



HU171/HU173 Mini-ITX Industrial Motherboard User's Manual

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FCC and DOC Statement on Class B

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

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

Notice:

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

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About this Manual

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

Warranty

- 1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
- 2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
- 3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
- 4. We will not be liable for any indirect, special, incidental or 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 HU171/HU173 motherboard
- One Serial ATA data with power cable
- One DVD
- One QR (Quick Reference)
- One Heat sink with fan

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 with power cable
- Power adapter (100W, 12V)
- Power adapter (120W, 19V)

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.

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

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

Chapter 1 - Introduction

Specifications

Processor	 4th generation Intel[®] Core[™] processors 4650U: Intel[®] Core[™] i7-4650U, 4M Cache, up to 3.3 GHz, 15W 4010U: Intel[®] Core[™] i3-4010U, 3M Cache, 1.7 GHz, 15W (The following specifications will be available upon request. Please contact your sales representative for more information.) 4300U: Intel[®] Core[™] i5-4300U, 3M Cache, up to 2.9 GHz, 15W 2980U: Intel[®] Celeron[®] 2980U, 2M Cache, 1.6 GHz, 15W BGA 1168 packaging technology 22nm process technology
Super I/O Address	• NCT6106/4Eh
System Memory	 Two 204-pin SODIMM sockets Supports DDR3L 1333/1600MHz Supports up to 16GB system memory Supports dual channel memory interface DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC
Expansion Interfaces	 1 PCIe x1 slot 2 Mini PCIe slots 1 full size supports USB, PCIe and mSATA signals 1 half size supports USB and PCIe signals
Graphics	 Intel[®] HD Graphics GT series Display ports: 1 HDMI, 1 DP, 1 LVDS (default) or 1 VGA* (optional) or 1 eDP* (optional) HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz DP: supports DP++, resolution up to 3200x2000 @ 60Hz LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz VGA: resolution up to 1920x1200 @ 60Hz Intel[®] Clear Video Technology Intel[®] Advanced Vector Extensions 2.0 (Intel[®] AVX 2.0) Instructions Supports DirectX 11.1, OpenGL 4.0, OpenCL 1.2
Audio	 Realtek ALC888 5.1-channel High Definition Audio S/PDIF audio interface
LAN	 Intel[®] I210 PCI Express Gigabit Ethernet controller Intel[®] I218 with iAMT9.5 Gigabit Ethernet Phy Integrated 10/100/1000 transceiver Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Serial ATA	 3 SATA 3.0 ports with data transfer rate up to 6Gb/s SATA port 2 provides adequate space for SATA DOM Integrated Advanced Host Controller Interface (AHCI) controller Supports RAID 0/1/5 Supports Intel[®] Smart Response Technology
Active Management Technology - AMT	 Supports iAMT9.5 Out-of-band system access Remote troubleshooting and recovery Hardware-based agent presence checking Proactive alerting Remote hardware and software asset tracking
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 12V (HU171) or 19~24V (HU173) DC-in jack or 4-pin power connector* (optional) 1 HDMI port 1 DP port 2 RJ45 LAN ports 4 USB 3.0 ports Line-out and mic-in jacks
I/O Connectors	 3 connectors for 6 external USB 2.0 ports 1 vertical USB 2.0/1.1 port* (optional) 4 connectors for 4 external serial ports (2.0mm pitch) 1 RS232/RS422/485 (RS232 and/or power) 3 RS232 1 LVDS LCD panel connector 1 LCD/inverter power connector 1 eDP connector* (optional) 1 VGA connector* (optional) 1 8-bit Digital I/O connector 1 bigital I/O power connector 1 front audio connector for line-out and mic-in jacks 1 S/PDIF connector 1 SMBus connector 3 Serial ATA connectors 3 Serial ATA power connectors 1 front panel connector 3 front panel connector 3 front panel connector 3 front panel connectors 3 front panel connector 3 front panel connector 3 front panel connector
WatchDog Timer	Watchdog timeout programmable via software from 1 to 255 seconds
BIOS	• AMI BIOS - 64Mbit SPI BIOS
Energy Efficient Design	 Supports ErP Lot6 power saving* (optional) Supports ACPI System Power Management Wake-On-Events include: Wake-On-FS/2 KB/Mouse* (optional) Wake-On-USB KB/Mouse* (optional) Wake-On-LAN RTC timer to power-on the system AC power failure recovery
Damage Free Intelligence	 Monitors CPU/system temperature and overheat alarm Monitors VCORE/12V/5V/DDR 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
Temperature	• Operating: 0°C to 60°C • Storage: -20°C to 85°C

Humidity	• 5% to 90%
OS Support	 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 8.1 Enterprise x86 (32-bit) Windows 8.1 Enterprise x64 (64-bit)
Dimensions	• Mini-ITX form factor • 170mm (6.7") x 170mm (6.7")



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.

• DDR3L

DDR3L is a higher performance DDR3 SDRAM interface providing less voltage and higher speed successor. DDR3L SDRAM modules support 1333/1600MHz for DDR modules. DDR3L delivers increased system bandwidth and improved performance to provide its higher bandwidth and its increase in performance at a lower power.

• 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 1 HDMI, 1 DP, 1 LVDS (default) or 1 VGA (optional) or 1 DP (optional) interface for display outputs.

PCI Express •

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes.

Serial ATA •

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 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 •

Intel® I210 PCI Express Gigabit Ethernet and Intel® I218 with iAMT9.5 Gigabit Ethernet Phy controllers support up to 1Gbps data transmission.

Wake-On-PS/2 (optional)

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.

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 PCIe LAN card that uses the PCIe 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 (optional)

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.



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



- HU171: 12V DC-in jack (default) or 4-pin power connector (optional). HU173: 19~24V DC-in jack (default) or 4-pin power connector (optional).
- USB 5, VGA connector and eDP connecotr are optional and not supported in standard model. Please contact your sales representative for more information.
- JP11 will work when USB 5 is populated on the system board.

Important:

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

System Memory

Important:

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



Two 204-pin DDR3L SODIMM sockets

- Supports 1333/1600MHz DDR3L SDRAM
- Supports up to 16GB system memory
- Supports dual channel memory interface

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.

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

Installing the DIMM Module



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

- 1. Make sure the PC and all other peripheral devices connected to it has been powered down.
- 2. Disconnect all power cords and cables.
- 3. Locate the SODIMM socket on the system board.
- 4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one direction.





5. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

6. Push down the module until the clips at each end of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.



Jumper Settings

Clear CMOS Data



If you encounter the following,

- 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 JP1 pins 2 and 3 to On. Wait for a few seconds and set JP1 back to its default setting, pins 1 and 2 On.
- 3. Now plug the power cord and power-on the system.

Auto Power-on Select



JP25 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP25 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP25 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

USB Power Select



JP11, JP15, JP27, JP28, JP30 and JP31 are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.



Important:

1. If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the +5V standby power source of your power supply must support ≥2A.

2. JP11 will work when USB 5 is populated on the system board.

COM 1 RS232/422/485 Select



JP3, JP5 and JP6 allow you to configure the Serial COM port 1 to RS232, RS422 (Full Duplex) or RS485. The pin functions of Serial COM port 1 will vary according to these jumpers' setting.

	COM 1	•
RIS-CIS-	2 1 4 4 4 4 4 4 4 4 4 4 4 4 4	DATA TXD CONNCCO
RS232	Full Duplex	RS485
	JP3	
6 5 4 3 2 1 1-2 On: RS232 (default)	6 5 4 3 2 1 3-4 On: RS422 Full Duplex	6 5 4 3 2 1 5-6 On: RS485
	JP5 and JP6	
6 5 4 3 2 1 1-3, 2-4 On: RS232 (default)	6 5 4 3 2 1 3-5, 4-6 On: RS422 Full Duplex/RS485	

Note:

When COM 1 RS232/422/485 is selected, JP5 and JP6 must be set in accordance to JP3.

COM 1 RS232/Power Select



JP4 is designed to configure the Serial COM port 1 to pure RS232 or RS232 with power.

Backlight Power Select



JP32 is used to select the power level of backlight control: +3.3V (default) or +5V.



Important:

Before powering-on the system, make sure that the power settings of JP32 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.

LCD/Inverter Power Select



Dimming Mode Select



JP19 is used to select the power level of the LCD/Inverter power connector.

JP33 allows you to select the mode for the lightness control of the LVDS panel.

You need to

You need to refer to your panel's user guide to determine the type of mode (PWM or Voltage) most appropriate for your panel.

	<u> </u>
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napic	

Digital I/O Power Select



1-2 On: +5V_standby

3 2 1 2-3 On: +5V (default)

Digital I/O Output State



JP23 is used to select the power of DIO (Digital I/O) signal.

Based on the power level of DIO (Digital I/O) selected on JP23, JP21 (DIO pin 0-3) and JP22 (DIO pin 4-7) 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 JP23's setting.

Panel Power Select



LVDS Channel and bpp Select



JP18 is used to select the power supplied with the LVDS LCD panel.



Important:

Before powering-on the system, make sure that the power settings of JP18 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel. The Switch 1 allows you to select the LVDS channel and the color of bits per pixel.

PS/2 Keyboard/Mouse Power Select



1-2 On: +5V (default)

Mini PCIe Signal Select



JP2 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.



Important: The +5V_standby power source of your power supply must support \geq 720mA. JP17 is used to select the Mini PCIe signal: PCIe or mSATA.

SATA DOM Power Select



JP20 is used to select the power level of SATA DOM.



Note: SATA port 2 provides adequate space for SATA DOM.

Rear Panel I/O Ports



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

- 1 12V DC-in jack (default) or 4-pin power connector (optional) HU171
- 1 19~24V DC-in jack (default) or 4-pin power connector (optional) HU173
- 1 HDMI port
- 1 DP port
- 2 RJ45 LAN ports
- 4 USB 3.0 ports
- 1 Mic-in jack
- 1 Line-out jack

12V DC-in (HU171)/19~24V DC-in (HU173)



This jack provides maximum of 100W power (for HU171)/ 120W power (for HU173) and is considered a low power solution. Connect a DC power cord to this jack. We only provide 12V DC output (for HU171)/ 19V DC output (for HU173) in the package contents. Using a voltage more than the recommended range may fail to boot the system or cause damage to the system board.

The DC-in jack on the system board co-lays with a 4-pin power connector (optional) as the photo displayed below.



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Graphics Interfaces

The display ports consist of the following:

- 1 DP port
- 1 HDMI port



HDMI Port

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

DP Port

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

Driver Installation

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

RJ45 LAN Ports



• Intel® I210 PCI Express Gigabit Ethernet controller

• Intel[®] I218 with iAMT9.5 Gigabit Ethernet Phy

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

BIOS Setting

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

Driver Installation

Install the LAN drivers. Refer to 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 four onboard USB 3.0 ports (USB 0-3). The 10-pin connectors allow you to connect 6 additional USB 2.0 ports (USB HUB 1-6) and the vertical USB port (USB 5) is the USB Drive Security for securing USB flash drive. 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 the onboard USB in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system 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

JP11, JP15, JP27, JP28, JP30 and JP31 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.

Limportant:

- 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 ≥1.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥2A.
- 2. JP11 will work when USB 5 is populated on the system board.

Audio



Rear Audio

The system board is equipped with 2 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

- Line-out Jack (Lime) This jack is used to connect a headphone or external speakers.
- Mic-in (Pink) This jack is used to connect an external microphone.

Front Audio

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

Driver Installation

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

I/O Connectors

Digital I/O Connector

Digital I/O Power Connector



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

Digital I/O Connector

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

na	nt	er	
па			

SATA (Serial ATA) Connectors



Features

- 3 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s
- SATA port 2 provides adequate space for SATA DOM
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5
- Supports Intel[®] Smart Response Technology

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

BIOS Setting

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

SATA (Serial ATA) Power Connectors



These SATA power connectors supply power to the SATA drive. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device. **COM (Serial) Ports**



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.



When COM 1 RS232/422/485 is selected, JP5 and JP6 must be set in accordance to JP3.

COM 2, COM 3 and COM 4 are fixed at RS232.

The pin functions of COM port 1 will vary according to JP3's, JP5's and JP6's setting. JP4 is used to configure Serial COM port 1 to pure RS232 or RS232 with power. Refer to "COM 1 RS232/RS422/RS485 Select" and "COM 1 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.

Front Panel Connector



HDD-LED - HDD LED

This LED will light when the hard drive is being accessed.

RESET-SW - Reset Switch

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

PWR-BTN - Power Switch

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

PWR-LED - Power/Standby LED

When the system's power is on, this LED will 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
	7	Ground	PWR-BTN	6	Signal
RESET-SW	9	RST Signal		8	Ground
	11	N.C.		10	Signal

Cooling Fan Connectors



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

BIOS Setting

The Advanced menu ("NCT6106D HW Monitor" submenu) of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.

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LVDS LCD Panel Connector

LCD/Inverter Power Connector



The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

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

BIOS Setting

Configure the LCD panel in the Advanced/Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.



Note: DFI board's LVDS connector: Hirose DF13-40DP-1.25V(91)/40P/1.25mm; cable side connector: Hirose DF13-40DS-1.25C.

LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	GND	2	GND
3	LVDS_Out3+	4	LVDS_Out7+
5	LVDS_Out3-	6	LVDS_Out7-
7	GND	8	GND
9	LVDS_Out2+	10	LVDS_Out6+
11	LVDS_Out2-	12	LVDS_Out6-
13	GND	14	GND
15	LVDS_Out1+	16	LVDS_Out5+
17	LVDS_Out1-	18	LVDS_Out5-
19	GND	20	GND
21	LVDS_Out0+	22	LVDS_Out4+
23	LVDS_Out0-	24	LVDS_Out4-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	LVDS_DDCCLK	34	N.C.
35	LVDS_DDCDTA	36	+3.3V
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

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



The Keyboard/Mouse connector is used to connect PS/2 keyboard and PS/2 mouse by means of a PS/2 cable. Connect one end of the cable to the Keyboard/Mouse connector. The other ends are used to connect a PS/2 keyboard and a PS/2 mouse.



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

JP2 must be set to ``2-3 On: 5V_standby". Refer to ``PS/2 Keyboard/Mouse Power Select" in this chapter for more information.

Important:

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

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.

SMBus Connector



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

Expansion Slots





PCI Express x1 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x1 slot.

Mini PCI Express Slots

The Mini PCIe sockets are used to install a Mini PCIe card. Mini PCIe card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI.

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.

Chassis Intrusion Connector

eDP Connector (optional)



The eDP connector is an embedded displayport which has advanced power-saving features to connect a display device to transmit digital communication of audio and video signals. The table below indicates the pin fuctions of the eDP connector.

Pins	Pin Assignment	Pins	Pin Assignment
1	DP_OUT1N	2	DP_OUT2N
3	DP_OUT1P	4	DP_OUT2P
5	GND1	6	GND4
7	DP_OUT0P	8	DP_OUT3N
9	DP_OUT0N	10	DP_OUT3P
11	GND2	12	GND5
13	DP_AUXP	14	DP_CLK
15	DP_AUXN	16	DP_DATA
17	GND3	18	GND6
19	DP_HPD	20	POWER2

Connecting the EXT-DP Card to HU171/HU173

Note:



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

The EXT-DP card is connected to HU171/HU173 via two cables. The photos below guides you how to connect the extension module to the motherboard.



ha	nt		
			~

VGA Connector (optional)



Standby Power LED



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.

Pins	Pin Assignment	Pins	Pin Assignment
1	VGA_RED_C	2	VGA_GRE_C
3	VGA_BLE_C	4	Х
5	GND	6	VGA_DET
7	GND	8	GND
9	+5V	10	GND
11	Х	12	DDCSDA_C
13	HSYNC_C	14	VSYNC_C
15	DDCSCL_C	16	

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.

Battery



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

Safety Measures

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

Chapter 3 - BIOS Setup

Overview

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

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



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	Sav	e & Exi	it
 CPU C SATA 0 Intel(R AMT 0 USB C PCH-F Super 1 PC Heis Power WatchI Netword Intel(R 	l Computing configuration Configuration Onfiguration Configuration W Configuration W Configuratic alth Status Failure Contro Dog Configurati	on on l ion nection I218					System ACPI Paramete → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defa F4: Save & Exit ESC: Exit

ACPI Settings

This section is used to configure the system ACPI parameters.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced						
Advanced ACPI Settings ACPI Sleep State Resume by RTC Alarm	[S3 only (Suspend to)] [Disabled]	Select ACPI sleep state the system will enter when the SUSPEND button is pressed.				
		$\begin{array}{rcl} \rightarrow \leftarrow: & \text{Select Screen} \\ \uparrow \downarrow: & \text{Select Item} \\ & \text{Enter: Select} \\ & \text{Fit: General Help} \\ F1: & \text{General Help} \\ F2: & \text{Previous Values} \\ F3: & \text{Optimized Defaults} \\ F4: & \text{Save & Exit} \\ \hline ESC: & \text{Exit} \\ \end{array}$				
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.						

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S3 only (STR) Enables the Suspend to RAM.

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 -	Copyright (C) 2012 American Megat	rends, Inc.			
Advanced					
Configuration Security Device Support Current Status Information SUPPORT TURNED OFF	[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 ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit 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 Advanced	v - Copyright (C) 2012 Am	ierican Megatrends, Inc.
CPU Configuration Intel(R) Core(TM) i5-4300U CPU of CPU Signature Processor Family Microcode Patch FSB Speed Max CPU Speed Max CPU Speed CPU Speed Processor Cores Intel HT Technology Intel SMX Technology Intel SMX Technology G4-bit EIST Technology CPU C3 State CPU C3 State CPU C7 State L1 Data Cache L1 Code Cache L2 Cache L3 Cache Hyper-Inreading Active Processor Cores Limit CPUID Maximum Intel Virtualization Technology EIST Turbo Mode Intel TXT(LT) Support	 21.90GHz 40651 6 17 100 MHz 1900 MHz 2600 MHz 2600 MHz 2 Supported Supported<	 Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled. → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	6. Copyright (C) 2012 Amer	rican Megatrends, Inc.

Hyper-threading

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

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

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.

Turbo Mode

Enable or disable the turbo mode.

SATA Configuration

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



Intel(R) Rapid Start Technology

This section is used to enable or disable the Intel Rapid Start Technology.

Rapid Start Technology → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values	Aptio Setup Utility - (Advanced	Copyright (C) 2012 Americ	can Megatrends, Inc.
	Intel(R) Rapid Start Technology	[Disabled]	 ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Exit

SATA Controller(s)

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

SATA Mode Selection

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

AHCI Mode

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

RAID Mode

This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

Port 0, 1 and 3

This field is used to enable or disable the serial ATA port.

SATA Device Type

Identify the serial ATA port which is connected to the Solid State $\ensuremath{\mathsf{Drive}}$ or the Hard $\ensuremath{\mathsf{Disk}}$ $\ensuremath{\mathsf{Drive}}$.

AMT Configuration

This section configures the parameters of Active Management Technology.



Intel AMT

Enables or disables the AMT function.

Un-Configure ME

OEMFlag Bit 15: Un-configure ME without the password confirmation prompt.

USB Configuration

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

USB Configuration		Enables Legacy USB
USB Module Version	8.10.28	support. AUTO option disables legacy support if no USB devices are connected. DISABLE
USB Devices: 2 Hubs		option will keep USB devices available only for
Legacy USB Support EHCI Hand-off	[Enabled] [Disabled]	EFI applications.
		$\rightarrow \leftarrow$: Select Screen
		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit ESC: Exit

Legacy USB Support

Enabled Enables legacy USB.

Disabled

Keeps USB devices available only for EFI applications.

Auto

Disables support for legacy when no USB devices are connected.

EHCI Hand-off

This is a workaround for OSes without the EHCI hand-off support. The EHCI ownership change should be claimed by the EHCI driver.

PCH-FW Configuration

This section only displays the parameters of Management Engine Technology.

Aptio Setup Utility Advanced	- Copyright (C) 2012 American Megata	rends, Inc.
ME FW Version ME Firmware Mode ME Firmware Type ME Firmware SKU PTT Capability/State Firmware Update Configuration	9.5.30.1808 Normal Mode Full Sku Firmware 5MB 1/0	Configure Management Engine Technology Parameters.
		 → ←: Select Screen ↑↓: Select Item Enter: Select Fange Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Firmware Update Configuration

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

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
Me FW Image Re-Flash	[Disabled]	Enable or Disable Me FW Image Re-Flash function
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.12	36. Copyright (C) 2012 American M	legatrends, Inc.

Super IO Configuration

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

	y - Copyright (C) 2012 America	n Megatrends, Inc.
Advanced		
Super IO Configuration Super IO Chip OS Select > Serial Port 1 Configuration > Serial Port 2 Configuration > Serial Port 3 Configuration > Serial Port 4 Configuration	NCT6106D [Windows]	Windows/Linux (DOS) for COM port setting.
		→ \leftarrow : Select Screen \uparrow 3: Select Item Enter: Select +/: Change Opt. FI: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	86. Copyright (C) 2012 American	Megatrends, Inc.

OS Select

Select the OS support, Windows or Linux/DOS, for COM ports settings.

Serial Port 1 Configuration to Serial Port 4 Configuration

Sets the parameters of serial port 1 (COM A) and serial port 4 (COM D).

Aptio Setup Utility Advanced	- Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 1 Configuration Serial Port Device Settings Change Settings RS485 Auto Flow	[Enabled] IO=3F8h; IRQ=4; [Auto] [Disabled]	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 & Exit ESC: Exit

Advanced	- Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 2 Configuration Serial Port Device Settings Change Settings	[Enabled] IO=2F8h; IRQ=3; [Auto]	Enable or Disable Serial Port (COM)
		$\begin{array}{c} \rightarrow \leftarrow: \text{ Select Screen} \\ \uparrow \downarrow: \text{Select Item} \\ \text{Enter: Select} \\ +/: \text{Change Opt.} \\ F1: \text{General Help} \\ F2: \text{Previous Values} \\ F3: \text{Optimized Defaults} \\ F4: \text{Save & Exit} \\ \text{ESC: Exit} \end{array}$

Aptio Setup Utili Advanced	ty - Copyright (C) 2012 American N	Megatrends, Inc.
Serial Port 3 Configuration Serial Port Device Settings	[Enabled] IO=3E8h; IRQ=11;	Enable or Disable Serial Port (COM)
Change Settings	[Auto]	→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.12	36. Copyright (C) 2012 American Me	egatrends. Inc.

Aptio Setup Utility Advanced	- Copyright (C) 2012 American M	Megatrends, Inc.
Serial Port 4 Configuration Serial Port Device Settings	[Enabled] IO=2E8h; IRQ=10;	Enable or Disable Serial Port (COM)
Change Settings	[Auto]	
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	6. Copyright (C) 2012 American Me	egatrends, Inc.

Serial Port

Enables or disables the serial COM port.

Change Settings

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

RS485 Auto Flow

Sets the RS485 auto flow of the serial COM port.

PC Health Status

This section displays the hardware health monitor.

Aptio Setup Utility - Advanced	Copyright (C) 2012 American	1 Megatrends, Inc.
PC Health Status Smart Fan Function SYS Thermistor Temp CPU (PECI) Temp CPUFan Speed VCORE VIO0 VIN0 (5V) VIN1 (12V) VIN2 (DRAM) VBAT	: +31.0 C : +24.0 C : 3648 RPM : N/A : +1.728 V : +5.017 V : +11.968 V : +1.344 V : +3.024 V	Smart Fan function setting → ←: Select Screen ↑J: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236.	Copyright (C) 2012 American M	Megatrends, Inc.

Smart Fan Function

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Advanced		
	Enable CPU Smart Fan	
[Enabled] 60 50 40 30 100 75 50 40 30 [Enabled] 60 50	→ ←: Select Screen ↑↓: Select Item	
40 30 100 75 50 40 30	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
	[Enabled] 60 50 40 30 100 75 50 40 30 [Enabled] 60 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 40 30 100 75 50 40 40 30 100 75 50 40 40 30 100 75 50 40 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 75 50 40 30 100 50 40 30 50 40 30 50 40 30 50 40 50 50 40 50 50 50 50 50 50 50 50 50 5	

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%.

Power Failure Control

This section configures the status when the power failure occurs.

Aptio Set Advanced	tup Utility - Copyright (C) 2012 Amer <mark>1</mark>	ican Megatrends, Inc.	
Power Failure Control Power-Loss State	[Always on]	Control the status when power loss occurs	
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			

Power-Loss State

Controls the status when the power loss occurs.

Always 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.

Always On

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

Keep 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 Configuration

This section sets the system watchdog parameters.

Aptio Setup Utilit Advanced	y - Copyright (C) 2012 Ameri	ican Megatrends, Inc.
WatchDog Parameters WatchDog Count Mode WatchDog TimeOut Value	[Second] O	WatchDog Count Mode Selection
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

WatchDog Count Mode

Select the watchdog count mode: second or minute.

WatchDog TimeOut Value

Enter the watchdog timeout value. 0 means disabled.

Network Stack

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

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

When enabled, it will display the following information:

Aptio Setup Utility - Advanced	Copyright (C) 2012 American I	Megatrends, Inc.
Network Stack Ipv4 PXE Support Ipv6 PXE Support	(Enabled) [Enabled] [Enabled]	Enable/Disable UEFI network stack. → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Intel(R) Ethernet Connection I218-LM - 88:88:88:88:87:88... (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					
Advanced PORT CONFIGURATION MENU NIC Configuration Blink LEDs 0 PORT CONFIGURATION INFORMATION UEFI Driver: Intel(R) PRO/1000 5.5.23 Adapter PBA: FFFFFF-OFF Chip Type: Intel PCH LPT PCI Device ID 155.A Bus: Device: Function: 00:19:00 Link Status [Disconnected] MAC Address: 88:88:88:88:87:88	Configure Boot Protocol, Wake on LAN, Link Speed, and VLAN. → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help E2: Previous Values				
Version 2.15.1236, Copyright (C) 2012 American Megat	F3: Optimized Defaults F4: Save & Exit ESC: Exit				

Blink LEDs

Identifies the physical network port by blinking the associated LED.

Link Status

This field indicates the link status of the network device.

NIC Configuration

This field is used to configure the Boot Protocol, Wake on LAN, Link Speed and VLAN.

	Aptio Setup Utility - Copyright (C) 2012 American Megati	rends, Inc.		
 	Advanced			
c Speed te on LAN	[Auto Negotiaed] [Enabled]	Specifies the port speed used for the selected boot protocol		
		$\begin{array}{llllllllllllllllllllllllllllllllllll$		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

Link Speed

This field is used to specify the port speed used for the selected boot protocol.

Wake on LAN

Enables the server to be powered on using an in-band magic packet.

Intel(R) I210 Gigabit Network Connection - 00:01:29:57... (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		Configure Boot Protocol, Wake on LAN, Link Speed, and VLAN.		
Blink LEDs PORT CONFIGURATION INFORMATION UEFI Drive: Adapter PBA: Chip Type: PCI Device ID Bus: Device: Function: Link Status MAC Address: Virtual MAC Address	0 Intel(R) PRO/1000 5.5.23 001300-000 Intel i210 1533 02:00:00 [Disconnected] 00:01:29:57:FF:D4 00:01:29:57:FF:D4	→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

Blink LEDs

Identifies the physical network port by blinking the associated LED.

Link Status

This field indicates the link status of the network device.

Virtual MAC Address

Programmatically assignable MAC address of the Ethernet port.

NIC Configuration

This field is used to configure the Boot Protocol, Wake on LAN, Link Speed and VLAN.

	Aptio Setup Utility - Copyright (C) 2012 American Megate Advanced	rends, Inc.		
Link Speed Wake on LAN	[Auto Negotiaed] [Enabled]	Specifies the port speed used for the selected boot protocol → ←: Select Screen ↑↓: Select Item Enter: Select +/:: Change Opt. +/:: General Help F2: Previous Values F3:: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

Link Speed

This field is used to specify the port speed used for the selected boot protocol.

Wake on LAN

Enables the server to be powered on using an in-band magic packet.

Chipset

This section configures relevant chipset functions.

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

PCH-IO Configuration

This section illustrates the PCH parameters.

Chipset		
Intel PCH RC Version Intel PCH SKU Name Intel PCH Rev ID	1.7.0.0 Premium SKU 04/B2	PCI Express Configurations settings.
 PCI Express Configuration USB Configuration Wake on LAN 	[Enabled]	
		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Exit

Wake on LAN

Enables or disables the integrated LAN controller to wake the system. (The Wake on LAN cannot be disabled if ME is set to On at the Sx state.)

47

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 3 Settings.	
 PCI Express Root Port 3 		
	Enter: Select +/-: Change Opt. F1: General Help	
	F1: General Help F2: Previous Values F3: Optimized Defaults	
	F4: Save & Exit ESC: Exit	
	LOC. LAIT	
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

PCI Express Root Port 3

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.				
Chip	set			
PCI Express Root Port 3 PCIe Speed	[Enabled] [Auto]	Control the PCI Express Root port. $\rightarrow \leftarrow$: Select Screen $\uparrow \downarrow$: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.				

PCIe Speed

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

USB Configuration

This field is used to configure the USB settings.

	tility - Copyright (C) 2012 America	n Megatrends, Inc.
Chip	oset	
USB Configuration		Mode of operation of XHCI controller.
XHCI Mode		AHCI controller.
		$\rightarrow \leftarrow$: Select Screen $\uparrow \downarrow$: Select Item
		Enter: Select
		+/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.15	.1236. Copyright (C) 2012 American	Megatrends, Inc.

XHCI Mode

Selects the operation mode of the XHCI controller. The options are Smart Auto, Auto, Enabled, Disabled and Manual.

System Agent (SA) Configuration

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

Aptio Setup Utility	y - Copyright (C) 2012 America	an Megatrends, Inc.
Chipset		
System Agent Bridge Name System Agent RC Version VT-d Capability	Haswell 1.7.0.0 Supported	Check to enable VT-d function on MCH.
VT-d		
 Graphics Configuration Memory Configuration 		→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	6. Copyright (C) 2012 American	Megatrends, Inc.

VT-d

Enable the VT-d function on MCH.

Graphics Configuration

This field configures the graphics settings.

Aptio Setup Utilit Chipset	y - Copyright (C) 2012 Americ	ean Megatrends, Inc.
Graphics Configuration IGFX VBIOS Version IGfx Frequency DVMT Pre-Allocated ► LCD Control	2179 400 MHz [32M]	Select DVMT 5.0 Pre- Allocated (Fixed) Graph- ics Memory size used by the Internal Graphics Device.
		→ \leftarrow : Select Screen ↑\: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.12	36. Copyright (C) 2012 America	n Megatrends, Inc.

DVMT Pre-Allocated

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

Aptio Setup Utility - Chipset	Copyright (C) 2012 American Meg	atrends, Inc.
Graphics Configuration IGFX VBIOS Version IGFX Frequency DVMT Pre-Allocated LCD Control	2179 400 MHz DVMT Pre-Allocated 32M 64M 96M 128M 128M 160M 192M 224M 224M 224M 226M 320M 352M 384M 3416M 416M 4480M 512M 1024M	Select DVMT5.0 Pre- Allocated (Fixed) Graph- ics Memory size used by the Internal Graphics Device. → ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236.	Copyright (C) 2012 American Megati	rends, Inc.

LCD Control

This field configures the LCD control.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc. Chipset Select the Video Device LCD Control which will be activated during POST. This has no Primary IGFX Boot Display Secondary IGFX Boot Display [HDMI1] effect if external graphics [VBIOS Default] LCD Panel Type Active LVDS present. [Enabled] Secondary boot display selection will appear base on your selection. VGA modes will be supported only on primary display. $\rightarrow \leftarrow:$ Select Screen $\uparrow\downarrow:$ Select Item Enter: Select Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Secondary IGFX Boot Display

Select the secondary display device: DP, LVDS, eDP or HDMI1.

LCD Panel Type

Select the LCD panel used by the Internal Graphics Device via selecting the appropriate setup item.



Active LVDS

Enable or disable the LVDS function.

Memory Configuration

This field only displays the memory configuration.

Aptio Setup Utility - C Chipset	Copyright (C) 2012 American M	legatrends, Inc.
Memory Information Memory RC Version Memory Frequency Total Memory Memory Voltage DIMM#1 CAS Latency (tCL) Minimum delay time CAS to RAS (tRCDmin) Row Precharge (tRPmin) Active to Precharge (tRASmin)	1.7.0.0 1600 Mhz 8192 MB (DDR3) 1.35V 8192 MB (DDR3) 11 11 11 28	→ ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. C	Copyright (C) 2012 American Me	gatrends, Inc.

Boot



Setup Prompt Timeout

Select 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

Enable or disable the quiet boot function.

CSM Parameters

Aptio Setup Utility	- Copyright (C) 2012 American Boot	Megatrends, Inc.
Launch CSM Boot option filter Launch PXE OpROM policy Launch Storage OpROM policy Launch Video OpROM policy Other PCI device ROM priority	[Enabled] [UEFI and Legacy] [Do not launch] [Legacy only] [Legacy only] [UEFI OpROM]	This option controls if CSM will be launched. ∴ Select Screen ↑↓: Select Item Enter: Select Item Enter: Select Item F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236	. Copyright (C) 2012 American M	legatrends, Inc.

Launch CSM

This option controls if CSM will be launched.

Boot option filter

This option controls what devices system can 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.

Launch Video OpROM policy

Controls the execution of UEFI and legacy video 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 Utilit	y - Copyri	ght (C) 2012	American Megati	rends, Inc.
Main Advanced Chipset	Boot	Security	Save & Exit	
Password Description If ONLY the Administrator's passw then this only limits access to Setup asked for when entering Setup. If ONLY the User's password and must be boot or enter Setup. In Setup the Us Administrator rights. The password length must be in the following range: Minimum length Maximum length Administrator Password User Password	and is onl then this entered to)		Set Administrator Password. → ←: Select Screen ↑↓: Select Item Enter: Select H-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.123	6. Copyrig	tt (C) 2012	American Megatrer	nds, Inc.

Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit

A	otio Setup Utility ·	- Copyri	ght (C) 2012	American Mega	trends, Inc.
Main Advar	nced Chipset	Boot	Security	Save & Exit	
Save Changes and Discard Changes a					Exit system setup after saving the changes
Save Options Save Changes Discard Changes					
Restore Defaults Boot Override					
Launch EFI Shell f	rom filesystem dev	vice			
					$ \rightarrow \leftarrow: Select Screen \uparrow_{\star}: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit$
	Version 2.15.1236.	Copyrig	ht (C) 2012	American Megatr	ends, Inc.

Save Changes and Exit

Exits the system setup after saving the changes.

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.

Save Changes

Saves changes done so far to any of the setup options.

Discard Changes

Discards changes done so far to any of the setup options.

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>.

	irmware Update Utility(APTIO) v2.25 2 American Megatrends Inc. All Rights Reserved.
Reading file Erasing flash Writing flash Verifying flash Erasing BootBlock Writing BootBlock Verifying BootBlock C:\AFU\AFUDOS>	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.

Chapter 4 - Supported Software

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".

For Windows 8





For Windows 7





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.



2. Read the license agreement then click Yes.

License Agreement	Software	- A	(inte
four must accept all of the terms of the program. Do you accept the terms? INTEL SOFTWARE LICENSE AGREEMEN IMPORTANT - READ BEFORE COPTING Do not use or load this software and a	IT (OEM / DHV / ISV Distribut	ton & Single Use ectively, the "So	r)
until you have carefully read the follow Softmare, you agree to the terms of th install or use the Software.	ing terms and conditions. By		g the
until you have carefully read the follow Software, you agree to the terms of th	ing terms and conditions. B is Agreement. If you do no sufacturer (DEM), Independ	t wish to so agre	g the se, do not andor

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

	el® Chip adme File			tware		inte
	er to the Readm is the Page Dow			en requirements : file,	and installation i	nformation.
	Release: Version:	Producti 9.1.1.10 hipset#:	on Versi 24 Intel(R)	Device So on 5 Series/1		s Chipse
		_				,
22						

Intel® Chinaet Device Software

and the second second Name

4. Click Finish to exit setup.



Intel HD Graphics Drivers

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



If the graphics driver is not installed into the system, the 4K display monitor will display black or white screen. After completing the installation of the graphics dri

display black or white screen. After completing the installation of the graphics driver, the monitor will display normally.

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



By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this 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.



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



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

ntel® HD Graphics Driver	(inter
etup Progress	(intel)
Please wait while the following setup operations are performe	ed:
Creating Registry Key: HKLM\SOFTWARE\Microsoft\Window: Creating Registry Key: HKLM\SOFTWARE\Microsoft\Window:	
Cleasing registry Net: RNAW NOCH INAGE WINDSHIMMOST Registreng DLI: C (Program File: Charmon File: Initial Media Registreng DLI: C (Program File: Charmon File: Initial Media Deleting Registry Key: HAN/IGCTIVARE: Unitial Media Deleting Registry Key: HAN/IGCTIVARE: Unitial Media Construction: C (State State	s Media Foundation\HardwareMFT SDK\2\2\3.0\mfx_mft_h264vd_32. SDK\2\2\3.0\mfx_mft_h264ve_32. SDK\2\3.0\mfx_mft_mp2vd_32.d SDK\2\3.0\mfx_mft_vc1vd_32.dl SDK\2\3.0\mfx_mft_vpp_32.dll spatch\w32+1-1
Creating Registry Key: HKM/SOFTWARE/Wrozoft/Window Registreng DL: C/Program File:/Common Files/Intel/Weda Registreng DL: C/Program File:/Common Files/Intel/Weda Registreng DL: C/Program File:/Common Files/Intel/Weda Registreng DL: C/Program File:/Common Files/Intel/Weda Registreng DL: C/Program File:/Common Files/Intel/Weda Deleting Registry Key: HKM/SOFTWARE/Intel/WedaSOK/Dip Creating Process: E/Graphices/WIN78.15.10.2639Win32Y Click Next to continue.	s Media Foundation\HardwareMFT SDK\2\2\0.0\mfx_mft_h264vd_32., SDK\2\3.0\mfx_mft_h264vd_32., SDK\2\3.0\mfx_mft_mp2vd_32.d SDK\2\3.0\mfx_mft_vc1vd_32.dl SDK\2\3.0\mfx_mft_vp_32.dll spatch\w32-s1-1

- 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.

Setup Is Complete	(intel)
You must restart this computer for the changes to to computer now?	ake effect. Would you like to restart the
Yes, I want to restart this computer now.	
No, I will restart this computer later.	
Click Finish, then remove any installation media from	the drives.

Intel Management Engine Drivers 9.5

To install the driver, click "Intel Management Engine Drivers 9.5" on the main menu.



2. Read the license agreement then click Yes.

ntel® Management Engine Co	mponents	
icense Agreement		(intel)
You must accept all of the terms of the license ag program. Do you accept the terms?	reement in order to conti	inue the setup
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IMPORTANT - READ BEFORE COPTING, INSTALL Do not use or load this software and any associa until you have carefully read the following terms Software, you agree to the terms of this Agreem install or use the Software.	ING OR USING. ated materials (collectively and conditions. By loadin	y, the "Software") ig or using the
Please Also Note: * If you are an Original Equipment Manufacturer (IHV), or Independent Software Vendor (ISV), th * If you are an End-User, then only Exhibit A, th	his complete LICENSE AGE	REEMENT applies;

3. Setup is currently installing the driver. After installation has completed, click Next.

4. After completing installation, click

Finish.

ntel® N etup Pro		ment E	ngine Con	nponents	(intel)
Please wait	while the fo	bllowing set	up operations ar	e performed:	
Creating Pr Deleting File Copying File Creating Pr Creating Pr Installing: I	Deess: regs C:\WIND Deess: C:\F C:\Progr. C:\Progr. Deess: C:\F Deess: C:\F Deess: C:\F Deess: C:\Progr. C:\Progr.	vr32.exe OWS\syste rogram Files am Files (x8 rogram File vrogram File W Recover am Files (x8	36)\Intel\Intel(R) 36)\Intel\Intel(R) 35 (x86)\Intel\Int 35 (x86)\Intel\Int 37 Agent	el(R) Management Er Management Engine Management Engine el(R) Management Er el(R) Management Er	igine Components/FWS Components/FWServic Components/FWServic gine Components/FWS igine Components/FWS Components/Firmware
<	o concinder)		>
					Next >
				Ir	itel® Installation Framev

tel® Installation Framework ntel® Management Engine Components	
etup Is Complete	(intel)
The setup program successfully installed the following components: - Intel® Mmaagement Engine Interface - Intel® Johanni Application Loader - Intel® Johanni Application Loader - Load Mnaagement Service - Load Mnaagement Service - Load Mnaagement Service - Load Notification Service - Load Notification Service - Loader Notification - Loader Noti	ou like to restart the
 Yes, 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
	tel® Installation Framev

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

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

 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.

Ready to Install the Program	
The wizard is ready to begin installation.	intel
Click Install to begin the installation.	
If you want to review or change any of your installation settings, exit the wizard.	click Back. Click Cancel 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			X
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:			
1			
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



DIO



WatchDog



Backllight

Microsoft Framework 4.5

To install the utility, click "Microsoft Framework 4.5" on the main menu.

1. Read and accept the license agreement. Then, click "Installation".



2. Setup is installing the driver.

Microsoft .NET Framework 4.5	×
Installation Progress Please wait while the .NET Framework is being installed.	Margade
	NET
File security verification:	_
All files were verified successfully.	
	6
Installation progress:	
Instaling .NET Framework 4.5	
	Cancel

3. After completing installation, click Finish.



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 Only)

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 Release 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 * January 2012 * NOTE: This document refers to systems containing the * following Intel processors/chipsets: Intel® USB 3.0 Monitor < Back Click Next to continue. 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 (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) 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 (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® USB 3.0 eXtensible Host Controller Driver - Intel® Installation Frames Setup Is Complete

64

(intel)

Cancel

(intel)

•

Next >

- - -

(intel)

Finish Intel® Installation F

You must restart this computer for the changes to take effect. Would you like to restart the

computer now

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

Click Finish, then remove any installation media from the drives

intel® Installation Frame

Next >

- Intel® Installation Fra

Intel Dynamic Platform and Thermal Framework 7.1

The Intel Dynamic Platform and Thermal Framework Technology enables the control of power and temperature management for the system protection.

To install the driver, click "Intel Dynamic Platform and Thermal Framework 7.1" on the main menu.

1. Setup is now ready to install the utility. Exit all programs before continuing and click Next to continue.

	intel® installation Framework	· · · · · · · · · · · · · · · · · · ·
Intel(R) Dynamic Framework Welcome to the Se	Platform and Thermal etup Program	(intel)
	all the following components: and Thermal Framework Installer	
It is strongly recommended	that you exit all programs before continuin	ig. Click Next to continue.
8.0.10002.14	< <u>B</u> ack	Next > Cancel

2. Read the license agreement and then click Yes.

intel(R) Dynamic Platform and Thermal rramework .icense Agreement	intel
You must accept all of the terms of the license agreement in order to co program. Do you accept the terms?	ntinue the setup
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution / IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collecti- unit you have careful) yre dit the following terms and conditions. By load Software, you agree to the terms of this Agreement. If you do not wis install or use the Software.	ely, the "Software") ding or using the
Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent (IHV), or Independent Software Vendor (ISV), this complete LICENSE A * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE L	AGREEMENT applies;
	Yes <u>No</u>

3. After the setup progress finishes, click Next to continue..

ntel(R) Dynami ramework etup Progress	c Platform and T	'hermal	(intel)
Copying File: C: \Progra Copying File: C: \Progra	owing setup operations are m Files Untel (Intel (R) Dynan m Files (Intel (Intel (R) Dynan m Sigystem 32) difxapi. dll	iic Platform and Thermal iic Platform and Thermal	Framework\Uninst Framework\Uninst Framework\Uninst Framework\Uninst Framework\Uninst Framework\Uninst
Click Next to continue.			*
<			>
			Next >
		Intel(Installation Framework

4. Click Finish to complete the setup process.

Inter® Installation Framewon	
Intel(R) Dynamic Platform and Thermal Framework Setup Is Complete	(intel)
The setup program successfully installed the following components: • Intel(R) Dynamic Platform and Thermal Framework Installer	
Click Finish to complete the setup process.	
	Finish
	– Intel® Installation Framework

3. Read the license agreement then

click Yes.

Intel Rapid Storage Technology

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.



Intel® Installation Framework

Intel® Rapid Storage Technology

Iccense Agreement

Vou must accept al of the terms of the lcense agreement in order to continue the setup
program. Do you accept the terms?

INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)

MPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (colectively, the "Software")
unit you have careful yre adth reflowing terms and conditions. By budding or using the
Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not
rated or use the Software.

Please Aloo Note:

*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET apples;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET apples;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET, apples;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET, apples;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET, apples;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET Software;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A, the INTE. SOFTWARET LICENSE AGREEMENT;
*If you are an End-User, then only Exhibit A and the advare tend or intervise
*If you are an



Intel® Installation Framework

Intel® Rapid Storage Technology
Setup Progress

Please wat while the following setup operations are performed:

Creating Registry Key: HKCR\CLSID\(E34790F=FF1C=+41+827-40271FC90396)\(System.CC)
Creating Registry Key: HKCR\SOFTWARE_WITE\(USC)\(US

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.



Intel Rapid Start Technology

The Intel Rapid Start Technology is a utility that allows your system to wake up and run faster. To install the driver, click "Intel Rapid Start Technology" on the main menu.

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



2. Click ON and select the Advanced Settings to enable the Intel Rapid Start Technology. Then, click Save.

	Start Technol anager	logy
Status		
Intel Rapid Start Technology 🛛	On	Off
lide Advanced Settings		
Advanced Settings		
Critical Battery 🔞	On	Off
Timer 🛛	On	Off
0	10 Minutes	
0		1

F6 Floppy (For Windows 7 Only)

This is used to create a floppy driver diskette needed when you install Windows® XP using the F6 installation method. This will allow you to install the operating system onto a hard drive when in AHCI mode.

- 1. Insert a blank floppy diskette.
- 2. Locate for the drivers in the CD then copy them to the floppy diskette. The CD includes drivers for both 32-bit and 64-bit operating systems. The path to the drivers are shown below.

32-bit

CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy32

64-bit

CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy64

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



4. Enter the necessary information and then click Next.

记 Infineon TPM Professional Package - InstallShield Wizard	
Customer Information Please enter your information.	4
User Name:	
Test	
Organization:	
Instalishield < Back	Cancel

5. Select a setup type and then click Next.



6. Click Install.

🖥 Infineon TPM Professional Package - InstallShield Wizard	
Ready to Install the Program The wizard is ready to begin installation.	4
· ·	
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click B exit the wizard.	ack. Click Cancel to
< Back Install	Cancel

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



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

er innieon	r rem eroressional eachage - instalismetu wizaru	
	Infineon TPM Professional Package gram features you selected are being installed.	C
ß	Please wait while the InstallShield Witcard Installs Infineon TPM Professie Package. This may take several minutes. Status: Copying new Files	onal
instaliShield —	< Back Next >	Cancel

9. Click Finish.



10. Click "Yes" to restart your system.

🕼 Infineon TPM 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	

Adobe Acrobat Reader 9.3

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

👼 Adobe Reader 9.3 - Setup

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

	ion Folder xxt 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.

X

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;
Chapter 6 - RAID

The system board allows configuring RAID on Serial ATA drives. It supports RAID 0, RAID 1, RAID 5 and RAID 10.

RAID Levels

RAID 0 (Striped Disk Array without Fault Tolerance)

RAID 0 uses two new identical hard disk drives to read and write data in parallel, interleaved stacks. Data is divided into stripes and each stripe is written alternately between two disk drives. This improves the I/O performance of the drives at different channel; however it is not fault tolerant. A failed disk will result in data loss in the disk array.

RAID 1 (Mirroring Disk Array with Fault Tolerance)

RAID 1 copies and maintains an identical image of the data from one drive to the other drive. If a drive fails to function, the disk array management software directs all applications to the other drive since it contains a complete copy of the drive's data. This enhances data protection and increases fault tolerance to the entire system. Use two new drives or an existing drive and a new drive but the size of the new drive must be the same or larger than the existing drive.

RAID 5

RAID 5 stripes data and parity information across hard drives. It is fault tolerant and provides better hard drive performance and more storage capacity.

Settings

To enable the RAID function, the following settings are required.

- 1. Connect the Serial ATA drives.
- 2. Configure Serial ATA in the AMI BIOS.
- 3. Configure RAID in the RAID BIOS.
- 4. Install the RAID driver during OS installation.
- 5. Install the Intel Rapid Storage Drivers.

Step 1: Connect the Serial ATA Drives

Refer to chapter 2 for details on connecting the Serial ATA drives.

Important:

- 1. Make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.
- Treat the cables with extreme caution especially while creating RAID. A damaged cable will ruin the entire installation process and operating system. The system will not boot and you will lost all data in the hard drives. Please give special attention to this warning because there is no way of recovering back the data.

Step 2: Configure Serial ATA in the AMI BIOS

- 1. Power-on the system then press to enter the main menu of the AMI BIOS.
- 2. Configure Serial ATA in the appropriate fields.
- 3. Save the changes in the Save & Exit menu.
- 4. Reboot the system.

Step 3: Configure RAID in the RAID BIOS

When the system powers-up and all drives have been detected, the Intel RAID BIOS status message screen will appear. Press the <Ctrl> and <I> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

Step 4: Install the RAID Driver During OS Installation

The RAID driver must be installed during the Windows[®] XP or Windows[®] 2000 installation using the F6 installation method. This is required in order to install the operating system onto a hard drive or RAID volume when in RAID mode or onto a hard drive when in AHCI mode.

- 1. Start Windows Setup by booting from the installation CD.
- 2. Press <F6> when prompted in the status line with the 'Press F6 if you need to install a third party SCSI or RAID driver' message.
- 3. Press <S> to "Specify Additional Device".
- 4. At this point you will be prompted to insert a floppy disk containing the RAID driver. Insert the RAID driver diskette.
- 5. Locate for the drive where you inserted the diskette then select RAID or AHCI controller that corresponds to your BIOS setup. Press <Enter> to confirm.

You have successfully installed the driver. However you must continue installing the OS. Leave the floppy disk in the floppy drive until the system reboots itself because Windows setup will need to copy the files again from the floppy disk to the Windows installation folders. After Windows setup has copied these files again, remove the floppy diskette so that Windows setup can reboot as needed.

Step 5: Install the Intel Rapid Storage Technology Utility

The Intel Rapid Storage Technology Utility can be installed from within Windows. It allows RAID volume management (create, delete, migrate) from within the operating system. It will also display useful SATA device and RAID volume information. The user interface, tray icon service and monitor service allow you to monitor the current status of the RAID volume and/ or SATA drives. It enables enhanced performance and power management for the storage subsystem.

- 1. Insert the provided CD into an optical drive.
- 2. Click "Intel Rapid Storage Technology Utility" on the main menu.
- 3. Setup is ready to install the utility. Click Next.

Infineerin fem eroressionar	Package - Instationieto wizaro
	Preparing to Install
0	Infineon TPM Professional Package Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
	Configuring Windows Installer
	Cancel

🛃 Infineon TPM Professional Package - InstallShield Wizard

2

Welcome to the InstallShield Wizard for

The InstallShield(R) Wizard will install Infineon TPM Professional Package on your computer. To continue, click Next. It is recommended that you close all other applications before

WARNING: This program is protected by copyright law and international treaties.

Next > Cancel

Infineon TPM Professional Package

Version 4.3.100.3287

tarting Setup

 Read the license agreement and click "I accept the terms in the License Agreement." Then, click Next.

Chapter 6

5. Go through the readme document to view system requirements and installation information then click Next.

License Agreement Please read the following license agre	ement carefully.	
Software Setup End User Licer Professional Package	nse Conditions for the l	nfineon TPM 🦰
1. Attention		
This software contains copyright and confidential content (e.g. algo Technologies AG and Microsoft C Enterprise Library © Microsoft Co	orithms, ideas and concep corporation (Microsoft patt	ots) of Infineon
Diasan road thank linenan terms	and conditions (haroins#a	w the Canditiana)
 I accept the terms in the license agree 	ement	Print
I do not accept the terms in the licens	e agreement	

8. Click "Yes, I want to restart 🔐 Infineon TPM Professional Package - InstallShield Wizard this computer now" to complete the installation and then click Finish.



6. Click Next to install to the default folder or click change to choose another destination folder.

Finfineon TPM Professional Package - InstallShield Wizard	
Please enter your information.	
User Name:	
test	
Organization:	
< Back Next >	Cancel

7. Confirm the installation and Infinent TPM Professional Package - InstallShield Wizard click Next.

16 million in a	reforessional eachage - instatismeta wizara	· 🗠
Setup Type Choose the set	tup type that best suits your needs.	5
Please select a	setup type.	
• Complete	All program features will be installed. (Requires the most disk space.)	
Custom	Choose which program features you want installed and where they will be installed. Recommended for advanced users.	
InstallShield	< Back Next > Can	cel

Chapter 7 - Intel AMT Settings

Overview

Intel Active Management Technology (Intel® AMT) combines hardware and software solution to provide maximum system defense and protection to networked systems.

The hardware and software information are stored in non-volatile memory. With its built-in manageability and latest security applications, Intel® AMT provides the following functions.

• Discover

Allows remote access and management of networked systems even while PCs are powered off; significantly reducing desk-side visits.

• Repair

Remotely repair systems after OS failures. Alerting and event logging help detect problems quickly to reduce downtime.

• Protect

Intel AMT's System Defense capability remotely updates all systems with the latest security software. It protects the network from threats at the source by proactively blocking incoming threats, reactively containing infected clients before they impact the network, and proactively alerting when critical software agents are removed.

Enable Intel[®] AMT in the AMI BIOS

- 1. Power-on the system then press to enter the main menu of the AMI BIOS.
- 2. In the Advanced menu, select AMT Configuration.

Aptio Se	tup Utility -	Copyrig	ght (C) 2012	American Meg	atrends, Inc.
Main Advanced	Chipset	Boot	Security	Save & Exit	
ACPI Settings Trusted Computing CPU Configuration SATA Configuration Intel(R) Rapid Start T AMT Configuration USB Configuration PCH-FW Configuration PCH-FW Configuration NCT6106D HW Mon Power Failure Control WatchDog Configurat Network Stack Intel(R) Ethernet Con Intel(R) 1210 Gigabit	n Configuratio itor on nection I218-	LM - 88			$\begin{array}{c c} \hline \\ \hline $
Versio	n 2.15.1236.	Copyrig	ht (C) 2012 A	American Megati	rends, Inc.

3. In the Advanced menu, select Enable in the AMT field.

Aptio Setup Utility - Co Advanced	pyright (C) 2012 Americ	an Megatrends, Inc.
Intel AMT Hide Un-Configure ME Confirmation	[Enabled] [Disabled]	Enable/ Disable Intel(R) Active Management Tech- nology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execu- tion. If enabled, this re- quires additional firmware in the SPI device. → ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. FI: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Cor	pyright (C) 2012 Americar	Megatrends, Inc.

4. In the Save & Exit menu, select Save Changes and Reset then select OK.

А	ptio Setu	p Utility -	Copyrig	sht (C) 2012	American Megati	rends, Inc.
Main Adva	nced (Chipset	Boot	Security	Save & Exit	
Save Changes and Discard Changes and Discard Changes and Discard Changes and Save Options Save Changes Discard Changes	and Exit Reset					Exit system setup after saving the changes
Restore Defaults Save as User Def Restore as User D Boot Override P1: ST160LT007- UEFI: TOSHIBA Launch EFI Shell	9ZV14D TransMen	Ĩ	ice			→ ←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. FI: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2	2.15.1236.	Copyrig	ht (C) 2012	American Megatrer	ids, Inc.

Enable Intel[®] AMT in the Intel[®] Management Engine BIOS Extension (MEBX) Screen

 When the system reboots, the following message will be displayed. Press <Ctrl-P> as soon as the message is displayed; as this message will be displayed for only a few seconds.



2. You will be prompted for a password. The default password is "admin". Enter the default password in the space provided under Intel(R) ME Password then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.
MAIN MENU
MEBx Login > Intel (R) ME General Settings > Intel (R) AMT Configuration MEBx Exit
Intel(R) ME Password
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry [Esc]= Exit

- 3. Enter a new password in the space provided under Intel(R) ME New Password then press Enter. The password must include:
 - 8-32 characters

 - Strong 7-bit ASCII characters excluding : , and " characters
 At least one digit character (0, 1, ...9)
 At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
 Both lower case and upper case characters

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel	l(R) ME v9.5.30.1808
Copyright(C) 2003-13 Intel Corporation. All Righ	ts Reserved.
MAIN MENU	
MEBx Login > Intel (R) ME General Settings > Intel (R) AMT Configuration MEBx Exit Intel (R) ME New Password	
Intel(R) ME Password	
$\left[\uparrow\downarrow\right] = Move Highlight$ [Enter] = Select Entry	[Esc]= Exit

4. You will be asked to verify the password. Enter the same new password in the space pro-vided under Verify Password then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Int Copyright(C) 2003-13 Intel Corporation. All Rig	
MAIN MENU	
MEBx Login > Intel (R) ME General Settings > Intel (R) AMT Configuration MEBx Exit Verify Password	
Intel(R) ME Password	
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry	[Esc]= Exit

5. Select Intel(R) ME General Settings then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029 Copyright(C) 2003-13 Intel Corporation. All	
MAIN MENU	
Intel (R) ME General Settings Intel (R) AMT Configuration MEBx Exit	
$\uparrow\uparrow\downarrow$] = Move Highlight [Enter] = Select Entry	[Esc]= Exit

Chapter 7

6. Select Change Intel(R) ME Password then press Enter.

You will be prompted for a password. The default password is "admin". Enter the default password in the space provided under Intel(R) ME New Password then press Enter.

- 8-32 characters
- Strong 7-bit ASCII characters excluding : , and " characters
 At least one digit character (0, 1, ...9)
- At least one 7-bit ASCII non alpha-numeric character, above 0x20, (e.g. !, \$, ;)
 Both lower case and upper case characters

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.			
INTEL (R) ME PLATFORM CONFIGURATION			
Change ME Password			
Local FW Update <enabled></enabled>			
Intel (R) ME New Password			
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry [Esc]= Exit			

7. Select Local FW Update then press Enter. Select Enabled then press Enter.

	ne BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 13-13 Intel Corporation. All Rights Reserved.	
INTEL (R)	INTEL (R) ME PLATFORM CONFIGURATION	
Change ME Password Local FW Update	<enabled></enabled>	
	Disabled Enabled Password Protected	
$\uparrow\uparrow\downarrow$] = Move Highlight	[Enter] = Complete Entry [Esc]= Discard Changes	

8. Select Previous Menu until you return to the Main Menu. Select Intel(R) AMT Configuration then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.		
INTEL (R) AMT CONFIGURATION		
Manageability Feature Selection > SOL/ IDER/ KVM > User Consent	< Enabled>	
Password Policy	<anytime></anytime>	
 > Network Setup Unconfigure Network Access > Remote Setup And Configuration > Power Control 	<full unprovision=""></full>	
$[\uparrow\downarrow] = Move Highlight [Enter] = Selet$	ect Entry [Esc]= Exit	

9. In the Intel(R) AMT Configuration menu, select Manageability Feature Selection then press Enter. Select Disabled then press Enter.

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INTEL (R) AMT CONFIGURATION	
Manageability Feature Selection SOL/ IDER/ KVM User Consent Password Policy 	
$[\uparrow\downarrow]$ = Move Highlight [Enter] = Complete Entry [Esc]= Discard Changes	

10. In the Intel(R) AMT Configuration menu, select SOL/IDER/KVM then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.	
SOL/ IDER/ KV	/M
Username and Password	< Enabled>
SOL	<enabled></enabled>
IDER	<enabled></enabled>
KVM Feature Selection	<enabled></enabled>
Legacy Redirection Mode	<disabled></disabled>
Menu for FW Redirection Configuratio	n
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select E	Intry [Esc]= Exit

11. In the **SOL/IDER/KVM** menu, select **Username and Password** then press Enter. Select **Disabled** then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.	
SOL/ 1	IDER/ KVM
Username and Password	< Enabled>
SOL	<enabled></enabled>
IDER	<enabled></enabled>
KVM Feature Selection	<enabled></enabled>
Legacy Redirection Mode	<disabled></disabled>
	Disabled Enabled
$[\uparrow\downarrow] = Move Highlight [Enter] = 0$	Complete Entry [Esc]= Discard Changes

12. In the **SOL/IDER/KVM** menu, select **SOL** then press Enter. Select **Disabled** then press Enter.



13. In the **SOL/IDER/KVM** menu, select **IDER** then press Enter. Select **Disabled** then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.		
SOL/ IDER/ KVM		
Username and password SOL IDER KVM Feature Selection Legacy Redirection Mode	< Enabled> <enabled> <enabled> <enabled> <disabled></disabled></enabled></enabled></enabled>	
	Disabled Enabled	
[↑↓] = Move Highlight [Enter] =	Complete Entry [Esc]= Discard Changes	

14. In the SOL/IDER/KVM menu, select KVM Feature Selection then press Enter. Select Disabled then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.	
SOL/ IDER/ KVM	
Username and password SOL IDER KVM Feature Selection Legacy Redirection Mode	< Enabled> <enabled> <enabled> <enabled></enabled> <disabled></disabled></enabled></enabled>
	Disabled Enabled
$[\uparrow\downarrow] = Move Highlight [Enter] =$	Complete Entry [Esc]= Discard Changes

15. In the SOL/IDER/KVM menu, select Legacy Redirection Mode then press Enter.



16. Select **Enabled** then press Enter.



17. Select Previous Menu until you return to the Intel(R) AMT Configuration menu. Select User Consent then press Enter.

Intel(R) Management Engine BIOS Extension v9.0.0.0029/Intel(R) ME v9.5.30.1808 Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.
USER CONSENT
User Opt-in Configurable from Remote IT < KVM> Opt-in Configurable from Remote IT < Enabled>
Configure When User Consent Should be Required.
$[\uparrow\downarrow]$ = Move Highlight [Enter] = Select Entry [Esc] = Exit

18. In the **User Consent** menu, select **User Opt-in** then press Enter. Select **None** then press Enter.

Intel(R) Management Engine Copyright(C) 2003	BIOS Extension v9.0.0.002 -13 Intel Corporation. All	
	USER CONSENT	
User Opt-in Opt-in Configurable from		< KVM> < Enabled>
	NONE KVM ALL	
$[\uparrow\downarrow] = Move Highlight$ [[Enter] = Complete Entry	[Esc]= Discard Changes

19. In the User Consent menu, select Opt-in Configurable from Remote IT then press Enter. Select Disable Remote Control of KVM Opt-in Policy then press Enter.

Intel(R) Management Engine BIOS Extensio Copyright(C) 2003-13 Intel Corp	
USER CONSENT	
User Opt-in Opt-in Configurable from Remote IT	< KVM> < Enabled>
	Disabled Enabled
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Com	plete Entry [Esc]= Discard Changes

20. Select Previous Menu until you return to the Intel(R) AMT Configuration menu. Select Password Policy then press Enter.

You may choose to use a password only during setup and configuration or to use a password anytime the system is being accessed.



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21. In the Intel(R) AMT Configuration menu, select Network Setup then press Enter.

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INTEL (R) AMT CONFIGURATION		
Manageability Feature Selection > SOL/ IDER/ KVM > User Consent	< Enabled>	
Password Policy > Network Setup	<anytime></anytime>	
Unconfigure Network Access > Remote Setup And Configuration > Power Control	<full unprovision=""></full>	
$[\uparrow\downarrow] = Move Highlight$ [Enter] = Sele	ect Entry [Esc]= Exit	

22. In the Intel(R) ME Network Setup menu, select Intel(R) ME Network Name Settings then press Enter.

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INTEL (R) ME NETWORK SETUP
Intel (R) ME Network Name Settings TCP/ IP Settings
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry [Esc]= Exit

23. In the Intel(R) ME Network Name Settings menu, select Host Name then press Enter. Enter the computer's host name then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS	
Host Name Domain Name Shared/ Dedicated FQDN Dynamic DNS Update Computer Host Name	
[Enter] = Complete Entry [Esc]= Discard Changes	

24. Select **Domain Name** then press Enter. Enter the computer's domain name then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS		
Host Name Domain Name Shared/ Dedicated FQDN <shared> Dynamic DNS Update <disabled> Computer Domain Name</disabled></shared>		
[Enter] = Complete Entry [Esc]= Discard Changes		

25. Select Shared/Dedicated FQDN then press Enter. Select Shared or Dedicated then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS	
Host Name – Domain Name – Shared/ Dedicated FQDN <shared> Dynamic DNS Update <disabled></disabled></shared>	
Dedicated Shared	
$[\uparrow\downarrow]$ = Move Highlight [Enter] = Complete Entry [Esc]= Discard Changes	

26. Select **Dynamic DNS Update** then press Enter. Select **Enabled** or **Disabled** then press Enter.

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INTEL (R) ME NETWORK NAME SETTINGS		
Host Name Domain Name Shared/ Dedicated FQDN Dynamic DNS Update	- - Shared> <disabled></disabled>	
	Disabled Enabled	
$[\uparrow\downarrow] = Move Highlight$ [1]	Enter] = Complete Entry	[Esc]= Discard Changes

27. Select Previous Menu until you return to the Intel(R) ME Network Setup menu. Select TCP/IP Settings then press Enter.

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TCP/ IP SETTINGS		
> Wired LAN IPV4 Configuration		
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry [Esc] = Exit		

28. In the TCP/IP Settings menu, select Wired LAN IPV4 Configuration then press Enter.



29. In the Intel(R) AMT Configuration menu, select Unconfigure Network Access then press Enter.

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Copyright(C) 2003-13 Intel C	Corporation. All Rights Reserved.	
INTEL (R) AMT CONFIGURATION		
Manageability Feature Selection > SOL/ IDER/ KVM	< Enabled>	
> SOL/ IDER/ KVM > User Consent Password Policy	<anytime></anytime>	
> Network Setup Unconfigure Network Access	<full unprovision=""></full>	
> Remote Setup And Configuration > Power Control		
	Full Unprovision Partial Unprovision	
$[\uparrow ↓]$ = Move Highlight [Enter] = Complete Entry [Esc]= Discard Changes		

30. In the Intel(R) AMT Configuration menu, select Remote Setup And Configuration then press Enter.

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INTEL (R) AMT CONFIGURATION		
Manageability Feature Selection > SOL/IDER/KVM	< Enabled>	
> User Consent Password Policy	<anytime></anytime>	
> Network Setup Unconfigure Network Access	<full unprovision=""></full>	
> Remote Setup And Configuration > Power Control		
$\left[\uparrow\downarrow\right] = Move Highlight [Enter] = Selet$	ect Entry [Esc]= Exit	
[[+v] = move mginght [Liner] = Set	Esc]- LAR	

31. In the Intel(R) Remote Setup And Configuration menu, select Current Provisioing Mode then press Enter.

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Copyright(C) 2003-13 Intel Corporation. All Rights Reserved.
INTEL (R) REMOTE SETUP AND CONFIGURATION
Current Provisioning Mode Provisioning Record
Provisioning Mode:PKI
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Select Entry [Esc] = Exit

32. In the Intel(R) Remote Setup And Configuration menu, select Provisioning Record then press Enter.

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INTEL (R) REMOTE SETUP AND CONFIGURATION		
Current Provisioning Mode Provisioning Record		
Provision Record is not present		
$\uparrow \downarrow$] = Move Highlight [Enter] = Select Entry [Esc]= Exit		

33. In the Intel(R) AMT Configuration menu, select Power Control then press Enter.

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INTEL (R) AMT CONFIGURATION		
Manageability Feature Selection	< Enabled>	
> SOL/ IDER/ KVM		
> User Consent		
Password Policy	<anytime></anytime>	
> Network Setup		
Unconfigure Network Access	<full unprovision=""></full>	
> Remote Setup And Configuration		
> Power Control		
$[\uparrow\downarrow] = Move Highlight [Enter] = Selection$	ct Entry [Esc]= Exit	

34. In the Intel(R) AMT Power Control menu, select Intel(R) AMT ON in Host Sleep States then press Enter. Select an option then press Enter.

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INTEL (R) AMT POWER CONTROL		
Intel (R) AMT ON in Host Sleep States	<mobile: in="" on="" s0,<br="">ME Wake in S3, S4-5 (AC only)></mobile:>	
Idle Timeout	65535	
Mobile: ON in S0 Mobile: ON in S0, ME Wake in S3, S4-5 (AC only)		
$[\uparrow\downarrow] =$ Move Highlight [Enter] = Complete H	Entry [Esc]= Discard Changes	

35. In the Intel(R) AMT Power Control menu, select Idle Timeout then press Enter. Enter the timeout value (1-65535).

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INTEL (R) AMT POW	VER CONTROL
This configurations are effective only after AMT provisioning has started	
Intel (R) ME ON in Host Sleep States	<mobile: in="" on="" s0,<br="">ME Wake in S3, S4-5 (AC only)></mobile:>
Idle Timeout	65535
Timeout Value (1-65535)	
<enter> = Complete Entry [ESC]= Discard Changes</enter>	

 Select Previous Menu until you return to the Main Menu. Select Exit then press Enter. Type Y then press Enter.



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.