DFI

KSM-SD Series

Modular-Designed Industrial Panel PC
User's Manual

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Changes after the publication's first release will be based on the product's revision. The website will always provide the most updated information.

Trademarks

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

FCC and DOC Statement on Class A

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

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

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Shielded interface cables must be used in order to comply with the emission limits.

Table of Contents

About this Manual

An electronic file of this manual 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 damages to the product that has been modified or altered.

Static Electricity Precautions

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

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.

2. Wear an antistatic wrist strap.

3. Do all preparation work on a static-free surface.

4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.

5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or con nectors by their ends.

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

Safety Measures

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

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

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

Safety Precautions

- Use the correct DC input voltage range.

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

- Danger of explosion if battery incorrectly replaced.

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

- Dispose of used batteries according to local ordinance.

- Keep this system away from humidity.

- Place the system on a stable surface. Dropping it or letting it fall may cause damage.

- The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.

- Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.

- If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

- If one of the following occurs, consult a service personnel:

  - The power cord or plug is damaged.

  - Liquid has penetrated the system.

  - The system has been exposed to moisture.

  - The system is not working properly.

  - The system dropped or is damaged.

  - The system has obvious signs of breakage.

- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.

- Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

About the Package

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

- KSM-SD system unit
- Screw pack for SATA installation
- Screw pack for Mini PCIe installation

Optional Items

- Panel mount kit
- Power cord
- Power adapter (160W)

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

Front View

Rear View

Key Features

Model Name	KSM-SD
Processor	6th Generation Intel® Core™ processors, LGA 1151 Socket
Chipset	Intel® Q170 Chipset
LAN	2 LAN ports
COM	4 COM ports
Display	VGA
	DVI-D (DVI-I connector)
	HDMI or DP
USB	4 USB 3.0 Type A ports
Power	9~36V DC-in

Specifications

Processor System	6th/7th Generation Intel® Core™ Processors, LGA 1151 Socket • Intel® Core™ i7-6700TE, Quad Core, 8M Cache, 2.4GHz (3.4GHz), 35W • Intel® Core™ i5-6500TE, Quad Core, 6M Cache, 2.3GHz (3.3GHz), 35W • Intel® Core™ i3-6100TE, Dual Core, 4M Cache, 2.7GHz, 35W
Chipset	• Intel® Q170 Chipset
Memory	Two 260-pin SODIMM • Supports dual-channel DDR4 1866/2133MHz • Supports up to 32GB system memory
Graphics	Intel® HD Gen 9 Graphics OpenGL 5.0, DirectX 12, OpenCL 2.1 • Supports these codecs: HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9 • Output displays: VGA: resolution up to 1920x1200 @ 60Hz DVI: resolution up to 2560x1600 @ 60Hz HDMI: resolution up to 4096x2160 @ 24Hz or 2560x1600 @ 60Hz DP: resolution up to 4096x2304 @ 60Hz
Triple/Dual Display	VGA (+) DVI-D (DVI-I connector) (+) HDMI/DP
Storage	One 2.5" SATA drive bay • SATA 3.0 port with data transfer rate up to 6Gb/s
Ethernet	One Intel® I211AT PCIe (10/100/1000Mbps) One Intel® I219V (10/100/1000Mbps)
Expansion	One full-size Mini PCIe (PCIe/USB) One half-size Mini PCIe (USB/mSATA)

Front Panel I/O Ports	• Front Panel - One power button with LED - One reset button - One status and one HDD LED - One remote power-on/power-off connector - Two RS-232/422/485 (DB-9) (RS-232 with power) - Two RS-232/422/485 (DB-9) • Rear Panel - Two RJ45 LAN ports - One VGA port/one DVI (DVI-D signal)/one HDMI or DP - Four USB 3.0 Type A ports - One 9~36V DC-in 3-pole terminal block
Power	• Power input voltage: 9~36V DC-in (terminal block type connector)
Cooling System	• Fanless with heatsink
Environment	• Operating Temperature: -20 to 50°C (SSD or mSATA-mini or CFast card, with 0.7m/s air flow) • Storage Temperature: -20 to 50°C • Relative Humidity: 5 to 95% RH (non-condensing) • Shock: Half sine wave 3G, 11ms, 3 shock per axis
Construction	• Aluminum + SGCC
Mounting	• Panel/VESA Mount - Mounting brackets and screws* (optional)
Dimensions	• 235mm x 63.2mm x 221.2mm (W x H x D)
Weight	• 3.5 kg
OS Support	• Windows 7 (32/64-bit) • Windows 10 IoT LTSB RS1 Enterprise (64bit) • Linux
Other Features	System Reset, Programmable via Software from 1 to 255 Seconds
Standards and Certifications	• Shock Half sine wave 3G, 11ms, 3 shock per axis • Vibration IEC68-2-64 • Certificates CE, FCC Class A, RoHS

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

Getting to Know the KSM-SD

Front View

Status LED (Orange)
HDD LED (Red)
Power Button [1]
(Green LED)
COM 2 COM 1
Remote Power-on Switch
Reset Button
COM 3 COM 4

Rear View

DVI-D
(DVI-I connector)
LAN 1 LAN 2
USB 3.0
DC-in
VGA
HDMI (optional)
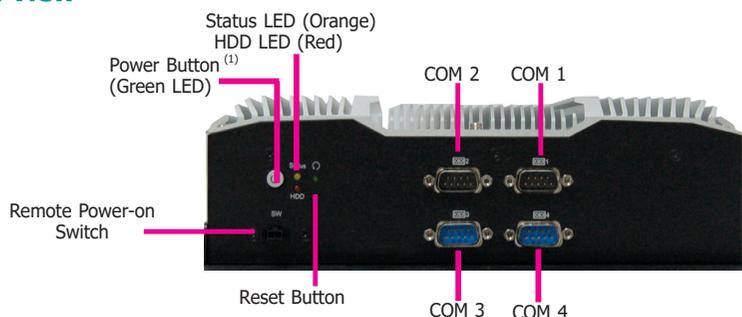
Power button with LED (Green)
Press to power on or power off the system.

Reset button
Press to reset the system.

HDD LED (Red)
Indicates the status of storage devices (including the mSATA card) as below.

HDD LED		
HDD State	**Disk access activity**	**Disk drives present or not present**
LED Behavior	Blink	Off

Status LED (Orange)
Indicates system status as below.

Status LED			
ACPI States	**Powered-On**	**Standby/Sleep**	**Hibernate/ Soft off**
LED Behavior	Always ON	Blinks	Off

Remote power-on/power-off switch connector
Connects a distant power on/off switch.

COM Ports
All COM ports can be selected among RS232, RS422 and RS485 via jumper settings.
In addition, COM1 and COM2 can be selected between standard RS232 and RS232 with power via jumper settings.
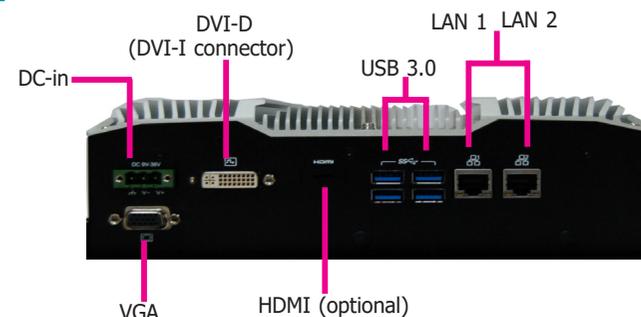
DC-in
DC 9~36V power input via a terminal block connector.

DVI-D (DV-I connector)
Connects the DVI-D connector of an LCD monitor.

HDMI (or DP, optional)
Connects the HDMI connector of an LCD monitor.

USB 3.0 Ports
Connect USB 3.0 devices as well as devices based on previous USB versions.

Gigabit LAN Ports
Connect the system to a local area network.

VGA Connector
Connects the VGA connector of a monitor.

Panel View*

Backlight or Power on/off[1] Volume Control Brightness Control[2,3] Power[4] (green) HDD (orange)
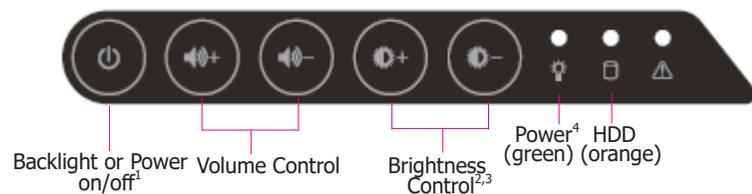
The front OSD is capable of controlling the system in the following ways in addition to its explicit functions.

1. System Power On/Off: Press the Backlight on/off button for 3 seconds.
2. Light Sensor On/Off: Press the Brightness up arrow for 3 seconds.
3. OSD Lock/Unlock: Press the Brightness down arrow for 3 seconds.

Note:
The front panel OSD is an optional feature for SKUs with panel modules.

Mechanical Dimensions

Front View

Left View
60.70

Right View
221.20
60.70

Rear View
235
63.20
6
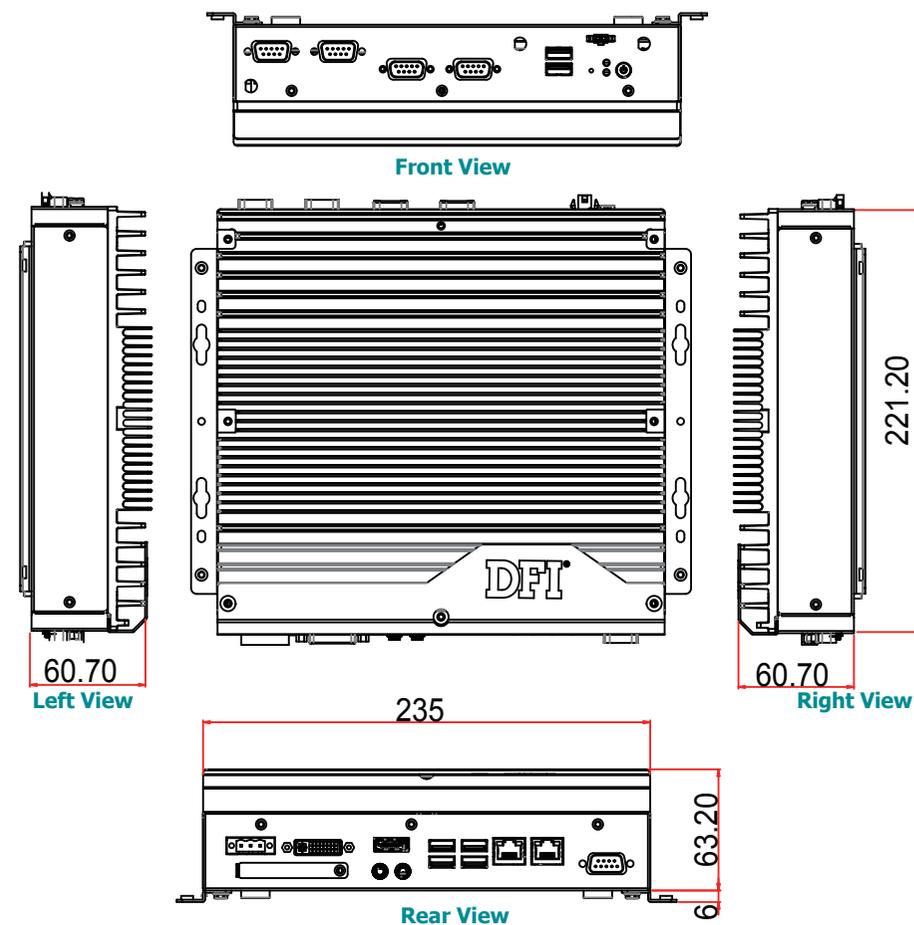
Chapter 2 - Getting Started

Preparing the System

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

• SATA hard drive
• Any means of power supply
• Memory module
• Screwdriver

Installing Devices

The following devices can be installed in the system.

• Memory modules
• SATA hard drives
• M.2 and Mini PCIe cards

Configuring the BIOS

You may need to change configurations such as the date, time and settings of devices in the system before you install an operating system or deploy the device in your operating environment.

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

Installing an Operating System

Most operating system software can be installed using a DVD or bootable USB drive. Be sure to install a storage device.

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

Installing the Drivers

The system requires you to install drivers for some devices to operate properly. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing the Devices

Assemble the Modular Panel PC

The modular panel PC comprises two parts: a box module and a panel module. The assembly of these two parts is easy thanks to DFI's ADP (Adaptive Display Platform) innovation, which makes the box modules and the panel modules interchangeable. Please use the following procedure to assemble these two parts.

1. At the bottom of the box, there's a male ADP connector.

Box Module

2. Hold the box module with its ADP connector (female) in line with the ADP connector (male) of the panel module. Align the box module with the panel module using the alignment posts.

Alignment Post
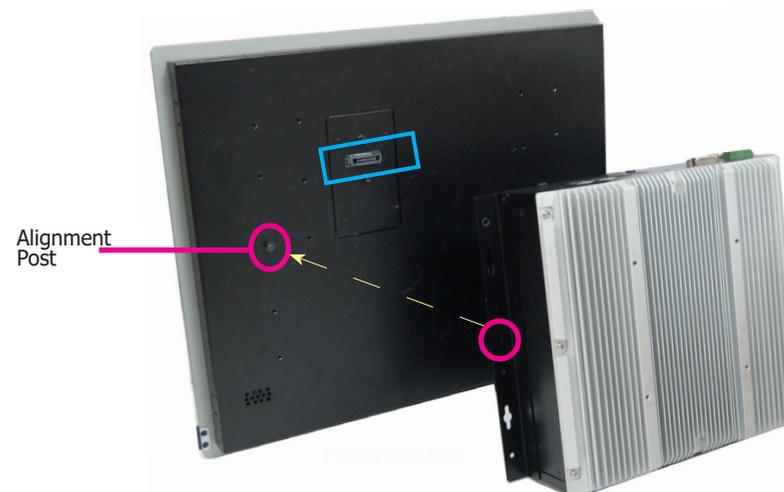
> **Note:**
> If the orientation of the assembly is not correct, the box module will not seat evenly on top of the panel module, which results in some space in between them and indicates that the ADP connectors are not engaged. When this is the case, please turn the box module the other way around.

3. Place the box module on top of the panel module with the alignment posts effortlessly slip-ing into the designated holes on the box module. Press to install these two modules and secure the installation with 8 mounting screws.

Mounting Screw

Alignment Post

Mounting Screw
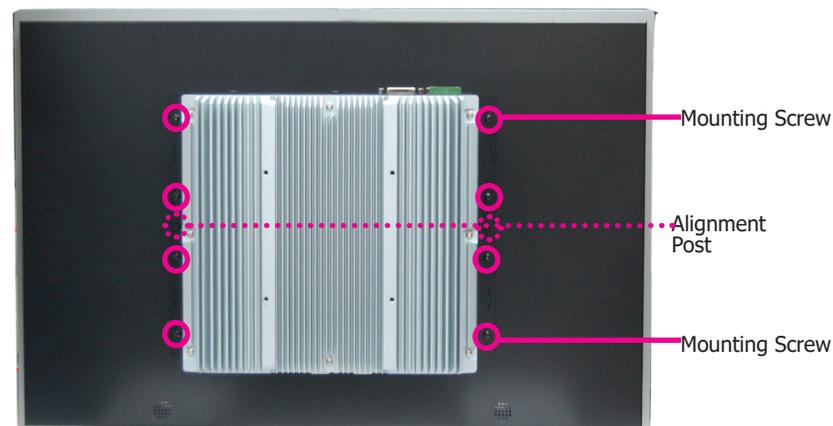
Box + Panel Module

Removing the Chassis Cover

Please follow these guidelines before performing any installation procedures:

1. Make sure the system and all other peripherals connected to it have been powered off.

2. Disconnect all power cords and cables.

3. The 6 mounting screws on the left and right sides and 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 upward to open the system.

5. The SODIMM sockets, Mini PCIe slots, M.2 slot and SATA drive bay are accessible after removing the chassis cover.
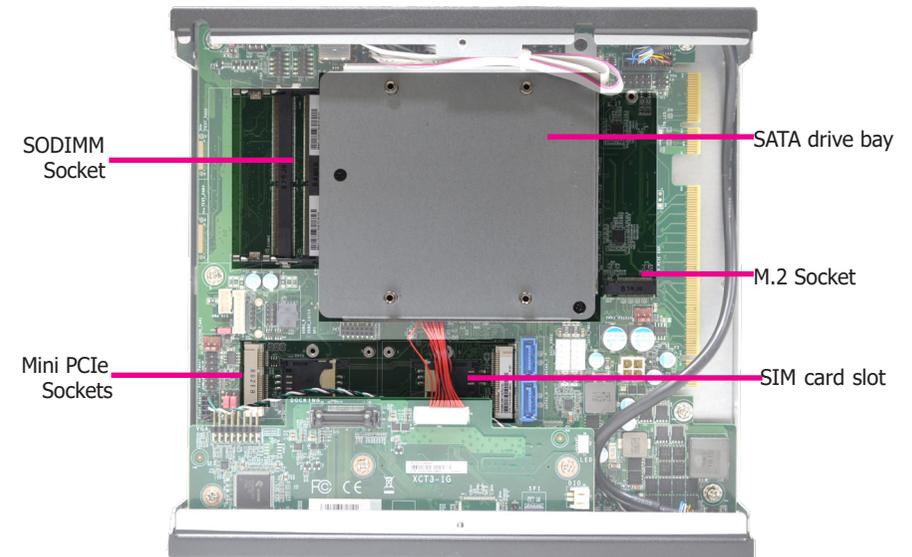
Installing a SODIMM

The system supports two DDR4 SODIMM socket. The SODIMM sockets are located on the system board.

SODIMM sockets

Grasp the module by its edges and align the memory's notch with the socket's notch. Then insert the memory into the socket at an angle and push it down until you feel a click.

Retention Notch

↓ Notch

《《 **DDR4 SO-DIMM**

Retention Clip

↓ Key

《《 **Socket Top View**

45°

Step 1

Step 2

Step 3

Notes:

1. The system supports dual-channel configuration. To enable dual-channel, populate both SODIMM sockets.

2. The SKUs with ECC-supported CPUs and Intel® CM238 Chipset support ECC memory.

3. If installing only one memory module, please install it on the memory socket labeled DIMM 1 (the one closer to the center of the board).

4. The SODIMM sockets can only accept DDR4 memory modules. Please do not install other types of memory modules.

Installing a 2.5" SATA Drive

The system can accommodate one SATA drive. Please use the following procedure to install a SATA drive in the system.

1. Before installing the SATA drive, connect the SATA data/power cable to the SATA data connector of the SATA drive. Then install the SATA drive onto the HDD bracket with the provided mounting screws.

Mounting Screws

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

Mounting Screws

Mounting hole

3. Connect the other end of the SATA data and power cable to the SATA data and power connectors on the system board respectively.

SATA power connector
SATA data connector

Installing a Mini PCIe and SIM Card

The system board is equipped with 2 Mini PCIe slots with Mini SIM card sockets to support a variety of wireless LAN and mobile broadband communication modules. Mini PCIe slot 1 provides both USB and PCIe interfaces whereas Mini PCIe slot 2 provides only USB interface.

1.   Grasp the Mini PCIe card by its edges and align the notch in the connector of the Mini PCIe card with the notch in the connector on the system board.

Mini PCIe sockets

2.   Push the Mini PCIe card down and use the provided mounting screw to secure the card on the system board. If antenna cables are used, route them to the antenna holes on the rear panel of the system.

Antenna hole

Mounting screw
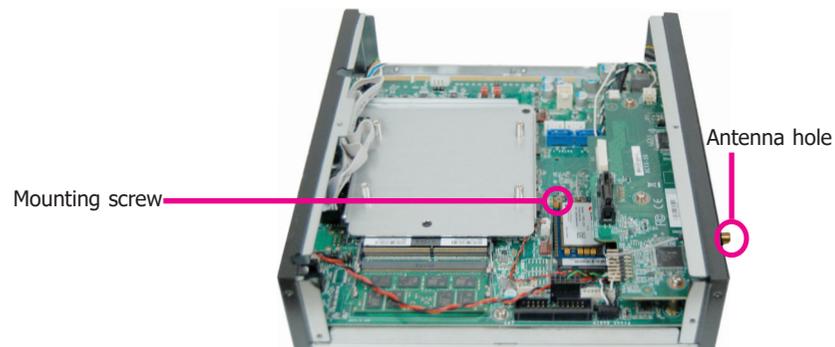
Chapter 4 - Jumper Settings

Clear CMOS Data

3
2
1

1-2 On: Normal (default)

JP1

3
2
1

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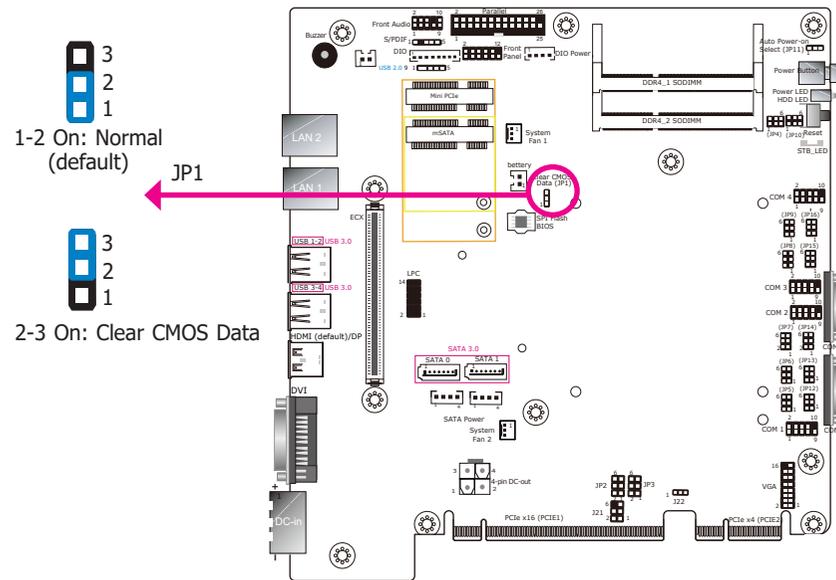
If you encounter the following conditions, you can reconfigure the system with the default values stored in the BIOS ROM.

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 the jumper pins 2 and 3 to On. Wait for a few seconds and set the jumper back to its default setting: 1-2 On.

3. Now plug the power cord and power on the system.

Auto Power-on Select

JP11

1 2 3

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

1 2 3

**2-3 On:
Power-on via AC power**
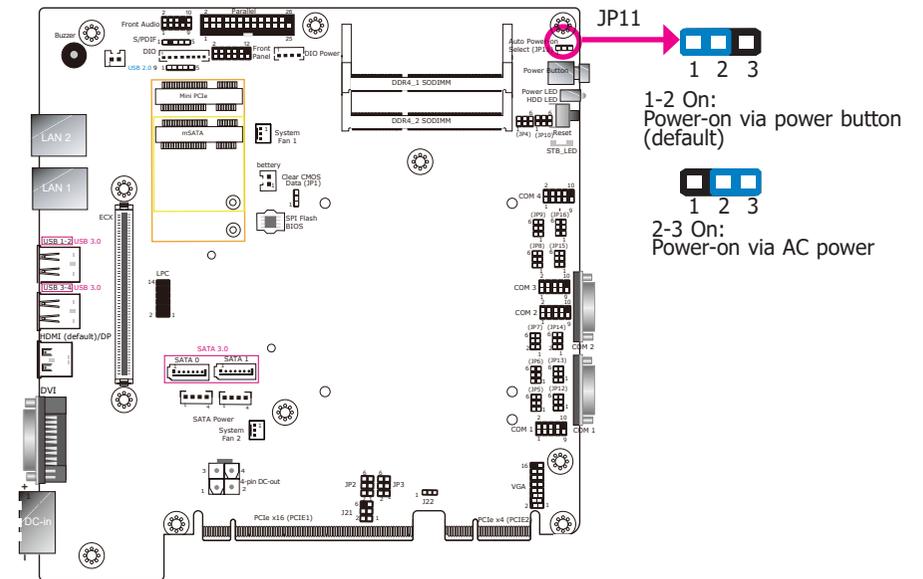
JP11 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set jumper pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

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

COM1/COM2 RS232 Power Select

JP2   JP3

6   6

2   1   1
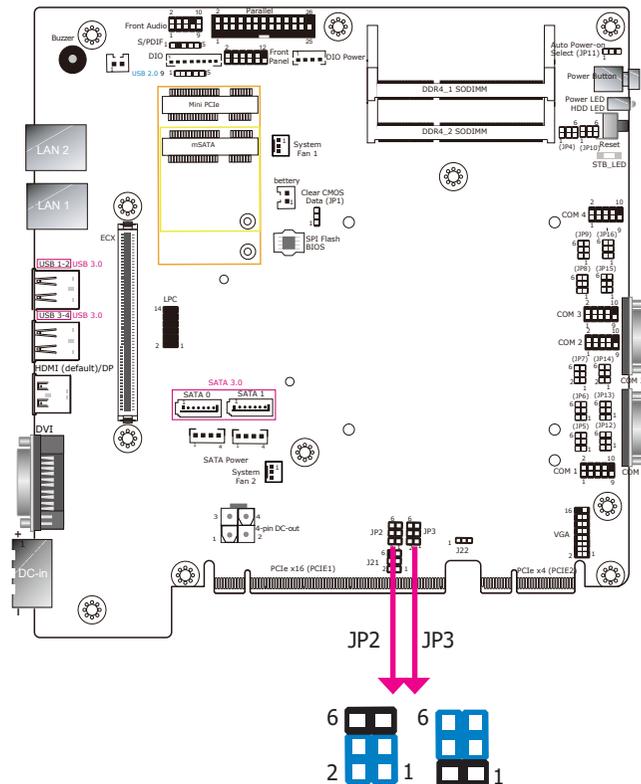
1-3 (RI), 2-4 (DCD) On: 3-5 (+5V), 4-6 (+12V) On:
RS232 (default)   RS232 with power

JP3 (for COM1) and JP2 (for COM2) are used to configure serial COM ports to standard RS232 or RS232 with power. The pin assignments (Pin 1: optional 12V and Pin 9: optional 5V) of COM1 and COM2 will vary according to JP3's and JP2's setting respectively.

COM1/COM2 RS232/422/485 Select
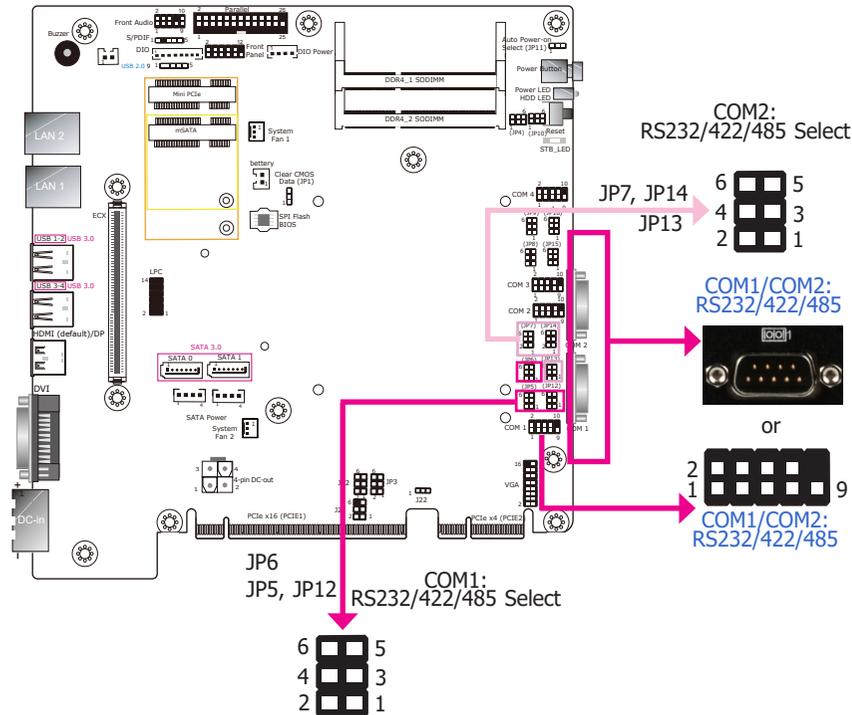
JP7, JP14
JP13

COM2:
RS232/422/485 Select

6 5
4 3
2 1

COM1/COM2:
RS232/422/485

or

2 9
1

COM1/COM2:
RS232/422/485

JP6
JP5, JP12

COM1:
RS232/422/485 Select

6 5
4 3
2 1

These jumpers allow you to configure the serial COM ports to RS232, RS422 (full duplex) or RS485. JP5, JP6 and JP12 are used to configure serial COM port 1. JP7, JP13 and JP14 are used to configure serial COM port 2. The pin functions of COM port 1 and COM port 2 will vary according to these jumpers' settings.

Both COM1 and COM2 are wired as either external ports or internal connectors. You can also configure the RS485 auto flow mechanism through the BIOS setup utility. For more information, refer to Chapter 7.

COM1 / COM2

DCD (or +12V) RXD TXD DTR GND	RXD+ RXD- TXD+ TXD- N.C.	DATA+ DATA- N.C. N.C. N.C.
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6 7 8 9	6 7 8 9	6 7 8 9
DSR RTS CTS RI (or +5V)	N.C. N.C. N.C. N.C.	N.C. N.C. N.C. N.C.
RS232	RS422 Full Duplex	RS485

COM1 / COM2

RXD DTR DSR CTS	RXD- TXD- N.C. N.C.	DATA- N.C. N.C. N.C.
2 ... 9 / 1	2 ... 9 / 1	2 ... 9 / 1
DCD TXD GND RTS RI	RXD+ TXD+ N.C. N.C. N.C.	DATA+ TXD N.C. N.C. N.C.
RS232	RS422 Full Duplex	RS485

JP6 (for COM1) / JP13 (for COM2)

6 □ 5 / 4 □ 3 / 2 □ 1	6 □ 5 / 4 □ 3 / 2 □ 1	6 □ 5 / 4 □ 3 / 2 □ 1
1-2 On: RS232 (default)	3-4 On: RS422 Full Duplex	5-6 On: RS485

JP5 and JP12 (for COM1) / JP7 and JP14 (for COM2)

6 □ 5 / 4 □ 3 / 2 □ 1	6 □ 5 / 4 □ 3 / 2 □ 1
1-3, 2-4 On: RS232 (default)	3-5, 4-6 On: RS422 Full Duplex/RS485

Note:
When COM1 RS232/422/485 is selected, JP5 and JP12 must be set in accordance to JP6. And when COM2 RS232/422/485 is selected, JP7 and JP14 must be set in accordance to JP13.

COM3/COM4 RS232/422/485 Select
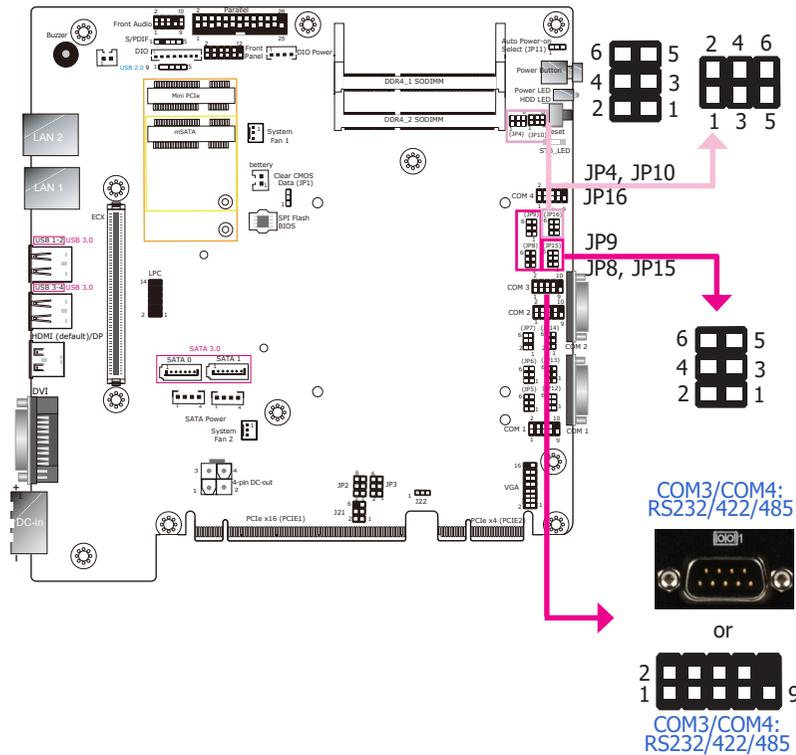
JP4, JP10
JP16

JP9

JP8, JP15

COM3/COM4:
RS232/422/485

or

COM3/COM4:
RS232/422/485

COM3 / COM4

RS232

RS422
Full Duplex

RS485

COM3 / COM4

RS232

RS422
Full Duplex

RS485

JP9 (for COM3) / JP4 (for COM4)

JP9

JP4

1-2 On: RS232
(default)

3-4 On: RS422
Full Duplex

5-6 On: RS485

JP8 and JP15 (for COM3) / JP10 and JP16 (for COM4)

JP8, JP15, JP16

JP10

1-3, 2-4 On:
RS232 (default)

3-5, 4-6 On:
RS422 Full Duplex/RS485

These jumpers allow you to configure the serial COM ports to RS232, RS422 (full duplex) or RS485. JP8, JP9 and JP15 are used to configure serial COM port 3. JP4, JP10 and JP16 are used to configure serial COM port 4.

The pin functions of COM port 3 and COM port 4 will vary according to these jumpers' settings. You can also configure the RS485 auto flow mechanism through the BIOS setup utility. For more information, refer to Chapter 7.

Note:
When COM3 RS232/422/485 is selected, JP8 and JP15 must be set in accordance to JP9. And when COM4 RS232/422/485 is selected, JP10 and JP16 must be set in accordance to JP4.

Chapter 5 - Ports and Connectors

Bottom Panel I/O Ports
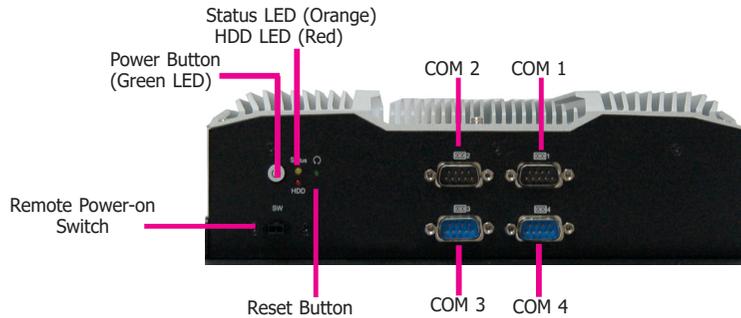
The bottom panel I/O consists of the following ports:

- Power button with LED (green)
- Reset button
- Remote power on/off switch connector
- Status and HDD LEDs (orange/red)
- Four RS232 serial ports

COM (Serial) Ports
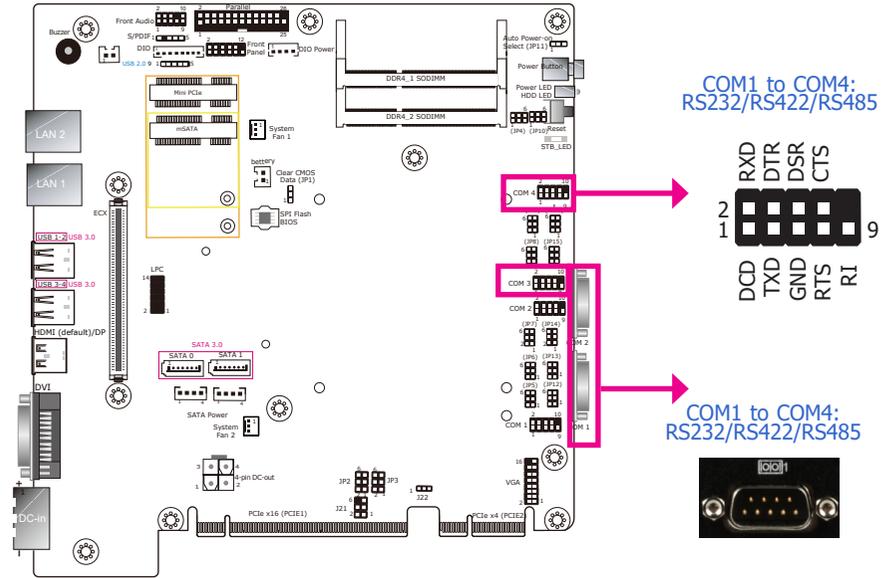
COM1 to COM4 can be selected among RS232, RS422 and RS485. In addition, COM1 and COM2 can be switched between standard RS232 and RS232 with power. For pin definitions and jumper selection of different communication modes, please refer to Chapter 4.

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

- **BIOS Setting**

Configure the serial ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. You can use the BIOS setup utility to configure RS485 auto flow mechanism. Refer to Chapter 7 for more information.

Remote Power-on Switch
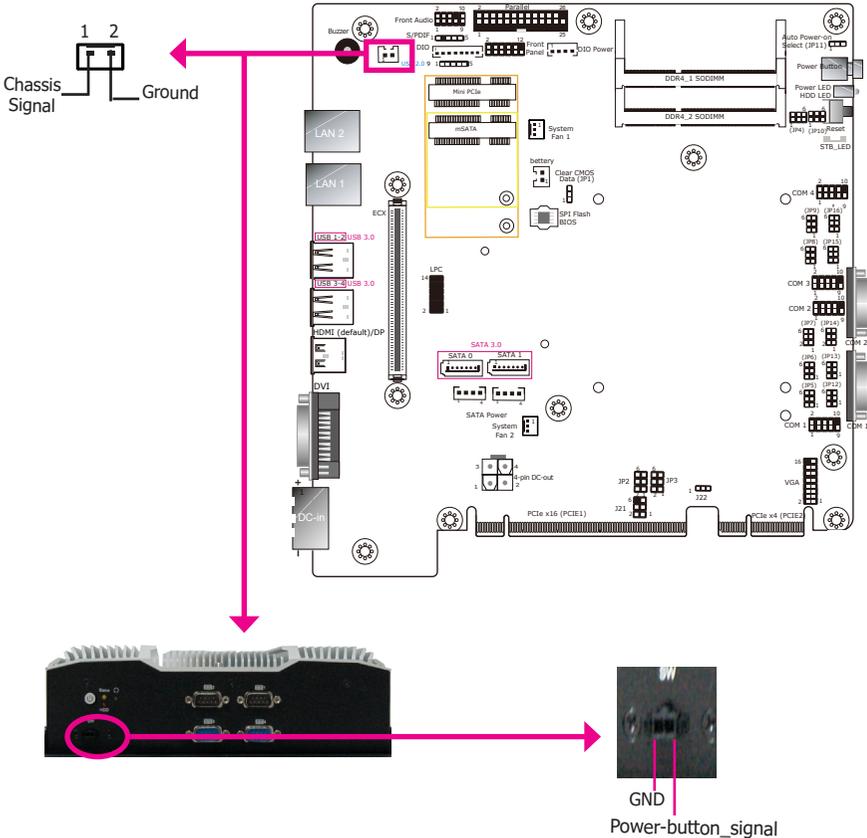
This connector provides power-on function for distant power control.

Top Panel I/O Ports
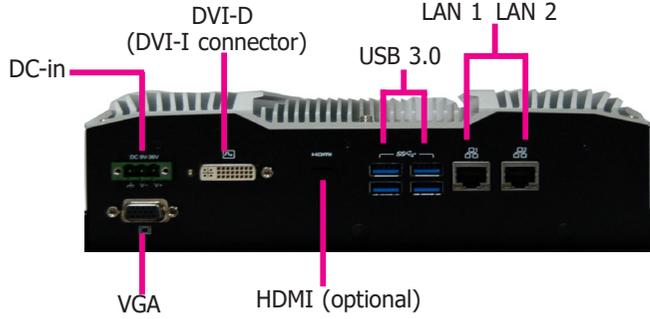
The top panel I/O consists of the following ports:

- 9~36V DC-in
- DVI-D (DVI-I connector) / HDMI or DP (optional) / VGA connectors
- Four USB 3.0 ports
- Two RJ45 LAN ports

RJ45 LAN Ports

LAN 2

LAN 1

LAN 1   LAN 2

Link/ACT LED
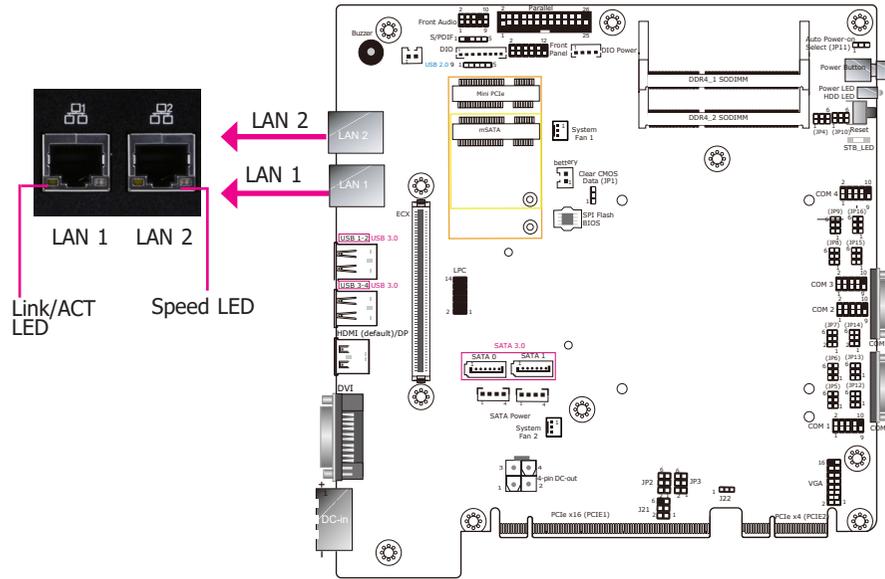
Speed LED

Features

- LAN1: Intel® I219V PCIe Gigabit Ethernet Controller
- LAN2: Intel® I211AT PCIe Gigabit Ethernet Controller

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

Activity/Link LED		Speed LED	
LED Behavior	Description	LED Behavior	Description
Off	No link	Off	10Mbps connection
Blinking	Data Activity	Green	100Mbps connection
On	Linked	Orange	1Gbps connection

BIOS Setting

Configure the onboard LAN for Wake-on-LAN (WoL) ("ACPI Configuration") and UEFI network settings ("UEFI Device Manager") in the Advanced menu of the BIOS. Refer to Chapter 7 for more information.

Driver Installation

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

Display Interfaces

VGA

GND — VGA_SCL
VSYNC_C — VGA_HSYNC_C
VGA_SDA — NC
GND — 5V
GND — GND
VGA_DET — GND
NC — VGA_BLUE_C
VGA_GREEN_C — VGA_RED_C

2   1

5   1

15   11

HDMI or DP

DVI-D
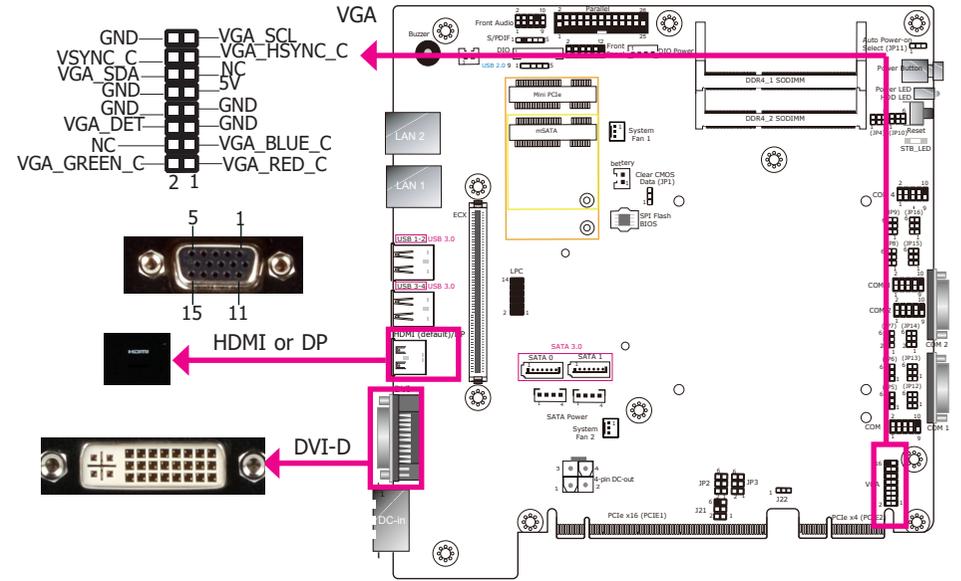
VGA Port

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.

DVI-D (DVI-I Connector) Port

The DVI-D (DVI-I connector) port is used to connect a digital LCD monitor to transmit uncompressed digital video. This connector has a DVI-I receptacle but implements DVI-D signals (digital only).

HDMI Port or DisplayPort

The HDMI (or DP) port which carries both digital audio and video signals is used to connect the HDMI (or DP) port of an LCD monitor or a digital TV.

BIOS Setting

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

Driver Installation

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

USB Ports

9~36V DC-in
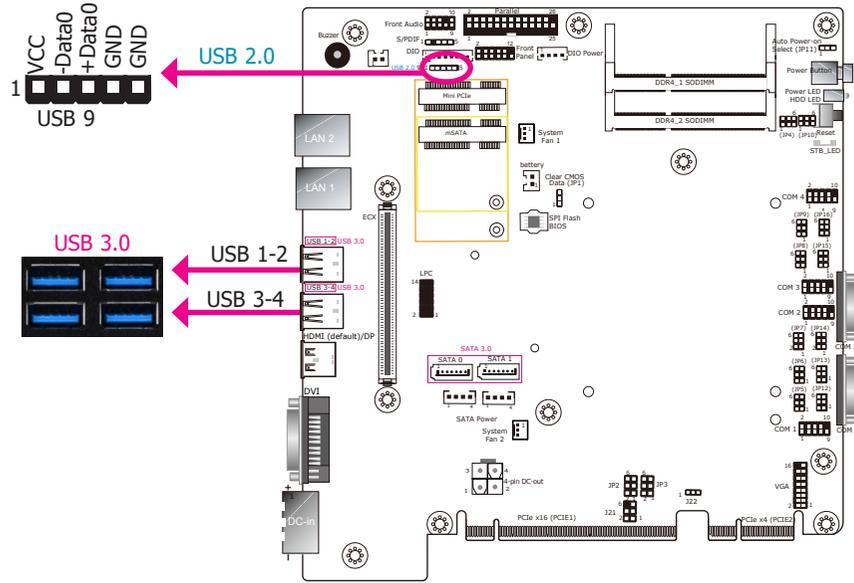
The USB device allows data exchange between your computer and a wide range of simultane-ously accessible external Plug and Play peripherals. The system board is equipped with 4 USB 3.0 ports on the top panel and 1 USB 2.0 port through internal pin headers. The USB 3.0 can transfer data up to 5 Gbps whereas the USB 2.0 can transfer data up to 480Mbps.

This connector provides options of wide power input from 9 to 36V. Using a voltage not within the recommended range may fail to boot the system or cause damage to the system board.

● **BIOS Setting**

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

I/O Connectors
Parallel Connector

LPT
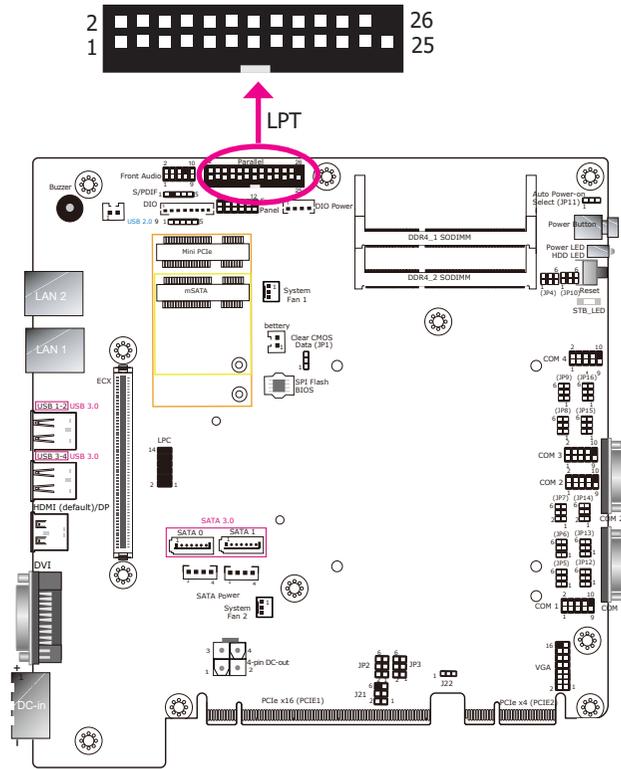
The 25-pin connector is used to connect the parallel port of a device such as a printer. It supports SPP, ECP and EPP standards.

SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at the maximum speed.

12V DC-out

DC-out
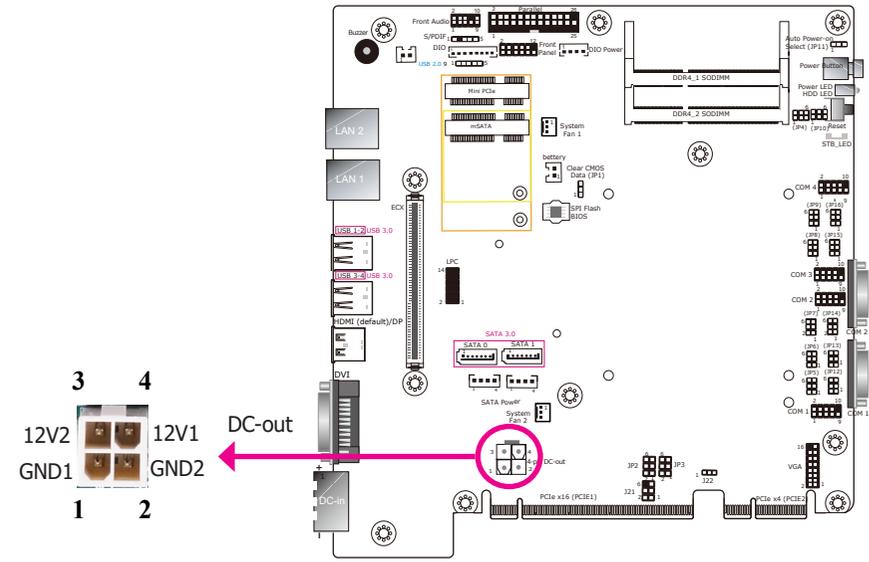
The 4-pin vertical type connector (optional) provides low power output.

Front Panel Connector
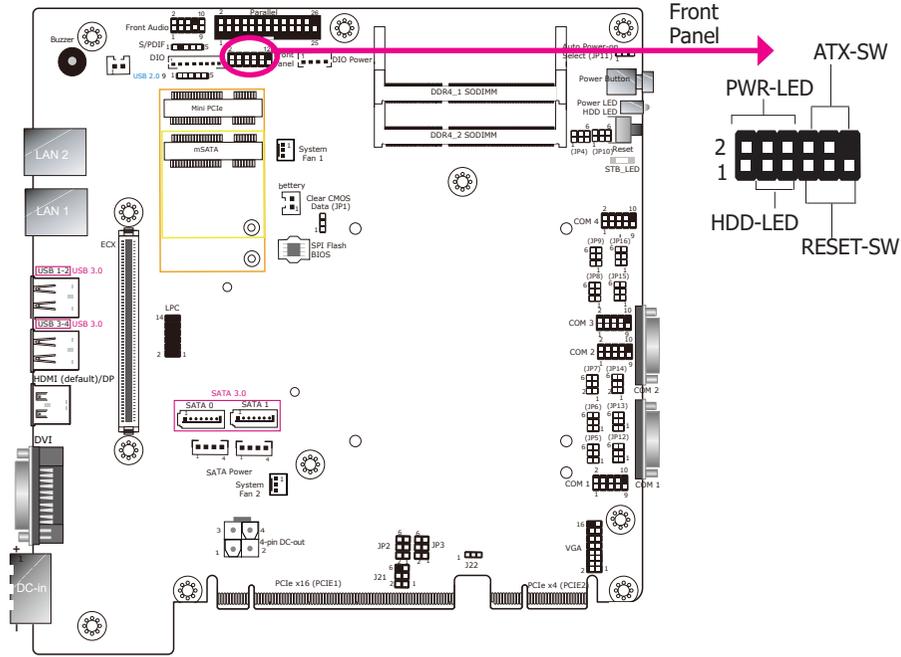
HDD-LED - HDD LED

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

RESET SW - Reset Switch

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

ATX-SW - ATX Power Switch

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

PWR-LED - Power/Standby LED

When the system's power is on, this LED will be lit. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

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

SATA (Serial ATA) Connectors
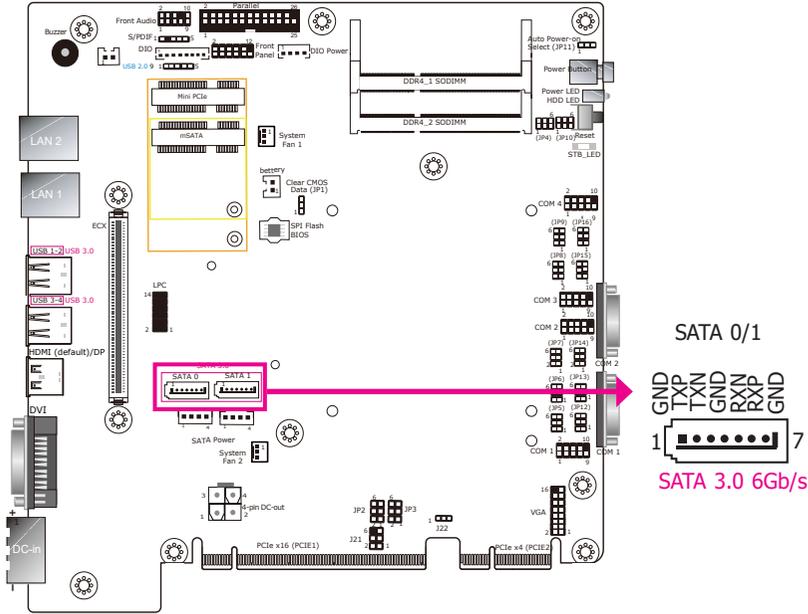
Features

- 2 Serial ATA 3.0 ports
  - SATA port 0 and 1 with data transfer rate up to 6Gb/s

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

The power cable must be connected from the system board's Serial ATA power connector to a SATA drive's power connector in order to provide power to the drive. Refer to the next page for pin definitions of the SATA power connectors.

BIOS Setting

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

SATA (Serial ATA) Power Connectors

SATA
Power 0/1

+12V
Ground
Ground
+5V

1   4
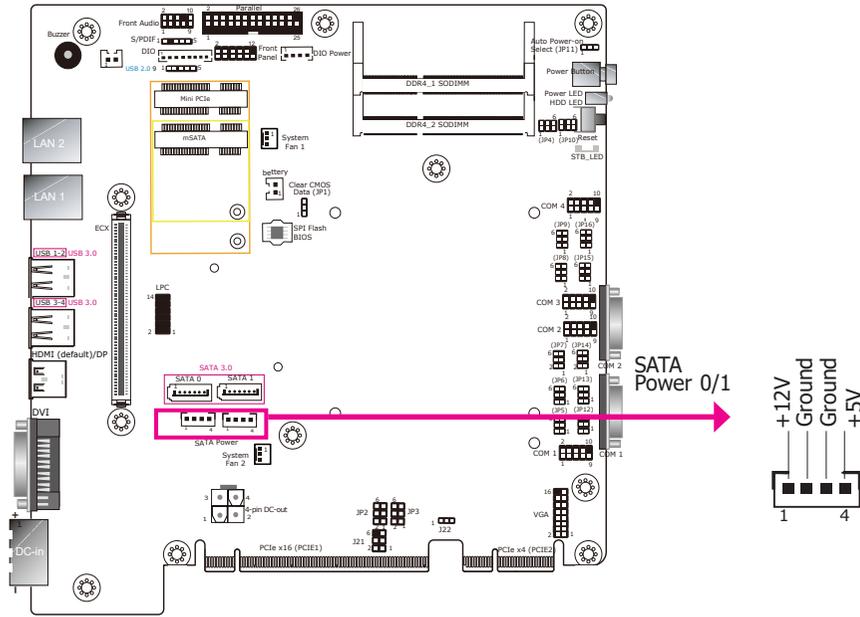
These SATA power connectors supply power to the SATA drives. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device.

SMBus Connector

SMBus

6 5
NC — SMBUS_Alert
SMBUS Data — SMBUS Clock
GND — +3.3V_standby
2 1
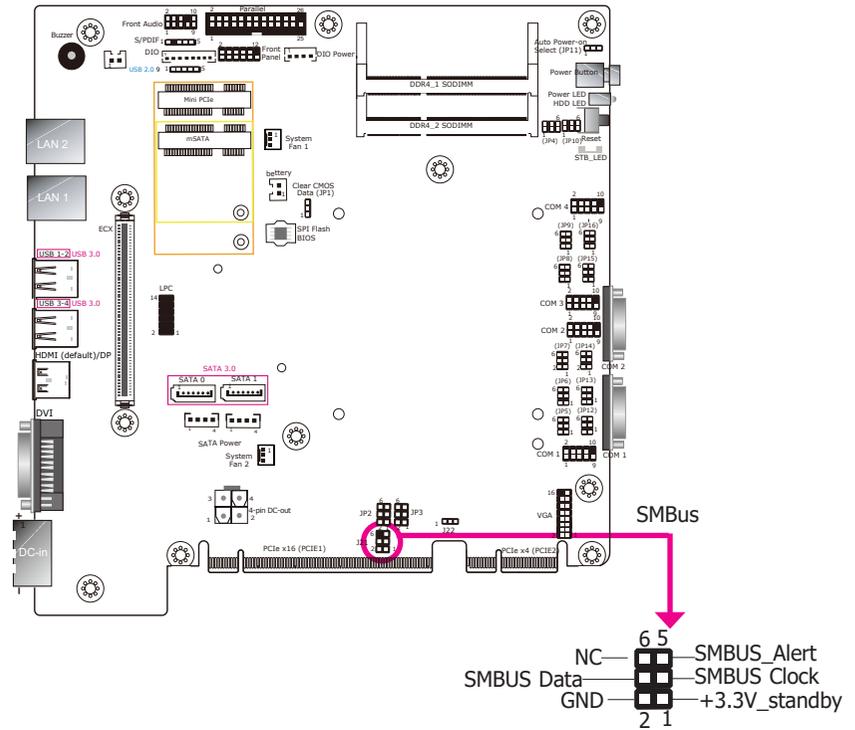
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

Cooling Fan Connectors
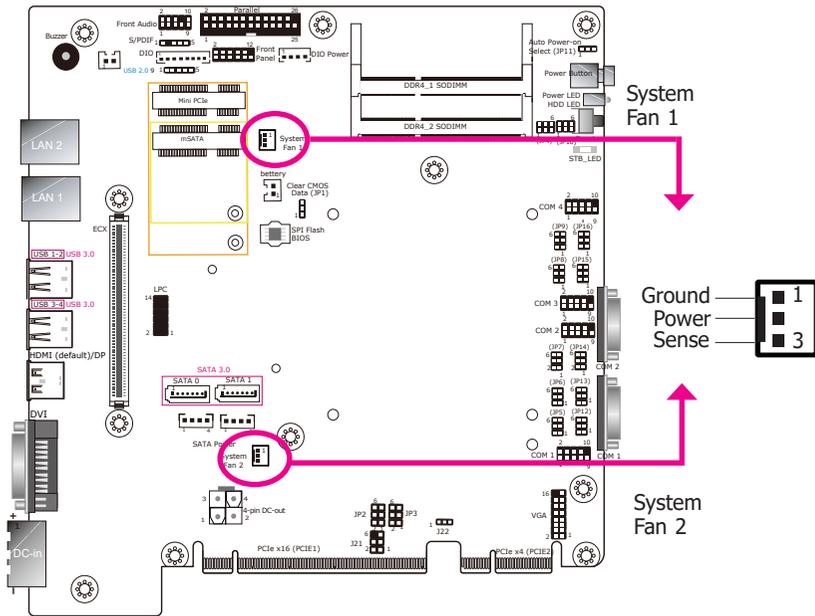
The fan connectors are used to connect cooling fans.

BIOS Setting

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

Digital I/O Connector
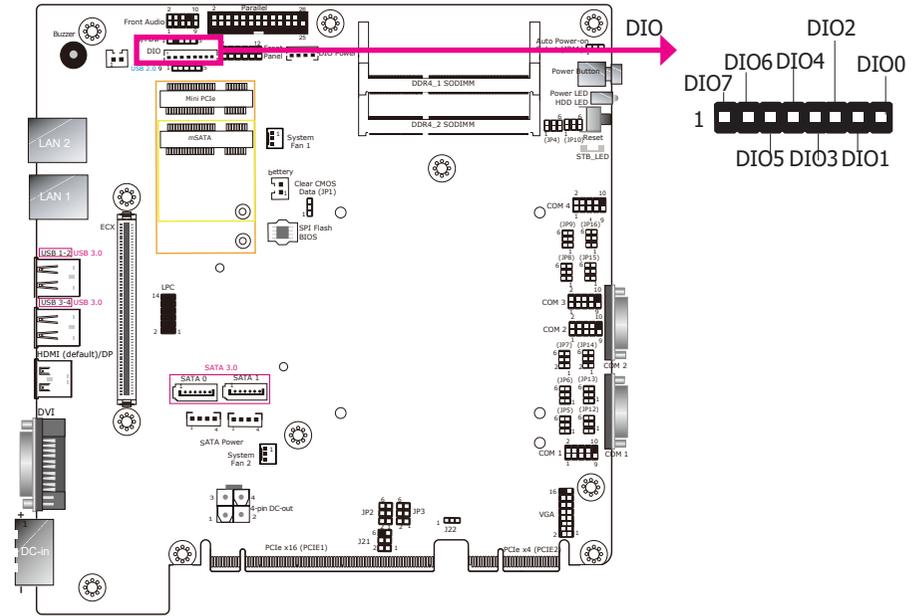
The Digital I/O connector provides 8-bit digital inputs or outputs to enable monitor and control of the states of connected external devices. We have built support software called EAPI that enables the functionality of hardware components. Please contact our technical support or sales representatives for the support software package

Digital I/O Connector

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

S/PDIF Connector
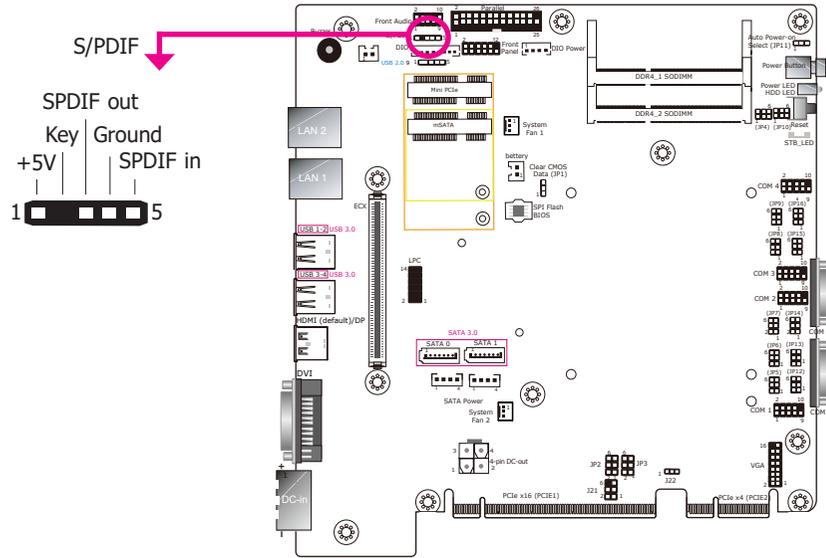
The S/PDIF connector is an audio interface for transmitting digital audio signals. The system includes an S/PDIF header on the board.

LPC Connector
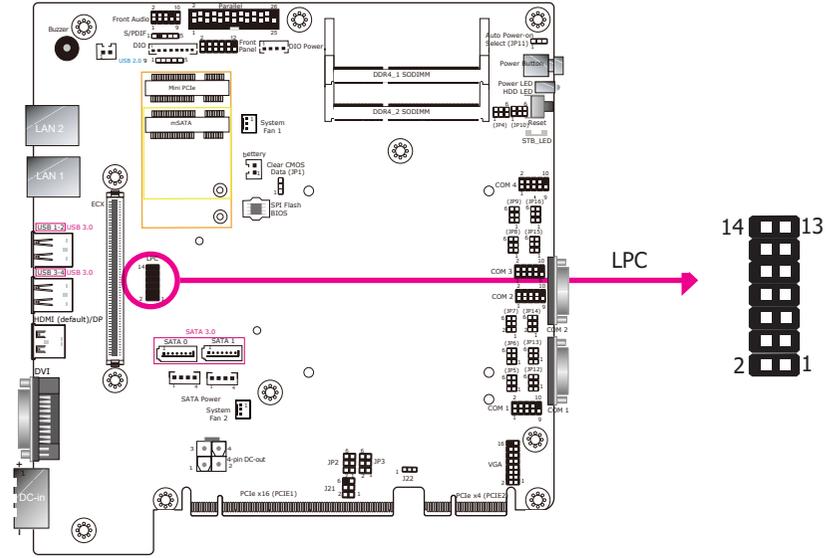
The Low Pin Count Interface was defined by Intel® Corporation to facilitate the industry's transition towards legacy free systems. It allows the integration of low-bandwidth legacy I/O components within the system, which are typically provided by a Super I/O controller. Furthermore, it can be used to interface firmware hubs, Trusted Platform Module (TPM) devices and embedded controller solutions. Data transfer on the LPC bus is implemented over a 4 bit serialized data interface, which uses a 24MHz LPC bus clock. For more information about LPC bus, please refer to the Intel® Low Pin Count Interface Specification Revision 1.1. The table below indicates the pin assignments of the LPC connector.

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

Expansion Slots

Mini PCI Express

ECX Slot

PCI Express x16

PCI Express x4
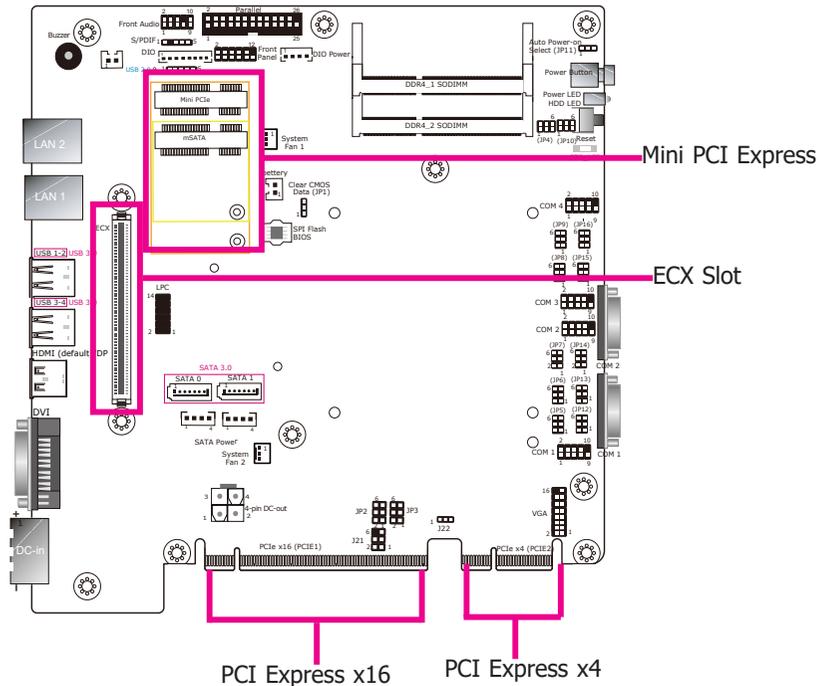
Mini PCIe Slot

The Mini PCIe socket is used to install a Mini PCIe card. The system is equipped with a full-size Mini PCIe slot (PCIe/USB signals) and a half-size Mini PCIe (mSATA/USB signals) slot. Supporting both USB and mSATA signals, the half-size Mini PCIe slot can be used to expand the system's storage capacity or provide mobile communication capability.

PCI Express x16 Slot/PCI Express x4 Slot

Install a PCIe x16 or x4 expansion card such as network cards that comply with the PCI Express specifications into this slot.

ECX Slot

The ECX interface is used to install an ECX card for I/O expansion via a proprietary daughter board. The system is pre-installed with the XCT3-1G card.

Chapter 6 - Mounting Options

VESA Mount

The VESA-mount specifications for this device is 100 x 100 (mm). Please use a compatible VESA mount kit that can sustain the weight and size of this device. The VESA mount kit includes the following:

- 2 VESA mount brackets
- Bracket screws

VESA mount bracket 1

VESA mount bracket 2
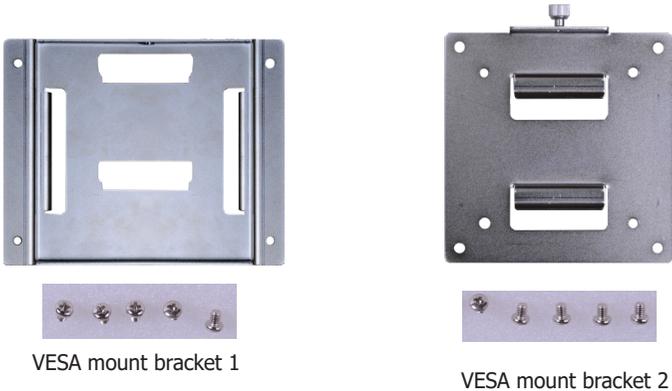
1. Select a place on the wall where you will mount the Panel PC.

2. Use the provided mounting screws to attach "VESA mount bracket 1" to the wall.

Mounting screw

VESA mount bracket 1
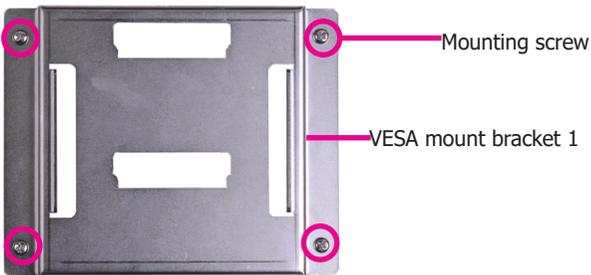
3. The system has designed Attach the other bracket (VESA mount bracket 2) to the rear of the Panel PC.

Thumb screw

VESA mount bracket 2

Hooks

Mounting screw
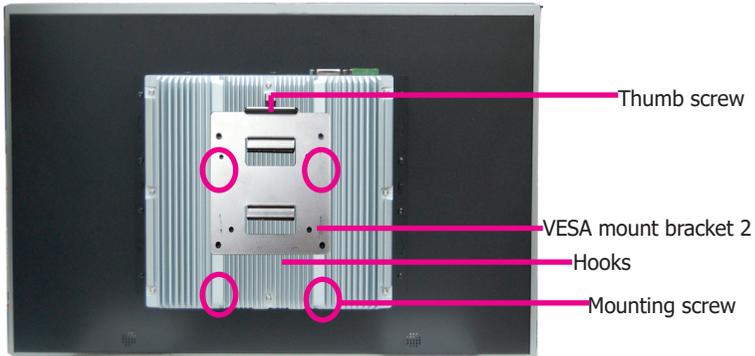
4. Slide the Panel PC to "wall mount bracket 1" to attach the two brackets with the hooks. Then tighten the thumb screw to secure the assembly in place. Note that the following diagram is for illustration only and may not resemble the actual product.

Thumb screw
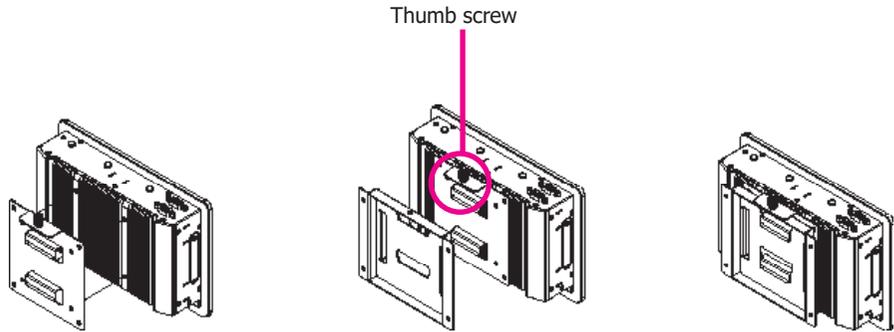
Panel Mount

The panel mounting kit includes the following:

• 10 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 (15": 367mm x 300mm; 18.5": 454mm x 296mm; 19": 447mm x 380mm; 21.5": 526.2mm x 342.6mm) and ensure that the Panel PC can be fitted into the panel properly.
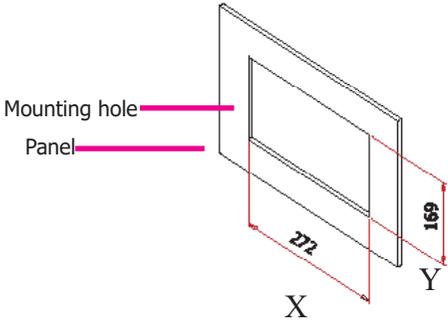
3. Insert the Panel PC from the outside surface of the panel into the mounting hole until it is properly fitted against the panel.

4. Position the mounting clamps along the rear edges of the Panel PC and insert them into the slits around the Panel PC. Note that the following diagram is for illustration only and may not resemble the actual product.
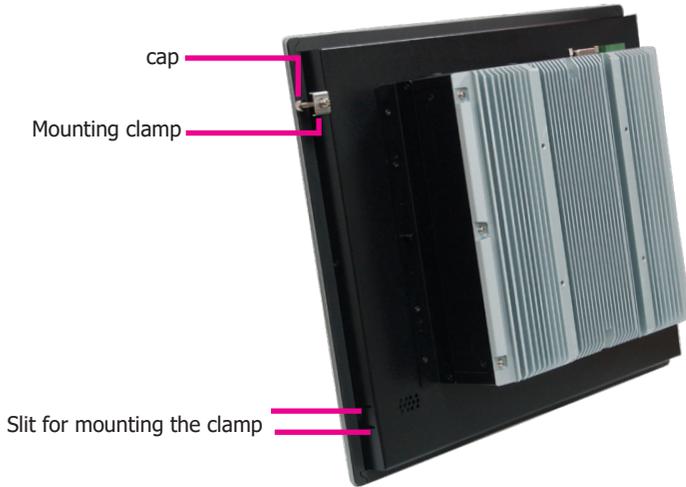
5. The first and second clamps must be positioned and secured diagonally prior to mounting the rest of the clamps. Tighten the clamp's screw using an electric screwdriver by pressing the flat cap onto the back of the panel.
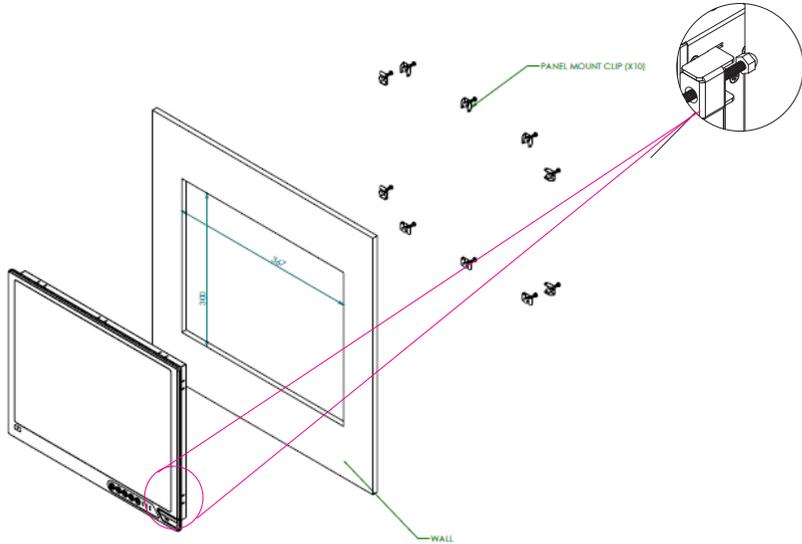
> **Note:**
> The maximum thickness of your panel's mounting wall should be 10 mm for secure panel mount.

Chapter 7 - BIOS Setup

Overview

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

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

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

Legends

KEYs	Function
Right and Left Arrows	Moves the highlight left or right to select a menu.
Up and Down Arrows	Moves the highlight up or down between submenus or fields.
<Esc>	Exits to the BIOS setup utility
<F1>	Displays general help
<F5/F6>	Changes the highlighted value
<F9>	Applies the default setup
<F10>	Saves changes and exits the setup program.
<Enter>	Press <Enter> to enter the highlighted submenu

Scroll Bar

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

Submenu

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

Insyde BIOS Setup Utility

Main

The Main menu is the first screen displayed when you enter the BIOS Setup Utility.

```
                          InsydeH20 Setup Utility                        Rev. 5.0
 Main  Advanced  Security  Boot  Exit
 Project Name            KS150-SD                   This is the help for the hour, minute,
 BIOS Version            B196.20B                   second field. Valid range is from 0 to
 Supported Processor     Intel 6th and 7th Generation CPU   23, 0 to 59, 0 to 59.  INCREASE/REDUCE :
                                                    +/-.
 Processor Type          Intel(R) Core(TM) i7-6700TE CPU @ 2.40GHz
 CPUID                   0x506E3 (SKYLAKE DT HALO)
 CPU Speed               2400 MHz
 CPU Stepping            03 (R0/S0/N0 Stepping)
 L1 Data Cache           32 KB
 L1 Instruction Cache    32 KB
 L2 Cache                256 KB
 L3 Cache                8192 KB
 Number Of Processors    4 Core(s) / 8 Thread(s)
 Microcode Rev           000000CC

 Total Memory            8192 MB
 System Memory Speed     2133 MHz
 DIMM 1                  [Not Installed]
 DIMM 2                  8192 MB

 PCH Rev / SKU           31 (D1 Stepping) / SKL PCH-H H110
 Intel ME Version / SKU  11.8.50.3399 / CONSUMER

 System Time             [13:28:33]
 System Date             [12/31/2019]



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

System Date

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

System Time

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

Advanced

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

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

```
                          InsydeH20 Setup Utility                        Rev. 5.0
 Main  Advanced  Security  Boot  Exit
                                                    ACPI Configuration Setting
 ▶ACPI Configuration
 ▶CPU Configuration
 ▶Video Configuration
 ▶Audio Configuration
 ▶SATA Configuration
 ▶USB Configuration
 ▶PCI Express Configuration
 ▶ME Configuration
 ▶Debug Configuration
 ▶UEFI Device Manager
 ▶SIO NUVOTON6106D
 ▶Console Redirection




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

ACPI Settings

This section configures the ACPI settings.

```
                          InsydeH20 Setup Utility                      Rev. 5.0
  Advanced
ACPI Configuration                                    Determines the action taken when the
                                                      system power is off and a PCI Power
Wake on LAN                  <Enabled>                 Management Enable wake up event occurs.
After G3                     <Always On>
Wake On RTC                  <Disabled>




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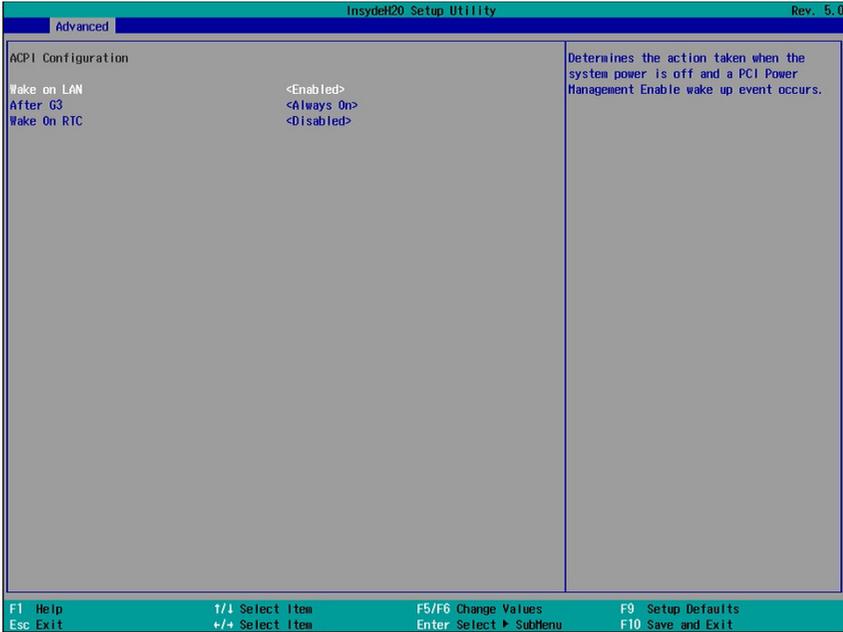
Wake on LAN

Enable the system to be woken up via its onboard Ethernet ports.

State After G3

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

Always on   Power on the system when power is re-applied after a AC power loss.

Always off Power off the system when power is re-applied after a AC power loss.

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> (00~23), <minute> (00~59), <second> (00~59).

CPU Configuration

This section configures the CPU.

```
                          InsydeH20 Setup Utility                      Rev. 5.0
  Advanced
CPU Configuration                                     Allows more than two frequency ranges to
                                                      be supported.
Intel Speed Step             <Enabled>
Turbo Mode                   <Enabled>
CPU C States                 <Enabled>
Hyper-Threading              <Enabled>




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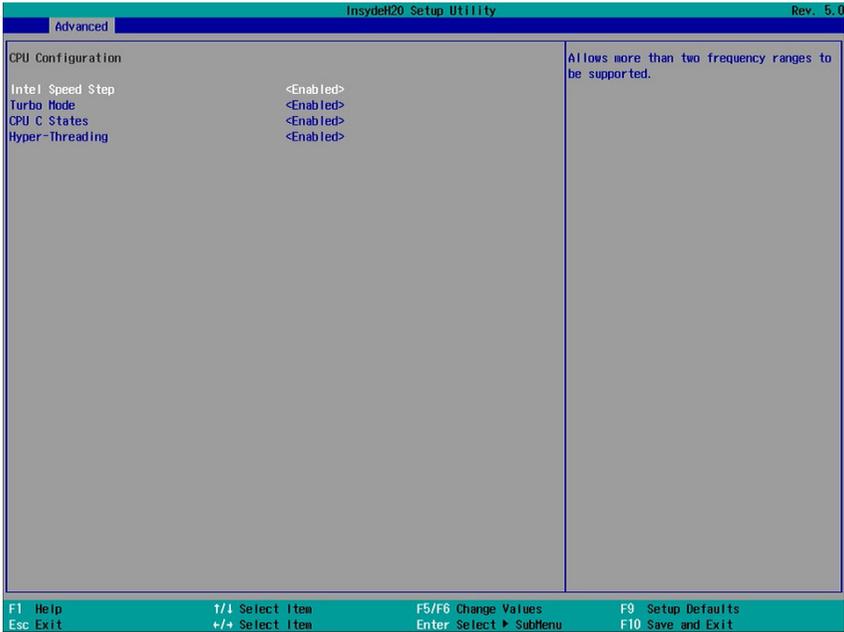
Intel® SpeedStep™

Enable or disable the Enhanced Intel SpeedStep® Technology (EIST). The EIST helps optimize the balance between system's power consumption and performance.

Turbo Mode

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

Video Configuration

This section configures the video settings. Note that the options may vary according to the "Boot type" selected in the "Boot" menu.
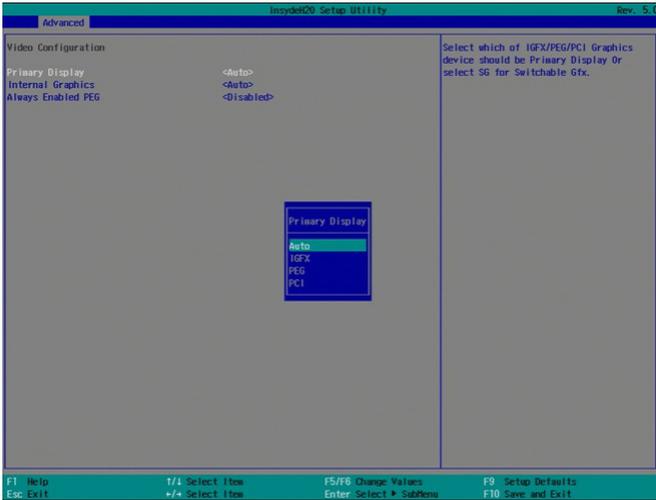
Primary Display

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). 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->PCI graphics devices->IGFX (internal graphics)

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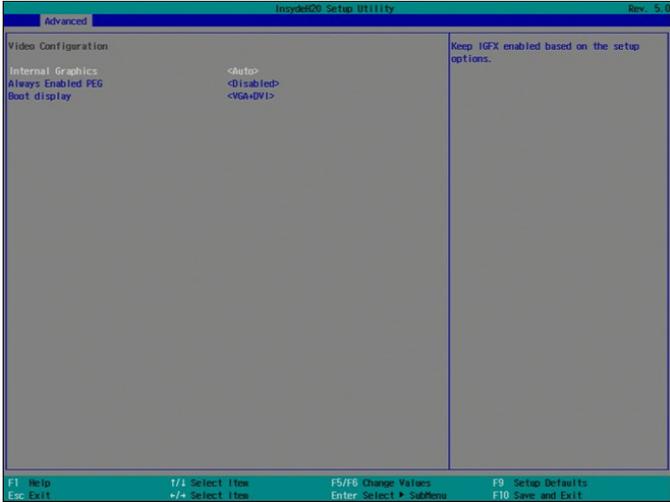
Internal Graphics

Enable, disable or to automatically detect internal graphics.
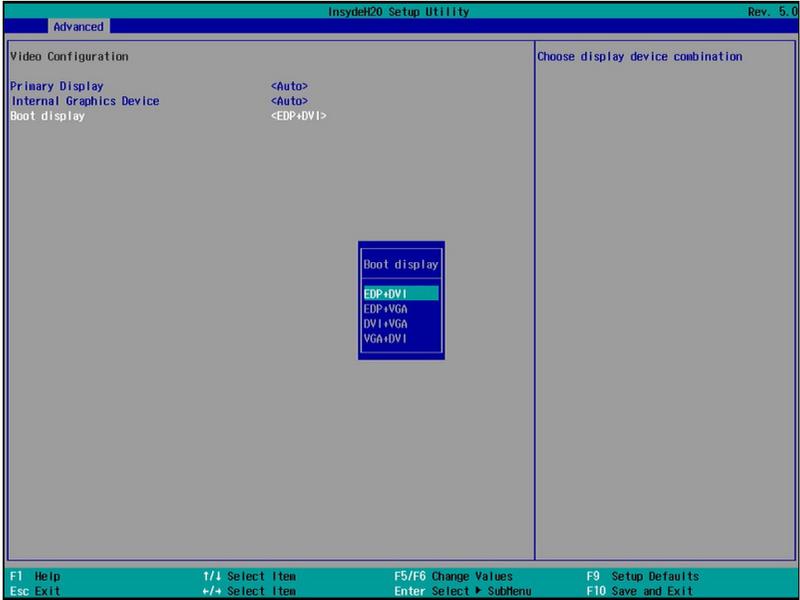
Boot display

Set the display device combination during system booting. Note that this option only appears when the boot type is dual or legacy boot type.

Audio Configuration

This section configures the audio settings.

SATA Configuration

This section configures the SATA controllers.
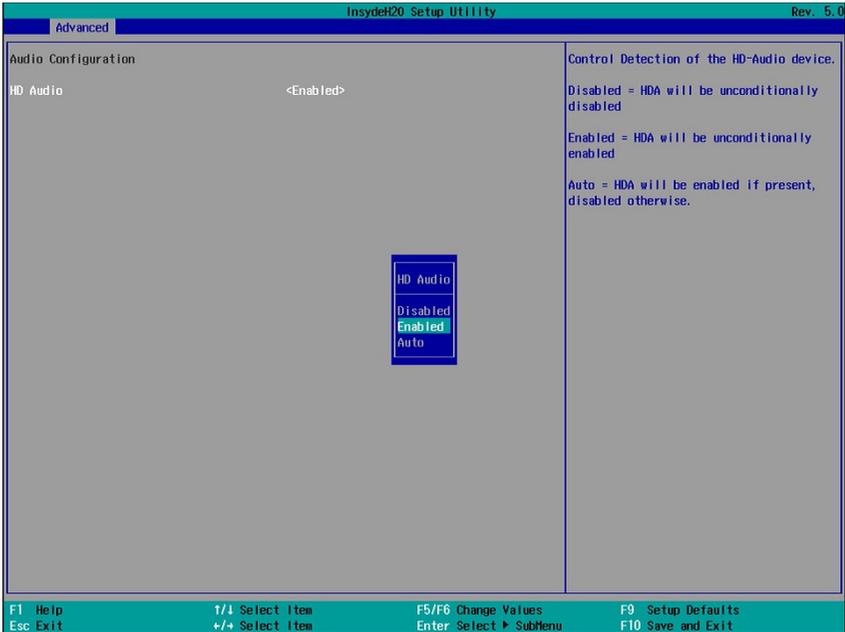
HD Audio

Control the detection of high-definition audio devices.

Disabled

The high-definition audio will be unconditionally disabled.

Enabled

The high-definition audio will be unconditionally enabled.

Auto

The high-definition audio will be enabled if present and disabled otherwise.
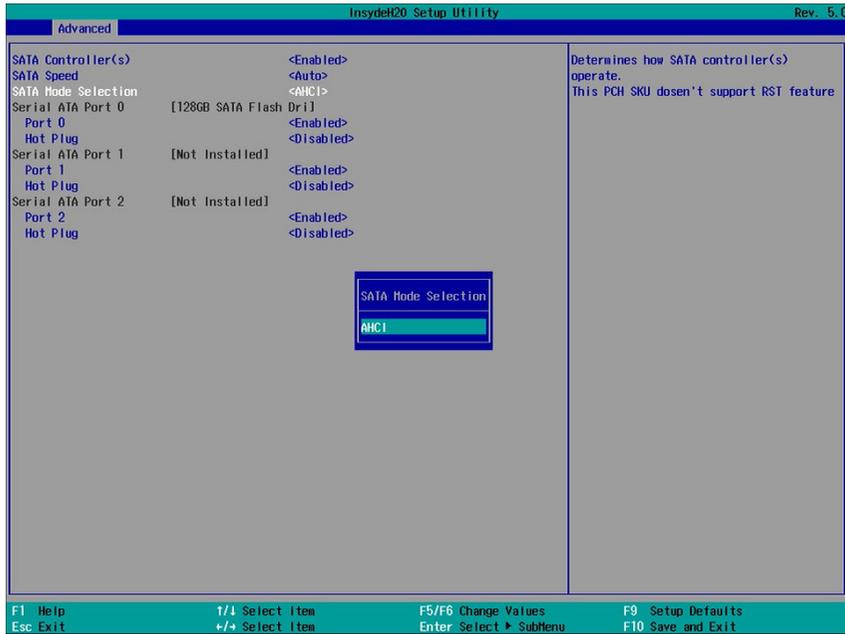
SATA Controller(s)

Enable or disable Serial ATA devices.

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).

Serial ATA Port 0, 1 and 2

Enable or disable each serial ATA port:
SATA Port 0 controls SATA3_0
SATA Port 1 controls SATA3_1
SATA Port 2 controls the half-size Mini PCIe slot

USB Configuration

This section configures the parameters of the USB devices.
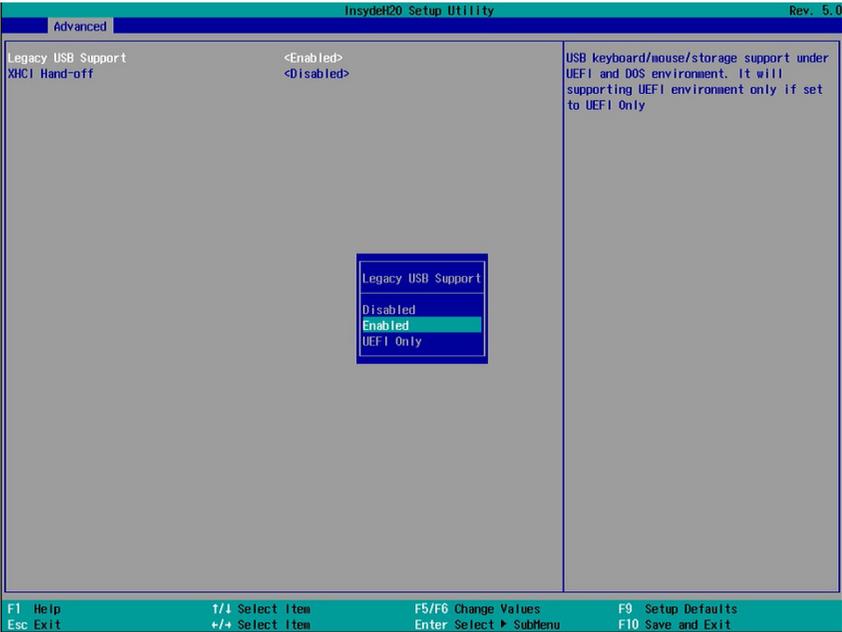
Legacy USB Support

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.
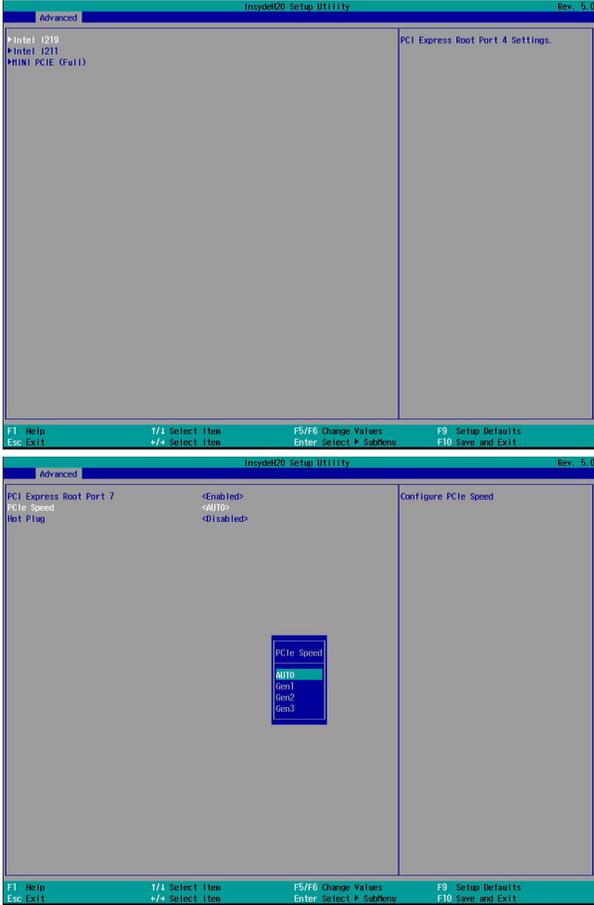
PCI Express Root Port

Enable or disable each PCI Express Root Port:

LAN 1: Intel I219V

LAN 2: Intel I211AT

Mini PCIe slot (full-size)

PCIe Speed

Select the speed for the PCI Express Root Port: Auto, Gen1 (2.5 GT/s), Gen2 (5 GT/s) or Gen3 (8 GT/s).

ME Configuration

This section configures flashing of Intel® Active Management Engine region.

```
                        InsydeH20 Setup Utility                    Rev. 5.0
     Advanced

 Me Fw Image Re-Flash            <Disabled>              Enable/disable to flash ME region




                              Me Fw Image Re-Flash

                              Disabled
                              Enabled









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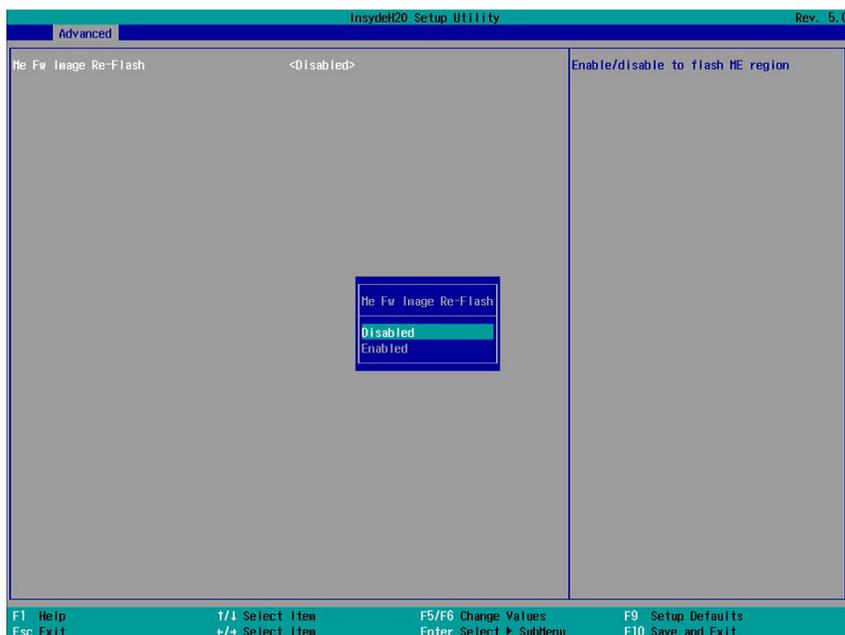
Me Fw Image Re-Flash

Enable or disable flashing of the Intel® ME region.

Debug Configuration

This section configures the debug function.

```
                        InsydeH20 Setup Utility                    Rev. 5.0
     Advanced

 Dynamic EFI DEBUG               <On>                    Enable it to output debug message from
 EFI debug print level          [0x80000000]            COM port.
 EFI debug serial port          [0x3F8]
 EFI debug baud rate            [115200]












 F1  Help              ↑/↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
 Esc Exit              +/- Select Item      Enter Select ▶ SubMenu    F10 Save and Exit
```
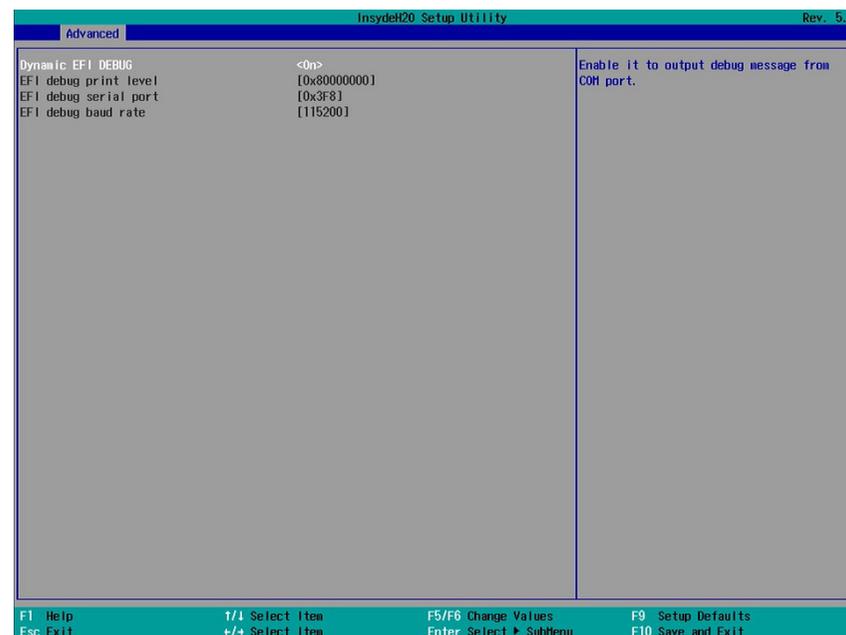
Dynamic EFI Debug

Enable or disable output of the log messages for debugging through a serial port.

If you select to enable this function, please set a serial port for this purpose with the following parameters:

EFI debug print level

Shows desired print level for displaying different type of log messages. The options are as follows:

0x00000001: Display messages of system initialization

0x00000002: Display warning messages

0x00000004: Display messages of Load events

0x00000008: Display messages of EFI File system

0x00000040: Display informational debug messages

0x80000000: Display Error messages

0x8000004F: Display all types of messages shown above

EFI Debug serial port

Shows the serial port number for message output: COM1 (0x3F8)

EFI Debug baud rate

Enter or choose the baud rate for serial communication. The default is 115200.

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. When this function is selected, the screen will warn you that you are going to exit the BIOS setup utility.
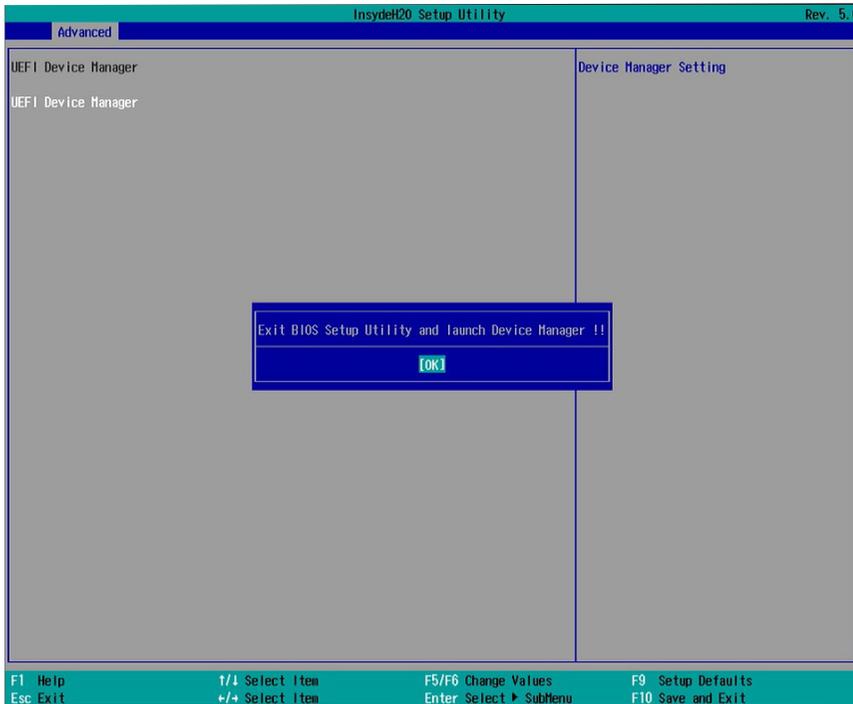
Network Device List

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.

Port 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 speed 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.

Wake on LAN

Enable the system to be woken up over the LAN via this Ethernet port.
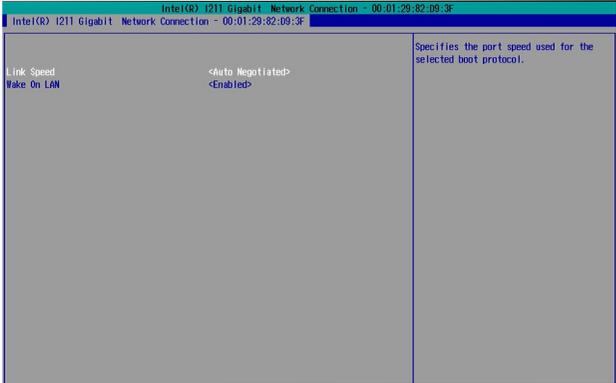
IPv4 Network Configuration

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.
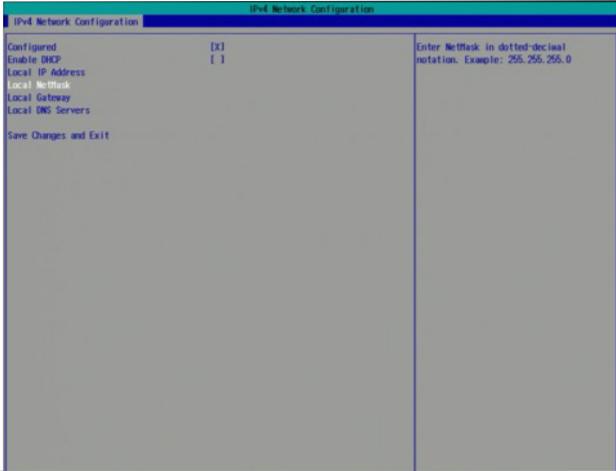
IPv6 Network Configuration

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 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

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

Smart Fan Function

This section configures the Smart Fan Function.
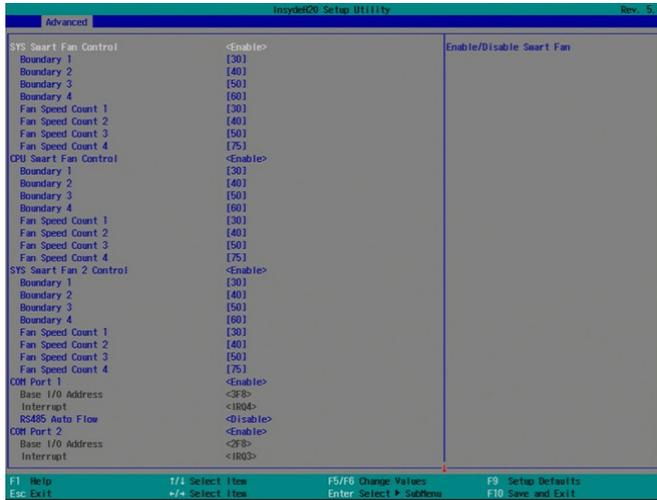
SYS Smart Fan/CPU Smart Fan/SYS Smart Fan2 Control

Enable or disable the smart fan.

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 127ºC.

Fan Speed Count 1 to Fan Speed Count 4

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

COM Port Configuration

This section configures serial port settings.
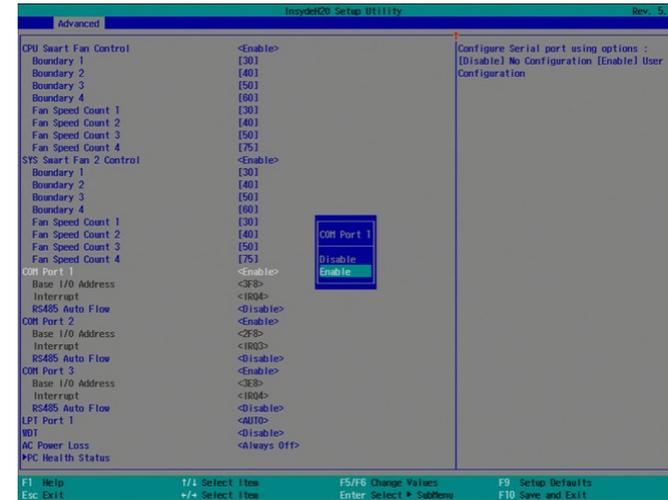
COM Port 1 to COM Port 4

Configure the settings of each serial port.

Disable Disable the serial port.

Enable Enable the serial port.

RS485 Auto Flow

Disable Disable the RS485 auto flow mechanism.

Enable Enable the RS485 auto flow mechanism.

LPT Port 1

Enable, disable or automatically detect the parallel port on the board.
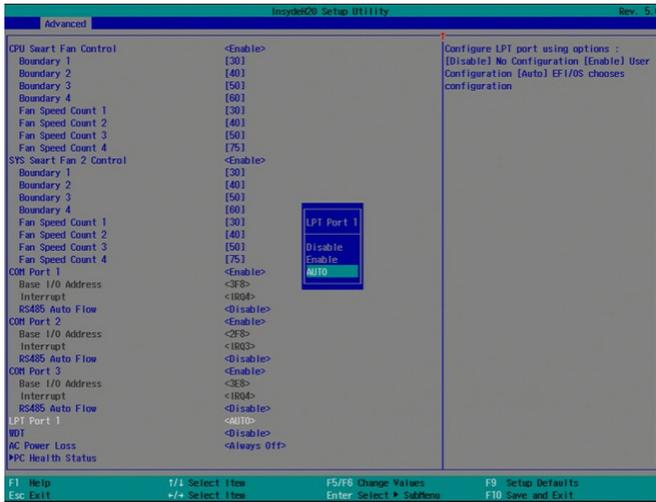
PC Health Status

This screen displays PC health information.
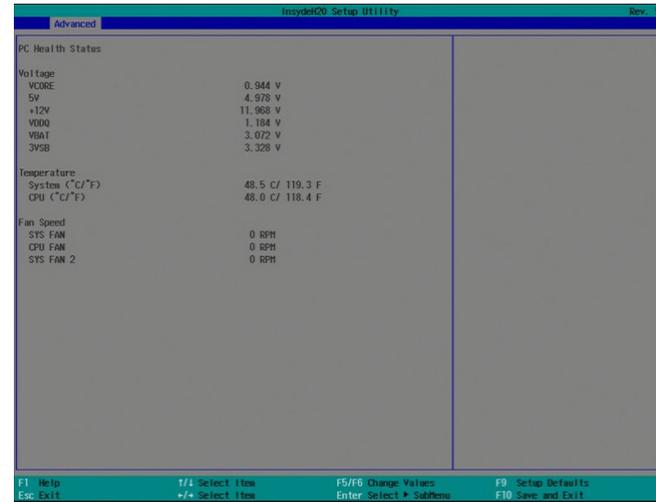
WDT

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

Security

This section configures the security for the BIOS Setup utility and the optional Trusted Platform Module (TPM) function.

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

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

 Set Supervisor Password
 Set All Hdd Password
 Set All Master Hdd Password

 ▶Storage Password Setup Page




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

TPM Availability

Show or hide the TPM availability and its configurations.

TPM Operation

Enable or disable the TPM function. It displays the following options:
- No Operation: No changes to current state.
- Disable: Disable and deactivate TPM / Enable: Enable and activate TPM.

Clear TPM

Remove all TPM ownership contents.

Set Supervisor Password

Set the administrative password. The length of the password must be greater than one character and less than or equal to 10 characters. Depending on the state of power-on password selected, the supervisor password may be required during POST or when entering the BIOS setup utility.

Power on Password
Select "enabled" to require users to input the supervisor password when the system is entering the POST (power-on self-test).

Boot

This section configures boot options.

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

 Numlock                     <On>                     Legacy Boot Order Settings
 Boot Type                   <Legacy Boot Type>
 PXE Boot to LAN             <Disabled>
 USB Boot                    <Enabled>

 ▶Legacy




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

Numlock
Select the power-on state for the numlock key.

Boot Type
Select the boot type. The options are Dual Boot Type, 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">"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.

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

Legacy Boot Menu

This section configures legacy boot order.
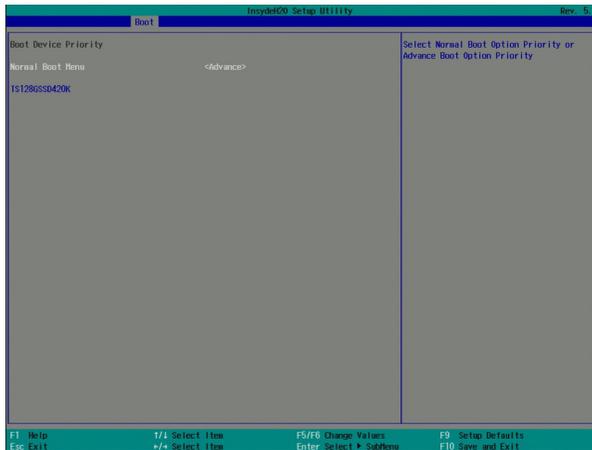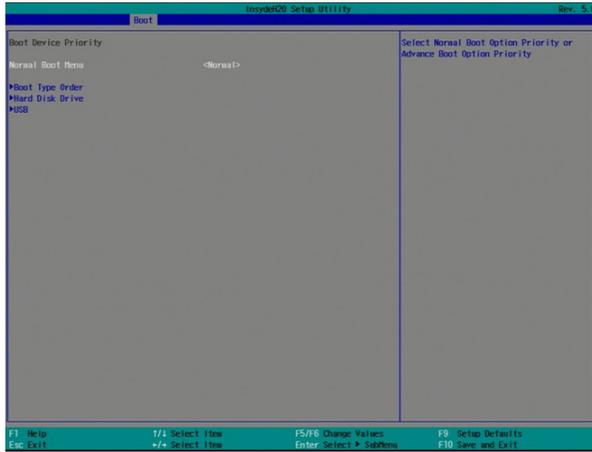
Normal/Advanced Boot Menu

Normal

Select the boot menu type: normal or advanced.

For advanced menu type: Use + and - keys to arrange the priority of the detected boot devices.

For normal menu type: Select the "Boot Type Order", "Hard Disk Drive" or USB category to view and arrange the order of the listed devices in each category.

Boot Type Order

Use + and - keys to arrange the sequence of storage devices that the system's hardware will check in the operating system's boot files. The first device in the order list has the highest boot priority.
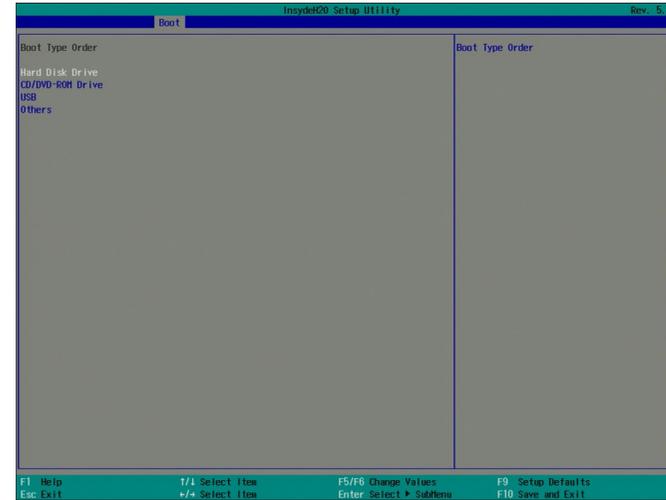
Hard Disk Drive

All installed hard disk drives will be displayed in this field. Use + and - keys to arrange the sequence of hard disk drives that the system's hardware will check in the operating system's boot files.
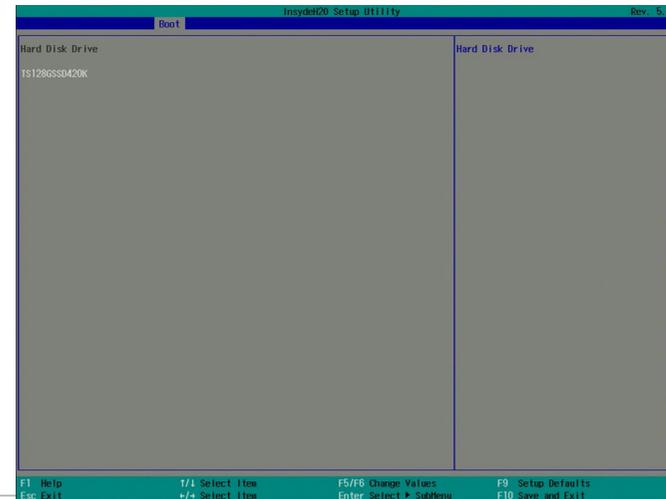
Exit

This section configures the parameters for exiting the BIOS menu.
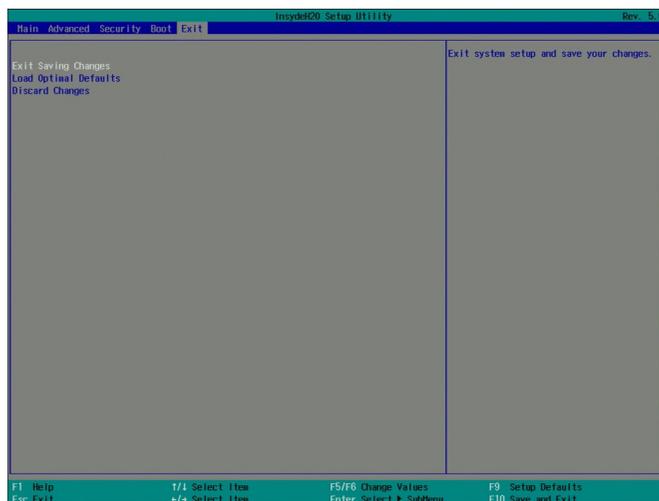
Exit Saving Changes

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

Load Optimal Defaults

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

Discard Changes

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

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 in 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.

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

                            Information
                    Please do not remove the AC power


            Insyde H20FFT (Flash Firmware Tool) Version (SEG) 100.00.08.10
            Copyright(c) 2012 - 2017, Insyde Software Corp. All Rights Reserved.

                            Initializing
                    Current BIOS Model name: SD263
                    New   BIOS Model name: SD263

                    Current BIOS version: B194.20B
                    New BIOS version: B196.20B

                    Updating Block at FFFFF000h
        0%      25%          50%          75%        100%
                                                        100%
C:\SD263>_
```

Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into the 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

Some devices of the system require drivers from hardware manufactures to operate properly. The system may come with a CD/DVD that contains drivers, utilities and software applications. Insert the CD into a CD-ROM drive. The auto-run screen (Mainboard Utility CD) will appear. If the "Autorun" does not automatically start, please go to the root directory of the CD and double-click "Setup".

If your product package does not include a CD/DVD, you can download the latest drivers from the DFI Download Center:

http://www.dfi.com/DownloadCenter

Once you are on 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:

•   Intel® Chipset Device Software

•   Intel® Graphics Driver

•   Intel® LAN Driver

•   Intel® ME Driver

•   Kernel Mode Driver Framework (KMDF) Driver

•   PenMount Windows Universal Driver

•   Intel® USB 3.0 Driver

•   Audio Driver

•   Intel® Serial IO Driver

•   TPM2.0 Hotfix

Intel Chipset Device Software

The Intel Chipset Device Software is used for updating Windows® INF files so that the hardware devices can be recognized and configured properly in the system. Note that the Intel Chipset Device Software does not install drivers for AGP or USB.

Follow these steps to install "Intel® Chipset Device Software":

1. Setup is ready to install the utility. Click "Next" to continue.
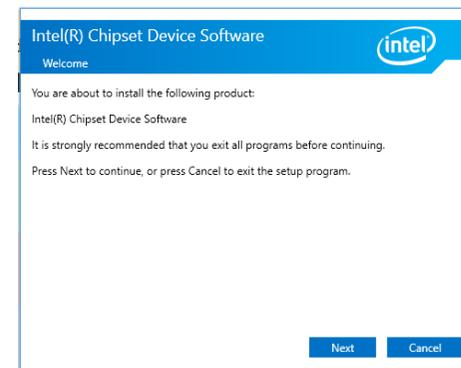
2. Read the license agreement and then click "Yes".
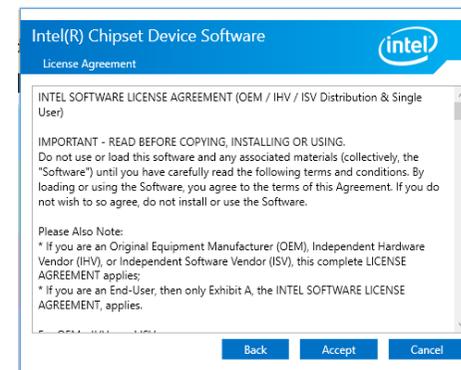
3. Go through the readme document for more installation tips and then click "Next".
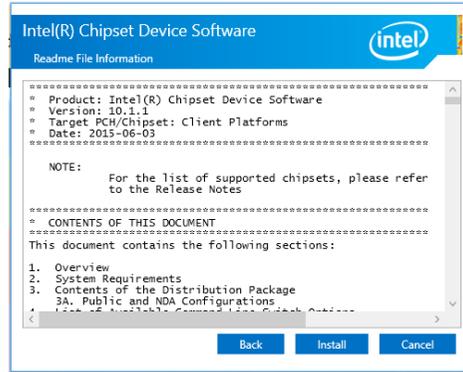
4. Click "Finish" to exit setup.

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

1. Setup is ready to install the driver. Click "Next" to continue.
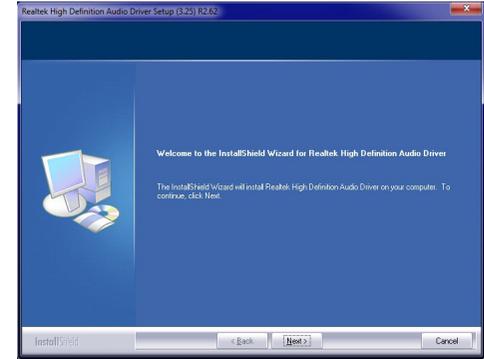
2. Click "Yes, I want to restart my computer now" and then click "Finish".

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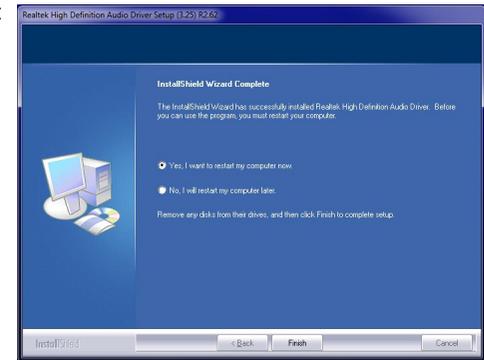
Intel Graphics Drivers

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

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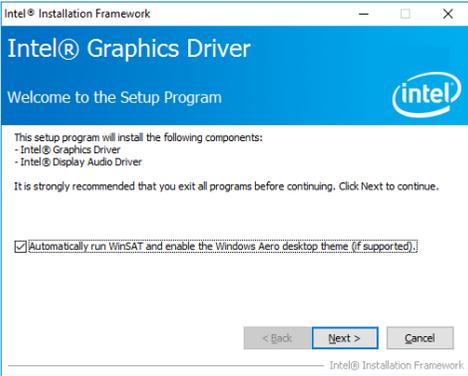
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after the graphics driver is installed and the system is rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/Windows 8.1/Windows 10 desktop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

2. Read the license agreement and then click "Yes".
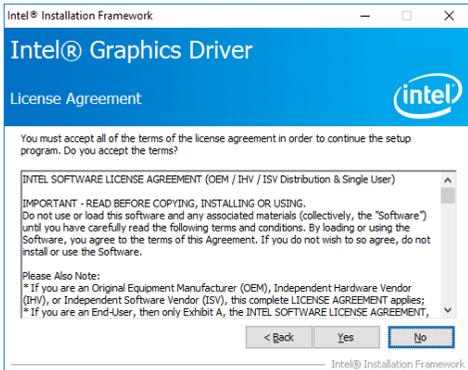
3. Go through the readme document for system requirements and installation tips and then click "Next".
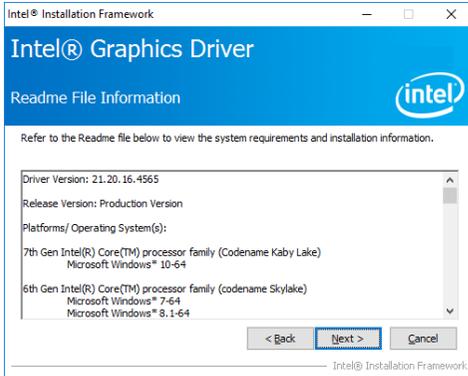
4. Setup is now installing the driver. Click "Next" to continue.
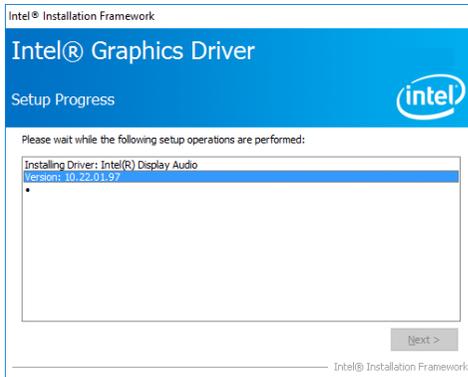
5. Click "Yes, I want to restart this computer now" and then click "Finish".

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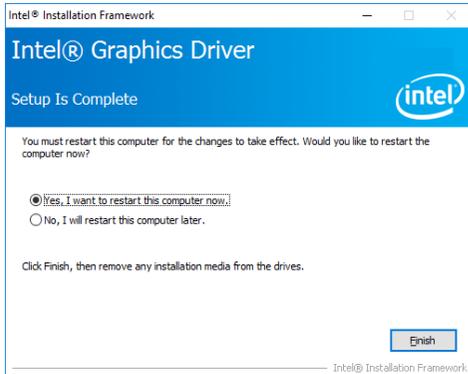
Intel LAN Drivers

Follow these steps to install "Intel LAN Drivers":

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".
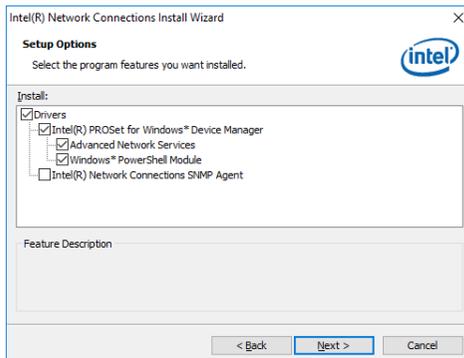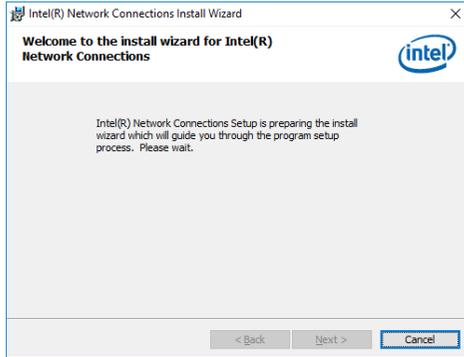
4. Click "Install" to begin the installation.
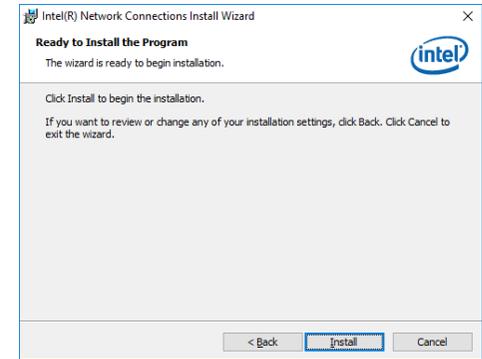
5. After the installation is complete, click "Finish" to exit setup.
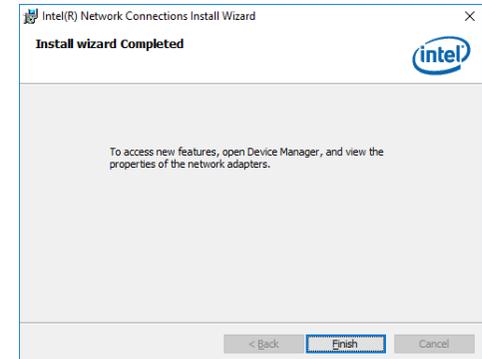
Kernel Mode Driver (For Windows 7 only)

Follow these steps to install "Microsoft Kernel Mode Driver Framework":

1. Click "Yes" to install the update.

2. The update is being installed now.
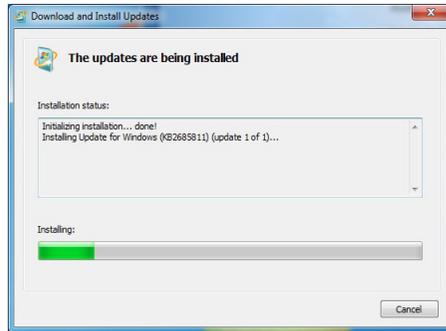
3. Click "Restart Now" to restart your computer when the installation is complete.

Intel Management Engine Drivers

Follow these steps to install "Intel® Management Engine Drivers":

1. Setup is ready to install the driver. Click "Next" to continue.
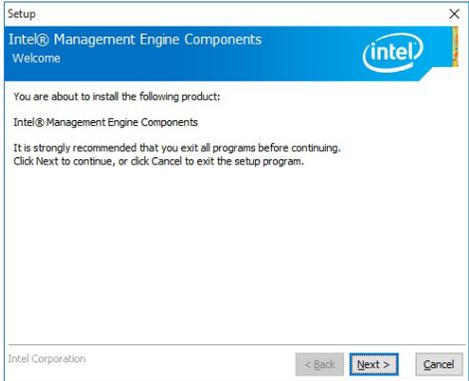
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree with the terms in the agreement, and then click "Next".
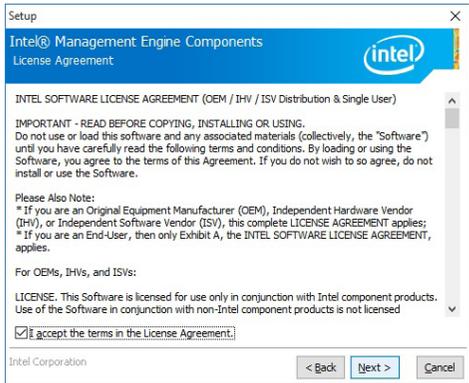
3. Setup is currently installing the driver. After the installation is complete, click "Next".
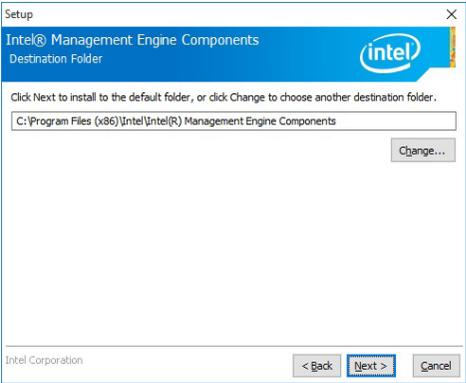
4. Please wait while the product is being installed.
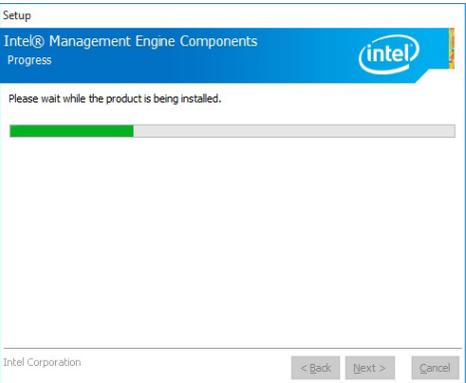
5. After the installation is complete, click "Finish" to exit setup.
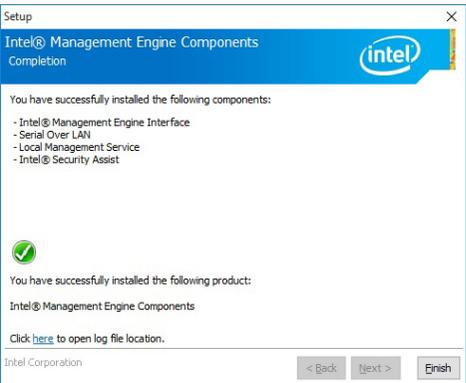
USB 3.0 Driver (For Windows 7 only)

Follow these steps to install "Intel® USB 3.0 Host Drivers":

1. Setup is ready to install the driver. Click "Next" to continue.
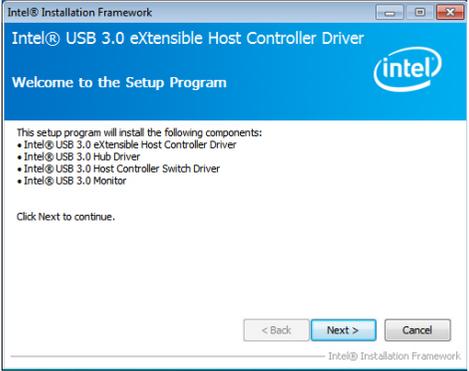
2. Read the license agreement and then click "Yes" if you agree with the terms in the agreement.
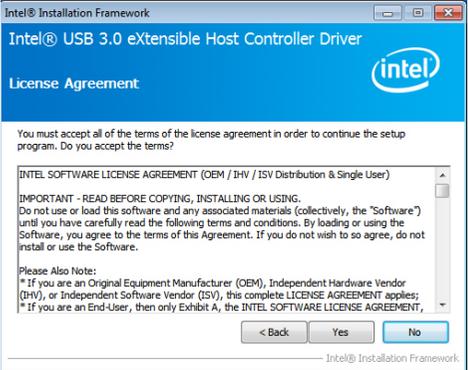
3. Go through the readme document for more installation tips and then click "Next".
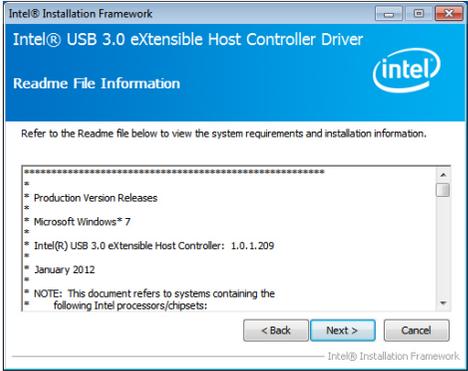
4. Setup is currently installing the driver. After the installation is complete, click "Next".
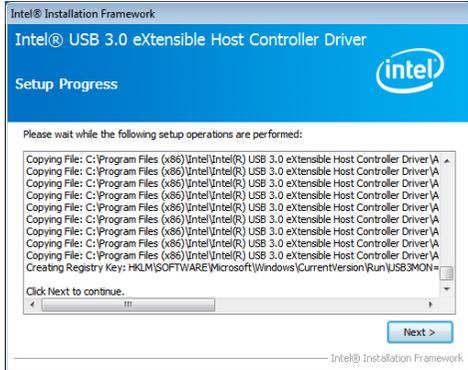
5. After the installation is complete, click "Finish".

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

Follow these steps to install "Intel® Serial IO Driver":

1. Setup is ready to install the driver. Click "Next" to continue.
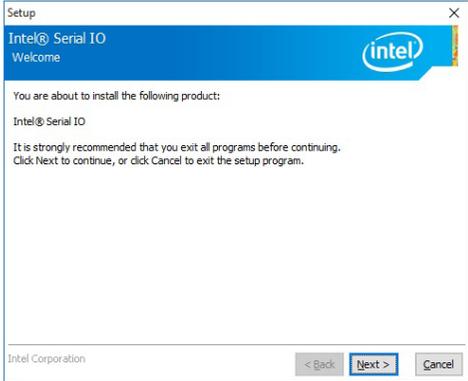
2. Read the license agreement carefully.

   Click "I accept the terms in the License Agreement" if you agree with the terms in the agreement and then click "Next".
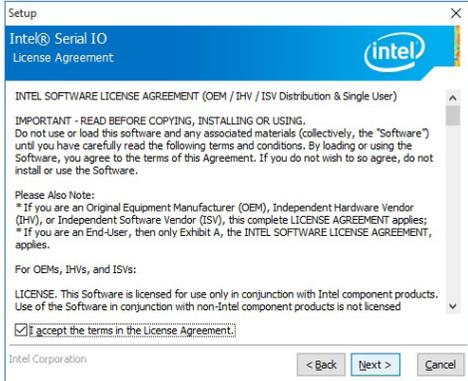
3. Read the file information and then click "Next".
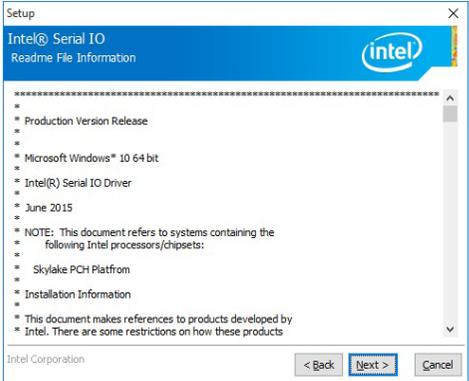
4. Setup is ready to install the driver. Click "Next" to begin the installation.
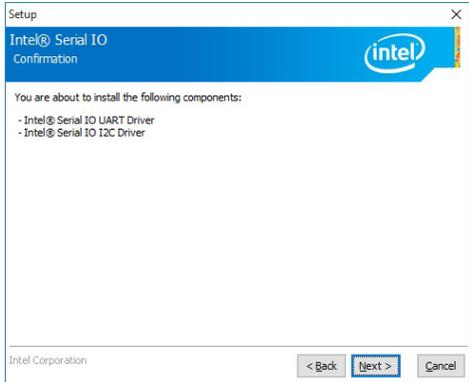
5. Setup is now installing the driver.
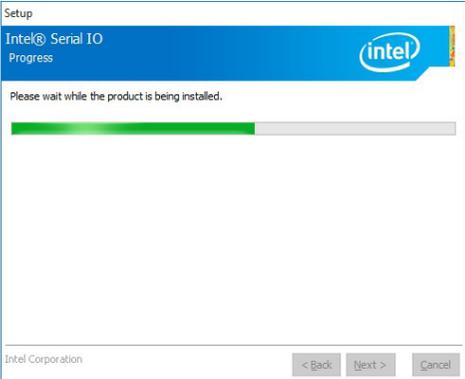
6. Click "Finish" to exit setup.

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.

Follow these steps to install "Microsoft Framework 4.5.2":

1. Setup is now extracting files.
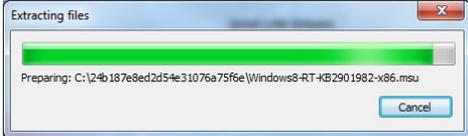
2. Read the license agreement carefully.

   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".
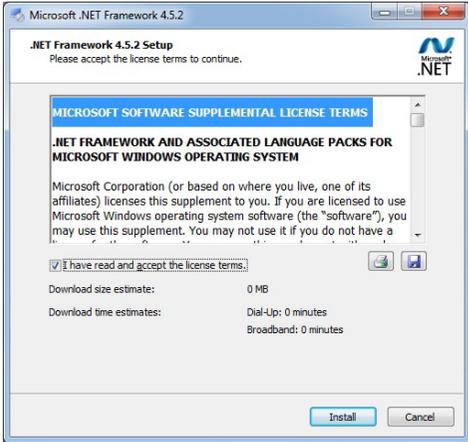
3. Setup is now installing the driver.
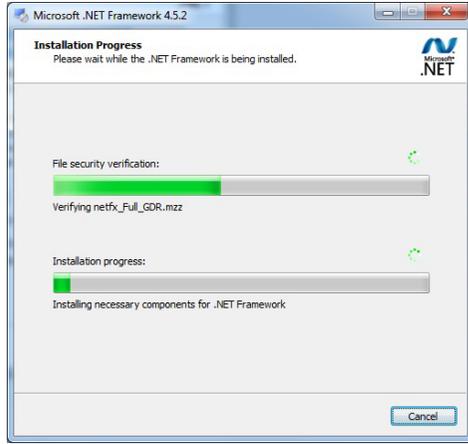
4. Click "Finish" to exit setup.
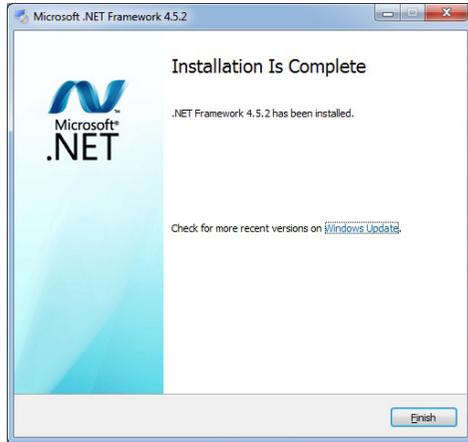
Infineon TPM Driver and Tool (optional)

Use these steps to install "Infineon TPM driver and tool (option)":

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 you agree with the terms in the agreement and then click "Next".

4. Enter the necessary information and then click "Next".
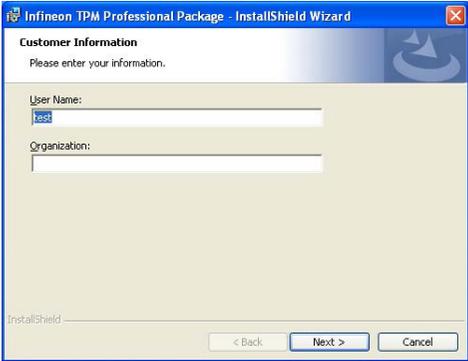
5. Select the setup type and then click "Next".

6. Click "Install" to start the installation.
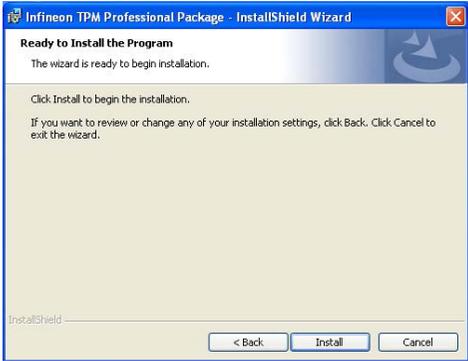
7. TPM requires installing the Micro-soft Visual C++ package prior to installing the utility. Click "Install".

8. Click "Finish" to exit setup. You must restart your system for the changes to take effect.

PenMount Windows Universal Driver

Use these steps to install "PenMount Windows Universal Driver":

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

2. Click on "I agree".
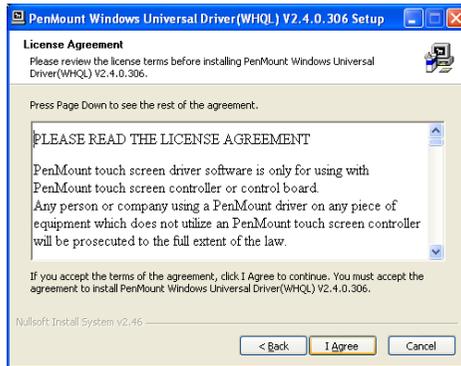
3. Click on "Browse" to install the driver in a different folder and select another folder. Click on "Install" to begin the installation.
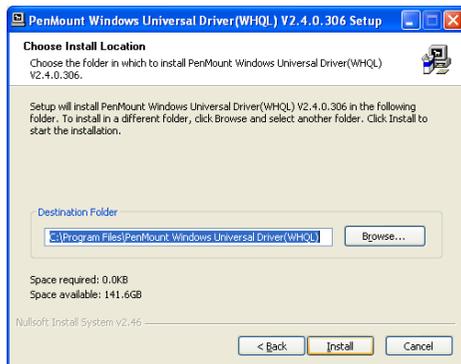
4. Setup is currently installing the utility.
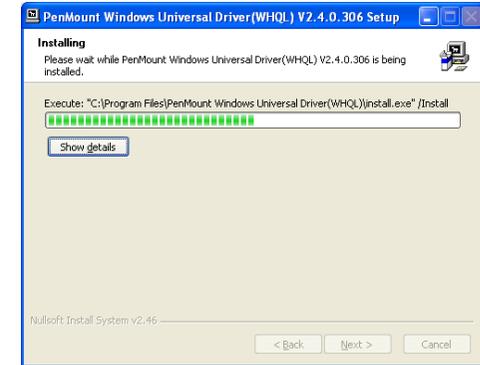
5. After completing the installation, click "Finish".

TPM 2.0 Hotfix (for Windows 7 only)

This hotfix is applicable to Windows 7 Service Pack 1 (SP1) installed with Trusted Platform Module (TPM) 2.0. In addition, your system must be 64-bit Windows and supports UEFI booting mode with Compatibility Support Module (CSM). It enables the use of BitLocker Drive Encryption with TPM 2.0.

Use these steps to install this hotfix:

1. Click "Yes" to install the Windows software update.

2. The update is being installed now.

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