




Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

[Introduction](#)
[Indicators, Messages, and Codes](#)
[Finding Software Solutions](#)
[Running System Diagnostics](#)
[Troubleshooting Your System](#)
[Installing System Components](#)
[Installing Drives](#)
[Getting Help](#)
[Jumpers and Connectors](#)
[I/O Connectors](#)

Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
-  **CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see your *User's Guide*.

Information in this document is subject to change without notice.
© 2004 Dell Inc. All rights reserved.

Reproduction in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, *PowerEdge*, *Dell OpenManage*, *Dimension*, *Inspiron*, *OptiPlex*, *Latitude*, *Dell Precision*, *PowerApp*, *PowerEdge*, *PowerVault*, *Axim*, and *DellNet* are trademarks of Dell Inc.; *Microsoft*, *Windows*, and *MS-DOS* are registered trademarks of Microsoft Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

Initial release: 2 April 2004

[Back to Contents Page](#)

Jumpers and Connectors

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Jumpers—A General Explanation](#)
- [System Board Jumpers](#)
- [System Board Connectors](#)
- [Disabling a Forgotten Password](#)

This section provides specific information about the system jumpers. It also provides some basic information on jumpers and switches and describes the connectors on the various boards in the system.

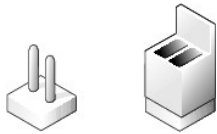
Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When reconfiguring the system, you may need to change jumper settings on circuit boards or drives.

Jumpers

Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated. [Figure A-1](#) shows an example of a jumper.

Figure A-1. Example Jumpers



⚠ CAUTION: Ensure that the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.

A jumper is referred to as open or unjumped when the plug is pushed down over only one pin or if there is no plug at all. When the plug is pushed down over two pins, the jumper is referred to as jumped. The jumper setting is often shown in text as two numbers, such as 1-2. The number 1 is printed on the circuit board so that you can identify each pin number based on the location of pin 1.

[Figure A-2](#) shows the location and default settings of the system jumper blocks. See [Table A-1](#) for the designations, default settings, and functions of the system's jumpers.

System Board Jumpers

[Figure A-2](#) shows the location of the configuration jumpers on the system board. [Table A-1](#) lists the jumpers settings.

Figure A-2. System Board Jumpers

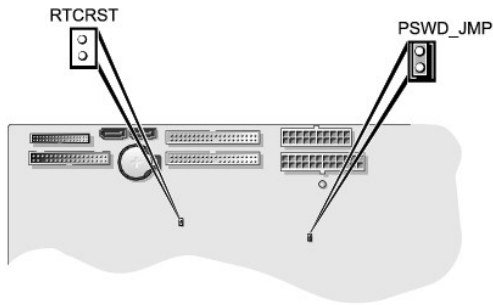


Table A-1. System Board Jumper Settings

Jumper	Setting	Description
PSWD_JMP	(default)	The password feature is enabled.
		The password feature is disabled.
RTCRST	(default)	The configuration settings in NVRAM are retained at system boot.
		The configuration settings in NVRAM are cleared at next system boot.
jumpered unjumpered		

System Board Connectors

See [Figure A-3](#) and [Table A-2](#) for the location and description of system board connectors. [Figure A-3](#) also indicates expansion slots and bus operating speeds.

Figure A-3. System Board Connectors

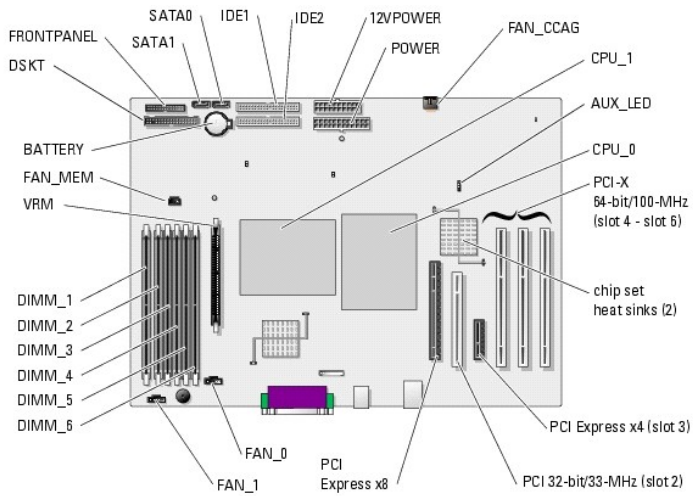


Table A-2. System Board Connectors

Connector	Description
12VPOWER	System board power
AUX_LED	Hard drive activity connector for controller cards

BATTERY	System battery
CPU_n	Processors (2)
DIMM_x	Memory modules (6)
DSKT	Diskette drive
FAN_CCAG	PCI fan power
FAN_MEM	Memory fan power
FAN_n	Processor fan power (2)
FRONT PANEL	Front-panel switches and indicators
IDE1	Primary IDE
IDE2	Secondary IDE
POWER	System board power
SATA0	SATA hard drive0
SATA1	SATA hard drive1
PCI expansion cards	Expansion card slots: <ul style="list-style-type: none"> 1: PCI Express x8 2: 32-bit/33-MHz PCI 3: PCI Express x4 4-6: 64-bit/66-MHz PCI-X
VRM	Voltage regulator module (required if CPU_1 is installed)

Disabling a Forgotten Password

The system's software security features include a system password and an admin password, which are discussed in detail in "Using the System Setup Program" in your *User's Guide*. The password jumper enables these password features or disables them and clears any password(s) currently in use.

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System".
3. Remove the password jumper plug.

See [Figure A-2](#) to locate the password jumper on the system board.

4. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System".
5. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

The existing passwords are not disabled (erased) until the system boots with the password jumper plug removed. However, before you assign a new system and/or admin password, you must install the jumper plug.

6. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System".
8. Install the password jumper plug.

See [Figure A-2](#) to locate the password jumper on the system board.

9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System".
10. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
11. Assign a new system and/or admin password.

To assign a new password using the System Setup program, see "Using the System Setup Program" in your *User's Guide*.

[Back to Contents Page](#)

I/O Connectors

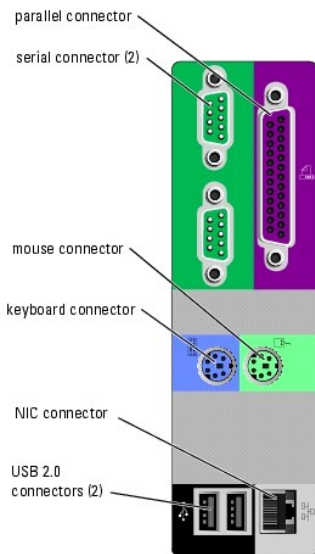
Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [I/O Connectors](#)
 - [Serial Connector](#)
 - [Parallel Connector](#)
 - [PS/2-Compatible Keyboard and Mouse Connectors](#)
 - [Video Connector](#)
 - [USB Connector](#)
 - [Integrated NIC Connector](#)
 - [Network Cable Requirements](#)
-

I/O Connectors

I/O connectors are the gateways that the system uses to communicate with external devices, such as a keyboard, mouse, printer, or monitor. This section describes the various connectors on your system. If you reconfigure the hardware connected to the system, you may also need the pin number and signal information for these connectors. [Figure B-1](#) illustrates the connectors on the system.



Figure B-1. I/O Connectors



[Table B-1](#) shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
	Serial connector
	Parallel connector
	Mouse connector
	Keyboard connector


	USB connector
	NIC connector

Serial Connector

Serial connectors support devices such as external modems, printers, and mice that require serial data transmission. The serial connector uses a 9-pin D-subminiature connector.

Serial Connector Autoconfiguration

The default designation of the integrated serial connector is COM1. When you add an expansion card containing a serial connector that has the same designation as the integrated connector, the system's autoconfiguration feature remaps (reassigns) the integrated serial connector to the next available designation. Both the new and the remapped COM connectors share the same IRQ setting. COM1 and COM3 share IRQ4, while COM2 and COM4 share IRQ3.

 **NOTE:** If two COM connectors share an IRQ setting, you may not be able to use them both at the same time. In addition, if you install one or more expansion cards with serial connectors designated as COM1 and COM3, the integrated serial connector is disabled.

Before adding a card that remaps the COM connectors, check the documentation that came with the software to make sure that the software can accommodate the new COM connector designation.

[Figure B-2](#) illustrates the pin numbers for the serial connector and [Table B-2](#) defines the pin assignments for the connector.

Figure B-2. Serial Connector Pin Numbers

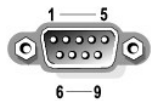


Table B-2. Serial Connector Pin Assignments

Pin	Signal	I/O	Definition
1	DCD	I	Data carrier detect
2	SIN	I	Serial input
3	SOUT	O	Serial output
4	DTR	O	Data terminal ready
5	GND	N/A	Signal ground
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator
Shell	N/A	N/A	Chassis ground

Parallel Connector

The integrated parallel connector, intended primarily for use by printers that require data in parallel format, uses a 25-pin D-subminiature connector on the system's back panel. The default designation of the system's parallel connector is LPT1. If you add an expansion card containing a parallel connector configured as LPT1 (IRQ7, I/O address 378h), use the System Setup program to remap the integrated parallel connector. See "Using the System Setup Program" in the *User's Guide*. [Figure B-3](#) illustrates the pin numbers for the parallel connector and [Table B-3](#) defines the pin assignments for the connector.

Figure B-3. Parallel Connector Pin Numbers

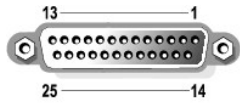


Table B-3. Parallel Connector Pin Assignments

Pin	Signal	I/O	Definition
1	STB#	I/O	Strobe
2	PD0	I/O	Printer data bit 0
3	PD1	I/O	Printer data bit 1
4	PD2	I/O	Printer data bit 2
5	PD3	I/O	Printer data bit 3
6	PD4	I/O	Printer data bit 4
7	PD5	I/O	Printer data bit 5
8	PD6	I/O	Printer data bit 6
9	PD7	I/O	Printer data bit 7
10	ACK#	I	Acknowledge
11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	AFD#	O	Automatic feed
15	ERR#	I	Error
16	INIT#	O	Initialize printer
17	SLIN#	O	Select in
18-25	GND	N/A	Ground

PS/2-Compatible Keyboard and Mouse Connectors

The PS/2-compatible keyboard and mouse cables attach to 6-pin, miniature DIN connectors. [Figure B-4](#) illustrates the pin numbers for these connectors and [Table B-4](#) defines the pin assignments for these connectors.

Figure B-4. PS/2-Compatible Keyboard and Mouse Connector Pin Numbers



Table B-4. Keyboard and Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	KBDATA or MFDATA	I/O	Keyboard data or mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	KBCLK or MFCLK	I/O	Keyboard clock or mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Video Connector

You can attach a VGA-compatible monitor to the system's add-in expansion card using a 15-pin high-density D-subminiature connector. [Figure B-5](#) illustrates the pin numbers for the video connector and [Table B-5](#) defines the pin assignments for the connector.

Figure B-5. Video Connector Pin Numbers

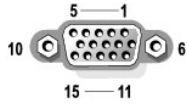


Table B-5. Video Connector Pin Assignments

Pin	Signal	I/O	Definition
1	RED	O	Red video
2	GREEN	O	Green video
3	BLUE	O	Blue video
4	NC	N/A	No connection
5-8, 10	GND	N/A	Signal ground
9	VCC	N/A	Vcc
11	NC	N/A	No connection
12	DDC data out	O	Monitor detect data
13	HSYNC	O	Horizontal synchronization
14	VSYNC	O	Vertical synchronization
15	NC	N/A	No connection

USB Connector

The system's USB connector supports USB-compliant peripherals such as keyboards, mice, and printers and may also support USB-compliant devices such as diskette drives and CD drives. [Figure B-6](#) illustrates the pin numbers for the USB connector and [Table B-6](#) defines the pin assignments for the connector.

- ➔ **NOTICE:** Do not attach a USB device or a combination of USB devices that draw a maximum current of more than 500 mA per channel or +5 V. Attaching devices that exceed this threshold may cause the USB connectors to shut down. See the documentation that accompanied the USB devices for their maximum current ratings.

Figure B-6. USB Connector Pin Numbers



Table B-6. USB Connector Pin Assignments

Pin	Signal	I/O	Definition
1	Vcc	N/A	Supply voltage
2	DATA	I	Data in
3	+DATA	O	Data out
4	GND	N/A	Signal ground

Integrated NIC Connector

The system's integrated NIC functions as a separate network expansion card while providing fast communication between servers and workstations. [Figure B-7](#) illustrates the pin numbers for the NIC connector and [Table B-7](#) defines the pin assignments for the connector.

Figure B-7. NIC Connector

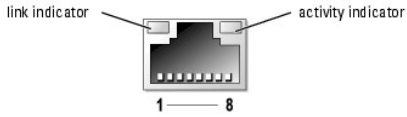


Table B-7. NIC Connector Pin Assignments

Pin	Signal	I/O	Definition
1	TD+	O	Data out (+)
2	TD-	O	Data out (-)
3	RD+	I	Data in (+)
4	NC	N/A	No connection
5	NC	N/A	No connection
6	RD-	I	Data in (-)
7	NC	N/A	No connection
8	NC	N/A	No connection

Network Cable Requirements

The NIC supports a UTP Ethernet cable equipped with a standard RJ45-compatible plug. Observe the following cabling restrictions.

NOTICE: To avoid line interference, voice and data lines must be in separate sheaths.

- 1 Use Category 5 or greater wiring and connectors.
- 1 Do not exceed a cable run length (from a workstation to a hub) of 100 m (328 ft).

For detailed guidelines on operation of a network, see "Systems Considerations of Multi-Segment Networks" in the IEEE 802.3 standard.

[Back to Contents Page](#)

[Back to Contents Page](#)

Introduction

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

[Other Documents You May Need](#)


Your system includes the following service and upgrade feature:

- 1 System diagnostics, which checks for hardware problems (if the system can boot).


The following upgrade options are available:

- 1 Processor
 - 1 Memory
 - 1 PCI, PCI-X, or PCI-Express expansion cards
-

Other Documents You May Need

 The *System Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

- 1 The *Getting Started Guide* provides an overview of initially setting up your system.
- 1 The *User's Guide* provides information about system features and technical specifications.
- 1 The *System Administrator's Guide* provides system configuration, operation, and management information.
- 1 Operating system documentation describes how to install (if necessary), configure, and use the operating system software.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

 **NOTE:** Always read the updates first because they often supersede information in other documents.

- 1 Release notes or readme files may be included to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.
-

[Back to Contents Page](#)

Indicators, Messages, and Codes

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Front-Panel Indicators and Features](#)
- [Back-Panel Indicators and Features](#)
- [System Messages](#)
- [System Beep Codes](#)
- [Warning Messages](#)
- [Diagnostics Messages](#)

The system, applications, and operating systems can identify problems and alert you to them. Any of the following can indicate when the system is not operating properly:

- 1 System indicators
- 1 System messages
- 1 Beep codes
- 1 Warning messages
- 1 Diagnostics messages

This section describes each type of message, lists the possible causes, and provides steps to resolve any problems indicated by a message. The system indicators and features are illustrated in this section.

Front-Panel Indicators and Features

[Figure 2-1](#) shows the front-panel indicators for hard-drive activity and diagnostic purposes. The power button has a status indicator built into the button. Also, the optional diskette drive has an activity indicator. [Table 2-1](#) details the conditions associated with each front-panel indicator code. [Table 2-2](#) details the conditions associated with the diagnostic indicator codes.

Figure 2-1. Front-Panel Indicators and Features

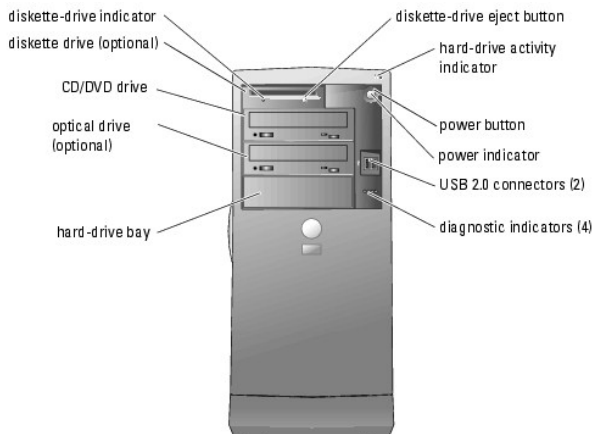



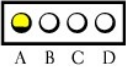
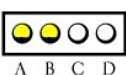
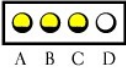
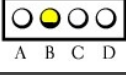
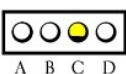
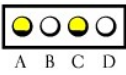
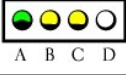
Table 2-1. Front-Panel Indicator Codes

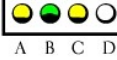


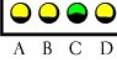


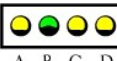
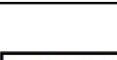
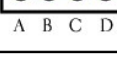


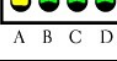
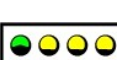
Indicator Type	Activity Indicator	Indicator Code
Power	Off	The system is off.
	Amber blinking	The system is powering up. If the hard-drive indicator is off, the power supply may need to be replaced. See " Getting "






		Help. If the hard-drive indicator is on, the system board or a VRM is faulty. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2 .
	Solid amber	The power supply is probably good. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2 .
	Solid green	Indicates that the system is powered on.
	Green blinking	The system is in a low power state. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2 .
Diskette drive	Green blinking	Indicates diskette-drive activity.
Hard drive	Green blinking	Indicates hard-drive activity.

The front panel also incorporates two USB 2.0 connectors. See [Figure 2-1](#).

Table 2-2. Diagnostic Indicator Codes

Code	Causes	Corrective Action
	No electrical power is supplied to the system.	<p>Connect the system to an electrical outlet. Ensure that the front-panel power indicator is on. If the power indicator is off, ensure that the system is connected to a working electrical outlet and then press the power button.</p> <p>If the problem is still not resolved, see "Getting Help."</p>
	The system is in a normal off condition; the system is connected to an electrical outlet.	<p>Press the power button to turn the system on.</p> <p>If the system does not turn on, ensure that the front-panel power indicator is on. If the power indicator is off, ensure that the system is connected to a working electrical outlet and then press the power button.</p> <p>If the problem is still not resolved, see "Getting Help."</p>
	The system is in a reduced power or "sleep" state.	<p>Use one of the following methods to "wake up" the system:</p> <ul style="list-style-type: none"> 1 Press the power button 1 Auto power on 1 Move or click the mouse 1 Type on the keyboard 1 USB device activity 1 Power management event <p>If the problem is not resolved and you are trying to wake the system with a USB mouse or keyboard, substitute the mouse or keyboard with a working PS/2 mouse or keyboard and then try to wake the system.</p>
	The BIOS is not executing.	<p>Ensure that the processor is seated correctly and restart the system. See "Processor" in "Installing System Components."</p> <p>If the problem is still not resolved, see "Getting Help."</p>
	A possible power supply or power cable failure has occurred.	See "Getting Help."
	A possible system board failure has occurred.	See "Getting Help."
	A processor and/or VRM mismatch exists.	See "Troubleshooting the Processors" in "Troubleshooting Your System."
	A possible VRM 0 failure has occurred.	See "Getting Help."
	A possible VRM 1 failure has occurred.	See "Troubleshooting the Processors" in "Troubleshooting Your System."

 <p>A B C D</p>		
 <p>A B C D</p>	<p>A possible VRM 0 and VRM 1 failure has occurred.</p>	<p>See "Getting Help."</p>
 <p>A B C D</p>	<p>A possible processor failure has occurred.</p>	<p>Reinstall the processor, see "Processor" in "Installing System Components" and restart the system.</p>
 <p>A B C D</p>	<p>Memory modules are detected, but a memory failure has occurred.</p>	<p>Remove and reinstall all memory modules. See "System Memory" in "Installing System Components." Ensure that the memory modules are proper installed. See "Memory Module Installation Guidelines." Ensure that all the connector tabs are locked.</p> <p>Restart the system.</p>
 <p>A B C D</p>	<p>A possible expansion-card failure has occurred.</p>	<p>See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."</p> <p>If the problem persists, see "Getting Help."</p>
 <p>A B C D</p>	<p>A possible video card failure has occurred.</p>	<p>Reinstall the video card. See "Expansion Cards" in "Installing System Components" and restart the system.</p> <p>If the problem still exists, install a video card that you know works and restart the system.</p> <p>If the problem persists, see "Getting Help."</p>
 <p>A B C D</p>	<p>A possible diskette or hard-drive failure has occurred.</p>	<p>Check all the power and data cable connections. See "Troubleshooting a Diskette Drive" or the appropriate hard-drive troubleshooting procedure ("Troubleshooting a SCSI Hard Drive" or "Troubleshooting a SATA Hard Drive") in "Troubleshooting Your System."</p>
 <p>A B C D</p>	<p>A possible USB failure has occurred.</p>	<p>Check cable connections, reinstall all USB devices, and restart the system.</p>
 <p>A B C D</p>	<p>No memory modules are detected.</p>	<p>Remove and reinstall all memory modules. See "System Memory" in "Installing System Components." Ensure that the memory modules are proper installed. See "Memory Module Installation Guidelines." Ensure that all the connector tabs are locked.</p> <p>Restart the system.</p>
 <p>A B C D</p>	<p>A system board failure has occurred.</p>	<p>See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."</p> <p>If the problem persists, see "Getting Help."</p>
 <p>A B C D</p>	<p>Memory modules are detected, but a memory configuration or compatibility error exists.</p>	<p>Ensure that memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components."</p> <p>Reinstall the memory modules and restart the system.</p> <p>If the problem persists, see "Getting Help."</p>
 <p>A B C D</p>	<p>A possible system board resource and/or hardware failure has occurred.</p>	<p>See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."</p> <p>If the problem persists, see "Troubleshooting the System Battery."</p> <p>If the problem persists, see "Troubleshooting System Memory."</p> <p>If the problem persists, see "IRQ Assignment Conflicts" in "Finding Software Solutions."</p> <p>If the problem persists, see "Getting Help."</p>
 <p>A B C D</p>	<p>A possible expansion card failure has occurred.</p>	<p>See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."</p> <p>If the problem persists, see "IRQ Assignment Conflicts" in "Finding Software Solutions."</p> <p>If the problem persists, see "Getting Help."</p>

 A B C D	Other failure has occurred.	Ensure that the cables are properly connected from the diskette drive, hard drive, CD drive, and DVD drive to the system board. If the problem persists, see " Getting Help ."
 A B C D	The system is in a normal operating condition after POST.	None.
 = yellow  = green  = off		

Back-Panel Indicators and Features

[Figure 2-2](#) shows the back-panel indicators and features. [Figure 2-3](#) shows the indicators for the integrated network adapter and [Table 2-3](#) details the conditions associated with the indicator codes.

Figure 2-2. Back-Panel Indicators and Features

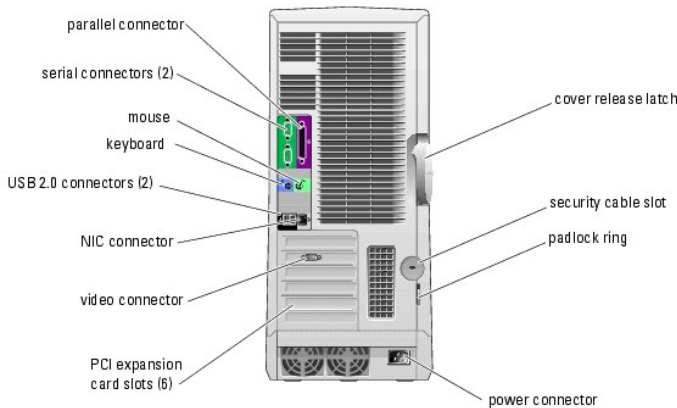


Figure 2-3. NIC Indicators

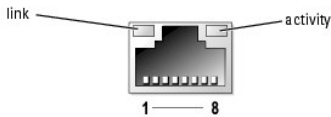


Table 2-3. NIC Indicators

Indicator Type	Indicator Code	Description
Activity	Off	When off at the same time that the link indicator is off, the NIC is not connected to the network or the NIC is disabled in the System Setup screen. See "Using the System Setup Program" in the <i>User's Guide</i> .
	Blinking	Indicates that network data is being sent or received.
Link	Off	When off at the same time that the activity indicator is off, the NIC is not connected to the network or the NIC is disabled in the System Setup screen. See "Using the System Setup Program" in the <i>User's Guide</i> .
	Yellow	1000-Mbps connection

Orange	100-Mbps connection
Green	10-Mbps connection

System Messages

System messages appear on the screen to notify you of a possible problem with the system. [Table 2-4](#) lists the system messages that can occur and the probable cause and corrective action for each message.


 **NOTE:** If you receive a system message that is not listed in [Table 2-4](#), check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-4. System Messages

Message	Causes	Corrective Actions
A filename cannot contain any of the following characters: \\ / : * ? " < >		Do not use these characters in filenames.
A required .DLL file was not found	The program that you are trying to open is missing an essential file.	Remove and then reinstall the program. See the program documentation for installation instructions.
Alert! Card-cage fan failure.	The expansion card fan is faulty or the fan assembly is not installed correctly.	Ensure that the fan assembly is properly installed. See " Expansion Card Fan " in "Installing System Components."
Alert! Chipset heat sink not detected.	The chip set heat sink is not properly installed or is missing.	Ensure that the chip set heat sink is properly installed. See Figure A-3 . If the heat sink is missing, see "Getting Help."
Alert! Cover was previously removed.	The system was opened.	Information only. To reset the chassis intrusion switch, see "Using the System Setup Program" in your <i>User's Guide</i> .
Alert! CPU 0 fan failure. Alert! CPU 1 fan failure.	Specified fan is faulty or the fan assembly is not installed correctly.	Ensure that the processor cooling shroud is properly installed. See " Troubleshooting Fans " in "Troubleshooting Your System."
Alert! Error initializing PCI Express slot n (or bridge).	The system encountered a problem while trying to configure a PCI Express expansion card	See " Troubleshooting Expansion Cards " in "Troubleshooting Your System."
Alert! OS Install Mode enabled. Amount of available memory limited to 256MB	The OS Install Mode option in the System Setup program is set to On . This limits the amount of available memory to 256 MB because some operating systems will not complete installation with more than 2 GB of system memory.	After the operating system is installed, enter the System Setup program and set the OS Install Mode option to Off . See your <i>User's Guide</i> for details.
Alert! Power supply fan failure	Faulty power supply.	Replace the power supply. See " Getting Help ."
Alert! Previous fan failure.	The fan caused errors the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are properly installed and operating correctly.
Alert! Processor Cache size mismatch. Install like processors or one processor. System Halted! Alert! Processor type mismatch. Install like processors or one processor. System halted! Alert! Processor speed mismatch. Install like processors or one processor. System halted! Alert! Unsupported processor type detected. System halted!	The installed processors are not identical.	Ensure that the processors are identical. See " Processor " in "Installing System Components."

Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The system failed to complete the boot routine three consecutive times for the same error.	See " Getting Help ."
Alert! Previous Processor Thermal Failure	The processor overheated the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are properly installed and operating correctly. Also, ensure that the processor heat sink is properly installed. See " Processor " in "Installing System Components."
Alert! Previous Shutdown Due to Thermal Event	The processor or hard drive overheated the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are working correctly. Also, ensure that the processor heat sink is properly installed. See " Processor " in "Installing System Components."
Alert! Previous Voltage Failure	Voltage used by the system either exceeded or fell below acceptable thresholds.	See " Troubleshooting the System Battery " in "Troubleshooting Your System." If the problem persists, see " Getting Help ."
Alert! System Battery Voltage is Low	The system battery is providing inadequate voltage.	See " Troubleshooting the System Battery " in "Troubleshooting Your System."
Alert! Uncorrectable Memory Error Previously Detected	One or more memory modules might be improperly seated or faulty, or the system board may be faulty.	See " Troubleshooting System Memory " and "Troubleshooting Your System." If the problem persists, see " Getting Help ."
Attachment failed to respond	The diskette or hard-drive controller cannot send data to the associated drive.	See " Troubleshooting a Diskette Drive " or " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Bad command or file name		Ensure that you have spelled the command correctly, have put spaces in the proper place, and have used the correct pathname.
Bad error-correction code (ECC) on disk read	The diskette or hard-drive controller detected an uncorrectable read error.	See " Troubleshooting a Diskette Drive " or " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
bb/dd/f: Error allocating IRQ for PCI Device bb/dd/f: Error allocating I/O Bar for PCI Device bb/dd/f: Error allocating Mem BAR for PCI Device bb/dd/f: Error allocating PMem BAR for PCI Device bb/dd/f: Error allocating UMB for PCI Device where bb is the bus number, dd is the device number, and f is the function number. NOTE: bb, dd, and f are hexadecimal numbers.	The system encountered a problem while trying to configure an expansion card or integrated LegacySelect device.	If the device number points to an expansion card, the card can be removed. See " Troubleshooting Expansion Cards " in "Troubleshooting Your System." If the device number points to a LegacySelect device, disable the device. See "Using the System Setup Program" in your <i>User's Guide</i> for details.
Controller has failed	The hard drive or the associated controller is defective.	See " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Data error	The diskette drive or hard drive cannot read the data.	For the operating system, run the appropriate utility to check the file structure of the diskette drive or hard drive. See your operating system documentation for information on running these utilities.
Decreasing available memory	One or more memory modules might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See " System Memory " in "Installing System Components." See " Troubleshooting System Memory " in "Troubleshooting Your System."
Diskette drive 0 seek failure	A cable might be loose or the system configuration information might not match the hardware configuration.	See " Troubleshooting a Diskette Drive " in "Troubleshooting Your System."


Diskette read failure	The diskette might be defective, or a cable might be loose.	If the diskette-drive indicator turns on, try a different disk. See " Troubleshooting a Diskette Drive " in "Troubleshooting Your System."
Diskette subsystem reset failed	The diskette drive controller might be faulty.	Run the system diagnostics. See " Running System Diagnostics ."
Diskette write protected	The diskette is write-protected.	Slide the write-protect notch to the open position.
Drive not ready	No diskette is in the drive.	Put a diskette in the drive.
Error: Memory configured incorrectly	The memory modules are not installed in identical pairs, dual-ranked modules installed after single-ranked modules, dual-ranked modules installed in DIMM_5 and DIMM_6.	Ensure that the memory modules are properly installed. See " Memory Module Installation Guidelines " in "Installing System Components."
Gate A20 failure	Faulty keyboard controller (faulty system board).	See " Getting Help ."
General failure	The operating system is unable to carry out the command.	This message is usually followed by specific information. Take the appropriate action to resolve the problem.
Hard-disk configuration error Hard-disk controller failure Hard-disk drive failure	The hard drive failed initialization.	Run the system diagnostics. See " Running System Diagnostics ." See " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Insert bootable media	The operating system is trying to boot from a nonbootable diskette or CD.	Insert a bootable diskette or CD.
Invalid configuration information - please run SETUP program	The system configuration information does not match the hardware configuration.	Enter the System Setup program and correct the system configuration information. See your <i>User's Guide</i> for details.
Keyboard Controller Failure KeyBoard Stuck Key Failure Keyboard failure	A cable or connector might be loose, or the keyboard or keyboard/mouse controller might be faulty.	See " Troubleshooting the Keyboard " in "Troubleshooting Your System."
Memory address line failure at <i>address</i> , read value expecting value	A memory module might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See " Troubleshooting System Memory " in "Troubleshooting Your System."
Memory allocation error	The software you are attempting to run is conflicting with the operating system, another program, or a utility.	Turn off the system, wait 30 seconds, restart the system, and then try to run the program again. If the error message appears again, see the software documentation for additional troubleshooting suggestions.
Memory data line failure at <i>address</i> , read value expecting value Memory double word logic failure at <i>address</i> , read value expecting value Memory odd/even logic failure at <i>address</i> , read value expecting value Memory write/read failure at <i>address</i> , read value expecting value	A memory module might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See " Troubleshooting System Memory " in "Troubleshooting Your System."
	The amount of memory recorded in the	Restart the system. If the error message

Memory size in CMOS invalid	system configuration information does not match the memory installed in the system.	appears again, see " Troubleshooting System Memory " in "Troubleshooting Your System." If the problem persists, see " Getting Help ."
No boot device available	The system cannot find the diskette or hard drive.	If the diskette drive is your boot device, ensure that a bootable disk is in the drive. If the hard drive is your boot device, ensure that the hard drive is installed, properly seated, and partitioned as a boot device. User's Guide for details.
No boot sector on hard-disk drive	The system configuration information in the System Setup program might be incorrect.	Enter the System Setup program and verify the system configuration information for the hard drive. See your <i>User's Guide</i> for details. If the message continues to appear after verifying the information in the System Setup program, the operating system might have been corrupted. Reinstall the operating system. See your operating system documentation for reinstallation information.
No timer tick interrupt	A chip on the system board might be malfunctioning.	Run the system diagnostics. See " Running System Diagnostics ."
Non-system disk or disk error	The diskette in the diskette drive or your hard drive does not have a bootable operating system installed on it.	Replace the diskette with one that has a bootable operating system or remove the diskette, and then restart the system. If the problem persists, see the appropriate hard drive troubleshooting procedure: " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System." If the problem persists, see " Getting Help ."
Not a boot diskette	The operating system is trying to boot from a diskette that does not have a bootable operating system installed on it.	Insert a diskette that has a bootable operating system.
Not enough memory or resources. Close some programs and try again	You have too many programs open.	Close all windows and open the program that you want to use. In some cases, you might have to restart your system to restore system resources. If so, try opening the program that you want to use first
Operating system not found		See " Getting Help ."
Read fault	The operating system cannot read from the diskette or hard drive, the system could not find a particular sector on the disk, or the requested sector is defective.	See " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Requested sector not found	The operating system cannot read from the diskette or hard drive, the system could not find a particular sector on the disk, or the requested sector is defective.	See " Troubleshooting a Diskette Drive " or " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Reset failed	The disk reset operation failed.	See " Troubleshooting a Diskette Drive " or " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Sector not found	A faulty diskette drive or hard drive.	See " Troubleshooting a Diskette Drive " or " Troubleshooting a SATA Hard Drive " and " Troubleshooting a SCSI Hard Drive " in "Troubleshooting Your System."
Seek error		
Shutdown failure	A chip on the system board might be malfunctioning.	Run the system diagnostics. See " Running System Diagnostics ."
The file being copied is too large for the destination drive	The file that you are trying to copy is too large to fit on the disk.	Try copying the file to a blank diskette or using a larger capacity disk.
Time-of-day clock stopped	The battery might be dead.	See " Troubleshooting the System Battery " in "Troubleshooting Your System."
Time-of-day not set	The time or date stored in the System Setup program does not match the system clock.	Enter the System Setup program and correct the Date and Time options. See your <i>User's Guide</i> for details. If the problem persists, see " Troubleshooting the System Battery " in "Troubleshooting Your System."
Timer chip counter 2 failed	A chip on the system board might be malfunctioning.	Run the system diagnostics. See " Running System Diagnostics ."

<p>NOTICE: The [primary/secondary/primary serial] IDE [master/slave] hard drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem.</p>	<p>During initial start-up, the drive detected possible error conditions.</p>	<p>When your system finishes booting, immediately back up your data and replace your hard drive. See "Hard Drives" in "Installing drives."</p> <p>If no replacement hard drive is immediately available and the drive is not the only bootable drive, enter the System Setup program and change the appropriate drive setting to Off. See your <i>User's Guide</i> for details. Then remove the hard drive from the system.</p>
<p>Write fault</p>	<p>The operating system cannot write to the diskette drive or hard drive.</p>	<p>See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."</p>
<p>Write fault on selected drive</p>	<p>The operating system cannot write to the diskette drive or hard drive.</p>	<p>See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."</p>
<p>x:\ is not accessible. The device is not ready</p>	<p>The diskette drive cannot read the diskette.</p>	<p>Insert a diskette into the drive and try again.</p>

System Beep Codes

If an error that cannot be reported on the screen occurs during POST, the system may emit a series of beeps that identifies the problem.

 **NOTE:** If the system boots without a keyboard, mouse, or monitor attached, the system does not issue beep codes related to those peripherals.

If a beep code is emitted, write down the series of beeps and then look it up in [Table 2-5](#). If you are unable to resolve the problem by looking up the meaning of the beep code, use system diagnostics to identify the possible cause. If you are still unable to resolve the problem, see "[Getting Help](#)."

Table 2-5. Server Module Beep Codes

Code	Cause	Corrective Action
1-1-2	CPU register test failure	See " Troubleshooting the Processors " in "Troubleshooting Your System."
1-1-3	CMOS write/read failure; faulty system board	Faulty system board. See " Getting Help ."
1-1-4	BIOS checksum failure	
1-2-1	Programmable interval-timer failure; faulty system board	See " Troubleshooting System Memory " in "Troubleshooting Your System."
1-2-2	DMA initialization failure	
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	
1-3-2	No memory installed	
1-3-3	Chip or data line failure in the first 64 KB of main memory	
1-3-4	Odd/even logic failure in the first 64 KB of main memory	
1-4-1	Address line failure in the first 64 KB of main memory	
1-4-2	Parity failure in the first 64 KB of main memory	
1-4-3	Fail-safe timer test failure	
1-4-4	Software NMI port test failure	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	Faulty system board. See " Getting Help ."
3-1-1	Slave DMA-register failure	
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-2	Interrupt vector loading failure	
3-2-4	Keyboard-controller test failure	
3-3-1	CMOS failure	

3-3-2	System configuration check failure	
3-3-3	Keyboard controller not detected	
3-3-4	Video memory test failure	
3-4-1	Screen initialization failure	
3-4-2	Screen-retrace test failure	
3-4-3	Video ROM search failure	
4-2-1	No timer tick	
4-2-2	Shutdown test failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	See " Troubleshooting Expansion Cards " in "Troubleshooting Your System."
4-3-1	Improperly installed or faulty memory modules	See " Troubleshooting System Memory " in "Troubleshooting Your System."
4-3-2	No memory modules installed in the first memory module connector	Install a memory module in the first memory module connector. See " Installing a Memory Module " and " Memory Module Installation Guidelines " in "Installing System Components."
4-3-3	Faulty system board	Faulty system board. See " Getting Help ."
4-3-4	Time-of-day clock stopped	See " Troubleshooting the System Battery " in "Troubleshooting Your System." If the problem persists, see " Getting Help ."
4-4-1	Super I/O chip failure; faulty system board	Faulty system board. See " Getting Help ."
4-4-4	Cache test failure; faulty processor	See " Troubleshooting the Processors " in "Troubleshooting Your System."

Warning Messages

A warning message alerts you to a possible problem and prompts you to respond before the system continues a task. For example, before you format a diskette, a message will warn you that you may lose all data on the diskette. Warning messages usually interrupt the task and require you to respond by typing *y* (yes) or *n* (no).



NOTE: Warning messages are generated by either the application or the operating system. For more information, see "[Finding Software Solutions](#)" and the documentation that accompanied the operating system or application.

Diagnostics Messages

When you run system diagnostics, an error message may result. Diagnostic error messages are not covered in this section. Record the message on a copy of the Diagnostics Checklist in "[Getting Help](#)," and then follow the instructions in that section for obtaining technical assistance.

[Back to Contents Page](#)

[Back to Contents Page](#)

Finding Software Solutions

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Before You Begin](#)
- [Troubleshooting Errors and Conflicts](#)

Software problems can be caused by:

- 1 Improper installation or configuration of an application
- 1 Application conflicts
- 1 Input errors
- 1 Interrupt assignment conflicts

Ensure that you are installing the software application according to the software manufacturer's recommended procedures. If a problem occurs after you install the software, you might need to troubleshoot your software application and your system.

See the documentation that accompanied the software or contact the software manufacturer for detailed troubleshooting information.

 **NOTE:** If all of the system diagnostic tests complete successfully, then the problem is most likely caused by the software and not the hardware.

Before You Begin

- 1 Scan the software media with antivirus software.
- 1 Read the software documentation before you run the installation utility.
- 1 Be prepared to respond to prompts from the installation utility.

The installation utility may require you to enter information about your system, such as how the operating system is configured, and the type of peripherals that are connected to the system. Have this information available before running the installation utility.

Troubleshooting Errors and Conflicts

While configuring and running software, problems might occur that are caused by input errors, application conflicts, and/or IRQ assignment conflicts. The problems are sometimes indicated by error messages.

Error messages are generated by system hardware or software. "[Indicators, Messages, and Codes](#)" provides information about error messages that are hardware-based. If you receive an error message that is not listed, see your operating system or software program documentation for troubleshooting information.

Input Errors

Pressing a specific key or set of keys at the wrong time may produce unexpected results. See the documentation that came with the software application to ensure that the values or characters you are entering are valid.

Ensure that your operating system is configured properly to run the application. Remember that whenever you change the parameters of the operating system, the changes can conflict with an application's operating requirements. After you configure the operating system, you may need to reinstall or reconfigure a software application so that it can run properly in its new environment.

Application Conflicts

Some applications can leave unnecessary files or data behind after they are deleted from your system. Device drivers can also create application errors. If application errors occur, see your application device driver or operating system documentation for troubleshooting information.

IRQ Assignment Conflicts

Most PCI devices can share an IRQ with another device, but they cannot use an IRQ simultaneously. To avoid this type of conflict, see the documentation for each PCI device for specific IRQ requirements.

Table 3-1. IRQ Assignment Defaults

IRQ Line	Assignment
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	Serial port 2 (COM2 and COM4)
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	<i>Available</i>
IRQ6	Diskette drive controller
IRQ7	Parallel port
IRQ8	Real-time clock
IRQ9	<i>Available</i>
IRQ10	<i>Available</i>
IRQ11	<i>Available</i>
IRQ12	PS/2 mouse port unless the mouse is disabled through the System Setup program
IRQ13	Math coprocessor
IRQ14	IDE CD drive controller
IRQ15	<i>Available</i>

[Back to Contents Page](#)

[Back to Contents Page](#)

Running System Diagnostics

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Using Server Administrator Diagnostics](#)
- [System Diagnostics Features](#)
- [When to Use the System Diagnostics](#)
- [Running the System Diagnostics](#)
- [System Diagnostics Testing Options](#)
- [Using the Advanced Testing Options](#)
- [Error Messages](#)

If you experience a problem with your system, run the diagnostics before calling for technical assistance. The purpose of the diagnostics is to test your system's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use diagnostics test results to help you solve the problem.

Using Server Administrator Diagnostics

To assess a system problem, first use the online Server Administrator diagnostics. If you are unable to identify the problem, then use the system diagnostics

To access the online diagnostics, log into the Server Administrator home page, and then click the **Diagnostics** tab. For information about using diagnostics, see the online help. For additional information, see the *Server Administrator User's Guide*.

System Diagnostics Features

The system diagnostics provides a series of menus and options for particular device groups or devices. The system diagnostics menus and options allow you to:


- 1 Run tests individually or collectively.
 - 1 Control the sequence of tests.
 - 1 Repeat tests.
 - 1 Display, print, or save test results.
 - 1 Temporarily suspend testing if an error is detected or terminate testing when a user-defined error limit is reached.
 - 1 View help messages that briefly describe each test and its parameters.
 - 1 View status messages that inform you if tests are completed successfully.
 - 1 View error messages that inform you of problems encountered during testing.
-

When to Use the System Diagnostics

If a major component or device in the system does not operate properly, component failure may be indicated. As long as the microprocessor and the system's input/output devices (monitor, keyboard, and diskette drive) are functioning, you can use the system diagnostics to help identify the problem.

Running the System Diagnostics

The system diagnostics can be run either from the utility partition on your hard drive or from a set of diskettes that you create using the *Dell OpenManage Server Assistant for PowerEdge SC Products* CD.

 **NOTICE:** Use the system diagnostics to test only your system. Using this program with other systems may cause invalid results or error messages. In addition, use only the program that came with your system (or an updated version of that program).

From the Utility Partition


1. As the system boots, press <F10> during POST.
2. From the utility partition main menu under **Run System Utilities**, select **Run System Diagnostics**.

From the Diagnostics Diskettes

1. Create a set of diagnostics diskettes from the *Dell OpenManage Server Assistant for PowerEdge SC Products* CD. See "Using the Dell OpenManage Server Assistant CD" in your *User's Guide* for information on creating the diskettes.
2. Insert the first diagnostics diskette.
3. Reboot the system.

If the system fails to boot, see Getting Help."

When you start the system diagnostics, a message is displayed stating that the diagnostics are initializing. Next, the **Diagnostics** menu appears. The menu allows you to run all or specific diagnostics tests or to exit the system diagnostics.

 **NOTE:** Before you read the rest of this section, start the system diagnostics so that you can see the utility on your screen.

System Diagnostics Testing Options

To select an option from the **Diagnostics** menu, highlight the option and press <Enter>, or press the key that corresponds to the highlighted letter in the option.

[Table 4-1](#) provides a brief explanation of testing options.

Table 4-1. System Diagnostics Testing Options

Testing Option	Function
Quick Tests	Performs a quick check of the system. Select Test All Devices and then select Quick Tests . This option runs device tests that do not require user interaction. Use this option to quickly identify the source of your problem.
Test One Device	Tests a particular device.
Extended Tests	Performs a more thorough check of the system. Select Test All Devices and then select Extended Tests .
Advanced Testing	Checks a particular area of the system.
Information and Results	Displays test results.
Program Options	Sets various test parameters.
Device Configuration	Displays an overview of the devices in the system.
Exit to MS-DOS	Exits the diagnostics and returns to the System Utilities menu.

Using the Advanced Testing Options

When you select **Advanced Testing** from the **Diagnostics** menu, the main screen of the diagnostics appears and displays the following information:

- 1 Two lines at the top of the screen identify the diagnostics utility, the version number, and the system's service tag number.
- 1 The left side of the screen under **Device Groups** lists the diagnostic device groups in the order that they are tested if you select **All** under the **Run Tests** submenu. Press the up- or down-arrow keys to highlight a particular device group. Press the left- or right-arrow keys to select the options on the menu. As you move from one menu option to another, a brief explanation of the highlighted option appears at the bottom of the screen.
- 1 The right side of the screen under **Devices for Highlighted Group** lists the specific devices within a particular test group.

- 1 The menu area consists of two lines at the bottom of the screen. The first line lists the menu options that you can select; press the left- or right-arrow key to highlight an option. The second line provides information about the highlighted option.

For more information about a device group or device, highlight the **Help** option and press <Enter>. Press <Esc> to return to the previous screen.

Error Messages

When you run a system diagnostics test, you may receive an error message during testing. Record the message on a copy of the Diagnostics Checklist. For a copy of the Diagnostics Checklist and instructions for obtaining technical assistance, see "Getting Help."

[Back to Contents Page](#)


Troubleshooting Your System

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Safety First—For You and Your System](#)
- [Start-Up Routine](#)
- [Opening the System](#)
- [Closing the System](#)
- [Checking the Equipment](#)
- [Inside the System](#)
- [Troubleshooting a Wet System](#)
- [Troubleshooting a Damaged System](#)
- [Troubleshooting the System Battery](#)
- [Troubleshooting System Cooling Problems](#)
- [Troubleshooting System Memory](#)
- [Troubleshooting a Diskette Drive](#)
- [Troubleshooting a CD Drive](#)
- [Troubleshooting a SCSI Hard Drive](#)
- [Troubleshooting a SATA Hard Drive](#)
- [Troubleshooting a Hard Drive in a RAID Configuration](#)
- [Troubleshooting a RAID Controller Card](#)
- [Troubleshooting Expansion Cards](#)
- [Troubleshooting the Processors](#)

Safety First—For You and Your System

To perform certain procedures in this document, you must remove the system cover and work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in your system documentation.

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

Start-Up Routine

Look and listen during the system's start-up routine for the indications described in [Table 5-1](#).

Table 5-1. Start-Up Routine Indications

Look/listen for:	Action
An error message displayed on the monitor.	See " System Messages " in "Indicators, Codes, and Messages."
A series of beeps emitted by the system.	See " System Beep Codes " in "Indicators, Codes, and Messages."
The monitor's power indicator.	See " Troubleshooting the Video Subsystem ."
The keyboard indicators.	See " Troubleshooting the Keyboard ."
The diskette drive activity indicator.	See " Troubleshooting a Diskette Drive ."
The CD drive activity indicator.	See " Troubleshooting a CD Drive ."
The hard-drive activity indicator.	See " Troubleshooting a SCSI Hard Drive ."
An unfamiliar constant scraping or grinding sound when you access a drive.	See " Getting Help ."

Opening the System

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Press the power button to ground the system board.
3. If you have installed a padlock through the padlock ring on the back panel, remove the padlock.
4. Lay the system on its side as shown in [Figure 5-1](#).

➡ NOTICE: Ensure that sufficient space exists to accommodate the open cover—at least 30 cm (1 ft) of desktop space.

5. Open the system by sliding the cover release latch and rotating the cover open as shown in [Figure 5-1](#).

Closing the System

1. Ensure that all cables are connected, and fold cables out of the way.
2. Ensure that no tools or extra parts are left inside the system.
3. Close the system cover.
 - a. Rotate the cover down. See [Figure 5-1](#).
 - b. Press down on the cover until the cover release latch is fully engaged.
4. If applicable, install the padlock.
5. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

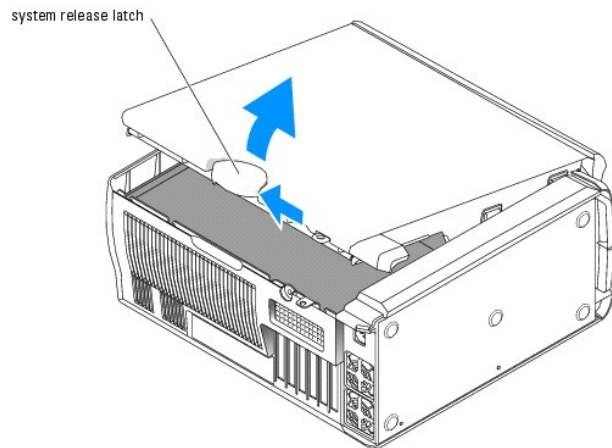
After you open and close the cover, the chassis intrusion detector, if enabled, causes the following message to appear on the screen at the next computer start-up:

ALERT! Cover was previously removed.

6. Reset the chassis intrusion detector by changing **Chassis Intrusion** to **Enabled** or **Enabled- Silent**. See your *User's Guide* for details.

🔍 NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

Figure 5-1. Opening and Closing the System



Checking the Equipment

This section provides troubleshooting procedures for external devices attached to the system, such as the monitor, keyboard, or mouse. Before you perform any of the procedures, see "[Troubleshooting External Connections](#)."

Troubleshooting External Connections

Loose or improperly connected cables are the most likely source of problems for the system, monitor, and other peripherals (such as a printer, keyboard, mouse, or other external device). Ensure that all external cables are securely attached to the external connectors on your system. See [Figure 2-2](#) for the back-panel connectors and [Figure 2-1](#) for the front-panel connectors on your system.

Troubleshooting the Video Subsystem

Problem

- 1 Monitor is not working properly.
- 1 Video memory is faulty.
- 1 Video card is faulty.

Action

1. Check the system and power connections to the monitor.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that the video card is properly installed. See "[Expansion Cards](#)" in "Installing System Components."
5. Close the system. See "[Closing the System](#)."
6. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."

If the tests run successfully, the problem is not related to video hardware. See "[Finding Software Solutions](#)."

If the tests fail, see "[Getting Help](#)."

Troubleshooting the Keyboard

Problem

- 1 System message indicates a problem with the keyboard.
- 1 Keyboard is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
2. Press each key on the keyboard, and examine the keyboard and its cable for signs of damage.
3. Swap the faulty keyboard with a working keyboard.

If the problem is resolved, replace the faulty keyboard. See "[Getting Help](#)."

If the problem is not resolved, see "[Getting Help](#)."

Troubleshooting the Mouse

Problem

- 1 System message indicates a problem with the mouse.
- 1 Mouse is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."

If the test fails, continue to the next step.

2. Examine the mouse and its cable for signs of damage.

If the mouse is not damaged, go to [step 4](#).

If the mouse is damaged, continue to the next step.

3. Swap the faulty mouse with a working mouse.

If the problem is resolved, replace the faulty mouse. See "[Getting Help](#)."

4. Enter the System Setup program and ensure that the mouse controller is enabled. See "Using the System Setup Program" in your *User's Guide*.

If the problem is not resolved, see "[Getting Help](#)."

Troubleshooting Basic I/O Functions

Problem

- 1 Error message indicates a problem with a serial or parallel port.
- 1 Device connected to a serial or parallel port is not operating properly.

Action

1. Enter the System Setup program and ensure that the serial port(s) and parallel port are enabled. See "Using the System Setup Program" in the *User's Guide*.
2. If the problem is confined to a particular application, see the application documentation for specific port configuration requirements that the program may require.
3. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."

If the tests run successfully but the problem persists, see the appropriate procedure—"[Troubleshooting a Serial I/O Device](#)" or "[Troubleshooting a Parallel Printer](#)."

Troubleshooting a Serial I/O Device

Problem

- 1 Device connected to the serial port is not operating properly.

Action

1. Turn off the system and any peripheral devices connected to the serial port.
2. Swap the serial interface cable with a working cable, and turn on the system and the serial device.

If the problem is resolved, replace the interface cable. See "[Getting Help](#)."

3. Turn off the system and the serial device, and swap the device with a comparable device.
4. Turn on the system and the serial device.

If the problem is resolved, replace the serial device. See "[Getting Help](#)."

If the problem persists, see "[Getting Help](#)."

Troubleshooting a Parallel Printer

Problem

1. Device connected to the parallel port is not operating properly.

Action

1. Turn off the system and any peripheral devices connected to the parallel port.
2. Swap the printer interface cable with a working cable, and turn on the system and the printer.

If the problem is resolved, replace the interface cable. See "[Getting Help](#)."

3. Turn off the system and the printer, and swap the printer with a comparable printer.
4. Turn on the system and the printer.

If the problem is resolved, replace the printer. See "[Getting Help](#)."

If the problem persists, see "[Getting Help](#)."

Troubleshooting a USB Device

Problem

1. System message indicates a problem with a USB device.
1. Device connected to a USB port is not operating properly.

Action

1. Enter the System Setup program, and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide*.
2. Turn off the system and any USB devices.
3. Disconnect the USB devices, and connect the malfunctioning device to the other USB connector.
4. Turn on the system and the reconnected device.

If the problem is resolved, the USB connector might be defective. See "[Getting Help](#)."

5. If possible, swap the interface cable with a working cable.

If the problem is resolved, replace the interface cable. See "[Getting Help](#)."

6. Turn off the system and the USB device, and swap the device with a comparable device.
7. Turn on the system and the USB device.

If the problem is resolved, replace the USB device. See "[Getting Help](#)."

If the problem persists, see "[Getting Help](#)."

Troubleshooting a NIC

Problem

- 1 NIC cannot communicate with network.

Action

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
2. Check the appropriate indicator on the NIC connector. See [Table 2-3](#) in "Indicators, Messages, and Codes."
 - 1 If the link indicator does not light, check all cable connections.
 - 1 If the activity indicator does not light, the network driver files might be damaged or missing.

Remove and reinstall the drivers if applicable. See the NIC's documentation.

- 1 Change the autonegotiation setting, if possible.
- 1 Use another connector on the switch or hub.

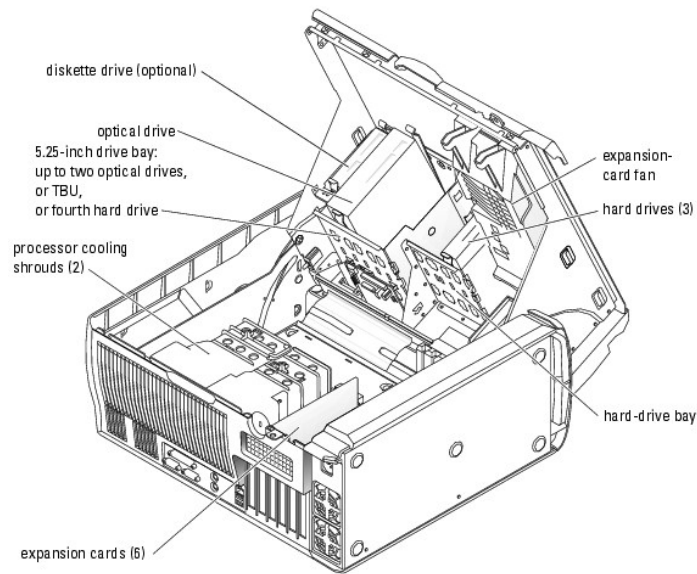
If you are using a NIC card instead of an integrated NIC, see the documentation for the NIC card.

3. Ensure that the appropriate drivers are installed and the protocols are bound. See the NIC's documentation.
4. Enter the System Setup program and confirm that the NICs are enabled. See "Using the System Setup Program" in your *User's Guide*.
5. Ensure that the NICs, hubs, and switches on the network are all set to the same data transmission speed. See the network equipment documentation.
6. Ensure that all network cables are of the proper type and do not exceed the maximum length. See "Network Cable Requirements" in your *User's Guide*.

Inside the System

In [Figure 5-2](#), the system cover is opened to provide an interior view of the system.

Figure 5-2. Inside the System



The system board can accommodate up to two processors, six expansion cards (three 64-bit, 100-MHz PCI-X, two 2.5-GHz PCI-Express, and one 32-bit, 33-MHz), and six 400-MHz DDR II SDRAM memory modules upgradable to 12 GB.

The drive bays provide space for up to four 1-inch SATA (up to two SATA drives with the integrated SATA controller and up to four SATA drives with a SATA controller card) or SCSI hard drives. The SCSI hard drives must be connected to a controller card. They also provide space for two optical drives, an optional diskette drive, and an optional tape backup unit (TBU). Power is supplied to the system board and internal peripherals through a single nonredundant power supply.

Troubleshooting a Wet System

Problem

- 1 Liquid spilled on the system.
- 1 Excessive humidity.

Action

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)."
3. Remove all expansion cards, memory modules, and processors installed in the system. See "[Removing an Expansion Card](#)," "[Removing a Memory Module](#)," and "[Removing the Processor](#)" in "Installing System Components."
4. Let the system dry thoroughly for at least 24 hours.
5. Install the video card.

If SCSI hard drives or more than two SATA hard drives are installed, install the controller card. See "[Installing an Expansion Card](#)" in "Installing System Components."

6. Close the system. See "[Closing the System](#)."
7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the system does not start properly, see "[Getting Help](#)."

8. If the system starts properly, shut down the system and reinstall all of the expansion cards that you removed. See "[Installing an Expansion Card](#)" in "Installing System Components."
9. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."


If the tests fail, see "[Getting Help](#)."

Troubleshooting a Damaged System

Problem

1. System was dropped or damaged.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.


1. Open the system. See "[Opening the System](#)."
2. Ensure that the following components are properly installed:
 1. Expansion card(s)
 1. Processors(s)
 1. Memory modules
 1. Hard drives, optical drives, and TBU
 1. Fans
 1. VRM
3. Ensure that all cables are properly connected.
4. Close the system. See "[Closing the System](#)."
5. Run the system board tests in the system diagnostics. See "[Running System Diagnostics](#)."

If the tests fail, see "[Getting Help](#)."

Troubleshooting the System Battery

Problem

1. System message indicates a problem with the battery.
1. System Setup program loses system configuration information.
1. System date and time do not remain current.


 **NOTE:** If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is caused by a defective battery.

Action

1. Re-enter the time and date through the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
2. Turn off the system and disconnect it from the electrical outlet for at least one hour.
3. Reconnect the system to the electrical outlet and turn on the system.
4. Enter the System Setup program.

If the date and time are not correct in the System Setup program, replace the battery. See "[System Battery](#)" in "Installing System Components."

If the problem is not resolved by replacing the battery, see "[Getting Help](#)."

 **NOTE:** Some software may cause the system time to speed up or slow down. If the system seems to operate normally except for the time kept in the System Setup program, the problem may be caused by software rather than by a defective battery.

Troubleshooting System Cooling Problems

Problem

- 1 System issues a fan-related or thermal failure error message.

Action

Ensure that none of the following conditions exist:


- 1 Ambient temperature is too high.
- 1 External airflow is obstructed.
- 1 Cables inside the system obstruct airflow.
- 1 Processor heat sinks are not installed properly. See "[Processor](#)" in "Installing System Components."
- 1 An individual cooling fan is not installed properly or has failed. See "[Troubleshooting Fans](#)."

Troubleshooting Fans

Problem

- 1 A fan-related error message.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Run the appropriate diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that the faulty fan's power cable is firmly attached to the system board connector. See [Figure A-3](#).
5. Close the system. See "[Closing the System](#)."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
7. If the problem is not resolved, install the appropriate new fan. See "[Installing the Processor Cooling Shrouds](#)" or "[Installing the Expansion Card Fan](#)" in "Installing System Components."


If the replacement fan does not operate, see "[Getting Help](#)."

Troubleshooting System Memory


Problem

- 1 Error message during POST.
- 1 Faulty memory module.
- 1 Faulty system board.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that the memory modules are proper installed. See "[Memory Module Installation Guidelines](#)" and "[Installing a Memory Module](#)" in "Installing System Components."
5. Remove all of the memory modules. See "[Removing a Memory Module](#)" in "Installing System Components."

 **NOTE:** Record the DIMM socket so that the memory modules can be properly reinstalled in [step 9](#).

6. Install the suspected faulty memory module in DIMM_1.
7. Close the system. See "[Closing the System](#)."
8. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If no memory errors occur during POST, repeat [step 2](#) and [step 3](#), and [step 6](#) through [step 8](#) for all the suspected faulty memory modules.

If memory errors occur, replace the faulty memory modules.

9. Reinstall the memory modules. See "[Installing a Memory Module](#)" in "Installing System Components."
10. Close the system. See "[Closing the System](#)."
11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
12. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.


If the problem persists, see "[Getting Help](#)."

Troubleshooting a Diskette Drive

Problem

- 1 Error message indicates a diskette drive problem.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Enter the System Setup program and verify that the diskette drive is configured correctly. See "Using the System Setup Program" in the *User's Guide*.
2. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
4. Open the system. See "[Opening the System](#)."
5. Ensure that the diskette drive interface cable is securely connected to the diskette drive and the system board. See [Figure A-3](#).

6. Ensure that a power cable is properly connected to the drive.
7. Close the system. See "[Closing the System](#)."
8. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
9. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.
10. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.
11. Open the system. See "[Opening the System](#)."
12. Remove all expansion cards installed in the system (except the video card). See "[Removing an Expansion Card](#)" in "Installing System Components."
13. Close the system. See "[Closing the System](#)."
14. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
15. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.

If the tests run successfully, an expansion card may be conflicting with the diskette drive logic, or an expansion card may be faulty. Continue to the next step.

If the tests fail, see "[Getting Help](#)."

16. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
17. Open the system. See "[Opening the System](#)."
18. Reinstall one of the expansion cards you removed in [step 12](#). See "[Installing an Expansion Card](#)" in "Installing System Components."
19. Close the system. See "[Closing the System](#)."
20. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
21. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.
22. Repeat [step 16](#) through [step 22](#) until all expansion cards are reinstalled or one of the expansion cards causes the tests to fail.


If the problem is not resolved, see "[Getting Help](#)."

Troubleshooting a CD Drive

Problem

1. System cannot read data from a CD drive.
1. CD drive indicator does not blink during boot.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Try using a different CD that you know works properly.
2. Enter the System Setup program and ensure that the drive's IDE controller is enabled. See "Using the System Setup Program" in the *User's Guide*.
3. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
5. Open the system. See "[Opening the System](#)."
6. Ensure that the CD interface cable is securely connected to the CD drive and to the system board. See [Figure A-3](#).
7. Ensure that a power cable is properly connected to the drive.
8. Close the system. See "[Closing the System](#)."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.


If the problem is not resolved, see "[Getting Help](#)."

Troubleshooting a SCSI Hard Drive


Problem

- 1 Device driver error.
- 1 Hard drive not recognized by the system.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

 **NOTICE:** This procedure can destroy data stored on the hard drive. Before you continue, back up all files on the hard drive.


 **NOTE:** If the hard drive is used in a RAID configuration, see "[Troubleshooting a Hard Drive in a RAID Configuration](#)."

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."

For information about testing the controller, see the SCSI or RAID controller's documentation.

If the tests fail, continue to the next step.

2. Restart the system and enter the SCSI configuration utility.

 **NOTE:** To enter the utility, press <Ctrl><a> or <Ctrl><m>, depending on the utility. See the documentation supplied with the controller for information about the configuration utility.

3. Ensure that the primary SCSI channel is enabled, and restart the system. See the SCSI controller documentation.
4. Ensure that the required device drivers are installed and configured correctly. See the *Dell OpenManage Server Assistant for PowerEdge SC Products CD*.
5. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
6. Open the system. See "[Opening the System](#)."
7. Ensure that the hard-drive interface cable is properly connected between the drive and the controller card. See the documentation supplied with the controller card.
8. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "[Configuring the Boot Drive](#)" in "Installing Drives."
9. Ensure that a power cable is properly connected to the drive.
10. Ensure that the hard drive is configured with a unique SCSI ID number and that the drive is terminated or not terminated as appropriate. See the documentation for the hard drive.
11. Close the system. See "[Closing the System](#)."
12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the problem persists, continue to the next step.

13. Format and partition the hard drive. See the operating system documentation.
14. If possible, restore the files to the drive.


If the problem persists, see "[Getting Help](#)."


Troubleshooting a SATA Hard Drive


Problem

- 1 Faulty hard drive.
- 1 Damaged or improperly connected hard-drive cables.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

 **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

 **NOTE:** If the hard drive is used in a RAID configuration, see "[Troubleshooting a Hard Drive in a RAID Configuration](#)."

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."
2. Enter the System Setup program and verify that the system is configured correctly. See "Using the System Setup Program" in your *User's Guide*.
3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
4. Open the system. See "[Opening the System](#)."
5. Ensure that the hard-drive interface cable is properly connected between the drive and the system board or controller card.

To identify system board connectors, see [Figure A-3](#).

To identify controller card connectors, see the documentation that accompanied the controller card.

6. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "[Configuring the Boot Drive](#)" in "Installing Drives."
7. Ensure that the power cable is properly connected to the drive.
8. Close the system. See "[Closing the System](#)."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
10. Format and partition the hard drive. See the operating system documentation.
11. If possible, restore the files to the drive.


If the problem persists, see "[Getting Help](#)."


Troubleshooting a Hard Drive in a RAID Configuration

Problem

- 1 Device driver error.
- 1 Damaged or improperly connected hard-drive cables.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

 **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."
2. Restart your system and enter the RAID configuration utility. See the RAID controller documentation.
3. Ensure that the required device drivers are installed and are configured correctly. See the *Dell OpenManage Server Assistant for PowerEdge SC Products CD* and the RAID controller's documentation.
4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
5. Open the system. See "[Opening the System](#)."

6. Ensure that the hard-drive interface cable is properly connected to the drive and to the system board or RAID controller card.

To identify system board connectors, see [Figure A-3](#).

To identify controller card connectors, see the documentation that accompanied the controller card.


7. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "[Configuring the Boot Drive](#)" in "Installing Drives."
8. Ensure that the power cable is properly connected to the drive.
9. Close the system. See "[Closing the System](#)."
10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the problem persists, continue to the next step.

11. Format and partition the hard drive. See the operating system documentation.
12. If possible, restore the files to the drive.

If the problem persists, see "[Getting Help](#)."


Troubleshooting a RAID Controller Card

 **NOTE:** When troubleshooting a RAID controller card, also see the documentation for your operating system and the RAID controller.

Problem

1. Error message indicates a RAID controller problem.
1. RAID controller performs incorrectly or not at all.


Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that the controller card is firmly seated in its connector. See "[Installing a SATA or SCSI Controller Card](#)" in "Installing System Components."
5. Ensure that the appropriate cables are firmly connected to their corresponding connectors on the controller card.
6. Close the system. See "[Closing the System](#)."
7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the problem persists, see the RAID controller's documentation for more information on troubleshooting.

Troubleshooting Expansion Cards


 **NOTE:** When troubleshooting an expansion card, see the documentation for your operating system and the expansion card.

Problem

1. Error message indicates a problem with an expansion card.

- 1 Expansion card performs incorrectly or not at all.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that each expansion card is firmly seated in its connector. See "[Installing an Expansion Card](#)" in "Installing System Components."
5. Close the system. See "[Closing the System](#)."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the problem persists, go to the next step.

7. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
8. Open the system. See "[Opening the System](#)."
9. Remove all expansion cards installed in the system (except the video card). See "[Removing an Expansion Card](#)" in "Installing System Components."
10. Close the system. See "[Closing the System](#)."
11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
12. Run the appropriate online diagnostic test.

If the tests fail, see "[Getting Help](#)."

13. For each expansion card you removed in [step 9](#), perform the following steps:
 - a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
 - b. Open the system. See "[Opening the System](#)."
 - c. Reinstall one of the expansion cards.
 - d. Close the system. See "[Closing the System](#)."
 - e. Run the appropriate diagnostic test.


If the tests fail, see "[Getting Help](#)."

Troubleshooting the Processors

Problem

- 1 Error message indicates a processor problem.
- 1 A heat sink is not installed for each processor.

Action

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Run the appropriate online diagnostics test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)."
4. Ensure that each processor and heat sink are properly installed. See "[Installing a Processor](#)" in "Installing System Components."

5. Ensure that the VRM is properly installed for processor 1. See "[Installing the VRM](#)" in "Installing System Components."
6. Close the system. See "[Closing the System](#)."
7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
8. Run the appropriate online diagnostic test.

If the tests fail or the problem persists, continue to the next step.

If only one processor is installed, see "[Getting Help](#)."

9. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
10. Open the system. See "[Opening the System](#)."
11. Remove processor 1 and the VRM. See "[Removing the Processor](#)" and "[Removing the VRM](#)" in "Installing System Components."

To locate the processors and VRM, see [Figure A-3](#).

12. Close the system. See "[Closing the System](#)."
13. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
14. Run the appropriate online diagnostic test.

If the tests complete successfully, go to [step 20](#).

15. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
16. Open the system. See "[Opening the System](#)."
17. Replace processor 0 with another processor of the same capacity. See "[Installing a Processor](#)" in "Installing System Components."
18. Close the system. See "[Closing the System](#)."
19. Run the appropriate online diagnostic test.

If the tests complete successfully, replace processor 0. See "[Getting Help](#)."

If the tests fail, see "[Getting Help](#)."

20. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
21. Open the system. See "[Opening the System](#)."
22. Reinstall processor 1 and the VRM that you removed in [step 11](#). See "[Installing a Processor](#)" and "[Installing the VRM](#)" in "Installing System Components."
23. Close the system. See "[Closing the System](#)."
24. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

If the problem persists, see "[Getting Help](#)."

Installing System Components

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Processor Cooling Shrouds](#)
- [Processor Cooling Shroud Blank](#)
- [Expansion Card Fan](#)
- [Expansion Cards](#)
- [System Memory](#)
- [Processor](#)
- [System Battery](#)

This section describes how to install the following system components:


- 1 Processor cooling shrouds
 - 1 Processor cooling shroud blank
 - 1 Expansion card fan
 - 1 Expansion cards
 - 1 System memory
 - 1 Processors
 - 1 System battery
-


Processor Cooling Shrouds

Your system contains up to two processor cooling shrouds with fans to direct air flow over the processor(s). If your system contains two processor cooling shrouds, you must remove the cooling shroud for CPU_1 before you can remove the cooling shroud for CPU_0.


If only one processor is installed (CPU_0), a fan blank must be installed in place of the CPU_1 fan to maintain proper cooling.

Removing the Processor Cooling Shrouds

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

 **NOTICE:** To avoid damaging the fan power cables, do not remove the shroud too quickly.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."

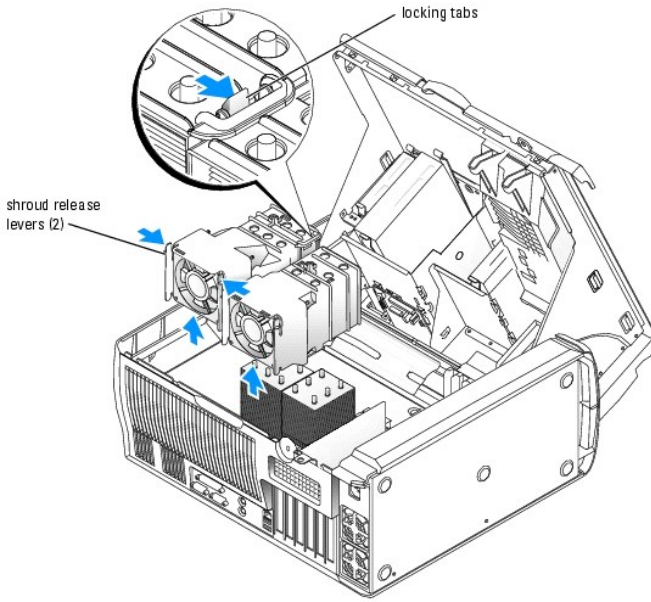
 **NOTE:** If there are two processor cooling shrouds installed, you must remove the CPU_1 cooling shroud first.

3. If two processor cooling shrouds are installed, disconnect the fan's power cable for CPU_1 from the system board. See [Figure A-3](#).

If only one processor cooling shroud is installed, disconnect the fan's power cable for CPU_0 from the system board. Proceed to [step 5](#).

4. Press the cooling shroud's locking tab and lift the CPU_1 cooling shroud up slightly. See [Figure 6-1](#).
5. While squeezing the two shroud release levers that secure the cooling shroud to the back of the chassis, lift the shroud up and out of the chassis. See [Figure 6-1](#).

Figure 6-1. Removing and Installing the Processor Cooling Shrouds



Installing the Processor Cooling Shrouds

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

NOTE: When two processor cooling shrouds are installed, the cooling shroud for CPU_0 must be installed first.

1. Connect the fan's power cable for CPU_0 to the system board. See [Figure A-3](#).
2. Align the processor cooling shroud with the securing slots on the back of the chassis. See [Figure 6-1](#).
3. Slide the cooling shroud down until the cooling shroud snaps into place.
4. If two processor cooling shrouds are installed, repeat [step 1](#) and [step 3](#) for the CPU_1 cooling shroud. Ensure that the two cooling shrouds are secured by the locking tab.
5. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Processor Cooling Shroud Blank

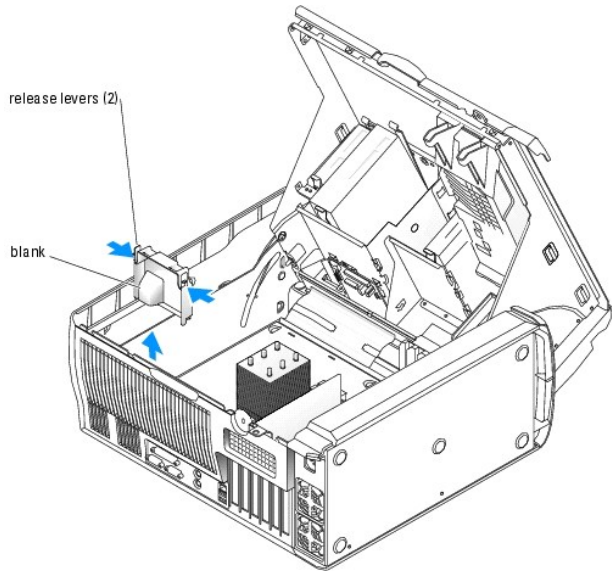
The processor cooling shroud blank is used when only one processor is installed. The blank must be installed in place of the CPU_1 cooling shroud to maintain proper cooling.

Removing the Processor Cooling Shroud Blank

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. While squeezing the two release levers on the processor cooling shroud blank, slide the blank up and out of the system. See [Figure 6-2](#).

Figure 6-2. Removing and Installing the Processor Cooling Shroud Blank



Installing the Processor Cooling Shroud Blank

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Align the processor cooling shroud blank with the securing slots on the back of the chassis. See [Figure 6-2](#).
4. Slide the blank down until it snaps into place.
5. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Expansion Card Fan

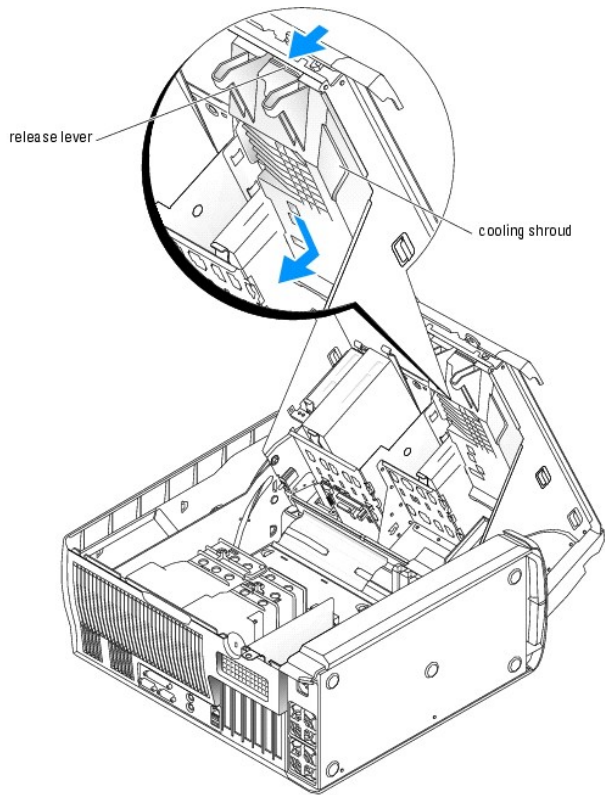
The expansion card fan is part of the expansion card cooling shroud. The fan and shroud are replaced as a unit.

Removing the Expansion Card Fan

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Disconnect the fan's power cable from the system board. See [Figure A-3](#).
4. While pressing on the expansion card cooling shroud release lever, slide the cooling shroud forward toward the front of the system. See [Figure 6-3](#).
5. Remove the cooling shroud from the system.

Figure 6-3. Removing and Installing the Expansion Card Cooling Shroud



Installing the Expansion Card Fan

1. Align the eight securing tabs of the cooling shroud with the holes in the system cover.
2. Lower the cooling shroud into the holes in the cover and slide the cooling shroud backward toward the back of the system until the cooling shroud snaps into place. See [Figure 6-3](#).
3. Connect the fan's power cable to the system board. See [Figure A-3](#).
4. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
5. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Expansion Cards

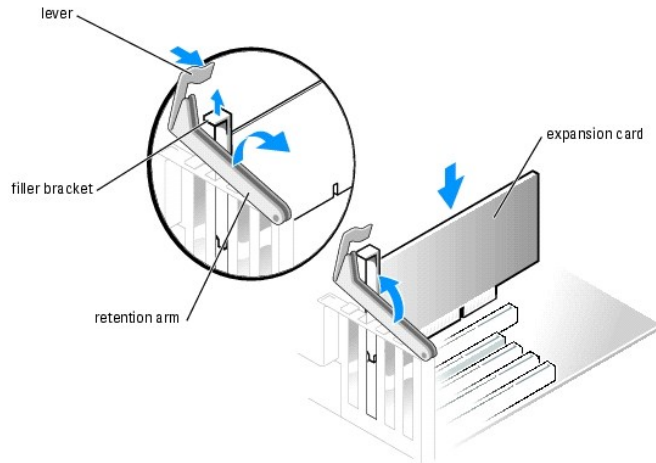
The system supports up to six half-length PCI expansion cards (three 64-bit, 100-MHz PCI-X, two 2.5-GHz PCI Express, and one 32-bit, 33-MHz). See [Figure A-3](#) for the location of the expansion card slots.

Installing an Expansion Card

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Press the lever on the card retention arm and raise the retention arm. See [Figure 6-4](#).

Figure 6-4. Installing an Expansion Card



4. If you are installing a new card, remove the filler bracket.

NOTE: Keep this bracket in case you need to remove the expansion card. Filler brackets must be installed over empty expansion-card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

5. Prepare the card for installation.

See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your system.

NOTE: Some NICs automatically start the system when they are connected to a network.

6. Place the card-edge connector in the expansion-card connector and press down firmly. Ensure that the card is fully seated in the slot.
7. Lower the retention arm, ensuring that:
 - a. The tops of all cards and filler brackets are flush with the alignment bar.
 - b. The notch in the top of the card or filler bracket fits around the alignment guide.
8. Press the retention arm into place, securing the card(s) in the system.

NOTE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the system cover from closing properly or cause damage to the equipment.

9. Connect any cables that should be attached to the card.

See the documentation for the card for information about the card's cable connections.

10. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
12. Install any device drivers required for the card as described in the documentation for the card.

Removing an Expansion Card

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Press the lever on the retention arm and raise the retention arm. See [Figure 6-4](#).
4. If necessary, disconnect any cables from the card.
5. Grasp the card by its top corners, and ease it out of its connector.

6. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

NOTE: Filler brackets must be installed over empty expansion card slots to maintain FCC certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

7. Lower the retention arm and press it into place, securing the remaining card(s) in the system. See [Figure 6-4](#).
8. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
10. Remove the card's device driver from the operating system.

System Memory

See [Figure A-3](#) for the location of the six memory module connectors. The six memory module connectors on the system board can accommodate from 256 MB to 12 GB of 400-MHz registered ECC DDR II memory modules.

Memory Module Upgrade Kits

The system is upgradable to 12 GB by installing combinations of 256-MB, 512-MB, 1-GB, or 2-GB 400-MHz registered ECC DDR II memory modules. You can purchase memory upgrade kits from Dell.

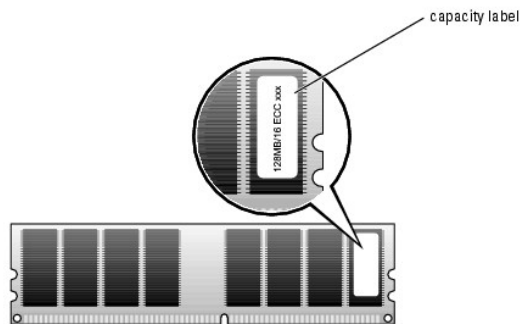
Memory Module Installation Guidelines

1. If only one memory module is installed, it must be installed in connector DIMM_1.
1. If only one memory module is installed in connector DIMM_1, its capacity must be 256 MB.
1. If more than one memory module is installed, the memory modules should be installed in *pairs of matched memory size, speed, and technology*. See [Figure 6-5](#) to determine the module's capacity. Memory modules marked with a 1R are single ranked and ones marked with a 2R are dual ranked.
1. Memory modules should be installed in order, connectors DIMM_1 and DIMM_2, DIMM_3 and DIMM_4, and then DIMM_5 and DIMM_6.
1. Dual-ranked memory modules should be installed first regardless of capacity.

NOTE: Dual-ranked memory modules with less capacity take precedence over single-ranked memory modules with greater capacity.

1. Install memory modules with the largest capacity in connector DIMM_1 and the least capacity in connector DIMM_6.
1. Dual-ranked memory modules are not supported in DIMM_5 and DIMM_6.
1. If you have installed dual-ranked memory modules in DIMM_1, DIMM_2, DIMM_3, and DIMM_4, you cannot install memory modules in DIMM_5 and DIMM_6.

Figure 6-5. Determining the Memory Module's Capacity and Rank



NOTE: If you remove your original memory modules from the system during a memory upgrade, keep them separate from any new memory modules that you may have, even if you purchased the new memory modules from Dell. Use only registered ECC DDR II memory modules.

[Table 6-1](#) illustrates sample memory configurations. The configurations shown do not indicate dual-ranked memory modules. See "[Memory Module Installation Guidelines](#)" for detailed information.

Table 6-1. Sample Memory Configurations

Total Memory	DIMM_1	DIMM_2	DIMM_3	DIMM_4	DIMM_5	DIMM_6
256 MB	256 MB	none	none	none	none	none
512 MB	256 MB	256 MB	none	none	none	none
1 GB	256 MB	256 MB	256 MB	256 MB	none	none
1 GB	512 MB	512 MB	none	none	none	none
2 GB	512 MB	512 MB	512 MB	512 MB	none	none
2 GB	1 GB	1 GB	none	none	none	none
4 GB	1 GB	1 GB	1 GB	1 GB	none	none
4 GB	1 GB	1 GB	512 MB	512 MB	512 MB	512 MB
6 GB	2 GB	2 GB	1 GB	1 GB	none	none
6 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
8 GB	2 GB	2 GB	2 GB	2 GB	none	none
8 GB	2 GB	2 GB	1 GB	1 GB	1 GB	1 GB
12 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB

Addressing Memory With 4-GB Configurations (Microsoft® Windows® Only)

Your system supports a maximum of 4 GB of memory using four 1-GB memory modules. Current operating systems can use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is slightly less than 4 GB. Certain components within the system require address space in the 4-GB range. Any address space reserved for these components cannot be used by system memory.

The following components require address space:

- 1 System ROM
- 1 Advanced Programmable Interrupt Controllers (APIC)
- 1 Integrated PCI devices (such as NICs) and SCSI controllers
- 1 PCI expansion cards

At start-up, the BIOS identifies the components that require address space. The BIOS dynamically calculates the amount of reserved address space required. The BIOS then subtracts the reserved address space from 4 GB to determine the amount of usable space.

- 1 If the total installed system memory is less than the usable space, all installed system memory is available for use only by the operating system.
- 1 If the total installed system memory is equal to or greater than the usable address space, a small portion of installed memory is available for use by the operating system.

Installing a Memory Module

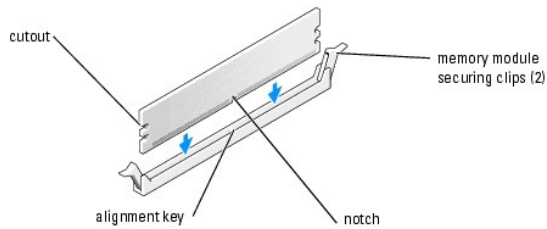
CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Press on the securing clip at each end of the memory module connector. See [Figure 6-6](#).
4. Align the memory module's edge connector with the alignment key in the connector.

The memory module connector has an alignment key that allows the memory module to be installed in the connector in only one way.

5. Insert the module into the connector, and carefully press each end of the module into place.

Figure 6-6. Installing a Memory Module



6. Pull up on the securing clips to lock the module into place.

If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.

When the memory module is properly seated in the connector, the securing clips on the memory module socket should align with the securing clips on the other connectors with memory modules installed.

7. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
8. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

The system detects that the new memory does not match the existing configuration information and generates the following message:

The amount of system memory has changed.
Strike the F1 key to continue, F2 to run the setup utility

9. Press <F2> to enter the System Setup program and check the value for **Memory Info**. See your *User's Guide* for detailed information.

The system should have changed the value for **Memory Info** to reflect the newly installed memory. Verify the new value. If it is correct, skip to [step 13](#).

10. If the memory value is incorrect, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
11. Open the system.
12. Ensure that the installed memory modules are seated properly in their connectors, and repeat [step 6](#) through [step 9](#).
13. When the **Memory Info** value is correct, press <Esc> to exit the System Setup program.
14. Run the system diagnostics to verify that the memory modules are operating properly.

Removing a Memory Module


⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Press out on the securing clip at each end of the memory module connector. See [Figure 6-6](#).
4. Grasp the memory module and pull it out of the connector.

If the module is difficult to remove, gently move the module back and forth to remove it from the connector.


Processor


To take advantage of future options in speed and functionality, you can upgrade to a second processor or replace either the primary or secondary processor.

 **NOTE:** If two processors are installed, they must be identical (speed, type, and cache).

Each processor and its associated cache memory are contained in a PGA package that is installed in a ZIF socket on the system board.


Removing the Processor

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

 **CAUTION:** The processor and heat sink can get very hot during normal operation. Ensure that they have had sufficient time to cool before you touch them.

 **NOTE:** If two processors are installed, CPU_0 must be removed before removing CPU_1.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Remove the processor cooling shroud(s). See "[Removing the Processor Cooling Shrouds](#)."
4. Remove the processor heat sink.

 **NOTE:** If you are removing the CPU_1 heat sink, remove the VRM before removing the heat sink. See "[Removing the VRM](#)."

- a. Remove the two retention module clips by squeezing the tabs on the clip and lifting the retention module clip up. See [Figure 6-7](#).
- b. On the retention module base, pull the tab away from the heat sink and rotate the heat sink away from the processor as shown in [Figure 6-8](#).

Figure 6-7. Removing the Retention Module Clip

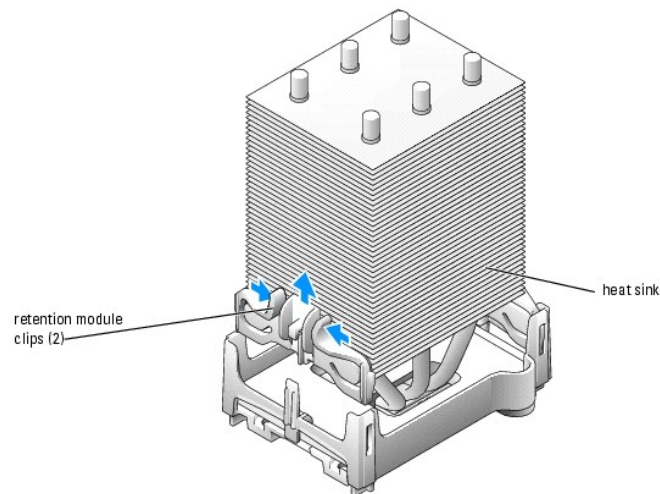
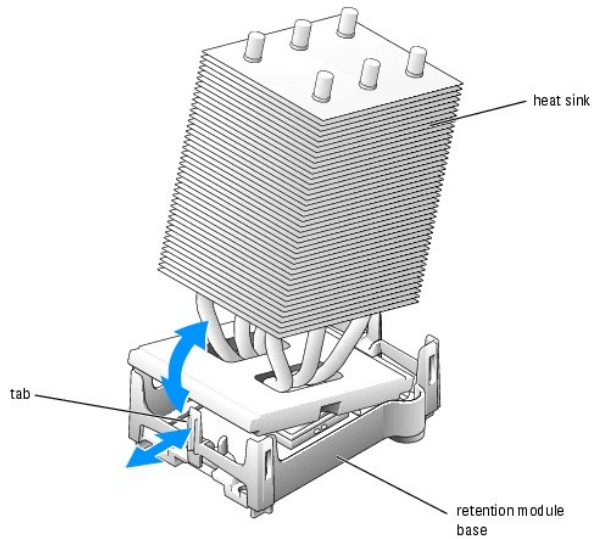
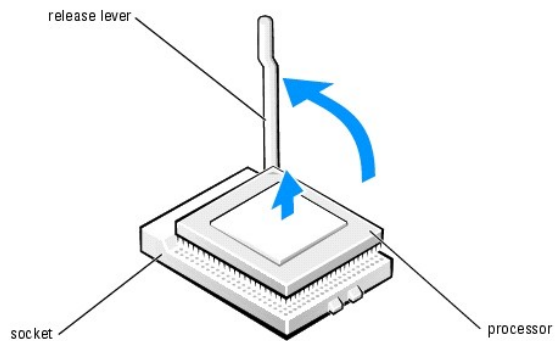


Figure 6-8. Removing and Installing the Heat Sink



5. Pull the processor socket release lever straight up until the processor is released. See [Figure 6-9](#).

Figure 6-9. Removing the Processor



- ➡ **NOTICE:** Be careful not to bend any of the pins when you remove the processor from the socket. Bending the pins can permanently damage the processor.

6. Remove the processor from the socket.

If you are replacing the processor, leave the release lever in the release position so that the socket is ready for the new processor and go to "[Installing a Processor](#)."

7. If you are permanently removing the processor, rotate the release lever back toward the system board until it snaps into place.

While squeezing the tabs on retention module clip, lower the clip into the retention module base until it snaps into place. See [Figure 6-7](#). Repeat this step for the second retention module clip.

8. Install the CPU_1 cooling shroud blank. See "[Installing the Processor Cooling Shroud Blank](#)."
9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Installing a Processor

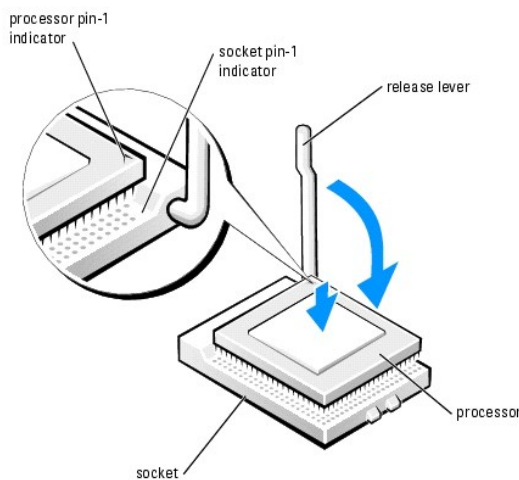
CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. If the processor release lever is not in the release position, move it to that position.
4. Align pin 1 (the imprinted corner) of the processor and pin 1 of the socket.

NOTICE: Processor pins are delicate. To avoid damage, ensure that the processor aligns properly with the socket, and do not use excessive force when you install the processor.

5. Carefully set the processor in the socket and press it down lightly to seat it. See [Figure 6-10](#).
6. Rotate the release lever back toward the system board until it snaps into place, securing the processor.

Figure 6-10. Installing the Processor



7. Remove the thermal grease protective cover from the heat sink.
8. Place one end of the heat sink under the retention module base tab, and lower the heat sink onto the processor until the heat sink snaps securely in the retention module base. See [Figure 6-8](#).
9. While squeezing the tabs on retention module clip, lower the clip into the retention module base until it snaps into place. See [Figure 6-7](#).

Repeat this step for the second retention module clip.

10. If you are adding a second processor, remove the processor cooling shroud blank and install the VRM. See "[Removing the Processor Cooling Shroud Blank](#)" and "[Installing the VRM](#)."

If you are replacing a processor, replace the processor cooling shroud. See "[Installing the Processor Cooling Shrouds](#)."

11. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Removing the VRM

CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

NOTICE: Remove the VRM before you remove the CPU_1 processor.

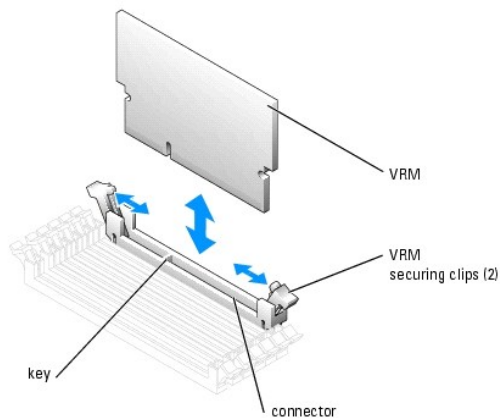
1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Remove the CPU_1 processor cooling shroud. See "[Removing the Processor Cooling Shrouds](#)."
4. Press out on the securing clip at each end of the VRM connector. See [Figure 6-11](#).
5. Grasp the VRM and pull it out of the connector.
6. If dual processors are installed, install the new VRM. See "[Installing the VRM](#)."

If the system is operating in a single processor mode, continue to the next step.

7. Install a processor cooling shroud blank. See "[Installing the Processor Cooling Shroud Blank](#)."
8. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Figure 6-11. Removing and Installing the VRM



Installing the VRM

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

➡ NOTICE: A VRM must be installed to operate the system with two processors. See [Figure A-3](#) for the location of the VRM connector.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Remove the processor cooling shroud blank or processor cooling shroud. See "[Removing the Processor Cooling Shrouds](#)" or "[Removing the Processor Cooling Shroud Blank](#)."
4. Align the VRM's edge connector with the alignment key in the connector. See [Figure 6-11](#).

The VRM connector has an alignment key that allows the VRM to be installed in the connector in only one way.

5. Insert the VRM into the connector, and carefully press each end of the VRM into place.
6. Pull up on the securing clips to lock the VRM into place.

If you insert the VRM correctly, the securing clips snap into the cutouts at each end of the VRM.

7. Install the processor cooling shrouds. See "[Installing the Processor Cooling Shrouds](#)."
8. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

System Battery

A coin-cell battery maintains system configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

The battery may need replacing if you have repeatedly reset the time and date information after turning on the system or if one of the following messages appear:

Time-of-day not set - please run SETUP program

or

Invalid configuration information -
please run SETUP program

To determine whether you need to replace the battery, see "[Troubleshooting the System Battery](#)" in "Troubleshooting Your System."

You can operate your system without a battery; however, without a battery, the configuration information is erased if the system is turned off or unplugged from the electrical outlet. In this case, you must enter the System Setup program and reset the configuration options.

⚠ CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Replacing the Battery

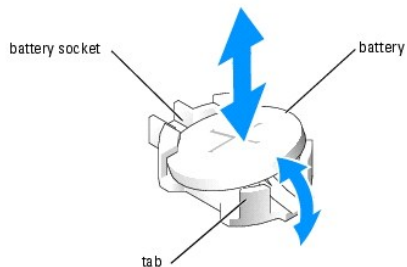
⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens. See "Using the System Setup Program" in the *User's Guide*.
2. Open the system. See "[Opening the System](#)" in Troubleshooting Your System."
3. Locate the battery on the system board. See [Figure A-3](#) for the battery location.

➡ NOTICE: If you use a blunt, nonconductive object to depress the tab next to the battery, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the tab before you attempt to depress the tab. Do not pry out the battery. You may damage the system board by prying off the socket or by breaking circuit traces on the system board.

4. Remove the battery by pressing on the tab. See [Figure 6-12](#).

Figure 6-12. Replacing the Battery



5. Install the new battery with the side labeled "+" facing up, and press down until it snaps into place.
6. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
8. Enter the System Setup program to confirm that the battery operates properly.
9. From the main screen, select **System Time** to enter the correct time and date.

Also, re-enter any system configuration information that is no longer displayed on the System Setup screens, and then exit the System Setup program.

10. To test the newly installed battery, turn off the system and disconnect it from electrical power for at least an hour.
11. After an hour, reconnect the system to a power source and turn it on.
12. Enter the System Setup program. If the time and date are still incorrect, see "[Getting Help](#)."
13. Properly dispose of the old battery. For more information, see your *System Information Guide*.

[Back to Contents Page](#)

[Back to Contents Page](#)

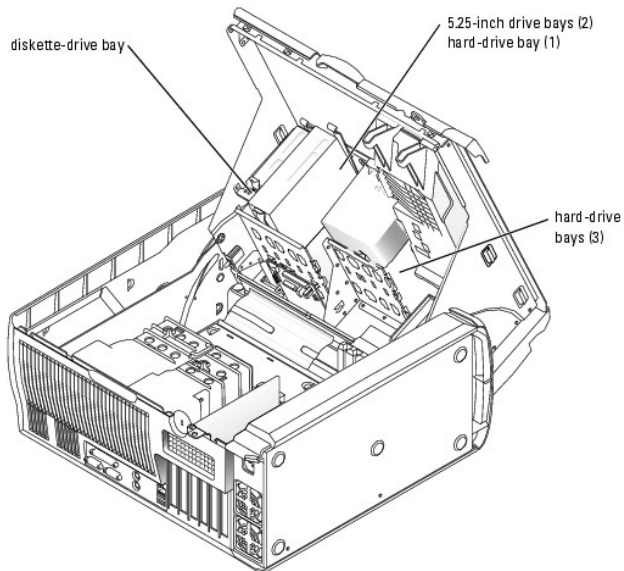
Installing Drives

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [General Installation Guidelines](#)
- [Front-Panel Inserts](#)
- [Hard Drives](#)
- [Installing a SATA or SCSI Controller Card](#)
- [Diskette Drive \(Optional\)](#)
- [5.25-Inch Optical and Tape Drives](#)

The drive bays in your system provide space for up to four SATA or SCSI hard drives, two 5.25-inch optical drives, and an optional diskette drive. See [Figure 7-1](#).

Figure 7-1. Drive Locations Inside the System



General Installation Guidelines

IDE Drive Installation Guidelines


When you connect two IDE devices to a single IDE interface cable and configure them for the Cable Select setting, the device attached to the last connector on the interface cable is the primary (master) or boot device (drive 0), and the device attached to the middle connector on the interface cable is the secondary (slave) device (drive 1). See the drive documentation in your upgrade kit for information on configuring drives for the Cable Select setting.

Because Cable Select is the default setting, you do not need to set any additional drives as a primary or secondary drive.

SCSI Installation Guidelines

Although SCSI drives are installed in essentially the same way as other drives, their configuration requirements are different. To install and configure a SCSI

drive, follow the guidelines in the following subsections.

 **NOTE:** SCSI devices installed by Dell are configured correctly during the manufacturing process. You do not need to set the SCSI ID for these drives.

SCSI Interface Cables

SCSI interface connectors are keyed for correct insertion. Keying ensures that the pin-1 wire in the cable connects to pin 1 in the connectors on both ends. When you disconnect an interface cable, take care to grasp the cable connector, rather than the cable itself, to avoid stress on the cable.

SCSI ID Numbers

Each drive attached to a SCSI controller must have a unique SCSI ID number from 0 to 15.

- 1 The SCSI hard drive from which the system boots is configured as SCSI ID 0.
- 1 If you install an additional SCSI drive or change your SCSI configuration, see the documentation for each SCSI drive for information on setting the appropriate SCSI ID number.

 **NOTE:** There is no requirement that SCSI ID numbers be assigned sequentially or that drives be attached to the interface cable in order by ID number.

SCSI Device Termination

SCSI logic requires that termination be enabled for the two drives at opposite ends of the SCSI chain and disabled for all drives in between. For internal SCSI drives, termination is configured automatically. See the documentation provided with any optional SCSI drive you purchase for information on disabling termination.

Configuring the Boot Drive

The drive or device from which the system boots is determined by the boot order specified in the System Setup program. See "Using the System Setup Program" in your *User's Guide*. To boot the system from a hard drive or drive array, the drive(s) must be connected to the appropriate controller:

- 1 To boot from a SCSI hard drive, the drive must be connected to the optional SCSI controller card. See the documentation that accompanied the controller card.


After you open and close the cover, the chassis intrusion detector, if enabled, causes the following message to appear on the screen at the next computer start-up:

ALERT! Cover was previously removed.

- 1 Reset the chassis intrusion detector by changing **Chassis Intrusion** to **Enabled** or **Enabled-Silent**.

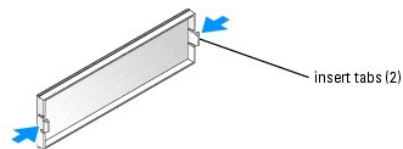
Front-Panel Inserts

If you are installing a new 5.25-inch drive, remove the front-panel inserts to allow external access to the drive. To gain access to the front-panel insert, you might need to remove a device.

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. If applicable, remove a device. See the appropriate removal procedure.
4. Squeeze the insert tabs until the insert pops free of the front-panel cover. See [Figure 7-2](#).

Figure 7-2. Removing Front-Panel Inserts



Hard Drives

Your system contains up to four SATA or SCSI non-hot-plug hard drives. The integrated SATA controller supports two SATA hard drives. If more than two SATA drives are installed, they must be connected to an optional SATA controller card. If your system contains SCSI hard drives, they must be connected to an optional SCSI controller card.

The fourth hard drive is installed in the 5.25-inch drive bay (see [Figure 7-1](#)) using an adapter. After installing the drive and adapter, the removing and installing procedures are the same as the other hard drives.

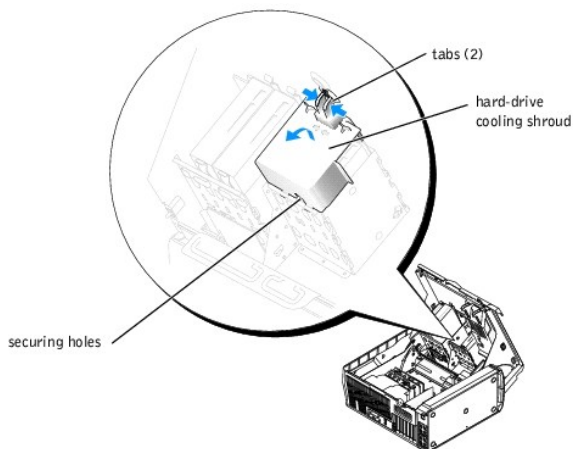
The basic steps for removing and installing SATA and SCSI hard drives are the same.

Removing a Hard Drive

⚠ CAUTION: Only trained service technicians are authorized to open the system and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. On the hard-drive cooling shroud, squeeze the two tabs that secure the shroud to the cover and rotate the shroud away from the cover. See [Figure 7-4](#).
4. Remove the hard-drive cooling shroud from the system.

Figure 7-3. Removing or Installing the Hard-Drive Cooling Shroud



5. Disconnect the power and interface cables from the hard drive. See [Figure 7-4](#) and [Figure 7-5](#).
6. Press in on the tabs on each side of the drive and slide the drive up and out of the drive bay.

NOTICE: When replacing the hard-drive cooling shroud, ensure that the cables are properly routed to prevent damaging the cables.

7. Insert the tabs of the hard-drive cooling shroud into the securing holes in the hard-drive bay. See [Figure 7-3](#).
8. While rotating the shroud up, squeeze the two tabs and secure the shroud to the cover.
9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

Figure 7-4. Removing or Installing a SCSI Hard Drive

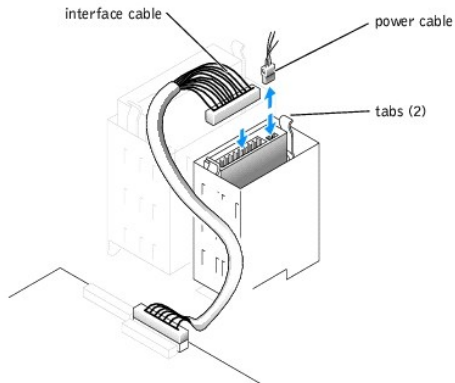
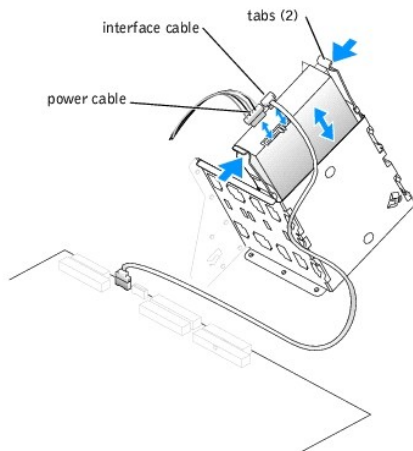


Figure 7-5. Removing or Installing a SATA Hard Drive



Installing a Hard Drive

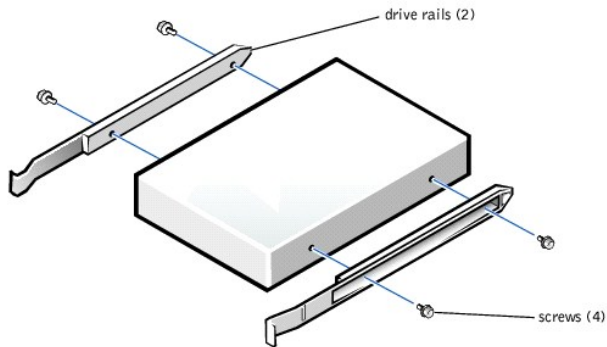
CAUTION: Only trained service technicians are authorized to open the system and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Unpack the hard drive, and prepare it for installation.
4. Check the documentation for the drive to verify that it is configured for your system.
5. If the hard drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See [Figure 7-6](#).

If you are installing a fourth hard drive in the 5.25-inch drive bay, proceed to [step 6](#).

If you are installing a drive in the hard-drive bay, proceed to [step 10](#).

Figure 7-6. Installing Drive Rails



6. Attach the adapter rails to the adapter by aligning the screw holes on the adapter with the screw holes on the rails and then inserting and tightening all four screws (two on each rail). See [Figure 7-7](#).
7. Slide the adapter into the 5.25-inch drive bay until the tabs on the rails securely click into position. See [Figure 7-8](#).

Figure 7-7. Installing the Adapter Rails

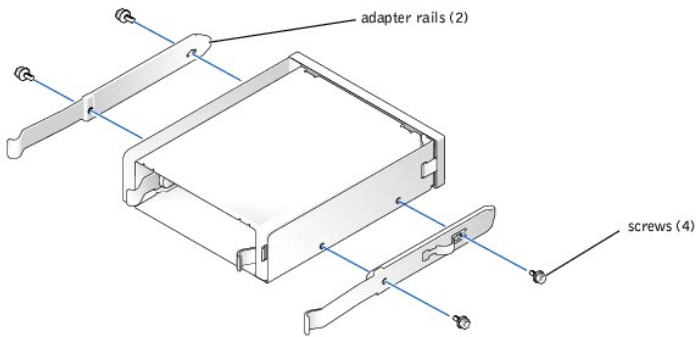
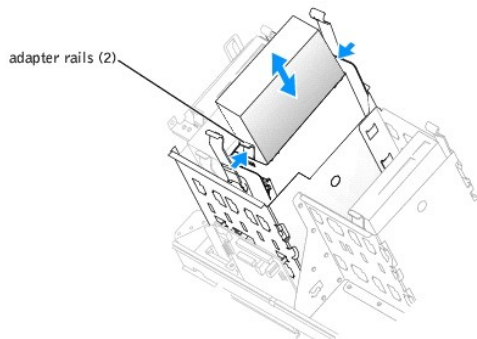



Figure 7-8. Installing the Adapter



8. On the hard-drive cooling shroud, squeeze the two tabs that secure the shroud to the cover and rotate the shroud away from the cover. See [Figure 7-3](#).
9. Remove the hard-drive cooling shroud from the system.
10. Slide the new drive into the drive bay or the adapter until the tabs on the rails securely click into position.

11. Connect the power cable to the drive. See [Figure 7-4](#) and [Figure 7-5](#).
12. Connect the interface cable to the drive:
 1. Connect SATA hard drives to the SATA0 and SATA1 connectors on the system board or to the SATA controller card if more than two SATA hard drives are installed. See the documentation for the controller card.
 1. Connect SCSI hard drives to the SCSI controller card. See the documentation for the controller card.

See [Figure A-3](#) for the location of the drive interface connectors on the system board.

 **NOTICE:** When replacing the hard-drive cooling shroud, ensure that the cables are properly routed to prevent damaging the cables.

13. Insert the tabs of the hard-drive cooling shroud into the securing holes in the hard-drive bay. See [Figure 7-3](#).
14. While rotating the shroud up, squeeze the two tabs and secure the shroud to the cover.
15. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
16. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
17. Enter the System Setup program and ensure that the drive's controller is enabled. See "Using the System Setup Program" in the *User's Guide*.
18. Partition and logically format your drive before you go to the next step.

See the documentation for your operating system for instructions.

19. Test the hard drive by running the system diagnostics. See "[Running System Diagnostics](#)."
20. If the drive you just installed is the primary drive, install your operating system on the hard drive.


Installing a SATA or SCSI Controller Card

See "[Installing an Expansion Card](#)" in "Installing System Components" for instructions about installing the card and routing the cables.

Diskette Drive (Optional)


The system supports an optional standard diskette drive.

Removing the Diskette Drive

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Disconnect the power and interface cables from the diskette drive. See [Figure 7-9](#).
4. Press in on the tabs on each side of the drive and slide the drive up and out of the drive bay.
5. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

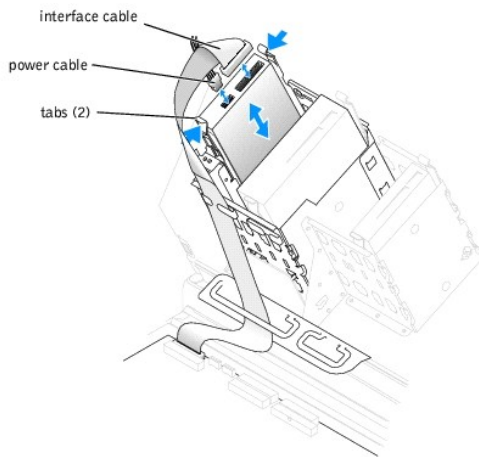
Installing an Optional Diskette Drive

 **CAUTION:** Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Unpack the replacement diskette drive, and prepare it for installation.
4. Check the documentation for the drive to verify that it is configured for your system.
5. If your new diskette drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See [Figure 7-6](#).
6. Slide the drive into the diskette-drive bay until the tabs on the rails securely click into position.
7. Connect the power cable to the drive. See [Figure 7-9](#).

Figure 7-9. Removing or Installing an Optional Diskette Drive



8. Connect the interface cable to the drive. See [Figure 7-9](#).

See [Figure A-3](#) for the location of the diskette-drive interface connector on the system board.

9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
11. Enter the System Setup program and ensure that the drive's controller is enabled. See "Using the System Setup Program" in the *User's Guide*.
12. Test the drive by running the system diagnostics. See "[Running System Diagnostics](#)."

5.25-Inch Optical and Tape Drives

You can install an additional 5.25-inch drive of your choice in the second 5.25-inch drive bay. See [Figure 7-1](#). If you are installing a tape backup unit (TBU), it must be installed in the second bay.

Installing a 5.25-Inch Drive

⚠ CAUTION: Only trained service technicians are authorized to open the system cover and access any of the components inside the system. See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

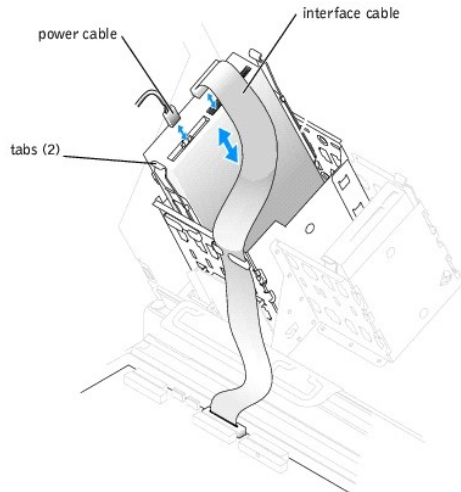
1. Unpack the drive and prepare the drive for installation.

For instructions, see the documentation that accompanied the drive. Also, see "[IDE Drive Installation Guidelines](#)" for information on configuring the drive.

2. If the drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See [Figure 7-6](#).
3. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
4. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."

5. Remove the front-panel insert for the empty drive bay. See "[Front-Panel Inserts](#)."
6. Slide the drive into the drive bay until the tabs on the rails securely click into position.
7. Connect the power cable to the drive. See [Figure 7-10](#).

Figure 7-10. Installing a 5.25-Inch Drive



8. Connect the interface cable from the drive to the IDE2 connector on the system board. See [Figure 7-10](#) and [Figure A-3](#).
9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
11. Enter the System Setup program and ensure that the drive's IDE controller is enabled. See "Using the System Setup Program" in the *User's Guide*.
12. Test the drive by running the system diagnostics. See "[Running System Diagnostics](#)."

[Back to Contents Page](#)

Getting Help

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide

- [Technical Assistance](#)
 - [Dell Enterprise Training and Certification](#)
 - [Problems With Your Order](#)
 - [Product Information](#)
 - [Returning Items for Warranty Repair or Credit](#)
 - [Before You Call](#)
 - [Contacting Dell](#)
-

Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the procedures in "Troubleshooting Your System."
2. Run the system diagnostics and record any information provided.
3. Make a copy of the [Diagnostics Checklist](#), and fill it out.
4. Use Dell's extensive suite of online services available at Dell Support at support.dell.com for help with installation and troubleshooting procedures.

For more information, see "Online Services."

5. If the preceding steps have not resolved the problem, call Dell for technical assistance.

NOTE: Call technical support from a phone near or at the system so that technical support can assist you with any necessary procedures.

NOTE: Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using the technical support service, see "[Technical Support Service](#)" and "[Before You Call](#)."

NOTE: Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Online Services

You can access Dell Support at support.dell.com. Select your region on the **WELCOME TO DELL SUPPORT** page, and fill in the requested details to access help tools and information.

You can contact Dell electronically using the following addresses:

- 1 World Wide Web

www.dell.com/

www.dell.com/ap/ (Asian/Pacific countries only)

www.dell.com/jp (Japan only)

www.euro.dell.com (Europe only)

www.dell.com/la (Latin American countries)

www.dell.ca (Canada only)

- 1 Anonymous file transfer protocol (FTP)

[ftp.dell.com/](ftp://ftp.dell.com/)

Log in as user: `anonymous`, and use your e-mail address as your password.

- 1 Electronic Support Service

support@us.dell.com

apsupport@dell.com (Asian/Pacific countries only)

support.jp.dell.com (Japan only)

support.euro.dell.com (Europe only)

- 1 Electronic Quote Service

sales@dell.com

apmarketing@dell.com (Asian/Pacific countries only)

sales_canada@dell.com (Canada only)

- 1 Electronic Information Service

info@dell.com

AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop computer systems.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions.

The AutoTech service is available 24 hours a day, 7 days a week. You can also access this service through the technical support service. See the contact information for your region.

Automated Order-Status Service

To check on the status of any Dell™ products that you have ordered, you can go to support.dell.com, or you can call the automated order-status service. A recording prompts you for the information needed to locate and report on your order. See the contact information for your region.

Technical Support Service

Dell's technical support service is available 24 hours a day, 7 days a week, to answer your questions about Dell hardware. Our technical support staff use computer-based diagnostics to provide fast, accurate answers.

To contact Dell's technical support service, see "[Before You Call](#)" and then see the contact information for your region.

Dell Enterprise Training and Certification

Dell Enterprise Training and Certification is available; see www.dell.com/training for more information. This service may not be offered in all locations.

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip available when you call. See the contact information for your region.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at www.dell.com. For the telephone number to call to speak to a sales specialist, see the contact information for your region.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.

For the telephone number to call, see the contact information for your region.

2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of any diagnostic information (including the Diagnostics Checklist) indicating the tests you have run and any error messages reported by the system diagnostics.
4. Include any accessories that belong with the item(s) being returned (such as power cables, media such as CDs and diskettes, and guides) if the return is for credit.
5. Pack the equipment to be returned in the original (or equivalent) packing materials.


You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

Before You Call

NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the [Diagnostics Checklist](#). If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer system itself. Ensure that the system documentation is available.

 **CAUTION:** Before servicing any components inside your computer, see your *System Information Guide* for important safety information.

Diagnostics Checklist
Name:
Date:
Address:
Phone number:
Service Tag (bar code on the back of the computer):
Express Service Code:
Return Material Authorization Number (if provided by Dell support technician):
Operating system and version:
Peripherals:
Expansion cards:
Are you connected to a network? Yes No
Network, version, and network card:
Programs and versions:
See your operating system documentation to determine the contents of the system's start-up files. If possible, print each file. Otherwise, record the contents of each file before calling Dell.
Error message, beep code, or diagnostic code:
Description of problem and troubleshooting procedures you performed:

Contacting Dell

To contact Dell electronically, you can access the following websites:

- 1 www.dell.com
- 1 support.dell.com (technical support)
- 1 premiersupport.dell.com (technical support for educational, government, healthcare, and medium/large business customers, including Premier, Platinum, and Gold customers)

For specific web addresses for your country, find the appropriate country section in the table below.

NOTE: Toll-free numbers are for use within the country for which they are listed.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Anguilla	General Support	toll-free: 800-335-0031
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires)	Website: www.dell.com.ar	
International Access Code: 00	Tech Support and Customer Care	toll-free: 0-800-444-0733
	Sales	0-810-444-3355

Country Code: 54	Tech Support Fax	11 4515 7139
City Code: 11	Customer Care Fax	11 4515 7138
Aruba	General Support	toll-free: 800-1578
Australia (Sydney)	E-mail (Australia): au_tech_support@dell.com	
International Access Code: 0011	E-mail (New Zealand): nz_tech_support@dell.com	
Country Code: 61	Home and Small Business	1-300-65-55-33
City Code: 2	Government and Business	toll-free: 1-800-633-559
	Preferred Accounts Division (PAD)	toll-free: 1-800-060-889
	Customer Care	toll-free: 1-800-819-339
	Corporate Sales	toll-free: 1-800-808-385
	Transaction Sales	toll-free: 1-800-808-312
	Fax	toll-free: 1-800-818-341
Austria (Vienna)	Website: support.euro.dell.com	
International Access Code: 900	E-mail: tech_support_central_europe@dell.com	
Country Code: 43	Home/Small Business Sales	0820 240 530 00
City Code: 1	Home/Small Business Fax	0820 240 530 49
	Home/Small Business Customer Care	0820 240 530 14
	Preferred Accounts/Corporate Customer Care	0820 240 530 16
	Home/Small Business Technical Support	0820 240 530 14
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	0820 240 530 00
Bahamas	General Support	toll-free: 1-866-278-6818
Barbados	General Support	1-800-534-3066
Belgium (Brussels)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: tech_be@dell.com	
Country Code: 32	E-mail for French Speaking Customers: support.euro.dell.com/be/fr/emaildell/	
City Code: 2	Technical Support	02 481 92 88
	Customer Care	02 481 91 19
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	General Support	1-800-342-0671
Bolivia	General Support	toll-free: 800-10-0238
Brazil	Website: www.dell.com/br	
International Access Code: 00	Customer Support, Technical Support	0800 90 3355
Country Code: 55	Tech Support Fax	51 481 5470
City Code: 51	Customer Care Fax	51 481 5480
	Sales	0800 90 3390
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei	Customer Technical Support (Penang, Malaysia)	604 633 4966
Country Code: 673	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario)	Online Order Status: www.dell.ca/ostatus	
International Access Code: 011	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	TechFax	toll-free: 1-800-950-1329
	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago)	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
Country Code: 56		
City Code: 2		
China (Xiamen)	Tech Support website: support.dell.com.cn	

Country Code: 86 City Code: 592	Tech Support E-mail: cn_support@dell.com	
	Tech Support Fax	818 1350
	Technical Support (Dimension™ and Inspiron™)	toll-free: 800 858 2969
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	toll-free: 800 858 0950
	Technical Support (servers and storage)	toll-free: 800 858 0960
	Technical Support (projectors, PDAs, printers, switches, routers, and so on)	toll-free: 800 858 2920
	Customer Experience	toll-free: 800 858 2060
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2222
	Large Corporate Accounts South	toll-free: 800 858 2355
Large Corporate Accounts West	toll-free: 800 858 2811	
Large Corporate Accounts Spare Parts	toll-free: 800 858 2621	
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: czech_dell@dell.com	
Country Code: 420	Technical Support	02 2186 27 27
City Code: 2	Customer Care	02 2186 27 11
	Fax	02 2186 27 14
	TechFax	02 2186 27 28
	Switchboard	02 2186 27 11
Denmark (Copenhagen)	Website: support.euro.dell.com	
International Access Code: 00	E-mail Support (portable computers): den_nbk_support@dell.com	
Country Code: 45	E-mail Support (desktop computers): den_support@dell.com	
	E-mail Support (servers): Nordic_server_support@dell.com	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Fax Switchboard (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Fax Switchboard (Home/Small Business)	3287 5001
Dominica	General Support	toll-free: 1-866-278-6821
Dominican Republic	General Support	1-800-148-0530
Ecuador	General Support	toll-free: 999-119
El Salvador	General Support	01-899-753-0777
Finland (Helsinki)	Website: support.euro.dell.com	
International Access Code: 990	E-mail: fin_support@dell.com	
Country Code: 358	E-mail Support (servers): Nordic_support@dell.com	
City Code: 9	Technical Support	09 253 313 60
	Technical Support Fax	09 253 313 81
	Relational Customer Care	09 253 313 38
	Home/Small Business Customer Care	09 693 791 94
	Fax	09 253 313 99
	Switchboard	09 253 313 00
France (Paris) (Montpellier)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: support.euro.dell.com/fr/fr/emaildell/	
Country Code: 33	Home and Small Business	
City Codes: (1) (4)	Technical Support	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700

	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: tech_support_central_europe@dell.com	
Country Code: 49	Technical Support	06103 766-7200
City Code: 6103	Home/Small Business Customer Care	0180-5-224400
	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
Greece	Website: support.euro.dell.com	
International Access Code: 00	E-mail: support.euro.dell.com/gr/en/emailldell/	
Country Code: 30	Technical Support	080044149518
	Gold Technical Support	08844140083
	Switchboard	2108129800
	Sales	2108129800
	Fax	2108129812
Grenada	General Support	toll-free: 1-866-540-3355
Guatemala	General Support	1-800-999-0136
Guyana	General Support	toll-free: 1-877-270-4609
Hong Kong	Website: support.ap.dell.com	
International Access Code: 001	E-mail: ap_support@dell.com	
Country Code: 852	Technical Support (Dimension™ and Inspiron™)	2969 3189
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	Gold Queue EEC Hotline	2969 3187
	Customer Advocacy	3416 0910
	Large Corporate Accounts	3416 0907
	Global Customer Programs	3416 0908
	Medium Business Division	3416 0912
	Home and Small Business Division	2969 3105
India	Technical Support	1600 33 8045
	Sales	1600 33 8044
Ireland (Cherrywood)	Website: support.euro.dell.com	
International Access Code: 16	E-mail: dell_direct_support@dell.com	
Country Code: 353	Technical Support	1850 543 543
City Code: 1	U.K. Technical Support (dial within U.K. only)	0870 908 0800
	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	1850 200 982
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	Fax/SalesFax	01 204 0103
	Switchboard	01 204 4444
Italy (Milan)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: support.euro.dell.com/it/it/emailldell/	
	Home and Small Business	

Country Code: 39 City Code: 02	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
	Jamaica	General Support (dial from within Jamaica only)
Japan (Kawasaki) International Access Code: 001 Country Code: 81 City Code: 44	Website: support.jp.dell.com	
	Technical Support (servers)	toll-free: 0120-198-498
	Technical Support outside of Japan (servers)	81-44-556-4162
	Technical Support (Dimension™ and Inspiron™)	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)	toll-free: 0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (Axim™)	toll-free: 0120-981-690
	Technical Support outside of Japan (Axim)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
Individual User	044-556-1760	
Switchboard	044-556-4300	
Korea (Seoul) International Access Code: 001 Country Code: 82 City Code: 2	Technical Support	toll-free: 080-200-3800
	Sales	toll-free: 080-200-3600
	Customer Service (Seoul, Korea)	toll-free: 080-200-3800
	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	Switchboard	2194-6000
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600 or 512 728-3772
Luxembourg International Access Code: 00 Country Code: 352	Website: support.euro.dell.com	
	E-mail: tech_be@dell.com	
	Technical Support (Brussels, Belgium)	3420808075
	Home/Small Business Sales (Brussels, Belgium)	toll-free: 080016884
	Corporate Sales (Brussels, Belgium)	02 481 91 00
	Customer Care (Brussels, Belgium)	02 481 91 19
	Fax (Brussels, Belgium)	02 481 92 99
Switchboard (Brussels, Belgium)	02 481 91 00	
Macao Country Code: 853	Technical Support	toll-free: 0800 582
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-free: 0800 581
Malaysia (Penang) International Access Code: 00 Country Code: 60 City Code: 4	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free: 1 800 88 0193
	Technical Support (Dimension and Inspiron)	toll-free: 1 800 88 1306
	Customer Service	04 633 4949
	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213
Mexico	Customer Technical Support	001-877-384-8979

International Access Code: 00		or 001-877-269-3383
Country Code: 52	Sales	50-81-8800 or 01-800-888-3355
	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800 or 01-800-888-3355
Montserrat	General Support	toll-free: 1-866-278-6822
Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam)	Website: support.euro.dell.com	
International Access Code: 00	E-mail (Technical Support):	
Country Code: 31	(Enterprise): nl_server_support@dell.com	
City Code: 20	(Latitude): nl_latitude_support@dell.com	
	(Inspiron): nl_inspiron_support@dell.com	
	(Dimension): nl_dimension_support@dell.com	
	(OptiPlex): nl_optiplex_support@dell.com	
	(Dell Precision): nl_workstation_support@dell.com	
	Technical Support	020 674 45 00
	Technical Support Fax	020 674 47 66
	Home/Small Business Customer Care	020 674 42 00
	Relational Customer Care	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand	E-mail (New Zealand): nz_tech_support@dell.com	
International Access Code: 00	E-mail (Australia): au_tech_support@dell.com	
Country Code: 64	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
Nicaragua	General Support	001-800-220-1006
Norway (Lysaker)	Website: support.euro.dell.com	
International Access Code: 00	E-mail Support (portable computers):	
Country Code: 47	nor_nbk_support@dell.com	
	E-mail Support (desktop computers):	
	nor_support@dell.com	
	E-mail Support (servers):	
	nordic_server_support@dell.com	
	Technical Support	671 16882
	Relational Customer Care	671 17514
Home/Small Business Customer Care	23162298	
Switchboard	671 16800	
Fax Switchboard	671 16865	
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw)	Website: support.euro.dell.com	
International Access Code: 011	E-mail: pl_support_tech@dell.com	
Country Code: 48	Customer Service Phone	57 95 700
	Customer Care	57 95 999
	Sales	57 95 999
City Code: 22	Customer Service Fax	57 95 806

	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Website: support.euro.dell.com	
International Access Code: 00	E-mail: support.euro.dell.com/pt/en/emaiddell/	
Country Code: 351	Technical Support	707200149
	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	General Support	1-800-805-7545
St. Kitts and Nevis	General Support	toll-free: 1-877-441-4731
St. Lucia	General Support	1-800-882-1521
St. Vincent and the Grenadines	General Support	toll-free: 1-877-270-4609
Singapore (Singapore)	Technical Support	toll-free: 800 6011 051
International Access Code: 005	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: 65	Transaction Sales	toll-free: 800 6011 054
	Corporate Sales	toll-free: 800 6011 053
South Africa (Johannesburg)	Website: support.euro.dell.com	
International Access Code: 09/091	E-mail: dell_za_support@dell.com	
Country Code: 27	Technical Support	011 709 7710
City Code: 11	Customer Care	011 709 7707
	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: support.euro.dell.com/es/es/emaiddell/	
Country Code: 34	Home and Small Business	
City Code: 91	Technical Support	902 100 130
	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Care	902 118 546
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: swe_support@dell.com	
Country Code: 46	E-mail Support for Latitude and Inspiron: Swe-nbk_kats@dell.com	
City Code: 8	E-mail Support for OptiPlex: Swe_kats@dell.com	
	E-mail Support for Servers: Nordic_server_support@dell.com	
	Technical Support	08 590 05 199
	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	20 140 14 44
	Fax Technical Support	08 590 05 594
	Sales	08 590 05 185
Switzerland (Geneva)	Website: support.euro.dell.com	
International Access Code: 00	E-mail: swisstech@dell.com	
Country Code: 41	E-mail for French-speaking HSB and Corporate Customers: support.euro.dell.com/ch/fr/emaiddell/	
City Code: 22	Technical Support (Home and Small Business)	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721

	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan	Technical Support (portable and desktop computers)	toll-free: 00801 86 1011
International Access Code: 002	Technical Support (servers)	toll-free: 0080 60 1256
Country Code: 886	Transaction Sales	toll-free: 0080 651 228
	Corporate Sales	toll-free: 0080 651 227
Thailand	Technical Support	toll-free: 0880 060 07
International Access Code: 001	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: 66	Sales	toll-free: 0880 060 09
Trinidad/Tobago	General Support	1-800-805-8035
Turks and Caicos Islands	General Support	toll-free: 1-866-540-3355
U.K. (Bracknell)	Website: support.euro.dell.com	
International Access Code: 00	Customer Care website: support.euro.dell.com/uk/en/ECare/Form/Home.asp	
Country Code: 44	E-mail: dell_direct_support@dell.com	
City Code: 1344	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct/PAD and general)	0870 908 0800
	Global Accounts Customer Care	01344 373 186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	01344 373 185
	Preferred Accounts (500-5000 employees) Customer Care	0870 906 0010
	Central Government Customer Care	01344 373 193
	Local Government & Education Customer Care	01344 373 199
	Health Customer Care	01344 373 194
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Home and Small Business Fax	0870 907 4006
Uruguay	General Support	toll-free: 000-413-598-2521
U.S.A. (Austin, Texas)	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: 011	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
Country Code: 1	Consumer (Home and Home Office)	
	Technical Support	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	DellNet™ Service and Support	toll-free: 1-877-DellNet (1-877-335-5638)
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Financial Services website: www.dellfinancialservices.com	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	Business	
	Customer Service and Technical Support	toll-free: 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Printers and Projectors Technical Support	toll-free: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-234-1490
	Dell Sales	toll-free: 1-800-289-3355 or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)
U.S. Virgin Islands	General Support	1-877-673-3355

[Back to Contents Page](#)

[Back to Contents Page](#)

Dell™ PowerEdge™ SC1420 Systems Installation and Troubleshooting Guide



NOTE: A NOTE indicates important information that helps you make better use of your computer.



NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

For a complete list of abbreviations and acronyms, see your *User's Guide*.

Information in this document is subject to change without notice.

© 2004 Dell Inc. All rights reserved.

Reproduction in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, *PowerEdge*, *Dell OpenManage*, *Dimension*, *Inspiron*, *OptiPlex*, *Latitude*, *Dell Precision*, *PowerApp*, *PowerEdge*, *PowerVault*, *Axim*, and *DellNet* are trademarks of Dell Inc.; *Microsoft*, *Windows*, and *MS-DOS* are registered trademarks of Microsoft Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

[Back to Contents Page](#)