SX220

User Guide

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Contents

1. Overview

Introduction

This manual describes the Viglen SX220 system and the SCB2 motherboard. The motherboard is the most important part of your computer. It contains all of the CPU, memory and graphics circuitry that makes the computer work.

The motherboard contains the very latest in CPU design, the Intel Pentium III processors, which include MMX, Internet Streaming SIMD Extensions and Tualatin technology. MMX technology adds a total of 57 instructions to the CPU, all of which are designed to vastly improve both multimedia and communications on your PC. SIMD Extensions add 70 new instructions enabling advanced imaging, 3D, streaming audio and video, and speech recognition for an enhanced Internet experience. Tualatin technology includes a smaller die size of 0.13 micron, resulting in lower power consumption and lower heat output. The Level2 cache on die has increased to 512K in size. The combination of the Intel Pentium III processors, MMX, SIMD, Tualatin technology and Viglen expertise make this a formidable computer.

This manual contains technical information about the Viglen SCB2 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 or 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.

2. Chassis Specification

The SX220 system consists of the following major components:

- The chassis and its subassemblies, device bays, and front bezel

- A slim-line CD-ROM drive & Floppy Disk Drive

- The power supply

- The cooling system

- SCB2 Motherboard & PCI riser cards

The major component of the kit is the chassis. It is important to become familiar with the chassis both externally and internally and the security features it provides.

Physical Specifications

The SX220 chassis is designed as a 2U 19" Rackmount unit. The server will be supplied complete with a pair of industry standard 19" Rails, handles and all of the necessary nuts and bolts.

Table 1: Physical Specifications

Specifications	
Height	89 mm
Width / Rackmount Height	430 mm / 2U
Depth	648 mm
Weight	18 kg typical configuration

Chassis Front Controls and Indicators

The front panel controls and indicators are located behind the optional front bezel of the system as shown in **Figure 1**. You can access the panel and the system peripherals by grasping the bezel at its edges and gently pulling it towards you.
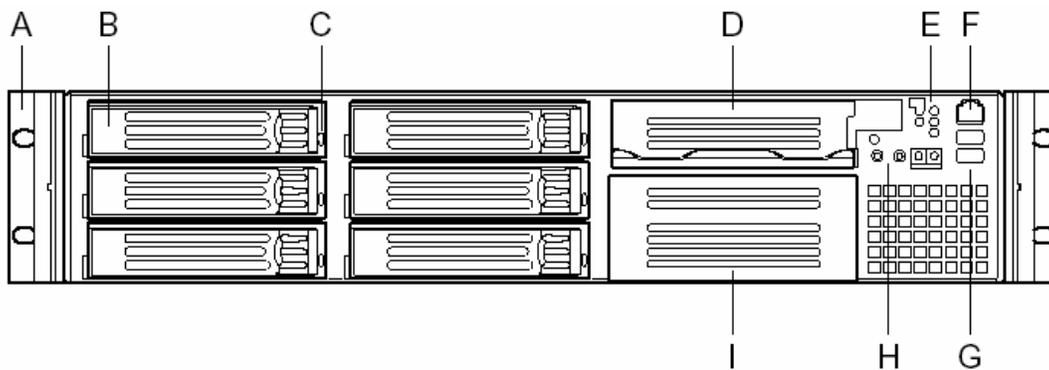
Figure 1: Chassis Front Controls and Indicators

A – Chassis handles	**F** – RJ-45 serial port (PC-to-PC)
B – Drive bay (1-inch)	**G** – USB connectors 3 and 4
C – HDD activity/fault indicator	**H** – System controls
D – Flex bay (seventh HDD or optional CDROM drive/FDD module)	**I** – Tape drive bay
E – Front panel indicator lights	

Front Panel Controls and Indicators
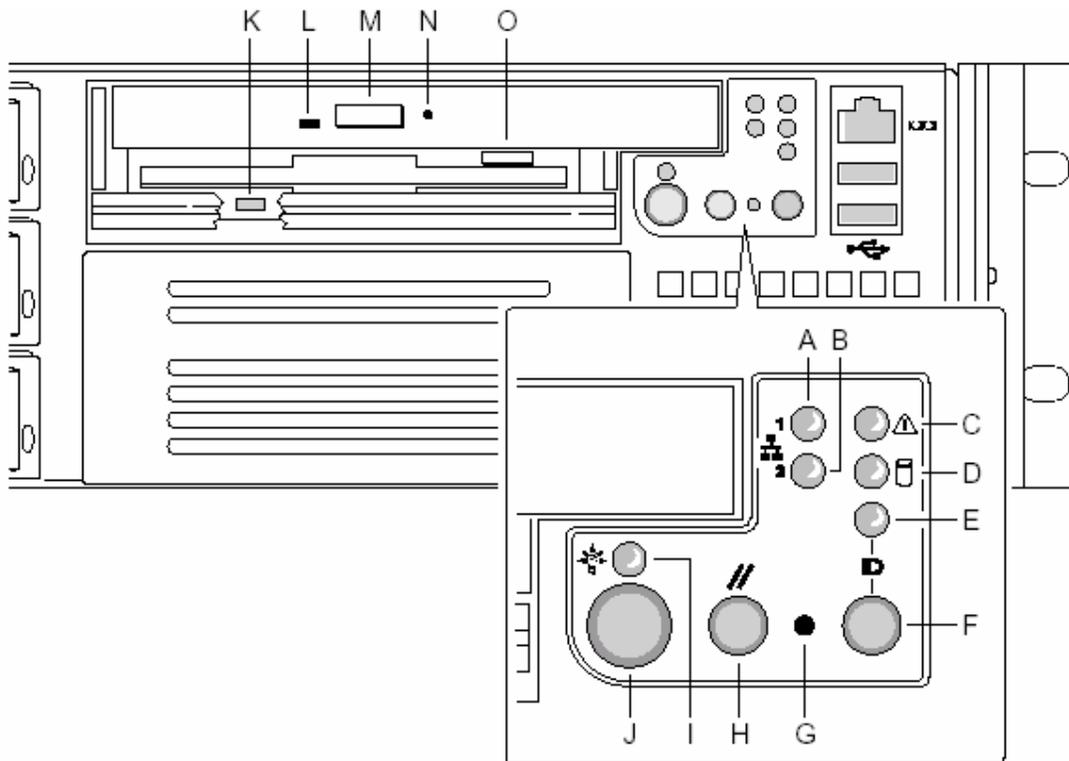
Figure 2: Front Panel Controls and Indicators

A – NIC 1 activity LED	**I** – Power/sleep LED
B – NIC 2 activity LED	**J** – Power button
C – System status LED	**K** – FDD activity LED
D – Fixed disk drive status LED	**L** – CD-ROM activity LED
E – ID LED	**M** – CD-ROM drive eject button
F – ID button	**N** – Manual CD-ROM drive eject button
G – NMI button (tool assisted)	**O** – FDD eject button
H – Reset button	

Chassis Back I/O Ports and Features

The back panel provides connectors for the server board, slots for add-in cards, and the power supply for the server. **Figure 3** identifies the features of the back panel.
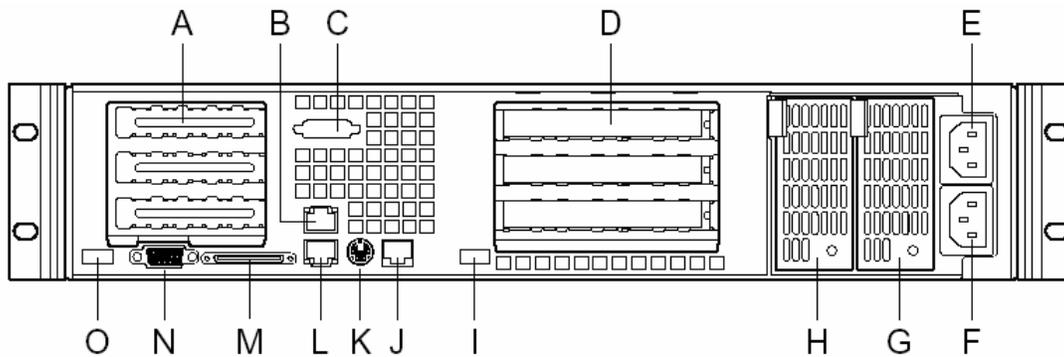
Figure 3: Chassis Back I/O Ports and Features

A – PCI card bracket (low profile)	**I** – USB connector 2
B – RJ45 NIC 2 connector	**J** – RJ45 serial 2 port
C – Serial 1 port mounting hole	**K** – PS/2* mouse/keyboard connector
D – PCI card bracket (full-height)	**L** – RJ45 NIC 1 connector
E – AC power input (primary)	**M** – SCSI connector
F – AC power input (redundant)	**N** – Video connector
G – Power supply module, redundant	**O** – USB connector 1
H – Power supply module, primary	

Power Supply

The power supply consists of the power supply bay and one power supply module. A second power supply module can be purchased to provide a redundant, 1+1 system. With either configuration, the power supply provides 350 watts of power and is designed to minimise EMI.

The power supply operates within the following voltage ranges and is rated as follows:

100 - 120 V~ at 50/60 Hertz (Hz); 6.3A maximum
200 - 240 V~ at 50/60 Hz; 2.5A maximum

The power subsystem supports the implementation of remote management features, including remote enable that permits power to be activated from a variety of sources.

System Cooling

The chassis includes two 80-mm non-hot-swappable system fans for cooling the processor(s), hard drives, and add-in cards. A third fan may be added in the center position to provide cooling redundancy for system components. The system fans are mounted in a fan assembly located in the middle of the chassis to pull cooling air through the chassis. The power supply contains a single fan for cooling.

Security

To help prevent unauthorised access to the system's peripherals and control panel, an optional key-locked front bezel can be used. The chassis also includes a preinstalled intrusion switch that can be monitored by server management software. When the cover is opened, a switch located on the front panel board transmits a signal to the Baseboard Management Controller (BMC) on the server board. Through server management software, the system can be programmed to respond to an intrusion by powering down or by locking the keyboard. At the chassis level a variety of security options are provided.

Rack and Cabinet Mounting Options

The SX220 chassis was designed to support 19" wide by up to 30" deep server cabinets. The chassis comes equipped with a relay rack or cabinet mount kit that can be configured to support front-mount or mid-mount 2-post racks and 4-post cabinets. Viglen also provides an optional sliding rail kit that is used to mount the chassis into a standard (19" by up to 30" deep) EIS 310D compatible server cabinet.

For mounting in a regular server cabinet, the front mount brackets are attached to the front of the chassis, and a set of rear support brackets are attached to the back end of the cabinet. This evenly distributes the server to prevent the mounting rails on the cabinet from bending. Caution should be used in using the front mount-only option. Even though the rail mount kit hardware was designed to support the weight

of the system, some 2-post relay racks may not, causing the racks to fail. Only use relay racks that are specifically designed to support the weight and stresses of a 2-post front-mount only chassis.

Optional Peripherals

The SX220 server chassis provides six hard drive bays at the front of the chassis. An optional seventh drive may be used in the flex bay. All hard drive bays may be populated with a tray mounted 3½" hard disk drive. If a configuration requires the use of a floppy disk drive and CDROM drive Floppy/CDROM module may be used in place of the seventh hard drive in the flex bay. A tape drive bay is located below the flex bay.

Hot-Swappable Hard Disk Drives

The SX220 server chassis can support up to seven tray-mounted SCA2, 3½" x 1" and Ultra2/Ultra160 hard disk drives.

A major feature of the hot-swap bay is the backplane which powers down a drive when a failure is detected and reported to the SCSI bus. When a new drive is inserted, the power control waits a short time for the drive to become fully seated and then applies power to the drive. The backplane provides signals to the control panel to indicate failure status for each drive in the bay.

The chassis ships with six drive carriers for mounting the separately purchased hard drives. For information on how to install these drives, refer to page 43.

Flex Bay

For those configurations that require a floppy drive and CD-ROM drive, the seventh drive bay or "Flex Bay" will be configured as a peripheral bay by inserting the Floppy/CDROM module. The Floppy/CDROM module is a 3½" floppy drive and a ½" (12.7mm) slim-line CDROM drive mounted as a single unit in the peripheral bay. A release latch allows for tool-less removal from the front of the server, however, the Floppy/CDROM Module is not hot swappable. The system must be powered down before the module is inserted or removed from the flex bay.

If the Flex Bay is used to house a SCA2 hard disk drive the bay will be hot-swappable the same as the six other standard bays.

3. Motherboard Specification

Server Board Features

Table 2: Server Board Features

Feature	Description
Processor	Dual processor slots supporting Intel® Pentium® III processors in a Socket370 Flip Chip Pin Grid Array (FC-PGA) package.
Memory	Six dual inline memory module (DIMM) slots support: • SDRAM DIMMs: 133 MHz, ECC, registered, PC/133 compliant, 72-bit, 168-pin, gold contact, 3.3V. A 1U chassis requires low-profile (LP) 1.2-inch DIMMs. • Up to 6 GB of memory in a 2U chassis.
Graphics	Integrated onboard ATI RAGE XL PCI 64 bit SVGA controller.
Video Memory	8 MB SDRAM of video memory
PCI bus	Two PCI riser slots capable of supporting three full-length, full-height 64-bit/66-MHz PCI riser slots and three LP 64-bit/66-MHz PCI riser slots.
SCSI	Adaptec AIC- AIC7899W, supporting onboard Ultra160 (LVD) Ultra-wide SCSI interfaces.
Network	Dual on-board 10/100 Network Interface Controllers (NIC)
System I/O	• One PS/2 keyboard/mouse port (6 pin DIN) • One VGA video port (15 pin) • Two USB ports • One serial port (RJ-45) • One SCSI port (SCSI server board only) • Two NIC ports (RJ-45)
Form Factor	Server ATX form factor

Server Board Connector and Component Locations

Figure 4: Server Board components

A – Speaker	**R** – CPU 1 fan connector
B – ID LED	**S** – Sys fan 1 connector
C – Battery	**T** – Aux fan connector
D – Diagnostic LEDs (POST code)	**U** – Floppy drive connector
E – 66 MHz/64-bit PCI riser slot	**V** – Fan module connector
F – A DIMM slots	**W** – Main power connector
G – I/O ports	**X** – Auxiliary signal connector
H – ICMB connector	**Y** – Floppy/FP/IDE connector
I – COM 1 serial header	**Z** – Alternate front panel connector
J – Chassis intrusion connector	**AA** – ATA/IDE connector
K – 66 MHz/64-bit PCI riser slot (LP)	**BB** – IPMB connector
L – USB 3 & 4 header	**CC** – SSI front panel connector
M – Sys fan 3 connector	**DD** – Configuration jumper block
N – CPU 2 fan connector	**EE** – Not applicable on SX220
O – Secondary processor socket	**FF** – SCSI connector
P – Primary processor socket	**GG** – Hard Disk Drive LED header
Q – Sys fan 2 connector	

Back Panel Connectors
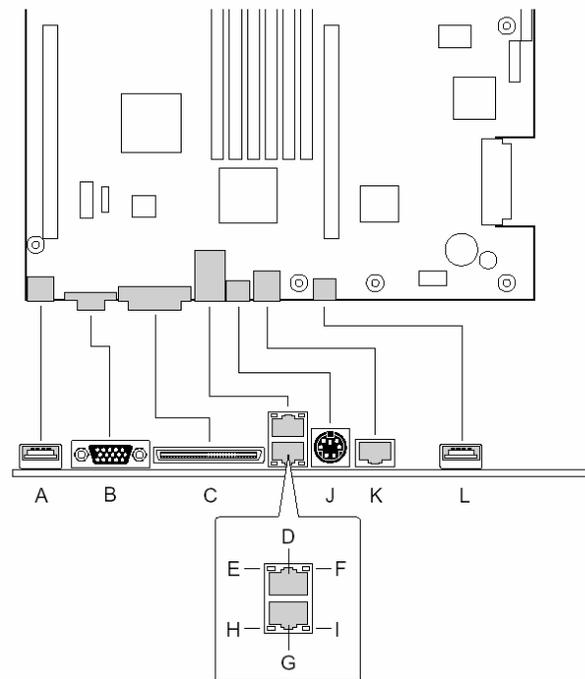
Figure 5: Back Plane Connectors

A – USB 1 connector	**G** – NIC 1 RJ-45 connector
B – Video connector	**H** – Green Status LED
C – SCSI connector	**I** – Yellow Status LED
D – NIC 2 RJ-45 connector	**J** – PS/2 keyboard/mouse connector
E – Green Status LED	**K** – RJ-45 serial port
F – Yellow Status LED	**L** – USB 2 connector

Processor

The SCB2 motherboard accommodates one or two Intel Pentium III processors with 512k cache in the FC-PGA2 package. This processor uses the 0.13 micron technology and offers advanced performance. The processor external interface operates at a maximum of 133 MHz.

Memory

The system board contains six 168-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered SDRAM DIMMs (PC-133 compatible). Memory is two-way interleaved and partitioned in three banks. You may install a minimum of 128 MB (64MB x 2) and as much as 6 GB.

The controller automatically detects, sizes, and initialises the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

NOTE: Use DIMMs that have been tested for compatibility with the server board. Contact your sales representative or dealer for a current list of approved memory modules

Add-in Board Slots

The server board has two PCI riser slots, each capable of supporting 64-bit/66-MHz PCI riser cards. PCI features:

- Bus speed up to 66 MHz

- 32 bit memory addressing

- 5 V/3.3 V signaling environment

- Burst transfers of up to 512 Mbps

- 8, 16, 32, or 64-bit data transfers

- Plug and Play ready

- Parity enabled

Video

The SCB2 motherboard uses an ATI RAGE XL PCI graphics accelerator with 8 MB of video SDRAM that supports all standard IBM VGA modes. The embedded SVGA video subsystem supports:

- Pixel resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D

- CRT and LCD monitors up to 100 Hz vertical refresh rate

The server board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

SCSI Controller

The server board includes an embedded Adaptec AIC-7899W controller providing dual Ultra160 Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVD devices generally are terminated through a jumper or resistor pack on the device itself.

IDE Controller

The system includes a single channel enhanced IDE 32 bit interface controller for intelligent disk drives with disk controller electronics onboard. The controller has a connector located on the system board that supports a master and a slave device. The device controls:

- PIO and DMA transfer modes

- DMA-33 capable

- Mode 4 timings

- Transfer rates up to 33 MB/s

- Buffering for PCI/IDE burst transfers

- Master/slave IDE mode

- Up to two devices.

Network Controller

NOTE: To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

The server board uses two Intel® 82550PM Fast Ethernet Controllers and supports two 10Base-T/100Base-TX network subsystems. The 82550 PM controller supports the following features:

- 32-bit PCI, CardBus master interface

- Integrated IEEE 802.3 10Base-T and 100Base-TX compatible PHY

- IEEE 820.3u auto-negotiation support

- Chained memory structure similar to the 82559, 82558, 82557 and 82596

- Full duplex support at both 10 Mbps and 100 Mbps operation

- Low power +3.3 V device

- IP checksum off-loading

The SX220 server NIC 1 can be used as both a network interface and server management interface.

NIC Connector and Status LEDs

The 82550 controller drives LEDs on the network interface connector that indicates link/activity on the LAN and 10- or 100-Mbps operation. The green LED indicates network connection when on and TX/RX activity when blinking. The yellow LED indicates 100-Mbps operation when lit.

Network Teaming Features

NOTE: Using both on-board NICs in a team does not allow the use of NIC 1 for server management access. To support both network teaming features and server management features, a third NIC must be added and teamed to NIC 2.

The network controller provides several options for increasing throughput and fault tolerance when running Windows NT 4.0, Windows 2000, NetWare 4.1x or newer, or Linux:

- Adapter Fault Tolerance (AFT) - provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over. AFT works with any hub or switch.

- Adaptive Load Balancing (ALB) - creates a team of 2 - 8 adapters to increase transmission throughput. Also includes AFT. Works with any 10Base-TX or 100Base-TX switch.

- Fast EtherChannel (FEC) or Intel® Link Aggregation - creates a team of up to 8 adapters to increase transmission and reception throughput. Also includes AFT. Requires a FEC-enabled switch.

To set up an option, read the instructions in the Windows NT 4.0 or NetWare 4.1x readme files.

General Configuration Notes

1. Windows NT versions prior to 4.0 do not support Adapter Teaming options.

2. Adapter Teaming options require NT 4.0 with Service Pack 4.0 or Service Pack 3.0 and the Windows Hot Fix.

3. In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Adapter Fault Tolerance

Adapter Fault Tolerance (AFT) is a simple, effective, and fail-safe approach to increase the reliability of server connections. AFT gives you the ability to set up link recovery to the server adapter in case of a cable, port, or network interface card failure. By assigning two server adapters as a team, AFT enables you to maintain uninterrupted network performance.

AFT is implemented with two server adapters: a primary adapter and a backup, or secondary, adapter. During normal operation, the backup will have transmit disabled. If the link to the primary adapter fails, the link to the backup adapter automatically takes over.

Preferred Primary Adapter

With multiple adapters installed, you can specify one as the Preferred Primary adapter. For example if you have a server with a PRO/1000 server adapter as the primary adapter and a PRO/100+ adapter as the secondary, you could configure the PRO/1000 server adapter to be the preferred primary. In this scenario, if the PRO/1000 server adapter fails, the PRO/100+ will take over. Then when the PRO/1000 server adapter is replaced, it will automatically revert to being the primary adapter in the team.

If a Preferred Primary is not selected, PROSet will attempt to select the best adapter, based on adapter model and speed.

Mixed Adapter Teaming

AFT supports up to eight server adapters per team, in any mix.

Adaptive Load Balancing

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your server's transmit throughput. With ALB you group server adapters in teams to provide an increased transmit rate (up to 8 Gbps) using a maximum of eight adapters. The ALB software continuously analyses transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps or 1 Gbps depending on the primary adapter's capability.

To use ALB, you must have 2-8 server adapters installed in your server or workstation and linked to the same network switch.

Cisco Fast EtherChannel

Fast EtherChannel (FEC) is a performance technology developed by Cisco to increase your server's throughput. Unlike ALB, FEC can be configured to increase both transmission and reception channels between your server and switch. FEC works only with FEC-enabled switches, such as the Catalyst 5000 series. With FEC, as you add adapters to your server, you can group them in teams to provide up to 18 Gbps at full duplex, with a maximum of 8 server adapters. The FEC software continuously analyses loading on each adapter and balances network traffic across the adapters as needed. Adapter teams configured for FEC also provide the benefits of AFT.

To use FEC, you must have 2, 4, or 8 server adapters installed in your server and linked to the same FEC-enabled Cisco switch.

Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. If specified through the System Setup Utility (SSU), the server may be locked automatically if there is no keyboard or mouse activity for a predefined length of time. Once the inactivity (lockout) timer has expired, the keyboard and mouse do not respond until the previously stored password is entered. A Y-cable can be used if both a PS/2 mouse and keyboard are required at the same time.

RJ-45 Serial Port

The rear RJ-45 serial port is a fully functional COM port that supports any standard serial device and provides support for serial concentrators, which typically support RJ45 serial connectors. For server applications that use a serial concentrator to access the server management features of the baseboard, a standard 8-pin CAT-5 cable from the serial concentrator is plugged directly into the rear RJ45 serial port.

The 8 pins of the RJ45 connector can be configured to match either of two pin-out standards used by serial port concentrators. To accommodate either standard, the J6A2 jumper block located directly behind the rear RJ45 serial port must be jumpered appropriately according to which standard is desired.

NOTE: By default, as configured in the factory, the SCB2 baseboard will have the rear RJ45 serial port configured to support a DSR signal.

For serial concentrators that require a DCD signal, the J6A2 jumper block must be configured as follows: The DCD jumper in position 2 and 3 and the DSR jumper in position 2 and 3. Pin 1 on the jumper is denoted by an arrow directly next to the jumper block. See Figure 9 on page 129 for the jumper block pin-out of this configuration.

DSR to Pin#7

DCD to Pin#7
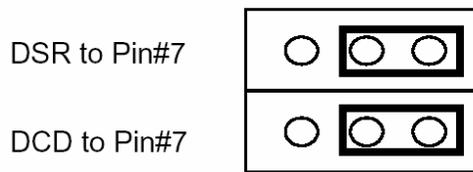
Figure 6: Jumper Block Pin-out

For serial concentrators that require a DSR signal, the J6A2 jumper block must be configured as follows: The DSR jumper in position 1 and 2 and the DCD jumper in position 1 and 2. An arrow directly next to the jumper block denotes pin 1 on the jumper. See Figure 7.

DSR to Pin#7

DCD to Pin#7

Figure 7: Jumper Clock Pin-out

For those server applications that require a DB9 type of serial connector, an 8-pin RJ45-to-DB9 adapter must be used. The following table defines the pin-out required for the adapter to provide RS232 support.

Table 3: Pin-out required for an RS-232 support

RJ45	Signal	Abbreviation	DB9
1	Request to Send	RTS	7
2	Data Terminal Ready	DTR	4
3	Transmitted Data	TD	3
4	Signal Ground	SGND	5
5	Ring Indicator	RI	9
6	Received Data	RD	2
7	DCD or DSR	DCD/DSR	1 OR 6
8	Clear To Send	CTS	8

NOTE: The RJ45-to-DB9 adapter should match the configuration of the serial device used. One of two pin-out configurations are used depending on whether the serial device requires a DSR or DCD signal. The final adapter configuration should also match the desired pin-out of the RJ45 connector, as it can also be configured to support either DSR or DCD.

For systems configured with both a front and rear RJ45 serial connectors, the adapters used for the rear port cannot be used with the front port, as the pin-out for both RJ45 ports are different. For example, modem applications typically use DCD. In this case the user would use a DCD-configured adapter and set the jumper block as shown in Figure 6.

ACPI

The SCB2 server motherboard supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 1.0 and PC97 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The boards sleep states s0, s1, s4, and s5:

- s0: Normal running state.

- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.

- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.

- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.

CAUTION!

The system is off only when the AC power is disconnected.

Security

Intrusion Switch Monitoring

To help prevent unauthorised entry or use of the server, Intel® Server Control server management software monitors the chassis intrusion switch if one is installed. Opening an access cover will transmit an alarm signal to the server board, where BMC firmware and server management software process the signal. The system can

be configured through ISC to respond to an intrusion a number of ways, including powering down or locking the keyboard.

Software Locks

The BIOS Setup and the System Setup Utility (SSU) provide a number of security features to prevent unauthorised or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period.1 to 120 minutes.

- Set and enable a supervisor password.

- Set and enable a user password.

- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.

- Activate a hot key combination to enter secure mode quickly.

- Disable writing to the diskette drive when secure mode is set.

- Disable access to the boot sector of the operating system hard disk drive.

Using Passwords

You can set the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup or the SSU.

- Must enter the user password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.

- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup or the SSU.

- Must enter the supervisor password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.

- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup or the SSU. However, you will not be able to change many of the options.

- Must enter the supervisor password if you want to enter BIOS Setup or the SSU and have access to all of the options.

- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.

- May enter either password to exit secure mode.

Secure Mode

Configure and enable the secure boot mode by using the SSU. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.

- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the SSU and go to the Security Subsystem Group, menu. The table also refers to other SSU menus and to the Setup utility.

Table 4: Software Security Features

Feature	Description
Secure mode	**How to enter secure mode:** - Setting and enabling passwords automatically places the system in secure mode. - If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period. When the system is in secure mode:

| | The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered.

At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode.

If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time.

To leave secure mode: Enter the correct password(s). |
|---|---|
| Disable writing to diskette | In secure mode, the server will not boot from or write to a diskette unless a password is entered.

To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only. |
| Set a time out period so that keyboard and mouse input are not accepted

Also, screen can be blanked, and writes to diskette can be inhibited | Specify and enable an inactivity time out period of from 1 to 120 minutes.

If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted.

The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup).

To resume activity: Enter the correct password(s). |
| Control access to using the SSU: set supervisor password | To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup.

If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed.

To disable a password, change it to a blank entry or press CTRL-D in the Change
Password menu of the Supervisor Password Option menu found in the Security
Subsystem Group.

To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 9). |
| Control access to the system other than SSU: set user password | To control access to using the system, set a user password and enable it through
Setup.

To disable a password, change it to a blank entry or press CTRL-D in the Change |

| | Password menu of the User Password Option menu found in the Security Subsystem Group.

To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 9). |
|---|---|
| Boot without keyboard | The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message. |
| Specify the boot sequence | The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the "Secure Boot Mode" option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input. |

4. Assembling the System

This chapter will give a step-by-step guide of installing the server board and the main components in the system. It will give information on how to add add-in cards and upgrade processors and memory along with other relevant information that may be of important use.

Before You Begin!

Before you start the assembly process you will need to have the right tools available to you and you will need to make sure you follow certain basic safety precautions. Tools and Supplies Needed

Before beginning your work, make sure you have the following tools and supplies available:

- Phillips (cross head) screwdriver (#2 bit)
- Anti-static wrist strap (recommended)
- Installation / Assembly Safety Instructions

System components must be installed in the order presented below. If installed in a different order, component damage may occur.

CAUTION!

Integration / servicing of this chassis sub assembly shall be performed only by technically qualified persons.

Follow these guidelines to meet and maintain safety and product regulatory requirements when integrating this chassis subassembly.

WARNING!

Do not attempt to modify or use the supplied AC power cord(s) if it is not the exact type required.

The power supply cords are the main disconnect device to mains (AC power). The socket outlet shall be installed near the equipment and shall be readily accessible.

Warnings and Cautions!

These warnings and cautions apply whenever you remove the access cover to access components inside the server. Only a technically qualified person should integrate and configure the server.

Before removing the access cover for any reason, observe these safety guidelines.

- Turn off all peripheral devices connected to the server.

- Turn off the server by pressing the power button on the front of the chassis. Then unplug the AC power cord from the chassis or wall outlet.

- Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back of the chassis.

- Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground—any unpainted metal surface—when handling components.

WARNING!

The power button on the front panel **DOES NOT** turn off the AC power. To remove power from server, you must unplug the AC power cord(s) from the wall outlet or the chassis.

WARNING!

Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cords, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

WARNING!

Do not open the power supply, as there is risk of electric shock and burns from high voltage and rapid overheating. Refer servicing of the power supply to qualified technical personnel.

Installing the Server Board

Installing the server board consists of the following steps:

- Removing the cover, Riser cards and fan assembly.

- Mounting the server board in the chassis.

- Cabling the server board to the other chassis components.

- Adding processors and memory to the server board.

- Replacing riser cards, fan assembly and the top cover.

Removing the Cover

1. While pressing the blue latch button (A) with your left thumb, slide the top cover back using the heal of your right hand on the blue pad.

NOTE: A non-skid surface or a stop behind the chassis may be needed if attempting to remove the top cover on a flat surface.

2. Set the cover aside and away from the immediate work area.
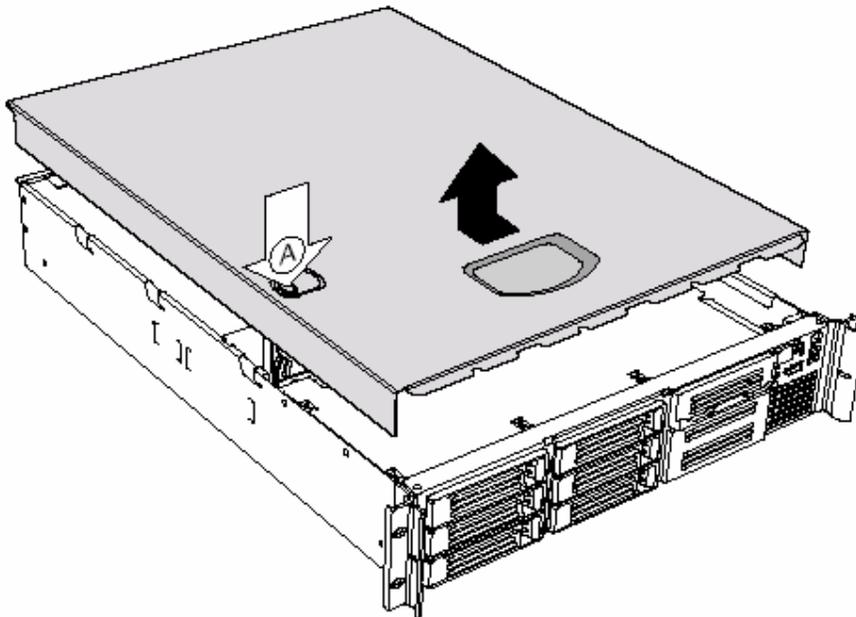
Figure 8: Removing the Cover

Removing the Riser Cards

1. Grasp riser card (A) at both ends (C) of the EMI shield.

2. Lift straight up and remove it from the chassis.

3. Insert your finger in the plastic loop on riser card (B).

4. Pull straight up and remove it from the chassis.

5. Discard the protective foam blocks.
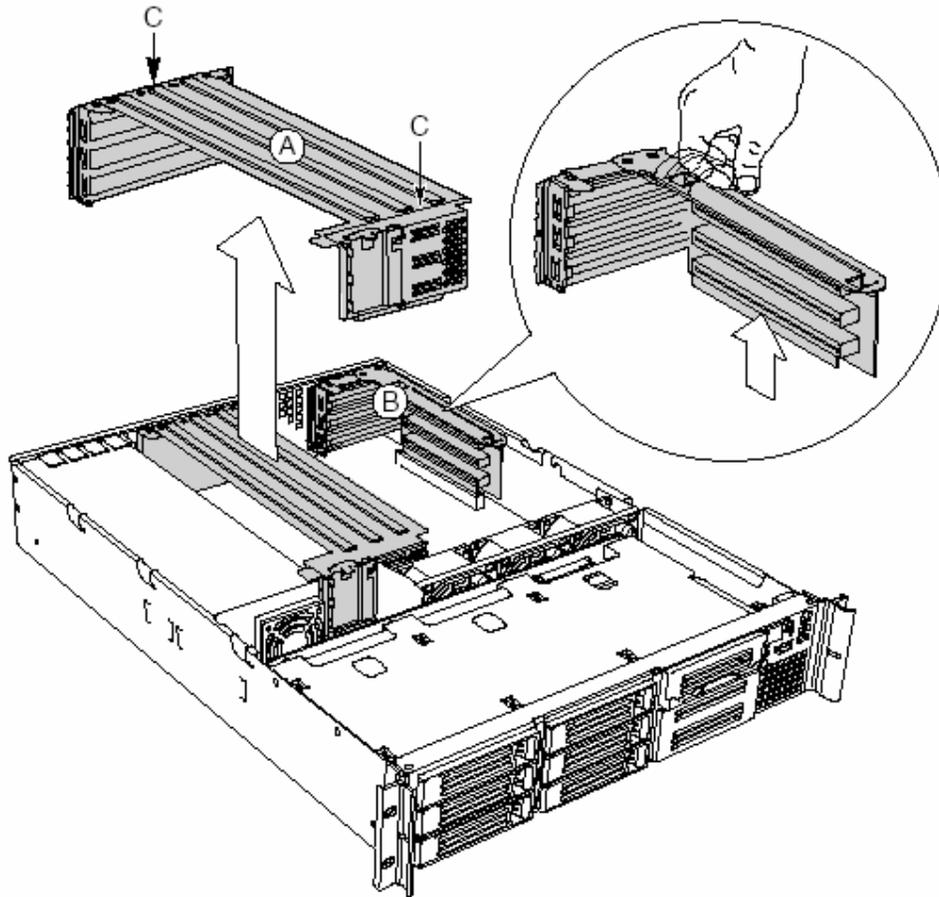
Figure 9: Removing the Riser Cards

Removing the Fan Assembly

1. At the end of the fan assembly closest to the chassis centerline, lift up on tab (A).

2. While lifting up on the tab, slide the fan assembly toward the chassis centerline (B) until it releases from the chassis.

3. Lift the fan assembly out of the chassis.
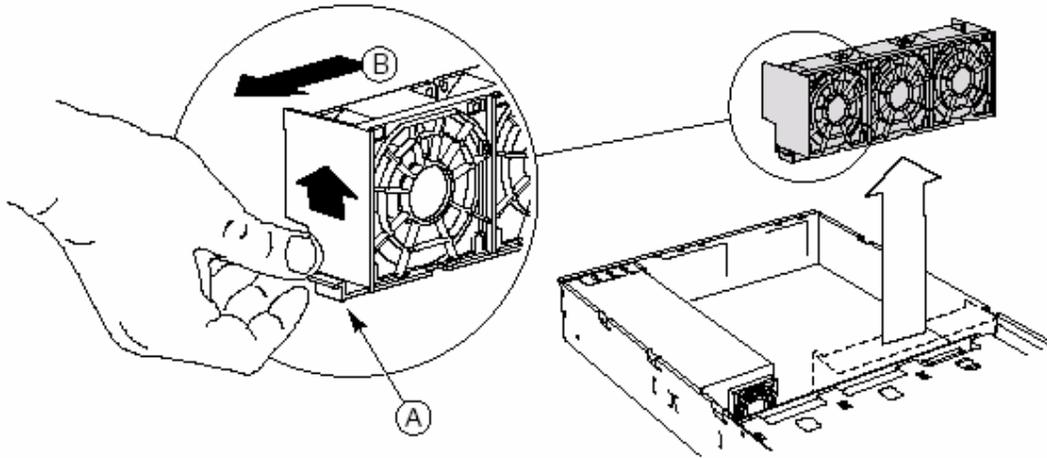
Figure 10: Removing the Fan Assembly

Installing the Server Board

1. Ensure that the Mylar insulator sheet is seated securely over the standoffs, is laying flat on the chassis floor, and that the edge of the sheet is seated below the studs in the rear chassis wall.

2. Remove the server board from its packaging and antistatic bag.

3. While placing the board on the chassis standoffs, carefully position the board I/O connectors in the rear chassis I/O openings.

4. Adjust board position so that the two mounting holes near the board edges rest securely on the two corresponding shouldered standoffs.

NOTE: The three holes on the server board used to mount the board to the standoffs have white circles around them.

5. Attach the board to the chassis using the three thumbscrews shipped in the chassis accessory kit.
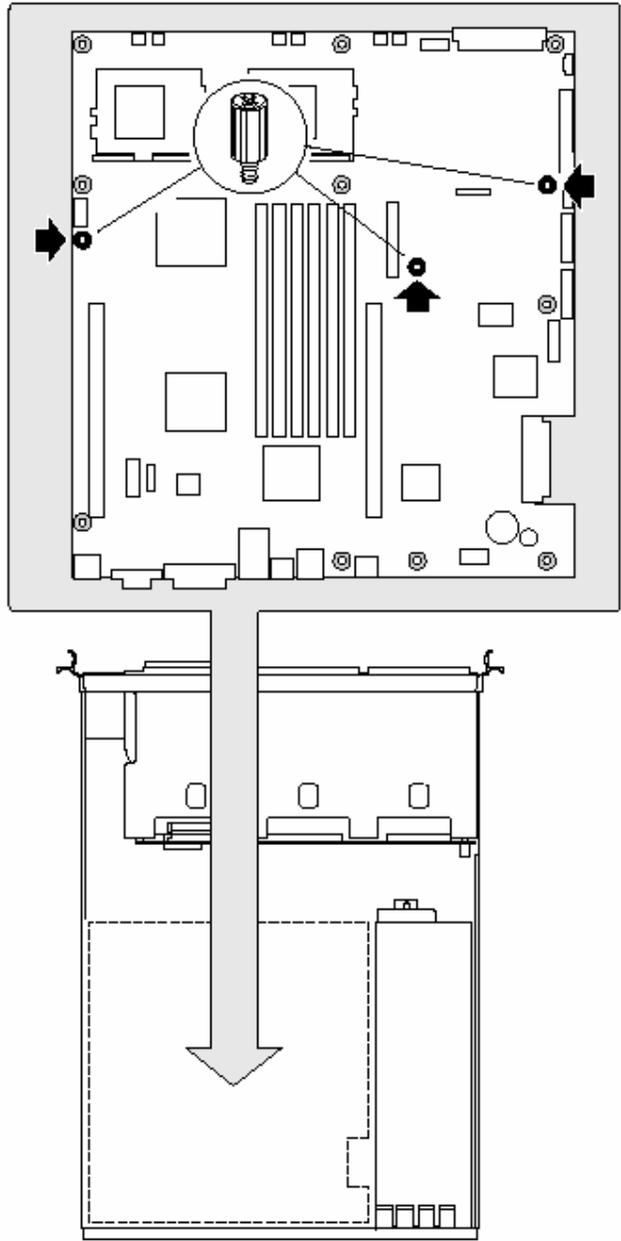
Figure 11: Attaching the Server Board

Routing Cables

System Components
① Power Supply
② SCSI Hard Disk Drives
③ CD-ROM/Floppy Module
④ Tape Drive [optional]
⑤ Front Panel Board
⑥ Fan Assembly
⑦ SCSI Backplane Board
 [shown horizontal for clarity]
⑧ Server Board

Connections
Ⓐ To backplane Power connector from Power Supply
Ⓑ To server board Primary Power connector from Power Supply
Ⓒ Server board Floppy/FP/IDE connector to backplane ... flex cable
Ⓓ Server board to backplane ... SCSI ribbon cable
Ⓔ Server board to front panel board ... front panel USB cable
 ⊛ Position USB Cable on chassis floor against sidewall
Ⓕ Front panel board to backplane ... ribbon cable
Ⓖ Fan Assembly fans to server board fan connectors [3] ... center fan is optional
Ⓗ Tape Drive to Server Board ... SCSI ribbon cable
Ⓘ To server board Auxiliary Signal connector from Power Supply
Ⓙ To Tape Drive power connector from Power Supply
Ⓚ Processor Fans to Server Board fan connectors
⊷ Insert Ⓔ Ⓕ in cable clip here

Figure 12: Routing Cables

1. Route the backplane power cable (A) from the power supply to the backplane board and connect it to the white 6-pin connector.

2. Route the server board power cable (B) from the power supply to the cable clip and connect it to the white 24-pin connector on the server board. Firmly press the two connectors together until they are fully seated.

3. If you are not installing a tape drive, coil the tape drive power cable, wire tie the coil, and place it on the floor.

4. Route the auxiliary signal cable (I) from the power supply to the server board and connect it to 5-pin auxiliary signal connector.

5. Connect the end of the flex circuit cable (C) labeled to the floppy/front panel/IDE connector on the server board. Route the cable to the backplane board and connect the opposite cable end to the matching connector on the backplane.

CAUTION!

After connection of cable (C) in step 5, ensure that each cable connector is properly seated in the board connector. The connector should be parallel to its board connector and not cocked to one side. If in doubt, remove, reinsert, and recheck.
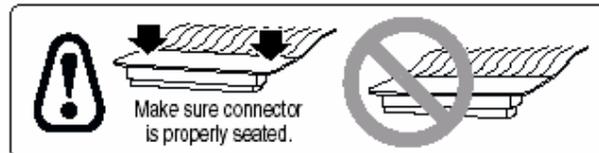
6. Locate the end of the SCSI ribbon cable (I) that is labeled baseboard. Connect that end to the SCSI connector on the server board. Route the cable to the backplane board and connect it to the matching connector on the backplane board.

7. Route the backplane power cable (A) from the power supply to the backplane board and connect it to the white 6-pin connector.

8. Connect the front panel cable (E) to the front panel board. Insert the cable in the cable clip (**), route it to the backplane, and connect it to the matching connector.

9. Connect the USB cable (F) to the USB connector on the server board. Route the cable along the chassis floor at the bottom of the chassis sidewall (*). Connect it to the front panel board.

10. Connect the system fan cables (G) to their server board connectors.

11. If you have installed a tape drive, connect the tape drive power cable (D) to the drive.

Installing the Fan Assembly

CAUTION!

When installing the fan assembly, avoid pinching cables routed in the area.

1. Ensure the USB cable is routed in the corner where the chassis floor meets the sidewall.

2. Position the fan assembly as shown in Figure 14 and lower it to the chassis floor.

3. While pressing down on the fan assembly, slide it (A) toward the chassis sidewall.

4. Check for the following:

   - The floor tabs have engaged the holes in the bottom of the fan assembly.

   - The latch tab (B) has engaged the chassis slot and locked the fan assembly in place.
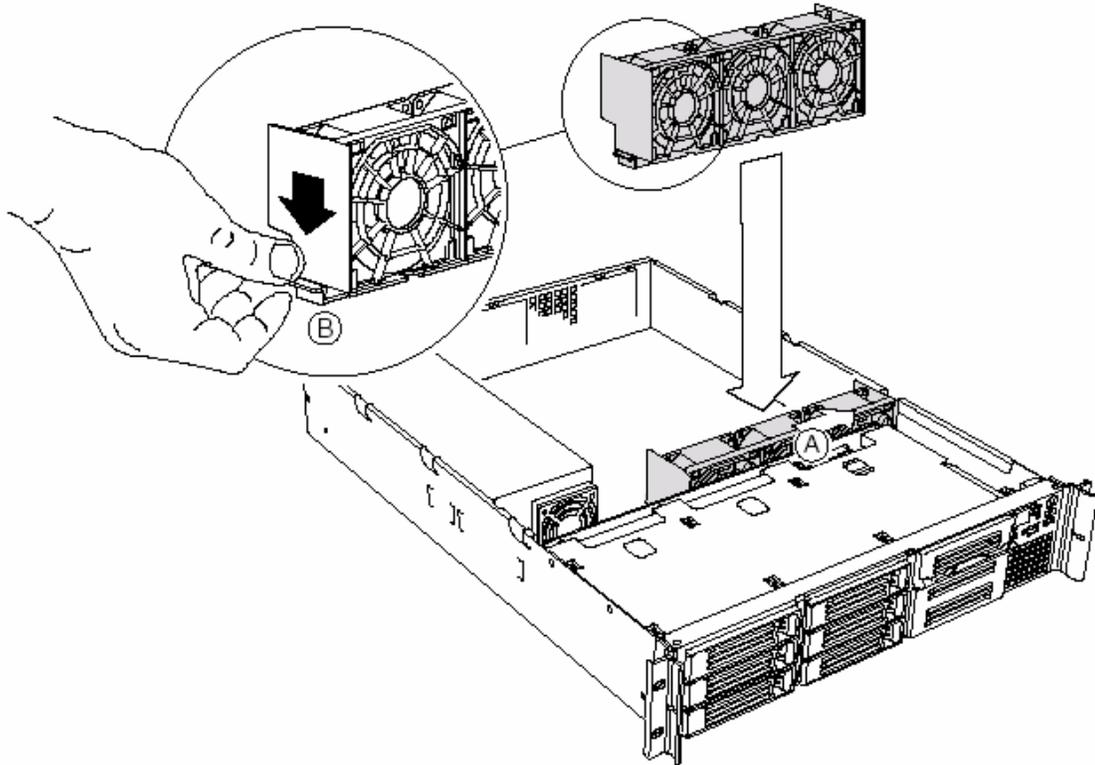
Figure 13: Installing the Fan Assembly

5. Connect the fan power cables to the server board at the system fan connectors (Figure 14).
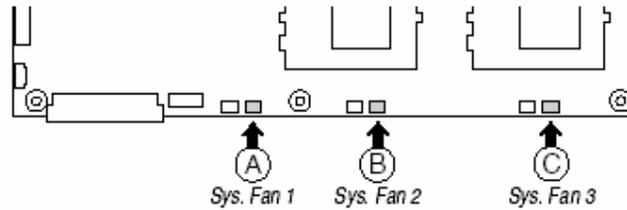
Figure 14: System Fan Connectors

6. Connect the USB cable to the 10-pin USB connector on the server board (Figure 4, Position L on page 13).

Installing the Power Cord and Strain Relief Strap

NOTE: If you will be placing your server in a rack, wait to install the power cord until after the server is in the rack.

1. Insert the expansion nipple (A) of the strain relief strap into the chassis hole.

2. Plug the power cord into the power supply but not into the power source.

3. Insert the power cord into the plastic loop (B) of the strain relief.

4. Pull the plastic band (C) until it tightens around the power cord.

To release the plastic loop and free the cord, squeeze the release lever (D).
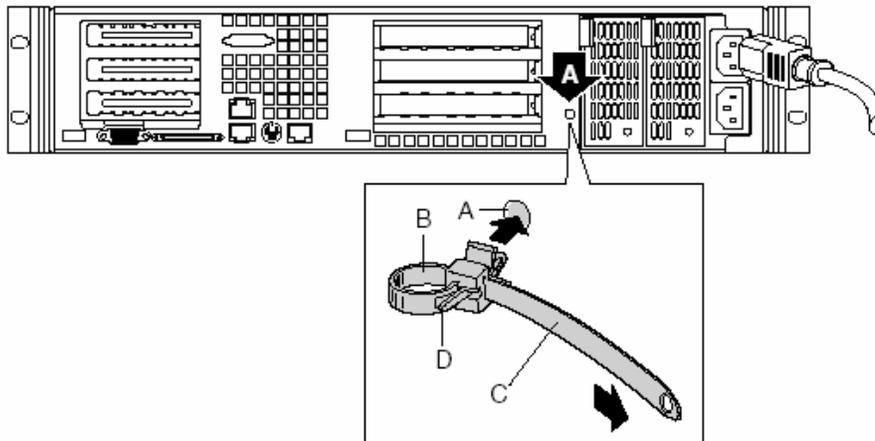
Figure 15: Installing the Power Cord

Adding Components to the Server Board

After installing the server board, you must add the desired number of processors and memory DIMMs.

NOTE: Once the server board and its components are installed, you are done assembling the system unless you have optional peripherals or add-in cards you wish to install. If you need to install these components, continue on to the next section. Otherwise, install the cover and bezel and continue on to Chapter 5, "Installing the System in a Rack" found on page 51.

Installing Processors

1. Observe the safety and ESD precautions at the beginning of this chapter.

2. Raise the locking bar on the socket.

3. Observe the safety and ESD precautions at the beginning of this chapter.

4. Raise the locking bar on the socket.
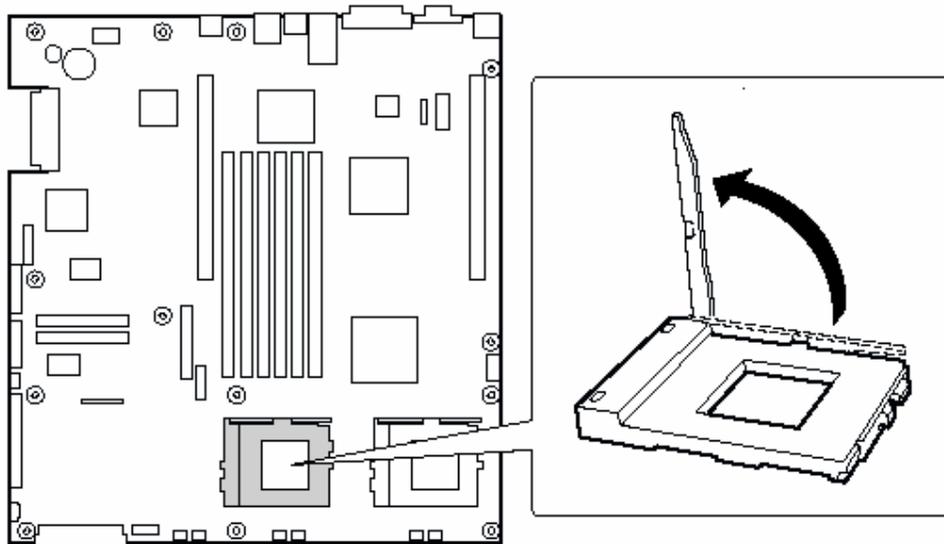
Figure 16 Raising the Locking bar on the socket

5. Aligning the pins of the processor with the socket, insert the processor into the socket.

6. Lower the locking bar completely.
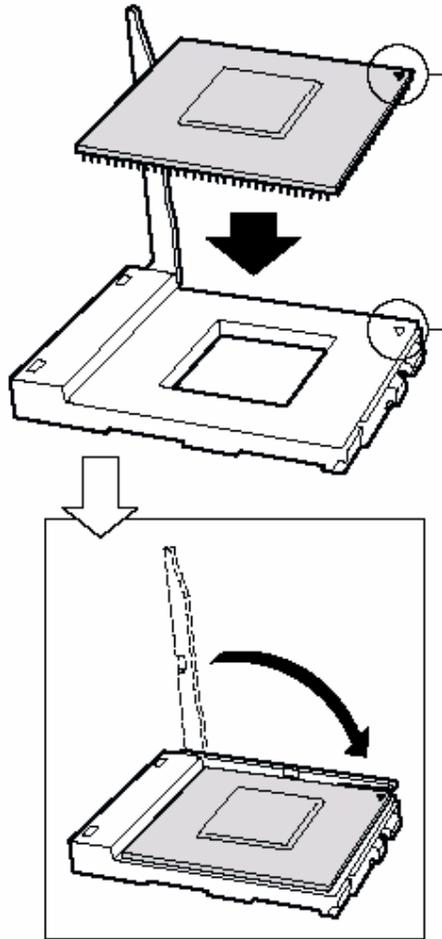
Figure 17: Inserting the Processor

7. Following the instructions packaged with the applicator, apply thermal grease to the processor.

8. Position the heat sink slot (2) above the socket/processor slot (3).

9. Aligning the raised metal surfaces, place the heat sink on top of the processor.

10. Install the heat sink clip with pin (1) inserted into slot (2).
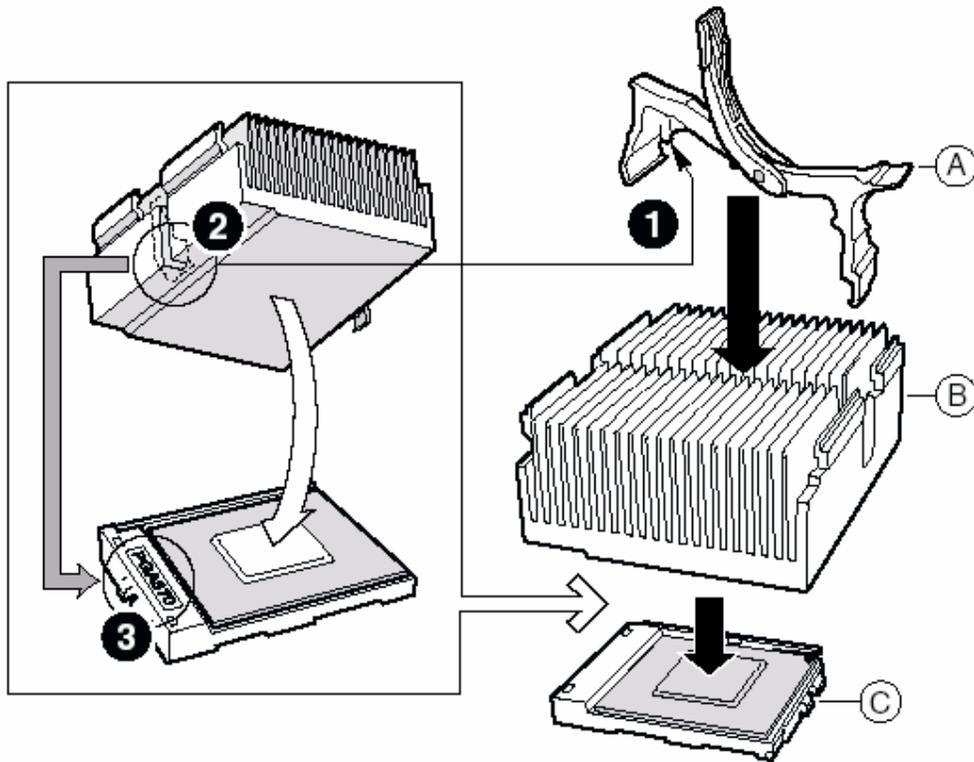
Figure 18: Installing the Heatsink

A. Heat sink retention clip
B. Heat sink
C. Socket and processor

CAUTION!

Use care when closing the locking lever—do it slowly.

11. Slowly close the locking lever (A) until it contacts tab (B), see Figure 19.
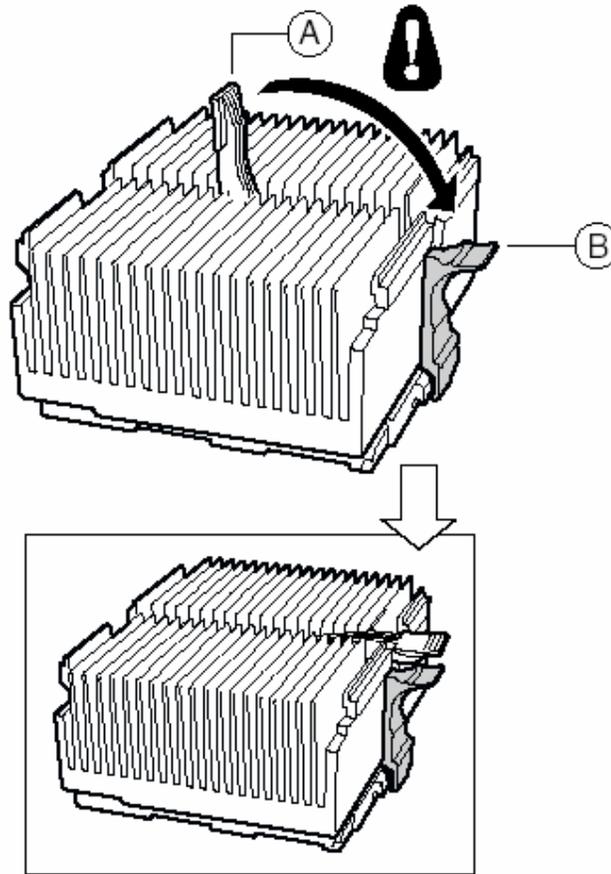
Figure 19: Locking Heatsink Lever

12. Install the fan on the processor heat sink making sure that it is seated flat on the heatsink.

13. Connect the fan to (A) if it is on the primary processor or to (B) if it is on the secondary processor.

CPU 1 Fan   CPU 2 Fan
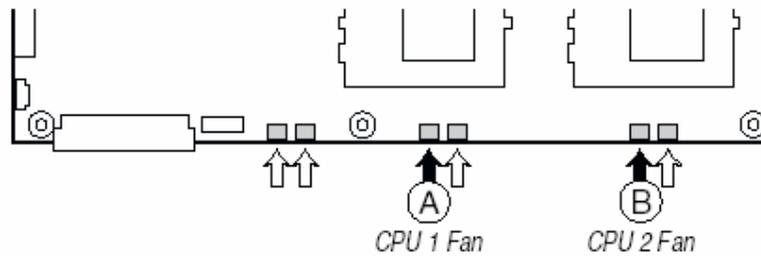
Figure 20: Processor Fan Connectors

Install the Processor Terminator

If you are installing only one processor, you **must** install a terminator in the secondary processor socket (A). If you are installing two processors, skip this section.

1. Raise the locking bar (B) on the socket.

2. Aligning the two corner marks on the terminator with the handle-side of the socket (C), insert the terminator into the socket.

Lower the locking bar completely (D).
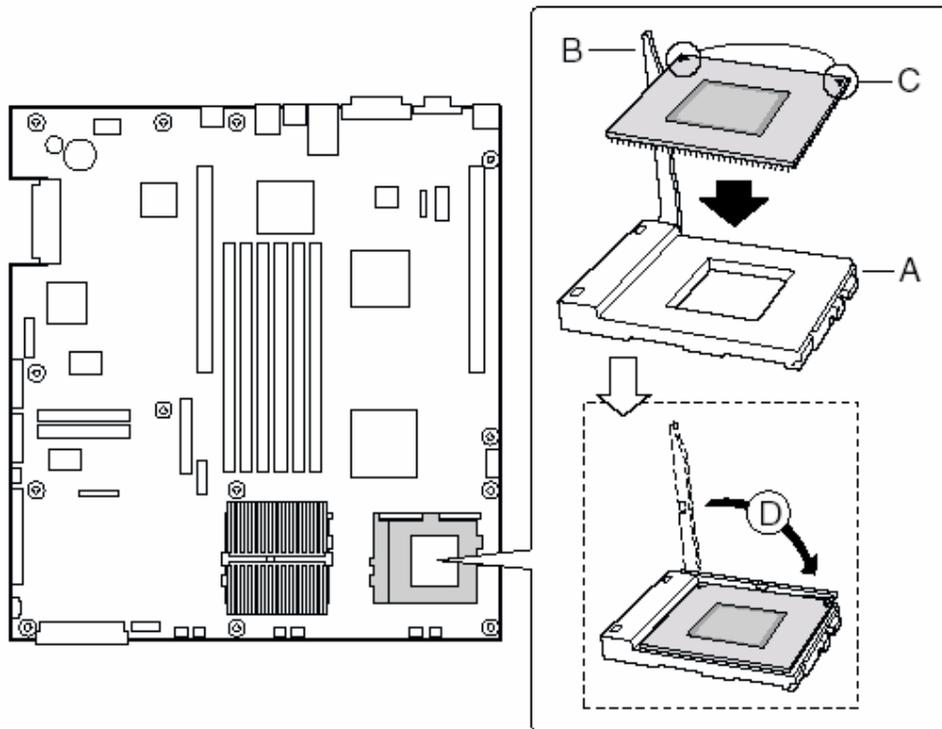
Figure 21: Installing the Processor Terminator

Memory

Only PC-133 compliant SDRAM is supported by the SX220 server board. Install from 128 MB to 6 GB of registered, ECC memory, using up to six DIMMs.

DIMMs must be installed in pairs and in the following order: 1a and 1b, 2a and 2b, 3a and 3b.

Installed DIMMs must be the same speed and must all be registered. For a list of supported memory, call your service representative.
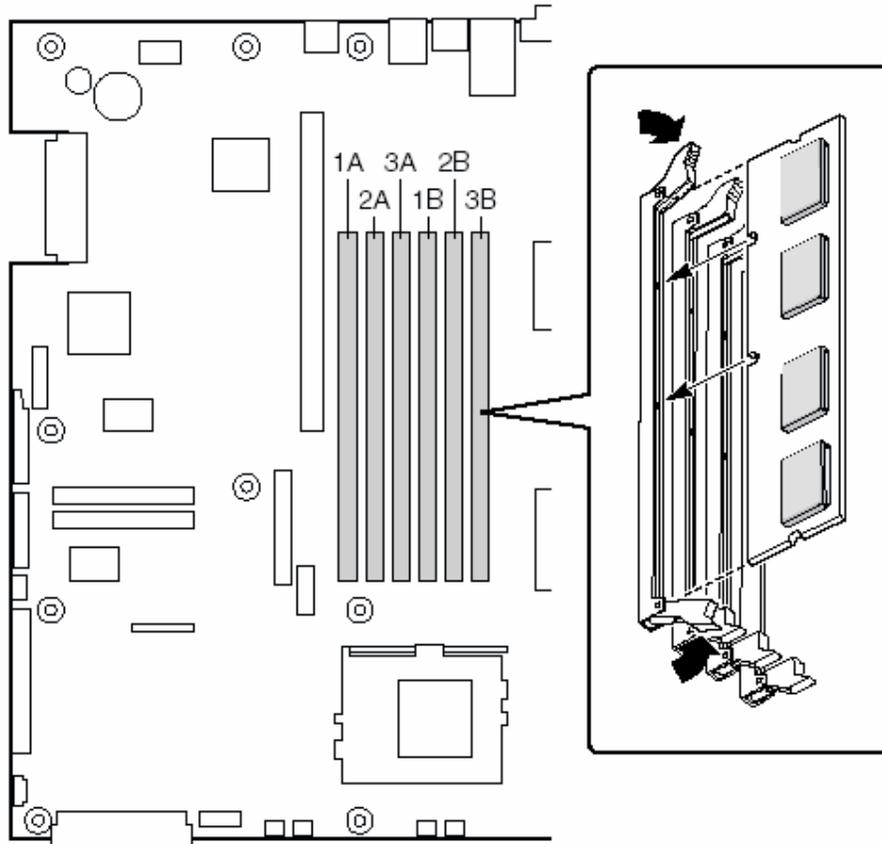
Figure 22: Installing DIMMs

Installing Peripherals

Peripherals and add-in cards are not included in your system and must be purchased separately. The following sections describe how to install PCI add-in cards, hard disk drives, a CD-ROM drive/floppy disk, and a tape drive.

Installing a PCI Card on a Riser Card

The riser card nearest the chassis sidewall supports three Low Profile (LP) PCI add-in cards. The riser card on the chassis centerline supports three full-length, full-height add-in cards or three LP cards (an LP card must be equipped with a standard full-height PCI mounting bracket).

NOTE: Add-in cards must be installed on a riser card while the riser card is removed from the chassis.

1. Open the retainer clip (A) and remove the filler panel from the rear retention bracket (B) of the riser card.

2. Insert the PCI card edge connector in the riser PCI slot (D) while aligning the end of the PCI card bracket in opening (C).

3. Firmly push the PCI card connector into the riser card slot until it is fully seated.

4. Close the retainer clip (A). Ensure the clip is latched.
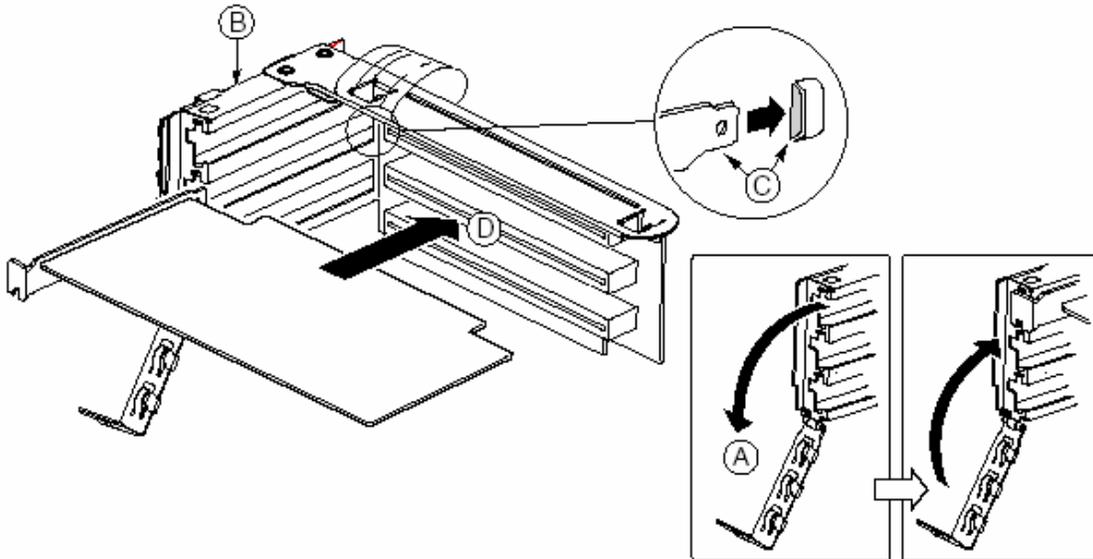
Figure 23: Installing a PCI card of the riser

Installing a Riser Card on the Server Board

1. Insert the riser card connector into the server board slot while aligning the tabs on the rear retention bracket with the holes in the chassis.

CAUTION!

Press the riser card straight down into the slot. Tipping it into the slot while installing it may damage the riser card or slot.

2. Firmly press the riser card straight down until it is fully seated in the server board slot.
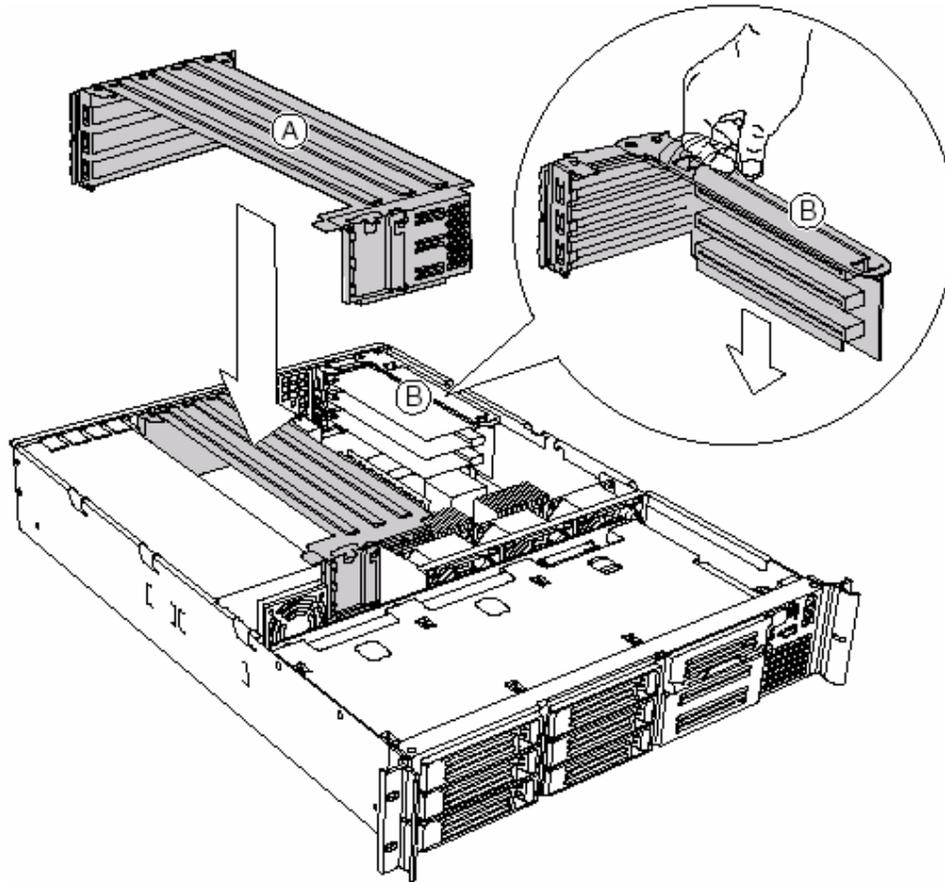
Figure 24: Installing a Riser Card

Installing a Hard Drive

The server can support up to seven hot swappable hard drives: six hard drives in the drive bays, plus one in the flex bay.

CAUTION!

To allow proper airflow and server cooling, all drive bays must contain either a carrier with a hard drive installed or a carrier with an air baffle installed.

1. If present, remove the front bezel.

2. If the drive carrier is installed in the drive bay, remove it.

3. Remove the air baffle (Figure 25, A) from the drive carrier by removing the four screws (B) from the slide track (C).

4. Store the air baffle for future reinstallation in the event you must operate your server without a drive in one of the bays.
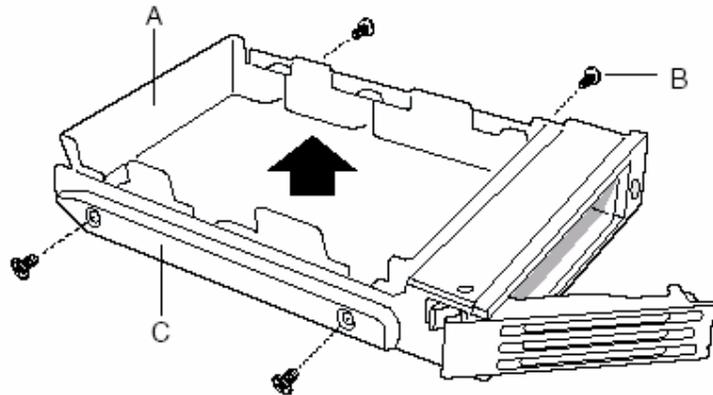
Figure 25: Hard Drive Carrier

5. Remove the hard drive from its wrapper and place it on an anti-static surface.

6. Set any jumpers and/or switches on the drive according to the drive manufacturer's instructions.

7. With the drive circuit-side-down (Figure 26, A), position the connector end (E) so that it is facing the back of the carrier (B).

8. Align the holes in the drive to the holes in the drive carrier slide track (C), insert the screws (D) that you previously removed, and attach the carrier to the drive.
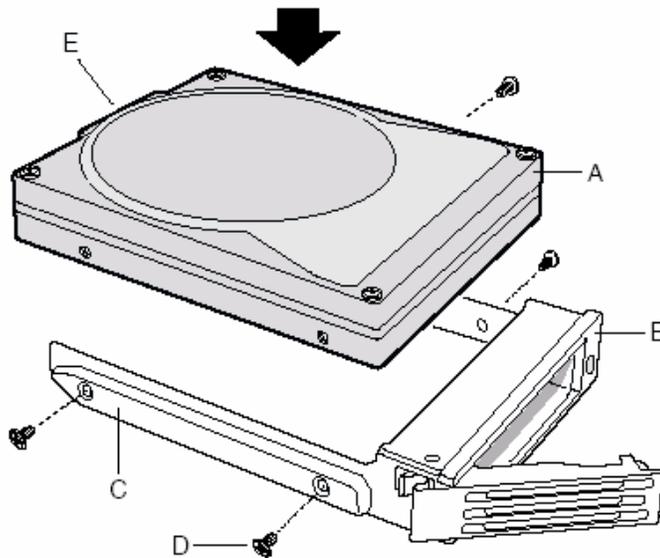
Figure 26: Installing the Hard Drive

9. Slide the carrier/drive all the way into the drive bay with the retention lever in the fully open position.

10. Push the retention lever closed to secure the carrier/drive in the bay.

11. Reinstall a carrier/air baffle in any bays where you are not installing a carrier/drive.

Installing a CD-ROM Drive/FDD Module

The SX220 server is supplied with a CD-ROM drive and a floppy disk drive already installed in the Flex Bay. The blow steps will help you to re-install the unit if it has been removed to make way for an additional SCSI hard disk drive.

1. Remove the filler panel and plug from the front of the chassis.

2. Ensure the handle bar (A) on the front of the module is rotated to the down position.

3. Insert the module into the flex bay and slide it back until you feel the connectors touch.

4. With your thumbs positioned above the handle bar indentations (B), push the module in until it locks in place.
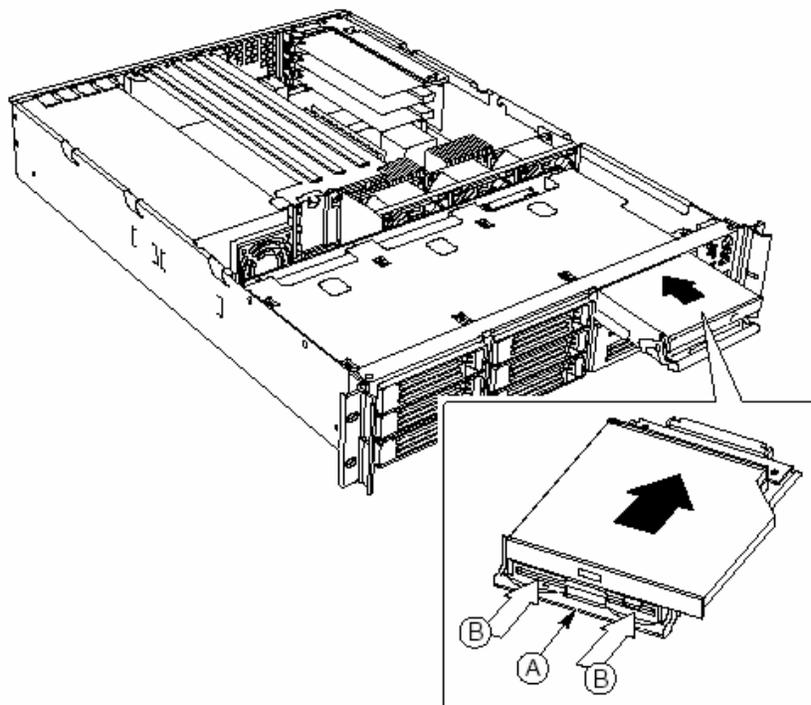
Figure 27: Installing a CDROM/FDD Module

Installing a Tape Drive

You may purchase a tape drive and install it in the 3.5-inch drive bay using the carrier provided. SCSI tape drives are recommended due to the cable length required. If you install an IDE tape drive, you must install an IDE add-in controller card. The cable routing will be similar to what is shown for a SCSI tape drive.

NOTE: Using the legacy IDE connector on the SCB2 server board to support an IDE peripheral device in the SX220 server is not a supported configuration. Using this connector in the SX220 server may produce unreliable operation of the IDE device and may result in data loss.

If you install a SCSI tape drive, you can connect it one of two ways:

- To the on-board SCSI controller. This requires that you connect the backplane to an add-in RAID or SCSI controller.

- To an add-in SCSI controller board. This allows you to leave the backplane connected to the on-board SCSI controller.

Mounting the Tape Drive

1. Remove the chassis cover.

2. Remove the blank panel from the bay.

3. Push on the retainer clip at the rear of the carrier (A) to release it from the chassis.

4. Remove the carrier by sliding it toward the front of the chassis.

5. Set any jumpers and/or switches on your tape drive (B) according to the drive manufacturer's instructions.

6. Install the tape drive in the carrier.

7. Insert the carrier/drive assembly in the empty bay and slide it toward the rear of the chassis until the retainer clip latches.
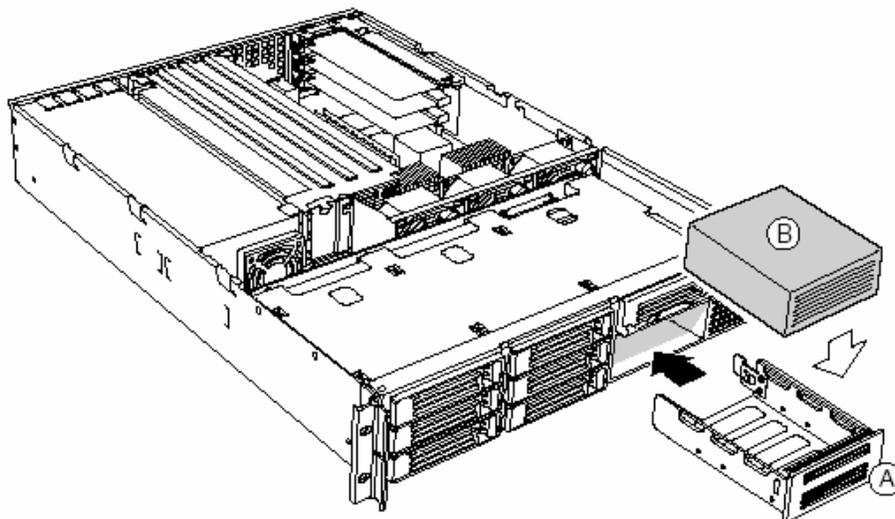
Figure 28: Mounting a Tape Drive

CAUTION!

Carefully route cables to minimise airflow blockage and cooling problems.

Suggested Tape Drive Cabling

A peripheral power cable (4-pin connector) is included in the cable output from the power supply.

Route and connect to the tape drive before the SCSI cable is installed.

Connecting to the On-board SCSI Controller

1. Obtain a SCSI cable with an unfolded length of 26-inches.

2. Flatten the cable and fold it in half beginning about 1-inch from the tape drive end (see Figure 29, A). Continue folding for a distance of about 10-inches.

3. Fold the cable in half again and secure with electrical tape.

4. Connect the cable to the tape drive (see Figure 30, A) and carefully route the folded and taped section on the chassis floor between the fan assembly (C) and the tape drive (A).

5. Connect the cable to the on-board SCSI controller at connector (B).

Because the on-board SCSI controller is now unavailable, you will need to install a PCI add-in card that provides RAID or SCSI control and connect it to the backplane.
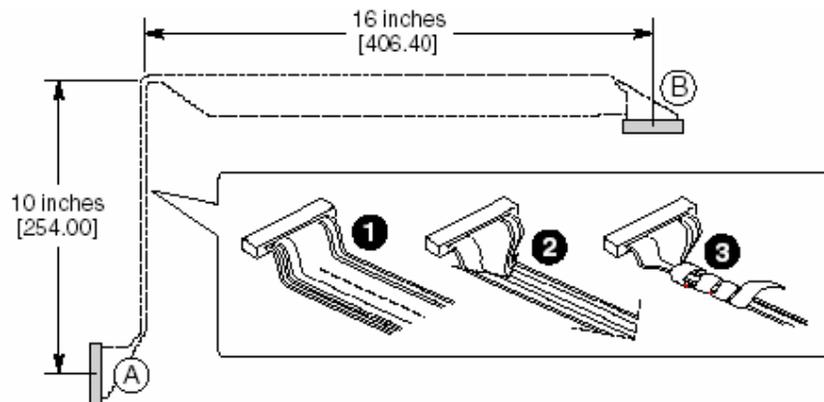
Figure 29: SCSI Cable Length Required
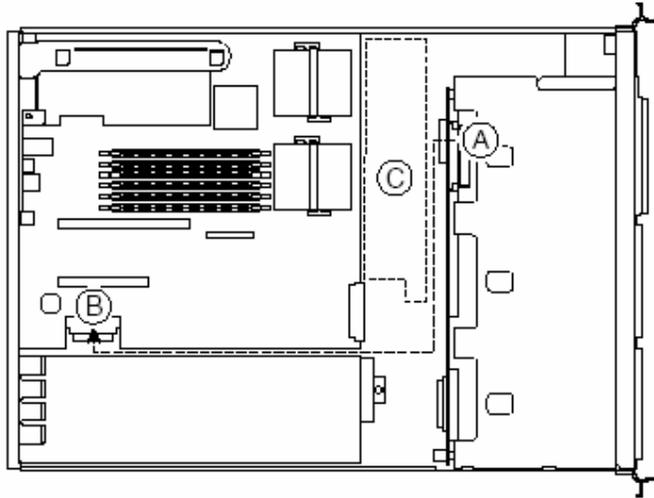
Figure 30: Onboard SCSI Connector

Connecting to a SCSI Controller on a Full-height PCI Card

1. Obtain a SCSI cable with an unfolded length of 26-inches.

2. Flatten the cable and fold it in half beginning about 1-inch from the tape drive end (see Figure 29, A). Continue folding for a distance of about 10-inches.

3. Fold the cable in half again and secure with electrical tape.

4. Connect the cable to the tape drive (see Figure 31, A) and carefully route the folded and taped section on the chassis floor between the fan assembly (C) and the tape drive (A).

5. Connect the cable to the SCSI controller (B) on the full-height PCI card.
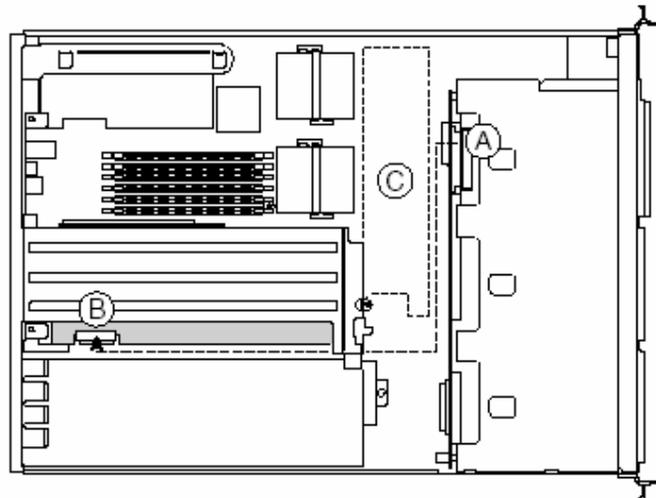
Figure 31: Connecting to a Full Height PCI SCSI Controller

Connecting to a SCSI Controller on a Low Profile PCI Card

1. Obtain a SCSI cable with an unfolded length of 26-inches.

2. Flatten the cable and fold it in half for the full length, leaving about 1-inch at each end (see Figure 32).

3. Fold the cable in half again and secure with electrical tape.

4. Connect the cable to the tape drive (see Figure 33, A) and carefully route the folded and taped section on the chassis floor between the fan assembly (C) and the tape drive (A).

5. Connect the cable to the SCSI controller (B) on the low-profile PCI card.
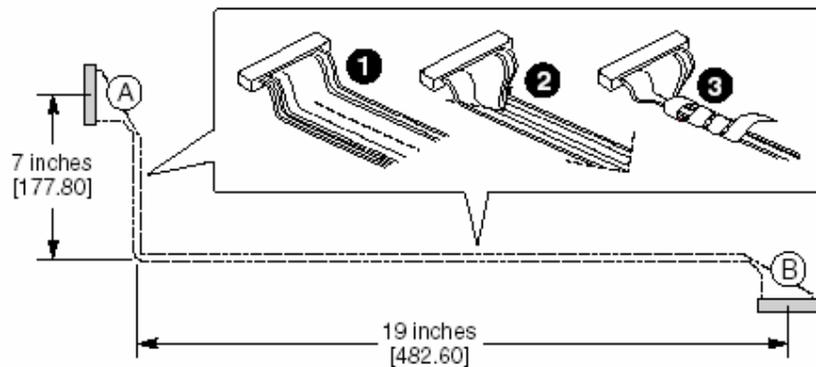
Figure 32: SCSI Cable Length Required
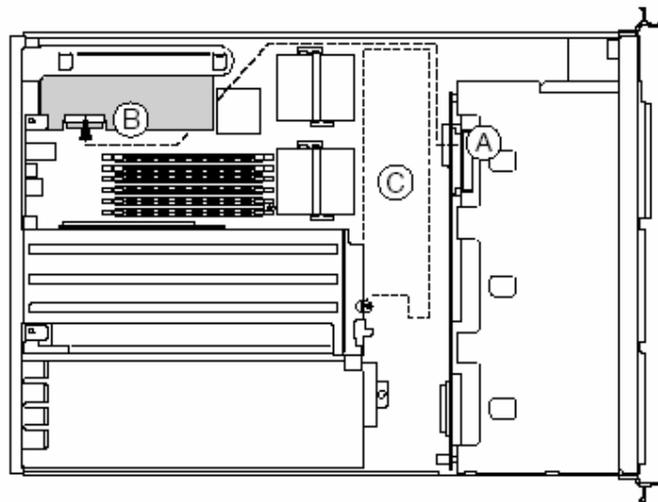
Figure 33: Connecting to a half Height PCI SCSI Controller

Installing a COM 1 port in the Rear I/O

Using a standard DH-10 to DB-9 COM cable, you may install a COM 1 port in the opening provided in the rear I/O (see Figure 3, C, on page 9). Connect the other end to the COM 1 serial port header on the server board (see Figure 4 on page 13)

Installing the Bezel

Place the bezel between the chassis handles and push it toward the front of the chassis until it snaps into place.
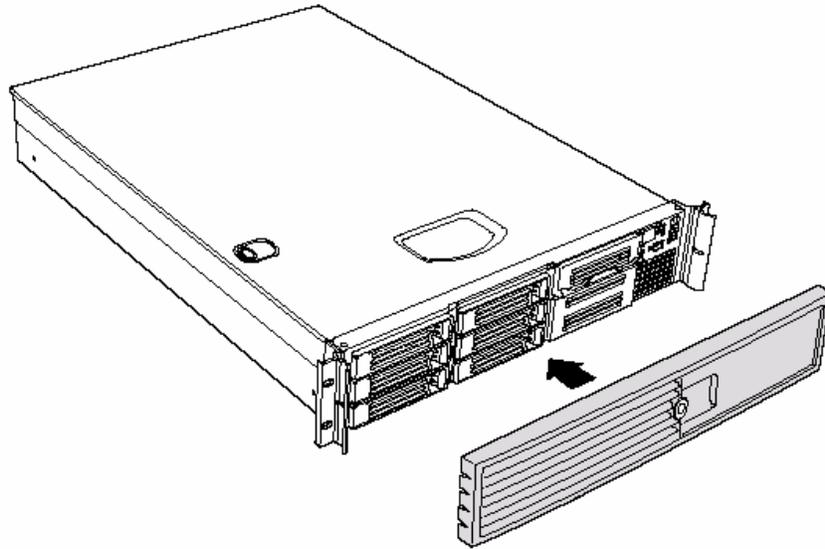
Figure 34: Installing the Front Bezel

5. Installing the System in a Rack

CAUTION!

ANCHOR THE EQUIPMENT RACK: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The equipment rack must be installed according to the manufacturer's instructions. You must also consider the weight of any other device installed in the rack.

MAIN AC POWER DISCONNECT: You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

GROUNDING THE RACK INSTALLATION: To avoid the potential for an electrical shock hazard, you must include a third wire safety grounding conductor with the rack installation. If server power cords are plugged into AC outlets that are part of the rack, then you must provide proper grounding for the rack itself. If server power cords are plugged into wall AC outlets, the safety grounding conductor in each power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

OVER CURRENT PROTECTION: The server is designed for an AC line voltage source with up to 20 amperes of over current protection. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. If more than one server is installed in the rack, the power source for each server must be from a separate branch circuit.

CAUTION!

Temperature: The operating temperature of the server, when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 35 °C (95 °F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. It must also include ventilation sufficient to exhaust a maximum of 1840 Btu's per hour for a fully loaded SX220 server.

It is important to note that this is the maximum, and a minimum or typical system could be much less. You may want to calculate the BTU/hr more accurately for your configuration. An extra 500 BTU/hr over many systems would translate into a large error calculating air conditioning capacity.

Removing the Rails

1. Fully extend a rail assembly (Figure 35). The finger tab (D) for the extension lock is revealed.

2. Press the finger tab and slide the inside rail (C) from the middle rail (B) until it completely separates.

NOTE: The middle rail (B) and outer rail (A) cannot be separated.
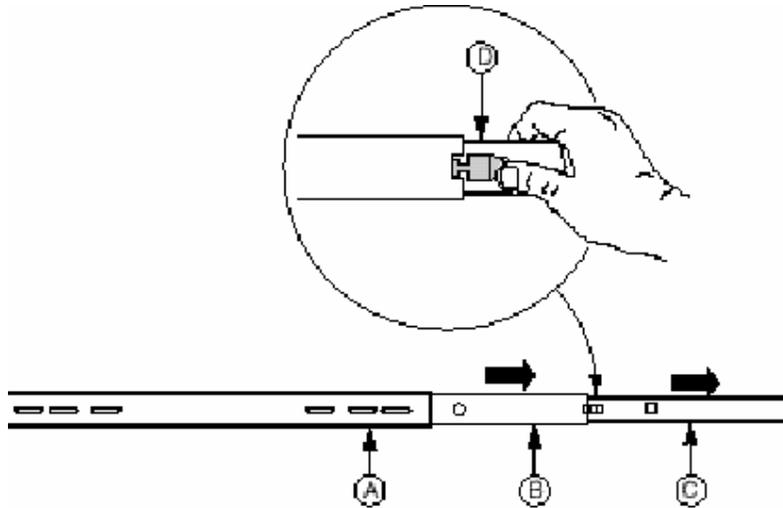
Figure 35: Removing the Rails

A. Outer rail
B. Middle rail
C. Inner rail
D. Finger tab on extension lock

Attach Inside Rails to Chassis

1. Position an inside rail (Figure 36, A) along one side of the chassis with the finger tab facing outward and located closer to the rear of the chassis.

2. Align the holes (C) in the rail with the tabs (D) on the chassis and place the rail against the chassis.

3. Slide the rail as far as it will go toward the front of the chassis to engage the tabs.

4. Fasten the rail to the chassis using screw (B).

5. In the same manner, attach the other inside rail to the other side of the chassis.
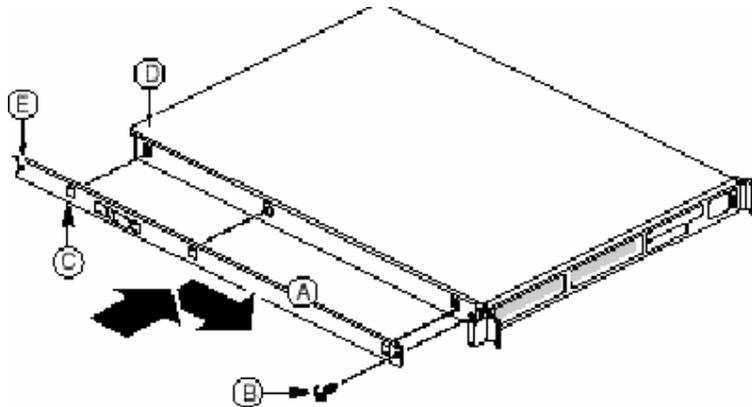
Figure 36: Attaching the Rails

    A. Inside rail
    B. #6-32 x 3/16-inch screw
    C. Attachment hole
    D. Attachment tab
    E. Attachment hole for cable manager (available from others)

Attach Rail Brackets to Posts

1. Using two screws with washers (Figure 38, A), attach one nut bar (B) at the same height on the inside of each rack post. Do not completely tighten the screws—leave them loose enough to allow insertion of the brackets in the next step.

2. Insert the slotted foot of a rail bracket between each nut bar and post.

3. Align the face of the bracket foot with the inside edge of the rack post and firmly tighten the screws.
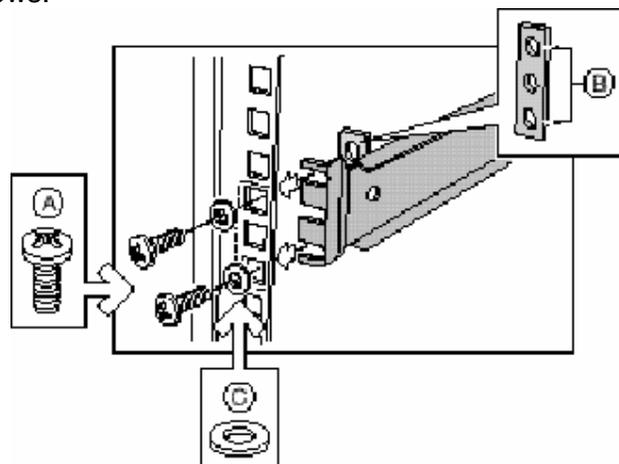
Figure 37: Attaching Rail Brackets to Post

    A. #10-32 x ½-inch screw with washer
    B. Nut bar
    C. Washer

Attach a Rail Assembly to a Front Bracket

1. Position a rail assembly (middle and outer rails) with its black plastic end caps toward the rear of the rack and its outer rail closest to the brackets.

2. Align the front screw hole (Figure 38, C) in the outer rail (B) with the threaded hole (D) nearest the front of the front bracket (A) and fit the rail assembly into the front and rear brackets.

3. Slide the middle rail toward the front (E) until the access hole (F) in the middle rail is aligned with the front screw hole (C) in the outer rail.

4. Insert screw (G) through the access hole and loosely attach the outer rail to the front bracket.

5. In a similar manner to steps 2 through 4, install a screw through a slot in the outer rail and into the rear-most threaded hole in the front bracket. Firmly tighten this screw.

6. Firmly tighten the front screw (G) installed loosely in step 4.

7. In the same manner, attach the other rail assembly to the other side.
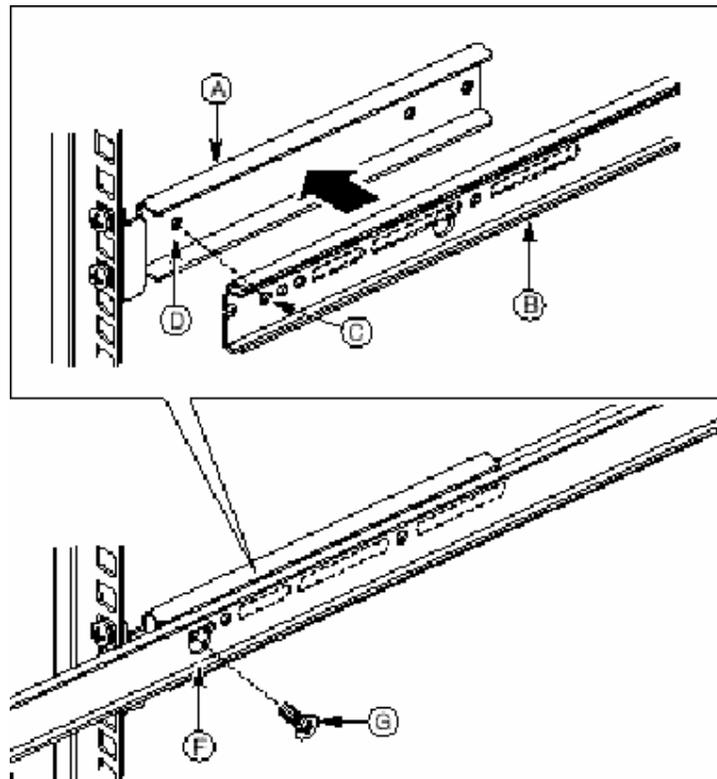
Figure 38: Attaching Rail Assembly to Front Bracket

A. Front bracket
B. Outer rail
C. Screw hole
D. Threaded hole
E. Not Shown
F. Access hole
G. #6-32 x 3/16-inch screw

Attach a Rail Assembly to a Rear Bracket

1. Slide the middle rail toward the front until the rear bracket area is accessible.

2. Attach the rear end of the outer rail (B) to the rear bracket (A) with at least one screw (C). If possible, attach at two places.

3. In the same manner, attach the other rail assembly to the other side.
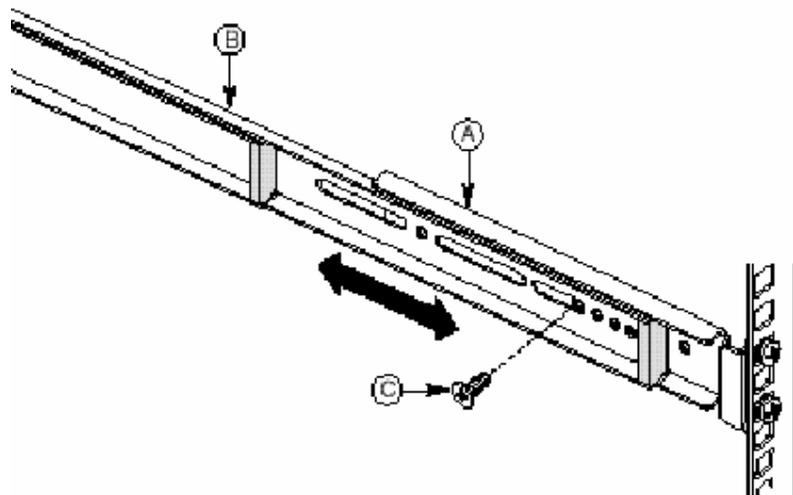
Figure 39: Attaching Rail Assembly to Rear Bracket

A. Rear bracket
B. Outer/middle rail assembly
C. #6-32 x 3/16-inch screw

Install the Chassis on the Rails

1. Fully extend the left and right rails (Figure 7, A) until the extension locks have engaged and the rails will not push back in. The rail system is now ready to receive the chassis.
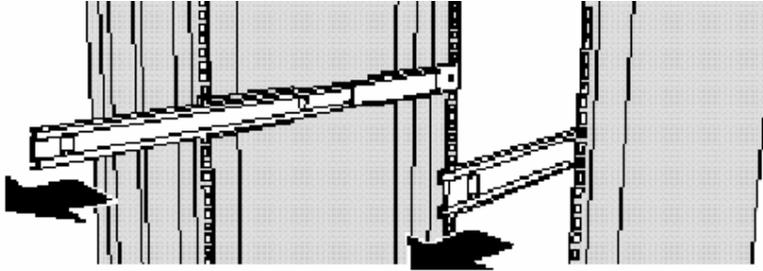
Figure 40: Rails Fully Extended

CAUTION!

Lifting and placing the chassis in the rails is a two-person job. If needed, use an appropriate lifting device. A fully loaded Viglen SX220 server weighs approximately 23.1 kg (51 lbs.).

2. With the chassis front facing you, lift the chassis and carefully insert the rails attached to the chassis in the extended rails.

3. Slide the chassis toward the rear of the cabinet until the rails lock together.

4. Depress and hold down the finger tabs (Figure 41, A) on both extension locks while sliding the chassis towards the rear.
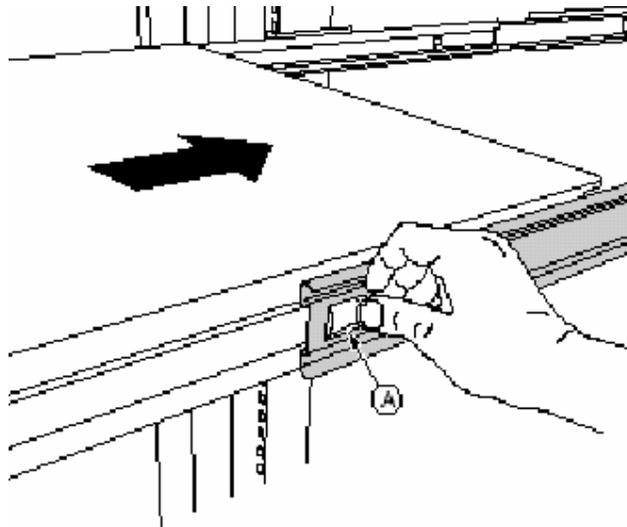
Figure 41: Sliding the Chassis towards the rear of the Rack

6. Configuration Software and Utility

This chapter describes the Power-On Self-Test (POST) and server configuration utilities. The table below briefly describes the utilities.

Table 5: configuration Utilities

Utility	Description and brief procedure
BIOS Setup	Use for system configuration of onboard resources, setting boot device priority, or setting system security options. You can move the CMOS jumper on the system board from the default setting (Protect CMOS memory) to the Clear setting; this will allow most system configurations to boot.
Changing Boot Device Priority	Use this option to change the boot device priority temporarily permanently.
Adaptec SCS*ISelect* † Utility	Use to configure or view the settings of the SCSI host adapters and onboard SCSI devices in the system.
Direct Platform Control (DPC) Console	Use to access and monitor the server remotely.
System Setup Utility (SSU) And Client System Setup Utility (CSSU)	Use for viewing and configuring server management options, viewing the system event log (SEL), setting boot device priority, or setting system security options. The SSU can run either from the configuration software CD or from a set of bootable diskettes. You can create the diskettes from the CD. The CSSU is run from the service partition via the DPC console. It provides the same functionality as the SSU, but from a remote console. Information entered via the SSU/CSSU overrides information entered via BIOS Setup.
FRU/SDR Load Utility	Use to update the Field Replacement Unit (FRU) and Sensor Record (SDR) flash components. NOTE: You must run the FRU/SDR Load utility whenever BMC is updated or if you change your processors.
BIOS Update Utility	Use to update the BIOS or recover from a corrupted BIOS update.
Firmware Update Utility	Use to update BMC flash ROM or other firmware.

Hot Keys

Use the keyboard's numeric pad to enter numbers and symbols.

Table 6: Hot Keys

To do this:	Press these keys
Clear memory and reload the operating system—this is a system reset.	<Ctrl+Alt+Del>
Enter the Adaptec SCSI Utility during POST.	<Ctrl+A> (SCSI model only)
Enter the Promise Technology IDE RAID Utility.	<Ctrl+F> (ATA model only)
Enter BIOS Setup during POST.	<F2>
Abort memory test during POST.	<ESC> (Press while BIOS is updating memory size on screen.)
Display a menu for selecting the boot device.	<ESC> (Press anytime after memory check.)

To remove the splash screen.	<ESC>

Power-On Self-Test (POST)

Each time you turn on the system, POST starts running. POST checks the server board, processor, memory, keyboard, and most installed peripheral devices. During the memory test, POST displays the amount of memory that it is able to access and test. The length of time needed to test memory depends on the amount of memory installed. POST is stored in flash memory.

1. Turn on your video monitor and server. After a few seconds POST begins to run.

2. After the memory test, these screen prompts and messages appear:

Press <F2> key if you want to run SETUP

3. If you do not press <F2> and do NOT have a device with an operating system loaded, the above message remains for a few seconds while the boot process continues, and the system beeps once. Then this message appears:
Operating system not found

If you do not press <F2> and DO have an operating system loaded, the boot process continues, and this message appears:

Press <Ctrl><A> to enter SCSI Utility

4. Press <Ctrl+A> if there are SCSI devices installed. When the utility opens, follow the displayed instructions to configure the onboard SCSI host adapter settings and to run the SCSI utilities. If you do not enter the SCSI utility, the boot process continues.

5. Press <Esc> during POST to pop up a boot menu when POST finishes. From this menu you can choose the boot device or enter BIOS Setup.

After POST completes, the system beeps once.

What appears on the screen after this depends on whether you have an operating system loaded and if so, which one.

If the system halts before POST completes running, it emits a beep code indicating a fatal system error that requires immediate attention. If POST can display a message on the video display screen, it causes the speaker to beep twice as the message appears.

Note the screen display and write down the beep code you hear; this information is useful for your service representative. For a listing of beep codes and error messages that POST can generate, see the "Solving Problems" chapter in this manual.

Using BIOS Setup

This section describes the BIOS Setup options. Use Setup to change the server configuration defaults. You can run Setup with or without an operating system being present. Setup stores most of the configuration values in battery backed CMOS; the rest of the values are stored in flash memory. The values take effect when you boot the server. POST uses these values to configure the hardware; if the values and the actual hardware do not agree, POST generates an error message. You must then run Setup to specify the correct configuration.

Record you Setup Settings

If the default values ever need to be restored (after a CMOS clear, for example), you must run Setup again. Referring to the worksheets could make your task easier.

If You Cannot Access BIOS Setup

If the diskette drive is misconfigured so that you cannot access it to run a utility from a diskette, you may need to clear CMOS memory. You will need to open the server, change a jumper setting, use Setup to check and set diskette drive options, and change the jumper back. For a step-by-step procedure, see Chapter 9, under the heading, "CMOS Jumper."

Setup Menu

Table 7: Setup Menu

To:	Press
Get general help	<F1> or <Alt+H>
Move between menus	← →
Go to the previous item	↑
Go to the next Item	↓
Change the value of an item	+ or -
Select an item or display a submenu	<Enter>
Leave a submenu or exit Setup	<Esc>
Reset to Setup defaults	<F9>
Save and exit Setup	<F10>
When you see this:	**What it means**
An option is grayed out and not accessible	You cannot change or configure the option in that menu screen for one of the following reasons: • The option is auto-configured or auto-detected. • The field is informational only. • The field is password protected and is accessible only by the User or Administrator

The rest of this section lists the features that are displayed onscreen after you press <F2> to enter Setup. Not all of the option choices are described, because (1) a few are not user selectable but are displayed for your information, and (2) many of the choices are relatively self explanatory.

Main Menu

You can make the following selections on the Main Menu itself. Use the submenus for other selections.

Table 8: Main Menu Features

Feature	Choices	Description
System Time	HH:MM:SS	Sets the system time
System Date	MM/DD/YYYY	Sets the system date
Diskette A	Disabled **1.44/1.25 MB**	Selects the diskette type
Diskette B	**Disabled** 1.44/1.25 MB	Selects the diskette type
Hard Disk Pre-Delay	**Disabled** 3 Seconds 6 Seconds 9 Seconds 12 Seconds 15 Seconds 21 Seconds 30 Seconds	Adds a delay before first access of the hard drive
Primary Master	<Enter>	Enters submenu
Primary Slave	<Enter>	Enters submenu
Processor	<Enter>	Enters submenu
Language	**English (US)** Français Deutsch Italiano Español	Selects which language BIOS displays

Primary Master/Slave Submenu

Table 9: Primary Master/Slave Submenu Features

Feature	Choices	Description
Type	None **Auto**	Informs the system to ignore this drive. Allows the system to attempt auto-detection of the drive type.
Multi-Sector Transfers	**Disabled** 2, 4, 8, or 16 sectors	Determines the number of sectors per block for multisector transfers. For Type Auto, this field is informational only.
LBA Mode Control	**Disabled** Enabled	For Type Auto, this field is informational only.
PIO Mode	**Standard** 1, 2, 3, 3/DMA 1, 4, 4/DMA 2	
Ultra DMA Mode	Mode 2 Mode 4	Displays the method for moving data to/from the drive. This field is informational only.

Processor Settings Submenu

Table 10: Processor Settings Submenu Features

Feature	Choices	Description
Processor Type	**N/A**	Reports type of processor(s) installed in system.
Processor POST Speed	**N/A**	Reports the speed of the processor measured at POST.

Processor Retest	**Disabled** Enabled	Select yes for the BIOS to clear historical processor status and retest all processors on the next boot.
Processor Serial Number	**Enabled** Disabled	If enabled, the system records the serial number of each processor.
Processor 1 CPU ID	N/A	Reports Stepping for Processor 1.
Processor 1 L2 Cache Size	N/A	Reports L2 Cache Size for Processor 1. This feature does not appear if processor 1 is absent or disabled.
Processor 2 CPU ID	N/A	Reports Stepping for Processor 2.
Processor 2 L2 Cache Size	N/A	Reports L2 Cache Size for Processor 2. This feature does not appear if processor 2 is absent or disabled.

Advanced Menu

You can make the following selections on the Advanced Menu itself. Use the submenus for the three other selections that appear on the Advanced Menu.

Table 11: Advanced Menu Features

Feature	Choices	Description
PCI Configuration Memory	Press <Enter>	Enters submenu.
Peripheral Configuration	Press <Enter>	Enters Submenu
Configuration Advanced	Press <Enter>	Enters Submenu
Chipset Control Reset	Press <Enter>	Enters submenu
Configuration Data	**No** Yes	Select Yes to clear the system configuration data during next boot. System automatically resets to No in next boot.
Plug & Play O/S	**No** Yes	Selecting "No" lets the BIOS configure all the devices in the system. Selecting "Yes" allows the OS configure Plug and Play devices.
NumLock	**Off** On	Enables or disables the "NumLock" function at power up.

PCI Configuration Submenu

Table 12: PCI Configuration Submenu Features

Feature	Choices	Description
On-board SCSI Controller	<Enter>	Selects sub-menu
On-board LAN #1 Controller	<Enter>	Selects sub-menu
On-board LAN #2 Controller	<Enter>	Selects sub-menu
On-board VGA Controller	<Enter>	Selects sub-menu
Riser Card Override	**Enabled** Disabled	This option will only be displayed if a non-Intel chassis is used. If enabled, all six options for PCI slots will be displayed if disabled, only two options for PCI slots will be displayed
PCI Slot 1B ROM	**Enabled** Disabled	Used to enable or disable an option ROM that may be present on a PCI add-in card installed in the slot. In a 2U chassis, options for additional PCI slots PCI bus B will be displayed
PCI Slot 1C ROM	**Enabled**	Used to enable or disable an option ROM that may be

	Disabled	present on a PCI add-in card installed in the slot In a 2U chassis, options for additional PCI slots PCI bus C will be displayed

USB Function Submenu

Table 13: USB Function Submenu Features

Feature	Choices	Description
USB Function	**Enabled** Disabled	Enables the embedded USB controller.

Onboard NIC 1 and 2 Submenu

Table 14: Onboard NIC 1 and 2 Submenu Features

Feature	Choices	Description
Onboard NIC	**Enabled** Disabled	If enabled, the system uses the embedded NIC.
Embedded NIC ROM	**Enabled** Disabled	Enables the device option ROM.

Onboard SCSI Submenu

Table 15: Onboard SCSI Submenu Features

Feature	Choices	Description
Onboard SCSI	**Enabled** Disabled	Enables or disables embedded legacy SCSI controller hardware.
Embedded LVD SCSI ROM	**Enabled** Disabled	Enables the device expansion ROM

Onboard R-IDE Submenu

Table 16: Onboard R-IDE Submenu Features

Feature	Choices	Description
Onboard R-IDE	**Enabled** Disabled	If disabled, the embedded R-IDE device is turned off and the device resources are hidden from the system
Onboard R-IDE ROM	**Enabled** Disabled	If enabled, initialises the embedded R-IDE device expansion ROM

Onboard Video Submenu

Table 17: Onboard Video Submenu Features

Feature	Choices	Description
Onboard Video	**Enabled** Disabled	Enables the embedded video controller.

Peripheral Configuration Submenu

Table 18: Peripheral Configuration Submenu Features

Feature	Choices	Description
Serial Port 1 Address	Disabled 3F8 2F8 3E8 2E8	Used to configure the serial port address. If console redirection is used, verify that the I/O and IRQ are identical to values configured in the "Server Setup" menu.
Serial Port 2 Address	4 3	Used to configure the interrupt for serial port 1.
Serial Port 1 IRQ	Disabled 3F8 2F8 3E8 2E8	Used to configure the serial port address. If console redirection is used, verify that the I/O and IRQ are identical to values configured in the "Server Setup" menu.
Serial Port 2 IRQ	4 3	Used to configure the interrupt for serial port 2.
Diskette Controller	Enabled Disabled	Used to enable or disable the onboard floppy disk controller.
Legacy USB Support	Disabled Keyboard Only Auto Keyboard & Mouse	Enables support for legacy USB.
Front Panel USB	Disabled Enabled	Used to enable the USB ports accessed through the internal USB header found on the baseboard.

Memory Configuration Submenu

Table 19: Peripheral Configuration Submenu Features

Feature	Choices	Description
Extended Memory Test	1 MB 1 KB Every Location **Disabled**	Extended memory test options run during POST. Note: the smaller the increment, the longer the test takes during POST.
Bank #1	N/A	Informational screen used to display whether DIMMs are present in bank #1
Bank #2	N/A	Informational screen used to display whether DIMMs are present in bank #2
Bank #3	N/A	Informational screen used to display whether DIMMs are present in bank #3
Memory Retest	**Disabled** Enabled	If enabled, BIOS will activate and retest all DIMMs on the next system boot. This option will be automatically reset to disabled on the next system boot.

Advanced Chipset Control Submenu

Table 20: Advanced Chipset Control Submenu Features

Feature	Choices	Description
Wake on Ring	**Disabled** Enabled	Legacy wake only: Determines the action of the system when the system power is off and the modem is ringing.

Wake on LAN	**Disabled** Enabled	Legacy wake only: Determines the action of the system when a LAN wake up event occurs.
Wake on PME	**Disabled** Enabled	Legacy wake only: Determines the action of the system when a PCI Power Management Enable wake up event occurs.
Wake on RTC Alarm	**Disabled** Enabled	Legacy wake only: Determines the action of the system when a RTC Alarm Wake up event occurs.

Security Menu

You can make the following selections on the Security Menu itself. Enabling the Supervisor Password field requires a password for entering Setup. The passwords are not case-sensitive.

Table 21: Security Menu Features

Feature	Choices	Description
User Password is	Installed Not Installed	Informational Only.
Administrator Password is	Installed Not Installed	Informational Only.
Set Administrative Password	Press <Enter>	When the <Enter> key is pressed, a password prompt appears. Press ESC key to abort. Once set, this can be disabled by setting it to a null string or by clearing password jumper on server board.
Set User Password	Press <Enter>	When the <Enter> key is pressed, a password prompt appears. Press ESC key to abort. Once set, this can be disabled by setting it to a null string or by clearing password jumper on server board.
User Access Level	**Limited** No Access View Only Full	Sets the User access level for various BIOS setup functions.
Password on Boot	**Disabled** Enabled	If your password is set and enabled, the system prompts you for a password before it boots.
Secure Mode Timer	**1 minute** 2 minutes 5 minutes 10 minutes 20 minutes 60 minutes 120 minutes	Period of PS/2 keyboard and/or mouse inactivity specified for secure mode to activate. A password is required for secure mode to function. This option only appears on the screen after a "user" password has been entered.
Secure Mode Hot Key (CTRL-ALT-)	**Z** L	Key assigned to invoke secure mode features cannot be enabled unless at least one password is set. This option only appears on the screen after a "user" password has been entered.
Secure Mode Boot	**Disabled** Enabled	System boots in secure mode. The user must enter a password to unlock the system. This option only appears on the screen after a "user" password has been entered.
Video Blanking	**Disabled** Enabled	Blank video when secure mode is activated. A pass word is required to unlock the system. This option only appears on the screen after a "user" password has been entered.
Power Switch Inhibit	**Disabled** Enabled	When enabled, the power switch is inoperable. This option only appears on the screen after a "user" password has been entered.

Server Menu

Table 22: Server Menu Features

Feature	Choices	Description
System Management	Press <Enter>	Enters Submenu.
Console Redirection	Press <Enter>	Enters Submenu.
Event Log Redirection	Press <Enter>	Enters Submenu
Service Boot	Enable **Disable**	If enabled, server boots directly to System Management.
Assert NMI on PERR	**Disabled** Enabled	If enabled, PCI bus parity error (PERR) routes to NMI.
Assert NMI on SERR	Disabled **Enabled**	If enabled, PCI bus system error (SERR) routes to NMI.
FRB-2 Policy	**Disable BSP** Do not Disable BSP Retry 3 Times	Controls the policy of the FRB-2 timeout. This option determines when the Boot Strap Processor (BSP) should be disabled if an FRB-2 error occurs.
BMC IRQ	**Disabled** IRQ 5 IRQ 11	Sets the BMC IRQ.
After Power Failure	Stays Off **Last State** Power On	Determines the mode of operation if a power loss occurs.
Temperature Sensor	**Disabled** Enabled	If enabled, the system will not boot if the ambient system temperature is outside the range specified in the Sensor Data Record (SDR).
POST Error Pause	Disabled **Enabled**	If enabled, the system will wait for user intervention on critical POST errors.
Platform Event Filtering	**Disabled** Enabled	Enable/Disable triggers for system sensor events inside the Baseboard Management Controller (BMC).

Server Redirection Submenu

Table 23: Server Redirection Submenu Features

Feature	Choices	Description
Board Part Number	N/A	Information field only
Board Serial Number	N/A	Information field only
System Part Number	N/A	Information field only
System Serial Number	N/A	Information field only
Chassis Part Number	N/A	Information field only
Chassis Serial Number	N/A	Information field only
BIOS Revision BMC	N/A	Information field only
Revision Primary HSBP	N/A	Information field only
Revision	N/A	Information field only

Console Redirection Submenu

Table 24: Console Redirection Submenu Features

Feature	Choices	Description
Serial Console Redirection	**Disabled** Enabled	If enabled, BIOS uses the specified serial port to redirect the console to a remote ANSI terminal. Enabling this option will disable the Quiet Boot option.
Serial Port	COM1 3F8 IRQ4	Serial port and IRQ designated for server

	COM2 2F8 IRQ3	management features. Make sure these values are identical to those of Serial Port A and B in the Peripheral Configuration Setup menu.
Baud Rate	9600 **19.2k** 38.4k 115.2k	Console Redirection, when enabled, uses the baud rate specified. When the Direct Platform Control (DPC) shares the COM port as console redirection, set the baud rate to 19.2k to match DPC baud rate, unless the autobaud feature is used.
Flow Control	No flow control **CTS/RTS** XON/XOFF CTS/RTS + CD	None, disallows flow control. CTS/RTS is hardware based flow control. XON/XOFF is software flow control. CTS/RTS +CD is hardware based plus carrier-detect flow control. When DPC is sharing the COM port as Console Redirection, set the flow control to XON/XOFF or XON/XOFF+CD depending whether a modem is used.

Event Log Configuration Submenu

Table 25: Event Log Configuration Submenu Features

Feature	Choices	Description
Clear All Event Logs	**No** Yes	Setting this option to YES will clear the DMI event log after a system reboot.
Event Logging	**Enabled** Disabled	When enabled, all systems events are logged. If enabled, BIOS will detect and log events for system critical errors.
Critical Event Logging	**Enabled** Disabled	Critical errors are fatal to system operation. These errors include PERR, SERR, ECC, Memory errors and NMI.

Boot Menu

Table 26: Boot Menu Features

Feature	Choices	Description
Quiet Boot	Disabled **Enabled**	Disabled, displays normal POST messages. Enabled, displays OEM Logo instead of POST messages. Enabling this option disables serial redirection.
Boot Device Priority	Press <Enter>	Enters submenu.
Hard Drive	Press <Enter>	Enters submenu.
Removable Devices	Press <Enter>	Enters submenu.
ATAPI CDROM Drives	Press <Enter>	Enters submenu.

Boot Device Priority Submenu

Use the up or down arrow keys to select a device; then press the <+> or <-> keys to move the device higher or lower in the boot priority list.

Table 27: Boot Device Priority Submenu Features

Boot Priority	Device	Description
1st Boot Device	Removable	Attempts to boot from a removable media device.
2nd Boot Device	Hard Drive	Attempts to boot from a hard drive device.
3rd Boot Device	Devices ATAPI CD-ROM Drive	Attempts to boot from an ATAPI CD-ROM drive.
4th Boot Device	Intel Boot Agent version 4	Attempts to boot from a network when a network device controlled by a PXE compliant ROM is present in the system.

Hard Disk Submenu

For options on this menu, use the up or down arrow keys to select a device. Press the <+> or <-> keys to move the device higher or lower in the boot priority list.

Table 28: Hard Disk Submenu Features

Feature	Choices	Description
1. Drive #1 (or actual drive string)		Other bootable cards cover all the boot devices not reported to the system BIOS through BIOS Boot Specification mechanisms. It may or may not be bootable, and may not correspond to any device.
2. Other bootable cards (additional entries for each drive that has a PnP header)		Other bootable cards cover all the boot devices not reported to the system BIOS through BIOS Boot Specification mechanisms. It may or may not be bootable, and may not correspond to any device.

Removable Devices Submenu

For options on this menu, use the up or down arrow keys to select a device.

Table 29: Removable Devices Submenu Features

Feature	Choices	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices	This list includes legacy 1.44-MB floppy drives and 120-MB floppy drives.

ATAPI CDROM Drives Submenu

For options on this menu, use the up or down arrow keys to select a device.

Table 30: ATAPI CDROM Drive Submenu Features

Feature	Choices	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices	This includes any ATAPI CDROM Drive installed

Exit Menu

You can make the following selections on the Exit Menu. Select an option using the up or down arrow keys. Press <Enter> to run the option. Pressing <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Table 31: Exit Menu Features

Feature	Choices	Description
Exit Saving Changes		Exits and saves changes to CMOS.
Exit Discarding Changes		Exits without saving changes to CMOS. BIOS Setup utility is exited and POST continues.
Load BIOS Setup Defaults		Loads factory default values for all BIOS Setup data.
Load Custom Defaults		Loads custom defaults saved from previous Custom Save.
Save Custom Defaults		Saves new BIOS settings and stores them as custom default values.
Discard Changes		Discards any changes made to BIOS settings and restores previous settings.

Temporarily Changing the Boot Device Priority

During POST, you can change the boot device priority for the current boot process. The changes are not saved for the next boot process.

1. Boot the server.

2. At any time during POST, press <Esc>. When POST completes, a popup Boot menu displays.

3. Use the arrow keys to highlight the device you want the server system to boot from first. For example, if you want the server system to boot from the CD-ROM first, you select "CD-ROM Drive."

NOTE: One of the selections on the popup Boot menu is "Enter Setup." Selecting this option brings you into the BIOS Setup. For more information about the BIOS Setup, see "Using BIOS Setup" on Page 59.

4. Press <Enter>.

5. The boot process continues. When finished, a system prompt displays.

Running the Adaptec SCSISelect Utility

Each host adapter includes an onboard SCS*ISelect* configuration utility that allows you to configure/view the settings of the host adapter and devices in the server.

The system finds the Adaptec AIC-7899 SCSI host adapter and displays the message Adaptec AIC-7899 SCSI BIOS V x.xxx where x.xxx is the version number of the SCS*ISelect* utility. Pressing <Ctrl+A> at this time allows you to configure the Adaptec AIC-7899 SCSI host adapter.

When to Run the Adaptec SCS*ISelect* Utility

Use the SCS*ISelect* utility to:

- Change default values

- Check and/or change SCSI device settings that may conflict with those of other devices in the server

- Do a low-level format on SCSI devices installed in the server

Running the SCS*ISelect* Utility

1. When this message appears on the video monitor:

<<<Press <Ctrl><A> for SCSISelect(TM) Utility>>>

2. Press <Ctrl+A> to run the utility. When the main menu for the host adapter appears, choose the device that you want to configure—each SCSI bus accepts up to 15 devices.

Use the following keys to navigate through the menus and submenus:

Table 32: SCS*ISelect* Navigation Keys

Press	To
ESC	Exit the utility
Enter	Select an option
Up-Arrow	Return to a previous option
Down-Arrow	Move to the next option
F5	Switch between color and monochrome
F6	Reset to host adapter defaults

Configuring the Adaptec AIC-7899 SCSI Adapter

The Adaptec AIC-7899 SCSI adapter has two busses. Select the bus from the following menu:

Figure 32: Main Menu

Main Menu	Options
You have an AIC-7899 adapter in your system. Move the cursor to the bus:device:channel of the one for configuration and press <Enter>.	Bus:Device:Channel 01:06:A 01:06:B
<F5> - Toggle color/monochrome	

After selecting the bus, the following menu displays:

Table 33: Menu for each SCSI Channel

Host Adapter	Option	Comment
AIC-7899 at Bus:Device:Channel 01:06:A (or 01:06:B)	Configure/View Host Adapter Settings	Press <Enter> to view the Configuration Menu.

	SCSI Disk Utilities	Press <Enter> to view the SCSI Disk Utilities Menu. This menu allows you to format hard disks and/or verify disk media.

When you are finished, press <Esc> and make your selection from the following menu:

Table 34: Exit Menu

Feature	Option	Comment
Exit Utility?	Yes No	When you finish configuring your SCSI devices, press <Esc>. Then select Yes and press <Enter>. When this message appears: Please press any key to reboot Press any key, and the server reboots.

Running the Promise FastBuild Utility

This utility is only found on the SCB2 ATA model only.

The Promise ATA-100 host adapter is configured using the FastBuild†configuration utility that allows you to configure/view the settings of the host adapter and set RAID configurations.

When to Run the Promise FastBuild Utility

Use the FastBuild utility to:

- Define a RAID array

- Delete a RAID array

- Restore a RAID array

Running the Promise FastBuild Utility

1. When this message appears on the video monitor:

   <<<Press <Ctrl><F> to enter FastBuild (TM) Utility>>>

2. Press <Ctrl+F> to run the utility.

Direct Platform Control (DPC) Console

Direct Platform Control (DPC) Console is part of Intel Server Control. Direct Platform Control is a server management application that supports remote system management via LAN, or an RS-232 serial connection to the server COM2 port over a modem or a direct serial cable. The Direct Platform Control Console provides the ability for remote management of Intel servers via modem or LAN with a capability to run DOS-based programs.

DPC console runs on a client workstation. It communicates with a server by:

- Accessing the server management capabilities of the on-board NIC

- A Windows 2000 compatible modem.

- An RS-232 connection to the server COM2 port.

DPC Console is independent of the server operating system.

Even when the server is off, you can use DPC Console to verify the state of a server or diagnose a problem with the server hardware. DPC console features allow you to:

- Establish connection to remote servers

- Server Control: power on, power off, and reset operations

- Retrieve and display entries in the System Event Log (SEL)

- Retrieve and display Sensor Data Records (SDR)

- Retrieve and display Field Replaceable Unit (FRU) information

- Retrieve and display current Remote Sensor Access (RSA) information

- Access a phonebook for remote connection management

- Remote control of the service partition

- File transfer from / to the server

DPC Console Modes of Operation

There are three DPC console modes of operation:

- EMP mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the EMP port.

- DPC over LAN mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the LAN.

- Re-direct mode. Active when the server is running BIOS console redirection. In this mode, the DPC console launches a separate window. The window operates as an ANSI terminal and communicates with the server through the port. Character-based commands you type in the DPC

Console go directly to the server, and the DPC Console displays the text that you would normally see on the server console.

To use this mode, you must configure the Console Redirection option of BIOS Setup for Re-direct mode. Enabling Console Redirection requires that the Boot Time Diagnostics Screen be Enabled in BIOS Setup. If the redirection window does not display information, the Console Redirection is either incorrectly configured or disabled, the EMP is disabled in BIOS Setup, or the server is in protected mode. For DPC to function, the server must NOT be in graphics mode.

If the DPC console fails to connect in EMP within 10 seconds and the server can operate in Re-direct mode, a prompt is displayed with the option to switch to Re-direct mode.

- Service Partition mode. Entered when the server reboots from the service partition and the DPC Console has successfully connected to the server through a modem. This mode allows running of DOS-based programs that are stored on the service partition and transferring of files.

Running the DPC Console

For more information about setting up and running the DPC Console, see the document named "ENUDPCUG.pdf." This document is in the Manuals\SrvMgmt directory on the server software kit accompanying the SCB2 server board.

Using the System Setup Utility

The System Setup Utility (SSU) is located on the SCB2 System Resource CD-ROM shipped with the server board. The SSU provides a graphical user interface (GUI) over an extensible framework for server configuration. For the SCB2 systems, the SSU framework supports the following functions and capabilities:

- Allows configuration of Sever Management options

- Allows you to specify boot device order and system security options

- Permits viewing and clearing of the system's critical event log

- Allows troubleshooting of the server when the OS is not operational

- Allows you to view the system's Sensor Data Records and Field Replaceable Unit information

What You Need to Do

You can run the SSU directly from the SCB2 Server Software Kit CD-ROM by booting the server system to the CD and selecting "Utilities" or from a set of DOS diskettes.

If you choose to run the SSU from a set of DOS diskettes, you must create the SSU diskettes from the SCB2 Resource CD-ROM by booting to the CD-ROM and selecting "Create Diskettes." Alternatively, if you have a Windows based workstation; you can insert the CD into that system and create diskettes from the "Utilities" menu of the graphical user interface.

If your diskette drive is disabled, or improperly configured, you must use BIOS Setup to enable it so that you can use the SSU. If necessary, you can disable the drive after you exit the SSU. Information entered using the SSU overrides any entered using BIOS Setup.

Running the SSU

Running the ssu.bat file provided on the SSU media starts the SSU. If the server boots directly from the SSU media, the ssu.bat file automatically runs. If it boots from a different media, you can start the SSU manually or by another application. When the SSU starts in the local execution mode (the default mode), the SSU accepts input from the keyboard and/or mouse. The SSU presents a VGA based Graphical User Interface (GUI) on the primary monitor.

The SSU runs from writable, non-writable, removable, and non-removable media. If you run the SSU from non-writable media, you cannot save user preference settings (such as screen colours).

The SSU supports the ROM-DOS$^{®}$ V6.22 operating system. It may run on other ROM-DOS-compatible operating systems but they are not supported. The SSU will not operate from a "DOS box" running under an operating system such as Windows.

Starting the SSU

SSU consists of a collection of task oriented modules plugged into a common framework called the Application Framework (AF). The Application Framework provides a launching point for individual tasks and a location for setting customisation information. For full functionality, the SSU requires the availability of the AF.INI, AF.HLP, plus any .ADN files and their associated .HLP and .INI files.

1. Turn on your video monitor and your system.

2. There are two ways to start the SSU:

a. After creating set of three SSU diskettes from the CD: Insert the first SSU diskette in drive A, and press the reset button or <Ctrl+Alt+Del> to reboot your server from the diskette.

b. Directly from the SCB2 Server Software Kit CD-ROM: Insert the CD into your CD-ROM drive and press the reset button or <Ctrl-Alt-Del> to reboot. When prompted to do so, press <F2> to enter BIOS Setup. From the Boot Menu, select the Boot Device Priority option and then select CD-ROM as your primary boot device. Save those settings and exit BIOS Setup. The server will boot from the CD-ROM and display a menu of options. Follow the instructions in the menu to start the SSU.

3. When the SSU title appears on the screen, press <Enter> to continue.

4. The mouse driver loads if it is available; press <Enter> to continue.

5. This message appears:

   Please wait while the Application Framework loads....

6. When the main window of the SSU appears, you can customise your interface before continuing. (See Figure 42).
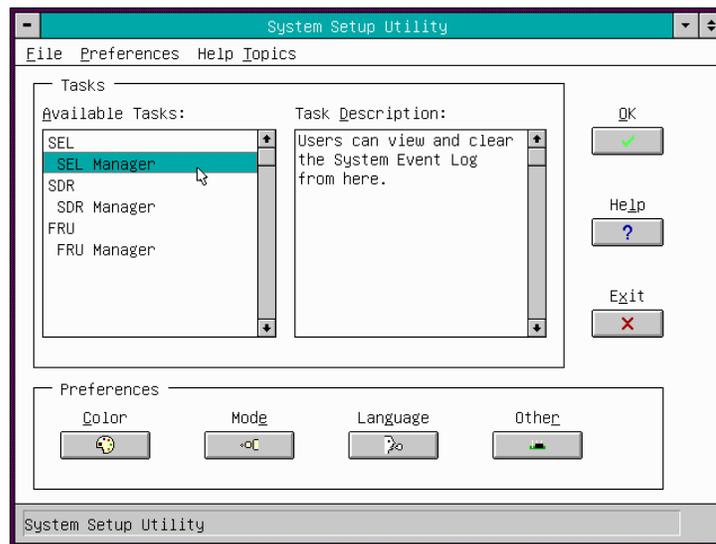
Figure 42: System Setup Utility Main Window

Customising the SSU

The SSU lets you customise your interface according to your preferences. The AF sets these preferences and saves them in the AF.INI file so that they take effect the next time you start the SSU. There are four user customisable settings:

- Colour - this button lets you change the default colors associated with different items on the screen with predefined color combinations. The color changes are instantaneous.

- Mode - this button lets you set the desired expertise level.

  — novice
  — intermediate
  — expert

  The expertise level determines which tasks are visible in the Available Tasks section and what actions each task performs. For a new mode setting to take effect, you must exit the SSU and restart it.

- Language - this button lets you change the strings in the SSU to strings of the appropriate language. For a new language setting to take effect, you must exit the SSU and restart it.

- Other - this button lets you change other miscellaneous options in the SSU. The changes take effect immediately.

To change the interface default values:

- Use the mouse to click on the proper button in the Preferences section of the SSU Main window.

  OR

- Use the tab and arrow keys to highlight the desired button, and press the spacebar or <Enter>.

  OR

- Access the menu bar with the mouse or hot keys (Alt + underlined letter).

NOTE: If you run the SSU from non-writable media (like a CD-ROM), these preferences will be lost when you exit the SSU.

Launching a Task

It is possible to have many tasks open at the same time, although some tasks may require complete control to avoid possible conflicts. The tasks achieve complete control by keeping the task as the center of operation until you close the task window.

To launch a task:

- In the SSU Main window, double click on the task name under Available Tasks to display the main window for the selected task.

OR

- Highlight the task name, and click on OK.

OR

- Use the tab and arrow keys to highlight the desired button, and press the spacebar or <Enter>.

MultiBoot Options Add-in

The Multi-boot Add-in (MBA) provides an interface for selecting Initial Program Load (IPL) devices. Using the MBA, the user can identify all IPL devices in the system and prioritise their boot order. On power-up, the BIOS will sequentially attempt to boot from each device.

Under this window, you can change the boot priority of a device.

1. Select a device.

2. Press the + button to move it up in the list. Press the - button to move it down.

Password Add-in

The Password Add-in (PWA) provides security and password support options. Within the PWA, the user can either set or modify the current system passwords or update any of the various security options available.

To Set your Password

1. Click on your password button.

2. Enter the password in the first field.

3. Confirm the password by entering it again in the second field.

To Change or Clear your Password

1. Click on your password button.

2. Enter the old password in the first field.

3. Enter the new password in the second field (or leave blank to clear).

4. Confirm the password by entering it again in the second field (or leave blank to clear).

Admin Password Button

The 'Admin Password' button allows the user to set or change the administrative password used by both the SSU and the system BIOS. Note that this option is not available if both an administrative and a user password are set on the on the system and only the user password has been provided upon starting the SSU. All changes to the admin password take place immediately.

To Change or Clear the Administrator Password

1. Click on the Administrator password button.

2. Enter the old password in the first field.

3. Enter the new password in the second field (or leave blank to clear).

4. Confirm the password by entering it again in the second field (or leave blank to clear).

User Password Button

The 'User Password' button allows the user to set or change the user password used by both the SSU and the system BIOS. All changes to the user password take place immediately.

To Change or Clear the User Password

1. Click on the User password button.

2. Enter the old password in the first field.

3. Enter the new password in the second field (or leave blank to clear).

4. Confirm the password by entering it again in the second field (or leave blank to clear).

Options Button

The 'Options' button allows the user to set or change any of the various security options available on the system platform. The window created by the 'Options' button includes 'Save', 'Close', and 'Help' buttons.

Under this window, you can set the other security options:

- Hot Key—Set a key sequence that, when pressed, will drop the server into secure mode.

- Lockout Timer—Set an interval that, if no activity takes place, it will drop the server into secure mode.

- Secure Boot Mode—Force the server to boot directly into secure mode.

- Video Blanking—Turn off the video when the server is in secure mode.

- Floppy Write—Control access to the diskette drive while the server is in secure mode.

- Reset/Power Switch Locking—Control the power and reset buttons while the server is in secure mode.

Close Button

The 'Close' button exits the PWA and returns the user to the SSU.

Help Button

The 'Help' button invokes the SSU help subsystem.

SEL Manager Add-in

The System Event Log (SEL) Manager Add-In provides services to allow users to view the system event log stored on the server management storage device of a server. The SEL Manager provides support for the user to perform the following:

- Examine all system event log entries, stored in the non-volatile storage area of the server.

- Examine system event log entries from a previously stored file.

- Save the system event log entries to a file.
- Clear the system event log entries from the non-volatile storage area.

The SEL Manager has the following menus:

File

The File menu has the following options:

- **Open**: View data from a previously saved SEL file.

- **Save As**: Save the currently loaded SEL data to a file.

- **Exit**: Quits the SEL Viewer.

SEL

The SEL menu has the following options:

- **Properties**: Displays information about the SEL. These fields are display only.

- **Clear SEL**: Clears the SEL data from the BMC.

- **All Events**: Displays the current SEL data from the BMC.

- **Reload**: Allows the user to re-load the SEL entries from the server.

Help

The Help menu has the following option:

Help Topics: Displays the SEL Manager Version information.

FRU Manager Add-in

The FRU Manager is an add-in module, which allows users to view the FRU inventory areas on the server machine. The FRU Manager will have the functionality to display the FRU inventory areas in an interpreted, easy-to-understand textual form. The add-in allows users to do the following operations:

1. Examine any of the individual FRU inventory areas.

2. Examine FRU inventory areas from a previously stored file.

3. Save the FRU inventory areas to a file in either text.

The FRU Manager has the following menus:

File

The File menu has the following options:

- **Load**: View data from a previously saved FRU file.

- **Save**: Saves the currently loaded FRU data to a file.

- **Save As**: Saves the currently loaded FRU data to a file.

- **Exit**: Quits the FRU Viewer.

View

The View menu has the following options:

- **FRU Info**: Displays information about the FRU. These fields are display only.

- **All FRU Areas**: Displays the current FRU data from the BMC.

- **By Device Type**: Brings up a popup menu that allows you to view only the data from a certain device type.

Settings

The Settings menu has the following options:

- **Display HEX/Verbose**: Toggles between the Hex/interpreted mode of displaying the FRU records.

- **Output Text/Binary**: Determines whether FRU data will be saved to the file (as under File - Save) in binary format or verbose format.

Help

The Help menu has the following option:

- **About**: Displays the FRU Viewer version information.

SDR Manager Add-in

The Sensor Data Record (SDR) Manager Add-in component allows users to view sensor data records stored in the server management storage device of a server.

The add-in allows users to perform the following operations:

1. Examine all SDR's through the BMC.

2. Examine SDR's from a previously stored file.

3. Save all SDR's to a file.

File

The File menu has the following options:

- **Open**: View data from a previously saved SDR file.

- **Save As**: Saves the currently loaded SDR data to a file.

- **Exit**: Quits the SDR Viewer.

SDR

The View menu has the following options:

- **Properties**: Displays information about the SDR. These fields are display only.

- **Reload**: Allows the user to re-load the SDR data from the server.

Help

The Help menu has the following option:

- **Help Topics**: Displays the SDR Manager Version information.

System Update Add-In

Clicking on the System Update Add-in task allows you to update non-volatile storage on the server. The add-in allows you to do the following operations:

- Determine the current revision of firmware on the server controllers.

- Determine the current revision of BIOS on the server.

- Update firmware revisions for controllers from external hex files.

- Verify firmware code currently loaded versus an external hex file.

- Update the BIOS from .bio or .uif files.

The System Update Add-in has the following menus:

File

The File menu has the following options:

- **Load**: Select the file to use in the update.

- **Exit**: Quits the System Update Add-in.

Area

The Area menu has the following options:

- **Update**:   Use the loaded file to update the system.   If a file was not selected, the system will prompt you for one.

- **Verify**: Compares the contents of the nonvolatile storage with the selected file. If a file was not selected, the system will prompt you for one. You cannot verify the BIOS.

Help

The Help menu has the following options:

- **Help Topics**: Displays help information about the System Update Add-in.

- **About SU**: Displays System Update Add-in version information.

Recovery Agent

If the BMC firmware remote update fails, the server will reboot into the service partition and the recovery agent will attempt to finish the update. The recovery agent is an executable file (recover.exe) that exists on the service partition.

Configuration Save/Restore Add-In

Clicking on the Configuration Save/Restore Add-in (CSR) allows you to save configuration information from various sources to a file. The CSR saves information from the following sources:

- CMOS

- ESCD

- PCI records in non-volatile storage

- Non-volatile emergency management port (EMP), platform event paging (PEP), and Platform event filtering (PEF) settings

Buttons

- **Save To File**: Displays a file dialog so you can choose a filename and location.   The CSR then tries to save any non-volatile configuration information it can to that file. Data is saved from all sources. There is no way to choose only certain pieces of configuration data to save. The CSR also saves the platform type, BIOS version and firmware version information in the file.

- **Restore From File**: Displays a file dialog so you can choose a file containing configuration data to restore. The CSR then reads the platform identification string from the file and compares it to a string retrieved from the BIOS on the server. If the two do not match, an error message is displayed and the restore operation aborts. If they do match, the add-in restores the configuration data to the server. It prompts you to reboot the server for the new settings to take effect.

NOTE: BIOS passwords are stored in the file. Restoring a configuration can make passwords change on a server.

- **Close**: Closes the CSR main window.

- **Help**: Displays help information.

Area

The Area menu has the following options:

- **Update**: Use the loaded file to update the system. If a file was not selected, the system will prompt you for one.

- **Verify**: Compares the contents of the nonvolatile storage with the selected file. If a file was not selected, the system will prompt you for one. You cannot verify the BIOS.

Help

The Help menu has the following options:

- **Help Topics**: Displays help information about the System Update Add-in.

- **About SU**: Displays System Update Add-in version information.

Recovery Agent

If the BMC firmware remote update fails, the server will reboot into the service partition and the recovery agent will attempt to finish the update. The recovery agent is an executable file (recover.exe) that exists on the service partition.

Configuration Save/Restore Add-In

Clicking on the Configuration Save/Restore Add-in (CSR) allows you to save configuration information from various sources to a file. The CSR saves information from the following sources:

- CMOS

- ESCD

- PCI records in non-volatile storage

- Non-volatile emergency management port (EMP), platform event paging (PEP), and Platform event filtering (PEF) settings

Buttons

- **Save To File**: Displays a file dialog so you can choose a filename and location. The CSR then tries to save any non-volatile configuration information it can to that file. Data is saved from all sources. There is no way to choose only certain pieces of configuration data to save. The CSR also saves the platform type, BIOS version and firmware version information in the file.

- **Restore From File**: Displays a file dialog so you can choose a file containing configuration data to restore. The CSR then reads the platform identification string from the file and compares it to a string retrieved from the BIOS on the server. If the two do not match, an error message is displayed and the restore operation aborts. If they do match, the add-in restores the configuration data to the server. It prompts you to reboot the server for the new settings to take effect.

NOTE: BIOS passwords are stored in the file. Restoring a configuration can make passwords change on a server.

- **Close**: Closes the CSR main window.

- **Help**: Displays help information.

Platform Event Manager Add-in

The Platform Event Manager (PEM) provides an interface for configuring Platform Event Paging (PEP), the Emergency Management Port (EMP), BMC LAN Configuration (LAN) and Platform Event Filtering (PEF).

Platform Event Manager Window

The PEM presents a main window to the user and supports several features (see Figure 43). These features appear in additional detail in the following sections. Note that each option included on the main window supports an accelerator key. An underlined letter in the text listing the option in VGA mode indicates accelerator keys. In text mode, accelerator key letters appear highlighted rather than underlined.
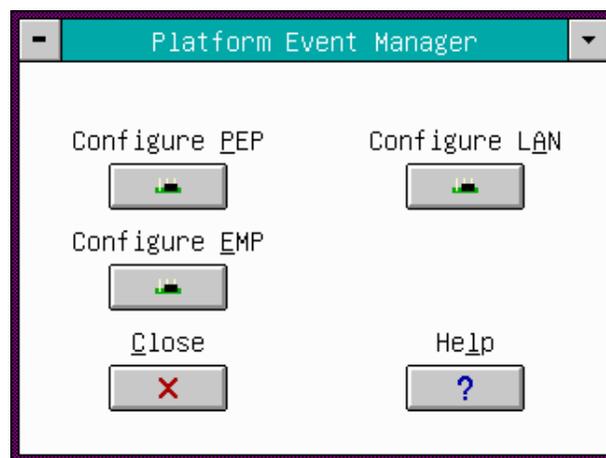
Figure 43: Platform Event Manager Main Window

Buttons

- **Configure PEP**: Opens a new dialog that allows you to configure the Platform Event Paging features.

- **Configure LAN**: Opens a new dialog that allows you to configure the BMC LAN-Configuration features.

- **Configure EMP**: Opens a new dialog that allows you to configure the Emergency Management Port features.

- **Close**: Exits the Platform Event Manager and returns you to the AF.

- **Help**: Displays help information.

Platform Event Paging Dialog

This dialog allows you to configure the Platform Event Paging features. (See Figure 44)
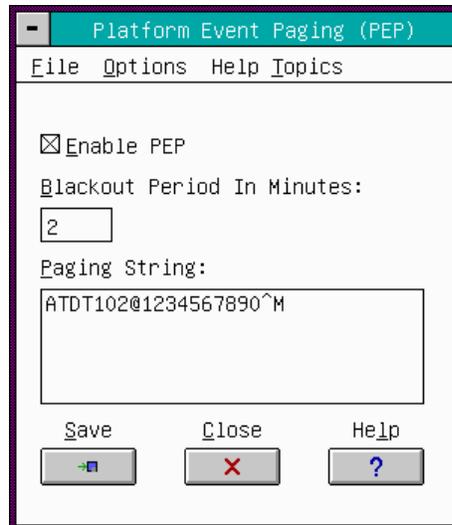
Figure 44: Platform Event Paging Dialog

File

The File menu has the following options:

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Platform Event Paging dialog without saving changes.   If changes have been made, you will be prompted to save changes before closing.

Options

The Options menu has the following options:

- **Enable PEP**: Allows you to enable or disable the PEP feature entirely. A check will appear next to the menu item when PEP is enabled.

- **Send Alert**:   Allows you to immediately send a test page with the configuration currently shown on the screen.

- **Configure Event Actions**: Launches the Platform Event Paging Actions Dialog (see Figure 43) to allow you to configure event actions.

Help Topics

The Help Topics menu has the following options:

- **Help Topics**: Displays help information.

Enable PEP Checkbox

Enable or disable the PEP feature entirely.

Blackout Period in Minutes

Enter the time, in minutes, between successive pages. The valid range is [0 – 255] where 0 disables the blackout period.

Paging String

Enter the paging string that contains both the paging service number and the characters that are sent once the connection has been made. The length of the paging string is determined at run-time from firmware. You will be notified if the string is truncated. The screen will show the string that was saved after a save operation is done.

Buttons

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Platform Event Paging dialog without saving changes. If changes have been made, you will be prompted to save changes before closing.

- **Help**: Displays help information.

BMC LAN-Configuration Dialog

This dialog allows you to configure the BMC LAN-Configuration features. (See Figure 45)
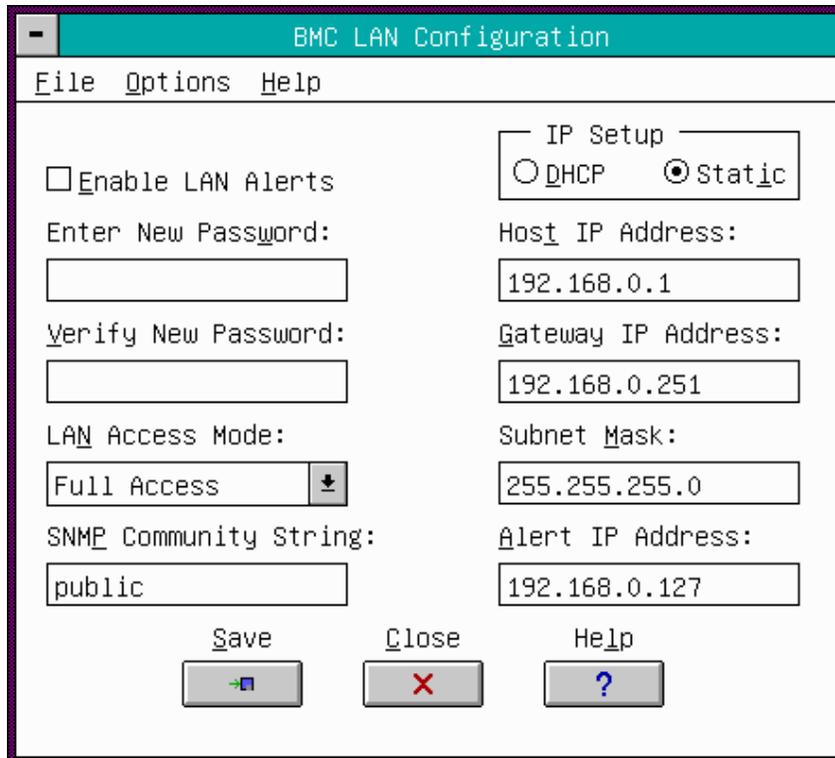
Figure 45: BMC LAN-Configuration Dialog

File

The File menu has the following options:

- **Save**: Allows you to save the configuration immediately.

- **Close**:   Allows you to close the BMC LAN-Configuration dialog without saving changes. If changes have been made, you will be prompted to save changes before closing.

Options Menu

The Options menu has the following options:

- **Enable LAN Alerts**: Allows you to enable or disable the BMC LAN-Alerting features entirely. A check will appear next to the menu item when it is enabled.

- **Clear LAN Password**:   Allows you to clear the currently saved LAN password. This takes effect immediately. This option is only available if the LAN password is set.

- **Configure Event Actions**: Launches the BMC LAN-Alerting Actions Dialog to allow you to configure event actions.

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Help Topics Menu

The Help Topics menu has the following options:

- **Help Topics**: Displays help information.

Enable LAN Alerts Checkbox

Enables or disables BMC LAN-Alerting.

Enter New Password

Allows you to enter a LAN password. The valid range of characters includes ASCII values 32-126. The password must be from 1-16 characters long.

Verify New Password

Enter the same password as above.

LAN Access Mode

Allows you to set the remote access mode desired. In Enabled mode, a remote system can initiate a LAN session regardless of system state or health. In Disabled mode, remote LAN sessions cannot be initiated. In Restricted mode, control operations cannot be performed such as power down, front panel NMI, and reset.

SNMP Community String

Can be configured for the community field in the Header section of the SNMP trap sent for a LAN alert. The default string is 'public'. The string must be from 5-16 characters long.

IP Configuration

- DHCP: Enables the dynamic host configuration protocol to allow the server to automatically assign the host IP address, router IP address and subnet mask. The host IP address, router IP address and subnet mask will not be saved if this radio button is checked.

- Static: Allows you to set the server host IP address, router IP address and subnet mask. The host IP address, router IP address and subnet mask will be saved if this radio button is checked. The values saved will take effect immediately.

Host IP Address

Enter the Logical or Internet Address of the host. The Host IP Address will only be saved when DHCP is disabled. The IP is entered as a dotted IP, (e.g., 192.168.0.2).

Gateway IP Address

Enter the Logical or Internet Address of the router. The Gateway IP Address will only be saved when DHCP is disabled. The IP is entered as a dotted IP, (e.g., 192.168.0.2).

Subnet Mask

Enter the logical or Internet address of the host's subnet. The server uses this to decide if the alert destination is in the local subnet or in another subnet relative to the server. The Subnet Mask will only be saved when DHCP is disabled. The IP is entered as a dotted IP, e.g., 192.168.0.2

Alert IP Address

Enter the logical or Internet address of the Alert-Destination. In case of single node destination, this is the unicast or specific IP address. This is the IP Subnet address if the alert needs to be broadcast within a particular subnet. The Alert IP Address is always saved. The IP is entered as a dotted IP, e.g., 192.168.0.2

Buttons

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the BMC LAN-Alert dialog without saving changes. If changes have been made, you will be prompted to save changes before closing.

- **Help**: Displays help information.

Platform Event Action Dialog

These similar dialogs allow you to configure the Platform Event Action features for PEP and BLA (See Figure 43). If an event is in the enabled listbox, it will generate the appropriate action when it occurs. If an event is in the disabled listbox, it will not generate an action when it occurs. Enable global action for events to generate actions. This global flag is in the PEP or BLA dialogs as 'Enable PEP' or 'Enable BLA' checkboxes.
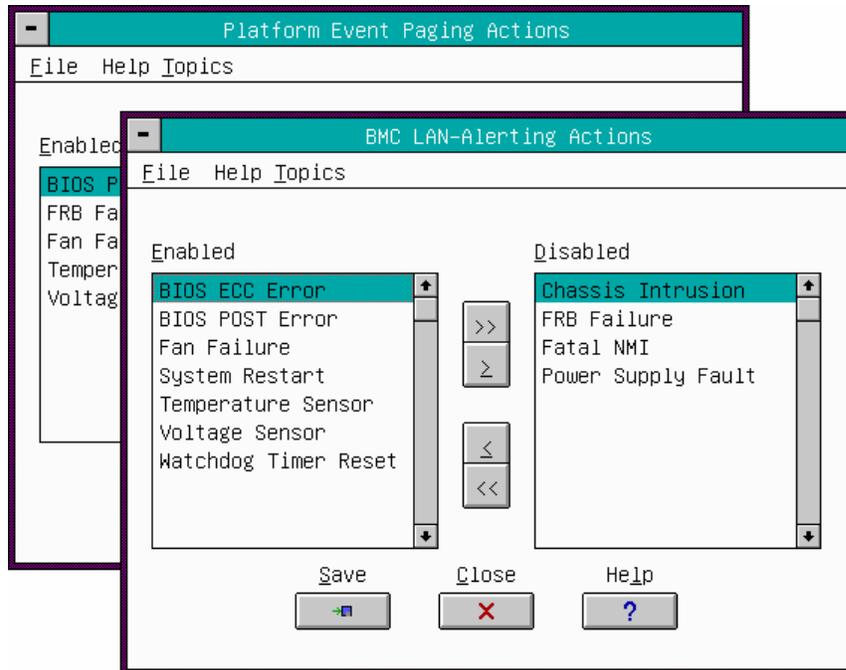
Figure 46 : Platform Event Action Dialog

File Menu

The File menu has the following options:

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Platform Event Action dialog without saving changes. If you have made changes, you will be prompted to save changes before closing.

Help Topics Menu

The Help Topics menu has the following options:

- **Help Topics**: Displays help information.

Enabled Listbox

Contains the active events.

Disabled Listbox

Contains the events that are not active.

Buttons

- **>>**: Moves all the events from the enabled listbox to the disabled listbox.

- **>**: Moves the selected event from the enabled listbox to the disabled listbox.

- **<**: Moves the selected event from the disabled listbox to enabled the listbox.

- **<<**: Moves all the events from the disabled listbox to the enabled listbox.

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Platform Event Action dialog without saving changes. If you have made changes, you will be prompted to save changes before closing.

- **Help**: Displays help information.

Emergency Management Port Dialog

This dialog allows you to configure the Emergency Management Port features. (See Figure 47)

Figure 47: Emergency Management Port Dialog

File

The File menu has the following options:

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Emergency Management Port dialog without saving changes. If you have made changes, you will be prompted to save changes before closing.

Options

The Options menu has the following options:

- **Clear EMP Password**: Allows you to clear the currently saved EMP password. This takes effect immediately. This option is only available if the EMP password is set.

Help Topics

The Help Topics menu has the following options:

- **Help Topics**: Displays help information.

Enter New Password

Enter an EMP password. The valid range of characters includes ASCII values 32-126.

The password must be from 1-16 characters long.

Verify New Password

Enter the same password as above.

ESC Sequence

The ESC Sequence string is sent to the modem before sending a command string to the modem. The length of the paging string is determined at run-time from firmware. You will be notified if the string is truncated. The string that has been saved is the one that will be shown in the edit box.

Hangup String

The Hangup Line string is sent to the modem whenever the EMP wants to terminate the session. The EMP automatically sends an <ENTER> character after this string. The length of the paging string is determined at run-time from firmware. You will be notified if the string is truncated. The string that has been saved is the one that will be shown in the edit box.

Modem Init String

The Modem Init String string is transmitted every time the EMP initialises. The length of the paging string is determined at run-time from firmware. You will be notified if the string is truncated. The string that has been saved is the one that will be shown in the edit box.

System Phone Number

Enter the system telephone number. This can be retrieved and reported via in-band management connections.

Access Mode

In Pre-boot Only the EMP is automatically activated when the system is powered-down or hard reset. In Always Active the EMP is active when the system is powered-down or hard reset. In Disabled the EMP powers-up deactivated and is not automatically activated by BIOS, power-down or hard resets.

Restricted Mode Access

When restricted mode is enabled control operations that could disable or alter a running system via the EMP are disabled.

Connection Mode

Direct connect mode is for applications that connect the port directly to another computer system, while Modem Mode is for applications where the port is connected to an external modem.

Buttons

- **Save**: Allows you to save the configuration immediately.

- **Close**: Allows you to close the Emergency Management Port dialog without saving changes. If you have made changes, you will be prompted to save changes before closing.

- **Help**: Displays help information.

Exiting the SSU

Exiting the SSU causes all windows to close.

1. Exit the SSU by opening the menu bar item File in the SSU Main window.
2. Click on Exit or Highlight Exit, and press <Enter>.

Platform Event Paging

With Platform Event Paging (PEP), your server can automatically dial up a paging service and page you when a server management related event occurs. Platform events include temperature out-of-range, voltage out-of-range, chassis intrusion, and fan failure.

If PEP is enabled and the BMC receives or detects a new event, it automatically sends a page. It can send a page if the processors are down or if the system software is unavailable.

PEP needs an external modem connected to the server's EMP (Emergency Management Port) serial connection. This is typically the COM2 serial connector.

Using Platform Event Paging

1. From the SSU main window, launch the Platform Event Manager Add-in (PEM).

2. In the PEM dialog box, click the Configure PEP button.

3. In the PEP dialog box, check the Enable PEP to box.

4. Enter your page string in the Paging String field. This consists of the following:

   - The attention command for your modem (generally ATDT).

   - The number of your paging service, several commas (each comma is a 1-second pause).

   - The number/message you wish to appear on your pager.

   - The hang up command for your modem (generally ATH).

   You will need to experiment with the timing to ensure you are paged properly. Select Send Alert form the Options menu to generate a test page.

5. Set the time between pages with the Blackout Period In Minutes field. If you want to be paged every five minutes, set it to 5. The range is from 0 to 10 minutes.

6. If you wish to filter events so that only certain events will originate a page, select Configure Event Actions from the Options menu. This will bring up the Platform Event Action dialog.

7. Save all the changes made by clicking on the Save button. Saving writes your current configuration to nonvolatile storage where it will be available to the system after every reboot.

Software Updates

Your system comes with preinstalled system BIOS and BMC firmware. When necessary, updates will be available for download from the Viglen support website.

The updates are available in two forms:

- A software update package (SUP) containing all three updates

- Individual files, one for each update, that are manually executed

With either form, bootable diskettes must be created.

Creating a Bootable Diskette

Each update diskette created must be made bootable with ROM-DOS Ver. 6.22 or MS-DOS Ver. 6.22.

NOTE: It is recommended that the target system be booted with the Resource CD that accompanied the product. However, the process for making the diskettes is the same for all the compatible versions of DOS. ROM-DOS Ver. 6.22 is included on the Resource CD.

1. Insert and boot to the Resource CD.

2. Exit from the menu to a DOS prompt.

3. Insert a diskette into the floppy drive.

4. At the DOS prompt, for an unformatted diskette, type:

   format a:/s
   Or, for a formatted diskette, type:
   sys a:

5. Press <Enter

Software Update Package

A Software Update Package (SUP) contains all the necessary files to perform BIOS, BMC, FRU/SDR, or other software updates.

Preparation

Before proceeding, review the release notes.

1. Download the software update.

2. Print, review, and follow the instruction.rtf file (it supercedes any other instructions)

3. Label three blank floppy disks as follows:

   - Disk 1 - SCB2 BIOS update diskette

   - Disk 2 – SCB2 BMC update diskette

   - Disk 3 – SCB2 FRU/SDR update diskette

4. Make the diskettes DOS bootable.

5. Record the current BIOS settings.

   a. Boot the computer and press <F2> when you see the splash screen.

   b. Write down the current settings in the BIOS Setup program.

NOTE: Be sure to record the current custom BIOS settings. They will be cleared and reset to their default values during the BIOS update portion of the operation. You will need these settings to configure your computer at the end of the update procedure. To record the current custom settings, boot the computer and press <F2> when you see the splash screen. Write down the current custom settings in the BIOS Setup program

Extraction

Double click the executable file you downloaded. Read the License Agreement, select "I Agree" to accept the terms and conditions or select "Cancel" to cancel the installation.

During the extraction process, you will be prompted to insert each of the three labelled diskettes. Follow the prompts until the process is completed. When completed, you will have three diskettes that can be used to update the BIOS, the BMC firmware, and the FRU/SDR records.

Updating

NOTE: Do not turn off the system during the update process.

Apply the updates in order by booting from each floppy diskette beginning with Disk 1.

1. Disk 1 - SCB2 BIOS update—Choose option 1 to update the system BIOS. The system will automatically reboot following completion.

2. Disk 2 – SCB2 BMC update—Automatic, no questions are asked. The system will notify you that it is going to reboot.

3. Disk 3 – SCB2 FRU/SDR update—Prompts you to choose the chassis type. You can choose to update the chassis information; you will be prompted for the Serial Number, Part Number, and Asset Tag.

Following the update process, the system will automatically reboot. Upon completion, it may be necessary to enter BIOS setup and reconfigure the setting values.

Individual Updates

BIOS Upgrade Description

Preparing for the Upgrade

Before upgrading the BIOS, prepare for the upgrade by recording the current custom BIOS settings, and obtaining the upgrade utility.

Obtaining a BIOS Update

You can download the most current version of the BIOS from the Viglen support website

NOTE: Print and review the release notes and instructions distributed with the upgrade utility before attempting a BIOS upgrade. This upgrade utility allows you to upgrade the BIOS in flash memory. The following steps explain how to upgrade the BIOS.

Creating the BIOS Upgrade Diskette

The BIOS upgrade file is a compressed self-extracting archive that contains the files you need to upgrade the BIOS.

1. Copy the BIOS upgrade file to a temporary directory on the hard disk.

2. From the C:\ prompt, change to the temporary directory.

3. To extract the file, type the name of the BIOS upgrade file, for example:

   10006BI1.EXE

4. Press <Enter>. The extracted file contains the following files:

   LICENSE.TXT
   INSTALL.TXT
   BIOS.EXE

5. Read the LICENSE.TXT file, this contains the software license agreement, and the INSTALL.TXT file. It contains the instructions for the BIOS upgrade.

6. Insert the bootable diskette into drive A.

7. To extract the BIOS.EXE file to the diskette, change to the temporary directory that holds the BIOS.EXE file and type:

    BIOS A:

8. Press <Enter>.

9. The diskette now holds the BIOS upgrade and recovery files.

Upgrading the BIOS

1. Insert the diskette holding the BIOS upgrade and recovery files into drive A and boot the computer.

2. Press <1> and <Enter>.

3. When the utility finishes updating the BIOS, remove the diskette from the drive A, reboot the system, clear CMOS

4. Press F2 to enter Setup and reconfigure any custom settings.

5. If you need to change the BIOS settings, press <F2> while the splash screen displays to enter the Setup program.

Recovering the BIOS

It is unlikely that anything will interrupt the BIOS upgrade; however, an interruption could damage the BIOS. The following steps explain how to recover the BIOS if an upgrade fails. The following procedure uses recovery mode for the Setup program.

NOTE: Because of the small amount of code available in the non-erasable boot block area, there is no video support. You will not see anything on the screen during the procedure. Monitor the procedure by listening to the speaker and looking at the floppy drive LED.

1. Turn off all connected peripherals, turn off system power, and disconnect the AC power cord.

2. Remove the access cover and expose the server board. For instructions, see the product guide accompanying your system.

3. Locate the server board jumpers.

4. Move the Recovery Boot (RCVRY BOOT) jumper from its normal position to the BIOS recovery position.

5. Reinstall the access cover and connect the power cord.

6. Insert the diskette holding the BIOS upgrade and recovery files into drive A.

7. Turn on system power and listen to the speaker:

    - Two beeps indicate successful BIOS recovery—Go to the next step.

    - A series of continuous beeps indicates failed BIOS recovery—Return to Step 1 and repeat the recovery process.

8. Turn off system power and disconnect all AC power cords.

9. Remove the access cover.

10. Move the Recovery Boot jumper back to its normal position.

11. Reinstall the access cover.

12. Connect all AC power cords and turn on system power.

Changing the BIOS Language

You can use the BIOS upgrade utility to change the language BIOS displays. Use a bootable diskette containing the Intel flash utility and language files.

Firmware Update Utility Description

The Firmware Update Utility is a DOS-based program used to update the BMCs firmware code. You need to run the utility only if new firmware code is necessary.

Running the Firmware Update Utility

Review the release notes before proceeding.

1. Create a DOS-bootable diskette. The version of DOS must be 6.0 or higher.

2. Place the firmware update utility (FWUPDATE.EXE) and the *.hex file on the diskette. Make a note of the *.hex file name, because you will need it later.

3. Insert the diskette into the drive and boot to it.

4. At the DOS prompt, run the executable file (FWUPDATE.EXE).

5. The utility displays a menu screen. Select "Upload Flash."

6. The utility asks for a file name. Enter the name of the *.hex file.

7. The program will load the file and then ask if it should upload boot code. Press "N" to continue unless otherwise directed by the release notes or an Intel support professional.

8. The program next asks if it should upload operational code. Press "Y" to continue. The process of uploading operational code takes a few minutes.

9. Once the operational code updates and verifies, press any key to continue. Then press <ESC> to exit the program.

10. Shut the system down and remove any diskettes in the system.

11. Disconnect the AC power cord from the system and wait 60 seconds.

12. Reconnect the AC power cord and power up the system.

FRU/SDR Load Utility Description

The Field Replacement Unit (FRU) and Sensor Data Record (SDR) load utility is a DOS-based program used to update the server management subsystem's product level FRU and SDR non-volatile storage components (EEPROMs). The utility:

- Discovers the product configuration based on instructions in a master configuration file

- Displays the FRU information

- Updates the EEPROM associated with the Baseboard Management Controller (BMC) that holds the SDR and FRU area

- Generically handles FRU devices that might not be associated with the BMC

What You Need to Do

Either run the utility directly from the Resource CD or from diskettes created from the CD.

If you run the FRU/SDR Load Utility from a diskette, copy the utility from the CD. Follow the instructions in the included README.TXT file.

If the diskette drive is disabled, or improperly configured, use BIOS Setup to enable it. If necessary, disable the drive after you are done with the FRU/SDR utility.

How You Use the FRU/SDR Load Utility

The utility:

- Is compatible with ROM-DOS Ver. 6.22, MS-DOS Ver. 6.22 (and later versions), Windows 95 DOS, and Windows 98 DOS

- Accepts CFG, SDR, and FRU load files (the executable file for the utility is FRU/SDR.exe)

- Requires the following supporting files:

  — One or more .fru files describing the system's field replaceable units
  — A .cfg file describing the system configuration
  — An .sdr file describing the sensors in the system

Command Line Format

If you are not performing an automated update using a Software Update Package (SUP), the basic command line format is:

FRU/SDR [-?] [-h] [-d {fru, sdr}] [-cfg filename.cfg] [-fru filename.fru]

Table 35: Command Line Format

Command	Description
-? or –h	Displays usage information.
-d {fru, sdr}	Displays requested area only.
-cfg filename.cfg	Uses custom CFG file.
-p	Pause between blocks of data.

Parsing the Command Line

The FRU/SDR load utility allows only one command line function at a time. A command line function can consist of two parameters. Example: -cfg filename.cfg. Invalid parameters cause an error message and exit the program. You can use either a slash (/) or a minus sign (-) to specify command line options. Use the -p and flags with any of the other options.

Displaying a Given Area

When the utility is run with the -d FRU or -d SDR command line flag, information about each area is read from memory and printed on the screen. Each area represents one sensor for each instrumented device in the server. If the given display function fails because of an inability to parse the data present or a hardware failure, the utility displays an error message and exits.

Using Specified CFG File

Run the utility with the command line parameter of -cfg filename.cfg. The filename can be any DOS-accepted, eight-character filename string. The utility loads the

specified CFG file and uses the entries in that file to probe the hardware and to select the proper SDRs to load into non-volatile storage.

Displaying Utility Title and Version

The utility displays its title:

FRU & SDR Load Utility, Version Y.Y, Revision X.XX where Y.Y is the version number and X.XX is the revision number for the utility.

Configuration File

The configuration file is in ASCII text. The utility executes commands formed by the strings present in the configuration file. These commands cause the utility to run tasks needed to load the proper SDRs into the non-volatile storage of the BMC and possibly generic FRU devices. Some of the commands may be interactive and require you to make a choice.

Prompting for Product Level FRU Information

With a configuration file, the utility might prompt you for FRU information.

Filtering Records from the SDR File

The MASTER.SDR file has all the possible SDRs for the system. You might need to filter these records based on the current product configuration. The configuration file directs the filtering of the SDRs.

Updating the SDR Non-volatile Storage Area

After the utility validates the header area of the supplied SDR file, it updates the SDR repository area. Before programming, the utility clears the SDR repository area. The utility filters all tagged SDRs depending on the product configuration set in the configuration file. Untagged SDRs come automatically programmed. The utility also copies all written SDRs to the SDR.TMP file; it contains an image of what was loaded. The TMP file is also useful for debugging the server.

Updating FRU Non-volatile Storage Area

After the configuration is determined, the utility updates the FRU non-volatile storage area. First, it verifies the common header area and checksum from the specified FRU file. The internal use area reads out of the specified .FRU file then programmed into the non-volatile storage. The chassis area reads out of the specified .FRU file. Finally, it reads the product area out of the specified FRU file, then the area programs into the FRU non-volatile storage. All areas write to the FRU.TMP file.

7. Intel Server Control

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An Intel ® product, when used in accordance with its associated documentation, is "Year 2000 Capable" when, upon installation, it accurately stores, displays, processes, provides, and/or receives date data from, into, and between the twentieth and twenty-first centuries, including leap year calculations, provided that all other technology used in combination with said product properly exchanges date data with it.

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About Intel Server Control

NOTE: This section describes the Intel Server Control (ISC) server-management package.

Introducing Intel Server Control

Intel Server Control (ISC) is a package that provides tools to manage remote servers. The components of ISC are described in the following paragraphs.

Intel Server Control Components

The following components are part of Intel Server Control:

Intel Server Control Console: The Intel Server Control Console is a management console that provides basic server management functions. It allows you to run Platform Instrumentation Control (PIC), Direct Platform Control (DPC), DMI Explorer, Client System Setup Utility (CSSU), and Remote Diagnostics.

The ISC Console will run by itself, within a web browser or under Microsoft Management Console. The ISC Console provides you with the ability to discover servers with ISC management tools.

The ISC Console is installed whenever one of the other components is installed.

See Using the Intel Server Control Console (Page 105) for information about the Console interface.

Platform Instrumentation Control (PIC): Platform Instrumentation Control (PIC) provides real-time monitoring and alerting for server hardware sensors. PIC communicates via a LAN connection to the Platform Instrumentation (PI) software on the Server, using standard DMI/RPC protocols.

See Platform Instrumentation Control (Page 105) for summary information, and click the Help button in the PIC Console for detailed information.

Direct Platform Control: Direct Platform Control is a server management tools that gives you access to a remote server when it is online or offline, when the operating system is hung, or when it's powered off. When you receive notice that a server has malfunctioned (via a page, for example), you can use DPC to investigate the cause of the alert, to initiate corrective action, and to restart the server into normal operation.

DPC communicates with the Emergency Management Port (EMP) on the server. The access path is via modem or via direct serial connection.

Remote Diagnostics: Remote Diagnostics consists of Modular Test Architecture (MTA) diagnostic tests on the managed server's Service Partition. These tests can

be used to validate and isolate problems in the server. The tests are controlled via a text-based console redirected to the client workstation from DPC.

See Direct Platform Control and Remote Diagnostics (Page 105) for summary information, and click the Help button in the DPC Console for detailed information.

Client System Setup Utility: The Client System Setup Utility allows you to run the System Setup Utility for a managed server from a remote location. It communicates via a channel opened by DPC.

See Client System Setup Utility (Page 106) for summary information, and click the Help button in the Client SSU for detailed information.

DMI Explorer: DMI Explorer shows attribute values for each DMI-compliant component, and manage third-party DMI-compliant components. ISC installs the DMI Explorer browser in the ISC Console.

See DMI Explorer (Page X) for summary information.

Finding the Right Tool

This table is a summary that will help you find the right tool to use for any server condition. Read the tool descriptions that follow for more information.

Table 36: Finding the right tools summary

Managed Server Status	Potential Remote Tasks	Access	Tools Available
The operating system is running and the server is online. Applications are running	Update software Shutdown	LAN	Platform Instrumentation Control DMI Explorer
Operating System is running but the server is offline or otherwise malfunctioning.	Inspect Remedy Restart	LAN/ Local	Platform Instrumentation Control
The server runs its BIOS and Power On Self-Test successfully.	Redirect Console Boot Service Partition	POTS	Direct Platform Control Client System Setup Utility Remote Diagnostics
The server is off, hung, or won't boot. (Standby power enabled)	View history Run hardware diagnostics Update drivers Examine state Restart	POTS	Direct Platform Control Remote Diagnostics

Managing Remote Servers

Server Management Basics

The Intel Server Control components provide a means to communicate with a managed server, and to perform administrative tasks and troubleshooting from a remote client.

The next table shows the typical tasks that a system administrator might do. They include normal system administration, setting up system alerts so that an administrator is notified when something on the server needs attention, and acting in response to alerts or errors.

Table 37: System Administrator Tasks

Administer	• Monitoring system status
	• Tracking system history
	• Managing system assets
Alert	• Configure sensor thresholds
	• Configure alert actions
	• Respond to alerts received from the managed server
	• Configure Predictive Failure Notification
Act	• Restoration
	• Diagnosis
	• Updating the system
	• Configuration
	• Repair

The tools used for the various server management tasks are described below, under Server Management Tools. See Management Consoles later in this chapter for a description of the available management consoles. The different methods for communicating with a managed server are described in Connecting to a Remote Server.

Server Management Tools

There are several tools available for server management, each for a different purpose or for use in a different condition. Tools are sometimes used together, or in sequence, to perform server management tasks.

The available tools for remote server management, described in the following paragraphs, include:

Platform Instrumentation Control
Direct Platform Control
Client System Setup Utility
The Service Partition
Remote Diagnostics
DMI Explorer

Platform Instrumentation Control

Platform Instrumentation Control (PIC) works with Microsoft Windows NT, NetWare, and UnixWare server systems, and provides real-time monitoring and alerting for server hardware sensors. PIC communicates via a LAN connection to the Platform Instrumentation (PI) on the Server, using standard DMI/RPC protocols.

ISC installs Platform Instrumentation on the managed server and console software on a client workstation. On a Windows NT network, it is possible to install both parts

of the software on the same server. It is also possible to install Platform Instrumentation on multiple servers and Console software on multiple clients.

PIC integrates into the enterprise and workgroup management consoles, as well as into the Intel Server Control Console. PIC relies on the management console to discover servers over the LAN. It also forwards changes in the server state to the management consoles for appropriate alert handling.

What is Platform Instrumentation?

Platform Instrumentation consists of the server-resident software used to monitor and control the server when the operating system is online. The instrumentation retrieves data from the operating system as well as from the Platform Management Technology (hardware, firmware and BIOS), and communicates with management tools with Desktop Management Interface 2.0 (DMI 2.0) commands.

Platform Instrumentation also provides instrumentation data for the servers connected through the Intelligent Chassis Management Bus (ICMB). This allows PIC to use the Platform Instrumentation on one server to access the Platform Management Technology on another server/chassis. This is useful when the target server is not fully operational (such as when the OS is down) and cannot be reached directly by the PIC, or when the target server is running an OS that is not supported by the Platform Instrumentation.

Any change in the server state generates a DMI indication. A Local Response Agent responds by taking actions such as:

- Powering off the server.

- Resetting the server.

- Shutting down the server.

- Generating an NMI.

- Beeping the system speaker.

- Logging to a disk.

- Broadcasting a message on the network.

- Displaying a message on the system console.

- Paging the administrator.

You can use Platform Instrumentation Control to:

- View consolidated server health information.

- Manage non-Intel-based systems via the Intelligent Chassis Management Bus (ICMB).

- Remotely monitor server hardware sensors.

- Configure sensor thresholds.

- Update the server's LCD display (if available).

- Configure, receive, and act upon alert events in the system event log (SEL).

- Configure audio or visual notifications in response to an event.

- Configure options to shut down, reboot, or power-off the system automatically in response to an event.

- View system event log, system hardware inventory, BIOS and system slot information. If they are implemented on the server, you can also view SCSI controller status and LAN adapter status.

You can use PIC to track system status and manage hardware conditions, such as:

- Temperature.

- Voltage.

- Cooling fan status.

- Chassis intrusion.

- ECC memory.

- Processor status.

- Power supply status.

Direct Platform Control

Direct Platform Control is a server management tool that gives you access to a remote server when it is online or offline, when the operating system is hung, or when it's powered off. When you receive notice that a server has malfunctioned (via a page, for example), you can use DPC to investigate the cause of the alert, to initiate corrective action, and to restart the server into normal operation.

DPC communicates with the Emergency Management Port (EMP) on the server. The access path is via modem or via direct serial connection. DPC also works via a redirected text-based console.

Since DPC does not communicate with the server-resident operating system, it can be used to manage the server even if the server's operating system and primary processors are not working. Because the server's emergency management hardware works on 5V standby power, DPC can be used to communicate with and control a powered down server.

DPC integrates into a variety of management consoles, as well as the ISC Console. DPC relies on the management console or ISC Console to discover servers over the LAN.

Using DPC, you can:

- Reboot a server.

- Restart a server that's powered off.

- View the System Event Log (SEL) for information about recent server activity.

- View Sensor Data Records (SDRs) for information about sensor characteristics.

- Review Field Replaceable Unit (FRU) inventories.

- Run Remote Diagnostics on a managed server's Service Partition.

Client System Setup Utility

Use the Client SSU when you need to:

- View and modify the assignment of resources (ports, memory, IRQ's, DMA).

- Modify the server's boot device order or security settings.

- Change the server configuration settings.

- Save the server configuration.

- View or clear the System Event Log (SEL).

- View Field Replaceable Unit (FRU) information.

- View the Sensor Data Record (SDR) table.

To specify a system configuration, SSU uses the information provided by:

- The baseboard CFG file

- Configuration registers

The Client SSU stores configuration values in flash memory. These values take effect when you boot the server.

Start a Client SSU session, by requesting a service boot through the Emergency Management Port. As the service environment boots, a network stack and agent are started and communication switches to the required protocol.

The Client SSU integrates into the ISC Console and enterprise management consoles.

The Service Partition and Remote Diagnostics

Remote Diagnostics are available on a service partition on a hard drive on the managed server.

To use the remote diagnostics, a system manager needs to connect to the server with Direct Platform Control then reboot to the service partition. After the server reboots, the remote diagnostics become available and the system manager can use them for testing server hardware.

What is the Service Partition?

Both the Client System Setup Utility and Remote Diagnostics rely on the server's Service Partition.

The Service Partition is installed on a separate file system partition, and includes the ROM-DOS operating system, SSU and Diagnostics agents/tests. It provides a standard communication stack that can be used over a modem or a serial port to provide remote control of the SSU, diagnostics or any other compatible utility.

The Service Partition may also be used with a redirected text-based console.

Once the utilities and the tests are completed on the Service Partition, the system can be rebooted. The BIOS reverts back to normal boot order after the reboot.

Remote Diagnostics

Remote Diagnostics consists of Modular Test Architecture (MTA) diagnostic tests resident on the Service Partition. The tests can be controlled via a menu maintained on the Service Partition and a text-based console redirected to the client workstation.

DMI Explorer

You can use DMI Explorer to view attribute values for each DMI-compliant component, and to manage third-party DMI-compliant components.

The DMI Explorer can be installed as a tool available from the ISC Console. Select "Install DMI Explorer" when you are installing the ISC software.

Management Consoles

Server management tools such as Platform Instrumentation Control, Direct Platform Control, and the Client System Setup Utility run as components within a server management console. Server management consoles provide the basic functions of establishing connections with remote systems, displaying server or network status, and launching the tool applications.

Server management consoles range from basic versions that are used with single servers to complex versions that are used with complex enterprise-wide network systems.

Server Management Consoles

Server Managers are used in small-office environments to manage a single server or a small number of servers. Server Managers provide the tools to find servers on a network ("discovery"), view multiple servers, receive LAN-based alerts from the remote servers, and control the security of the server.

The Intel Server Control Console provides a straightforward and inexpensive Server Management Console when used by itself, within an ActiveX-enabled web browser, or Microsoft Management Console.

Workgroup Management Consoles

Workgroup Management Consoles are used in small business or department environments to manage a network of servers. They may include auto discovery of servers, enhanced security, paging alerts, and report generation.

Intel LANDesk ® Server Manager (LDSM) is a Workgroup Management Console. To use the ISC tool modules with LDSM, select the LDSM Integration Agent when you are installing the ISC software. When LDSM establishes a connection with a server that is running the ISC Platform Instrumentation software, a "Intel Server Control" launch point is added to the snap-in branch of the LDSM navigation tree. LDSM may also add "Intel Server Control" as an option in the "Snap-In" branch, depending upon the version of LDSM.

Enterprise Management Consoles

Enterprise Management Consoles are used in an enterprise-wide environment to manage a complex organisation of networks. They may include performance monitoring, load balancing, optimisation, and traffic analysis.

HP OpenView NNM and CA Unicenter TNG are enterprise management consoles. To use the ISC tool modules with an enterprise management console, select the appropriate Integration Agent when you are installing the ISC software.

OpenView

The HP OpenView Network Node Manager Console automatically detects servers running the ISC Platform Instrumentation software. ISC-enabled servers display on the network map, and an "Intel Server Control" applet is added as an option in the Tools menu.

Unicenter TNG

Unicenter TNG automatically detects servers running the ISC Platform Instrumentation software if the ISC to discovery service is enabled. The service can be started either from the Auto Discovery dialog or from the Windows NT Services applet. The discovery service creates a new "Intel Server Control" object for each ISC-enabled server. The ISC objects display under "ISC World View."

Connecting to a Remote Server

There are several methods for connecting to a server for management. A key to effective management is to configure your system with methods that will allow you to communicate with the server in conditions ranging from fully functional to powered-off. The available connections are:

- Telephone

- Local Area Network (LAN)

- Intelligent Chassis Management Bus (ICMB)

- Local Direct

The connection methods are described in the following paragraphs.

Telephone

A telephone/modem connection may be used to communicate with a managed server.

A telephone connection is particularly useful when the managed server is not communicating with the local area network, such as when the server is hung or powered-off.

Using a telephone line to connect to an unpowered server requires that a battery-backed-up management card be installed in the server.

From the Console

With a modem installed in both the client console system and the remote server, you can connect to the server using DPC or Client SSU.

Using the modem connection via the Direct Platform Control (DPC), you can:

- Reset the remote server's power.

- Reboot the remote server using the service partition.

NOTE: Direct Platform Control is an optional application that may not be installed on this system. Look for the DPC icon in the right-hand pane of the ISC Console. To install DPC, rerun the installation program on the ISC CD-ROM.

From the Remote Server

The remote server may be set up to send messages to your console via the telephone connection.

Setting Up a Telephone Connection

Using a telephone connection requires:

- A modem on both the managed server and the client workstation.

- A server with on-board emergency management features.

In order to use a telephone/modem link to a server, you must configure a serial connection on both the managed server and the client workstation.

LAN

The "normal" method of communicating with a managed server is via a network connection. All of the server-management tools will work via a network connection.

A network connection is dependent upon the network working, and upon the operating system and networking application working correctly on the managed server.

When LAN communication is not possible, use the telephone/modem link to connect to the managed server.

ICMB

ICMB may be used to communicate with platforms with operating systems or architectures that are not otherwise supported by the server management tool applications.

Using the ICMB connection requires that you have a functioning LAN connection to a server that is connected via ICMB to the managed server.

Setting Up an ICMB Connection

An ICMB connection requires:

- A managed server with an ICMB interface.

- A server with an ICMB interface, connected to the server management console.

See the Product Guide for the managed server for information about setting up an ICMB connection.

Direct

With a direct connection to the managed server via a serial link, you may use the System Setup Utility to set up and configure the server, perform BIOS and other firmware upgrades, manage hardware components, and perform off-line diagnostics. On servers running Windows NT, you may also use Platform Instrumentation Control to monitor server health, configure alerts, set thresholds, and monitor the system logs.

Setting Up a Direct Connection

The direct connection method is the same as the telephone/modem method described previously. Connect the managed server and the workstation client using a null-modem serial cable.

Paging an Administrator

Platform Event Paging (PEP)

Platform Event Paging allows the managed server to alert a system administrator of critical system failures and state changes, independent of the state of the operating system or server management software. Platform Event Paging uses a numeric paging service via an external modem.

Platform Event Paging can generate pages during pre-boot and post-boot states—all that is required is that the Baseboard Management Controller is functional and there is power to the system.

The managed server's BIOS setup provides a configuration for the paging string and event filters. The paging string contains all the information to connect to the pager and the message to send. The Platform Instrumentation Control tool also has a dialog for configuring the same paging string.

When notified by a page, an administrator can use the server management tools to remotely view server health/status, system logs, and current configuration; reconfigure, reset or power off /on the server; or execute off-line diagnostics to

further analyse the condition of the server. Pages can be configured for the following events:

- Temperature Sensor out of range.

- Voltage Sensor out of range.

- Chassis Intrusion [Security Violation].

- Power Supply Fault.

- BIOS: Uncorrectable ECC error.

- BIOS: POST Error Code.

- FRB Failures.

- Fatal NMI (NMI from source other than Front Panel NMI or Uncorrectable ECC Error).

- Watchdog Timer reset, power down, or power cycle.

- System restart (reboot).

- Fan failures.

Server Event Notifications

The server's Local Response Agent can be configured to shut down a server, broadcast messages, make a local alarm beep, send a page to an administrator, and other actions. Use the Platform Instrumentation Control tool to configure an LRA page. See "What is Platform Instrumentation?" for more information.

Using the Intel Server Control Console

The Intel Server Control Console is a lightweight management console that provides basic server management functions. It allows you to run Platform Instrumentation Control (PIC), Direct Platform Control (DPC), DMI Explorer, and Client System Setup Utility. The ISC Console will run by itself, within a web browser or under Microsoft Management Console. The ISC Console provides you with the ability to:

- Discover ISC servers.

- Discover management tools on discovered servers.

- Launch the management tools on the managed servers.

Intel Server Control Console Main Screen

The following figure shows the Intel Server Control Console.
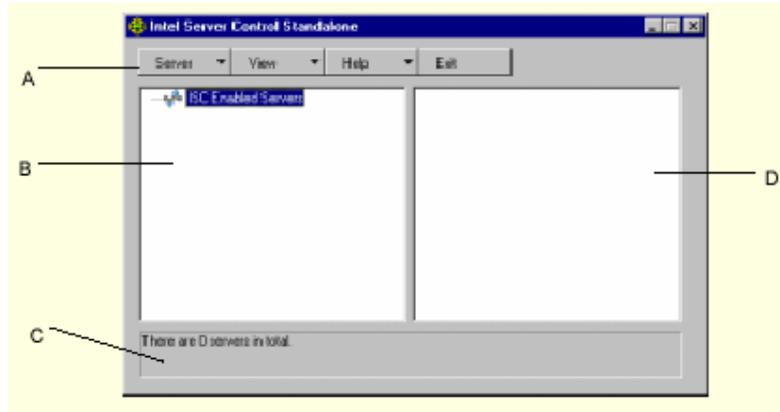
Figure 48: Intel Server Control Main Screen

> A. Button bar
> B. Navigation Pane
> C. Tool Pane
> D. Status Bar

ISC Console Button Bar

The ISC Console uses a Windows Explorer-like model, with a navigation pane (tree view) and a presentation pane (list view). Servers that are discovered are added to the tree view. When you select a server from the tree, the presentation pane shows a list of supported "tools" running on that server. Launch the supported tool from the presentation pane by double-clicking on the icon.

The Button Bar includes the following options:

Table 38: Button Bar Features

Item	Options
Server Menu	Discover: Start server discovery Add: Manually add a server to the tree Delete: Delete the selected server from the tree Delete All: Delete all servers from the tree
View Menu	List View: View the tool list as a list Icon View: View the tool list as icons
Help Menu	Contents: Accesses ISC Console help topics About ISC Console: Displays ISC Console version information
Exit	Exit ISC Console

Server Menu Options

Discover

You can discover multiple servers in a single step and add them to the server tree. Servers are discovered using a Ping Sweep mechanism supported on servers running TCP/IP.

To discover a range of servers with IP addresses, do the following steps:

1. On the Button Bar, click the Server->Discover menu selection.

2. Enter the starting address and ending address to be discovered. The starting address will default to the network subnet of the console machine starting at address 0. The ending range will default to the value 255, indicating that ISC will search the entire network subnet. If you change the default address value, enter the full IP address. Wild card characters are not allowed. For all IP addresses, the range of values allowed for any IP address segment is between 0 and 255.

3. Click <OK>.

The ISC Console will ping each server and test each server for all ISC-registered tools. If one or more of the tools is found, then the server will be added to the server tree.

During the discovery process, the status bar indicates ping status, the number of servers found, and the number of servers not responding.

Information on servers discovered by ISC is maintained across machine boots. When the ISC Console is run, servers discovered during previous sessions are displayed. You do not have to run discovery every time the ISC Console is launched.

If any of the tools supported by the ISC Console are installed or removed from any managed server, the ISC Console discovery process will need to be rerun to update the tool list for that server.

Add

You can manually add a server with an IP address to the ISC Console server tree.

To add a server with an IP address, do the following steps:

1. On the Button Bar, click the Server > Add menu selection.

2. Choose a radio button for the IP label.

3. Enter the full address of the desired server. Wild card characters are not allowed. For all IP addresses, the range of values allowed for any IP address segment is between 0 and 255.

4. Click OK.

The ISC Console will test the specified server for all ISC-registered tools. If one or more of the tools is found, then the server will be added to the server tree.

Delete/Delete All

You can manually delete a server from the ISC Console server tree.

To delete a server, do the following steps:

1. Select a server or multiple servers from the Windows NT Servers, NetWare Servers, UnixWare Servers, or Servers of Unknown Type branch in the server tree.

2. On the Button Bar, click the Server->Delete or Server->Delete All menu selection.

3. A confirmation dialog will be displayed. Click <OK>.

ISC will delete the server(s) from the server tree. To restore information about that server, you must rediscover the server using Server->Add or Server->Discover.

View Menu Options

Icon View/List View

Changes the format of the icons in the Tool Pane.

The Navigation Pane

The Navigation pane shows a tree view of servers with management tools that have been discovered. The tree view has expansion icons ("+" or "-") appearing to the left. The tree can be expanded to list managed servers or collapsed to hide managed servers.

The Tool Pane

When you select a server in the navigation pane, the tool pane displays a set of icons representing the management tools supported on that server. You can start the management tool for the managed server by double-clicking the tool icon in the tool pane.

The DPC or CSSU application icons will not appear in the tool list for servers discovered by the ISC console application unless the ISC platform instrumentation is running on the server during discovery or an entry for the server exists in the DPC or CSSU phonebook.

The Status Bar

The status bar displays information about ISC Console operations, such as the number of servers found with valid addresses and number of servers not responding during a Discover.

8. 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.

Viglen Technical Support can be reached in the following ways:

Telephone: 020 8758 7050
Fax: 020 8758 7080
Email: technical@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

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

Resetting the System

Table 39: Resetting the System

To do this:	Press:
Soft boot reset, which clears system memory and reloads the operating system.	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system.	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals.	Power off/on

Initial System Startup

Problems that occur at initial system start-up are usually caused by incorrect installation or configuration. Hardware failure is a less frequent cause.

Checklist

❑ Are all cables correctly connected and secured?
❑ Are the processors or processor termination board fully seated in their slots on the server board?
❑ Are all add-in PCI boards fully seated in their slots on the server board?
❑ Are all jumper settings on the server board correct?
❑ Are all jumpers and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts—for example, two add-in boards sharing the same interrupt.

❑ Are all DIMMs installed correctly?
❑ Are all peripheral devices installed correctly?
❑ If the system has a hard disk drive, is it properly formatted or configured?
❑ Are all device drivers properly installed?
❑ Are the configuration settings made in BIOS Setup correct?
❑ Is the operating system properly loaded? Refer to the operating system documentation.
❑ Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
❑ Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V~ or a NEMA 6-15R outlet for 200-240 V~?
❑ Is AC power available at the wall outlet?
❑ Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list on the Intel Customer Support website.

Running New Application Software

Problems that occur when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly.

Checklist

❑ Does the system meet the minimum hardware requirements for the software? See the software documentation.
❑ Is the software an authorised copy? If not, get one; unauthorised copies often do not work.
❑ If you are running the software from a diskette, is it a good copy?
❑ If you are running the software from a CD-ROM disk, is the disk scratched or dirty?
❑ If you are running the software from a hard disk drive, is the software correctly installed? Were all necessary procedures followed and files installed?
❑ Are the correct device drivers installed?
❑ Is the software correctly configured for the system?
❑ Are you using the software correctly?

If the problems persist, contact the software vendor's customer service representative.

After the System Has Been Running Correctly

Problems that occur after the system hardware and software have been running correctly often indicate equipment failure. Many situations that are easy to correct, however, can also cause such problems.

Checklist

❑ If you are running the software from a diskette, try a new copy of the software.

❑ If you are running the software from a CD-ROM disk, try a different disk to see if the problem occurs on all disks.

❑ If you are running the software from a hard disk drive, try running it from a diskette. If the software runs correctly, there may be a problem with the copy on the hard disk drive. Reinstall the software on the hard disk, and try running it again. Make sure all necessary files are installed.

❑ If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.

❑ If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. (Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.)

NOTE: **Random errors in data files**: If you are getting random errors in your data files; they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.

More Problem Solving Procedures

This section provides a more detailed approach to identifying a problem and locating its source.

Preparing the System for Diagnostic Testing

CAUTION!

Turn off devices before disconnecting cables: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect all of them from the system, except the keyboard and video monitor.

2. Make sure the system power cord is plugged into a properly grounded AC outlet.

3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).

4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A. Otherwise, place a diskette containing the operating system files in drive A.

5. Turn on the system. If the power LED does not light, see "Power Light Does Not Light" on page 125

6. If errors are encountered, power off the system and remove all add-in cards.

Monitoring POST

Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly.
Check for the following:

❑ Does the diskette drive activity light turn on briefly? If not, see "Diskette Drive Activity Light Does Not Light" on page 126.
❑ If a second diskette drive is installed, does its activity light turn on briefly? If not, see "Diskette Drive Activity Light Does Not Light" on page 126.

Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see "Initial System Start-up" on page 121.

Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.

- There is no beep or an incorrect beep pattern.

- No characters appear on screen.

- Characters on the screen appear distorted or incorrect.

- System cooling fans do not rotate.

- Diskette drive activity light does not light.

- CD-ROM drive activity light does not light.

- There are problems with application software.

- The bootable CD-ROM is not detected.

Try the solutions in the order given. If you cannot correct the problem, contact your service representative or authorised dealer for help.

Power Light Does Not Light

Check the following:

❏ Is the system operating normally? If so, the power LED is probably defective or the cable from the front panel to the server board is loose.
❏ Are there other problems with the system? If so, check the items listed under "System Cooling Fans Do Not Rotate Properly."

If all items are correct and problems persist, contact your service representative or authorised dealer for help.

No Characters Appear on Screen

Check the following:

❏ Is the keyboard functioning? Check to see that the "Num Lock" light is functioning.
❏ Is the video monitor plugged in and turned on?
❏ Are the brightness and contrast controls on the video monitor properly adjusted?
❏ Are the video monitor switch settings correct?
❏ Is the video monitor signal cable properly installed?
❏ Is the onboard video controller enabled?

If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in the server board connector.

2. Reboot the system for changes to take effect.

3. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.

4. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorised dealer for help.

Characters Are Distorted or Incorrect

Check the following:

❏ Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer's documentation.
❏ Are the video monitor signal and power cables properly installed?

If the problem persists, the video monitor may be faulty or it may be the incorrect type. Contact your service representative or authorised dealer for help.

System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, system components could be damaged.

Check the following:

- ❑ Is AC power available at the wall outlet?
- ❑ Is the system power cord properly connected to the system and the wall outlet?
- ❑ Did you press the power button?
- ❑ Is the power on light lit?
- ❑ Have any of the fan motors stopped (use the server management subsystem to check the fan status)?
- ❑ Are the fan power connectors properly connected to the server board?
- ❑ Is the cable from the front panel board connected to the server board?
- ❑ Are the power supply cables properly connected to the server board?
- ❑ Are there any shorted wires caused by pinched cables or power connector plugs forced into power connector sockets the wrong way?

If the switches and connections are correct and AC power is available at the wall outlet, contact your service representative or authorised dealer for help.

Diskette Drive Activity Light Does Not Light

Check the following:

- ❑ Are the diskette drive power and signal cables properly installed?
- ❑ Are all relevant switches and jumpers on the diskette drive set correctly?
- ❑ Is the diskette drive properly configured?
- ❑ Is the diskette drive activity light always on? If so, the signal cable may be plugged in incorrectly.

If you are using the onboard diskette controller, use the Setup Utility to make sure that "Onboard Floppy" is set to "Enabled." If you are using an add-in diskette controller, make sure that "Onboard Floppy" is set to "Disabled."

If the problem persists, there may be a problem with the diskette drive, server board, or drive signal cable. Contact your service representative or authorised dealer for help.

CD-ROM Drive Activity Light Does Not Light

Check the following:

- ❑ Are the power and signal cables to the CD-ROM drive properly installed?

❑ Are all relevant switches and jumpers on the drive set correctly?
❑ Is the drive properly configured?
❑ Is the onboard IDE controller enabled?

Cannot Connect to a Server

❑ Make sure you are using the drivers that are shipped on the system Configuration Software CD for the onboard network controller.
❑ Make sure the driver is loaded and the protocols are bound.
❑ Make sure the network cable is securely attached to the connector at the system back panel. If the cable is attached but the problem persists, try a different cable.
❑ Make sure the hub port is configured for the same duplex mode as the network controller.
❑ Check with your LAN administrator about the correct networking software that needs to be installed.
❑ If you are directly connecting two servers (no hub), you will need a crossover cable (see your hub documentation for more information on crossover cables).
❑ Check the network controller LEDs that are visible through an opening at the system back panel.

Problems with Network

The server hangs when the drivers are loaded:

❑ Change the PCI BIOS interrupt settings. Try the "PCI Installation Tips" below.

Diagnostics pass, but the connection fails:

❑ Make sure the network cable is securely attached.
❑ Make sure you specify the correct frame type in your NET.CFG file.

The Activity LED doesn't light:

Make sure the network hub has power.

The controller stopped working when an add-in adapter was installed:

❑ Make sure the cable is connected to the port from the onboard network controller.
❑ Make sure your PCI BIOS is current.
❑ Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts; OS/2† does not.
❑ Try reseating the add-in adapter.

The add-in adapter stopped working without apparent cause:

❑ Try reseating the adapter first; then try a different slot if necessary.
❑ The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.

❑ Run the diagnostics.

Problems with Application Software

If you have problems with application software, do the following:

❑ Verify that the software is properly configured for the system. See the software installation and operation documentation for instructions on setting up and using the software.
❑ Try a different copy of the software to see if the problem is with the copy you are using.
❑ Make sure all cables are installed correctly.
❑ Verify that the server board jumpers are set correctly. See Chapter 5.
❑ If other software runs correctly on the system, contact your vendor about the failing software.

If the problem persists, contact the software vendor's customer service representative for help.

Bootable CD-ROM Is Not Detected

Check the following:

❑ Is the BIOS set to allow the CD-ROM to be the first bootable device?
❑ Check cable connections.
❑ Verify CD is bootable in another known good CD-ROM drive. (Especially if the CD is a copy.)

9. Technical Reference

Server Board Jumpers
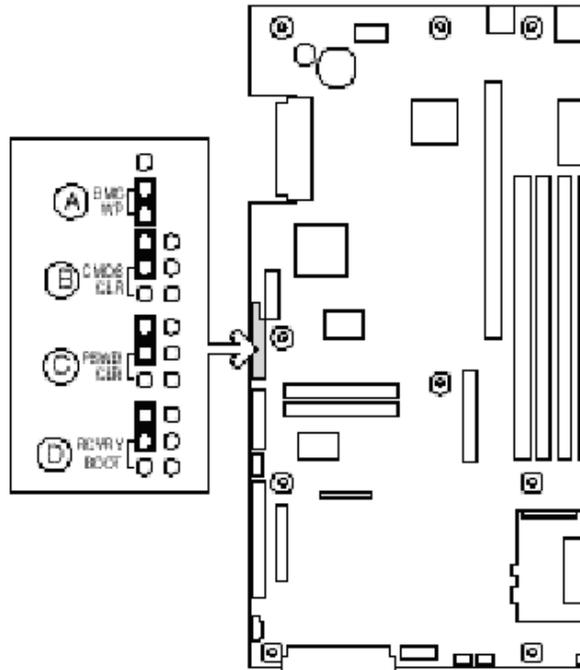
Figure 49: Server Board Jumpers

Table 40: Configuration Jumper

Jumper Name	Pins	What it does at system reset
BMC WP	A	BMC boot block is write protected (normal operation). If these pins are **not** jumpered, BMC boot block is erasable and programmable at next reset.
CMOS CLR	B	If these pins are jumpered, the CMOS settings are cleared. These pins should **not** be jumpered for normal operation.
PSWD CLR	C	If these pins are jumpered, the CMOS password is cleared. These pins should **not** be jumpered for normal operation.
RCVRY BOOT	D	If these pins are jumpered, the system will attempt BIOS recovery. These pins should **not** be jumpered for normal operation.

Diagnostic LEDs

To help diagnose POST failures, a set of four bi-colour diagnostic LEDs is located on the back edge of the baseboard. Each of the four LEDs can have one of four states: Off, Green, Red, or Amber.

The LED diagnostics feature consists of a hardware decoder and four dual colour LEDs. During POST, the LEDs will display all normal Port80 codes representing the progress of the BIOS POST. Each postcode will be represented by a combination of colours from the 4 LEDs. The LEDs are in pairs of green and red. The post codes are broken into two nibbles, an upper and a lower nibble. Each bit in the upper

nibble is represented by a red LED and each bit in the lower nibble is represented by a green LED. If both bits are set in the upper and lower nibble then both red and green LEDs are lit, resulting in an amber colour. Likewise, if both bits are clear then the red and green LEDs are off.

During the POST process, each light sequence represents a specific Port-80 POST code. If a system should hang during POST, the Diagnostic LEDs will present the last test executed before the hang. When reading the lights, the LEDs should be observed from the back of the system. The most significant bit (MSB) is the first LED on the left, and the least significant bit (LSB) is the last LED on the right.

NOTE: When comparing a diagnostic LED colour string from the baseboard to those listed in the diagnostic LED decoder in the following tables, the LEDs on the baseboard should be referenced when viewed by looking into the system from the back. Reading the LEDs from left to right, the Hi bit is located on the left.

Table 41 : POST Codes

Post Code	Diagnostic LED Decoder				Description
	G=Green, R=Red, A=Amber				
	MSB			LSB	
07h	Off	G	G	G	Uncompress various BIOS Modules
08h	G	Off	Off	Off	Verify password Checksum
08h	G	Off	Off	Off	Verify CMOS Checksum.
07h	Off	G	G	G	Read Microcode updates from BIOS ROM.
07h	Off	G	G	G	Initialising the processors. Set up processor registers. Select least featured processor as the BSP.
0Bh	G	Off	G	G	Hook before the keyboard BAT command is issued.
0Ch	G	G	Off	Off	Keyboard Controller Test: The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller
0Eh	G	G	G	Off	Init after Keyboard Test: The keyboard controller BAT command result has been verified. Next, performing any necessary initialisation after the keyboard controller BAT command test.
0Fh	G	G	G	G	Write Command Byte 8042: The initialisation after the keyboard controller BAT command test is done. The keyboard command byte will be written next.
10h	Off	Off	Off	R	Keyboard Init: The keyboard controller command byte is written. Next, issuing the pin 23 and 24 blocking and unblocking commands
10h	Off	Off	Off	R	Disable and initialise 8259
11h	Off	Off	Off	A	Detect Configuration Mode, such as CMOS clear.
13h	Off	Off	G	A	Chipset Initialisation before CMOS initialisation

Continued

Table 41 : POST Codes (Continued)

Post Code	Diagnostic LED Decoder				Description
	G=Green, R=Red, A=Amber				
	MSB			LSB	
19h	G	Off	Off	A	Init System Timer: The 8254 timer test is over. Starting the memory refresh test next.
1Ah	G	Off	G	R	Check Refresh Toggle: The memory refresh line is toggling. Checking the 15 second on/off time next
23h	Off	Off	A	G	Setup Interrupt Vectors: Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initialising the interrupt vectors
24h	Off	G	R	Off	Before Vector: Configuration is required before interrupt vector initialisation has completed. Interrupt vector initialisation is about to begin
25h	Off	G	R	G	Init interrupt Vectors: Interrupt vector initialisation is done.
F2h	R	R	A	R	Initialise SMM handler. Initialise USB emulation.
F5h	R	A	R	A	Validate NVRAM areas. Restore from backup if corrupted.
12h	Off	Off	G	R	Load defaults in CMOS RAM if bad checksum or CMOS clear jumper is detected.
12h	Off	Off	G	R	Initialising APP CMOS RAM for appliance servers only.
12h	Off	Off	G	R	Check point After CMOS Initialised
27h	Off	G	A	G	Validate date and time in RTC.
F4h	R	A	R	R	Load Micro Code To All CPUs
F6h	R	A	A	R	Scan SMBIOS GPNV areas
15h	Off	G	Off	A	8254 Timer Test on Channel 2
15h	Off	G	Off	A	Enable 8042
15h	Off	G	Off	A	Keyboard Reset
26h	Off	G	A	Off	Initialise LCD, if supported.
28h	G	Off	R	Off	Set Video Mode: Initialisation before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
29h	G	Off	R	G	Debugger Hook
2Ah	G	Off	A	Off	Init PCI devices and motherboard devices. Pass control to video BIOS. Start serial console redirection.
2Bh	G	Off	A	G	Platform hook
2Dh	G	G	R	G	Initialise AMI display manager Module. Initialise support code for headless system if no video controller is detected.
2Dh	G	G	R	G	Scan flash for logos and Initialise logo data areas
30h	Off	Off	R	R	Detect PS/2 Mouse
30h	Off	Off	R	R	Hook after c000 ROM control
2Eh	R	R	A	Off	Set up video parameters in BIOS data area.
37h	Off	G	A	A	Activate ADM: The display mode is set. Displaying the power-on message next.
37h	Off	G	A	A	Initialise language module. Display splash logo.
37h	Off	G	A	A	Display Sign on message, BIOS ID and processor information.
38h	G	Off	R	R	Detect USB Mouse: Initialising the bus input, and general devices next, if present.
34h	Off	G	R	R	Reset IDE Controllers

Continued

Table 41 : POST Codes (Continued)

Post Code	Diagnostic LED Decoder G=Green, R=Red, A=Amber				Description
	MSB			LSB	
39h	G	Off	R	A	Displaying bus initialisation error messages.
3Ah	G	Off	A	R	Display Setup Message: The new cursor position has been read and saved. Displaying the Hit Setup message next.
40h	Off	R	Off	Off	Ensure Timer Keyboard Interrupts are on.
4Bh	G	R	G	G	Memory Test: The amount of memory above 8 MB has been found and verified. Checking for a soft reset and clearing the memory below 8 MB for the soft reset next. If this is a power-on situation, going to checkpoint 4Eh next.
57h	Off	A	G	A	Chipset hook after memory size
53h	Off	R	A	A	Display processor cache size.
54h	Off	A	Off	R	Disable parity and nmi reporting.
60h	Off	R	R	Off	Test 8237 DMA Controller: The DMA page register test passed. Performing the DMA Controller 1 base register test next
65h	Off	A	R	G	Init 8237 DMA Controller: The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
7Fh	G	A	A	A	Extended NMI enable: Extended NMI source enabling is in progress.
80h	R	Off	Off	Off	Enable Mouse and Keyboard: The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next
81h	R	Off	Off	G	Keyboard Interface Test: A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	R	Off	G	Off	Check Stuck Key Enable Keyboard: The keyboard controller interface test completed. Writing the command byte and initialising the circular buffer next.
83h	R	Off	G	G	Disable parity NMI: The command byte was written and global data initialisation has completed. Checking for a locked key next
84h	R	G	Off	Off	Verify RAM Size: Checking for a memory size mismatch with CMOS RAM data next
84h	R	G	Off	Off	Check ATA Cable Type presence of ATAPI devices
84h	R	G	Off	Off	Display Keyboard Message
16h	Off	G	G	R	Display IDE mass storage devices.
17h	Off	G	G	A	Display USB mass storage devices.
85h	R	G	Off	G	Report the first set of POST Errors To Error Manager.
86h	R	G	G	Off	Boot Password Check: The password was checked. Performing any required programming before Setup next.
8Dh	A	G	Off	G	OEM Patch 9
8Dh	A	G	Off	G	Set Printer RS-232 Timeout
8Dh	A	G	Off	G	Init FDD Devices: Resetting the hard disk controller next.
95h	R	G	Off	A	Lock out PS/2 keyboard/mouse if unattended start is enabled.
92h	R	Off	G	R	Option ROM Scan
98h	A	Off	Off	R	Init Boot Devices: The adapter ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.

Continued

Table 41 : POST Codes (Continued)

Post Code	Diagnostic LED Decoder				Description
	G=Green, R=Red, A=Amber				
	MSB			LSB	
9Bh	A	Off	G	A	Float Processor Initialise: Performing any required initialisation before the coprocessor test next.
9Eh	A	G	G	R	Enable Interrupts 0,1,2: Checking the extended keyboard, keyboard ID, and NUM Lock key next. Issuing the keyboard ID command next
A2h	R	Off	A	Off	Report second set of POST errors To Error messager
86h	R	G	G	Off	Prepare And Run Setup: Error manager displays and logs POST errors. Waits for user input for certain errors. Execute setup.
8Bh	A	Off	G	G	Set Base Expansion Memory Size
8Ch	A	G	Off	Off	Adjust Setup: Programming the Setup options next.
A5h	R	G	R	G	Set Display Mode
A7h	R	G	A	G	OEM Patch 12
A7h	R	G	A	G	Build SMBIOS table and MP tables.
A7h	R	G	A	G	Program hotkey and timeout settings in keyboard controller.
A7h	R	G	A	G	Processor initialisation before boot.
A7h	R	G	A	G	Copy required language strings to shadow RAM.
AAh	A	Off	A	Off	Clear video screen.
000h	Off	Off	Off	Off	One Beep to indicate end of POST. No beep if silent boot is enabled.
000h	Off	Off	Off	Off	POST completed. Passing control to INT 19h boot loader next.

10. Regulatory & Integration Information

Product Regulatory Compliance

Product Safety Compliance

The SCB2 complies with the following safety requirements:

- UL 1950 - CSA 950 (US/Canada)

- EN 60 950 (European Union)

- IEC60 950 (International)

- CE – Low Voltage Directive (73/23/EEC) (European Union)

- EMKO-TSE (74-SEC) 207/94 (Nordics)

- GOST R 50377-92 (Russia)

Product EMC Compliance

The SCB2 has been has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed in a compatible Intel® host system. For information on compatible host system(s), contact your local Intel representative.

- FCC (Class A Verification) – Radiated & Conducted Emissions (USA)

- ICES-003 (Class A) – Radiated & Conducted Emissions (Canada)

- CISPR 22 (Class A) – Radiated & Conducted Emissions (International)

- EN55022 (Class A) – Radiated & Conducted Emissions (European Union)

- EN55024 (Immunity) (European Union)

- CE – EMC Directive (89/336/EEC) (European Union)

- GOST R 29216-91 Radiated & Conducted Emissions (Russia)

- GOST R 50628-95 Immunity (Russia)

- VCCI (Class A) – Radiated & Conducted Emissions (Japan)

- AS/NZS 3548 (Class A) – Radiated & Conducted Emissions (Australia / New Zealand)

- RRL (Class A) Radiated & Conducted Emissions (Korea)

- BSMI (Class A) Radiated & Conducted Emissions (Taiwan)

For questions related to the EMC performance of this product, contact:

Viglen Technical Support
Tel: 020 8758 7000

Product Regulatory Compliance Markings

This product is provided with the following Product Certification Markings.

- cURus Recognition Mark

- CE Mark

- Russian GOST Mark

- Australian C-Tick Mark

- Taiwan BSMI Certification Number 3902I904 and BSMI EMC Warning

Electromagnetic Compatibility Notices

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

Australian Communications Authority (ACA) (C-Tick Declaration of Conformity)

This product has been tested to AS/NZS 3548, and complies with ACA emission requirements. The product has been marked with the C-Tick Mark to illustrate its compliance.

Ministry of Economic Development (New Zealand) Declaration of Conformity

This product has been tested to AS/NZS 3548, and complies with New Zealand's Ministry of Economic Development emission requirements.

BSMI (Taiwan)

The BSMI Certification number 3902I904 is silk screened on the component side of the server board; and the following BSMI EMC warning is located on solder side of the server board.

檢磁 3902I904
警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策

Replacing the Backup Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

WARNING!

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

11. Equipment Log & Power Consumption

Equipment Log

Use the blank equipment log provided here to record information about your system. You will need some of this information when you run the SSU.

Table 42: Equipment Log

Item	Manufacturer Name and Model Number	Serial Number	Date Installed
System			
Server Board			
Primary Processor Speed and Cache			
Secondary Processor Speed and Cache			
Video Display			
Keyboard			
Mouse			
Diskette Drive A			
Diskette Drive B			
Tape Drive			
CD-ROM Drive			
Hard Disk Drive 1			
Hard Disk Drive 2			
Hard Disk Drive 3			
Hard Disk Drive 4			
Hard Disk Drive 5			

Continued

Table 42: Equipment Log (continued)

Item	Manufacturer Name and Model Number	Serial Number	Date Installed

Current Usage

NOTE: Both processors pull power from +5V. This may limit the number of drives and/or add-in cards you may install.

As an overall current usage limitation on the power supply, do not exceed a combined power output of 195 watts for the +5 and +3.3 volt outputs.

The PCI slots on the server board are rated at a maximum of 5 amperes per slot. The maximum power allowed for each slot is 20 watts at +5 volts. The average current usage per slot should not exceed 3.0 amperes per slot; that is, 15 watts.

The cooling efficiency varies per slot; therefore, ensure that adequate cooling is available in the target slot—especially in an expansion slot drawing more than 2.0 amperes.

Calculating Power Consumption

The total combined wattage for the system configuration must be less than the output of your power supply. Use the two worksheets in this section to calculate the power used by your server boards. For current and voltage requirements of add-in boards and peripherals, see your vendor documents.

Worksheet, Calculating DC Power Usage

1. List the current for each board and device in the appropriate voltage level column.

2. Add the currents in each column. Then go to the next worksheet.

Table 43: Power Usage Worksheet 1

Device	Current (maximum) at voltage level:				
	+3.3 V	**+5 V**	**5 V Standby**	**+12 V**	**−12 V**
Server board	3.0 A	3.0 A	.7 A	0.0 A	0.0 A
Primary Processor					
Secondary Processor					
Memory (six DIMMs)					
Full-Height PCI riser slot *(see note 1)*					
PCI slot 1					
PCI slot 2					
PCI slot 3					
Low-Profile PCI riser slot *(see note 1)*					
PCI slot 1					
PCI slot 2					
PCI slot 3					
Server Board Current **SUBTOTALS**					
System Components *(see note 2)*					
Total Current					

Note 1: Number of PCI cards depends on system and riser card configuration.
Note 2: List additional system devices and associated currents.

Worksheet, Total Combined Power Used by the System

1. From the previous worksheet, enter the total current for each column.

2. Multiply the voltage by the total current to get the total wattage for each voltage level.

3. Add the total wattage for each voltage level to arrive at a total combined power usage on the power supply.

Table 44: Power Usage Worksheet 2

Voltage level and total current (V X A = W)	Total Watts for each voltage level
(+3.3 V) X (_____ A)	_____ W
(+5 V) X (_____ A)	_____ W
(–5 V) X (_____ A)	_____ W
(+12 V) X (_____ A)	_____ W
(–12 V) X (_____ A)	_____ W
Total Combined Wattage	_____ W

12. Appendix

Contacting Viglen

Viglen Technical Support   Tel: 020 8758 7050
Fax: 020 8758 7097

E-mail: technical@viglen.co.uk

Viglen's Internet Website   http://www.viglen.co.uk

The Viglen BBS service   020 8758 7095

Viglen Service Centre   Tel: 020 8991 3582
Fax: 020 8758 7085,

E-mail: service@viglen.co.uk

Account Sales: Call the department appropriate to your business sector.

Education: Tel: 020 8758 7170
Fax: 020 8566 7105

E-mail: education@viglen.co.uk

Schools: Tel: 020 8758 7027
Fax: 020 8758 7417

E-mail: schools@viglen.co.uk

Corporate: Tel: 020 8758 7172
Fax: 020 8566 8930

E-mail: corporate@viglen.co.uk

Public Sector: Tel: 020 8758 7079
Fax: 020 8566 8931

E-mail: public@viglen.co.uk

13. Notes

Viglen SX220 User Guide

14. Viglen, EMC and the 'CE' mark

CE Marking
As we begin the 21st century, European standards are being harmonised across borders. If products comply to the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies with the currently enforced directive(s).

$$C \in$$

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 to the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

Install the system according to Viglen's instructions

If you open up your Viglen System:

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 any ferrite rings 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.

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

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

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

3. Does the manual go into enough detail?

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

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

_____

_____

_____

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

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7. Other points you would like to mention?

_____

_____

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_____

_____

_____

Please return this slip to: Product Development.
                              Viglen Ltd.
                              Viglen House
                              Alperton Lane
                              Alperton
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                              HA0 1DX