

VIG556M Motherboard Manual

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Minds
Think**

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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).



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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Chapter 1: Motherboard Overview

Introduction

This manual describes the Viglen Vig556M 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® Pentium® 4 & Pentium® D family including Hyper-Threading enabled CPU's and the very latest Dual Core CPU's. 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 Vig556M 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 Vig556M motherboard supports Intel® Pentium® 4 & Pentium® D processors with up to 2MB of second-level cache integrated in an LGA 775 Socket package operating at speeds of up to 3.6GHz. Also supported is the Intel® Celeron® D processor 775 pin with up to 512K second-level cache and a 533MHz system bus operating at speeds of up to 3.46GHz.

The motherboard features:

Form factor:

- Micro ATX Form Factor: 243mm by 230mm

Processor:

- Single Celeron® D/Pentium® 4/Pentium® D CPU
- 400MHz Quad-pumped bus
- Integrated up to 2MB second-level cache (CPU dependant)
- Socket 775 connector

Main memory:

- Two 184-pin DDR DIMM sockets.
- Support for up to 2GB of DDR DIMM memory.

Chipset

- SiS 661FX
 - 800Hz Front Side Bus (FSB)
 - AGP 8x
 - Support for 266/333/400MHz DDR RAM
 - Advanced System Power Management features
 - Integrated Super I/O Controller
 - DirectSound AC97 Audio
 - Dual bus master IDE Ultra DMA33/66/100/133

Audio

Audio Codec '97 (AC '97) compatible audio subsystem

LAN

Realtek 10/100 Mbit/sec Platform LAN Connect (PLC) device

Peripheral Interfaces

- Support for two internal Universal Serial Bus (USB) ports and four external
- One serial port
- One parallel port
- Two IDE interfaces with Ultra DMA 33, ATA66/100/133 support.
- Two SATA interfaces.
- One diskette drive interface
- PS/2 keyboard and mouse ports

Expansion Capabilities

- Three PCI bus add-in card connectors
- One AGP Pro connector

Instantly Available PC

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

Wake on LAN Technology Connector

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

Microprocessor

The motherboard supports a single Celeron D, Pentium 4 or Pentium D processor. The processor's VID pins automatically program the voltage regulator on the motherboard to the required processor voltage. In addition, the front side bus speed is automatically selected. The motherboard currently supports processors that run internally up to 3.6GHz and have up to a 2MB second-level cache running at full CPU Speed.

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

Microprocessor Packaging

The Pentium 4/D processor comes in an LGA package that connects to the motherboard through a socket 775 connector. The package consists of:

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

Second Level Cache

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

Processor Upgrades

The motherboard can be upgraded with a Pentium 4 or Pentium D processor that runs at higher speeds.

Memory

Main Memory

The motherboard has two DDR DIMM sockets. Minimum memory size is 128MB; maximum memory size is 2GB. The BIOS automatically detects memory type, size, and speed.

The motherboard supports the following memory features:

- 184-pin DIMMs.
- 266/333/400Mhz
- Un-Buffered Non-ECC DIMM.

RDRAM

Synchronous DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timing is dependent on the number of memory clock cycles.

Chipset

The SiS 661FX chipset is the latest generation of desktop PCI set, it includes new features such as –

- 8x AGP Support
- ATA-133 IDE Hard drive support
- SATA Hard drive support
- 800MHz Front Side Bus support
- ACPI & On-Now

Accelerated Graphics Port (AGP)

The Vig556M features both integrated graphics and an AGP port. When using the integrated graphics then a dynamic portion of the main system memory is used as video memory. You can also use any AGP video card, with 4x/8x AGP performance. The Accelerated Graphics Port (AGP) is a high-performance interconnect for graphic-intensive applications, such as 3D applications. AGP is independent of the PCI bus and is intended for exclusive use with graphical-display devices. AGP overcomes certain limitations of the PCI bus related to handling a large amount of graphics data with the following performance features:

- Pipelined-memory read and write operations that hide memory access latency.
- Demultiplexing of address and data on the bus for near 100 percent bus efficiency.
- AC timing for 133 MHz data transfer rates, allowing data throughput of 500 MB/sec.

Realtek 8100C Platform LAN Connect Device

The Realtek 8100C 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 8100C provides the following functions:

- Basic 10/100 Ethernet LAN Connectivity
- Supports RJ-45 connector with status indicator LEDs
- Full driver compatibility
- Advanced Power Management support
- 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 Colour	LED State	Condition
Green	Off	10 Mbit/sec data rate is selected.
Green	On	100 Mbit/sec data rate is selected.
Yellow	Off	LAN link is not established.
Yellow	On (steady state)	LAN link is established.
Yellow	On (brighter and pulsing)	The computer is communicating with another computer on the LAN.

Universal Serial Bus (USB)

The motherboard has four USB ports and a further four can be added via internal headers; one USB peripheral can be connected to each port. For more than eight

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

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

LS-120 Support

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

The Vig556M 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 °C with 3.3 V applied.

I/O Interface Controller

The motherboard uses the SMC FDC37C777 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

One 9-pin D-Sub serial port connector is located on the back panel and is compatible with NS16C550 UARTs.

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
- 1.2 MB, 3.5-inch (driver required)
- 1.25/1.44 MB, 3.5-inch
- 2.88 MB, 3.5-inch

PS/2 Keyboard and Mouse Interface

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

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

Audio Subsystem

The Vig556M board has multiple AC '97 V 1.03 compliant audio features including an Analog Devices ALC 655 codec.

The audio subsystem includes these features:

- Split digital/analog architecture for improved S/N (signal-to-noise) ratio: $\geq 85\text{dB}$ – measured at line out, from any analog input, including line in, CD-ROM, and auxiliary line in.
- 3-D stereo enhancement
- Power management support for APM 1.2 and ACPI 1.0 (driver dependant)
- Audio inputs:
 - Four analog line-level stereo inputs for connection from line in, CD, video source line in and aux
 - Two analog line-level inputs for speakerphone input and PC beep
 - One mono microphone input

- Audio outputs:
 - Stereo line-level output
 - Mono output for speakerphone

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 AGP universal connector.

System Board Components

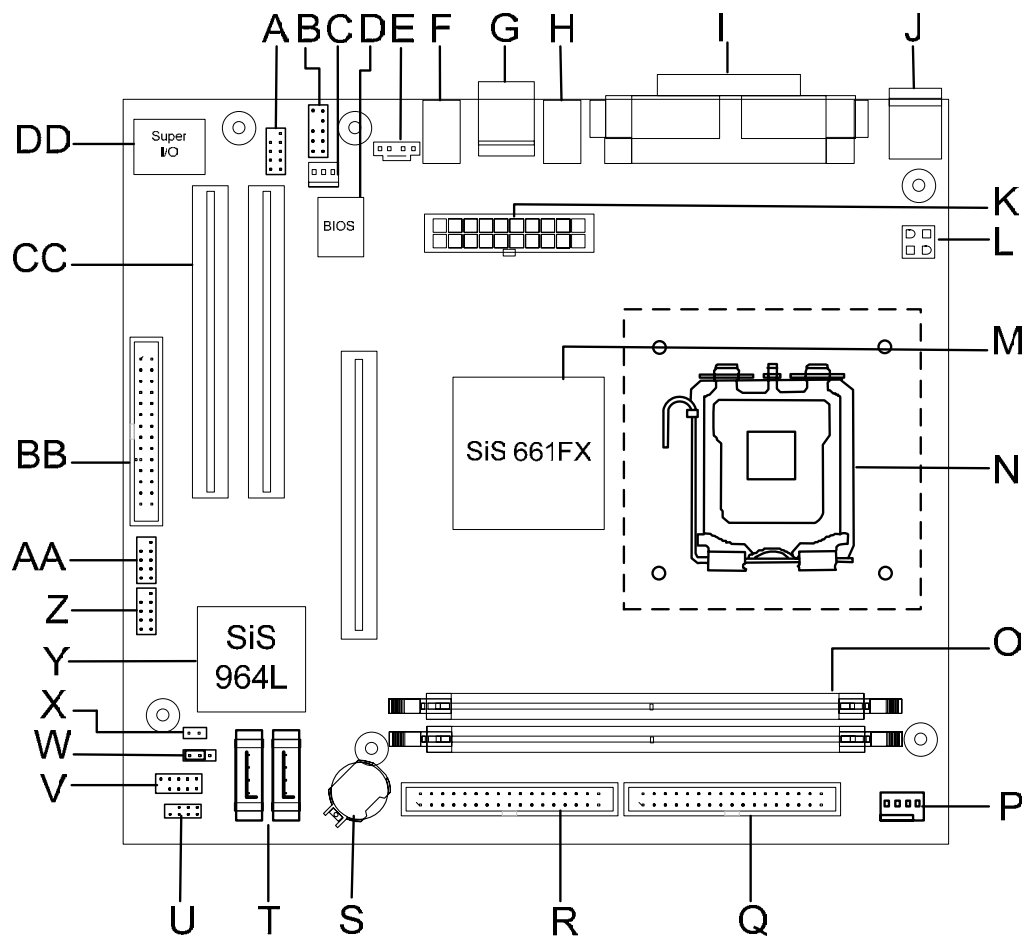


Figure 1: Motherboard Layout & Components

Table 2: Motherboard Connection

A: Serial header	P: CPU Fan header
B: Audio header	Q: IDE 2
C: Case Fan	R: IDE 1
D: BIOS	S: CMOS Battery
E: Audio CD in	T: SATA 1 and 2
F: Rear Audio	U: Power LED and speaker header
G: LAN and USB	V: Front Panel header
H: USB	W: Clear CMOS jumper
I: VGA, Serial and Parallel	X: Chassis intrusion header
J: PS/2 Keyboard and mouse	Y: South Bridge
K: ATX 20 pin	Z: USB header 1
L: ATX 4 pin	AA: USB header 2
M: North Bridge	BB: Floppy connector
N: 775 pin CPU socket	CC: PCI slots
O: DIMM socket 1 and 2	DD: I/O chip

Overview of System Board Components

A – Serial Header

Allows a serial device to be attached.

B – Audio Header

Allows a front audio panel to be connected. (Intel® Standard)

C – Case Fan Header

Allows a case fan to be connected to aid cooling.

D – BIOS

This controls the boot loader and all the hardware in the system.

E – Rear Audio

Allows a MIC, a Line-in and a Line-out to be connected.

F – Front Panel Audio

Allows a front facing audio panel to be fitted.

G – LAN and USB

Allows up to four USB devices to be connected and a network.

H – VGA, Serial and Parallel

Allows a VGA monitor, a serial device and a parallel device to be attached.

I – PS/2 Keyboard and mouse

Allows a PS/2 Keyboard and mouse to be attached.

K – 20 pin ATX power connector

This is the main power connector for the motherboard.

L – 4 pin ATX power connector

This provides power directly to the CPU and to the AGP port.

M – North Bridge

The SIS ® 611FX provides the processor interface with 800/533/400 MHz frequency, support for Intel ® Hyper-Threading Technology, system memory interface at

266MHz operation, and 1.5V AGP interface that supports AGP 2.0 specification including 8x Fast Write protocol.

N – 775 pin CPU Socket

This is where the CPU is installed.

O – DIMM slots 1 and 2.

This allows up to 2GB of DDR RAM to be installed. Up to 1GB of RAM in each slot.

P – CPU Fan header

Allows a CPU fan to be connected

Q – Second IDE

This allows an additional 2 IDE device to be added to the motherboard. The port is slotted to ensure correct installation.

R – Primary IDE

This allows up to 2 devices, such as CD/DVD drives and hard drives to be added to the IDE channel. The port is slotted to ensure correct installation.

S – CMOS Battery

Supplies backup power to the CMOS. This keeps all the settings and information in the BIOS.

T – SATA 0 and 1

This allows two SATA devices to be connected.

U – Power LED and speaker header.

This allows a three pin power LED and a speaker to be connected to the board.

V – Front Panel header

This allows the case cables to be connected, such as HDD LED, Reset switch and power switch.

W – Clear CMOS jumper

Moving the jumper from the default position allows the CMOS to be cleared and reset.

X – Chassis intrusion

Allows a chassis intrusion switch to be added.

Y – South Bridge

The SIS® 964L integrated peripheral controller supports various I/O functions including 2-channel ATA/133 bus master IDE controller, up to six USB 2.0 ports, LPC Super I/O interface, AC'97 interface and PCI 2.2 interface.

Z – USB Header 1

This allows up to two USB devices to be connected through the use of a cable.

AA – USB Header 2

This allows an addition two USB devices to be connected through the use of a cable.

BB – Floppy Connector

Allows a floppy drive to be connected

CC – PCI slots

Allows two PCI devices to be connected to the board.

DD – I/O chip

This controls the Input and the Output on the motherboard

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.

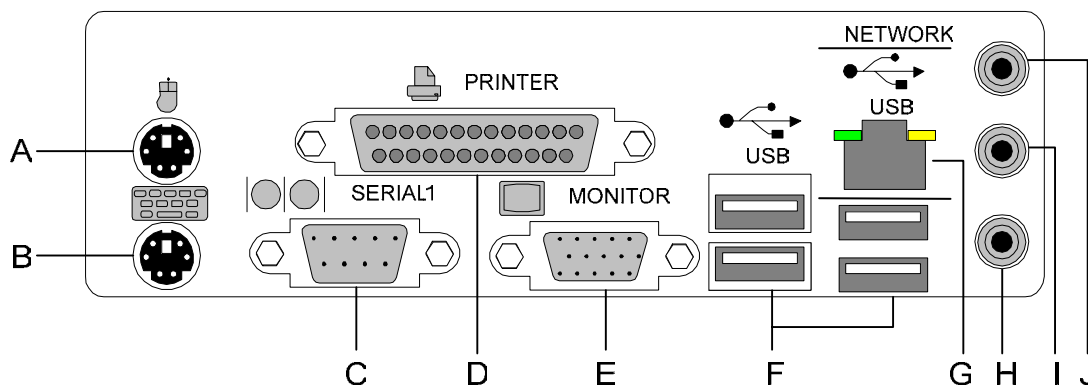


Figure 2: Rear I/O Shield

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

A/B – PS/2 Keyboard/Mouse Ports

The purple connector is for a PS/2 keyboard and the green connector is for a PS/2 mouse connector.

C – Serial Port

This 9-pin COM1 port is for a pointing device or other serial devices.

D – Parallel Port

This 25-pin port allows connection of a parallel device e.g. Printer, scanner etc

E – Video Graphics Adapter Port

This 15-pin port is for a VGA monitor or other VGA-compatible devices.

F – USB 2.0 Ports

These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

G – RJ-45 Port

This port allows connection to a Local Area Network (LAN) through a network hub.

H – Line-In Jack

This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Bass/Center.

I – Line-Out Jack

This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.

J – Microphone Jack

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 3: 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 VIG556M motherboard is capable of accepting Celeron® D, Pentium® 4 or Pentium® D CPU's. RAM can be upgraded to a maximum of 2GB using DDR266, DDR333 or DDR400 SDRAM 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.

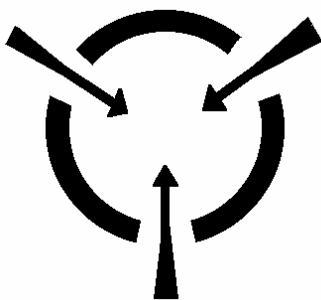
The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment. Do not operate the system with the cover removed. Always replace the cover before turning on 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 VIG556M 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 VIG556M motherboard contains the latest technology to offer an almost jumperless configuration. All Celeron[®] D, Pentium[®] 4 and Pentium[®] D 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

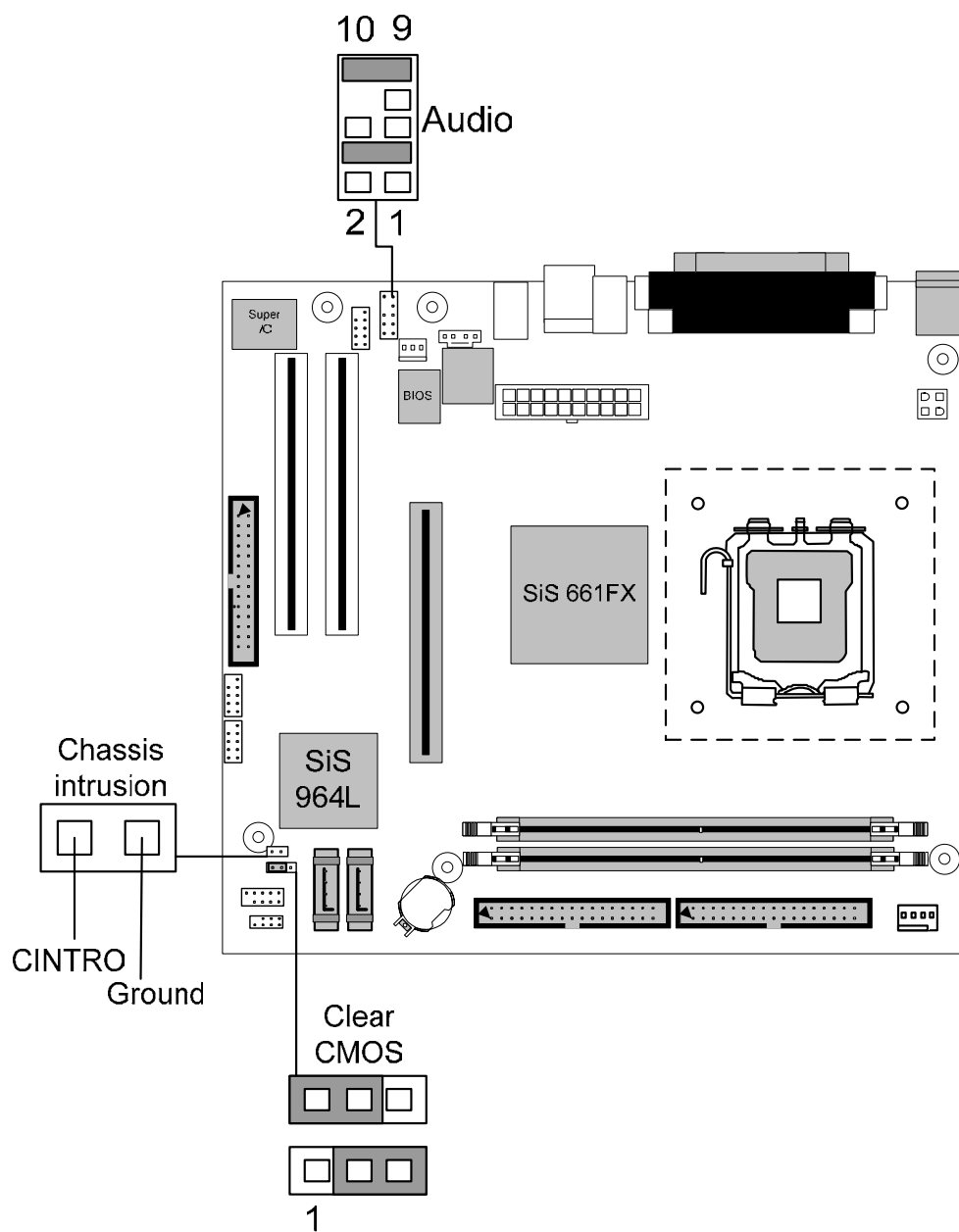


Figure 3: System Board Jumper Settings

Table 4: 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.

Table 5: Front Panel Audio Jumper Settings

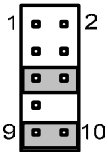
Function	Jumper	Configuration
Normal 	5 – 6 and 9- 10	The audio line signals are routed back to the line connector.

Table 5a: Front panel Audio Connector

Pin	Signal name	Pin	Signal name
1	Audio Mic	2	Ground
3	Audio Mic Bias	4	VCC
5	Speaker Out Right Channel	6	Speaker Out Right Channel Return
7	X	8	Key
9	Speaker Out Left Channel	10	Speaker Out Left Channel Return

CAUTION!

Do not move the jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing the jumper.

NOTE: 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.

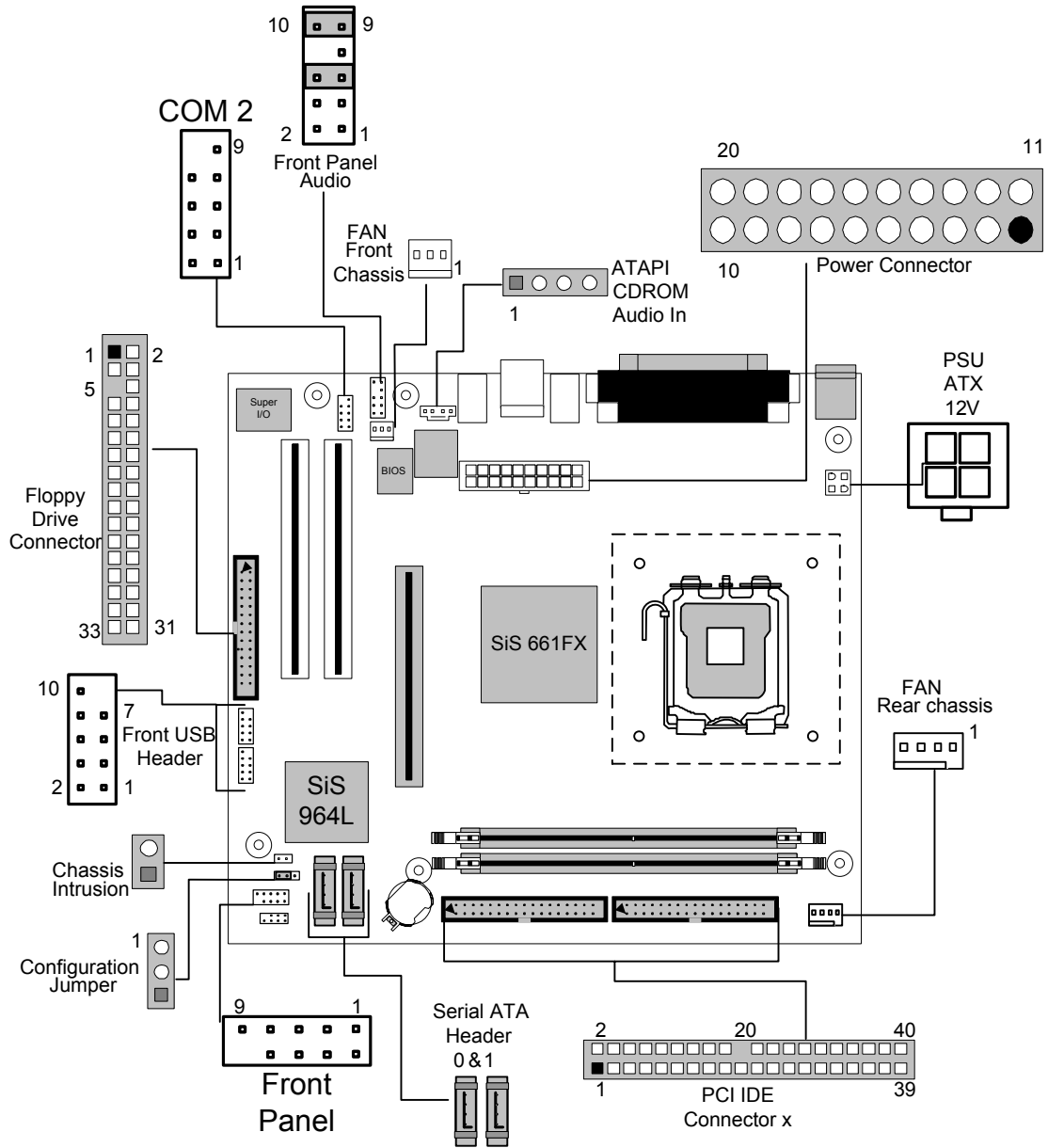


Figure 4: Motherboard Connectors

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.

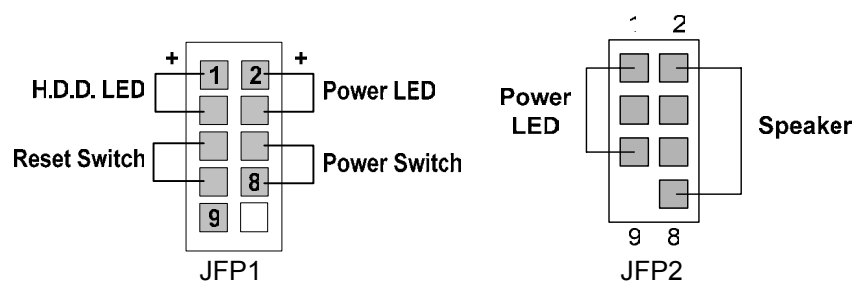


Figure 5: Front panel connectors

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. You can attach either a three pin LED or a 2 pin depending on what the case is supplied with.

Power On/Off

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

Upgrading the CPU

CAUTION!

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

The Pentium® 4 & Pentium® D processor together with Level 2 cache chips are housed in a protective package.

The design of the VIG556M computer makes it a simple job to replace or upgrade the processor. To do so please refer to figure 6 and follow the instructions below:

1. The CPU has a plastic cap on it to protect the contact from damage. Before you have installed the CPU, always cover it to protect the socket pin. Remove the cap from lever hinge side. The pins of socket reveal. Lift the load lever up and open the load plate.
2. The CPU has a cover on the bottom to prevent contact damage. Rotate it to make the pin 1 indicator (yellow triangle) in the left-bottom corner. The availability of it depends on the CPU packing.
3. Use 2 hands to remove the cover on the bottom of the CPU (if any). Please note not to touch the underside of it.
4. Align the pin 1 indicators (the triangles on the CPU).
5. Using your forefinger and thumb place CPU in socket. Being careful not to move the CPU whilst in the socket.
6. Lay the load plate on top of the CPU and press down the load lever until the lever is locked in place.

Installing & Removing Memory Modules

Installing Memory

You can install from 64MB to 2GB of memory in the motherboard DIMM sockets. The motherboard has two DIMM sockets. The motherboard supports the following memory features:

- 184-pin DIMMs with gold-plated contacts.
- Non-ECC (64-bit) memory.
- 64MB, 128MB, 256MB, 512MB and 1GB modules.

NOTE: *DDR 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.

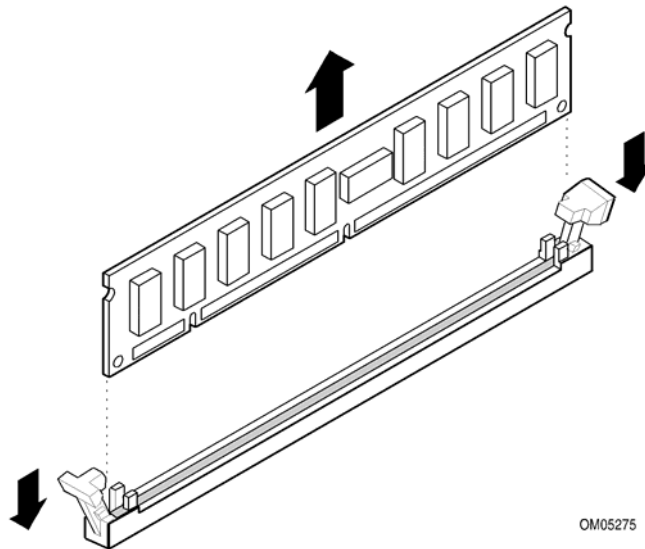


Figure 6: Removing Memory Modules

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 6: 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.



Figure 7: Installing a PCI card

AGP Slot

This motherboard has an Accelerated Graphics Port (AGP) slot that supports AGP 8X (3.3V/1.5V) cards.

NOTE: The notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.

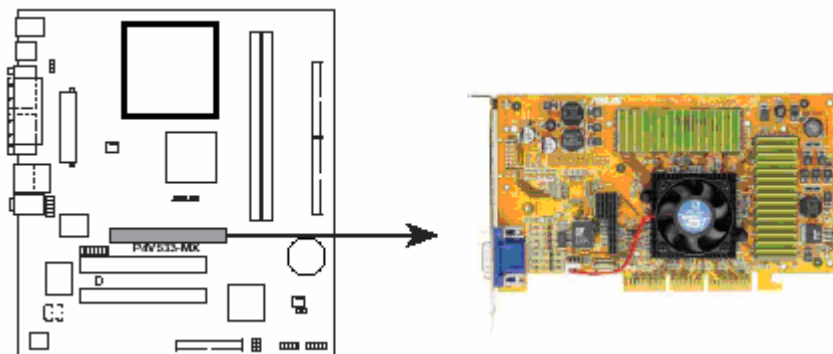


Figure 8: Install an AGP card

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 10).
6. Install the new battery in the socket.

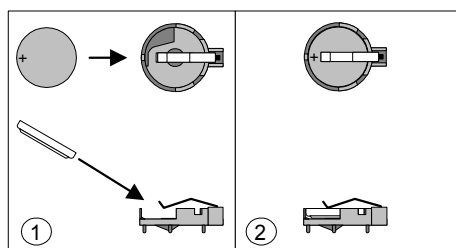


Figure 9: Removing the Battery

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: 08705 922 922
Fax: 01727 201 888
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 7: 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 - DFFFFH, run Set-up and enable shared memory for the appropriate memory space.

Problems & Suggestions

Table 8: Problems and Suggestions

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

Table 8: 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 AWFL855A.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 AWFL855A.EXE utility in DOS environment.

- Copy the AWFL855A.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:

Awfl855a filename.bin

Where "filename.bin" 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 halt 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.

W7103SMS V1.0 121404 14:27:50

The V number is the version, in this case Version 1.0.

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.

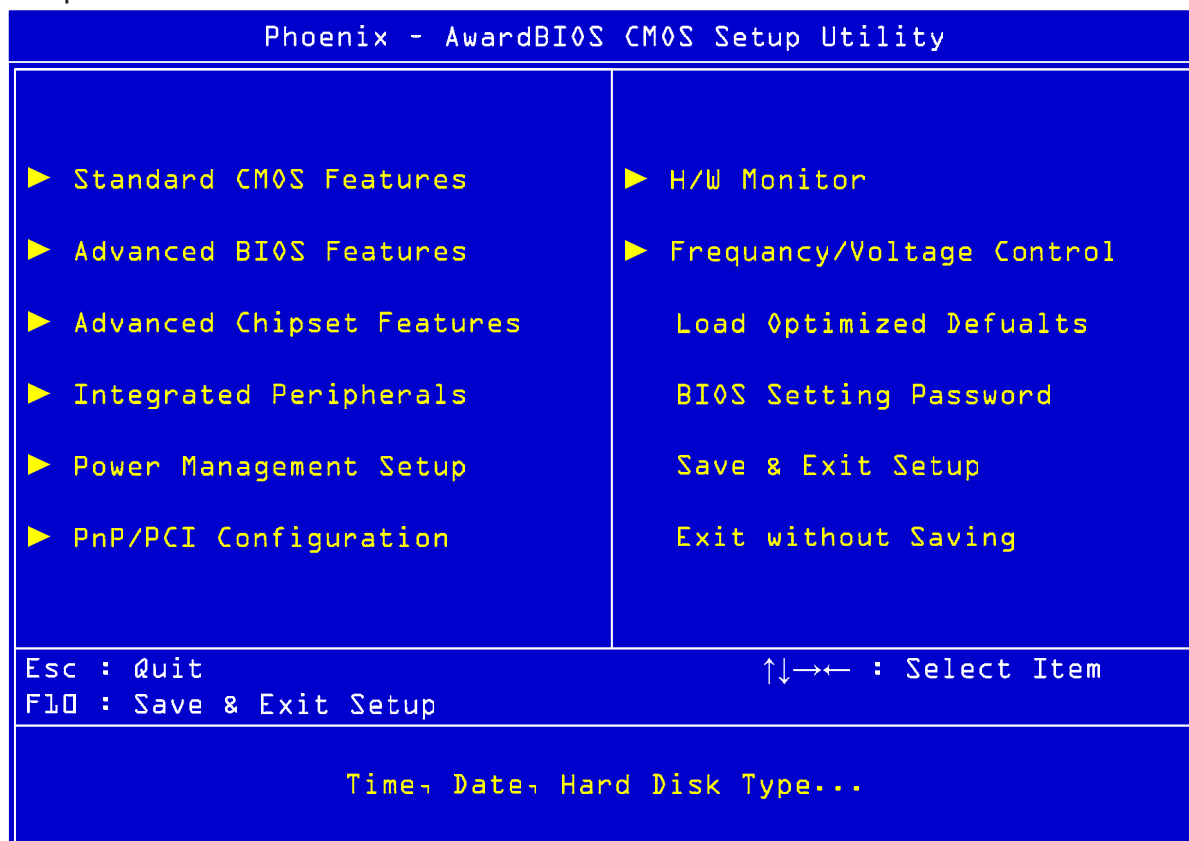


Figure 10: Main Menu

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

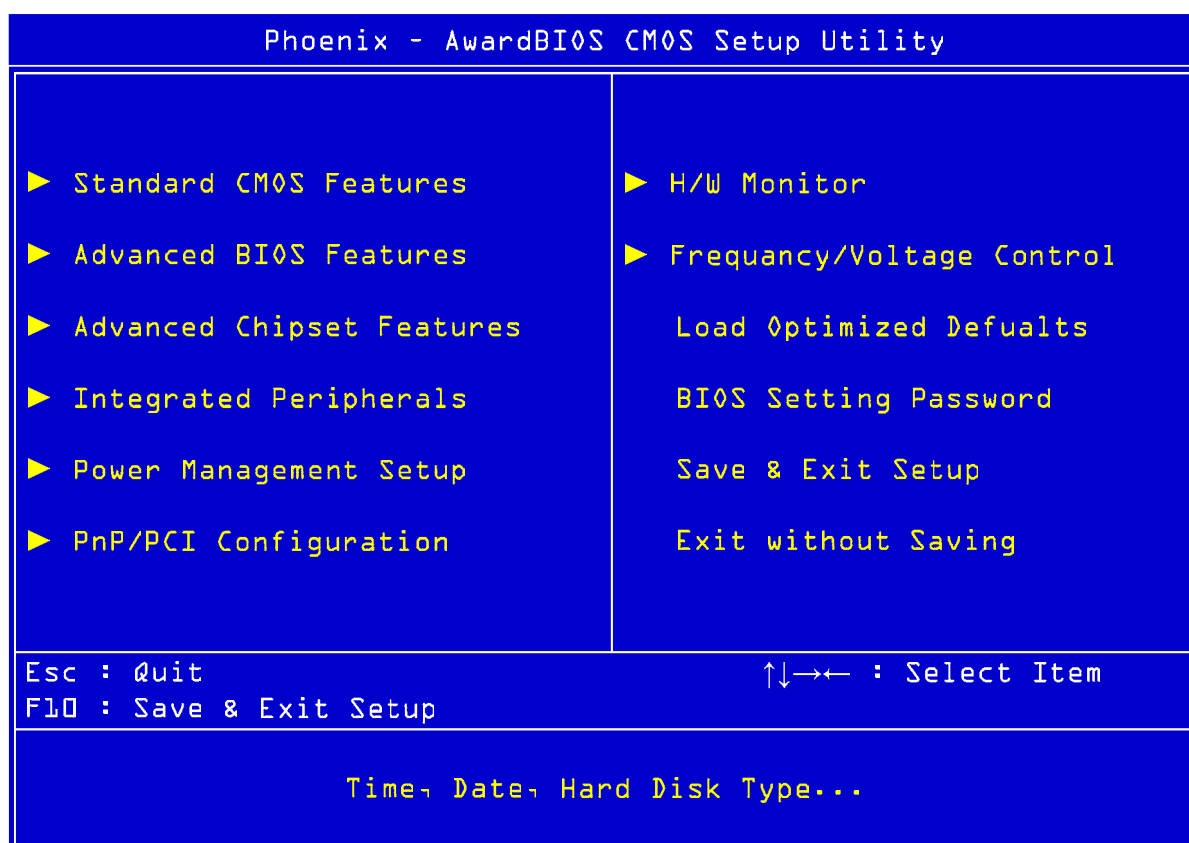


Figure 11: BIOS Menu Screen

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.

IDE Primary/Secondary Master/Slave

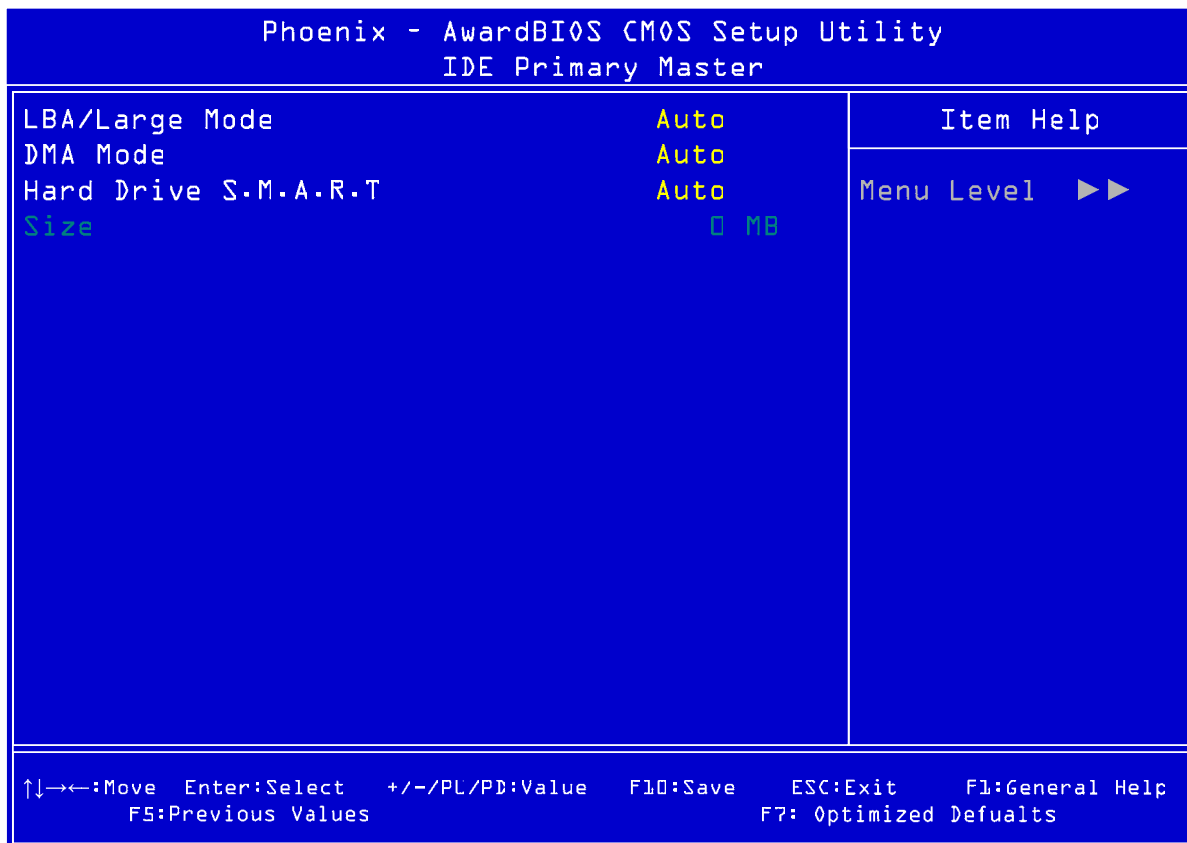


Figure 13: IDE Device Sub-Menu

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 (**S**elf-**M**onitoring, **A**nalysis and **R**eporting **T**echnology) then this allows all the functions to be used.

Size: This indicates the capacity of the hard drive.

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.

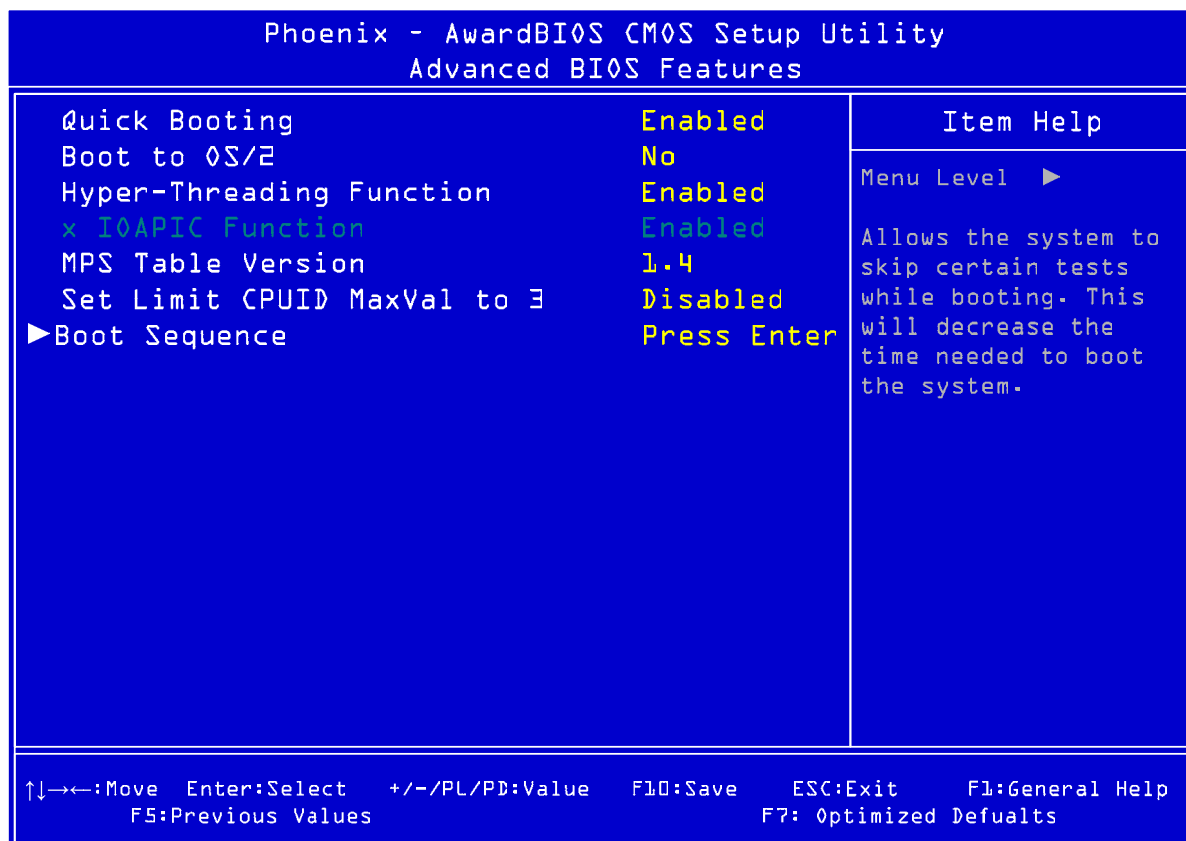


Figure 14: Advanced BIOS features Sub-Menu

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 to OS/2: This tells the BIOS whether OS/2 is being used and adjusts settings accordingly.

Hyper-Threading Function: This allows full functionality of hyper-threading CPU's to be used.

MPS Table version: The version of the MPS table being used.

Set Limit CPUID MaxVal to 3: Sets the CPUID limit to 3

Boot Sequence

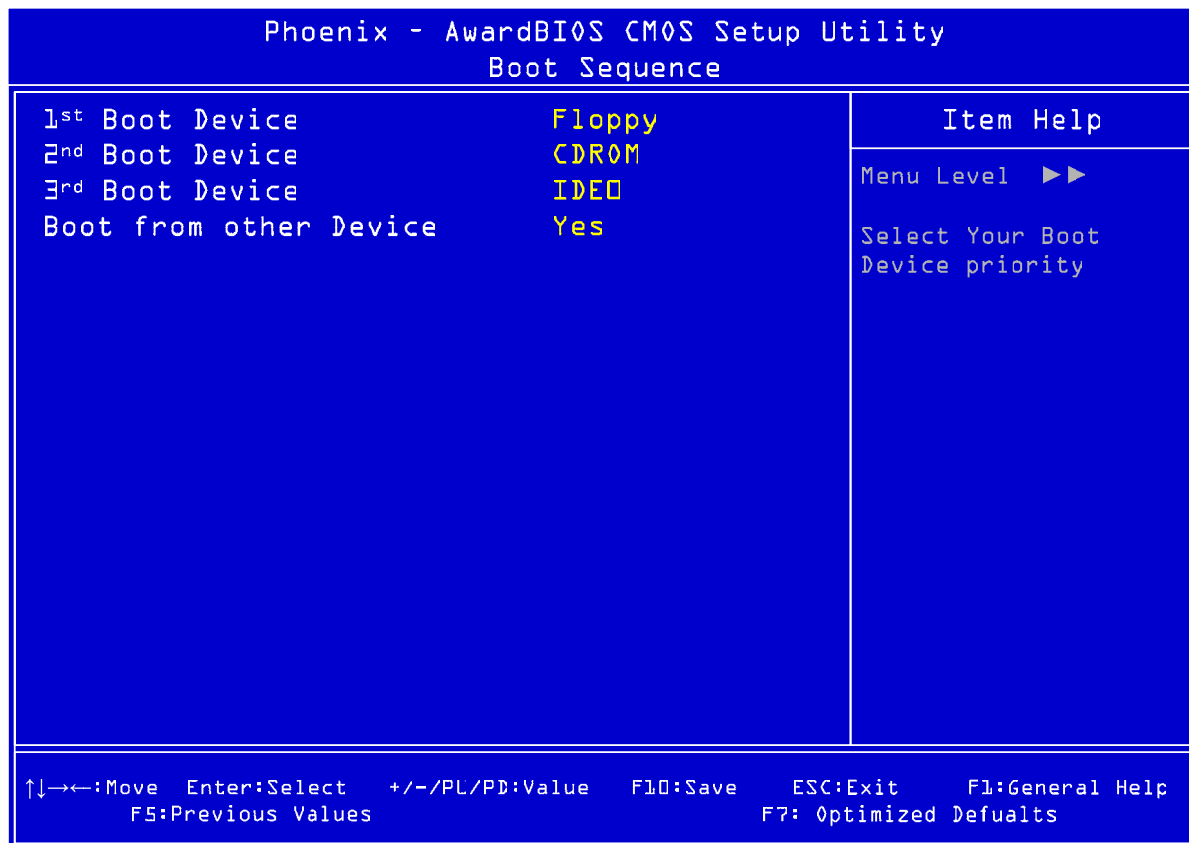


Figure 15. Boot sequence Sub-menu

1st Boot Device: The 1st device the system tries to boot from

2nd Boot Device: The 2nd device the system tries to boot from

3rd Boot Device: The 3rd device the system tries to boot from

Boot from other Device: Allows another device to be booted from such as a USB device.

Advanced Chipset Features

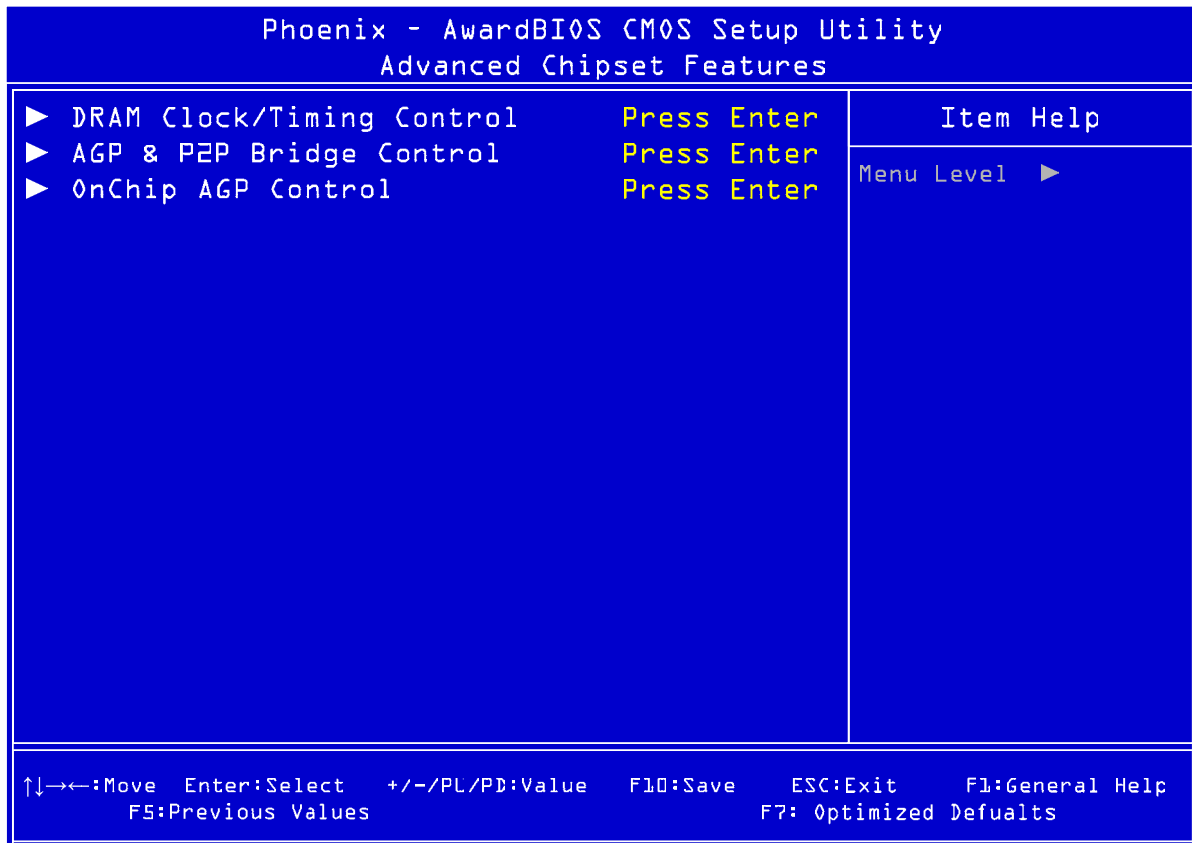


Figure 16: Advanced Chipset Features

DRAM Clock/Timing Control: Allow control over the timing of the DRAM

AGP & P2P Bridge Control: Allows control over the AGP Bridge

OnChip AGP Control: Controls the AGP

DRAM Timing Control

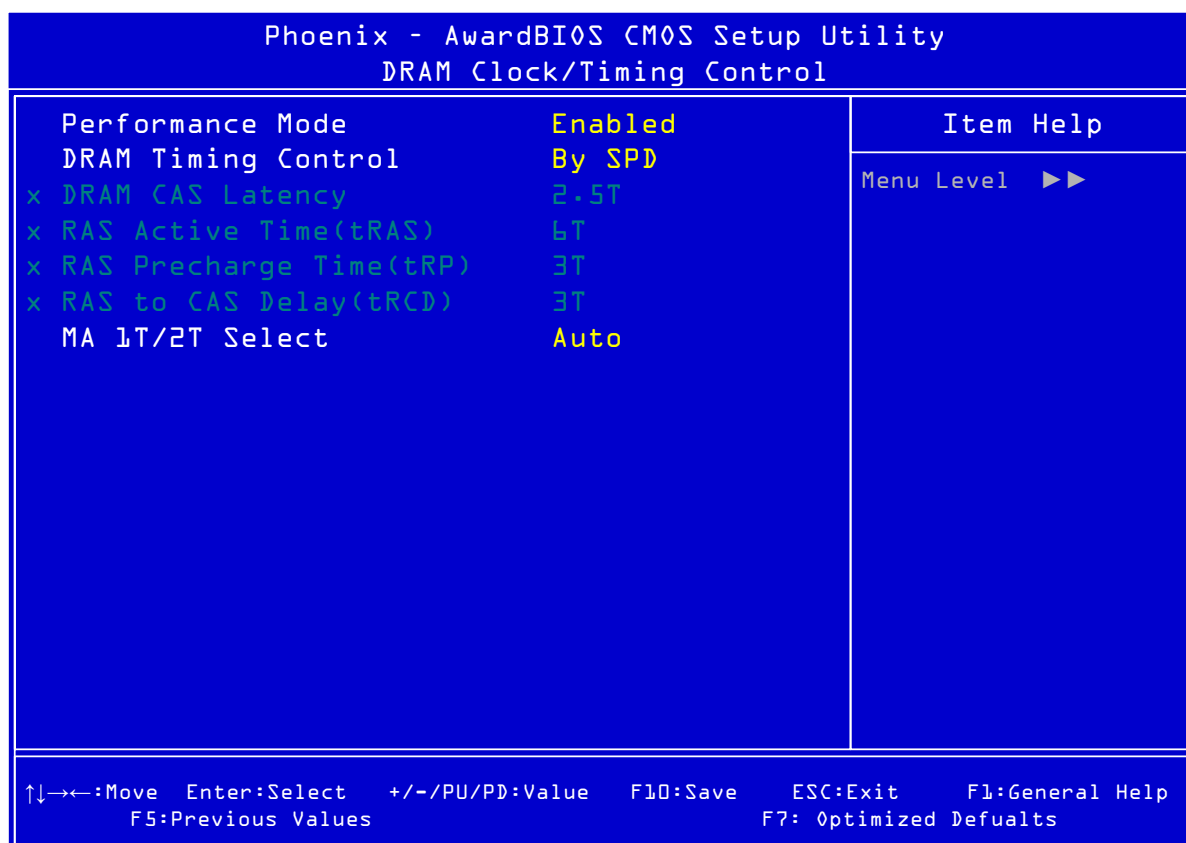


Figure 17: DRAM Timing Control

Memory Timing

Allows the user to select the CAS latency time in HCLKs of 2, 2.5 or 3. The value is set the factory depending on the DRAM installed. DO NOT change the values in this field unless you have changed the DRAM or CPU.

AGP & P2P Bridge Control

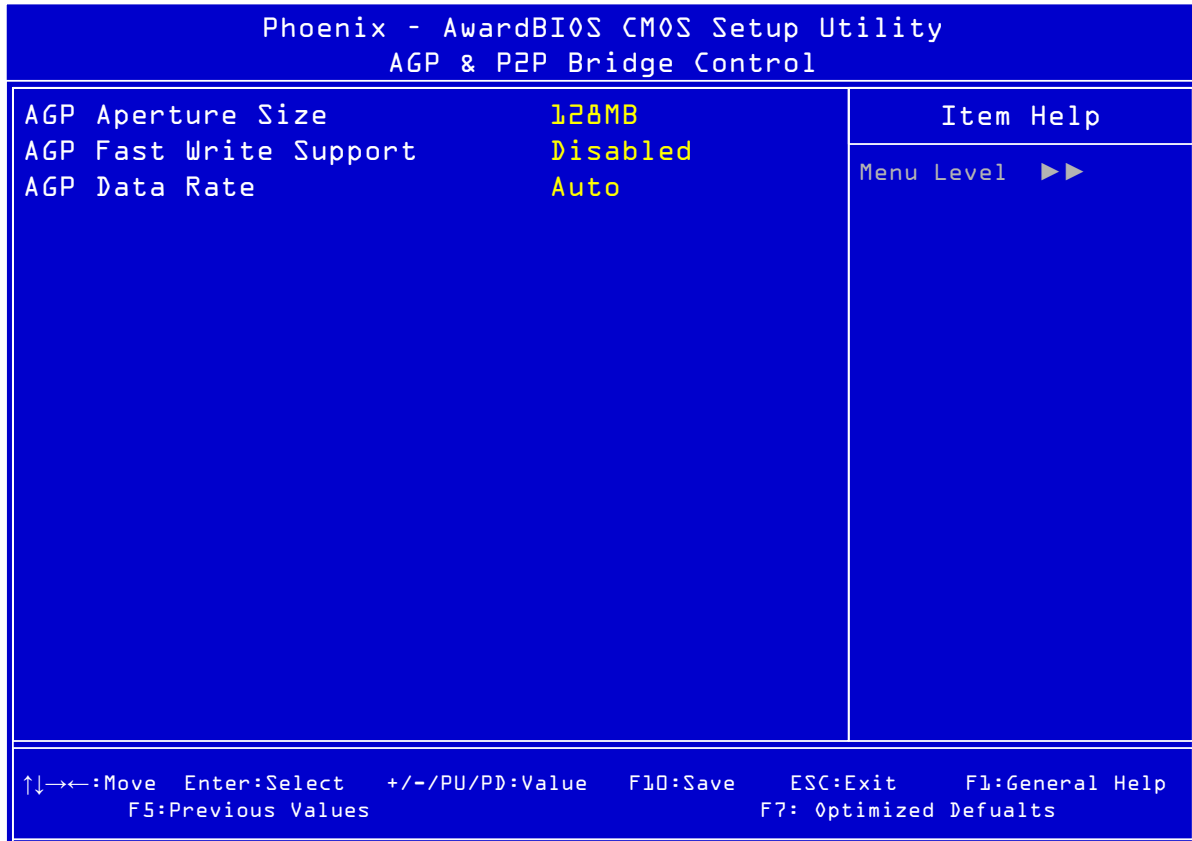


Figure 18: AGP & P2P Bridge Control

AGP Aperture Size: This controls how much system RAM is allocated to the AGP for video purposes.

AGP Fast Write Support: Enables and disables AGP fast write support.

AGP Data Rate: This allows the user to control the AGP card data transfer rate.

OnChip AGP Control

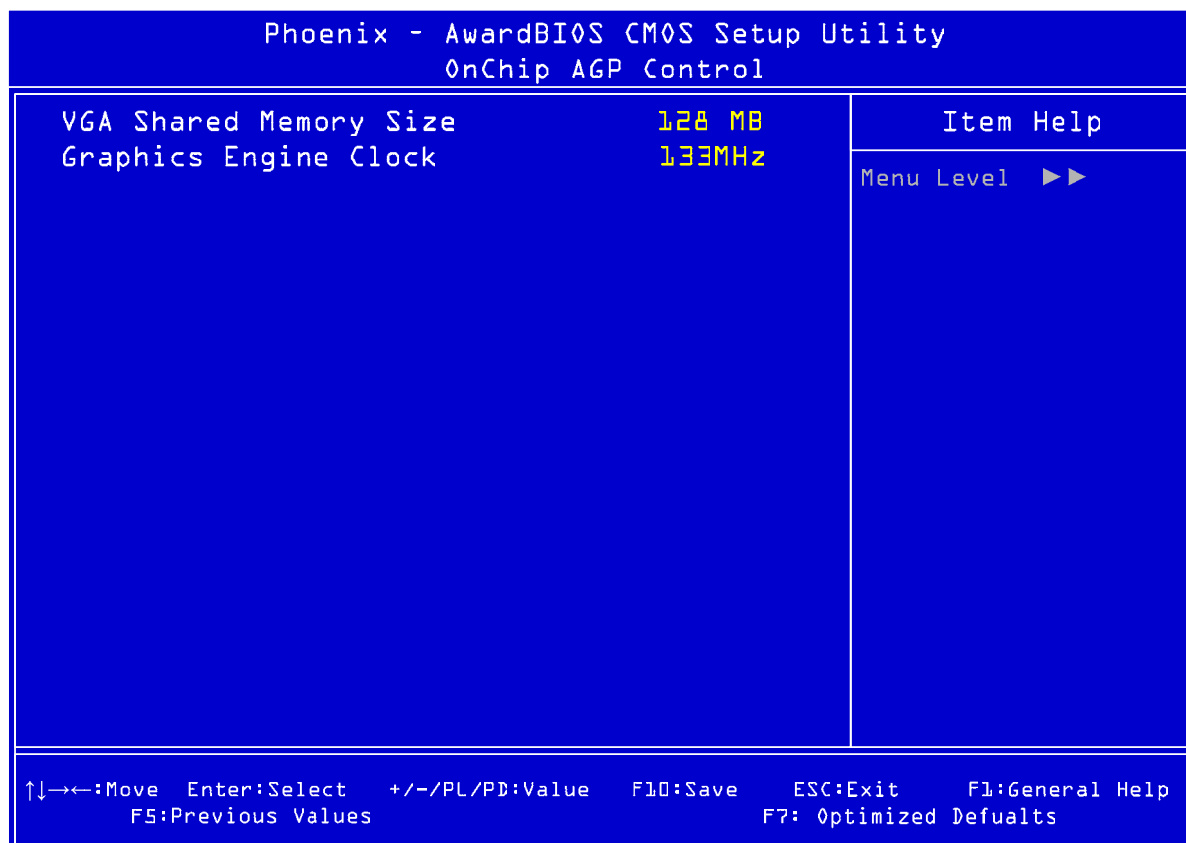


Figure 19: OnChip AGP Control

VGA Share Memory Size: This shows the amount of memory shared from the main memory for use with the VGA. In the case above the memory being used for the VGA is 32MB; this also means that 32MB will be de-allocated from the main memory.

Graphics Engine Clock: This displays the speed at which the Graphics clock is running.

Integrated Peripherals

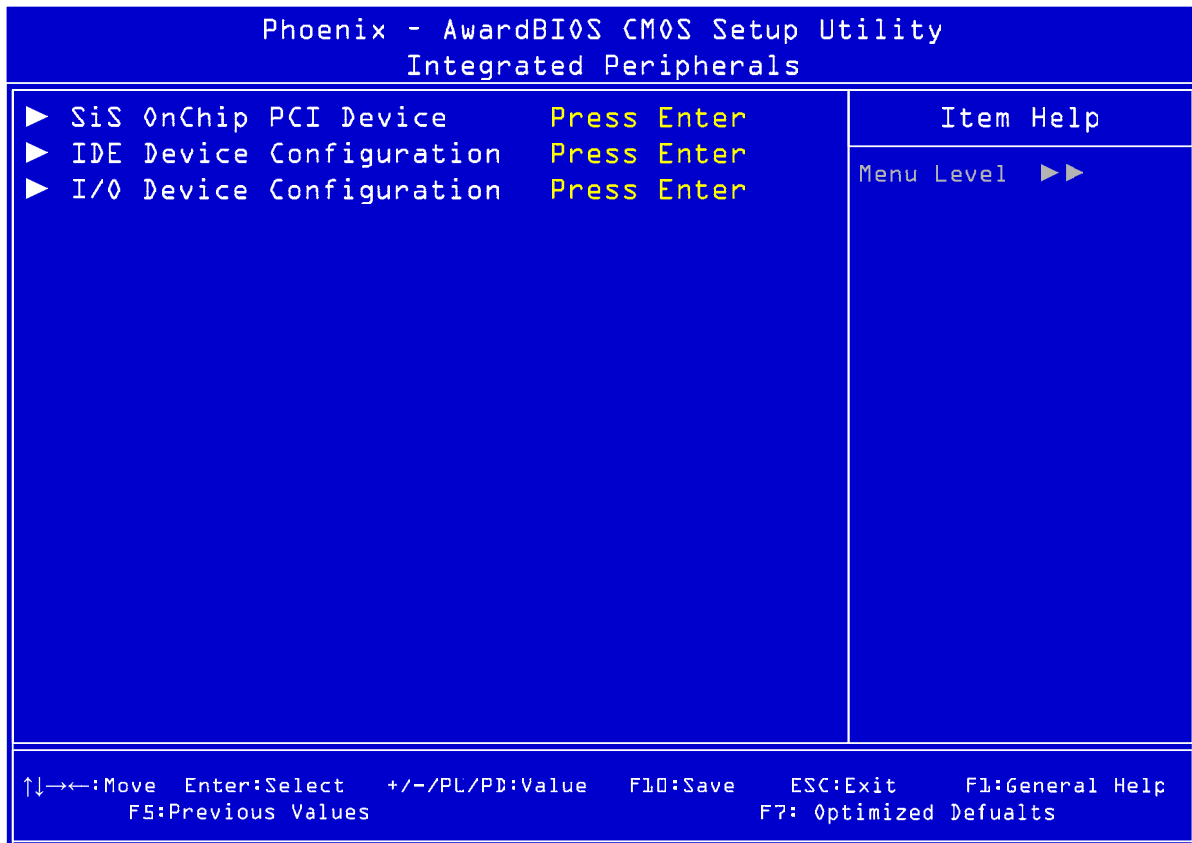


Figure 20: Integrated Peripherals

Integrated Peripherals: Integrated peripherals sub menus

SIS OnChip PCI Device

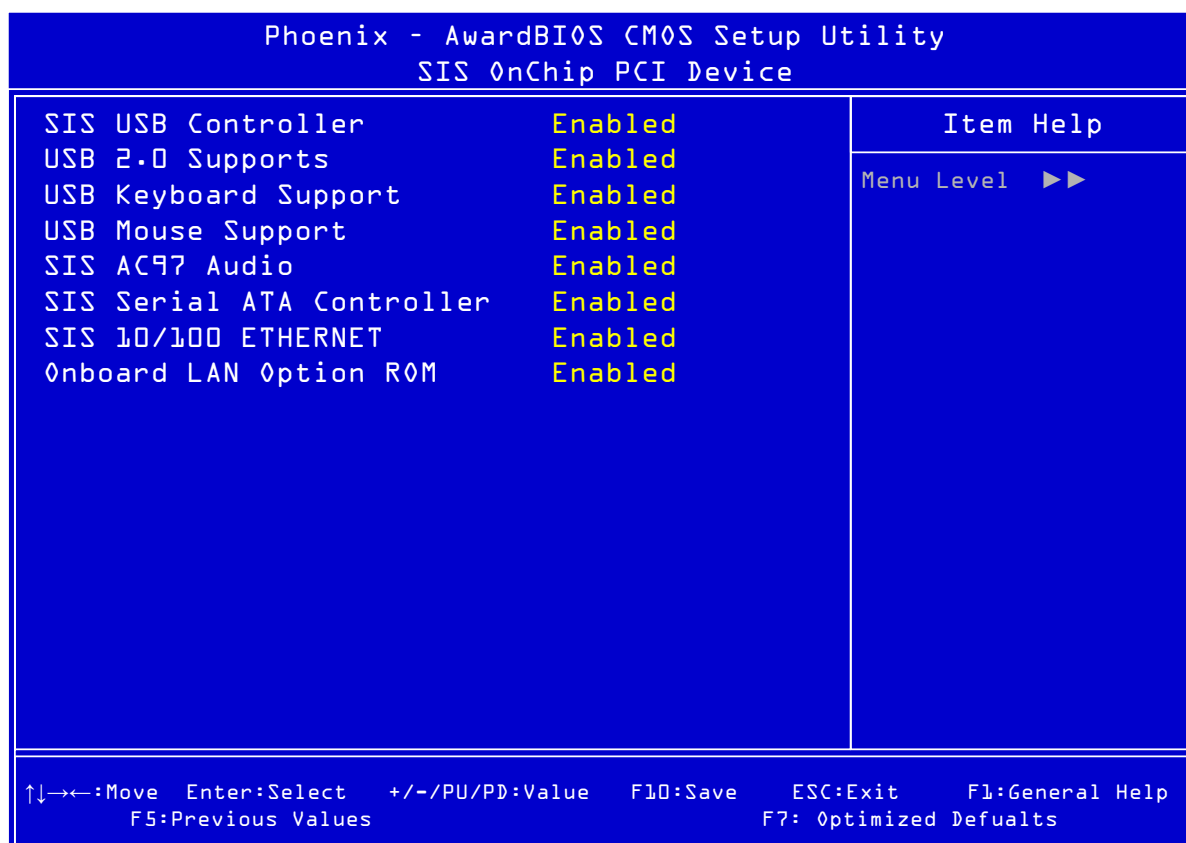


Figure 21: SIS OnChip PCI Device

SIS USB Controller: This enables the USB controller. Leave as the default 'Enable' if you wish to add a USB device to your computer.

USB 2.0 Supports: Enables USB 2.0 support on your computer.

USB Keyboard Support: This allows a USB keyboard to be used in a DOS environment by selecting [BIOS] or in the OS by selecting [OS].

USB Mouse Support: This allows a USB mouse to be used in a DOS environment by selecting [BIOS] or in the OS by selecting [OS].

SIS AC97Audio: This allows you to control the onboard AC97 audio. Disable this item if you are going to install a PCI audio add-on card.

SIS Serial ATA Controller: Enables support for SATA devices.

SIS 10/100 ETHERNET: Enables the on-board LAN

On-board LAN option ROM: Enables LAN boot ROM support

IDE Device Configuration

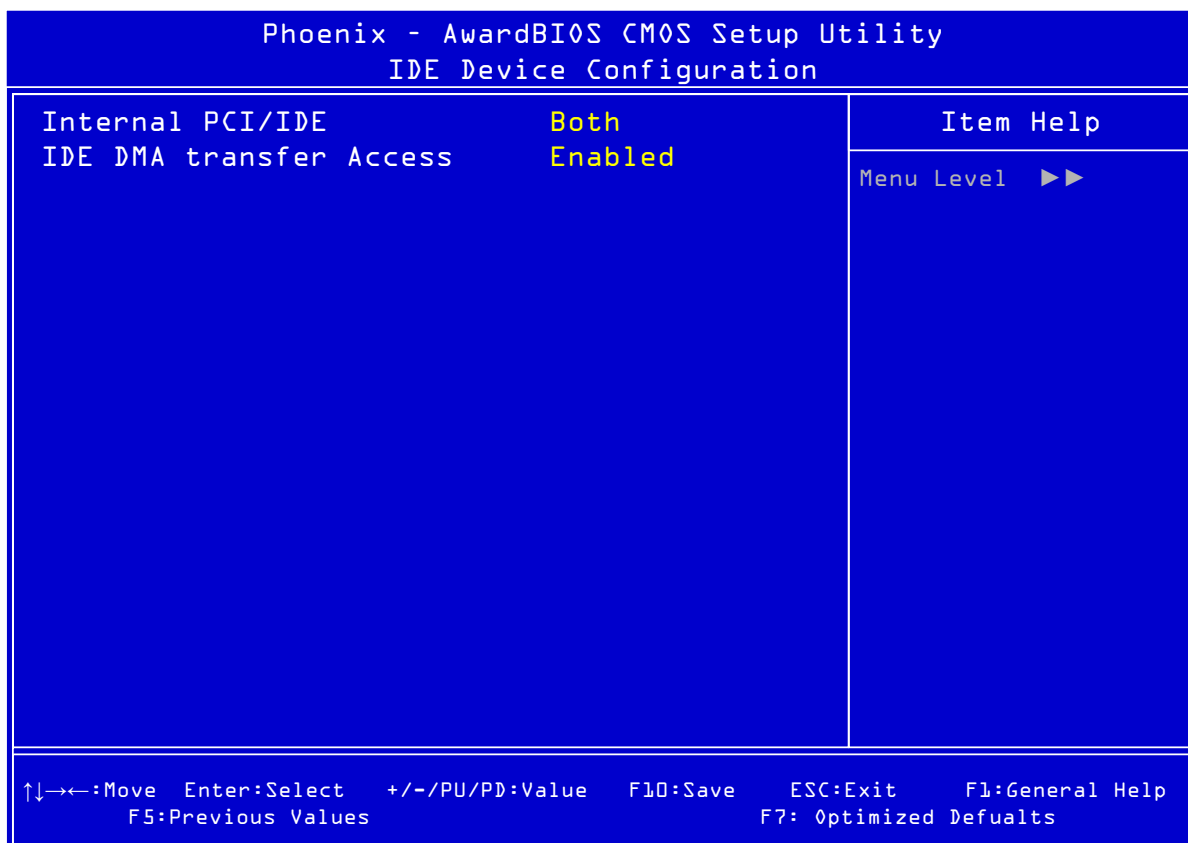


Figure 22: OnChip IDE Device

Internal PCI/IDE: Used to enable or disable the internal PCI IDE channel.

IDE DMA transfer Access: Enables DMA access for the IDE device

I/O Device Configuration

Phoenix - AwardBIOS CMOS Setup Utility I/O Device Configuration		Item Help
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART Mode Select	Normal	
x RxD \rightarrow TxD Active	Hi-Low	
x IR Transmission Delay	Enabled	
x UR2 Duplex Mode	Half	
x Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	ECP	
x EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	

Menu Level \gg

\uparrow \downarrow \rightarrow \leftarrow : Move Enter: Select +/-/PL/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F7: Optimized Defaults

Figure 23: OnChip PCI Device

Onboard FDC Controller: Enables the Floppy Disk Controller.

Onboard Serial Port 1/2: Enables the serial ports on the motherboard

UART Mode Select: Sets the mode for the serial port.

Onboard Parallel Port: Sets the IRQ for the Parallel port

Parallel Port Mode: Sets the mode for the Parallel port.

ECP Mode Use DMA: Sets the DMA used by the Parallel port.

Power Management Setup

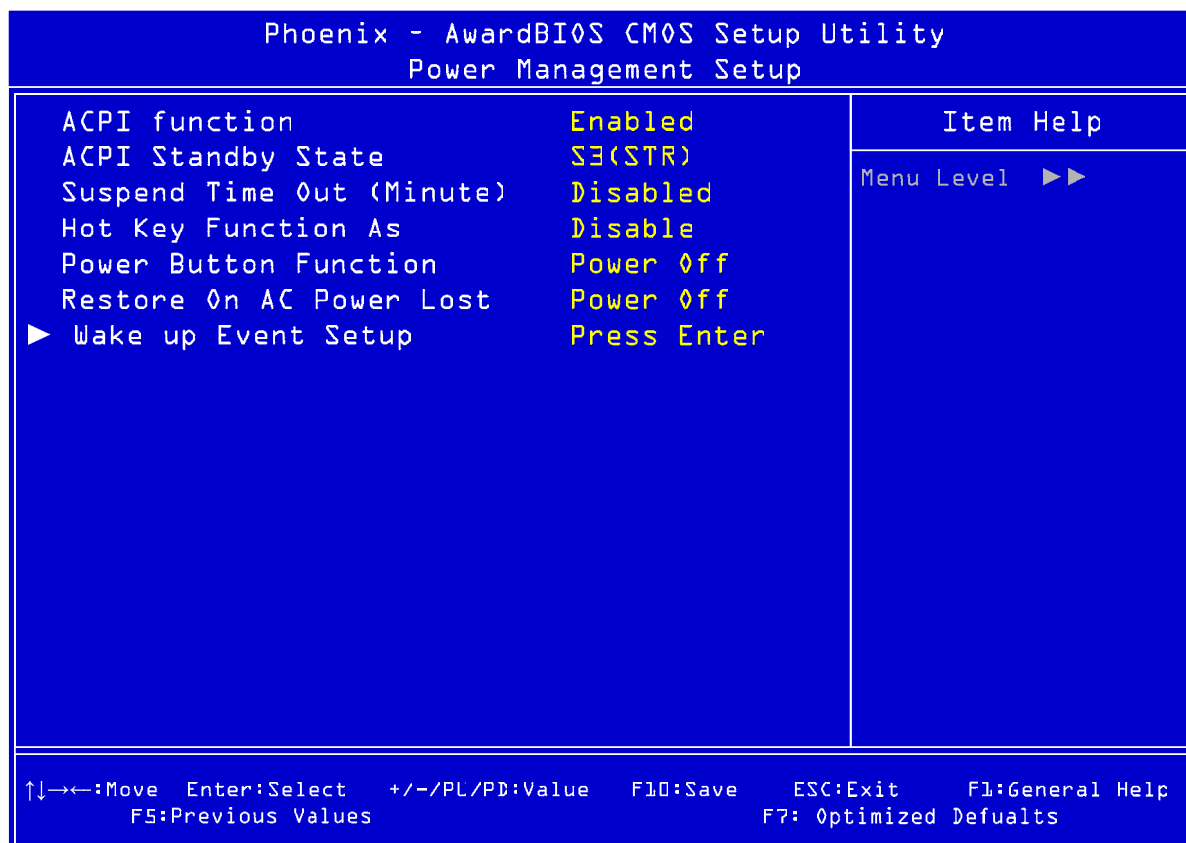


Figure 24: Onboard SuperIO device

ACPI function: Enables the ACPI features of the CPU

ACPI Standby State: Sets the suspend mode of the system

Suspend Time Out (Minute): Time before the system goes into suspend.

Hot Key Function As: This allows a hot key to be set to send the system into suspend

Power button function: This dictates how the power button operates.

Restore on AC power lost: This dictates how the system reacts to total power loss.

Wake up Event Setup: Configures the events that may wake the system.

Wake up Event Setup

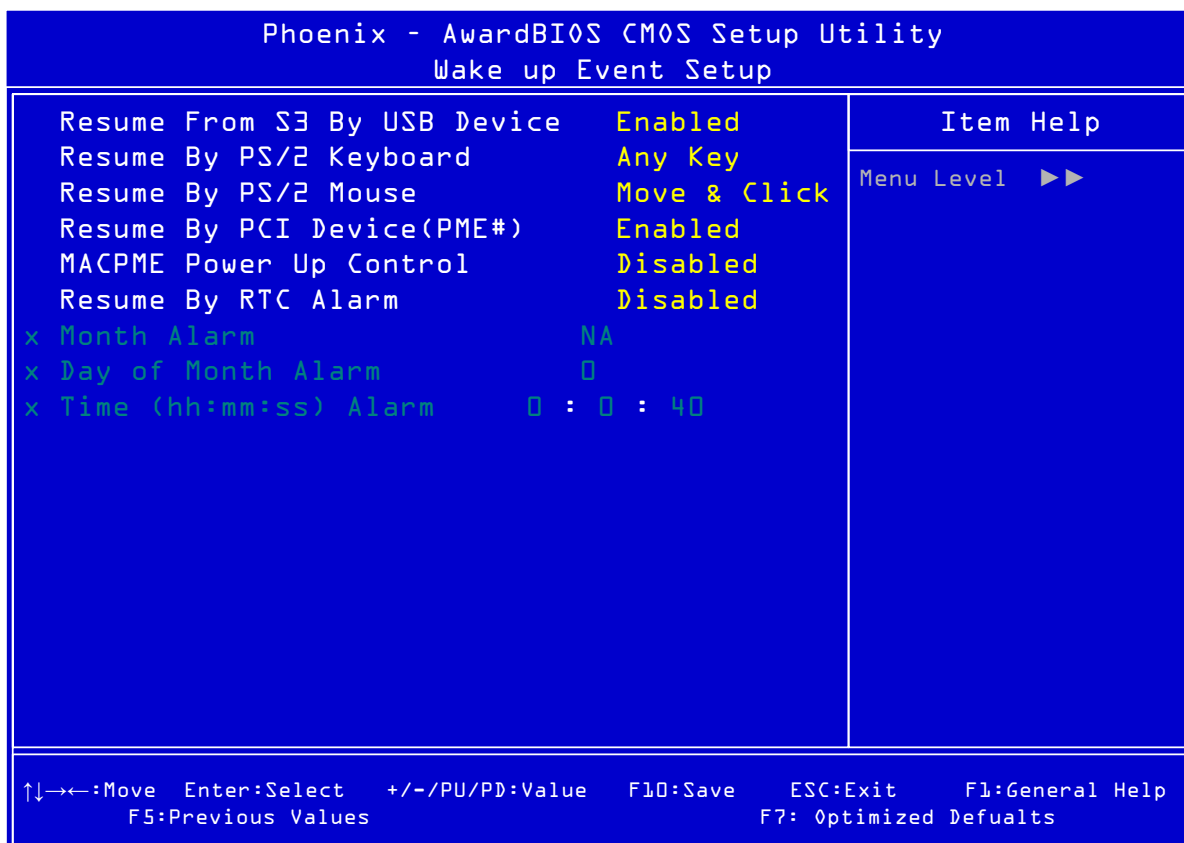


Figure 25: Onboard PCI Device

Resume From S3 By USB Device: Allows a USB device to wake the system

Resume By PS/2 Keyboard: Allows a PS/2 keyboard to wake the system by either a hot key combination or any key that is pressed. The default is [Any Key].

Resume By PS/2 Mouse: Allows a PS/2 mouse to wake the system by either just movement or movement and a click. The default is [Move & Click].

Resume By PCI device (PME#): Wakes the system from power saving mode when a signal is received from a specific hardware peripheral or component.

MACPME Power Up Control: This is WOL function.

Resume By RTC Alarm: Allows an alarm time to be set to wake the system.

PnP/PCI Configuration

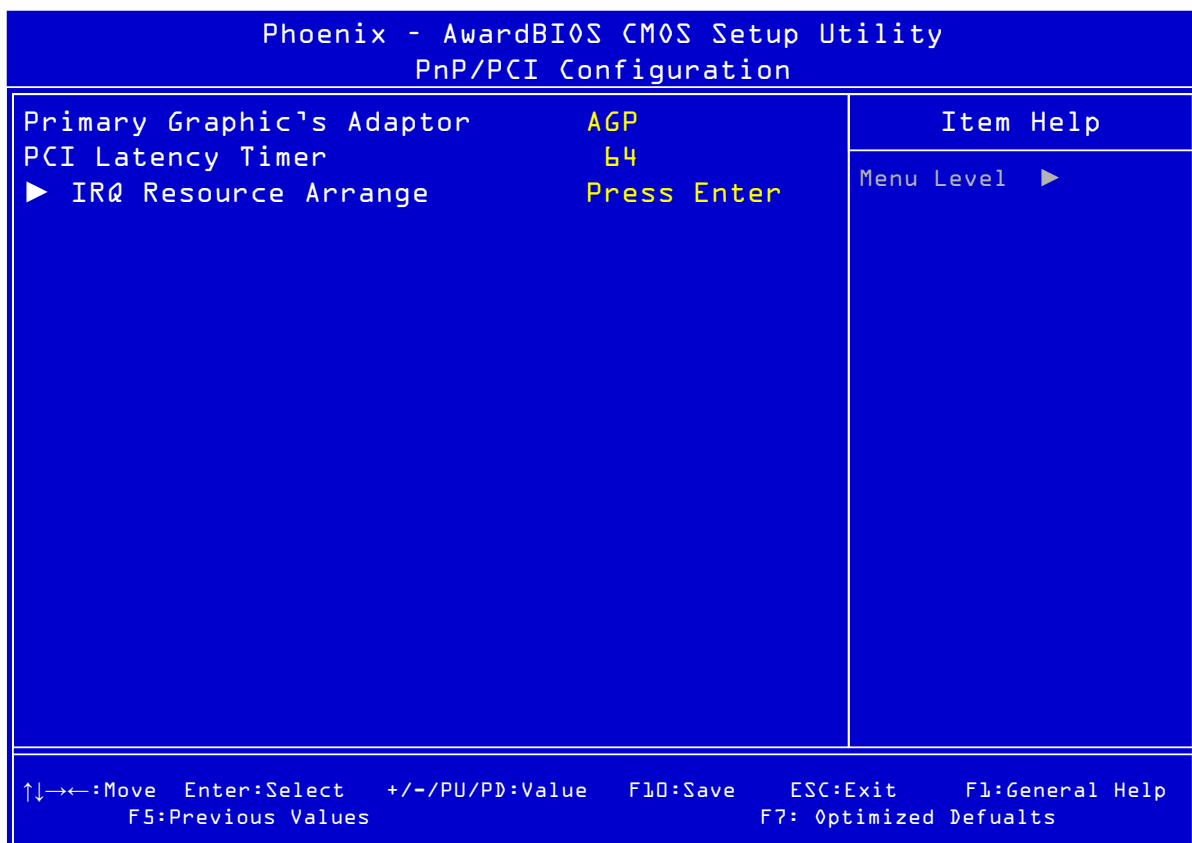


Figure 26: Power Management Setup

Primary Graphic's Adaptor: Sets which type of graphics adaptor is being used.

PCI Latency Timer: Sets the Latency timer for the PCI bus.

IRQ Resource Arrange: Sets the IRQ's

IRQ Resources

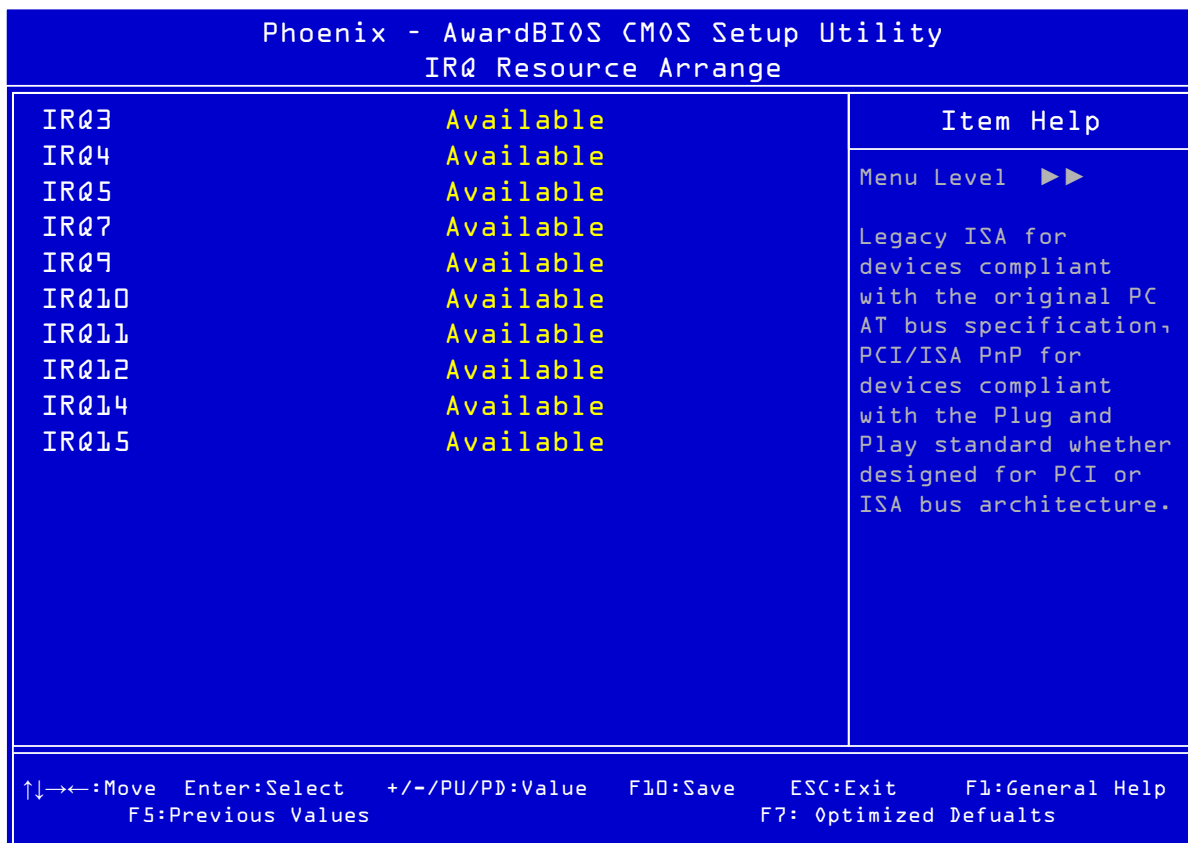


Figure 27: IRQ Resources

IRQ Resources: Allows system IRQ to be reserved be made available for motherboard or operating system to assign as required.

PC Health Status

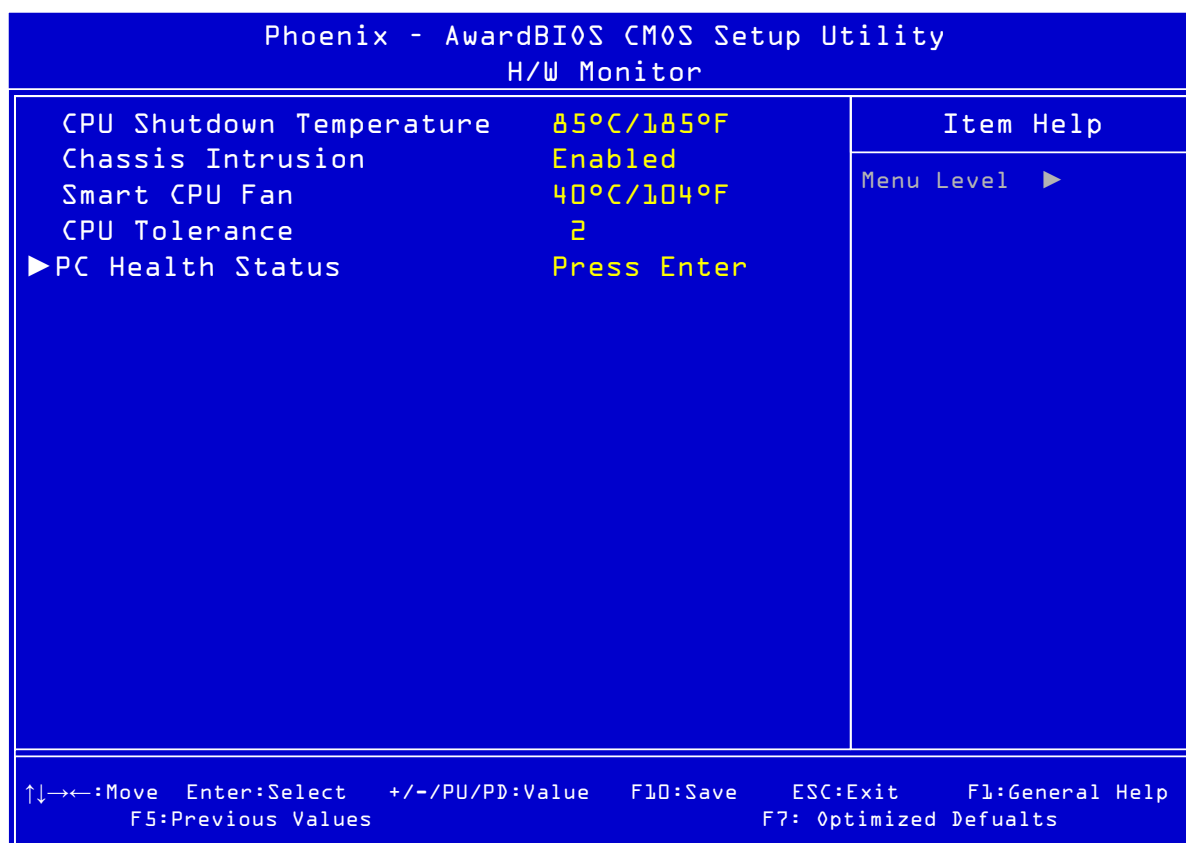


Figure 28: PC health Status

CPU Shutdown Temperature: This item allows a temperature to be set at which the system will shut down automatically to prevent over heating.

Chassis Intrusion: Sets whether chassis intrusion switch is attached.

Smart CPU Fan: Sets the thermal controlled fan

CPU Tolerance: This sets the thermal tolerance on the CPU

PC Health Status: Monitors all the various speeds, temperatures and voltages over the board.

PC Health Status: These are unchangeable as they give the current statuses of the CPU, environment temperatures, fan speeds and the system power voltage.

PC Health Status

Phoenix - AwardBIOS CMOS Setup Utility		
PC Health Status		
CPU Temperature	40°C/107°F	Item Help
System Temperature	34°C/93°F	Menu Level ▶
CPU Fan Speed	2250 RPM	
Northbridge Fan Speed	3391 RPM	
CPU Vcore	1.34V	
3.3V	3.34V	
5V	5.18V	
12V	12.09V	
5V SB	5.00V	

↑↓→←:Move Enter:Select +/-/PL/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

Figure 29: PC Health Status

PC Health Status: displays information monitored of the CPU temperature, system temperature, system fan speeds and PSU voltages.

Frequency/Voltage Control

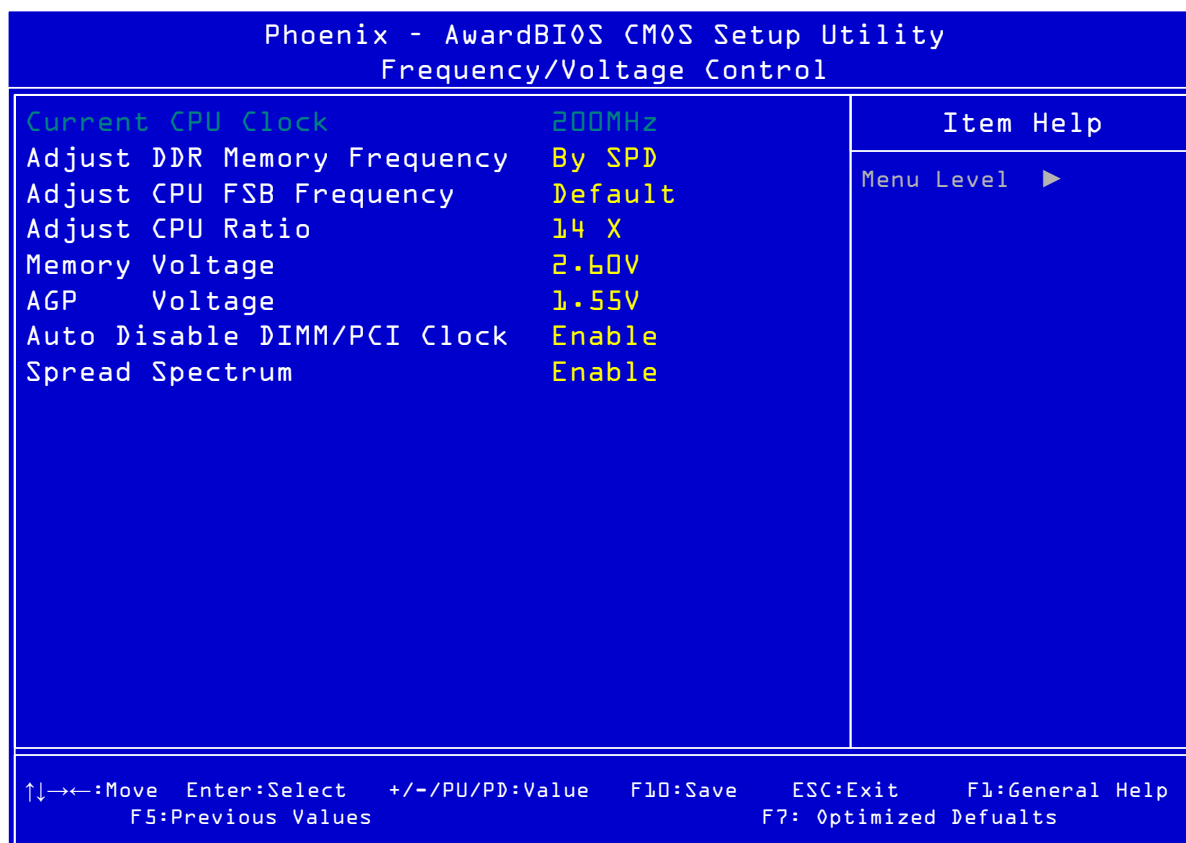


Figure 30: Frequency/Voltage Control

Current CPU Clock: This shows the current clock speed of the CPU

Adjust DDR Memory Frequency: Allows the speed of the DDR memory to be changed

Adjust CPU FSB Frequency: Allows the speed of the CPU front side bus to be changed

Adjust CPU Ratio: Allows the CPU clock ratio to be changed if it isn't locked.

Memory Voltage: Sets the voltage used by the memory

AGP Voltage: Sets the voltage used by the AGP slot

Spread Spectrum: If enabled, could reduce the EMI (Electro-Magnetic Interference) generated by the system.

Main Menu Additional Options

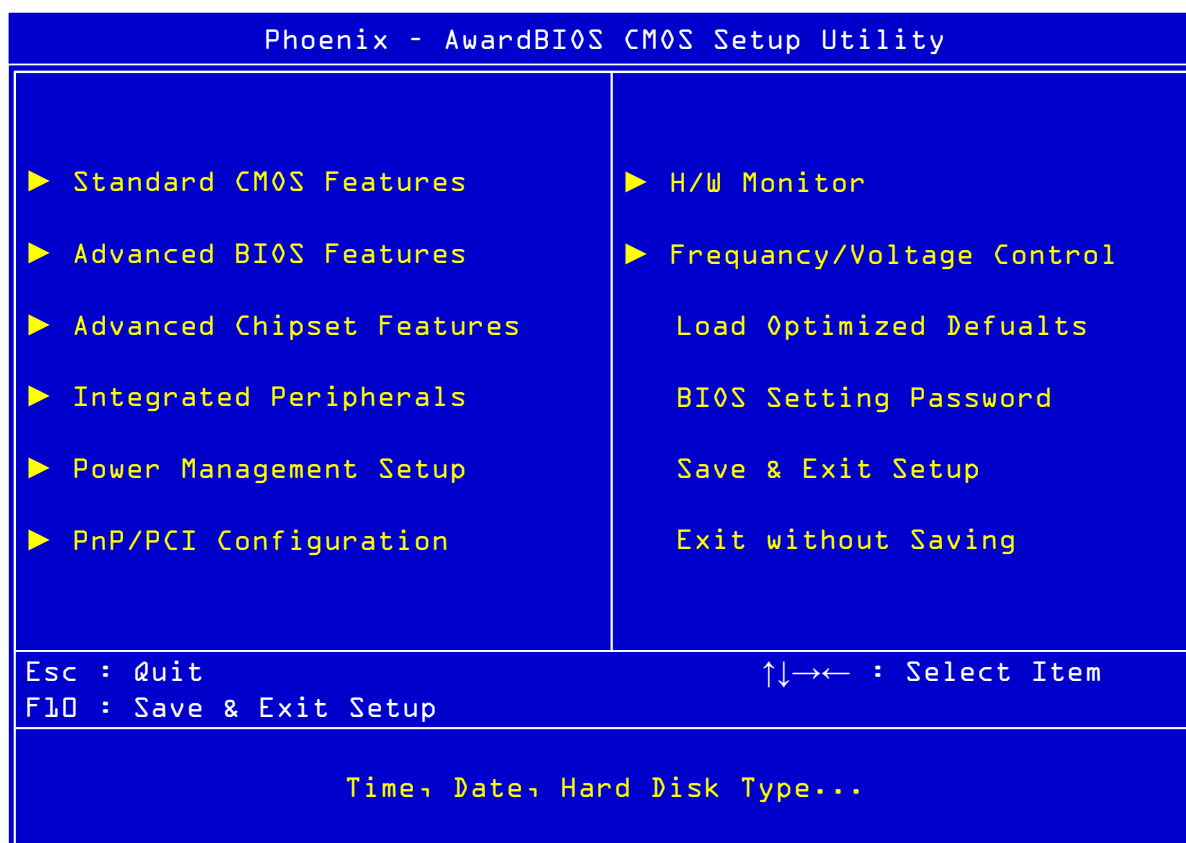


Figure 31: Main Menu

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 have 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 10: 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 11: 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	0V 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 12: 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 13: Stacked USB Connectors

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

Table 14: 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 15: Audio Line Out Connector

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

Table 16: Audio Line In Connector

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

Table 17: Audio Mic In Connector

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

Table 18: 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 19: 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 20: 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 21: 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 22: 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 286,877 hours.

Temperature

Table 23: 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.

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?

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

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

7. Other points you would like to mention?

Please return this slip to: Product Development Dept.
Vigen Head Quarters
7 Handley Page Way
Old Parkbury Lane
Colney Street
St Albans
Hertfordshire
AL2 2DQ