



BPC370-BW
TFT-LCD Bar Type Panel PC
User's Manual

Copyright

This publication contains information that is protected by copyright. No part of it may be reproduced in any form or by any means or used to make any transformation/adaptation without the prior written permission from the copyright holders.

This publication is provided for informational purposes only. The manufacturer makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. The user will assume the entire risk of the use or the results of the use of this document. Further, the manufacturer reserves the right to revise this publication and make changes to its contents at any time, without obligation to notify any person or entity of such revisions or changes.

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

© 2017. All Rights Reserved.

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

Copyright.....	2
Trademarks.....	2
FCC and DOC Statement on Class A	2
About this Manual.....	4
Warranty	4
Static Electricity Precautions	4
Safety Measures.....	4
Safety Precautions	5
About the Package.....	5
Before Using the System	5
Chapter 1 - Introduction.....	6
Overview	6
Key Features.....	6
Specifications	7
Getting to Know the BPC370-BW	8
Mechanical Dimensions.....	9
Motherboard Dimension	10
Chapter 2 - Getting Started	11
Chapter 3 - Installing Devices.....	12
Removing the Chassis Cover	12
Installing a Mini PCIe Card	12

Chapter 4 - Jumper Settings.....	13
----------------------------------	----

Clear CMOS.....	13
Auto Power-on Select	13
Backlight Power Select.....	14
Panel Power Select.....	14
LVDS Channel and bpp Select.....	15

Chapter 5 - Ports and Connectors	16
--	----

Panel I/O Ports	16
12V DC-in	16
Graphics Interfaces.....	17
RJ45 LAN Ports.....	17
USB Ports.....	18
COM (Serial) Ports	19
I/O Connectors	20
Digital I/O Connector	20
Front Audio Connector	20
Standby Power LED	21
Front Panel Connector	21
SATA (Serial ATA) Connector	22
SATA (Serial ATA) Power Connector.....	22
LVDS LCD Panel Connector	23
LCD/Inverter Power Connector	23
Expansion Slot.....	24
Cooling Fan Connector	24
SMBus Connector	25
Chassis Intrusion Connector	25
Battery.....	26

Chapter 6 - Mounting Options	27
------------------------------------	----

Chapter 7 - BIOS Setup	28
------------------------------	----

Main	29
Advanced	29
Security.....	37
Boot.....	38
This section configures boot options.	38
Exit.....	38

Chapter 8 - Supported Software	40
--------------------------------------	----

About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

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

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



Important:

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

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

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

Battery:

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

Safety Precautions

- Use the correct DC input voltage range.
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.
- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.
- Keep this system away from humidity.
- Place the system on a stable surface. Dropping it or letting it fall may cause damage.
- The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.
- Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.
- If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- If one of the following occurs, consult a service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the system.
 - The system has been exposed to moisture.
 - The system is not working properly.
 - The system dropped or is damaged.
 - The system has obvious signs of breakage.
- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.
- Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

About the Package

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

- One BPC370-BW Panel PC
- 1 CD disk includes
 - Manual

Optional Items

- Wi-Fi kit (SparkLAN WPEA-121N WiFi PCI express card)
- Power Cord

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

Before Using the System

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

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

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

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

Chapter 1 - Introduction

Overview



Key Features

	BPC370-BW
Processor	Intel® Pentium®/Celeron® Processor N3000 Family, BGA 1170 Intel® Pentium® Processor N3710, Quad Core, 2M Cache, 1.6GHz (2.56GHz), 6W
LAN	Two LAN ports
COM	Two RS-232/422/485 COM ports (DB-9)
Display interfaces	VGA and DP++
USB	4 USB 3.0 type-A connectors
Audio	Speaker 2W+2W built on Realtek ALC888S-VD2-GR (optional)

Specifications

Processor System	Intel® Pentium®/Celeron® Processor N3000 Family, BGA 1170 Intel® Pentium® Processor N3710, Quad Core, 2M Cache, 1.6GHz (2.56GHz), 6W
Memory	One 204-pin SODIMM up to 8GB Single Channel DDR3L 1600MHz (4GB DDR3L memory by default)
LCD and Touch Screen	<ul style="list-style-type: none"> • 37" 1920x540 TFT-LCD Panel (no touch screen) • 70,000 MTBF LED backlight • Brightness (cd/m²): 700 (1000 available upon request) • Contrast: 4000:1
Graphics	Intel® HD Graphics Supported applications: OpenGL 4.2, Direct X 11.1, OpenCL 1.2, OGL ES 3.0 Supported codecs: HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4 HW Encode: H.264, MPEG2, MPEG4
Display	1 x VGA (resolution up to 2560X1600 @ 60Hz) 1 x DP++ (resolution up to 3840x2160 @ 30Hz or 2560x1600 @ 60Hz)
Storage	1 x Full-size Mini PCIe (mSATA)
Expansion	1 x Half-size Mini PCIe (PCIe/USB) 1 x SIM (available upon request)
Ethernet	2 x Intel® I211AT PCIe (10/100/1000Mbps)
Audio	• Realtek ALC888S-VD2-GR high definition audio codec
COM	• 2 RS232/422/485 COM port via DB-9 connector
USB	• 4 x USB 3.0 type-A connectors
Power	• AC Input 110V ~ 240V via C14 Power Inlet
Environment	<ul style="list-style-type: none"> • Temperature <ul style="list-style-type: none"> - Operating: -5°C ~ 50°C - Storage: -10°C ~ 65°C • Storage Humidity <ul style="list-style-type: none"> - 5% ~ 95% (non-condensing)
Vibration	• Non-operating: Sweep sine, 3Grms @ 10~500Hz, 30min
Shock	• Non-operating: Half-sine, 5G @ 11ms

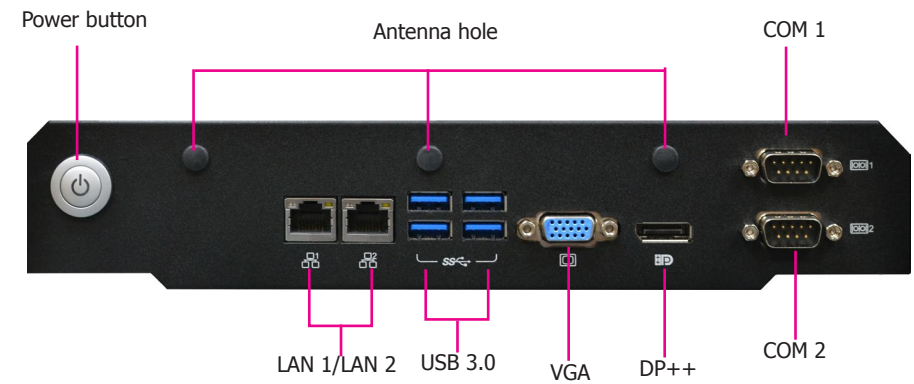
Bottom I/O Ports	Ethernet: 2 x GbE (RJ-45) (10/100/1000Mbps) Serial: 2 x RS-232/422/485 (DB-9) USB: 4 x USB 3.0 (type A) Display: 1 x VGA and 1 x DP++ Audio: Speaker 2W+2W (available upon request) Buttons: 1 x power button with LED Antenna holes: 3 x Antenna Hole for Wi-Fi or Cell Module
Protection	• IP65 Front Protection Glass (available upon request)
Construction	• Sheet Metal
Mounting	• VESA mount
Dimensions	• 948.1mm x 305.1mm x 75.3mm (W x H x D)
Weight	• 11.15 kg
OS Support	<ul style="list-style-type: none"> • Windows 7 (32/64-bit) • Windows 8.1 (64-bit) • Windows 10 IoT Enterprise (32/64-bit) • Ubuntu 15.10 (Intel graphics driver available)
Certification	<ul style="list-style-type: none"> • CE • FCC (to be applied)

Getting to Know the BPC370-BW

Front View



I/O Panel



Power Button with LED (green)

Connects an M12 power plug.

LAN Ports

Connect the system to a local area network.

USB 3.0 Ports

Connect USB 3.0 devices as well as USB 2.0/1.1 devices.

VGA

Connects to the VGA port of a display.

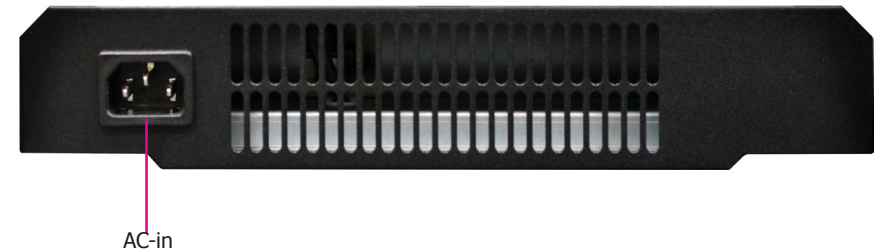
DP++

Connects to the DisplayPort of a display.

COM Ports

Connect serial devices.

COM 1 and COM 2 ports: Provide RS-232/422/485 communication modes.

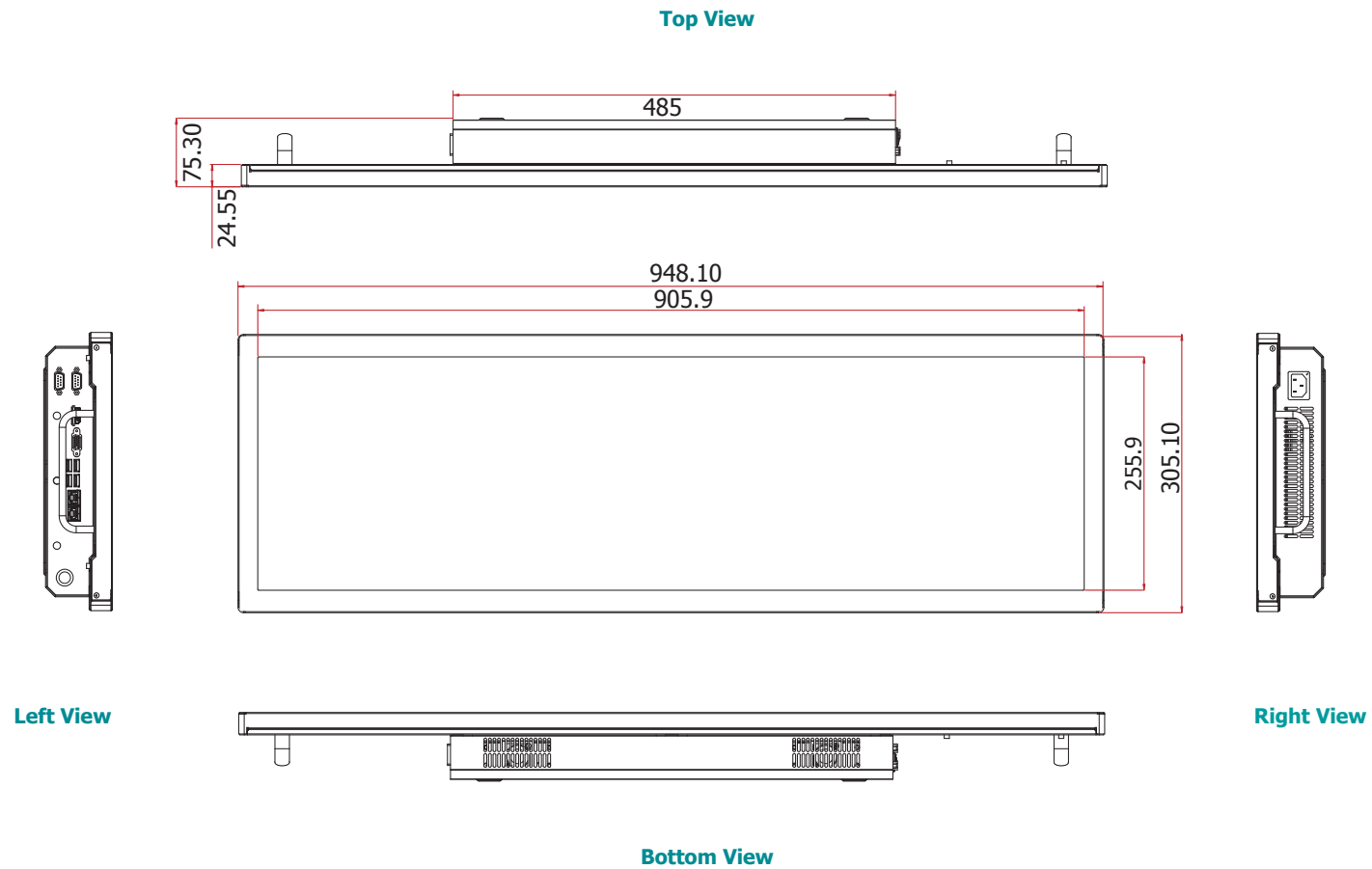


AC-in Power Inlet

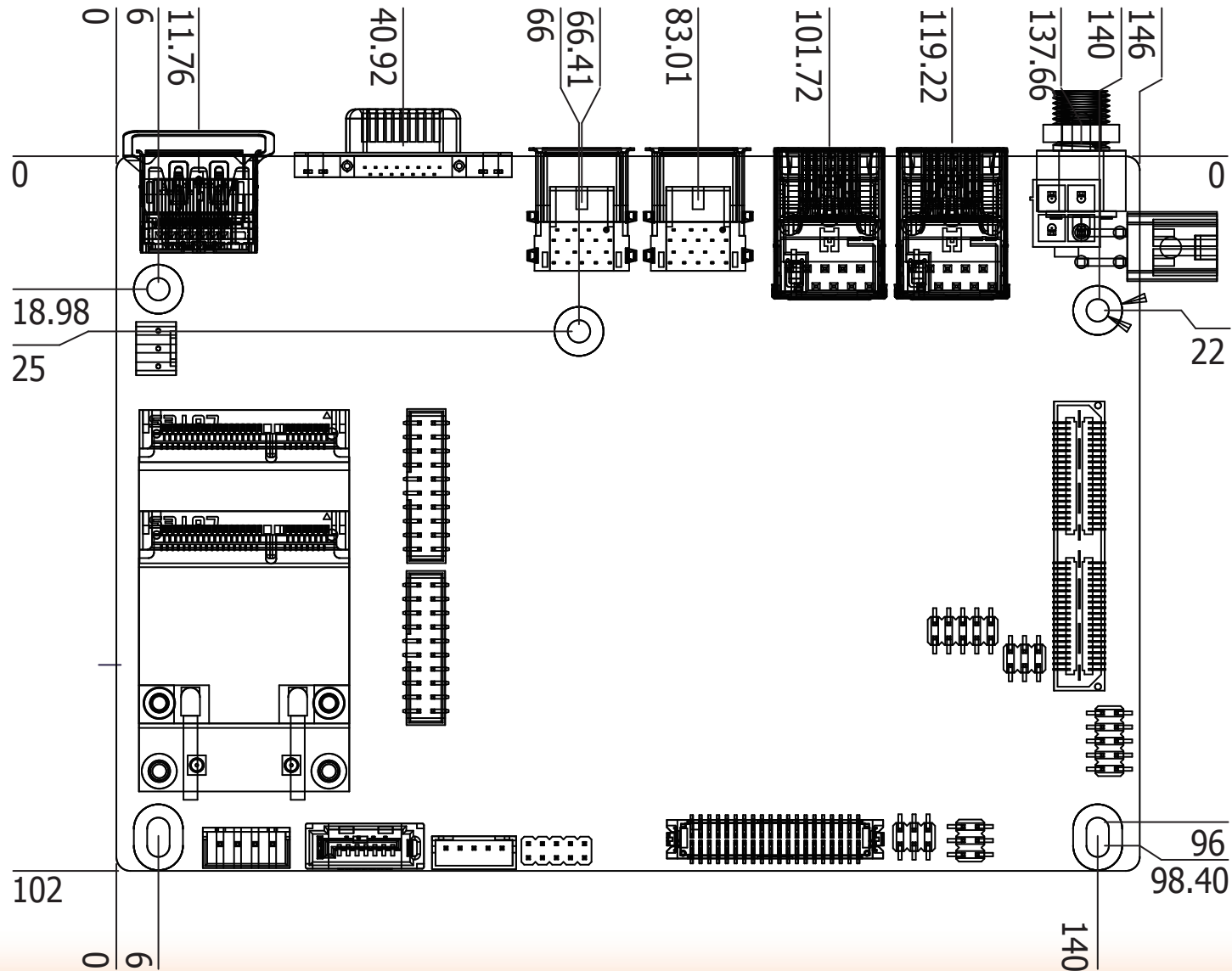
Connects the AC power plug.

Mechanical Dimensions

BPC370-BW



Motherboard Dimension



Chapter 2 - Getting Started

Preparing the System

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

- AC power adapter
- USB keyboard
- USB mouse
- CD-ROM drive
- Screwdriver

Installing Devices

The following devices can be installed in the system:

- Memory module
- mSATA card
- Mini PCIe card

Configuring the BIOS

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

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

Installing an Operating System

To install an operating system, you need to install a CD-ROM drive to use the OS installation CD or use a bootable USB drive.

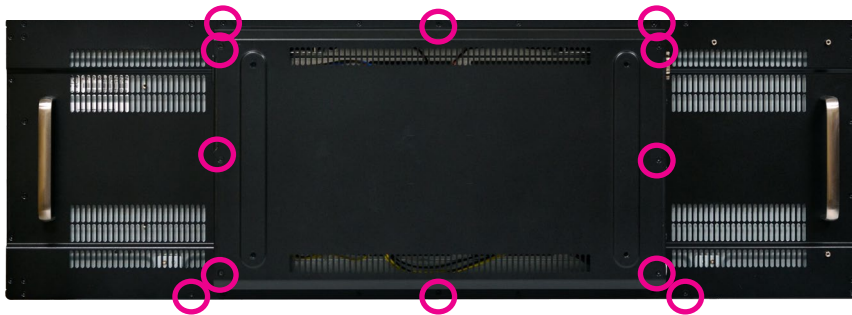
Make sure a 2.5" SATA drive is already installed.

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

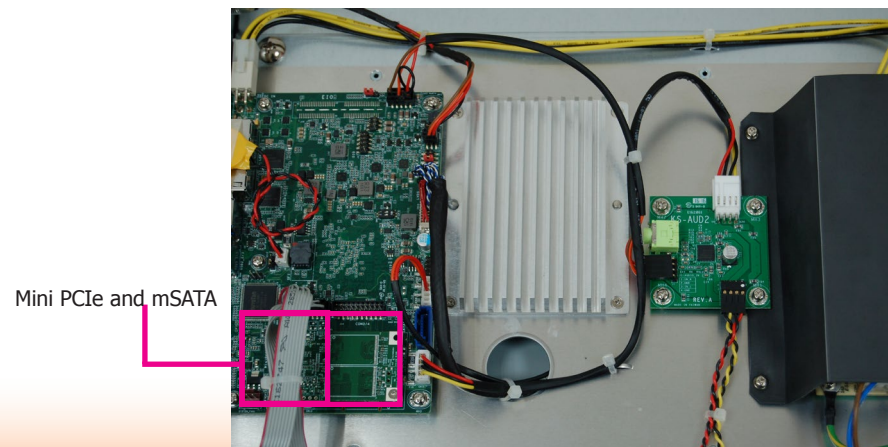
Chapter 3 - Installing Devices

Removing the Chassis Cover

1. Make sure the system and all other peripheral devices connected to it have been powered-off.
2. Disconnect all power cords and cables.
3. The 12 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.



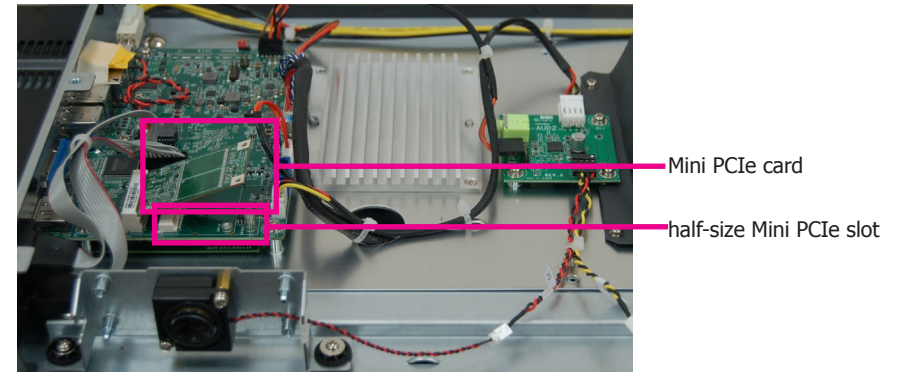
4. Lift the cover up to open the system.
5. The Mini PCIe slots are on the front side and the SODIMM slot are on the rear side of the system board.



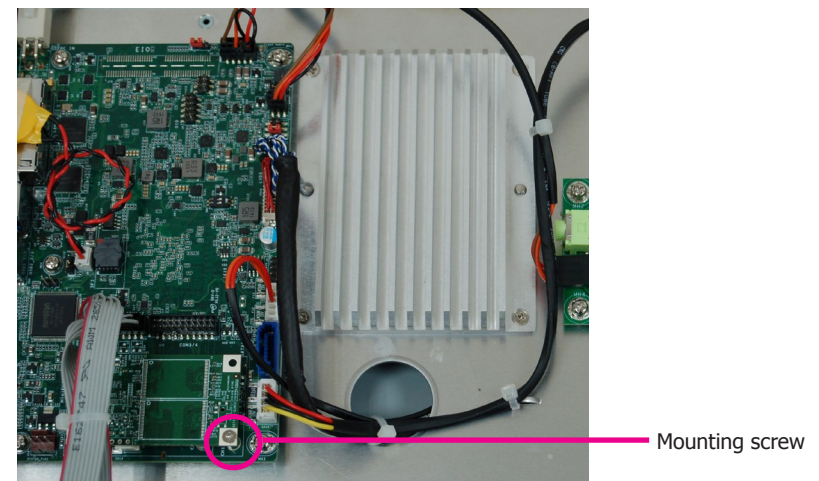
Installing a Mini PCIe Card

The system board is equipped with 2 Mini PCIe slots: one full-size and one half-size slots. Here we will demonstrate the installation of the full-size Mini PCIe card with the mSATA interface.

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.

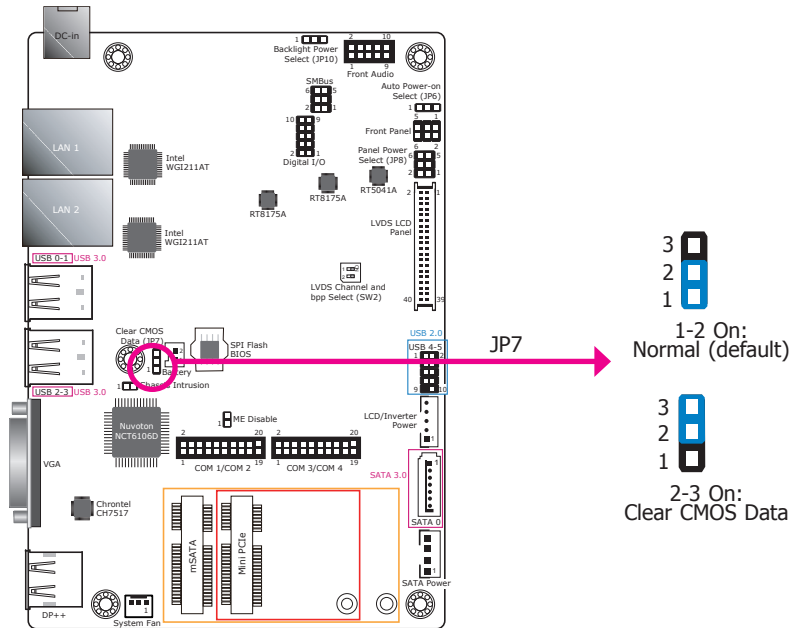


Note:

The system also has a half-size Mini PCIe slot that uses PCIe and USB signals.

Chapter 4 - Jumper Settings

Clear CMOS



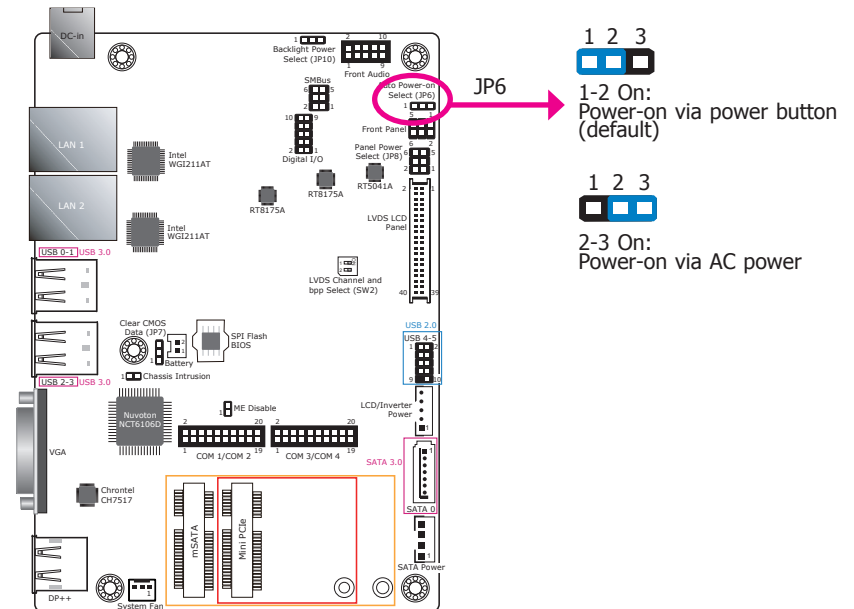
If you encounter the following conditions, you can reconfigure the system with the default values stored in the ROM BIOS.

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

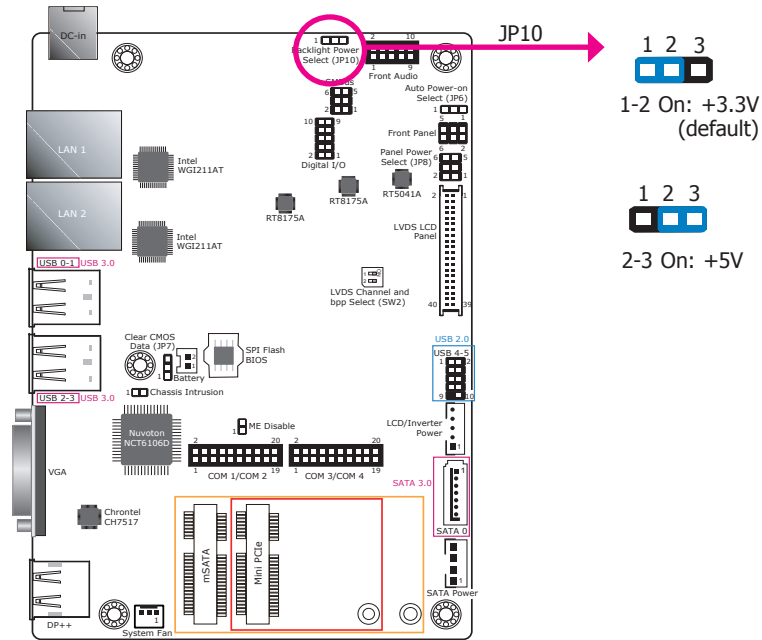
Auto Power-on Select



JP6 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 JP6 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP6 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

Backlight Power Select

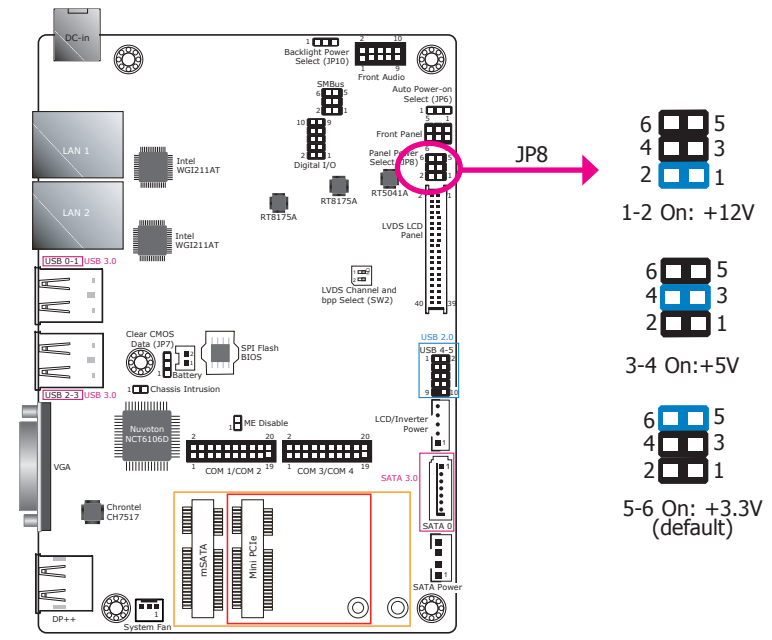


JP10 is used to select the power level of backlight brightness control: +3.3V or +5V.

**Important:**

Before powering-on the system, make sure that the power settings of JP10 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.

Panel Power Select

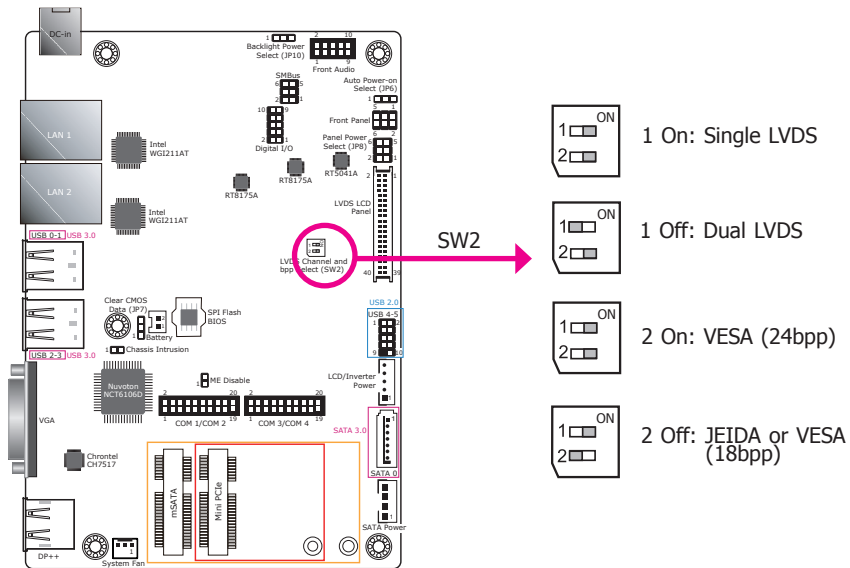


JP8 is used to select the power supplied with the LCD panel.

**Important:**

Before powering on the system, make sure that the power settings of JP8 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

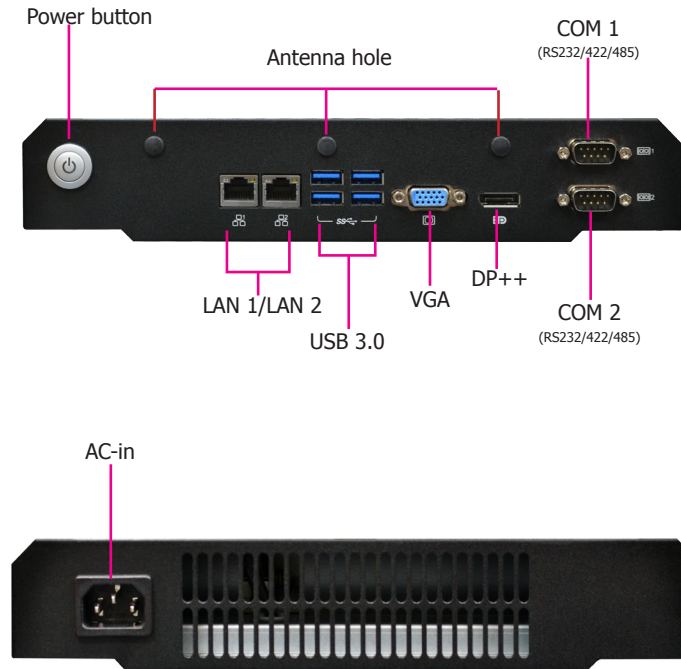
LVDS Channel and bpp Select



Switch 1 allows you to select the LVDS channel and the color of bits per pixel.

Chapter 5 - Ports and Connectors

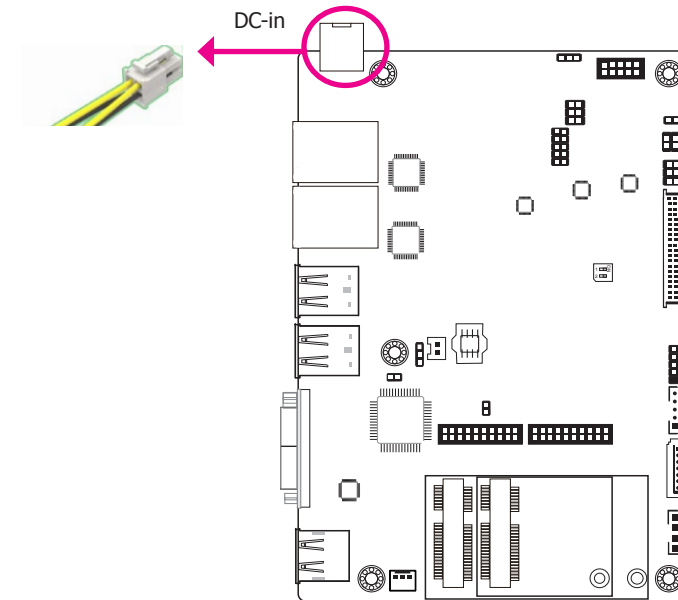
Panel I/O Ports



The side panel I/O consists of the following ports:

- AC-in power inlet
- 2 GbE (RJ-45) ports
- 4 USB 3.0 ports
- 1 VGA port
- 1 DP++ port
- 2 serial ports

12V DC-in

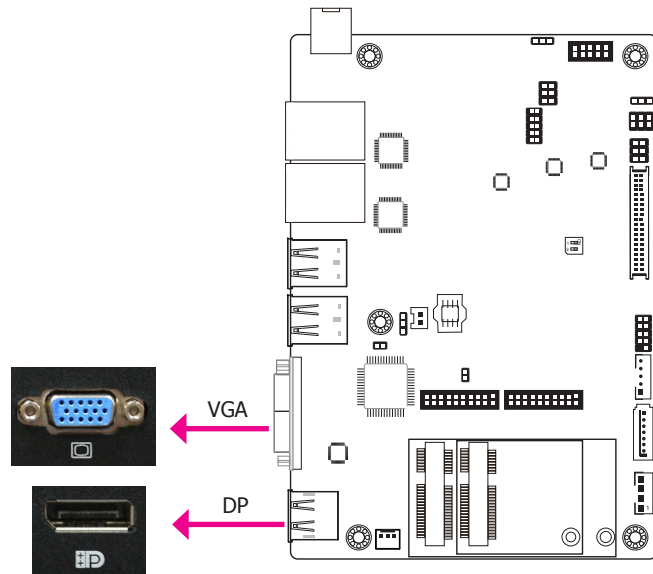


Connect a DC power cord to this jack. In the system, the DC-in power connector is connected to a power board (AC-DC open frame, 100W) that supplies power to the entire system. Using a voltage more than the recommended range for the system board (Single 12V +/-10% DC) may fail to boot the system or cause damage to the system board.

Graphics Interfaces

The display output consists of the following ports:

- 1 DP++ port
- 1 VGA 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.

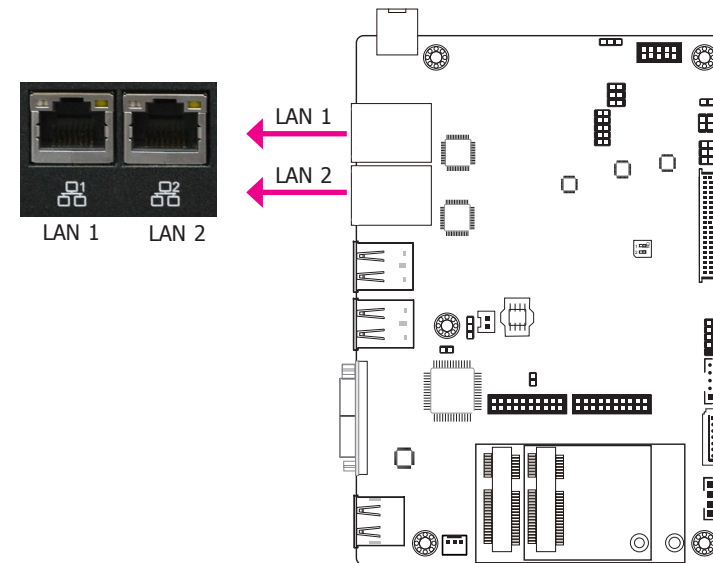
DP Port

The DisplayPort is a digital display interface used to connect a display device. The interface, developed by VESA and backwards compatible with VGA, DVI and HDMI, delivers higher performance than any other digital interfaces.

Driver Installation

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

RJ45 LAN Ports



Features

- 2 Intel® I211AT PCI Express Gigabit Ethernet controllers

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

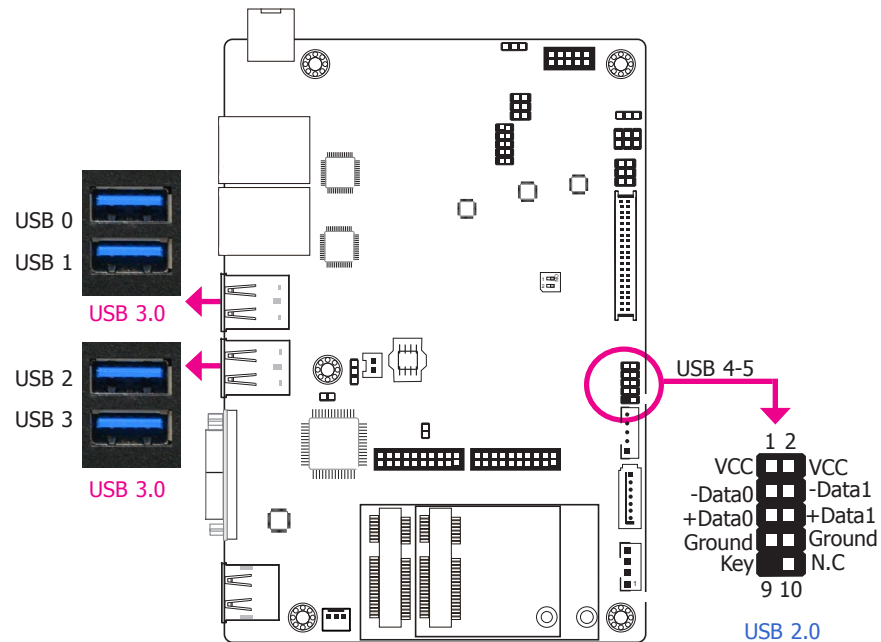
BIOS Setting

Configure the onboard LAN such as the wake-on-LAN function in the Advanced menu ("ACPI Configuration" submenu) of the BIOS.

Driver Installation

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

USB Ports



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

The system board is equipped with 4 onboard USB 3.0 ports (USB 0-1/2-3). The 10-pin connector allows you to connect 2 additional USB 2.0 ports (USB 4-5) for a variety of purposes.

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

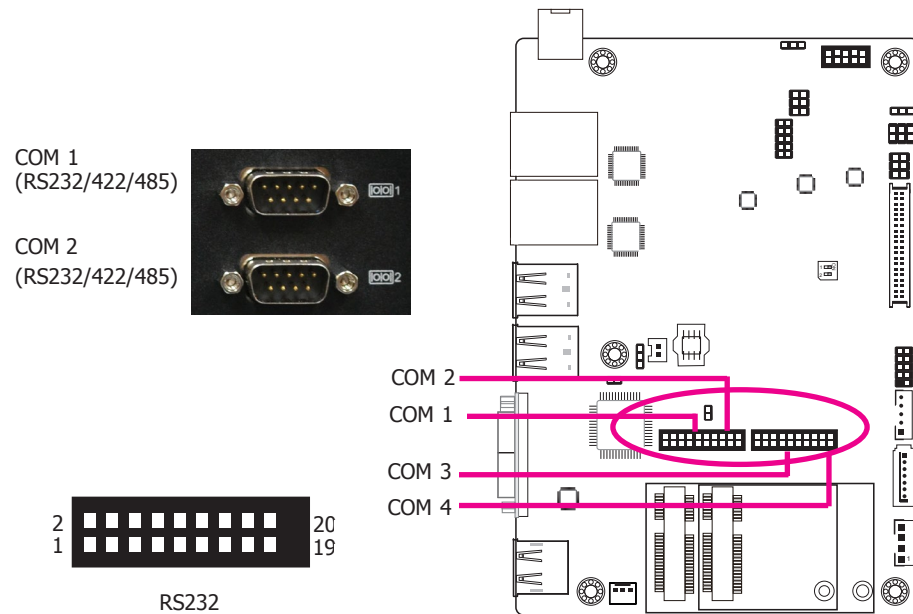
The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.



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

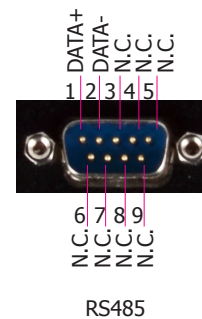
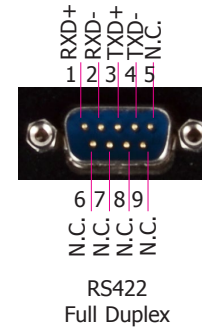
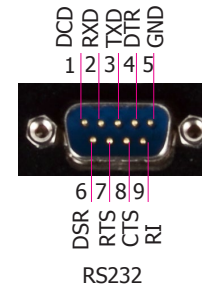


COM 1 and COM 2 can be selected among RS232, RS422 and RS485. COM 3 and COM 4 are fixed at RS232.

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

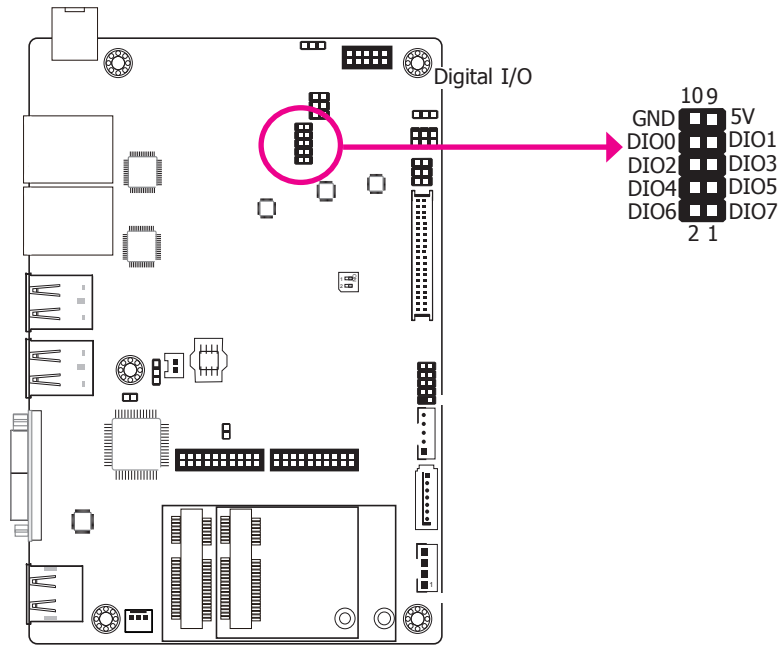
Configure the serial COM ports including the communication mode in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to Chapter 7 for more information.



Pins	RS-232	RS-422	RS-485
1	DCD_1	TD_1	RD_1
2	DSR_1	---	---
3	RD_1	DTR_1	DCD_1
4	RTS_1	---	---
5	TD_1	DCD_1	---
6	CTS_1	---	---
7	DTR_1	RD_1	---
8	RI_1	---	---
9	GND	GND	GND
10	GND	---	---
11	DCD_2	TD_2	RD_2
12	DSR_2	---	---
13	RD_2	DTR_2	DCD_2
14	RTS_2	---	---
15	TD_2	DCD_2	---
16	CTS_2	---	---
17	DTR_2	RD_2	---
18	RI_2	---	---
19	GND	GND	GND
20	GND	---	---

I/O Connectors

Digital I/O Connector

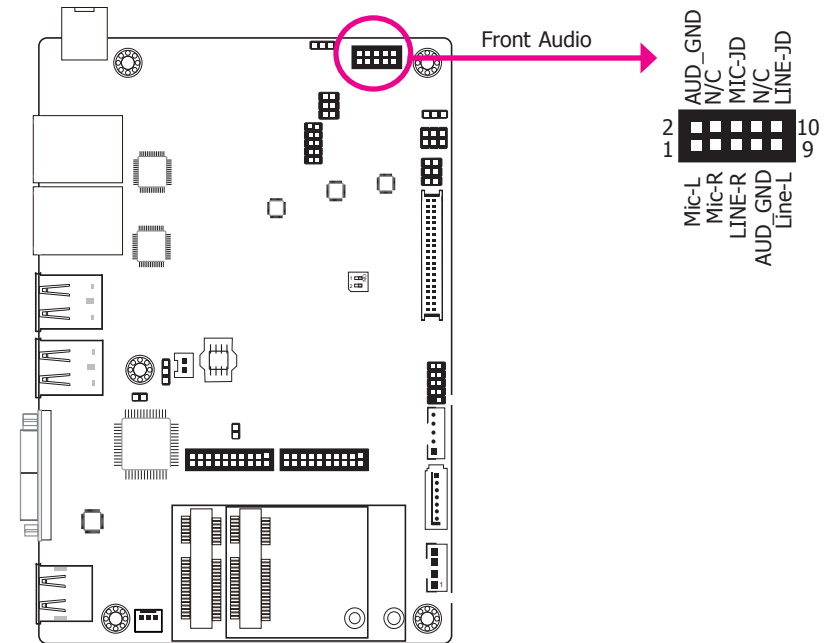


The 8-bit Digital I/O connector provides control and monitoring functions to connected external devices.

Digital I/O Connector

Pins	Function	Pins	Function
1	DIO7	2	DIO6
3	DIO5	4	DIO4
5	DIO3	6	DIO2
7	DIO1	8	DIO0
9	5V	10	GND

Front Audio Connector



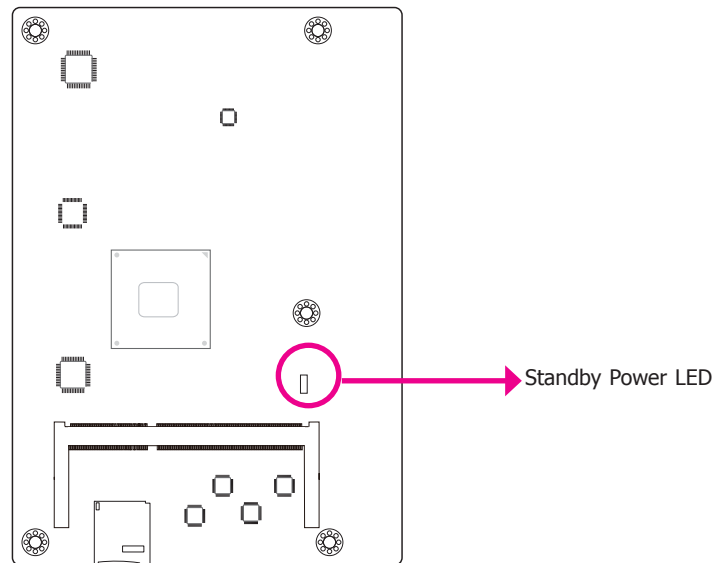
Front Audio

The front audio connector allows you to connect the line-out and mic-in jacks at the front panel of your system. In the system, the front audio connector is connected to the KS-AUD2 audio board which connects to the optional 2W+2W speaker.

Driver Installation

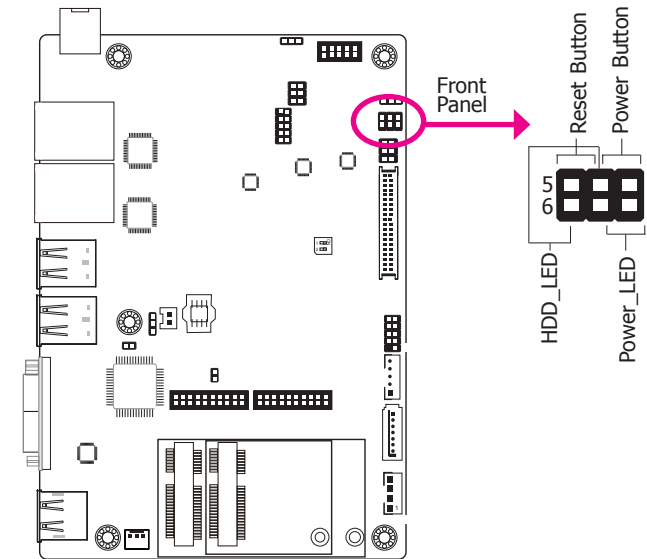
Install the audio driver. Refer to Chapter 8 for more information.

Standby Power LED



This LED (on the rear side of the system board) will be red when the system is in the standby mode. It indicates that there is power on the system board. Power off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

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.

PWR-BTN - Power Switch

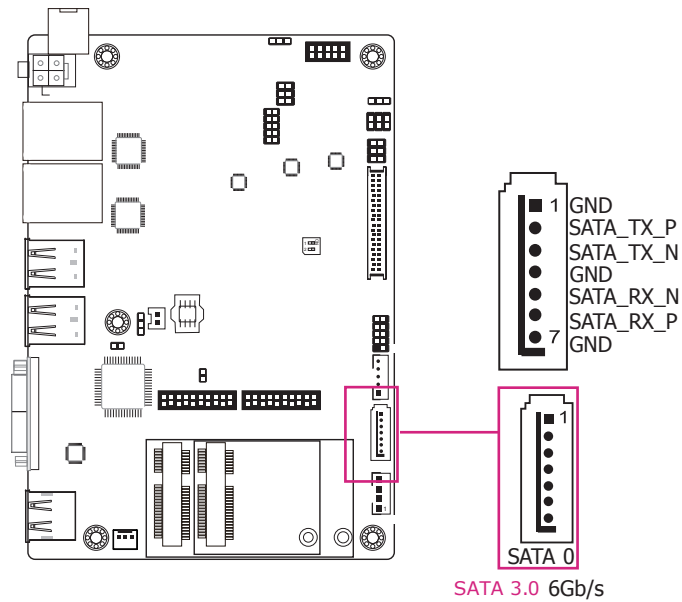
This switch is used to power on or off the system.

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	6	HDD_LED	RESET-SW	5	Reset Button
	3	GND		3	GND
PWR-LED	4	SUS_LED	PWR-BTN	1	Power Button
	2	V_LED		3	GND

SATA (Serial ATA) Connector



Features

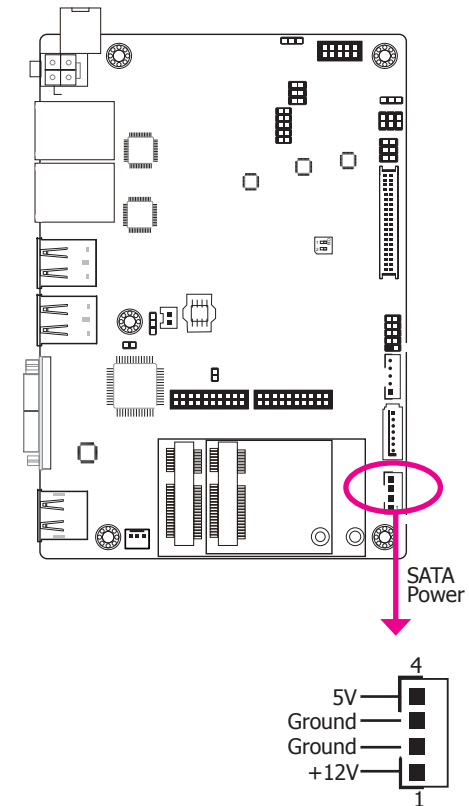
- 1 Serial ATA 3.0 port with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

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

BIOS Setting

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

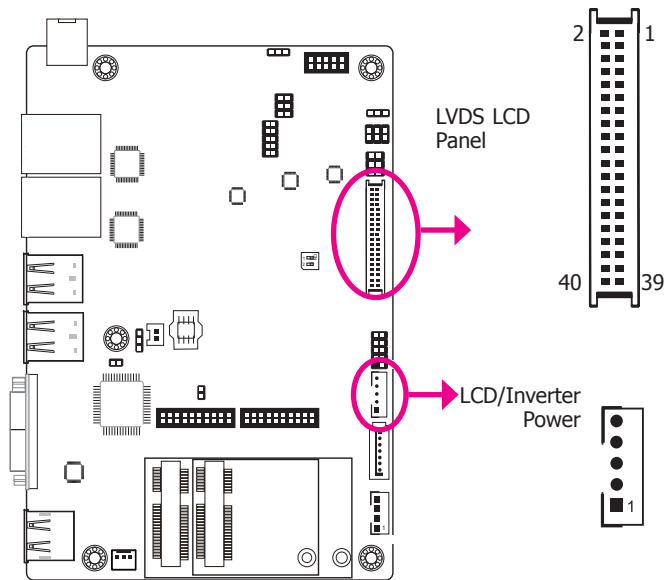
SATA (Serial ATA) Power Connector



The SATA power connector supplies power to the SATA drive. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device.

LVDS LCD Panel Connector

LCD/Inverter Power Connector



These connectors are used to connect the external LCD display panel of the system. They transmit video signals and power from the system board to the LCD display panel.

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

BIOS Setting

Configure the LCD panel in the Advanced menu ("Video Configuration" sub-menu) of the BIOS. Please refer to Chapter 7 for more information.

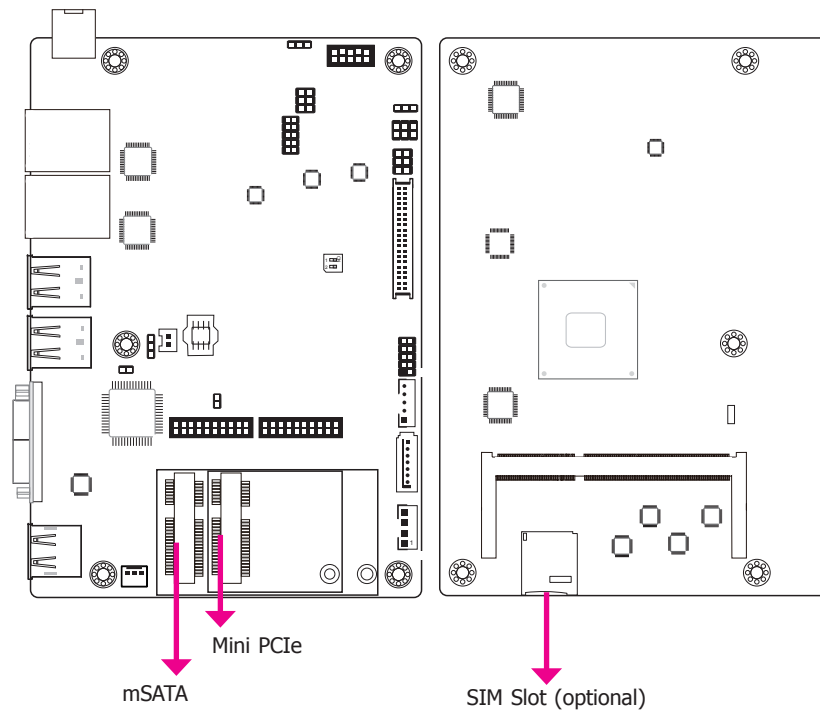
LVDS LCD Panel Connector

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

LCD/Inverter Power Connector

Pins	Function
1	+12V
2	GND
3	Panel Backlight On/Off Control
4	Dimming Control
5	+5V

Expansion Slot



Mini PCI Express Slot (half-size)

The Mini PCIe socket supports PCIe x1 and USB2.0 signals and is used to install a Mini-PCIe card.

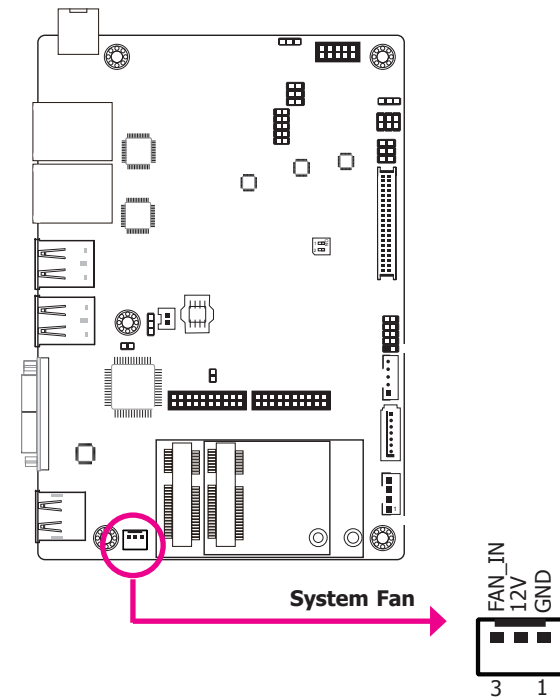
mSATA Slot (full-size)

The mSATA port supports SATA III (6Gb/s) transmission rate and is used to connect an mSATA card. It is used for the system's storage.

SIM Slot (optional)

The SIM slot on the system board is used to insert a SIM card.

Cooling Fan Connector

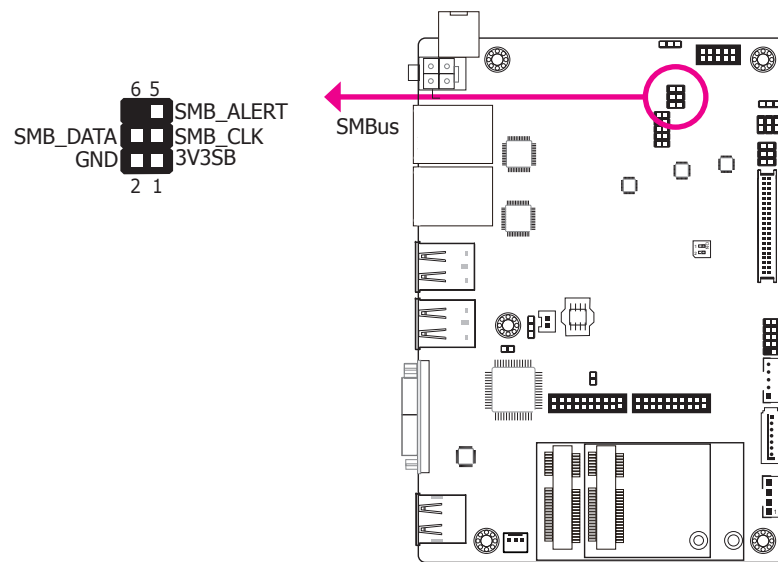


The fan connector is used to connect the cooling fan. The cooling fan will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

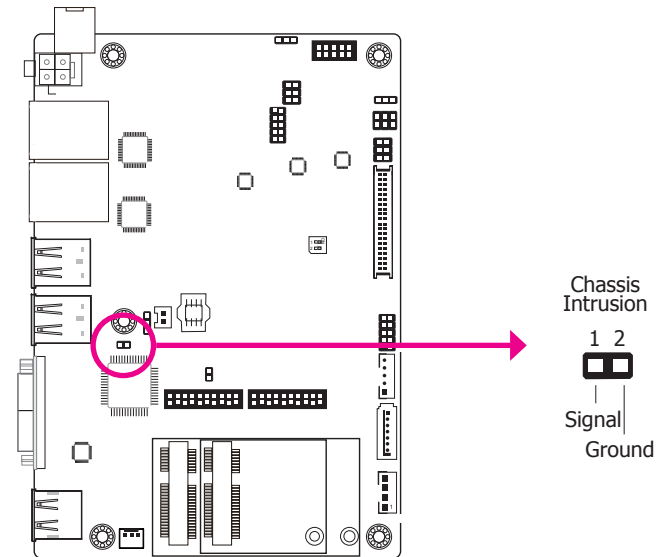
The Advanced menu ("PC health status" of the "SIO Configuration" submenu) of the BIOS displays the current speed of the cooling fans. Refer to Chapter 7 for more information.

SMBus Connector



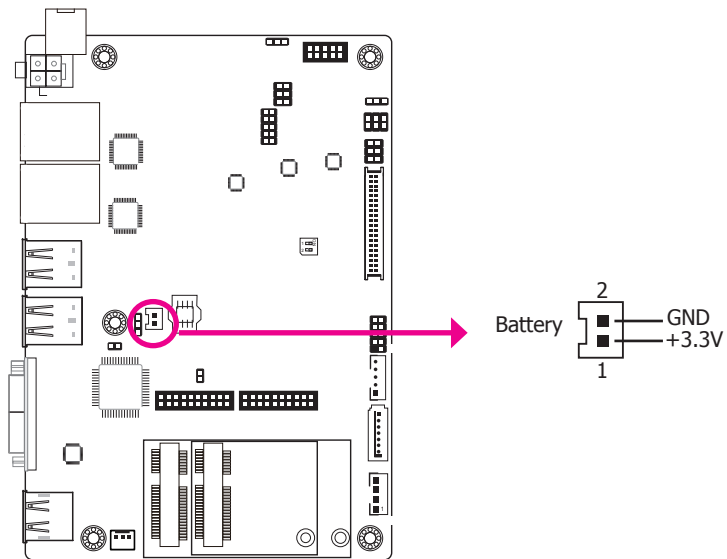
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

Chassis Intrusion Connector



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

Battery



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

Safety Measures

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

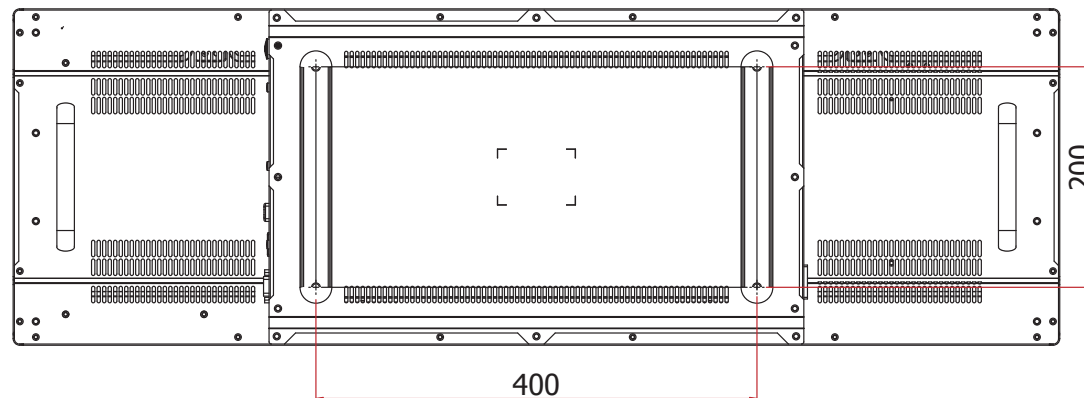
Chapter 6 - Mounting Options

VESA Mount

**Notes:**

1. The system unit used in the following illustrations may not resemble the actual one. These illustrations are for reference only.
2. The VESA mount kit is not included in the product package.

The VESA-mount specifications for this device is 400 x 200 (mm). Please use a compatible VESA-mount kit that can sustain the weight and size of this device. Please refer to the following illustration for screw-hole positions.



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 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
<F5/F6>	Change values
<F9>	Optimized defaults
<F10>	Save and exit 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.

InsydeH20 Setup Utility				Rev. 5.0
Main	Advanced	Security	Boot	Exit
Project Name BIOS Version			BPC370 X64 7A.12A	This is the help for the hour, minute, second field. Valid range is from 0 to 23, 0 to 59, 0 to 59. INCREASE/REDUCE: +/-.
Processor Type			Intel(R) Pentium(R) CPU N3710@ 1.60GHz	
CPU Speed			1600MHz	
CPUID			000406C4h	
L1 Data Cache			24 KB	
L1 Instruction Cache			32 KB	
L2 RAM			1024 KB	
L3 Cache			0 KB	
Number of Processors			Core 4	
Microcode Revision			40A	
Total Memory			4096 MB	
System Memory Speed			1600 MHz	
SODIMM 0			4096 MB	
TXE FW Version			2.0.4.3098	
System Time			[21:12:02]	
System Date			[11/22/2017]	
F1 Help Esc Exit	↑/↓ ←/→	Select Item Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. 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.



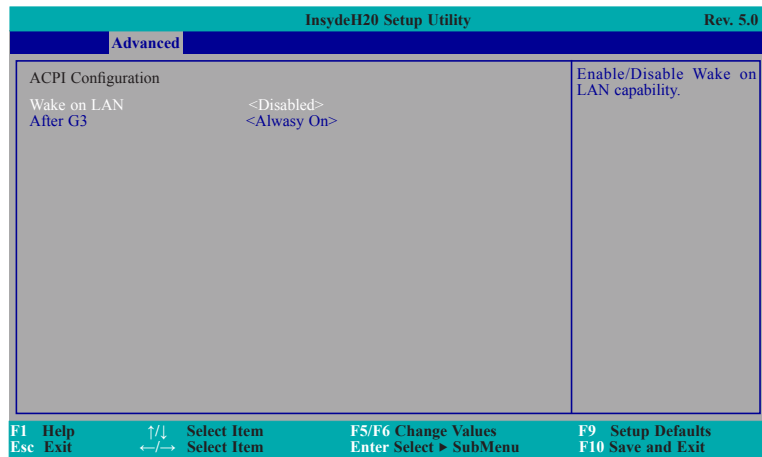
Important:

Setting incorrect field values may cause the system to malfunction.

InsydeH20 Setup Utility					Rev. 5.0
Main	Advanced	Security	Boot	Exit	
<div>▶ ACPI Configuration</div> <div>▶ CPU Configuration</div> <div>▶ Video Configuration</div> <div>▶ Audio Configuration</div> <div>▶ SATA Configuration</div> <div>▶ USB Configuration</div> <div>▶ PCI Express Configuration</div> <div>▶ ME Configuration</div> <div>▶ SIO NUVOTON6106D</div>					Configures ACPI Tables/Features setting
F1 Esc	Help Exit	↑/↓ ←/→	Select Item Select Item	F5/F6 Enter	Change Values Select ► SubMenu
					F9 F10
					Setup Defaults Save and Exit

ACPI Settings

This section configures the system ACPI parameters.



Wake on LAN

Enable or disable the LAN signal to wake up the system.

After G3

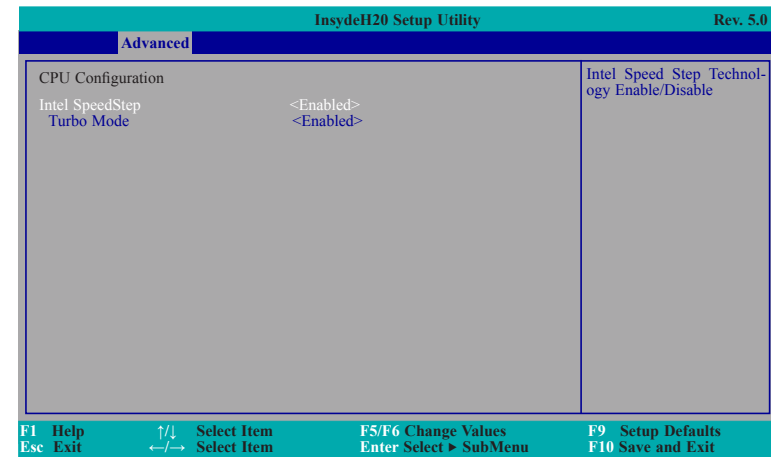
This field specifies what state the system should be in when power is re-applied after a power failure (G3, the mechanical-off, state).

Always On The system is in working state.

Always Off The system is in soft-off state.

CPU Configuration

This section configures the CPU.



Intel SpeedStep®

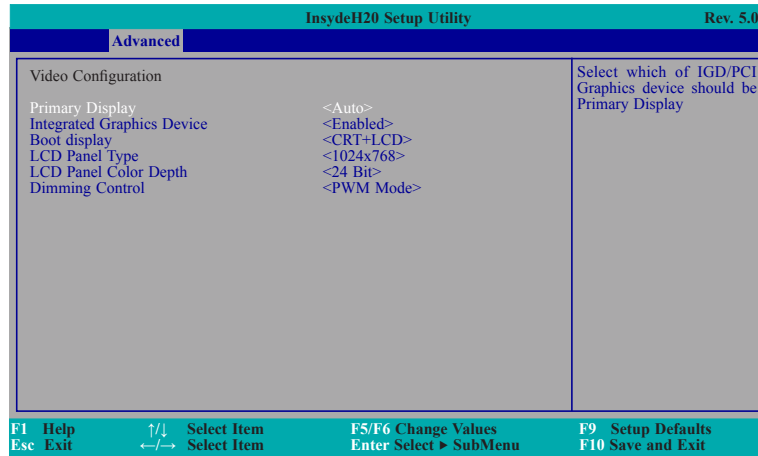
Enable or disable the Enhanced Intel SpeedStep® Technology, which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, you can enable the EIST feature using the operating system's power management.

Turbo Mode

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

Video Configuration

This section configures the video settings. The options vary depending on the "Boot Type" selected in the "Boot" menu.



Primary Display

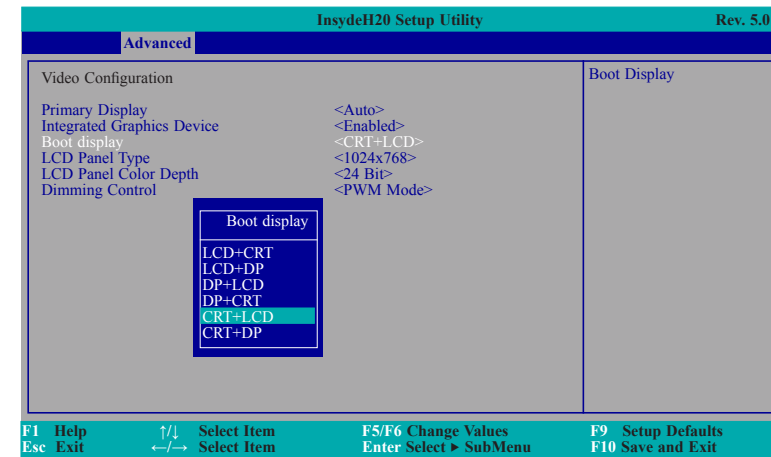
Select the IGD (integrated graphics device), PCIe graphics device, or automatic configuration to be the primary display. Note that this option is only shown if the "Boot type" is set to "Dual" or "UEFI."

Integrated Graphics Device

Enable or disable the IGD function.

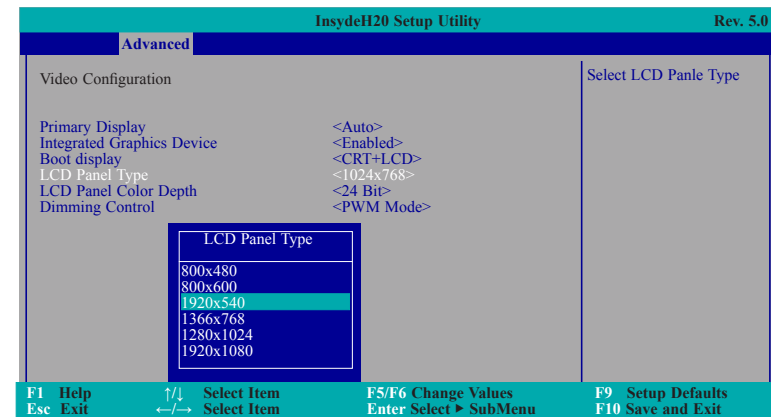
Boot display

Set the display device combination during the system boot process. Note that this option will be shown only if the "Boot type" is set to "Dual" or "Legacy."



LCD Panel Type

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



LCD Panel Color Depth

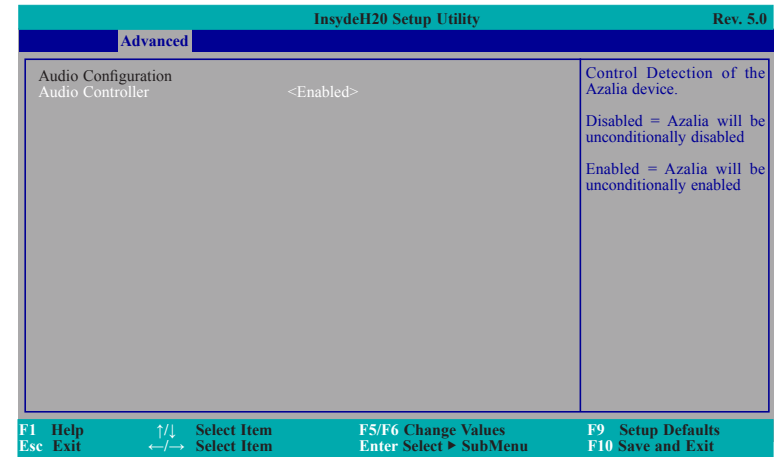
Select the LCD panel color depth: 18 bit, 24 bit, 36 bit, and 48 bit.

Dimming Control

Select Dimming control type from PWM or DC mode for the LCD panel.

Audio Configuration

This section configures the audio controller.



Audio Controller

Set to enable or disable the onboard Azalia controller.

Disabled

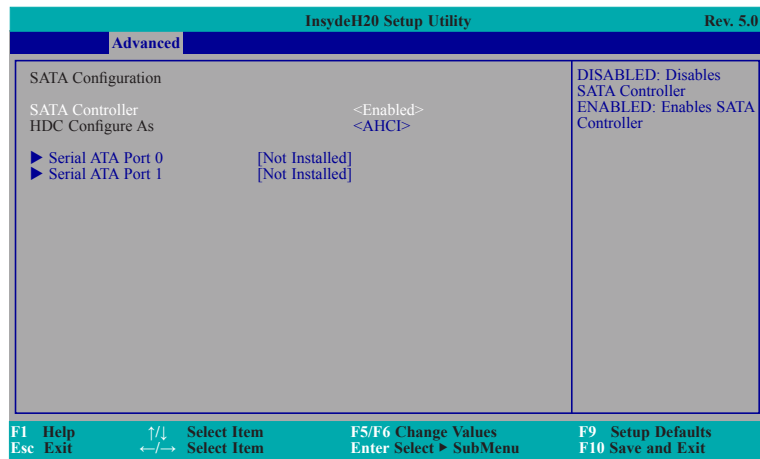
Azalia will be unconditionally disabled.

Enabled

Azalia will be unconditionally enabled.

SATA Configuration

This section configures the SATA controller.



SATA Controller

Enable or disable the Serial ATA controller(s).

HDC Configure As

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

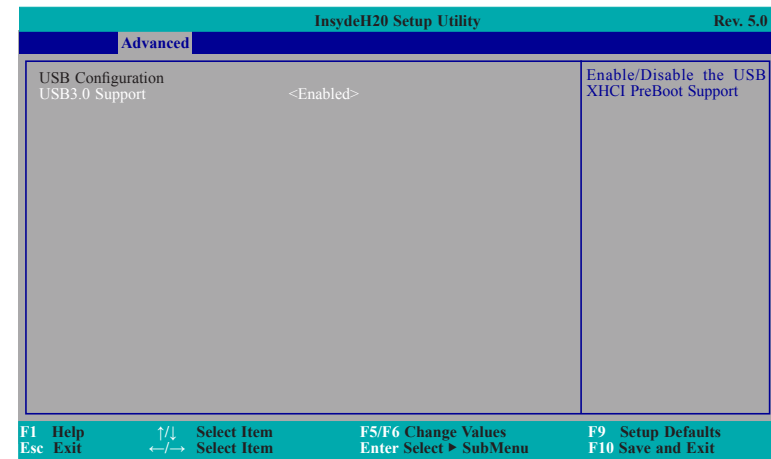
Enable or disable the SATA port:

SATA Port 0 controls SATA Port 0.

SATA Port 1 controls the full-size Mini PCIe slot (mSATA).

USB Configuration

This configures the parameters of the USB 3.0 xHCI (eXtensible Host Controller Interface).



USB3.0 Support

Disabled

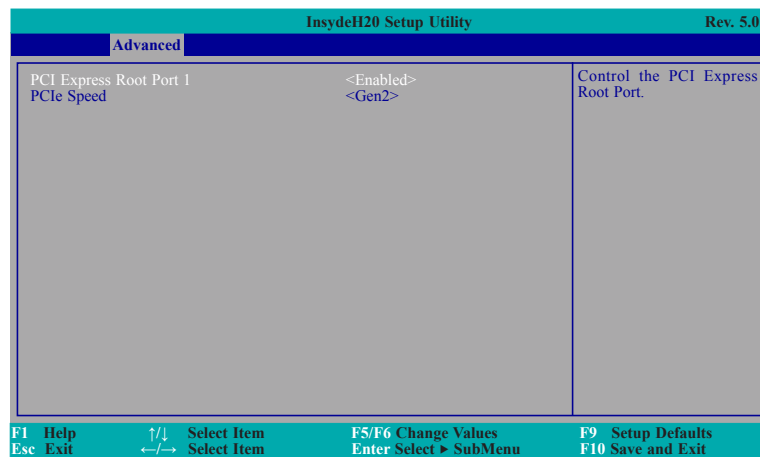
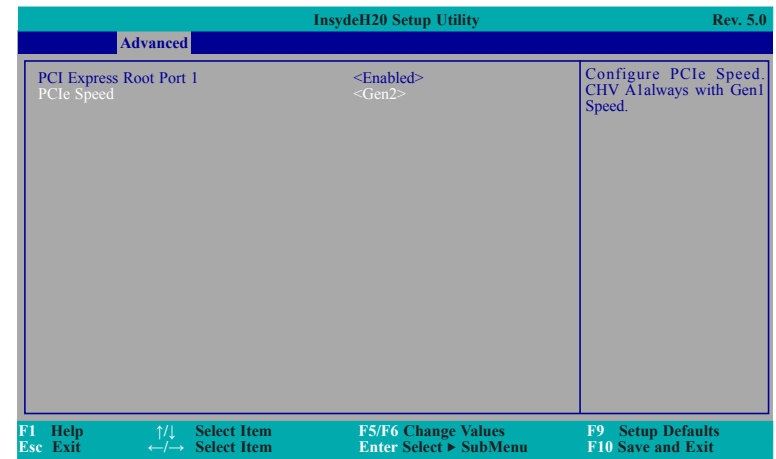
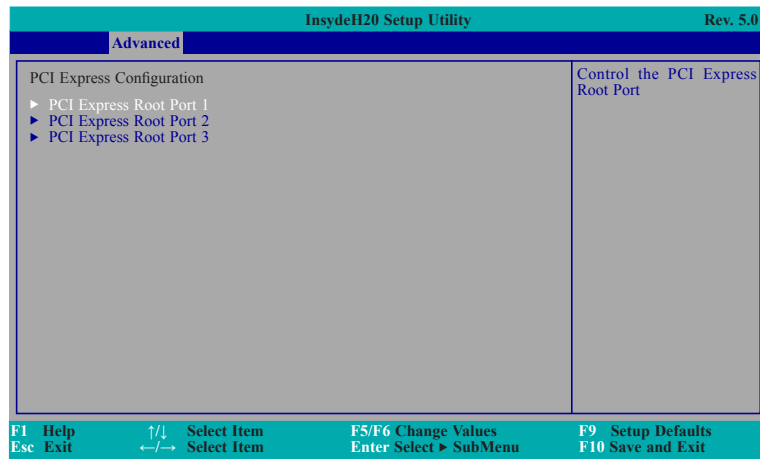
Disable USB XHCI Pre-Boot Support.

Enabled

Enable USB XHCI Pre-Boot Support.

PCI Express Configuration

This section configures the settings of PCI Express root ports.



For each PCIe root port, configure the following parameters:

PCI Express Root Port

Enable or disable the PCI Express Root Port:

PCI Express Root Port 1 controls the half-size Mini PCIe slot.

PCI Express Root Port 2 controls LAN 1.

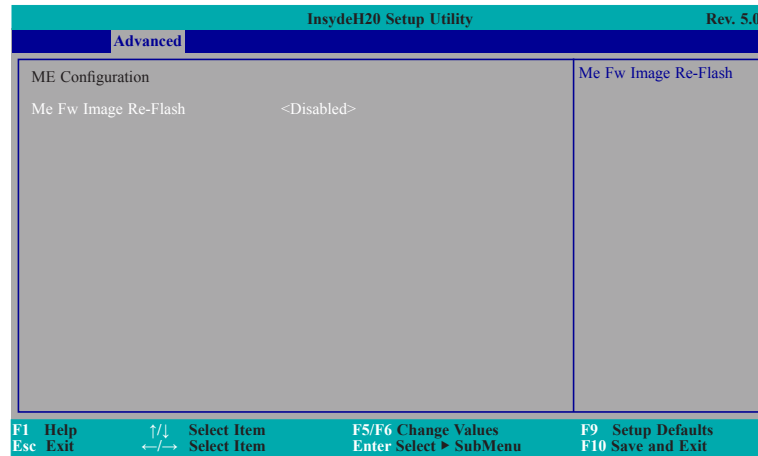
PCI Express Root Port 3 controls LAN 2.

PCIe Speed

Select the speed of the PCI Express Root Port: Gen 1 or Gen 2.

ME Configuration

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

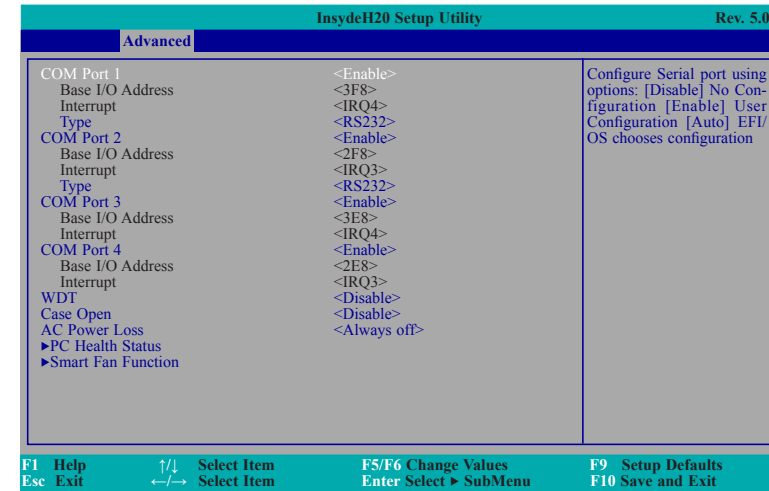


Me Fw Image Re-Flash

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

Super IO (SIO) Configuration

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



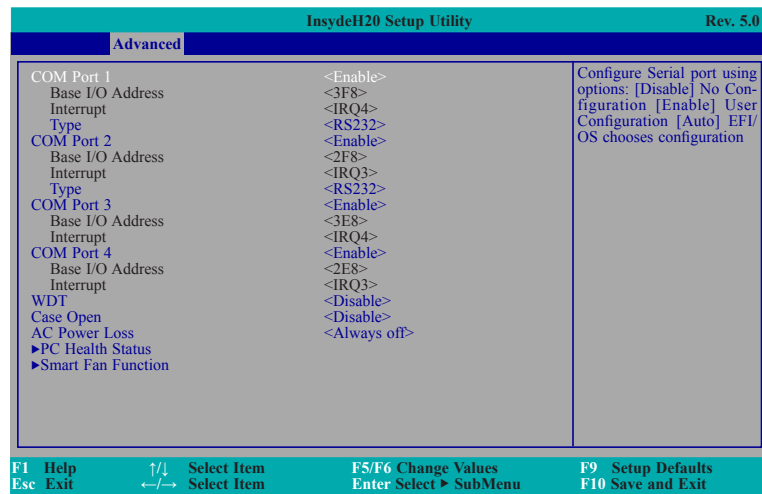
Serial Port 1 to Serial Port 4

Configure the settings of each serial port.

- Disable: Disable this serial port.
- Enable: Enable this serial port.

Type

Choose RS232/RS422/RS485 (Peer-to-Peer) for the serial port type for COM port 1 and COM port 2.



WDT

Enable or disable the watchdog function. If it is enabled, enter the watchdog time-out value in seconds.

Case Open

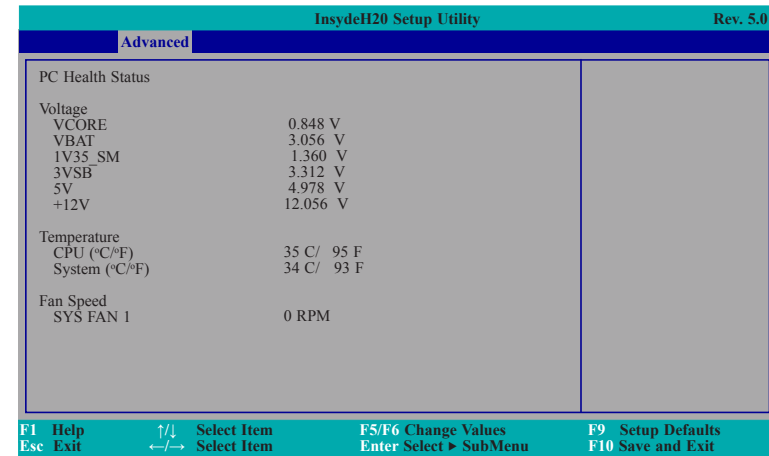
Enable or disable the case open function.

AC Power Loss

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

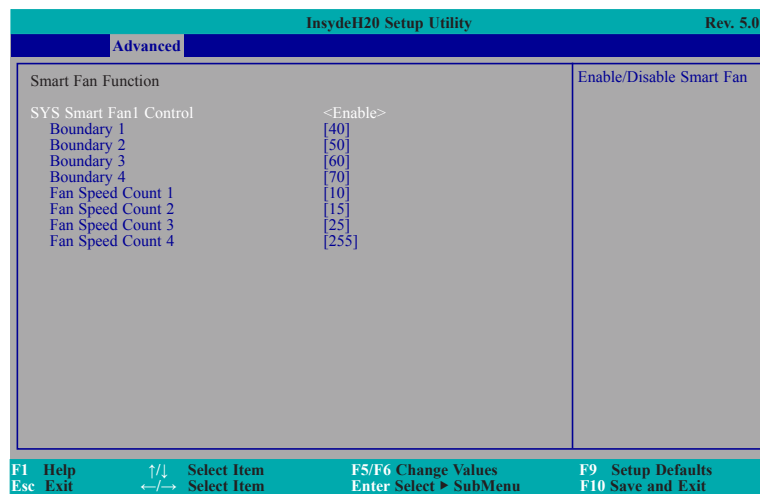
PC Health Status

This section displays the system's health information such as the CPU and system temperatures.



Smart Fan Function

This section configures the Smart Fan Function.



SYS Smart Fan Control

Enable or disable the smart fan control. If you choose to disable this function, enter the fan speed (in the fixed speed mode) from 0 (non-operating) to 255 (full-speed).

Boundary 1 to Boundary 4

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

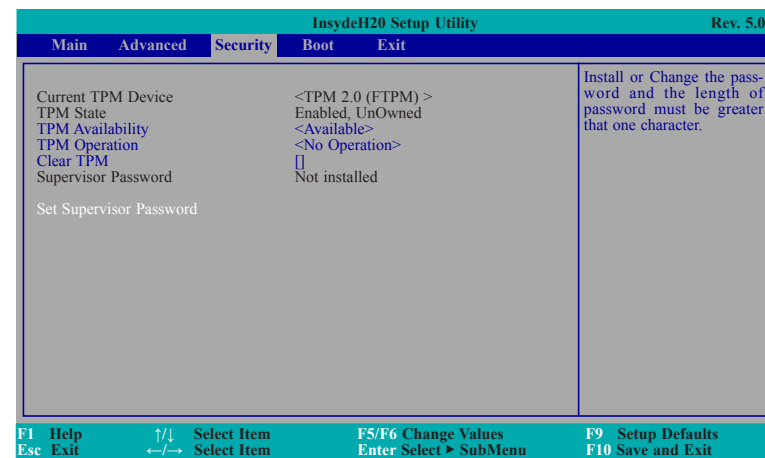
The range of the temperature is from 0 to 127°C.

Fan Speed Count 1 to Fan Speed Count 4

Set the fan speed. The range is from 0 (non-operating) to 255 (full-speed).

Security

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



TPM Availability

Show or hide the TPM availability and its configurations.

TPM Operation

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

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

Clear TPM

Remove all TPM ownership contents.

Set Supervisor Password

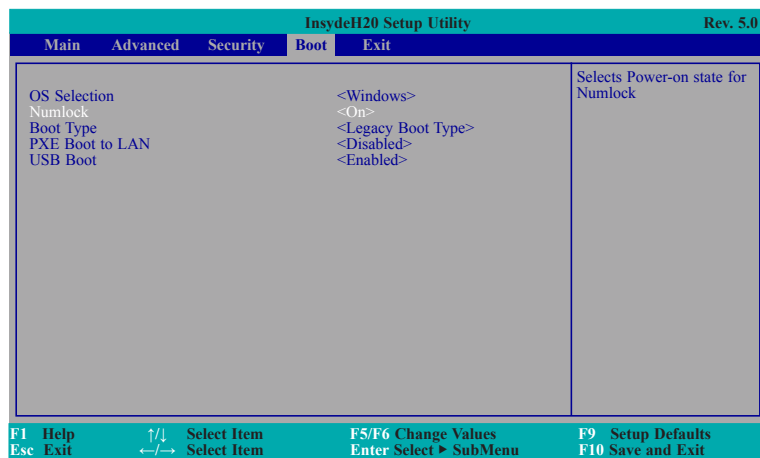
Set the administrative password for entering the BIOS utility or upon entering the power-on self-test (POST) process. The length of the password must be greater than 1 character and less than or equal to 10 characters.

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

This section configures boot options.



OS Selection

Select the system's operating system: Windows, Linux or DOS.

Numlock

Select the power-on state for the numlock key.

Boot Type

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

PXE Boot Capability or PXE Boot to LAN

Disables or enables Preboot eXecution Environment (PXE) boot to LAN (if Boot Type selected is legacy) or PXE Boot Capability (if Boot Type selected is UEFI).

Network Stack

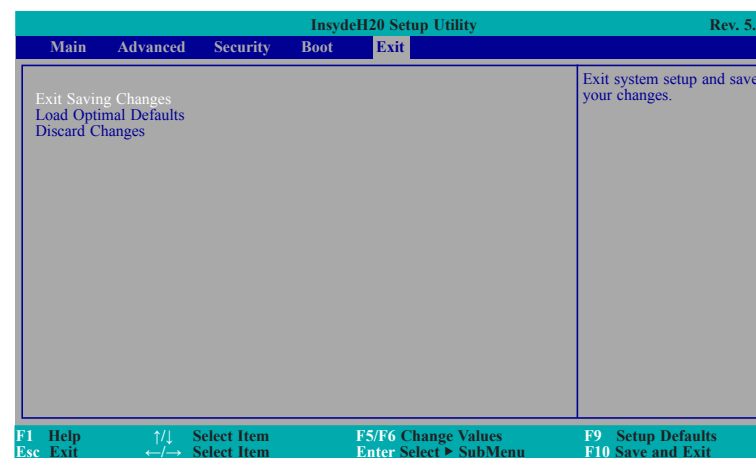
Enable or disable network stack in UEFI mode. This option will be shown only if the PXE Boot Capability is enabled.

USB Boot

Enable or disable the booting to USB boot devices.

Exit

This section configures the parameters for exiting the BIOS menu.



Exit Saving Changes

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

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files and specific instructions about how to update BIOS with the flash utility.

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

```

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

Information
Please do not remove the AC power

Insyde H2OFFT (Flash Firmware Tool) Version (SEG) 100.00.08.10
Copyright(c) 2012 - 2016, Insyde Software Corp. All Rights Reserved.

Initializing
Current BIOS Model name: BPC370
New BIOS Model name: BPC370

Current BIOS version: 65.05A
New BIOS version: 65.05A

Updating Block at FFFFFFF000h
0%      25%      50%      75%      100%
C:\BPC370>_

```

Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.
2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.
3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.



Note:

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

Chapter 8 - Supported Software

The system requires you to install drivers for some devices to operate properly.
To download the latest driver, please go to the Intel Download Center:
<https://downloadcenter.intel.com/>

You may also use the Intel® Driver Update Utility to let the utility automatically check for the latest drivers for the system. To download the utility, please visit:
<https://www.intel.com/content/www/us/en/support/detect.html>

Drivers are available for the following devices with the download links:

Intel Chipset Software Installation Utility

Intel Graphics Drivers

Realtek Audio Drivers (Realtek ALC888 series High-Definition Audio Codecs)

SparkLAN WPEA-121N Wireless Drivers (optional)

<http://www.sparklan.com/p2-products-detail.php?PKey=25c0Ma0Cj9d7HopM4rLAPTAIGkPKew3bIVVxmd7DnA&WPEA-121N>

Intel USB 3.0 Drivers

(for Win 8.1: <https://downloadcenter.intel.com/download/26253/NUCs-Intel-USB-3-0-Host-Controller-Adaptation-Driver-for-Windows-8-1-?wapkw=usb+3.0+host+controller>)

(for Win 7: <https://downloadcenter.intel.com/download/24503/Intel-USB-3-0-Device-Driver-for-Intel-NUC-Products>)

Intel Serial IO Drivers

(for Win 10: <https://downloadcenter.intel.com/download/25601/NUCs-Intel-Serial-IO-Driver-for-Windows-10>)

(for Win 8.1: <https://downloadcenter.intel.com/download/25602/NUCs-Intel-Serial-IO-Driver-for-Windows-8-1->)

Intel® Trusted Execution Engine Drivers

(<https://downloadcenter.intel.com/download/24892/NUCs-Intel-Trusted-Execution-Engine-Driver-for-Intel-NUC-Kit-NUC5CPYH-NUC5PPYH-NUC5PGYH?product=85254>)

Kernel-Mode Driver Framework (For Windows 7 only)

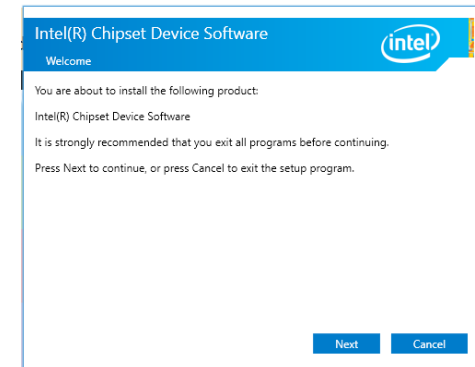
<https://www.microsoft.com/en-us/download/details.aspx?id=38423>

Intel Chipset Software Installation Utility

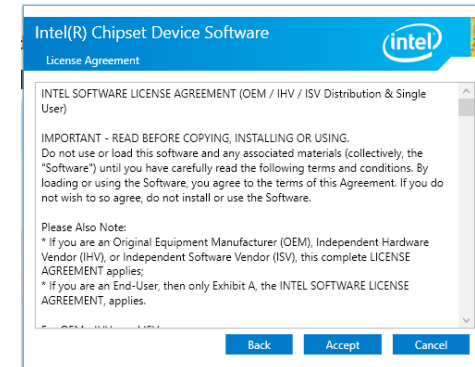
The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, follow these steps:

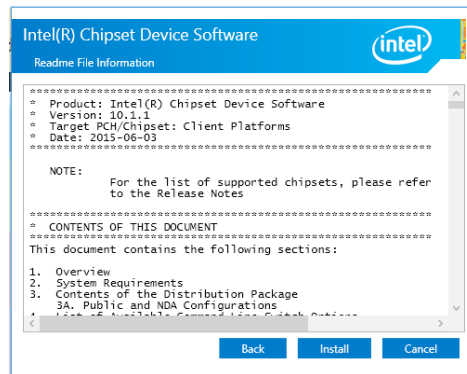
1. Setup is ready to install the utility. Click "Next."



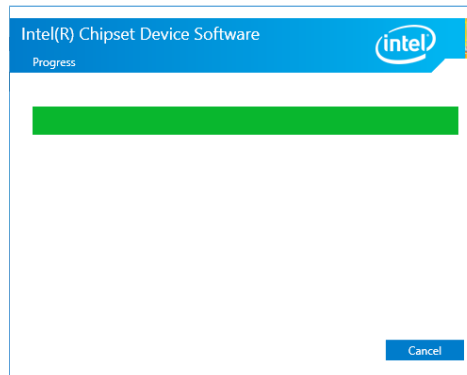
2. Read the license agreement, and then click "Yes."



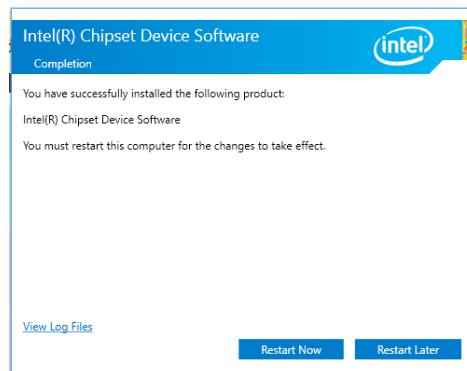
- Go through the readme document for system requirements and installation tips, and then click "Next". Please wait while the installation is in progress.



- Please wait while the installation is in progress.



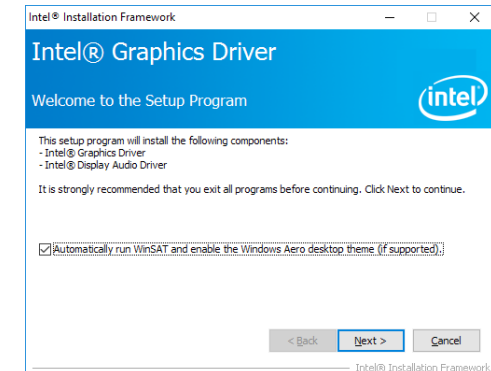
- Click "Restart Now" to allow the new software installation to take effect.



Intel Graphics Driver

To install the driver, follow these steps:

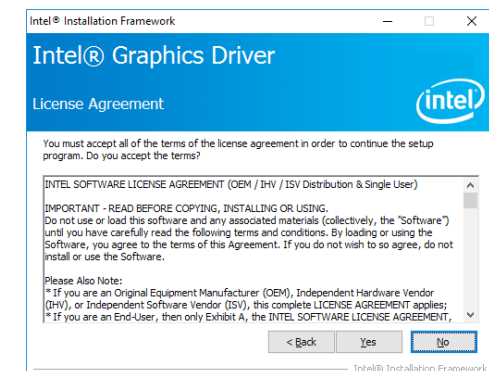
- Setup is now ready to install the graphics driver. Click "Next."



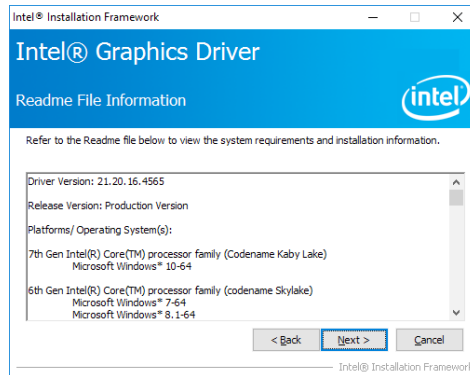
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this is enabled and after the system is rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/ Windows 8.1/ Windows 10 desktop appears. The "blank screen"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

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

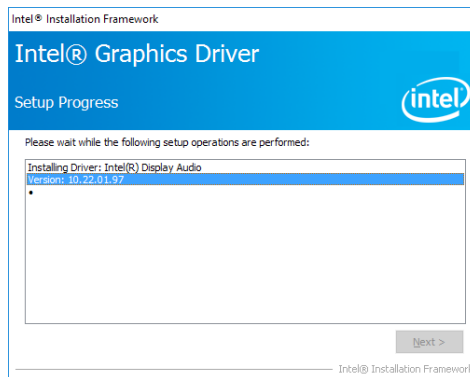
- Read the license agreement, and then click "Yes."



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

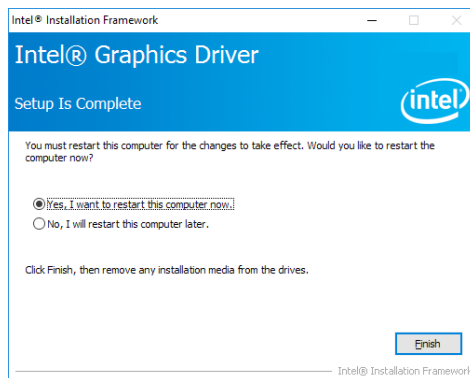


- Setup is now installing the driver. Click "Next" to continue.



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

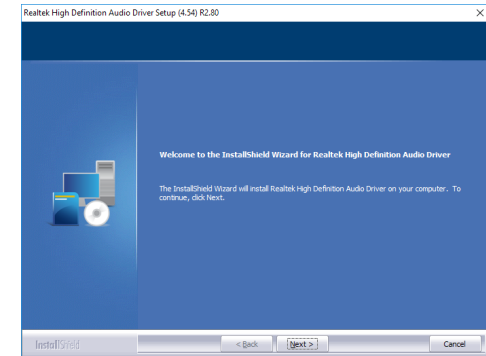
Restarting the system will allow the new software installation to take effect.



Audio Driver

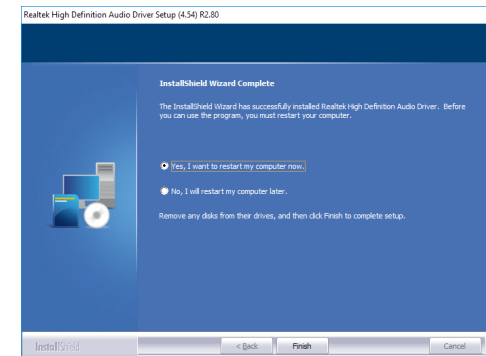
To install the driver, follow these steps:

- Setup is now ready to install the audio driver. Click "Next."
- Follow the rest of the steps on the screen; click "Next" each time you finish a step.



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

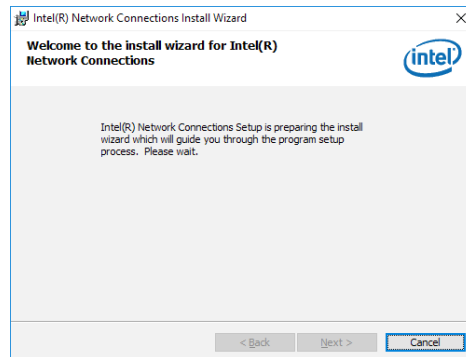
Restart the system to allow the new software installation to take effect.



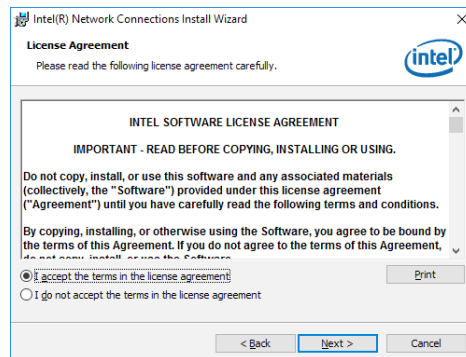
Intel LAN Driver

To install the driver, follow these steps:

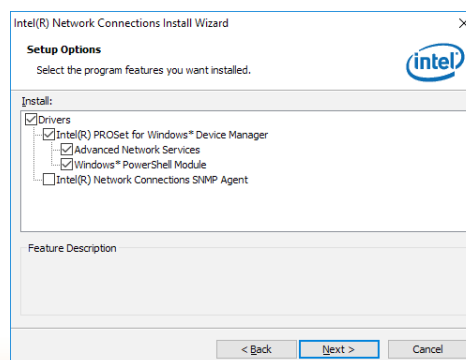
1. Setup is preparing to install the driver. Click "Next" to continue.



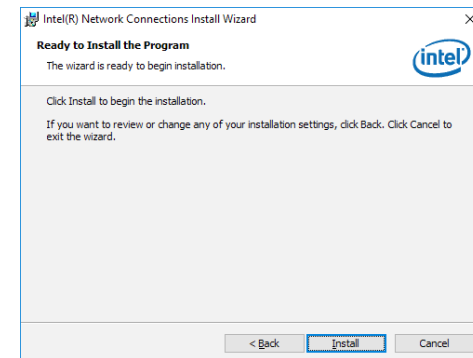
2. Click "I accept the terms in the license agreement" if you accept the agreement, and then click "Next."



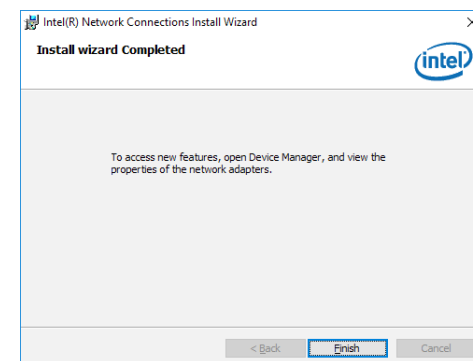
3. Select the program features you want installed, and then click "Next."



4. Click "Install" to begin the installation.



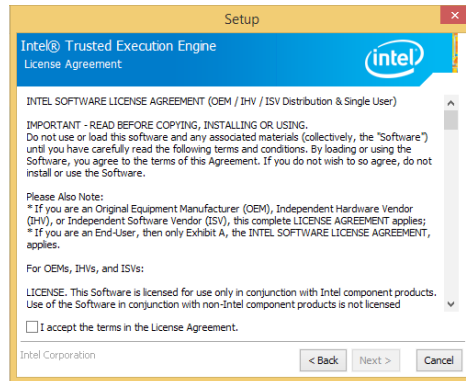
5. After the installation is complete, click "Finish."



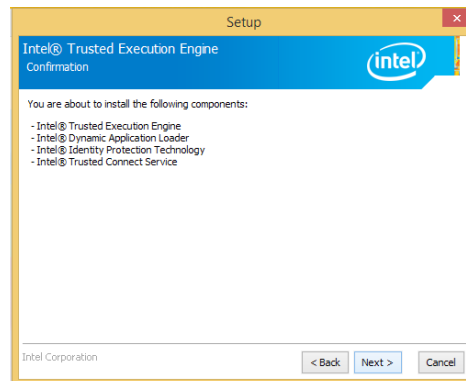
Intel Trusted Execution Engine Driver

To install this driver, follow these steps:

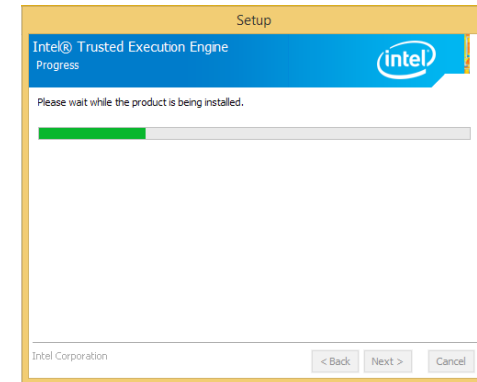
1. Setup is ready to install the driver. Click "Next" to continue.



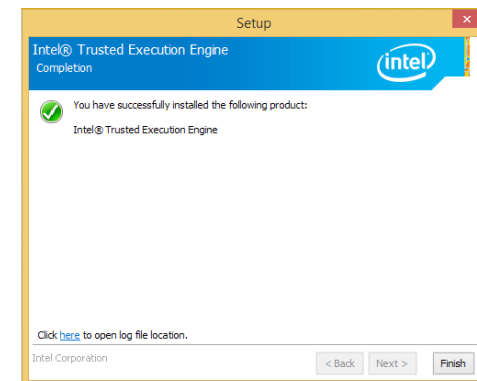
2. The step shows the components that will be installed. Then, Click "Next."



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



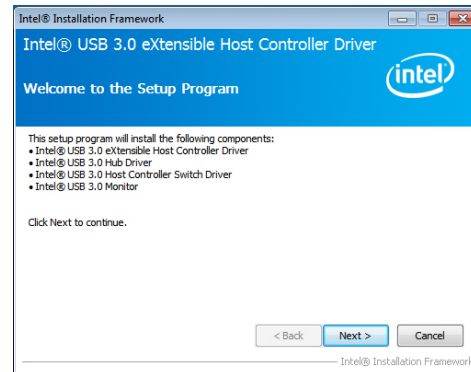
4. After the installation is complete, click "Finish."



Intel USB 3.0 Driver (For Windows 8.1 and 7 only)

To install this driver, follow these steps:

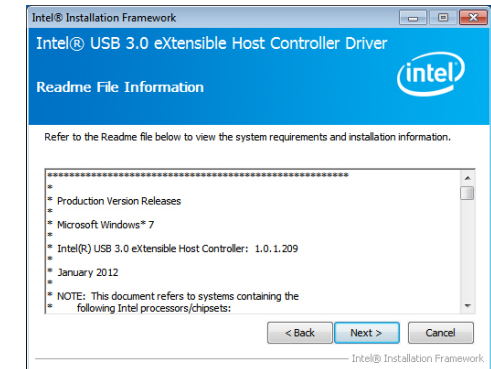
1. Setup is ready to install the driver. Click "Next" to continue.



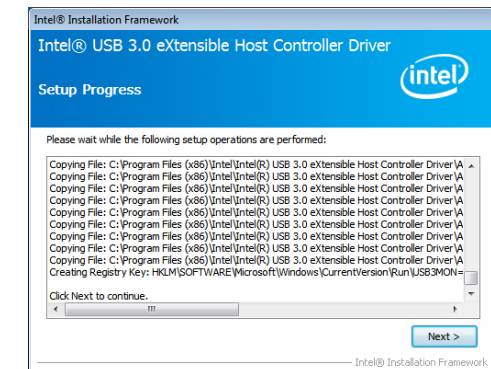
2. Read the license agreement, and then click "Yes."



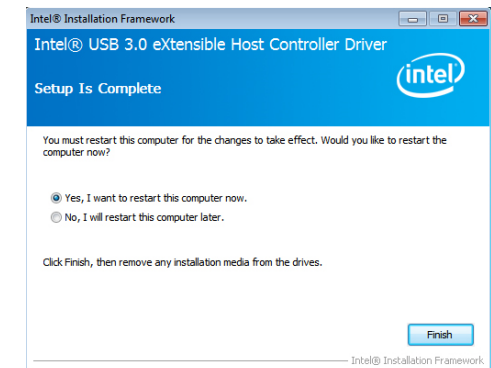
3. Go through the readme document for more installation tips, and then click "Next."



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



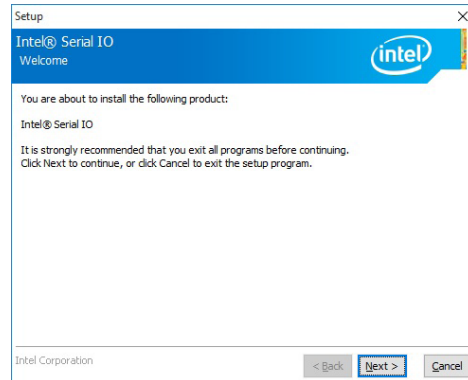
5. After the installation is complete, click "Finish."



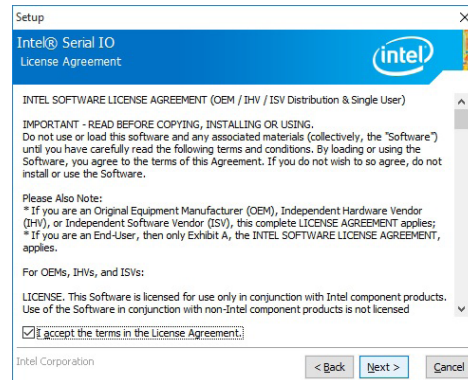
Serial IO Driver (For Windows 8.1 and Windows 10)

To install the driver, follow these steps:

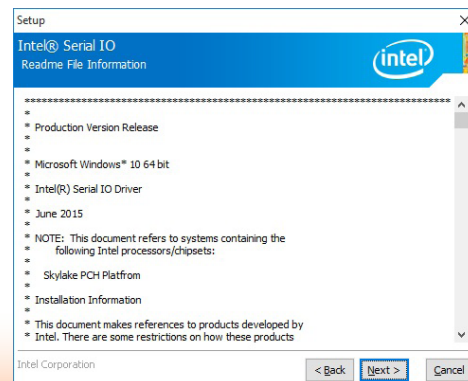
1. Setup is ready to install the driver.
Click "Next" to continue.



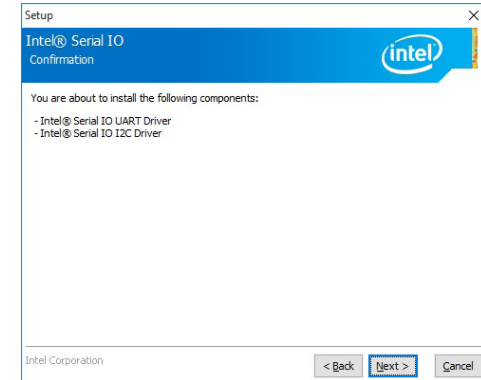
2. Read the license agreement carefully.
Click "I accept the terms in the License Agreement" then click "Next."



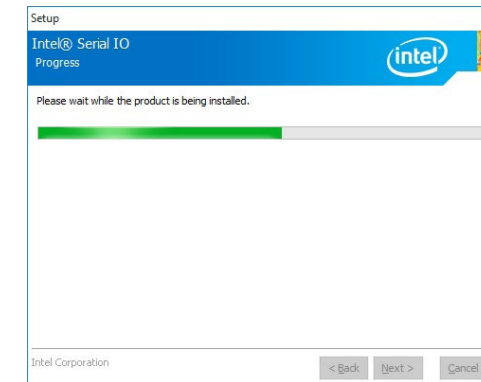
3. Read the file information then click "Next."



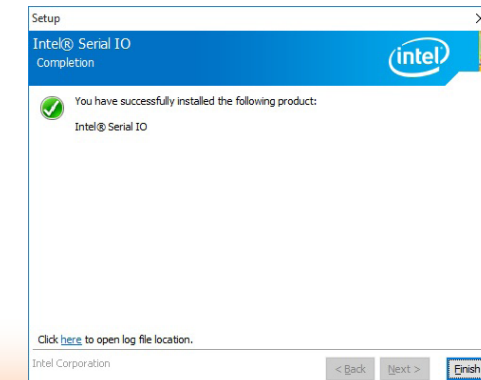
4. Setup is ready to install the driver.
Click "Next" to continue.



5. Setup is now installing the driver.



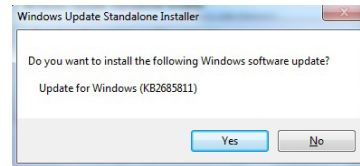
6. Click "Finish" to exit the Setup.



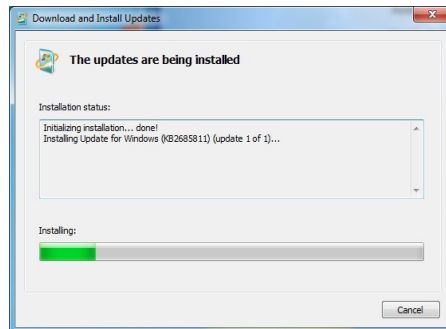
Kernel Mode Driver Framework (For Windows 7 only)

To install this update, follow these steps:

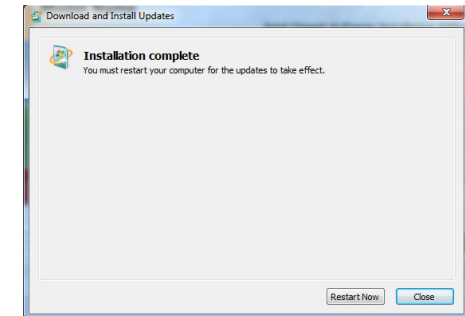
1. Click "Yes" to install the update.



2. The update is being installed now.



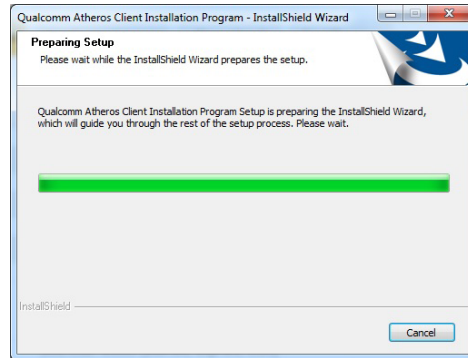
3. Click "Restart Now" to restart your computer when the installation is complete.



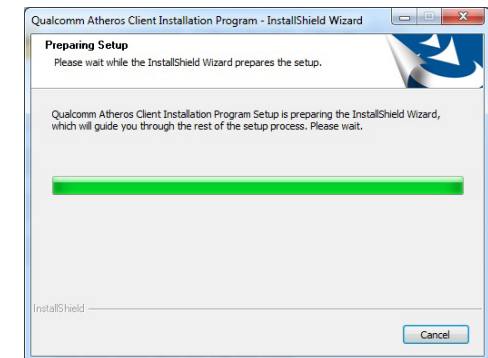
SparkLAN WPEA-121N Wireless Driver (optional)

To install this driver, follow these steps:

1. Setup is preparing the installation.
Please wait.



2. Read the license agreement and click "Yes" and follow the on-screen instructions for the rest of the installation process.



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

