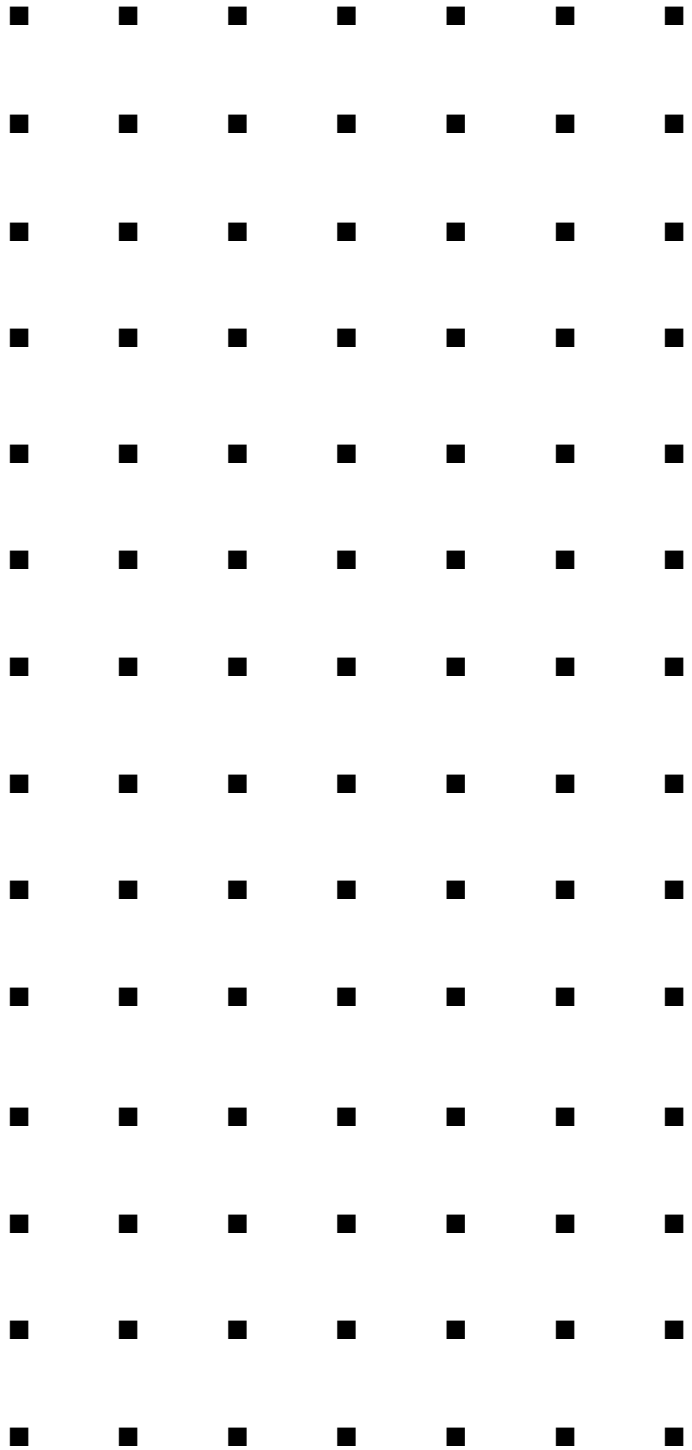


**EXPRESS5800/320Lb/320Lb-R**



**User's Guide**



## **Proprietary Notice and Liability Disclaimer**

The information disclosed in this document, including all designs and related materials, is the valuable property of NEC Solutions (America), Inc. and/or its licensors. NEC Solutions (America), Inc. and/or its licensors, as appropriate, reserve all patent, copyright and other proprietary rights to this document, including all design, manufacturing, reproduction, use, and sales rights thereto, except to the extent said rights are expressly granted to others.

The NEC Solutions (America), Inc. product(s) discussed in this document are warranted in accordance with the terms of the Warranty Statement accompanying each product. However, actual performance of each product is dependent upon factors such as system configuration, customer data, and operator control. Since implementation by customers of each product may vary, the suitability of specific product configurations and applications must be determined by the customer and is not warranted by NEC Solutions (America), Inc.

To allow for design and specification improvements, the information in this document is subject to change at any time, without notice. Reproduction of this document or portions thereof without prior written approval of NEC Solutions (America), Inc. is prohibited.

### **Trademarks**

Windows 2000 is a registered trademark of Microsoft Corporation.

Intel is a registered trademark of Intel Corporation.

Xeon is a trademark of Intel Corporation.

All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

**PN: 456-01675-000**

**February 2003**

Copyright 2003  
NEC Solutions (America), Inc  
10850 Gold Center Drive, Suite 200,  
Rancho Cordova, CA 95670  
All Rights Reserved



---

# Contents

## Proprietary Notice

## Using This Guide

Text Conventions .....	viii
Related Documents .....	ix
Safety Notices .....	x
Safety Notices for Users Outside of the U.S.A. and Canada .....	xi
Care and Handling.....	xii

## 1 System Overview

Overview .....	1-2
Fault-Tolerant Hardware .....	1-4
System Chassis.....	1-5
Front View (Bezel Installed).....	1-5
Front View (Bezel removed).....	1-7
Rear View .....	1-9
CPU Module .....	1-11
CPU Module Board.....	1-12
PCI Module.....	1-13
PCI Module Board .....	1-14
Chassis Board Layout (Rack-mount Model).....	1-15
PCI Module LEDs.....	1-16
POWER LED.....	1-16
BMC Status LED .....	1-16
PCI Module Status LEDs (1 and 2) and Disk Access LED .....	1-18
CPU Module LEDs .....	1-19
CPU Module Status LEDs (1 and 2).....	1-19
PCI Board Slot Status LEDs .....	1-20
Hard Disk LED .....	1-20
LAN Connector LEDs.....	1-21
System Components and Module Set.....	1-22
CPU Modules.....	1-22
PCI modules.....	1-22
Storage Bays .....	1-23
PCI Adapter Cards .....	1-24
Floppy Disk Drive.....	1-25
Optional Components.....	1-26
Monitor, Keyboard, and Mouse .....	1-26
System Features .....	1-26
Xeon Processor .....	1-26
System Memory .....	1-26
SAF-TE Controller.....	1-26
BIOS .....	1-27
USB/IDE Controller.....	1-27
Network Controllers.....	1-27
SCSI Controller.....	1-28
Video Controller .....	1-28
Peripheral Controller.....	1-28

Serial Ports.....	1-28
Real Time Clock.....	1-28
Baseboard Management Controllers (BMC).....	1-29
External Device Connectors.....	1-29

## 2 Setting Up the System

Overview .....	2-2
Selecting a Site .....	2-2
Unpacking the System .....	2-3
Installation .....	2-4
Tower Model .....	2-4
Installation of Rack-mount Model.....	2-7
Connections .....	2-9
Connecting the Power Cord(s) .....	2-11
Basic Operation .....	2-12
Locking and Unlocking the Front Bezel .....	2-12
Tower Model .....	2-12
Rack-mount Model.....	2-13
Detach.....	2-13
Attach .....	2-13
Power ON.....	2-14
Power OFF.....	2-15
POST Check .....	2-15
Flow of POST.....	2-16
Behavior at Occurrence of Error .....	2-17
POST Error Messages .....	2-17
Forced Shutdown and Clear .....	2-18
Forced Shutdown.....	2-18

## 3 Configuring Your System

Configuring Your System.....	3-2
BIOS Setup Utility.....	3-3
Using the BIOS Setup Utility .....	3-3
BIOS Setup Configuration Settings.....	3-4
Main Menu .....	3-5
Advanced Menu .....	3-6
Advanced Submenu.....	3-7
Processor Information Submenu .....	3-7
Memory Information Submenu .....	3-8
Peripheral Configuration Submenu .....	3-8
Monitoring Configuration Submenu.....	3-9
Option ROM Submenu.....	3-9
Keyboard Features Submenu.....	3-10
Security Menu .....	3-11
System Hardware Menu .....	3-12
Thermal Sensor Submenu.....	3-13
Wake On Events Submenu .....	3-13
Console Redirection Submenu .....	3-13
Boot Menu.....	3-14
Exit Menu.....	3-14
Fast!Util Utility.....	3-15
Running the Fast!Util .....	3-15

---

Configuration Settings Menu .....	3-16
Host Adapter Settings Submenu .....	3-16
SCSI Device Settings Submenu .....	3-17
SCSI Bus Settings Submenu .....	3-18
Autoconfigure SCSI Device Submenu.....	3-18
Selectable Boot Settings Submenu.....	3-19
Restore Default Settings Submenu.....	3-19
Raw NVRAM Data Submenu .....	3-19
Scan SCSI Bus .....	3-19
SCSI Disk Utility .....	3-20
Select Host Adapter .....	3-20
Exit.....	3-20
Configuring System Jumpers .....	3-22
Before You Begin .....	3-22
Moving System Jumpers.....	3-24
Clearing CMOS and Password .....	3-25

## 4 CRU Replacement and Upgrades

General Information .....	4-2
Precautions .....	4-3
Preparing Your System for Upgrade.....	4-5
Opening and Closing the Front Bezel .....	4-6
Tower Model.....	4-6
Rack-mount Model .....	4-7
Detach .....	4-7
Attach.....	4-7
Replacing CPU Modules.....	4-8
Removing a CPU Module.....	4-8
Installing a CPU Module.....	4-9
Replacing or Adding Processors .....	4-11
Installing a Processor .....	4-11
Removing a Processor.....	4-16
Replacing or Adding DIMMs .....	4-19
Installing DIMMs.....	4-20
Removing DIMMs .....	4-21
Replacing a PCI Module .....	4-22
Removing a PCI Module.....	4-22
Installing a PCI Module .....	4-24
Installing PCI Adapter Boards .....	4-25
Installing a Hard Disk Drive .....	4-29
Removing a Hard Disk Drive.....	4-31
Hot-Swapping a Hard Drive .....	4-32

## 5 Problem Solving

Problem Solving.....	5-2
Static Precautions .....	5-2
Troubleshooting Checklists.....	5-3
Initial System Startup.....	5-3
Checklist .....	5-3
Running New Application Software .....	5-4
Checklist .....	5-4
After System Has Been Running Correctly .....	5-5

---

Checklist.....	5-5
Diagnostic Procedures .....	5-6
Error Checking .....	5-6
Troubleshooting Guide.....	5-6
Preparing the System for Diagnosing Problems.....	5-6
Monitoring POST .....	5-7
Verifying Proper Operation of Key System Indicators .....	5-8
Confirming Loading of the Operating System .....	5-8
Specific Problems and Corrective Actions .....	5-9
Power LED Does Not Light .....	5-9
Incorrect or No Beep Code.....	5-9
No Characters Appear on Screen .....	5-10
Characters are Distorted or Incorrect .....	5-10
Diskette Drive Activity LED Does Not Light.....	5-11
CD-ROM Drive Activity Light Does Not Light .....	5-12
Problems with Application Software.....	5-12
Bootable CD-ROM Is Not Detected.....	5-12
Problems with the Network .....	5-13
PCI Installation Tips.....	5-13
Error Messages and Beep Codes .....	5-14
MWA/ESMPRO Error Messages.....	5-14
POST Error Codes and Messages.....	5-26
How to Identify BIOS and BMC Revision Levels .....	5-34
BIOS Revision Level Identification .....	5-34
BMC Revision Level Identification .....	5-34

## **A Technical Specifications**

Server Unit.....	A-2
------------------	-----

## **B I/O Port Addresses**

I/O Port Address .....	B-2
------------------------	-----

## **Glossary**

## **Equipment Log**

## **INDEX**



---

# Using This Guide

This User's Guide provides a quick reference to information about your fault-tolerant server system. Its goal is to familiarize you with your system and the tasks necessary for system configuring and upgrading.

This guide contains the following information:

- Chapter 1, "System Overview" provides an overview of your system and describes your system's major system components. See this chapter to familiarize yourself with your system.
- Chapter 2, "Setting Up Your System" tells you how to select a site, unpack the system, assemble the rack-mount system, make cable connections, and how to use your system.
- Chapter 3, "Configuring Your System" tells you how to configure the system and provides instructions for running the BIOS Setup Utility and the Fast!Util Configuration Utility, which is used to configure SCSI devices in your system. This chapter also provides information on system board jumper settings.
- Chapter 4, "CRU Replacement and Server Upgrades" provides you with instructions on how you can access, remove, and install Customer-Replaceable Units (CRUs) and directions for upgrading your server system with additional processors, optional memory, and options cards.
- Chapter 5, "Problem Solving" contains helpful information for solving problems that might occur with your system.
- Appendix A, "Specifications" provides specifications for your server unit.
- Appendix B, "I/O Port Addresses" defines the factory-set I/O port addresses for the server.
- "Glossary" defines the standard acronyms and technical terms used in this manual.

---

# Text Conventions

This guide uses the following text conventions.

Warnings, cautions, and notes have the following meanings:

---

## **WARNING**

Warnings alert you to situations that could result in serious personal injury or loss of life.

---


---

## **CAUTION**

Cautions indicate situations that can damage the system hardware or software.

---

---

 **Note:** Notes give important information about the material being described.

---

- Names of keyboard keys are printed as they appear on the keyboard. For example, **Ctrl**, **Alt**, or **Enter**.
- Text or keystrokes that you enter appear as boldface type. For example, type **abc123** and press **ENTER**.
- File names are printed in uppercase letters. For example, **AUTOEXEC.BAT**.

---

## ***Related Documents***

In addition to this guide, the following system documentation is included with your server either as electronic files on EXPRESSBUILDER or as paper copy shipped with your server.

- *System Release Notes*  
Release Notes provide you with the latest information about your system. This information was not available to be included in your user's guide at the time it was developed and released.
- *Getting Started Sheet*  
The Getting Started Sheet provides several easy-to-follow steps to become familiar with your server documentation and to complete your installation successfully.
- *EXPRESSBUILDER User's Guide*  
The EXPRESSBUILDER User's Guide contains the instructions needed for reloading the operating system (OS) and installing ESMPRO and MWA support programs.
- *ServerCare<sup>SM</sup> Guide*  
The ServerCare Guide contains information about NEC's warranty and server registration.

---

# Safety Notices

## General Notices

---

### **WARNING**

Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance. Replace only with the same or equivalent type battery.

The CD-ROM drive uses a laser beam. Do not look or insert a mirror inside while the system is on. A laser beam is invisible; if your eyes get exposed to it, there is a risk of losing your eyesight.

This equipment uses 3-wire, grounded power cords. To prevent electrical hazards, do not remove or defeat the ground prong on the power cords. Replace a power cord if it gets damaged. The detachable power supply cords are intended to serve as the disconnect devices. Contact your dealer for an exact replacement.

The DC push-button on/off switch does not turn off the system AC power. Also, +5vdc is present within the system whenever the AC power cords are connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and/or equipment damage.

Under no circumstances should you attempt to disassemble a power supply. The power supply has no user-replaceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. A defective power supply must be returned to your dealer.

Never connect the ground wire to a gas pipe. There is a risk of a gas explosion.

The equipment weighs around 60 to 70 kg (depending on its hardware configuration). If you carry it alone, injuries may result. It takes at least four people to carry it; hold the equipment firmly by its bottom. Do not hold the front bezel, or it may become detached, causing an injury.

Immediately after powering off the system, components such as CPU processor heat sinks and hard disk drives may be very hot. Wait for the server to cool down completely before adding/removing components.

Do not attempt to remove a device while it is in operation. Device malfunction or personal injury may result.

Be careful not to get your fingers or hair caught in cooling fans located in the back of a running server.

---

- Be sure to power off the equipment and unplug its power cords from the wall outlet before installation/relocation. All voltage is removed only when the power cords are unplugged.
- Turn off your cellular phone or pager when you use the equipment. Their radio waves may cause the equipment to malfunction.

- 
- Do not use damaged power cords. (Replace it with a new one of the same type.)
  - In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type ST or SJT, 16 AWG, 3-conductor, provided with a molded-on NEMA type 5-15 P plug cap at one end and a molded-on cord connector body at the other end. The cord length must not exceed 9 feet (2.7 meters).
  - Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country. The voltage change occurs via a switch in the power supply.

### ***Safety Notices for Users Outside of the U.S.A. and Canada***

- **PELV (Protected Extra-Low Voltage) Integrity:** To ensure the extra-low voltage integrity of the equipment, connect only equipment with mains-protected electrically-compatible circuits to the external ports.
- **Remote Earths:** To prevent electrical shock, connect all local (individual office) computers and computer support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.
- **Earth Bonding:** For safe operation, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those regulations are the IEE.

---

## **Fire Related Notices**

---

### **CAUTION**

To prevent fires, and damage to the equipment and supply wiring, make sure that the rated load of the power branch circuit is not exceeded. Equipment nameplate ratings should be used when addressing this concern. For more information on installation and wiring of power-related facilities, contact your electrician or local power company.

If the equipment emits smoke, odor, or noise, immediately turn off the POWER switch, unplug the cord, and contact your sales agent. There may be a risk of a fire.

Use a wall outlet with the specified voltage rating and power type. Otherwise, there is a risk of a fire or current leakage.

Avoid installing the equipment where you may need to use an extension cord. If you use a cord that does not meet power specifications, there is a risk of overheating that could lead to a fire.

Insert the plug firmly into an outlet. Otherwise, there is a risk of heat or fire due to poor contact. If dust settles on the slots and it absorbs moisture, there is also a risk of heat or fire.

Use only the supplied power cords. If the rated current of the power cord is exceeded, there is a risk of a fire. Also observe the following prohibitions to prevent damage to cords:

- Do not pull on the cord.
- Do not pinch the cord.
- Do not bend the cord.
- Keep chemicals away from the cord.
- Do not twist the cord.
- Do not place any object on the cord.
- Do not bundle several cords.
- Do not alter, modify, or repair the cord.
- Do not staple the cord.

Use only interface cables designed for your server. Identify which component or connector to attach beforehand. If you use a wrong cable or make a wrong connection, there is a risk of short-circuit that could lead to a fire. You also have to observe the following prohibitions about handling and connecting interface cables:

- Do not use any damaged cable connector.
- Do not step on the cables.
- Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

Firmly install all power cords, interface cables and/or boards. An incompletely installed component may cause a contact failure, resulting in fire and/or smoke.

---

---

## **Shock Related Notices**

---

### **WARNING**

Do not insert a wire or metal objects into a vent or disk drive slot. There is a risk of an electric shock.

Do not let water or foreign objects (e.g., pins or paper clips) enter the equipment. There is a risk of a fire, electric shock, and breakdown. When such objects accidentally enter the equipment, immediately turn off the power and unplug the cord. Contact your sales agent instead of trying to disassemble it yourself.

Do not plug/unplug a power cord with a wet hand. There is a risk of an electric shock.

Make sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is powered off, but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire.

Unless described herein, never attempt to disassemble, repair, or alter the equipment. There is a risk of an electric shock or fire as well as malfunction.

You may want to unplug the equipment if a thunderstorm is eminent. Do NOT touch the equipment and cables during a thunderstorm in your area. There is a risk of a fire or electric shock.

Make sure to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even if the server is off-powered.

---

---

## Rack-mount Related Notices

---

### **WARNING**

To avoid a risk of injuries, users should not attempt to install the equipment into a rack. Installation should be performed by trained maintenance personnel.

It takes at least two people to carry or maneuver a rack. Otherwise, it may be dropped and cause injuries or damage to physical assets. A tall rack (such as 44U rack) is quite unstable, especially when not fixed by stabilizers.

For stability and to distribute the weight, attach stabilizers or install two or more racks together. Otherwise, the rack may topple over and cause injuries.

It takes at least two people to mount doors and trays to a rack. Otherwise, parts may be dropped causing breakage or injuries.

If you extend two or more devices from the rack at the same time, the rack may topple over on you. Extend only one device from the rack at a time.

Install the equipment into a 19-inch rack conforming to EIA standards. Do not use the equipment without a rack or install it on a nonconforming rack. Otherwise, the equipment may not function properly, and there is a risk of equipment damage or personal injury. For suitable racks, contact your sales agent.

Exercise great care not to hurt your fingers on the rail when you mount/dismount the equipment into/from the rack.

---

- **Elevated Operating Ambient Temperature** – If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient environment. Therefore, consideration should be given to installing the equipment in an environment compatible with the a maximum rated ambient temperature of 35°C. Refer to Chapter 2 on this manual for more details on room ambient temperature.
- **Reduced air Flow** – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Before pulling a server or device out of a rack**, make sure that the rack is secured by stabilizers.
- **To prevent fires**, and damage to rack equipment and supply wiring, make sure that the rated load of the power branch circuit is not exceeded. Equipment nameplate ratings should be used when addressing this concern. For more information on installation and wiring of power-related facilities, contact your electrician or local power company.
- **To prevent electrical shock**, connect all rack and rack support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.
- **For safe operation**, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those regulations are the IEE.



---

## Care and Handling

Use the following guidelines to properly handle and care for your system.



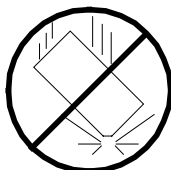
Protect the system from extremely low or high temperatures. Let the system warm (or cool) to room temperature before using it.



Keep the system away from magnetic forces.



Keep the system dry. Do not wash the system with a wet cloth or pour fluid into it.



Protect the system from being bumped or dropped.



Check the system for condensation. If condensation exists, allow it to evaporate before powering on the system.



Keep the system away from dust, sand, and dirt.

# 1

## System Overview

- Overview
- Fault-Tolerant Hardware
- System Chassis
- PCI Module LEDs
- CPU Module LEDs
- PCI Board Slot Status LEDs
- Hard Disk LED
- LAN Connector LEDs
- System Components and Module Set
- Optional Components
- System Features

---

## Overview

This server is well suited for Symmetric Multiprocessing (SMP) and Enterprise class network server environments and is a highly reliable, high-powered, fault-tolerant, high-capacity multiprocessing system based on the Intel<sup>®</sup> Xeon<sup>®</sup> processor family. It is a fully redundant system with on-line serviceability and hot plug replacement of all major subsystems and a solid performer offering the latest technology. The server is conveniently housed and available as a tower-based system (see Figure 1-1) or as a rack-mount system (see Figure 1-2) in a relatively small form factor (fits into a standard EIA 19-inch rack assembly.)

The combination of mirrored computing performance, memory capacity, and integrated I/O provides a high performance environment for many applications including network servers. The server is designed for use in applications where fault-tolerant, advanced technology, high performance, and high levels of reliability and compatibility are expected.



**Figure 1-1. Tower-Based System**



**Figure 1-2. Rack-Mount System**

---

This server is designed for full redundancy and hot plug replacement of all major subsystems. The system modules that can be replaced are identified as Customer Replaceable Units (CRUs) of which most are redundant and hot pluggable. To this end, the server includes or has the option to include the following:

- SCSI hard disk drive bays accessible from the front of the chassis.
- Hot-swap SCSI disk drive backplane; a failed drive can be removed and replaced with a new drive without system power being turned off.
- High degree of SCSI disk fault tolerance and advanced disk array management features.
- Video Graphics Array (VGA) controller with 2 MB of video memory (occupies one PCI slot per PCI module).
- SCSI disk adapter providing Ultra 160 SCSI interface for the hot swap hard disk drives.
- Embedded single channel enhanced IDE adapter providing interface for a peripheral device (CD-ROM drive).
- Integrated Network Interface Controller (NIC), supporting 10Base-T/100Base-TX/1000Base-T network systems.
- Storage module that holds up to six hot-swap SCSI hard disk drives (three logical disks).
- SCSI backpanel is Ultra2 capable.
- Integrated dual Universal Serial Bus (USB) ports that include support for the keyboard, mouse, and a USB floppy diskette drive.
- Hardware monitors (temperature, fans, and voltage) and software monitors to indicate failures.
- Easy access to all parts for service.

---

As application requirements increase, you can expand your server with additional processors, additional memory, add-in boards and peripheral devices.

Your server features the following major components:

- Up to two high-performance Xeon 2.4GB processors in each CPU module.
- Up to 3 GB of Synchronous Dynamic Random-Access (SDRAM) system memory in each CPU module.
- Three PCI expansion slots, which support one 32-bit/33Mhz and two 64-bit/33Mhz PCI adapter cards in each PCI module. One of the PCI expansion slots in each PCI module contains a graphics board.

## ***Fault-Tolerant Hardware***

The hardware architecture of the system provides fault tolerance transparency. If a hardware component fails, the application program continues processing and is never aware that a failure occurred.

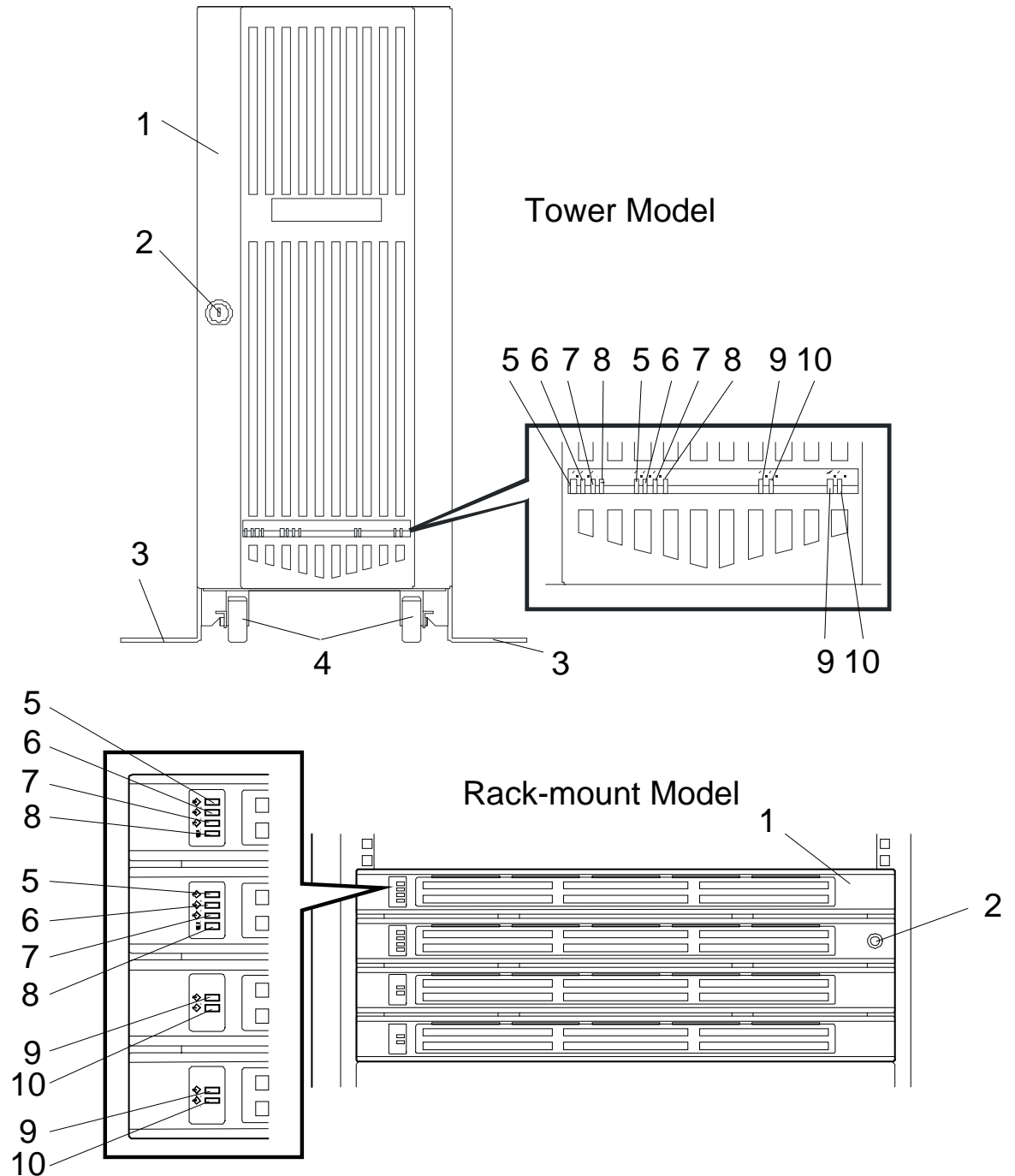
To provide system redundancy this system uses dual hardware technology. That means that all major components are mirrored within a single hardware chassis. There are two CPU modules and each CPU module is operating in lockstep (performing the same instructions at the same time) with the other as a single system. Thus, if a failure occurs in one CPU module the other CPU module will continue to operate with no interruption, no loss of data, and system performance is not affected. Note that the PCI module, PCI adapters, and power supplies are also paired for system redundancy.

# System Chassis

The system chassis is a fabricated metal structure. The following subsections describe the system chassis external view, internal view, and the system board set.

## Front View (Bezel Installed)

Figure 1-3 shows the front chassis features and controls visible with the front bezel installed.

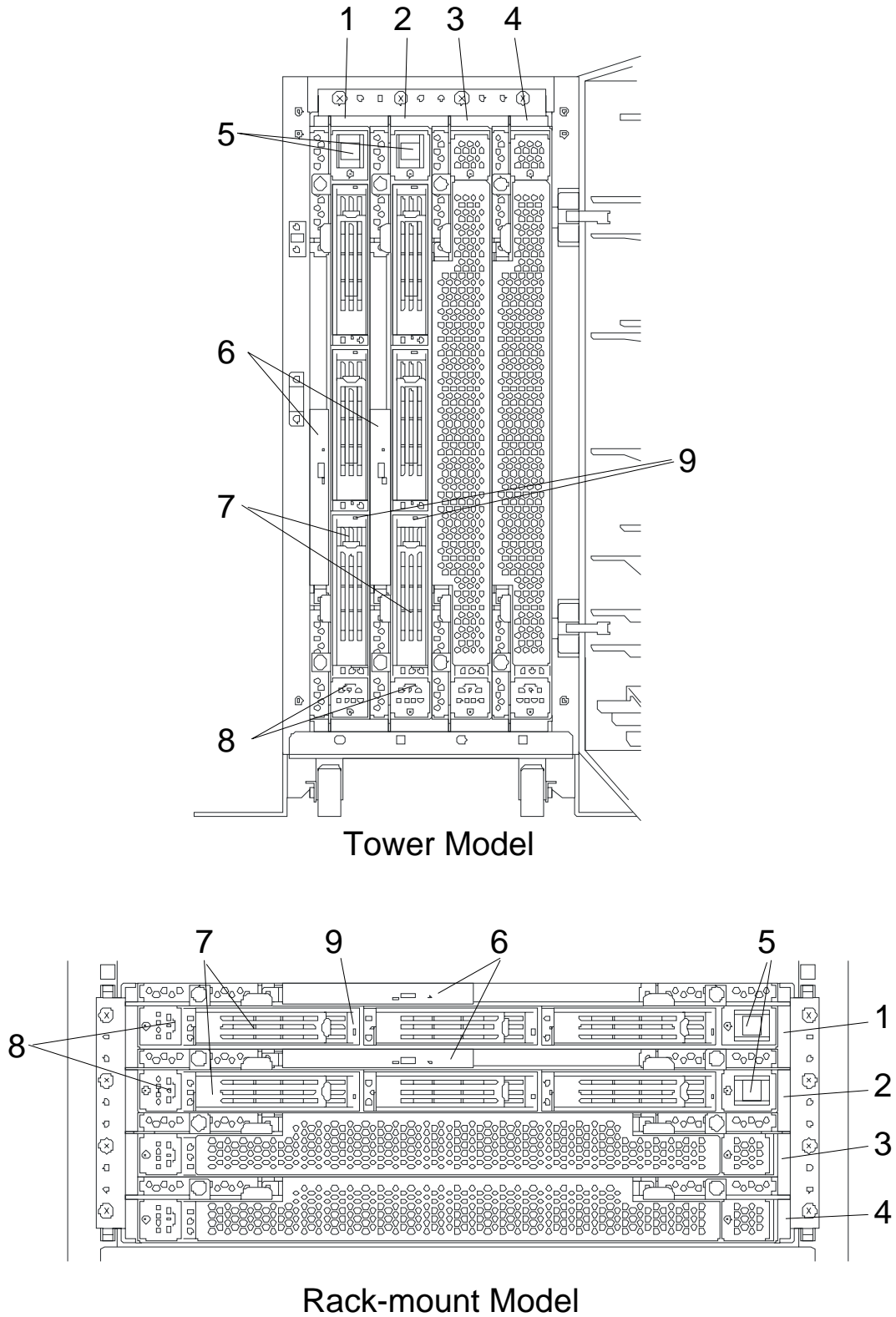


- 
- 1 Front bezel  
A door that covers internal components. You can lock it with the included security key.
  - 2 Key slot  
**Insert the security key in this slot to unlock the front bezel.**
  - 3 Stabilizers  
**Parts for stabilizing a tower-model unit.**
  - 4 Casters  
**Wheels for moving a tower-model unit.**
  - 5 BMC status LED  
See “LEDs” in this chapter for details.
  - 6 PCI module status LED 1  
See “LEDs” in this chapter for details.
  - 7 PCI module status LED 2  
See “LEDs” in this chapter for details.
  - 8 DISK ACCESS LED  
See “LEDs” in this chapter for details.
  - 9 CPU module status LED 1  
**See “LEDs” in this chapter for details.**
  - 10 CPU module status LED 2  
See “LEDs” in this chapter for details.

**Figure 1-3. Front Chassis Features and Controls (Bezels installed)**

## Front View (Bezel removed)

Figure 1-4 shows the front chassis features and controls visible with the front bezel removed.



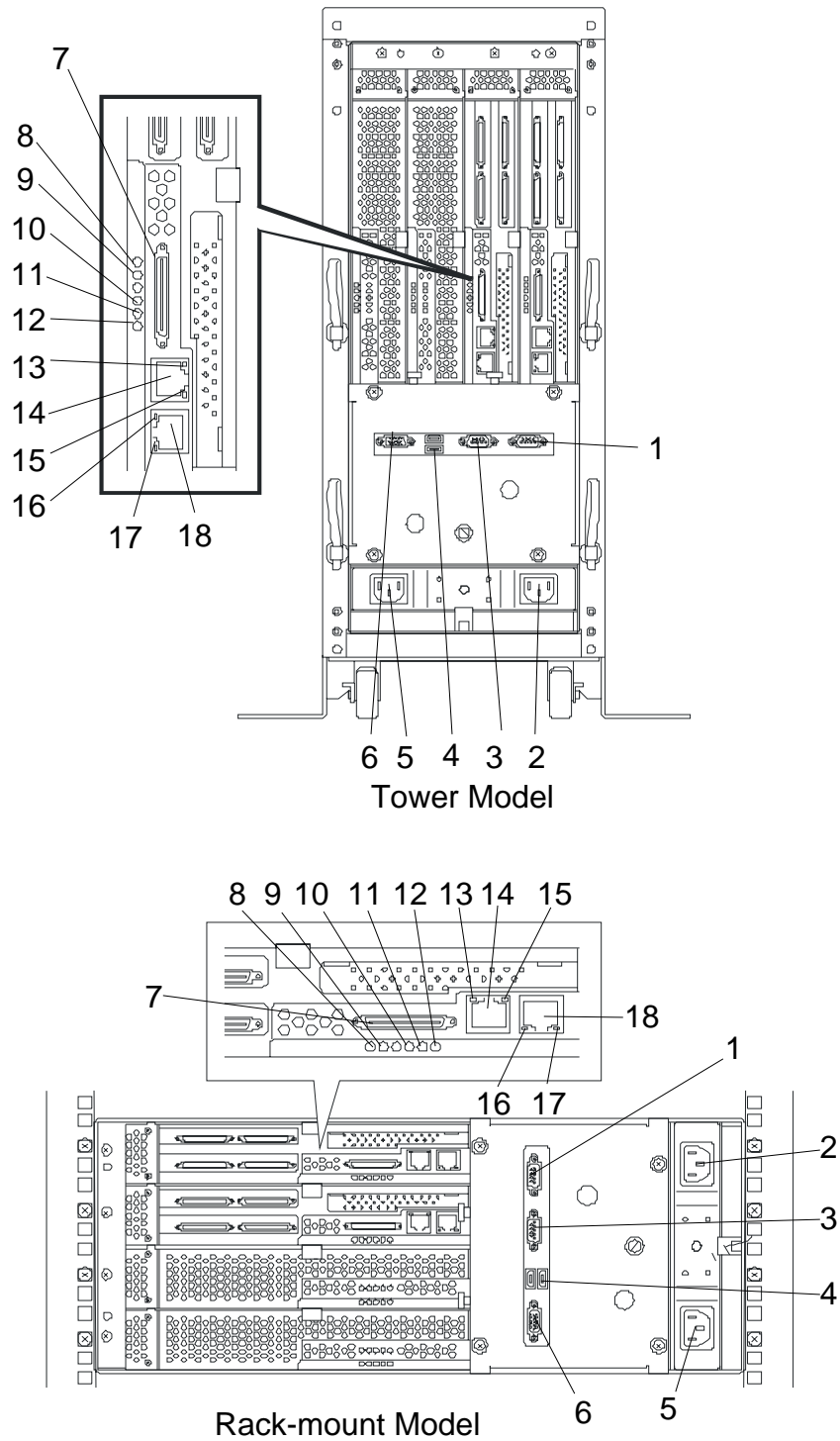


- 
- 1 PCI module (for group 1)  
A module that includes a PCI board and LAN controller.
  - 2 PCI module (for group 2)  
A module that includes a PCI board and LAN controller.
  - 3 CPU module (for group 1)  
A module that includes a CPU (processor) and memory (DIMM).
  - 4 CPU module (for group 2)  
A module that includes a CPU (processor) and memory (DIMM).
  - 5 POWER switch  
A switch for turning on/off power to the system. The POWER switch on the primary PCI module will be lit. Press it once to turn on power. Press it again to turn off power. Depress the switch for more than four seconds to force the system to power down. The POWER switch on the secondary PCI module will be unlit and will not respond until a failure in the primary PCI module causes the secondary PCI module to assume primary functionality.
  - 6 CD-ROM drive  
Used for reading data from CD-ROMs.  
Although there are two CD-ROM drives, only the one on the active primary PCI module can be used (the module with the lit POWER Switch LED).
  - 7 3.5-inch disk bay  
Slots for adding hard disks. On a tower model, they are called Slots 1, 2, and 3 from the bottom. On a rack-mount model, they are called Slots 1, 2, and 3 from the left. Slots of the same number are mirrored between the groups 1 and 2.
  - 8 DUMP switch  
A switch for outputting a memory image from the kernel to a file.
  - 9 **DISK LED (green/amber)**  
An LED that blinks in green while the hard disk is accessed. When operating in simplex mode or the hard disk fails, it will turn amber.

**Figure 1-4. Front Chassis Features and Controls (Bezels installed)**

## Rear View

Figure 1-5 shows the rear chassis features and controls visible.



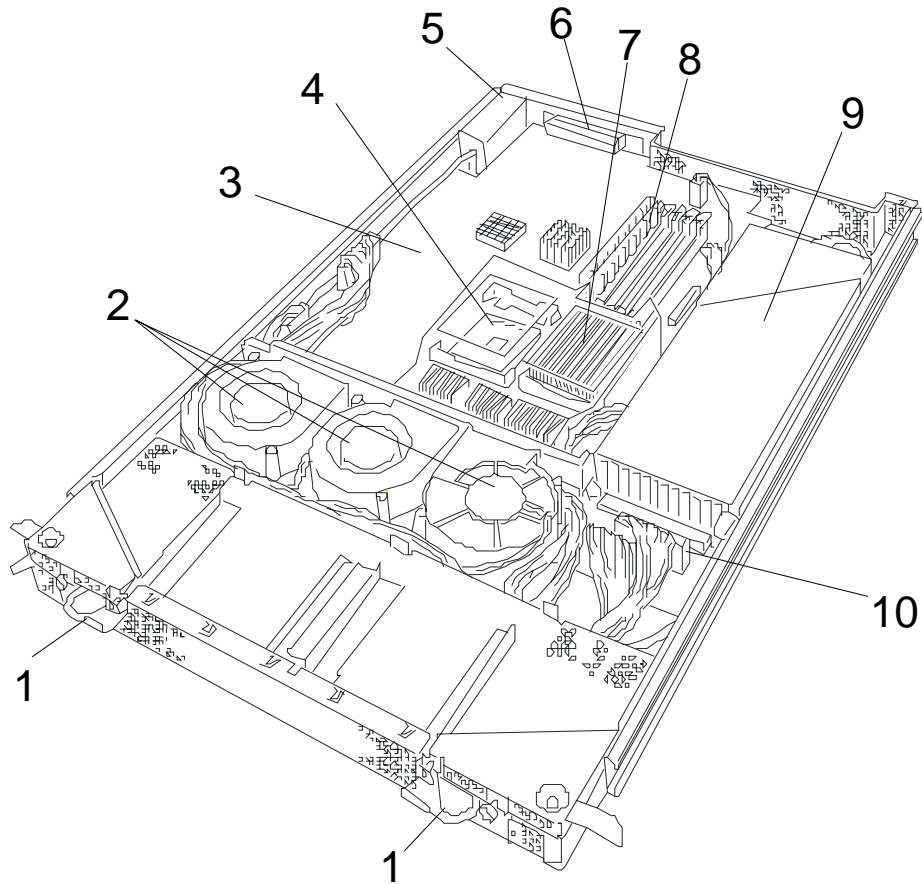
- 
- 1 **Serial port A connector**  
Connected to a device that has a serial interface. For maintenance use only.
  - 2 **AC inlet**  
PC socket for plugging a power cord.
  - 3 **Serial port B connector**  
Connected to a device that has a serial interface. For maintenance use only.
  - 4 **USB connectors 1 and 2**  
Connected to devices that support the USB interface.  
Connect the mouse/keyboard to USB 1; connect the floppy diskette drive to USB 2.
  - 5 **AC inlet**  
AC socket for plugging a power cord.
  - 6 **Monitor connector**  
Connected to the display unit.
  - 7 **SCSI connector**  
Used for connecting external SCSI devices.
  - 8 **PCI module status LED 1**  
See “LEDs” in this chapter for details.
  - 9 **PCI module status LED 2**  
See “LEDs” in this chapter for details.
  - 10 **PCI board slot status LED (Slot1)**  
See “LEDs” in this chapter for details.
  - 11 **PCI board slot status LED (Slot2)**  
See “LEDs” in this chapter for details.
  - 12 **PCI board slot status LED (Slot3)**  
See “LEDs” in this chapter for details.
  - 13 **LINK/ACT LED LAN connector 2**  
See “LEDs” in this chapter for details.
  - 14 **LAN connector 2**  
A connector for 1000BASE-TX, 100BASE-TX, and 10BASE-T. Connected to the network system on LAN.
  - 15 **100/10 LED LAN connector 2**  
See “LEDs” in this chapter for details.
  - 16 **LINK/ACT LED LAN connector 1**  
See “LEDs” in this chapter for details.
  - 17 **100/10 LED LAN connector 1**  
See “LEDs” in this chapter for details.
  - 18 **LAN connector 1**  
A connector for 100BASE-TX and 10BASE-T. Connected to the network system on LAN.

***Figure 1-5. Rear View***

---

## CPU Module

Figure 1-6 shows the internal components of the CPU Module. Both CPU modules in the server are identical.

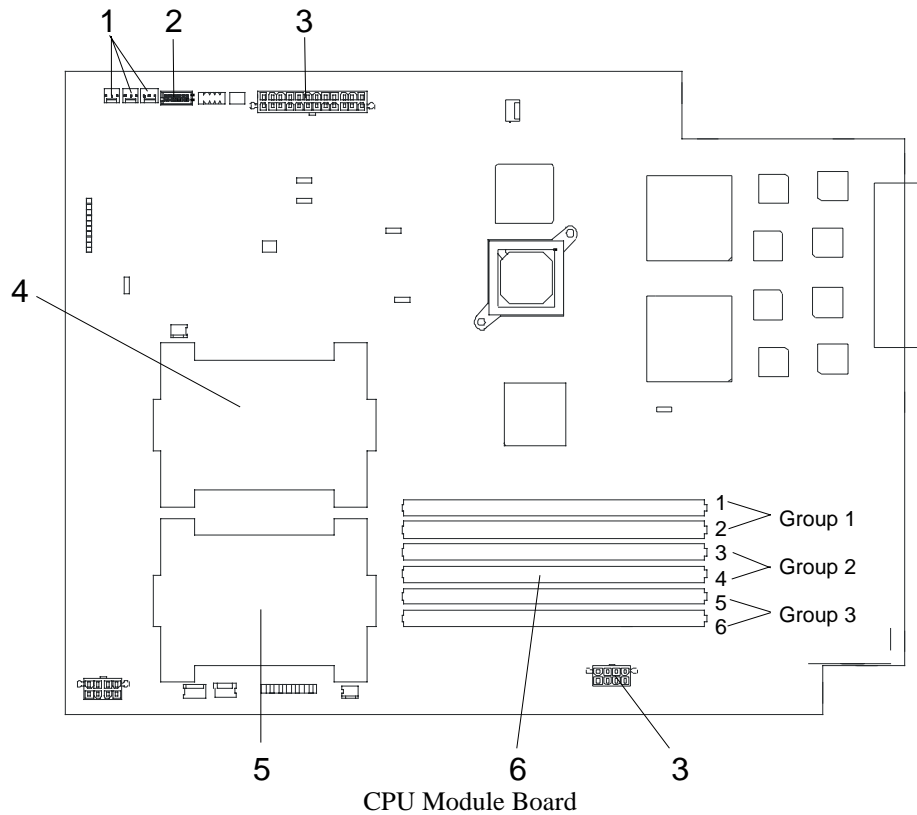


- 1 **Module handle**
- 2 **Cooling fans**
- 3 **CPU module board**
- 4 **CPU socket #2 (additional)**
- 5 **AC inlet (in the back)**
- 6 **Backboard connector (in the back)**
- 7 **CPU socket #1 (standard)**
- 8 **DIMMs**
- 9 **Power unit**
- 10 **Power backboard**

**Figure 1-6. CPU Module**

## CPU Module Board

Figure 1-7 shows the major components of the CPU module board.



- 1 Cooling fan connector
- 2 LED connector
- 3 Power connector
- 4 CPU socket #2
- 5 CPU socket #1
- 6 DIMM sockets (Slots #1 to #6 from top to bottom). Add memory modules in pairs: #1 and #2, #3 and #4, #5 and #6.)

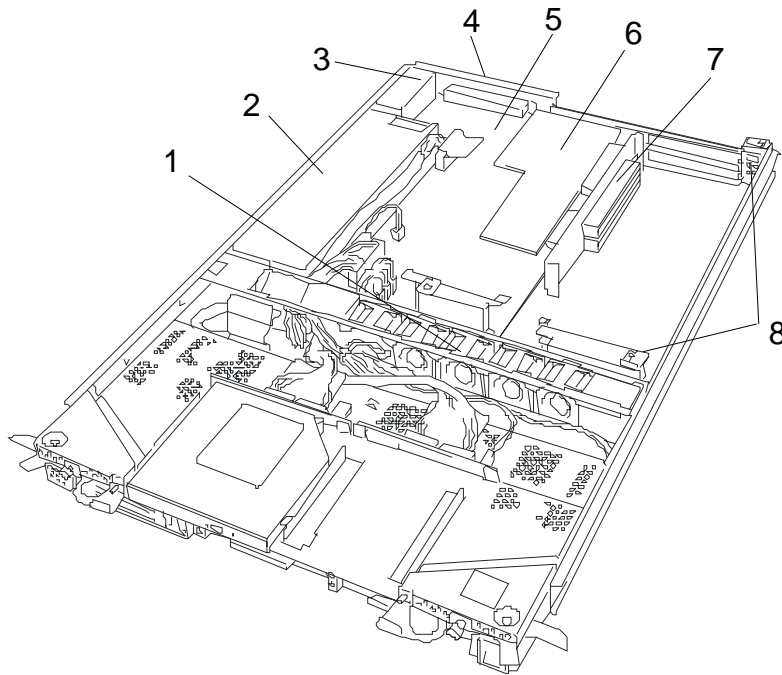
\*This section only describes connectors that are used for replacing parts or upgrading. Other connectors have been setup before shipment.

**Figure 1-7. CPU Module Board**

---

## PCI Module

Figure 1-8 shows the internal components of the PCI module. Both PCI modules in the server are identical.



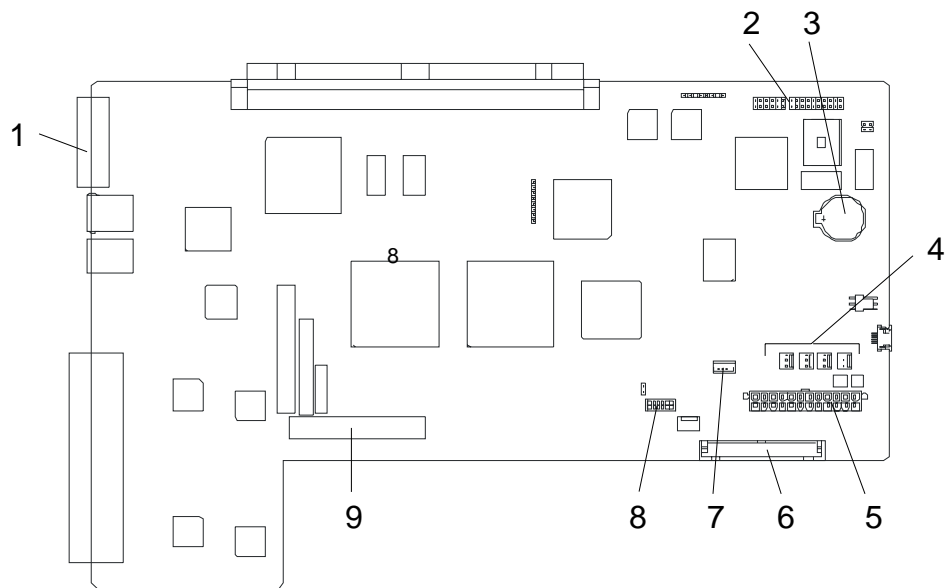
- 1 Cooling fans
- 2 Power unit
- 3 AC inlet (in the rear)
- 4 Backboard connector (in the rear)
- 5 PCI module board
- 6 Video board
- 7 PCI riser card
- 8 **PCI board retention bracket**

**Figure 1-8 PCI Module**

---

## PCI Module Board

Figure 1-9 shows the major components of the PCI module board.



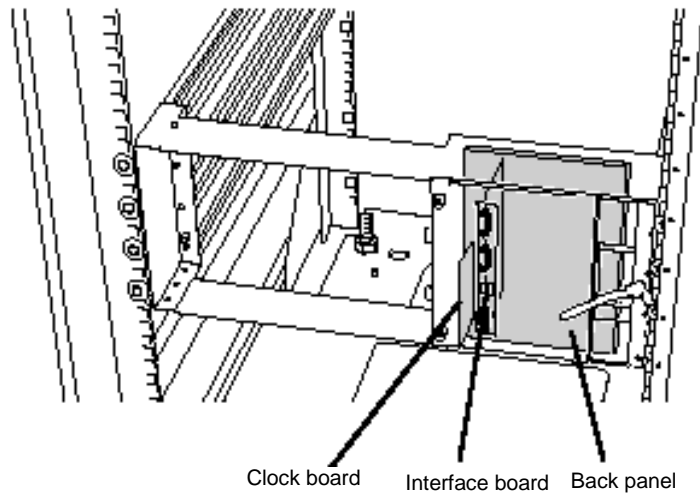
- 1 SCSI connector (external)
- 2 Configuration jumper pin
- 3 Battery (lithium battery)
- 4 Cooling fan 1 connector
- 5 Power connector
- 6 IDE connector
- 7 Power switch connector
- 8 LED connector
- 9 SCSI connector (internal)

**Figure 1-9. PCI Module Board**

---

## **Chassis Board Layout (Rack-mount Model)**

Figure 1-10 shows the location of the clock board, I/O interface board and the back panel in the rack-mount model. In the tower model, these components are located at the lower rear of the plug-in modules.



**Figure 1-10. Chassis Board Layout**



## PCI Module LEDs

This section describes the LED indicators located in the PCI Module and will assist you in determining the appropriate action to take as the result of a specific LED indications. PCI Module LEDs include the Power LED, the BMC LED, the PCI Status LEDs 1 and 2 and the Disk Access LED.

### POWER LED

The POWER switch of the primary PCI module also functions as a POWER LED. See Figure 1-4. When AC power is supplied to the modules, the POWER LED on the primary PCI module illuminates. The POWER switch on the secondary PCI module will be unlit and will not respond until a failure in the primary PCI module causes the secondary PCI module to assume primary functionality.

### BMC Status LED

The BMC Status LED located on the front of the PCI module (see Figure 1-3) indicates the status of the Baseboard Management Controller (BMC).

The LED stays green while the server is running normally. If the LED is not green, there is something wrong with the server.

The Table 1-1 shows the indications of the BMC Status LED and their meanings.

---

#### Tips:

- To determine the cause of trouble, use ESM PRO or the Off-line Maintenance Utility to view the error log.
  - When you want to restart the server, perform a shutdown if the OS allows you to shut down the system. If not, perform a reset or forced shutdown, or you can restart the server by unplug and plugging the power cord.
- 

**Table 1-1. BMC Status LED**

LED indications	Description	Action
Green	BMC operates normally and CPU and PCI modules are in duplex mode.	
Green (blinking every 1 second)	CPU or PCI modules are not in duplex mode during operation.	Remount components whose Status LED is red. If the problem persists, replace that module.
Off	AC power is all off.	Turn on the AC power.
	Performing POST.	Wait for a while; it will illuminate in green shortly after POST.
	CPU module error occurred. PCI module error occurred.	After turning off the power, turn it on to restart the system. If some error message appears on the POST screen, write it down and contact your sales agent.
Amber	Detected a fatal temperature error.	If LCD displays some error message, refer to the error message list (see Chapter 5). Check if dust is accumulated on internal fans and confirm that the fan cables are connected firmly. If the message does not disappear, contact your sales agent.

LED indications	Description	Action
	Detected a fatal voltage error.	Contact your sales agent.
Amber (blinking every 1 second)	Detected a temperature error to be warned.	If LCD displays some error message, refer to the error message list (see Chapter 5). Check if dust is accumulated on internal fans and confirm that the fan cables are connected firmly. If the message does not disappear, contact your sales agent.
	Detected a voltage error to be warned.	Contact your sales agent.
	Detected a device defect.	
	Detected a fan alarm.	If LCD displays some error message, refer to the error message list (see Chapter 5). Check if dust is accumulated on internal fans, and confirm that the fan cables are connected firmly. If the message does not disappear, contact your sales agent.
Red in one module	BMC is being dumped	Wait for a while; it will go off soon.
	PCI module may be connected incorrectly.	Check if PCI module is connected correctly. Look for loose screws.
	BMC may be out of order.	BMC firmware may need reprogramming. Contact your sales agent.
Red in both modules	Both BMCs are out of order.	Check if both PCI modules are connected correctly. Look for loose screws. If the message does not disappear, contact your sales agent.
Red (blinking every 1 second)	Revisions to BMC firmware don't match.	Contact your sales agent.
Red (blinking every 0.5 second)	Transfer of synced data after a PCI module is replaced (this is not an error).	Do not loosen a screw on PCI modules or turn off the AC power before the LED stops blinking.

## PCI Module Status LEDs (1 and 2) and Disk Access LED

The PCI module has three LEDs that combined, indicate the status of the PCI modules and hard disks. These LEDs are located on the front of each PCI module in the server and are described in Table 1-2. Refer to Figure 1-3 for the location of these three LEDs on the front of the PCI Module. The two PCI Module status LEDs are also visible from the rear of the server. Refer to Figure 1-5 for the location for these LEDs on the rear of the server.

**Table 1-2. PCI Module Status and Disk Access LEDs**

LED indications			Description	Action
1	2	Disk Access		
Off	Green	Green	Status LEDs and Disk Access LED stay green on both PCI modules, they operate normally in duplex mode.	–
			Status LEDs and Disk Access LED stay green only on one module, there is some kind of trouble with the hard disk. In this case, Status LED 2 and Disk access LED on the other PCI module stay in amber.	Check the condition of hard disk mirrors. If the problem persists, contact your sales agent.
		Off	Disk Access LED is off only on one PCI module; power is not supplied to the hard disk. In this case, Status LED 2 and Disk access LED on the other PCI module stay in amber.	Check the condition of hard disk mirrors. Remount the hard disks. If the problem persists, contact your sales agent.
	Off	Off	AC power is not supplied to the PCI modules.	Remount the PCI module. Check the condition of power unit. Check if the power cord is connected correctly. Check the condition of breaker and UPS. If the problem persists, contact your sales agent.
	Amber	Amber	Status LEDs and Disk Access LED stay amber on both PCI modules, they are shifting to duplex mode by mirroring. The PCI module is mounted correctly and operates in simplex mode.	Wait until the mirroring is finished. Start the other PCI module to use fit series features. If the problem persists, contact your sales agent.
Red	Green	Off	The PCI module is performing diagnosis.	–
	Off	Off	On standby (AC power is supplied through the cord, but the system has not been powered on yet.)	After turning on the power, wait for the OS to start. When the OS starts and duplex mode is established, the indications will get back to normal. If they do not get back to normal, remount the CPU module.
			Power is not supplied due to a failure of the CPU module.	Remount the CPU module. If the problem persists, contact your sales agent.
	Amber	Green Amber	Memory is being dumped.	

---

# CPU Module LEDs

This section describes the LED indicators assist you in determining the appropriate action to take as the result of a specific LED indications. PCI Module LEDs include the CPU Status LEDs 1 and 2.

## CPU Module Status LEDs (1 and 2)

The two CPU module LEDs combined show the status of CPU modules. These LEDs are located on the front of each CPU module on the server and are described in Table 1-3. Refer to Figure 1-3 for the location of these LEDs on the front of the CPU Module.

**Table 1-3 CPU Status LEDs**

LED status		Description	Action
1	2		
Off	Green	The CPU module operates normally in duplex mode.	–
	Off	Power is not supplied to the CPU module.	Remount the CPU module. Check the condition of power unit. Check if the power cord is connected correctly. Check the condition of breaker and UPS. If the problem persists, contact your sales agent.
	Amber	The CPU module is mounted correctly and operates in simplex mode.	Start the other CPU module to use ft series features. If the problem persists, contact your sales agent.
Red	Green	The CPU module is performing diagnosis.	–
	Off	On standby (AC power is supplied through the cord, but the system has not been powered on yet.)	After turning on the power, wait for the OS to start. When the OS starts and duplex mode is established, the indications will get back to normal. If they do not get back to normal, remount the CPU module.
		Power is not supplied due to a failure of the CPU module.	Remount the CPU module. If the problem persists, contact your sales agent.
	Amber	Memory is being dumped.	–

---

## PCI Board Slot Status LEDs

Up to three PCI boards may be installed in each PCI Module. One of these slots is dedicated to the VGA graphics board. Refer to Figure 1-5 for the location on the PCI board slot status LEDs. To show the status of PCI board slots, each PCI module has three status LEDs. The PCI Board Slot status LEDs are described in the following table.

**Table 1-4. PCI Board Slot Status LEDs**

LED indications	Description	Action
Off	PCI board is mounted correctly and operates in duplex mode.	The system operates normally.
	The PCI board is not mounted; is mounted incorrectly; or power is not supplied.	If the PCI board is not mounted or is mounted incorrectly, just mount it correctly; there is no problem. Check the condition of power unit. If the problem persists, contact your sales agent.
Amber	Performing POST; or the PCI board is mounted correctly and operates in simplex mode.	Simplex mode is not a problem. To use ft series features, attach a PCI board to a slot of the same on the other PCI module.
Red	Although the PCI board is mounted, it may be offline or not be working.	Remount the PCI board correctly. Remount the PCI module correctly. If the problem persists, contact your sales agent.

## Hard Disk LED

A hard disk LED shows the status of hard disks that are mounted in the 3.5-inch device bay. Combined, the two hard disk LEDs on PCI modules 1 and 2 show the status of the hard disks. Refer to Figure 1-4 for the location of the hard disk LEDs.

**Table 1-5. Hard Disk Status LEDs**

PCI module 1	PCI module 2	Description	Action
Green	Green	Hard disks are mirrored and operate normally.	—
Green	Amber	Some trouble occurred on the hard disk of the PCI module 1. The hard disk on the PCI module 2 is operating without mirroring.	Check the condition of hard disk mirrors. If the problem persists, contact your sales agent.
Amber	Amber	Hard disk mirroring is being performed.	Wait until the mirroring is finished.

---

### Tips:

- When there are many accesses, the access LED will blink frequently. Check if the LED blinks in green when the number of accesses decreases, or if it is green when there are no accesses anymore.
  - When you power on NEC Express5800/ft series and the access LEDs do not illuminate green, remount the hard disks.
-

---

## LAN Connector LEDs

Two LAN ports (connectors) located in the rear of the server include two LEDs each: 100/10 LED (LAN connector 1) and 1000/100/10 LED (LAN connector 2)

These LEDs show the transfer rate of the network in use. Refer to Figure 1-5 for the location of the LAN connector LEDs.

**Table 1-6. LAN Connector LEDs**

LED indications	LAN connector 1 100/10	LAN connector 2 1000/100/10
Amber	Operating as 100BASE-TX.	Operating as 1000BASE-T.
Off	Operating as 10BASE-T.	Operating as 10BASE-T.

### LINK/ACT LED

The LINK/ACT LED shows the status of a standard network port. It is green if power is supplied to the main unit and hub, and they are connected correctly (“LINK”). It blinks green while the network port sends or receives data (ACT).

When the LED does not illuminate during “LINK,” check the condition and connection of network cables. If there is nothing wrong with the cables, a defect is suspected in the network (LAN) controller. In this case, contact your sales agent.

---

# System Components and Module Set

The following sections describe the system components and module sets inside the server.

## CPU Modules

The server has two CPU modules that provide Dual Modular Redundancy (DMR). The CPU modules are numbered 1 and 2, left to right as seen from the front of the tower system. The CPU modules are numbered 1 and 2, top to bottom as seen from the front of the rack-mount system. See Figure 1-4. Each CPU module has two status indicators that are listed along with a description of each in Table 1-3. Table 1-7 summarizes the features of a CPU module.

**Table 1-7. Features of the CPU Module**

Feature	Description
Upgradable multiple processor slots	Two processor sockets are available on the CPU board for one or two processors.
Upgradable memory	Six DIMM sockets on the CPU board. Can contain a minimum of 256 MB up to a maximum of 3 GB of Synchronous Dynamic Random-Access (SDRAM) two-way interleaved system memory.
SMP	Supports two-way Symmetric Multiprocessing (SMP) when two processors are installed.
Fans	Three integrated fans that provide cooling for the CPU module.

The system runs identical applications in both CPU modules in lockstep. Thus, if one CPU module fails, the second CPU module takes over the processing without any interruption to the current application running on the system. Note that this type of failure is transparent to the user.

In simplex mode the system is operating with only one CPU module and one PCI module. Thus, the failure of one CPU module or one PCI module causes the whole system to fail. A fault-tolerant system should not run in the simplex mode for any longer than necessary for upgrading or repair.

## PCI modules

The server has two PCI modules that are CRUs, hot pluggable, and fault-tolerant. Each PCI module contains a PCI board that transfers data from PCI devices to the CPU. The PCI module is fault-tolerant such that if one stops functioning the other PCI module takes over.

The PCI modules are numbered 1 and 2, left to right as seen from the front of the tower system. The PCI modules are numbered 1 and 2, top to bottom as seen from the front of the rack-mount system. See Figure 1-4. Each PCI module includes four status indicators that are listed along with a description of each in Tables 1-1 and 1-2. Table 1-8 summarizes the features of a PCI module.

**Table 1-8. Features of the PCI module**

<b>Feature</b>	<b>Description</b>
PCI slots	Three PCI expansion card slots are available in the PCI module. Note that Slot 1 is reserved for a graphics video card.
Embedded adapters	Three embedded adapters are available as follows: – LAN X 2 – SCSI disk
Network port	Two Ethernet ports for connecting to a network from the embedded LAN adapters.

## **Storage Bays**

Each PCI module has a storage area containing three storage bays that support three hard disk drives (three logical disks). The hard disk drives are CRUs, hot pluggable, and redundant. The disk slots are physically numbered 1 – 3, bottom to top in the left PCI module (Group 1) and are physically numbered 4 – 6, bottom to top in the right PCI module (Group 2) as seen from the front of the tower system. The disk drives SCSI ID numbers are 0, 1, 2, bottom to top for each group of logical disk drives and the first mirrored pairs are physical drives 1 and 4 that contain the boot software, as shown below. See Figure 1-4 for the location of hard disk drives in the PCI modules.

<b>GROUP 1</b>	<b>GROUP 2</b>
SCSI ID 2 Disk #3	SCSI ID 2 Disk #6
SCSI ID 1 Disk #2	SCSI ID 1 Disk #5
<b>SCSI ID 0</b> <b>Disk #1</b>	<b>SCSI ID 0</b> <b>Disk #4</b>

For true dual modular redundancy, all the disk drives must be mirrored in the system, as shown below. All the disk drives must be added in pairs and only similar disks can mirror each other. Pairs include drives 1 and 4, 2 and 5, and 3 and 6.

<b>Mirrored Drives</b>	
<b>PCI Module Group 1</b>	<b>PCI Module Group 2</b>
<b>Drives</b>	<b>Drives</b>
3	6
2	5
1	4



---

Table 1-9 summarizes the features of storage bays and hard disk drives.

**Table 1-9. Features of the Storage Bays and Hard Disk Drives**

<b>Feature</b>	<b>Description</b>
Disk drives	Hot pluggable and redundant.
Disk drive speeds and storage capacity	Disk drive spindle speeds of 10,000 RPM for 36Gb and 73GB storage capacity disk drives; 15,000 RPM for 18GB storage capacity disk drives.
Disk drive carrier	Each disk drive is mounted in a disk drive carrier containing a handle, latching mechanism, and two status indicators. The status indicators are listed along with a description of each in Table 1-5.
Storage bays	The storage bays can contain any combination of disk drive carriers and dummy disk drive carriers as long as equivalent drives are mirrored. DO NOT remove dummy disk drive carriers from unused slots. They are present to direct airflow around the devices.

## **PCI Adapter Cards**

For fault-tolerant systems the 32/64-bit PCI adapter cards must be installed in the PCI modules as redundant pairs. This is so that if a PCI card fails in one PCI module its equivalent PCI card in the other PCI module takes over the I/O operation without the processing being interrupted or having any loss of data or performance.

Located on the rear of each PCI module are PCI adapter-slot status LEDs that monitor the status of each PCI card. See Table 1-4 for a list and description of these PCI adapter-slot status LEDs.

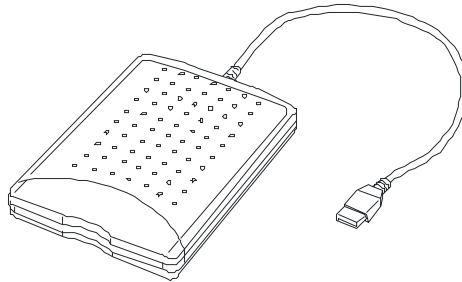
---

## **Floppy Disk Drive**

A USB floppy disk drive is attached to the server. It allows you to read and write (save) data using floppy disks. See Figure 1-11.

The USB floppy disk drive accepts the following types of floppy disks:

- 2HD floppy disk (1.44MB)
- 2DD floppy disk (720KB)



**Figure 1-11. External Floppy Diskette Drive**

Drive letter of floppy disk drive

The drive letter will change when the primary PCI module is switched to the standby PCI module while the Windows 2000 operating system is in operation. The drive letter of the floppy disk will be determined as follows:

“A” will be assigned to the floppy disk drive for the PCI module that is operating as the primary PCI module during Windows 2000 operating system boot-up. “B” will be assigned to the floppy disk drive for the standby PCI module.

Only the floppy disk drive of the primary PCI module will be recognized by the Windows 2000 operating system. The floppy disk drive of the secondary PCI module will not be recognized. (Only one floppy disk drive is recognized at any given time.)

Ex) Primary PCI module connects the floppy disk drive to the group 1 for the first time, initial floppy disk drive connection made when the primary PCI module is group 1.

Primary PCI module

PCI module (for group 1): A drive

PCI module (for group 2): B drive

---

**IMPORTANT:** In the event that the active PCI module switches to the standby PCI module due to a failure while the system is in operation, the floppy disk drive letter will change at the point PCI module switches to the standby module.

---

---

## Optional Components

Optional components are described in the following subsections.

### *Monitor, Keyboard, and Mouse*

The system does not require a monitor, keyboard, or mouse for most server management functions other than the initial boot, system upgrading, or system troubleshooting.

USB-compatible keyboard and mouse connectors are available on the rear of the system.

Support for a colored VGA monitor is also available by using the VGA monitor connector available on the rear of the system.

## System Features

The following subsections provide a description of the system features.


### **Xeon Processor**

Depending on system configuration, each CPU CRU can include up to two Xeon 2.4GHz processors, see Figure 1-7. Each processor is mounted on the CPU board located in the CPU module. Each processor plugs into a Zero Insertion Force (ZIF) socket on the board. The processor features a 512 KB cache. An optional second Xeon processor enhances performance and allows Symmetric Multiprocessing (SMP).

### **System Memory**

Up to 3 GB of Synchronous Dynamic Random-Access Memory (SDRAM) can be configured on the CPU board located in the CPU module. The CPU board contains six 168-pin DIMM sockets allowing for system memory expansion within a CPU module. See Figure 1-7.

---

 **Note:** Only use DIMMs approved for use in this server. Call your customer service representative for information.

---

### **SAF-TE Controller**

The SCSI backplane has a SAF-TE (SCSI Accessed Fault Tolerant Enclosure) controller that provides an interface to a disk subsystem that supports status signals, hot swapping drives, and module monitoring.

The transport mechanism for the standardized alert detection and status reporting is the SCSI bus. Disk drives are continually monitored and the conditions are reported over the SCSI bus to the system. This allows the user to react to conditions that could normally go unnoticed until data loss.

---

## **BIOS**

The BIOS and Setup Utility are located in the Flash EPROM on the CPU board and include support for system setup and legacy device configuration. A number of security, reliability, and management features also have been incorporated to meet vital server needs.

## **USB/IDE Controller**

The ServerWorks ROSB chip supports the USB and IDE controllers. The I/O panel board provides the connector interface for two USB ports that support the keyboard/mouse and floppy diskette drive.

The system includes a single channel enhanced IDE 32 bit interface. The IDE controller provides support for the internally mounted CD-ROM.

The device controls:

- PIO and DMA transfer modes
- Mode 4 timings
- Transfer rates up to 33 MB/s
- Buffering for PCI/IDE burst transfers.

## **Network Controllers**

Each PCI CRU includes a 10BASE-T/100BASE network controller and a 10BASE-T/100BASE-TX/1000BASE-T network controller. As a PCI bus master, the controller can burst data at up to 132 MB/sec. The controller contains two receive and transmit FIFO buffers that prevent data overruns or underruns while waiting for access to the PCI bus. The controller has the following:

- 32-bit PCI bus master interface for 10BASE-T/100BASE and a 64-bit PCI bus master interface for a 10BASE-T/100BASE-TX/1000BASE, compatible with *PCI Bus Specification, Revision 2.1*
- Chained memory structure with improved dynamic transmit chaining for enhanced performance
- Programmable transmit threshold for improved bus utilization
- Early receive interrupt for concurrent processing of receive data
- On-chip counters for network management
- Autodetect and autoswitching for 10 or 100 Mbps network speeds
- Support for both 10 Mbps, 100 Mbps and 1000Mbps networks, capable of full or half duplex, with back-to-back transmit at 100 Mbps
- Support for Wake On LAN.

---

## **SCSI Controller**

The PCI board includes an embedded QLogic ISP12160A SCSI dual channel controller for supporting the hard disk drives in the storage bays. It is a 64-bit direct memory access (DMA) bus master and a 64-bit PCI bus at 33 MHz. This SCSI controller interfaces the PCI bus to two Ultra 160 SCSI buses. The SCSI controller is fully autonomous and capable of managing multiple I/O operations and data transfers without host intervention.

## **Video Controller**

The system has an integrated Intel CT69000 HiQVideo™ Accelerator highly integrated graphics controller that supports the following:

- BIOS compatibility with 1/4VGA, VGA, SVGA, XGA, and SXGA
- 2 MB of onboard synchronous DRAM (SDRAM) embedded memory
- Superb 2D video performance
- Analog VGA monitors (single and multiple frequency, interlaced and noninterlaced) with a maximum vertical retrace noninterlaced frequency of 100 Hz.

## **Peripheral Controller**

The Super I/O integrated peripheral controller supports two enhanced serial ports (UARTs) and an integrated Real Time Clock (RTC) module. The I/O panel board provides the connector interface for each serial port.

### *Serial Ports*

The serial ports (UART1 and UART 2) provide data rates up to 1.5 Mbaud and 13 IRQ channel options. When disabled, serial port interrupts are available to add-in boards.

### *Real Time Clock*

The real-time clock (RTC), which is located in the PCI module on the PCI board, provides system clock/calendar information stored in a non-volatile memory (NVRAM). The real-time clock battery provides power backup for the real-time clock. See Figure 1-10.

The RTC battery may need to be replaced because of its battery life span. The battery powers the clock in the absence of power. When the battery starts to weaken, it loses voltage, and the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

The RTC battery (Vendor Part No. CR2032) is available through many vendors. Contact your sales representative or dealer for a list of approved devices.

---

## **Baseboard Management Controllers (BMC)**

Server management is concentrated in the Baseboard Management Controllers (BMC). The BMCs and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The BMC supports the Management Workstation Application (MWA), which allows remote server management via a modem, LAN, or direct connection to a manager system. Events monitored by the manager system include over-temperature and over-voltage conditions or fan failure.

Information on the Management Workstation Application (MWA) in the ESMPRO Suite User's Guide on the ESMPRO CD-ROM.

One major function of the BMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, or fan failure. To enable accurate monitoring, the BMC maintains the nonvolatile Sensor Data Record (SDR), from which sensor information can be retrieved. The BMC provides an ISA host interface to SDR sensor information, so that software running on the server can poll and retrieve the server's current status.

The BMC performs the following:

- Monitors server board temperature and voltage
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking and diskette write-protect monitoring
- Controls Wake On LAN via Magic Packet support.

## **External Device Connectors**

The external device I/O connectors located on the I/O panel board (see Figure 1-6) provide support for two USB ports that support a mouse/keyboard and a floppy diskette drive and two serial port connectors, and a VGA monitor port.

---

The external device I/O connectors located on each PCI module (see Figure 1-6) provide support for two LAN ports and a SCSI connector for connecting external SCSI devices.

# 2

## Setting Up the System

- Overview
- Selecting a Site
- Unpacking the System
- Installation
- Connections
- Connecting the Power Cord(s)
- Basic Operation
- Power ON
- Power OFF
- POST Check
- Forced Shutdown and Clear



---

# Overview


This chapter describes how to select a site, unpack the server, make cable connections, and power on the tower-based or rack-mount server units.

## Selecting a Site

The server operates reliably in a typical office environment. Choose a site that is:

- Near grounded, three-pronged power outlets.

---

 **Note:** For the United States and Canada, this means a NEMA 5-15R outlets for 100-120 VAC. For other international sites, this means three-pronged power outlets applicable for the electrical code of the region.

---

---

### **WARNING**

Be sure the power service connection is through a properly grounded outlet.

---

---

### **CAUTION**

The power plugs must be plugged into the same common ground power outlets.

---

- Clean, dust-free, and well ventilated. Front and rear ventilating openings kept free of obstructions. Away from sources of heat, vibration or physical shock.
- Isolated from strong electromagnetic fields and electrical noise produced by electrical devices (such as air conditioners, large fans, large electric motors, radio and TV transmitters, and high-frequency security devices)
- Spacious enough to provide at least 15 inches (38.1 centimeters) behind and on each side of the server and at least 32 inches (81.3 centimeters) in front of the server for proper cooling, airflow, and cable clearance.
- Easily accessible for server maintenance and installation of server upgrades.

---

# Unpacking the System

---

## **WARNING**

Your server weighs approximately 132 pounds (60 kg). If your server contains numerous optional boards and peripheral devices, it will weigh more. To avoid personal injury, make sure you have someone help you lift or move the server.

---

When you receive your server, if the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

---

### **IMPORTANT:** Accessories

---

- Keep the accessories in a safe place. You will need them when you perform setup, addition of options, or replacement of failed components.
  - Make backup copies of included floppy disks, if any. Keep the original disks as the master disks.
  - Improper use of an included floppy disk or CD-ROM may alter your server performance.
-

# Installation


This section describes installation of your server.

## Tower Model

**IMPORTANT:** The server is a precision instrument. Handle it with care.

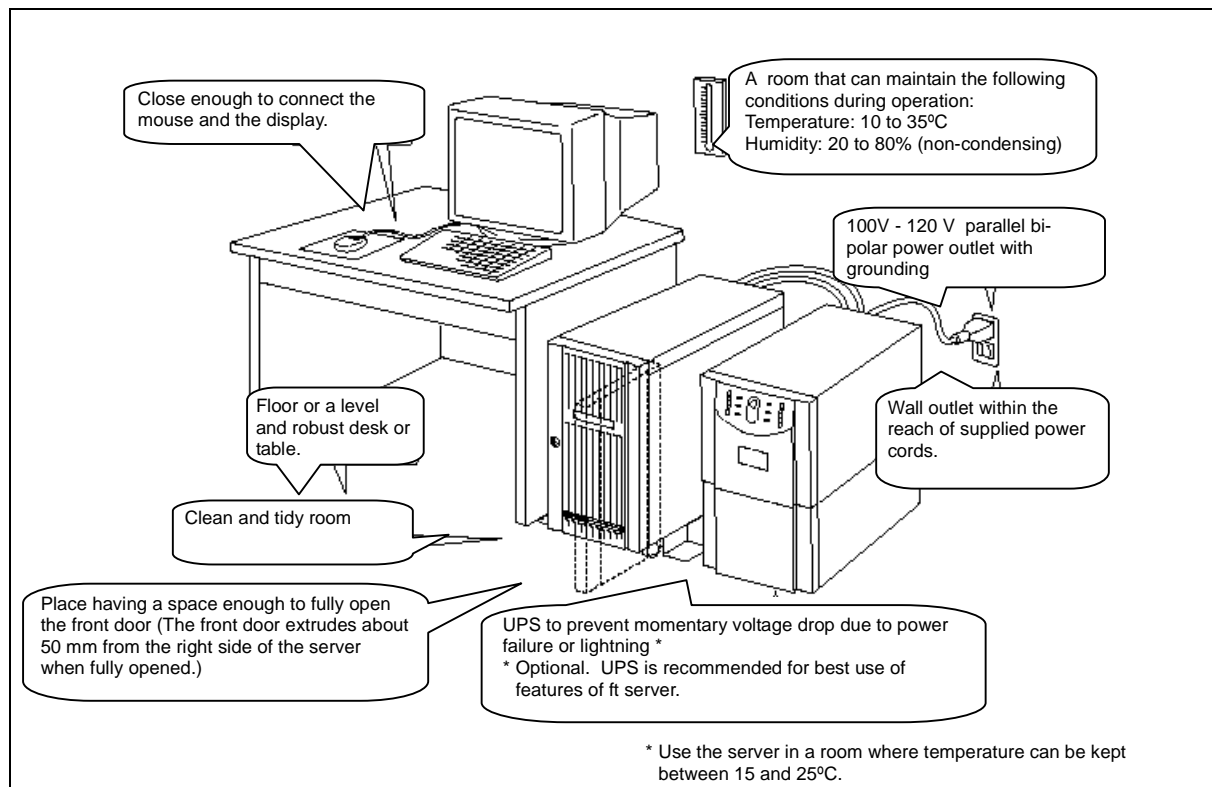
Select a suitable location for the tower model.

**⚠ CAUTION**



Observe the following instructions to use this equipment safely. Failure to follow these instructions could cause a burn, injury, or damage to physical assets.

- Do not lift the equipment alone.
- Do not install the equipment in non-designated places.



Do not install the server in the locations listed below. Otherwise, the server may malfunction.

- A location where temperatures change widely (near a heater, air conditioner, or refrigerator).
- A location that is subject to intense vibration.

- 
- A location where corrosive gas (sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, or ozone) is generated, or a location that is close to chemicals or exposed to chemicals.
  - A location whose floor is covered with non-antistatic carpet.
  - A location that may be subject to falling objects.
  - A location where you may step or trip on the power cords or interface cables.
  - A location that is close to equipment that generates intense magnetic field (e.g., TV set, radio, broadcasting/communications antenna, power transmission wire, and electromagnetic crane). (If unavoidable, contact your sales agent to request proper shield construction.)
  - A location where the power cord of the server must be connected to an AC outlet that shares the outlet of another device using large power consumption.
  - A location that is close to equipment that causes power noises (e.g., sparks caused by power-on/off using a relay). If you must install the server close to such equipment, request your sales agent for separate power cabling or noise filter installation.

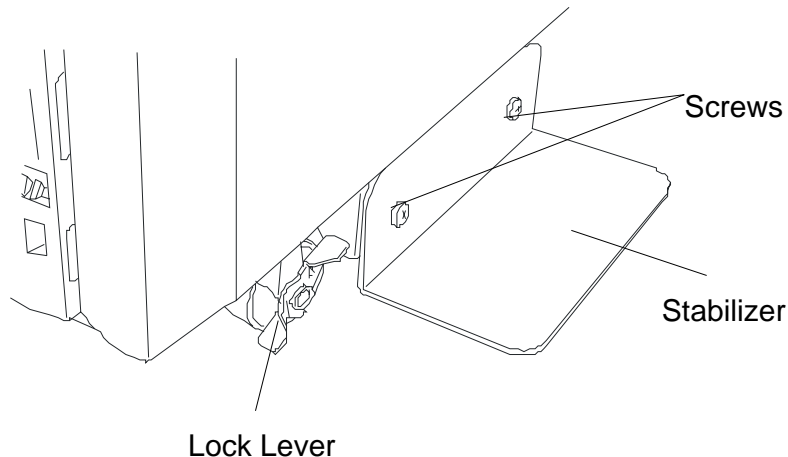
---

**⚠ WARNING**

It takes at least four people to safely carry the server; hold it firmly by its bottom and place it slowly at the selected site.

---

After positioning the server, lock its two front casters and screw the attached four stabilizers onto the cabinet adjusting their height as required.



**Figure 2-1. Tower Model Lock and Stabilizer Locations**

---

After installing the server, open its front door and install the CPU and PCI modules. For details, see the following section “Installation of Rack-mount Model.” Procedures are basically the same for the tower model, except that its modules are mounted vertically instead of horizontally.

---

**IMPORTANT:** Follow the procedures below to install the CPU and PCI modules. Note the following before installing these module.

- Confirm the server is immobilized.
  - Place removed modules to the side of the server. Do not place modules on top of the server.
  - It takes at least two people to install the modules; install them slowly and carefully.
  - If the modules do not install smoothly, remove them and try again.
  - Install the CPU modules in the right two slots, the PCI modules in the left two slots. CPU and PCI modules will only install into their proper slots.
  - Perform installation starting at the left-most slot.
-


---

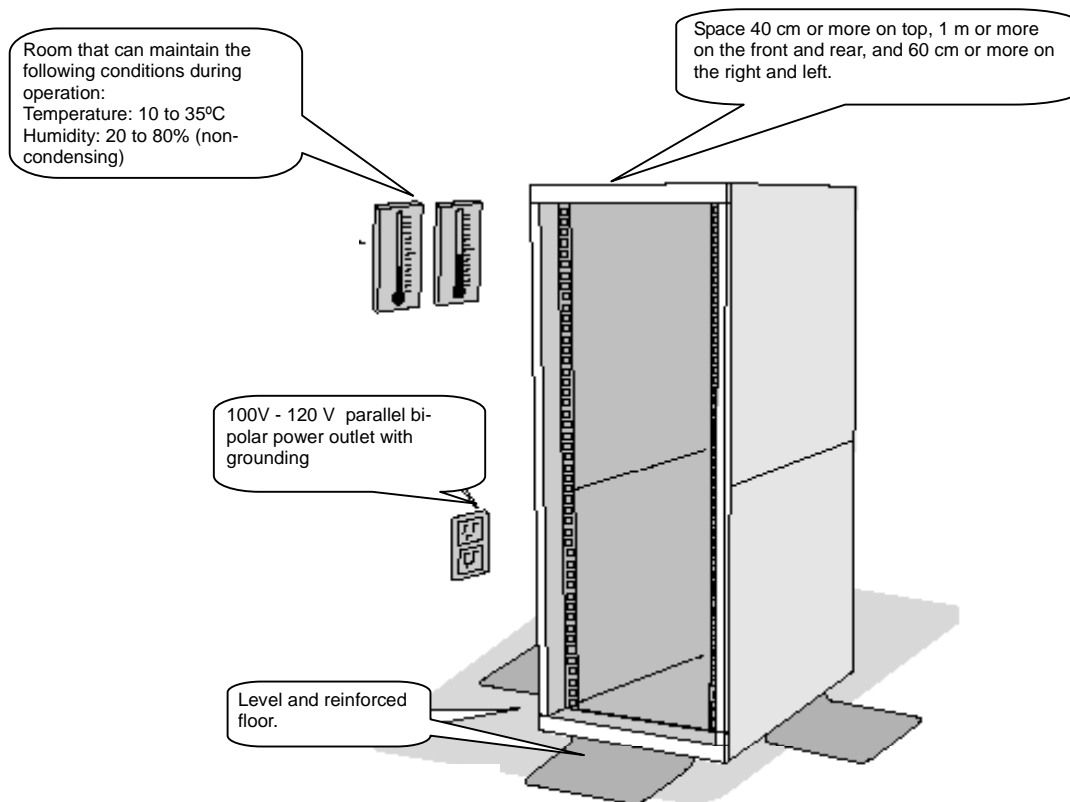
## Installation of Rack-mount Model

**IMPORTANT:** The server is a precision instrument. Handle with care.

---

Mount the server in a rack that conforms to the EIA standards. To install a rack, contact your sales agent or maintenance personnel.

<b>⚠ CAUTION</b>	
	To avoid the risk of personal injury, users should not attempt to install the server into the rack assembly. The server should be installed in the rack only by trained maintenance personnel.



---

**⚠ WARNING**



Observe the following instructions to use the server safely. Failure to follow these instructions could lead to a death or serious injury.

- Do not install the equipment in non-designated places.
- Do not connect the ground wire to a gas pipe.

**⚠ CAUTION**



Observe the following instructions to use the equipment safely. Failure to follow these instructions may cause a burn, personal injury, or damage to physical assets.

- Do not carry or install the equipment alone.
- Do not install the equipment in such a manner that its weight is imposed on a single place.
- Do not assemble or disassemble parts alone.
- Do not pull a device out of the rack if it is unstable.
- Do not leave two or more devices pulled out from the rack.
- Do not install excessive wiring.

Do not install the server in the locations as listed below. Otherwise, the server may malfunction.

- A location where temperatures change widely (near a heater, air conditioner, or refrigerator).
- A location that is subject to intense vibration.
- A location where corrosive gas (sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, or ozone) is generated, or a location that is close to chemicals or exposed to chemicals.
- A location whose floor is covered with non-antistatic carpet.
- A location that may be subject to falling objects.
- A location where you may step or trip on the power cords or interface cables.
- A location that is close to equipment that generates intense magnetic field (e.g., TV set, radio, broadcasting/communications antenna, power transmission wire, and electromagnetic crane). (If unavoidable, contact your sales agent to request proper shield construction.)
- A location where the power cord of the server must be connected to an AC outlet that shares the outlet of another device using large power consumption.

- 
- A location that is close to equipment that causes power noises (e.g., sparks caused by power-on/off using a relay). If you must install the server close to such equipment, request your sales agent for separate power cabling or noise filter installation.

---

**IMPORTANT:** Temperature increase inside the rack and airflow

If you install several components or the ventilation isn't good inside the rack, the internal temperature may increase due to heat emitted from the components. When the operating temperatures of the server (10° to 35°C) are exceeded, there is a risk of server malfunction. You must take adequate precautions and measures for airflow inside the rack as well as in the room so that the internal temperature can be kept within this range during operation.

---

## Connections

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure below illustrates available peripheral devices for the server in the standard configuration, and locations of the connectors for the devices. After connecting the peripheral devices, connect the provided power cords to the server, then plug the power cord into the power outlet.

### WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions could lead to a death or serious injury.

- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

### CAUTION



Observe the following instructions to use the equipment safely. Failure to follow these instructions may cause a burn, personal injury, or damage to physical assets..

- Do not plug the power cord in a nonconforming outlet.
- Do not plug too many cords in a single outlet.
- Do not plug the cord insecurely.
- Do not use nonconforming power cords.



---

**IMPORTANT:**

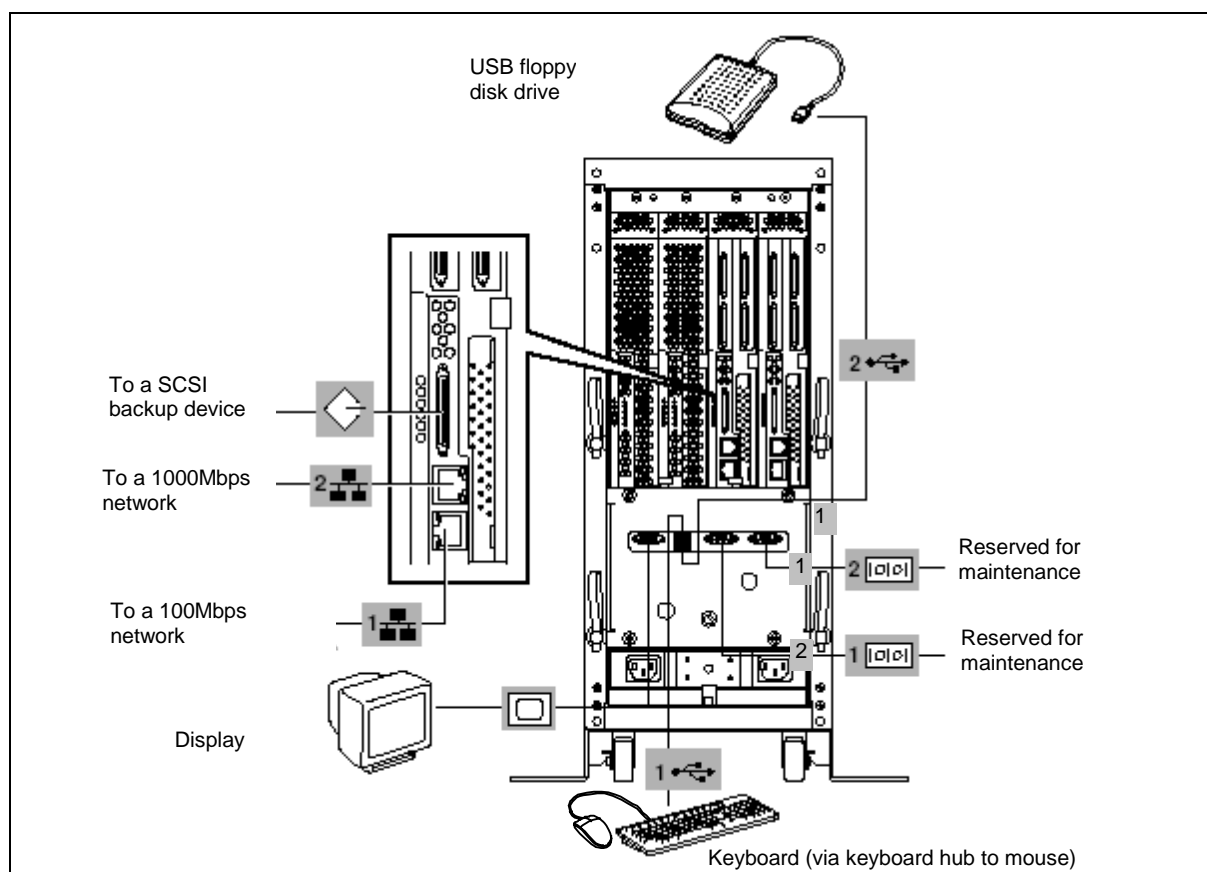
- Power off the server before connecting peripheral devices, with the exception of peripherals with USB interface. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
  - To connect a third-party peripheral device or interface cable to the server, check with your sales agent to see if they are compatible with the server. Some third-party devices may not be used with the server.
  - The total cable length of SCSI device connections is up to 6 m, including the internal SCSI cables.
  - The serial port connectors are reserved for maintenance.
- 

A tower model is shown in the following illustration. However, connections are the same for a rack-mount model, except that its modules are mounted horizontally.

---

**IMPORTANT:** Place the USB floppy disk drive on top of the tower cabinet. However, to place it on a rack-mount model, put a distance of one unit between the disk drive and the module.

---



---

**IMPORTANT:** Connection of optional devices

- In the standard configuration, complete setup of the operating system before installing optional PCI cards or hard disks.
-

---

After connecting cables to PCI modules, secure them with the cable ties.

When completing connections to peripheral equipment, secure the cables with the cable tie provided on the server.

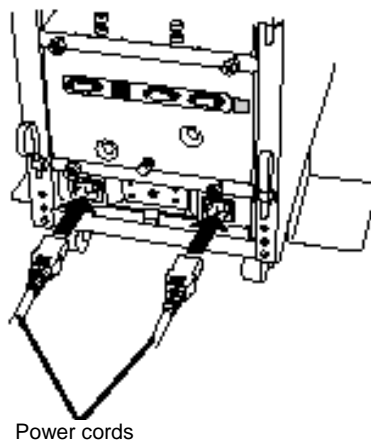
## ***Connecting the Power Cord(s)***

Plug the female end of each AC power cord into the input receptacle(s) on the rear of the server unit chassis. Plug the male end of the power cord into NEMA 5-15R outlet for 100-120 VAC or optional UPS AC outlets. Most optional Uninterruptible Power Source (UPS) units have a 30 amp plug that requires a special L5-30R connector that is plugged into a 100-120 VAC outlet.

If the power cord(s) supplied with the server are not compatible with the AC wall outlet in your region, obtain a suitable power cord that meets the following criteria.

- The power cord must be rated for the available AC voltage and have a current rating that is at least 125% of the current rating of the server.
- The power cord connector that plugs into the wall outlet must be terminated in a grounding-type male plug designed for use in your region. It must have certification marks showing certification by an agency acceptable in your region.
- The power cord connector that plugs into the server must be an IEC- type CEE-22 female connector.
- The power cord must be less than 1.8 meters (6.0 feet) long.

When connecting the power cord to a power control unit, such as an UPS confirm that the power control unit is powered off. Connecting the power cord while power is supplied to the power control unit may cause a failure.



***Figure 2-2. Connecting the Power Cords***

---

# Basic Operation

This section describes basic operation procedures of the server.

## Locking and Unlocking the Front Bezel

The front bezel covers built-in components of the server such as the POWER switch, CD-ROM drive, and hard disks.

The tower model server has a door-type bezel (it can also be detached). The rack-mount model server has a cover-like detachable bezel

You need to open the front bezel to access the POWER switch, CD-ROM drive or hard disk.

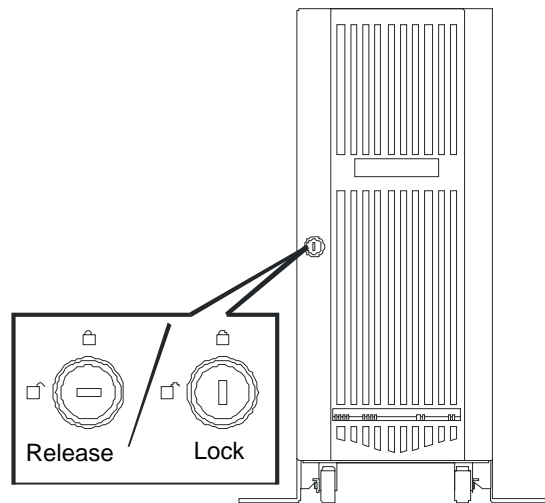
---

### IMPORTANT:

- Without using the security key, you cannot open or detach the front bezel.
  - It is not recommended to use the server with its bezel detached.
- 

## Tower Model

Insert the security key into the slot and turn it to release the lock. Hold the handle on the left side of the bezel and pull it. After closing the front bezel, lock it with the key for security. See Figure 2-3.



**Figure 2-3. Unlocking the Front Bezel (Tower Model)**

---

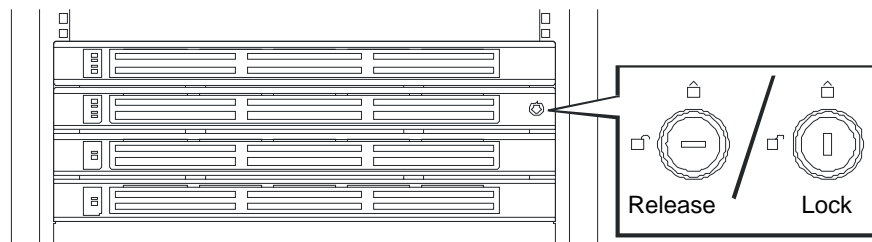
## ***Rack-mount Model***

The rack-mount model server is equipped with a detachable front bezel. See Figure 2-4.

### ***Detach***

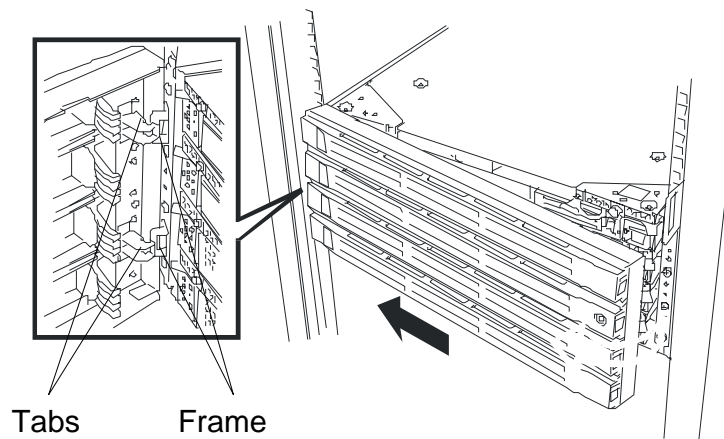
Follow the steps below to detach the front bezel:

1. Insert the security key into the slot and turn it with a little pressure to release the lock.



***Figure 2-4. Unlocking the Front Bezel (Rack-mount Model)***

2. Hold the right side of the front bezel lightly and pull it open.
3. Detach the bezel from the main unit by sliding it to the left a little to disengage the tabs from the frame. See Figure 2-5.



***Figure 2-5. Opening the Front Bezel (Rack-mount Model)***

### ***Attach***

To attach the front bezel, engage the tabs on the frame on the left side of the main unit. After attaching and closing the front bezel, lock it with the key for security.

---

# Power ON

Follow the steps below to turn on the power. (A rack-mount model is shown here for convenience of explanation. However, the steps are the same for a tower model except that the modules are mounted vertically.)

1. Power on the display unit and other peripheral devices connected to the server.

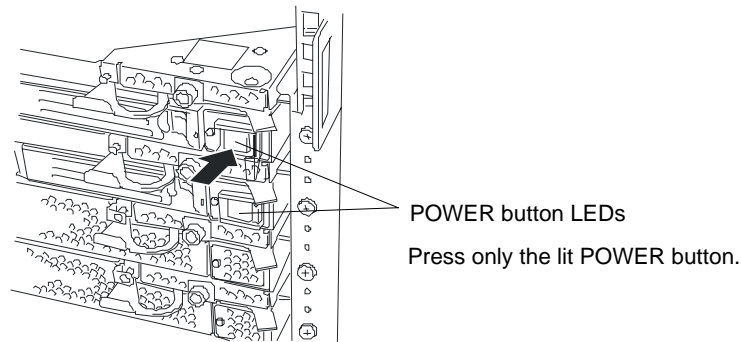
---

**NOTE:** If the power cord is connected to a power controller like a UPS, make sure that it is powered on.

---

2. Open the front bezel (or detach it in the case of a rack-mount model).
3. Each PCI module includes a power button, however only one of the power buttons will be lit. Press the lit POWER button located on the PCI module. See Figure 2-6.

The logo appears on the display screen.



**Figure 2-6. PCI Module Power Button Location**

---

**IMPORTANT:** Do not turn off the power before the logo appears.

---

While the logo is displayed on the screen, the server is performing a power-on self test (POST). For details, see "Check by POST" described later in this manual. Upon the completion of POST, Windows 2000 Advanced Server loads.

---

**NOTE:** If the server finds errors during POST, it will interrupt POST and display the error message.

---

---

## ***Power OFF***

Follow the steps below to turn off the power. If the server is plugged to a UPS, see manuals included with the UPS or the application that controls the UPS.

1. Perform a normal shutdown from Windows 2000 Advanced Server.

The server will be powered off automatically and only one PCI Module POWER LED will remain lit.

2. Power off all peripheral devices.

## ***POST Check***

POST (power-on self test) is a self-test function stored on the system board of the server.

When you power on the server, POST will start automatically to check the system board, ECC memory modules, CPU modules, PCI modules, keyboard, mouse, etc. POST displays startup messages for various BIOS setup utilities.

According to the factory default settings, the logo appears on the display while POST is being performed. (To view POST's details, press **Esc**.)

You don't always need to check POST details. You will need to check messages when:

- You install a new server.
- A failure is suspected.
- You hear several beeps between the time of the power-on and OS start-up.
- The display unit shows an error message\*.

\*For details, see "Error Messages" in Chapter 5.

---

## Flow of POST

This section walks you through how POST is performed.

1. When you power on the server, one selected CPU/PCI module will start up.  
POST will be performed on this selected CPU/PCI module.

2. Memory check starts.

A message appears at the upper left of the screen to show that the basic and expanded memories are being counted. The memory check may take a few minutes to complete depending on the server's memory size. Likewise, it may take about one minute for the screen to appear when the server is rebooted.

Note that if you have replaced the PCI module, the server will perform a reset of the MAC address, then reboot itself before the memory check.

3. The server starts processor check, IO check, and initialization.

Several messages appear: they show the ID of the selected CPU/PCI modules, information on the processor, detection of the keyboard and mouse, etc.

4. A message appears at the lower left of the screen, prompting for startup of the BIOS setup utility "SETUP."

Press <F2> to enter SETUP

You will need to start it when you want modify the configuration for using the server. Unless this message appears together with an error message, you don't need to start the utility to modify the configuration. (If you wait for a few seconds, POST will go on automatically.)

To start the SETUP utility, press **F2** while the above message is displayed. For setting and parameter functions, see the section of BIOS setup.

When SETUP is completed, the server will reboot itself automatically and perform POST.

5. A message appears prompting for startup of SCSI BIOS setup utility.

When a built-in SCSI controller is detected, a message will appear prompting for startup of SCSI BIOS setup utility. (If you wait for a few seconds, POST will go on automatically.)

If you press **Ctrl + Q**, the SCSI BIOS setup utility will start. For setting and parameter functions, see the section on SCSI setup.

You will need to use this utility, for example, when you have changed the server's internal SCSI device connections. However, you usually don't need to use it.

When SETUP is complete, the server will reboot automatically and perform POST again.

---

If multiple SCSI controller boards are mounted on the PCI bus, the SCSI BIOS startup message will appear for these boards in numerical order (PCI #1, PCI #2, PCI #3...).

6. The screen shows SCSI ID numbers used by the connected SCSI devices.
7. Upon completion of POST, the password entry screen appears prior to OS startup.

The password entry screen will appear after the normal termination of POST only if you have set a password in the BIOS setup utility "SETUP."

You can enter a password up to three times. If you enter an incorrect password three times, the startup will be unsuccessful. In this case, turn off the power and then turn it on again after waiting ten seconds to boot the server.

---

**IMPORTANT:** Do not set a password before installing the OS.

---

8. Upon completion of POST, the OS will start up.

### ***Behavior at Occurrence of Error***

If POST or OS startup does not finish normally, the server will reboot itself automatically.

At the time of reboot, it will select the other CPU/PCI module and run POST or OS startup.

In this manner, the server retries POST or OS startup with different combinations of CPU/PCI modules. If POST does not finish normally with any combinations, the server will stop with the state of DC OFF.

Press <F1> to resume, <F2> to enter SETUP

While performing retries, the server displays or registers the error types.

For details of error messages, see Chapter 5 "Troubleshooting."

### ***POST Error Messages***

When the server detects an error during POST, it will notify you of the occurrence in the following manners:

- Displays an error message on the display unit\*.
- Makes a beeping sound.

\*For details, see "Error Messages" in Chapter 5.

---

**IMPORTANT:** Before you contact your sales agent, write down the error messages and patterns of the beeping sound. They will serve as helpful information at the time of maintenance.

---



---

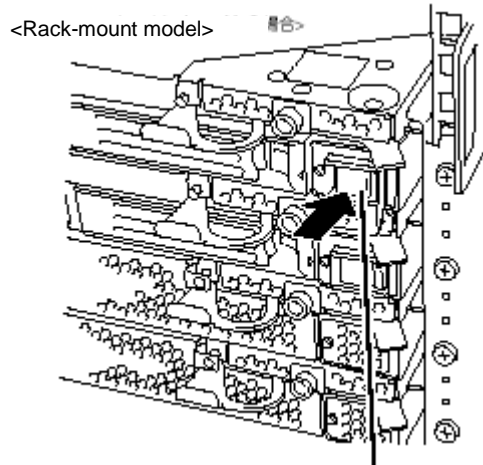
## ***Forced Shutdown and Clear***

Read this section if your server does not operate as expected, or if you want to return all setup values to those made at shipment.

### ***Forced Shutdown***

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not function.

Press and hold the POWER switch on the server for over four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).



---

**IMPORTANT:** If the remote power-on feature is used, power on the server and start the OS, and turn off the power in the normal way.

---

# 3

## Configuring Your System

- Configuring Your System
- BIOS Setup Utility
- Fast!Util Utility
- Configuring System Jumpers

---

## ***Configuring Your System***

Configuration and setup utilities are used to change your system configuration. You can configure your system, as well as option boards you may add to your system, using the BIOS Setup Utility. Several unique system parameters are configured using the BIOS Setup, which is stored in the system FLASH memory.

The Fast!Util Utility is used if you need to configure either of the SCSI controllers in your system or to perform a SCSI disk format or verify disk operation of these drives.

If your system has been factory configured, the BIOS Setup or Fast!Util Utility do not need to be run unless you want to change the password or security features, add certain types of option boards or devices, or upgrade your system board.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

Use the EXPRESSBUILDER CD-ROM to create the device driver diskettes.

---

# BIOS Setup Utility

The BIOS Setup Utility is used to change system configuration parameters. The utility is resident in the system FLASH memory and does not require a diskette or an operating system present to run.

## Using the BIOS Setup Utility

You access the BIOS Setup utility when you turn on or reboot your system. To run the BIOS Setup Utility, perform the following procedure:

1. Power-on or reboot the system.
2. If the NEC logo appears, press **ESC** in order to display POST information.
3. “Press <F2> to enter SETUP” displays.
4. Press **F2**. After a short period of time the BIOS Setup Utility starts and the Main Menu is displayed. The menu bar at the top of the Main Menu lists the following selections:

Menu	Use
Main	Use this menu for basic system configuration.
Advanced	Use this menu for setting the Advanced Features available on your system.
Security	Use this menu to set User and Supervisor Passwords and the Backup and Virus-Check reminders.
System Hardware	Use this menu for configuring unique Server features.
Boot	Use this menu to configure Boot Device priority.
Exit	Exits the current menu.

Use the arrow keys to select a menu or an item on a displayed menu. Press the value keys (see Table 3-1) to cycle through the allowable values for the selected field. Use the Exit menu’s “Save Values” selection to save the current values on all the menus.

To display a submenu, position the cursor on a selection that has a submenu and press **ENTER**. An arrow precedes selections with submenus.

Refer to Table 3-1 for information on the value keys that you use with BIOS Setup. These keys are also listed at the bottom of the Setup menu.

---

**Table 3-1 Setup Menu Value Keys**

<b>Key</b>	<b>Function in Setup Menu</b>
F1 or Alt-H	Get Help about an item.
ESC	Exit the current menu and return to the previous menu.
Left or right arrow keys	Move between menus.
Up or down arrow keys	Move cursor up and down. The cursor moves only to the settings that you can change.
HOME or END	Move cursor to top or bottom of window.
PAGE UP or PAGE DOWN	Move cursor to next or previous page.
F5 or -	Select the previous value for the field.
F6 or + or SPACE	Select the next value for the field.
F9	Load default configuration values for this menu.
F10	Save configuration values and exit.
ENTER	Execute command or Select ► submenu.

---

### ***BIOS Setup Configuration Settings***

The BIOS Setup Configurations tables show the default settings for the BIOS Setup Utility and provides a place for you to record any changes you make to these settings. Recommended values are bold in the following tables.

---

## Main Menu

Feature	Choices or Display Only	Description	Your Setting
Processor Type	—————	(Display Only). Shows the type of processor installed.	
Processor Speed	XXX MHz	(Display Only). Indicates the processor speed.	
Cache RAM	XXX KB	(Display Only). Indicates the cache RAM size.	
System Memory	XXX KB	(Display Only). Indicates the total capacity of the basic memory.	
Extended Memory	XXX MB	(Display Only). Indicates the total capacity of the extended memory.	
BIOS Version	—————	(Display Only). Indicates the version of the system BIOS.	
System Time	HH:MM:SS	Sets the system time (hour, minutes, seconds, on 24 hour clock).	
System Date	MM/DD/YYYY	Sets the system date (month, day, year).	
Language	<b>English (US)</b> German, French Italian, Spanish	Selects which language BIOS displays. Note: This feature <i>immediately</i> changes to the language BIOS selected.	
Primary Master	CD-ROM	(Display Only). Shows the type of CD-ROM connected to IDE (Primary master).	

---

## ***Advanced Menu***

<b>Feature</b>	<b>Description</b>	<b>Your Setting</b>
Advanced	Refer to Advanced Submenu.	
Processor Information	Refer to Processor Information Submenu	
Memory Information	Refer to Memory Information Submenu.	
Peripheral Configuration	Refer to Peripheral Configuration Submenu.	
Monitoring Configuration	Refer to Monitoring Configuration Submenu. It sets POST Monitoring and Boot Monitoring.	
Option ROM	Refer to Option ROM Submenu. It Disables/Enables the mapping of Option ROM BIOS from the PCI Bus.	
Keyboard Features	Refer to Keyboard Features Submenu. It selects Keyboard Options.	

---

---

## Advanced Submenu

Feature	Choices or Display Only	Description	Your Setting
Boot-time Diagnostic Screen:	Disabled <b>Enabled</b>	Displays the diagnostic screen during POST instead of the Logo. The Boot-Time diagnostic screen is automatically enabled if redirection or RomPilot is enabled.	
RomPilot Support	Disabled <b>Enabled</b>	Disables or enables RomPilot support (including the remote console and remote drive functions during activation of OS). The Boot-time diagnostic screen is enabled if RomPilot is enabled. (See Appendix B for more details.)	
POST Error Pause:	Disabled <b>Enabled</b>	Pauses and displays SETUP entry or resume boot prompt if error occurs on boot. If disabled, system always attempts to boot.	

## Processor Information Submenu

Feature	Choices or Display Only	Description	Your Setting
Processor 1 Type:	--	(Display Only). Shows the type of processor installed on Processor 1.	
Processor 2 Type:	none	(Display Only). Shows the type of processor installed on Processor 2.	



---

## Memory Information Submenu

Feature	Choices or Display Only	Description	Your Setting
DIMM #1 - #6 Size:		(Display Only). Shows the memory size of DIMM installed.	
DIMM #1 - #6 Speed:		(Display Only). Shows the clock speed of DIMM installed.	

## Peripheral Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Serial Port A: (COM 1)	Disabled 3F8, IRQ3 <b>3F8, IRQ4</b> 2F8, IRQ3 2F8, IRQ4 3E8, IRQ3 3E8, IRQ4 2E8, IRQ3 2E8, IRQ4 Auto	Disables serial port 1 or selects the base address and interrupt (IRQ) for serial port 1.	
Serial Port B: (COM 2)	Disabled 3F8, IRQ3 3F8, IRQ4 <b>2F8, IRQ3</b> 2F8, IRQ4 3E8, IRQ3 3E8, IRQ4 2E8, IRQ3 2E8, IRQ4 Auto	Disables serial port 2 or selects the base address and interrupt (IRQ) for serial port 2. If Console Redirection is enabled, this port configuration must match the settings for the console port.	

---

## Monitoring Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Option ROM Scan Monitoring	<b>Disabled</b> Enabled	Disables and enables the Option ROM Scan Monitoring Feature.	
Option ROM Monitoring Time-out*	<b>5</b> (1 to 20)		
Boot Monitoring	<b>Disabled</b> Enabled	Disable or enable the boot monitoring feature. Set to disabled when installing OS. Once OS is installed, re-enable.	
Boot Monitoring Time-out Period*	<b>5</b> (1 to 20)		
POST PAUSE Monitoring	Disabled <b>Enabled</b>	Disables and enables the POST Pause Monitoring Feature.	
POST Pause Monitoring Time-Out*	<b>3</b> (1 to 20)	Selects the time-out value of the POST Pause Monitoring Feature.	

\*This feature is displayed only when POST Pause Monitoring is Enabled.

## Option ROM Submenu

Feature	Choices or Display Only	Description	Your Setting
Onboard SCSI	<b>Enabled</b> Disabled	Disables/Enables the mapping of the onboard SCSI BIOS.	
Onboard LAN 1, 2	<b>Enabled</b> Disabled	LAN1: Disables/Enables 10/100BASE onboard LAN controller.  LAN2: Disables/Enables 1000BASE onboard LAN controller.	
PCI Slot 1	<b>Enabled</b> Disabled	Initializes device expansion ROM.	
PCI Slot 2	<b>Enabled</b> Disabled	Initializes device expansion ROM.	
PCI Slot 3	<b>Enabled</b> Disabled	Initializes device expansion ROM.	

---

### Keyboard Features Submenu


<b>Feature</b>	<b>Choices or Display Only</b>	<b>Description</b>	<b>Your Setting</b>
Numlock	<b>Auto</b> On OFF	Selects the power-on state for Numlock.	
Key Click	<b>Disabled</b> Enabled	Disables or enables keyclick.	
Keyboard Auto-repeat Rate	<b>10/sec</b> 6/sec 2/sec	Selects key repeat rate.	
Keyboard Auto-repeat Delay	0.25 sec 0.5 sec 0.75 sec <b>1 sec</b>	Selects delay before key repeat.	

---

---

## Security Menu

---

 **Note:** Enabling the Supervisor Password field requires a password for entering Setup. The passwords are not case sensitive.

---

Feature	Choices or Display Only	Description	Your Setting
Supervisor Password is	<b>Clear</b>	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see System Board Jumpers in this Chapter).	
User Password is	<b>Clear</b>	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see System Board Jumpers in this Chapter).	
Set Supervisor Password	Press <b>ENTER</b>	<p>Supervisor password (up to 7 alphanumeric characters) controls access to the setup utility.</p> <p>When the &lt;Enter&gt; key is pressed, the user is prompted for a password; press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to System Board Jumpers in this chapter).</p> <p>This feature is available only when you logged in the SETUP utility with the supervisor password.</p>	
Set User Password	Press <b>ENTER</b>	<p>When the &lt;Enter&gt; key is pressed, the user is prompted for a password (up to 7 alphanumeric characters); press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to System Board Jumpers in this chapter).</p> <p>With a user password, accessible SETUP menus are restricted. This feature is available only if the Supervisor Password is specified.</p>	
Password on Boot	<b>Disabled</b> Enabled	Disables or enables password entry on boot.	

---

Feature	Choices or Display Only	Description	Your Setting
Power Switch Mask	Masked <b>Unmasked</b>	Determines whether power switch is masked or unmasked. Selecting "Masked" disables power-off with the power switch after the operating system is started (including shutdown by pressing the Power switch for at least 4 seconds.)	
Option ROM Menu Mask	<b>Unmasked</b> Masked	Determines whether Option ROM Menu Mask is masked or unmasked.	

## System Hardware Menu

Feature	Choices or Display Only	Description	Your Setting
Thermal Sensor		Refer to Thermal Sensor Submenu.	
Wake On Events		Refer to Wake On Events Submenu.	
AC Link	Power On <b>Last State</b> Stay Off	Determines the mode of AC Link. This determines the state of the server when AC power is reapplied (see Table below).  Note: When "Wake On LAN" is enabled, <i>Stay Off</i> is the only choice for selection.	
Error Log Initialization	Press <b>Enter</b>	Request to initialize the System Error Log now. If <i>Clear OK</i> , then display "System Event Log Cleared!" If <i>Clear NG</i> , then display "System Event Log Not Cleared!"	
Console Redirection		Additional setup menus to configure console. The Boot-time diagnostic screen is enabled if redirection is enabled.	
Ft Memory	Press Enter		

### Server Power State Versus AC Link Settings

State Before Power Off	Setting		
	Stay Off	Last State	Power On
In Service	Off	On	On
Out of Service (DC Power Off)	Off	Off	On
Forced Shutdown*	Off	Off	On

---

\*Pressing the Power switch for at least 4 seconds shuts down power to the server.

### *Thermal Sensor Submenu*

<b>Feature</b>	<b>Choices or Display Only</b>	<b>Description</b>	<b>Your Setting</b>
Thermal Sensor	Disabled <b>Enabled</b>	When enabled determines if the BIOS will disable boot (if temperature is not within a safe range).	
Upper Limit	7 – <b>48</b> - 80	Specifies the upper temperature limit for bootup restriction in Celsius. Specify a value greater than the Lower Limit by at least 8 using the + and – keys.	
Lower Limit	0 – <b>5</b> - 73	Specifies the lower limit temperature for boot-up restriction in Celsius. Do not specify 4 degrees or lower. Specify a value smaller than the "Upper Limit" value by at least 8 using + and – keys.	

### *Wake On Events Submenu*

<b>Feature</b>	<b>Choices or Display Only</b>	<b>Description</b>	<b>Your Setting</b>
Wake On LAN	Disabled <b>Enabled</b>	Enable or disable the remote power-on feature via the network.  When "Enable" is selected, change the "AC-LINK" setting in the "System Hardware" to "Stay Off".	

### *Console Redirection Submenu*

<b>Feature</b>	<b>Choices or Display Only</b>	<b>Description</b>	<b>Your Setting</b>
Serial Port Address	<b>Disabled</b> On-board COM B	Select a serial port to connect the HW console. Selecting "On-board COM B" changes "Boot-time Diagnostic Screen" to "Enabled".	•
Baud Rate	57.6K <b>19.2K</b>	Enables the specified baud rate.	
Flow Control	No Flow Control <b>XON/OFF</b>	Enables flow control.	
Console Connection	<b>Direct</b> Via Modem	Indicate whether the console is connected directly to the system or a modem is used to connect.	

Feature	Choices or Display Only	Description	Your Setting
Size	[0]	Size of ft Memory is specified (MB)	
Start Address	-	Shows the start address of ft Memory (view only)	

## Boot Menu

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.

### Boot Device Priority Menu

Boot Priority	Device	Description	Your Setting
1.	ATAPI CD-ROM Drive	Attempts to boot from an ATAPI CD-ROM drive.	
2.	Removable Devices	Attempts to boot from a diskette drive.	
3.	Hard Drive	Attempts to boot from a hard drive device.	
4.	Intel UNDI, PXE-2.0 (Build 071)	Attempts to boot from a PXR server.	

## Exit Menu

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

### Exit Menu

Choices	Description
Save Changes and Exit	Exits System Setup after saving all changes to CMOS.
Exit Without Saving Changes	Exits System Setup without saving setup data to CMOS.
Get Default Value	Loads default values for all Setup items.
Load Previous Values	Loads previous values from CMOS for all Setup items.
Save Changes	Writes all Setup item values to CMOS.

---

## Fast!Util Utility

The Fast!Util utility detects the SCSI host adapters on the PCI board and on option SCSI controller boards. However, the Fast!Util is only used when an optional SCSI Controller is installed and is used mainly to set the transfer rate of connected SCSI device.

Use the Fast!Util to:

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

### Running the Fast!Util


You access the Fast!Util when you turn on or reboot your system.

To run the Fast!Util utility, perform the following procedure:

1. Power-on or reboot the system.
2. The following message appears on the video monitor:  
*Press Alt-Q for Fast!Util...*
3. Press **Ctrl+Q** to run this utility. The Fast!Util starts and the Fast!Util Options Menu is displayed listing the following selections.

Fast!Util Options Menu
Configuration Settings
Scan SCSI Bus
SCSI Disk Utility
Select Host Adapter
Exit Fast!Util

4. Highlight *Select Host Adapter* using the cursor keys and press **ENTER**.
5. The *Select Host Adapter* screen is displayed. Select the proper adapter.

 **Note:** Do Not select *Adapter QLA12160 Ultra3 5800* it is the on-board SCSI host adapter.

6. Highlight one of the displayed *Adapter Types* with the cursor keys and press **ENTER**.
7. The display returns to the *Fast!Util Options* menu where you can continue to change the system SCSI configuration parameters. The name of the selected host adapter is displayed in the upper left-hand corner of the screen.



---

## Configuration Settings Menu

The *Configuration Settings Menu* lists the following selections.

Configuration Settings Menu
Host Adapter Settings
SCSI Device Settings
SCSI Bus Settings
Autoconfigure SCSI Devices
Selectable Boot Settings
Restore Default Adapter Settings
Raw Nvram Data

### Host Adapter Settings Submenu

Feature	Choices or Display Only	Description	Your Setting
BIOS Address	—	(Display Only).	
BIOS Revision	—	(Display Only).	
Interrupt Level	—	(Display Only).	
Host Adapter BIOS	<b>Enabled</b> Disabled	Specify whether the BIOS extension of the host adapter is enabled or disabled.	
PCI Bus DMA Burst	<b>Enabled</b> Disabled	Specify whether the DMA burst transfer on the PCI bus is enabled or disabled.	
CDROM Boot	Enabled <b>Disabled</b>	Specify whether the start from CD-ROM is enabled or disabled.	
Adapter Configuration	<b>Auto</b> Manual Safe	Specify whether the adapter configuration is set automatically by BIOS, manually, or safely.	
Drivers Load RISC	<b>Enabled</b> Disabled	Specify whether the load of RISC codes is enabled or disabled.	
>4Gbyte Addressing	<b>Enabled</b> Disabled	Specify whether hard disks of 4 GB or larger are used or not used.	
Fast Command Porting	<b>Enabled</b> Disabled	Factory set. Do not change.	

---

## SCSI Device Settings Submenu

---

Feature	Choices or Display Only	Description	Your Setting
Disconnects OK	<b>Yes</b> No	Specify whether the disconnection of SCSI devices from the SCSI bus is enabled or disabled.	
Check Parity	<b>Yes</b> No	Specify whether the parity check is provided or is not provided.	
Enable LUNs	<b>Yes</b> No	Specify whether more than one LUN number are given to SCSI ID.	
Enable PPR	Yes <b>No</b>	Factory set. Do not change.	
Enable Device	<b>Yes</b> No	Factory set. Do not change.	
Negotiate Wide	<b>Yes</b> No	Specify whether the wide (32 bits) transfer is enabled or disabled.	
Negotiate Synchronous	<b>Yes</b> No	Specify whether the synchronous transfer is enabled or disabled.	
Tagged Queuing	Yes No	Factory set. Do not change.	
Sync Offset	00, 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, <b>24</b>	Select the proper offset value in synchronous transfer.	
Sync Period	Transfer Rate (Mbytes/sec) <hr/> 9    160 (Ultra3 SCSI) <hr/> <b>10</b> 80 (LVD SCSI) <hr/> 12    40 (Ultra SCSI) <hr/> 25    20 (Fast SCSI) <hr/> 40    12.5	Select the proper speed in synchronous transfer.	
Exec Throttle	1, 4, 8, <b>16</b> , 32, 64, 128, 255	Factory set. Do not change.	

---

---

## SCSI Bus Settings Submenu

---

Feature	Choices or Display Only	Description	Your Setting
SCSI Bus SCSI ID	0, 1, 2, 3, 4, 5, 6, <b>7</b> , 8, 9, 10, 11, 12, 13, 14, 15	Specify the SCSI bus ID value. Value 7 is set for SCSI Bus 0 and value 6 is set for SCSI Bus 1.	
SCSI Bus Reset	<b>Enabled</b> Disabled	Make the reset valid or invalid for SCSI buses.	
SCSI Bus Reset Delay	0, 1, 2, 3, 4, <b>5</b> , 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	Factory set. Do not change.	
SCSI Bus Termination	<b>Auto</b> High only Disabled Enabled	Set the termination resistance of the SCSI bus.	


---

## Autoconfigure SCSI Device Submenu

When "Autoconfigure SCSI Device" is selected the screen for setting the information on the device connected to the host adapter appears.

The parameters (choices) and their default settings are the same as those listed in the table for "SCSI Device Settings."

---

 **Notes:** Always check the SCSI ID of the target device before changing the SCSI bus settings and SCSI IDs.

The default settings at shipment are identical for both SCSI bus 0 and SCSI bus 1.

The following items can be changed by setting the *Adapter Configuration* in "SCSI Device Setting" to *Manual*.

- Enable Device
  - Enable LUNs
  - Negotiate Wide
  - Negotiate Sync
  - Tagged Queuing
  - Sync Offset
  - Sync Period
  - Exec Throttle
-

---

## Selectable Boot Settings Submenu

---


Feature	Choices or Display Only	Description	Your Setting
Selectable SCSI Boot	Enabled <b>Disabled</b>	Specify whether the boot from the SCSI device can be selected or not selected.	
SCSI Bus	<b>0</b> 1	Select the bus to which the started SCSI device is connected.	
SCSI Boot ID	<b>0</b> , 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	Set the SCSI ID of the started SCSI device.	
SCSI Boot LUN	<b>0</b> , 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	Select the number of the LUN to which the started SCSI device is bound.	

---

## Restore Default Settings Submenu

When "Restore Default Settings" is selected the screen for returning the setting values to the default values is displayed.

---

 **Note:** After restoring the default settings you must set the SCSI ID for SCSI Bus 1 to the value 6. Also, under the "Host Adapter Settings Submenu" the *>4Gbyte Addressing* must be set to "Enabled".

---

## Raw NVRAM Data Submenu

When "Raw NVRAM Data" is selected the information on NVRAM installed in the host adapter is displayed in hexadecimal format and can not be edited. This function is only provided to solve problems.

## Scan SCSI Bus

When "Scan SCSI Bus" is selected in the "Fast!Util Options Menu" the list of devices connected to each SCSI bus is displayed in the order of SCSI IDs. The information to be displayed includes the vendor (device manufacturer), product name, and firmware revision.

---

## SCSI Disk Utility

When "Scan SCSI Bus" is selected in the "Fast!Util Options Menu" the utility menu appears that is used to format or verify the connected SCSI devices.

---

### CAUTION

Devices can be processed in SCSI buses and SCSI IDs. Be careful not to forget the selected bus and ID.

The selection of "Continue With Format" in "Low-Level Format" causes all data in disks to be lost.

---

#### ■ Low-Level Format

Physically formats the device selected in "Continue With Format." If you select "Do Not Format Disk", the prior menu displayed reappears.

#### ■ Verify Disk Media

Verifies the device selected in "Continue With Verify." If you select "Do Not Verify Media," the prior menu displayed reappears.


#### ■ Select Different Disk

Selects another SCSI device on the same SCSI bus.

## Select Host Adapter

When "Select Host Adapter" is selected from the "Fast!Util Options" menu, the list of the host adapters installed in the main system is displayed. Select the adapter for which the settings are modified.

---

 **Note: Do Not** select *Adapter QLA1280 Single Ended/LVD 5800* it is used for built-in hard disk.

---

The utility menu appears which is used to format or verify the connected SCSI devices.

## Exit

After modifying the settings, press **ENTER** several times to display the "Fast!Util Options" menu. If you select "Exit Fast!UTIL" from the menu, the screen for terminating Fast!UTIL appears.

However, if the settings are different from those before the start, the screen prompting you to save the settings appears before the display of the termination screen.

---

The "Configuration Settings Modified" screen selections are as follows.

<b>Configuration Settings Modified</b>
Save Changes
Do not save changes

The termination screen "Exit Fast!UTIL" selections are as follows.

<b>Exit Fast!UTIL</b>
Reboot System
Return to FAST!UTIL

# Configuring System Jumpers

## Before You Begin

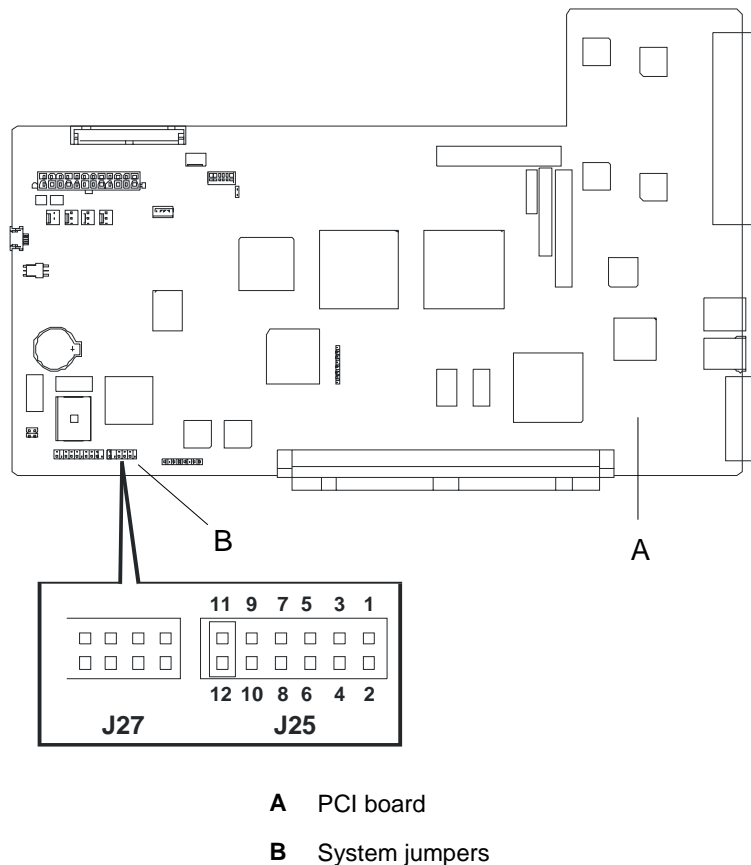
Only a qualified technical person should perform the procedures in this section.

### CAUTION

Electrostatic discharge (ESD) can damage the system boards. Modify system boards only at an ESD workstation. Otherwise, wear an antistatic wrist strap attached to chassis ground.

The jumper blocks on the PCI board located in the PCI module (one PCI board per PCI module) enable you to set specific operating parameters for your system. A jumper is a small plastic-encased conductor (shorting plug) that slips over two jumper pins.

Figure 3-1 shows the location of the system jumpers.



**Figure 3-1. System Jumpers**

---

Table 3-1 lists the System Jumpers and their factory default settings.



## CAUTION

**DO NOT** change any other switch jumper settings. Any change may cause the server to fail or malfunction.

---

**Table 3-1. System Jumper Summary**

<b>Jumpers</b>	<b>Function</b>	<b>Jumper On/Off (default in bold)</b>	<b>What it does at system reset.</b>
1–2	CMOS clear*	<b>Off, Protect</b> On, Erase	Preserves the contents of CMOS. Clears CMOS.
3–4	Password disable	<b>Off, Enable</b> On, Disable	Enables password protection. Disables the password.
5–6	Reserved	<b>Off, Not Used</b>	Reserved. Do Not Change.
7–8	Reserved	<b>Off, Not Used</b>	Reserved. Do Not Change.
9–10	Reserved	<b>Off, Not Used</b>	Reserved. Do Not Change.
11–12	Spare	Off, Not Used <b>On, Spare</b>	Provides a spare jumper.

\*Clearing CMOS returns the system to its factory default settings.



---

## Moving System Jumpers

---

### CAUTION

Before doing the procedures in this section, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before moving the jumpers can result in personal injury and equipment damage.


Observe static precautions. Use an antistatic wrist strap.

---

To configure the system jumpers on the PCI board:

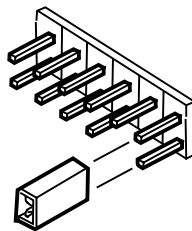
1. Perform steps 1 through 5 of subsection *Modifying the PCI Board* in chapter 4.

---

 **Note:** Use the same jumper settings for both PCI modules.

---

2. Locate the position of the system jumpers that you are changing on the PCI board. To change a jumper setting, use a pair of needle-nose pliers or your fingers to remove the jumper from its current location, see Figure 3-2. Position the jumper over the two pins for the desired setting and press it onto the pins. Be careful not to bend the pins. Refer to Table 3-1 for system jumper settings.



**Figure 3-2 Moving a Jumper (Shorting Plug)**

3. Perform steps 12 through 14 of subsection *Modifying the PCI Board* in chapter 4.

---

## **Clearing CMOS and Password**

To clear CMOS and password:

- 1.** Perform steps 1 through 5 of subsection *Modifying the PCI Board* in chapter 4.
- 2.** Remove the spare jumper from pins 11 and 12 on system jumper block, see Figure 3-1.
- 3.** If clearing CMOS, reinstall the spare jumper on pins 1 and 2 (CMOS clear) of system jumper block. Otherwise, go to next step.
- 4.** If clearing password, reinstall the spare jumper on pins 3 and 4 (Password disable) of system jumper block. Otherwise, go to next step.
- 5.** Perform steps 12 through 14 of subsection *Modifying the PCI Board* in chapter 4.
- 6.** While waiting for POST to complete, press the F2 key to enter BIOS setup. This automatically clears CMOS and all passwords, provided you exit and save the BIOS setup.
- 7.** Repeat step 1 of these procedures.
- 8.** Remove the jumper you just installed on the system jumper block and place it back on pins 11 and 12 as the spare jumper.
- 9.** Perform steps 12 through 14 of subsection *Modifying the PCI Board* in chapter 4.
- 10.** If specifying a new password run the BIOS Setup Utility as described earlier in this chapter.



# 4

## CRU Replacement and Upgrades

- General Information
- Precautions
- Preparing Your System For Upgrade
- Opening And Closing The Front Bezel
- Replacing CPU Modules
- Replacing Or Adding Processors
- Replacing Or Adding Dimms
- Replacing A PCI Module
- Installing PCI Adapter Boards
- Installing A Hard Disk Drive

---

## **General Information**

This chapter contains procedures for removing and installing customer-replaceable units (CRUs) and step-by-step instructions for upgrading your server system. When you disassemble any part of the server, note the orientation and placement of any cables or shielding that you remove.

---

### **WARNING**

The DC push button on/off switches on the PCI modules do not turn off system AC power. Also, +5vdc is present on the system boards whenever the AC power cord is connected between the system and an AC outlet. Before performing any procedures that require the server to be off, first power off the DC by pushing the power on/off button. Make sure your system is powered off and the AC power cord is unplugged from the system. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

---

### **CAUTION**

Operating your system with the access cover removed can damage system components. For proper cooling and airflow, always replace the access cover before powering on.

---

---

## Precautions

The following warnings and cautions apply throughout this chapter. Only a technically qualified person should integrate and configure the system.

The only procedures that can safely be done with the system power on is removing or installing (hot-swapping) an SCA disk drive/carrier assembly in the SCSI hot-swap drive cage, or hot swapping a CPU or PCI module. Note that hot-swapping a PCI module or a CPU module requires that the other module be operating properly. For any other procedures inside the system, turn off system power and disconnect the AC power cord (s).

---

### **WARNING**

Before doing any procedures in this chapter that require the server to be off, make sure that your system is powered off and unplug all AC power cords. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

**System power on/off.** The DC push-button on/off switches DO NOT turn off the system AC power. To remove power from system, you must unplug the AC power cords (from wall outlets or power supply).

**Hazardous conditions, power supply.** Hazardous voltage, current, and energy levels are present inside the module power supplies. There are no user serviceable parts inside these supplies; servicing should be done by technically qualified personnel.

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

---

---

 **CAUTION**

**Electrostatic discharge (ESD) and ESD protection.** ESD can damage disk drives, boards, and other parts. This system can withstand normal levels of environmental ESD while you are hot-swapping SCSI hard drives or hot-swapping a failed fan module or power supply. However, we recommend that you do all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on your system when handling parts.

**ESD and handling boards.** Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place it component-side up on a grounded, static-free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

**Chassis covers, proper cooling and airflow.** For proper cooling and airflow, always install the chassis top cover before turning on the system. Operating it without the cover in place can damage system parts.

---

Contact your sales representative or dealer for a list of approved optional peripheral devices.


---

## Preparing Your System for Upgrade

Always observe the following guidelines when replacing or installing devices in your system.

- Your fault-tolerant server allows you to remove, install, and replace devices while the server is in continuous operation. However, when it is necessary to work on the server with its power off, you must use the Windows 2000 shut down procedures, power off the server, and disconnect all the power cords and interface cables.
- To remove a CPU module or PCI module while the system is in an operational state the module must be disabled (placed into off-line status) by using the server utility of the ESMPRO/ServerAgent or the ESMPRO/ServerManager from the management PC on the network. Then after a new module is installed it must be reenabled by using the server utility of the ESMPRO/ServerAgent or the ESMPRO/ServerManager.

---

 **Note:** The system default automatically boots a module, once installed.

---

- Do not remove a CRU when its amber status LED indicator is on. This indicates that the CRU is operating in simplex mode (i.e., its duplex partner is not functional) and removing it will cause the system to fail.
- Provide the same hardware configuration for both group 1 and group 2.
- Ensure that the installed devices have the same specifications, performance, and features.

Have the following tools available:

- Phillips screwdriver (#2 bit)
- flat-head screwdriver
- small needle nose pliers
- pen or pencil
- utility knife
- ESD workstation or antistatic wrist strap (recommended.)



---

## Opening and Closing the Front Bezel

The front bezel covers built-in components of the server such as the POWER switch, CD-ROM drive, and hard disks.

The tower model server has a door-type bezel (it can also be detached). The rack-mount model server has a cover-like detachable bezel

You need to open the front bezel to access the POWER switch, CD-ROM drive or hard disk.

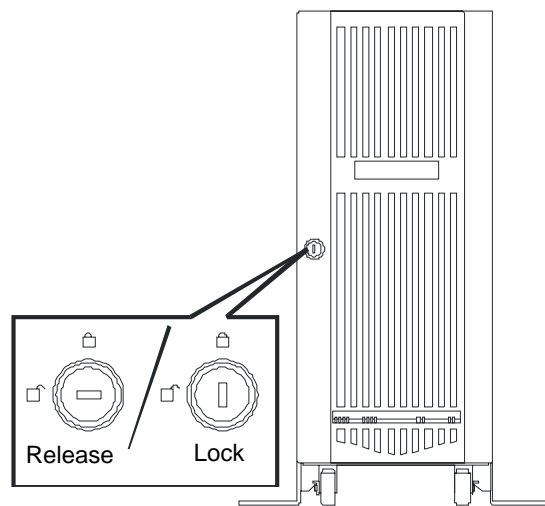
---

### IMPORTANT:

- Without using the security key, you cannot open or detach the front bezel.
  - It is not recommended to use the server with its bezel detached.
- 

### Tower Model

Insert the security key into the slot and turn it to release the lock. Hold the handle on the left side of the bezel and pull it. After closing the front bezel, lock it with the key for security. See Figure 4-1.



**Figure 4-1. Unlocking the Front Bezel (Tower Model)**

---

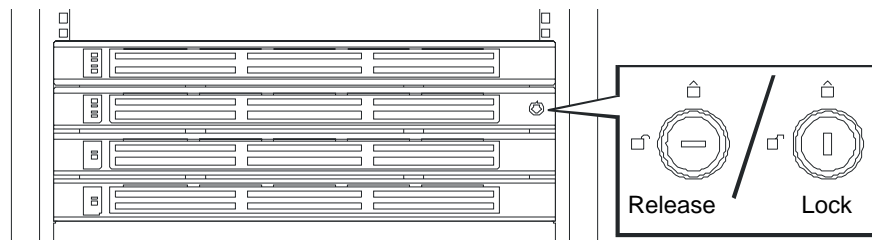
## ***Rack-mount Model***

The rack-mount model server is equipped with a detachable front bezel. See Figure 4-2.

### ***Detach***

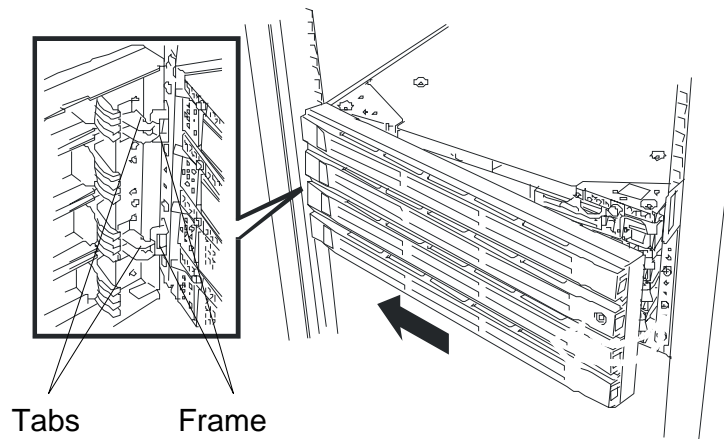
Follow the steps below to detach the front bezel:

1. Insert the security key into the slot and turn it with a little pressure to release the lock.



***Figure 4-2. Unlocking the Front Bezel (Rack-mount Model)***

2. Hold the right side of the front bezel lightly and pull it open.
3. Detach the bezel from the main unit by sliding it to the left a little to disengage the tabs from the frame. See Figure 4-3.



***Figure 4-3. Opening the Front Bezel (Rack-mount Model)***

### ***Attach***

To attach the front bezel, engage the tabs on the frame on the left side of the main unit. After attaching and closing the front bezel, lock it with the key for security.

---

# Replacing CPU Modules

Your system contains two redundant CPU modules that are accessible from the front of the server unit.

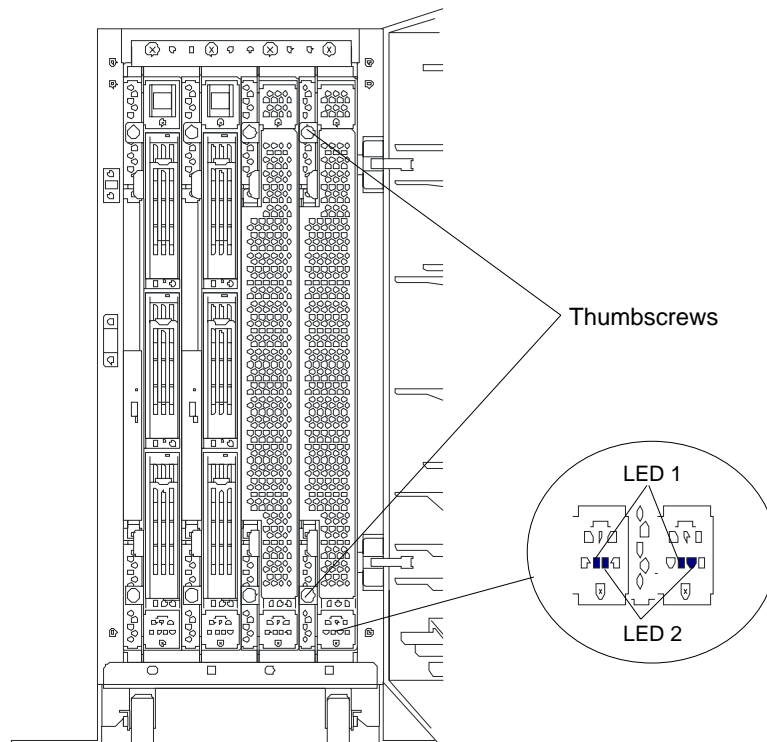
The following subsections provide the procedures for removing and installing CPU modules.

## Removing a CPU Module

1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Unlock and open the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Bezel* earlier in this chapter.
3. Ensure that the CPU module is off-line by viewing its status LED indicators (See Figure 4-4 and Table 1-3) The state of the status LEDs should be as follows:

Status LED 1: Red

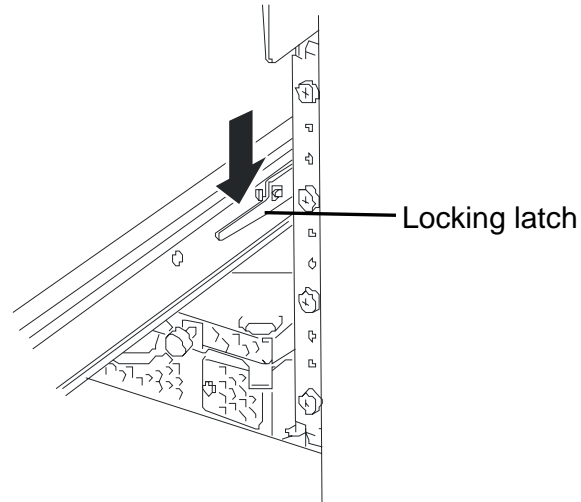
Status LED 2: Off



**Figure 4-4. CPU Module Status LED Indicators**

4. Unscrew the thumbscrews securing the locking handle to the CPU module. See Figure 4-4.

- 
5. Pull the release levers to their unlocked position. This disconnects the CPU module from its backplane. Then pull the CPU module out of the chassis until the locking latch engages. See Figure 4-5.

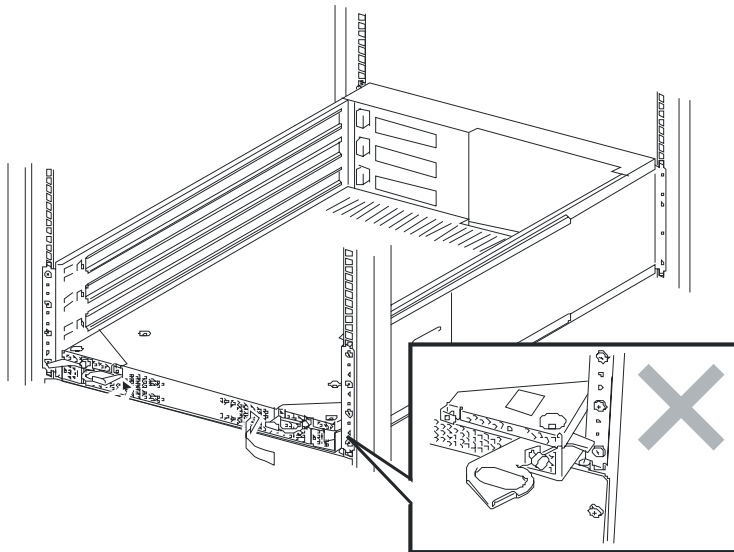


**Figure 4-5. Module Locking Latch**

6. Then, with the assistance of another person, push downwards (tower model) or to the right (rack-mount model) on the locking latch and carefully remove the module from the server unit and place it on a flat sturdy surface.

### ***Installing a CPU Module***


1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Position the locking latches on the front of the CPU module in the unlocked position.
3. With the assistance of another person, support the CPU module with both hands and carefully slide it into the chassis until it is firmly seated in its connector.
4. Push the locking handles all the way their locked position. See Figure 4-6.



**Figure 4-6. Locking the CPU Module in the Chassis.**

5. Hand-tighten the two thumbscrews that fasten the CPU module locking latches to the cabinet.

---

 **Note:** Hand-tighten the thumbscrews only as much as required to activate the interlock switch that allows power to be applied to the CPU module.

---


6. Close and lock the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Bezel* earlier in this chapter.

---

# Replacing or Adding Processors

The following subsections provide the procedures for removing and installing the Xeon processor. Use these procedures when replacing or adding processors to your system. When adding a second processor to a CPU module an identical processor must be added to the other CPU module to provide total system redundancy and mirroring. Each processor includes a thermal cool sheet (heat radiation sheet) and a heat sink. Each processor installs in a processor socket on a CPU board located in the CPU module.

---

 **Note:** Your system may have up to two processors on a CPU board. All installed processors must be matched for speed. If replacing a processor, the replacement processor must match the speed of all installed processors. If upgrading a processor, all processors must be upgraded to match.

---

---

## CAUTION

Electrostatic discharge (ESD) can damage components; place them on an antistatic surface. Update the CPU board using an antistatic wrist strap attached to chassis ground.

---

---

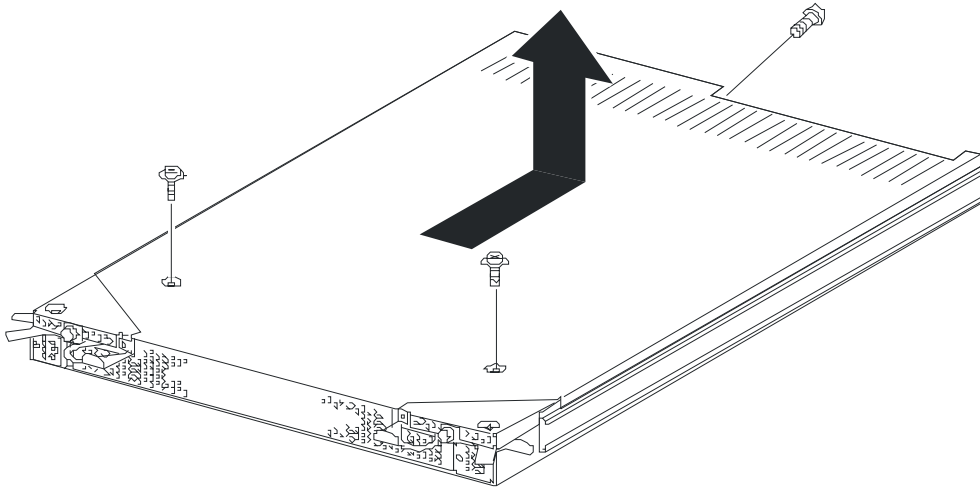
## WARNING

If the system was running, any processor and heat sink installed is hot. To avoid the possibility of a burn, let the components cool for 10 minutes before continuing with these procedures.

---

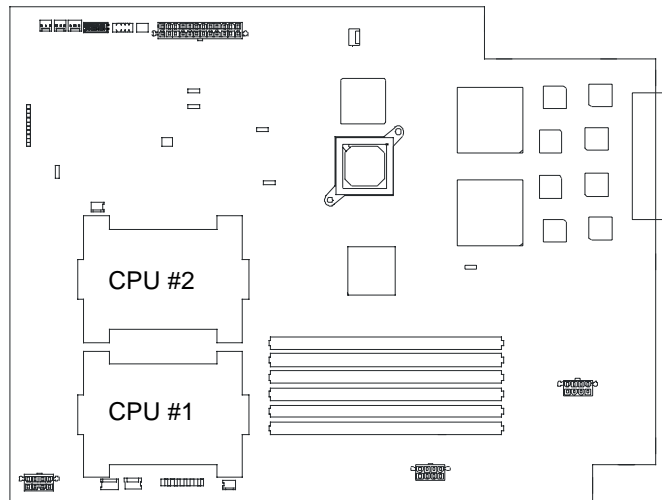
### Installing a Processor

1. Remove the appropriate CPU module from the server chassis. See *Removing a CPU Module* earlier in this chapter.
2. Remove the three screws from the top and rear of the CPU module securing its top cover. See Figure 4-7.
3. Remove the top cover of the CPU module by sliding it slightly towards the rear of the module until it stops and its hooks disengage from the tab slots in the module chassis and then pull it straight up. See Figure 4-7.



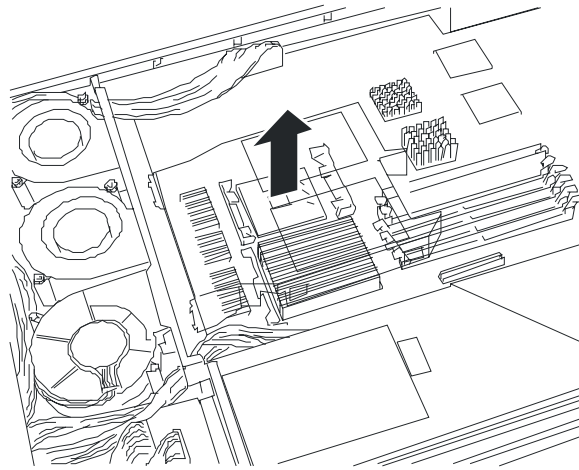
**Figure 4-7. Removing the Three Screws Securing the Top cover of the CPU Module**

4. Locate the two processor sockets on the CPU board inside the CPU module. See Figure 4-8.



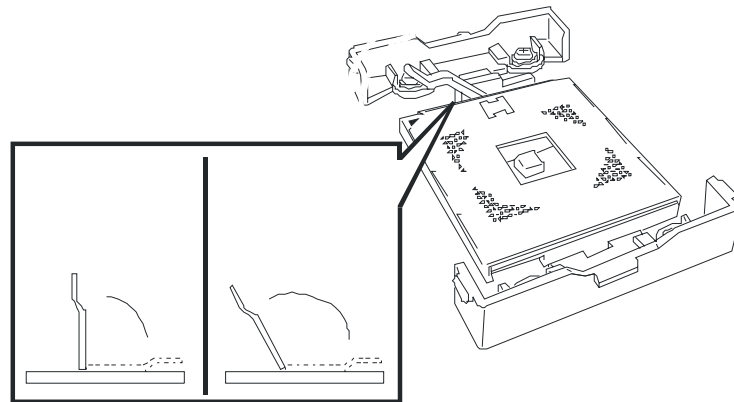
**Figure 4-8. CPU Board Component Locations**

5. Remove the CPU air duct from the processors and the anti-dust sheet from the empty processor socket. See Figure 4-9



**Figure 4-9. Removing the CPU Air Duct**


6. Raise the lever on the socket to its up position. See Figure 4-10.



**Figure 4-10. Raising the Socket Lever**

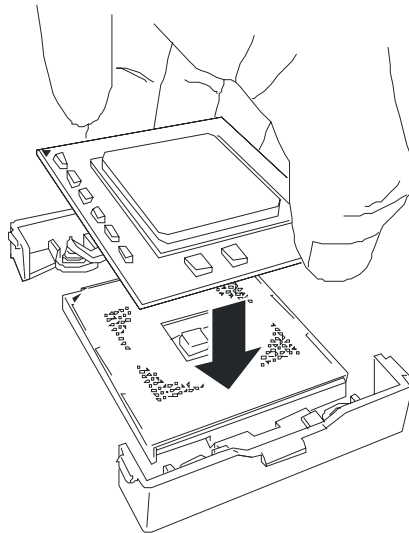
7. Position the processor over the processor socket so that its pins align with the socket holes. See Figure 4-11.

---

 **Note:** Both the processor and processor socket have different pin assignments at two of its four corners to prevent misinsertion. Check the orientation pin mark and pin assignment on the socket to mount the processor correctly.

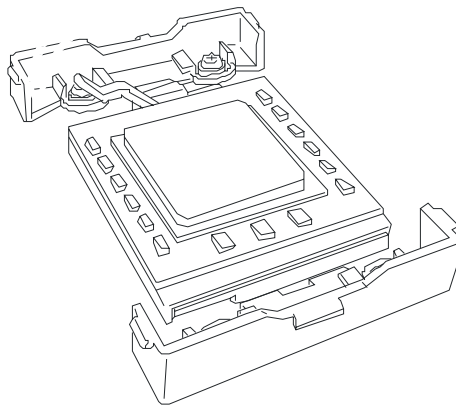
---





**Figure 4-11. Installing the Processor**


8. Gently apply pressure equally over the top surface of the processor until it seats in the socket. The processor should fit, do not force the processor into the socket. Push the socket lever down until it snaps into the locked position. See Figure 4-12.



**Figure 4-12. Installing a Processor**

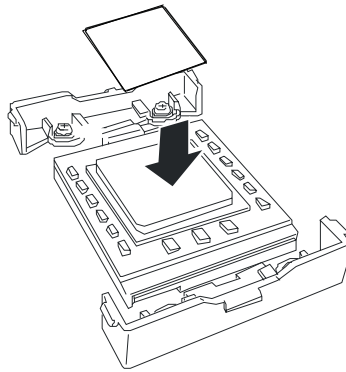
9. Very carefully apply the thermal interface material (heat radiation sheet) on top of the processor so that it is completely covered. See Figure 4-13.

---

 **Notes:** The thermal interface material is very fragile, it must be handled very carefully. If the cooling sheet is damaged, it must be replaced with a new one. Reuse of the cooling sheet is not permitted.

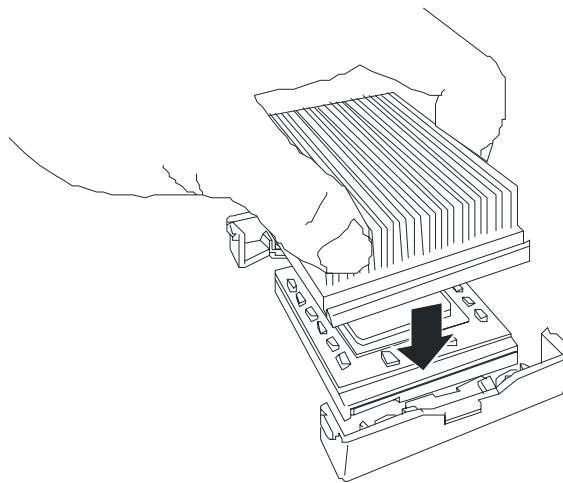
Do not stick multiple cooling sheets on a processor, only one is needed. Keep any remaining cooling sheets as spares.

---



**Figure 4-13. Installing the Thermal Cooling Sheet**

**10.** Position the heat sink on the processor. See Figure 4-14.



**Figure 4-14. Installing the Processor Heat Sink**

**11.** Install both heat sink clips as follows:



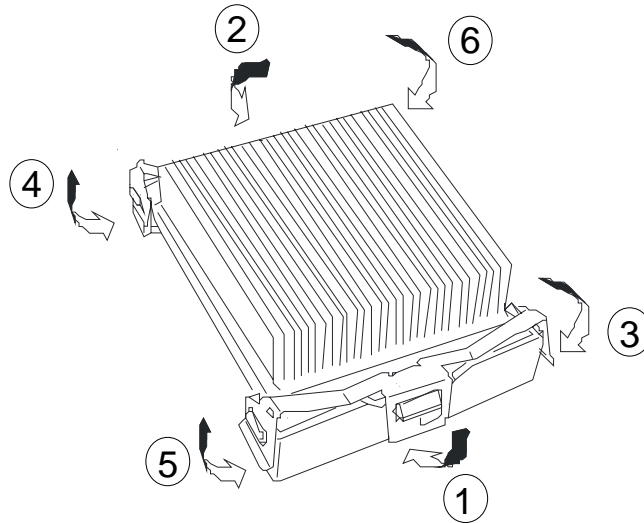
### **CAUTION**

Do not allow the heat sink to rock back and forth while securing the heat sink clips. If the CPU becomes dislodged from the socket, catastrophic failure may occur.

---

- Place the heat sink clip on the center tab of the retention module and rotate the clip towards the heat sink to engage the center tab (1). Repeat this step with the second clip (2). See Figure 4-15.

- 
- While ensuring the heat sink is level and secure with one hand, snap one end of the clip down over the corresponding tab on the retention module (3). Then snap the opposite corner clip (4). Snap the remaining end of the clips down over the corresponding tabs (5) (6). Be sure the clip is adequately engaged with the tab. Ensure the heat sink is absolutely level.



**Figure 4-15. Securing the Processor Heatsink**

12. Attach the CPU air duct removed in Step 5.
13. Install the CPU module top cover removed in Step 2, securing it with three screws.
14. Install the CPU module into the system cabinet following procedures previously detailed in this chapter.
15. Power on the CPU module and reboot the system to ensure POST does not display any error messages. If error messages are displayed, see the POST error messages listed in Chapter 5.
16. To operate a multi-processor system, do the following:
  - If in “Computer” of Device Manager, [Driver] is set to “ACPI single processor PC,” change it to “ACPI multi-processor PC” and restart the server to update the system.

## **Removing a Processor**

1. Remove the appropriate CPU module from the server chassis. See *Removing a CPU Module* earlier in this chapter.
2. Remove the top cover of the CPU module. See *Installing a Processor* earlier in this chapter.
3. Locate the processor on the CPU board. See *Installing a Processor* earlier in this chapter.
4. Remove the CPU air duct. See Figure 4-9.

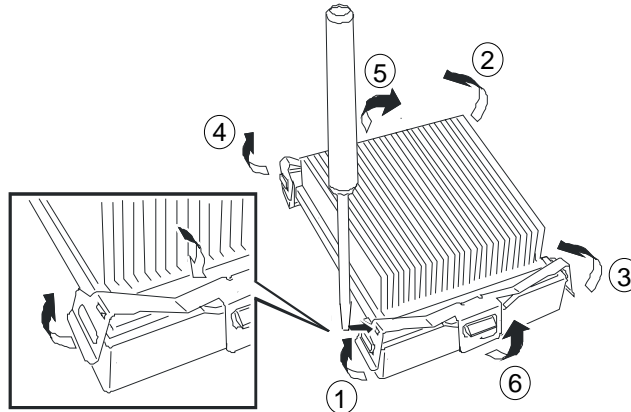
---

## **⚠ WARNING**

If the system was running, any processor and heat sink installed is hot. To avoid the possibility of a burn, let the components cool for 10 minutes before continuing with these procedures.

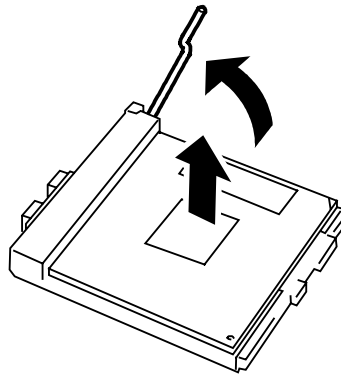
---

5. Remove the heat sink from the top of the processor by inserting a small screwdriver into the slots on its heat sink clips. Release the clip pressure points in the order (1-6) shown in Figure 4-16.



**Figure 4-16. Removing the Processor Heatsink**

6. Swing its processor socket lever up until it is in the unlocked position and carefully remove the processor. See Figure 4-17.



**Figure 4-17. Removing the Processor**

8. Install an anti-dust sheet on the CPU socket. Place the adhesive part of the sheet on the opposite side of the socket lever.
9. Attach the CPU air duct removed in Step 5.
10. Install the CPU module top cover removed in Step 2, securing it with three screws.

- 
- 11.** Install the CPU module into the system cabinet following procedures previously detailed in this chapter.
  - 12.** Power on the CPU module and reboot the system to ensure POST does not display any error messages. If error messages are displayed, see the POST error messages listed in Chapter 5.


---

## Replacing or Adding DIMMs

The following subsections provide the procedures for configuring and upgrading system memory. Use these procedures when replacing or adding dual inline memory modules (DIMMs) to your system. When adding or changing memory in a CPU module the same changes must be made to the other CPU module to provide total system redundancy and mirroring.

The CPU board contains six DIMM sockets (see Figure 4-18). DIMMs should be installed in the six sockets starting from the lowest number (DIMM #1) to the highest number (DIMM #6). Each 168-pin socket can hold a single 72-bit DIMM module with 128MB, 256MB or 512MB of memory. DIMMs must be installed in pairs of the same memory capacity (i.e., three groups of two DIMMs each.)

---

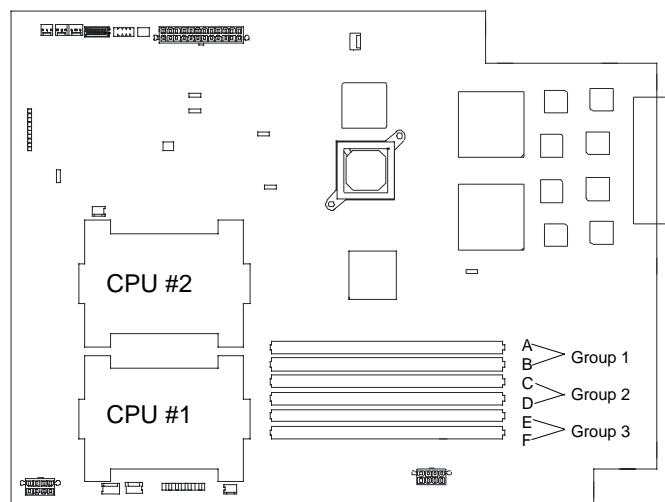
 **Note:** When replacing or upgrading DIMMs the replacement DIMMs must be of the same specifications of all the installed DIMMs.

---

### CAUTION

Electrostatic discharge (ESD) can damage components; place them on an antistatic surface. Add or replace DIMMs on the CPU board using an antistatic wrist strap attached to chassis ground.

---



A	DIMM #1
B	DIMM #2
C	DIMM #3
D	DIMM #4
E	DIMM #5
F	DIMM #6

**Figure 4-18. DIMM Component Layout**


---

## Installing DIMMs

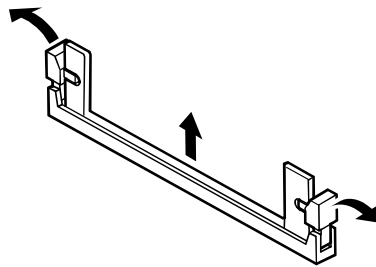
When properly installed, the DIMM module is oriented at an angle of 90 degrees relative to the CPU board.

1. Remove the appropriate CPU module from the server chassis. See *Removing a CPU Module* earlier in this chapter.
2. Remove the three screws from the top and rear of the CPU module securing its top cover. See Figure 4-7.
3. Remove the top cover of the CPU module by sliding it slightly towards the rear of the module until it stops and its hooks disengage from the tab slots in the module chassis and then pull it straight up. See Figure 4-7.
4. If you are replacing an existing DIMM, perform "Removing DIMMs" later in this chapter and then go to step 7. Otherwise, continue with the next step.
5. Spread the latch levers located on both ends of the DIMM socket just enough to unlock the DIMM cover and remove it (see Figure 4-19).

---

 **Note:** A DIMM cover is always mounted in an empty DIMM socket.

---



**Figure 4-19. Removing a DIMM Cover**

6. Holding the DIMM module only by its edges, remove it from its antistatic package.

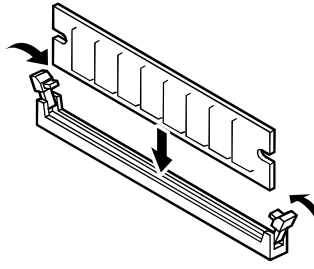
---

### CAUTION

Observe static precautions. Use an antistatic wrist strap.  
Hold DIMMs only by their edges.

---

7. DIMMs are keyed so they can only be inserted one way. Position the DIMM over the socket on the CPU board. The notches in the bottom edge of the DIMM mates with the raised bumps in the DIMM socket. See Figure 4-20.
8. Press down evenly on the DIMM until it seats correctly. The socket levers are not tools to aid in the insertion, only to keep the DIMM's in place and to aid in extraction. The levers should automatically click in place once the DIMM is fully inserted.



**Figure 4-20. Installing a DIMM**

9. Repeat steps 5 through 8 to install additional DIMMs.
10. Install the CPU module top cover removed in Step 2, securing it with three screws.
11. Install the CPU module into the system cabinet following procedures previously detailed in this chapter.
12. Power on the CPU module and reboot the system to ensure POST does not display any error messages. If error messages are displayed, see the POST error messages listed in Chapter 5.

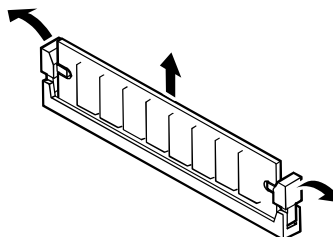
### **Removing DIMMs**

1. Remove the appropriate CPU module from the server chassis. See *Removing a CPU Module* earlier in this chapter.
2. Remove the top cover of the CPU module. See *Installing a Processor* earlier in this chapter.
3. Spread the latch levers located on both ends of the DIMM socket just enough to unlock the DIMM and remove it (see Figure 4-21). Store the DIMM in an antistatic package.



### **CAUTION**

Observe static precautions. Use an antistatic wrist strap.  
Hold DIMMs only by their edges.



**Figure 4-21. Removing a DIMM**

4. Repeat Steps 3 to remove additional DIMMs.



- 
5. If you are replacing DIMMs, perform *Installing DIMMs* earlier in this chapter, otherwise continue with the next step.
  6. Install a DIMM cover in the now empty socket. See *Installing DIMMs* earlier in this chapter.
  7. Install the CPU module top cover removed in Step 2, securing it with three screws.
  8. Install the CPU module into the system cabinet following procedures previously detailed in this chapter.
  9. Power on the CPU module and reboot the system to ensure POST does not display any error messages. If error messages are displayed, see the POST error messages listed in Chapter 5.

## ***Replacing a PCI Module***

Your system contains two redundant PCI modules that are accessible from the front of the server unit.

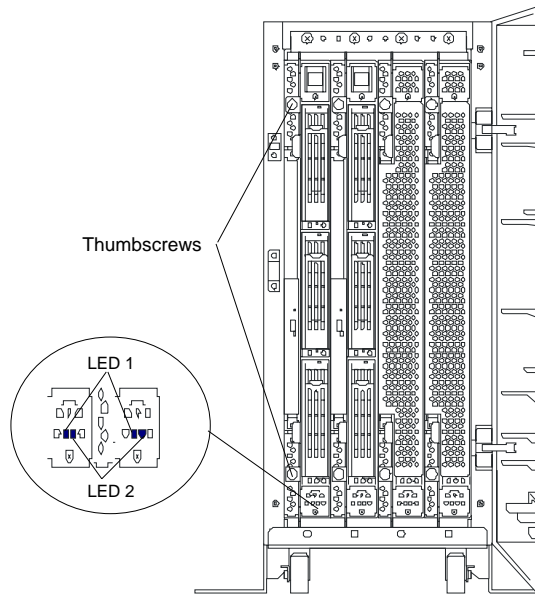
The following subsections provide the procedures for removing and installing PCI modules.

### ***Removing a PCI Module***

1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Unlock and open the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Bezel* earlier in this chapter.
3. Ensure that the PCI module is off-line by viewing its status LED indicators (See Figure 4-22). The state of the status LEDs should be as follows:

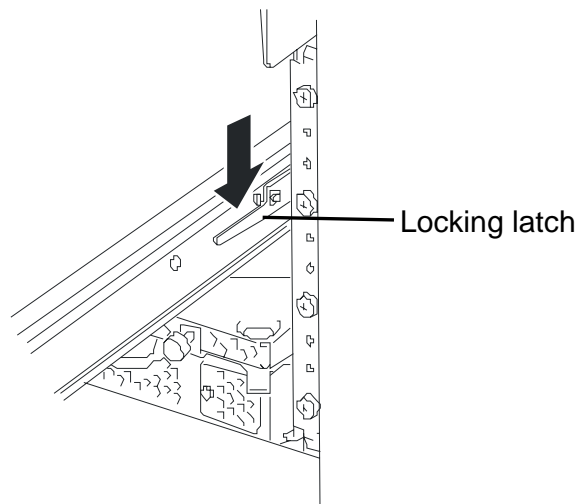
Fail lamp:     Red

State lamp:    Off



**Figure 4-22. PCI Module Status LED Indicators**

4. Disconnect (if connected) all PCI cables and the network cable from the rear of the PCI module.
5. Unscrew the knurled screws securing the locking handle to the PCI module. See Figure 4-22.
6. Pull the release levers to their unlocked position. This disconnects the PCI module from its backplane. Then pull the PCI module out of the chassis until the locking latch engages. See Figure 4-23.



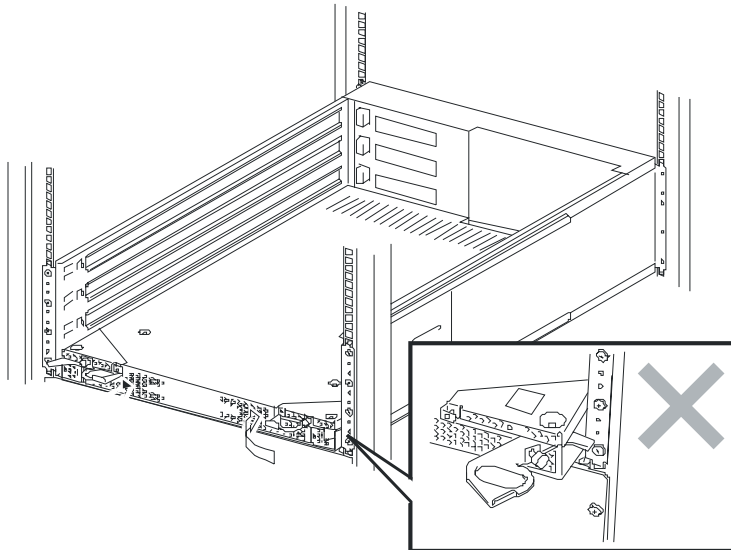
**Figure 4-23. Module Locking Latch**

7. Then, with the assistance of another person, push downwards (tower model) or to the right (rack-mount model) on the locking latch and carefully remove the module from the server unit and place it on a flat sturdy surface.

---

## Installing a PCI Module


1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Position the locking latches on the front of the PCI module in the unlocked position.
3. With the assistance of another person, support the PCI module with both hands and carefully slide it into the chassis until it is firmly seated in its connector.
4. Push the locking handles all the way their locked position. See Figure 4-24.



**Figure 4-24. Locking the PCI Module in the Chassis.**

5. Hand-tighten the two thumbscrews that fasten the PCI module locking latches to the cabinet.

---

 **Note:** Hand-tighten the thumbscrews only as much as required to activate the interlock switch that allows power to be applied to the CPU module.

---


7. Close and lock the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Bezel* earlier in this chapter.

---

## Installing PCI Adapter Boards

This subsection describes how to install PCI adapter boards. Use these procedures when adding or replacing PCI adapter boards in your system. When adding, but not replacing a PCI adapter board in a PCI module an identical PCI adapter board must be added to the other PCI module to continue total system redundancy and mirroring.


---

 **Notes:** All installed PCI adapter boards must have the same specifications and performance characteristics in order to provide total system redundancy and mirroring.

---

The PCI module board, is located in the PCI module and can have up to two 64-bit PCI adapter boards and one 32-bit adapter board installed in its expansion slots. However one VGA video board is already installed in each module in the standard configuration. See Figure 4-25.

---

 **Note:** PCI expansion slot #1 is dedicated to the standard video graphics board.

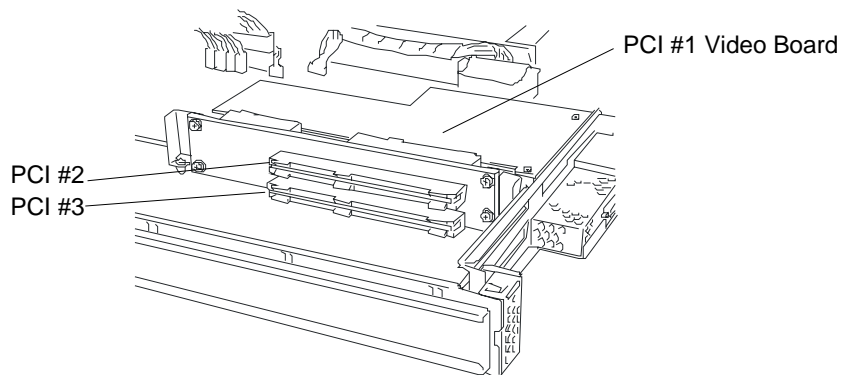
---

---

### CAUTION

Electrostatic discharge (ESD) can damage components; place them on an antistatic surface. Only handle PCI adapter boards using an antistatic wrist strap attached to chassis ground.

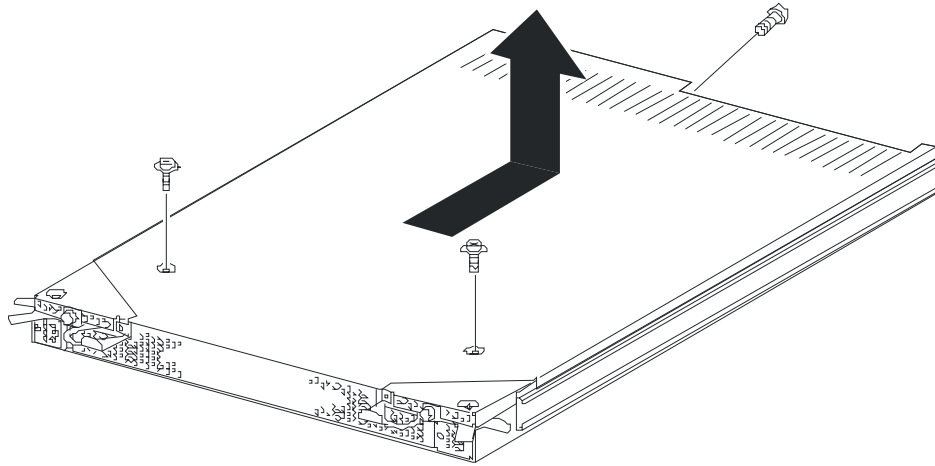
---



**Figure 4-25. PCI Adapter Board Expansion Slots**

1. Remove the appropriate PCI module from the server chassis. See *Removing a PCI Module* earlier in this chapter.
2. Remove the three screws from the top and rear of the CPU module securing its top cover. See Figure 4-26.

3. Remove the top cover of the CPU module by sliding it slightly towards the rear of the module until it stops and its hooks disengage from the tab slots in the module chassis and then pull it straight up. See Figure 4-26.

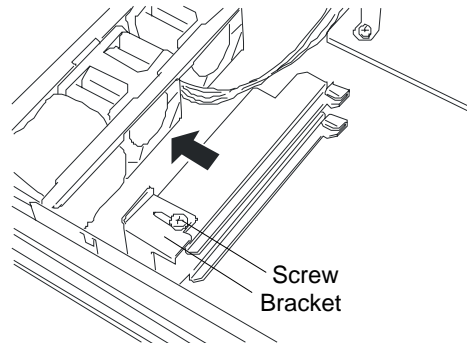


**Figure 4-26. Removing the Three Screws Securing the Top cover of the PCI Module**

4. Identify the slot to which you want to install a PCI board and remove the connector cap.

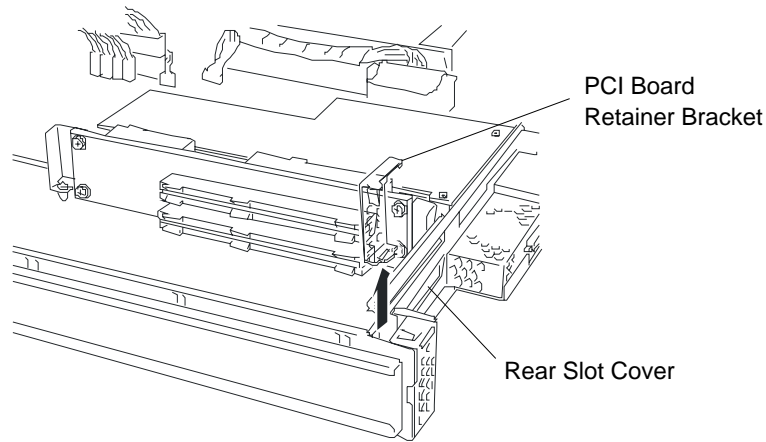
**IMPORTANT:** Carefully keep the removed connector cap.

5. To install a long card, loosen the set screw and slide the board retainer bracket towards the front of the PCI module., and secure it with the set screw. See Figure 4-27.



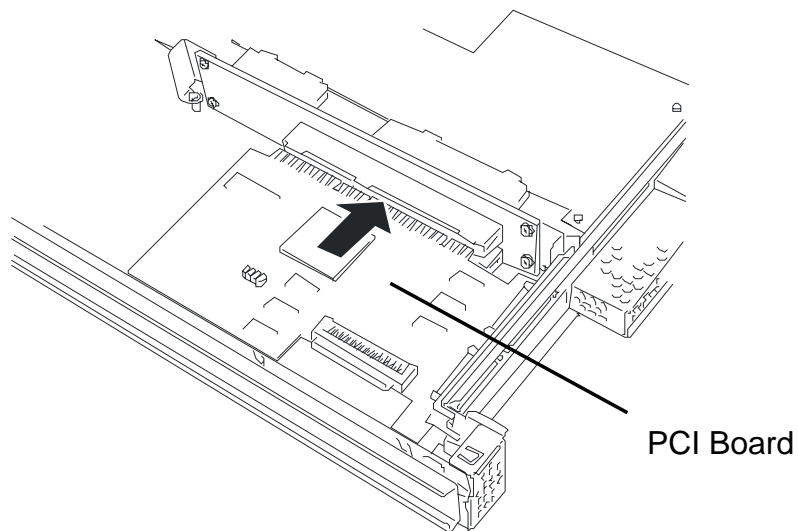
**Figure 4-27. Adjusting the Board Bracket**

6. If present, unscrew the set, and remove the rear slot cover. Save the slot cover for future use. See Figure 4-28.
7. Remove the PCI Board Retaining bracket by pulling it straight up and away from the module. See Figure 4-28.



**Figure 4-28. Rear Slot Cover and Retainer Bracket Locations**

8. Holding the PCI board by its top edge or upper corners, firmly press the board into the PCI expansion slot on the PCI module board. The tapered foot of the PCI board retaining bracket must fit into the mating slot in the expansion slot frame. See Figure 4-29. Be sure to Align the PCI board with the guide rail groove and insert the board slowly.



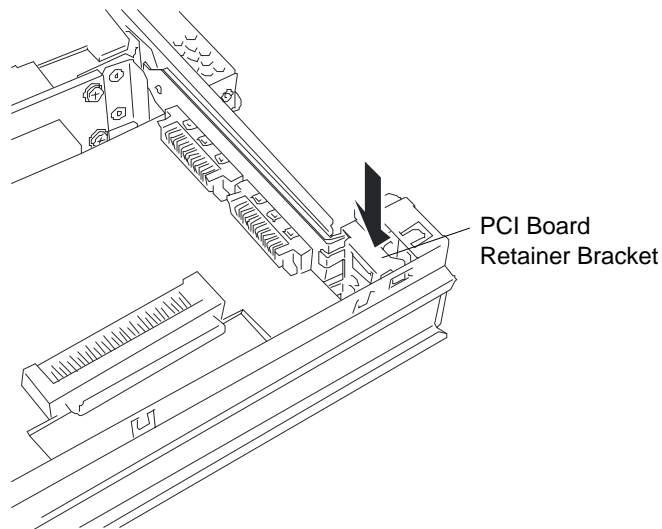
**Figure 4-29. Installing the PCI Board.**

---

**NOTE:** Check to see if the edge of the bracket (taper) is inserted into a slot of the chassis. In the case of a long board, check also to see if its other edge is inserted into the bracket guide.

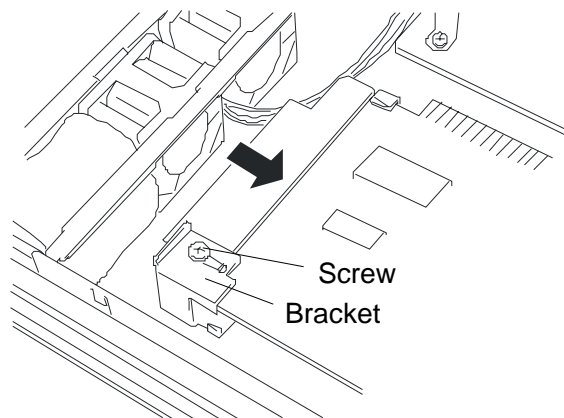
---

9. Install the PCI board retaining bracket. See Figure 4-30.



**Figure 4-30. Installing the PCI Board Retaining Bracket.**

10. If installing a long PCI board, slide the bracket towards the rear of the module to fasten the other edge of the board. Tighten the bracket screw. See Figure 4-31.



**Figure 4-31. Adjusting the Card Bracket to Secure long PCI Boards.**


11. Install the PCI module top cover, securing it with three screws.
12. Install the PCI module into the system cabinet following procedures previously detailed in this chapter.
13. Connect the network cables and option board cables.
14. Power on the PCI module and reboot the system to ensure POST does not display any error messages. If error messages are displayed, see the POST error messages listed in Chapter 5.
15. Boot the PCI module using the NEC ESMPRO Manager or the ft series utility to establish a dual configuration.

---

## Installing a Hard Disk Drive

1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Unlock and open the front bezel on the tower cabinet or front bezel on the rack-mount system. See *Opening and Closing the Front Bezel* found earlier in this chapter.
3. Determine which hard disk drive bay slot will house the new hard drive.
4. Remove the drive carrier from the system. See Figure 4-32.

---

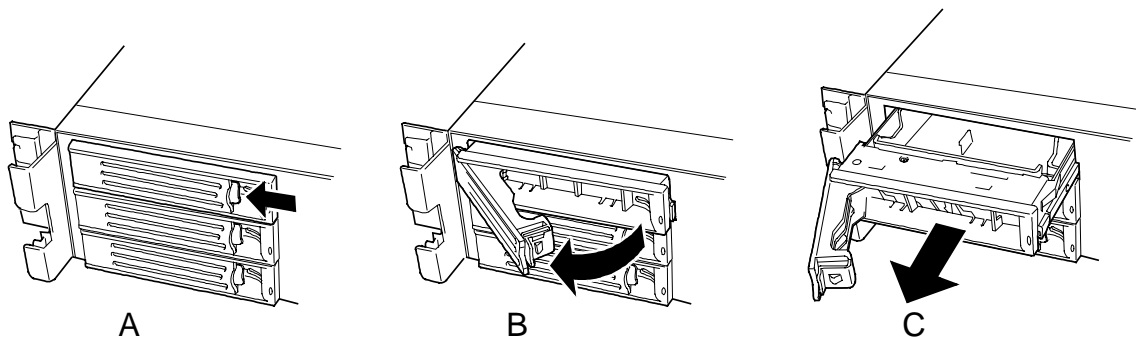
 **Note:** The dummy carriers are provided to maintain proper cooling. Leave the dummy carriers in unused slots, and keep all removed dummy drive carriers for future use.

---

### CAUTION


Do not insert your hand or any tool into the slot with the disk tray or dummy drive carrier removed. Failure to follow this caution may cause an electric shock or fire.

---



**Figure 4-32. Unlocking and Removing a Drive Carrier**

---

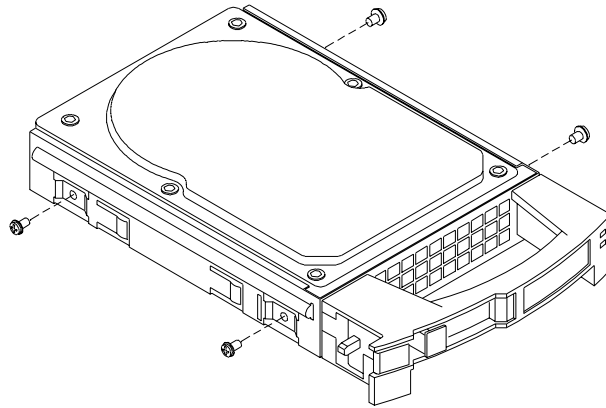
 **Note:** Observe static precautions. Use an antistatic wrist strap.

---

5. Remove four screws securing the empty tray within the drive carrier removed in Step 4.
6. Remove the new disk drive from its protective wrapper and place it on an antistatic surface.



- 
- Secure the drive in the drive carrier with the four screws supplied with the disk drive. See Figure 4-33.



**Figure 4-33. Mounting the Hard Drive into the Drive Carrier**

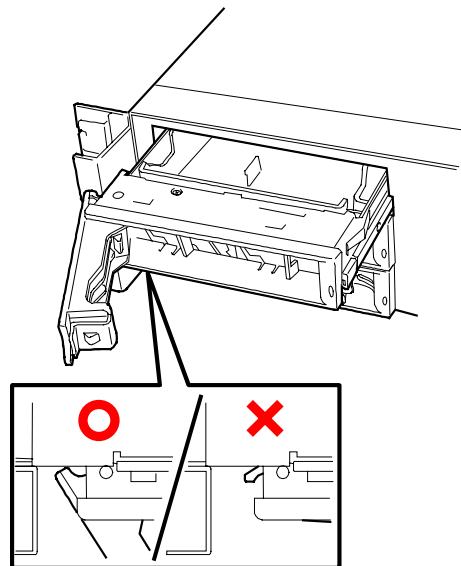
- Firmly hold the hard disk drive (with the tray provided) and handle, and insert it into the slot.

---

**IMPORTANT:**

---

- Carefully hold the hard disk drive with both hands.
  - .Push the hard disk drive until the handle engages with the frame.
- 



**Figure 4-34. Installing the hard Drive**


- Slowly close the handle. See Figure 4-34. The handle is locked when a "click" is heard.
- Install the front bezel.

---

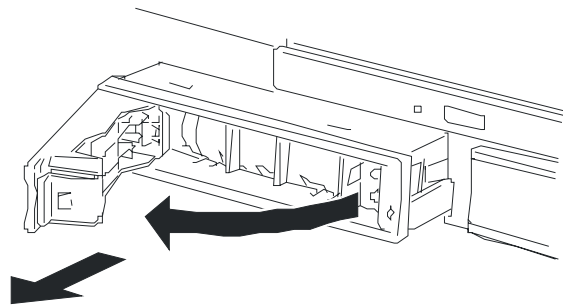
## Removing a Hard Disk Drive

1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Unlock and open the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Door of the Tower Cabinet* earlier in this chapter or *Removing and Installing the Front Covers of the Rack-Mount System* earlier in this chapter.
3. Determine which hard disk drive bay slot contains the hard drive you want to remove.
4. Grasp the handle of the hard disk's carrier and unlock the lever located at the bottom of the carrier handle, see Figure 4-35. The hard disk carrier will come out approximately 1/2-inch so that its handle is fully accessible in order to pull the carrier the rest of the way out of the bay.

---

 **Note:** After the drive is disconnected from its backplane wait approximately 10 seconds for the drive to spin down before removing it from the storage bay.

---



**Figure 4-35. Removing a Hard Disk Drive**


5. Remove the hard disk drive and place it in an antistatic wrapper.
6. If another hard disk drive is not going to be installed into the vacant slot then a dummy drive carrier must be. This will ensure proper system cooling.
7. Close and lock the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Door of the Tower Cabinet* earlier in this chapter or *Removing and Installing the Front Covers of the Rack-Mount System* earlier in this chapter.

---

## Hot-Swapping a Hard Drive

If you are swapping out a faulty hard drive, you can determine which drive to remove by checking its Disk Drive Status LEDs. See “Status LED Indicator Descriptions” in Chapter 1.


---

 **Note:** When the Disk Error LED indicates a drive fault (steady amber light), you can remove the drive and swap in a replacement at any time without needing to power down the system. Drive manufacturer's caution against moving a drive that is still spinning because of possible damage to the drive. Also, when the Disk Error LED indicates that the hard disk drive is being rebuilt (flashing amber light) do not remove the drive.

---

1. Observe the safety and ESD precautions listed at the beginning of this chapter.
2. Unlock and open the front door on the tower cabinet or front covers on the rack-mount system. See *Opening and Closing the Front Door of the Tower Cabinet* earlier in this chapter or *Removing and Installing the Front Covers of the Rack-Mount System* earlier in this chapter.
3. Check all the hard disk drive status LEDs to confirm which faulty drive to remove. Each drive has two status indicators located on its front handle. See *Table 1-2. Disk Drive Status LED Panel Indicators* in Chapter 1.


---

 **Note:** Depending on the drive fault, the drive may be still spinning when you remove it. Follow the next step exactly when removing drives.

---

4. Grasp the handle of the hard disk's carrier and unlock the lever located at the bottom of the carrier handle, see Figure 4-34. Pull the faulty drive out of the bay far enough to disengage the drive connector from the backplane. Wait approximately 10 seconds until the drive spins down, then remove the drive from the bay.

---

 **Note:** Observe static precautions. Use an antistatic wrist strap.

---

5. Place the removed hard drive on an antistatic surface.
6. Remove the replacement drive from its protective wrapper and place it on an antistatic surface. If a drive carrier was not shipped with the replacement drive, use the carrier from the removed drive.
7. Place the removed hard drive in an antistatic wrapper.
8. Perform steps 5 through 10 of *Installing a Hard Disk Drive*.

# 5

## Problem Solving

- Problem Solving
- Static Precautions
- Troubleshooting Checklists
- Diagnostic Procedures
- Specific Problems and Corrective Actions
- Problems with the Network
- PCI Installation Tips
- Error Messages and Beep Codes
- How to Identify BIOS and BMC Revision Levels

---

# Problem Solving

This chapter helps you identify and solve problems that may occur during system installation or while using your system. The first section of this chapter tells you how to reset your system in the event of problems. The next few sections provide troubleshooting checklists and procedural steps that help you isolate specific system problems. The last section includes BIOS, system, and disk status user information.

Fault-tolerant systems require both hardware and software-based methods of troubleshooting system hardware. Hardware-based troubleshooting relies on status LED indicators and error messages either displayed on a monitor or LCD panel. Software-based troubleshooting is achieved by way of the server manager. Information about hardware failures is viewed from various sources:

- Status LEDs on each hardware component
- Alarm messages on the system monitor and LCD panel
- Windows 2000 Event Log
- System inventory from the Server Manager

The failed system component related to an error condition is identified as a Customer Replaceable Unit (CRU) of which most are hot-pluggable and redundant.

---

## WARNING

The DC push-button on/off switch on the front of the PCI module does not turn off the system AC power. Also, +5vdc is present on some of the system boards whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage

---

## Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

---

# Troubleshooting Checklists

The following subsections provide troubleshooting checklists for problems that occur at initial system startup, when you run new application software, and after the system hardware and software have been running correctly.

## Initial System Startup

Incorrect installation or configuration usually causes problems that occur at initial system startup. Hardware failure is a less frequent cause. If you have problems during initial system startup, review the following checklist.

### Checklist

- Are the system power cords properly connected to the system and plugged into a NEMA 5-15R outlet (100-120 VAC), a NEMA 6-15R outlet (200-240 VAC), or an UPS that meets the power specifications of the system?
- Is AC power available at the wall outlet?
- Did you press the power on/off push-button switch on the PCI Module to turn the system on (power on LED should be lit)?
- Are all cables correctly connected and secured?
- Are all jumpers and switch settings on option 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 option boards sharing the same interrupt.
- Are all switch and jumper settings on internal boards and drives correct?
- Are the CPU modules and PCI modules fully seated in their bays? Refer to Chapter 4 for installation instructions?
- Are all peripheral devices installed correctly?
- Are all option boards and disk drives installed correctly?
- Is the system hard disk drive properly formatted or configured?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Are all drivers properly installed? For information about installing drivers, refer to your *Network Operating System Configuration Guide*.
- Are the configuration settings in BIOS Setup and the SCSISelect Utility correct? For information about running these utilities, refer to the *Configuring Your System* chapter 3.

If the above items are all correct, but the problem reoccurs, refer to *Diagnostic Procedures* in this chapter.

---

## ***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. If you have problems while running new application software, check the following checklist.

### ***Checklist***

- Does the system meet the minimum hardware requirements for the software? Refer to the software documentation.
- Is the software an authorized copy? If not, obtain an authorized copy of the software. Unauthorized 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 hard disk drive, is the software correctly installed? Were all necessary procedures followed and files installed?
- If you are running the software from a CD-ROM disk is the disk scratched or dirty?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?
- If other software runs correctly on the system, contact your vendor about the failing software.

If the problems persist with the software, contact the software vendor's customer service representative.

---


## ***After System Has Been Running Correctly***

Problems that occur after the system hardware and software have been running correctly often indicate equipment failure. However, many situations that are easy to correct can also cause such problems. If you have problems after the system has been running correctly, check the following checklist.

### ***Checklist***

- If you are running the software from a diskette or CD-ROM, try a new copy of the software or try a different floppy disk or CD-ROM disk to see if the problem occurs on all the disks.
- If you are running the software from a hard disk drive, try running it from a floppy diskette. If the software runs correctly, there may be a problem with the copy on the hard disk. Reinstall the software on the hard disk drive and try running it again. Make sure all the necessary files are installed.
- If the problem recurs, you may need to reformat the hard disk drive. The hard disk drive, the drive controller, or the system device backplane board set may be defective.
- 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:** Voltage spikes can corrupt or destroy data files on the drive. If you are experiencing voltage spikes on the power line, install a surge suppresser between the power outlet and the system power cord.

---

If the problem recurs after you have checked and corrected all of the above items, refer to *Diagnostic Procedures* in this chapter.



---

# Diagnostic Procedures

This section provides a more detailed approach to diagnosing and identifying problems and then locating their sources.

## Error Checking

Each time you turn on the system, POST (Power-On-Self-Test) runs automatically and checks all boards, processors, keyboard, and mouse.

If POST finds an error, it displays an error message. Refer to the *Error Message* section in this chapter for an explanation of each error message.

## Troubleshooting Guide


Use the following troubleshooting procedures to help you identify a problem. These general procedures lead you through the following:

- Preparing the system for diagnosing problems
- Monitoring POST while it is running
- Verifying proper operation of key system LEDs
- Confirming loading of the operating system.

### Preparing the System for Diagnosing Problems

To prepare the system for diagnosing problems, perform the following:

---

 **Note:** 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 devices from the system except the keyboard and video monitor.
2. Make sure the system power cords are 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 (refer to 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 indicator LED does not light, refer to *Power Light Does Not Light* found later in this chapter.

---

## Monitoring POST

Each time you turn on the system, the Power-On Self-Test (POST) runs automatically and checks the CPU modules, PCI modules, keyboard, mouse, and most installed peripheral devices.

During the memory test, POST displays the amount of memory that it is able to access and test. Depending on the amount of memory, it may take several minutes to complete the memory test. When the memory test completes, the following is displayed:

Press <F2> to enter SETUP

Press <**F2**> to enter BIOS SETUP. When the utility appears, follow the instructions on your monitor to configure BIOS. See Chapter 3, "Configuring Your System." If you do not press <**F2**>, the above message remains for a few seconds, the boot process continues, and the system beeps once. Then this message appears:

Operating System not found

If you do not press <F2>, the boot process continues and this message appears:

Press <Alt Q> to enter Fast!Util™ Utility!

Press <**Alt Q**> if you want to configure SCSI devices in your system. When the utility appears, follow the instructions on your monitor to configure the SCSI host adapter settings and run the SCSI disk utilities. See Chapter 3, *Configuring Your System*. If you choose not to run Fast!Util™ Utility, the boot process continues.

After POST completes, the system beeps once.

If POST finds an error, it displays an error message and, in case there is a problem with the display, it emits a series of long and short beeps. Write down any beep code emitted. This information is useful to your service representative.

Refer to the "Error Messages" section in this chapter for a list of items to check for each error code and for an explanation of the error beep codes.

The POST Tests table at the end of this chapter lists keys active during POST and provides a description of errors that may occur.

The BIOS indicates errors by writing an error code to the standard logging area in the Extended BIOS Data Area, and by displaying a message on the screen, which is sometimes preceded by the POST Error Code. The error code will also be logged to the Event Logging area.

Report any error code to your service representative.

---

## POST Keys and Errors

Action/Message	Description
If POST Beeps Before Video Appears	Initialization failed before video initialized. Most beep code errors are fatal; initialization cannot continue. Refer to the section "Error Messages" in this chapter.
If Monitor Displays Error	Note error; press <b>F1</b> to continue boot or <b>F2</b> to enter Setup. Refer to the section "Error Messages" in this chapter.
To Enter Setup	Setup changes specific options, then writes to CMOS, NVRAM. Press <b>F2</b> during initialization to run Setup. If you do not press <b>F2</b> , the boot process continues.
Enter BOOT Diskette	If prompted, insert the boot diskette.

### Verifying Proper Operation of Key System Indicators

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 indicator should turn on briefly. Check for the following:

- Does the diskette drive activity indicator turn on briefly? If not, refer to "Diskette Drive Activity Indicator Does Not Light" in this chapter.
- If there is a hard disk drive or SCSI devices installed in the system, does the hard disk drive activity indicator turn on briefly? If not, refer to *Hard Disk Drive Activity Indicator Does Not Light* in this chapter.

### 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, refer to *Problems with Application Software* found later in this chapter.

---

## ***Specific Problems and Corrective Actions***

This section provides possible solutions for the following specific problems:

- Power LED does not light
- No beep or incorrect beep pattern
- No characters appear on screen
- Characters on the screen appear distorted or incorrect
- Diskette drive activity LED does not light
- Hard disk drive activity LED does not light
- CD-ROM drive activity LED does not light
- Problems with application software
- The startup prompt “Press <F2> key if you want to run Setup” does not appear on the screen.
- The bootable CD-ROM is not detected.

Try the solutions in the order given. If you cannot correct the problem, contact your service representative for assistance.

### ***Power LED Does Not Light***

Check the following:

- Is the power turned on to the AC outlet? Is there a blown fuse or breaker?
- Is the system connected to a 110 or 208 VAC source?
- Is the system operating normally? If so, the power LED is probably defective.
- Are there other problems with the system? If so, check the items listed under System Cooling Fans Do Not Rotate.

### ***Incorrect or No Beep Code***

Check the following:

- Is the speaker operating?

If the system operates normally, but there was no beep, the speaker may be defective. If the speaker is enabled, but the speaker does not function, contact your service representative or authorized dealer for assistance..

Record the beep code emitted by POST, and see the “Messages and Beep Codes” section found later in this chapter.

---

## **No Characters Appear on Screen**

Check the following:

- Is the keyboard working? Check to see if the **Num Lock** light is functioning.
- Is the video display monitor plugged in and turned on? Many modern video monitors shut down when inactive and may require a moment to warm up when activated.
- 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 video controller installed?

If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in its connector in the I/O module (and verify that the video monitor is plugged in to the ACTIVE video controller).
2. Reboot the system for changes to take effect.
3. If there are still no characters on the screen after rebooting the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative. See “Post Error Codes and Messages” later in this chapter.
4. POST emits one long beep and two short beeps pattern to indicate a possible problem with the video display controller. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. You can verify this by trying the monitor on another system or trying a different monitor on this system. Contact your service representative or authorized dealer for assistance.

## **Characters are Distorted or Incorrect**

Check the following:

- Are the brightness and contrast controls properly adjusted on the video display? Refer to the documentation supplied with your video display.
- Are the video monitor's 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 for assistance.

---

## ***Diskette Drive Activity LED Does Not Light***

Check the following:

- Are the diskette drive's 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.

Use BIOS Setup to make sure that the diskette drive controller is set to Enabled. For information about running BIOS Setup, refer to *Configuring Your System*, Chapter 3. If the problem persists, there may be a problem with the diskette drive, device backplane boards, or drive signal cable. Contact your service representative for assistance.

---

## ***CD-ROM Drive Activity Light Does Not Light***

Check the following:

- Is the power and signal cable 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?

## ***Problems with Application Software***

If you have problems with application software, perform the following:

- Verify that the software is properly configured for the system. Refer to the software installation and operation documentation for instructions on setting up and using the software.
- Verify a different copy of the software to see if the problem is with the copy that you are using.
- Make sure all cables are installed correctly.
- Verify that the PCI board jumpers are set correctly. Refer to the *Configuring Your System*, Chapter 3 for jumper settings.
- 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 assistance.

## ***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 your BIOS Setup (F2) configuration.

---

## ***Problems with the Network***

Diagnostics pass, but the connection fails:

- Make sure the network cable is securely attached.

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 the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts.
- 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.

## ***PCI Installation Tips***

Certain drivers may require interrupts that are not shared with other PCI drivers. The BIOS Setup Utility can be used to adjust the interrupt numbers for PCI devices. For certain drivers, it may be necessary to alter settings so that interrupts are not shared.



---

# ***Error Messages and Beep Codes***

This section describes the MWA/ESMPRO error messages, POST error codes and messages, and the POST error beep codes.

## ***MWA/ESMPRO Error Messages***

If the server system detects an error while operating (power on) or while the power is off, these error messages may be viewed using ESMPRO or MWA Managers. Refer to ESMPRO and MWA documentation included on the EXPRESSBUILDER CD for more information on viewing error messages using these applications.

Table 5-1 below lists the error messages viewed with ESMPRO Manager or MWA Manager. Included in the error messages are actions for you to remove and replace certain Customer Replaceable Units (CRUs). These actions are numbered to indicate the order in which to perform them.

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
<b>= A =</b>					
AmbientTempAlarm00	Amber	Blink	CPU module	Temperature alarm (lower limit)	Contact your sales agent.
AmbientTempAlarm02	Amber	Lit	CPU module	Fatal temperature alarm (lower limit)	
AmbientTempAlarm07	Amber	Blink	CPU module	Temperature alarm (upper limit)	
AmbientTempAlarm09	Amber	Lit	CPU module	Fatal temperature alarm (upper limit)	
<b>= B =</b>					
BMC Unsync	-	-	PCI module #1	The BMC cannot be synchronized.	Contact your sales agent.
BMC0 Not Ready	Green	Blink	PCI module #1	PCI module's BMC is disconnected	If disconnection continues for a while, contact your sales agent.
BMC1 Not Ready	Green	Blink	PCI module #2		
<b>= C =</b>					
Cor0 +12VAlarm00	Amber	Blink	PCI module #1	12-V power voltage alarm (lower limit)	Contact your sales agent.
Cor0 +12VAlarm02	Amber	Lit	PCI module #1	Fatal 12-V power voltage alarm (lower limit)	
Cor0 +12VAlarm07	Amber	Blink	PCI module #1	12-V power voltage alarm (upper limit)	
Cor0 +12VAlarm09	Amber	Lit	PCI module #1	Fatal 12-V power voltage alarm (upper limit)	
Cor0 +2.5VAlarm00	Amber	Blink	PCI module #1	2.5-V power voltage alarm (lower limit)	
Cor0 +2.5VAlarm02	Amber	Lit	PCI module #1	Fatal 2.5-V power voltage alarm (lower limit)	
Cor0 +2.5VAlarm07	Amber	Blink	PCI module #1	2.5-V power voltage alarm (upper limit)	
Cor0 +2.5VAlarm09	Amber	Lit	PCI module #1	Fatal 2.5-V power voltage alarm (upper limit)	
Cor0 +3.3VAlarm00	Amber	Blink	PCI module #1	3.3-V power voltage alarm (lower limit)	
Cor0 +3.3VAlarm02	Amber	Lit	PCI module #1	Fatal 3.3-V power voltage alarm (lower limit)	
Cor0 +3.3VAlarm07	Amber	Blink	PCI module #1	3.3-V power voltage alarm (upper limit)	
Cor0 +3.3VAlarm09	Amber	Lit	PCI module #1	Fatal 3.3-V power voltage alarm (upper limit)	
Cor0 +3.3VAlarm00	Amber	Blink	PCI module #1	3.3-V power voltage alarm (lower limit)	
Cor0 +3.3VAlarm02	Amber	Lit	PCI module #1	Fatal 3.3-V power voltage alarm (lower limit)	
Cor0 +3.3VAlarm07	Amber	Blink	PCI module #1	3.3-V power voltage alarm (upper limit)	
Cor0 +3.3VAlarm09	Amber	Lit	PCI module #1	Fatal 3.3-V power voltage alarm (upper limit)	
Cor0 +5.0VAlarm00	Amber	Blink	PCI module #1	5-V power voltage alarm (lower limit)	Contact your sales agent.
Cor0 +5.0VAlarm02	Amber	Lit	PCI module #1	Fatal 5-V power voltage alarm (lower limit)	
Cor0 +5.0VAlarm07	Amber	Blink	PCI module #1	5-V power voltage alarm (upper limit)	

<b>Error Message</b>	<b>STATUS LED</b>		<b>Suspected module</b>	<b>Description</b>	<b>Procedure</b>
Cor0 +5.0vAl m 09	Amber	Lit	PCI module #1	Fatal 5-V power voltage alarm (upper limit)	Contact your sales agent.
Cor0 +5.0vsAl m 00	Amber	Blink	PCI module #1	5-V power voltage alarm (lower limit)	
Cor0 +5.0vsAl m 02	Amber	Lit	PCI module #1	Fatal 5-V power voltage alarm (lower limit)	
Cor0 +5.0vsAl m 07	Amber	Blink	PCI module #1	5-V power voltage alarm (upper limit)	
Cor0 +5.0vsAl m 09	Amber	Lit	PCI module #1	Fatal 5-V power voltage alarm (upper limit)	
Cor0 -12vAl m 00	Amber	Blink	PCI module #1	-12-V power voltage alarm (lower limit)	
Cor0 -12vAl m 02	Amber	Lit	PCI module #1	Fatal -12-V power voltage alarm (lower limit)	
Cor0 -12vAl m 07	Amber	Blink	PCI module #1	-12-V power voltage alarm (upper limit)	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
Cor0 -12vAl m 09	Amber	Lit	PCI module #1	Fatal -12-V power voltage alarm (upper limit)	Contact your sales agent.
Cor0 Bus PERR 01	Green	Blink	PCI module #1	PCI bus parity error	
Cor0 Bus SERR 01	Green	Blink	PCI module #1	Fatal PCI bus error	
Cor0 CLK Al m 00	Amber	Blink	CLOCK board	Cl ock alarm (lower limit)	
Cor0 CLK Al m 02	Amber	Lit	CLOCK board	Fatal Cl ock alarm (lower limit)	
Cor0 CLK Al m 07	Amber	Blink	CLOCK board	Cl ock alarm (upper limit)	
Cor0 CLK Al m 09	Amber	Lit	CLOCK board	Fatal Cl ock alarm (upper limit)	
Cor0 FAN Al m 01	Amber	Blink	PCI module #1	Cooling fan1 alarm	
Cor0 FAN Al m 02	Amber	Blink	PCI module #1	Cooling fan2 alarm	
Cor0 FAN Al m 03	Amber	Blink	PCI module #1	Cooling fan3 alarm	
Cor0 FAN Al m 04	Amber	Blink	PCI module #1	Cooling fan4 alarm	
Cor0 FAN Al m 05	Amber	Blink	PCI module #1	Cooling fan5 alarm	
Cor0 offl i ne	Green	Blink	PCI module #1	PCI module logically isolated	Start the PCI module by ft sever utility or dismount and remount that module. If not solved by the above, contact your sales agent.
Cor0 removed	Green	Blink	PCI module #1	PCI module detached	Dismount and remount the PCI module. If not solved by the above, contact your sales agent.
Cor0 Temp Al m 00	Amber	Blink	PCI module #1	Temperature alarm (lower limit)	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
Cor0 Temp Al m 02	Amber	Lit	PCI module #1	Fatal temperature alarm (lower limit)	
Cor0 Temp Al m 07	Amber	Blink	PCI module #1	Temperature alarm (upper limit)	
Cor0 Temp Al m 09	Amber	Lit	PCI module #1	Fatal temperature alarm (upper limit)	
Cor1 +12vAl m 00	Amber	Blink	PCI module #2	12-V power voltage alarm (lower limit)	Contact your sales agent.
Cor1 +12vAl m 02	Amber	Lit	PCI module #2	Fatal 12-V power voltage alarm (lower limit)	
Cor1 +12vAl m 07	Amber	Blink	PCI module #2	12-V power voltage alarm (upper limit)	
Cor1 +12vAl m 09	Amber	Lit	PCI module #2	Fatal 12-V power voltage alarm (upper limit)	
Cor1 +2. 5vAl m 00	Amber	Blink	PCI module #2	2. 5-V power voltage alarm (lower limit)	
Cor1 +2. 5vAl m 02	Amber	Lit	PCI module #2	Fatal 2. 5-V power voltage alarm (lower limit)	
Cor1 +2. 5vAl m 07	Amber	Blink	PCI module #2	2. 5-V power voltage alarm (upper limit)	
Cor1 +2. 5vAl m 09	Amber	Lit	PCI module #2	Fatal 2. 5-V power voltage alarm (upper limit)	
Cor1 +3. 3vAl m 00	Amber	Blink	PCI module #2	3. 3-V power voltage alarm (lower limit)	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
Cor1 +3. 3vAl m 02	Amber	Lit	PCI module #2	Fatal 3. 3-V power voltage alarm (lower limit)	Contact your sales agent.
Cor1 +3. 3vAl m 07	Amber	Blink	PCI module #2	3. 3-V power voltage alarm (upper limit)	
Cor1 +3. 3vAl m 09	Amber	Lit	PCI module #2	Fatal 3. 3-V power voltage alarm (upper limit)	
Cor1 +3. 3vsAl m 00	Amber	Blink	PCI module #2	3. 3-V power voltage alarm (lower limit)	
Cor1 +3. 3vsAl m 02	Amber	Lit	PCI module #2	Fatal 3. 3-V power voltage alarm (lower limit)	
Cor1 +3. 3vsAl m 07	Amber	Blink	PCI module #2	3. 3-V power voltage alarm (upper limit)	
Cor1 +3. 3vsAl m 09	Amber	Lit	PCI module #2	Fatal 3. 3-V power voltage alarm (upper limit)	
Cor1 +5. 0vAl m 00	Amber	Blink	PCI module #2	5-V power voltage alarm (lower limit)	
Cor1 +5. 0vAl m 02	Amber	Lit	PCI module #2	Fatal 5-V power voltage alarm (lower limit)	
Cor1 +5. 0vAl m 07	Amber	Blink	PCI module #2	5-V power voltage alarm (upper limit)	
Cor1 +5. 0vAl m 09	Amber	Lit	PCI module #2	Fatal 5-V power voltage alarm (upper limit)	
Cor1 +5. 0vsAl m 00	Amber	Blink	PCI module #2	5-V power voltage alarm (lower limit)	
Cor1 +5. 0vsAl m 02	Amber	Lit	PCI module #2	Fatal 5-V power voltage alarm (lower limit)	
Cor1 +5. 0vsAl m 07	Amber	Blink	PCI module #2	5-V power voltage alarm (upper limit)	
Cor1 +5. 0vsAl m 09	Amber	Lit	PCI module #2	Fatal 5-V power voltage alarm (upper limit)	
Cor1 -12vAl m 00	Amber	Blink	PCI module #2	-12-V power voltage alarm (lower limit)	
Cor1 -12vAl m 02	Amber	Lit	PCI module #2	Fatal -12-V power voltage alarm (lower limit)	
Cor1 -12vAl m 07	Amber	Blink	PCI module #2	-12-V power voltage alarm (upper limit)	
Cor1 -12vAl m 09	Amber	Lit	PCI module #2	Fatal -12-V power voltage alarm (upper limit)	
Cor1 Bus PERR 01	Green	Blink	PCI module #2	PCI bus parity error	
Cor1 Bus SERR 01	Green	Blink	PCI module #2	Fatal PCI bus error	
Cor1 CLK Al m 00	Amber	Blink	CLOCK board	Cl ock alarm (lower limit)	
Cor1 CLK Al m 02	Amber	Lit	CLOCK board	Fatal Cl ock alarm (lower limit)	
Cor1 CLK Al m 07	Amber	Blink	CLOCK board	Cl ock alarm (upper limit)	
Cor1 CLK Al m 09	Amber	Lit	CLOCK board	Fatal Cl ock alarm (upper limit)	
Cor1 FAN Al m 01	Amber	Blink	PCI module #2	Cooling fan1 alarm	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
Cor1 FAN Al m 02	Amber	Blink	PCI module #2	Cooling fan2 alarm	
Cor1 FAN Al m 03	Amber	Blink	PCI module #2	Cooling fan3 alarm	
Cor1 FAN Al m 04	Amber	Blink	PCI module #2	Cooling fan4 alarm	
Cor1 FAN Al m 05	Amber	Blink	PCI module #2	Cooling fan5 alarm	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
Cor1 offl ine	Green	Blink	PCI module #2	PCI module logically isolated	Start the PCI module by ft sever utility or dismount and remount that module. If not solved by the above, contact your sales agent.
Cor1 removed	Green	Blink	PCI module #2	PCI module detached	Dismount and remount the PCI module. If not solved by the above, contact your sales agent.
Cor1 Temp Al m 00	Amber	Blink	PCI module #2	Temperature alarm (lower limit)	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
Cor1 Temp Al m 02	Amber	Lit	PCI module #2	Fatal temperature alarm (lower limit)	
Cor1 Temp Al m 07	Amber	Blink	PCI module #2	Temperature alarm (upper limit)	
Cor1 Temp Al m 09	Amber	Lit	PCI module #2	Fatal temperature alarm (upper limit)	
CPU IERR 00	Green	Blink	CPU module #1	CPU#1 internal error	Contact your sales agent.
CPU IERR 01	Green	Blink	CPU module #1	CPU#2 internal error	
CPU IERR 20	Green	Blink	CPU module #2	CPU#1 internal error	
CPU IERR 21	Green	Blink	CPU module #2	CPU#2 internal error	
CPU T-Tri p 00	Green	Blink	CPU module #1	CPU#1 thermal change error (upper limit)	
CPU T-Tri p 01	Green	Blink	CPU module #1	CPU#2 thermal change error (upper limit)	
CPU T-Tri p 20	Green	Blink	CPU module #2	CPU#1 thermal change error (upper limit)	
CPU T-Tri p 21	Green	Blink	CPU module #2	CPU#2 thermal change error (upper limit)	
CPU0 +12ss Al m 00	Amber	Blink	CPU module #1	+12-V power voltage alarm (lower limit)	
CPU0 +12ss Al m 02	Amber	Lit	CPU module #1	Fatal +12-V power voltage alarm (lower limit)	
CPU0 +12ss Al m 07	Amber	Blink	CPU module #1	+12-V power voltage alarm (upper limit)	
CPU0 +12ss Al m 09	Amber	Lit	CPU module #1	Fatal +12-V power voltage alarm (upper limit)	
CPU0 +12v Al m 00	Amber	Blink	CPU module #1	12-V power voltage alarm (lower limit)	
CPU0 +12v Al m 02	Amber	Lit	CPU module #1	Fatal 12-V power voltage alarm (lower limit)	
CPU0 +12v Al m 07	Amber	Blink	CPU module #1	12-V power voltage alarm (upper limit)	
CPU0 +12v Al m 09	Amber	Lit	CPU module #1	Fatal 12-V power voltage alarm (upper limit)	
CPU0 +1. 5v Al m 00	Amber	Blink	CPU module #1	1. 5-V power voltage alarm (lower limit)	
CPU0 +1. 5v Al m 02	Amber	Lit	CPU module #1	Fatal 1. 5-V power voltage alarm (lower limit)	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
CPU0 +1. 5v AI m 07	Amber	Blink	CPU module #1	1. 5-V power voltage alarm (upper limit)	Contact your sales agent.
CPU0 +1. 5v AI m 09	Amber	Lit	CPU module #1	Fatal 1. 5-V power voltage alarm (upper limit)	
CPU0 +2. 5vAI m 00	Amber	Blink	CPU module #1	2.5-V power voltage alarm (lower limit)	
CPU0 +2. 5vAI m 02	Amber	Lit	CPU module #1	Fatal 2.5-V power voltage alarm (lower limit)	
CPU0 +2. 5vAI m 07	Amber	Blink	CPU module #1	2.5-V power voltage alarm (upper limit)	
CPU0 +2. 5vAI m 09	Amber	Lit	CPU module #1	Fatal 2.5-V power voltage alarm (upper limit)	
CPU0 +2. 5VcAI m 00	Amber	Blink	CPU module #1	2.5-V power voltage alarm (lower limit)	
CPU0 +2. 5VcAI m 02	Amber	Lit	CPU module #1	Fatal 2.5-V power voltage alarm (lower limit)	
CPU0 +2. 5VcAI m 07	Amber	Blink	CPU module #1	2.5-V power voltage alarm (upper limit)	
CPU0 +2. 5VcAI m 09	Amber	Lit	CPU module #1	Fatal 2.5-V power voltage alarm (upper limit)	
CPU0 +3. 3vAI m 00	Amber	Blink	CPU module #1	3.3-V power voltage alarm (lower limit)	
CPU0 +3. 3vAI m 02	Amber	Lit	CPU module #1	Fatal 3.3-V power voltage alarm (lower limit)	
CPU0 +3. 3vAI m 07	Amber	Blink	CPU module #1	3.3-V power voltage alarm (upper limit)	
CPU0 +3. 3vAI m 09	Amber	Lit	CPU module #1	Fatal 3.3-V power voltage alarm (upper limit)	
CPU0 +3. 3vsAI m 00	Amber	Blink	CPU module #1	3.3-V power voltage alarm (lower limit)	
CPU0 +3. 3vsAI m 02	Amber	Lit	CPU module #1	3.3-V power voltage alarm (lower limit)	
CPU0 +3. 3vsAI m 07	Amber	Blink	CPU module #1	Fatal 3.3-V power voltage alarm (upper limit)	
CPU0 +3. 3vsAI m 09	Amber	Lit	CPU module #1	Fatal 3.3-V power voltage alarm (upper limit)	
CPU0 +5. 0vAI m 00	Amber	Blink	CPU module #1	5-V power voltage alarm (lower limit)	
CPU0 +5. 0vAI m 02	Amber	Lit	CPU module #1	Fatal 5-V power voltage alarm (lower limit)	
CPU0 +5. 0vAI m 07	Amber	Blink	CPU module #1	5-V power voltage alarm (upper limit)	
CPU0 +5. 0vAI m 09	Amber	Lit	CPU module #1	Fatal 5-V power voltage alarm (upper limit)	
CPU0 +5. 0vsAI m 00	Amber	Blink	CPU module #1	5-V power voltage alarm (lower limit)	
CPU0 +5. 0vsAI m 02	Amber	Lit	CPU module #1	Fatal 5-V power voltage alarm (lower limit)	
CPU0 +5. 0vsAI m 07	Amber	Blink	CPU module #1	5-V power voltage alarm (upper limit)	
CPU0 +5. 0vsAI m 09	Amber	Lit	CPU module #1	Fatal 5-V power voltage alarm (upper limit)	
CPU0 broken	Green	Blink	CPU module #1	CPU module breakdown	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
CPU0 FAN Al m 01	Amber	Blink	CPU module #1	Cooling fan1 alarm	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
CPU0 FAN Al m 03	Amber	Blink	CPU module #1	Cooling fan2 alarm	
CPU0 FAN Al m 04	Amber	Blink	CPU module #1	Cooling fan3 alarm	
CPU0 offl ine	Green	Blink	CPU module #1	PCI module logically isolated	Start the PCI module by ft sever utility or dismount and remount that module. If not solved by the above, contact your sales agent.
CPU0 removed	Green	Blink	CPU module #1	PCI module detached	Dismount and remount the PCI module. If not solved by the above, contact your sales agent.
CPU0 Temp Al m 00	Amber	Blink	CPU module #1	Temperature alarm (lower limit)	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
CPU0 Temp Al m 02	Amber	Lit	CPU module #1	Fatal temperature alarm (lower limit)	
CPU0 Temp Al m 07	Amber	Blink	CPU module #1	Temperature alarm (upper limit)	
CPU0 Temp Al m 09	Amber	Lit	CPU module #1	Fatal temperature alarm (upper limit)	
CPU0 VccpAl m 00	Amber	Blink	CPU module #1	CPU operating voltage alarm (lower limit) (VCCP)	Contact your sales agent.
CPU0 VccpAl m 02	Amber	Lit	CPU module #1	Fatal CPU operating voltage alarm (lower limit) (VCCP)	
CPU0 VccpAl m 07	Amber	Blink	CPU module #1	CPU operating voltage alarm (upper limit) (VCCP)	
CPU0 VccpAl m 09	Amber	Lit	CPU module #1	Fatal CPU operating voltage alarm (upper limit) (VCCP)	
CPU0 Vtt Al m 00	Amber	Blink	CPU module #1	1.25-V power voltage alarm (lower limit)	
CPU0 Vtt Al m 02	Amber	Lit	CPU module #1	Fatal 1.25-V power voltage alarm (lower limit)	
CPU0 Vtt Al m 07	Amber	Blink	CPU module #1	1.25-V power voltage alarm (upper limit)	
CPU0 Vtt Al m 09	Amber	Lit	CPU module #1	Fatal 1.25-V power voltage alarm (upper limit)	



Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
CPU00 Temp Al m 00	Amber	Blink	CPU module #1	CPU#1 temperature alarm (lower limit)	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
CPU00 Temp Al m 02	Amber	Lit	CPU module #1	CPU#1fatal temperature alarm (lower limit)	
CPU00 Temp Al m 07	Amber	Blink	CPU module #1	CPU#1temperature alarm (upper limit)	
CPU00 Temp Al m 09	Amber	Lit	CPU module #1	CPU#1 fatal temperature alarm (upper limit)	
CPU01 Temp Al m 00	Amber	Blink	CPU module #1	CPU#2 temperature alarm (lower limit)	
CPU01 Temp Al m 02	Amber	Lit	CPU module #1	CPU#2 fatal temperature alarm (lower limit)	
CPU01 Temp Al m 07	Amber	Blink	CPU module #1	CPU#2 temperature alarm (upper limit)	
CPU01 Temp Al m 09	Amber	Lit	CPU module #1	CPU#2 fatal temperature alarm (upper limit)	
CPU2 +12ss Al m 02	Amber	Lit	CPU module #2	Fatal 12-V power voltage alarm (lower limit)	Contact your sales agent.
CPU2 +12ss Al m 07	Amber	Blink	CPU module #2	12-V power voltage alarm (upper limit)	
CPU2 +12ss Al m 09	Amber	Lit	CPU module #2	Fatal 12-V power voltage alarm (upper limit)	
CPU2 +12v Al m 00	Amber	Blink	CPU module #2	12-V power voltage alarm (lower limit)	
CPU2 +12v Al m 02	Amber	Lit	CPU module #2	Fatal 12-V power voltage alarm (lower limit)	
CPU2 +12v Al m 07	Amber	Blink	CPU module #2	12-V power voltage alarm (upper limit)	
CPU2 +12v Al m 09	Amber	Lit	CPU module #2	Fatal 12-V power voltage alarm (upper limit)	
CPU2 +1.5vAl m 00	Amber	Blink	CPU module #2	1.5-V power voltage alarm (lower limit)	
CPU2 +1.5vAl m 02	Amber	Lit	CPU module #2	Fatal 1.5-V power voltage alarm (lower limit)	Contact your sales agent.
CPU2 +1.5vAl m 07	Amber	Blink	CPU module #2	1.5-V power voltage alarm (upper limit)	
CPU2 +1.5vAl m 09	Amber	Lit	CPU module #2	Fatal 1.5-V power voltage alarm (upper limit)	
CPU2 +2.5vAl m 00	Amber	Blink	CPU module #2	2.5-V power voltage alarm (lower limit)	
CPU2 +2.5vAl m 02	Amber	Lit	CPU module #2	Fatal 2.5-V power voltage alarm (lower limit)	
CPU2 +2.5vAl m 07	Amber	Blink	CPU module #2	2.5-V power voltage alarm (upper limit)	
CPU2 +2.5vAl m 09	Amber	Lit	CPU module #2	Fatal 2.5-V power voltage alarm (upper limit)	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
CPU2 +2.5VcAl m00	Amber	Blink	CPU module #2	2.5-V power voltage alarm (lower limit)	Contact your sales agent.
CPU2 +2.5VcAl m02	Amber	Lit	CPU module #2	Fatal 2.5-V power voltage alarm (lower limit)	
CPU2 +2.5VcAl m07	Amber	Blink	CPU module #2	2.5-V power voltage alarm (upper limit)	
CPU2 +2.5VcAl m09	Amber	Lit	CPU module #2	Fatal 2.5-V power voltage alarm (upper limit)	
CPU2 +3.3vAl m00	Amber	Blink	CPU module #2	3.3-V power voltage alarm (lower limit)	
CPU2 +3.3vAl m02	Amber	Lit	CPU module #2	Fatal 3.3-V power voltage alarm (lower limit)	
CPU2 +3.3vAl m07	Amber	Blink	CPU module #2	3.3-V power voltage alarm (upper limit)	
CPU2 +3.3vAl m09	Amber	Lit	CPU module #2	Fatal 3.3-V power voltage alarm (upper limit)	
CPU2 +3.3vsAl m00	Amber	Blink	CPU module #2	3.3-V power voltage alarm (lower limit)	
CPU2 +3.3vsAl m02	Amber	Lit	CPU module #2	Fatal 3.3-V power voltage alarm (lower limit)	
CPU2 +3.3vsAl m07	Amber	Blink	CPU module #2	3.3-V power voltage alarm (upper limit)	
CPU2 +3.3vsAl m09	Amber	Lit	CPU module #2	Fatal 3.3-V power voltage alarm (upper limit)	
CPU2 +5.0vAl m00	Amber	Blink	CPU module #2	5-V power voltage alarm (lower limit)	
CPU2 +5.0vAl m02	Amber	Lit	CPU module #2	Fatal 5-V power voltage alarm (lower limit)	
CPU2 +5.0vAl m07	Amber	Blink	CPU module #2	5-V power voltage alarm (upper limit)	
CPU2 +5.0vAl m09	Amber	Lit	CPU module #2	Fatal 5-V power voltage alarm (upper limit)	
CPU2 +5.0vsAl m00	Amber	Blink	CPU module #2	5-V power voltage alarm (lower limit)	
CPU2 +5.0vsAl m02	Amber	Lit	CPU module #2	Fatal 5-V power voltage alarm (lower limit)	
CPU2 +5.0vsAl m07	Amber	Blink	CPU module #2	5-V power voltage alarm (upper limit)	
CPU2 +5.0vsAl m09	Amber	Lit	CPU module #2	Fatal 5-V power voltage alarm (upper limit)	
CPU2 broken	Green	Blink	CPU module #2	CPU module breakdown	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
CPU2 FAN Al m01	Amber	Blink	CPU module #2	Cooling fan 1 alarm	
CPU2 FAN Al m03	Amber	Blink	CPU module #2	Cooling fan 2 alarm	
CPU2 FAN Al m04	Amber	Blink	CPU module #2	Cooling fan 3 alarm	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
CPU2 offline	Green	Blink	CPU module #2	The CPU module has been logically disconnected.	Start the PCI module by ft sever utility or dismount and remount that module. If not solved by the above, contact your sales agent.
CPU2 removed	Green	Blink	CPU module #2	The CPU module has come off.	Dismount and remount the PCI module. If not solved by the above, contact your sales agent.
CPU2 Temp Al m 00	Amber	Blink	CPU module #2	Temperature alarm (lower limit)	Check to see if dust is accumulated on the internal fans. Check also if the fan cables are connected securely. If not solved by the above, contact your sales agent.
CPU2 Temp Al m 02	Amber	Lit	CPU module #2	Fatal temperature alarm (lower limit)	
CPU2 Temp Al m 07	Amber	Blink	CPU module #2	Temperature alarm (upper limit)	
CPU2 Temp Al m 09	Amber	Lit	CPU module #2	Fatal temperature alarm (upper limit)	
CPU2 VccpAl m 00	Amber	Blink	CPU module #2	CPU operating voltage alarm (lower limit) (VCCP)	Contact your sales agent.
CPU2 VccpAl m 02	Amber	Lit	CPU module #2	Fatal CPU operating voltage alarm (lower limit) (VCCP)	
CPU2 VccpAl m 07	Amber	Blink	CPU module #2	CPU operating voltage alarm (upper limit) (VCCP)	
CPU2 VccpAl m 09	Amber	Lit	CPU module #2	Fatal CPU operating voltage alarm (upper limit) (VCCP)	
CPU2 VttAl m 00	Amber	Blink	CPU module #2	1.25-V power voltage alarm (lower limit)	
CPU2 VttAl m 02	Amber	Lit	CPU module #2	Fatal 1.25-V power voltage alarm (lower limit)	
CPU2 VttAl m 07	Amber	Blink	CPU module #2	1.25-V power voltage alarm (upper limit)	
CPU2 VttAl m 09	Amber	Lit	CPU module #2	Fatal 1.25-V power voltage alarm (upper limit)	
CPU20 TempAl m 00	Amber	Blink	CPU module #2	CPU#1 temperature alarm (lower limit)	
CPU20 TempAl m 02	Amber	Lit	CPU module #2	Fatal CPU#1 temperature alarm (lower limit)	
CPU20 TempAl m 07	Amber	Blink	CPU module #2	CPU#1 temperature alarm (upper limit)	
CPU20 TempAl m 09	Amber	Lit	CPU module #2	Fatal CPU#1 temperature alarm (upper limit)	
CPU21 TempAl m 00	Amber	Blink	CPU module #2	CPU#2 temperature alarm (lower limit)	
CPU21 TempAl m 02	Amber	Lit	CPU module #2	Fatal CPU#2 temperature alarm (lower limit)	
CPU21 TempAl m 07	Amber	Blink	CPU module #2	CPU#2 temperature alarm (upper limit)	
CPU21 TempAl m 09	Amber	Lit	CPU module #2	Fatal CPU#2 temperature alarm (upper limit)	

Error Message	STATUS LED		Suspected module	Description	Procedure
	Color	State			
<b>= D =</b>					
DUMP Request!	Off		-	DUMP switch request	Contact your sales agent.
<b>= F =</b>					
FRB Processing	Off		-	During POST execution or OS start processing	The server is operating normally.
<b>= M =</b>					
Memory U-Err 01	Green	Blink	CPU module #1	DIMM#1 2-bit error	The DIMM must be replaced. Contact a maintenance service company.
Memory U-Err 02	Green	Blink	CPU module #1	DIMM#2 2-bit error	
Memory U-Err 03	Green	Blink	CPU module #1	DIMM#3 2-bit error	
Memory U-Err 04	Green	Blink	CPU module #1	DIMM#4 2-bit error	
Memory U-Err 05	Green	Blink	CPU module #1	DIMM#5 2-bit error	
Memory U-Err 06	Green	Blink	CPU module #1	DIMM#6 2-bit error	
Memory U-Err 21	Green	Blink	CPU module #2	DIMM#1 2-bit error	
Memory U-Err 22	Green	Blink	CPU module #2	DIMM#2 2-bit error	
Memory U-Err 23	Green	Blink	CPU module #2	DIMM#3 2-bit error	
Memory U-Err 24	Green	Blink	CPU module #2	DIMM#4 2-bit error	
Memory U-Err 25	Green	Blink	CPU module #2	DIMM#5 2-bit error	
Memory U-Err 26	Green	Blink	CPU module #2	DIMM#6 2-bit error	
<b>= O =</b>					
OS shutdown Alarm	Off		-	Shutdown due to a timeout error of the watch dog timer (fatal error)	Contact your sales agent.
<b>= P =</b>					
Power-off	Off		-	The DC power is turned off.	-
<b>= S =</b>					
SSR Processing	Off		-	Reboot processing for recovery	DUMP is being collected.
<b>= W =</b>					
WDT timeout	Off		-	Timeout error of the watch dog timer (fatal error)	Contact your sales agent.

---

## POST Error Codes and Messages

Whenever a recoverable error occurs during POST, BIOS displays a message on the video display screen to indicate both status and error conditions and causes the speaker to beep as the message appears. BIOS also issues a beep code (one long tone followed by two short tones) during POST if the video configuration fails or if an external ROM module does not a checksum of zero. The BIOS indicates errors by writing an error code to the standard logging area in the Extended BIOS Data Area, and by displaying a message on the screen, which is sometimes preceded by the POST Error Code. The error code is also logged to the Event Logging area.

Recommended actions are specified for each error condition and some will prompt you to remove and replace CRUs. Refer to Chapter 4 for the CRUs associated with the error codes displayed.

Table 5-1 *POST Error Codes and Messages* is a list of the error codes and messages written at the start of each POST test. Table 5-2 *POST Error Beep Codes* is a list of beep codes issued for each POST test.

**Table 5-1. POST Error Codes and Messages**

Error Code and Message		Description	Action
0200	Failure Fixed Disk	<ul style="list-style-type: none"><li>• Configuration error in Setup menu.</li><li>• Hard disk is faulty.</li><li>• CPU module board is faulty.</li><li>• PCI module board is faulty.</li></ul>	<ul style="list-style-type: none"><li>• Check configuration in Setup menu.</li><li>• Replace the hard disk.</li><li>• Replace the CPU module board.</li><li>• Replace the PCI module board.</li></ul>
0210	Stuck Key	Keyboard connection error.	<ul style="list-style-type: none"><li>• Disconnect and reconnect the keyboard.</li><li>• Replace the keyboard.</li><li>• Replace the PCI module board.</li></ul>
0211	Keyboard Error	Keyboard is faulty.	<ul style="list-style-type: none"><li>• Check the keyboard connection.</li></ul>
0212	Keyboard Controller Failed	Keyboard controller is faulty.	<ul style="list-style-type: none"><li>• Restart the server.</li><li>• Replace the PCI module board.</li></ul>
0213	Keyboard Locked - Unlock Key Switch	Keyboard is locked.	<ul style="list-style-type: none"><li>• Unlock the key switch.</li></ul>
0220	Monitor type does not match CMOS - Run SETUP	Illegal monitor type is specified.	<ul style="list-style-type: none"><li>• Select "Get Default Value" from the Setup menu.</li><li>• Clear the CMOS data.</li></ul>

**Table 5-3. POST Error Codes and Messages (continued)**

Error Code and Message		Description	Action
0230	System RAM Failed at offset	DIMM is faulty.	<ul style="list-style-type: none"> <li>• Replace DIMM.</li> <li>• Replace the CPU module board.</li> </ul>
0231	Shadow RAM Failed at offset	DIMM is faulty.	<ul style="list-style-type: none"> <li>• Replace DIMM.</li> <li>• Replace the CPU module board.</li> </ul>
0232	Extend RAM Failed at address line	DIMM is faulty.	<ul style="list-style-type: none"> <li>• Replace DIMM.</li> <li>• Replace the CPU module board.</li> </ul>
0233	Memory type mixing detected	DIMMs of the different types are installed.	<ul style="list-style-type: none"> <li>• Replace DIMM with appropriate one.</li> </ul>
0234	Single - bit ECC error	DIMM is faulty.	<ul style="list-style-type: none"> <li>• Replace DIMM.</li> <li>• Replace the CPU module board.</li> </ul>
0235	Multiple - bit ECC error	DIMM is faulty.	<ul style="list-style-type: none"> <li>• Replace DIMM.</li> <li>• Replace the CPU module board.</li> </ul>
0250	System Battery is Dead - Replace and Run SETUP	No battery is available for the system.	<ul style="list-style-type: none"> <li>• Replace the CPU module board.</li> </ul>
0251	System CMOS Checksum Bad - Default Configuration Used	NvRAM is faulty.	<ul style="list-style-type: none"> <li>• Re-configure using the Setup menu.</li> <li>• Replace the PCI module board.</li> </ul>
0252	Password checksum bad - Password cleared	NvRAM is faulty.	<ul style="list-style-type: none"> <li>• Re-set the password in the Setup menu.</li> <li>• Replace the PCI module board.</li> </ul>
0260	System Timer Error	CPU module board is faulty.	<ul style="list-style-type: none"> <li>• Replace the CPU module board.</li> </ul>
0270	Real Time Clock Error	Real-time clock error	<ul style="list-style-type: none"> <li>• Replace the CPU module board.</li> </ul>
0271	Check date and time setting	Real-time clock is set incorrectly.	<ul style="list-style-type: none"> <li>• Set the correct date and time in Setup menu.</li> <li>• Replace the PCI module board.</li> </ul>
0280	Previous boot incomplete - Default configuration used	Configuration error in Setup menu.	<ul style="list-style-type: none"> <li>• Check configuration in Setup menu.</li> </ul>
02B0	Diskette drive A error	Floppy drive A is faulty.	<ul style="list-style-type: none"> <li>• Replace the floppy disk drive A.</li> </ul>
02B2	Incorrect Drive A type - run SETUP	Configuration error in Setup menu.	Specify the correct drive type in Setup menu.
02D0	System cache error - Cache disabled	<ul style="list-style-type: none"> <li>• CPU is faulty.</li> <li>• CPU module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the CPU.</li> <li>• Replace the CPU module board.</li> </ul>
0B1B	PCI System Error on Bus/Device/Function	PCI device is faulty.	<ul style="list-style-type: none"> <li>• Replace the PCI device board.</li> </ul>
0B1C	PCI Parity Error on Bus/Device/Function	PCI device is faulty.	<ul style="list-style-type: none"> <li>• Re-install the PCI device board.</li> <li>• Re-configure the PCI board.</li> </ul>

**Table 5-3. POST Error Codes and Messages (continued)**

Error Code and Message		Description	Action
0B22	CPUs are installed out of order	CPU is faulty.	<ul style="list-style-type: none"> <li>Replace the CPU.</li> </ul>
0B28	Unsupported Processor detected on Processor 1	The processor (CPU) not supported by this server is installed in Processor 1.	<ul style="list-style-type: none"> <li>Install the CPU appropriate to the server.</li> </ul>
0B29	Unsupported Processor detected on Processor 2	The processor (CPU) not supported by this server is installed in Processor 2.	<ul style="list-style-type: none"> <li>Install the CPU appropriate to the server.</li> </ul>
0B30	CPU FAN #1 Alarm occurred	<ul style="list-style-type: none"> <li>Dust obstructing the fan.</li> <li>Fan is faulty.</li> <li>CPU module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the fan.</li> <li>Replace the CPU module board.</li> <li>Connect fan cable properly.</li> </ul>
0B31	CPU FAN #2 Alarm occurred	<ul style="list-style-type: none"> <li>Dust obstructing the fan.</li> <li>Fan is faulty.</li> <li>PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the fan.</li> <li>Replace the PCI module board.</li> <li>Connect fan cable properly.</li> </ul>
0B32	CPU FAN #3 Alarm occurred	<ul style="list-style-type: none"> <li>Dust obstructing the fan.</li> <li>Fan is faulty.</li> <li>PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the fan.</li> <li>Replace the PCI module board.</li> <li>Connect fan cable properly.</li> </ul>
0B40	Invalid System Configuration Data	<ul style="list-style-type: none"> <li>Configuration error in SETUP.</li> <li>CPU/PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Reset the setting by selecting [Yes] at [Reset Configuration Data]</li> <li>Replace the CPU/PCI module board.</li> </ul>
0B41	System Configuration Data Read error	<ul style="list-style-type: none"> <li>Configuration error in SETUP.</li> <li>CPU/PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Reset the setting by selecting [Yes] at [Reset Configuration Data]</li> <li>Replace the CPU/PCI module board.</li> </ul>
0B42	Resource Conflict	Configuration error in SETUP.	Correct device configuration in SETUP
0B43	Warning: IRQ not configured	Configuration error in SETUP.	Correct settings in SETUP
0B44	Expansion ROM not initialized	Configuration error in SETUP.	In SETUP, disable decompression of expansion ROM on unnecessary optional PCI cards.
0B45	System Configuration Data Write error	<ul style="list-style-type: none"> <li>Configuration error in SETUP.</li> <li>CPU/PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Reset the setting by selecting [Yes] at [Reset Configuration Data]</li> </ul> <p>Replace the CPU/PCI module board.</p>
0B47	Missing date and time synchronization	The date and time are incorrect due to a communication error between BMCs.	<ul style="list-style-type: none"> <li>Restart the system.</li> <li>Re-set the date and time in SETUP.</li> <li>If the error persists, replace the PCI module board.</li> </ul>
0B49	BMC Issued Reset Command, but failed System Reset	<ul style="list-style-type: none"> <li>System cannot be reset by BMC's reset command.</li> </ul>	Replace PCI module board.
0B6E	DIMMs are installed out of order	<ul style="list-style-type: none"> <li>DIMM is faulty.</li> </ul>	Replace DIMM.
0B70	The error occurred during temperature sensor reading	<ul style="list-style-type: none"> <li>SMBus device is faulty.</li> <li>SMBus is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the CPU/PCI module or front panel board.</li> </ul>
0B71	System temperature out of Range	<ul style="list-style-type: none"> <li>Fan is faulty.</li> <li>CPU/PCI module board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Clean the fan.</li> <li>Replace the fan.</li> <li>Replace the PCI module board.</li> </ul>

Error Code and Message		Description	Action
0B80	BMC Memory Test Failed	BMC is faulty.	<ul style="list-style-type: none"> <li>• Replace the PCI module board.</li> </ul>
0B81	BMC Firmware Code Area CRC check failed		
0B82	BMC core Hardware failure		
0B83	BMC IBF or OBF check failed		
0B90	BMC Platform Information Area corrupted	BMC is faulty.	<ul style="list-style-type: none"> <li>• Replace the PCI module board.</li> </ul>
0B91	BMC update firmware corrupted		
0B92	Internal Use Area of BMC FRU corrupted	<ul style="list-style-type: none"> <li>• SROM is faulty.</li> <li>• BMC is faulty.</li> </ul>	



**Table 5-3. POST Error Codes and Messages (continued)**

Error Code and Message		Description	Action
0B93	BMC SDR Repository empty	BMC is faulty.	<ul style="list-style-type: none"> <li>Replace the PCI module board.</li> </ul>
0B94	IPMB signal lines do not respond		
0B95	BMC FRU device failure		
0B96	BMC SDR Repository failure		
0B97	BMC SEL device failure		
0B98	BMC SEL Overflow	SEL (System Event Log) overflowed.	<ul style="list-style-type: none"> <li>Clear the SEL.</li> </ul>
0BB0	SMBIOS - SROM data read error	<ul style="list-style-type: none"> <li>SROM is faulty.</li> <li>Front panel board is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the front panel board.</li> </ul>
0BB1	SMBIOS - SROM data checksum bad		
0BD0	1st SMBus device address not acknowledged	Board is faulty.	<ul style="list-style-type: none"> <li>Check cable connection.</li> <li>Replace the board.</li> </ul>
0BD1	1st SMBus device Error detected		
0BD2	1st SMBus timeout		
0BD3	2nd SMBus device address not acknowledged		
0BD4	2nd SMBus device Error detected		
0BD5	2nd SMBus timeout		
0BD6	3rd SMBus device address not acknowledged		
0BD7	3rd SMBus device Error detected		
0BD8	3rd SMBus timeout		
0BD9	4th SMBus device address not acknowledged		
0BDA	4th SMBus device Error Detected		
0BDB	4th SMBus device timeout		
0BDC	5th SMBus device address not acknowledged		
0BDD	5th SMBus device Error detected		

Error Code and Message		Description	Action
0BDE	5th SMBus timeout		
0BDF	6th SMBus device address not acknowledged		
0BE0	6th SMBus device Error detected		
0BE1	5th SMBus timeout		
0BE2	7th SMBus device address not acknowledged		
0BE3	7th SMBus device Error detected		
0BE4	7th SMBus timeout		
0BE5	8th SMBus device address not acknowledged		
0BE6	8th SMBus device Error detected		
0BE7	8th SMBus timeout		

**Table 5-3. POST Error Codes and Messages (continued)**

Error Code and Message		Description	Action
0C00	Rompilot reports error number xx	<ul style="list-style-type: none"><li>• Configuration error in SETUP.</li><li>• CPU/PCI module board is faulty.</li></ul>	<ul style="list-style-type: none"><li>• Re-configure Rompilot.</li><li>• Replace the CPU/PCI module board.</li></ul>
8600	No working DQS value found	<ul style="list-style-type: none"><li>• DIMM is faulty</li><li>• DIMM is not supported</li></ul>	<ul style="list-style-type: none"><li>• Replace DIMM</li><li>• Replace DIMM with appropriate one.</li></ul>
8610	MAC Address update failed – Corel/O#010/100Mbit Ethernet COntroller	FRB2 timeout occurred when setting MAC address, and rewrite was unsuccessful.	<ul style="list-style-type: none"><li>• Replace the back panel board.</li><li>• Replace the PCI module board.</li></ul>
8611	MAC Address update failed – Corel/O#0 Gbit Ethernet COntroller	FRB2 timeout occurred when setting MAC address, and rewrite was unsuccessful.	<ul style="list-style-type: none"><li>• Replace the back panel board.</li><li>• Replace the PCI module board.</li></ul>
8612	MAC Address update failed – Corel/O#110/100 Mbit Ethernet Controller	FRB2 timeout occurred when setting MAC address, and rewrite was unsuccessful.	<ul style="list-style-type: none"><li>• Replace the back panel board.</li><li>• Replace the PCI module board.</li></ul>
8613	MAC Address update failed – Corel/O#1 Gbit Ethernet Controller	FRB2 timeout occurred when setting MAC address, and rewrite was unsuccessful.	<ul style="list-style-type: none"><li>• Replace the back panel board.</li><li>• Replace the PCI module board.</li></ul>

**Table 5-2. Post Error Beep Codes**

<b>Beeps</b>	<b>Error</b>	<b>Recommended Action</b>
1-2-2-3	ROM Checksum Error	Contact your service representative to replace the CPU module.
1-1-2-4	ROMEXEC Code Error	Check if DIMM board is installed correctly. If the error persists, contact your service representative to replace the DIMM or CPU module board.
1-3-1-1	DRAM Refresh Test Error	
1-3-1-3	Keyboard Controller Error	Disconnect and reconnect the keyboard. If the same error persists, call your service representative to replace the CPU module.
1-3-3-1	Failed to Detect Memory or Incorrect DIMM Type	Check if DIMM boards are installed correctly. If the same error persists, call your service representative to replace the DIMM or CPU module board.
1-3-3-2	Initial Setting error of the POST Memory Manager	
1-3-4-1	RAM Address Error	
1-3-4-3	RAM Low Byte Data Error	
1-4-1-1	RAM High Byte Data Error	
2-2-3-1	Illegal Interrupt Test Error	
2-1-2-3	Copyright Check Error	
1-2	Video BIOS Initialization Error	If nothing is displayed on the monitor, check if the main board is installed correctly. If the same error persists, call your service representative to replace the CPU module.
	Option ROM Initialization Error	If the Option ROM on an added PCI board is not displayed on the monitor, check if the PCI board is installed correctly. If the same error persists, call your service representative to replace the CPU module board, PCI module board or added PCI board.
	Option ROM Expansion Error	

---

# How to Identify BIOS and BMC Revision Levels

To help you identify your system's current BIOS and BMC revision levels, refer to the following subsections.

## BIOS Revision Level Identification


During system Power-On Self Test (POST), which runs automatically when your system is powered on, your system monitor displays several messages, one of which identifies the BIOS revision level currently loaded on your system, see the example below.

Example: BIOS Revision Level

```
Phoenix BIOS 4.0 Release 6.0.250A
```

In the example above, BIOS 6.0.250A is the current BIOS revision level loaded on your system.

---


 **Note:** The BIOS Revision Level stated in the example may not reflect the actual BIOS setting in your system.

---

## BMC Revision Level Identification

During system Power-On Self Test (POST), which runs automatically when your system is powered on, system diagnostics are run. Following the memory test diagnostic, several messages will appear informing you that the mouse was detected and system configuration data updated, when you see these messages the BMC messages are displayed next.

---

 **Note:** In order to see the diagnostic messages, the ESC key must be pressed.

---


To identify your system's current BMC revision level, see the example below.

Example: BMC Messages

```
Base Board Management Controller
Copyright (c) 1999 NEC Corporation, all rights reserved.
Device ID      :01      Device Revision   :00
IPMI Version   :1.0     Firmware Revision :00.60
Self Test Result :
```

In the example above, Firmware Revision 00.60 is the current BMC revision level loaded on your system.

---

 **Note:** The Firmware Revision Level stated in the example may not reflect the actual BMC revision level setting in your system.

---

# A

## Technical Specifications

- Server Unit

---

This appendix provides the technical specifications for your server unit.

## Server Unit

Table A-1 lists the server unit technical specifications.

**Table A-1. Server Unit Technical Specifications**

Item	Specification
<b>Chassis</b>	
Dimensions	Tower-Based System: Width: 8.7 inches (222 mm) 14.6 inches (370 mm) inc. stabilizers Height: 22.0 inches (560 mm) Depth: 31.2 inches (795 mm)  Rack-Mount System: Width: 18.9 inches (480 mm) Height: 7.0 inches (177 mm) Depth: 31.1 inches (790 mm)
Weight	Maximum 150 lbs. (68 kg) Max. 160.9 lbs. (73kg)
Enclosure	Tower or 19-inch rack-mountable
Environment	Temperature: 50° to 95°F (10° to 35°C) Internal rack ambient temperature should not exceed 25°C Relative humidity: 20% to 80% (no condensation)
Peripheral Interface (rear access)	Two USB (4-pin) port connectors for keyboard /mouse and floppy diskette drive Two serial (9-pin) port connectors SVGA (15-pin) port connector  RJ-45 T/10Base-T/100Base –T/1000Base Ethernet port connectors
Option PCI Slots per PCI Module	Two 64-bit/33MHz PCI bus slots One 32-bit/33MHz PCI bus slot (reserved for a graphics card)
Storage Device Capacity	Two IDE 24X CD-ROM drive One 3 1/2-inch IDE high-capacity (120 MB) super (floppy) disk drive Six hot-pluggable 3 1/2-inch SCSI hard disk drives (two logical groups of three disks)
<b>CPU Module</b>	
Processor (up to two per module)	Intel® Xeon® Processor Clock rate: 2.4GHz Cache: 512 KB
Optional Processor Support	Each CPU Module is upgradeable from one to two processors

---

## A-2 Technical Specifications

---

**Table A-1. Server Unit Technical Specifications (Continued)**

<b>Item</b>	<b>Specification</b>
Chipset	Server Works Server Set III GC-LE
Graphics (VRAM)	Intel® CT69000 (2 MB VRAM)
Fast Ethernet PCI Bus Controller per I/O Module	10BASE-T/100BASE-TX T1000BASE-TX network controller
SCSI Controller	Embedded Adaptec dual function controller
Real-Time Clock/Battery	Lithium battery (vendor part no. CR2032)
Peripheral Controller	Integrated peripheral controller
Baseboard Management Controller (BMC)	QLogic Zircon BMC
Memory	Up to 3 GB of ECC SDRAM DIMM memory.
<b>Keyboard</b>	USB-compatible 104-key 12 function keys separate numeric and cursor pads
<b>Mouse</b>	USB serial mouse 2-button
<b>Power Supply</b>	Each CPU module and PCI module contains a power unit
<b>System Power</b>	AC input: 100 - 120VAC Power consumption: 850 VA at 870 Watts

---





# ***B***

## **I/O Port Addresses**

- I/O Port Addresses

# I/O Port Address

The factory-set I/O port addresses for the server are assigned as follows:

Address	Chip in Use
00-1F	8-bit DMA control register
20-21	Master 8259 programming interface
2E-2F	Configuration
40-43	8254 programming interface
60	Keyboard & mouse
61	NMI status register
64	Keyboard & mouse
70-71	NMI enable register/real-time clock
80-8F	16-bit DMA control register
A0-A1	Slave 8259 programming interface
C0-DF	DMA controller page register
E0-E9	Base address register
F0	Register IRQ13
F1-FF	Logical device configuration
170-177 or BAR2	EDMA2-compatible mode primary command block register
1F0-1F7 or BAR0	EDMA2-compatible mode secondary command block register
278-27F	(Parallel port 3)
2F8-2FF	Serial port 2
BAR or 376	EDMA2-compatible mode secondary command block register
370-377	(Floppy disk drive 2), IDE 2
378-37F	(Parallel port 2)
3B0-3BB	VGA
3BC-3BE	Parallel port 1
3C0-3DF	VGA
3F6 or BAR1	EDMA2-compatible mode primary command block register
3F0-3F7	(Floppy disk drive 1), IDE 1
3F8-3FF	Serial port A
40B	DMA1 expansion write mode register
4D0	Master 8259 ELCR programming
4D1	Slave 8259 ELCR programming
4D6	DMA2 expansion write mode register
580-58F	SMBus control
C00	PCI IRQ mapping index register
C01	PCI IRQ mapping data register
C14	PCI error status register
C49	Address & status control
C4A	Rise time counter control
C52	General register (GPMs)
C6C	ISA wait register
C6F	Other control registers
CA2-CA3	IPMI (IMPI KCS interface)
CA4-CA5	IPMI (SMI interface)
CA6-CA-7	IPMI (SCI/SW1 interface)
CD6	Power management index register
CD7	Power management data register
CF8, CFC	PCI configuration space
CF9	Reset control
F50-F58h	General chipset
BAR4+00-0F	EDMA2 PCI base address register 4

\* Expressed in hexadecimal digits.

\* I/O port addresses of PCI devices are specified based on the type and number of PCI devices.

---

# Glossary

## A

### AC

(Alternating Current) The type of current available in wall outlets. All computers must convert alternating current to direct current to operate. See also DC.

### address

A label, name, or number that identifies a location in computer memory.

### ASCII

(American Standard Code for Information Interchange) A standard number assigned to each of the alphanumeric characters and keyboard control code keys to enable the transfer of information between different types of computers and peripherals.

## B

### backplane slot

A connector on the backplane board in desktop computers and expansion boxes that allows you to install circuit cards.

### backup

A copy of data for safe-keeping. The data is copied from computer memory or disk to a floppy disk, magnetic tape, or other media.

### backup battery

The battery in your computer that maintains the real-time clock and the configuration information when the computer's power is removed.

### base memory

An area of memory between 0 and 640 kilobytes.

### baud rate

The speed with which data is transmitted during serial communication. The computer's operating system and software program must be configured for the same baud rate as the communication device, such as a serial printer. See also bps.

### BIOS

(Basic Input/Output System) A program stored in flash EPROM or ROM that controls the keyboard, disk drives, video monitor, and other devices. See also flash EPROM, EPROM, and ROM.

### bit

Derived from BInary digiT, a bit is the smallest unit of information a computer handles. See also byte.

---

**BMC**

(Baseboard Management Controller) Contains all of the server management functions. One major function of the BMC is to monitor system management events and log their occurrence in the System Event Log (SEL).

**boot**

The process of loading the operating system into memory.

**bps**

(bits per second) The number of bits transferred in one second during serial communication, such as modem transmission.

**byte**

A group of eight bits.

**C****cache memory**

A very fast, limited portion of RAM set aside for temporary storage of data for direct access by the microprocessor.

**CD-ROM drive**

(Compact Disk ROM drive) A type of mass storage device that reads information from a compact disk.

**Centronics port**

An industry standard parallel port. See also parallel port.

**CGA**

(Color Graphics Adapter) A type of video display system that provides low-resolution text and graphics on TTL monochrome and color monitors.

**CMOS**

(Complimentary Metal-Oxide Semiconductor) A type of low-power integrated circuit used in computers. See also TTL.

**COM1 or COM2**

The name you can assign a serial port to set or change its address. See also serial port.

**command**

An instruction that directs the computer to perform a particular operation.

**configuration**

The way in which a computer is set up to operate. Some configurable options include CPU speed, serial port designation, and memory allocation.

**CPU**

(Central Processing Unit) See microprocessor.

---

**CRT**

(Cathode-Ray Tube) The type of video display used in monitors for desktop computers.

**D****DC**

(Direct Current) The type of current available in the rechargeable battery packs used in portable computers. See also AC.

**default**

The factory setting your computer uses unless you instruct it otherwise. For example, when powering up, the computer will boot from the default drive.

**density**

The capacity of information (bytes) that can be packed onto a storage device, such as a floppy disk.

**device driver**

A software program that a computer must use to recognize and operate certain hardware, such as a mouse or a video monitor.

**disk drive**

A device that stores data on a hard or floppy disk. A floppy disk drive requires a floppy disk to be inserted; a hard disk drive has a permanently encased hard disk.

**DOS**

(Disk Operating System) See operating system.

**DRAM**

(Dynamic RAM) See RAM.

**E****ECC**

(Error Checking and Correction) A method of detecting and correcting errors.

**EEPROM**

(Electrically Erasable Programmable Read-Only Memory) A type of memory device that stores password and configuration information.

**EGA**

(Enhanced Graphics Adapter) A type of video display system that provides medium-resolution text and graphics on TTL monochrome, color, and enhanced color monitors.

**EMP**

The Emergency Management Port (EMP) provides an interface to the console manager. This interface allows remote server management via a modem or direct connection.

---

**EMS**

(Expanded Memory Specification) A method of accessing memory beyond the 640K limit of DOS by exchanging data in and out of main memory at high speeds. Some software requires EMS to operate.

**EPROM**

(Erasable Programmable Read-Only Memory) A type of memory device that is usually used to store system BIOS code. This code can be erased with ultraviolet light, but is not lost when the computer is powered off. See also flash EPROM and ROM.

**expansion slot**

See backplane slot.

**extended memory**

The protected memory above 1M that is directly accessible by the microprocessor through certain utilities and operating systems.

**F****fault tolerance**

The capability of a system to respond smoothly to an unexpected hardware or software failure. There are many levels of fault tolerance, of which the lowest is having the ability to continue operation in the event of a power failure. Fault-tolerant computer systems mirror all operations, which means that every operation is performed on two or more duplicate systems at all times, so that if one fails another takes over.

**flash EPROM**

A type of memory device that is usually used to store system BIOS code. This code can be replaced with updated code from a floppy disk, but is not lost when the computer is powered off. See also EPROM and ROM.

**floppy disk drive**

See disk drive.

**format**

The process used to organize a hard or floppy disk into sectors so it can accept data. Formatting destroys all previous data on the disk.

**FRB**

(Fault Resilient Boot) Is a server management feature. FRB attempts to boot a system using the alternate processor or DIMM.

**G****(Gigabyte)**

1,073,741,824 bytes. See also byte.

---

## H

### **hard disk drive**

See disk drive.

### **hardware**

The physical parts of your computer, including the keyboard, monitor, disk drives, cables, and circuit cards.

### **hot swap**

A method used to insert or remove SCSI disk drives into or from an operating bus. This method is typically used in RAID subsystems. When used in non-RAID subsystems the operating system must typically be restarted.

## I

### **IC**

(Integrated Circuit) An electronic device that contains miniaturized circuitry.

### **IDE**

(Integrated Drive Electronics) A type of hard disk drive with the control circuitry located inside the disk drive rather than on a drive controller card.

### **interface.**

A connection between the computer and a peripheral device that enables them to exchange data. See also parallel port and serial port.

### **ISA**

(Industry Standard Architecture) An industry standard for computers and circuit cards that transfer 16 bits of data at a time.

## J

### **jumper**

A small electrical connector used for configuration on some computer hardware.

## K

### **(Kilobyte)**

1,024 bytes. See also byte.

## L

### **LAN**

(Local Area Network) A group of computers linked together within a limited area to exchange information.

### **LCD**

(Liquid Crystal Display) The type of video display used in portable computers.



---

**LED**

(Light-Emitting Diode) A small electronic device that glows when current flows through it.

**LPT1 or LPT2**

The name you can assign a parallel port to specify its address. See also parallel port.

**LVD**

Super-fast Ultra 2 SCSI Low Voltage Differential (LVD) Parallel SCSI Interface. A new SCSI interface that provides greater I/O bandwidth, device connectivity, data reliability, and longer cable lengths for Ultra2 SCSI hard disk drives. Note that in order to achieve LVD performance all devices including cable, controller, and drive must support LVD.

**M****(Megabyte)**

1,048,576 bytes. See also byte.

**memory**

The circuitry in your computer that stores data and programs. See also EMS, extended memory, RAM, and ROM.

**microprocessor**

The integrated circuit that processes data and controls the basic functions of the computer.

**modem**

A device used to exchange information with other computers over telephone or data lines.

**module**

A circuit board that plugs into a dedicated connector on the system board in your computer.

**mouse**

A small input device that you guide on a flat surface to control the cursor movement and operation of the computer when using certain software programs.

**N****NVRAM**

(Nonvolatile RAM) A type of RAM that retains its contents even after the computer is powered off. This memory stores EISA configuration information. See also RAM and SRAM.

**O****operating system**

A set of programs that provides the interface between other software programs and the computer.

---

## P

### **parallel port**

The connector on the back of your computer that allows the transfer of data between the computer and a parallel device, such as a parallel printer.

### **partition**

The process of dividing the storage space on a hard disk into separate areas so that the operating system treats them as separate disk drives.

### **password**

A security feature that prevents an unauthorized user from operating your computer. See also EEPROM.

### **PCI**

Peripheral Component Interconnect. PCI is a high-performance peripherals I/O bus supporting data transfers of up to 528MB per second.

### **Pentium**

A type of microprocessor, with a built-in math coprocessor, cache memory, and memory and bus controllers, that processes and communicates 32 bits of data at a time. This microprocessor also contains power management capabilities.

### **peripheral**

A device connected to and controlled by the computer, such as an external disk drive or a printer.

### **pixel**

The smallest element that is visible on a video display. The resolution of a video display system is measured in pixels.

### **PnP**

(Plug-n-Play) Plug-and-play is the ability to plug a device into a computer and have the computer recognize that the device is there. The user doesn't have to tell the computer.

### **POST**

Power-On-Self-Test.

## R

### **RAM**

(Random-Access Memory) A temporary storage area for data and programs. This type of memory must be periodically refreshed to maintain valid data, and is lost when the computer is powered off. See also NVRAM and SRAM.

### **real-time clock**

The IC in your computer that maintains the time and date.

---

**registered SDRAM**

A type of SDRAM containing an additional buffer that allows memory to run faster. See also RAM and SDRAM.

**ROM**

(Read-Only Memory) A type of memory device that usually is used to store system BIOS code. This code cannot be altered and is not lost when the computer is powered off. See also BIOS, EPROM, and flash EPROM.

**RS-232C port**

An industry standard serial port. See also serial port.

**S****SAF-TE**

(SCSI Accessed Fault Tolerant Enclosure) A specification for monitoring the state of the drives and enclosure environment (fan, power supply, temperature, etc.) using the SCSI bus to indicate faults.

**save**

To store information on a floppy disk, hard disk, magnetic tape, or some other permanent storage device.

**SCSI**

(Small Computer System Interface) An industry standard interface that provides high-speed access to tape drives, hard disk drives, and other peripheral devices.

**SDRAM**

(Synchronous DRAM) A type of DRAM that runs at faster clock speeds than conventional memory. See also DRAM and registered SDRAM.

**SEL**

(System Event Log) A record of system management events. The information stored includes the name of the event, the date and time the event occurred and data pertinent to the event. Event data may include POST error codes that reflect hardware errors or software conflicts within the system.

**serial communication**

Information sent sequentially, one bit at a time.

**serial port**

The connector on the back of your computer that allows the transfer of data between the computer and a serial device, such as a mouse, a modem, or a serial printer.

**setup program**

The program that you use to change the configuration of some ISA desktop and notebook computers. This program also contains information about the hardware in the computer.

**SMI**

(System Management Interrupt).

---

**software**

Programs with specific functions, such as word processing, data base management, communications, and operating system.

**SRAM**

(Static RAM) A temporary storage area for data and programs. This type of memory does not need to be refreshed, but it is lost when the computer is powered off. See also NVRAM and RAM.

**SVGA**

(Super VGA) A type of video display system that provides very high-resolution text and graphics on analog color monitors.

**system board**

The main circuit board in your computer. It contains most of the connectors and ports.

**T****tape drive**

A type of storage device using magnetic tape.

**TTL**

(Transistor-Transistor Logic) A type of integrated circuit used in computers. See also CMOS.

**U****ultra 160/m SCSI**

Ultra 160/m is a parallel SCSI interface based on Ultra3 SCSI technology. This interface features data transfer speeds up to 160MB/second (double-edge clocking), cyclical redundancy checking (CRC) providing higher levels of data reliability, and domain validation that detects the configuration of the SCSI bus and automatically tests and adjusts the SCSI bus transfer rate to optimize interoperability. Note that the Ultra 160/m uses the standard Ultra2 LVD cabling and termination, making it backward compatible for easy implementation.

**V****VGA**

(Video Graphics Array) A type of video display system that provides high-resolution text and graphics on analog color monitors.

**W****WOL**

(Wake-On-LAN) A feature that provides the ability to remotely wake a sleeping (powered off) system through a network connection.



---

# Equipment Log

Use this equipment log form to record pertinent information about your system. You will need some of this information to run the System Setup Utility. Be sure to update the equipment log when you add options.

Record the model and serial numbers of the system components, dates of component removal or replacement, and the name of the vendor from whom the component was purchased. Be sure to record the same information for any components added to the system, such as hard disk drives, add-in boards, or devices.

Record the model and serial numbers of the system unit. The model and serial numbers of the system unit are recorded on a label attached to the rear of the unit.

The location of serial numbers on add-in boards, hard disk drives, and external equipment, such as video displays or printers, varies from one manufacturer to another. Literature accompanying these products should illustrate or describe the location of model and serial numbers.

<b>Component</b>	<b>Manufacturer Name &amp; Model</b>	<b>Serial Number (if available)</b>	<b>Date Installed</b>
Server			
CPU Module 1			
Module Board 1			
Processor 1			
Processor 2			
DIMM Slot 1A			
DIMM Slot 1B			
DIMM Slot 2A			
DIMM Slot 2B			
DIMM Slot 3A			
DIMM Slot 3B			
CPU Module 2			
Module Board 2			
Processor 1			
Processor 2			
DIMM Slot 1A			
DIMM Slot 1B			
DIMM Slot 2A			
DIMM Slot 2B			
DIMM Slot 3A			
DIMM Slot 3B			
PCI Module 1			
Module Board 1			
Hard Disk Drive 1			
Hard Disk Drive 2			
Hard Disk Drive 3			
CD-ROM Drive			
PCI Module 2			
Module Board 2			
Hard Disk Drive 1			
Hard Disk Drive 2			
Hard Disk Drive 3			
CD-ROM Drive			

## **2 Equipment Log**







---

# Index

## A

Advance menu  
    configuring in setup, 3-6

## B

Baseboard management (BMC), 1-29  
Beep codes, 5-14, 5-33  
BIOS, 1-27, 3-3  
BIOS and BMC revision levels  
    how to identify, 5-34  
Boot menu  
    configuring in setup, 3-14

## C

Controller  
    baseboard management (BMC), 1-29  
    network, 1-27  
    peripheral, 1-28  
    SAF-TE, 1-26  
    SCSI, 1-28  
    USB/IDE, 1-27  
    video, 1-28  
CPU module, 1-22  
    installing, 4-9, 4-24  
    removing, 4-8, 4-22  
    replacing or adding DIMMs, 4-19  
    replacing or adding processors and VRMs,  
        4-11  
Customer replaceable units (CRUs)  
    removing and installing, 4-2

## D

Diagnostic procedures, 5-6

## E

Error codes. *See* POST  
Error messages, 5-14  
    LCD error messages, 5-14  
    POST error codes and messages, 5-26  
Exit menu  
    configuring in setup, 3-14  
External device connectors, 1-29

## F

Fast!Util utility, 3-15  
Fault-Tolerant hardware, 1-4  
Features, 1-4  
Floppy disk drive, 1-25

## H

Hard disk drives  
    disk drives, 1-23  
    hot swapping, 4-32  
Hot swap  
    hard drives, 4-32

## M

Main menu  
    configuring in setup, 3-5  
Memory, 1-26  
Monitoring system status, 1-29

## N

Network  
    controller, 1-27  
    problems, 5-13

## O

Overview, 1-2

## P

Password  
    clearing and changing, 3-25  
PCI adapter boards  
    installing, 4-25  
PCI adapter cards, 1-24  
PCI modules, 1-22  
    removing, 4-22  
Peripheral  
    controller, 1-28  
POST  
    error beep codes, 5-33  
    error codes and messages, 5-26  
Power cords  
    connecting, 2-11  
Power supply  
    monitoring power state, 1-29  
Precautions  
    upgrading, 4-3  
Problems  
    application software, 5-12  
    beep code, 5-9  
    bootable CD-ROM not detected, 5-12  
    CD-ROM drive activity light, 5-12  
    characters distorted, 5-10  
    diskette drive activity LED, 5-11  
    network, 5-13  
    no characters on screen, 5-10

---

- PCI installation tips, 5-13
- power LED, 5-9
- Processors
  - description, 1-26

## **R**

- Real time clock, 1-28

## **S**

- SAF-TE controller, 1-26
- SCSI controller, 1-28
- Security menu
  - configuring in Setup, 3-11
- Server management
  - BMC, 1-29
  - features, 1-29
- Setup
  - advanced menu, 3-6
  - boot menu, 3-14
  - exit menu, 3-14
  - main menu, 3-5
  - security menu contents, 3-11
  - system hardware menu, 3-12
- Specifications
  - server unit technical specifications, A-2
- Storage bays, 1-23
- System
  - chassis, 1-5
  - components and module set, 1-22
  - configuring, 3-2
  - configuring jumpers, 3-22
  - installing PCI adapter boards, 4-25
  - memory, 1-26
  - opening and closing the front door of the tower cabinet, 4-7
  - removing a PCI module, 4-22
  - replacing CPU modules, 4-8
  - upgrading, 4-2
- System hardware menu
  - configuring in setup, 3-12
- System upgrade
  - precautions, 4-3
  - preparing, 4-5

## **T**

- Troubleshooting checklists, 5-3

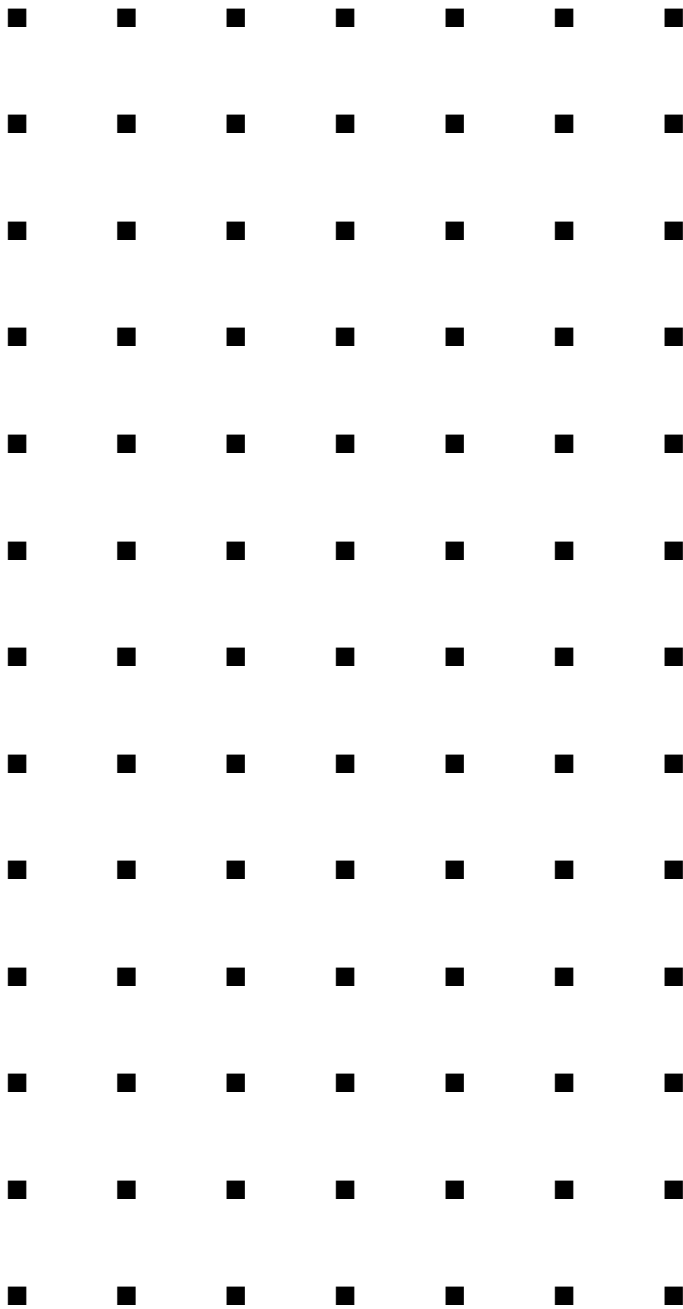
## **U**

- Unpacking the system, 2-3
- Upgrading your system, 4-2
- USB/IDE controller, 1-27

## **V**

- Video controller, 1-28





456-01675-000

## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>