

Vig430p Motherboard Manual

Viglen

**Great
Minds
Think**

viglen

COMPUTERS ♦ NETWORKS ♦ SOLUTIONS

Viglen EMC and the 'CE' mark

CE Marking

As we begin the 21st century, 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 that 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 that 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.

Copyrights and Trademarks

Please note

The material in this manual is subject to change without notice.

Trademarks

Microsoft, Windows, Windows NT, Windows 95, Windows 98, Windows ME, Windows 2000 Pro, Windows XP Pro and MS-DOS are registered trademarks of Microsoft Corporation. IBM PC, XT, AT and PS/2 are trademarks of International Business Machines Corporation. Pentium and Pentium Pro are registered trademarks of Intel Corporation. AMI BIOS is a registered trademark of American Megatrends. All other trademarks are acknowledged. JAC-UP, Genie, Contender, Dossier, Vig, Viglen, and Envy are trademarks of Viglen Limited.

Copyright and Patents

This manual and all accompanying software and documentation are copyrighted and all rights reserved. This product, including software and documentation, may not, in whole or in part, be copied, photocopied, translated or reduced to any electronic or machine-readable form, without prior written consent except for copies retained by the purchaser for backup.

© Copyright 2009 Viglen Limited
All Rights Reserved
Vig430P Manual Version 1.0
Printed in the United Kingdom

Liability

No warranty or representation, either expressed or implied, is made with respect to this documentation, its quality, performance, merchantability or fitness for a particular purpose. As a result the documentation is licensed as is, and you, the licensee, are assuming the entire risk as to its quality and performance. The vendor reserves the right to revise this operation manual and all accompanying software and documentation and to make changes in the content without obligation to notify any person or organisation of the revision or change.

In no event will the vendor be liable for direct, indirect, special, incidental or consequential damages arising out of the use or inability to use this product or documentation, even if advised of the possibility of such damages. In particular, the vendor shall not have liability for any hardware, software or data stored or used with the product, including the costs of repairing, replacing or recovering such hardware, software or data.

Contents

Chapter 1: Motherboard Overview	5
Motherboard Features	6
Special Features	9
Chipset Overview	13
System Board Components	14
Back Panel Connectors	16
System Memory	17
Chapter 2: System Board Options	18
Overview of Jumper Settings	20
Motherboard Jumper Settings	21
Motherboard Connectors	24
Upgrading the Central Processing Unit (CPU)	32
Upgrading System Memory	38
Installing an Expansion Card	39
Replacing the Clock/CMOS RAM Battery	41
Chapter 3: Solving Problems	42
Resetting the System	42
Troubleshooting Procedures	43
Problems Operating Add-in Boards	44
Problems & Suggestions	46
Error and Information Messages	48
BIOS Post Codes	52
Chapter 4: System RAID Options	58
Intel HostRAID Setup Guidelines	58
Chapter 5: System BIOS	68
Introduction	68
Updating the BIOS	69
Main BIOS Setup	70

Advanced Setup	71
Boot Features	71
Power Configuration	72
CPU Configuration	72
CPU Power Management Configuration	74
Chipset Configuration	75
SATA Configuration	80
SCU Configuration	81
PCIe/PCI/PnP Configuration	81
Super IO Configuration	82
Serial Port Console Redirection	83
Hardware Health Configuration	85
ACPI Settings	86
Event Logs	88
Boot Settings	90
Security Settings	91
Exit Options	92
Chapter 6: BIOS Recovery	94
How to Recover the AMIBIOS Image	94
Flash Memory Recovery Update	94
Recover Update Procedure	94
Chapter 7: Glossary	96
Notes	100
Chapter 7: Suggestions	101

Chapter 1: Motherboard Overview

Introduction

This manual describes the Viglen Vig430P 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 Vig430P is built upon the functionality and the capability of the Intel C602 chipset platform. The Vig430P Motherboard provides the performance required for dual processor-based CAD workstations or graphic-intensive systems. With the Intel QuickPath interconnect (QPI) controller built in, the E5-2400 Series Processor platform offers the next generation point-to-point system interconnect interface, outperforming the previous generation of QPI and offering enhanced system performance with increased bandwidth and scalability.

This manual contains technical information about the Viglen Vig430P 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.

Motherboard Features

Form factor:

- ATX form factor: 12 in x 10 in (254 mm x 304.8 mm)

CPU Support:

- Dual Intel® SandyBridge EN Series (LGA 1356) processors, each processor supporting two full-width Intel QuickPath Interconnect (QPI) @8.0 GT/s

Chipset Support:

- Intel PCH C602 chipset

Memory Support:

- Six 240-pin DIMM sockets support up to 192GB of DDR3 Buffered ECC or Unbuffered ECC/Non-ECC Memory at 1600/1333/1066/800 MHz. (See Section 2-4 in Chapter 2 for DIMM Slot Population.)

Expansion Support:

- One PCI-E 3.0 x16 slot (Slot 6)
- Three PCI-E 3.0 x8 slot (Slot 1, 3, 4)
- One PCI-E 3.0 x4 (in x8) slot (Slot 5)
- One 32-bit PCI 33 slots (Slot 2)

Storage Support:

- Two SATA3 (6GB/s) ports (port 0/1)
- Eight SATA2 (3GB/s) Ports (2~5, 6~9)

RAID

- Windows – 0, 1, 5, 10
- Linux – 0, 1, 5, 10

HD Audio Support:

- HD ALC883 Audio Controller supports High Definition 7.1 Audio with Line-in, Line-out and Microphone

LAN Support:

- Dual 82574L Gigabit Ethernet controllers support two Giga-bit LAN ports

USB Support:

- Up to four USB 3.0 ports (2 back panel ports, two via onboard header)
- Up to ten USB 2.0 connections (4 Backpanel USB Ports, and 3 Headers w/6 connections supported)

BIOS Features:

- 4 MB AMI SPI Flash EEPROM
- APM 1.2, DMI 2.3, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard, Plug and Play (PnP) and SMBIOS 2.3

PC Health Monitoring:

- Onboard voltage monitors for Vcore1, Vcore2, 1.5V, 5VDD, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt.
- Fan status monitor with firmware control
- Tachometer Monitoring
- Pulse Width Modulation (PWM) fan control.
- Low-noise fan speed control
- CPU/chassis temperature monitoring
- Platform Environment Control Interface (PECI) ready
- Thermal Monitor 2 (TM2) support
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection, power LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU cores
- System overheat/Fan Fail • LED Indicator and control
- Chassis intrusion detection/header
- System resource alert via Super Doctor III

Rear Panel Port Support:

- 1 x PS/2 keyboard/mouse combo port
- 1 x Serial Port
- 4 x USB 2.0 ports
- 2 x USB 3.0 ports
- 2 x LAN (RJ-45) port
- 1 x Side Surround
- 1 x Back Surround
- 1 x CEN/LFE
- 1 x Microphone
- 1 x Front
- 1 x Line-In

Internal Connectors:

- 2 x Serial ATA 3 connectors
- 8 x Serial ATA 2 connectors
- 2 x CPU fan connector
- 4 x Chassis fan connector
- 3 x USB 2.0 connectors (total 4 USB ports)
- 1 x 24-pin ATX power connector
- 2 x 8-pin 12V processor connector
- 1 x Front panel AC'97 Audio connector
- 1 x Chassis intrusion connector
- 1 x Overheat LED/Fan fail connector
- 1 x Power LED/External Speaker connector
- 1 x Power SMB (System Management Bus) connector
- 2 x SGPIO (Serial-Link General Purpose Input/Output) connectors
- 1 x Front control panel connectors

ACPI Features:

- Slow blinking LED for suspend state indicator
- Main switch override mechanism
- ACPI/ACPM Power Management (S1, S3, S4, S5)

Other:

- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS

Power Requirements:

- ATX power supply with SSI power connectors (24-pin, 8-pin, 8-pin)
- These connectors need to meet the SSI EPS 12V specification

Dimensions:

ATX 12.00" (L) x 10.00" (W) (304.80mm x 254.20mm)

Special Features:

- **Recovery from AC Power Loss**

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Boot Features) to change this setting. The default setting is **Last State**.

PC Health Monitoring:

This section describes the PC health monitoring features of the Vig430P. All have an onboard System Hardware Monitor chip that supports PC health monitoring via Super Doctor II or III. An onboard voltage monitor will scan these onboard voltages continuously: Vcore1, Vcore2, 1.5V, 5VDD, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

- **Fan Status Monitor with Firmware Control**

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under Hardware Monitoring in the Advanced Setting).

- **Environment Temperature Control**

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

- **System Resource Alert**

This feature is available when used with Super Doctor III in the Windows OS environment or used with Super Doctor II in Linux. Super Doctor is used to notify the user of certain system events. For example, you can also configure Super Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a pre-defined range.

ACPI Features:

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2000 and Windows 2003 Operating Systems.

- **Slow Blinking LED for Suspend-State Indicator**

When the CPU goes into a suspend state, the chassis power LED and LE1 will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

- **Main Switch Override Mechanism**

When an ATX power supply is used, the power button may function as a system suspend button, allowing the system to enter a Soft Off state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again to "wake-up" the whole system. During the Soft Off state, the ATX power supply provides power to keep the required circuitry in the system "alive." In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the BIOS Setup utility.

Power Supply:

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the Standby or Off state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

The Vig430P can accommodate 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, the two 12V 8-pin power connections are also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the web site at <http://www.ssiforum.org/>). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

WARNING!

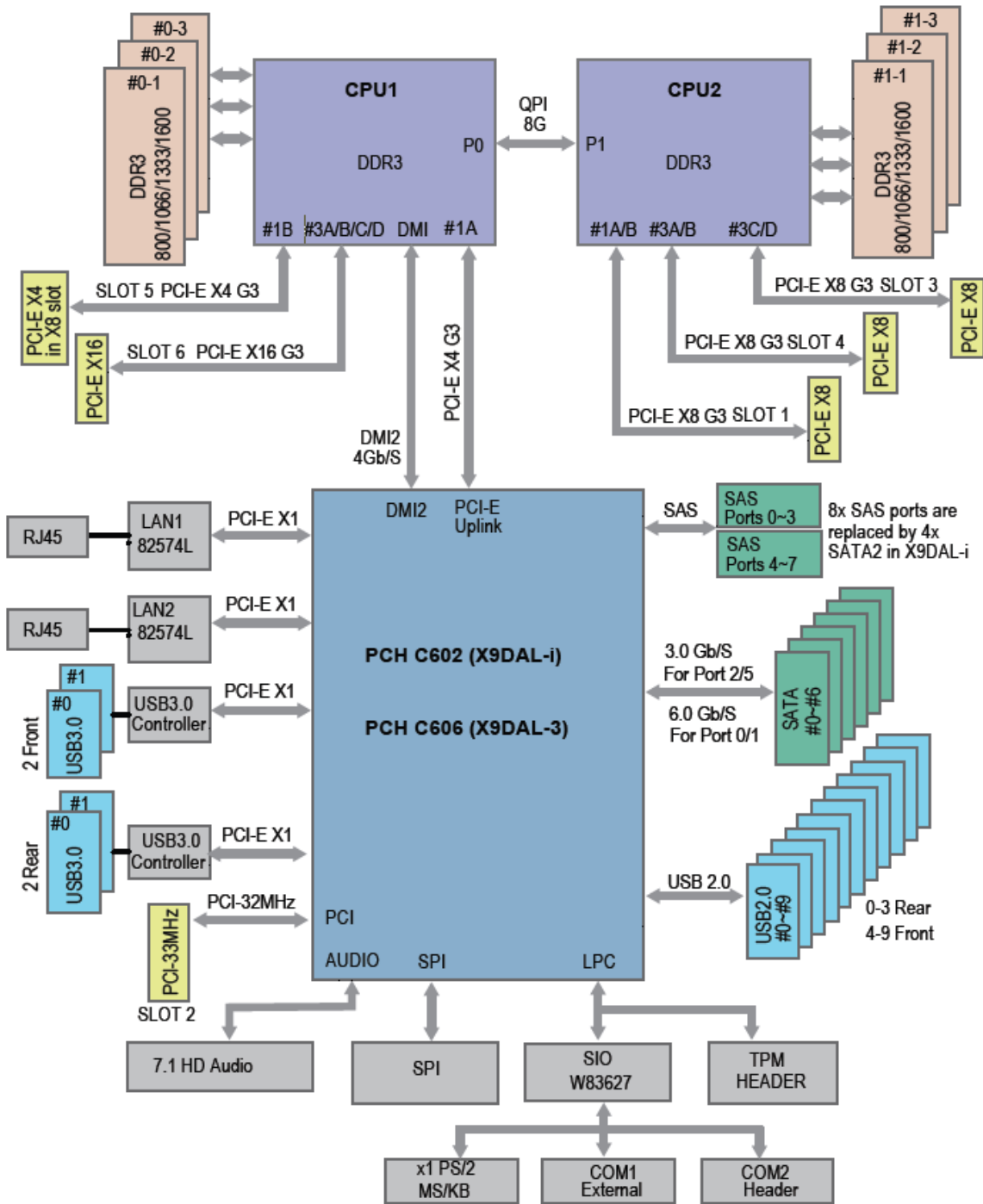
To prevent damage to the power supply or Motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2, JPW3) power connectors on the Motherboard for adequate power supply to your system. Failure in doing so will void the manufacturer warranty on your power supply and Motherboard.

Super I/O:

The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. It also provides two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

Block Diagram of the Intel C602 Chipset Platform



Note: This is a general block diagram. Please see the previous Motherboard features pages for details on the features.

Chipset Overview

Built upon the functionality and the capability of the Intel C602 chipset platform, the Vig430P Motherboard provides the performance required for dual processor- based CAD workstations or graphic-intensive systems. With the Intel QuickPath interconnect (QPI) controller built in, the C602 Series Processor platform offers the next generation point-to-point system interconnect interface, outperforming the previous generation of QPI and offering enhanced system performance with increased bandwidth and scalability.

The C602 Chipset connects to each processor through an independent QPI link. Each link consists of 40 pairs of unidirectional differential lanes for transmission and receiving in addition to a differential forwarded clock.

The C602 Chipset supports up to 48 PCI Express lanes, peer-to-peer read and writes transactions. It provides up to six PCI-Express ports, ten SATA ports and fourteen USB connections.

In addition, the C602 platform also supports a wide range of RAS (Reliability, Availability and Serviceability) features. These features include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Cyclic Redundancy Check (CRC), parity protection, out-of-band register access via SMBus, memory mirroring, memory sparing, and Hot-plug support on the PCI-Express Interface.

Main Features of the E5-2400 Series Processors and C602 Chipset

- Up to eight processor cores in each processor with 20MB shared cache among cores
- Two full-width Intel QuickPath interconnect links, up to 8GT/s of data transfer rate in each direction
- Virtualization Technology, Integrated Management Engine supported
- Point-to-point cache coherent interconnect, Fast/narrow unidirectional links, and Concurrent bi-directional traffic
- Error detection via CRC and Error correction via Link level retry

System Board Components

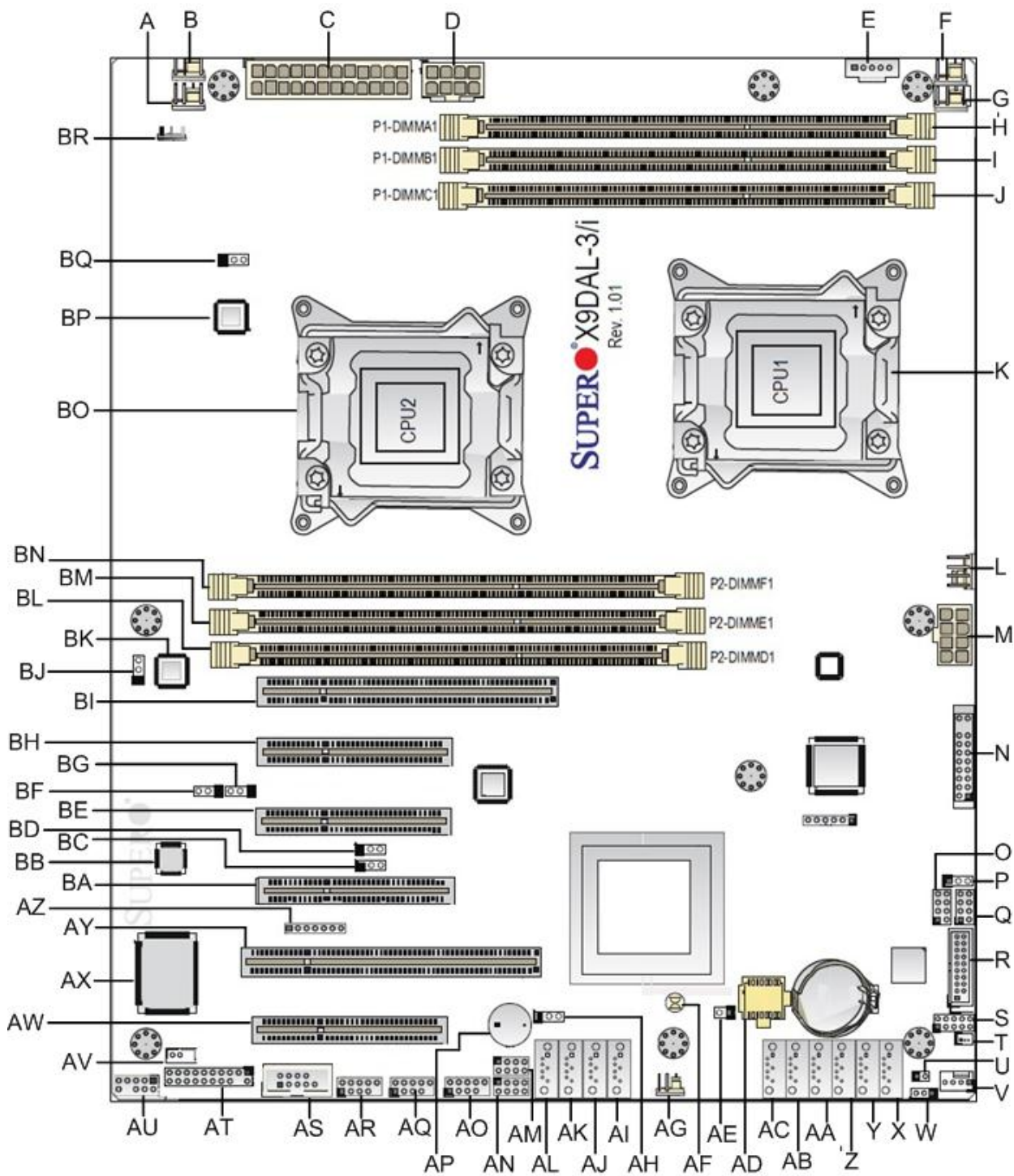


Figure 1: Motherboard Layout & Components

Table 1: Motherboard Connections

Label	Description	Label	Description
A	Fan5 (CPU2)	AJ	SATA 8 (3GB/s)
B	Fan3 (System Fan)	AK	SATA 7 (3GB/s)
C	24-pin Power Connector (JPWR3)	AL	SATA 6 (3GB/s)
D	8-pin Power Connector (JPWR2)	AM	SCU Connector 2 (SGPI02)
E	Power Supply SMBbus header (JPI2C1)	AN	SCU Connector 1 (SGPI01)
F	Fan4 (CPU1)	AO	USB 2.0 Header 3 (Ports 8/9)
G	Fan1 (System Fan)	AP	Onboard Speaker (Buzzer)
H	DIMM A1 (CPU1)	AQ	USB 2.0 Header 1 (Ports 4/5)
I	DIMM B1 (CPU1)	AR	USB 2.0 Header 2 (Ports 6/7)
J	DIMM C1 (CPU1)	AS	Serial COM header (COM2)
K	CPU1 (Socket LGA1356)	AT	Trusted Platform Module (JTPM1)
L	Fan2 (System Fan)	AU	Front Panel Audio Header (J18)
M	8-pin Power Connector (JPWR1)	AV	Standby Header (JSTBY1)
N	Front Panel Header (FP CTRL)	AW	PCIe 3.0 x8 Slot (CPU2)
O	Serial Link IO header (T-SGPIO 2)	AX	Southbridge I/O Chip
P	Energy Saving Jumper (JPES)	AY	PCI 33MHz Slot
Q	Serial Link IO header (T-SGPIO 1)	AZ	Speaker/Power LED Indicator (JD1)
R	USB 3.0 Header	BA	PCIe 3.0 x8 Slot (CPU2)
S	Debug Header (J23)	BB	Onboard Audio CTRL Chip
T	SATA DOM device module (JSD1)	BC	SMB to PCIe/PCI Slots (JI2C2)
U	Chassis Intrusion (JL1)	BD	SMB to PCIe/PCI Slots (JI2C1)
V	FanA (system Fan)	BE	PCIe 3.0 x8 Slot (CPU2)
W	Watch Dog	BF	Sony/Philips Digital Interface Out (JSPDIF_OUT)
X	SATA 0 (6GB/s)	BG	Sony/Philips Digital Interface Out (JSPDIF_IN)
Y	SATA 1 (6GB/s)	BH	PCIe 3.0 x4 *(in x8 Slot) (CPU1)
Z	SATA 2 (3GB/s)	BI	PCIe 3.0 x16 (CPU1)
AA	SATA 3 (3GB/s)	BJ	GLAN2 Enable/Disable Header (JPL2)
AB	SATA 4 (3GB/s)	BK	Onboard LAN CTRL Chip
AC	SATA 5 (3GB/s)	BL	DIMM D1 (CPU2)
AD	BIOS ROM	BM	DIMM E1 (CPU2)
AE	Overheat LED Header (JOH1)	BN	DIMM F1 (CPU2)
AF	Clear CMOS (JBT1)	BO	CPU2 (Socket LGA1356)
AG	PCH-Fan	BP	USB 3.0 CTRL Chip
AH	Front Panel USB Standby Power Header (JUSB2)	BQ	GLAN1 Enable/Disable Header (JPL1)
AI	SATA 9 (3GB/s)	BR	Back Panel USB Standby Power (JUSB1)

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 a PS/2 keyboard/mouse combo port as well as one serial port, four USB 2.0 ports, two USB 3.0 ports, two RJ-45 Ethernet Ports and the audio connectors.

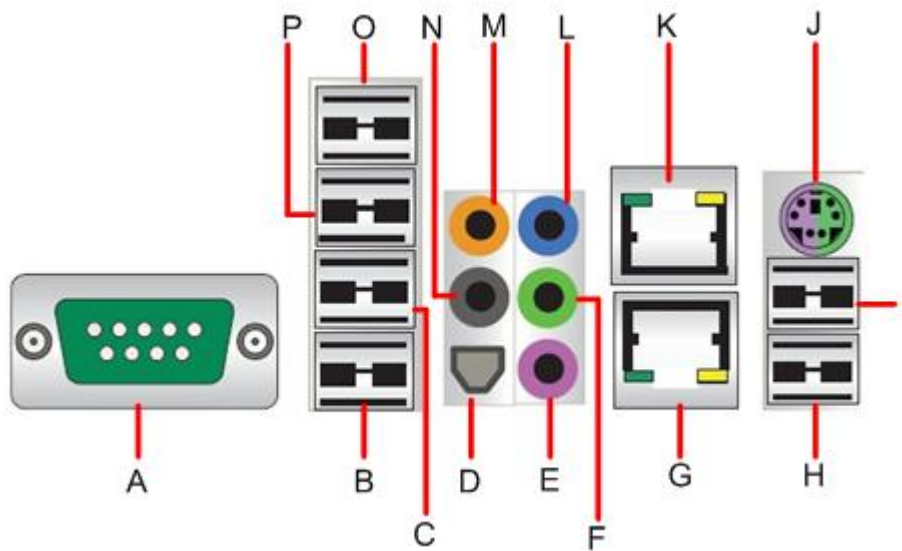


Figure 2: Back Panel Connectors

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

Table 2: Back Panel Connectors

Label	Description	Label	Description
A	Serial Port (COM1)	I	USB 3.0 Port 1
B	USB 2.0 Port 0	J	PS/2 Keyboard/Mouse Combo Port
C	USB 2.0 Port 1	K	RJ45 Port 1
D	SPDIF Out	L	Line In
E	Mic In	M	CEN/LFE
E	Front Audio	N	Surround In
F	COM Port 1 (Turquoise)	O	USB 2.0 Port 3
G	RJ45 Port 1	P	USB 2.0 Port 2
H	USB 3.0 Port 0		

Note: The back panel audio out connectors are designed to power headphones or amplified speakers only. Poor audio quality occurs if passive (non-amplified) speakers are connected to these outputs.

This Motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple- streaming 7.1 sound playback with 2 channels of independent stereo output through the front panel stereo out for front L&R, rear L&R, center and subwoofer speakers. Use the Advanced software included in the CD-ROM with your Motherboard to enable this function.

System Memory

Main Memory

The Motherboard has six DDR3 Dual Inline Memory Module (DIMM) sockets. Support for up to a maximum memory size of 192GB. The BIOS automatically detects memory type, size, and speed.

The Motherboard supports the following memory features:

- Registered ECC or Unbuffered ECC/Non-ECC DDR3 1600/1333/1066/800 MHz Memory
- 192 GB maximum total system memory total amount of addressable memory.
- Minimum total system memory: 1GB
- 72bit registered ECC DIMMs

Table 3: DIMM Population Configurations

Processor and Memory Module Population	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (*For memory to work properly, please follow the instructions below.)
1 CPU & 2 DIMMs	CPU1 P1-DIMM1A, P1-DIMM2A
1 CPU & 3 DIMMs	CPU1 P1-DIMM1A, P1-DIMM2A, P1-DIMM3A
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMM1A/P1-DIMM2A, P2-DIMM1A/P2-DIMM2A
2 CPUs & 5 DIMMs	CPU1 + CPU2 P1-DIMM1A/P1-DIMM2A, P2-DIMM1A/P2-DIMM2A, P1-DIMM3A
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMM1A/P1-DIMM2A, P2-DIMM1A/P2-DIMM2A, P1-DIMM3A, P2-DIMM3A

Notes:

1. Due to OS limitations, some operating systems may not show more than 4 GB of memory.
2. Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (See the following Table.)

Chapter 2: System Board Options

- The Vig430P Motherboard is capable of accepting Duo Xeon E5-2400 (SandyBridge) processors. RAM can be upgraded to a maximum of 192GB using DDR3 Registered ECC or Unbuffered ECC/Non-ECC 1600/1333/1066/800 MHz 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.

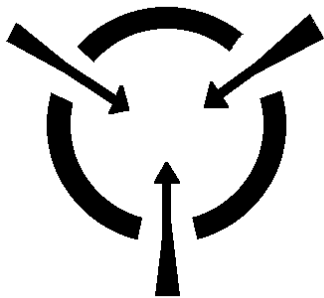
Do not operate the system with the cover removed. Always replace the cover before turning on the system.

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 \perp 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 Vig430P 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 Vig430P Motherboard contains the latest technology to offer an almost jumper less configuration. All Xeon CPU's are automatically detected and the Speed is automatically set from the information provided by the CPU.

CAUTION!!

- 1. 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.**
- 2. Do not move the jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing a jumper, taking all necessary anti static precautions**

System Board Jumper Settings

The following figure shows the jumper locations of the Motherboard. Please refer to the following tables describing each jumper's configuration.

Explanation of Jumpers

To modify the operation of the Motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

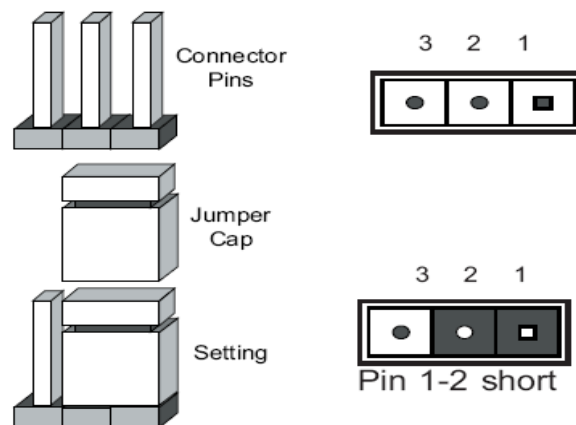


Figure 3: Explanation of jumpers

Motherboard Jumper Settings

Clear CMOS (JBT1)

JBT1 is used to clear CMOS. Instead of pins this “jumper” consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.



GLAN Enable/Disable Jumper (JPL1/JPL2)

JPL1/JPL2 enables or disables the GLAN Port1/GLAN Port2 on the Motherboard. The default setting is **Enabled**.

- A. GLAN Port 1 Enable
- B. GLAN Port 2 Enable

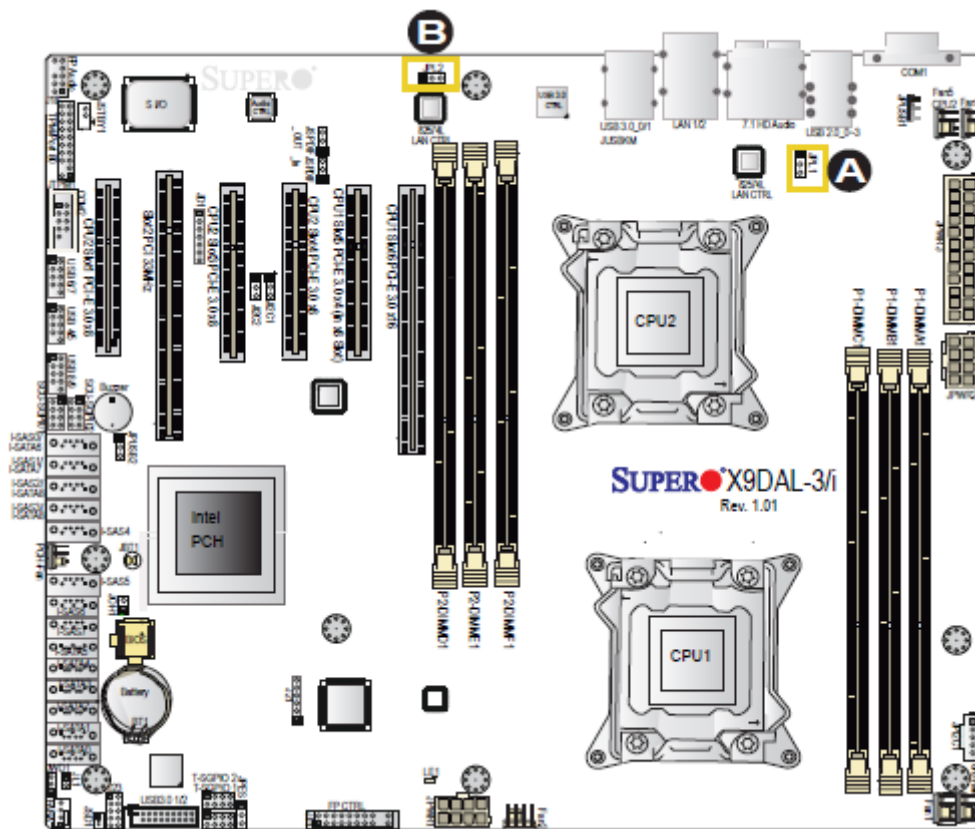
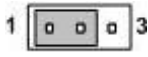



Figure 4: GLAN Jumper Location


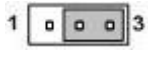

Table 4: GLAN Jumper

Function/Mode	Jumper Setting		Configuration
(Default) Enable	1-2		Enables onboard LAN controller, this may also be controlled via additional BIOS setting.
Disable	2-3		Disables onboard LAN controller. If set to disabled this may not be enabled via additional BIOS setting.

Watch Dog Enable/Disable Jumper (JWD)

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is “hung up”. The table below describes the jumper settings.

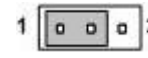
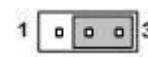
Table 5: Watch Dog Jumper

Function/Mode	Jumper Setting		Configuration
(Default) Reset	1-2		This will cause WD to reset the system if an application is hung up.
NMI	2-3		This will generate a non-maskable interrupt signal for the application that is hung up
Disable	Open		This disables the Watch Dog feature

I²C Bus to PCI Slots Jumper (JI²C1/JI²C2)

Jumpers JI²C1/JI²C2 allows you to connect the System Management Bus (I²C) to PCI slots. The table below describes the jumper settings.

Table 6: I²C Bus to PCI slots Jumper

Function/Mode	Jumper Setting		Configuration
Enables	Closed		This enables the System Management Bus (I ² C) to PCI slots connection.
(Default) Disable	Open		This disables the System Management Bus (I ² C) to PCI slots connection.

Front Panel Audio Control Jumper (Audio FP)

When front panel headphones are plugged in, the back panel audio output is disabled. This is done through the FP Audio header (FP Audio). If the front panel interface card is not connected to the front panel audio header, jumpers should be left blank. The table below describes the jumper settings.

Table 7: Front Panel Audio Jumpers (Front panel audio)

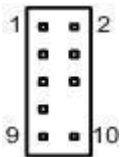
Function/Mode	Jumper Setting		Configuration
Front panel audio	Open		In this open state there is no FP Audio connection connected. Audio line out and mic in signals are available for front panel audio connectors on this connector when a FP Audio connection is installed

Table 8: Front panel Audio Connector

Pin	Signal name	Pin	Signal name
1	MIC_IN	2	Ground
3	MIC_BIAS	4	+5V
5	RIGHT_OUT	6	RIGHT_IN
7	Ground	8	Key
9	LEFT_OUT	10	LEFT_IN

Motherboard Connectors

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

- **Front panel connections**

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

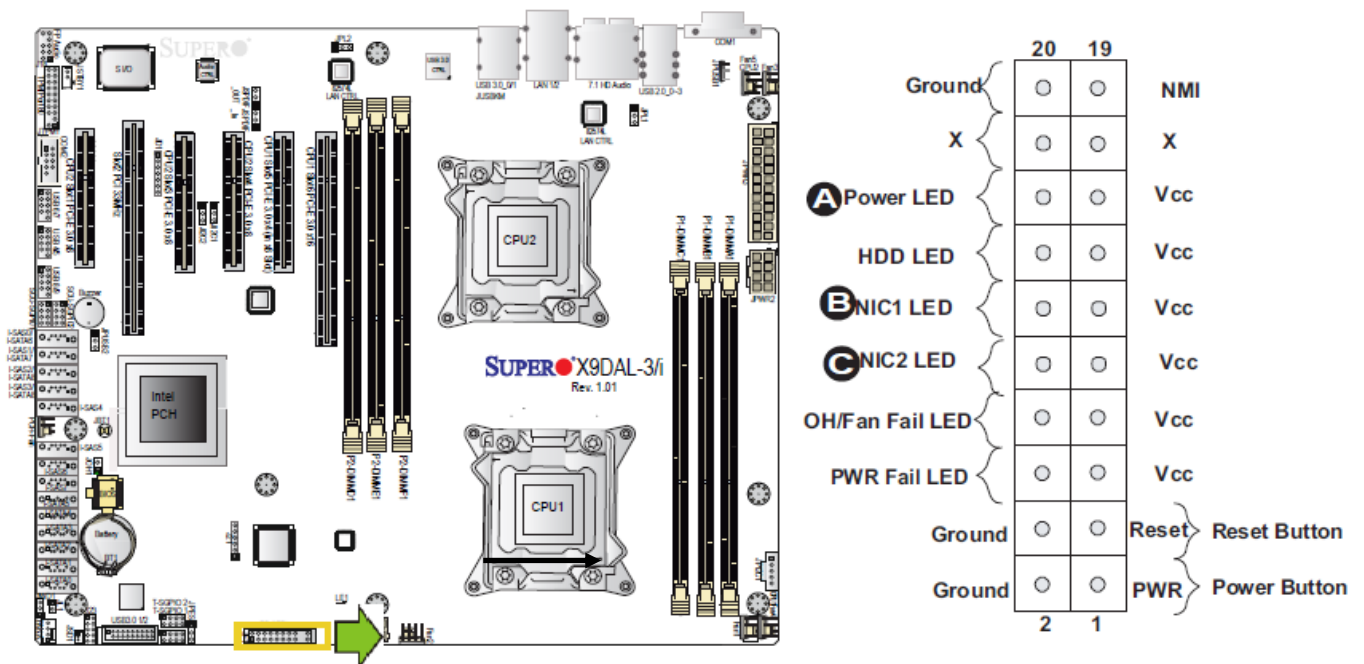


Figure 5: Front panel connections

A-NMI

This non-maskable interrupt

B- Power LED

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

C-HDD (Hard disk drive) LED

This 2-pin connector is for the HDD activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

D-NIC1/NIC2 LED Indicators

These connectors are for the network activity LED. Connect the NIC LED cables to this connector. Anytime a network cable is connected to a NIC the LED will light up.

E- Overheat/Fan Fail LED (OH)

This 2-pin connector is for the advanced warning of chassis overheating or fan failure. If the system is overheating the LED will stay on, if a fan fails the LED will flash constantly.

F- Power Fail LED

This 2-pin connector is for the power stability for the system. If systems does not have the required amount of power the LED will light up.

G-Reset Button

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

H-Power Button

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Power Connectors**

ATX Power Connector

There is a 24-pin main power supply connector and two 8-pin CPU PWR connectors on the Motherboard. These power connectors meet the SSI EPS 12V specification.

Processor Power Connector

In addition to the primary ATX power connector, the 12V 8-pin CPU Power connector must also be connected to the Motherboard.

- A- 24-pin ATX power connector
- B- 8-pin processor power connector
- C- 8-pin processor power connector

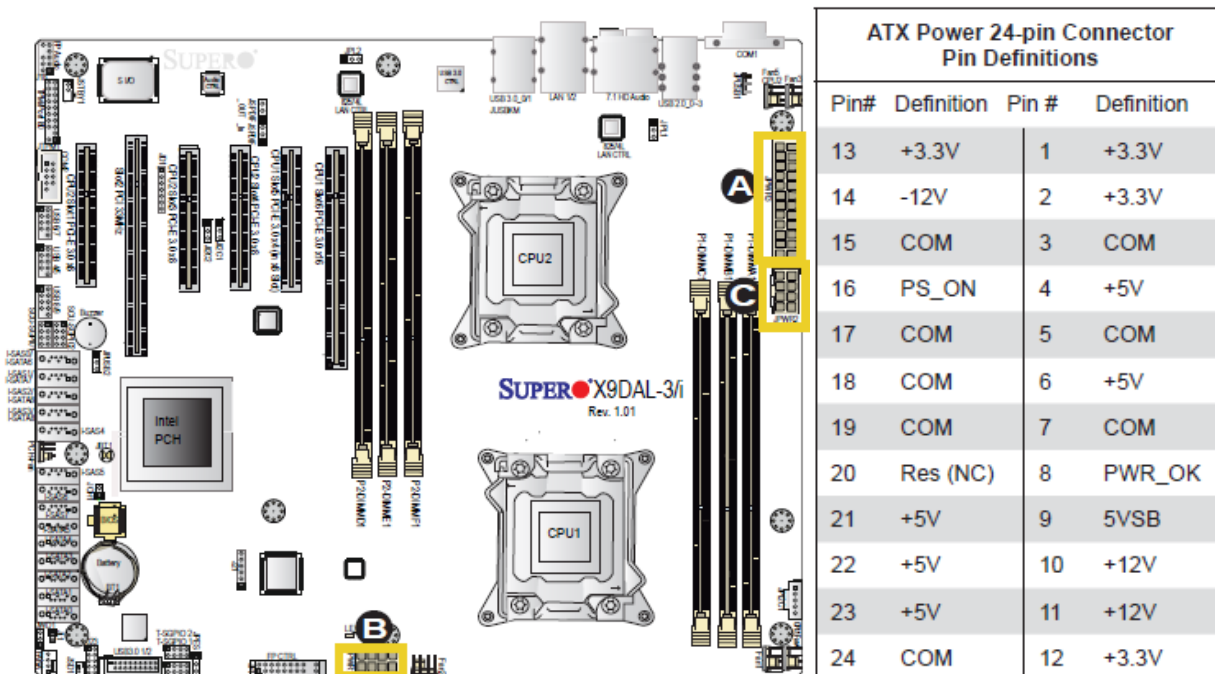


Figure 6: Power Connectors

CAUTION!!

Do not forget to connect the 24+8+8-pin power plugs; otherwise, the system will not boot up. Please connect both CPU power connectors even if one CPU is installed.

Pins	Definition
1 through 4	Ground
5 through 8	+12V

- **Serial ATA connectors**

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

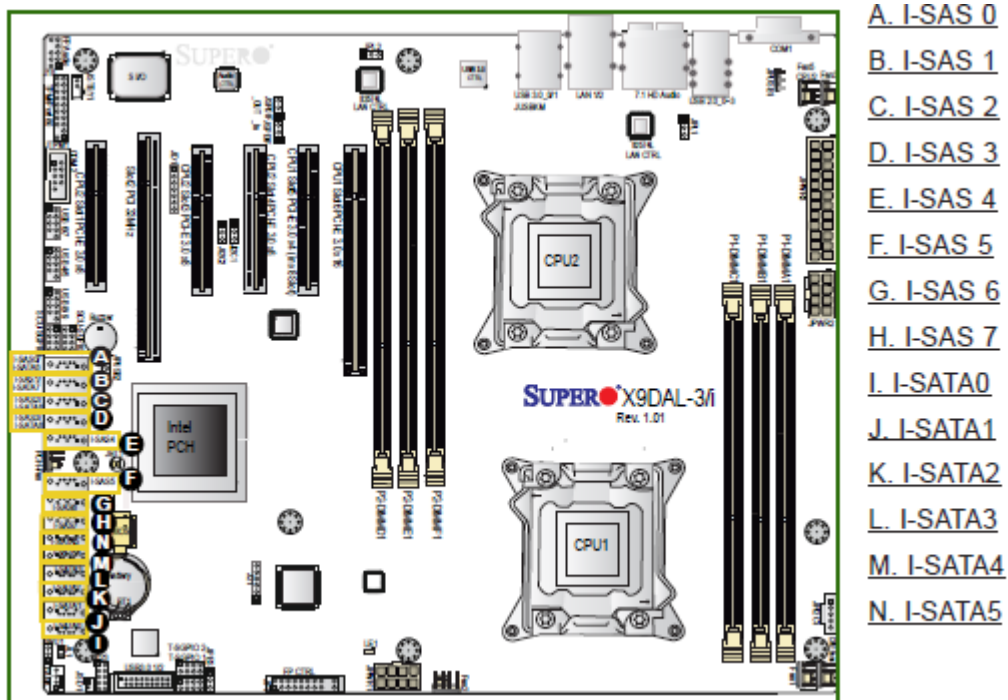


Figure 7: Serial ATA connectors

- **Universal Serial Bus (USB)**

There are three USB 2.0 (Universal Serial Bus) headers on the Motherboard and one USB 3.0 header.

Back Panel USB (2.0) #0~3 Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Front Panel USB (2.0) #4/5, 6/7, 8/9 Pin Definitions			
USB 5/7/9		USB 4/6/8	
Pin #	Definition	Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Back Panel USB (3.0) #0/1, Front Accessible USB (3.0) #2/3 Pin Definitions			
Pin#	Pin#	Signal Name	Description
1	10	VBUS	Power
2	11	D-	USB 2.0 Differential Pair
3	12	D+	
4	13	Ground	Ground of PWR Return
5	14	StdA_SSRX-	SuperSpeed Receiver
6	15	StdA_SSRX+	Differential Pair
7	16	GND_DRAIN	Ground for Signal Return
8	17	StdA_SSTX-	SuperSpeed Transmitter
9	18	StdA_SSTX+	Differential Pair

Figure 8: Universal Serial Bus (USB) header

- **Chassis Intrusion**

A Chassis Intrusion header is located at JL1 on the Motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

Table 9: Chassis Intrusion Header

- **Fan Connectors**

This motherboard has four chassis/system fan headers (Fan 3 to Fan6) and two CPU fans (Fan1/Fan2) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via Hardware Monitoring in the Advanced Setting in the BIOS. (The Default setting is Disabled.) See the table for pin definitions.

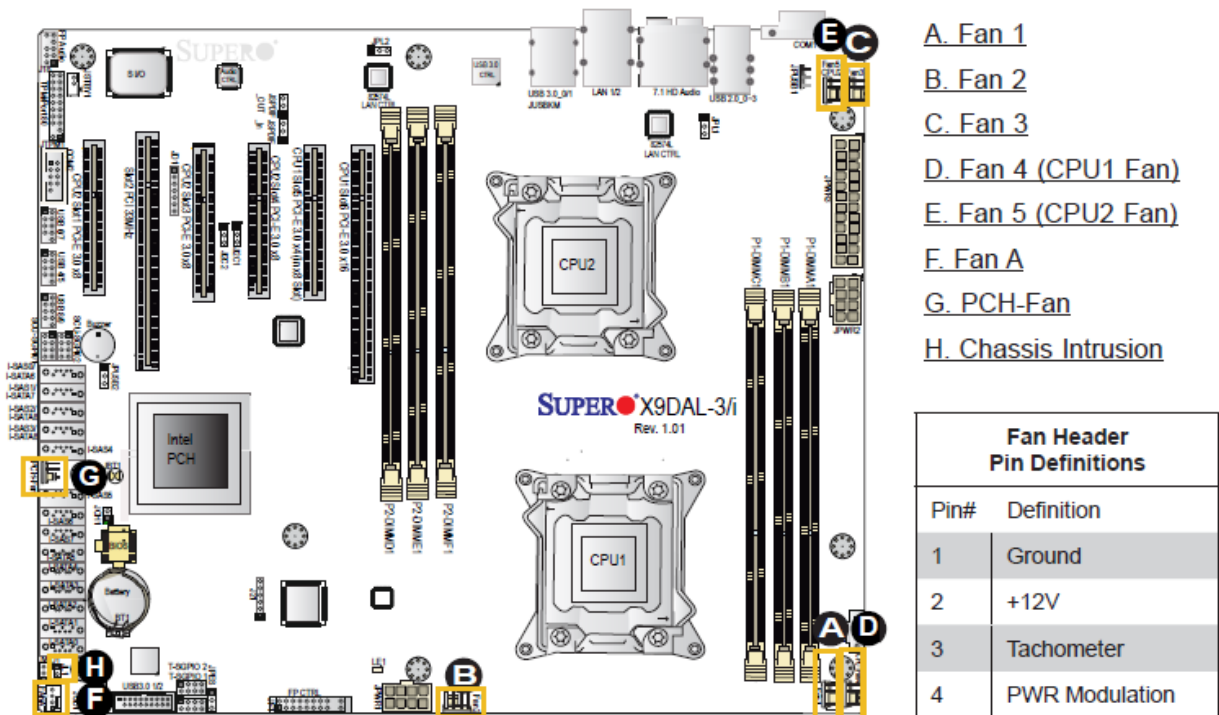


Figure 9: Fan connectors

CAUTION!!

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the Motherboard components. These are not jumpers!! Do not place jumper caps on the fan connectors!!

- **Internal Speaker**

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Buzzer (SP1).

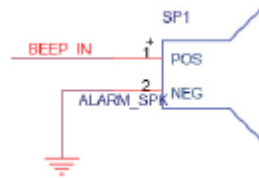


Figure 10: Internal Speaker

- **Power LED/Speaker**

On the JD1 header, pins 1~3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. If you wish to use the onboard speaker, you should close pins 6~7 with a jumper. Connect a cable to pins 4~7 of JD1 to use an external speaker.

- A- Internal Speaker (Buzzer)
- B- Power LED/Speaker
- C-

Internal Buzzer (SP1) Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	Cathode (-)

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker

Figure 11: Power LED/Speaker connection

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6.7 with a jumper.

- **Overheat LED/Fan Fail (JOH1)**

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

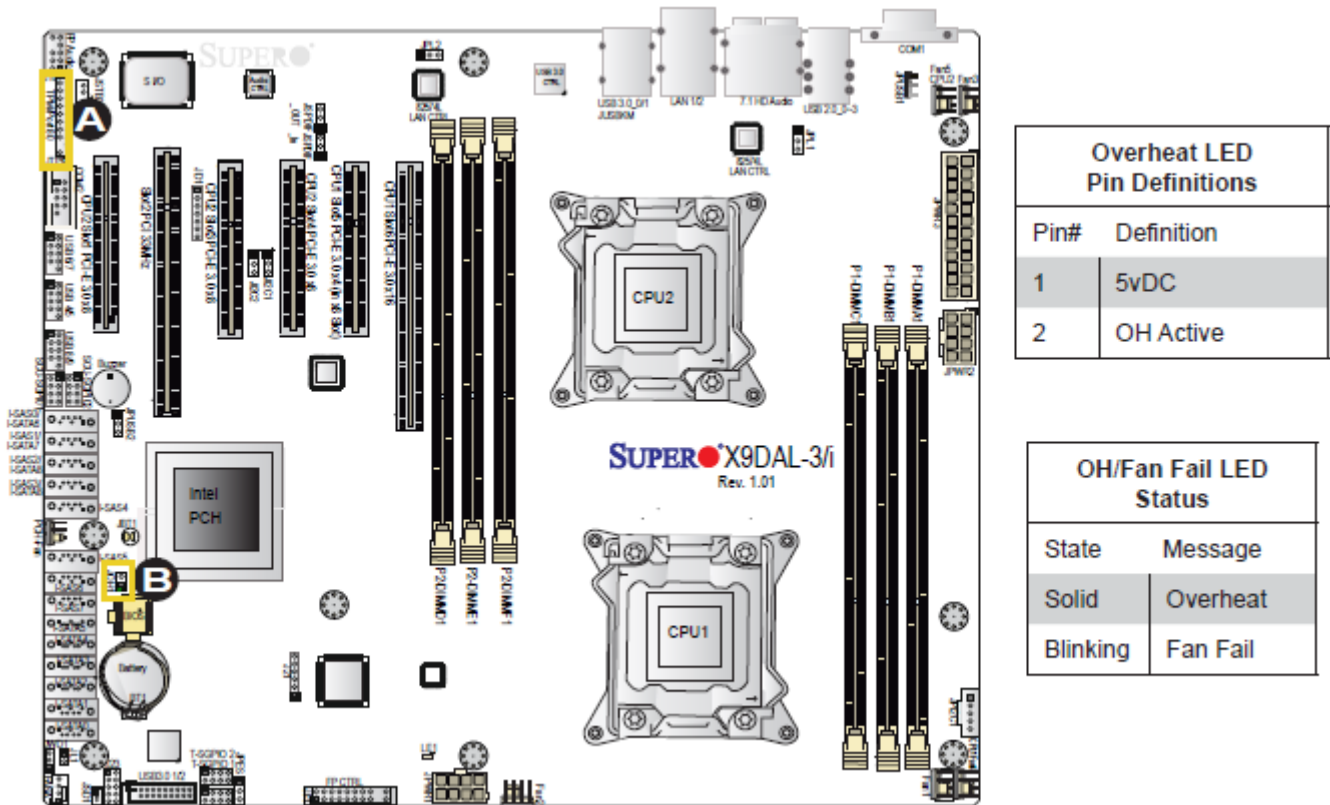


Figure 12: Overheat LED/Fan Fail (JOH1)

- **Power SMB (I²c) Connector**

Power System Management Bus (I2C) Connector (JPI2C) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

Table 10: Overheat LED/Fan Fail and SMB connectors

- **T-SGPIO Headers**

Two SGPIO (Serial General Purpose Input/Output) headers are located on the Motherboard. These headers are used for SATA monitoring on the backplane. Refer to the board layout below for the locations of the headers.

- A- T-SGPIO1
- B- T-SGPIO2
- C- 6-SGPIO1
- D- 6-SGPIO2

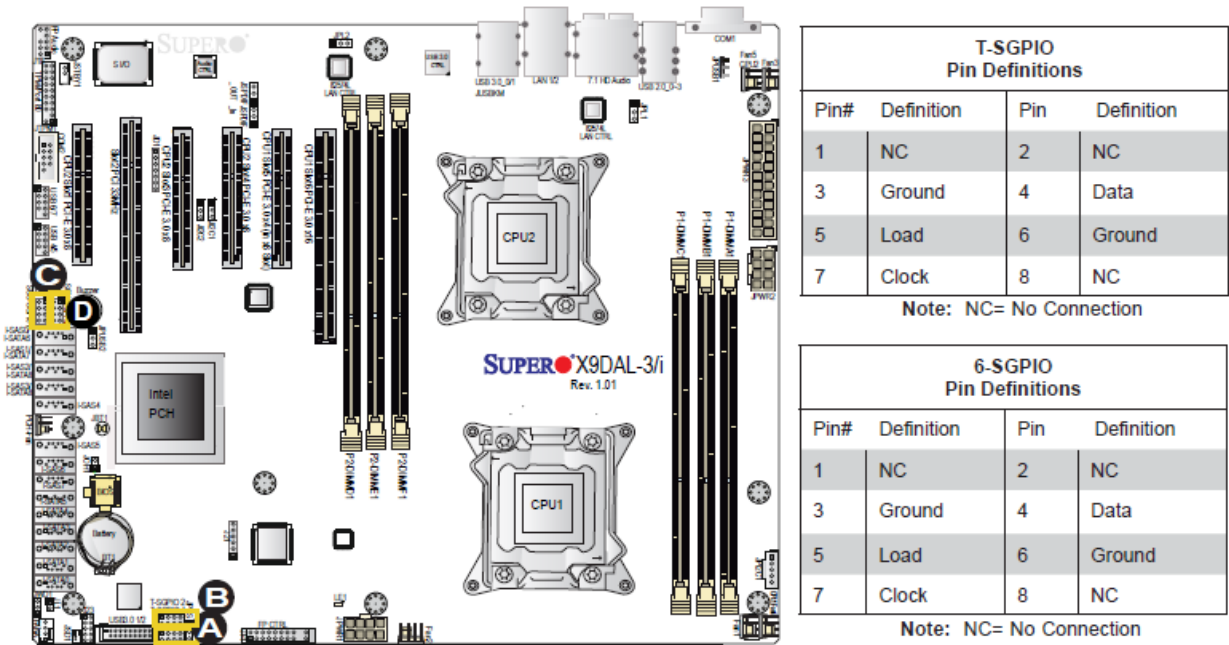


Figure 13: T-SGPIO connectors

Upgrading the Central Processing Unit (CPU)

The Motherboard comes with a surface mount LGA1356 socket designed for the Intel® Xeon E5-2400 series processors

CAUTION!!

When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes:

- 1. Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.*
- 2. Make sure you install the Motherboard into the chassis before you install the CPU heatsink and fan.*

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

The design of the Vig430P computer makes it a simple job to replace or upgrade the processor. To do so please refer to the follow instructions below:

Un-install the Heatsink

1. Remove the lid from the system by lifting the securing latch at the rear of the case

CPU heatsink (Top View)



CPU heatsink (Bottom View)

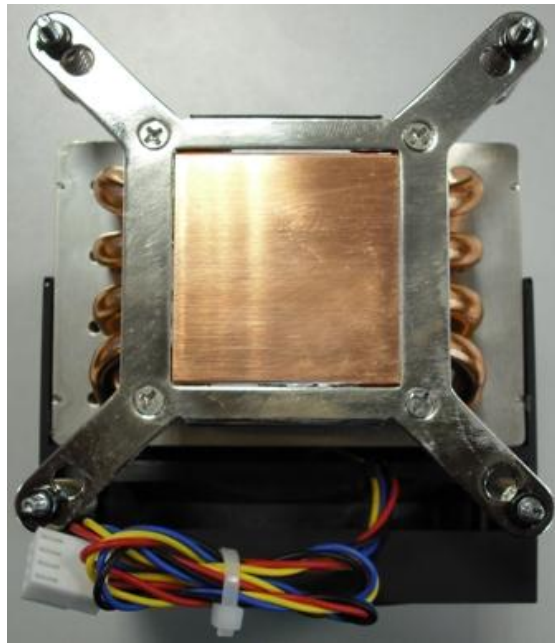


Figure 14: Xeon Active CPU heatsink

2. Unplug the heatsink fan from Motherboard fan connector. Then remove the fan from the heatsink.

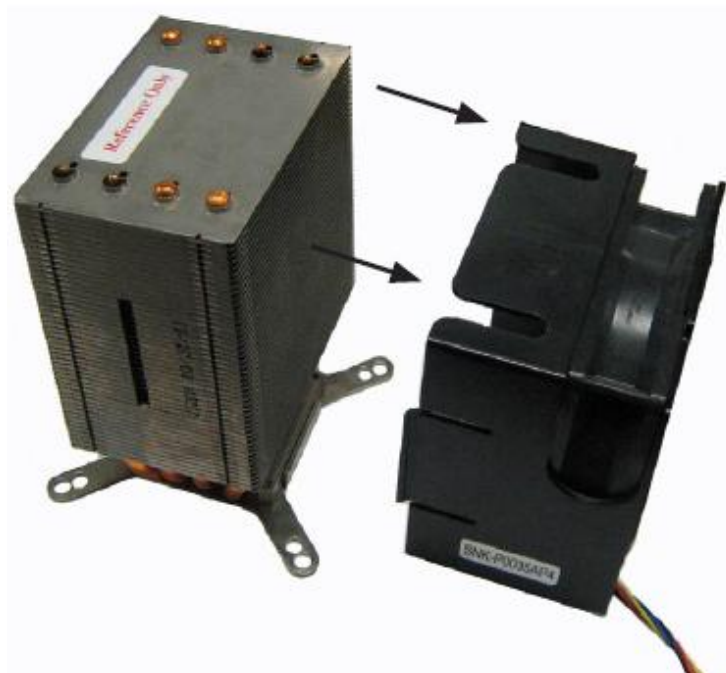


Figure 15: Heatsink Fan Removal

3. Remove the heatsink screws from the Motherboard in the sequence as shown in the picture below.

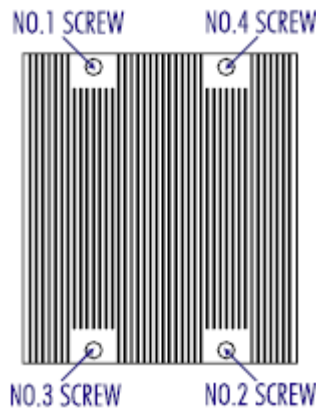


Figure 16: Heatsink screws

4. **Gently** wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!).
5. Once the heatsink is loosened, remove the heatsink from the CPU socket.
6. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the CPU and the heatsink.

Installing the CPU:

1. Press the socket clip to release the load plate that covers the CPU socket from its locking position.

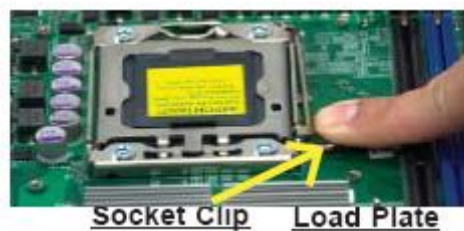


Figure 17: Release load plate

2. Gently lift the socket clip to open the load plate.



Figure 18: Lift Load Plate

3. Hold the CPU at the north and south edges.

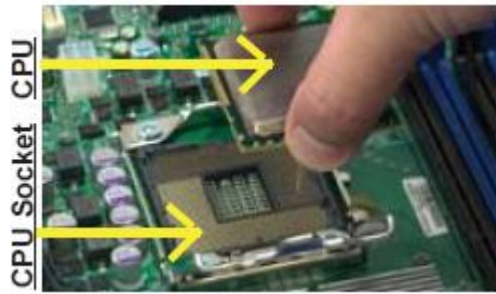


Figure 19: Holding the CPU

4. Align the CPU key, which is the semi-circle cut-out against the socket key, which is the notch below the gold colour dot, on the side of the socket.

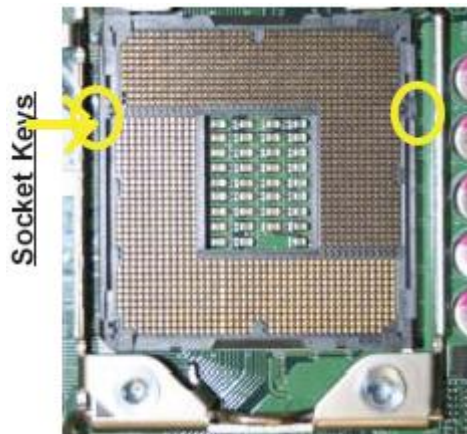


Figure 20: Aligning the CPU

5. When both CPU and the sockets are aligned, carefully lower the CPU straight down into the socket (Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.)



Figure 21: Aligning the CPU

6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.



Figure 22: Ensure CPU is Properly Secured

7. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket. Use your thumb to gently push the socket clip down to the clip lock.

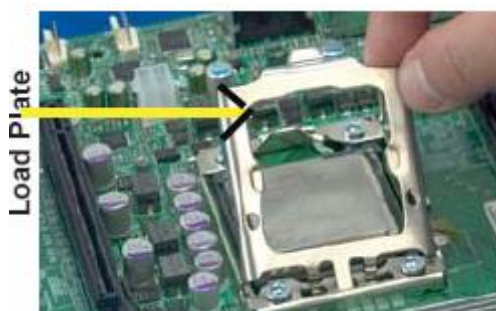


Figure 23: Secure CPU Load Plate

Note: *If one CPU is to be installed it should be installed in socket for CPU1.*

Installing Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die; if it has already been applied. If Heatsink thermal paste is not already applied to heatsinks this must be done now.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (Do not fully tighten the screws to avoid possible damage to the CPU.)

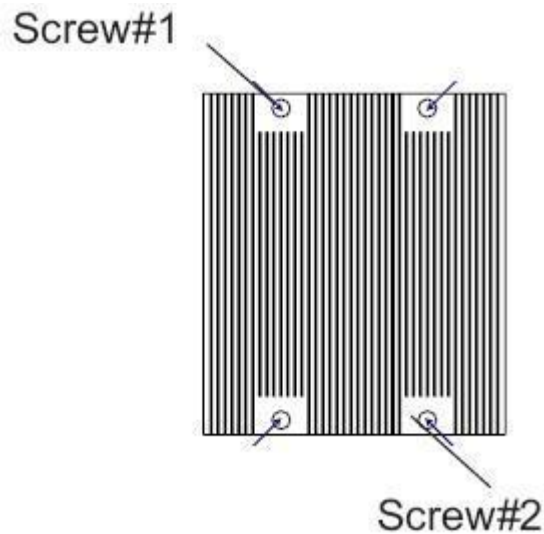


Figure 24: Heatsink diagonal screw locations

4. Finish the installation by fully tightening all four screws.
5. Repeat the steps for the second heatsink if required.

Upgrading System Memory

CAUTION!!

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance!!

To install DIMM:

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below. (See System Memory, Page 17.)
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

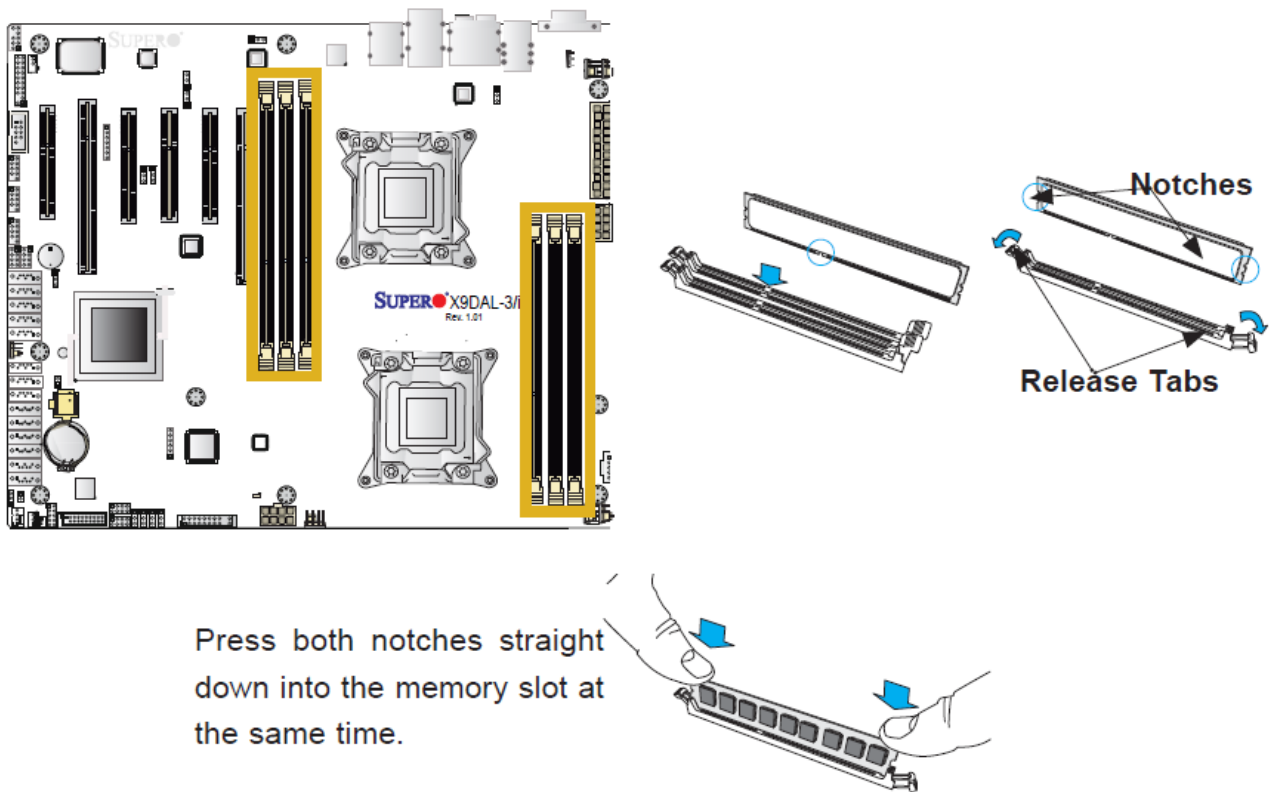


Figure 25: Installing Memory Modules

To Remove DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM

Note: Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket

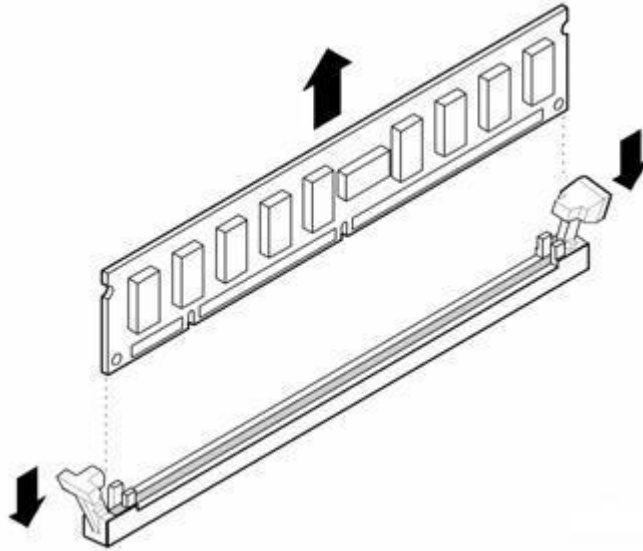


Figure 26: Removing DIMM

Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the lid from the system by un-screwing the two screws at the rear of the case
2. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
4. Secure the card to the chassis with the screw you removed earlier.
5. Replace the system lid.

Configuring an expansion card

After installing the expansion card, configure the card by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any.
2. Install the software drivers for the expansion card.

PCI Slots

There are two 64-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 27: Installing a PCI card

PCI Express x16 Slot

This Motherboard supports PCI Express x16 graphic cards that comply with the PCI Express specifications.

Figure 44 shows a graphics card installed on the PCI Express x16 slot.



Figure 28: Install a PCI Express x16 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.

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 45).
6. Install the new battery in the socket.

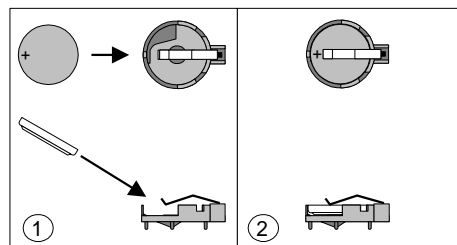


Figure 29: Removing the Battery

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 Viglen's Technical Support team for further assistance.

Viglen Technical Support can be reached in the following ways:

Telephone: 01727 201 850
Fax: 01727 201 858
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 <F1> for Set-up, <F2> to Boot
You can note the error and press <F2> to resume the boot- up process, or <F1> 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.

No Power

1. Make sure that there are no short circuits between the Motherboard and the chassis.
2. Make sure that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your Motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the page 56 for details on beep codes.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information.
2. The battery on your Motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact technical support

o

Memory Errors

When a No_Memory_Beep_Code is issued by the system, check the following:

1. Make sure that the DIMM modules are properly and fully installed.
2. Check if different speeds of DIMMs have been installed and check if the BIOS setup is configured for the fastest speed of RAM used. (It is recommended to use the same RAM speed for all DIMMs in the system.)
3. Make sure you are using the correct type of DDR3 Registered ECC or Unbuffered ECC/Non-ECC 1333 MHz/1066 MHz SDRAM (recommended by the manufacturer.)
4. Check for bad DIMM modules or slots by swapping a single module between all memory slots and check the results.
5. Make sure that all memory modules are fully seated in their slots. Make sure to follow the instructions given on DIMM population on page 17 Check the position of the 115V/230V switch on the power supply.
6. Please follow the instructions given in the DIMM Population Tables listed on page 17 to install your memory modules.

Problems & Suggestions

Table 11: 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>
CMOS RAM settings are wrong	<p>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).</p>
Diskette drive light does not go on when drive is in use or is tested by POST	<p>Make sure the power and signal cables for the drive are properly installed.</p> <p>Check that the drive is properly configured and enabled in Setup.</p>

Table 12: Problems and Suggestions (Continued)

What happens	What to do
Hard drive light does not go on when drive is in use or is tested by POST	<p>Make sure the power and signal cables for the drive are properly installed.</p> <p>Make sure the front panel connector is securely attached to the system board headers.</p> <p>Check that the drive is properly configured and enabled in Setup.</p> <p>Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.</p>
Power-on light does not go on	<p>If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.</p>
Prompt doesn't appear after system boots	<p>It's probably switched off.</p> <p>A serious fault may have occurred consult your dealer service department / Technical Support.</p>
Setup, can't enter	<p>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.</p>
System halts before completing POST	<p>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.</p>

Error and Information Messages

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk

Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key

Stuck key on keyboard.

Keyboard error

Keyboard not working.

Keyboard Controller Failed

Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch

Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP

Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn

Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn

System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn

Extended memory not working or not configured properly at offset **nnnn**.

System battery is dead - Replace and run SETUP

The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error

The timer test failed. Requires repair of system board.

Real time clock error

Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the wait state configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS

Memory size found by POST differed from CMOS.

Diskette drive A error

Drive A: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP

Type of floppy drive A: not correctly identified in Setup.

System cache error - Cache disabled

RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:

CPU socket number for Multi-Processor error.

EISA CMOS not writeable

ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed

ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed

ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed

Server BIOS2 test error: Fail-Safe Timer takes too long.

Device Address Conflict

Address conflict for specified **device**.

Allocation Error for: device

Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive

CD ROM Drive identified.

Entering SETUP ...

Starting Setup program

Failing Bits: nnnn

The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n

Fixed disk **n** (0-3) identified.

Invalid System Configuration Data

Problem with NVRAM (CMOS) data.

I/O device IRQ conflict

I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:

PS/2 Mouse installed.

nnnn kB Extended RAM Passed

Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed

Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed

Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed

Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu

There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found

Operating system cannot be located on either drive A: or drive C: Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn

Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????**. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ?????.

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: nnnn

Displays the address *nnnn* of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the Phoenix BIOS. POST codes are divided into two categories: recoverable and terminal.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep w/ Front Panel OH LED on	System Overheat	1 continuous beep with the front panel OH LED on

Table 13: BIOS Error Beep Codes

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

Table 14: POST code description

POST Code	Description
01h	IPMI Initialization
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Reset PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh

Table 15: POST code description (Continued)

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line xxxx*
2Eh	1-3-4-3 RAM failure on data bits xxxx* of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot (optional)
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board (optional)
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press <ESC> to enter SETUP"
5Bh	Disable CPU cache

Table 16: POST code description (Continued)

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring (optional)
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs (optional)
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table

Table 17: POST code description (Continued)

POST Code	Description
98h	1-2 Search for option ROMs and shadow if successful. One long, two short beeps on checksum failure
99h	Check for SMART Drive (optional)
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase <ESC> prompt
AAh	Scan for <ESC> key stroke
ACh	Enter SETUP
A Eh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST (optional)
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS and PPM Structures
B9h	Prepare Boot
BAh	Initialize SMBIOS
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error flags
C6h	Console redirection init.
C7h	Unhook INT 10h if console redirection enabled
C8h	Force check (optional)
C9h	Extended ROM checksum (optional)
CDh	Reclaim console redirection vector
D2h	Unknown interrupt
D4h	Check Intel Branding string

Table 18: POST code description (Continued)

POST Code	Description
D8h	Alert Standard Format initialization
D9h	Late init for IPMI
DEh	Log error if micro-code not updated properly

The following are for boot block in Flash ROM

Table 19: POST code description

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

Note:

If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the low-order byte of the error. It repeats this sequence continuously.

Chapter 4: System RAID Options

Intel ICH10R HostRAID Setup Guidelines

After all the hardware has been installed, you must first configure Intel's SATA RAID before you install the Windows Operating System and other software drivers.

Notes:

1. *If you do not wish to configure onboard SATA RAID functions, please go directly to page and page for Operating System & Other Software Installation.*
2. *This chapter describes RAID Configuration Instructions for the Intel ICH10R Host RAID Controller designed for the Windows OS. To configure the Adaptec HostRAID for your Motherboard, please refer to page 72.*

Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH10R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2003/2008/Vista operating system and other software drivers. The necessary drivers are all included on the Viglen Driver CD supplied with the system.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3.0 Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to the Intel ICH10R Serial RAID

Located in the South Bridge of the 5000X chipset, the I/O Controller Hub (ICH10R) provides the I/O subsystem with access to the rest of the system. It supports 1- channel UltraATA/100 Bus Master IDE controller (PATA) and six Serial ATA (SATA) ports. The ICH10R supports the following PATA and SATA device configurations: Legacy mode and Native mode.

Intel HostRAID Configurations

The following types of Intel's HostRAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

The Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH10R, allows the user to create RAID 0, RAID 1, RAID 10 and RAID 5 sets by using only six identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generates a virtual RAID 0, RAID 1, RAID 10 and RAID 5 sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (Native Mode)

1. Press the key during system bootup to enter the BIOS Setup Utility.

Note: *If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.*

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "IDE/Floppy Configuration" section in BIOS.

4. Scroll down to "SATA#1 Configuration" and press the <Enter> key to select "Enhanced".

5. Scroll down to "Configure SATA#1 as" and press <Enter>. Then, select "RAID"

6. Scroll down to "ICH RAID CodeBase" and press <Enter>. Then, select "Intel"

7. Go to "Exit." Select "Exit Saving Changes" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

8. Once you've exited the BIOS Utility, the system will re-boot.

9. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <I> for the Intel RAID Configuration Utility.*

Note: *The Intel RAID Configuration Utility is only available for systems with two or more drives installed. The Intel RAID Utility screen will not display in systems with one drive installed.*

Using the Intel ICH10R SATA RAID Utility Program

Creating, Deleting and Resetting RAID Volumes:

- 1) After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test.

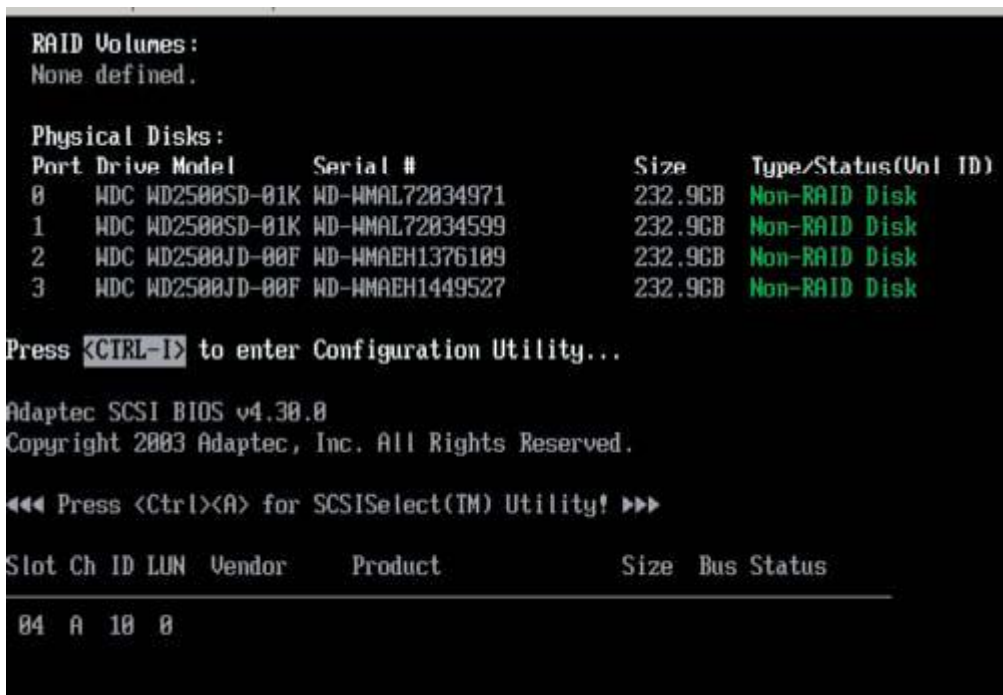


Figure 30: Entering the Intel ICH10R SATA Utility

Note: *All graphics and screen shots shown in the manual are for reference only. Your screens may or many won't look exactly the same as the graphics shown in this manual.*

2. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to have the main menu of the SATA RAID Utility appear:

Creating a RAID 0 Volume

1. Select "Create RAID Volume" from the main menu and press the <Enter> key.

The following screen will appear:



Figure 31: Creating a RAID 0 Volume

2. Specify a name for the **RAID 0** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)
3. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 0 (Stripe)** and hit <Enter>.
4. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays:



Figure 32: Selecting Drives for RAID 0 Volume

5. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

- Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>.

Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.

- Press <Enter> when the Create Volume item is highlighted. A warning message displays.
- When asked "Are you sure you want to create this volume (Y/N)", press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume

- Select "Create RAID Volume" from the main menu and press the <Enter> key.

The following screen will appear:

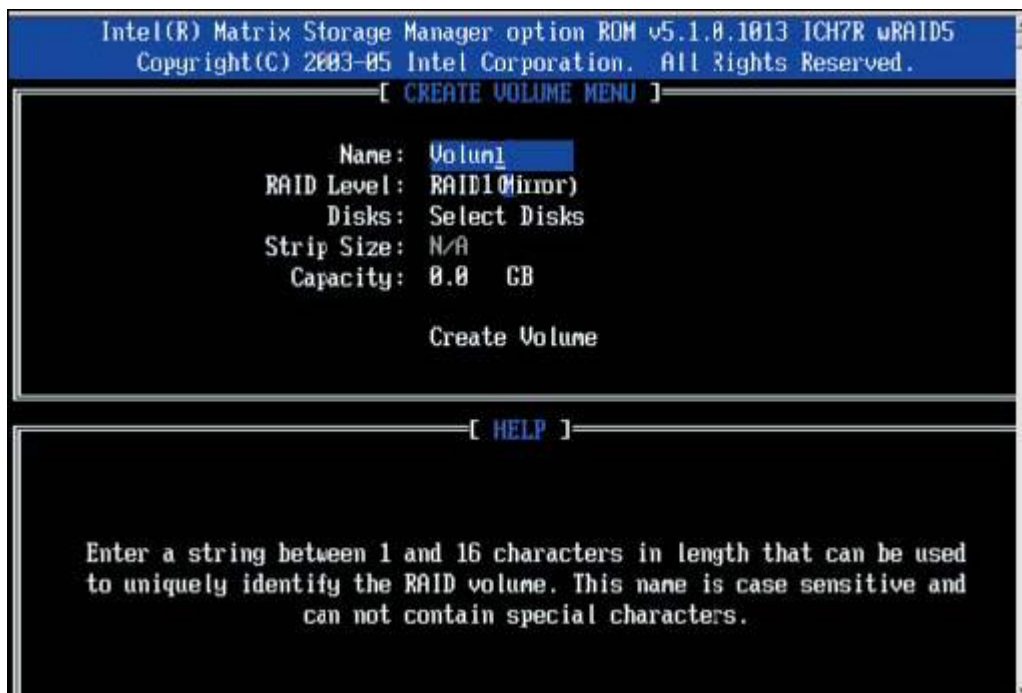


Figure 33: Creating a RAID 1 Volume

- Specify a name for the **RAID 1** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)
- When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 1 (Mirror)** and hit <Enter>.
- When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.
- Press <Enter> when the Create Volume item is highlighted. A warning message displays.

- When asked "Are you sure you want to create this volume (Y/N)", press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+RAID 0)

- Select "Create RAID Volume" from the main menu and press the <Enter> key.

The following screen will appear:

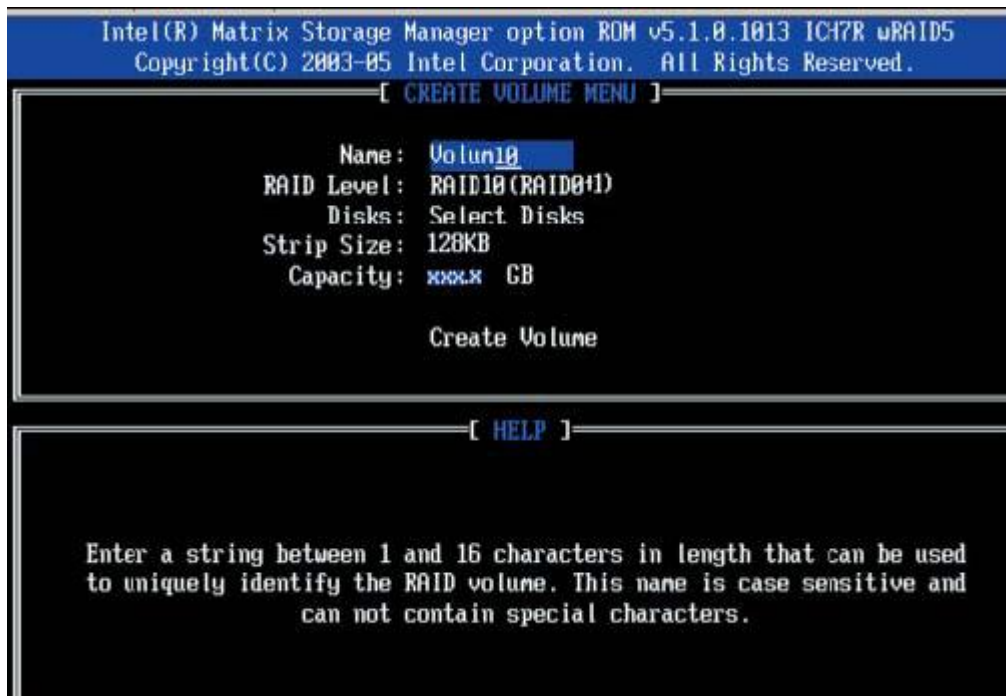


Figure 34: Creating a RAID 10 (RAID 1 + RAID 0) Volume

- Specify a name for the **RAID 10** set and press <Enter>.
 - When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 10 (RAID1 + RAID0)** and hit <Enter>.
 - When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 64 KB.
- Note:** For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.
- When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.
 - Press <Enter> when the Create Volume item is highlighted. A warning message displays.

- When asked "Are you sure you want to create this volume (Y/N)", press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 (Parity)

- Select "Create RAID Volume" from the main menu and press the <Enter> key.

The following screen will appear:

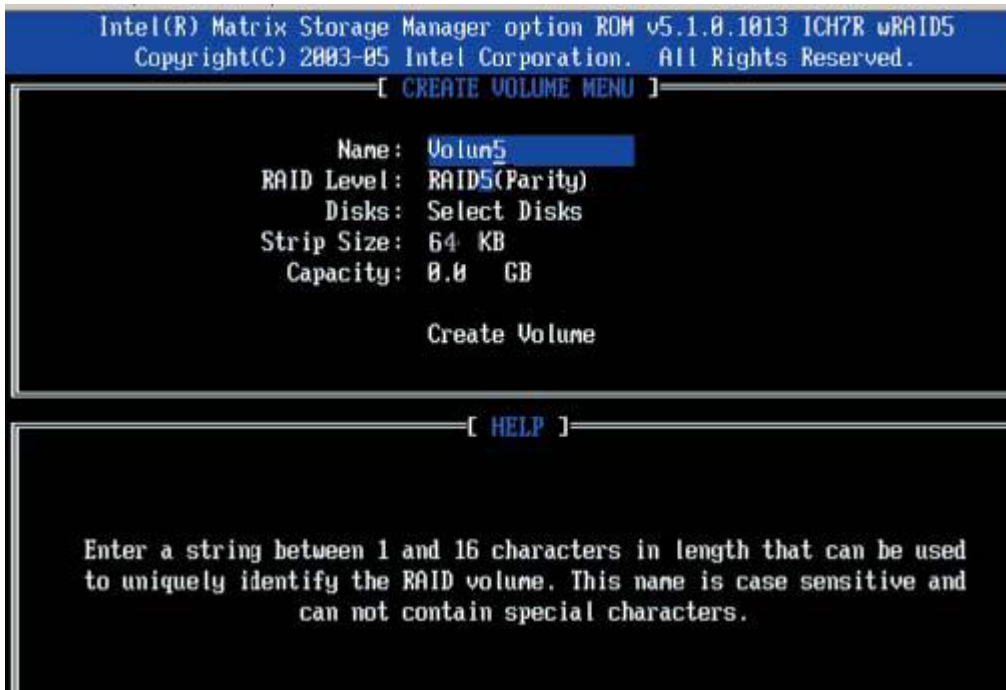


Figure 35: Creating a RAID 5 (Parity) Volume

- Specify a name for the **RAID 5** set and press <Enter>.
- When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 5 (Parity)** and hit <Enter>.
- When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (See Note on Page 70) displays:

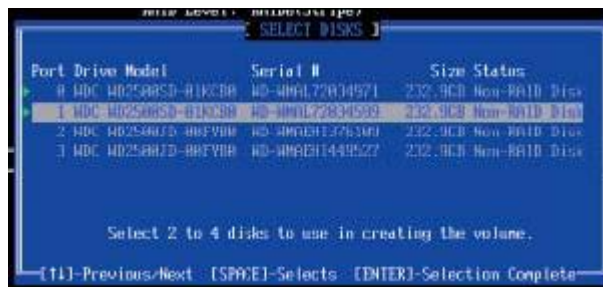


Figure 36: Selecting Drives for RAID 5 (Parity) Volume

5. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.
6. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>.

Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.

7. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.
8. Press Enter when the Create Volume item is highlighted. A warning message displays.
9. When asked "Are you sure you want to create this volume (Y/N)", press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume

CAUTION!!

Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.

1. From the main menu, select item2-Delete RAID Volume, and press <Enter>.
2. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press . A Warning message displays.
3. When asked "Are you sure you want to delete this volume (Y/N)", press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD

CAUTION!!

Be cautious when you reset a RAID volume HDD to non-RAID or Resetting a RAID HDD. Resetting a RAID volume HDD or Resetting a RAID HDD will reformat the HDD and delete the internal RAID structure on the drive.

1. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>.

The following screen will appear:



Figure 37: Resetting to Non-RAID and Resetting a RAID HDD

2. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select.
3. Press <Enter> to reset the RAID set drive. A Warning message displays.
4. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

1. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.
2. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Installing the Windows XP/2003/2008/Vista for systems with RAID Functions

New Operating System-Windows XP/2003/2008/Vista Installation

1. Copy the Intel ICH10R SATA RAID Controller Drivers for the appropriate OS to a formatted diskette. These drivers can be found on the Viglen driver CD provided with the system.
2. Reboot system.
3. Insert Microsoft Windows XP/2003/2008/Vista Setup CD in the CD Driver, and the system will start booting up from CD.
4. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.
5. When the Windows XP/2003/2008/Vista Setup screen appears, press "S" to specify additional device(s).
6. Insert the driver diskette-"Intel AA RAID XP/2003/2008/Vista Driver for ICH10R into Drive A: and press the <Enter> key.
7. Choose the Intel ICH10R SATA RAID Controller from the list indicated in the XP/2003/2008/Vista Setup Screen, and press the <Enter> key.
8. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
9. From the Windows XP/2003/2008/Vista Setup screen, press the <Enter> key. The XP/2003/2008/Vista Setup will automatically load all device files and then, continue the Windows XP/2003/2008/Vista installation.
10. After Windows XP/2003/2008/Vista installation is completed, the system will automatically reboot.

Chapter 5: System BIOS

Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the Vig430P. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

What is the BIOS?

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS Logic, enabling it to retain system parameters. Each time the computer is powered on the computer is configured with the values stored in the CMOS Logic by the system BIOS, which gains control at boot up.

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.

How to Enter the BIOS

To enter the BIOS Setup you will need to repeatedly press the **Delete** button when the machine is first turned on and is performing its Power On Self Test (POST).

How to Access the Boot Menu

To access the Boot Menu you will need to repeatedly press the F11 button when the machine is first turned on and is performing its Power On Self Test (POST).

Updating the BIOS

The system BIOS can be updated using one of the following methods:

- Flash BIOS update under Windows
- Flash BIOS update with a USB stick

All necessary BIOS files can be obtained from the Viglen FTP site at:

<http://download.viglen.co.uk/files/>

- **Flash BIOS update under Windows**

1. Start your system and boot into Windows
2. Download the latest BIOS update for Windows from Viglen FTP site
3. Run the application to begin update process
4. **For additional help refer to readme.txt (included in download package)**

CAUTION!!

Do not shut down or reset the system while updating the BIOS. Doing so may cause permanent damage to the motherboard

- **Flash BIOS update with a USB Stick (DOS)**

1. Have a bootable USB stick ready
2. Download and decompress (unzip) the latest BIOS update for DOS from Viglen FTP site
3. Copy the contents to the root of your bootable USB stick
4. Restart your system and press F11 during POST to open the Boot Menu
5. Select your bootable USB stick
6. Launch the flash BIOS update using the necessary commands
7. **For additional help refer to readme.txt (included in download package)**

CAUTION!!

Do not shut down or reset the system while updating the BIOS. Doing so may cause permanent damage to the motherboard

Main BIOS Setup

All main Setup options are described in this section. The main BIOS Setup screen is displayed below. Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting. Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus. Items that use submenus are indicated with the _ icon. With the item highlighted, press the <Enter> key to access the submenu.

Note: To enter the BIOS Setup you will need to repeatedly press the **Delete** button when the machine is first turned on and is performing its Power On Self Test (POST).



Figure 38: Main Bios Screen

Main Setup Features

- **System Time/System Date**
Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format.
- **SMC Version:** This item displays the BIOS revision used by your system
- **SMC Build Date:** This item displays the date when this BIOS was completed.
- **System Memory:** This item displays the installed memory size detected by the BIOS.

Advanced Setup Configuration

Choose Advanced from the BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>.

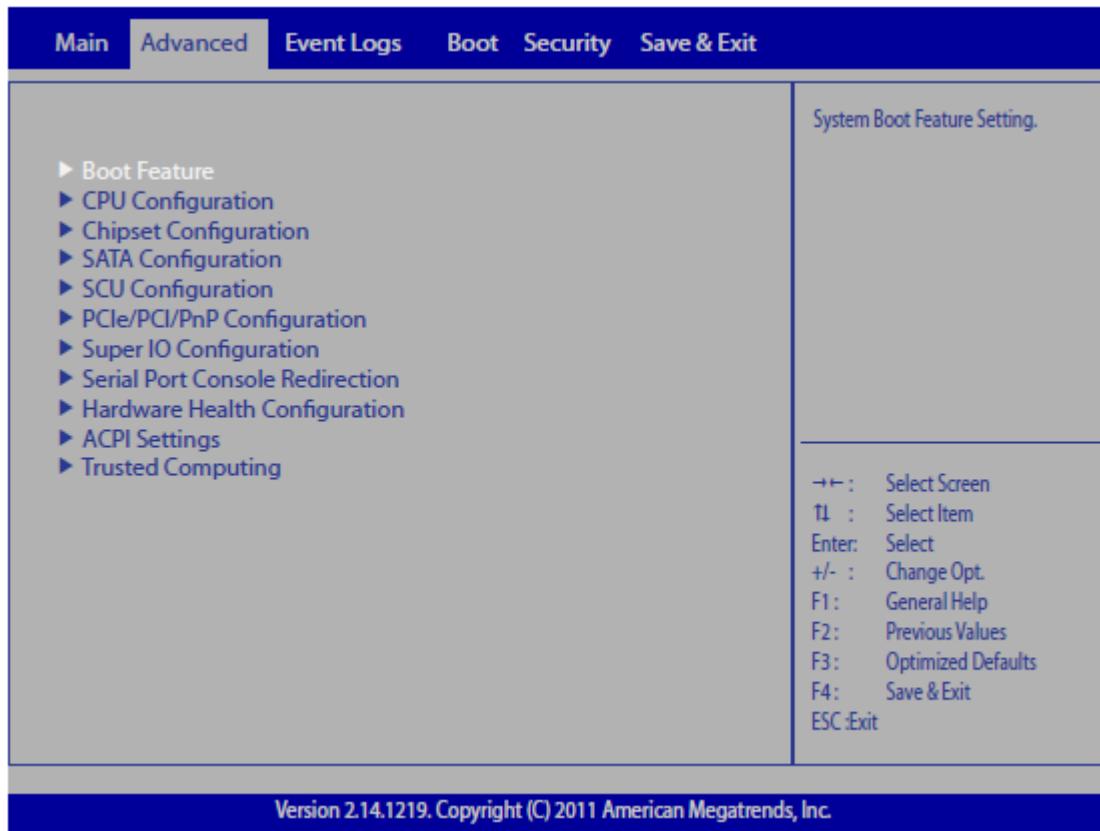


Figure 39: Advanced Settings

Boot Features

- **Quiet Boot**
This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.
- **AddOn ROM Display Mode**
This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.
- **Bootup Num-Lock**
This feature selects the Power-on state for Numlock key. The options are Off and **On**.
- **PS/2 Mouse Support**
This feature enables support for the PS/2 mouse. The options are Disabled, Enabled and **Auto**.

- **Wait For 'F1' If Error**

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

- **Interrupt 19 Capture**

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Power Configuration

- **Watch Dog Function**

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

- **Power Button Function**

If set to Instant_Off, the system will power off immediately as soon as the user hits the power button. If set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

- **Restore on AC Power Loss**

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configure CPU settings.

- **Socket 1/Socket 2 CPU Information**

This submenu displays the following information regarding the CPU installed in Socket 1 and (or) Socket 2 as detected by the BIOS:

- Type of CPU
- CPU Signature
- Microcode Patch
- CPU Stepping
- Maximum CPU Speed
- Minimum CPU Speed
- Processor Cores
- Intel HT (Hyper-Threading) Technology

- Intel VT-x Technology
 - L1 Data Cache
 - L1 Code Cache
 - L2 Cache
 - L3 Cache
- **CPU Speed**
This item displays the speed of the CPU installed in Socket 0.
 - **64-bit**
This item indicates if the CPU installed in Socket 0 supports 64-bit technology.
 - **Active Processor Cores**
Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are All, 1, and 2.
 - **Limit CPUID Maximum**
This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and Disabled (for the Windows OS).
 - **Execute-Disable Bit Capability (Available if supported by the OS & the CPU)**
Select Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is Enabled. (Refer to Intel and Microsoft Web sites for more information.)
 - **Hardware Prefetcher (Available when supported by the CPU)**
If set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and Enabled
 - **Adjacent Cache Line Prefetch (Available when supported by the CPU)**
The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to Enabled
 - **DCU Streamer Prefetcher (Available when supported by the CPU)**
Select Enabled to support Data Cache Unit (DCU) prefetch to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and Enabled
 - **DCU IP Prefetcher**
Select Enabled for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are Enabled and Disabled

- **Intel® Virtualization Technology (Available when supported by the CPU)**
Select Enabled to support Intel Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and Disabled.
 - Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)
- **Clock Speed Spectrum**
Select Enable to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are Disabled and Enabled.
- **EUP**
Select Enabled to support the Low-power Compliance Mode for Energy-using Products (EuP). The options are Enabled and Disabled

CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

- **Power Technology**
Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disabled, Energy Efficiency, and Custom. If the option is set to Custom, the following items will display:
 - **EIST** – EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel's web site for detailed information. The options are Disabled and Enabled.
 - **C1E Support** – Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are Enabled and Disabled.
 - **CPU C3 Report** – Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and Disabled.
 - **CPU C6 Report** – Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are Enabled and Disabled.
 - **CPU C7 Report** – Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are Enabled and Disabled.
 - **Package C State Limit** – If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are C0, C2, C6, and No Limit.
 - **Energy Performance** – Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by

the firmware management via IPMI 2.0. The options are Performance, Balanced Performance, Balanced Energy, and Energy Efficient.

- **Factory Long Duration Power Limit** – This item displays the power limit (in watts) set by the manufacturer during which long duration power is maintained.
- **Long Duration Power Limit** – This item displays the power limit (in watts) set by the user during which long duration power is maintained. The default setting is 0
- **Factory Long Duration Maintained** – This item displays the period of time (in seconds) set by the manufacturer during which long duration power is maintained.
- **Long Duration Maintained** – This item displays the period of time (in seconds) during which long duration power is maintained. The default setting is 0
- **Recommended Short Duration Power** – This item displays the short duration power settings (in watts) recommended by the manufacturer.
- **Short Duration Power Limit** – This item displays the time period during which short duration power (in watts) is maintained. The default setting is 0

Chipset Configuration

- **North Bridge**

This feature allows the user to configure the settings for the Intel North Bridge

IOH Configuration

- **Intel® VT-d**
Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are Enabled and Disabled.
- **Intel® I/OAT**
The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing the system resource for other tasks. The options are Disabled and Enabled.
- **DCA Support**
Select Enabled to use Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are Enabled and Disabled
- **IOH 0, IOH 1 PCIe Port Bifurcation Control**
This allows the user to configure the following IO PCIe Port Bifurcation Control settings for IOH 0 PCIe port and IOH 1 PCIe port, which determine how to distribute the available PCI-Express lanes to the PCI-Exp. Root Ports.
- **IOU1-PCIe Port**
This feature allows the user to set the PCI-Exp bus speed between IOU1 and PCIe port. The options are x4x4 and x8. The default setting for IOH 0 is x4x4. The default setting for IOH 1 is x8.
- **Port 1A Link Speed**

Select GEN1 to enable PCI-Exp Generation 1 support for Port 1A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 1A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 1A. The options are GEN1, GEN2, and GEN3.

- **Port 1B Link Speed**

Select GEN1 to enable PCI-Exp Generation 1 support for Port 1B. Select GEN2 to enable PCI-Exp Generation 2 support for Port 1B. Select GEN3 to enable PCI-Exp Generation 3 support for Port 1B. The options are GEN1, GEN2, and GEN3.

- **IOU2-PCIe Port**

If this feature allows the user to set the bus speed between the IOU2 and the PCI-Exp port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

- **Port 2A Link Speed**

Select GEN1 to enable PCI-Exp Generation 1 support for Port 2A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 2A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 2A. The options are GEN1, GEN2, and GEN3.

- **IOU3-PCIe Port**

If this feature allows the user to set the bus speed between the IOU3 and the PCI-Exp port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16. The default for IOH 0 is x16. The default for IOH 1 is x8x8

- **Port 3A Link Speed**

Select GEN1 to enable PCI-Exp Generation 1 support for Port 3A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 3A. Select GEN3 to enable PCI-Exp Generation 3 support for Port 3A. The options are GEN1, GEN2, and GEN3.

- **Port 3C Link Speed**

Select GEN1 to enable PCI-Exp Generation 1 support for Port 3C. Select GEN2 to enable PCI-Exp Generation 2 support for Port 3C. Select GEN3 to enable PCI-Exp Generation 3 support for Port 3C. The options are GEN1, GEN2, and GEN3.

QPI Configuration

- **Current QPI Link Speed**

This item displays the speed of the QPI Link.

- **Current QPI Link Frequency**

This item displays the frequency of the QPI Link.

- **QPI (Quick Path Interconnect) Link Speed Mode**

Use this feature to select data transfer speed for QPI Link connections. The options are Fast and Slow.

- **QPI Link Frequency Select**

Use this feature to select the desired QPI frequency. The options are Auto, 6.4GT/s, 7.2 GT/s, and 8.0 GT/s.

DIMM Configuration

- **Current Memory Mode**
This item displays the current memory mode
- **Current Memory Speed**
This item displays the current memory speed.
- **Mirroring**
This item displays if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.
- **Sparing**
This item displays if memory sparing can be supported by the motherboard. Memory sparing enhances system reliability, availability, and serviceability

DIMM Information

The status of the memory modules will be displayed as detected by the BIOS

- **Memory Mode**
When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are Independent, Mirroring, Lock step and Sparing.
- **DRAM RAPL BWLIMIT**
This item sets the limits on the average power consumption and the bandwidth of a DRAM module in operation so that the OS can manage power consumption and energy budget of hardware more effectively within a certain window of time. The options are 0, 1, 8, and 16.
- **Perfmon and DFX Devices**
A PerfMon device monitors the activities of a remote system such as disk usage, memory consumption, and CPU load which will allow an IT administrator to maximize the performance of each computer within the network. A DFX device, usually in the form of a USB adaptor, can be used to enhance audio performance. Select Unhide to display the Perfmon and DFX devices installed in the system. The options are HIDE and UNHIDE.
- **DRAM RAPL Mode**
RAPL which stands for Running Average Power Limit is a feature that provides mechanisms to enforce power consumption limits on supported processors The options are DRAM RAPL MODE0 , DRAM RAPL MODE1, and Disabled
- **MPST Support**
Select Enabled to enable the Message Processing Subscriber Terminal which is used to process short messages. The options are Disabled and Enabled

- **DDR Speed**
Use this feature to force a DDR3 memory module to run at a frequency other than what the system is specified in the specification. The options are Auto, Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DDR3-1600 and Force SPD
- **Channel Interleaving**
This feature selects from the different channel interleaving methods. The options are Auto, 1 Way, 2 Way, 3, Way, and 4 Way
- **Rank Interleaving**
This feature allows the user to select a rank memory interleaving method. The options are Auto, 1 Way, 2 Way, 4, Way, and 8 Way
- **Patrol Scrub**
Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the IO hub will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are Enabled and disabled
- **Demand Scrub**
Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and Disabled.
- **Data Scrambling**
Select Enabled to enable data scrubbing and ensure data security and integrity. The options are Disabled and Enabled.
- **DRAM RAPL (Running Average Power Limit)**
This item allows the user to select the average power limit setting when a DRAM module is in operation. The options are Disabled, Mode 0, and Mode 1.
- **Device Tagging**
Select Enabled to support device tagging. The options are Disabled and Enabled.
- **Thermal Throttling**
Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled and CLTT (Closed Loop Thermal Throttling).
- **OLTT (Open Loop Thermal Throttling) Peak BW (Bandwidth) %**
This item sets a percentage of the peak bandwidth allowed for Open Loop Thermal Throttling. The range is between 25% and 100%. The default is 50 (%).

- **South Bridge**

This feature allows the user to configure the settings for the Intel PCH chip

- **PCH Information**
This feature displays the following PCH information
- **Name**
This item displays the name of the PCH chip
- **Stepping**
This item displays the status of the PCH stepping
- **USB Devices**
This item displays the USB devices detected by the BIOS.
- **All USB Devices**
This feature enables all USB ports/devices. The options are Disabled and Enabled. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)
 - **EHCI Controller 1/EHCI Controller 2** – Select Enabled to enable Enhanced Host Controller Interface (EHCI) Controller 1/Controller 2 The options are Disabled and Enabled
- **Legacy USB Support (Available when USB Functions is not Disabled)**
Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, Enabled and Auto.
- **Port 60/64 Emulation**
Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that does not recognize a USB device. The options are Disabled and Enabled
- **EHCI Hand-Off**
This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The options are Disabled and Enabled
- **Azalia HD Audio**
Select Enabled to enable support for Azalia High Definition Audio. The options are Enabled and Disabled.

SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items

- **SATA Port0~SATA Port5**

The AMI BIOS displays the status of each SATA port as detected by the BIOS.

- **SATA Mode**

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, AHCI Mode and RAID Mode. The following are displayed depending on your selection:

- **IDE Mode**

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, AHCI Mode and RAID Mode. The following are displayed depending on your selection:

- **Serial-ATA (SATA) Controller 0~1**

Use this feature to activate or deactivate the SATA controller, and set the compatibility mode. The options are Enhanced and Compatible. The default for SATA controller 0 is Compatible. The default for SATA controller 1 is Enhanced.

- **AHCI Mode**

The following items are displayed when the AHCI Mode is selected:

- **Aggressive Link Power Management**

When Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are Enabled and Disabled

- **Port 0~5 Hot Plug**

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are Enabled and Disabled.

- **Staggered Spin Up**

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are Enabled and Disabled.

- **RAID Mode**

The following items are displayed when RAID Mode is selected:

- **Port 0~5 Hot Plug**

Select Enabled to enable hot-plug support for the particular port. The options are Enabled and Disabled

SCU Configuration

- **SCU Devices**
Select Enabled to enable support for PCH SCU (System Configuration Utility) devices. The options are Disabled and Enabled.
- **On-Chip SAS ROM**
Select Enabled to support the onboard SAS Option ROM to boot up the system via a storage device. The options are Disabled and Enabled

PCIe/PCI/PnP Configuration

- **PCI ROM Priority**
Use this feature to set the Option ROM priority to boot the system when there are multiple Option ROMs available in the system. The options are EFI Compatible ROM and Legacy ROM
- **PCI Latency Timer**
Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, 64, 96, 128, 160, 192, 224 and 248
- **Above 4G Decoding (Available if the system supports 64-bit PCI decoding)**
Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and Disabled
- **PERR# Generation**
Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and Disabled
- **SERR# Generation**
Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and Disabled.
- **Maximum Payload**
Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes
- **Maximum Read Request**
Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

- **ASPM Support**

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are Disabled, Force L0s, and Auto.

- **Warning:** Enabling ASPM support may cause some PCI-E devices to fail

- **Slot 1~6 OPROM**

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified above. The options are Enabled and Disabled

- **Onboard LAN Option ROM Select**

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use a PXE Option ROM to boot the computer using a network device. The options are iSCSI and PXE

- **Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM**

Select Enabled to enable the onboard LAN1 Option ROM~LAN4 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is Enabled. The default setting for LAN2 Option ROM is Disabled.

- **Network Stack**

Select Enabled enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and Disabled.

Super IO Configuration

- **Super IO Chip**

Displays the Super IO chip type

- **Serial Port 0, Serial Port 1 Configuration**

The submenus allow the user to configure the following settings for Serial Port 0 and Serial Port 1:

- **Serial Port**

Select Enabled to enable a serial port specified by the user. The options are Enabled and Disabled

- **Device Settings**

This feature indicates whether or not a reset is required for a serial port specified

- **Change Settings**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The default setting is Auto.

- **PS/2 Connector**
This option enables the selection of keyboard or mouse for the PS/2 connector. The options are Keyboard or Mouse.

Serial Port Console Redirection

- **COM1 / COM2 Console Redirection**

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled

- **Console Redirection Settings**

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

- **Terminal Type** – This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and VT-UTF8
- **Bits Per Second** – Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and 115200 (bits per second).
- **Data Bits** – Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and 8 Bits.
- **Parity** – A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are None, Even, Odd, Mark and Space.
- **Stop Bits** – A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are 1 and 2.
- **Flow Control** – This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are None and Hardware RTS/CTS.

- **VT-UTF8 Combo Key Support** – Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Enabled and Disabled.
 - **Recorder Mode** – Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are Disabled and Enabled.
 - **Resolution 100x31** – Select Enabled for extended-terminal resolution support. The options are Disabled and Enabled.
 - **Legacy OS Redirection** – Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and 80x25.
 - **Putty Keypad** – Use this feature to select function key and keypad setting on Putty. The options are VT100, LINUX, XTERMR6, SCO, ESCN, and VT400.
- **Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)**
The submenu allows the user to configure the following Console Redirection settings to support Out-of-Band Serial Port management.
 - **Console Redirection (for EMS)**
Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled.
 - **Console Redirection Settings**
This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.
 - **Out-of-Band-Mgmt Port**
Use this feature to select the port for out-of-band management. The options are COM1 and COM2.
 - **Terminal Type**
This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and VT-UTF8.

- **Bits Per Second**
This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and 115200 (bits per second).
- **Flow Control**
This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are None, Hardware RTS/ CTS, and Software Xon/Xoff.

Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed

- **Fan Speed Control Mode**
This feature allows the user to set the fan speed mode. Select Optimal to reduce fan speed for optimal power saving. Select Full Speed for the fan to run at the full speed which will increase power consumption. The options are Standard, Full Speed and Optimal.
- **CPU Temperature Display Mode**
This feature displays the CPU temperature detected by DTS (i.e., +34oC) or temperature status in text ("Low", "Medium" or "High"). The options are Text Mode or DTS.
- **CPU 1 Temperature/CPU 2 Temperature**
The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:
 - **Low**
This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).
 - **Medium**
The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition , but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings
 - **High**
The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm. The system may shut down if it continues for a long

period to prevent damage to the CPU. If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

- **System Temperature, Patsburg Temperature, Peripheral Temperature**

The temperature for the above items will be displayed as detected by the BIOS

- **Fan Speed**

This feature displays the fan speed readings for all fans detected by the BIOS.

- **Voltage Readings**

The following voltage readings will be displayed:

- VTT_P0, VTT_P1, 1.1V, 1.5V, 5VSB, 5V, 12V, CPU1 Vcore, CPU2 Vcore, VDIMM AB, VDIMM EF, 3.3V, 3.3VSB, and VBAT.

ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system

- **ACPI Sleep State**

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU_Stop_Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend Disabled to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are S1 (CPU_Stop_Clock), Suspend Disabled, and S3 (Suspend to RAM).

- **Numa**

This feature enables the Non-Uniform Memory Access ACPI support. The options are Enabled and Disabled.

- **High Precision Timer**

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback, reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Enabled and Disabled.

Trusted Computing (Available if a TPM device is installed)

- **TPM Support**

Select Enabled on this item and enable the TPM jumper on the motherboard to allow TPM support to improve data integrity and network security. The options are Enable and Disable.

- **Current Status Information**

If a TPM device is detected, this item displays the information regarding the current TPM status:

- **TPM Enable Status**

If a security device is detected by the BIOS, this item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

- **TPM Active Status**

If a security device is detected by the BIOS, this item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

- **TPM Owner Status**

If a security device is detected by the BIOS, this item displays the status of TPM Ownership.

Event Logs

Use this feature to configure Event Log settings

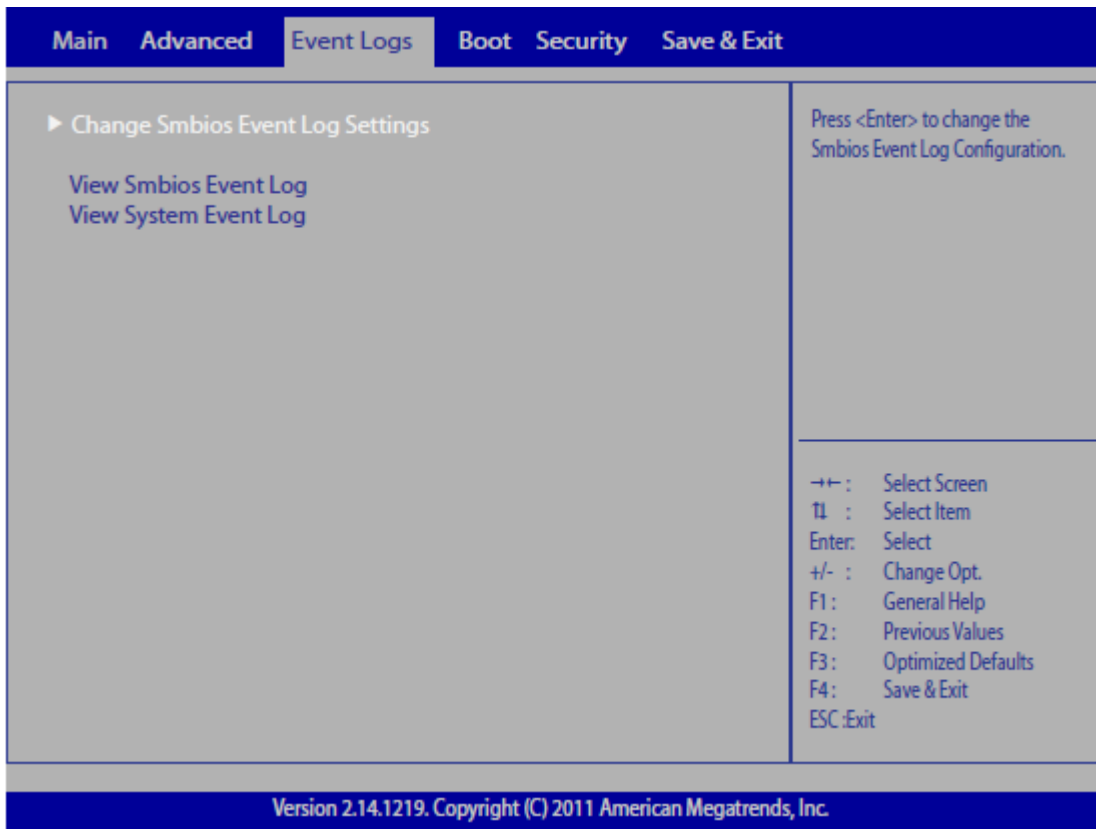


Figure 40: Event Logs

- **Change SMBIOS Event Log Settings**
This feature allows the user to configure SMBIOS Event settings.
 - **Enabling/Disabling Options**
 - **SMBIOS Event Log**
Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are Enabled and Disabled
 - **Runtime Error Logging Support**
Select Enabled to support Runtime Error Logging. The options are Enabled and Disabled.
 - **Memory Correctable Error Threshold**
This feature allows the user to enter the threshold value for correctable memory errors. The default setting is 10.

- **PCI Error Logging Support**
Select Enabled to support error event logging for PCI slots. The options are Enabled and Disabled.
- **Erasing Settings**
 - **Erase Event Log**
Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before a event logging is initialized upon system reboot. The options are No, Yes Next Reset, and Yes Every Reset.
 - **When Log is Full**
Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are Do Nothing and Erase Immediately.
- **SMBIOS Event Log Standard Settings**
 - **Log System Boot Event**
Select Enabled to log system boot events. The options are Disabled and Enabled
 - **MECI (Multiple Event Count Increment)**
Enter the increment value for the multiple event counter. Enter a number from 1 to 255. The default setting is 1.
 - **METW (Multiple Event Count Time Window)**
This item allows the user to decide how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number from 0 to 99. The default setting is 60.
 - **View Smbios Event Log**
This feature displays the contents of the SmBIOS Event Log.
 - **View System Event Log**
This feature displays the contents of the System Event Log.

Boot Settings

This submenu allows the user to configure the following boot settings for the system.

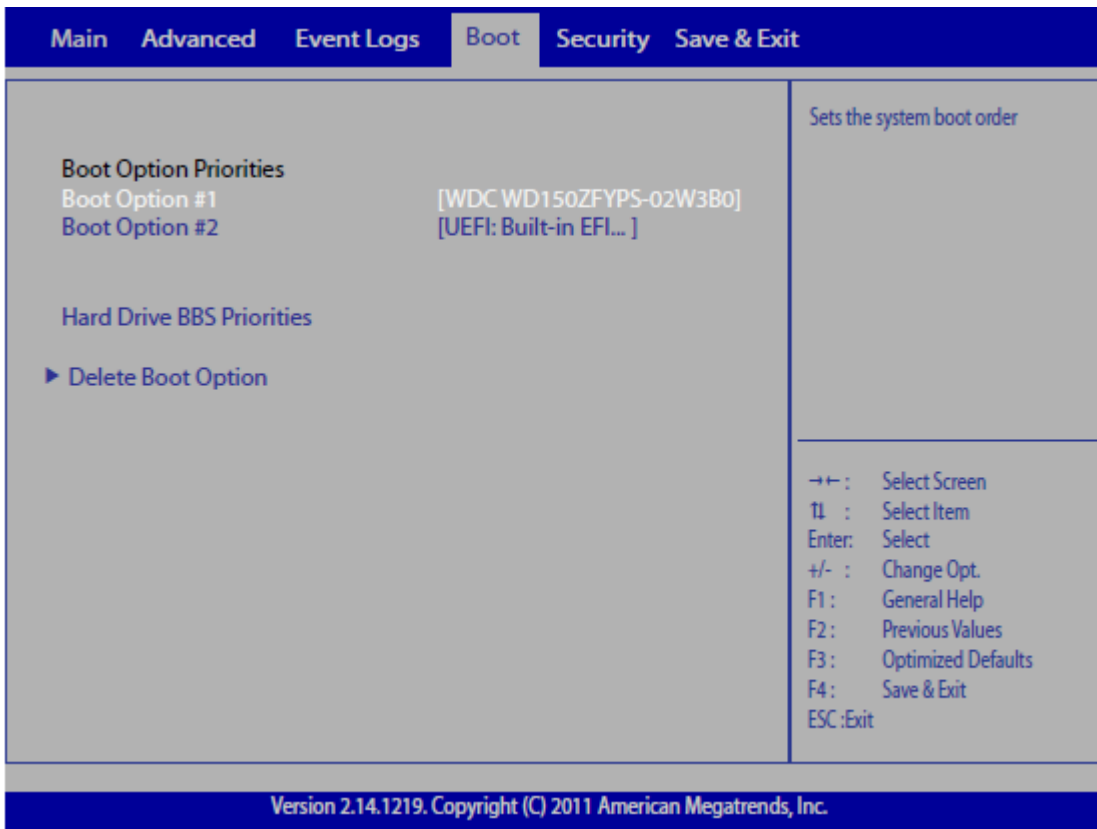


Figure 41: Boot Settings

- **Boot Option Priorities**
 - **Boot Option #1, Boot Option #2, etc.**
Use this feature to specify the sequence of boot device priority
- **Hard Drive BBS Priorities**
This option sets the order of the legacy and Hard Disks detected by the motherboard.
- **Delete Boot Option**
This feature allows the user to delete a previously defined boot device from which the system boots during startup

Security Settings

This menu allows the user to configure the following security settings for the system.

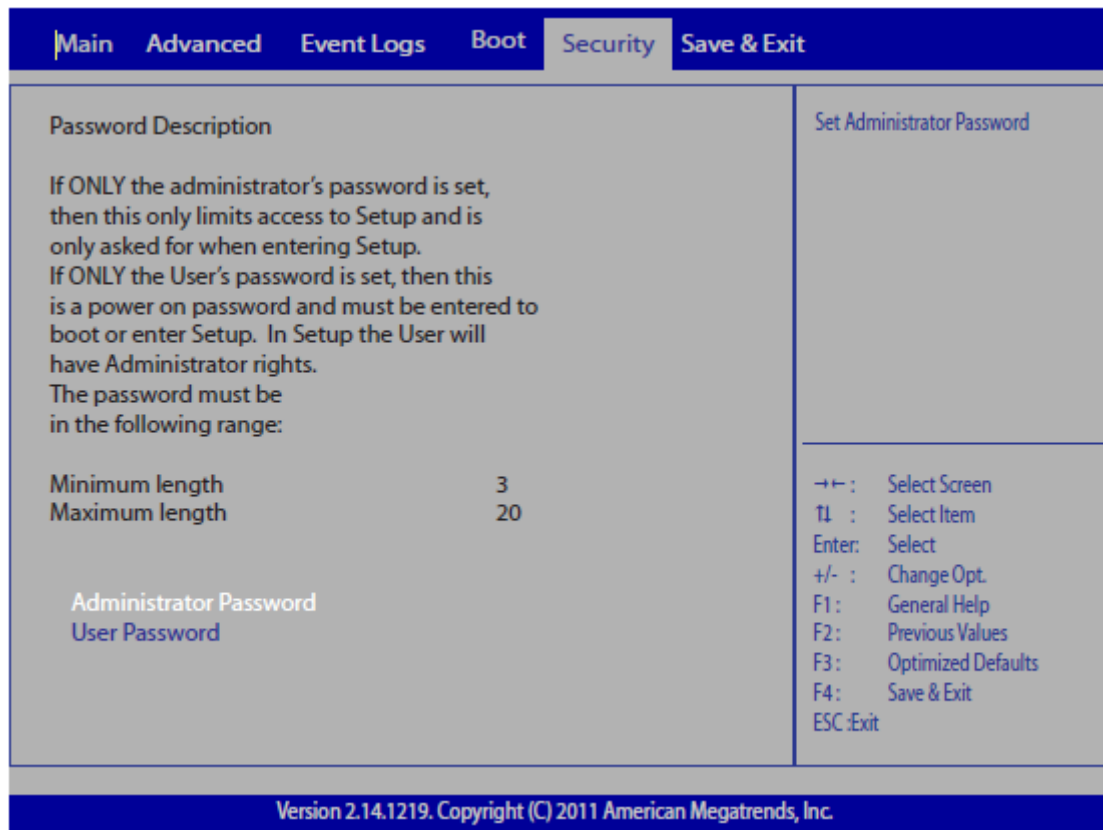


Figure 42: Security Settings

Exit Options

This submenu allows the user to configure the Save and Exit settings for the system.

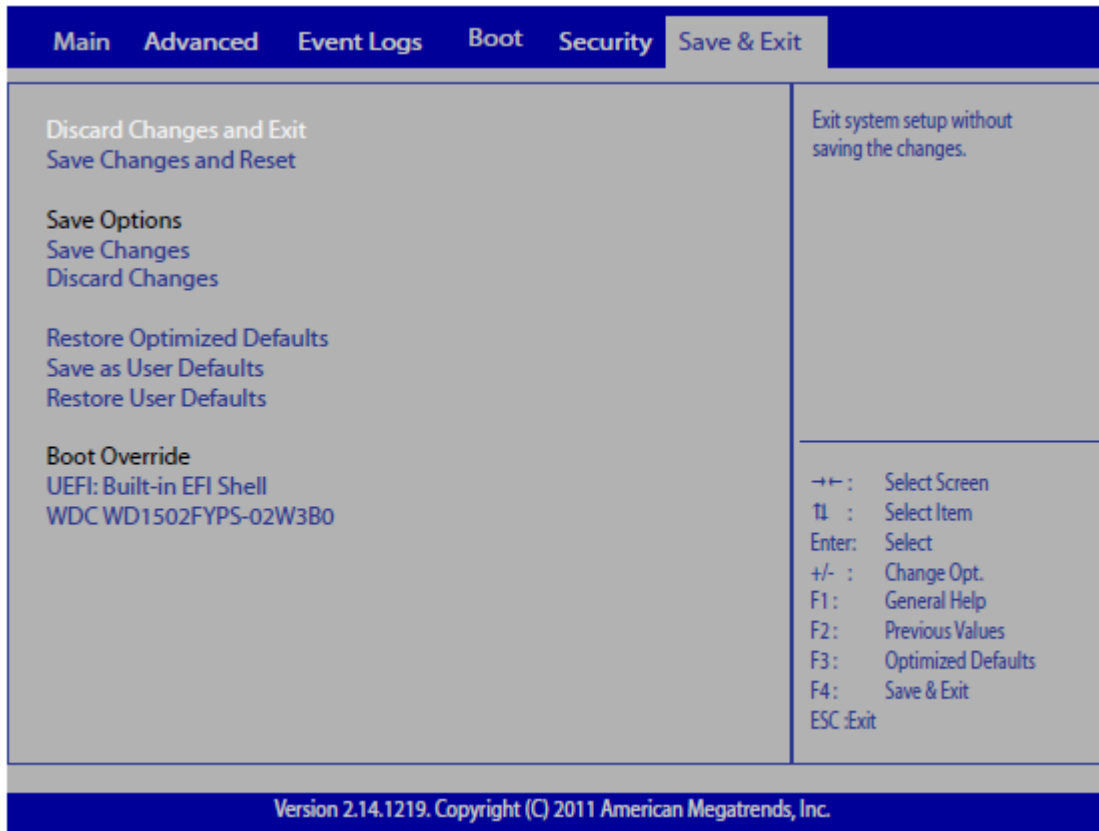


Figure 43: Exit Menu

- **Discard Changes and Exit**
Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select Yes to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.
- **Save Changes and Reset**
When you have completed the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select Yes to quit BIOS without saving the changes, or select No to quit the BIOS and save changes
- **Save Changes**
Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, select Yes to save the changes, or select No to return to the BIOS without making changes.

- **Discard Changes**
Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select Yes to load the values previous saved, or select No to keep the changes you've made so far.
- **Restore Defaults**
To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.
- **Save as User Defaults**
Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select Yes to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults
- **Restore User Defaults**
Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select Yes to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.
- **Boot Override**
This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead immediately boot the system with one of the listed devices. This is a one-time override.

Chapter 6: BIOS Recovery

Warning!

Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Viglen be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

How to Recover the AMIBIOS Image (The Main BIOS Block)

An AMIBIOS flash chip consists of a boot sector block, and a main BIOS code block (a main BIOS image). The boot sector block contains critical BIOS code, including memory detection and recovery code to be used to flash a new BIOS image if the original BIOS Image is corrupted. When the system is powered on, the boot sector code executes first. Once it is completed, the main BIOS code will continue with system initialization and complete the bootup process.

Notes:

BIOS Recovery described below is used when the main BIOS block crashes. However, when the BIOS Boot sector crashes, you will need to send the Motherboard back to Viglen for RMA repairs.

Flash Memory Recovery Update

This Flash Memory Recovery Update feature allows the user to recover a BIOS image using a USB device without additional utilities needed. A user can download the BIOS image to a USB flash device and perform BIOS recovery using the following procedure:

• Recovery Update Procedure

1. Have a bootable USB stick ready
2. Switch off the system and unplug it from the mains supply
3. Open the casing and enable Recovery using the jumper / DIP switch on the system board
4. Connect the system to the mains supply again and switch it on
5. Use cd DOS to change directory, launch BIOS Recovery Update with the command necessary command and follow any further instructions
6. After the Recovery process has finished, switch off the system and disconnect it from the mains supply
7. Remove the USB stick
8. For all jumpers / DIP switches which were changed, return them to their original positions
9. Connect the system to the mains supply again and switch it on
10. The system will now boot up with the new version of BIOS

11. Check the settings in the BIOS Setup. If necessary, configure the settings once again
12. **For additional help refer to readme.txt (included in download package)**

CAUTION!!

Do not shut down or reset the system during BIOS Recovery. Doing so may cause permanent damage to the motherboard

Chapter 7: Glossary

Advanced Dynamic Execution

Part of the Xeon processor's Intel® NetBurst® micro-architecture. Improved branch prediction algorithm accelerates the flow of work to the processor and helps overcome the deeper pipeline. Very deep, out-of-order speculative execution allows the processor to view 126 instructions in flight and handle up to 48 loads and 24 stores in the pipeline. A 4 KB branch target buffer stores more detail on the history of past branches, reducing inaccurate branch predictions by roughly 33% (when compared to P6 micro-architecture).

Advance Transfer Cache (Level 2 Advance Transfer Cache)

The 256 KB Level 2 Advance Transfer Cache (ATC) delivers a much higher data throughput channel between the Level 2 cache and the processor core. 512 KB L2 Advance Transfer Cache is available on 0.13 micron technology Pentium® 4 processors, while 0.18 micron technology Pentium 4 processors utilise a 256 KB L2 Advance Transfer Cache. Features of the ATC include: Non-Blocking, full speed, on-die level 2 cache, 8-way set association, 512-bit or 256-bit data bus to the level 2 cache, data clocked into and out of the cache every clock cycle.

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.

Enhanced Floating Point and Multimedia Unit

Part of the Pentium® 4 processor's Intel® NetBurst® micro-architecture. An expanded 128-bit floating point register and an additional register for data movement improves performance on floating-point and multimedia applications.

Execution Trace Cache (Level 1 Execution Trace Cache)

Part of the Pentium® 4 processor's Intel® NetBurst® micro-architecture. In addition to the 8 KB data cache, the Pentium 4 processor includes an Execution Trace Cache that stores up to 12 K decoded micro-ops in the order of program execution. This increases performance by removing the decoder from the main execution loop and makes more efficient usage of the cache storage space since instructions that are branched around are not stored. As a result, a high volume of instructions are delivered to the processor's execution units and the overall time required to recover from erroneous branch predictions is decreased.

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.

Hyper-Pipelined Technology

Part of the Pentium® 4 processor's Intel® NetBurst® micro-architecture. Hyper-pipelined technology doubles the pipeline depth of the Pentium® III processor's P6 micro-architecture, increasing the branch prediction and recovery pipeline to 20 stages. The deeper pipeline enables instructions to be queued and executed at the fastest-possible rate, increasing performance, frequency, and scalability.

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.

Internet Streaming SIMD Extensions

Consists of 70 instructions and includes single instruction, multiple data for floating-point, additional SIMD-integer and cache ability control instructions. Benefits include higher resolution image viewing and manipulation, high quality audio, MPEG2 video, and simultaneous MPEG2 encoding and decoding, reduced CPU utilisation for speech recognition, and higher accuracy and faster response times

L.E.D.

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

PCI (Peripheral Component Interconnect)

Developed by Intel, PCI is a local bus standard. A bus is a channel used to transfer data to (input) and from (output) a computer and to or from a peripheral device. Most PCs have a PCI bus usually implemented at 32-bits providing a 33 MHz clock speed with a throughput rate of 133 MBps.

NetBurst® micro-architecture (Intel NetBurst® micro-architecture)

The NetBurst® micro-architecture delivers a number of new and innovative features including Hyper Pipelined Technology, 400 MHz System Bus, Execution Trace Cache, and Rapid Execution Engine. It also delivers a number of enhanced features, including Advanced Transfer Cache, Advanced Dynamic Execution, Enhanced Floating Point and Multimedia Unit, and Streaming SIMD Extensions 2. Intel NetBurst® Microarchitecture provides higher throughput within the processor and out to memory and I/O for improved headroom.

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'.

PCI-X

The 64-bit PCI-X interface (PCI-X 1.0a) can be operated at 133 MHz, (or at 100 MHz and 66 MHz) which achieves a greater than two-fold boost in performance over PCI 2.2 bus technology. The 133 MHz PCI-X interface achieves up to 1 GB/s throughput, a two-fold increase over 66 MHz PCI 2.2.

PCI-Express

PCI Express is a 3rd generation I/O architecture where ISA and PCI were respectively the 1st and 2nd generations. A high-speed, general-purpose serial I/O interconnect, PCI Express will initially offers speeds of 2.5 Gigabits per second, support multiple widths ("lanes" of data that range from 1 to 32), and scale to the limits of copper. PCI Express will unify I/O architecture for desktop, mobile, server, communications platforms, workstations and embedded devices while also coexisting with PCI and USB connection types

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.

Rapid Execution Engine

Part of the Pentium® 4 processor's Intel® NetBurst® micro-architecture. Two Arithmetic Logic Units (ALUs) are clocked at twice the core processor frequency, allowing basic integer instructions such as Add, Subtract, Logical AND, and Logical OR to execute in half of a clock cycle. For example, the Rapid Execution Engine on a 1.50 GHz Pentium 4 processor runs at 3 GHz.

S-ATA (Serial ATA)

Serial ATA is the next-generation internal storage interconnect designed to replace Parallel ATA technology. Serial ATA is the proactive evolution of the ATA interface from a parallel bus to a serial bus architecture. This architecture overcomes many design and usage constraints that are increasing the difficulty of continued speed enhancements for the classic parallel ATA bus. Serial ATA will be introduced at 150Mbytes/sec, with a roadmap already planned through 600Mbytes/sec.

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.

SSE (Streaming SIMD Extensions)

Internet Streaming SIMD (Single Instruction Multiple Data) Extensions are instructions that reduce the overall number of instructions required to execute a particular program task. As a result, they can boost performance by accelerating a broad range of applications, including video, speech, and image, photo processing, encryption, financial, engineering and scientific applications. NetBurst® micro-architecture adds 144 new SSE instructions, which are known as SSE2.

Streaming SIMD Extensions 3

Better multimedia and encryption/decryption processing than previous generations, along with support for more computationally intensive graphics.

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 8: 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?
