



SYM86349V GGA

ATX Industrial Motherboard

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 B

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

Warranty

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

Static Electricity Precautions

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

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



Important:

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

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

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

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 HD620 motherboard
- One Serial ATA data cable
- One I/O shield
- One DVD
- One QR (Quick Reference)

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.

Optional Items

- USB port cable
- Serial ATA data cable
- COM port cable
- I/O shield

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 Board

Before using the system board, prepare basic system components.

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

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

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

Chapter 1 - Introduction

Specifications

Processor	<ul style="list-style-type: none"> LGA 1150 socket for: <ul style="list-style-type: none"> 4th Generation Intel® Core™ processors <ul style="list-style-type: none"> Intel® Core™ i7-4790S (8M Cache, up to 4.0 GHz); 65W Intel® Core™ i7-4770S (8M Cache, up to 3.9 GHz); 65W Intel® Core™ i7-4770TE (8M Cache, up to 3.3 GHz); 45W Intel® Core™ i5-4590S (6M Cache, up to 3.7 GHz); 65W Intel® Core™ i5-4590T (6M Cache, up to 3.0 GHz); 35W Intel® Core™ i5-4570S (6M Cache, up to 3.6 GHz); 65W Intel® Core™ i5-4570TE (4M Cache, up to 3.3 GHz); 35W Intel® Core™ i3-4360 (4M Cache, 3.7 GHz); 54W Intel® Core™ i3-4350T (4M Cache, 3.1 GHz); 35W Intel® Core™ i3-4340TE (4M Cache, 2.6 GHz); 35W Intel® Core™ i3-4330 (4M Cache, 3.5 GHz); 54W Intel® Core™ i3-4330TE (4M Cache, 2.4 GHz); 35W Intel® Pentium® G3420 (3M Cache, 3.2 GHz); 53W Intel® Pentium® G3320TE (3M Cache, 2.3 GHz); 35W Intel® Celeron® G1820 (2M Cache, 2.7 GHz); 53W Intel® Celeron® G1820TE (2M Cache, 2.2 GHz); 35W 22nm process technology
Chipset	<ul style="list-style-type: none"> Intel® H81 Express Chipset
Super I/O Address	<ul style="list-style-type: none"> NCT6102/4Eh
System Memory	<ul style="list-style-type: none"> Two 240-pin DDR3 DIMM sockets Supports DDR3 1333/1600MHz Supports dual channel memory interface Supports up to 16GB system memory DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC
Expansion Slots	<ul style="list-style-type: none"> 1 PCIe x16 Gen 3 slot (PCIe 3.0) 1 PCIe x4 Gen 2 slot (PCIe 2.0) <ul style="list-style-type: none"> x1 signal 4 PCI slots (PCI 2.3) <ul style="list-style-type: none"> 1 shared with ISA slot 2 ISA slots
Graphics	<ul style="list-style-type: none"> Intel® HD Graphics Display ports: VGA and DVI-D VGA and DVI-D support up to 1920x1200 @60Hz resolution Supports 6 Graphics Execution Units (EUs) Intel® Clear Video Technology DirectX Video Acceleration (DXVA) support for accelerating video processing
Audio	<ul style="list-style-type: none"> Realtek ALC886 5.1-channel High Definition Audio Audio outputs: Mic-in/Center+Subwoofer, Line-in/Surround and Line-out S/PDIF audio interface
LAN	<ul style="list-style-type: none"> Intel® 82574 PCI Express Gigabit Ethernet controller Intel® I217LM Gigabit Ethernet Phy Integrated 10/100/1000 transceiver Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Serial ATA	<ul style="list-style-type: none"> 2 SATA 3.0 ports with data transfer rate up to 6Gb/s <ul style="list-style-type: none"> SATA port 1 provides adequate space for SATA DOM 2 SATA 2.0 ports with data transfer rate up to 3Gb/s Integrated Advanced Host Controller Interface (AHCI) controller
Rear Panel I/O Ports	<ul style="list-style-type: none"> 1 mini-DIN-6 port for PS/2 mouse/keyboard 2 DB-9 serial ports <ul style="list-style-type: none"> Supports RS232/422/485 (RS232 and/or Power) 1 VGA port 1 DVI-D port 2 RJ45 LAN ports 2 USB 3.0 ports 4 USB 2.0 ports Line-in/Surround, Line-out, Mic-in/Center+Subwoofer jacks
I/O Connectors	<ul style="list-style-type: none"> 2 connectors for 4 external USB 2.0/1.1 ports 8 connectors for 8 external RS232 serial ports 1 vertical USB 2.0/1.1 port* (optional) 1 8-bit Digital I/O connector 1 front audio connector for line-out and mic-in jacks 1 LAN LED connector 1 S/PDIF connector 1 parallel port 4 Serial ATA ports 1 24-pin ATX power connector 1 8-pin 12V power connector 1 chassis intrusion connector 1 front panel connector 2 fan connectors
BIOS	<ul style="list-style-type: none"> AMI BIOS <ul style="list-style-type: none"> 64Mbit SPI BIOS
WatchDog Timer	<ul style="list-style-type: none"> Software programmable from 1 to 255 seconds
Trusted Platform Module - TPM* (optional)	<ul style="list-style-type: none"> Provides a Trusted PC for secure transactions Provides software license protection, enforcement and password protection
Energy Efficient Design	<ul style="list-style-type: none"> Supports ErP Lot6 power saving* (optional) Supports ACPI System Power Management Wake-On-Events include: <ul style="list-style-type: none"> Wake-On-PS/2 KB/Mouse Wake-On-USB KB/Mouse Wake-On-LAN RTC timer to power-on the system CPU stopped clock control AC power failure recovery
Damage Free Intelligence	<ul style="list-style-type: none"> Monitors CPU/system temperature and overheat alarm Monitors VCore/5V/3.3V/V_DIMM/12V/5VSB voltages and failure alarm Monitors CPU/system fan speed and failure alarm Read back capability that displays temperature, voltage and fan speed
Power Consumption	<ul style="list-style-type: none"> TBD
Temperature	<ul style="list-style-type: none"> Operating: 0°C to 60°C Storage: -20°C to 85°C
Humidity	<ul style="list-style-type: none"> 5% to 90%

OS Support	<ul style="list-style-type: none"> • Windows XP Professional x86 & SP3 (32-bit) (limited function) • Windows 7 Ultimate x86 & SP1 (32-bit) • Windows 7 Ultimate x64 & SP1 (64-bit) • Windows 8 Enterprise x86 (32-bit) • Windows 8 Enterprise x64 (64-bit)
Dimensions	<ul style="list-style-type: none"> • ATX form factor • 305mm (12") x 244mm (9.6")
Certification	<ul style="list-style-type: none"> • CE, FCC Class B, RoHS

**Note:**

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

Features

• Watchdog Timer

The Watchdog Timer function allows your application to regularly “clear” the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

• DDR3

DDR3 delivers increased system bandwidth and improved performance. It offers peak data transfer rate of up to 16Gb/s bandwidth. The advantages of DDR3 are its higher bandwidth and its increase in performance at a lower power than DDR2.

• Graphics

The integrated Intel® HD graphics engine delivers an excellent blend of graphics performance and features to meet business needs. It provides excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. Supports VGA and DVI-D interfaces for display outputs.

• PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x4 PCI Express lane supports transfer rate of 4 Gigabyte per second (2 directions). The PCI Express architecture also supports high performance graphics infrastructure by enhancing the capability of a PCIe x16 Gen 3 at 16GB/s bandwidth (8GB/s in each direction).

• Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 3Gb/s (SATA 2.0) and 6Gb/s (SATA 3.0), it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s. The bandwidth of the SATA 3.0 will be limited by carrier board design.

• Gigabit LAN

One Intel® 82574 PCI Express Gigabit Ethernet controller and one Intel® I217 Gigabit Ethernet Phy support up to 1Gbps data transmission.

(supports one Intel 82574 PCI Express Gigabit Ethernet controller only.)

• Audio

The Realtek ALC886 audio codec provides 5.1-channel High Definition audio output.

- **Wake-On-LAN**

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.



Important:
The 5V_standby power source of your power supply must support $\geq 720\text{mA}$.

- **Wake-On-USB**

This 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 $\geq 1.5\text{A}$. For 3 or more USB ports, the 5V_standby power source of your power supply must support $\geq 2\text{A}$.

- **RTC Timer**

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

- **ACPI STR**

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.



Important:
The 5V_standby power source of your power supply must support $\geq 720\text{mA}$.

- **Wake-On-PS/2**

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.



Important:
The 5V_standby power source of your power supply must support $\geq 720\text{mA}$.

- **Power Failure Recovery**

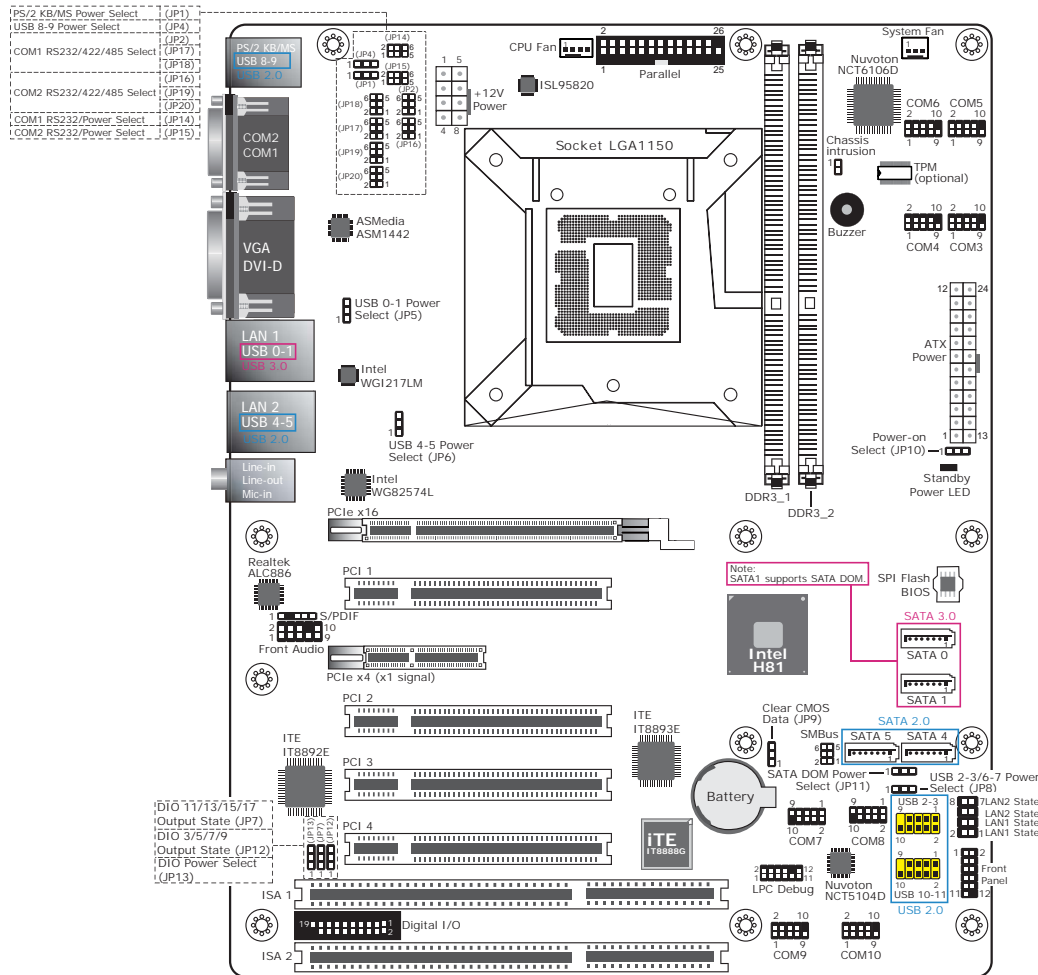
When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

- **USB**

The system board supports the new USB 3.0. It is capable of running at a maximum transmission speed of up to 5 Gbit/s (625 MB/s) and is faster than USB 2.0 (480 Mbit/s, or 60 MB/s) and USB 1.1 (12Mb/s). USB 3.0 reduces the time required for data transmission, reduces power consumption, and is backward compatible with USB 2.0. It is a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Chapter 2 - Hardware Installation

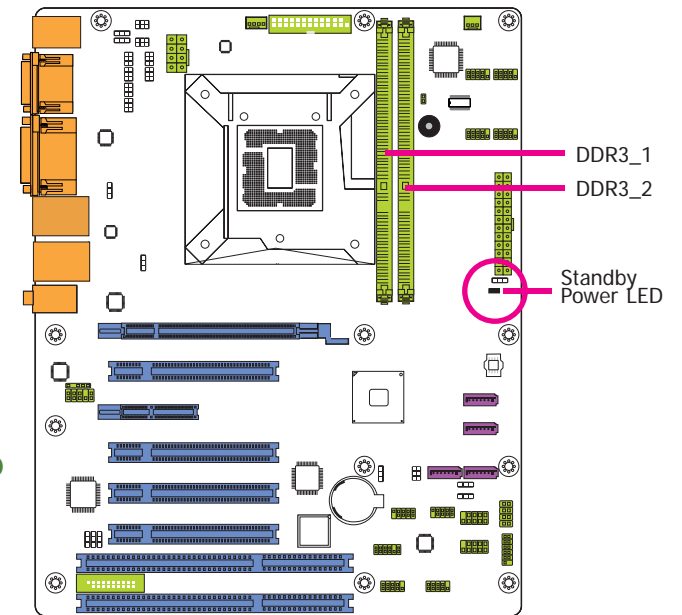
Board Layout



Important: Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures 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.

System Memory

Important: When the Standby Power LED lights red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



Features

- Two 240-pin DDR3 DIMM sockets
- Supports DDR3 1333/1600MHz
- Supports dual channel memory interface
- Supports up to 16GB system memory

The system board supports the following memory interface.

Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel	DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs. Not all slots need to be populated.
Dual Channel	DIMMs of the same memory configuration are on different channels.

Installing the DIMM Module



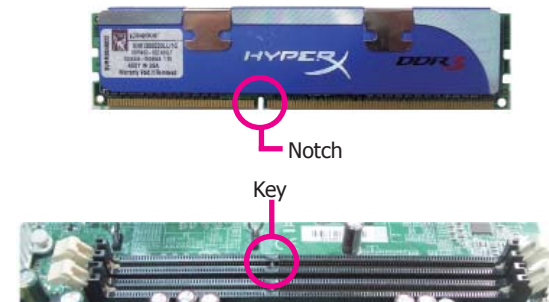
Note:

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

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board.
4. Push the "ejector tabs" which are at the ends of the socket to the side.



5. Note how the module is keyed to the socket.



6. Grasping the module by its edges, position the module above the socket with the “notch” in the module aligned with the “key” on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.



8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



CPU

The system board is equipped with a surface mount LGA 1150 socket. This socket is exclusively designed for installing a LGA 1150 packaged Intel CPU.



Important:

1. Before you proceed, make sure (1) the LGA 1150 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA 1150 socket comes with the protective cap.

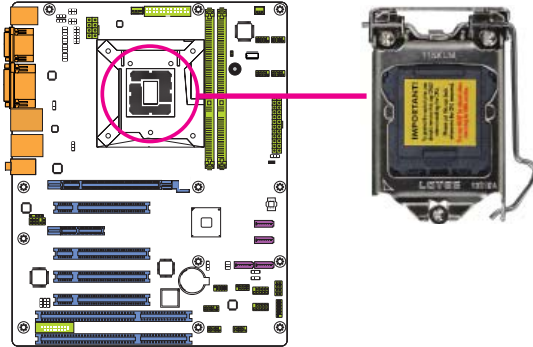


Note:

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

Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the LGA 1150 CPU socket on the system board.



Important:

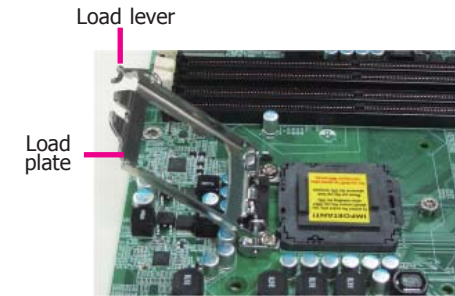
The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

4. Unlock the socket by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift the load lever up.

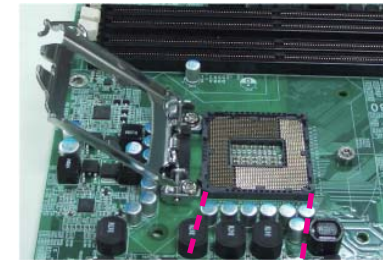


5. Lifting the load lever will at the same time lift the load plate.

Lift the load lever up to the angle shown on the photo.

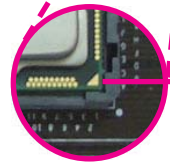
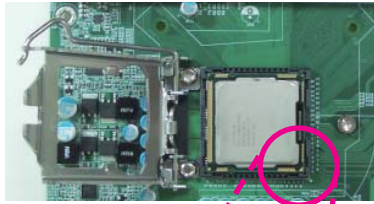


6. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



Protective cap

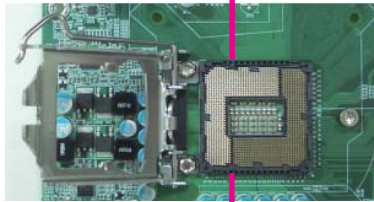
7. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.



Gold triangular mark

Alignment key

The CPU's notch will at the same time fit into the socket's alignment key.

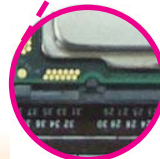


Alignment key



Important:

The CPU will fit in only one orientation and can easily be inserted without exerting any force.



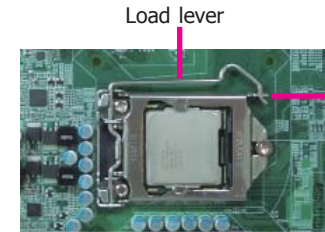
8. Close the load plate then push the load lever down.

While closing the load plate, make sure the front edge of the load plate slides under the retention knob.



Retention knob

9. Hook the load lever under the retention tab.



Load lever

Retention tab

Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.



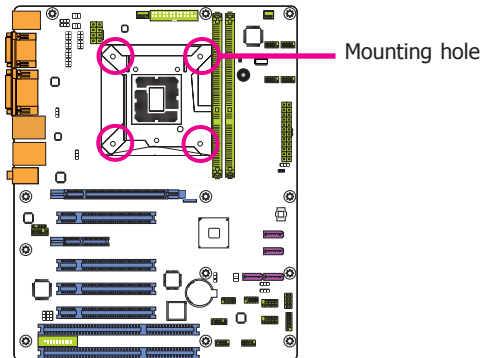
Note:

A boxed Intel® processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel®-certified fan and heat sink.

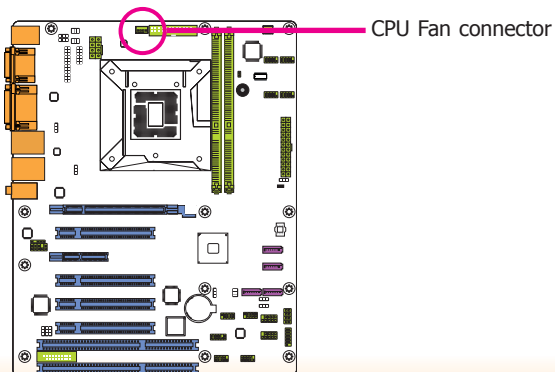
1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

2. Place the heat sink on top of the CPU. The 4 push-pins around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the socket.

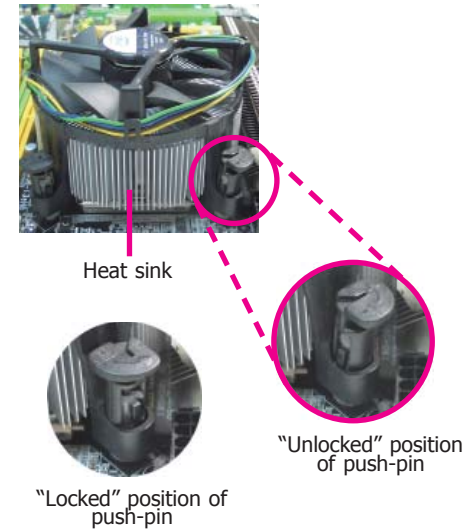


3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan connector.

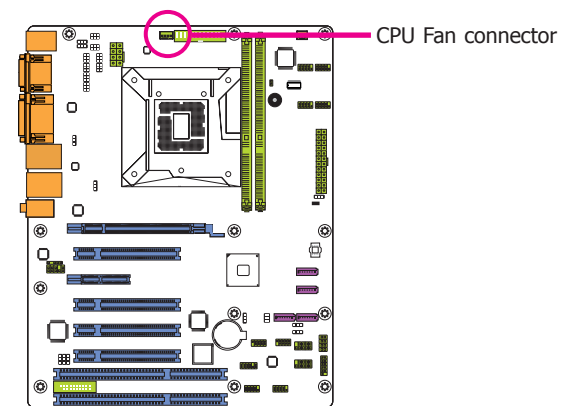


4. Rotate each push-pin according to the direction of the arrow shown on top of the pin.

Push down two pushpins that are diagonally across the heat sink. Perform the same procedure for the other two push-pins.

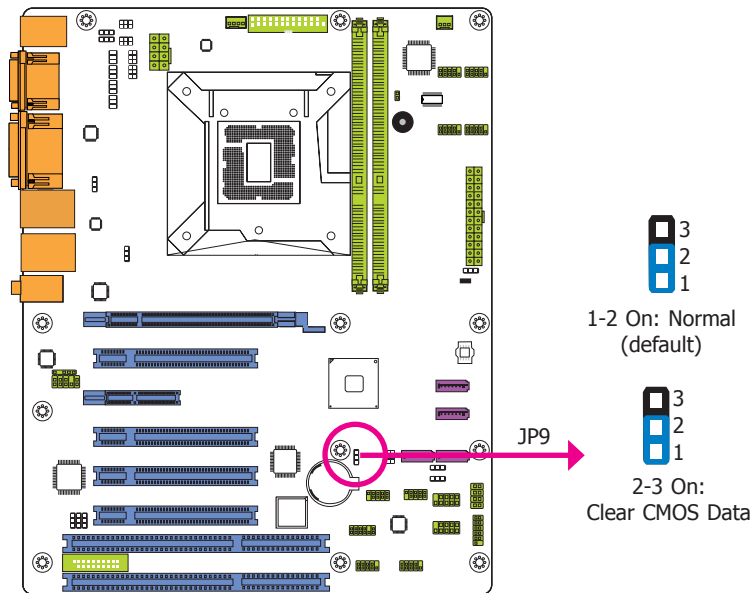


5. Connect the CPU fan's cable to the CPU fan connector on the system board.



Jumper Settings

Clear CMOS Data



If you encounter the followings,

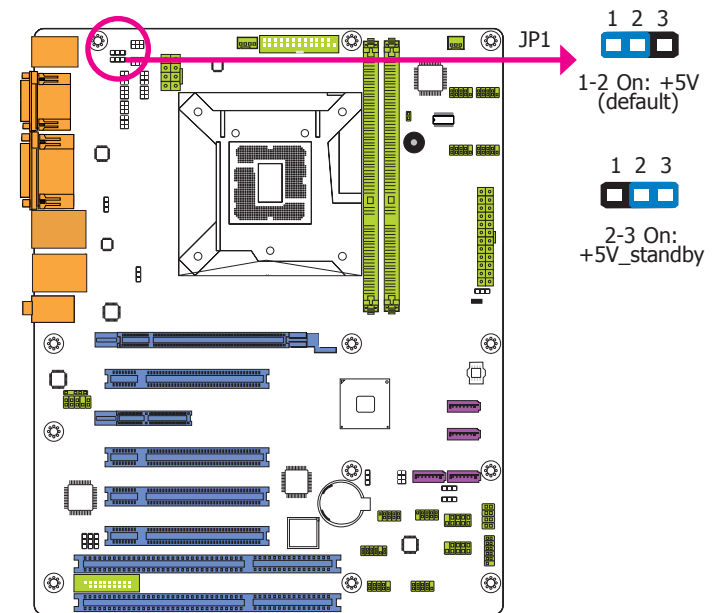
- a) CMOS data becomes corrupted.
- b) You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

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

1. Power-off the system and unplug the power cord.
2. Set JP9 pins 2 and 3 to On. Wait for a few seconds and set JP9 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.

PS/2 Keyboard/Mouse Power Select



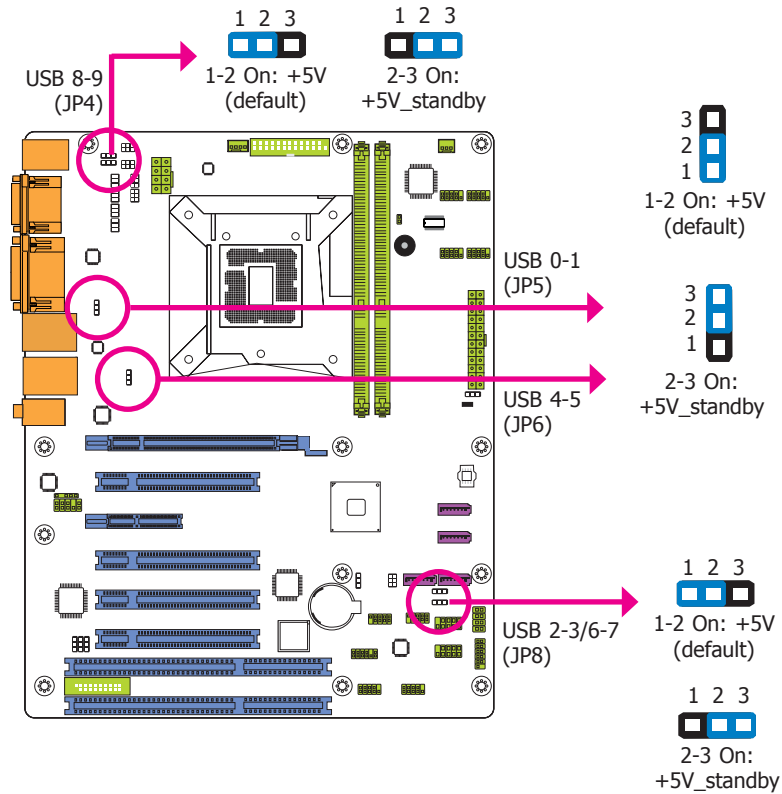
JP1 is used to select the power of the PS/2 keyboard/mouse port. Selecting +5V_standby will allow you to use the PS/2 keyboard or the PS/2 mouse to wake up the system.



Important:

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

USB Power Select



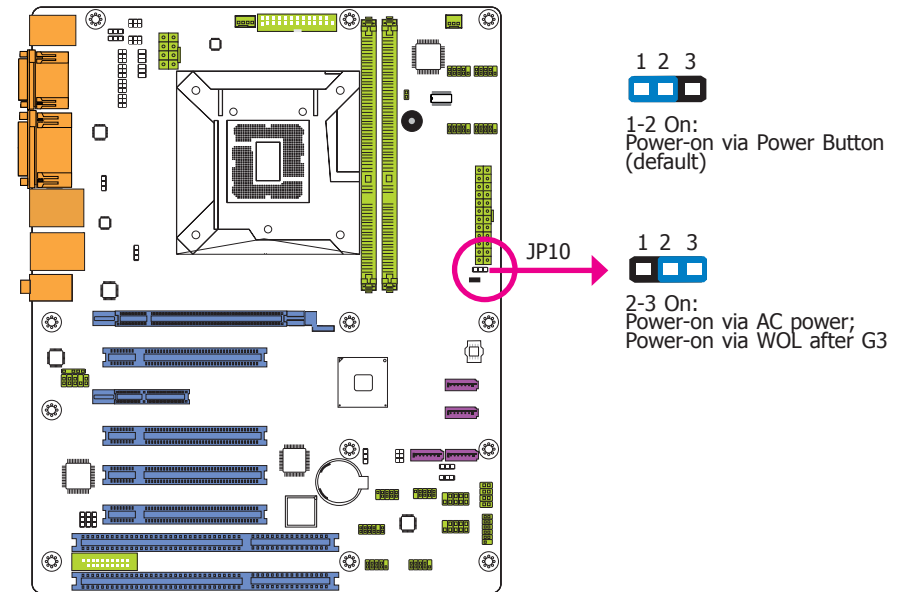
JP4, JP5, JP6 and JP8 are used to select the power of the USB devices. Selecting +5V_standby will allow you to use a USB device to wake up the system.



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 $\geq 2A$.

Power-on Select



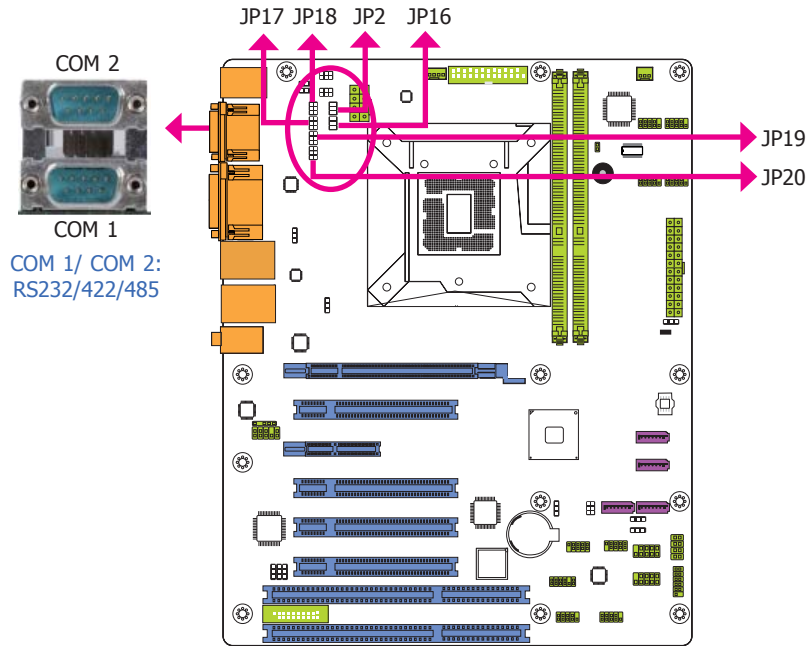
To power-on via WOL after G3:

1. Set JP10 pins 2 and 3 to On.
2. Set the "After G3" field to **Power Off/WOL**.
3. Set the "GbE Wake Up From S5" to **Enabled**.

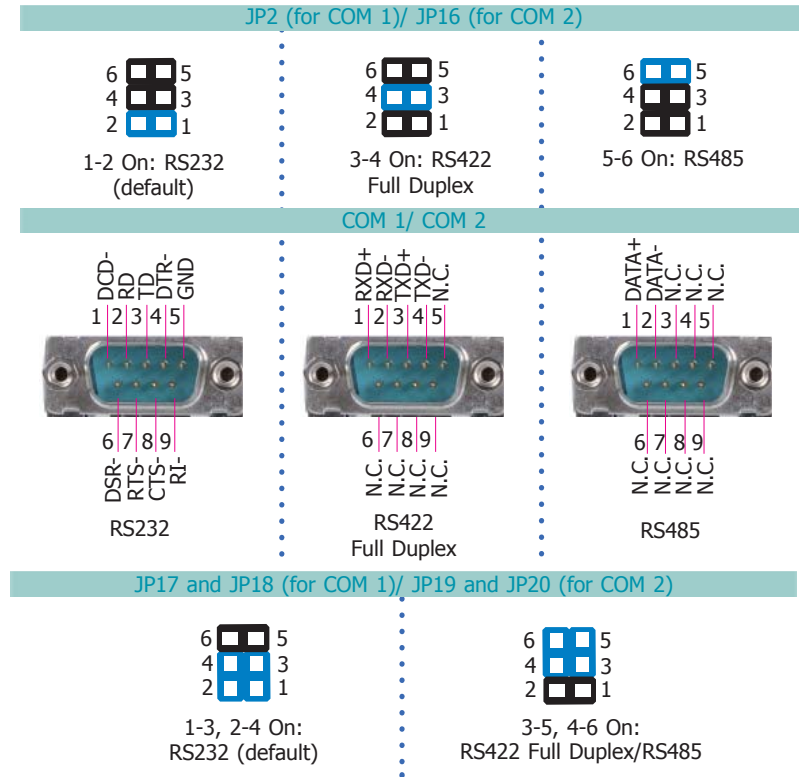
To power-on via AC Power:

1. Set JP10 pins 2 and 3 to On.
2. Set the "After G3" field to **Power On**.

COM 1/COM 2 RS232/422/485 Select

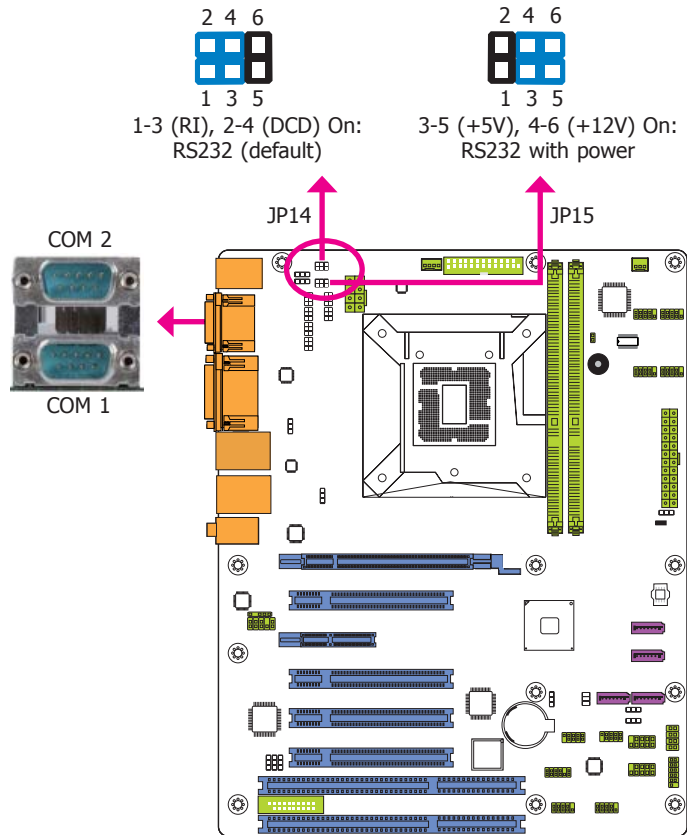


These jumpers allow you to configure the Serial COM ports to RS232, RS422 (Full Duplex) or RS485. JP2, JP17 and JP18 are used to configure the Serial COM port 1. JP16, JP19 and JP20 are used to configure the Serial COM port 2. The pin functions of Serial COM ports 1 and 2 will vary according to these jumpers' setting.



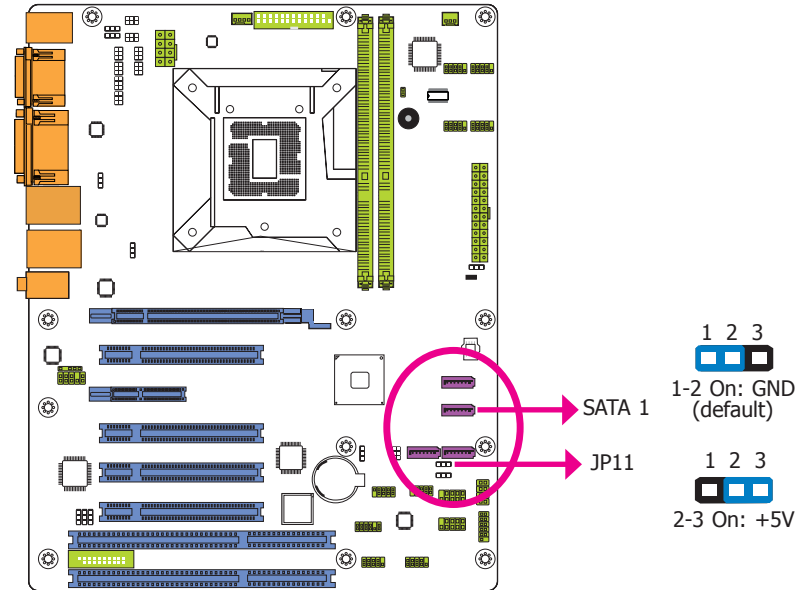
Note: When COM 1 RS232/422/485 is selected, JP17 and JP18 must be set in accordance to JP2. And when COM 2 RS232/422/485 is selected, JP19 and JP20 must be set in accordance to JP16.

COM 1/COM 2 RS232/Power Select



JP14 (for COM 1) and JP15 (for COM 2) are used to configure Serial COM ports to pure RS232 or RS232 with power.

SATA DOM Power Select

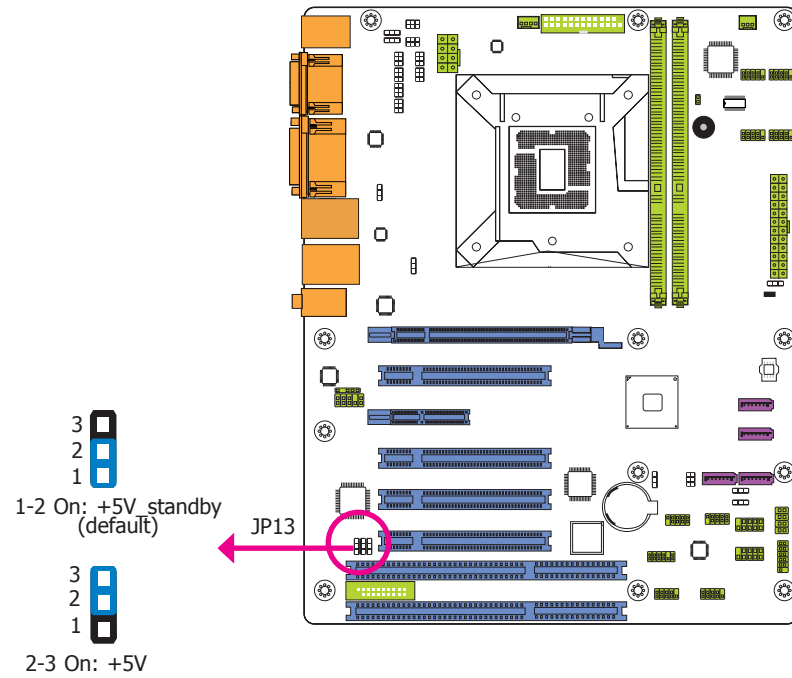


JP11 is used to select the power of SATA DOM.



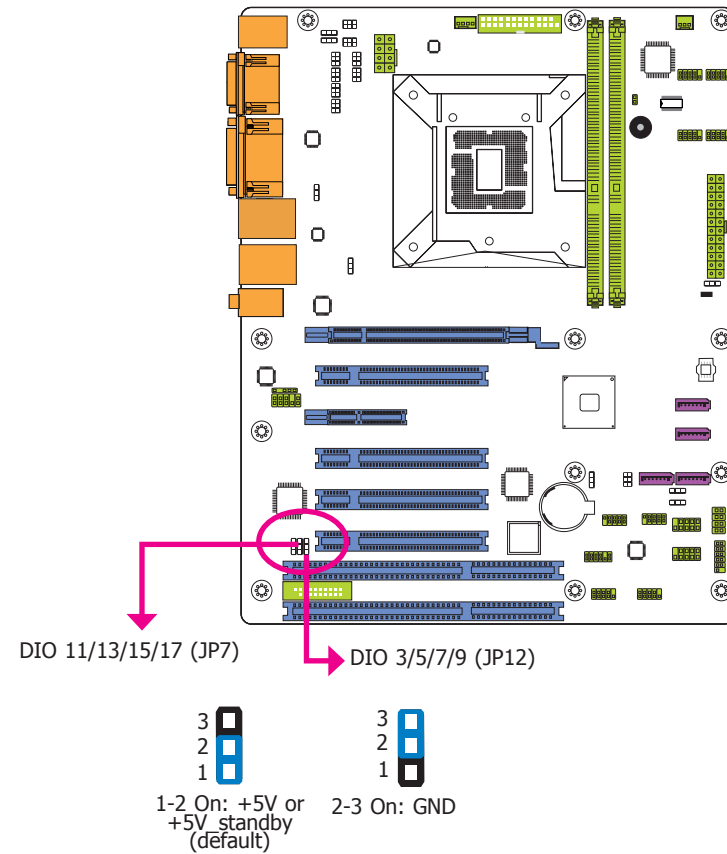
Note:
SATA port 1 provides adequate space for SATA DOM.

Digital I/O Power Select



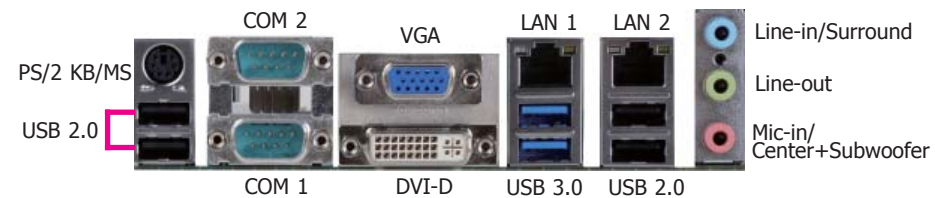
JP13 is used to select the power of DIO (Digital I/O) signal.

Digital I/O Output State



Based on the power level of DIO (Digital I/O) selected on JP13, JP12 (DIO pin 3/5/7/9) and JP7 (DIO pin 11/13/15/17) are used to select the state of DIO output: pull high or pull low. When selecting pull high, the power selection will be the same as JP13's setting.

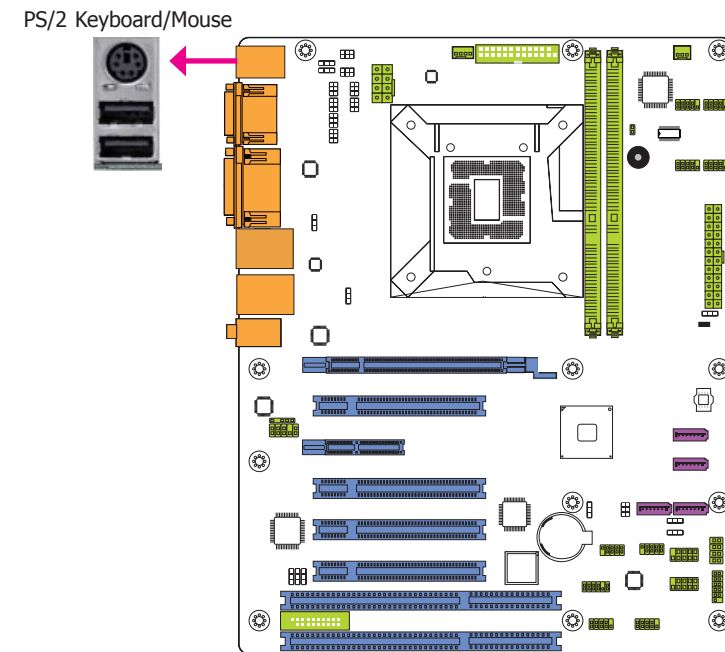
Rear Panel I/O Ports



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

- 1 PS/2 Keyboard/Mouse port
- 2 Serial COM ports
- 1 VGA port
- 1 DVI-D port
- 2 RJ45 LAN ports
- 2 USB 3.0 ports
- 4 USB 2.0 ports
- Line-in/Surround jack
- Line-out jack
- Mic-in/Center+Subwoofer jack

PS/2 Keyboard/Mouse Port



This rear I/O port is used to connect a PS/2 keyboard/mouse. The PS/2 mouse port uses IRQ12.

Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

• Jumper Setting

JP1 must be set to "2-3 On: +5V_standby". Refer to "PS/2 KB/MS Power Select" in this chapter for more information.

• BIOS Setting

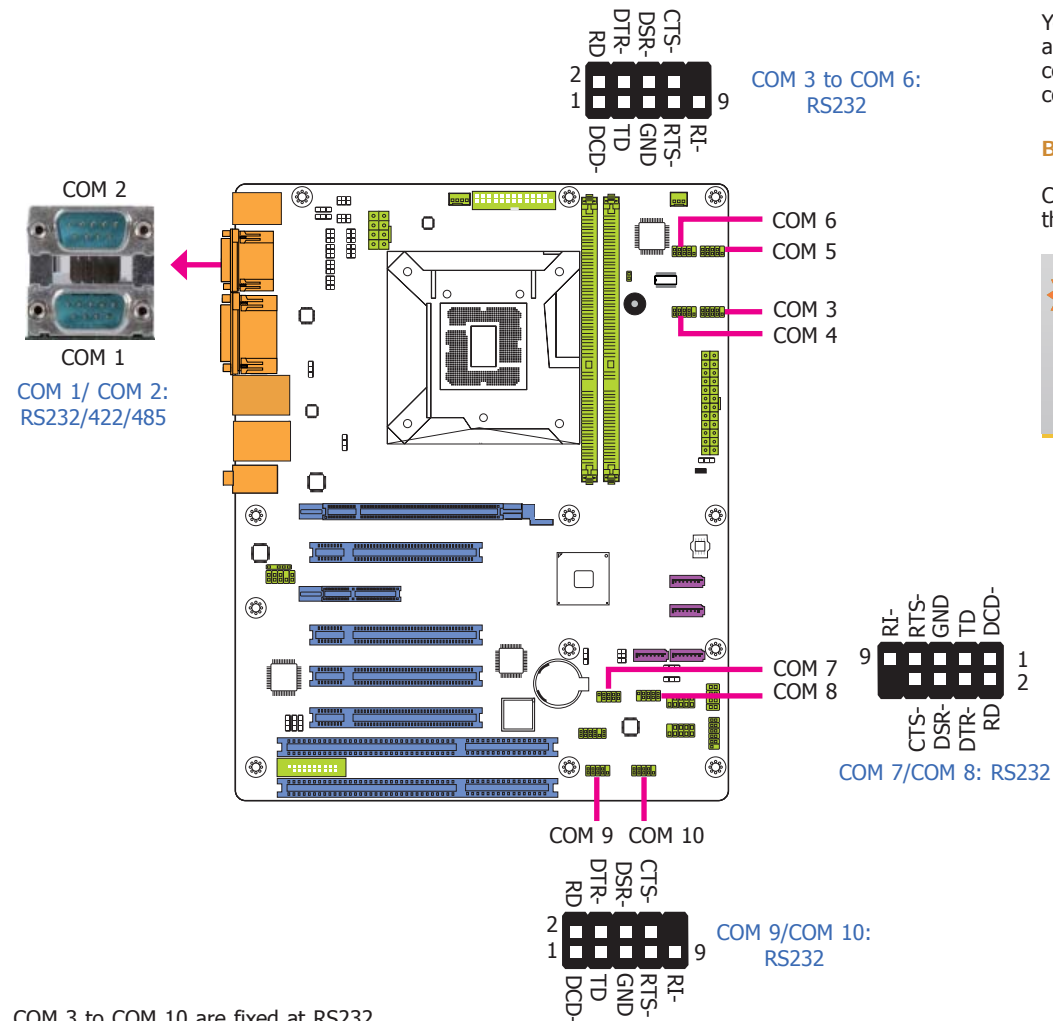
Configure the wake-up function of PS/2 keyboard/mouse in the Advanced menu ("ACPI Power Management Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.



Important:

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

COM (Serial) Ports



COM 3 to COM 10 are fixed at RS232.

The pin functions of COM 1 and COM 2 will vary according to jumpers' setting. JP2, JP17 and JP18 are used to configure the Serial COM port 1. JP16, JP19 and JP20 are used to configure the Serial COM port 2. JP14 (for COM 1) and JP15 (for COM 2) are used to configure Serial COM ports to pure RS232 or RS232 with power. Refer to "COM 1/COM 2 RS232/422/485 Select" and "COM 1/COM 2 RS232/Power Select" in this chapter for more information.

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 serial COM ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.



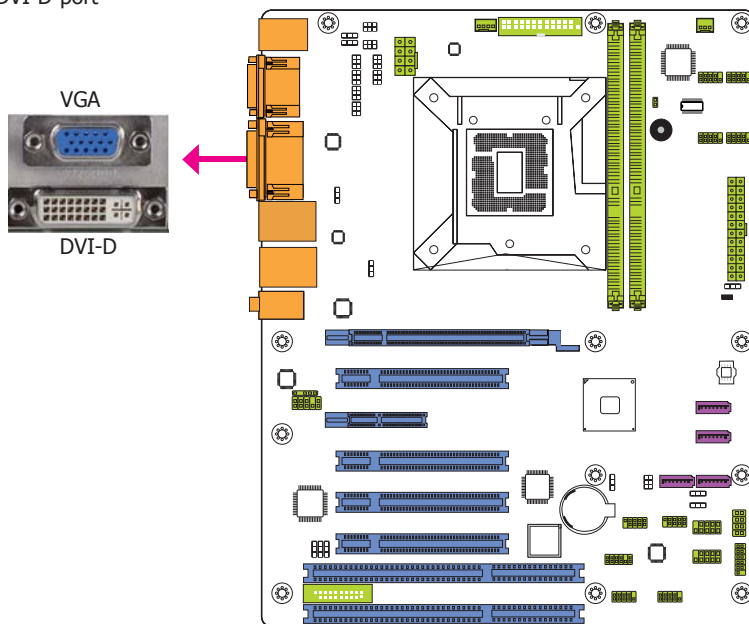
Note:

- 1.: 10 COM (COM 1 to COM 10).
: 2 COM (COM 1 and COM 2).
2. When COM 1 RS232/422/485 is selected, JP17 and JP18 must be set in accordance to JP2.
3. When COM 2 RS232/422/485 is selected, JP19 and JP20 must be set in accordance to JP16.

Graphics Interfaces

The display ports consist of the following:

- 1 VGA port
- 1 DVI-D port



VGA Port

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

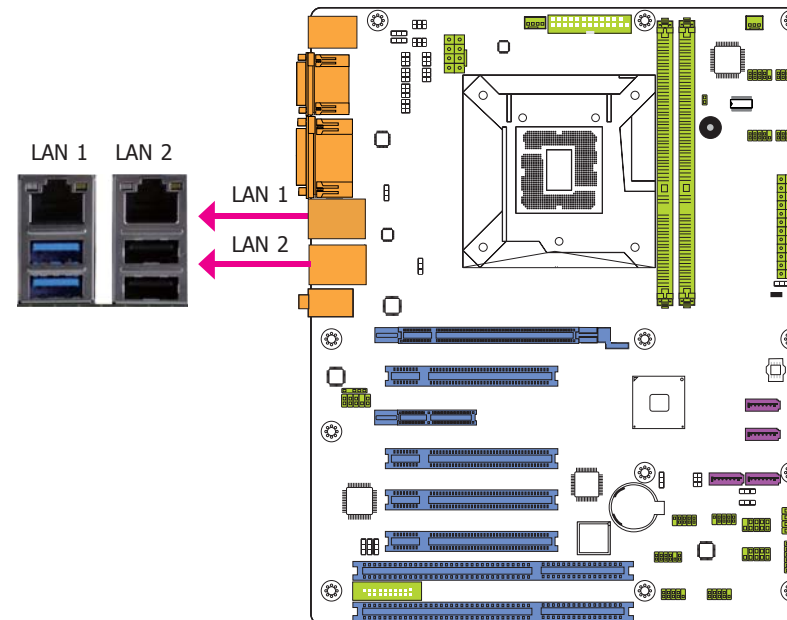
DVI-D Port

The DVI-D (Digital Visual Interface) port is used to connect a digital LCD monitor or LCD TV. Connect the display device's cable connector to the DVI-D port at location CN13. After you plug the cable connector into the DVI-D port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display devices in the Chipset menu ("System Agent Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.

RJ45 LAN Ports



Features

- Intel® 82574 PCI Express Gigabit Ethernet controller
- Intel® I217 Gigabit Ethernet Phy

The LAN ports allow the system board to connect to a local area network by means of a network hub.

BIOS Setting

Configure the onboard LAN ports in the Chipset menu ("PCH-IO Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.

Driver Installation

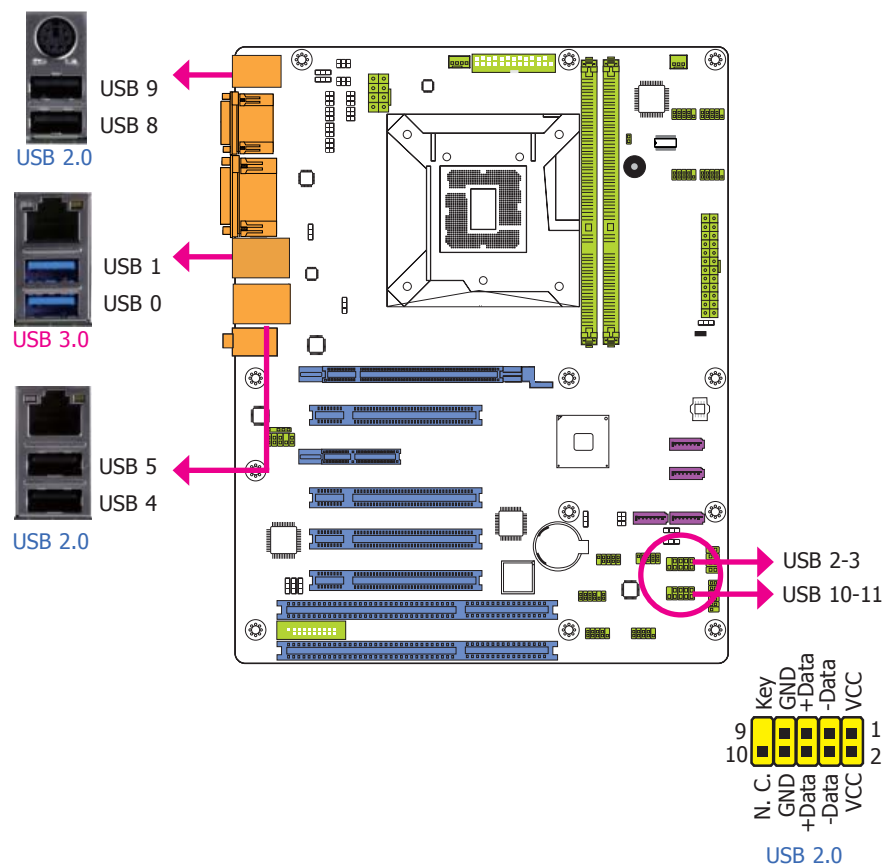
Install the LAN drivers. Refer to the chapter 4 for more information.



Note:

supports Intel 82574 PCI Express Gigabit Ethernet controller (LAN 1) only.

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 two onboard USB 3.0 ports (USB 0-1) and four onboard USB 2.0 ports (USB 4-5/8-9). The 10-pin connectors allow you to connect 4 additional USB 2.0/1.1 ports (USB 2-3/10-11). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of 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 the chapter 3 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. To use this function:

- **Jumper Setting**

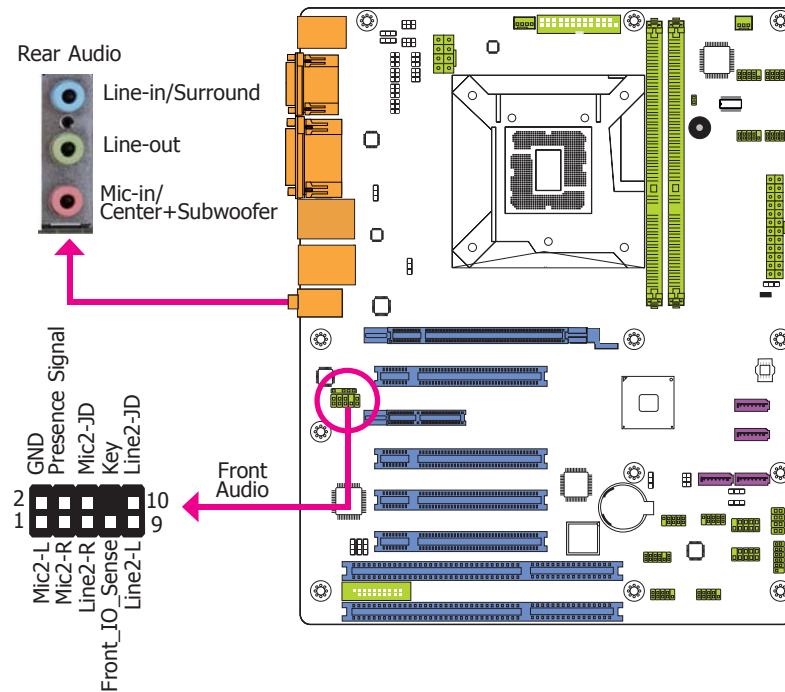
JP4, JP5, JP6 and JP8 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.



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 $\geq 2A$.

Audio



Rear Audio

The system board is equipped with 3 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

- Line-in/Surround Jack (Light Blue)
This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.
- Line-out Jack (Lime)
This jack is used to connect a headphone or external speakers.
- Mic-in/Center+Subwoofer Jack (Pink)
This jack is used to connect an external microphone.

Front Audio

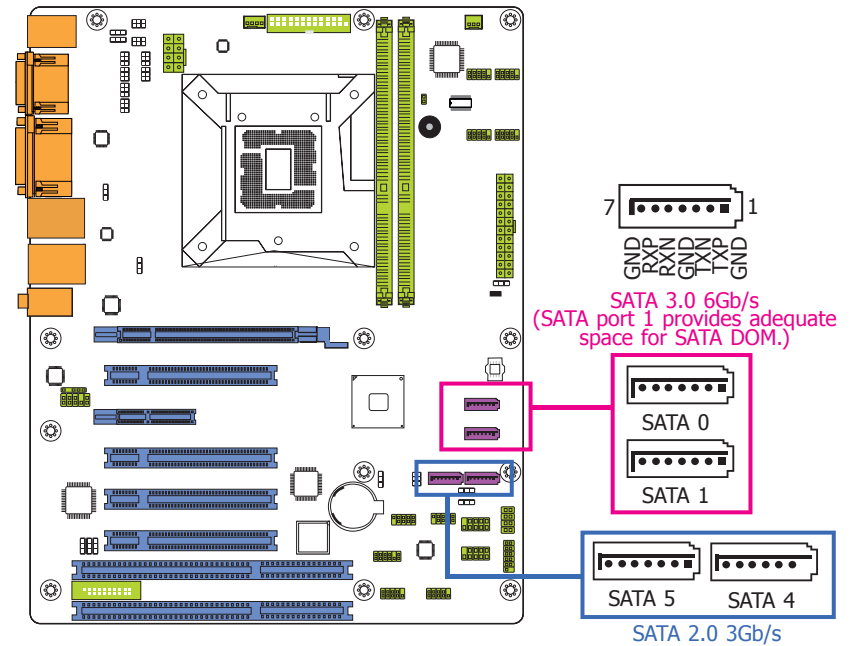
The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.

Driver Installation

Install the audio driver. Refer to the chapter 4 for more information.

I/O Connectors

SATA (Serial ATA) Connectors



Features

- 4 Serial ATA ports
 - 2 SATA 3.0 ports with data transfer rate up to 6Gb/s (SATA 0 and SATA 1)
 - 2 SATA 2.0 ports with data transfer rate up to 3Gb/s (SATA 4 and SATA 5)
- Integrated Advanced Host Controller Interface (AHCI) controller

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

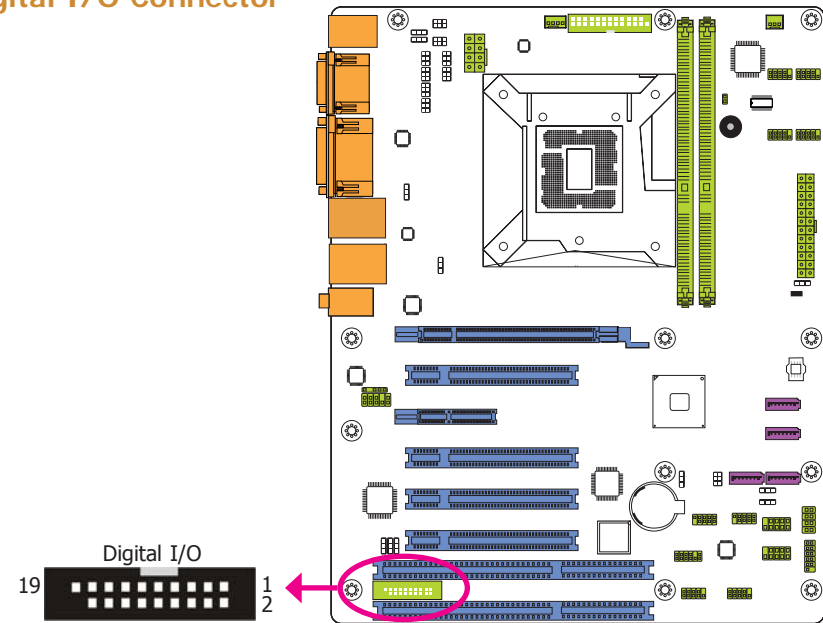
Configure the Serial ATA drives in the Advanced menu ("SATA Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.



Note:

Some 3rd party SATA Gen 2 speed device controllers used on the system board paired with the Intel® 8 series chipset are intermittently detected. Before using SSD devices or mSATA SSD devices, please check whether the device and the cable which are used on the system board conform to Intel's official regulations.

Digital I/O Connector

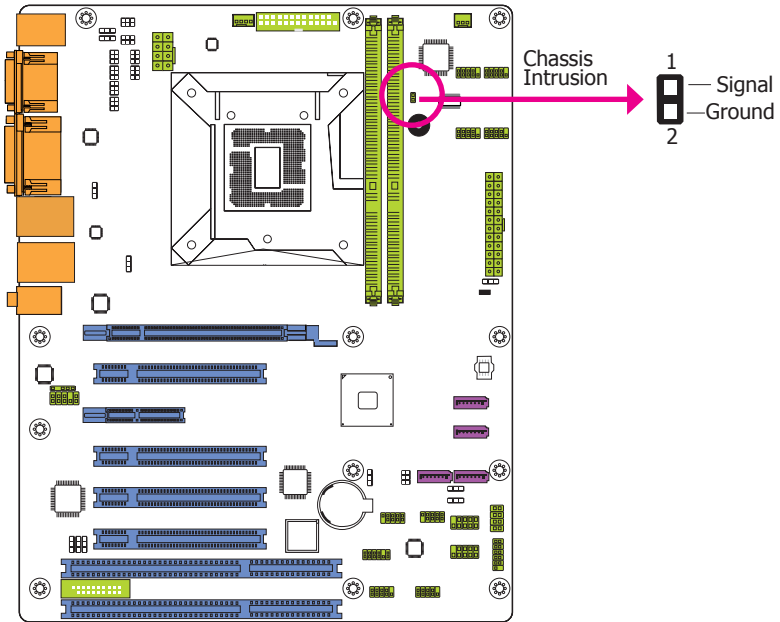


The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

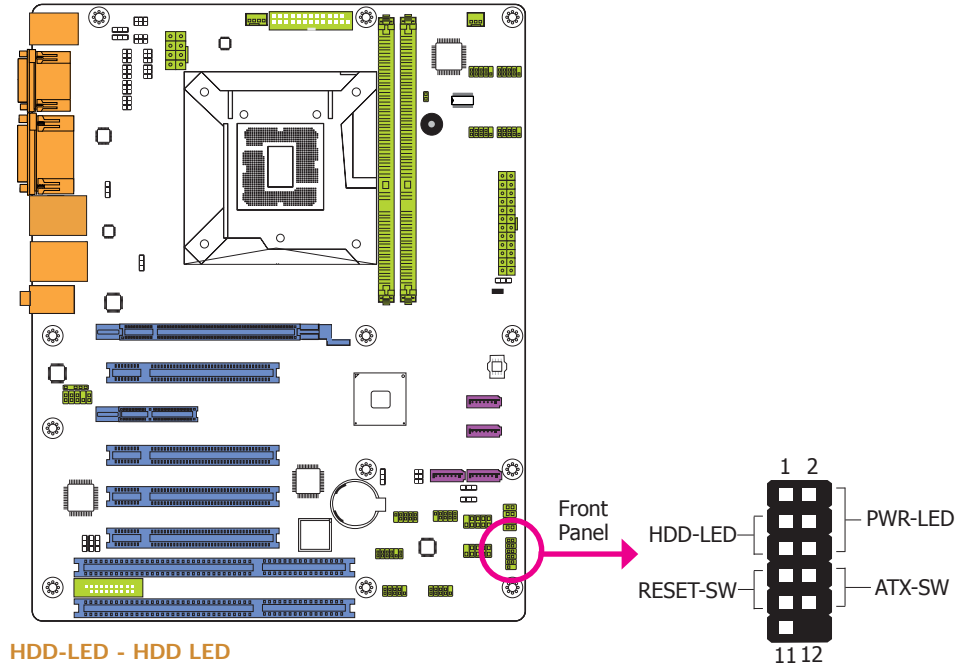
Pins	Pin Assignment	Pins	Pin Assignment
1	GND	2	+12V
3	DIO7	4	+12V
5	DIO6	6	GND
7	DIO5	8	+5V
9	DIO4	10	+5V
11	DIO3	12	GND
13	DIO2	14	+5V_Standby
15	DIO1	16	+5V_Standby
17	DIO0	18	GND
19	GND		

Chassis Intrusion Connector



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

Front Panel Connector



HDD-LED - HDD LED

This LED will light 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

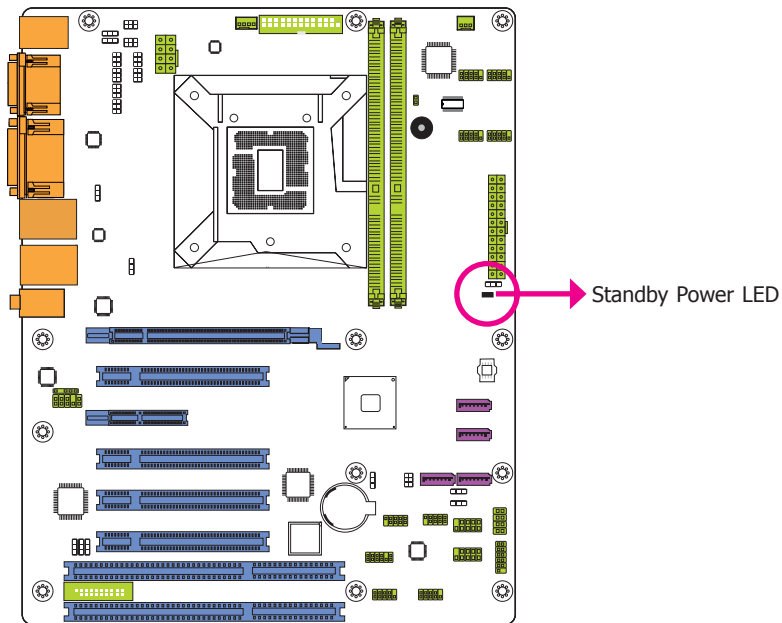
This switch is used to power on or off the system.

PWR-LED - Power/Standby LED

When the system's power is on, this LED will light. 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.

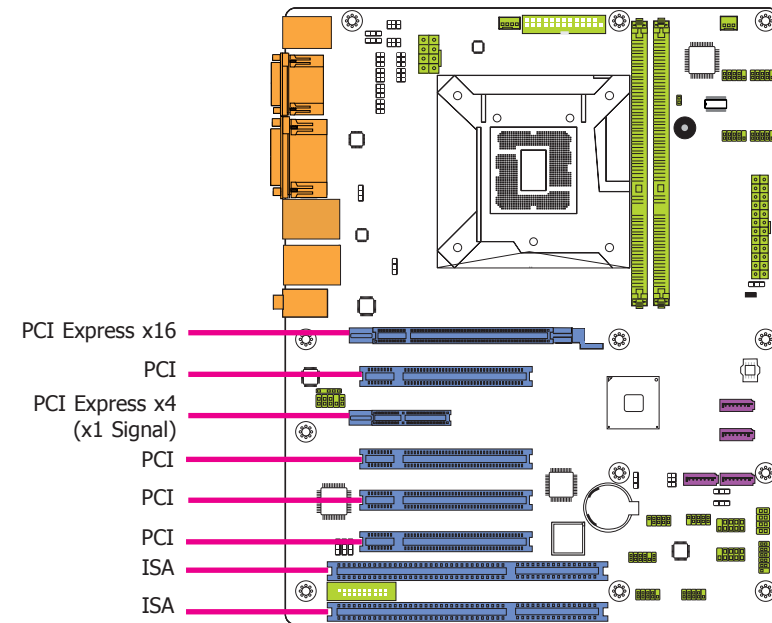
	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	3	HDD Power	PWR-LED	2	LED Power
	5	Signal		4	LED Power
RESET SW	7	Ground	ATX-SW	6	Signal
	9	RST Signal		8	Ground
	11	N.C.		10	Signal

Standby Power LED



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

Expansion Slots



PCI Express x16 Slot

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place.

PCI Slot

The PCI slot supports expansion cards that comply with PCI specifications. You can install a PCI expansion card or a customized riser card designed for only 2 PCI slots expansion (for low profile PCI card only) into the PCI slot.

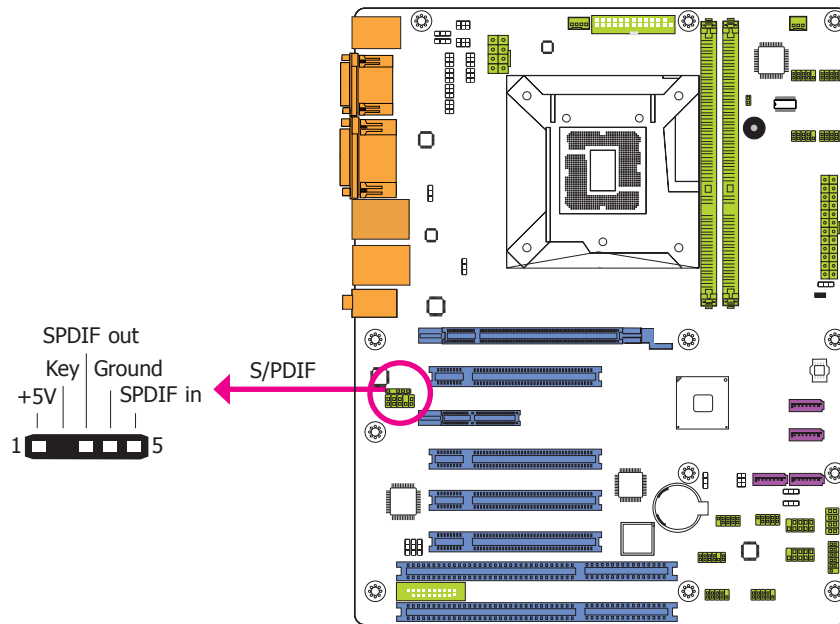
PCI Express x4 Slot

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

ISA Slot

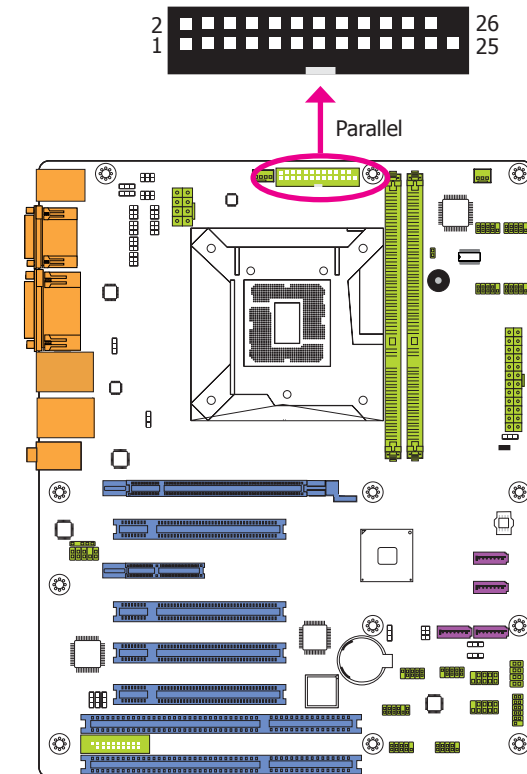
The ISA slot is used to connect ISA-compatible expansion cards.

S/PDIF Connector



The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

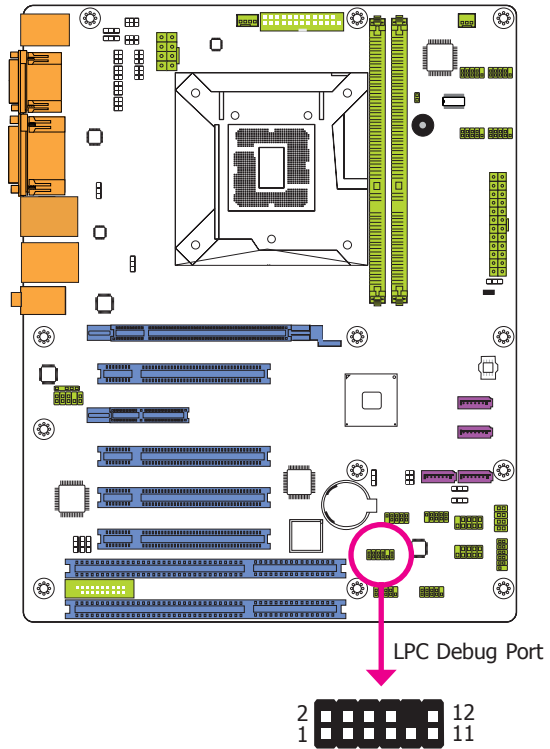
Parallel Port



The 25-pin connector is used to connect an external parallel port. The parallel port connects your PC to a parallel printer. It supports SPP, ECP and EPP.

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

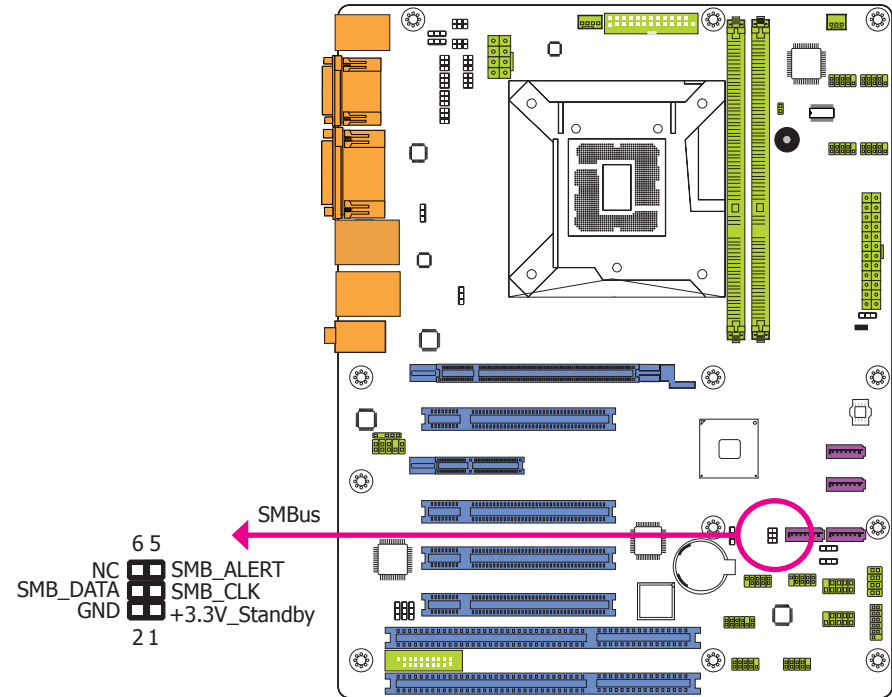
LPC Debug Port



The LPC connector is used for the debug function and its pin functions are listed below.

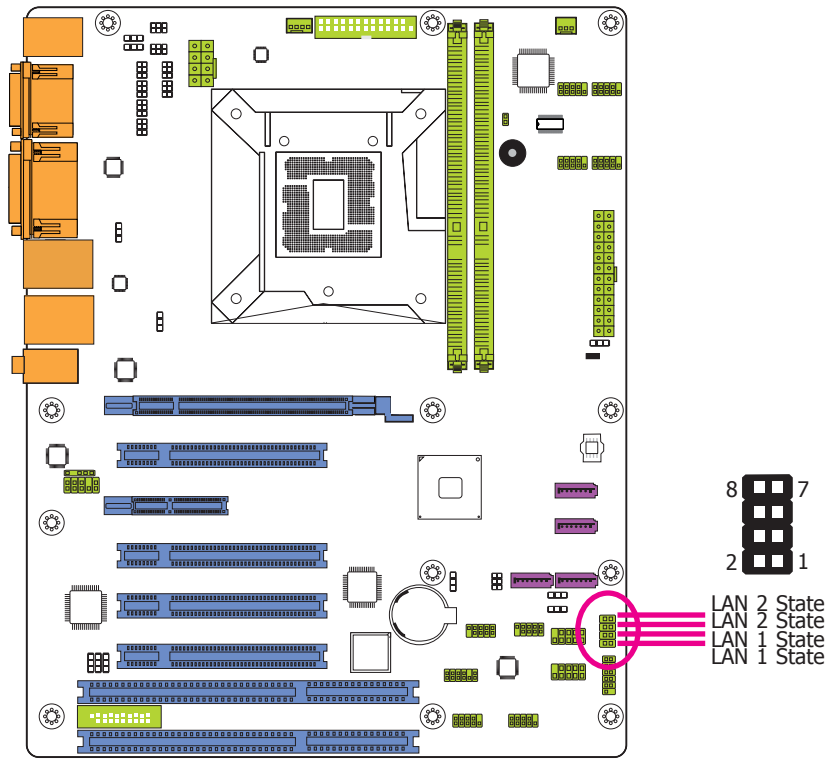
Pins	Pin Assignment	Pins	Pin Assignment
1	CLK	2	LAD1
3	RST#	4	LAD0
5	FRAME#	6	VCC_+3V
7	LAD3	8	GND
9	LAD2	10	x
11	SERIRQ	12	48MHz

SMBus Connector



The SMBus (System Management Bus) connector is used to connect the SMBus device. 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.

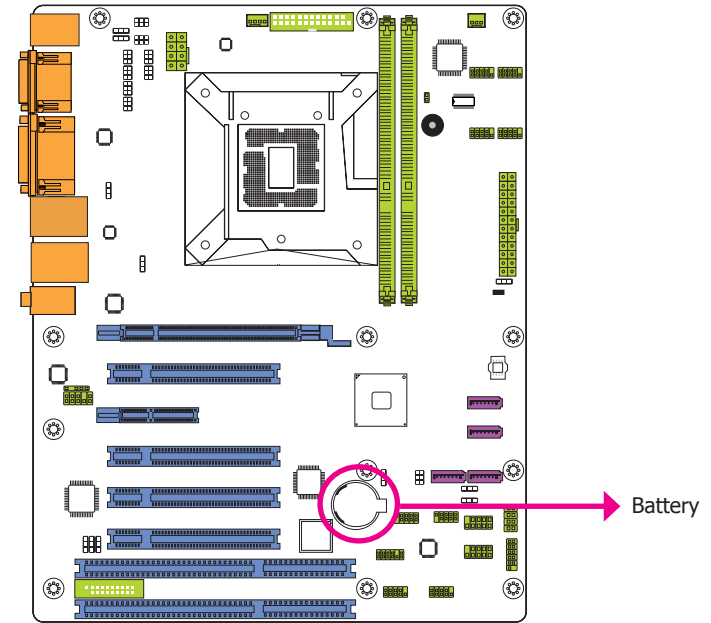
LAN LED Connector



The LAN LED connector is used to detect the connection state of RJ45 LAN ports when the connection is made to an active network via a cable. The pin functions of the LAN LED connector are listed below.

Pins	Pin Assignment	Pins	Pin Assignment
1	Link Activity	2	+3V_standby
3	GLED_LED_1000-	4	GLED_LED_100-
5	Link Activity	6	+3V_standby
7	GLED_LED_1000-	8	GLED_LED_100-

Battery



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

Safety Measures

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

Chapter 3 - BIOS Setup

Overview

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

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



Note:

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenu or fields.
<Esc>	Exit to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Select a field.
<F1>	Displays general help
<F2>	Previous values
<F3>	Optimized defaults
<F4>	Saves and resets the setup program.
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

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

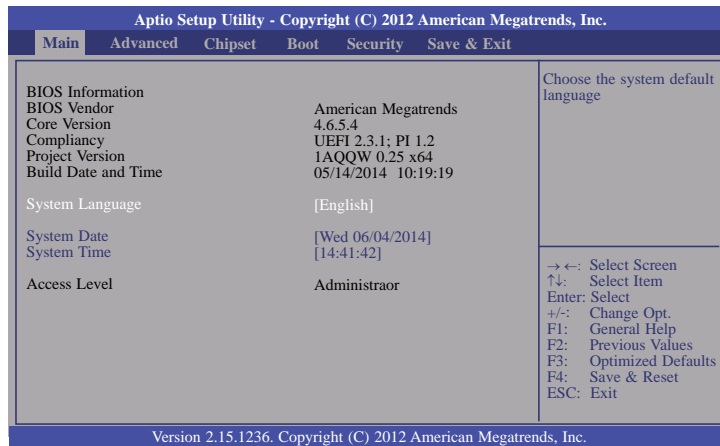
Submenu

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

AMI 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 <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

System Time

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

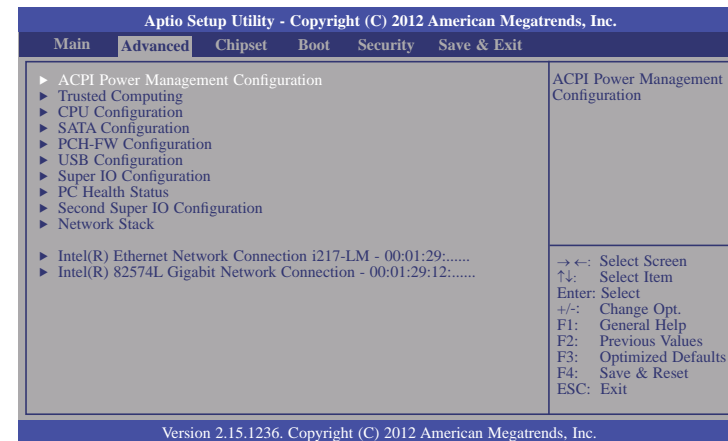
Advanced

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



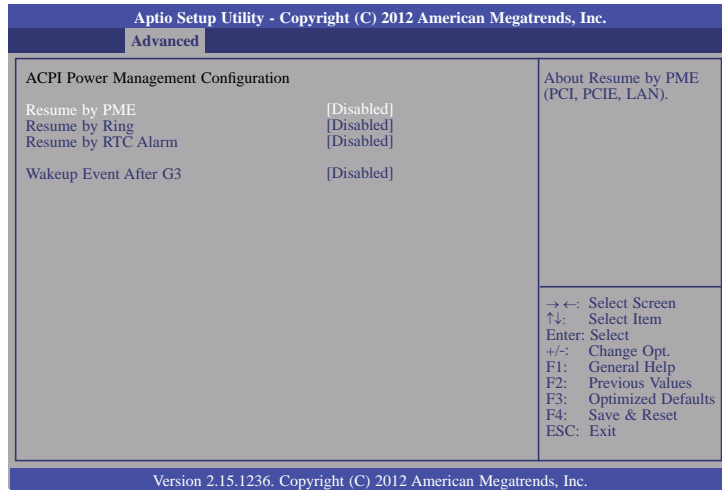
Important:

Setting incorrect field values may cause the system to malfunction.



ACPI Power Management Configuration

This section is used to configure the ACPI Power Management.



Resume by PME

Enables this field to use the PME signal to wake up the system.

Resume by Ring

Enables this field to use the Ring signal to wake up the system.

Resume by RTC Alarm

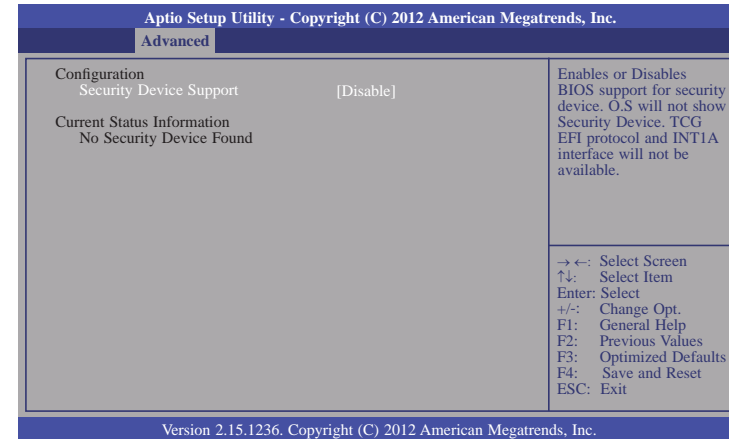
When Enabled, the system uses the RTC to generate a wakeup event.

Wakeup Event After G3

This field is used to enable or disable the specific wakeup event after G3. It needs to switch the hardware jumper (for AC power on) to the proper setting.

Trusted Computing

This section configures settings relevant to Trusted Computing innovations.

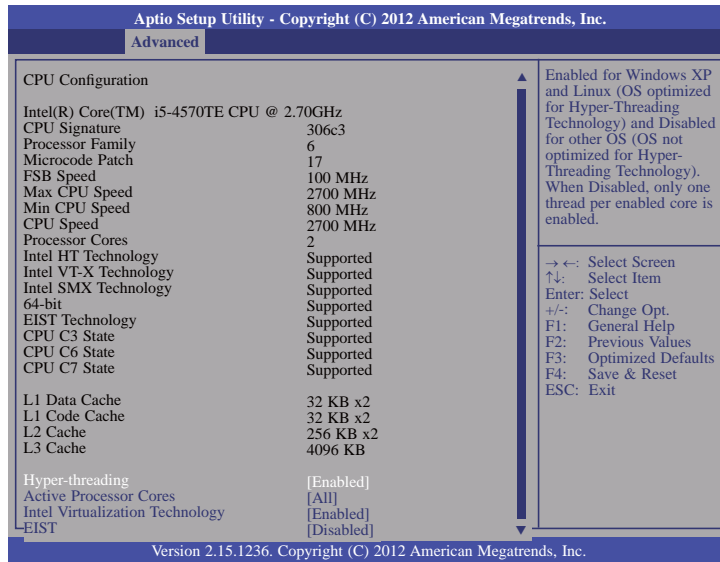


Security Device Support

This field is used to enable or disable BIOS supporting for the security device. O.S will not show the security device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

This section is used to configure the CPU. It will also display the detected CPU information.



Hyper-threading

Enables this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

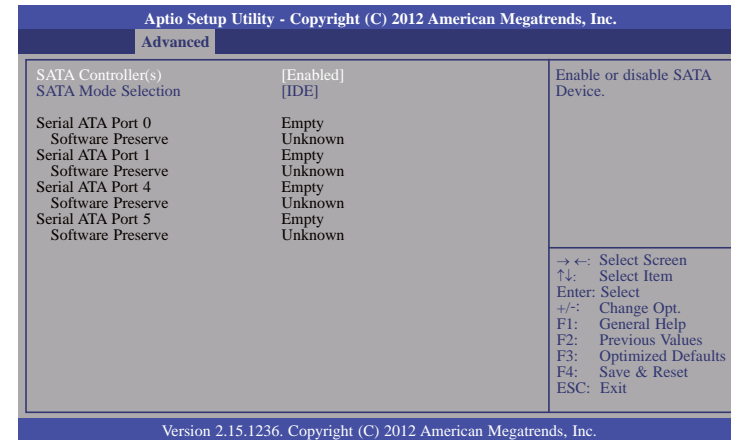
When this field is set to enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

EIST

This field is used to enable or disable the Intel Enhanced SpeedStep Technology.

SATA Configuration

This section is used to configure the settings of SATA device.



SATA Controller(s)

This field is used to enable or disable the Serial ATA devices.

SATA Mode Selection

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

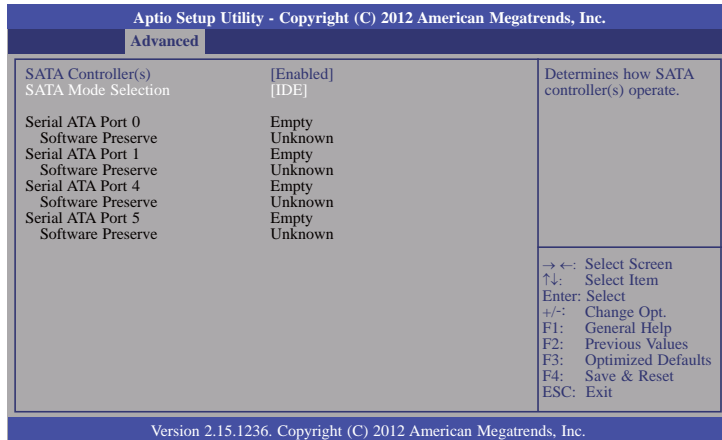
IDE Mode

This option configures the Serial ATA drives as Parallel ATA storage devices.

AHCI Mode

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

When IDE mode is selected in the SATA Mode Selection, it will display the following information:



SATA Controller Speed

Indicates the maximum speed that the SATA controller can support.

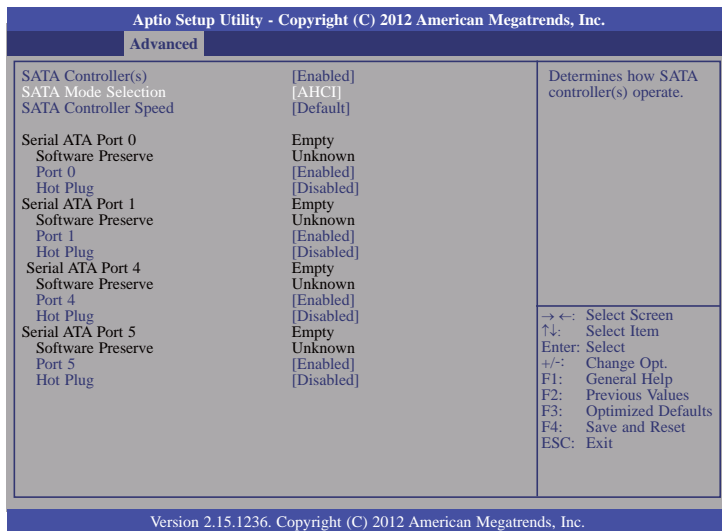
Port 0, Port 1, Port 4 and Port 5

Enables or disables the SATA port.

Hot Plug

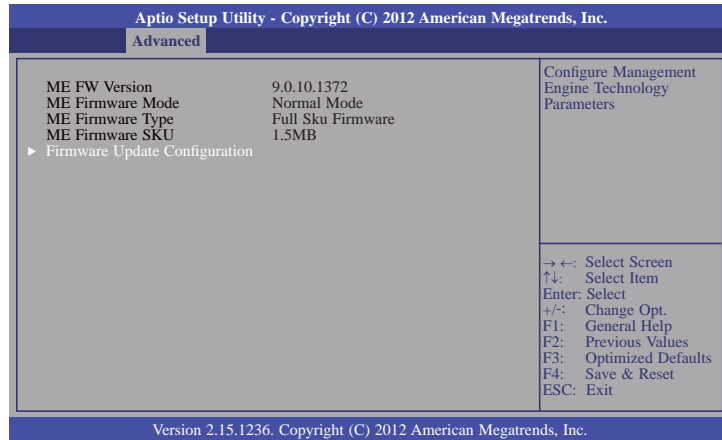
Designates the SATA port as hot pluggable.

When AHCI mode is selected in the SATA Mode Selection, it will display the following information:



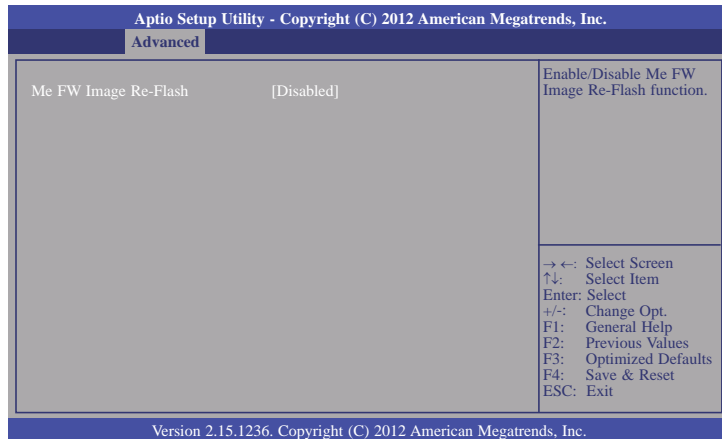
PCH-FW Configuration

This section is used to configure the parameters of Management Engine Technology.



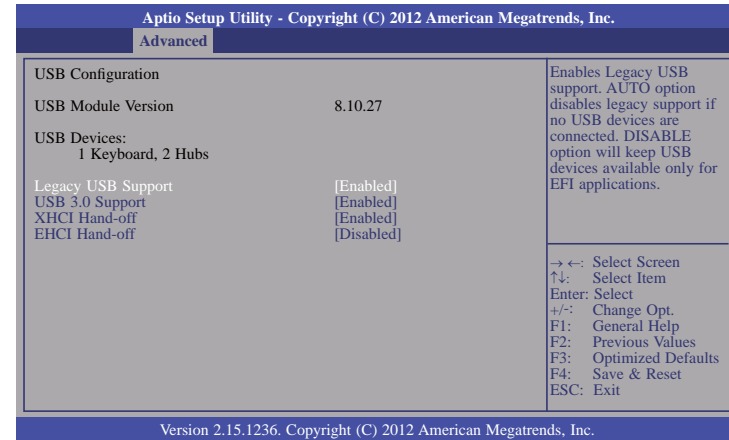
Firmware Update Configuration

This field is used to configure the parameters of Management Engine Technology.



USB Configuration

This section is used to configure the parameters of the USB device.



Legacy USB Support

Enabled

Enables legacy USB.

Auto

Disables support for legacy when no USB devices are connected.

Disabled

Keeps USB devices available only for EFI applications.

USB 3.0 Support

Enables or disables USB 3.0 (XHCI) Controller support.

XHCI Hand-off

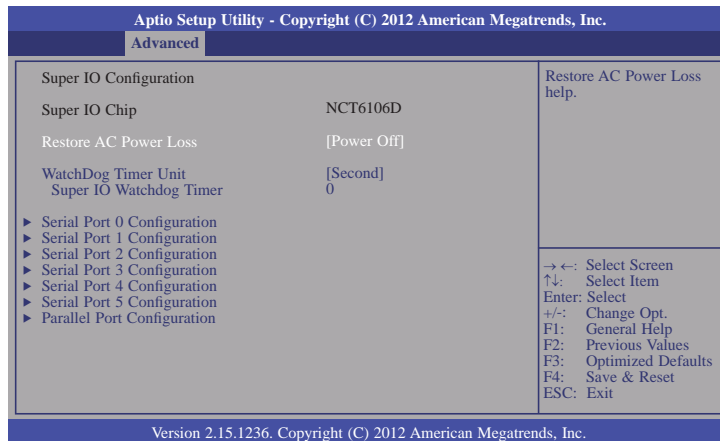
This is a workaround for OSeS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

This is a workaround for OSeS that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

Super IO Configuration

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



Restore AC Power Loss

Power Off

When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

Power On

When power returns after an AC power failure, the system will automatically power-on.

Last State

When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Watchdog Timer Unit

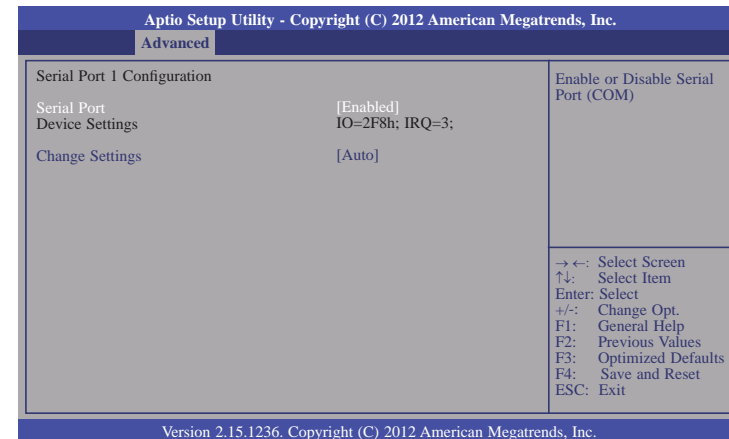
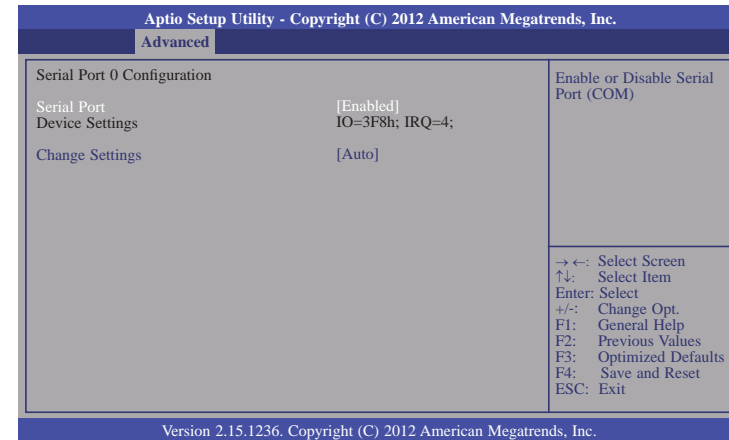
Selects the watchdog timer unit: second or minute.

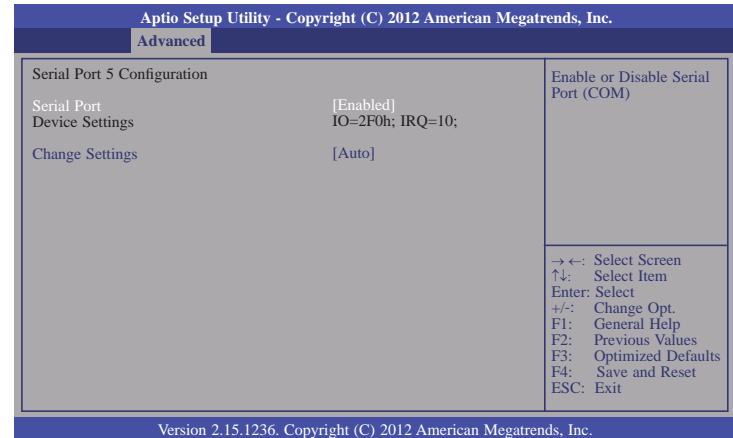
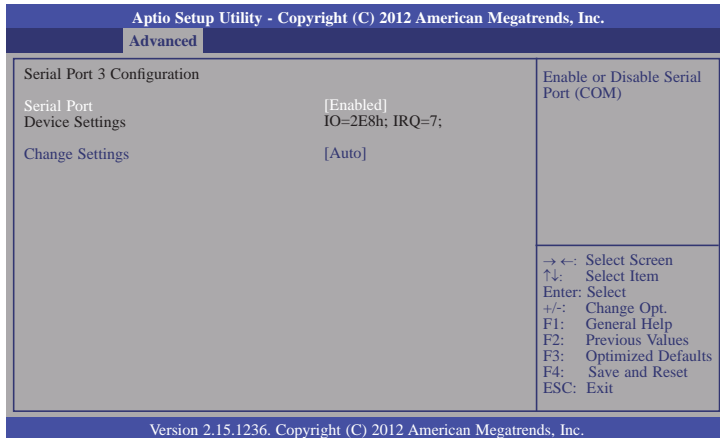
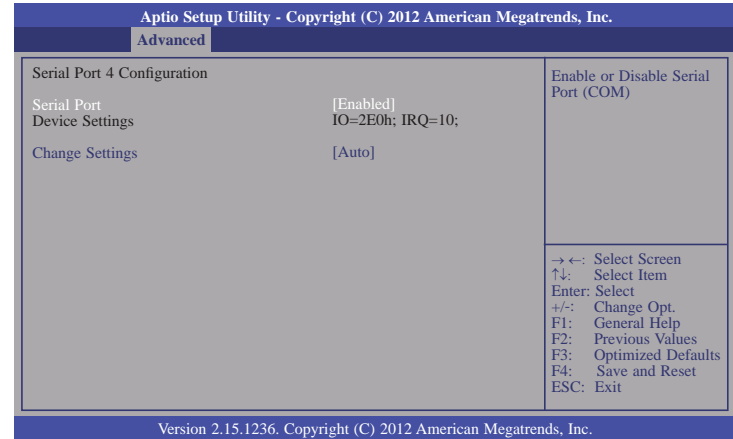
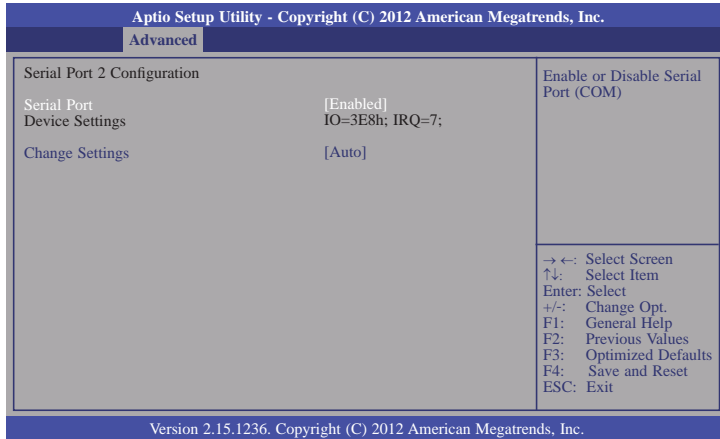
Super IO Watchdog Timer

Sets the timeout value of the super IO watchdog timer. 0 means disabled.

Serial Port 0 Configuration to Serial Port 5 Configuration

Sets the parameters of serial port 0 (COM A) to serial port 5 (COM F).





Serial Port

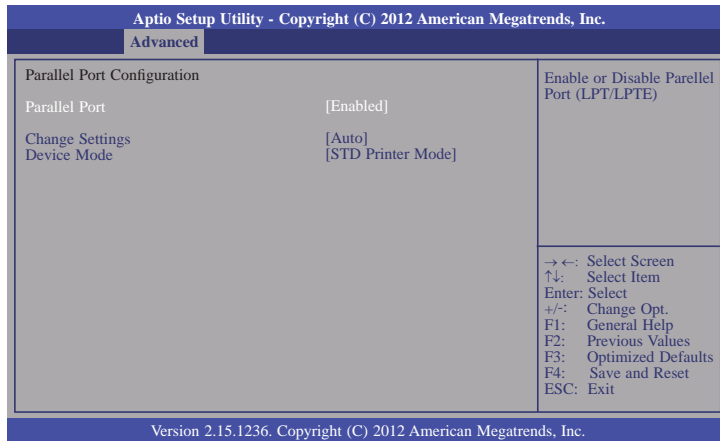
Enables or disables these serial ports (COM).

Change Settings

Selects the IO/IRQ settings for the super I/O device.

Parallel Port Configuration

Sets the parameters of the parallel port (LPT/LPTE).



Parallel Port

Enables or disables the parallel port (LPT/LPTE).

Change Settings

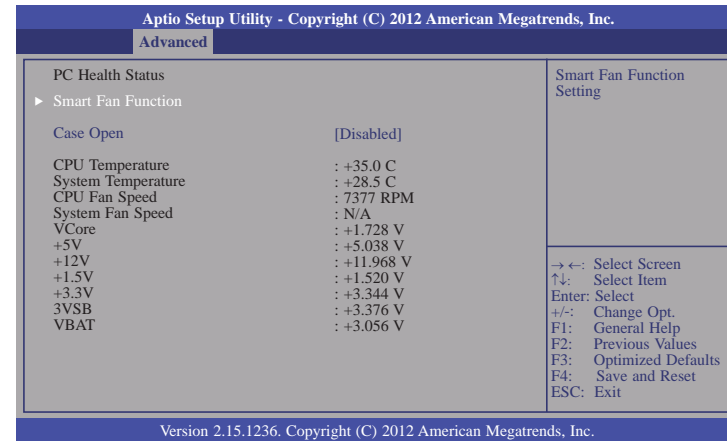
Selects an optimal setting for the super IO device.

Device Mode

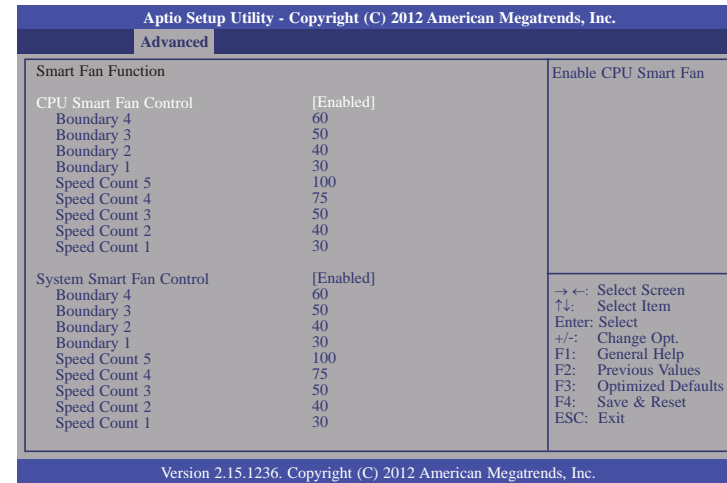
Changes the mode of the printer port.

PC Health Status

This section displays the hardware health monitor.



Smart Fan Function



CPU Smart Fan Control

When this feature is set to Automatic, the CPU's fan speed will rotate according to the CPU's temperature. The higher the temperature, the faster the speed of rotation.

System Smart Fan Control

When this feature is set to Automatic, the System's fan speed will rotate according to the System's temperature. The higher the temperature, the faster the speed of rotation.

Boundary 1 to Boundary 4

The range is 0-127.

Speed Count 1 to Speed Count 5

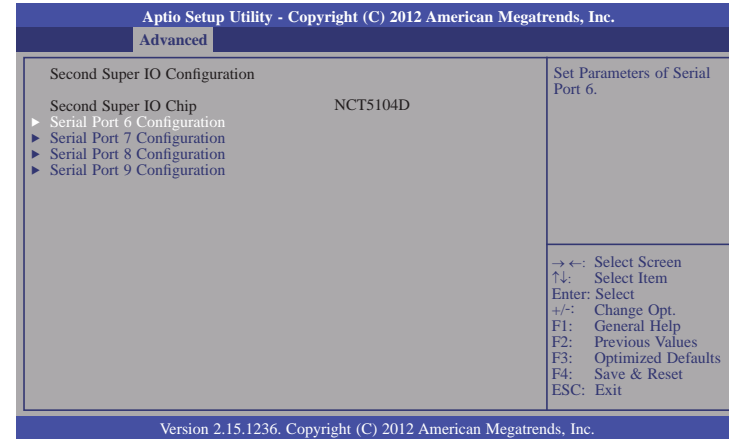
The range is 1-100%.

Case Open

Sets this field to Enabled to allow the system to alert you of a chassis intrusion event.

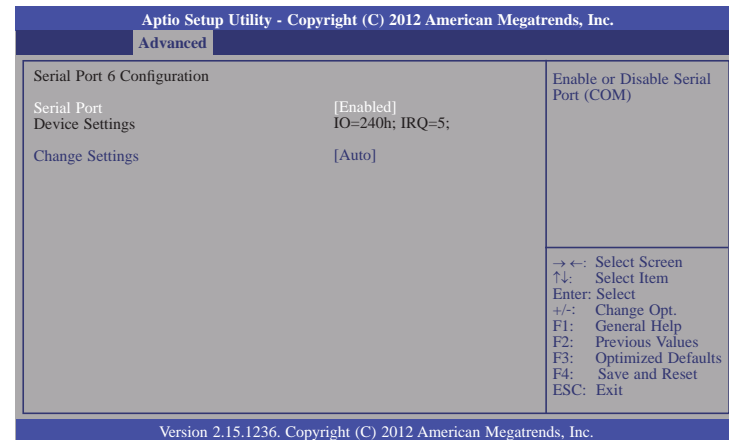
Second Super IO Configuration

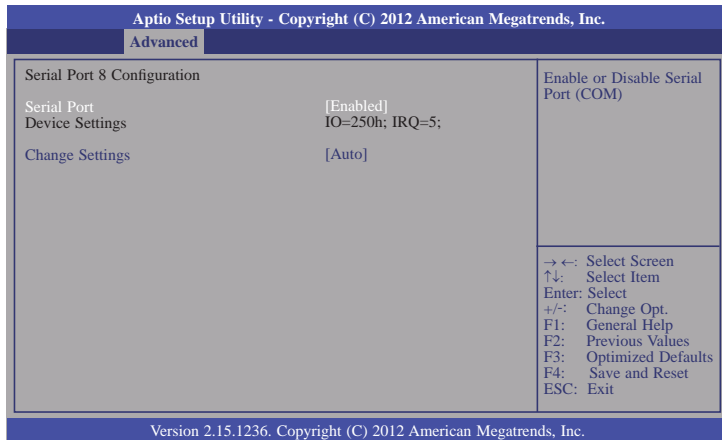
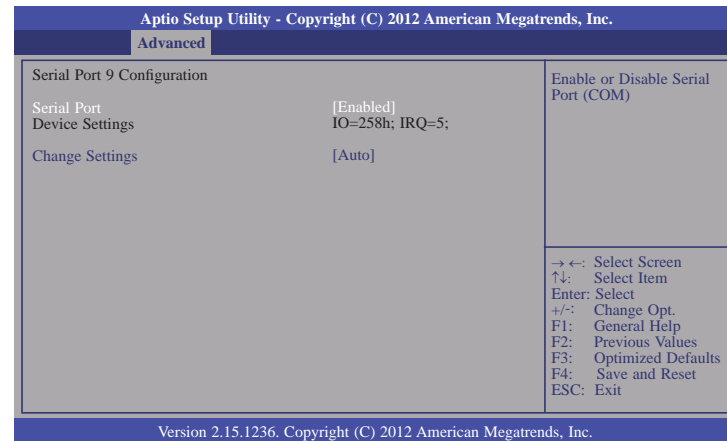
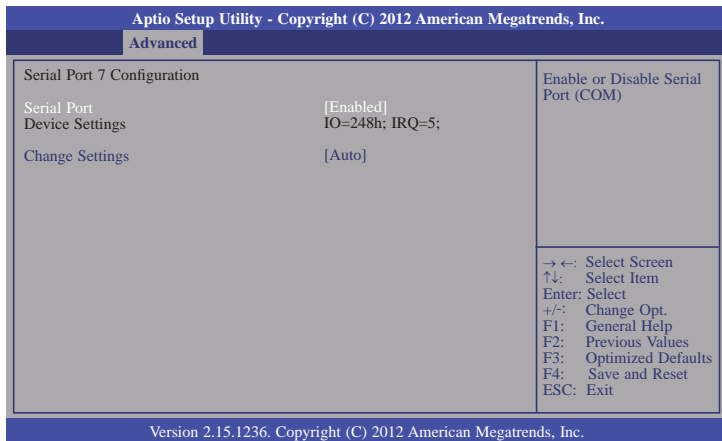
This section is used to configure the parameters of the system second super I/O chip.



Serial Port 6 Configuration to Serial Port 9 Configuration

Sets the parameters of serial port 6 to serial port 9.





Serial Port

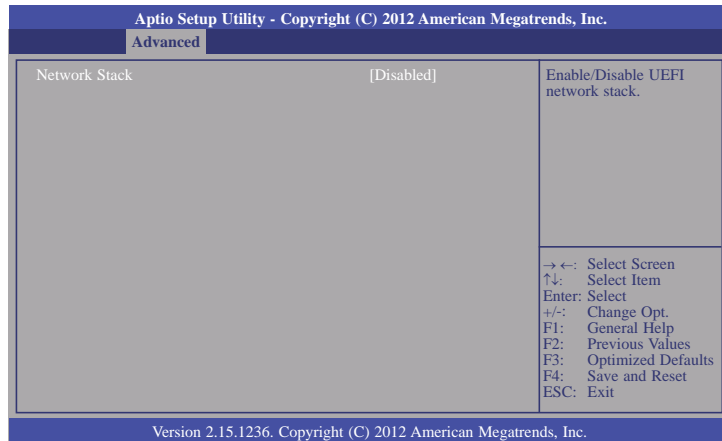
Enables or disables these serial ports (COM).

Change Settings

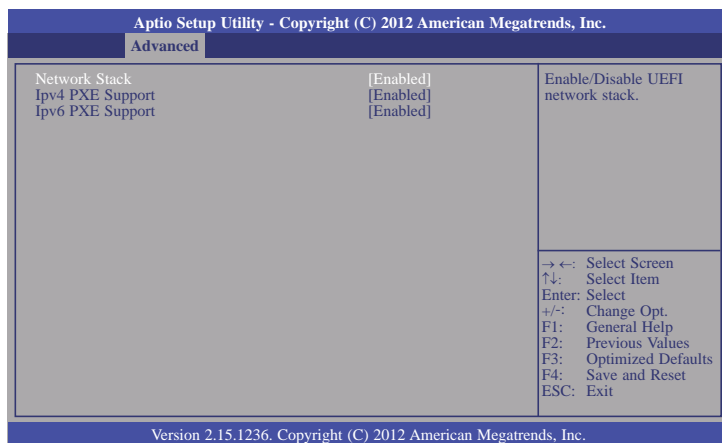
Selects the IO/IRQ settings for the super I/O device.

Network Stack

This section is used to enable or disable UEFI network stack.



When Network Stack is enabled, it will display the following information:



Ipv4 PXE Support

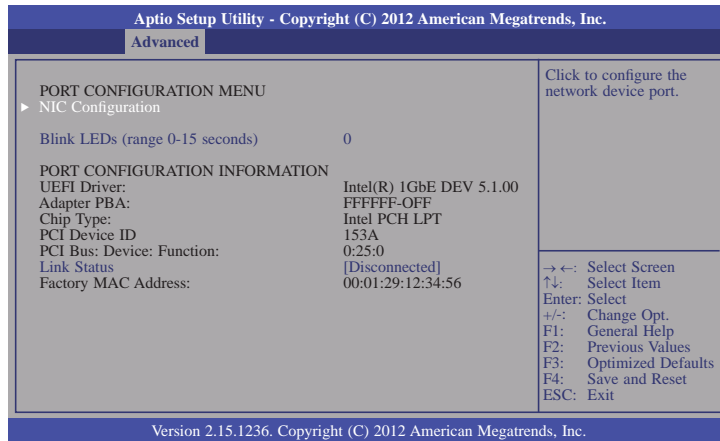
When enabled, Ipv4 PXE boot supports. When disabled, Ipv4 PXE boot option will not be created.

Ipv6 PXE Support

When enabled, Ipv6 PXE boot supports. When disabled, Ipv6 PXE boot option will not be created.

Intel(R) Ethernet Network Connection i217-LM - 00:01:29:...

This section is used to configure the parameters of the Gigabit Ethernet device.

**NIC Configuration**

This field is used to configure the network device.

Blink LEDs

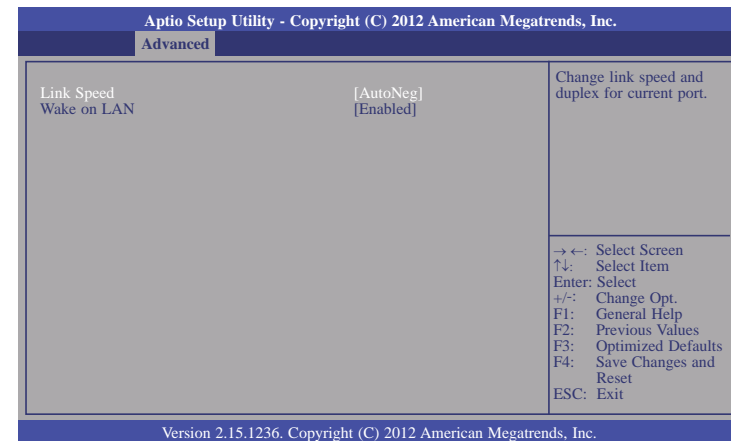
Blink LEDs for the specified duration (up to 15 seconds).

Link Status

This field indicates the link status of the network device.

NIC Configuration

This field is used to configure the network device.

**Link Speed**

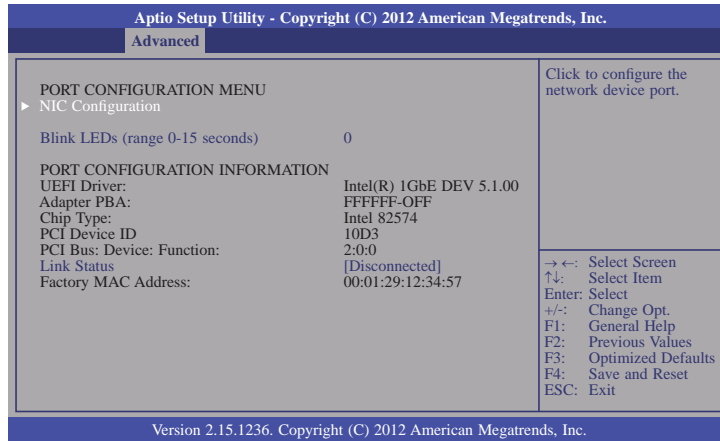
Selects the link speed and duplex for the current network port.

Wake on LAN

Enables this option to wake the system with a magic packet.

Intel(R) 82574L Gigabit Network Connection - 00:01:29:12...

This section is used to configure the parameters of the Gigabit Ethernet device.

**NIC Configuration**

This field is used to configure the network device.

Blink LEDs

Blink LEDs for the specified duration (up to 15 seconds).

Link Status

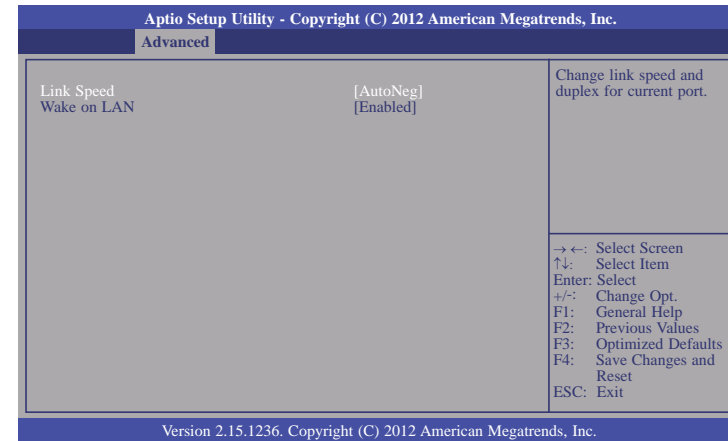
This field indicates the link status of the network device.

Alternate MAC Address

Alternates assigned MAC address of Ethernet port.

NIC Configuration

This field is used to configure the network device.

**Link Speed**

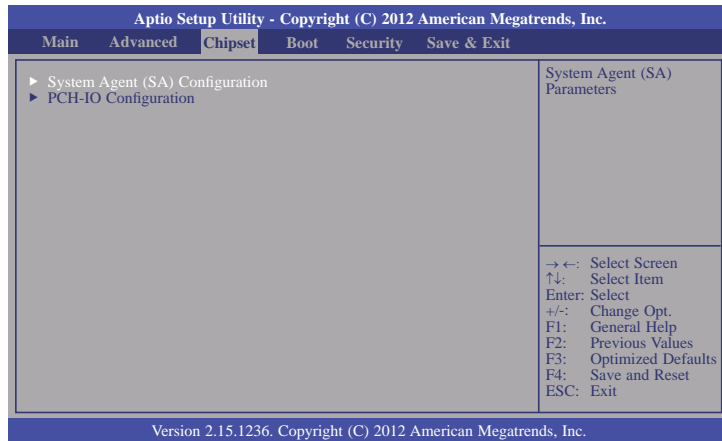
Selects the link speed and duplex for the current network port.

Wake on LAN

Enables this option to wake the system with a magic packet.

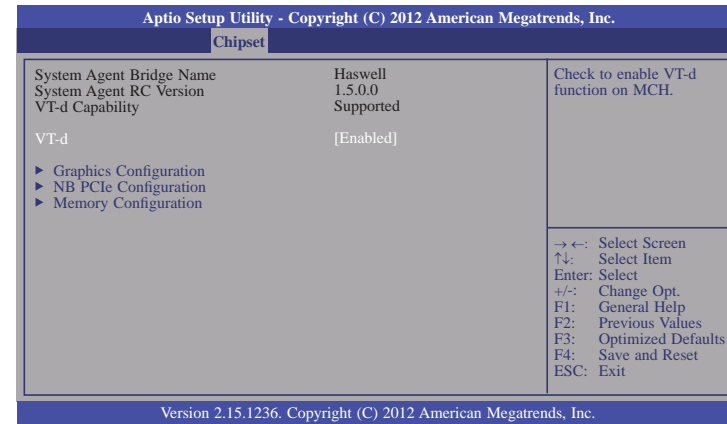
Chipset

This section configures relevant chipset functions.



System Agent (SA) Configuration

This section is used to configure the parameters of System Agent.

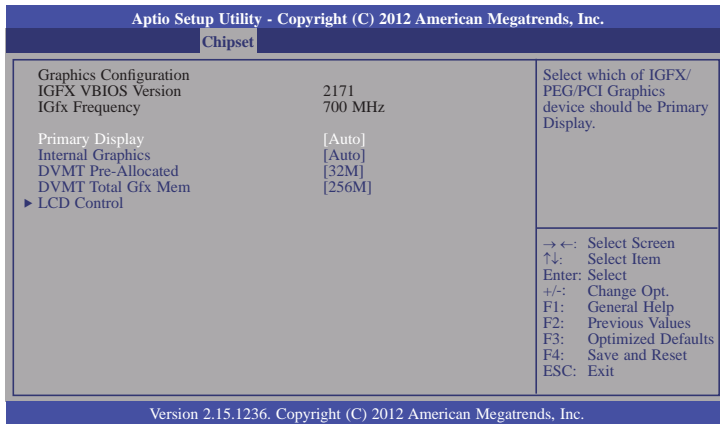


VT-d

Enables the VT-d function on MCH.

Graphics Configuration

This field configures the graphics settings.



Primary Display

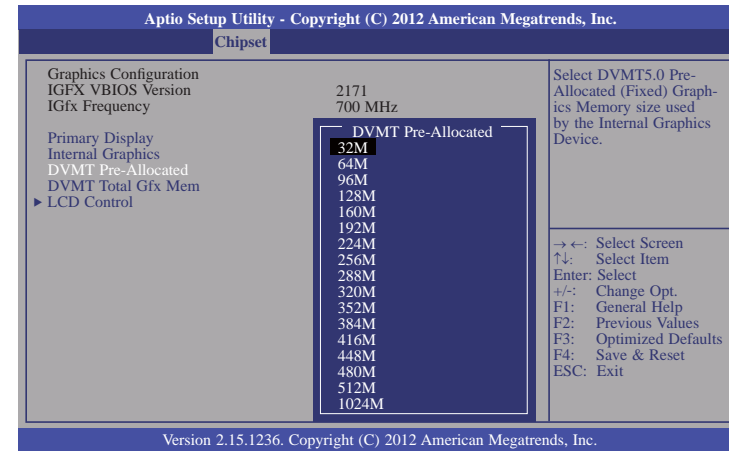
- Auto** When the system boots, it will automatically detect the display device.
- IGFX** When the system boots, it will first initialize the onboard VGA.
- PEG** When the system boots, it will first initialize the PCI Express x16 graphics card.

Internal Graphics

Keeps IGD enabled based on the setup options.

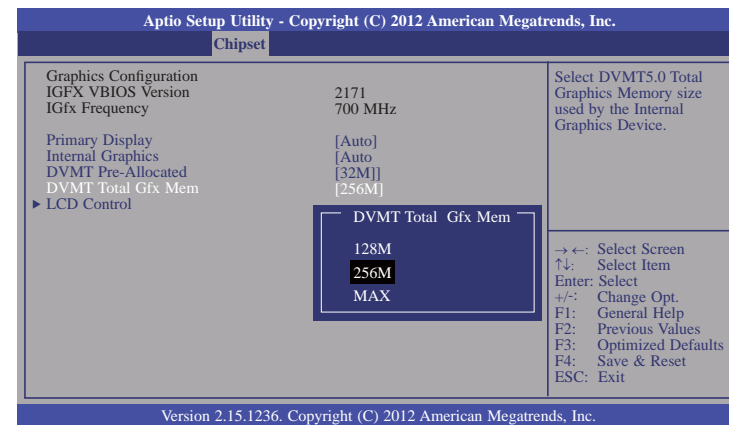
DVMT Pre-Allocated

Selects DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device. Please refer to the screen shown below.



DVMT Total Gfx Mem

Selects DVMT 5.0 total graphics memory size used by the internal graphics device. Please refer to the screen shown below.



LCD Control

This field configures the LCD control.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
LCD Control		Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
Primary IGFX Boot Display	[VBIOS Default]	
		→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

When any device is selected in the Primary IGFX Boot Display, it will display the following information:

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
LCD Control		Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
Primary IGFX Boot Display	[CRT]	
Secondary IGFX Boot Display	[None]	
		→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Secondary IGFX Boot Display

Selects the secondary display device.

NB PCIe Configuration

This field is used to configure the settings of NB PCI Express.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
NB PCIe Configuration		Configure PEG0 B0:D1:F0 Gen1-Gen2.
PEG0 - Gen X	[Auto]	
Enable PEG	[Auto]	
		→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Enable PEG

Enables or disables the PEG.

Memory Configuration

This field only displays the memory configuration.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
Memory Information		
Memory RC Version	1.5.0.0	
Memory Frequency	1333 Mhz	
Total Memory	2048 MB (DDR3)	
Memory Voltage	1.50V	
DIMM#1	Not Present	
DIMM#2	2048 MB (DDR3)	
CAS Latency (tCL)	9	
Minimum delay time		
CAS to RAS (tRCDmin)	9	
Row Precharge (tRPmin)	9	
Active to Precharge (tRASmin)	24	
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

PCH-IO Configuration

This section illustrates the PCH parameters.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
Intel PCH RC Version	1.5.0.0	PCI Express Configuration settings.
Intel PCH SKU Name	H81	
Intel PCH Rev ID	05/C2	
▶ PCI Express Configuration		
▶ USB Configuration		
▶ PCH Azalia Configuration		
Onboard I217 LAN Controller	[Enabled]	
Onboard 82574 LAN Controller	[Enabled]	
High Precision Event Timer Configuration		
High Precision Timer	[Enabled]	
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Onboard I217 LAN Controller

Enables or disables the onboard I217 LAN controller.

Onboard 82574 LAN Controller

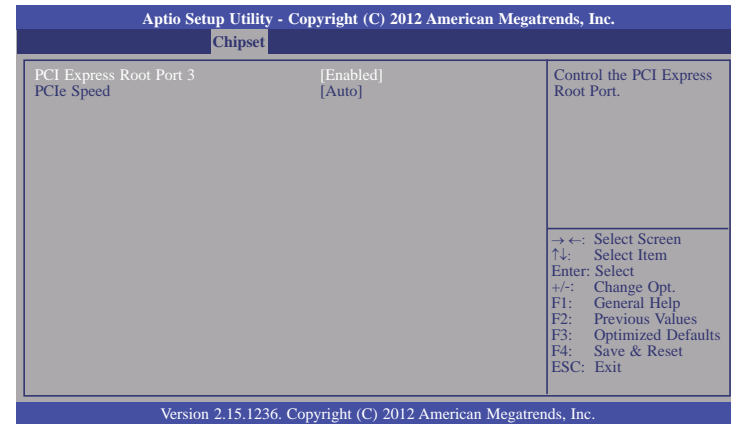
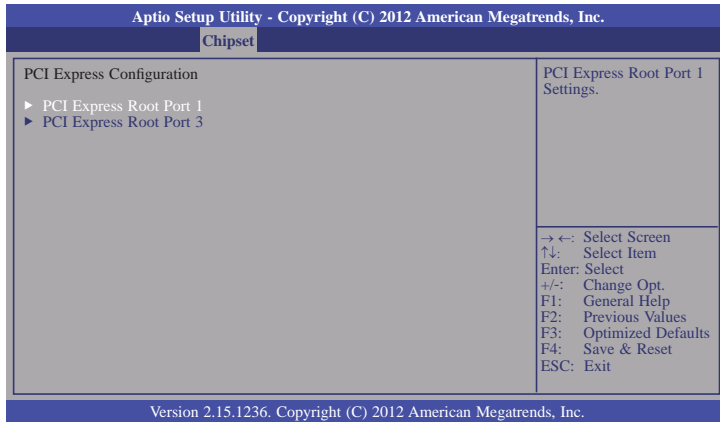
Enables or disables the onboard 82574 LAN controller

High Precision Timer

Enables or disables the High Precision Event Timer.

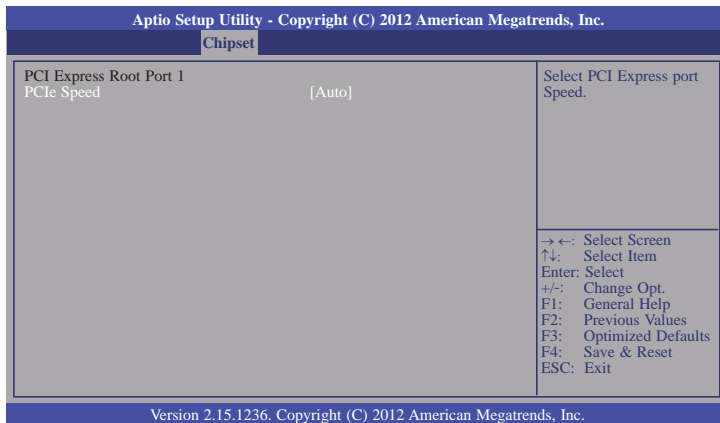
PCI Express Configuration

This field is used to configure the PCI Express settings.



PCI Express Root Port 1 and 3

Controls the PCI Express Root Port.

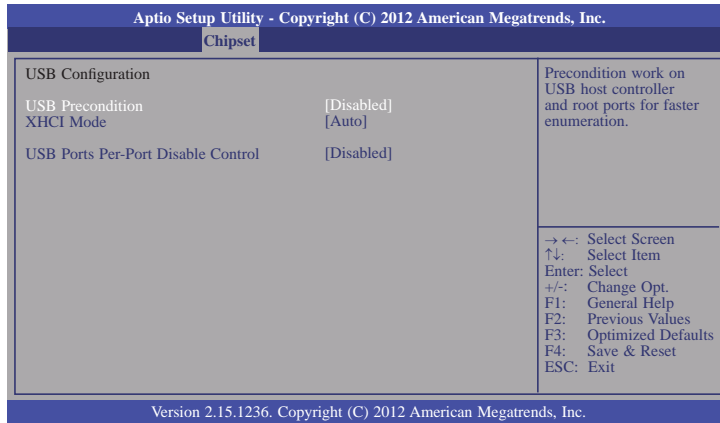


PCIe Speed

Selects the speed of PCI Express port: Auto, Gen 1 or Gen 2.

USB Configuration

This field is used to configure the USB settings.

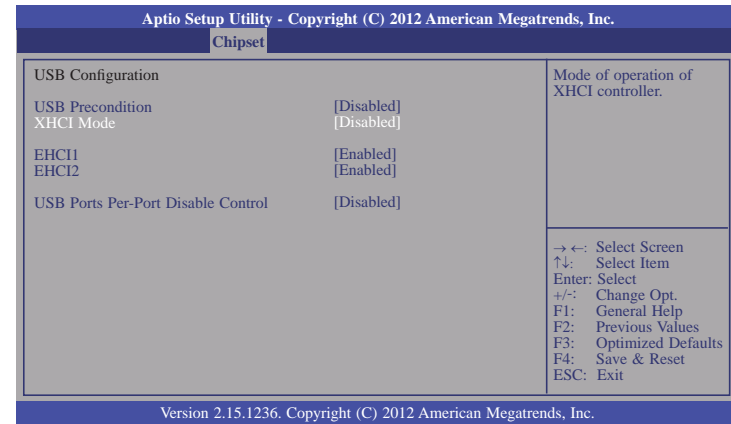


USB Precondition

Precondition works on USB host controller and root ports for faster enumeration.

XHCI Mode

Selects the operation mode of XHCI controller. These options are Auto, Enabled, and Disabled. When Disabled is selected in the XHCI Mode, it will display the following information:

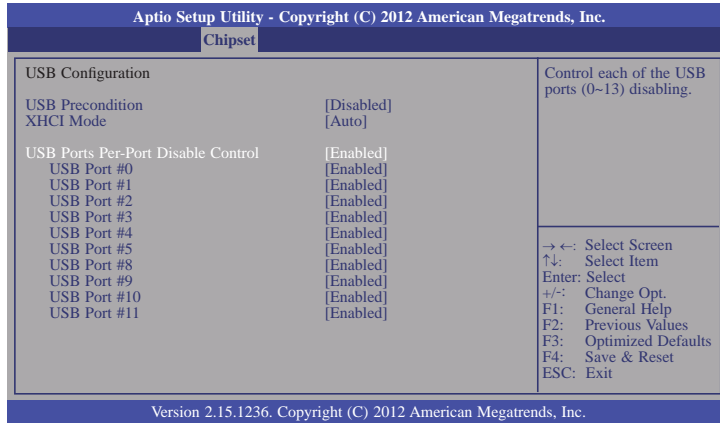


EHCI 1 and EHCI 2

These fields are used to control the functions of USB EHCI (USB 2.0) controllers. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

This field is used to control each of the USB ports(0-13) disabling. When enabled, it will display the following information:

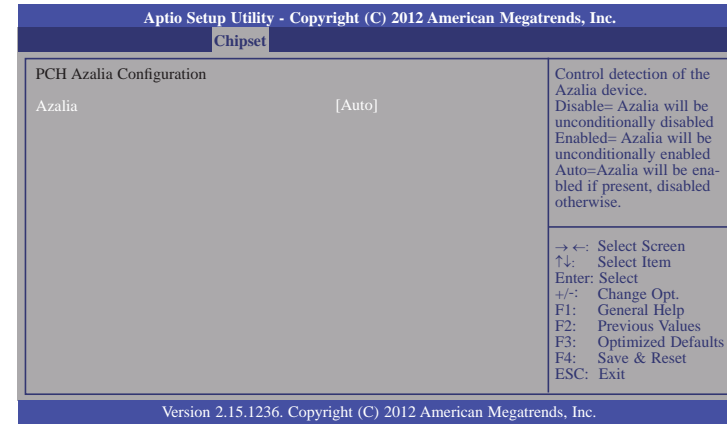


USB Port #0/1/2/3/4/5/8/9/10/11

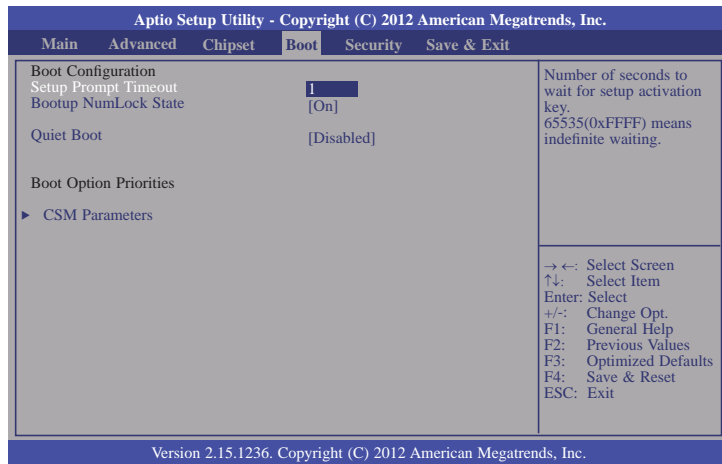
Enables or disables these USB ports.

PCH Azalia Configuration

This field is used to configure the PCH Azalia settings.



Boot



Setup Prompt Timeout

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

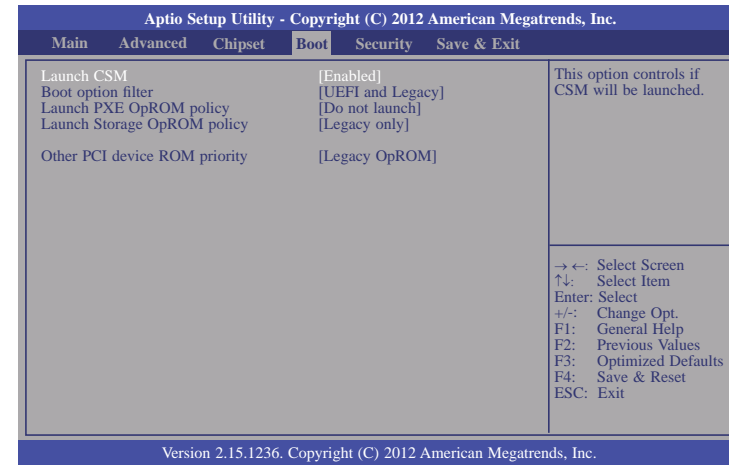
Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enables or disables the quiet boot function.

CSM Parameters



Boot option filter

This option controls what devices system can be boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and legacy PXE OpROM.

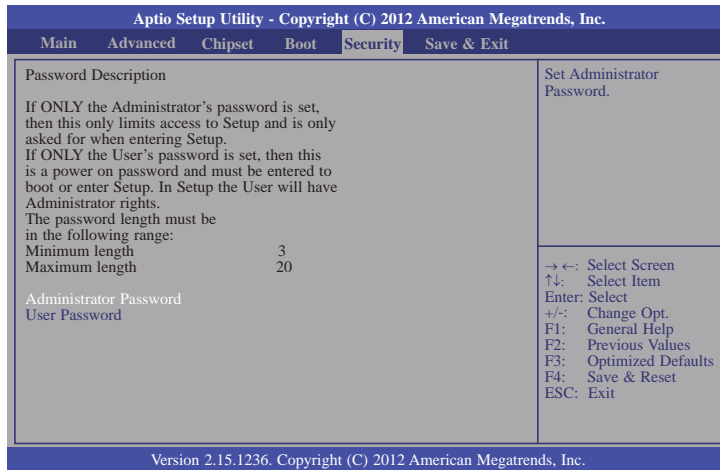
Launch Storage OpROM policy

Controls the execution of UEFI and legacy storage OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass Storage, or Video defines which OpROM to launch.

Security



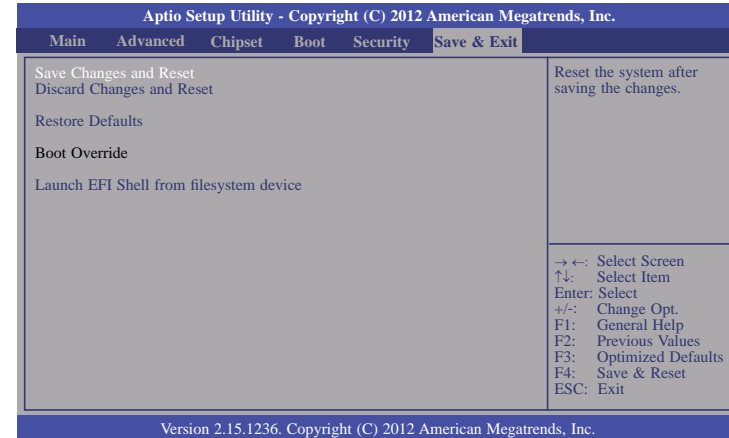
Administrator Password

Sets the administrator password.

User Password

Sets the user password.

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 of all the setup options.

Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

Updating the BIOS

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

To execute the utility, type:

```
A:> AFUDOS BIOS_File_Name /b /p /n
```

then press <Enter>.

```
C:\AFU\AFUDOS>afudos filename /B /P /N
+-----+
|              AMI Firmware Update Utility(APTIO) v2.25              |
|              Copyright (C)2008 American Megatrends Inc. All Rights Reserved.              |
+-----+
Reading file ..... done
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing BootBlock ..... done
Writing BootBlock ..... done
Verifying BootBlock ..... done
C:\AFU\AFUDOS>
```

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.