



HD632-H81 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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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 consequencial 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 HD632 motherboard
- One Serial ATA data cable
- One 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.

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, 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	 LGA 1150 socket for: - 4th Generation Intel[®] Core[™] processors : Intel[®] Core[™] i⁷-4790S (8M Cache, up to 4.0 GHz); 65W : Intel[®] Core[™] i⁷-4770E (8M Cache, up to 3.9 GHz); 65W : Intel[®] Core[™] i⁷-4770E (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); 65W : Intel[®] Core[™] i⁵-4570S (6M Cache, up to 3.6 GHz); 65W : Intel[®] Core[™] i⁵-4570TE (4M Cache, up to 3.6 GHz); 65W : Intel[®] Core[™] i³-4350T (4M Cache, 3.7 GHz); 54W : Intel[®] Core[™] i³-4350T (4M Cache, 3.7 GHz); 54W : Intel[®] Core[™] i³-4340TE (4M Cache, 2.6 GHz); 35W : Intel[®] Core[™] i³-4340TE (4M Cache, 2.6 GHz); 55W : Intel[®] Core[™] i³-4330TE (4M Cache, 2.4 GHz); 35W : Intel[®] Core[™] i³-4330TE (4M Cache, 2.3 GHz); 53W : Intel[®] Pentium[®] G3420 (3M Cache, 3.2 GHz); 35W : Intel[®] Celeron[®] G1820TE (2M Cache, 2.7 GHz); 53W : Intel[®] Celeron[®] G1820TE (2M Cache, 2.2 GHz); 35W : Intel[®] Celeron[®] G1820TE (2M Cache, 2.2 GHz); 35W 	
Chipset	Intel [®] H81 Express Chipset	
System Memory	 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	 1 PCIe x16 Gen 3 slot (PCIe 3.0) 1 PCIe x4 Gen 2 slot (PCIe 2.0) 5 PCI slots (PCI 2.3) 	
Graphics	 Intel[®] HD Graphics Display ports: 1 VGA and 1 DVI-I (DVI-D signal) VGA and DVI-I (DVI-D signal): resolution up to 1920x1200 @ 60Hz Supports 6 Graphics Execution Units (EUs) Intel[®] Clear Video Technology DirectX Video Acceleration (DXVA) support for accelerating video processing 	
Audio	 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	 2 Intel[®] I210 PCI Express Gigabit Ethernet controllers Integrated 10/100/1000 transceiver Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab 	
Serial ATA	 2 SATA 3.0 ports with data transfer rate up to 6Gb/s 2 SATA 2.0 ports with data transfer rate up to 3Gb/s SATA port 5 provides adequate space for SATA DOM Integrated Advanced Host Controller Interface (AHCI) controller 	
Trusted Platform Module - TPM* (optional)	 Provides a Trusted PC for secure transactions Provides software license protection, enforcement and password protection 	

Rear Panel I/O Ports	 1 mini-DIN-6 port for PS/2 mouse/keyboard 2 DB-9 RS232 serial ports (RS232 and/or Power) 1 VGA port 1 DVI-I (DVI-D signal) port 2 RJ45 LAN ports 2 USB 3.0/2.0/1.1 ports 4 USB 2.0/1.1 ports Line-in/Surround, Line-out, and Mic-in/Center+Subwoofer jacks
I/O Connectors	 1 connector for 2 external USB 2.0/1.1 ports 1 vertical USB 2.0/1.1 port 8 connectors for 8 external serial ports (2.54mm pitch) 7 RS232 1 RS422/485 1 8-bit Digital I/O connector 1 front audio connector for line-out and mic-in jacks 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 3 fan connectors
BIOS	AMI BIOS - 64Mbit SPI BIOS
WatchDog Timer	Software programmable from 1 to 255 seconds
Energy Efficient Design	 Supports ErP Lot6 power saving* (optional) Supports ACPI System Power Management Wake-On-Events include: 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	 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	• TBD
OS Support	 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) Windows 10 IoT Enterprise

Temperature	• Operating: 0°C to 60°C • Storage: -20°C to 85°C
Humidity	• 5% to 90%
MTBF	 568,240 hrs @ 25°C; 313,841 hrs @ 45°C Calculation model: Telcordia Issue 2, Method I Case 3 Environment: GB, GC – Ground Benign, Controlled
Dimensions	• ATX form factor • 305mm (12") x 244mm (9.6")
Certification	CE, FCC Class B, RoHS, KC

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-I (DVI-D signal) interfaces for 2 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.

• 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

Two Intel® I210 PCI Express Gigabit LAN controllers support up to 1Gbps data transmission.

• 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 720mA.

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

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.



Wake-On-PS/2

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



The 5V_standby power source of your power supply must support \geq 720mA.

Power Failure Recovery

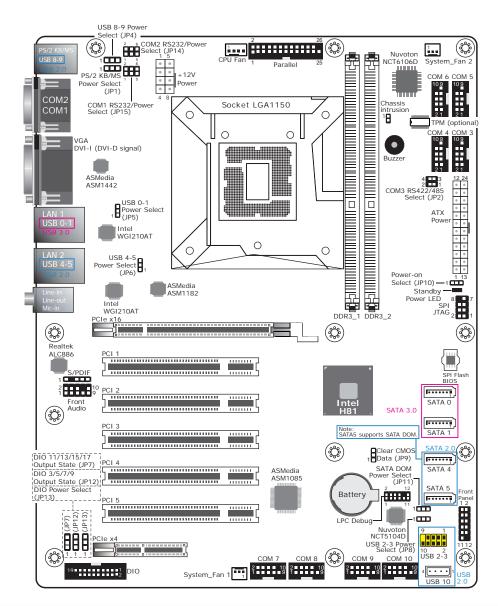
When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

• 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





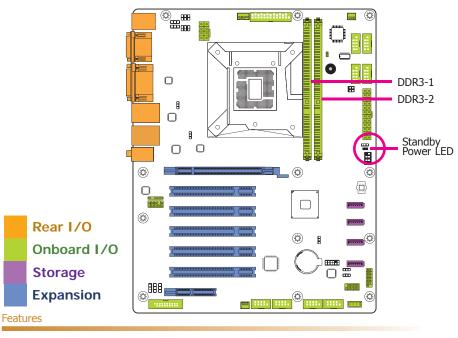
Important:

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 lit 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.



- 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.



Important:

You can populate either Channel A or Channel B first.

Installing the DIMM Module

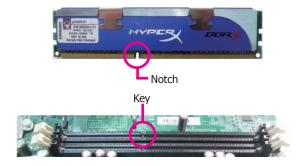


<u>Note:</u> The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

- 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.



- 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.



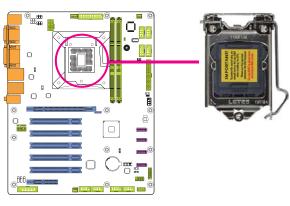
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Note:

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.



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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.

 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.
- 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.

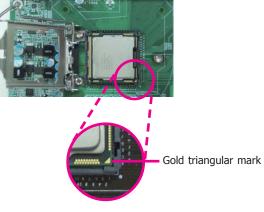
Load lever







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.



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

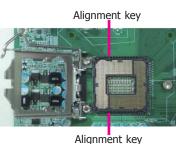
9. Hook the load lever under the retention tab.

Load lever



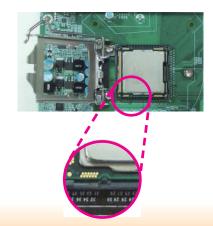
Retention tab

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





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



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.

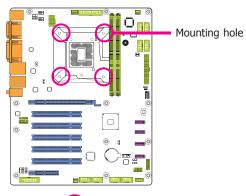


A boxed Intel[®] processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel[®]-certified fan and heat sink.

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.

 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.



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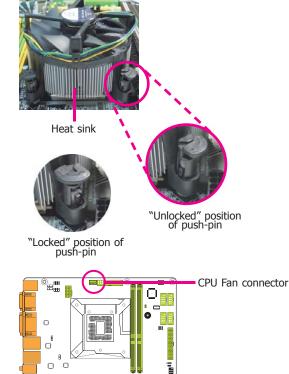
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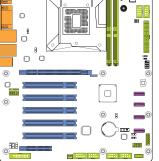
3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan connector.

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.

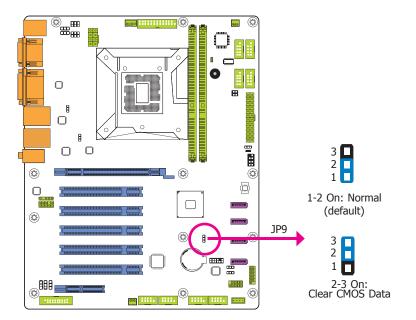




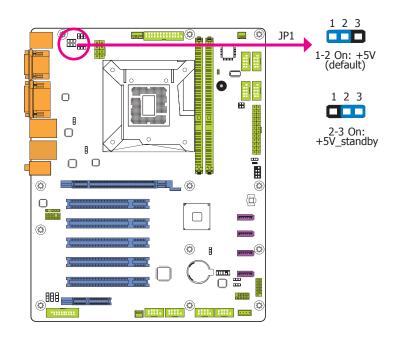
CPU Fan connector

Jumper Settings

Clear CMOS Data



PS/2 Keyboard/Mouse Power Select



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.

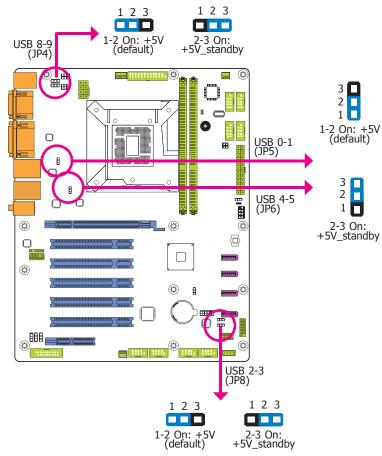
- 1. Power-off the system and unplug the power cord.
- 2. Set JP9 pins 2 and 3 to On. Wait for a few seconds and set JP9 back to its default setting, pins 1 and 2 On.
- 3. Now plug the power cord and power-on the system.

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 PS/2 mouse to wake up the system.



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

USB Power Select

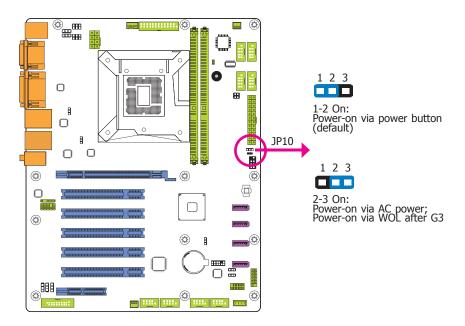


JP4, JP5, JP6 and JP8 are used to select the power of the USB devices. Selecting +5V_standby will allow you to use a USB device to wake up the system.

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



JP10 is used to select the method of powering on the system. If you want to use the power button, set pins 1 and 2 to On.

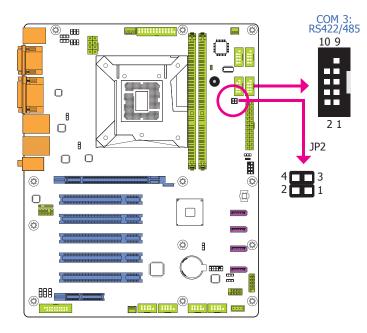
To power-on via WOL after G3:

- 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.

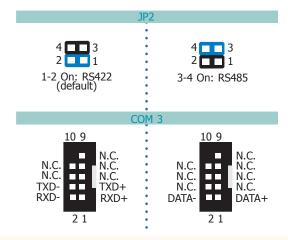
To power-on via AC Power:

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

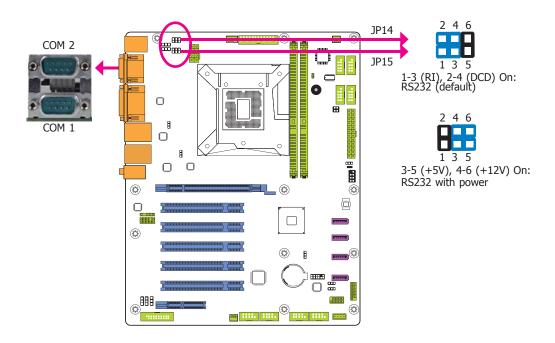
COM3 RS422/485 Select



JP2 is used to configure the COM port 3 to RS422 or RS485. The pin functions of the COM port will vary according to the jumper's setting.



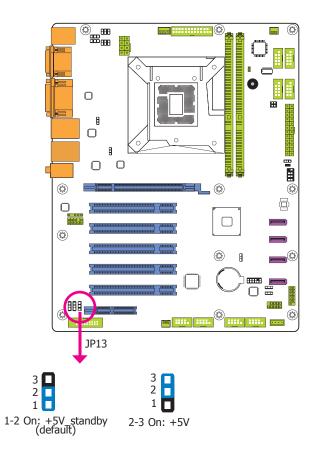
COM1/COM2 RS232/Power Select



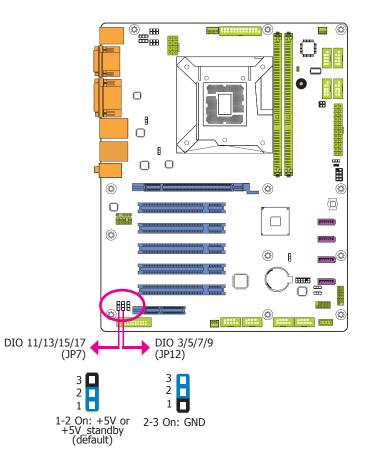
JP15 (for COM 1) and JP14 (COM 2) are used to configure Serial COM ports to pure RS232 or RS232 with power. The pin functions of COM 1 and COM 2 will vary according to JP14's and JP15's setting respectively.

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Digital I/O Power Select



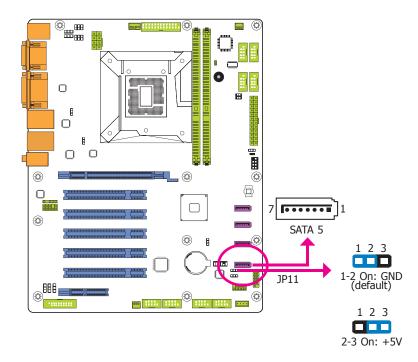
Digital I/O Output State



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

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.

SATA DOM Power Select



JP11 is used to select the power of SATA DOM.



Note: SATA port 5 provides adequate space for SATA DOM.

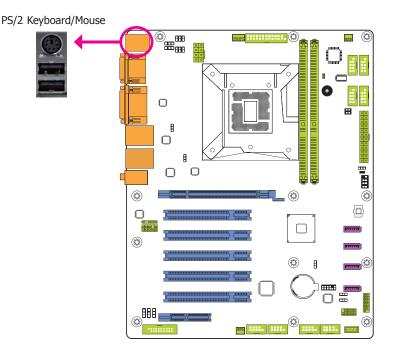
Rear Panel I/O Ports



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-I (DVI-D signal) 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.

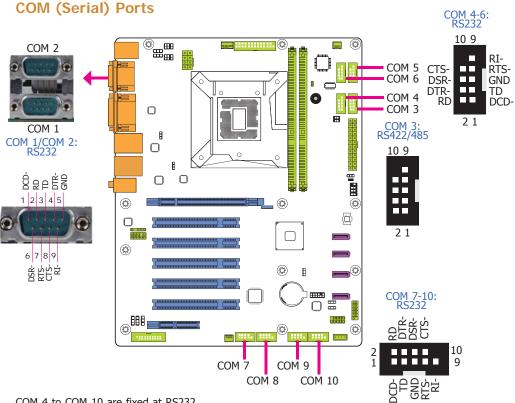
BIOS Setting

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 720mA.



COM 4 to COM 10 are fixed at RS232.

The pin functions of COM 3 port will vary according to JP2's setting. JP15 (for COM 1) and JP14 (COM 2) are used to configure Serial COM ports to pure RS232 or RS232 with power. Refer to "COM3 RS422/RS485 Select" and "COM1/COM2 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.

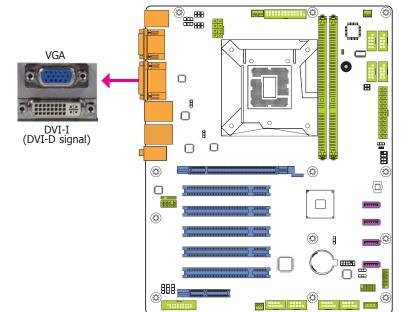
BIOS Setting

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

Graphics Interfaces

The display ports consist of the following:

- 1 VGA port
- 1 DVI-I (DVI-D signal) 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-I Port (DVI-D signal)

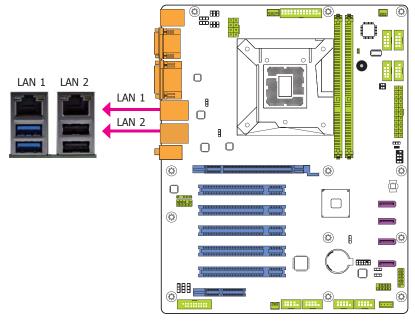
The DVI (Digital Visual Interface) port is used to connect a digital LCD monitor or LCD TV.

Connect the display device's cable connector to the DVI-I port (DVI-D signal) at location CN13. After you plug the cable connector into the DVI-I port (DVI-D signal), 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

• 2 Intel® I210 PCI Express Gigabit Ethernet controllers

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

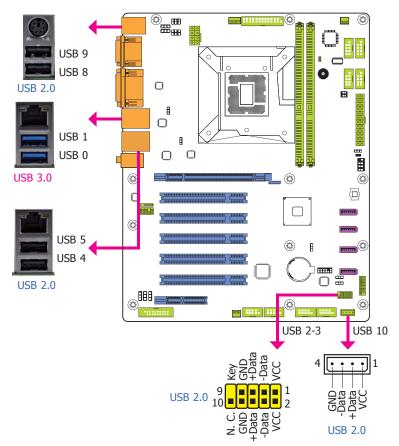
BIOS Setting

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.

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 3.0/2.0/1.1 ports (USB 0-1) and four onboard USB 2.0/1.1 ports (USB 4-5/8-9). The 10-pin connector allows you to connect 2 additional USB 2.0/1.1 ports (USB 2-3) and the vertical USB connector is designed to connect 1 external USB 2.0/1.1 port (USB 10). 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

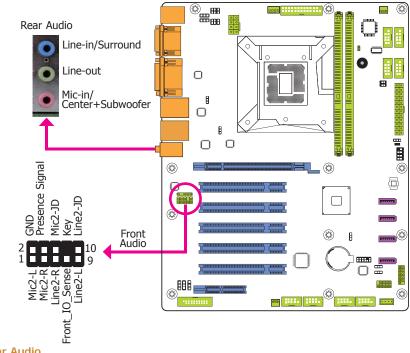
JP4, JP5, JP6 and JP8 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.



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

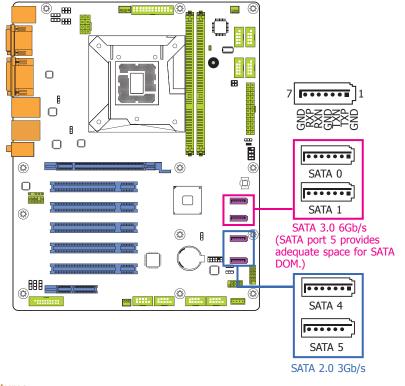
Install the audio driver. Refer to the chapter 4 for more information.

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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

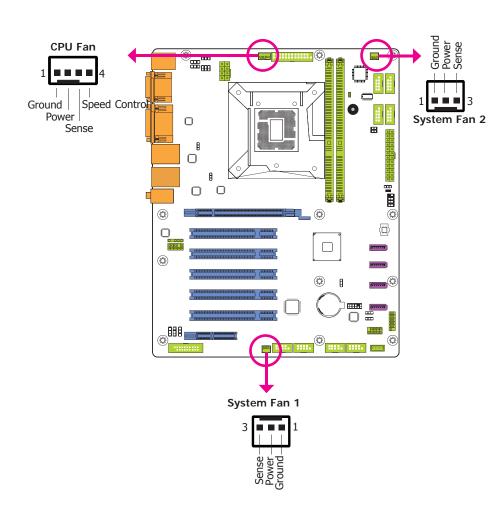
Configure the Serial ATA drives in the Advanced menu ("SATA Configuration" submenu) of the BIOS. Refer to the chapter 3 for more information.

Some 3 with th or mSA

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.

Cooling Fan Connectors

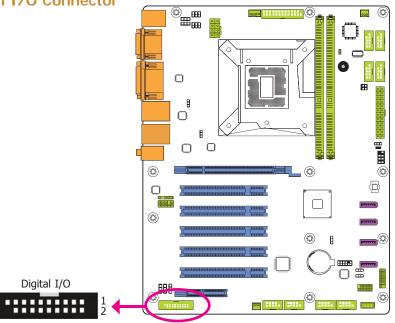
Digital I/O Connector



These 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 ("PC Health Configuration" submenu) of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.



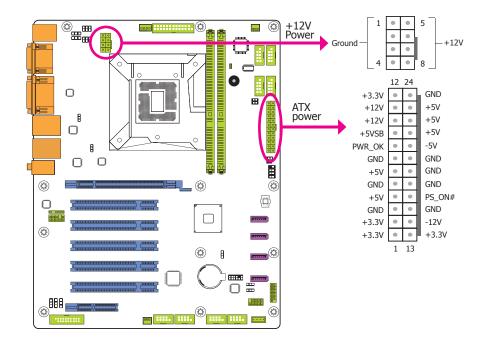
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

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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		

Power Connectors



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

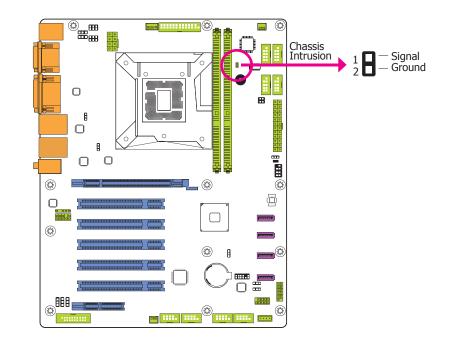
The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.

Important:

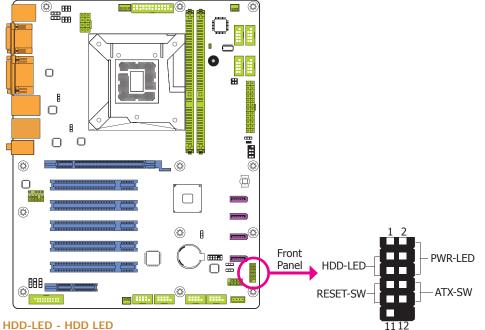
Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

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



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

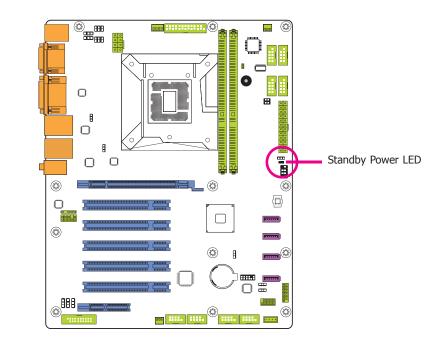
This switch is used to power on or off the system.

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.

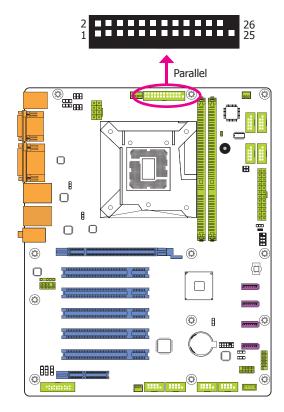
	Pin	Pin Assignment		Pin	Pin Assignment
	3	HDD Power	PWR-LED	2	LED Power
HDD-LED	5	Signal		4	LED Power
RESET SW	7	Ground		6	Signal
	9	RST Signal	ATX-SW	8	Ground
	11	N.C.		10	Signal

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.

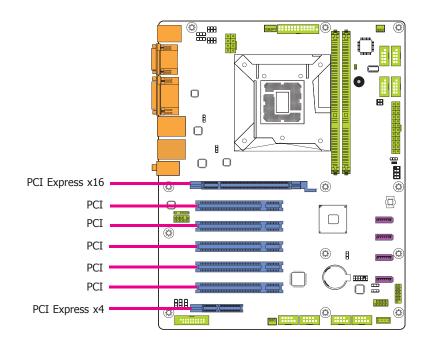
Parallel Port



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.

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.

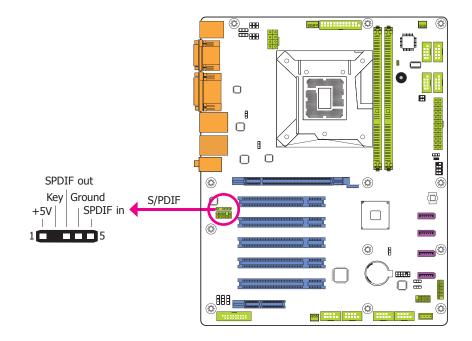
PCI Slot

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

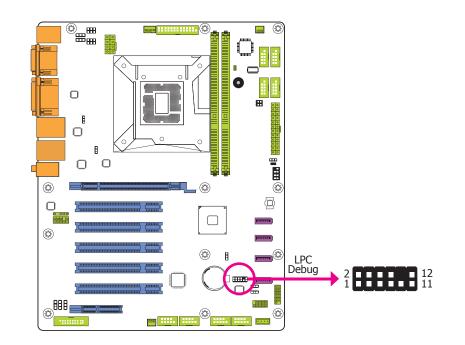
Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

S/PDIF Connector



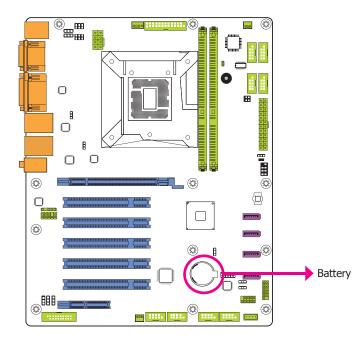
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned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

LPC Connector



The Low Pin Count Interface was defined by Intel[®] Corporation to facilitate the industry's transition towards legacy free systems. It allows the integration of low-bandwidth legacy I/O components within the system, which are typically provided by a Super I/O controller. Furthermore, it can be used to interface firmware hubs, and embedded controller solutions. Data transfer on the LPC bus is implemented over a 4 bit serialized data interface, which uses a 33MHz LPC bus clock. For more information about LPC bus refer to the Intel[®] Low Pin Count Interface Specification Revision 1.1'.

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 recommended 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.



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 hightlight up or down between submenu or fields.	
<esc></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></f1>	Displays general help	
<f2></f2>	Pervious values	
<f3></f3>	Optimized defaults	
<f4></f4>	Saves and resets the setup program.	
<enter></enter>	Press <enter> to enter the highlighted submenu.</enter>	

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.

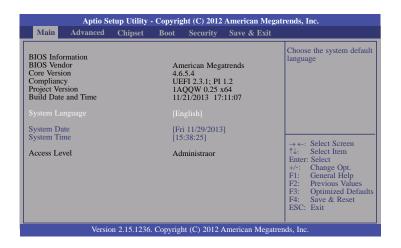
Submenu

When " \blacktriangleright " 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.



Main	Advanced	Chipset	Boot	Security	Save & Exi	it
 Trustee CPU C SATA C PCH-F USB C Super 1 PC Heat Second 	Power Manager l Computing configuration Configuration W Configuration ionfiguration IO Configuration alth Status I Super IO Coni rk Stack	on n				ACPI power managemen configuration
 Intel(R) I210 Gigabit Network Connection - 00:01:29:53: Intel(R) I210 Gigabit Network Connection - 00:01:29:53: 				→ \leftarrow : Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Reset ESC: Exit		

ACPI Power Management Configuration

This section is used to configure the ACPI Power Management.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced			
ACPI Power Management Configuration Resume by PME Resume by Ring Resume by RTC Alarm	[Disabled] [Disabled] [Disabled]	About Resume by PME (PCI, PCIE, LAN). → ←: Select Screen ↑↓: Select Item Enter: Select	
		 Lintel, Select Fl: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit 	
Version 2.15.1236, Copyr	right (C) 2012 American Megatren	ids. Inc.	

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.

Trusted Computing

This section configures settings relevant to Trusted Computing innovations.

Aptio Setup Utility - O	Copyright (C) 2012 American Megat	rends, Inc.		
Advanced				
Configuration Security Device Support Current Status Information No Security Device Found	[Disable]	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. → ←: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

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.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.				
Advanced				
		Number of cores to enable in each processor package. → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset		
L1 Data Cache L1 Code Cache L2 Cache L3 Cache Active Processor Cores Intel Virtualization Technology EIST 	32 KB x4 32 KB x4 256 KB x4 6144 KB [All] [Enabled] [Enabled] [Disabled]	ESC: Exit		
· / II	pyright (C) 2012 American Megatre	nds, Inc.		

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

When this field is set to Enabled, the 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.

Intel TXT(LT) Support

Enables or disables the support of the Intel Trusted Execution Technology.

SATA Configuration

This section is used to configure settings of SATA devices.

Advanced		
SATA Controller(s) SATA Mode Selection	[Enabled] [IDE]	Enable or disable SATA Device.
Serial ATA Port 0 Software Preserve Serial ATA Port 1 Software Preserve Serial ATA Port 4 Software Preserve Serial ATA Port 5 Software Preserve	Empty Unknown Empty Unknown Empty Unknown Empty Unknown	
		$ \rightarrow \leftarrow: Select Screen \uparrow i: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Reset ESC: Exit$

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:

Aptio Setup U Advanced	itility - Copyright (C) 2012 An	nerican Megatrends, Inc.
SATA Controller(s) SATA Mode Selection Software Preserve Serial ATA Port 1 Software Preserve Serial ATA Port 4 Software Preserve Serial ATA Port 5 Software Preserve	[Enabled] [IDE] Empty Unknown Empty Unknown Empty Unknown Empty Unknown	Determines how SATA controller(s) operate. $\rightarrow \leftarrow$: Select Screen $\uparrow \downarrow$: Select Item Enter: Select $+ \not$ -: Change Opt. $+ \not$ -: 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 AHCI mode is selected in the SATA Mode Selection, it will display the following information:

Advanced		
SATA Controller(s) SATA Mode Selection SATA Controller Speed	[Enabled] [AHCI] [Default]	Determines how SATA controller(s) operate.
Serial ATA Port 0 Software Preserve Port 0 Hot Plug Serial ATA Port 1 Software Preserve Port 1 Hot Plug Serial ATA Port 4 Software Preserve Port 4 Hot Plug Serial ATA Port 5 Software Preserve Port 5 Hot Plug	Empty Unknown [Enabled] Empty Unknown [Enabled] [Disabled] Empty Unknown [Enabled] [Disabled] Empty Unknown [Enabled] [Disabled]	$\rightarrow \leftarrow: Select Screen \\\uparrow \downarrow: Select Item \\Enter: Select \\+/-: Change Opt. \\F1: General Help F2: Previous Values F3: Optimized Default F4: Save and Reset ESC: Exit$

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.

PCH-FW Configuration

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

Aptio Setup Utility Advanced	- Copyright (C) 2012 American Megati	rends, Inc.		
ME FW Version ME Firmware Mode ME Firmware SKU ME Firmware SKU Firmware Update Configuration	9.0.10.1372 Normal Mode Full Sku Firmware 1.5MB	Configure Management Engine Technology Parameters → ←: Select Screen ↑ Select Item Enter: Select Fil: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

Firmware Update Configuration

Enables or disables the Me FW Image Re-Flash function.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced			
Me FW Image Re-Flash	[Disabled]	Enable/Disable Me FW Image Re-Flash function.	
		→ \leftarrow : 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.			

USB Configuration

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

USB Configuration		Enables Legacy USB
USB Module Version USB Devices:	8.10.27	support. AUTO option disables legacy support if no USB devices are connected. DISABLE
2 Keyboards, 2 Hubs		option will keep USB devices available only for
Legacy USB Support USB 3.0 Support XHCI Hand-off EHCI Hand-off	[Enabled] [Enabled] [Enabled] [Disabled]	EFI applications.
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit

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.

Aptio Setup Utility - Advanced	• Copyright (C) 2012 America	an Megatrends, Inc.
Super IO Configuration Super IO Chip Restore AC Power Loss	NCT6106D [Power Off]	Restore AC Power Loss Help.
 WatchDog Timer Unit Super IO Watchdog Timer Serial Port 0 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Serial Port 5 Configuration Parallel Port Configuration 	[Second] 0	→ \leftarrow : Select Screen $\uparrow \downarrow$: 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.

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
Serial Port 0 Configuration		Enable or Disable Serial
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	Port (COM)
Change Settings	[Auto]	
		 → ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236. Copyr	right (C) 2012 American Megatren	ds, Inc.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
Serial Port 1 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=2F8h; IRQ=3; [Auto]	Enable or Disable Serial Port (COM)
		$\rightarrow \leftarrow: Select Screen \\\uparrow \downarrow: Select Item \\Enter: Select \\+ /: Change Opt. \\Fl: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit$
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Aptio Setup Utilit	y - Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 2 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=3E8h; IRQ=7; [Auto]	Enable or Disable Serial Port (COM)
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. FI: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.123	6. Copyright (C) 2012 American M	egatrends, Inc.

Aptio Setup Utility Advanced	y - Copyright (C) 2012 American M	Megatrends, Inc.
Serial Port 3 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=2E8h; IRQ=7; [Auto]	Enable or Disable Serial Port (COM)
		→ \leftarrow : Select Screen $\uparrow \downarrow$: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
Serial Port 4 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=2E0h; IRQ=10; [Auto]	Enable or Disable Serial Port (COM)
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236 Conv	right (C) 2012 American Megatren	de Inc

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
Serial Port 5 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=2F01; IRQ=10; [Auto]	Enable or Disable Serial Port (COM)
		→ \leftarrow : Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236, Copyright (C) 2012 American Megatrends, Inc.		

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 parameters of Parallel port (LPT/LPE).

Aptio Setup Utilit Advanced	ty - Copyright (C) 2012 American Me	gatrends, Inc.
Parallel Port Configuration Parallel Port Change Settings Device Mode	[Enabled] [Auto] [STD Printer Mode]	Enable or Disable Parallel Port (LPT/LPTE).
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.12	36. Copyright (C) 2012 American Mega	atrends, Inc.

Parallel Port

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

Change Settings

Selects the IO setting for the super I/O device.

Device Mode.

Changes the mode for the printer port.

PC Health Status

This section displays the hardware health monitor.

PC Health Status Smart Fan Function		Smart Fan Function Setting
Case Open CPU Temperature System Temperature CPU Fan Speed System Fan 1 Speed VCore +5V +12V +1.5V +3.3V 3VSB VBAT	[Disabled] : +87.0 C : 436.0 C : 3349 RPM : N/A : N/A : +1.776 V : +5.116 V : +12.144 V : +1.520 V : +3.408 V : +3.376 V : +3.056 V	→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save and Reset ESC: Exit

Smart Fan Function

Advanced		
Smart Fan Function		▲ Enable CPU Smart Fan
CPU Smart Fan Control Boundary 4 Boundary 3 Boundary 2 Boundary 1 Speed Count 5 Speed Count 5 Speed Count 2 Speed Count 2 Speed Count 1 System Smart Fan (1) Control Boundary 4 Boundary 3 Boundary 3 Boundary 1 Speed Count 5 Speed Count 5 Speed Count 4 Speed Count 3 Speed Count 1 System Smart Fan (2) Control Boundary 4 Boundary 4 Boundary 4 Boundary 1 Speed Count 5 Speed Count 5 Speed Count 5 Speed Count 1 System Smart Fan (2) Control Boundary 4 Boundary 4 Boundary 1 Speed Count 5 Speed Co	[Enabled] 60 50 40 30 100 75 50 40 30 [Enabled] 60 50 40 30 [Enabled] 60 50 40 30 [Enabled] 60 50 40 30 100 75 50 50 40 30 100 75 50 50 40 30 100 75 50 30 100 75 50 30 100 100 75 50 30 100 100 75 50 30 100 100 100 100 100 100 100	→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Reset ESC: Exit

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 set parameters for the system second super IO chip.

Aptio Setup Utility Advanced	- Copyright (C) 2012 America	an Megatrends, Inc.
Second Super IO Configuration Second Super IO Chip Serial Port 6 Configuration Serial Port 7 Configuration Serial Port 8 Configuration Serial Port 9 Configuration	NCT5104D	Set Parameters of Serial Port 6.
		→ \leftarrow : Select Screen $\uparrow\downarrow$: 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.		

Serial Port 6 Configuration to Serial Port 9 Configuration

Sets parameters of serial port 6 to serial port 9.

Aptio Setup Utility Advanced	- Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 6 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=240h; IRQ=5; [Auto]	Enable or Disable Serial Port (COM)
		→ \leftarrow : Select Screen \uparrow ↓: Select Item Enter: Select +/-: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236	. Copyright (C) 2012 American M	egatrends, Inc.

Aptio Setup Utilit Advanced	y - Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 7 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=248h; IRQ=5; [Auto]	Enable or Disable Serial Port (COM)
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.123	6. Copyright (C) 2012 American M	legatrends, Inc.

Aptio Setup Utility Advanced	y - Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 8 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=250h; IRQ=5; [Auto]	Enable or Disable Serial Port (COM)
		→ \leftarrow : Select Screen $\uparrow \downarrow$: Select Item Enter: Select +/-: Change Opt. +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
Serial Port 9 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=258h; IRQ=5; [Auto]	Enable or Disable Serial Port (COM)
		→ \leftarrow : Select Screen \uparrow ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

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.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
Network Stack	[Disabled]	Enable/Disable UEFI network stack.
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

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

Aptio Setup Utility -	Copyright (C) 2012 American M	Megatrends, Inc.	
Network Stack Ipv6 PXE Support Ipv6 PXE Support	[Enabled] [Enabled] [Enabled]	Enable/Disable UEFI network stack. → ←: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. FI: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit	
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			

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) I210 Gigabit Network Connection - 00:01:29:53... (Only for reference)

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.					
Advanced					
PORT CONFIGURATION MENU NIC Configuration		Click to configure the network device port.			
Blink LEDs (range 0-15 seconds)	0				
PORT CONFIGURATION INFORMATION UEFI Driver: Adapter PBA: Chip Type: PCI Device ID PCI Bus: Device: Function: Link Status Factory MAC Address: Alternate MAC Address:	Intel(R) 1GbE DEV 5.1.00 001300-000 Intel i210 1533 4:0:0 [Disconnected] 00:01:29:53:38:F6 00:01:29:53:38:F6	 → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit 			
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.					

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.

Chipset

This section configures relevant chipset functions.

	Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit	
	Agent (SA) C O Configuration	onfiguration				System Agent (SA) Parameters → ←: Select Screen 1↓: Select Item Enter: Select +/: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
	Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			nds, Inc.		

System Agent (SA) Configuration

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.			
Chipset			
System Agent Bridge Name System Agent RC Version VT-d Capability	Haswell 1.5.0.0 Supported	Check to enable VT-d function on MCH.	
VT-d			
 Graphics Configuration NB PCIe Configuration Memory Configuration 		→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset	
		ESC: Exit	
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			

VT-d

Checks to enable VT-d function on MCH.

Graphics Configuration

This field configures the graphics settings.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
Graphics Configuration IGFX VBIOS Version IGfx Frequency Primary Display Internal Graphics DVMT Pre-Allocated DVMT Total Gfx Mem ► LCD Control	2171 700 MHz [Auto] [Auto] [32M] [256M]	Select which of IGFX/ PEG/PCI Graphics device should be Primary Display.
		→ \leftarrow : Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Reset ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Primary Display

Auto When the system boots, it will auto detects 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.

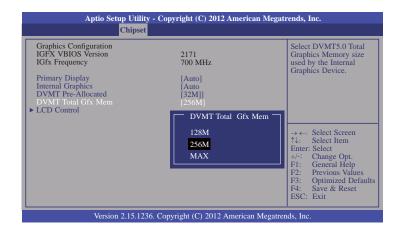
DVMT Pre-Allocated

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.			
Chipset			
Graphics Configuration IGFX VBIOS Version IGfx Frequency Primary Display Internal Graphics DVMT Total Gfx Mem > LCD Control	2171 700 MHz DVMT Pre-Allocated 32M 64M 96M 128M 160M 192M 224M 256M 288M 320M 352M 384M 416M 448M 448M 448M 512M	Select DVMT5.0 Pre- Allocated (Fixed) Graph- ics Memory size used by the Internal Graphics Device. → ←: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
	1024M		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			

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 Primary IGFX Boot Display	[VBIOS Default]	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 sup- ported only on primary display. $\Rightarrow \leftarrow$: Select Screen $\uparrow \downarrow$: Select Item Enter: Select $\pm/-$: Change Opt. $\pm/-$: Change Opt. $\pm/-$: Change Opt. $\pm/-$: Optimized Defaults \mp 3: Optimized Defaults \mp 4: 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 - O Chipset	Copyright (C) 2012 An	nerican Megatrends, Inc.
LCD Control Primary IGFX Boot Display Secondary IGFX Boot Display	[CRT] [None]	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. → e: 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 PEG0 - Gen X	[Auto]	Configure PEG0 B0:D1:F0 Gen1-Gen2.	
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 Memory Frequency Total Memory Memory Voltage DIMM#1 DIMM#2 CAS Latency (tCL) Minimum delay time CAS to RAS (tRCDmin) Row Precharge (tRPmin) Active to Precharge (tRASmin)	1.5.0.0 1333 Mhz 1024 MB (DDR3) 1.50V 1024 MB (DDR3) Not Present 9 9 9 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 Intel PCH SKU Name Intel PCH Rev ID > PCI Express Configuration > USB Configuration > PCH Azalia Configuration	1.5.0.0 H81 05/C2	PCI Express Configuration settings.		
Onboard I210 LAN 1 Controller Onboard I210 LAN 2 Controller	[Enabled] [Enabled]			
High Precision Event Timer Configuration High Precision Timer	[Enabled]			
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

Onboard I210 LAN 1/2 Controller

Enables or disables the onboard I210 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.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Chipset			
PCI Express Configuration PCI Express Root Port 1 	PCI Express Root Port 1 Settings.		
	→ \leftarrow : 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.			

PCI Express Root Port 1

Selects settings of the PCI Express Root Port 1.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Chipset			
PCI Express Root Port 1 PCIe Speed	[Auto]	Select PCI Express port speed. → ←: 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.			

PCIe Speed

Selects the speed of PCI Express port.

USB Configuration

This field is used to configure the USB settings.

Aptio Setup Utility - C Chipset	opyright (C) 2012 Americ	an Megatrends, Inc.	
USB Configuration USB Precondition XHCI Mode USB Ports Per-Port Disable Control	[Disabled] [Auto] [Disabled]	Precondition work on USB host controller and root ports for faster enumeration.	
		→ \leftarrow : Select Screen \uparrow .': 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.			

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:

Aptio Setup Utility - C Chipset	opyright (C) 2012 Americ	can Megatrends, Inc.	
USB Configuration USB Precondition XHCI Mode EHCI1 EHCI2 USB Ports Per-Port Disable Control	[Disabled] [Disabled] [Enabled] [Enabled] [Disabled]	Mode of operation of XHCI controller.	
		→ \leftarrow : Select Screen $\uparrow \downarrow$: 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.			

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:

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Chipset				
USB Configuration USB Precondition XHCI Mode USB Ports Per-Port Disable Control USB Port #0 USB Port #1 USB Port #2 USB Port #3 USB Port #3 USB Port #5 USB Port #5 USB Port #9 USB Port #9 USB Port #10	[Disabled] [Auto] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled]	Control each of the USB ports (0~13) disabling. $\rightarrow \leftarrow$: Select Screen \uparrow_{L} : Select Item Enter: Select Item Enter: Select Item 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 Azalia Configuration

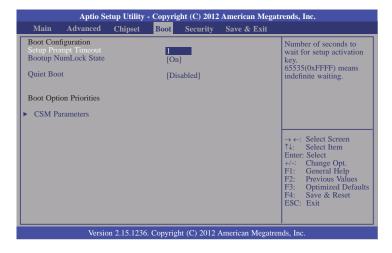
This field is used to configure the PCH Azalia settings.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Chipset			
PCH Azalia Configuration Azalia	[Auto]	Control detection of the Azalia device. Disable= Azalia will be unconditionally disabled Enabled= Azalia will be unconditionally enabled Auto=Azalia will be ena- bled if present, disabled otherwise. → ←: Select Screen ↑↓: Select Item Enter: Select Henter: Select Henter: 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.			

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

Enables or disables these USB ports.

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

	tup Utility - Copyr	ight (C) 2012	American Megat	rends, Inc.
Main Advanced	Chipset Boot	Security	Save & Exit	
Launch CSM Boot option filter Launch PXE OpROM pt Launch Storage OpROM Other PCI device ROM p	Dicy [U policy [D policy [L	nabled] EFI and Legat o not launch] egacy only] egacy OpROM		This option controls if CSM will be launched. → ←: Select Screen ↑↓: Select Item
Versio	n 2.15.1236. Copyri	ght (C) 2012 A	American Megatrer	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit

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 $\ensuremath{\mathsf{OpROM}}$ to launch.

Security

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.				
Main Advanced Chipset	Boot	Security	Save & Exit	
	en this)		Set Administrator Password. → ←: 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.				

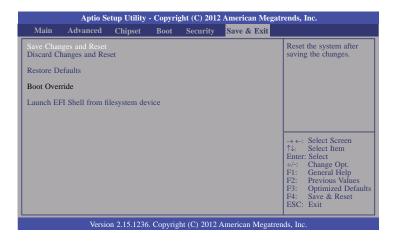
Administrator Password

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	. 1		
AMI Firmware Update Utility(APTIO) v2.25 Copyright (C)2008 American Megatrends Inc. All Rights Reserved.				
Reading file Erasing flash Writing flash Erasing BootBlock Writing BootBlock Verifying BootBlock C:\AFU\AFUDOS>	done done done done done done done done			

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.

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Chapter 4 - Supported Software

Install drivers, utilities and software applications that are required to facilitate and enhance the performance of the system board. You may acquire the software from your sales representatives, from an optional DVD included in the shipment, or from the website download page at https://www.dfi.com/DownloadCenter.

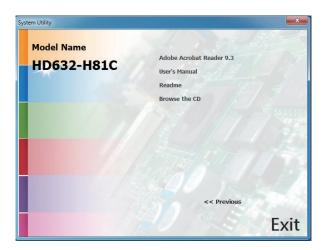
For Windows 8





For Windows 7







Note:

This step can be ignored if the applications are standalone files.

For Windows XP





Microsoft .NET Framework 3.5 (For Windows XP)



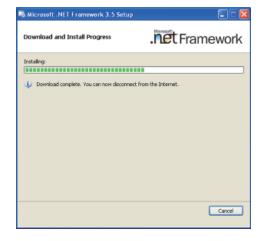
Before installing Microsoft .NET Framework 3.5, make sure you have updated your Windows XP operating system to Service Pack 3.

To install the driver, click "Microsoft .NET Framework 3.5" on the main menu.

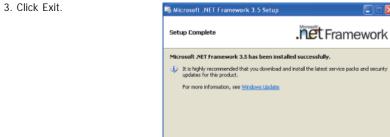
- 1. Read the license agreement carefully.
- Click "I have read and accept the terms of the License Agree ment" then click Install.



2. Setup is now installing the driver.



Exit



Intel Chipset Software Installation Utility

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

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

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

Intel® Chipset Device Software	
Intel® Chipset Device Software	inter
Welcome to the Setup Program	
This setup program will install the Intel® Chipset Device Software strongly recommended that you exit all programs before continuin	
< <u>B</u> ack.	Next > Cancel Intel@ Installation Framework

2. Read the license agreement then click Yes.



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

	adme File Information	-
	er to the Readme file below to view the system requirements and installation informal	ion.
	ss the Page Down key to view the rest of the file.	
*	Product: Intel(R) Chipset Device Software	***
*	Release: Production Version	
*	Version: 9.0.0.1008	
*	Target Chipset#: Intel(R) 4 Series Chipset	
*	Date: May 01 2008	
* * :	***************************************	***
		>
<		

4. Click Finish to exit setup.



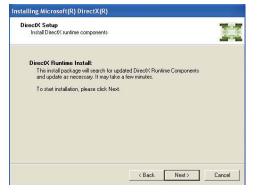
Microsoft DirectX 9.0C (For Windows XP)

To install the utility, click "Microsoft DirectX 9.0C Driver" on the main menu.

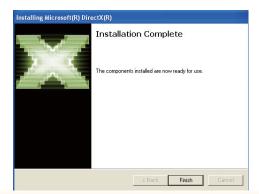
1. Click "I accept the agreement" then click Next.



2. To start installation, click Next.



 Click Finish. Reboot the system for DirectX to take effect.



4. Setup is now installing the

driver. Click Next to continue.

Intel HD Graphics Drivers (For Windows XP)

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

1. To start installation, click Intel® Graphics Media Accelerator Driver Next. Intel[®] Graphics Media Accelerator Driver Welcome to the Setup Program This setup program will install the following components: - Intel® Graphics Media Accelerator Driver It is strongly recommended that you exit all programs before continuing. Click Next to continue. 5. Click "Yes, I want to restart < Ball Next > Cancel this computer now" then - Iniskin Installation Peak click Finish. Restarting the system will allow 2. Read the license agreement Intel® Graphics Media Accelerator Driver the new software installation to then click Yes. take effect. Intel® Graphics Media Accelerator Driver (inte License Agreement You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User) ~ IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software. Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies; < Back Yes No Intel® Installation Framewo 3. Go through the readme Intel® Graphics Media Accelerator Driver document for system requirements and installation tips then (intel) Intel® Graphics Media Accelerator Driver click Next. Readme File Information Refer to the Readme file below to view the system requirements and installation information. ***** ******** Production Version Releases

> Nicrosoft Windows* 2000 Nicrosoft Windows* XP

- Intel® Graphics Media Accelerator Driver

 Intel® Graphics Media Accelerator Driver
 Setup Progress

 Please wat while the following setup operations are performed:

 Copying Flee: ClyProgram FleeStheffinite(1) Graphics Media Accelerator Driver funnstaller-Th
 Copying Flee: ClyProgram FleeStheffinite(1) Graphics Media Accelerator Driver funnstaller-Th
 Copying Flee: ClyProgram FleeStheffinite(1) Graphics Media Accelerator Driver funnstaller-Th
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 Copying Flee: ClyProgram FleeStheffinite(1) Graphics Media Accelerator Driver funnstaller-Th
 Copying Flee: ClyProgram FleeStheffinite(1) Graphics Media Accelerator Driver funnstaller-Th
 Copying Flee: ClyProgra
- Intel® Graphics Media Accelerator Driver

 Intel@ Graphics Media Accelerator Driver

 Setup Is Complete

 Vourmust restart this computer for the changes to take effect. Would you like to restart the
 computer now?

 Ves, I want to restart this computer now.
 No, I will restart this computer later.

 Click Finish, then remove any installation media from the drives.

 Finish

v

Next > Cancel

< Back Next >

Intel Graphics Drivers (For Windows 7 and Windows 8)

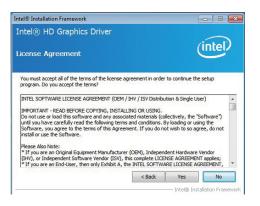
To install the driver, click "Intel Graphics Drivers" on the main menu.

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

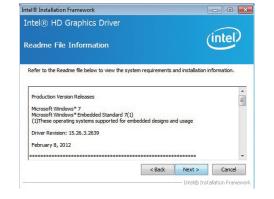
tel® Installation Framework	
Intel® HD Graphics Driver Welcome to the Setup Program	intel
This setup program will install the following components: - Intel® HD Graphics Driver - Intel® Display Audio Driver	
It is strongly recommended that you exit all programs before co	ntinuing. Click Next to continue.
It is strongly recommended that you exit all programs before co	

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

2. Read the license agreement then click Yes.



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



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

(intel)		Graphics Driver	el® HD (up Progre
	ations are performed:	the following setup operati	ase wait while
dation V-landware/MFT fation V-landware/MFT fx_mft_h264vd_32. fx_mft_h264ve_32. fx_mft_h264ve_32. fx_mft_vc1vd_32.dl fx_mft_vc1vd_32.dl fx_mft_vpp_32.dll i-1	Wicrosoft Windows Medi Wicrosoft Windows Medi on Files [Intel Media SDK V; on Files [Intel] Media SDK V;	Key: HKLM\SOFTWARE\M Key: HKLM\SOFTWARE\M Key: HKLM\SOFTWARE\M C:\Program Files\Common I C:\Program Files\Common I C:\Prog	eating Registry eating Registry gistering DLL: gistering DLL: gistering DLL: gistering DLL: gistering DLL: leting Registry
et	15. 10. 2639 (WIN32 (Opend	inue.	

- 5. Click "Yes, I want to restart this computer now" then click Finish.
- Restarting the system will allow the new software installation to take effect.



3. Setup is currently installing the driver. After installation

has completed, click Next.

Intel® Installation Framework

Setup Progress

Intel® Management Engine Components

(intel)

Intel Management Engine Drivers

To install the driver, click "Intel Management Engine Drivers" on the main menu.

1	Setup is ready to install the	Intel® Installation Framework			
	driver. Click Next.			Please wait while the following setup operations are performed:	
	differ. click hext.	Intel® Management Engine Components		Creating Process: regsvr32.exe Creating Process: regsvr32.exe	^
		(intel)		Copying File: C: \Windows\system32\drivers\IntelMEFWVer.dll Creating Process: C: \Program Files\Intel\Intel(R) Management Engine C	Components EWCarvics
		Welcome to the Setup Program		Deleting File: C:\Program Files\Intel\Intel(R) Management Engine Comp	onents FWService Inte
				Copying File: C: \Program Files \Intel\Intel(R) Management Engine Comp Creating Process: C: \Program Files \Intel\Intel(R) Management Engine C	Components FWService
		This setup program will install the Intel® Management Engine Components.		Creating Process: C:\Program Files\Intel\Intel(R) Management Engine C Installing: Intel® ME FW Recovery Agent	Components FWService
		It is strongly recommended that you exit all programs before continuing. Click Next to continue.		Copying File: C:\Program Files\Intel\Intel(R) Management Engine Comp	onents\Firmware Reco
				Click Next to continue.	
		Install Intel® Control Center			
		Intel® Control Center provides a centralized starting point for Intel applications making it			Next >
		easier to find the programs that you need.		Ir	ntel® Installation Framework
			4 After completing installe		
		< Back Next > Cancel	4. After completing installa-	Intel® Installation Framework	
		Intel® Installation Framework	tion, click Finish.	Intel® Management Engine Components	\frown
					(intel)
				Setup Is Complete	0
2	Read the license agreement	Intel® Installation Framework			
۷.	then click Yes.			The setup program successfully installed the following components: - Intel® Management Engine Interface	
	then then tes.	Intel® Management Engine Components		- Intel® Dynamic Application Loader	
		(intel)		- Intel® Identity Protection Technology (Intel® IPT) - Serial Over LAN	
		License Agreement		 Intel® Management and Security Status Local Management Service 	
				- User Notification Service	
		You must accept all of the terms of the license agreement in order to continue the setup		Click Finish to complete the setup process.	
		program. Do you accept the terms?			
		INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)			
		IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software")			1.37
		until you have carefully read the following terms and conditions. By loading or using the			Finish
		Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.			tel® Installation Framework
		Please Also Note:			
		If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;			
		* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,			
		< Back Yes No			

- Intel® Installation Fram

Audio Drivers

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

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



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

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



Intel LAN Drivers (For Windows XP)

The LAN driver for Windows XP supporting on the HD632-H81 system boards has to be installed manually. When you want to install the LAN driver for Windows XP, please follow the steps below to accomplish the installation.

1. Launch the Hardware Update Wizard for the selected device. Select "Update Driver."

-		
	telp	_ 6
	8 🕺 🕿 🗶 😹	
Compare Management (Local) Service Management (Local) Generater Management (Local) Generater Management Generater Management	Keybards Keybards	

2. Choose "Install from a list or specific location (Advanced)" and click "Next" to continue the installation.

This wizard helps you instal	software for:			
Ethernet Controller	Ethernet Controller			
If your hardware or floppy disk, in	If your hardware came with an installation CD or floppy disk, insert it now.			
What do you want the wiza	rd to do?			
	utomatically (Recommended) ecific location (Advanced)			
Click Next to continue.				
K Bac	Next > Cancel			

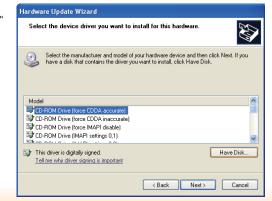
- Choose the option "Don't search. I will choose the driver to install" in order to select the device driver from a list, and click "Next."
- Hardware Update Wizard
 Please choose your search and installation options.

 Search for the best driver in these locations.
 Use the check boxes below to limit or expand the default search, which includes local paths and removable media (The best driver found will be installed.
 Search removable media (The best driver found will be installed.
 Search removable media (The best driver found will be installed.
 Search removable media (The best driver found will be installed.
 Search removable media (The best driver found will be installed.
 Search removable media (The Desktop\CDNIGATE vertice).
 Browse
 O Don't search relia the driver to install.
 Choose the driver to install.
 Choose will be the best match for your hardware.
 (Back Next) Cancel

4. Select a hardware type: DVD/CD-ROM drives. Then, click "Next."



5. Select your hardware disk and then click "Have Disk..."



 Insert the installation disk and make sure the selected drive is correct.

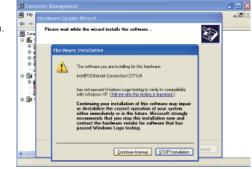


(For 32-bit, the file name is "e1d5132.inf".)

 Select the device driver you want to install for this hardware and then click "Next."

Hardware Update Wizard	
Select the device driver you want to in	nstall for this hardware.
Select the manufacturer and model of y have a disk that contains the driver you	our hardware device and then click Next. If you a want to install, click Have Disk.
Show compatible hardware	
Model	
Intel(R) Ethernet Connection I217-LM	
This driver is not digitally signed! Tell me why driver signing is important	Have Disk
	< Back Next > Cancel

8. Check the software you are installing, Then, click "Continue Anyway" to start the installation.



61

9. Click "Finish" to close the wizard. Hardware Update Wizard



 After completing the installation, the Network adapters "Intel(R) Ethernet Connection I217LM" will appear on the computer management list.

■ File Action View Window +		
Computer Veragement (J. scal) Compu	Berger CF-CFERSTORTS Berger CF-CFERSTORTS Dec Constant Dec CFERSTORTS DEC CFERSTORTS	

Intel LAN Drivers (For Windows 7 and Windows 8)

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

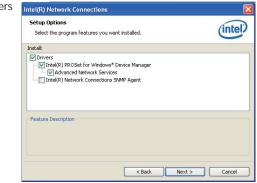
1. Setup is ready to install the driver. Click Next.



2. Click "I accept the terms in the license agreement" then click "Next".



 Select the program featuers you want installed then click Next.



4. Click Install to begin the installation.

ancel to
ancel to
ancel to

5. After completing installation, click Finish.



DFI Utility

DFI Utility provides information about the board, Watchdog, and DIO. To access the utility, click "DFI Utility" on the main menu.



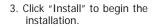
Note: If you are using Windows 7, you need to access the operating system as an administrator to be able to install the utility.

 Setup is ready to instal the DFI Utility driver Click "Next".



 Click "I accept the terms in the license agreement" then click "Next".

	greement				
Please re	ad the following lice	nse agreemen	t carefully.		C
To add your editor.	own license text to	this dialog, sp	ecify your lice	nse agreement file	e in the Dialog
 Select Choose 	te to the User Inte the LicenseAgree to edit the dialog the Dialog editor, s	ment dialog. layout.	no ScrollableT	ext control.	
5. Set File	eName to the name	e or your licens	e agreement i	KIT IIC.	
	e Name to the name ild your release, yo		-		Agreement dialog.
After you bi		ur license text	will be display		Agreement dialog. Print
After you bu	uild your release, yo	ur license text	will be display		



🖟 DFI Utility - InstallShield Wizard			×
Ready to Install the Program	_		
The wizard is ready to begin installation.			
If you want to review or change any of exit the wizard.	your installation s	ettings, click Back. (Click Cancel to
Current Settings:			
Setup Type:			
Typical			
Destination Folder:			
C:\Program Files\DFI\DFI Utility\			
User Information:			
Name:			
Company:			
ļ			
InstallShield			
	< Back	Install	Cancel

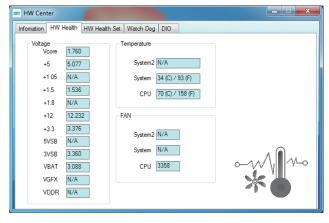
4. After completing installa tion, click "Finish".



The DFI Utility icon will appear on the desktop. Double-click the icon to open the utility.



Information

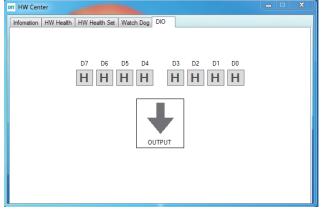


HW Health

HW Health Set

INT HW Center	X
Infomation HW Health HW Health Set Watch Dog DIO	
Enable watch dog function	
Setting	
Timer Value 255	
Counting Mode Sec V	
Reset Mode Software sec	
Keyboard	
V Mouse	

WatchDog



DIO

3. Go through the readme docu-

then click Next.

ment for more installation tips

Intel® Installation Framework

Readme File Information

Intel® USB 3.0 eXtensible Host Controller Driver

Intel USB 3.0 Drivers (For Windows 7)

To install the driver, click "Intel USB 3.0 Driver" on the main menu.

1. Setup is ready to install the driver. Intel® Installation Framework - • -Refer to the Readme file below to view the system requirements and installation information. Click Next. Intel® USB 3.0 eXtensible Host Controller Driver (intel) Production Version Releases Welcome to the Setup Program Microsoft Windows* 7 * Intel(R) USB 3.0 eXtensible Host Controller: 1.0.1.209 This setup program will install the following components: Intel® USB 3.0 eXtensible Host Controller Driver
 Intel® USB 3.0 Hub Driver
 Intel® USB 3.0 Hub Driver
 Intel® USB 3.0 Host Controller Switch Driver January 2012 NOTE: This document refers to systems containing the Intel® USB 3.0 Monitor following Intel processors/chipsets: < Back Next > Click Next to continue. - Intel® Installation Fran 4. Setup is currently installing the Intel® Installation Framework driver. After installation has com-Intel® USB 3.0 eXtensible Host Controller Driver < Back Next > Cancel pleted, click Next. Intel® Installation Framewor Setup Progress 2. Read the license agreement then Intel® Installation Framework Please wait while the following setup operations are performed: - • × click Yes. Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Controller Driver\A . Intel® USB 3.0 eXtensible Host Controller Driver Copying File: C: (Program File: (x88) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Copying File: C: (Program File: (x88)) Untel WinHR (V US3 3.0 eXtensible Host Controller Driver /A Creating Registry Key: HXIMSOFTWARE (Windows) (Qurrent Winston Kum (US383MON= (intel) License Agreement You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms? Click Next to continue. INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User) INPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software. ntel® Installation Frame Please Also Note: * IF you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (HV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT apples; * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT, 5. After completing installation, click Intel® Installation Framework < Back Yes No Finish. - Intel® Installation Frames Setup Is Complete



(intel)

Cancel

(intel)

Þ

Next >

Intel Rapid Storage Technology (For Windows 7 and Windows 8)

The Intel Rapid Storage Technology is a utility that allows you to monitor the current status of the SATA drives. It enables enhanced performance and power management for the storage subsystem.

To install the driver, click "Intel Rapid Storage Technology" on the main menu.

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



2. Read the warning then click Yes.

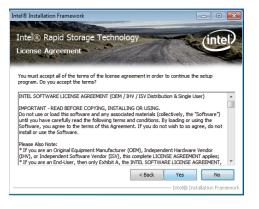


3. Read the license agreement then click Yes.

4. Go through the readme document

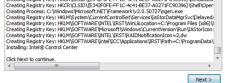
lation tips then click Next.

for system requirements and instal-





5. Setup is now installing the utility. Click Next to continue. Intel® Installation Framewor Intel[®] Rapid Storage Technology Setup Progress Please wait while the following setup operations are performed: Creating Registry Key: HKCR\CLSID\{E342F0FE-FF1C-4c41-BE37-A0271FC90396}\System.Cc Creating Registry Key: HKCR\CLSID\{E342F0FE-FF1C-4c41-BE37-A0271FC90396}\DefaultIco



Intel® Installation Fran

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

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



Infineon TPM Driver and Tool (optional)

To install the driver, click "Infineon TPM driver and tool (option)" on the main menu.

1. The setup program is preparing to install the driver.



2. The setup program is now ready to install the utility. Click Next.

click "Next".

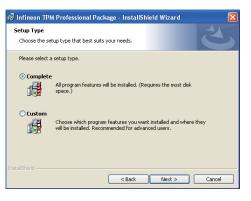


3. Click "I accept the terms in the 🛃 Infineon TPM Professional Package - InstallShield Wizard license agreement" and then License Agreement Please read the following license agreement carefully. Software Setup End User License Conditions for the Infineon TPM Professional Package 1. Attention This software contains copyright protected content (e.g. codes and structures) and confidential content (e.g. algorithms, ideas and concepts) of Infineon Technologies AG and Microsoft Corporation (Microsoft patterns & practices Enterprise Library © Microsoft Corporation). a road thaca licena no and conditio un ditio Print I accept the terms in the license agreement I do not accept the terms in the license agreement Next > Cancel

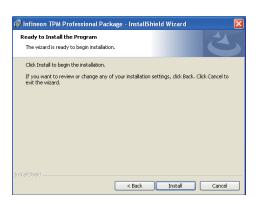
4. Enter the necessary information and then click Next.

Customer Information		
Please enter your information.		
User Name:		
test		
Organization:		
1		

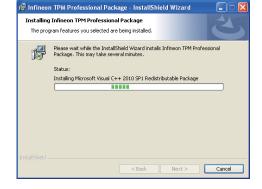
5. Select a setup type and then click Next.



6. Click Install.



 TPM requires installing the Microsoft Visual C++ package prior to installing the utility. Click Install.



8. The setup program is currently installing the Microsoft Visual C++ package.

-	Infineon TPM Professional Package ram features you selected are being installed.
ß	Please wait while the InstallShield Wizard installs Infineon TPM Professional Package. This may take several minutes.
	Status:
	Copying new files
	< Back Next > Cancel

🖟 Infineon TPM Professional Package - InstallShield Wizard

9. Click Finish.



10. Click "Yes" to restart your system.

IN Infineon IPM Professional Package Installer Info
You must restart your system for the configuration changes made to Infineon TPM Professional Package to take effect. Click Yes to restart now or No if you plan to restart later.
Yes No

. III...

Adobe Acrobat Reader 9.3

To install the reader, click "Adobe Acrobat Reader 9.3" on the main menu.

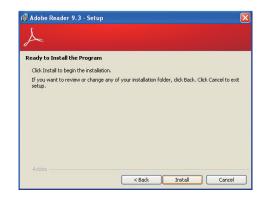
记 Adobe Reader 9.3 - Setup

 Click Next to install or click Change Destination Folder to select another folder.

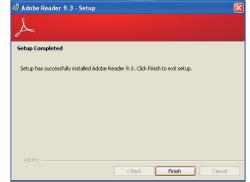
	ion Folder ext to install to this folder, or click Change to install to a different folder.
	Install Adobe Reader 9.3 to:
	C:\Program Files\Adobe\Reader 9.0\
WARNI	NG: This program is protected by copyright law and international treaties.

×

2. Click Install to begin installation.



3. Click Finish to exit installation.



Chapter 5 - Digital I/O Programming Guide

Register Description

The Input Port Register (register 0) reflects the incoming logic levels of the pins, regardless of whether the pin if defined as an input or output by the Configuration Register. They act only on the red operation. Writes to this register have no effect. The default value (X) is determined by the externally applied logic level. Before a red operation, a write transmission is sent with the command byte to indicate to the I²C device that the Input Port Regiser will be accessed next.

Register 0 (Input Port Register)

BIT	1-7	1-6	1-5	1-4	1-3	1-2	I-1	1-0
DEFAULT	Х	Х	Х	Х	Х	Х	Х	Х

The Onput Port Register (register 1) shows the outgoing logic levels of the pins defined as outputs by the Configuration Register. Bit values in this register have no effect on pins defined as inputs. In turns, reads from this register reflect the value that is in the flip-flop contolling the output selection, not the actual pin value.

Register 1 (Onput Port Register)

віт	0-7	0-6	0-5	O-4	0-3	0-2	0-1	0-0
DEFAULT	1	1	1	1	1	1	1	1

The Polarity Inversion Register (register 2) allows polarity inversion of the pins defined as inputs by the Configuration Register. If a bit in this register is set (written with 1), the corresponding port pin's polarity is inverted. If a bit in this register is clear (written with a 0), the corresponding port pin's original polarity is retained.

Register 2 (Polarity Inversion Register)

віт	N-7	N-6	N-5	N-4	N-3	N-2	N-1	N-0
DEFAULT	0	0	0	0	0	0	0	0

The Configuration Register (register 3) configures the direction of the I/O pins. If a bit in this register is set to 1, the corresponding port pin is enabled as an input with a high-impedence output driver. If a bit in this register is cleared to 0, the corresponding port is enabled as an input.

Register 3 (Configuration Register)

BIT	C-7	C-6	C-5	C-4	C-3	C-2	C-1	C-0
DEFAULT	1	1	1	1	1	1	1	1

Function Description

I2CWriteByte(SlaveAddr, SubAddr, Data): Write a Byte data to a specified I2C Device.

I2CReadByte(SlaveAddr, SubAddr, *Data): Read a Byte data from a specified I2C Device.

SetBit(*Data, Bit) : Set Data bit n as "1".

ClrBit(*Data, Bit) : Set Data bit n as "0".

GetBit(Data, Bit) : Return the value of data bit n.

Sample Code

GPIO Configuration

#define	SLAVE_ADDR	0x42
#define	INPUT_PORT	0x00
#define	OUTPUT_PORT	0x01
#define	INVERSION_PORT	0x02
#define	COMFIG PORT	0x03

GpioConfig(int PinNum, int Mode)

BYTE Data; BYTE TempPinNum = PinNum%8;

//Pin0-7 Input/Output Configuration I2C_ReadByte(SLAVE_ADDR, CONFIG_PORT, &Data); if(Mode == 1){SetBit(&Data, TempPinNum);} //Input else {ClrBit(&Data, TempPinNum);} //Output I2C_WriteByte(SLAVE_ADDR, CONFIG_PORT, Data);

return 1;

GPIO Output Process

#define	SLAVE_ADDR	0x42
#define	INPUT_PORT	0x00
#define	OUTPUT PORT	0x01
#define	INVERSION_PORT	0x02
#define	COMFIG_PORT	0x03

GpioOut(int PinNum, int Level)

BYTE Data; BYTE TempPinNum = PinNum%8;

//Pin0-7

I2C_ReadByte(SLAVE_ADDR, OUTPUT_PORT, &Data); if(Level == 0){ClrBit(&Data, TempPinNum);} else {SetBit(&Data, TempPinNum);} I2C_WriteByte(SLAVE_ADDR, OUTPUT_PORT, Data);

return 1;

GPIO Iutput Process

#define SLAVE_ADDR	0x42
#define INPUT PORT	0x00
#define OUTPUT PORT	0x01
#define INVERSION PORT	0x02
#define COMFIG_PORT	0x03

GpioIn(int PinNum, int *Status)

BYTE Data: BYTE Group = PinNum/8; BYTE TempPinNum = PinNum%8;

//Pin0-7 I2C_ReadByte(SLAVE_ADDR, INPUT_PORT, &Data); *Status = GetBit(Data, TempPinNum);

return 1;

Appendix A - Watchdog Sample Code

;Software programming example:

MOV MOV OUT	DX,4EH AL,87H DX,AL		
OUT	·		
;(2) Co timer)	nfiguration Logical	Device 8, register CRF0/CRF1 (WDT Control/WD	
	DX,4EH AL.07H	;Ready to Program Logical Device	
MOV MOV OUT	DX,4FH AL,08H DX,AL	;Select Logical Device 8	
MOV MOV OUT	DX,4EH AL, F1H DX,AL	;Select watchdog timer register	
MOV MOV OUT	DX,4FH AL,10H DX,AL	;Set watchdog timer value	
MOV MOV OUT	DX,4EH AL, FOH DX,AL	;Select watchdog Control Register	
MOV MOV OUT	DX,4FH AL,02H DX,AL	;Set Watchdog Control Value	
;(1) Exi	t extended function		
MOV	DX,4EH AL,AAH		

OUT DX,AL

Appendix B - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.



Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

The BIOS reports memory test fail if the memory has error(s).

Appendix C - Troubleshooting Checklist

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

- 1. The power switch of each peripheral device is turned on.
- 2. All cables and power cords are tightly connected.
- 3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
- 4. The monitor is turned on.
- 5. The display's brightness and contrast controls are adjusted properly.
- 6. All add-in boards in the expansion slots are seated securely.
- 7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

- 1. Make sure that the monitor's power switch is on.
- 2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
- 3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
- 4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

- 1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
- 2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
- 3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

- 1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
- 2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
- 3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

- 1. The floppy diskette may not be formatted. Format the diskette and try again.
- 2. The diskette may be write-protected. Use a diskette that is not write-protected.
- 3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
- 4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Appendix C

Hard Drive

Hard disk failure.

- 1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
- 2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled

characters.

- 1. Make sure that the serial device's power is turned on and that the device is on-line.
- 2. Verify that the device is plugged into the correct serial port on the rear of the computer.
- 3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
- 4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

- 1. Make sure the keyboard is properly connected.
- 2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

- 1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
- 2. Check the jumper settings to ensure that the jumpers are properly set.
- 3. Verify that all memory modules are seated securely into the memory sockets.
- 4. Make sure the memory modules are in the correct locations.
- 5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
- 6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.