



ST102-CS

Desktop Box PC
User's Manual

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

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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.

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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.

- 1 ST102-CS system unit
- 1 CPU cooler
- 1 Quick Installation Guide

Optional Items

Optional Items	Part Number	Description
CPU	143-101805-500G	i7-9700TE, 1.8GHz to 3.8GHz, 8C8T, 12M cache, TDP 35W
	143-10220G-500G	i5-9500TE, 2.2GHz to 3.6GHz, 6C6T, 9M cache, TDP 35W
	143-10220E-500G	i3-9100TE, 2.2GHz to 3.2GHz, 4C4T, 6M cache, TDP 35W
	143-10240A-500G	i7-8700T, 2.4GHz to 4GHz, 6C12T, 12M cache, TDP 35W
	143-102104-501G	i5-8500T, 2.1GHz to 3.5GHz, 6C6T, 9M cache, TDP 35W
	143-103105-500G	i3-8100T, 3.1GHz, 4C4T, 6M cache, TDP 35W
DIMM	138-540002-106G	4GB DDR4 2666Mhz SO-DIMM 1Rx8 512Mx8 CL19 1.2V
	138-580004-102G	8GB DDR4 2666Mhz SO-DIMM 1Rx8 1Gx8 CL19 1.2V
	138-5G0163-102G	16GB DDR4 2666Mhz SO-DIMM 2Rx8 1Gx8 CL19 1.2V

SSD M.2 2280	TBD	32GB, M.2 2280 SSD, SATA3 B+M Key, MLC
	TBD	64GB, M.2 2280 SSD, SATA3 B+M Key, MLC
	638-712811-100G	128GB, M.2 2280 SSD, SATA3 B+M Key, MLC
	638-725615-100G	256GB, M.2 2280 SSD, SATA3 B+M Key, MLC
	638-712818-100G	128GB, M.2 2280 SSD, SATA3 B+M Key, 3D TLC, PE: 3K
	638-725614-100G	256GB, M.2 2280 SSD, SATA3 B+M Key, 3D TLC, PE: 3K
	TBD	512GB, M.2 2280 SSD, SATA3 B+M Key, 3D TLC, PE: 3K
	638-701T01-100G	1TB, M.2 2280 SSD, SATA3 B+M Key, 3D TLC, PE: 3K
	638-712816-110G	128GB, M.2 2280, PCIe Gen3x4, M-Key, 3D TLC, PE: 3K
	638-725608-100G	256GB, M.2 2280, PCIe Gen3x4, M-Key, 3D TLC, PE: 3K
	TBD	512GB, M.2 2280, PCIe Gen3x4, M-Key, 3D TLC, PE: 3K
	TBD	1TB, M.2 2280, PCIe Gen3x4, M-Key, 3D TLC, PE: 3K
SSD MSATA	638-703203-110G	32GB, mSATA SSD, SATA3, MLC
	638-706403-130G	64GB, mSATA SSD, SATA3, MLC
	638-712800-160G	128GB, mSATA SSD, SATA3, MLC
	638-725600-100G	256GB, mSATA SSD, SATA3, MLC
	TBD	64GB, mSATA SSD, SATA3, 3D TLC, PE: 3K
	TBD	128GB, mSATA SSD, SATA3, 3D TLC, PE: 3K
	TBD	256GB, mSATA SSD, SATA3, 3D TLC, PE: 3K
	TBD	512GB, mSATA SSD, SATA3, 3D TLC, PE: 3K
	TBD	1TB, mSATA SSD, SATA3, 3D TLC, PE: 3K

SSD 2.5"	635-600322-1A0G	32GB, 2.5" SSD, SATA3, MLC
	635-600644-100G	64GB, 2.5" SSD, SATA3, MLC
	635-601282-1E0G	128GB, 2.5" SSD, SATA3, MLC
	635-602562-121G	256GB, 2.5" SSD, SATA3, MLC
	635-605122-130G	512GB, 2.5" SSD, SATA3, MLC
	635-601286-110G	128GB, 2.5" SSD, SATA3, 3D TLC, PE: 3K
	635-602566-150G	256GB, 2.5" SSD, SATA3, 3D TLC, PE: 3K
	635-605126-140G	512GB, 2.5" SSD, SATA3, 3D TLC, PE: 3K
	635-610006-110G	1TB, 2.5" SSD, SATA3, 3D TLC, PE: 3K
HDD 2.5"	635-550092-090G	2.5" SATAIII 500GB 5400RPM 128MB BLUE
	635-500100-220G	2.5" SATAIII 1TB 5400RPM 128MB BLUE
	TBD	2.5" SATAIII 2TB 5400RPM 128MB BLUE
	TBD	2.5" SATAIII 500GB 7200RPM 64MB BLACK
	635-500111-000G	2.5" SATAIII 1TB 7200RPM 64MB BLACK
OS	921-151310-000G	Win10 IoT Ent 2019 LTSC MultiLang High End EPKEA
	921-151320-000G	Win10 IoT Ent 2019 LTSC MultiLang High End PKEA
	921-151340-000G	Win10 IoT Ent 2019 LTSC MultiLang High Value EPKEA
	921-151330-000G	Win10 IoT Ent 2019 LTSC MultiLang High Value PKEA
	642-000W10-000G	Win Pro 10 64Bit English 1pk DSP OEI DVD version 1809
Adapter AC/DC	671-110006-100G	Power Adapter AC/DC 100W 12V, inlet C14, lockable DC Jack 5.5/2.5mm, cable length 1500mm, with DFI-JP PSE
Power Cord	332-700010-201G	Power Cord US 3pin 1830mm Length
	A81-004003-000G	Power Cord EU 2pin 1830mm Length
	A81-000001-000G	Power Cord China 3pin 1830mm Length
	A81-004056-000G	Power Cord Japan 3pin 2000mm Length
Foot Stand	A31-027042-210G	ST102 support frame, AL BLACK

M.2 WIFI	761-OPS150-001G	1x intel M.2 2230 AC 3168.NGWG 802.11abgn/ac 1T1R + Bluetooth 4.2 2x MHF4 to SMA cable 200mm 2x dipole antenna 1x M2x4mm screw
	TBD	1x Intel® Wireless-AC 9260, 2230, 2x2 AC+BT, Gigabit 2x MHF4 to SMA cable 200mm 2x dipole antenna 1x M2x4mm screw

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

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



Front View



Rear View

Key Features

Model Name	ST102-CS
Processor	8th/9th Generation Intel® Core™ i7/i5/i3 processors
LAN	2 LAN ports
Displays	1 HDMI, 2 DP
USB	2 USB 2.0 ports (front) 4 USB 3.0 ports (rear)
Audio	Mic-in, Line-out

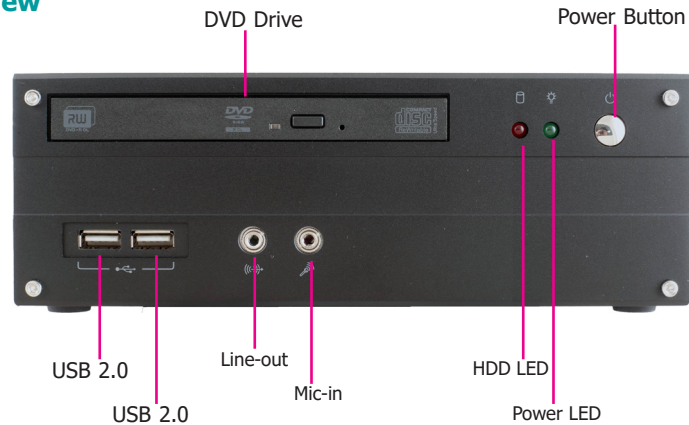
Specifications

Processor System	<ul style="list-style-type: none"> Processor: 9th Generation Intel® Core™ Processors, LGA 1151 Socket, TDP up to 65W i7-9700TE (Core 8; Max speed 3.8 GHz; TDP 35W) i5-9500E (Core 6; Max speed 4.2 GHz; TDP 65W) i5-9500TE (Core 6; Max speed 3.6 GHz; TDP 35W) i3-9100E (Core 4; Max speed 3.7 GHz; TDP 65W) i3-9100TE (Core 4; Max speed 3.2 GHz; TDP 35W) 8th Generation Intel® Processors, LGA 1151 Socket, TDP up to 80W Xeon E-2176G (Core 6; Max speed 4.7 GHz; TDP 80W) Core™ i7-8700 (Core 6; Max speed 4.6 GHz; TDP 65W) Core™ i5-8500 (Core 6; Max speed 4.1 GHz; TDP 65W) Core™ i3-8100 (Core 4; Max speed 3.6 GHz; TDP 65W) Pentium G5400 (Core 2; Max speed 3.7 GHz; TDP 58W) Celeron G4900 (Core 2; Max speed 3.1 GHz; TDP 54W) Chipset: Intel® Q370/C246/H310 Express chipset
Memory	<ul style="list-style-type: none"> Two 260-pin SODIMM up to 32GB Dual Channel DDR4 2666MHz (C246 support ECC)
Graphics	<ul style="list-style-type: none"> Intel® UHD Graphics 630 (only Pentium G5400, Celeron G4900 support 610) OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9 Displays: 1 x LVDS up to 4096x2304 @ 60Hz, or eDP up to 1920x1200 @ 60Hz (by request) 2 x DP++ up to 4096x2304 @ 60Hz 1x HDMI (resolution up to 2560x1600 @ 60Hz or 4096x2160 @ 24Hz) Dual Display: DP++ + DP++; DP++ + HDMI; DP++ + LVDS(eDP); HDMI+ LVDS(eDP)
Storage	<ul style="list-style-type: none"> 1 x 2.5" SATA 3.0 Drive Bay 1 x slim ODD Bay (optional)
Ethernet	<ul style="list-style-type: none"> 1 x Intel® I211AT PCIe (10/100/1000Mbps) 1 x Intel® I219V PCIe with iAMT11.0 (10/100/1000Mbps)
Audio	Realtek ALC888S-VD2-GR
Power	<ul style="list-style-type: none"> Power type - DC-in External Power Adapter: DC output 12V 100W, Level 6
Cooling System	<ul style="list-style-type: none"> 1 x System Fan 1 x CPU Fan

I/O Ports	<ul style="list-style-type: none"> Front Panel <ul style="list-style-type: none"> - 1 Power button - 2 x USB 2.0 - 2 LED indicators: Power, HDD - Mic-in and line-out jack Rear Panel <ul style="list-style-type: none"> - 2 x GbE (RJ-45) - 4 x USB 3.0 - 1 x HDMI - 2 x DP - DC-in Jack
Environment	<ul style="list-style-type: none"> Temperature <ul style="list-style-type: none"> - Operating: 0°C~60°C - Storage: -40°C~85°C Humidity <ul style="list-style-type: none"> - 5 to 90% RH (non-condensing)
Construction	<ul style="list-style-type: none"> Metal chassis + Aluminum front bezel
Dimensions	<ul style="list-style-type: none"> 219mm x 77.15mm x 229.7mm (W x H x D)
Mounting	Desktop/wall mount
Weight	TBD
OS Support	Windows 10 IoT Enterprise 64bit Linux
STANDARDS AND CERTIFICATIONS	<ul style="list-style-type: none"> Shock <ul style="list-style-type: none"> Operating: 3G Non-operating: 5G Vibration <ul style="list-style-type: none"> Operating: Random 5~500Hz 1G Non-operating: Sweep Sine 10~500Hz 1.5G Package Drop <ul style="list-style-type: none"> ISTA Project 1A CE/FCC/VCCI
Other Features	<ul style="list-style-type: none"> Watchdog Timer function; System Reset, programmable via software from 1 to 255 Seconds

Getting to Know the ST102-CS

Front View



DVD RW Drive

A Slim Optical Disc Drive (ODD) for reading a disc.

Power Button⁽¹⁾

Press to power on or power off the system.

Line-out

Connects a speaker.

Mic-in

Connects an external microphone.

USB Ports (2.0)

Connect USB 2.0/1.1 devices. They comply with USB 2.0 which supports data transmission rate up to 480 Mbit/s.

HDD LED (flashing red)

Indicates the status of the hard drive.

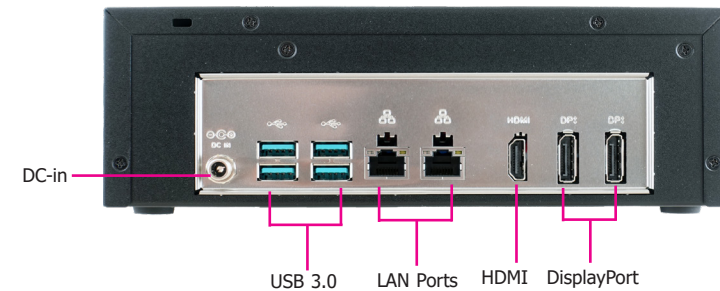
HDD LED		
HDD State	Disk access activity	HDD present or HDD not present
LED Behavior	Blink	Off

Power LED (solid green)

Indicates the power status of the system.

Power LED			
Power Mode	power-on	Sleep	power-off
LED Behavior	Always ON	Blink	Off

Rear View



DC-in Jack

Connects a DC-in power adapter. Please note the acceptable power range: 12V.

USB Ports (3.0)

Connect USB 3.0/2.0/1.1 devices. They comply with USB 3.0 which supports data transmission rate up to 5 Gbits.

LAN Ports

Connect the system to a local area network.

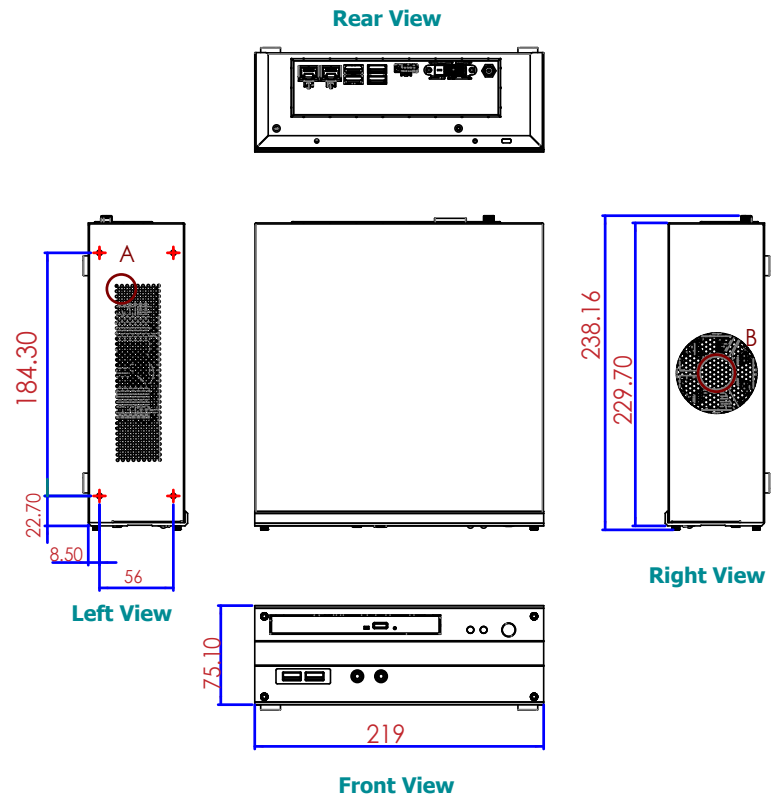
HDMI Port

Connects to the HDMI port of an LCD monitor.

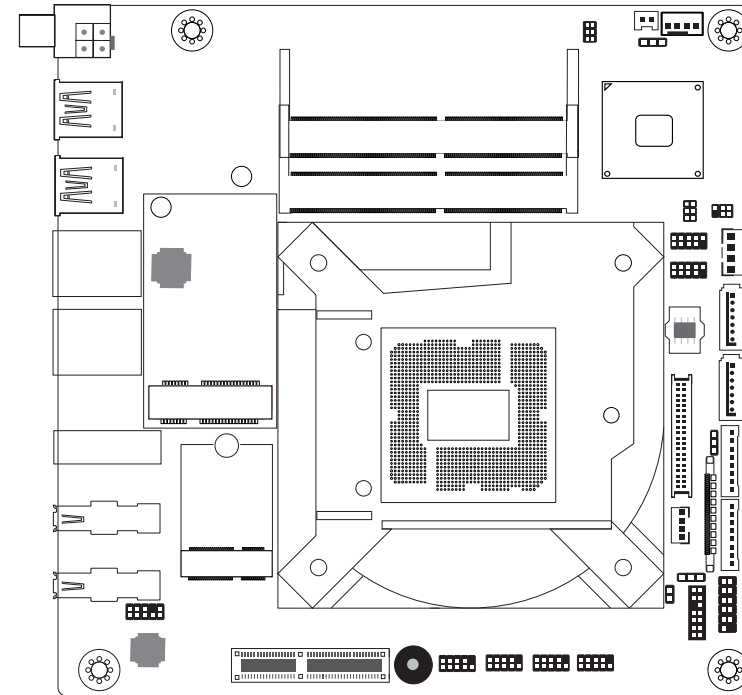
DisplayPort

Connects to the DisplayPort of an LCD monitor.

Mechanical Dimensions



Motherboard Dimensions



Chapter 2 - Getting Started

Preparing the System

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

- SATA hard drive
- AC power adapter
- Screwdriver
- Memory modules

Installing Devices

The following devices can be installed in the system.

- Memory module(s)
- SATA hard drive(s)

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

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

Make sure that a SATA drive is already installed.

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

Installing the Drivers

The system package includes a CD disk. The CD includes drivers that must be installed to provide the best system performance. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing Devices



Import:

To prevent damage to the system board, power down the system and remove all AC power cords before opening the chassis cover.

Opening the chassis

1. Make sure the system and all other peripheral devices connected to it have been powered off.
2. Disconnect all power cords and cables.
3. The 4 mounting screws on the rear side of the system are used to secure the cover to the chassis. Remove these screws and then put them in a safe place for later use.

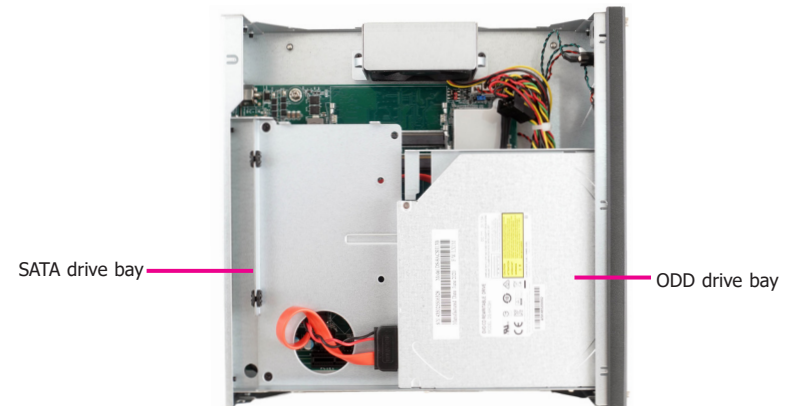
Mounting
screw



4. Slide the cover backwards to open the system.



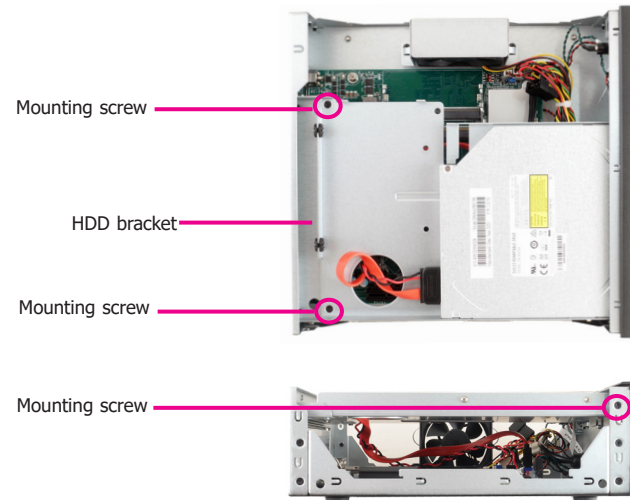
5. The SODIMM sockets and SATA drive bay are readily accessible after removing the chassis cover.



Installing a 2.5" SATA Drive

The system can accommodate one 2.5" SATA drive. Please use the following procedure to install a 2.5" SATA drive:

1. Remove the 3 mounting screws that secure the drive bay to the system.



2. Align the mounting holes on the SATA drive with the mounting holes on the HDD bracket.
SATA mounting screws

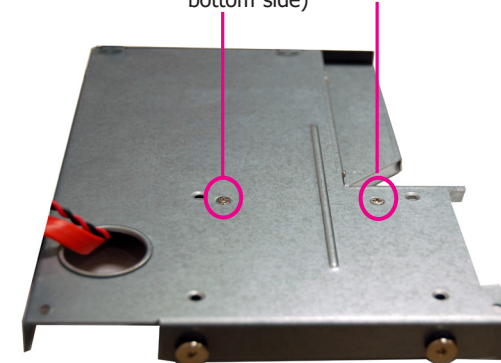


3. Use the mounting screws provided in the drive bay kit to attach the HDD bracket onto the drive bay and secure the drive in place.

HDD bracket mounting screws



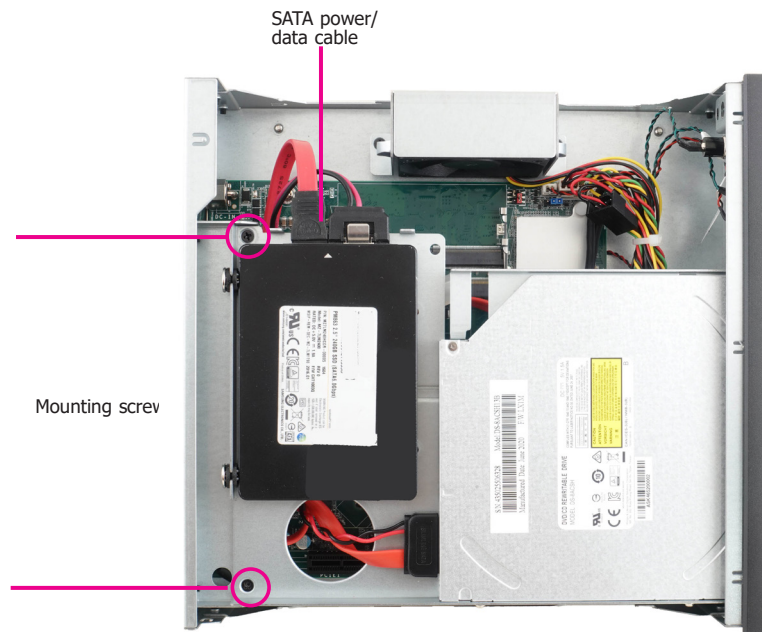
HDD bracket mounting holes
(on the drive bay's
bottom side)



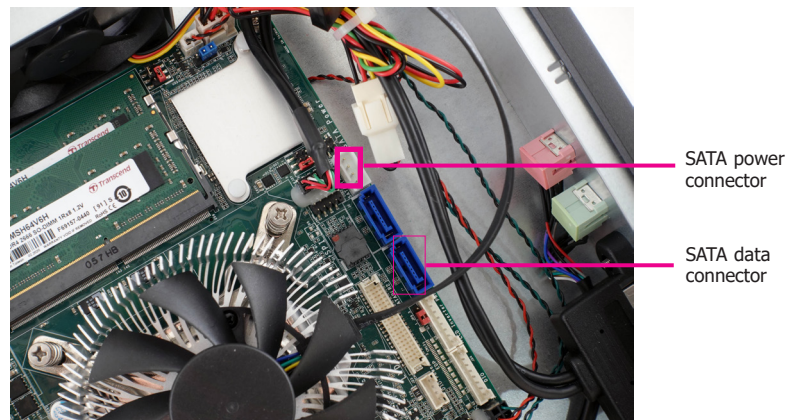
SATA mounting screws



- Place the SATA drive bay back in the chassis and install the SATA drive bay using the mounting screws you removed in step 1.



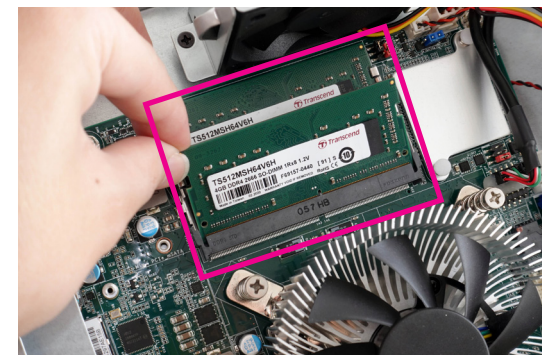
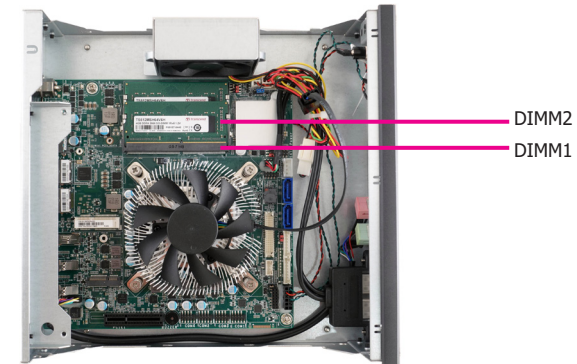
- Connect the SATA data/power cable to the SATA drive (refer to the above picture). Make sure the other end of the SATA data/power cable is connected to the connectors on the system board (refer to the picture below).



Installing a Memory Module

The system board is equipped with two memory slots. Please use the following procedure to install SODIMM modules.

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

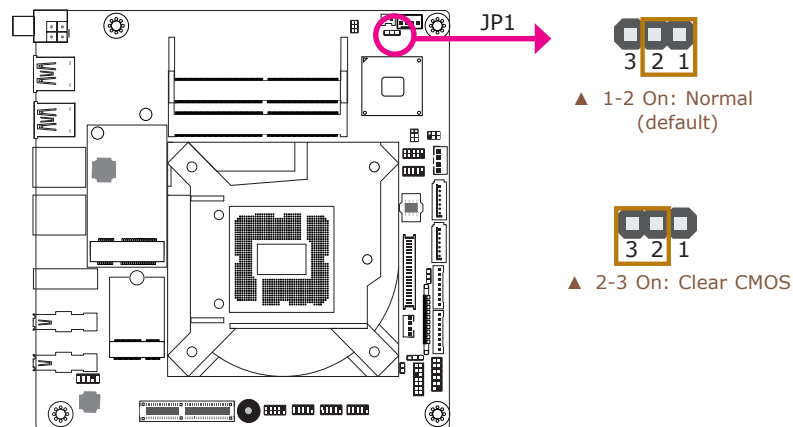


Notes:

- The system supports dual-channel configuration. To enable dual-channel, populate both SODIMM sockets.
- If installing only one memory module, please install it on the memory socket labeled DIMM 1 (the one closer to the center of the board).
- The SODIMM sockets can only accommodate DDR4 memory modules. Please do not install other types of memory modules.

Chapter 4 - Jumper Settings

Clear CMOS Data



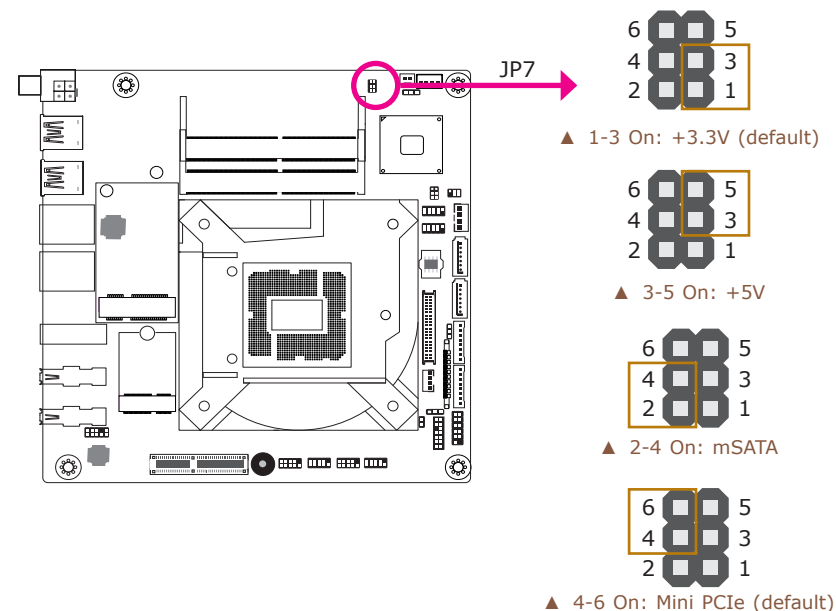
If you encounter the following situations, you can reconfigure the system with the default values stored in the ROM BIOS.

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

To load the default values stored in the ROM BIOS, please follow the 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 JP5 back to its default setting, pins 1 and 2 On.
- Now plug the power cord and power-on the system.

Backlight Brightness Select



JP7 Pin 1/3/5 is used to select the power level of backlight brightness — +3.3V (default) or +5V. For CS101-Q370/C246 motherboards, JP7 Pin 2/4/6 is also used to select between Mini PCIe and mSATA signals.



Important:

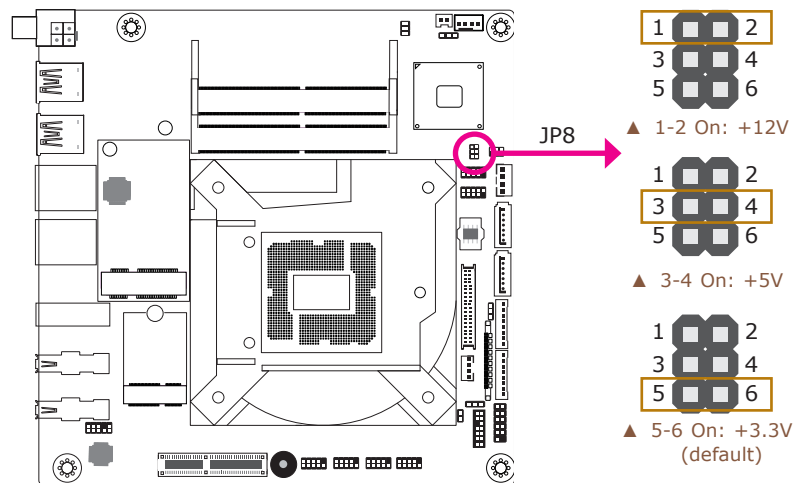
Before powering on the system, make sure that the power settings of JP6 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.



Note:

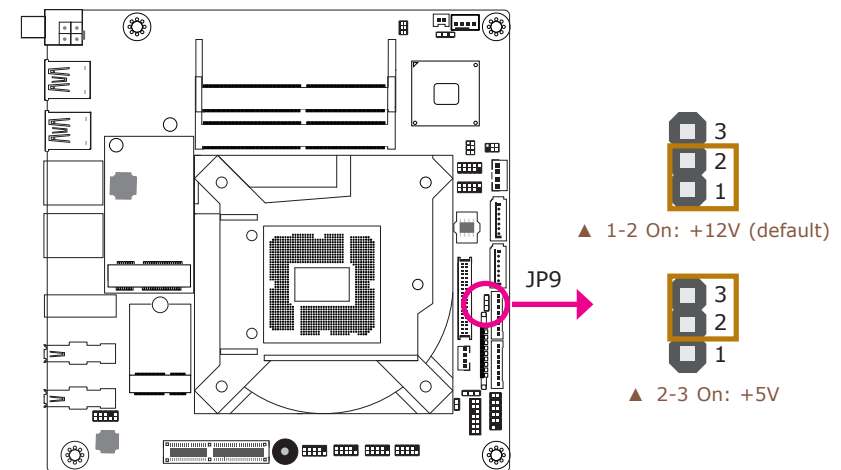
Mini PCIe signal is only supported by Q370/C246. H310 only supports mSATA.

Panel Power Select



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

LCD/Inverter Power Select



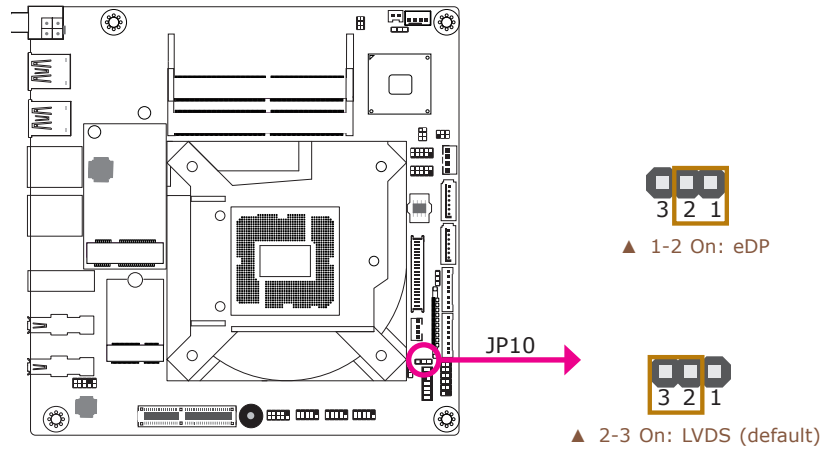
JP9 is used to select the power level of LVDS LCD inverter connector.



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.

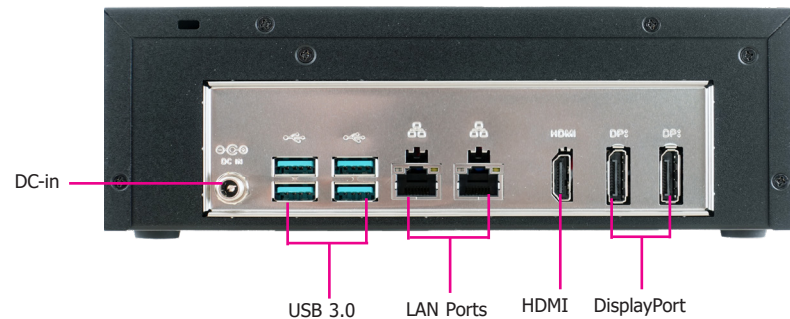
LVDS/eDP Signal Select



JP10 is used to select the LVDS/eDP signal.

Chapter 5 - Ports and Connectors

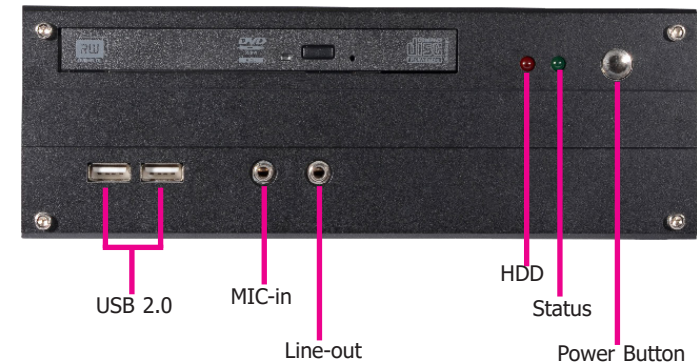
Rear Panel I/O Ports



The rear panel I/O ports consist of the following:

- Power Socket:
DC-in Jack
- USB Ports:
Four USB 3.0
- Ethernet Ports:
Two GbE (RJ-45)
- HDMI ports:
- Display ports:

Front Panel I/O Ports



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

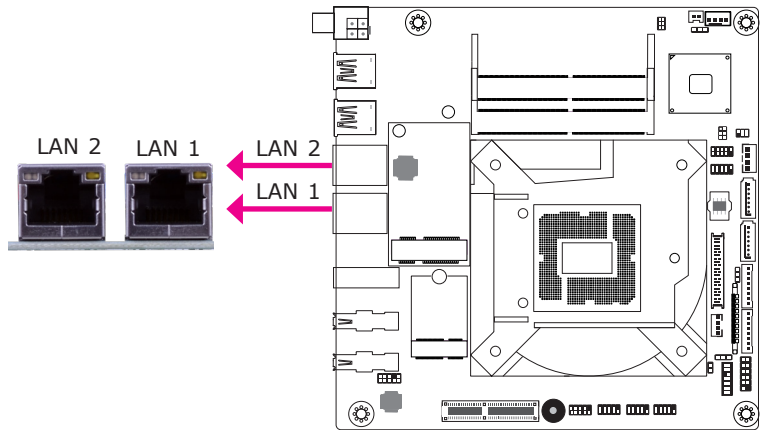
- Power button*
- USB Ports:
Two USB 2.0
- Audio Ports:
Microphone & Line-out
- Power and Status LED:
HDD LED
Status LED



Note:

Please gently press the power button to avoid possible damage.

RJ45 LAN Ports



Features

- LAN 1: Intel® I211AT PCIe (10/100/1000Mbps)
- LAN 2: Intel® I219V/LM (10/100/1000Mbps)

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

The two LAN ports allow the system board to connect to a local area network with a network hub.

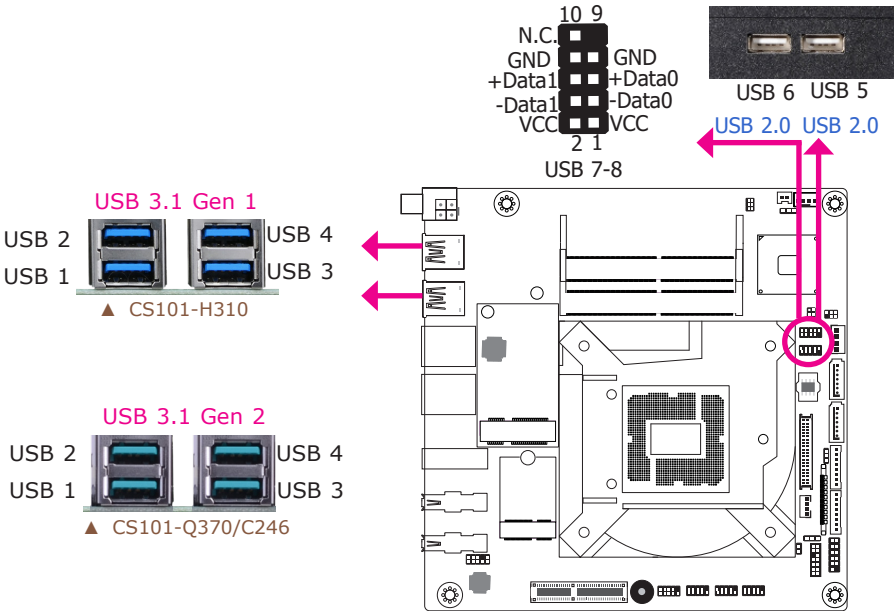
BIOS Setting

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

Driver Installation

Install the LAN drivers. Refer to Chapter 8 - Supported Software 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 motherboard is equipped with 4 onboard USB Type A ports (USB 1-2/3-4) at the rear panel I/O ports. The four USB rear ports support USB 3.1 Gen 1 on CS101-H310, and USB 3.1 Gen 2 on CS101-Q370/C246. Two 10-pin USB internal connectors allow you to connect to 4 additional USB 2.0 ports (USB 5-6/7-8)

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

BIOS Setting

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

Driver Installation

You may need to install the proper drivers in your system operation to use the USB device. Refer to your operating system's manual or documentation 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.



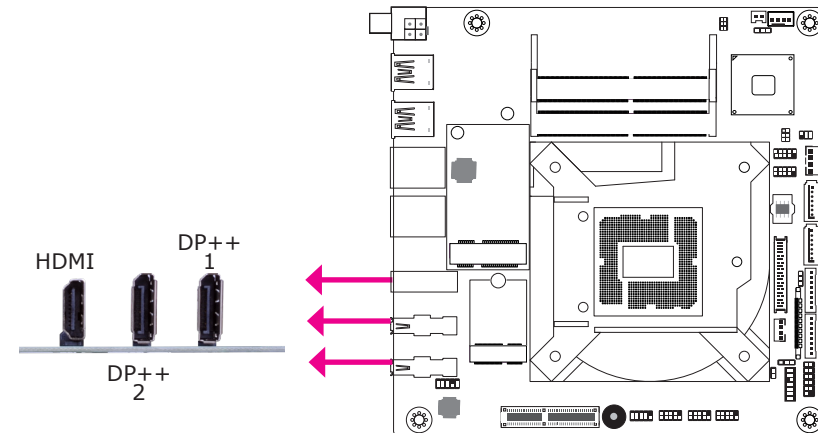
Important:

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 $\geq 2A$.

Graphics Interfaces

The display ports consist of the following:

- 1 HDMI port
- 2 DP++ ports



HDMI Port

The HDMI port which carries both digital audio and video signals is used to connect a LCD monitor or digital TV that has the HDMI port.

DP++ Port

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

Driver Installation

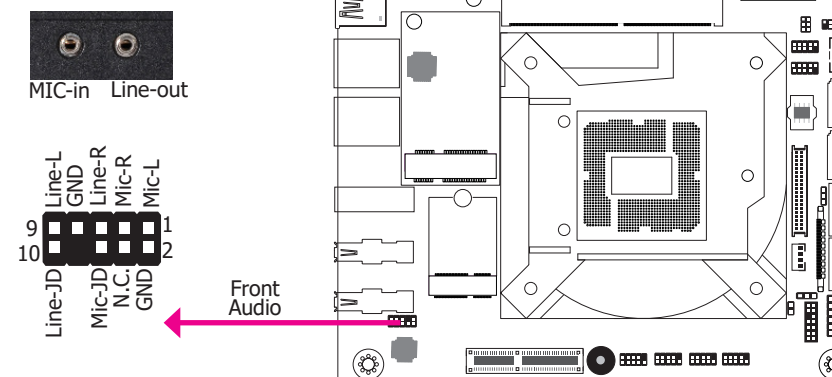
Install the graphics driver. Refer to Chapter 8 - Supported Software for more information.

DC-in Jack



This jack is considered a low power solution. Connect a DC power cord to this jack. Using a voltage more than the recommended range (12V only) may fail to boot the system or cause damage to the system board.

Audio



Rear Audio

The system board is equipped with 2 audio jacks.

- Line-out Jack
This jack is used to connect a headphone or external speakers.
- Microphone-in Jack
This jack is used to connect an external microphone.

BIOS Setting

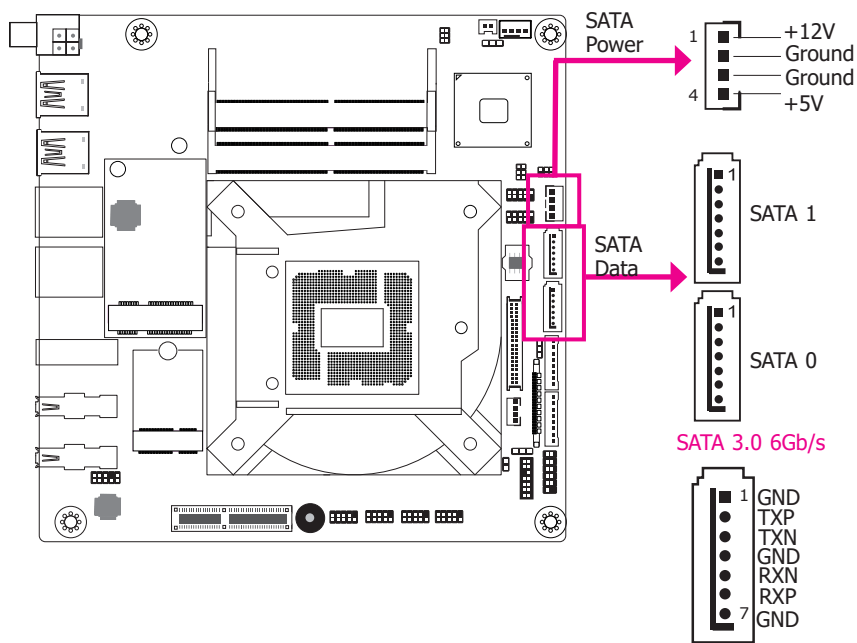
Configure the audio settings in the Advanced menu ("Audio Configuration" submenu) of the BIOS. Refer to Chapter 7 - BIOS for more information.

Driver Installation

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

I/O Connectors

SATA (Serial ATA) & Power Connectors



Features

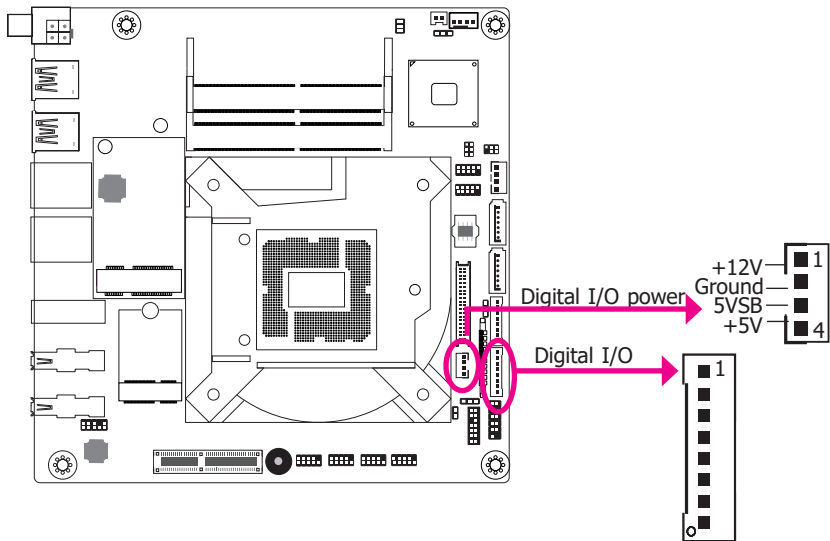
- 2 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (SATA 0 and SATA 1)

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

BIOS Setting

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

Digital I/O Connector

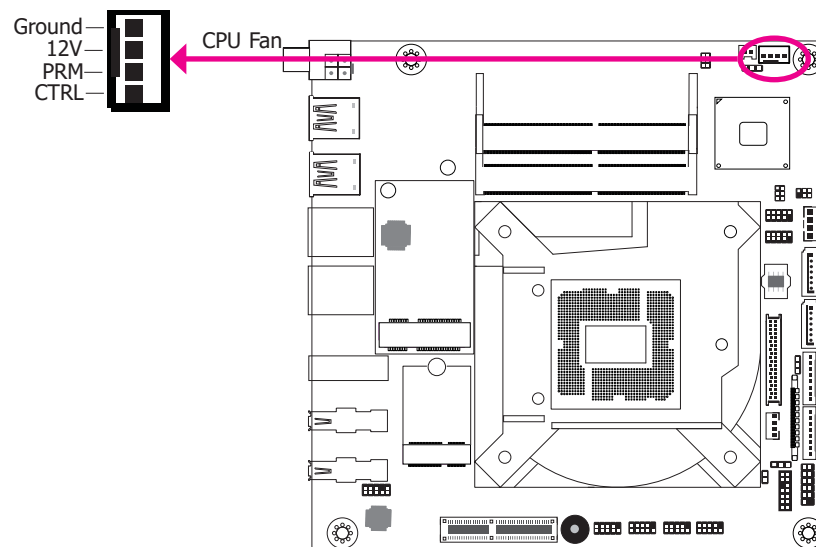


The 8-bit Digital I/O connector provides the ability to monitor and control connected external devices.

Digital I/O Connector

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

Cooling Fan Connectors

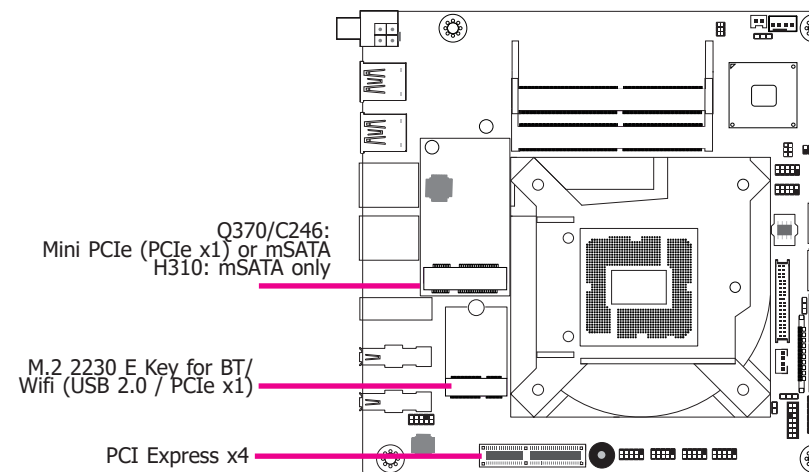


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

Expansion Slots



Mini PCI Express Slot

The full-size Mini PCIe socket supports the installation of a Mini PCIe card or an mSATA card. To switch between these two signals, use JP7. Refer to the "Jumper Settings" section for more information.

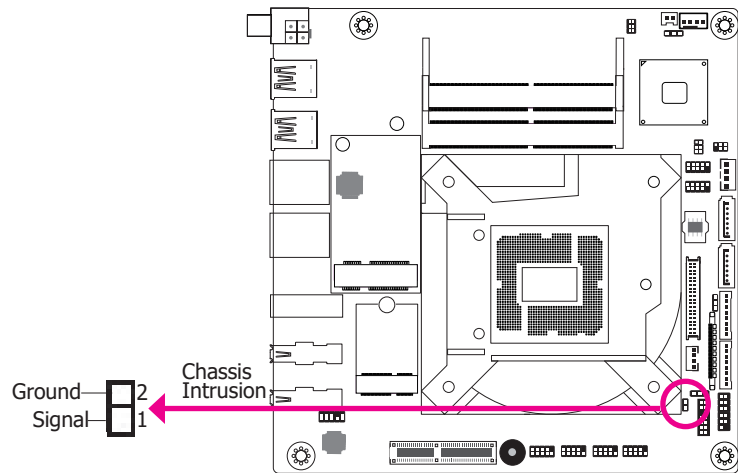
M.2 Sockets

The M.2 socket is the Next Generation Form Factor (NGFF) which is designed to support multiple modules and make the M.2 more suitable in application for solid-state storage. A 22x30mm socket and standoff is reserved on the PCB for a M.2 E Key module, and a 22x80mm socket and standoff for a M.2 M Key module.

PCI Express x4 Slot

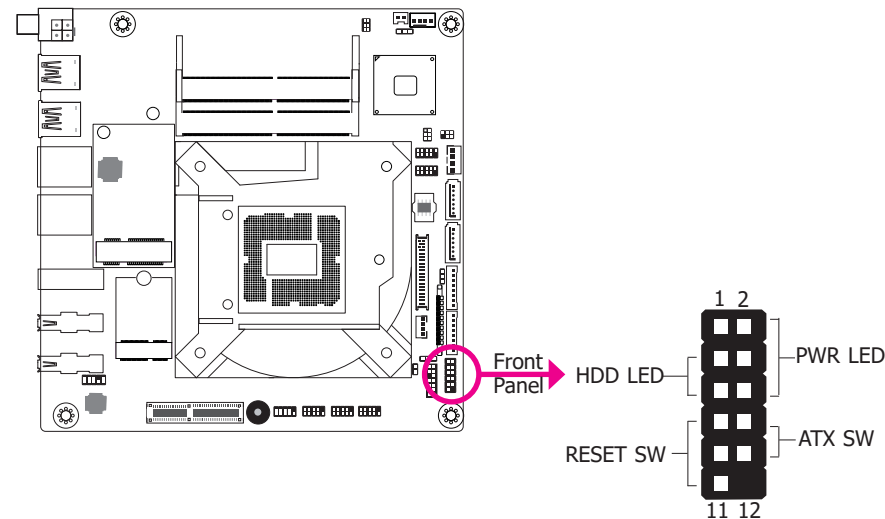
Install PCI Express cards such as network cards or USB expansion cards that comply to the PCI Express specifications into the PCI Express x4 slot.

Chassis Intrusion Connector



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

Front Panel Connector



HDD LED - HDD LED

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

RESET SW - Reset Switch

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

ATX SW - ATX Power Switch

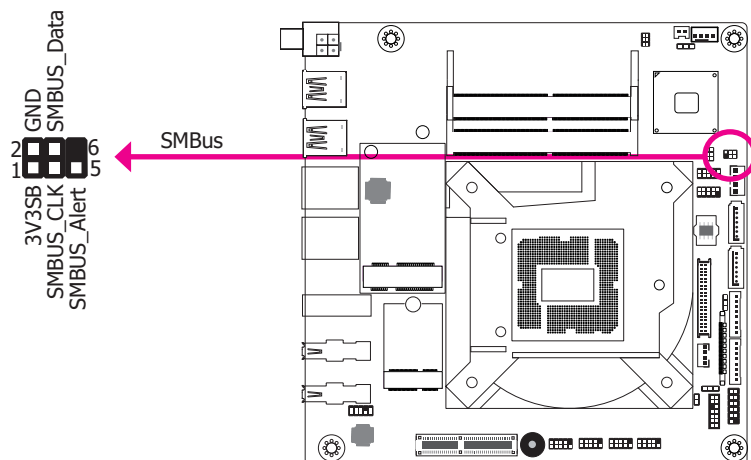
This switch is used to power on or off the system.

PWR LED - Power/Standby LED

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

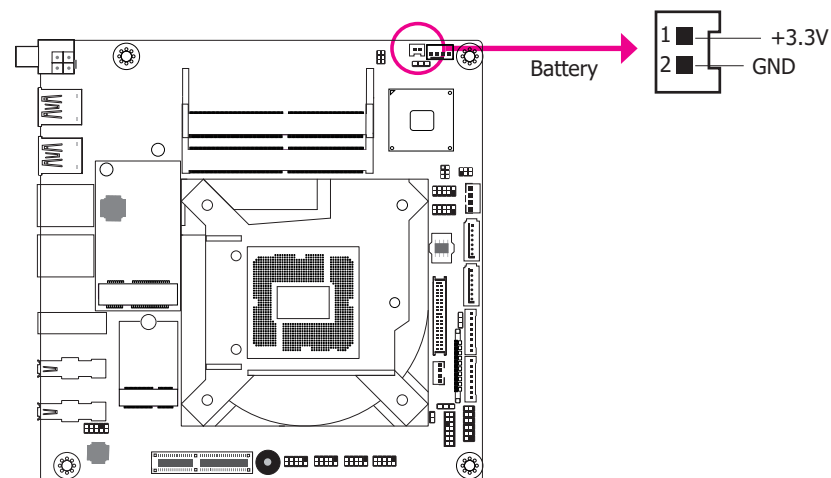
	Pin	Pin Assignment		Pin	Pin Assignment
HDD LED	3	HDD Power	PWR LED	2	LED Power
	5	Signal		4	LED Power
RESET SW	7	Ground	ATX SW	6	Signal
	9	RST Signal		8	Ground
	11	N.C.		10	Signal

SMBus Connector



The SMBus (System Management Bus) connector is used to connect low-bandwidth 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

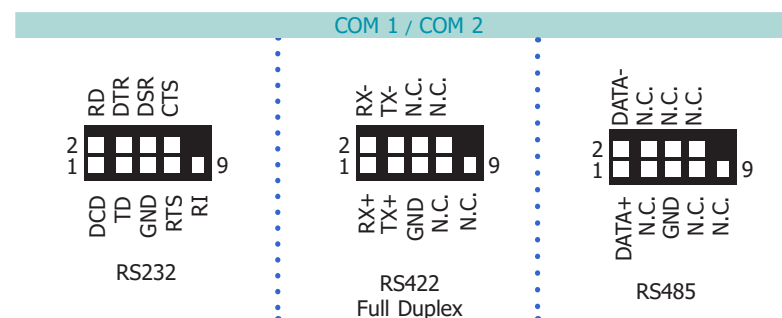
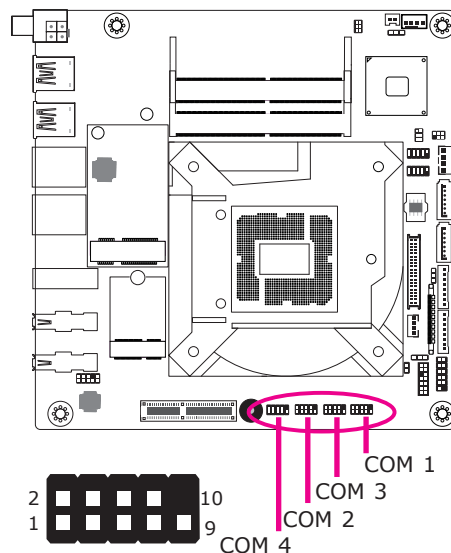


The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

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.

COM (Serial) Ports



The serial mode of COM 1 and COM 2 can be configured to RS232, RS422 and RS485 via BIOS, whereas the serial mode of COM 3 and COM 4 is 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.

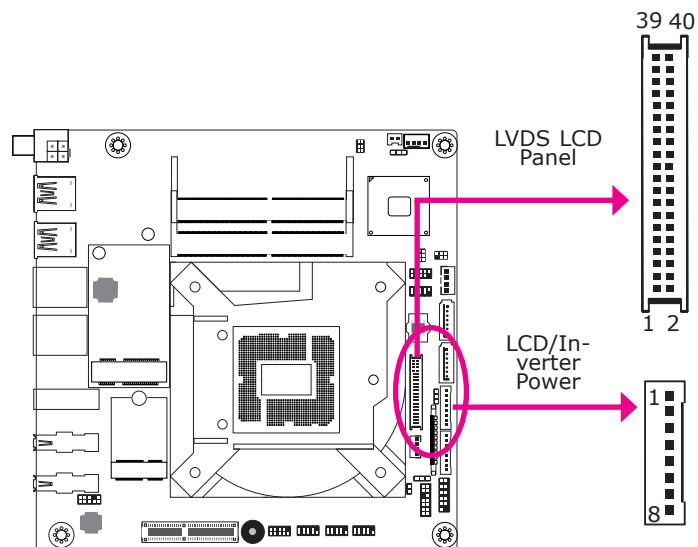
Connecting External Serial Ports

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

BIOS Setting

Configure the COM ports 1/2/3/4 in the Advanced menu ("NCT6116D Super IO Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

LVDS LCD Panel Connector LCD/Inverter Power Connector



The system board allows you to connect an LCD panel with the LVDS LCD panel connector and the LCD/Inverter Power connector. These connectors transmit video signals and power from the system board to the LCD panel.

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

BIOS Setting

Configure the LCD panel in the Advanced menu ("PTN3460 Configuration" sub-menu) of the BIOS. Refer to the chapter 7 for more information.



Note:

a. LVDS LCD Panel Connector (DFI PN: 346-714000-204G) Description: WTB HEADER 40P, 1.25mm, M,H=4.8mm, 180D, SMT, BEIGE, 712-76-40GWE0(PRINEX) RoHS

b. LCD/Inverter Power Connector (DFI PN: 3346-510801-100G) Description: BOX HEADER 1*8, 8P/2.0mm/180D, 721-81-08TW00(PINREX)RoHS

LVDS LCD Panel Connector

Pin	Function	Pin	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	LVDS_DDC_CLK	34	NC
35	LVDS_DDC_DATA	36	+3.3V
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

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

Chapter 6 - Mounting Options

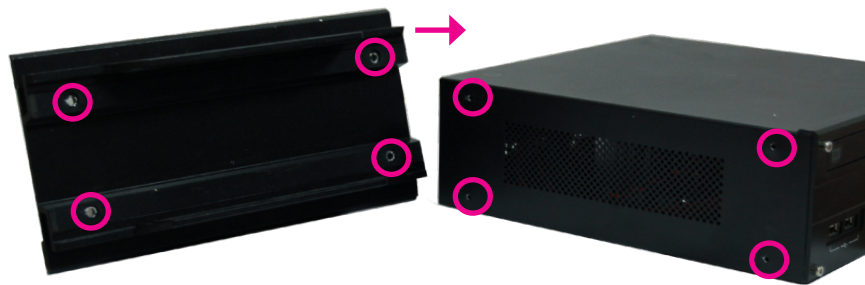
Desktop Mount

The desktop mount kit includes the following:

- 1 Desktop mounting stand
- Mounting screws

1. The mounting holes are located at the side panel of the system. Fasten the mounting stand on the side of the system using the mounting screws.

Mounting screws



2. Place the system upright with the stand's support at the bottom.



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	Move the highlight left or right to select a menu.
Up and Down arrows	Move the highlight up or down between submenu or fields.
+ (plus key)	Scroll forward through the values or options of the highlighted field
- (minus key)	Scroll backward through the values or options of the highlighted field
<Esc>	Return to previous menu
<F1>	Display general help
<F2>	Display previous values
<F9>	Optimized defaults
<F10>	Save and Exit
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

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

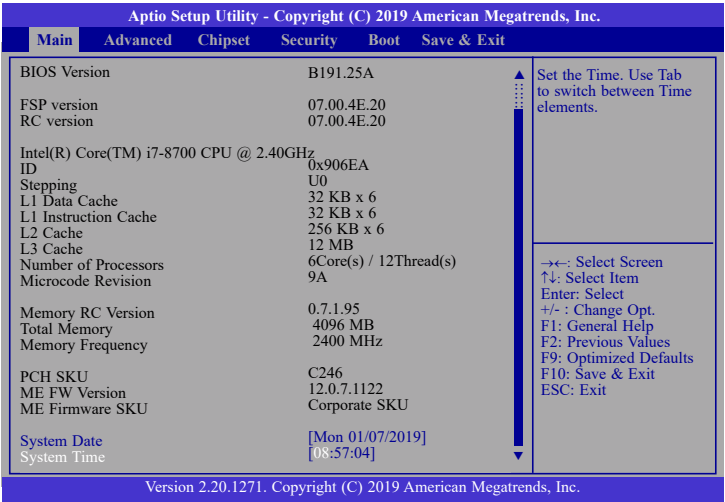
Submenu

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

Aptio BIOS Setup Utility

Main

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



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 2005 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.

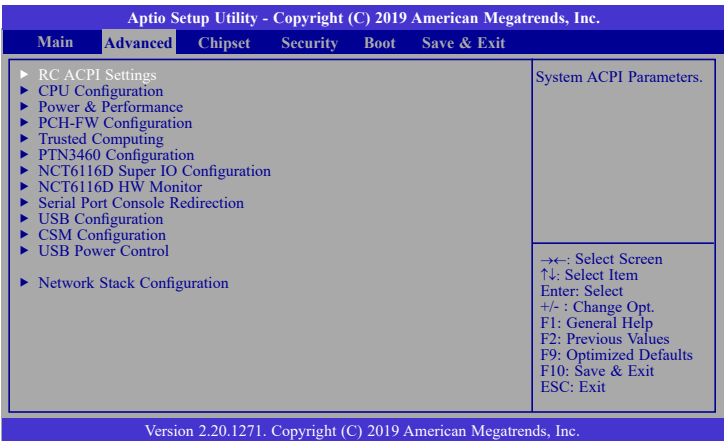
Advanced

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.



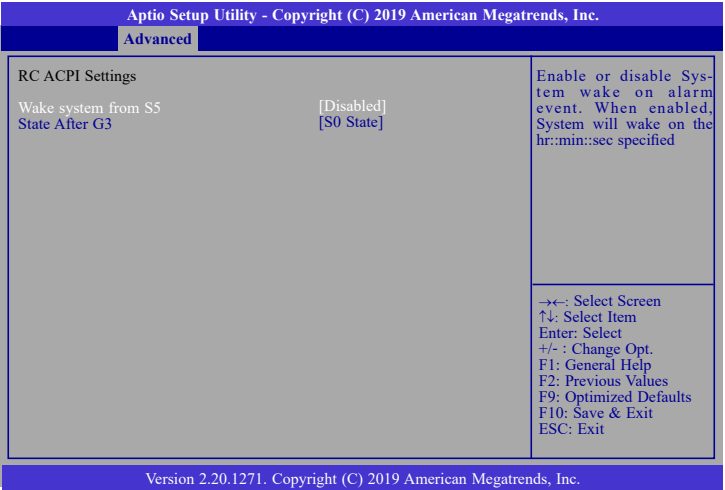
Important:

Setting incorrect field values may cause the system to malfunction.



RC ACPI Settings

Configure power management related settings in this page.

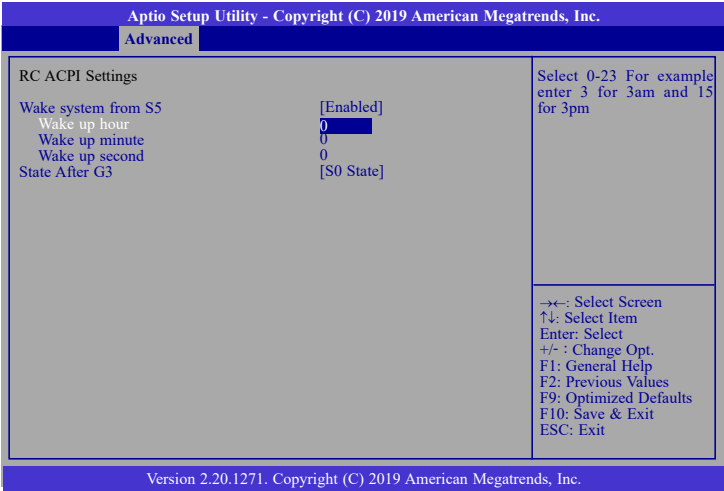


Wake system from S5

When Enabled, the system will automatically power up at a designated time every day from the Real-time clock (RTC) battery. More settings will be displayed once it's switched to [Enabled] as detailed in the next page.

State After G3

Select between S0 State, Last State, and S5 State. This field is used to specify what state the system is set to return to when power is re-applied after a power failure (G3 state).



When "Wake system from S5" is enabled, the following fields will appear.

Wake up hour

Press +/- to set the hour from 0 to 23.

Wake up minute

Press +/- to set the minute from 0 to 59.

Wake up second

Press +/- to set the second from 0 to 59.

CPU Configuration

This section configures the CPU.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
CPU Configuration		
Intel (VMX) Virtualization Technology	[Enabled]	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	[All]	
Hyper-Threading	[Enabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

Intel (VMX) Virtualization Technology

When this field is enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

Select number of cores to be enabled in each processor package: all, 1, 2, 3, 4 or 5.

Hyper-Threading

Enable or disable Hyper-threading. When it is enabled, a physical core will perform as two logical processors, and the user may experience better computational efficiency of the system. Please make sure that the OS operating on your system is optimized for Hyper-Threading, e.g. Windows and Linux. This field is not available when the equipped CPU does not support Hyper-threading.

Power & Performance

Configure the power and performance settings in this page.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
Power & Performance		
Intel(R) SpeedStep(tm)	[Enabled]	Allows more than two frequency ranges to be supported.
Turbo Mode	[Enabled]	
C states	[Enabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

Intel(R) SpeedStep(tm)

Enable or disable Intel Enhanced SpeedStep Technology. Voltage and frequency are switched between high and low levels in response to processor load when this field is enabled, and the Turbo Mode field will appear.

Turbo Mode

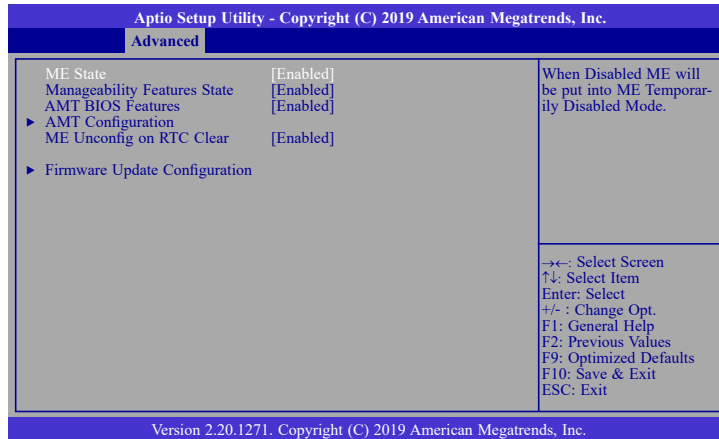
Enable or disable processor turbo mode, which allows the processor core to automatically run faster than the base frequency when the processor's power, temperature, and specification are within the limits of TDP. This field is only available when "Intel(R) SpeedStep(tm)" is enabled.

C states

Enable or disable CPU Power Management. When enabled, the CPU is allowed to go to C states when it's not 100% utilized.

PCH-FW Configuration

Configure the parameters of Management Engine Technology.



ME State

Enable or disable Management Engine. When this field is set to Disabled, ME will be put into ME Temporarily Disabled Mode. The following fields will only appear when ME State is enabled.

Manageability Features State

Enable or disable Intel(R) Manageability features. This option disables/enables Manageability Features support in FW. To disable, support platform must be in an unprovisioned state first.

AMT BIOS Features

When disabled, AMT BIOS features are no longer supported and user is no longer able to access MEBx Setup. This option does not disable manageability features in FW.

▶ AMT Configuration

This section is used to configure Intel(R) Active Management Technology Parameters. Please refer to the following pages.

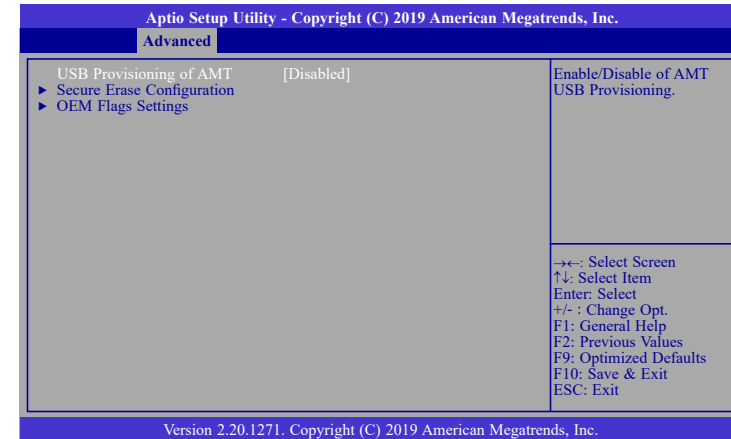
ME Unconfig on RTC Clear

When disabled, ME will not be unconfigured on RTC Clear.

▶ Firmware Update Configuration

Please refer to the following pages.

▶ AMT Configuration



USB Provisioning of AMT

Enable or disable AMT USB Provisioning.

▶ Secure Erase Configuration

Please refer to the following pages.

▶ OEM Flags Settings

Please refer to the following pages.

► AMT Configuration ► Secure Erase Configuration

This section is used to configure Secure Erase.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
Secure Erase mode	[Simulated]	Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD Real: Erase SSD.
Force Secure Erase	[Disabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

Secure Erase Mode

Select Secure Erase module behavior: Simulated or Real.

Force Secure Erase

Enable or disable Force Secure Erase on next boot.

► AMT Configuration ► OEM Flags Settings

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Advanced		
Hide Unconfigure ME Confirmation Prompt	[Disabled]	OEMFlag Bit 6: Hide Unconfigure ME confirmation prompt when attempting ME unconfiguration.
Unconfigure ME	[Disabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

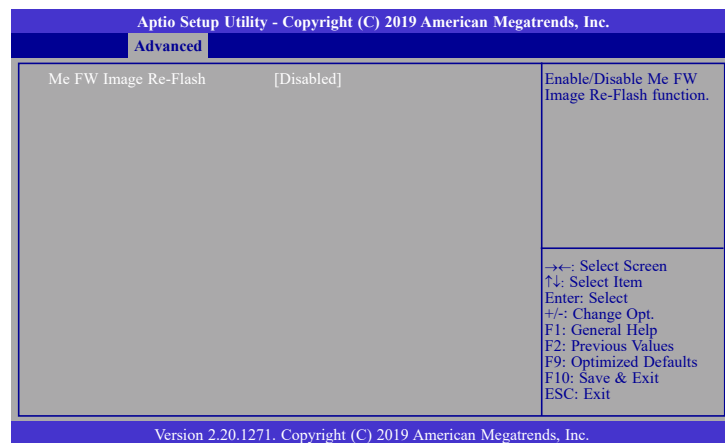
Hide Unconfigure ME Confirmation Prompt

Enable or disable to hide unconfigure ME confirmation prompt when attempting ME unconfiguration.

Unconfigure ME

Enable or disable to unconfigure ME with resetting MEBx password to default.

► Firmware Update Configuration



Me FW Image Re-Flash

This field is used to enable or disable the Me FW Image Re-Flash function.

Trusted Computing

Configure Trusted Computing settings.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
TPM20 Device Found	7.63	Enables or Disables BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	IFX	
Vendor:		
Security Device Support	[Enable]	
Pending operation	[None]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

Security Device Support

This field is used to enable or disable BIOS support for the security device. A security device will not be shown on the OS. TCG EFI protocol and INT1A interface will not be available.

Pending operation

Schedule an opeartion for the security device. Your computer will reboot during restart in order to change state of the security device.

PTN3460 Configuration

This section configures settings relevant to Trusted Computing innovations.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
PTN3460 Function	[Disabled]	Enabled or Disabled PTN3460 LCD Features.
LCD Panel Type	[1024X768]	
LCD Panel Color Depth	[18 Bit]	
Backlight Type	[Normal+PWM Mode]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

PTN3460 Function

Enabled or Disabled PTN3460 LCD Features.

LCD Panel Type

Select the resolution of the LCD Panel — 800X480, 800X600, 1024X768, 1366X768, 1280X1024, 1280X768, 1920X1080, or 1600X900.

LCD Panel Color Depth

Select the color depth of the LCD Panel — 18 Bit, 24 Bit, 36 Bit, 48 Bit.

Backlight Type

Enable or disable the serial ATA port and its hot plug function.

**Important:**
The configuration must match the specifications of your LCD Panel in order for the LCD Panel to display properly.

NCT6116D Super IO Configuration

TThis section is used to configure the I/O functions supported by the onboard Super I/O chip.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
NCT6116D Super IO Configuration		WatchDog Timer Unit Selection
Super IO Chip	NCT6116D	
WatchDog Timer Unit	[Second]	
SuperIO WatchDog Timer	0	
▶ Serial Port 1 Configuration		
▶ Serial Port 2 Configuration		
▶ Serial Port 3 Configuration		
▶ Serial Port 4 Configuration		
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

WatchDog Timer Unit

Select WatchDog Timer Unit: Second or Minute.

SuperIO WatchDog Timer

Set SuperIO WatchDog Timer Timeout value. The range is from 0 (disabled) to 255.

▶ Serial Port 1/2/3/4 Configuration

Configure the parameters of serial port 1 (COM 1) to serial port 4 (COM 4) as detailed later.

▶ Serial Port 1/2/3/4 Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
Electrical Interface Mode	[RS232]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

Serial Port

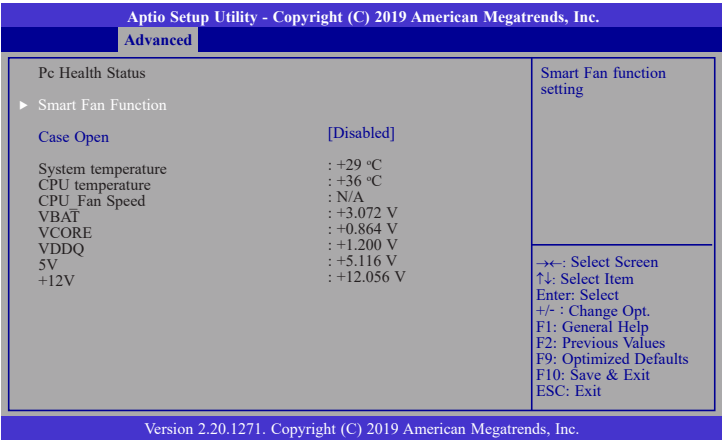
Enable or disable the serial COM port.

PCI Express Configuration

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

NCT6116D HW Monitor

This section displays the hardware health monitor.



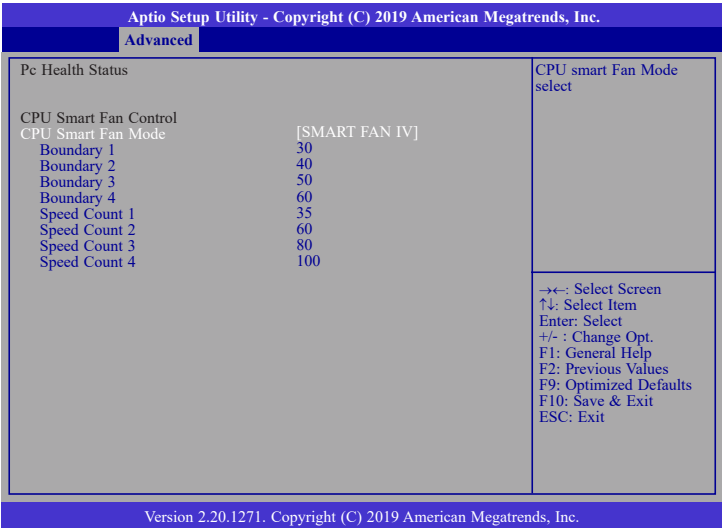
► Smart Fan Function

Please refer to the following pages.

Case Open

Enable or disable the case open detection function.

► Smart Fan Function



CPU Smart Fan Mode

Enable or disable the system smart fan. When set to "Manual mode", fan speed will not be controllable according to different system temperatures. Instead, a "Manual PWM Setting" field will be displayed to configure at which speed the fan will always be fixed regardless of system temperature.

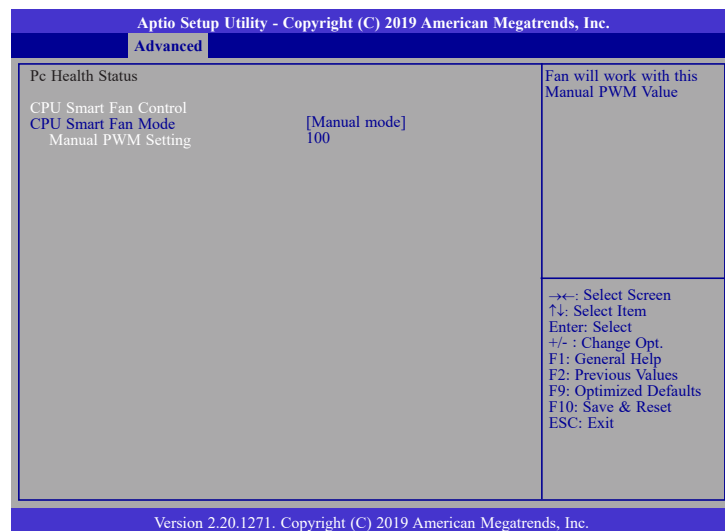
When "CPU Smart Fan Mode" is set to "SMART FAN IV", the following fields will appear.

Boundary 1 to Boundary 4

Set the boundary temperatures that determine the fan speeds accordingly, the value ranging from 0-127oC. For example, when the system temperature reaches Boundary 1 setting, the fan speed will be turned up to the designated speed of the Fan Speed Count 1 field.

Speed Count 1 to Speed Count 4

Set the fan speed, the value ranging from 1-100%, 100% being full speed. The fans will operate according to the specified boundary temperatures above-mentioned.



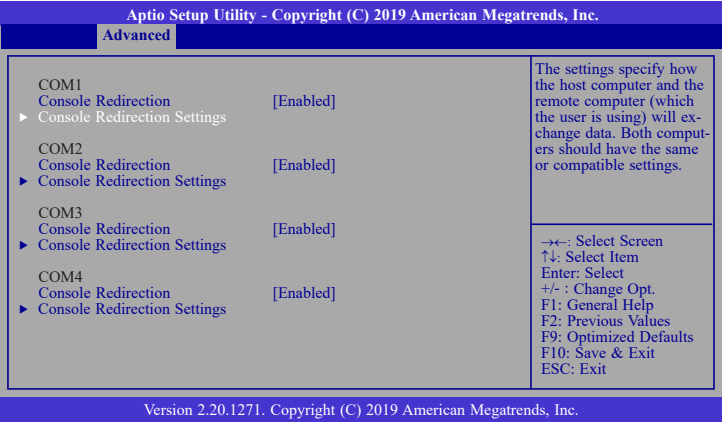
When "CPU Smart Fan Mode" is set to "Manual mode", the following field will appear.

Manual PWM Setting

Set the fan speed to a fixed value, ranging from 1-100%, 100% being maximum speed.

Serial Port Console Redirection

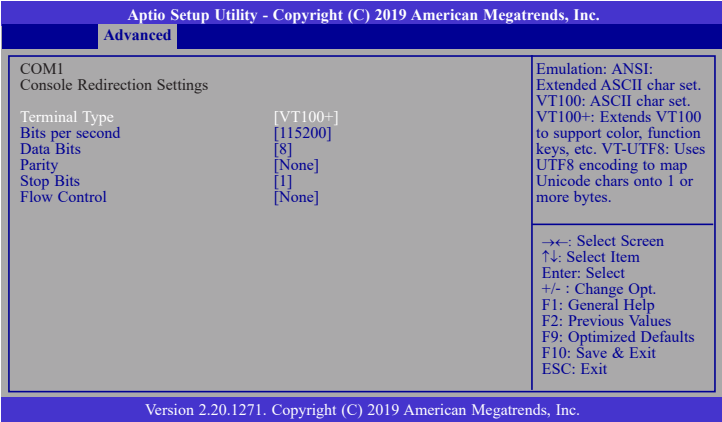
This section configures settings relevant to serial port console redirection.



Console Redirection

This field is used to enable or disable the console redirection function. When console redirection is set to enabled, console redirection settings are available as instructed below.

▶ Console Redirection Settings



Terminal Type

Select terminal type: VT100, VT100+, VT-UTF8 or ANSI.

Bits per second

Select serial port transmission speed: 9600, 19200, 38400, 57600 or 115200.

Data Bits

Select data bits: 7 bits or 8 bits.

Parity

Select parity bits: None, Even, Odd, Mark or Space.

Stop Bits

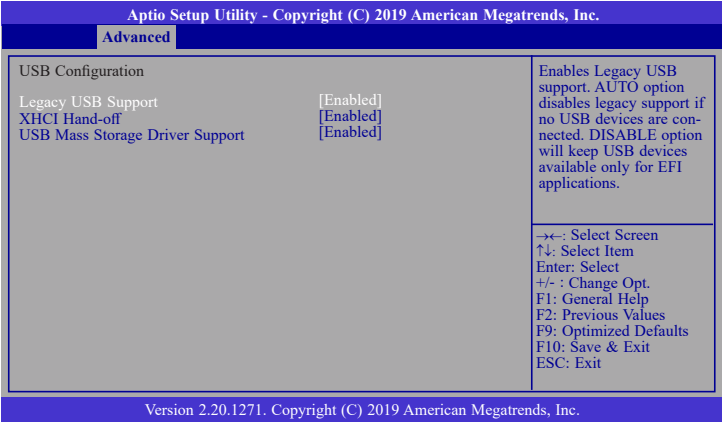
Select stop bits: 1 bit or 2 bits.

Flow Control

Select flow control: None or Hardware RTS/CTS.

USB Configuration

This section is used to configure the USB settings.



Legacy USB Support

- Enabled** Enable Legacy USB support.
- Disabled** Keep USB devices available only for EFI applications.
- Auto** Disable Legacy support if no USB devices are connected.

XHCI Hand-off

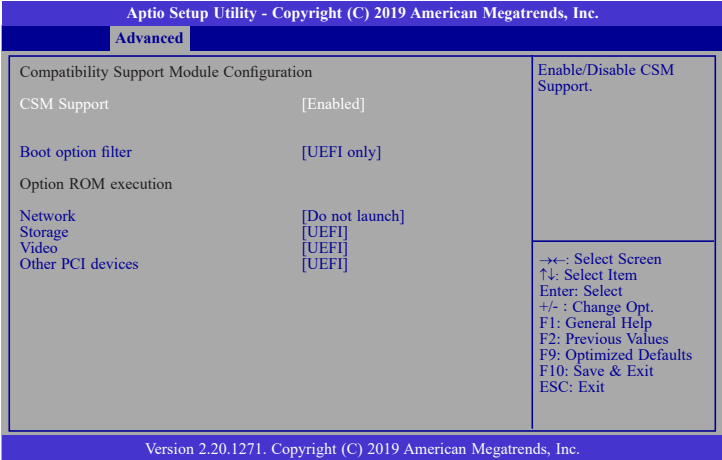
Enable or disable XHCI Hand-off.

USB Mass Storage Driver Support

Enable or disable USB Mass Storage Driver Support.

CSM Configuration

This section is used to configure the CSM settings.



CSM Support

This section is used to enable or disable CSM Support. When CSM Support is set to enabled, several options will appear for configuration.

Boot option filter

This field controls Legacy/UEFI ROMs priority.

Network

This field controls the execution of UEFI and Legacy Network OpROM.

Storage

This field controls the execution of UEFI and Legacy Storage OpROM.

Video

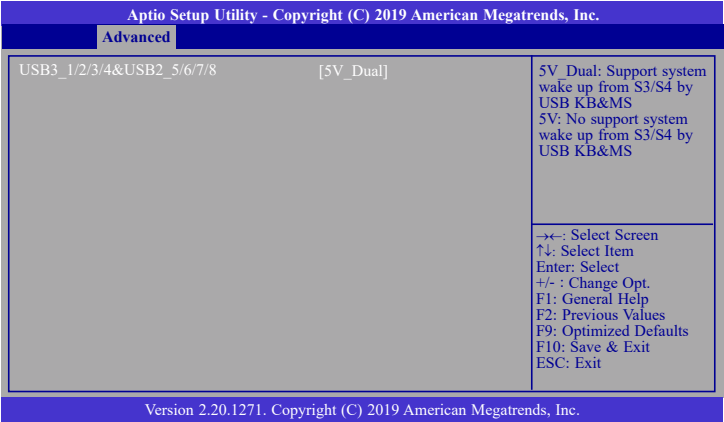
This field controls the execution of UEFI and Legacy Video OpROM.

Other PCI devices

This field determines OpROM execution policy for devices other than Network, Storage or Video.

USB Power Control

Configure USB port power voltage.

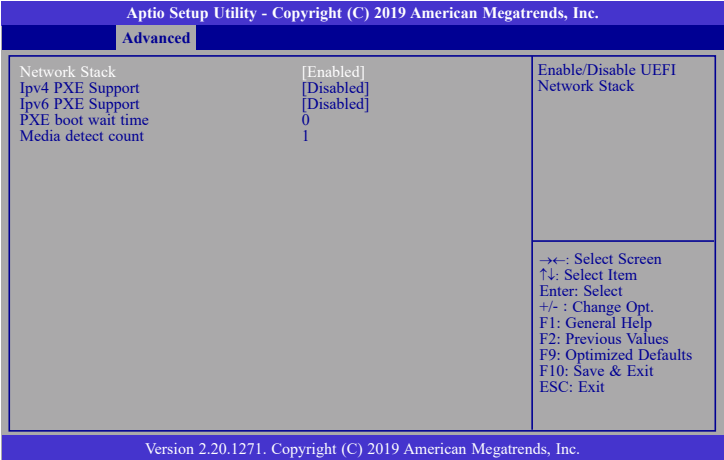


USB3_1/2/3/4&USB2_5/6/7/8

Select the power voltage for USB 1-8 — 5V_Dual or 5V.

Network Stack Configuration

This section is used to configure the Network Stack settings.



Network Stack

This section is used to enable or disable UEFI network stack. When Network Stack is enabled, the following fields will appear.

Ipv4 PXE Support

Enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

Ipv6 PXE Support

Enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

PXE boot wait time

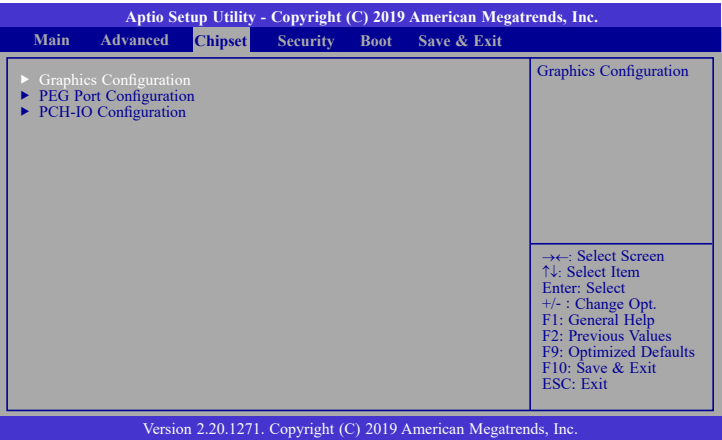
Set the wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

Media detect count

Set the number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

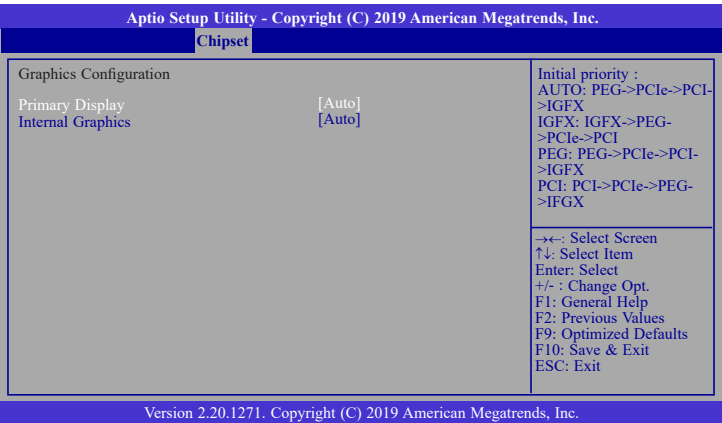
Chipset

This section configures relevant chipset functions.



Graphics Configuration

This section is used to configure the Network Stack settings.



Primary Display

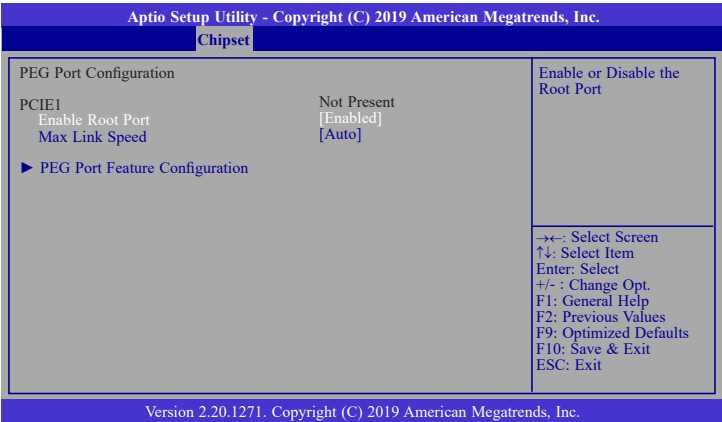
Select a Graphics device to be the primary display — Auto, IGFX, PEG, PCI.

Internal Graphics

Keep IGFX enabled based on the setup options.

PEG Port Configuration

Configure the internal PCIe1 (PCIe x4) channel.



Enable Root Port

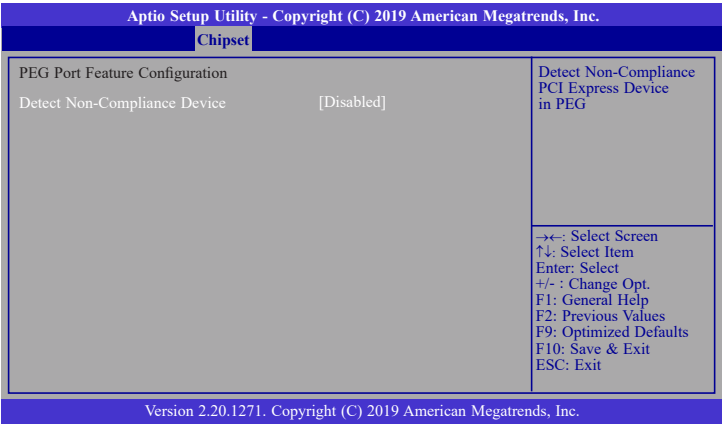
Enable or disable the root port.

Max Link Speed

Configure Max Link Speed: Auto, Gen1, Gen2 or Gen3.

► PEG Port Feature Configuration

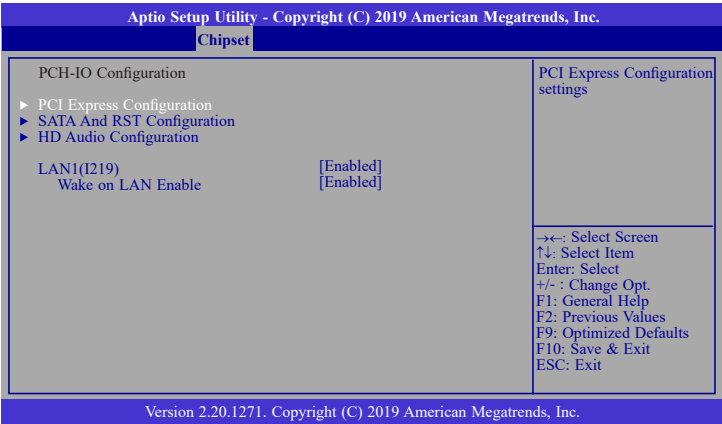
This section configures the PEG port.



Detect Non-Compliance Device

Enable or disable this field to detect non-compliance PCIe devices in the PEG.

PCH-IO Configuration



► PCI Express Configuration

Please refer to the following pages.

► SATA And RST Configuration

Please refer to the following pages.

► HD Audio Configuration

Please refer to the following pages.

LAN1(I219)

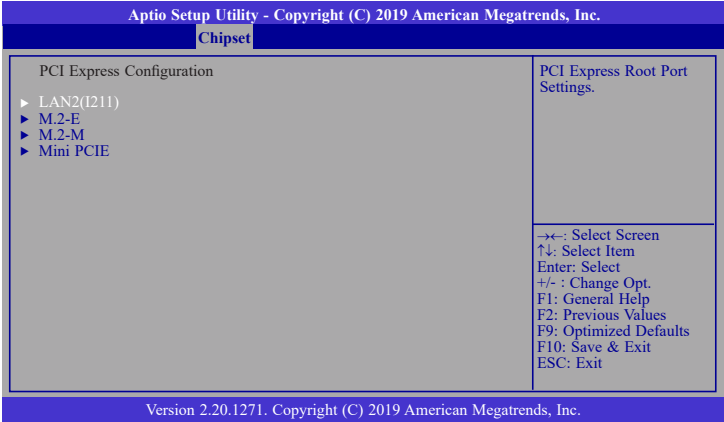
Enable or disable onboard NIC.


Wake on LAN Enable

Enable or disable integrated LAN to wake the system.

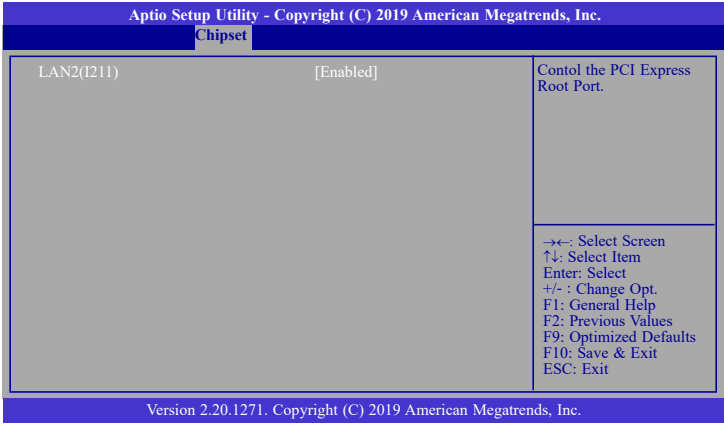
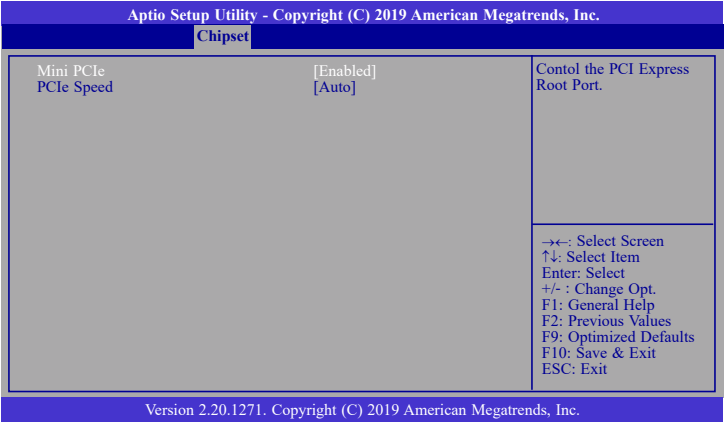
► **PCI Express Configuration**

Select a PCIe root port.



 **Note:**
The PCIe1 internal x4 channel is configured under the “PEG Port Configuration” submenu as instructed previously.

► **PCI Express Configuration ► LAN2(I211)/M.2-E/M.2-M/Mini PCIe**



LAN2(I211)/M.2-E/M.2-M/Mini PCIe

This field is used to enable or disable the PCI express root port.

PCIe Speed

Select the speed of the PCI Express root port: Auto, Gen1, Gen 2 or Gen3. This field will not appear when the root port does not support speed configuration.

► SATA and RST Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Chipset		
SATA And RST Configuration		Enable/Disable SATA Device.
SATA Controller(s)	[Enabled]	
SATA Speed	[Auto]	
SATA Mode Selection	[AHCI]	
Serial ATA Port 0 (Mini PCIe) Port 0	Empty [Enabled]	
Serial ATA Port 1 (M.2-M) Port 1	Empty [Enabled]	
Serial ATA Port 2 (SATA0(R2)) Port 2	Empty [Enabled]	
Hot Plug	[Disabled]	
Serial ATA Port 3 (SATA1(R3)) Port 3	Empty [Enabled]	
Hot Plug	[Disabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

SATA Controller(s)

Enable or disable the Serial ATA controller. When theis field is enabled, the following fields will appear.

SATA Speed

Select the speed of the Serial ATA controller: Auto, Gen1, Gen 2 or Gen3.

SATA Mode Selection

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

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

Intel RST Premium With Intel Optane System Acceleration This option allows you to create RAID or Intel Rapid Storage configuration with Intel® Optane™ system acceleration on Serial ATA devices.

Use RST Legacy OROM

This field is only available when SATA Mode Selection is set to "Intel RST Premium With Optane System Acceleration." It is used to enable or disable to use RST Legacy OROM.

Serial ATA Port 0/1/2/3 and Hot Plug

Enable or disable the Serial ATA port and its hot plug function.RST Legacy OROM.

► HD Audio Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Chipset		
HD Audio Subsystem Configuration Settings		Control Detection of the HD-Audio device.
HD Audio	[Enabled]	Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

HD Audio

Control the detection of the HD Audio device.

Disabled HDA will be unconditionally disabled.

Enabled HDA will be unconditionally enabled.

Security

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
Password Description			Set Administrator Password		
Minimum length			3		
Maximum length			20		
Administrator Password					
▶ Secure Boot					
			→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit		
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.					

Administrator Password

Set the administrator password. Input the password, press Enter, and then input the same character string again to confirm. To remove the password, input no character.

Secure Boot

Secure Boot is used to verify that your boot loader is not tampered by malware.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Security		
System Mode	User	Set Administrator Password
Secure Boot	[Enabled] Not Active	
Secure Boot Mode	[Standard]	
▶ Restore Factory Keys		
▶ Reset To Setup Mode		
		→←: Select Screen ↑↓: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

System Mode

This field displays whether the system is in User or Setup mode.

Secure Boot

Enable or disable Secure Boot. Please reset the platform after changing the setting.

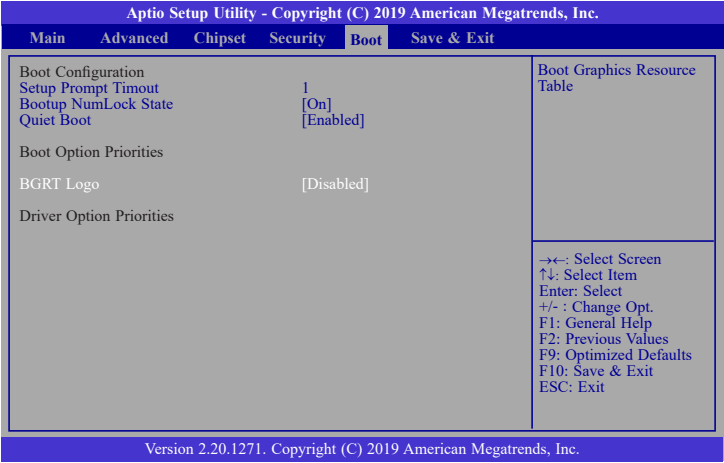
Restore Factory Keys

Force System to User Mode and install factory default Secure Boot key data-bases.

Return to Setup Mode

This command is only available when the system mode is in User mode and Secure Boot Mode is set to Custom.

Boot



Setup Prompt Timeout

Set the number of seconds to wait for the setup activation key. 65535 (0xFFFF) denotes indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state: On or Off.

Quiet Boot

This section is used to enable or disable quiet boot option.

Boot Option Priorities

Select the system boot order.

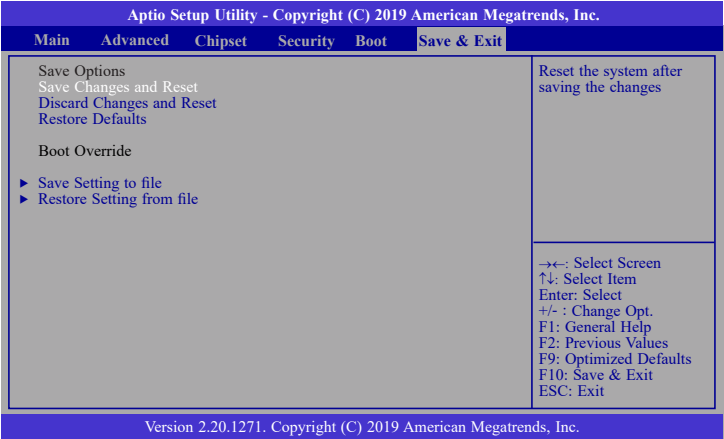
BGRT Logo

It is used to enable or disable to support display logo with ACPI BGRT table.

Driver Option Priorities

Select the driver boot order.

Save & Exit



Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

Discard Changes and Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values.

Boot Override

Move the cursor to an available boot device and press Enter, the system will immediately boot from the boot device. This function will only be effective for the current boot. The “Boot Option Priorities” in the Boot menu will not be changed.

Save Setting to file

Select this option to save BIOS configuration settings to a USB flash device.

Restore Setting from file

This field will appear only when a USB flash device is detected. Select this field to restore setting from the USB flash device.

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. You may refer to the how-to video "How to update AMI BIOS in UEFI mode on DFI products?" at <https://www.dfi.com/Knowledge/Video/5> for updating the BIOS steps.

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. 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.

Drivers are available for the following devices in Windows 10:

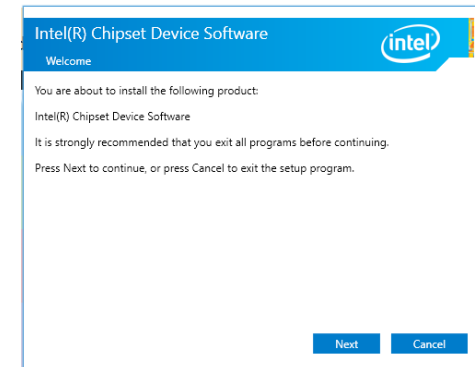
- Intel® Chipset Device Software
- Intel® Graphics Driver
- Intel® LAN Driver
- Intel® ME Driver
- Audio Driver
- Intel® Serial IO Driver

Intel Chipset Device Software

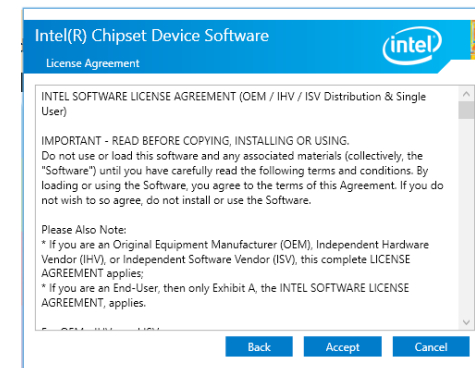
The Intel Chipset Device Software is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

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

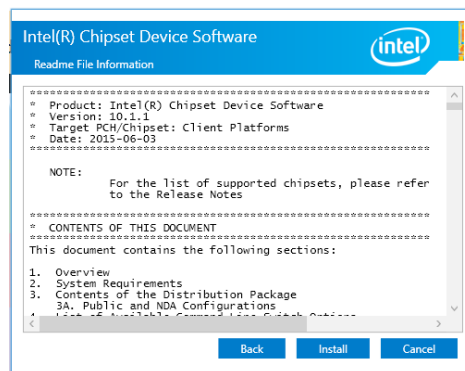
1. Setup is ready to install the utility. Click "Next" to continue.



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



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



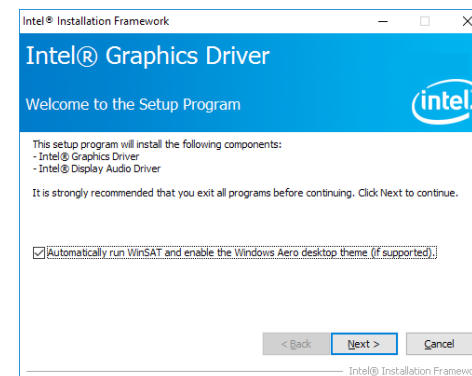
4. Click "Finish" to exit setup.



Intel Graphics Driver

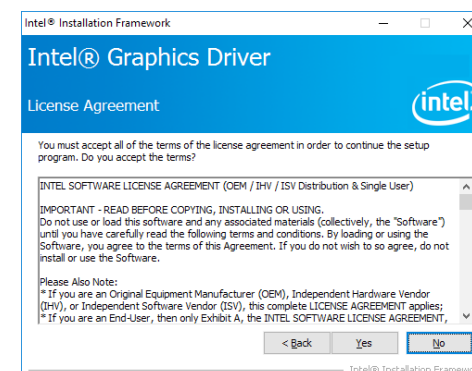
Please use the following procedure to install the Intel Graphics Driver.

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

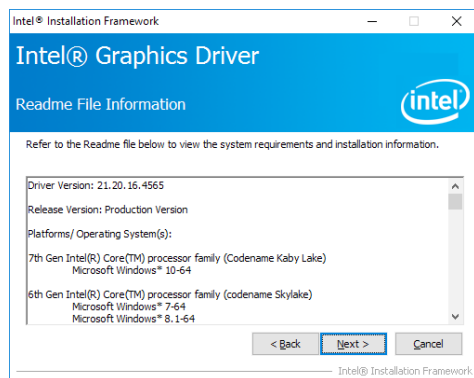


By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after the graphics driver is installed and the system is rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7/Windows 8.1/Windows 10 desktop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

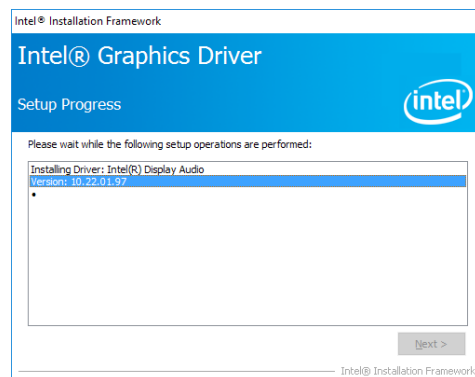
2. Read the license agreement and then click "Yes".



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

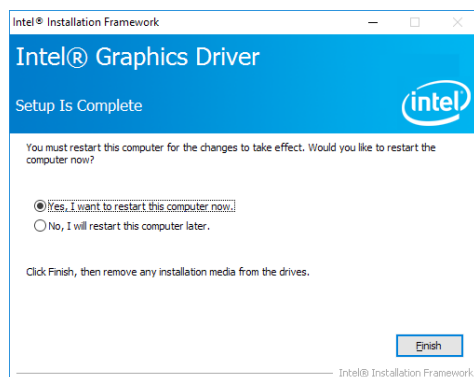


- Setup is now installing the driver. Click "Next" to continue.



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

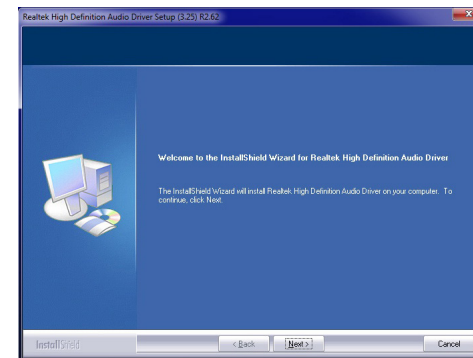
Restarting the system will allow the new software installation to take effect.



Audio Drivers

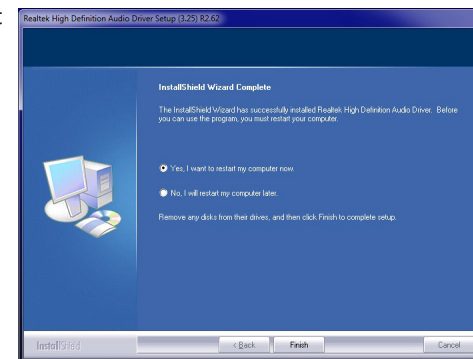
Please use the following procedure to install audio drivers.

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



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

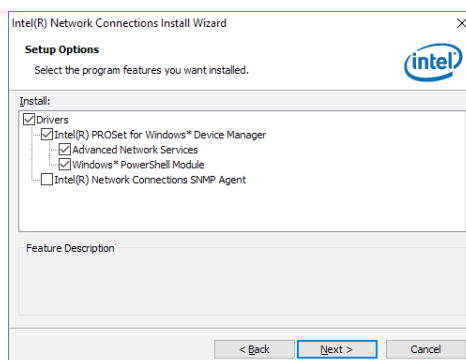
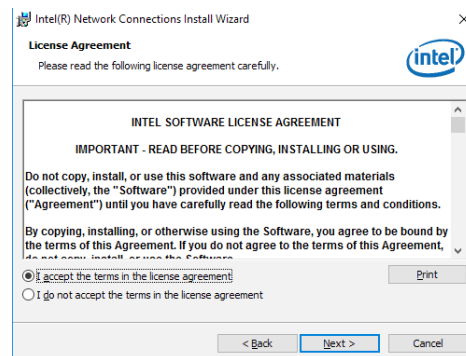
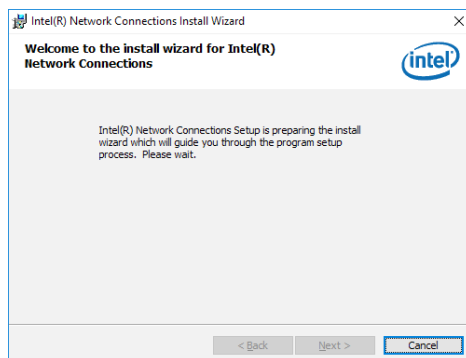
Restarting the system will allow the new software installation to take effect.



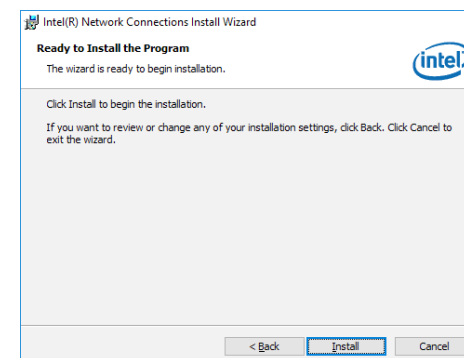
Intel LAN Driver

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

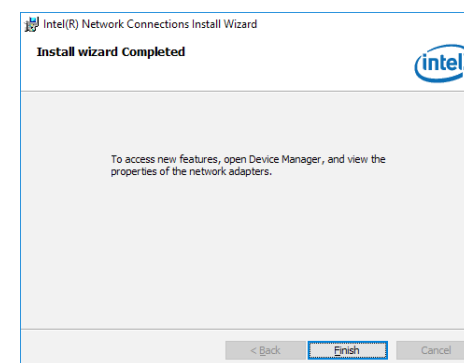
1. Setup is ready to install the driver. Click "Next" to continue.
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree the terms in the agreement, and then click "Next".
3. Select the program features you want to install and then click "Next".



4. Click "Install" to begin the installation.



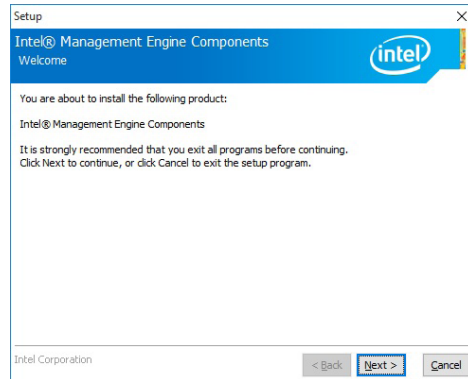
5. After the installation is complete, click "Finish" to exit setup.



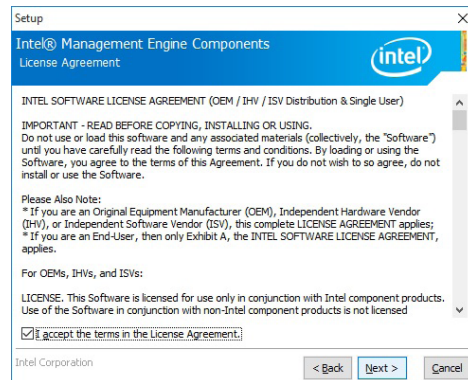
Intel Management Engine Drivers

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

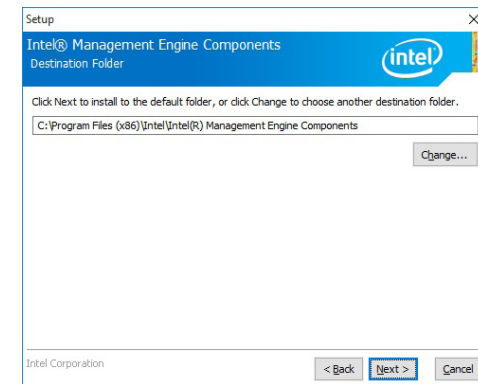
1. Setup is ready to install the driver. Click "Next" to continue.



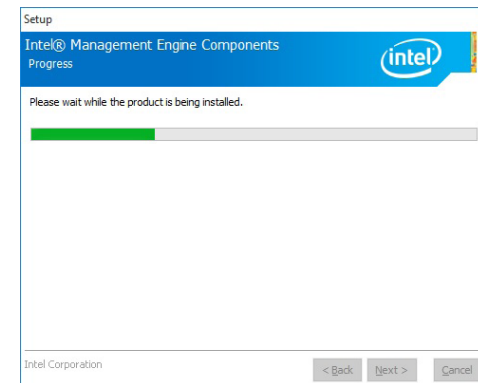
2. Read and License Agreement and click "I accept the terms in the license agreement" if you agree with the terms in the agreement, and then click "Next".



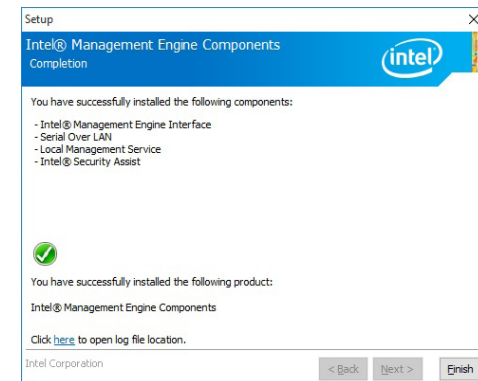
3. Setup is currently installing the driver. After the installation is complete, click "Next".



4. Please wait while the product is being installed.



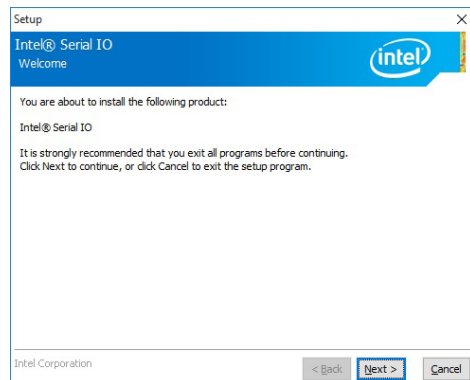
5. After the installation is complete, click "Finish" to exit setup.



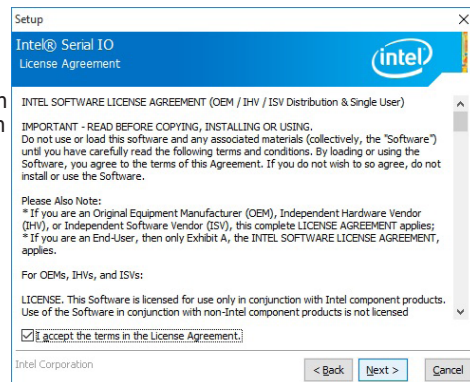
IO Driver

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

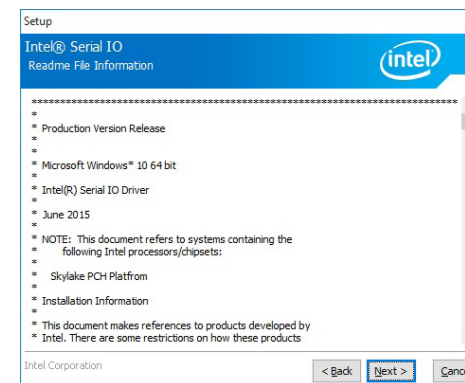
1. Setup is ready to install the driver.
Click "Next" to continue.



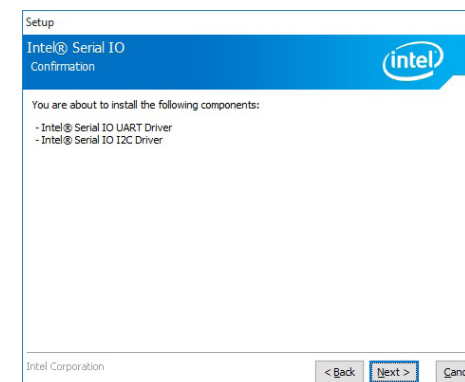
2. Read the license agreement carefully.
Click "I accept the terms in the License Agreement" if you agree with the terms in the agreement and then click "Next".



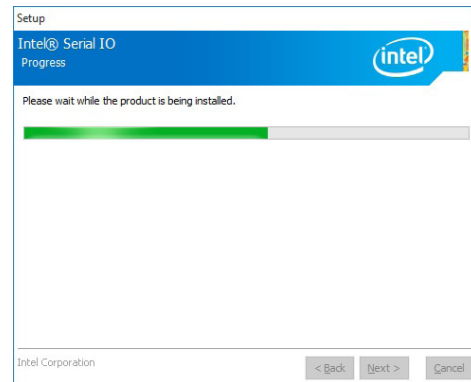
3. Read the file information and then click "Next".



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



5. Setup is now installing the driver.



6. Click "Finish" to exit setup.

