IEI Technology Corp.

MODEL:

IBX-500A

AMD Geode LX 800 Fanless Embedded System with 802.11b/g Wireless Module

User Manual

Rev. 1.00 July 2007

RoHS Lead Free

Revision

IBX-500A Embedded System		
Date	**Version**	**Changes**
July 2007	1.00	Initial release

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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 IBX-500A 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 IBX-500A package.

- 1 x IBX-500A embedded system
- 1 x Power adaptor
- 1 x Power cord
- 1 x Wireless antenna
- 1 x Wall mount kit
- 1 x Screw set
- 4 x Foot pads
- 1 x Quick installation guide (QIG)
- 1 x Driver and manual CD
- 1 x DIN mount kit (optional)
- 1 x 128MB CompactFlash® card with Windows CE 5.0 pre-installed (optional)
- 1 x 1GB CompactFlash® card with Windows XPE pre-installed (optional)

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

Precautions

SAFETY PRECAUTIONS

1. Prior to installing, moving and modifying the embedded system, make sure that the unit's power is turned off and the power cord is disconnected.
2. Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire or an electrical shock.
3. Electric shock can occur if the embedded system is opened. Do not drop or insert any objects into any openings of the embedded system.
4. Only qualified engineers from certified system integrators or VARs are allowed to make necessary modifications to the embedded system.
5. If considerable amounts of dust, water, or fluids enter the embedded system, turn off the power supply immediately, unplug the power cord, and contact the vendor.
6. Explosions may occur with installations in environments where flammable gases are present.
7. Fault-tolerant and failsafe designs should be implemented with the use of the embedded system on transportation vehicles, ships, safety/security devices, or medical devices not related to life-support functions. Users/integrators should take responsibility for adequate levels of reliability and safety.
8. Preventive designs should be implemented so as to avoid communications faults between the embedded system and the devices it controls.

HANDLING PRECAUTIONS

1. Do not drop the embedded system against a hard surface.
2. Do not strike or exert excessive force onto the embedded system.
3. Avoid exposing the embedded system to direct sunlight, dust, or chemical vapors.
4. Condensation might form inside the embedded system chassis if exposed to sudden changes in temperature.
5. Carefully route the power cord so that people cannot step on it. Do not place anything over the power cord.

6. If the equipment should be left unused for an extended period of time, disconnect it from the power source to avoid damage by transient over-voltage.
7. If any of the following situations arises, get the equipment checked by service personnel:
   - The power cord or plug is damaged.
   - Liquid has penetrated into the equipment.
   - The equipment has been exposed to moisture.
   - The equipment does not work properly, or the user cannot get it to work according to the user manual.
   - The equipment has been dropped and damaged.
   - The equipment shows obvious signs of breakage.

WARNING!

Any changes or modifications made to the equipment that are not expressly approved by the relevant standards could void the authority to operate the equipment.

MAINTENANCE AND CLEANING

Note the following precautions before beginning to clean the embedded system.

When cleaning any single part or component of the computer, please read and understand the details below fully.

- Never spray or squirt liquids directly onto any computer component. To clean the device, please rub it with a piece of dry and soft cloth or a slightly moistened cloth.
- The interior of the embedded system does not require cleaning. Keep fluids away from the embedded system and the interior of it.
- Turn the system off before cleaning the embedded system.
- Never drop any objects through the openings of the embedded system or get the circuit board damp or wet.

- Be cautious of any cleaning solvents or chemicals used when cleaning the embedded system as some individuals may be allergic to the ingredients.
- Avoid any eating, drinking or smoking near the embedded system.

CLEANING TOOLS

Below is a list of items to use while cleaning the computer or computer peripherals. Please keep in mind that some components in the computer may only be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

- ***Cloth*** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is recommended to rub it with a piece of cloth.
- ***Water or rubbing alcohol*** – Moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- ***Vacuum cleaner*** - Removing the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- ***Cotton swabs*** - Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in the keyboard, mouse, and other locations.
- ***Foam swabs*** - Whenever possible it is better to use lint free swabs such as foam swabs.

ESD PRECAUTIONS

Observe all conventional anti-ESD methods while handling the components contained within the embedded system should the need arise to remove any of the chassis panels. The use of a grounded wrist strap and an anti-static work pad is recommended. Avoid dust and debris or other static-accumulating materials in the work area.

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1

Introduction

1.1 IBX-500A Embedded System Overview

Figure 1-1: IBX-500A Embedded System

There are two AMD® Geode™ LX 800 500MHz based embedded solutions in the IBX-500A series. All fanless motherboards have been optimized for multimedia applications that require minimum installation space. The AFLMB-LX-800 main board supports a full range of functions for an AT/ATX-compatible industrial computer.

1.1.1 IBX-500A Benefits

The IBX-500A embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Quick access CF storage card interface
- Compact size saves space
- Powerful preinstalled AMD® Geode™ LX 800 500MHz CPU and motherboard ensures rigorous processing needs can be met

1.1.2 IBX-500A Features

The IBX-500A has the following features

- RoHS compliant design
- Fanless system
- AMD® Geode™ LX 800 500MHz CPU supported

- Built-in 802.11b/g wireless LAN module
- Dual 10/100Mbps LAN RJ-45 connectors supported
- One CompactFlash® Type I or Type II card supported
- Wall mount and DIN mount supported

1.2 IBX-500A Model Variations

There are two models in the IBX-500A embedded system series. One model has a preinstalled 256MB DDR memory module and the other one model has a 512MB DDR memory module preinstalled. The two models are listed in **Table 1-1** below.

Model	CPU	Memory	Wireless LAN
IBX-500A/256MB	AMD® Geode LX 800 500MHz	256MB DDR	Yes
IBX-500A/512MB	AMD® Geode LX 800 500MHz	512MB DDR	Yes

Table 1-1: Model Variations

Optional 128MB or 1GB CF card pre-installed with Windows® CE 5.0 or Windows® XP Embedded is also provided by IEI for the IBX-500A embedded system. The information of the optional CF card is listed below.

S/N	OS Image	Capacity	Software Development Kit
IBXCF-500A-CE	Windows® CE 5.0	128MB	Yes
IBXCF-500A-XPE	Windows® XP Embedded	1GB	No

Table 1-2: CF Card with Preinstalled OS

1.3 Technical Specifications

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

	IBX-500A
CPU	AMD® Geode™ LX 800 500MHz CPU
System Chipset	AMD® LX 800 + CS-5536
System Memory	256MB/512MB 200-pin SO-DIMM DDR SDRAM
Ethernet	Dual 10/100Base-T RTL8100C
Display	CRT integrated in AMD® Geode™ LX 800
USB	2 x USB 2.0 supported
Serial Port	2 x RS-232 1 x RS-232/422/485 (selectable)
Audio	AC'97 Codec Realtek ALC203 One audio connector
Storage	One CompactFlash® Type I or Type II card supported
Chassis Construction	Aluminum Alloy
Power Supply	External power adapter, input voltage: 115V AC ~ 230V AC @ 47Hz ~ 63Hz, 36W
Operating Temperature	0ºC ~ 50ºC
Color	Black
Net Weight	645g
Dimensions (D x W x H)	210mm x 109mm x 38mm

Table 1-3: Technical Specifications

1.4 Wireless LAN Module

The IBX-500A series models are preinstalled with a VIA networking VNT6655AM wireless Mini PCI card. The specifications for the wireless module are listed in **Table 1-4**:

	VIA VNT6655AM
Standard	IEEE 802.11 b/g
Interface	Mini PCI
Controller Chip	VIA VT6655
Connectors	2 x U.FL (I-PEX) Antenna connectors
Security	Supports WPA and WPA 2.0 Built-in hardware security engine for 802.11i 4.0 WEP (128-bit, 64-bit), TKIP, AES CCMP
Frequency Range	2.4 ~ 2.4835GHz (for US, Canada, Europe) 2.4 ~ 2.497GHz (for Japan)
Power Consumption	802.11b: 250mA@3.3V 802.11g: 230mA@3.3V Listening: 190mA@3.3V
Operating Voltage	3.3V
Dimensions (W x H x D)	64.7mm x 3.8mm x 44.6mm
Supported OS	Windows: 98SE/Me/NT/2000/XP/2003 Server CE (4.2/5.0b) Linux (2.4x/2.6x)
Compliant	FCC Part 15 B, C

Table 1-4: Wireless Module Specifications

1.5 Power Adapter

The IBX-500A series models are shipped with a 36W power adapter.

Figure 1-2: Power Adapter

The specifications for the adapter are listed in **Table 1-5**:

Output	**Nominal**	12.0V	
	Regulation	11.4V – 12.6V	
	Ripple/Noise	150mV	
	Min.	0A	
	Max.	3.0A	
Protection	**Short Circuit**	Output can be shorted without damage and auto-recovery	
	Over-Voltage	Upper Trip Limit:	13VDC~18VDC
		Output Voltage	11.4VDC~12.6VDC
Time	**Hold Up**	5ms	
Input	**Min.**	90V	
	Nominal	115V ~ 230V	

	Max.	264V	
	Frequency	47Hz ~ 63Hz	
	Inrush Current	100A Max.	
	Input Line Current	1.0A (rms Max.)@115V 0.6A (rms Max.)@230V	
	Efficiency	80% (typical)	
Environment	**Temperature**	Operating	0ºC ~ 40ºC
		Storage	-20ºC ~ 65ºC
	Relative Humidity	Operating (non-condensing)	20% ~ 80%
		Storage (non-condensing)	10% ~ 90%
	Vibration	0.5G, 10Hz~100Hz, random vibration, 10mins/axis, 3 direction	
	Shock	Operating: 50 to 90 in/sec in 10 in/sec increments (all 6 sides)	
		Storage: 40 to 70 in/sec in 10 in/sec increments (all sides except top panel)	
Reliability	**MTBF**	60,000 hours of continuous operation at 25ºC	
	Leakage Current	3.5mA max @240VAC 60Hz	

Table 1-5: Power Adapter Specifications

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Chapter

2

Mechanical Description

2.1 IBX-500A Mechanical Overview

The IBX-500A RoHS compliant, AMD® Geode™ LX 800 fanless embedded system features industrial grade components that offer longer operating life, high shock/vibration resistance and endurance over a wide temperature range. The IBX-500A combines these features in an aluminum enclosure designed for space critical applications that require low power consumption. Featuring two LAN, two USB, three serial communication ports, as well as audio, and VGA, the IBX-500A offers system integrators and developers the best selection of robust and high performance computing system platforms. A CompactFlash® slot on the side panel supports one Type I or Type II CF card.

2.2 IBX-500A Physical Dimensions

The dimensions of the IBX-500A are listed below and shown in **Figure 2-1**.

- **Height**: 38.00mm
- **Width**: 210.00mm
- **Length**: 109.00mm

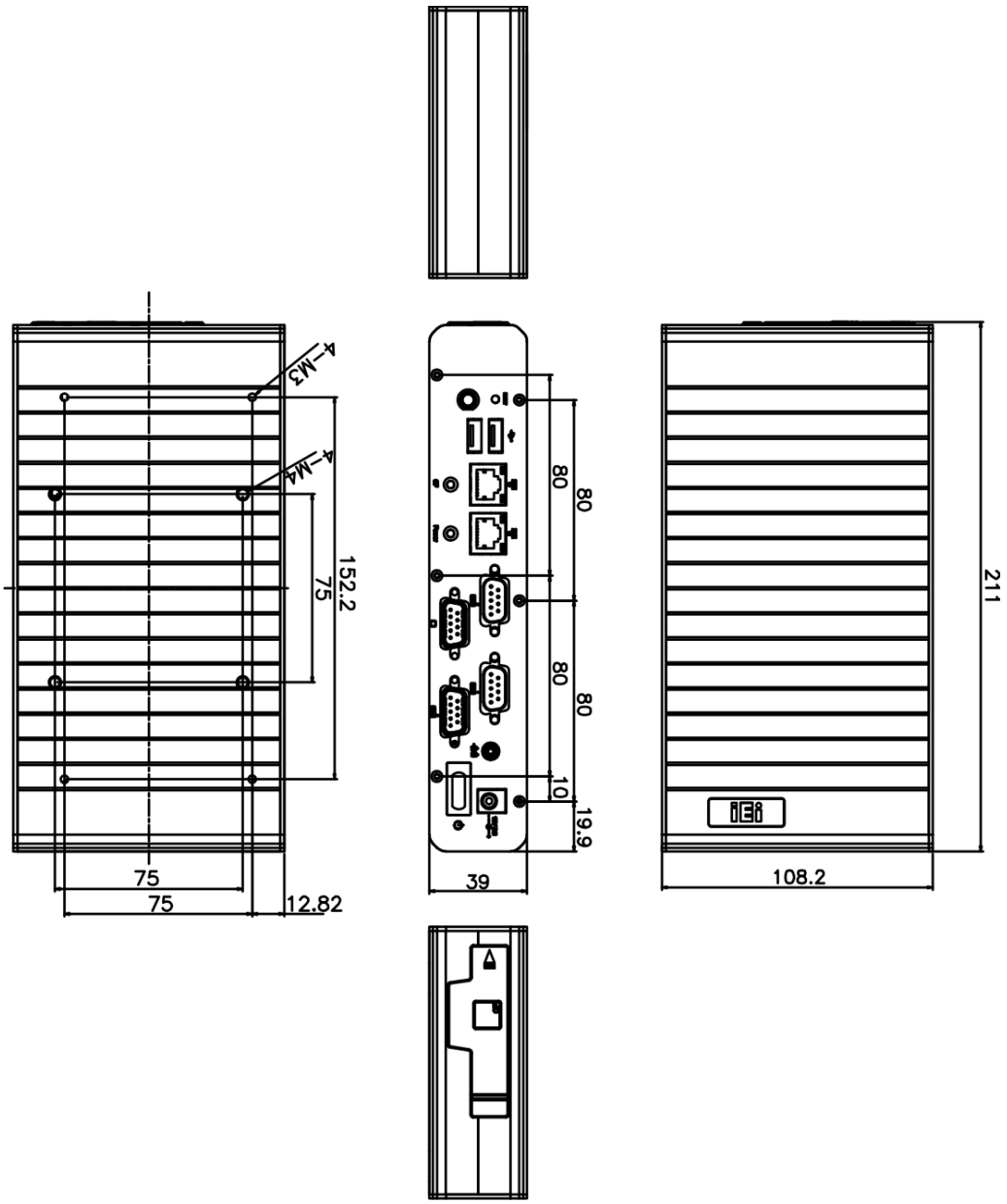

Figure 2-1: IBX-500A Dimensions (mm)

2.3 External Overview

2.3.1.1 Front Panel Overview

The IBX-500A contains all the external I/O interface connectors, power connectors, status LEDs and switches. An overview of the front panel is shown in **Figure 2-2** below.

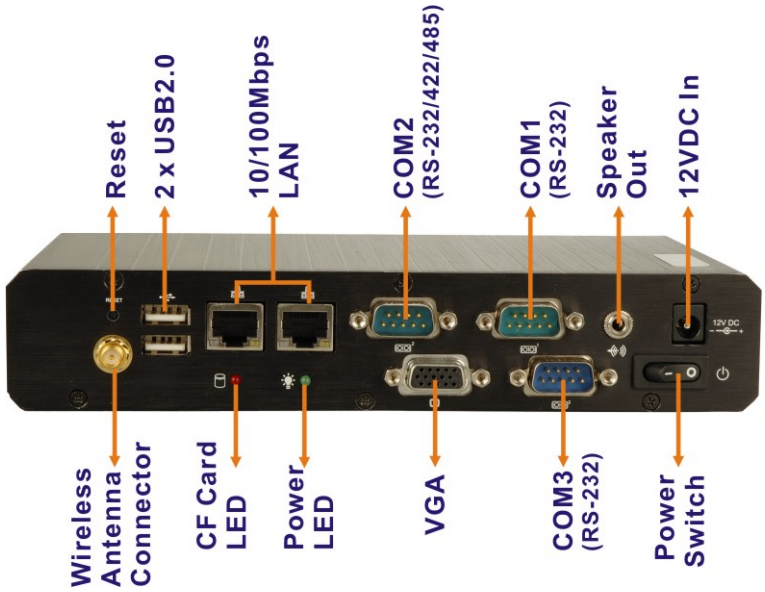

Figure 2-2: IBX-500A Front Panel

2.3.1.2 Front Panel Connectors and Indicators

The connectors, indicators and switches listed in this section are shown in **Figure 2-2** above. The front panel I/O connectors are listed below:

- 1 x Wireless antenna connector
- 2 x USB ports
- 2 x RJ-45 Ethernet connectors
- 2 x RS-232 serial ports connectors
- 1 x RS-232/422/485 serial ports connector
- 1 x VGA connector
- 1 x Audio connector
- 1 x 12V DC inlet

The front panel also contains the following button and switch:

- 1 x Reset button
- 1 x Power switch

Status indicator LEDs on the front panel include:

- 1 x Power LED
- 1 x CF card LED

All the front panel items listed above are shown in **Figure 2-2** above.

2.3.2 Side Panel

The side panel of the IBX-500A provides access to a CompactFlash® slot. The CompactFlash® slot is covered with a rubber cover and supports a Type I or Type II CF card. An overview of the side panel is shown in **Figure 2-3**.

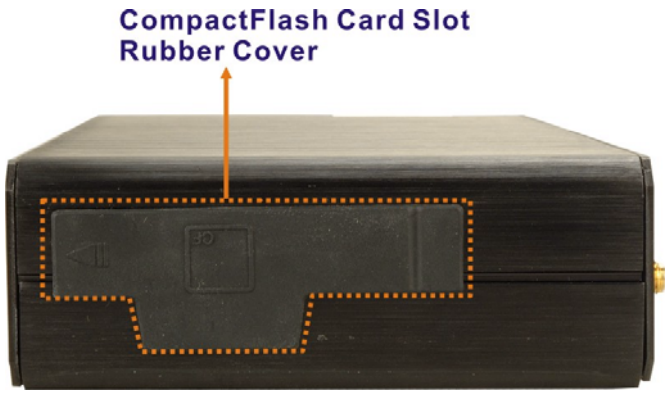

Figure 2-3: IBX-500A Side Panel

2.3.3 Bottom Surface

WARNING:

Never remove the bottom access panel from the chassis while power is still being fed into the system. Before removing the bottom access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom surface of the IBX-500A contains the retention screw holes for the VESA MIS-D 75 wall-mount kit and foot pads/DIN mount bracket.

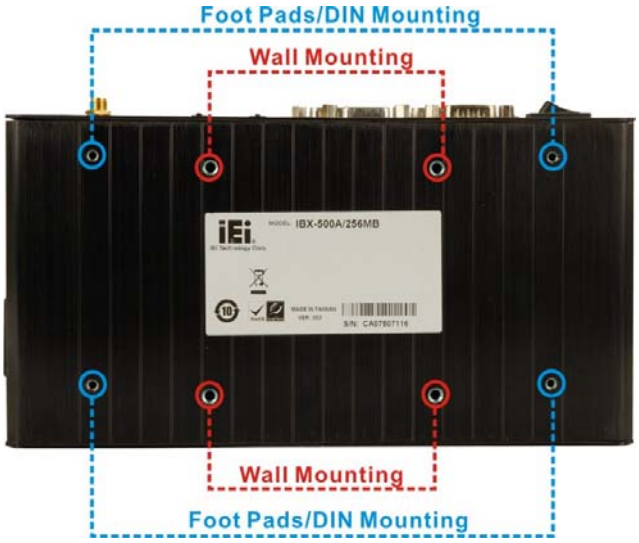

Figure 2-4: Bottom Surface

2.4 Internal Overview

The IBX-500A internal components are listed below:

- 1 x IEI AFLMB-LX motherboard (preinstalled)
- 1 x SO-DIMM module (preinstalled)
- 1 x Wireless LAN module (preinstalled)
- 1 x CF module (provided and installed by the user)

Except for the CF module (CF Type I or CF Type II), all the components are accessed by removing the back cover. The CF module is accessed through the left side panel.

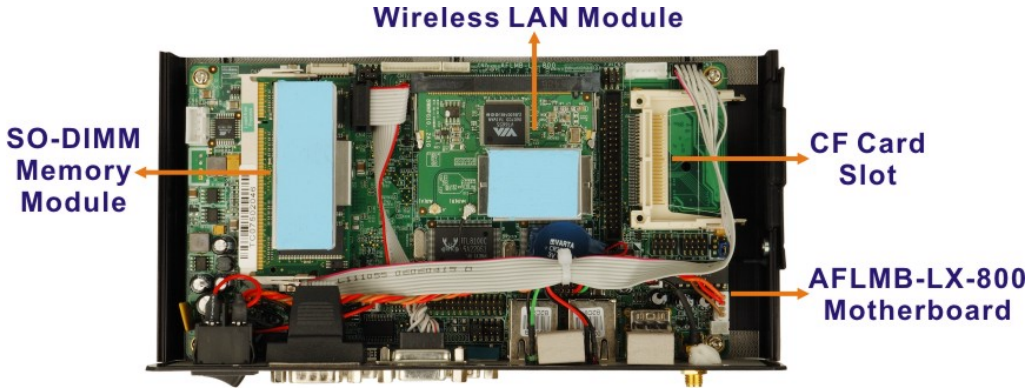

Figure 2-5: Internal Overview

Chapter

3

System Components

3.1 IBX-500A Embedded System Motherboard

3.1.1 IBX-500A Embedded System Motherboard

NOTE:

The jumpers and connectors shown in the section below are those jumpers and connectors that are relevant to the configuration and installation of the embedded system. For a complete list of jumpers and connectors on the AFLMB-LX-800 motherboard, please refer to the AFLMB-LX-800 user manual.

The IBX-500A models have an AFLMB-LX-800 motherboard installed in the system. The following sections describe the relevant connectors and jumpers on the motherboard.

3.1.2 AFLMB-LX-800 Motherboard Overview

The locations of the AFLMB-LX-800 jumpers and connectors used on the IBX-500A are shown in **Figure 3-1** below.

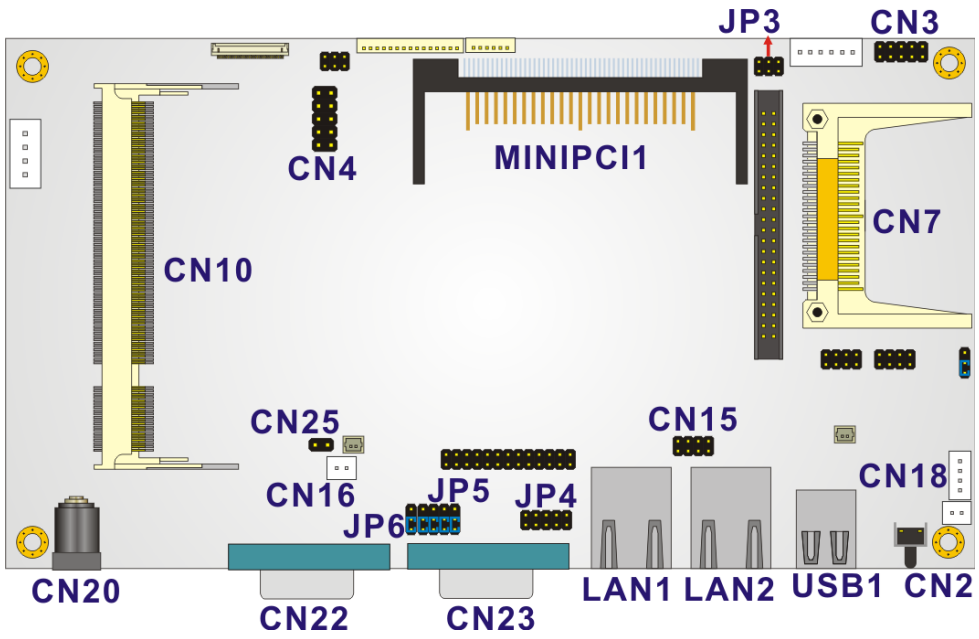

Figure 3-1: AFLMB-LX-800 Jumper and Connector Locations

3.1.3 CPU Support

NOTE:

The IBX-500A has a preinstalled AMD® Geode™ LX 800 500MHz CPU on-board. If the CPU fails, the motherboard has to be replaced. Please contact the IEI reseller or vendor you purchased the IBX-500A from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The AFLMB-LX800 motherboard comes with a preinstalled AMD® Geode™ LX 800 500MHz CPU.

3.1.3.1 AMD® Geode™ LX 800 500MHz Specifications

The specifications for the 500MHz AMD® Geode™ LX 800 are listed below

- x86/x87-compatible core
- Processor frequency up to 500 MHz
- 64K I/64K D L1 cache and 128K L2 cache
- Split I/D cache/TLB (Translation Look-Aside Buffer)
- 64-bit DDR Memory interface up to 400MHz (LX 800), up to 333MHz (LX 700)
- Integrated FPU that supports the Intel MMX® and AMD 3DNow!™ Technology instruction sets
- 9 GB/s internal GeodeLink™ Interface Unit (GLIU)
- Security Block
  - 128-bit AES (CBC/ECB)
  - True Random Number Generator
- High-resolution CRT and TFT outputs (simultaneous operation)
  - Support for High Definition (HD) and Standard Definition (SD) standards
  - Support 1920x1440 in CRT mode and 1600x1200 in TFT mode
- VESA 1.1 and 2.0 VIP/VDA support
- 0.13 micron process
- 481-terminal PBGA (Plastic Ball Grid Array) with internal heatspreader

3.1.4 AMD® Geode™ LX 800 500MHz Power Management

The power management for the 500MHz AMD® Geode™ LX 800 is listed below:

- 1.8W Typical (3.9W TDP) @ 500MHz
- GeodeLink active hardware power management
- Hardware support for standard ACPI software power management
- I/O companion SUSP#/SUSPA# power controls
- Lower power I/O
- Wakeup on SMI/INTR

3.2 System Chipset

The AFLMB-LX800 motherboard has a preinstalled AMD® Geode™ CS5536 system chipset. The system chipset features are listed below.

- **GeodeLink™ Interface Unit**
  - 64-bit, 66MHz operation
  - PCI VSM (Virtual System Module) that makes the interface transparent to applications software and BIOS
  - Programmable routing descriptors, use and activity monitors, and SSMI (Synchronous System Management Interrupt)
- **ATA-6 Controller**
  - 100 MB/second IDE Controller in UDMA mode per the ATA-6 specification
  - 5V interface
- **Flash Interface**
  - Multiplexed with IDE interface Connects to an array of industry standard NAND Flash and/or NOR Flash
- **USB Controller**
  - 4 USB ports (two internal and two external)
  - Supports both USB 1.1 and USB 2.0
  - 3 host ports
  - 1 host/device

- **Audio Codec 97 (AC97) Controller**
  - AC97 specification v2.3 compliant interface to multiple audio codecs: Serial In, Serial Out, Sync Out, Bit Clock In
  - Legacy “PC Beep” support
- **Diverse Device**
  - 82xx Legacy Devices
  - IR Communication Port
  - System Management Bus (SMB) Controller
  - LPC (Low Pin Count) Port
  - General Purpose I/Os (GPIOs)
  - 8 Multi-Function General Purpose Timers (MFGPTs)
  - Real-Time Clock (RTC) with CMOS RAM
  - Power Management Controller
  - ACPI v2.0 compliant

3.3 Graphics Support

The Geode LX processor’s Graphics Processor is a BitBLT/vector engine that supports pattern generation, source expansion, pattern/source transparency, 256 ternary raster operations, alpha blenders to support alpha- BLTs, incorporated BLT FIFOs, a GeodeLink interface and the ability to throttle BLTs according to video timing. New features added to the Graphics Processor include:

- Command buffer interface
- Hardware accelerated rotation BLTs
- Color depth conversion
- Paletized color
- Full 8x8 color pattern buffer
- Separate base addresses for all channels
- Monochrome inversion

Table : Geode LX Graphics Features lists a complete list of Geode LX graphics features. For more details, please refer to the AMD website or the Geode LX series data book available from AMD.

Feature	AMD Geode™ LX Processor
Color Depth	8, 16, 32 bpp (A) RGB 4 and 8-bit indexed
ROPs	256 (2-src, dest and pattern)
BLT Buffers	FIFOs in Graphics Processor
BLT Splitting	Managed by hardware
Video Synchronized BLT/Vector	Throttle by VBLANK
Bresenham Lines	Yes
Patterned (stippled) Lines	Yes
Screen to Screen BLT	Yes
Screen to Screen BLT with mono expansion	Yes
Memory to Screen BLT	Yes (throttled rep movs writes)
Accelerated Text	No
Pattern Size (Mono)	8x8 pixels
Pattern Size (Color)	8x8 pixels
Monochrome Pattern	Yes (with inversion)
Dithered Pattern (4 color)	No
Color Pattern	8, 16, 32 bpp
Transparent Pattern	Monochrome
Solid Fill	Yes
Pattern Fill	Yes
Transparent Source	Monochrome
Color Key Source Transparency	Y with mask
Variable Source Stride	Yes
Variable Destination Stride	Yes
Destination Write Bursting	Yes
Selectable BLT Direction	Vertical and Horizontal
Alpha BLT	Yes (constant α, α/pix, or sep. α channel)
VGA Support	Decodes VGA Register
Pipeline Depth	Unlimited
Accelerated Rotation BLT	8, 16, 32 bpp
Color Depth Conversion	5:6:5, 1:5:5:5, 4:4:4:4, 8:8:8:8

Table : Geode LX Graphics Features

3.4 Ethernet Controller Specifications

3.4.1 Overview

The Realtek RTL8100C(L) is a highly integrated and cost-effective single-chip Fast Ethernet controller. It is enhanced with an ACPI (Advanced Configuration Power Interface) management function for PCI in order to provide efficient power management for advanced operating systems with OSPM (Operating System Directed Power Management).

The RTL8100C(L) also supports remote wake-up (including AMD Magic Packet™ and Microsoft® Wake-up frame) to increase cost-efficiency in network maintenance and management. It is an ideal solution for notebook/motherboard-embedded network designs.

3.4.2 Features

- Integrates Fast Ethernet MAC, physical chip, and transceiver onto a single chip
- 10Mbps and 100Mbps operation
- Supports 10Mbps and 100Mbps N-way auto-negotiation
- Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- Complies with PC99/PC2001 standards
- Supports ACPI power management
- Provides PCI bus master data transfer
- Provides PCI memory space or I/O space mapped data transfer
- Supports PCI clock speed of 16.75MHz-40MHz
- Advanced power saving mode
- Supports Wake-on-LAN and remote wake-up (AMD Magic Packet™, Link Change, and Microsoft® Wake-up frame)
- Half/Full duplex capability
- Supports Full Duplex Flow Control (IEEE 802.3x)
- Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- Provides PCI clock run pin

- Provides LED pins for network operation status indication
- 2.5/3.3V power supply with 5V tolerant I/Os

3.5 Peripheral Interface Connectors

Section 3.5.1 lists all the peripheral interface connectors seen in **Section 3.1.2**.

3.5.1 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the AFLMB-LX-800 used for the IBX-500A embedded system.

Connector	Type	Label
Audio connector	4-pin wafer connector	CN18
CompactFlash® slot	50-pin CF connector	CN7
Front panel connector	8-pin header	CN15
Mini-PCI socket	124-pin Mini PCI Slot	MINIPCI1
Power switch connector	2-pin wafer connector	CN16
Serial port connector (COM3)	10-pin header	CN3
SO-DIMM socket	200-pin connector	CN10
VGA connector	10-pin header	CN4

Table 3-1: Peripheral Interface Connectors

3.5.2 External Interface Panel Connectors

Table 3-2 lists the rear panel connectors on the AFLMB-LX-800.

Connector	Type	Label
DC power connector	Power outlet	CN20
Ethernet connectors	RJ-45 connector	LAN1, LAN2

Reset button	Push-button	CN2
RS-232 serial port (COM1)	DB-9 connector	CN22
RS-232/422/485 serial port (COM2)	DB-9 connector	CN23
USB ports	USB port	USB1

Table 3-2: Rear Panel Connectors

3.6 AFLMB-LX-800 Motherboard On-board Jumpers

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

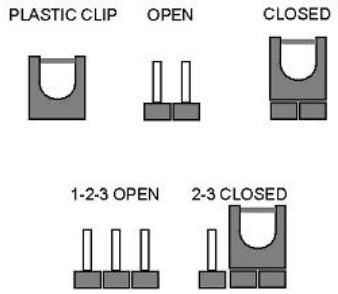

Figure 3-2: Jumpers

The AFLMB-LX-800 motherboard has several onboard jumpers (**Table 3-3**).

Description	Label	Type
AT/ATX power select	CN25	2-pin header
COM3 pin-9 signal select	JP3	6-pin header
COM1 and COM2 pin-9 signal select	JP4	10-pin header
COM2 port select (pin-12 signal select)	JP5	12-pin header
COM2 port select (pin-3 signal select)	JP6	3-pin header

Table 3-3: Jumpers

3.6.1 AT/ATX Power Select

Jumper Label:	**CN25**
Jumper Type:	2-pin header
Jumper Settings:	See **Table 3-4**
Jumper Location:	See **Figure 3-3**

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. AT Power Select jumper settings are shown in **Table 3-4**.

JP3	Description	
Short	AT	
Open	ATX	Default

Table 3-4: AT/ATX Power Select Jumper Settings

The location of the AT/ATX Power Select jumper is shown in **Figure 3-3** below.

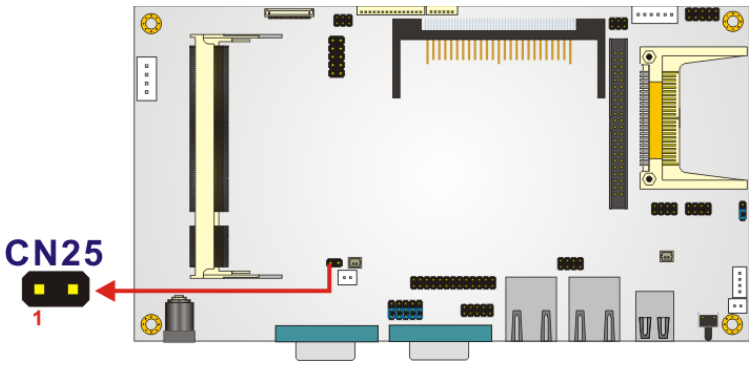

Figure 3-3: AT/ATX Power Select Jumper Location

3.6.2 COM3 Pin-9 Signal Select Jumper Settings

Jumper Label:	**JP3**
Jumper Type:	6-pin header
Jumper Settings:	See **Table 3-5**

Jumper Location: See **Figure 3-4**

The COM3 pin-9 signal can be selected as 12V, 5V or Ring.

JP3	Description	
Short 1-2	COM3 pin-9 is 12V output	
Short 3-4	COM3 pin-9 is RI input	Default
Short 5-6	COM3 pin-9 is 5V output	

Table 3-5: COM3 Pin-9 Signal Select Jumper Settings

The location of the COM3 Pin-9 Signal Select jumper is shown in **Figure 3-4** below.

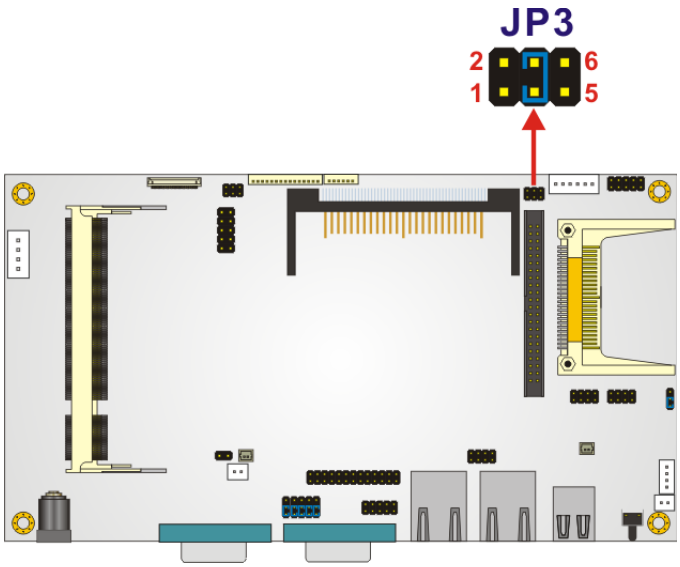

Figure 3-4: COM3 Pin-9 Signal Select Jumper Location

3.6.3 COM1 and COM2 Pin-9 Signal Select Jumper Settings

Jumper Label:	**JP4**
Jumper Type:	2-pin header
Jumper Settings:	See **Table 3-6**
Jumper Location:	See **Figure 3-5**

The COM1 and COM2 pin-9 signal can be selected as 12V, 5V or Ring.

JP4	Description	
Short 1, 3	COM1 pin-9 is 12V output	
Short 3, 5	COM1 pin-9 is 5V output	
Short 5, 7	COM1 pin-9 is 5V output	
Short 7, 9	COM1 pin-9 is RI input	Default
Short 2, 4	COM2 pin-9 is 12V output	
Short 4, 6	COM2 pin-9 is 5V output	
Short 6, 8	COM2 pin-9 is 5V output	
Short 8, 10	COM2 pin-9 is RI input	Default

Table 3-6: COM1 and COM2 Pin-9 Signal Select Jumper Settings

The location of the COM1 and COM2 Pin-9 Signal Select jumper is shown in **Figure 3-5** below.

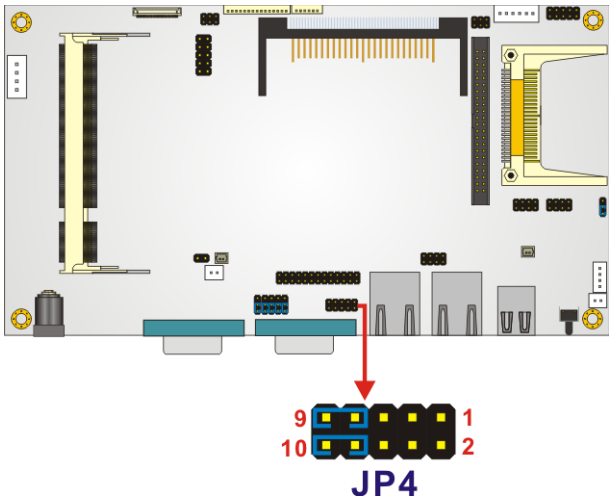

Figure 3-5: COM1 and COM2 Pin-9 Signal Select Jumper Location

3.6.4 COM2 Select Jumper Settings

Jumper Label:	**JP5** and **JP6**
Jumper Type:	12-pin header, 3-pin header
Jumper Settings:	See **Table 3-7** and **Table 3-8**
Jumper Location:	See **Figure 3-6**

The COM2 serial port can be set as RS-422/485 via JP5 and JP6.

JP5	Description	
Short 1-2	DCD2 (RS-232)	Default
Short 2-3	TX2-(RS-422/485)	
Short 4-5	RXD2(RS-232)	Default
Short 5-6	TX+(RS-422/485)	
Short 7-8	DSR2(RS-232)	Default
Short 8-9	RX-(RS-422/485)	
Short 10-11	RTS2(RS-232)	Default
Short 11-12	RX+(RS-422/485)	

Table 3-7: COM2 Select Jumper Settings (JP5)

JP6	Description	
Short 1-2	RS-232	Default
Short 2-3	RS-422/485	

Table 3-8: COM2 Select Jumper Settings (JP6)

The location of the COM2 Select jumper is shown in **Figure 3-6** below.

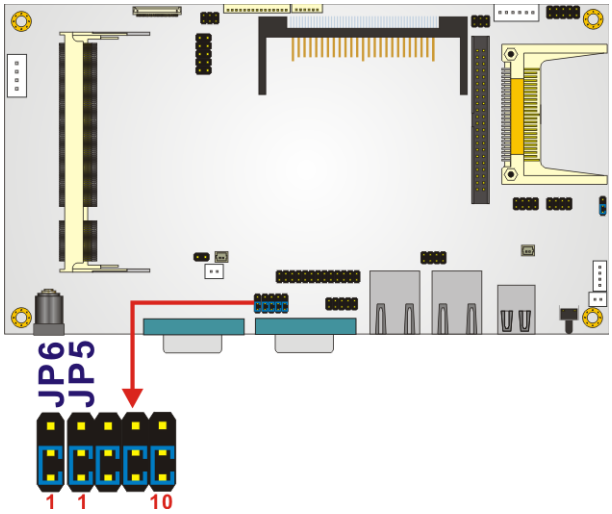

Figure 3-6: COM2 Select Jumper Location

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 AFLMB-LX-800 motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the IBX-500A 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 IBX-500A, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Configure the jumper settings

Step 3: Install the CF card

Step 4: Install the four foot pads/Mount the IBX-500A

Step 5: Connect the front panel peripheral connectors

Step 6: Power the system up

4.2.2 Unpacking

After the IBX-500A is received make sure the following components are included in the package. If any of these components are missing, please contact the IBX-500A reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	IBX-500A embedded system	
1	Power adaptor	
1	Power cord	
1	Screw set	
4	Foot pads	
1	Wireless antenna	
1	Wall mount kit	
1	Driver and manual CD	

1	Quick installation guide	
1	DIN mount kit (optional)	
1	128MB CompactFlash® card with Windows CE 5.0 pre-installed and SDK (optional)	
1	1GB CompactFlash® card with Windows XPE pre-installed (optional)	

Table 4-1: Package List Contents

4.2.3 Bottom Cover Removal

Before the jumper settings can be configured, the bottom cover must be removed. To remove the bottom cover, please follow the steps below:

Step 1: Turn the IBX-500A over.

Step 2: Remove the bottom cover retention screws. The bottom cover is secured to the front pane and the rear panel with six retention screws, three in the front panel (**Figure 4-1**) and three in the rear panel (**Figure 4-2**). All six screws must be removed.

Figure 4-1: Bottom Cover Retention Screws (Front Panel)

Figure 4-2: Bottom Cover Retention Screws (Rear Panel)

Step 3: Gently remove the bottom cover from the IBX-500A.

4.2.4 Configure the Jumper Settings

To configure the jumper settings, please follow the steps below.

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

Step 2: Locate the jumper settings on the embedded motherboard. See **Section 3.6**.

Step 3: Make the jumper settings in accordance with the settings described and defined in **Section 3.6**.

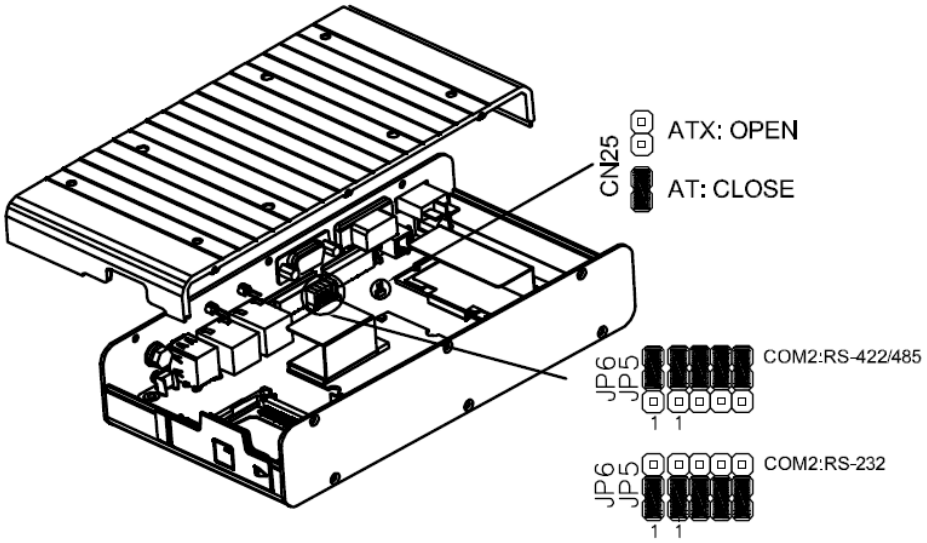

Figure 4-3: COM2 Port Select and AT/ATX Power Select Jumper Settings

4.2.5 CompactFlash® Card Installation

The IBX-500A embedded system has one CF slot on left side panel. To install the CF card, follow the instructions below.

Step 1: Locate the CF card slot rubber cover on the left side panel.

Step 2: Remove CF card slot rubber cover.

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

Figure 4-4: CF Card Installation

Step 4: Replace the CF card slot cover.

4.2.6 Foot Pad Installation

The IBX-500A embedded system is shipped with four foot pads. To install the foot pads, follow the instructions below.

Step 1: Turn the IBX-500A embedded system over.

Step 2: Locate the four retention screw holes for the food pad in the bottom surface.

Step 3: Align the hole of the foot pad with the retention screw holes on the bottom surface.

Step 4: Secure the foot pad to the chassis by inserting the retention screw. (**Figure 4-5**).

Figure 4-5: Foot Pads Installation

4.2.7 Mounting the System with Wall Mount Kit

To mount the embedded system onto a wall using the VESA MIS-D 75 wall mount kit, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 4-6**).

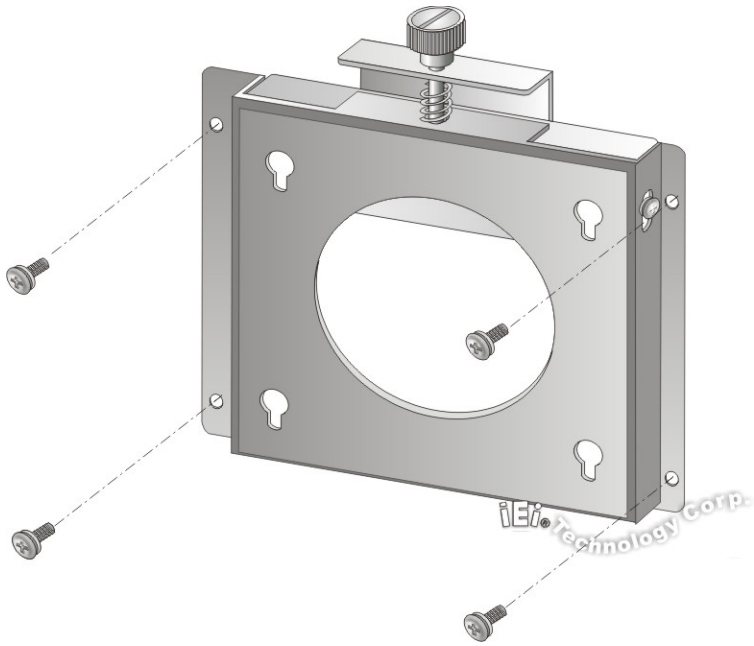

Figure 4-6: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (**Figure 4-7**).

Step 5: Align the mounting screws on the IBX-500A bottom panel with the mounting holes on the bracket.

Step 6: Carefully insert the screws through the holes and gently pull the monitor downwards until the IBX-500A rests securely in the slotted holes (**Figure 4-7**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

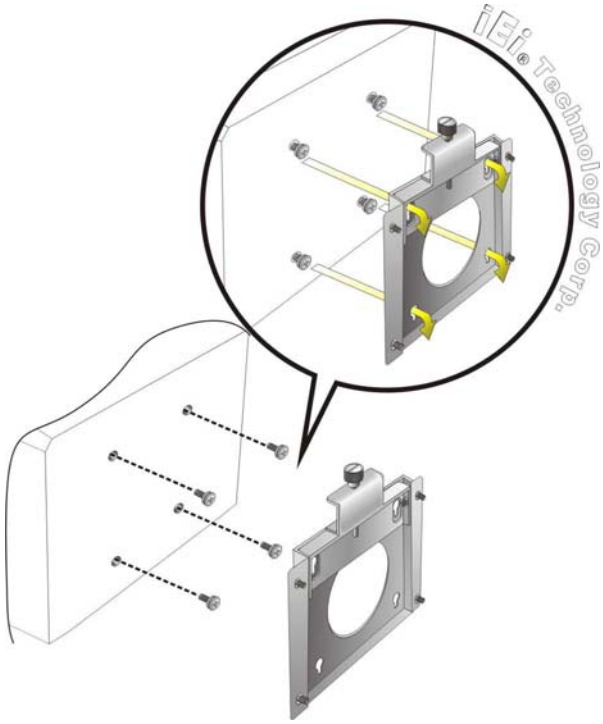

Figure 4-7: Mount the Embedded System

Step 7: Secure the embedded system by fastening the retention screw of the wall-mounting bracket. (**Figure 4-8**).

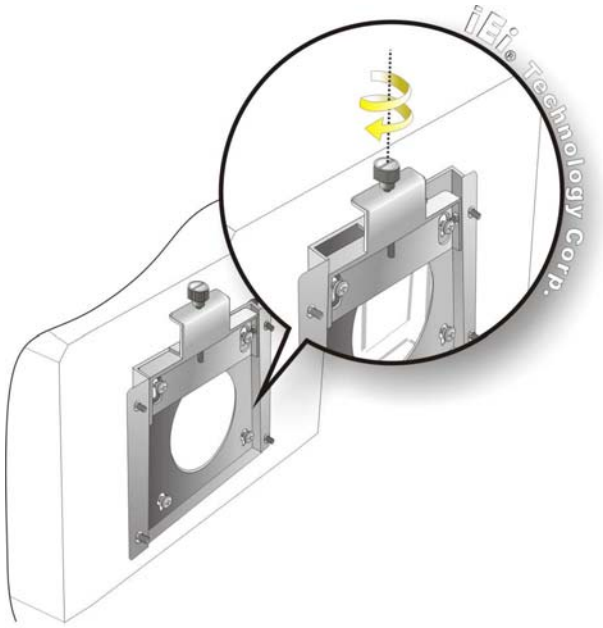

Figure 4-8: Secure the Embedded System

4.2.8 DIN Mounting

To mount the IBX-500A embedded system onto a DIN rail, please follow the steps below.

Step 7: Attach the DIN rail mounting bracket to the bottom panel of the embedded system. Secure the bracket to the embedded system with the supplied retention screws (**Figure 4-9**).

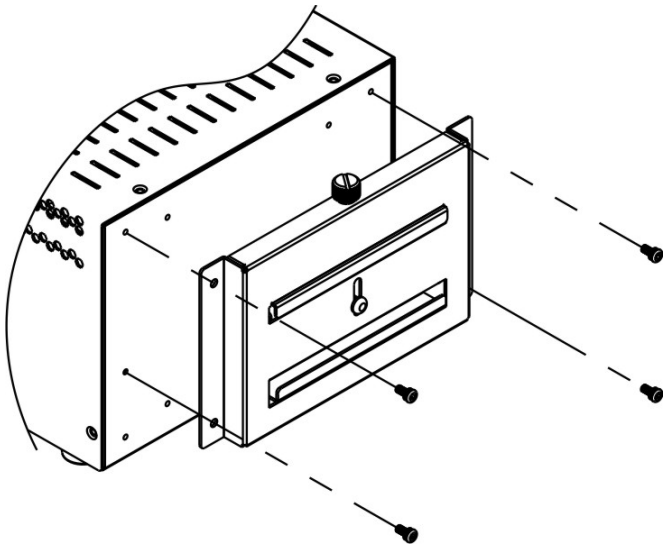

Figure 4-9: DIN Rail Mounting Bracket

Step 8: Make sure the inserted screw in the center of the bracket is at the lowest position of the elongated hole (**Figure 4-10**).

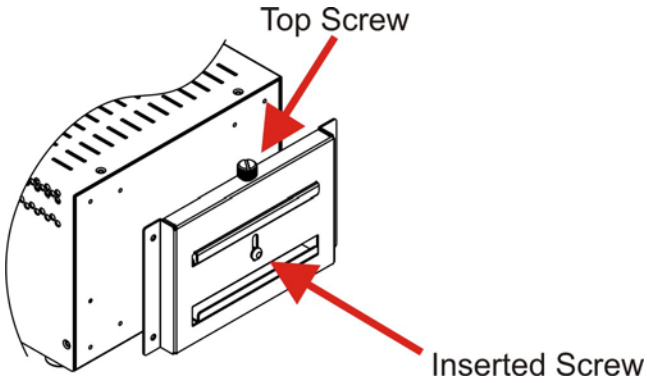

Figure 4-10: Screw Locations

Step 9: Place the DIN rail flush against the back of the mounting bracket making sure

the edges of the rail are between the upper and lower clamps (**Figure 4-11**).

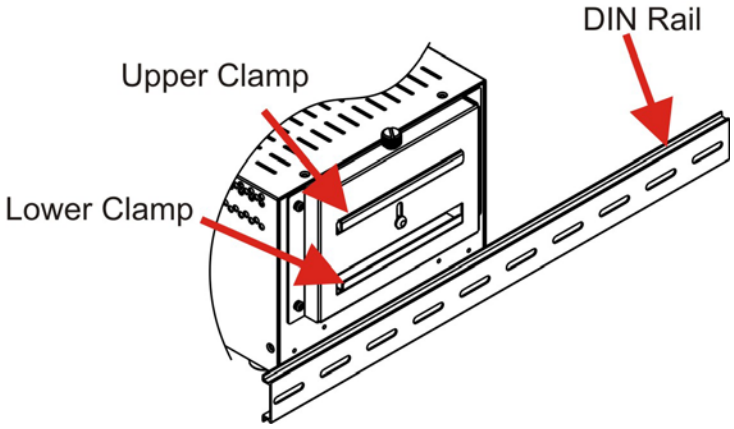

Figure 4-11: Mounting the DIN RAIL

Step 10: Secure the DIN rail to the mounting bracket by turning the top screw clockwise. This draws the lower clamp up and secures the embedded system to the DIN rail (**Figure 4-12**).

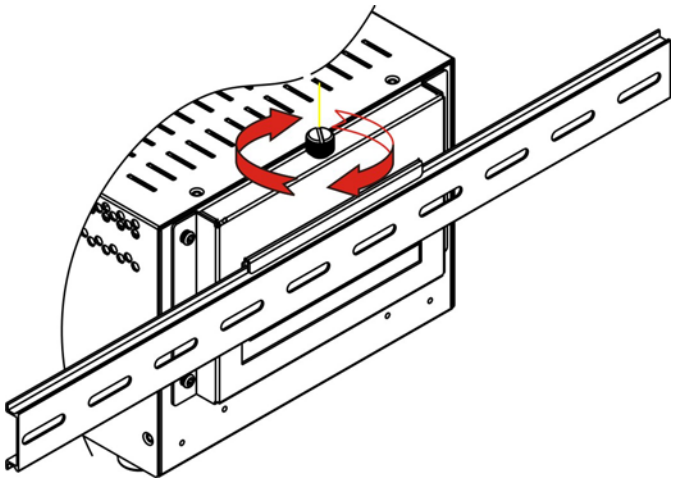

Figure 4-12: Secure the Assembly to the DIN Rail

4.2.9 Cable Connections

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

- VGA cable connector

- Serial port connectors
- RJ-45 connectors
- USB devices can be connected to the system.

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

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.

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

- The memory module is installed
- The wireless LAN module is installed
- The CF module is installed
- The bottom cover is installed
- All peripheral devices (VGA monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

4.3.2 Power-on Procedure

To power-on the IBX-500A please follow the steps below:

Step 1: Turn on the power switch.

Step 2: Once turned on, the green power LED should be turned on. See **Figure 4-13**.

Figure 4-13: Power Switch and Power LED

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Chapter

5

BIOS Settings

5.1 Introduction

A licensed copy of Phoenix Award 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 Phoenix Award 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, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the **PAGEUP** and **PAGEDOWN** keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown below.

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

F2	Item help
F5	Previous values for the page menu items
F6	Fail-safe defaults for the current page menu items
F7	Optimized defaults for the current page menu items
F9	Menu in BIOS
F10	Save changes and Exit BIOS

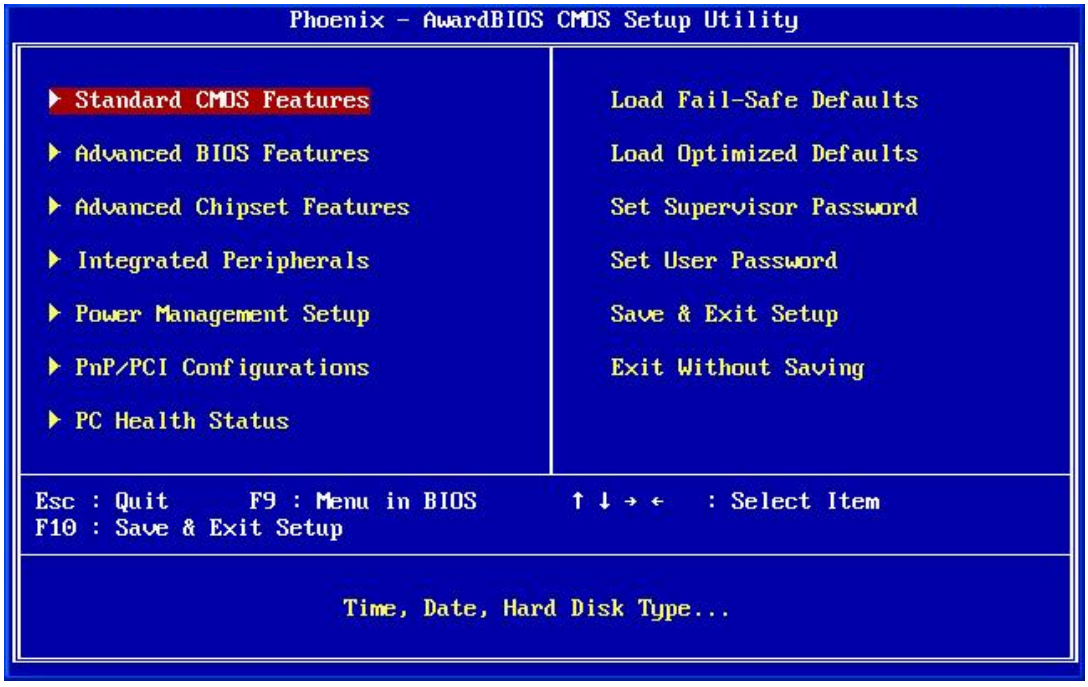
Table 5-1: BIOS Navigation Keys

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 Main BIOS Menu

Once the BIOS opens, the main menu (**BIOS Menu 1**) appears.



BIOS Menu 1: Award BIOS CMOS Setup Utility

NOTE:

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS Menu 1**.

- **Standard CMOS Features**: Changes the basic system configuration.
- **Advanced BIOS Features**: Changes the advanced system settings.
- **Advanced Chipset Features**: Changes the chipset configuration features.
- **Integrated Peripherals**: Changes the settings for integrated peripherals.
- **Power Management Setup**: Configures power saving options.
- **PnP/PCI Configurations**: Changes the advanced PCI/PnP settings.
- **PC Health Status**: Monitors essential system parameters.

The following user configurable options are also available in **BIOS Menu 1**:

➔ **Load Fail-Safe Defaults**

Use the **Load Fail-Safe Defaults** option to load failsafe default values for each BIOS parameter in the setup menus. Press **F6** for this operation on any page.

➔ **Load Optimized Defaults**

Use the **Load Optimized Defaults** option to load optimal default values for each BIOS parameter in the setup menus. Press **F7** for this operation on any page.

➔ **Set Supervisor Password**

Use the **Set Supervisor Password** option to set the supervisor password. By default, no supervisor password is set. To install a supervisor password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password:** ". Type the password and press **ENTER**. Retype the original password into the "**Confirm Password:** " dialogue box and press **ENTER**. To disable the password, simply

press **ENTER** in the "**Enter Password:** " dialogue box, then press any key in the "**Password Disabled !!!**" dialogue box.

➔ **Set User Password**

Use the **Set User Password** option to set the user password. By default no user password is set. To install a user password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password:** ". Type the password and press **ENTER**. Retype the original password into the "**Confirm Password:** " dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the "**Enter Password:** " dialogue box, then press any key in the "**Password Disabled !!!**" dialogue box.

➔ **Save & Exit Setup**

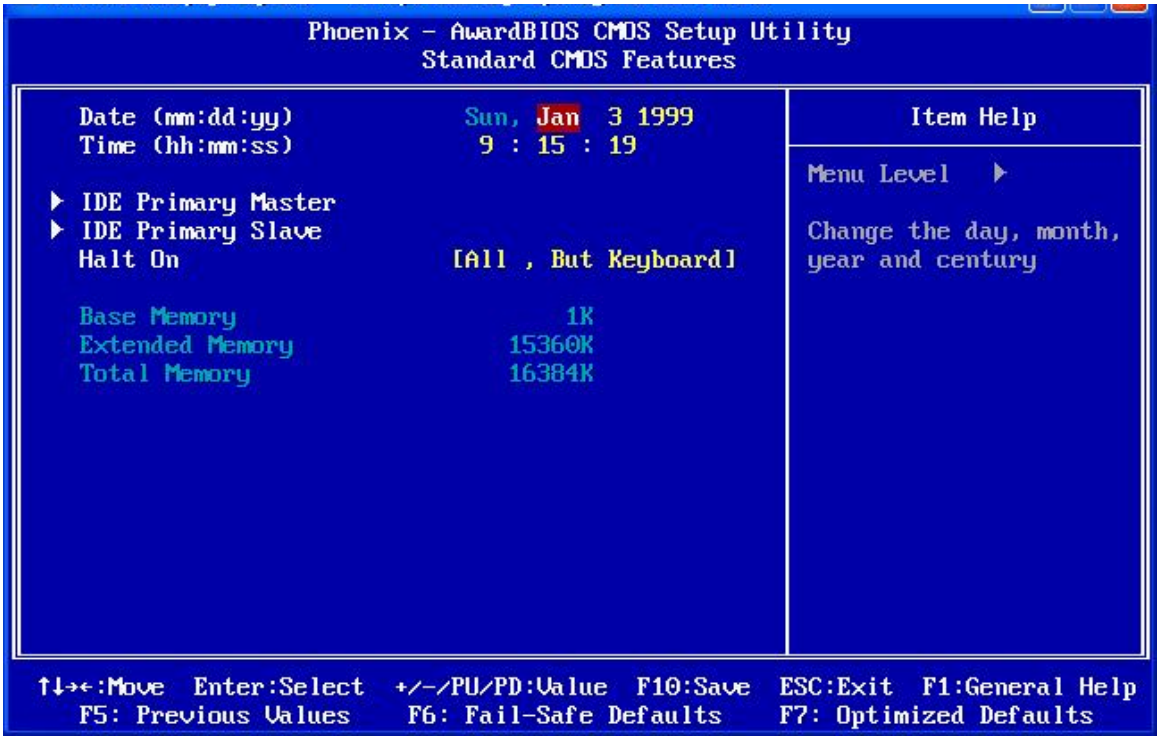
Use the **Save & Exit Setup** option to save any configuration changes made and exit the BIOS menus.

➔ **Exit Without Saving**

Use the **Exit Without Saving** option to exit the BIOS menus without saving any configuration changes.

5.2 Standard CMOS Features

Use the Standard CMOS Features BIOS menu (**BIOS Menu 2**) to set basic BIOS configuration options.



BIOS Menu 2: Standard CMOS Features

➔ **Date [Day mm:dd:yyyy]**

Use the **Date** option to set the system date.

➔ **Time [hh/mm/ss]**

Use the **Time** option to set the system time.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. The **Standard CMOS Features** menu shows the status of the auto detected IDE devices. The following IDE devices are detected and shown in the **Standard CMOS Features** menu:

- IDE Primary Master
- IDE Primary Slave

IDE device configurations are changed or set in the IDE Configuration menu. If an IDE device is detected, and one of the above listed two BIOS configuration options is selected, the IDE configuration options shown in **Section 5.2.1** appear.

➔ **Halt On [All, But Keyboard]**

Use the **Halt On** option to specify what errors detected during the power up process stop the system.

➔	**All Errors**		Whenever BIOS detects a non-fatal error the system is stopped and the user prompted.
➔	**No Errors**		The system boot is not stopped for any errors that may be detected.
➔	**All, But Keyboard**	(Default)	The system boot does not stop for a keyboard error; it stops for all other errors.

➔ **Base Memory:**

The **Base Memory** is NOT user configurable. The POST determines the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed, or 640K for systems with 640K or more memory installed.

➔ **Extended Memory**

The **Extended Memory** is NOT user configurable. The BIOS determines how much extended memory is present during the POST. This is the amount of memory above 1MB located in the memory address map of the CPU.

➔ **Total Memory**

The **Total Memory** is NOT user configurable.

5.2.1 IDE Primary Master/Slave

Use the IDE Primary Master/Slave menu to set or change the master/slave IDE configurations.

➔ **IDE HDD Auto-Detection [Press Enter]**

Use the **IDE HDD Auto-Detection** option to enable BIOS to automatically detect the IDE settings. Select **IDE HDD Auto-Detection** and press **ENTER.** BIOS automatically detects the HDD type. Do not set this option manually.

➔ **IDE Primary Master [Auto]**

Use the **IDE Primary Master** option to activate or deactivate the following drive channels:

- Channel 0 Master
- Channel 0 Slave
- Channel 1 Master
- Channel 1 Slave

➔ **None**		If no drives are connected to the IDE channel select this option. Once set, this IDE channel becomes inaccessible and any drives attached to it are undetected.
➔ **Auto**	(Default)	Setting this option allows the device to be automatically detected by the BIOS.
➔ **Manual**		Selecting this option allows manual configuration of the device on the IDE channel in BIOS.

➔ **Access Mode [Auto]**

The **Access Mode** option can only be configured if the BIOS configuration option is set to either **Manual** or **Auto**. Use the **Access Mode** option to determine the hard disk BIOS

translation modes. Most systems now use hard drives with large capacities and therefore either the LBA translation mode or auto mode should be selected.

➔	**CHS**		Select this mode if the HDD capacity is less than 504MB.
➔	**LBA**		Select this mode if the HDD capacity is more than 8.4GB.
➔	**Large**		This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.
➔	**Auto**	(Default)	If you are unsure of what access mode to set, select this option.

➔ **Capacity**

The **Capacity** specification indicates the storage capacity of the HDD installed in the system.

➔ **Cylinder**

The **Cylinder** specification indicates how many cylinders (tracks) are on the HDD installed in the system.

➔ **Head**

The **Head** specification indicates how many logical heads are on the HDD installed in the system.

➔ **Precomp**

The **Precomp** specification indicates on what track the write precompensation begins.

➔ **Landing Zone**

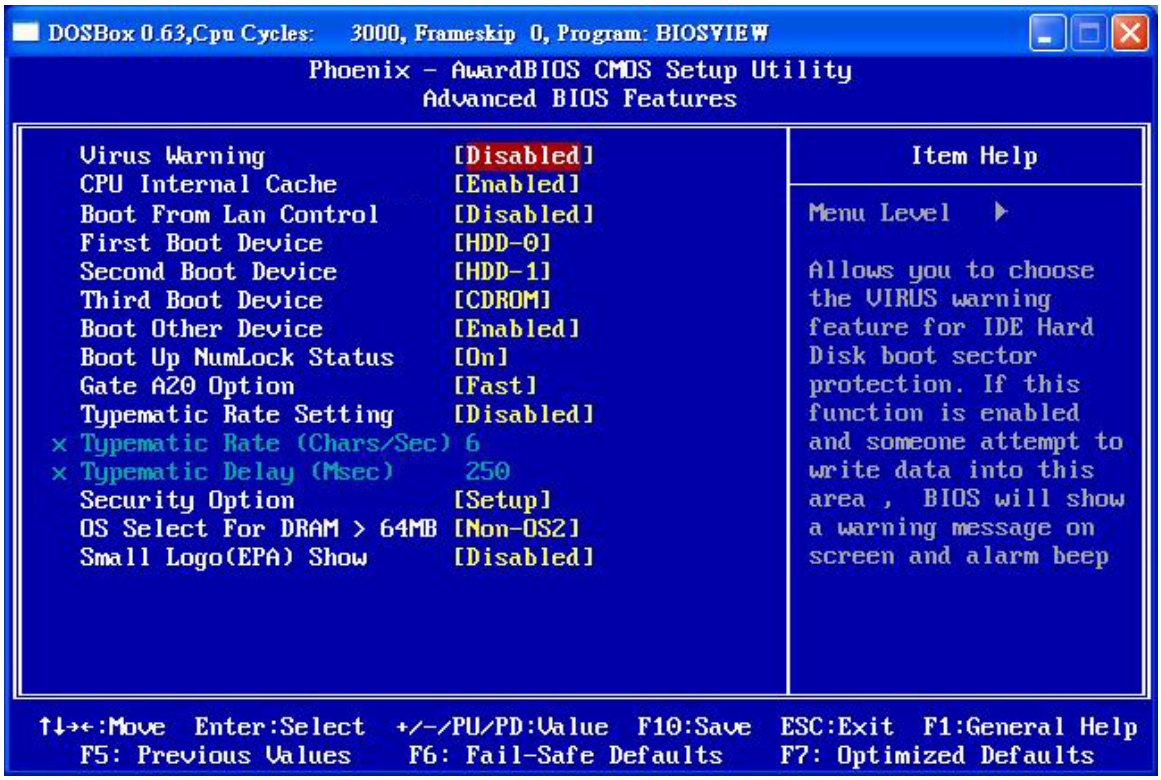
The **Landing Zone** specification indicates where the disk head will park itself after the system powers off.

➔ **Sector**

The **Sector** specification indicates how many logical sectors the HDD has been divided into.

5.3 Advanced BIOS Features

Use the **Advanced BIOS Features** menu (**BIOS Menu 3**) to configure the CPU and peripheral device configuration options.



BIOS Menu 3: Advanced BIOS Features

➔ **Virus Warning [Disabled]**

NOTE:

Many disk diagnostic programs can cause the above warning message to appear when the program attempts to access the boot sector table. If you are running such a program, it is recommended that the virus protection function be disabled beforehand.

Use the **Virus Warning** option to enable BIOS to monitor the boot sector and partition table of the HDD for any attempted modification. If a modification attempt is made, the BIOS halts the system and an error message appears. If necessary, an anti-virus program can then be run to locate and remove the virus before any damage is done.

➔ **Enabled** Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or HDD partition table.

➔ **Disabled** (Default) No warning message appears when there is an attempt to access the boot sector or HDD partition table.

➔ **CPU Internal Cache [Enabled]**

Use the **CPU Internal Cache** option to enable or disable the internal CPU cache.

➔ **Disabled** The internal CPU cache is disabled.

➔ **Enabled** (Default) The internal CPU cache is enabled.

➔ **Quick Power On Self Test [Enabled]**

Use the **Quick Power On Self Test** option to speed up the POST after the computer is turned on. If enabled, BIOS shortens or skips some POST check items.

➔ Disabled Normal POST occurs after the computer is turned on.

➔ Enabled (Default) Quick POST occurs after the computer is turned on.

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

Use the **BOOT From LAN Control** option to enable the system to be booted from a remote system.

➔ **Disabled** (Default) The system cannot be booted from a remote system through the LAN.

➔ **Enabled** The system can be booted from a remote system through the LAN.

➔ **Boot Device**

Use the **Boot Device** options to select the order of the devices the system boots from. There are three boot device configuration options:

- **First Boot Device** [Default: HDD-0]
- **Second Boot Device** [Default: HDD-1]
- **Third Boot Device** [Default: CDROM]

Using the default values, the system first looks for a HDD to boot from. If it cannot find the first HDD, it boots from a second HDD. If both the HDD are unavailable, the system boots from a CD-ROM.

Boot Device configuration options are:

- LS120
- HDD-0
- CDROM
- HDD-1
- USB-FDD
- USB-ZIP

- USB-CDROM
- USB-HDD
- LAN
- Disabled

➔ **Boot Other Device [Enabled]**

Use the **Boot Other Device** option to determine whether the system uses a second or third boot device if the first boot device is not found.

➔ **Disabled**		The system does not look for second and third boot devices if the first one is not found.
➔ **Enabled**	(Default)	The system looks for second and third boot devices if the first one is not found.

➔ **Boot Up Numlock Status [On]**

Use the **Boot Up Numlock Status** option to specify the default state of the numeric keypad.

➔ **Off**		The keys on the keypad are not activated.
➔ **On**	(Default)	Activates the keys on the keypad.

➔ **Gate A20 Option [Fast]**

Use the **Gate A20 Option** to set if the keyboard controller or the chipset controls the Gate A20 switching.

➔ **Normal**		The keyboard controller does the switching.
➔ **Fast**	(Default)	The chipset does the switching.

➔ **Typematic Rate Setting [Disabled]**

Use the **Typematic Rate Setting** configuration option to specify if only one character is allowed to appear on the screen if a key is continuously held down. When this option is enabled, the BIOS reports as before, but it then waits a moment, and, if the key is still held down, it begins to report that the key has been pressed repeatedly. This feature accelerates cursor movement with the arrow keys.

- ➔ **Disabled** (Default) Disables the typematic rate.
- ➔ **Enabled** Enables the typematic rate.

➔ **Typematic Rate (Chars/sec) [6]**

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Rate** option to specify the rate keys are accelerated.

- ➔ **6** (Default) 6 characters per second
- ➔ **8** 8 characters per second
- ➔ **10** 10 characters per second
- ➔ **12** 12 characters per second
- ➔ **15** 15 characters per second
- ➔ **20** 20 characters per second
- ➔ **24** 24 characters per second
- ➔ **30** 30 characters per second

➔ **Typematic Delay (Msec) [250]**

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Delay** option to specify the delay time between when a key is first pressed and when the acceleration begins.

- ➔ **250** (Default) 250 milliseconds
- ➔ **500** 500 milliseconds
- ➔ **750** 750 milliseconds
- ➔ **1000** 1000 milliseconds

➔ **Security Option [Setup]**

Use the **Security Option** to limit access to both the system and Setup, or just Setup.

- ➔ **Setup** (Default) The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.
- ➔ **System** The system boots, but access to Setup is denied if the correct password is not entered at the prompt.

NOTE:

To disable security, select the password setting in the Main Menu. When asked to enter a password, don't type anything, press **ENTER** and the security is disabled. Once the security is disabled, the system boots and Setup can be accessed.

➔ **OS Select For DRAM > 64MB [Non-OS2]**

Use the **OS Select For DRAM > 64MB** option to specify the operating system.

- ➔ **Non-OS2** (Default) Select this option when not using the OS/2 operating system.
- ➔ **OS2** Specifies the operating system used as OS/2.

➔ **Small Logo (EPA) Show [Disabled]**

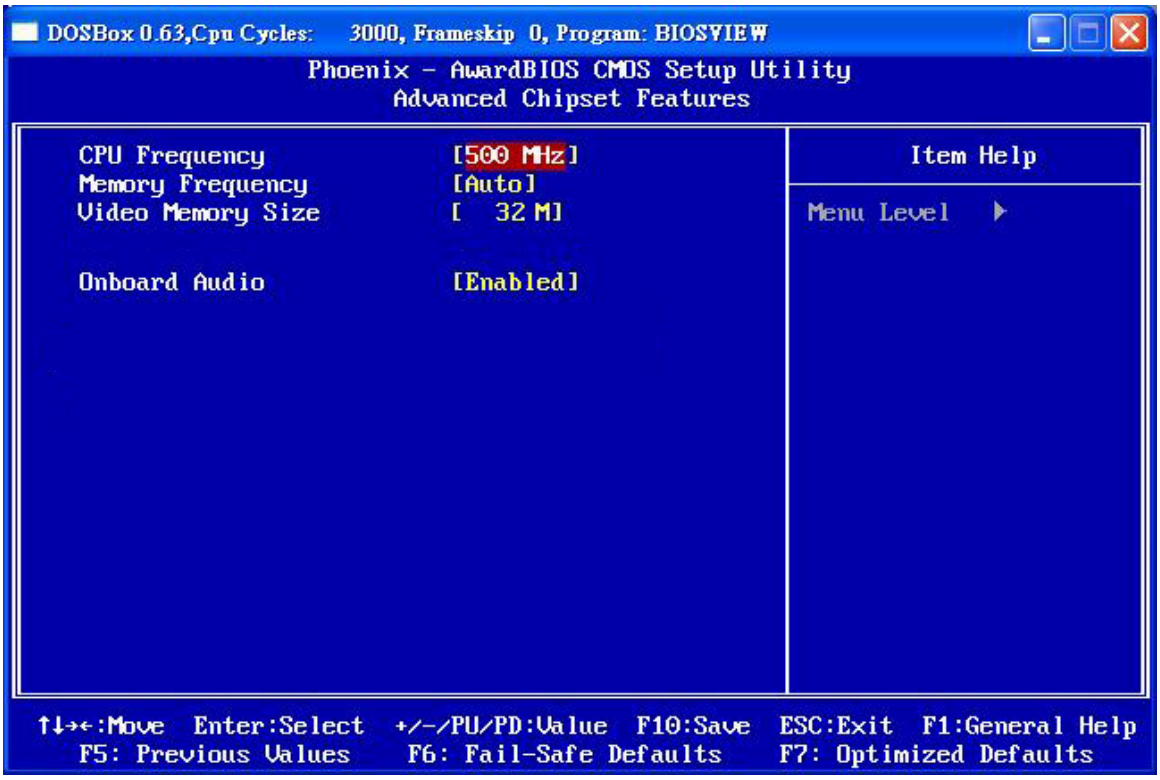
Use the **Small Logo (EPA) Show** option to specify if the Environmental Protection Agency (EPA) logo appears during the system boot-up process. If enabled, the boot up process may be delayed.

➔ **Disabled** (Default) EPA logo does not appear during boot up.

➔ **Enabled** EPA logo appears during boot up.

5.4 Advanced Chipset Features

Use the Advanced Chipset Features menu (**BIOS Menu 4**) to change chipset configuration options.



BIOS Menu 4: Advanced Chipset Features

➔ **CPU Frequency [500MHz]**

Use the **CPU Frequency** option to set the CPU frequency. The **CPU Frequency** options are:

- Auto
- 200MHz
- 333MHz
- 400MHz
- 433MHz
- 500MHz (Default)

➔ **Memory Frequency [Auto]**

Use the **Memory Frequency** option to set the frequency of the installed DRAM modules. The **Memory Frequency** options are:

- Auto (Default)
- 100MHz
- 133MHz
- 166MHz
- 200MHz

➔ **Video Memory Size [32M]**

Use the **Video Memory Size** option to determine how much memory is allocated to the video graphics device. The **Video Memory Size** options are:

- None
- 8M
- 16M
- 32M (Default)
- 64M
- 128M
- 254M

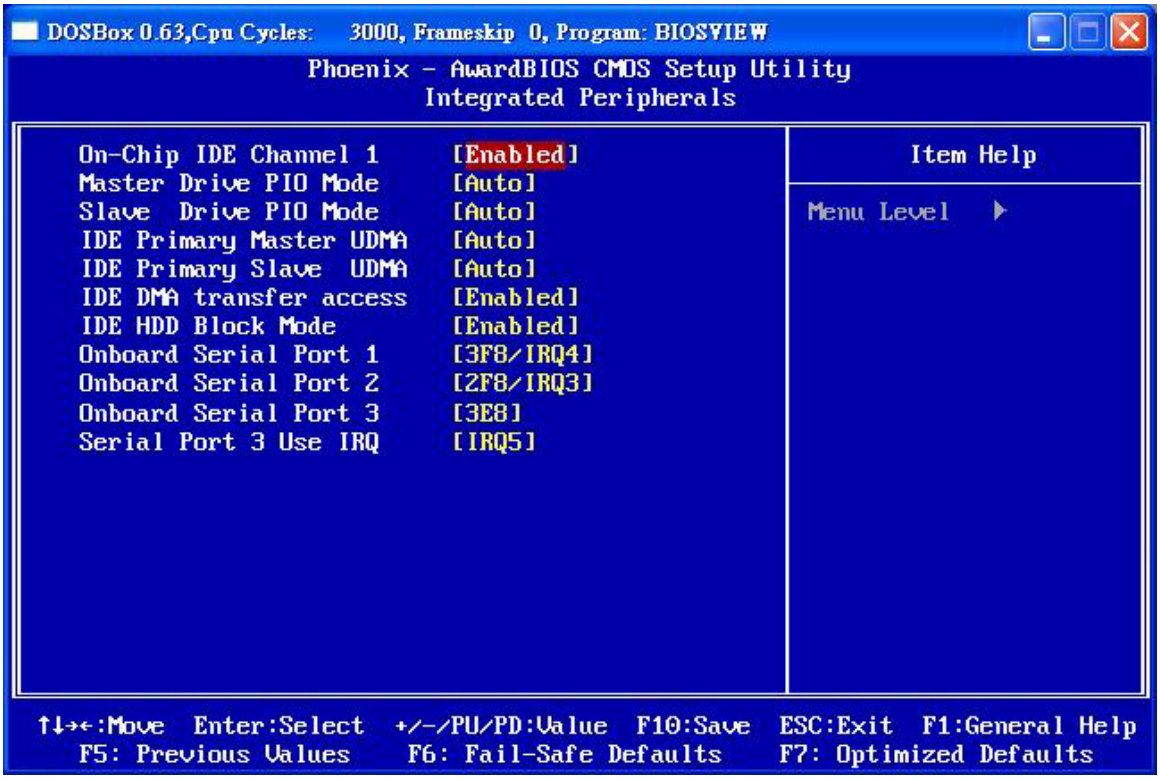
➔ **OnBoard Audio [Enabled]**

Use the **OnBoard Audio** option to enable or disable the onboard codec.

➔ **Disabled**		The onboard codec is disabled.
➔ **Enabled**	(Default)	The onboard codec is detected and enabled.

5.5 Integrated Peripherals

Use the Integrated Peripherals menu (**BIOS Menu 5**) to change the configuration options for the attached peripheral devices.



BIOS Menu 5: Integrated Peripherals

➔ **On-Chip IDE Channel 1 [Enabled]**

Use the **On-Chip IDE Channel 1** option to specify if the system uses the integrated primary IDE channel or not.

➔ **Disabled** The primary IDE channel is not used.

➔ **Enabled** (Default) The primary IDE channel is used.

➔ **Drive PIO Mode [Auto]**

Use the **Drive PIO Mode** options below to select the Programmed Input/Output (PIO) mode for the following HDDs:

- Master Drive PIO Mode
- Slave Drive PIO Mode

➔ **Auto** (Default) The computer selects the correct mode.

➔ **Mode 0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps.

➔ **Mode 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps.

➔ **Mode 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps.

➔ **Mode 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps.

➔ **Mode 4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps.

➔ **IDE UDMA [Auto]**

Use the **IDE UDMA** option below to select the Ultra DMA (UDMA) mode for the following HDDs:

- IDE Primary Master UDMA
- IDE Primary Slave UDMA

➔ **Disabled** The UDMA for the HDD device is disabled.

➔ **Auto** (Default) The computer selects the correct UDMA.

➔ **IDE DMA transfer access [Enabled]**

Use the **IDE DMA transfer access** option to enable or disable DMA support for IDE devices connected to the system.

➔ **Disabled**		All IDE drive DMA transfers are disabled. The IDE drives use PIO mode transfers.
➔ **Enabled**	(Default)	All IDE drive DMA transfers are enabled.

➔ **IDE HDD Block Mode [Enabled]**

If the drive connected to the system supports block mode, use the **IDE HDD Block Mode** option to enable the system to detect the optimal number of block read/writes per sector the system IDE drive can support. Block mode is also called block transfer, multiple commands, or multiple sector read/write.

➔ **Disabled**		Block mode is not supported.
➔ **Enabled**	(Default)	Block mode is supported.

➔ **Onboard Serial Port 1 [3F8/IRQ4]**

Use the **Onboard Serial Port 1** option to select the I/O address and IRQ for the onboard serial port 1. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 1** options are:

- Disabled
- 3F8/IRQ4 (Default)
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

➔ **Onboard Serial Port 2 [2F8/IRQ3]**

Use the **Onboard Serial Port 2** option to select the I/O address and IRQ for the onboard serial port 2. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 2** options are:

- Disabled
- 3F8/IRQ4
- 2F8/IRQ3 (Default)
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

➔ **Onboard Serial Port 3 [3E8]**

Use the **Onboard Serial Port 3** option to select the I/O address for the onboard serial port 3. The serial port can be disabled or the I/O address can be automatically selected by the BIOS. The **Onboard Serial Port 3** options are:

- Disabled
- 3F8
- 2F8
- 3E8 (Default)
- 2E8

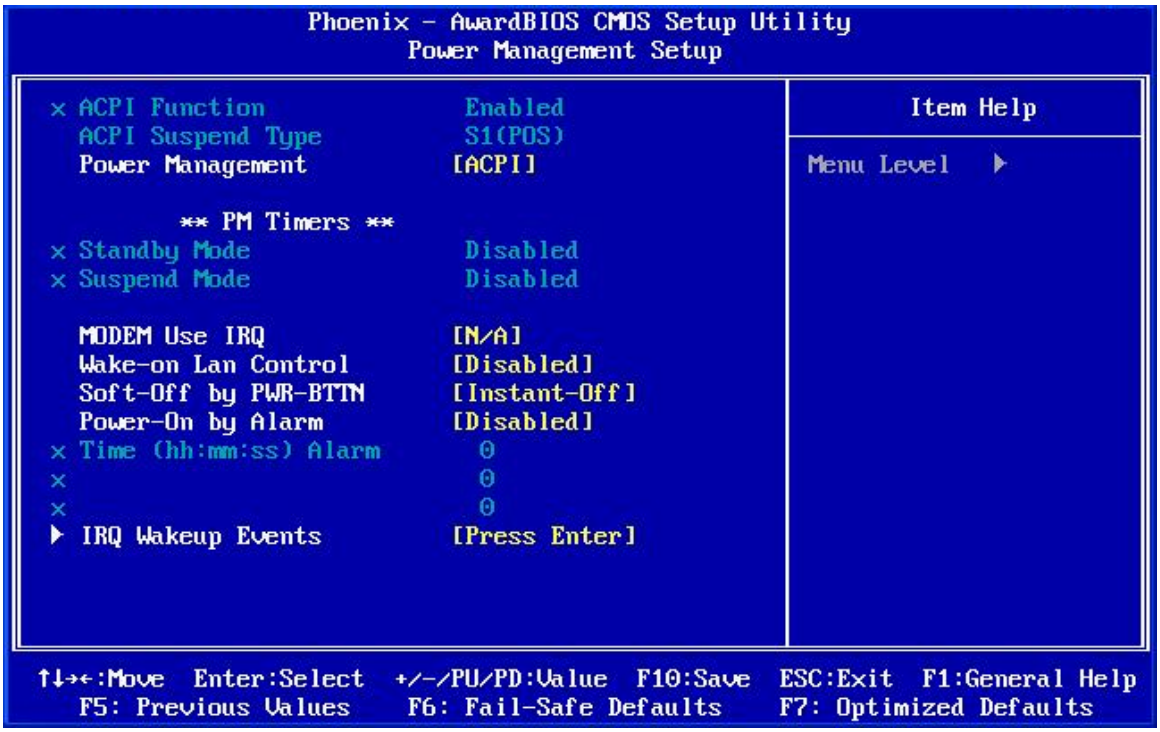
➔ **Serial Port 3 Use IRQ [IRQ5]**

Use the **Serial Port 3 Use IRQ** option to select the IRQ for the onboard serial port 3. The serial port can be disabled or the IRQ can be automatically selected by the BIOS. The **Serial Port 3 Use IRQ** options are:

- Disabled
- IRQ5 (Default)
- IRQ7

5.6 Power Management Setup

Use the **Power Management Setup** menu (**BIOS Menu 6**) to set the BIOS power management and saving features.



BIOS Menu 6: Power Management Setup

➔ **ACPI Function [Enabled]**

Use the **ACPI Function** to enable the ACPI (Advanced Configuration and Power Interface) function.

Disabled		ACPI function disabled.
Enabled	(Default)	ACPI function enabled.

➔ **ACPI Suspend Type [S1(POS)]**

Use the **ACPI Suspend Type** BIOS option to specify the sleep state the system enters when not being used.

- ➔ **S1 (POS)** (Default) System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.
- ➔ **S1 & S3** Both suspend modes are implemented

➔ **Power Management [ACPI]**

Use the **Power Management** option to set the power management type used by the system.

- ➔ **Disabled** All power management options are turned off. The only user configurable options are the power button and alarm settings.
- ➔ **Legacy** Standby and suspend modes can be set.
- ➔ **APM** Advanced power management (APM) is activated
- ➔ **ACPI** (Default) Advanced Configuration and Power Interface (ACPI) is activated.

➔ **x Standby Mode [Disabled]**

The **Standby Mode** option can only be selected if the **Power Management** option is set to Legacy. The **Standby Mode** specifies the amount of time the system can be inactive before the system enters standby mode. The **Standby Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min
- 45 Min
- 60 Min
- 90 Min
- 120 Min

➔ **x Suspend Mode [Disabled]**

The **Suspend Mode** option can only be selected if the **Power Management** option is set to Legacy. The **Suspend Mode** specifies the amount of time the system can be inactive before the system enters suspend mode. The **Suspend Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min

- 45 Min
- 60 Min
- 90 Min
- 120 Min

➔ **Modem Use of IRQ**

Use **the Modem Use of IRQ** to select the IRQ address for the system modem. The following IRQ addresses are available.

- N/A
- 3 (Default)
- 4
- 5
- 7
- 9
- 10
- 11

➔ **Wake-on Lan Control [Disabled]**

Use the **Wake-on Lan Control** option to enable activity on the LAN to rouse the system from a suspend or doze state.

➔ **Disabled** (Default) Wake event not generated by LAN activity.

➔ **Enabled** Wake event generated by LAN activity.

➔ **Soft-Off by PWR-BTTN [Instant-Off]**

Use the **Soft-Off by PWR-BTTN** option to enabled the system to enter a very low-power-usage state when the power button is pressed.

➔ **Instant-Off** (Default) When the power button is pressed, the system is immediately shutdown.

➔ **Delay 4-sec** To shutdown the system the power button must be held

down longer than four seconds otherwise the system enters a low power usage state.

➔ **Power-On by Alarm [Disabled]**

Use the **Power-On by Alarm** option to specify when the computer is roused from a suspended state.

➔ **Disabled** (Default) The real time clock (RTC) cannot generate a wake event

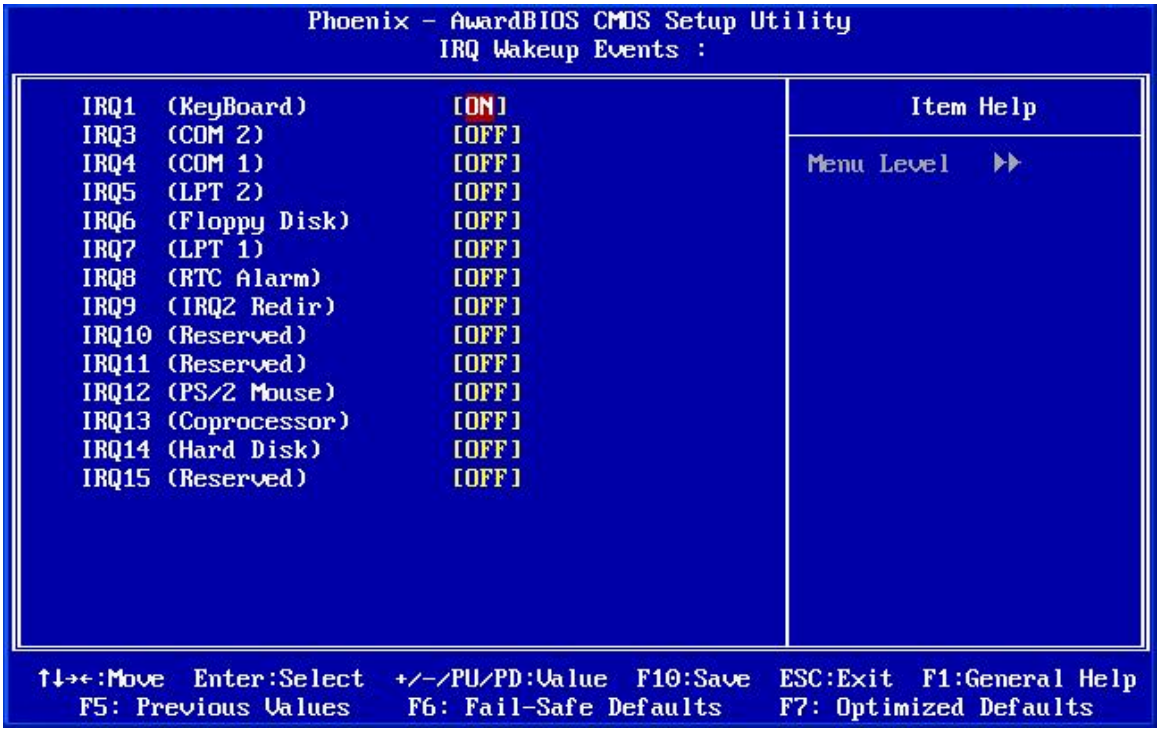
➔ **Enabled** If selected, the following appears with values that can be selected:

➔ **Time (hh:mm:ss) Alarm**

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

➔ **IRQ Wakeup Events [Press Enter]**

To view the **IRQ Wakeup Events** options press **ENTER**.



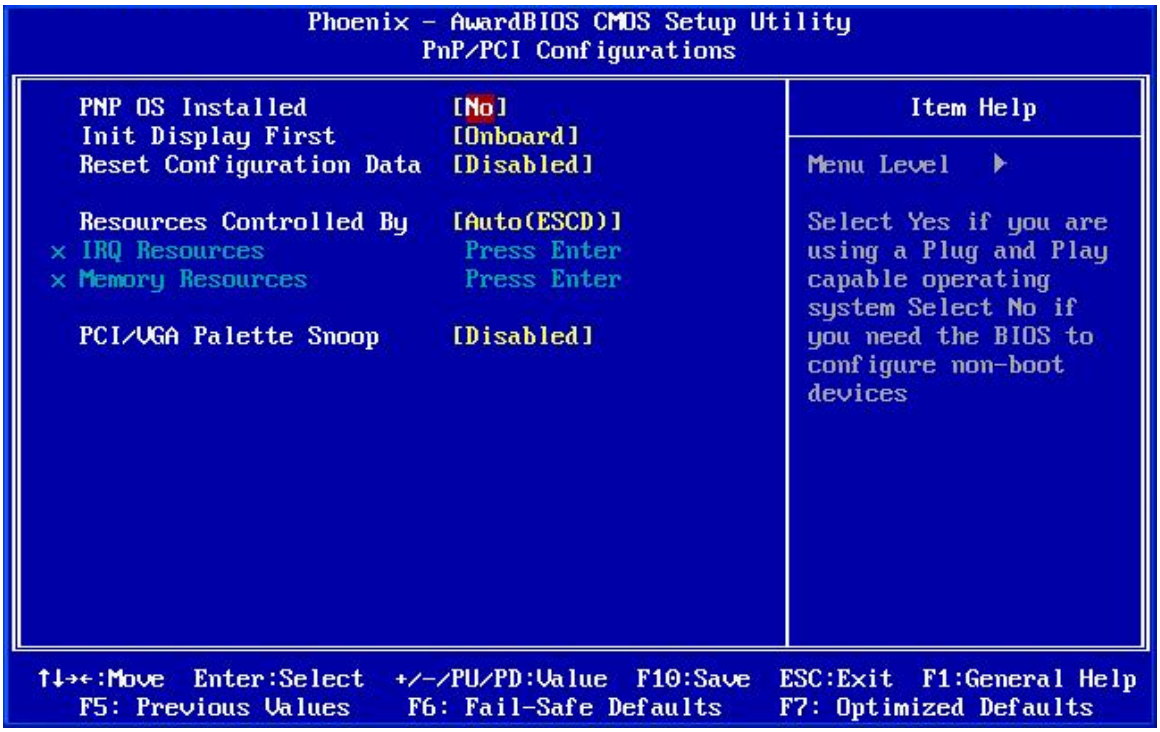
BIOS Menu 7: IRQ Wakeup Events

The following IRQs can be used to generate wake events:

- IRQ1 (KeyBoard) ON
- IRQ3 (COM 2) OFF
- IRQ4 (COM 1) OFF
- IRQ5 (LPT 2) OFF
- IRQ6 (Floppy Disk) OFF
- IRQ7 (LPT 1) OFF
- IRQ8 (RTC Alarm) OFF
- IRQ9 (IRQ2 Redir) OFF
- IRQ10 (Reserved) OFF
- IRQ11 (Reserved) OFF
- IRQ12 (PS/2 Mouse) OFF
- IRQ13 (Coprocessor) OFF
- IRQ14 (Hard Disk) OFF
- IRQ15 (Reserved) OFF

5.7 PnP/PCI Configurations

Use the PnP/PCI Configurations menu (**BIOS Menu 8**) to set the plug and play, and PCI options.



BIOS Menu 8: PnP/PCI Configurations

➔ **PNP OS Installed [No]**

The **PNP OS Installed** option determines whether the Plug and Play devices connected to the system are configured by the operating system or the BIOS.

➔ **No** (Default) If the operating system does not meet the Plug and Play specifications, BIOS configures all the devices in the system.

➔ **Yes** Set this option if the system is running Plug and Play aware operating systems. The operating system changes the interrupt, I/O, and DMA settings.

➔ **Init Display First [Onboard]**

Use the **Init Display First** option to select the primary display device.

➔ **PCI Slot**		The display connected to the PCI slot is the primary display.
➔ **Onboard**	(Default)	The display connected to the onboard connector is the primary display.

➔ **Reset Configuration Data [Disabled]**

Use the **Reset Configuration Data** option to reset the Extended System Configuration Data (ESCD) when exiting setup if booting problems occur after a new add-on is installed.

➔ **Disabled**	(Default)	ESCD will not be reconfigured
➔ **Enabled**		ESCD will be reconfigured after you exit setup

➔ **Resources Controlled By [Auto (ESCD)]**

Use the **Resources Controlled By** option to either manually configure all the boot and plug and play devices, or allow BIOS to configure these devices automatically. If BIOS is allowed to configure the devices automatically IRQs, DMA and memory base address fields cannot be set manually.

➔ **Auto(ESCD)**	(Default)	BIOS automatically configures plug and play devices as well as boot devices.
➔ **Manual**		Manually configure the plug and play devices and any other boot devices.

➔ **x IRQ Resources [Press Enter]**

The **IRQ Resources** option can only be selected if the Resources Controlled By option is set to Manual.

The **IRQ Resources** menu has the following options:

- IRQ-3 assigned to
- IRQ-4 assigned to
- IRQ-10 assigned to
- IRQ-11 assigned to

The above options all have the following default options.

➔ **PCI Device** (Default) The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

➔ **Reserved** The IRQ is reserved by BIOS.

➔ **x Memory Resources [Press Enter]**

The **Memory Resources** menu can only be accessed if the Resources Controlled By option is set to Manual. Use **Memory Resources** to select a base address and the length for the memory area used by a peripheral that requires high memory.

The menu has two configurable options:

- Reserved Memory Base
- Reserved Memory Length

➔ **PCI/VGA Palette Snoop [Disabled]**

Use the **PCI/VGA Palette Snoop** option to enable the system to determine whether or not some special VGA cards, high-end hardware MPEG decoders and other similar devices are allowed to look at the VGA palette on the video card so these devices can determine what colors are in use. This option is needed *very* rarely and should be left "Disabled" unless a video device specifically requires the setting to be enabled upon installation.

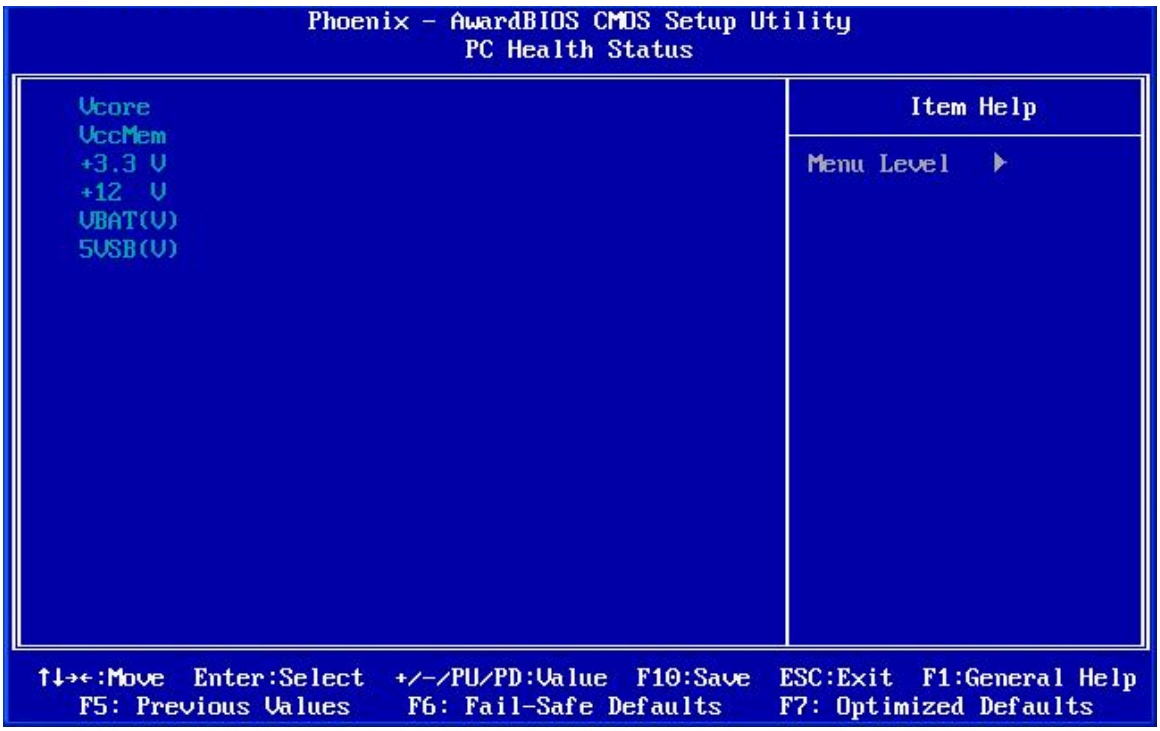
➔ **Disabled** (Default) Does not allow the graphics devices to examine the VGA

palette on the graphics card.

➔ **Enabled** Allows the graphics devices to examine the VGA palette on the graphics card.

5.8 PC Health Status

The **PC Health Status** menu (**BIOS Menu 9**) has no user configurable options, but shows system operating parameters that are essential to the stable operation of the system.



BIOS Menu 9: PC Health Status

The following system parameters are monitored by the **PC Health Status** menu.

➔ **Voltages**

The following voltages are monitored:

- Vcore
- VccMem
- +3.3 V

- +12 V
- VBAT(V)
- 5VSB(V)

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. You may visit the IEI website or contact technical support for the latest updates.

The IBX-500A embedded system has five software drivers:

- VGA Driver
- Audio Driver
- LAN Driver
- Wireless LAN Driver
- AES Driver (for Windows XP or XPe)

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

6.2 AMD® VGA Installation

NOTE:

This installation assumes the use of Windows XP as the operating system.

Follow the steps below to install the AMD® VGA display device controller.

Step 1: Open **Windows Control Panel** from the **Start** menu (**Figure 6-1**).

Figure 6-1: Access Windows Control Panel

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

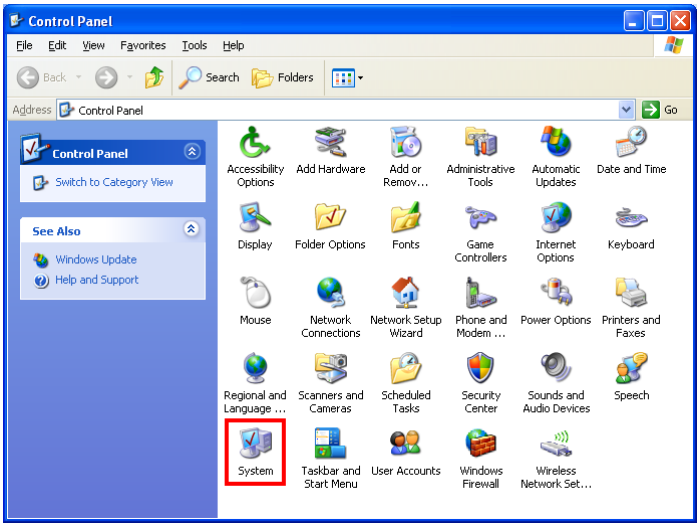


Figure 6-2: Double Click the System Icon

Step 3: Click the **Device Manager** tab (**Figure 6-3**).

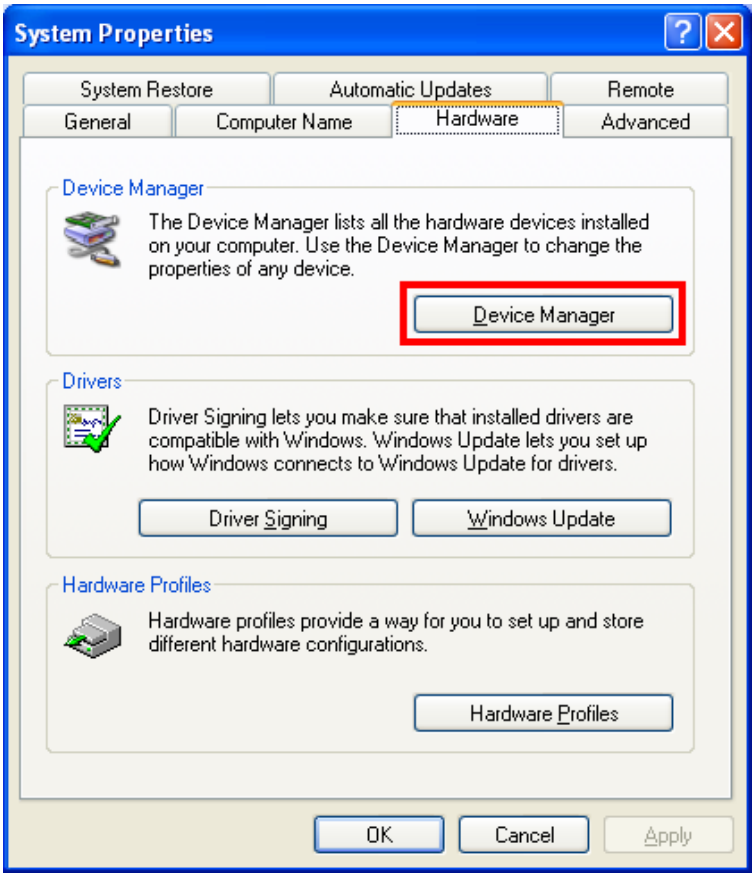


Figure 6-3: Click the Device Manager Tab

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

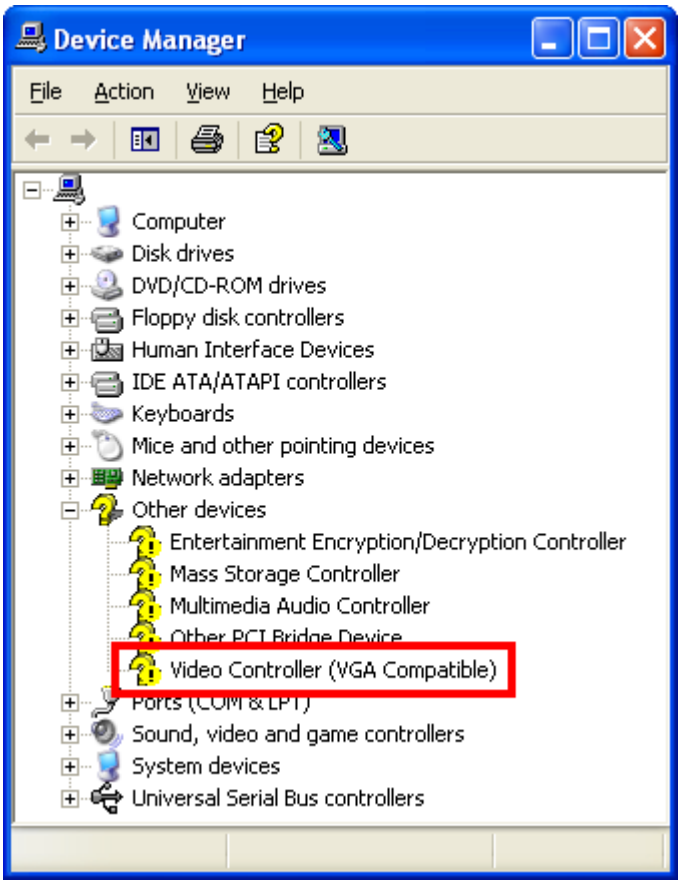


Figure 6-4: Device Manager List

Step 5: Double-click the **Video Controller** device.

Step 6: The **Video Controller Properties** window appears (**Figure 6-5**).

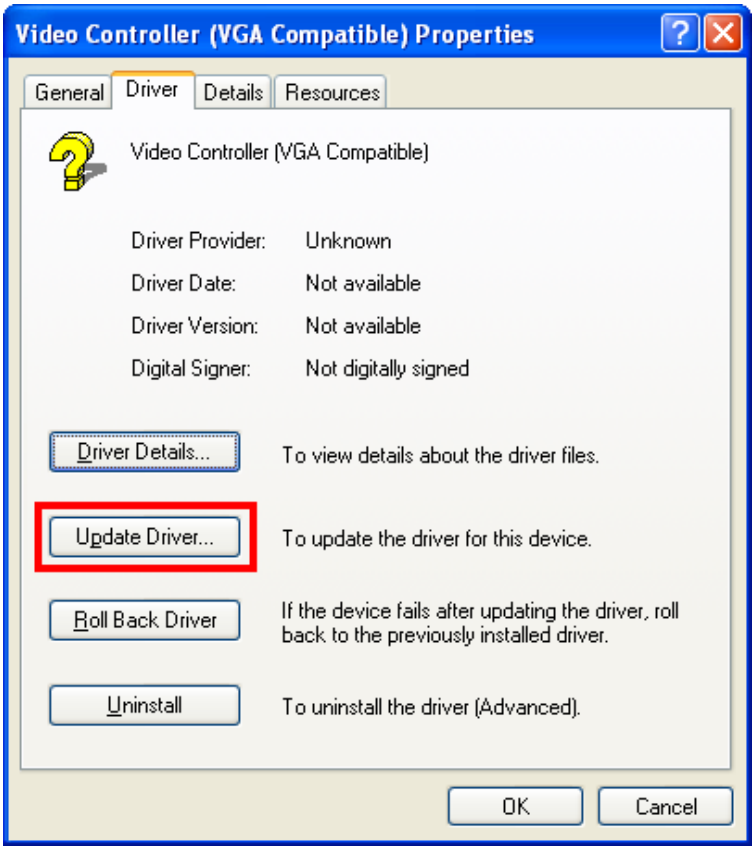


Figure 6-5: Video Controller Properties Window

Step 7: Click the **Update Driver** button in the **Driver** tab.

Step 8: The **Hardware Update Wizard** appears (**Figure 6-6**).

Figure 6-6: Hardware Update Wizard

Step 9: Select "**No, not this time**," and click **NEXT** to continue.

Step 10: The following window (**Figure 6-7**) appears.

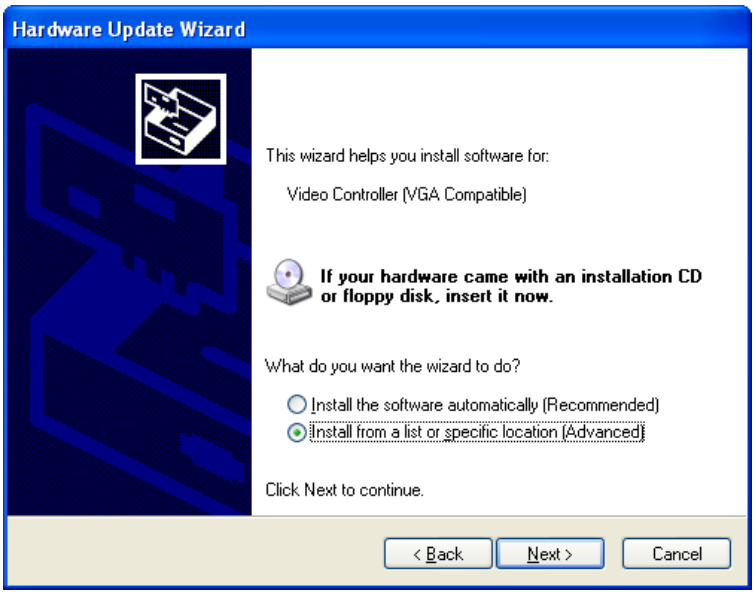


Figure 6-7: Install Options Window

Step 11: Select "**Install from a list or specific location**…" and click **NEXT** to continue.

Step 12: The following window (**Figure 6-8**) appears.

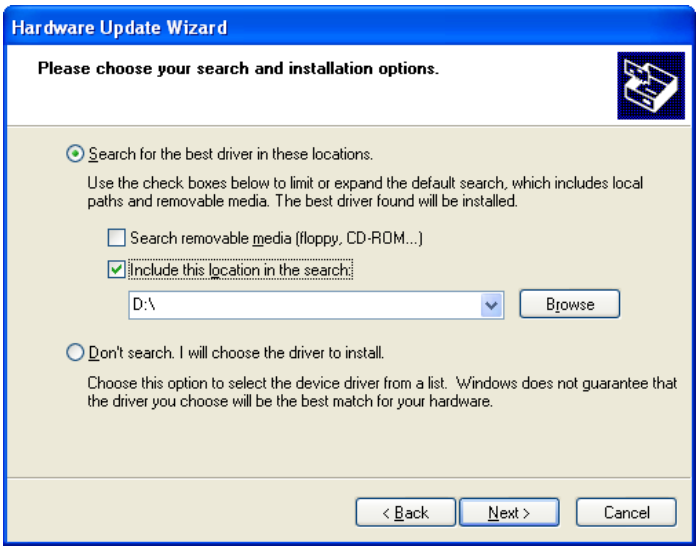


Figure 6-8: Search Options Window

Step 13: Select "**Search for the best driver in these locations**," "**Include this location in the search**," and click **BROWSE** to continue.

Step 14: The following window (**Figure 6-9**) appears.

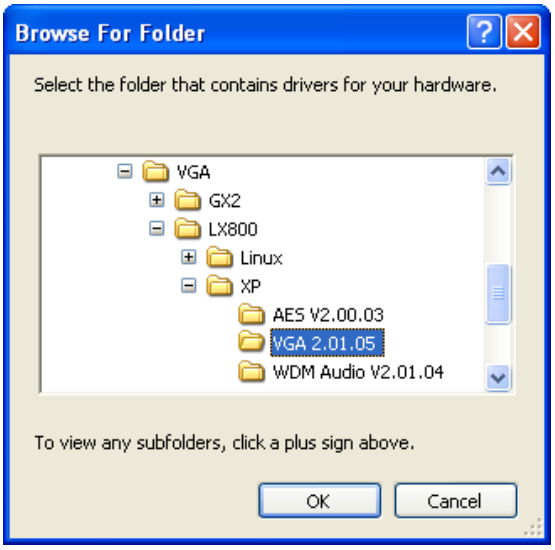


Figure 6-9: Folder Selection Window

Step 15: Select the proper driver folder under the "**X:\VGA\LX 800\XP**" directory in the

location browsing window, where "**X:\"** is the system CD drive, and click **OK** to continue.

Step 16: The following window (**Figure 6-10**) appears.

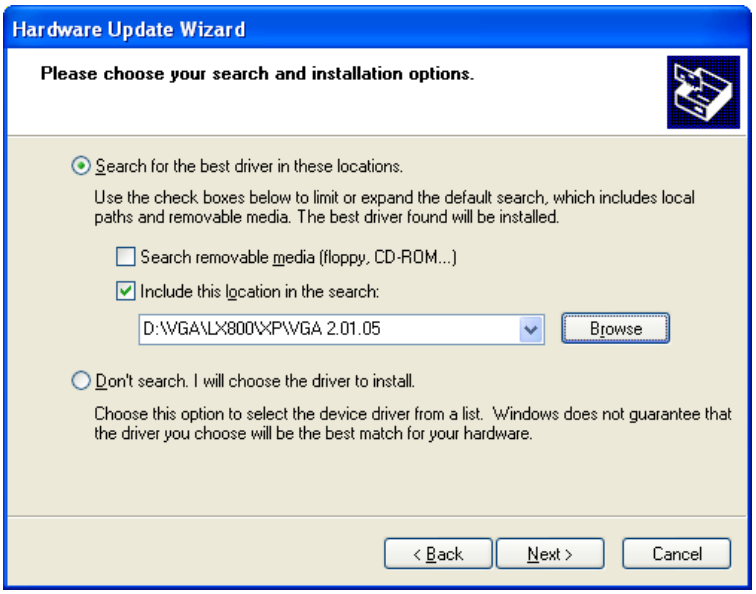


Figure 6-10: Search Options Window

Step 17: Click **NEXT** to continue.

Step 18: The following window (**Figure 6-11**) appears as the OS searches for the driver.

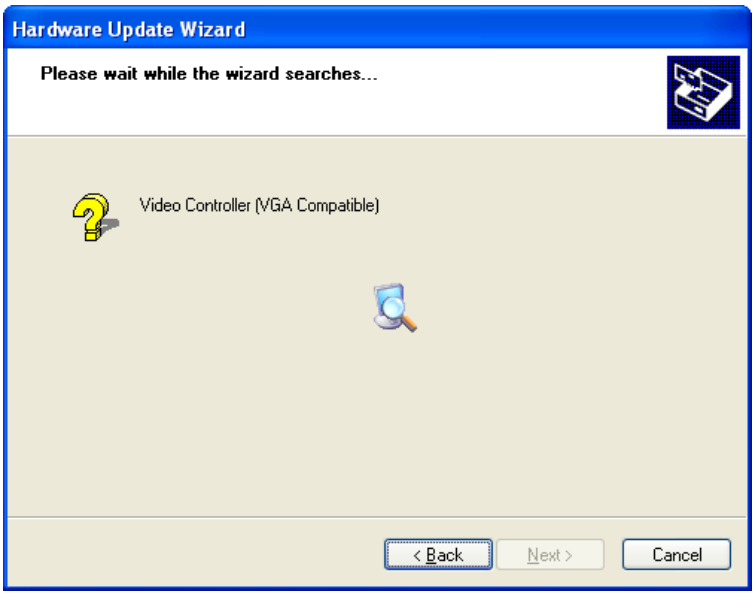


Figure 6-11: Hardware Update Wizard Search Window

Step 19: The following window (**Figure 6-12**) appears.

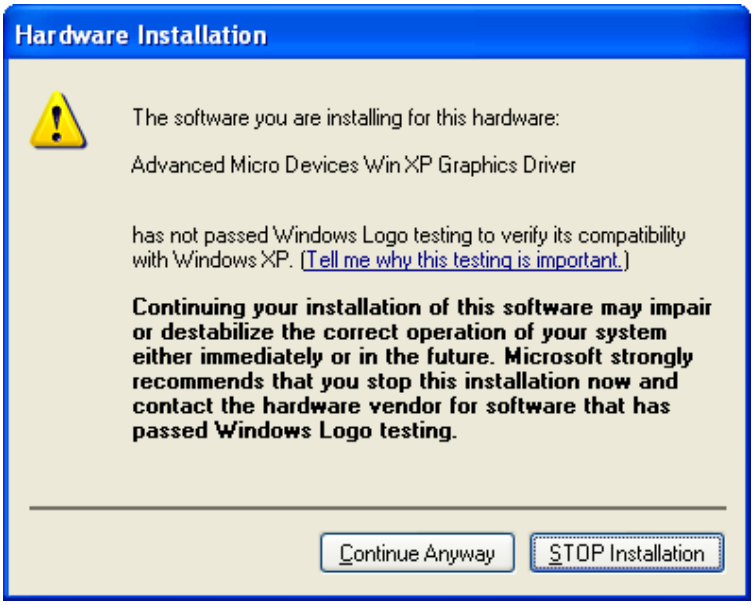


Figure 6-12: Windows Logo Testing Window

Step 20: Click **CONTINUE ANYWAY** to continue.

Step 21: The following window (**Figure 6-13**) appears as the driver is installed.

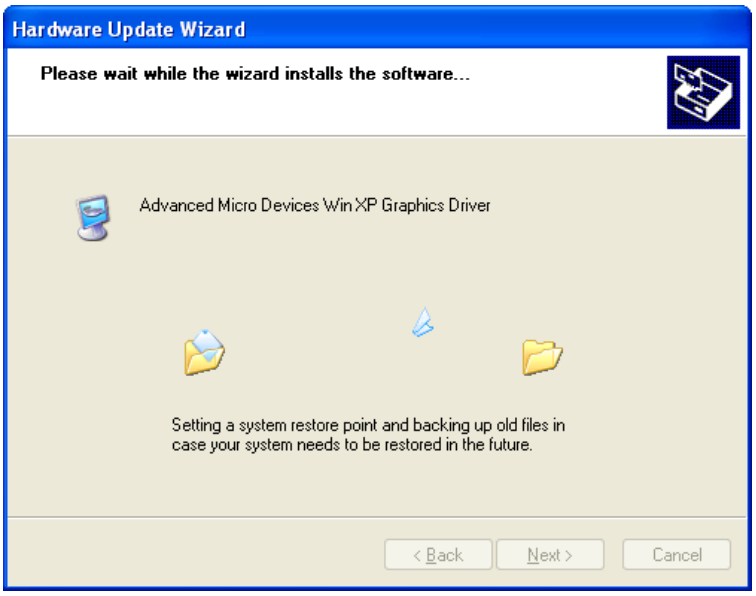


Figure 6-13: Driver Installation Window

Step 22: After the driver installation process is complete, a confirmation screen appears (**Figure 6-14**).

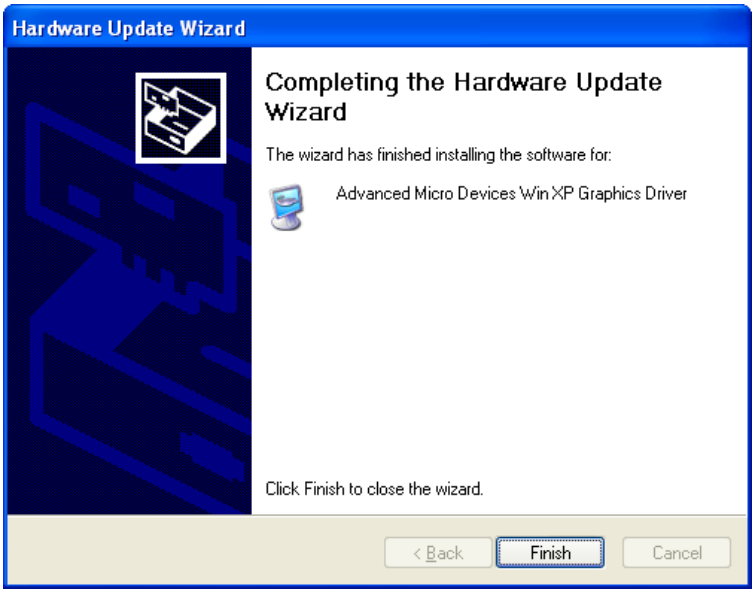


Figure 6-14: Driver Installation Complete Window

Step 23: Click **FINISH** to exit the program.

Step 24: The **Device Manager Window** now shows the installed AMD graphics driver (**Figure 6-15**).

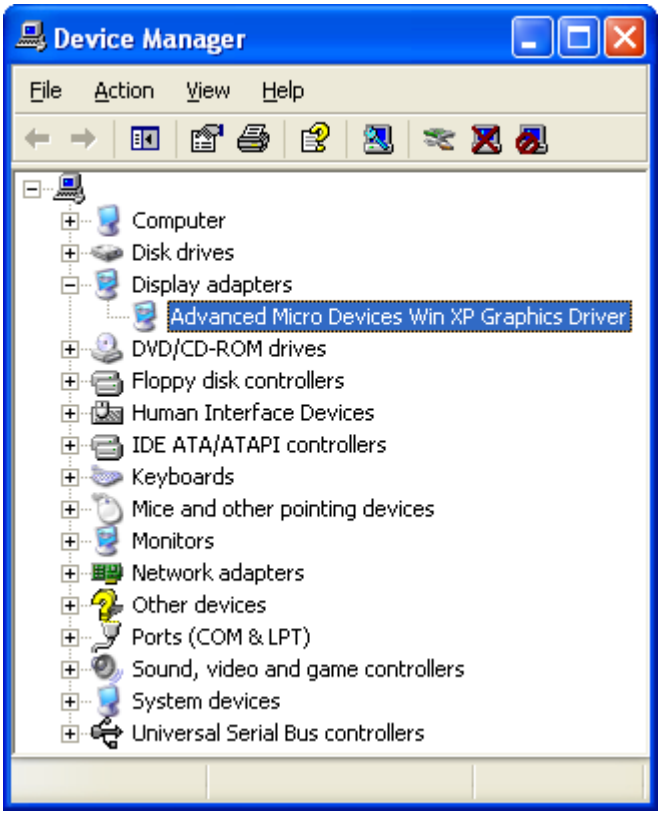


Figure 6-15: Device Manager Window

6.3 Audio Driver Installation

To install the audio driver please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 6-16**).

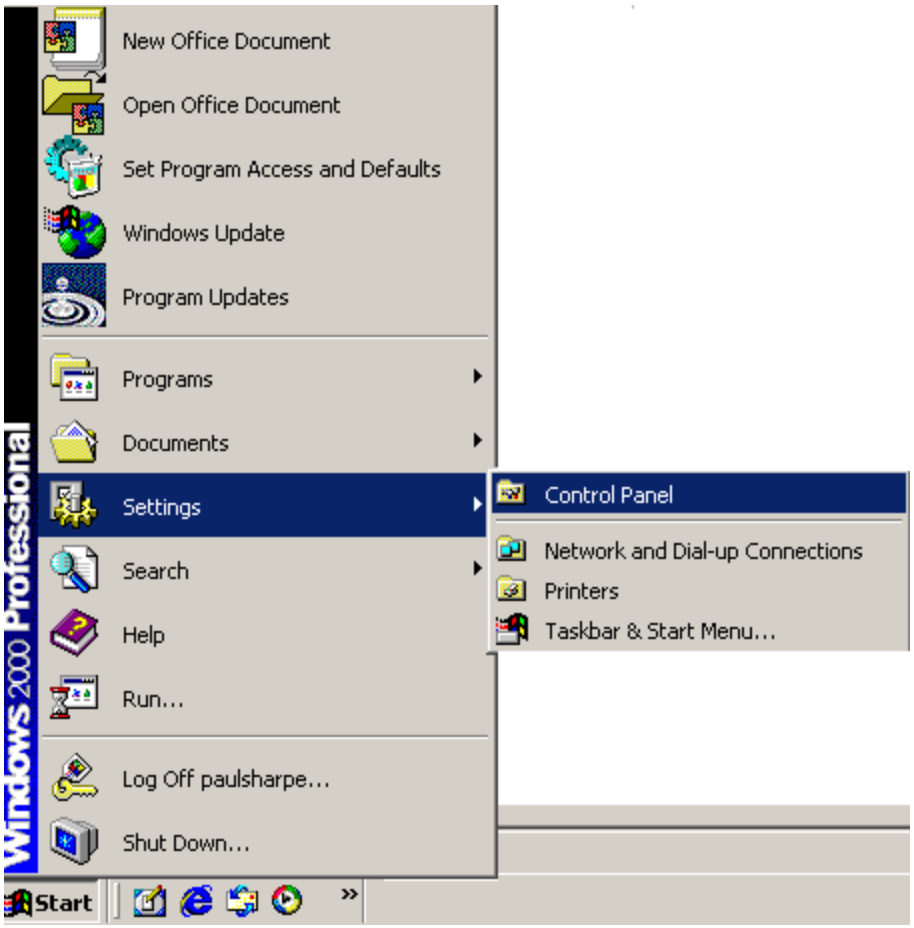


Figure 6-16: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-17**).

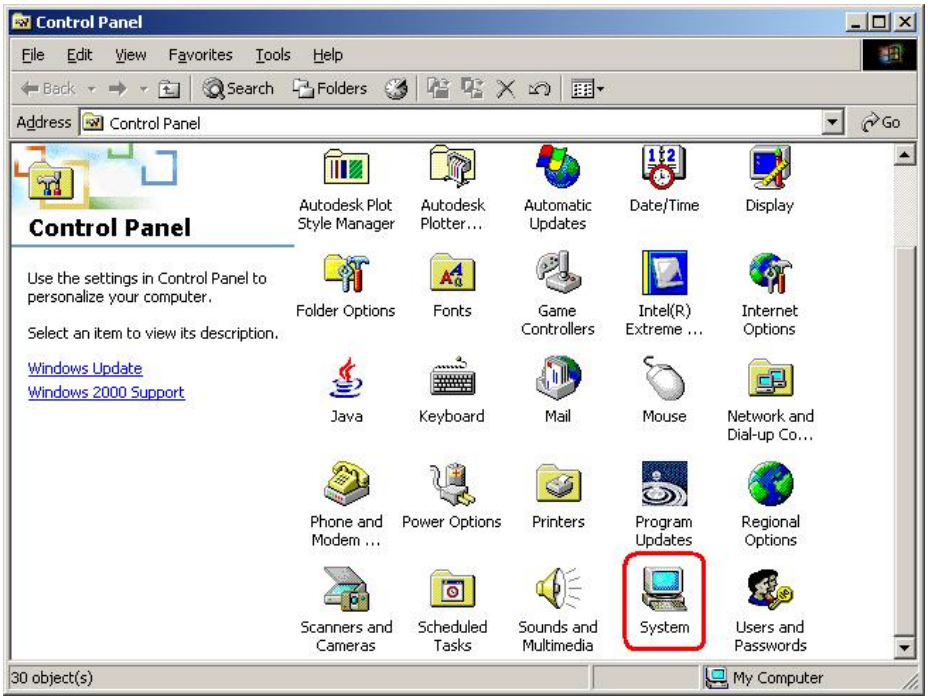


Figure 6-17: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-18**).

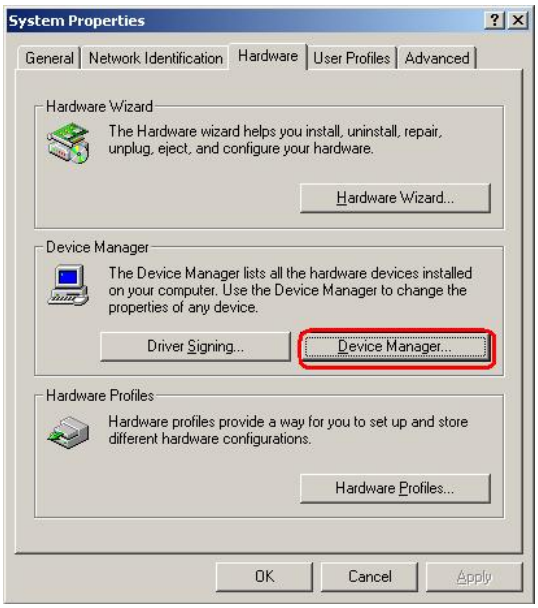


Figure 6-18: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-19**).

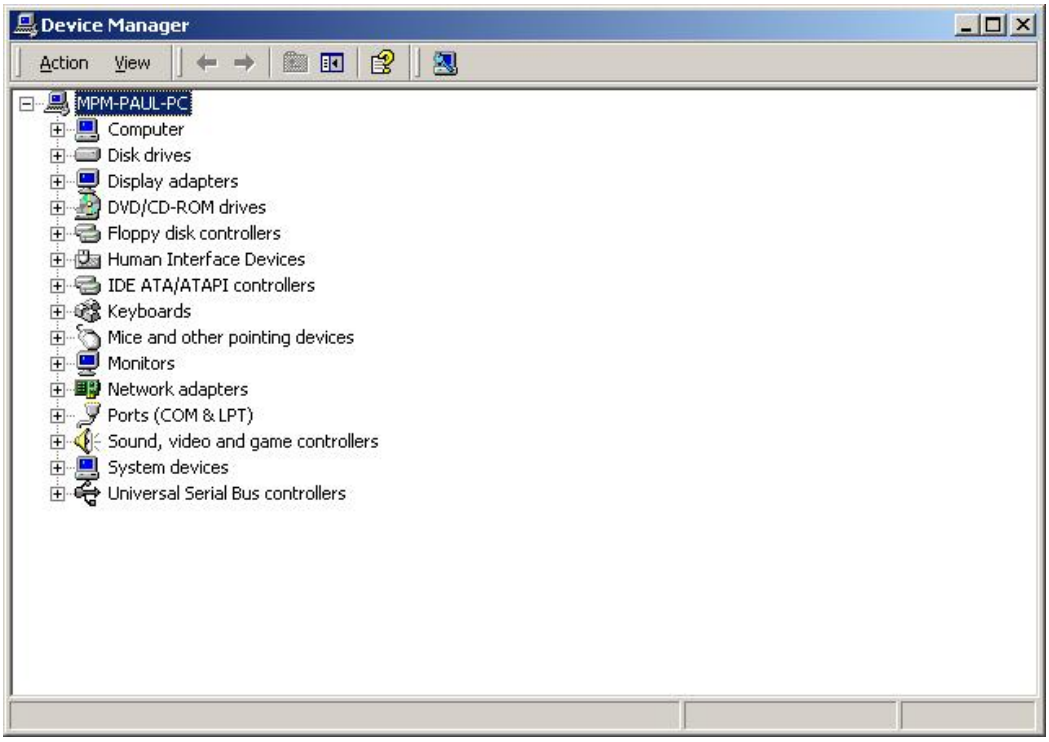


Figure 6-19: Device Manager List

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 6-20**). Click **NEXT** to continue.

Figure 6-20: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-21**).

Click **NEXT** to continue.

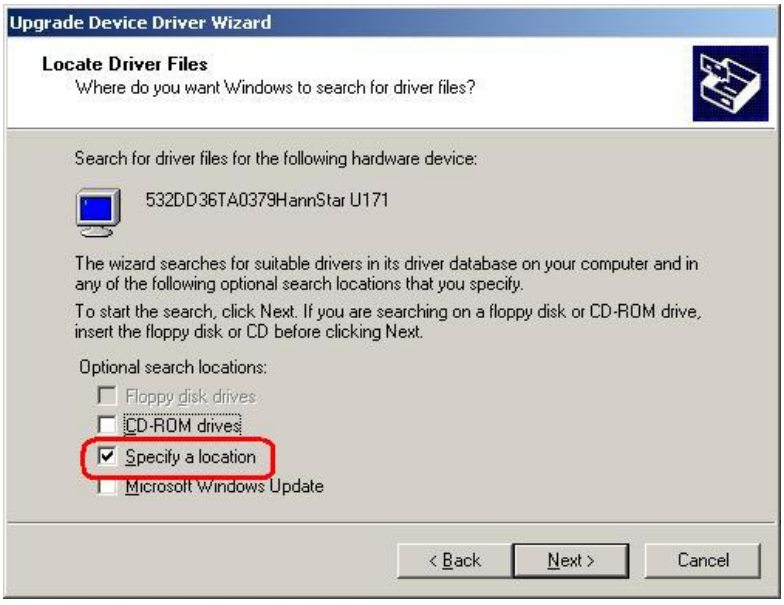


Figure 6-21: Locate Driver Files

Step 8: Select "**X:\ Audio\GeodeLX_XP_XPe_WDM_Audio_v2.03.00**" directory in the

location browsing window, where "**X:\"** is the system CD drive (**Figure 6-22**).

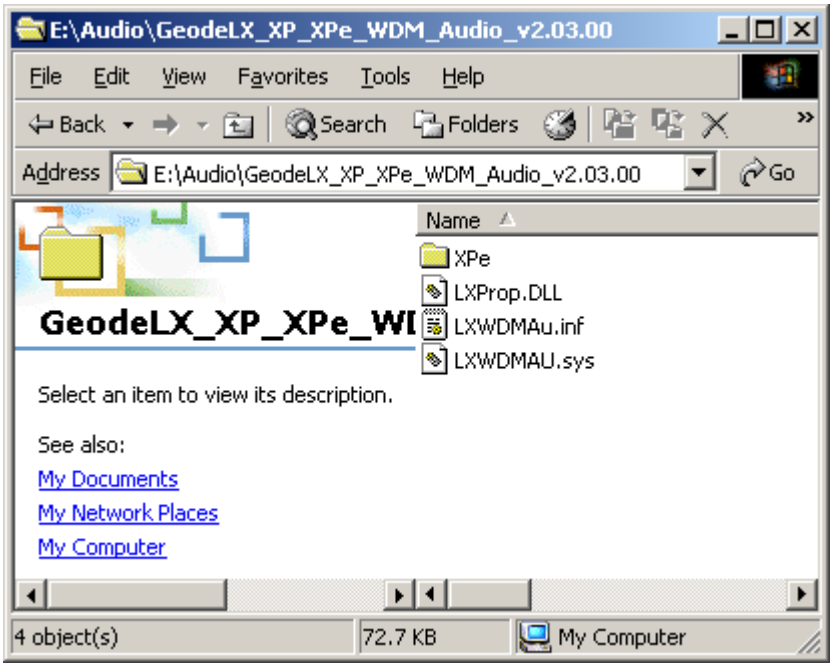


Figure 6-22: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Select the **LXWDMAu.inf** file and click **OPEN** to continue. The driver is installed.

6.4 Realtek RTL8100C LAN Installation

To install the RTL8100C LAN driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the IBX-500A.

Step 2: Access the CD drive on your system.

Step 3: Open the **LAN** folder. See **Figure 6-23**.

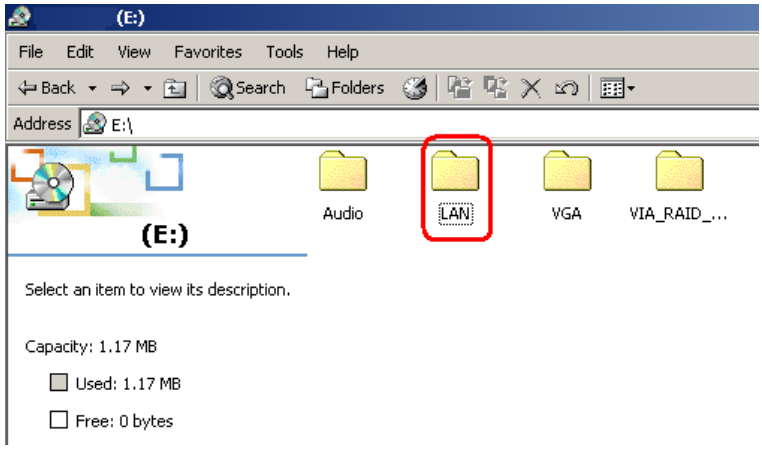


Figure 6-23: Access the LAN Folder

Step 4: Open the **PCI_InstallShield_5649_061019** folder. See **Figure 6-24**.

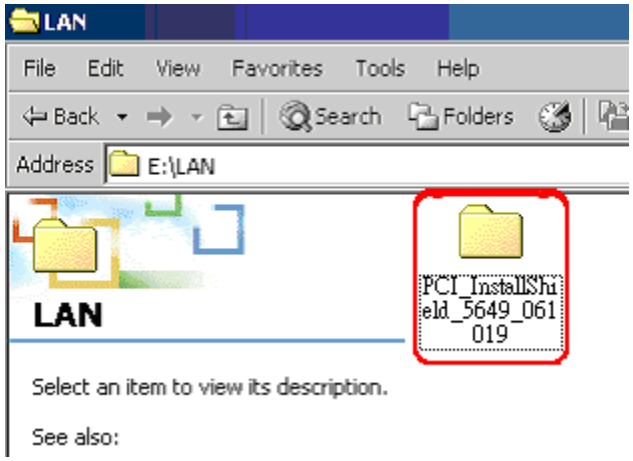


Figure 6-24: Access the Realtek Folder

Step 5: Locate the **Setup** program icon. See **Figure 6-25**.

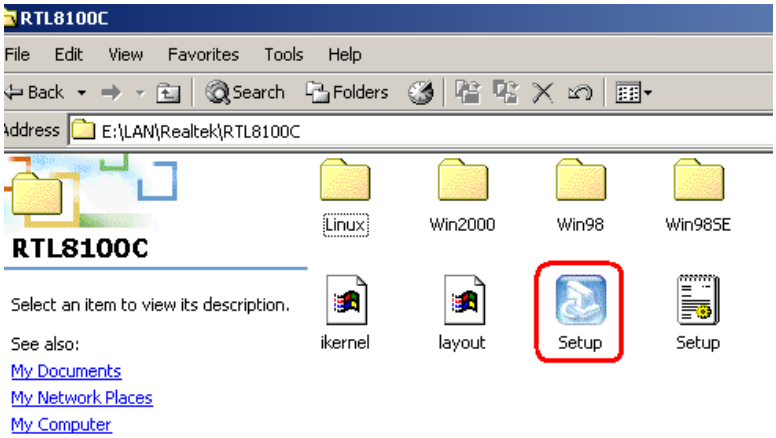


Figure 6-25: Locate the Setup Program Icon

Step 6: Double click the **Setup** program icon in **Figure 6-25**.

Step 7: The **Install Shield Wizard** is prepared to guide the user through the rest of the process. See **Figure 6-26**.

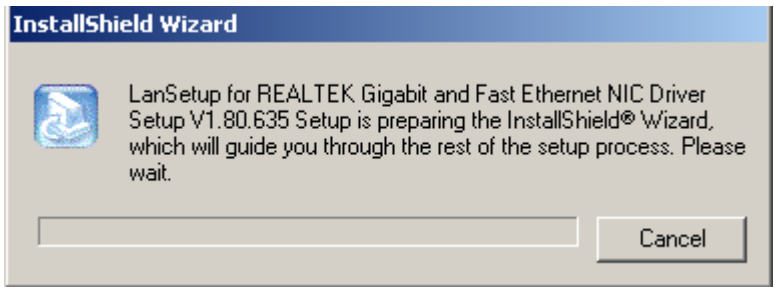


Figure 6-26: Preparing Setup Screen

Step 8: Once initialized, the **Install Wizard** welcome screen appears. See **Figure 6-27**.

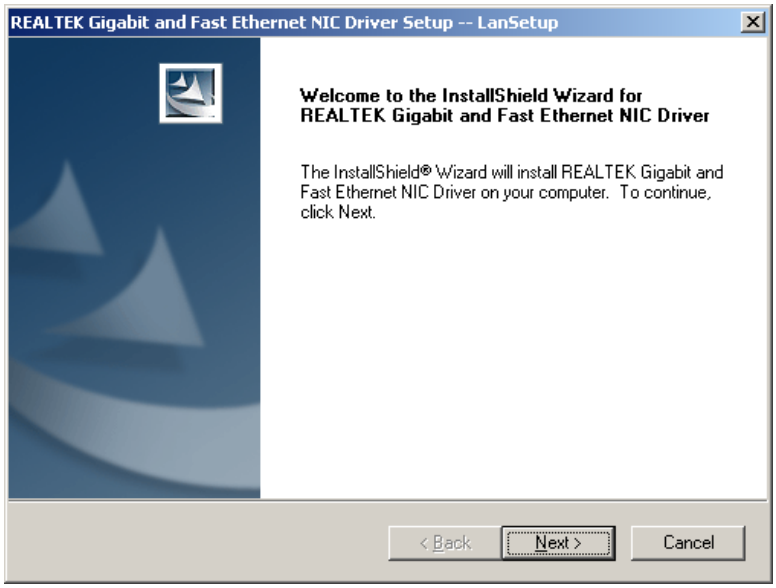


Figure 6-27: Install Wizard Welcome Screen

Step 9: Click **NEXT** to continue the installation or **CANCEL** to stop the installation.

Step 10: The **Install Wizard** starts to install the LAN driver. See **Figure 6-28**.

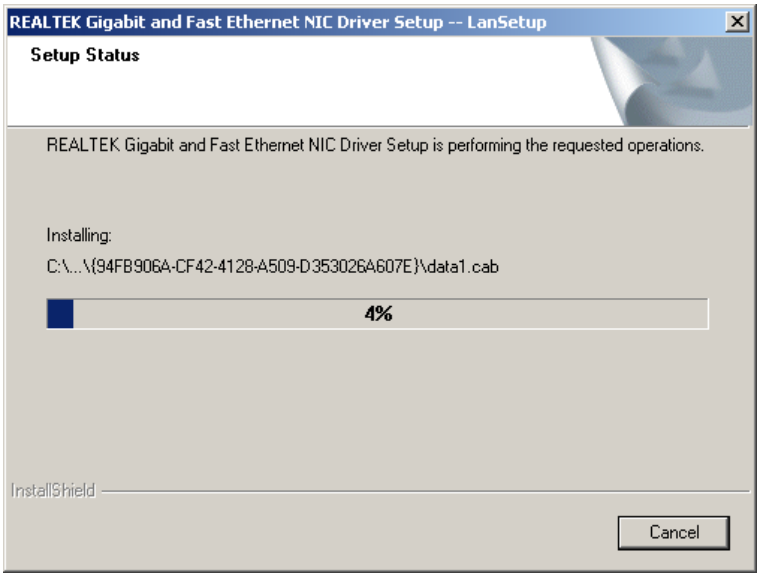


Figure 6-28: LAN Driver Installation

Step 11: Once the installation is complete, the **InstallShield Wizard Complete** screen appears. See **Figure 6-29**.

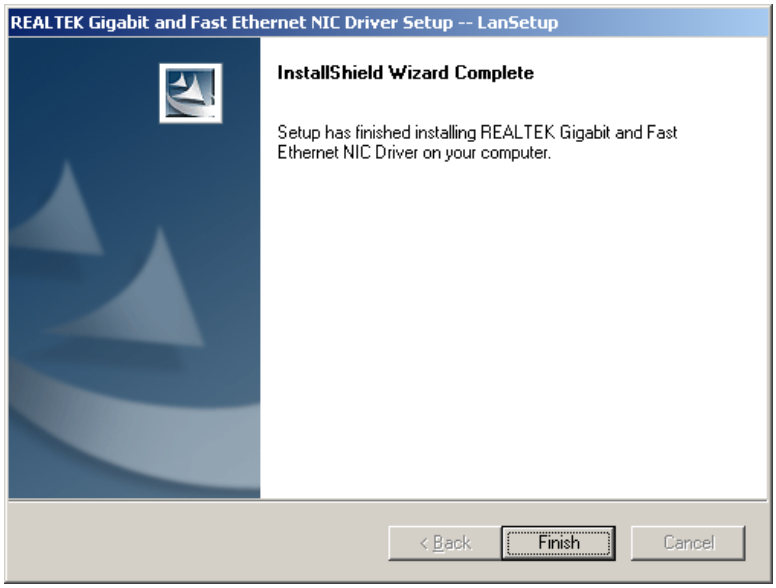


Figure 6-29: Installing Screen

Step 12: Click **FINISH** to complete the installation and exit the **Install Shield Wizard**.

Step 13: Once the installation process is complete, the computer may be restarted now or in the future. See **Figure 6-30**. Select the preferred option and click **FINISH** to complete the installation process.

Figure 6-30: LAN Driver Installation Complete

6.5 VIA Wireless LAN Module (VNT6655AM) Installation

To install the VIA wireless LAN module driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the IBX-500A.

Step 2: Access the CD drive on your system.

Step 3: Open the **WL** folder. See **Figure 6-31**.

Figure 6-31: Access the LAN Folder

Step 4: Open the **VT6655 Software package(v1.3)** folder. See **Figure 6-32**.

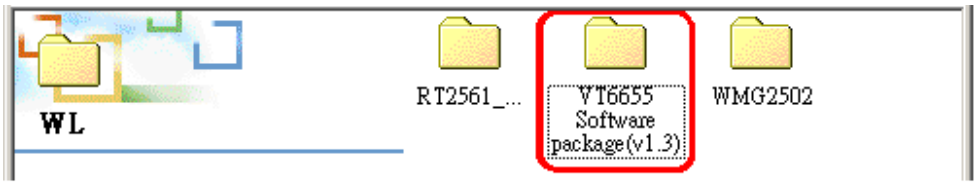


Figure 6-32: Access the VT6655 Folder

Step 5: Locate the **WinSetup** program icon. See **Figure 6-33**.

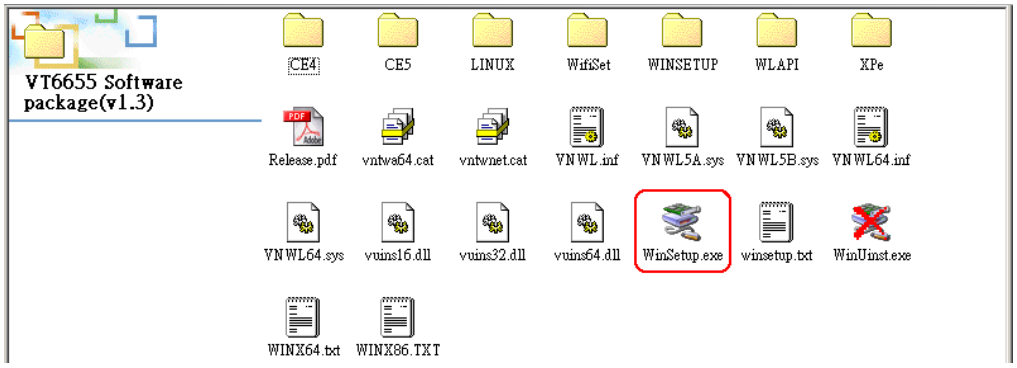


Figure 6-33: Locate the WinSetup Program Icon

Step 6: Double click the **WinSetup** program icon in **Figure 6-33**.

Step 7: The **Install Shield Wizard** is prepared to guide the user through the rest of the process.

Step 8: Once initialized, the **Install Wizard** welcome screen appears.

Step 9: Click **NEXT** to continue the installation or **CANCEL** to stop the installation.

Step 10: The **Install Wizard** starts to install the wireless LAN driver.

Step 11: Once the installation is complete, the **InstallShield Wizard Complete** screen appears.

Step 12: Click **FINISH** to complete the installation and exit the **Install Shield Wizard**.

Step 13: Once the installation process is complete, the computer may be restarted now or in the future.

6.6 AMD® AES Driver Installation

Follow the steps below to install the AMD® Geode LX Windos XP/XPe AES driver.

Step 1: Open **Windows Control Panel** from the **Start** menu (**Figure 6-34**).

Figure 6-34: Access Windows Control Panel

Step 2: Double-click the **System** icon (**Figure 6-35**).

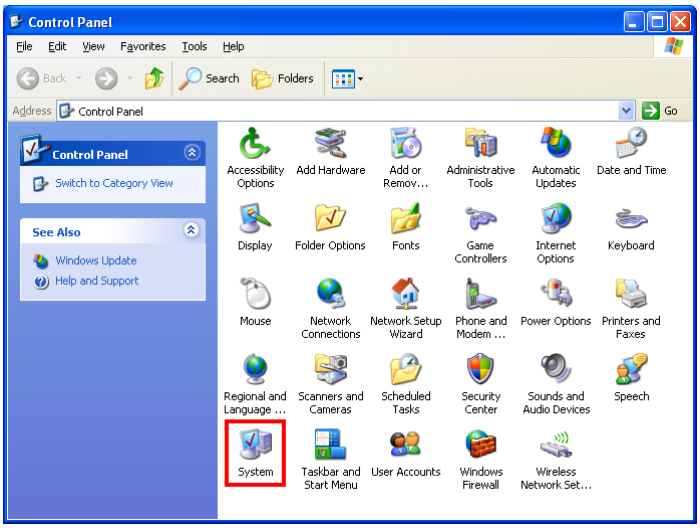


Figure 6-35: Double Click the System Icon

Step 3: Click the **Device Manager** tab (**Figure 6-36**).

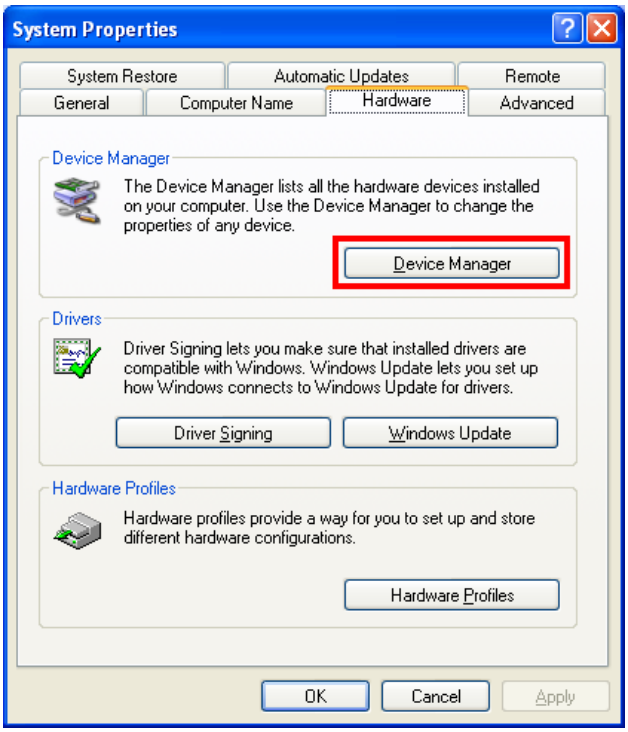


Figure 6-36: Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-37**).

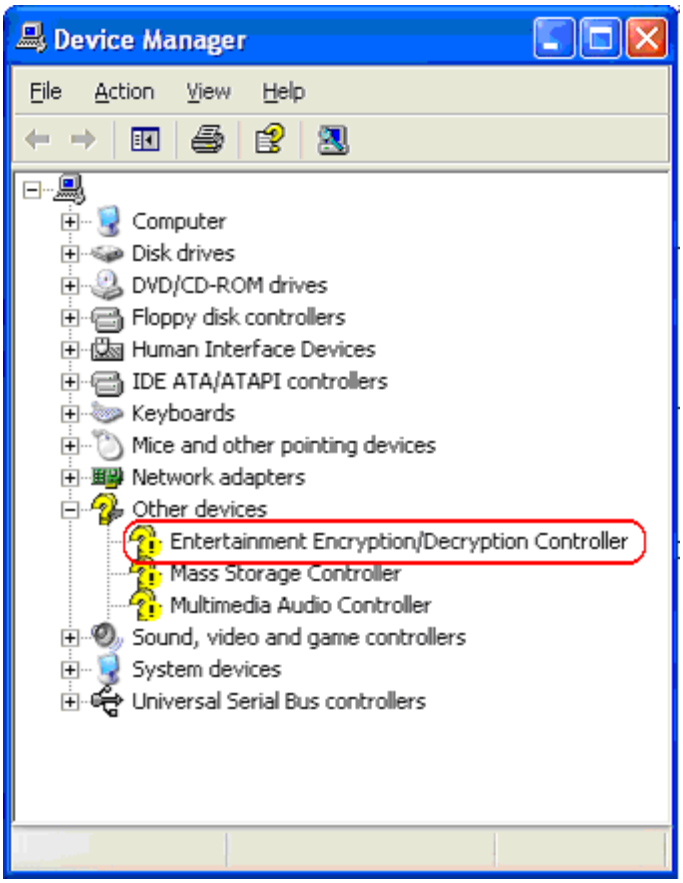


Figure 6-37: Device Manager List

Step 5: Right click the **Entertainment Encryption/Decryption Controller** and pick update driver.

Step 6: The **Hardware Update Wizard** appears (**Figure 6-38**).

Figure 6-38: Hardware Update Wizard

Step 7: Select "**No, not this time**," and click **NEXT** to continue.

Step 8: The following window (**Figure 6-39**) appears.

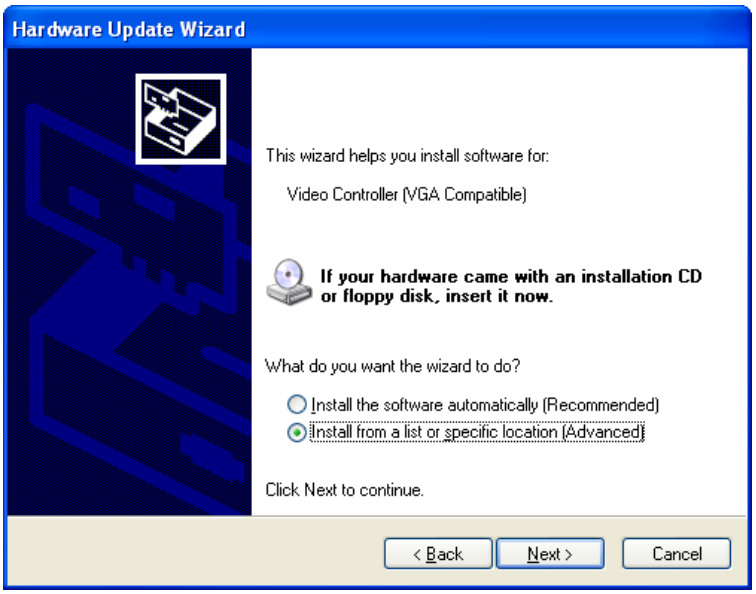


Figure 6-39: Install Options Window

Step 9: Select "**Install from a list or specific location**…" and click **NEXT** to continue.

Step 10: The following window (**Figure 6-40**) appears.

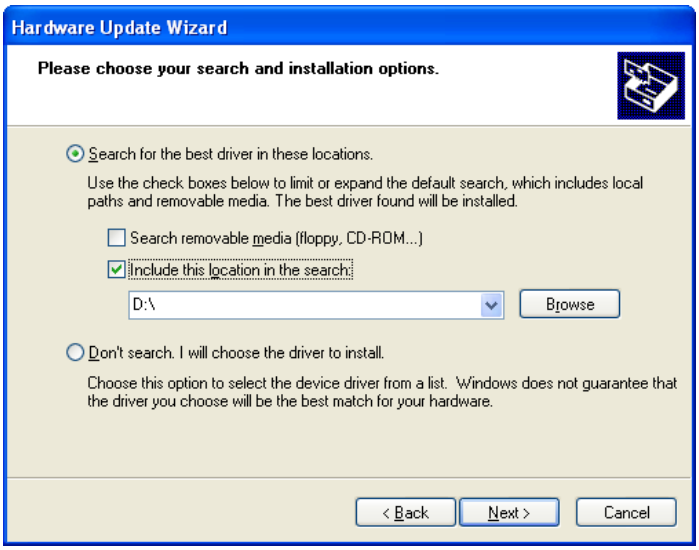


Figure 6-40: Search Options Window

Step 11: Select "**Search for the best driver in these locations**," "**Include this location in the search**," and click **BROWSE** to continue.

Step 12: Select the proper driver folder under the "**X:\AES\GeodeLX_XP_WDM_AES_v2.01.01\GeodeLX_XP_WDM_AES_v2.01.01**" directory in the location browsing window, where "**X:\"** is the system CD drive, and click **OK** to continue.

Step 13: Click **NEXT** to continue.

Step 14: A warning window appears. Click **CONTINUE ANYWAY** to continue.

Step 15: After the driver installation process is complete, a confirmation screen appears.

Step 16: Click **FINISH** to exit the program.

Appendix

A

IEI Embedded System Series

A.1 IEI Embedded System Series

A.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.

A.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-3688G
- ECK-3699G
- IBX-500A
- IBX-650A

A.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-3688G	NANO	One cooling fan	None	One 2.5” drive bay
ECK-3699G	NANO	Two cooling fans	None	One 2.5” drive bay (optional)
IBX-500A	AFLMB-LX-800	Fanless	One CF slot	None
IBX-650A	NANO	Fanless	One CF slot	One 2.5” drive bay

Table A-1: Embedded System Series Overview

A.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).

A.2.1 AMD® Geode® LX800 500MHz Solutions

All the models listed in the table below support an AMD® Geode® LX800 500MHz 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

Model Number	System Chipset	DC Input	Fan	Drive Bays
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-500A	AMD® CS5536	12V	None	None

Table A-2: AMD® Geode® LX800 Embedded System Solutions

A.2.2 AMD® Geode® GX466 333MHz Solutions

All the models listed in the table below support an AMD® Geode® GX466 333MHz 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

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

A.2.3 VIA® LUKE® 1GHz Solutions

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

Model Number	System Chipset	DC Input	Fan	Drive Bays
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 A-4: VIA® LUKE® Embedded System Solutions

A.2.4 VIA® MARK® 800MHz Solutions

All the models listed in the table below support a VIA® MARK® 800MHz 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 A-5: VIA® MARK® Embedded System Solutions

A.2.5 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 A-6: Intel® Celeron® M 1 GHz Solutions

A.2.6 Intel® Celeron® M 1.5GHz Solutions

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

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS5X	SiS 661CX + SiS 964	12V	Two	None

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

Table A-7: Intel® Celeron® M 1.5GHz Solutions

A.2.7 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 A-8: Intel® Pentium® M Embedded System Solutions

A.2.8 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 A-9: Intel® Socket 479 Pentium®/Celeron® M Embedded System Solutions

A.2.9 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 A-10: LGA 775 Intel® Pentium® 4/ Pentium® D System Solutions

A.2.10 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 + ICH7M	19V DC	Two	One 2.5” HDD (optional)

Table A-11: Intel® Socket 479 Core Duo/Solo System Solutions

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Chapter

B

BIOS Menu Options

B.1 BIOS Configuration Options

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

Appendix

C

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 C-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 ;
```

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Appendix

D

Address Mapping

D.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
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
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 D-1: IO Address Map

D.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 D-2: 1st MB Memory Address Map

D.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 D-3: IRQ Mapping Table

D.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 D-4: DMA Channel Assignments Table

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Appendix

E

Hazardous Materials Disclosure

E.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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