



EC90A-AL

Fanless Embedded System

User's Manual

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

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

Notice:

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

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About this Manual

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

Warranty

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

Static Electricity Precautions

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

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or 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 EC90A-AL system unit
- One Quick Installation Guide

Optional Items

- Wall Mount/DIN-rail Mount kit
- Power Cord

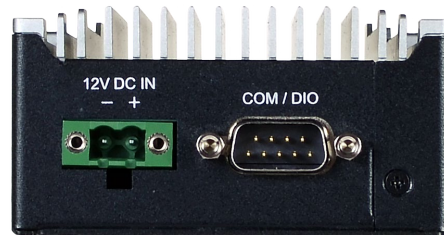
The board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Chapter 1 - Introduction

Overview



Front View



Left View

Key Features

Model Name	EC90A-AL
Processor	Intel Atom® Processor E3900 Series, BGA 1296
LAN	Two LAN ports
COM/DIO	One serial or digital input/output port: RS-232/422/485 in DB9 connector
Display	One Mini DisplayPort
USB	Two USB 3.0 and one USB 2.0 Type A ports
Digital input/output	Terminal block for DC-in power input

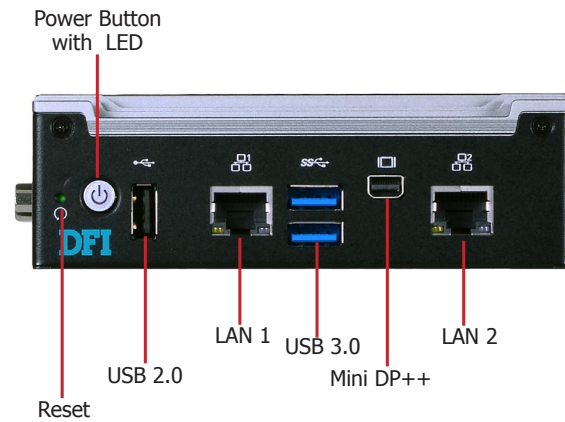
Specifications

Processor System	Intel Atom® Processor E3900 Series, BGA 1296 Intel Atom® x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9W Intel Atom® x5-E3930 Processor, Dual Core, 2M Cache, 1.3GHz (1.8GHz), 6.5W
Memory	<ul style="list-style-type: none"> 2GB/4GB Memory Down single channel LPDDR4 2400MHz
Graphics	<ul style="list-style-type: none"> 1 x Mini-DP++ DP: resolution up to 4096x2160 @ 60Hz Supported drivers and codecs: OpenGL 4.2, Direct X 11.1, OpenCL 1.2, OGL ES 3.0 HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4, MVC, VP9, WMV9, JPEG/MJPEG HW Encode: H.264, MPEG4, VP8, H.265, MVC
Storage/Expansion	<ul style="list-style-type: none"> Storage: 16GB/32GB/64GB eMMC Expansion: 1 x Full-size Mini PCIe (PCIe/USB)
Ethernet	<ul style="list-style-type: none"> 2 x Intel® I210IT PCIe (10/100/1000Mbps)
I/O Ports and LED Indicators	<ul style="list-style-type: none"> Front Panel <ul style="list-style-type: none"> 2 x RJ-45 LAN ports 1 x Mini DP++ port 2 x USB 3.0 (type A) 1 x USB 2.0 (type A) 1 x power button 1 reset button Side Panel <ul style="list-style-type: none"> 1 x DC-in connector (2-wire terminal block) 1 x DB9 connector (selectable between COM & 8-bit DIO; RS232 by default)
Security	Firmware-based Trusted Platform Module (TPM) 2.0
Power	<ul style="list-style-type: none"> 12V DC-in
Environment	<ul style="list-style-type: none"> Temperature <ul style="list-style-type: none"> Operating: -20°C ~ 60°C (With 0.7m/s Air Flow) Storage: -40 to 85°C Relative Humidity <ul style="list-style-type: none"> 5% to 90% RH (non-condensing)

Vibration	<ul style="list-style-type: none"> Operating: Random 5~500Hz, IEC68-2-64 (3G) Non-Operating: Sine 10~500Hz, IEC68-2-6 (3G)
Shock	<ul style="list-style-type: none"> Operating: 3G, 11ms Non-Operating: 5G, 11ms
Construction	<ul style="list-style-type: none"> Sheet Metal
Mounting	<ul style="list-style-type: none"> Wall/DIN rail Mount
Dimensions	<ul style="list-style-type: none"> 127mm x 42mm x 80.4mm (W x H x D)
Weight	<ul style="list-style-type: none"> TBD
OS Support (UEFI Only)	<ul style="list-style-type: none"> Windows 10 IoT (64-bit) Ubuntu 16.04 64-bit (Intel graphics driver available) Linux Yocto Project (64-bit)

Getting to Know the EC90A-AL

Front View



Reset Button

Press to reset the system without disconnecting the system's power.

Power Button with LED (green)

Press to power on or off the system.

USB 2.0 Port

Connects USB 2.0 and 1.1 devices.

USB 3.0 Ports

Connect USB 3.0 devices and devices based on USB 2.0 and 1.1/1.0 versions.

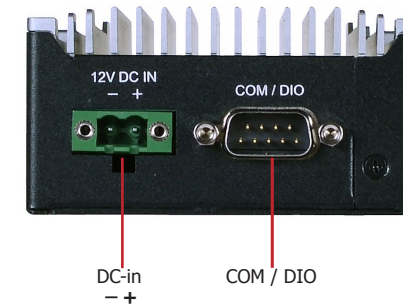
LAN Ports

Connect the system to a local area network.

Mini DP++ Port

Connects the Mini DisplayPort of an LCD monitor.

Side View



DC-in Connector

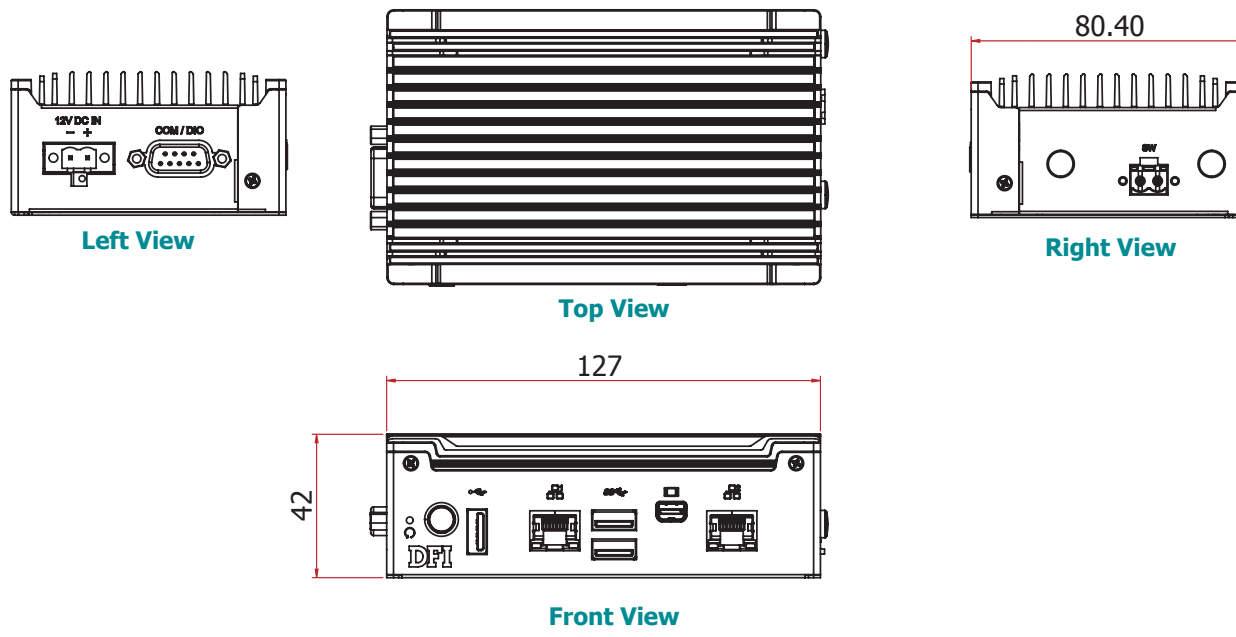
DC 12V power input via a terminal block connector.

COM/DIO Port

Connects RS232/422/485 devices. It can also be used as an 8-bit digital input/output via jumper settings.

Mechanical Dimensions

Chassis Dimension



Chapter 2 - Getting Started

Preparing the System

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

- Power adapter (an optional item) or other means of power supply
- Screwdriver

Installing Devices

The following devices can be installed in the system.

- 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 BIOS setup utility.

Installing the Operating System

Most operating system software can be installed using a DVD (and DVD burner) or bootable USB drive.

Please refer to your operating system manual for instructions on installing an operating system.

Installing the Drivers

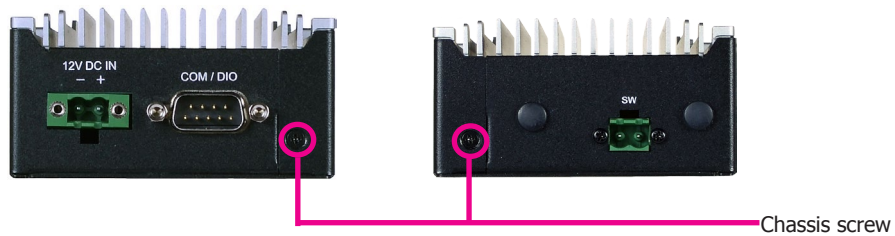
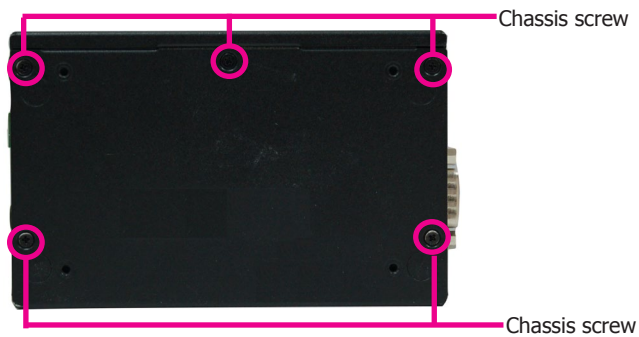
The system comes with a software package including drivers. These drivers must be installed to provide the best system performance. Refer to the Supported Software Chapter for instructions on installing drivers.

Chapter 3 - Installing Devices

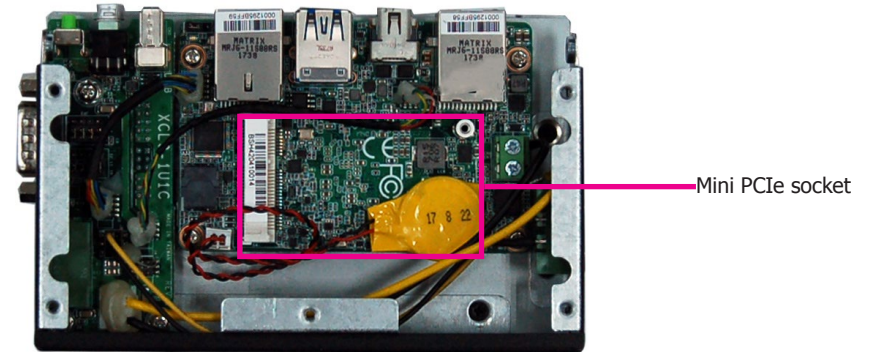
Removing the Chassis Cover

Please observe the following guidelines and follow the procedure to open the system.

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



4. Lift the cover to open the system. The Mini PCIe socket is readily accessible after removing the chassis cover.



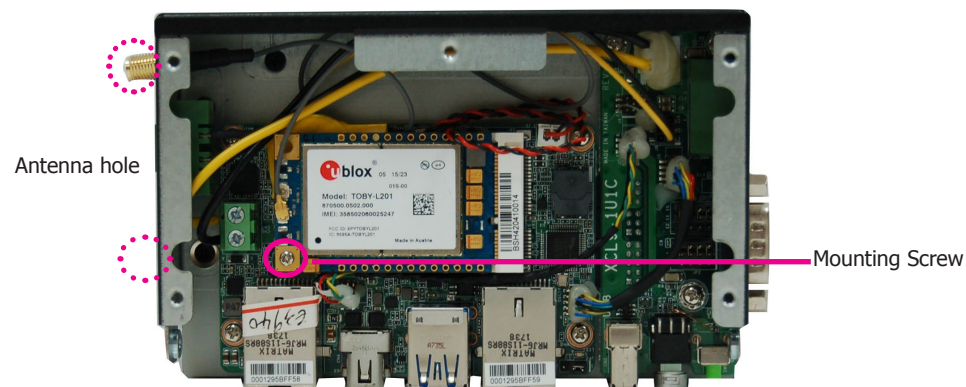
Installing a Mini PCIe Card

The system board is equipped with one Mini PCIe slot that supports both PCIe and USB interfaces.

1. Grasp the Mini PCIe card by its edges and align the notch in the connector of the PCIe card with the key in the connector on the system board. Insert the bottom edge of the card into the socket.



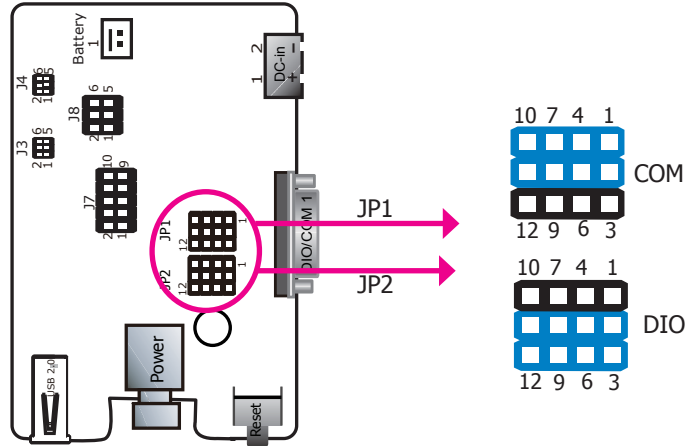
2. Push down on the other end of the Mini PCIe card and use the provided mounting screw to secure the card on the system board. Route the antenna(s) to the antenna holes on side of the chassis.



Note: If installing a wireless module, place the antenna cable(s) on top of the Mini PCIe and route the cables to the side of the chassis to reach the antenna holes.

Chapter 4 - Jumper Settings

COM1/DIO Select



JP1 and JP2 are used to select between serial communication and DIO for the external COM port 1. They are located on the power board: XCL9-1U1C.

External COM Port 1 / DIO Select	JP1	JP2
COM (default)	1-2, 4-5, 7-8, 10-11 On	1-2, 4-5, 7-8, 10-11 On
DIO	2-3, 5-6, 8-9, 11-12 On	2-3, 5-6, 8-9, 11-12 On

Note: You cannot use COM1 and DIO at the same time. Please set up JP1 and JP2 at the same time.

If COM1 is configured as a serial port, its pin definition is as follows:

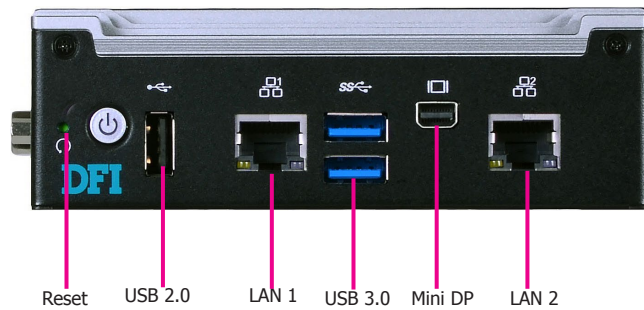
Pin	RS232	RS422 Full Duplex	RS485
1	DCD	TXD-	DATA-
2	RXD	TXD+	DATA+
3	TXD	RXD+	N.C.
4	DTR	RXD-	N.C.
5	GND	GND	GND
6	DSR	N.C.	N.C.
7	RTS	N.C.	N.C.
8	CTS	N.C.	N.C.
9	RI	N.C.	N.C.
10	GND	GND	GND

If COM1 is configured as a digital I/O port, its pin definition is as follows:

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

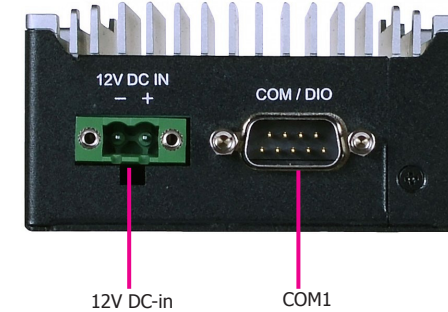
Chapter 5 - Ports and Connectors

Panel I/O Ports



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

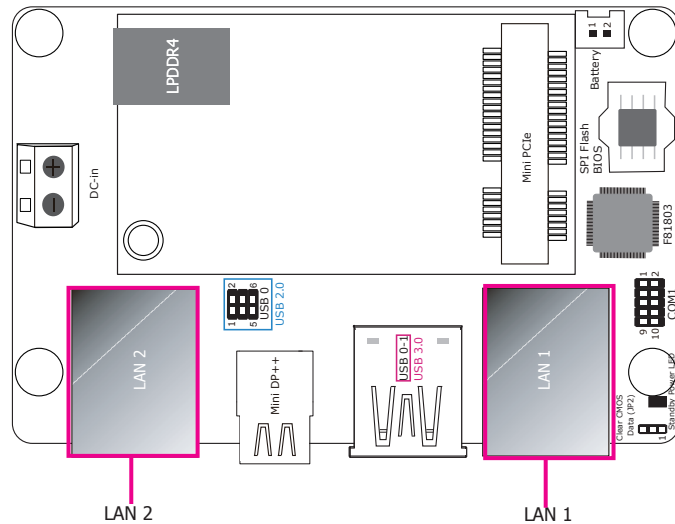
- Reset button
- Network connection
Two LAN ports
- USB ports
Two USB 3.0 ports
One USB 2.0 port
- Display outputs
Mini DisplayPort
- Reset button



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

- Power connector
DC-in power connector (2-pole)
- Serial communication
COM port (or 8-bit DIO)

RJ45 LAN Ports



Features

- 2 Intel® I210IT PCI Express Gigabit Ethernet controllers

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

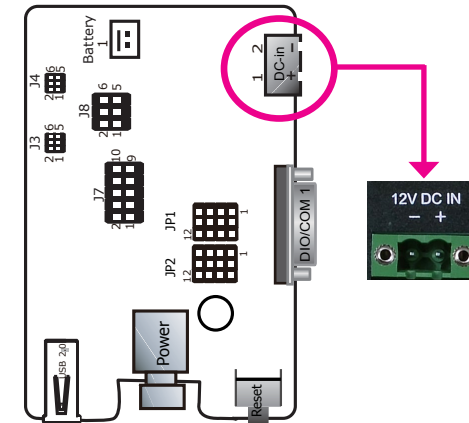
BIOS Setting

Configure the onboard LAN in the “ACPI Configuration” submenu of the Advanced menu in the BIOS. Refer to Chapter 7 for more information.

Driver Installation

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

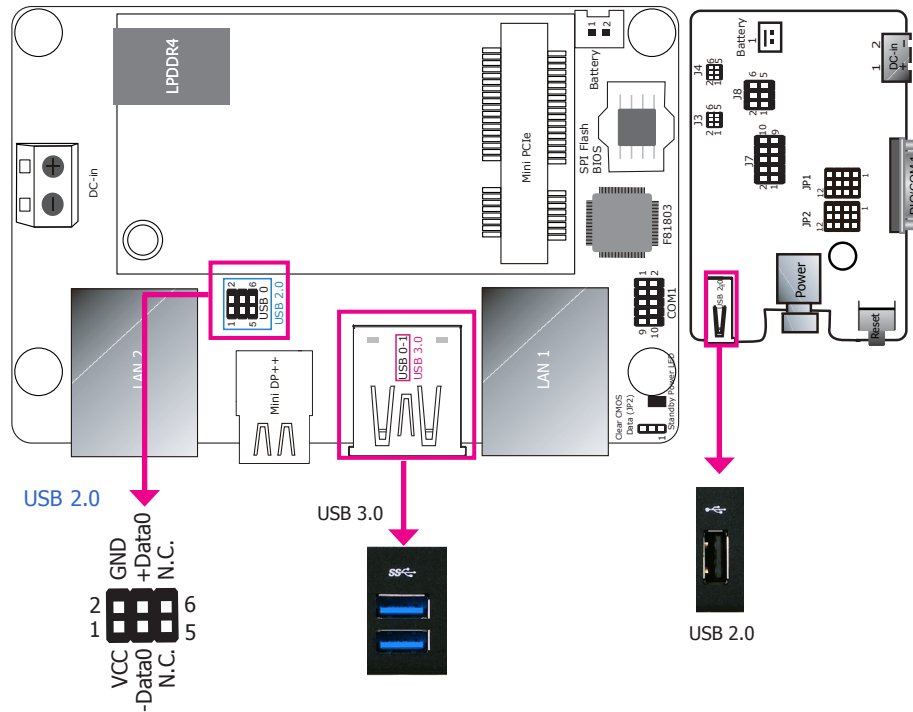
12V DC-in



This 2-pin terminal block on the power board is considered a low power solution. It is an external DC-in connector that accepts DC power and supplies power to the main board. Please note that using a voltage more than the recommended range may fail to boot the system or cause damage to the system board.

The reset button allows you to reboot the system without powering off the system first.

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 external USB 3.0 ports (on the main board) and 1 external USB 2.0 port (on the power board). There is also an internal 6-pin connector that allows you to connect 1 additional USB 2.0 port (USB 0).

BIOS Settings

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

Driver Installation

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

Wake-On-USB Keyboard/Mouse

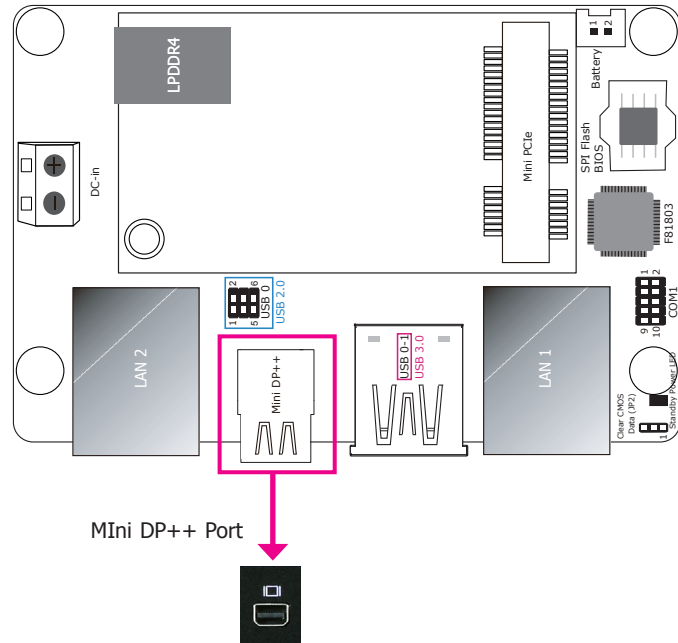
The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up the system from the S3 (STR - Suspend To RAM) state.



Important:

1. 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 $\geq 2A$.

Graphics Interface



Mini DP++ Port

The Mini DP++ port 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, has the same pin assignments as the full-size DisplayPort connector but only in a much smaller form factor with dimensions of 7.50 mm (width) × 4.60 mm (height) × 4.99 mm (depth).

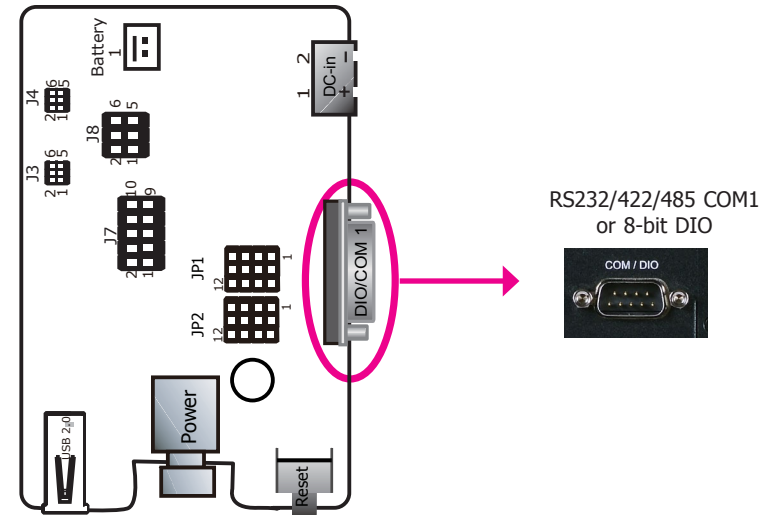
BIOS Settings

Configure the onboard display outputs in the “Video Configuration” submenu of the Advanced menu in the BIOS. Refer to Chapter 7 for more information.

Driver Installation

Install graphics drivers. Refer to Chapter 8 for more information.

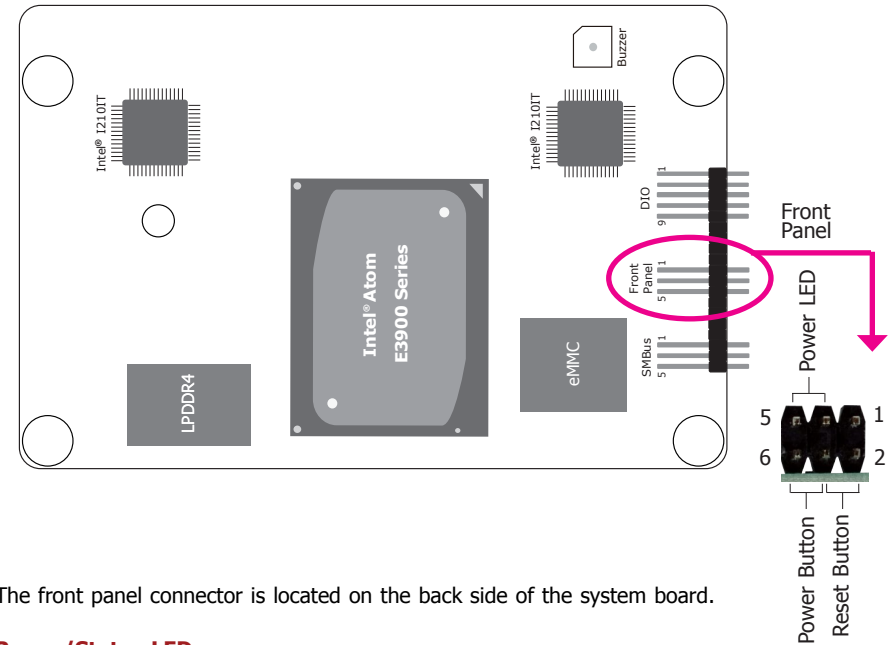
Serial Port



Pins	COM1 Function			DIO Function
	RS232	RS422 Full Duplex	RS485	
1	DCD	TXD-	DATA-	DIO0
2	RXD	TXD+	DATA+	DIO1
3	TXD	RXD+	N.C.	DIO2
4	DTR	RXD-	N.C.	DIO3
5	GND	GND	GND	GND
6	DSR	N.C.	N.C.	DIO6
7	RTS	N.C.	N.C.	DIO7
8	CTS	N.C.	N.C.	DIO4
9	RI	N.C.	N.C.	DIO5
10	GND	GND	GND	

Internal I/O Connectors

Front Panel Connector (Internal)



The front panel connector is located on the back side of the system board.

Power/Status 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.

Reset Button

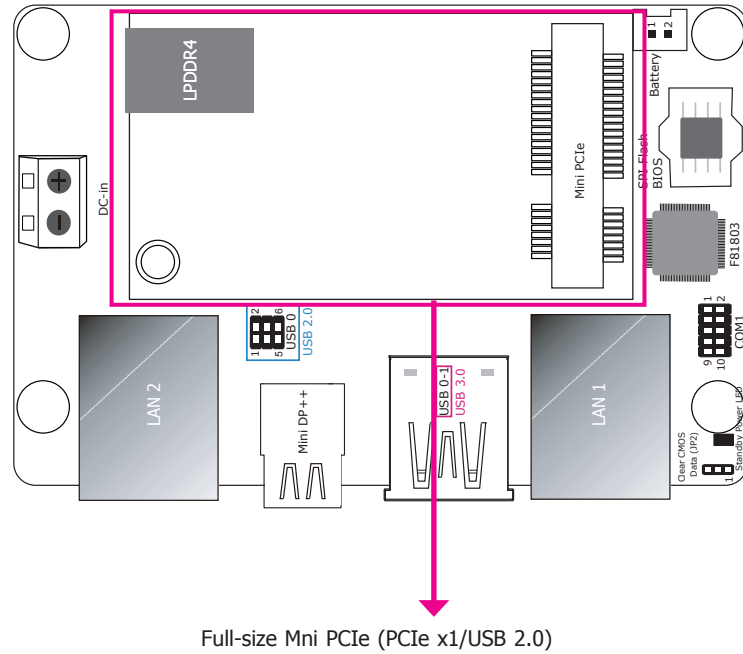
This button allows you to reboot without having to power off the system.

Power Button

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

	Pin	Pin Name		Pin	Pin Name
Power/Status LED	1	NC	Power Button	6	Power Button
	3	SUS_LED		4	GND
	5	V_LED	Reset Button	4	GND
		2		Reset Button	

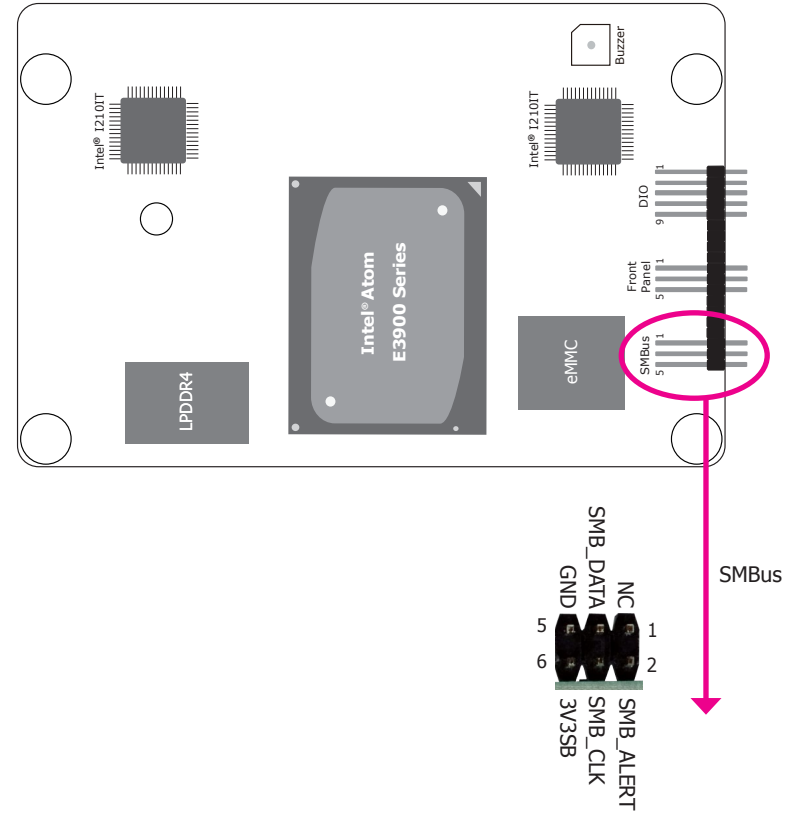
Expansion Slot



Mini PCI Express Slot

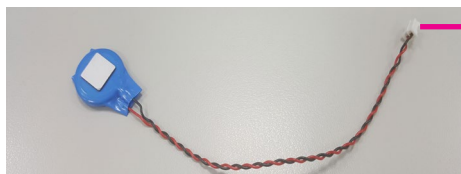
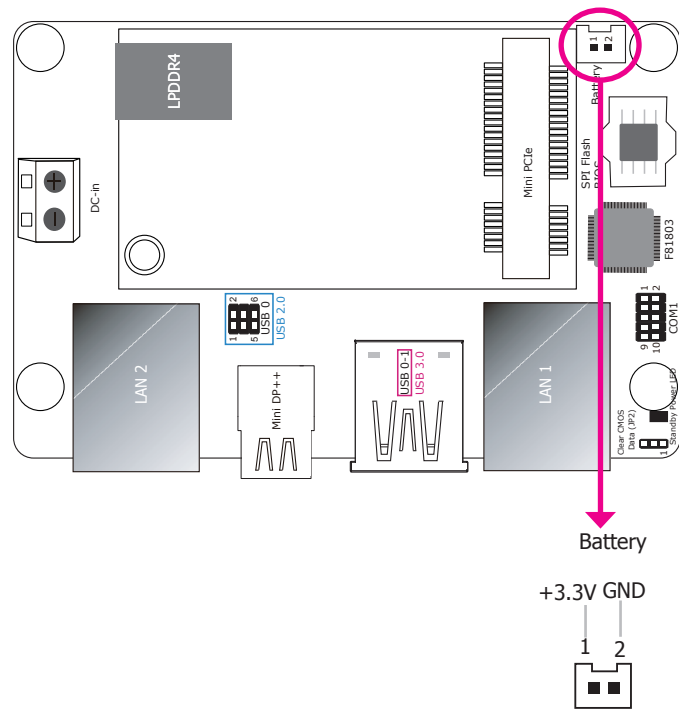
The full-size Mini PCIe socket provides PCIe x1 and USB 2.0 signals and is used to install a Mini PCIe card.

SMBus Connector



The System Management Bus (SMBus) connector (on the back side of the system board) 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.

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

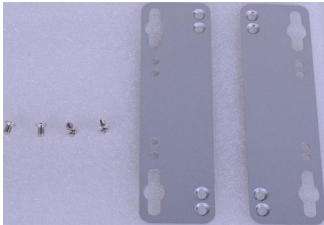
- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

Chapter 6 - Mounting Options

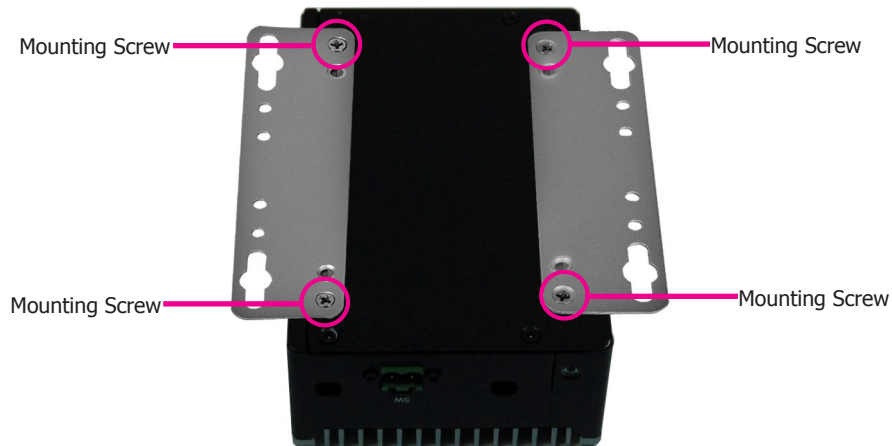
Wall Mount

The wall mount kit includes the following:

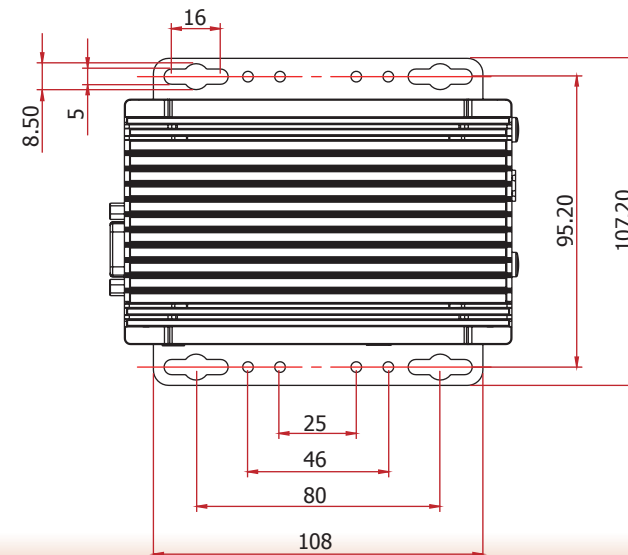
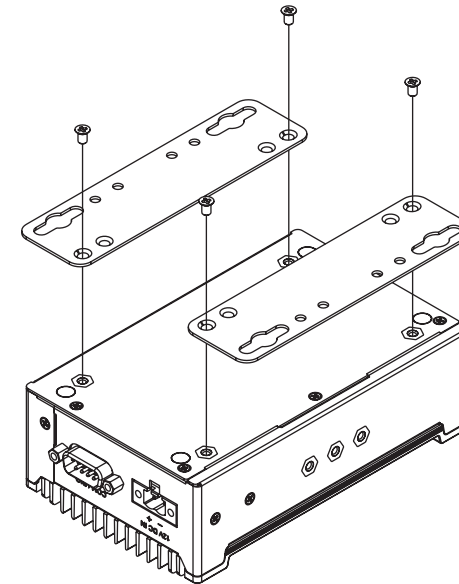
- Two wall mount brackets
- Bracket screws



1. Align the mounting holes of the wall mount bracket with the screw holes of the system and use the provided mounting screws to secure the wall mount brackets on both sides of the system.



The following diagrams show the location and dimension of the wall mounting holes.



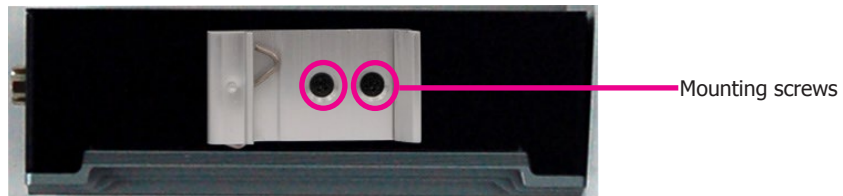
DIN rail Mount

The system features DIN rail mount chassis that facilitates fast installation of the EC90A-AL to a DIN rail.

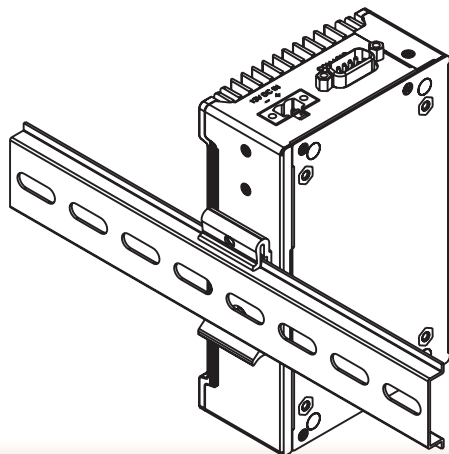
The DIN rail mount kit includes the following:

- DIN rail mount bracket
- 2 screws

1. Use the provided mounting screws to attach the DIN rail mount bracket to the rear side of the device.



2. Install the device onto the rail.



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 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
<F9>	Optimized defaults
<Enter>	Press <Enter> to enter the highlighted submenu.
<F10>	Save and Exit

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.

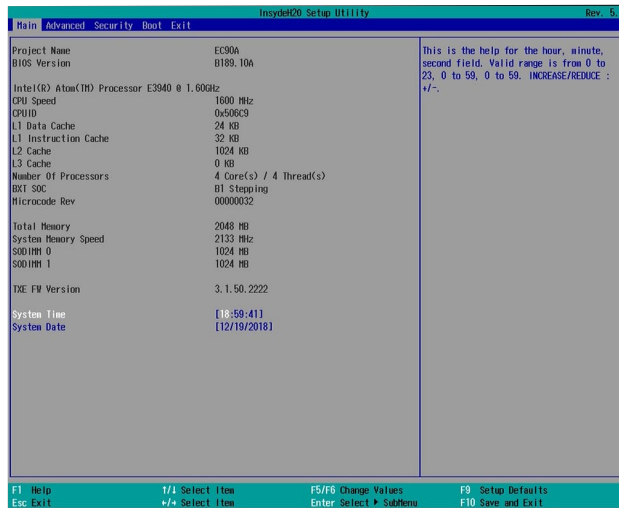
Submenu

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.

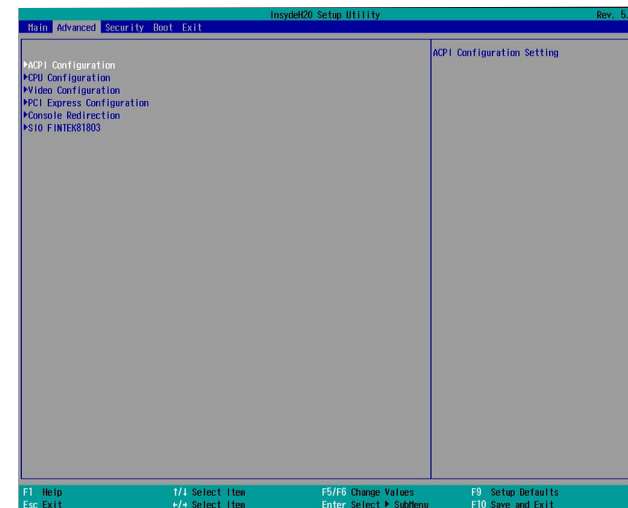
Advanced

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.



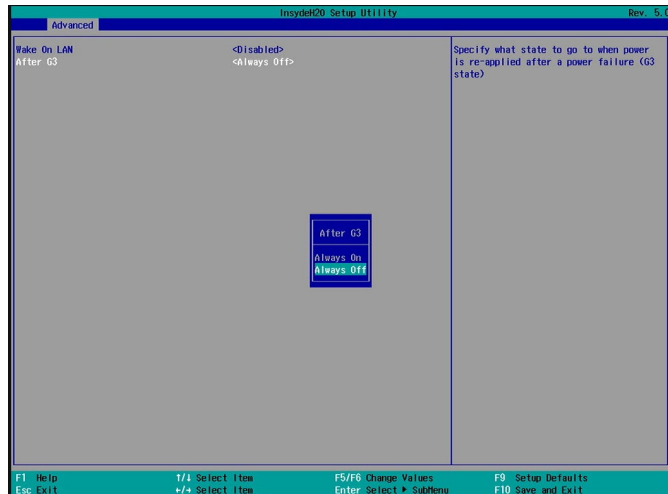
Important:

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

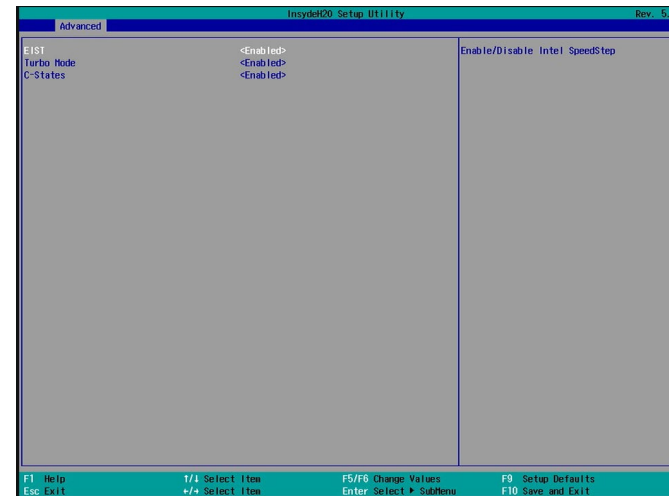
This field is to specify which state the system should be in when power is re-applied after a power failure (G3, the mechanical-off, state).

Always On The system is powered on.

Always Off The system is powered off.

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

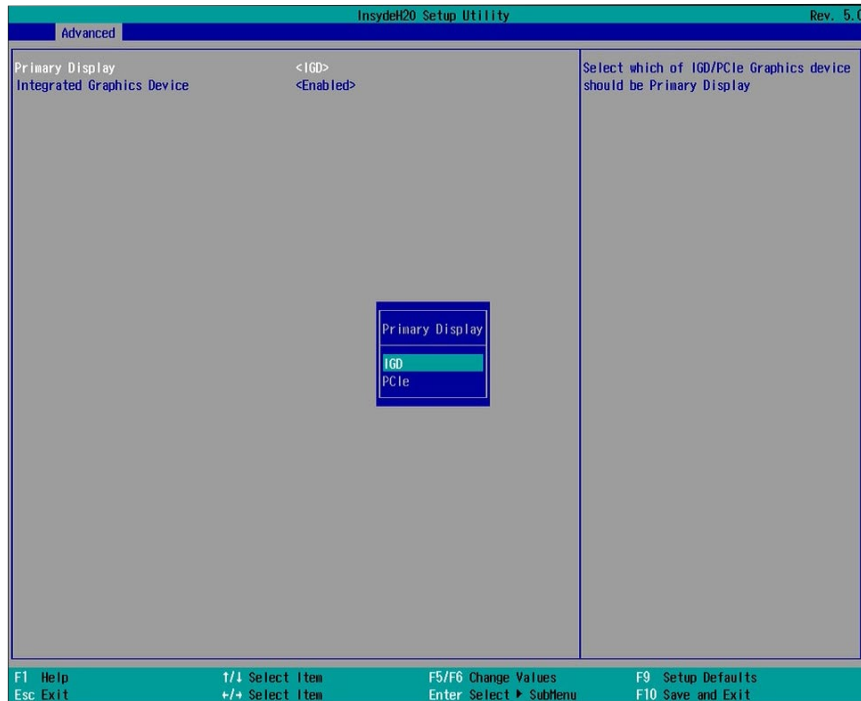
Enable or disable processor turbo mode, which allows the processor core to automatically run faster than the base frequency by taking advantage of thermal and power headroom.

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

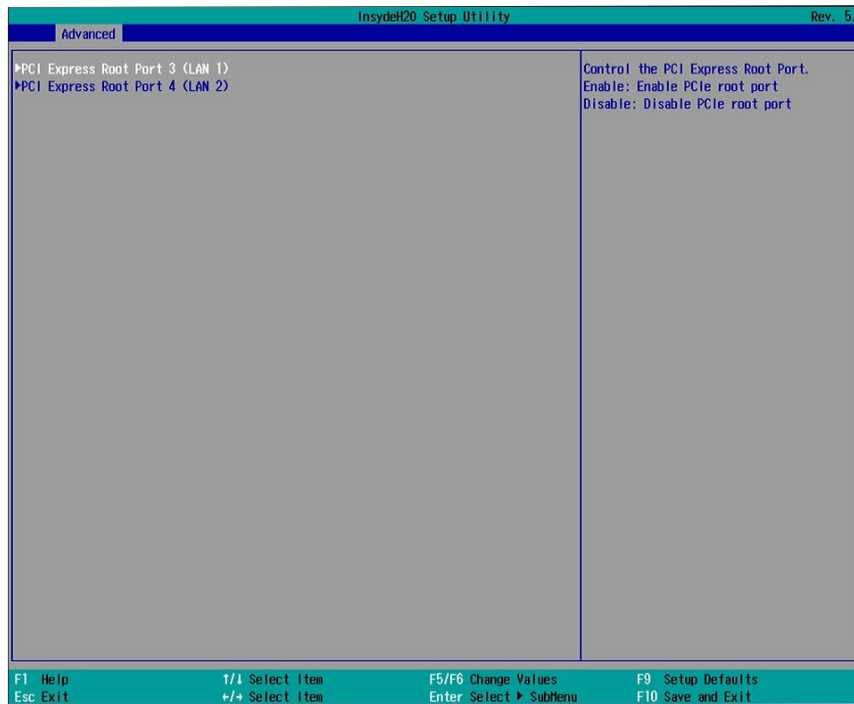
PCIe: PCIe graphics devices

Integrated Graphics Device

Enable or disable the integrated graphics device.

PCI Express Configuration

This section configures the settings of PCI Express root ports.

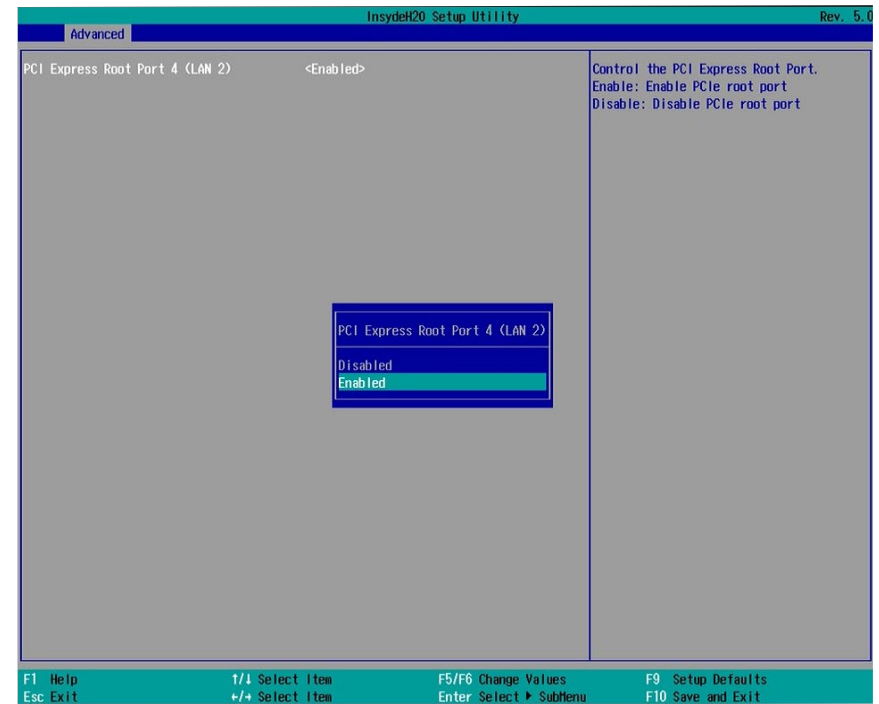


PCI Express Root Port 3

Controls the PCIe signal of LAN Port 1.

PCI Express Root Port 4

Controls the PCIe signal of LAN Port 2.

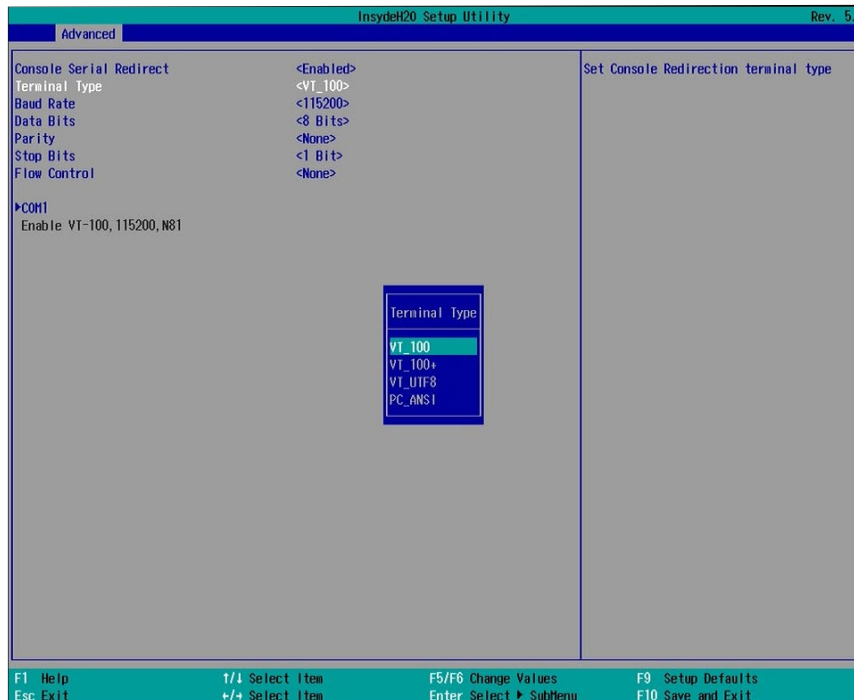


PCI Express Root Port

Enable or disable this PCI Express root port.

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 and 9600.

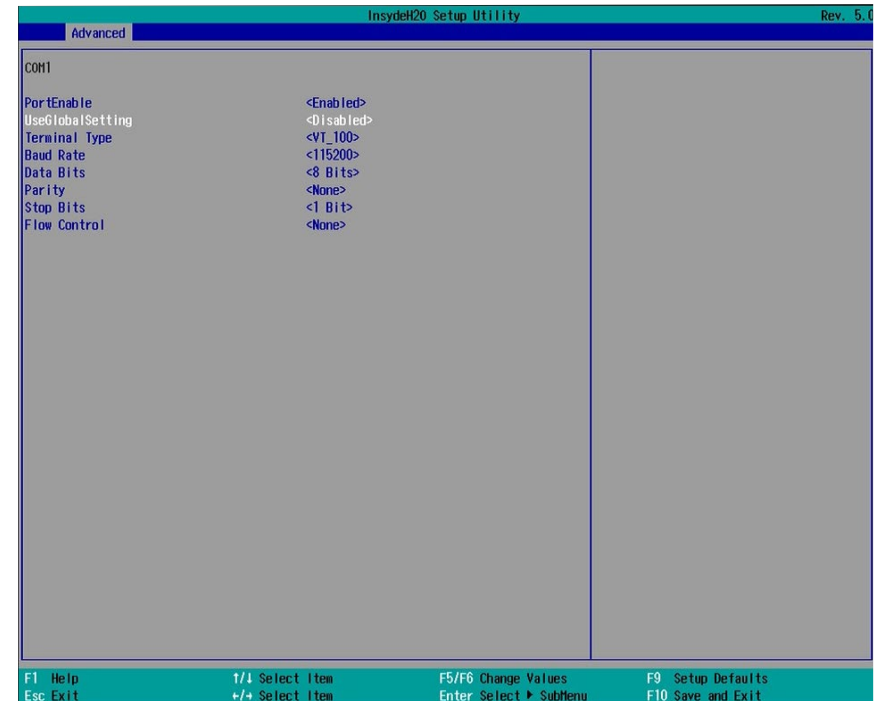
Data bits: 8 bits or 7 bits.

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 the console redirection function.



COM 1

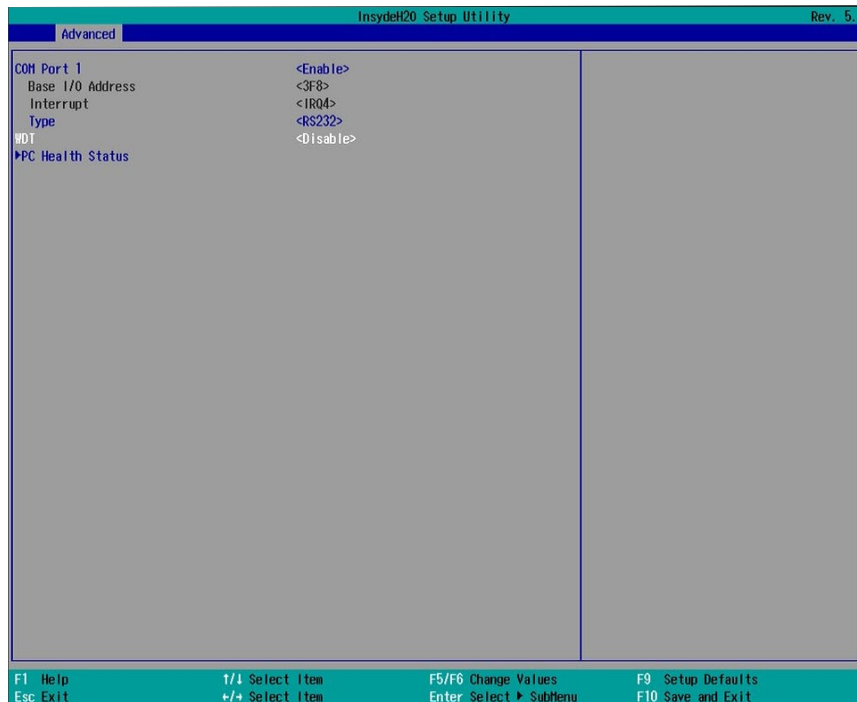
Enable or disable the serial redirection function for COM1 port on the system and configure the serial communication parameters to be used between the system and a remote station.

UseGlobalSetting

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

Super I/O

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



COM Port 1

Enable or disable a 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

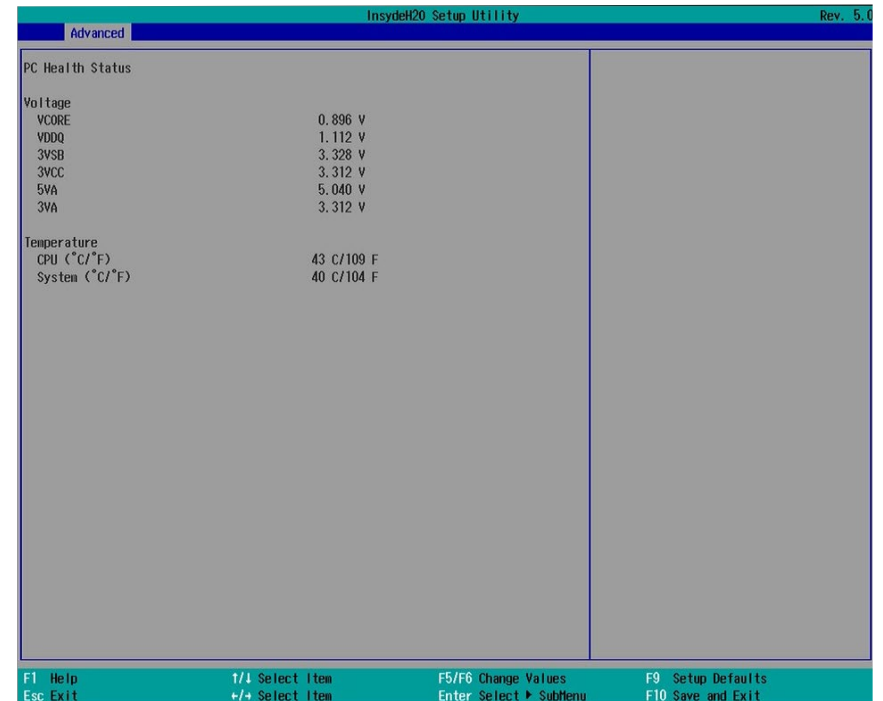
Choose RS232, RS422 or RS485 (Peer-to-Peer) for the serial communication type for COM port 1.

WDT

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

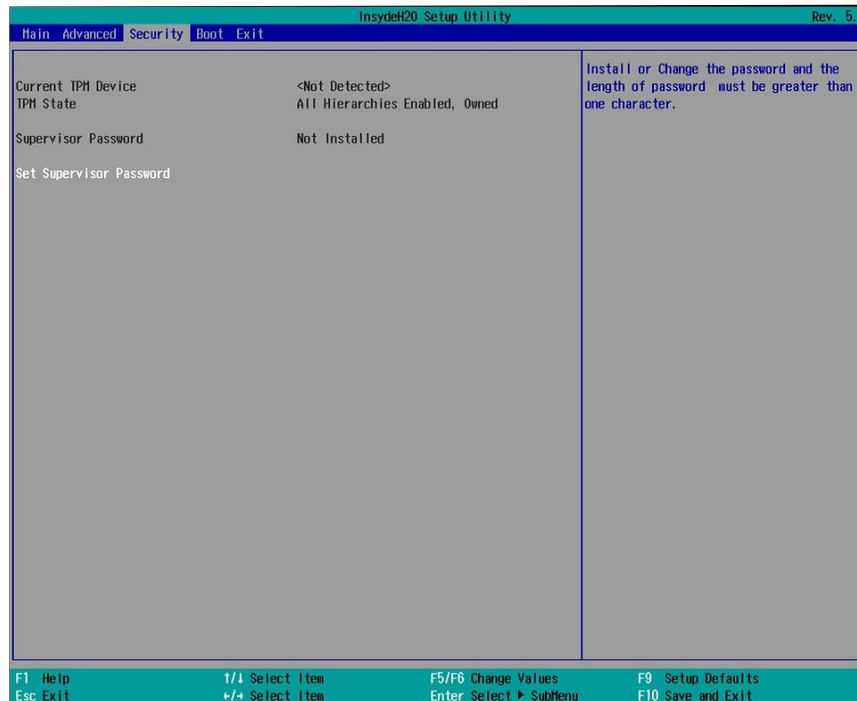
PC Health Status

This section displays PC health status.



Security

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



TPM Availability

Show or hide TPM availability and its configurations.

TPM Operation

Select one of the supported operation: Enable, Disable, or No Operation.

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.

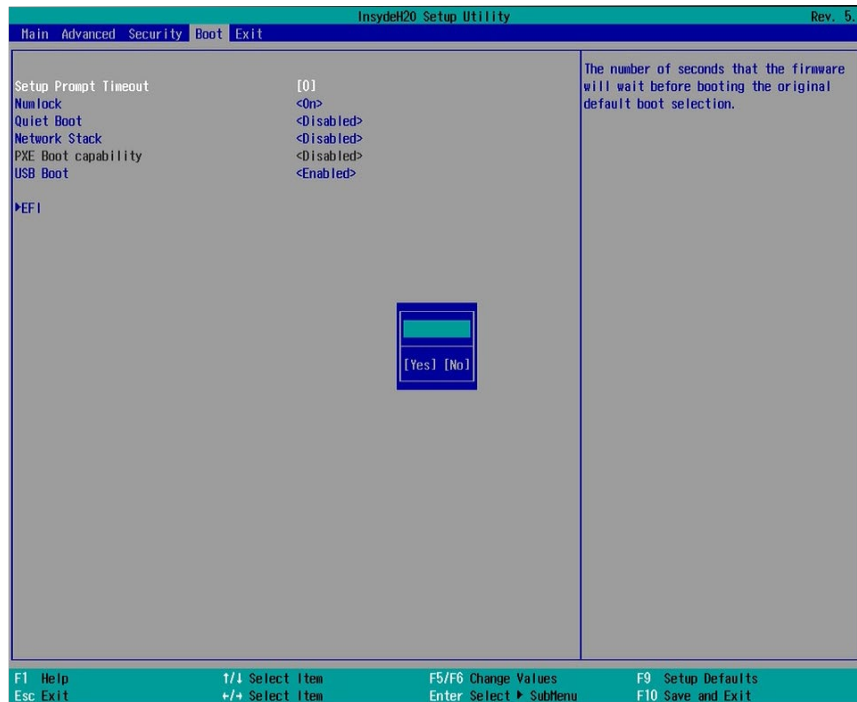
Set Supervisor Password

Set the administrative password for entering the BIOS utility or upon the entering of 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 designated boot device.

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 text messages or the OEM logo at bootup. Select Disabled to display the text messages. 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 an Ethernet port. This function can only be enabled if the Network Stack support is enabled.

USB Boot

Enable this function to boot from a USB flash drive.



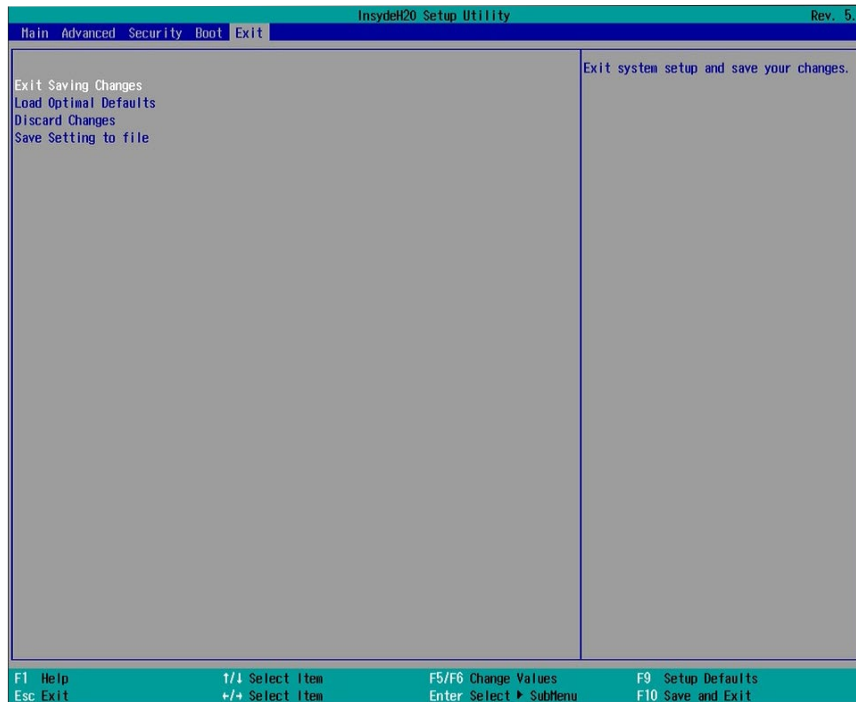
Note:

The BIOS supports only UEFI boot but not legacy.

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.

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 in the system.

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for latest BIOS file and the firmware update utility.

For instructions on how to update BIOS with the flash utility, please see <https://www.dfi.com/knowledge/video/31> from the Knowledge Base of the DFI website.

```

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

Information
Please do not remove the AC power

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

Initializing
Current BIOS Model name: EC90A
New BIOS Model name: B189.10A

Current BIOS version: B188.20A
New BIOS version: B189.10A

Updating Block at FFFF000h
0%      25%      50%      75%      100%
|-----|-----|-----|-----|
C:\EC90A>_

```

Notice: BIOS SPI ROM

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

Note:



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

Chapter 8 - Supported Software

The system requires you to install drivers for some devices to operate properly. Your product package may include a CD that contain drivers. You can also download the latest drivers from 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.

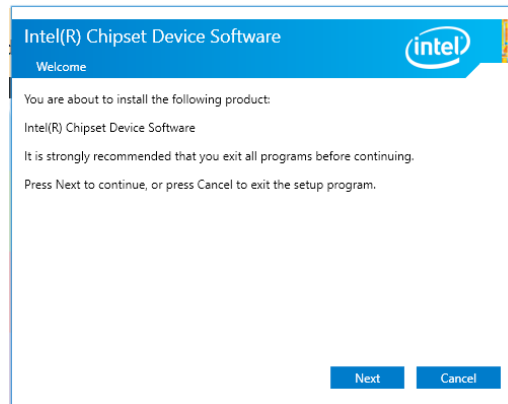
- Intel® Chipset Device Software
- Intel® Graphics Driver
- Intel® LAN Driver
- Intel® TXE Driver
- Audio Driver
- Intel® Serial IO Driver

Intel Chipset Device Software

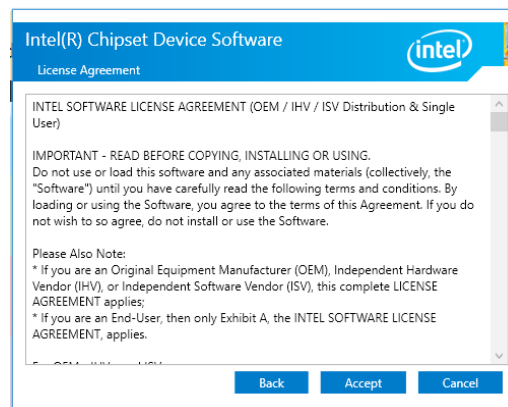
The Intel Chipset Device Software is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

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

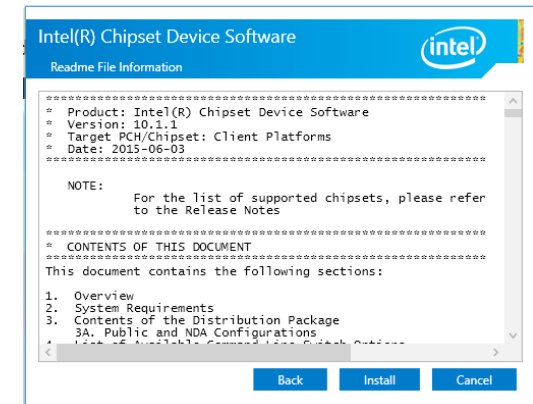
1. Setup is ready to install the utility. Click “Next” to continue.



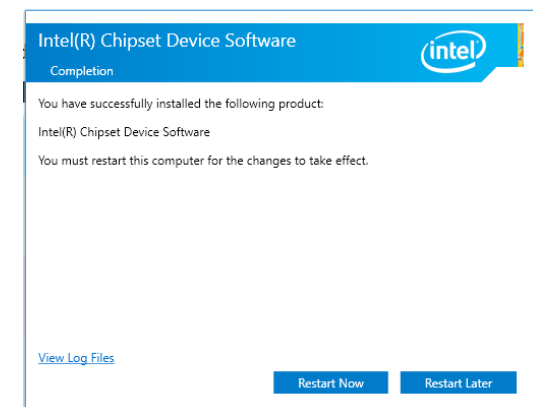
2. Read the license agreement and then click “Yes”.



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



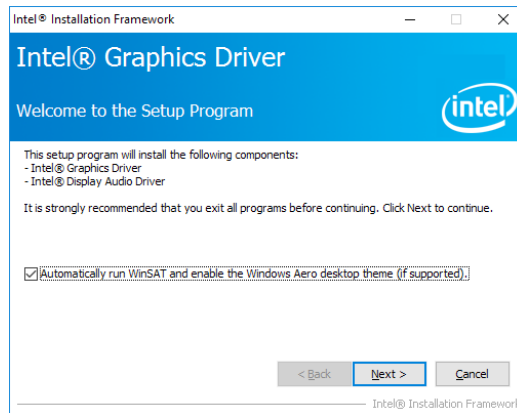
4. Click “Finish” to exit setup.



Intel Graphics Driver

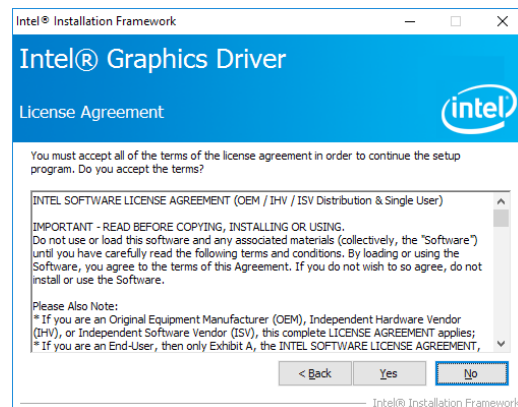
Please use the following procedure to install the Intel Graphics Driver.

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

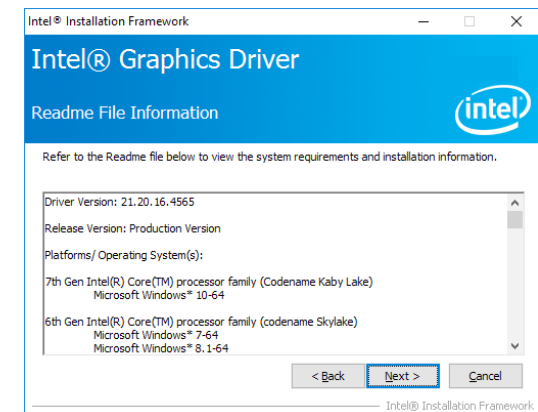


By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after the graphics driver is installed and the system is rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/Windows 8.1/Windows 10 desktop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

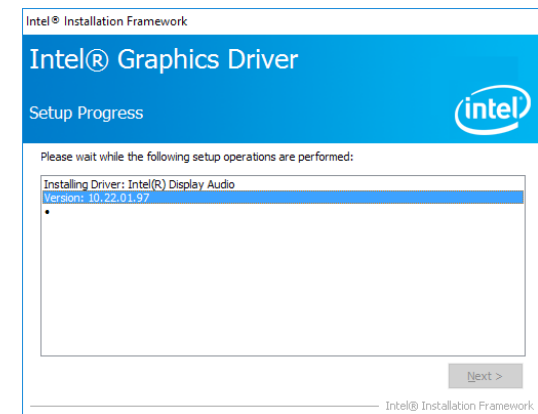
2. Read the license agreement and then click "Yes".



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

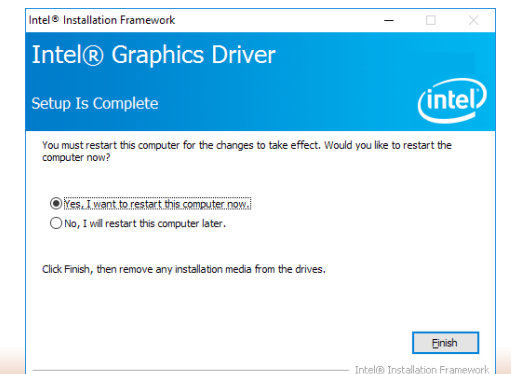


4. Setup is now installing the driver. Click "Next" to continue.



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

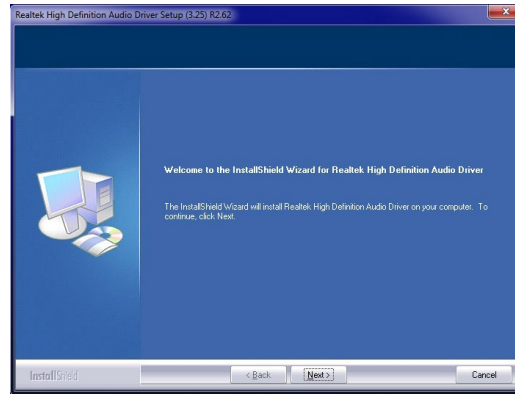
Restarting the system will allow the new software installation to take effect.



Audio Driver

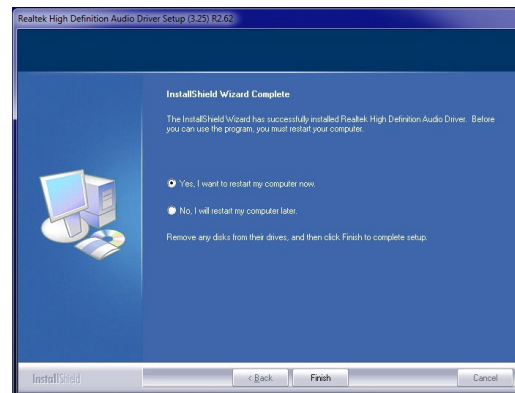
Please use the following procedure to install audio drivers.

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



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

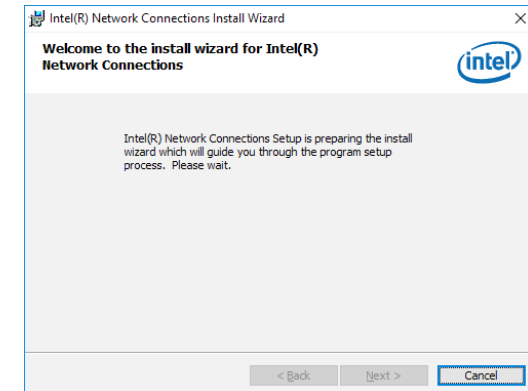
Restarting the system will allow the new software installation to take effect.



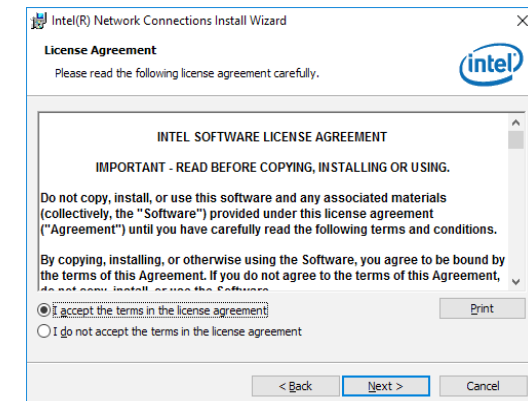
Intel LAN Driver

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

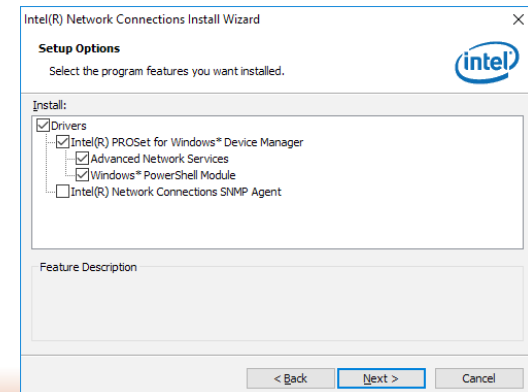
1. Setup is ready to install the driver. Click "Next" to continue.



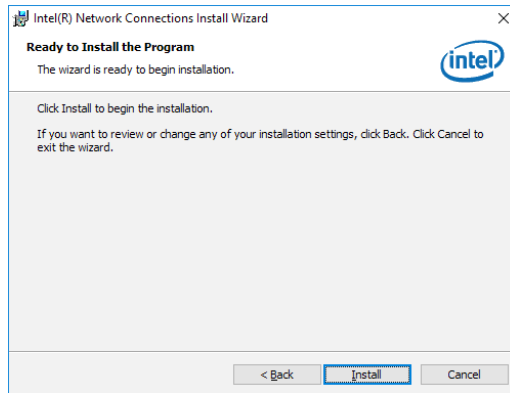
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree the terms in the agreement, and then click "Next".



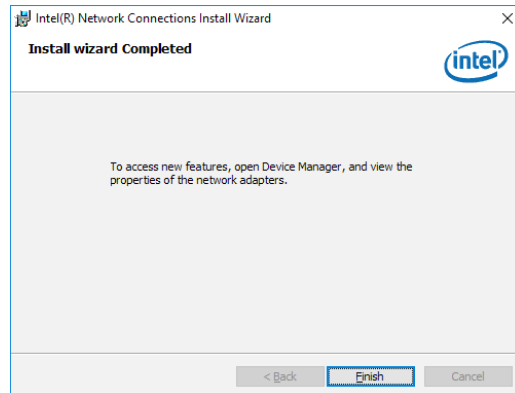
3. Select the program features you want to install and then click "Next".



- Click "Install" to begin the installation.



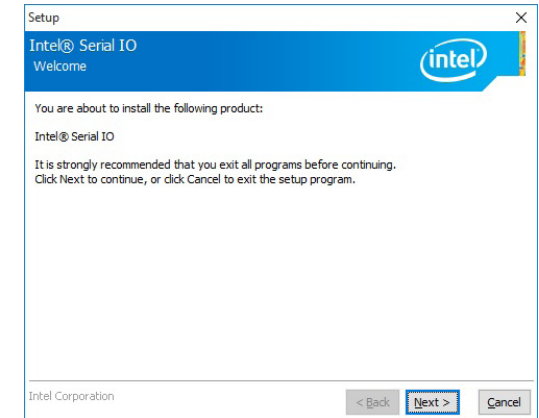
- After the installation is complete, click "Finish" to exit setup.



Intel Serial IO Driver

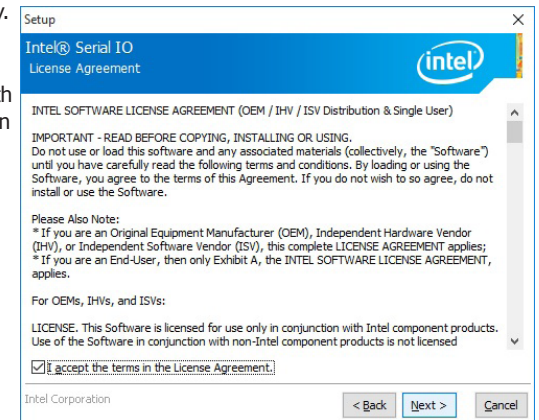
Please use the following procedure to install the Intel Serial IO Driver.

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

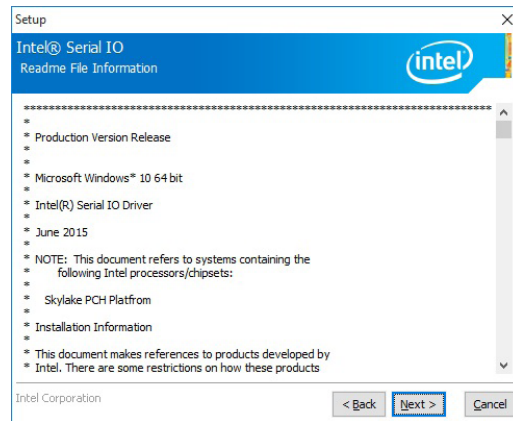


- Read the license agreement carefully.

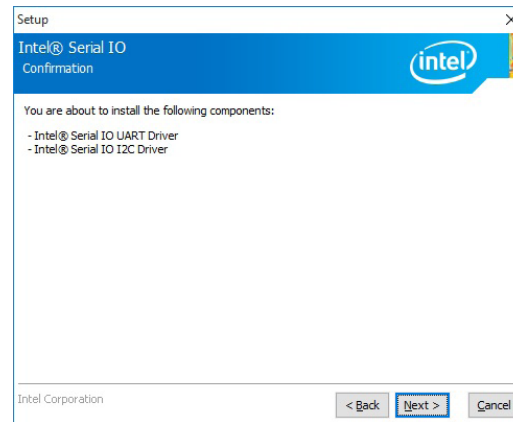
Click "I accept the terms in the License Agreement" if you agree with the terms in the agreement and then click "Next".



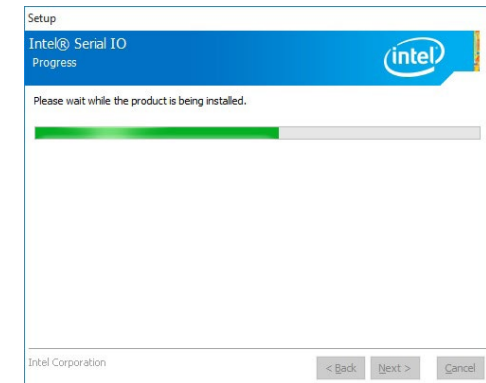
3. Read the file information and then click "Next".



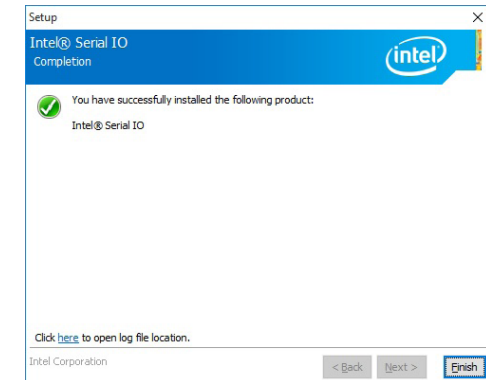
4. Setup is ready to install the driver. Click "Next" to begin the installation.



5. Setup is now installing the driver.



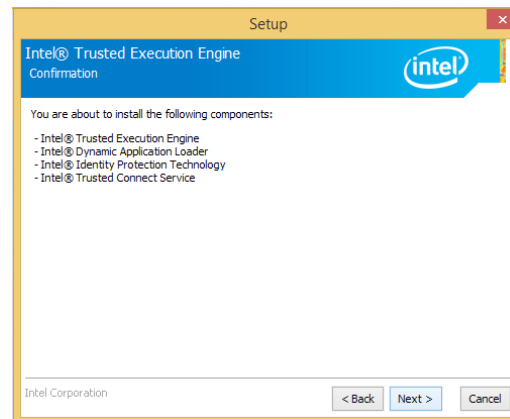
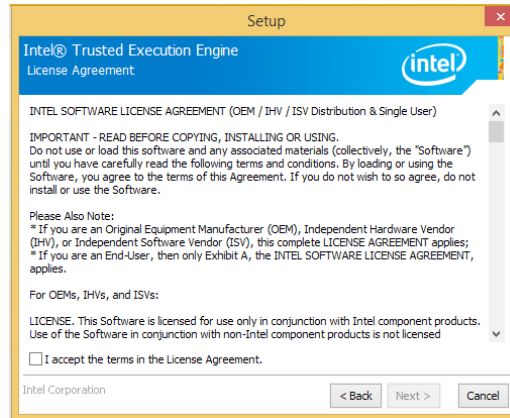
6. Click "Finish" to exit setup.



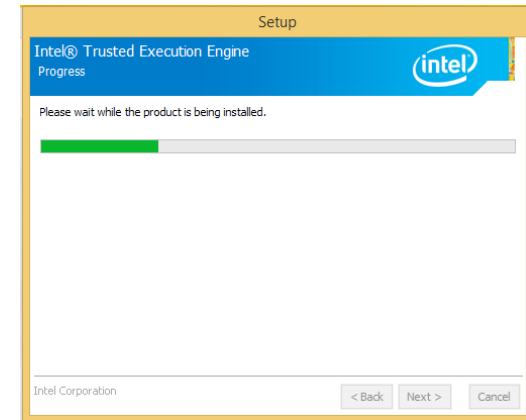
Intel TXE Driver

Please use the following procedure to install the Intel Trusted Execution Engine (TXE) Driver:

1. Select "I accept the terms in the License Agreement" then click "Next."
2. The screen shows the components that will be installed. Click "Next" to continue.



3. The screen displays the installation status in progress.



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

