IEI Technology Corp.

MODEL:

ECK-161B

High Performance Intel® Core™2 Duo Fanless System Supports CF Card, PCI Card, 7.1 Channels HD Audio, TV-out, Six USB 2.0 Ports and Four Serial Ports

User Manual

Rev. 1.00 July 2008

RoHS Lead Free

Revision

Date	Version	Changes
2008-07	1.00	Initial Release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the ECK-161B or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the ECK-161B. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the ECK-161B. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the ECK-161B. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the ECK-161B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the ECK-161B package.

- 1 x ECK-161B embedded system
- 1 x Screw set
- 1 x Power adaptor
- 1 x Power cord
- 1 x QIG
- 2 x Wall mount brackets
- 1 x HDD installation kit
- 1 x Driver CD
- 1 x Manual CD

Images of the above items are shown in **Chapter 4**.

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1

Introduction

1.1 ECK-161B Embedded System Overview

Figure 1-1: ECK-161B Embedded System

The ECK-161B is an Intel® Core™ Duo or Intel® Celeron® M based embedded system that is ideal for multimedia applications. The ECK-161B embedded system supports diverse display including one VGA display and one HDTV display. The High Definition (HD) Audio integrated in the ECK-161B provides surround sound quality and supports up to eight channels of sound. A 1 GB DDR2 SDRAM memory module is preinstalled in the ECK-161B.

The aluminum alloy fins on the chassis offers superior heat dissipation and makes the fanless ECK-161B embedded system have high performance and low operating temperature. The ECK-161B has two power input connectors to support 12 V DC input and 9 V ~ 36 V DC input.

The ECK-161B supports one 2.5” SATA HDD and has one front-accessible CompactFlash® card slot. Featuring two GbE, six USB, four serial communication ports, as well as audio, TV-out, and VGA, the ECK-161B offers system integrators and developers the best selection of robust and high performance computing system platforms. The ECK-161B embedded system also supports one PCI card for more expansion options.

1.1.1 ECK-161B Benefits

The ECK-161B embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Multiple display interfaces and high quality HD audio support
- Powerful preinstalled Intel® Core™ Duo/Celeron® M CPU and motherboard ensures rigorous processing needs can be met

1.1.2 ECK-161B Features

The ECK-161B has the following features

- RoHS compliant design
- Fanless system
- 1.66 GHz Intel® Core™ Duo/1.86 GHz Intel® Celeron® M CPU supported
- One PCI expansion card supported
- Two GbE RJ-45 connectors supported
- VGA and HDTV display interfaces supported
- 7.1 channel HD audio support
- Six USB 2.0 ports and four serial ports

1.2 ECK-161B Model Variation

The ECK-161B embedded system has one preinstalled 1 GB DDR2 SDRAM memory module preinstalled. The model information is listed in **Table 1-1** below.

ECK-161B	CPU	L2 Cache	CPU #	PCI Slot
SF-WD/T2300E/1GB	1.66 GHz Intel® Core™ Duo	2 MB	T2300E	Yes
SF-WD /CM440/1GB	1.86 GHz Intel® Celeron® M	1 MB	440	Yes

Table 1-1: Model Variation

1.3 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	ECK-161B
CPU	1.66 GHz Intel® Core™ Duo T2300E CPU with 2 MB L2 cache 1.86 GHz Intel® Celeron® M 440 CPU with 1 MB L2 cache
System Chipset	GMCH: Intel® 945GM ICH: Intel® ICH7-M
System Memory	One 1 GB DDR2 SDRAM DIMM preinstalled
Ethernet	Two Broadcom PCIe GbE controllers
Display	CRT and TV-out interfaces integrated in Intel® 945GM ■ 1 x 7-pin mini DIN TV-out port ■ 1 x VGA port (DB-15)
USB	Six USB 2.0 supported (two on the front panel and four on the rear panel)
Serial Port	Four RS-232
Audio	7.1 channel HD audio
Storage	One CompactFlash® card slot One 2.5” SATA hard disk drive bay
Expansion	One PCI slot
Chassis Construction	Aluminum Alloy with heavy duty metal
Power Input	12 V DC input by 4-pin mini DIN connector 9 ~ 36 V DC input by terminal block
Operating Temperature	0ºC ~ 40ºC (with consumer hard drive) 0ºC ~ 50ºC (with automotive hard drive/CF card)

Net Weight (NW/GW)	4.1 kg / 6.0 kg
Dimensions (W x D x H)	222.20 mm x 210.20 mm x 99.49 mm
EMC/Safety	CE, FCC class A

Table 1-2: Technical Specifications

1.4 Power Adapter Specifications

The ECK-161B series models are shipped with a 150 W power adapter. The specifications for the adapter are listed in **Table 1-3**:

Output	**Nominal**	12.0 V DC	
	Regulation	11.4 V – 12.6 V	
	Output Voltage	380 mV P-P	
	Output Current	0 A	
	AC Inlet	12.5 A	
Protection	**Short Circuit**	Yes	
	Over-Voltage	Yes	
Time	**Hold Up**	≧3 ms	
Input	**Min.**	90 V	
	Nominal	100V ~ 240V	
	Max.	264 V	
	Frequency	47Hz ~ 63Hz	
	Efficiency	≧85% 100 Vac / 7.89 A ≧86% 240 Vac / 7.89 A	
Environment	**Temperature**	Operating	0ºC ~ 40ºC
		Storage	-20ºC ~ 80ºC
	Relative Humidity	Operating (non-condensing)	20% ~ 80%
		Storage (non-condensing)	10% ~ 90%
Reliability	**MTBF**	100,000 hours of continuous operation at 25ºC	

Table 1-3: Power Adapter Specifications

Chapter

2

Mechanical Description

2.1 ECK-161B Mechanical Overview

The ECK-161B RoHS compliant, Intel® Core™ Duo/Celeron® M fanless embedded system features industrial grade components that offer longer operating life, high shock/vibration resistance and endurance over a wide temperature range. The ECK-161B combines these features in an aluminum enclosure designed for space critical applications that require low power consumption. Featuring two GbE, six USB, four serial communication ports, as well as audio, TV-out, and VGA, the ECK-161B offers system integrators and developers the best selection of robust and high performance computing system platforms. The ECK-161B embedded system also supports one PCI card for more expansion options.

2.2 ECK-161B Physical Dimensions

The dimensions of the ECK-161B are listed below and shown in **Figure 2-1**.

- **Height**: 99.49 mm
- **Width**: 222.20 mm
- **Length**: 210.20 mm

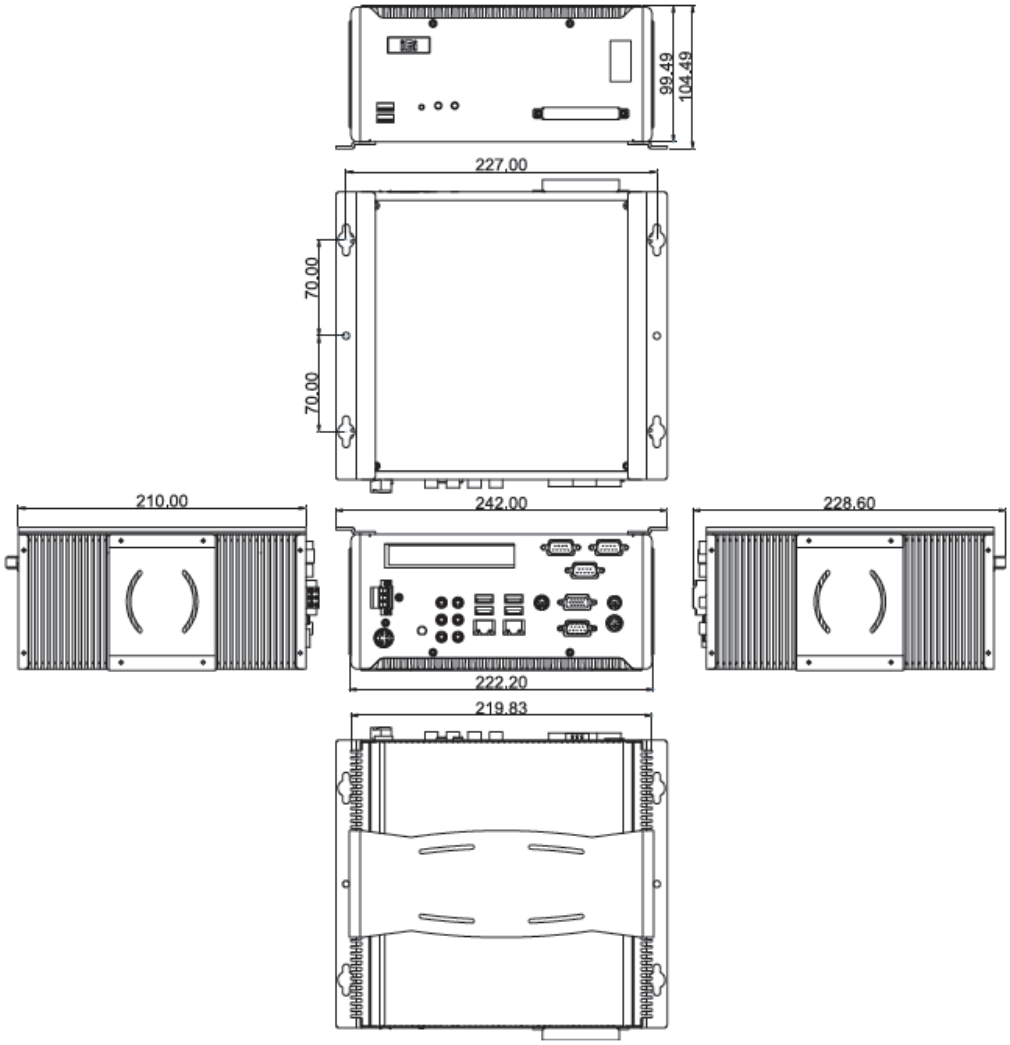


Figure 2-1: ECK-161B Dimensions (mm)

2.3 External Overview

2.3.1 Front Panel

The front panel of the ECK-161B (**Figure 2-3**) contains following connectors and buttons:

- 2 x USB 2.0 ports
- 1 x CompactFlash® slot
- 1 x Power switch
- 1 x Reset button

- 1 x HDD LED
- 1 x Power LED

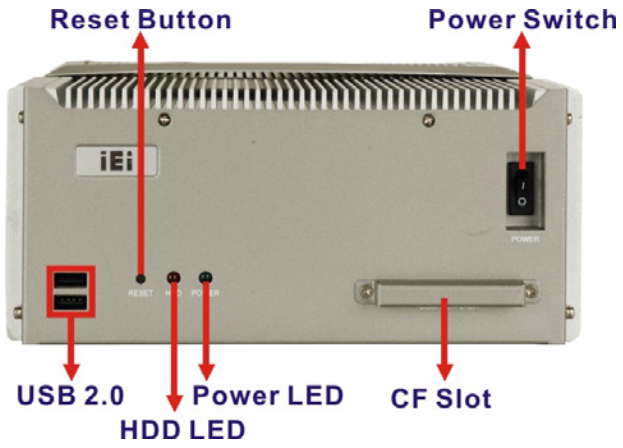


Figure 2-2: ECK-161B Front Panel

2.3.2 Rear Panel Overview

The rear panel of the ECK-161B contains all the external I/O interface connectors and power connector. An overview of the rear panel is shown in **Figure 2-3** below.

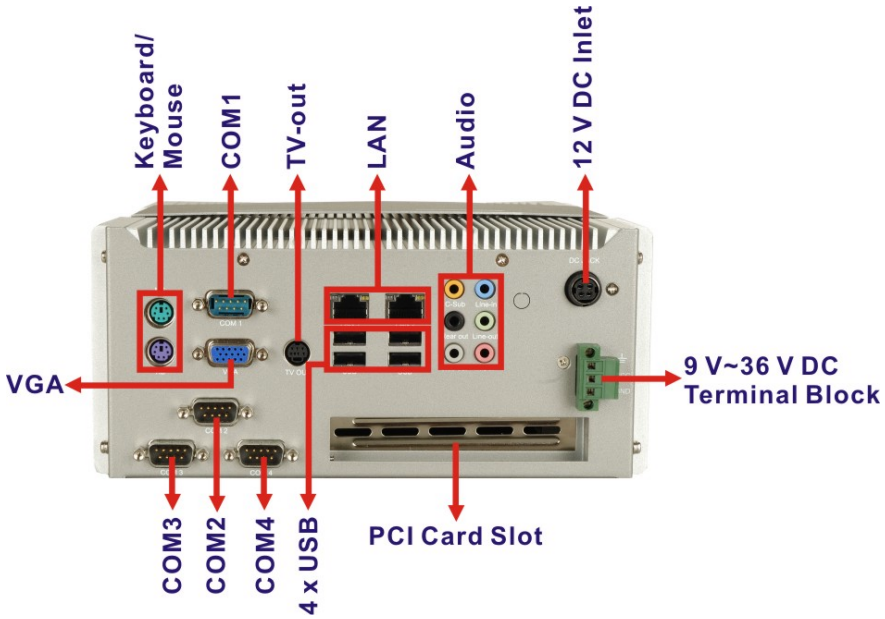


Figure 2-3: ECK-161B Rear Panel

The front panel I/O connectors shown in **Figure 2-3** are listed below:

- 1 x 12 V DC inlet
- 1 x 9 V ~ 36 V DC input terminal block
- 6 x Audio jacks
- 1 x Keyboard connector
- 1 x Mouse connector
- 1 x PCI expansion card slot
- 2 x RJ-45 GbE connectors
- 4 x RS-232 serial port connectors
- 1 x TV-out connector
- 4 x USB 2.0 ports
- 1 x VGA connector

2.4 Internal Overview

The ECK-161B internal components are listed below:

- 1 x IEI KINO-9452 motherboard (preinstalled)
- 1 x 1 GB DDR2 SDRAM DIMM module (preinstalled)
- 1 x 2.5” SATA HDD (optional)
- 1 x PCI expansion card (optional)

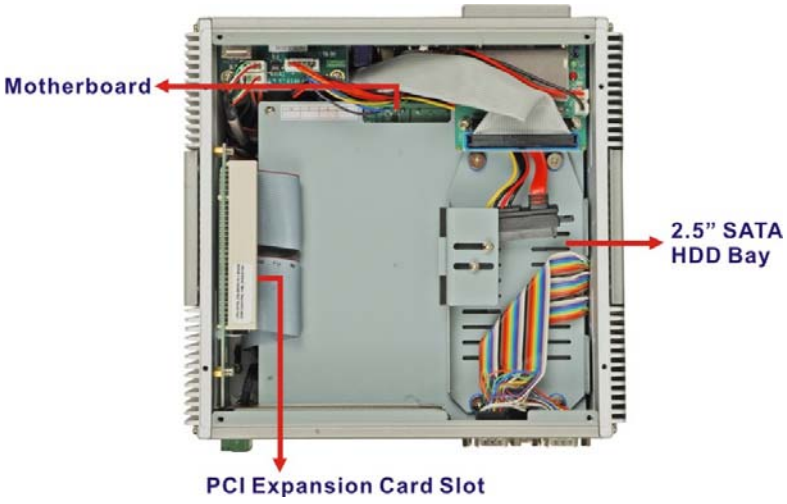


Figure 2-4: Internal Overview

Chapter

3

System Specifications

3.1 CPU Support

NOTE:

The ECK-161B has a preinstalled 1.66 GHz Intel® Core™ Duo or 1.86GHz Intel® Celeron® M CPU. If the CPU fails, the motherboard has to be replaced. Please contact the IEI reseller or vendor you purchased the ECK-161B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The KINO-9452 motherboard comes with a preinstalled 1.66 GHz Intel® Core™ Duo or 1.86 GHz Intel® Celeron® M CPU.

3.1.1 Intel® Core™ Duo Specifications

The specifications for the Intel® Core™ Duo processor are listed below

- Two complete execution cores in one processor package provide advancements in simultaneous computing
- Dual-core processing efficiently delivers performance while balancing power requirements
- Two execution cores share a high-performance, power-optimized 667 MHz front-side bus (FSB) to access the same chipset memory.
- Enhanced Intel® SpeedStep® technology allows a system to dynamically adjust processor voltage and core frequency, decreasing average power consumption and average heat production
- Intel® Smart Cache Design allows two execution cores to share 2 MB of L2 cache, reducing FSB traffic and enhancing system responsiveness
- Intel® Advanced Thermal Manager supports new digital temperature sensors and thermal monitors on each execution core to enhance thermal monitoring accuracy
- Streaming SIMD Extensions 3 (SSE3) provides significant performance enhancement for multi-media applications

- Embedded lifecycle support protects system investment by enabling extended product availability for embedded and communications customers

3.1.2 Intel® Celeron® M Specifications

The specifications for the Intel® Celeron® M processor are listed below

- Intel® Streaming SIMD Extensions accelerates 3D graphics performance, video decoding/encoding, and speech recognition.
- Advanced power management features
- Compatible with IA-32 software.
- Advanced branch prediction and data prefetch logic

3.2 System Chipset

3.2.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the board:

- **Northbridge**: Intel® 945GM
- **Southbridge**: Intel® ICH7-M

The following two sections (**Section 3.2.2** and **Section 3.2.3**) list some of the features of the Intel® 945GM and the Intel® ICH7-M chipsets. For more information on these two chipsets please refer to the Intel website.

3.2.2 Intel® 945GM Northbridge Chipset

The Intel® 945GM Northbridge chipset comes with the following features:

- System Memory Support
  - Supports single/dual-channel DDR2 SDRAM
  - 64-bit wide per channel
  - 256 MB, 512 MB and 1 GB memory technologies supported
  - Support for DDR2 On-Die Termination (ODT)
  - Support for 2N timings only
- Internal Graphics
  - Intel® Gen 3.5 Integrated Graphics Engine

- 250 MHz core render clock and 200 MHz core display clock at 1.05 V core voltage
- Supports TV-Out, CRT and SDVO

- DMI
  - Chip-to-chip interface between (G)MCH and ICH
  - Configurable as x2 or x4 DMI lanes
  - DMI lane reversal support
  - 32-bit downstream address
- Power Management
  - ACPI S0, S3, S4, S5
  - CPU States C0, C1, C2, C3, C4 states
  - Rapid Memory Power Mgmt

3.2.3 Intel ICH7-M Southbridge Chipset

The Intel® ICH7-M Southbridge chipset comes with the following features:

- PCI Local Bus Specification, Revision 2.3 support for 33 MHz PCI operations (supports up to six Req/Gnt pairs)
- ACPI Power Management Logic support
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated Serial ATA host controller with independent DMA operation on two ports and AHCI
- Integrated IDE controller supports Ultra ATA 100/66/33
- USB host interface with support for six USB ports; four UHCI host controller; one EHCI high-speed USB 2.0 Host controller
- Integrated Intel® PRO 82573E GbE controller
- Supports Audio Codec ’97, Revision 2.3 Specification
- Supports Intel® High Definition Audio
- Low Pint Count (LPC) interface
- Firmware Hub (FWH) interface support
- Serial Peripheral Interface (SPI) support

3.3 Graphics Support

The graphics features listed below are all integrated on the Intel® 945GM Northbridge chipset.

- Analog CRT
  - Integrated 400 MHz RAMDAC
  - Analog monitor support up to QXGA
  - Support for CRT hot plug
- TV-Out
  - Three integrated 10-bit DACS
  - Overscaling
  - NTSC/PAL
  - HDTV support – 480p/720p/1080i/1080p
- SDVO Ports
  - Concurrent operation of x1 PCIe with SDVO
  - Two SDVO ports supported
- Supports appropriate external SDVO and TV-Out)

3.4 Ethernet Controller Specifications

3.4.1 Overview

The Broadcom BCM5787 is a seventh generation 10/100/1000BASE-T Ethernet LAN controller solution for high performance network applications. The device combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, PCIe bus interface, and on-chip buffer memory in a single device. The device is fabricated in a 1.2V CMOS process providing a low-power system solution. The GbE controller features are below.

3.4.2 Features

- Integrated 10/100/1000 transceiver
- 10/100/1000 full/half-duplex MAC
- Automatic MDI crossover function
- Supports PCIe v1.0a

- Wake-on-LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash supported
- JTAG supported
- 196-FBGA package

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

If the following anti-static precautions are not followed, a user may be injured and the system irreparably damaged.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the ECK-161B is opened and any electrical component handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.

4.2 Installation Procedure

4.2.1 Installation Procedure Overview

To properly install the ECK-161B, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Install the CF card

Step 3: Install the HDD

Step 4: Install the PCI expansion card

Step 5: Mount the ECK-161B

Step 6: Connect the rear panel peripheral connectors

Step 7: Power the system up

4.2.2 Unpacking

After the ECK-161B is received make sure the following components are included in the package. If any of these components are missing, please contact the ECK-161B reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	ECK-161B embedded system	
1	Power adaptor	
1	Power cord	
1	Screw set	
1	HDD installation kit	
2	Wall mount brackets	
1	Driver and manual CD	
1	Quick installation guide	

Table 4-1: Package List Contents

4.2.3 CompactFlash® Card Installation

To install the CF card, please follow the steps below.

Step 1: Locate the CF slot on the front panel of the ECK-161B.

Step 2: Remove the two CF slot cover retention screws from the front panel (**Figure 4-1**).

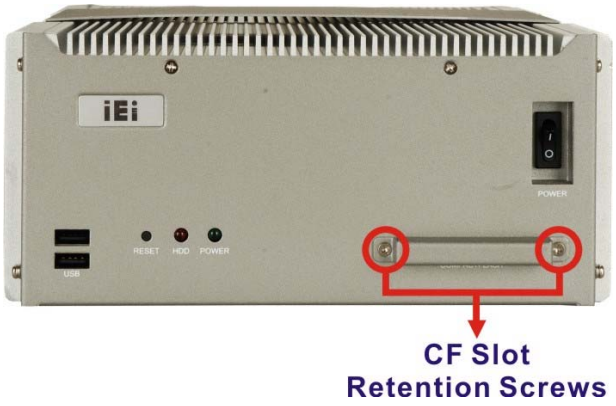


Figure 4-1: CF Slot Cover Retention Screws

Step 3: Insert the CF card into the slot (**Figure 4-2**).

Figure 4-2: CF Card Installation

Step 4: Replace the CF slot cover to protect the CF card and secure the slot cover with two previously removed retention screws.

4.2.4 Bottom Panel Removal

Before installing the internal components, the bottom panel must be removed. To remove the bottom panel, please follow the steps below:

Step 1: Turn the ECK-161B embedded system over.

Step 2: Locate the bottom panel retention screws, four on the bottom panel (**Figure 4-3**), two on the right panel and two on the left side panel (**Figure 4-4**).

Figure 4-3: Bottom Panel Retention Screws (Bottom)

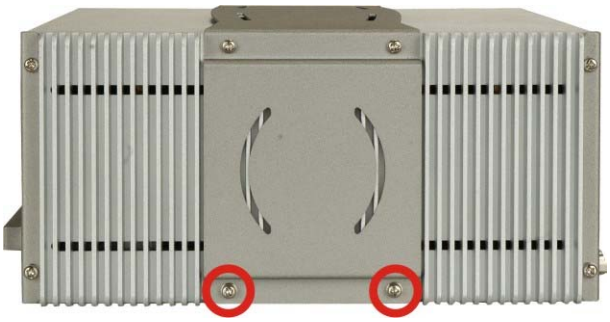


Figure 4-4: Bottom Panel Retention Screws (Side)

Step 3: Remove the eight bottom panel retention screws.

Step 4: Gently remove the bottom panel from the ECK-161B.

4.2.5 HDD Installation

One 2.5” SATA HDD can be installed in the ECK-161B embedded system. To install the HDD, follow the instructions below.

Step 1: **Remove the bottom panel**. See **Section 4.2.3**.

Step 2: **Remove the two PCI card holder** retention screws and remove the PCI card holder (**Figure 4-5**).

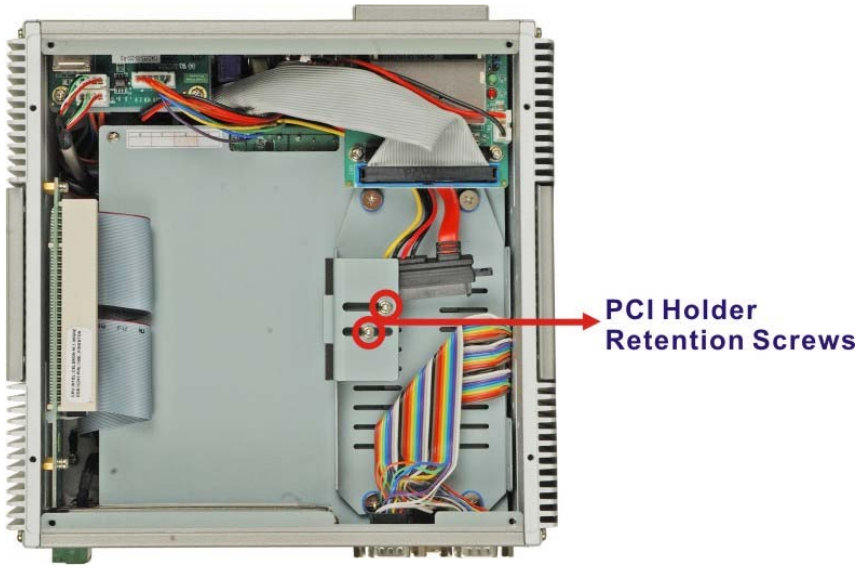


Figure 4-5: PCI Card Holder Retention Screws

Step 3: **Remove the HDD bracket** by removing the four retention screws (**Figure 4-6**).

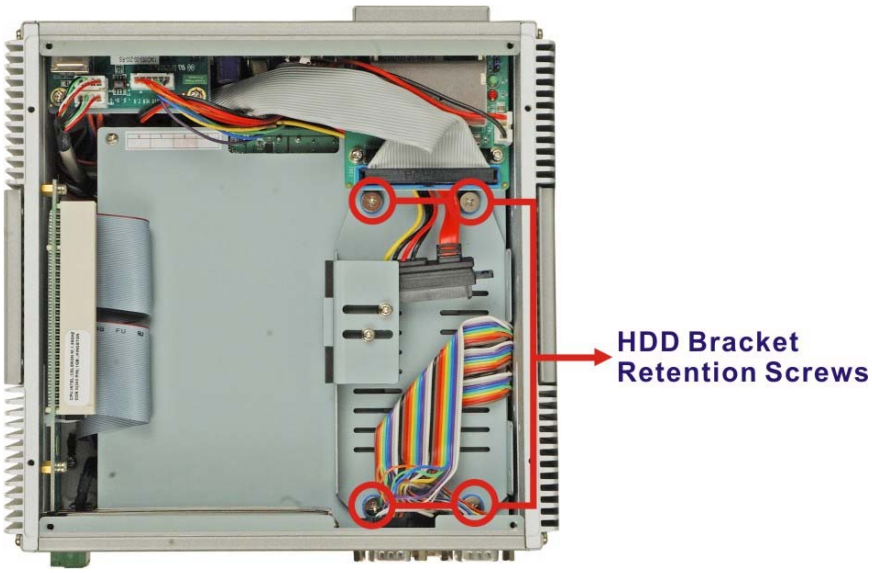


Figure 4-6: HDD Bracket Retention Screws

Step 4: **Install the metal plate for securing SATA cable**. Align the retention screw holes on the metal plate with the two retention screw holes near the connector side on the bottom of the HDD. Insert two retention screws to secure the metal plate with the HDD (Figure 4-7).

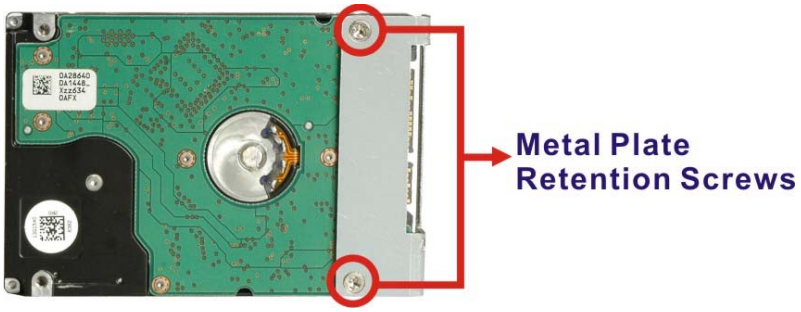


Figure 4-7: SATA Cable Metal Plate Installation

Step 5: **Secure the HDD with the HDD bracket**. Align the retention screw holes on the sides of the HDD with the retention screw holes on the bracket. Insert four retention screws from the sides of the bracket to secure the HDD with the bracket (**Figure 4-8**).

Figure 4-8: HDD Retention Screws

Step 6: **Secure the SATA cable to the HDD**. Connect the SATA cable from the ECK-161B to the rear of the HDD. Insert two retention screws to secure the SATA cable with the HDD (Figure 4-9).

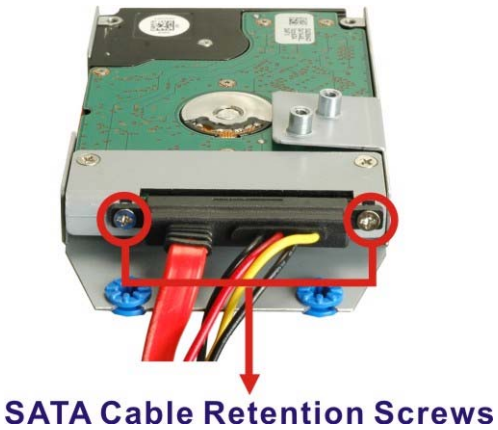


Figure 4-9: SATA Cable Retention Screws

Step 7: Replace the HDD bracket into the ECK-161B and reinsert the four previously removed retention screws (**Figure 4-10**).

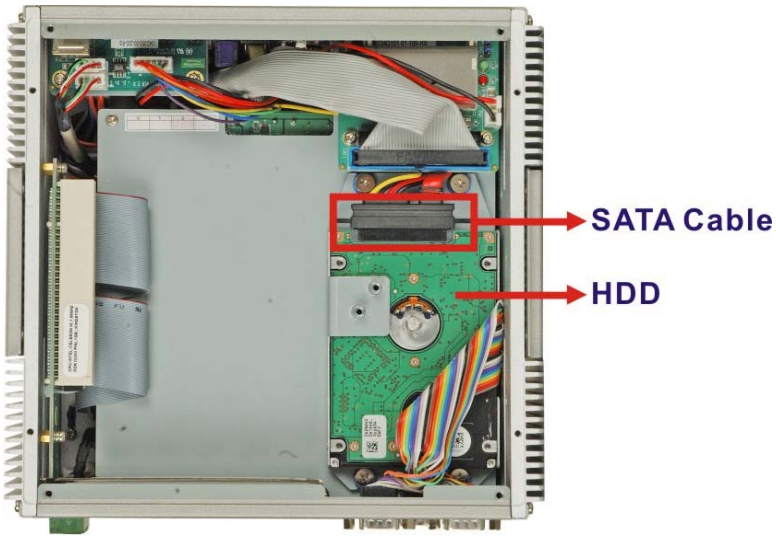


Figure 4-10: HDD Installation

Step 8: Replace the bottom panel.

4.2.6 PCI Expansion Card Installation

The ECK-161B has one PCI slot. The PCI expansion card with a depth under 155 mm can be installed in the ECK-161B. To install the PCI card, follow the instructions below.

Step 1: Remove the bottom panel. See **Section 4.2.3**.

Step 2: Remove the PCI slot cover on the rear panel of the ECK-161B by removing the retention screw shown in **Figure 4-11**.

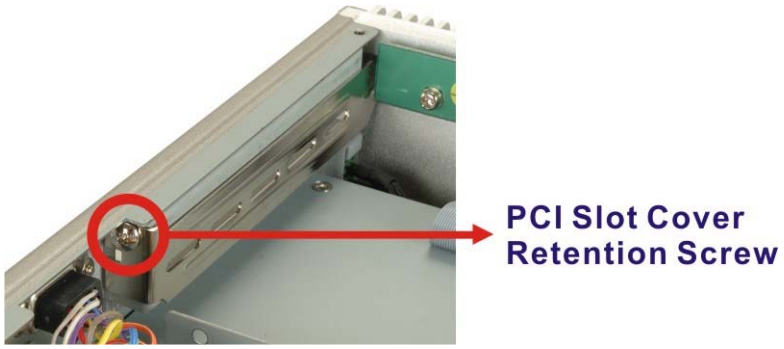


Figure 4-11: PCI Slot Cover Retention Screw

Step 3: Remove the two PCI card holder retention screws (**Figure 4-12**) and remove the PCI card holder.

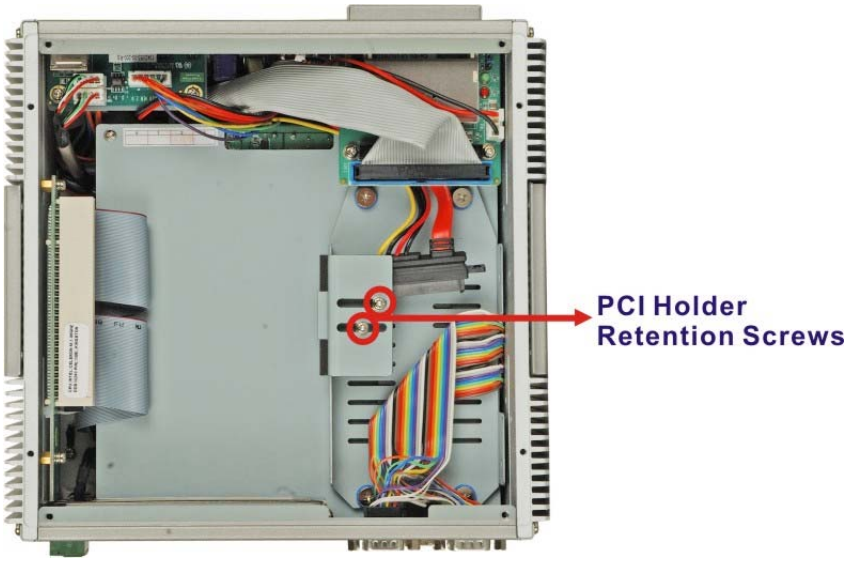


Figure 4-12: PCI Card Holder Retention Screws

Step 4: Insert the PCI card into the PCI slot in the ECK-161B (**Figure 4-13**).

Figure 4-13: PCI Card Installation

Step 5: Secure the PCI card with one retention screws and the cad holder (**Figure 4-14**).

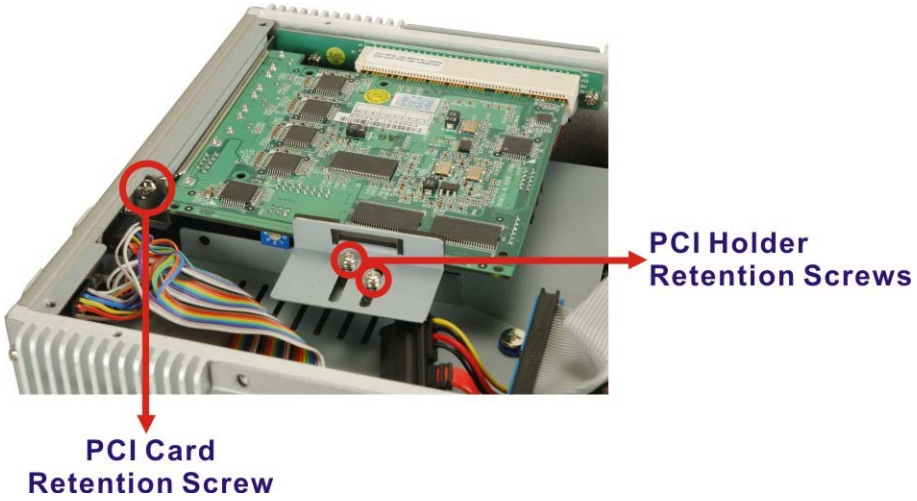


Figure 4-14: Secure the PCI Card

4.2.7 ECK-161B Series Wall Mounting

To mount the ECK-161B, please follow the steps below.

Step 1: Locate the four ECK-161B series mounting bracket retention screw holes on the bottom of the chassis. See **Figure 4-15**.

Figure 4-15: Mounting Bracket Retention Screw Holes

Step 2: Align the round retention screws on the first bracket with the ECK-161B retention screw holes on the bottom of the chassis. Insert one of the retention screws into each of the retention holes.

Step 3: Align the round retention screws on the second bracket with the ECK-161B series retention screw holes on the other side of the bottom of the chassis. Insert one of the retention screws into each of the retention holes.

Step 4: Drill four properly spaced holes into the surface on which the controller is going to be mounted.

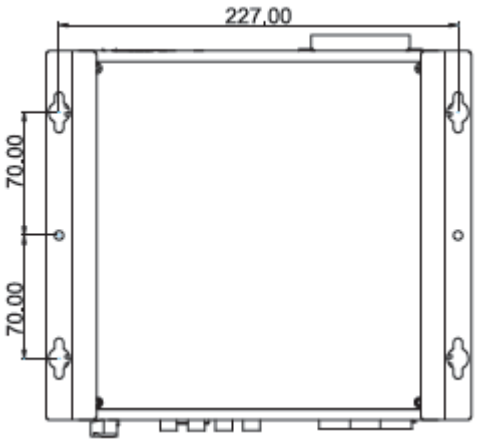


Figure 4-16: Wall Mounting Dimensions (mm)

Step 5: Insert one machine screw into each of the four retention holes on the bracket and into the wall or surface on which the ECK-161B is mounted.

4.2.8 Cable Connections

Once the system has been mounted on the wall, the following connectors can be connected to the system.

- Audio jacks
- Keyboard and mouse connectors
- Power input connector

- RJ-45 connector
- Serial port connector
- TV-out cable connector
- USB devices
- VGA devices

The cable connection locations are shown in **Figure 2-3**.

4.3 Power-On Procedure

4.3.1 Installation Checklist

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user. The ECK-161B has two power input connectors shown below, one supports 12 V DC input and the other supports 9 ~ 36 V DC input.

To power on the embedded system please make sure of the following:

- The bottom panel is installed
- All peripheral devices (monitor, serial communications devices etc.) are connected
- The power cables are plugged in

4.3.2 Power-on Procedure

To power-on the ECK-161B please follow the steps below:

Step 6: Turn on the power switch (**Figure 4-17**).

Step 7: Once turned on, the green power LED on the front panel should be turned on.

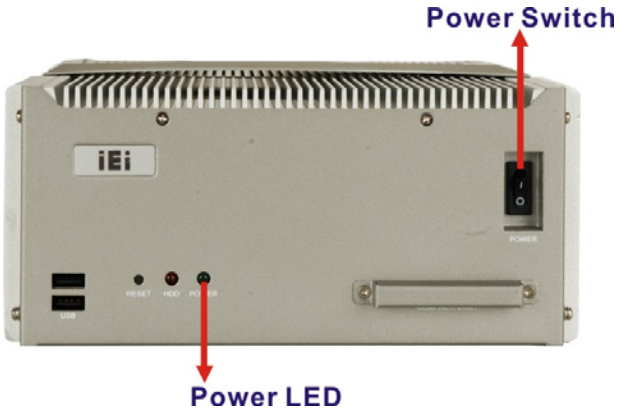


Figure 4-17: Power Switch and Power LED

4.4 System Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the embedded system components. Failure to take anti-static precautions can cause permanent embedded system damage.

The embedded system components listed below can all be replaced if they fail:

- HDD
- PCI card
- CF card

For the replacement procedures of the component listed above, please refer to **Section 4.2**.

A user cannot replace some of the components in the ECK-161B. If the following components fail it must be shipped back to IEI to be replaced. Please contact the system vendor, reseller or an IEI sales person directly.

- Motherboard
- CPU
- DIMM

Chapter

5

AMI BIOS Setup

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the "+" and "-" keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
"+" key	Increase the numeric value or make changes
"-" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 BIOS Menu Bar

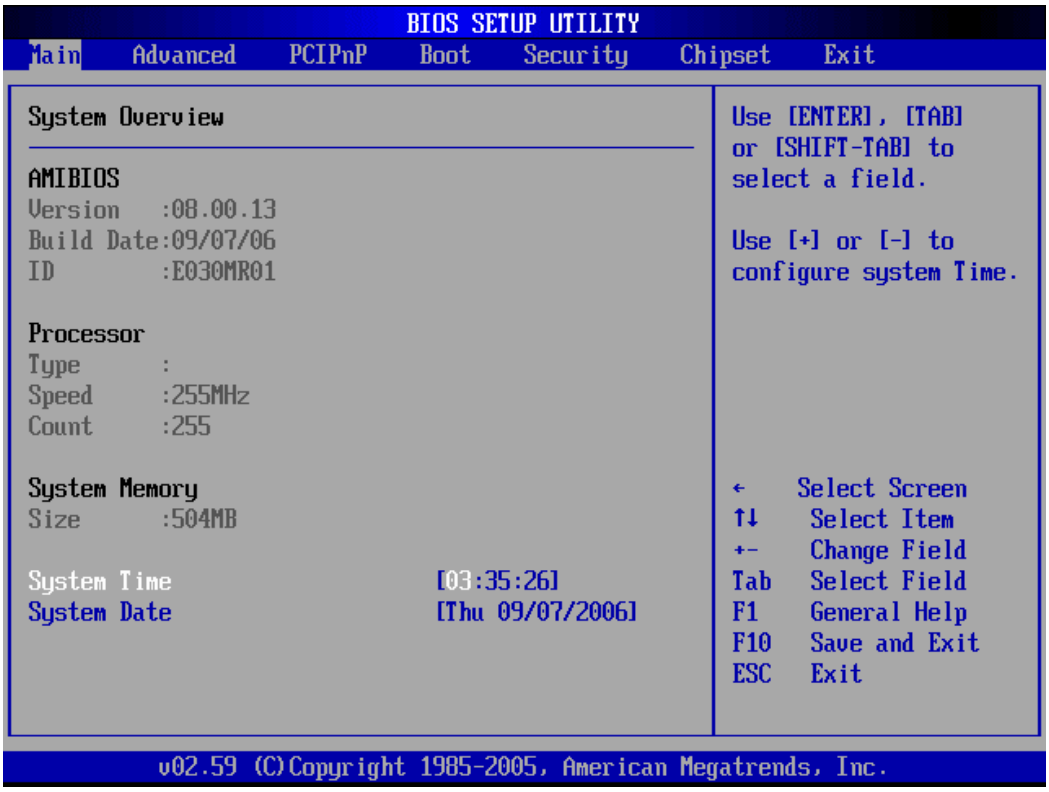
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

When the **BIOS Setup** program is entered, the **Main** menu (**BIOS Menu 1**) appears. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

- **System Time [xx:xx:xx]**: The system time is set here.
- **System Date [Day xx/xx/xxxx]:** The system date is set here.

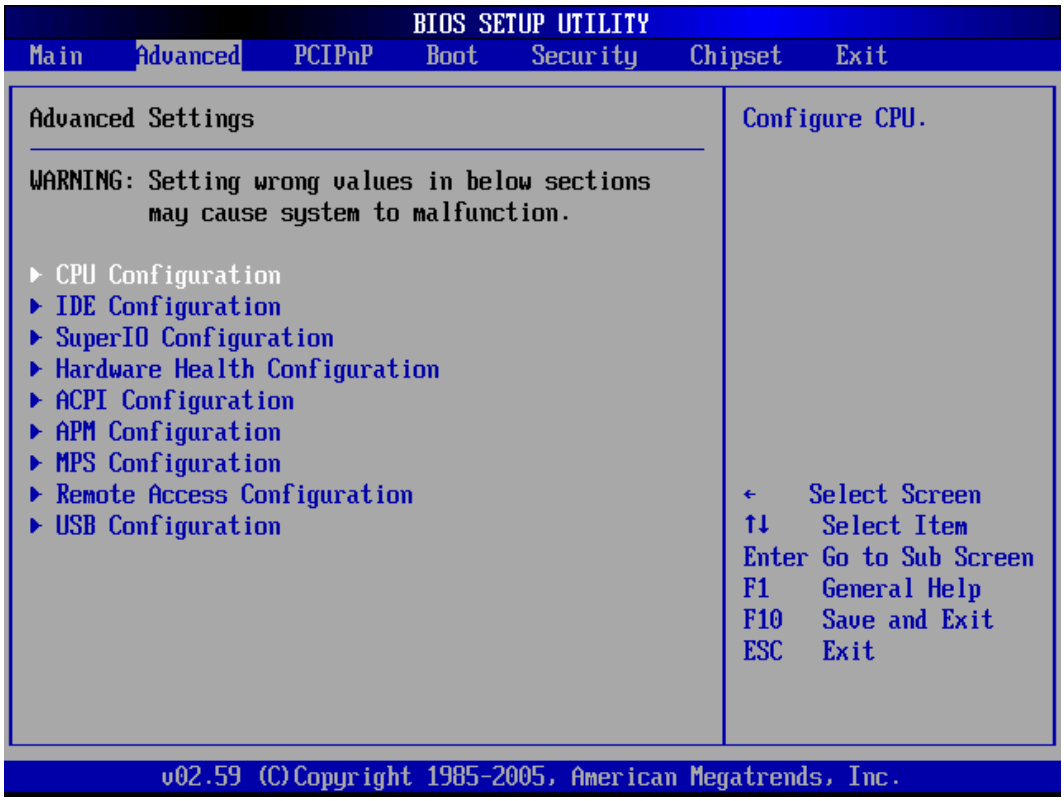
5.3 Advanced

The **Advanced** menu (**BIOS Menu 2**) allows access to the CPU and peripheral device configuration options through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

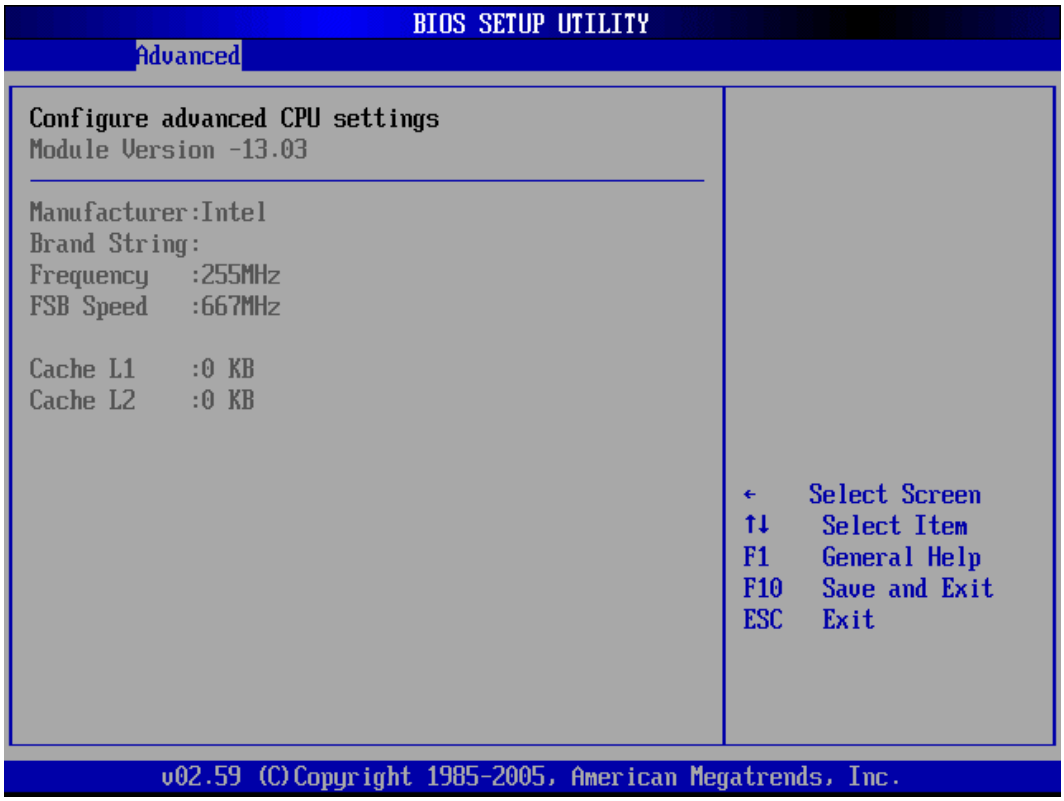
- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- SuperIO Configuration (see **Section 5.3.3**)
- Hardware Health Configuration (see **Section 5.3.4**)
- ACPI Configuration (see **Section 5.3.5**)
- APM Configuration (see **Section 5.3.6**)
- Remote Access Configuration (see **Section 5.3.7**)
- USB Configuration (see **Section 5.3.8**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

The **CPU Configuration** menu (**BIOS Menu 3**) shows detailed CPU specifications and CPU configuration options.



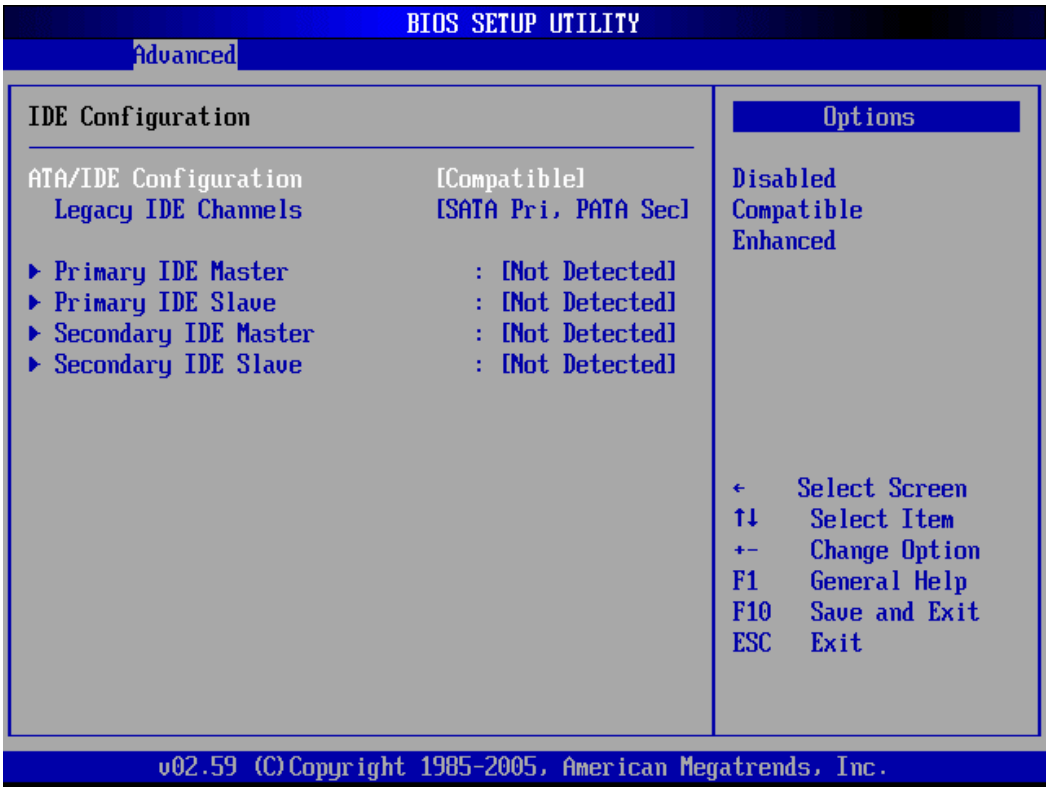
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

5.3.2 IDE Configuration

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configuration [Compatible]**

The ATA/IDE Configuration BIOS option allows the user to configure the ATA/IDE device mode.

➔ **Disabled** Disable all ATA/IDE ports. No Primary/Secondary IDE mode is presented for configuration

➔ **Compatible** **DEFAULT** Up to 4 HDDs can be used, two for SATA and the other for PATA IDE. If this option is selected, “Legacy IDE Channels” option is presented for configuration.

➔ **Enhanced** If this option is selected, “Configure SATA as” and “Configure SATA channels” options are presented for configuration.

➔ **Legacy IDE Channels [SATA Pri, PATA Sec]**

Use the Legacy IDE Channels option configures PATA and SATA resources for operating systems that require legacy IDE operation.

➔ **SATA Only**	Enable up to two SATA devices
➔ **SATA Pri, PATA Sec** (**DEFAULT**)	This option allows the system to access the SATA devices before the primary IDE devices

➔ **IDE Master and IDE Slave**

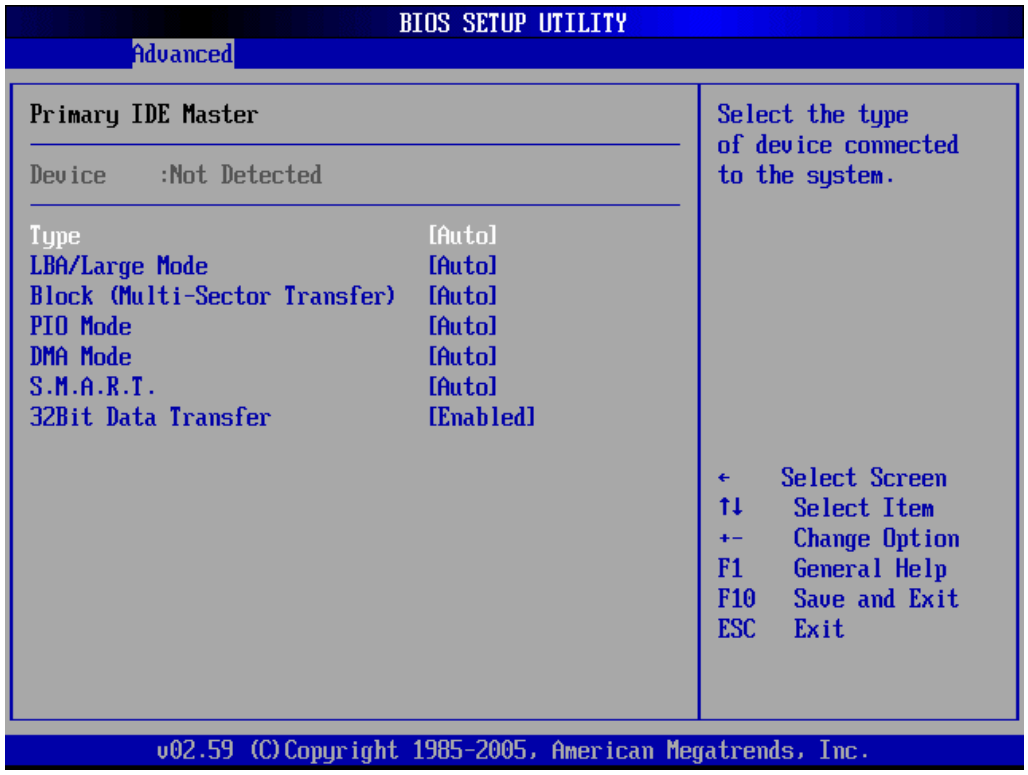
When entering setup, BIOS auto detects the presence of IDE devices. This displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

IDE Master and IDE Slave configuration options for both primary and secondary IDE devices are shown in the BIOS menu below.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Type [Auto]**

The **Type** BIOS option determines the type of device that the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) has completed.

➔ **Not Installed** Selecting this value prevents the BIOS from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** This selection enables the BIOS to auto detect the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of

IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

The **LBA/Large Mode** BIOS option disables or auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** This selection prevents the BIOS from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** This option allows the BIOS to auto detect the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

➔ **Disabled** Selecting this option prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** Selecting this value to allows the BIOS to auto detect the device support for Multi-Sector Transfers on the specified channel. If supported. Select this value to allow the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to the memory. The data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

The **PIO Mode** option selects the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	This setting allows the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3MBps
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2MBps
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3MBps
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1MBps
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

The **DMA Mode** BIOS selection adjusts the DMA mode options.

➔ **Auto**	**DEFAULT**	The BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **S.M.A.R.T [Auto]**

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS to auto detects if the hard disk drive supports S.M.A.R.T. Use this setting if the IDE disk drive support

cannot be determined.

➔ **Disabled** Select this value to prevent the BIOS from using the SMART feature.

➔ **Enabled** Select this value to allow the BIOS to use the SMART feature on support hard disk drives.

➔ **32Bit Data Transfer [Enabled]**

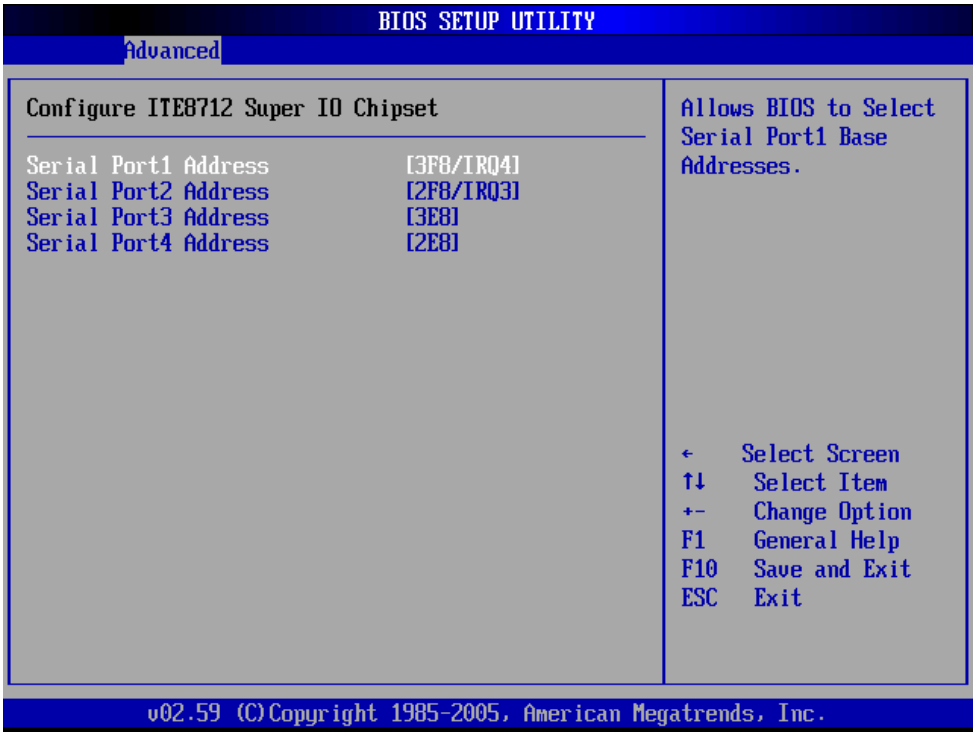
The **32Bit Data Transfer** BIOS option enables or disables 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on support hard disk drives.

5.3.3 Super IO Configuration

The **Super IO Configuration** menu (**BIOS Menu 6**) sets or changes the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

The **Serial Port1 Address** option allows BIOS to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

The **Serial Port2 Address** option allows BIOS to select the Serial Port 2 base address.

- ➔ **Disabled** No base address is assigned to Serial Port 2
- ➔ **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- ➔ **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port3 Address [3E8]**

This option allows BIOS to select the base addresses for serial port 3

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **2E0** Serial port 3 I/O port address is 2E0

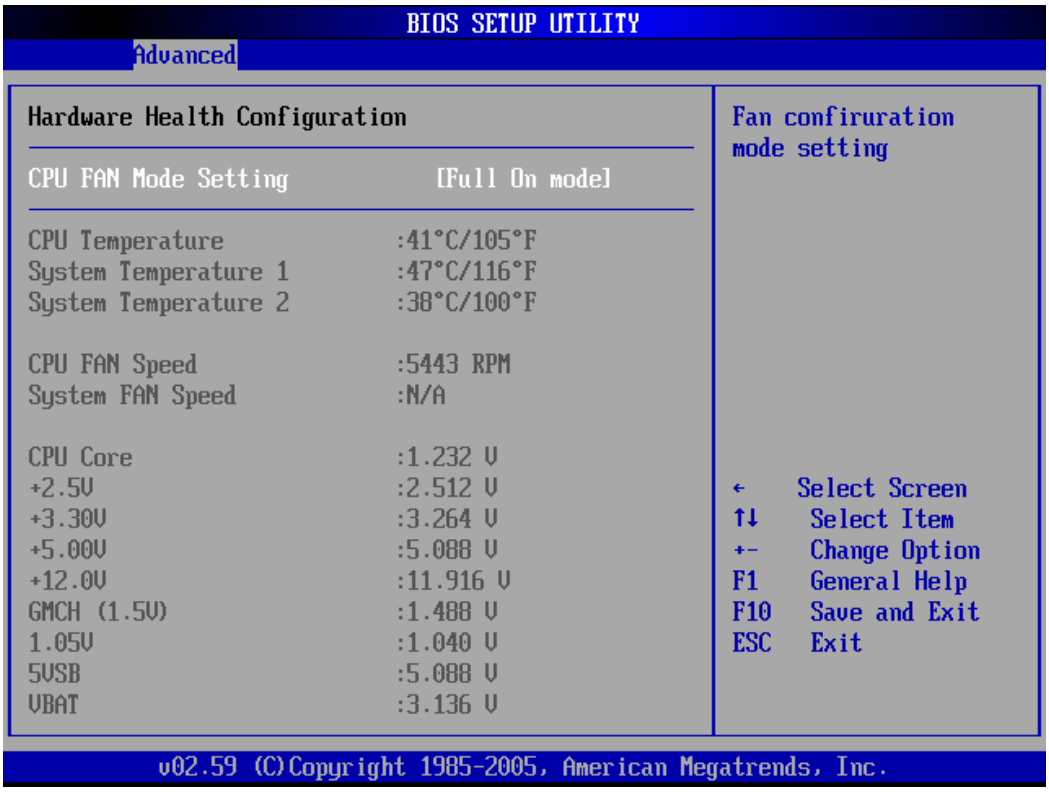
➔ **Serial Port4 Address [2E8]**

This option allows BIOS to select the base addresses for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 4
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- ➔ **2E0** Serial port 4 I/O port address is 2E0

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

➔ **CPU FAN Mode Setting: [Full On mode]**

The CPU **FAN Mode Setting** has the following options:

➔ **Full On mode** **DEFAULT** If selected, there are no additional configurable options.

➔ **Automatic Mode** If selected, the following options will appear with values that can be configured:

- ➔ **CPU Temp. Limit of OFF**
- ➔ **CPU Temp. Limit of Start**
- ➔ **CPU Temp. Limit of Full**
- ➔ **CPU Fan Start PWM**

➔ **Slop PWM 1:** 0 PWM, 1 PWM (Default), 2 PWM, 4 PWM, 8 PWM, 16 PWM, 32 PWM or 64 PWM

➔ **PWM Manually mode** — If selected, the following option will appear with values that can be configured:

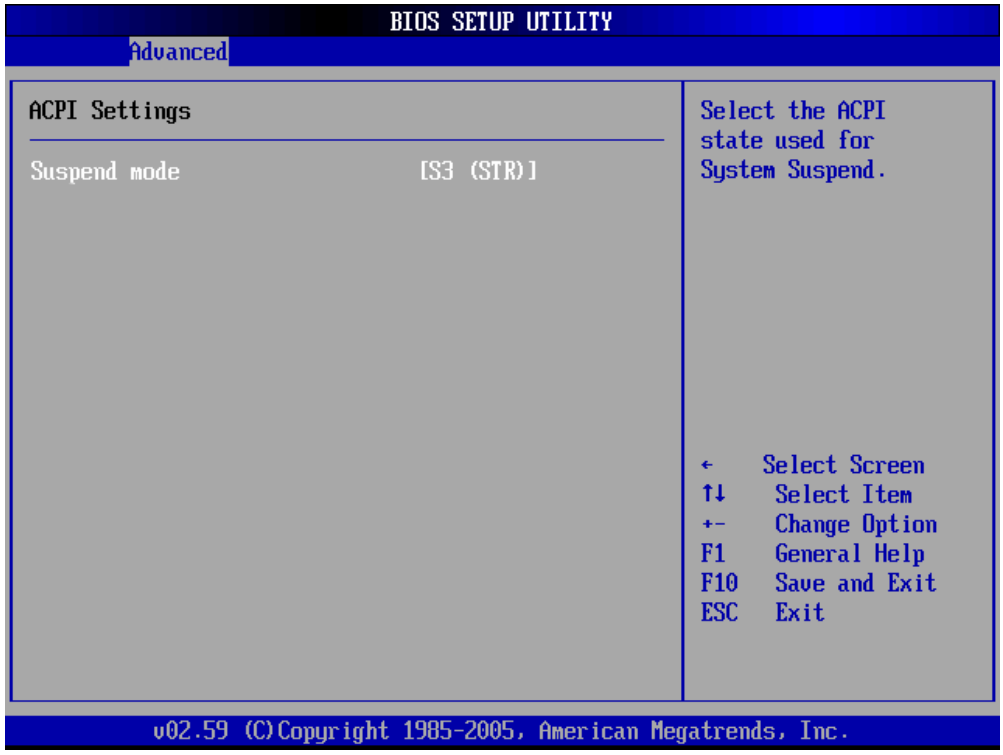
➔ **CPU Fan PWM Control**

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - CPU Fan Speed
  - System Fan Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - +2.5V
  - +3.30V
  - +5.00V
  - +12.0V
  - GMCH (1.5V)
  - 1.05V
  - 5VSB
  - VBAT

5.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

➔ **Suspend mode [S3 (STR)]**

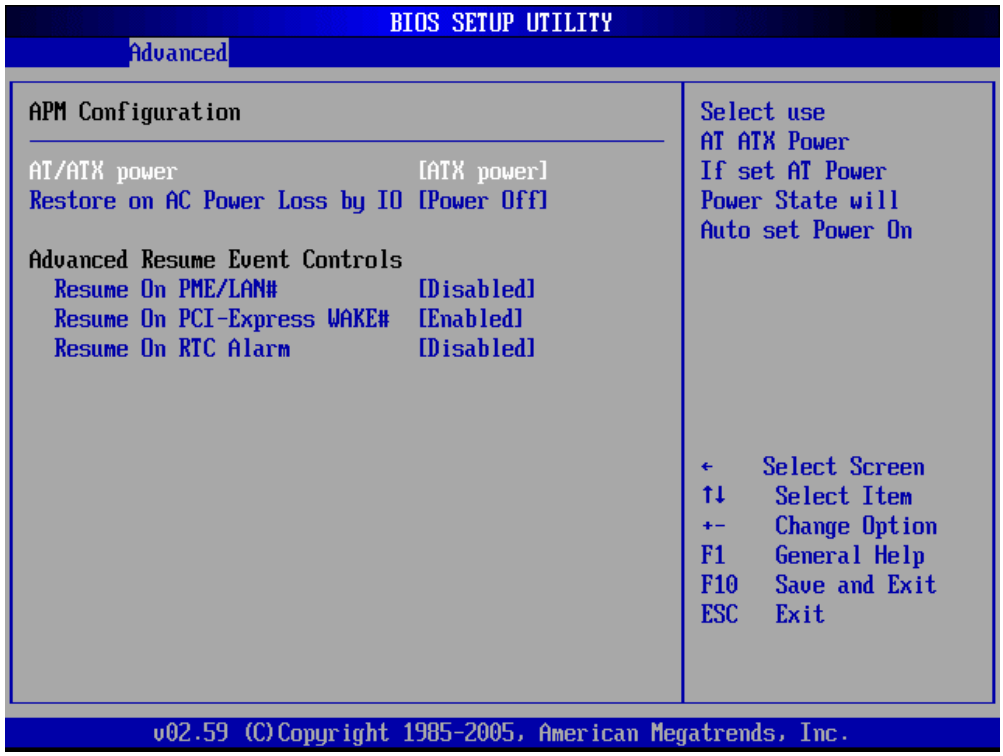
Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** **DEFAULT** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.6 APM Configuration

Use the **APM Configuration** menu (**BIOS Menu 9**) to select the advanced power management.



BIOS Menu 9: APM Configuration

➔ **AT/ATX power [ATX power]**

Use the **AT/ATX power** BIOS option to select the power supply that is connected to the system.

➔ **AT power** An AT power supply is connected to the system

➔ **ATX power** **DEFAULT** An ATX power supply is connected to the system

➔ **Restore on AC Power Loss by IO [Power Off]**

The **Restore on AC Power Loss by IO** BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

- ➔ **Power Off** **DEFAULT** The system remains turned off
- ➔ **Power On** The system turns on

➔ **Resume on PME# [Disabled]**

The **Resume on PME#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

- ➔ **Disabled** **DEFAULT** Wake event not generated by PCI PME controller activity
- ➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **Resume On PCI-Express WAKE# [Enabled]**

The **Resume On PCI-Express WAKE#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI-Express controller.

- ➔ **Disabled** Wake event not generated by PCI-Express controller activity
- ➔ **Enabled** **DEFAULT** Wake event generated by PCI-Express controller activity

➔ **Resume On RTC Alarm [Disabled]**

The **Resume On RTC Alarm** determines when the computer will be roused from a suspended state.

- ➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event
- ➔ **Enabled** If selected, the following will appear with values that can be selected:

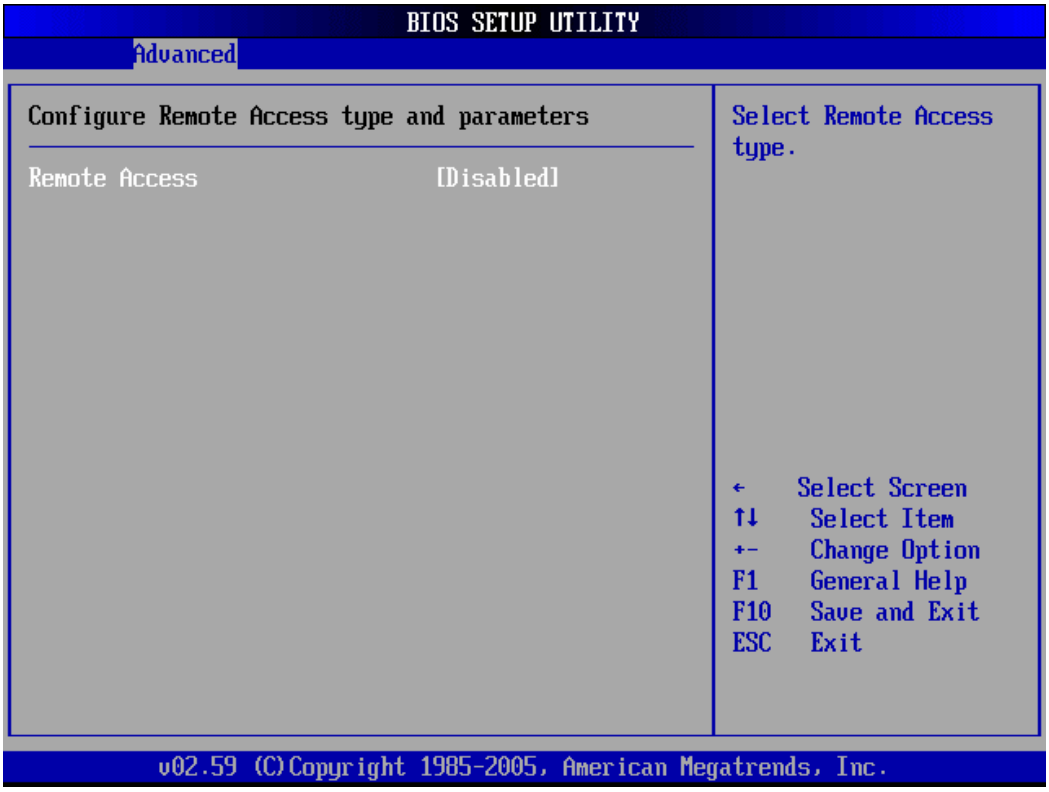
➔ **RTC Alarm Date (Days)**

➔ **RTC Alarm Time**

After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

5.3.7 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 10**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 10: Remote Access Configuration [Advanced]

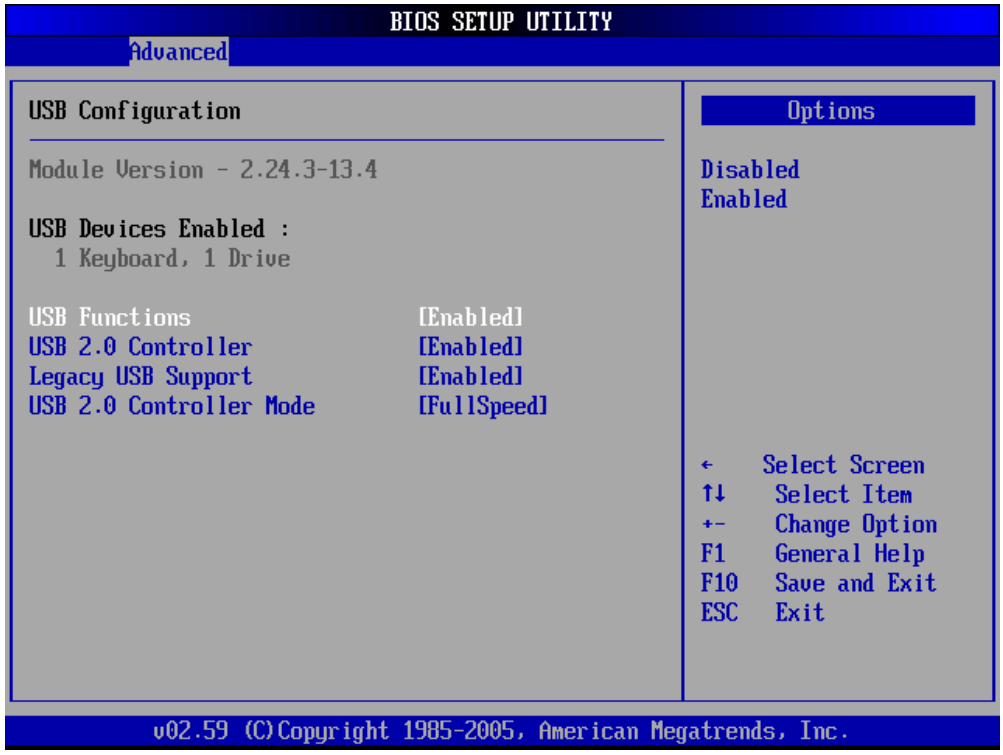
➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**	**DEFAULT**	Remote access is disabled.
➔ **Enabled**		Remote access configuration options shown below appear: ➔ **Serial Port Number** ➔ **Serial Port Mode** ➔ **Flow Control** ➔ **Redirection after BIOS POST** ➔ **Terminal Type** ➔ **VT-UTF8 Combo Key Support** These configuration options are discussed below.

5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 11**) to read USB configuration information and configure the USB settings.



BIOS Menu 11: USB Configuration

➔ USB Configuration

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ USB Devices Enabled

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ USB Functions [Enabled]

Use the **USB Functions** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB function support disabled
➔ **Enabled**	**DEFAULT**	USB function support enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled
➔ **Disabled**		USB 2.0 controller disabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [FullSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**	**DEFAULT**	The controller is capable of operating at 12Mb/s
➔ **HiSpeed**		The controller is capable of operating at 480Mb/s

➔ **BIOS EHCI Handoff [Enabled]**

Use the **BIOS EHCI Handoff** option for systems running OSes that do not have EHCI hand-off support. The EHCI ownership change is managed by the EHCI driver.

➔ **Disabled** Systems with OSes that do not support EHCI can use the EHCI handoff functionality.

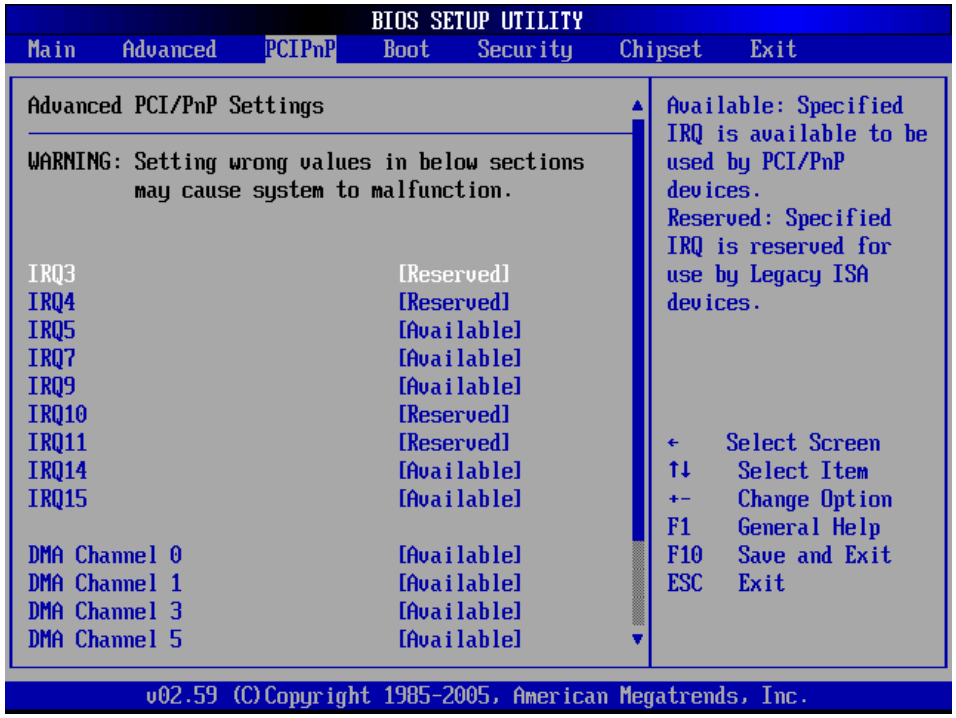
➔ **Enabled** **DEFAULT** Systems with OSes that do not support EHCI cannot use the EHCI handoff functionality.

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 12**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 12: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0

- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

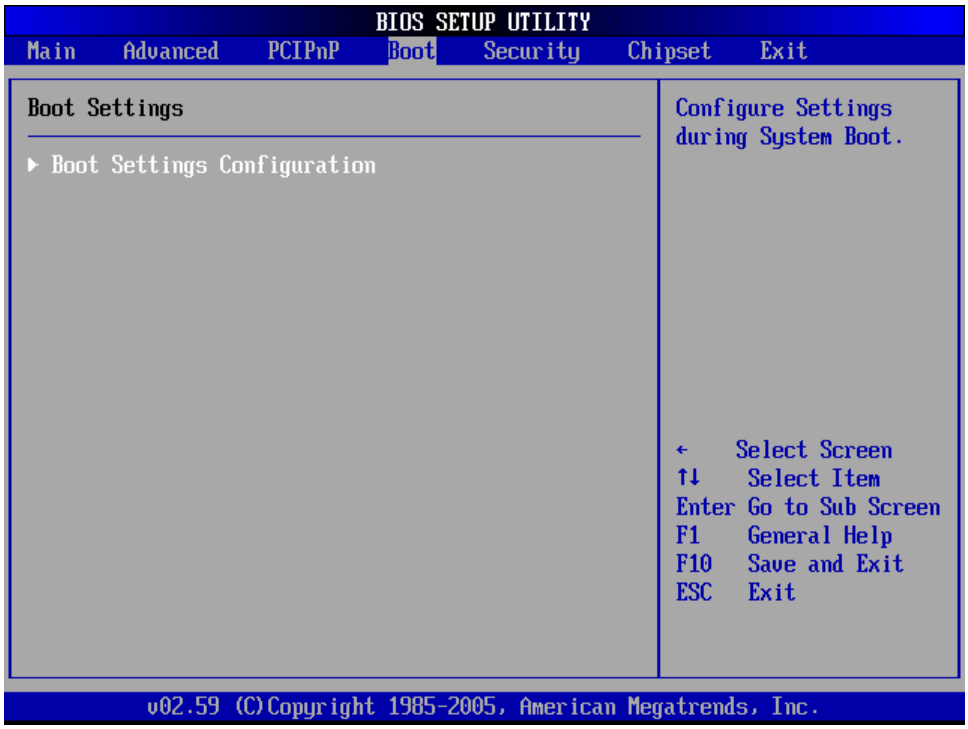
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

5.5 Boot

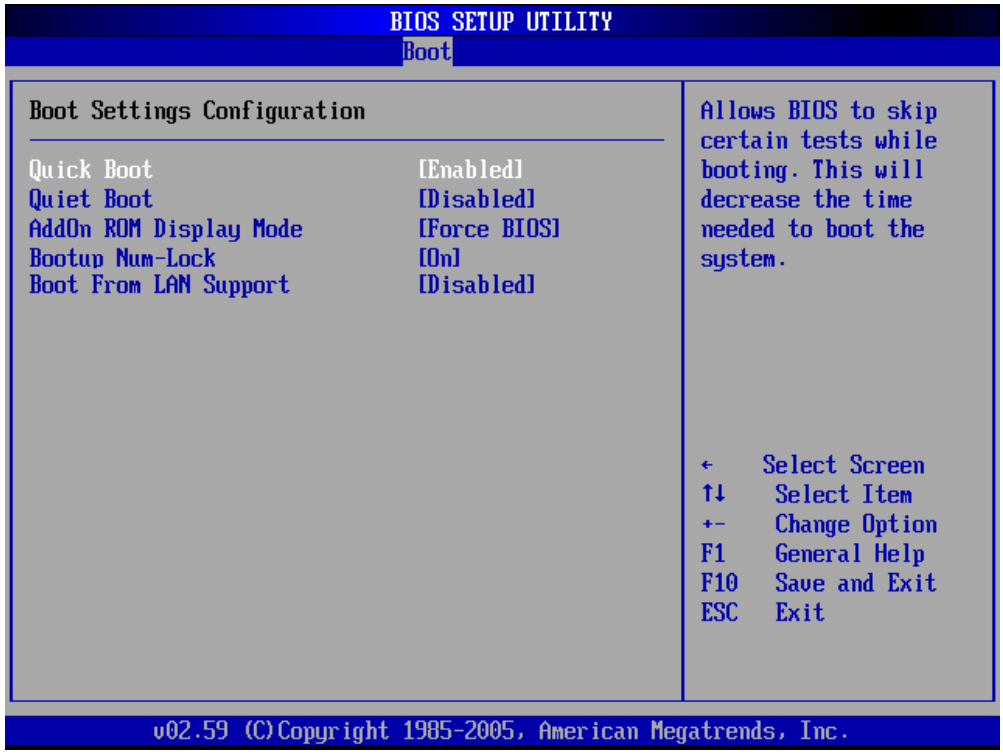
Use the **Boot** menu (**BIOS Menu 13**) to configure system boot options.



BIOS Menu 13: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 14**) to configure advanced system boot options.



BIOS Menu 14: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Boot From LAN Support [Disabled]**

The **BOOT From LAN Support** option enables the system to be booted from a remote system.

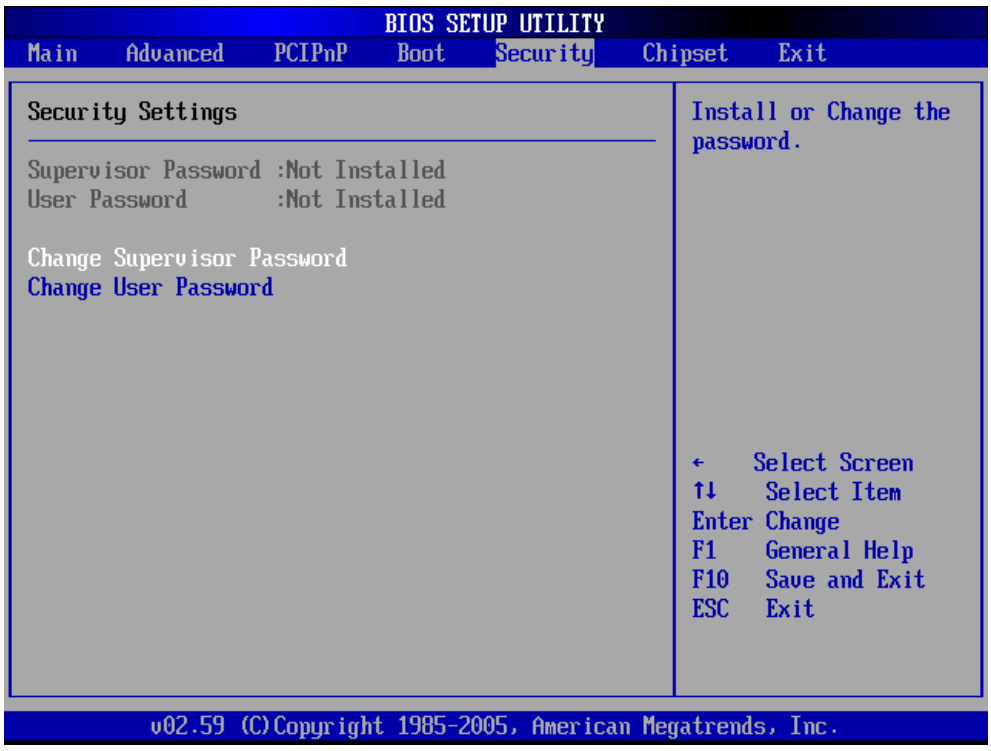
➔ **Disabled**	**DEFAULT**	Cannot be booted from a remote system through the

LAN

➔ **Enabled** Can be booted from a remote system through the LAN

5.6 Security

Use the **Security** menu (**BIOS Menu 15**) to set system and user passwords.



BIOS Menu 15: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the Northbridge and Southbridge configuration menus

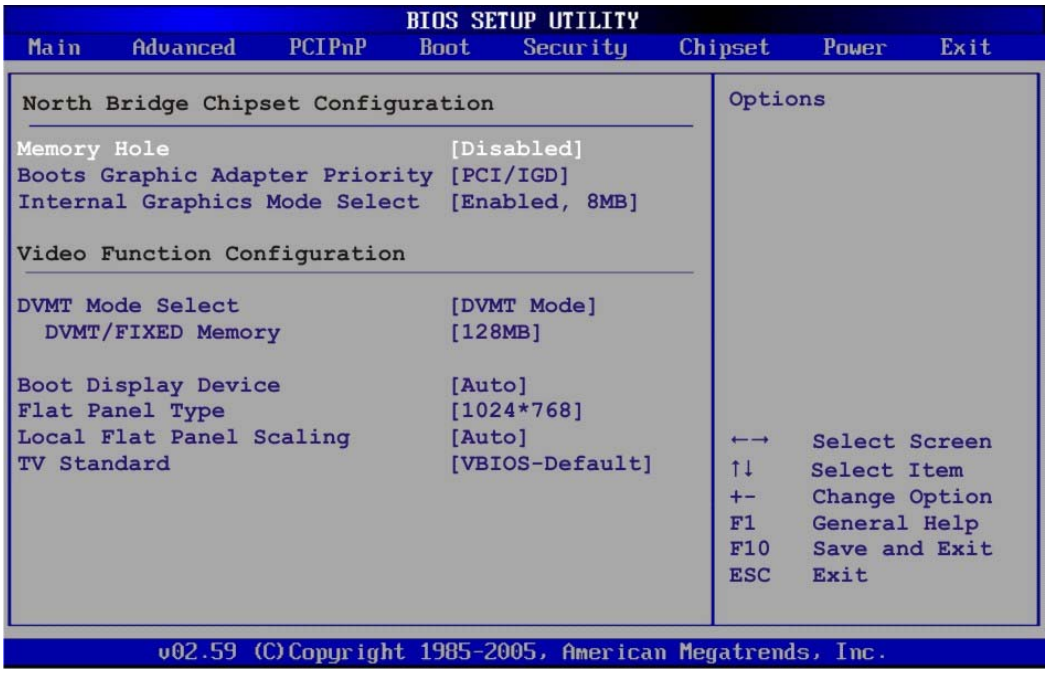
WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

BIOS Menu 16: Chipset

5.7.1 North Bridge Configuration

Use the **North Bridge Configuration** menu (**BIOS Menu 17**) to configure the northbridge chipset.



BIOS Menu 17: North Bridge Chipset Configuration

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15MB – 16MB**		Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔ **Boots Graphics Adapter Priority [PCI/IGD]**

Use the **Boots Graphics Adapter Priority** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD **DEFAULT**

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device

➔ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**		A fixed portion of graphics memory is reserved as graphics memory.
➔ **DVMT Mode**	**DEFAULT**	Graphics memory is dynamically allocated according to the system and graphics needs.
➔ **Combo Mode**		A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

➔ **DVMT/FIXED Memory [128MB]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Selec**t option. If **Combo Mode** is

selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB **DEFAULT**
- Maximum DVMT

➔ **Boot Display Device [Auto]**

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration option is listed below.

- Auto **DEFAULT**
- CRT
- TV
- LFP

➔ **Flat Panel Type [1024*768]**

Use the **Flat Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- 1366*768
- 1920*1080
- 1024*768 **DEFAULT**
- 1280*1024 (36bits)
- 1400*1050 (36bits)
- 1600*1200 (36bits)
- 1280*768
- 1680*1050 (36bits)
- 1920*1200 (36bits)
- 1024*768 (48bits)
- 1440*900 (36bits)
- 1440*900 (48bits)
- 1280*800
- 1280*600

- 2048*1536 (36bits)

➔ **Local Flat Panel Scaling [Auto]**

Use the **Local Flat Panel Scaling** option to select the method of scaling for the flat panel screen attached to the system.

➔ **Auto**	**DEFAULT**	Scaling is automatic
➔ **Forced Scaling**		Scaling is forced
➔ **Disabled**		Scaling is disabled

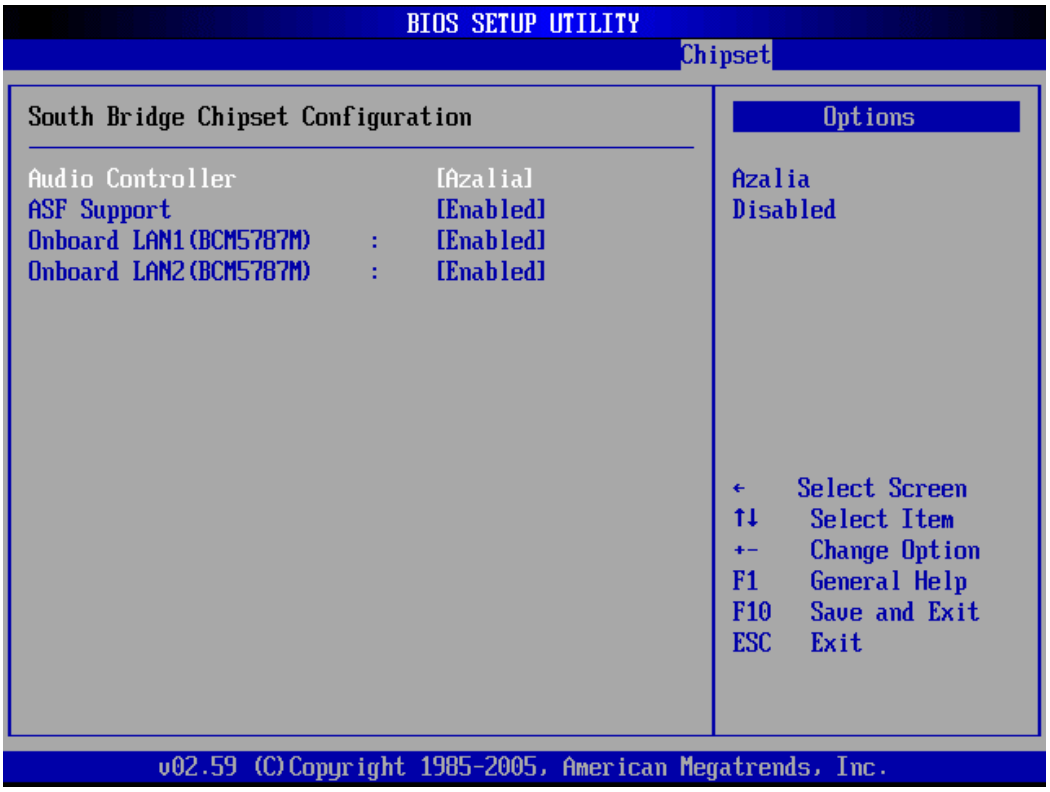
➔ **TV Standard [VBIOS-Default]**

Use the **TV Standard** option to select the standard of the television connected to the system. The configuration options are listed below.

- VBIOS-Default **DEFAULT**
- NTSC
- PAL

5.7.2 South Bridge Configuration

The **SouthBridge Configuration** menu (**BIOS Menu 18**) the Southbridge chipset to be configured.



BIOS Menu 18:South Bridge Chipset Configuration

➔ **ASF Support [Enabled]**

Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

➔ **Enabled** **DEFAULT** The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

➔ **Audio Controller [Azalia]**

The **Audio Controller** option enables or disables the High Definition Audio CODEC.

➔ **Azalia** **DEFAULT** The Intel High Definition Audio controller automatically detected and enabled

➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ **OnBoard LAN1 (BCM5787M) [Enabled]**

The **OnBoard LAN1 (BCM5787M)** option enables or disables the onboard LAN1.

➔ **Disabled** Onboard LAN1 controller manually disabled

➔ **Enabled** **DEFAULT** The onboard LAN1 controller automatically detected and enabled

➔ **OnBoard LAN2 (BCM5787M) [Enabled]**

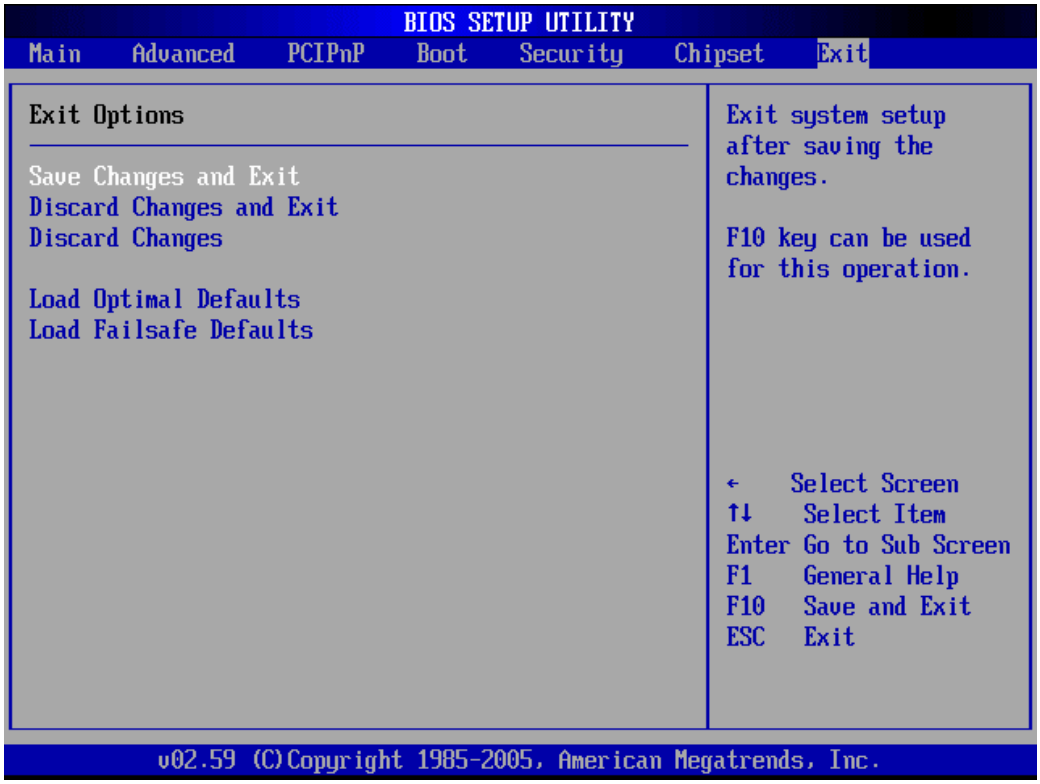
The **OnBoard LAN2 (BCM5787M)** option enables or disables the onboard LAN1.

➔ **Disabled** Onboard LAN2 controller manually disabled

➔ **Enabled** **DEFAULT** The onboard LAN2 controller automatically detected and enabled

5.8 Exit

Use the **Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 19:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

6

Driver Installation

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The ECK-161B embedded system has the following software drivers:

- Intel Chipset Driver Installation
- VGA Utilities Driver
- LAN Driver (for GbE LAN) Installation
- RealTek Audio Driver (ALC883) Installation
- SATA Driver Installation

All drivers can be found on the CD that came with the motherboard. To install the drivers please follow the instructions in the sections below.

6.2 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the ECK-161B embedded system. Open the **1-INF** directory and locate the icon for the **infinst_autol.exe** installation file. Once located, use the mouse to double click the icon.

Step 2: The “InstallShield Wizard Preparation Screen” in **Figure 6-1** appears.

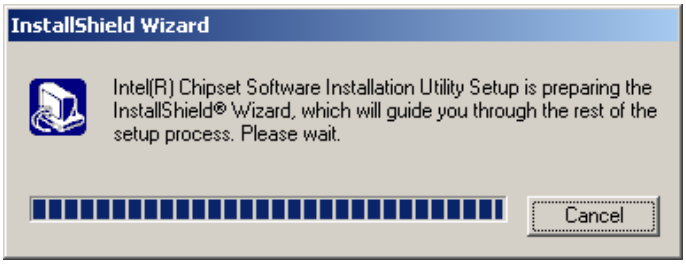


Figure 6-1: InstallShield Wizard Preparation Screen

Step 3: The "Welcome" window in **Figure 6-2** appears next.

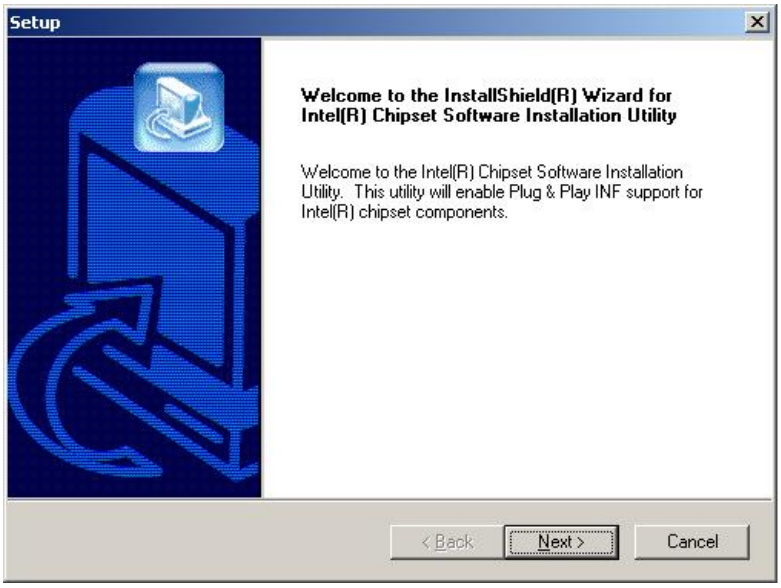


Figure 6-2: Welcome Screen

Step 4: Click "**NEXT**" and the license agreement shown in **Figure 6-3** appears.

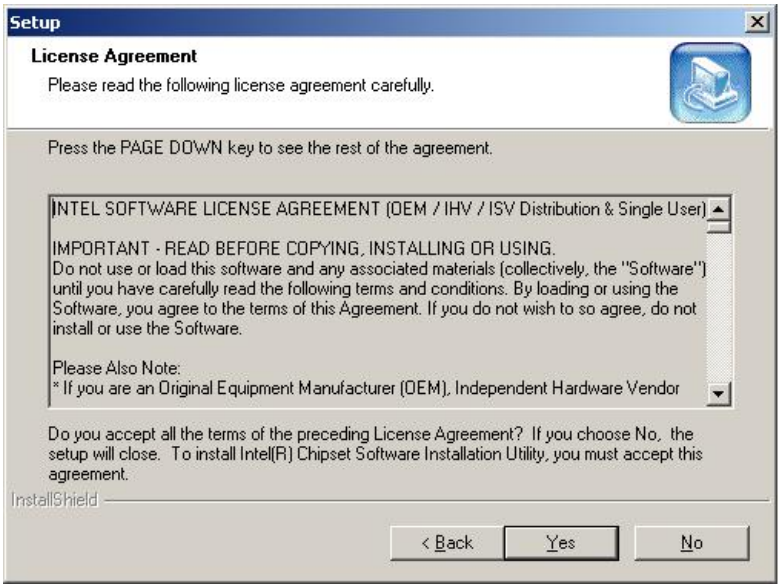


Figure 6-3: License Agreement

Step 5: Agree to the license terms by clicking "**YES**". The "**Readme**" in **Figure 6-4** appears.

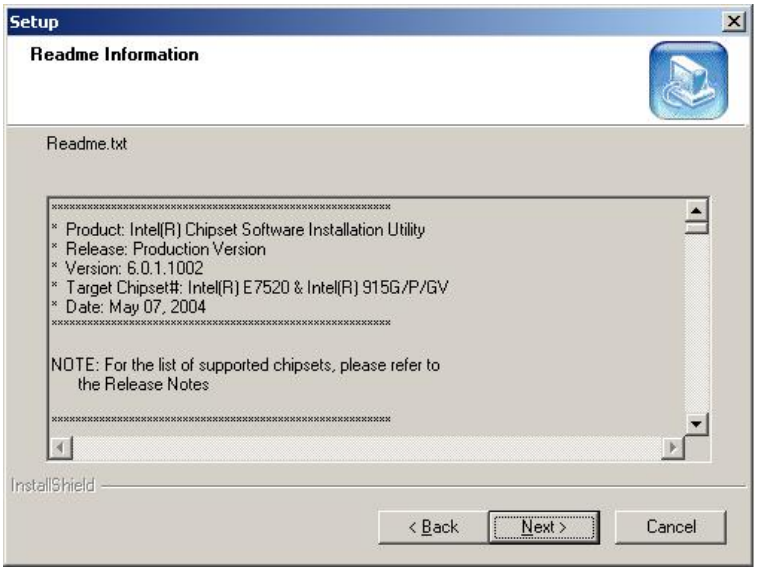


Figure 6-4: Readme Information

Step 6: Click "**YES**". The driver is installed on the computer. After the installation is complete, the installation complete screen shown in **Figure 6-5** appears. Select

the preferred option and click "**FINISH**" to complete the installation process.

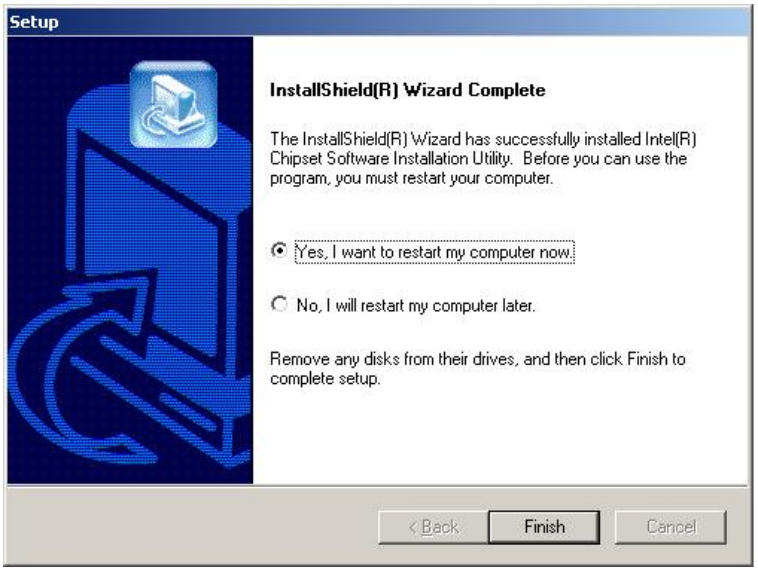


Figure 6-5: Restart the Computer

6.3 VGA Driver

To install the VGA driver, please follow the steps below:

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive.

Step 2: Open the **X:\2-VGA\WIN2K_XP** directory (where **X:** is the system CD drive) and double-click the **win2k_xp1420.exe** installation file.

Step 3: The Starting Install Shield Wizard appears (**Figure 6-6**).

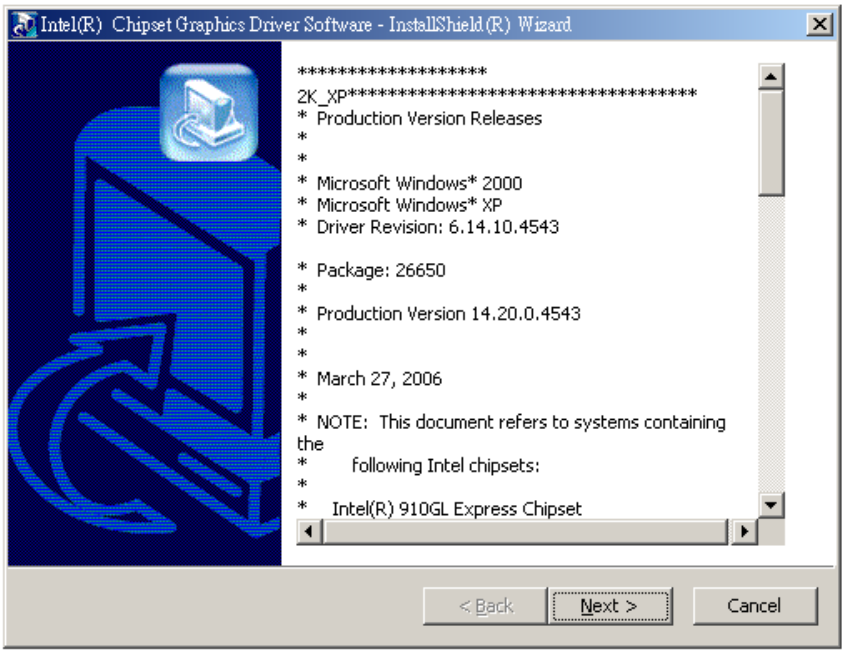


Figure 6-6: Starting Install Shield Wizard Screen

Step 4: The Preparing Setup window appears next (**Figure 6-7**).

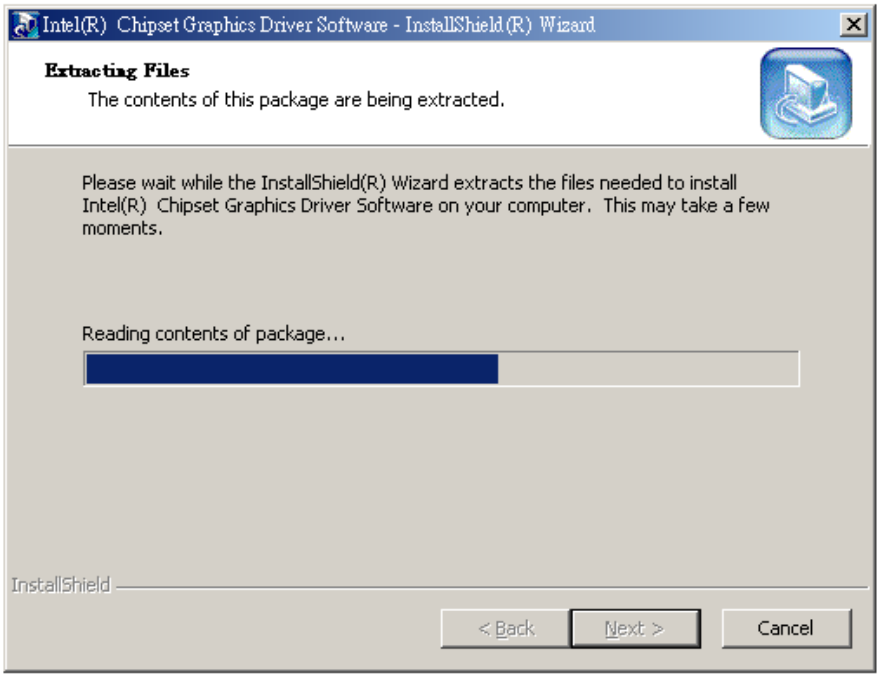


Figure 6-7: Preparing Setup Screen

Step 5: A Welcome screen shown in **Figure 6-8** appears. Click **NEXT** to continue the installation.

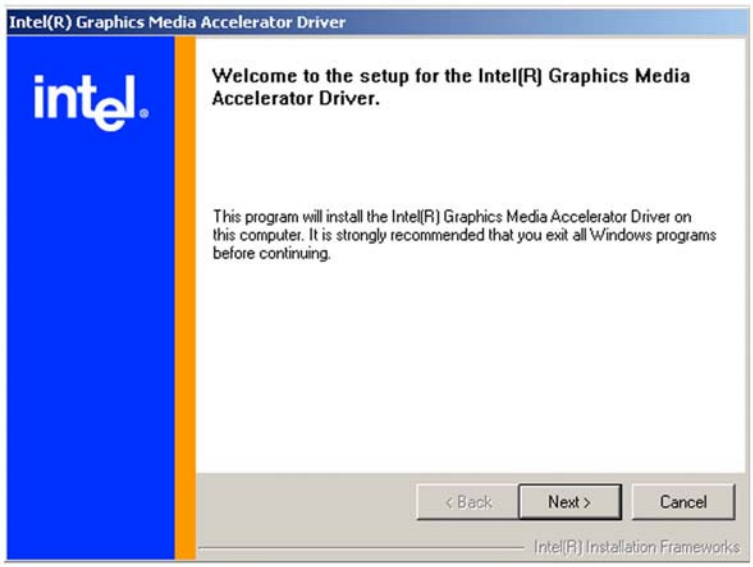


Figure 6-8: VGA Driver Installation Welcome Screen

Step 6: A license agreement shown in **Figure 6-9** appears. Read through the license agreement.

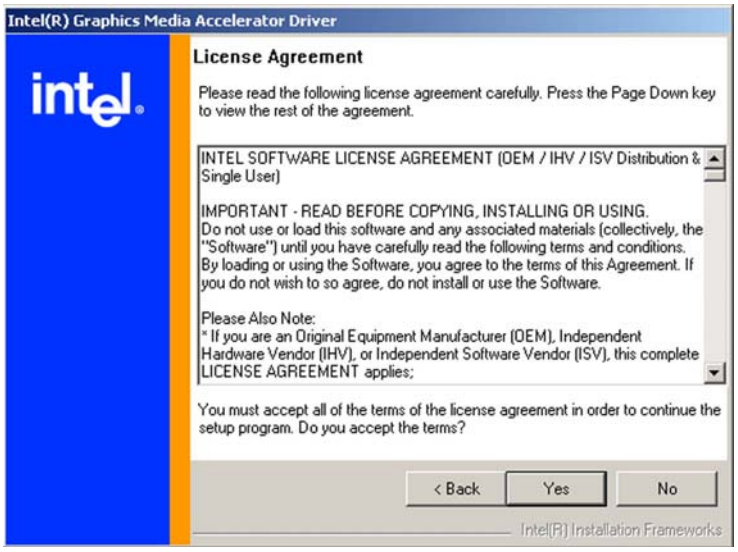


Figure 6-9: VGA Driver License Agreement

Step 7: Accept the terms and conditions stipulated in the license agreement by clicking

the "**YES**" button (**Figure 6-9**). The installation notice shown in **Figure 6-10** appears.

Figure 6-10: VGA Driver Installing Notice

Step 8: After the driver installation process is complete, a confirmation screen shown in **Figure 6-11** appears.

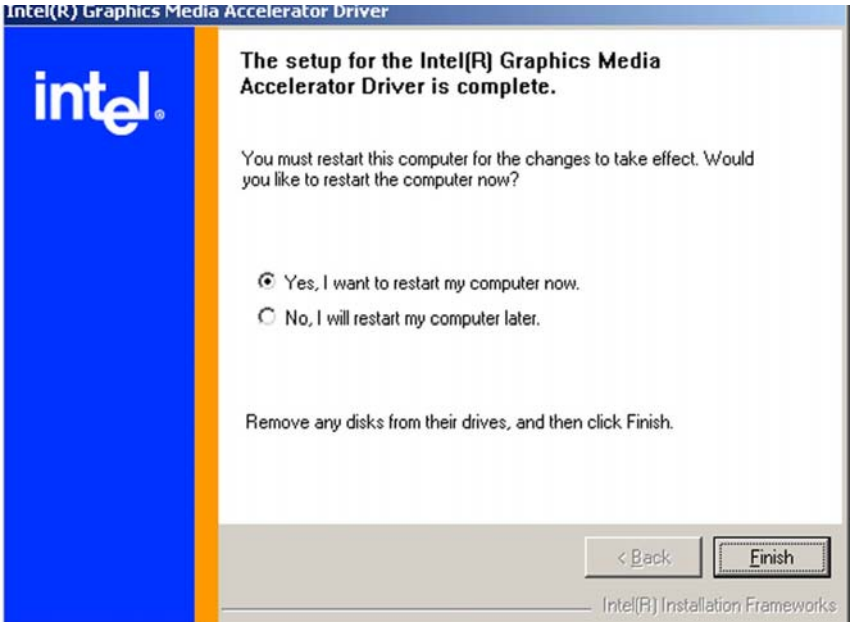


Figure 6-11: VGA Driver Installation Complete

Step 9: The confirmation screen shown in **Figure 6-11** allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided when to restart the computer, click the "**FINISH**" button.

6.4 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 6-12**).

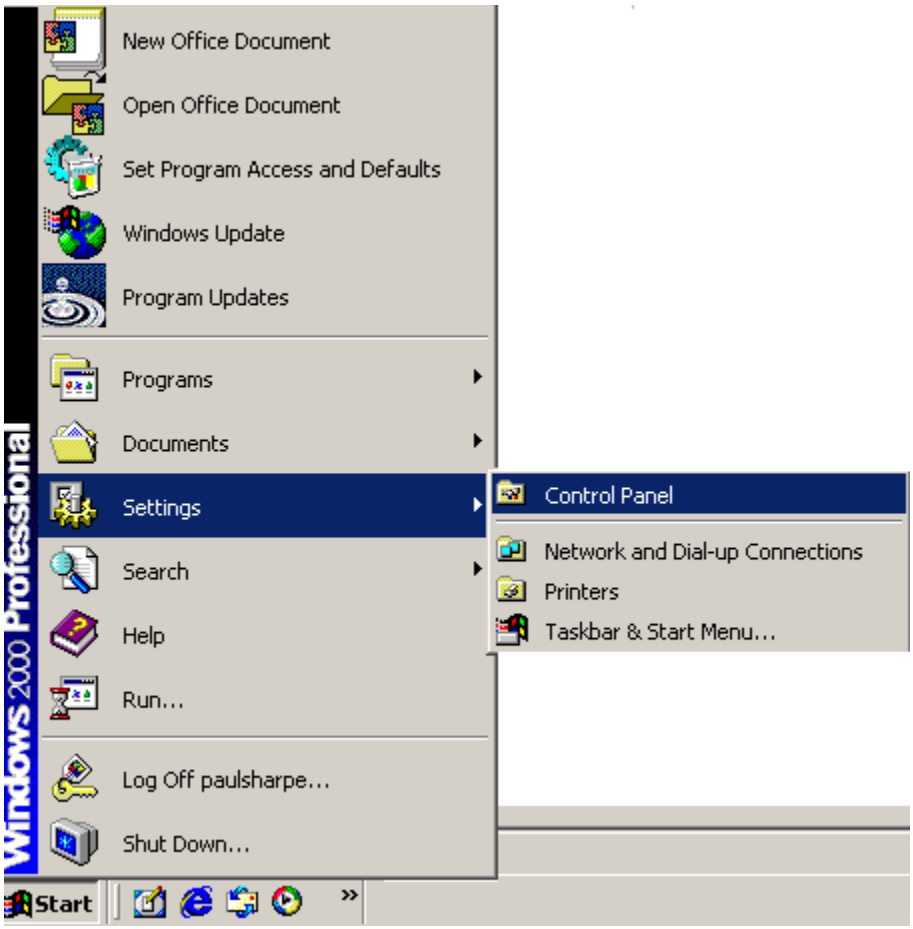


Figure 6-12: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-13**).

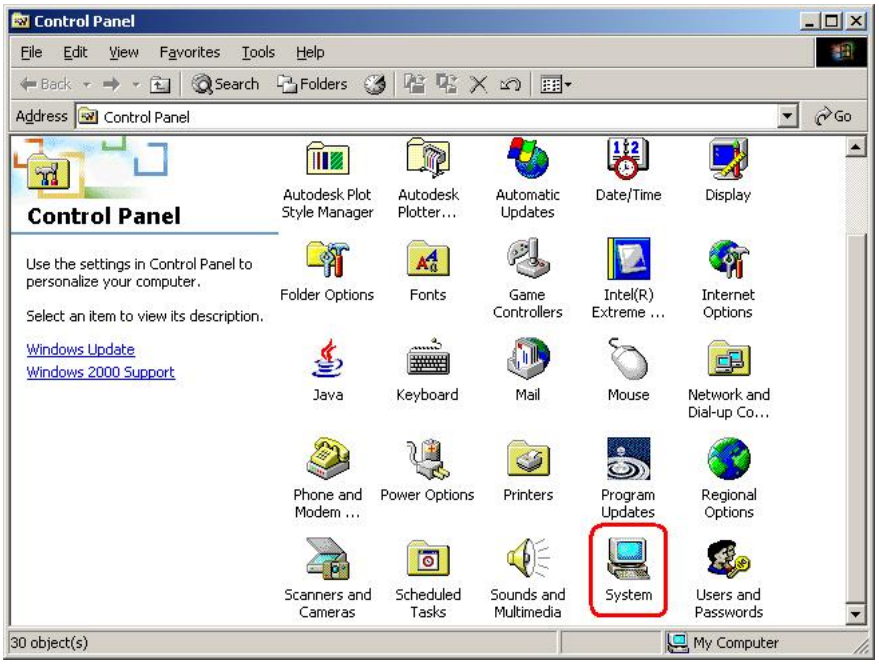


Figure 6-13: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-14**).

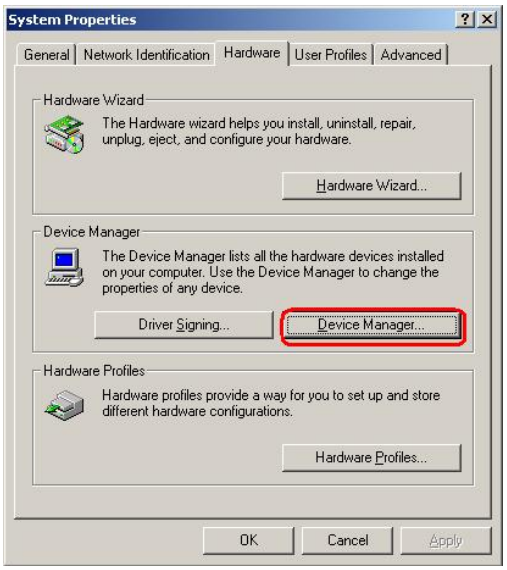


Figure 6-14: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-15**).

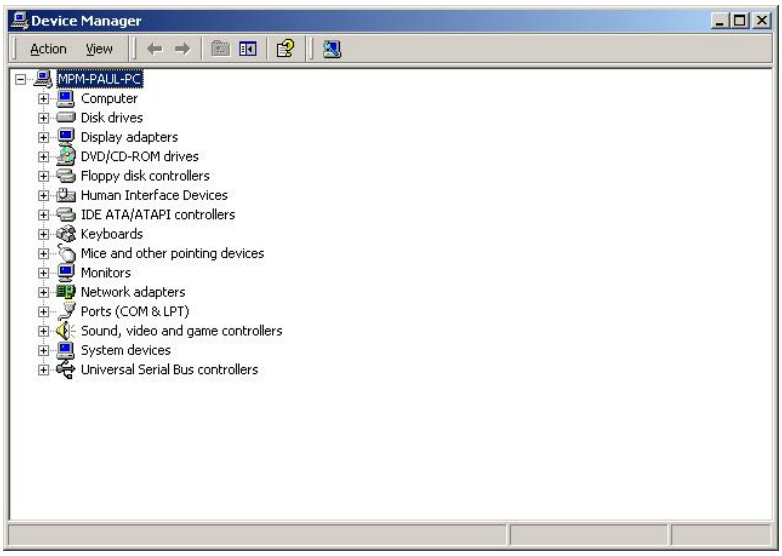


Figure 6-15: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 6-16**). Click **NEXT** to continue.

Figure 6-16: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-17**). Click **NEXT** to continue.

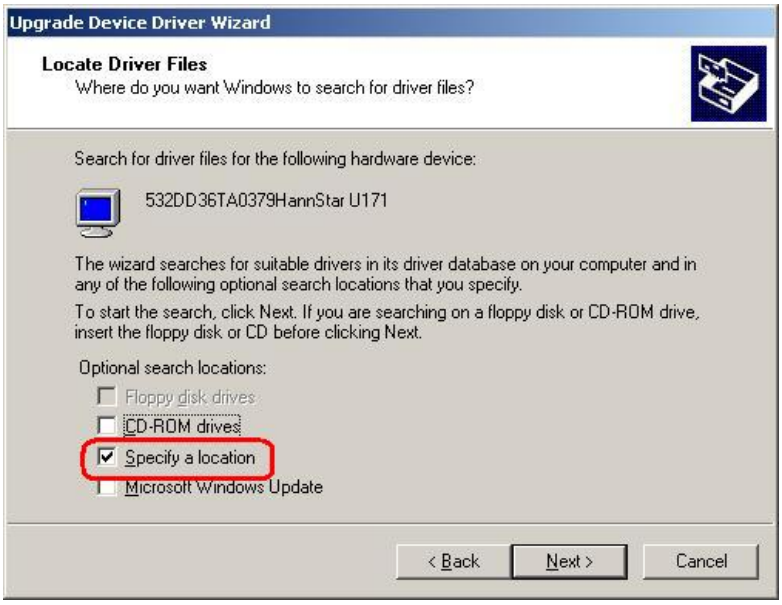


Figure 6-17: Locate Driver Files

Step 8: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory (**Figure 6-18**) in the location browsing window, where "**X:\"** is the system CD drive.

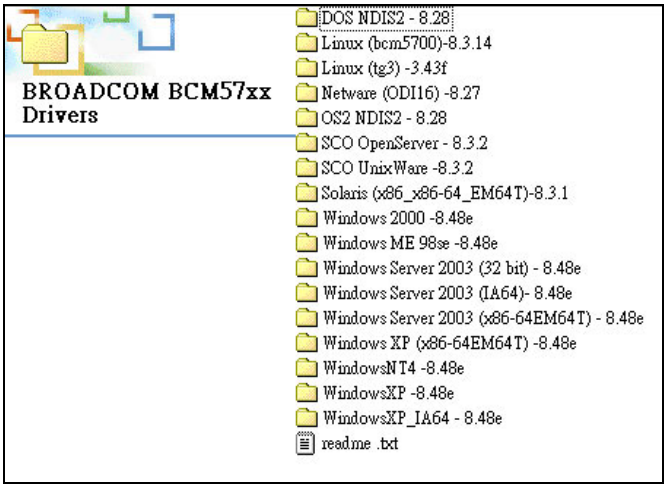


Figure 6-18: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

6.5 RealTek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 6-12**).

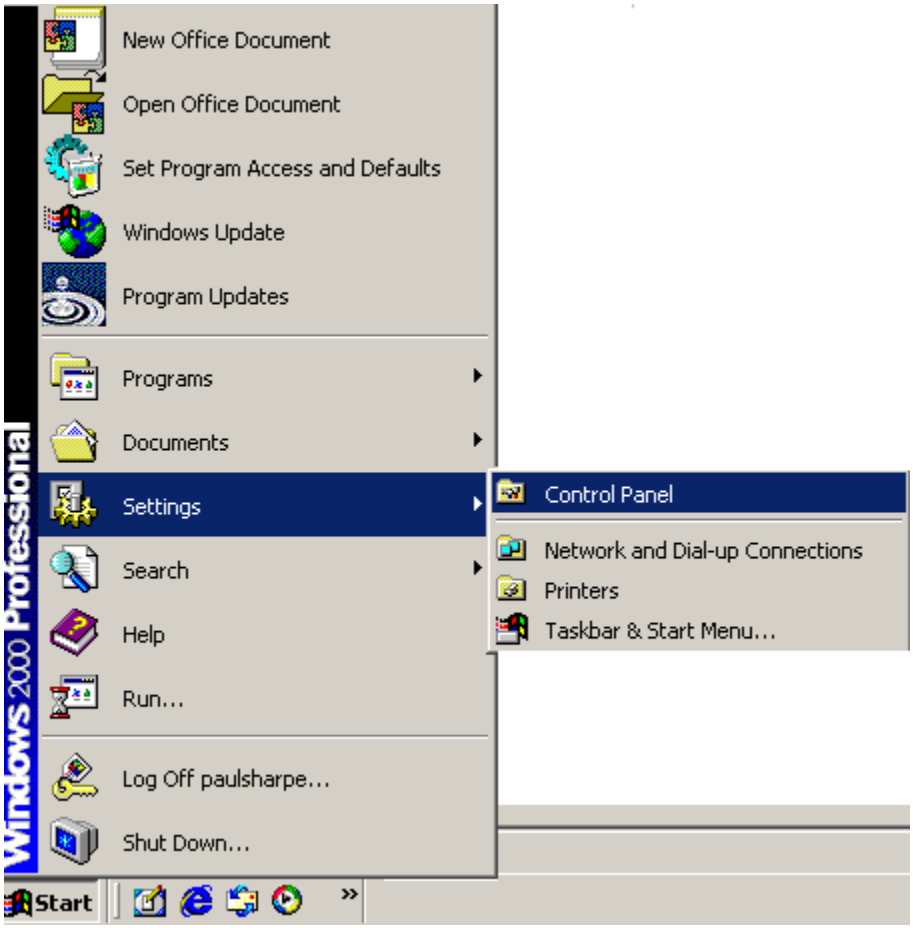


Figure 6-19: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-13**).

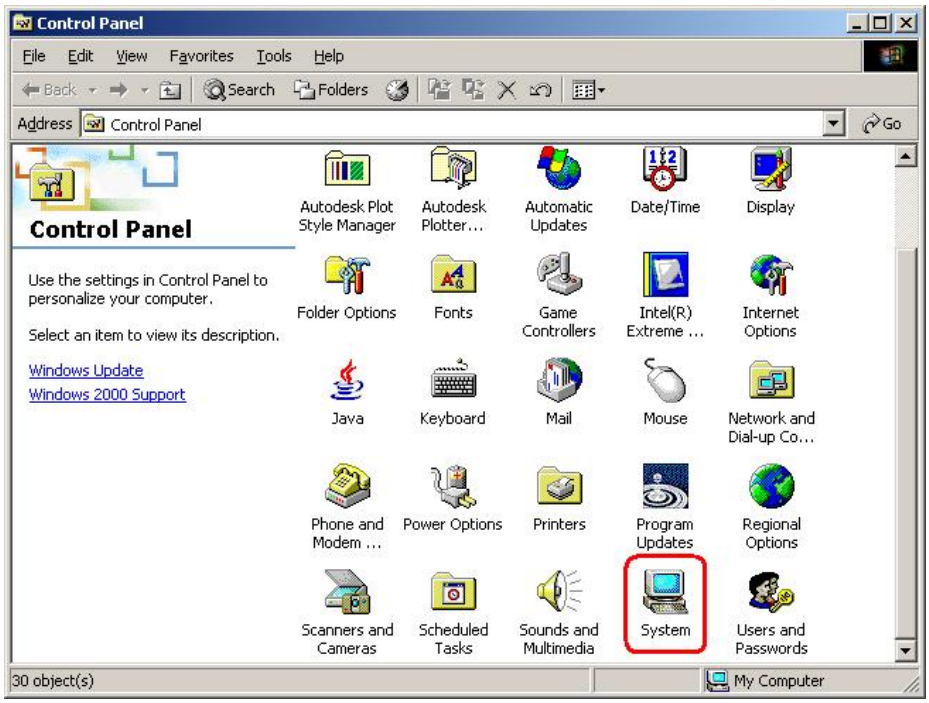


Figure 6-20: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-14**).

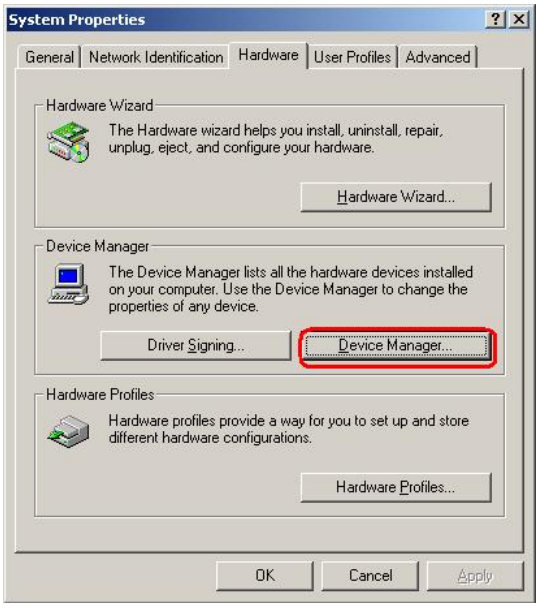


Figure 6-21: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-15**).

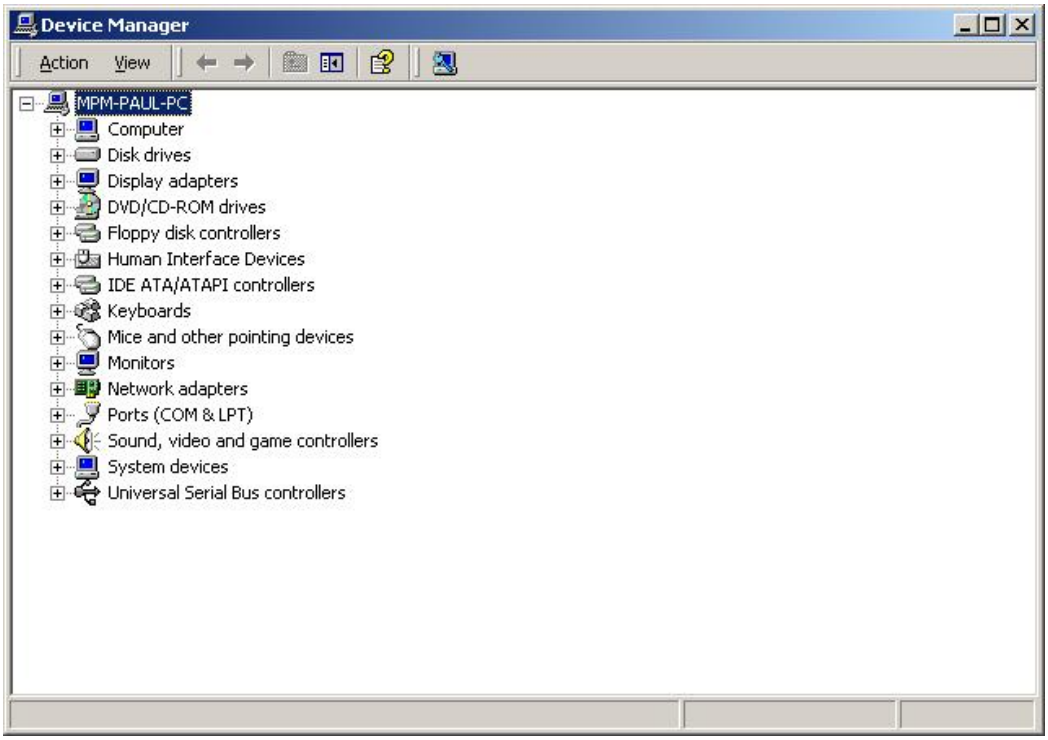


Figure 6-22: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 6-16**). Click **NEXT** to continue.

Figure 6-23: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-17**).

Click **NEXT** to continue.

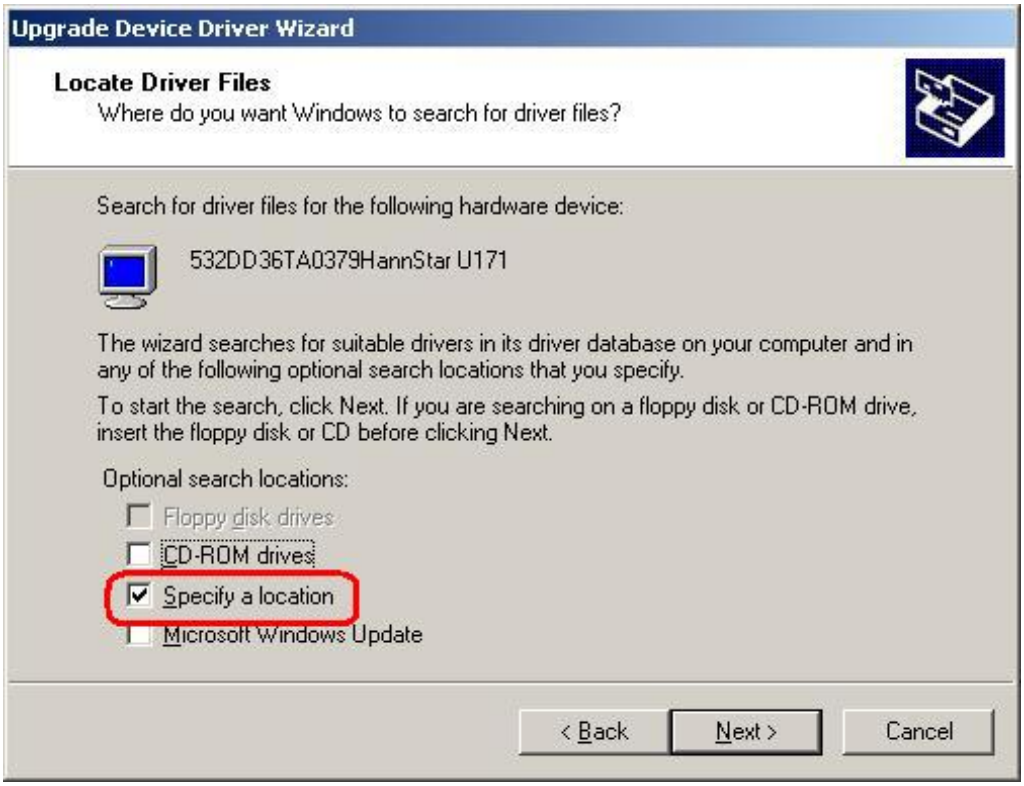


Figure 6-24: Locate Driver Files

Step 8: Select "**X:\4-AUDIO\AC-KIT883HD\WIN**" directory in the location browsing window, where "**X:\"** is the system CD drive (**Figure 6-18**).

Step 9: Click **OK** to continue. The driver is installed.

Step 1: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

6.6 Intel Matrix Storage Manager Installation

To install the Intel Matrix Storage Manager driver, please follow the steps below:

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive.

Step 2: Open the **X:\5-SATA\ICH7R** directory and double-click the **iata60_cd.exe**

installation file.

Step 3: The Preparing Setup window appears ().

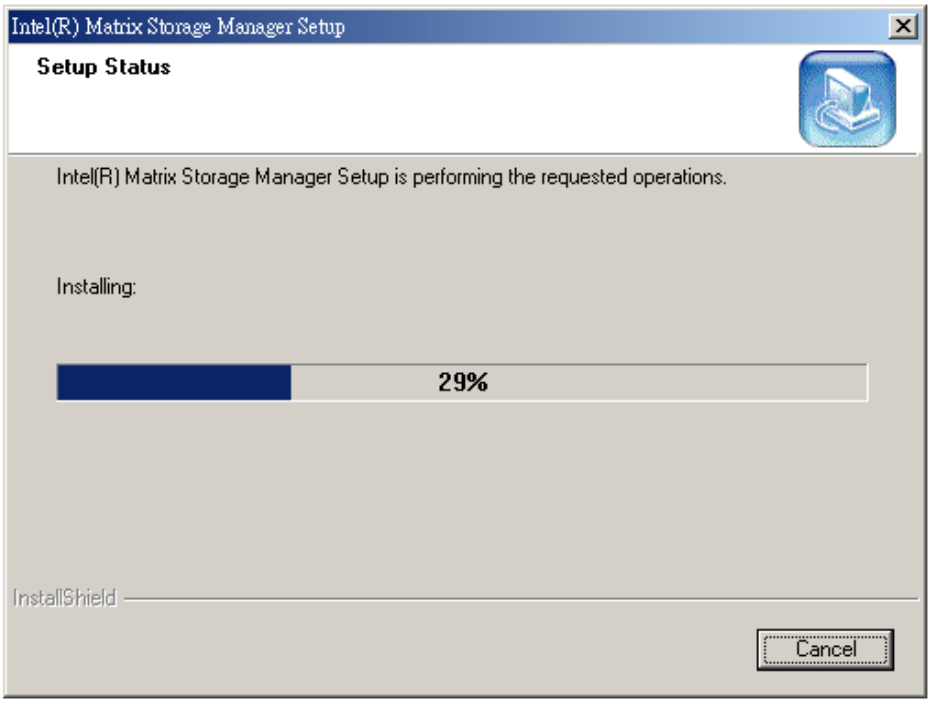


Figure 6-25: Preparing Setup Screen

Step 4: A Welcome screen appears. Click **NEXT** to continue the installation.

Step 5: A license agreement appears. Read through the license agreement.

Step 6: The "Uninstallation Warning" window appears. Click on the **NEXT** button to continue.

Step 7: Accept the terms and conditions stipulated in the license agreement by clicking the "**YES**" button.

Step 8: The "Choose Destination Location" window appears. Click on the **NEXT** button to continue. By default, all installed files are copied to the following path: **<bootdrive>:\Program Files\Intel\Intel(R) Matrix Storage Manager**.

Step 9: The "Select Program Folder" window appears. Click on the **NEXT** button to continue installing the driver.

Step 10: After the driver installation process is complete, a confirmation screen appears.

Step 11: The confirmation screen allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided when to restart the computer, click the "**FINISH**" button.

Appendix

A

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the ECK-161B.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the ECK-161B is opened.
- Make sure the power is turned off and the power cord is disconnected whenever the ECK-161B is being installed, moved or modified.
- Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the ECK-161B chassis is opened when the ECK-161B is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the ECK-161B.
- ***If considerable amounts of dust, water, or fluids enter the ECK-161B***, turn off the power supply immediately, unplug the power cord, and contact the ECK-161B vendor.
- DO NOT:
  - Drop the ECK-161B against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ECK-161B may result in permanent damage to the ECK-161B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECK-161B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECK-161B is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECK-161B, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECK-161B, please read the details below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.

- The interior of the ECK-161B does not require cleaning. Keep fluids away from the ECK-161B interior.
- Be cautious of all small removable components when vacuuming the ECK-161B.
- Turn the ECK-161B off before cleaning the ECK-161B.
- Never drop any objects or liquids through the openings of the ECK-161B.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECK-161B.
- Avoid eating, drinking and smoking within vicinity of the ECK-161B.

A.2.2 Cleaning Tools

Some components in the ECK-161B may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the ECK-161B.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECK-161B.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the ECK-161B.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the ECK-161B as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the ECK-161B. Dust and dirt can restrict the airflow in the ECK-161B and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

IEI Embedded System Series

B.1 IEI Embedded System Series

B.1.1 Overview

IEI embedded industrial PC systems are ideal for manufacturing and automation environments where heavy processing demands exist. These systems are designed to operate effectively within high-stress environments that have diverse operational conditions. This appendix introduces the full range of IEI embedded systems.

B.1.2 IEI Embedded System Series

The embedded system series are:

- ECW-180A
- ECW-180B
- ECW-181A
- ECW-181B
- ECW-281BB6
- ECN-171B
- ECN-171B
- ECK-161B
- ECK-3688G
- ECK-3699G
- ECK-3692G
- IBX-100-GX2
- IBX-100-LX2
- IBX-500A
- IBX-520CX
- IBX-650A

B.1.3 IEI Embedded System Series Variations

The differences between the series are listed below.

	Motherboard	Cooling	CompactFlash	Drive Bays
ECW-180A	WAFER	Two cooling fans	One CF slot	None
ECW-180B	WAFER	Fanless	One CF slot	None
ECW-181A	WAFER	Two cooling fans	One CF slot	Two 2.5” drive bays
ECW-181B	WAFER	Fanless	One CF slot	Two 2.5” drive bays
ECN-171B	NANO	Fanless	One CF slot	None
ECN-171B	NANO	Fanless	One CF slot	One 2.5” drive bay
ECK-161B	KINO	Fanless	One CF slot	One 2.5” drive bay
ECK-3688G	NANO	One cooling fan	None	One 2.5” drive bay
ECK-3699G	NANO	Two cooling fans	None	One 2.5” drive bay (optional)
ECK-3692G	KINO	Fanless	None	One 2.5” drive bay
IBX-100	NANO	Fanless	One CF slot	One 2.5” drive bay
IBX-500A	AFLMB-LX-800	Fanless	One CF slot	None
IBX-520CX	AFLMB-CX700	Fanless	One CF slot	One SATA drive supported
IBX-650A	NANO	Fanless	One CF slot	One 2.5” drive bay

Table B-1: Embedded System Series Overview

B.2 Embedded System Solutions

The different IEI Embedded System solutions are listed below. For further information, please contact an IEI distributor, reseller, vendor or IEI sales representative. Please also visit the IEI website (www.ieiworld.com).

B.2.1 AMD® Geode® LX 800 500 MHz Solutions

All the models listed in the table below support an AMD® Geode® LX 800 500 MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS1	AMD® CS5536	12V	Two	None
ECW-180AS1WD	AMD® CS5536	9V ~ 36V	Two	None
ECW-180BS1	AMD® CS5536	12V	None	None
ECW-180BS1WD	AMD® CS5536	9V ~ 36V	None	None
ECW-181AS1	AMD® CS5536	12V	Two	Two 2.5” HDD
ECW-181AS1WD	AMD® CS5536	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS1	AMD® CS5536	12V	None	Two 2.5” HDD
ECW-181BS1WD	AMD® CS5536	9V ~ 36V	None	Two 2.5” HDD
ECK-3688GA	AMD® CS5536	12V	One	One 2.5” HDD
IBX-100-LX2	AMD® CS5536	5 V	None	One 2.5” HDD
IBX-500A	AMD® CS5536	12V	None	None

Table B-2: AMD® Geode® LX 800 Embedded System Solutions

B.2.2 AMD® Geode® GX 466 333 MHz Solutions

All the models listed in the table below support an AMD® Geode® GX 466 333 MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS2	AMD® CS5536	12V	Two	None
ECW-180AS2WD	AMD® CS5536	9V ~ 36V	Two	None
ECW-180BS2	AMD® CS5536	12V	None	None
ECW-180BS2WD	AMD® CS5536	9V ~ 36V	None	None
ECW-181AS2	AMD® CS5536	12V	Two	Two 2.5” HDD
ECW-181AS2WD	AMD® CS5536	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS2	AMD® CS5536	12V	None	Two 2.5” HDD
ECW-181BS2WD	AMD® CS5536	9V ~ 36V	None	Two 2.5” HDD
IBX-100-GX2	AMD® CS5536	5V	None	One 2.5” HDD

Table B-3: AMD® Geode® GX466 Embedded System Solutions

B.2.3 VIA® LUKE® 1GHz Solutions

All the models listed in the table below support a VIA® LUKE® 1 GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS3	VIA® VT8237R+	12V	Two	None
ECW-180AS3WD	VIA® VT8237R+	9V ~ 36V	Two	None
ECW-180BS3	VIA® VT8237R+	12V	None	None
ECW-180BS3WD	VIA® VT8237R+	9V ~ 36V	None	None
ECW-181AS3	VIA® VT8237R+	12V	Two	Two 2.5” HDD
ECW-181AS3WD	VIA® VT8237R+	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS3	VIA® VT8237R+	12V	None	Two 2.5” HDD
ECW-181BS3WD	VIA® VT8237R+	9V ~ 36V	None	Two 2.5” HDD
ECK-3688GB	VIA® VT8237R+	12V	One	One 2.5” HDD

Table B-4: VIA® LUKE® Embedded System Solutions

B.2.4 VIA® MARK® 800MHz Solutions

All the models listed in the table below support a VIA® MARK® 800 MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS4	VIA® VT82C686B	12V	Two	None
ECW-180AS4WD	VIA® VT82C686B	9V ~ 36V	Two	None
ECW-180BS4	VIA® VT82C686B	12V	None	None
ECW-180BS4WD	VIA® VT82C686B	9V ~ 36V	None	None
ECW-181AS4	VIA® VT82C686B	12V	Two	Two 2.5” HDD
ECW-181AS4WD	VIA® VT82C686B	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS4	VIA® VT82C686B	12V	None	Two 2.5” HDD
ECW-181BS4WD	VIA® VT82C686B	9V ~ 36V	None	Two 2.5” HDD

Table B-5: VIA® MARK® Embedded System Solutions

B.2.5 VIA® Eden™ 500 MHz Solutions

All the models listed in the table below support a VIA® Eden™ 500 MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
IBX-520CX	VIA® CX700M	12V	None	One SATA drive supported

Table B-6: VIA® MARK® Embedded System Solutions

B.2.6 Intel® Celeron® M 1 GHz Solutions

The model listed in the table below support an Intel® Celeron® M 1 GHz zero cache CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-281BB6	Intel® 852GM + ICH4	12V	No	One 2.5" HDD

Table B-7: Intel® Celeron® M 1 GHz Solutions

B.2.7 Intel® Celeron® M 1.5GHz Solutions

All the models listed in the table below support an Intel® Celeron® M 1.5 GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS5X	SiS 661CX + SiS 964	12V	Two	None
ECW-180AS5XWD	SiS 661CX + SiS 964	9V ~ 36V	Two	None
ECW-181AS5X	SiS 661CX + SiS 964	12V	Two	Two 2.5" HDD
ECW-181AS5XWD	SiS 661CX + SiS 964	9V ~ 36V	Two	Two 2.5" HDD
ECN-171BSE0-CM15G	Intel® 852GM + ICH4	12V	None	None
ECN-171BSE0-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	None
ECN-171BSEA-CM15G	Intel® 852GM + ICH4	12V	None	None
ECN-171BSEA-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	None
ECN-171BSEB-CM15G	Intel® 852GM + ICH4	12V	None	None
ECN-171BSEB-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	None
ECN-171BSE0-CM15G	Intel® 852GM + ICH4	12V	None	One 2.5" HDD
ECN-171BSE0-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	One 2.5" HDD
ECN-171BSEA-CM15G	Intel® 852GM + ICH4	12V	None	One 2.5" HDD
ECN-171BSEA-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	One 2.5" HDD
ECN-171BSEB-CM15G	Intel® 852GM + ICH4	12V	None	One 2.5" HDD
ECN-171BSEB-WD-CM15G	Intel® 852GM + ICH4	9V ~ 36V	None	One 2.5" HDD
ECK-3688GDX	SiS 661CX + SiS 964	12V	One	One 2.5" HDD

Model Number	System Chipset	DC Input	Fan	Drive Bays
				(optional)

Table B-8: Intel® Celeron® M 1.5GHz Solutions

B.2.8 Intel® Pentium® M 1.6GHz Solutions

All the models listed in the table below support an Intel® Pentium® M 1.6GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECN-171BSE0-PM16G	Intel® 852GM + ICH4	12V	None	None
ECN-171BSE0-WD-PM16G	Intel® 852GM + ICH4	9V ~ 36V	None	None
ECN-171BSEC-PM16G	Intel® 852GM + ICH4	12V	None	None
ECN-171BSEC-WD-PM16G	Intel® 852GM + ICH4	9V ~ 36V	None	None
ECN-171BSE0-PM16G	Intel® 852GM + ICH4	12V	None	One 2.5” HDD
ECN-171BSE0-WD-PM16G	Intel® 852GM + ICH4	9V ~ 36V	None	One 2.5” HDD
ECN-171BSEC-PM16G	Intel® 852GM + ICH4	12V	None	One 2.5” HDD
ECN-171BSEC-WD-PM16G	Intel® 852GM + ICH4	9V ~ 36V	None	One 2.5” HDD

Table B-9: Intel® Pentium® M Embedded System Solutions

B.2.9 Intel® Socket 479 Pentium®/Celeron® M 2GHz Solutions

All the models listed in the table below support an Intel® Socket 479 Pentium®/Celeron® M 2GHz CPU with a 400/533MHz FSB (front side bus).

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS5S	SiS 661CX + SiS 964	12V	Two	None
ECW-180AS5SWD	SiS 661CX + SiS 964	9V ~ 36V	Two	None
ECW-181AS5S	SiS 661CX + SiS 964	12V	Two	Two 2.5” HDD
ECW-181AS5SWD	SiS 661CX + SiS 964	9V ~ 36V	Two	Two 2.5” HDD
ECK-3688GDS	SiS 661CX + SiS 964	12V	One	One 2.5” HDD (optional)

Table B-10: Intel® Socket 479 Pentium®/Celeron® M Embedded System Solutions

B.2.10 LGA 775 Intel® Pentium® 4/ Pentium® D Solutions

All the models listed in the table below support a LGA 775 Intel® Pentium® 4/ Pentium® D CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECK-3699GE	Intel® 945G + ICH7	19V DC	Two	One 2.5" HDD (optional)
ECK-3699GH	SiS 661CX + SiS 966	19V DC	Two	One 2.5" HDD (optional)

Table B-11: LGA 775 Intel® Pentium® 4/ Pentium® D System Solutions

B.2.11 Intel® Socket 479 Core Duo/Solo Solutions

All the models listed in the table below support an Intel® Socket 479 Core Duo/Solo CPU with a 667MHz FSB (front side bus).

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECK-3699GF	Intel® 945GM + ICH7-M	19V DC	Two	One 2.5" HDD (optional)

Table B-12: Intel® Socket 479 Core Duo/Solo System Solutions

Appendix

C

BIOS Menu Options

C.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Appendix

D

Address Mapping

E.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
3B0-3BB	Graphics Controller
3C0-3DF	Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table E-1: IO Address Map

E.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table E-2: 1st MB Memory Address Map

E.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table E-3: IRQ Mapping Table

E.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table E-4: DMA Channel Assignments Table

Appendix

E

Hazardous Materials Disclosure

F.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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W