VIG615M
Motherboard
Manual

Viglen

Great

Minds

Think

Viglen

Viglen, EMC and the 'CE' mark

CE Marking

European standards are being harmonised across borders. If products comply with 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 with the currently enforced directive(s).

$$C \; E$$

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 'real world' 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 with 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.

This symbol on the product or on its packaging indicates that the product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or Viglen Ltd.

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Contents

Chapter 1: Motherboard Overview

Introduction

This manual describes the Viglen Vig615M 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 that supports the Intel® Core® 2 Quad and Core 2 Duo family. All of the supported CPU's include 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 Vig615M 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.

Feature Summary

The Vig615M is based on the Intel® G31 & ICH7/ICH7R chipsets for optimal system efficiency. Designed to fit the advanced Intel® Core 2 Duo/Quad/Pentium/Celeron LGA775 processor, the Vig615M delivers a high performance and professional desktop platform solution.

The motherboard features:

Form factor:

- Micro ATX Form Factor: 244mm by 193mm

Processor:

- Intel® Core2 Quad/Core 2 Duo/Pentium Dual-Core E2XXX and Celeron 400
- Socket 775 connector.
- Supports 4 pin CPU fan pin-header with fan speed control
- Supports Intel® Hyper-Threading Technology

Main memory:

- Two 240 pin DDR2 DIMM sockets.
- Supports memory speeds 667/800 MHz
- Support for up to 4GB of DDR2 DIMM memory.

Chipset

- Intel G31
- Supports 800/1066/1333 MHz Front Side Bus (FSB)
- Advanced System Power Management features
- Integrated Super I/O Controller

Audio

- Realtek ALC888 HD (High Definition) Audio compatible audio subsystem
- Flexible 8-channel audio with jack sensing

LAN

- Realtek RTL8111C 10/100/1000Mb/s Mbit/sec Platform LAN Connect (PLC) device.
- Compliance with PCI 2.2
- Supports ACPI Power Management

Rear Panel Port Support

- 1x PS/2 mouse port
- 1x PS/2 keyboard port
- 1x serial port (COM1)
- 1x VGA port
- 1x parallel port supporting SPP/EPP/ECP mode
- 4x USB 2.0 Ports
- 1x RJ-45 LAN Jack
- 3 flexible audio jacks

Internal Connectors

- 2x USB 2.0 pin headers
- 1x CD-in pin header
- 1x SPDIF-out pin header
- 1x Front panel audio pin header
- 1x serial port pin header
- 1x Chassis intrusion switch pin header
- 1x SPI Debugging connector

Expansion Capabilities

- One PCI Express x16 slot
- Two PCI bus add-in card connectors
- Supports 3.3V/5V PCI bus interfae

Instantly Available PC

- Suspend to RAM support
- Wake on PS/2 keyboard, Mouse and USB ports

Microprocessor

The motherboard supports the latest powerful and energy efficient processors from Intel. These include Intel's Core 2 Duo and Core 2 Quad processors in the LGA775 package. With the new Intel Core microarchitecture technology and 1333/1066/800 MHz FSB, users are able to step up to new levels o gaming experience and multi-tasking performance.

Memory

Main Memory

The motherboard has two DDR2 DIMM sockets. Minimum memory size is 512MB; maximum memory size is 4GB. The BIOS automatically detects memory type, size, and speed.

The motherboard supports the following memory features:

- 240-pin DIMMs.
- 667/800 MHz
- Supports memory bandwidths of up to 12.8 GB/s
- Un-Buffered Non-ECC DIMM.

Chipset

The Intel® G31 chipset boosts your gaming and multimedia experience with integrated graphic engine Intel Graphics Media Accelerator 3100. It supports 1066/800 MHz front side bus (FSB), and delivers breakthrough advances in 3D and 2D graphics, and video capabilities. This integrated chipset contains one 16-lane PCI Express port intended for an external PCI Express graphics card and provides the interface for the processor in the 775-land package, and the dual channel DDR2 memory at speeds up to 800MHz.

Realtek 8111C Platform LAN Connect Device

The Realtek 8111C component provides an interface to the back panel RJ-45 connector with integrated LEDs. This physical interface may alternately be provided via the CNR connector.

The Realtek 8111C provides the following functions:

- 10/100/1000 Ethernet LAN Connectivity
- Supports RJ-45 connector with status indicator LEDs
- Full driver compatibility
- ACPI Power Management
- Programmable transit threshold
- Configuration EEPROM that contains the MAC address

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.

Table 1: LAN LED Status

LED	Color	LED State	Condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

Universal Serial Bus (USB)

The motherboard has four USB ports and a further five can be added via internal headers; one USB peripheral can be connected to each port. For more than nine 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.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.
- 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 one independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), Ultra DMA/66 & Ultra DMA/100 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 Vig615M 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 multi-century 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 ± 13 minutes/year at 25 ºC with 3.3 V applied.

I/O Interface Controller

The motherboard uses the I/O controller which features:

- Serial ports:
  - Internal send/receive 16-byte FIFO buffer.
  - Four internal 8-bit DMA options for the UART with SIR support (USI).
- Multimode bidirectional parallel port:
  - Standard mode, IBM and Centronics compatible.
  - Enhanced parallel port (EPP) mode with BIOS and driver support.
  - High-speed extended capabilities port (ECP) mode.
- Floppy disk controller:
  - N82077 compatible.
  - Single diskette drive interface.
  - 16-byte FIFO.
  - High-performance digital data separator (DDS).
  - PC-AT and PS/2 drive-mode support.

- Keyboard and mouse controller:
  - Industry standard 8042A compatible.
  - General-purpose microcontroller.
  - 8-bit internal data bus.
- ISA Plug-and-Play compatible register set.
- PCI PME interface.
- Intelligent auto power management:
  - Shadowed write-only registers for ACPI compliance.
  - Programmable wake up event interface.

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.

Serial Ports

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

Parallel Port

The connector for the multimode bidirectional 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).
- Bidirectional (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
- 1.44MB, 3.5 inch
- 1.2 MB, 3.5-inch (driver required)
- 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 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

These audio connectors are used for audio devices. You can differentiate the colour of the audio jacks for different audio sound effects.

- Line-In / RS-Out (Blue) - Line In is used for external CD player, tape player or other audio devices. Rear-Surround Out in 4/ 5.1 channel mode.
- Line-Out (Green) - Line Out, is a connector for speakers or headphones.
- Mic / CS-Out (Pink) - Mic, is a connector for microphones. Center/
- Subwoofer Out in 5.1 channel mode.

Management Extension Component

System BIOS

The system BIOS, from Phoenix 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 2.1 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 two PCI bus add-in card connectors and one PCI Express x16 connector and one PCI Express x1 connector.
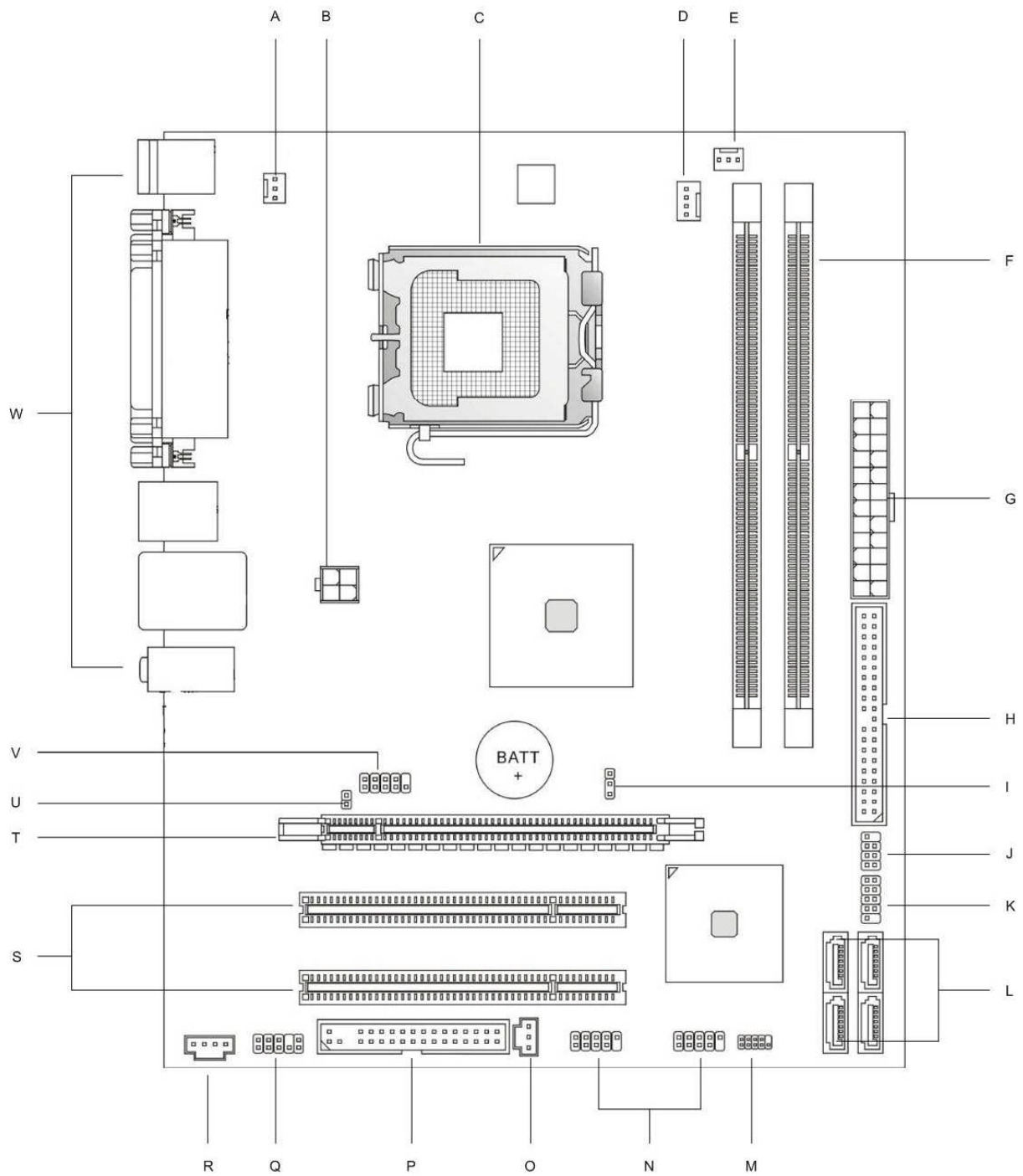

System Board Components

Figure 1: Motherboard Layout & Components

Table 2: Motherboard Connection

A	Rear System Fan	M	SPI Debugging Connector
B	ATX 12V Power Connector	N	USB headers
C	LGA 775 CPU Socket	O	S/PDIF-Out Connector
D	CPU Fan Connector	P	Floppy Disk Drive Connector
E	Front System Fan*	Q	Front Panel Audio Connector
F	Memory DIMM Slots	R	CD-In Connector
G	ATX 24-Pin Power Connector	S	PCI Slot 32-bit
H	IDE Connector	T	PCI Express x1 and x16 Slot
I	Clear CMOS Jumper	U	Chassis Intrusion Connector
J	Front Panel Connector 1 (Speaker, Power LED)	V	Serial Port Connector
K	Front Panel Connector 2 (Reset Switch, HDDLED, Power LED, Power Switch)	W	Rear I/O Connectors
L	Serial ATA Connectors		

Overview of System Board Components

A – System Fan1
This is used to keep the Motherboard components and other components cool.

B – ATX 12V Power Connector
This 12V power connector is used to provide power to the CPU

C – LGA775 pin CPU socket
CPU sits in the LGA775 pin socket.

D – CPU Fan Header
Fan header dedicated purely for the Heatsink to cool the CPU.

E – Front System Fan header
This is used to keep the Motherboard components and other components cool.

F – 2 x DIMM Slots
Insert Memory modules DDR2 667/800 MHz.

G – ATX 24 pin Power Connector
This is the main power connector for the motherboard.

H – IDE Connector
This can be used to connect an IDE Hard Disk Drive or even a CD-ROM drive.

I – Clear CMOS jumper
This allows you to clear the CMOS of the Motherboard when moving the jumper from pins 1-2 to 2-3.

J – Front Panel Connector 1
Controls the Hard Disk Drive LED, Power Switch, Reset Switch and Power LED

K – Front Panel Connector 2
Controls the Speaker and Power LED

L – Serial ATA II Connectors
Can connect up to 4 SATA devices (Hard Disk Drive, CD-ROM)

M – SPI Debugging Connector
This connector is for internal debugging only.

N – USB header
Allows up to 2 USB devices to be connected to each USB header

O – S/PDIF-Out Connector
This connector is used to connect S/PDIF (Sony & Phillips digital Interconnect Format) interface for digital transmission.

P – Floppy Connector
This connector allows you to connect a floppy drive to the chassis.

Q – Front Panel Audio Connector
This header supports HD Audio which allows the Motherboard to support front panel Audio.

R – CD-In Connector
This connector is provided for external audio input.

S – PCI Slot 32bit
The PCI slots support LAN cards, USB cards and other add-on cards that comply with PCI specifications.

T – PCI Express x1 and x16 Slot
The PCI Express x1 supports up to 250 MB/s transfer rate. The PCI Express x16 supports up to 4.0 GB/s transfer rate.

U – Chassis Intrusion
Notifies before entering OS that the Chassis panel may have been tampered with.

V – Serial Port Connector
This connector allows you to connect a serial device to the chassis

W - Rear I/O Connector
Consists of multiple components to connect i.e. VGA, PS/2 Keyboard and Mouse.

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.

The I/O shield provides external access to PS/2 keyboard and mouse connectors as well as one serial port, one parallel port, four USB ports, one LAN Port and the audio connectors.
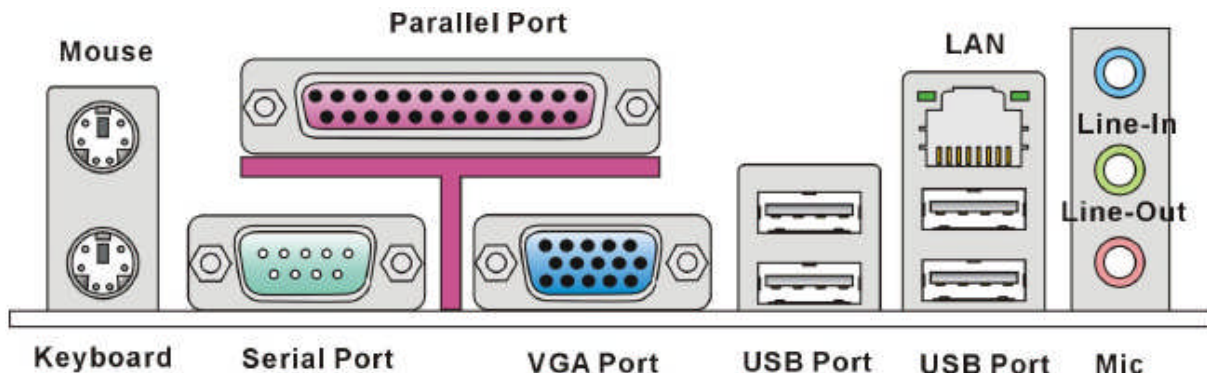
Figure 2: Back Panel Connectors

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

The I/O shield provides external access to the following:

1. 1x PS/2 Keyboard
This port is for a PS/2 Keyboard

2. 1x PS/2 Mouse
This port is for a PS/2 Mouse

3. 1x Serial port
The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

4. 1x parallel port
A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

5. 4x USB ports
The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

6. 1x LAN port
The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.
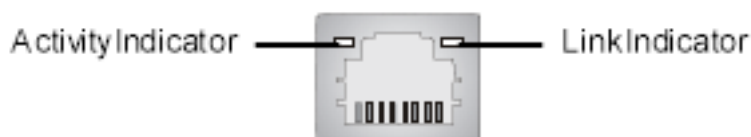

Figure 3: LAN Port indicators locations

Table 4: LAN Port indicators meanings

LED	Color	LED State	Condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

7. 3x Audio connectors.
These audio connectors are used for audio devices. You can differentiate the colour of the audio jacks for different audio sound effects.
- Line-In (Blue) - Line In is used for external CD player, tape player or other audio devices.
- Line-Out (Green) - Line Out, is a connector for speakers or headphones.
- Mic (Pink) - Mic, is a connector for microphones.

This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

NOTE: The functions of the Line Out, Line In, and Microphone jacks change when you select the 6-channel audio configuration.

Table 5: Audio 2, 4 or 6-channel configuration

	Headphone/2-Speaker	4-Speaker	6-Speaker
Light Blue	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center

Chapter 2: System Board Options

The VIG615MM motherboard is capable of accepting Intel® Core2 Quad and Core 2 Duo CPU's. RAM can be upgraded to a maximum of 4GB using DDR2 667 and 800MHz RAM DIMMs Non ECC Unbuffered memory.

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 precede 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.
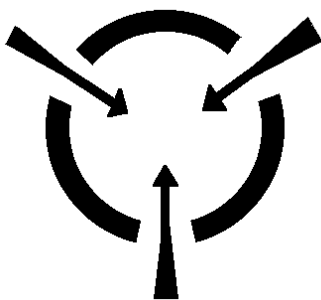
CAUTION!
The Viglen VIG615MM motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.

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.

Overview of Jumper Settings

The VIG615MM motherboard contains the latest technology to offer an almost jumperless configuration. All Intel® Core 2 Quad and Core 2 Duo CPUs are automatically detected and the Speed is automatically set from the information provided by the CPU.

The only jumpers present on the motherboard are for clearing all the CMOS settings. In the unlikely event of the CMOS becoming corrupted then jumper JP1 can be set to clear the contents of the CMOS, and for write protecting the BIOS.

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.
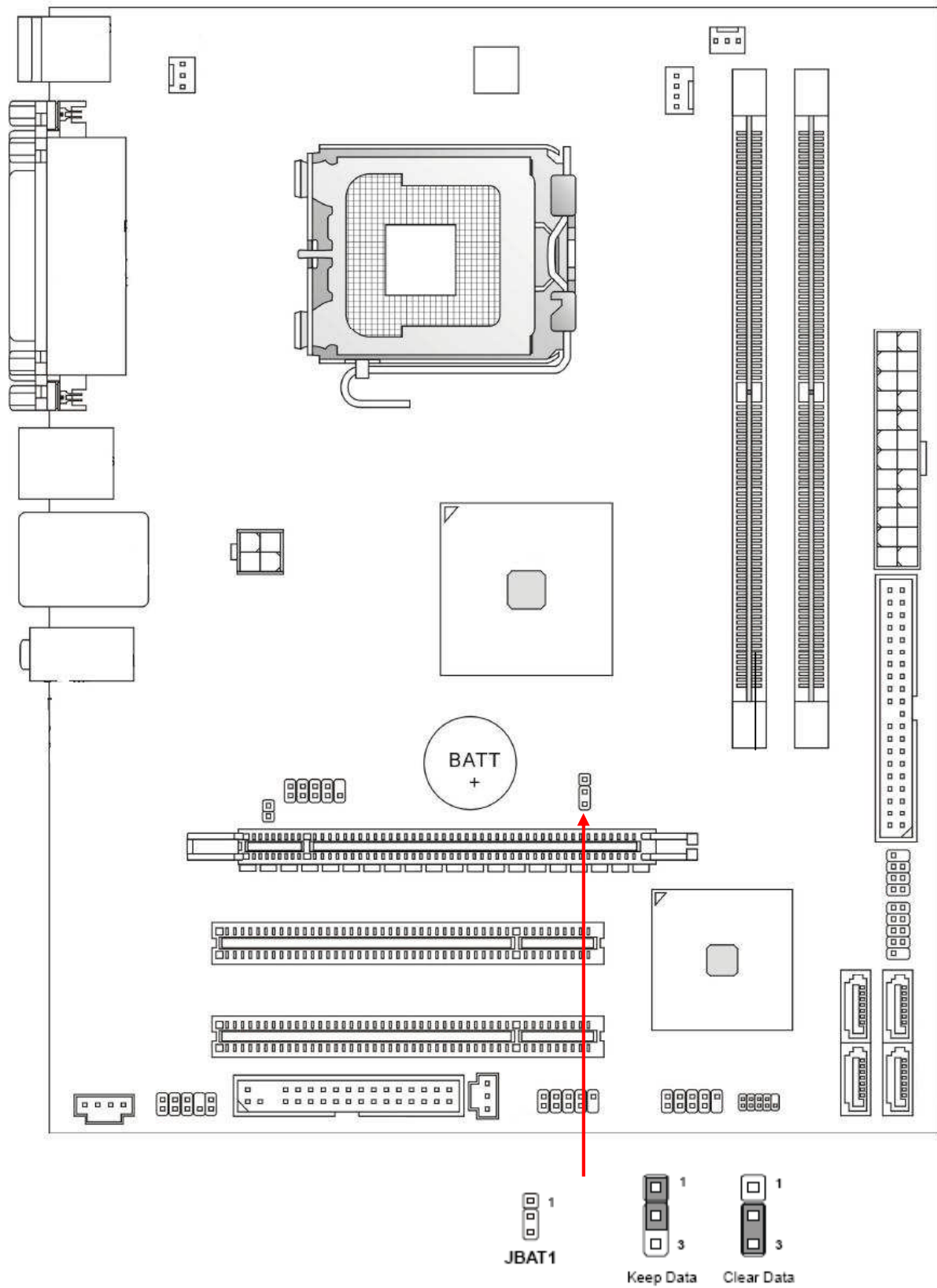
System Board Jumper Settings

Figure 4: System Board Jumper Settings

Table 6: Clear CMOS Jumper Settings

Function	Jumper (JP1)	Configuration
Save CMOS (Default)	1-2	The BIOS uses current configuration information and passwords for booting.
Clear	2-3	Turn off the system and unplug the power cord. Move the jumper from pins 1-2 (default) to pins 2-3 for about 5~10 seconds. Then move the jumper back to pins 1-2.

NOTE:

- *Except when clearing the rtc ram, never remove the jumper on JP1 default position. Removing the jumper will cause system boot failures.*
- *There is no jumper setting for configuring the processor speed or bus frequency.*

Motherboard Connectors

There are connectors on the motherboard for FAN, IDE, Power supply, CD audio, Floppy, IDE, & Front Panel Connectors. The location and/or details of these connections are shown below.

Front Panel Connectors

The following are all connectors situated along the front edge of the motherboard. They are often connected to buttons and LED's situated on the front panel of the case.

JFP1   JFP2
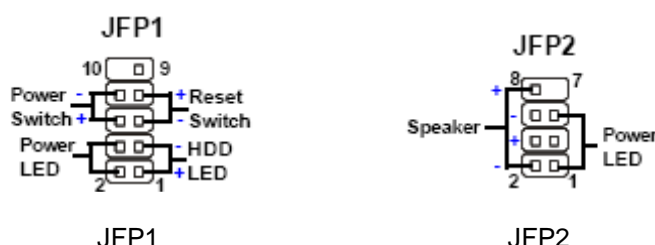
Figure 5: Front Panel Connectors

Table 7: Front Panel Connector Pin Definition (JFP1)

PIN	SIGNAL	DESCRIPTION
1	HD_LED+	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW+	Power Switch high reference pull-up
7	RST_SW+	Reset Switch high reference pull-up
8	PWR_SW-	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

Table 8: Front Panel Connector Pin Definition (JFP2)

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	SPK-	Speaker-
3	SLED	SuspendLED
4	BUZ+	Buzzer+
5	PLED	PowerLED
6	BUZ-	Buzzer-
7	NC	Noconnection
8	SPK+	Speaker+

Hard Disk L.E.D. Connector

This goes to the Hard Disk L.E.D. on the front panel, which lights up when the IDE Hard Disk is in use.

Reset switch connector

When these pins are shorted, it will cause the computer to perform a cold reboot.

Power L.E.D.

This attaches to the power L.E.D on the front panel, to display if the computer is active or not.

Power On/Off

When these pins are shorted it turns the computer on and off.

Power Supply

ATX 24-Pin Power Connector: ATX1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Figure 6: ATX 24-pin Power Connector Pin Definition

ATX 12V Power Connector: JPW1

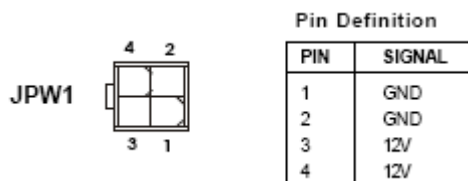This 12V power connector is used to provide power to the CPU.

Figure 7: ATX 12V Power Connector Pin Definition

Floppy Disk Drive Connector: FDD1

This connector supports 360KB, 720KB, 1.2MB, 1.44MB or 2.88MB floppy disk drive.
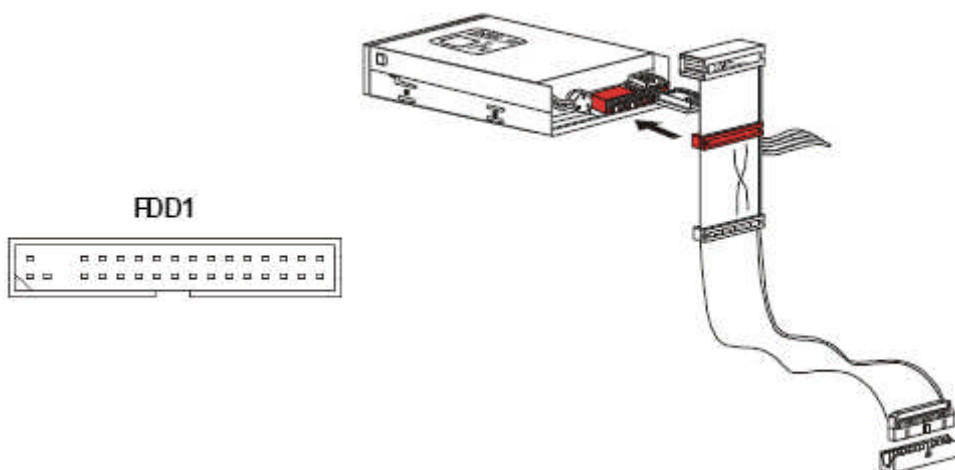
Figure 8: Floppy Disk Drive Connector

IDE Connector: IDE1

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.
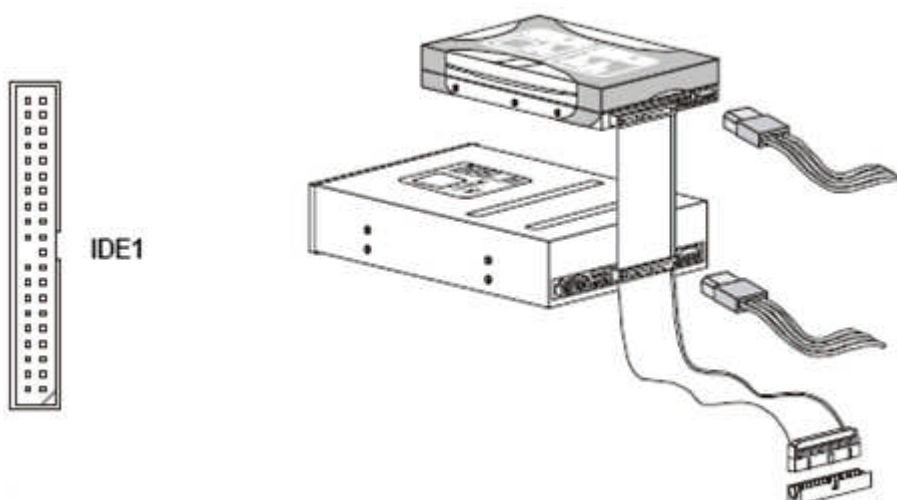
Figure 9: IDE Connector

Serial ATA Connector: SATA1 ~ SATA4

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.
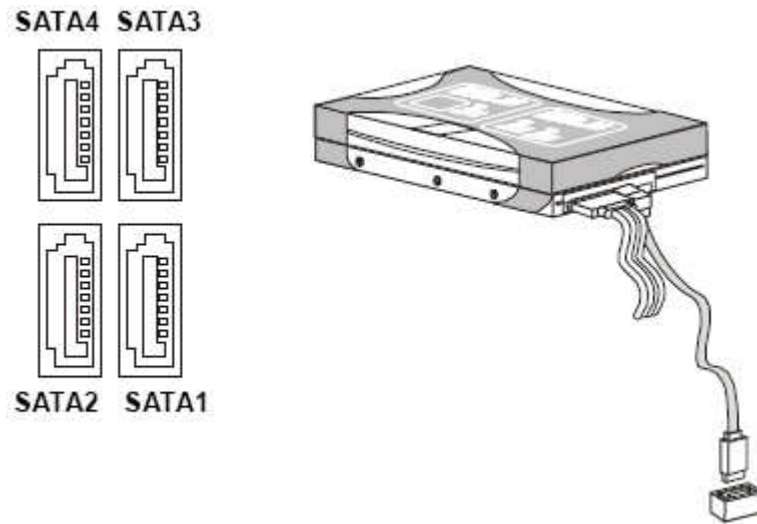
Figure 10: Serial ATA Connector

Fan Power Connectors: CPUFAN1, SYSFAN1~2

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the motherboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan.
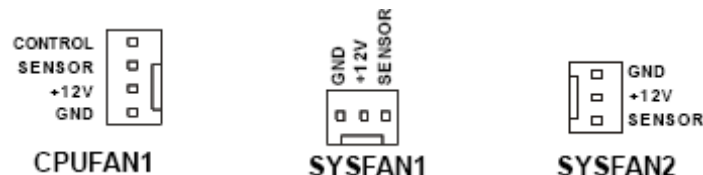
Figure 11: Fan Power Connectors

Chassis Intrusion Connector: JCI1

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

CINTRU ▢ ▢ GND
1 2

JCI1

Figure 12: Chassis Intrusion Connector

S/PDIF-Out Connector: JSPD1

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF Out module cable to this connector, and then install the module to a slot opening at the back of the system chassis.

JSPD1

GND
SPDIF
VCC
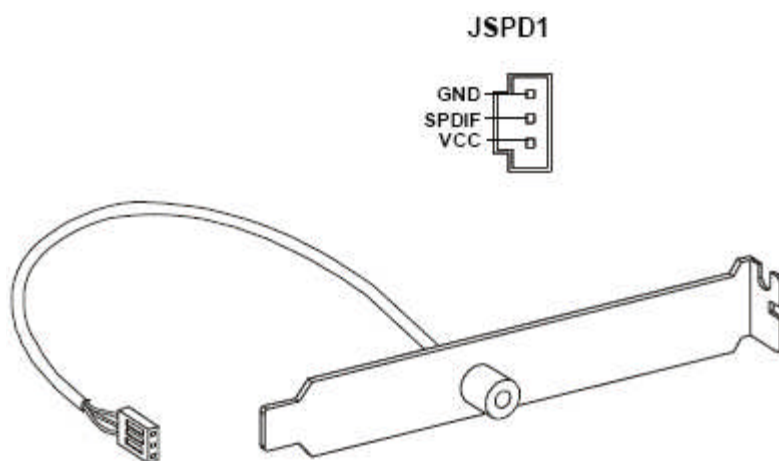
Figure 13: S/PDIF-Out Connector

CD-In Connector: CD_IN1

This connector is provided for external audio input.

CD_IN1

L GND R
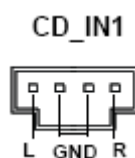
Figure 14: CD-In Connector

Front Panel Audio Connector: JAUD1

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard.

Figure 15: Front Panel Audio Connector

Table 9: Front Panel Audio Pin Definition (JAUD1)

PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	PRESENCE#	Active low signal-signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected
5	LINEout_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No control
9	LINEout_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

Front USB Connector: JUSB1~2

These connectors are for USB2.0 ports. Connect the USB module cable to any of these connectors, and then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.
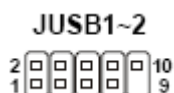
Figure 16: Front USB Connector

Table 11: Front USB connector (JUSB1~2)

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key(no pin)	10	USBOC

Note:

The pins of VCC and GND must be connected correctly to avoid possible damage

Serial Port Connector: JCOM1

This connector is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial device.
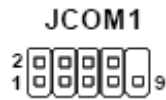
JCOM1

Figure 17: Serial Port Connector

Table 12: Serial Port connector (JCOM1)

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

Upgrading the CPU

CAUTION!

Allow time for the processor and heat sink to cool before touching either of them.

All Intel processors together with Level 2 cache chips are housed in a protective package.

The design of the VIG615M computer makes it a simple job to replace or upgrade the processor. To do so please refer to the 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.
4. Locate the heat sink clips, and remove heat sink (and unplug FAN cable)
5. Lift arm on Socket to release the CPU
6. Lift the CPU Vertically upwards until it is clear of the socket

You can now fit the replacement CPU and heat sink into the socket.
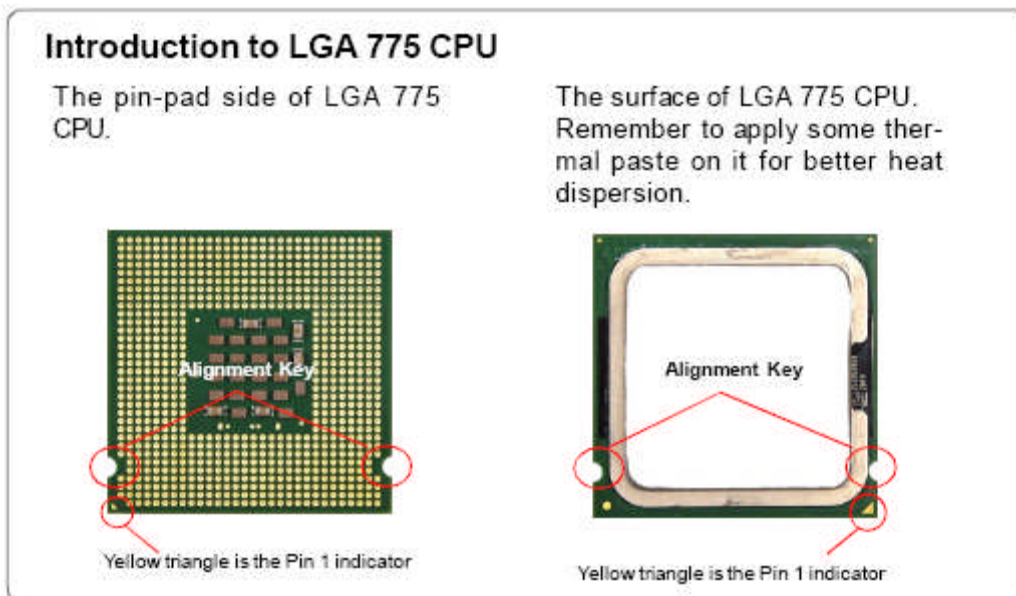
Figure 18: LGA 775 CPU

Installing the CPU

1. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin. Remove the cap from lever hinge side (as the arrow shows).
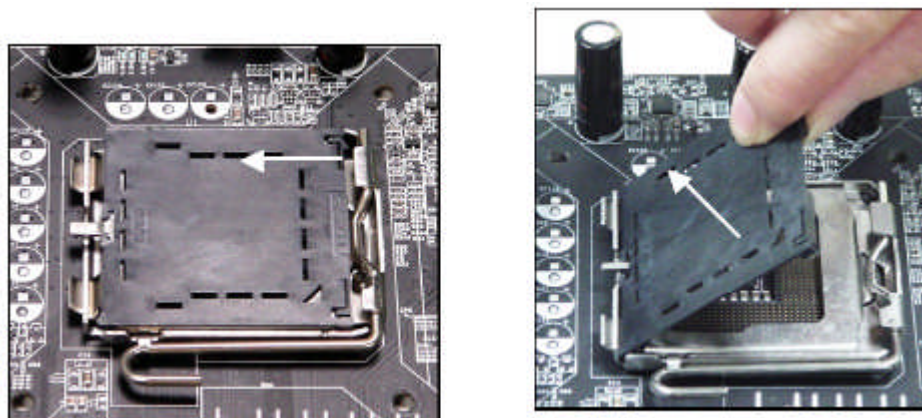
Figure 19: Remove protective cap

2. The pin sockets are revealed, now open the load lever.
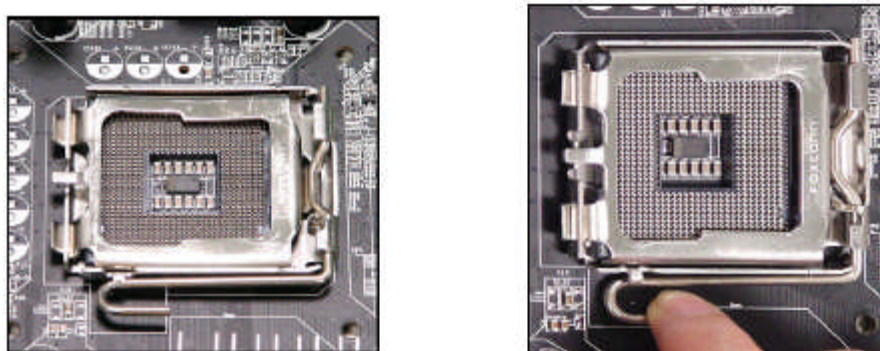
Figure 20: Open load lever

3. Lift the load lever up and open the load plate. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.
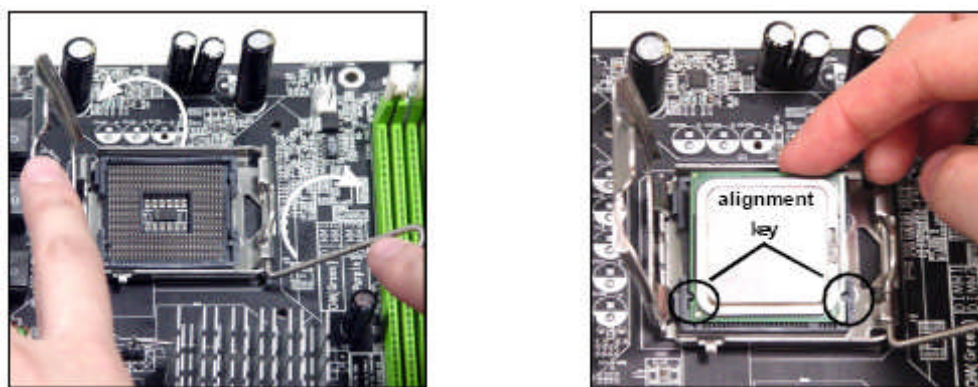
Figure 21: Place CPU in the socket housing

4. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall. Cover the load plate onto the package.
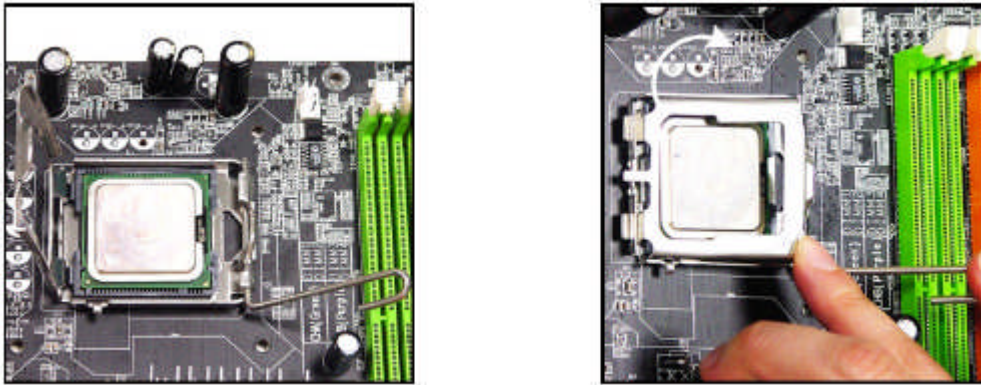
Figure 22: Cover the load plate

5. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab. Align the holes on the motherboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the motherboard.
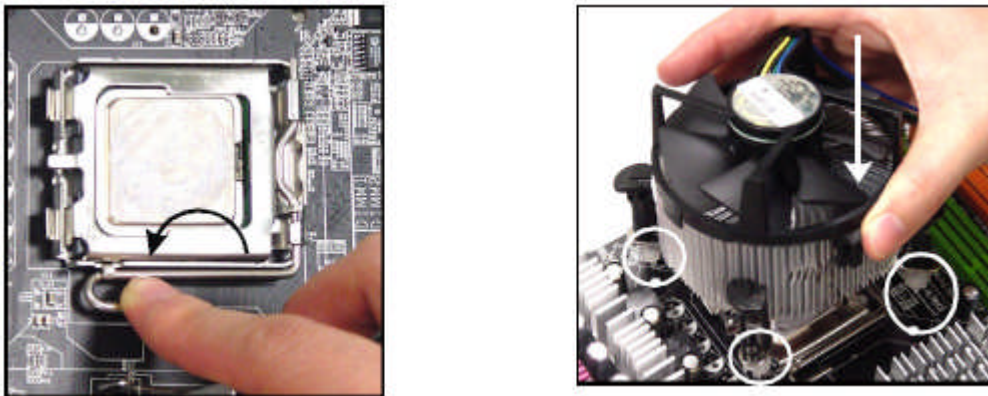
Figure 23: Install heatsink

6. Press the four hooks down to fasten the cooler. Then rotate the locking switch (refer to the correct direction marked on it) to lock the hooks. Turn over the motherboard to confirm that the clip-ends are correctly inserted.
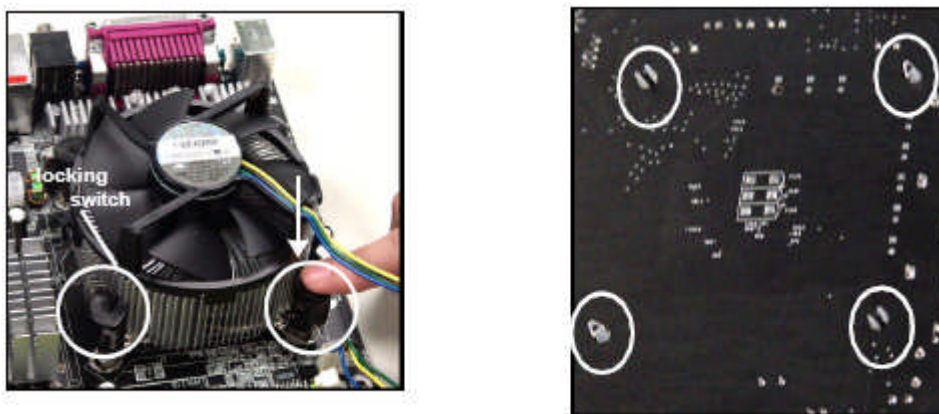
Figure 24: Install heatsink 2

Installing & Removing Memory Modules

Installing Memory

You can install from 512MB to 4GB of memory in the motherboard DIMM sockets. The motherboard has two DIMM sockets. The motherboard supports the following memory features:

- 240-pin DIMMs with gold-plated contacts.
- Non-ECC (64-bit) memory.
- 512MB, 1GB and 2GB DDR2 modules.

NOTE: DDR2 SDRAM must meet the Version 1.0 June 2000 JEDEC Solid State Technology Association specifications for DDR266 SDRAM.

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.

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. Hold the DIMM by the edges, lift it away from the socket, and store it in an antistatic package.
5. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.

OM05275
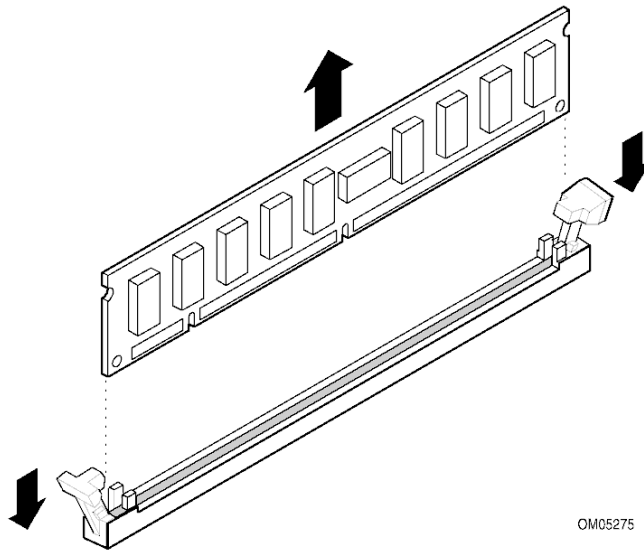
Figure 25: Removing Memory Modules

Expansion Slots

The motherboard has two PCI slots and one Accelerated Graphics Port (AGP) slot. To install and configure an expansion card:

1. Install an expansion card following the instructions that came with the chassis.
2. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4, System BIOS.
3. Assign an IRQ to the card. Refer to the tables below.
4. Install the drivers and/or software applications for the expansion card according to the card documentation.

Table 13: Standard IRQ Assignment

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
4*	12	Communication Port (COM1)
5*	13	IRQ Holder for PCI steering
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	IRQ Holder for PCI steering
10*	5	Advanced AC'97 CODEC
11*	6	Standard PCI Graphics Adapter (VGA)
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices

PCI Slots

There are two 32-bit PCI slots on this motherboard. The slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. At 32 bits and 33 MHz, it yields a throughput rate of 133 MBps.

 32-bit PCI Slot

Figure 26: Installing a PCI card

PCI Express X16 Slots

There is 1 PCI Express X16 slot on the Motherboard which can be used for Graphics Cards and Sound Cards.

 PCI Express x16 Slot

Figure 27: PCIe x16

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 'S' on the diagram on Figure 1.

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 27).
6. Install the new battery in the socket.
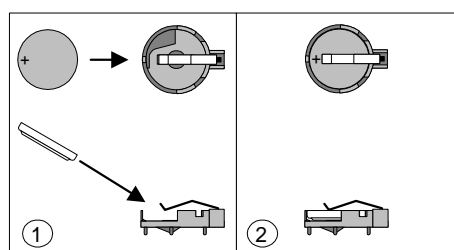
Figure 28: Removing the Battery

Chapter 3 : Solving Problems

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

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.

Table 14: Resetting the System

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 Procedures

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/ISA legacy (non-Plug and Play) add-in boards.

* If the PCI/ISA board uses an interrupt, run Set-up and set the interrupt that is being used by the PCI/ISA board to Used by PCI/ISA Card. Please refer to the BIOS manual for details of how to do this.

* If the PCI/ISA legacy board uses memory space between 80000H - 9FFFFH, run Set-up and set conventional memory to 256 K.

* If the PCI/ISA legacy board uses shared memory between C8000H - DFFFH, run Set-up and enable shared memory for the appropriate memory space.

Problems & Suggestions

Table 15: Problems and Suggestions

What happens	What to do
Application software problems	Try resetting the system.
	Make sure all cables are installed correctly.
	Verify that the system board jumpers are set properly.
	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.
	Make sure the software is properly configured for the system. Refer to the software documentation for information.
	Try a different copy of the software to see if the problem is with the copy you are using.
	If other software runs correctly on the system, contact the vendor of the software that fails.
	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.
Characters on-screen are distorted or incorrect	Make sure the brightness and contrast controls are properly adjusted on the monitor.
	Make sure the video signal cable and power cables are properly installed.
	Make sure your monitor is compatible with the video mode you have selected.
Characters do not appear on screen	Make sure the video display is plugged in and turned on.
	Check that the brightness and contrast controls are properly adjusted.
	Check that the video signal cable is properly installed.
	Make sure a video board is installed, enabled, and the jumpers are positioned correctly.
	Reboot the system.

Table 16: Problems and Suggestions **(Continued)**

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.

Chapter 4: System BIOS

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 Award BIOS, 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>+ <Delete> 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 98SE, 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.

Phoenix Award BIOS

Introduction

The motherboard uses a Phoenix 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 AFUDOS.EXE utility that is available from the Viglen FTP site. 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.

BIOS upgrades and the AFUD4234.EXE utility may be available online at www.viglen.co.uk or by request.

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

Using AWDFLASH to update the BIOS

The BIOS can be updated using the AFUD4234.EXE utility in DOS environment.

- Copy the AFUD4234.EXE utility to the bootable floppy disk that contains the BIOS file.
- Boot the system from the floppy disk.
- At the DOS prompt, type the command line:

AFUD4234 filename.rom

Where "filename.rom" means the latest (or original) BIOS file that you copied to the bootable floppy disk.
The whole process is automated and needs no input from the user.

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

When the BIOS update process is complete, the utility reboots the system.
Once the system has been restarted it will hold on the Pre-BIOS screen. At this stage the following need to be completed before starting windows.

1.   The system will halt on pre-BIOS, at this point you need to shut the machine down.
2.   Reboot the computer.
3.   System will holt on the pre-BIOS screen and display an error message (CMOS checksum error – Defaults loaded)
4.   Enter the BIOS setup by pressing DEL
5.   Once in the setup load the optimized settings by selecting 'Load Optimized Defaults'
6.   Exit the setup by selecting 'Save & Exit setup'.
7.   Now boot in to windows.

When you reboot the system it will hold on the Pre-BIOS screen. At this stage there will be an error message shown and details of the current BIOS. Check the BIOS version. The BIOS version is made up of the BIOS file name, version, build and time of flash E.g.

A7528IMS V1.0 011708 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.
2nd - 5th digit refers to the model number.
6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.
7th - 8th digit refers to the customer as MS = all standard customers.
V1.0 refers to the BIOS version.
011708 refers to the date this BIOS was released.

Power on the computer and the system will start POST (Power On Self Test) process.

When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

This requires the user to choose one of two options. Either F1 to continue with the default BIOS settings loaded or DEL to enter the BIOS setup.
Enter the BIOS setup and select 'load optimized default'. Then select 'Save & Exit setup'.

Configuring the Motherboard using BIOS Setup

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.

BIOS Setup Program

This motherboard supports a programmable firmware hub (FWH) that you can update using the provided utility described in section "2.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognise these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On Self Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. It is a menu driven program, which means you can scroll through the various sub-menus and make your selections from the available options using the navigation keys.

NOTE: If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system stability. Select the Load Default Settings item under the Exit Menu.

Main Menu Items

The Main menu is the first screen you are presented with on entering the BIOS setup.
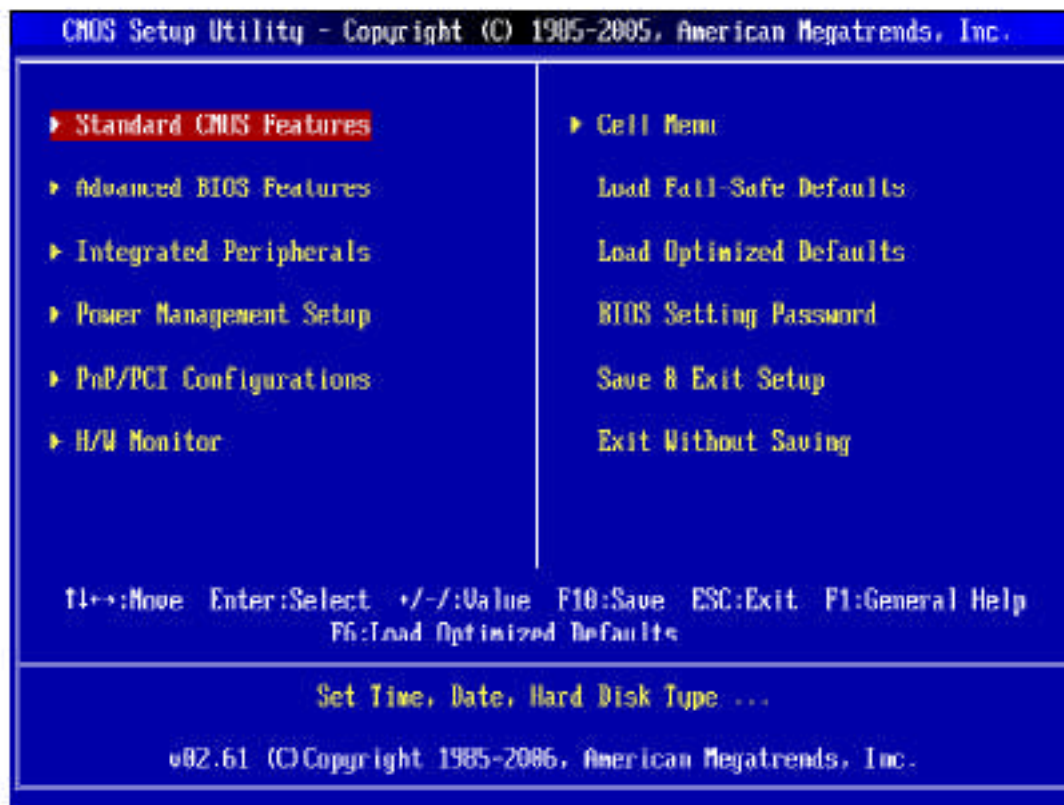
Figure 29: Main Menu

Sub Menu Items: An item with a sub-menu on any menu screen is distinguished by a solid triangle before the item. To display the sub-menu, select the item and press Enter.

Configuration Fields: These fields show the values for the menu items. If an item is user-configurable, you may change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press Enter to display a list of options.

Pop Up Window: Select a menu item then press Enter to display a pop-up window with the configuration options for that item.

Scroll Bar: A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press left/right or **Up/Down arrow keys** or **PageUp/PageDown keys** to display the other items on the screen.

General Help: To view general help press F1. This displays help information on the particular option you are in.

Main BIOS Menu Screen
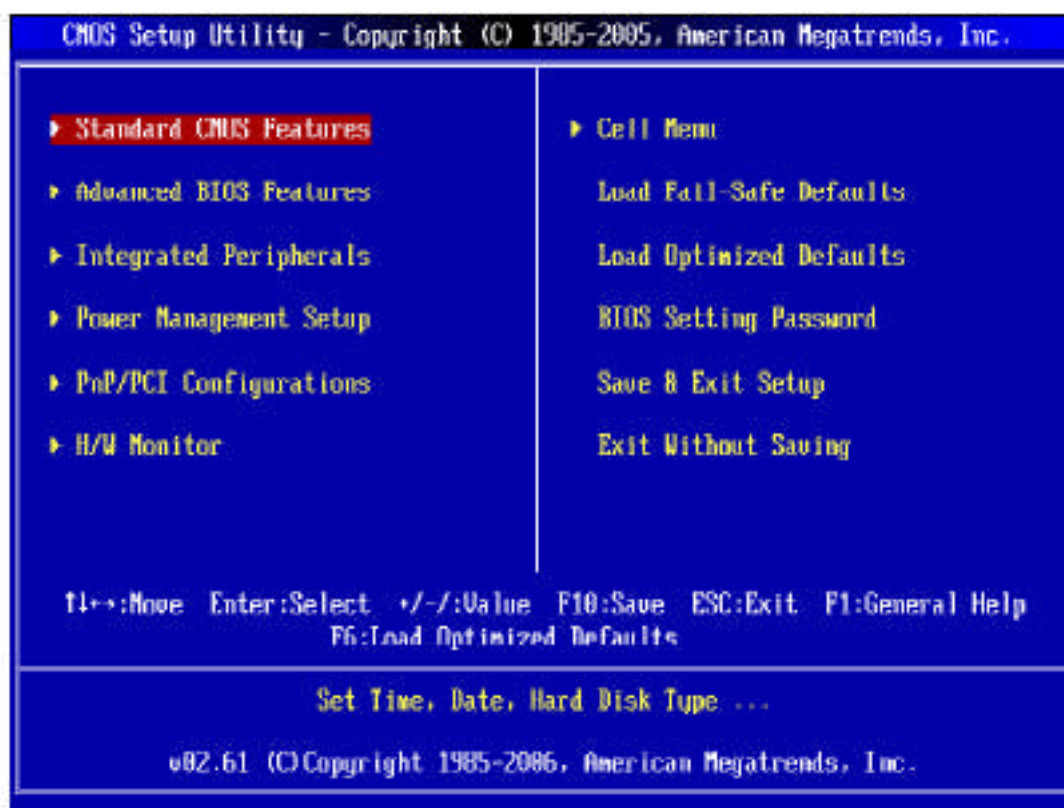
Figure 30: BIOS Menu Screen

Standard CMOS features: For changing the basic system configuration

Advanced BIOS features: For accessing advanced system settings

Advanced Chipset Features: For accessing Advanced chipset settings

Integrated Peripherals: For changing PCI, AGP and USB settings

Power Management Setup: For accessing advanced power management (APM) configuration

PnP/PCI Configurations: For changing IRQ settings

PC Health Status: Displays information regarding CPU temp and fan speed

Frequency/Voltage Control: For changing the CPU frequency and displaying current frequency information

Load Optimized Defaults: loads BOIS default values

BIOS setting password: option that allows a password to be set to access and change BIOS settings.

Save & Exit Setup: this option will save any changes made that have been made whilst using the BIOS CMOS setup utility and exit out of the BIOS CMOS setup utility.

Exit Without Saving: this option will not save any changes made that have been made whilst using the BIOS CMOS setup utility and exit out of the BIOS CMOS setup utility.

Standard CMOS Features

When you enter the BIOS Setup program, the Main menu screen appears giving you an overview of the basic system information.
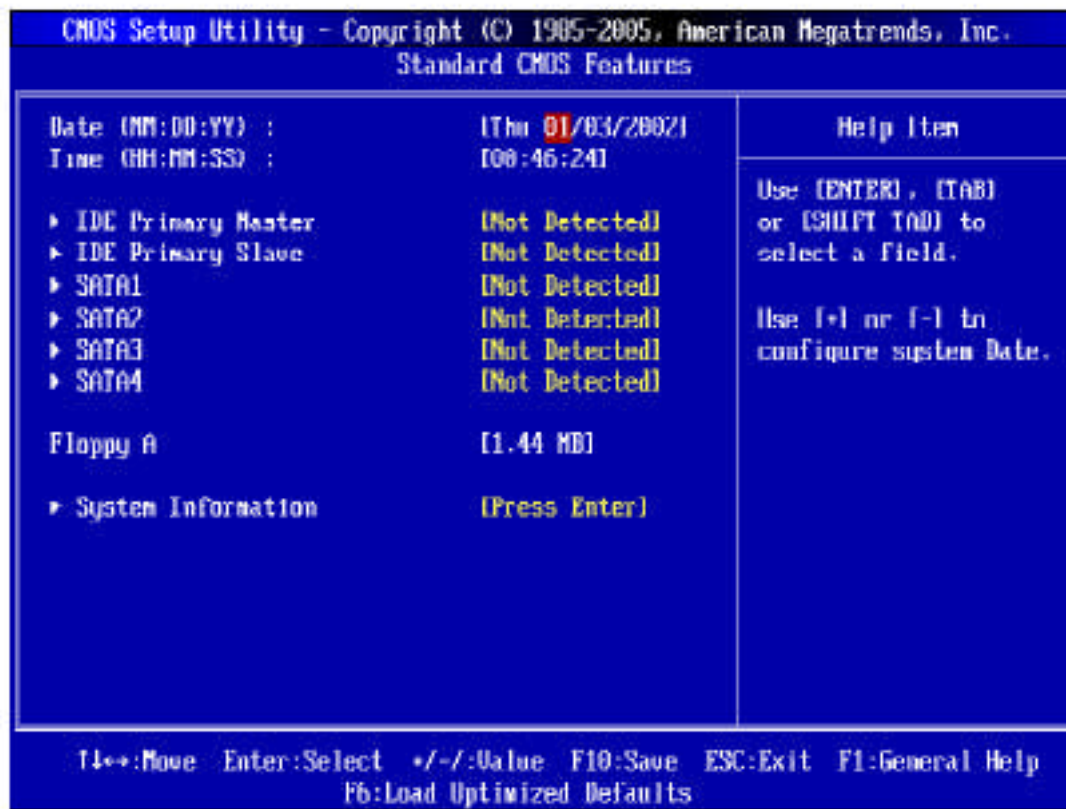
Figure 31: Standard CMOS features

System Date: This item allows you to set the system date [mm:dd:yyyy].

System Time: This item allows you to set the system time [hh:mm:ss]

IDE Primary/Secondary Master/Slave: This shows what devices are running of which IDE channel.

Floppy Drive A [1.44M, 3.5 in.]: Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M, 5.25 in.] [720K, 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

IDE Primary/Secondary Master/Slave

Figure 32: SATA Device Sub-Menu

LBA/Large Mode: This indicates the mode of the hard drive. Leave on auto if mode is not known.

DMA Mode: Allows the hard drive direct access to the memory.

Hard Drive S.M.A.R.T: If the hard drive used supports S.M.A.R.T (**Self-Monitoring, Analysis and Reporting Technology)** then this allows all the functions to be used.

Size: This indicates the capacity of the hard drive.

System Information

Press <Enter> to enter the sub-menu, and the following screen appears.
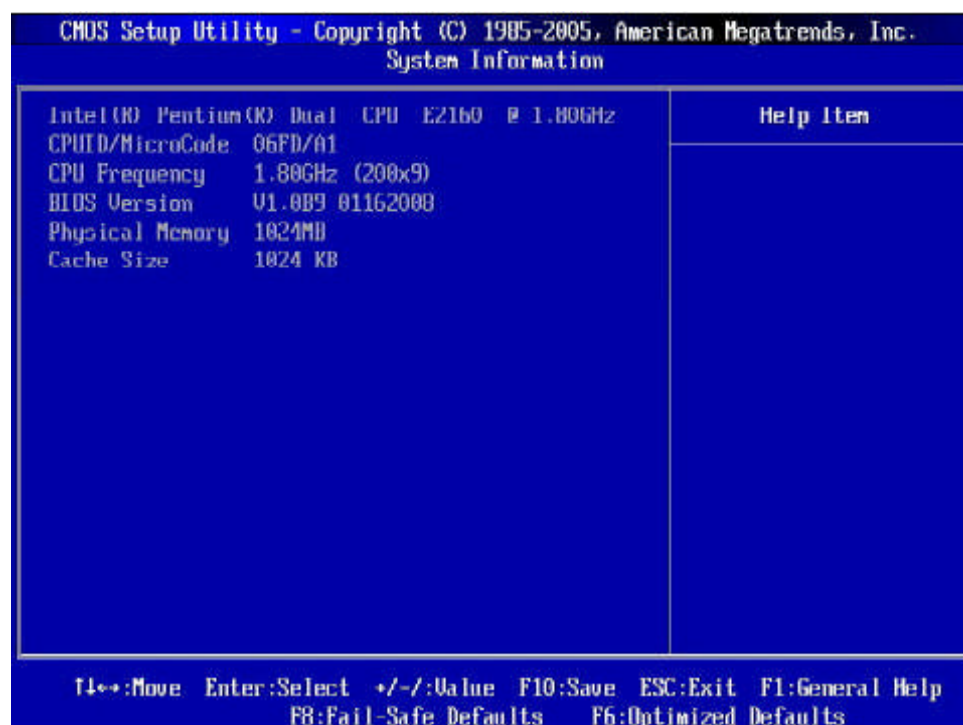
Figure 33: System Information Sub-Menu

This sub-menu shows the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS features

The Advanced menu items allow you to change the settings for the CPU and other system devices.

CAUTION!

Take caution when changing the settings of the Advanced menu items. Incorrect field values may cause the system to malfunction.
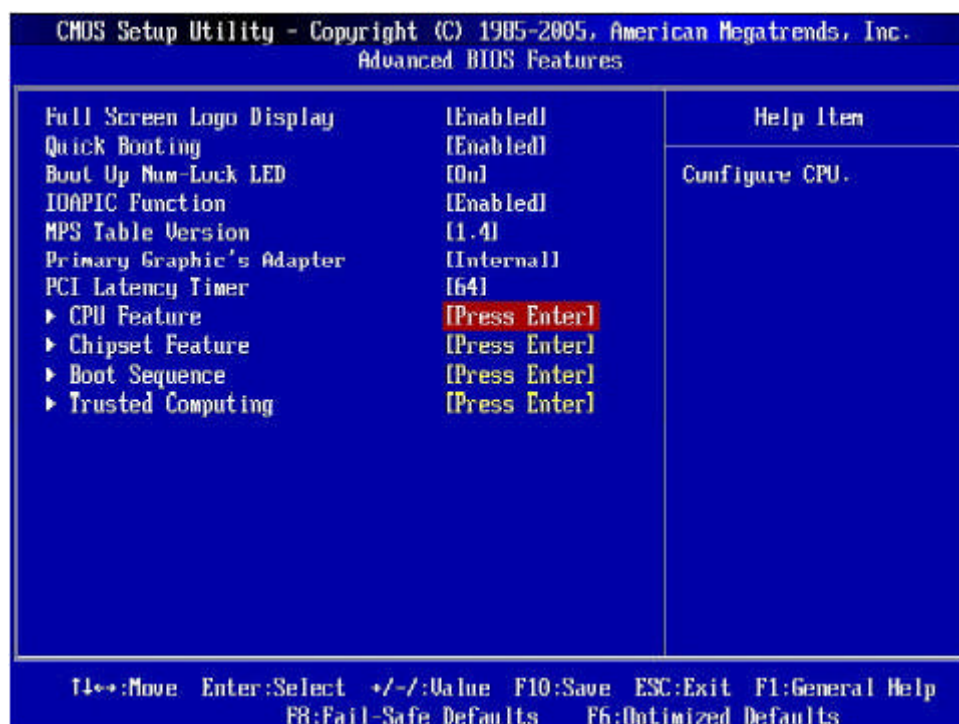
Figure 34: Advanced BIOS features Sub-Menu

Full Screen LOGO Display
This item enables you to show the company logo on the bootup screen. Settings are: [Enabled] shows a still image (logo) on the full screen at boot. [Disabled] shows the POST messages at boot.

Quick Booting: This speeds up the boot time of the system by not running a full memory test. If disabled, the boot time varies according to the amount of memory installed.

Boot Up Num-Lock LED
This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

IOAPIC Function
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

Primary Graphics Adapter
This setting specifies which graphic card is your primary graphics adapter.

PCI Latency Timer
This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

CPU Feature
Press <Enter> to enter the sub-menu:

➢ **Execute Disable Bit**
Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

➢ **Set Limit CPUID MaxVal to 3**
The Max CPUID Value Limit is designed to limit the listed speed of the processor to older operating systems.

Chipset Feature
Press <Enter> to enter the sub-menu:

➢ **HPET**
The HPET (High Precision Event Timers) is a component that is part of the chipset. You can to enable it, and will provide you with the means to get to it via the various ACPI methods.

➢ **VGA Share Memory Size**
The system shares memory to the onboard VGA card. This setting controls the exact memory size shared to the VGA card.

➢ **DVMT Mode Select**
This item allows you to set the mode for the graphics core.
  ○ [Fixed] mode, a fixed-size fragment of the system memory is allocated to the graphics core. It can only be used by the graphics core.

---

o [DVMT] mode, the driver of the graphics core uses the system memory like any other OS component or application does.

➢ **DVMT/FIXED Memory**
Specify the size of DVMT memory to allocate for video memory.

Boot Sequence
Press <Enter> to enter the sub-menu:

➢ **1st/ 2nd/ 3rd/ 4th Boot Device**
The items allow you to set the first/ second/ third boot device where BIOS attempts to load the disk operating system.

➢ **Boot From Other Device**
Setting the option to [Yes] allows the system to try to boot from other device. If the system fails to boot from the 1st/ 2nd boot device.

Trusted Computing
Press <Enter> to enter the sub-menu:

➢ **TCG/TPM SUPPORT**
This setting allows you to enable/disable the TCG/TPM.

➢ **Execute TPM Command**
This item allows you to enable or disable the TPM security chip.

➢ **Clearing the TPM**
This item allows you to clear the user information saved in the TPM security chip. When you press <Enter>, a warning message will appear to ask if you want to clear the user information in the security chip. Use the left / right arrow key to select between [OK] and [Cancel], and then press <Enter> to confirm your choice.

➢ **TPM Enable/Disable Status**
This item is not configurable.

➢ **TPM Owner Status**
This item is not configurable.

Integrated Peripherals
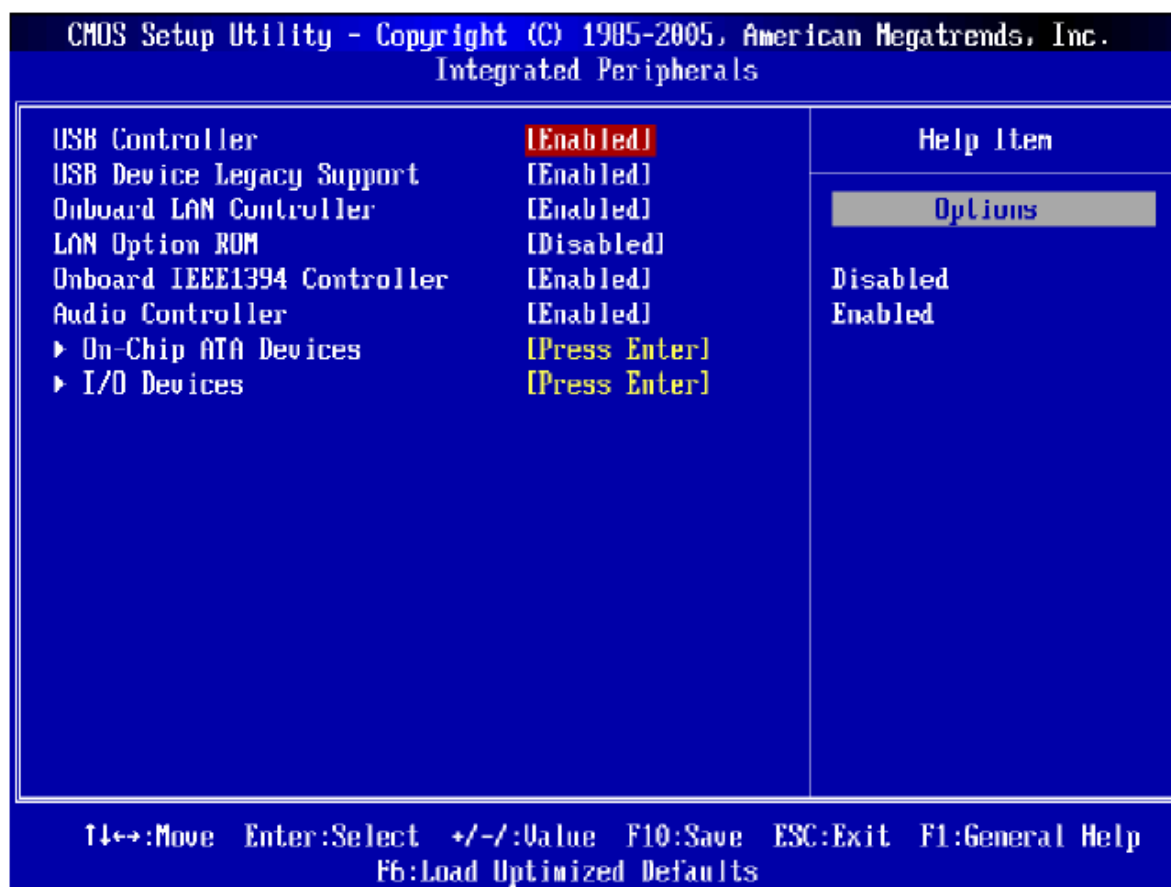
Figure 35: Integrated Peripherals Menu

USB Controller
This setting allows you to enable/disable the onboard USB controller.

USB Device Legacy Support
Select [Enabled] if you need to use a USB-interfaced device in the operating system.

Onboard LAN Controller
This item is used to enable/disable the onboard LAN controller.

LAN Option ROM
This item is used to decide whether to invoke the Boot ROM of the LAN controller.

Onboard IEEE1394 Controller
This item allows you to enable/disable the onboard IEEE1394 controller.

Audio Controller
This setting is used to enable/disable the onboard audio controller.

On-Chip ATA Devices
Press <Enter> to enter the sub-menu:

➢ **On-Chip IDE Controller**
These items allow users to enable or disable the IDE controller.

➢ **PCI IDE BusMaster**
This item allows you to enable/ disable BIOS to used PCI busmastering for reading/ writing to IDE drives.

➢ **On-Chip SATA Controller**
These items allow users to enable or disable the SATA controller.

➢ **RAID Mode**
This item is used to enable/disable the RAID function for SATA devices.

I/O Device Configuration
Press <Enter> to enter the sub-menu:

➢ **COM Port 1/2**
Select an address and corresponding interrupt for the first serial port.

➢ **Parallel Port**
There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

[Disabled]
[3BC] Line Printer port 0
[278] Line Printer port 2
[378] Line Printer port 1

➢ **Parallel Port Mode**
This item allows you to select the parallel port mode.

Power Management Setup

Figure 36: Power Management Setup menu

ACPI Function
This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 2000/ XP, select [Enabled].

ACPI Standby State
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 2000/ XP, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Settings are:

  ➤ [S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

  ➤ [S3] The S3 sleep mode is a lower power state where the in formation of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Power Button Function
This feature sets the function of the power button. Settings are:

  ➤ [On/ Off] The power button functions as normal power off button.
  ➤ [Suspend] When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Restore On AC Power Loss
This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

 ➢ [Off] Always leaves the computer in the power off state.
 ➢ [On] Always leaves the computer in the power on state.
 ➢ [Last State] Restores the system to the status before power failure or interrupt occurred.

Wakeup Event Setup
Press <Enter> and the following sub-menu will appear.

 ➢ **Resume From S3 By USB Device**
    The item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state.

 ➢ **Resume From S3 By PS/2 Keyboard**
    This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 keyboard is detected.

 ➢ **Resume From S3 By PS/2 Mouse**
    This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected.

 ➢ **Resume by PCI Device (PME#)**
    When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

 ➢ **Resume by PCI-E Device**
    When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCIE device.

 ➢ **Resume by RTC Alarm**
    The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

H/W Monitor

```
     CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                                  H/W Monitor
┌──────────────────────────────────────────────────┬────────────────────────┐
│ Chassis Intrusion              [Disabled]         │      Help Item         │
│ CPU Smart FAN Target           [Disabled]         │                        │
│                                                   │       Options          │
│            PC Health Status                       │                        │
│                                                   │  Disabled              │
│ CPU Temperature         :  54°C/129°F             │  Enabled               │
│ System Temperature      :  55°C/131°F             │  Reset                 │
│ CPU FAN Speed           :  3759 RPM               │                        │
│ SYS FAN1 Speed          :  N/A                    │                        │
│ SYS FAN2 Speed          :  N/A                    │                        │
│ CPU Vcore               :  1.392 V                │                        │
│ 3.3V                    :  3.264 V                │                        │
│ 5V                      :  5.003 V                │                        │
│ 12V                     .  11.000 V               │                        │
│                                                   │                        │
│                                                   │                        │
├──────────────────────────────────────────────────┴────────────────────────┤
│   ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help  │
│                    F6:Load Optimized Defaults                               │
└─────────────────────────────────────────────────────────────────────────────┘
```

Figure 37: Hardware monitor menu

Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to Enabled] later.

CPU Smart FAN Target
The motherboard provides the Smart Fan function which can control the CPU fan speed automatically depending on the current temperature to keep it with in a specific range. You can select a fan target value here. If the current CPU fan temperature reaches to the target value, the smart fan function will be activated. It provides several sections to speed up for cooling down automatically.

PC Health Status

> ➢ CPU/ System Temperature, CPU FAN/ SYS FAN1/ SYS FAN2 Speed, CPU Vcore, 3.3V, 5V, 12V

These items display the current status of all of the monitored hardware devices/components such as CPU voltage, temperatures and all fans' speeds.

Cell Menu

Figure 38: Cell Menu configuration

Current CPU / DRAM Frequency
These items show the current clocks of CPU and Memory speed. Read-only.

Intel EIST
The Enhanced Intel SpeedStep technology allows you to set the performance level of the microprocessor whether the computer is running on battery or AC power. This field will appear after you installed the CPU which supports speedstep technology.

Adjust CPU FSB Frequency
This item allows you to set the CPU FSB frequency (in MHz).

Adjusted CPU Frequency
It shows the adjusted CPU frequency (FSB x Ratio). Read-only.

Advance DRAM Configuration
Press <Enter> to enter the sub-menu.

➢ **DRAM Timing by Mode**
Setting to [Enabled] enables DRAM CAS# Latency automatically to be determined by BIOS based on the configurations on the SPD (Serial Presence Detect) EEPROM on the DRAM module.

➢ **CAS Latency (CL)**
When the Configuration DRAM Timing by SPD sets to [Disabled], the field is adjustable. This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

Advance DRAM Configuration -> tRCD
When the **DRAM Timing Mode** sets to [Manual], the field is adjustable. When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.

Advance DRAM Configuration -> tRP
When the **DRAM Timing Mode** sets to [Manual], this field is adjustable. This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.

Advance DRAM Configuration -> tRAS
When the **DRAM Timing Mode** sets to [Manual], this setting determines the time RAS takes to read from and write to a memory cell.

Advance DRAM Configuration -> tRTP
When the **DRAM Timing Mode** sets to [Manual], this setting controls the time interval between a read and a precharge command.

Advance DRAM Configuration -> tRC
When the **DRAM Timing Mode** sets to [Manual], the field is adjustable. The row cycle time determines the minimum number of clock cycles a memory row takes to complete a full cycle, from row activation up to the precharging of the active row.

Advance DRAM Configuration -> tWR
When the **DRAM Timing Mode** sets to [Manual], the field is adjustable. It specifies the amount of delay (in clock cycles) that must elapse after the completion of a valid write operation, before an active bank can be precharged. This delay is required to guarantee that data in the write buffers can be written to the memory cells before precharge occurs.

Advance DRAM Configuration -> tRRD
When the **DRAM Timing Mode** sets to [Manual], the field is adjustable. Specifies the active-to-active delay of different banks.

Advance DRAM Configuration -> tWTR
When the **DRAM Timing Mode** sets to [Manual], the field is adjustable. This item controls the Write Data In to Read Command Delay memory timing. This constitutes the minimum number of clock cycles that must occur between the last valid write operation and the next read command to the same internal bank of the DDR device.

Power User Mode
Press <Enter> to enter the sub-menu.

> **ADJUST CHANNEL 0/1 DRIVE**
> These two Groups are used to program RCOMP buffer strengths and slew rate table for the various signal groups of MCH. Each channel contains seven groups of signal (GROUP 0 ~ GROUP 6)

➢ **ADJUST ODT Strength**
This feature is designed to improve the signal integrity of the memory channel. ODT (On-Die termination) allows a DRAM to adjust the termination resistance for each DQ and DQS/DQS# signal.

➢ **ADJUST SCOMP Strength**
SCOMP (Secure Communications Processor) hardware protections against DMA devices that allow it to move the corresponding device drivers from the base layer to less critical parts of the system.

FSB/Memory Ratio
This item will allow you to adjust the FSB/Ratio of the memory.

Adjusted DRAM Frequency
It shows the adjusted DDR Memory frequency. Read-only.

Adjust PCI-E Frequency (MHz)
This field allows you to select the PCIE frequency (in MHz).

Auto Disable DIMM/PCI Frequency
When set to [Enabled], the system will remove (turn off) clocks from empty DIMM and PCI slots to minimize the electromagnetic interference (EMI).

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses create EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at Disabled for optimal system stability and performance. But if you are plagued by EMI, set to Enabled for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.

Main Menu Additional Options
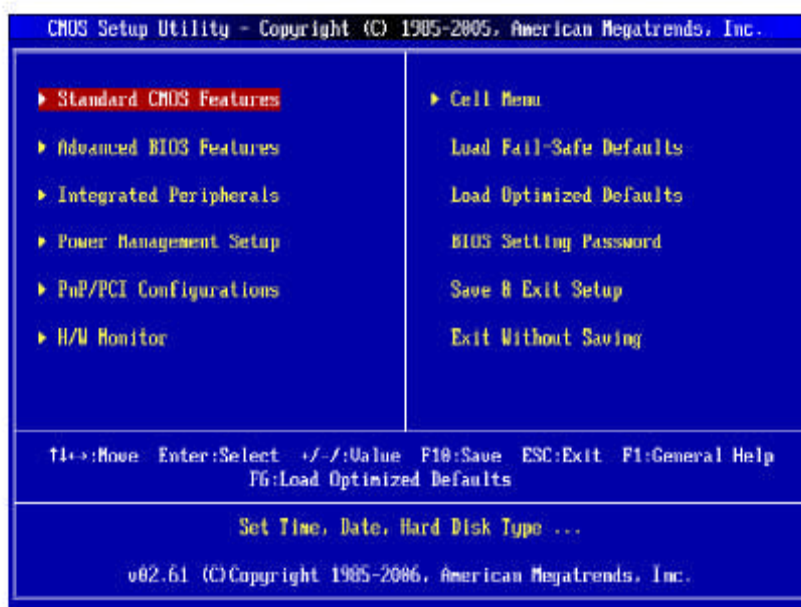
Figure 39: Main Menu

Load Optimized Defaults: Loads the BIOS defaults that are set by the factory for optimal performance.

BIOS Settings Password: Allows a password to be set to restrict access to the BIOS configuration

Save & Exit Setup: Allows the settings that have been changed to be saved and exits the BIOS setup menu. This also reboots the machine.

Exit Without Saving: Exits the BIOS setup menu without saving any setting that has been changed. This also reboots the machine.

Chapter 5: Technical Information

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 realised 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.

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'.

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 17: 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

Other Useful Connectors

Table 18: Front Panel I/O Connectors

Connector	Pin	Signal Name	Connector	Pin	Signal Name
Sleep/Power LED Green	2	+5 V	HDD LED	1	+5V HDD
Sleep/Power LED Yellow	4	0 v	HDD LED	3	OV HDD
Power Switch	6	SWITCH ON	RESET	5	RESET
Power Switch	8	Ground	RESET	7	Ground
No connection	10	None	No connection	9	+5V

Table 19: 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 20: Stacked USB Connectors

Pin	Signal Name
1	+5 V (fused)
2	USBP0# [USBP1#]
3	USBP0 [USBP1]
4	Ground

Table 21: 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 22: Audio Line Out Connector

Pin	Signal Name
Sleeve	Ground
Tip	Audio Left Out
Ring	Audio Right Out

Table 23: Audio Line In Connector

Pin	Signal Name
Sleeve	Ground
Tip	Audio Left In
Ring	Audio Right In

Table 24: Audio Mic In Connector

Pin	Signal Name
Sleeve	Ground
Tip	Mono In
Ring	Electret Bias Voltage

Table 25: 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 26: 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.

Table 27: Front Panel USB

Pin	Pin Assignment	Pin	Pin Assignment
1	VCC	2	VCC
3	Data0 -	4	Data1 -
5	Data0 +	6	Data1 +
7	Ground	8	Ground
9	NC	10	NC

Table 28: COM2

Pin	Pin Assignment	Pin	Pin Assignment
1	DCD	2	RXD
3	TXD	4	DTR
5	Ground	6	DSR
7	RTS	8	CTS
9	RI	10	NC

Table 29: Internal Speaker

Pin	Pin Assignment
1	Signal
2	NC
3	Ground
4	+5V

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 213,209 hours.

Temperature

Table 30: Temperature

Temperature	Specification
Non-operating	-40°C to +70°C
Operating	0°C to +55°C

Chapter 6: Glossary

BIOS

(Basic Input Output System) 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.

Notes

Chapter 7: Suggestions

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?

_____
_____
_____
_____
_____
_____

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

_____
_____
_____
_____
_____
_____

3. Does the manual go into enough detail?

_____
_____
_____
_____
_____

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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Please return this slip to: Product Development Dept.
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