

DFI



KD171

Mini-ITX Industrial Motherboard User's Manual

**Preliminary
Version**

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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 B

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

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

Notice:

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

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About this Manual

This manual can be downloaded from the website, or acquired as an electronic file included in the optional CD/DVD. The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

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 consequential damages to the product that has been modified or altered.

Static Electricity Precautions

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

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



Important:

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

Safety Measures

- To avoid damage to the system, use the correct AC input voltage range.
- To reduce the risk of electric shock, unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

About the Package

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

- One KD171 board
- One Serial ATA cable (500mm)
- One Serial ATA power cable (260mm)
- One COM port cable (300mm)
- One battery addendum

Optional Items

- USB 2.0 cable
- COM cable
- SATA cable
- I/O shield
- Thermal Solution

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

Before Using the System Board

Before using the system board, prepare basic system components.

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

- CPU
- Memory module
- Storage device such as hard disk drive, CD-ROM, etc.

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

Chapter 1 - Introduction

► Specifications

SYSTEM	Processor	6th/7th Generation Intel® Core™ Processors, LGA 1151 Socket <ul style="list-style-type: none"> Core™ i7-7700T Processor, Quad Core, 8M Cache, 2.9GHz (3.8GHz), 35W Core™ i7-7700 Processor, Quad Core, 8M Cache, 3.6GHz (4.2GHz), 65W Core™ i5-7500T Processor, Quad Core, 6M Cache, 2.7GHz (3.3GHz), 35W Core™ i5-7500 Processor, Quad Core, 6M Cache, 3.4GHz (3.8GHz), 65W Core™ i3-7101E Processor, Dual Core, 3M Cache, 3.9GHz , 54W Core™ i3-7101TE Processor, Dual Core, 3M Cache, 3.4GHz , 35W Celeron® G3930, Dual Core, 3M Cache, 2.9GHz, 51W Celeron® G3930E, Dual Core, 3M Cache, 2.9GHz, 54W Core™ i7-6700TE, Quad Core, 2.4GHz (3.4GHz), 35W Core™ i5-6500TE, Quad Core, 2.3GHz (3.3GHz), 35W Core™ i7-6700, Quad Core, 8M Cache, 3.4GHz (4.0GHz), 65W Core™ i5-6500, Quad Core, 6M Cache, 3.2GHz (3.6GHz), 65W Core™ i3-6100, Dual Core, 3.7GHz, 51W Core™ i3-6100TE, Dual Core, 2.7GHz, 35W Pentium® G4400, Dual Core, 3.3GHz, 54W Pentium® G4400TE, Dual Core, 2.4GHz, 35W Celeron® G3900, Dual Core, 2.8GHz, 51W Celeron® G3900TE, Dual Core, 2.3GHz, 35W 	
	Chipset	Intel® Q170/H110	
	Memory	Two 288-pin UDIMM, up to 32GB, Dual Channel DDR4 2133/2400MHz	
	BIOS	Insyde SPI	
	GRAPHICS	Controller	Intel® HD Gen 9 Graphics
		Display	1 x HDMI 1.4, resolution support up to 4K @ 24Hz 2 x DP++, resolution up to 4096x2304 @ 60Hz
		Feature	OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9
		Triple Displays	HDMI, DP++, and DP++
	EXPANSION	Interface	1 x PCIe x16 (Gen 3) (Max. 75W)
	ETHERNET	Controller	2 x GbE (10/100/1000Mbps) 2 x Realtek® 8111HN or 8119 (opt.)
REAR I/O		Ethernet	2 x GbE (RJ-45)
	Serial	2 x RS232 (DB9)	
	USB	2 x USB 3.0 Type A 2 x USB 2.0 Type A	
	Display	2 x Full Size DP++, 1 x HDMI 1.4 (opt.)	

INTERNAL I/O	Serial	4 x RS-232 (TX/RX only)
	USB	1 x Vertical USB 3.0 4 x USB 2.0
	SATA	2 x SATA 3.0 (up to 6Gb/s)
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	TPM	Infineon TPM2.0
Power	ATX	12VDC, 2x2 pin vertical connector or coaxial connector
OS SUPPORT	Microsoft	Windows 10 LTSB (64 bits) Window 7 (32/64bit) for 6th Generation Processors
	Linux	
ENVIRONMENT	Temperature	Operating: 0 to 60°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH
	MTBF	KD171-Q170: 1,454,376 hrs @ 25°C; 737,553 hrs @ 45°C ; 447,012 hrs @ 60°C KD171-H110: 1,454,376 hrs @ 25°C; 737,553 hrs @ 45°C ; 447,012 hrs @ 60°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled
MECHANICAL	Dimensions	Mini-ITX Form Factor: 170mm (6.7") x 170mm (6.7") PCB: 1.6mm

► Features

Watchdog Timer

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

DDR4

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

Graphics

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

Serial ATA

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

Gigabit LAN

Two Realtek® 8111HN PCI Express Gigabit Ethernet controllers for two individual LAN ports are equipped to support data transmission at 1Gbps (10/100/1000Mbps).

Wake-On-LAN

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

USB

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

Wake-On-USB

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

RTC Timer

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

ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enable PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

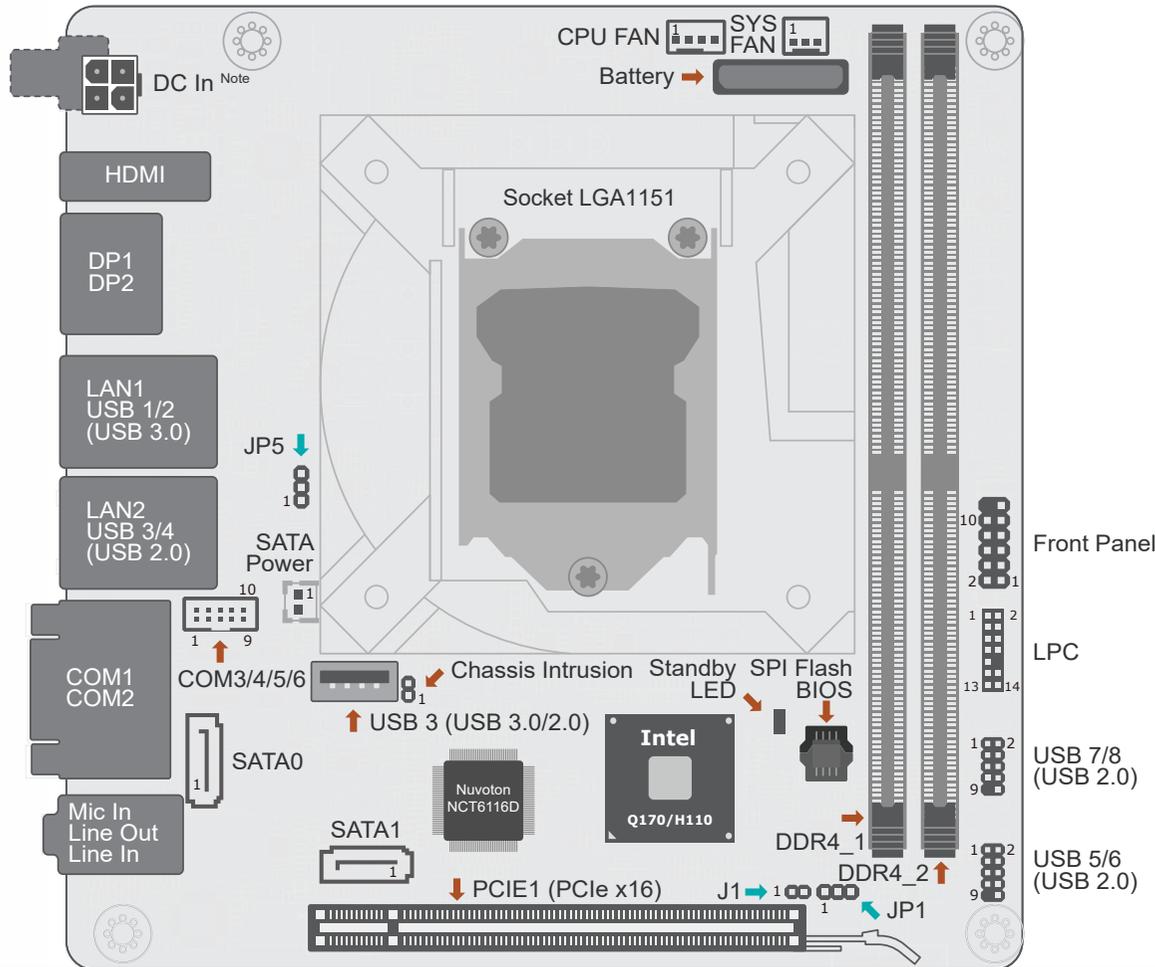
With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting “Standby” when you shut down Windows® without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

Power Failure Recovery

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

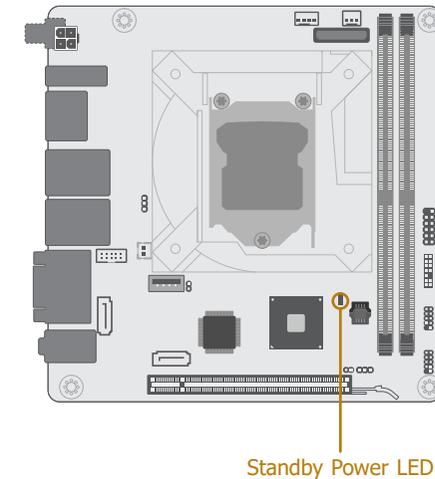
Chapter 2 - Hardware Installation

► Board Layout



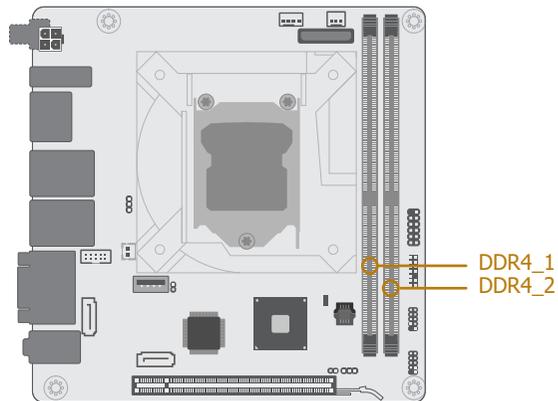
Important: Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching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

► Standby Power LED



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

► System Memory



The system board supports the following memory interface.

Single Channel (SC)

Data will be accessed in chunks of 64 bits from the memory channels.

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs. Not all slots need to be populated.

Dual Channel DIMMs of the same memory configuration are on different channels.

Features

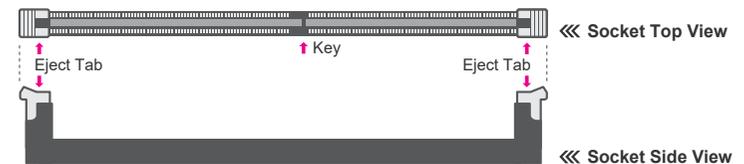
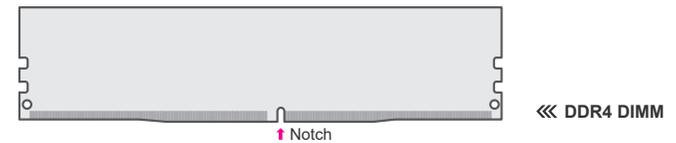
- Two 288-pin DDR4 UDIMM vertical sockets
- Supports 2133/2440 MHz DDR4 SDRAM
- Dual channel memory interface
- Supports maximum of 32GB system memory

► System Memory

Installing the DIMM Module

Before installing the memory module, please make sure that the following safety cautions are well-attended.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board
4. Make sure the notch on memory card is aligned to the key on the socket.



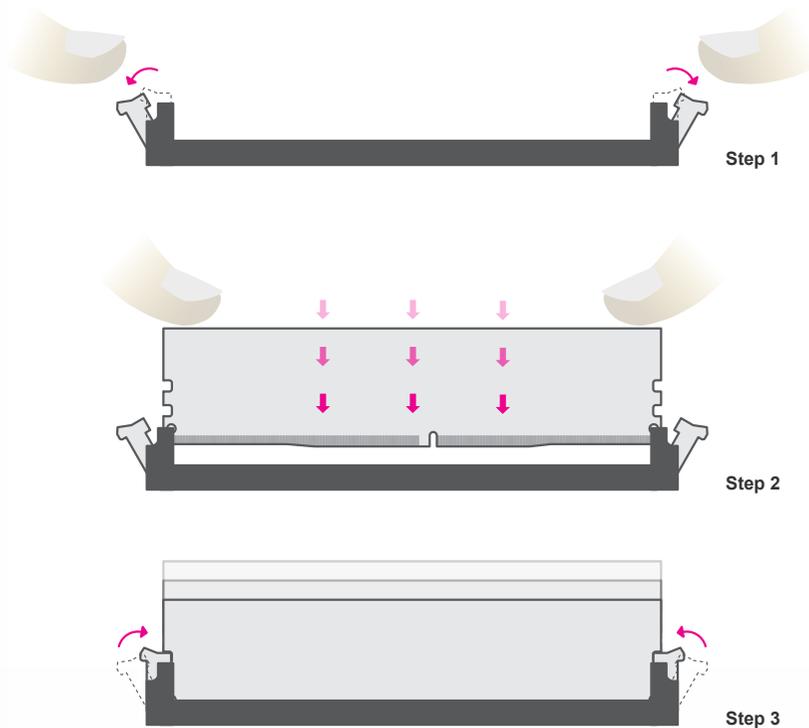
► System Memory ► Installing the DIMM Module

Please follow the steps below to install the memory card into the socket.

Step 1:
Press the eject tabs at both ends of the socket outward and downward to release them from the locked position.

Step 2:
Insert the memory card into the slot while making sure the notch and the key are aligned. Press the card down firmly with fingers while applying and maintaining even pressure on both ends.

Step 3:
The tabs snap automatically to the edges of the card and lock the card in place.



► System Memory

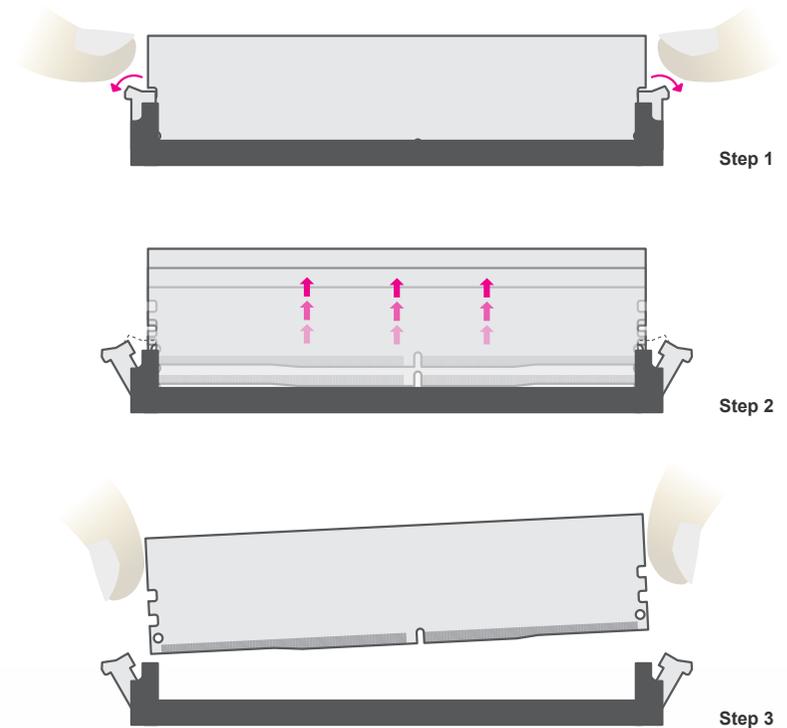
Removing the DIMM Module

Please follow the steps below to remove the memory card from the socket.

Step 1:
Press the eject tabs at both ends of the socket outward and downward to release them from the locked position.

Step 2:
The memory card ejects from the slot automatically.

Step 3:
Hold the card by its edges and remove it from the slot.



► CPU

The system board is equipped with a surface mount LGA 1151 socket. This socket is exclusively designed for installing a LGA 1151 packaged Intel CPU.



Important:

1. Before you proceed, make sure (1) the LGA 1151 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA 1151 socket comes with the protective cap.

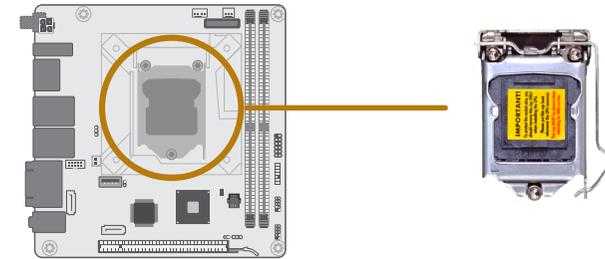


Note:

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

Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it have been powered down.
2. Disconnect all power cords and cables.



3. Locate the LGA 1151 CPU socket on the system board.



Important:

The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

4. Unlock the socket by pressing the load lever down, moving it sideways until to escape the retention tab. Lift the load lever up when it's released.



► CPU ► Installing the CPU

5. Lift the load lever and the load plate all the way up as shown in the photo.



6. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



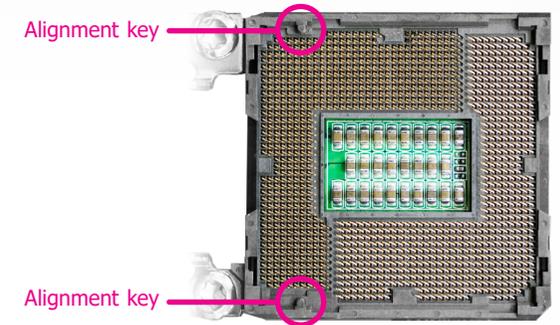
7-1. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the chamfer corner of the CPU socket shown in the photo.



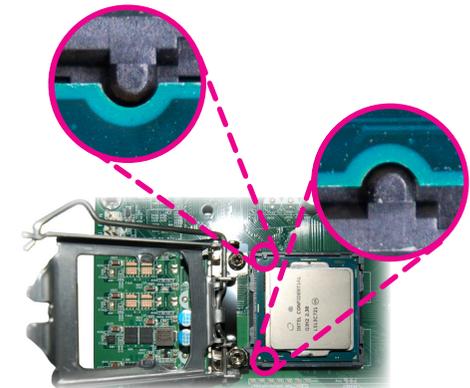
Important:
The CPU will fit in only one orientation and can easily be seated without exerting any force.

► CPU ► Installing the CPU

7-2. Two keys on the socket and notches on the CPU also facilitate alignment.

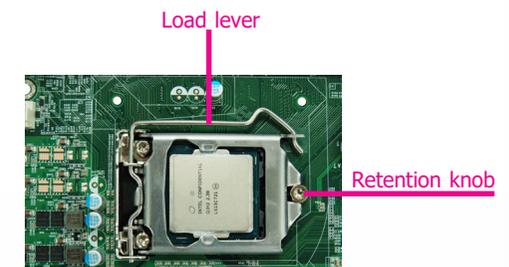


7-3. The CPU's notch will fit into the socket's alignment key when it's seated in the correct orientation.



8. Close the load plate then push the load lever down.

While closing the load plate, make sure the front edge of the load plate slides under the retention knob.



9. Press down the load lever and hook it under the retention tab.

► CPU

Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.

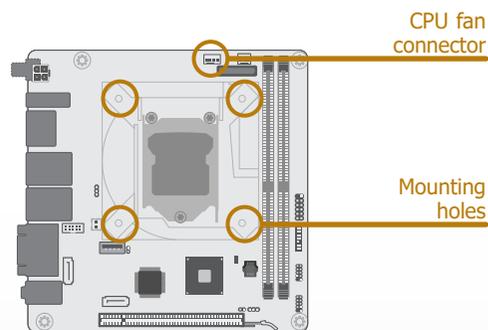
**Note:**

A boxed Intel® processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel®-certified fan and heat sink.

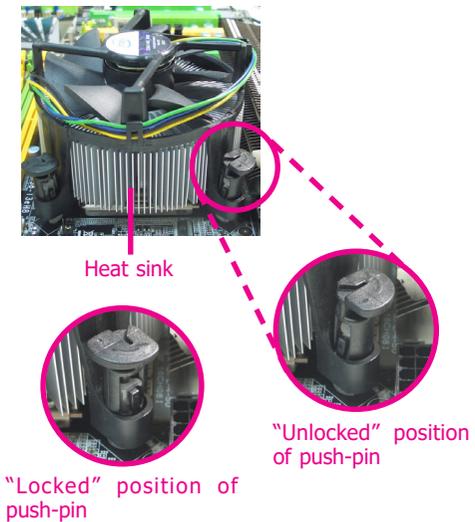
1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will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

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

2. Place the heat sink on top of the CPU. The 4 spring screws around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the socket.
3. Orient the heat sink so that the CPU fan's cable is nearest the CPU fan connector.



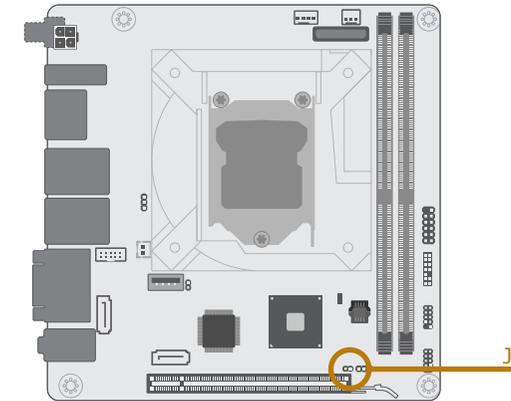
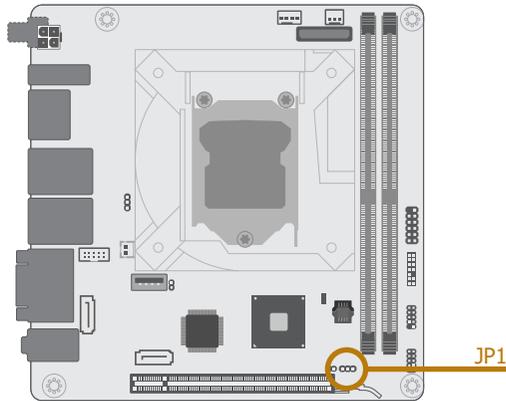
4. Screw tight two of the spring screws at opposite corners into the mounting holes. And then proceed with the other two spring screws.



5. Connect the CPU fan's cable to the CPU fan connector on the system board.

► Jumper Settings

Clear CMOS



If any anomaly of the followings is encountered —

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

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

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



▲ 1-2 On: Normal (default)

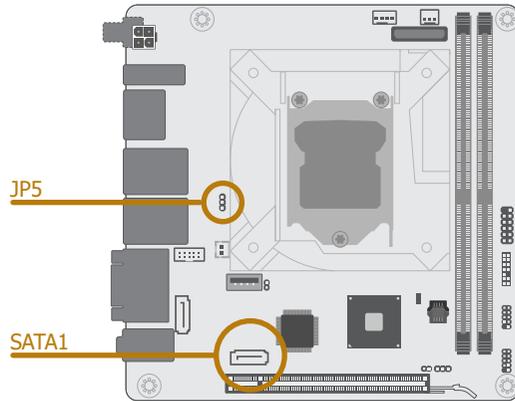


▲ 2-3 On: Clear CMOS

ME Disable

The 2-pin jack J1 is used to enable or disable Management Engine (ME). Put on a jumper cap to disable ME (default), or remove the jumper to enable ME.

SATA1 Power Select



SATA1 supports power supply via power cable or Disk on Module (DOM) to which power is supplied via Pin 7. To switch between the power supply mode, please configure the jumper settings as illustrated below.



▲ 1-2 On: Normal SATA (default)

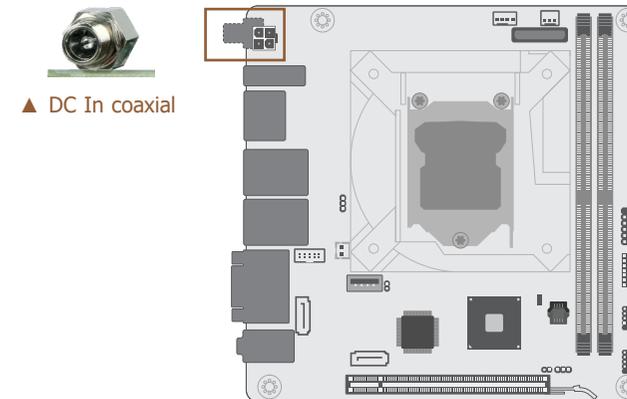


▲ 2-3 On: SATA DOM

► Rear I/O Ports



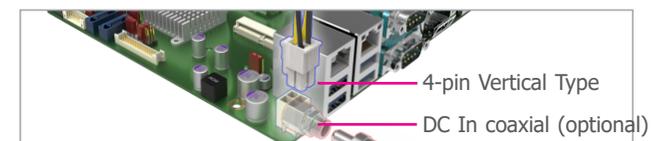
12V DC In



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

- DC In (optional)
- 1 x HDMI 1.4
- 2 x DP++
- 2 x USB 3.0
- 2 x USB 2.0
- 2 x GbE (RJ-45)
- 2 x RS-232 (DB-9)
- Mic In, Audio Line In, and Audio Line Out

Connect a coaxial DC power cord to the rear coaxial connector for DC supply. Using a voltage higher than the recommended range may result in failure in starting and booting the system or causing irreversible damage to the system board. A power adaptor/converter is necessary when the power source on site does not comply with the power specifications of the board.

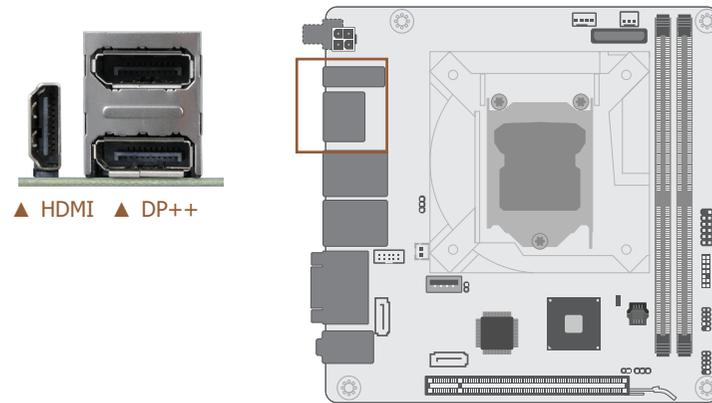


Note:

The DC power jack can be a rear coaxial connector or an internal 2x2 pin vertical connector.

► Rear I/O Ports

Graphics Display



DP++

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 interface.

HDMI 1.4

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

BIOS Setting

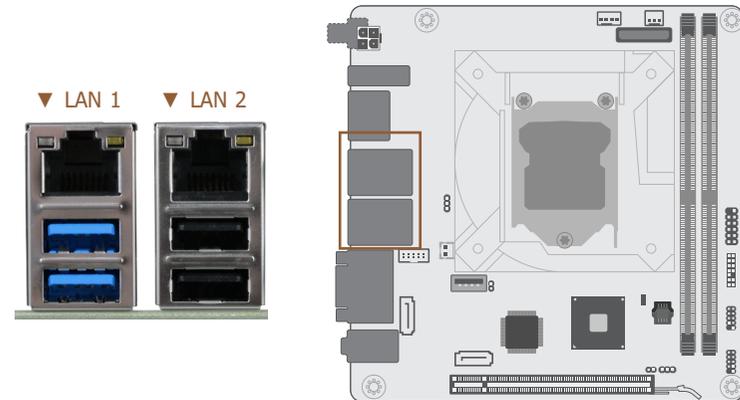
Configure VGA in the Advanced menu ("Video Configuration" submenu) of the BIOS. Refer to Chapter 3 for more information.

Driver Installation

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

► Rear I/O Ports

RJ45 LAN Ports



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

BIOS Setting

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

Driver Installation

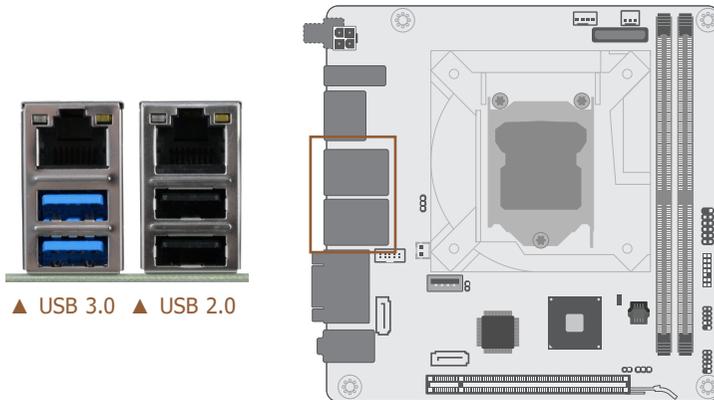
Install the LAN drivers. Refer to chapter 4 for more information.

Features

- LAN 1/2: Realtek® 8111HN (81119 by request) PCIe GbE Controller

► Rear I/O Ports

USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals. The system board is equipped with two onboard USB 3.0 ports (USB 1&2) at the rear side. For the internal USB 3.0 and 2.0 ports, please refer to the next section.

BIOS Setting

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

Wake-On-USB Keyboard/Mouse

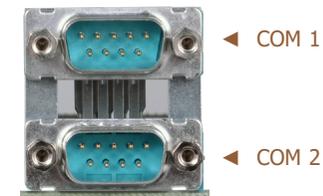
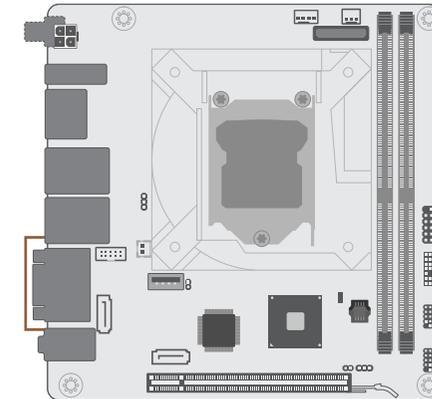
The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

► Rear I/O Ports

COM (Serial) Ports

▼ COM 1/2 Pin Assignment

Pin	RS232
1	DCD-
2	RD
3	TD
4	DTR-
5	GND
6	DSR-
7	RTS-
8	CTS-
9	RI-



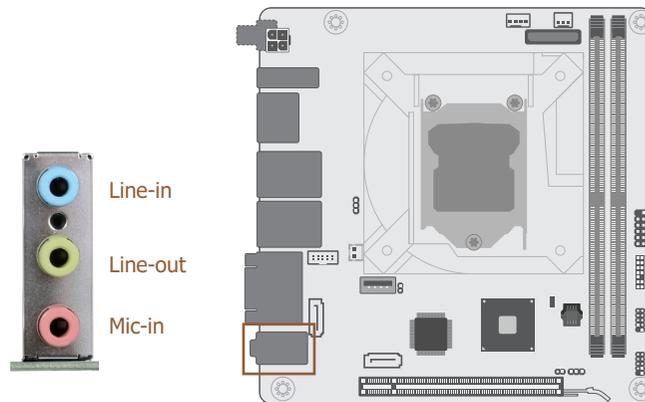
The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

COM 1 and COM 2 (Rear Ports) support only RS232. COM 3 - COM 6 (Internal Ports) support RS232 with only RX and TX signals as addressed later in this chapter.

BIOS Setting

Configure the onboard COM ports in the Advanced menu ("Console Redirection" submenu) of the BIOS. Refer to chapter 3 for more information.

► Rear I/O Ports

Audio

The system board is equipped a rear stacked audio jacks.

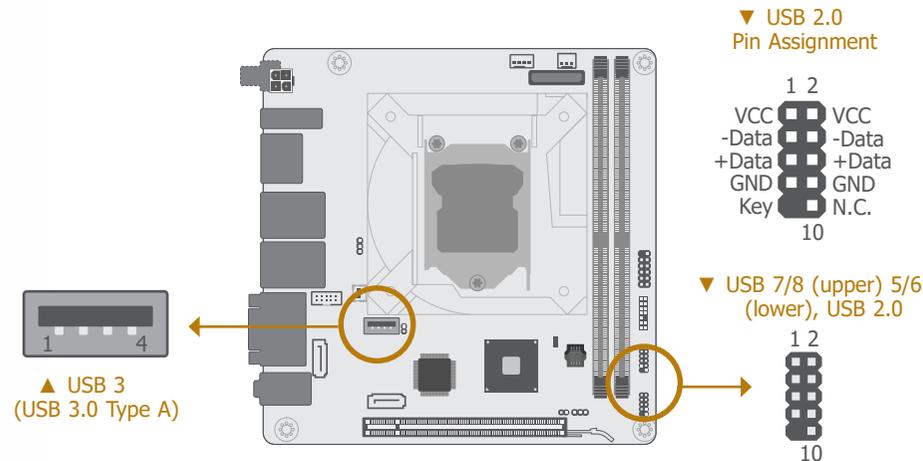
- Line-in Jack (Light Blue)
This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.
- Line-out Jack (Lime)
This jack is used to connect a headphone or external speakers.
- Mic-in Jack (Pink)
This jack is used to connect an external microphone.

Driver Installation

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

► Internal I/O Connectors

USB Ports



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

In addition to the rear USB ports as introduced previously in this chapter, the system board is equipped with an internal USB 3.0 and USB 2.0 ports as illustrated above.

The internal USB pin headers may be connected to a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

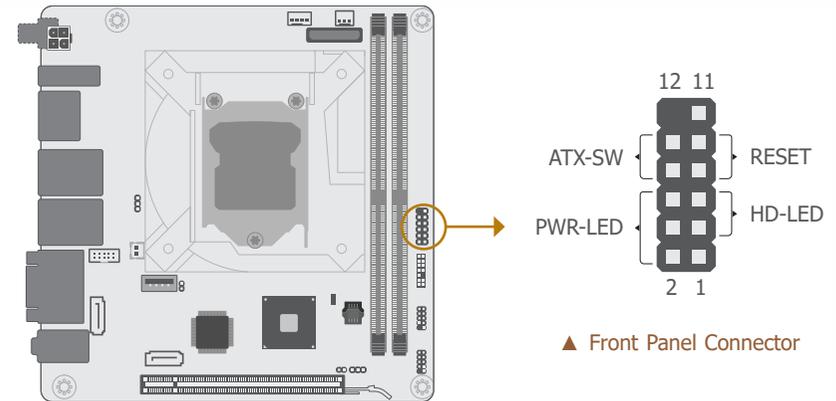
Configure the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

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 S state(s).

► Internal I/O Connectors

Front Panel



▼ Front Panel Pin Assignment

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

HDD-LED - Hard Disk Drive LED

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

RESET - Reset Switch

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

PWR-LED - Power/Standby LED

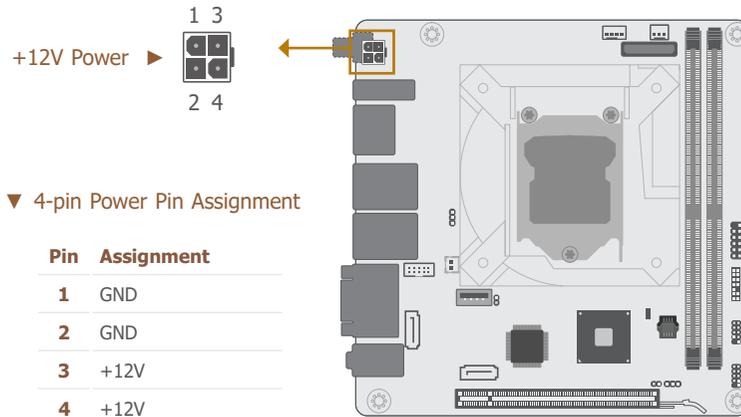
When the system's power is on, this LED will light up. When the system is in the S1 (POS - Power On Suspend) state, it will blink at 1-second intervals. When the system is in the S3 (STR - Suspend To RAM) state, it will blink at 4-second intervals.

ATX-SW - ATX Power Switch

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

► Internal I/O Connectors

Power



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

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

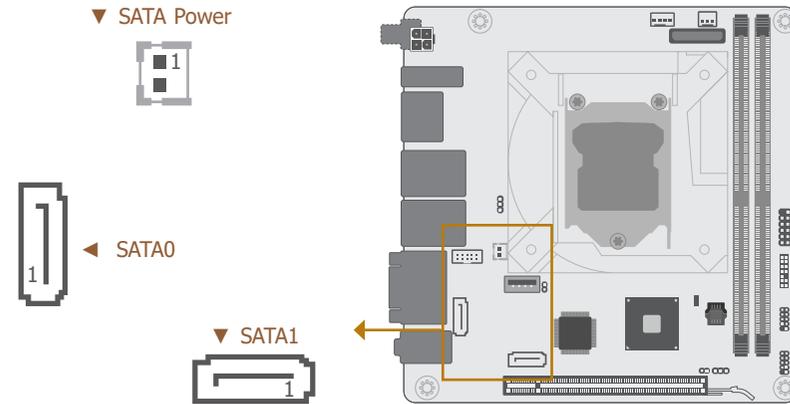


Important:

Insufficient power supplied to the system may result in instability or malfunction of the add-in boards and peripherals. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

► Internal I/O Connectors

SATA (Serial ATA) Connectors



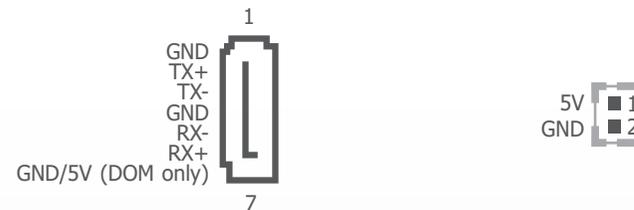
The Serial ATA (SATA) connectors are used to connect the Serial ATA device. SATA 3.0 is supported by the five SATA ports and provides data rate up to 6Gb/s. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device. SATA1, in addition, support Disk on Module (DOM) to which power is supplied via Pin 7.

BIOS Setting

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

Jumper Setting

The power supply mode of SATA1 can be configured via JP5 as instructed previously in this chapter.

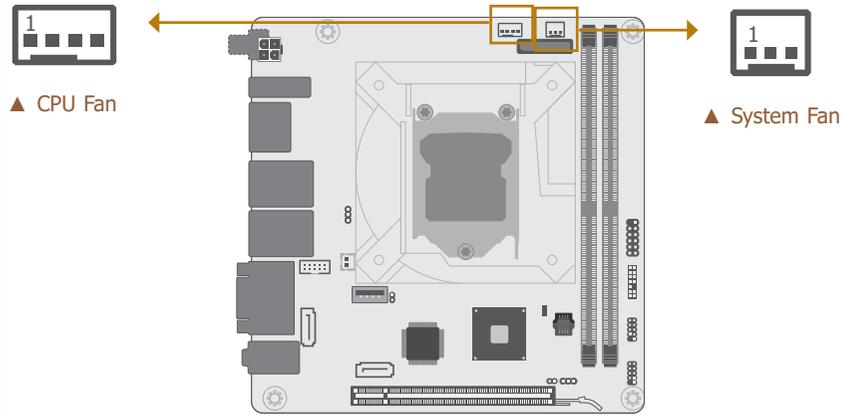


▲ SATA 3.0 Pin Assignment

▲ SATA Power Pin Assignment

► Internal I/O Connectors

Cooling Fan Connectors



▼ 3-pin Fan Pin Assignment

Pin	Assignment
1	Ground
2	Power
3	Sense

▼ 4-pin PWM Fan Pin Assignment

Pin	Assignment
1	Ground
2	Power
3	Sense
4	Speed Control

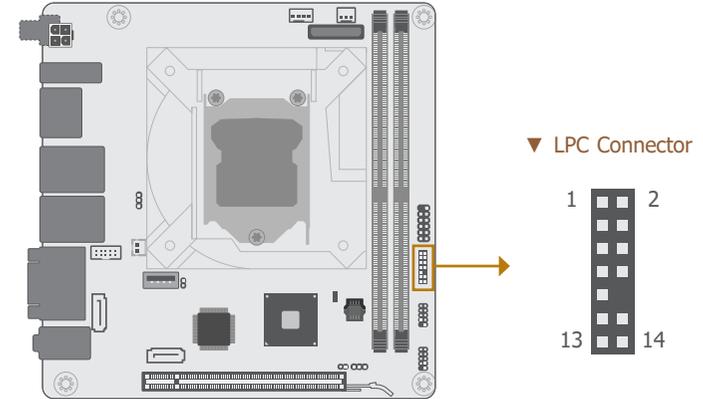
These fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components. The 4-pin fan provides PWM to modulate fan speed whereas the 3-pin fan does not.

BIOS Setting

Configure the Smart Fan function in the Advanced menu ("SIO NUVOTON6116D" submenu) of the BIOS. Refer to chapter 3 for more information.

► Internal I/O Connectors

LPC



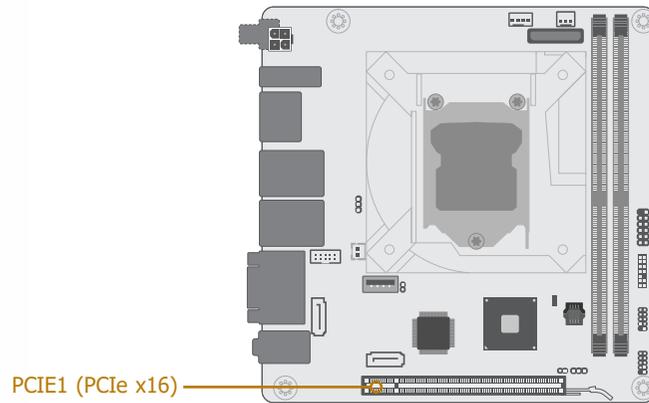
▼ LPC Pin Assignment

Pin	Assignment	Pin	Assignment
1	L_CLK	2	L_LAD1
3	L_RST#	4	L_LAD0
5	L_FRAME#	6	3.3V
7	L_LAD3	8	GND
9	L_LAD2	10	---
11	SERIRQ	12	GND
13	5VSB	14	5V

The LPC connector is used for debugging.

► Internal I/O Connectors

Expansion Slots



PCI Express x16 Slot

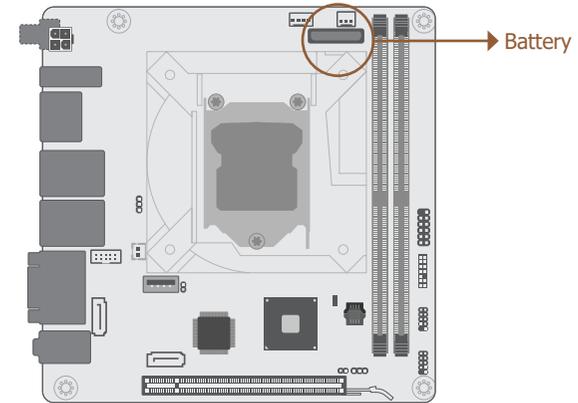
Install a PCI Express x16 graphics card that complies to the PCI Express specifications into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card to the socket and perpendicularly to the board, be cautious in aligning the locations of notch and key, and then press the card down firmly until it is completely seated. The retaining clip of the slot will close up automatically to hold the graphics card in place.

BIOS Setting

Configure PCIe root ports in the Advanced menu ("PCI Express Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

► Internal I/O Connectors

Battery



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

To install or remove the battery into or from the vertical slot, please bend the protective cap away before inserting or removing the battery.

Safety Measures

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

Chapter 3 - BIOS Setup

► Overview

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

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



Note:

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

Default Configuration

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

Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen. The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and keys simultaneously.

Legends

Keys	Function
Right / Left arrow	Move the highlight left or right to select a menu
Up / Down arrow	Move the highlight up or down between submenus or fields
<Enter>	Enter the highlighted submenu
+ (plus key)/F6	Scroll forward through the values or options of the highlighted field
- (minus key)/F5	Scroll backward through the values or options of the highlighted field
<F1>	Display general help
<F9>	Optimized defaults
<F10>	Save and Exit
<Esc>	Return to previous menu

Scroll Bar

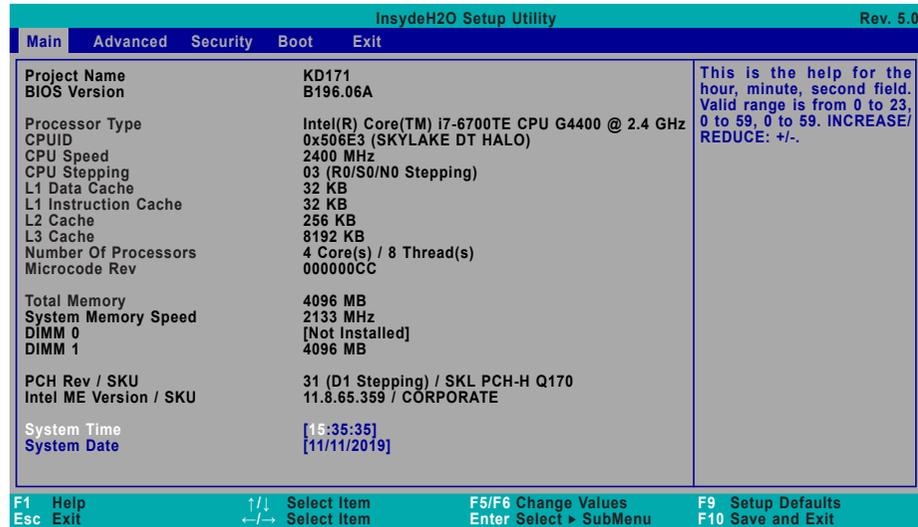
When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

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>.

► Main

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



System Time

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

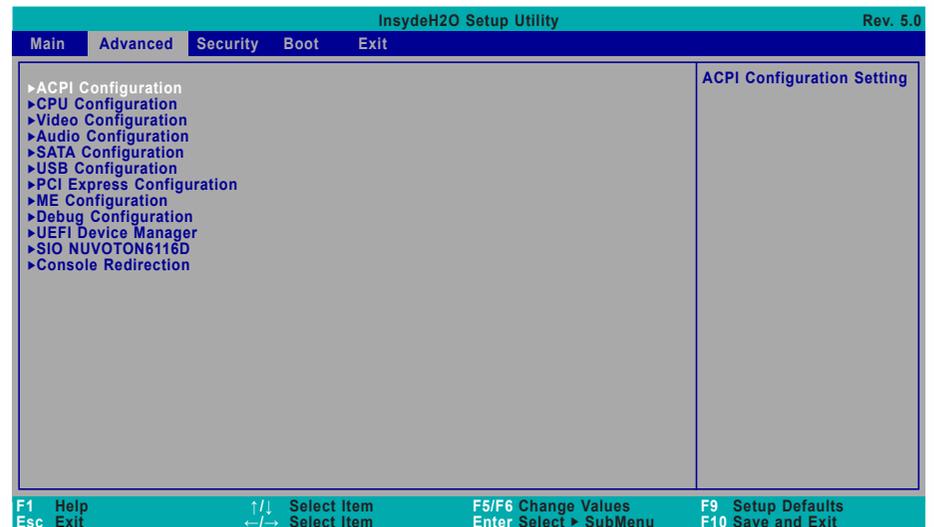
System Date

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

► Advanced

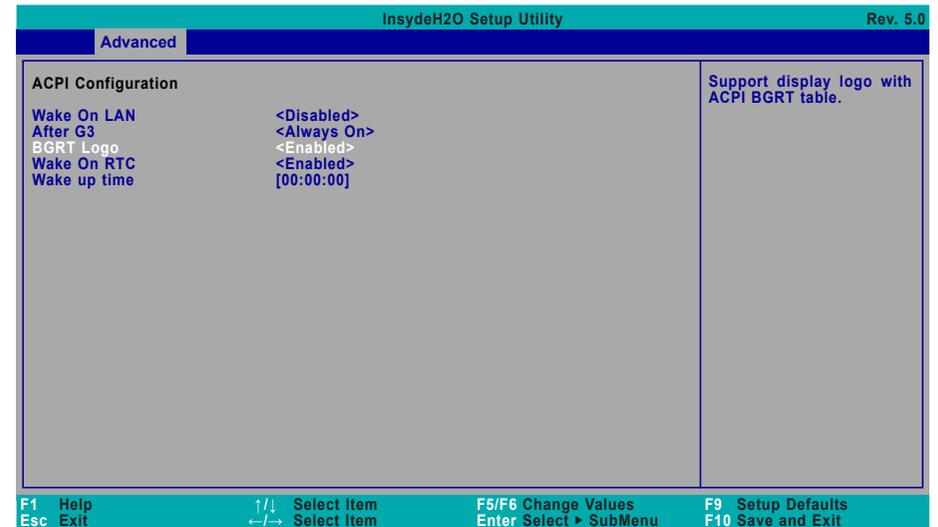
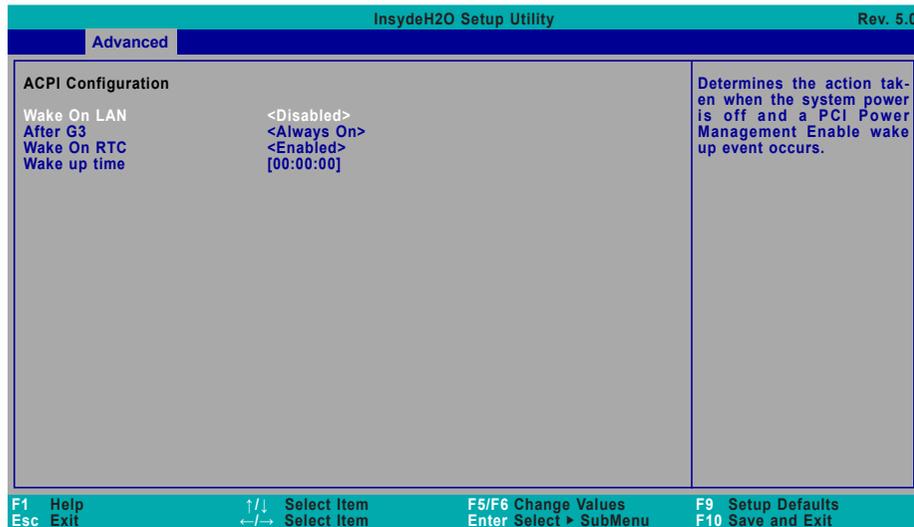
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

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



► **Advanced**

ACPI Configuration



Wake On LAN

Enable or Disable this field to allow LAN signal to power up the system.

After G3

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

- Always On** The system automatically powers on after power failure.
- Always Off** The system remains power off after power failure. Power-on signal input is required to power up the system.

Wake On RTC

When Enabled, the system will automatically wake up from S4/S5 state at a designated time every day via the Real-time clock (RTC) battery.

[Wake up time]

Configure the time of day the system will wake on RTC — [HH:MM:SS]. This field will only appear when "Wake On RTC" is enabled.

BGRT Logo

This field is used to enable or disable to support display logo with ACPI BGRT table. This field is only available when Quiet Boot is enabled.

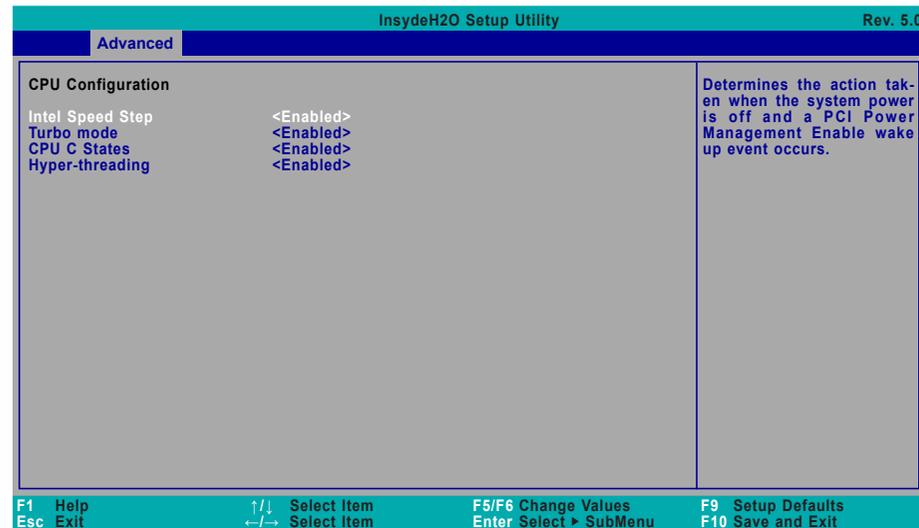


Note: To enable "Quiet Boot", please refer to the Boot menu section in this chapter for more information.

► **Advanced**

CPU Configuration

Configure CPU processing related settings in this page.



Intel Speed Step

This field is used to enable or disable the Enhanced Intel SpeedStep® Technology (EIST), which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, EIST features can then be enabled via the operating system's power management.

Turbo Mode

Enable or disable turbo mode of the processor. This field will only be displayed when "Intel Speed Step" is enabled. This field is not available when the equipped CPU does not support Turbo Mode.

CPU C States

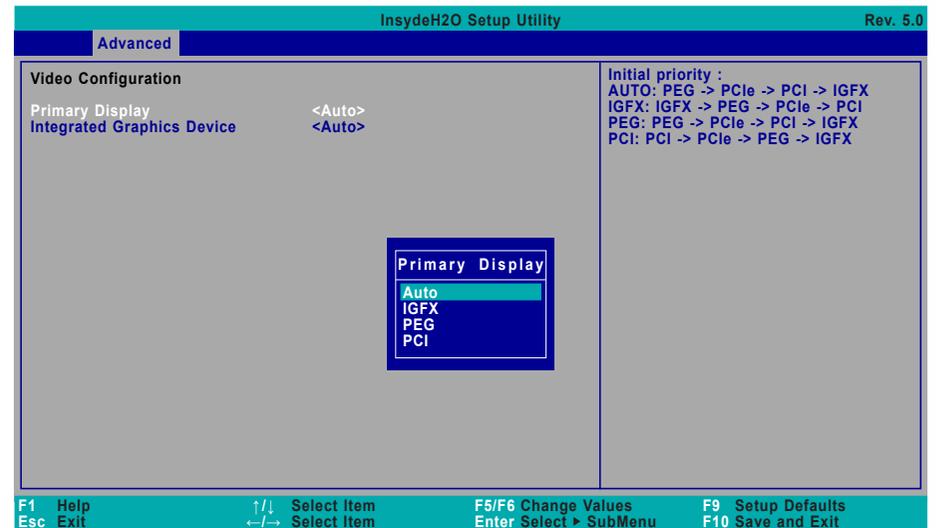
Enable or disable CPU Power Management. It allows CPU to go to C States when it's not 100% utilized.

Hyper-threading

Enable or disable Hyper-threading. When it is enabled, a physical core will perform as two logical processors, and the user may experience better computational efficiency of the system. Please make sure that the OS operating on your system is optimized for Hyper-Threading, e.g. Windows and Linux. This field is not available when the equipped CPU does not support Hyper-threading.

► **Advanced**

Video Configuration



Primary Display

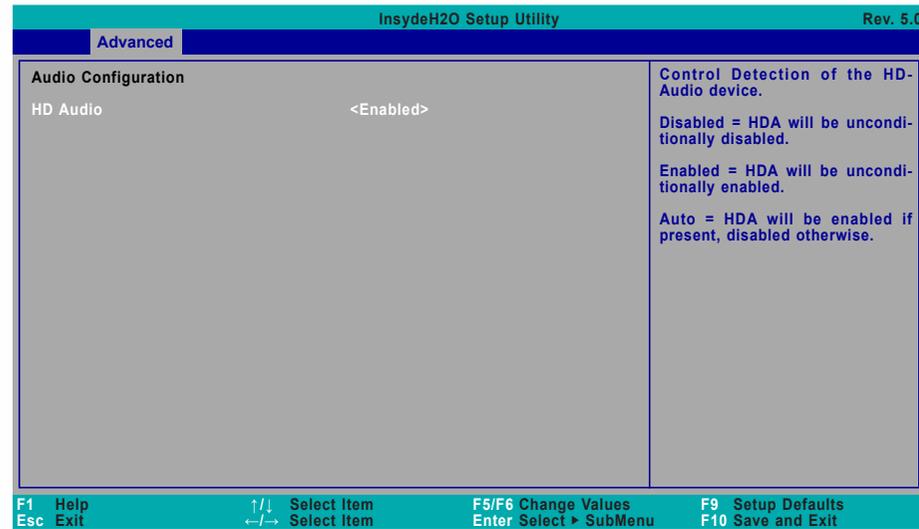
Select among Auto, IGFX, PEG, and PCI Graphics devices to be the primary display.

Integrated Graphics Device

Keep IGFX enabled or disabled based on the setup options.

► **Advanced**

Audio Configuration

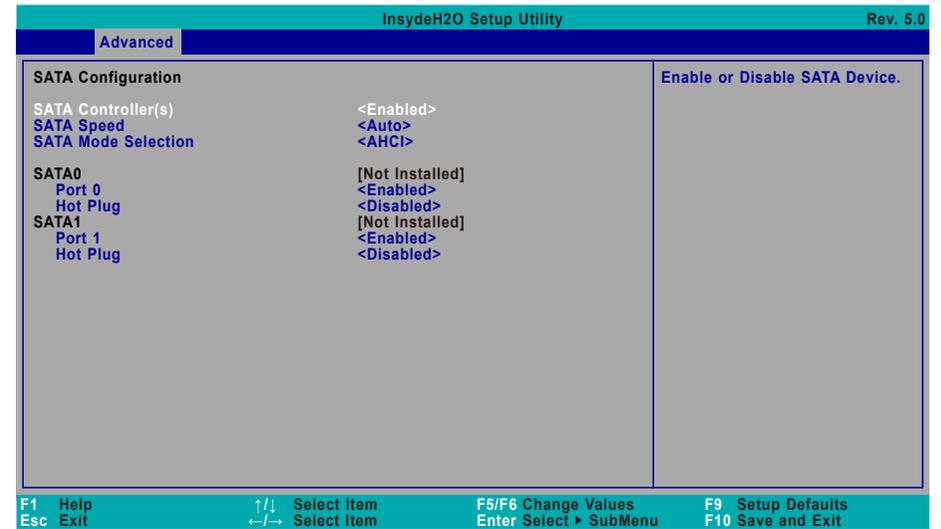


Azalia

Enable or disable Intel High Definition Audio (HDA), also known as Azalia.

► **Advanced**

SATA Configuration



SATA Controller(s)

Enable or disable the Serial ATA controller. This following fields will only be displayed when this field is enabled.

SATA Speed

Select Serial ATA controller(s) speed — Auto, Gen1 (1.5 Gbit/s), Gen2 (3 Gbit/s) or Gen 3 (6 Gbit/s).

SATA Mode Selection

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

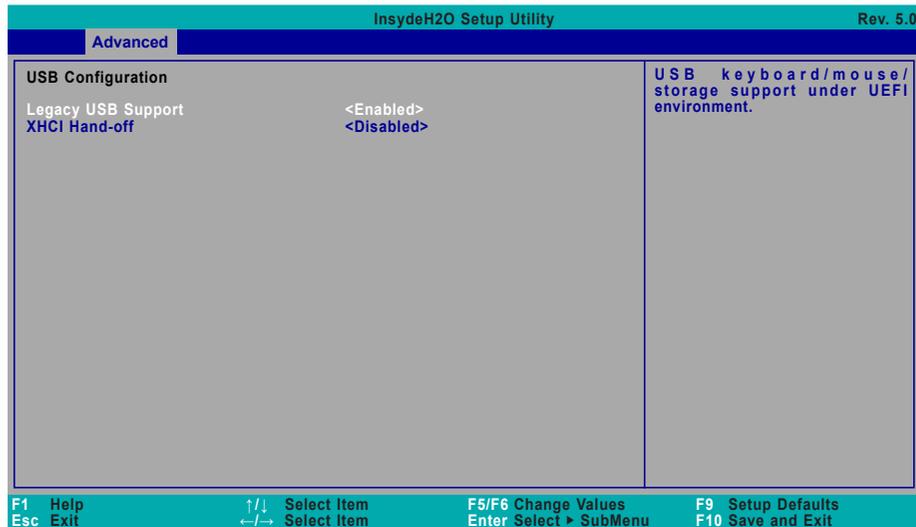
AHCI This option allows the Serial ATA controller(s) to use AHCI (Advanced Host Controller Interface).

Intel RST Premium This option allows the Serial ATA controller(s) to use UEFI, RAID, and Intel Rapid Storage Technology.

SATA Port 0, 1/Hot Plug

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

► Advanced

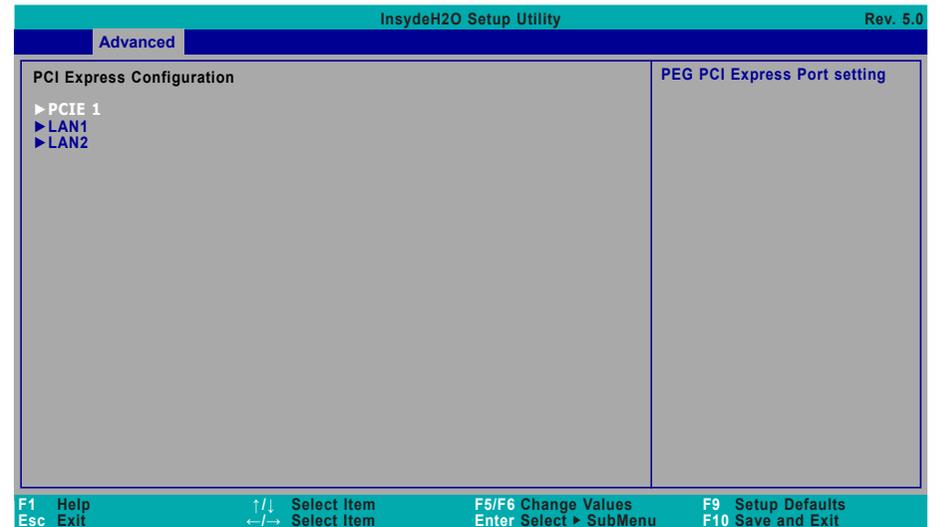
USB Configuration**Legacy USB Support**

- Enabled** Enable Legacy USB support.
- Disabled** Keep USB devices available only for EFI applications.

XHCI Hand-off

Enable or disable XHCI Hand-off.

► Advanced

PCI Express Configuration

Select one of the PCI Express channels and press enter to configure the following settings.

PCIE1/PCI Express Root Port

Enable or disable the PCI Express Root Port.

PCIe Speed

Select PCIe Speed of the current port — AUTO, Gen1, Gen2, or Gen3. Gen 3 is only available for the PCIe1 port. This field may not appear when the speed of the port is not configurable.

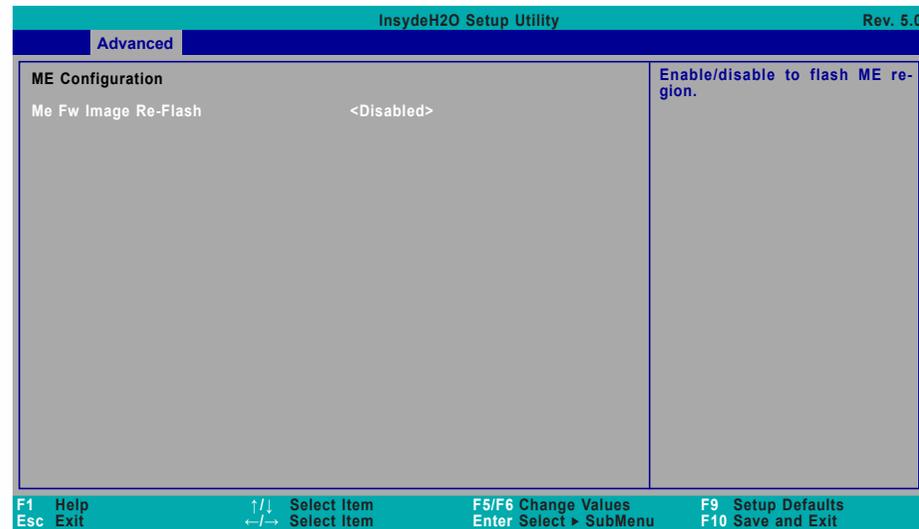
Hot Plug

Enable or disable hot plug function of the port. This field may not appear when the port does not support hot plug.

► **Advanced**

ME Configuration

Configure Management Engine related settings in this page.



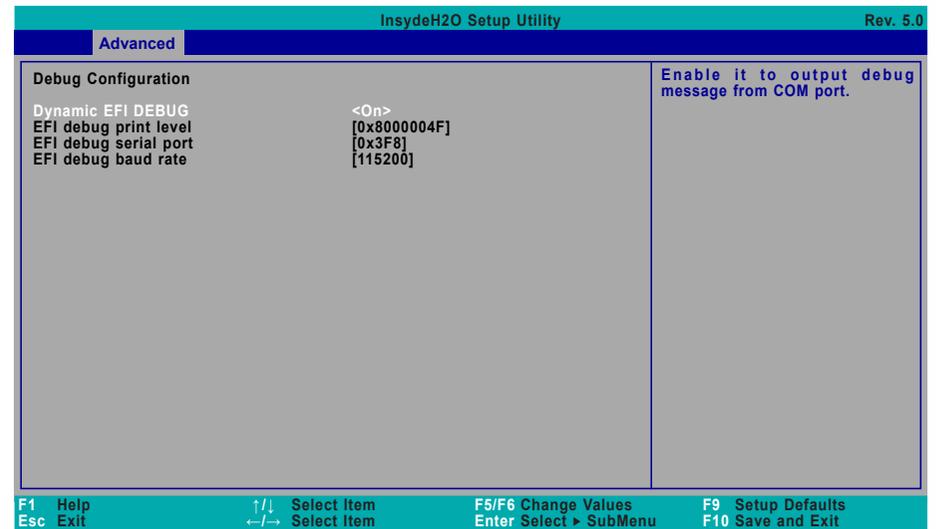
Me Fw Image Re-Flash

- Enabled** Allow the user to re-write the ME firmware.
- Disabled** ME firmware re-write is not allowed.

► **Advanced**

Debug Configuration

This section configures Debug setting.



Dynamic EFI DEBUG

This field is used to turn on or off the function to output debug message from COM port. When this field is set to "On", the following EFI debug configurations will be displayed.

EFI debug print level

Default value is 0x8000004F.

EFI debug serial port

Default value is 0x3F8.

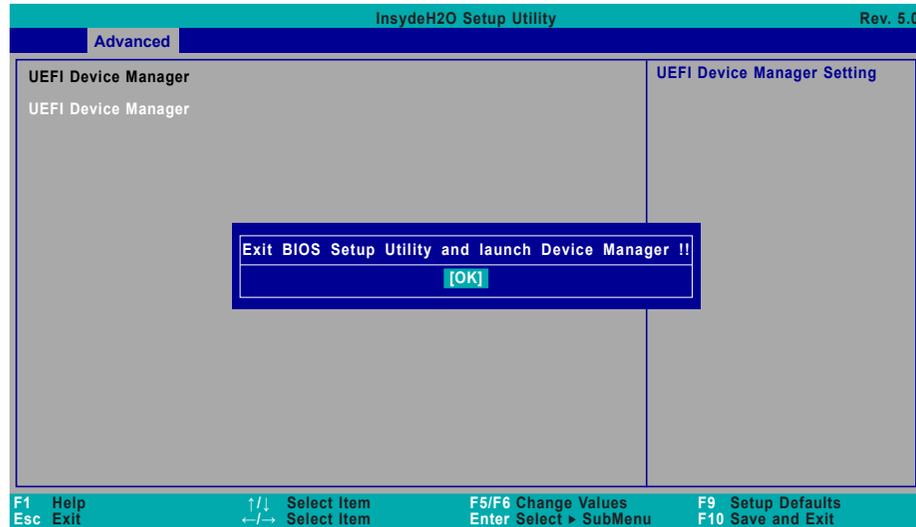
EFI debug baud rate

Default value is 115200.

► **Advanced**

UEFI Device Manager

Configure UEFI device with option ROM, such as LAN card, etc.



Press "Enter" and "OK" to enter UEFI Device Manager setup page. More device settings can be configured in the UEFI Device Manager, including LAN, Network Stacks, and etc.



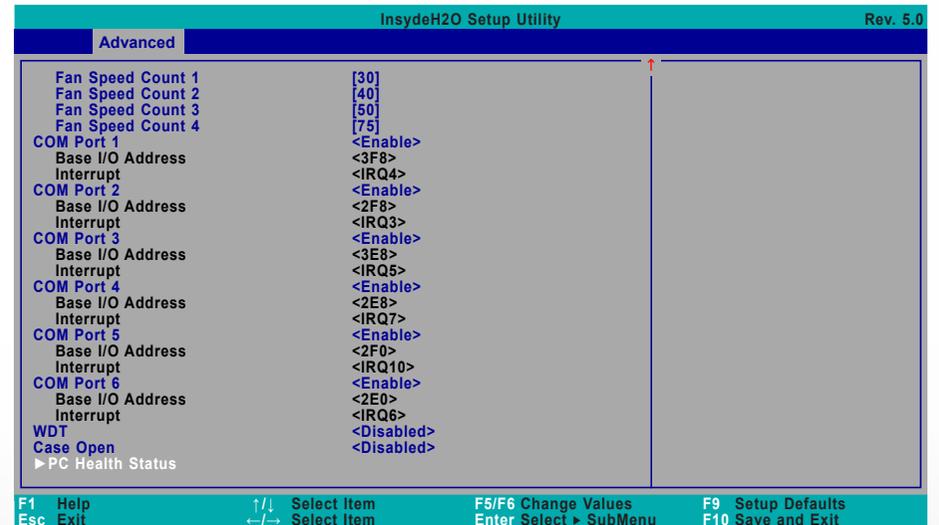
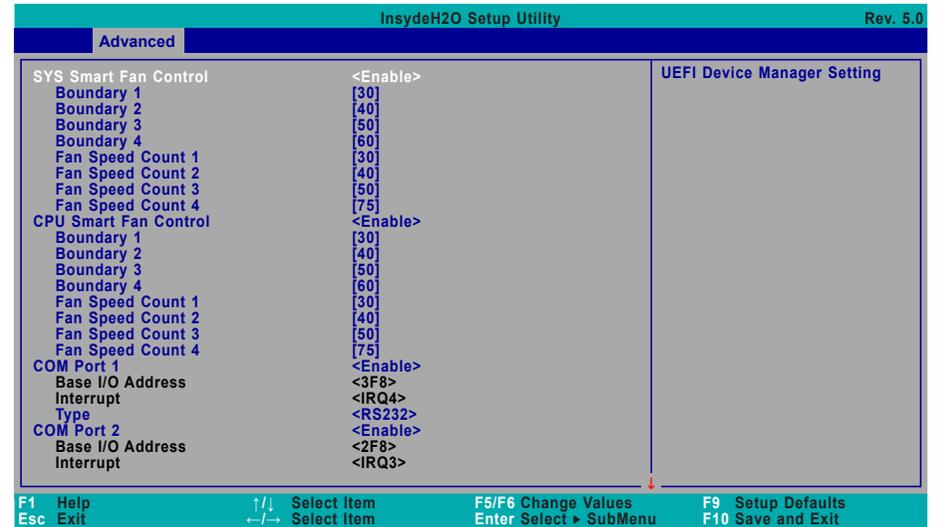
Note:

Network Device will not be configurable in Device Manager if "Network Stack" is disabled in the "Boot" menu.

► **Advanced**

SIO NUVOTON6116D

Configure Super I/O settings in this submenu. Scroll by moving the cursor up or down to reveal more options.



► **Advanced** ► **SIO NUVOTON6116D**

Smart Fan

Smart Fan is a fan speed moderation strategy that depends on the current system temperature. When the system temperature goes higher than the Boundary setting, the fan speed will be turned up to the setting of the Fan Speed Count that bears the same index as the Boundary field.

SYS Smart Fan/CPU Smart Fan Control

Enable or disable the system smart fan. When disabled, fan speed will not be controllable according to different system temperatures. Instead, a Fix Fan Speed Count field will be displayed to configure at which speed the fan will always be fixed regardless of system temperature.

▼ **SYS Smart Fan/CPU Smart Fan Control = [Enabled]**

Boundary 1 to Boundary 4

Set the boundary temperatures that determine the fan speeds accordingly, the value ranging from 0-127°C. For example, when the system temperature reaches Boundary 1 setting, the fan speed will be turned up to the designated speed of the Fan Speed Count 1 field.

Fan Speed Count 1 to Fan Speed Count 4

Set the fan speed, the value ranging from 1-100%, 100% being full speed. The fans will operate according to the specified boundary temperatures above-mentioned.

▼ **SYS Smart Fan/CPU Smart Fan Control = [Disabled]**

Fix Fan Speed Count

Set the fan speed, the value ranging from 1-100%, 100% being full speed. The fans will always operate at the specified speed regardless of gauged temperatures.

COM Port 1 to COM Port 6

Enables or disables the serial ports (COM). The following bracketed fields will only appear when the port is enabled.

WDT

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

▼ **WDT = [Enable]**

COUNTER

Set the timeout value of the WDT — 1-255 seconds.

► **Advanced** ► **SIO NUVOTON6116D**

► **PC Health Status**

This section displays the PC health status.

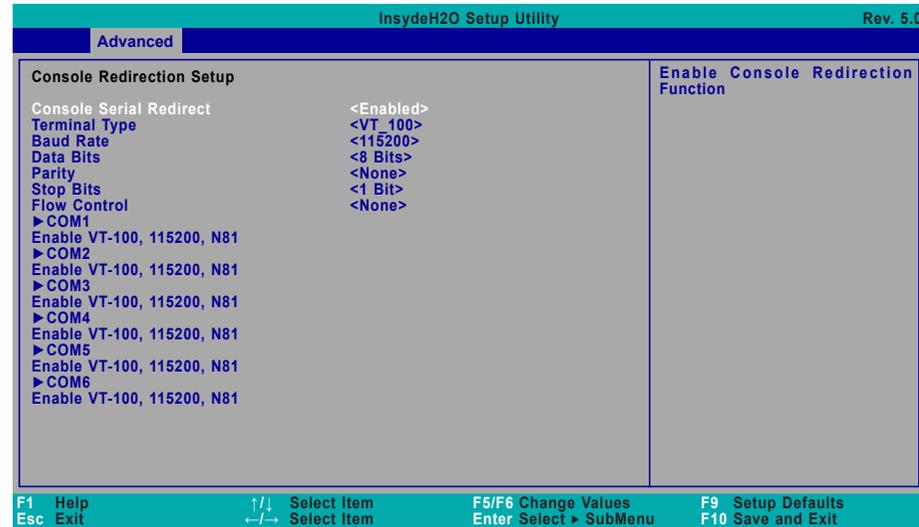
InsydeH2O Setup Utility		Rev. 5.0
Advanced		
PC Health Status		
Voltage		
VBAT	3.072 V	
Vcore	0.784 V	
VDDQ	1.184 V	
5V	4.939 V	
+12V	11.616 V	
Temperature		
System (°C/°F)	35.0 C/ 95.0 F	
CPU (°C/°F)	42.0 C/ 107.6 F	
Fan Speed		
SYS FAN	0 RPM	
CPU FAN	2561 RPM	

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

► **Advanced**

Console Redirection

Configure COM port serial settings in the submenu.



Terminal Type

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

Baud Rate

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

Data Bits

Select data bits — 7 bits or 8 bits.

Parity

Select parity bits — none, even or odd.

Stop Bits

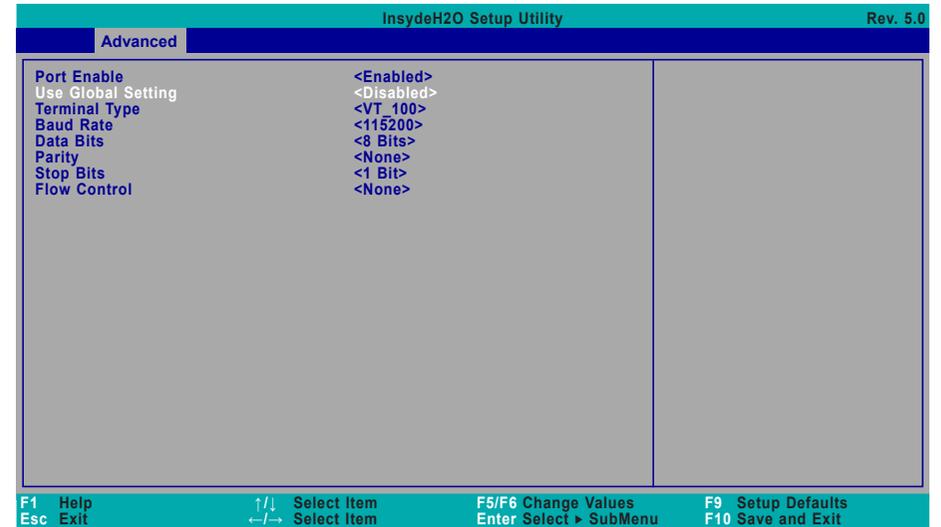
Select stop bits — 1 bit or 2 bits.

Flow Control

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

► **COM1/COM2/COM3/COM4/COM5/COM6**

Configure individual COM port serial settings in the submenu.



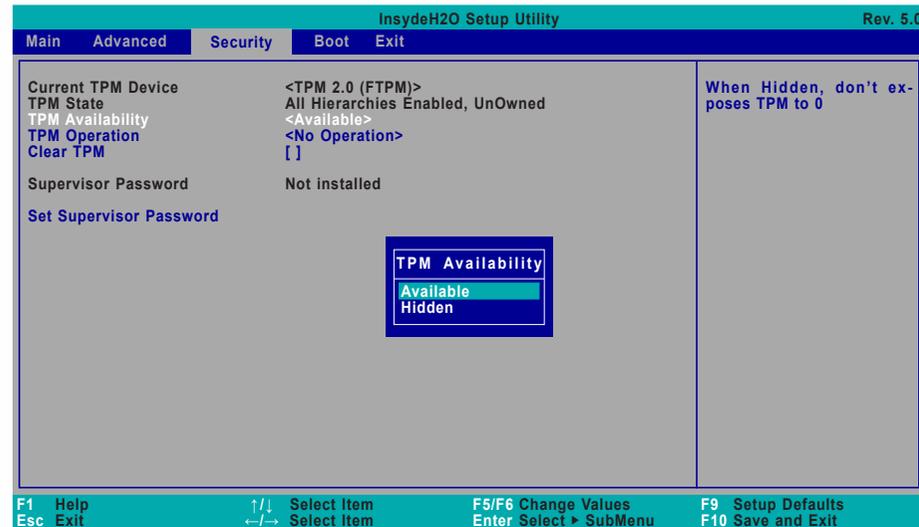
Port Enable

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

Use Global Setting

This field is to enable or disable using the global setting. When "Use Global Setting" is enabled, settings of the current port will dependent on Console Redirection settings. When "Use Global Setting" is disabled, settings of the current port can be configured independently in this section.

► Security



TPM Availability

Set the TPM availability — Available, or Hidden.

TPM Operation

Select one of the supported operation to change TPM state.

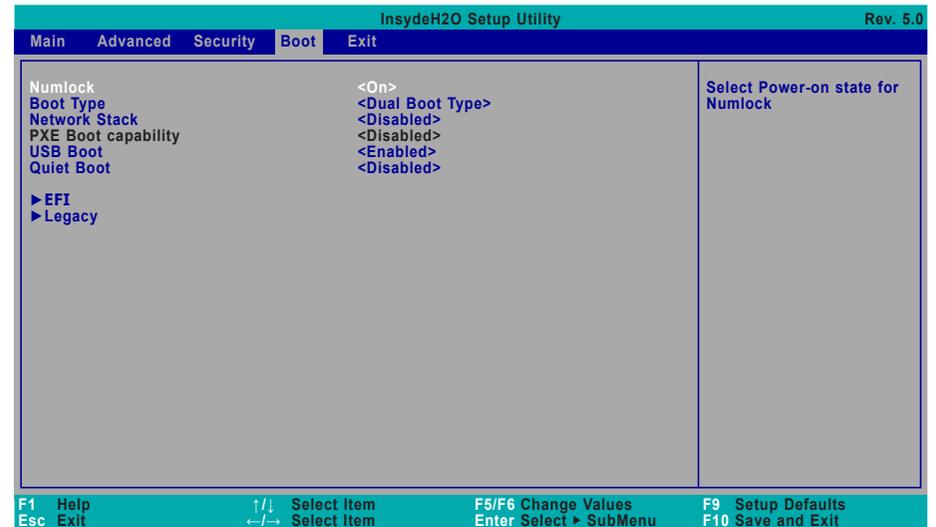
Clear TPM

Remove all TPM context associated with a specific owner.

Set Supervisor Password

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

► Boot



Numlock

Select the power-on state for numlock.

Boot Type

Select the boot type — UEFI Boot Type, Legacy Boot Type or Dual Boot Type. If you select "UEFI Boot Type" or "Dual Boot Type", the "Network Stack", "PXE Boot capability", "USB Boot" and "Quiet Boot" will show up. If you select "Legacy Boot Type", "PXE Boot to LAN", "USB Boot" and "Quiet Boot" will show up.



Note:

Please press F10 to save the settings and re-start the system board after changing "Boot Type".

Network Stack

This field is used to enable or disable network stacks, i.e. IPv4 or IPv6 network protocols.

► **Boot**

PXE Boot capability

This field is only available when "Boot Type" is set to "UEFI Boot Type" or "Dual Boot Type", and when "Network Stack" is enabled.

- Disabled** Support Network Stack
- UEFI** IPv4/IPv6
- Legacy** Legacy PXE OPROM only

PXE Boot to LAN

Enable or disable Boot into the Pre-boot Execution Environment (PXE) stored in the LAN. This field is only available when "Boot Type" is set to "Legacy Boot Type" or "Dual Boot Type", and when "Network Stack" is enabled.

USB Boot

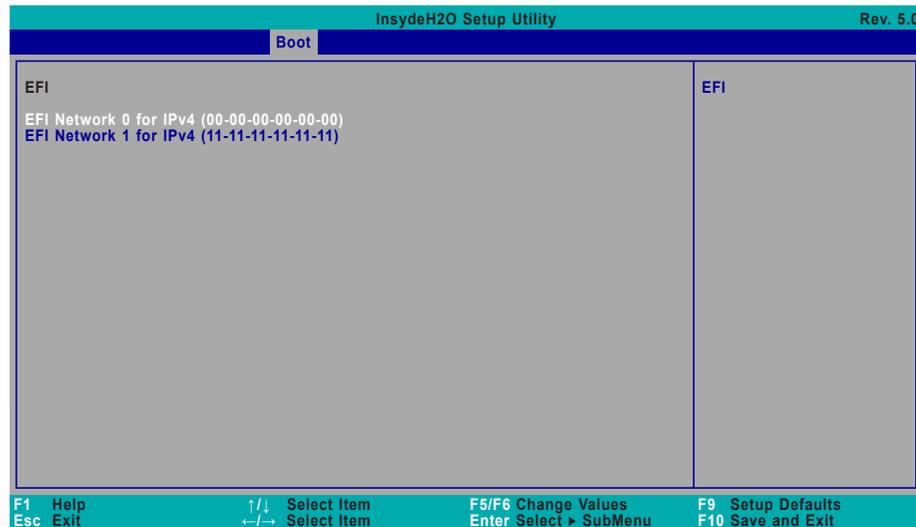
Enable or disable booting to USB boot devices.

Quiet Boot

Enable or disable booting in text mode.

► **EFI**

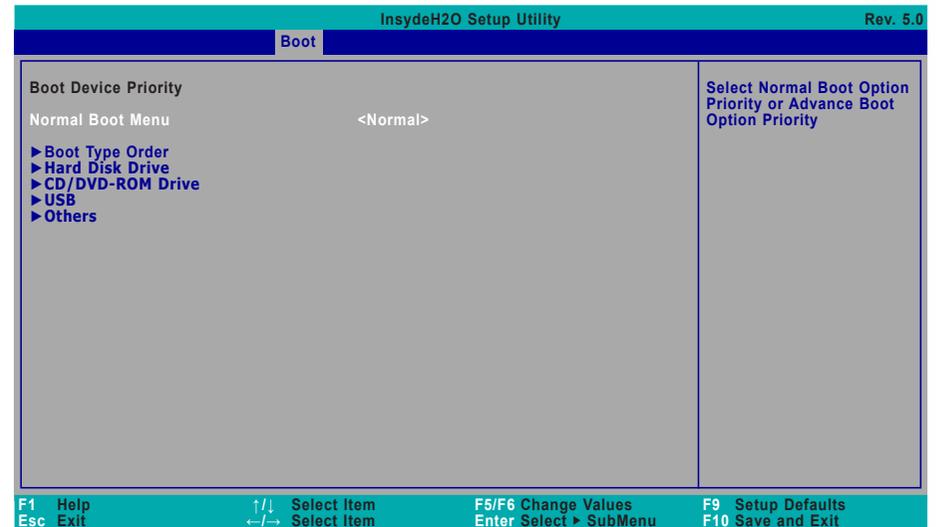
Configure boot priorities in this submenu. Press -/+ or F5/F6 to move the highlighted item down/up the priority list. This field is only available when "Boot Type" is set to "UEFI Boot Type" or "Dual Boot Type".



► **Boot**

► **Legacy**

Configure boot priorities in this submenu. Re-arrange the order by pressing -/+ or F5/F6 to move the highlighted item down/up the priority list. This field is only available when "Boot Type" is set to "Legacy Boot Type" or "Dual Boot Type".



Normal Boot Menu

Select a priority arranging method.

- Normal** Boot priority is arranged according to the type of the storage devices, and the configured order.
- Advance** Boot priority is arranged according to the configured order regardless of the type of the storage devices.

► **Boot Type Order**

Arrange the priority of types of the storage devices.

► **Hard Disk Drive/ ► CD/DVD-ROM Drive / ► USB / ► Others**

Arrange the priority of the storage devices in each category. The submenu will not be displayed when there is no available storage device of the type.



Note:

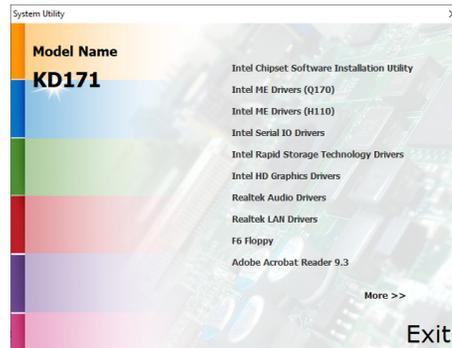
When a desired LAN port for PXE boot is not listed as a boot device, please confirm that the "PXE Boot to LAN", "PXE boot capability", "Network Stack" and the LAN controller of the said LAN (go to "Advanced" > "PCI Express Configuration") are enabled. Please press F10 to save the settings and re-start the system board for the settings to take effect.

Chapter 4 - Supported Software

Install drivers, utilities and software applications that are required to facilitate and enhance the performance of the system board. You may acquire the software from your sales representatives, from an optional DVD included in the shipment, or from the website download page at <https://www.dfi.com/DownloadCenter>.

► Auto-run Menu

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



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



Note:

This step can be ignored if the applications are downloaded standalone files.

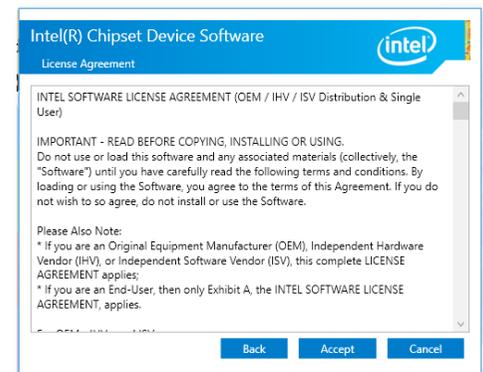
► Intel Chipset Software Installation Utility

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

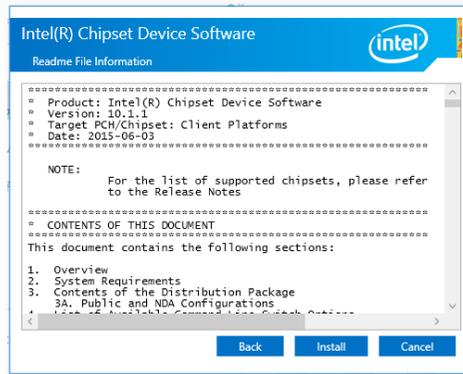
1. Setup is ready to install the utility. Click "Next".



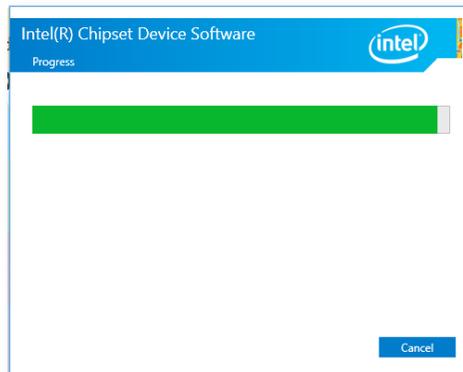
2. Read the license agreement then click "Accept".



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

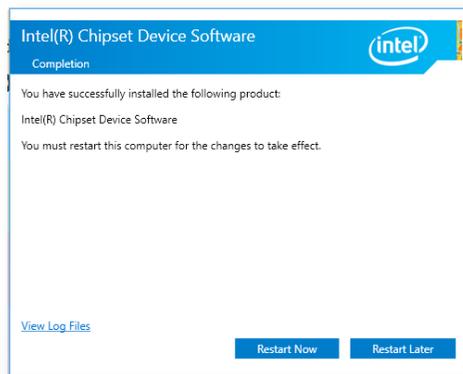


- The step displays the installing status in the progress.



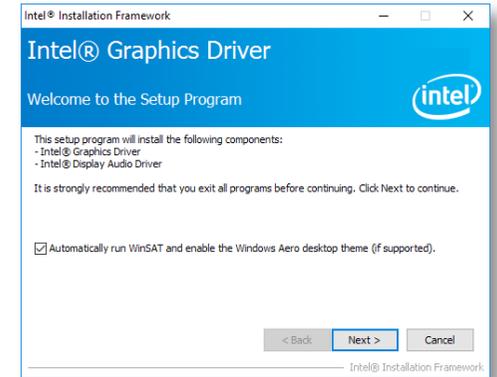
- After completing installation, click "Restart Now" to exit setup.

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



► Intel HD Graphics Drivers

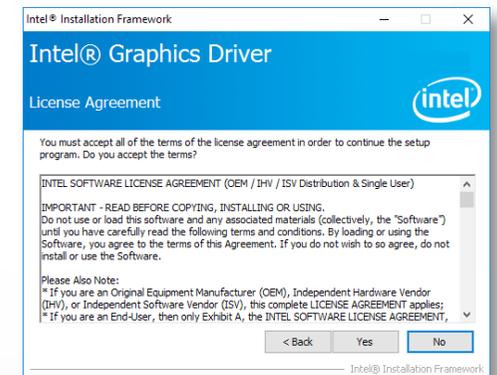
- Setup is now ready to install the graphics driver. Click "Next".



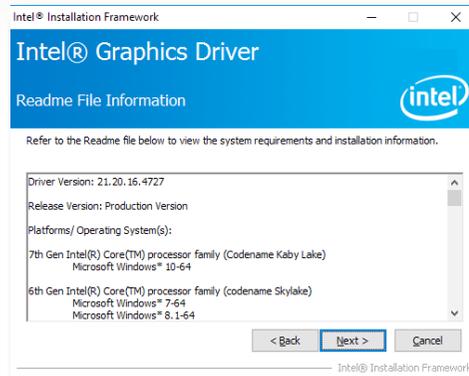
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 10 desktop appears. The "blank screen"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

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

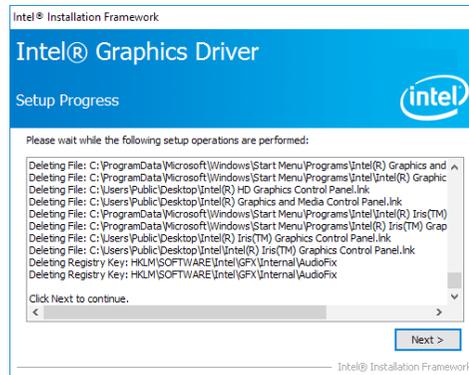
- Read the license agreement then click "Yes".



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

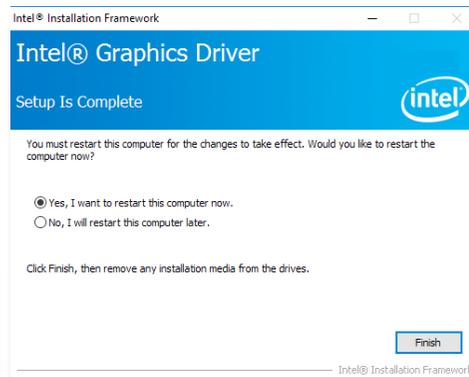


- Setup is now installing the driver. Click "Next" to continue.



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

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



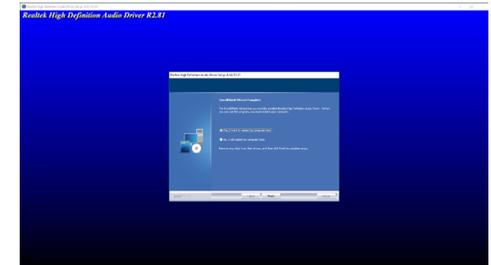
► Realtek Audio Drivers

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



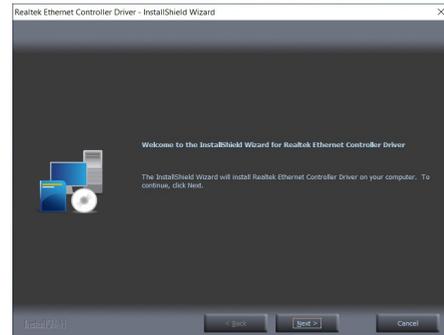
- Click "Yes, I want to restart my computer now" then click "Finish".

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



► Realtek LAN Driver

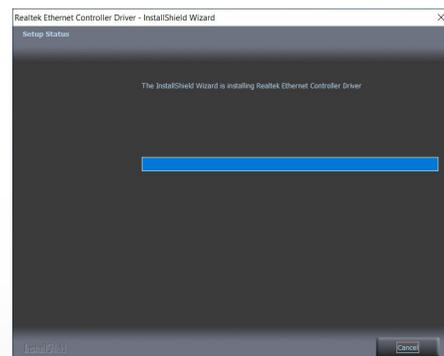
1. Setup is ready to install the driver. Click "Next".



2. Click "Install" to begin the installation.

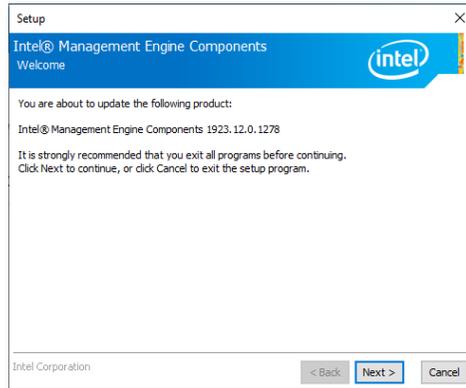


3. The step displays the installing status in the progress.

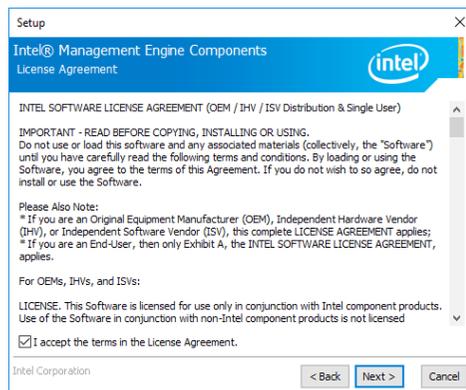


► Intel ME Drivers

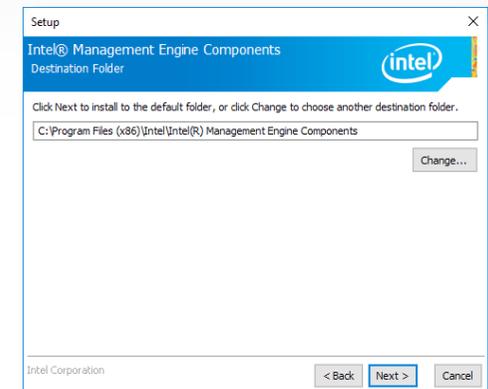
1. Setup is ready to install the driver. Click "Next".



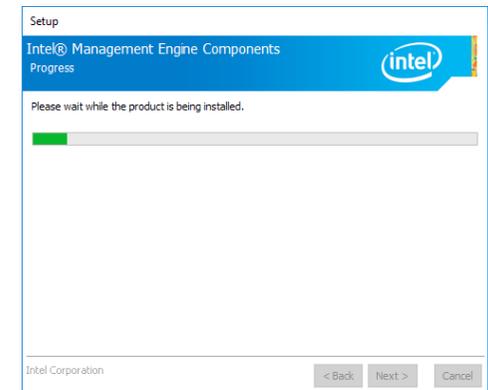
2. Read the license agreement then tick "I accept the terms in the License Agreement". Click "Next".



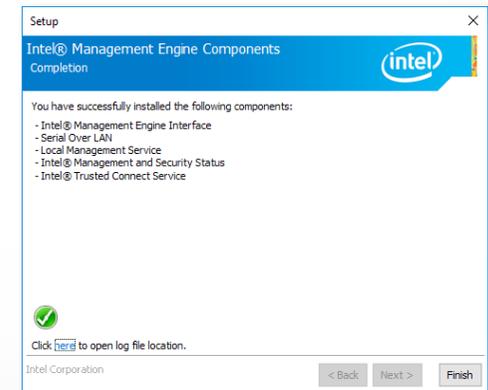
3. Click "Next" to install to the default folder, or click "Change" to choose another destination folder.



4. Please wait while the product is being installed.

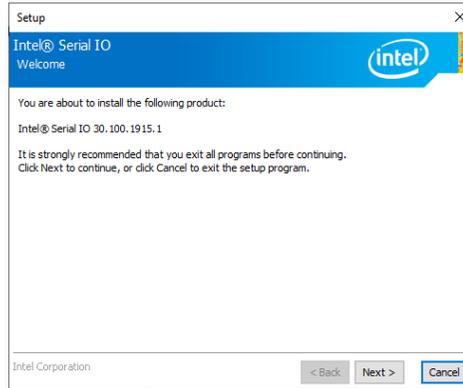


5. After completing installation, click "Finish".



► Intel Serial IO Drivers

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

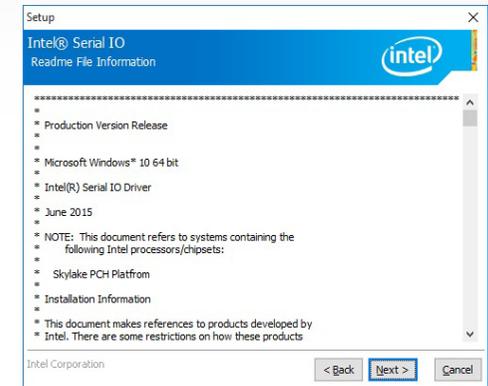


2. Read the license agreement carefully.

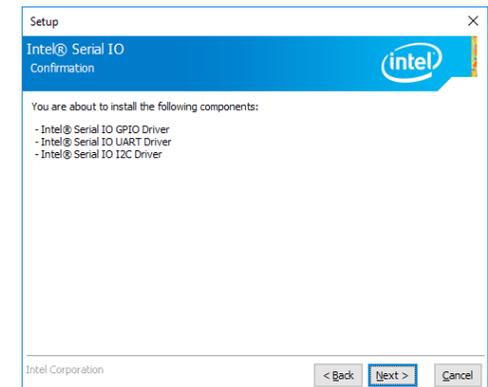
Tick "I accept the terms in the License Agreement" then click "Next".



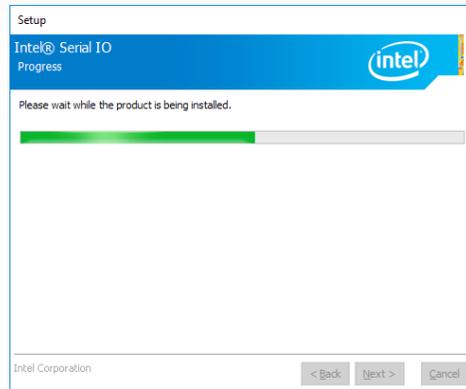
3. Go through the readme document for system requirements and installation tips then click "Next".



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

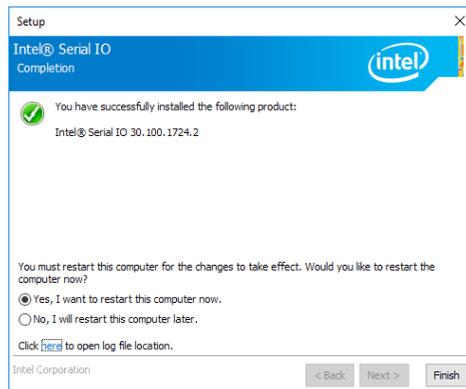


5. Setup is now installing the driver.



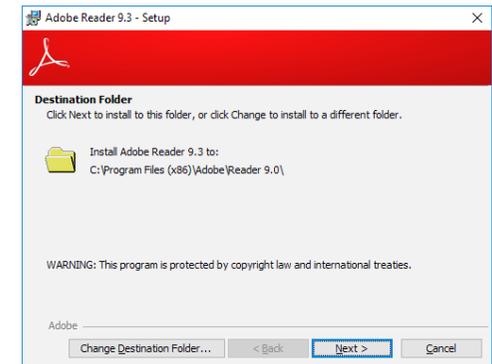
6. Click "Yes, I want to restart this computer now" then click "Finish".

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

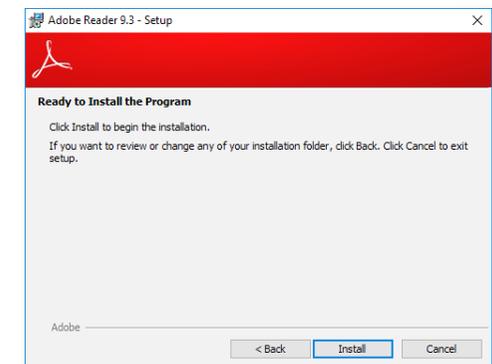


► Adobe Acrobat Reader 9.3

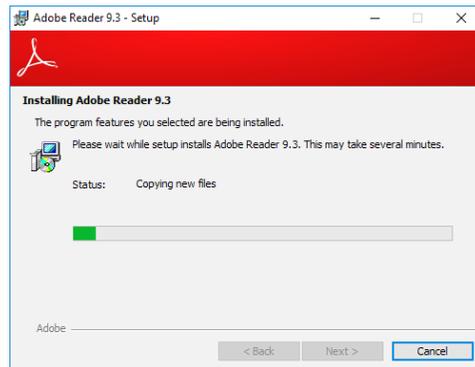
1. Click "Next" to install or click "Change Destination Folder" to select another folder.



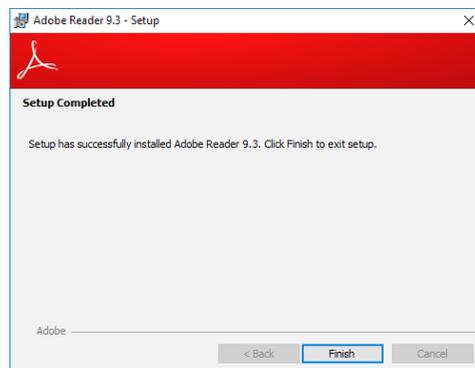
2. Click "Install" to begin installation.



3. Setup is now installing the driver.



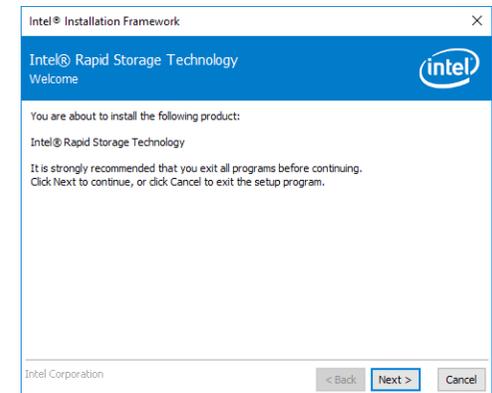
4. Click "Finish" to exit installation.



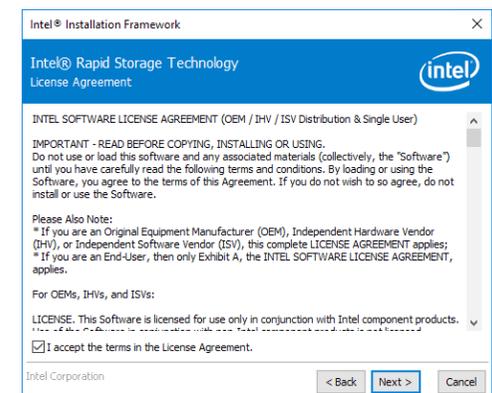
► Intel Rapid Storage Technology

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

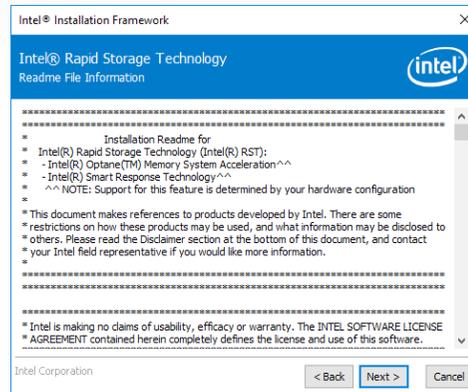
1. Setup is ready to install the utility. Click "Next".



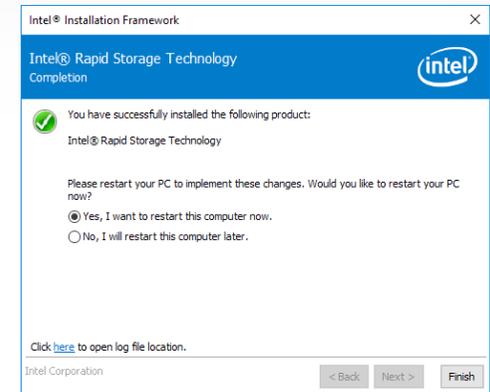
2. Read the license agreement and click "I accept the terms in the License Agreement". Then, click "Next".



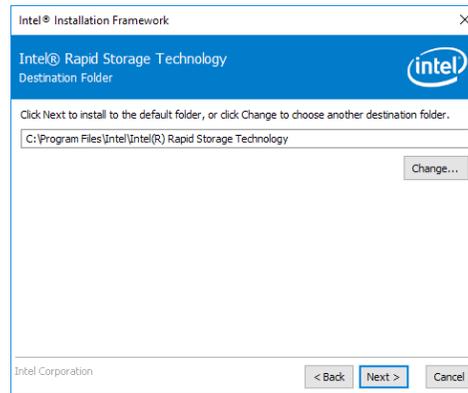
- Go through the readme document to view system requirements and installation information then click "Next".



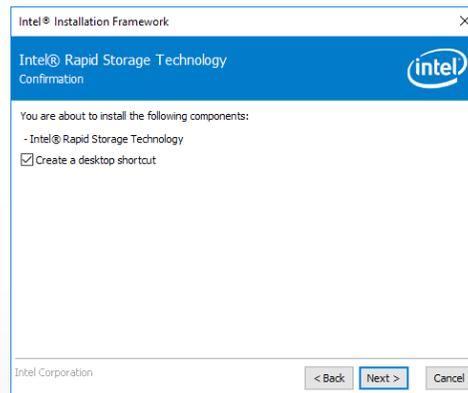
- Click "Yes, I want to restart this computer now" to complete the installation and then click "Finish".



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



- Confirm the installation and click "Next".



Chapter 5 - RAID

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

► RAID Levels

RAID 0 (Striped Disk Array without Fault Tolerance)

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

RAID 1 (Mirroring Disk Array with Fault Tolerance)

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

RAID 5

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

RAID 10 (Mirroring and Striping)

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

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

► Setup Procedure

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

1. Install SATA drives.
2. Enable RAID in the Insyde BIOS.
3. Create a RAID volume.
- 3-1. Create a RAID volume if the boot type is UEFI.
4. Install the Intel Rapid Storage Technology Utility.

Step 1: Install SATA Drives

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



Important:

1. Please make sure the SATA drives that you are to create a RAID volume with are connected and powered, and are able to be detected by the system. Otherwise, the RAID BIOS utility would not be accessible.
2. While creating a RAID volume, please make sure the system, drives, and cables are perfectly steady and mounted correctly. Disturbance during creating a RAID volume will result in irreversible data corruption stored on the drive.

Step 2: Enable RAID in the Insyde BIOS

1. Power-on the system then press to enter the main menu of the Insyde BIOS.
2. Go to "Advanced" menu and select the "SATA Configuration" menu.
3. Change the "SATA Mode Selection" to "Intel RST Premium" mode.
4. Save the changes in the "Exit" menu.
5. Reboot the system.

► Setup Procedure

Step 3: Create a RAID Volume

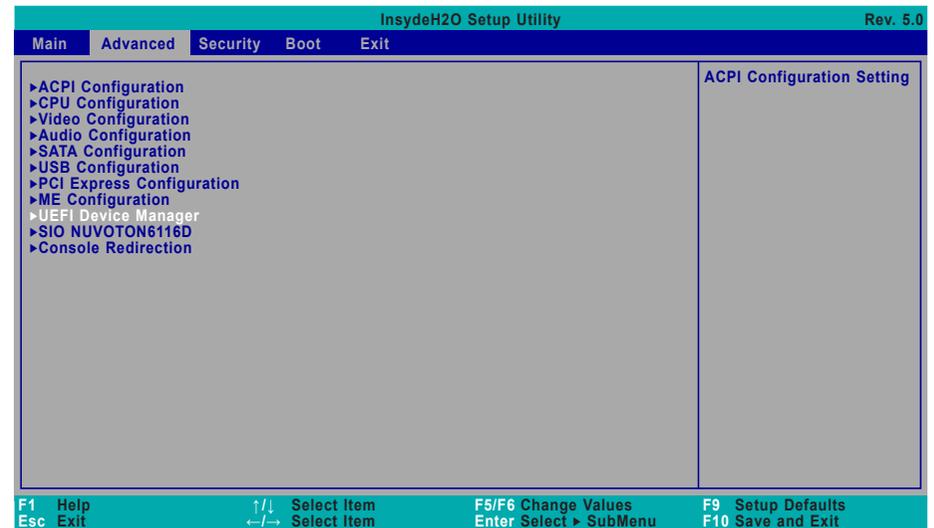
1. When the Intel® RST option ROM status screen displays during POST, press <Ctrl> and <I> simultaneously to enter the option ROM user interface.
2. Select 1: Create RAID Volume and press <Enter>.
3. Create a volume name and press <Enter>.
4. Use the up or down arrow keys to select the RAID level and press <Enter>.
5. Use the up or down arrow keys to select the strip size and press <Enter>.
6. Select the capacity and press <Enter>. You must select less than one hundred percent of the available volume space to leave space for the second volume.
7. Press <Enter> to create the volume.
8. At the prompt, press <Y> to confirm volume creation.
9. Select 4: Exit and press <Enter>.
10. Press <Y> to confirm exit.

► Setup Procedure

Step 3-1: Create a RAID Volume in UEFI Mode

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 in the Insyde BIOS and select "UEFI Device Manager".



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

► **Setup Procedure**

Step 4: Install Intel Rapid Storage Technology

The Intel Rapid Storage Technology can be installed from within Windows. It allows you to display, manage (create, delete, migrate), and monitor SATA and RAID volume via user-friendly and icon-driven UI, and enables enhanced performance and power management for your storage subsystems.

Please refer to Chapter 4 for more instructions on installing Intel Rapid Storage Technology.