

# Viglen VIG520S Motherboard Manual

COMPUTERS • NETWORKS • SOLUTIONS

Viglen VIG520S Motherboard Manual

# Viglen®

Great  
Minds  
Think

**Viglen®**

Version 1.00

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# Viglen, EMC and the 'CE' mark

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## **CE Marking**

European standards are being harmonised across borders. If products comply to the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies to the currently enforced directive(s).



## **Introduction to EMC**

EMC (Electromagnetic Compatibility) is the term used to describe certain issues with RF (Radio Frequency) energy. Electrical items should be designed so they do not interfere with each other through RF emissions. E.g. If you turn on your microwave, your television shouldn't display interference if both items are CE marked to the EMC directive.

If emitted RF energy is not kept low, it can interfere with other electrical circuitry - E.g. Cars Automatic Braking Systems have been known to activate by themselves while in a strong RF field. As this has obvious repercussions ALL electrical products likely to cause RF related problems have to be 'CE' marked from 1st January 1996 onwards.

If a product conforms to the EMC directive, not only should its RF emissions be very low, but its immunity to RF energy (and other types) should be high. The apparatus has to resist many 'realworld' phenomena such as static shocks and mains voltage transients.

## **Viglen's Environment laboratory**

To gain a 'CE' mark, the Viglen computer range has had to undergo many difficult tests to ensure it is Electromagnetically Compatible. These are carried out in the in-house 'Environment lab' at Viglen Headquarters. We have made every effort to guarantee that each computer leaving our factory complies fully to the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

- > Install the system according to Viglen's instructions
- > If you open up your Viglen:
  - > Keep internal cabling in place as supplied.
  - > Ensure the lid is tightly secured afterwards
  - > Do not remove drive bay shields unless installing a 'CE' marked peripheral in its place
  - > The clips or 'bumps' around the lips of the case increase conductivity - do not remove or damage.
  - > Do not remove the ferrite ring from the L.E.D cables.
- > Only use your Viglen computer with 'CE' marked peripherals

This system has been tested in accordance with European standards for use in residential and light industrial areas-this specifies a 10 meter testing radius for emissions and immunity. If you do experience any adverse affects which you think might be related to your computer, try moving it at least 10 meters away from the affected item. If you still experience problems, contact Viglen's Technical Support department who will put you straight through to an EMC engineer - s/he will do everything possible to help. If modifications are made to your Viglen computer system, it might breach EMC regulations. Viglen take no responsibility (with regards to EMC characteristics) of equipment which has been tampered with or modified.

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## Chapter 1 Overview

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### Introduction

This manual describes the Viglen VIG520S motherboard inside your computer. The motherboard is the most important part of your computer. It contains all of the CPU, memory and graphics circuitry that make the computer work.

The motherboard contains the very latest CPU design, the Intel Pentium 4 processor, which includes Intel's **MMX technology**. MMX technology adds a total of 57 new instructions to the CPU, all of which are designed to vastly improve both multimedia and communications on your PC. The combination of the Intel processor, MMX technology and Viglen expertise make this a formidable computer.

This manual contains technical information about the Viglen VIG520S motherboard and other hardware components inside your computer. If you are new to computers we recommend that you read the user guide first. If you are an experienced computer user this manual should provide all the information you will need to perform simple upgrades and maintenance.

We hope that this manual is both readable and informative. If you have any comments for suggestions about how we could improve the format then please fill out the form at the back of the manual and send it to us.

Above all we hope that you enjoy using your Viglen computer.

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## VIG520S Motherboard Specification

### System Board Components

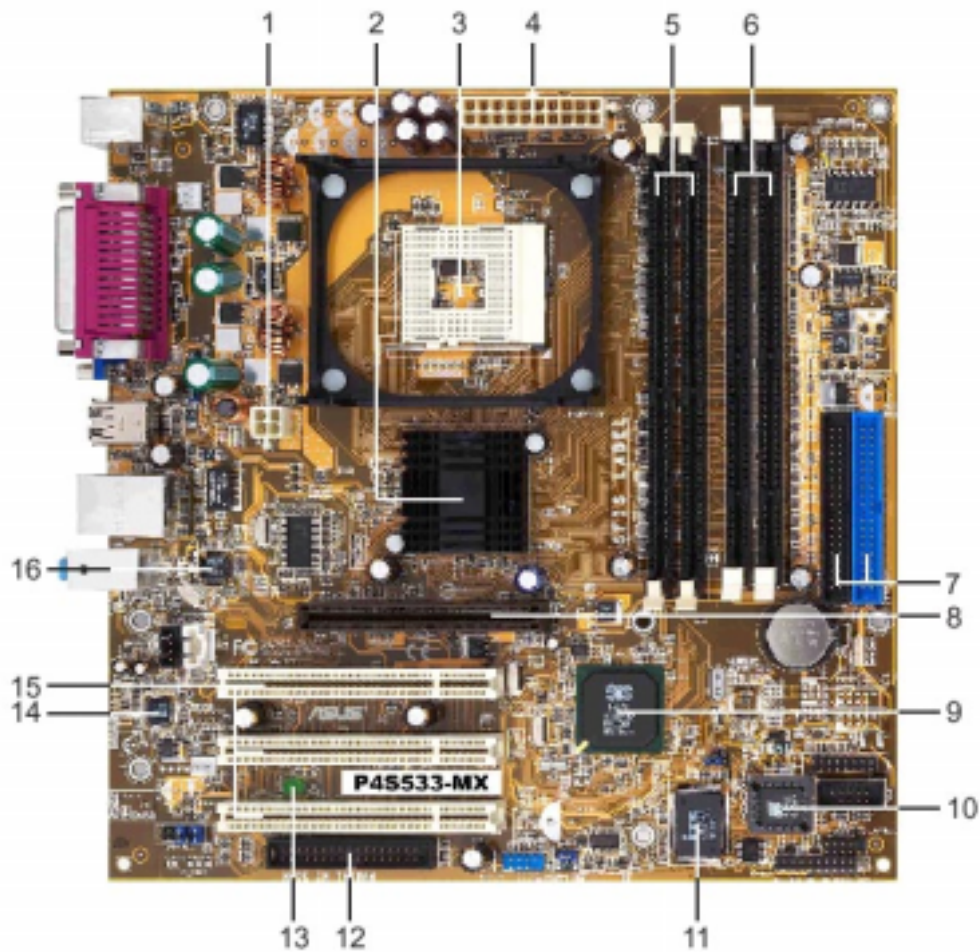


Table 1:

1	ATX 12V Connector	9	South bridge controller
2	North bridge controller	10	Flash ROM
3	CPU socket	11	Super I/O controller
4	ATX Power connector	12	Floppy disk connector
5	DDR DIMM sockets	13	Standby power LED
6	SDRAM DIMM sockets	14	Audio CODEC
7	IDE Connectors	15	PCI slots
8	AGP slot	16	LAN PHY

---

### Back Panel Connectors

The motherboard external IO connectors are attached to a metallic I/O shield. This shield serves several purposes:

- It protects the sensitive motherboard from any external EMC interference.
- It stops the computer from interfering with other electrical devices.

- It allows the motherboard to be easily upgraded in the future without having to resort to buying a whole new case. Simply change the I/O shield to match the motherboard.

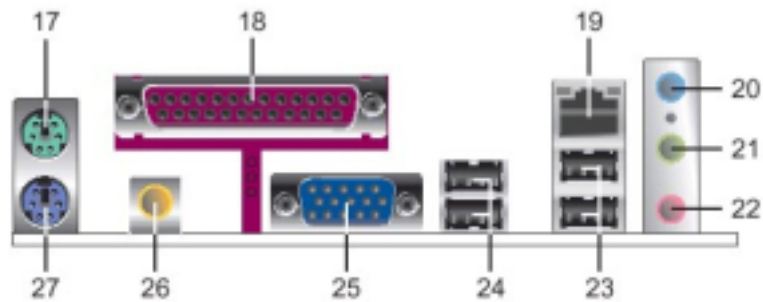


Table 2:

17	PS/2 mouse port	23	USB 2.0 ports 3 and 4
18	Parallel Port	24	USB 2.0 ports 1 and 2
19	RJ-45 Port	25	VGA port
20	Line In jack	26	S/PDIF port
21	Line Out jack	27	PS/2 keyboard port
22	Microphone jack		

**Note:**

*Power to the computer should be turned off before a keyboard or mouse is connected or disconnected.*



## Feature Summary

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The VIG520S motherboard supports Intel Pentium 4 & Celeron processors with 512KB of second-level cache (128KB for Celeron) integrated in a Socket 478 operating at speeds up to 2.0GHz + for Intel Celeron Processors and up to 2.8GHz for Intel Pentium 4 processors.

The motherboard features:

**Form factor:**

- Micro ATX form factor

**Processor:**

- Single Pentium 4 or Celeron processor
- 400/533FSB
- Integrated 512KB second-level cache
- Socket 478 connector

**Main memory:**

- Two 184-pin DDR DIMM sockets
- Two 168-pin SDR DIMM sockets
- Support for up to 2GB of 333MHz/266MHz DDR memory
- Support for up to 2GB of 100MHz/133MHz SDR memory

**Chipset: SIS 651 Chipset consisting of:**

- 64 bit high performance DDR-266MHz/333MHz Memory Controller
- Integrated A.G.P. Compliant Target/66MHz Host-to-PCI Bridge
- High performance 2D/3D Graphic Engine

**I/O Control**

- High throughput MuTIOL® Connect interfaced to SiS962 MuTIOL® Media I/O

**Video**

- SIS651 integrated graphics support

**Audio (SoundMAX)**

- AC'97 Interface
- AC'97 v2.2 Compliant
- Support 6 Channels of AC'97 Speakers Out and v.90 HSP Modem.

**LAN (SIS 900)**

- Support 10/100Mb Fast Ethernet or 1/10Mb HomePNA 2.0 with External PHY

**Peripheral Interfaces**

- Support for four Universal Serial Bus (USB) ports (4 on motherboard)
- One serial port (via COM Port cable)
- One parallel port
- Four IDE interfaces with Ultra DMA ATA66/100/133 support

- One diskette drive interface
- Audio I/O and S/PDIF Digital Audio
- PS/2 keyboard and mouse ports

#### **Expansion Capabilities**

- Three PCI bus add-in card connectors.
- One AGP slot.
- Two DIMM sockets.

#### **Instantly Available PC**

- Support for PCI Local Bus Specification Revision 2.2
- Suspend to RAM support
- Wake on PS/2 keyboard and USB Keyboard
- Support for USB 2.0

#### **Wake on LAN Technology Connector**

- Support for system wake up using an add-in network interface card with remote wake up capability

## **Microprocessor**

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The motherboard supports a single Pentium 4 or Celeron processor. The processor's VID pins automatically program the voltage regulator on the motherboard to the required processor voltage. In addition, the front side bus speed (400 & 533MHz) is automatically selected. The motherboard currently supports processors that run internally up to 2.8GHz + and have a 512KB second-level cache (128KB on Celeron) running at full CPU Speed.

The processor implements MMX™ technology and maintains full backward compatibility with the 8086, 80286, Intel386™, Intel486™, Pentium, Pentium Pro & Pentium II processors. The processor's numeric coprocessor significantly increases the speed of floating-point operations and complies with ANSI/IEEE standard 754-1985.

### **Microprocessor Packaging**

The Pentium 4 & Celeron processors come in a Micro-PGA package that connects to the motherboard through a socket 478 connector. The package consists of:

- Processor card including the processor core and the second-level cache burst pipelined synchronous static RAM (BSRAM) and tag RAM.
- Thermal plate.
- Back cover.

### **Second Level Cache**

The second-level cache is located on the die of the CPU itself. The cache includes burst pipelined synchronous static RAM (BSRAM) and tag RAM. All supported onboard memory can be cached.

## Processor Upgrades

The VIG520S motherboard can be upgraded to Intel Pentium 4 & Celeron processors with 512KB of second-level cache (128KB for Celeron) integrated in a Socket 478 operating at speeds up to 2.0GHz + for Intel Celeron Processors and up to 2.8GHz for Intel Pentium 4 processors.

## Main Memory

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The motherboard has two dual inline memory module (DIMM) sockets. Maximum memory size is 2GB. The BIOS automatically detects memory type, size, and speed.

The motherboard supports the following memory features:

- 184-pin / 168-pin DIMMs with gold-plated contacts
- 100MHz and 133MHz / 266MHz and 333MHz DDR
- Unregistered non-ECC PC2700/2100/1600 memory
- Single- or double-sided DIMMs

### Note:

*Memory can be installed in one or two sockets. Memory size can vary between sockets.*

## DDR

DDR transfers data twice as fast as SDR SDRAM modules. This does not mean your system will run twice as fast, but your memory will. And the faster memory will improve your PC's performance.

### Note:

*All memory components and DIMMs used with the VIG520S motherboard must comply with the PC DDR specifications.*

*In addition to the above, the motherboard will be supplied with DDR memory only. Should you wish to use SDR memory, you will need to remove the DDR memory first. This is because the board will support EITHER DDR or SDR and not both simultaneously.*

## Chipset

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SiS651 IGUI Host Memory Controller integrates a high performance host interface for Intel Pentium 4 processor, a high performance 2D/3D Graphic Engine, a high performance memory controller, an AGP 4X interface, and SiS MuTIOL® Technology connecting w/ SiS962 MuTIOL® Media IO.

SiS651 Host Interface features the AGTL & AGTL+ compliant bus driver technology with integrated on-die termination to support Intel Pentium 4 series processors with FSB 533/400MHz. SiS651 provides a 12-level In-Order-Queue to support maximum outstanding transactions up to 12.

It integrated a high performance 2D/3D Graphic Engine, Video Accelerator and Advanced Hardware Acceleration MPEGI/MPEGII Video Decoder for the Intel Pentium 4 series based PC systems.

It also integrates a high performance 2.7GB/s DDR333 Memory controller to sustain the bandwidth demand from the integrated GUI or external AGP master, host processor, as well as the multi I/O masters. In addition to integrated GUI, SiS651 also can support external AGP slot with AGP 1X/2X/4X capability and Fast Write Transactions.

A high bandwidth and mature SiS MuTIOL® technology is incorporated to connect SiS651 and SiS962 MuTIOL® Media I/O together. SiS MuTIOL technology is developed into three layers, the Multi-threaded I/O Link Layer delivering 1.2GB bandwidth to connect embedded DMA Master devices and external PCI masters to interface to Multi-threaded I/O Link layer, the Multi-threaded I/O Link Encoder/Decoder in SiS962 to transfer data w/ 533 MB/s bandwidth from/to Multi-threaded I/O Link layer to/from SiS651, and the Multi-threaded I/O Link Encoder/Decoder in SiS651 to transfer data w/ 533 MB/s from/to Multi-threaded I/O.

### **Key features:**

#### **PC2001 Compliance**

#### **High Performance Host Interface**

- Support Intel Pentium 4 series CPU with data transfer rate of 533/400MHz

#### **64 bit high performance DDR-266/333 Memory Controller**

- Supports DDR333/DDR266/200 SDRAM or PC133/100 SDRAM
- Support Up to 2 un-buffered DIMM DDR333 or up to 3 un-buffered Double-sided DIMM DDR266/200
- Up to 1 GB per DIMM with max. memory size up to 3 GB
- Supports 16Mb, 64Mb, 128Mb, 256Mb, 512Mb SDRAM technology with page size from 2KB up to 16KB
- Sustains DDR SDRAM CAS Latency at options of 2, 2.5, & 3 clocks
- Programmable buffer strength optimizing performance and stability
- High performance unified memory controller optimizing the DRAM bus utilization

### **Integrated A.G.P. Compliant Target/66MHz Host-to-PCI Bridge**

- AGP v2.0 Compliant
- Supports Additional AGP4X/2X interface and Fast Write Transaction

### **High throughout MuTIOL® Connect interfaced to SiS962 MuTIOL® Media I/O**

- Bi-directional 16 bit data bus
- 1 GB/s performance in 133MHz x 4 mode
- Distributed arbitration strategy with enhanced mode of contiguous DMA data streaming
- Packet based, pipelining, and split transaction scheme

### **Dedicated Isochronous Response Queue**

- Built-in a high performance 256-bit 3D engine
- Built-in a high quality 3D engine

### **High Performance 2D Accelerator**

### **LAN Subsystem - Integrated Fast Ethernet controller and 10/100 megabit per second (Mbps) Physical Layer Transceivers for the PCI local bus**

- PCI specification revision 2.1 compliant
- 32-bit glueless PCI host interface
- Plug and Play compatible
- Supports PCI clock frequency from DC to 33 MHz independent of network clock
- Supports network operation with PCI clock from 25Mhz to 33Mhz
- Supports both +3.3v and +5v PCI signalling
- High-performance 32-bit PCI bus master architecture with an integrated Direct

### **Memory Access (DMA ) Controller for low CPU and bus utilization**

- Supports an unlimited PCI burst length
- Supports big endian and little endian byte alignments
- Supports PCI Device ID, Vendor ID/Subsystem ID, Subsystem Vendor ID

### **Programming through the EEPROM interface**

- Implements optional PCI 3.3v auxiliary power source 3.3Vaux pin and optional

### **PCI power management event (PME#) pin**

- IEEE 802.3 and 802.3u standard compatible
- IEEE 802.3u Auto Negotiation and Parallel detection for automatic speed

### **Selection**

- Full duplex and half duplex mode for both 10 and 100 Mbps
- Fully compliant ANSI X3.263 TP-PMD physical sub-layer which includes adaptive

### **Equalization and Baseline Wander compensation**

- Automatic Jam and IEEE 802.3x Auto-Negotiation for flow control
- Flexible hardware and software interrupt capability
- Single access to complete PHY register set
- Built-in waveform shaping requires no external filters
- Power down of 10Base-T/100Base-TX sections when not in use
- Jabber control and auto-polarity correction for 10Base-T.
- User programmable LED function mapping
- Supports software, enhanced software, and automatic polling schemes to internal PHY status monitor and interrupt
- Supports 10BASE-T, 100BASE-TX, and any future

### **Supports PC97, PC98, and Net PC requirements**

- Green PC compatible
- Supports Advanced Configuration and Power Interface Specification (ACPI) Revision 1.0

- Supports PCI Bus Power Management Interface Specification Version 1.0a
- Supports Network Device Class Power Management Specification Version 1.0a
- Supports PCI Hot-Plug Specification Revision 1.0
- Implements full OnNow features including pattern matching and link status wake-up with automatic internal PHY status polling
- Implements optional Magic Packet™ remote wake-up scheme
- Implements IEEE 802.3x compliant Flow Control

### Table 3: RJ-45 LAN Connector LEDs

Two LEDs are built into the RJ-45 LAN connector. The following table describes the LED states when the board is powered up and the LAN subsystem is operating.

LED Colour	LED State	Condition
Green	Off	10 Mbit/sec data rate is selected.
Green	On	100 Mbit/sec data rate is selected.
Yellow	Off	LAN link is not established.
Yellow	On (steady state)	LAN link is established.
Yellow	On (brighter and pulsing)	The computer is communicating with another computer on the LAN.

### Wake on LAN

The integrated SIS900 Network on the motherboard has full support for Wake-On LAN.

#### Note:

*For Wake on LAN, the 5-V standby line for the power supply must be capable of delivering 5 V ±5 % at 720 mA.*

### Universal Serial Bus (USB)

The motherboard has four USB ports; one USB peripheral can be connected to each port. For more than four USB devices, an external hub can be connected to either port. The motherboard fully supports the universal host controller interface (UHCI) and uses UHCI-compatible software drivers.

USB features include:

- Self-identifying peripherals that can be plugged in while the computer is running.
- Automatic mapping of function to driver and configuration.
- Supports isochronous and asynchronous transfer types over the same set of wires.
- Supports up to **127** physical devices.
- Error-handling and fault-recovery mechanisms built into the protocol.

**Note:**

*Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed (sub-channel) USB device is attached to the cable. Use shielded cable that meets the requirements for high-speed (fully rated) devices.*

**IDE Support**

The motherboard has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), Ultra DMA/33, Ultra DMA/66, Ultra DMA/100 & Ultra DMA/133 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

**LS-120 Support**

LS-120 MB Diskette technology enables you to store 120MB of data on a single, 3.5" removable diskette. LS-120 technology is backward (both read and write) compatible with 1.44MB and 720KB DOS-formatted diskette and is supported by Windows 95 and Windows NT operating system.

The VIG520S board allows connection of an LS-120 compatible drive and a standard 3½" floppy drive. The LS-120 drive can be configured as a boot device before a floppy drive, if selected in the BIOS setup utility.

**Note:**

*If you connect an LS-120 drive to an IDE connector and configure it as the "A" drive and configure a standard 3.5" floppy as "B" drive, the standard floppy must be connected to the floppy drive cable's "A" connector (the connector at the end of the cable).*

The BIOS setup utility can be configured to boot firstly from either the LS120 or standard 3½" floppy drive.

**Real-Time Clock, CMOS SRAM, and Battery**

The real-time clock is compatible with DS1287 and MC146818 components. The clock provides a time-of-day clock and a multicentury calendar with alarm features and century rollover. The real-time clock supports 256 bytes of battery-backed CMOS SRAM in two banks that are reserved for BIOS use.

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program. An external coin-cell (CR 2032) battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3-V standby current from the power supply extends the life of the battery. The clock is accurate to  $\pm 13$  minutes/year at 25 °C with 3.3 V applied.

## **I/O Interface Controller**

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### **MuTIOL® Delivering 533MB/s Bandwidth**

- Proprietary Interconnect between SiS north bridge and SiS962
- Bi-Directional 16-bit Data Bus at 266MHz Operating Frequency

### **USB 2.0/1.1 Host Controller**

- One EHCI USB 2.0 Controller and 3 OHCI USB 1.1 Controllers
- Support Total 6 USB 2.0/1.1 Ports
- Support USB 2.0 High-Speed Device @480 Mb/s Transfer Rates

### **Fast Ethernet/Home Networking Controller with MII Interface**

- Support 10/100Mb Fast Ethernet or 1/10Mb HomePNA 2.0 with External PHY

### **Audio/Modem Controllers with AC'97 Interface**

- AC'97 v2.2 Compliant
- Support 6 Channels of AC'97 Speakers Out and v.90 HSP Modem

### **Advanced Power Management**

- ACPI 1.0b and APM 1.2 Compliant

### **Dual IDE Channels with ATA 133/100/66**

### **Support Up to 6 PCI Masters**

### **LPC 1.0 Interface**

### **Integrated RTC**

### **Integrated Keyboard/PS2 Mouse Controller**

### **PC2001 Compliant**

By default, the I/O controller interfaces are automatically configured during boot up. The I/O controller can also be manually configured in the Setup program.

## **Parallel Port**

The connector for the multimode bi-directional parallel port is a 25-pin D-Sub connector located on the back panel. In the Setup program, the parallel port can be configured for the following:

- Compatible (standard mode).
- Bi-directional (PS/2 compatible).
- Extended Parallel Port (EPP).
- Enhanced Capabilities Port (ECP).



## **Floppy Controller**

The I/O controller is software compatible with the N82077 floppy drive controllers and supports both PC-AT and PS/2 modes. In the Setup program, the floppy interface can be configured for the following floppy drive capacities and sizes:

- 360 KB, 5.25-inch
- 1.2 MB, 5.25-inch
- 720 KB, 3.5-inch
- 1.2 MB, 3.5-inch (driver required)
- 1.25/1.44 MB, 3.5-inch
- 2.88 MB, 3.5-inch

## **PS/2 Keyboard and Mouse Interface**

PS/2 keyboard and mouse connectors are located on the back panel. The +5 V lines to these connectors are protected with a PolySwitch circuit that, like a self-healing fuse, re-establishes the connection after an over-current condition is removed.

The keyboard controller also supports the hot-key sequence <Ctrl><Alt><Del> for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

## **Audio Subsystem**

The VIG520S board has multiple AC '97 V 2.2 compliant audio features.

The audio subsystem includes these features:

- High performance 3D technology
- Energy saving power down modes
- 6 channels for full surround sound capability

## **System BIOS**

The system BIOS, from Award Technology, provides ISA and PCI compatibility. The BIOS is contained in a flash memory device on the system board. The BIOS provides the power-on self test (POST), the system Set-up program, a PCI and IDE auto-configuration utility, and BIOS recovery code.

## **PCI Auto Configuration**

The PCI auto-configuration utility works in conjunction with the Set-up program to support using PCI add-in boards in the system. When you turn on the system power after installing a PCI board, the BIOS automatically configures interrupts, DMA channels, I/O space, and so on. Since PCI add-in boards use the same interrupt resources as ISA add-in boards, you must specify the interrupts used by ISA boards in the set-up program. The PCI auto-configuration program complies with version 2.2 of the PCI BIOS specification.

## **IDE Auto Configuration**

If you install an IDE drive in the system, the IDE auto-configuration utility automatically detects and configures the drive for operation in the system. This utility eliminates the need to enter the Set-up program after you install an IDE drive.

## **Expansion Slots**

The system has three PCI bus add-in card connectors, one AGP slot.

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## Chapter 2 System Board Options

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The VIG520S motherboard is capable of accepting Celeron and Pentium 4 CPU's. RAM can be upgraded to a maximum of 2GB using DDR DIMMs Non ECC.

### **WARNING**

**Unplug the system before carrying out the procedures described in this chapter. Failure to disconnect power before you open the system can result in personal injury or equipment damage. Hazardous voltage, current, and energy levels are present in this product. Power switch terminals can have hazardous Voltages present even when the power switch is off.**

**The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.**

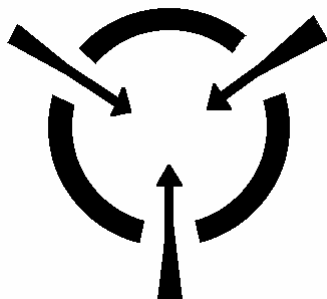
**Do not operate the system with the cover removed. Always replace the cover before turning on the system.**

As the colours of the wires in the mains lead of this computer may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter **E** or by the safety Earth symbol **Q** or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter **N** or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter **L** or coloured red.



### **CAUTION!**

The Viglen VIG520S motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.

Make sure you are earthed and free of static charge before you open the computer case. If you are unsure about upgrading your computer, return it to Viglen so a qualified engineer can perform the upgrade.

## **STEPS TO TAKE TO PREVENT STATIC DISCHARGE:**

1. The best way to prevent static discharge is to buy an anti-static strap from your local electrical shop. While you are wearing the strap and it is earthed, static charge will be harmlessly bled to ground.
2. Do not remove the component from its anti-static protective packaging until you are about to install it.
3. Hold boards by the edges - try not to touch components / interface strips etc.

### **Note:**

*We recommend that you return your computer to the service department for upgrading. Any work carried out is fully guaranteed. Upgrades should only be carried out by persons who are familiar with handling IC's, as incorrect installation will invalidate the guarantee.*

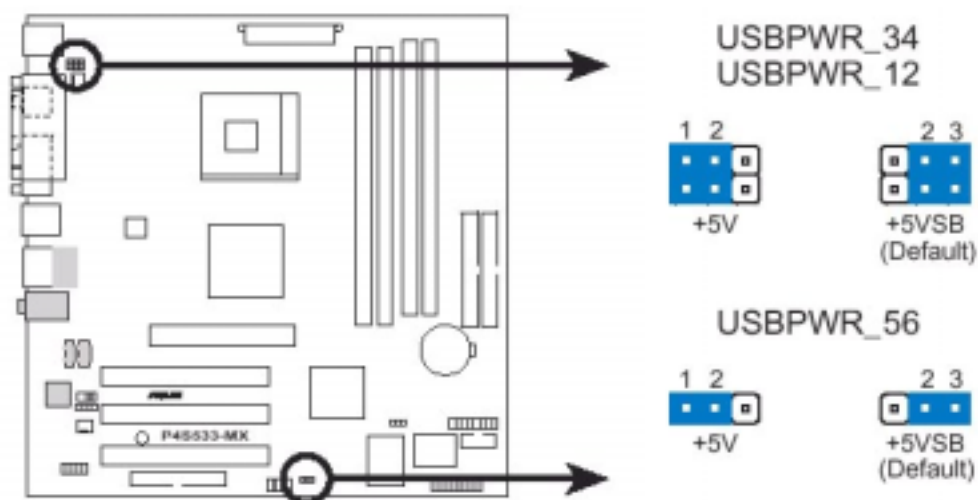
## Jumper Settings

### **Caution!**

Never remove jumpers using large pliers as this can damage the pins. The best way to remove a jumper is to use a small pair of tweezers or fine needle-nosed pliers.

Never remove a jumper when the computer is switch on. Always switch the computer off first.

### USB device wake-up (3-pin USBPWR\_12, USBPWR\_34, USBPWR\_56)



Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 sleep mode (no power to CPU, DRAM in slow refresh, power supply in reduced power mode). Both jumpers are set to pin 2-3 (+5VSB) by default.

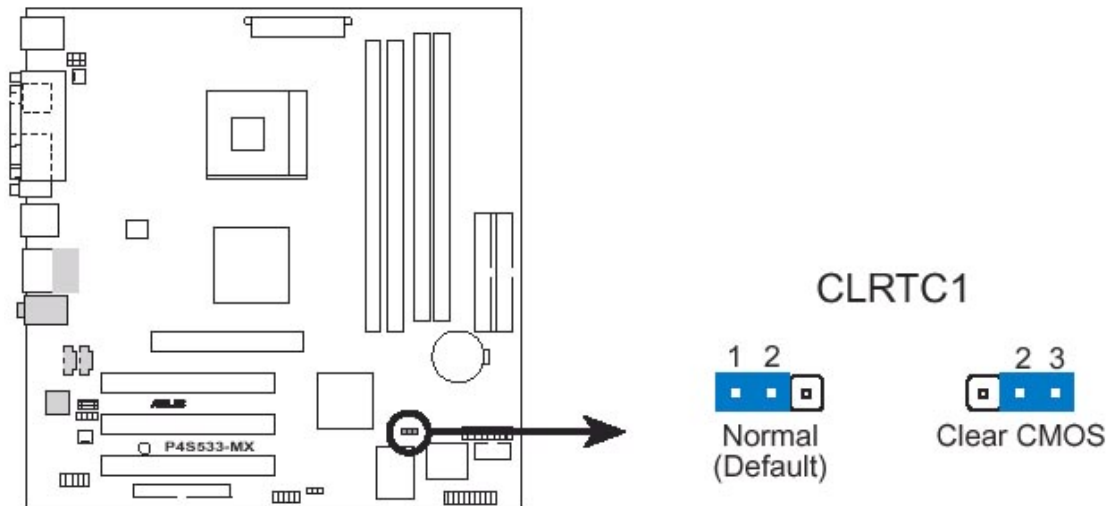
The USBPWR\_12, and USBPWR\_34 jumpers are for the rear USB ports. The USBPWR\_56 is for the internal USB header that you can connect to the front USB ports.

### Clear RTC RAM (CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that includes system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power chord
2. Remove the onboard battery
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Replace the battery
5. Plug the power chord in and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

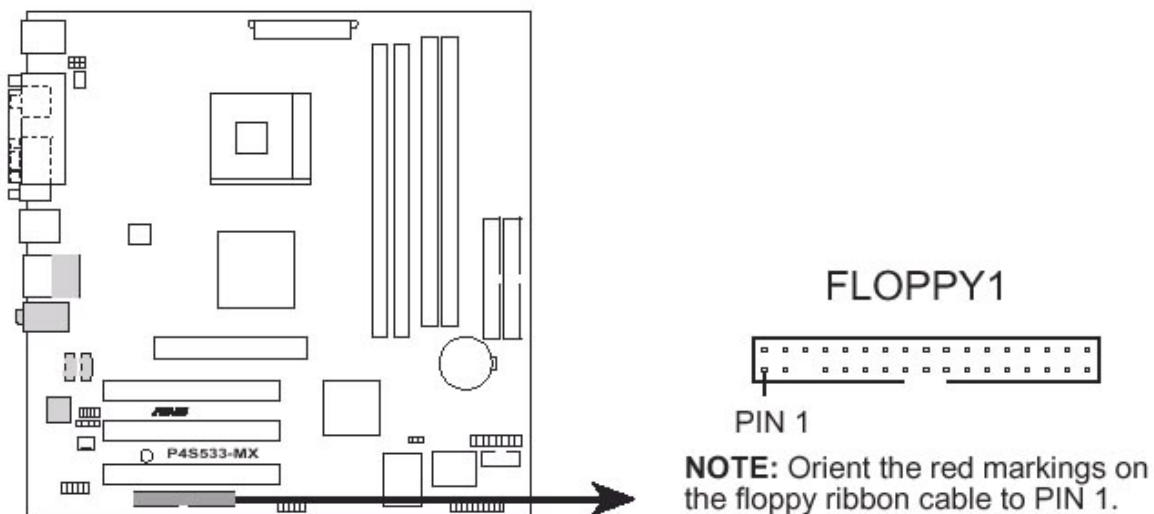


## Motherboard Connectors

There are connectors on the motherboard for Floppy drive, IDE drives, COM Port, Power connectors, Front USB, Front Panel Audio, Internal audio connectors and System front panel connectors. The location and/or details of these connections are shown below.

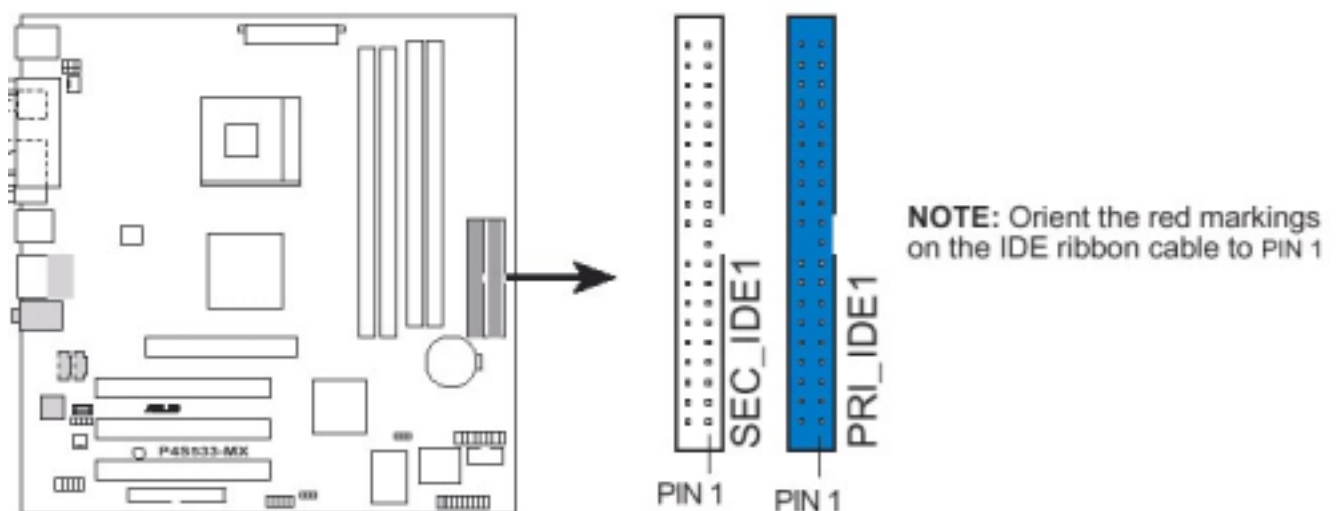
### Floppy disk drive connector (34-1 pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using the ribbon cables with pin 5 plug).



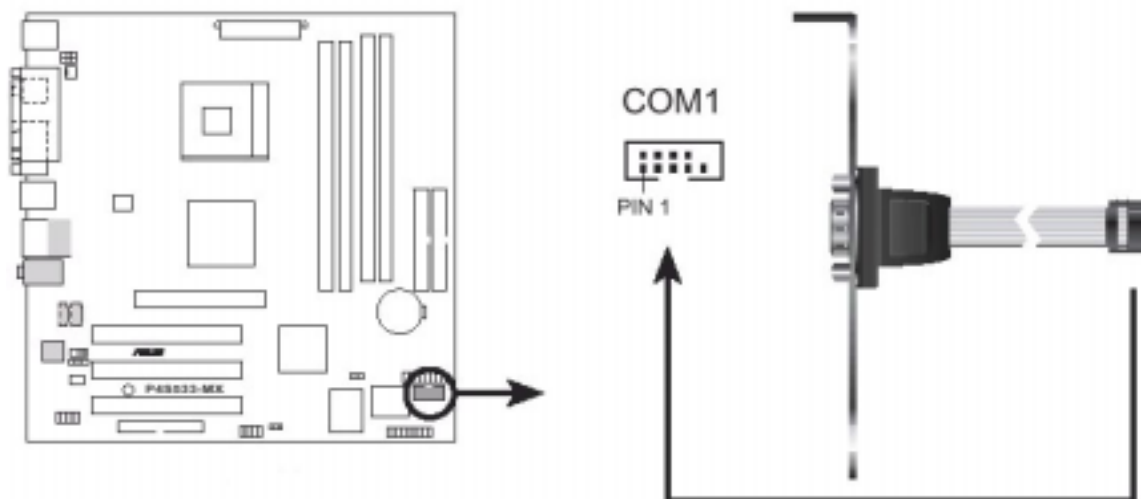
### IDE connectors (40-1 pin PRI\_IDE1, SEC\_IDE1)

If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for these settings. The BIOS supports specific device boot up.



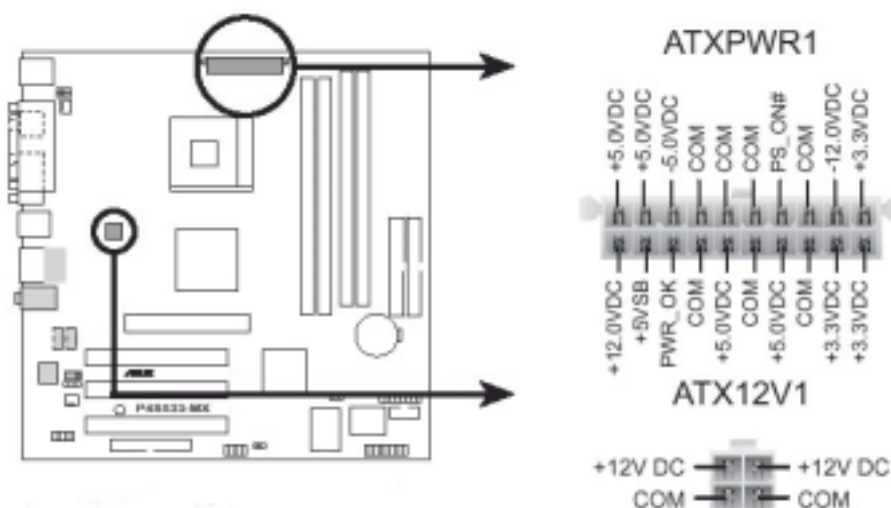
### COM1 connector (10-1 pin COM1)

This connector accommodates a serial port using an optional serial port bracket. Connect the bracket cable to this connector and then install the bracket into a slot opening at the back of the system chassis.



### ATX power connectors (20-pin ATXPWR1, 4-pin ATX12V1)

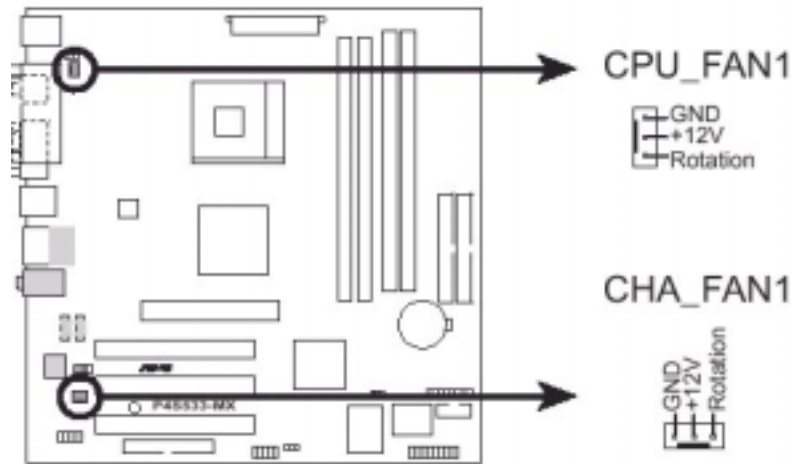
These connectors connect to an ATC 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit. In addition to the 20-pin ATXPWR1 connector, this motherboard requires that you connect the 4-pin ATX +12V power plug to provide sufficient power to the CPU.





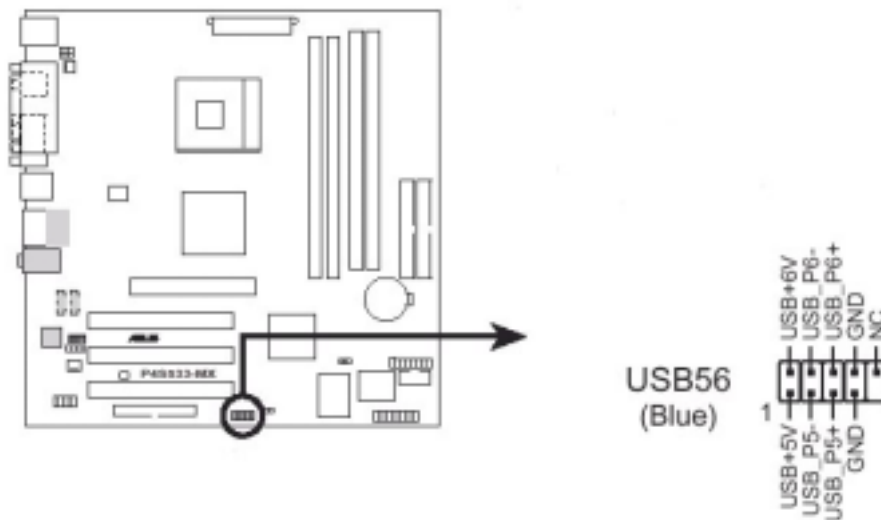
### CPU and Chassis Fan connectors (3-pin CPU\_FAN1, CHA\_FAN1)

The fan connectors support cooling fans of 350mA ~ 740mA (8.88W max.) or a total of 1A ~ 2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.



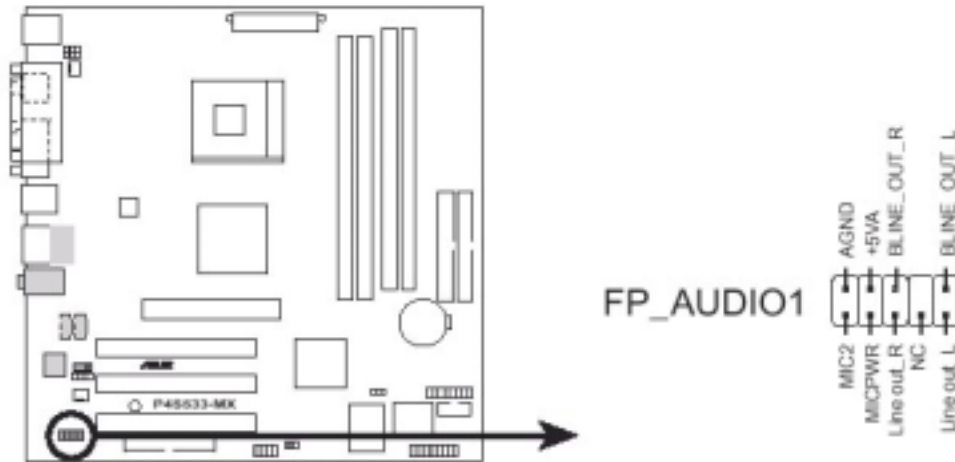
### USB header (10-1 pin USB\_56)

The USB header complies with USB 2.0 specification that supports up to 480 Mbps connection speed. This speed advantage over the faster conventional 12Mbps on USB 1.1 allows faster Internet connection, interactive game, and simultaneous running of high speed peripherals.



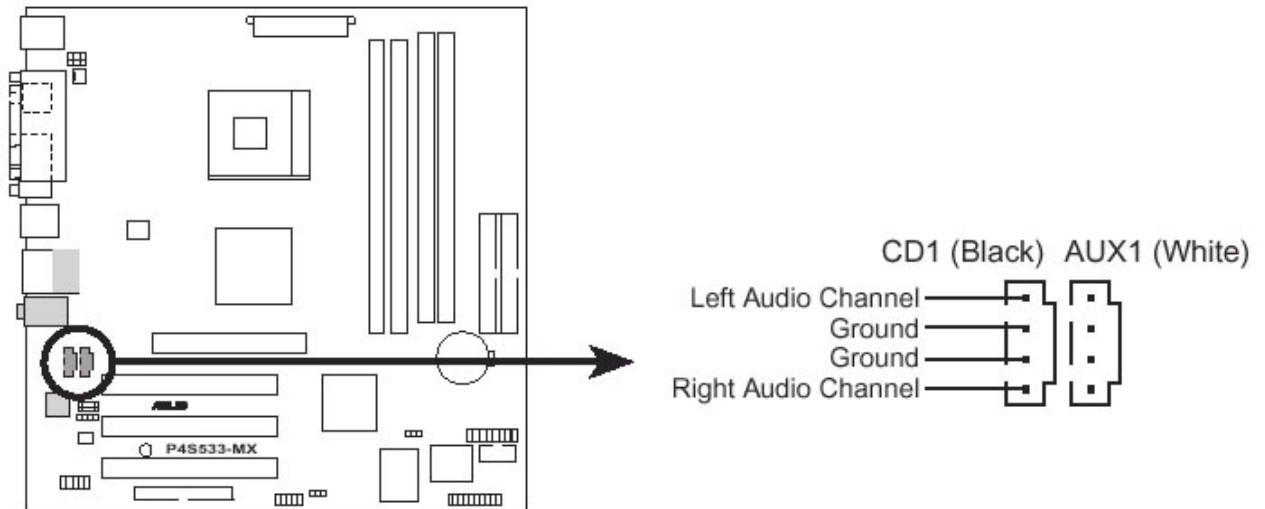
### Front panel audio connector (10-1 pin FP\_AUDIO1)

This is an interface for the Intel front panel audio cable that allows convenient connection and control of audio devices.



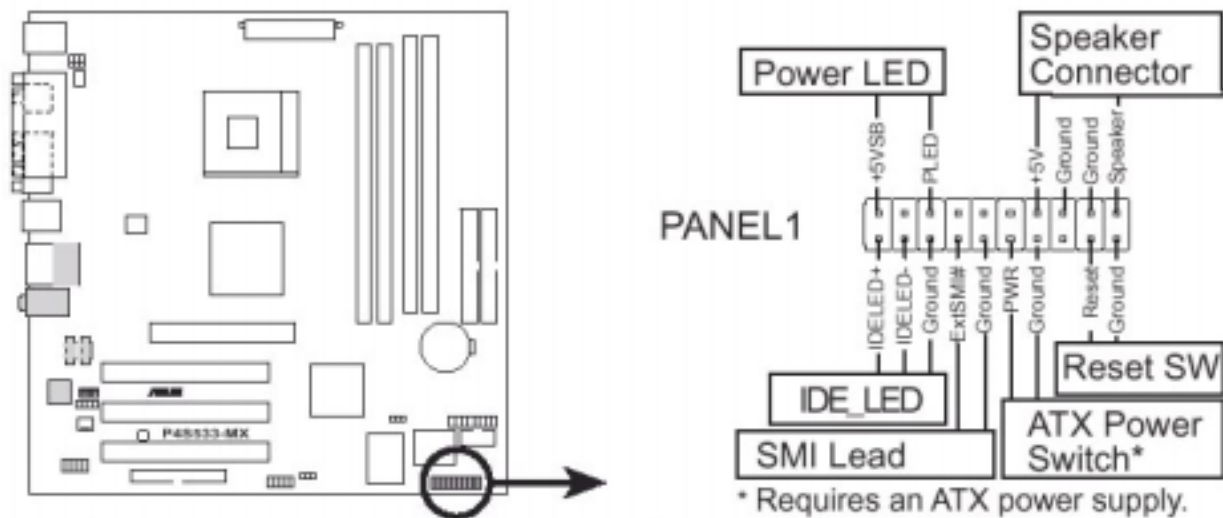
### Internal Audio connectors (4-pin CD1, AUX1)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV-tuner or MPEG card.



## System panel connector (20-pin PANEL1)

This connector accommodates several system front panel functions.



### System Power LED Lead (3-1 pin PLED)

This 3-1 pin connector connects to the system power LED. This LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

### System Warning Speaker Lead (4-pin SPEAKER)

This 4-pin connector connects to the case-mounted speaker and allows you to hear system beeps and warnings.

### ATX Power Switch / Soft-Off Switch Lead (2-pin PWRBTN)

This connector connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. By holding the power switch when in the ON mode for more than 4 seconds turns the system OFF.

### Reset Switch Lead (2-pin RESET)

The 2-pin connector connects to the case-mounted reset switch for rebooting the system without turning off the system power.

### Hard Disk Activity Lead (2-pin IDE\_LED)

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary or the secondary IDE connector cause this LED to light up.

## Upgrading the CPU

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### **CAUTION!**

**Allow time for the processor and heatsink to cool before touching either of them.**

The Pentium 4 & Celeron processors together with Level 2 cache chips are housed in a protective package.

The design of the VIG520S computer makes it a simple job to replace or upgrade the processor. To do so please refer to guide and follow the instructions below.

1. Read the warnings at the start of this chapter and ensure a static free environment
2. Remove the lid from the computer by removing the four screws at the rear of the case
3. Locate the CPU module by referring to motherboard layout if necessary
4. Locate the heat sink clips, and remove heat sink
5. Lift arm on Socket to release the CPU



6. Lift the CPU Vertically upwards until it is clear of the socket



7. You can now fit the replacement CPU and heat sink into the socket.

# Installing & Removing Dual In-line Memory Modules DIMMs

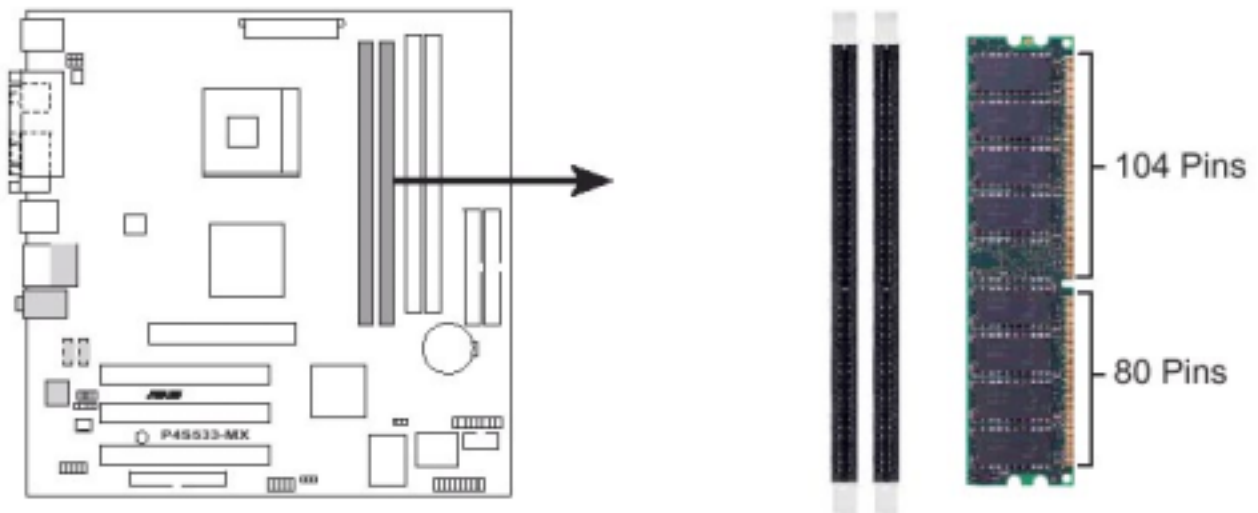
## Installing Memory

You can install from 64MB to 2GB of memory in the motherboard DIMM sockets. The board has DIMM sockets arranged as banks 0 & 1. The motherboard supports the following memory features:

- 184-pin DDR / 168-pin SDR DIMMs with gold-plated contacts.
- 333/266MHz DDR / 100/133 SDR RAM, PC2700/2100/PC1600 compliant.
- 64 MB, 128 MB, 256 MB, 512MB and 1GB modules.

When adding memory, follow these guidelines:

- You can install DIMMs in any of the banks.
- You can use different size DIMMs in different banks.
- The BIOS detects the size and type of installed memory.
- Please note, the motherboard will not support DDR and SDR at the same time



### To install DIMMs, follow these steps:

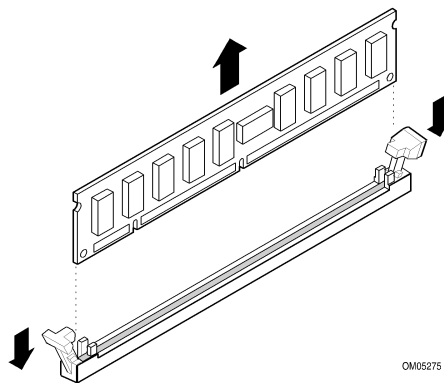
1. Observe the precautions in “Before You Begin”. Turn off the computer and all peripheral devices.
2. Remove the computer cover and locate the DIMM sockets.
3. Holding the DIMM by the edges, remove it from its antistatic package.
4. Make sure the clips at either end of the socket are pushed away from the socket.
5. Position the DIMM above the socket. Align the two small notches in the bottom edge of the DIMM with the keys in the socket. Insert the bottom edge of the DIMM into the socket.
6. When the DIMM is seated, push down on the top edge of the DIMM until the retaining clips at the ends of the socket snap into place. Make sure the clips are firmly in place.
7. Replace the computer cover.

8. If you installed a DIMM with ECC memory, start the computer and use the ECC Configuration feature in Setup to enable the use of ECC.

## Removing Memory

To remove a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin".
2. Turn off all peripheral devices connected to the computer. Turn off the computer.
3. Remove the computer cover.
4. Gently spread the retaining clips at each end of the socket. The DIMM pops out of the socket.
5. Hold the DIMM by the edges, lift it away from the socket, and store it in an antistatic package.
6. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.



## Replacing the Clock/CMOS RAM Battery

A lithium battery is installed in a socket on the system board. The battery has an estimated life expectancy of seven years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

If the battery fails, you will need to replace it with a **CR2032** battery or an equivalent. As long as local ordinance permits, you may dispose of individual batteries as normal rubbish. Do not expose batteries to excessive heat or any naked flame. Keep all batteries away from children.

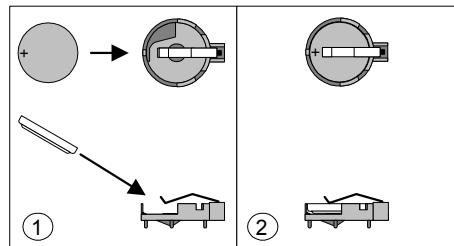
### **CAUTION!**

*Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Viglen. Discard used batteries according to manufacturer's instructions.*

The battery is listed as board component 'T' on the diagram on page 6. It is located near to the main motherboard front panel connectors.

To replace the battery, carry out the following:

1. Observe the precautions in "Before You Begin."
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. Remove any components that are blocking access to the battery.
5. Figure 1 shows the battery location. Gently pry the battery free from its socket, taking care to note the "+" and "-" orientation of the battery (Figure 6).
6. Install the new battery in the socket.



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## Chapter 3 Solving Problems

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The first part of this chapter helps you identify and solve problems that might occur when the system is in use. The second part lists error code messages that might be displayed.

Please remember that if you cannot solve the problem by yourself then you should contact your suppliers Technical Support for further assistance.

Viglen Technical Support can be reached in the following ways:

Telephone: 020 8758 7000  
Fax: 020 8758 7080  
Email: techsupport@viglen.co.uk

You can also look for support information on our web site:

<http://www.viglen.co.uk>

Device drivers and various useful utilities can be downloaded from our ftp site:

<ftp://ftp.viglen.co.uk>

### Table 4: Resetting the System

Before checking your system for hardware problems, it is always a good idea to try resetting your computer and see if a re-boot can solve the problem. Most software related problems can be solved simply by re-booting your PC.

To do the following	Press
Soft boot: Clear the system memory and reload the operating system (also called warm reset).	<Ctrl + Alt + Del>
Cold boot: Clear the system memory, halt power to all peripherals, restart POST, and reload the operating system.	Power off/on or reset button (at front of the system)



## Troubleshooting Procedure

This section provides a step-by-step troubleshooting procedure to identify a problem and locate its source.

### **CAUTION!**

1. Turn off the system and any peripheral devices before you disconnect any peripheral cables from the system. Otherwise, you can permanently damage the system or the peripheral devices.
2. Make sure the system is plugged into a properly grounded power outlet.
3. Make sure your keyboard and video display are correctly connected to the system. Turn on the video display, and turn up its brightness and contrast controls to at least two-thirds of the maximum (refer to the documentation supplied with the video display).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in the diskette drive. If the operating system normally loads from a diskette, insert the operating system diskette into the drive.
5. Turn on the system. If the power indicator does not light, but the system seems to be operating normally, the indicator is probably defective. Monitor the power-on self test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.

#### **Note:**

*If the POST does not detect any errors, the system beeps once and boots up.*

*Errors that do not prevent the boot process (non-fatal errors) display a message that looks similar to the following:*

*Error Message Line 1*

*Error Message Line 2*

*Press <F2> for Set-up, <F1> to Boot*

*You can note the error and press <F1> to resume the boot- up process, or <F2> to enter Set-up.*

*Errors that prevent the boot process from continuing (fatal errors), are communicated by a series of audible beeps. If this type of error occurs, refer to the error codes and messages listed at the end of this chapter.*

6. Confirm that the operating system has loaded.

## Problems Operating Add-in Boards

Problems related to add-in boards are usually related to improper board installation or interrupt and address conflicts. Go through the checklist below to see if you can correct the problem. If the problem persists after you have checked and corrected all of these items, contact the board vendor's customer service representative. Did you install the add-in board according to the manufacturer's instructions? Check the documentation that came with the board. Are all cables installed properly?

The following items are suggestions for troubleshooting problems related to PCI legacy (non-Plug and Play) add-in boards.

- If the PCI board uses an interrupt, run Set-up and set the interrupt that is being used by the PCI board to Used by PCI Card. Please refer to the BIOS manual for details of how to do this.
- If the PCI legacy board uses memory space between 80000H - 9FFFFH, run Set-up and set conventional memory to 256 K.
- If the PCI legacy board uses shared memory between C8000H - DFFFFH, run Set-up and enable shared memory for the appropriate memory space.

**Table 5: Problems and Suggestions**

What happens	What to do
<p>Application software problems</p>	<p>Try resetting the system.</p> <p>Make sure all cables are installed correctly.</p> <p>Verify that the system board jumpers are set properly.</p> <p>Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings you recorded previously. If an error is evident (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change.</p> <p>Make sure the software is properly configured for the system. Refer to the software documentation for information.</p> <p>Try a different copy of the software to see if the problem is with the copy you are using.</p> <p>If other software runs correctly on the system, contact the vendor of the software that fails.</p> <p>If you check all of the above with no success, try clearing CMOS RAM and reconfiguring the system. Make sure you have your list of system settings available to re-enter, because clearing CMOS RAM sets the options to their default values.</p>
<p>Characters on-screen are distorted or incorrect</p>	<p>Make sure the brightness and contrast controls are properly adjusted on the monitor.</p> <p>Make sure the video signal cable and power cables are properly installed.</p> <p>Make sure your monitor is compatible with the video mode you have selected.</p>
<p>Characters do not appear on screen</p>	<p>Make sure the video display is plugged in and turned on.</p> <p>Check that the brightness and contrast controls are properly adjusted.</p> <p>Check that the video signal cable is properly installed.</p> <p>Make sure a video board is installed, enabled, and the jumpers are positioned correctly.</p> <p>Reboot the system.</p>

What happens	What to do
CMOS RAM settings are wrong	If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day develops an error), the backup battery may no longer have enough power to maintain the settings. Replace the battery (Chapter 2).
Diskette drive light does not go on when drive is in use or is tested by POST	Make sure the power and signal cables for the drive are properly installed. Check that the drive is properly configured and enabled in Setup.
Hard drive light does not go on when drive is in use or is tested by POST	Make sure the power and signal cables for the drive are properly installed. Make sure the front panel connector is securely attached to the system board headers. Check that the drive is properly configured and enabled in Setup. Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.
Power-on light does not go on	If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.
Prompt doesn't appear after system boots	It's probably switched off. A serious fault may have occurred consult your dealer service department / Technical Support.
Setup, can't enter	If you can't enter Setup to make changes, check the switch that disables entry into Setup (Chapter 2). If the switch is set to allow entry into Setup, you might need to clear CMOS RAM to the default values and reconfigure the system in Setup.
System halts before completing POST	This indicates a fatal system error that requires immediate service attention. Note the screen display and write down any beep code emitted. Provide this information to your dealer service department / Technical Support.

## Error and Information Messages

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The rest of this chapter describes beep codes, and error messages that you might see or hear when you start up the system:

**Table 6: BIOS Error Messages**

Error Message	Explanation
Diskette drive A error or Diskette drive B error	Drive A: or B: is present but fails the POST diskette tests. Check that the drive is defined with the proper diskette type in Setup and that the diskette drive is installed correctly.
Extended RAM Failed at offset: <i>nnnn</i>	Extended memory not working or not configured properly at offset <i>nnnn</i> .
Failing Bits: <i>nnnn</i>	The hex number <i>nnnn</i> is a map of the bits at the RAM address (System, Extended, or Shadow memory) that failed the memory test. Each 1 in the map indicates a failed bit.
Fixed Disk 0 Failure or Fixed Disk 1 Failure or Fixed Disk Controller Failure	Fixed disk is not working or not configured properly. Check to see if fixed disk is installed properly. Run Setup be sure the fixed-disk type is correctly identified.
Incorrect Drive A type - run SETUP	Type of floppy drive for drive A: not correctly identified in Setup.
Incorrect Drive B type - run SETUP	Type of floppy drive for drive B: not correctly identified in Setup.
Invalid NVRAM media type	Problem with NVRAM (CMOS) access.
Keyboard controller error	The keyboard controller failed test. Try replacing the keyboard.
Keyboard error	Keyboard not working.
Keyboard error nn	BIOS discovered a stuck key and displays the scan code nn for the stuck key.
Keyboard locked - Unlock key switch	Unlock the system to proceed.
Monitor type does not match CMOS - Run SETUP	Monitor type not correctly identified in Setup.
Operating system not found	Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.
Parity Check 1	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.

### BIOS Error Messages (continued)

Error Message	Explanation
Parity Check 2	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Press <F1> to resume, <F2> to Setup	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change any settings.
Real time clock error	Real-time clock fails BIOS test. May require motherboard repair.
Shadow RAM Failed at offset: <i>nnnn</i>	Shadow RAM failed at offset <i>nnnn</i> of the 64 KB block at which the error was detected.
System battery is dead - Replace and run SETUP	The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
System cache error - Cache disabled	RAM cache failed the BIOS test. BIOS disabled the cache.
System CMOS checksum bad - run SETUP	System CMOS RAM has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. Run Setup and reconfigure the system either by getting the default values and/or making your own selections.
System RAM Failed at offset: <i>nnnn</i>	System RAM failed at offset <i>nnnn</i> of the 64 KB block at which the error was detected.
System timer error	The timer test failed. Requires repair of system motherboard.

## BIOS Beep Codes

If an unrecoverable hardware problem occurs the computer may emit a number of beeps from the speaker. These are known as beep codes. The pitch and duration of the beep codes may vary but there will always be a set number of beeps. These beeps stem from the BIOS's initial check on the system and will normally occur in the first few seconds of power on.

Beeps codes represent a terminal error. If the BIOS detects a terminal error condition, it outputs an error beep code, halts the POST, and attempts to display a port 80h code on a POST card's LED display.

Table 8: Beep Codes

<b>Beeps</b>	<b>Description</b>
1-short	One short beep before boot (not an error)
1-long repeated	No DRAM installed or detected
1-long 3-short	Video card not found or video card memory fault
High frequency beeps	While system running, CPU overheated. System running at lower frequency.

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## Chapter 4 System BIOS

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### What is the BIOS?

The BIOS (Basic Input Output System) is an important piece of software which is stored in a ROM (Read Only Memory) chip inside the computer. It consists of the basic instructions for controlling the disk drives, hard disk, keyboard and serial/parallel ports. The BIOS also keeps a list of the specifications of the computer in battery-backed RAM (also known as the CMOS RAM) and provides a special Setup program to change this information.

The BIOS in your Viglen computer is guaranteed to be fully compatible with the IBM BIOS. It has been written by Phoenix Technology Ltd., an industrial leader in the field of BIOS software.

### The Power-on sequence

When the computer is first switched on, certain instructions in the BIOS are executed to test various parts of the machine. This is known as the POST (Power-On Self Test) routine. When you switch the computer on (or when you press the Reset button or press <Ctrl + Alt + Del> keys, which has the same effect), you can see on the monitor that it counts through the memory, testing it. The floppy disk drives are then accessed and tested, and the various interfaces are checked. If there are any errors, a message is displayed on the screen.

Having passed all the tests, and if you have activated the password facility, the BIOS then asks you to enter the boot password to continue. The following section describes how to do this. The BIOS then loads the operating system, either - MS DOS, Windows 95, OS/2 or NetWare, etc. - from the hard disk (or floppy disk if one is inserted in Drive A:). The computer is then ready for use.



# AWARD BIOS

## Introduction

The motherboard uses an AWARD BIOS, which is stored in flash memory and can be upgraded using a disk-based program. In addition to the BIOS, the flash memory contains the Setup program, Power-On Self Test (POST), Advanced Power Management (APM), the PCI auto-configuration utility, and is Windows 95-ready Plug and Play. This motherboard supports system BIOS shadowing, allowing the BIOS to execute from 64-bit onboard write-protected DRAM.

The BIOS displays a message during POST identifying the type of BIOS and the revision code.

## BIOS Upgrades

A new version of the BIOS can be upgraded from a diskette using the AFLASH.EXE utility that is available from Viglen. This utility does BIOS upgrades as follows:

- Updates the flash BIOS from a file on a disk.
- Updates the language section of the BIOS.
- Makes sure that the upgrade BIOS matches the target system to prevent accidentally installing a BIOS for a different type of system.
- Backup the current BIOS before upgrading to newer BIOS note BIOS settings before hand.
- If you encounter a problem unsuccessfully updating new BIOS do not switch off load saved BIOS or system may not be able to boot.

BIOS upgrades and the Flash utility may be available from your system supplier.

### **Note:**

*Please review any instructions distributed with the upgrade utility before attempting a BIOS upgrade.*

## BIOS Flash Memory Organisation

The 2-Mbit flash component is organised as 256 KB x 8 bits and is divided into areas as described in Table 9. The table shows the addresses in the ROM image in normal mode (the addresses change in BIOS Recovery Mode).

**Table 9: Typical Flash Memory Organization**

Address (Hex)	Size	Description
FFFFC000 – FFFFFFFF	16 KB	Boot Block
FFFFA000 – FFFFBFFF	8 KB	Vital Product Data (VPD) Extended System Configuration Data (ESCD) (DMI configuration data / Plug and Play data)
FFFF9000 - FFFF9FFF	4 KB	Used by BIOS (e.g., for Event Logging)
FFFC0000 - FFFF7FFF	228 KB	Main BIOS Block

## Plug and Play: PCI Auto-configuration

The BIOS automatically configures PCI devices and Plug and Play devices. PCI devices may be onboard or add-in cards. Plug and Play devices are ISA add-in cards built to meet the Plug and Play specification. Auto-configuration lets a user insert or remove PCI or Plug and Play cards without having to configure the system. When a user turns on the system after adding a PCI or Plug and Play card, the BIOS automatically configures interrupts, the I/O space, and other system resources. Any interrupts set to Available in Setup are considered to be available for use by the add-in card.

PCI interrupts are distributed to available ISA interrupts that have not been assigned to an ISA card or to system resources. The assignment of PCI interrupts to ISA IRQs is non-deterministic. PCI devices can share an interrupt, but an ISA device cannot share an interrupt allocated to PCI or to another ISA device. Auto-configuration information is stored in the extended system configuration data (ESCD) format.

## PCI IDE Support

If Auto is selected as a primary or secondary IDE in Setup, the BIOS automatically sets up the two local-bus IDE connectors with independent I/O channel support. The IDE interface supports hard drives up to PIO Mode 4 and recognises any ATAPI devices, including CD-ROM drives, tape drives and Ultra DMA drives. Add-in ISA IDE controllers are not supported. The BIOS determines the capabilities of each drive and configures them so as to optimise capacity and performance. To take advantage of the high-capacity storage devices, hard drives are automatically configured for logical block addressing (LBA) and to PIO Mode 3 or 4, depending on the capability of the drive. To override the auto-configuration options, use the specific IDE device options in Setup. The ATAPI specification recommends that ATAPI devices be configured as shown in Table 10.

**Table 10: Recommendations for Configuring an ATAPI Device**

Configuration	Primary Cable		Secondary Cable	
	Drive 0	Drive 1	Drive 0	Drive 1
Normal, no ATAPI	ATA			
Disk and CD-ROM for enhanced IDE systems	ATA		ATAPI	
Legacy IDE system with only one cable	ATA	ATAPI		
Enhanced IDE with CD-ROM and a tape or two CD-ROMs	ATA		ATAPI	ATAPI

## ISA Plug and Play

If Plug and Play operating system is selected in Setup, the BIOS auto-configures only ISA Plug and Play cards that are required for booting (IPL devices). If Plug and Play operating system is not selected in Setup, the BIOS auto-configures all Plug and Play ISA cards.

## **Desktop Management Interface (DMI)**

Desktop Management Interface (DMI) is an interface for managing computers in an enterprise environment. The main component of DMI is the management information format (MIF) database, which contains information about the computing system and its components. Using DMI, a system administrator can obtain the system types, capabilities, operational status, and installation dates for system components. The MIF database defines the data and provides the method for accessing this information. The BIOS enables applications such as Intel LANDesk® Client Manager to use DMI. The BIOS stores and reports the following DMI information:

- BIOS data, such as the BIOS revision level.
- Fixed-system data, such as peripherals, serial numbers, and asset tags.
- Resource data, such as memory size, cache size, and processor speed.
- Dynamic data, such as event detection and error logging.

DMI does not work directly under non-Plug and Play operating systems (e.g., Windows NT). However, the BIOS supports a DMI table interface for such operating systems. Using this support, a DMI service-level application running on a non-Plug and Play OS can access the DMI BIOS information.

## **Advanced Power Management (APM)**

The BIOS supports APM and standby mode. The energy saving standby mode can be initiated in the following ways:

- Time-out period specified in Setup.
- Suspend/resume switch connected to the front panel sleep connector.
- From the operating system, such as the Suspend menu item in Windows 95.

In standby mode, the motherboard reduces power consumption by using SMM capabilities, spinning down hard drives, and reducing power to or turning off VESA DPMS-compliant monitors. Power-management mode can be enabled or disabled in Setup.

While in standby mode, the system retains the ability to respond to external interrupts and service requests, such as incoming faxes or network messages. Any keyboard or mouse activity brings the system out of standby mode and immediately restores power to the monitor.

The BIOS enables APM by default, but the operating system must support an APM driver for the power-management features to work. For example, Windows 95 supports the power-management features upon detecting that APM is enabled in the BIOS.

## Advanced Configuration and Power Interface (ACPI)

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. ACPI requires an ACPI-aware operating system. ACPI features include:

- Plug and Play (including bus and device enumeration) and APM functionality normally contained in the BIOS.
- Power management control of individual devices, add-in boards, video displays, and hard disk drives.
- Methods for achieving less than 30-watt system operation in the Power On Suspended sleeping state, and less than 5-watt system operation in the Suspended to Disk sleeping state.
- A soft-off feature that enables the operating system to power off the computer.
- Support for multiple wake up events.
- Support for a front panel power and sleep mode switch. Table 11 describes the system states based on how long the power switch is pressed, depending on how ACPI is configured with an ACPI-aware operating system.

**Table 11: Effects of Pressing the Power Switch**

<b>If the system is in this state...</b>	<b>... and the power switch is pressed for</b>	<b>...the system enters this state</b>
Off	Less than 4 seconds	Power On
On	Less than 4 seconds	Soft Off/ Suspended
On	More than 4 seconds	Fail safe power off
Sleep	Less than 4 seconds	Wake up

Under ACPI, the operating system directs all system and device power state transitions. The operating system puts devices in and out of low-power state based on user preferences and knowledge of how devices are being used by applications. Devices that are not being used can be turned off.

Table 12 lists the power states supported by the motherboard along with the associated system power targets.

**Table 12: Power States and Targeted System Power**

<b>Global States</b>	<b>Sleeping States</b>	<b>CPU States</b>	<b>Device States</b>	<b>Targeted System Pwr</b>
G0 – working state	S0 - working	C0 - working	D0 – working state	Full power > 60 W
G1 – sleeping state	S1 – CPU stopped	C1 stop grant	D1, D2, D3 – device specification specific.	5 W < power < 30 W
G1 – sleeping state	S4BIOS – suspended to disk. Context saved to disk	No power	D3 – no power except for wake up logic.	Power < 5 W
G2/ S5	S5 – Soft Off Context not saved. Cold boot is required	No power	D3 – no power except for wake up logic.	Power < 5 W
G3 – mechanical off. AC power is disconnected from the computer.	No power to the system	No power	D3 – no power for wake up logic, except when provided by battery or external source	No power to the system so that service can be performed.

The table below describes which devices or events can wake up the system.

**Table 13: Wake Up Devices and Events**

<b>These devices/ events can wake up the system...</b>	<b>...from this state</b>
Power switch	S1, S3, S4BIOS, S5
RTC alarm	S1, S3, S4BIOS, S5
LAN	S1, S3, S4BIOS, S5
Modem	S1, S4BIOS, S5
IR command	S1
USB	S1, S3
PS/2 keyboard	S1, S3
PS/2 mouse	S1, S3

**Note:**

*Depend on the configuration and version of your motherboard, some of the functions listed above may not be available to your system.*

## **Language Support**

The Setup program and help messages can be supported in 32 languages. The default language is American English, which is present unless another language is programmed into the BIOS using the flash memory update utility.

## **Boot Options**

In the Setup program, the user can choose to boot from a floppy drive, hard drive, CD-ROM, or the network. The default setting is for the floppy drive to be the primary boot device and the hard drive to be the secondary boot device. By default the third and fourth devices are disabled.

Booting from CD-ROM is supported in compliance to the El Torito bootable CD-ROM format specification. Under the Boot menu in the Setup program, CD-ROM is listed as a boot device. Boot devices are defined in priority order. If the CD-ROM is selected as the boot device, it must be the first device.

The network can be selected as a boot device. This selection allows booting from a network add-in card with a remote boot ROM installed.

## **USB Support**

The USB connectors allow any of several USB devices to be attached to the computer. Typically, the device driver for USB devices is managed by the operating system. However, because keyboard and mouse support may be needed in the Setup program before the operating system boots, the BIOS supports USB keyboards and mice.

## **BIOS Setup Access**

Access to the Setup program can be restricted using passwords. User and supervisor passwords can be set using the Security menu in Setup. The default is no passwords enabled.

# Configuring the Motherboard BIOS using Setup

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## Before You Begin



### **CAUTION!**

- Always follow the steps in each procedure in the correct order.
- Set up a log to record information about your computer, such as model, serial numbers, installed options, and configuration information.
- Use an anti-static wrist strap and a conductive foam pad when working on the motherboard.



### **WARNINGS**

*The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.*

*Disconnect the computer from its power source and from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or perform any procedures can result in personal injury or equipment damage. Some circuitry on the motherboard may continue to operate even though the front panel power button is off.*



### **CAUTION!**

**Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the computer chassis.**



## **Clearing the CMOS Settings**

Please follow the instructions as found on page 20 to clear the CMOS. The instruction to remove the battery can be found on page 29

## BIOS Setup Program

The Setup program is for viewing and changing the BIOS settings for a computer. Setup is accessed by pressing the <DEL> key after the Power-On Self Test (POST) memory test begins and before the operating system boot begins.

Table 14: Navigation keys

key	Function
<F1> or <Alt + H>	Display general help.
<Esc>	Exit BIOS setup.
<←> or <→>	Select the main menu item left or right
<↑> or <↓>	Select item up or down between fields
<-> Minus key	Change value of highlighted fields to next value in list.
<+> Plus key	Change value of highlighted fields to previous value in list.
<Enter>	Select submenu for the for highlighted field
<F5>	Resets the screen to its Setup Defaults
<F10>	Saves changes and exits

# Main Menu

This is the main screen displayed when first entering the BIOS. From here you select the required sub-menu or option.

AwardBIOS Setup Utility		
<b>Main</b>	Advanced	Power Boot Exit
System Time	[17:23:54]	Item Specific Help
System Date	[06/22/2002]	
Legacy Diskette A	[1.44M, 3.5 in]	<Enter> to Select Field; <+>, <-> to change value
Floppy 3 Mode Support	[Disabled]	
▶ Primary Master	[Auto]	
▶ Primary Slave	[Auto]	
▶ Secondary Master	[Auto]	
▶ Secondary Slave	[Auto]	
▶ Keyboard Features		
Language	[English]	
Supervisor Password	[Disabled]	
User Password	[Disabled]	
Halt On	[All Errors]	
Installed Memory	128MB	
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select ▶ Sub-Menu
		<b>F5</b> Setup Defaults
		<b>F10</b> Save and Exit

**Table 15: Main Menu**

Feature	Options	Description
Advanced Features	No options	Displays Advanced CMOS Features
Power Features	No options	Displays Power Features
Boot Features	No options	Displays Boot Features
Exit Features	No options	Displays Exit Features
System Time	Hour, minute, and second	Set system time
System Date	Month, day, and year	Set system date
Legacy Diskette A	None, 360K, 5.25 in. 1.2M, 5.25 in. 720K, 3.5 in. 1.44M, 3.5in. 2.88, 3.5 in.	Legacy floppy drive support. The only approved modes are None and 1.44MB 3.5 in.
Floppy 3 Mode Support	<b>Disable</b> Enabled	Support for older Japanese floppy drives, treats a 1.44M 3.5 in floppy disk as a 1.2M 3.5 in. Floppy 3 Mode Support is not an approved mode of operation.
Primary Master	No options	Enters The Primary Master Submenu
Primary Slave	No options	Enters The Primary Slave Submenu
Secondary Master	No options	Enters The Secondary Slave Submenu
Secondary Slave	No options	Enters The Secondary Slave Submenu
Keyboard Features	No options	Enters Keyboard features sub menu

Language	No options	System Language only English is available
Set Supervisor Password	User set	Sets the supervisors password
Set User Password	User set	Sets the user password
Halt on	<b>All errors</b> No error All but Keyboard All but disk All but disk/ keyboard	Determines what errors system will not stop during POST boot
Installed Memory	[XXX MB]	Indicates amount of detected memory

**This is the Primary Master, Primary Slave, Secondary Master and Secondary Slave sub menus. Below is also the [User Type HDD] sub-menu.**

AwardBIOS Setup Utility		
Main		Item Specific Help
Primary Master [Auto]		
Type	[Auto]	<Enter> to Select the type of the IDE drive. [User Type HDD] allows you to set each entry on your own.  WARNING: Ultra DMA mode 3/4/5 can be enables only when BIOS detects shielded 80 - pin cable
Cylinders	[1024]	
Head	[255]	
Sector	[63]	
CHS Capacity	8422MB	
Maximum LBA Capacity	20020MB	
Multi-Sector Transfers	[Maximum]	
SMART Monitoring	[Disabled]	
PIO Mode	[4]	
Ultra DMA Mode	[Disabled]	
<b>F1</b> Help    ↑↓    Select Item    +/-    Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→    Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit		

AwardBIOS Setup Utility		
Main		Item Specific Help
Primary Master [User Type HDD]		
Type	[Auto]	<Enter> to Select the type of the IDE drive. [User Type HDD] allows you to set each entry on your own.  WARNING: Ultra DMA mode 3/4/5 can be enables only when BIOS detects shielded 80 - pin cable
Cylinders	[1024]	
Head	[255]	
Sector	[63]	
CHS Capacity	8422MB	
Maximum LBA Capacity	20020MB	
Multi-Sector Transfers	[Maximum]	
SMART Monitoring	[Disabled]	
PIO Mode	[4]	
Ultra DMA Mode	[Disabled]	
<b>F1</b> Help    ↑↓    Select Item    +/-    Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→    Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit		

**Table 16: The Primary Master, Primary Slave, Secondary Master and Secondary Slave sub menus.**

**Note:- Default settings in bold recommended.**

Feature	Options	Description
Type	None, <b>Auto</b> , User type HDD, CD-ROM LS-120 ZIP MO Other ATAPI device	Displays Advanced CMOS Features. Auto mode recommended unless CD-ROM, LS120, ZIP, MO or other ATAPI requires manual setting of Type to function.  By selecting User type HDD, you will need to refer to the hard disk documentation for the information that will need to be entered.
Translation Method	<b>LBA</b> Large Normal Match Partition Table Manual	Select the hard disk drive type in this field. When Logical Block Addressing is enabled, the 28-bit addressing of the hard drive is used without regard for cylinders, heads or sectors. Note that LBA Mode is necessary for drive with more that 504MB storage capacity.
Cylinders	<b>No options</b> , or Manually input	Displays HDD cylinders, or configured according to hard drive manufacture recommended cylinders if Type is set to "User Type HDD" and translation method set to "Manual".
Heads	<b>No options</b> , or Manually input	Displays HDD Heads , or configured according to hard drive manufacture recommended cylinders if Type is set to "User Type HDD" and translation method set to "Manual".
Sector	<b>No options</b> , or Manually input	Displays the number of sectors per track or configured to hard drive manufacture recommended cylinders if Type is set to "User Type HDD" and translation method set to "Manual".
CHS Capacity	<b>No options</b>	Field shows maximum CHS capacity from the drive information or user set options.
Maximum LBA Capacity	<b>No options</b>	Field shows maximum LBA capacity from the drive information or user set options.
Multi-Sector Transfers	<b>No options</b> or Disabled, 2 Sectors, 4 Sectors, 8 Sectors, 16 Sectors, 32 sectors, Maximum	Displays the highest number of sectors per block supported by drive or configured to hard drive manufacture recommended Multi-Sector transfers if Type is set to "User Type HDD"
SMART Monitoring	<b>Disabled</b> , Enabled	Enables or disables the SMART (Self-Monitoring Analysis and Reporting Technology)
PIO Mode	<b>No Options</b> , Or 0,1,2,3,4	Displays the Auto detected PIO mode of attached device or manual set.

Ultra DMA Mode	<b>Disabled</b> Or 0,1,2,3,4,5, 6	Displays the Auto detected UDMA mode of attached device or manual set manufacturers recommended settings and according to cabling used.
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This is the Keyboard features sub menu.

AwardBIOS Setup Utility		
<b>Main</b>	Keyboard Features	Item Specific Help
Boot Up Numlock Status [On] Keyboard Auto-Repeat Rate [6/ Sec] Keyboard Auto-Repeat Delay [1/4 Sec]		Select Power-on state for Numlock
<b>F1</b> Help    ↑↓ Select Item    +/- Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→ Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit		

**Table 17. Keyboard features**

Feature	Options	Description
Boot Up Numlock Status	<b>On</b> , Off	Set the status of Numlock on system boot.
Keyboard Auto-Repeat Rate	<b>6/Sec</b> 8/Sec 10/Sec 12/Sec 15/Sec 20/Sec 24/Sec 30/Sec	Set the status of Keyboard Auto-Repeat Rate on system boot.
Keyboard Auto-Repeat Delay	<b>1/4 Sec</b> 1/2 Sec 3/4 Sec 1 Sec	Set the status of Keyboard Auto-Repeat Delay on system boot.

# Advanced Menu

## This is the Advanced Menu

AwardBIOS Setup Utility			
Main	<b>Advanced</b>	Power	Boot Exit
CPU Speed [Manual] CPU Frequency Multiple [8x] CPU External Frequency (MHz) [100/133] Memory Frequency [Auto] CPU Level 2 Cache [Enabled] BIOS Update [Enabled] PS/2 Mouse Function Control [Auto] USB Legacy Support [Auto] OS/2 Onboard Memory > 64M [Disabled]		Item Specific Help To make changes to the First 4 fields, the motherboard must be set to jumper-free mode To set the following 2 fields, the CPU speed must be set to [Manual]. If the frequency multiple or bus frequency are adjusted too high, the system may hang. Please turn off the system and then restart to set the CPU settings.	
<ul style="list-style-type: none"> <li>▶ Chip Configuration</li> <li>▶ I/O Device Configuration</li> <li>▶ PCI Configuration</li> </ul>			
F1 Help    ↑↓ Select Item    +/- Change Values    F5 Setup Defaults ESC Exit   ←→ Select Menu    Enter Select ▶ Sub-Menu    F10 Save and Exit			

The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. Note incorrect settings may cause system to become unstable or function incorrectly.

**Table 18: Advanced Menu**

**Note: Default settings in bold recommended.**

Feature	Options	Description
CPU Speed	<b>Manual</b> 800MHz 1000MHz 1100MHz 1200MHz 1300MHz 1400MHz 1500MHz 1600MHz 1700MHz 1800MHz 1900MHz 2000MHz 2100MHz 2200MHz 2300MHz 2400MHz	Displays Advanced CPU Speed

CPU Frequency Multiple	8x 10x 11x 12x 13x 14x 15x 16x 17x 18x 19x 20x 21x 22x 23x 24x	This field sets the frequency multiple between the CPU's internal frequency. The item CPU Frequency Multiple is only accessible if you have an unlocked processor and CPU Speed is set to Manual.
CPU External Frequency (MHz)	100 <b>133</b>	This feature tells the clock generator what frequency to send to the System bus and PCI bus. The Bus frequency (External Frequency) multiplied by the Bus multiple equals the CPU Speed. This item is only accessible if the CPU Speed is set to Manual.
Memory Frequency	<b>Auto</b> 1:1 3:4	This field determines whether the memory clock frequency is set to be in synchronous or asynchronous mode with respect to the system frequency.
CPU Level 2 Cache	<b>Enabled,</b> Disabled	Allows the CPU cache to be enabled or disabled.
BIOS Update	<b>Enabled,</b> Disabled	This field functions as an update loader into the BIOS to supply the processor with the required data. When set to Enabled, the BIOS loads the update on all processors during system boot.
PS/2 Mouse Function Control	<b>Auto,</b> Enabled	This feature allows the system to detect a PS/2 mouse at startup. If a mouse is detected at startup, the BIOS assigns IRQ12 to the mouse.
USB Legacy Support	<b>Auto,</b> Enabled, Disabled	Allows the system to detect UB devices at startup. If detected, the USB controller legacy mode is enabled.
OS/2 Onboard Memory > 64M	No Options	OS/2 operating system memory configuration for greater than 64MB. Not required for other operating systems.



**This is the Chip Configuration sub menu**

AwardBIOS Setup Utility		
<b>Advanced</b>		
Chip Configuration	Item Specific Help	
SDRAM Configuration [By SPD] SDRAM CAS Latency [3T] SDRAM RAS to CAS Delay [1T] SDRAM RAS Precharge Time [3T] SDRAM RAS Active Time [6T] SDRAM Command Lead-off Time [Auto] Graphics Aperture Size [64MB] AGP Capability [4x Mode] AGP Fast Write Capability [Enabled] On board VGA shared mode [32M] Video Memory Cache Mode [VC] PCI 2.1 Support [Enabled] Onboard PCI IDE Enable [Both] IDE Bus Master Support [Enabled]	<Enter> to Select SDRAM configuration. [By SPD] recommended. [User define allows you to set each configuration on your own.	
<b>F1</b> Help    ↑↓ Select Item    +/- Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→ Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit		

**Table 19: Chip Configuration sub menu**

**Note: Default settings in bold recommended.**

Feature	Options	Description
SDRAM Configuration	<b>By SPD</b> , User Define	SDRAM timing control. The use of User Define mode is not supported.
SDRAM CAS Latency	<b>1.5T</b> , 2T, 2.5T	Controls latency between the SDRAM read command and time the data actually become available.
SDRAM RAS-to-CAS Delay	<b>3T</b> , 2T, 4T	Controls the latency between the DDR SDRAM active command and the read/write command.
SDRAM RAS Precharge Time	2T, <b>3T</b>	Controls the idle clocks after issuing a precharge command to DDR SDRAM.
SDRAM RAS Active Time	6T, 7T, 5T, 4T	This item controls the number of DDR SDRAM clocks used for DDR SDRAM parameters.
SDRAM Command Lead-off Time	<b>Auto</b> , 2T, 4T,	Configuration options left.
Graphics Aperture Size	<b>64MB</b> [4MB], [8MB], [16MB], [32MB], [64MB], [128MB], [256MB]	This feature allows you to select the size of mapped memory for AGP graphic data.
AGP Capability	<b>4x Mode</b> , 1x Mode	Controls AGP speed settings.
AGP Fast Write Capability	Disabled, Enabled	This field enables or disables the AGP 4x Fast Write feature.

Onboard VGA Shared Memory Size	<b>32MB</b> [4MB], [8MB], [16MB], [32MB], [64MB]	This field allows you to set the onboard VGA memory size with the currently installed memory.
Video Memory Cache Mode	<b>UC</b> , USWC	USWC is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. This option must be disabled (US) if the graphics adapter is unable to support the feature.
PCI 2.1 Support	Disabled, <b>Enabled</b>	This field enables or disables the motherboard feature PCI 2.1 cards.
Onboard PCI IDE	<b>Both</b> , Primary, Secondary, Disabled,	Onboard IDE controller channel control
IDE Bus Master Support	Disabled, <b>Enabled</b>	This item controls the IDE Bus Master support for non-Windows operating systems.

**This is the I/O Device Configuration sub menu**

AwardBIOS Setup Utility		
<u>Advanced</u>		
I/O Device Configuration		Item Specific Help
Floppy Disk Access Control	[R/W]	<Enter> to Select.
Onboard Serial port 1	[3F8/I RQ4]	
Onboard Parallel Port	[378H/I RQ7]	
Parallel Port Mode	[ECP+EPP]	
ECP DMA Select	[3]	
Onboard Game Port	[200H-207H]	
Onboard MIDI I/O	[Disabled]	
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select ▸ Sub-Menu
		<b>F5</b> Setup Defaults
		<b>F10</b> Save and Exit

Note the options displayed at the bottom of the screen only become available when the ↑↓ Select Item is used to scroll down.

**Table 20: I/O Device Configuration sub menu**

**Note: Default settings in bold recommended.**

Feature	Options	Description
Floppy Disk Access Control	<b>R/W</b> , Read Only	This parameter protects files from being copied to floppy disks by allowing reads from, but no writes to, the floppy disk drive.
Onboard Serial port 1	<b>3F8H/IRQ4</b> 2F8/IRQ3 3E8/IRQ4 2E8/IR3 Disalbed	Serial port address and IRQ setting and disable
Onboard Parallel Port	<b>378/IRQ7</b> 278H/IRQ5 Disable	Configuration of Parallel port address and IRQ.
Parallel Port Mode	Normal EPP ECP <b>ECP+EPP</b>	Configuration of Parallel port mode
ECP DMA Select	1 <b>3</b>	DMA channel select only available for ECP and ECP+EPP modes
Onboard Game Port	<b>Disabled</b> , 200-207H 208-20FH	Configuration of onboard Game port
Onboard MIDI I/O	<b>Disabled</b> , 330-331H 300-301H	Configuration of onboard MIDI port

**This is the PCI Configuration sub menu**

AwardBIOS Setup Utility		
<u>Advanced</u>		Item Specific Help
PCI Configuration		
Slot 1	[Auto]	<Enter> to Select an IRQ.
Slot 2	[Auto]	
Slot 3	[Auto]	
PCI/VGA Pallet Snoop	[Disabled]	
PCI Latency Timer	[32]	
Primary VGA BIOS	[PCI VGA Card]	
Onboard VGA	[Enabled]	
USB Function	[Enabled]	
USB2.0 Function	[Enabled]	
<ul style="list-style-type: none"> <li>▶ Onboard PCI Devices Control</li> <li>▶ PCI IRQ Resource Exclusion</li> </ul>		
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select ▶ Sub-Menu
		<b>F5</b> Setup Defaults
		<b>F10</b> Save and Exit

**Table 21: PCI Configuration sub menu**  
**Note: Default settings in bold recommended.**

Feature	Options	Description
Slot 1, Slot 2, Slot 3 IRQ	<b>Auto</b> NA,3,4,5,7,9,10,11,12,14,15	Allows IRQ to be allocated to PCI slot not all IRQs may be shown if already used by IDE, Parallel port etc.
PCI/VGA Pallet Snoop	<b>Disabled</b> Enabled	PCI/VGA pallet snoop used by none standard VGA cards capture cards
PCI Latency Timer	<b>32</b> to 256	PCI bus latency timer 32 supported other modes not recommended
Primary VGA BIOS	<b>PCI Card</b> On-Board	Allows primary selection of Onboard VGA or PCI VGA card
Onboard VGA	<b>Enabled,</b> Disabled	Allows you to enable or disable the onboard VGA port.
Primary VGA BIOS	<b>PCI VGA Card</b> AGP VGA Card On-Board VGA	Allows selection of the primary graphics card.
USB Function	<b>Enabled</b> Disable	Allows you to enable of disable the USB function.
USB 2.0 Function	<b>Enabled,</b> Disabled	Allows you to enable of disable the USB 2.0 function.

**This is the Onboard PCI Devices Control**

AwardBIOS Setup Utility		
<u>Advanced</u>	Onboard PCI Devices Control	Item Specific Help
	Onboard LAN [Enabled] Onboard LAN Boot ROM [Disabled] Onboard AC97 Audio Controller [Auto] Onboard AC97 Modem Controller [Auto]	<Enter> to enable or disable
<b>F1</b> Help <b>ESC</b> Exit	↑↓ Select Item ←→ Select Menu	<b>+/-</b> Change Values <b>Enter</b> Select ▸ Sub-Menu
		<b>F5</b> Setup Defaults <b>F10</b> Save and Exit

**Table 22: Onboard PCI Devices Control**

Onboard LAN	<b>Enabled,</b> Disabled	Allows you to enable or disable the onboard LAN.
Onboard LAN Boot ROM	<b>Enabled,</b> Disabled	Allows you to enable or disable the onboard LAN Boot ROM feature.
Onboard AC97 Audio controller	<b>Auto</b> Disabled	Allows you to enable or disable onboard AC97 Audio controller
Onboard AC97 Modem controller	<b>Auto,</b> Disabled	Allows you to enable or disable onboard AC97 Modem controller

**This is the PCI IRQ Resource Exclusion Configuration sub menu**

AwardBIOS Setup Utility	
<u>Advanced</u>	
PCI /PNP IRQ Resource Excl usi on	I tem Speci fi c Hel p
IRQ 3 Reserved [No/ICU] IRQ 4 Reserved [No/ICU] IRQ 5 Reserved [No/ICU] IRQ 7 Reserved [No/ICU] IRQ 9 Reserved [No/ICU] IRQ 10 Reserved [No/ICU] IRQ 11 Reserved [No/ICU] IRQ 12 Reserved [No/ICU] IRQ 14 Reserved [No/ICU] IRQ 15 Reserved [No/ICU]	Select [Yes] if this IRQ is required by a legacy card; otherwise, select [No/ICU]
<b>F1</b> Help    ↑↓    Select Item    +/-    Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→    Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit	

This menu is for reserving IRQ resources for legacy devices, the default for all available IRQ's is not reserved. The default allows IRQ's to be used as need by motherboard and add in cards etc. In most cases is the recommended configuration.

# Power Menu

This is the Power Menu

AwardBIOS Setup Utility			
Main	Advanced	<b>Power</b> Boot Exit	
Power Management	[User Defined]	Item Specific Help	
Video off Option	[Suspend-> Off]		
Video off Method	[DPMS OFF]	<p>&lt;Enter&gt; to select the power saving mode. You can select (User Defined] to go to the suspend mode entry below.</p>	
HDD Power Down	[Disabled]		
ACPI Suspend To RAM	[Enabled]		
Suspend Mode	[Disabled]		
PWR Button < 4 Sec	[Soft Off]		
▶ Power Up Control			
▶ Hardware Monitor			
<b>F1</b> Help    ↑↓    Select Item    +/-    Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→    Select Menu <b>Enter</b> Select ▶ Sub-Menu <b>F10</b> Save and Exit			

**Table 23: Power Menu**

**Note: Default settings in bold recommended.**

Feature	Options	Description
Power Management	<b>User Defined</b> Disabled Min Savings Max Savings	Power management control, must be enable to use any of the automatic power management features.
Video off Option	Always On <b>Suspend -&gt;Off</b>	Determines when to activate video off monitor power management
Video off Method	Blank Screen V/H SYNC+Blank DPMS Standby by <b>DPMS OFF</b> DPMS Reduce On	Defines video of features
HDD Power Down	<b>Disabled</b> 2Min...15Min	HDD power down control inactivity period
ACPI Suspend To RAM	<b>Disabled</b> Enabled	S3 suspend to RAM control
Power Up Control	No option	Access to Power Up Control sub menu
Hardware Monitor	No option	Access to Hardware Monitor sub menu

**This is the Power Up Control sub menu**

AwardBIOS Setup Utility		
<b>Power</b>		
Power Up Control	Item Specific Help	
AC PWR Loss Restart [Di s abl ed] Wake/Power Up On Ext. Modem: [Di s abl ed] Wake Up On PCI Device [Di s abl ed] Wake On By PS2 Keyboard [Di s abl ed] Automatic Power Up [Di s abl ed]	<Enter> to Select whether of not to restart the system after AC power Loss.	
<b>F1</b> Hel p    ↑↓    Select Item <b>+/-</b> Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exi t    ←→    Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exi t		

**Table 24: Power Up Control sub menu**

**Note: Default settings in bold**

Feature	Options	Description
AC PWR Loss Restart	<b>Disabled</b> Enabled Previous	System will start up if power resumes after AC power loss. Previous state sets the system back to the state it was before the power interruption
Wake/Power Up On Ext. Modem	<b>Disabled</b> Enabled	System will start on external modem Act. Modem call must be made more than once to allow system to boot up.
Power Up On PCI Device	<b>Disabled</b> Enabled	System boot up shut down control, Psu msut support at lest 720mA +5Vsb (Stand By)
Wake On By PS2 Keyboard	<b>Space Bar</b> Ctrl-Esc Wakeup Key	When "Wake On PS2 KB is enabled defines keys options to power up computer.
Wake On By PS2 Mouse	<b>Disabled</b> Enabled	System resume from standby via mouse control
Automatic Power Up	<b>Disabled</b> Every day (time) By date (day of month)	Allows unattended power up.

**This is the Hardware Monitor sub menu**

AwardBIOS Setup Utility		
Power		
Power Up Control		Item Specific Help
CPU Temperature	61°C/141°F	<Enter> to Switch between monitor or ignoring.
CPU Fan Speed	5844rpm	
Chassis Fan Speed	N/A	
Vcore Voltage	1.42V	
+3.3V Voltage	3.32V	
+5V Voltage	5.02V	
+12V Voltage	12.22V	
<b>F1</b> Help    ↑↓ Select Item    +/- Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→ Select Menu <b>Enter</b> Select ▸ Sub-Menu <b>F10</b> Save and Exit		

**Table 25: Power Up Control sub menu 2**

Feature	Options	Description
CPU Temperature	??°C/??°F Ignore	Hardware monitor CPU temperature
CPU Fan Speed	????rpm Ignore	Hardware monitor CPU FAN Speed. If N/A is displayed no fan present at boot up.
Chassis Fan Speed	????rpm Ignore	Hardware monitor Chassis FAN Speed. If N/A is displayed no fan present at boot up.
Vcore Voltage	?.??V Ignore	Hardware monitor CPU core Voltage.
+3.3V Voltage	?.??V Ignore	Hardware monitor +3.3V DC Supply voltage.
+5V Voltage	?.??V Ignore	Hardware monitor +5V DC Supply voltage.
+12V Voltage	?.??V Ignore	Hardware monitor +12V DC Supply voltage.



# Boot Menu

## This is the Boot menu

AwardBIOS Setup Utility		
Main	Advanced	Power <b>Boot</b> Exit
1. Removable Device	[Legacy Floppy]	Item Specific Help
2. IDE hard drive	[None]	
3. ATAPI Device	[None]	Boot Sequence:  <Enter> to Select Filed; Device.  To select the boot Sequence, use the up or down arrow. Press <+> to move the device up the list, or <-> to move it down the list.
4. Other Boot Device	[INT18 Device (Net)]	
Plug & Play O/S	[NO]	
Reset Configuration Data	[NO]	
Boot Virus Detection	[Enabled]	
Quick Power On Self Test	[Enabled]	
Boot Up Floppy Seek	[Enabled]	
Interrupt Mode	[APIC]	
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select ▸ Sub-Menu
		<b>F5</b> Setup Defaults
		<b>F10</b> Save and Exit

The boot menu allows selecting from the possible four boot devices the order the system will attempt to boot on system power up. The configuration fields “Removable Device”, “IDE hard drive”, “ATAPI Device” and “Other Boot Device” have there options promoted or demoted by using the <+> or <-> respectively.

**Table 26: Boot menu**

**Note: Default settings in bold**

Feature	Options	Description
1. Removable Device	Disabled <b>Legacy Floppy</b> LS120 ZIP ATAPIMO	Removable device boot selection. If a USB device (Floppy drive, USB Key etc) is plugged in before booting the system up, then it will appear in the Removable device list in the BIOS, so you can select this as a boot device.
2. IDE hard drive	Available IDE hard drives devices	Delectated IDE hard drive boot selection. Product ID's will be displayed. if none detected “None” will be displayed
3. ATAPI Device	Available ATAPI CD-ROM devices	Delectated ATAPI CD-ROM drive boot selection. Product ID's will be displayed if none detected “None” will be displayed
4. Other Boot Device	<b>INT18 device (Network)</b> , Disabled, SCSI/Onboard, ATA boot Device	Other boot device selection

Plug & Play O/S	Yes, <b>No</b>	If your operating System is Plug & Play then select 'Yes', otherwise select 'No'
Reset Configuration Data	<b>No</b> , Yes	The extended system configuration data (ESCD) contains information about non-PnP devices. It also holds the complete record of how the system was configured the last time it was booted.
Boot Virus Detection	<b>Enabled</b> , Disabled	If enabled system will attempt to detect and prevent any abnormal access of the systems boot sector. If detected the system will halt and display a warning message. Should this occur perform a virus check after booting from a known virus free media such as floppy disk and investigate further or seek advise.
Quick Power On Self Test	<b>Enabled</b> , Disabled	Performs a quick boot bypassing some POST boot tests.
Boot Up Floppy Seek	<b>Enabled</b> , Disabled	System boot floppy device search
Interrupt Mode	<b>APIC</b> , PIC	The advanced programmable interrupt controller (APIC) setting allows you to distribute interrupt routings other than 16 IRQs.

# Exit Menu

## This is the Exit Menu

AwardBIOS Setup Utility			
Main	Advanced	Power	Boot <b>Exit</b>
Exit Saving Changes Exit discarding changes Load Setup Defaults Discard Changes Save Changes		Item Specific Help  Exit setup utility and save your changes to CMOS.	
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values	<b>F5</b> Setup Defaults
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select Sub-Menu	<b>F10</b> Save and Exit

To exit the BIOS utility you must select from one of three options <F10> to save changes and exit (this may be selected whilst in any menu), Exit Saving Changes or Exit discarding changes.

**Table 27: Exit menu**

Feature	Options	Description
Exit Saving Changes	Y N	Exit BIOS utility and saves settings to CMOS none-volatile RAM
Exit discarding changes	Y N	Exits BIOS utility and does not save changes to CMOS none-volatile RAM.
Load Setup Defaults	Y N	Load set up defaults in all menus.
Discard Changes	Y N	Discards changes and reverts to previously saved settings.
Save Changes	Y N	Saves changes to CMOS none-volatile RAM.

# Set Supervisor Password/Set User Password

These two options set the system passwords. “Supervisor Password” sets a password that will be used to protect the system and the Setup utility; “User Password” sets a password that will be used exclusively on the system. By default, the system comes without any passwords. To specify a password, highlight the type you want and then press the <enter> key. A password prompt appears on the screen. Taking note that the password is case sensitive, and can be up to 8 alphanumeric characters long, type in your password and then press the <enter> key. The system confirms your password by asking you to type it again. After setting a password, the screen automatically reverts to the main screen.

## Supervisor Password

AwardBI OS Setup Utility		
Main	Advanced	Power Boot Exit
System Time	[17:23:54]	Item Specific Help
System Date	[06/22/2002]	
Legacy Diskette A	[1.44M. 3.5 in]	<Enter> to Select Filed; <+>, <-> to change value
Legacy Diskette B	[None]	
Floppy 3 Mode Support	[Di sabled]	
▶ Primary Master	<input type="text" value="Enter Password:"/>	
▶ Primary Slave		
▶ Secondary Master	[Auto]	
▶ Secondary Slave	[Auto]	
▶ Keyboard Features		
Language	[Engl i sh]	
<b>Supervi sor Password</b>	[Di sabled]	
User Password	[Di sabled]	
Halt On	[Al l Errors]	
Installed Memory	128MB	
<b>F1</b> Help	↑↓ Select Item	<b>+/-</b> Change Values
<b>ESC</b> Exit	←→ Select Menu	<b>Enter</b> Select ▶ Sub-Menu
		<b>F5</b> Setup Defaults
		<b>F10</b> Save and Exit

If set the Supervisor password allows full access to the BIOS setup Utility menus.

Continued 

## User Password

AwardBIOS Setup Utility			
Main	Advanced	Power	Boot Exit
System Time	[17:23:54]		
System Date	[06/22/2002]		
Legacy Diskette A	[1.44M. 3.5 in]		
Legacy Diskette B	[None]		
Floppy 3 Mode Support	[Disabled]		
▶ Primary Master			
▶ Primary Slave			
▶ Secondary Master	[Auto]		
▶ Secondary Slave	[Auto]		
▶ Keyboard Features			
Language	[English]		
Supervisor Password	[Disabled]		
<b>User Password</b>	<b>[Disabled]</b>		
Hard On	[All Errors]		
Installed Memory	128MB		
Item Specific Help			
<Enter> to Select Field; <+>, <-> to change value			
Enter Password:			
<b>F1</b> Help    ↑↓ Select Item    +/- Change Values <b>F5</b> Setup Defaults <b>ESC</b> Exit    ←→ Select Menu <b>Enter</b> Select ▶ Sub-Menu <b>F10</b> Save and Exit			

To implement the password protection, specify in the “Security Option” field of the BIOS Features Setup screen when the system will prompt for the password. If you want to disable either password, press the <enter> key instead of entering a new password when the “Enter Password” prompt appears. A message confirms the password has been disabled.

**NOTE:** If you forget the password, see page 20 “Clearing the CMOS Settings” for procedures on clearing the CMOS RAM.

If set the User password allows the system to boot for normal use.

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# Upgrading the BIOS

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## Upgrading the BIOS

This chapter describes how to upgrade the BIOS and how to recover the BIOS if an upgrade fails.

### Preparing for the Upgrade

Before you upgrade the BIOS, prepare for the upgrade by recording the current BIOS settings, obtaining the upgrade utility, and making a copy of the current BIOS.

### Obtaining the Upgrade Utility

You can upgrade to a new version of the BIOS using the new BIOS files and the BIOS upgrade utility, AFLASH.EXE. You can obtain the BIOS upgrade file and the utility through Viglen:  
<http://www.viglen.co.uk>

**Note:**

*Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.*

This upgrade utility allows you to:

- Upgrade the BIOS in flash memory.
- Update the language section of the BIOS.

The following steps explain how to upgrade the BIOS.

### Recording the Current BIOS Settings

Boot the computer and press <DEL> to enter the BIOS.  
Write down the current settings in the BIOS Setup program.

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## Chapter 5 Technical Information

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### **Note:**

*This chapter is indented for experienced users only, and only to be used as a reference. Changes to or modify any of the components/ connectors listed herein can and will seriously damage your system, including the motherboard, CPU and/or any other hardware.*

*You do not need to read this chapter to configure your motherboard. If you are not sure about the details listed herein, please skip and disregard them.*

### **Enhanced IDE**

IDE has been used in computer systems for some time, and has been a cheap solution to data storage. It has now been realized that traditional IDE has its limitations and thus needed to be improved. This was where Enhanced IDE came from. The main developments to the IDE interface are:

- Support hard drives of capacity greater than 528MB. This is achieved through BIOS changes.
- Improved data transfer rates. Transfer rates of 1-3MB/sec were the best to be expected from older IDE drives. With local bus technology this increased to about 6MB/sec. Now with multimedia applications, requiring vast amounts of information, even faster transfers rates were needed. Now drives with Enhanced IDE controllers can deliver up to 13MB/sec which is in the region of SCSI-2 performance.
- Dual-IDE channels have now been added which allows up to four IDE drives to be supported by the system. Each channel supporting two IDE devices.
- Non disk IDE peripherals have been developed (IDE CD-ROMs, IDE tape streamers) which can be simply attached to the one channel requiring no special hardware (requiring the use of an ISA slot) or complicated drivers. This is a standard interface meaning that any IDE CD-ROM or tape streamer can be attached.

### **Operating Systems and hard drives**

Standard CHS is the translation that has been used for years. Its use limits IDE capacity to maximum of 528MB regardless of the size of the drive used.

Logical Block mode overcomes the 528MB maximum size limitation imposed by the Standard CHS mode. It should be used only when the drive supports LBA (Logical Block Addressing), and the OS supports LBA, or uses the BIOS to access the disk.

Continued 

Extended CHS mode also overcomes the 528MB maximum size limitation imposed by Standard CHS mode. It can be used with drives which are larger than 528MB that do not support LBA.

Auto Detected allows the BIOS to examine the drive and determine the optimal mode. The first choice is to utilise Logical Block mode if it is supported by the drive. The second choice is to utilise Extended CHS mode if the drive topology allows. If neither of the above methods is possible, the Standard CHS mode is used.

Different operating systems have different abilities regarding IDE translation mode.

UNIX operating systems (as currently implemented) do not support either LBA or ECHS and must utilise the standard CHS method. UNIX can support drives larger than 528MB, but does so in its own way.

OS/2 2.1 and OS/2 Warp can support LBA, ECHS or standard CHS methods. Note that LBA support may require a switch setting on an OS/2 driver in order to operate in that mode.

OS/2 2.0 & Novel NetWare can support either ECHS or standard CHS methods. In order to use LBA with NetWare a driver that supports current parameters must be used. OS/2 2.0 does not support LBA.

DOS & Windows can use LBA, ECHS or standard CHS methods. The '32-bit Disk Access' driver built into Windows WDCTRL.386 can only be used with the standard CHS method, To use either LBA or ECHS method and '32-bit Disk Access' an alternative .386 driver must be installed, this combination will also provide the best performance. If this driver is not installed and the drive fitted to the system supports Type F DMA on the ISA interface or Mode 3 on the PCI interface then higher performance will be achieved by NOT using '32-bit Disk Access'.



## Connector Signal Detail

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**Table 28: ATX 12V**

Pin	Signal Name
1	+12V DC
2	+12V DC
3	GND
4	GND

**Table 29: CPU\_FAN1**

Pin	Signal Name
1	GND
2	+12V DC
3	Rotation

**Table 30: CHA\_FAN1**

Pin	Signal Name
1	GND
2	+12V DC
3	Rotation

**Table 31: USB Header**

Pin	Signal Name
1	USB+5V
2	LDM1
3	LDP1
4	GND
5	NC
6	USB+5V
7	LDM2
8	LDP2
9	GND
10	-

**Table 32: Internal Audio Connectors (4-pin CD\_IN1, AUX1)**

Pin	Signal Name
1	Right Audio Channel
2	GND
3	GND
4	Left Audio Channel

**Table 33: Front Panel Audio Connector (10-pin)**

1	MIC2
2	AGND
3	MICPWR
4	+5VA
5	Line out_R
6	Bline out_R

7	NC
8	-
9	Line out_L
10	Blinc out_L

**Table 34: Floppy Drive Connector**

Pin	Signal Name	Pin	Signal Name
1	Ground	2	DENSEL
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	FDINDX# (Index)
9	Ground	10	FDM00# (Motor Enable A)
11	Ground	12	No connect
13	Ground	14	FDDS0# (Drive Select A)
15	Ground	16	No connect
17	No Connect	18	FDDIR# (Stepper Motor Direction)
19	Ground	20	FDSTEP# (Step Pulse)
21	Ground	22	FDWD# (Write Data)
23	Ground	24	FDWE# (Write Enable)
25	Ground	26	FDTRK0# (Track 0)
27	Connect	28	FDWPD# (Write Protect)
29	Ground	30	FDRDATA# (Read Data)
31	Ground	32	FDHEAD# (Side 1 Select)
33	Ground	34	DSKCHG# (Diskette Change)

**Table 35: PCI IDE Connectors**

Pin	Signal Name	Pin	Signal Name
1	Reset IDE	2	Ground
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	Ground	20	Key
21	DDRQ0 [DDRQ1]	22	Ground
23	I/O Write#	24	Ground
25	I/O Read#	26	Ground
27	IOCHRDY	28	P_ALE (Cable Select pullup)
29	DDACK0# [DDACK1#]	30	Ground
31	IRQ 14 [IRQ 15]	32	Reserved
33	Address 1	34	Reserved
35	Address 0	36	Address 2
37	Chip Select 1P# [Chip Select 1S#]	38	Chip Select 3P# [Chip Select 3S#]
39	Activity#	40	Ground

**NOTE:**

Signal names in brackets ([ ]) are for the secondary IDE connector.

**Table 36: Accelerated Graphics Port**

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	+12V	B1	No Connect	A34	Vcc3.3	B34	Vcc3.3
A2	No Connect	B2	Vcc	A35	AD22	B35	AD21
A3	Reserved	B3	Vcc	A36	AD20	B36	AD19
A4	No Connect	B4	No Connect	A37	Ground	B37	Ground
A5	Ground	B5	Ground	A38	AD18	B38	AD17
A6	INTA#	B6	INTB#	A39	AD16	B39	C/BE2#
A7	RST#	B7	CLK	A40	Vcc3.3	B40	Vcc3.3
A8	GNT1#	B8	REQ#	A41	FRAME#	B41	IRDY#
A9	Vcc3.3	B9	Vcc3.3	A42	Reserved	B42	+3.3 V aux
A10	ST1	B10	ST0	A43	Ground	B43	Ground
A11	Reserved	B11	ST2	A44	Reserved	B44	Reserved
A12	PIPE#	B12	RBF#	A45	Vcc3.3	B45	Vcc3.3
A13	Ground	B13	Ground	A46	TRDY#	B46	DEVSEL#
A14	No Connect	B14	No Connect	A47	STOP#	B47	Vcc3.3
A15	SBA1	B15	SBA0	A48	PME#	B48	PERR#
A16	Vcc3.3	B16	Vcc3.3	A49	Ground	B49	Ground
A17	SBA3	B17	SBA2	A50	PAR	B50	SERR#
A18	Reserved	B18	SB_STB	A51	AD15	B51	C/BE1#
A19	Ground	B19	Ground	A52	Vcc3.3	B52	Vcc3.3
A20	SBA5	B20	SBA4	A53	AD13	B53	AD14
A21	SBA7	B21	SBA6	A54	AD11	B54	AD12
A22	Key	B22	Key	A55	Ground	B55	Ground
A23	Key	B23	Key	A56	AD9	B56	AD10
A24	Key	B24	Key	A57	C/BE0#	B57	AD8
A25	Key	B25	Key	A58	Vcc3.3	B58	Vcc3.3
A26	AD30	B26	AD31	A59	Reserved	B59	AD_STB0
A27	AD28	B27	AD29	A60	AD6	B60	AD7
A28	Vcc3.3	B28	Vcc3.3	A61	Ground	B61	Ground
A29	AD26	B29	AD27	A62	AD4	B62	AD5
A30	AD24	B30	AD25	A63	AD2	B63	AD3
A31	Ground	B31	Ground	A64	Vcc3.3	B64	Vcc3.3
A32	Reserved	B32	AD_STB1	A65	AD0	B65	AD1
A33	C/BE3#	B33	AD23	A66	SMB0	B66	SMB1

## Power Supply Connector

When used with an ATX-compliant power supply that supports remote power on/off, the motherboard can turn off the system power through software control.

To enable soft-off control in software, advanced power management must be enabled in the Setup program and in the operating system. When the system BIOS receives the correct APM command from the operating system, the BIOS turns off power to the computer.

With soft-off enabled, if power to the computer is interrupted by a power outage or a disconnected power cord, when power resumes, the computer returns to the power state it was in before power was interrupted (on or off).

**Table 37: Power Supply Connector**

Pin	Signal Name
1	+3.3 V
2	+3.3 V
3	Ground
4	+5 V
5	Ground
6	+5 V
7	Ground
8	PWRGD (Power Good)
9	+5 VSB (Standby)
10	+12 V
11	+3.3 V
12	-12 V
13	Ground
14	PS-ON# (power supply remote on/off control)
15	Ground
16	Ground
17	Ground
18	-5 V
19	+5 V
20	+5 V

**Table 38: Front Panel I/O Connectors**

Connector	Pin	Signal Name	Connector	Pin	Signal Name
Power LED	1	PLUS 5VSB			
IDE_LED	2	IDELED+	ATX Power Sw	12	PWR
			Speaker	13	PLUS 5V
IDE_LED	4	IDELED	ATX Power Sw	14	Ground
Power LED	5	PLED	Speaker	15	Ground
IDE_LED	6	Ground			
			Speaker	17	Ground
SMI Lead	8	ExtSMI#	Reset Sw	18	Reset
			Speaker	19	Speaker
SMI Lead	10	Ground	Reset Sw	20	Ground

**Table 39: PS/2 Keyboard/Mouse Connectors**

Pin	Signal Name
1	Data
2	No connect
3	Ground
4	+5 V (fused)
5	Clock
6	No connect

**Table 40: Serial Port Connectors**

Pin	Signal Name
1	DCD
2	Serial In #
3	Serial Out #
4	DTR#
5	Ground
6	DSR
7	RTS
8	CTS
9	RI

**Table 41: Parallel Port Connector**

Pin	Signal Name	Pin	Signal Name
1	Strobe#	14	Auto Feed#
2	Data bit 0	15	Fault#
3	Data bit 1	16	INIT#
4	Data bit 2	17	SLCT IN#
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	Ground
9	Data bit 7	22	Ground
10	ACK#	23	Ground
11	Busy	24	Ground
12	Error	25	Ground
13	Select		

**Table 42: PCI Bus Connectors**

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	Ground (TRST#)*	B1	-12 V	A32	AD16	B32	AD17
A2	+12 V	B2	Ground (TCK)*	A33	+3.3 V	B33	C/BE2#
A3	+5 V (TMS)*	B3	Ground	A34	FRAME#	B34	Ground
A4	+5 V (TDI)*	B4	no connect (TDO)*	A35	Ground	B35	IRDY#
A5	+5 V	B5	+5 V	A36	TRDY#	B36	+3.3 V
A6	INTA#	B6	+5 V	A37	Ground	B37	DEVSEL#
A7	INTC#	B7	INTB#	A38	STOP#	B38	Ground
A8	+5 V	B8	INTD#	A39	+3.3 V	B39	LOCK#
A9	Reserved	B9	no connect (PRSNT1#)*	A40	+5 V (SDONE)*	B40	PERR#
A10	+5 V (I/O)	B10	Reserved	A41	+5 V (SBO#)*	B41	+3.3 V
A11	Reserved	B11	no connect (PRSNT2#)*	A42	Ground	B42	SERR#
A12	Ground	B12	Ground	A43	PAR	B43	+3.3 V
A13	Ground	B13	Ground	A44	AD15	B44	C/BE1#
A14	+3.3 V aux	B14	Reserved	A45	+3.3 V	B45	AD14
A15	RST#	B15	Ground	A46	AD13	B46	Ground
A16	+5 V (I/O)	B16	CLK	A47	AD11	B47	AD12
A17	GNT#	B17	Ground	A48	Ground	B48	AD10
A18	Ground	B18	REQ#	A49	AD09	B49	Ground
A19	PME#	B19	+5 V (I/O)	A50	Key	B50	Key
A20	AD30	B20	AD31	A51	Key	B51	Key
A21	+3.3 V	B21	AD29	A52	C/BE0#	B52	AD08
A22	AD28	B22	Ground	A53	+3.3 V	B53	AD07
A23	AD26	B23	AD27	A54	AD06	B54	+3.3 V
A24	Ground	B24	AD25	A55	AD04	B55	AD05
A25	AD24	B25	+3.3 V	A56	Ground	B56	AD03
A26	IDSEL	B26	C/BE3#	A57	AD02	B57	Ground
A27	+3.3 V	B27	AD23	A58	AD00	B58	AD01
A28	AD22	B28	Ground	A59	+5 V (I/O)	B59	+5 V (I/O)
A29	AD20	B29	AD21	A60	REQ64C#	B60	ACK64C#
A30	Ground	B30	AD19	A61	+5 V	B61	+5 V
A31	AD18	B31	+3.3 V	A62	+5 V	B62	+5 V

- These signals (in parentheses) are optional in the PCI specification and are not currently implemented.

## Other Information

### Reliability

The mean time between failures (MTBF) prediction is calculated using component and subassembly random failure rates. The calculation is based on the Bellcore Reliability Prediction Procedure, TR-NWT-000332, Issue 4, September 1991.

The MTBF prediction is for:

- Redesigning the motherboard for alternate components if failure rates exceed reliability expectations.
- Estimating repair rates and spare parts requirements.

MTBF data is calculated from predicted data @ 55 °C.

The MTBF prediction for the motherboard is 30,000 – 50,000 hours.

Table 43: Temperature

<b>Temperature</b>	<b>Specification</b>
Non-operating	-40°C to +70°C
Operating	0°C to +55°C

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## Chapter 6 Glossary

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### **BIOS**

This is software stored on a chip and consists of the instructions necessary for the computer to function. The System BIOS contains the instructions for the keyboard, disk drives etc., and the VGA BIOS controls the VGA graphics card.

### **CPU**

Central Processing Unit. This is the main piece of equipment on the motherboard. The CPU processes data, tells memory what to store and the video card what to display.

### **Default**

The configuration of the system when it is switched on, or the standard settings before any changes are made.

### **DIMM**

Dual In-Line Memory Module, a type of memory module used for the systems main memory.

### **Driver**

A piece of software which is used by application software to control some special features. Each graphics board and printer requires its own driver.

### **D-Type**

A common type of connector used for connecting printers, serial ports, game port, and many other types of interface.

### **DRAM**

Dynamic Ram used for main system memory, providing a moderately fast but cheap storage solution.

### **FDC**

Floppy Disk Controller - the interface for connecting floppy disk drives to the computer.

### **Hercules**

A monochrome graphics video mode which first appeared in the Hercules graphics card. Provides a resolution of 720 by 348 pixels.

### **IDE**

Integrated Drive Electronics - currently the most popular type of interface for hard disk drives. Much of the circuitry previously required on hard disk controller cards is now integrated on the hard disk itself.

### **Interface**

The electronics providing a connection between two pieces of equipment. For example, a printer interface connects a computer to a printer.



**Interlace**

The mode the graphics card uses to refresh a monitor screen. When the graphics is in interlace mode, the frequency of the display update is lower than in non-interlace mode. This causes a slight flicker, so generally non-interlaced mode is better if the monitor supports it.

**L.E.D.**

Light Emitting Diode - a light which indicates activity - for example hard disk access.

**PCI**

Peripheral Component Interface. It became apparent to manufacturers that the 8MHz AT ISA BUS on the standard PC was just not fast enough for today's applications, and so PCI was invented. It is a high speed data bus that carries information to and from components - known as 'Local Bus'.

**RAM**

Random Access Memory - the memory used by the computer for running programs and storing data.

**ROM**

Read Only Memory - a memory chip which doesn't lose its data when the system is switched off. It is used to store the System BIOS and VGA BIOS instructions. It is slower than RAM.

**Shadow Memory**

The BIOS is normally stored in ROM. On certain systems it can be copied to RAM on power up to make it go faster. This RAM is known as shadow memory. The System BIOS is responsible for this copying.

**Super VGA**

Additional screen modes and capabilities provided over and above the standard VGA defined by IBM.

**VGA**

Video Graphics Array - the graphics standard defined by IBM and provided on IBM's PS/2 machines.

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## Suggestions

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Viglen is interested in continuing to improve the quality and information provided in their manuals. Viglen has listed some questions that you may like to answer and return to Viglen. This will help Viglen help to keep and improve the standard of their manuals.

1. Is the information provided in this and other manuals clear enough?

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2. What could be added to the manual to improve it?

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3. Does the manual go into enough detail?

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4. Would you like an on-line version of this manual?

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5. How do you rate the Viglen Technical support and Service Departments ?

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6. Are there any technological improvements that could be made to the system?

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7. Other points you would like to mention?

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