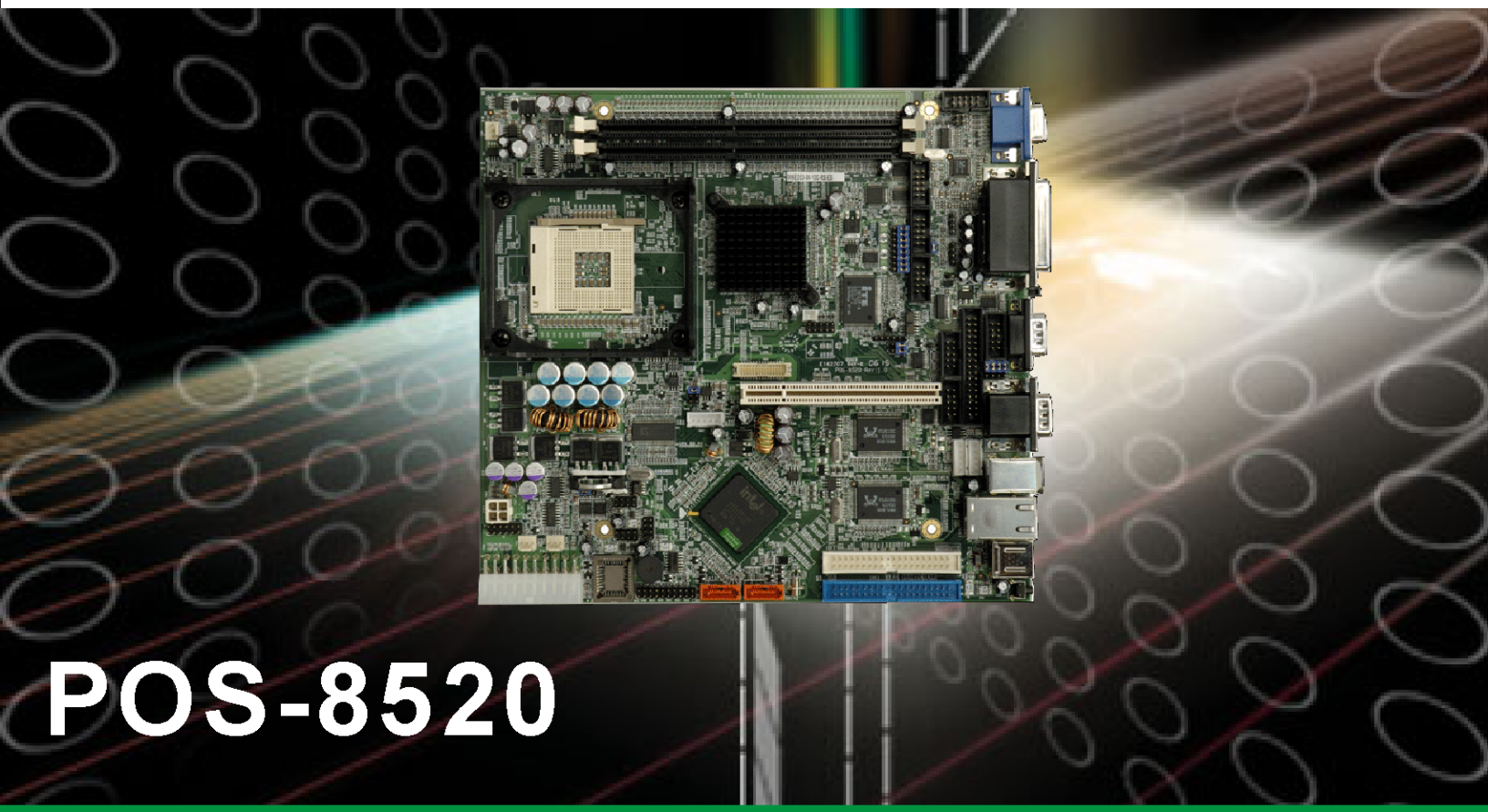
IEI Technology Corp.



POS-8520

POS Form Factor Motherboard, Pentium® 4 Processor 533MHz with CRT/LVDS, CFII, Dual GbE, SATA, 8 USB 2.0 , 6 COM & Audio

User Manual

Rev. 1.0 September, 2006

RoHS Lead Free

REVISION HISTORY

Title	POS-8520 Motherboard	
Revision Number	Description	Date of Issue
1.0	Initial release	September 2006

COPYRIGHT NOTICE

TRADEMARKS

Table of Contents

List of Figures

List of Tables

List of BIOS Menus

Glossary

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

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

1

Introduction

1.1 POS-8520 Motherboard Overview

The POS form factor POS-8520 Intel® Pentium® 4/Pentium® 4-M/Celeron® D Socket 478 motherboard is fully equipped with advanced multi-mode I/Os. The POS-8520 supports a full range of functions for an AT/ATX compatible industrial computer in a 220mm x 235mm profile. It also contains two DDR DIMM sockets that supports up to 2GB of memory size. The POS-8520 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 POS-8520 Motherboard Benefits

The POS form factor POS-8520 motherboard defines a new industry open standard for small form factor embedded computer boards. Some of the POS-8520 motherboard benefits are:

- Allowing additional space to support advanced processors and technologies
- Supporting complex I/O functions for industrial, medical, military, transportation, and commercial applications

1.1.2 POS-8520 Motherboard Features

The POS-8520 motherboard features are listed below:

- Complies with RoHS
- Supports Socket 478 Intel® Pentium® 4/ Pentium® 4-M/Celeron® D CPU
- Supports a maximum front side bus (FSB) speed up to 533MHz
- Supports up to 2GB of DDR-266/333MHz DDR DIMM socket memory
- Comes with dual high performance gigabit Ethernet (GbE) controllers
- Comes with one PCI expansion slot
- Comes with AC'97 2.3 Realtek ALC655 codec
- Supports two SATA channels with transfer rates up to 1.5Gb/s
- Supports eight USB 2.0 connections
- Supports five RS-232 serial communication connections
- Supports one RS-232/422/485 serial communication connection
- Two ATA-100 IDE connectors support four devices
- One FDD connector supports two devices
- One LPT connector supports one parallel device

- CRT/LCD VGA integrated in Intel® 852GME
- Supports CompactFlash Type II (CFII) solid state disk (SSD) plug and play (PnP) storage

1.2 POS-8520 Motherboard Overview

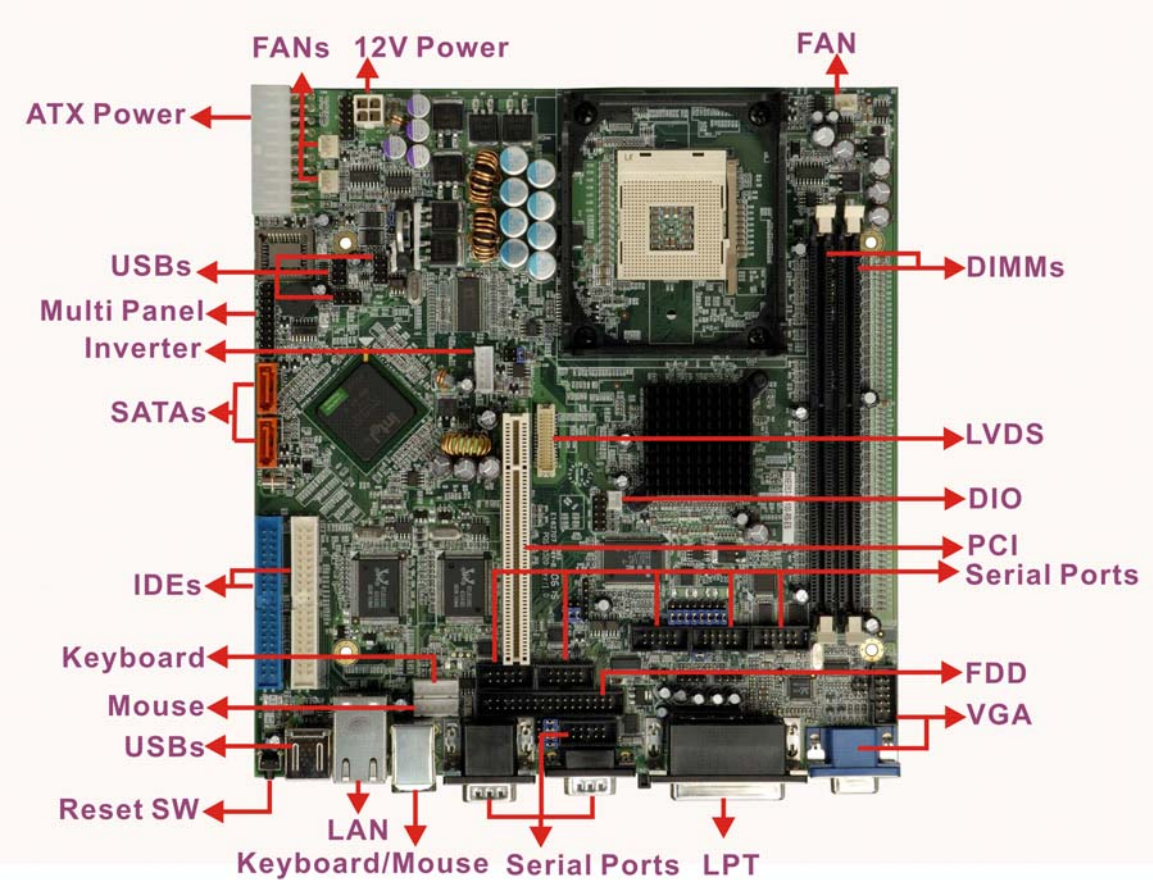


Figure 1-1: POS-8520 Motherboard Overview (Front Side)

Figure 1-2: POS-8520 Motherboard Overview (Solder Side)

1.2.1 POS-8520 Motherboard Connectors

The POS-8520 motherboard has the following on-board connectors:

- 1 x ATX-12V power connector
- 1 x ATX power connector
- 1 x Audio CD in connector
- 1 x Audio line out connector
- 1 x CompactFlash connector (solder side)
- 1 x Digital Input/Output connector
- 3 x Fan connectors
- 1 x Floppy disk drive connector
- 2 x IDE device connectors s
- 1 x IrDA connector
- 1 x Keyboard connector

- 1 x Inverter connector
- 1 x LVDS interface connector
- 1 x Mouse connector
- 1 x Multi panel connector
- 1 x Parallel port connector
- 1 x PCI expansion slot
- 2 x SATA connectors
- 6 x Serial port connectors
- 3 x USB 2.0 connectors
- 1 x VGA connector

The POS-8520 motherboard has the following connectors on the board external interface:

- 1 x USB combo connector
- 1 x RJ-45 Ethernet combo connector
- 1 x PS/2 Keyboard/Mouse combo connector
- 3 x Serial connectors
- 1 x Parallel connector
- 1 x 3-Phone jack audio connector
- 1 x VGA connector

The location of these connectors on the motherboard can be seen in Figure 1-1 and Figure 1-2. These connectors are fully described in **Chapter 3**.

1.2.2 Technical Specifications

The POS-8520 motherboard technical specifications are listed in Table 1-1. Detailed descriptions of each specification can be found in **Chapter 2**.

SPECIFICATION	DESCRIPTION
CPU Supported	**Intel® Pentium® 4 Socket 478** **Intel® Pentium® 4-M Socket 478** **Intel® Celeron ® D Socket 478**
Chipsets	**Northbridge: Intel® 852GME** **Southbridge: Intel® ICH5**
Graphics Support	**Intel® Extreme Graphics 2**
Memory	**Two DDR memory modules (Max. 2GB)**

SPECIFICATION	DESCRIPTION
PCI Bus Interface	33MHz, Revision 2.3
I/O Controller	Intel® ICH5
Super I/O	IT8712F
BIOS	AMI flash BIOS
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Ethernet	Realtek RTL8110SC GbE
Serial ATA (SATA)	Two SATA channels with 1.5Gb/s transfer rates
HDD Interface	Two IDE channels support four Ultra ATA/33/66/100 devices
Serial Ports	Six COM ports (five RS-232 and one RS-232/422/485)
USB Interfaces	Eight USB 2.0 connectors supported
Infrared Support	One Infrared Data Association (IrDA) interface
Power Support	AT/ATX power support
Power Consumption	+3.3V@2.99A; +5V@1.51A; 5Vsb@0.15A; +12V@6.7A (Intel® Pentium® 4 CPU, 3.06GHz, DDR 1GB x 2)
Power Management	Supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 1.0
Hardware Monitoring	Cooling fan, temperature and system voltages
Operating Temperature	Minimum: 0ºC (32°F) Maximum: 60°C (140°F)
Physical Dimensions	220mm x 235mm (width x length)
Audio Interfaces	AC ‘97 2.3 Realtek ALC655

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 CPU Support

Table 2-1 lists the CPUs supported by the POS-8520 motherboard.

Mfg.	Model	Max. Speed	L2 Cache	Max. FSB	Socket
Intel®	Pentium® 4	3.06 GHz	512KB	533MHz	478
Intel®	Pentium® 4-M	2.60 GHz	512KB	533MHz	478
Intel®	Celeron® D	3.20 GHz	256KB	533MHz	478

Table 2-1: Supported CPUs

2.1.1 Intel® Pentium® 4

The Intel® Pentium® 4 CPU comes with the following features:

- Hyper-Threading Technology (HT Technology) ensures greater performance
- SpeedStep® Technology improves overall system power management
- Execute Disable Bit technology prevents certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system.

Table 2-2 lists the Intel® Pentium® 4 processor supported by the POS-8520 motherboard.

Processor Number	Power	Architecture	L2 Cache	Speed	FSB	Execute Disable Bit
524	Normal	90 nm	1 MB	3.06 GHz	533 MHz	Yes

Table 2-2: Supported Intel® Pentium® 4 CPU

2.1.2 Intel® Pentium® 4-M

The Intel® Pentium® 4-M CPU comes with the following features:

- Hyper-Threading Technology (HT Technology) ensures greater performance
- Low power technologies
- Support for Enhanced Intel SpeedStep® technology
- Deeper/Deep Sleep states for dynamic power management
- Fixed Mobile Solutions Thermal Guidelines
- Flip Chip PGA packaging technology
- Dual Independent Display

Table 2-3 lists the Intel® Pentium® 4-M processors supported by the POS-8520 motherboard.

Power	Architecture	L2 Cache	Speed	FSB
Normal	130 nm	512 KB	2.6 GHz	400 MHz
Normal	130 nm	512 KB	2.5 GHz	400 MHz
Normal	130 nm	512 KB	2.4 GHz	400 MHz
Normal	130 nm	512 KB	2.2 GHz	400 MHz
Normal	130 nm	512 KB	2.0 GHz	400 MHz
Normal	130 nm	512 KB	1.9 GHz	400 MHz
Normal	130 nm	512 KB	1.8 GHz	400 MHz
Normal	130 nm	512 KB	1.7 GHz	400 MHz
Normal	130 nm	512 KB	1.6 GHz	400 MHz
Normal	130 nm	512 KB	1.5 GHz	400 MHz
Normal	130 nm	512 KB	1.4 GHz	400 MHz

Table 2-3: Supported Intel® Pentium® 4-M CPUs

2.1.3 Intel® Celeron® D

The Intel® Celeron® D CPU comes with the following features:

- Advanced Dynamic Execution Technology keeps the execution units executing instructions
- Intel® Streaming SIMD Extensions accelerates 3D graphics performance
- Execute Disable Bit Technology prevents certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system.

Table 2-4 lists the Intel® Celeron® D processors supported by the POS-8520 motherboard.

Processor Number	Power	Architecture	L2 Cache	Speed	FSB	Execute Disable Bit
350	Normal	90 nm	256 KB	3.20 GHz	533 MHz	No
345	Normal	90 nm	256 KB	3.06 GHz	533 MHz	No
340	Normal	90 nm	256 KB	2.93 GHz	533 MHz	No

Processor Number	Power	Architecture	L2 Cache	Speed	FSB	Execute Disable Bit
335	Normal	90 nm	256 KB	2.80 GHz	533 MHz	No
330	Normal	90 nm	256 KB	2.66 GHz	533 MHz	No
325	Normal	90 nm	256 KB	2.53 GHz	533 MHz	No
320	Normal	90 nm	256 KB	2.40 GHz	533 MHz	No
315	Normal	90 nm	256 KB	2.26 GHz	533 MHz	No
310	Normal	90 nm	256 KB	2.13 GHz	533 MHz	No

Table 2-4: Supported Celeron® D CPUs

2.2 Onboard Chipsets

2.2.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the card:

- **Northbridge**: Intel® 852GME
- **Southbridge**: Intel® ICH5

The following two sections (**Section 2.3.2** and **Section 2.3.3**) list some of the features of the 852GME and the ICH5 chipsets. For more information on these two chipsets please refer to the Intel website.

2.2.2 852GME Northbridge Chipset

The 852GME northbridge chipset comes with the following features:

- Supports the Intel Pentium 4 processor and Intel Celeron processor with Intel NetBurst® microarchitecture
- 400 MHz or 533 MHz system bus delivers a high-bandwidth connection between the processor and the platform
- Integrated graphics utilizing Intel® Extreme Graphics 2 technology
- AGP 4X support
- Three USB host controllers support up to six USB 2.0 ports.
- The latest AC '97 implementation delivers 20-bit audio for enhanced sound quality and full surround sound capability.
- LAN Connect Interface (LCI) provides network solutions for 10/100 Mbps

Ethernet and 10/100 Mbps Ethernet with LAN manageability

- Dual Ultra ATA/100 controllers
- Error Correcting Code (ECC) support in integrated graphics mode only
- The Intel Application Accelerator software provides additional performance over native ATA drivers by improving I/O transfer rates and enabling faster O/S load time, resulting in accelerated boot times
- Display
  - Analog display support
  - Dual independent pipe support
  - DVO (DVOB and DVOC) support
  - Dedicated Local Flat Panel (LFP) LVDS interface
- Intel® Embedded Graphics Drivers
  - Graphics interface support
  - Multi-monitor support
  - Dynamic display-mode support
  - Embedded video BIOS

2.2.3 ICH5 Southbridge Chipset

The ICH5 southbridge chipset comes with the following features:

- PCI Bus Interface
  - New: Supports PCI Revision 2.3 Specification at 33 MHz
  - 6 available PCI REQ/GNT pairs
  - One PCI REQ/GNT pair can be given higher arbitration priority (intended for external 1394 host controller)
  - Support for 44-bit addressing on PCI using DAC protocol
- Integrated LAN Controller
  - Integrated ASF Management Controller
  - WfM 2.0 and IEEE 802.3 Compliant
  - LAN Connect Interface (LCI)
  - 10/100 Mbit/sec Ethernet Support
- Integrated Serial ATA Host Controllers
  - Independent DMA operation on two ports.
  - Data transfer rates up to 1.5 Gb/s (1.5Gb/s).
  - RAID Level 0 Support (ICH5R Only)
- Integrated IDE Controller

- Supports “Native Mode” Register and Interrupts
- Independent timing of up to 4 drives
- Ultra ATA/100/66/33, BMIDE and PIO modes
- Tri-state modes to enable swap bay

- Interrupt Controller
  - Supports up to 8 PCI interrupt pins
  - Supports PCI 2.3 Message Signaled Interrupts
  - Two cascaded 82C59 with 15 interrupts
  - Integrated I/O APIC capability with 24 interrupts
  - Supports Front Side Bus interrupt delivery
- High-Precision Event Timers
- 1.5 V operation with 3.3 V I/O
  - 5V tolerant buffers on IDE, PCI, USB Overcurrent and Legacy signals
- Integrated 1.5 V Voltage Regulator (INTVR) for the Suspend wells
- Enhanced DMA Controller
  - Two cascaded 8237 DMA controllers
  - PCI DMA: Supports PC/PCI — Includes two PC/PCI REQ#/GNT# pairs
  - Supports LPC DMA
  - Supports DMA Collection Buffer to provide Type-F DMA performance for all DMA channels
- Real-Time Clock
  - 256-byte battery-backed CMOS RAM
  - Integrated oscillator components
  - Lower Power DC/DC Converter implementation

2.3 Data Flow

Figure 2-1 shows the data flow between the two onboard chipsets and other components installed on the motherboard and described in the following sections of this chapter.

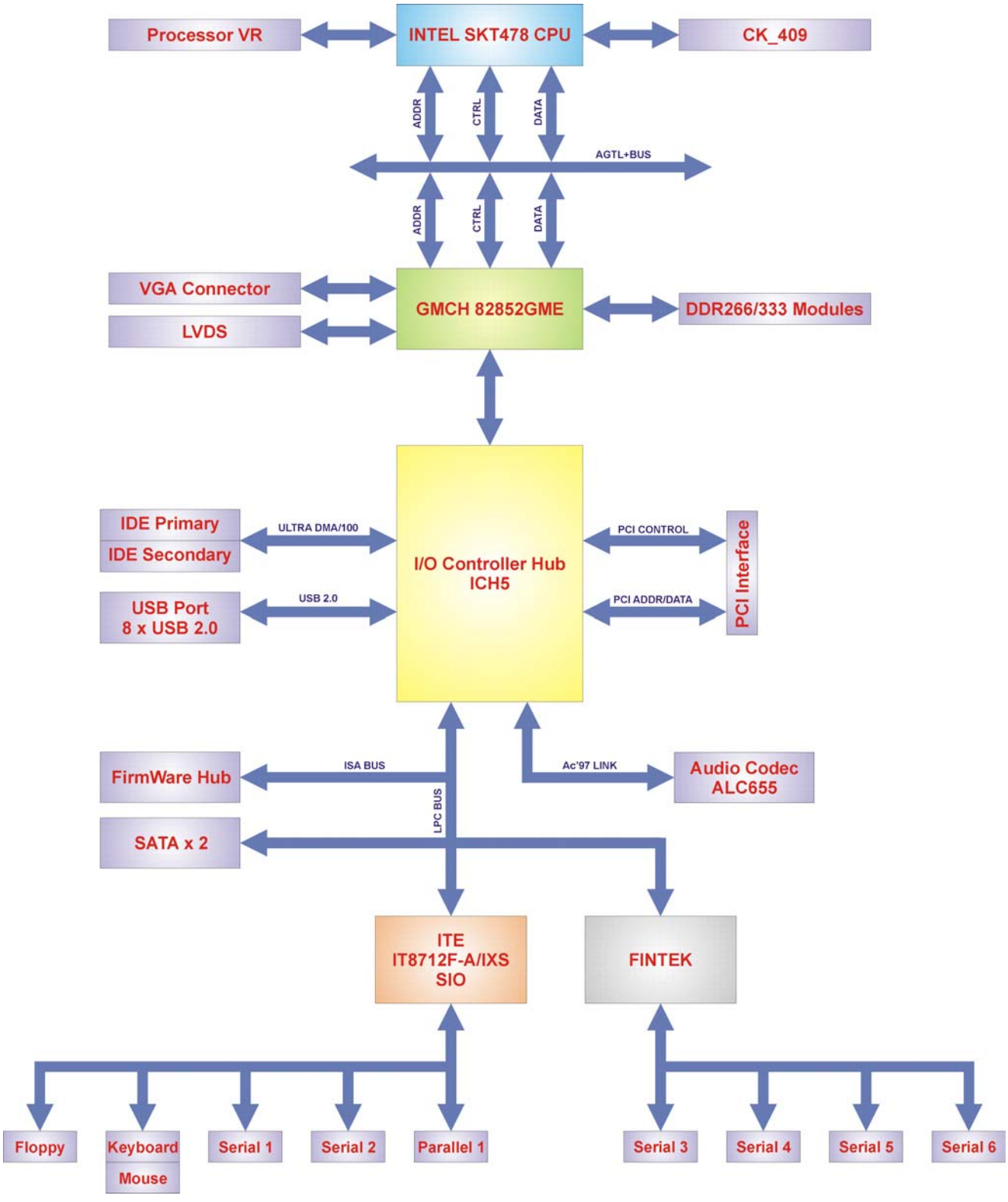


Figure 2-1: Data Flow Block Diagram

2.4 Graphics Support

The Intel® Extreme Graphics 2 is integrated on the Intel® 852GME Northbridge chipset. The Intel® Extreme Graphics 2 features are listed below.

- **Enhanced Rapid Pixel and Texel Rendering**: Optimized visual quality and performance from the addition of hardware to support of texel formatting, bicubic filter, color blending accuracy, and video mixing render, resulting in optimized visual quality and performance.
- **Zone Rendering 2 Technology**: Enhances the performance of zone rendering by using larger zones and new commands that improve graphics pipeline efficiency.
- **Dynamic Video Memory Technology v2.0**: Increases total system performance by optimizing the efficiency of AGP dynamic video memory by increasing its size of Video RAM allocation to 96 MB.
- **Enhanced Intelligent Memory Management**: Improves memory bandwidth efficiency and platform performance by improving the memory management arbitration between CPU, system memory and graphics memory.

Intel® Extreme Graphics 2 specifications are listed below:

- Enhanced 2D:
  - 256-bit internal path
  - 8/16/32bpp
  - DirectDraw*, GDI, GDI+
  - Anti-aliased text support
  - Alpha blending
  - Alphas stretch blitter
  - Hardware alpha blended RGB cursor
  - Color space conversion
  - 5x2 overlay support
  - Rotate, scale and translate operations
- High-performance 3D:
  - 256-bit internal path
  - 32bpp/ 24ZorW/ 8 Stencil
  - DX7*/DX8*/OGL*1.1
  - DXTn texture compression

- Up to 4 textures / pixel on a single pass
- Cubic reflection map
- Embossed/DOT3 bump mapping
- Multi-texture
- DOT3 bump-mapping
- Point sprites

- Video and Display:
  - DirectShow*/DirectVA*
  - Hardware motion compensation support for DVD playback
  - 4x2 overlay filter
  - 350 MHz DAC frequency
  - Maximum DVO pixel rate of up to 330MP/s
  - Flat panel monitors and TV-out support via AGP Digital Display (ADD) cards
  - 350 MHz DAC for 1800x1440 @ 85Hz max CRT resolution or 2048x1536@60Hz max FP resolution
  - Synchronous display for dual monitor capabilities
  - 350MHz RAMDAC for up to QXGA analog monitor support
  - Dual DVO ports for up to QXGA digital display support
  - Multiple display types (LVDS, DVI, TV-out, CRT)

2.5 Memory Support

The POS-8520 motherboard has two 184-pin dual inline memory module (DIMM) sockets and supports an un-buffered DDR DIMM with the following specifications:

- Maximum RAM: 2GB
- DIMM Transfer Rates: 333MHz

2.6 PCI Bus Interface Support

The PCI bus on the POS-8520 motherboard card has the following features:

- 33MHz Revision 2.3 is implemented
- Maximum throughput: 133MB/sec based on the ICH5 chipset
- Master devices: Maximum of six with three implemented
- One PCI REQ/GNT pair can be given higher arbitration priority
- 44-bit addressing using the DAC protocol supported

2.7 Super I/O

The ITE IT8712F is a Low Pin Count Interface-based highly integrated Super I/O. The IT8712F provides the most commonly used legacy Super I/O functionality plus the latest Environment Control initiatives, such as H/W Monitor, Fan Speed Controller, ITE's "SmartGuardian" function and Smart Card Reader Interface. The device's LPC interface complies with Intel "LPC Interface Specification Rev. 1.0". The IT8712F is ACPI & LANDesk compliant.

- Low Pin Count Interface
  - Comply with Intel Low Pin Count Interface Specification Rev. 1.0
  - Supports LDRQ#, SERIRQ protocols
  - Supports PCI PME# Interfaces
- ACPI & LANDesk Compliant
  - ACPI V. 1.0 compliant
  - Register sets compatible with "Plug and Play ISA Specification V. 1.0a"
  - LANDesk 3.X compliant
  - Supports 12 logical devices
- Enhanced Hardware Monitor
  - Built-in 8-bit Analog to Digital Converter
  - 3 thermal inputs from remote thermal resistor or thermal diode or diode-connected transistor
  - 8 voltage monitor inputs (VBAT is measured internally.)
  - 1 chassis open detection input with low power Flip-Flop backed by the battery
  - Watch Dog comparison of all monitored values

- Provides VID0 – VID5 support for the CPU

- Fan Speed Controller
  - Provides fan on-off and PWM control
  - Supports 5 programmable Pulse Width
  - Modulation (PWM) outputs
  - 128 steps of PWM modes
  - Monitors 5 fan tachometer inputs
- SmartGuardian Controller
  - Provides programmable fan speed automatic control
  - Supports mix-and-match for temperature inputs and fan speed control outputs
  - Overrides fan speed controller during catastrophic situations
  - Provides over temperature beep tone warning
- Two 16C550 UARTs
  - Supports two standard Serial Ports
  - Supports IrDA 1.0/ASKIR protocols
  - Supports Smart Card Reader protocols
- Smart Card Reader
  - Compliant with Personal Computer Smart Card (PC/SC) Working Group standard
  - Compliant with smart card (ISO 7816) protocols
  - Supports card present detect
  - Supports Smart Card insertion power-on feature
  - Supports one programmable clock frequency, and 7.1 MHz and 3.5 MHz (Default) card clocks
- Consumer Remote Control (TV remote) IR with power-up feature
- IEEE 1284 Parallel Port
  - Standard mode -- Bi-directional SPP compliant
  - Enhanced mode -- EPP V. 1.7 and V. 1.9 compliant
  - High speed mode -- ECP, IEEE 1284 compliant
  - Back-drive current reduction
  - Printer power-on damage reduction
  - Supports POST (Power-On Self Test) Data Port
- Floppy Disk Controller
  - Supports two 360K/ 720K/ 1.2M/ 1.44M/ 2.88M floppy disk drives
  - Enhanced digital data separator

- 3-Mode drives supported
- Supports automatic write protection via software

- Keyboard Controller
  - 8042 compatible for PS/2 keyboard and mouse
  - 2KB of custom ROM and 256-byte data RAM
  - GateA20 and Keyboard reset output
  - Supports any key, or 2-5 sequential keys, or 1-3 simultaneous keys keyboard power-on events
  - Supports mouse double-click and/or mouse move power on events
  - Supports Keyboard and Mouse I/F hardware auto-swap
- Game Port
  - Built-in 558 quad timers and buffer chips
  - Supports direct connection of two joysticks
- Dedicated MIDI Interface
  - MPU-401 UART mode compatible
- 38 General Purpose I/O Pins
  - Input mode supports either switch de-bounce or programmable external IRQ input routing
  - Output mode supports 2 sets of programmable LED blinking periods
- External IRQ Input Routing Capability
  - Provides IRQ input routing through GPIO input mode
  - Programmable registers for IRQ routing
- Watch Dog Timer
  - Time resolution 1 minute or 1 second, maximum 255 minutes or 255 seconds
  - Output to KRST# when expired
- ITE innovative automatic power-failure resume and power button de-bounce
- Dedicated Infrared pins
- VCCH and Vbat Supported
- Built-in 32.768 KHz Oscillator
- Single 24/48 MHz Clock Input
- +5V Power Supply

2.8 BIOS

The POS-8520 motherboard uses a licensed copy of AMI BIOS. Flash BIOS features used are listed below:

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

2.9 PXE: Pre-Boot Execution Environment

PXE is an open industry standard developed by a number of software and hardware vendors. IEI BIOS PXE feature allows a workstation to boot from a server on a network by receiving a pre-OS agent prior to booting the operating system on the local hard drive.

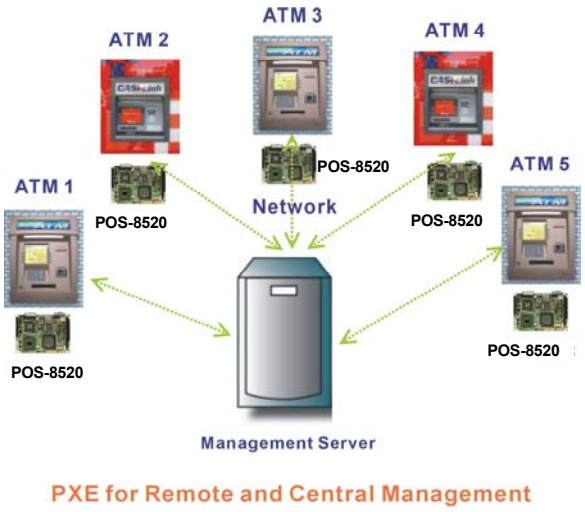


Figure 2-2: PXE: Pre-Boot Execution Environment

2.10 GbE Ethernet

The Realtek RTL8110SC GbE controller combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCI bus controller, and embedded memory. The controller has state-of-the-art DSP technology

and mixed-mode signal technology and it offers high-speed transmission over CAT 5 UTP cables or CAT 3 UTP (10Mbps only) cables. The GbE controller specifications are below.

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI rev.2.3, 32-bit, 33/66MHz
- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5 Checksum Offload (IP, TCP, UDP) and largesend offload support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- 3.3V signaling, 5V PCI I/O tolerant
- Transmit/Receive FIFO (8K/64K) support
- Supports power down/link down power saving
- Supports PCI Message Signaled Interrupt (MSI)

2.11 Drive Interfaces

The POS-8520 motherboard can support the following drive interfaces.

- 1 x CFII device
- 1 x FDD device
- 2 x IDE devices
- 2 x SATA drives

2.11.1 CompactFlash Device

The POS-8520 motherboard has one Type II CompactFlash adapters used to adapt Type II CompactFlash and CF+ cards for use in Type II (5 mm thick) PCMCIA card slots.

2.11.2 FDD Interface

The POS-8520 motherboard supports two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives through a standard 34-pin box header.

2.11.3 IDE HDD Interfaces

The POS-8520 motherboard southbridge chipset IDE controller supports up to four HDDs with the following specifications:

- **Programmed I/O (PIO)**: Processor is in control of the data transfer.
- **8237 style DMA**: DMA protocol that resembles the DMA on the ISA bus, although it does not use the 8237 in the ICH5. This protocol off loads the processor from moving data. This allows higher transfer rate of up to 16 MB/s.
- **Ultra ATA/33**: DMA protocol that redefines signals on the IDE cable to allow both host and target throttling of data and transfer rates of up to 33 MB/s.
- **Ultra ATA/66**: DMA protocol that redefines signals on the IDE cable to allow both host and target throttling of data and transfer rates of up to 66 MB/s.
- **Ultra ATA/100**: DMA protocol that redefines signals on the IDE cable to allow both host and target throttling of data and transfer rates of up to 100 MB/s.

2.11.4 SATA Drives

The POS-8520 motherboard supports two first generation SATA drives with transfer rates up to 1.5Gb/s.

2.12 Serial Ports

The POS-8520 motherboard has six high-speed UART serial ports, configured as COM1 through COM6. The serial ports have the following specifications.

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

2.13 PCI Interfaces

The POS-8520 motherboard offers one PCI Slot Expansion Module for board expansion.

2.14 USB Interfaces

The POS-8520 motherboard has two USB 2.0 ports on the external interface panel and three USB 2.0 8-pin headers on-board to connect a total of eight USB devices.

2.15 Infrared Data Association (IrDA) Interface

The POS-8520 motherboard IrDA supports the following interfaces.

- Serial Infrared (SIR)
- Shift Keyed Infrared (ASKIR)

To use the IrDA port, configure SIR or ASKIR mode in the BIOS under Super IO devices (**Section 5.3.4**). The normal RS-232 COM2 will then be disabled.

2.16 Audio Codec

The POS-8520 motherboard has an integrated REALTEK ALC655 CODEC. The ALC655 CODEC is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal
- 12.288MHz BITCLK input
- Integrated PCBEEP generator to save buzzer
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)

- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.17 Power Support

The POS-8520 motherboard is compatible with AT and ATX-based power supplies.

2.18 Power Consumption

Table 2-5 shows the power consumption parameters for the POS-8520 motherboard when a Intel® Pentium® 4/Intel® Celeron® D processor with a clock speed of 3.06GHz, an L2 cache of 256MB and a FSB 533MHz is running with a 2GB DDR266 module.

Voltage	Current
+3.3V	2.99A
+5V	1.51A
5Vsb	0.51A
+12V	6.7A

Table 2-5: Power Consumption

2.19 Power Management

The POS-8520 motherboard supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 1.0. The ACPI specification, revision 1.0 reads:

The ACPI interface gives the operating system (OS) direct control over the power management and Plug and Play functions of a computer. When it starts, the ACPI OS takes over these functions from legacy BIOS interfaces such as the APM BIOS and the PNPBIOS. Having done this, the OS is responsible for handling Plug and Play events as well as controlling power and thermal states based on user settings and application requests. ACPI provides low-level controls so the OS can perform these functions. The functional areas covered by the ACPI specification are:

- System power management - ACPI defines mechanisms for putting the computer as a whole in and out of system sleeping states. It also provides a general mechanism for any device to wake the computer.
- Device power management - ACPI tables describe motherboard devices, their power states, the power planes the devices are connected to, and controls for putting devices into different power states. This enables the OS to put devices into low-power states based on application usage.
- Processor power management - While the OS is idle but not sleeping, it will use commands described by ACPI to put processors in low-power states.
- Plug and Play - ACPI specifies information used to enumerate and configure motherboard devices. This information is arranged hierarchically so when events such as docking and undocking take place, the OS has precise, a priori knowledge of which devices are affected by the event.
- System Events - ACPI provides a general event mechanism that can be used for system events such as thermal events, power management events, docking, device insertion and removal, etc. This mechanism is very flexible in that it does not define specifically how events are routed to the core logic chipset.
- Battery management - Battery management policy moves from the APM BIOS to the ACPI OS. The OS determines the Low battery and battery warning points, and the OS also calculates the battery remaining capacity and battery remaining life. An ACPI-compatible battery device needs either a Smart Battery subsystem interface, which is controlled by the OS directly through the embedded controller interface, or a Control Method Battery (CMBatt) interface. A CMBatt interface is completely defined by AML control methods, allowing an OEM to choose any type of the battery and any kind of communication interface supported by ACPI.
- Thermal management - Since the OS controls the power states of devices and processors, ACPI also addresses system thermal management. It provides a simple, scaleable model that allows OEMs to define thermal zones, thermal indicators, and methods for cooling thermal zones.
- Embedded Controller - ACPI defines a standard hardware and software communications interface between an OS bus enumerator and an embedded controller. This allows any OS to provide a standard bus enumerator that can directly communicate with an embedded controller in the system, thus allowing other drivers within the system to communicate with and use the resources of system embedded controllers. This in turn enables the OEM to provide platform features that the OS and applications can use.
- System Management Bus Controller - ACPI defines a standard hardware and software communications interface between an OS bus driver and an SMBus Controller. This allows any OS to provide a standard bus driver that can directly communicate with SMBus Devices in the system. This in turn enables the OEM to provide platform features that the OS and applications can use.

2.20 System Monitoring

The POS-8520 motherboard is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +3.3V, +5V, and +12V
- RPM of cooling fans
- CPU and card temperatures (by the corresponding embedded sensors)

2.21 Real Time Clock

256-byte battery backed CMOS RAM

2.22 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the POS-8520 motherboard are listed below.

- Minimum Operating Temperature: 0ºC (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.

2.23 Packaged Contents and Optional Accessory Items

2.23.1 Package Contents

The POS-8520 motherboard comes with the following components:

- 1 x POS-8520 single board computer
- 1 x IDE Cable
- 1 x Dual RS232 Cable
- 1 x Single RS232 Cable
- 2 x SATA Cables
- 1 x SATA Power Cable
- 1 x mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

2.23.2 Optional Accessory Items

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

- Socket 478 type CPU Cooler
- FDD cable
- USB cable

Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

The locations of the peripheral interface connectors are shown in **Section 3.1.1**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.2**.

3.1.1 POS-8520 Motherboard Layout

Figure 3-1 shows the onboard peripheral connectors, external interface peripheral connectors and onboard jumpers on the front side of the card.

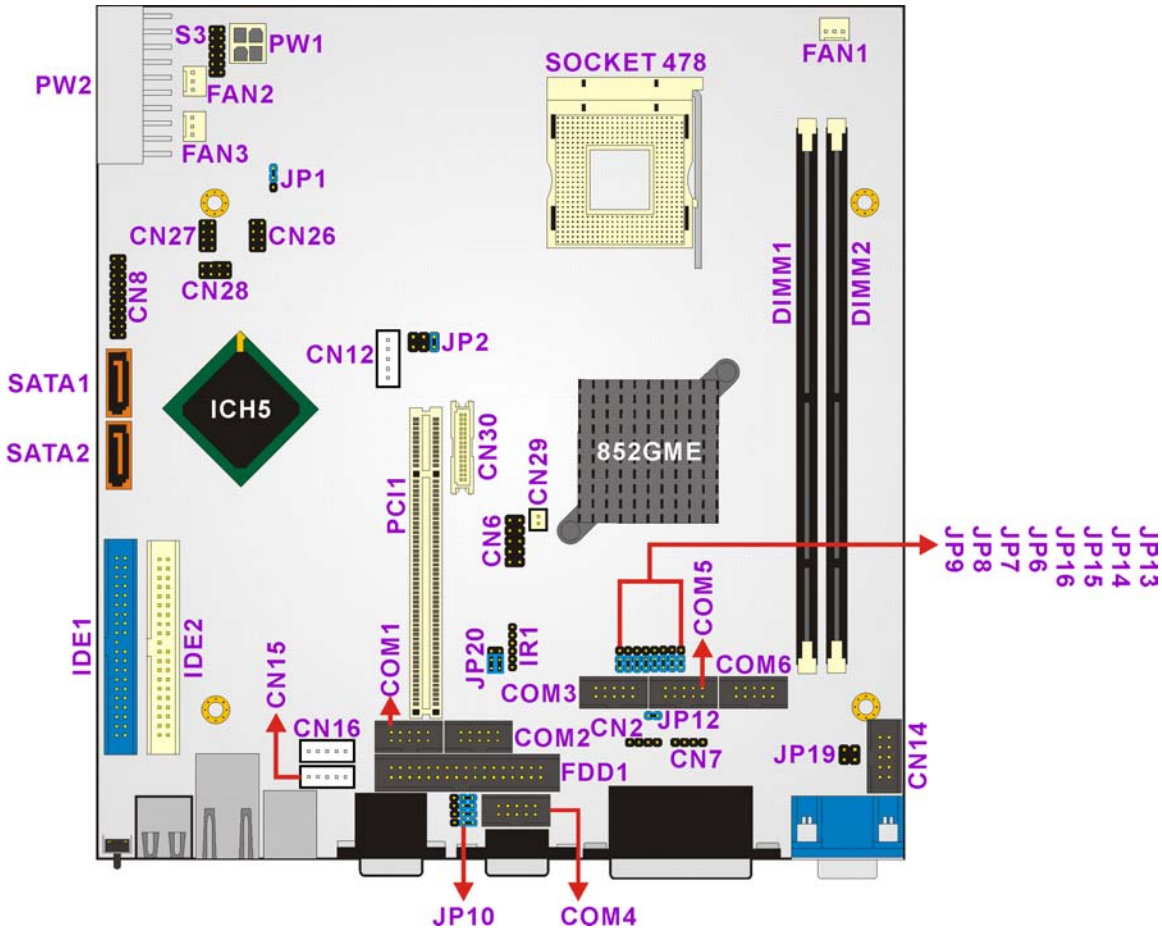


Figure 3-1: Connector and Jumper Locations (Front Side)

Figure 3-2 shows the onboard peripheral connectors on the solder side of the board.

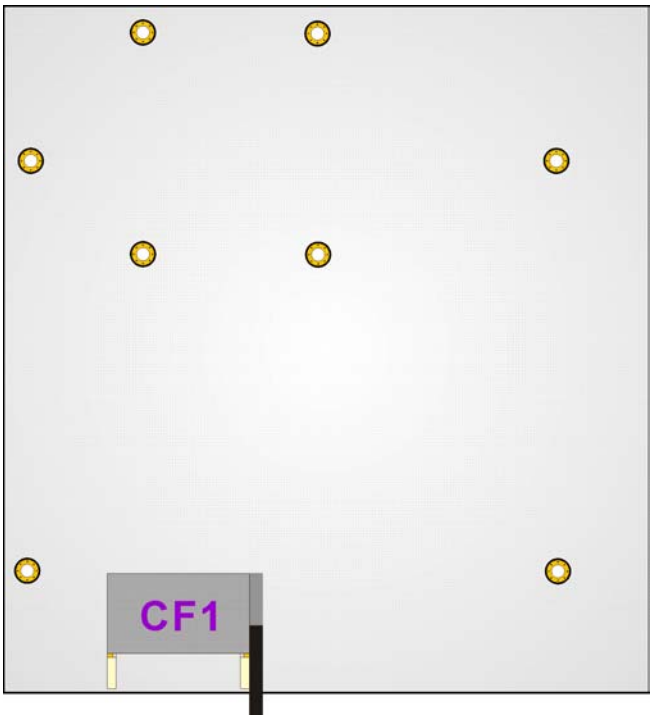


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the POS-8520 motherboard. Detailed descriptions of these connectors can be found in **Section 3.2**.

Connector	Type	Label
ATX 12V Power connector	4-pin connector	PW1
ATX Power connector	20-pin connector	PW2
Audio CD In connector	4-pin header	CN7
Audio Line Out connector	4-pin header	CN2
CompactFlash Type II connector	50-pin socket	CF1
Cooling Fan connector	3-pin header	FAN1, FAN2, FAN3
Digital Input/Output (DIO) connector	10-pin header	CN6
FDD connector	34-pin header	FDD1
IDE Interface connector	40-pin header	IDE1, IDE2
Inverter connector	5-pin header	CN12
IrDA connector	6-pin header	IR1
Keyboard connector	5-pin box header	CN16

Connector	Type	Label
LVDS connector	30-pin crimp connector	CN30
Mouse connector	5-pin box header	CN15
Multi-panel connector	20-pin header	CN8
PCI connector	120-pin PCI socket	PCI1
SATA Drive Port (1.5Gb/s)	SATA disk drive port	SATA1, SATA2
Serial Communications connector	10-pin box header	COM1 thru COM6
USB connector	8-pin header	CN26, CN27, CN28
VGA connector	10-pin box header	CN14

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Connectors

Table 3-2 lists the external interface connectors on the POS-8520 motherboard. Detailed descriptions of the connectors can be found in **Section 3.3**.

Connector	Type	Label
Reset button	Pushbutton	S2
USB connector	Dual USB port	CN25
Ethernet connector	Dual RJ45 Jack connector	CN31
Keyboard/Mouse connector	PS/2 Female Combo connector	CN23
Serial Communications connector	D-sub 9 Male connector	CN20, CN22
Parallel connector	DB-25 Female connector	LPT1
Audio connector	3 Phone Jack connector	CN24
VGA connector	HD-D-sub 15 Female connector	VGA1

Table 3-2: External Interface Connectors

3.1.4 Onboard Jumpers

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

Jumper	Type	Label
Clear CMOS Setup	3-pin header	JP1
COM# RI and Voltage Selection	3-pin header	JP6 JP7 JP8 JP9 JP13 JP14 JP15 JP16
COM2 RS-232/422/485 Setup	12-pin header	JP10
	6-pin header	JP20
CompactFlash Card Setup	2-pin header	JP12
CPU Voltage Setting	10-pin header	S3
Keyboard/Mouse Power Source	3-pin header	JP18
LCD Voltage Select	6-pin header	JP2

Table 3-3: Onboard Jumpers

3.2 Internal Peripheral Connectors

Internal peripheral connectors on the motherboard are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the POS-8520 motherboard.

3.2.1 ATX 12V Power Connector

CN Label:	PW1
CN Type:	4-pin connector
CN Location:	See **Figure 3-3**
CN Pinouts:	See **Table 3-4**

The ATX 12V Power connector connects 12V ATX power to the motherboard.

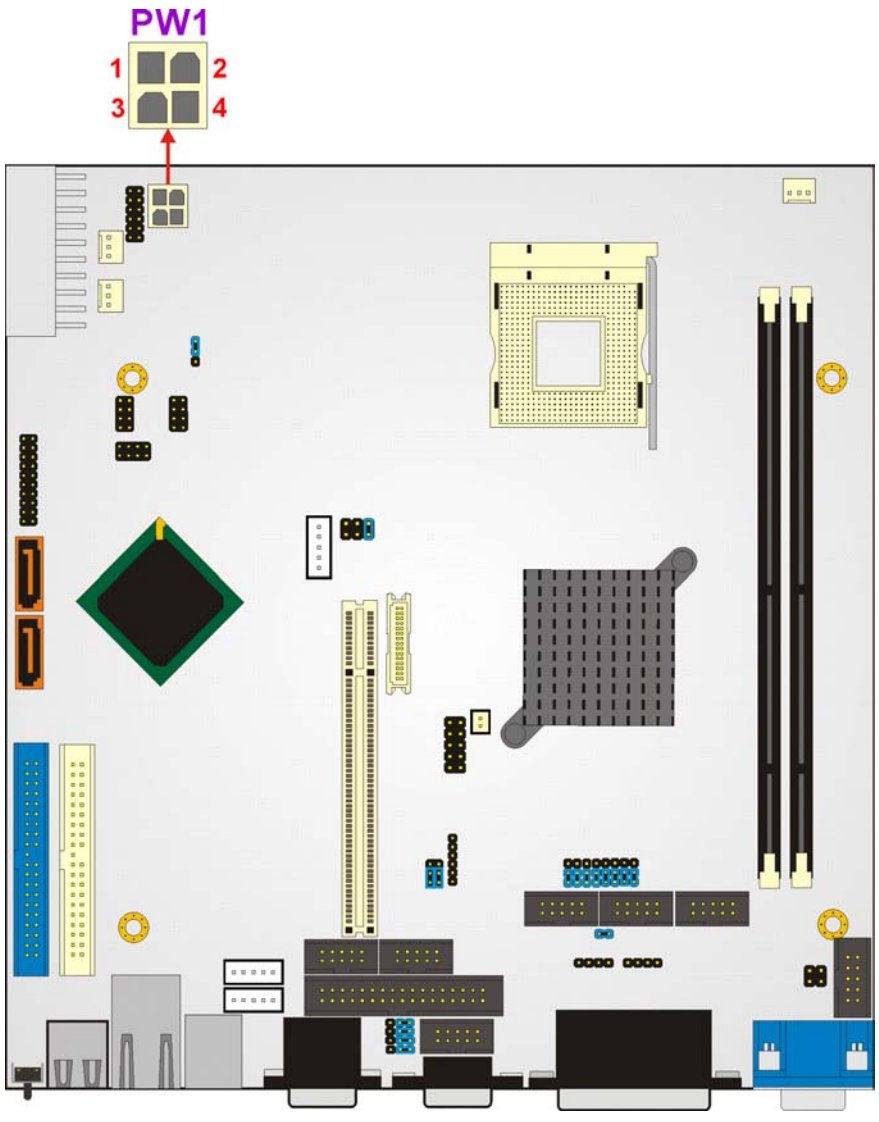


Figure 3-3: ATX 12V Power Connector Location

PIN	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 3-4: ATX 12V Power Connector Pinouts

3.2.2 ATX Power Connector

CN Label: PW2

CN Type: 20-pin connector

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

CN Pinouts: See **Table 3-5**

The ATX Power connector connects ATX power to the motherboard.

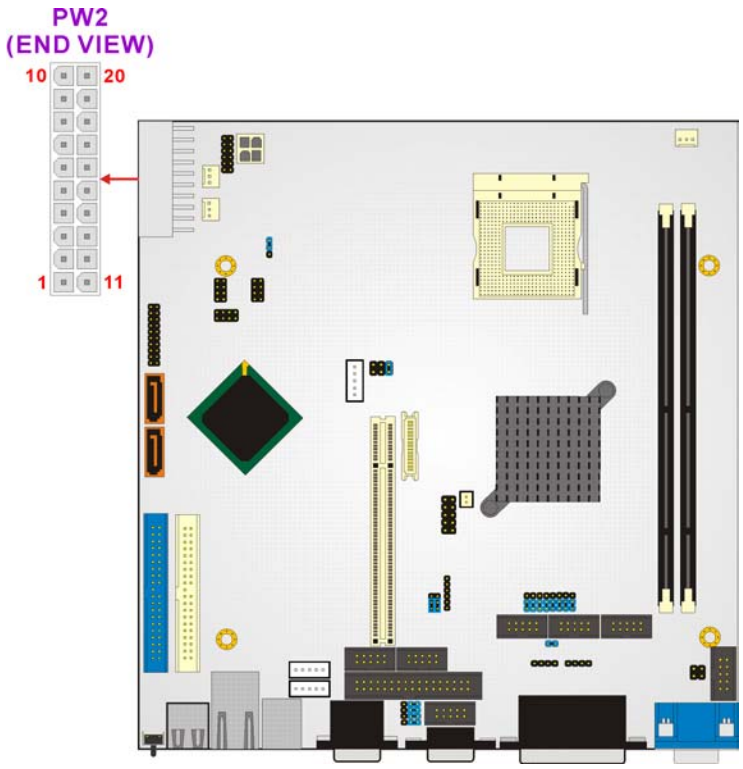


Figure 3-4: ATX Power Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
11	3.3V	1	3.3V
12	-12V	2	3.3V
13	GND	3	GND
14	PS-ON	4	+5V
15	GND	5	GND
16	GND	6	+5V
17	GND	7	GND
18	-5V	8	Power good
19	+5V	9	5VSB
20	+5V	10	+12V

Table 3-5: ATX Power Connector Pinouts

3.2.3 Audio CD In Connector

CN Label: CN7

CN Type: 4-pin header

CN Location: See Figure 3-5

CN Pinouts: See Table 3-6

AC'97 Audio signals are interfaced through a 4-pin flat-cable connector to the CD drive.

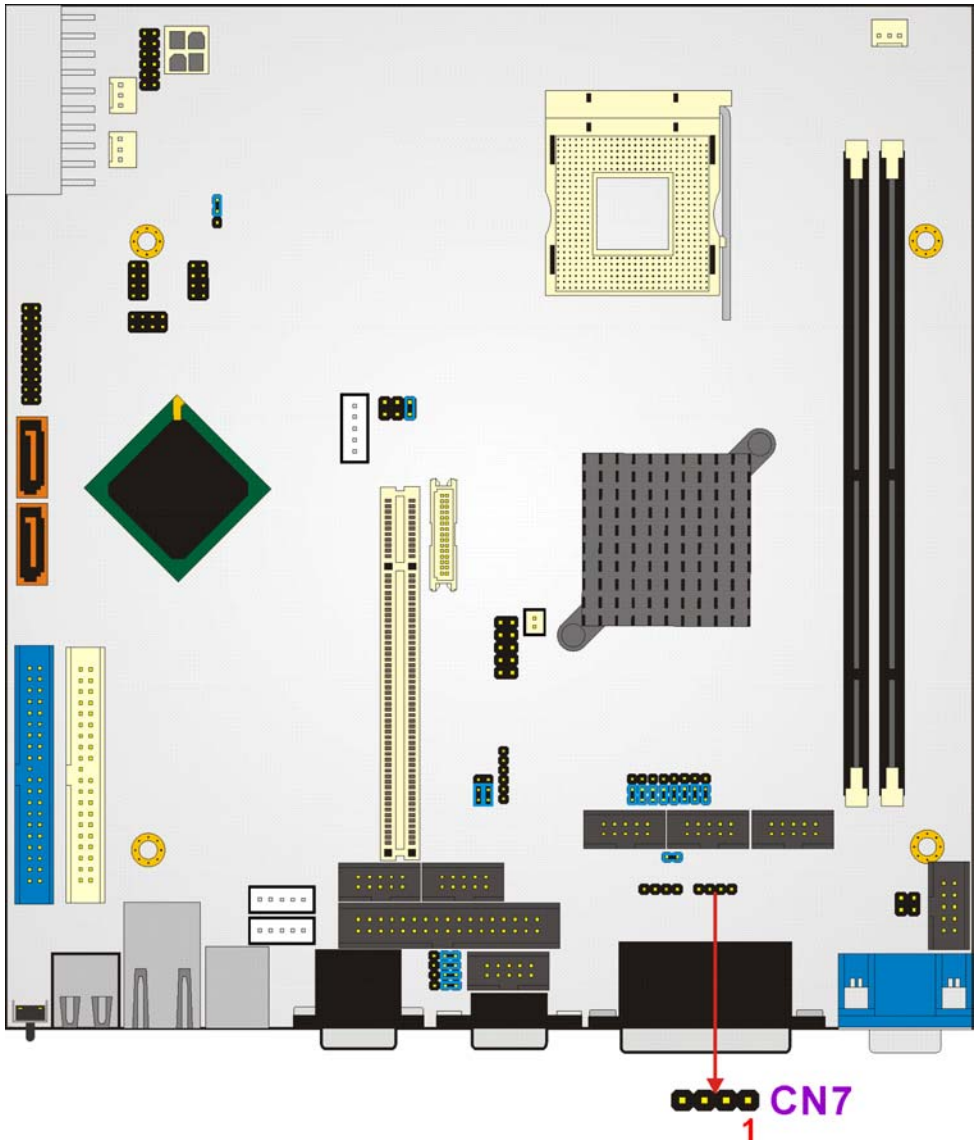


Figure 3-5: Audio CD In Connector Location

PIN	DESCRIPTION
1	CD IN_L
2	GND
3	GND
4	CD IN_R

Table 3-6: Audio CD In Connector Pinouts

3.2.4 Audio Line Out Connector

CN Label:	CN2
CN Type:	4-pin header
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-7

AC'97 Audio signals are interfaced through a 4-pin flat-cable connector. An audio 4-pin-to-phone-jack adapter kit is required.

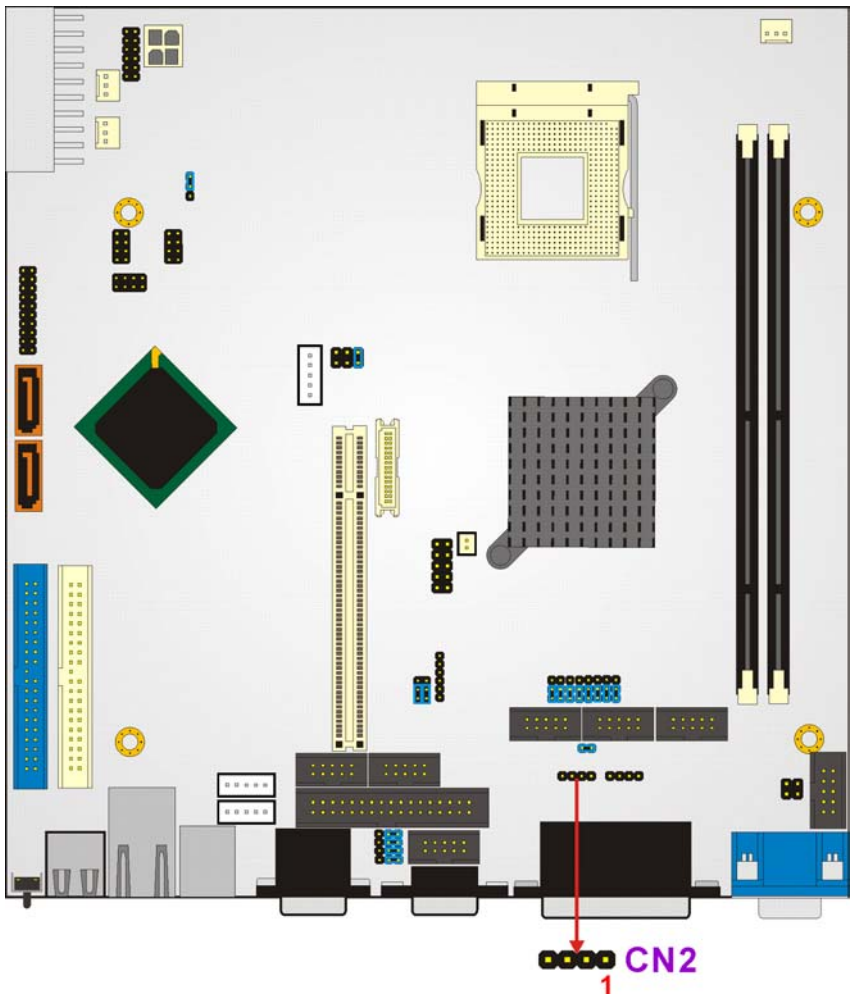


Figure 3-6: Audio Line Out Connector Location

PIN	DESCRIPTION
1	LINE OUT_L
2	GND
3	GND
4	LINE OUT _R

Table 3-7: Audio Line Out Connector Pinouts

3.2.5 CompactFlash Connector

CN Label: CF1

CN Type: 50-pin socket

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

The CompactFlash connector is used to adapt Type II Compact Flash and CF+ cards for use in Type II (5 mm thick) PCMCIA card slots.

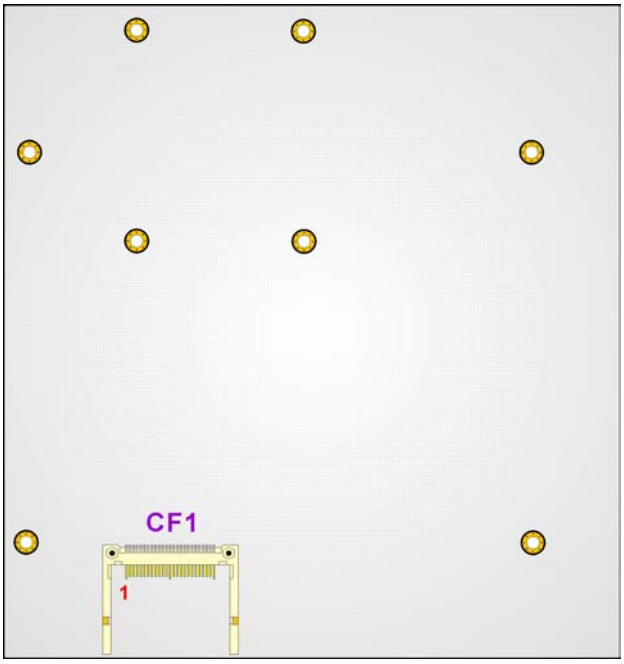


Figure 3-7: CompactFlash Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	VCC_COM
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	N/C
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-8: CompactFlash Connector Pinouts

3.2.6 Cooling Fan Connectors

CN Label:	FAN1, FAN2, FAN3
CN Type:	3-pin header
CN Location:	See **Figure 3-8**
CN Pinouts:	See Table 3-9

The FAN1, FAN2 and FAN3 cooling fan connectors provides a 12V current to the cooling fans. The connector has a "rotation" pin to get rotation signals from the fan and notify the system so the system BIOS can recognize the fan speed. Please note that only certain fans can issue the rotation signals.

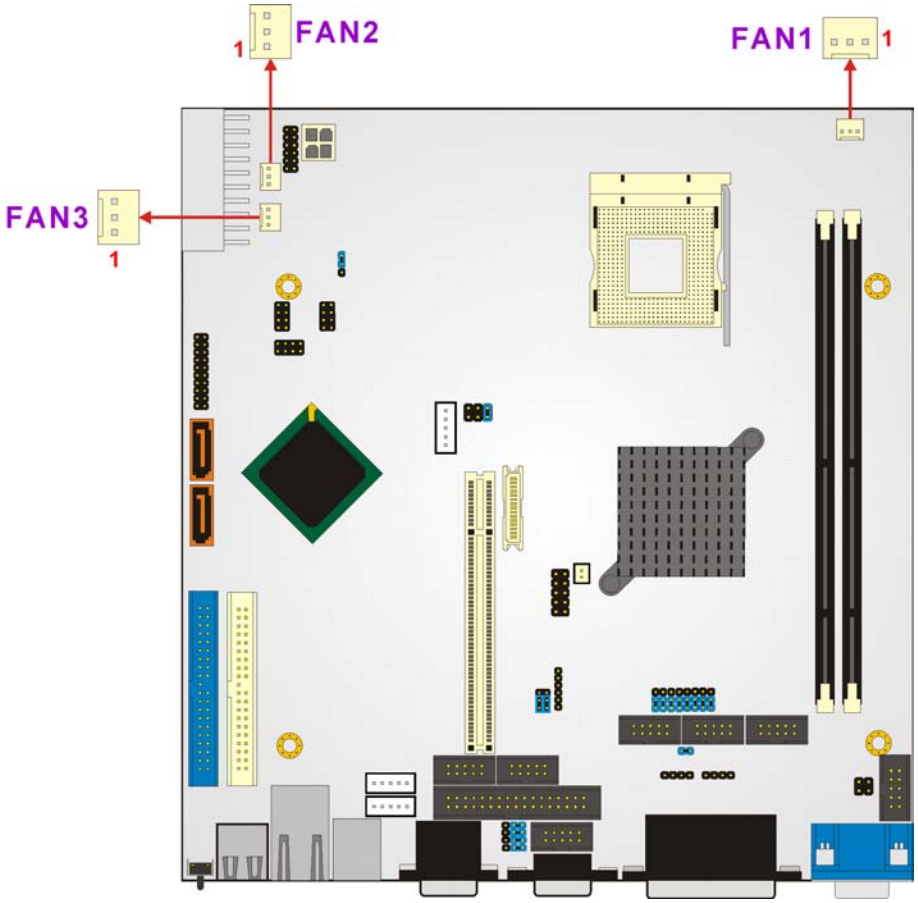


Figure 3-8: Cooling Fan Connector Locations

PIN	FAN1	FAN2, FAN3
1	GND	GND
2	Linear control	+12V
3	Fan Sensor	Fan Sensor

Table 3-9: Cooling Fan Connector Pinouts

3.2.7 Digital Input/Output (DIO) Connector

CN Label: CN6

CN Type: 10-pin header (2x5 pins)

CN Location: See **Figure 3-9**

CN Pinouts: See Table 3-10

The digital input output (DIO) connector is managed through the ITE IT8712F SI/O chip. The DIO connector pins are user programmable.

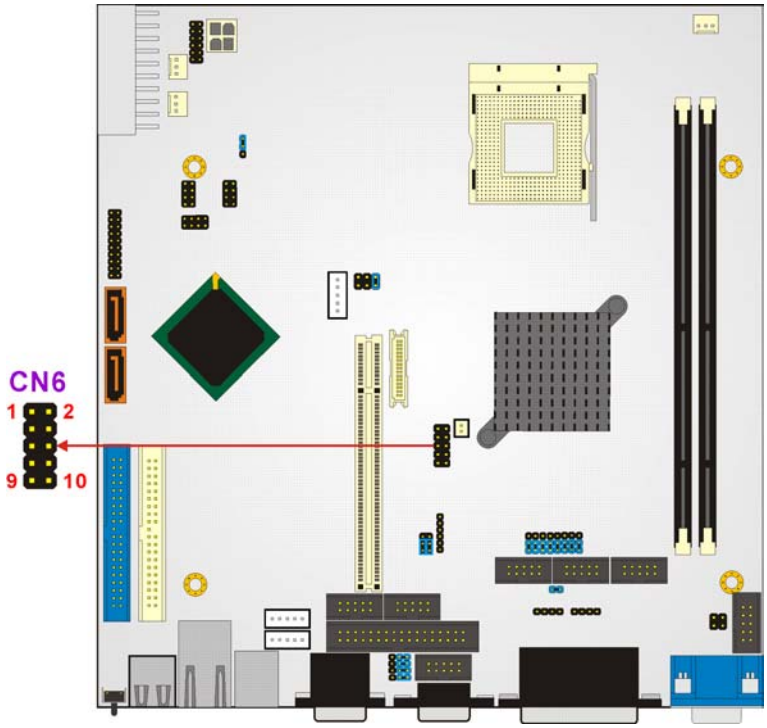


Figure 3-9: Digital Input/Output (DIO) Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	+5V
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-10: Digital Input/Output (DIO) Connector Pinouts

3.2.8 FDD Connector

CN Label: FDD1

CN Type: 34-pin box header (2x17 pins)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

The FDD connector connects to a floppy disk drive.

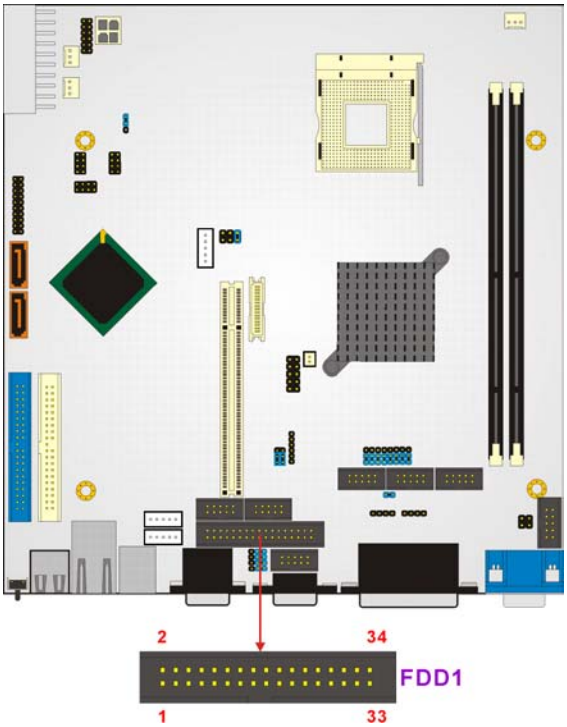


Figure 3-10: FDD Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

Table 3-11: FDD Connector Pinouts

3.2.9 IDE Interface Connector

CN Label: IDE1 (Primary), IDE2 (Secondary)

CN Type: 40-pin box header (2x20 pins)

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

The IDE Interface connectors provide connectivity for four IDE devices.

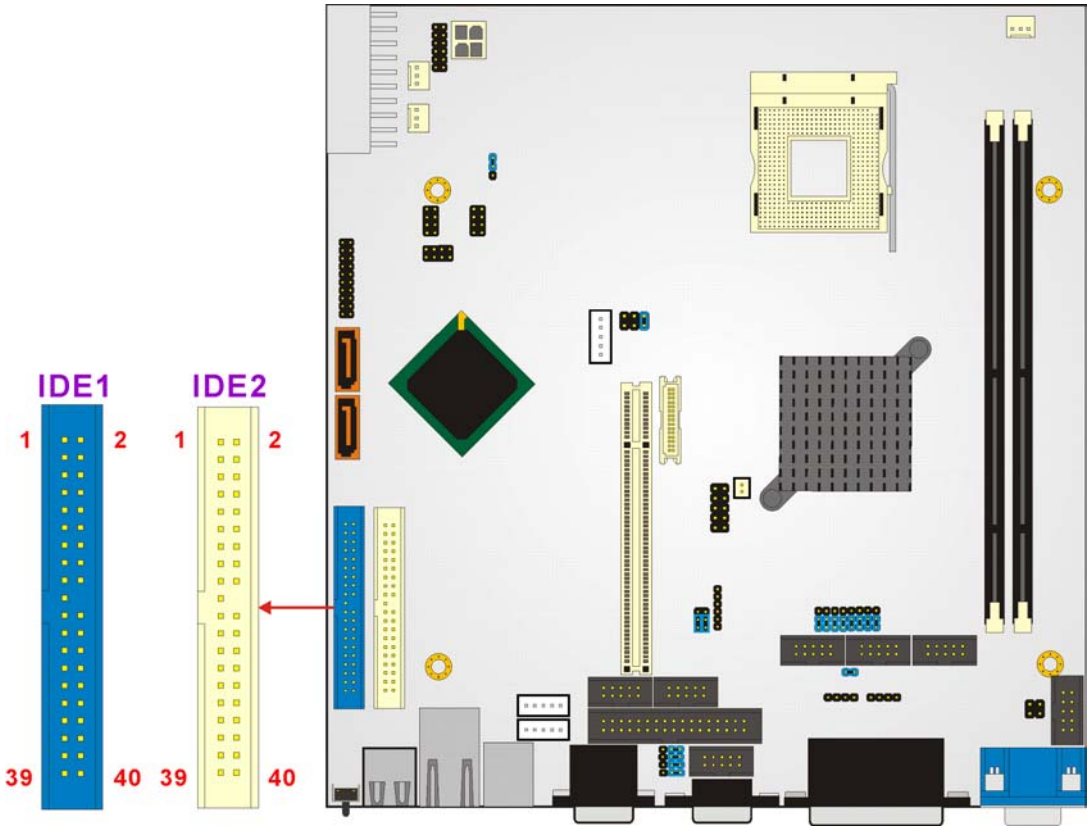


Figure 3-11: IDE Interface Connector Location

PIN	DESCRIPTION	PIN	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
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND

PIN	DESCRIPTION	PIN	DESCRIPTION
27	IDE CHRDY	28	GND
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA 1	34	N/C
35	SA 0	36	SA 2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

Table 3-12: IDE Interface Connector Pinouts

3.2.10 Inverter Connector

CN Label: CN12

CN Type: 5-pin header

CN Location: See Figure 3-12

CN Pinouts: See Table 3-13

The Inverter connector connects to the LCD backlight.

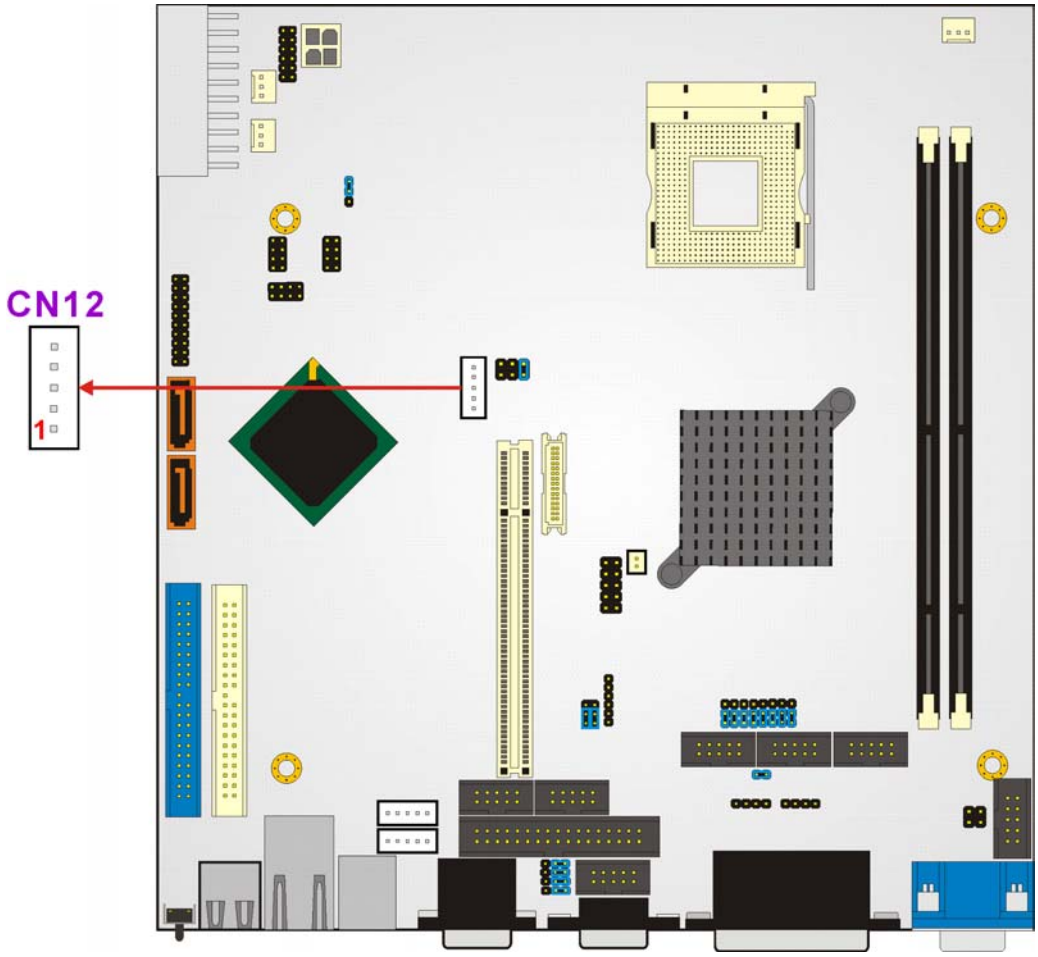


Figure 3-12: Inverter Connector Location

PIN	DESCRIPTION
1	NC
2	GND
3	+12V
4	GND
5	ENABKL

Table 3-13: Inverter Connector Pinouts

3.2.11 IrDA Connector

CN Label: IR1

CN Type: 6-pin header

CN Location: See Figure 3-13

CN Pinouts: See Table 3-14

POS-8520 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. To use the IrDA port, configure the FIR or ASKIR model in the Peripheral Setup COM2 in BIOS. The normal RS-232 COM2 will be disabled.

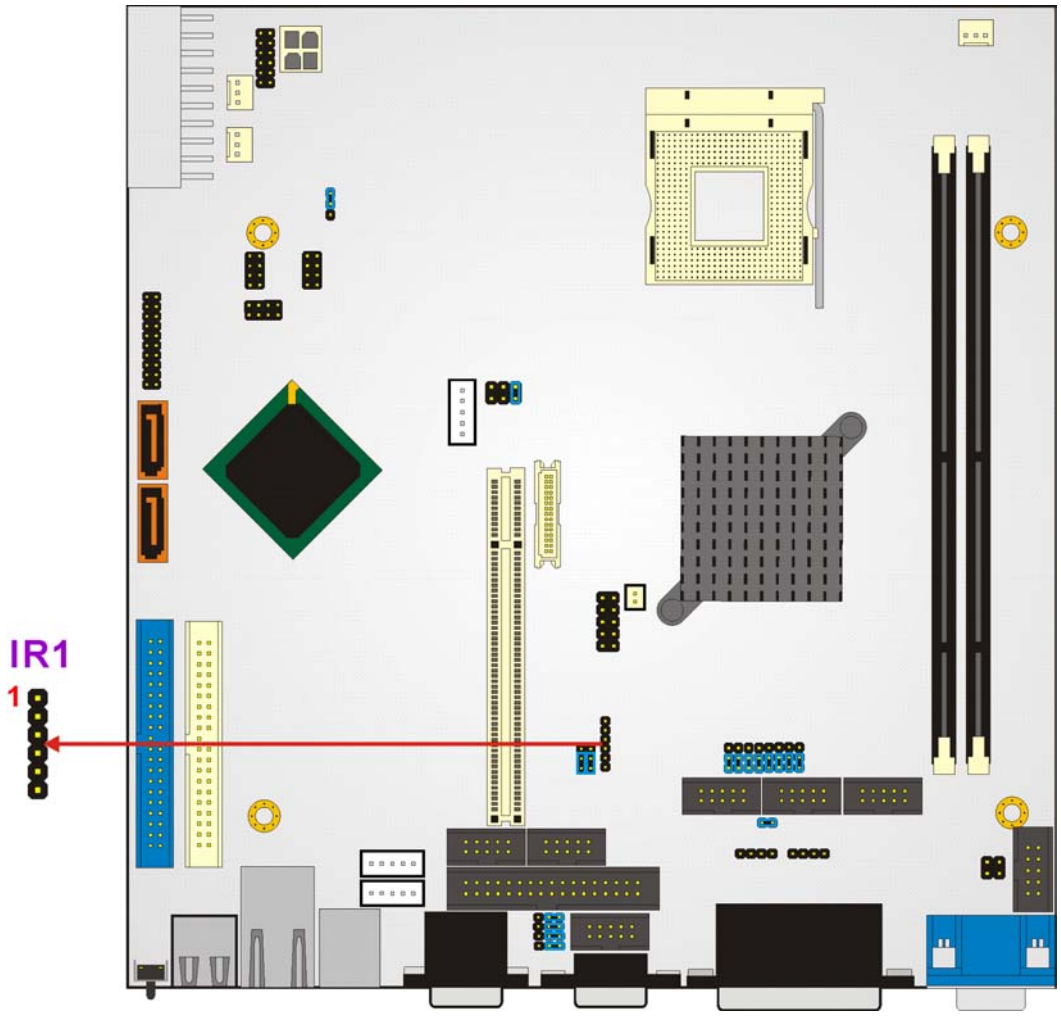


Figure 3-13: IrDA Connector Location

PIN	DESCRIPTION
1	+5V
2	NC
3	IR-RX

PIN	DESCRIPTION
4	GND
5	IR-TX
6	+5V

Table 3-14: IrDA Connector Pinouts

3.2.12 Keyboard Connector

CN Label: CN16

CN Type: 5-pin header

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15**

For alternative applications, an on board keyboard pin header connector is also available.

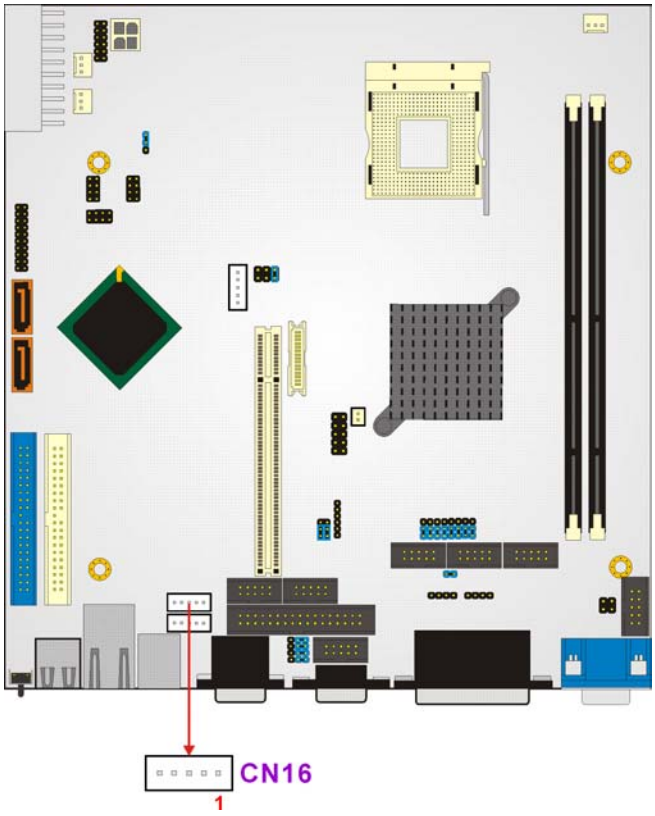


Figure 3-14: Keyboard Connector Location

PIN	DESCRIPTION
1	KB CLOCK
2	KB DATA
3	N/C
4	GND
5	+5V

Table 3-15: Keyboard Connector Pinouts

3.2.13 LVDS Connector

CN Label: CN30

CN Type: 30-pin crimp connector

CN Location: See Figure 3-15

CN Pinouts: See Table 3-16

The LVDS connector connects to a one or two channel (18-bit or 24-bit) LVDS panel.

NOTE:

The supplied voltage can be selected via JP7.

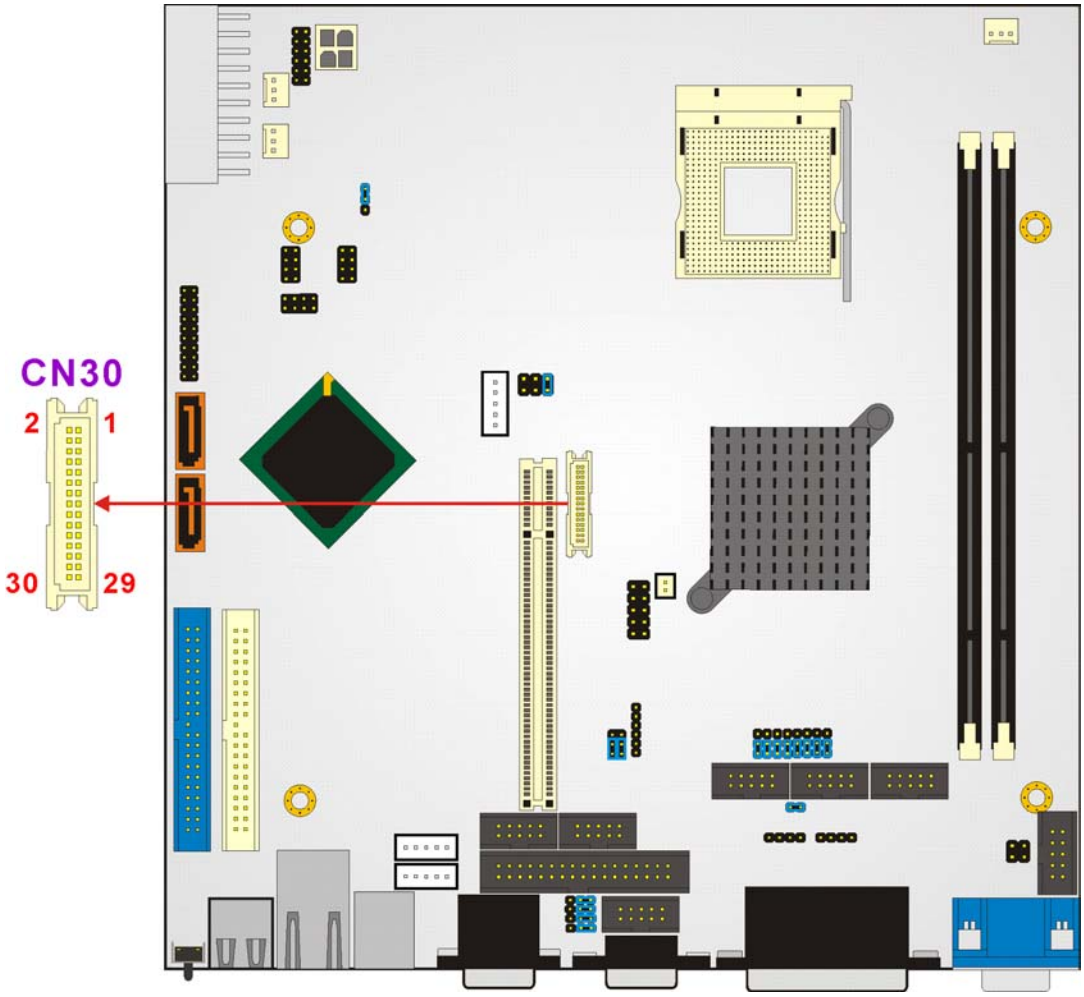


Figure 3-15: LVDS Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	GND
3	A0P	4	A0M
5	A1P	6	A1M
7	A2P	8	A2M
9	CLK1P	10	CLK1M
11	A3P	12	A3M
13	GND	14	GND
15	A4P	16	A4M
17	A5P	18	A5M
19	A6P	20	A6M

PIN	DESCRIPTION	PIN	DESCRIPTION
21	CLK2P	22	CLK2M
23	A7P	24	A7M
25	GND	26	GND
27	LCD_VDD	28	LCD_VDD
29	LCD_VDD	30	LCD_VDD

Table 3-16: LVDS Connector Pinouts

3.2.14 Mouse Connector

CN Label: CN15

CN Type: 5-pin box header

CN Location: See Figure 3-16

CN Pinouts: See Table 3-17

For alternative applications, an on-board mouse pin header connector is also available.

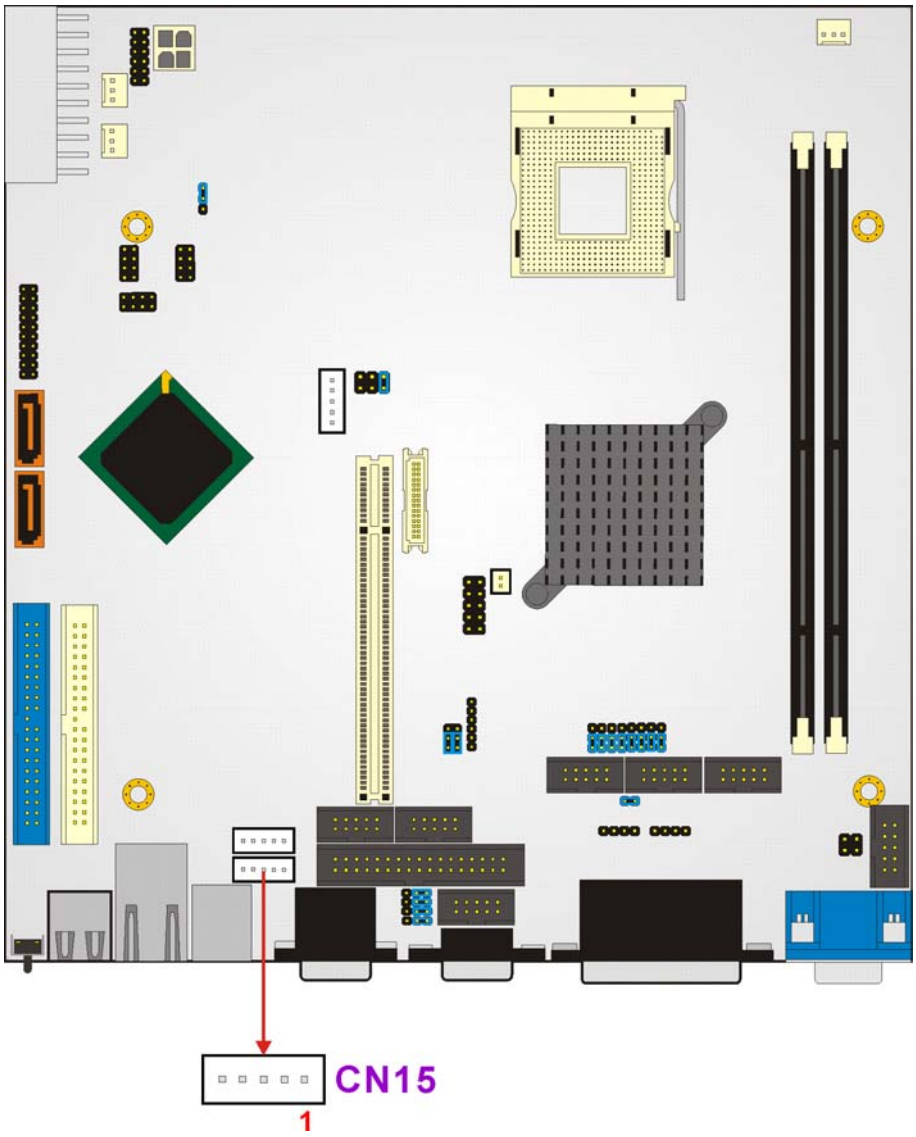


Figure 3-16: Mouse Connector Location

PIN	DESCRIPTION
1	MS CLOCK
2	MS DATA
3	N/C
4	GND
5	+5V

Table 3-17: Mouse Connector Pinouts

3.2.15 Multi-panel Connector

CN Label:	CN8
CN Type:	20-pin header (2x10 pins)
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-18

The Multi-panel connector provides connectivity to several external switches and indicators for monitoring and controlling the CPU board.

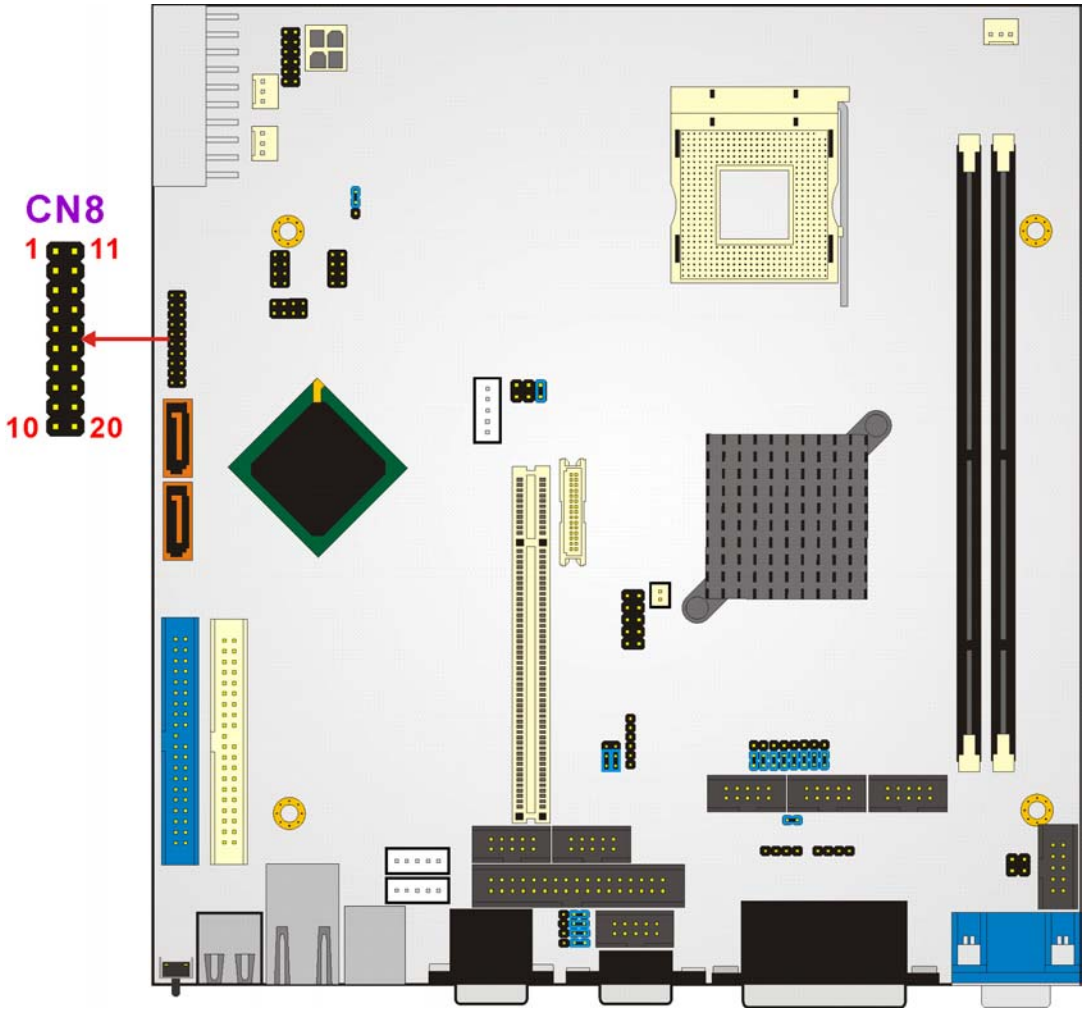


Figure 3-17: Multi-panel Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	SPEAKER	11	POWER-VCC
2	N/C	12	N/C
3	N/C	13	GND
4	+5V	14	KEYLOCK
5	RESET SW	15	GND
6	GND	16	GND
7	IDE LED -	17	N/C
8	IDE LED+	18	ATX POWER CONTROL
9	ATX POWER BUTTON	19	ATX 5VSB
10	GND	20	ATX 5VSB

Table 3-18: Multi-panel Connector Pinouts

3.2.16 PCI Connector

CN Label: PCI1

CN Type: 120-pin PCI socket

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-19**

Use the PCI slot connector to add auxiliary boards.

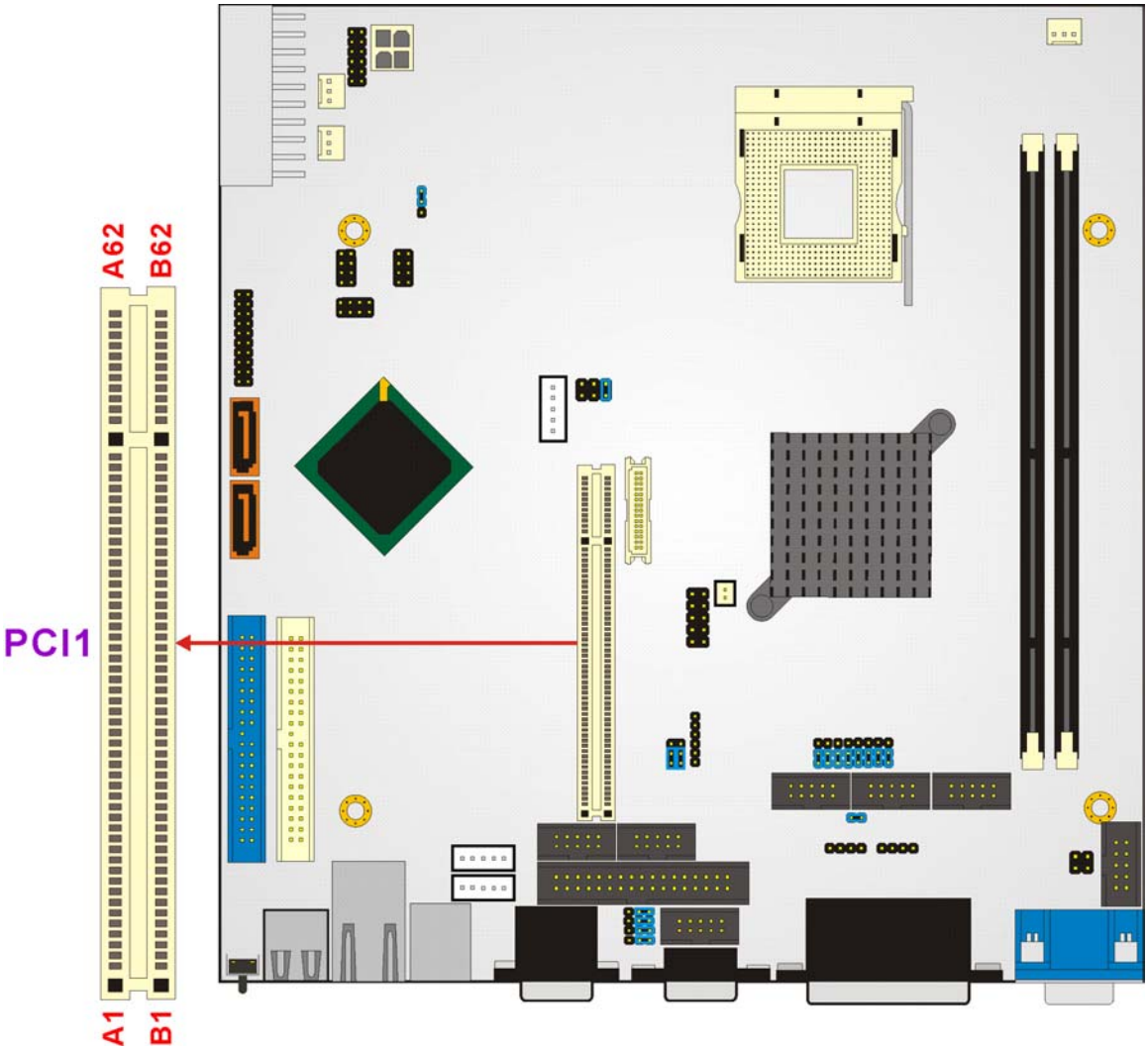


Figure 3-18: PCI Connector Location

Pin	Add-in Card		Pin	Add-in Card	
	Side B	Side A		Side B	Side A
1	Reserved	Ground	32	AD[17]	AD[16]
2	TCK	+12V	33	C/BE[2]#	+3.3V
3	Ground	TMS	34	Ground	FRAME#
4	TDO	TDI	35	IRDY#	Ground
5	+5V	+5V	36	+3.3V	TRDY#
6	+5V	INTA#	37	DEVSEL#	Ground
7	INTB#	INTC#	38	PCIXCAP	STOP#
8	INTD#	+5V	39	LOCK#	+3.3V
9	PRSNT1#	Reserved	40	PERR#	SMBCLK

Pin	Add-in Card		Pin	Add-in Card	
	Side B	Side A		Side B	Side A
10	Reserved	+5V	41	+3.3V	SMBDAT
11	PRSNT2#	Reserved	42	SERR#	Ground
12	Ground	Ground	43	+3.3V	PAR
13	Ground	Ground	44	C/BE[1]#	AD[15]
14	Reserved	3.3Vaux	45	AD[14]	+3.3V
15	Ground	RST#	46	Ground	AD[13]
16	CLK	+5V	47	AD[12]	AD[11]
17	Ground	GNT#	48	AD[10]	Ground
18	REQ#	Ground	49	M66EN	AD[09]
19	+5V	PME#	50	KEYWAY	
20	AD[31]	AD[30]	51	KEYWAY	
21	AD[29]	+3.3V	52	AD[08]	C/BE[0]#
22	Ground	AD[28]	53	AD[07]	+3.3V
23	AD[27]	AD[26]	54	+3.3V	AD[06]
24	AD[25]	Ground	55	AD[05]	AD[04]
25	+3.3V	AD[24]	56	AD[03]	Ground
26	C/BE[3]#	IDSEL	57	Ground	AD[02]
27	AD[23]	+3.3V	58	AD[01]	AD[00]
28	Ground	AD[22]	59	+5V	+5V
29	AD[21]	AD[20]	60	ACK64#	REQ64#
30	AD[19]	Ground	61	+5V	+5V
31	+3.3V	AD[18]	62	+5V	+5V

Table 3-19: PCI Connector Pinouts

3.2.17 SATA Drive Port

CN Label: SATA1, SATA2

CN Type: SATA disk drive port

CN Location: See Figure 3-19

CN Pinouts: See Table 3-20

The SATA drive ports provide connectivity to SATA drives with a maximum data transfer rate of 1.5Gb/s.

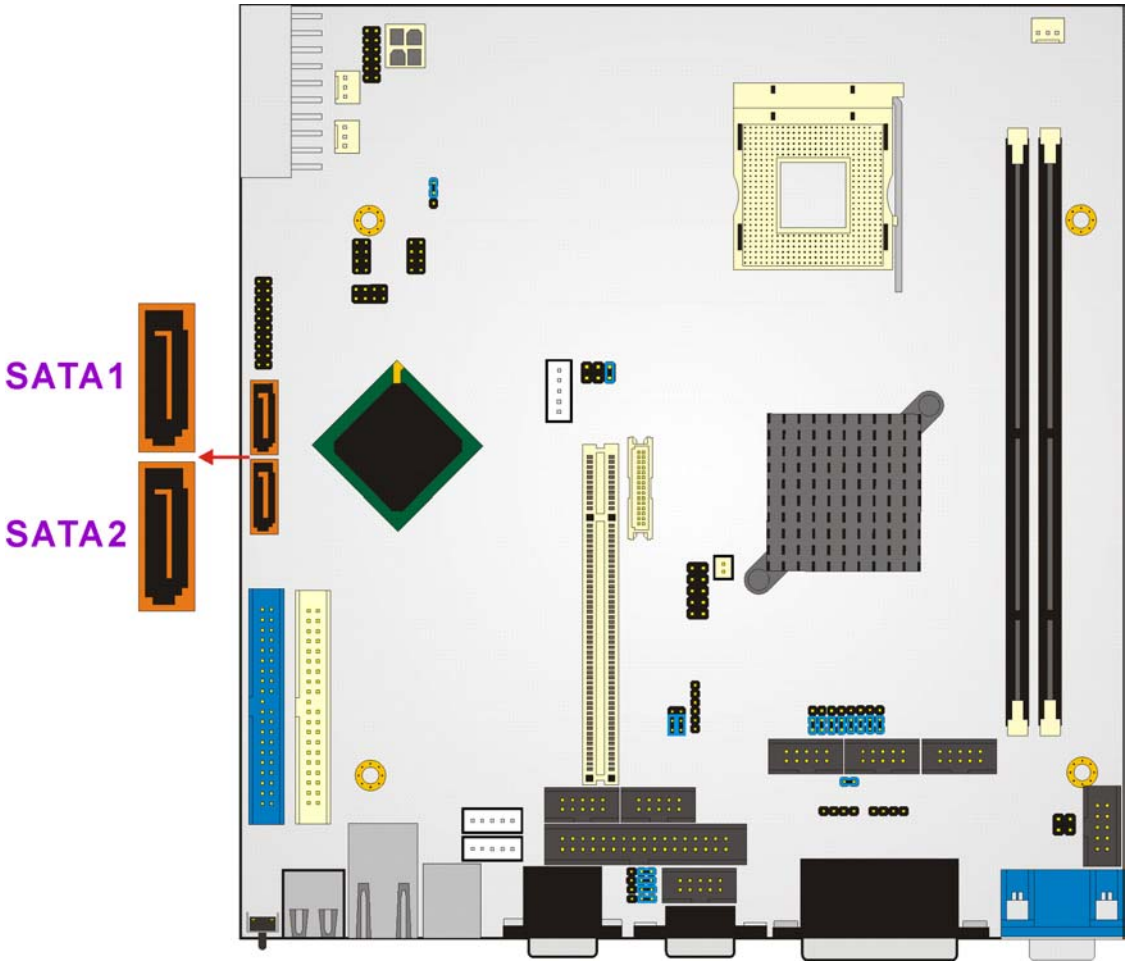


Figure 3-19: SATA Drive Port Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

Table 3-20: SATA Drive Port Pinouts

CAUTION!

SATA hard drives may come with both a 4P power connector and a SATA power interface. Attach either the 4P connector or the SATA power cable to the SATA hard drives. ***DO NOT*** attach both the power connectors to your SATA hard drives at the same time! Doing so will cause damage.

NOTE:

1. SATA is supported by:
    - Windows 2000 SP4
    - Windows XP SP1
    - Windows 2003, or later versions.
2. Older OSes, such as Windows 98SE or ME, do not support the SATA interface.

3.2.18 Serial Communications Connector

CN Label:	COM1, COM2, COM3, COM4, COM5, COM6
CN Type:	10-pin box headers (2x5 pins)
CN Location:	See **Figure 3-20**
CN Pinouts:	See Table 3-21, Table 3-22, Table 3-23

The POS-8520 offers six ten-pin headers for RS-232/422/485 serial connections.

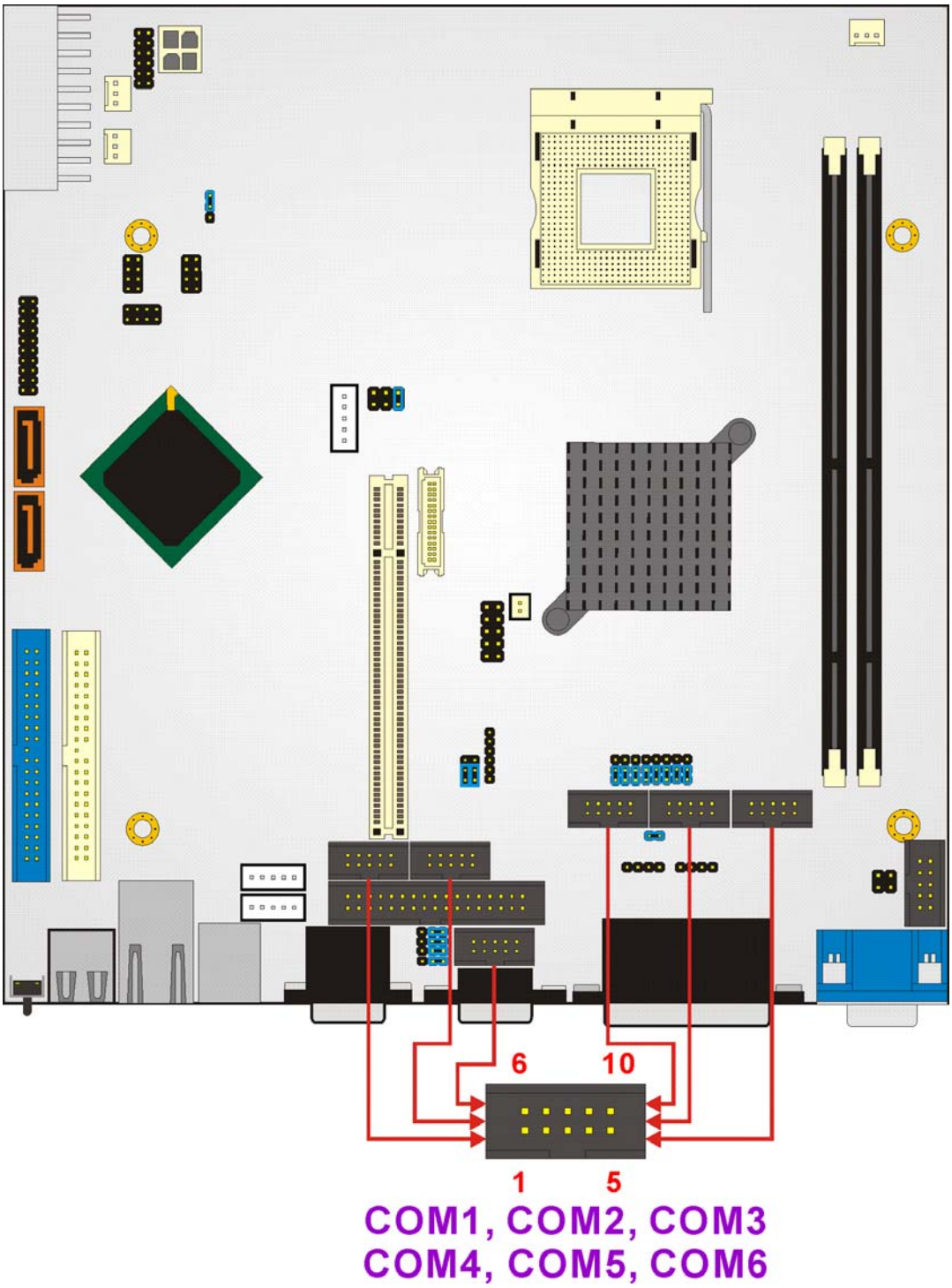


Figure 3-20 Serial Communications Connector Locations

All COM connectors provide RS-232 serial connections with the following pinouts.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

Table 3-21: RS-232 Serial Communications Connector Pinouts

COM2 provides an additional RS-422/485 serial connection with the following pinouts. Refer to **Section 0** for COM2 jumper settings.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXD-	2	RX-
3	TXD+	4	RX+
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

Table 3-22: COM2 RS-422 Serial Communications Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RTX-	2	NC
3	RTX+	4	NC
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

Table 3-23: COM2 RS-485 Serial Communications Connector Pinouts

3.2.19 USB Connectors

CN Label: CN26, CN27, CN28

CN Type: 8-pin header (2x4 pins)

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-24**

In addition to the dual USB connector on the external interface panel, the POS-8520 has three on-board 8-pin headers that provide connectivity to six USB 2.0 ports. The USB ports are used for I/O bus expansion.

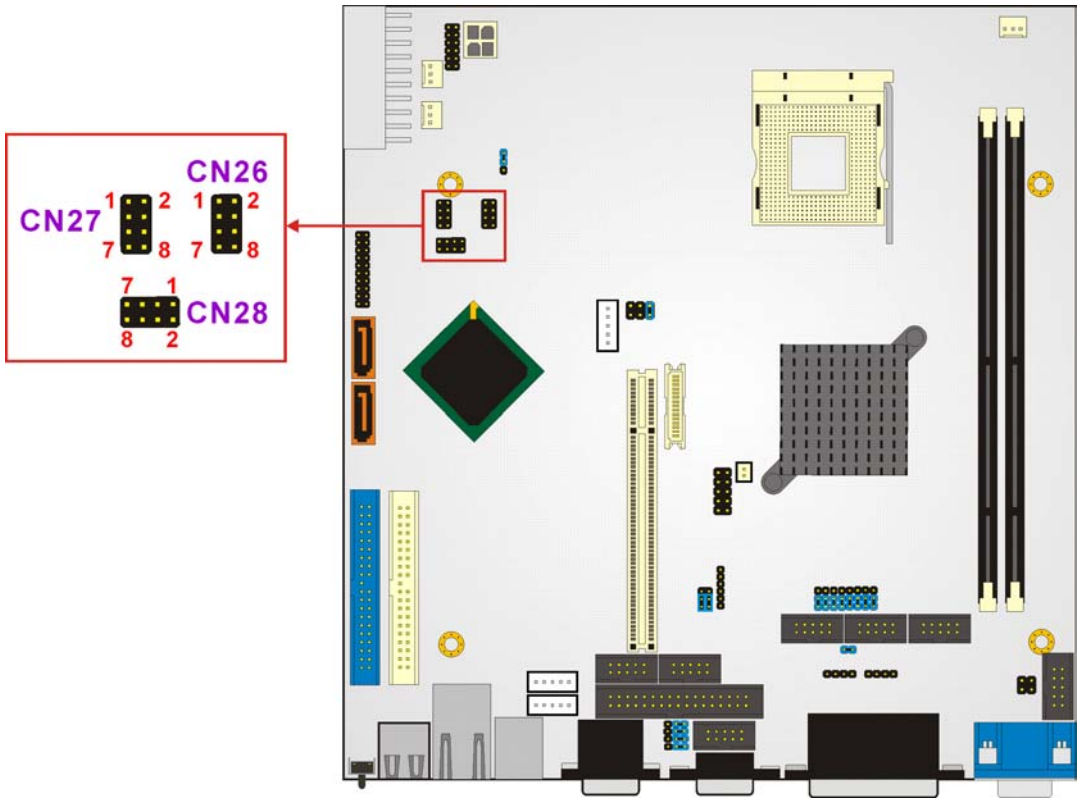


Figure 3-21 USB Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	8	VCC
3	USBD0-	6	USBD0-
5	USBD0+	4	USBD0+
7	GND	2	GND

Table 3-24: USB Connector Pinouts

3.2.20 VGA Connector

CN Label: CN14

CN Type: 10-pin box header (2x5 pins)

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-25**

The VGA connector is an internal VGA connector.

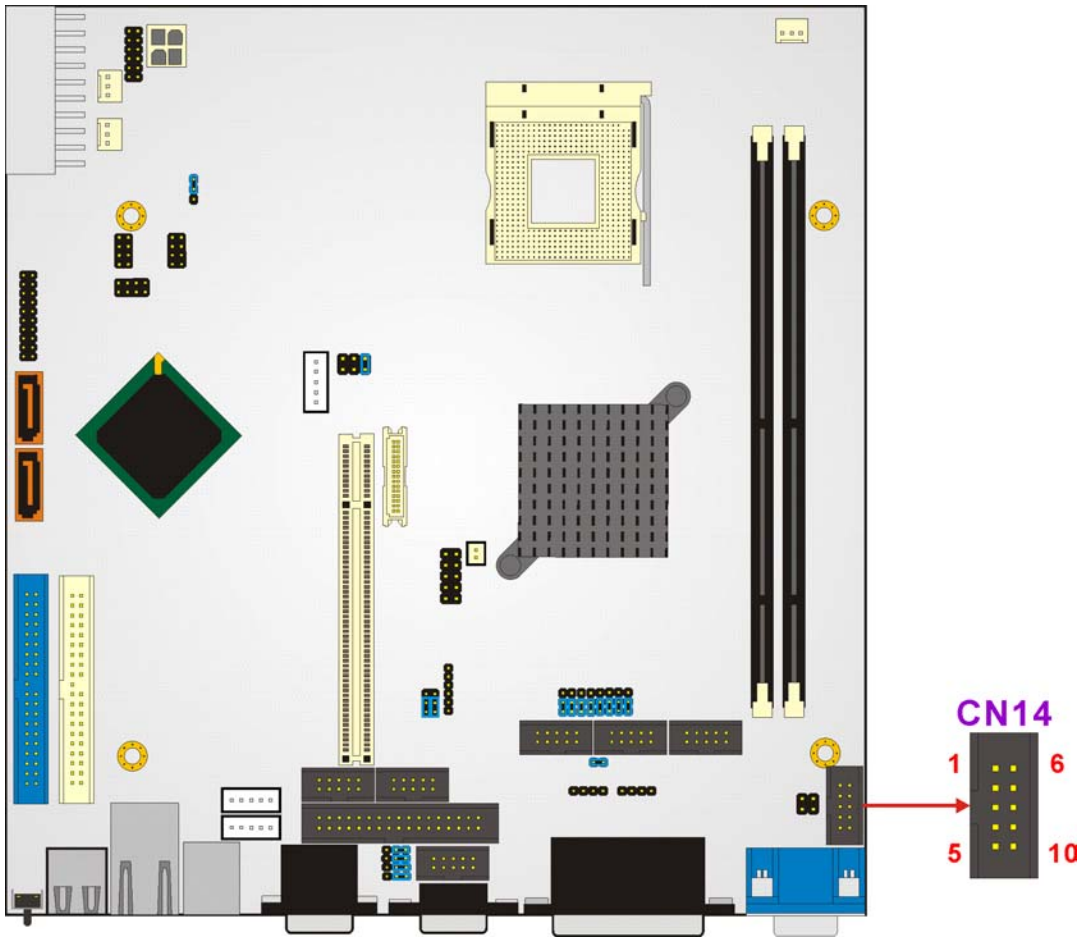


Figure 3-22 VGA Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	SMCLK

PIN	DESCRIPTION	PIN	DESCRIPTION
3	GREEN	4	SMDATA
5	BLUE	6	GND
7	H-SYNC	8	GND
9	V-SYNC	10	GND

Table 3-25: VGA Connector Pinouts

3.3 External Peripheral Interface Connectors

Figure 3-23 shows the POS-8520 Motherboard external peripheral connector panel. The peripheral connectors on the panel can be connected to devices externally when the motherboard is installed in a chassis. The external peripheral connectors are:

- 1 x Reset button (labeled 1)
- 2 x USB 2.0 ports (labeled 2)
- 2 x RJ-45 GbE connectors (labeled 3)
- 1 x Keyboard/Mouse connector (labeled 4)
- 3 x Serial port connectors (labeled 5 and 6)
- 1 x Parallel port connector (labeled 7)
- 1 x 3-jack audio connector (labeled 8)
- 1 x VGA connector (labeled 9

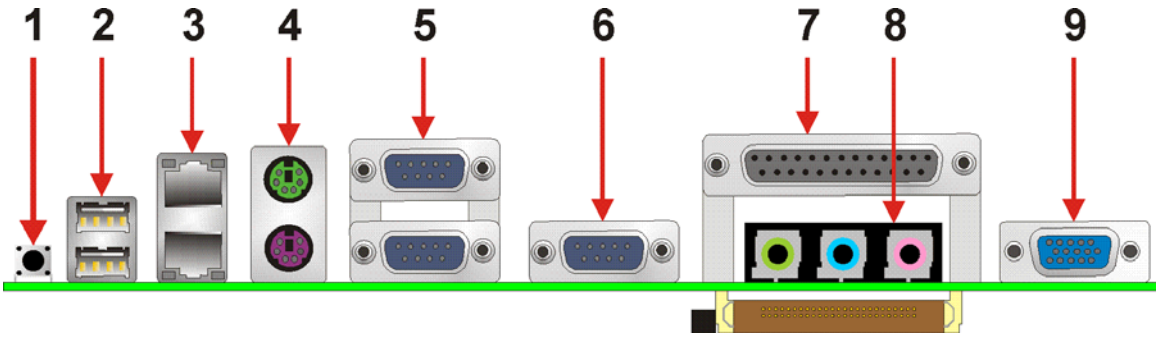


Figure 3-23: POS-8520 Motherboard External Peripheral Connector Panel

3.3.1 Reset Button

CN Label: S2

CN Type: Reset button

CN Location: See **Figure 3-23** (labeled 1)

CN Pinouts: See Table 3-30

Use the reset button to reset the system.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Reset	2	GND

Table 3-26: Reset Button Pinouts

3.3.2 USB Connectors

CN Label: CN25

CN Type: Dual USB port

CN Location: See Figure 3-23 (labeled 2)

CN Pinouts: See Table 3-27

USB devices connect directly to the USB connectors on the external peripheral connector panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 3-27: USB Connector Pinouts

3.3.3 Ethernet Connector

CN Label: CN31

CN Type: Dual RJ-45 ports

CN Location: See **Figure 3-23** (labeled 3)

CN Pinouts: See **Table 3-28** and Table 3-28

A 1Gb connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)
3	RX+ (or MDX1+)	7	N/C (or MDX3+)
4	N/C (or MDX2+)	8	N/C (or MDX3-)
13	MDX0+	17	MDX2-
14	MDX0-	18	MDX1-
15	MDX1+	19	MDX3+
16	MDX2+	20	MDX3-
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)

Table 3-28: Ethernet Connector Pinouts

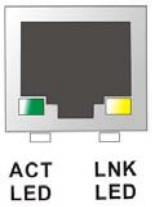


Figure 3-24: Ethernet Connector

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 (**Table 3-29**).

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 3-29: Ethernet Connector LEDs

3.3.4 Keyboard/Mouse Connector

CN Label: CN23

CN Type: Dual PS/2

CN Location: See **Figure 3-23** (labeled 4)

CN Pinouts: See **Figure 3-25**, **Table 3-30** and Table 3-31

The POS-8520 motherboard keyboard and mouse connectors are standard PS/2 connectors.

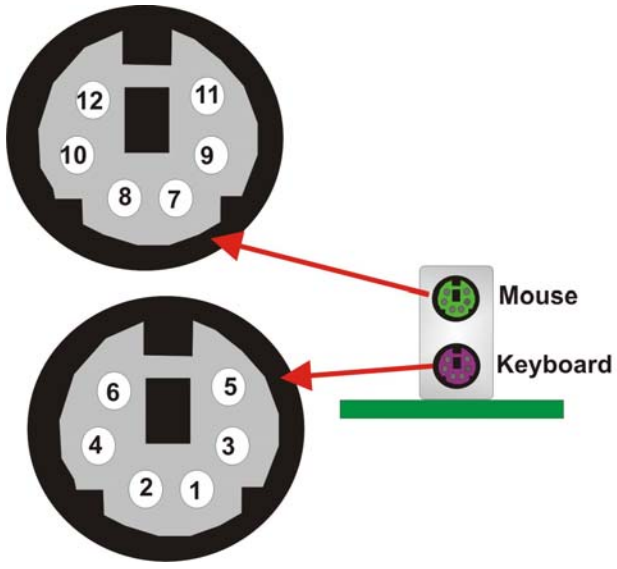


Figure 3-25: Dual PS/2 Pinouts and Configuration

PIN	DESCRIPTION
1	KB DATA
2	NC
3	GND
4	VCC
5	KB CLOCK
6	NC

Table 3-30: Keyboard Connector Pinouts

PIN	DESCRIPTION
1	MS DATA
2	NC
3	GND
4	VCC
5	MS CLOCK
6	NC

Table 3-31: Mouse Connector Pinouts

3.3.5 Serial Communications Connector

CN Label: CN20, CN22

CN Type: D-sub 9 Male connector

CN Location: See **Figure 3-23** (labeled 5 and 6)

CN Pinouts: See **Figure 3-26**, **Table 3-32**, **Table 3-33**, **Table 3-34** and **Table 3-35**

The serial connectors on the external interface panel provide serial connection in the RS-232/422/485 modes. Refer to the following tables as well as the jumper settings section for more information.

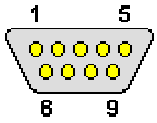


Figure 3-26: Serial Communications Connector Pinout Locations

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 3-32: CN20A (COM1) and CN22 (COM4) RS-232 Mode Connector Pinouts

PIN	Description	PIN	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTX
4	DTR	9	RI
5	GND		

Table 3-33: CN20B (COM2) RS-232 Mode Connector Pinouts

PIN	Description	PIN	Description
1	TXD-	6	RX-
2	TXD+	7	RX+
3	NC	8	NC
4	NC	9	Voltage
5	NC		

Table 3-34: CN20B (COM2) RS-422 Mode Connector Pinouts

PIN	Description	PIN	Description
1	RTX-	6	NC
2	RTX+	7	NC
3	NC	8	NC
4	NC	9	Voltage
5	NC		

Table 3-35: CN20B (COM2) RS-485 Mode Connector Pinouts

3.3.6 Parallel Connector

CN Label: LPT1

CN Type: DB-25 Female connector

CN Location: See **Figure 3-23** (labeled 7)

CN Pinouts: See Figure 3-27 and Table 3-36

The POS-8520 motherboard includes one external parallel port, accessed through 25-pin D-type female connector LPT1. These ports are usually connected to a printer.

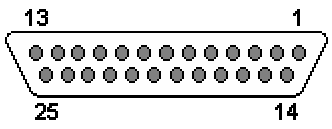


Figure 3-27: Parallel Connector Pinout Locations

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 3-36: Parallel Connector Pinouts

3.3.7 Audio Connector

CN Label: CN24

CN Type: 3 Phone Jack connector

CN Location: See **Figure 3-23** (labeled 8)

CN Pinouts: See Figure 3-28 and Table 3-37

The POS-8520 motherboard includes three external audio jacks for mic in, line in and speaker out functions.

Figure 3-28: Audio Connector Locations

Color	Description
RED	MIC IN
BLUE	LINE IN
GREEN	SPEAK OUT

Table 3-37: Audio Connector Jacks

3.3.8 VGA Connector

CN Label: VGA1

CN Type: HD-D-sub 15 Female connector

CN Location: See **Figure 3-23**

CN Pinouts: See **Figure 3-29** and **Table 3-38**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

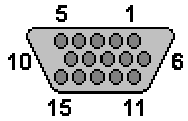


Figure 3-29: VGA Connector

PIN	Description	PIN	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 3-38: VGA Connector Pinouts

3.4 On-board Jumpers

The POS-8520 has fifteen on-board jumpers. Refer to **Section 4.5** for jumper configuration settings.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

4

Installation and Configuration

4.1 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.

4.1.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the POS-8520 motherboard. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the POS-8520 motherboard (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

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

4.1.2 Installation Notices

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the POS-8520 motherboard 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**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the POS-8520 motherboard off**:
  - When working with the POS-8520 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 POS-8520 motherboard 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.

4.2 Unpacking

 **NOTE:**

If any of the items listed below are missing when the POS-8520 motherboard is unpacked, do not proceed with the installation. Contact the POS-8520 motherboard reseller or vendor.

4.2.1 Unpacking Precautions

Some components on POS-8520 motherboard are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect the POS-8520 motherboard from being damaged, by ESD follow these precautions:

- Any person handling the POS-8520 motherboard should be grounded. This removes static charge before the POS-8520 motherboard is touched. To remove static electricity, wear a grounded wrist strap at all times or frequently touch any conductive materials that are connected to the ground.

- Handle the POS-8520 motherboard by its edges. Do not touch the IC chips, leads or circuitry unnecessarily.
- Do not place the PCB on top of the anti-static bag. Only the inside of the bag is safe from static discharge.

4.2.2 Checklist

When unpacking the POS-8520 motherboard, please make sure that the package contains the following items.

- 1 x POS-8520 single board computer
- 1 x IDE Cable
- 1 x Dual RS232 Cable
- 1 x Single RS232 Cable
- 2 x SATA Cables
- 1 x SATA Power Cable
- 1 x mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

If one or more of these items are missing, please contact the reseller or vendor the POS-8520 motherboard was purchased from. Do not proceed any further with the installation.

4.3 POS-8520 Motherboard Installation

WARNING:

Never run the motherboard without the appropriate heat sinks and coolers. Heat sinks and coolers can be ordered from IEI Technology or purchased separately.

WARNING:

Please note that the installation instructions described in this manual should be carefully followed in order to prevent damage to the POS-8520 motherboard components and injury to the user.

WARNING:

When installing electronic components onto the POS-8520 motherboard always take 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 POS-8520 motherboard or connected to the POS-8520 motherboard during the installation process.

NOTE:

Some POS-8520 motherboard models already have preinstalled CPUs. If the POS-8520 motherboard has a preinstalled CPU then the following section on CPU installation can be skipped.

- CPU
- CPU cooling kit
- DIMM modules
- Peripheral device connection

4.3.1 Socket 478 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 are properly installed before the POS-8520 motherboard is run.

If a heat sink and cooling fan are not properly installed both the CPU and the board may be damaged.

To install Socket 478-pin CPU onto the POS-8520 motherboard, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **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 2: **Open the CPU socket lever**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. (See **Figure 4-1**)

Step 3: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward. (See **Figure 4-1**)

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. (See **Figure 4-1**)

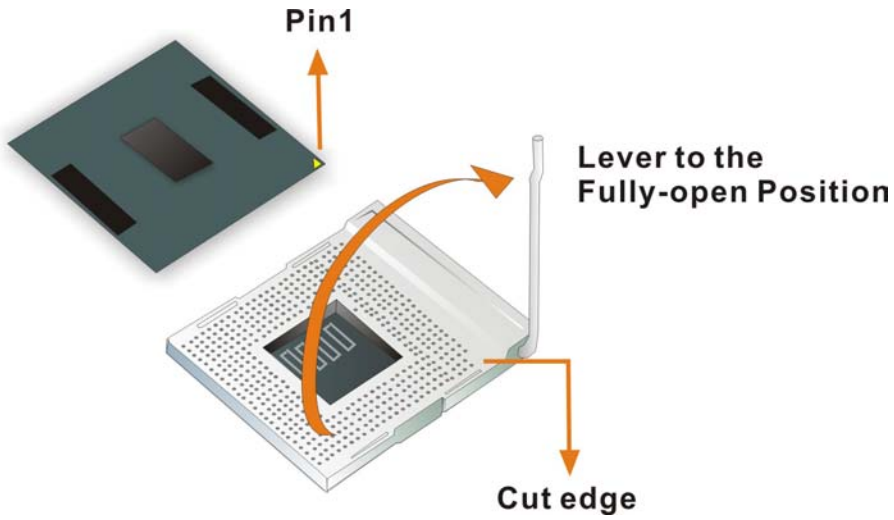


Figure 4-1: Install the CPU

Step 5: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly

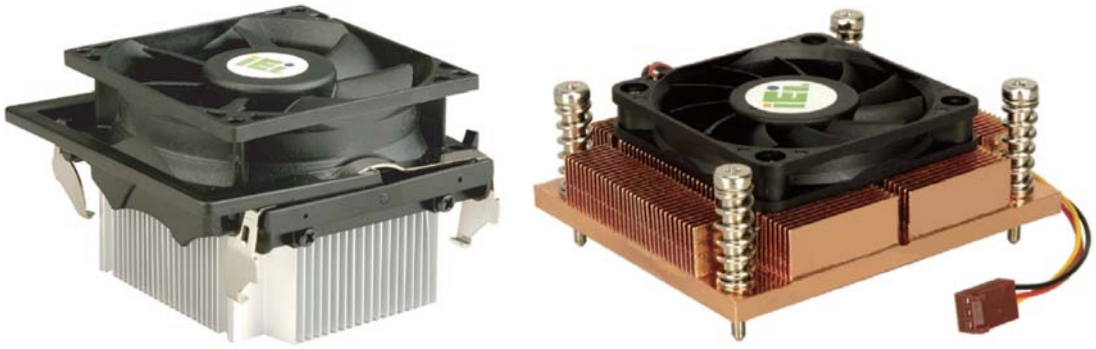
Step 6: **Close the CPU socket.** Re-engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

4.3.2 Socket 478 Cooling Kit (CF-519-RS or CF-478B-RS) Installation

IEI provides a cooling kit designed for socket 478 CPUS. The cooling kit is comprises a CPU heat sink and a cooling fan.

NOTE:

The (CF-519-RS or CF-478B-RS) cooling fan heat sink comes with a sprayed layer of thermal paste. Make sure you do not accidentally wipe away the thermal paste while unpacking or installing the heat sink. Thermal paste between the CPU and the heat sink is important for optimum heat dissipation.



CF-519-RS **CF-478B-RS**

Figure 4-2: IEI Socket 478 Cooling Kits

The IEI Socket 478 CPU cooling kits shown in Figure 4-2 comprise of a CPU heat sink, cooling fan and support bracket.

To install the cooling kit, please follow the steps below.

Step 1: **Install the cooling kit bracket**. A cooling kit bracket is installed on the rear of the CPU card. Align the bracket with the four retention holes at the back of the CPU card. Once properly aligned, insert four retention screws from the front of the CPU card.

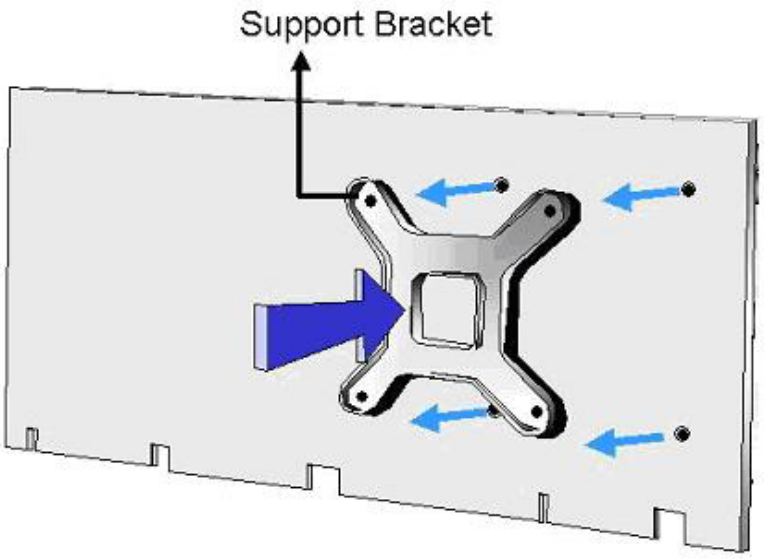


Figure 4-3: Cooling Kit Support Bracket

Step 2: **Open the lever at the top of the heat sink**. Lift the lever at the top of the cooling kit to loosen the cooling kit clamps.

Step 3: **Secure the cooling kit**. Gently place the heat sink and cooling kit onto the CPU. Make sure the hooks are properly secured to the bracket. To secure the cooling kit, close the top lever.

Step 4: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the POS-8520 motherboard. Carefully route the cable and avoid heat generating chips and fan blades.

4.3.3 DIMM Module Installation

4.3.3.1 Purchasing the Memory Module

When purchasing DIMM modules, the following considerations should be taken into account:

- Each DIMM module can support a memory chip with a maximum size of 1GB
- It is recommended that memory modules of identical brand, size, chips, and speed be used.
- DIMMs must use the same density memory chips.
- Both DIMMs must use the same DRAM bus width.
- Both DIMMs must be either single-sided or dual-sided.

4.3.3.2 DIMM Module Installation

The POS-8520 motherboard has two DDR 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 4-4**).

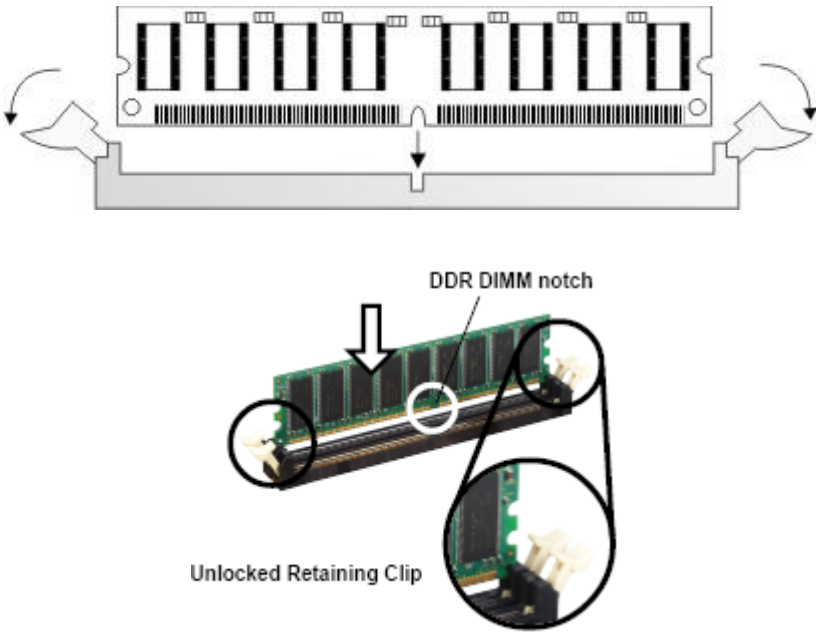


Figure 4-4: Installing the DIMM Module

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 4-5**).

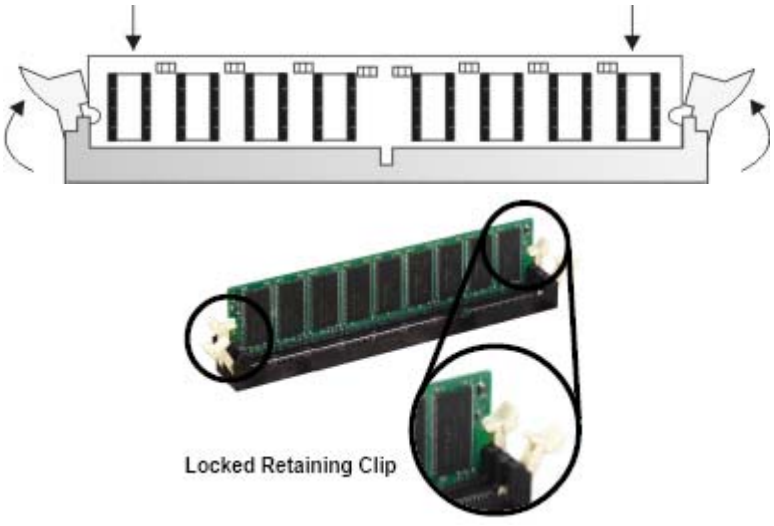


Figure 4-5: Locking the DIMM Module

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 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 Cable
1	Dual RS232 Cable
1	Single RS232 Cable
2	SATA Cables
1	SATA Power Cable
1	Mini jumper pack

Table 4-1: IEI Provided Cables

4.4.1 ATX 12V Power Connection

To connect the motherboard to an ATX 12V power supply, follow the instructions below.

Step 1: Connect the 4-pin connector end of the cable to the PW1 connector on the motherboard. Keyed pins on the connector prevent it from being connected incorrectly.

Step 2: Connect the other end of the cable to a power supply.

4.4.2 ATX Power Connection

To connect the motherboard to an ATX power supply, follow the instructions below.

Step 1: Connect the 20-pin connector end of the cable to the PW2 connector on the motherboard. Keyed pins on the connector prevent it from being connected incorrectly.

Step 2: Connect the other end of the cable to a power supply.

4.4.3 Audio CD In Installation

To connect an audio CD to the motherboard for sound, follow the instructions below.

Step 1: Connect the 4-pin connector end of the cable to the CN7 header on the motherboard. Be sure to align pin 1 on the header with pin 1 on the connector.

Step 2: Connect the other end of the cable to a CD's audio connector.

4.4.4 Audio Line Out Installation

AC'97 Audio signals are interfaced through a 4-pin flat-cable connector. An audio 4-pin-to-phone-jack adapter kit is required. To connect an audio CD to the motherboard for sound, follow the instructions below.

Step 1: Connect the 4-pin connector end of the cable to the CN2 header on the motherboard. Be sure to align pin 1 on the header with pin 1 on the connector.

Step 2: Connect the other end of the cable to a phone jack plug.

4.4.5 CompactFlash Installation

When appropriately formatted, a CompactFlash disk can serve as a bootable hard drive in applications where installation space is limited. The Compact Flash card occupies a secondary IDE channel. The compact flash connector is located on the bottom of the motherboard. To install a CompactFlash card onto the motherboard, follow the instructions below.

Step 1: Turn the motherboard over so that the CompactFlash socket is facing up.

Step 2: Gently insert the CompactFlash chip into the socket until it clicks into place.

Step 3: To release the CompactFlash chip from the socket, push the release button located next to the socket.

4.4.6 Cooling Fan Power Connections

There are three 3-pin cooling fan connectors on the POS-8520 motherboard labeled FAN1, FAN2, and FAN3. FAN1 should be used to connect the CPU cooling fan. To install

a CPU cooling fan onto the motherboard, see **Section 4.3.2**. To power a cooling fan, follow the instructions below.

Step 1: Connect the power cable from the cooling fan to the nearest fan connector. Keyed pins on the connector prevent it from being connected incorrectly.

4.4.7 COM# RS-232 Serial Port Installation

To connect an RS-232 serial port to the motherboard, follow the instructions below.

Step 1: Find the RS-232 cables in the kit that came with the motherboard.

Step 2: Connect the 10-pin connector end of the cables to the COM# box headers on the motherboard. Be sure to align the red wire on the connector to pin 1 on the box header.

Step 3: Connect the other end of the cables to standard female D-sub 9 connectors.

4.4.8 COM2 RS-422/485 Serial Port Installation

To connect an RS-422/485 serial port to the motherboard, follow the instructions below.

Step 1: Connect the 10-pin connector end of an RS-422/485 serial port cable to the COM2 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

NOTE:

Be sure to configure the JP10 and JP20 COM2 RS422/RS485 jumpers for either an RS-422 or RS-485 connection. Refer to **Section 4.5.3** for more information.

4.4.9 Floppy Disk Drive (FDD) Installation

The floppy drive connector provides access to one (1) externally mounted floppy drive (3.5”-profile, 1.44 MB type floppy drive).

A 26-pin FDD connector cable is required for the connection to the floppy drive. The cable should come with a 26-pin FDD-cable connector and floppy disk drive connector on the other end. Follow the instructions below to connect an IDE HDD to the CPU card.

Step 1: Plug the 26-pin FPC-cable connector into FDD1. Make sure that the red wire corresponds to pin one on the connector.

Step 2: Attach the appropriate connector on the other end of the cable to the floppy drive. Only one connector in the set can be used.

4.4.10 IDE Disk Drive Connector (IDE1, IDE2)

The cable used to connect the motherboard to the IDE HDD is a standard 40-pin ATA/100/66/33 flat cable. To connect an IDE HDD to the motherboard, follow the instructions below.

Step 1: Find the ATA 66/100 flat cable in the kit that came with the motherboard.

Step 2: Connect one end of the cable to the IDE1 connector on the motherboard. A keyed pin on the IDE connectors 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 HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.

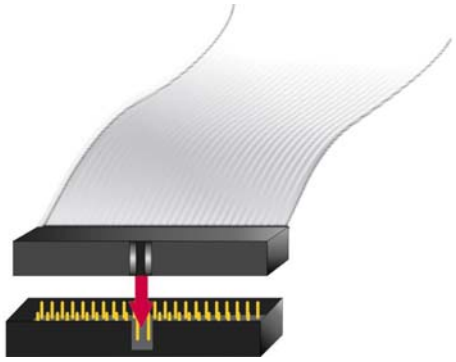


Figure 4-6: Connection of IDE Connector

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.

4.4.11 Inverter (LCD Backlight) Installation

To connect an Inverter (LCD Backlight) to the motherboard, follow the instructions below.

Step 1: Connect the 5-pin connector end of the LCD backlight cable to the CN12 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.4.12 IrDA (Infrared Data Association) Device Installation

To connect an IrDA device to the motherboard, follow the instructions below.

Step 1: Connect the 6-pin connector end of an IrDA cable to the IR1 header on the motherboard. Be sure to align pin 1 on the connector to pin 1 on the header.

4.4.13 Keyboard Installation

The cable used to connect the motherboard to a keyboard is a 5-pin header to PS/2 cable connector. To connect a keyboard to the motherboard, follow the instructions below.

Step 1: Connect the 5-pin connector end of the cable to the CN16 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 2: Connect the other side of the cable to a keyboard using a standard PS/2 connector.

4.4.14 LVDS Installation

To connect an LVDS to the motherboard, follow the instructions below.

Step 1: Connect the 30-pin connector end of a LVDS cable to the CN30 miniature crimping connector on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.4.15 Mouse Installation

The cable used to connect the motherboard to a mouse is a 5-pin header to PS/2 cable connector. To connect a keyboard to the motherboard, follow the instructions below.

Step 1: Connect the 5-pin connector end of the cable to the CN15 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 2: Connect the other side of the cable to a mouse using a standard PS/2 connector.

4.4.16 Multi-panel Connection

The Multi-panel connector provides connectivity to several external switches and indicators for monitoring and controlling the CPU board. See **Section 3.2.15** for the connector pinouts.

4.4.17 PCI Expansion

The POS motherboard comes with one PCI expansion slot. To connect an expansion card to the motherboard, follow the instructions below.

Step 1: Fit the PCI card-edge of a PCI expansion card into the PCI1 slot. The expansion card is keyed to prevent it from being inserted incorrectly.

4.4.18 SATA (Serial ATA) Connection

The POS motherboard comes with two 7-pin SATA connectors. To connect a SATA device to the motherboard, follow the instructions below.

Step 1: Find the SATA and SATA power cables in the kit that came with the motherboard.

Step 2: Connect one end of a 7-pin SATA connector to SATA1 or SATA2 on the motherboard. The SATA connector is keyed to prevent it from being inserted incorrectly.

Step 3: Connect the other end of the cable to a SATA drive.

Step 4: Connect the 15-pin end of the SATA power connector to a SATA drive power connector.

Step 5: Connect the 4P end of the of the SATA power connector to a power supply.

4.4.19 USB Port Installation

To connect a USB port to the motherboard, follow the instructions below.

Step 1: Connect the 8-pin connector end of a USB port to pin header cable to the CN26, CN27 or CN28 header on the motherboard. Be sure to align pin 1 on the connector to pin 1 on the header.

Step 2: Connect the other end of the cable to a standard USB connector.

4.4.20 VGA Port Installation

The cable used to connect the motherboard to a VGA port is a 10-pin header to female HD-D-sub 15 connector. To connect a VGA port to the motherboard, follow the instructions below.

Step 1: Connect the 10-pin connector end of the cable to the CN14 box header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

Step 2: Connect the other end of the cable to standard male HD-D-sub 15 VGA connector.

4.5 Jumper Configuration

NOTE:

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

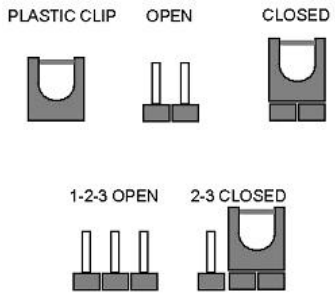


Figure 4-7: Jumper Locations

The POS-8520 CPU Board has fifteen onboard jumpers (**Figure 4-8**).

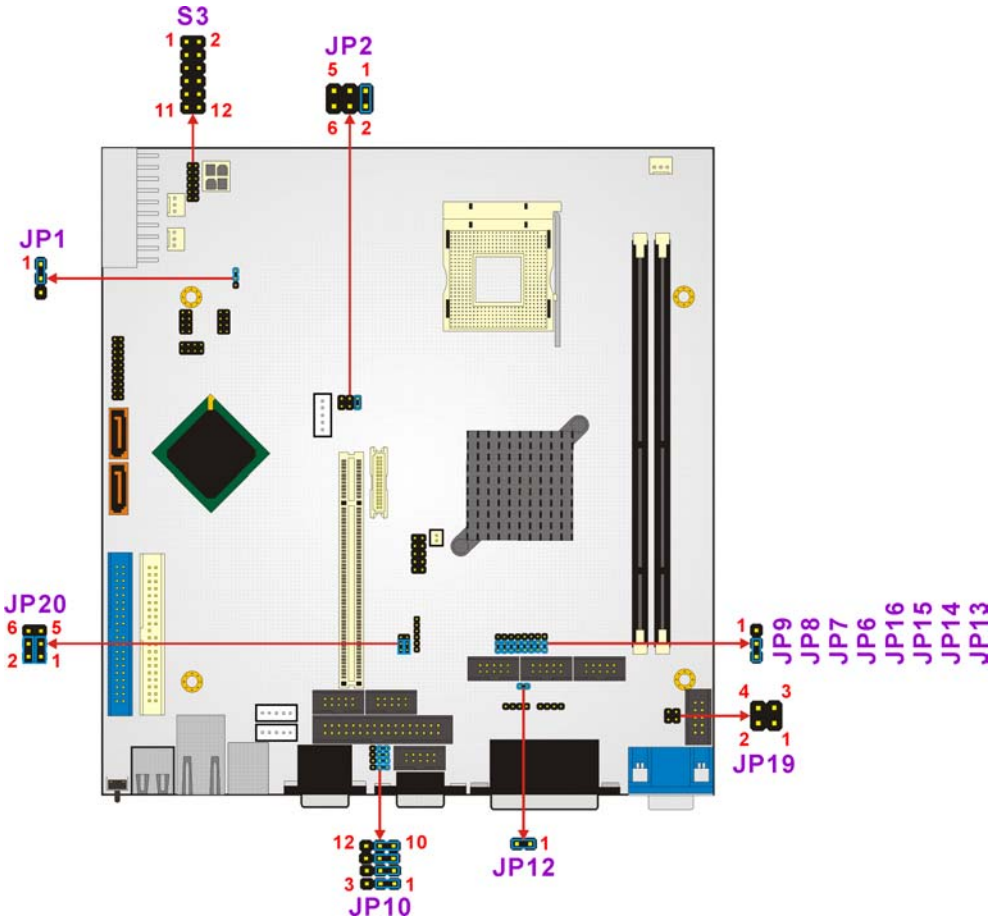


Figure 4-8: Jumper Locations

4.5.1 Clear CMOS Setup Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Location:	See Figure 4-8
Jumper Settings:	See **Table 4-2**

If the CPU card 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 displays during the boot up process, press F1 to enter the CMOS Setup menu, then do one of the following:

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

Save the changes and exit the CMOS Setup menu.

JP1	CLEAR CMOS
1-2 closed	Normal Operation (Default)
2-3 closed	Clear CMOS Setup

Table 4-2: Clear CMOS Setup Jumper Settings

4.5.2 COM# RI and Voltage Selection Jumpers

Jumper Label:	JP6, 7, 8, 9, 13, 14, 15 and 16
Jumper Type:	3-pin header
Jumper Location:	See **Figure 4-8**
Jumper Settings:	See Table 4-3 through Table 4-10

The following jumper settings control the COM connectors' RI pins.

4.5.2.1 JP7, JP9: Set Pin 9 of COM1 as Signal RI or Voltage Source

JP9	Description
2-3 closed	COM1 RI PIN Use RI
1-2 closed	COM1 RI PIN Use Voltage

Table 4-3: JP9 Jumper Settings

JP7	Description
2-3 closed	COM1 RI PIN Use Voltage +12V
1-2 closed	COM1 RI PIN Use Voltage +5V

Table 4-4: JP7 Jumper Settings

NOTE:

The use of JP7 (2-3) or (1-2) will not make any difference when JP9 (2-3) is in use.

4.5.2.2 JP6, JP8: Set Pin 9 of COM2 as Signal RI or Voltage Source

JP8	Description
2-3 closed	COM2 RI PIN Use RI
1-2 closed	COM2 RI PIN Use Voltage

Table 4-5: JP8 Jumper Settings

JP6	Description
2-3 closed	COM2 RI PIN Use Voltage +12V
1-2 closed	COM2 RI PIN Use Voltage +5V

Table 4-6: JP6 Jumper Settings

NOTE:

The use of JP6 (2-3) or (1-2) will not make any difference when JP8 (2-3) is in use.

4.5.2.3 JP13, JP15: Set Pin 9 of COM3 as Signal RI or Voltage Source

JP15	Description
2-3 closed	COM3 RI PIN Use RI
1-2 closed	COM3 RI PIN Use Voltage

Table 4-7: JP15 Jumper Settings

JP13	Description
2-3 closed	COM3 RI PIN Use Voltage +12V
1-2 closed	COM3 RI PIN Use Voltage +5V

Table 4-8: JP13 Jumper Settings

NOTE:

The use of JP13 (2-3) or (1-2) will not make any difference when JP15 (2-3) is in use.

4.5.2.4 JP14, JP16: Set Pin 9 of COM4 as Signal RI or Voltage Source

JP16	Description
2-3 closed	COM4 RI PIN Use RI
1-2 closed	COM4 RI PIN Use Voltage

Table 4-9: JP16 Jumper Settings

JP14	Description
2-3 closed	COM4 RI PIN Use Voltage +12V
1-2 closed	COM4 RI PIN Use Voltage +5V

Table 4-10: JP14 Jumper Settings

NOTE:

The use of JP14 (2-3) or (1-2) will not make any difference when JP16 (2-3) is in use.

4.5.3 COM2 RS-232/422/485 Setup Jumper

Jumper Label: JP10, JP20

Jumper Type: 12-pin and 6-pin headers

Jumper Location: See Figure 4-8

Jumper Settings: See Table 4-11

The JP10 jumper, when used in association with jumper JP20, sets the COM2 mode to RS-232/22/485.

JP10	JP20	Description
1-2, 4-5, 7-8, 10-11 closed	1-3 closed	RS-232
2-3, 5-6, 8-9, 11-12 closed	3-5, 2-4 closed	RS-422
2-3, 5-6, 8-9, 11-12 closed	3-5, 4-6 closed	RS-485

Table 4-11: COM2 RS-232/422/485 Setup Jumper Settings

4.5.4 CompactFlash Card Setup Jumper

Jumper Label: JP12

Jumper Type: 2-pin header

Jumper Location: See Figure 4-8

Jumper Settings: See Table 4-12

The CompactFlash Card Setup jumper sets the CompactFlash card to "Master" or "Slave" on the IDE bus.

JP12	Description
Closed	Master
Open	Slave (Default)

Table 4-12: CompactFlash Card Setup Jumper Settings

4.5.5 CPU Voltage Setting Jumper

Jumper Label: S3

Jumper Type: 10-pin header (2x5 pins)

Jumper Location: See Figure 4-8

Jumper Settings: See Table 4-13

Use the CPU voltage setting jumper (S3) to configure the power of CPU. When using a Pentium 4 CPU, leave the jumper open. CPU VID automatically configures the power of CPU. When using a Pentium 4-M CPU, short the jumper as indicated below. The power of CPU is then set to 1.3V.

S3	Description
All Open	Pentium 4 CPU (Default)
1-2, 7-8, 11-12 closed	Pentium 4-M CPU (1.3V)

Table 4-13: CPU Voltage Jumper Settings

4.5.6 Keyboard/Mouse Power Source Jumper

Use the keyboard/mouse power source jumper to set the keyboard/mouse power source.

JP18	DESCRIPTION
1-2 closed	VCC (default)
2-3 closed	5VSB

Table 4-14: Keyboard/Mouse Power Setting Jumper Settings

4.5.7 LCD Voltage Select Jumper

Jumper Label: JP2

Jumper Type: 6-pin header

Jumper Location: See Figure 4-8

Jumper Settings: See **Table 4-15**

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.

WARNING:

Selecting the wrong voltage will burn the LCD. Please check LCD technical documents provided by the vendor for the correct voltage.

JP2	Description
1-2 closed	3.3V (default)
3-4 closed	5V
5-6 closed	12V

Table 4-15: LCD Voltage Select 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 configured, 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.

4.7 External Peripheral Interface Panel Connectors

4.7.1 Reset Button

Use the reset button to reset the system.

4.7.2 USB Connection

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

4.7.3 Ethernet Connection

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

4.7.4 Keyboard and Mouse Connection

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

4.7.5 Serial Connection

The external serial connectors provide easy and quick access to external serial devices.

4.7.6 Parallel Connector

The external parallel port connector connects to a printer. The parallel port interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. The default interrupt channel is IRQ7. Select ECP or EPP DMA mode using the BIOS configuration utility.

4.7.7 Audio Interface

AC'97 Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out.

4.7.8 VGA Connection

The conventional CRT monitor connector, VGA1, is an HD-D-sub 15 female connector.

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 the DELETE key is pressed, 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

Key	Function
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 are made to the system configuration, use the jumper described in **Section 0** to reset the CMOS defaults.

5.1.5 BIOS Menu Bar

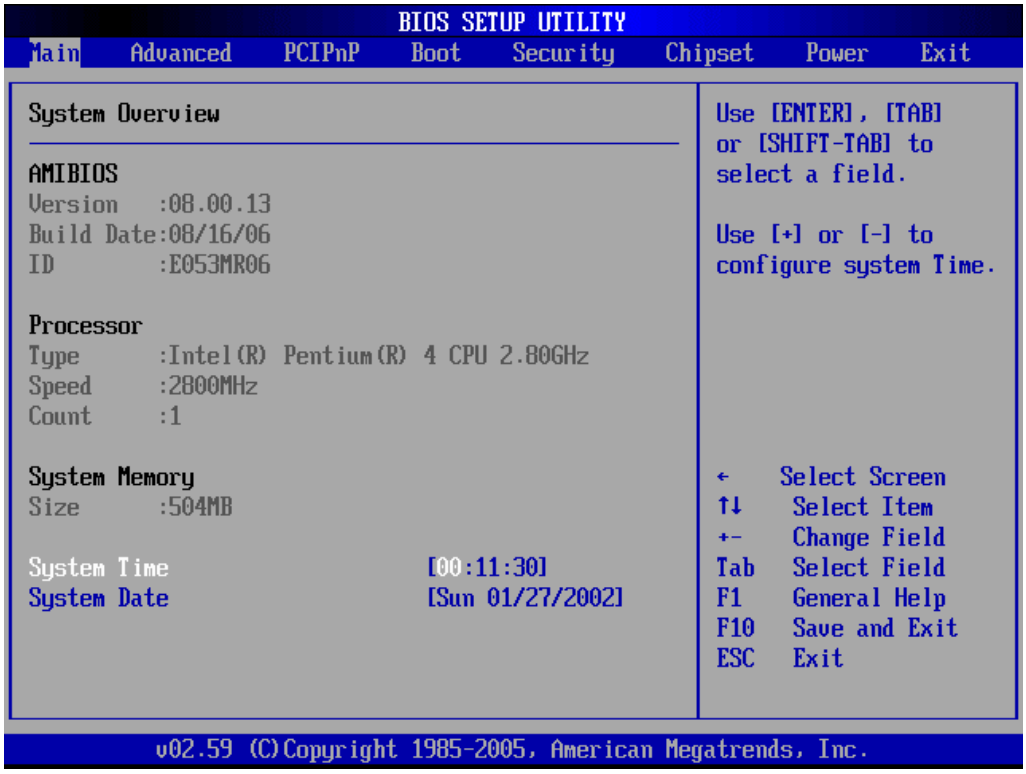
The menu bar on top of the BIOS screen has the following main items:

- **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.
- **Power** Changes power management 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

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



BIOS Menu 1: Main

➔ System Overview

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

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

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the System Time option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the System Date option to set the system date. Manually enter the day, month and year.

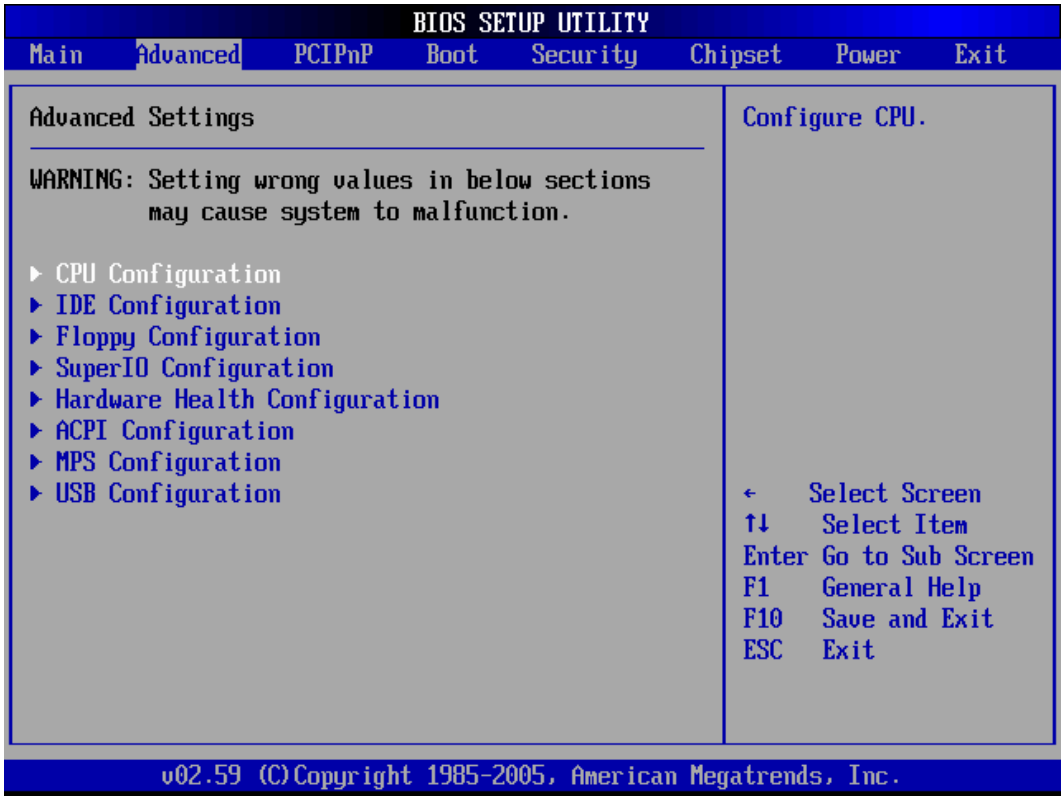
5.3 Advanced

Use the Advanced menu (**BIOS Menu 2**) to configure the CPU and peripheral devices 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.

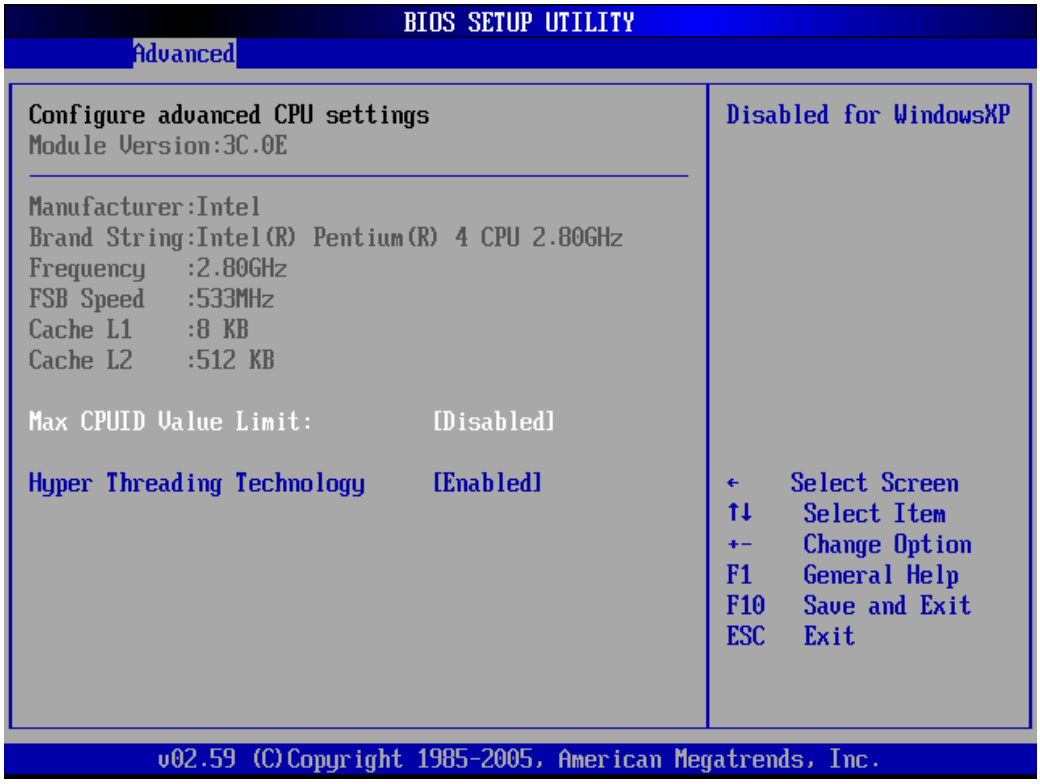
- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**
- Floppy Configuration (see **Section 5.3.3**)
- SuperIO Configuration (see **Section 5.3.4**)
- Hardware Health Configuration (see **Section 5.3.5**)
- ACPI Configuration (see **Section 5.3.6**)
- MPS Configuration (see **Section 5.3.7**)
- Remote Access Configuration (see **Section 5.3.8**)
- USB Configuration (see **Section 5.3.9**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



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

The following CPU Configuration menu items can be configured.

- Max CPUID Value Limit
- Hyper Threading Technology

➔ **Max CUPID Value Limit [Disabled]**

NOTE:

If the OS is NT, this value must be set to enabled.

➔ **Disabled** **DEFAULT** Disables legacy OSes that cannot support CPUs with extended CUPID functions from booting up

➔ **Enabled** Enables legacy OSes that cannot support CPUs with extended CUPID functions to boot up

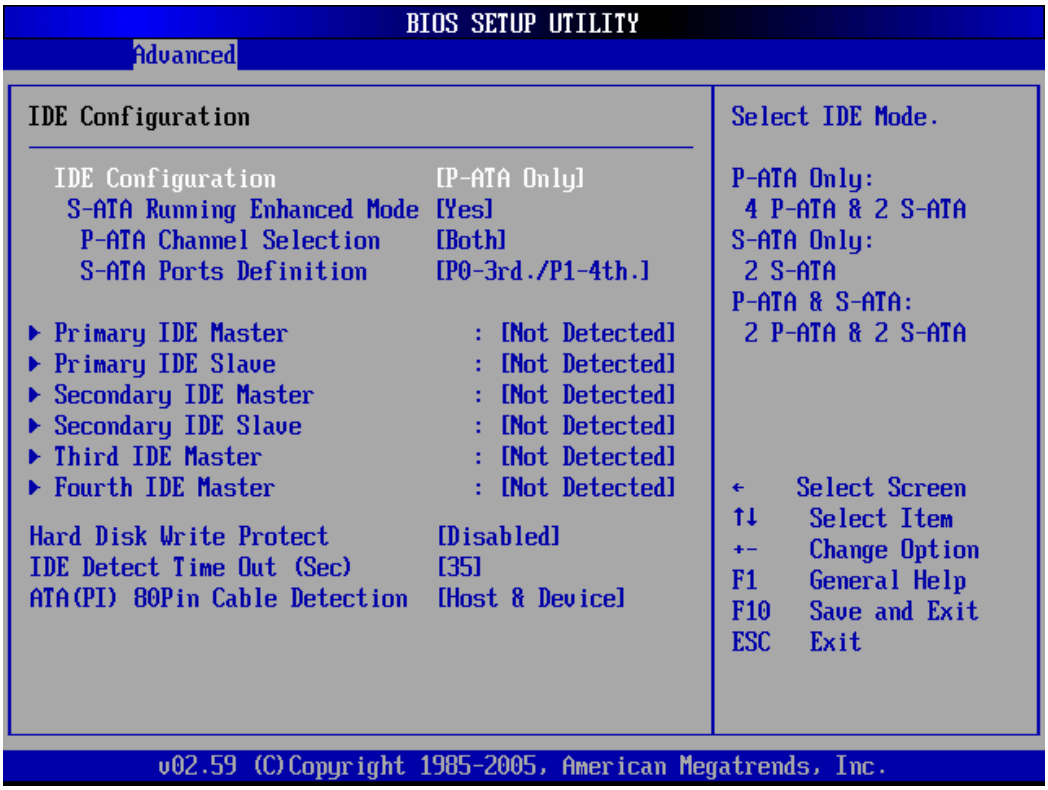
➔ **Hyper Threading Technology [Disabled]**

➔ **Disabled** **DEFAULT** Disables the use of hyper threading technology

➔ **Enabled** Enables the use of hyper threading technology

5.3.2 IDE Configuration

Use the IDE Configuration menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **IDE Configuration [P-ATA Only]**

Use IDE Configuration option to setup the configuration of the hard drive interfaces.

➔ **Disabled**		The hard drive interfaces are disabled.
➔ **P-ATA Only**	**DEFAULT**	The hard drive interfaces are configured as P-ATA only.
➔ **S-ATA Only**		The hard drive interfaces are configured as S-ATA only.
➔ **P-ATA & S-ATA**		The hard drive interfaces are configured as P-ATA and S-ATA.

➔ **S-ATA Running Enhanced Mode [Yes]**

Use S-ATA Running Enhanced Mode option to select whether the S-ATA interface is running in enhanced mode or legacy mode.

➔ **Yes**	**DEFAULT**	The S-ATA interface is running in enhanced mode.
➔ **No**		The S-ATA interface is running in legacy mode.

➔ **P-ATA Channel Selection [Both]**

Use P-ATA Channel Selection option to select the active IDE channels.

➔ **Primary**		The primary P-ATA channel is set to be the active IDE channel.
➔ **Secondary**		The secondary P-ATA channel is set to be the active IDE channel.
➔ **Both**	**DEFAULT**	The primary and secondary P-ATA channel are both set to be the active IDE channels.

➔ **S-ATA Ports Definition [PO-3rd./P1-4th.]**

Use S-ATA Ports Definition option to select the physical ports for S-ATA.

➔ **PO-3rd./P1-4th.**	**DEFAULT**	Set the physical ports (PO/PI) to be 3rd./4th.
➔ **PO-4th. /P1-3rd.**		Set the physical ports (PO/PI) to be 4th./3rd.

➔ **Configure S-ATA as RAID [No]**

The Configure S-ATA as RAID option can only be selected if the IDE Configuration option is set to “P-ATA Only”. Use Configure S-ATA as RAID option to configure the S-ATA interface as RAID.

➔ **No**	**DEFAULT**	The S-ATA interface cannot be configured as RAID drive.
➔ **Yes**		The S-ATA interface can be configured as RAID drive.

➔ **Hard Disk Write Protect [Disabled]**

The Hard Disk Write Protect BIOS option protects the hard disks from being overwritten. This menu item is only effective if the device is accessed through the BIOS.

➔ **Disabled** **DEFAULT** Allows hard disks to be overwritten

➔ **Enabled** Prevents hard disks from being overwritten

➔ **IDE Detect Time Out (Sec) [35]**

The IDE Detect Time Out (Sec) BIOS option specifies the maximum time (in seconds) the AMI BIOS will search for IDE devices. This allows fine-tunes the settings to allow for faster boot times. The following configuration options are available.

- 0 seconds
- 5 seconds
- 10 seconds
- 15 seconds
- 20 seconds
- 25 seconds
- 30 seconds
- 35 seconds **DEFAULT**

The best setting to use if the onboard IDE controllers are set to a specific IDE disk drive in the AMIBIOS is “0 seconds” and a large majority of ultra ATA hard disk drives can be detected well within “5 seconds” (the default setting).

➔ **ATA (PI) 80Pin Cable Detection [Host & Device]**

When an Ultra ATA/66, an Ultra ATA/100 or an Ultra ATA/133 IDE hard disk drive is used, an 80-conductor ATA cable must be used. The 80-conductor ATA cable is plug compatible with the standard 40-conductor ATA cable. The system must detect the presence of correct cable so that the AMIBIOS can instruct the drive to run at the correct speed for the cable type detected.

The ATA (PI) 80Pin Cable Detection BIOS option determines how the IDE cable will be detected.

➔ **Host & Device** **DEFAULT** Both the motherboard onboard IDE controller and IDE disk drive are used to detect the type of IDE cable used.

➔ **Host** The motherboard onboard IDE controller detects the type of IDE cable used.

➔ **Device** The IDE disk drive to detects the type of IDE cable used.

➔ **IDE Master and IDE Slave**

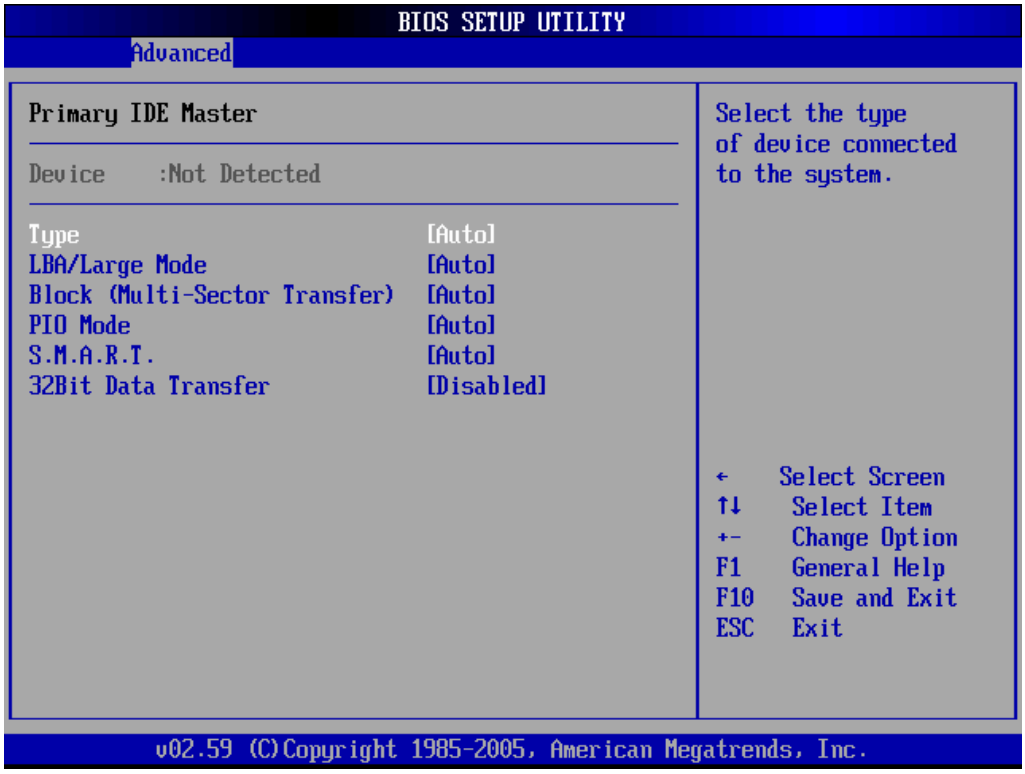
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master
- Fourth IDE Master

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

Use the IDE Master and IDE Slave configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **LBA/Large Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block (Multi-Sector Transfer)**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows

transfers of up to 64 KB per interrupt.

- **PIO Mode**: Indicates the PIO mode of the installed device.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the Type BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ➔ **ZIP** ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the LBA/Large Mode option to disable or enable BIOS to 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** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

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

Use the Block (Multi Sector Transfer) to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

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

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the PIO Mode option to select 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** BIOS auto detects 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.)

➔ **S.M.A.R.T [Auto]**

Use the S.M.A.R.T option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. S.M.A.R.T predicts impending drive failures. The S.M.A.R.T BIOS option enables or disables this function.

➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.

➔ **Disabled** Prevents BIOS from using the HDD SMART feature.

➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Disabled]**

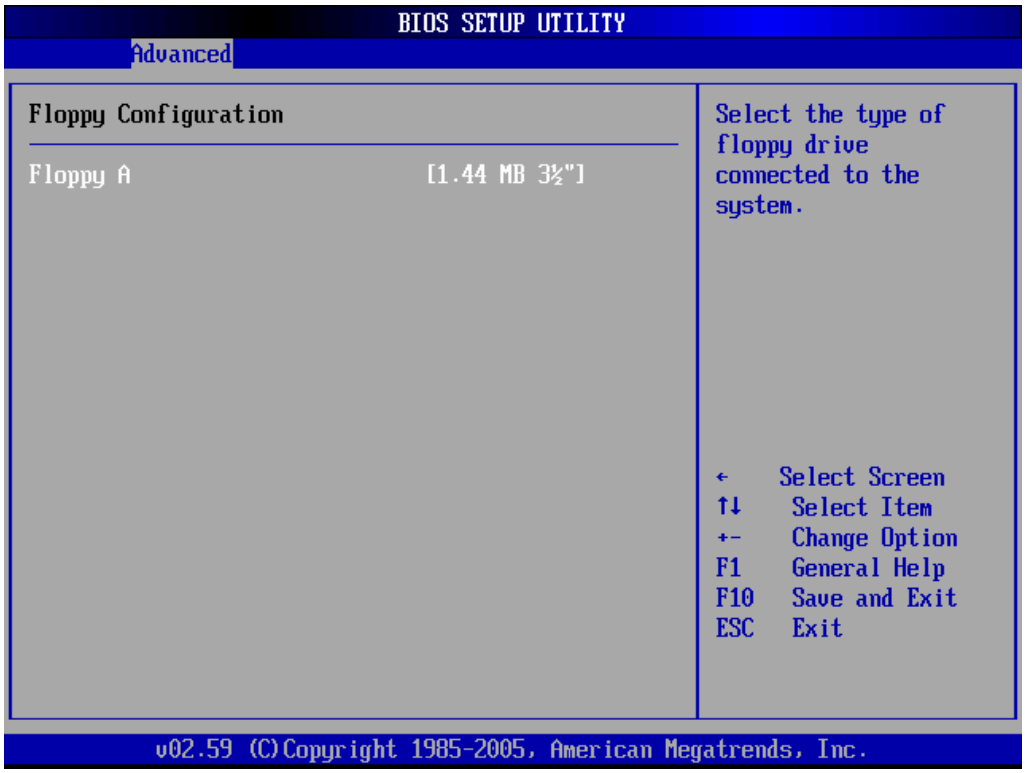
Use the 32Bit Data Transfer BIOS option to enables or disable 32-bit data transfers.

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

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

5.3.3 Floppy Configuration

Use the Floppy Configuration menu (**BIOS Menu 6**) to set or change the configurations for floppy disk drives.



BIOS Menu 6: Floppy Configuration

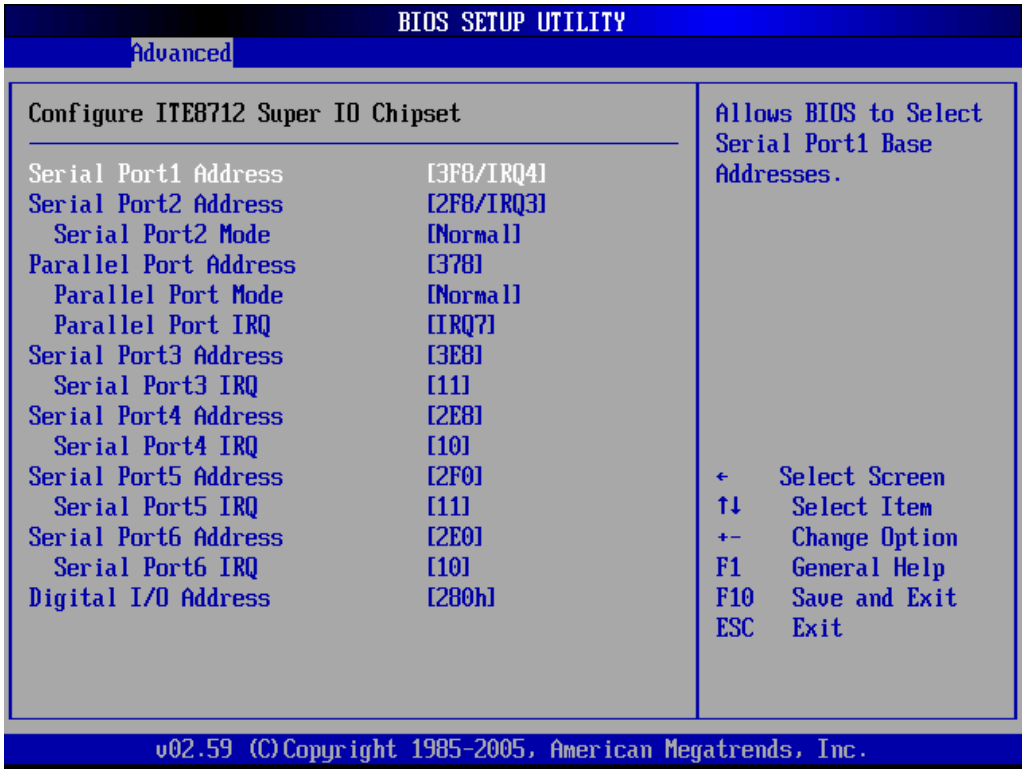
➔ **Floppy A [1.44 MB 3½"]**

The Floppy A configuration option determines the types of the floppy drive installed in the system. The following configuration options are available.

- Disabled (default)
- 360 KB 5¼"
- 1.2 MB 5¼"
- 720 KB 3 ½"
- 1.44 MB 3½"
- 2.88 MB 3½"

5.3.4 Super IO Configuration

Use the Super IO Configuration menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

➔ **On Board Floppy Controller [Enabled]**

➔ **Disabled** Allows BIOS to disable the floppy controller

➔ **Enabled** **DEFAULT** Allows BIOS to enable the floppy controller

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the Serial Port1 Address option to select the Serial Port 1 base address.

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

- **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
- **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the Serial Port2 Address option 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]**

Use the Serial Port2 Mode option to select the Serial Port2 operational mode.

- **Normal** **DEFAULT** Serial Port 2 mode is normal
- **IrDA** Serial Port 2 mode is IrDA
- **ASK IR** Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [378]**

Use the Parallel Port Address option to select the parallel port base address.

➔ **Disabled**		No base address is assigned to the Parallel Port
➔ **378**	**DEFAULT**	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the Parallel Port Mode option to select the mode the parallel port operates in.

➔ **Normal**	**DEFAULT**	The normal parallel port mode is the standard mode for parallel port operation.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode
➔ **EPP+ECP**		The parallel port is also be compatible with EPP and ECP devices

➔ **Parallel Port IRQ [IRQ7]**

Use the Parallel Port IRQ selection to set the parallel port interrupt address.

- ➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address
- ➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

➔ **Digital I/O Address [280h]**

Use the Digital I/O Address option to select the interrupt address for digital I/O.

- ➔ **200h** Digital I/O address is 200h
- ➔ **220h** Digital I/O address is 220h
- ➔ **240h** Digital I/O address is 240h
- ➔ **260h** Digital I/O address is 260h
- ➔ **280h** **DEFAULT** Digital I/O address is 280h

➔ **Serial Port3 Address [3E8]**

Use the Serial Port3 Address option 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]**

Use the Serial Port3 IRQ option to select the interrupt address for serial port 3.

- ➔ **4** Serial port 3 IRQ address is 4

- ➔ **9** Serial port 3 IRQ address is 9
- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the Serial Port4 IRQ option to select the interrupt address 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]**

Use the Serial Port4 IRQ option to select the interrupt address for serial port 4.

- ➔ **3** Serial port 4 IRQ address is 3
- ➔ **9** Serial port 4 IRQ address is 9
- ➔ **10** **DEFAULT** Serial port 4 IRQ address is 10
- ➔ **11** Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2F0]**

Use the Serial Port5 IRQ option to select the interrupt address for serial port 5.

- ➔ **Disabled** No base address is assigned to serial port 5
- ➔ **3E8** Serial port 5 I/O port address is 3E8
- ➔ **2E8** Serial port 5 I/O port address is 2E8

- **2F0** **DEFAULT** Serial port 5 I/O port address is 2F0
- **2E0** Serial port 5 I/O port address is 2E0

➔ **Serial Port5 IRQ [11]**

Use the Serial Port5 IRQ option to select the interrupt address for serial port 5.

- **4** Serial port 5 IRQ address is 4
- **9** Serial port 5 IRQ address is 9
- **10** Serial port 5 IRQ address is 10
- **11** **DEFAULT** Serial port 5 IRQ address is 11

➔ **Serial Port6 Address [2E0]**

Use the Serial Port6 IRQ option to select the interrupt address for serial port 6.

- **Disabled** No base address is assigned to serial port 6
- **3E8** Serial port 6 I/O port address is 3E8
- **2E8** Serial port 6 I/O port address is 2E8
- **2F0** Serial port 6 I/O port address is 2F0
- **2E0** **DEFAULT** Serial port 6I/O port address is 2E0

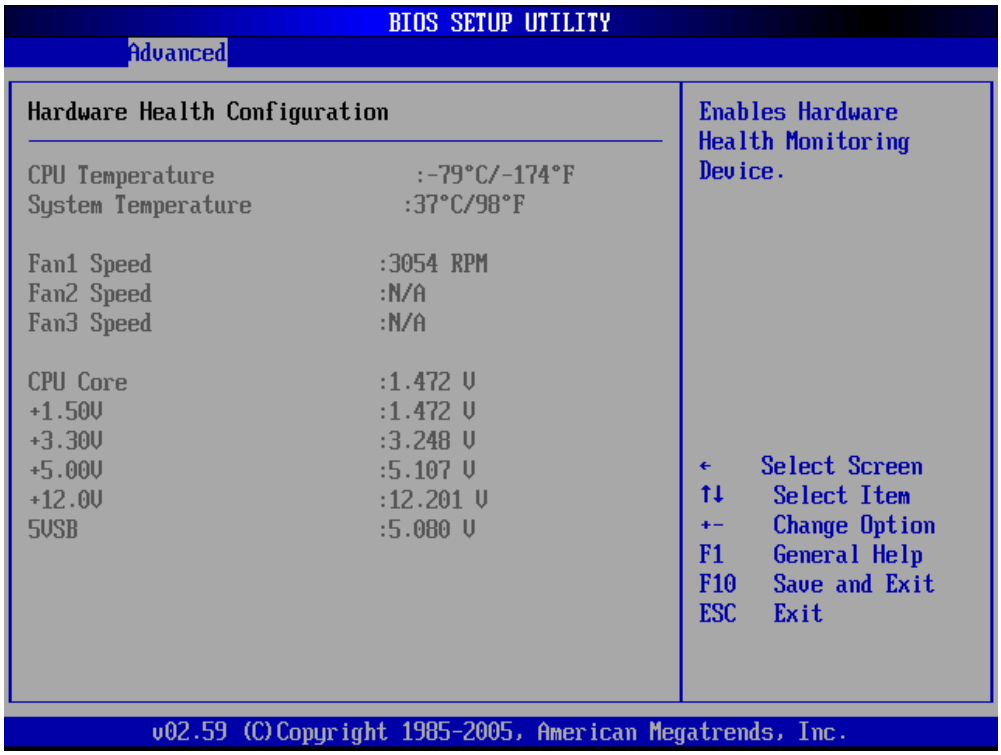
➔ **Serial Port6 IRQ [10]**

Use the Serial Port6 IRQ option to select the interrupt address for serial port 6.

- **3** Serial port 6 IRQ address is 3
- **9** Serial port 6 IRQ address is 9
- **10** **DEFAULT** Serial port 6 IRQ address is 10
- **11** Serial port 6 IRQ address is 11

5.3.5 Hardware Health Configuration

The Hardware Health Configuration menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 8: Hardware Health Configuration

➔ **H/W Health Function [Enabled]**

➔ **Disabled** Disables the health monitoring function

➔ **Enabled** **DEFAULT** Enables the health monitoring function

If the H/W Health Function is enabled different system parameters and values are shown. The system parameters that are monitored are:

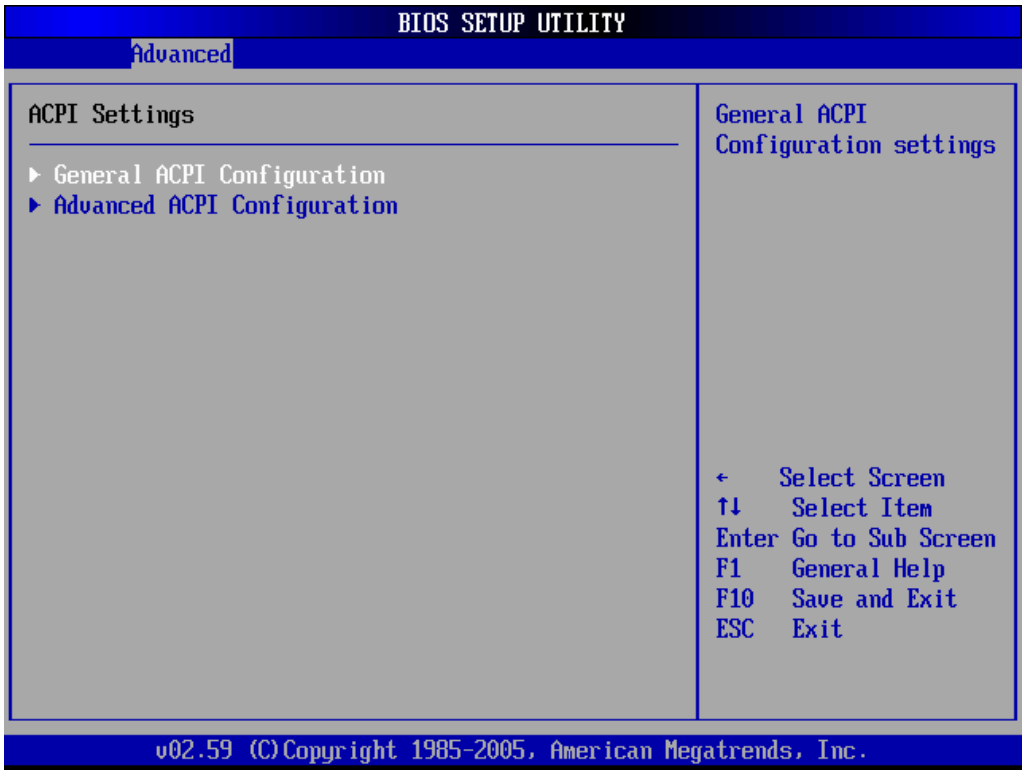
- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed

- Fan2 Speed
- Fan3 Speed

- **Voltages**: The following system voltages are monitored
  - Vcore
  - +1.50V
  - +3.30V
  - +5.00V
  - +12.0V
  - 5VSB

5.3.6 ACPI Configuration

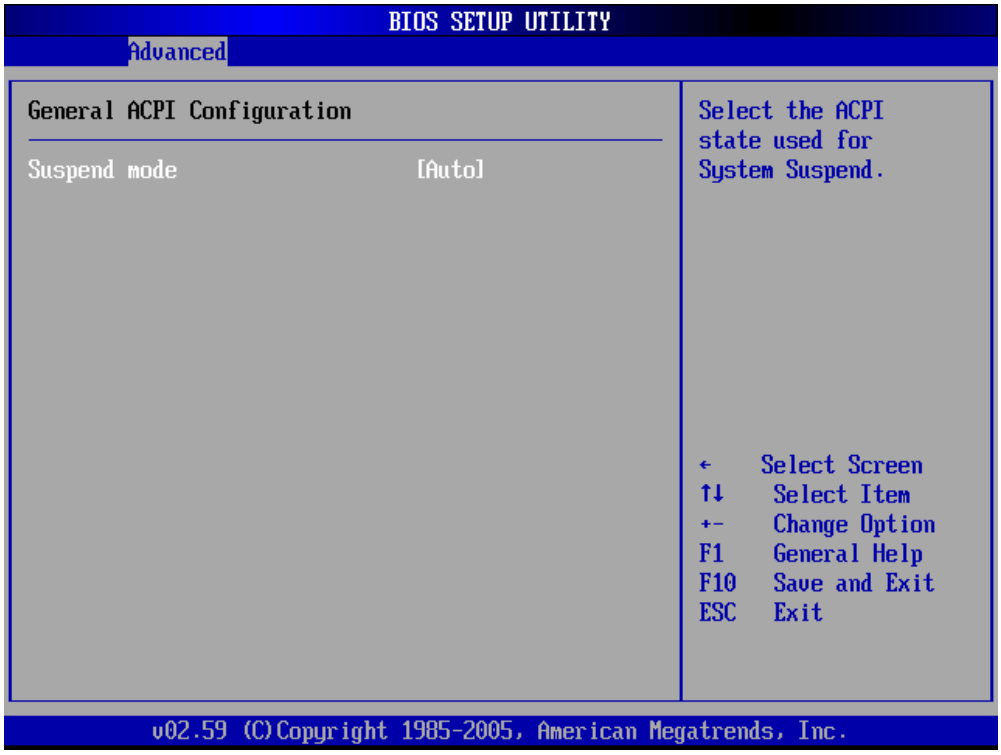
The ACPI Configuration menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 9: ACPI Configuration

5.3.6.1 General ACPI Configuration

Use the General ACPI Configuration menu (**BIOS Menu 10**) to select the ACPI state when the system is suspended.



BIOS Menu 10: General ACPI Configuration [Advanced\ ACPI Configuration]

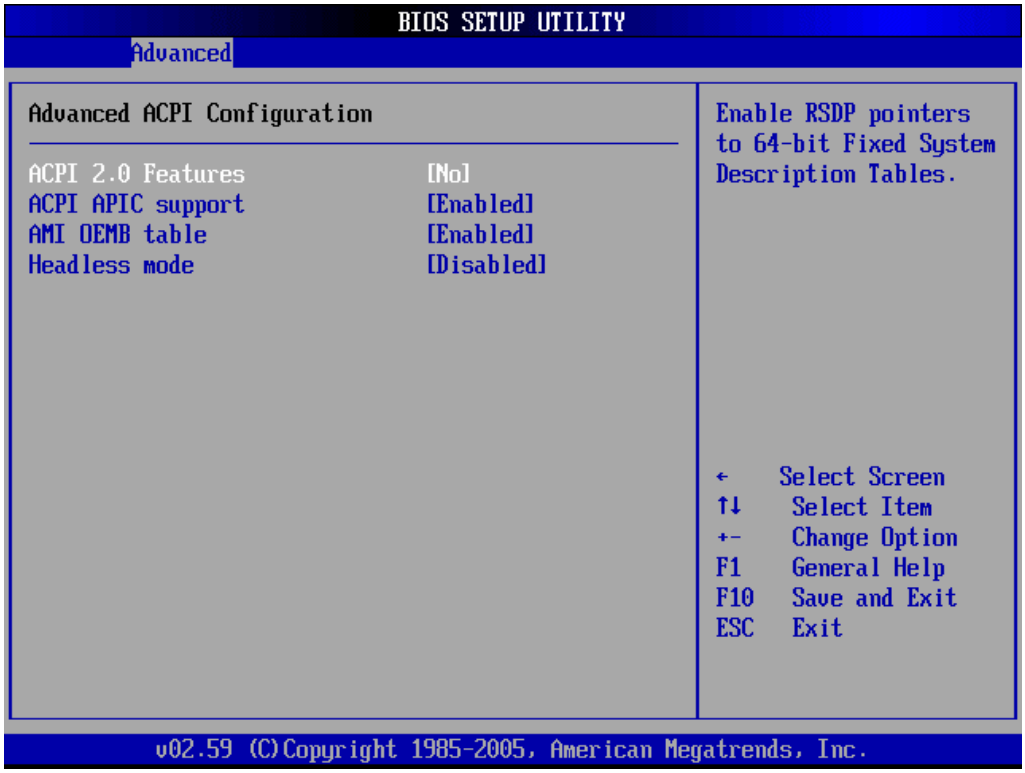
➔ **Suspend Mode [S1 (POS)]**

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.

5.3.6.2 Advanced ACPI Configuration

Use the Advanced ACPI Configuration menu (**BIOS Menu 11**) to select the ACPI state when the system is suspended.



BIOS Menu 11: Advanced ACPI Configuration [Advanced\ ACPI Configuration]

➔ **ACPI 2.0 Features [No]**

Use the ACPI 2.0 Features option to enable the ACPI (Advanced Configuration and Power Interface) features. By enabling this feature the system RSDP (Root System Description Pointer) is able to obtain physical addresses for other 64-bit fixed system description tables.

➔ **No** **DEFAULT** RSDP pointers to 64-bit fixed systems are not provided to the system

➔ **Yes** RSDP pointers to 64-bit fixed systems are provided to the system

➔ **ACPI APIC Support [Enabled]**

Use the ACPI APIC Support option to add a pointer to an ACPI APIC table in the RSDT (Root System Description Table). The RSDT is an array of pointers that direct the system to the physical addresses of other description tables. The RSDT is the main ACPI table. The RSDP is located in low memory space of the system and provides the physical address of the RSDT. The RSDT itself is identified in memory because it starts with the signature "RSDT."

➔ **Disabled**		Pointers to the APIC APIC table are not be provided in the RSDT
➔ **Enabled**	**DEFAULT**	Pointers to the APIC APIC table are provided in the RSDT

➔ **APIC ACPI SCI IRQ [Disabled]**

Use APIC ACPI SCI IRQ option to enable the system to send a flag report to the ACPI OS if a SCI IRQ interrupt event is made via the APIC.

➔ **Disabled**	**DEFAULT**	No flag report is sent to the ACPI OS when there is a "SCI IRQ" interrupt event.
➔ **Enabled**		Flag report is sent to the ACPI OS when there is a "SCI IRQ" interrupt event is made via the APIC.

➔ **AMI OEMB table [Enabled]**

Use the AMI OEMB table option to add a pointer to an OEMB table in the RSDT table and the Extended System Description Table (XSDT), which accommodates physical addresses of description headers that are larger than 32-bits. Notice that both the XSDT and the RSDT can be pointed to by the RSDP structure.

➔ **Disabled**		Pointers to the AMI OEMB table are not provided in the RSDT and the XSDT
➔ **Enabled**	**DEFAULT**	Pointers to the AMI OEMB table are provided in the RSDT and the XSDT

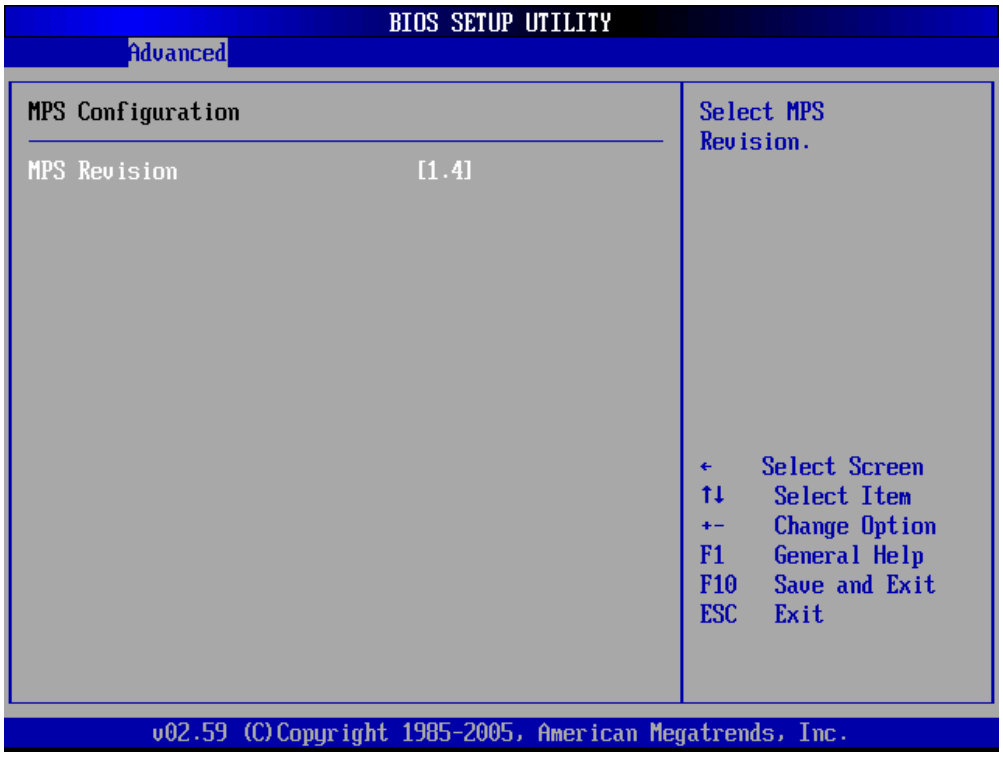
➔ **Headless Mode [Disabled]**

Use the Headless Mode option to update the ACPI FACP (Fixed ACPI Description Table) to indicate headless operations, i.e. a computer without a monitor, keyboard and mouse.

➔ **Disabled**	**DEFAULT**	The FACP is not updated to indicate headless mode
➔ **Enabled**		The FACP is updated to indicate headless mode

5.3.7 MPS Configuration

Use the MPS Configuration menu (**BIOS Menu 12**) to select `he multi-processor table.



BIOS Menu 12: MPS Configuration

➔ **MPS Revision [1.4]**

Use the Multiprocessor Specification (MPS) for OS 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 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.

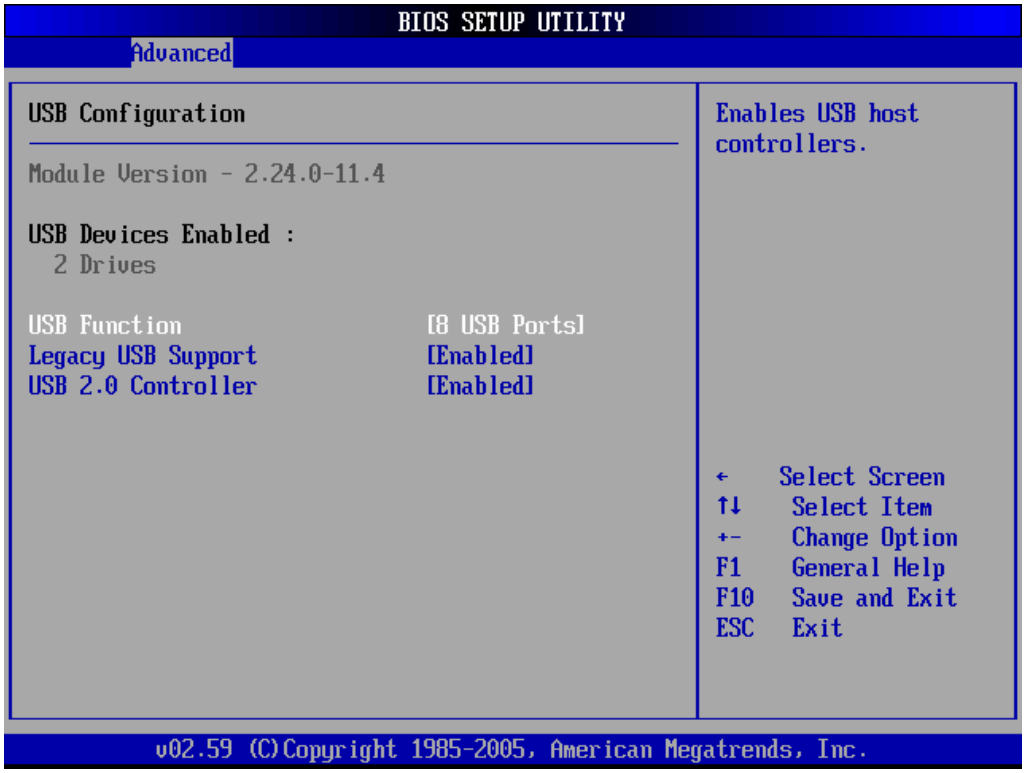
➔ **Remote Access [Disabled]**

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

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

5.3.9 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 select USB function support.

➔	**Disabled**		USB function support disabled
➔	**2 USB Ports**		USB function support two USB ports
➔	**4 USB Ports**		USB function support four USB ports
➔	**6 USB Ports**		USB function support six USB ports
➔	**8 USB Ports**	**DEFAULT**	USB function support eight USB ports

➔ **Legacy USB Support [Disabled]**

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

➔ **USB 2.0 Controller [Enabled]**

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

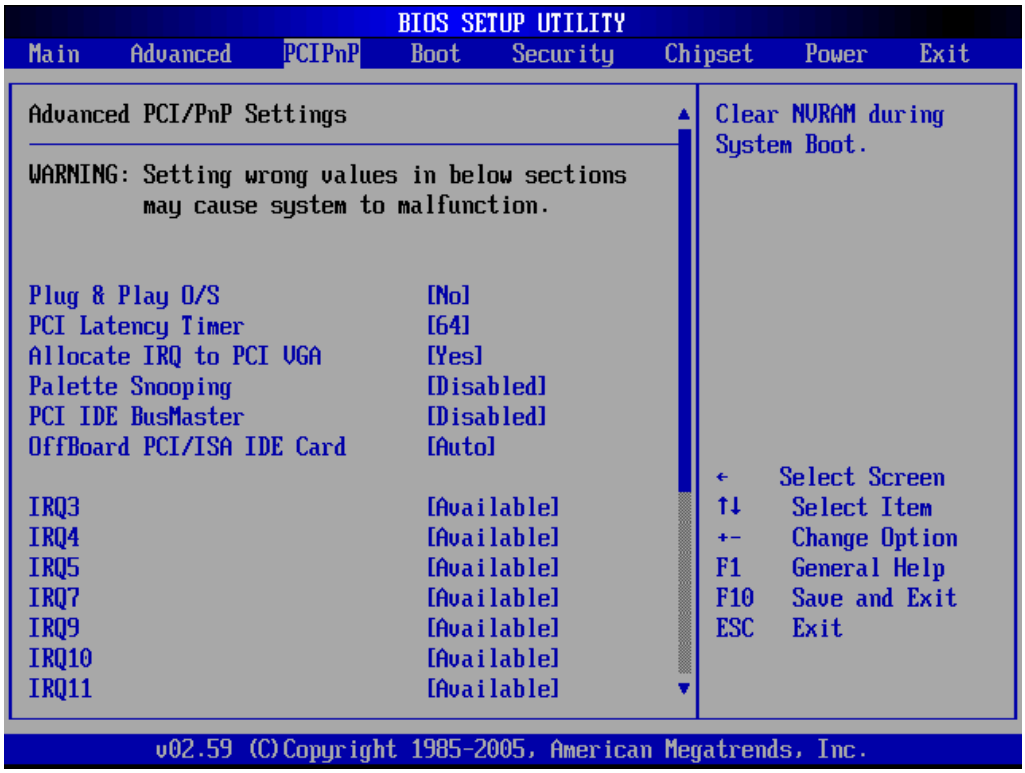
➔	**Enabled**	**DEFAULT**	USB 2.0 controller enabled
➔	**Disabled**		USB 2.0 controller disabled

5.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 14**) to configure advanced PCI and PnP settings.

WARNING!

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



BIOS Menu 14: PCI/PnP Configuration

➔ **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 [Disabled]**

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

➔ **Disabled**	**DEFAULT**	Busmastering is prevented
➔ **Enabled**		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

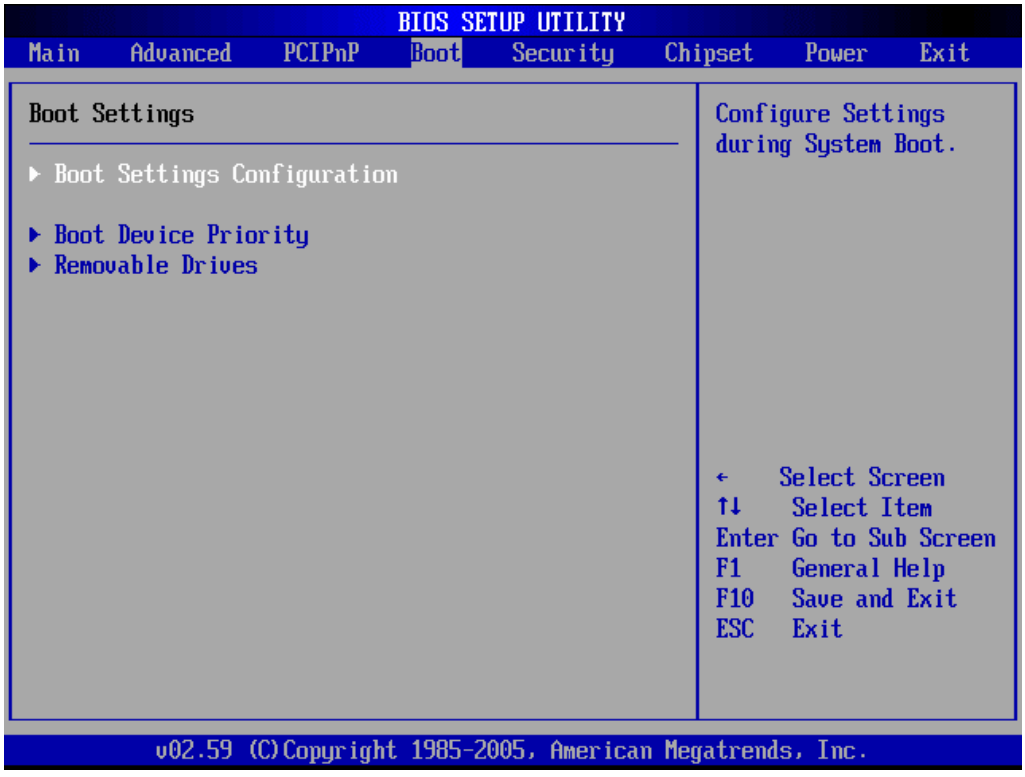
➔ **Reserved Memory Size [Disabled]**

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**		64KB reserved for legacy ISA devices

5.5 Boot

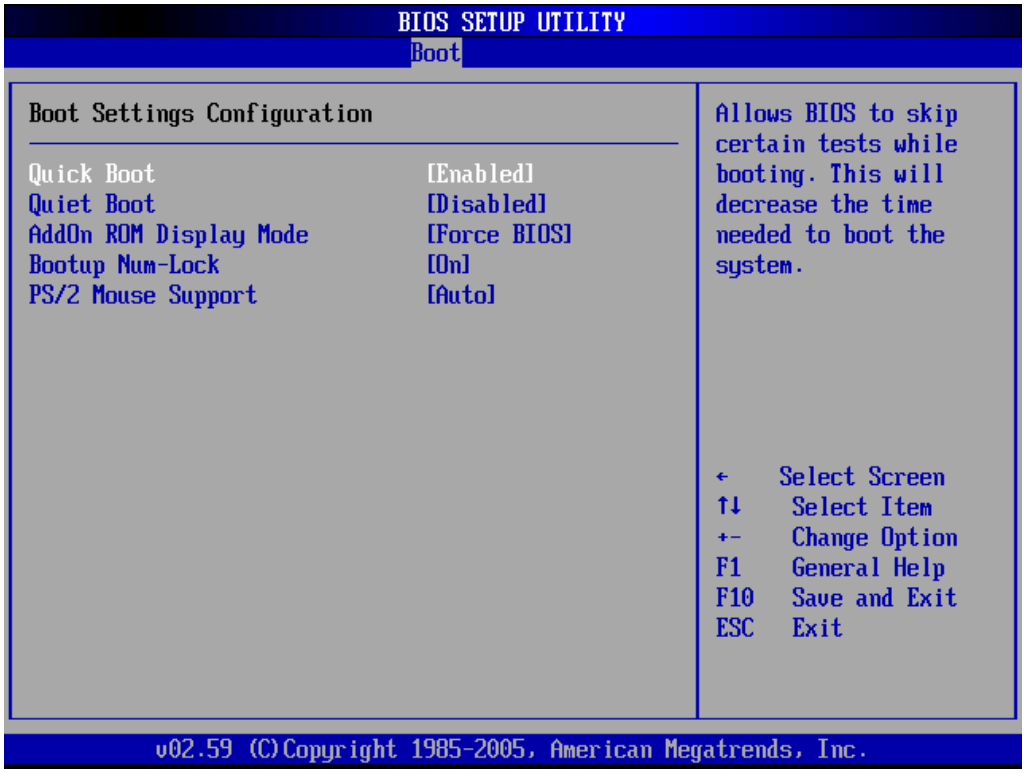
Use the Boot menu (**BIOS Menu 15**) to configure system boot options.



BIOS Menu 15: Boot

5.5.1 Boot Settings Configuration

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



BIOS Menu 16: 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]**

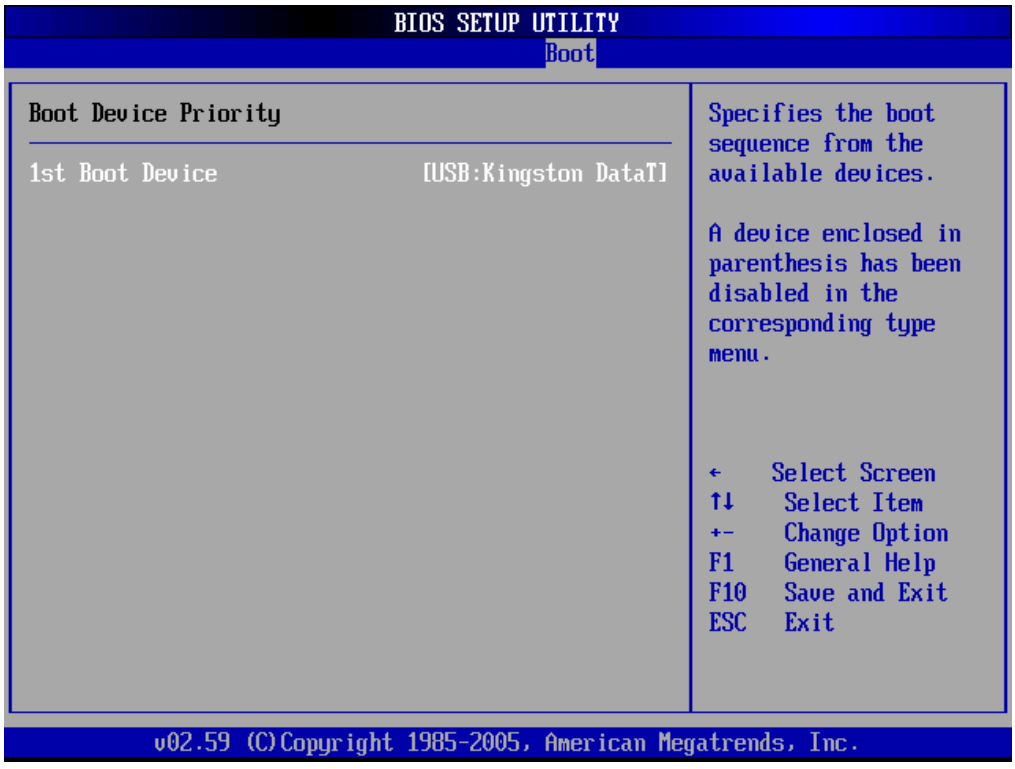
Use the PS/2 Mouse Support option adjusts PS/2 mouse support capabilities.

➔ **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.

5.5.2 Boot Device Priority

Use the Boot Device Priority menu (**BIOS Menu 17**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD



BIOS Menu 17: Boot Device Priority Setting

5.5.3 Removable Drives

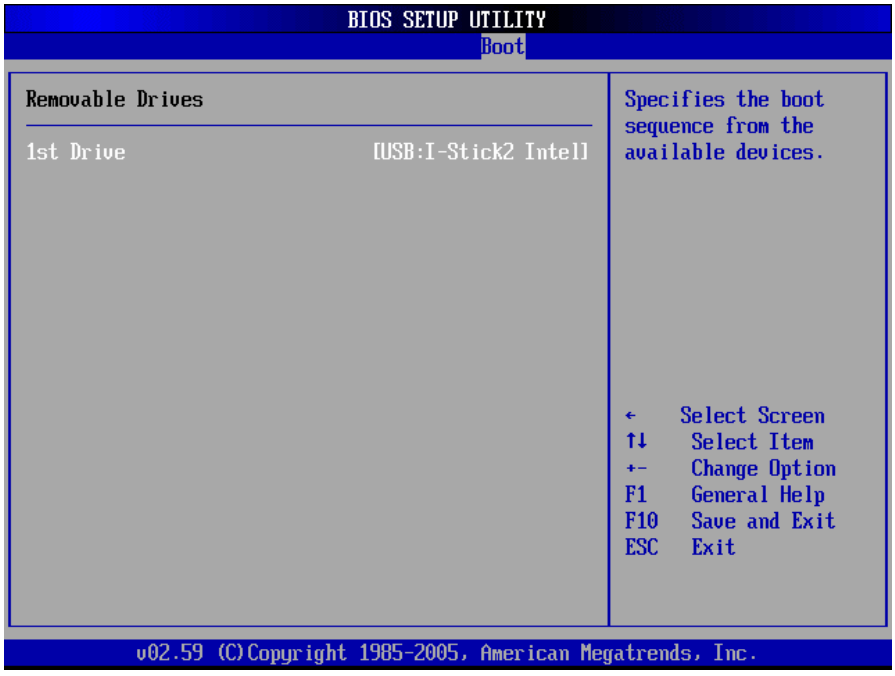
Use the Removable Drives menu (**BIOS Menu 18**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]

NOTE:

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

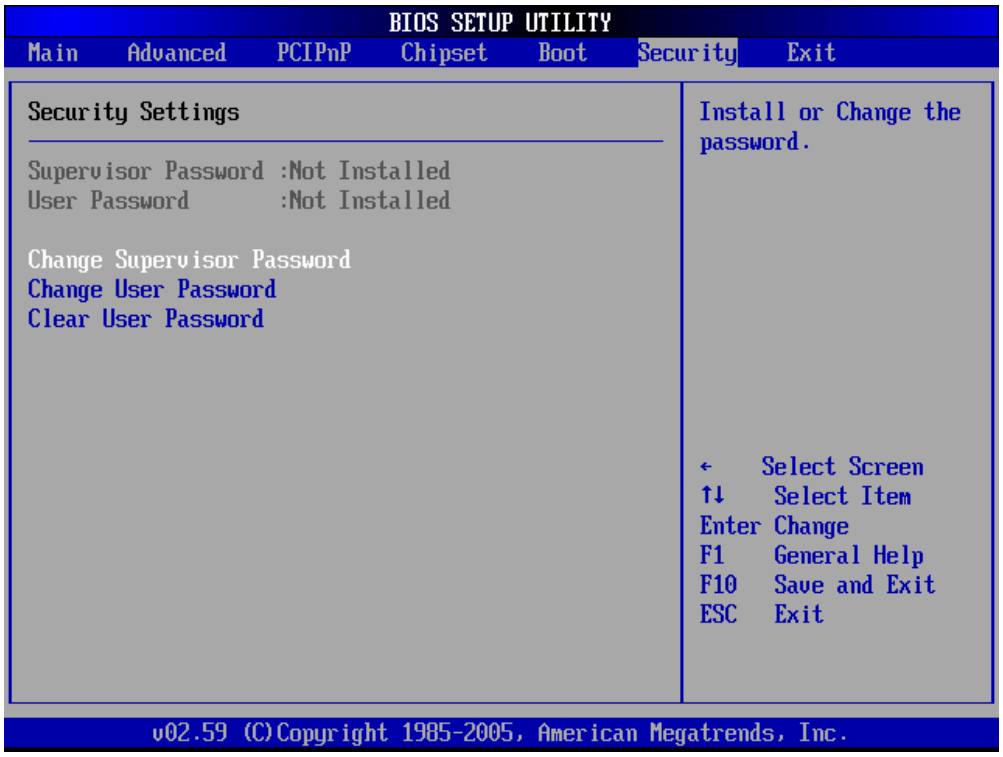
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 18: Removable Drives

5.6 Security

Use the Security menu (**BIOS Menu 19**) to set system and user passwords.



BIOS Menu 19: 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**

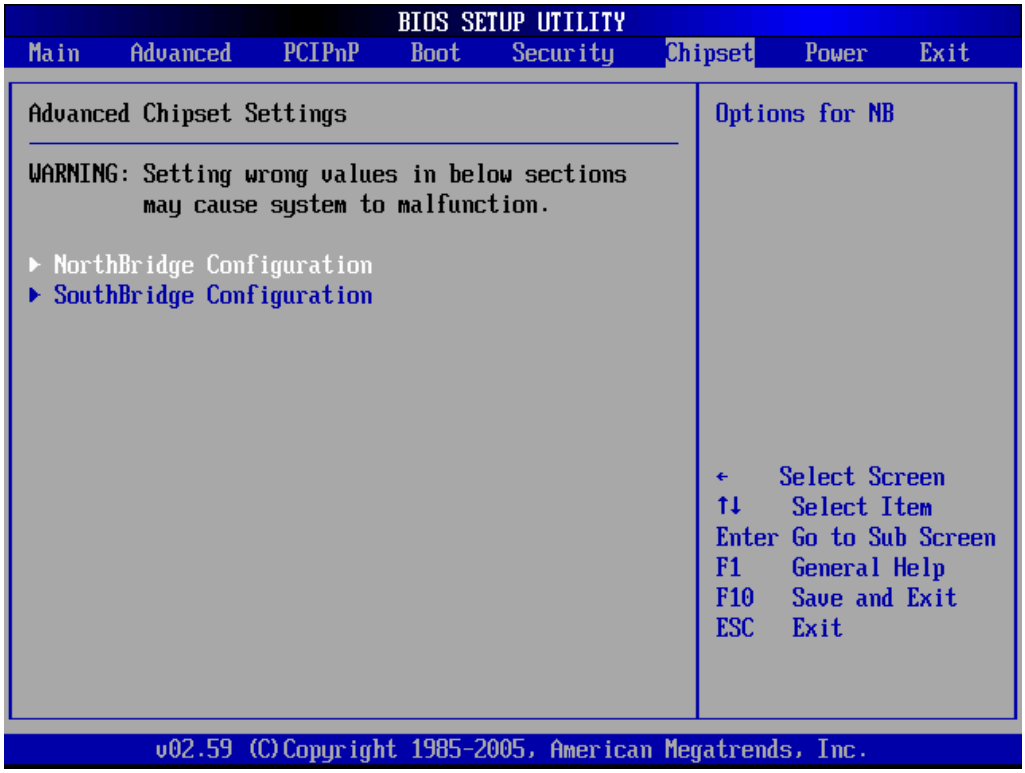
Use the Change User Password to set or change a user password. The default for this option is Not Installed. If a user password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change User Password.

5.7 Chipset

Use the Chipset menu (**BIOS Menu 20**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

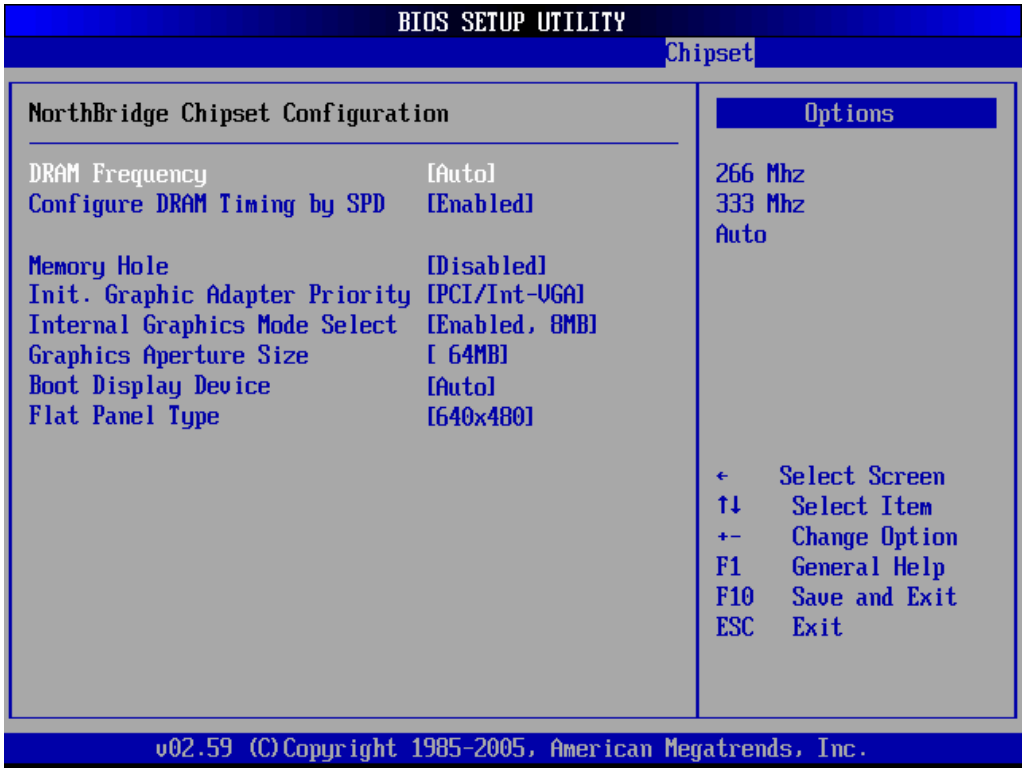
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 20: Chipset

5.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (**BIOS Menu 21**) to configure the northbridge chipset.



BIOS Menu 21: NorthBridge 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.

➔ **200MHz**		Sets the DRAM frequency to 200MHz
➔ **266MHz**		Sets the DRAM frequency to 266MHz
➔ **333MHz**		Sets the DRAM frequency to 333MHz
➔ **Auto**	**DEFAULT**	Automatically selects the DRAM frequency

➔ **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

➔ **Init. Graphic Adapter Priority [PCI/Int-VGA]**

The Init. Graphic Adapter Priority option selects the graphics controller the system uses as a primary boot device. The options are:

- Internal VGA
- PCI/Int-VGA **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, 4MB**		4MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device
➔ **Enable, 16MB**		16MB of memory used by internal graphics device
➔ **Enable, 32MB**		32MB of memory used by internal graphics device

➔ **Graphics Aperture Size [64MB]**

The Graphics Aperture Size option selects the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space.

➔ **64MB**	**DEFAULT**	Graphics aperture size set as 64MB
➔ **128MB**		Graphics aperture size set as 128MB

➔ **Boot Display Device [CRT+LFP]**

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

- CRT
- LFP
- CRT+LFP **DEFAULT**

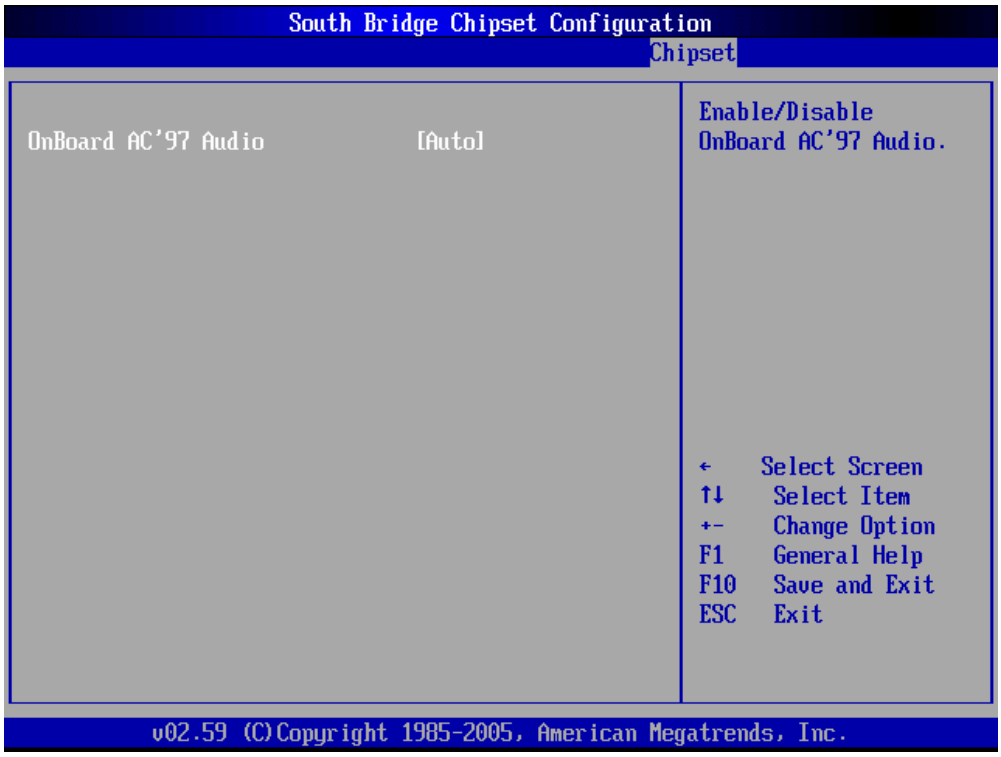
➔ **Flat Panel Type [640x480]**

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

- 640x480 **DEFAULT**
- 800x600
- 1024x768 24bits
- 1280x1024
- 1400x1050
- 1024x768 18bits
- 1600x1200 48bits
- 800x600 24bits
- 800x600 18bits
- 1024x768 36bits

5.7.2 SouthBridge Configuration

The SouthBridge Configuration menu (**BIOS Menu 22**) the southbridge chipset to be configured.



BIOS Menu 22: SouthBridge Chipset Configuration

➔ **OnBoard AC97 Audio [Auto]**

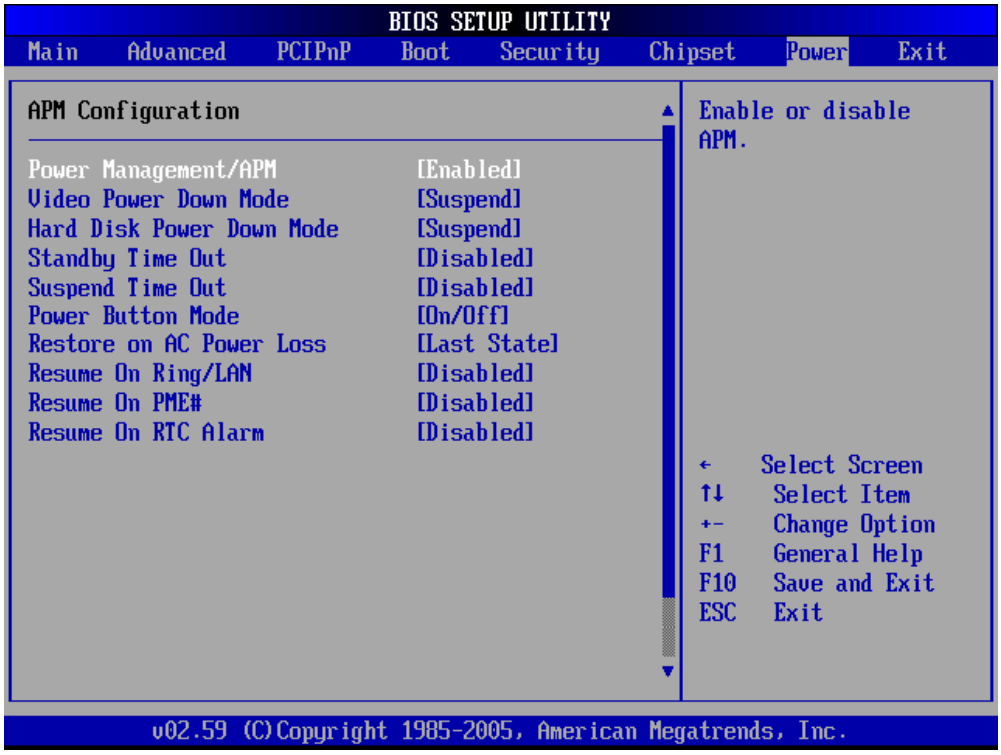
Use the OnBoard AC97 Audio option to enable or disable the AC'97 CODEC.

➔ **Auto** **DEFAULT** The onboard AC'97 automatically detected and enabled

➔ **Disabled** The onboard AC'97 is disabled

5.8 Power

The Power menu (**BIOS Menu 23**) allows the advanced power management options to be configured.



BIOS Menu 23: Power

➔ **Power Management/APM [Enabled]**

Use the Power Management/APM BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the Power Button Mode.

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

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Video Power Down Mode [Suspend]**

The Video Power Down Mode BIOS option specifies in what system mode the video device can be turned off.

➔ **Disabled**		The Video cannot be turned off in the Suspend or Standby mode
➔ **Standby**		The video can be turned off in the Standby mode
➔ **Suspend**	**DEFAULT**	The video can be turned off in the Suspend mode

➔ **Hard Disk Power Down Mode [Suspend]**

The Hard Disk Power Down Mode BIOS specifies in what system mode the hard disk device can be turned off.

➔ **Disabled**		The hard disk cannot be turned off in the Suspend or Standby mode
➔ **Standby**		The hard disk can be turned off in the Standby mode
➔ **Suspend**	**DEFAULT**	The hard disk can be turned off in the Suspend mode

➔ **Standby Time Out [Disabled]**

The Power Management/APM option must be enabled in order to change this configuration option. The Standby Time Out option specifies what length of time without activity on certain components will place those components in a standby state. The options are:

- Disabled **DEFAULT**
- 1 Min
- 2 Min
- 4 Min
- 8 Min
- 10 Min

- 20 Min
- 30 Min
- 40 Min
- 50 Min
- 60 Min

➔ **Suspend Time Out [Disabled]**

The Suspend Time Out option specifies what length of time without activity on certain components will place those components in a suspended state. The options are listed below:

- Disabled **DEFAULT**
- 1 Min
- 2 Min
- 4 Min
- 8 Min
- 10 Min
- 20 Min
- 30 Min
- 40 Min
- 50 Min
- 60 Min

➔ **Power Button Mode [On/Off]**

Use the Power Button Mode BIOS to specify how the power button functions.

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

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

Use the Restore on AC Power Loss option to specify what state the system returns to if there is a sudden loss of power to the system.

➔	**Power Off**		The system remains turned off
➔	**Power On**		The system turns on
➔	**Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on Ring/LAN [Disabled]**

The Resume on Ring/LAN 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

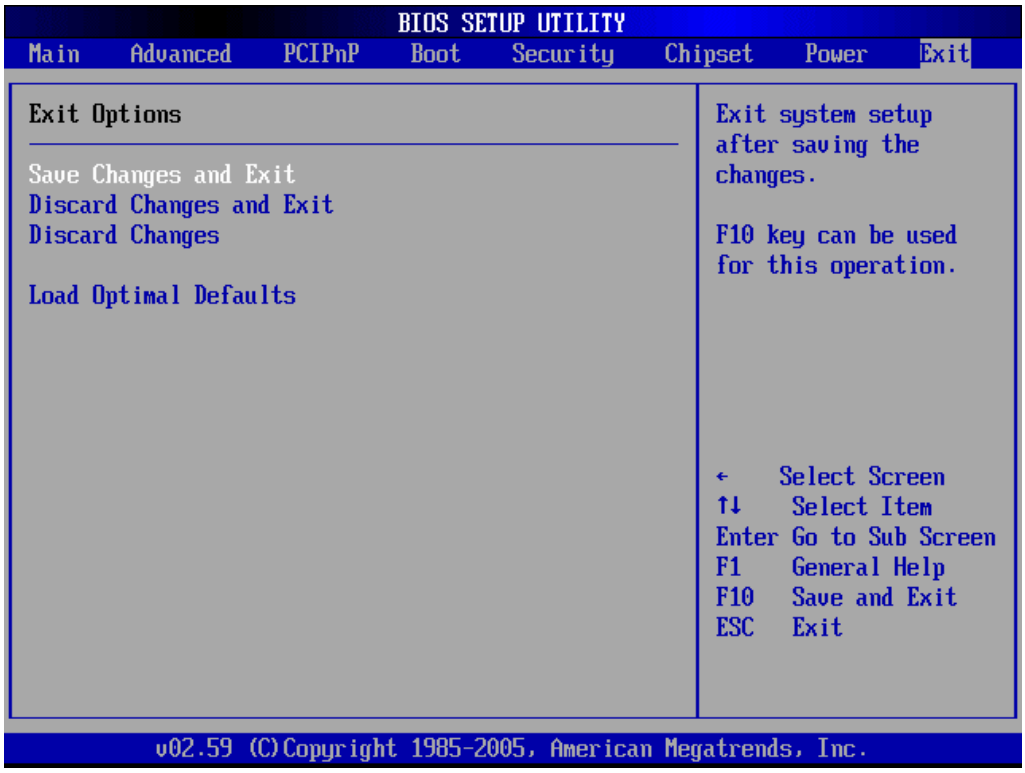
➔ **Resume On RTC Alarm [Disabled]**

Use the Resume On RTC Alarm option to specify the time the system should be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following appears with values that can be selected: ➔ **RTC Alarm Date (Days)** ➔ **System Time** After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.9 Exit

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



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.

THIS PAGE IS INTENTIONALLY LEFT BLANK

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 POS-8520 motherboard has six software drivers:

- Intel® Chipset Software Installation Utility
- Intel® Graphics Media Accelerator
- Realtek LAN Driver (for GbE LAN)
- Realtek AC'97 Codec (ALC655)
- ALi SATA/RAID Controller (M5281/M5283)

All six drivers can be found on the CD that came with the motherboard. To install the drivers please follow these instructions:

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 POS-8520. Open the **X:\Intel 852\1-INF** directory (where **X:** is the system CD drive) and double-click the **setup.exe** installation file.

Step 2: The **Chipset Software Installation Utility** prepares the **InstallShield Wizard** (**Figure 6-1**).

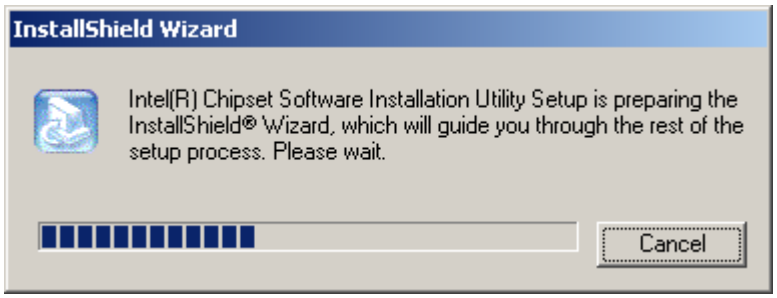


Figure 6-1: InstallShield Wizard Preparation Screen

Step 3: The **InstallShield Wizard Welcome** screen appears (**Figure 6-2**).

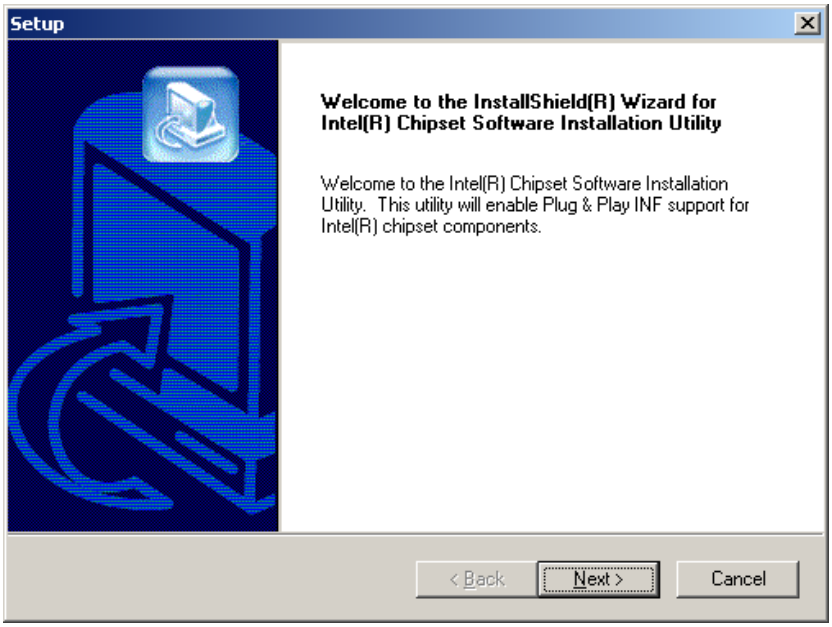


Figure 6-2: Chipset Software Installation Utility Welcome Screen

Step 4: Click **NEXT** and the license agreement appears (**Figure 6-3**).

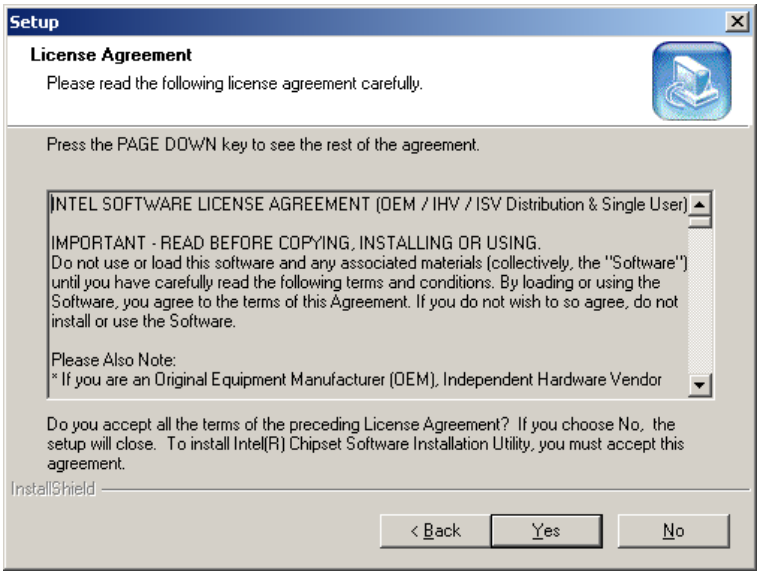


Figure 6-3: Chipset Software Installation Utility License Agreement

Step 5: Read the license agreement (**Figure 6-3**). To accept the terms and conditions stipulated in the agreement, click **YES** and the Readme file information appears (**Figure 6-4**).

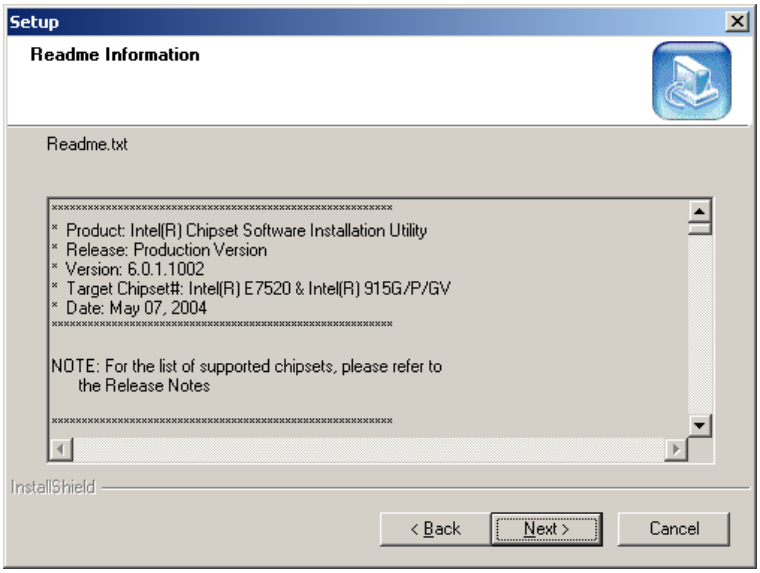


Figure 6-4: Chipset Software Installation Utility Readme File Information

Step 6: Read the Readme file information (**Figure 6-4**). Click **NEXT** and the chipset driver is installed (**Figure 6-5**).

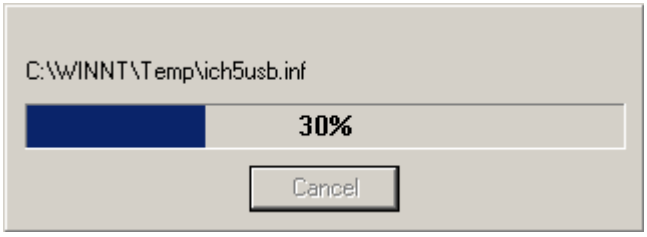


Figure 6-5: Installing Chipset Driver

Step 7: After the driver installation process is complete, a confirmation screen appears (**Figure 6-6**).

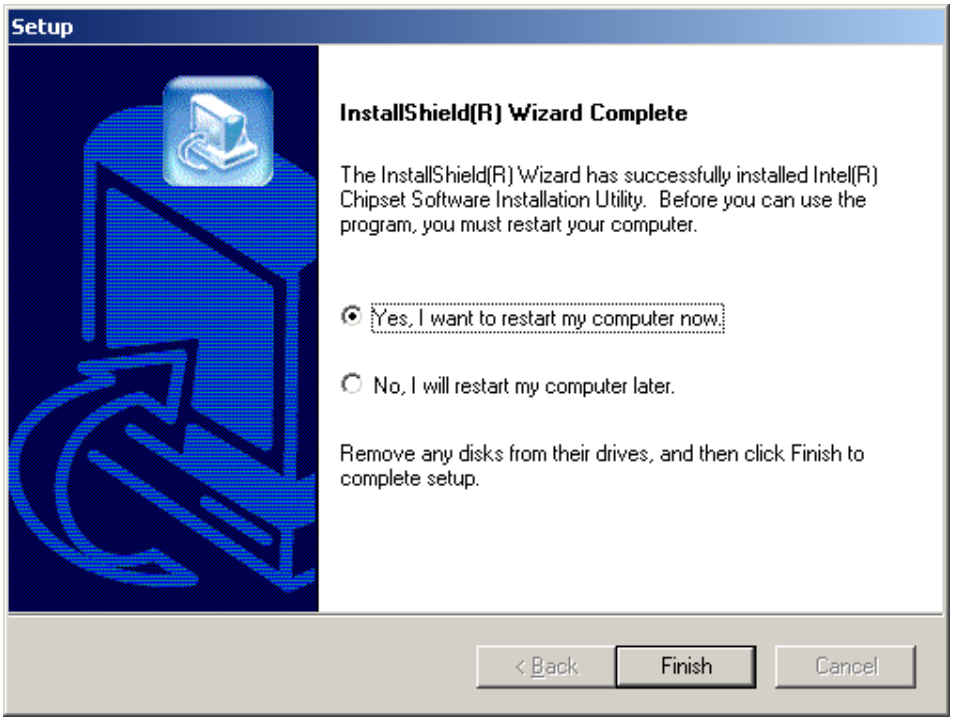


Figure 6-6: Chipset Software Installation Utility Complete

Step 8: The confirmation screen (**Figure 6-6**) 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.

6.3 Intel® Graphics Media Accelerator Driver

To install the Intel® Graphics Media Accelerator driver, please follow the steps below.

Step 1: Insert the CD into the system that contains the POS-8520. Open the **X:\Intel 852\2-VGA\???** directory (where **X:** is the system CD drive and **???** is the appropriate operating system) and double-click the corresponding **setup.exe** installation file.

Step 2: The **InstallShield Wizard Welcome** screen appears (**Figure 6-7**).

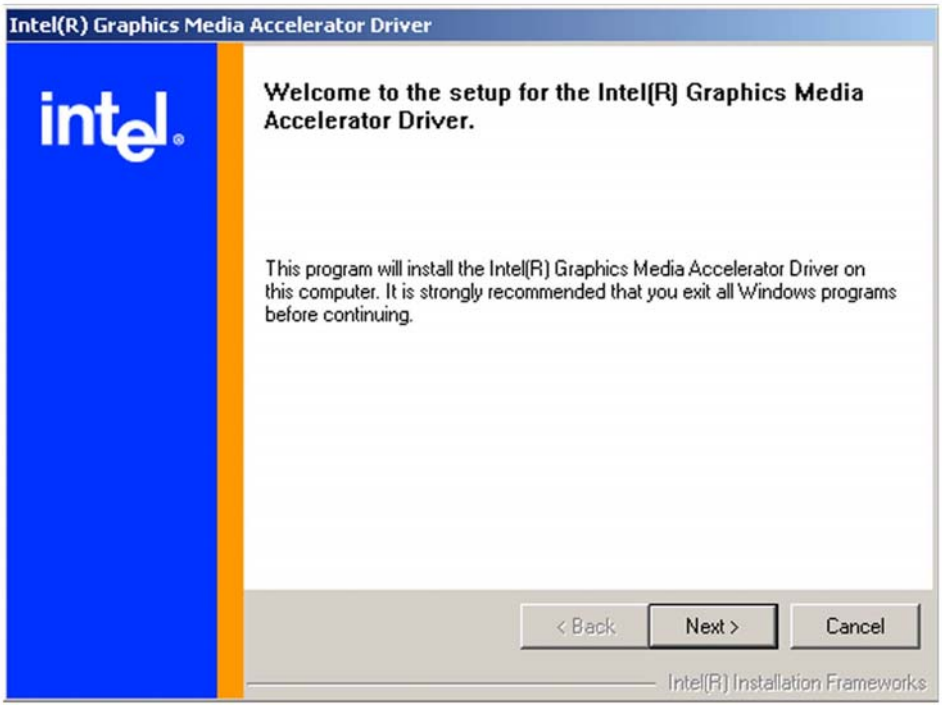


Figure 6-7: Intel® Graphics Media Accelerator Driver Welcome Screen

Step 3: Click **NEXT** and a license agreement appears (**Figure 6-8**).

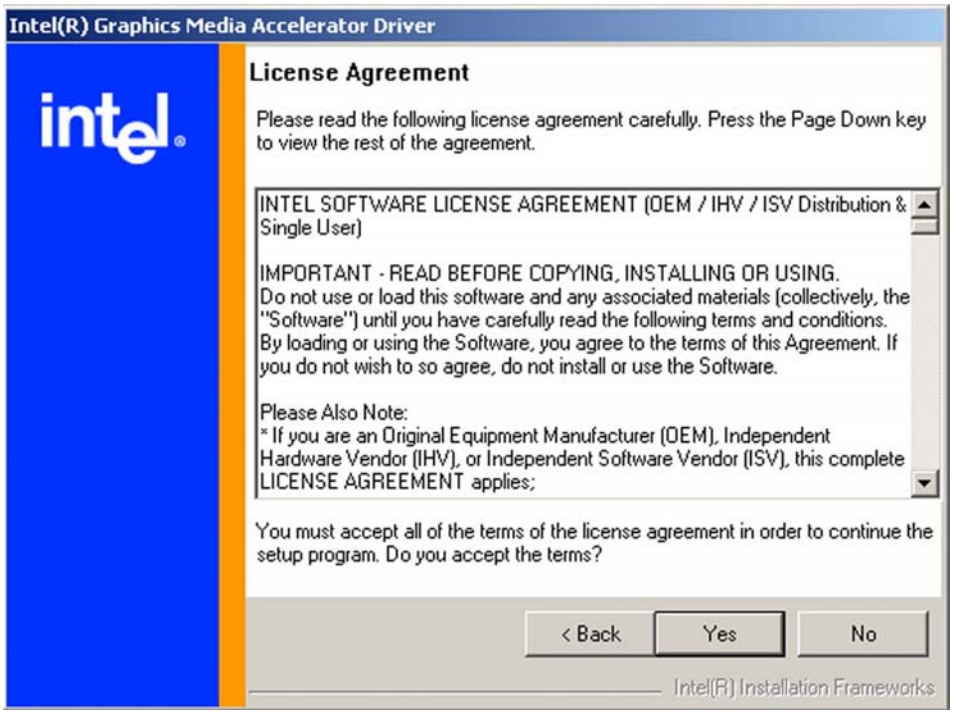


Figure 6-8: Intel® Graphics Media Accelerator Driver License Agreement

Step 4: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the installation notice appears (**Figure 6-9**).

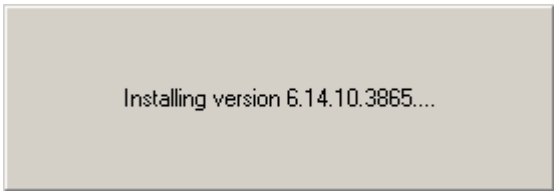


Figure 6-9: Intel® Graphics Media Accelerator Driver Installing Notice

Step 5: After the driver installation process is complete, a confirmation screen appears (**Figure 6-10**).

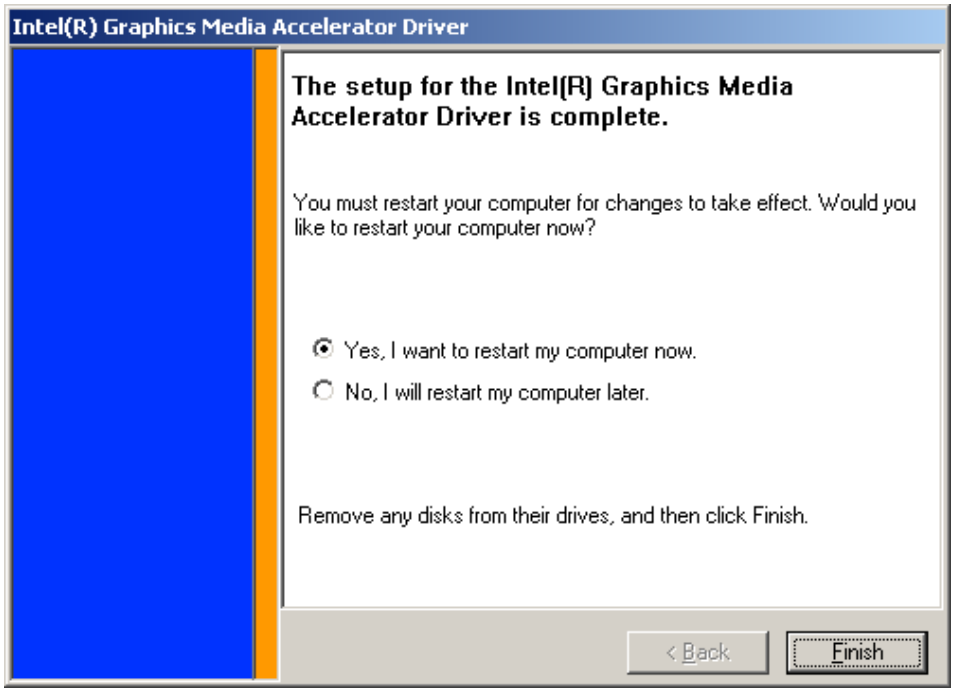


Figure 6-10: Intel® Graphics Media Accelerator Installation Complete

Step 6: 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.

6.4 Realtek LAN Driver (for GbE LAN) Installation

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

Step 1: Insert the CD into the system that contains the POS-8520. Open the **X:\Intel 852\3-LAN\Realtek** directory (where **X:** is the system CD drive) and double-click the **setup.exe** installation file to initiate the **InstallShield Wizard** (**Figure 6-11**).

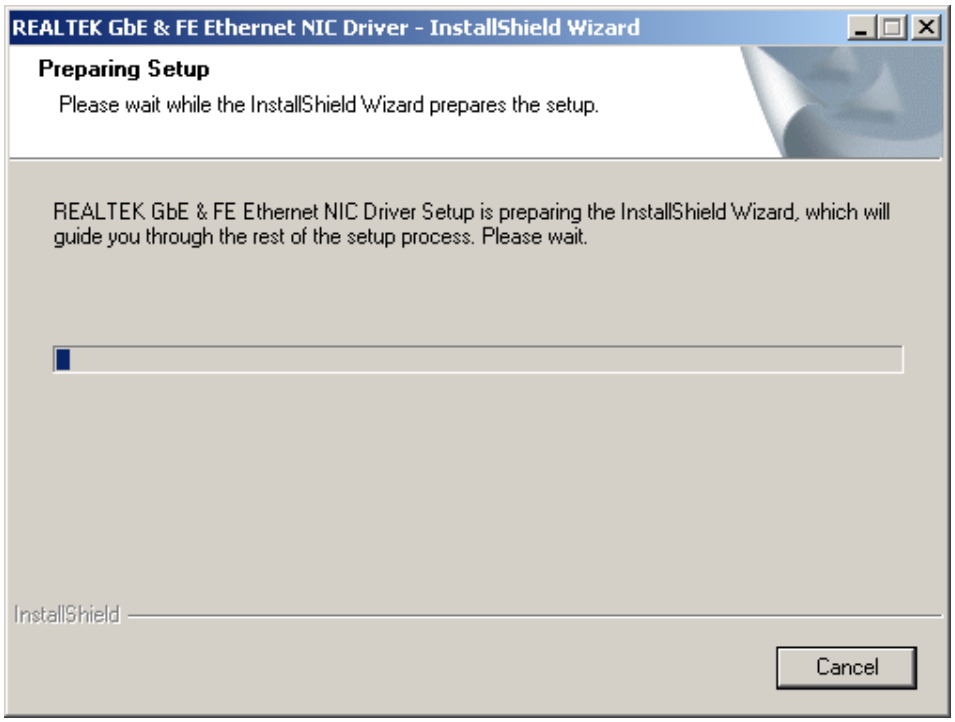


Figure 6-11: Realtek LAN Driver InstallShield Wizard

Step 2: The **InstallShield Wizard Welcome** screen appears (**Figure 6-12**).

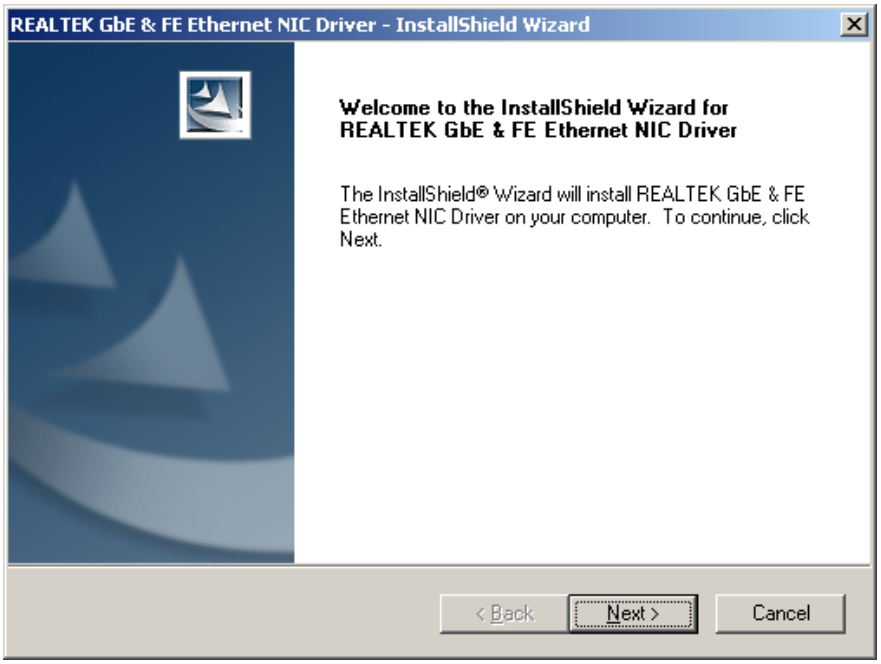


Figure 6-12: Realtek LAN Driver Welcome

Step 3: Click **NEXT** and the **Ready to Install** screen appears (**Figure 6-13**).

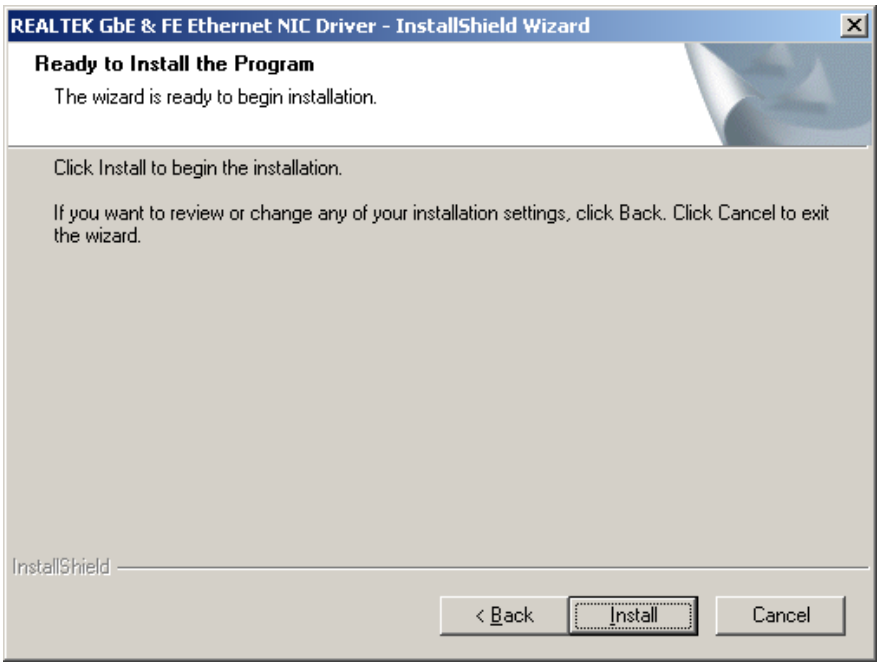


Figure 6-13: Realtek LAN Driver Ready to Install

Step 4: Click **INSTALL** and the **Setup Status** screen appears as the driver is installed (**Figure 6-14**).

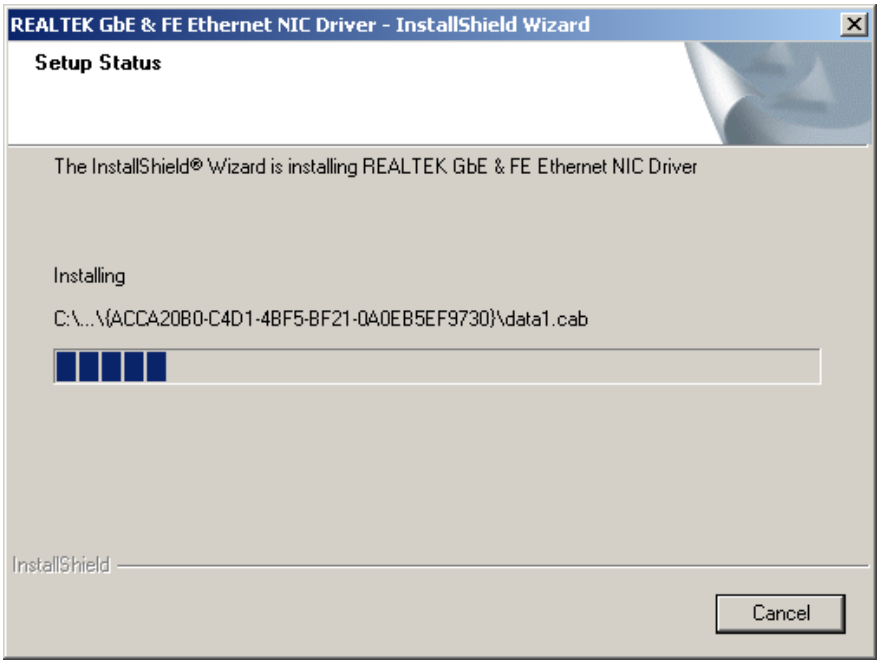


Figure 6-14: Realtek LAN Driver Setup Status

Step 5: After the driver installation process is complete, a confirmation screen appears (**Figure 6-15**).

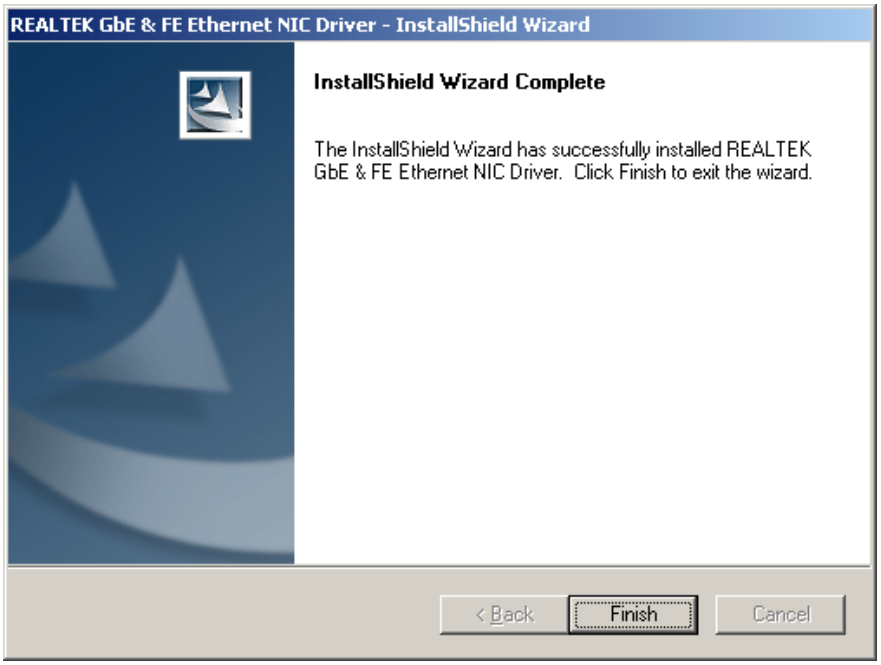


Figure 6-15: Realtek LAN Driver Installation Complete

Step 6: Click **FINISH** to exit the **InstallShield** wizard.

6.5 USB Driver Installation

To install the Realtek Audio driver, please follow the steps below.

Step 1: Insert the CD into the system that contains the POS-8520. Open the **X:\Intel 852\4-USB 2.0\???** directory (where **X:** is the system CD drive and **???** is the appropriate operating system). For Windows XP, double-click the **USB20.exe** installation file and follow the on-screen instructions. For other OSes, navigate to the appropriate folder and follow the installation instructions in the corresponding **readme.txt** file. The following steps are for a Windows XP installation process.

Step 2: The **InstallShield Wizard Welcome** screen appears (Figure 6-16).

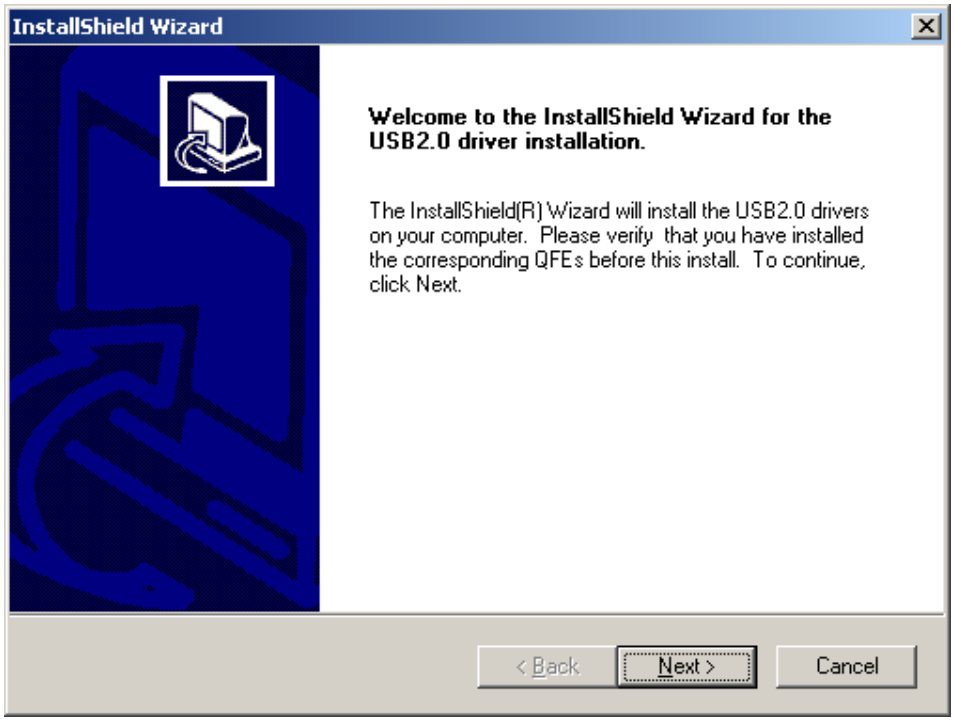


Figure 6-16: USB Driver Welcome

Step 3: Click **NEXT** and a license agreement appears (Figure 6-17).

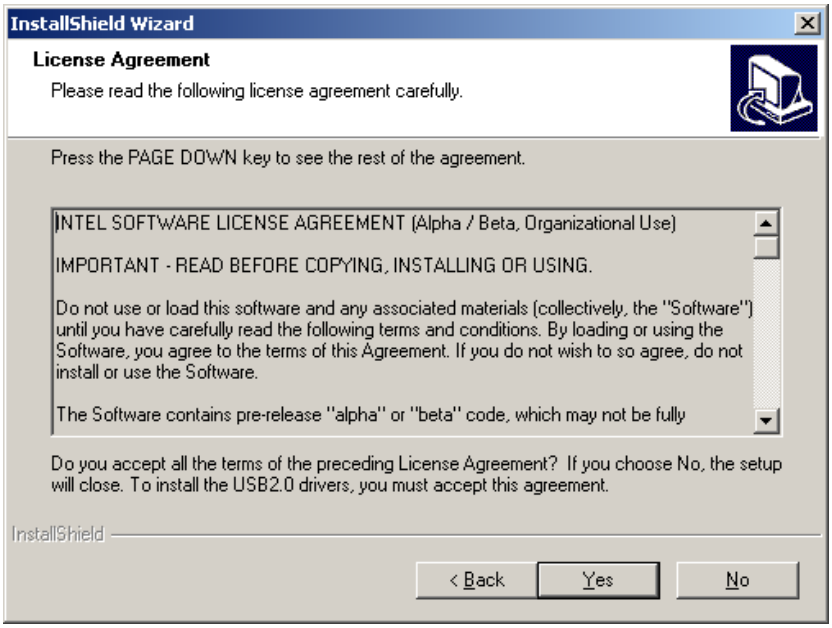


Figure 6-17: USB Driver License Agreement

Step 4: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the setup status appears (Figure 6-18).

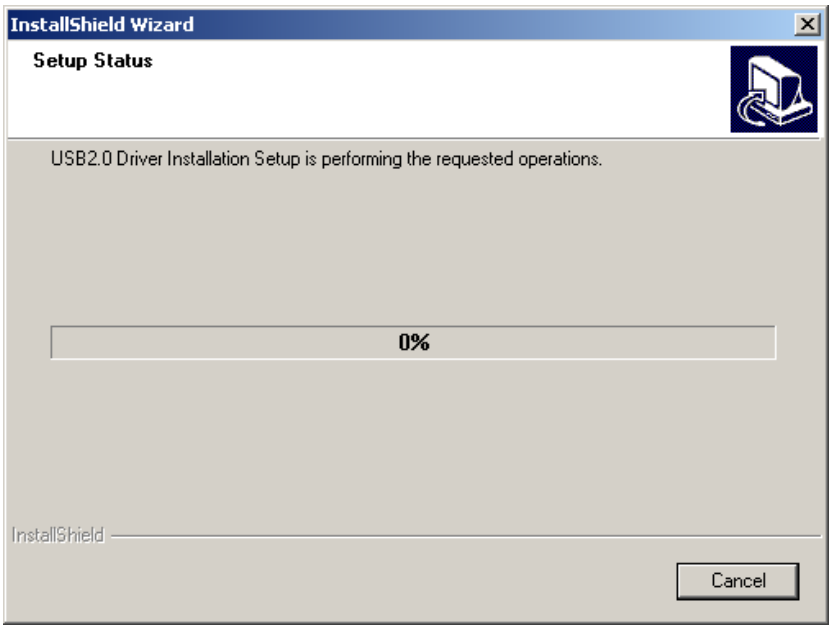


Figure 6-18: USB Driver Setup Status

Step 5: After the driver installation process is complete, a confirmation screen appears (Figure 6-19).

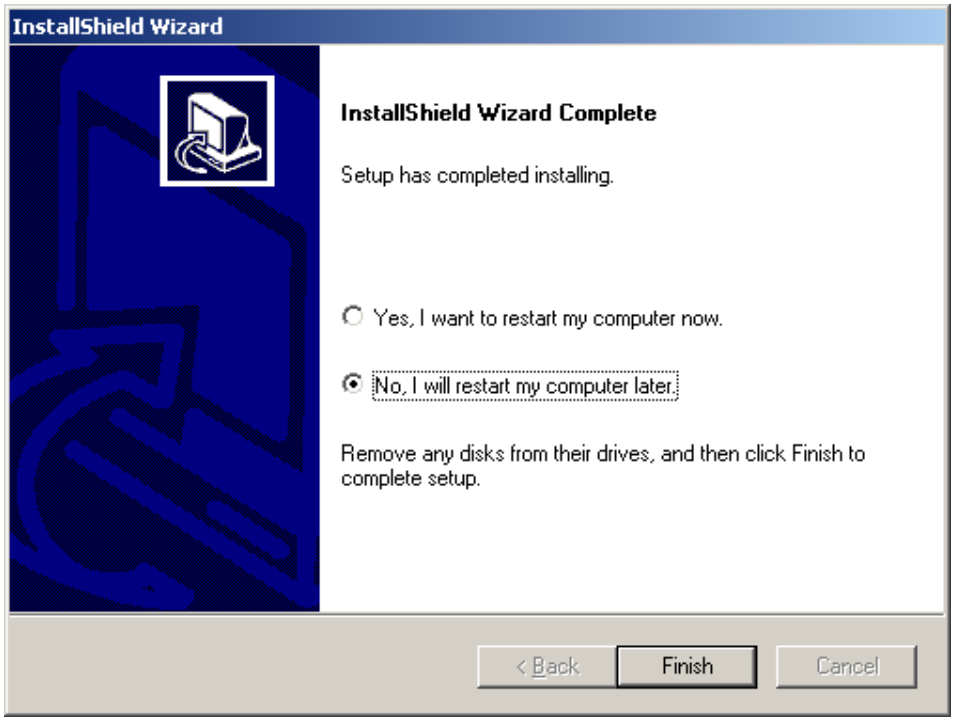


Figure 6-19: USB Driver Installation Complete

Step 6: 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 RealTek Audio Driver Installation

To install the Realtek Audio driver, please follow the steps below.

Step 1: Insert the CD into the system that contains the POS-8520. Open the **X:\Intel 852\5-Audio\Realtek\Alc655** directory (where **X:** is the system CD drive) and double-click the **setup.exe** installation file.

Step 2: The **Realtek AC'97 Audio Setup** prepares the **InstallShield Wizard** (**Figure 6-20**).

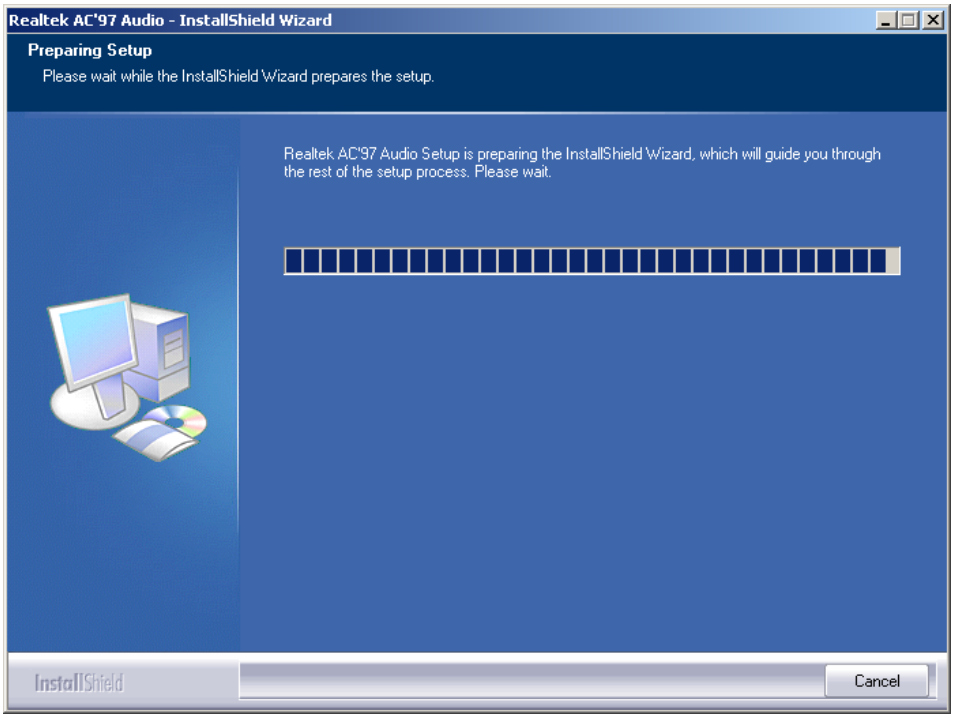


Figure 6-20: Audio Driver Install Shield Wizard Starting

Step 3: The **Setup Status** screen appears as the driver is installed (**Figure 6-21**).

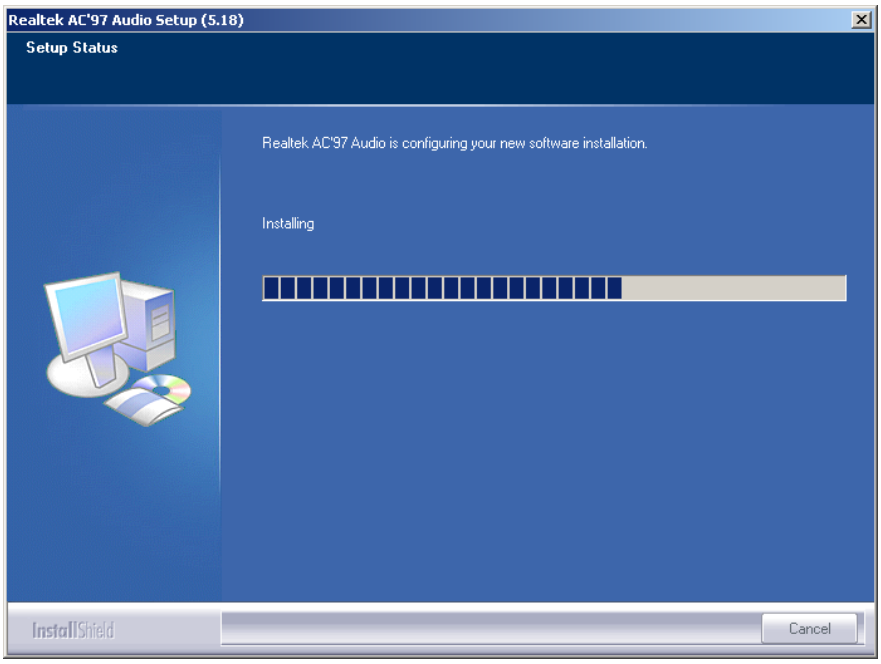


Figure 6-21: Audio Driver Setup Preparation

Step 4: At this stage the **Digital Signal Not Found** screen appears (**Figure 6-22**). Click **YES** to continue.

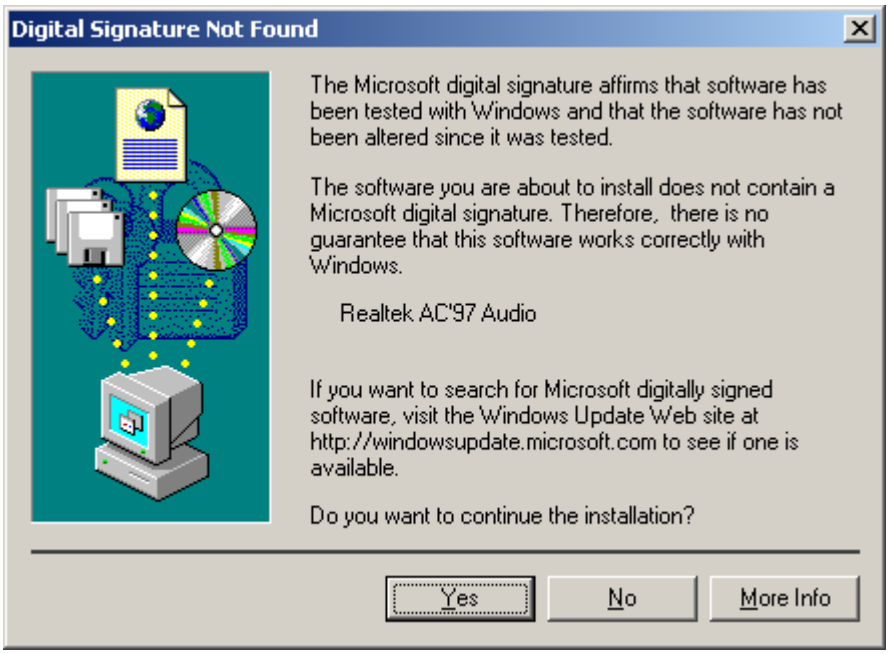


Figure 6-22: Audio Driver Digital Signal

Step 5: The audio driver installation continues (**Figure 6-23**).

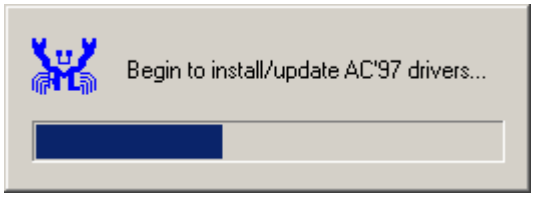


Figure 6-23: Audio Driver Installation Continues

Step 6: After the driver installation process is complete, a confirmation screen appears (**Figure 6-24**).

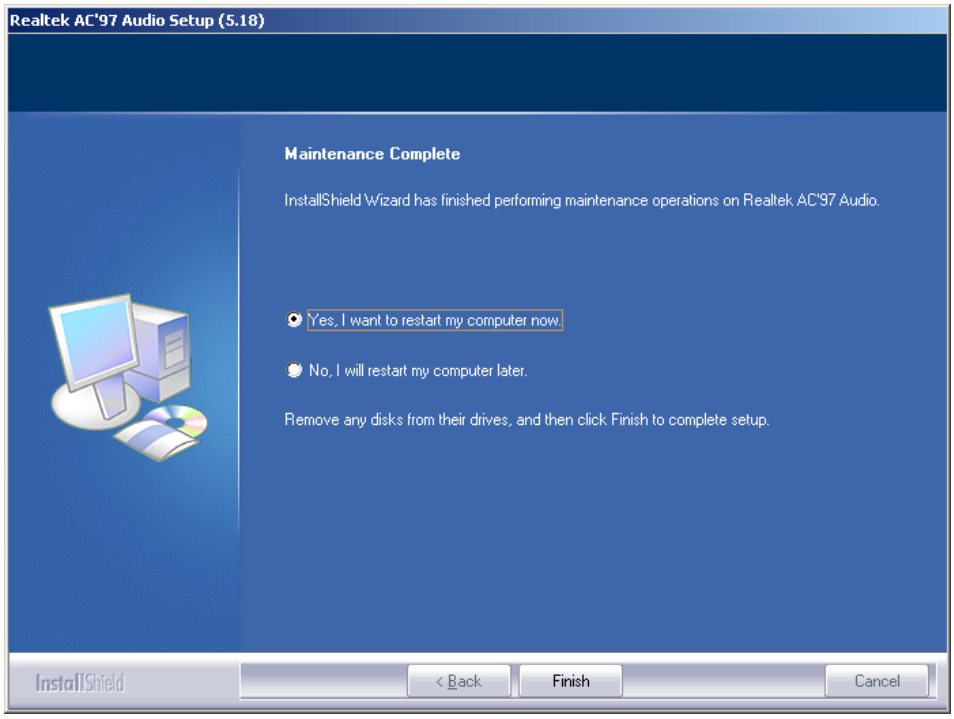


Figure 6-24: Audio Driver Installation Complete

Step 7: 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.

6.7 ALi SATA/RAID Driver

To install the ALi SATA/RAID driver, please follow the steps below.

Step 1: Insert the CD into the system that contains the POS-8520. Open the **X:\Intel 852\6-SATA\M5283** directory (where **X:** is the system CD drive) and double-click the **setup.exe** installation file.

Step 2: The **Install Shield Wizard** (**Figure 6-25**) is prepared to guide the user through the rest of the process.

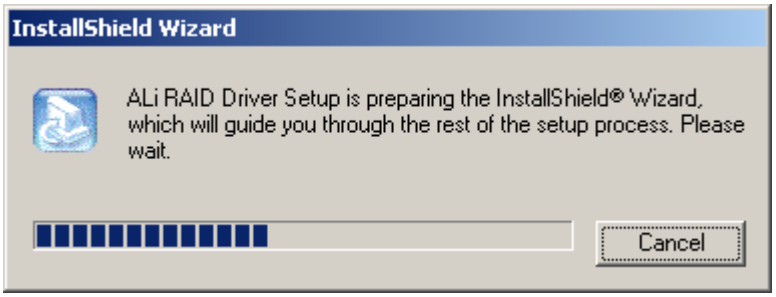


Figure 6-25: RAID Driver Preparing Setup Screen

Step 3: Once initialized, the **Install Wizard** welcome screen appears (**Figure 6-26**).

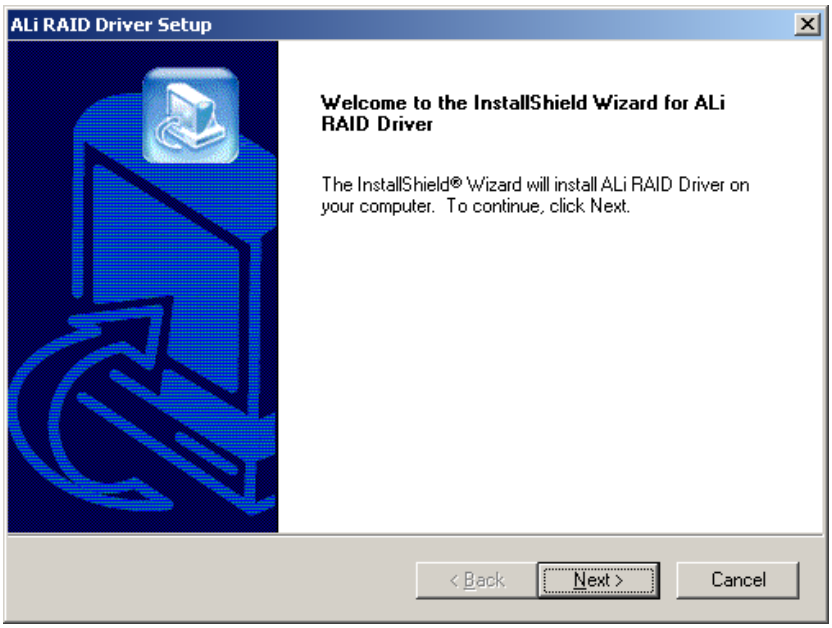


Figure 6-26: RAID Driver Install Wizard Welcome Screen

Step 4: Click **NEXT** to continue the installation or **CANCEL** to stop the installation.

Step 5: The **Install Wizard** starts to install the driver (**Figure 6-27**).

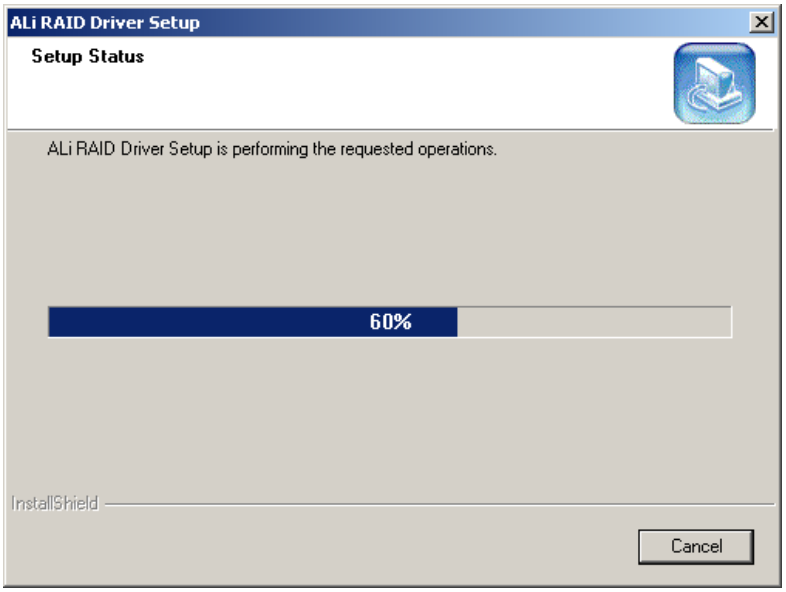


Figure 6-27: RAID Driver Installing Screen

Step 6: A **Digital Signal Not Found** screen appears (**Figure 6-28**). Click **YES** to continue the installation process.

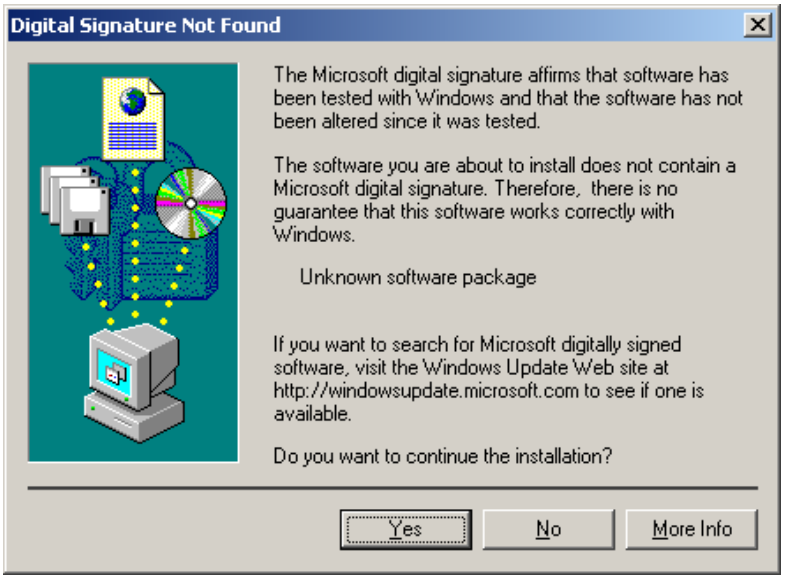


Figure 6-28: RAID Driver Digital Signal

Step 7: Once the installation is complete, the **InstallShield Wizard Complete** screen appears (**Figure 6-29**).

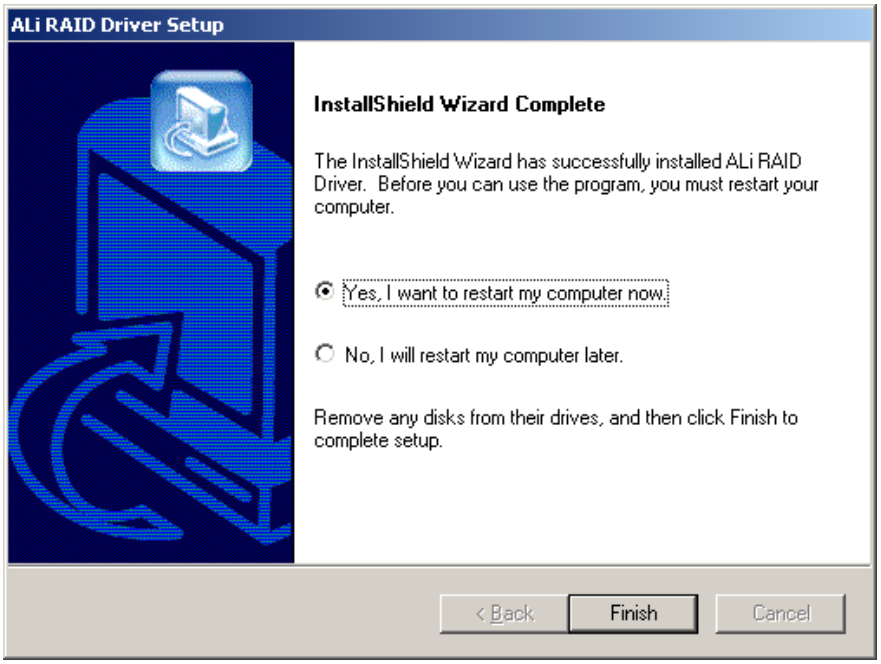


Figure 6-29: InstallShield Wizard Complete Screen

Step 8: Once the installation process is complete, the computer may be restarted immediately or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Configuration Options

A.1 BIOS Configuration Options

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

THIS PAGE IS INTENTIONALLY LEFT BLANK

Appendix

B

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. It is recommended you contact IEI support or visit our website 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 will either perform 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

You have to 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 will start counting down. While the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer will be disabled if you set the time-out value to be 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 will reset.

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
;
; ADD YOUR APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ; is your application over?
        JNE     W_LOOP          ; No, restart your application
        MOV     AX, 6F02H       ; disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

THIS PAGE IS INTENTIONALLY LEFT BLANK

Appendix

C

Address Mapping

C.1 I/O Address Map

I/O Address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel(R) Graphics Controller
3C0-3DF	Intel(R) Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: I/O 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	LAN
IRQ3	COM2	IRQ11	LAN/USB 2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	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: IRQ Mapping Table

THIS PAGE IS INTENTIONALLY LEFT BLANK

Appendix

D

ALi® RAID for SATA

D.1 Introduction

The ALi M5283 SATA RAID chipset can control parallel ATA (PATA) and serial ATA (SATA) disks. The ALi controller supports PATA UDMA transfer mode up to mode 6 and SATA 1 disk drives. The ALi M5283 also has a cost-effective RAID functionality that can increase the data read/write speed and provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID 1).

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

D.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

D.2 Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Supported Operating Systems include: Windows 98/Me, Windows 2000 and Windows XP
- Windows-based software for RAID management

D.3 Accessing the ALi RAID Utility

To access the Ali RAID Utility, please follow the steps below:

Step 1: **Connect SATA drives to the system**. Connect two SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration (JBOD, RAID 0 or RAID 1). If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **AMI BIOS** setup program. Next, open the **Advanced** menu. Enable the **SATA ROM Support BIOS** option. (See **Section 5.3.2**)

Step 3: **Save and Exit BIOS**. After the **SATA ROM Support BIOS** option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl-A**. When the screen in **Figure 6-30** appears press **Ctrl-A** to enter the **ALi RAID BIOS** setup program.

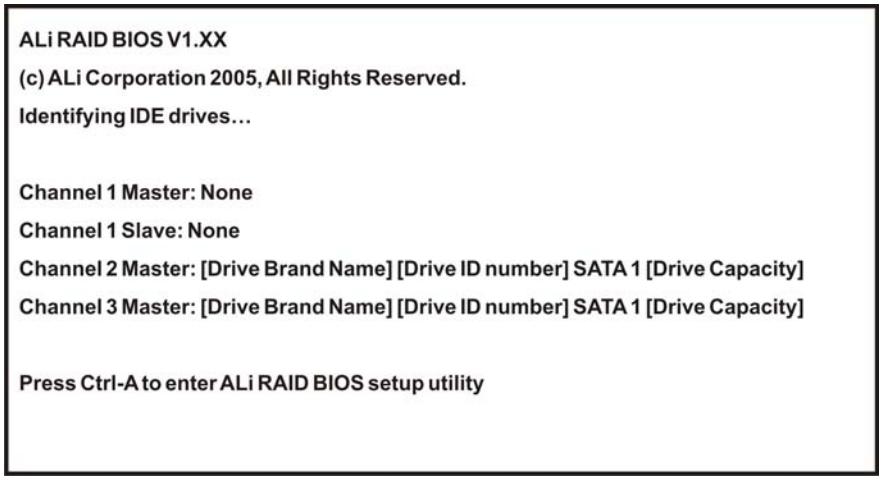


Figure 6-30: Accessing ALi RAID BIOS Utility

Step 6: **Delete RAID settings and partitions**. The **RAID BIOS Setup Utility** in **Figure 6-31** appears. Before configuring the array select the "**Delete All RAID Setting & Partition**".

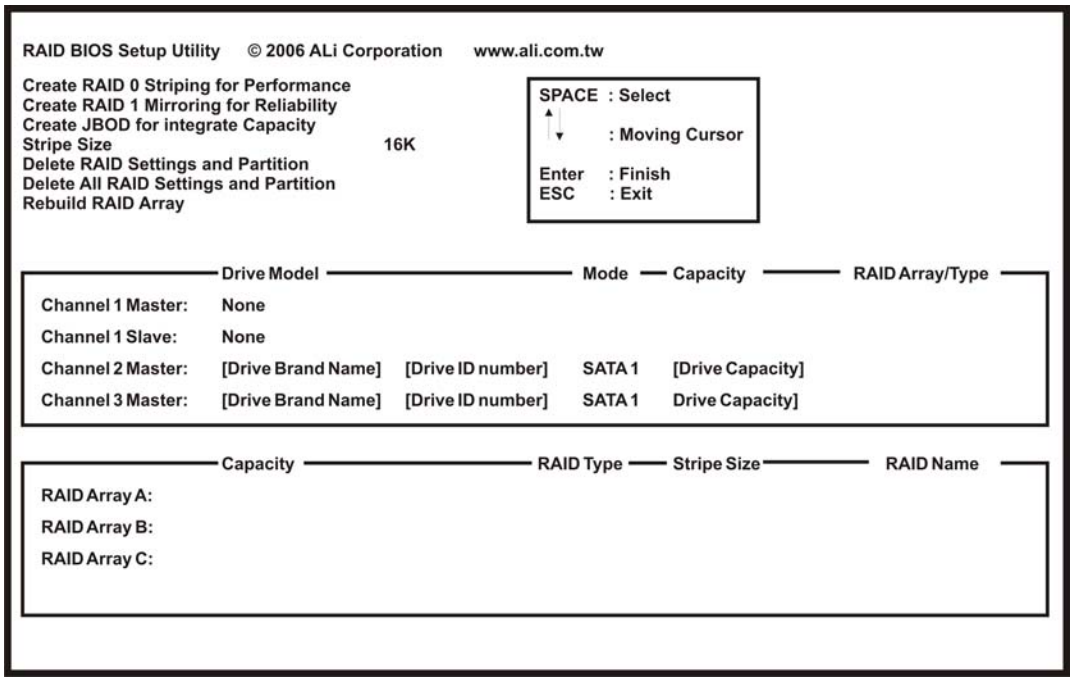


Figure 6-31: RAID BIOS Setup Utility

Step 7: **Configure the RAID settings**. Use the **RAID BIOS Setup Utility** in **Figure 6-31** to configure the RAID array. Brief descriptions are given below.

Step 8: **Install the OS**. After the RAID array has been configured (see below) install the OS. To do this, please refer to the documentation that came with the OS.

D.4 RAID Options:

D.4.1 Create RAID 0 Striping for Performance

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID 0 Striping for Performance"**. Use the arrow keys to highlight **Create RAID0 Striping for Performance** and press **ENTER**. A flashing 'S' appears on the **Drive Menu** where the member drives to be included in the RAID 0 array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case 's' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

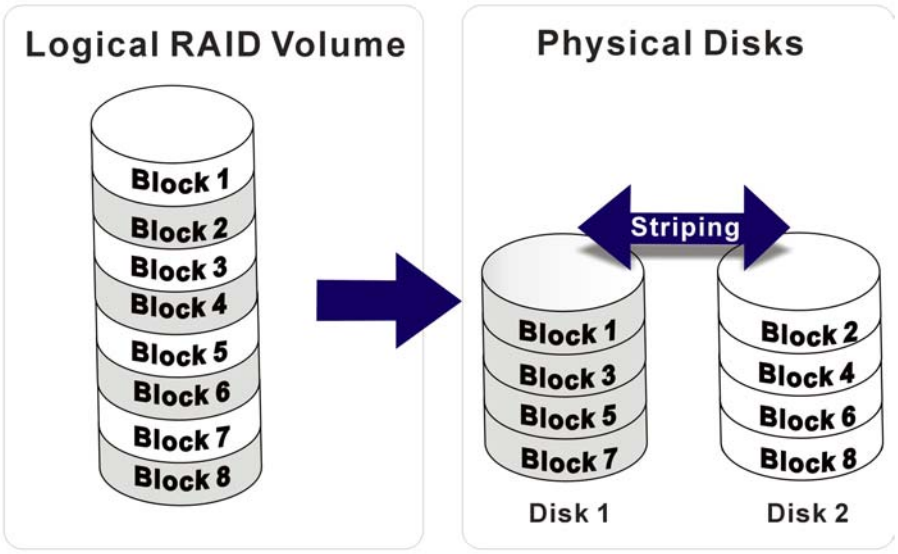
Step 3: **Confirm**. The **Create RAID0(Y/N)** confirm box appears. Press **Y**.

Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 0 array. Avoid mixing PATA and SATA disk drives in a RAID 0 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.



D.4.2 Create RAID 1 Mirroring for Reliability

WARNING!

All data previously stored on the member drives of a RAID configuration is destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select “Create RAID 1 Striping for Reliability”**. Use the arrow keys to highlight **Create RAID 1 Striping for Reliability** and press **ENTER**. A flashing ‘S’ appears on the **Drive Menu** where the member drives to be included in the RAID 0 array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case ‘s’ once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3: **Confirm**. The **Create RAID0(Y/N)** confirm box appears. Press **Y**.

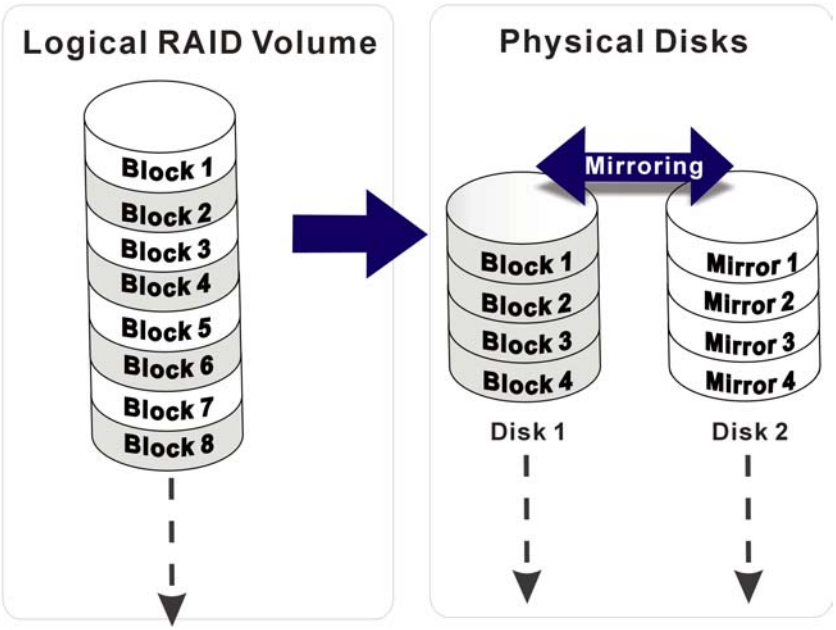
Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array

Step 5: **View the array**. A prompt appears to proceed with drive copy. The **Source** and **Destination** drives are indicated as “M” and “m” in the **Drive Menu**.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 1 array. Avoid mixing PATA and SATA disk drives in a RAID 1 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.



D.4.3 Create JBOD for Integrated Capacity

JBOD is defined as “Just a Bunch of Drives.” JBOD provides neither performance gains nor data redundancy.

WARNING!

All data previously stored on the member drives of a RAID configuration is destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** “**Create JBOD for Integrated Capacity”**. Use the arrow keys to highlight **Create JBOD for Integrated Capacity** and press **ENTER**. A flashing ‘J’ appears on the **Drive Menu** where the member drives to be included in the JBOD array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case ‘s’ once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3: **Confirm**. The **Create RAID 0 (Y/N)** confirm box appears. Press **Y**.

Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array

NOTE:

To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID1 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID1 array.

D.4.4 Stripe Size

Changing the stripe size effects RAID 0 arrays. Configurable options are:

- 64K (default)
- 32K
- 16K
- 8K
- 4K

Select a small stripe size if the I/Os to the hard drives are small and occur randomly. Choose a larger stripe size if the I/Os are mostly large and come in sequential orders, e.g., A/V playback and editing applications. The default value should be appropriate for most applications.

D.4.5 Delete RAID Setting & Partition

WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: **Delete a RAID setting**. Use the arrow keys to highlight **Delete RAID Setting & Partition** and press **ENTER**. A flashing 'E' appears at the **Drive Menu** where the member drives to be removed can be chosen.

Step 2: **Confirm Delete**. The **Data on RAID drives will be erased (Y/N)** confirm box

appears. Press **Y**.

D.4.6 Delete All RAID Setting & Partition

WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: **Delete RAID Settings**. Use the arrow keys to highlight **Delete All RAID Setting & Partition** and press **ENTER**.

Step 2: **Confirm delete**. The **Data on RAID drives will be erased (Y/N)** confirm box appears. Press **Y**.

D.4.7 Rebuild RAID Array

The Rebuild RAID Array option can rebuild a RAID array if a member of a RAID configuration should fail. Neither RAID 0 nor JBOD provides data redundancy. The Rebuild RAID Array option only applies to RAID1 arrays and is applicable when a member of a RAID1 configuration has failed.

Step 1: **Select Rebuild Array**. Use the arrow keys to highlight **Rebuild RAID Array** and press **ENTER**. A flashing 'R' appears in the list of existing arrays. The source and destination drives will be displayed.

Step 2: **Confirm rebuild array**. Press **Y** to begin the rebuild process.

NOTE:

A status bar will indicate the rebuild progress. Rebuild consumes considerable system resources and the time required for rebuilding a RAID array may vary depending on the size of stored data, disk drive capacity, and drive performance.

D.4.8 Select Boot Drive

Step 1: **Select the Boot Drive**. Use the arrow keys to highlight **Select Boot Drive** and press **ENTER**. A flashing 'A' appears at the **Drive Menu** where the boot drive can be chosen.

Step 2: **Press ENTER**. Press **ENTER** or the space bar to finish the configuration.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Index

G

H

I

J

M

N

O

P

R

S

U

W