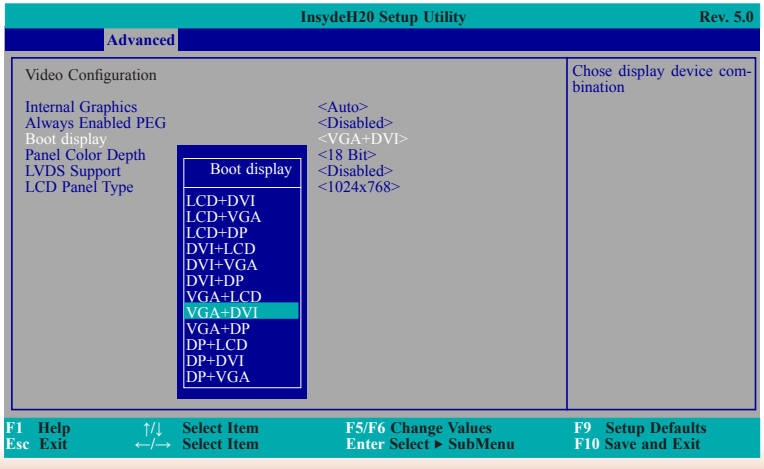
Keep IGFX enabled or disabled based on the setup options.

Always Enabled PEG

Enable or disable the PEG function.

Boot display

Set the display device combination during system booting.

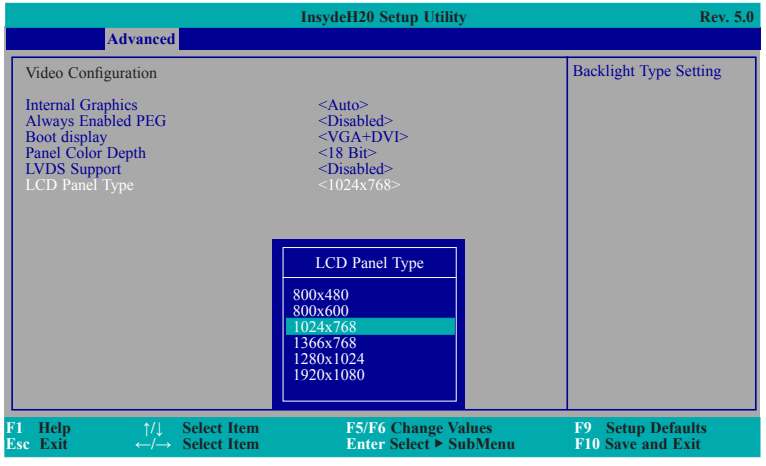


Panel Color Depth

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

LVDS Support

Turn on/off LVDS.

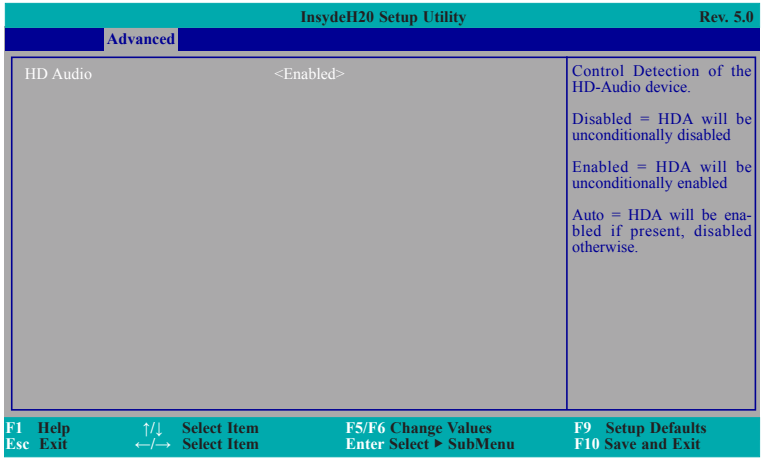


LCD Panel Type

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

Audio Configuration

This section configures the audio settings.



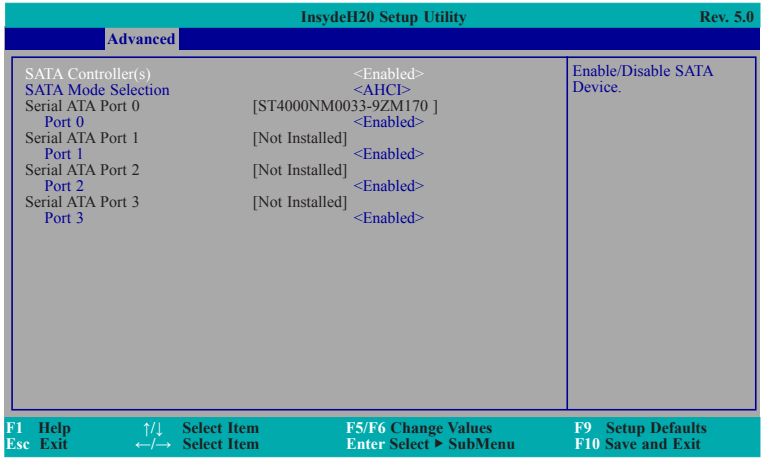
HD Audio

Control the detection of high-definition audio devices.

Disabled
HDA will be unconditionally disabled.
Enabled
HDA will be unconditionally enabled.
Auto
HDA will be enabled if present, disabled otherwise.

SATA Configuration

This section configures the SATA controller.



SATA Controller(s)

Enable or disable Serial ATA devices.

SATA Mode Selection

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

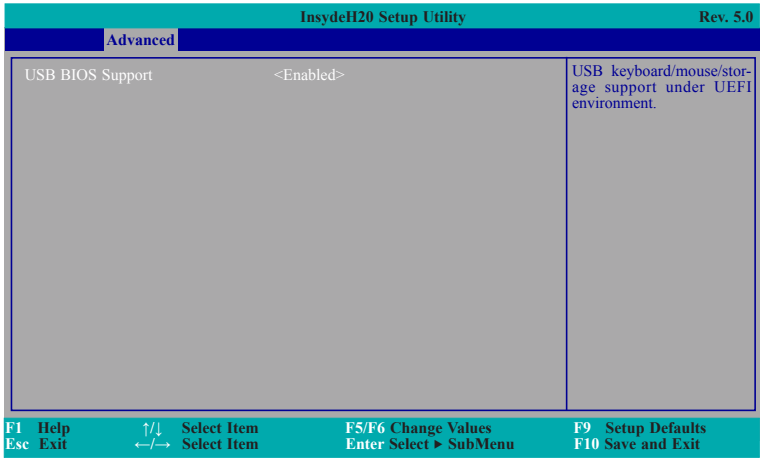
AHCI Mode
This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).
RAID Mode (only with Intel® Q170 chipset)
This option allows you to configure RAID on the Serial ATA devices .

Serial ATA Port 0, 1, 2, and 3

Enable or disable the serial ATA port.

USB Configuration

This section configures the parameters of the USB devices.



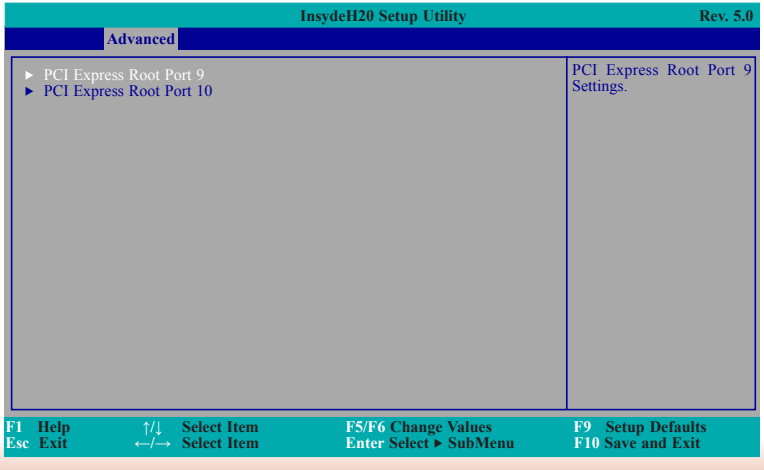
USB BIOS Support

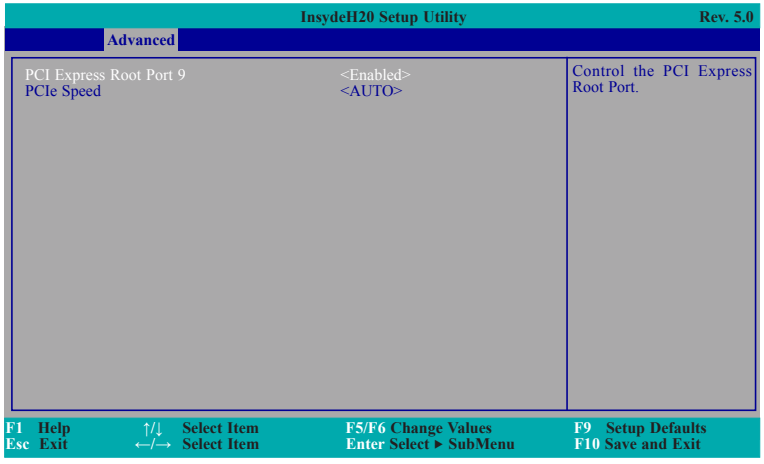
Disabled
Disable USB keyboard/mouse/storage support.

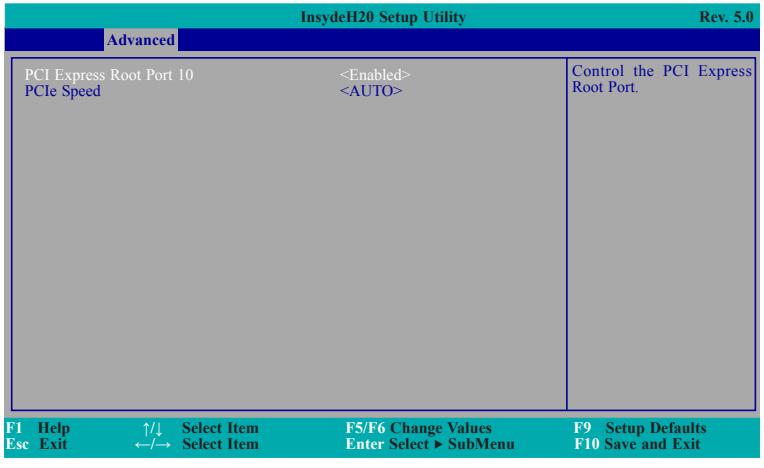
Enabled
Enable the support of USB keyboard/mouse/storage under UEFI and DOS environment.

PCI Express Configuration

This section configures the PCI Express root ports.







PCI Express Root Port

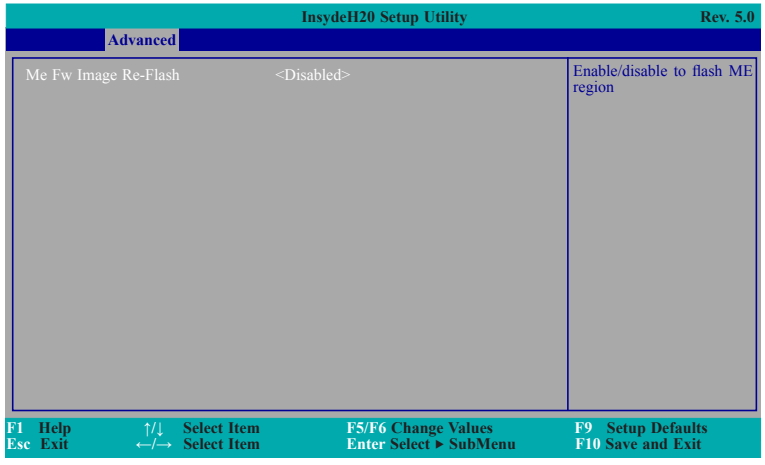
Enable or disable the PCI Express Root Port.

PCIe Speed

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

ME Configuration

This section configures settings of flashing the Intel® Management Engine firmware.

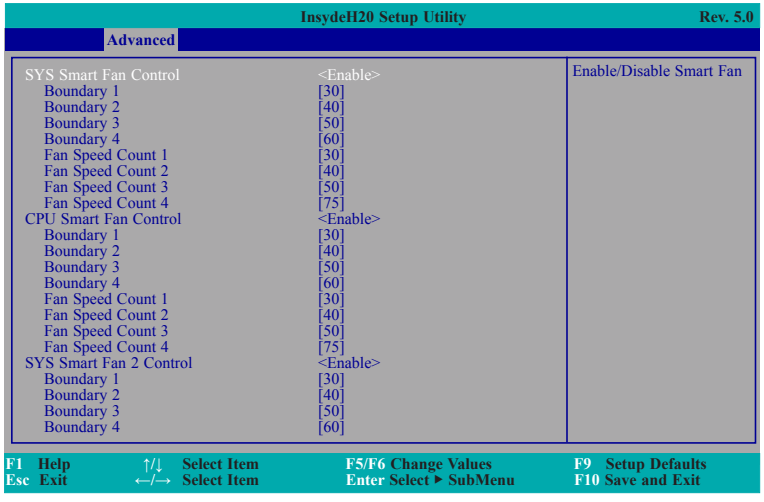


Me Fw Image Re-Flash

Enable or disable flashing of the Intel® Management Engine firmware.

SIO NUVOTON6106D

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



SYS/CPU Smart Fan/Fan 2 Control

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

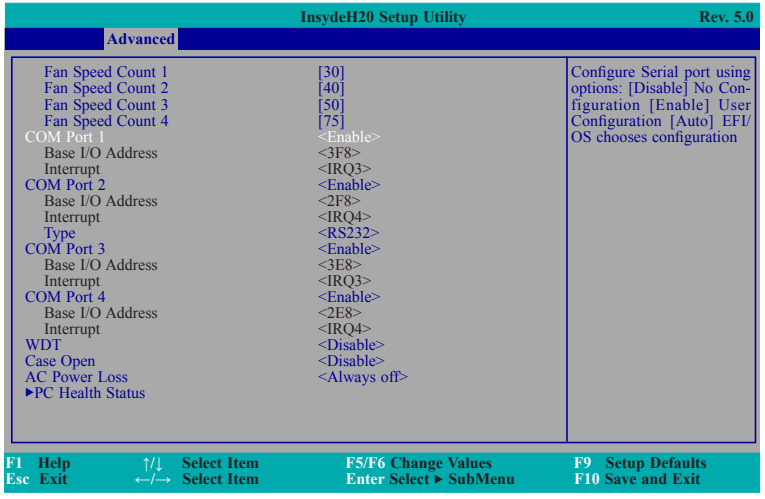
Boundary 1 to Boundary 4

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 temperature 1, the system or CPU fan should be turned on and operate at the designated speed.

The range of the temperature is from 0 to 127°C.

Fan Speed Count 1 to Fan Speed Count 4

Set the fan speed. The range is from 0 (fan stop)-100% (full speed).



Serial Port 1 to Serial Port 4

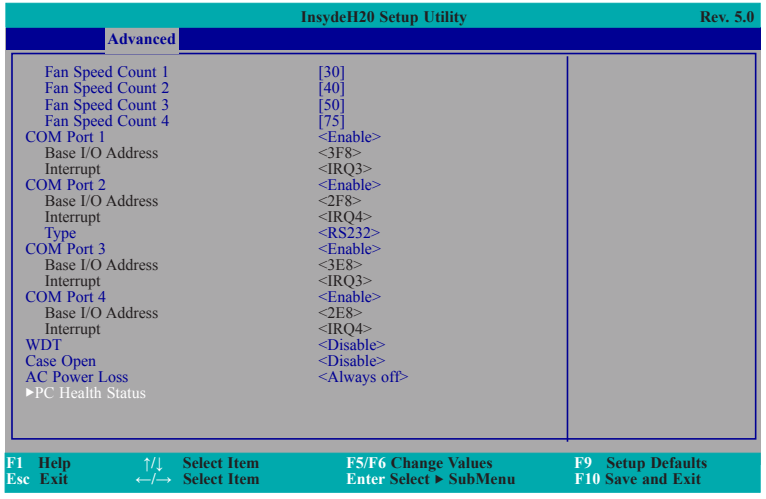
Configures the settings of the serial port.

Disable Disable this serial port.

Enable Enable this serial port.

Type

Choose RS232/RS422/RS485 for the serial port type for COM port 2 only.



WDT

Enable or disable the watchdog function.

Case Open

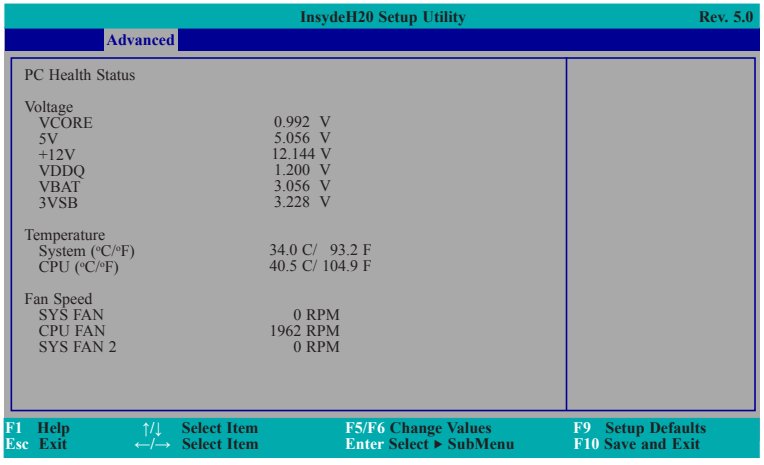
Enable or disable the case open function.

AC Power Loss

Set the AC power loss to Always off or Always on. When set to Always off, the system's status will be power-off after an AC power loss event. When set to Always on, the system's status will be power-on after an AC power loss event.

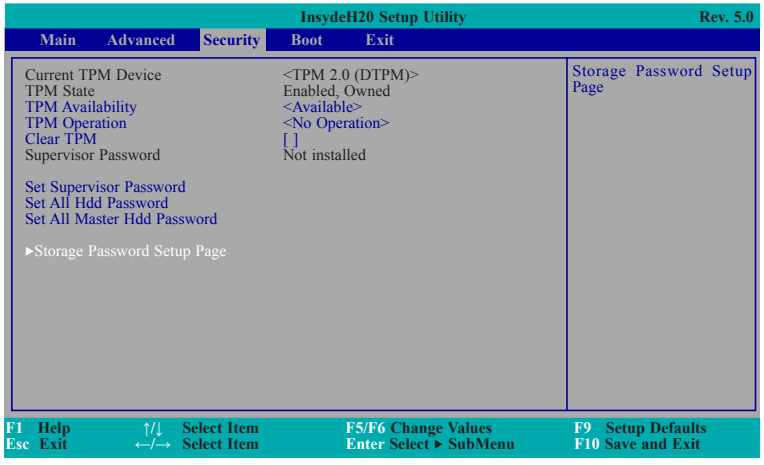
PC Health Status

This section displays the PC health status.



Security

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



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 the current state.
- Disable: Disable and deactivate TPM.
- Enable: Enable and activate TPM.

Clear TPM

Remove all TPM ownership contents.

Set Supervisor Password

Set the supervisor's password. The length of the password must be greater than one character and less than or equal to 10 characters.

Set All Hdd Password

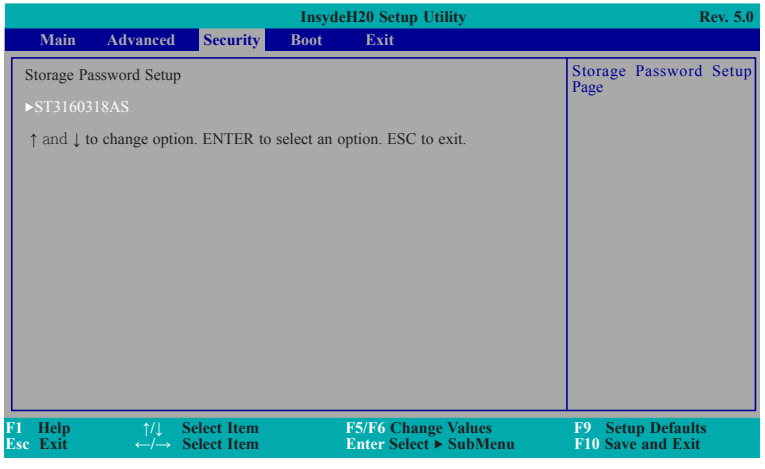
Set the user password for all HDDs. The length of the password must be greater than one character and less than or equal to 32 characters.

Set All Master Hdd Password

Set the master password for all HDDs. The length of the password must be greater than one character and less than or equal to 32 characters.

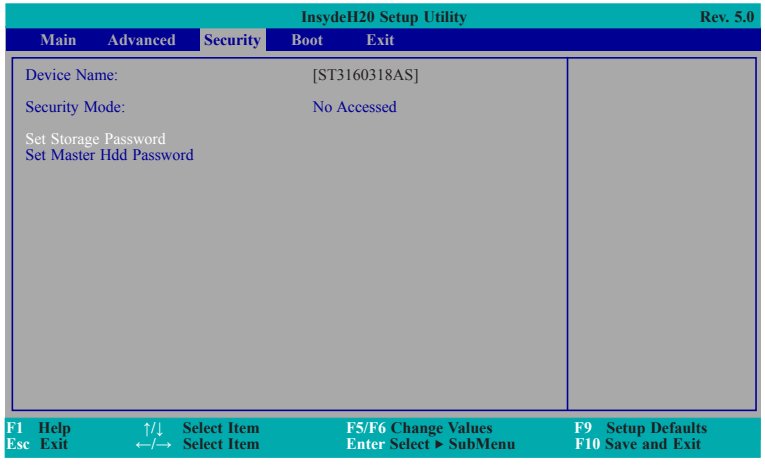
Storage Password Setup Page

Set the storage password for each detected device.



ST3160318AS (Device Name)

Select this option to set a password for the selected device.



Security Mode Description

Lock: HDD security status is enabled and lock.

Unlock: HDD security status is enabled and lock.

Change: HDD security status is unlock and users are allowed to change the password.

Disable: Remove the password from the device.

No Access: HDD Secutiry status is not enabled.

Set Storage Password

Set all HDD password. The length of password must be greater than one character.

Set Master Hdd Password

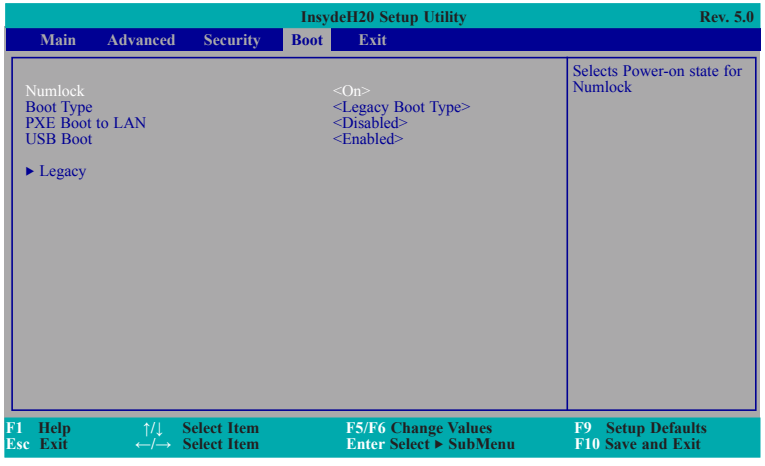
Set master HDD password. The length of password must be greater than one character and less than or equal to 32 characters.

When the security mode is set to Lock, input the master HDD password to unlock the HDD.

Clear the HDD password by pressing "Enter" to disable HDD security and set a new master HDD password.

Boot

This section configures boot options.



Numlock

Select the power-on state for numlock.

Boot Type

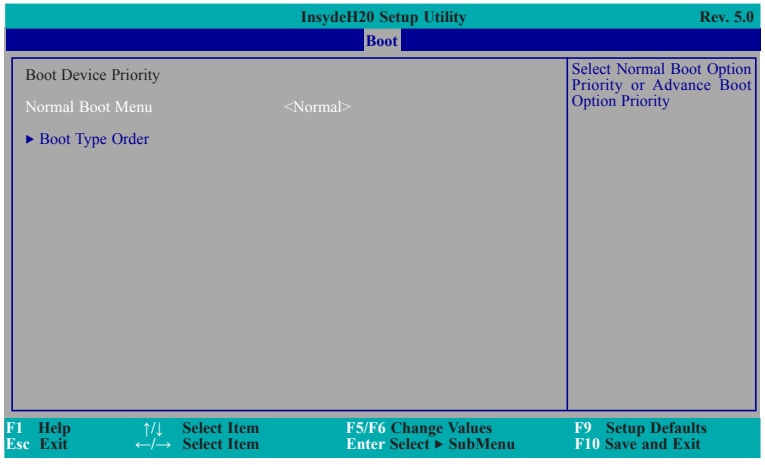
Select the boot type. The options are Dual Boot Type, Legacy Boot Type or UEFI Boot Type.

PXE Boot Capability

Enable or disable PXE boot to LAN.

USB Boot

Enable or disable booting to the USB boot devices.



Normal Boot Menu

Select the boot menu type: normal or advanced.
For the advanced menu type: Use + and - keys to arrange the priority of the boot devices in the list.
For normal menu type: Select the "Boot Type Order" or "Hard Disk Drive" category to view and arrange the order of the boot devices in the list.

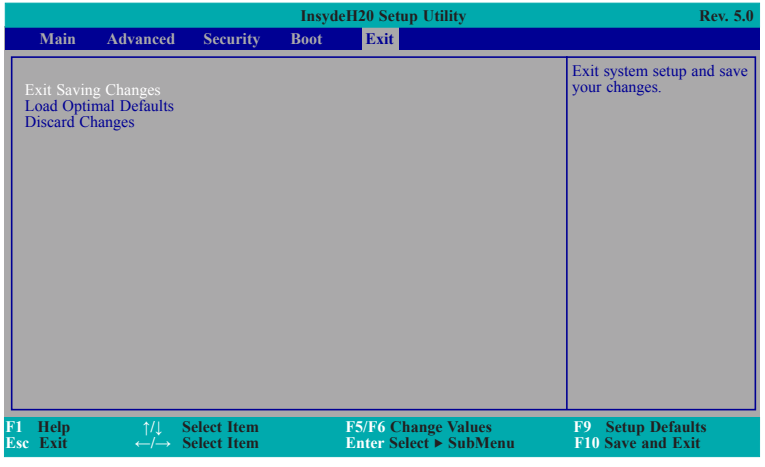
Boot Type Order

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

Note:
If the boot type is set to UEFI, the method for RAID volume creation will be different. Please refer to Chapter 9 – RAID for more information.

Exit

This section configures the parameters for exiting the BIOS menu.



Exit Saving Changes

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

Load Optimal Defaults

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

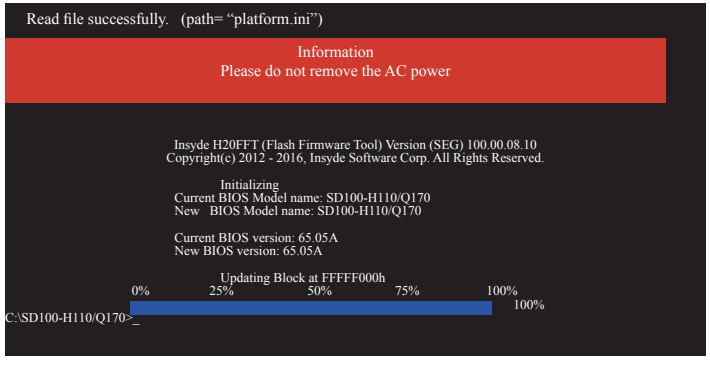
Discard Changes

Select this field and then press <Enter>to exit the BIOS 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.



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.

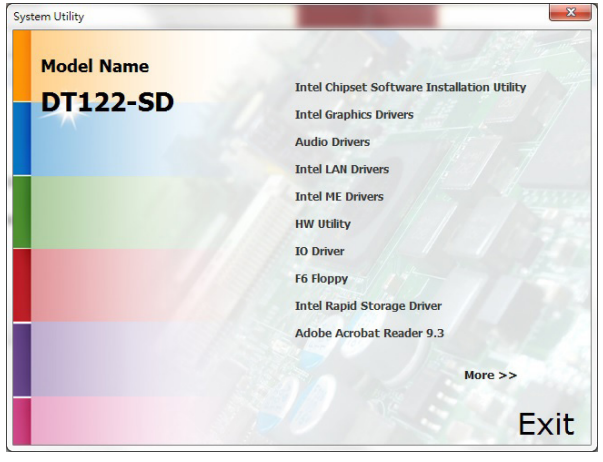
Note:
a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.
b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical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

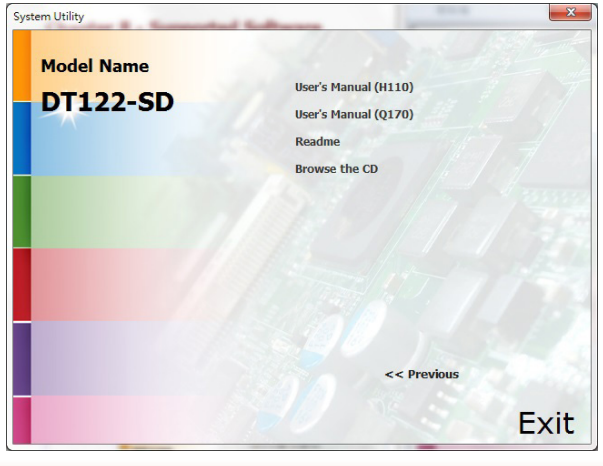
Chapter 8 - Supported Software

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

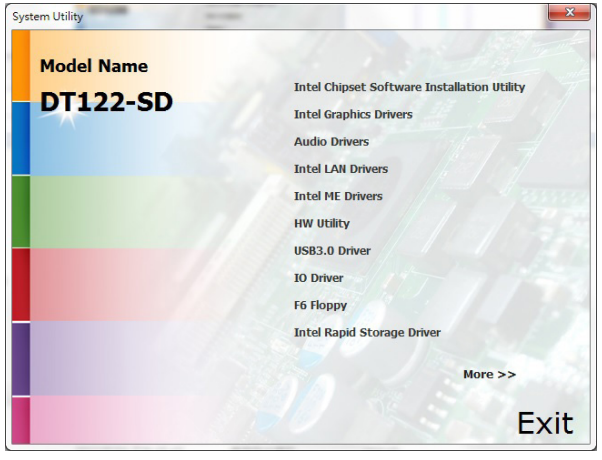
Insert the DVD into a DVD-ROM drive. The autorun screen (Mainboard Utility DVD) will appear. If the "Autorun" does not automatically start, please go directly to the root directory of the DVD and double-click "Setup".

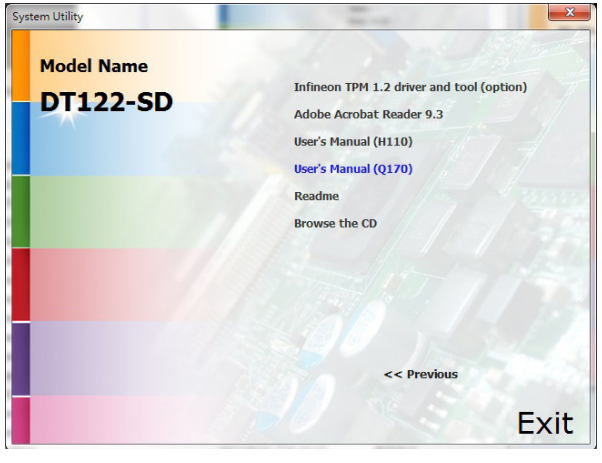
For Windows 10



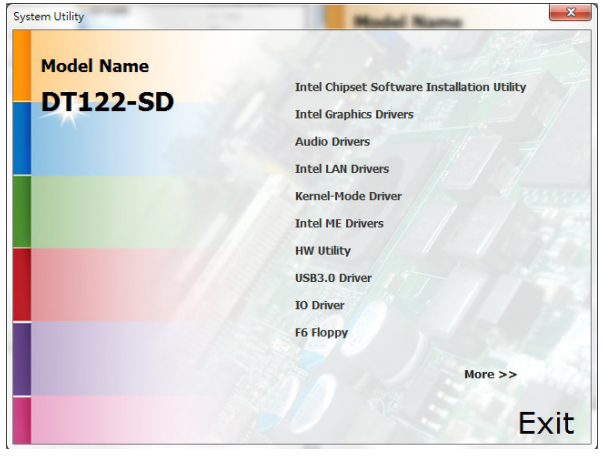


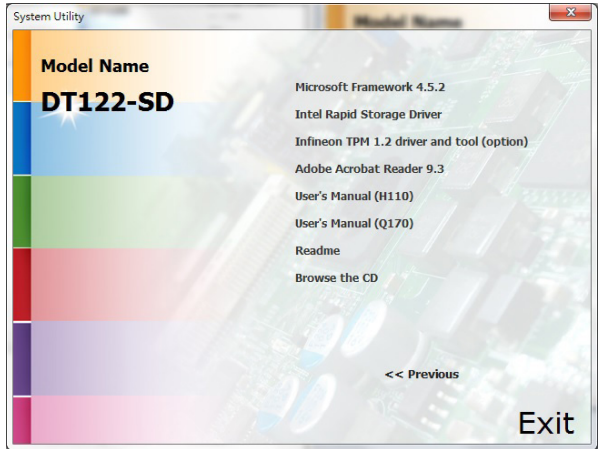
For Windows 8.1





For Windows 7





Intel Chipset Software Installation Utility

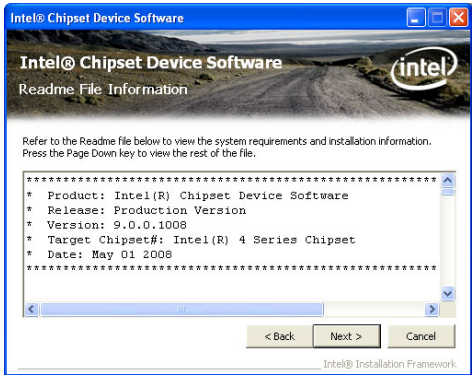
The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

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

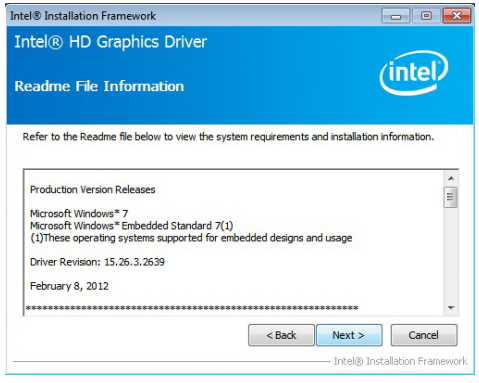
To install the driver, click "Intel Graphics Drivers" on the main menu.

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

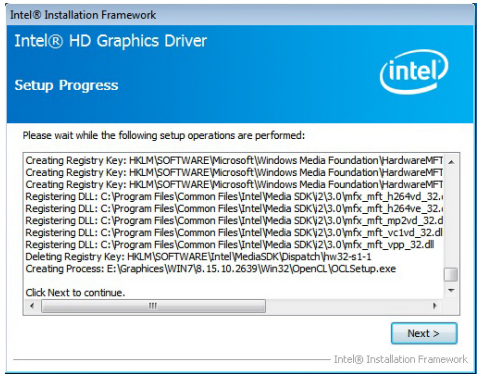
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/Windows 8.1/Windows 10 desktop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

2. Read the license agreement then click Yes.

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

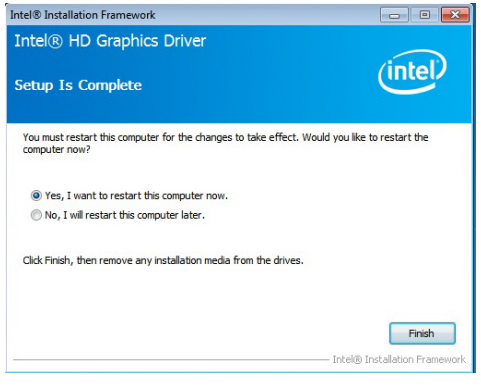


4. Setup is now installing the driver. Click Next to continue.



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

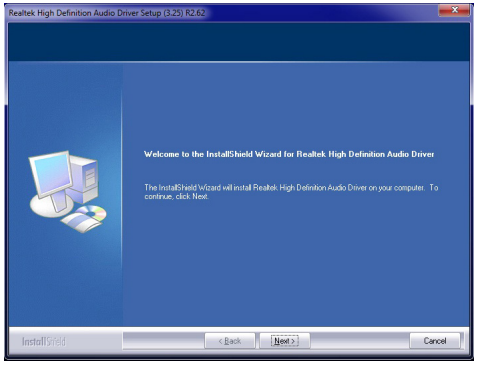
   Restarting the system will allow the new software installation to take effect.



Audio Drivers

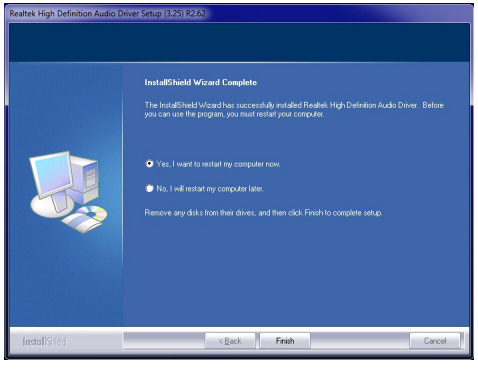
To install the driver, click "Audio Drivers" on the main menu.

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



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

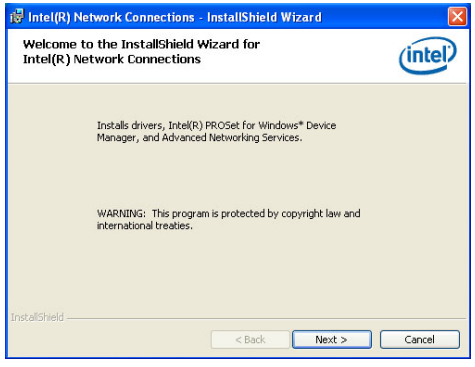
   Restarting the system will allow the new software installation to take effect.



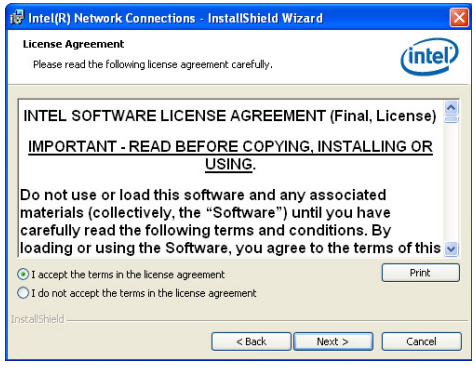
Intel LAN Drivers

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

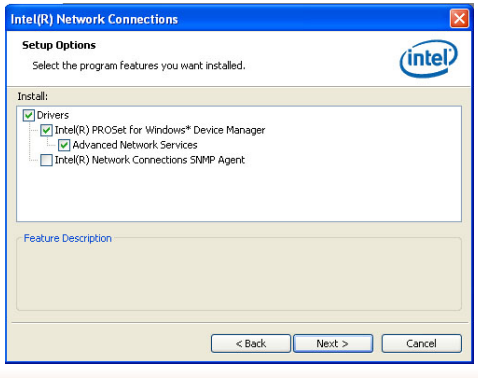
1. Setup is ready to install the driver. Click Next.



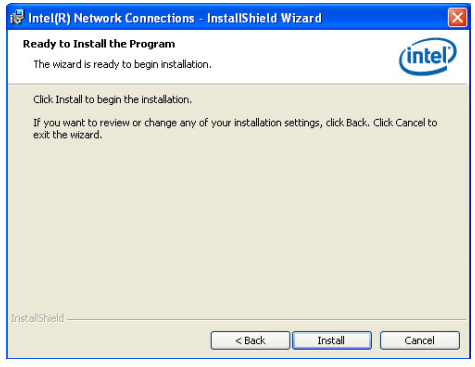
2. Click "I accept the terms in the license agreement" then click "Next".



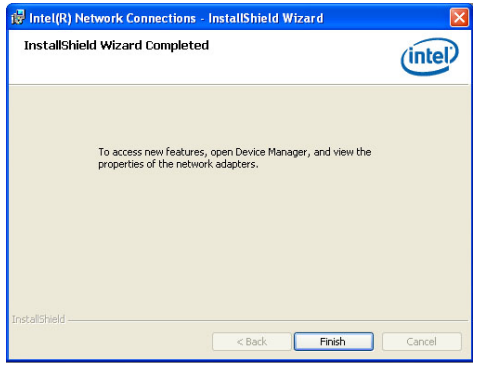
3. Select the program featuers you want installed then click Next.



4. Click Install to begin the installation.



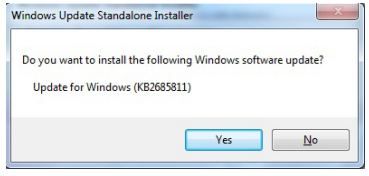
5. After completing installation, click Finish.



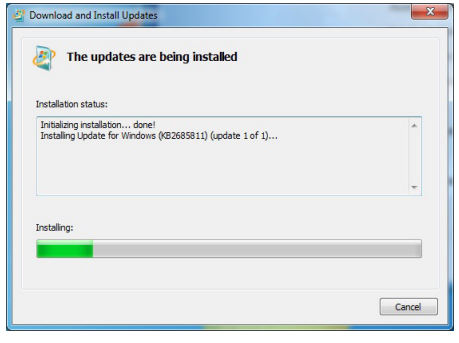
Kernel Mode Driver (For Windows 7 only)

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

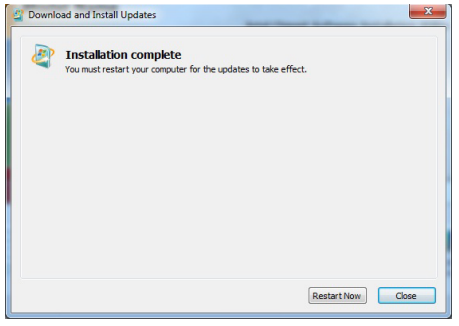
1. Click "Yes" to install the update.



2. The update is installed now.



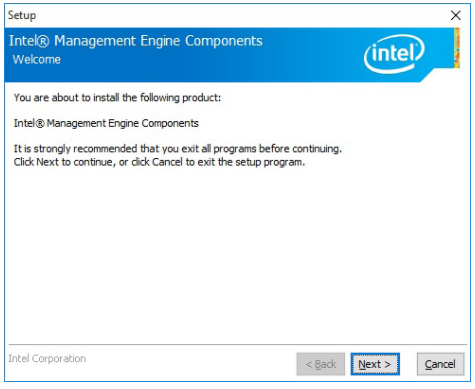
3. Click "Restart Now" to restart your computer when the installation is complete.



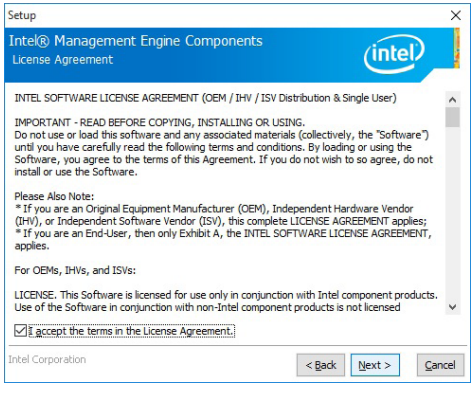
Intel Management Engine Drivers

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

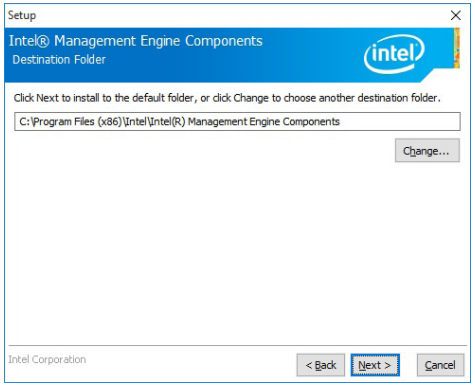
1. Setup is ready to install the driver. Click Next.



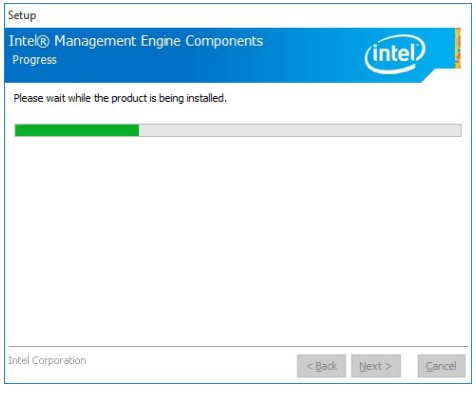
2. Read the license agreement then click Next.



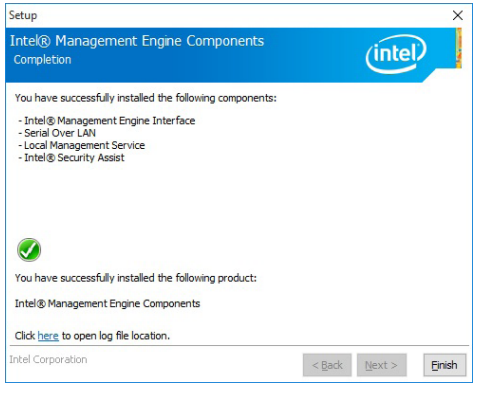
3. Setup is currently installing the driver. After installation has completed, click Next.



4. Please wait while the product is being installed.



5. After completing installation, click Finish.

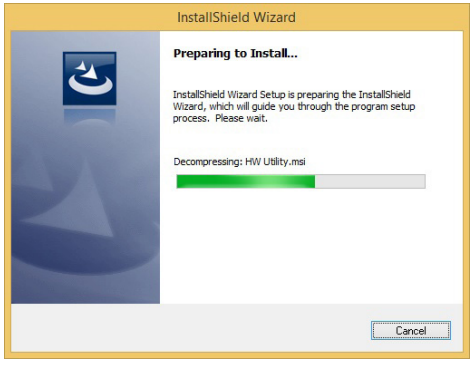


HW Utility

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

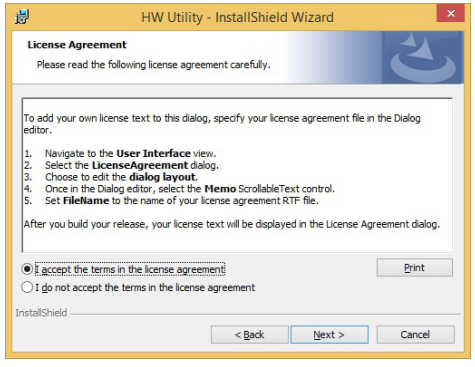
Note:
If you are using Windows 7 or later versions, you need to access the operating system as an administrator to be able to install the utility.

1. Setup is ready to install the driver.

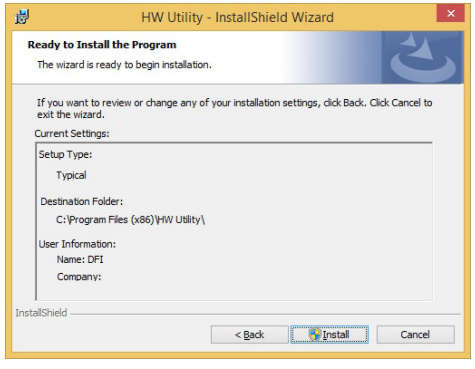


2. Click "Next" to continue.

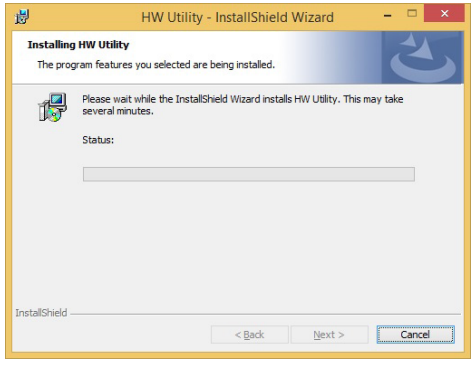
3. Read the license agreement then click "I accept the terms in the license agreement". Click "Next".



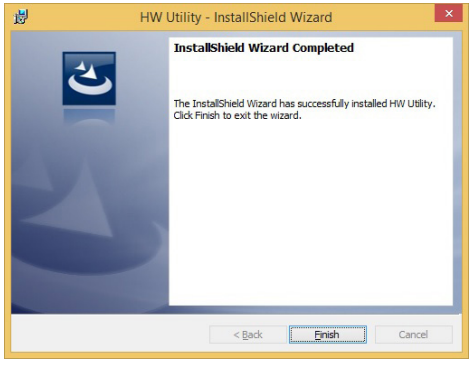
4. The wizard is ready to begin installation. Click "Install".



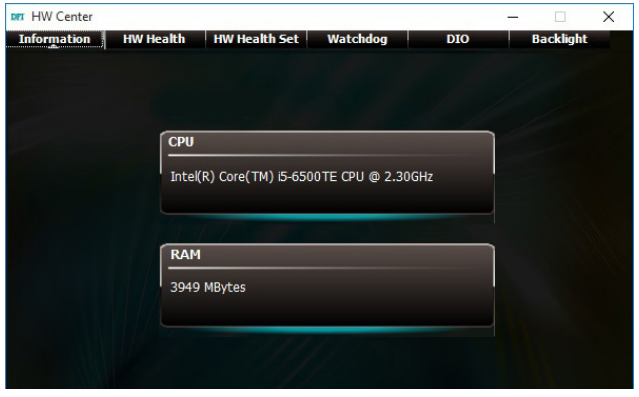
5. Please wait while the program features are being installed.



6. After completing installation, click "Finish".

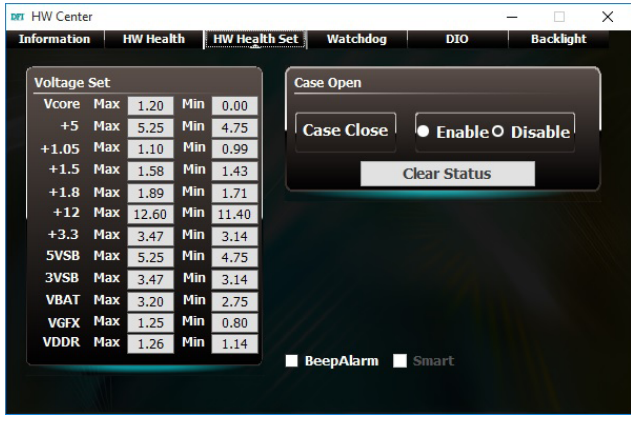


The HW Utility icon will appear on the desktop. Double-click the icon to open the utility.

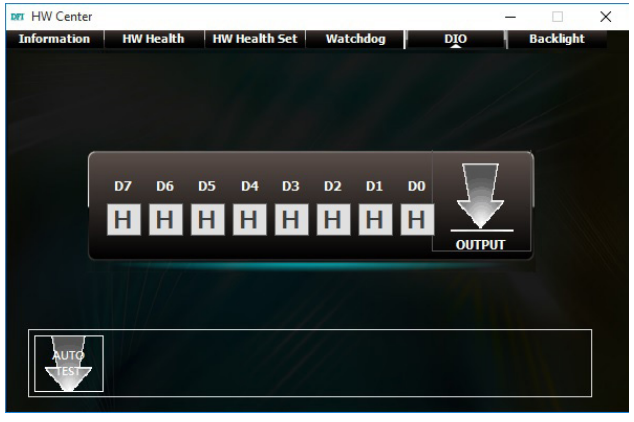


Information

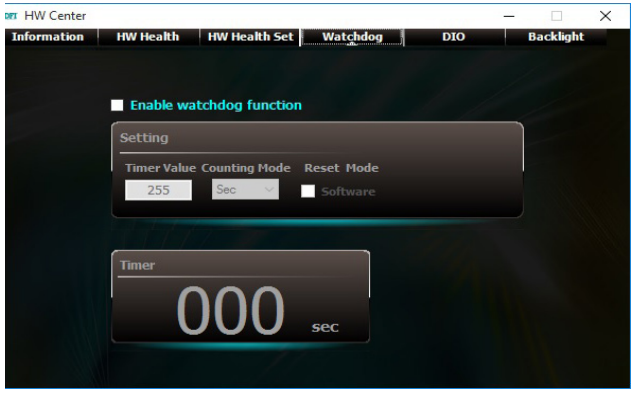
HW Health



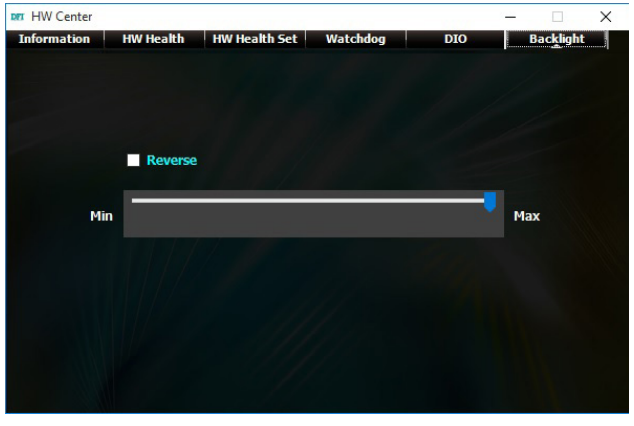
HW Health Set



DIO



WatchDog

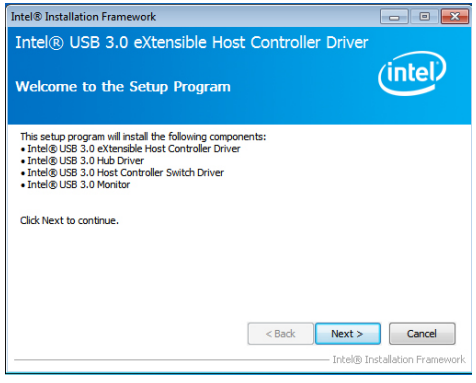


Backlight

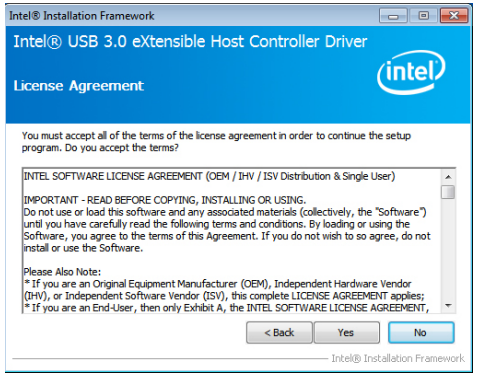
Intel USB 3.0 Drivers (For Windows 7 and Windows 8.1)

To install the driver, click "Intel USB 3.0 Driver" on the main menu.

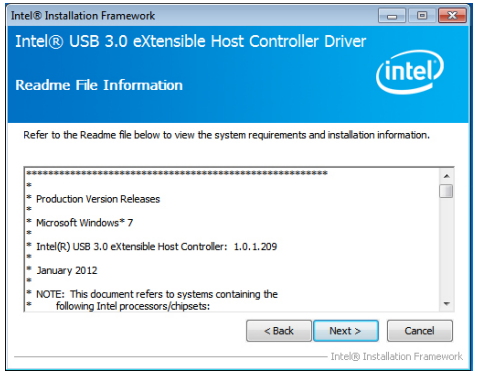
1. Setup is ready to install the driver. Click Next.



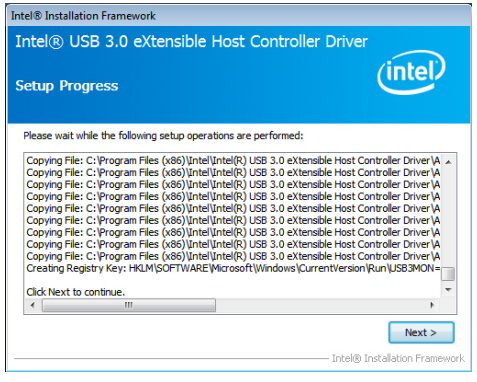
2. Read the license agreement then click Yes.



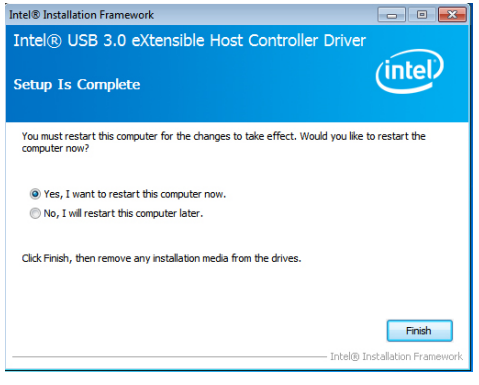
3. Go through the readme document for more installation tips then click Next.



4. Setup is currently installing the driver. After installation has completed, click Next.



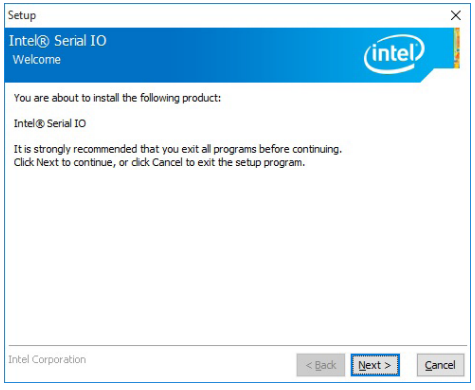
5. After completing installation, click Finish.



IO Driver

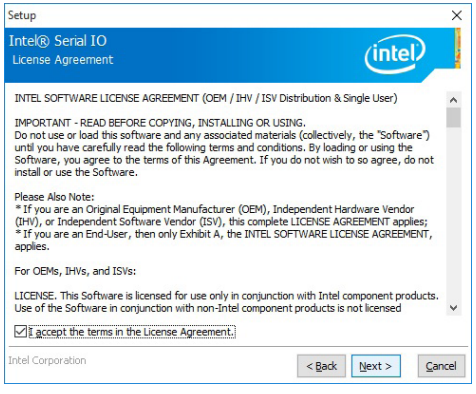
To install the driver, click "Intel Serial IO Driver" on the main menu

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

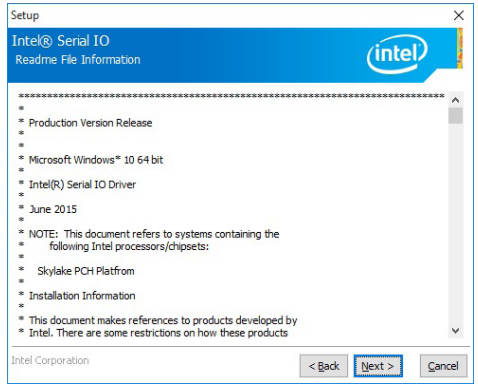


2. Read the license agreement carefully.

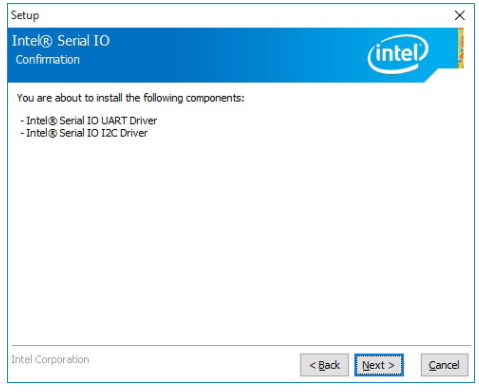
   Click "I accept the terms in the License Agreement" then click Next.



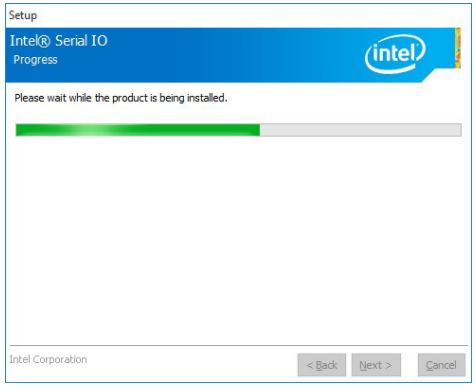
3. Read the file information then click Next.



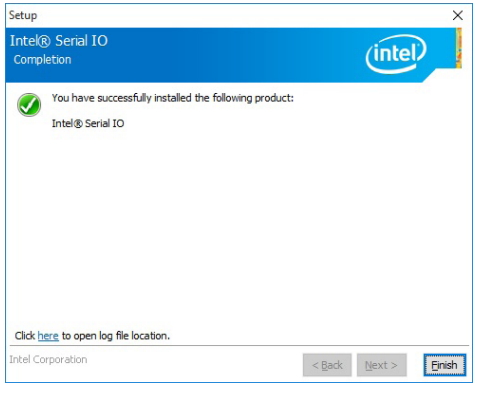
4. Setup is ready to install the driver. Click Next.



5. Setup is now installing the driver.



6. Click Finish.

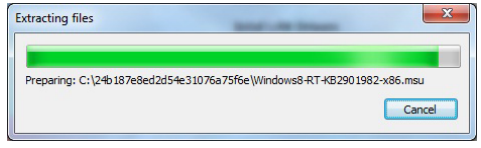


Microsoft Framework 4.5.2 (For Windows 7)

Note:
Before installing Microsoft Framework 4.5.2, make sure you have updated your Windows 7 operating system to Service Pack 3.

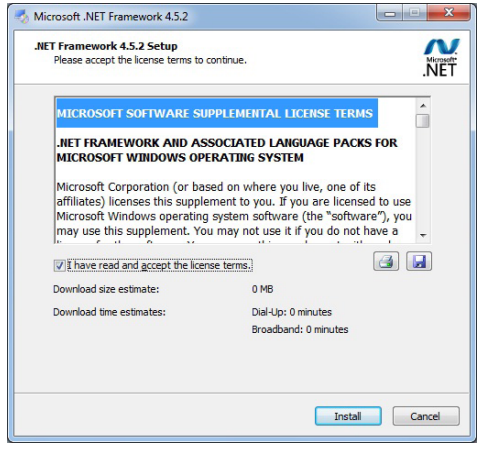
To install the driver, click "Microsoft Framework 4.5.2" on the main menu.

1. Setup is now extracting files.

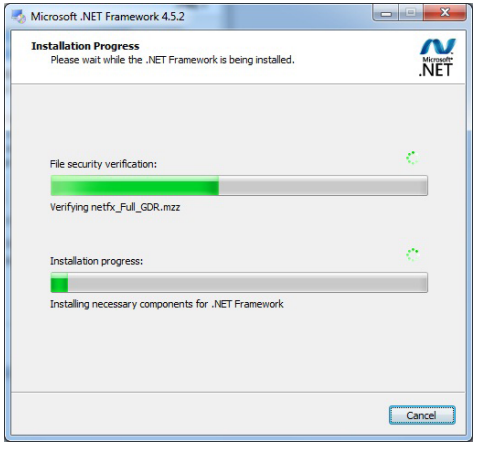


2. Read the license agreement carefully.

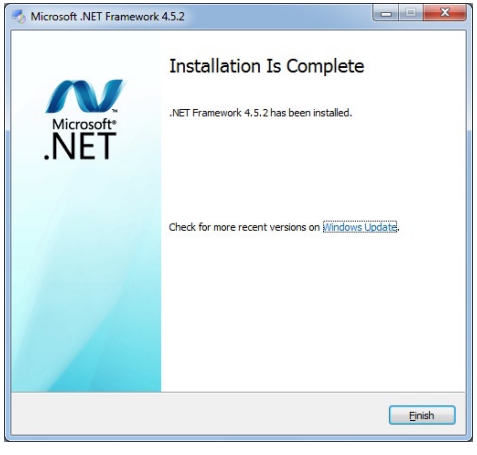
   Click "I have read and accept the terms of the License Agreement" then click Install.



3. Setup is now installing the driver.



4. Click Finish.



Intel® Rapid Storage Technology

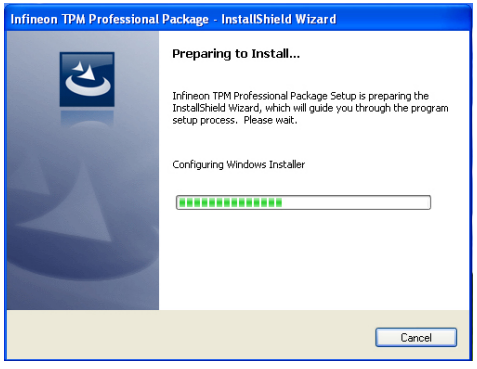
The Intel® Rapid Storage Technology is a utility that allows you to monitor the current status of the SATA drives. It enables enhanced performance and power management for the storage subsystem.

To install the driver, click "Intel Rapid Storage Technology" on the main menu. Please refer to **Chapter 9** for more information.

Infineon TPM 1.2 Driver and Tool (optional)

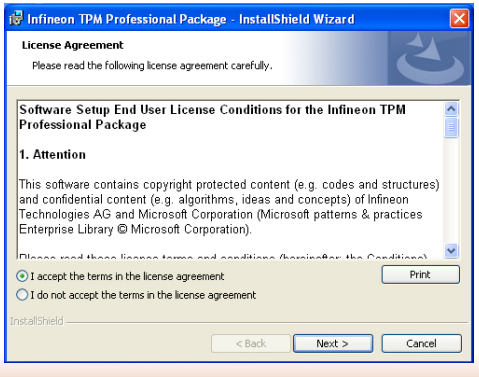
To install the driver, click "Infineon TPM driver and tool (option)" on the main menu.

1. The setup program is preparing to install the driver.

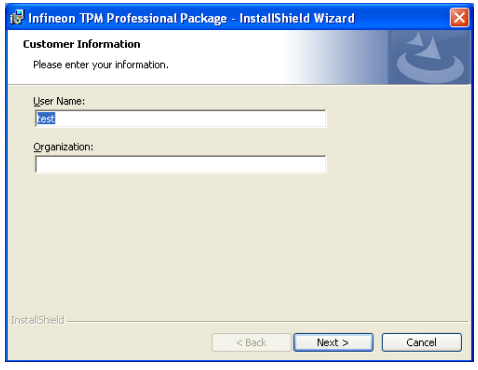


2. The setup program is now ready to install the utility. Click Next.

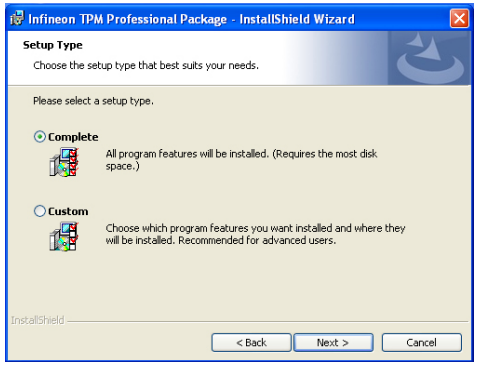
3. Click "I accept the terms in the license agreement" and then click "Next".



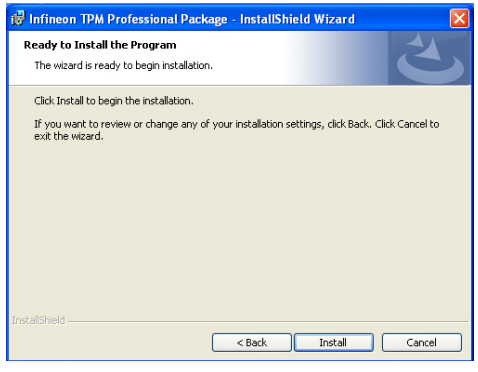
4. Enter the necessary information and then click Next.



5. Select a setup type and then click Next.

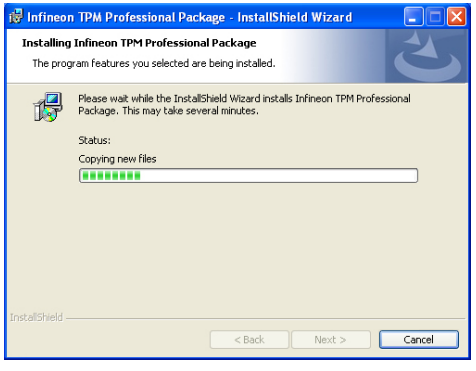


6. Click Install.

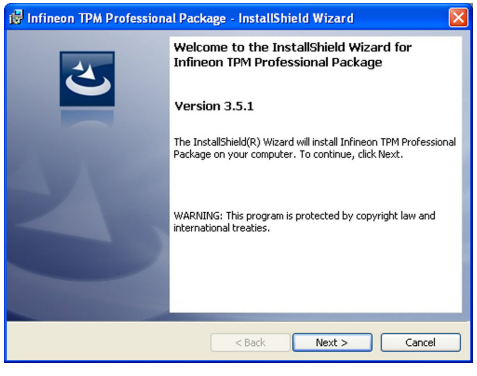


7. TPM requires installing the Microsoft Visual C++ package prior to installing the utility. Click Install.

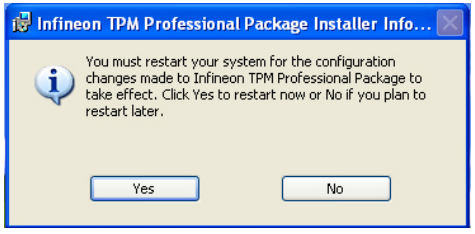
8. The setup program is currently installing the Microsoft Visual C++ package.



9. Click Finish.



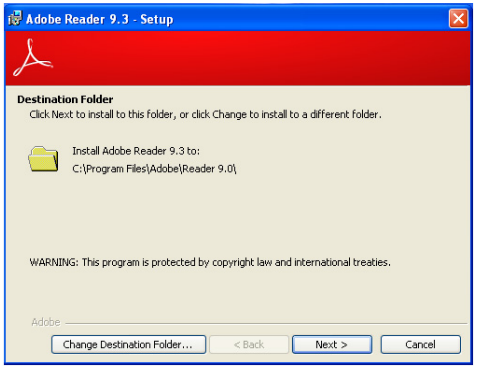
10. Click "Yes" to restart your system.



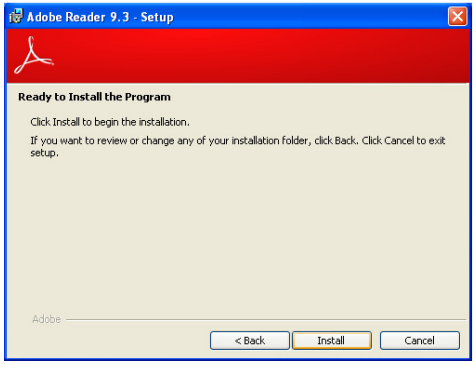
Adobe Acrobat Reader 9.3

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

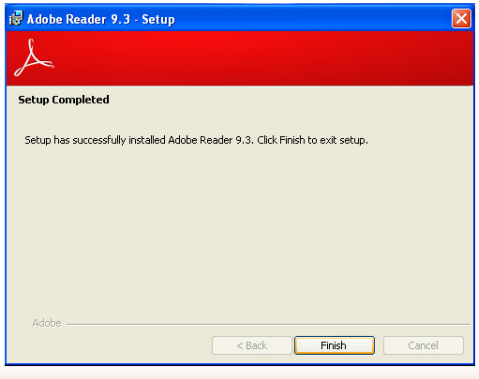
1. Click Next to install or click Change Destination Folder to select another folder.



2. Click Install to begin installation.



3. Click Finish to exit installation.



Chapter 9 - RAID (Only for Intel® Q170 Chipset)

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

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.

Settings

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

1. Connect the Serial ATA drives.
2. Enable RAID in the 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 Configuration 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 BIOS utility.
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

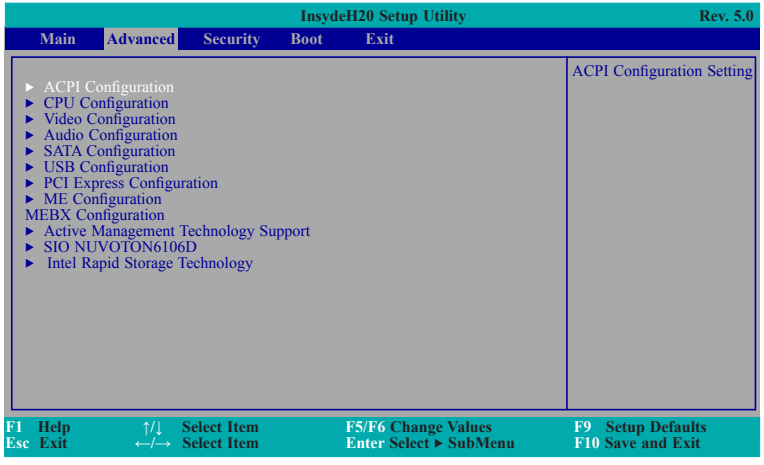
1. When the Intel® RST option ROM status screen displays during POST, press <Ctrl> and <I> simultaneously to enter the option ROM user interface.
2. Select 1: Create RAID Volume and press <Enter>.
3. Use the up or down arrow keys to select the RAID level and press <Enter>.
4. Use the up or down arrow 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).

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.

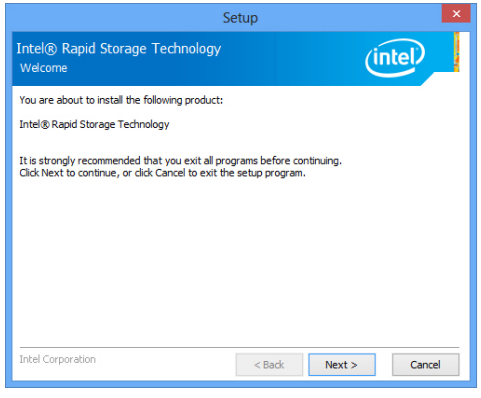
Step 4: Install the Intel Rapid Storage Technology Utility

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.

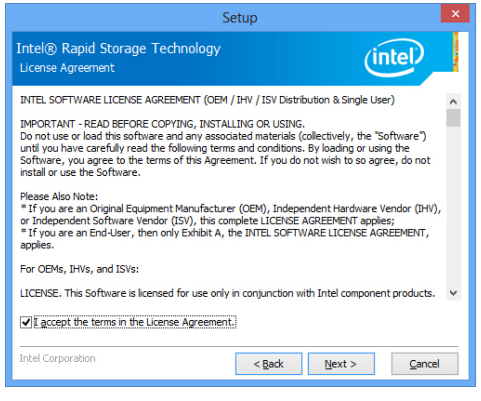
1. Insert the provided DVD into an optical drive.

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

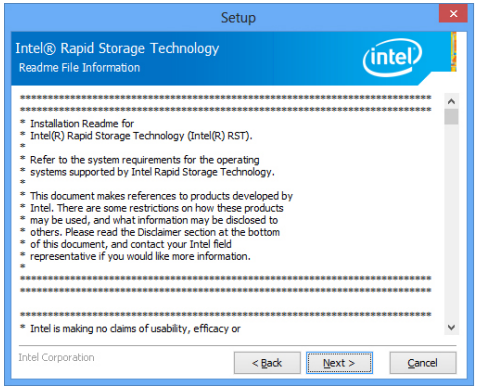
3. Setup is ready to install the utility. Click Next.



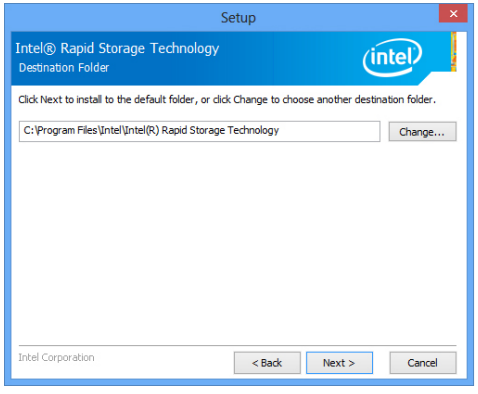
4. Read the license agreement and click "I accept the terms in the License Agreement." Then, click Next.



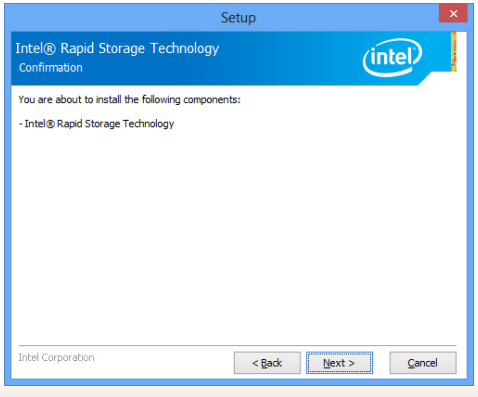
5. Go through the readme document to view system requirements and installation information then click Next.



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 10 - Intel AMT Settings (Only for Intel® Q170 Chipset)

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**

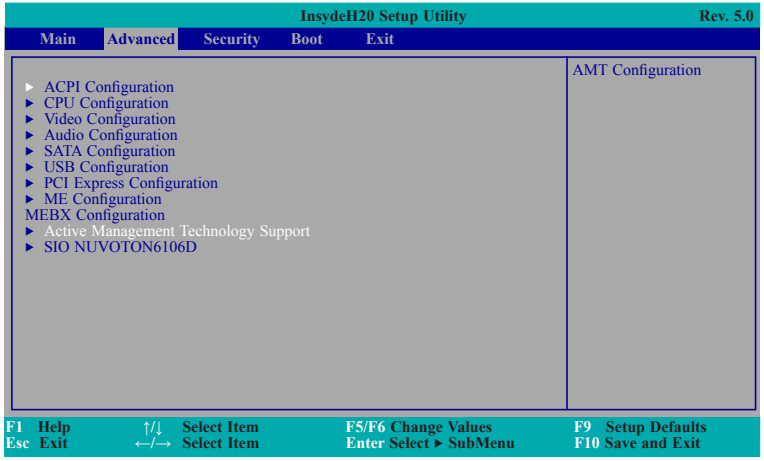
Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

- **Protect**

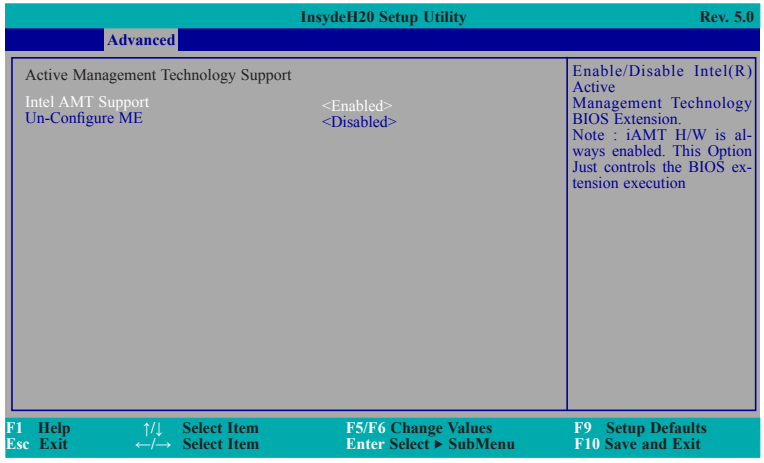
Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical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

Enable Intel® AMT in the BIOS

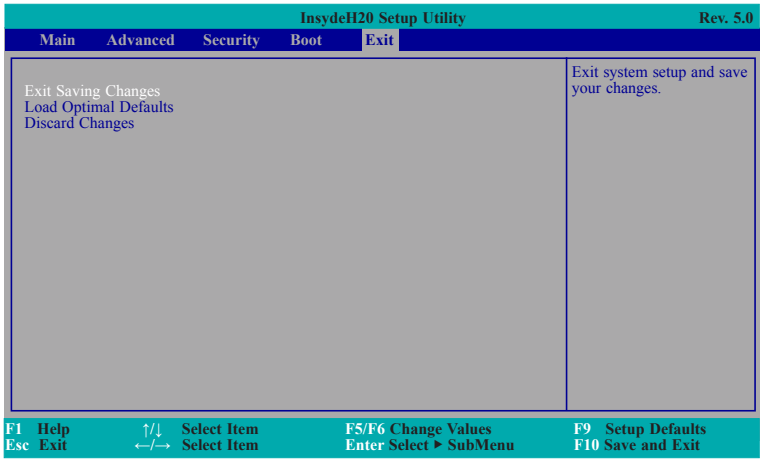
1. Power-on the system then press <Del> to enter the main menu of the Insyde BIOS.
2. In the **Advanced** menu, select **Avtive Management Technology Support**.



3. Select **Enabled** for the **Intel AMT Support** option.

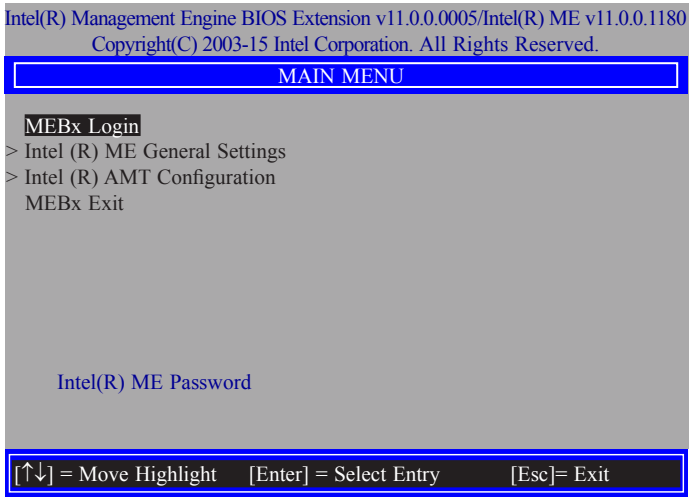


4. In the **Exit** menu, select **Exit Saving Changes** then select **OK**.



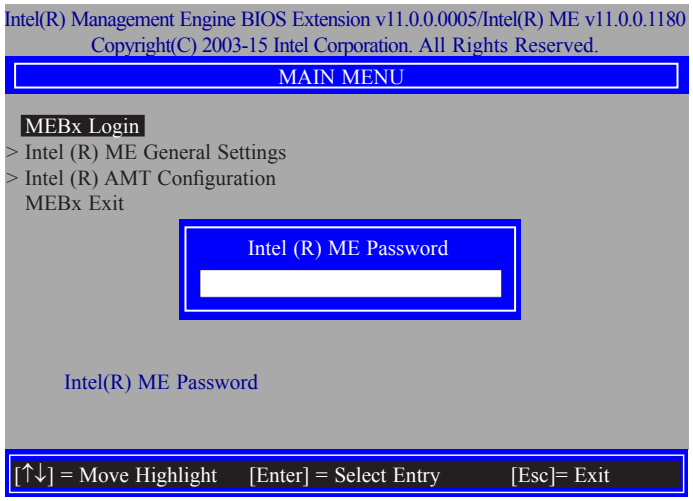
Set up Intel® AMT using the Intel® Management Engine BIOS Extension (MEBX)

1. After the system reboots, press <Del> to enter the BIOS menu again.
2. In the **Advanced** menu, select **MEBX Configuration** to enter the Manageability Engine BIOS Extension (MEBx) Setup.
3. 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".

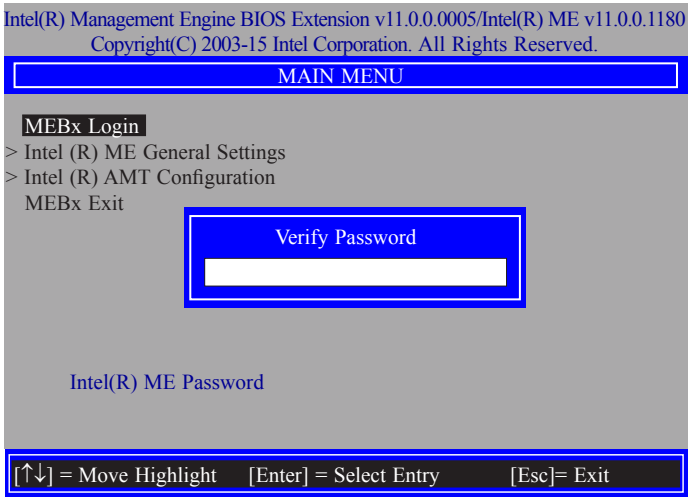


4. Enter a password in the space provided under Intel(R) ME Password then press Enter. The password must include:

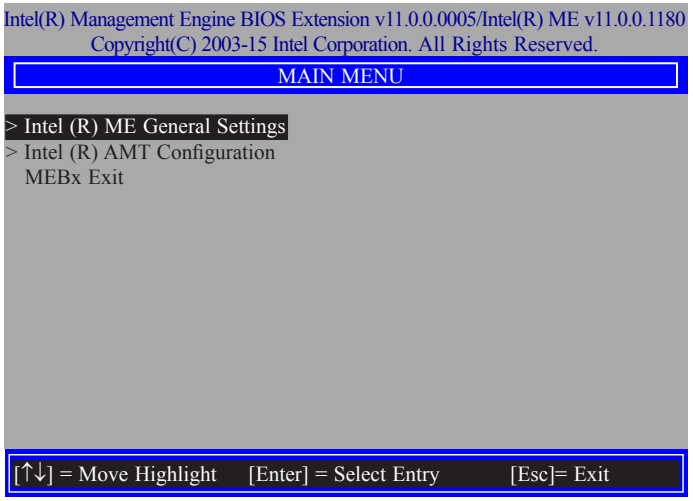
   - 8-32 characters
   - Strong 7-bit ASCII characters excluding **:**, and **"** characters
   - At least one digit character (0, 1, ...9)
   - At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
   - Both lower case and upper case characters



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



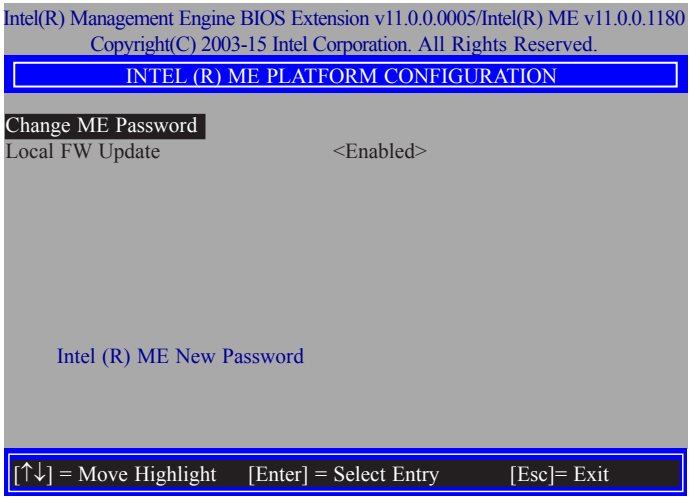
6. Select **Intel(R) ME General Settings** then press Enter.



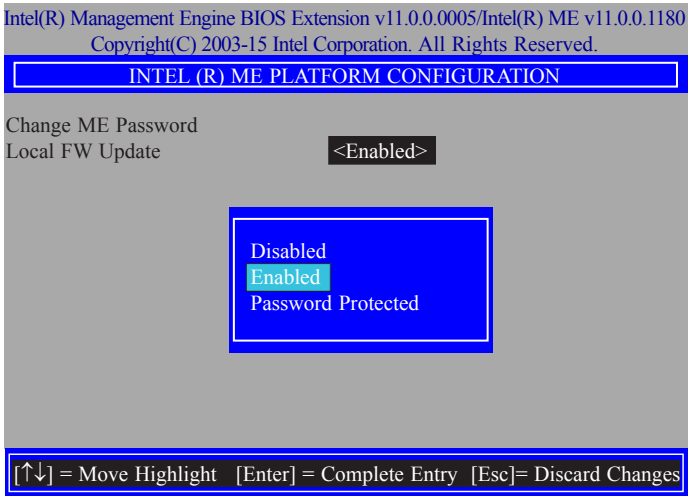
7. Select **Change Intel(R) ME Password** then press Enter.

   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.

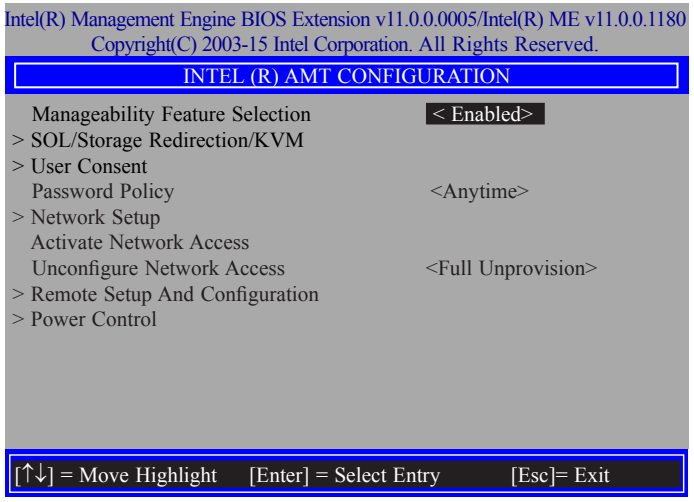
   - 8-32 characters
   - Strong 7-bit ASCII characters excluding **: ,** and **"** characters
   - At least one digit character (0, 1, ...9)
   - At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, $, ;)
   - Both lower case and upper case characters



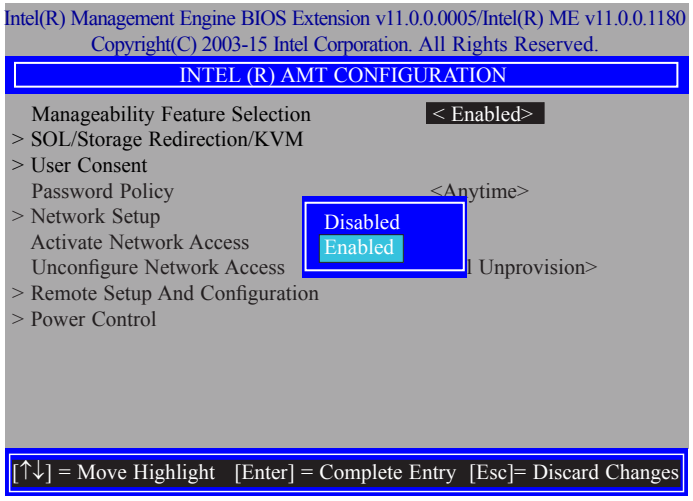
8. Select **Local FW Update** then press Enter. Select **Enabled** or **Disabled** or **password Protected** then press Enter.



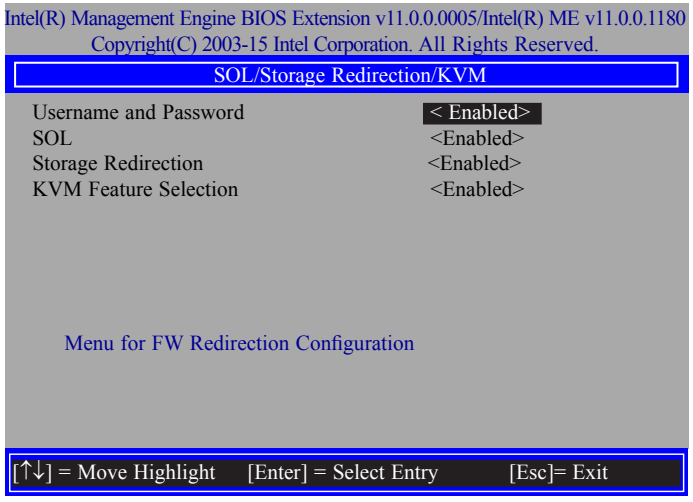
9. Select Previous Menu until you return to the **Main Menu**. Select **Intel(R) AMT Configuration** then press Enter.



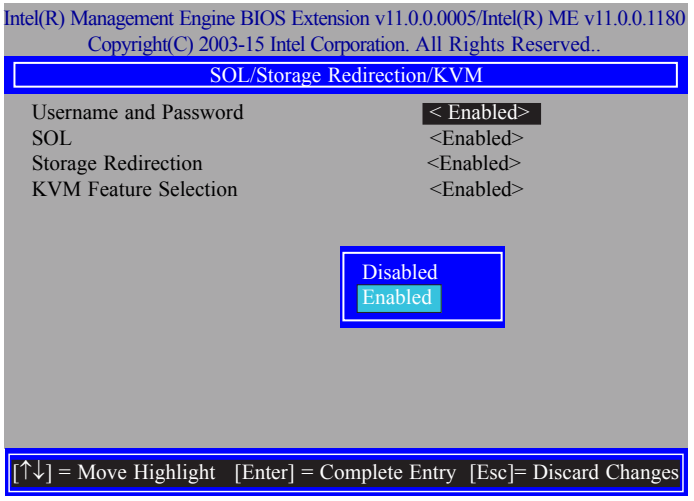
10. In the **Intel(R) AMT Configuration** menu, select **Manageability Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



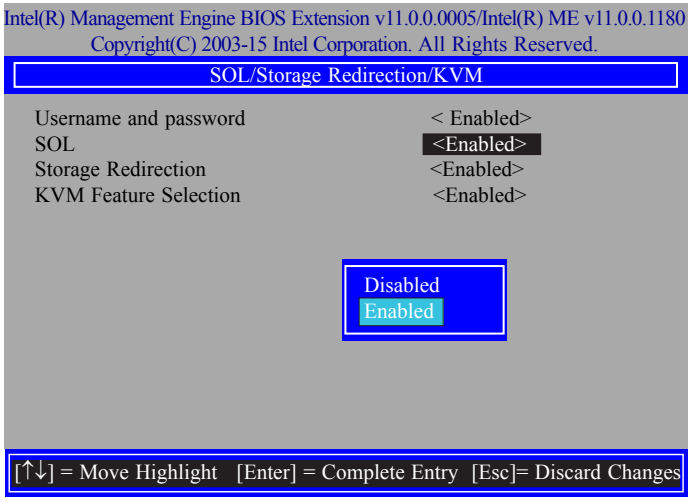
11. In the **Intel(R) AMT Configuration** menu, select **SOL/Storage Redirection/KVM** then press Enter.



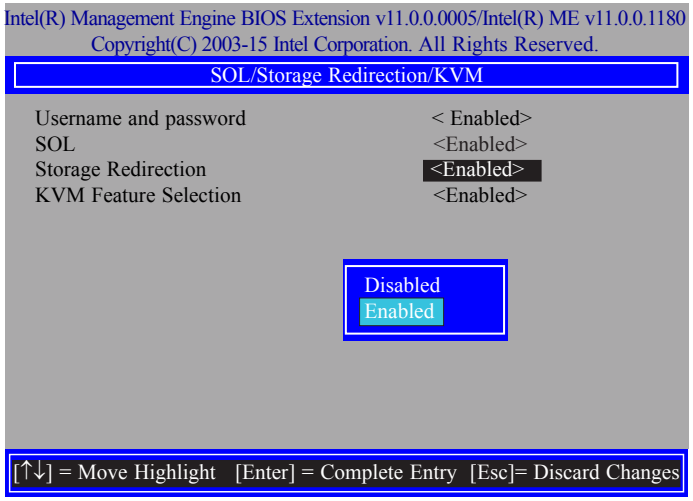
12. In the **SOL/Storage Redirection/KVM** menu, select **Username and Password** then press Enter. Select **Enabled** or **Disabled** then press Enter.



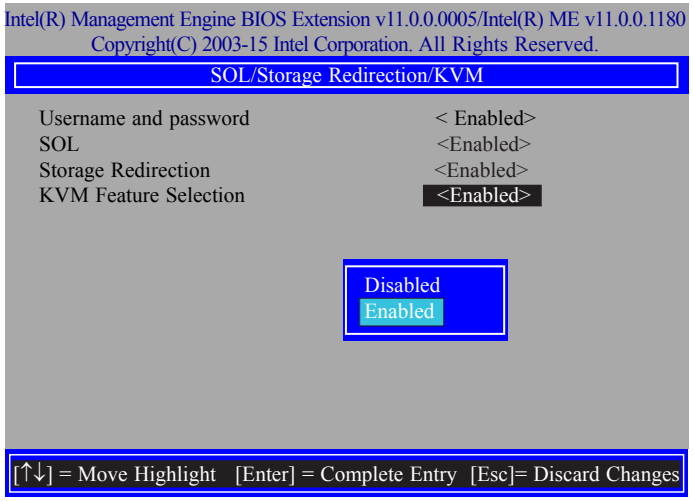
13. In the **SOL/Storage Redirection/KVM** menu, select **SOL** then press Enter. Select **Enabled** or **Disabled** then press Enter.



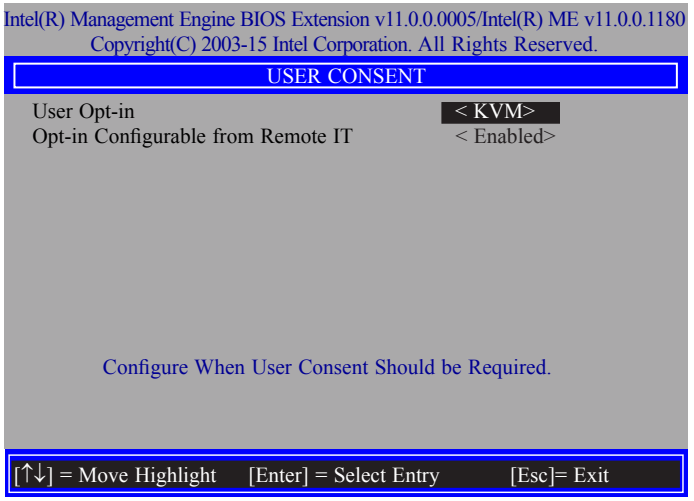
14. In the **SOL/Storage Redirection/KVM** menu, select **Storage Redirection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



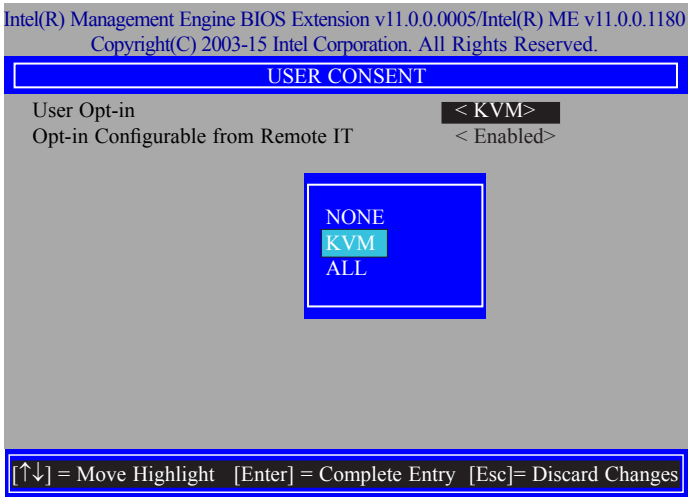
15. In the **SOL/IDER/KVM** menu, select **KVM Feature Selection** then press Enter. Select **Enabled** or **Disabled** then press Enter.



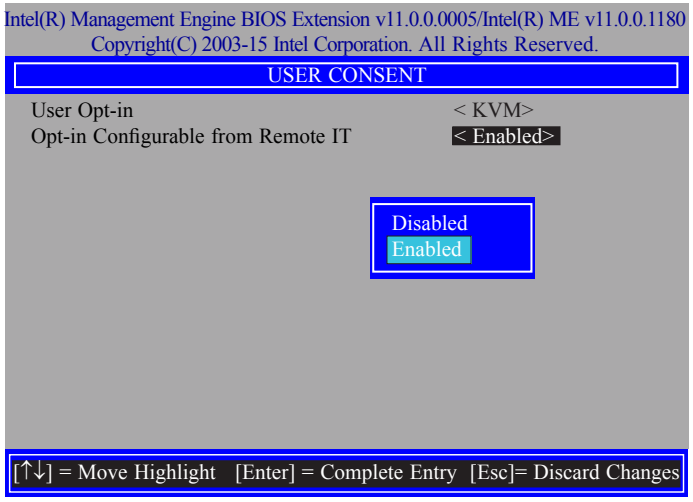
16. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **User Consent** then press Enter.



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

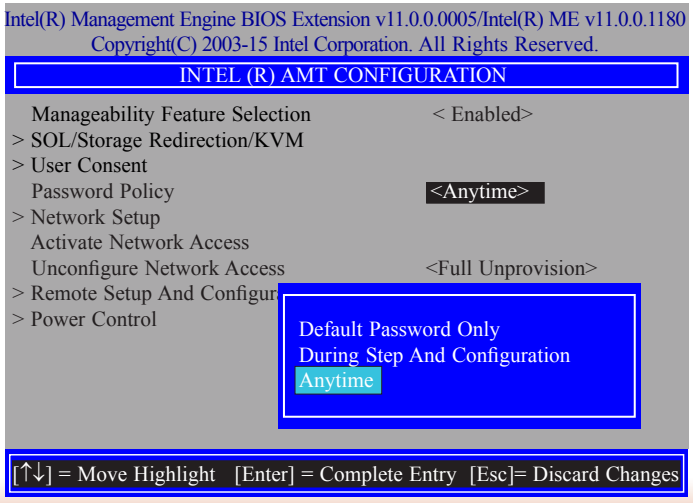


18. In the **User Consent** menu, select **Opt-in Configurable from Remote IT** then press Enter. Select **Enabled** or **Disable Remote Control of KVM Opt-in Policy** then press Enter.

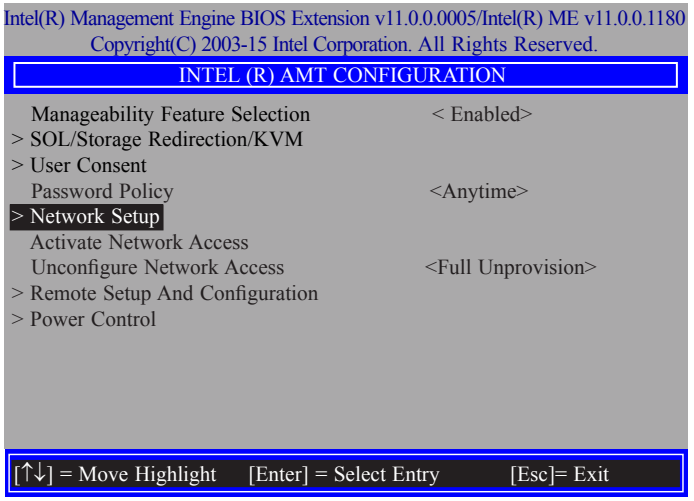


19. Select Previous Menu until you return to the **Intel(R) AMT Configuration** menu. Select **Password Policy** then press Enter.

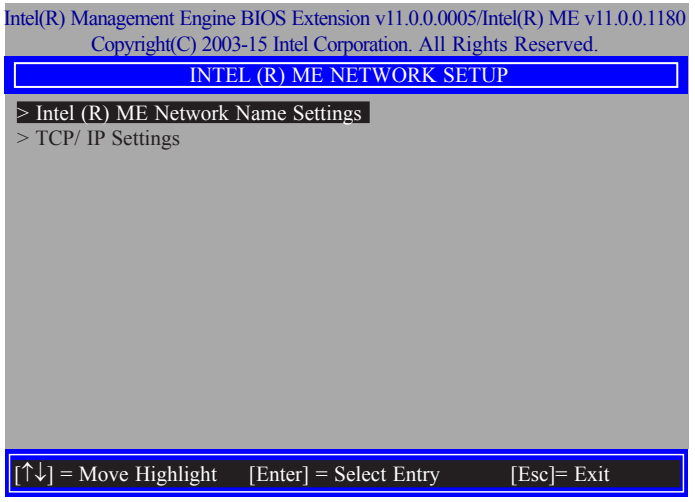
You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



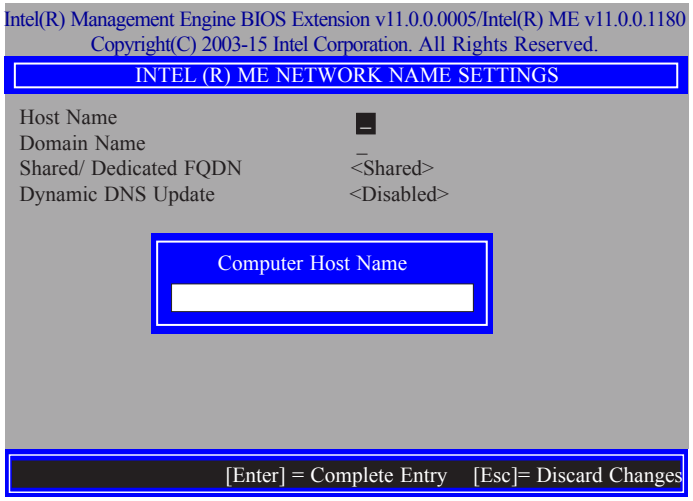
20. In the **Intel(R) AMT Configuration** menu, select **Network Setup** then press Enter.



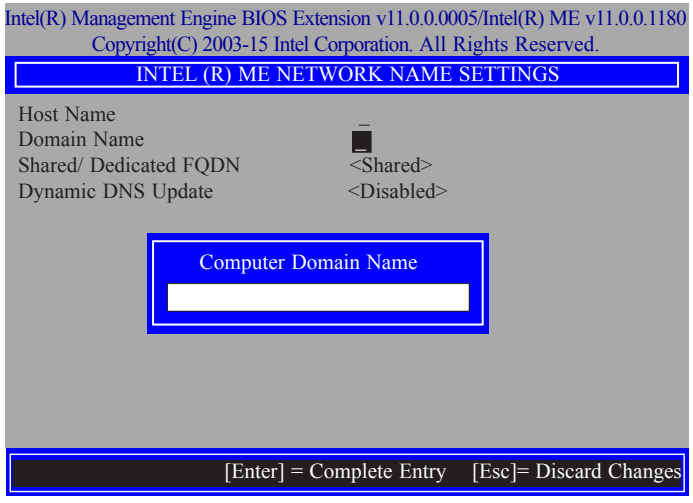
21. In the **Intel(R) ME Network Setup** menu, select **Intel(R) ME Network Name Settings** then press Enter.



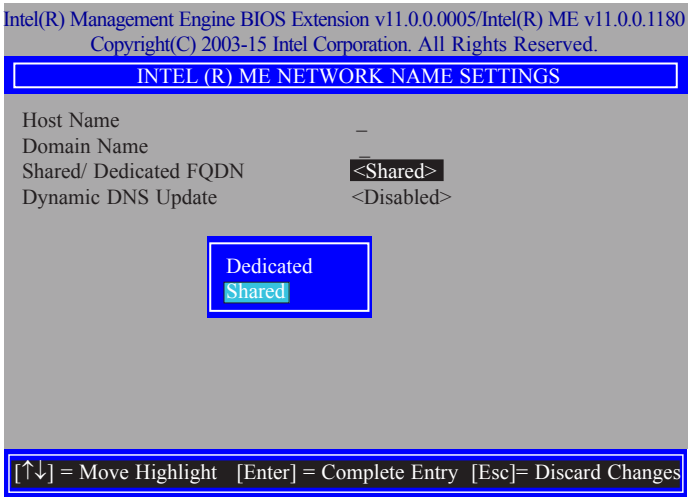
22. In the **Intel(R) ME Network Name Settings** menu, select **Host Name** then press Enter. Enter the computer's host name then press Enter.



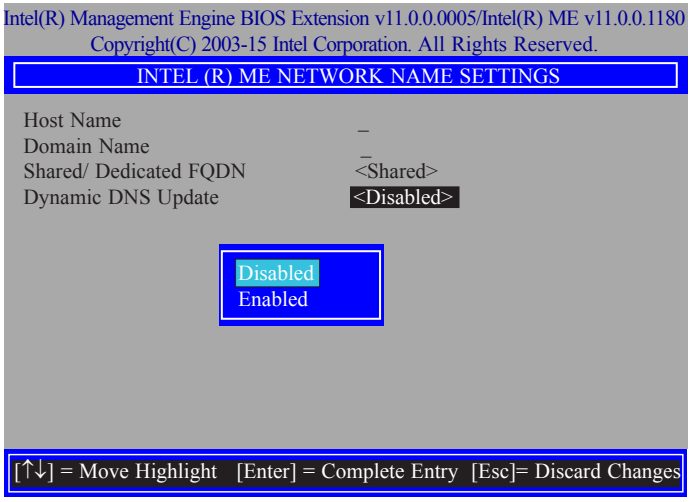
23. Select **Domain Name** then press Enter. Enter the computer's domain name then press Enter.



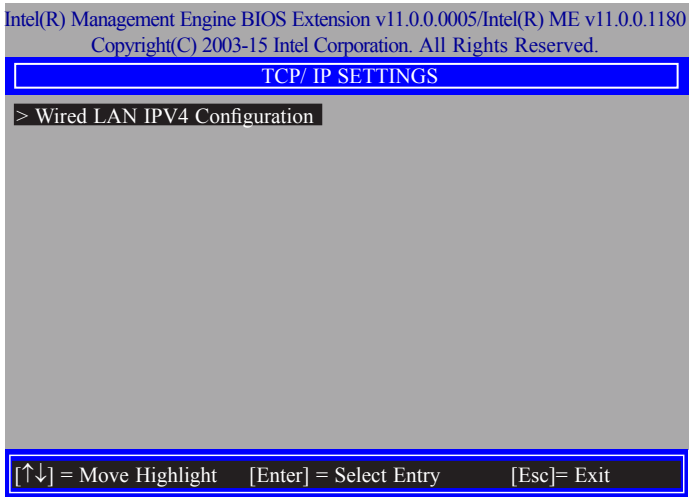
24. Select **Shared/Dedicated FQDN** then press Enter. Select **Shared** or **Dedicated** then press Enter.



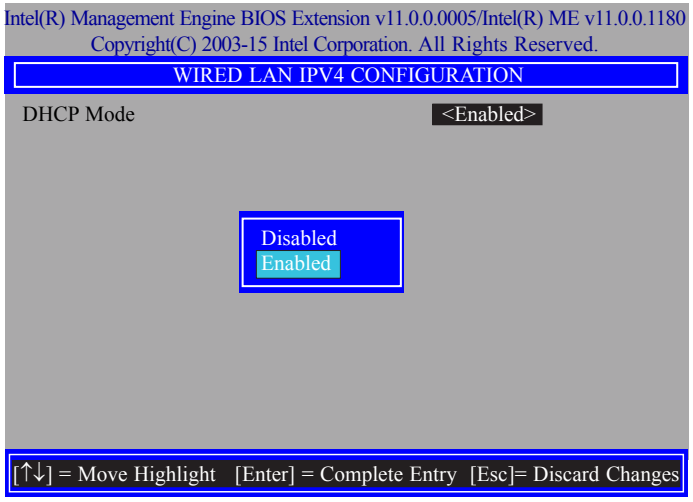
25. Select **Dynamic DNS Update** then press Enter. Select **Enabled** or **Disabled** then press Enter.



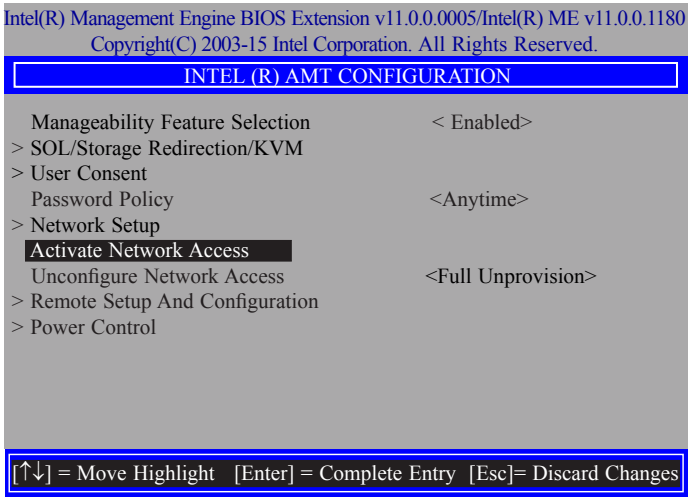
26. Select Previous Menu until you return to the **Intel(R) ME Network Setup** menu. Select **TCP/IP Settings** then press Enter.



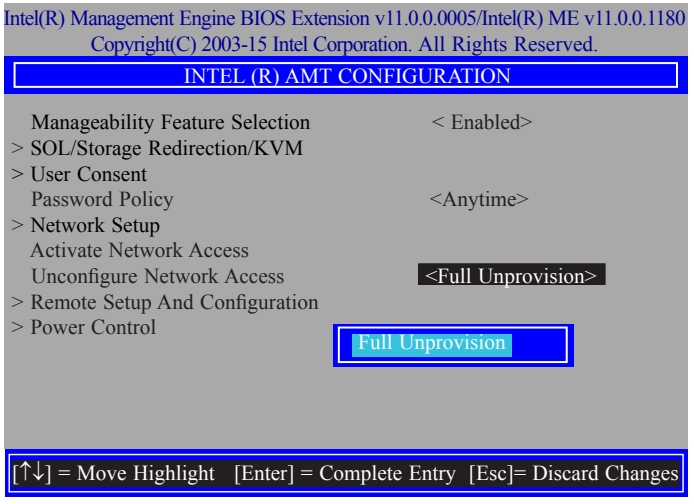
27. In the **TCP/IP Settings** menu, select **Wired LAN IPV4 Configuration** then press Enter.



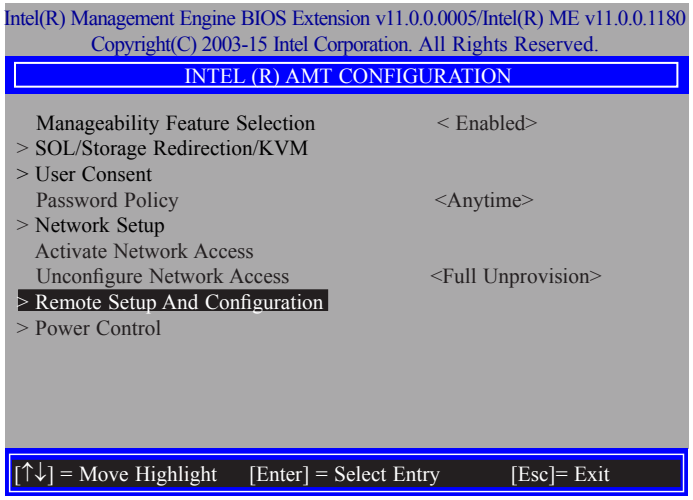
28. In the **Intel(R) AMT Configuration** menu, select **Activate Network Access** then select Y/N and press Enter.



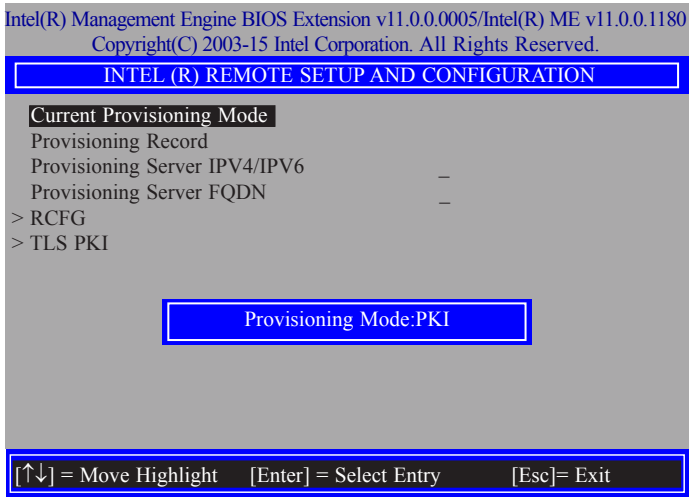
29. In the **Intel(R) AMT Configuration** menu, select **Unconfigure Network Access** then press Enter.



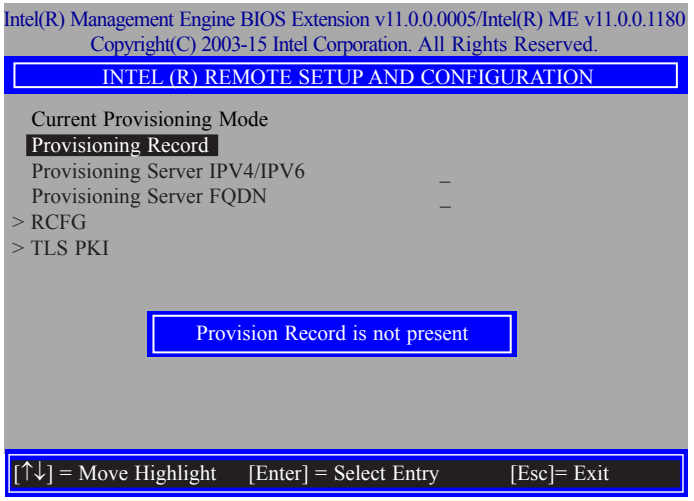
30. In the **Intel(R) AMT Configuration** menu, select **Remote Setup And Configuration** then press Enter.



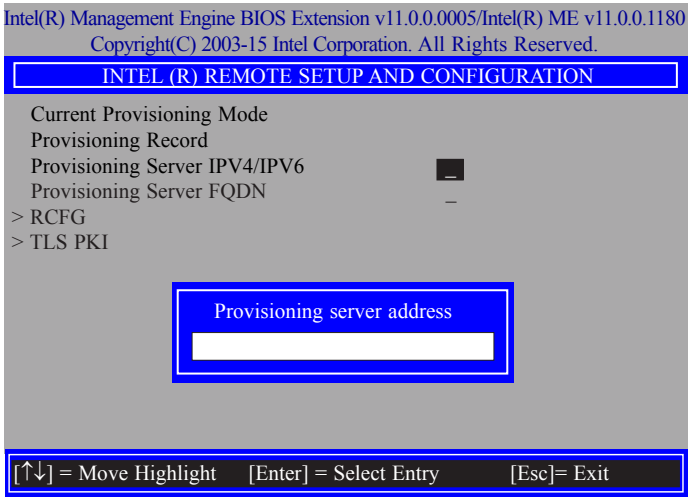
31. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Current Provisioing Mode** then press Enter.



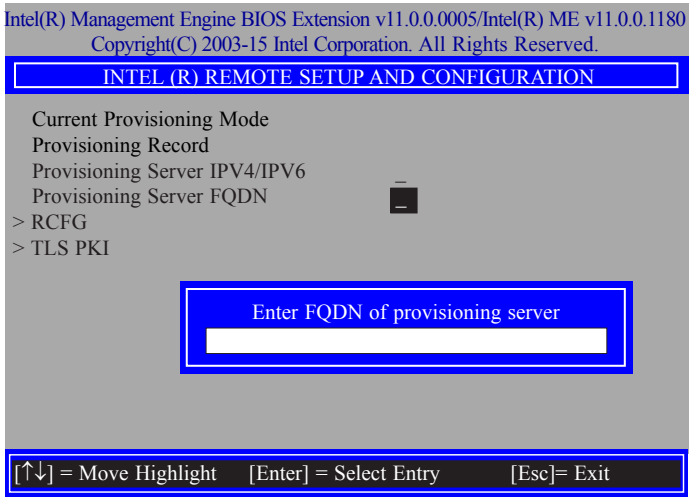
32. In the **Intel(R) Remote Setup And Configuration** menu**,** select **Provisioning Record** then press Enter.



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

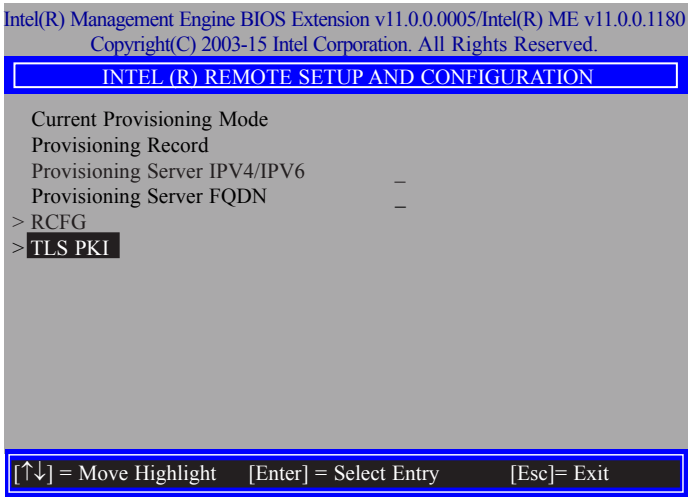


34. In the **Intel(R) Remote Setup And Configuration** menu, select **Provisioning server FQDN,** enter the FQDN of Provisioning server then press Enter.

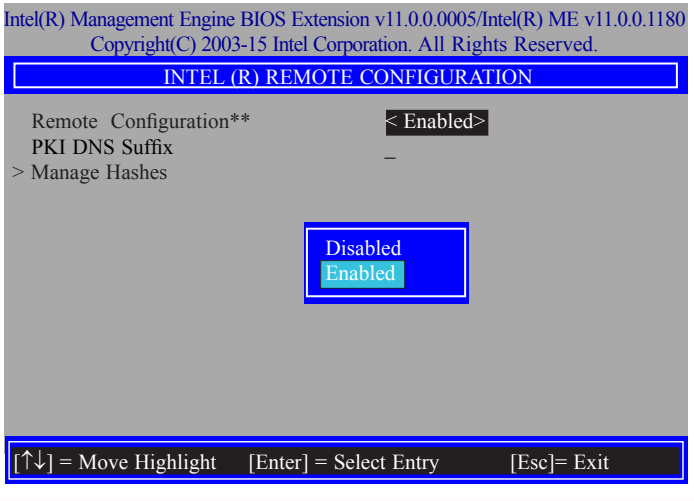


35. In the **Intel(R) Remote Setup And Configuration** menu, select **RCFG** then press Enter, and select **Start Configuration** Y/N then press enter.

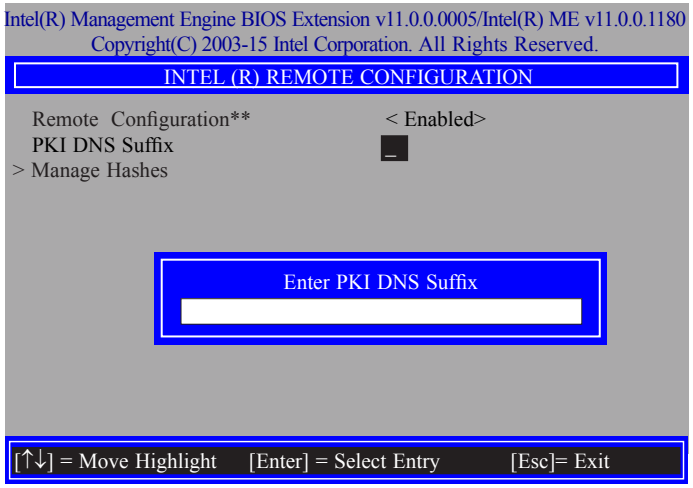
36. In the **Intel(R) Remote Setup And Configuration** menu, select **TLS PKI** then press Enter.



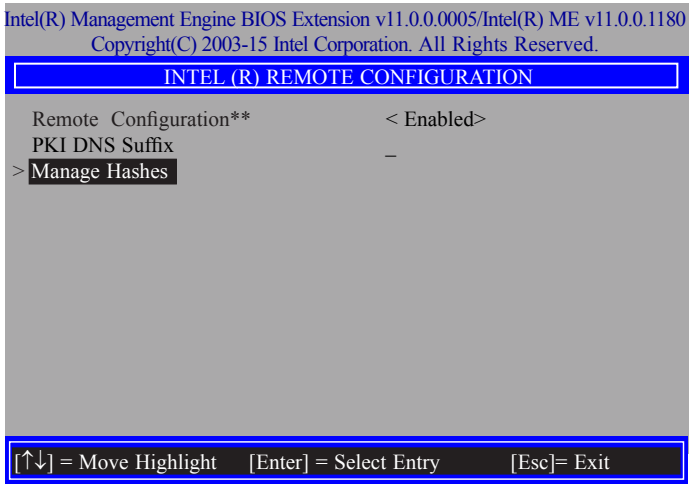
37. In the **Intel(R) Remote Configuration** menu, select **Remote Configuration**** then press Enter, select **Enabled** or **Disabled** then press Enter.



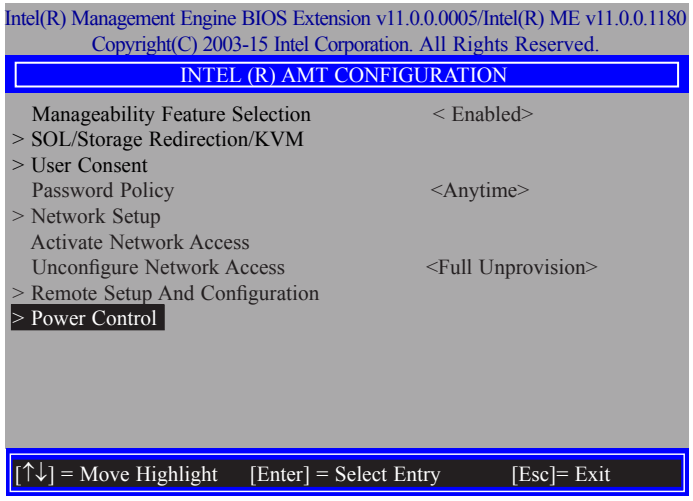
38. Select **PKI DNS Suffix,** Enter the PKI DNS Suffix then press Enter.



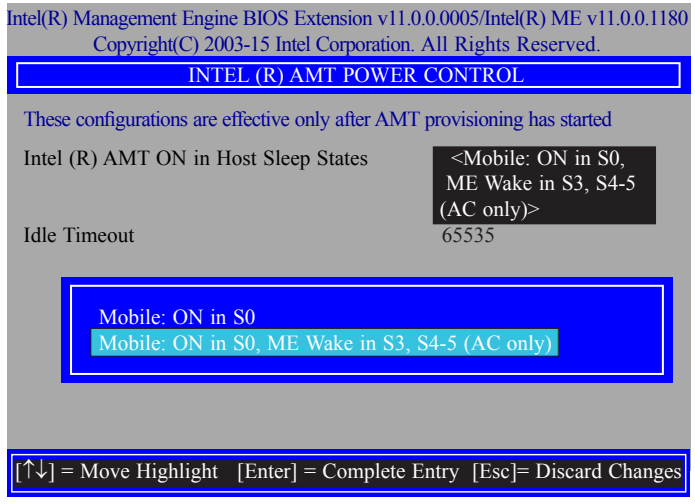
39. Select **Manage Hashes** then press Enter, and select one of hash name.



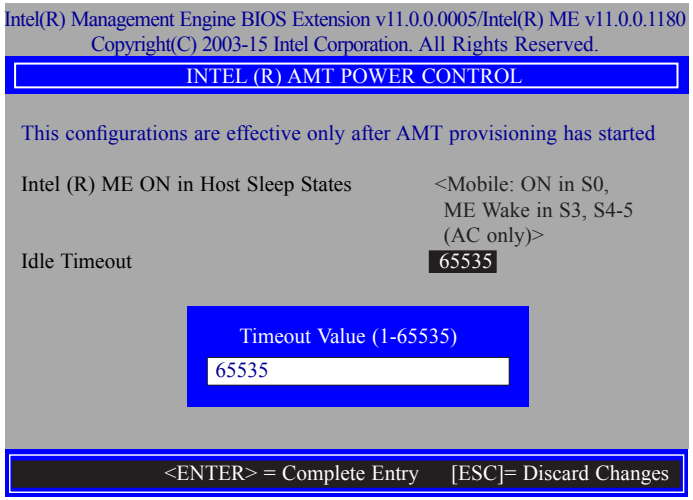
40. In the **Intel(R) AMT Configuration** menu**,** select **Power Control** then press Enter.



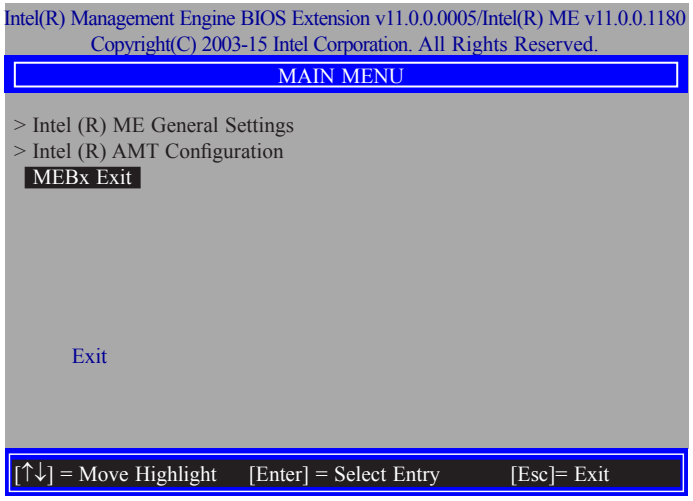
41. In the **Intel(R) AMT Power Control** menu**,** select **Intel(R) AMT ON in Host Sleep States** then press Enter. Select an option then press Enter.



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



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



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.