DFI®

TPC150-SD

15” Touch Panel PC

User’s Manual

A49700937

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Trademarks

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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 can be obtained from the DFI website at www.dfi.com. To download the user's manual from our website, please go to Support > Download Center. On the Download Center page, select your product or type the model name and click "Search" to find all technical documents including the user's manual for a specific product.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or 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 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 damages 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.

- One 15" Touch Panel PC
- One sheet of Poron Foam
- One HDD drive bay kit

Optional Items

- VESA Mount kit
- Panel Mount kit
- Power Cord
- SATA HDDs
- Wi-Fi Kit

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

Chapter 1 - Introduction

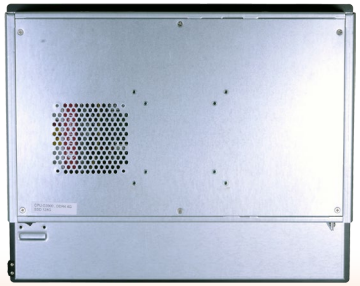
Overview

TPC150-SD

Side View

Top View

Rear View



Key Features

Model Name	TPC150-SD
Processor	7th Generation Intel® Core™ Processors
LAN	2 LAN ports
COM	1 or 3 COM ports (the additional 2 are only available upon request)
Display	1 x VGA 1 x DVI-I (DVI-D signal) 1 x DP++
USB	4 x USB 3.0 2 x USB 2.0
Audio	Line-out (available upon request)

Specifications

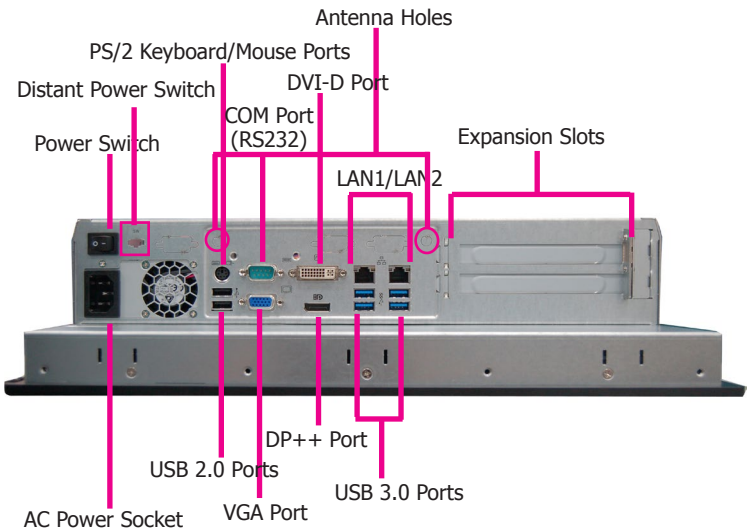
Processor	7th and 6th Generation Intel® Core™ Processors, LGA 1151 Socket Intel® Core™ i7-7700 Processor, Quad Core, 8M Cache, 3.6GHz (4.2GHz), 65W Intel® Core™ i5-7500 Processor, Quad Core, 6M Cache, 3.4GHz (3.8GHz), 65W Intel® Core™ i3-7101E Processor, Dual Core, 3M Cache, 3.9GHz , 65W 6th Generation Intel® Core™ Processors, LGA 1151 Socket Intel® Core™ i7-6700, Quad Core, 8M Cache, 3.4GHz (4.0GHz), 65W Intel® Core™ i5-6500, Quad Core, 6M Cache, 3.2GHz (3.6GHz), 65W Intel® Pentium® G4400, Dual Core, 3M Cache, 3.3GHz, 47W Intel® Celeron® Processor G3900, Dual Core, 2M Cache, 2.8GHz, 65W
Memory	Two 260-pin SODIMM up to 32GB Dual Channel DDR4 1866/2133MHz
Display and Touch Screen	• Display: 15" 1024x768 TFT LCD Panel with Projected Capacitive Touch and Resistive Touch Screen
	• Brightness: 420 cd/m²
	• Contrast: 2000:1
	• View Angle: 307.4 (H) / 231.3 (V)
	• Max. Color: 16.7M
	• Light Transmission: Over 90%
	• Backlight Lifetime: 50,000 MTBF LED Backlight
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
Storage	2 x 2.5" SATA Drive Bay
Expansion	1 x Full-size Mini PCIe (mSATA/PCIe, PCIe by default) 2 x PCIe x8 (Gen 3) with the riser card: T100-2E or 2 x PCI + 1 x Mini PCIe with the riser card: X100-2P1M
Audio Controller	Realtek ALC888S-VD2-GR
Ethernet Controller	1 x Intel® I210AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM PCIe (10/100/1000Mbps; only i7/i5 supports iAMT)

Top I/O Ports	1 x RS-232 (DB-9) 1 x RS-232 (DB-9) (available upon request) 1 x RS-232/422/485 (available upon request)
	4 x USB 3.0; 2 x USB 2.0
	1 x PS/2 (mini-DIN-6)
	1 x Power Switch
	1 x VGA 1 x DVI-D (DVI-I connector) 1 x DP++
	1 x Line-out (available upon request)
Front I/O Ports	1 x USB 2.0
Watchdog Timer	System Reset, Programmable via Software from 1 to 255 Seconds
Power	Type: 24V DC Connector: 3-pin C14 Connector
OS Support	Windows 7 (/WES7) 32/64-bit Windows 10 IoT Enterprise 64-bit Ubuntu 15.10 (Intel graphics driver available)
Mechanism	Construction: Sheet Metal IP Rating: IP65 Front Panel Protection Mounting: Panel/VESA (75x75) Mount* Dimensions (W x H x D): 403mm x 330mm x 103.5mm
Environment	Operating Temperature: 0 to 50°C Storage Temperature: -30 to 70°C Relative Humidity: 10% to 90% @ 40°C (non-condensing)
Standards & Certifications	CE, FCC Class A

Note:
*Optional items are not supported in standard model. Please contact your sales representative for more information.

Getting to Know the TPC150-SD

Top View



COM Ports

Connect serial RS232 devices. Besides this one, you can choose to install two additional COM ports on the top panel.

USB 3.0 Ports

Connect USB 3.0 devices. These ports can support data transfer speeds of up to 5Gbps.

USB 2.0 Ports

Connect USB 2.0 devices. These ports can support data transfer speeds of up to 480Mbps.

PS/2 Keyboard/Mouse Port

Connects PS/2 keyboard or mouse.

VGA Port

Connects the VGA port of a display.

DP++ Port

Connects the DisplayPort of a display.

DVI-D Port (DVI-I connector)

Connects the DVI-D port of a display.

LAN Ports

Connect the system to a local area network.

Expansion Slots

Provide PCIe or PCI expansion connectivity.

Distant Power Switch

Connects to a power switch for distant power-on and off control.

Power Switch

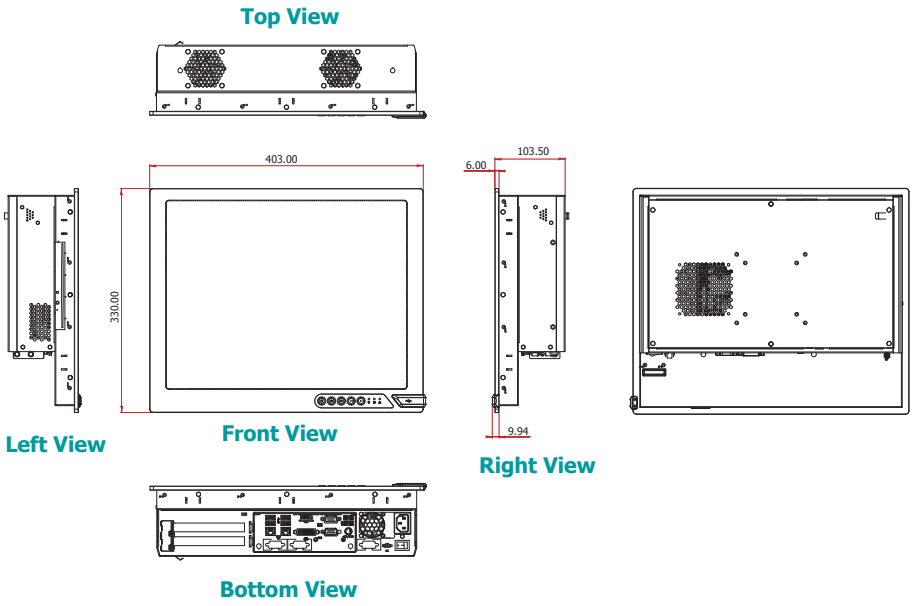
Press to power on or power off the system.

Power Socket

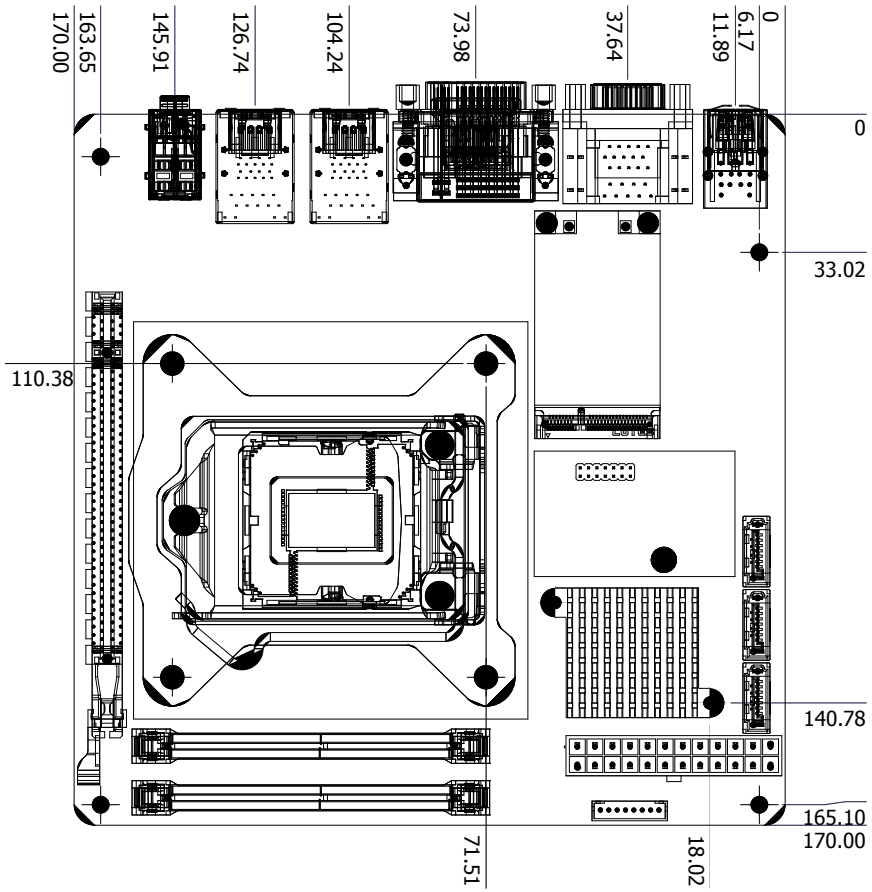
Connects AC power cord.

Mechanical Dimensions

TPC150-SD



Motherboard Dimensions



Chapter 2 - Getting Started

Preparing the System

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

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

Installing Devices

The following are devices that can be installed in the TPC150-SD system.

- Memory module
- SATA hard drive
- Mini PCIe card
- PCIe expansion cards

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 AMI BIOS setup utility.

Installing the Operating System

Depending on the method you choose to install your system, you may use a USB flash drive or install a CD-ROM drive to run the Operating System CD.

Make sure that a SATA drive or a Mini PCIe card is already installed.

1. Refer to the following chapters for information on installing a SATA drive or a Mini PCIe card.
2. Refer to your operating system manual for instructions on installing an operating system.

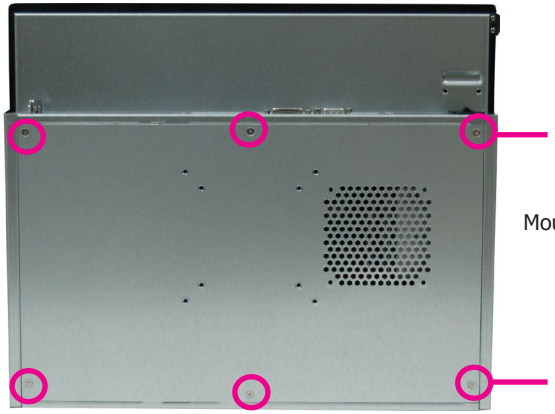
Installing the Drivers

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.

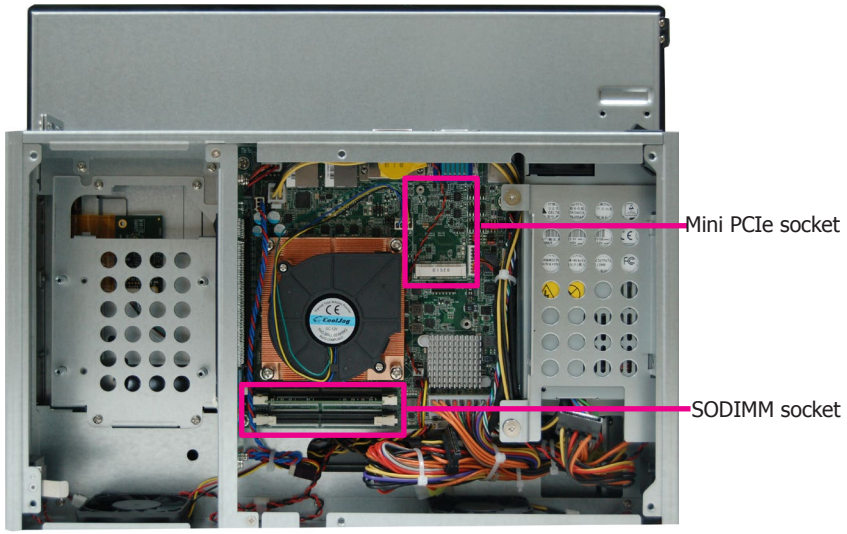
Chapter 3 - Installing Devices

Removing the Chassis Cover

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 6 mounting screws on the bottom of the system are used to secure the cover to the chassis. Remove these screws and put them in a safe place for later use.



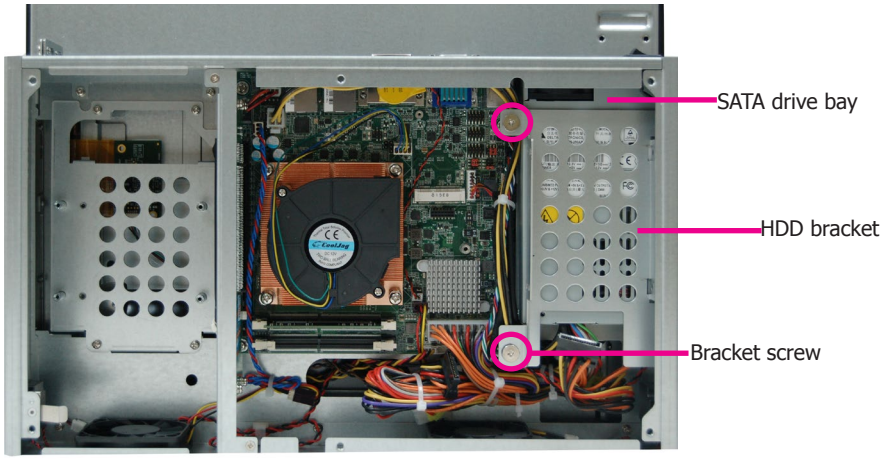
4. Lift the cover up to open the system.
5. The Mini PCIe and the SODIMM sockets are readily accessible after removing the chassis cover.



Installing a SATA Drive

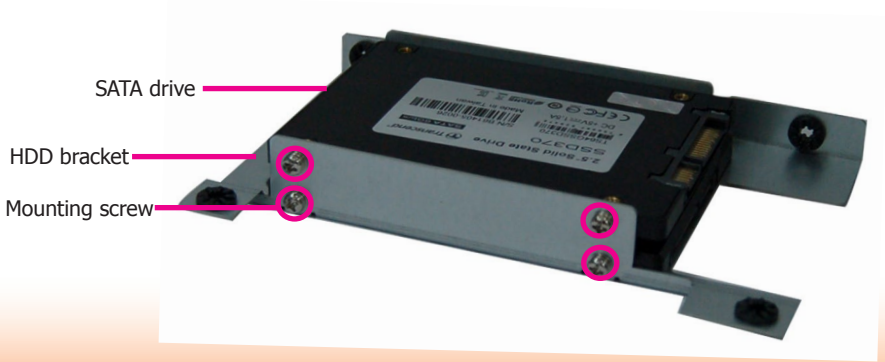
The system can accomondate two SATA drives. Please use the following procedure to install SATA drives into the system.

1. Locate the SATA drive bay inside the system and remove the mounting screws that secure the HDD bracekt to the drive bay.

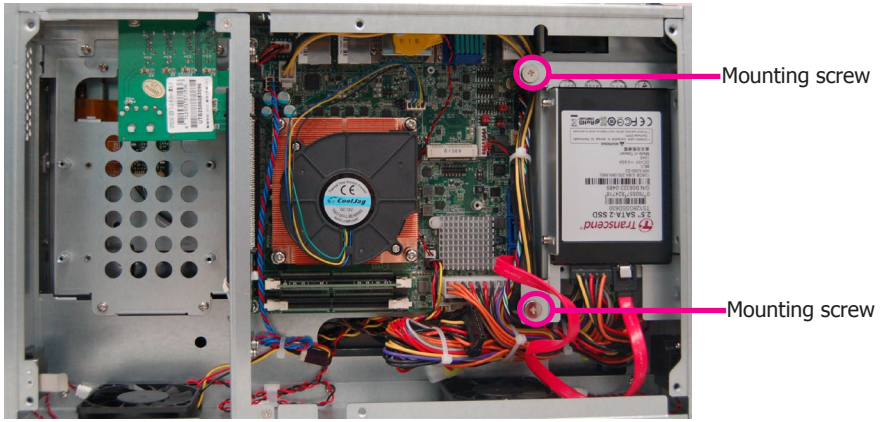


2. Align the mounting holes of the SATA HDD with the mounting holes on the HDD drive bay and use the mounting screws included in the HDD drive bay kit to attach the SATA HDD to the drive bay.

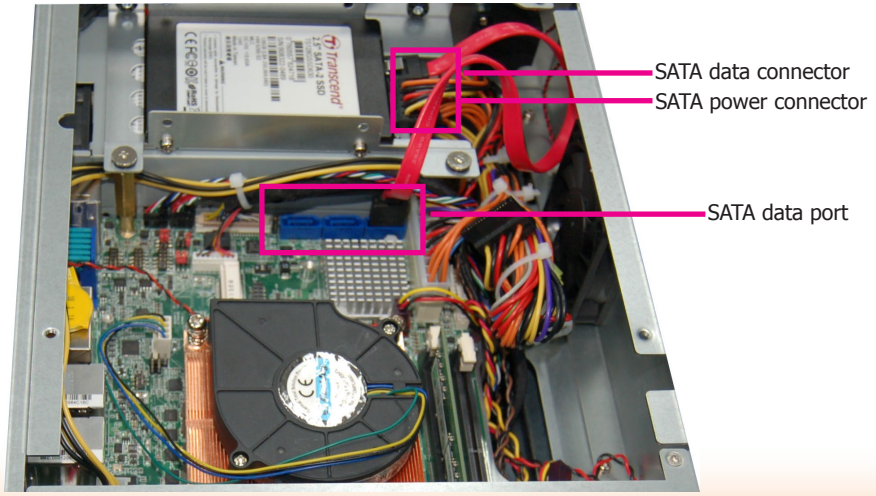

Mounting screws



3. Place the SATA drive (with the HDD bracket) back into the system. Align the mounting holes on the HDD bracket with the mounting holes on the SATA drive bay and then use the provided mounting screws to secure the drive in place.



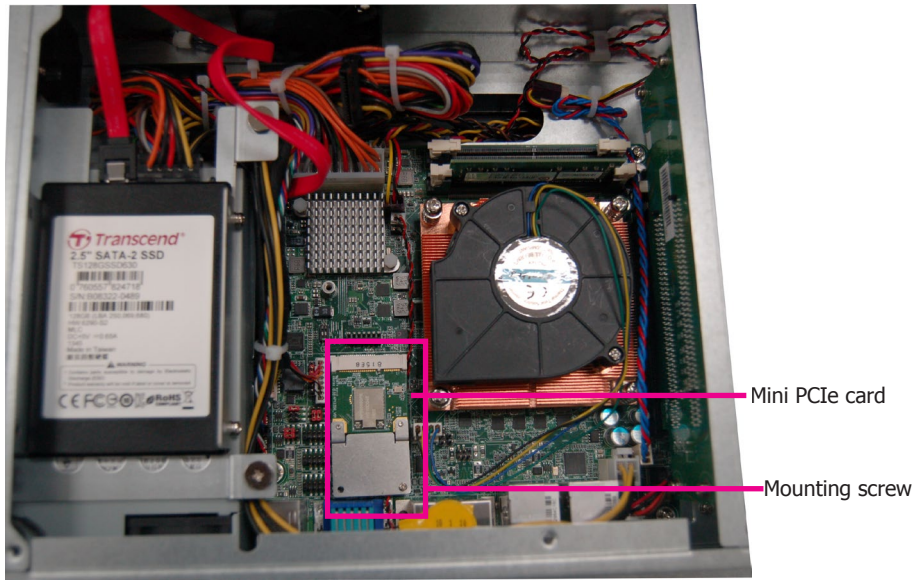
4. Connect one end to the SATA data connector of the SATA drive and the other end to the SATA data port on the system board. Connect the SATA power connector from the PSU to the SATA power connector.



Installing a Mini PCIe Card

The system board is equipped with one Mini PCIe slot that supports mSATA and PCIe interfaces. Use the following procedure to install a Mini PCIe card:

Align the notch in the connector of the Mini PCIe card with the key in the connector on the system board and use the provided mounting screws to secure the card on the system board.



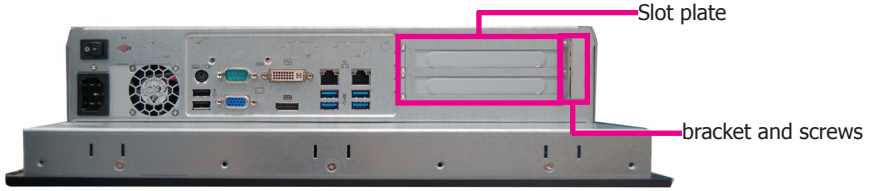
Note:
The Mini PCIe socket supports PCIe and SATA signals and can accommodate common mobile broadband and storage modules. For jumper settings on switching the signal betwen SATA and PCIe, refer to Chapter 4.

Installing a PCIe Expansion Card

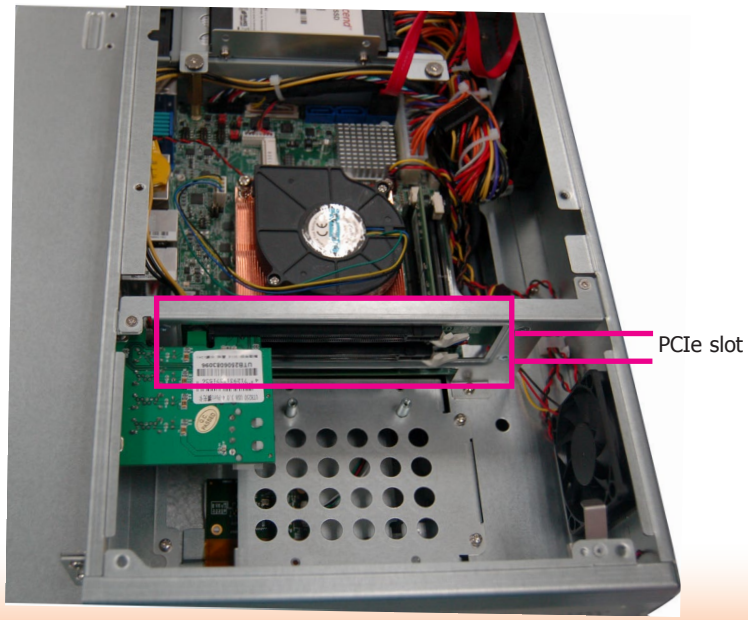
The PCIe slot on the riser card inside the system is used to install expansion cards. Use the following procedure to install a Mini PCIe card:

Note: The system provides two optioanl riser cards to accommodate different types of PCIe expansion slots:
The riser card *(DFI model: T100-2E)* provides 2 x PCIe Gen3 x8 expansion slots whereas the riser card *(DFI model: X100-2P1M)* provides two PCI and one Mini PCIe slots.

1. Remove the slot plate and bracket by removing the screws on the front chassis.

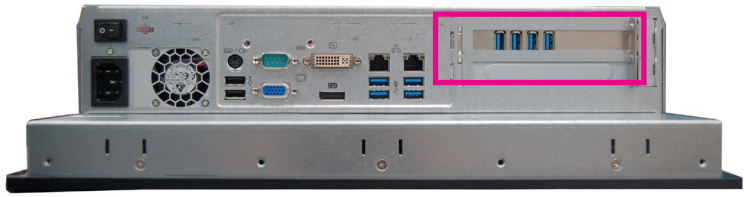


2. Insert the expansion card into the PCIe slot on the riser card. Ensure the card is properly seated into the slot.



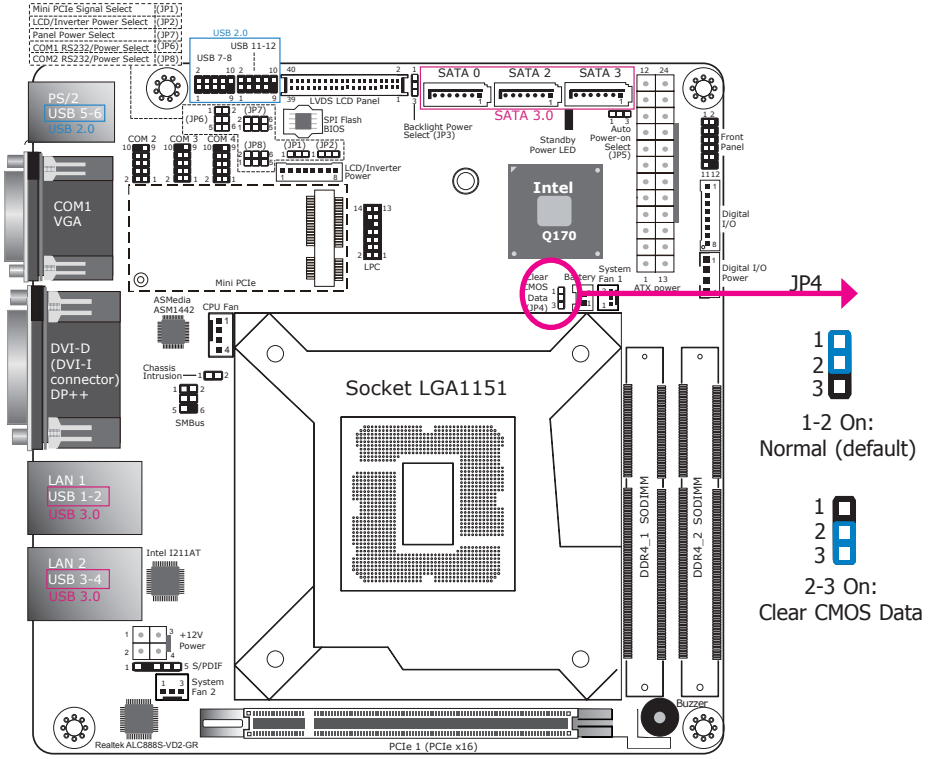
3. Install the bracket to secure the PCIe card in place.

Front View



Chapter 4 - Jumper Settings

Clear CMOS Data



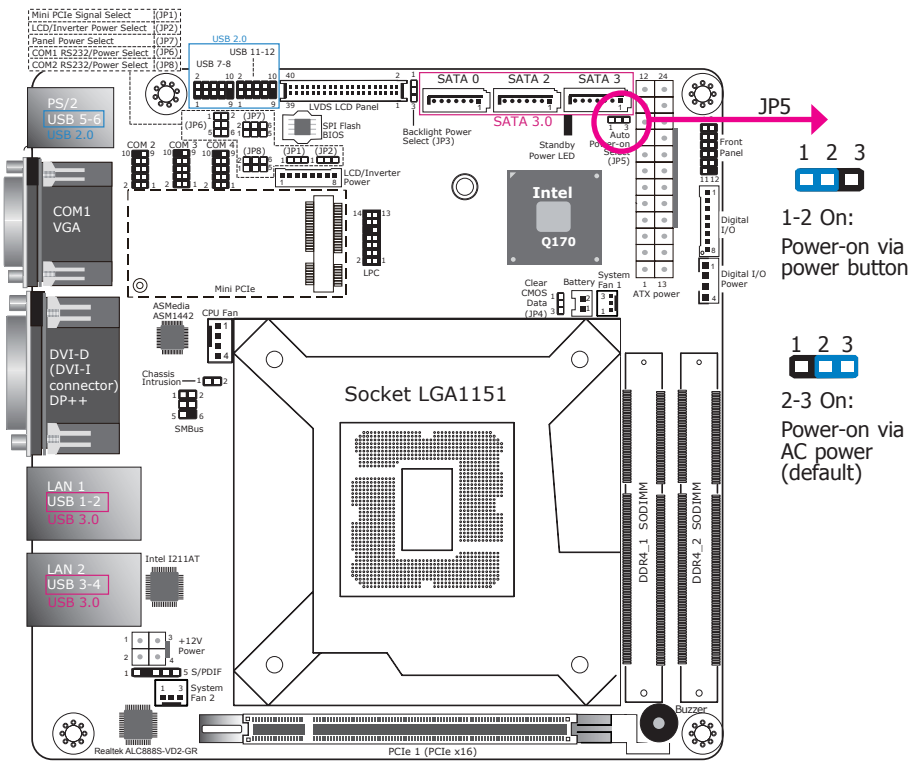
You can reconfigure the system with the default values stored in the ROM BIOS if you encounter the following situations:

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 these steps below:

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

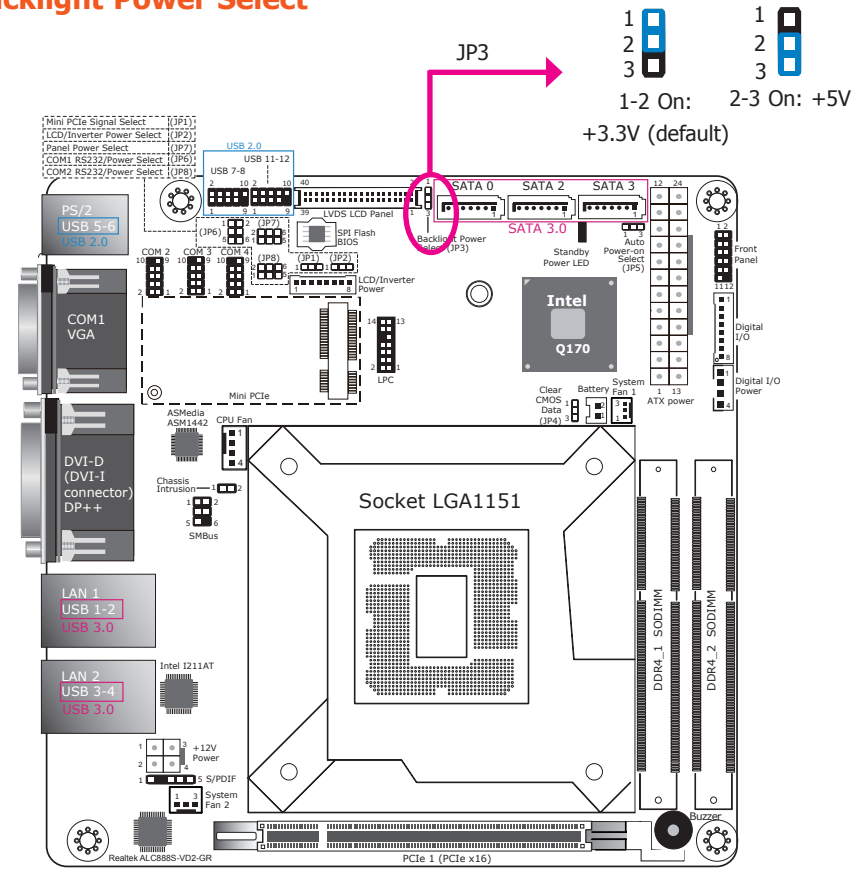
Auto Power-on Select



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

When using the "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 (i.e., power flicker).

Backlight Power Select

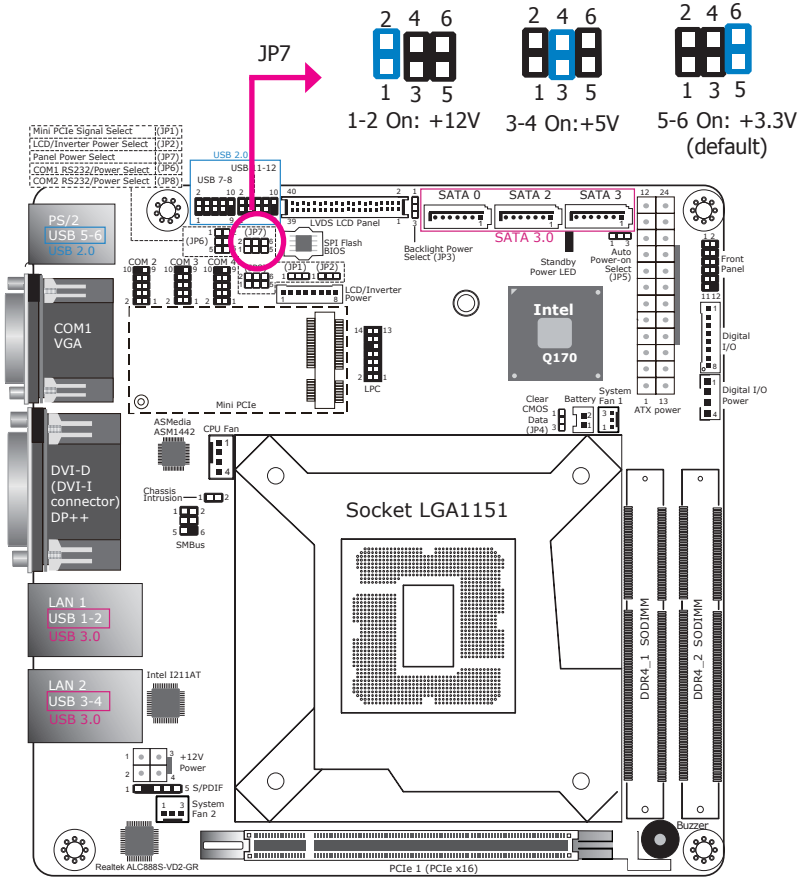


This jumper is used to select the power level of backlight brightness control: +3.3V (default) or 5V.

Important:

Please do not alter the setting of this jumper if you do not know the outcome of the change. Selecting the incorrect voltage will seriously damage the backlight.

Panel Power Select

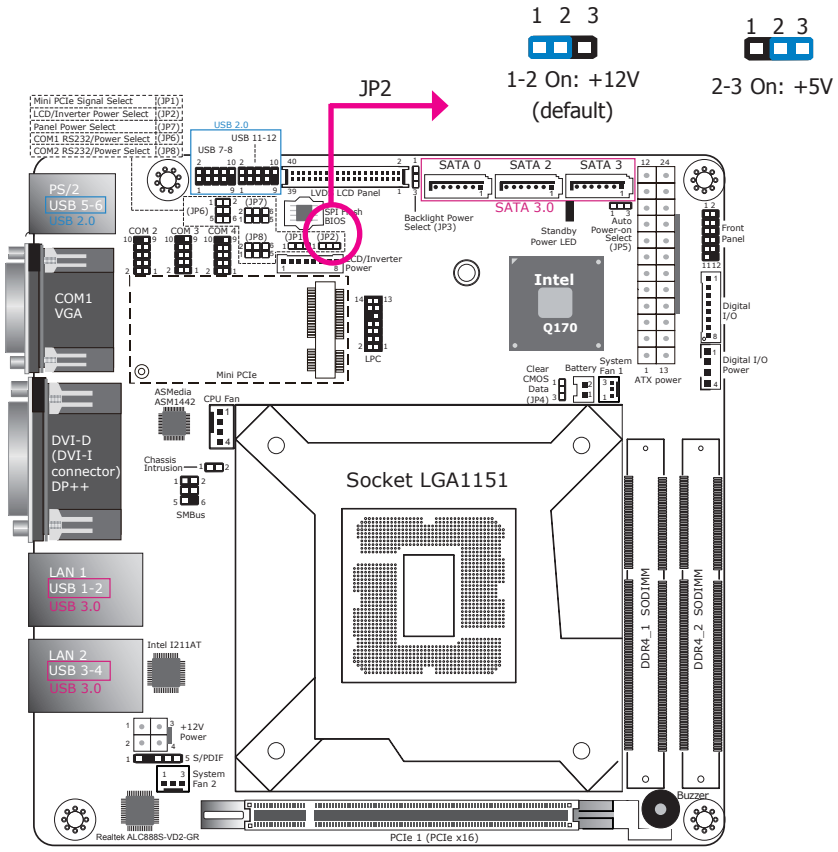


JP7 is used to select the power supplied with the LCD panel.

Important:

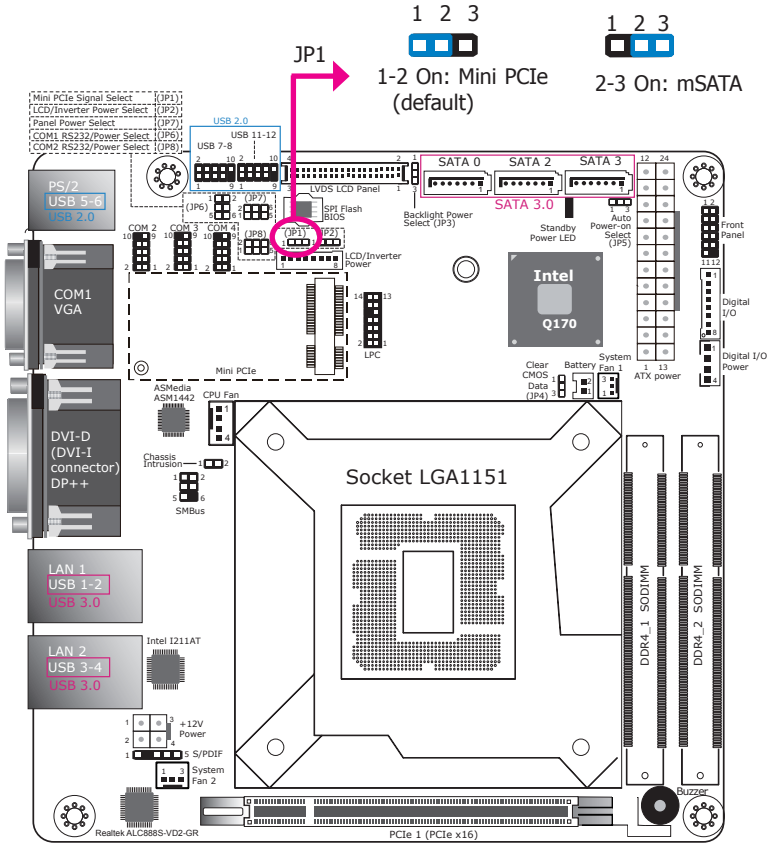
Please do not alter the setting of this jumper if you do not know the outcome of the change. Selecting the incorrect voltage will seriously damage the backlight.

LCD/Inverter Power Select



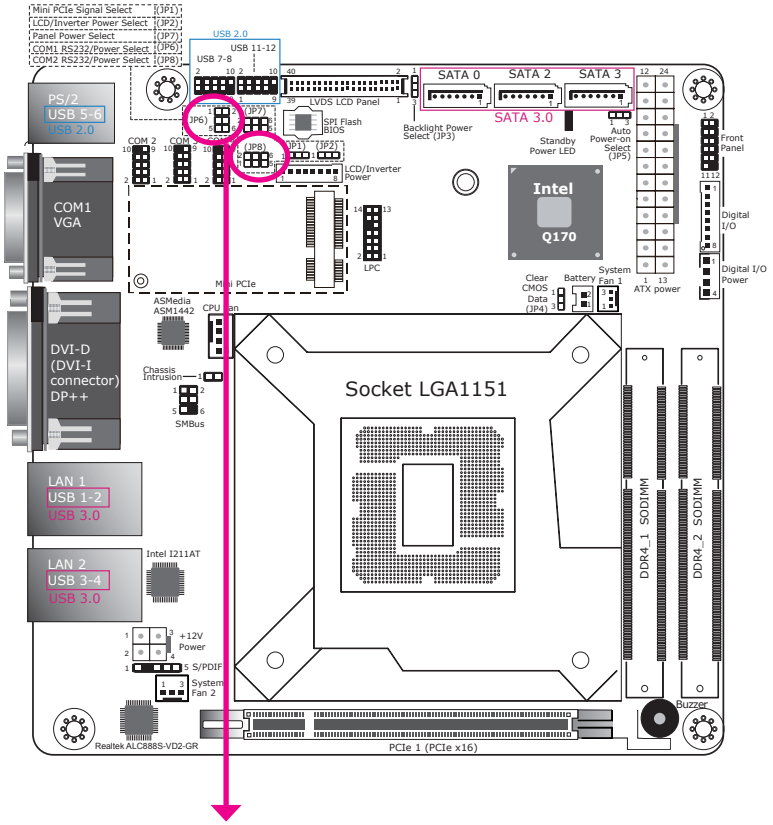
JP2 is used to select the power level of the LCD/inverter power connector.

Mini PCIe/mSATA Signal Select



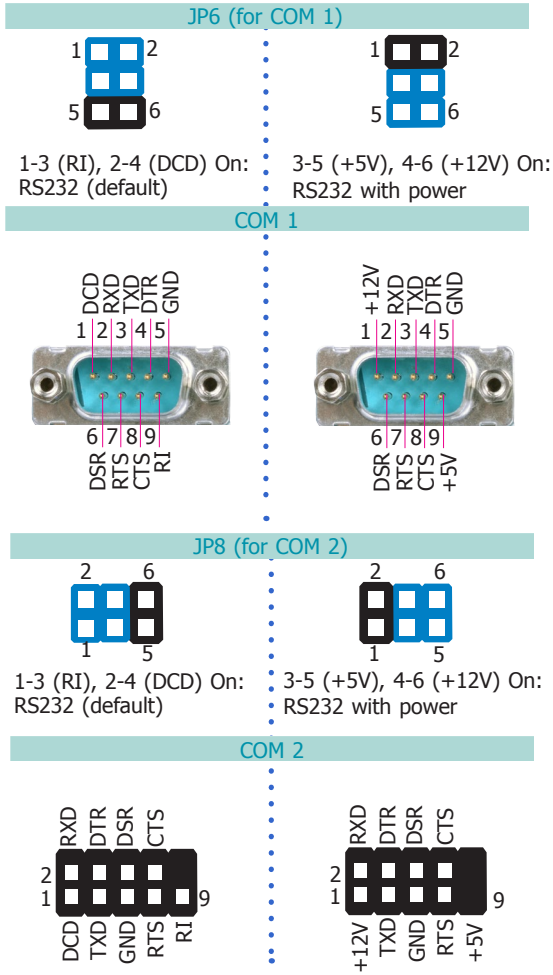
JP1 is used to select the signal for the Mini PCIe slot.

COM 1/COM 2 RS232 Power Select



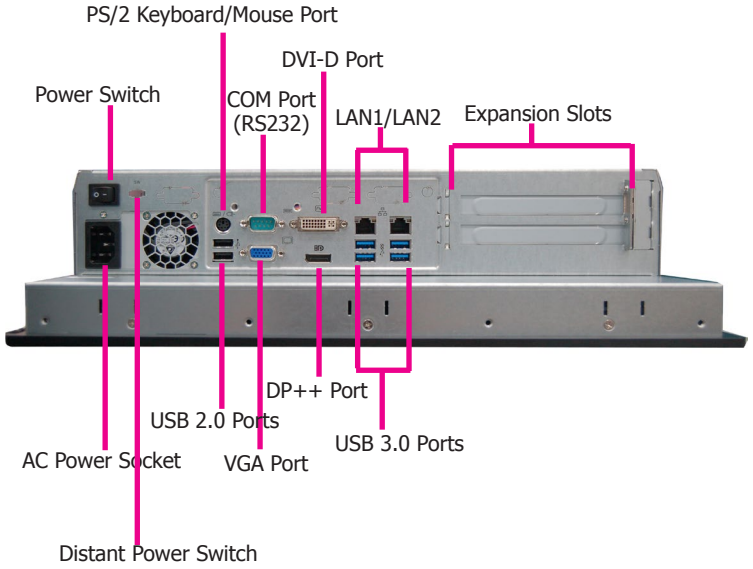
RS232/Power Select	COM 1 (JP6), COM 2 (JP8)
RS232 (default)	1-3 (RI), 2-4 (DCD) On
RS232 with power	3-5 (+5V), 4-6 (+12V) On

JP6 (for COM 1) and JP8 (for COM 2) are designed 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 the jumpers' settings accordingly.



Chapter 5 - Ports and Connectors

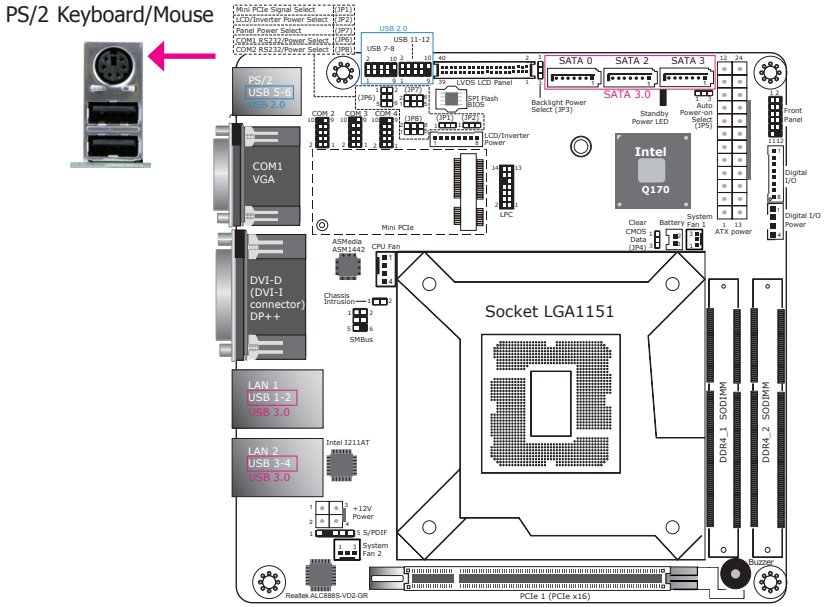
Top Panel I/O Ports



The top panel I/O consists of the following ports and connectors:

- Power switch
- AC power socket
- Four USB 3.0 and two USB 2.0 ports
- Distant power switch connector
- DVI-D, VGA and DP++ ports
- Serial port
- Two LAN ports
- PS/2 keyboard/mouse port
- Two expansion slots

PS/2 Keyboard/Mouse Port



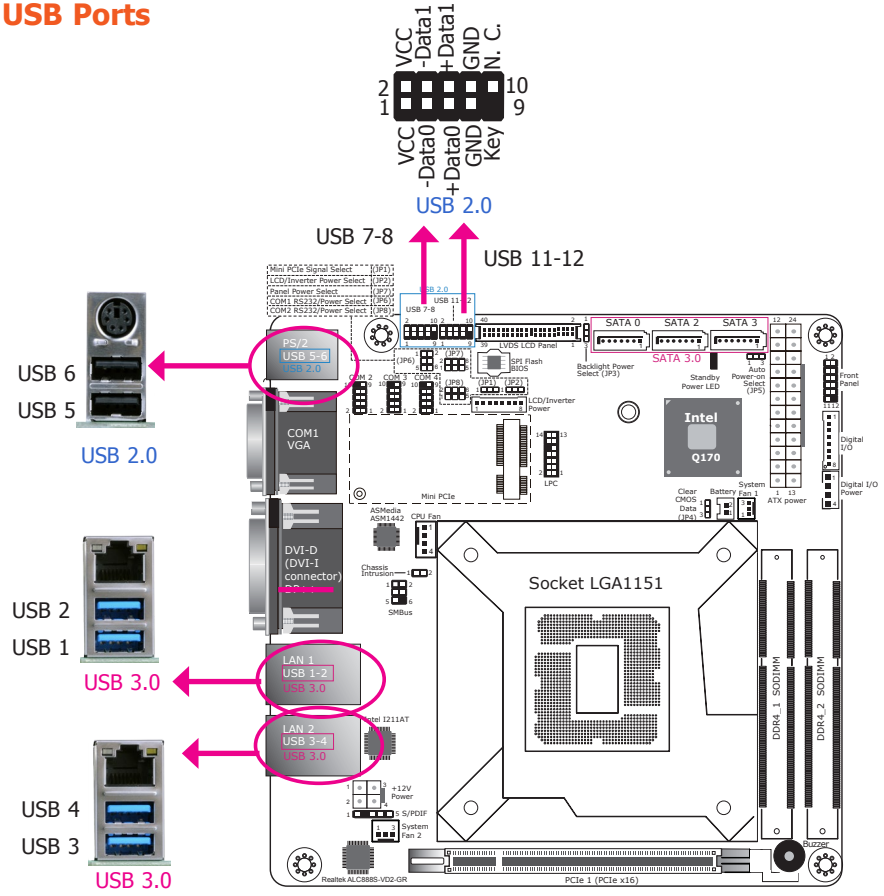
This port is used to connect a PS/2 keyboard or mouse.

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. To use this function, configure the wake-on function of PS/2 keyboard/mouse in the Advanced menu ("ACPI Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

Note:
This port cannot work with a PS/2 mouse alone. To connect both your keyboard and mouse, please use a PS/2 keyboard mouse splitter cable adapter.

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). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

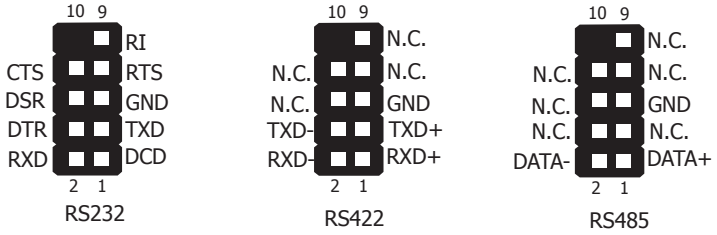
Configure the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

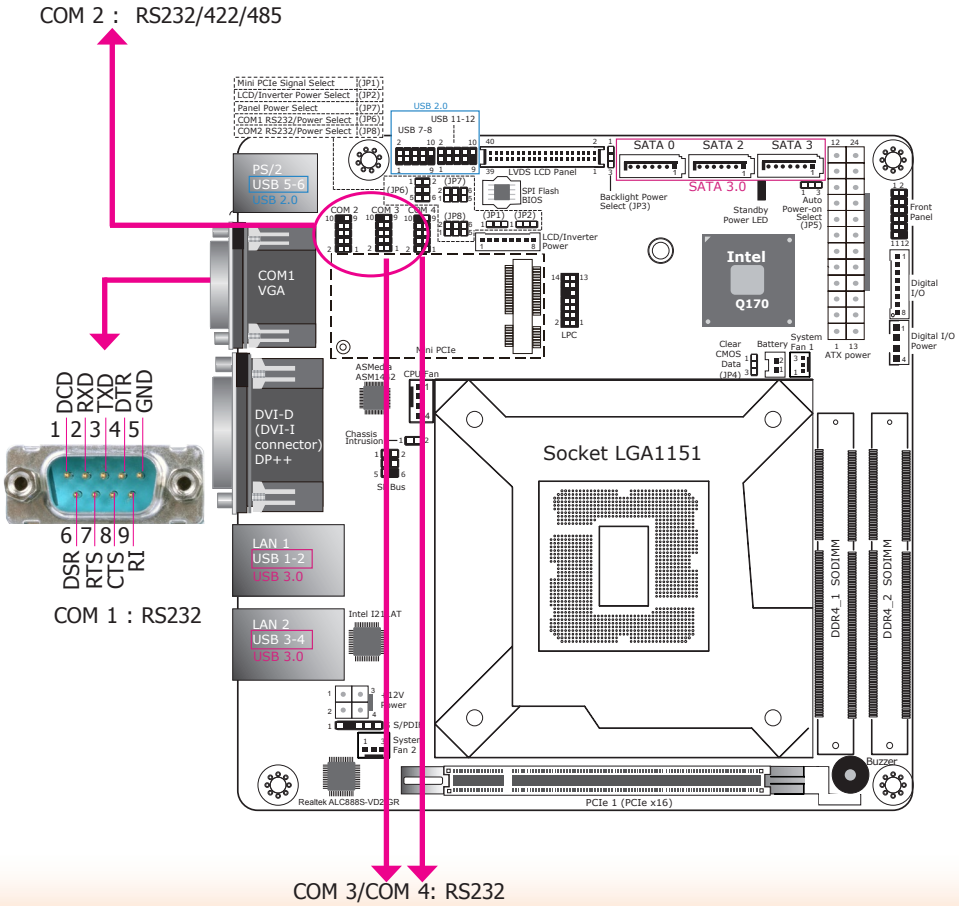
Wake-On-USB Keyboard/Mouse

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.

COM (Serial) Ports





COM 1, COM 3 and COM 4 are fixed at RS232. COM 2 can be selected among RS232, RS422 and RS485 via the BIOS setup utility.

The pin functions of COM 1 and COM 2 will vary according to JP6's and JP8's setting respectively. JP6 and JP8 allow you to configure COM 1 and COM 2 to RS232 or RS232 with power. Refer to "COM1/COM2 RS232/Power Select" in Chapter 4 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.

Connecting Extra External Serial Ports

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

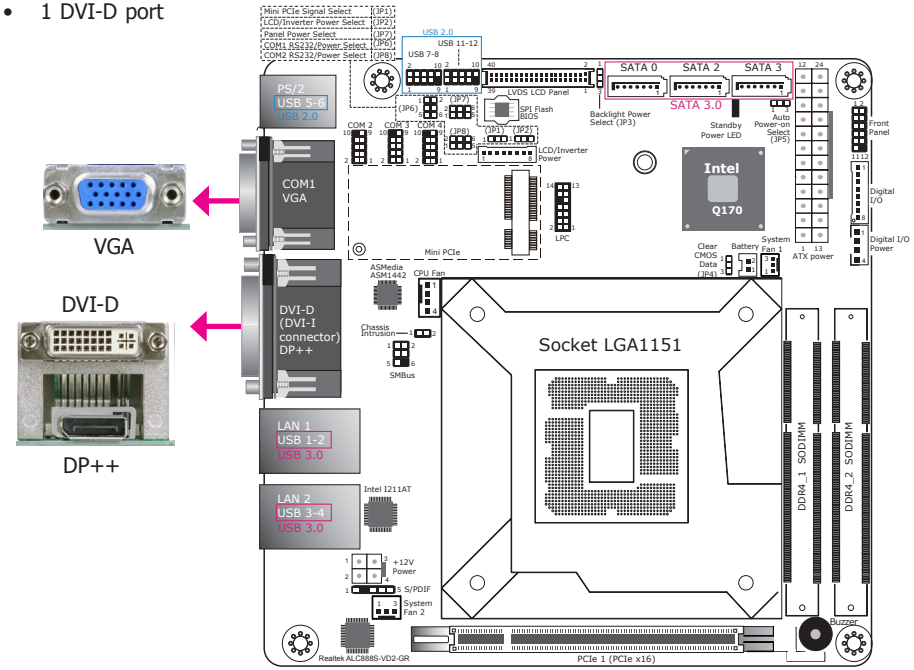
BIOS Setting

Configure the COM ports 1/2/3/4 in the Advanced menu ("Super I/O" submenu) of the BIOS. Please refer to Chapter 7 for more information.

Graphics Interfaces

The display ports consist of the following:

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

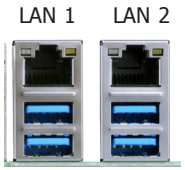
DP++ Port

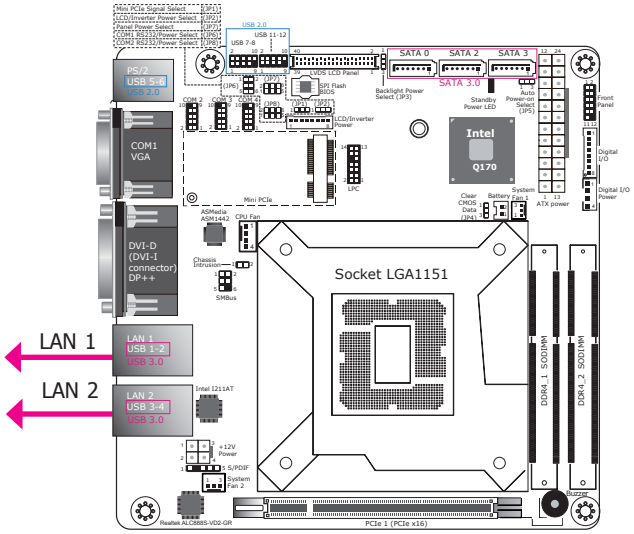
The DisplayPort is a digital display interface used to connect a display device such as a computer monitor. It is used to transmit audio and video simultaneously. The interface, which is developed by VESA, delivers higher performance features than any other digital interface.

DVI-D Port (DVI-I connector)

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

RJ45 LAN Ports





Features

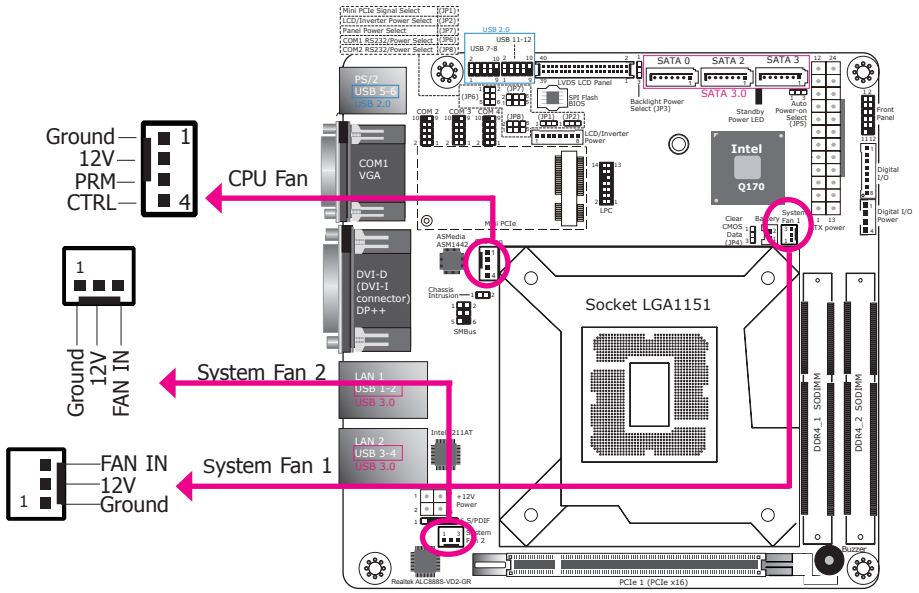
- LAN1: Intel® I219LM Gigabit Ethernet controller with iAMT11.0. (Note that Intel® Core™ i3, Celeron® and Pentium® processors do not support iAMT.)
- LAN2: Intel® I210AT Gigabit Ethernet controllers

The two 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 ports in the Advanced menu ("ACPI Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

Cooling Fan Connectors

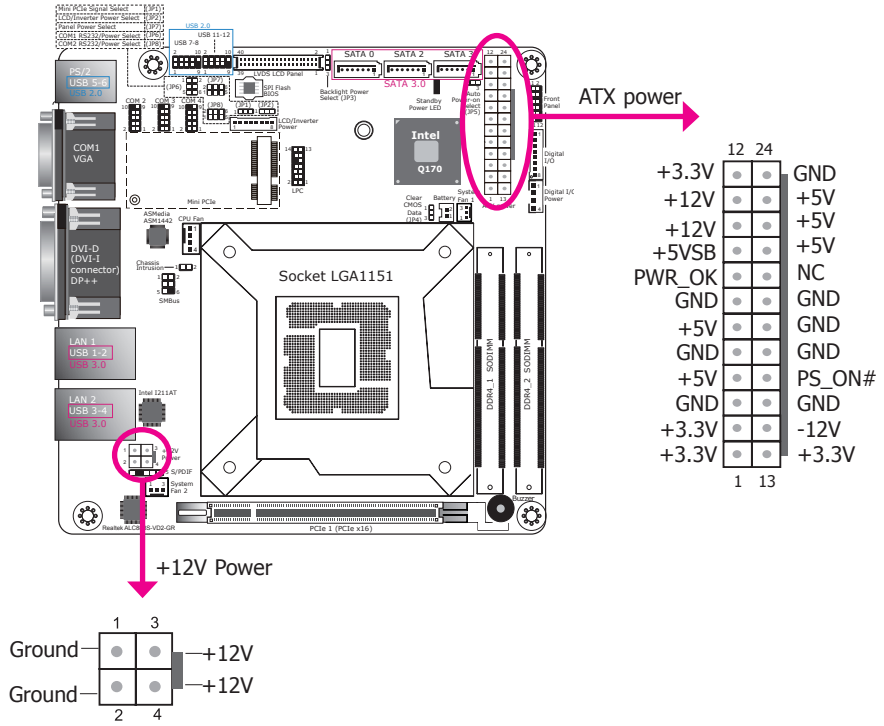


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("SIO NUVOTON6106D" submenu) of the BIOS will display the current speed of the cooling fans. Refer to the chapter 3 for more information.

Power Connectors



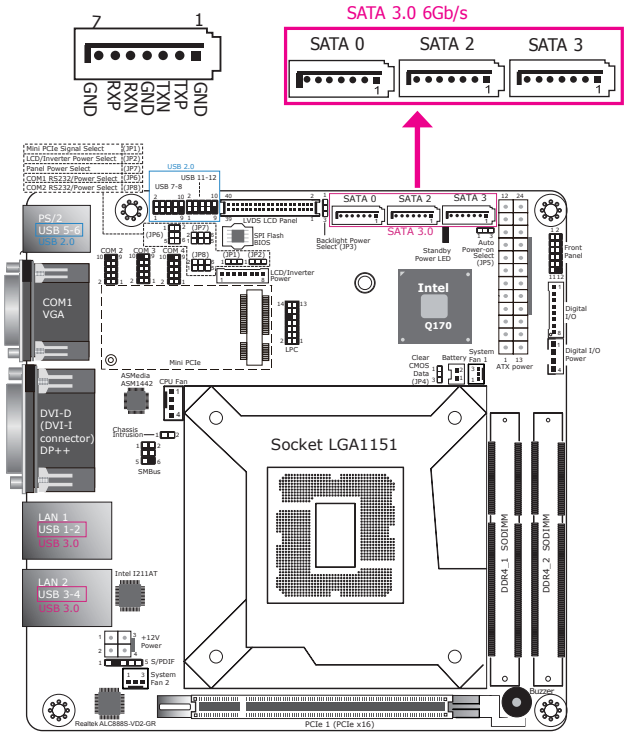
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's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

I/O Connectors

Serial ATA Connector

Serial ATA Power Connector



Features

- 3 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (SATA 0, SATA 2 and SATA 3)
- Integrated Advanced Host Controller Interface (AHCI) controller with Intel® RAID

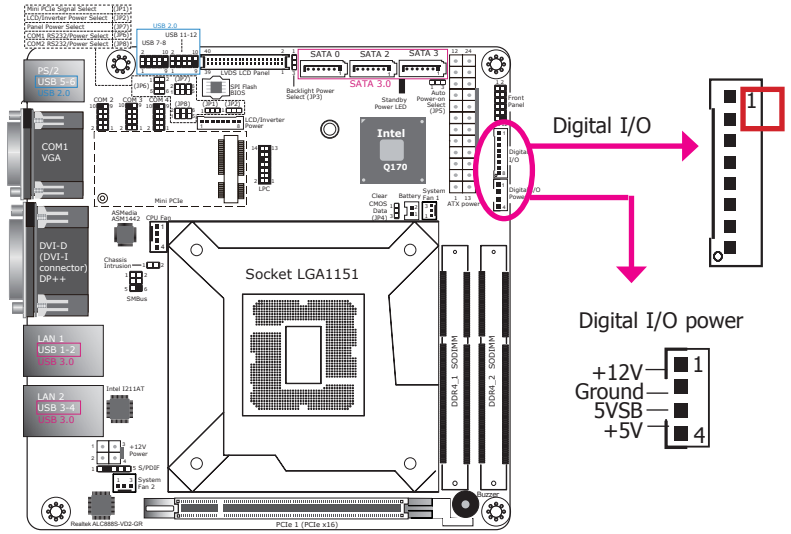
The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA data cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

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

Digital I/O Connector

Digital I/O Power Connector

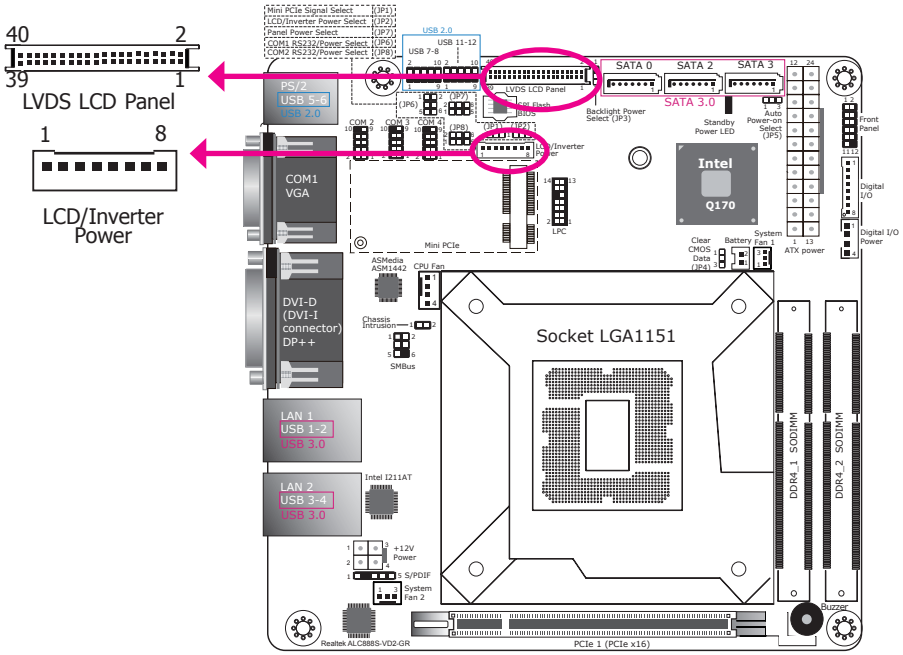


The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

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

LVDS LCD Panel



The system uses this connector as the output interface of the touch panel PC. It transmits video signals and power from the system board to the display panel.

Refer to the right side for the pin functions of the connector.

BIOS Setting

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

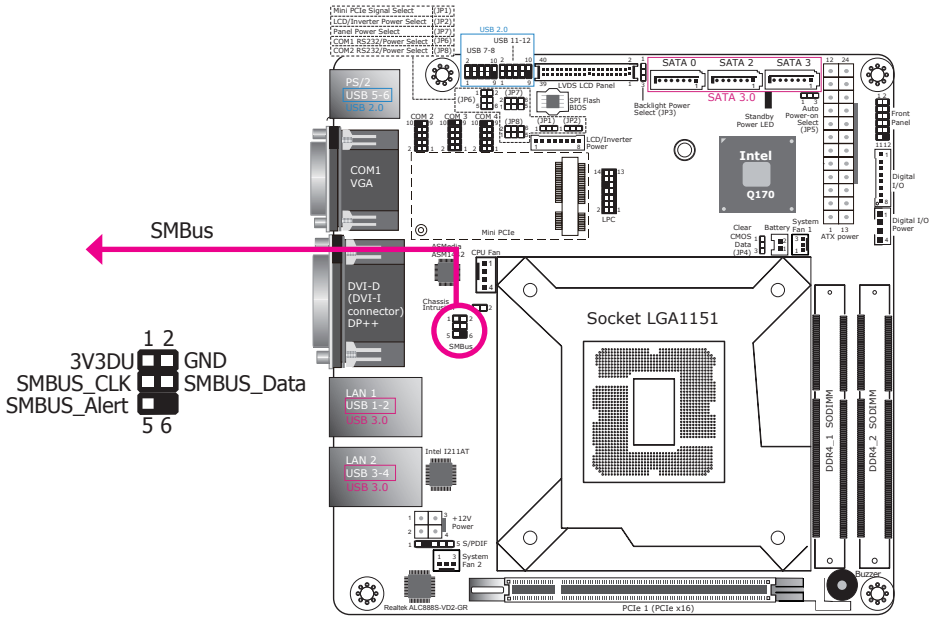
LVDS LCD Panel Connector

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

LCD/Inverter Power Connector

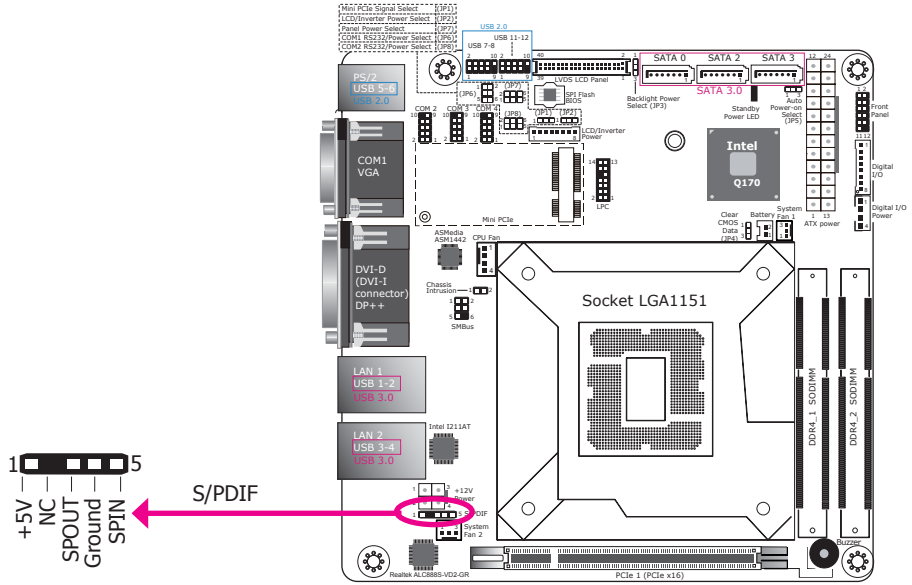
Pins	Function
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	+12V / +5V
8	+12V / 5+

SMBus Connector



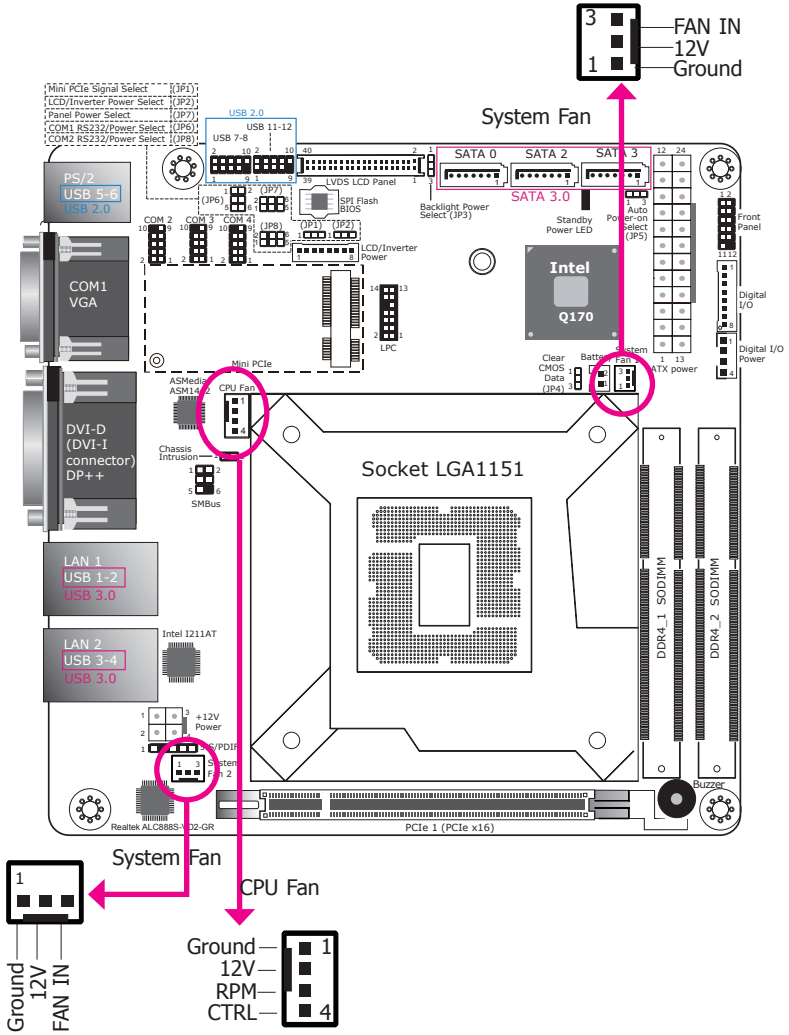
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

S/PDIF Connector



The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

Cooling Fan Connector

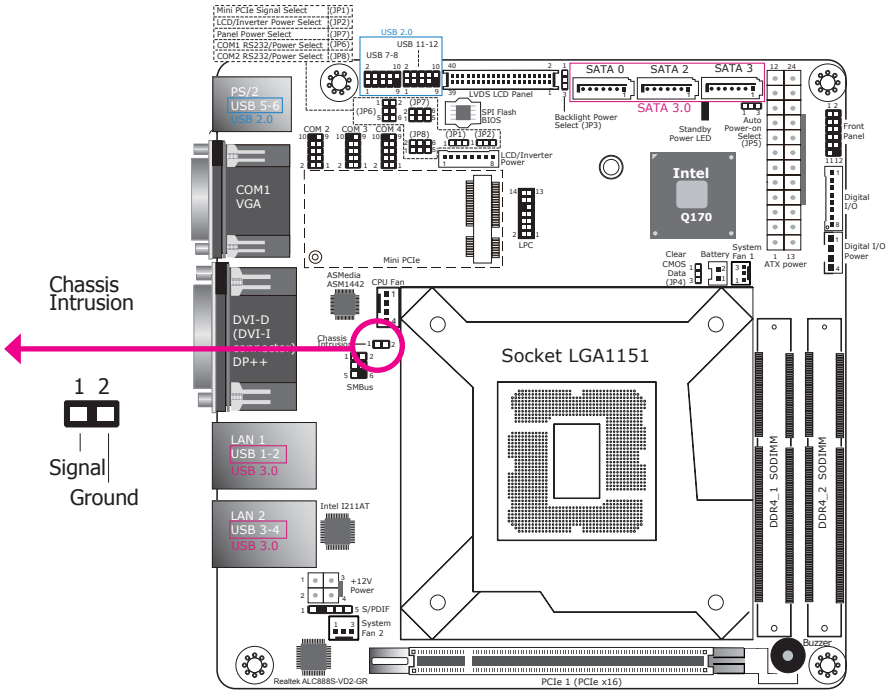


The fan connector is used to connect a cooling fan to provide airflow throughout the chassis.

BIOS Setting

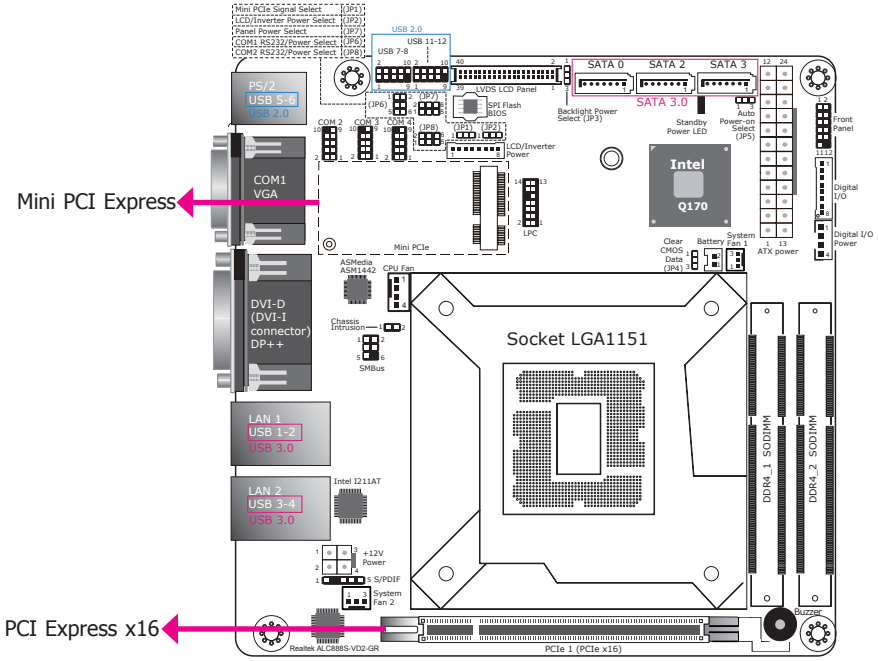
The Advanced menu ("Super IO" submenu) of the BIOS will display the current speed of the cooling fans. Refer to Chapter 7 for more information.

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 event occurs, an alarm will sound. When the system's power is off and a chassis intrusion event occurs, the alarm will sound only when the system restarts.

Expansion Slots



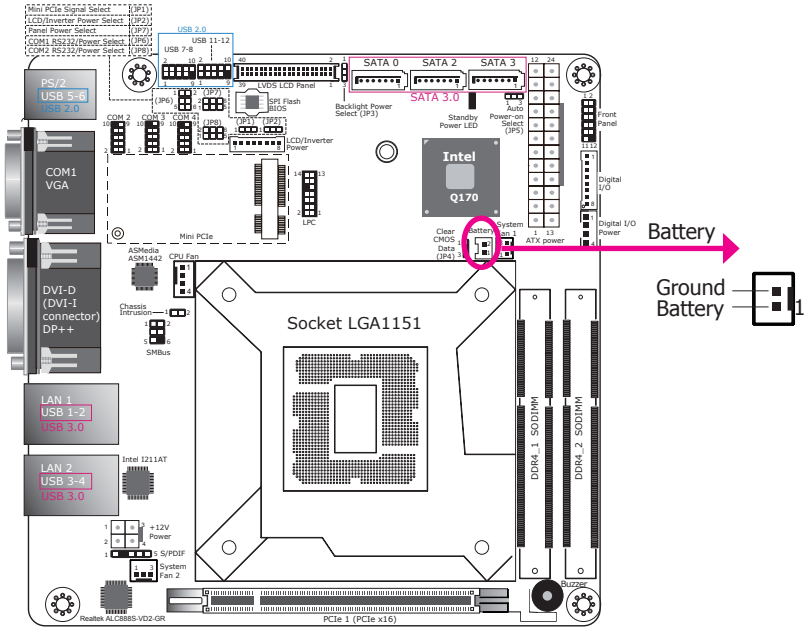
PCI Express x16 (Gen 3) Slot

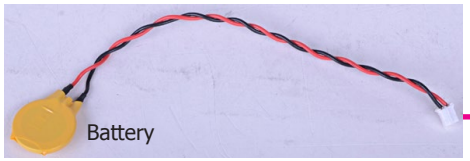
Install PCI Express x16 graphics card conformed to the PCI Express specifications, into the PCI Express x16 slot. You can choose to install T100-2E or X100-2P1M to have a different combination of expansion slots on the rear panel. The riser card T100-2E provides two PCIe Gen3 x8 expansion slots whereas the riser card X100-2P1M provides two PCI and one Mini PCIe slots.

Mini PCI Express Slot

The Mini PCIe socket is used to install a Mini PCIe card. Mini PCIe card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI. This slot can accommodate either an mSATA or a PCIe card via jumper settings (refer to Chapter 4 for more information).

Battery





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

Safety Measures

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

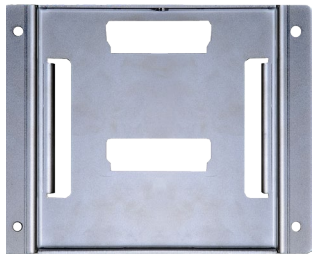
Chapter 6 - Mounting Options

VESA Mount

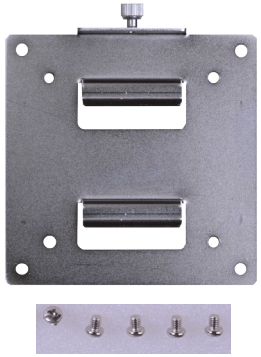
Note:
The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

The VESA Mount kit includes the following:

- 2 VESA Mount brackets
- Bracket screws

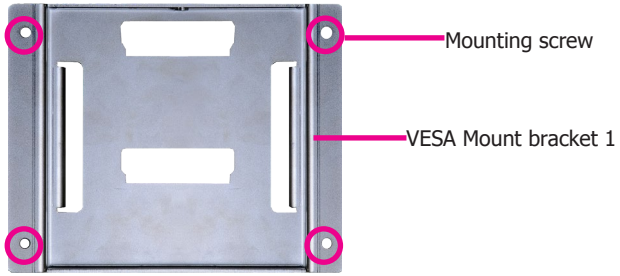


VESA Mount bracket 1

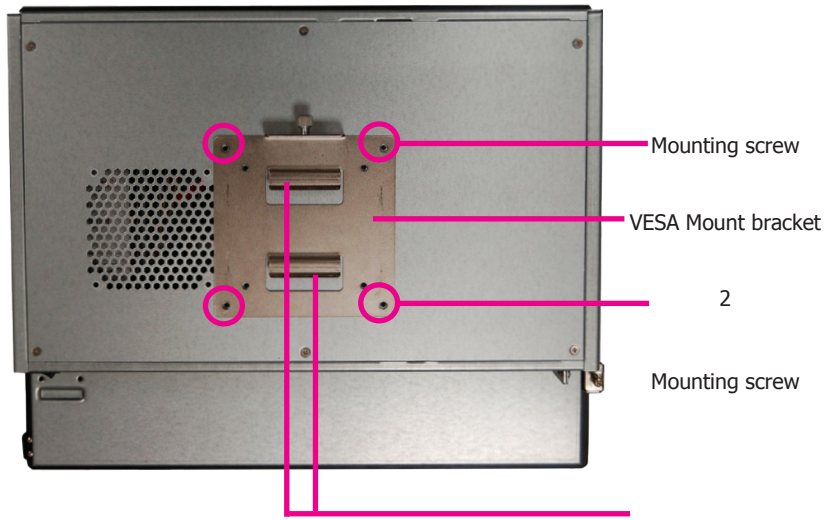


VESA Mount bracket 2

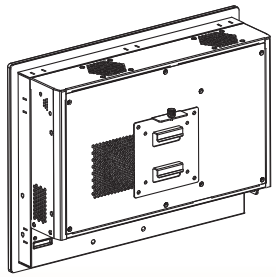
1. Select a place on the wall where you will mount the Panel PC.
2. Use the provided mounting screws to attach "VESA Mount bracket 1" to the wall.

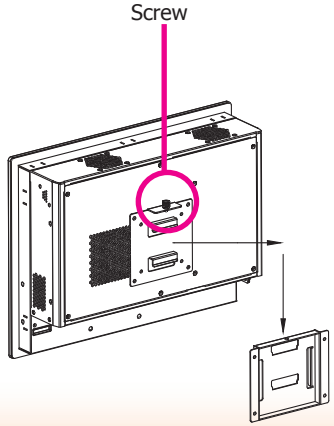


3. Attach the other bracket (VESA Mount bracket 2) to the rear of the Panel PC.

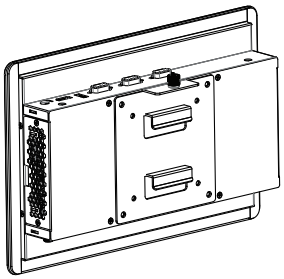


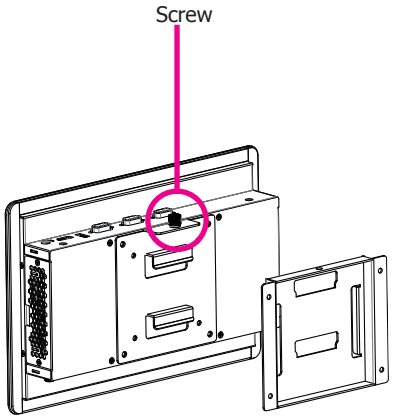
4. Slide the Panel PC to "VESA Mount bracket1" to attach the two brackets with the hooks. Then tighten the screw to secure the assembly in place.





5. Slide the Panel PC to "VESA Mount bracket 1" to attach the two brackets with the hooks. Then tighten the screw to secure the assembly in place.



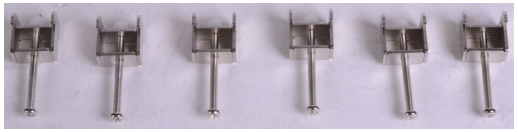


Panel Mount

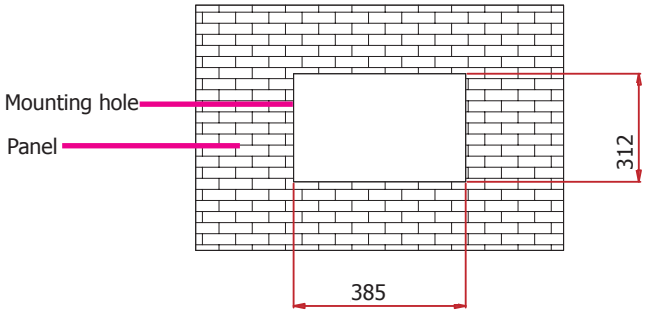
Note:
The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

The panel mounting kit includes the following:

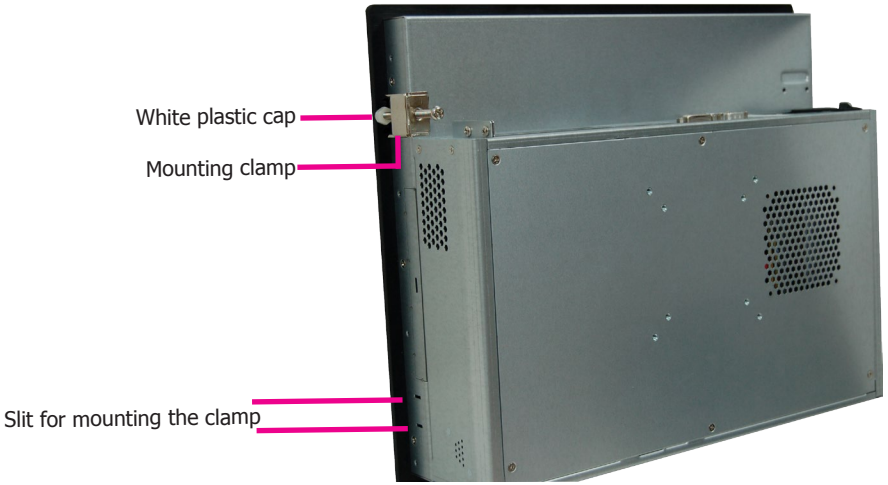
- 6 mounting clamps



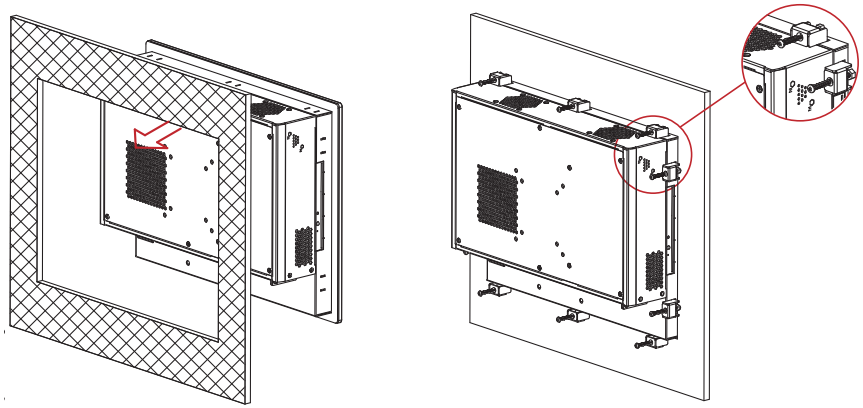
1. Select a place on the panel (or wall) where you will mount the Panel PC.
2. Cut out a shape on the panel that corresponds to the Panel PC's rear dimensions: (383+2) mm x (310+2) mm (plus 2 to allow for tolerances) and ensure that the Panel PC can be fitted into the panel properly.



3. Insert the Panel PC from the outside surface of the panel into the mounting hole until it is properly fitted against the panel.
4. Position the mounting clamps along the rear edges of the Panel PC and insert them into the slits around the Panel PC.



5. The first and second clamps must be positioned and secured diagonally prior to mounting the rest of the clamps. Tighten the clamp's screw using an electric screwdriver by pressing the white plastic cap onto the back of the panel. The illustration below shows that all clamps are properly mounted.



Note:
The maximum thickness of the panel's opening (or wall) should be 10 mm for the clamps to support the panel mount firmly.

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

Scroll Bar

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

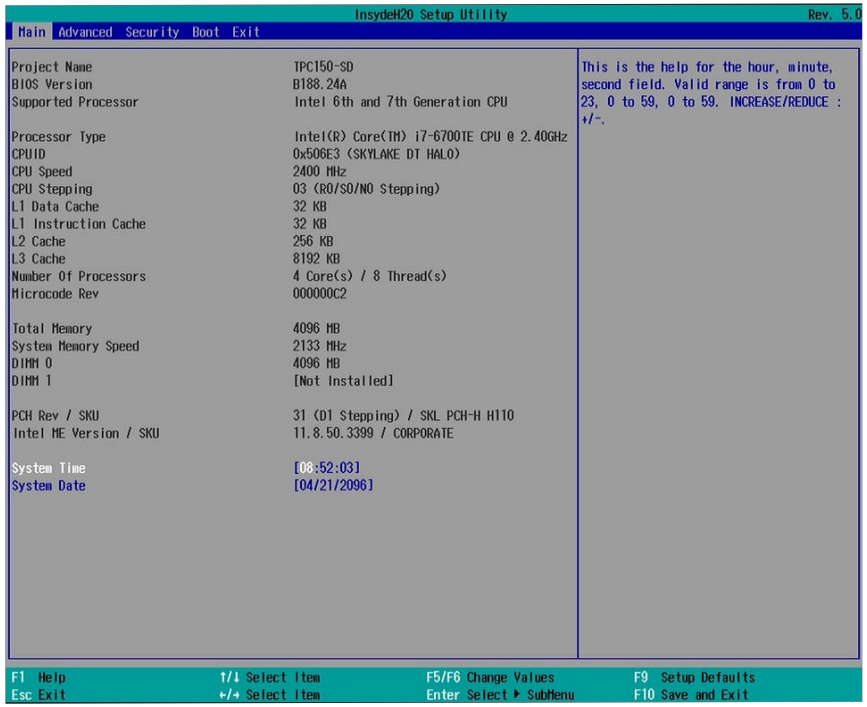
Submenu

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

Insyde BIOS Setup Utility

Main

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



System Time

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

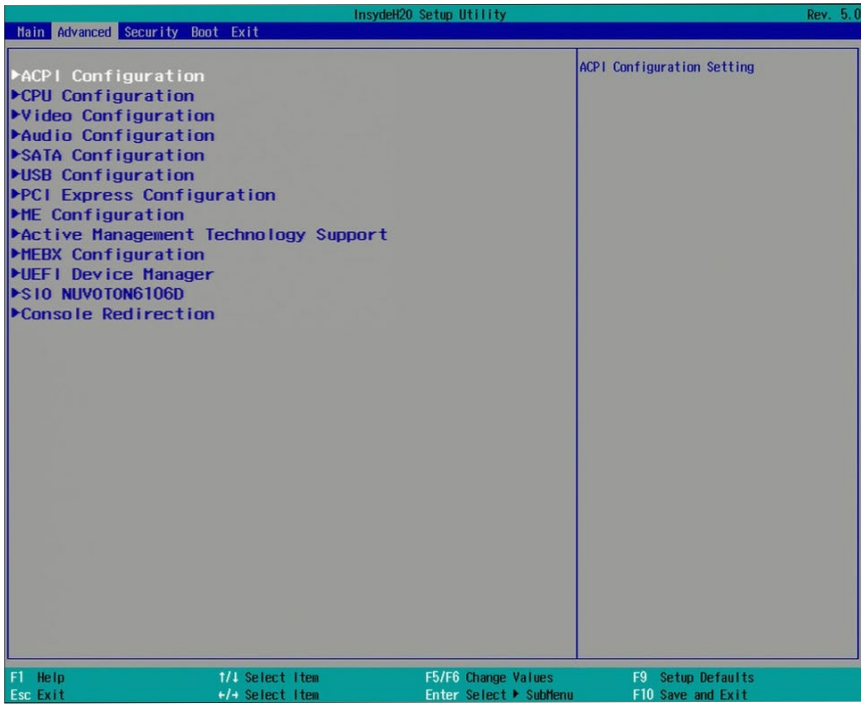
System Date

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

Advanced

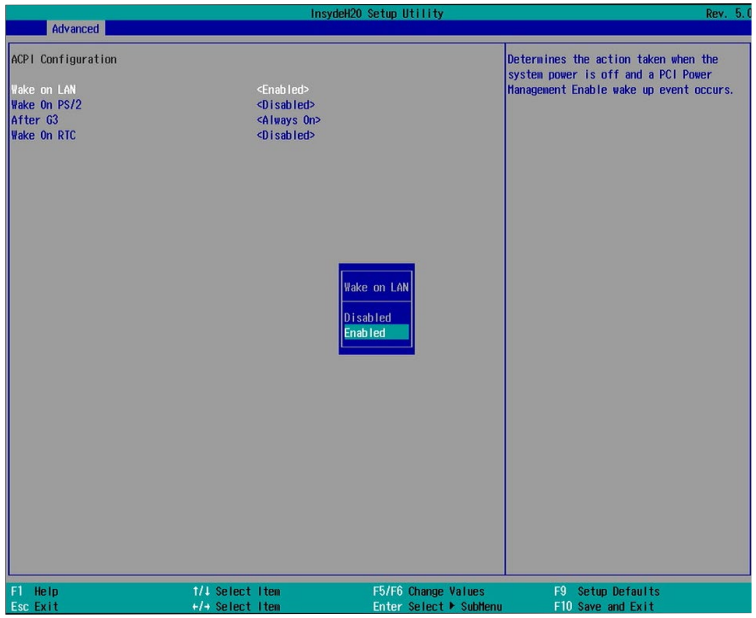
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

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



ACPI Settings

This section configures system's ACPI parameters.



Wake on LAN

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

Wake on PS/2

Enable or disable the use of a PS/2 device to wake the system.

After G3

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

Always On The system is powered on.

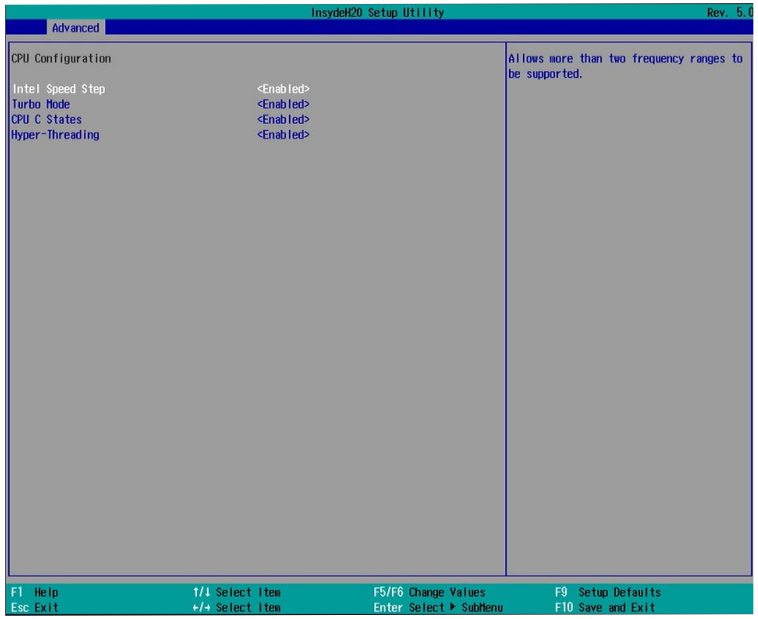
Always Off The system is powered off.

Wake on RTC

Automatically power the system on at a particular time every day from the real-time clock battery. Specify the wake up time of the day below: <hour>, <minute>, <second>.

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 take advantage of its offering by setting power schemes from the operating system's power options.

Turbo Mode

Enable or disable processor turbo mode, which allows the processor core to automatically run faster than the base frequency by taking advantage of thermal and power headroom. Note this option is not available on the Core™ i3 processor.

CPU C States

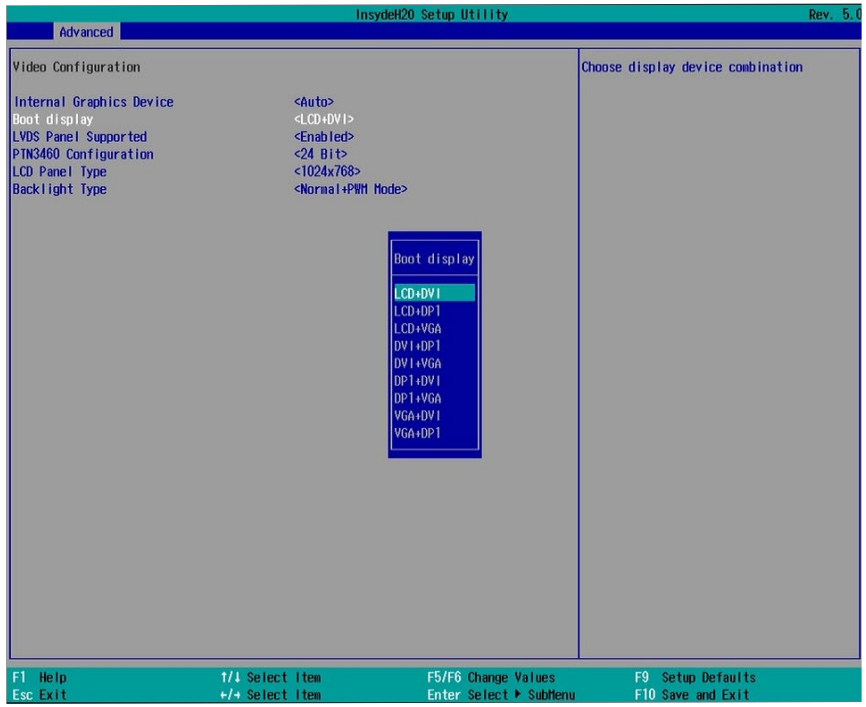
Enable or disable CPU Power Management. It allows the CPU to go to C states when it's not 100% utilized.

Hyper-Threading

Enable Intel® Hyper-Threading Technology (HT) on the processor to improve performance of operating systems and software that are optimized for hyper-threading technology. Please check the software specifications to determine if enabling HT can be advantageous to the overall system performance. Note this function is not available with the Intel® Core™ i5-6500, Pentium® G4400 and Celeron® G3900 processors.

Video Configuration

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



Primary Display

Select the primary display for the system. Note that this option will be shown only if the "Boot type" is set to "Dual" or "UEFI". The options are Auto or IGFX (internal graphics), PEG and PCIe. The order of video device initialization will be as follows:

Auto mode: PEG (PCIe Graphics devices connected to PEG lanes directly routed from the CPU)->PCIe graphics devices->PCI graphics devices->IGFX (internal graphics)

IGFX: IGFX (internal graphics)->PEG (PCIe Graphics devices connected to PEG lanes directly routed from the CPU)->PCIe graphics devices->PCI graphics devices

PEG: PEG (PCIe Graphics devices connected to PEG lanes directly routed from the CPU) ->PCIe graphics devices->IGFX (internal graphics)

PCIe: PCIe graphics devices->PEG (PCIe Graphics devices connected to PEG lanes directly routed from the CPU)->IGFX (internal graphics)

Internal Graphics Device

Enable, disable or automatically detect the internal graphics.

Boot display

Prioritize device combination for display during system boot with the following options. Note that this option will be shown only if the "Boot type" is set to "Dual" or "Legacy".

LCD+DVI

LCD+DP1

LCD+VGA

DVI+DP1

DVI+VGA

DP1+DVI

DP1+VGA

VGA+DVI

VGA+DP1

LVDS Panel Supported

Enable this option to configure your LCD panel with the following configurations:

PTN3460 Configuration Select the color depth from the following options: 18bit, 24bit, 36bit, and 48bit.

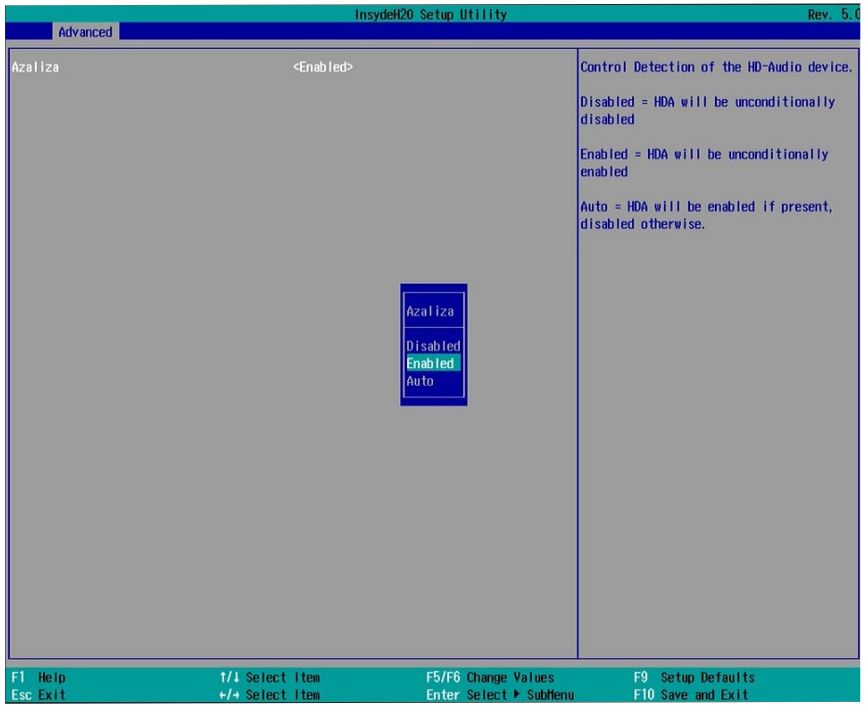
LCD Panel Type Select the resolution for the LCD panel from the following options: 800x480, 800x600, 1024x768, 1366x768, 1280x1024, and 1920x1080.

Backlight Type

Select the backlight type from the following options: Normal+PWM, Normal+DC, Invert+PWM, and Invert+DC.

Audio Configuration

This section configures the audio settings.



Azaliza

Control the detection of the high-definition audio devices.

Disabled

High-definition audio devices will be unconditionally disabled.

Enabled

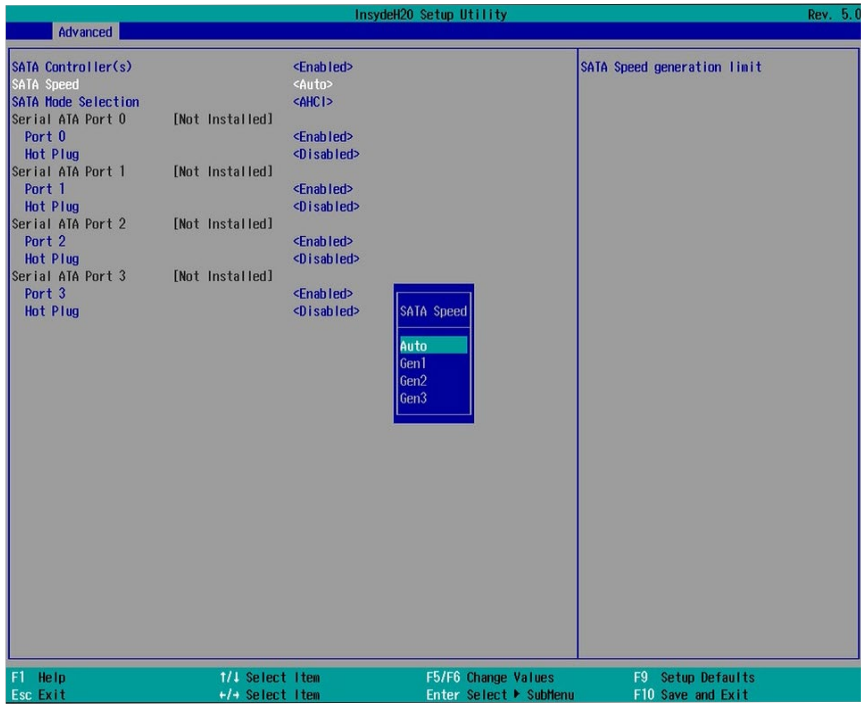
High-definition audio devices will be unconditionally enabled.

Auto

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

SATA Configuration

This section configures SATA controllers.



SATA Controller(s)

Enable or disable Serial ATA controllers.

SATA Speed

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

SATA Mode Selection

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

AHCI Mode

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

RAID Mode

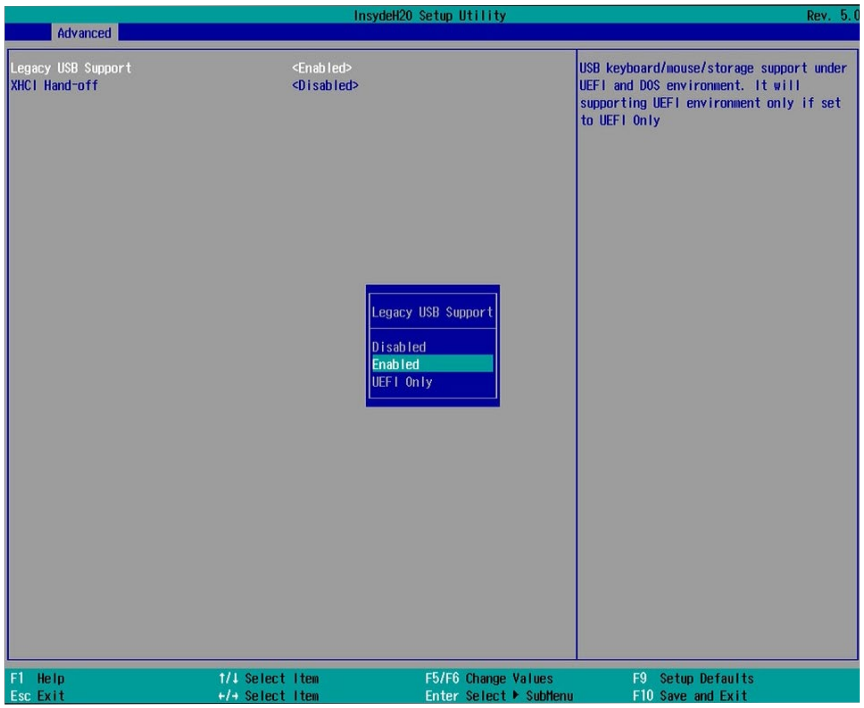
This option allows you to create RAID using Intel® Rapid Storage Technology on the Serial ATA devices. For more information, please see Chapter 9 - RAID.

Serial ATA Port 0 to 3 and Hot Plug

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

USB Configuration

This section configures the parameters of the USB devices.



Legacy USB Support

Disabled

Disable USB keyboard/mouse/storage support.

Enabled

Enable USB keyboard/mouse/storage support.

UEFI Only

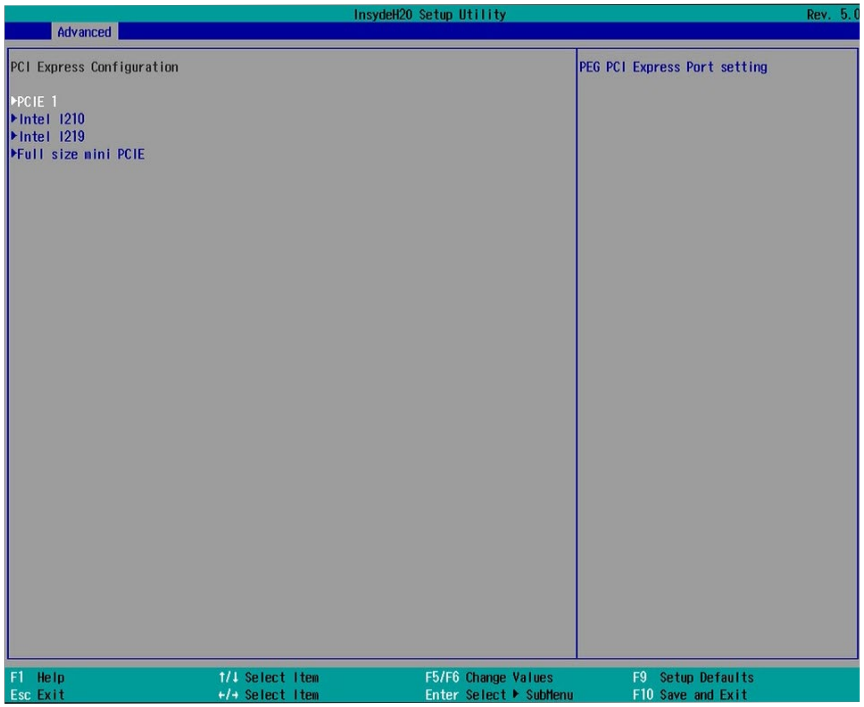
Enable USB keyboard/mouse/storage support only under the UEFI environment.

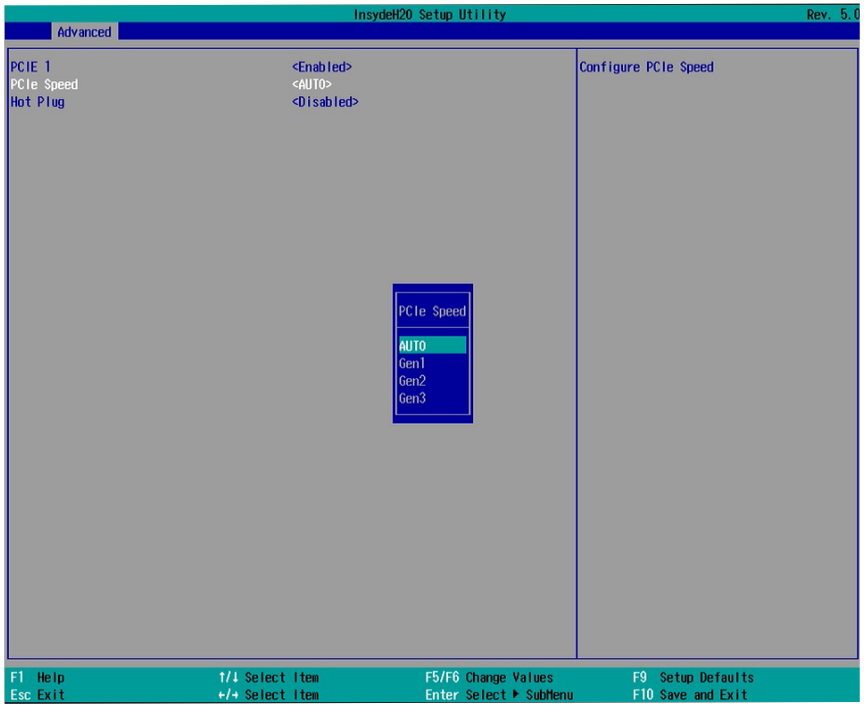
XHCI Hand-off

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

PCI Express Configuration

This section configures the settings of PCI Express root ports.





PCI Express Configuration

Select a PCI Express root port and press "Enter" to configure.

PCI Express Root Port

PCIE 1: PCIE1 expansion slot
Intel I210 Gigabit Ethernet port
Intel I219 Gigabit Ethernet port
Full-size Mini PCIe
Intel I210AT
Intel I219LM

For each PCIe root port above, configure the following parameters:

Enable/Disable

Enable or disable this PCI Express root port.

PCIe Speed

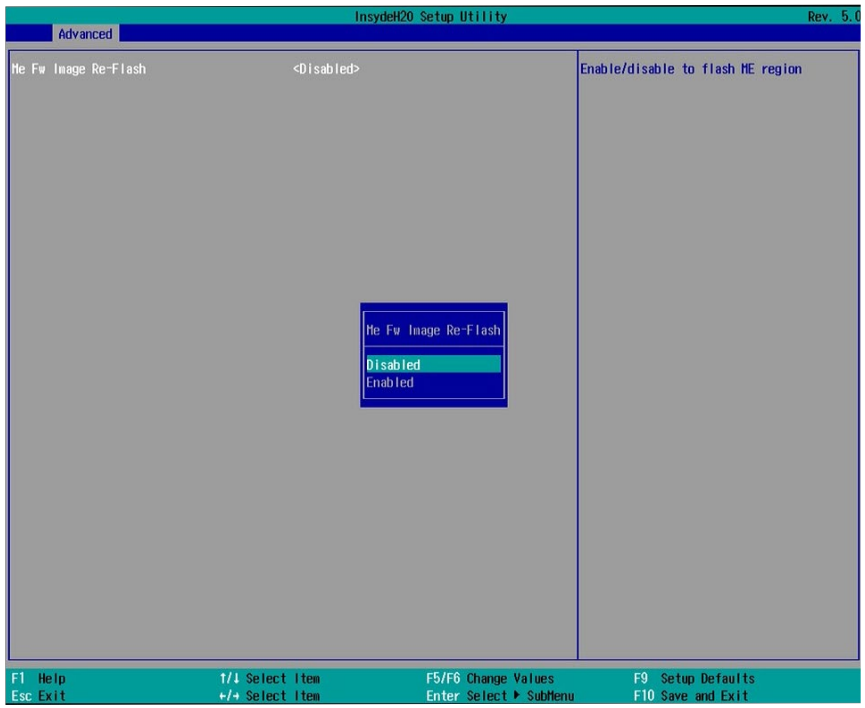
Select the speed of the PCI Express root port: Auto, Gen1 (2.5 GT/s), Gen2 (5 GT/s) or Gen3 (8 GT/s).

Hot Plug

Enable or disable the hot plug function of the PCIe root port.

ME Configuration

This section configures flashing of the Intel® Management Engine.

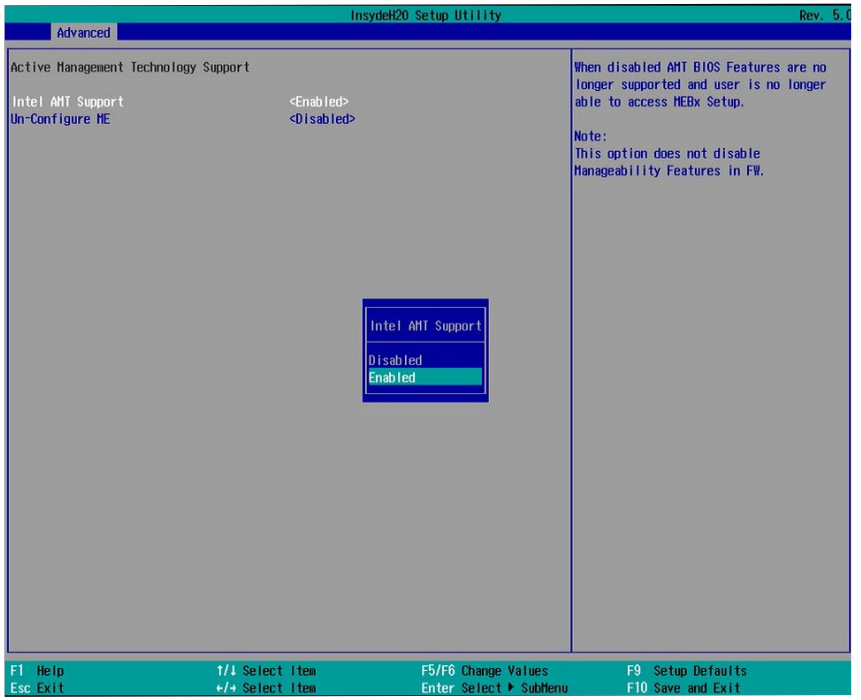


Me Fw Image Re-Flash

Enable or disable Intel® Management Engine firmware flashing when updating the BIOS.

Active Management Technology Support

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



Intel AMT Support

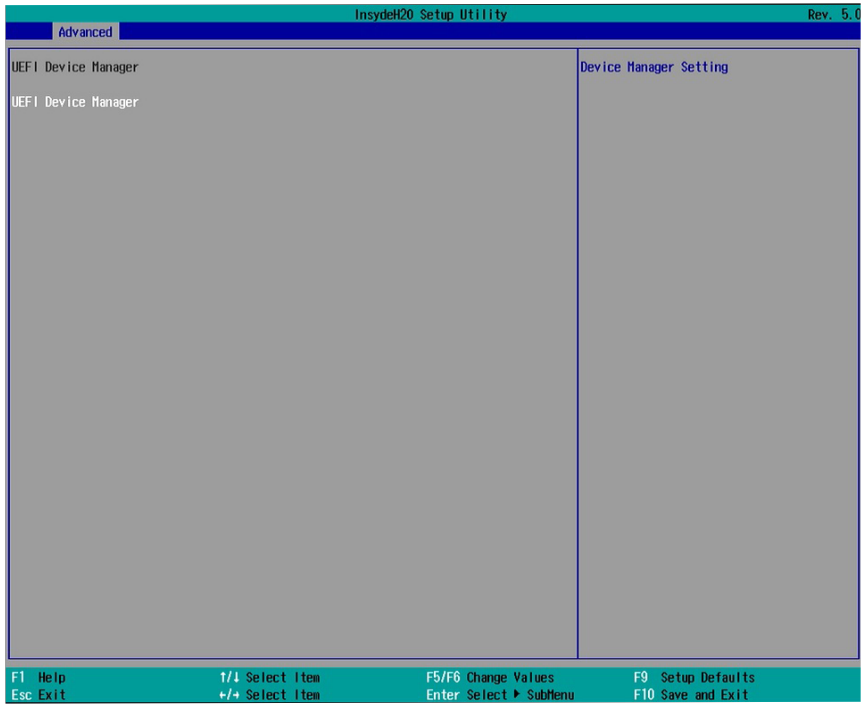
Enable or disable Intel® Active Management Technology BIOS extension.

Un-Configure ME

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

UEFI Device Manager

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



Network Device List

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

NIC Configuration Menu

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

Blink LEDs

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

NIC Configuration

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

IPv4 Network Configuration

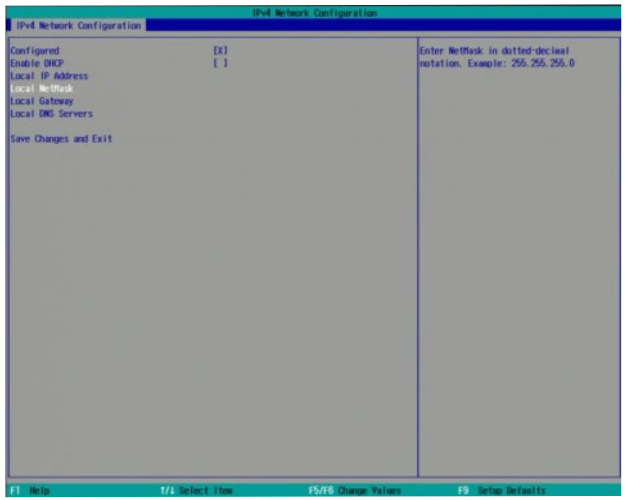
This screen configures the IP addressing method (DHCP or static IP). For static IP addressing, configure the following:

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

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

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

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



IPv6 Network Configuration

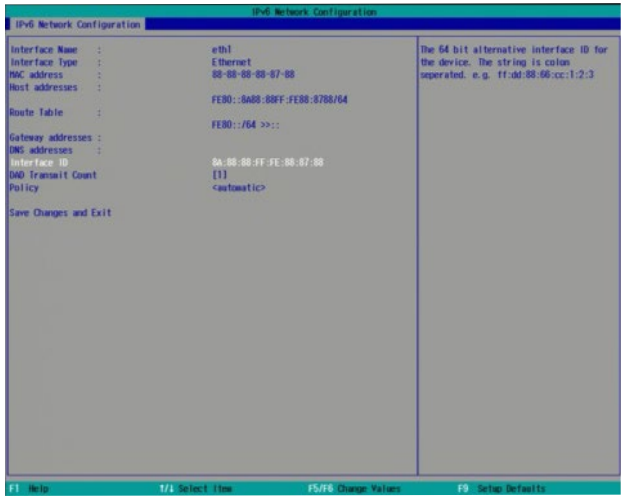
If you select to use IPv6 network settings, enter the Interface ID (64 bit).
Policy: Select either automatic or manual. And select "Advanced Configuration" to configure IPv6 network address manually if the manual option is selected.

New IPv6 address: Enter the IP address for the network device in the IPv6 format:

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

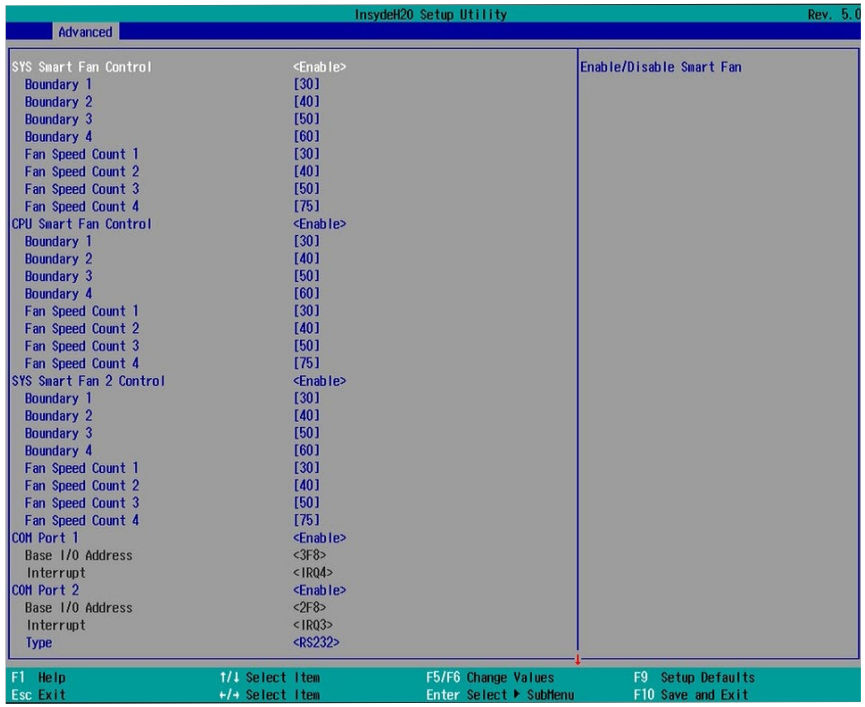
New Gateway addresses: Enter gateway addresses in the IPv6 format.

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



Super IO Configuration

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



SYS Smart Fan/CPU Smart Fan/SYS Smart Fan 2 Control

Enable or disable the smart fan control.

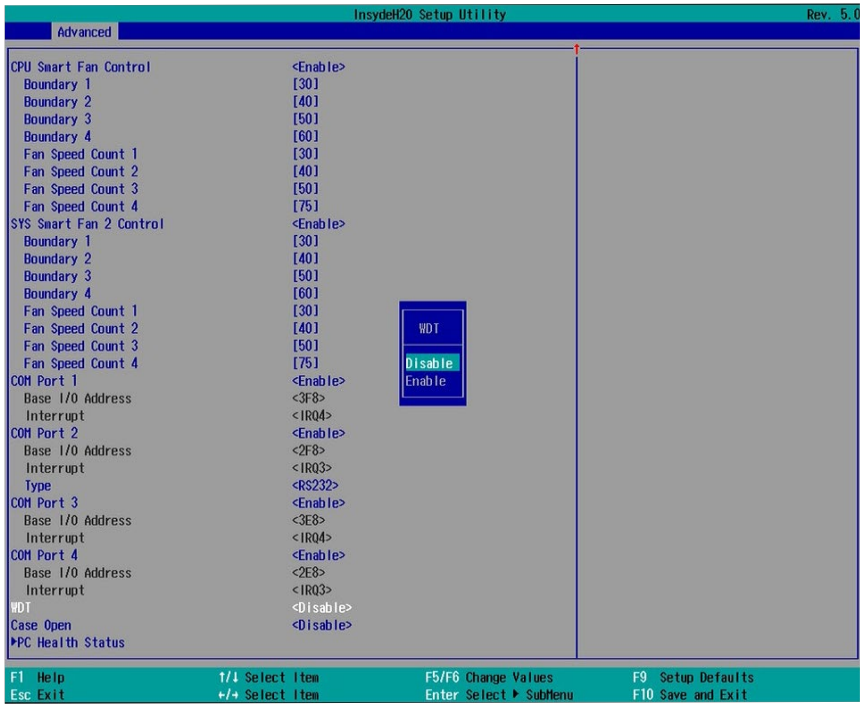
Boundary 1 to Boundary 4

Set the boundary temperatures that determine the operation of the fan with different fan speeds accordingly. For example, when the system or the CPU temperature reaches boundary temperature 1, the system or CPU fan should be turned on and operate at the designated speed.

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

Fan Speed Count 1 to Fan Speed Count 4

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



COM Port 1 and COM Port 4

Enable or disable each serial port.

Disable Disable this serial port.

Enable Enable this serial port.

It also shows the Base I/O address and the assigned interrupt number.

For COM Port 2, you can select serial communication type among RS232, RS422, and RS485.

WDT

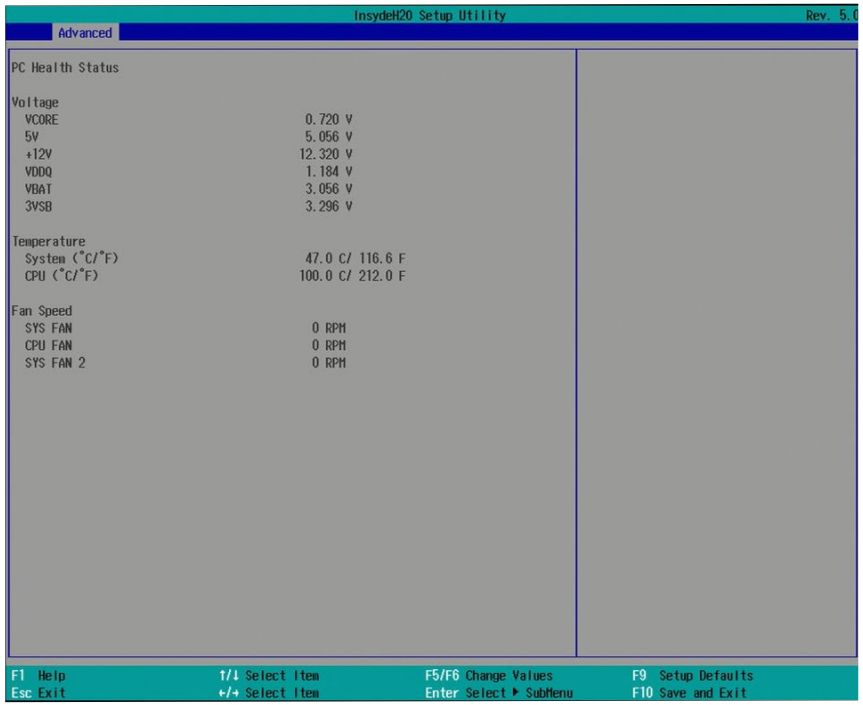
Enable or disable the watchdog function. A counter will appear if you select to enable WDT. Input any value between 1 and 255.

Case Open

Enable or disable the case open function.

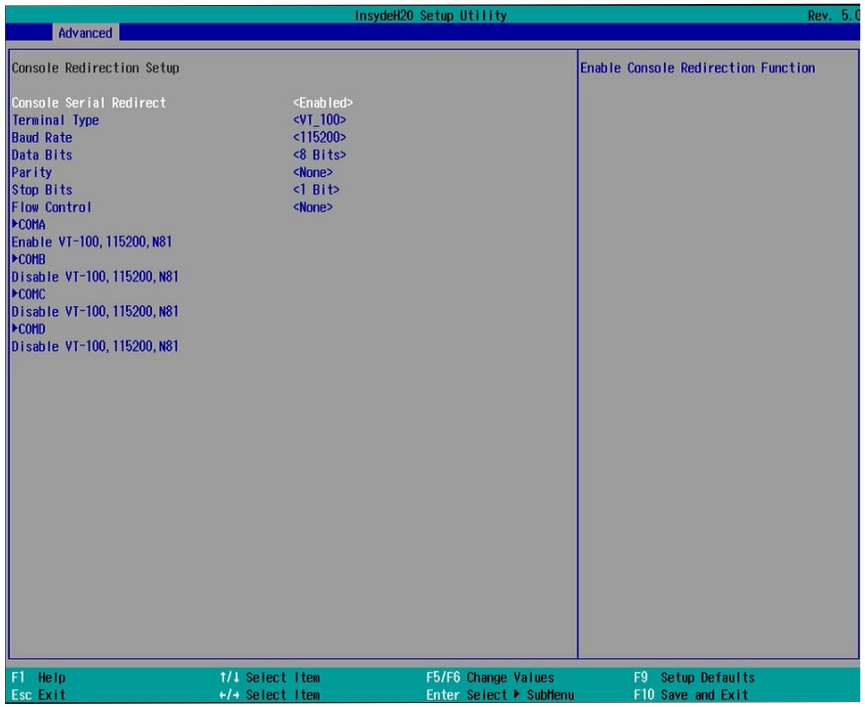
PC Health Status

This section displays PC health information such as the voltages and CPU and system temperatures.



Console Redirection

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



Console Serial Redirect

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

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

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

Data bits: 8 bits or 7 bits.

Parity: None, Even or Odd.

Stop bits: 1 bit or 2 bits.

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

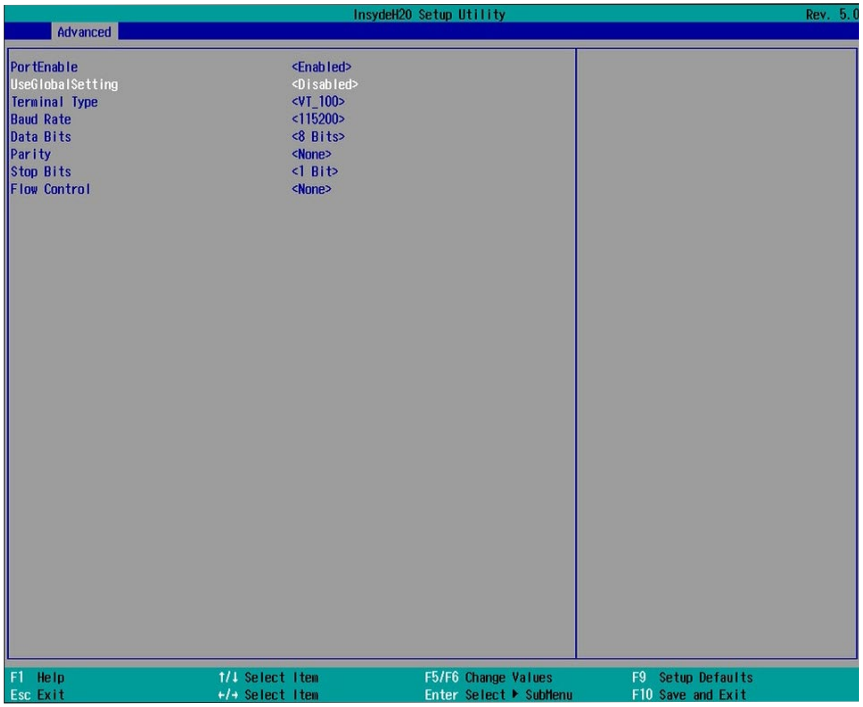
This is the global setting for all of the designated serial ports for the console redirection function.

COMA to COMD/PCI Serial Port

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

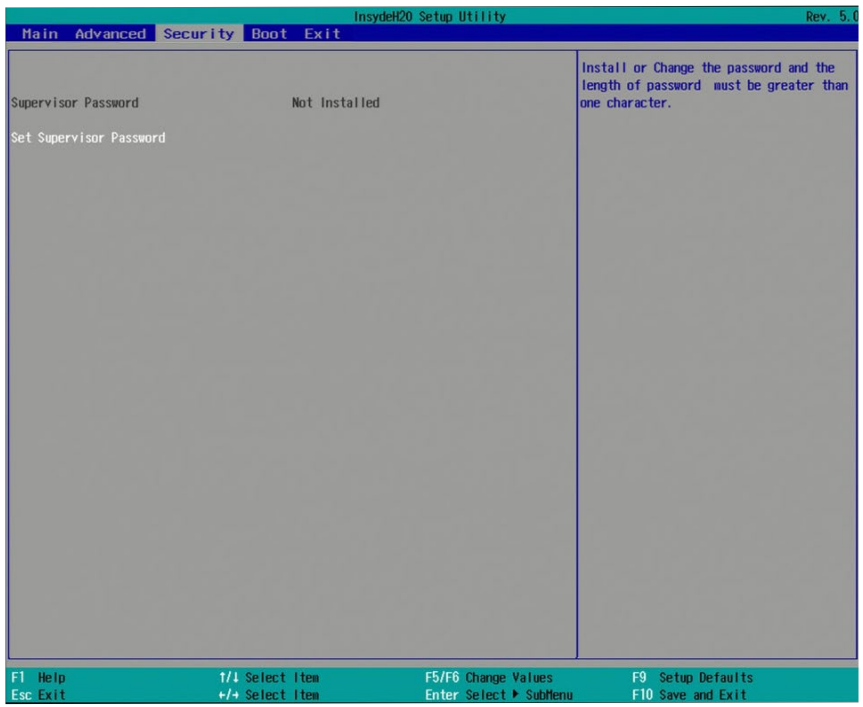
UseGlobalSetting

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



Security

This section configures the security of accessing the BIOS setup utility and system startup.



Set Supervisor Password

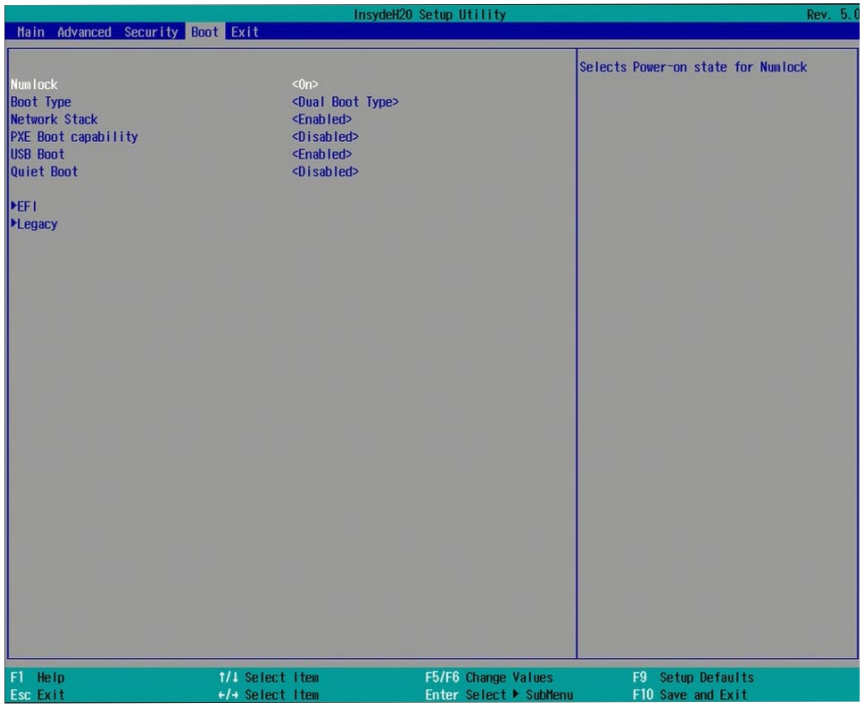
Set the administrative password for entering the BIOS setup utility or upon entering the power-on self-test (POST) process. The length of the password must be greater than 1 character and less than or equal to 10 characters.

Power-on Password

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

Boot

This section configures boot options.



Numlock

Select the power-on state for the Num Lock key.

Boot Type

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

Network Stack

This option is shown only when the boot type is set to Dual or UEFI.
Enable or disable UEFI network stack. It supports the operation of these functions or software: Windows 8 BitLocker Network Unlock, UEFI IPv4/IPv6 PXE and legacy PXE option ROM.
If this function is enabled, you can then go to "Advanced">"UEFI Device Manager" to configure network settings for network connection under the UEFI environment.

PXE Boot Capability (UEFI mode) /PXE Boot to LAN (Legacy mode)

Enable or disable Preboot eXecution Environment (PXE) boot to LAN. In the UEFI or Dual boot mode, this function can only be enabled if the Network Stack support is enabled.

USB Boot

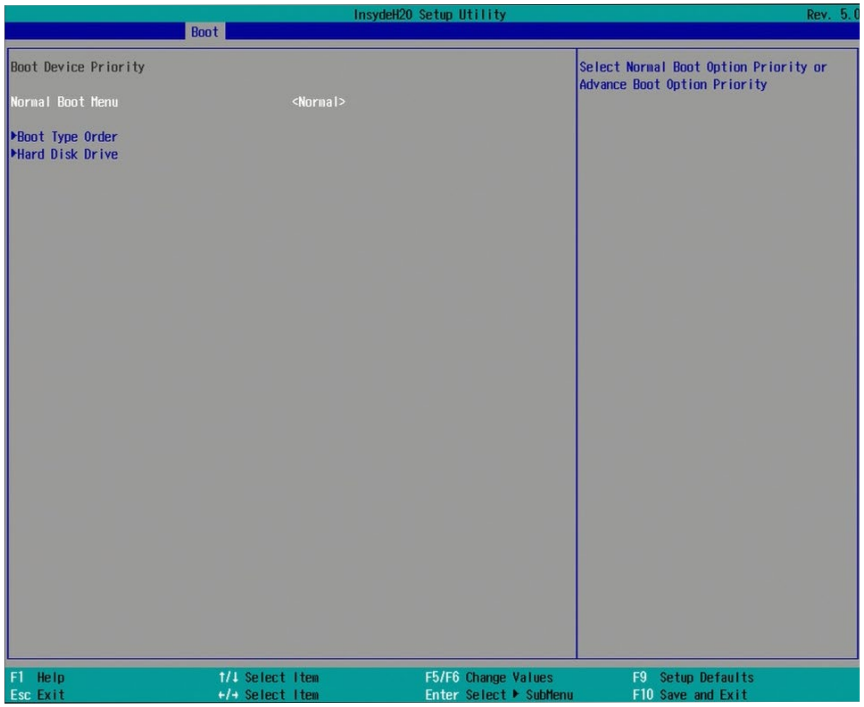
Enable or disable booting to USB boot devices.

Quiet Boot

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

Boot Device Priority

This section configures legacy or EFI boot order or both depending on the "Boot Type" selected.



EFI Boot Menu

Use + and - keys to arrange the priority of the boot devices in the list.

Legacy Boot Menu

Normal

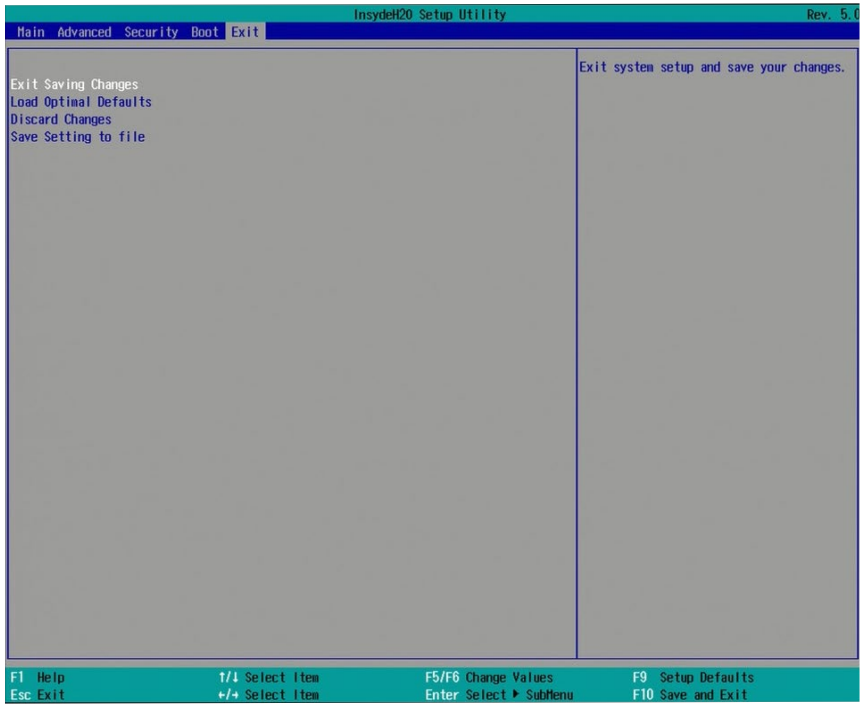
For this option, determine the boot order for the devices within each category. Use the + and - key to arrange the priority of the boot type devices in the list. The first device in the list has the highest boot priority.

Advance

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

Exit

This section configures the parameters for exiting the BIOS setup utility.



Exit Saving Changes

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

Load Optimal Defaults

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

Discard Changes

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

Save Setting to file

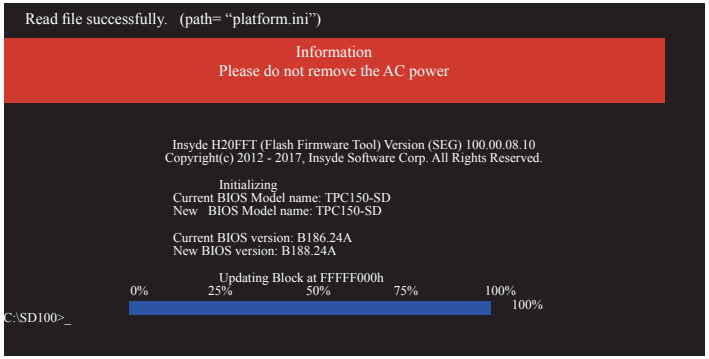
Select this option to save BIOS configuration settings to a USB drive. The operation will fail if there aren't any USB devices detected on the system. The saved configuration will have the DSF file extension and can be used for restoration.

Restore Setting from file

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

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the latest BIOS file and the firmware update utility. For instructions on how to update BIOS with the flash utility, please see https://www.dfi.com/knowledge/video/31 from the Knowledge Base of the DFI website.



Notice: BIOS SPI ROM

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

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

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

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

Chapter 8 - Supported Software

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

http://www.dfi.com/DownloadCenter

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

Drivers are available for the following devices in Windows 7 and 10:

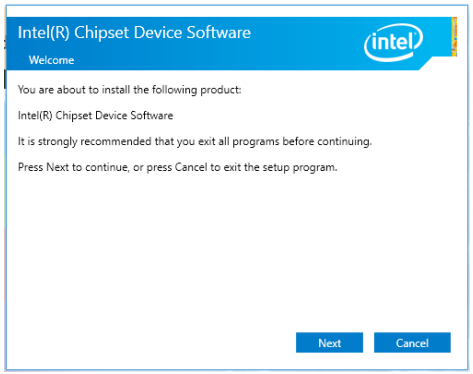
- Intel® Chipset Device Software
- Intel® Graphics Driver
- Intel® Rapid Storage Technology
- Intel® LAN Driver
- Kernel Mode Driver Framework (For Windows 7 only)
- Intel® ME Driver
- Intel® USB 3.0 Driver (For Windows 7 only)
- Audio Driver
- Intel® Serial IO Driver
- PenMount Windows Universal Driver
- TPC Series Hotkey Driver
- Trusted Platform Driver (optional)
- Microsoft Framework 4.5.2

Intel Chipset Device Software

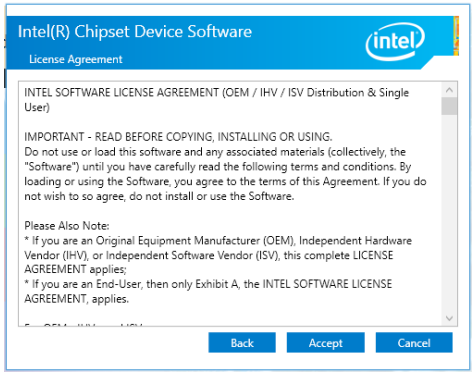
The Intel Chipset Device Software is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

Please use the following procedure to install the "Intel Chipset Device Software".

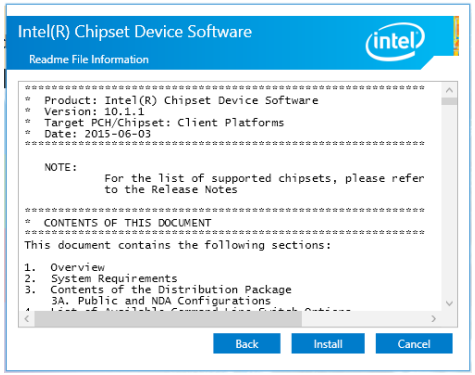
1. Setup is ready to install the utility. Click "Next" to continue.



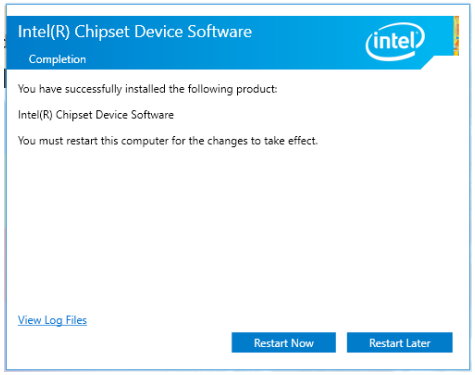
2. Read the license agreement and then click "Yes".



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



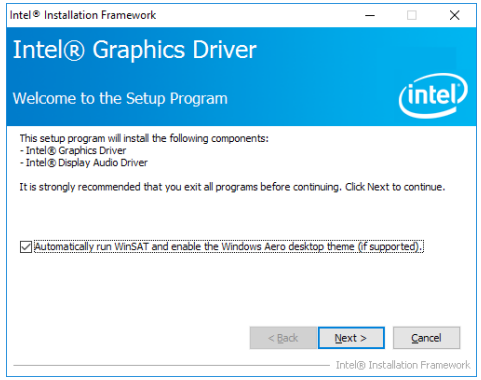
4. Click "Finish" to exit setup.



Intel Graphics Driver

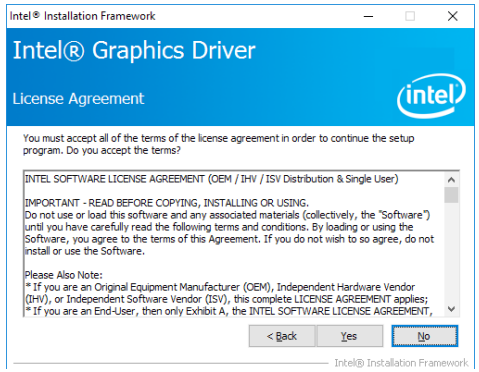
Please use the following procedure to install the Intel Graphics Driver.

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

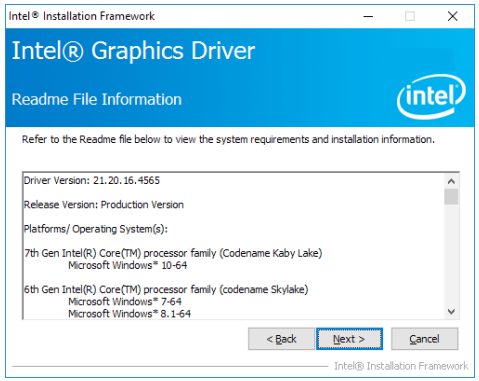


By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after the graphics driver is installed and the system is rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/Windows 8.1/Windows 10 desktop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

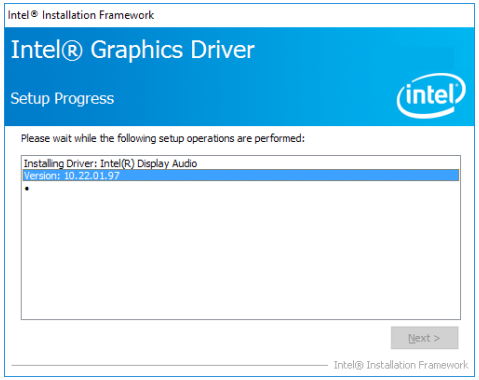
2. Read the license agreement and then click "Yes".



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

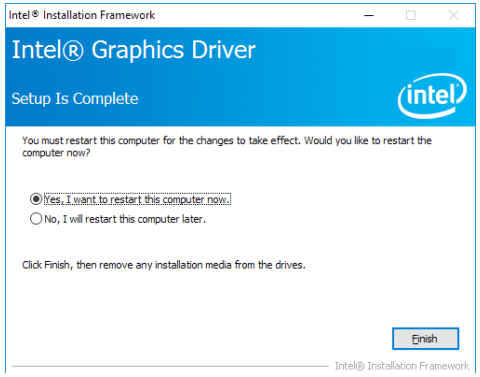


4. Setup is now installing the driver. Click "Next" to continue.



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

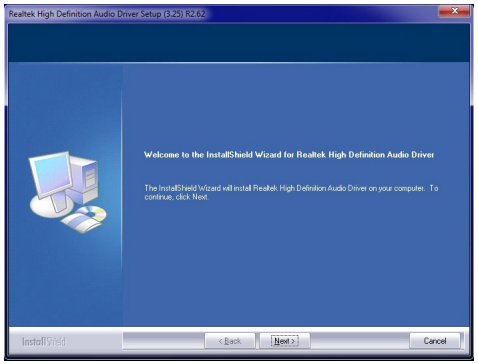
   Restarting the system will allow the new software installation to take effect.



Audio Drivers

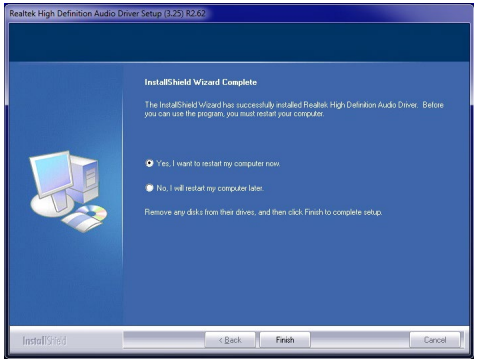
Please use the following procedure to install audio drivers.

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



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

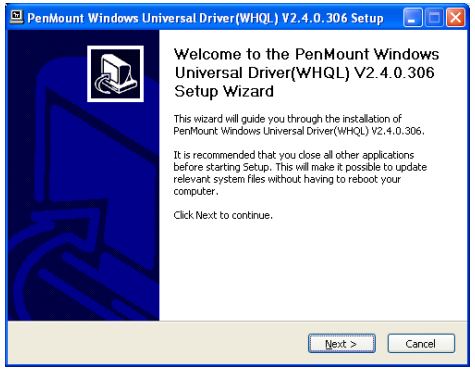
   Restarting the system will allow the new software installation to take effect.



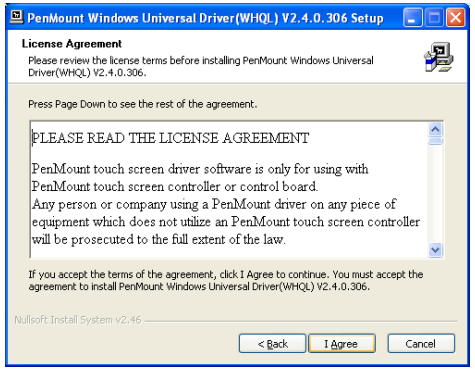
PenMount Windows Universal Driver

Please use the following procedure to install the PenMount Windows Universal Driver.

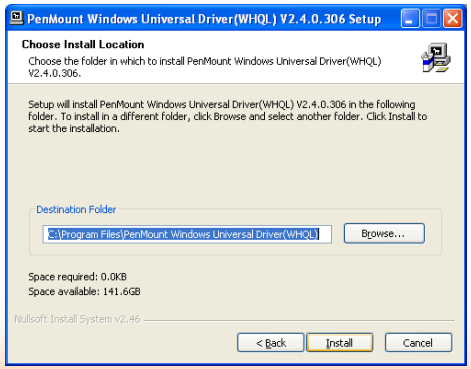
1. Setup is ready to install the driver. Click "Next".



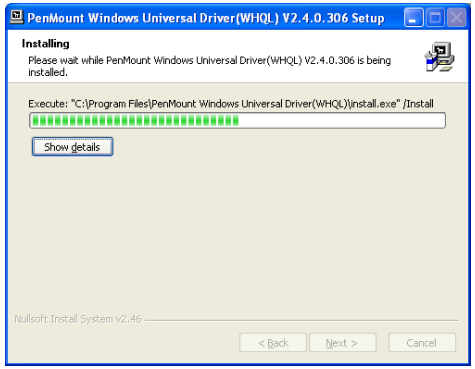
2. Click on "I agree".



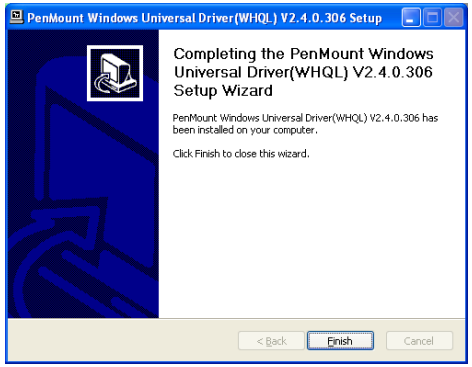
3. Click on "Browse" to install the driver in a different folder and select another folder. Click on "Install" to begin the installation.



4. Setup is currently installing the utility.



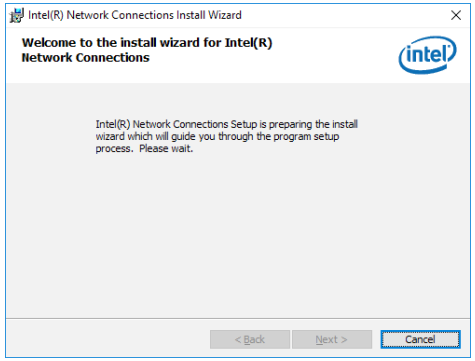
5. After completing installation, click "Finish".



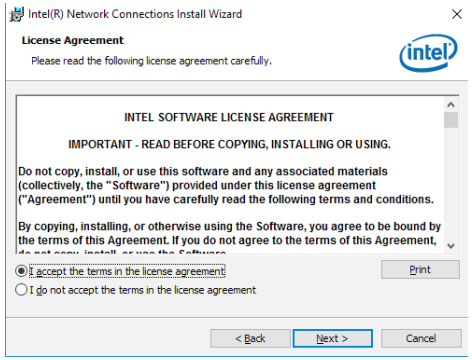
Intel LAN Driver

Please use the following procedure to install the Intel LAN Driver.

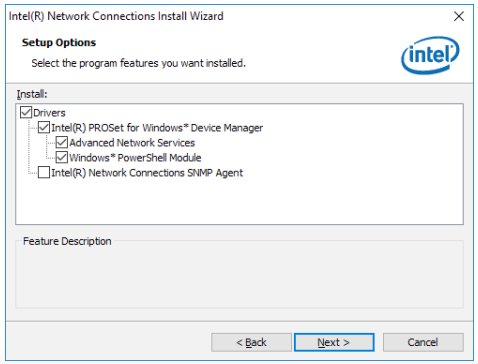
1. Setup is ready to install the driver. Click "Next" to continue.



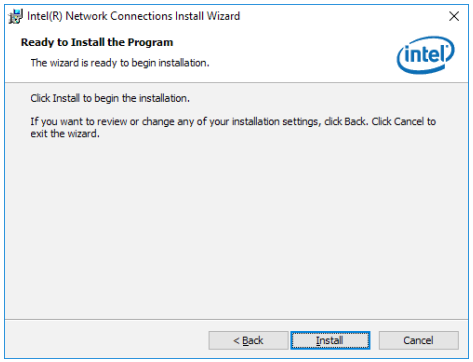
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree the terms in the agreement, and then click "Next".



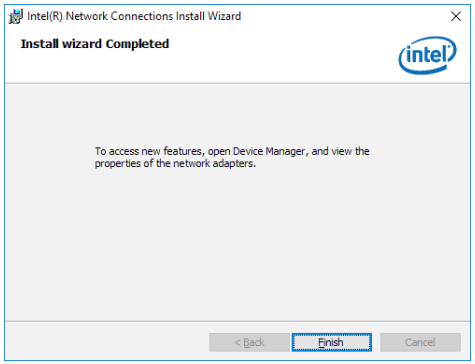
3. Select the program features you want to install and then click "Next".



4. Click "Install" to begin the installation.



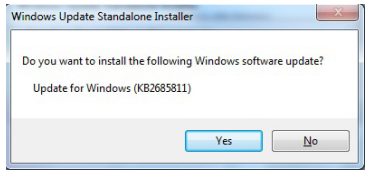
5. After the installation is complete, click "Finish" to exit setup.



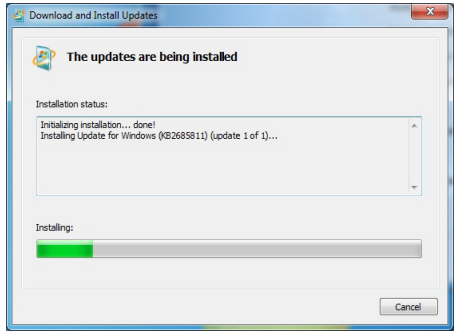
Kernel Mode Driver (For Windows 7 only)

Please use the following procedure to install the Kernel Mode Driver Framework.

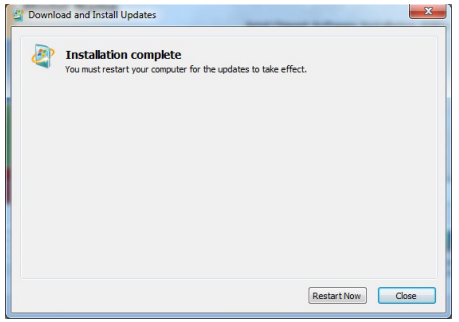
1. Click "Yes" to install the update.



2. The update is being installed now.



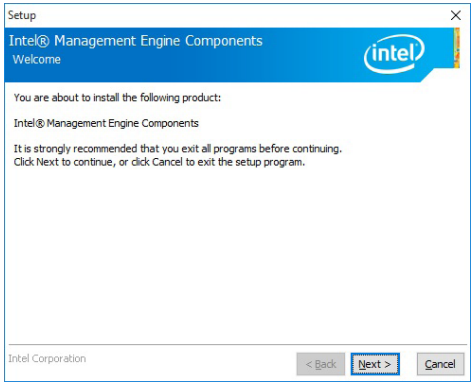
3. Click "Restart Now" to restart your computer when the installation is complete.



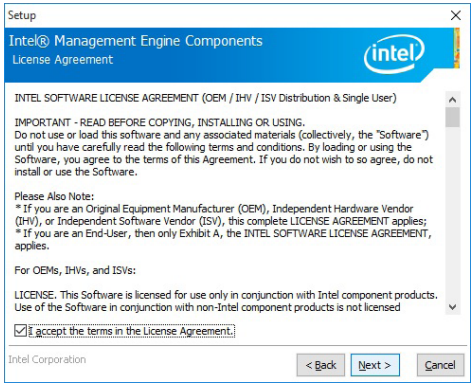
Intel Management Engine Drivers

Please use the following procedure to install the Intel Management Engine Driver.

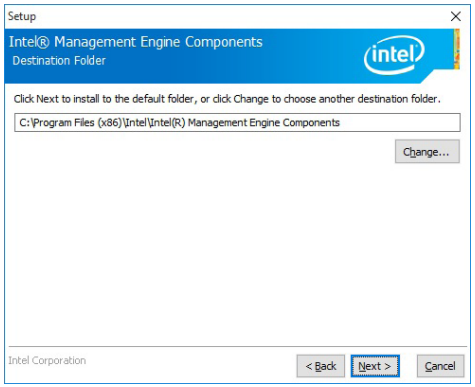
1. Setup is ready to install the driver. Click "Next" to continue.



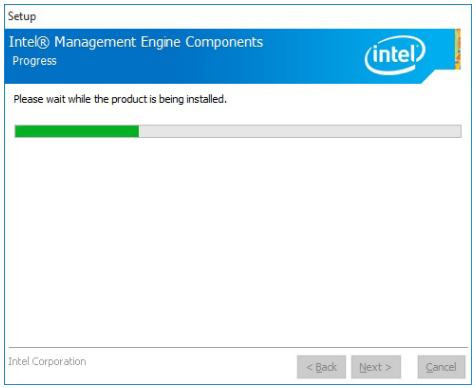
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree with the terms in the agreement, and then click "Next".



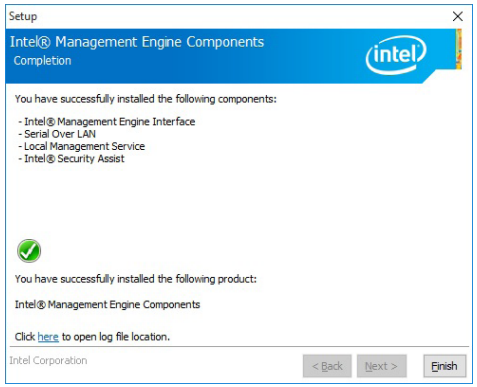
3. Setup is currently installing the driver. After the installation is complete, click "Next".



4. Please wait while the product is being installed.



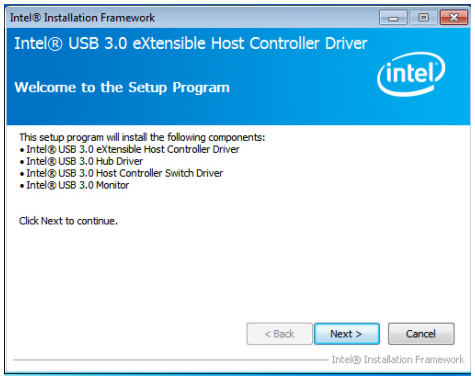
5. After the installation is complete, click "Finish" to exit setup.



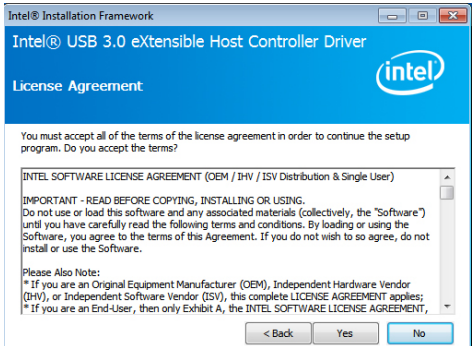
USB 3.0 Driver (For Windows 7)

Please use the following procedure to install the USB 3.0 Drivers.

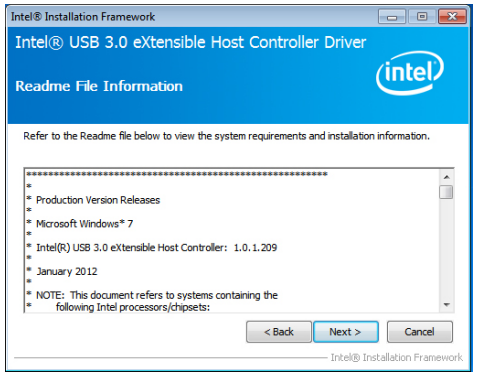
1. Setup is ready to install the driver. Click "Next" to continue.



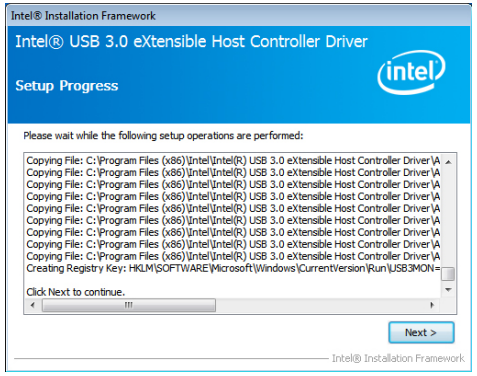
2. Read the license agreement and then click "Yes" if you agree with the terms in the agreement.



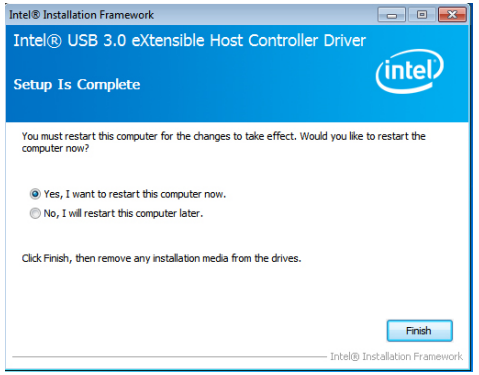
3. Go through the readme document for more installation tips and then click "Next".



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



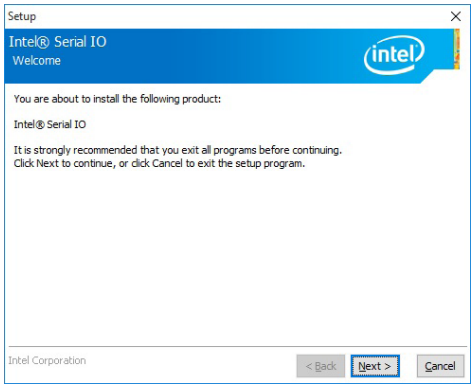
5. After the installation is complete, click "Finish".



IO Driver (For Windows 7-64 bit and 10)

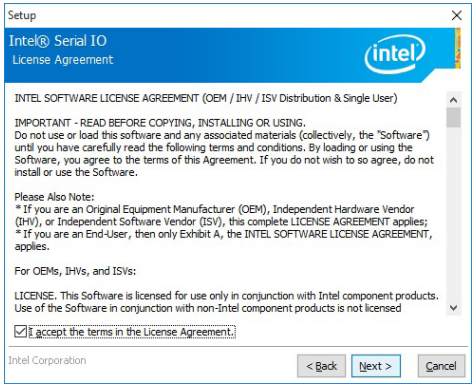
Please use the following procedure to install the Intel Serial IO Driver.

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

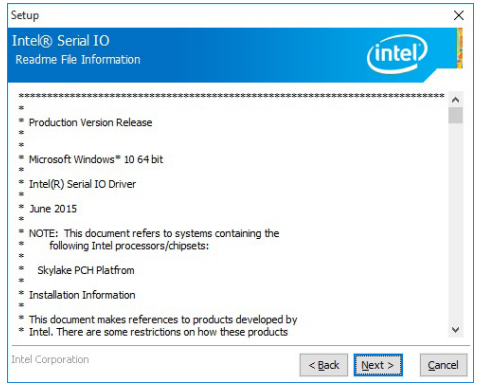


2. Read the license agreement carefully.

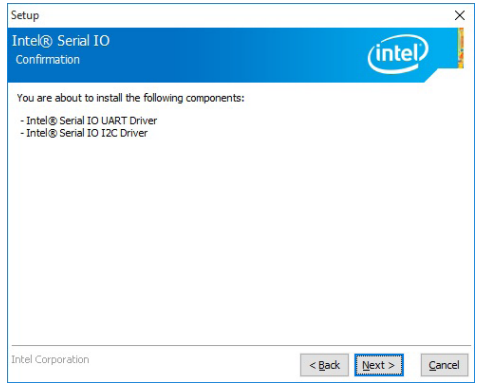
   Click "I accept the terms in the License Agreement" if you agree with the terms in the agreement and then click "Next".



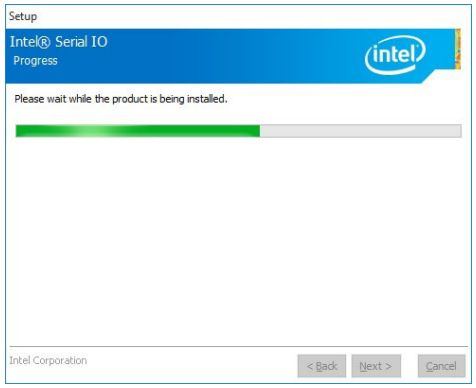
3. Read the file information and then click "Next".



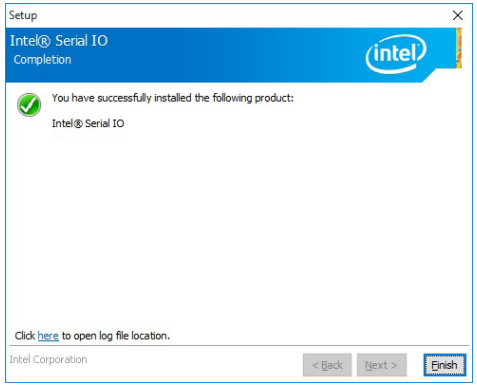
4. Setup is ready to install the driver. Click "Next" to begin the installation.



5. Setup is now installing the driver.



6. Click "Finish" to exit setup.

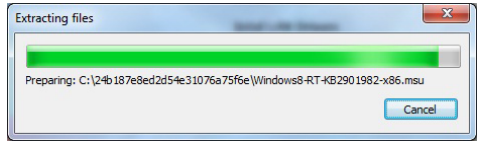


Microsoft Framework 4.5.2 (For Windows 7)

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

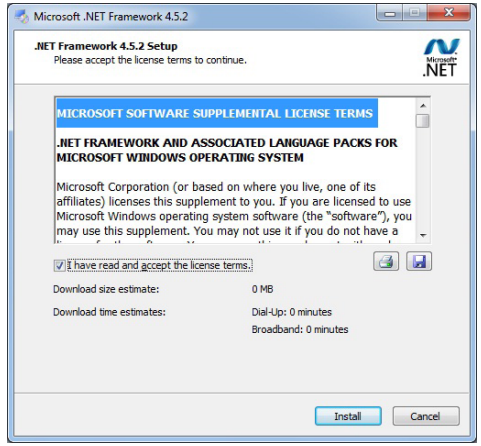
Please use the following procedure to install the Microsoft Framework 4.5.2.

1. Setup is now extracting files.

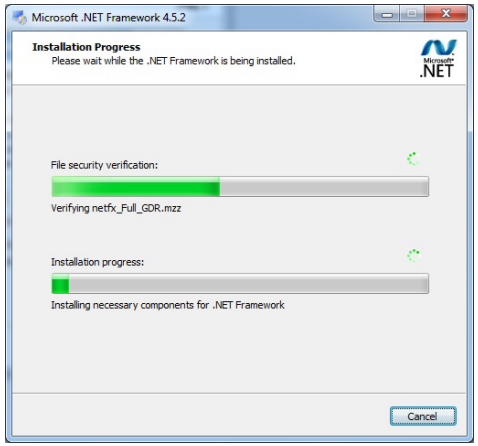


2. Read the license agreement carefully.

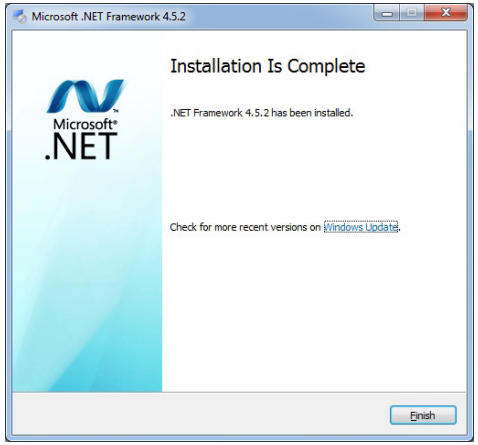
   Click "I have read and accept the terms of the License Agreement" if you agree with the terms in the agreement and then click "Next".



3. Setup is now installing the driver.



4. Click "Finish" to exit setup.

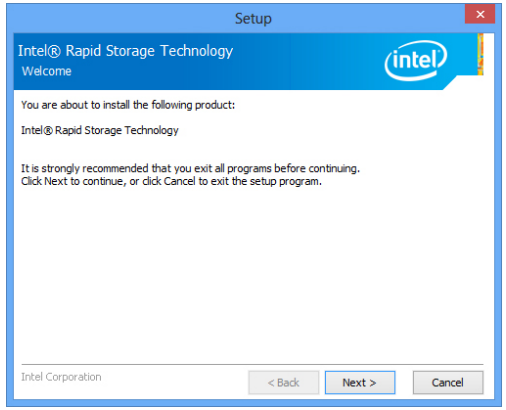


Intel Rapid Storage Technology

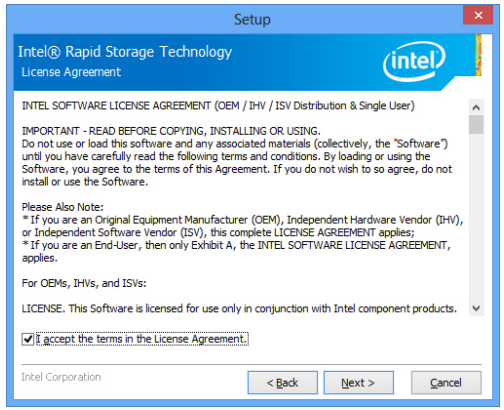
The Intel Rapid Storage Technology is a utility that allows you to monitor the current status of the SATA drives. It also enables enhanced performance and power management for the storage subsystem.

Please use the following procedure to install the Intel Rapid Storage Driver.

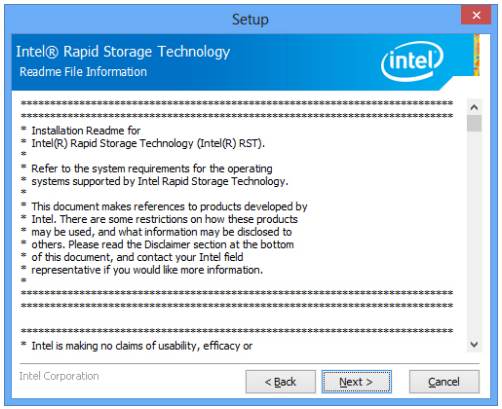
1. The setup program is preparing to install the driver. Please exit all programs before continuing with the installation.



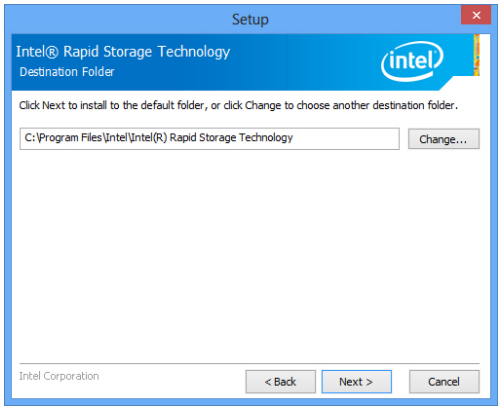
2. Read the license agreement carefully, accept the terms of the License Agreement, then click "Next" to continue.



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

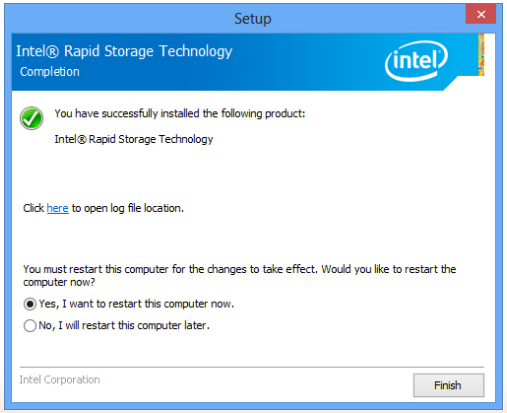


4. Setup is currently installing the driver. Click "Next" to install to the default folder or select to change the installation folder. The setup will then inform you that the Intel® Rapid Storage Technology will be installed on your system.



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

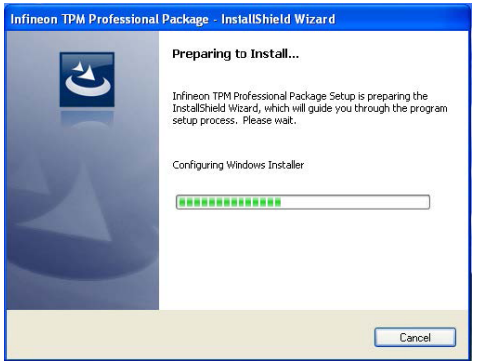
   Restarting the system will allow the new software installation to take effect.



Infineon Trusted Platform Module Driver (Optional)

Please use the following procedure to install the Infineon TPM Driver and Tool.

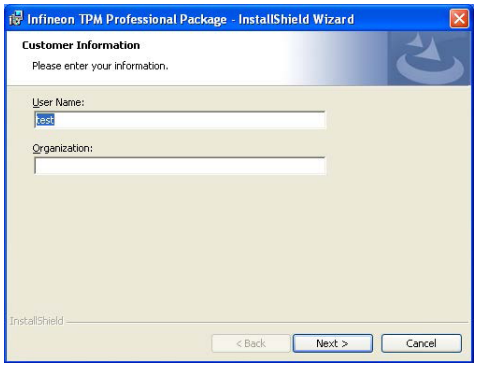
1. The setup program is preparing to install the driver.



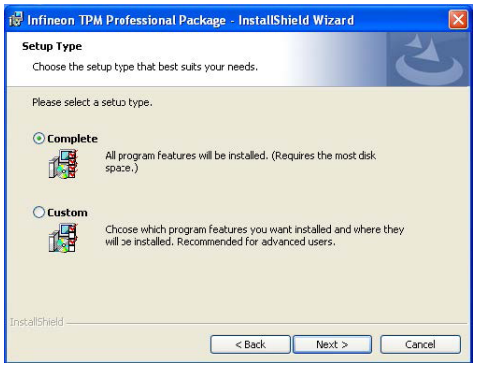
2. The setup program is now ready to install the utility. Click "Next" to continue.

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

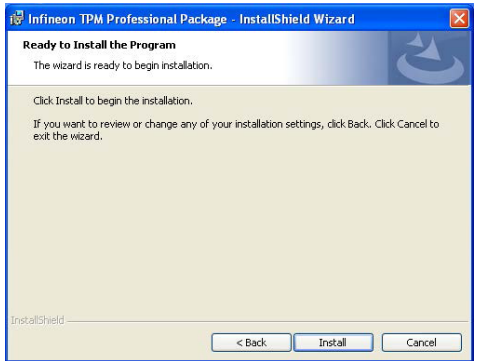
4. Enter the necessary information and then click "Next".



5. Select the setup type and then click "Next".



6. Click "Install" to start the installation.



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.

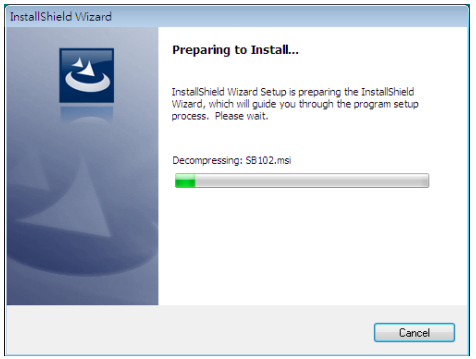
9. Click "Finish" to exit setup.

10. Click "Yes" to restart your system.

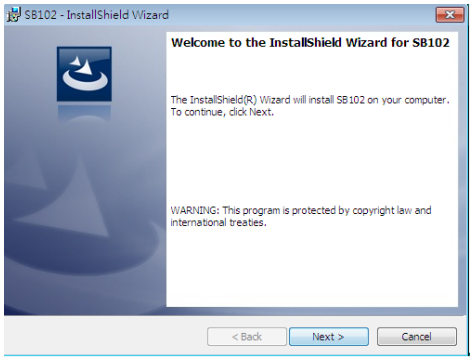
TPC Series Hotkey Driver

Please use the following procedure to install the TPC Series Hotkey Driver.

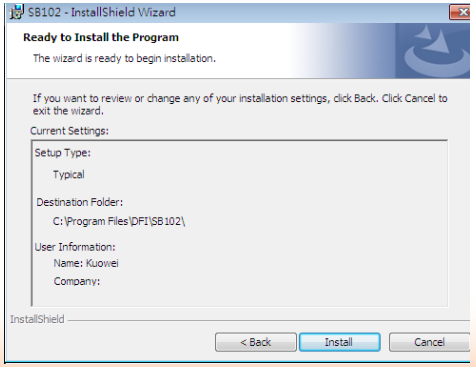
1. The InstallShield Wizard Setup is preparing to install, please wait.



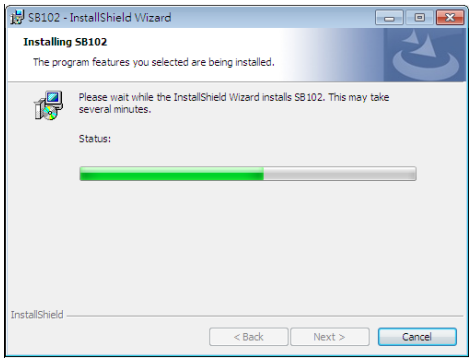
2. Setup is ready to install the driver. Click "Next".



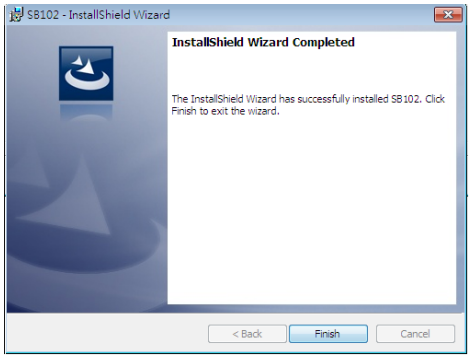
3. Click "Install" to begin the installation.



4. Setup is currently installing the utility.

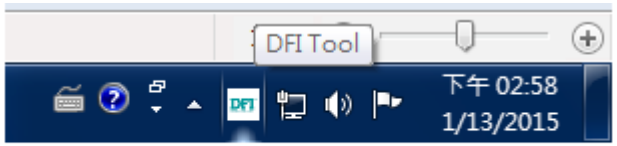


5. After the installation is completed, click "Finish".



Note:
The following illustrations are the TPC series hotkey guide for you to adjust the brightness of your touch panel. Please follow the steps below to complete the setting.

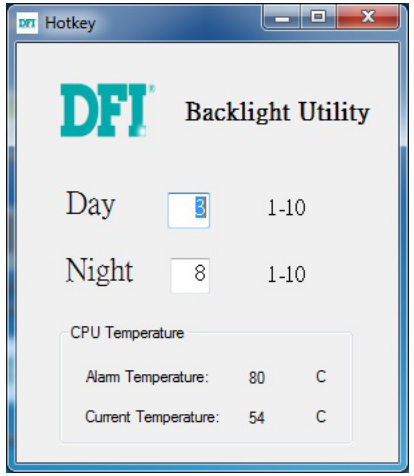
1. After the TPC Series Hotkey Driver is installed successfully, the system will execute the utility automatically when you power on the computer. You can find the four hotkeys on the bottom right side of the screen.



1

2. Click the utility twice to bring up the backlight brightness setting.

3. Enter the value for the backlight brightness for both day and night modes. The default setting is 3 (Day) and 8 (Night). 1 means the darkest level and 10 means the brightest level.



Chapter 9 - RAID

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 3 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.
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 "Exit" menu.
5. Reboot the system.

Step 3: Create a RAID Volume

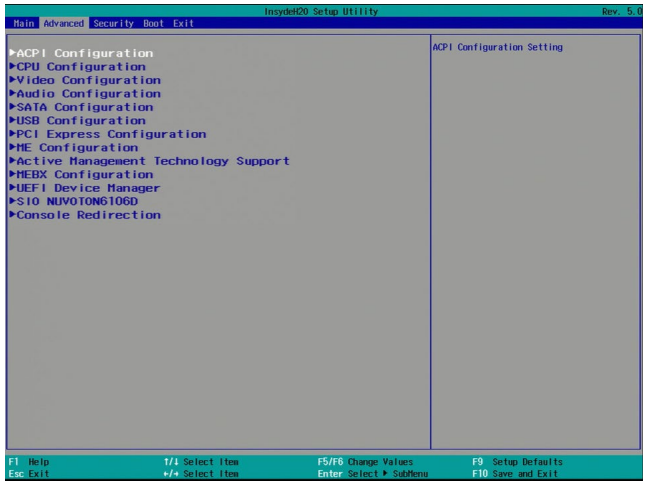
1. When the Intel® RST option ROM status screen displays during POST, press <Ctrl> and <I> simultaneously to enter the option ROM user interface.
2. Select 1: Create RAID Volume and press <Enter>.
3. Use the up or down arrow keys to select the RAID level and press <Enter>.
4. Use the up or down arrow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

1. In the BIOS, go to the "Advanced" > "UEFI Device Manager".
2. The "Intel® Rapid Storage Technology" menu appears. Enter this menu.



3. Select UEFI Device Manager. The system will prompt you that it is going to exit the BIOS utility. Select "OK" to continue.
4. The "Intel® Rapid Storage Technology" menu appears. Enter this menu.

5. The screen displays all available drives. Select "Create RAID volume" to create a RAID volume".

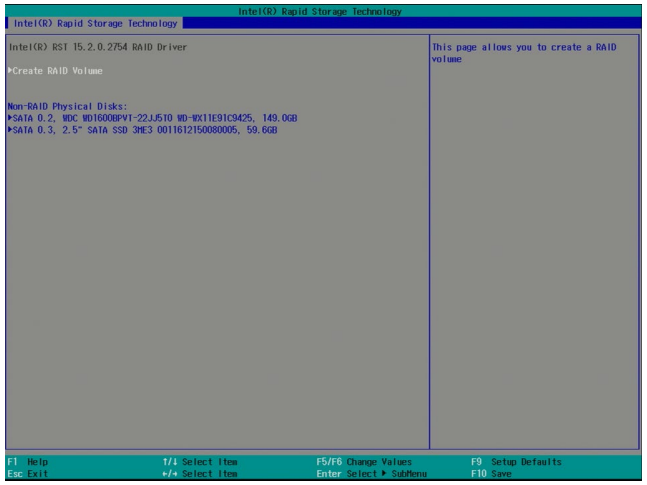
6. Use the up or down arrow keys to select the RAID level and press <Enter>.

7. Use the up or down arrow keys to scroll through the list of hard drives and press <Enter> and select "x" to select the drive for the RAID group.

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

9. Enter the capacity for the volume and press <Enter>.

10. Select "Create Volume" to start creating the volume.



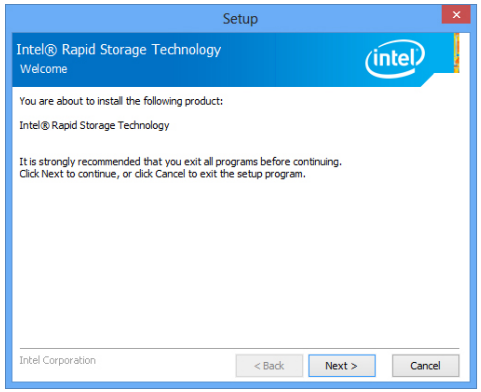
Step 4: Install the Intel Rapid Storage Technology Utility

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.

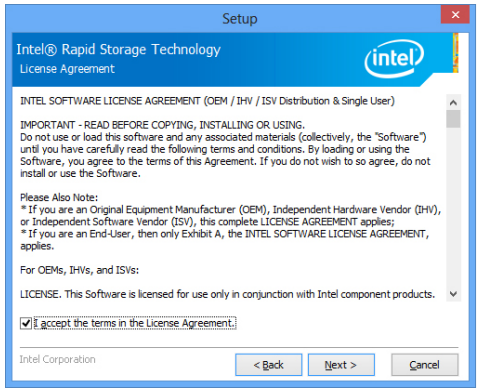
1. Insert the provided DVD into an optical drive.

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

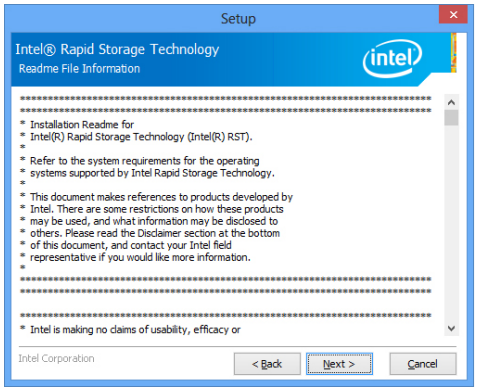
3. Setup is ready to install the utility. Click Next.



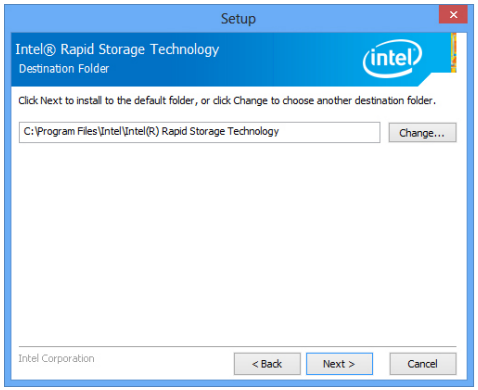
4. Read the license agreement and click "I accept the terms in the License Agreement." Then, click Next.



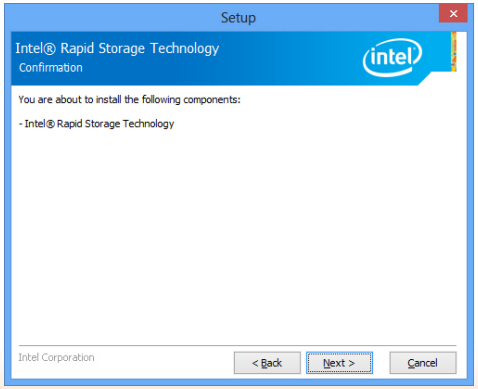
5. Go through the readme document to view system requirements and installation information then click Next.



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.