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KINO-9452

Mini-ITX Motherboard with Intel® Core Duo / Core Solo CPU Dual PCI-E GbE, HDTV Output, SATA II, USB 2.0, and Two Independent Audio Streams

User Manual

RoHS Lead Free

REVISION HISTORY

Title	KINO-9452 Intel Core Duo/Core Solo Motherboard	
Revision Number	Description	Date of Issue
1.0	Initial release	September 2006

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Glossary

AC '97	Audio Codec 97		HDD	Hard Disk Drive
ACPI	Advanced Configuration and Power Interface		IDE	Integrated Data Electronics
			I/O	Input/Output
APM	Advanced Power Management		ICH4	I/O Controller Hub 4
ARMD	ATAPI Removable Media Device		L1 Cache	Level 1 Cache
ASKIR	Shift Keyed Infrared		L2 Cache	Level 2 Cache
ATA	Advanced Technology Attachments		LCD	Liquid Crystal Display
			LPT	Parallel Port Connector
BIOS	Basic Input/Output System		LVDS	Low Voltage Differential Signaling
CFII	Compact Flash Type 2		MAC	Media Access Controller
CMOS	Complementary Metal Oxide Semiconductor		OS	Operating System
			PCI	Peripheral Connect Interface
CPU	Central Processing Unit		PIO	Programmed Input Output
Codec	Compressor/Decompressor		PnP	Plug and Play
COM	Serial Port		POST	Power On Self Test
DAC	Digital to Analog Converter		RAM	Random Access Memory
DDR	Double Data Rate		SATA	Serial ATA
DIMM	Dual Inline Memory Module		S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
DIO	Digital Input/Output			
DMA	Direct Memory Access		SPD	Serial Presence Detect
EIDE	Enhanced IDE		S/PDI	Sony/Philips Digital Interface
EIST	Enhanced Intel SpeedStep Technology		SDRAM	Synchronous Dynamic Random Access Memory
FDD	Floppy Disk Drive		SIR	Serial Infrared
FDC	Floppy Disk Connector		UART	Universal Asynchronous Receiver-transmitter
FFIO	Flexible File Input/Output			
FIFO	First In/First Out		USB	Universal Serial Bus
FSB	Front Side Bus		VGA	Video Graphics Adapter
IrDA	Infrared Data Association			

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Chapter

1

Introduction

1.1 KINO-9452 Overview

The Mini-ITX form factor KINO-9452 with Intel® Core™2 Duo / Core™ Solo CPU platform is fully equipped with latest technology and advanced multi-mode I/Os. The KINO-9452 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 KINO-9452 Benefits

Some of the KINO-9452 benefits include:

- Dual-core Intel® processor support
  - Two physical cores in a package share the system load
  - Each core has its own L1 cache and shares the L2 cache to enhance the processing speed
  - High performance levels especially in 3D graphic and multi media application
- Independent dual audio with HDTV output
- Excellent thermal control that enhance voltage efficiency and supports cooler and quieter systems
- Mini PCI expansion slot and rich I/O interface
  - Integrates a PCI and a mini PCI slot for flexible expansion capabilities
  - Integrates TV-out and multi channel audio for related applications
- DDR2 memory technology supported
- SATA II with 3.0Gb/s transfer rate
- Dual PCIe GbE enhance high performance in network

1.1.2 KINO-9452 Features

Some of the KINO-9452 features are listed below:

- Complies with RoHS
- Supports Intel® Core™2 Duo, Core™ Duo and Core™ Solo processor
- Supports a maximum front side bus (FSB) speed up to 667MHz
- Supports up to 2GB of 400MHz, 533MHz or 667MHz of DDR2 memory
- Comes with dual Broadcom BCM5787 for PCIe GbE
- Supports two SATA II channels with transfer rates up to 3.0Gb/s

- Supports eight USB 2.0 devices
- Supports HDTV-Out, dual 18 channel LVDS and CRT

1.2 KINO-9452 Board Overview
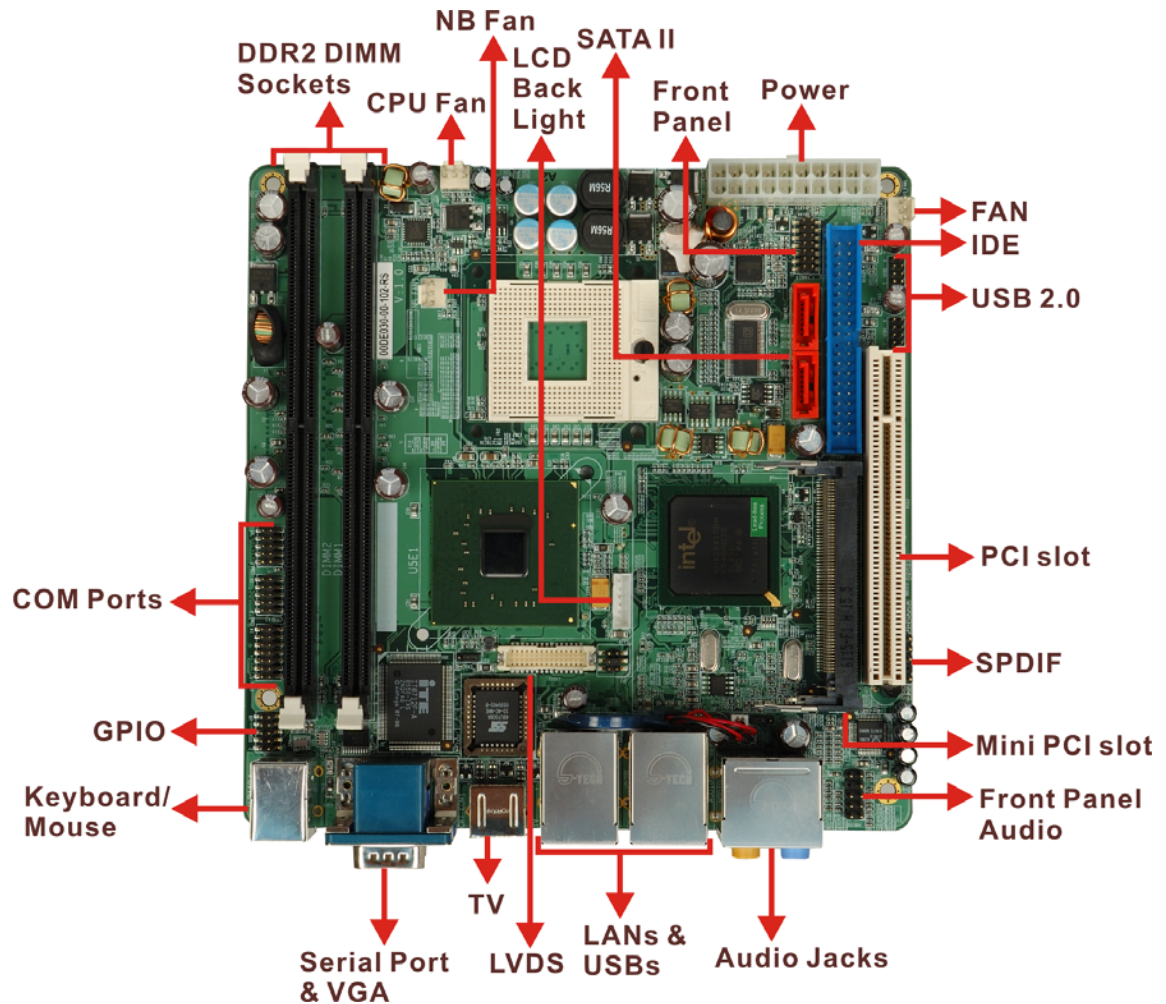
Figure 1-1: KINO-9452 Board Overview (Top View)

1.2.1 KINO-9452 Connectors

The KINO-9452 has the following connectors on-board:

- 2 x DDR2 DIMM sockets
- 1 x Digital I/O connector
- 3 x Fan connectors
- 1 x Front panel audio connector
- 1 x Front panel connector

- ■ 1 x IDE Interface connector
- ■ 1 x LCD backlight connector
- ■ 1 x LVDS LCD connector
- ■ 1 x Mini PCI slot
- ■ 1 x PCI slot
- ■ 1 x Power connector
- ■ 3 x Serial port connectors
- ■ 2 x SATA II connectors
- ■ 1 x SPDIF connector
- ■ 2 x USB connectors

The KINO-9452 has the following connectors on the board rear panel:

- ■ 6 x Audio jacks
- ■ 1 x CRT connector
- ■ 2 x Ethernet connectors
- ■ 1 x Keyboard/Mouse connector
- ■ 1 x Serial port connector
- ■ 1 x TV-Out port
- ■ 4 x USB 2.0 ports

The KINO-9452 has the following on-board jumpers:

- ■ Clear CMOS
- ■ COM2 mode selection (RS-232/422/485)
- ■ LVDS LCD voltage selection

The location of these connectors on the motherboard can be seen in **Figure 1-1**. These connectors are fully described in **Chapter 3**.

1.2.2 Technical Specifications

KINO-9452 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2 Detailed Specifications**.

SPECIFICATION	
CPUs Supported	Intel® Core™2 Duo/ Core™ Duo/Core™ Solo with 533/667MHz FSB
Chipsets	Northbridge: Intel 945GM Southbridge: ICH7-M
I/O Controller	ICH7-M
Graphics Support	Intel Gen 3.5 Integrated Graphics Engine
Display	**CRT** **HDTV:** 　・　MacroVision support / Overscaling / Component, S-Video and Composite output 　・　480P / 720P / 1080i / 1080P and NTSC / PAL support **LVDS:** Dual channel 18-bit LVDS
Memory	Dual channel DDR2 400/533/667MHz memory modules (Max. 2GB)
PCI Bus Interface	33MHz, Revision 2.3
Serial ATA (SATA)	Two SATA II connectors with 3.0Gb/s transfer rates
HDD Interface	One IDE channel support two Ultra ATA 100 devices
USB Interfaces	Eight USB 2.0 connectors supported
Serial Ports	Four COM ports
Extension	One Mini PCI slot One PCI slot
Super I/O	ITE8712
Digital I/O	8 bit digital I/O, 4 input / 4 output by super I/O
Audio	REALTEK ALC883 with 7.1 channel HD interface with 2 audio streams support

Ethernet	Dual Broadcom BCM5787 for PCI Express GbE with ASF2.0 remote control support
BIOS	AMI BIOS Label
Power	ATX power
Physical Dimensions	170mm x 170mm (width x length)
Operating Temperature	Minimum: 0ºC (32°F) Maximum: 60°C (140°F)

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the KINO-9452 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are shown in **Figure 2-1**.

Figure 2-1: KINO-9452 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External interface panel dimensions are shown in **Figure 2-2**.
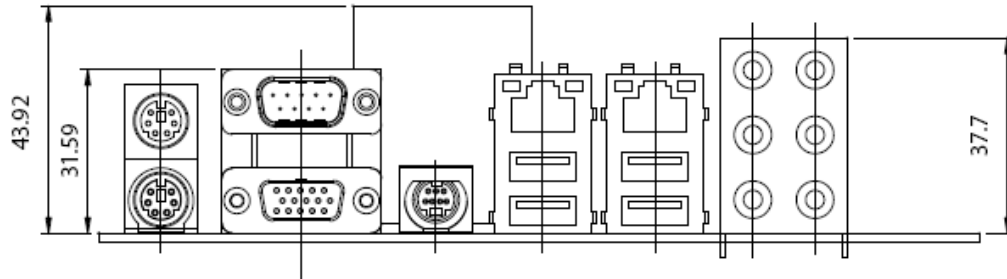
Figure 2-2: External Interface Panel Dimensions (mm)

2.3 CPU Support

Table-2-1 lists the CPUs supported by the KINO-9452 board.

Model	Clock Speed	L2 Cache	Max. FSB	Socket
Intel® Core™2 Duo	1.66 to 2.33 GHz	2MB/4MB	667 MHz	479
Intel® Core™ Duo	1.20 to 2.33 GHz	2 MB	667 MHz	479
Intel® Core™ Solo	1.06 to 1.83 GHz	2 MB	667 MHz	479

Table-2-1: Supported CPUs

2.3.1 Intel® Core™2 Duo

The Intel® Core™2 Duo processor comes with the following features:

- Dual core processor with enhanced performance
- Intel® 64 architecture
- Supports Intel Architecture with Dynamic Execution
- On-die, primary 32-kB instruction cache and 32-kB write-back data cache per core
- On-die, up to 4-MB second level shared cache with Advanced Transfer Cache Architecture
- Data Prefetch Logic

- 667-MHz, Source-Synchronous FSB for Standard Voltage processors
- Advanced Power Management features including Enhanced Intel SpeedStep® Technology
- Intel Enhanced Deeper Sleep state and Dynamic Cache Sizing

2.3.2 Intel® Core™ Duo

The Intel® Core™ Duo processor comes with the following features:

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

2.3.3 Intel® Core™ Solo

The Intel® Core™ Solo processor comes with the following features:

- Supports Intel Architecture with Dynamic Execution
- On-die, primary 32-KB instruction cache and 32-KB write-back data cache
- On-die, 2-MB second level cache with Advanced Transfer Cache Architecture
- Streaming SIMD Extensions 2 (SSE2) and Streaming SIMD Extensions 3 (SSE3)

■ Advanced power management features including Enhanced Intel SpeedStep® technology

■ Execute Disable Bit support for enhanced security

■ Intel Virtualization Technology enhances virtualization robustness and performance

2.4 On-board Chipsets

2.4.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the board:

■ **Northbridge**: Intel® 945GM

■ **Southbridge**: Intel® ICH7-M

The following two sections (**Section 2.4.2** and **Section 2.4.3**) list some of the features of the Intel 945GM and the Intel ICH7-M chipsets. For more information on these two chipsets please refer to the Intel website.

2.4.2 Intel 945GM Northbridge Chipset

The Intel 945GM northbridge chipset comes with the following features:

■ System Memory Support

  ○ Supports single/dual-channel DDR2 SDRAM

  ○ 64-bit wide per channel

  ○ 256-MB, 512-MB and 1-Gb memory technologies supported

  ○ Support for DDR2 On-Die Termination (ODT)

  ○ Support for 2N timings only

■ Internal Graphics

  ○ Intel Gen 3.5 Integrated Graphics Engine

  ○ 250 MHz core render clock and 200 MHz core display clock at 1.05 V core voltage

  ○ Supports TV-Out, LVDS, CRT and SDVO

■ DMI

  ○ Chip-to-chip interface between (G)MCH and ICH

  ○ Configurable as x2 or x4 DMI lanes

  ○ DMI lane reversal support

o 32-bit downstream address

■ Power Management

o ACPI S0, S3, S4, S5

o CPU States C0, C1, C2, C3, C4 states

o Rapid Memory Power Mgmt

2.4.3 Intel ICH7-M Southbridge Chipset

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

■ PCI Local Bus Specification, Revision 2.3 support for 33 MHz PCI operations (supports up to six Req/Gnt pairs)

■ ACPI Power Management Logic support

■ Enhanced DMA controller, interrupt controller, and timer functions

■ Integrated Serial ATA host controller with independent DMA operation on two ports and AHCI

■ Integrated IDE controller supports Ultra ATA 100/66/33

■ USB host interface with support for eight USB ports; four UHCI host controller; one EHCI high-speed USB 2.0 Host controller

■ Supports Audio Codec '97, Revision 2.3 Specification

■ Supports Intel High Definition Audio

■ Supports Intel Matrix Storage Technology

■ Supports Intel Active Management Technology

■ Low Pint Count (LPC) interface

■ Firmware Hub (FWH) interface support

■ Serial Peripheral Interface (SPI) support

2.5 Graphics Support

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

■ Analog CRT

o Integrated 400 MHz RAMDAC

o Analog monitor support up to QXGA

o Support for CRT hot plug

■ LVDS

o Panel support up to UXGA (1600 x 1200)

o 25 MHz – 112 MHz single-/dual-channel; @18bpp – TFT panel type supported

o Pixel Dithering for 18-bit TFT panel to emulate 24-bpp true color displays

o Panel Fitting. Panning, and Center Mode supported

o CPIS 1.5 compliant

o Spread spectrum clocking supported

o Panel Power Sequencing support

o Integrated PWM interface for LCD backlight inverter control

▪ TV-Out

o Three integrated 10-bit DACS

o MacroVision support

o Overscaling

o NTSC/PAL

o Component, S-Video and Composite Output interfaces

o HDTV support – 480p/720p/1080i/1080p

▪ SDVO Ports

o Concurrent operation of x1 PCIe with SDVO

o Two SDVO ports supported

o Supports appropriate external SDVO components (DVI, LVDS, TV-Out)

2.6 Memory Support

The KINO-9452 has two DDR2 DIMM sockets and supports two 400MHz, 533MHz or 667MHz DDR2 DIMM with a maximum RAM of up to 2GB.

2.7 PCI Bus Interface Support

The PCI bus on the KINO-9452 has the following features:

▪ 33MHz Revision 2.3 is implemented

▪ Six PCI REQ/GNT pairs is available

▪ 64-bit addressing on PCI using DAC protocol is supported

2.8 GbE Ethernet

The BCM5787 is a seventh generation 10/100/1000BASE-T Ethernet LAN controller solution for high performance network applications. The device combines a triple-speed

IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, PCIe bus interface, and on-chip buffer memory in a single device. The device is fabricated in a 1.2V CMOS process providing a low-power system solution. The GbE controller features are below.

- Integrated 10/100/1000 transceiver
- 10/100/1000 full/half-duplex MAC
- Automatic MDI crossover function
- Supports PCIe v1.0a
- Wake-on-LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash supported
- JTAG supported
- 196-FBGA package

2.9 Drive Interfaces

The KINO-9452 can support the following drive interfaces.

- 2 x SATA drives
- 2 x IDE devices

2.9.1 SATA Drives

The KINO-9452 supports two SATA II drives with transfer rates of up to 3.0Gb/s.

2.9.2 IDE Interfaces

The KINO-9452 southbridge chipset IDE controller supports up to two IDE devices with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports Ultra ATA 100 devices with data transfer rates up to 100MB/s

2.10 Serial Ports

The KINO-9452 has four high-speed UART serial ports, configured as COM1, COM2, COM3 and COM4. The serial ports have the following specifications.

- 16C550 UART with 16-byte FIFO buffer
- 115.2Kbps transmission rate

2.11 Real Time Clock

256-byte battery backed CMOS SRAM

2.12 USB Interfaces

The KINO-9452 supports eight USB interfaces, four internal and four external. The USB interfaces support USB 2.0.

2.13 BIOS

The KINO-9452 uses a licensed copy of AMI BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot **Ex**ecution **E**nvironment) support
- USB booting support

2.14 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the KINO-9452 are listed below.

- Minimum Operating Temperature: 0⁰C (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.15 Audio Codec

The KINO-9452 has an integrated REALTEK ALC883 CODEC. The ALC883 CODEC is a Value 7.1+2 Channel High Definition Audio (HDA) codecs. The ALC883 series provide 10 DAC channels that simultaneously support 7.1 sound playback, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel stereo output. Some of the features of the codec are listed below.

- High-performance DACs with 95dB SNR (A-Weighting), ADCs with 85dB SNR (A-Weighting)
- Meets performance requirements for audio on PC2001 systems and Microsoft WLP 2.x
- Ten DAC channels support 16/20/24-bit PCM format for 7.1 sound playback, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel output
- 2 stereo ADCs support 16/20/24-bit PCM format, one for stereo microphone, the other for legacy mixer recording
- All DACs support 44.1k/48k/96k/192kHz sample rate
- All ADCs support 44.1k/48k/96kHz sample rate
- 16/20/24-bit S/PDIF-OUT supports 44.1k/48k/96k/192kHz sample rate
- 16/20/24-bit S/PDIF-IN supports 44.1k/48k/96kHz sample rate
- Up to four channels of microphone array input are supported for AEC/BF application
- High-quality analog differential CD input
- Supports external PCBEEP input and built-in digital BEEP generator
- Software selectable 2.5V/3.75V VREFOUT
- Two jack detection pins, each designed to detect up to 4 jacks
- Reserve analog mixer architecture for backward compatibility with AC'97
- Wide range (–80dB ~ +42dB) volume control with 1.5dB resolution of analog to analog mixer gain
- All analog jacks are stereo input and output re-tasking for analog plug & play
- Built-in headphone amplifiers for each re-tasking jack
- 2 GPIOs (General Purpose Input/Output) for customized applications
- Power support: Digital: 3.3V; Analog: 3.0V~5.0V (Minimum AVDD is 3.0V)
- Pin compatible with the ALC880 and ALC882
- Enhanced S/PDIF-IN circuitry ensures compatibility with consumer DVD

players

- 48-pin LQFP 'Green' package
- Meets Microsoft WHQL/WLP 2.x audio requirements
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D Positional Audio
- Emulation of 26 sound environments to enhance gaming experience
- 10-Band Software Equalizer
- Voice Cancellation and Key Shifting in Karaoke mode
- Realtek Media Player
- Enhanced Configuration Panel to improve user experience
- Microphone Acoustic Echo Cancellation (AEC), Noise Suppression (NS), and Beam Forming (BF) technology for voice application
- ALC883D features optional Dolby® Digital Live output for consumer equipment
- ALC883DTS features optional DTS® Connect software

2.16 Power Consumption

Table 2-2 shows the power consumption parameters for the KINO-9452 when an Intel Core Duo processor with a clock speed of 2.16GHz is running with two DDR2 1GB DIMM modules.

Voltage	Current
+5V	1.58A
+12V	2.05A
+3.3V	3.12A
5VSB	0.32A

Table 2-2: Power Consumption

2.17 Packaged Contents and Optional Accessory Items

2.17.1 Package Contents

The KINO-9452 is shipped with the following components.

- 1 x KINO-9452 single board computer
- 1 x IDE flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 2 x RS-232 cables
- 1 x HDTV out cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Quick Installation Guide

2.17.2 Optional Accessory Items

The items shown in the list below are optional accessory items are purchased separately.

- CPU cooler
- USB cable
- RS-232/422/485 cable

Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. Section 3.1.2 lists all the peripheral interface connectors seen in Section 3.1.1.

3.1.1 KINO-9452 Layout

Figure 3-1 shows the on-board peripheral connectors, backplane peripheral connectors and on-board jumpers.
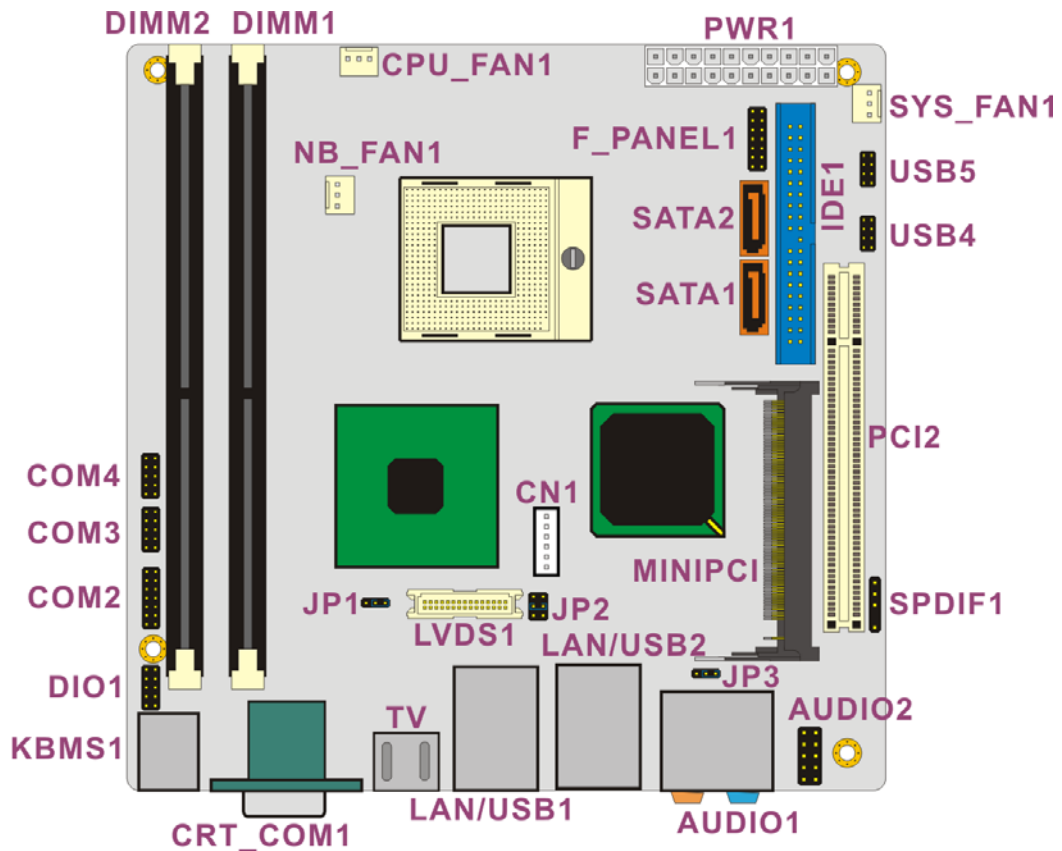
Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the KINO-9452. Detailed descriptions of these connectors can be found in Section 3.2.

Connector	Type	Label
DDR2 DIMM socket	240-pin slot	DIMM1
DDR2 DIMM socket	240-pin slot	DIMM2
Fan connector (CPU)	3-pin header	CPU_FAN1
Fan connector (System)	3-pin header	SYS_FAN1
Fan connector (Northbridge)	3-pin header	NB_FAN1
Front panel connector	14-pin header	F_PANEL1
Front panel audio connector	10-pin header	AUDIO2
Digital Input/Output connector	10-pin header	DIO1
IDE Interface connector	40-pin header	IDE1
LCD backlight connector	6-pin header	CN1
LVDS LCD connector	30-pin header	LVDS1
Mini PCI slot	124-pin Mini PCI Type III slot	MINIPCI
PCI slot	124-pin PCI slot	PCI2
Power connector	20-pin connector	PWR1
Serial port connector (1)	14-pin header	COM2
Serial port connector (2)	10-pin header	COM3
Serial port connector (3)	10-pin header	COM4
SATA drive connector (1)	7-pin SATA connector	SATA1
SATA drive connector (2)	7-pin SATA connector	SATA2
SPDIF connector	5-pin header	SPDIF1
USB connector (1)	8-pin header	USB4
USB connector (2)	8-pin header	USB5

Table 3-1: Peripheral Interface Connectors

3.1.3 Rear Panel Connectors

Table 3-2 lists the rear panel connectors on the KINO-9452. Detailed descriptions of these connectors can be found in **Section 3.3**.

Connector	Type	Label
Audio Jacks	Audio connector	AUDIO1
CRT connector	15-pin female connector	CRT_COM1
Ethernet connector (1)	RJ-45 connector	LAN/USB1A
Ethernet connector (2)	RJ-45 connector	LAN/USB2A
Keyboard/Mouse connector	6-pin mini din connector	KBMS1
Serial port connector	DB-9 male connector	CRT_COM1
TV-Out port	7-pin TV port	TV
USB 2.0 port (1)	USB port connector	LAN/USB1B
USB 2.0 port (2)	USB port connector	LAN/USB2B

Table 3-2: Rear Panel Connectors

3.1.4 On-board Jumpers

Table 3-3 lists the on-board jumpers. Detailed descriptions of these jumpers can be found in **Section 4.5.**

Description	Label	Type
Clear CMOS	JP3	3-pin header
COM2 mode selection	JP1	3-pin header
LVDS LCD voltage selection	JP2	6-pin header

Table 3-3: On-board Jumpers

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-9452.

3.2.1 Fan Connectors

CN Label: CPU_FAN1, SYS_FAN1 and NB_FAN1

CN Type: 3-pin header

CN Location: See Figure 3-2

CN Pinouts: See Table 3-4

The cooling fan connectors on the KINO-9452 provide a 12V, 500mA current to one CPU cooling fan, one system cooling fan and one Northbridge cooling fan. There is a "sense" pin in the fan connector, which transfers the fan's sense signal to the system BIOS in order to recognize the fan speed. Please note that only some specific types of fans offer a rotation signal.
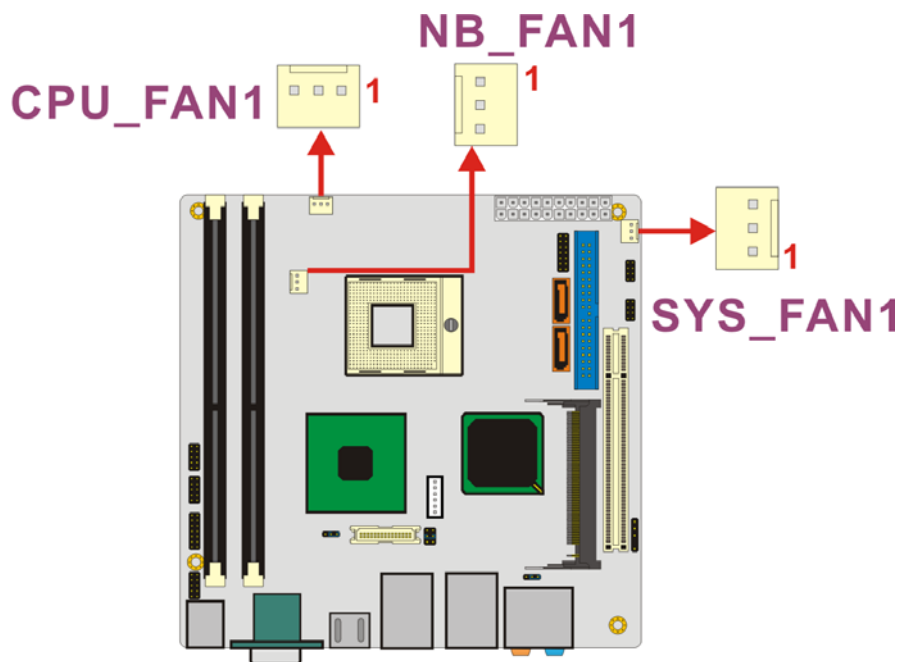
Figure 3-2: Fan Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Sense

Table 3-4: Fan Connector Pinouts

3.2.2 Front Panel Audio Connector

CN Label: AUDIO2

CN Type: 10-pin header (2x5)

CN Location: See Figure 3-3

CN Pinouts: See Table 3-5

The front panel audio connector connect the on-board sound system of the KINO-9452 to the audio line out and microphone jacks on the front of the computer chassis.
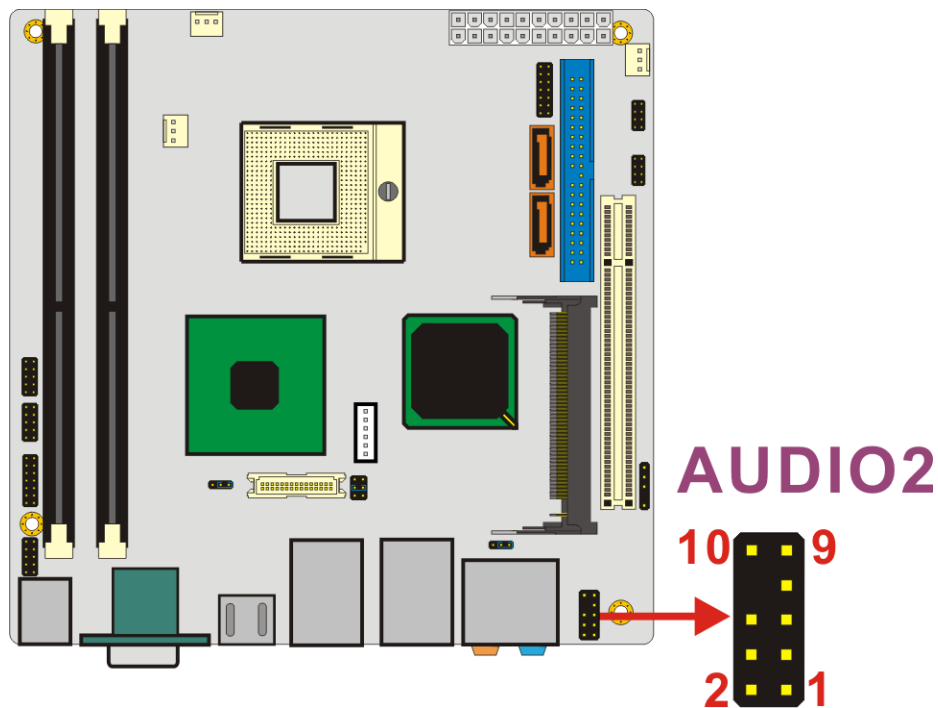
Figure 3-3: Front Panel Audio Connector Location

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1.	Port1_L	2.	GND
3.	Port1_R	4.	PRESENCE
5.	Port2_R	6.	SENSE1_RETUR
7.	SENSE_SEND	8.	(KEY)
9.	Port2_L	10.	SENSE2_RETUR

Table 3-5: Front Panel Audio Connector Pinouts

3.2.3 Front Panel Connector

CN Label: F_PANEL1

CN Type: 14-pin header (2x7)

CN Location: See Figure 3-4

CN Pinouts: See Table 3-6

The front panel connector connects to several external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power
- Power button
- Reset button
- Speaker
- HDD
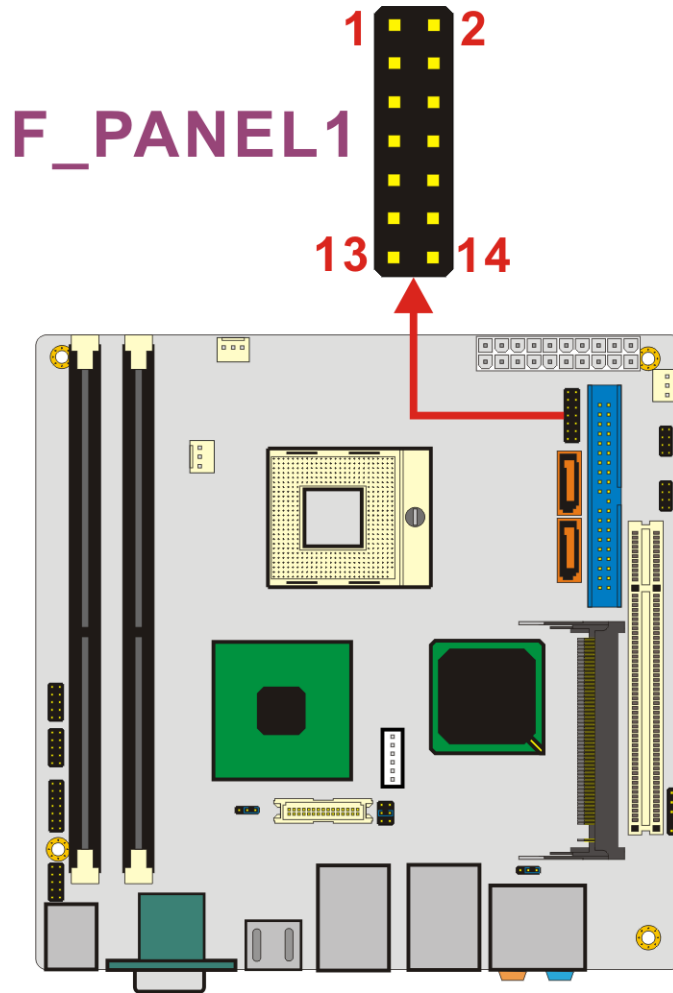
Figure 3-4: Front Panel Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power LED+	2	Speaker+
3	NC	4	NC
5	Power LED-	6	NC
7	Power Button#	8	Speaker-
9	Power Button	10	NC
11	IDE LED+	12	Reset Button
13	IDE LED-	14	Reset Button#

Table 3-6: Front Panel Connector Pinouts

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3.2.4 Digital Input/Output Connector

CN Label: DIO1

CN Type: 10-pin header (2x6)

CN Location: See Figure 3-5

CN Pinouts: See Table 3-7

The DIO connector is managed through a Super I/O chip. The DIO connector pins are user programmable. The digital IO port of KINO-9452 is 5V CMOS level.
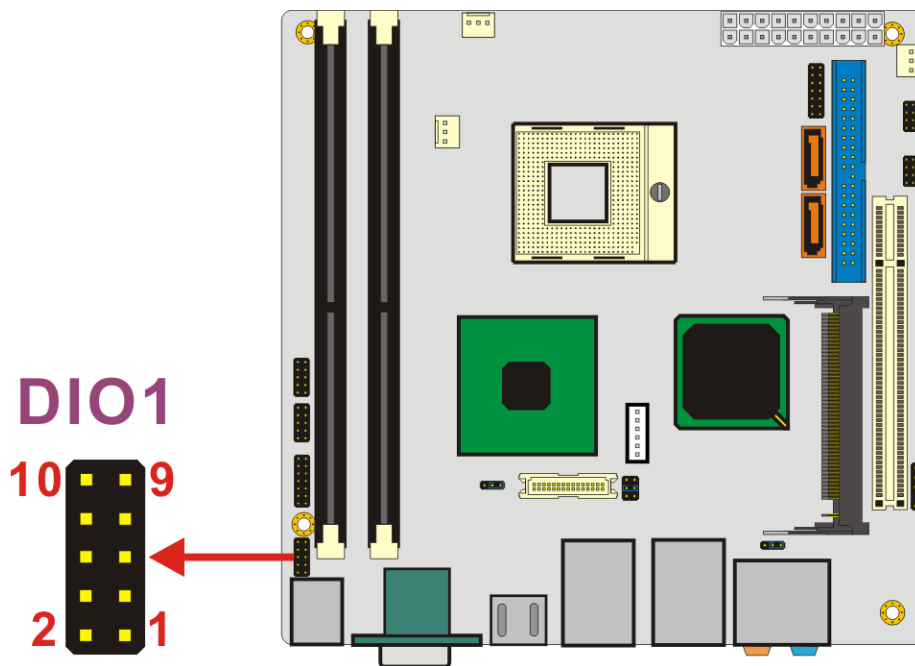
Figure 3-5: GPIO Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	INPUT0	4	OUTPUT0
5	INPUT1	6	OUTPUT1
7	INPUT2	8	OUTPUT2
9	INPUT3	10	OUTPUT3

Table 3-7: GPIO Connector Pinouts

3.2.5 IDE Connector

CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 3-6

CN Pinouts: See Table 3-8

One primary 40-pin IDE device connector on the KINO-9452 motherboard supports connectivity to ATA 100 IDE devices with data transfer rates up to 100MB/s.
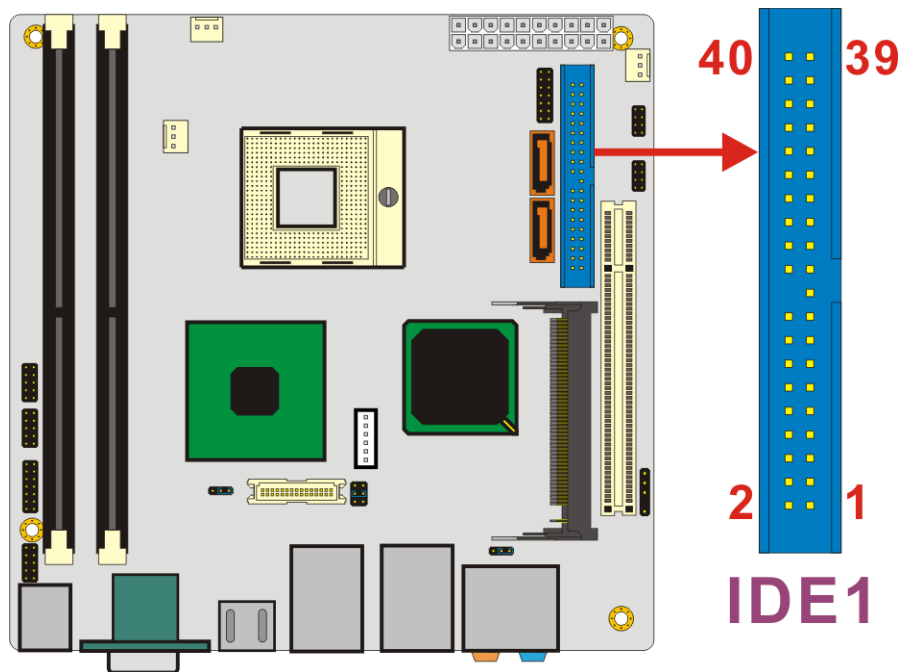
Figure 3-6: IDE Device Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	(KEY)
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	CHRDY	28	GND
29	DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	P66DET
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

Table 3-8: IDE Connector Pinouts

3.2.6 LCD Backlight Connector

CN Label: CN1

CN Type: 6-pin header (1x6)

CN Location: See Figure 3-7

CN Pinouts: See Table 3-9

The LCD backlight connector is for the LCD inverter connection.
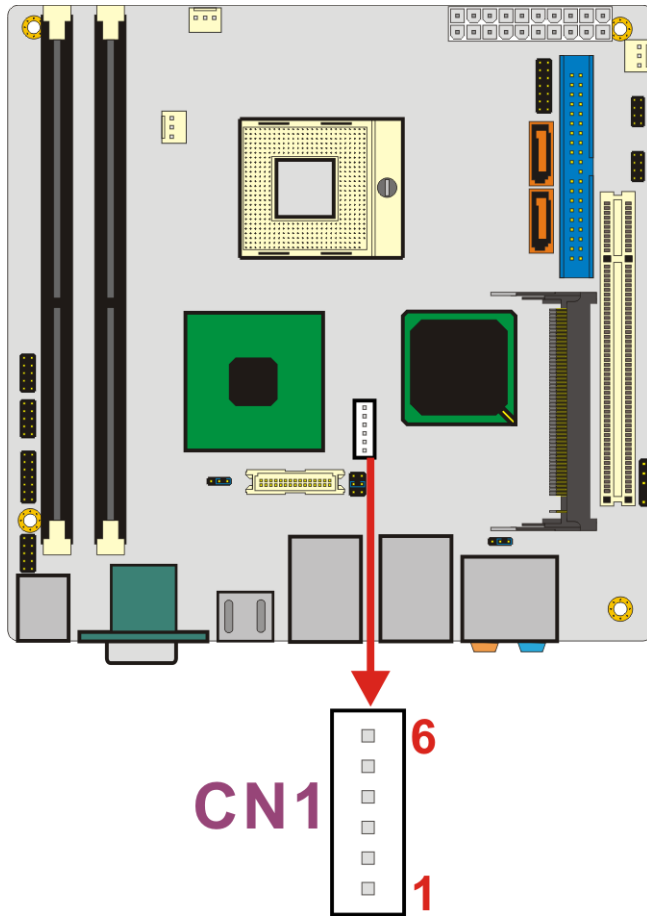
Figure 3-7: LCD Backlight Connector Location

PIN NO.	DESCRIPTION
1	Back Light Power
2	Back Light Power
3	Back Light enable
4	NC
5	GND
6	GND

Table 3-9: LCD Backlight Connector Pinouts

3.2.7 LVDS LCD connector

CN Label: LVDS1

CN Type: 30-pin connector (2x15)

CN Location:　　See Figure 3-8

CN Pinouts:　　See Table 3-10

The connector supports one or two channel (18 or 36bit) LVDS panel.
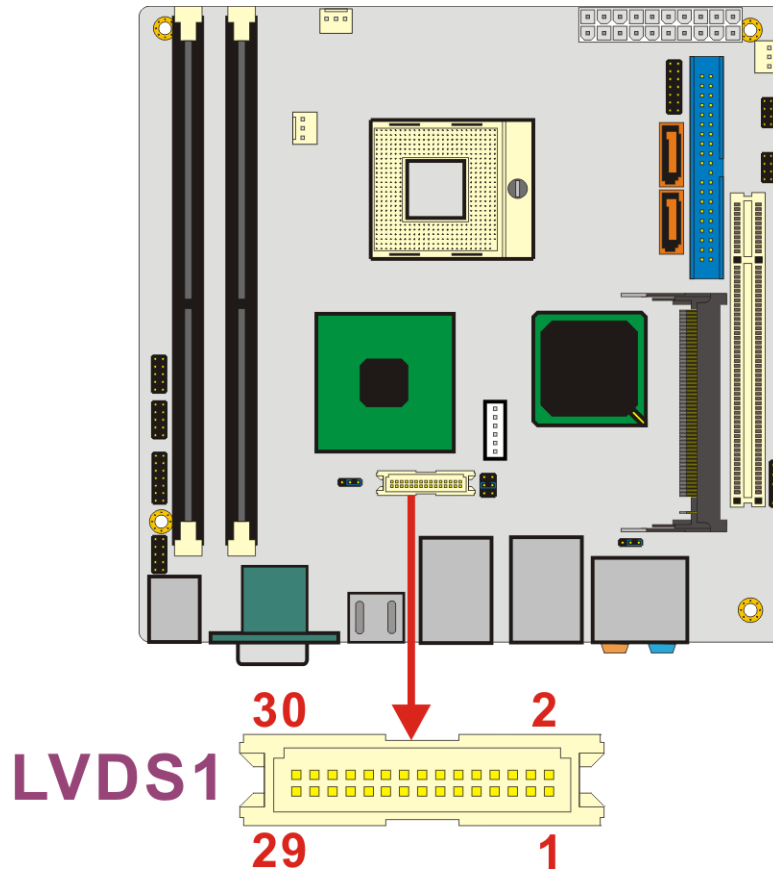
Figure 3-8: LVDS LCD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	1st LVDS data0 output +	4	1st LVDS data0 output -
5	1st LVDS data1 output +	6	1st LVDS data1 output -
7	1st LVDS data2 output +	8	1st LVDS data2 output -
9	1st LVDS clock output +	10	1st LVDS clock output -
11	NC	12	NC
13	GND	14	GND
15	2nd LVDS data0 output +	16	2nd LVDS data0 output -

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
17	2nd LVDS data1 output +	18	2nd LVDS data1 output -
19	2nd LVDS data2 output +	20	2nd LVDS data2 output -
21	2nd LVDS clock output +	22	2nd LVDS clock output -
23	NC	24	NC
25	GND	26	GND
27	+LCD (3.3V, 5V or 12V)	28	+LCD (3.3V, 5V or 12V)
29	+LCD (3.3V, 5V or 12V)	30	+LCD (3.3V, 5V or 12V)

Table 3-10: LVDS LCD Connector Pinouts

3.2.8 Mini PCI Slot

CN Label: MINIPCI

CN Type: 124-pin Mini PCI Type III slot

CN Location: See Figure 3-9

CN Pinouts: See Table 3-11

Mini PCI is a small form factor version of a PCI card. Mini PCI expansion devices can be inserted into the Mini PCI slot.
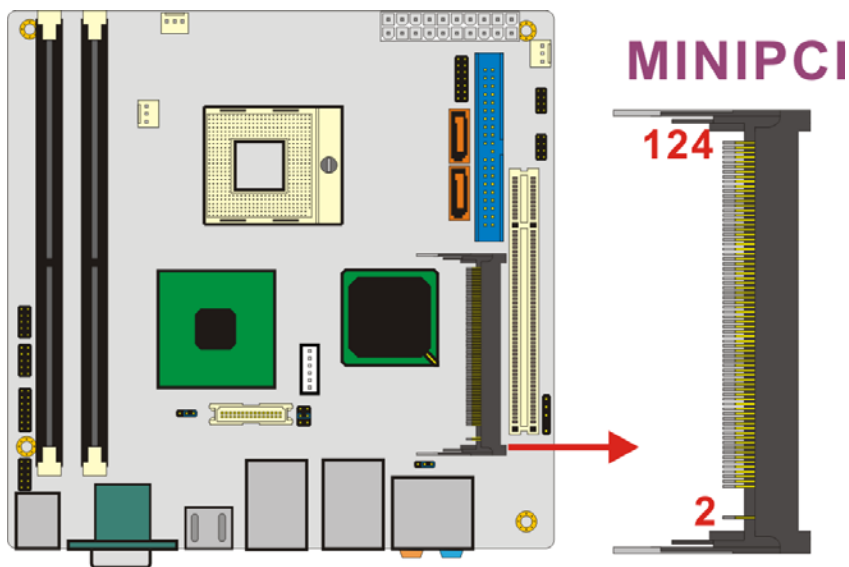
Figure 3-9: Mini PCI Slot Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	TIP	32	GROUND	63	3.3V	94	AD[02]
2	RING	33	AD[31]	64	FRAME#	95	AD[03]
3	8PMJ-3	34	PME#	65	CLKRUN#	96	AD[00]
4	8PMJ-1	35	AD[29]	66	TRDY#	97	5V
5	8PMJ-6	36	RESERVED	67	SERR#	98	RESERVED_WIP5
6	8PMJ-2	37	GROUND	68	STOP#	99	AD[01]
7	8PMJ-7	38	AD[30]	69	GROUND	100	RESERVED_WIP5
8	8PMJ-4	39	AD[27]	70	3.3V	101	GROUND
9	8PMJ-8	40	3.3V	71	PERR#	102	GROUND
10	8PMJ-5	41	AD[25]	72	DEVSEL#	103	AC_SYNC
11	LED1_GRNP	42	AD[28]	73	C/BE[1]#	104	M66EN
12	LED2_YELP	43	RESERVED	74	GROUND	105	AC_SDATA_IN
13	LED1_GRNN	44	AD[26]	75	AD[14]	106	AC_SDATA_OUT
14	LED2_YELN	45	C/BE[3]#	76	AD[15]	107	AC_BIT_CLK
15	CHSGND	46	AD[24]	77	GROUND	108	AC_CODEC_ID0#
16	RESERVED	47	AD[23]	78	AD[13]	109	AC_CODEC_ID1#
17	INTB#	48	IDSEL	79	AD[12]	110	AC_RESET#
18	5V	49	GROUND	80	AD[11]	111	MOD_AUDIO_MON
19	3.3V	50	GROUND	81	AD[10]	112	RESERVED
20	INTA#	51	AD[21]	82	GROUND	113	AUDIO_GND
21	RESERVED	52	AD[22]	83	GROUND	114	GROUND
22	RESERVED	53	AD[19]	84	AD[09]	115	SYS_AUDIO_OUT
23	GROUND	54	AD[20]	85	AD[08]	116	SYS_AUDIO_IN
24	3.3VAUX	55	GROUND	86	C/BE[0]#	117	SYS_AUDIO_OUT GND
25	CLK	56	PAR	87	AD[07]	118	SYS_AUDIO_IN GND
26	RST#	57	AD[17]	88	3.3V	119	AUDIO_GND
27	GROUND	58	AD[18]	89	3.3V	120	AUDIO_GND
28	3.3V	59	C/BE[2]#	90	AD[06]	121	RESERVED
29	REQ#	60	AD[16]	91	AD[05]	122	MPCIACT#
30	GNT#	61	IRDY#	92	AD[04]	123	VCC5VA
31	3.3V	62	Ground	93	RESERVED	124	3.3VAUX

Table 3-11: Mini PCI Slot Pinouts

3.2.9 Power Connector

CN Label: PWR1

CN Type: 20-pin connector

CN Location: See Figure 3-10

CN Pinouts: See Table 3-12

This 20-pin power connector supports the ATX power supply.
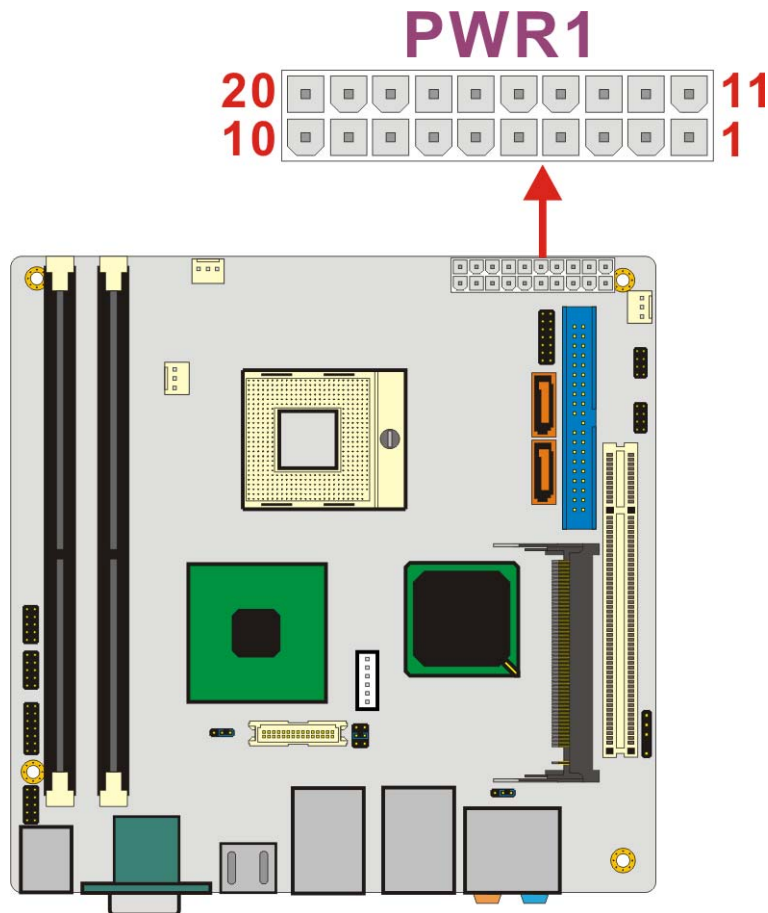
Figure 3-10: Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power good	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

Table 3-12: Power Connector Pinouts

3.2.10 14-Pin Serial Port Connectors

CN Label: COM2

CN Type: 14-pin header (2x7)

CN Location: See Figure 3-11

CN Pinouts: See Table 3-13

The serial ports connectors connect to RS-232/422/485 serial port device.
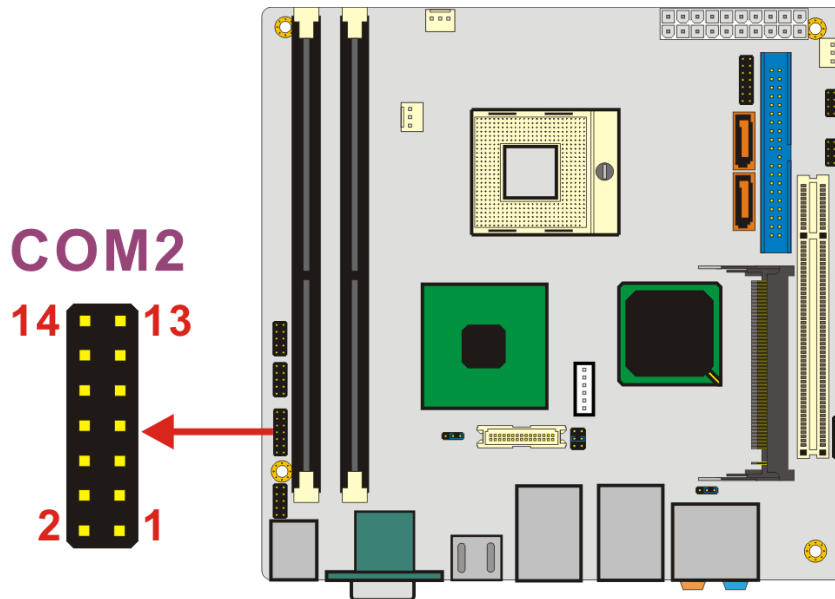
Figure 3-11: 14-Pin Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	NC
11	TX+	12	TX-
13	RX+	14	RX-

Table 3-13: COM2 Pinouts

3.2.11 10-Pin Serial Port Connectors

CN Label: COM3 and COM4

CN Type: 10-pin header (2x5)

CN Location: See Figure 3-12

CN Pinouts: See Table 3-14

The serial ports connectors connect to RS-232 serial port device.
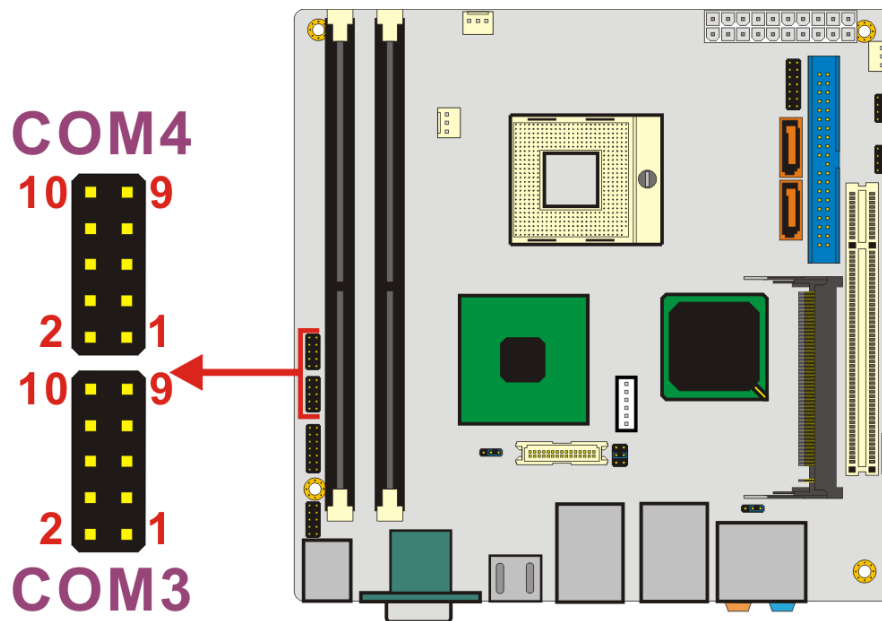
Figure 3-12: 10-Pin Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	NC

Table 3-14: COM3 and COM4 Pinouts

3.2.12 SATA Drive Connectors

CN Label: SATA1 and SATA2

CN Type: 1x7 pin SATA drive connectors

CN Location: See Figure 3-13

CN Pinouts: See Table 3-15

The two SATA drive connectors are connected to four SATA II drives. SATA II drives transfer data at speeds as high as 3.0Gb/s.
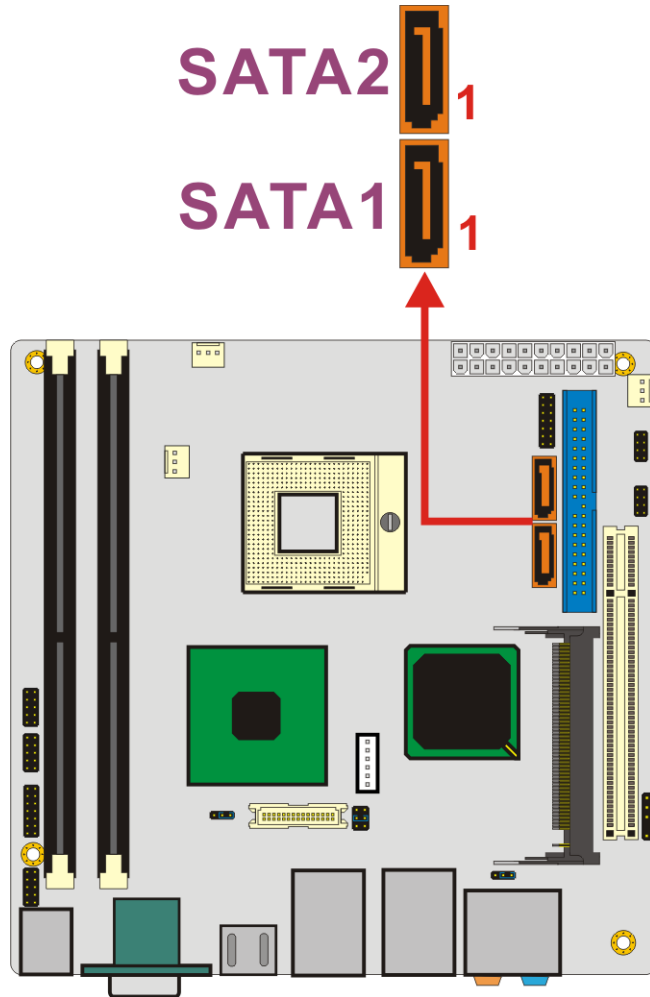
Figure 3-13: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Table 3-15: SATA Drive Connector Pinouts

3.2.13 SPDIF Connector

CN Label: SPDIF1

CN Type: 5-pin header (1x5)

CN Location: See Figure 3-14

CN Pinouts: See Table 3-16

The SPDIF connector connects to the S/PDIF audio module, which bears S/PDIF digital output. S/PDIF (Sony/Philips Digital Interface) is a newest audio transfer file format, which allows the user to enjoy digital audio. The SPDIF1 port provides digital audio to external speaker or compressed AC3 data to an external Dolby Digital Decoder via a coaxial cable.
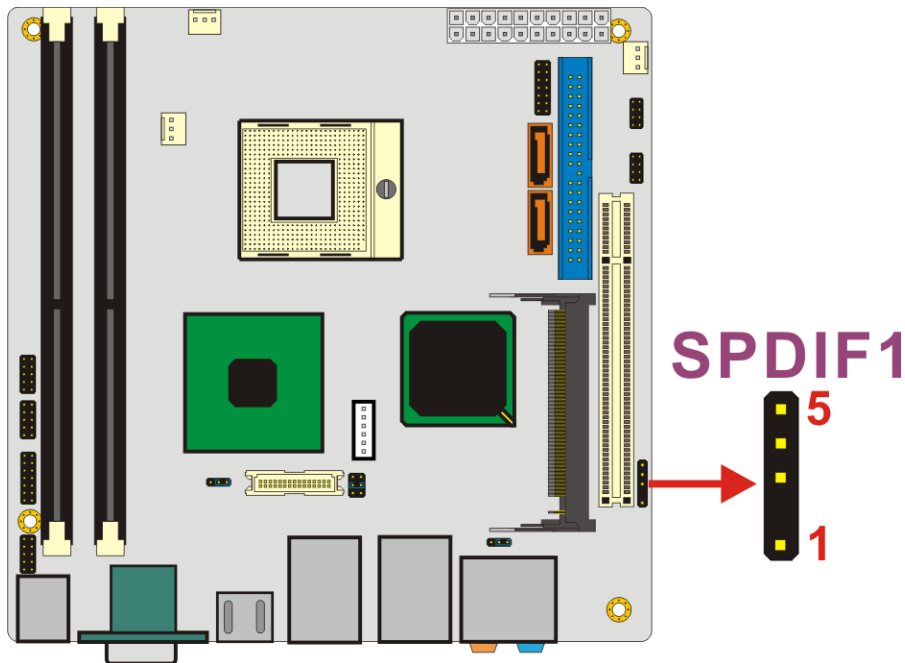
Figure 3-14: SPDIF Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	(KEY)
3	SPDIF_OUT
4	GND
5	SPDIF_IN

Table 3-16: SPDIF Pinouts

3.2.14 Internal USB Connectors

CN Label: USB4 and USB5

CN Type: 8-pin header (2x4)

CN Location: See Figure 3-15

CN Pinouts: See Table 3-17

One 2x4 pin connector provides connectivity to two USB 2.0 ports. The USB ports are used for I/O bus expansion.
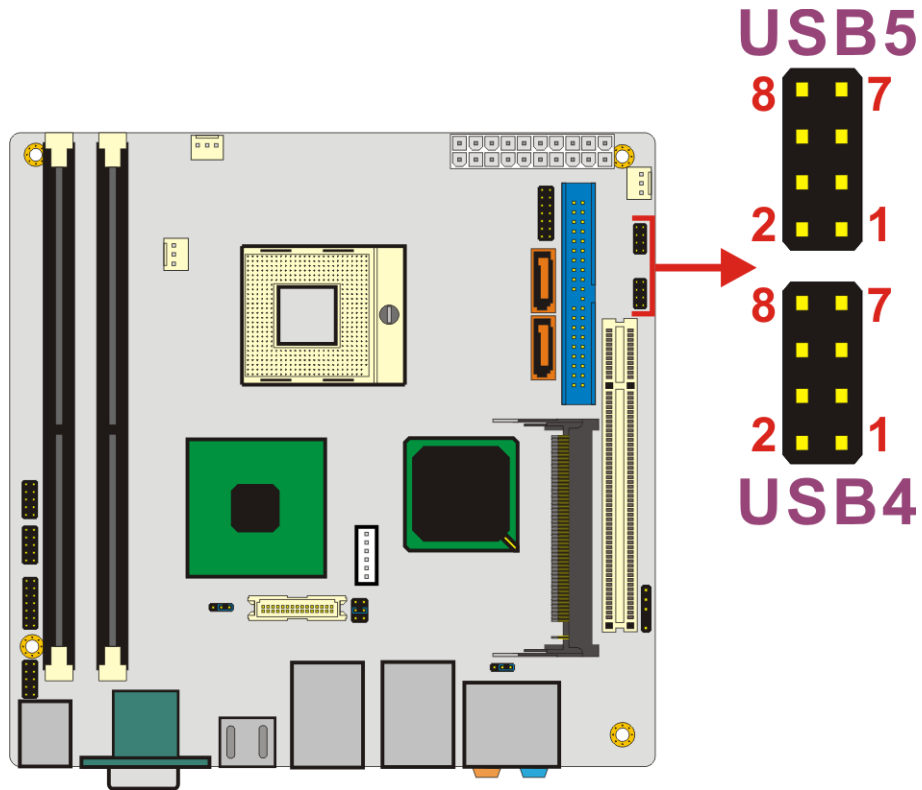
Figure 3-15: Internal USB Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA0-	4	DATA1+
5	DATA0+	6	DATA1-
7	GND	8	VCC

Table 3-17: USB3 and USB4 Pinouts

3.3 External Interface Connectors

The peripheral connectors on the back panel are connected to devices externally when the KINO-9452 is installed in a chassis. The peripheral connectors on the rear panel are:

- 6 x Audio jacks
- 1 x CRT connector
- 2 x RJ-45 Ethernet connectors
- 1 x Keyboard/mouse connector

- 1 x Serial port connector
- 1 x TV-Out connector
- 4 x USB 2.0 connectors
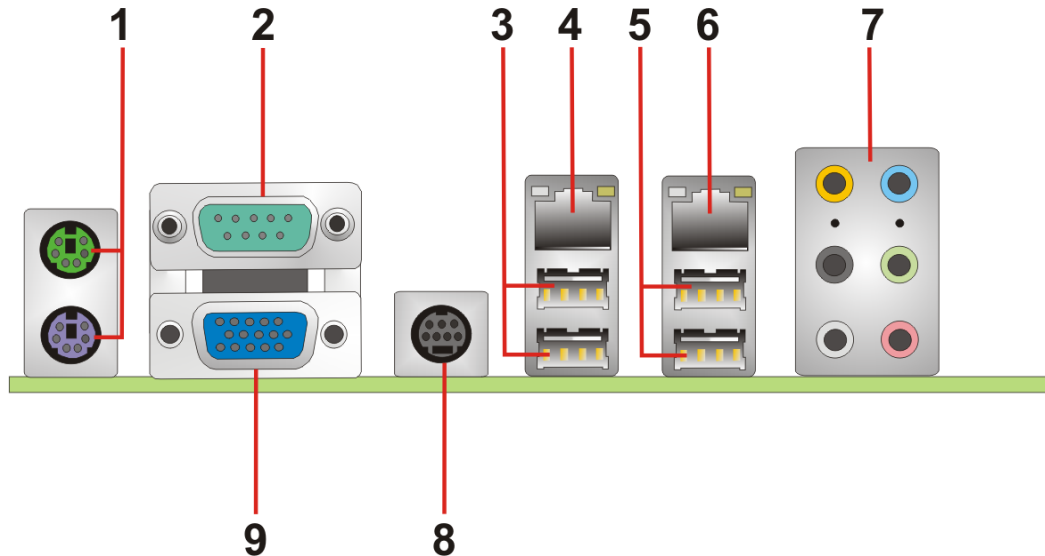
Figure 3-16: KINO-9452 External Interface Connectors

3.3.1 Audio Connectors

CN Label: AUDIO1

CN Type: Audio jack

CN Location: See Figure 3-16 (labeled number 7)

CN Pinouts: See Figure 3-17

- **Center/Subwoofer port (Yellow):** Connects the center/subwoofer speakers.
- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Rear Speaker Out port (Black):** Connects the rear speakers in a 4/6/8-channel audio configuration.
- **Line Out port (Lime):** Connects a headphone or a speaker. In 4,6,8-channel configuration, the function of this port becomes Front Speaker Out.
- **Side Speaker Out port (Gray):** Connectors the side speakers in an 8-channel audio configuration.

IEI® Technology, Corp.

■ **Microphone (Pink):** Connects a microphone.

Figure 3-17: Audio Connectors

3.3.2 CRT Connector

CN Label: CRT_COM1

CN Type: 15-pin female connector

CN Location: See Figure 3-16 (labeled number 9)

CN Pinouts: See Table 3-18

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.
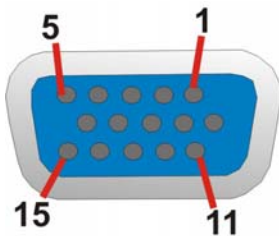
Figure 3-18: VGA Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND

11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 3-18: VGA Connector Pinouts

3.3.3 Ethernet Connectors

CN Label: LAN/USB1A and LAN/USB2A

CN Type: RJ-45

CN Location: See Figure 3-16 (labeled number 4 and 6)

CN Pinouts: See Table 3-19

The KINO-9452 is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDX0+	5	MDX2-
2	MDX0-	6	MDX1-
3	MDX1+	7	MDX3+
4	MDX2+	8	MDX3-

Table 3-19: LAN1 and LAN2 Pinouts
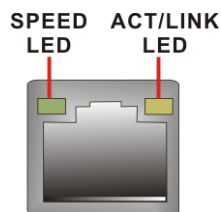
Figure 3-19: RJ-45 Ethernet Connector

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The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-20**.

SPEED LED		ACT/LINK LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
OFF	10Mbps connection	OFF	No link
ORANGE	100Mbps connection	YELLOW	Linked
GREEN	1Gbps connection	BLINKING	Data Activity

Table 3-20: RJ-45 Ethernet Connector LEDs

3.3.4 Keyboard/Mouse Connector

CN Label: KBMS1

CN Type: PS/2 connector

CN Location: See Figure 3-16 (labeled number 1)

CN Pinouts: See Table 3-21

The KINO-9452 keyboard and mouse connectors are standard PS/2 connectors.
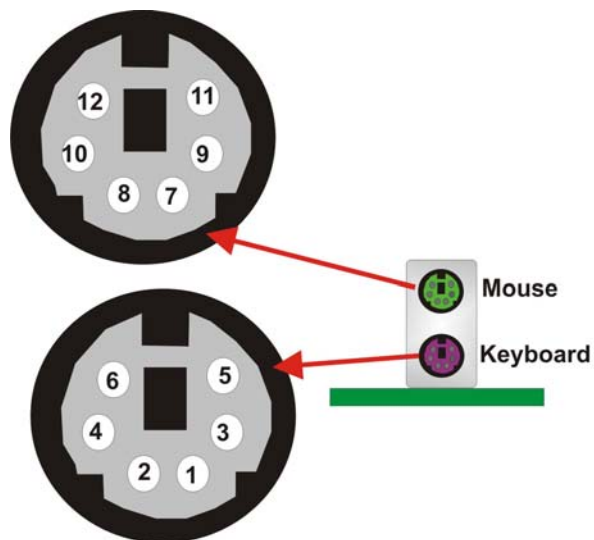
Figure 3-20: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 3-21: PS/2 Connector Pinouts

3.3.5 Serial Port Connectors

CN Label: CRT_COM1

CN Type: DB-9

CN Location: See Figure 3-16 (labeled number 2)

CN Pinouts: See Table 3-22

The serial ports can be connected to a serial communications device directly.
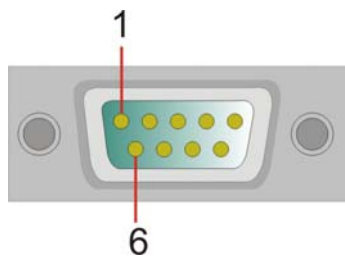
Figure 3-21: External Serial Port Connector

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)

4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

Table 3-22: External Serial Port Pinouts

3.3.6 TV-Out Connector

CN Label: TV

CN Type: 7-pin TV port

CN Location: See Figure 3-16 (labeled number 8)

CN Pinouts: See Table 3-23

The TV-Out port connects to a TV.
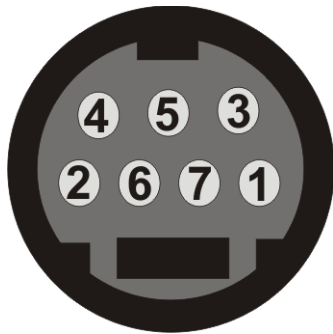
Figure 3-22: TV-Out Connector

PIN	Description
1	Ground
2	Ground
3	S-Vidio Luminance Component:Luminance (Y)
4	S-Vidio:Chrominance Component:Chrominance (Pr)

5	NC
6	Ground
7	Composite:CVBS Component:Chrominance (Pb)

Table 3-23: TV-Out Pinouts

3.3.7 USB Connector

CN Label:　　　　LAN/USB1B and LAN/USB2B

CN Type:　　　　USB port

CN Location:　　See Figure 3-16 (labeled number 3 and 5)

CN Pinouts:　　　See Table 3-24

USB devices can be connected directly to the USB connectors on the rear panel.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD1-
3	USBD0+	7	USBD1+
4	GND	8	GND

Table 3-24: External USB Connector Pinouts

Chapter

4

Installation and Configuration

4.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-9452. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the KINO-9452 (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

■ **Wear an anti-static wrist band:** Wearing a simple anti-static wrist band 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 Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the motherboard is installed. All installation notices pertaining to the installation of the motherboard should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the motherboard and injury to the person installing the motherboard.

4.2.1 Installation Notices

Before and during the installation of the KINO-9452, please **do** the following:

■ Read the user manual
  ○ The user manual provides a complete description of the KINO-9452, installation instructions and configuration options.
■ Wear an electrostatic discharge cuff (ESD)
  ○ Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
■ Place the motherboard on an antistatic pad

o   When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.

■   Turn off all power to the KINO-9452

o   When working with the motherboard, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-9452 **DO NOT:**

■   remove any of the stickers on the PCB board. These stickers are required for warranty validation.

■   use the product before verifying all the cables and power connectors are properly connected.

■   allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Unpacking

NOTE:

If any of the items listed below are missing when the KINO-9452 is unpacked, do not proceed with the installation and contact the KINO-9452 reseller or vendor.

4.3.1 Unpacking Precautions

Before installing the KINO-9452, unpack the motherboard. Some components on KINO-9452 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged, follow these precautions:

■   The user should ground them self to remove any static charge before touching the KINO-9452. To do so wear a grounded wrist strap at all times or frequently touch any conducting materials that is connected to the ground.

■   Handle the KINO-9452 by its edges. Do not touch the IC chips, leads or circuitry if not necessary.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.3.2 Checklist

When unpacking the KINO-9452, please make sure that the package contains the following items.

- 1 x KINO-9452 single board computer
- 1 x IDE flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 2 x RS-232 cables
- 1 x HDTV out cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Quick Installation Guide
- CPU cooler (optional)
- USB cable (optional)
- RS-232/422/485 cable (optional)

If one or more of these items are missing, please contact the reseller or vendor the KINO-9452 was purchased from and do not proceed any further with the installation.

4.4 KINO-9452 motherboard Installation

 WARNING!

1. Never run the motherboard without an appropriate heat sink and cooler that can be ordered from IEI Technology or purchased separately.
2. Be sure to use the CPU 12V power connector for the CPU power.

 WARNING!

Please note that the installation instructions described in this manual should

be carefully followed in order to avoid damage to the motherboard components and injury to the user.

⚠️ WARNING!

When installing electronic components onto the motherboard always take the following anti-static precautions in order to prevent ESD damage to the motherboard and other electronic components like the CPU and DIMM modules

The following components must be installed onto the motherboard or connected to the motherboard during the installation process.

- CPU
- CPU cooling kit
- DDR2 memory modules
- Peripheral device connection

4.4.1 CPU Installation

⚠️ WARNING!

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure that a heat sink and CPU cooling fan is properly installed before the motherboard is run or else both the CPU and the board may be damaged.

To install an Intel 479-pin CPU onto the motherboard, follow the steps below:

Step 1: **Is the CPU retention screw in an unlocked position?** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to position it in an unlocked position. (See **Figure 4-1**)
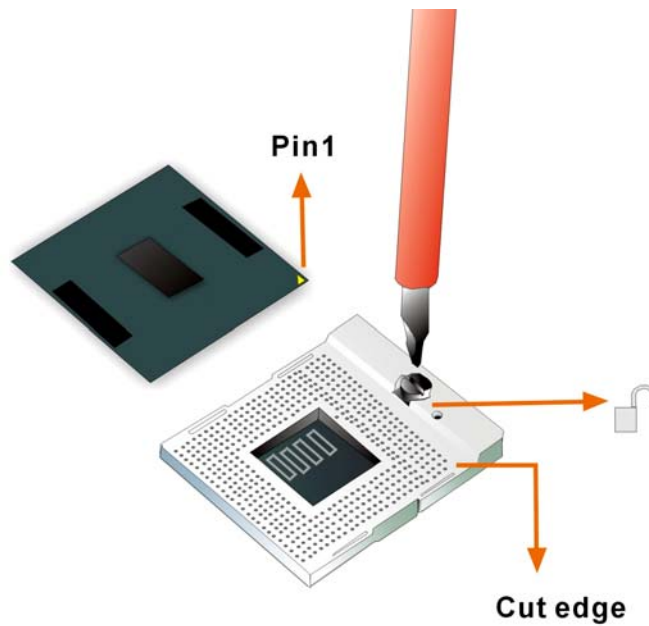
Figure 4-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly position the CPU.** Make sure the pin 1 mark matches the cut edge on the CPU socket. Carefully place the CPU on top of the socket. When properly placed, the CPU should be easily inserted into the socket.

Step 4: **Insert the CPU.** To insert the CPU into the socket, hold the CPU by its edges and follow the instructions below:

Step 5: Correctly orientate the CPU with the IHS (Integrated Heat Sink) side facing upward.

Step 6: Locate the pin 1 mark on the CPU.

Step 7: Gently insert the CPU into the socket.

Step 8: Rotate the retention screw into the locked position. (See **Figure 4-2**)
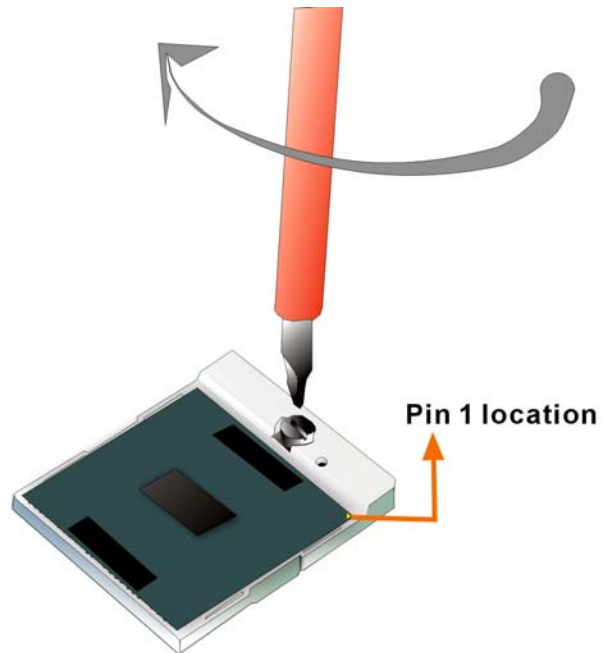
Figure 4-2: Lock the CPU Socket Retention Screw

4.4.2 Cooling Kit (CF-479B-RS) Installation

Figure 4-3: IEI CF-479B-RS Cooling Kit

IEI provides a cooling kit designed for socket 479 CPUs. (See **Figure 4-3**) The cooling kit is comprised of a CPU heat sink and a cooling fan.

 NOTE:

The CF-479B-RS heat sink comes with a sprayed layer of thermal paste.

> Make sure the paste is not accidentally wiped during the unpacking or installation of the heat sink. Thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU**.   Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit.** Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Secure the cooling kit.** From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 4-4**)
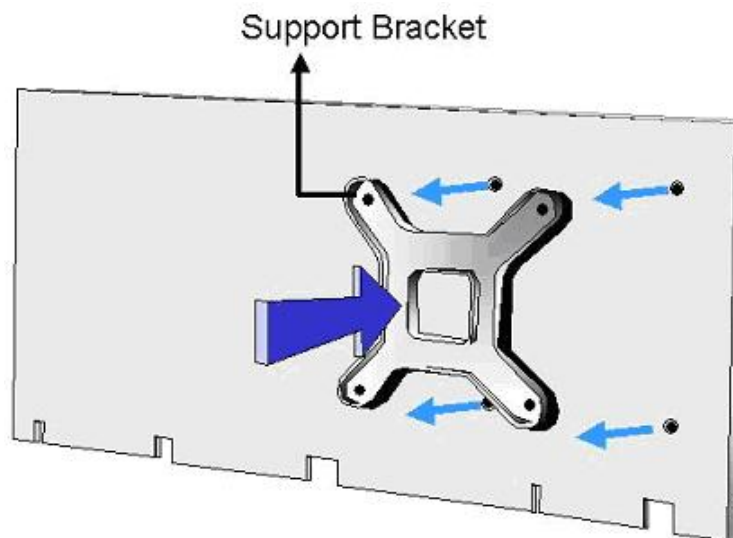
Figure 4-4: Securing the Cooling Kit

Step 4: **Tighten the screws.** Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. (See **Figure 4-5**)
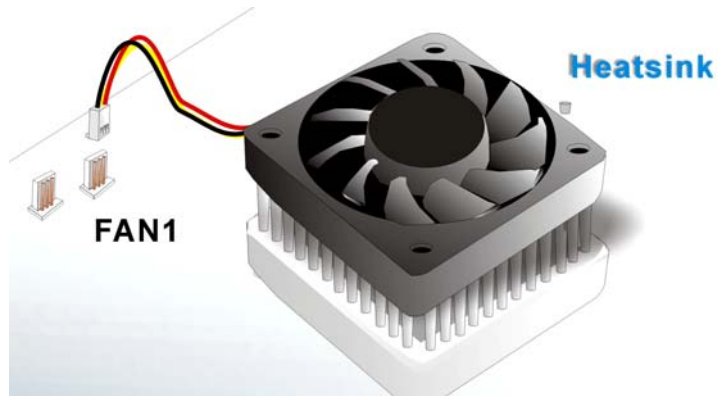
Figure 4-5: Connect the cooling fan cable

4.4.3 DIMM Module Installation

4.4.3.1 Purchasing the Memory Module

![warning icon] **WARNING!**

> When purchasing the DIMM modules, make sure the modules are compatible with the DIMM slot specified in **Section 2.6 Memory Support**.

![warning icon] **WARNING!**

> The board supports DDR2 DIMM modules only. DDR1 and DDR2 are not compatible. If a DDR1 DIMM module is installed, the system may be damaged and become inaccessible. Please only use DDR2 DIMM modules.

4.4.3.2 DIMM Module Installation

The KINO-9452 has two 240-pin DDR2 SDRAM DIMM sockets. Follow the steps below to install the DIMM modules.

Step 1: Make sure the two handles of the DIMM socket are in the "open" position, leaning outward (**Figure 4-6**).
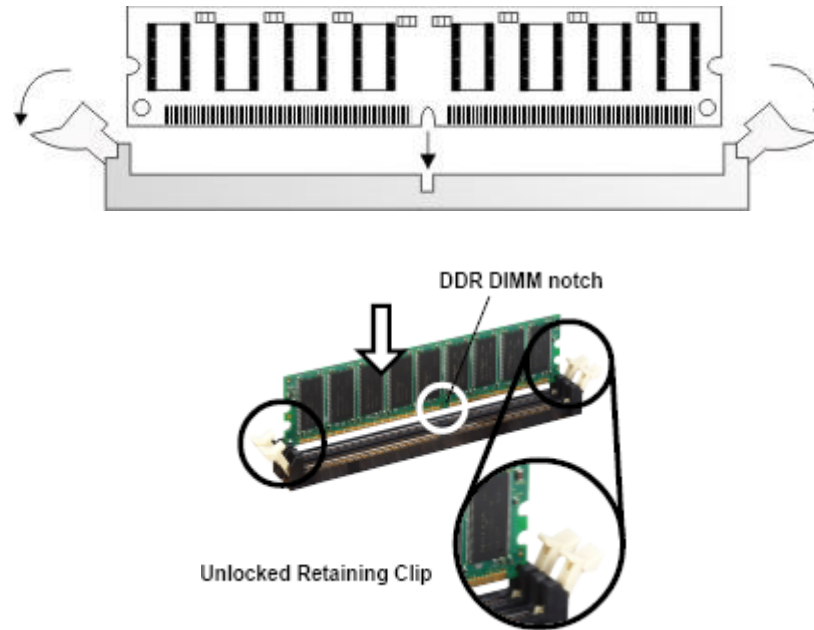
Figure 4-6: Installing the DIMM Module

Step 2: Slowly slide the DIMM module along the plastic guides on both ends of the socket. Press the DIMM module down into the socket until it clicks into position and the two handles have automatically locked the memory module into place (**Figure 4-7**).
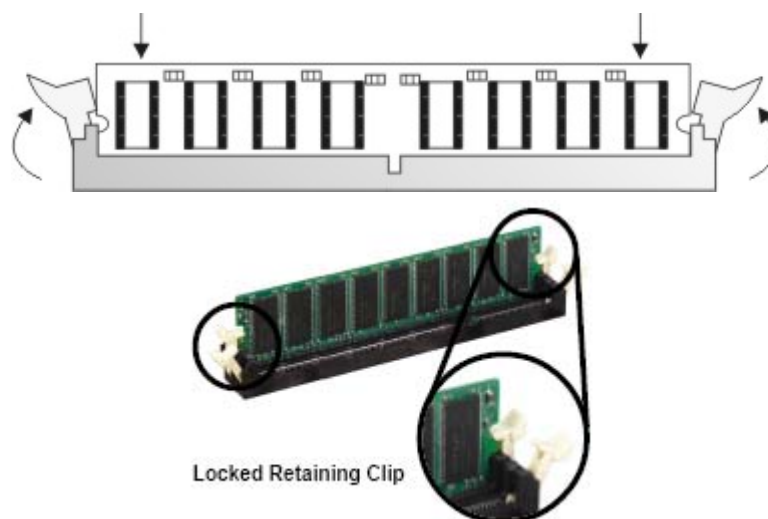
Figure 4-7: Locking the DIMM Module

Step 3: To remove the memory module, push both handles outward, and the memory

module is ejected by the mechanism in the socket.

4.4.4 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the motherboard are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

Quantity	Type
1	IDE flat cable
2	SATA cables
1	SATA power cable
2	RS-232 cables
1	HDTV-out cable

Table 4-1: IEI Provided Cables

4.4.4.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the motherboard to the IDE device is a standard 40-pin ATA/100 flat cable. To connect an IDE device to the motherboard, follow the instructions below.

Step 1: Find the IDE flat cable in the kit that came with the motherboard.

Step 2: Connect one end of the cable to the IDE connector on the motherboard. A keyed pin on the IDE connector prevents it from being connected incorrectly.

Step 3: Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.

Step 4: Connect the other side of the cable to the IDE device making sure that the pin 1 cable corresponds to pin 1 on the connector.
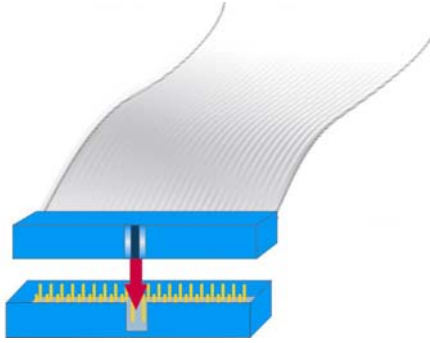
Figure 4-8: Connection of IDE Connector

![NOTE icon] **NOTE:**

> When two IDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

4.4.4.2 COM Port Connectors

The KINO-9452 provides four serial ports (COM1, COM2, COM3 and COM4) interfaced through two 10-pin male headers (COM3 and COM4), one 14-pin male headers (COM2) and one DB-9 connector (COM1). The serial ports facilitate the connection to serial devices or a communications network, e.g., terminal console.

4.5 On-board Jumpers

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two 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.
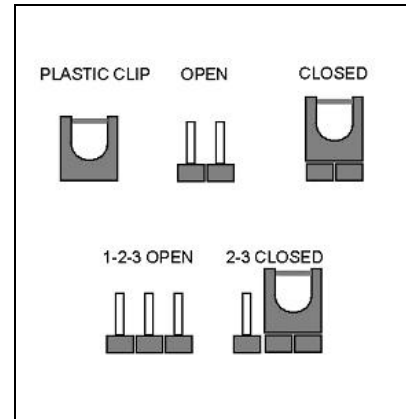
Figure 4-9 Jumper

The KINO-9452 motherboard has three on-board jumpers. The jumpers are described in **Table 4-2**.

Description	Label	Type
Clear CMOS	JP3	3-pin header
COM2 mode selection	JP1	3-pin header
LVDS LCD voltage selection	JP2	6-pin header

Table 4-2: On-board Jumpers
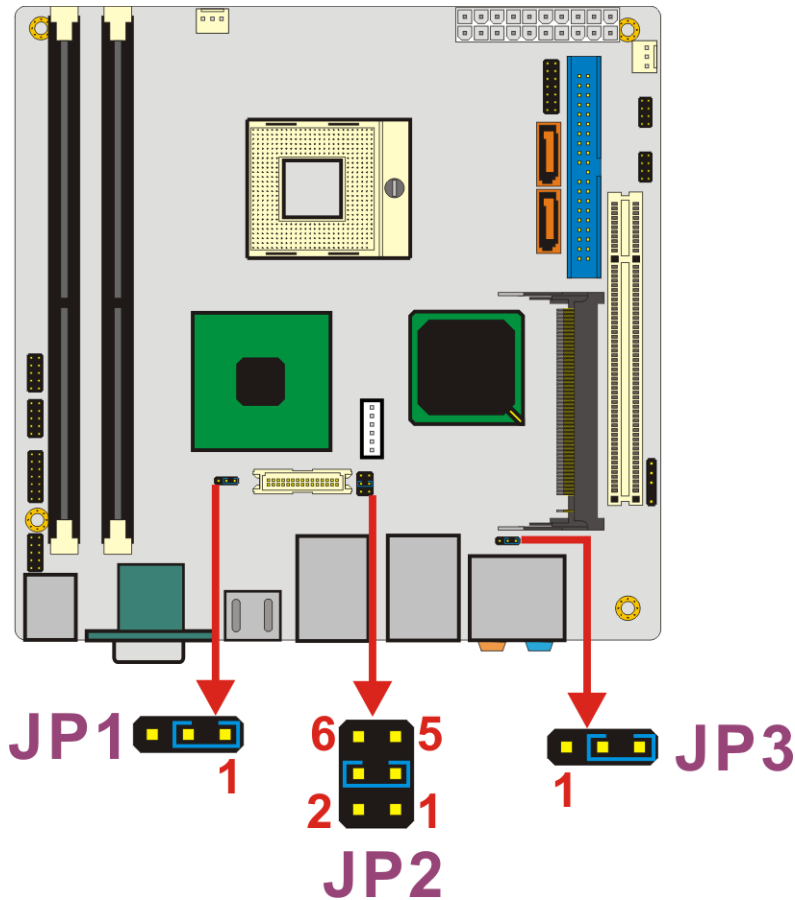
Figure 4-10: Jumper Locations

4.5.1 Clear CMOS Jumper

Jumper Label:	JP3
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-3
Jumper Location:	See Figure 4-10

If the KINO-9452 fails to boot due to improper BIOS settings, use this jumper to clear the CMOS data and reset the system BIOS information.   To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

Clear CMOS	DESCRIPTION
Short 1-2	Normal Operation (Default)
Short 2-3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

The clear CMOS jumper is located in **Figure 4-10**.

4.5.2 COM2 Mode Selection

Jumper Label: JP1

Jumper Type: 3-pin header

Jumper Settings: See Table 4-4

Jumper Location: See Figure 4-10

This jumper configures the COM2 connector as an RS-232 serial port or an RS-422/RS-485 serial port. The selection options are shown in **Table 4-4**.

JP1	DESCRIPTION
Short 1-2	RS-232 (Default)
Short 2-3	RS-422/RS-485

Table 4-4: JP1 Jumper Settings

4.5.3 LVDS LCD Voltage Selection

WARNING:

Making the wrong setting on this jumper may cause irreparable damage to both the motherboard and the LCD screen connected to the onboard connector.

Jumper Label: JP2

Jumper Type: 6-pin header

Jumper Settings: See Table 4-5

Jumper Location: See Figure 4-10

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 4-5**.

JP2	DESCRIPTION
1-2	+3V
3-4	+5V
5-6	+12V

Table 4-5: JP2 Jumper Settings

4.6 Chassis Installation

After the CPU, the cooling kit, and the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configure, the motherboard can be mounted into chassis.

To mount the motherboard into a chassis please refer to the chassis user guide that came with the product.

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4.7 Rear Panel Connectors

4.7.1 LCD Panel Connection

The conventional CRT monitor connector is a 15-pin, female D-SUB connector. Pin assignments can be seen in that can be connected to external monitors.

4.7.2 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 1Gb/s.

4.7.3 USB Connection

The rear panel USB connectors provide easier and quicker access to external USB devices. The rear panel USB connector is a standard connector and can easily be connected to other USB devices.

4.7.4 Serial Connection

The rear panel serial connector (COM1) provides easy and quick access to external serial devices.

4.7.5 Keyboard and Mouse Connection

A PS/2 keyboard and a PS/2 mouse can be connected to the appropriate PS/2 connector on the rear panel.

4.7.6 Audio Interface

Value 7.1+2 Channel High Definition Audio (HDA) signals are interfaced through the audio jack connectors. The signals include microphone line-in, line-in stereo, Center/Subwoofer speaker out, rear speaker out and side speaker out.

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Chapter

5

AMI BIOS Setup

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

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

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

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

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 4**, **Section 4.5.1**.

5.1.5 BIOS Menu Bar

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

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

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

5.2 Main

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

```
                    BIOS SETUP UTILITY
 Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

 System Overview                              Use [ENTER], [TAB]
                                              or [SHIFT-TAB] to
 AMIBIOS                                      select a field.
 Version   :08.00.13
 Build Date:09/07/06                          Use [+] or [-] to
 ID        :E030MR01                          configure system Time.

 Processor
 Type      :
 Speed     :255MHz
 Count     :255
                                              ←     Select Screen
 System Memory                                ↑↓    Select Item
 Size      :504MB                             +-    Change Field
                                              Tab   Select Field
 System Time          [03:35:26]              F1    General Help
 System Date          [Thu 09/07/2006]        F10   Save and Exit
                                              ESC   Exit

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```

BIOS Menu 1: Main

➔ **System Overview**

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

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

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

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■ **System Time [xx:xx:xx]**: The system time is set here.

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

5.3 Advanced

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

WARNING:

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

■ CPU Configuration (see Section 5.3.1)

■ IDE Configuration (see Section 5.3.2)

■ SuperIO Configuration (see Section 5.3.3)

■ Hardware Health Configuration (see Section 5.3.4)

■ ACPI Configuration (see Section 5.3.5)

■ APM Configuration (see Section 5.3.6)

■ MPS Configuration (see Section 5.3.7)

■ Remote Access Configuration (see Section 5.3.8)

■ USB Configuration (see Section 5.3.9)

```
                        BIOS SETUP UTILITY
   Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

   Advanced Settings                              Configure CPU.

   WARNING: Setting wrong values in below sections
            may cause system to malfunction.

  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ SuperIO Configuration
  ▶ Hardware Health Configuration
  ▶ ACPI Configuration
  ▶ APM Configuration
  ▶ MPS Configuration
  ▶ Remote Access Configuration            ←    Select Screen
  ▶ USB Configuration                      ↑↓    Select Item
                                          Enter Go to Sub Screen
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit


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```

BIOS Menu 2: Advanced

5.3.1 CPU Configuration

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

```
                        BIOS SETUP UTILITY
    Advanced

 Configure advanced CPU settings
 Module Version -13.03


 Manufacturer:Intel
 Brand String:
 Frequency    :255MHz
 FSB Speed    :667MHz

 Cache L1     :0 KB
 Cache L2     :0 KB


                                           ←     Select Screen
                                           ↑↓    Select Item
                                           F1    General Help
                                           F10   Save and Exit
                                           ESC   Exit



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```
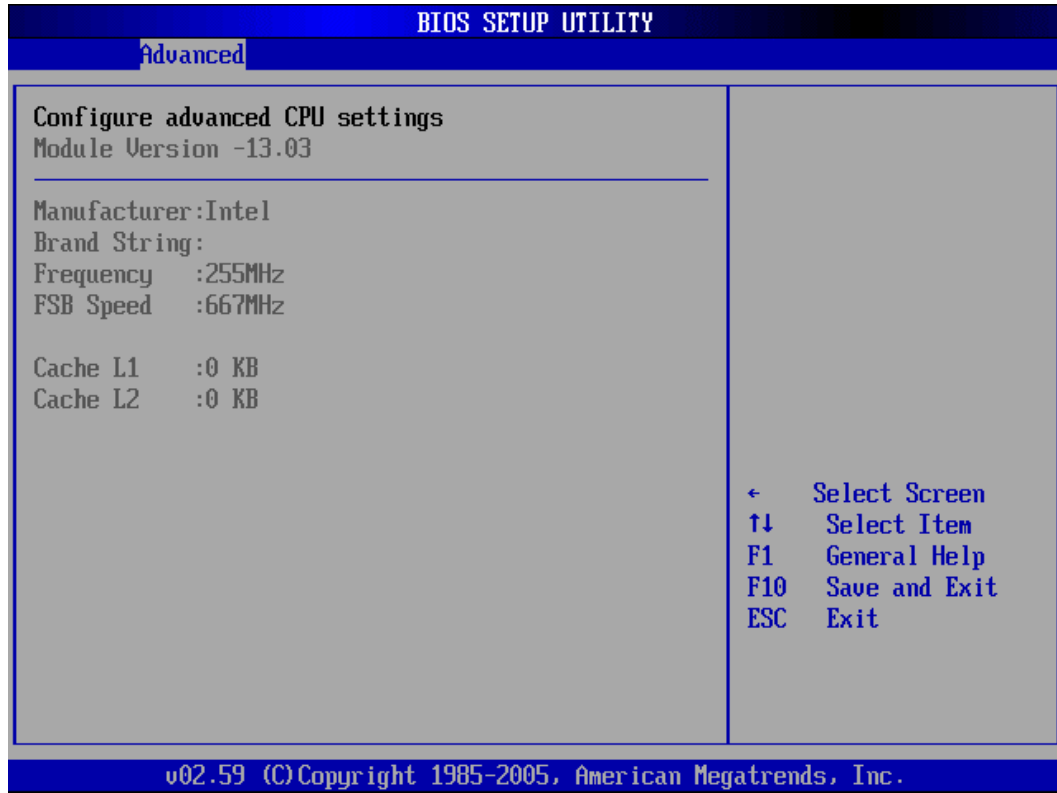
BIOS Menu 3: CPU Configuration

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

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

5.3.2 IDE Configuration

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

```
                      BIOS SETUP UTILITY
       Advanced

 IDE Configuration                                        Options

 ATA/IDE Configuration           [Compatible]       Disabled
    Legacy IDE Channels          [SATA Pri, PATA Sec]  Compatible
                                                     Enhanced
  ▶ Primary IDE Master           : [Not Detected]
  ▶ Primary IDE Slave            : [Not Detected]
  ▶ Secondary IDE Master         : [Not Detected]
  ▶ Secondary IDE Slave          : [Not Detected]


                                                     ←    Select Screen
                                                     ↑↓    Select Item
                                                     +-    Change Option
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit


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```
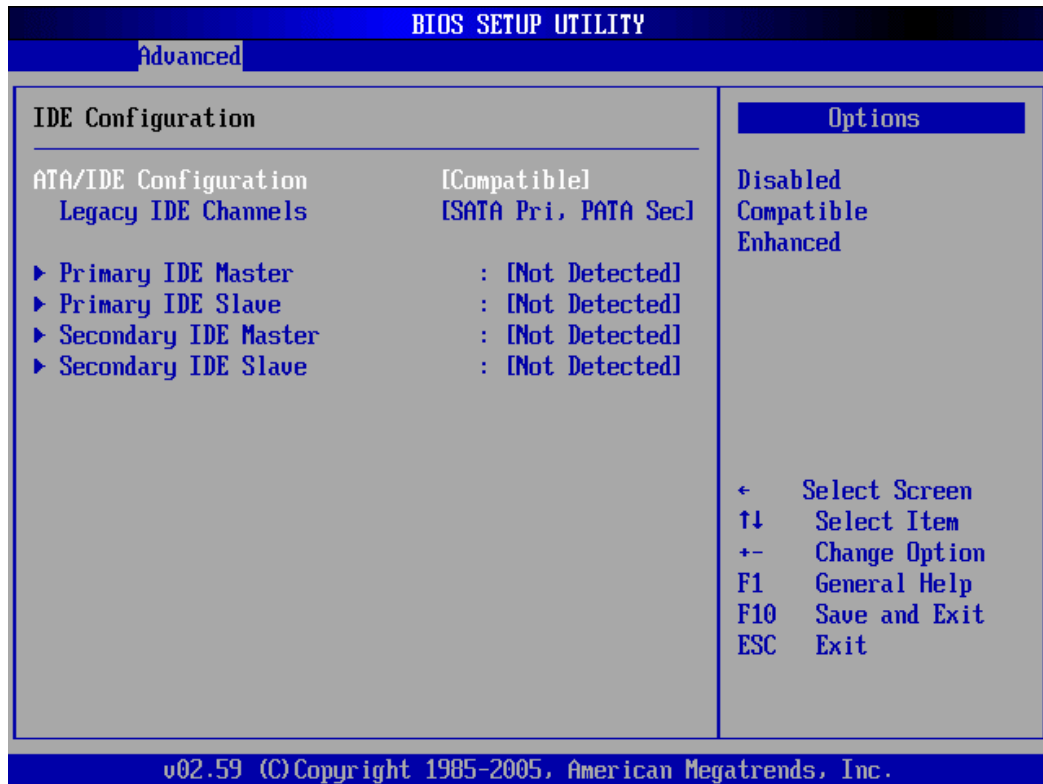
BIOS Menu 4: IDE Configuration

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

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

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

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

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

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

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

➔ **SATA Only**   Enable up to two SATA devices

➔ **Reserved**   The legacy IDE channels are reserved

➔ **SATA Pri, DEFAULT PATA Sec**   This option allows the system to access the SATA devices before the primary IDE devices

➔ **PATA Only**   Enable the two primary IDE devices. Select this option only when the two primary IDE devices are available

➔ **IDE Master and IDE Slave**

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

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

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

5.3.2.1 IDE Master, IDE Slave

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

```
                        BIOS SETUP UTILITY
     Advanced

 Primary IDE Master                              Select the type
─────────────────────────────────────────       of device connected
 Device    :Not Detected                         to the system.
─────────────────────────────────────────

 Type                          [Auto]
 LBA/Large Mode                [Auto]
 Block (Multi-Sector Transfer) [Auto]
 PIO Mode                      [Auto]
 DMA Mode                      [Auto]
 S.M.A.R.T.                    [Auto]
 32Bit Data Transfer           [Enabled]


                                              ←    Select Screen
                                              ↑↓   Select Item
                                              +-   Change Option
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit


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```

<center>**BIOS Menu 5: IDE Master and IDE Slave Configuration**</center>

➔ **Type [Auto]**

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

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

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

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

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

        ➔ **ZIP**

        ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

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

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

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

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

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

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

➔ **PIO Mode [Auto]**

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

➔ **Auto** DEFAULT This setting allows the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

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

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

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

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

➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

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

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

➔ **S.M.A.R.T [Auto]**

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

➔ **Auto** DEFAULT BIOS to auto detects if the hard disk drive supports S.M.A.R.T. Use this setting if the IDE disk drive support cannot be determined.

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

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

➔ **32Bit Data Transfer [Enabled]**

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

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

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

5.3.3 Super IO Configuration

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

```
                      BIOS SETUP UTILITY
     Advanced

 Configure ITE8712 Super IO Chipset            Allows BIOS to Select
                                               Serial Port1 Base
 Serial Port1 Address        [3F8/IRQ4]        Addresses.
    Serial Port1 Mode        [Normal]
 Serial Port2 Address        [2F8/IRQ3]
    Serial Port2 Mode        [Normal]
 Serial Port3 Address        [3E8]
    Serial Port3 IRQ         [11]
 Serial Port4 Address        [2E8]
    Serial Port4 IRQ         [10]


                                               ←    Select Screen
                                               ↑↓   Select Item
                                               +-   Change Option
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit


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```

BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

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

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

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

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

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

➔ **Serial Port1 Mode [Normal]**

Allows BIOS to select the mode for Serial Port 1

➔ **Normal** DEFAULT Serial Port 1 mode is normal

➔ **IrDA**   Serial Port 1 mode is IrDA

➔ **ASK IR**   Serial Port 1 mode is ASK IR

➔ **Serial Port2 Address [2F8/IRQ3]**

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

➔ **Disabled**   No base address is assigned to Serial Port 2

➔ **2F8/IRQ3** DEFAULT Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

➔ **3E8/IRQ4**   Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4

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

➔ **Serial Port2 Mode [Normal]**

Allows BIOS to select the mode for Serial Port 2

➔ **Normal** **DEFAULT** Serial Port 2 mode is normal

➔ **IrDA** Serial Port 2 mode is IrDA

➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **Serial Port3 Address [3E8]**

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

➔ **Disabled** No base address is assigned to serial port 3

➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8

➔ **2E8** Serial port 3 I/O port address is 2E8

➔ **2F0** Serial port 3 I/O port address is 2F0

➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

The **Serial Port3 IRQ** selection sets the interrupt address for serial port 3.

➔ **10** Serial port 3 IRQ address is 10

➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

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

➔ **Disabled** No base address is assigned to serial port 4

➔ **3E8** Serial port 4 I/O port address is 3E8

➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8

➔ **2F0**   Serial port 4 I/O port address is 2F0

➔ **2E0**   Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

The **Serial Port4 IRQ** selection sets the interrupt address for serial port 4.

➔ **10**   DEFAULT   Serial port 4 IRQ address is 10

➔ **11**   Serial port 4 IRQ address is 11

5.3.4 Hardware Health Configuration

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

```
                          BIOS SETUP UTILITY
        Advanced

 Hardware Health Configuration                          Fan confiruration
 ────────────────────────────────                       mode setting
 CPU FAN Mode Setting          [Full On mode]

 CPU Temperature              :41°C/105°F
 System Temperature 1         :47°C/116°F
 System Temperature 2         :38°C/100°F

 CPU FAN Speed                :5443 RPM
 System FAN Speed             :N/A

 CPU Core                     :1.232 V
 +2.5V                        :2.512 V          ←    Select Screen
 +3.30V                       :3.264 V          ↑↓   Select Item
 +5.00V                       :5.088 V          +-   Change Option
 +12.0V                       :11.916 V         F1   General Help
 GMCH (1.5V)                  :1.488 V          F10  Save and Exit
 1.05V                        :1.040 V          ESC  Exit
 5VSB                         :5.088 V
 VBAT                         :3.136 V

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```

BIOS Menu 7: Hardware Health Configuration

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

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

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

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

- ➔ **CPU Temp. Limit of OFF**
- ➔ **CPU Temp. Limit of Start**
- ➔ **CPU Temp. Limit of Full**
- ➔ **CPU Fan Start PWM**
- ➔ **Slop PWM 1:** 0 PWM, 1 PWM (Default), 2 PWM, 4 PWM, 8 PWM, 16 PWM, 32 PWM or 64 PWM

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

- ➔ **CPU Fan PWM Control**

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

- **System Temperatures**: The following system temperatures are monitored
  - o CPU Temperature
  - o System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - o CPU Fan Speed
  - o System Fan Speed
- **Voltages**: The following system voltages are monitored
  - o CPU Core
  - o +2.5V

o +3.30V

o +5.00V

o +12.0V

o GMCH (1.5V)

o 1.05V

o 5VSB

o VBAT

5.3.5 ACPI Configuration

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

```
                           BIOS SETUP UTILITY
        Advanced

 ACPI Settings                                     Enable / Disable
                                                   ACPI support for
 ACPI Aware O/S                 [Yes]              Operating System.
 ▶ General ACPI Configuration
                                                   ENABLE: If OS
                                                   supports ACPI.

                                                   DISABLE: If OS
                                                   does not support
                                                   ACPI.


                                                   ←    Select Screen
                                                   ↑↓   Select Item
                                                   +-   Change Option
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit


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```
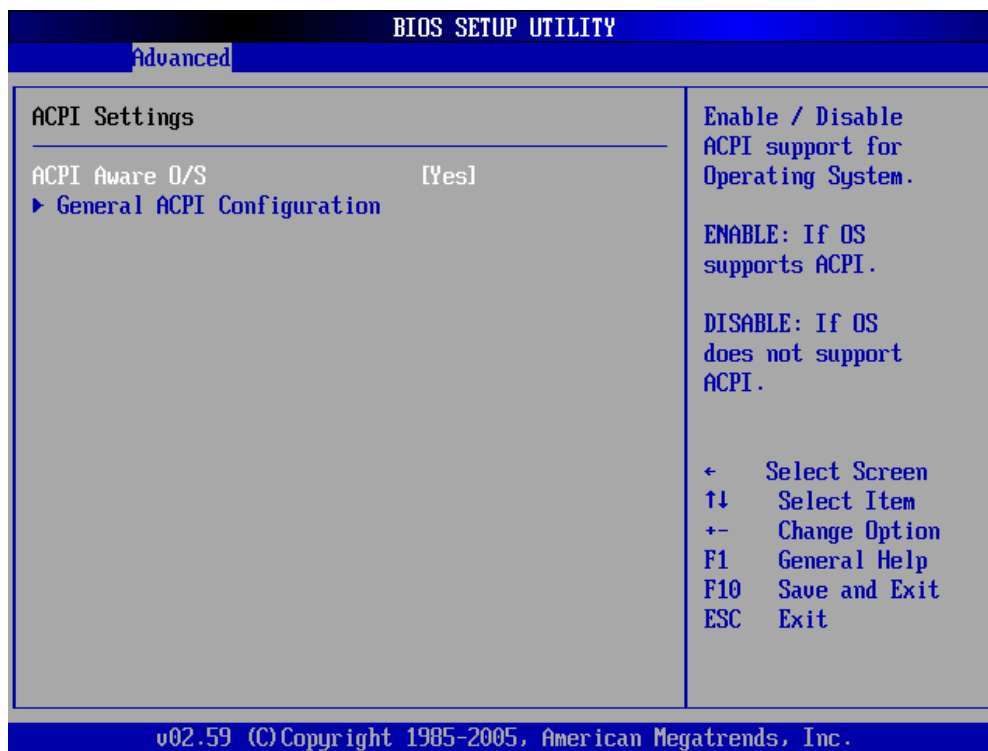
BIOS Menu 8: ACPI Configuration

➔ **ACPI Aware O/S [Yes]**

Use the **ACPI Aware O/S** option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

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➔ **No**   Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** DEFAULT   Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

5.3.5.1 General ACPI Configuration

Use the **General ACPI Configuration** menu (**BIOS Menu 9**) to select the ACPI state when the system is suspended.
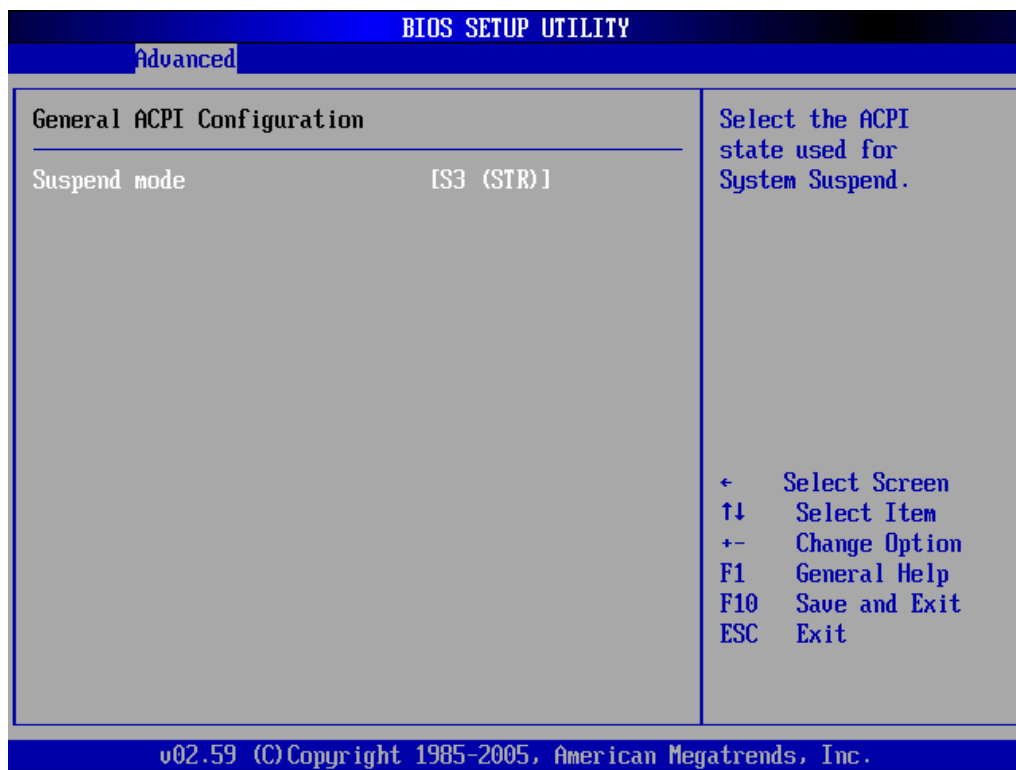
BIOS Menu 9: General ACPI Configuration [Advanced\ ACPI Configuration]

➔ **Suspend mode [S3 (STR)]**

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

➔ **S1 (POS)**   The system enters S1(POS) sleep state. The system

appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

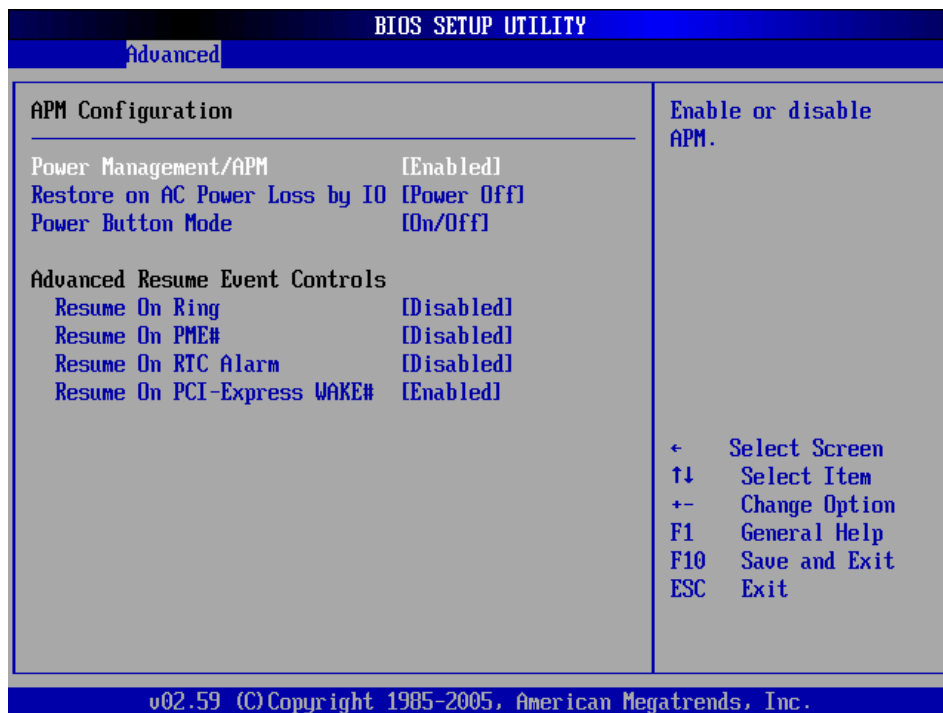➔ **S3 (STR)** **DEFAULT** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.6 APM Configuration

Use the **APM Configuration** menu (**BIOS Menu 10**) to select the advanced power management.

```
                        BIOS SETUP UTILITY
        Advanced

 APM Configuration                                    Enable or disable
 ─────────────────────────────────────────────        APM.
 Power Management/APM            [Enabled]
 Restore on AC Power Loss by IO  [Power Off]
 Power Button Mode               [On/Off]

 Advanced Resume Event Controls
   Resume On Ring                [Disabled]
   Resume On PME#                [Disabled]
   Resume On RTC Alarm           [Disabled]
   Resume On PCI-Express WAKE#   [Enabled]

                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit


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```

BIOS Menu 10: APM Configuration

➔ **Power Management/APM [Enabled]**

The **Power Management/APM** BIOS option accesses the advanced power management features.

➔ **Disabled** Disables the Advanced Power Management (APM)

feature

➔ **Enabled** DEFAULT Enables the APM feature

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

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

➔ **Power Off** DEFAULT The system remains turned off

➔ **Power On** The system turns on

➔ **Power Button Mode [On/Off]**

The **Power Button Mode** BIOS specifies how the power button functions.

➔ **On/Off** DEFAULT When the power button is pressed the system is either turned on or off

➔ **Resume on Ring [Disabled]**

The **Resume on Ring** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled** DEFAULT Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

➔ **Resume on PME# [Disabled]**

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

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

activity

➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

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

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

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

➔ **RTC Alarm Date (Days)**

➔ **RTC Alarm Time**

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

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

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

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

➔ **Enabled** DEFAULT Wake event generated by PCI-Express controller activity

5.3.7 MPS Configuration

Use the **MPS Configuration** menu (**BIOS Menu 11**) to select `he multi-processor table.
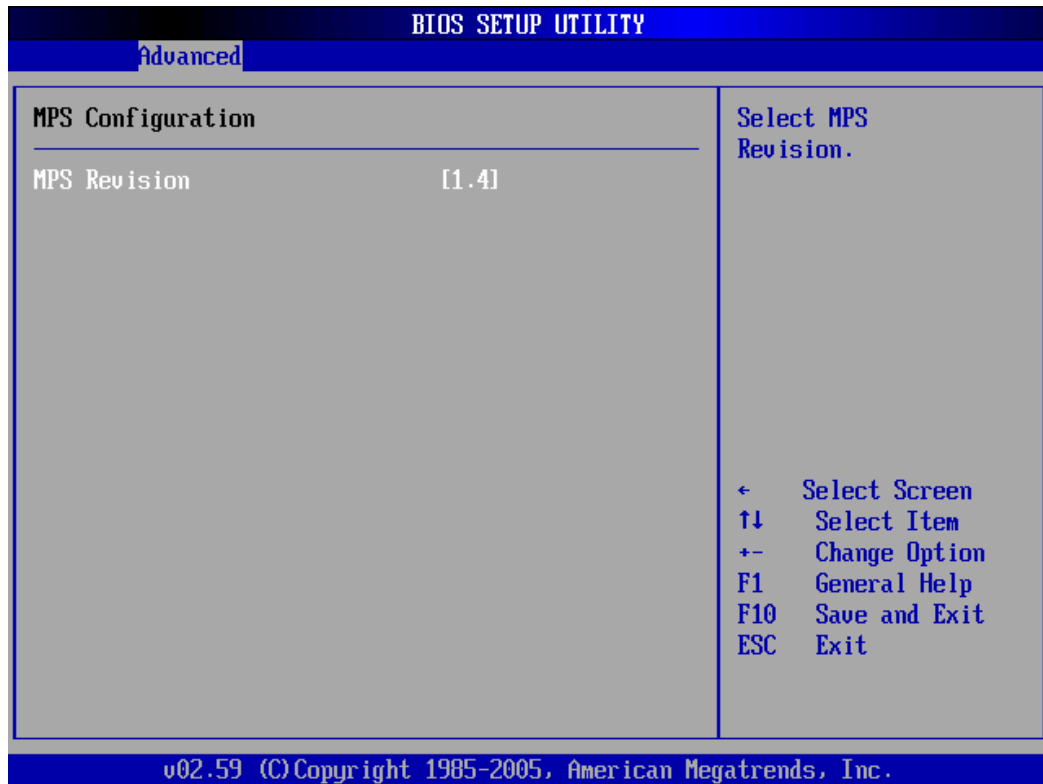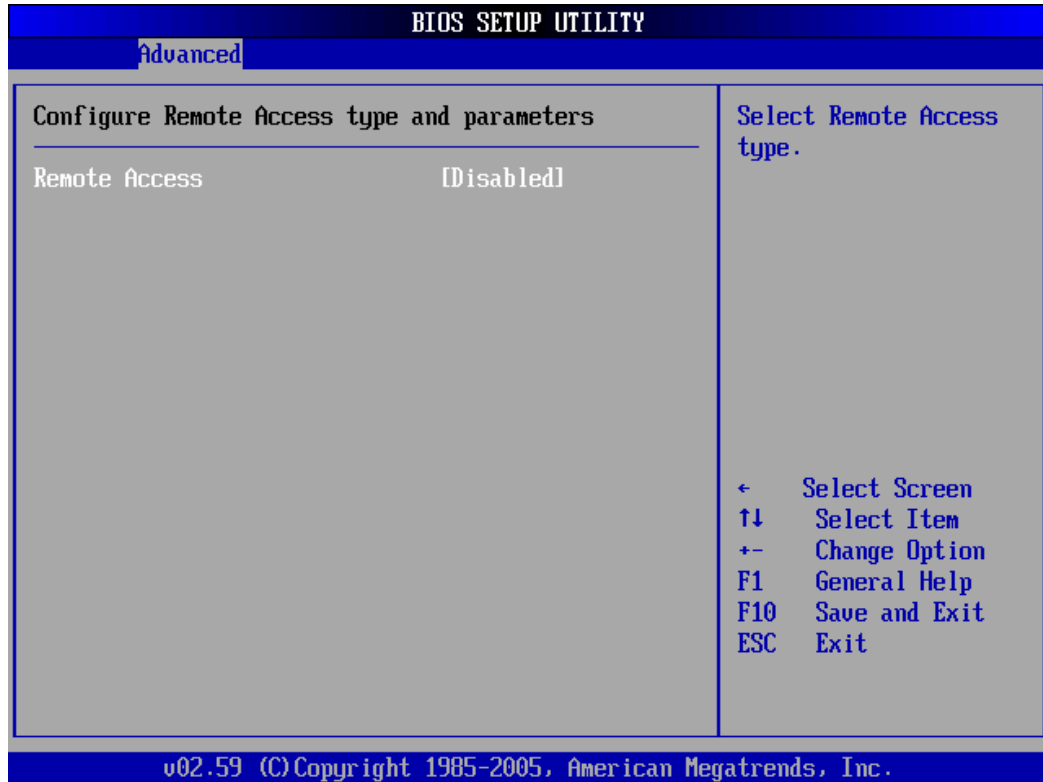
BIOS Menu 11: MPS Configuration

➔ **MPS Revision [1.4]**

Use the **Multiprocessor Specification (MPS) Revision** option to specify the MPS version to be used.

➔ **1.1**   MPS version 1.1 is used

➔ **1.4   DEFAULT**   MPS version 1.4 is used

5.3.8 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 12**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

BIOS Menu 12: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

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

➔ **Disabled**   **DEFAULT**   Remote access is disabled.

➔ **Enabled**   Remote access configuration options shown below appear:

         ➔ **Serial Port Number**

         ➔ **Serial Port Mode**

         ➔ **Flow Control**

         ➔ **Redirection after BIOS POST**

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➔ **Terminal Type**

➔ **VT-UTF8 Combo Key Support**

➔ **Sredir Memory Display Delay**

These configuration options are discussed below.

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.
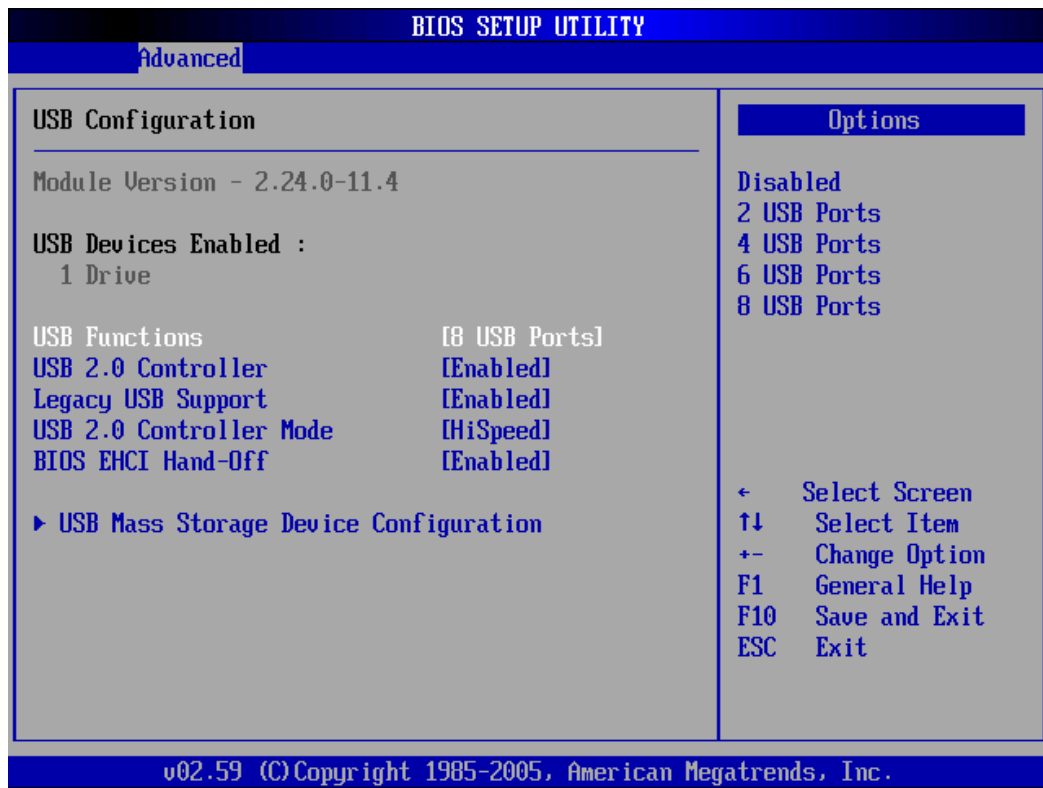
BIOS Menu 13: USB Configuration

➔ **USB Configuration**

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

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

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

➔ **USB Function [8 USB Ports]**

Use the **USB Function** BIOS option to disable USB function support or to set the number of USB ports to activate.

➔ **Disabled**　　　　　　USB function support disabled

➔ **2 USB Ports**　　　　　Two USB ports are activated.

➔ **4 USB Ports**　　　　　Four USB ports are activated.

➔ **6 USB Ports**　　　　　Six USB ports are activated.

➔ **8 USB Ports**　DEFAULT　Eight USB ports are activated.

➔ **USB 2.0 Controller [Enabled]**

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

➔ **Enabled**　DEFAULT　USB 2.0 controller enabled

➔ **Disabled**　　　　　　USB 2.0 controller disabled

➔ **Legacy USB Support [Enabled]**

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

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

➔ **Disabled**   Legacy USB support disabled

➔ **Enabled**   DEFAULT   Legacy USB support enabled

➔ **Auto**   Legacy USB support disabled if no USB devices are

connected

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

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

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

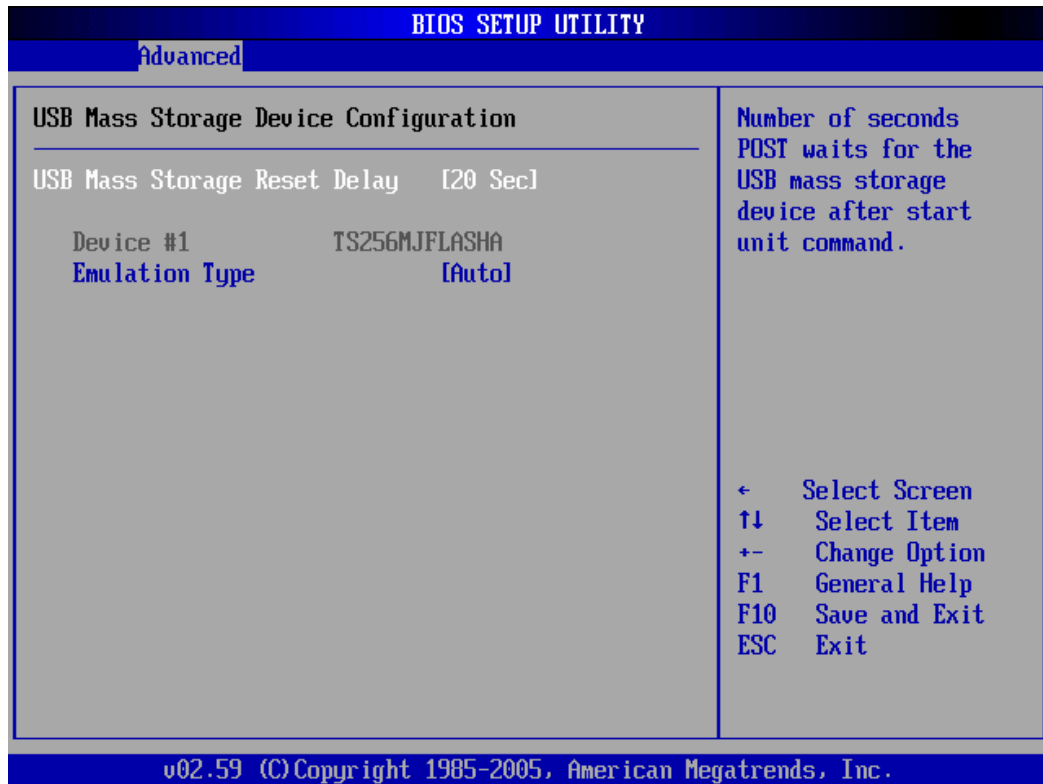➔ **HiSpeed**   DEFAULT   The controller is capable of operating at 480Mb/s

➔ **BIOS EHCI Handoff [Enabled]**

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

➔ **Disabled**   Systems with OSes that do not support EHCI can

use the EHCI handoff functionality.

➔ **Enabled**   DEFAULT   Systems with OSes that do not support EHCI cannot

use the EHCI handoff functionality.

5.3.9.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (**BIOS Menu 14**) to configure USB mass storage class devices.

```
                    BIOS SETUP UTILITY
        Advanced

 USB Mass Storage Device Configuration          Number of seconds
 ────────────────────────────────────────       POST waits for the
 USB Mass Storage Reset Delay    [20 Sec]        USB mass storage
                                                 device after start
    Device #1           TS256MJFLASHA            unit command.
    Emulation Type          [Auto]



                                                 ←    Select Screen
                                                 ↑↓   Select Item
                                                 +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit


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```

BIOS Menu 14: USB Mass Storage Device Configuration

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

 NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the

---

proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔ **Auto**   DEFAULT   BIOS auto-detects the current USB.

➔ **Floppy**   The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.

➔ **Forced FDD**   Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.

➔ **Hard Disk**   Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.

➔ **CDROM**   Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.
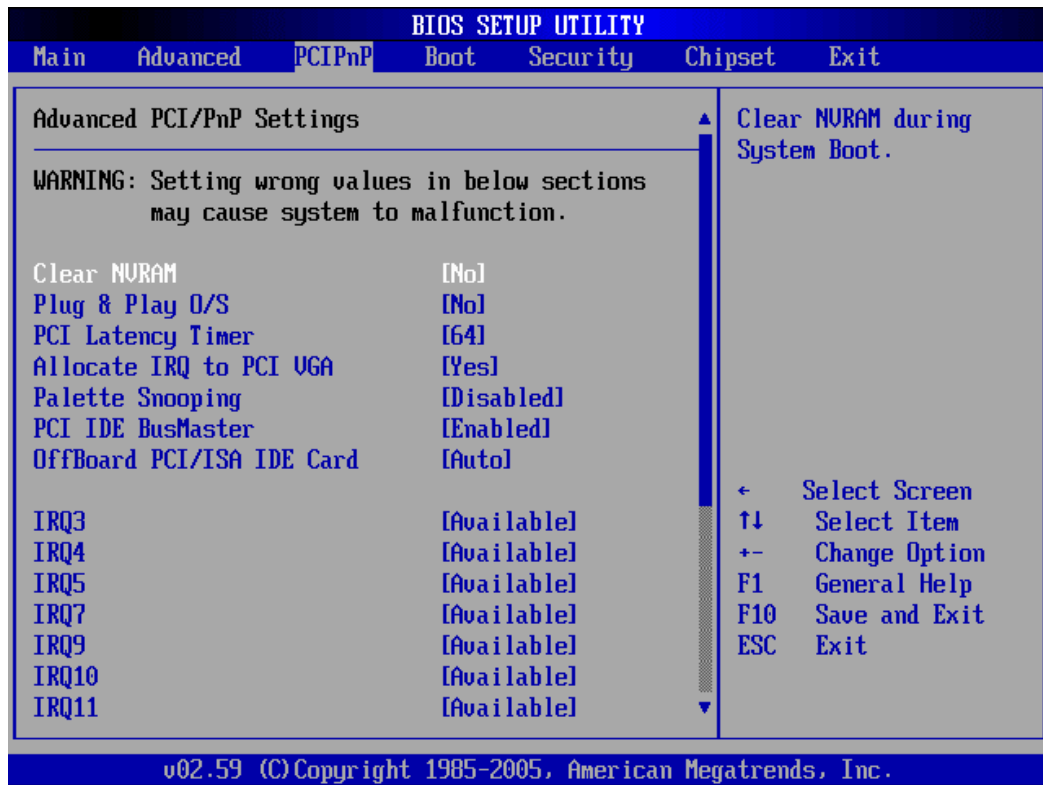
5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.

WARNING!

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

```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPnP    Boot    Security    Chipset    Exit

  Advanced PCI/PnP Settings                    ▲    Clear NVRAM during
                                                    System Boot.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  Clear NVRAM                      [No]
  Plug & Play O/S                  [No]
  PCI Latency Timer                [64]
  Allocate IRQ to PCI VGA          [Yes]
  Palette Snooping                 [Disabled]
  PCI IDE BusMaster                [Enabled]
  OffBoard PCI/ISA IDE Card        [Auto]
                                                    ←     Select Screen
  IRQ3                             [Available]      ↑↓    Select Item
  IRQ4                             [Available]      +-    Change Option
  IRQ5                             [Available]      F1    General Help
  IRQ7                             [Available]      F10   Save and Exit
  IRQ9                             [Available]      ESC   Exit
  IRQ10                            [Available]
  IRQ11                            [Available]  ▼

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```

BIOS Menu 15: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No**   **DEFAULT**   System does not clear NVRAM during system boot

➔ **Yes**   System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No**   **DEFAULT**   If the operating system does not meet the Plug and Play

specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes**   This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64   **DEFAULT**
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes   DEFAULT**   Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No**   Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled   DEFAULT**   Unless the VGA card manufacturer requires palette

snooping to be enabled, this option should be disabled.

➔ **Enabled**   PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Enabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled**   Busmastering is prevented

➔ **Enabled** DEFAULT   IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the **OffBoard PCI/ISA IDE Card** BIOS option to select the **OffBoard PCI/ISA IDE Card**.

➔ **Auto**   DEFAULT   The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.

➔ **PCI Slot 1**   PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.

➔ **PCI Slot 2**   PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3**   PCI Slot 3 is selected as the location of the OffBoard

PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4**   PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5**   PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6**   PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ#   [Available]**

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

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

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

Available IRQ addresses are:

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

■ IRQ 15

➔ **DMA Channel# [Available]**

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

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

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

Available DMA Channels are:

■ DM Channel 0
■ DM Channel 1
■ DM Channel 3
■ DM Channel 5
■ DM Channel 6
■ DM Channel 7

➔ **Reserved Memory Size [Disabled]**

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

➔ **Disabled** DEFAULT No memory block reserved for legacy ISA devices

➔ **16K** 16KB reserved for legacy ISA devices

➔ **32K** 32KB reserved for legacy ISA devices

➔ **64K** 54KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.

```
                    BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

  Boot Settings                                 Configure Settings
  ─────────────────────────────                during System Boot.
  ▶ Boot Settings Configuration

  ▶ Boot Device Priority
  ▶ Removable Drives


                                                ←     Select Screen
                                                ↑↓    Select Item
                                                Enter Go to Sub Screen
                                                F1    General Help
                                                F10   Save and Exit
                                                ESC   Exit


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```
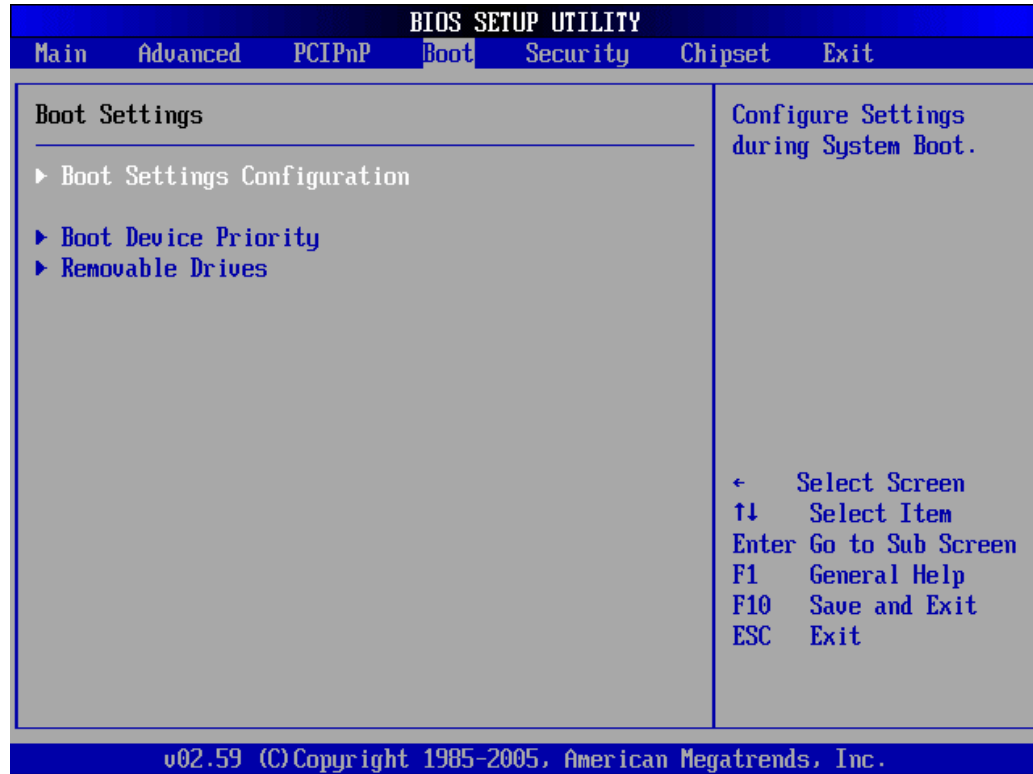
BIOS Menu 16: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 17**) to configure advanced system boot options.
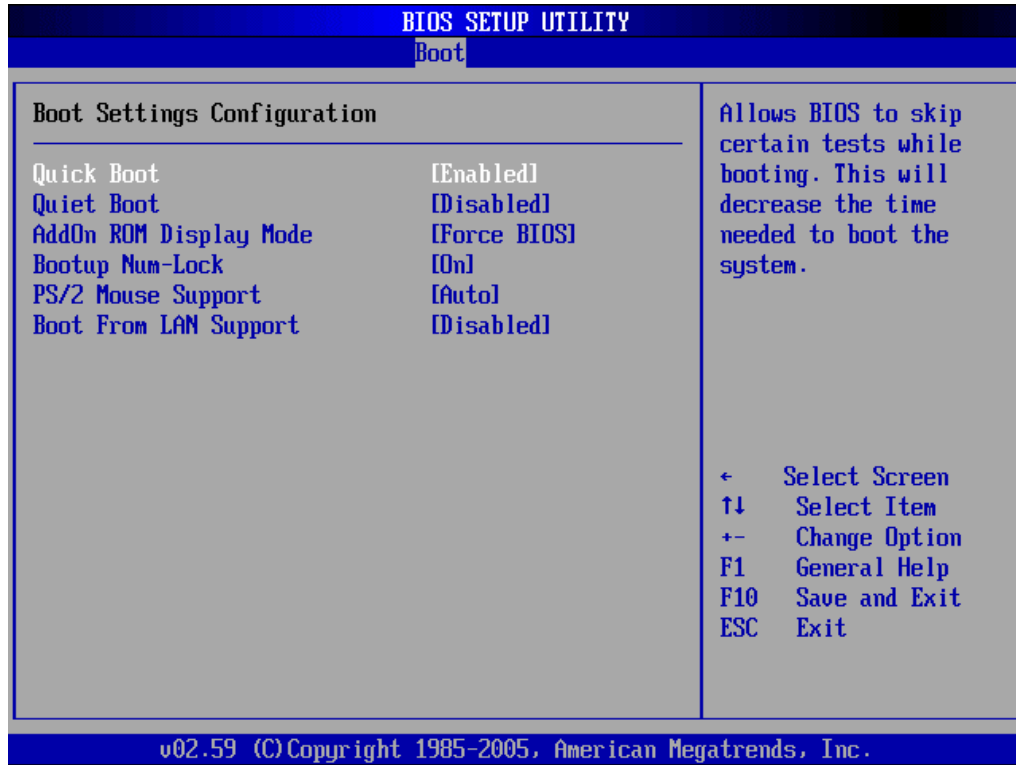
BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

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

➔ **Disabled** No POST procedures are skipped

➔ **Enabled** DEFAULT Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

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

➔ **Disabled** DEFAULT Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

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

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

➔ **Force BIOS**   DEFAULT   The system forces third party BIOS to display during system boot.

➔ **Keep Current**   The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

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

➔ **Off**   Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On**   DEFAULT   Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Auto]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

➔ **Disabled**   PS/2 mouse support is disabled and prevented from using system resources.

➔ **Enabled**   Allows the system to use a PS/2 mouse.

➔ **Auto** DEFAULT The system auto-adjusts PS/2 mouse support.

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

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

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

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

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD

```
                    BIOS SETUP UTILITY
                         Boot

 Boot Device Priority                         Specifies the boot
                                              sequence from the
 1st Boot Device        [USB: TS256MJFLASHA]  available devices.

                                              A device enclosed in
                                              parenthesis has been
                                              disabled in the
                                              corresponding type
                                              menu.



                                              ←     Select Screen
                                              ↑↓    Select Item
                                              +-    Change Option
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit


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```
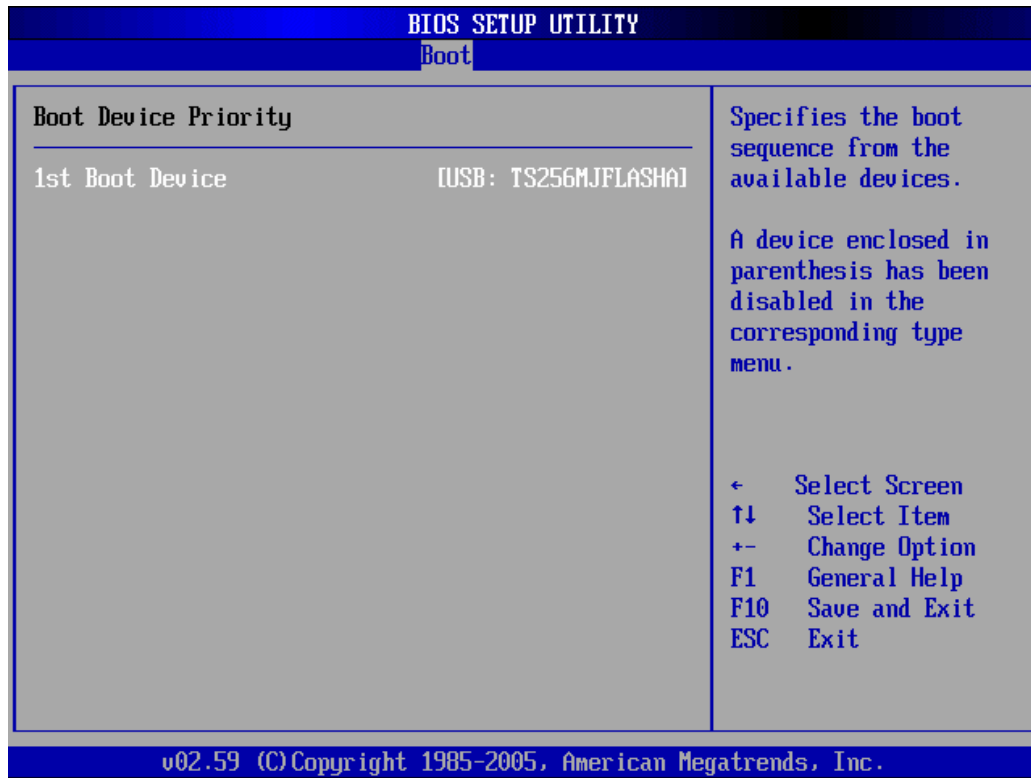
BIOS Menu 18: Boot Device Priority Settings

5.5.3 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 19**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

■ 1st Drive

NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available removable drives is shown. Select the first drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

```
                        BIOS SETUP UTILITY
                             Boot

Removable Drives                                 Specifies the boot
─────────────────────────────────────           sequence from the
1st Drive                    [USB: TS256MJFLASHA] available devices.




                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 +-    Change Option
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit

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```
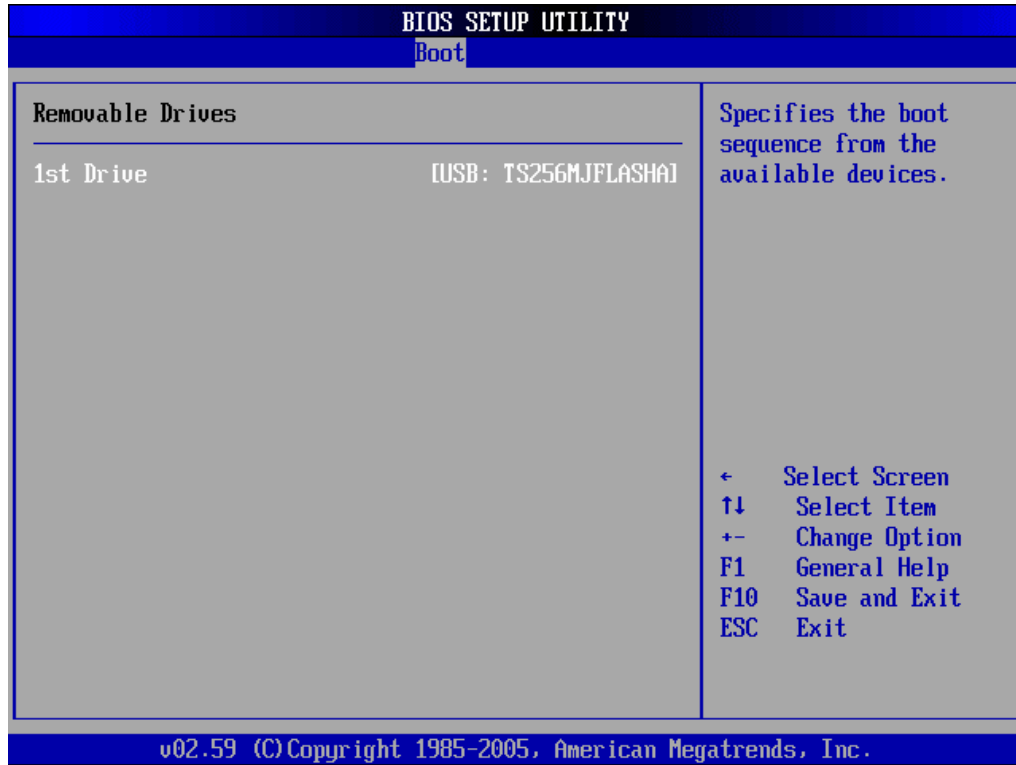
BIOS Menu 19: Removable Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.

```
                    BIOS SETUP UTILITY
  Main    Advanced   PCIPnP    Boot   Security   Chipset    Exit

  Security Settings                          Install or Change the
                                             password.
  Supervisor Password :Not Installed
  User Password       :Not Installed

  Change Supervisor Password
  Change User Password
  Clear User Password

                                             ←    Select Screen
                                             ↑↓    Select Item
                                             Enter Change
                                             F1    General Help
                                             F10   Save and Exit
                                             ESC   Exit

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```

BIOS Menu 20: Security

➔ **Change Supervisor Password**

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

➔ **Change User Password**

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

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 21**) to access the NorthBridge and SouthBridge configuration menus

---

⚠️ **WARNING!**

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

BIOS Menu 21: Chipset

5.7.1 North Bridge Configuration

Use the **North Bridge Configuration** menu (**BIOS Menu 22**) to configure the northbridge chipset.
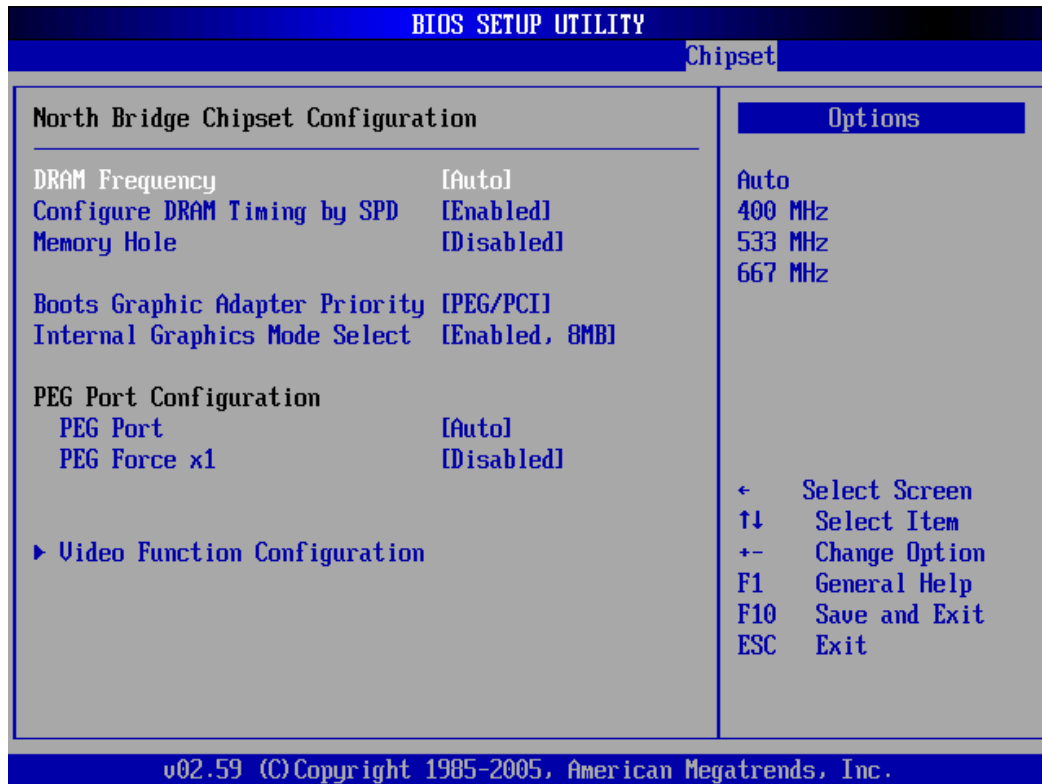
BIOS Menu 22: North Bridge Chipset Configuration

➔ **DRAM Frequency [Auto]**

Use the **DRAM Frequency** option to specify the DRAM frequency or allow the system to automatically detect the DRAM frequency.

➔ **Auto** **DEFAULT** Automatically selects the DRAM frequency

➔ **400MHz** Sets the DRAM frequency to 400MHz

➔ **533MHz** Sets the DRAM frequency to 533MHz

➔ **667MHz** Sets the DRAM frequency to 667MHz

➔ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD *(*Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual

components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

➔ **Disabled**   DRAM timing parameters are manually set using the DRAM sub-items

➔ **Enabled**   DEFAULT   DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD)

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- ◼ DRAM CAS# Latency [3]
- ◼ DRAM RAS# to CAS# Delay [5 DRAM Clocks]
- ◼ DRAM RAS# Precharge [5 DRAM Clocks]
- ◼ DRAM RAS# Activate to Precha [15 DRAM Clocks]

➔ **Memory Hole [Disabled]**

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

➔ **Disabled**   DEFAULT   Memory is not reserved for ISA expansion cards

➔ **15MB – 16MB**   Between 15MB and 16MB of memory is reserved for ISA expansion cards

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

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

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD
- PEG/PCI   **DEFAULT**

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

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

➔ **Disable**

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

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

➔ **PEG Port [Auto]**

Use the **PEG Port** option to enable or disable the PCI Express port.

➔ **Auto**   **DEFAULT**   BIOS auto detects the installed PEG cards

➔ **Disabled**   Installed PEG cards cannot function

➔ **PEG Force X1 [Disabled]**

Use the **PEG Force x1** option to convert a PCI express X16 slot into a PCI express X1 slot.

➔ **Enabled**   PCI express X16 slot runs in PCI express X1 mode

➔ **Disabled**   **DEFAULT**   PCI express X16 slot runs in normal mode

5.7.1.1 Video Function Configuration

Use the **Video Function Configuration** menu to configure the video device connected to the system.

➔ **DVMT Mode Select [DVMT Mode]**

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

➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.

➔ **DVMT Mode** DEFAULT Graphics memory is dynamically allocated according to the system and graphics needs.

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

➔ **DVMT/FIXED Memory [128MB]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Selec**t option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB DEFAULT
- Maximum DVMT

➔ **Boot Display Device [Auto]**

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

- Auto DEFAULT

➔ **Flat Panel Type [640*480]**

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

- 640*480 **DEFAULT**
- 800*600
- 1024*768
- 1280*1024 (36bits)
- 1400*1050 (36bits)
- 1600*1200 (36bits)
- 1280*768
- 1680*1050 (36bits)
- 1920*1200 (36bits)

➔ **Local Flat Panel Scaling [Auto]**

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

➔ **Auto** **DEFAULT** Scaling is automatic

➔ **Forced Scaling** Scaling is forced

➔ **Disabled** Scaling is disabled

➔ **TV Connector [Auto]**

Use the **TC Connector** option to select the connector that is used to connect the system to the television. The configuration option is listed below.

- Auto **DEFAULT**

➔ **TV Standard [VBIOS-Default]**

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

- VBIOS-Default **DEFAULT**

- NTSC
- PAL

5.7.2 South Bridge Configuration

The **SouthBridge Configuration** menu (**BIOS Menu 23**) the southbridge chipset to be configured.

```
                        BIOS SETUP UTILITY
                                            Chipset

South Bridge Chipset Configuration                    Options

Audio Controller           [Azalia]          Azalia
Onboard LAN1(BCM5787M)    :   [Enabled]       Disabled
Onboard LAN2(BCM5787M)    :   [Enabled]




                                             ←    Select Screen
                                             ↑↓   Select Item
                                             +-   Change Option
                                             F1   General Help
                                             F10  Save and Exit
                                             ESC  Exit



         v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.
```
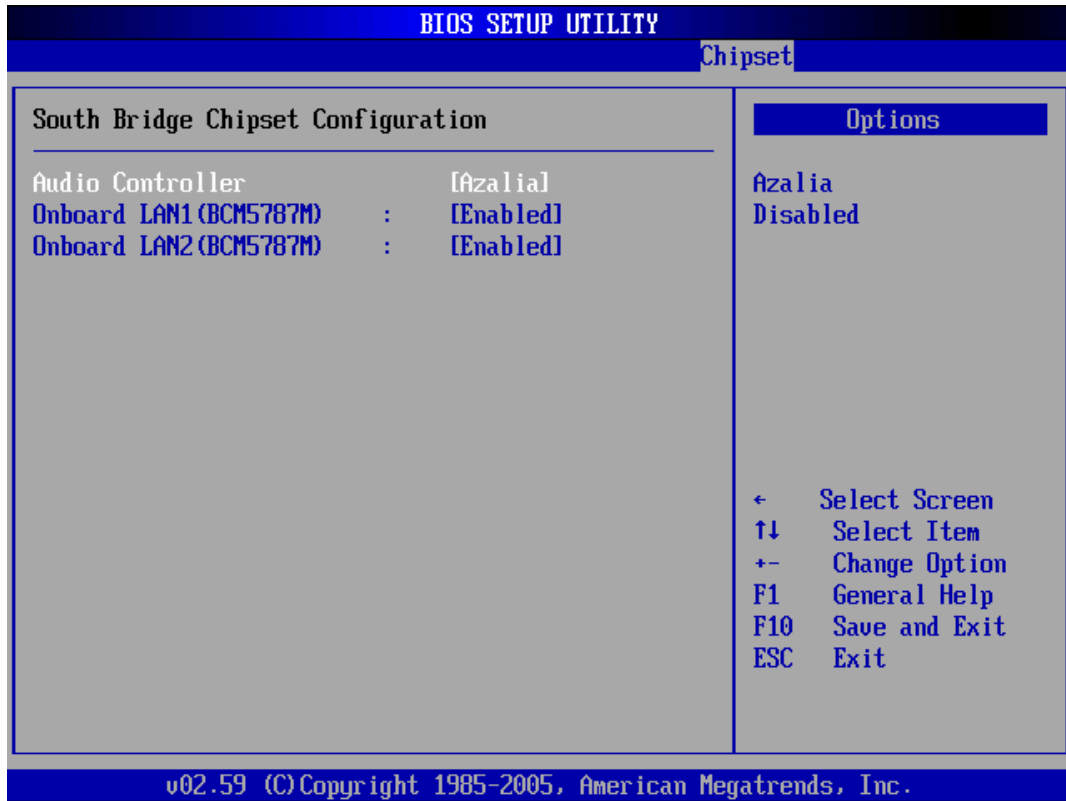
BIOS Menu 23:South Bridge Chipset Configuration

➔ **Audio Controller [Azalia]**

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

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

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

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

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

➔ **Disabled**   Onboard LAN1 controller manually disabled

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

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

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

➔ **Disabled**   Onboard LAN2 controller manually disabled

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

5.8 Exit

Use the **Exit** menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
                        BIOS SETUP UTILITY
  Main    Advanced   PCIPnP   Boot    Security    Chipset    Exit

  Exit Options                                    Exit system setup
  ───────────────────────────────                after saving the
  Save Changes and Exit                          changes.
  Discard Changes and Exit
  Discard Changes                                F10 key can be used
                                                 for this operation.
  Load Optimal Defaults
  Load Failsafe Defaults




                                                 ←    Select Screen
                                                 ↑↓    Select Item
                                                 Enter Go to Sub Screen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit



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```

BIOS Menu 24:Exit

➔ **Save Changes and Exit**

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

➔ **Discard Changes and Exit**

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

➔ **Discard Changes**

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

➔ **Load Optimal Defaults**

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

➔ **Load Failsafe Defaults**

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

Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

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

The KINO-9452 motherboard has the following software drivers:

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

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

6.2 Chipset Driver Installation

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

Step 1: Insert the CD into the system that contains the KINO-9452 board. Open the **1-INF** directory and locate the icon for the **infinst_autol.exe** installation file. Once located, use the mouse to double click the icon.

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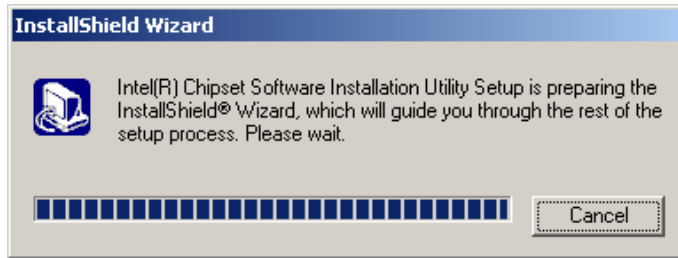
Figure 6-1: InstallShield Wizard Preparation Screen

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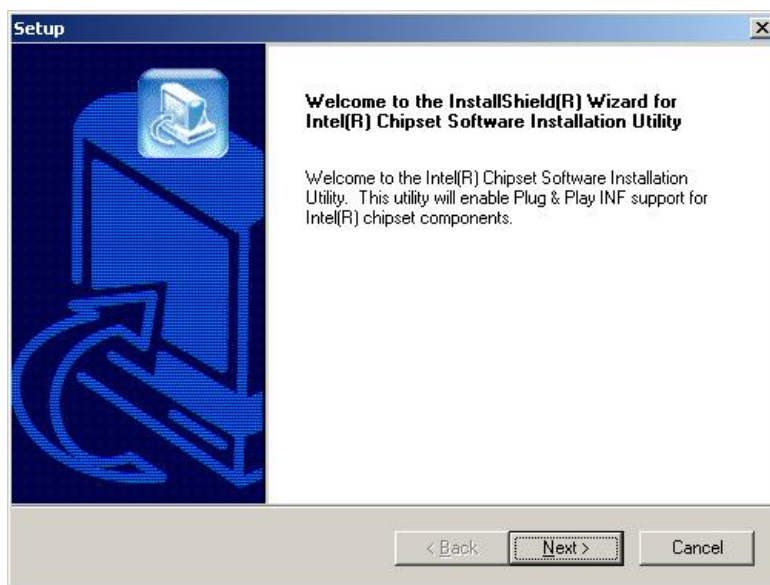
Figure 6-2: Welcome Screen

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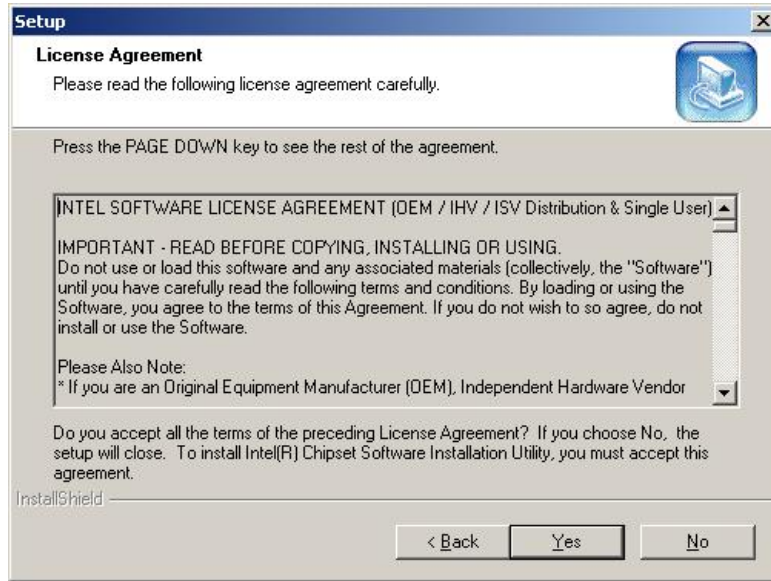
Figure 6-3: License Agreement

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

appears.
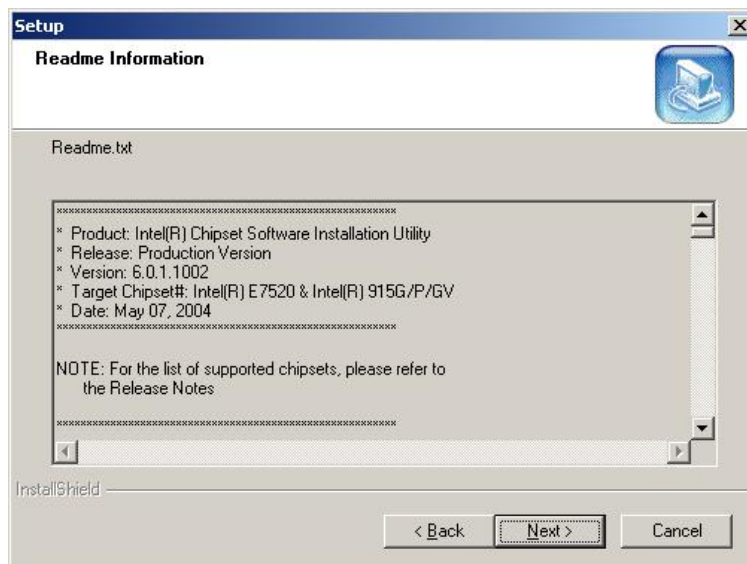
Figure 6-4: Readme Information

Step 6: Click "**YES**". The driver is installed on the computer. After the installation is

complete, the installation complete screen shown in **Figure 6-5** appears. Select

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

Figure 6-5: Restart the Computer

6.3 VGA Driver

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

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

Step 2: Open the **X:\2-VGA\WIN2K_XP** directory (where **X:** is the system CD drive)

and double-click the **win2k_xp1420.exe** installation file.

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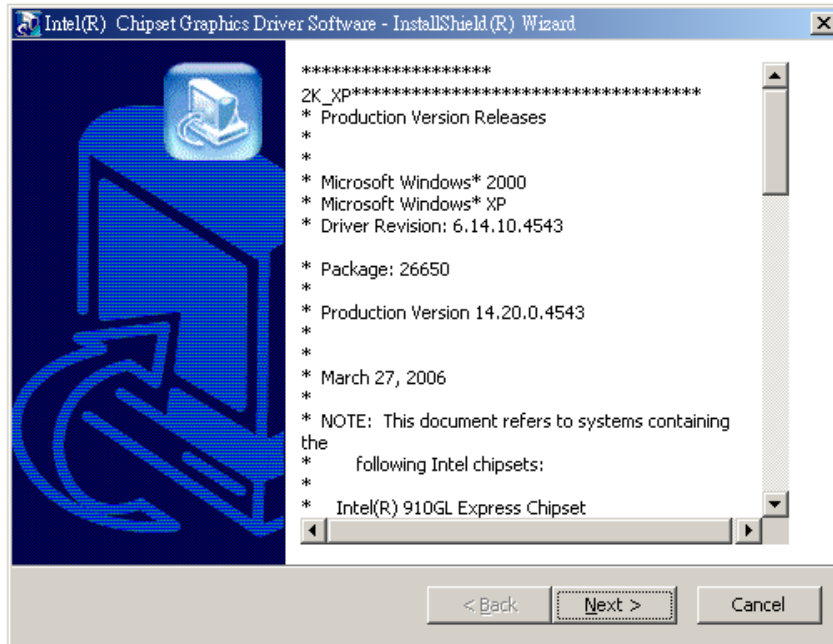
Figure 6-6: Starting Install Shield Wizard Screen

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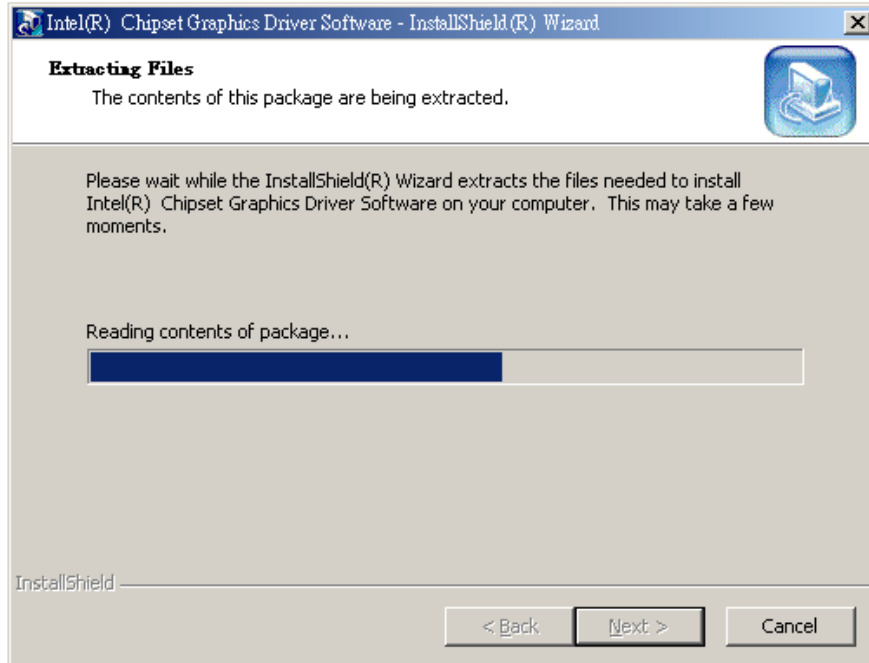
Figure 6-7: Preparing Setup Screen

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

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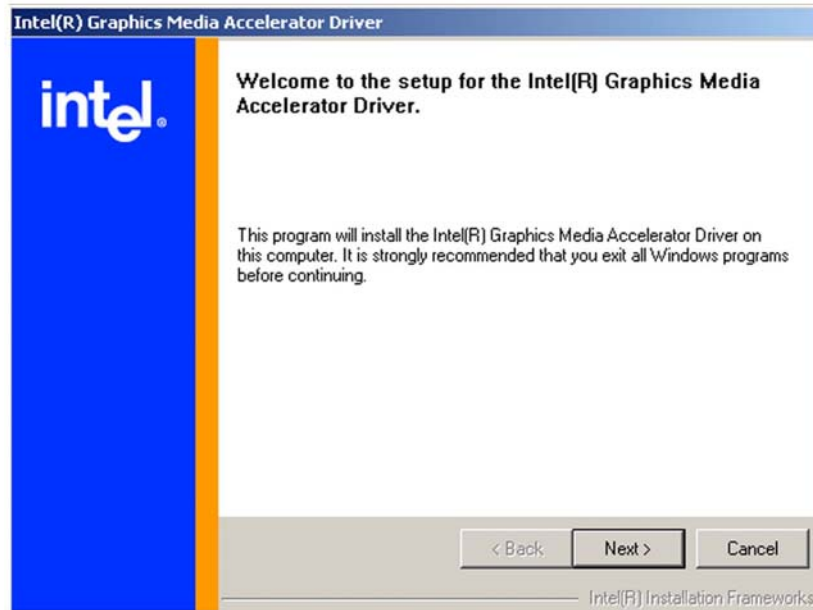
installation.

Figure 6-8: VGA Driver Installation Welcome Screen

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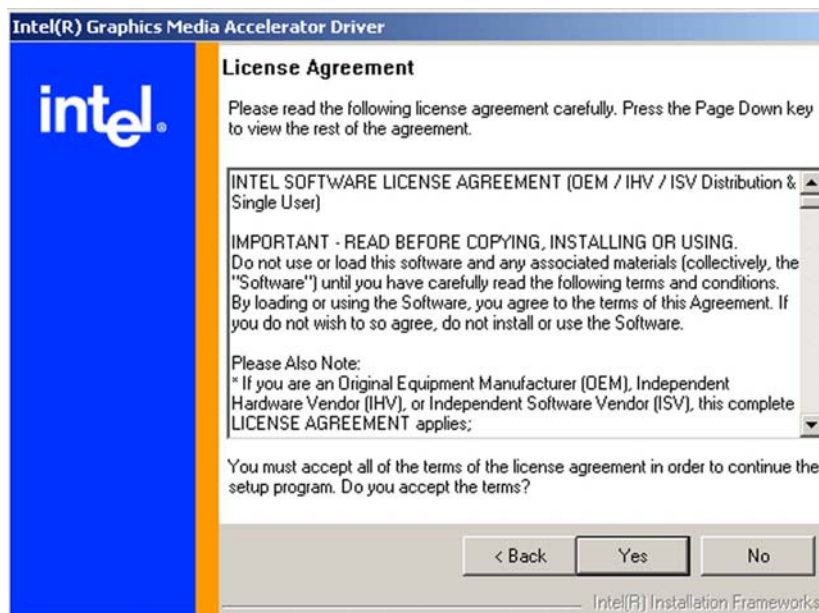
agreement.

Figure 6-9: VGA Driver License Agreement

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

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

Figure 6-10: VGA Driver Installing Notice

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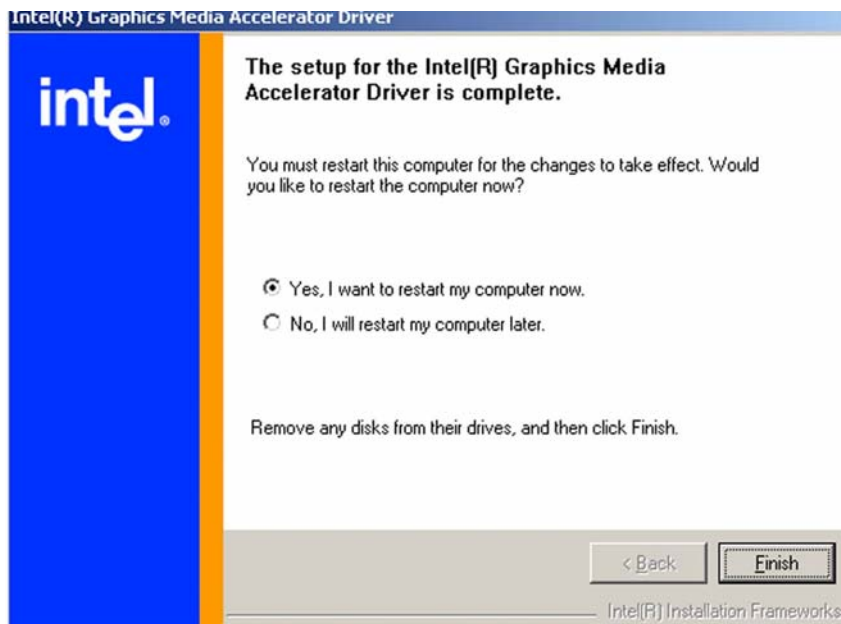
Figure 6-11: VGA Driver Installation Complete

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

6.4 Broadcom LAN Driver (for GbE LAN) Installation

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

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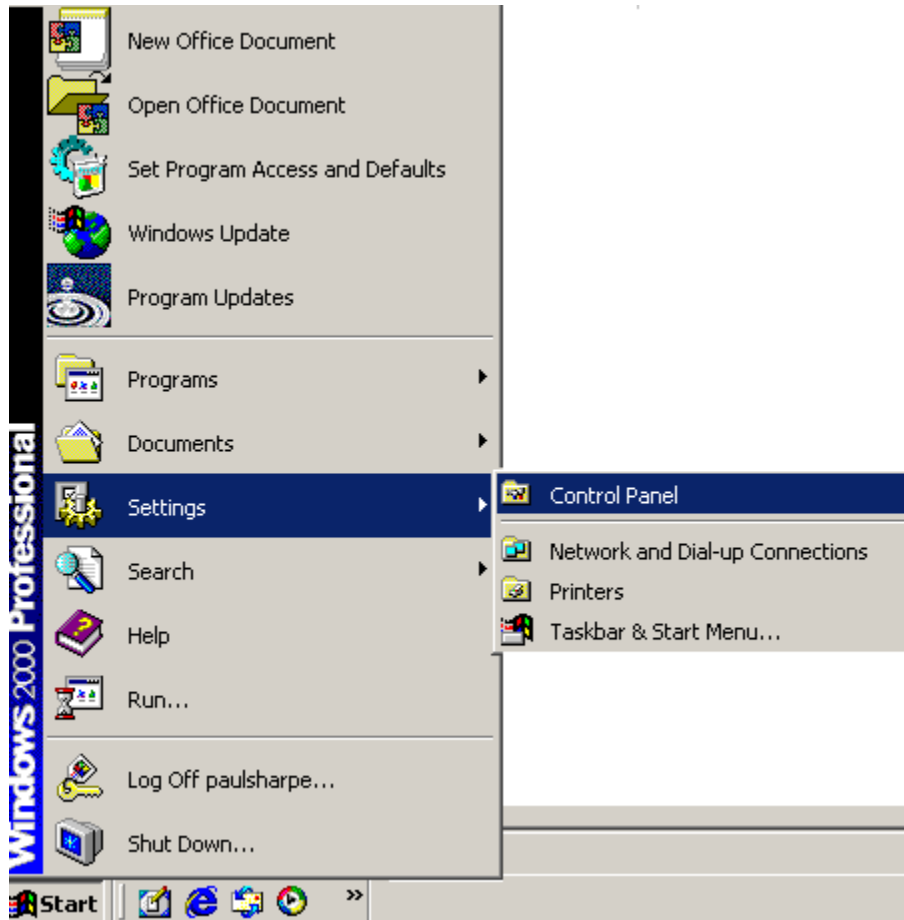
Figure 6-12: Access Windows Control Panel

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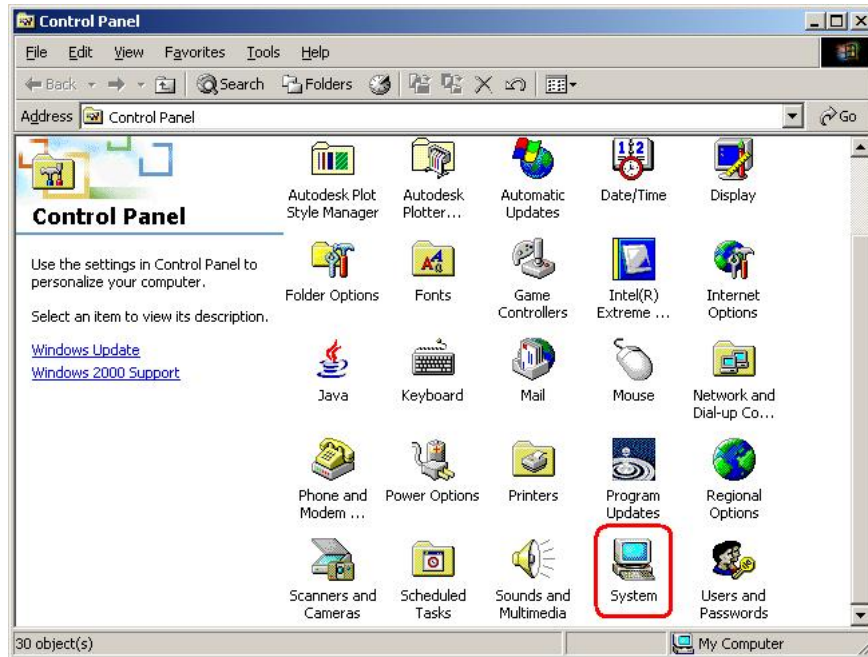
Figure 6-13: Double Click the System Icon

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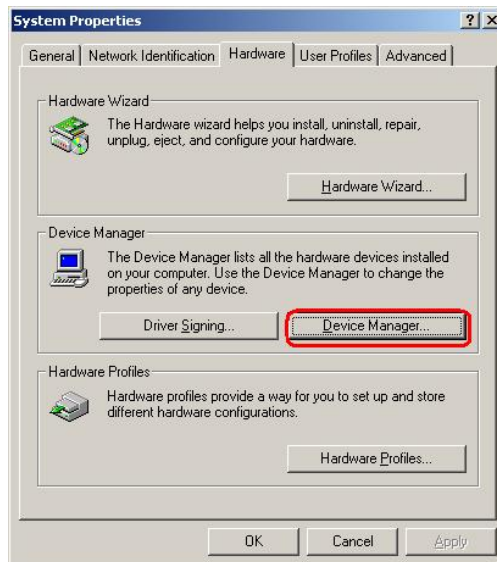
Figure 6-14: Double Click the Device Manager Tab

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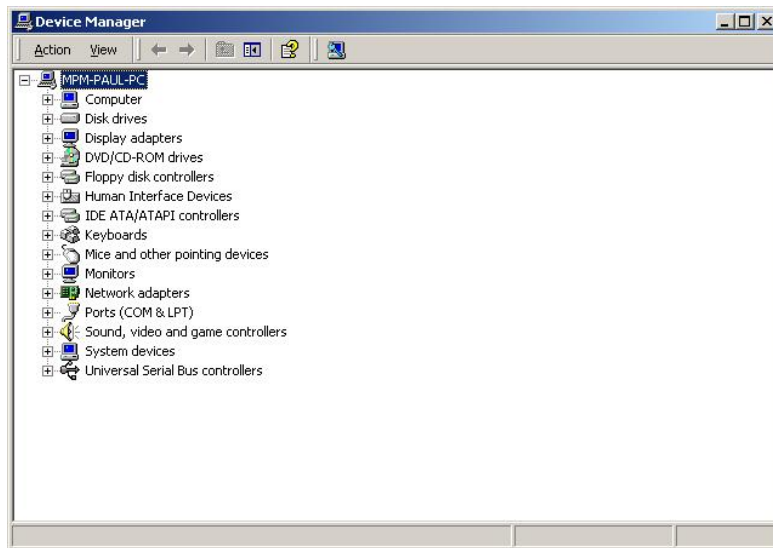
Figure 6-15: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means

Windows does not recognize the device).

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

Figure 6-16: Search for Suitable Driver

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

Click **NEXT** to continue.
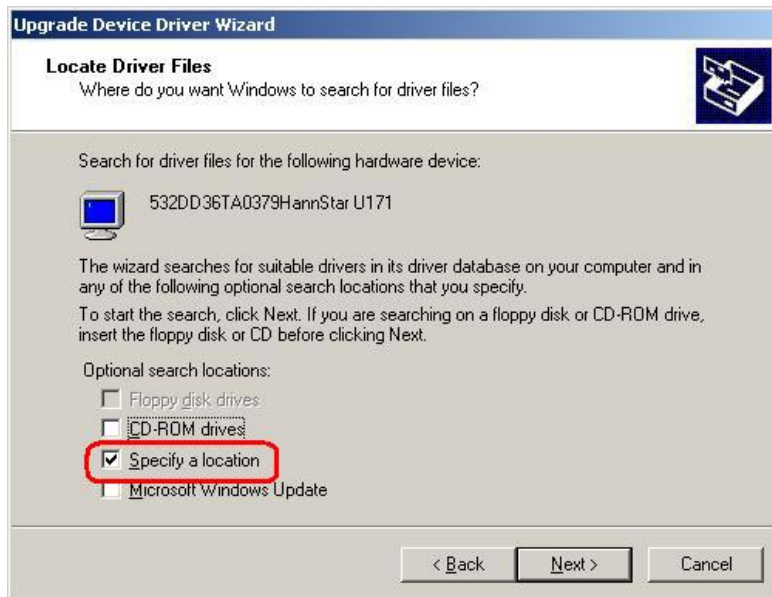
Figure 6-17: Locate Driver Files

Step 8: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx**

Drivers" directory (**Figure 6-18**) in the location browsing window, where "**X:**" is

the system CD drive.
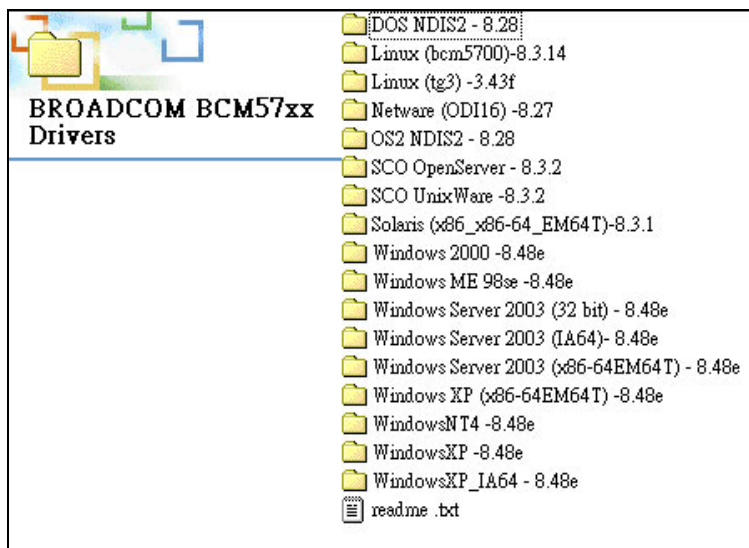
Figure 6-18: Location Browsing Window

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

continue. The driver is installed.

6.5 RealTek HD Audio Driver (ALC883) Installation

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

Step 1: Open **Windows Control Panel (Figure 6-12**).
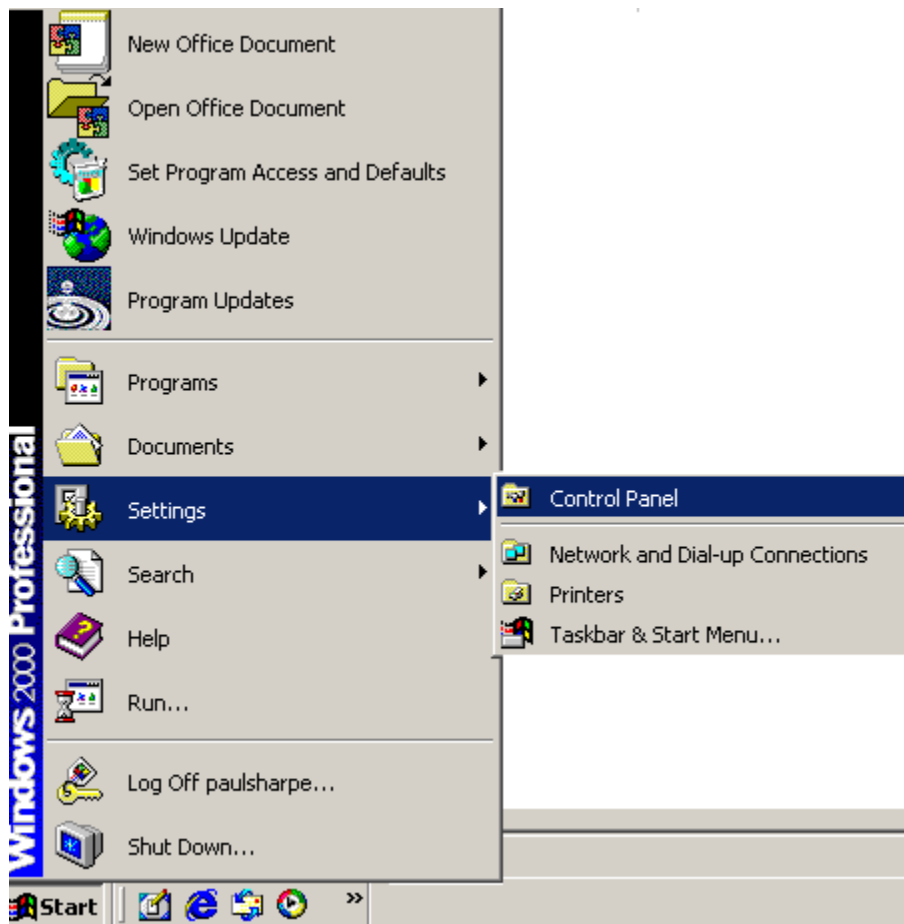
Figure 6-19: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-13**).
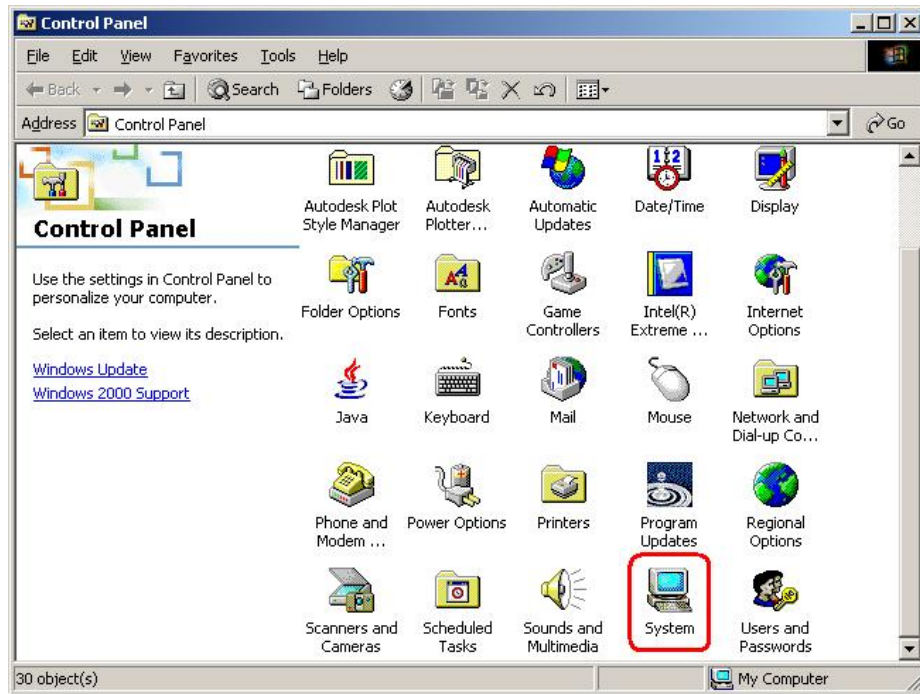
Figure 6-20: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-14**).
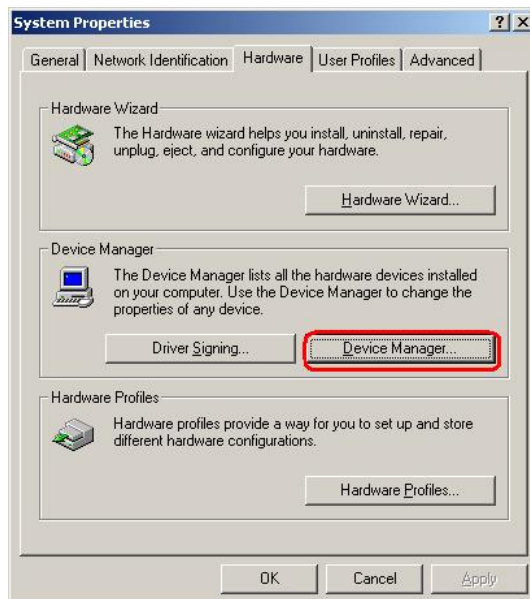
Figure 6-21: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-15**).
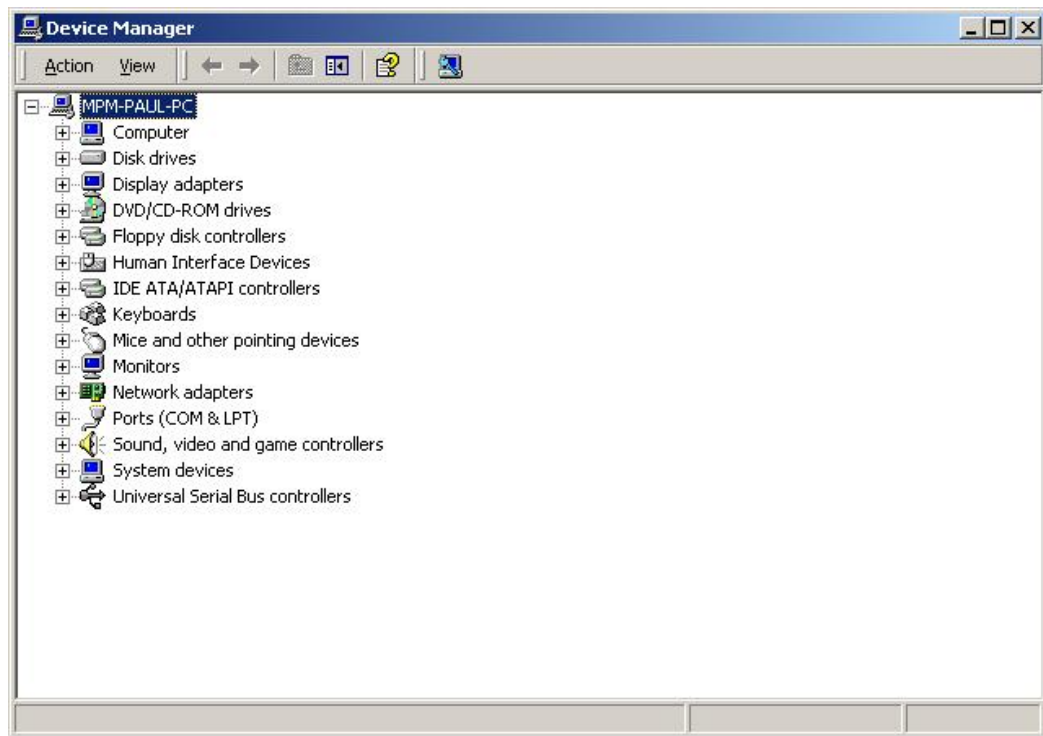
Figure 6-22: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means

Windows does not recognize the device).

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

Figure 6-23: Search for Suitable Driver

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

Click **NEXT** to continue.

Figure 6-24: Locate Driver Files

Step 8: Select "**X:\4-AUDIO\AC-KIT883HD\WIN**" directory in the location browsing

window, where "**X:**" is the system CD drive (**Figure 6-18**).

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

Step 1: The confirmation screen offers the option of restarting the computer now or later.

For the settings to take effect, the computer must be restarted. Click **FINISH** to

restart the computer.

6.6 Intel Matrix Storage Manager Installation

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

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

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

installation file.

Step 3: The Preparing Setup window appears ().
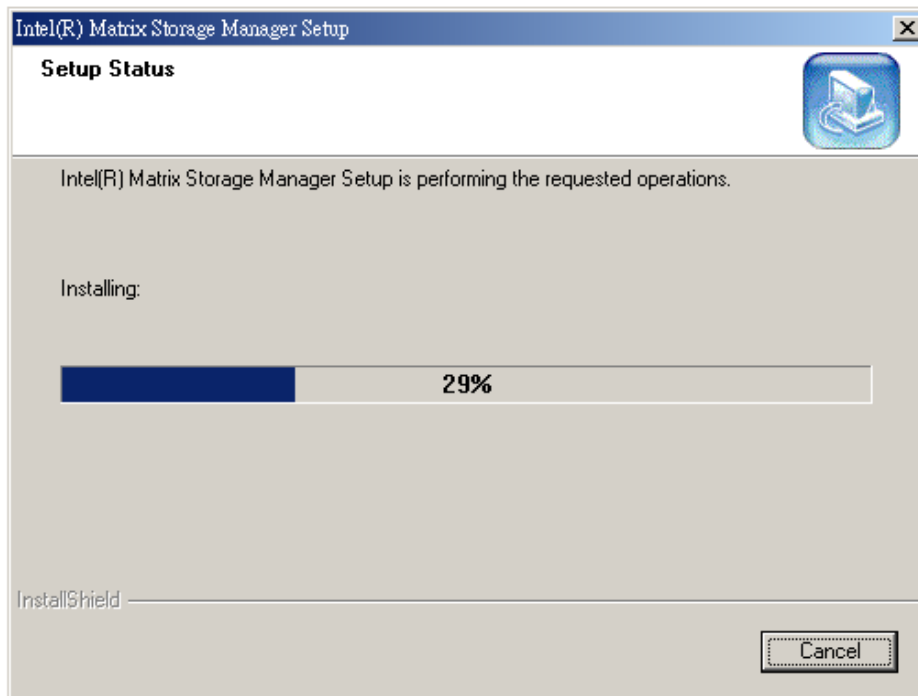
Figure 6-25: Preparing Setup Screen

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

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

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

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

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

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

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

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

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Appendix

A

BIOS Configuration Options

A.1 BIOS Configuration Options

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

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Appendix

B

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 B-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

C

Address Mapping

C.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
2E8-2EF	Serial Port 4 (COM4)
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel 945GM Graphics Controller
3C0-3DF	Intel 945GM Graphics Controller
3E8-3EF	Serial Port 3 (COM3)
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

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

C.3 IRQ Mapping Table

IRQ	Description	IRQ	Description
IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	COM 4
IRQ3	COM2	IRQ11	COM 3
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Parallel port	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.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 C-4: DMA Channel Assignments

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