



# **KSM-AL Series**

## **Modular Touch Panel PC**

### **User's Manual**



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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.

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## About this Manual

An electronic file of this manual can be obtained from the DFI website at [www.dfi.com](http://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 connectors by their ends.



### Important:

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

## Safety Measures

To avoid 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.

- Modular Touch Panel PC of different sizes
- One sheet of poron foam

## Optional Items

- VESA mount kit
- Panel mount kit
- Power cord

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

## Chapter 1 - Introduction

### Overview

#### KSM-AL Series

Top View



Bottom View



### Key Features

<b>Model Name</b>	<b>KSM-AL Series</b>
<b>Modular Design</b>	DFI's Adaptive Display Platform: integrating interchangeable box modules and panel modules
<b>Processor</b>	Intel Atom® Processor E3900 Series, BGA 1296
<b>In-vehicle Power Management</b>	Supports 24V / 9~48V power board modules with ignition control
<b>Touch Screen</b>	Resistive/P-Capacitive Touch Screen
<b>Wide Temp Range</b>	-20 to 70°C
<b>Protection</b>	IP65 Front Panel Protection

## Specifications

### Box Modules

<b>Processor</b>	Intel Atom® Processor E3900 Series, BGA 1296 Intel Atom® x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9.5W Intel® Celeron® Processor N3350, Dual Core, 2M Cache, 1.1GHz (2.4GHz), 6W
<b>Memory</b>	One 204-pin SODIMM up to 8GB Single Channel DDR3L 1866MHz
<b>BIOS</b>	Insyde SPI 128Mbit (supports UEFI support only)
<b>Graphics</b>	<ul style="list-style-type: none"> <li>Intel® HD Graphics</li> </ul> Display port: DP++ & VGA or DVI-D (DVI-D available upon request) DP++: resolution up to 4096x2160 @ 60Hz VGA: resolution up to 2560x1600 @ 60Hz DVI-D: resolution up to 1920x1200 @ 60Hz Triple Display: Panel Module, DP++, VGA or DVI-D Supported applications: OpenGL 4.2, DirectX 11.1, OpenCL 1.2, OpenGL ES 3.0 Supported Codecs: HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4 HW Encode: H.264, MPEG2, MPEG4
<b>Audio</b>	Realtek ALC262
<b>Storage</b>	1 x 2.5" SATA 3.0 Drive Bay (externally accessible) 1 x mini-mSATA (shared by half-size mini-PCIe socket)
<b>Expansion</b>	1 x Full-size Mini PCIe (USB/PCIe) 1 x Half-size Mini PCIe (USB/PCIe/mSATA) 1 x SIM Slot
<b>Audio Controller</b>	Realtek ALC262
<b>Ethernet Controller</b>	2 x Intel® I210AT PCIe (10/100/1000Mbps)
<b>Top I/O Ports</b>	2 x RS-232/422/485 (DB-9) 2 x RS-232/422/485 (available upon request); support 5V/12V Power 2 x GbE (RJ-45) (10/100/1000Mbps) Support Jumbo Frame, IEEE1588v2, WOL, PXE 802.3 af PoE (PSE), Individual Port 15.4W (available upon request)
	1 x Power button
	4 x Wi-Fi module antenna holes
	4 x DI / 4 x DO (10-pin terminal block) (available upon request)
<b>Bottom I/O Ports</b>	Distant power switch & reset switch Power management switch 2 x USB 3.0 (type A) 2 x USB 2.0 (type A) 2 x USB 2.0 (available upon request) 1 x Line-out & 1 x Mic-in port 1 x DC-in connector (terminal block) 1 x SATA Drive Bay 1 x DP++ & 1 x VGA or DVI-D port (DVI-D available upon request)
<b>Watchdog Timer</b>	System Reset, Programmable via Software from 1 to 255 Seconds
<b>Power</b>	24 VDC Input (available upon request) 9~48 VDC Input (available upon request) Power Management Includes Ignition On/Off and System On/Off Delay Time Control
<b>OS Support (UEFI only)</b>	Windows 10 IoT Enterprise 64-bit

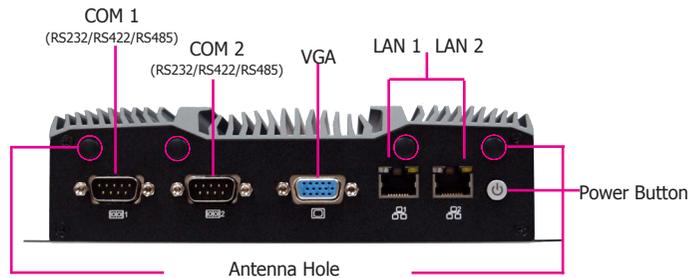
<b>Mechanism</b>	Construction: sheet metal IP Rating: IP65 front panel protection Mounting: VESA/panel mount (This is optional. Please contact your sales representative for more information.)
<b>Mounting</b>	Panel/VESA Mount
<b>Dimensions (W x H x D)</b>	Please refer to Panel Modules Specifications next page
<b>Weight</b>	Please refer to Panel Modules Specifications next page
<b>Environment</b>	<ul style="list-style-type: none"> <li>Operating Temperature Please refer to Panel Modules Specifications next page</li> <li>Storage Temperature Please refer to Panel Modules Specifications next page</li> <li>Relative Humidity 5 to 90% RH (non-condensing)</li> </ul>
<b>Tests and Certification</b>	Shock: Please refer to Panel Modules Specifications next page Vibration: Please refer to Panel Modules Specifications next page
<b>Certifications</b>	CE / FCC Class A
<b>Patent No. (Taiwan)</b>	I670589

## Panel Modules

Model Name	KSM121-AL	KSM150-AL	KSM170-AL	KSM190-AL	KSM070-AL	KSM101-AL	KSM156-AL	KSM185-AL	KSM215-AL
<b>Display type</b>	12.1" TFT LCD Panel	15" TFT LCD Panel	17" TFT LCD Panel	19" TFT LCD Panel	7" TFT LCD Panel	10.1" TFT LCD Panel	15.6" TFT LCD Panel	18.5" TFT LCD Panel	21.5" TFT LCD Panel
<b>Aspect Ratio</b>	4:3	4:3	5:4	5:4	Widescreen 16:9	Widescreen 16:10	Widescreen 16:9	Widescreen 16:9	Widescreen 16:9
<b>Max. Resolution</b>	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	800 x 480	1280 x 800	1366 x 768	1366 x 768	1920 x 1080
<b>Brightness (cd/m<sup>2</sup>)</b>	500	300	350	350	500	350	400	450	300
<b>Touch Technology</b>	Projected Capacitive / 5-wire Resistive				Projected Capacitive / 4-wire Resistive	Projected Capacitive / 5-wire Resistive			
<b>Backlight Lifetime (hours)</b>	30,000	70,000	30,000	70,000	40,000	25,000	50,000		
<b>Dimensions (W x H x D)</b>	308 x 265.3 x 77.9	387 x 320 x 80.5	404 x 363.8 x 80.9	467 x 400 x 80.5	224 x 163.55 x 72.9	275 x 212.3 x 72.9	407.3 x 277.3 x 6.1	472.1 x 314.1 x 80.9	544.2 x 360.6 x 80.9
<b>Weight</b>	TBD	5.3 kg	5.4 kg	7.6 kg	2.2 kg	TBD	TBD	5.7 kg	7 kg
<b>Front I/O &amp; LED (Optional)</b>	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED	1 x USB 2.0 Power LED HDD LED Alarm LED
<b>Environment</b>	Operating Temp: -20 to 70°C  Storage Temp: -40 to 80°C	Operating Temp: -20 to 70°C  Storage Temp: -30 to 70°C	Operating Temp: 0 to 50°C  Storage Temp: -20 to 60°C	Operating Temp: -20 to 70°C  Storage Temp: -30 to 85°C	Operating Temp: -20 to 70°C  Storage Temp: -30 to 80°C	Operating Temp: -20 to 70°C  Storage Temp: -30 to 80°C	Operating Temp: -0 to 60°C  Storage Temp: -20 to 60°C	Operating Temp: -0 to 60°C  Storage Temp: -20 to 60°C	Operating Temp: -0 to 60°C  Storage Temp: -20 to 60°C
<b>Shock</b>	Non-op : 200G, 2ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 11ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 20ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 20ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	TBD	Non-op : 240G, 2ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 20ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 20ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	Non-op : 50G, 20ms, half sine wave, 1 time for ± X, ± Y, ± Z direction
	Vibration	Non-op: 1.5G, 10 ~ 300 Hz sine wave, 10 min/cycle, 3 cycles each X, Y, Z direction	Non-op: 1.5G, 10 ~ 300 Hz sine wave, 10 min/ cycle, 3 cycles each X, Y, Z direction	Non-op : 1.5G , 10~200 Hz random, x, y, z each axis/30 min	Non-op : 1.5G , 10~200 Hz random, x, y, z each axis/30 min	Non-op: 1.5G, 10 ~ 300 Hz sine wave, 10 min/cycle, 3 cycles each X,Y, Z direction	Non-op: 1.5G, 10 ~ 300 Hz sine wave, 10 min/cycle, 3 cycles each X,Y, Z direction	Non-op : 1.5G , 10~200 Hz random, x, y, z each axis/30 min	Non-op : 1.5G , 10~200 Hz random, x, y, z each axis/30 min
<b>Auto Dimming (Opt.)</b>	Light Sensor				Light Sensor				

## Getting to Know the KSM-AL

### Top View



#### Power Button

Press to power on or power off the system.

#### COM Ports

COM 1 and COM 2 can be an RS232, RS422 or RS485 port.

#### LAN Ports

Connect a network device or a Ethernet cable for network connectivity.

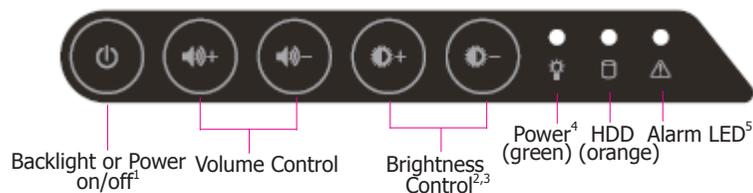
#### VGA Port

Connects the VGA port of a display.

#### Wireless Antenna Holes

Reserved for installing wireless antennas.

### Panel View\*



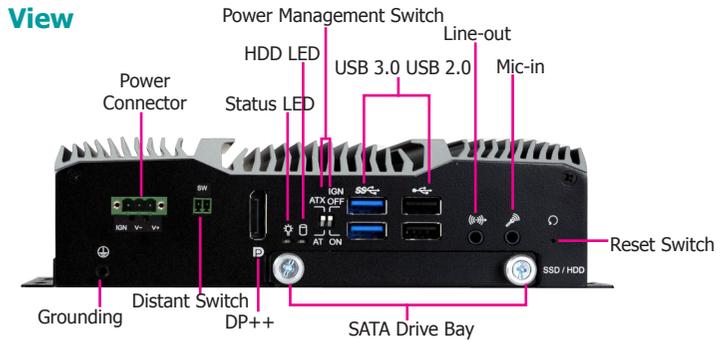
#### Notes on OSD Settings:

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.
4. Both the Status LED (on the box module) and Power LED (on the front OSD) will flash when the power on/off delay has been set in the BIOS.
5. The Alarm LED will be red when the CPU temperature reaches 100 °C (212 °F).



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

### Bottom View



#### DC-in Power Connector

Plug a power adapter into this 3-pin terminal block (or optional DC-in jack).

#### Line-out & Mic-in

Connects a speaker and a microphone.

#### USB 3.0 & USB 2.0 Ports

Connect USB 3.0 devices as well as devices from previous version such as USB 2.0 or USB 1.1.

#### DP++ Port

Connects to the dual-mode DisplayPort of a display.

#### VGA Port

Connects to the VGA port of a display.

#### Power Management Switch

AT Mode: The system powers on when power is applied.

ATX Mode: The system powers on via the power button or the auto power-on setting in the BIOS.

IGN Mode: The system powers on via the ignition control with settings of on/off delay in the BIOS, plus low-voltage protection (i.e. the system will not power on if the car battery's voltage is below 10.5, 21V and 42V for 12V input, 24V and 48V input respectively). Note that for this mode to work, please switch the AT/ATX mode to ATX. Also note this mode is not available for systems with a DC-in jack (optional).

#### Remote Switch

Connects distant power switch.

#### Reset Switch

Press to reset the system without powering off the system first.

#### SATA Drive Bay

Insert a SATA drive.

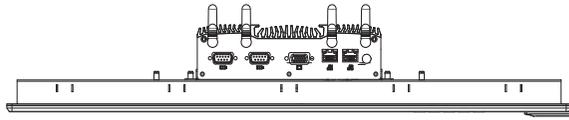
#### HDD LED (Yellow)/ Status LED (Green)

Indicates the status of hard disk drives/system operation.

HDD LED			Status LED			
HDD State	Disk access activity	Disk drives present or not present	System Status	Powered on	Power-on Power-off Delay enabled in the BIOS	S4, S5 Power States
LED Behavior	Blink	Off	LED Behavior	Always ON	Blinking	Off

Mechanical Dimensions

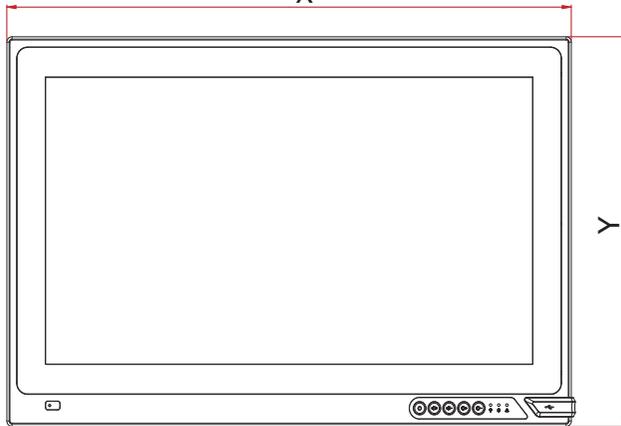
Top View



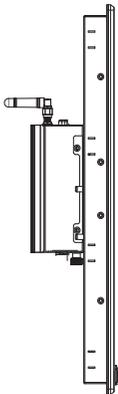
X

Y

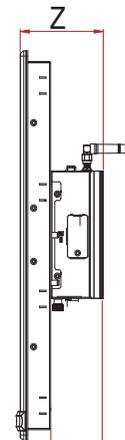
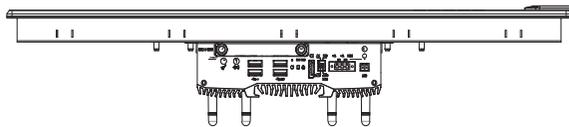
Front View



Left View

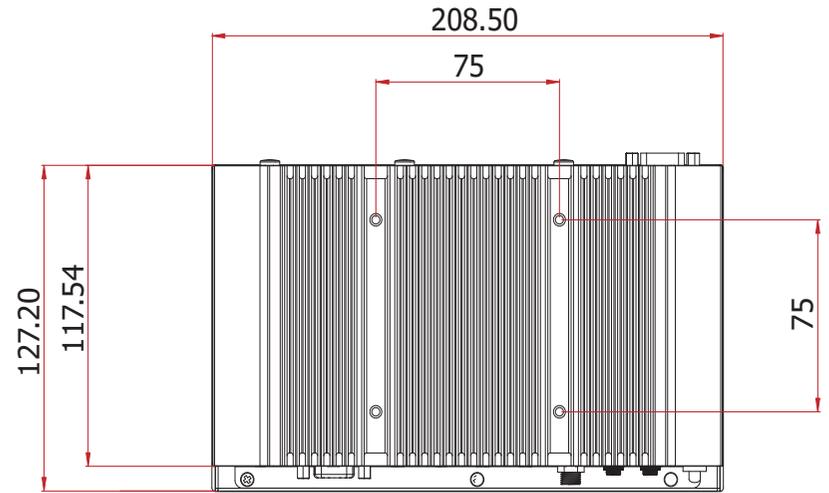


Bottom View



50.80

Right View



Display Type	System Dimensions (mm)		
	X1	Y1	Z1
7" LCD	224	163.55	72.9
10.1" LCD	275	212.3	72.9
12.1" LCD	308	265.3	77.9
15" LCD	387	320	80.5
15.6" LCD	407.3	277.3	76.1
17" LCD	404	363.8	80.9
18.5" LCD	472.1	314.1	80.9
19" LCD	467	400	80.5
21.5" LCD	544.2	360.63	80.9

## Chapter 2 - Getting Started

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### Preparing the System

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

- SATA HDD or mini-mSATA card
- AC power adapter

### Installing Devices

The following devices can be installed in the system.

- SODIMM
- mini-mSATA cards
- Mini PCIe 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 BIOS setup utility.

### Installing an 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 HDD or mini-mSATA card is already installed.

1. Refer to the following chapters for information on installing a SATA HDD or mini-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 Devices

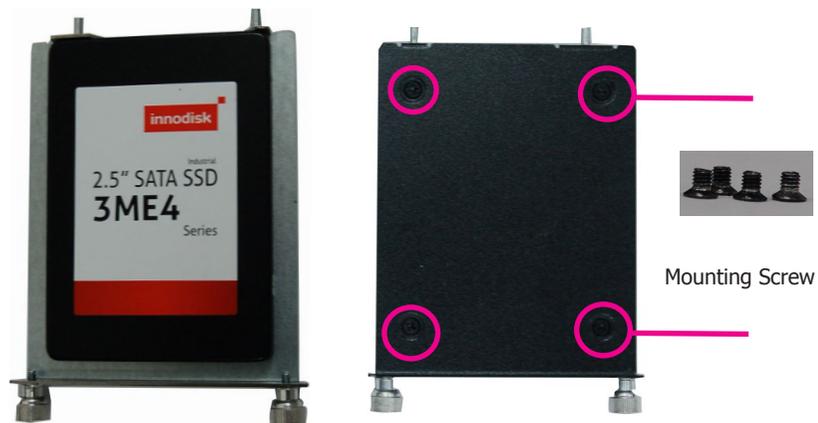
### Installing a SATA Drive

The SATA drive tray can be easily accessed without opening the system. However, the system does not support hot-swapping hard drives; turn off the system first.

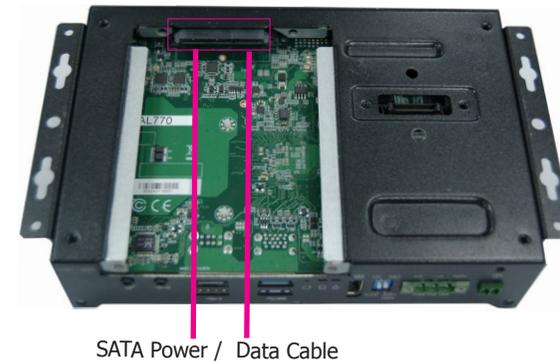
1. Locate the drive tray on the bottom panel and open it by releasing the thumbscrews.



2. Position the HDD on the drive tray and align the mounting holes of the HDD with the mounting holes of the drive tray. Then fasten the HDD with the provided mounting screws.



3. Slide the HDD into the drive bay by aligning the HDD's data and power connectors with the system's SATA data and power connectors. Then close the drive tray and secure the drive in place with the thumbscrews.



## Installing a SIM Card

The SIM card socket can be accessed without opening the chassis. It is located on the side of the box module.

1. Remove the screw to open the slot.

Side View



SIM Card Slot Screw

2. Insert the SIM card into the slot. Please place the card with the IC facing down and the angled corner facing toward the socket so that it will be in contact with the system board.



### Note:

Be sure to insert the SIM card completely into the socket; you should feel a force of the spring that locks the card in place. To release the card, push it inward to unlock it.

## Removing the Chassis Cover

Installing internal components requires you to remove the chassis. Please use the following procedure to open 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 4 mounting screws on the rear side 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.

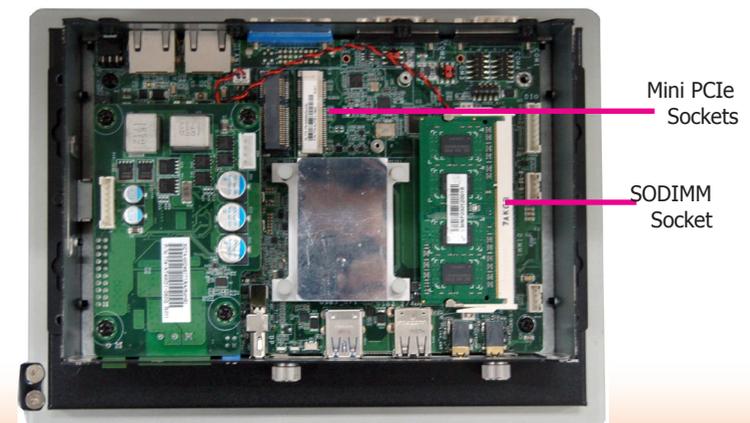


Mounting Screw



Mounting Screw

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

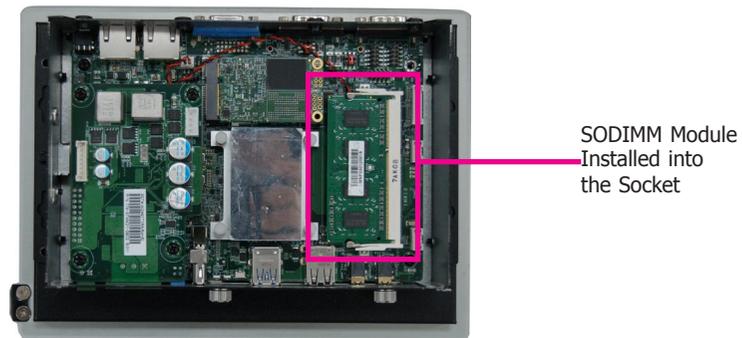
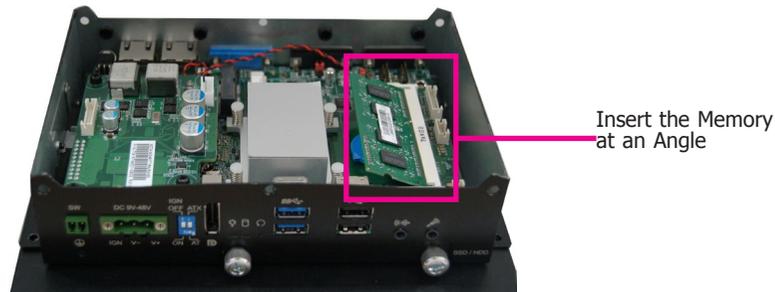


Mini PCIe Sockets

SODIMM Socket

## Installing a SODIMM

The system supports one DDR3L SODIMM socket. To install a memory module, grasp the memory module by its edges and align the module'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.



### Note:

The system can only accept DDR3L SODIMM modules. Please do not install any other types of memory modules.

## Installing a Mini PCIe Card/mini-mSATA

The system board is equipped with 2 Mini PCIe slots: one full-size (black) and one half-size (white) slots. Here we will demonstrate the installation of a full-size Mini PCIe card (working in conjunction with a SIM card) for 3G/4G connectivity.

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



2. Push the Mini PCIe card down and use the provided mounting screws to secure the card on the system board.

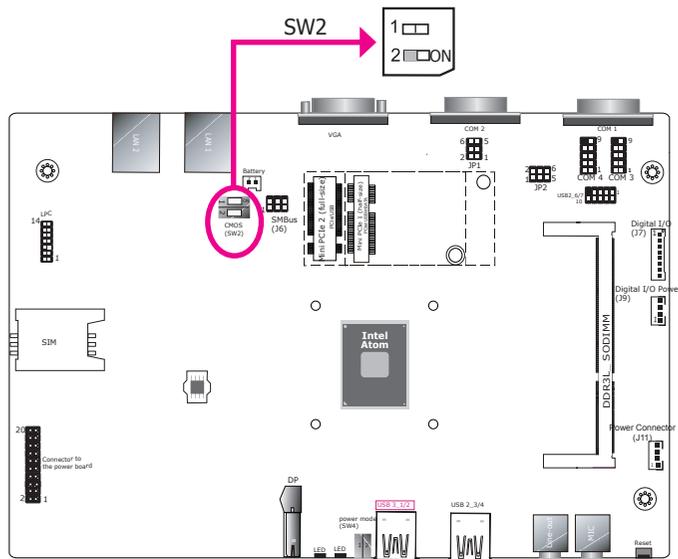


### Note:

The system has one additional half-size Mini PCIe slot that supports Mini PCIe and SATA interfaces. You can switch between these interfaces via the BIOS setup utility.

## 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:

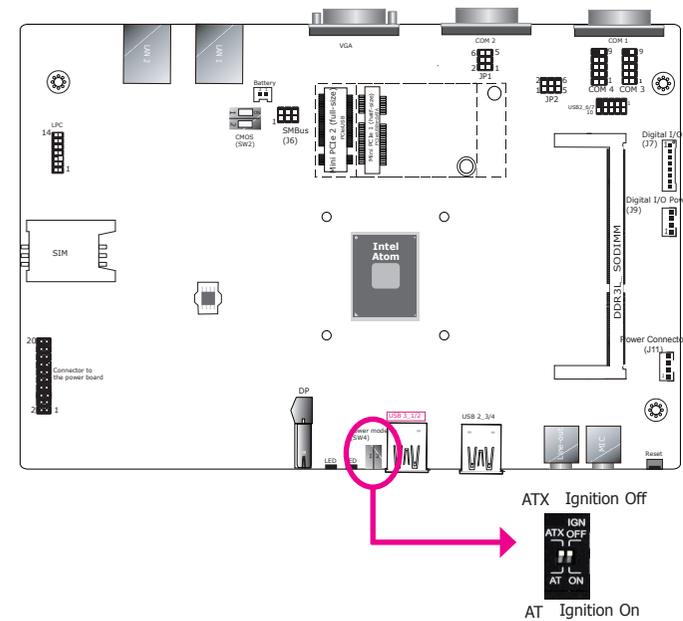
- CMOS data becomes corrupted.
- You forgot the supervisor or user password.

To load the default values stored in the ROM BIOS, please follow these steps below:

- Power off the system and unplug the power cord.
- Adjust SW2-2 to "On". Wait for a few seconds and set the switch back to its default position "Off".
- Now plug the power cord and power on the system.

Clear CMOS Data	SW2-2
Normal (default)	SW2-2 Off
Clear CMOS	SW2-2 On

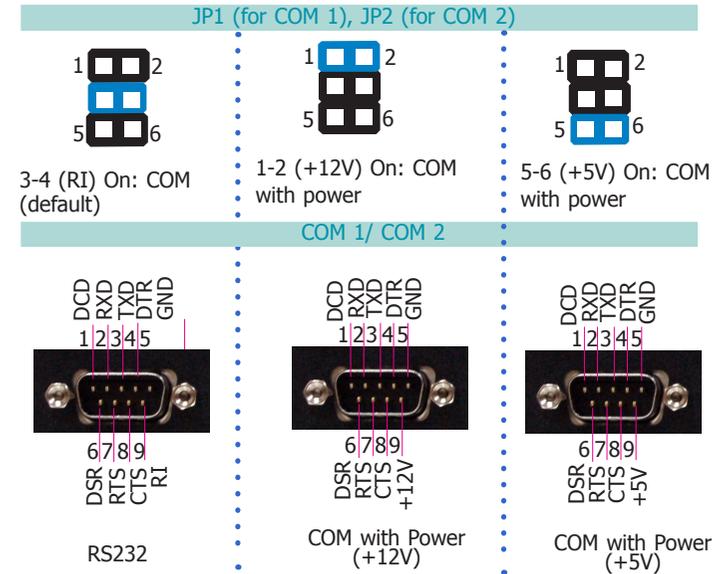
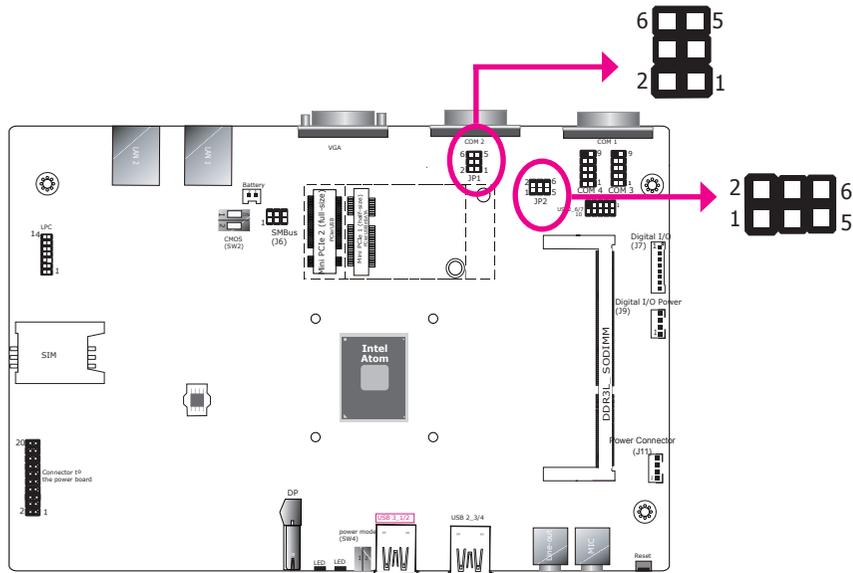
### Power-on Mode Select



Switch 4 is used to select the power-on mode.

Power-on Mode Select	SW4
Power-on via AT/ATX power	On (AT)/Off (ATX, default)
Power on via Ignition	On/Off (default)

Power over Serial

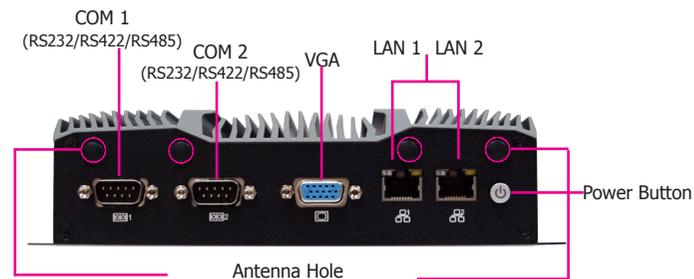


JP1 (for COM 1) and JP2 (for COM 2) are designed to configure the Serial COM ports to provide power. The pin functions of COM 1 and COM 2 will vary according to the jumpers' settings.

COM Power Select: COM1 (JP1), COM2 (JP2)	
COM (default)	3-4 (RI: No.9 pin)
COM with power	5-6 (+5V), 1-2 (+12V) On

## Chapter 5 - Ports and Connectors

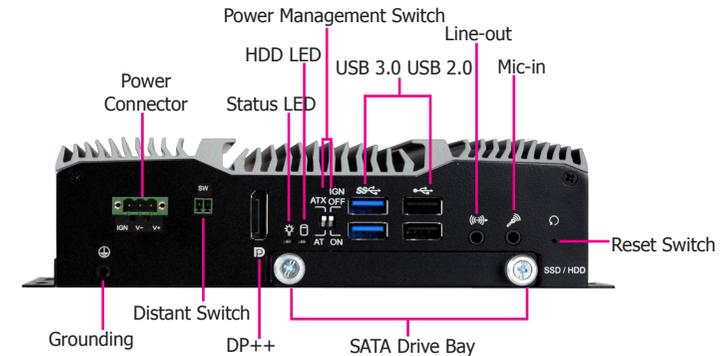
### Top Panel I/O Ports



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

- Buttons & LEDs:  
Power button with LED (Green)
- Serial Communication Ports:  
COM 1 and COM 2 can be an RS232, RS422 or RS485 port.
- Display Ports:  
VGA
- Ethernet Ports:  
LAN 1 & LAN 2

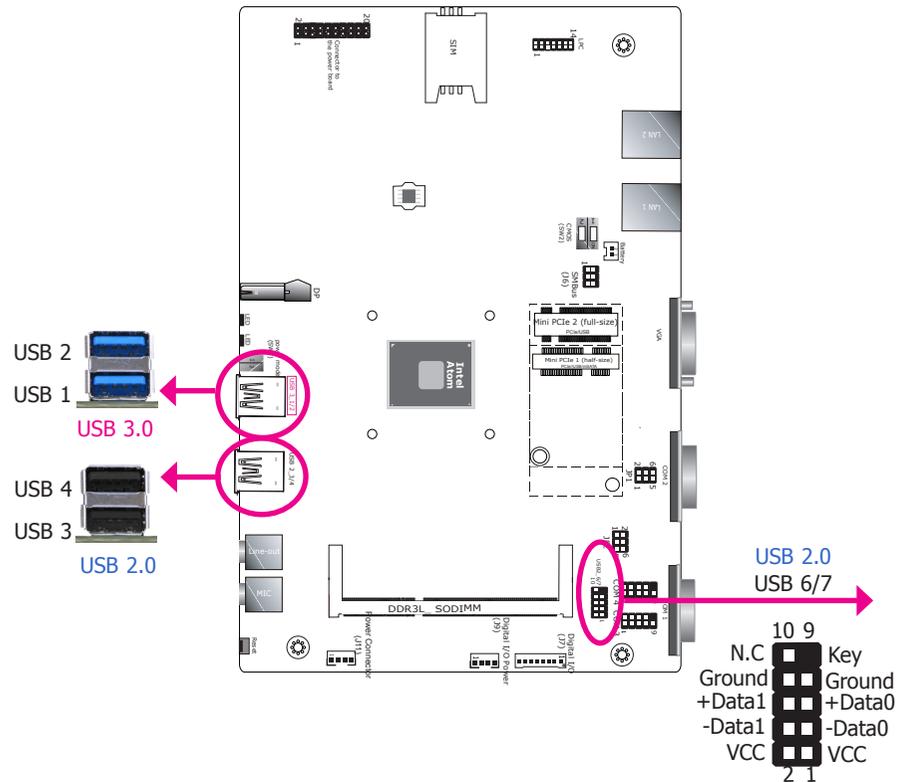
### Bottom Panel I/O Ports



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

- Buttons, Switches & LEDs:  
Reset switch  
Power management switch (ignition on/off control & AT/ATX mode)  
Remote power-on switch  
HDD LED (Yellow) and status LED (Green)
- Audio Ports:  
Line-out & microphone ports
- Power Connector:  
3-pin terminal block with ignition control
- Display Ports:  
DP++ port
- USB Ports:  
2 USB 3.0 ports & 2.0 ports
- SATA Drive Bay

## 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 2 onboard USB 3.0 ports (USB 1 & USB 2) and 2 onboard USB 2.0 ports (USB 3 & USB 4). The 10-pin connector allows you to connect 2 additional USB 2.0 ports (USB 6-7).

## BIOS Setting

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

## Driver Installation

You may need to install the proper drivers in your operating system to use USB devices. Refer to Chapter 8 for more information.

## Wake-On-USB Keyboard/Mouse

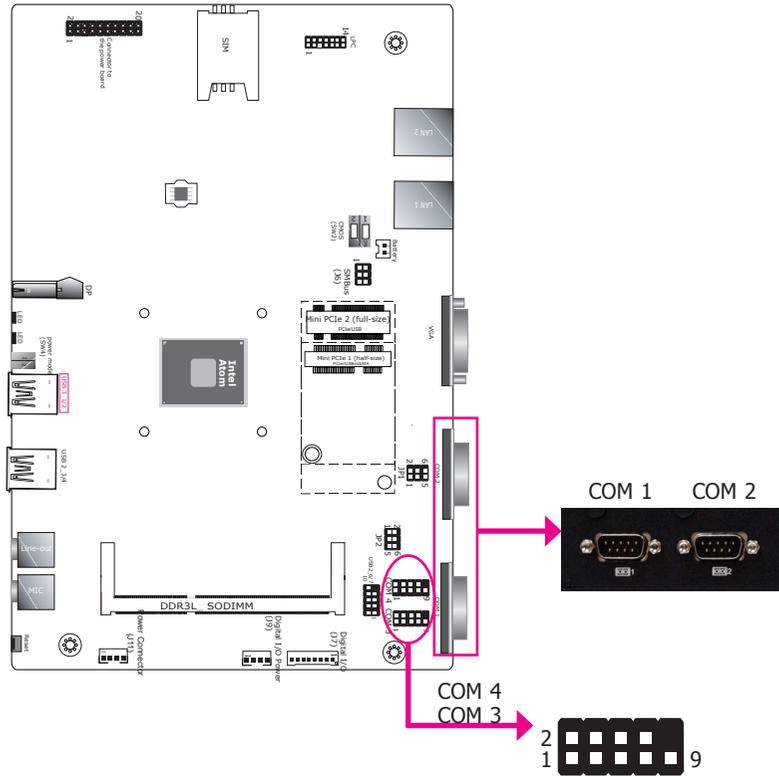
The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.



### 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  $\geq 1.5A$ . For 3 or more USB ports, the +5V\_standby power source of your power supply must support  $\geq 2A$ .

## COM (Serial) Ports



COM 1 to COM 4 can be selected among RS232, 422 and 485. In addition, COM 1 and COM 2 can be selected to supply +12V or +5V power on Pin 9 (default: RI).

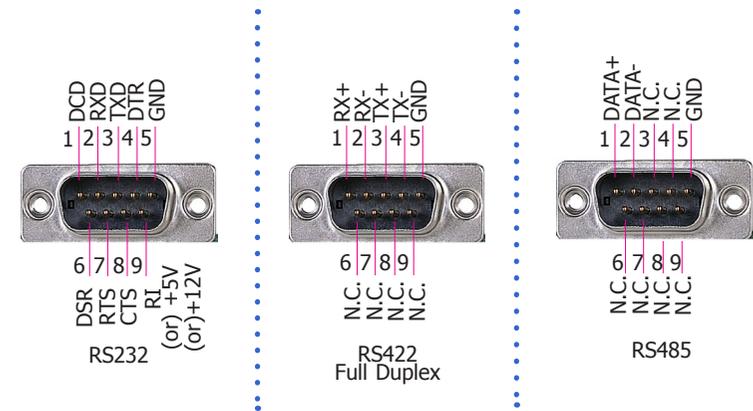
Please use the BIOS setup utility to configure serial port communication mode for COM 1 to COM 4.

### BIOS Setting

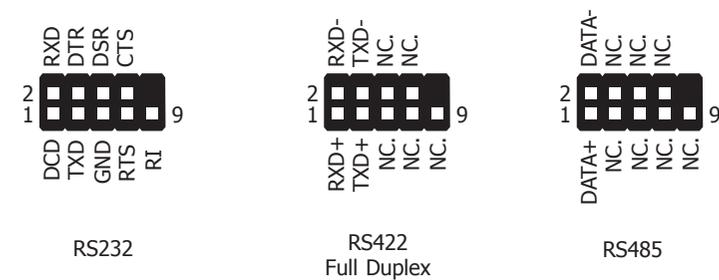
Configure the serial ports including the serial communication mode in the Advanced Configuration ("Super I/O Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.

## COM Port Connector

COM 1/ COM 2 (RS232 with Power /422/485) / COM 2 (RS232 with power/422/485)



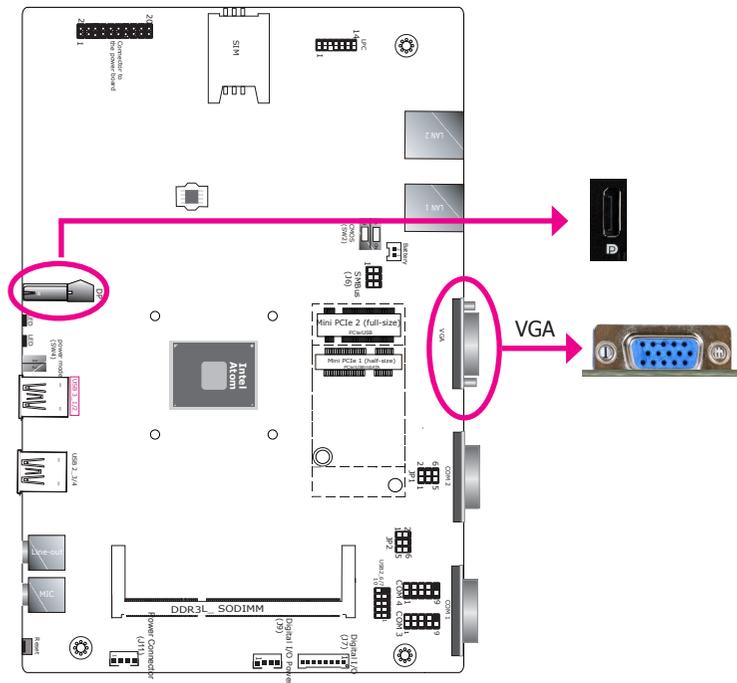
COM 3/ COM 4 (RS232/422/485)



## Graphics Interfaces

The display ports consist of the following:

- 1 VGA port
- 1 DP++ port



### VGA Port

The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

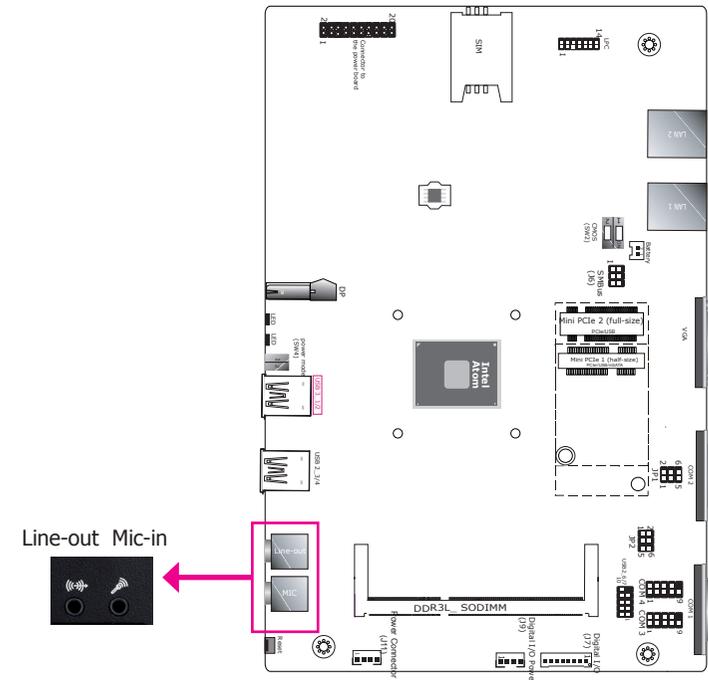
### DP++ Port

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

### Driver Installation

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

## Audio Output



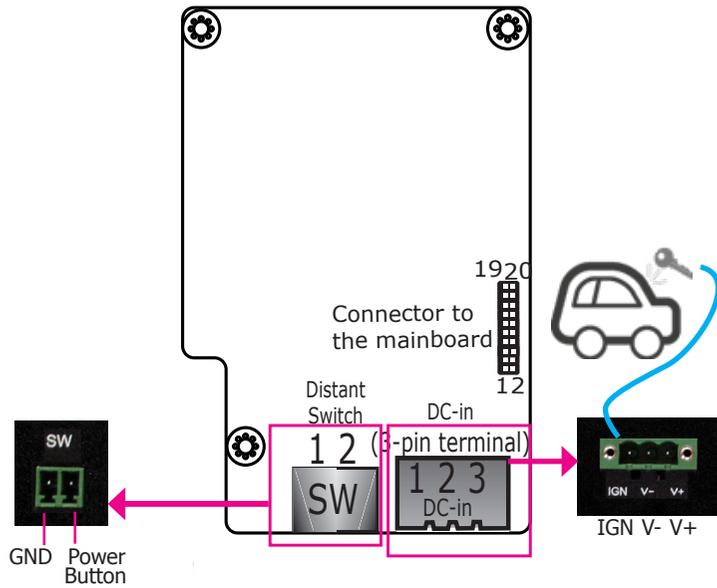
### Front Audio

This Line-out jack is used to connect a headphone or external speakers. And the MIC-in connector is used to connect an external microphone.

### Driver Installation

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

### DC-in Power Connector & Remote Power-on Switch (Power board)



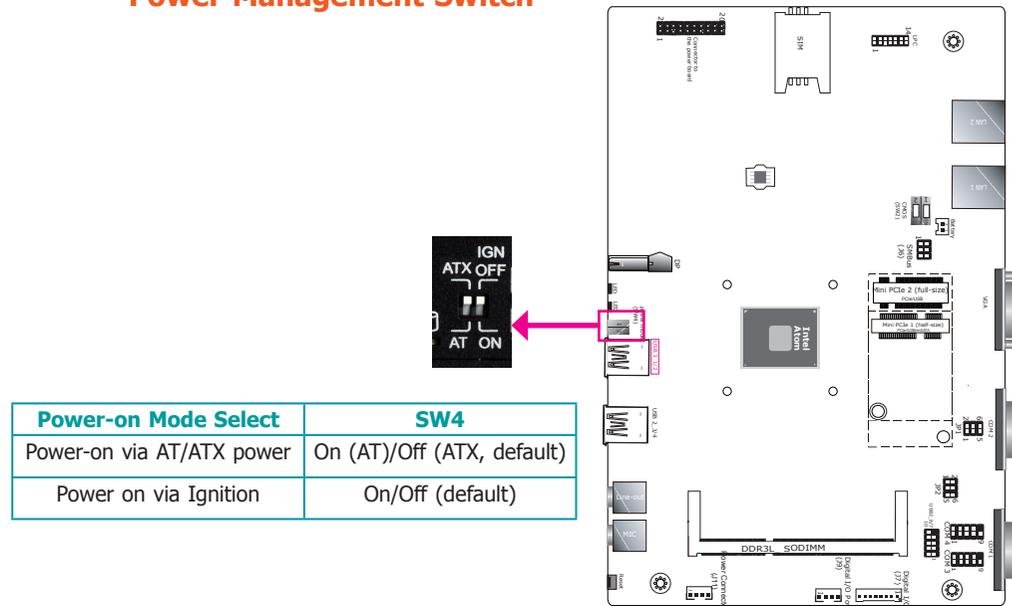
The 3-pole power connector connects to a car battery for power supply. Note that the system accepts a wide power range of 9 to 48V with in-vehicle power management that includes Battery Low-Voltage Protection and System on/off Delay Time control; please refer to the "Advanced" menu ("Advanced" > "IGN Configuration") in the BIOS. Refer to "IGN Configuration" in Chapter 7.

Using car ignition to power on or power off the system, you can power on or power off the system with a specific on/off delay time. These flowcharts below and on the right illustrate the startup and shutdown processes that the system goes through using ignition power control.

#### System startup with power management setting set to IGN mode

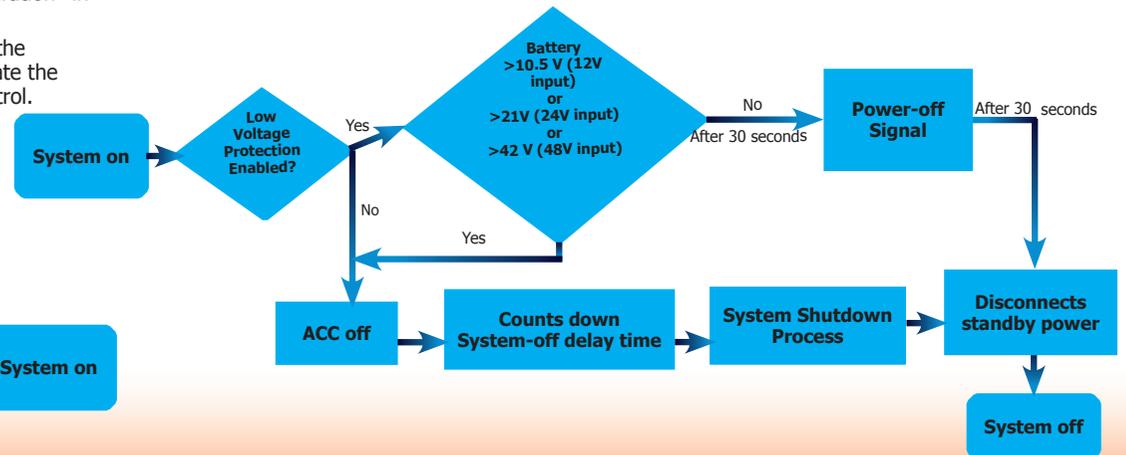


### Power Management Switch

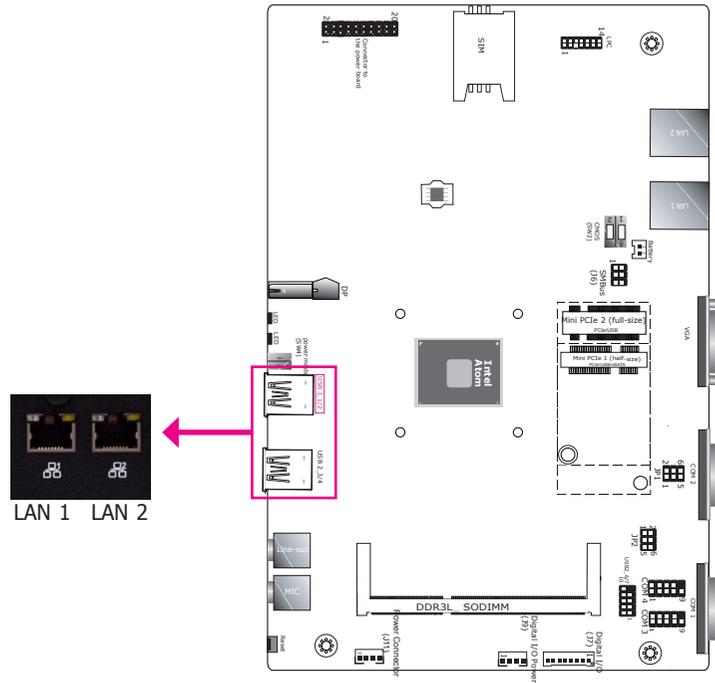


The system powers on via the ignition control with settings of power on/off delay in the BIOS, plus protection from low voltage (i.e. the system will not power on if the car battery's voltage is below 10.5, 21V and 42V for 12V input, 24V and 48V input respectively). Note that for this mode to work, please switch the adjacent AT/ATX mode to ATX first. Also note this mode is not available for systems with a DC-in jack (optional).

#### System shutdown with power management setting set to IGN mode



## RJ45 LAN Ports



### Features

- 2 Intel® I210IT PCI Express Gigabit Ethernet controllers
- Supports Jumbo frames, WoL (Wake on LAN), PXE (Preboot eXecution Environment), and IEEE1588v2 packet-based timing technology for real-time control applications.
- Optionally supports (Power over Ethernet) ports. With PoE (Power over Ethernet) support, the ports carry power to connected devices without the need for individual power supplies. Each port delivers up to 15.4 Watts of power to the connected devices that comply with IEEE 802.3af, for example, access points and IP cameras.

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

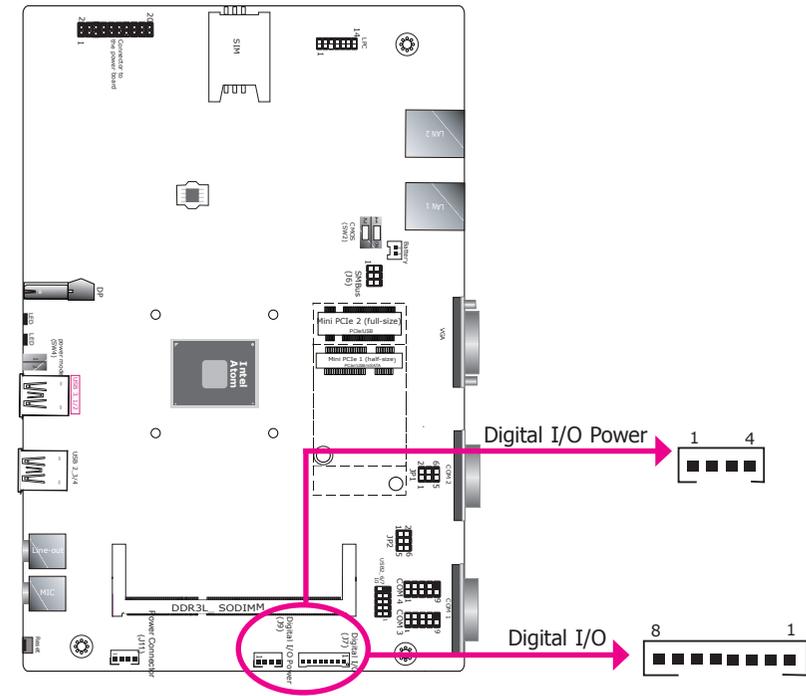
### BIOS Setting

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

### Driver Installation

Install the LAN drivers. Refer to Chapter 7 for more information.

## Digital I/O & Power Connector



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

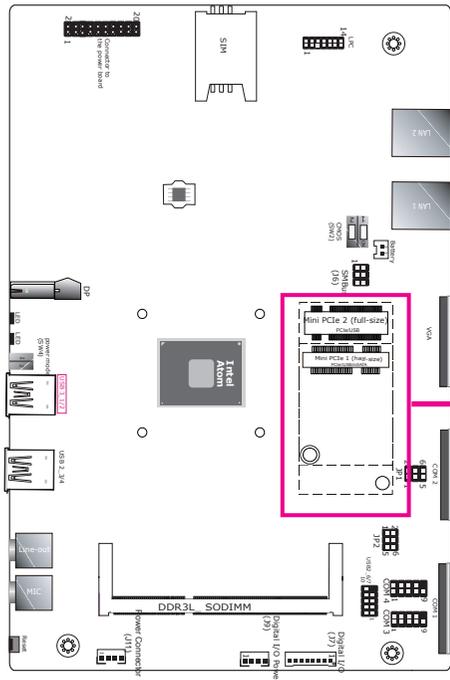
### Digital I/O Connector

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

### Digital I/O Power Connector

Pins	Function
1	+12V
2	GND
3	5V_Standby
4	+5V

## Expansion Slots



Full-size Mini PCIe (PCIe/USB)  
Half-size Mini PCIe (PCIe/USB/SATA)

### Mini PCI Express Slots

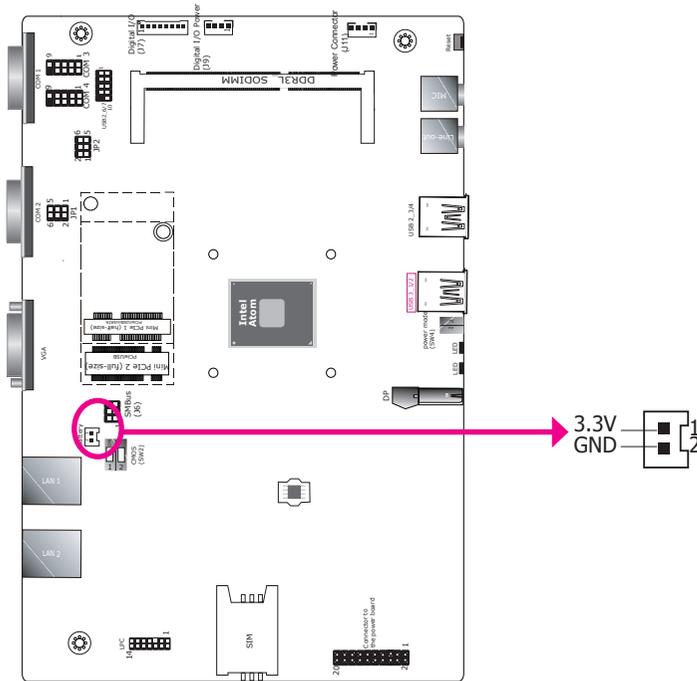
The full-size Mini PCIe socket (Mini PCIE1, black) supports PCIe and USB signals and is used to install a Mini PCIe card.

The half-size Mini PCIe socket (Mini PCIE2, white) supports PCIe, USB and SATA signals and is used to install a Mini PCIe or a mini-mSATA card.

### BIOS Setting

Configure the Mini PCIe slots including the designated interface for half-size Mini PCIe socket (Mini PCIE2; PCIe or SATA) in the Advanced Configuration ("PCI Express Configuration" sub-menu) of the BIOS. Refer to Chapter 7 for more information.

## Battery



Connect to the battery connector

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

### Safety Measures

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

## Chapter 6 - Assembling and Mounting

### Assembling 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 pane modules interchangeable.



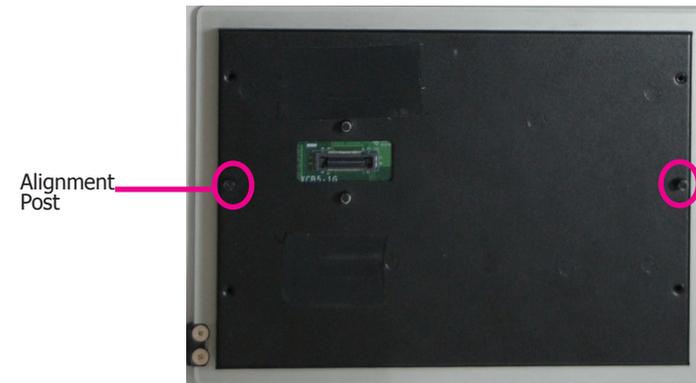
#### Notes:

1. The system can accommodate different sizes of panel modules.
2. Your product package may not include a panel module depending on the SKU.
3. The panel module used in the following illustrations may not be the same one as in your product package. These illustrations are for reference only.

1. Take off the cover of the ADP connector of the box module.



2. Locate the alignment posts of the panel module.



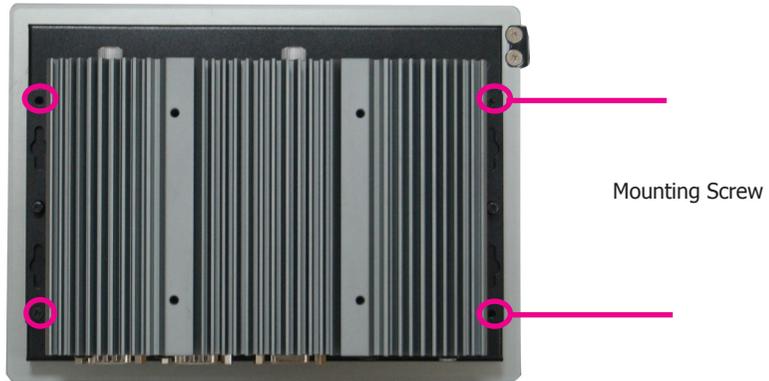
3. Hold the box module with its ADP connector in line with the ADP connector of the panel module. Align the box module with the panel module using the alignment posts.



#### 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.

4. Make sure that the box module seats on top of the panel module with the alignment post effortlessly slipping into the designated holes on the box module. Press to install these two modules and secure the installation with 4 mounting screws.



## Mounting

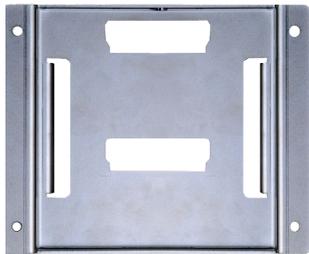
### VESA/Wall Mount


**Note:**

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

The wall mount kit includes the following:

- 2 wall mount brackets
- Bracket screws

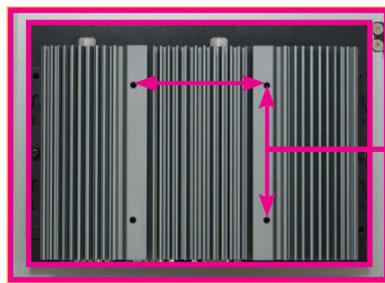


Wall mount bracket 1



Wall mount bracket 2

1. Before starting any installation procedure, attach the poron foam to the Panel PC.



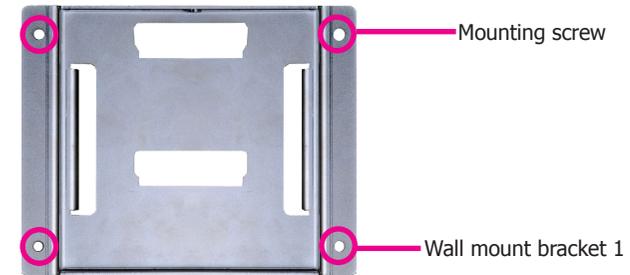
Poron Foam

75 x 75 mm

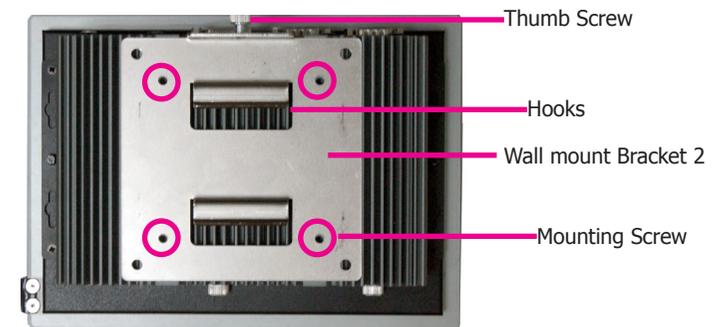

**Note:**

The VESA mount specifications for this device is 75 x 75 (mm). Please use a compatible VESA mount kit that can sustain the weight and size of the device.

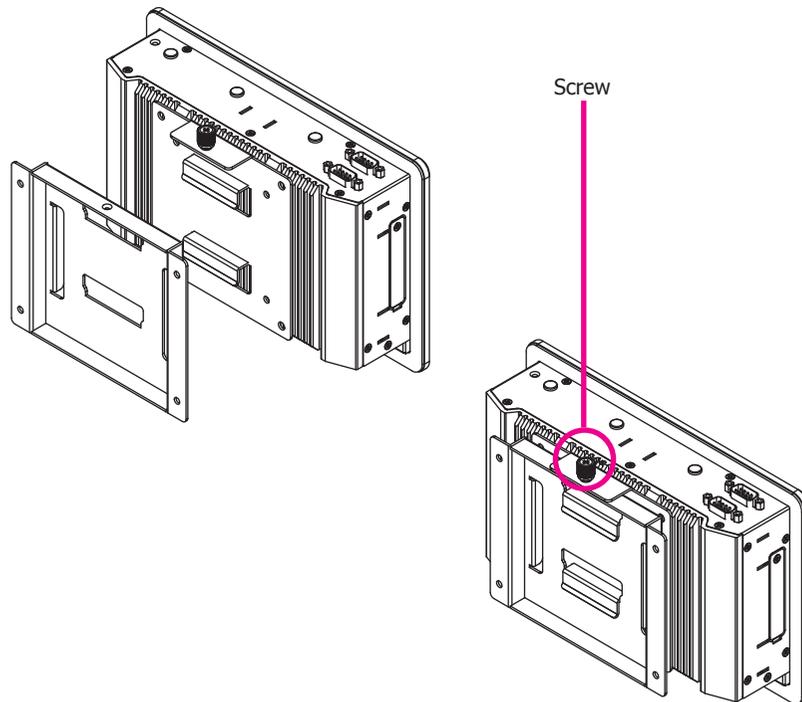
2. Select a place on the wall where you will mount the Panel PC.
3. Use the provided mounting screws to attach "wall mount bracket 1" to the wall.



4. Attach the other bracket (wall mount bracket 2) to the rear of the Panel PC.



5. 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.



## Panel Mount



### Note:

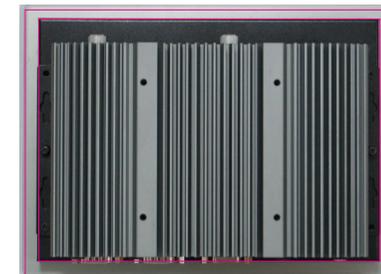
The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

The panel mounting kit includes the following:

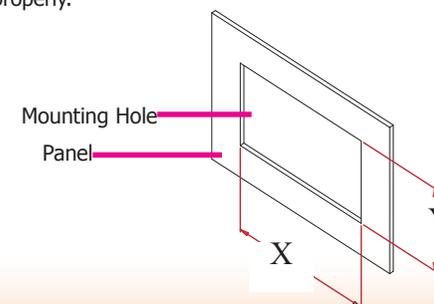
- 10 mounting clamps



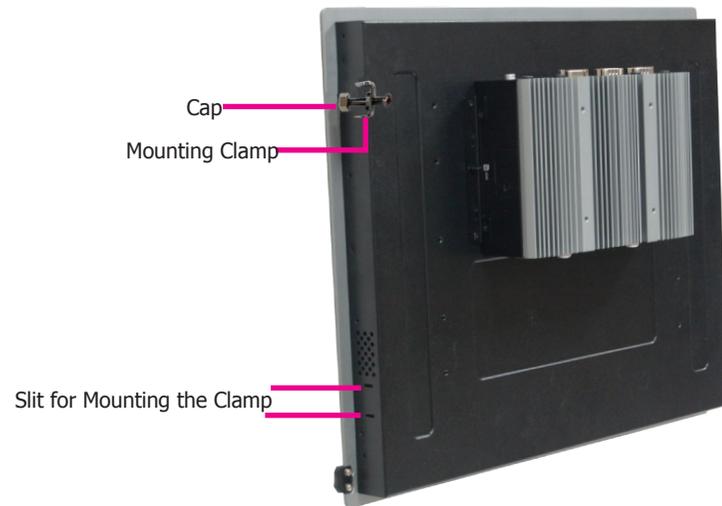
1. Before starting any installation procedures, attach the poron foam to the Panel PC.



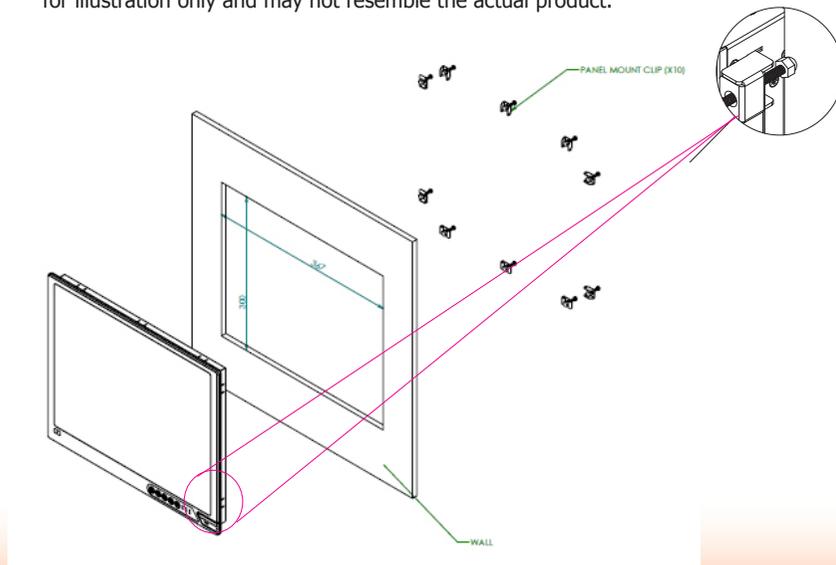
2. Select a place on the panel (or wall) where you will mount the Panel PC.
3. Cut out a shape on the panel that corresponds to the Panel PC's rear dimensions (7": 206mm x 145.6mm; 10.1": 257mm x 194.3mm; 12.1": 290mm x 247.5"; 15": 367mm x 300mm; 15.6": 389.3mm x 259.3mm; 17": 386mm x 346mm; 18.5": 454mm x 296.1mm; 19": 447mm x 380mm; 21.5": 526.2mm x 342.6mm) and ensure that the Panel PC can be fitted into the panel properly.



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



6. 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 head onto the back of the panel. Note that the following diagram is for illustration only and may not resemble the actual product.

**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 submenu or fields.
<Esc>	Exit to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
<F1>	Displays general help
<F2>	Pervious values
<F3>	Optimized defaults
<F4>	Saves and resets 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.

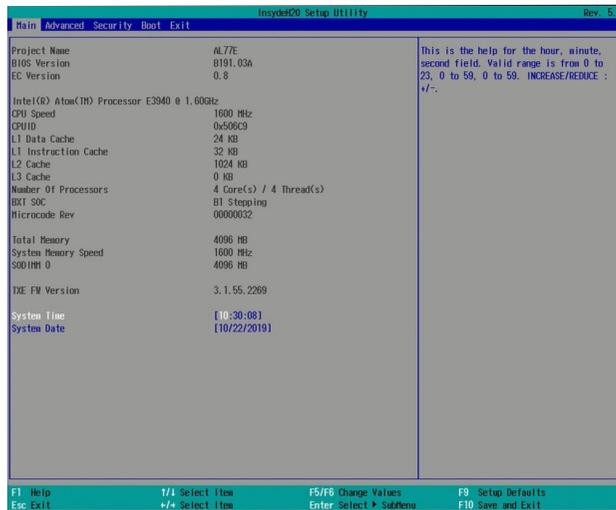
### Submenu

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 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.

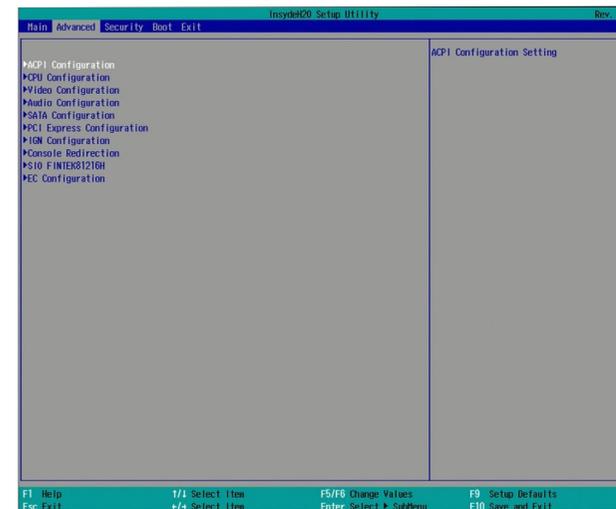
## Advanced

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.



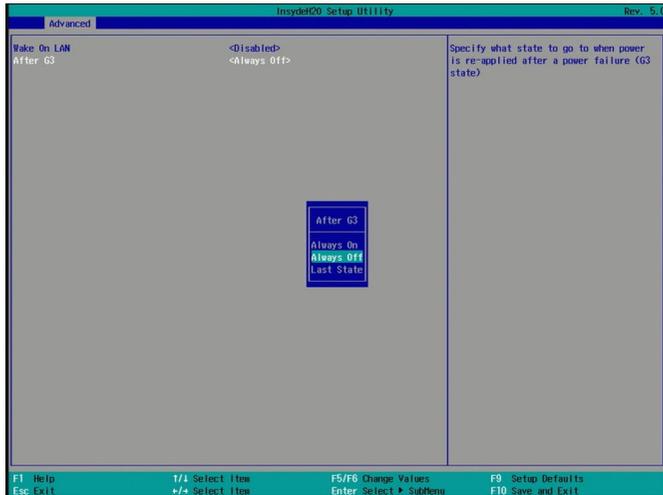
### Important:

Setting incorrect field values may cause the system to malfunction.



## ACPI Configuration

This section configures system ACPI parameters.



### Wake on LAN

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

### After G3

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.

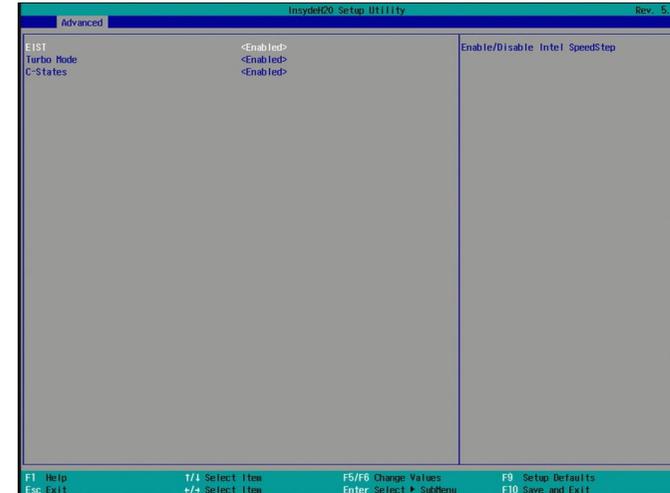
**Always Off** The system is powered off.

### BGRT Logo

Enable or disable the display of an operating system logo or image during boot using the BGRT (Boot Graphics Resource Table) mechanism.

## CPU Configuration

This section configures the CPU.



### EIST

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

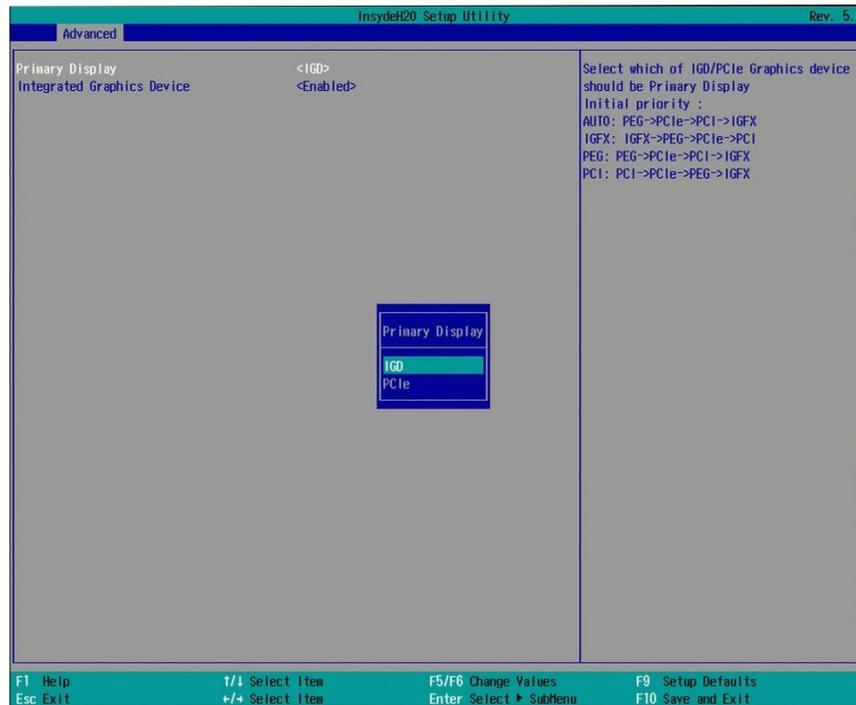
Enable or disable processor turbo mode, which allows the processor core to automatically run faster than the base frequency by taking advantage of thermal and power headroom.

### C-States

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

## Video Configuration

This section configures the video settings.



### Primary Display

Select the primary display for the system from the following options:

**IGD:** integrated graphics devices

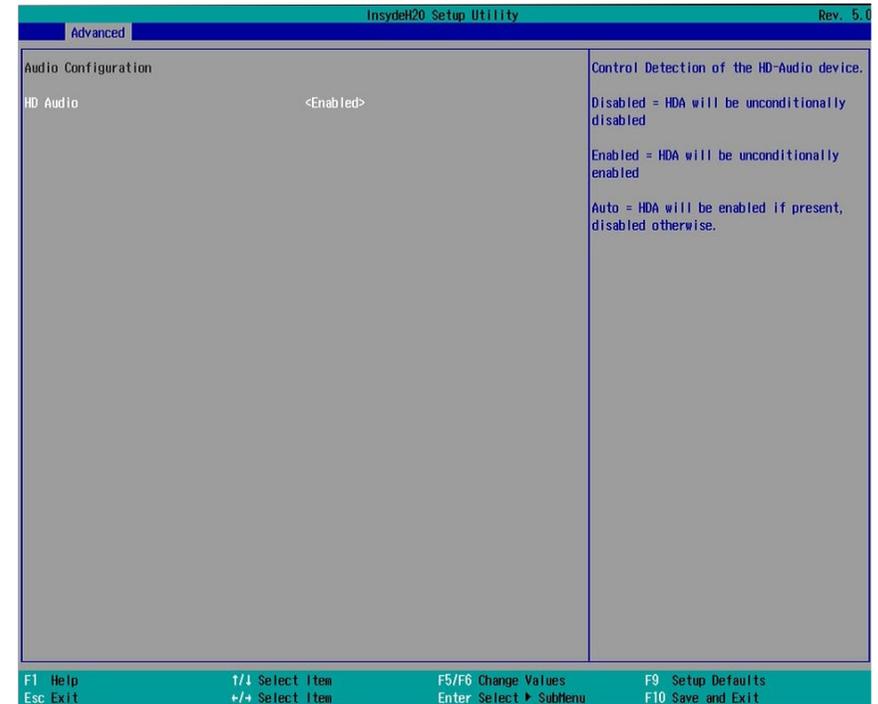
**PCIe:** PCIe graphics devices

### Integrated Graphics Device

Enable, disable or automatically detect the integrated graphics device.

## Audio Configuration

This section configures the audio settings.



### HD Audio

Control the detection of the high-definition audio devices.

#### Disabled

High-definition audio devices will be unconditionally disabled.

#### Enabled

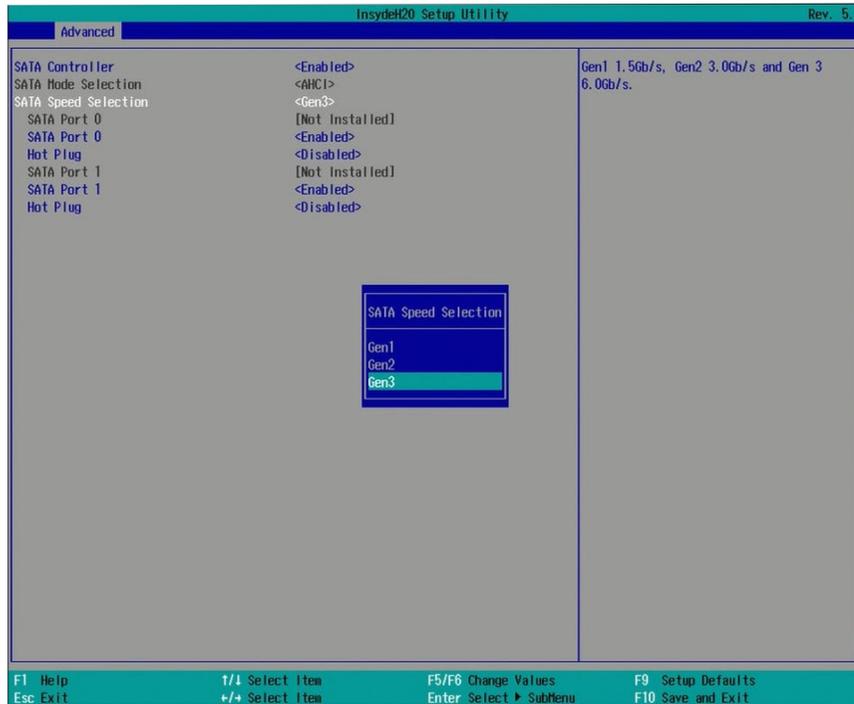
High-definition audio devices will be unconditionally enabled.

#### Auto

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

## SATA Configuration

This section configures SATA devices. It also shows the information about the installed SATA drives.



### SATA Speed

Select Serial ATA device speed from these options: Gen1 (1.5 Gbit/s), Gen2 (3 Gbit/s) or Gen3 (6 Gbit/s).

### SATA Mode Selection

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

### AHCI Mode

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

### Serial ATA Port 0 and 1 and Hot Plug

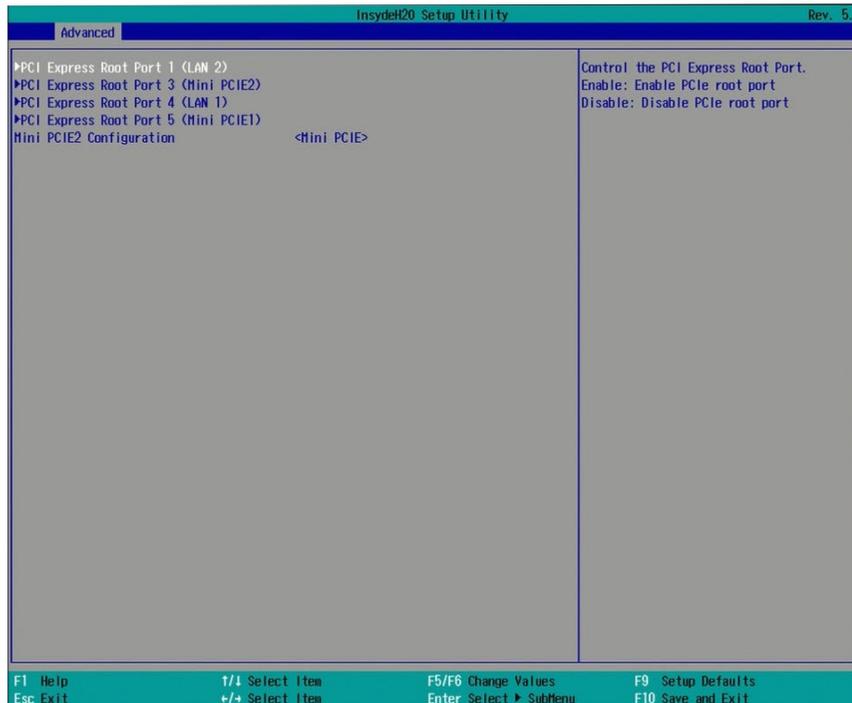
Enable or disable each Serial ATA port and its hot plug function.

### SATA Controller

Enable or disable the Serial ATA controller.

## PCI Express Configuration

This section configures the settings of PCI Express root ports.



### PCI Express Root Port 1

Controls the PCIe signal of LAN Port 2.

### PCI Express Root Port 3

Controls the PCIe signal of Mini PCIe 2 slot (half-size Mini PCIe slot).

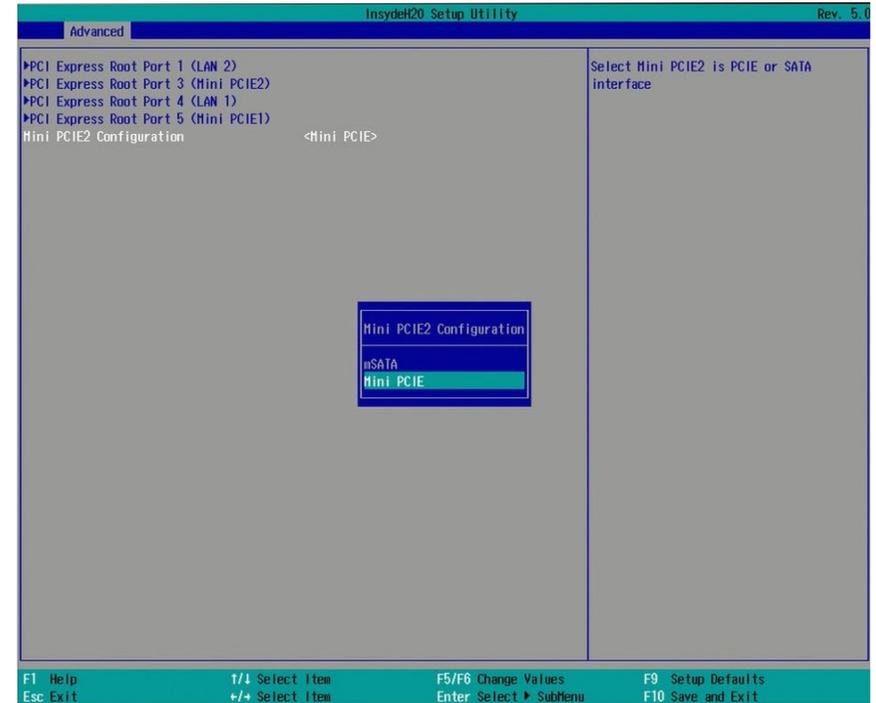
### PCI Express Root Port 4

Controls the PCIe signal of LAN Port 1.

### PCI Express Root Port 5

Controls the PCIe signal of Mini PCIe 1 slot (full-size Mini PCIe slot).

Press "Enter" to enter the configurations for each PCIe root port as shown on the next page.



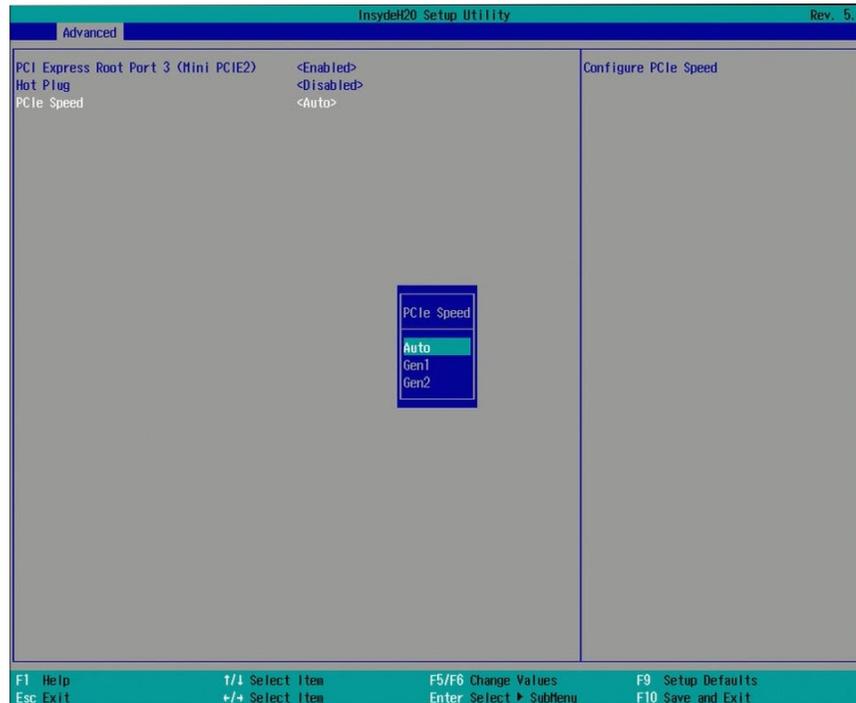
### Mini PCIE2 Configuration

Select the interface for Mini PCIe2 slot: mSATA or Mini PCIE.

Press "Enter" to enter the configurations for each PCIe root port as shown on the next page.

## 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.

### Hot Plug

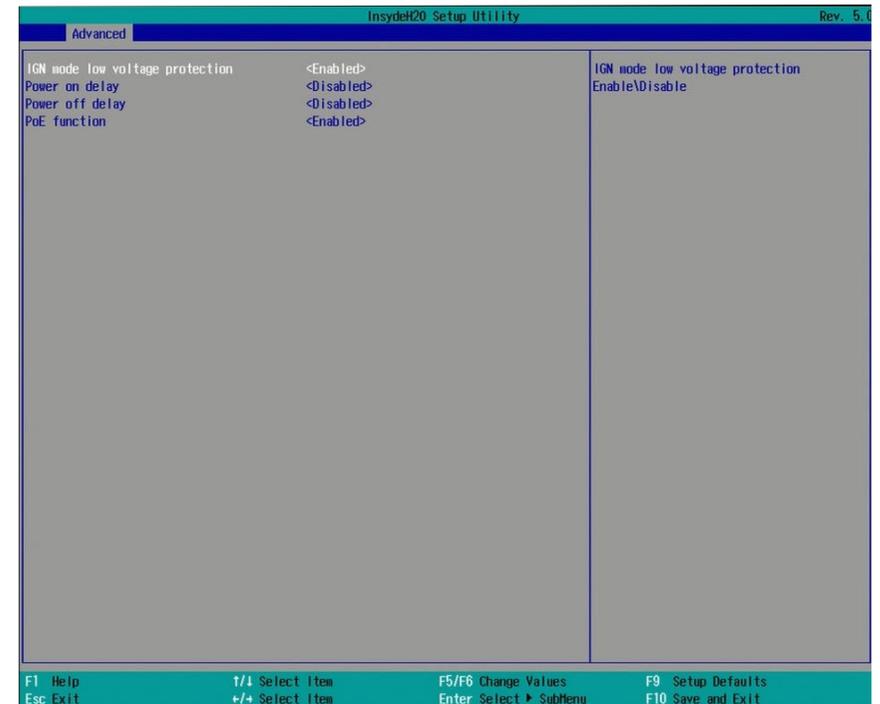
Enable or disable the hot plug function.

### PCIe Speed

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

## IGN Configuration

This section configures the settings of ignition power control. Note the settings of ignition power control are only applicable to systems set to IGN mode. Refer to "Power Management Switch" in Chapter 5.



The BIOS setup menu can be used to turn on or off the system with a specific on/off delay time via car ignition.

### IGN Mode Low Voltage Protection

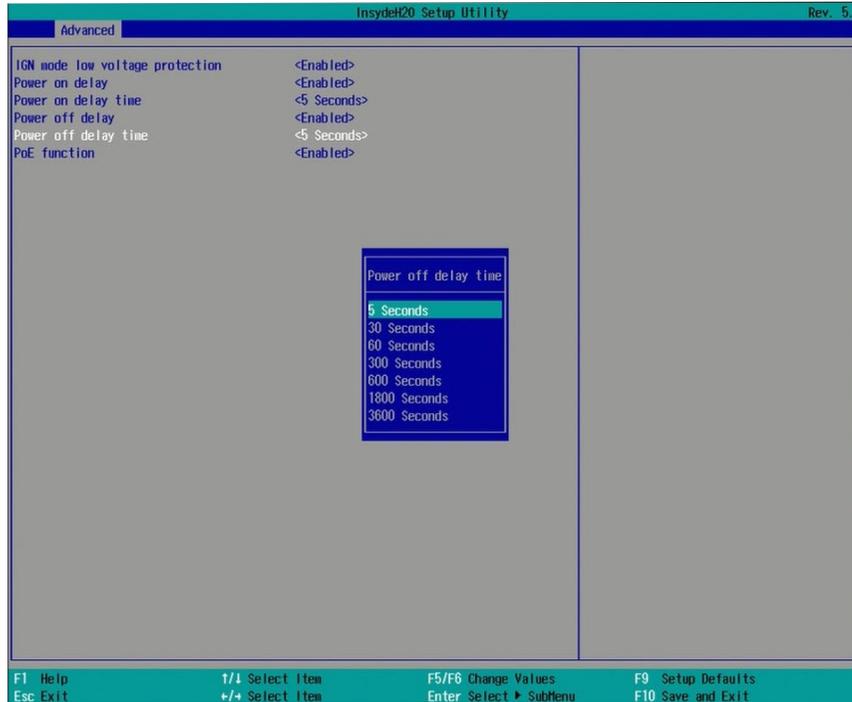
This option enables the low-voltage protection to protect your car battery. The system will not power on if the car battery's voltage is below 10.5, 21V and 42V for 12V input, 24V and 48V input respectively. The default is "Enabled."

### Power on Delay

This option enables power-on delay which allows the system to power on after the specified number of seconds. The default is "disabled" for systems set to non-IGN mode and "enabled" for systems set to IGN mode.

### Power on Delay Time

Specify the number of seconds after which the system will start the power-on process. This option appears only when Power on Delay is enabled. The default is 5 seconds.



### Power off Delay

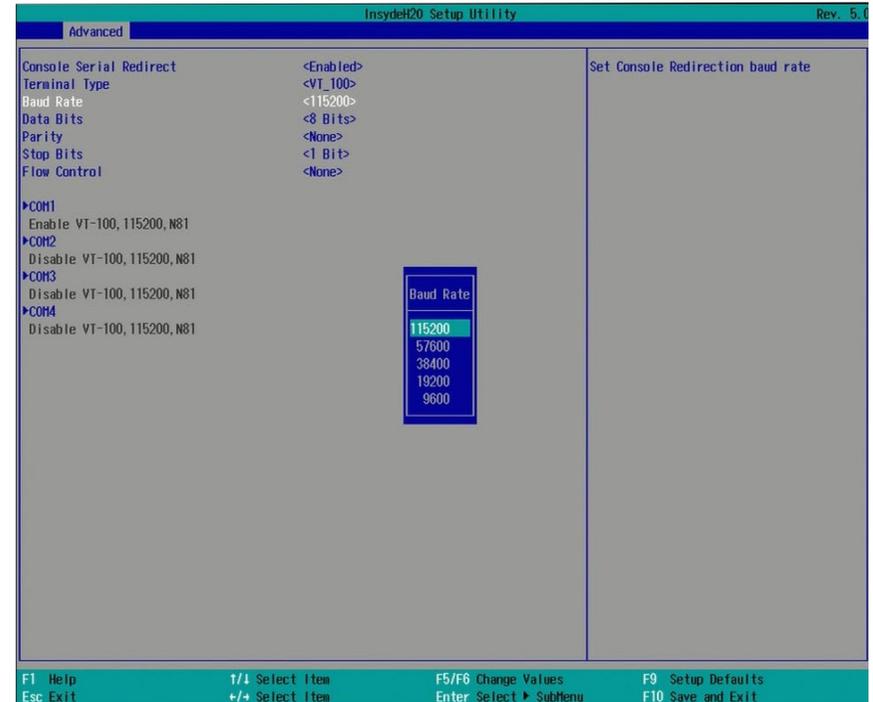
This option enables power-off delay which allows the system to power off after the specified number of seconds. The default is "disabled."

### Power off Delay Time

Specify the number of seconds after which the system will start the power-off process. This option appears only when Power off Delay is enabled. The default is 5 seconds.

### 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, or 9600.

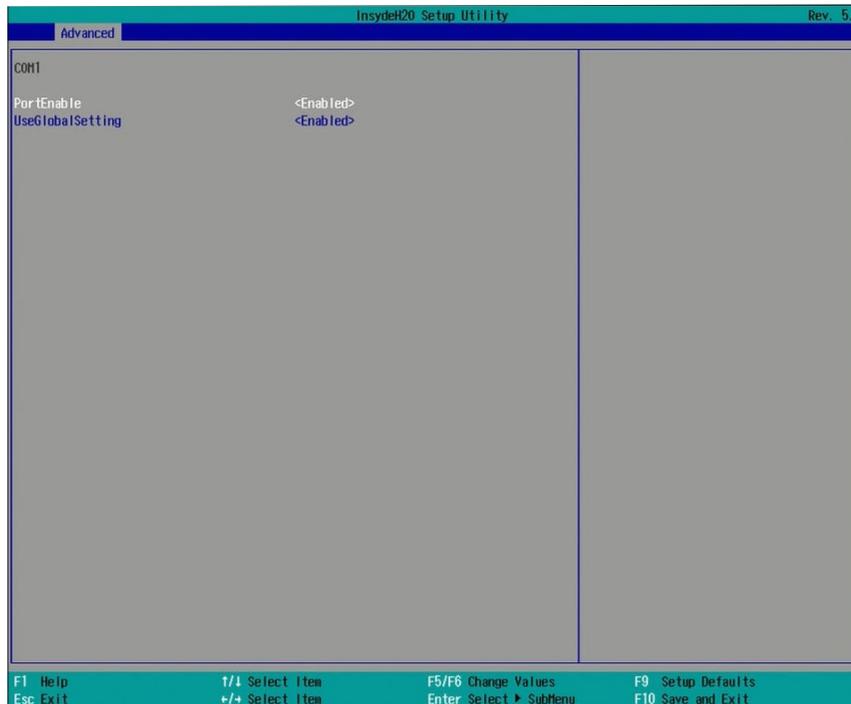
Data bits: 8 bits or 7 bits.

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 console redirection.



### COM A and COM B

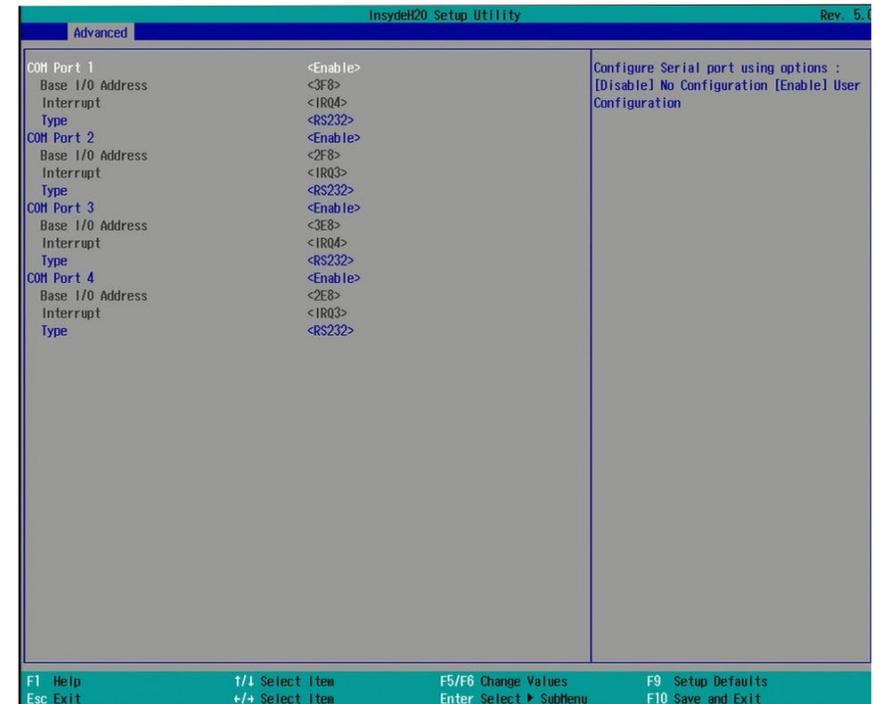
Enable or disable the serial redirection function for each of the serial ports on the system. (The default is disabled.) Configure the serial communication parameters to be used between the system and a remote station.

### UseGlobalSetting

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

### Super I/O

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



### COM Port 1 to COM Port 4

Enable or disable each serial port.

**Disable** Disable this serial port.

**Enable** Enable this serial port.

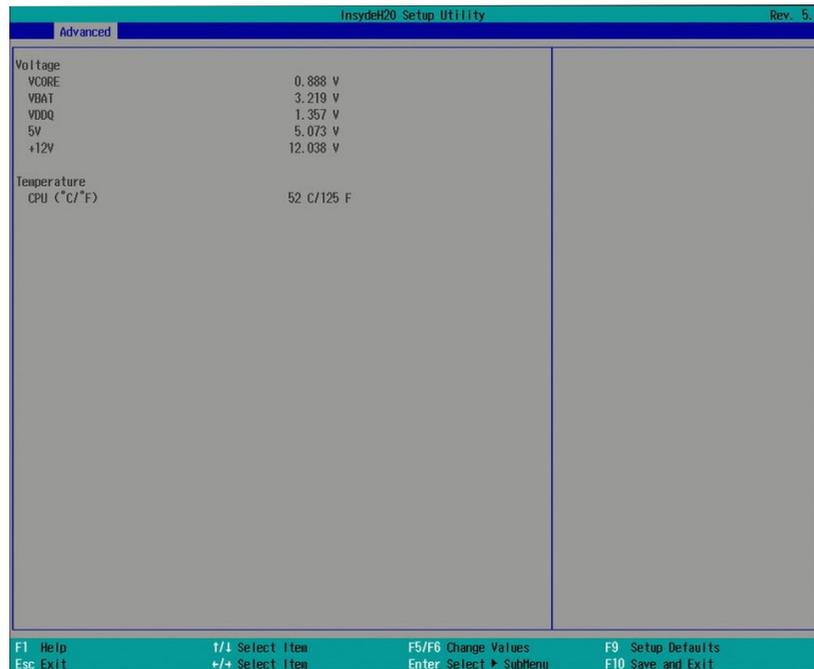
It also shows the Base I/O address and the assigned interrupt number.

### Type

Choose serial port type for COM port 1 to 4: RS232, RS422 or RS485 (Peer-to-Peer).

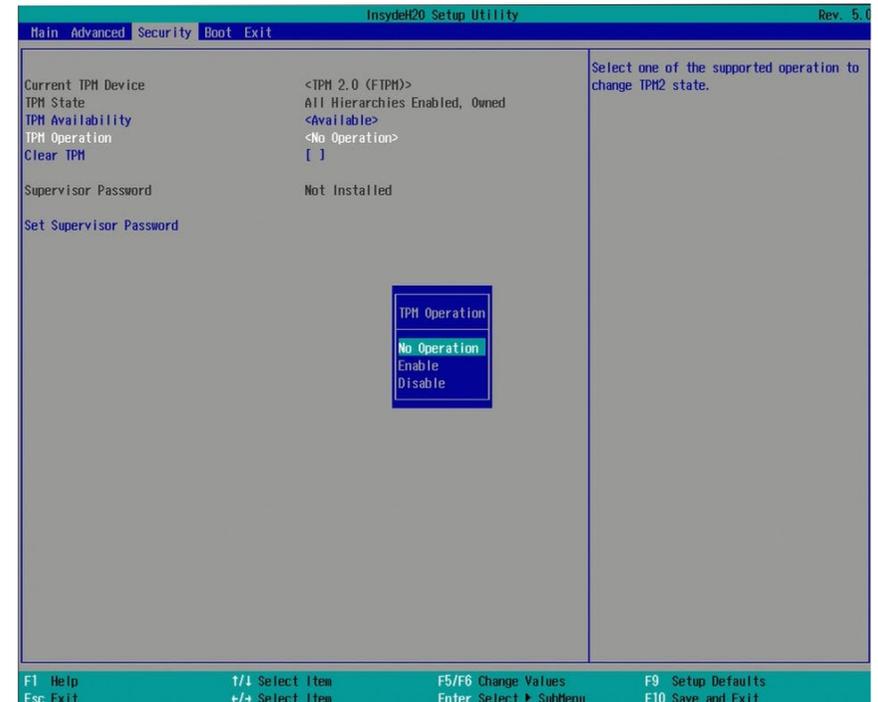
## PC Health Status

This section displays PC health status information.



## Security

This section configures the Trusted Platform Module (TPM) function.



### TPM Availability

Show or hide TPM availability and its configurations.

### TPM Operation (optional)

Enable or disable the TPM function. It displays the following options:

- No Operation: No changes to the current state.
- Disable: Disable and deactivate TPM.
- Enable: Enable and activate TPM.

### Clear TPM

Remove all TPM ownership contents.

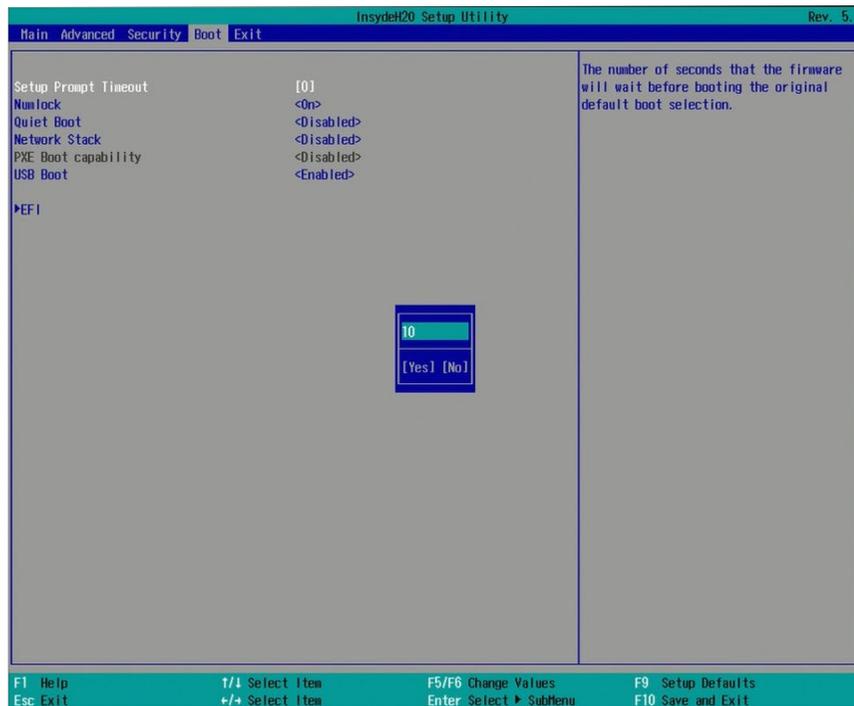
### Set Supervisor Password

Set the administrative password for entering the BIOS 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



### Setup Prompt Timeout

Select the number of seconds the system will wait before booting the original firmware selection.

### NumLock

This allows you to determine the default state of the numeric keypad at boot. By default, the system boots up with Num Lock on. When set to Off, the function of the numeric keypad is the arrow keys.

### 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.

### Network Stack

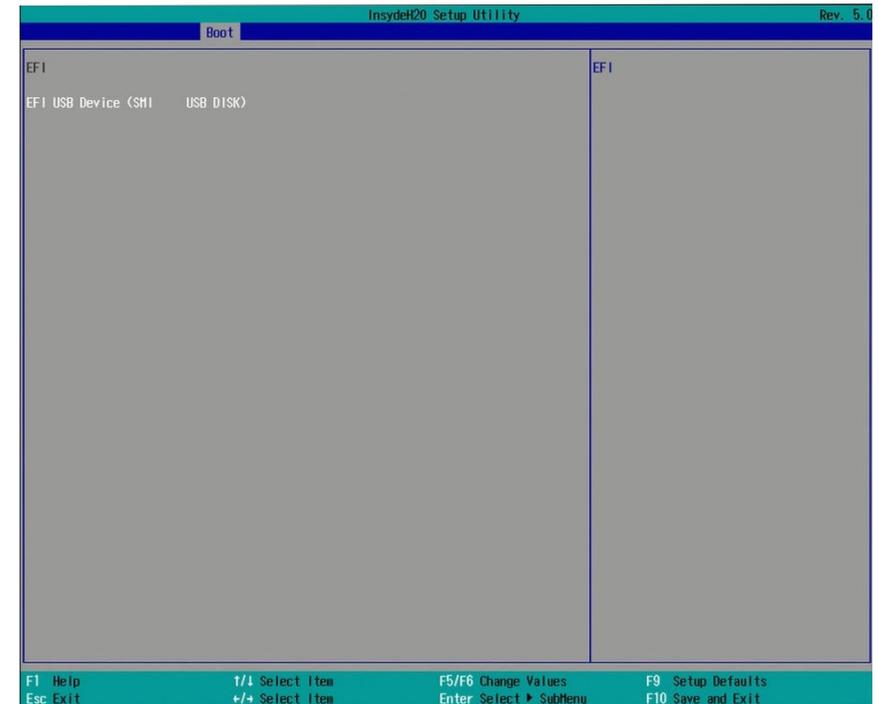
Enable or disable network stack. It supports the operation of these functions or software: Windows 8 BitLocker Network Unlock and UEFI IPv4/IPv6 PXE.

### PXE Boot Capability

Enable or disable Preboot eXecution Environment (PXE) boot through the Ethernet. This function can only be enabled if the Network Stack support is enabled.

## USB Boot

Enable or disable USB boot from a flash drive.



### EFI

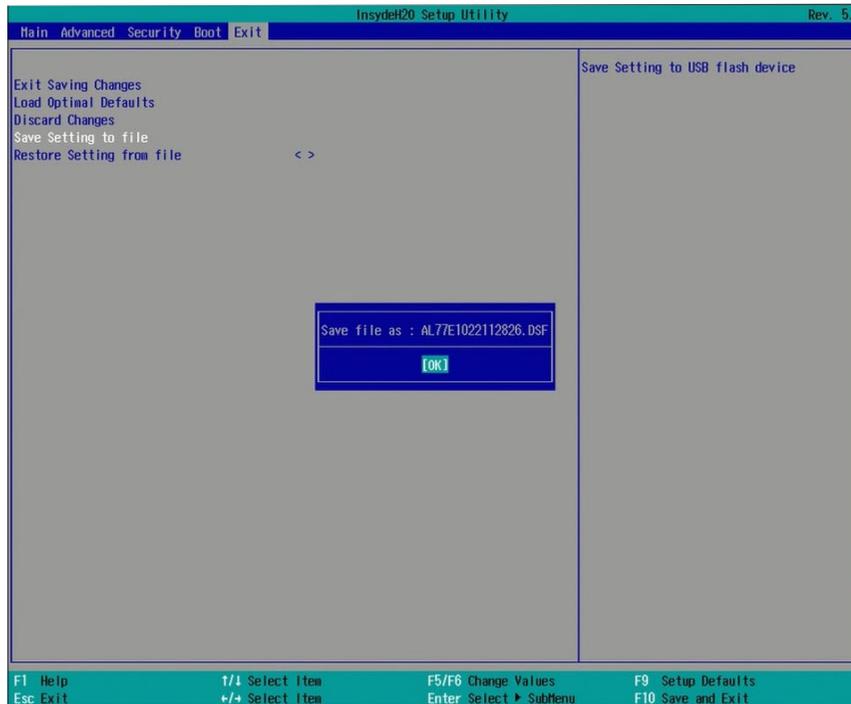
Enter this menu to select the priority of the UEFI boot devices. Use the "+" key to move an item up or the "-" key to move an item down. The one on the top of the list has the highest priority.



#### Note:

The BIOS supports only UEFI boot but not legacy.

## Exit



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

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

```

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

Information
Please do not remove the AC power

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

Initializing
Current BIOS Model name: AL77E
New BIOS Model name: AL77E

Current BIOS version: 68.08A
New BIOS version: 68.08A

Updating Block at FFFFF000h
0%      25%      50%      75%      100%
|-----|-----|-----|-----|
C:\AL77E>_

```

## 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

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The system requires you to install drivers for some devices to operate properly. The system may come with a CD that contains drivers, utilities and software applications required to enhance the performance of the system board. 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".

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 10:

- Intel® Chipset Device Software
- Intel® Graphics Driver
- Intel® LAN Driver
- Intel® TXE Driver
- Intel® Serial IO Driver
- Audio Driver

## Intel Chipset Software Installation Utility

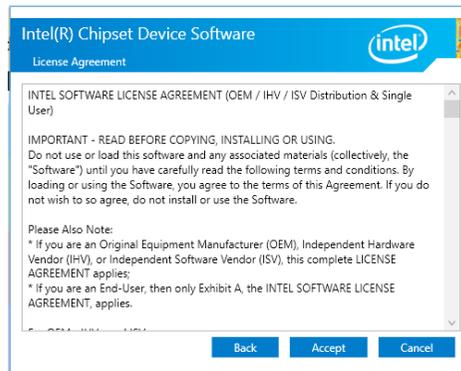
The Intel Chipset Device Software is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click "Intel Chipset Software Installation Utility" in the main menu.

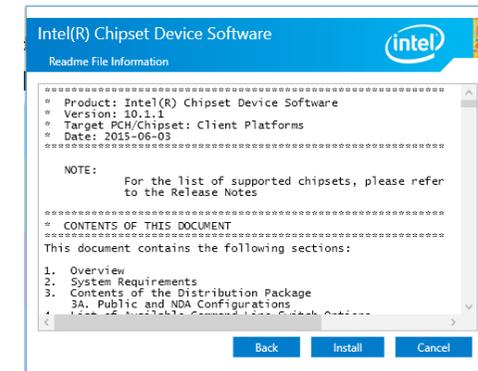
1. Setup is ready to install the utility. Click "Next" to continue.



2. Read the license agreement, then click "Accept" if you accept the terms and conditions.



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



4. After the installation is complete, click "Restart Now".

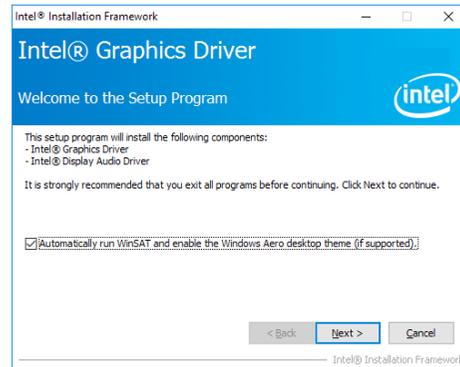
Restarting the system will allow the new software installation to take effect.



## Intel Graphics Drivers

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

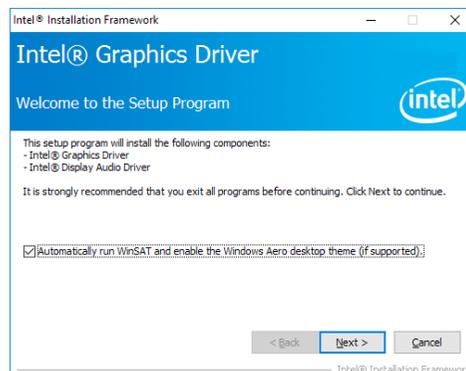
1. Setup is now ready to install the graphics driver. Click "Next" to continue.



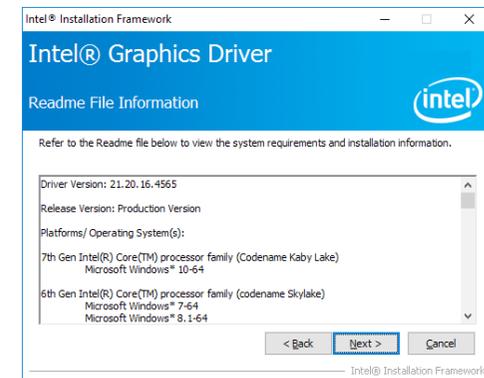
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. When this is enabled and the system reboots after driver installation, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/ Windows 8 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

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

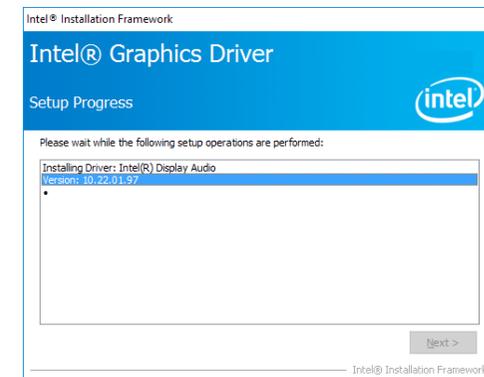
2. Read the license agreement, then click "Yes" if you accept the terms and conditions.



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

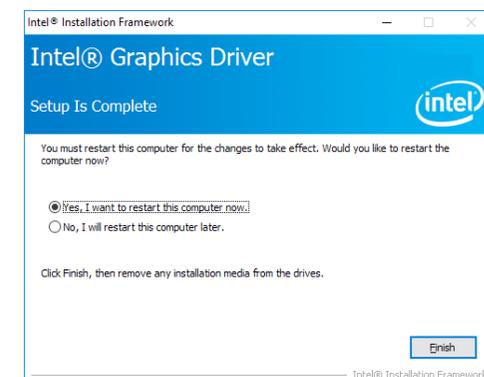


4. Setup is now installing the driver. Click "Next" to continue.



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

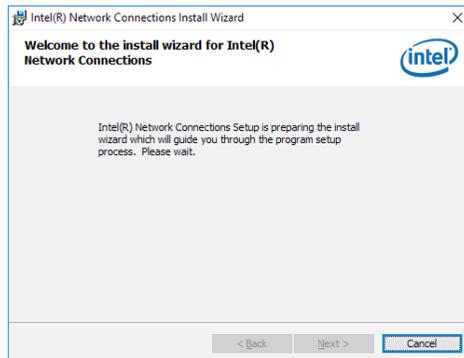
Restarting the system will allow the new software installation to take effect.



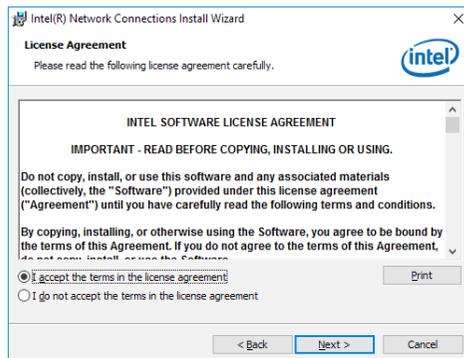
## Intel LAN Drivers

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

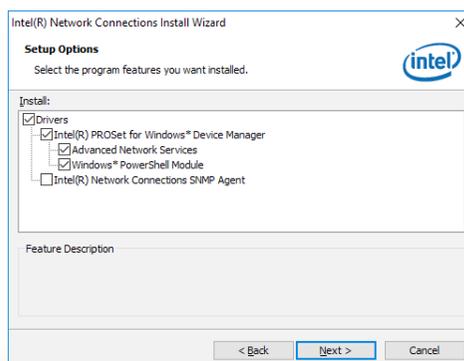
1. Setup is ready to install the driver. Click "Next" to continue.



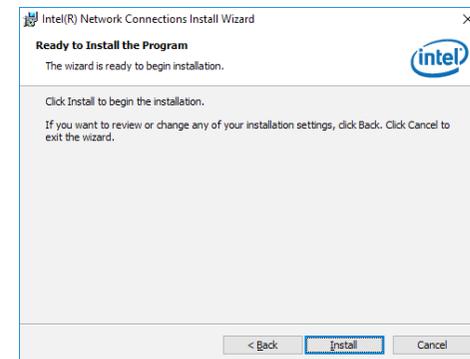
2. Click "I accept the terms in the license agreement" if you accept the terms and conditions, then click "Next".



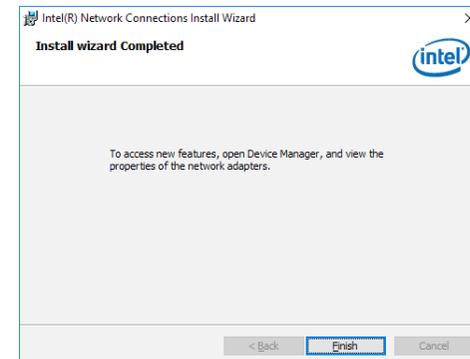
3. Select the program features you want to install then click "Next" to continue.



4. Click "Install" to begin the installation.



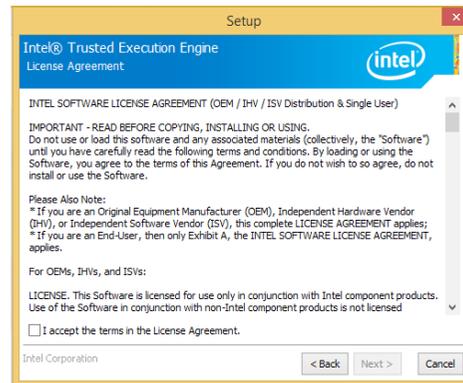
5. After the installation is complete, click "Finish" to exit the setup program.



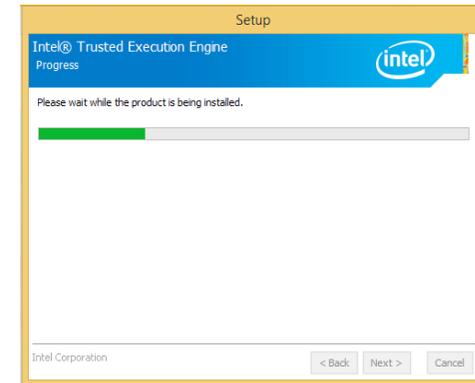
## Intel Trusted Execution Engine Driver

To install the driver, click "Intel TXE Drivers" in the main menu.

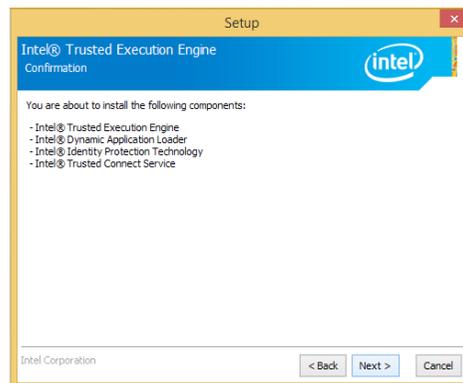
1. Select "I accept the terms in the License Agreement", then click "Next."



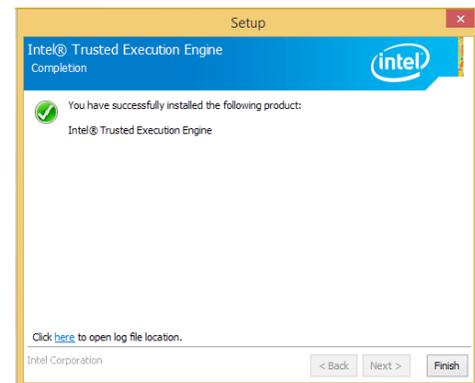
3. The screen displays the installation status in progress.



2. The screen shows the components that will be installed. Click "Next" to continue.



4. Click "Finish" when the installation is complete.



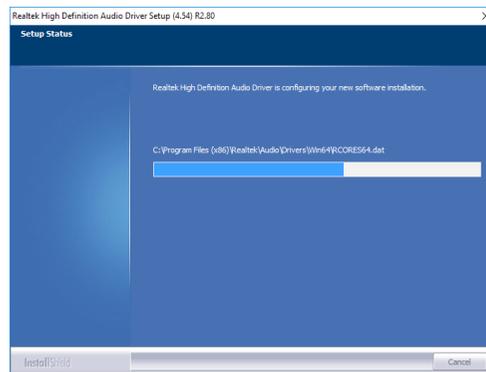
## Realtek Audio Drivers

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

1. Setup is now ready to install the audio driver. Click "Next" to start the installation.

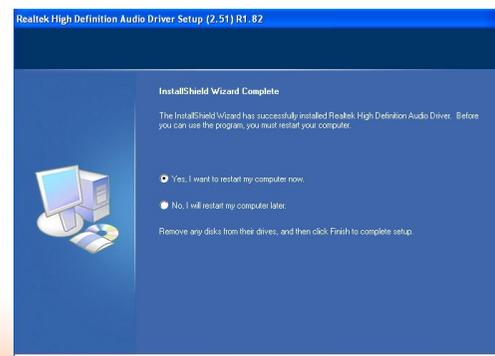


2. Follow the on-screen instructions to proceed with the setup program. Click "Next" each time you finish a step.



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

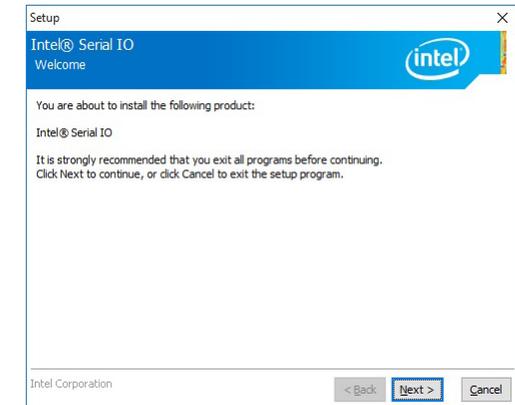
Restarting the system will allow the new software installation to take effect.



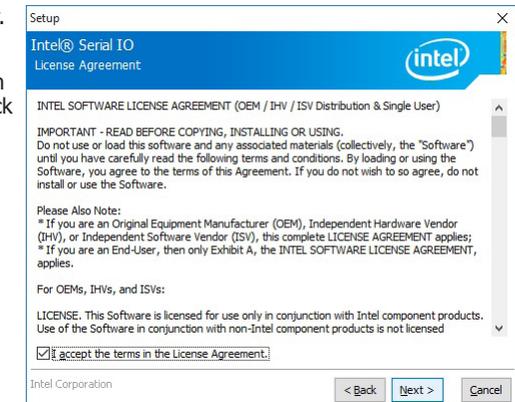
## IO Driver

To install the Intel® Serial IO driver, click "IO Driver" in the main menu.

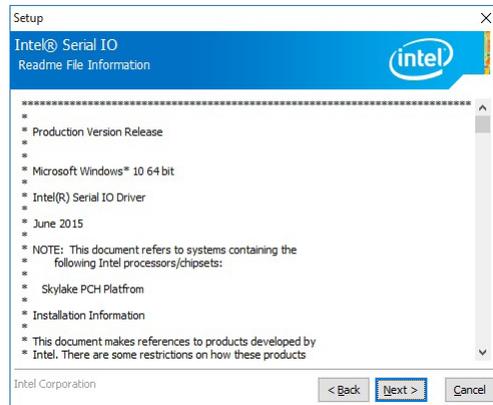
1. Setup is ready to install the driver. Click "Next" to continue.



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



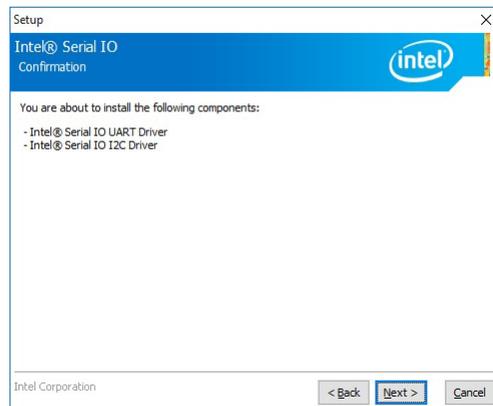
3. Read the file information for installation information, then click "Next".



5. Setup is now installing the driver.



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



6. Click "Finish" to exit setup.

