




Dell™ Dimension™ 5000 Service Manual

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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 the *Dell Dimension Help* file.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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Model DCSM

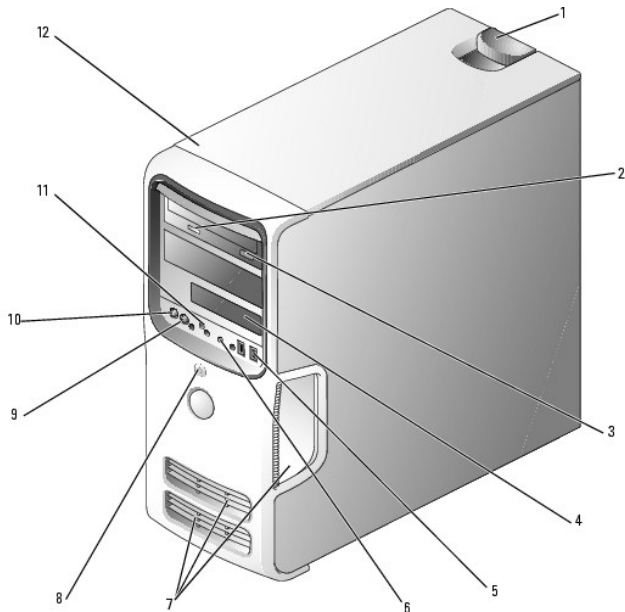
November 2004 Rev. A00

About Your Dell™ Dimension™ 5000 Computer

Dell™ Dimension™ 5000 Service Manual

- [Front View of Computer](#)
- [Back View of Computer](#)

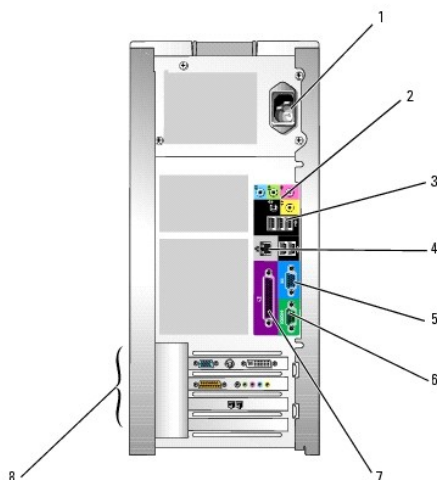
Front View of Computer



1	cover latch release	Use this latch release to remove the cover .
2	CD or DVD activity light	The drive light is on when the computer reads data from the CD or DVD drive.
3	CD or DVD eject button	Press to eject a disk from the CD or DVD drive.
4	FlexBay drive	Can contain an optional floppy drive or optional Media Card Reader.
5	USB 2.0 connectors (2)	Use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras. It is recommended that you use the back USB connectors for devices that typically remain connected, such as printers and keyboards.
6	hard-drive activity light	The hard drive activity light is on when the computer reads data from or writes data to the hard drive. The light might also be on when a device such as a CD player is operating.
7	vents	For adequate cooling, do not block any of the vents. NOTICE: Ensure that there is a minimum of two inches of space between all vents and any object near these vents. NOTICE: Keep the vent area clean and dust-free to ensure that the system is adequately ventilated. Use only a dry cloth to clean the vent area to avoid water damage to the system.
8	power button	Press to turn on the computer. NOTICE: To avoid losing data, do not use the power button to turn off the computer. Instead, perform an operating system shutdown.
9	headphone connector	Use the headphone connector to attach headphones and most kinds of speakers.

10	microphone connector	Use the microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program.
11	diagnostic lights (4)	Use the lights to help you troubleshoot a computer problem based on the diagnostic code. For more information, see " Diagnostic Lights ."
12	Service Tag	Used to identify your computer when you access the Dell Support website or call technical support.

Back View of Computer



1	power connector	Insert the power cable.
2	sound card connectors (5)	<ul style="list-style-type: none"> 1 Line-in connector — Use the blue line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. 1 Line-out connector — Use the green line-out connector to attach headphones and most speakers with integrated amplifiers. 1 Microphone connector — Use the pink microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. 1 Surround connector — Use the black surround connector to attach multichannel-capable speakers. 1 Center/subwoofer connector — Use the yellow subwoofer connector to attach multiple speakers.
3	USB 2.0 connectors (5)	<p>Use the back USB connectors for devices that typically remain connected, such as printers, keyboards, or for bootable USB devices.</p> <p>It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras.</p>
4	network adapter connector	<p>To attach your computer to a network or broadband device, connect one end of a network cable to either a network jack or your network or broadband device. Connect the other end of the network cable to the network adapter connector on your computer. A click indicates that the network cable has been securely attached.</p> <p>NOTE: Do not plug a telephone cable into the network connector.</p> <p>On computers with a network connector card, use the connector on the card.</p> <p>It is recommended that you use Category 5 wiring and connectors for your network. If you must use Category 3 wiring, force the network speed to 10 Mbps to ensure reliable operation.</p>
5	VGA video connector	If your monitor has a VGA connector, plug it into the VGA connector on the computer.
6	serial connector	<p>Connect a serial device, such as a handheld device, to the serial port. The default designations are COM1 for serial connector 1 and COM2 for serial connector 2.</p> <p>For more information, see "System Setup" options.</p>
7	parallel	Connect a parallel device, such as a printer, to the parallel connector. If

	connector	you have a USB printer, plug it into a USB connector. The integrated parallel connector is automatically disabled if the computer detects an installed card containing a parallel connector configured to the same address. For more information, see " System Setup " options.
8	card slots (4)	Access connectors for any installed PCI cards (two slots) and PCI Express cards (one x16 slot and one x1 slot).


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Advanced Troubleshooting

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Dell Diagnostics


 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

 **NOTE:** The *Drivers and Utilities CD* (ResourceCD) is optional, and as such, may not ship with all computers.

When to Use the Dell Diagnostics

If you experience a problem with your computer, perform the checks in this section and run the Dell Diagnostics before you contact Dell for technical assistance.

It is recommended that you print these procedures before you begin.


 **NOTICE:** The Dell Diagnostics works only on Dell™ computers.

Enter "[system setup](#)" to review your computer's configuration information, and ensure that the device you want to test displays in system setup and is active.

Start the Dell Diagnostics from either your hard drive or from the [Drivers and Utilities CD](#) (also known as the ResourceCD - optional).

Starting the Dell Diagnostics From Your Hard Drive

1. Turn on (or restart) your computer.
2. When the DELL™ logo appears, press <F12> immediately.

 **NOTE:** If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from your Drivers and Utilities CD (optional).

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer and try again.


3. When the boot device list appears, highlight **Boot to Utility Partition** and press <Enter>.
4. When the Dell Diagnostics **Main Menu** appears, [select the test you want to run](#).

Starting the Dell Diagnostics From the Drivers and Utilities CD (optional)

1. Insert the *Drivers and Utilities CD* (optional).
2. Shut down and restart the computer.

When the DELL logo appears, press <F12> immediately.

If you wait too long and the Windows logo appears, continue to wait until you see the Windows desktop. Then shut down your computer and try again.

 **NOTE:** The next steps change the boot sequence for one time only. On the next start-up, the computer boots according to the devices specified in system setup.

3. When the boot device list appears, highlight **IDE CD-ROM Device** and press <Enter>.
4. Select the **IDE CD-ROM Device** option from the CD boot menu.
5. Select the **Boot from CD-ROM** option from the menu that appears.

6. Type 1 to start the ResourceCD menu.
7. Type 2 to start the Dell Diagnostics.
8. Select **Run the 32 Bit Dell Diagnostics** from the numbered list. If multiple versions are listed, select the version appropriate for your computer.
9. When the Dell Diagnostics **Main Menu** appears, [select the test you want to run](#).


Dell Diagnostics Main Menu

1. After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

Option	Function
Express Test	Performs a quick test of devices. This test typically takes 10 to 20 minutes and requires no interaction on your part. Run Express Test first to increase the possibility of tracing the problem quickly.
Extended Test	Performs a thorough check of devices. This test typically takes 1 hour or more and requires you to answer questions periodically.
Custom Test	Tests a specific device. You can customize the tests you want to run.
Symptom Tree	Lists the most common symptoms encountered and allows you to select a test based on the symptom of the problem you are having.

2. If a problem is encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description and follow the instructions on the screen.

If you cannot resolve the error condition, contact Dell.

 **NOTE:** The Service Tag for your computer is located at the top of each test screen. If you contact Dell, technical support will ask for your Service Tag. Your computer's Service Tag is listed in the system information option in [system setup](#).

3. If you run a test from the **Custom Test** or **Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.
Configuration	Displays your hardware configuration for the selected device. The Dell Diagnostics obtains configuration information for all devices from system setup, memory, and various internal tests, and it displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

4. When the tests are completed, if you are running the Dell Diagnostics from the *Drivers and Utilities CD*, remove the CD.
5. Close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

System Lights

Your power button light and hard-drive light may indicate a computer problem.

Power Light	Problem Description	Suggested Resolution
Solid green	Power is on, and the computer is operating normally. On the desktop computer, a solid green light indicates a network connection.	No corrective action is required.
Blinking green	The computer is in the suspended state (Microsoft® Windows® 2000 and Windows XP).	Press the power button, move the mouse, or press a key on the keyboard to wake the computer.
Blinks green several times and then turns off	A configuration error exists.	Check the diagnostic lights to see if the specific problem is identified.
Solid yellow	The Dell Diagnostics is running a test, or a device on the system board may be faulty or incorrectly installed.	If the Dell Diagnostics is running, allow the testing to complete. Check the diagnostic lights to see if the specific problem is

		identified. If the computer does not boot, contact Dell for technical assistance.
Blinking yellow	A power supply or system board failure has occurred.	Check the diagnostic lights to see if the specific problem is identified. Also, see "Power Problems."
Solid green and a beep code during POST	A problem was detected while the BIOS was executing.	See " Beep Codes " for instructions on diagnosing the beep code. Also, check the diagnostic lights to see if the specific problem is identified.
Solid green power light and no beep code and no video during POST	The monitor or the graphics card may be faulty or incorrectly installed.	Check the diagnostic lights to see if the specific problem is identified. See "Video and Monitor Problems."
Solid green power light and no beep code but the computer locks up during POST	An integrated system board device may be faulty.	Check the diagnostic lights to see if the specific problem is identified. If the problem is not identified, contact Dell for technical assistance.

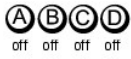







Diagnostic Lights

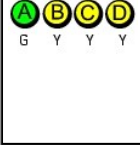
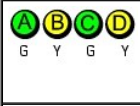
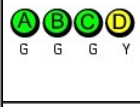
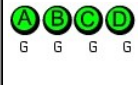
⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

To help you troubleshoot a problem, your small form factor, small desktop, and small mini-tower computers have four lights labeled "A," "B," "C," and "D" on the back panel. The lights can be yellow or green. When the computer starts normally, the patterns or codes on the lights change as the boot process completes. If the POST portion of system boot completes successfully, all four lights display solid green. If the computer malfunctions during the POST process, the pattern displayed on the lights may help identify where in the process the computer halted.

📌 NOTE: The orientation of the diagnostic lights may vary depending on the system type. The diagnostic lights can appear either vertical or horizontal.

Y = Yellow
G = Green

Light Pattern	Problem Description	Suggested Resolution
 off off off off	The computer is in a normal off condition or a possible pre-BIOS failure has occurred.	Plug the computer into a working electrical outlet and press the power button.
 Y Y Y G	A possible BIOS failure has occurred; the computer is in the recovery mode.	Run the BIOS Recovery utility, wait for recovery completion, and then restart the computer.
 Y Y G Y	A possible processor failure has occurred.	Reinstall the processor and restart the computer.
 Y Y G G	Memory modules are detected, but a memory failure has occurred.	<ul style="list-style-type: none"> 1 If you have one memory module installed, reinstall it and restart the computer. See "Memory" for instructions on how to remove and install memory modules. 1 If you have two or more memory modules installed, remove the modules, reinstall one module, and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. 1 If available, install properly working memory modules of the same type into your computer. 1 If the problem persists, contact Dell.
 Y G Y Y	A possible expansion card failure has occurred.	<ul style="list-style-type: none"> 1 Determine if a conflict exists by removing a card (not the graphics card) and then restarting the computer. 1 If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. 1 Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts. 1 Move each card one at a time to a different PCI slot and restart the computer after each move. 1 If the problem persists, contact Dell.
 Y G Y G	A possible graphics card failure has occurred.	<ul style="list-style-type: none"> 1 If the computer has a graphics card, remove the card, reinstall it, and then restart the computer. 1 If the problem still exists, install a graphics card that you know works and restart the computer. 1 If the problem persists or the computer has integrated graphics, contact Dell.
 Y G G Y	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
 Y G G G	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.

	No memory modules are detected.	<ul style="list-style-type: none"> 1 If you have one memory module installed, reinstall it and restart the computer. See "Memory" for instructions on how to remove and install memory modules. 1 If you have two or more memory modules installed, remove the modules, reinstall one module, and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. 1 If available, install properly working memory of the same type into your computer. 1 If the problem persists, contact Dell.
	Memory modules are detected, but a memory configuration or compatibility error exists.	<ul style="list-style-type: none"> 1 Ensure that no special memory module/memory connector placement requirements exist. 1 Verify that the memory modules that you are installing are compatible with your computer (see "Memory"). 1 If the problem persists, contact Dell.
	Other failure has occurred.	<ul style="list-style-type: none"> 1 Ensure that the cables are properly connected to the system board from the hard drive, CD drive, and DVD drive. 1 Check the computer message that appears on your monitor screen. 1 If the problem persists, contact Dell.
	The computer is in a normal operating condition after POST.	None.

Beep Codes

Your computer might emit a series of beeps during start-up if the monitor cannot display errors or problems. This series of beeps, called a beep code, identifies a problem. One possible beep code (code 1-3-1) consists of one beep, a burst of three beeps, and then one beep. This beep code tells you that the computer encountered a memory problem.

If your computer beeps during start-up:

1. Write down the beep codes.
2. Run the [Dell Diagnostics](#) to identify a more serious cause.
3. Contact Dell for technical assistance.

Code	Cause
1-1-2	Microprocessor register failure
1-1-3	NVRAM read/write failure
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer failure
1-2-2	DMA initialization failure
1-2-3	DMA page register read/write failure
1-3	Video Memory Test failure
1-3-1 through 2-4-4	Memory not being properly identified or used
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	NVRAM power loss
3-3-2	Invalid NVRAM configuration
3-3-4	Video Memory Test failure
3-4-1	Screen initialization failure
3-4-2	Screen retrace failure
3-4-3	Search for video ROM failure
4-2-1	No timer tick
4-2-2	Shutdown failure
4-2-3	Gate A20 failure
4-2-4	Unexpected interrupt in protected mode
4-3-1	Memory failure above address 0FFFFh
4-3-3	Timer-chip counter 2 failure
4-3-4	Time-of-day clock stopped
4-4-1	Serial or parallel port test failure

4-4-2	Failure to decompress code to shadowed memory
4-4-3	Math-coprocessor test failure
4-4-4	Cache test failure

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Before You Begin

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- [Getting Started](#)
 - [Recommended Tools](#)
 - [Turning Off Your Computer](#)
 - [Before Working Inside Your Computer](#)
-

Getting Started

This section provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- 1 You have performed the steps in "[Turning Off Your Computer](#)" and "[Before Working Inside Your Computer](#)."
 - 1 You have read the safety information in your Dell™ *Product Information Guide*.
 - 1 A component can be replaced by performing the removal procedure in reverse order.
-

Recommended Tools

The procedures in this document may require the following tools:

- 1 Small flat-blade screwdriver
 - 1 Phillips screwdriver
 - 1 Flash BIOS update program floppy disk or CD
-

Turning Off Your Computer

➡ **NOTICE:** To avoid losing data, save and close any open files and exit any open programs before you turn off your computer.

1. Shut down the operating system:
 - a. Save and close any open files, exit any open programs, click the **Start** button, and then click **Turn Off Computer**.
 - b. In the **Turn off computer** window, click **Turn off**.
The computer turns off after the operating system shutdown process finishes.
 2. Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for 4 seconds.
-

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.

⚠ **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

⚠ **CAUTION:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

➡ **NOTICE:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.


➡ **NOTICE:** When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

➡ **NOTICE:** To avoid damaging the computer, perform the following steps before you begin working inside the computer.


1. [Turn off your computer](#).

➡ **NOTICE:** To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

2. Disconnect any telephone or telecommunication lines from the computer.
3. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

 **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

4. Open the computer cover.


 **NOTICE:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

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Replacing the Computer Cover


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 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

1. Ensure that all cables are connected, and fold cables out of the way.

Gently pull the power cables toward you so that they do not get caught underneath the drives.

2. Ensure that no tools or extra parts are left inside the computer.
3. Align the bottom of the cover with the tabs located along the bottom edge of the computer.
4. Using the tabs as leverage, rotate the cover downward and close.
5. Snap the cover into place by pulling back on the cover latch release, and then releasing the latch release when the cover is seated.
6. Ensure that the cover is seated correctly before moving it to the upright position.

 **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

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Removing the Computer Cover

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⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the Product Information Guide.

⚠ CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

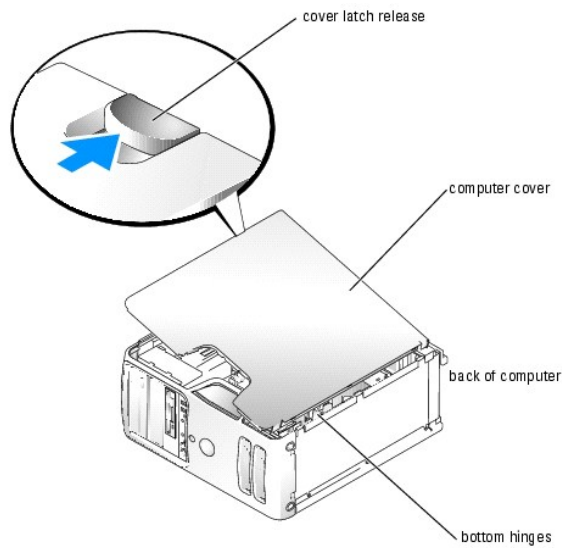
1. Follow the procedures in "[Before you Begin](#)."

➡ NOTICE: Ensure that sufficient space exists to support the removed cover—at least 30 cm (1 ft) of desk top space.

➡ NOTICE: Ensure that you are working on a level, protected surface to avoid scratching either the computer or the surface on which it is resting.

2. Lay your computer on its side with the computer cover facing up.

3. Pull back the cover latch release on the top panel.



4. Locate the three hinge tabs on the bottom edge of the computer.

5. Grip the sides of the computer cover and pivot the cover up, using the bottom hinges as leverage points.

6. Release the cover from the hinge tabs and set it aside in a secure location.

Removing and Installing Parts

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- [Cards](#)
- [Drive Panels](#)
- [Drives](#)
- [Hard Drive](#)
- [Floppy Drive](#)
- [Media Card Reader](#)
- [CD/DVD Drive](#)
- [Processor](#)
- [System Board](#)
- [Power Supply](#)
- [Battery](#)

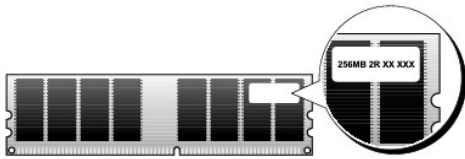
Memory

You can increase your computer memory by installing memory modules on the system board.

Your computer supports DDR2 memory.

DDR2 Memory Overview

DDR2 memory modules should be installed in *pairs of matched memory size, speed, and technology*. If the DDR2 memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance. See the label on the module to determine the module's capacity.



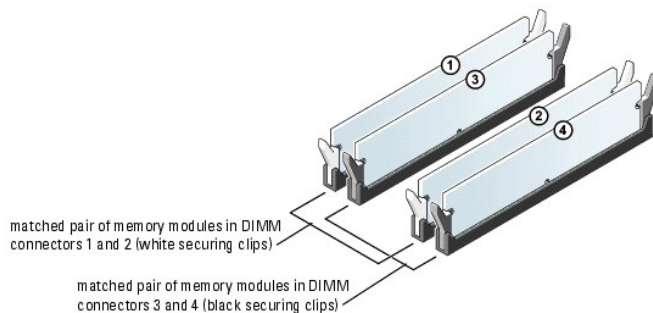
NOTE: Always install DDR2 memory modules in the order indicated on the system board.

The recommended memory configurations are:

- A pair of matched memory modules installed in DIMM connectors 1 and 2
- or
- A pair of matched memory modules installed in DIMM connectors 1 and 2 and another matched pair installed in DIMM connectors 3 and 4

NOTE: Do not install ECC memory modules.

- 1 If you install mixed pairs of DDR2 400-MHz (PC2-3200) and DDR2 533-MHz (PC2-4300) memory, the modules function at the slowest speed installed.
- 1 Be sure to install a single memory module in DIMM connector 1, the connector closest to the processor, before you install modules in the other connectors.



NOTE: Memory purchased from Dell is covered under your computer warranty.

NOTE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly. You should install your original memory modules in pairs either in DIMM connectors 1 and 2 or DIMM connectors 3 and 4.

Addressing Memory With 4-GB Configurations

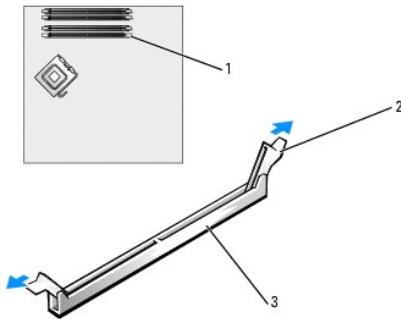
Your computer supports a maximum of 4 GB of memory when you use four 1-GB DIMMs. Current operating systems, such as Microsoft® Windows® XP, can only use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is less than 4 GB. Certain components within the computer require address space in the 4-GB range. Any address space reserved for these components cannot be used by computer memory.

Installing Memory

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

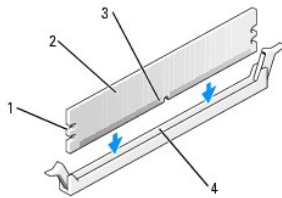
🔌 NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "[Before you Begin](#)."
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Press out the securing clip at each end of the memory module connector.



1	memory connector closest to processor
2	securing clips (2)
3	connector

4. Align the notch on the bottom of the module with the crossbar in the connector.

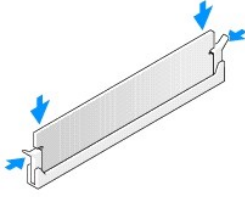


1	cutouts (2)
2	memory module
3	notch
4	crossbar

🔌 NOTICE: To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

5. Insert the module into the connector until the module snaps into position.

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



6. Replace the [computer cover](#).

➡ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

8. Right-click the **My Computer** icon and click **Properties**.

9. Click the **General** tab.

10. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

⚠ **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

➡ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "[Before you Begin](#)."

2. Press out the securing clip at each end of the memory module connector.

3. Grasp the module and pull up.

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

Cards

⚠ **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

➡ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

Your Dell™ computer provides the following slots for PCI and PCI Express cards:

- 1 Two PCI card slots
- 1 One PCI Express x16 card slot
- 1 One PCI Express x1 card slot

PCI Cards

Your computer supports two PCI cards.



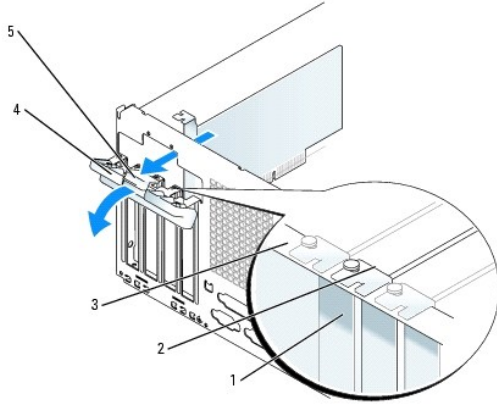
If you are installing or replacing a card, follow the procedures in the next section. If you are removing but not replacing a PCI card, see "[Removing a PCI Card](#)."

If you are replacing a card, remove the current driver for the card from the operating system.

If you are installing or replacing a PCI Express card, see "[Installing a PCI Express Card](#)."

Installing a PCI Card

1. Follow the procedures in "[Before you Begin](#)."



1	filler bracket
2	alignment guide
3	alignment bar
4	card retention door
5	release tab

2. Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.
3. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with [step 5](#).

4. If you are replacing a card that is already installed in the computer, remove the card.

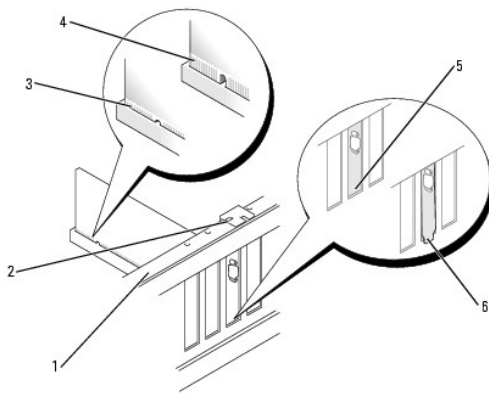
If necessary, disconnect any cables connected to the card. Grasp the card by its top corners, and ease it out of its connector.

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 computer.

⚠ CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

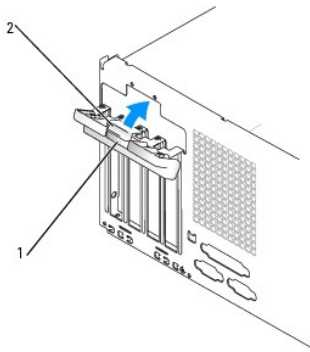
6. Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.



1	alignment bar
---	---------------

2	alignment guide
3	fully seated card
4	not fully seated card
5	bracket within slot
6	bracket caught outside of slot

7. Before you close the card retention door, ensure that:
 - 1 The tops of all cards and filler brackets are flush with the alignment bar.
 - 1 The notch in the top of the card or filler bracket fits around the alignment guide.



1	card retention door
2	release tab

8. Close the card retention door by snapping it into place to secure the card(s).

➡ **NOTICE:** Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer 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.

➡ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

10. Replace the [computer cover](#), reconnect the computer and devices to electrical outlets, and then turn them on.

11. If you installed a sound card:
 - a. Enter system setup, select **Audio Controller**, and then change the setting to **Off**.
 - b. Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the microphone, speaker/headphone, or line-in connectors on the back panel.

12. If you installed an add-in network adapter and want to disable the integrated network adapter:
 - a. Enter system setup, select **Network Controller**, and then change the setting to **Off**.
 - b. Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel.

13. Install any drivers required for the card as described in the card documentation.

Removing a PCI Card

1. Follow the procedures in "[Before you Begin](#)."
2. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

If you need a filler bracket, contact Dell.

🔍 **NOTE:** Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

3. Replace the [computer cover](#), reconnect the computer and devices to electrical outlets, and then turn them on.
4. Remove the card's driver from the operating system.
5. If you removed a sound card:
 - a. Enter system setup, select **Audio Controller**, and then change the setting to **On**.
 - b. Connect external audio devices to the audio connectors on the back panel of the computer.
6. If you removed an add-in network connector:
 - a. Enter system setup, select **Network Controller**, and then change the setting to **On**.
 - b. Connect the network cable to the integrated connector on the back panel of the computer.

PCI Express Cards

Your computer supports one PCI Express x16 card and one PCI Express x1 card.

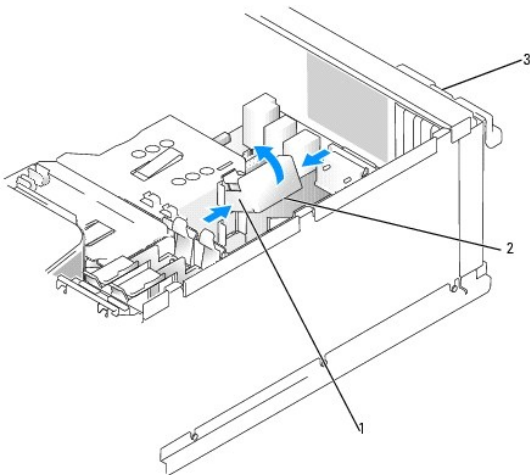
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see "[Removing a PCI Express Card](#)."

If you are replacing a card, remove the current driver for the card from the operating system.

If you are installing or replacing a PCI card, see "[Installing a PCI Card](#)."

Installing a PCI Express Card

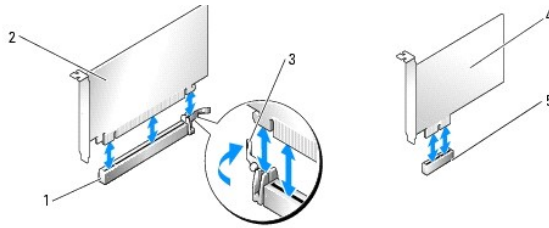
1. Follow the procedures in "[Before you Begin](#)."



1	release tabs (2)
2	card retention mechanism
3	card retention door

2. Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.
3. If your computer includes a card retention mechanism, to secure the x16 card in place from the top:
 - a. Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.
 - b. Set the retention mechanism aside in a secure location.
4. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with [step 5](#).
5. If you are replacing a card that is already installed in the computer, remove the card.

If necessary, disconnect any cables connected to the card. If your card includes a retention mechanism, remove the top of the retention mechanism by pressing the tab and pulling up on the top. Gently pull the securing tab, grasp the card by its top corners, and then ease it out of its connector.



1	PCI Express x16 card slot
2	PCI Express x16 card
3	securing tab
4	PCI Express x1 card
5	PCI Express x1 card slot

6. Prepare the card for installation.

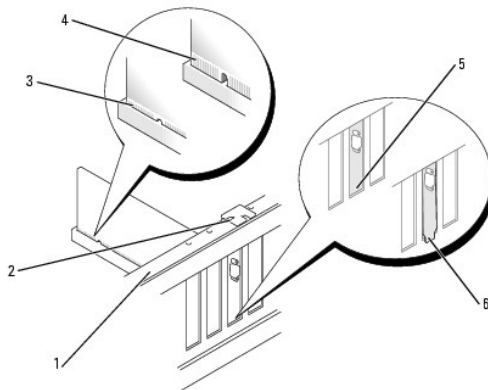
See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

7. If you are installing the card into the x16 card connector, position the card so the securing slot is aligned with the securing tab, and gently pull the securing tab.

NOTICE: Ensure that you release the securing tab to unseat the card. If the card is not removed correctly, the system board may be damaged.

8. Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.



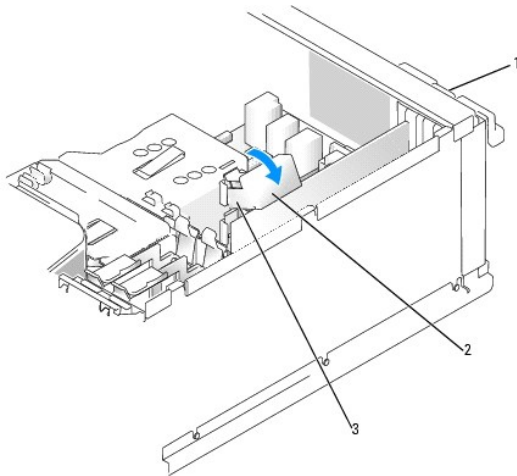
1	alignment bar
2	alignment guide
3	fully seated card
4	not fully seated card
5	bracket within slot
6	bracket caught outside of slot

9. If you replaced a card that was already installed in the computer and you removed the retention mechanism, you may reinstall the retention mechanism.

10. Before replacing the card retention mechanism, ensure that:

- 1 The tops of all cards and filler brackets are flush with the alignment bar.
- 1 The notch in the top of the card or filler bracket fits around the alignment guide.

11. Snap the card retention mechanism into place, securing the x16 PCI card.



1	card retention door
2	card retention mechanism
3	release tabs (2)

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

➡ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

12. Replace the [computer cover](#), reconnect the computer and devices to electrical outlets, and then turn them on.

13. If you installed a sound card:

- a. Enter system setup, select **Audio Controller**, and then change the setting to **Off**.
- b. Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the microphone, speaker/headphone, or line-in connectors on the back panel.

14. If you installed an add-in network adapter and want to disable the integrated network adapter:

- a. Enter system setup select **Network Controller**, and then change the setting to **Off**.
- b. Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel.

15. Install any drivers required for the card as described in the card documentation.

Removing a PCI Express Card

1. Follow the procedures in "[Before you Begin](#)."
2. Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.
3. If your computer includes a card retention mechanism, to secure the x16 card in place from the top:
 - a. Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.
 - b. Set the retention mechanism aside in a secure location.
4. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

If you need a filler bracket, contact Dell.

📌 **NOTE:** Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

5. Reseat the card retention mechanism in the tabs and pivot downward to snap it into place.
 6. Close the card retention door to snap it into place, securing the card(s).
- 🔊 **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.
7. Replace the [computer cover](#), reconnect the computer and devices to electrical outlets, and then turn them on.
 8. Remove the card's driver from the operating system.
 9. If you removed a sound card:
 - a. Enter system setup, select **Audio Controller**, and then change the setting to **On**.
 - b. Connect external audio devices to the audio connectors on the back panel of the computer.
 10. If you removed an add-in network connector:
 - a. Enter system setup, select **Network Controller**, and then change the setting to **On**.
 - b. Connect the network cable to the integrated connector on the back panel of the computer.
 11. Install any drivers required for the card as described in the card documentation.
-

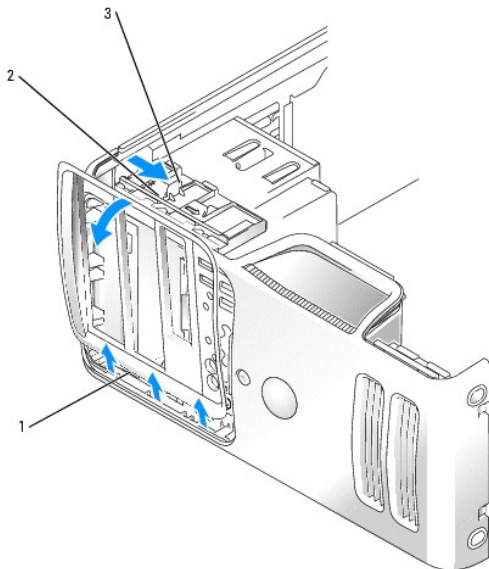
Drive Panels

⚠ **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

⚠ **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

Removing the Drive Panel

1. Follow the procedures in "[Before you Begin](#)."



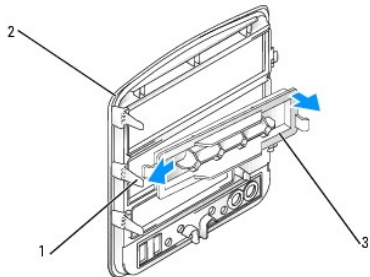
1	drive panel
2	sliding plate
3	sliding plate lever

2. Grasping the lever on the sliding plate, pull the sliding plate to the right until it snaps into the open position.

🔧 **NOTE:** This sliding plate secures and releases the drive panel and helps to secure the drives.

3. By pushing from the inside and pivoting the drive panel to the left, you can release the drive panel from its side hinges.
4. Set the drive panel aside in a secure location.

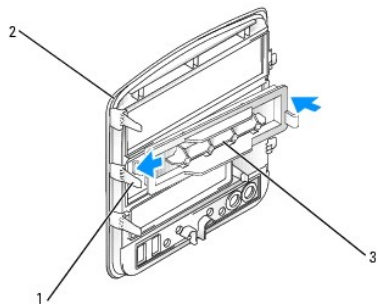
Removing the Drive-Panel Insert



1	drive panel tabs
2	drive panel
3	drive panel insert

1. On the inside of the drive panel, gently press the two drive-panel insert tab inward.
2. Pivot the drive-panel insert outward.
3. Set the drive-panel insert aside in a secure location.

Replacing the Drive-Panel Insert

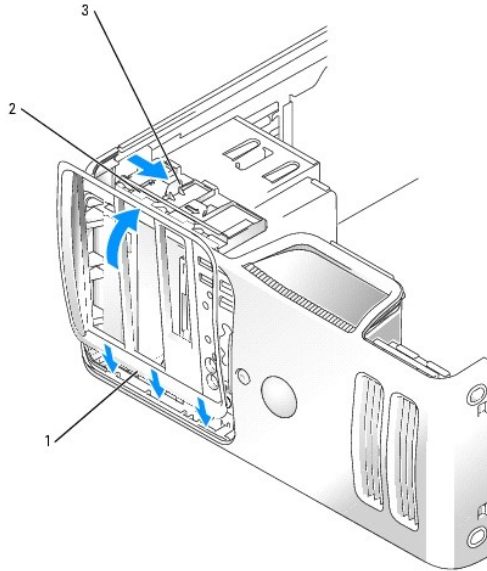


1	drive panel tabs
2	drive panel
3	drive panel insert

1. Align the tabs slots with the drive-panel insert tabs and seat the drive panel insert under the right edge.
2. Rotating inward toward the drive panel, align and snap the drive-panel insert into place on the drive panel.
3. Ensure that the drive-panel insert is correctly seated in the drive panel.

Replacing the Drive Panel

1. Follow the procedures in ["Before you Begin."](#)



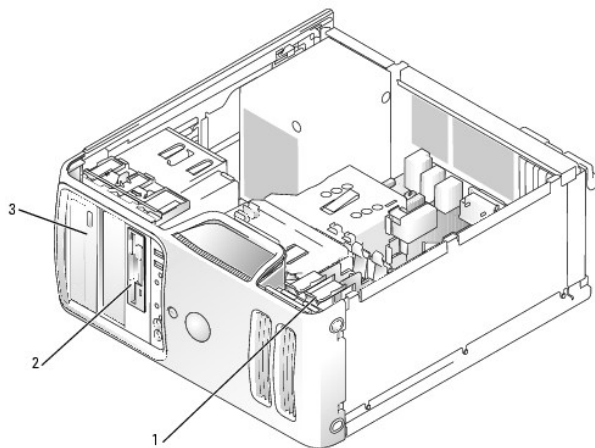
1	drive panel
2	sliding plate
3	sliding plate lever

2. Align the drive panel tabs with the side-door hinges.
3. Rotate the drive panel toward the computer until it snaps into place on the front panel.
4. Grasping the lever, pull the sliding plate to the left, snapping it into the closed position to secure the drive panel.

Drives

Your computer supports a combination of these devices:

- 1 Up to two serial ATA drives
- 1 One FlexBay drive (floppy drive or Media Card Reader)
- 1 Up to two CD or DVD drives



1	hard drive
2	FlexBay for optional floppy drive or Media Card Reader
3	CD/DVD drive(s)

Connect CD/DVD drives to the connector labeled "IDE" on the system board. Serial ATA hard drives should be connected to the connectors labeled "SATA0" or "SATA2" on the system board.

IDE Drive Addressing

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 master or boot device (drive 0), and the device attached to the middle connector on the interface cable is the slave device (drive 1). See the drive documentation in your upgrade kit for information on configuring devices for the cable select setting.

Connecting Drive Cables

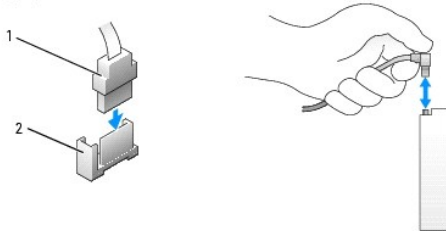
When you install a drive, you connect two cables—a DC power cable and a data cable—to the back of the drive and to the system board.

Drive Interface Connectors

Most interface connectors are keyed for correct insertion; that is, a notch or a missing pin on one connector matches a tab or a filled-in hole on the other connector. Keyed connectors ensure that the pin-1 wire in the cable (indicated by the colored stripe along one edge of the IDE cable—serial ATA cables do not use a colored stripe) goes to the pin-1 end of the connector. The pin-1 end of a connector on a board or a card is usually indicated by a silk-screened "1" printed directly on the board or card.

➡ **NOTICE:** When you connect an IDE interface cable, do not place the colored stripe away from pin 1 of the connector. Reversing the cable prevents the drive from operating and could damage the controller, the drive, or both.

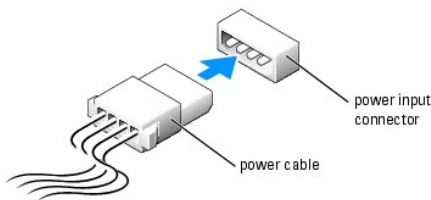
Table 2-1. Serial



1	interface cables
2	interface connectors

Power Cable Connector

To connect a drive using the power cable, locate the power input connector on the system board.

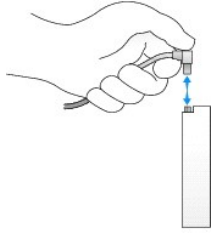


Connecting and Disconnecting Drive Cables

When removing an IDE drive data cable, grasp the colored pull tab and pull until the connector detaches.

When connecting and disconnecting a serial ATA data cable, hold the cable by the black connector at each end.

Like IDE connectors, the serial ATA interface connectors are keyed for correct insertion; that is, a notch or a missing pin on one connector matches a tab or a filled-in hole on the other connector.



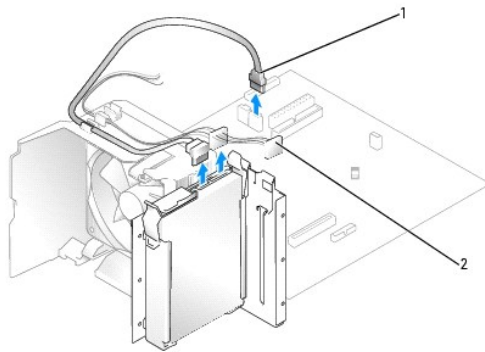
Hard Drive

- ⚠ CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.
- ⚠ CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
- 👉 NOTICE:** To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.
- 👉 NOTICE:** If you are replacing a hard drive that contains data you want to keep, back up your files before you begin this procedure.

Check the documentation for the drive to verify that it is configured for your computer.

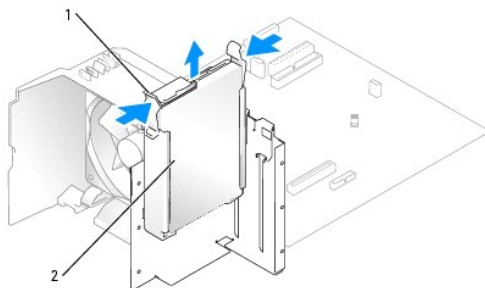
Removing a Hard Drive

1. Follow the procedures in "[Before you Begin.](#)"
2. Disconnect the power and hard-drive cables from the drive.



1	serial ATA data cables
2	power cables

3. Press in on the blue tabs on each side of the drive and slide the drive up and out of the computer.

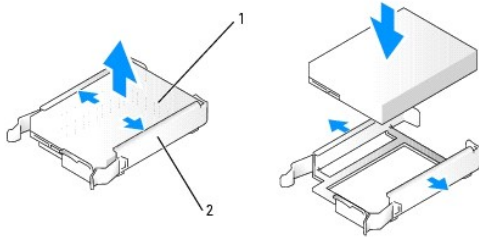


1	tabs (2)
2	hard drive

Installing a Hard Drive

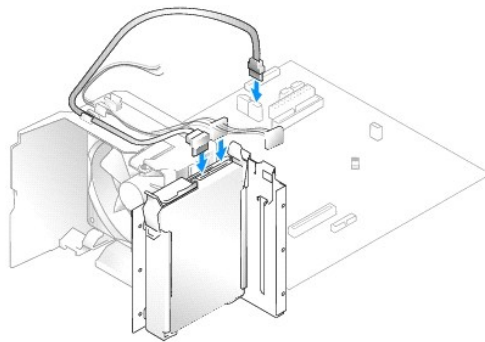
1. Unpack the replacement hard drive, and prepare it for installation.
2. Check the documentation for the drive to verify that it is configured for your computer.

NOTE: If your replacement hard drive does not have the plastic guide bracket attached, remove the bracket from the old drive by unsnapping it from the drive. Snap the bracket onto the new drive.



1	drive
2	bracket rails (2)

3. Gently slide the drive into place until it clicks or you feel the drive securely installed.
4. Connect the power and hard-drive cables to the drive.



5. Check all connectors to be certain that they are properly cabled and firmly seated.
6. Replace the [computer cover](#).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug the cable into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

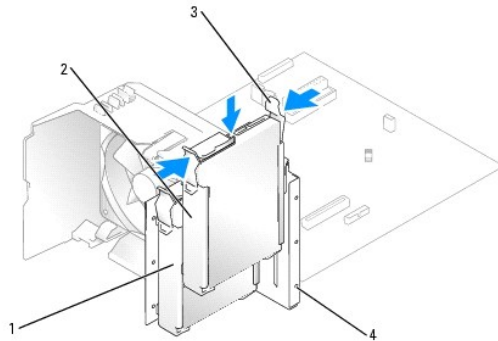
Adding a Second Hard Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

1. Check the documentation for the drive to verify that it is configured for your computer.
2. Follow the procedures in "[Before you Begin.](#)"
3. Remove the plastic guide bracket from the inside of the hard-drive bay by gently pulling the bracket up and out of the bay.
4. Snap the bracket to the hard drive.
5. Gently slide the new drive (second hard drive) into place until it clicks or you feel the drive securely installed.



1	primary hard drive in upper bay
2	secondary hard drive in lower bay
3	rail tabs (2)
4	hard drive bay

6. Connect a power cable to the drive.
7. Connect the data cable to the drive and to the system board.

Floppy Drive

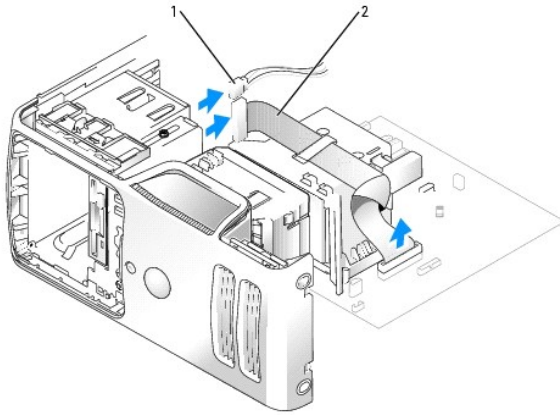
⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

⚠ CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

🔧 NOTE: If you are adding a floppy drive, see "[Installing a Floppy Drive.](#)"

Removing a Floppy Drive

1. Follow the procedures in "[Before you Begin.](#)"
2. Remove the [drive panel](#).

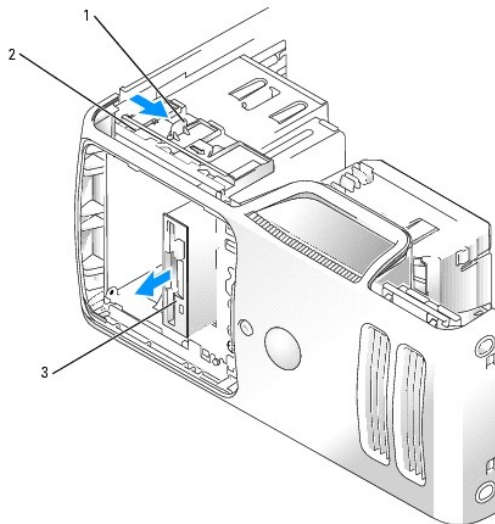


1	power cable
2	data cable

3. Disconnect the power and data cables from the back of the floppy drive.

NOTE: If you are installing a PCI Express x16 card, this card may cover the floppy-drive connectors. Remove this card before connecting the floppy-drive cables.

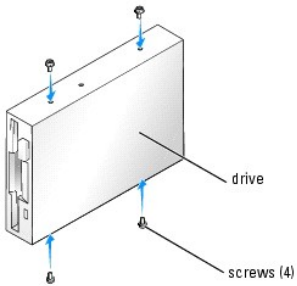
4. Remove the floppy drive by sliding and holding the drive latch release downward. Then, slide the drive out of the computer.



1	sliding plate lever
2	sliding plate
3	floppy drive

Installing a Floppy Drive

NOTE: In the event the replacement or new floppy drive does not have the shoulder screws, use the screws located within the drive panel insert.

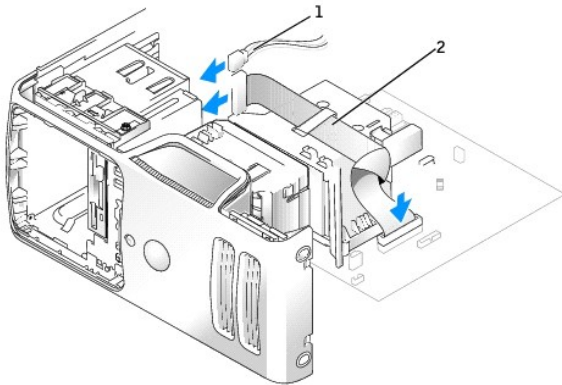


1	drive
2	screw (4)

1. Follow the procedures in "[Before you Begin.](#)"
2. Remove the [drive panel](#).
3. Gently slide the drive into place until it clicks or you feel the drive securely installed.

NOTE: If you are installing a new floppy drive rather than replacing a drive, remove the drive panel insert where you want the drive to be installed, insert the shoulder screws located in the back of the drive panel insert into the drive, and then slide the drive back into place.

4. Attach the power and data cables to the floppy drive.
5. Connect the other end of the data cable to the connector labeled "FLOPPY" on the system board and route the cable through the clip on the shroud.



1	power cable
2	data cable

6. If you are installing a new floppy drive rather than replacing a drive, remove the drive-panel inserts.
7. Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.
8. Remove the [drive panel](#).
9. Replace the [computer cover](#).

NOTICE: To connect a network cable, first plug the cable in to the network device and then plug the cable in to the computer.

10. Connect your computer and devices to their electrical outlets, and turn them on.
See the documentation that came with the drive for instructions on installing any software required for drive operation.
11. Enter system setup and select the appropriate **Diskette Drive** option.
12. Verify that your computer works correctly by running the Dell Diagnostics.

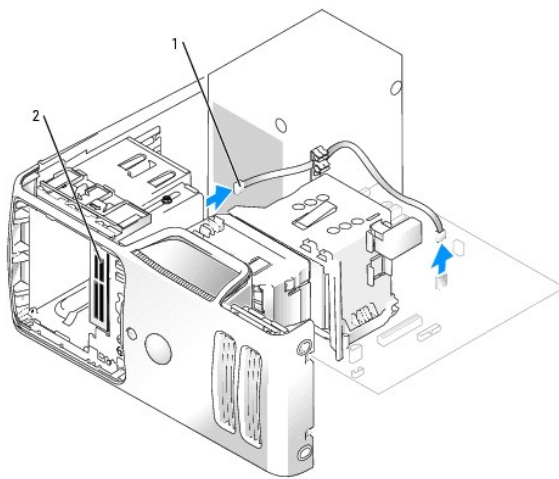
Media Card Reader

Removing a Media Card Reader

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

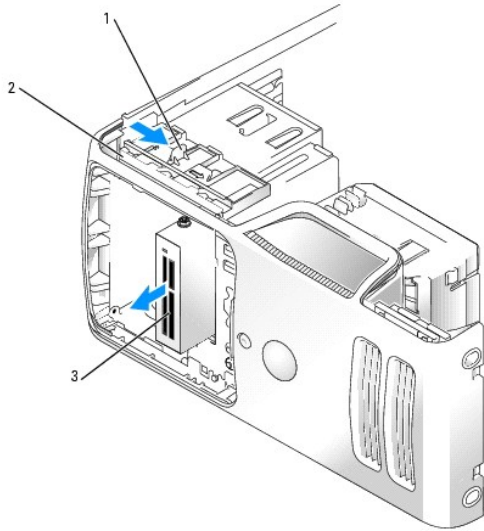
🔌 NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "[Before you Begin](#)."
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Replace the [computer cover](#).
4. Remove the [drive panel](#).



1	cables
2	Media Card Reader (not present on all computers)

5. Disconnect the cable on the back of the Media Card Reader to the front panel USB connector on the system board and route the cable through the clip on the shroud.



1	sliding plate lever
2	sliding plate
3	Media Card Reader

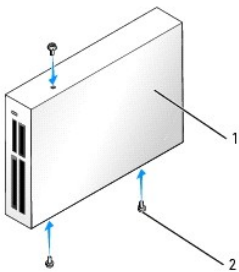
6. While pushing on the back of the drive, remove the Media Card Reader by sliding and holding the drive latch release downward.
7. Replace the [drive panel](#).
8. Replace the [computer cover](#).

Installing a Media Card Reader

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

🔌 NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "[Before you Begin](#)."



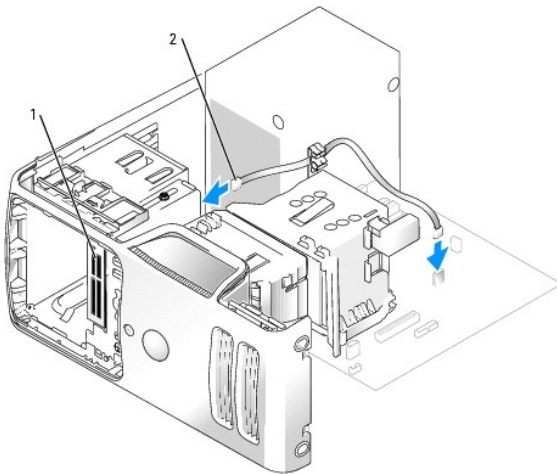
1	Media Card Reader
2	screw (3)

2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Remove the [computer cover](#).
4. Remove the [drive panel](#).

5. Remove the Media Card Reader and bracket from its packaging.
6. Ensure that the Media Card Reader is installed before the FlexBay USB cable is connected.

 **NOTE:** Connect the USB cable on the back of the Media Card Reader to the front panel USB connector on the system board.


7. Make sure the FlexBay USB cable is connected to the back of the Media Card Reader.




1	Media Card Reader
2	FlexBay cables

8. Insert the Media Card Reader by sliding and holding the drive latch release downward. Then, slide the drive in to seat it in the computer.
9. Route the USB cable through the cable routing clip.
10. Replace the [computer cover](#).

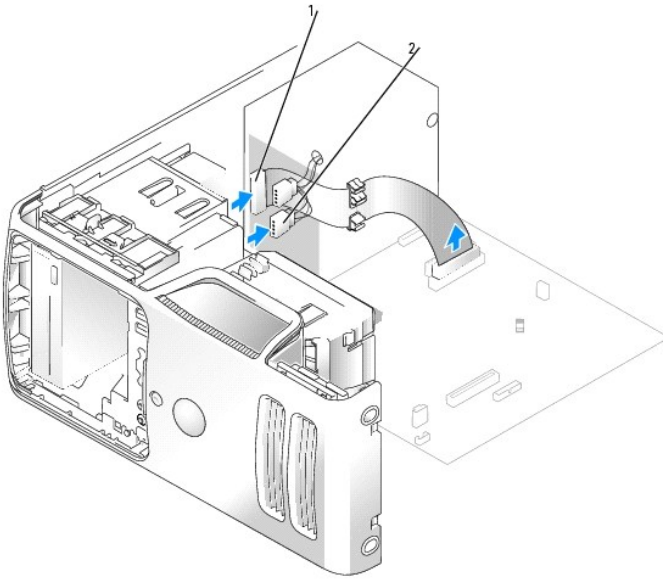
CD/DVD Drive

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

 **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

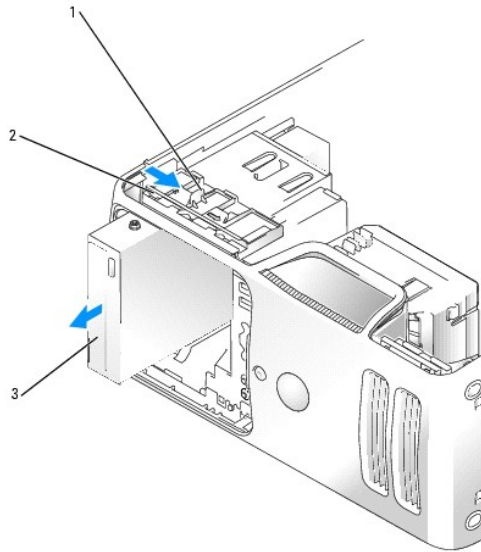
Removing a CD/DVD Drive

1. Follow the procedures in "[Before you Begin](#)."
2. Remove the [computer cover](#).
3. Remove the [drive panel](#).
4. Disconnect the power and data cables from the back of the drive.



1	data cable
2	power cable

5. Remove the CD/DVD drive by sliding and holding the drive latch release downward. Then, slide the drive out of the computer.

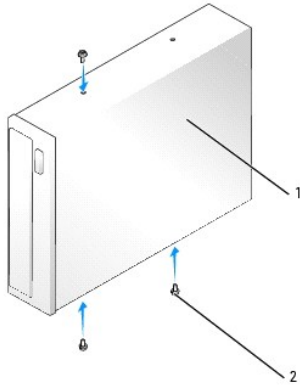


1	sliding plate lever
2	sliding plate
3	CD/DVD drive

Installing a CD/DVD Drive

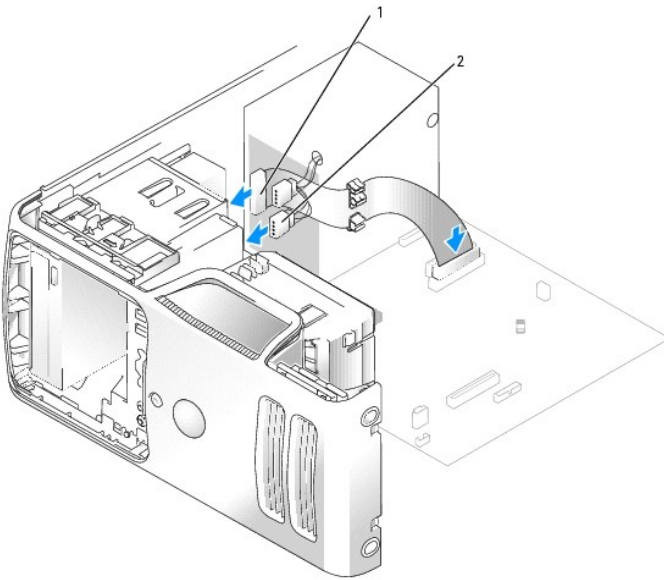
1. Follow the procedures in "[Before you Begin.](#)"
2. If you are installing a new CD/DVD drive rather than replacing a drive, remove the drive-panel inserts.
3. Gently slide the drive into place until it clicks or you feel the drive securely installed.

NOTE: If you are installing a new CD/DVD drive rather than replacing a drive, remove the drive panel inserts and slide the drive into place. Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.



1	drive
2	screw (3)

4. Connect the power and data cables to the drive.



1	data cable
2	power cable

5. Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

6. Replace the [computer cover](#).

7. Replace the [drive panel](#).

NOTICE: To connect a network cable, first plug the cable in to the network device and then plug the cable in to the computer.

8. Connect your computer and devices to their electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

9. Enter system setup and select the appropriate **Drive** option.

10. Verify that your computer works correctly by running the Dell Diagnostics.

Processor

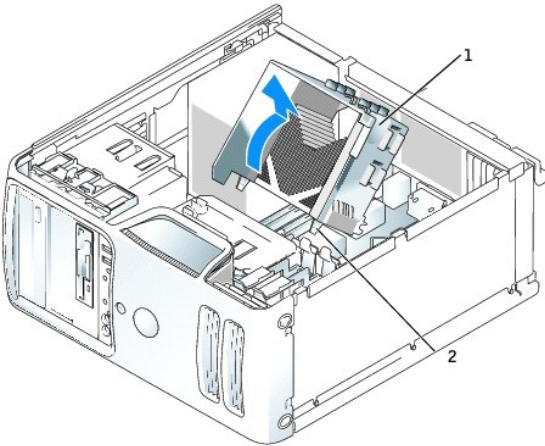
⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

Removing the Processor

1. Follow the procedures in "[Before you Begin](#)."
2. Loosen the two captive screws on each side of the heat sink assembly.

⚠ CAUTION: Despite having a plastic shield, the heat sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

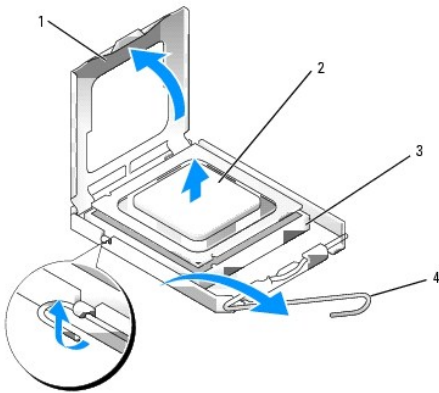
3. Rotate the heat sink assembly upward, and remove it from the computer.



1	heat sink and fan shroud assembly
2	captive screw housing (2)

🔧 NOTICE: If you are installing a processor upgrade kit from Dell, discard the original heat sink. If you are not installing a processor upgrade kit from Dell, reuse the original heat sink when you install your new processor.

4. Open the processor cover by sliding the release lever from under the center cover latch on the socket. Then, pull the lever back to release the processor.



1	processor cover
2	processor
3	socket

4 release lever

➡ **NOTICE:** When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

5. Gently remove the processor from the socket.

Leave the release lever extended in the release position so that the socket is ready for the new processor.

Installing the Processor

➡ **NOTICE:** Ground yourself by touching an unpainted metal surface on the back of the computer.

➡ **NOTICE:** When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

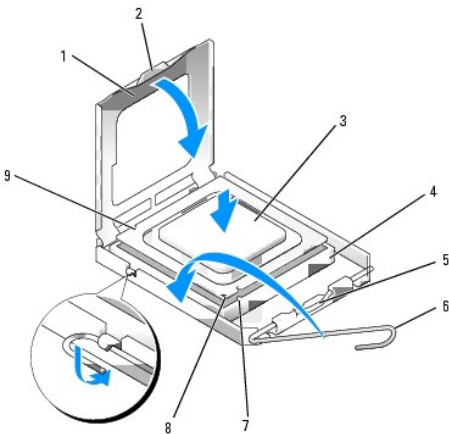
1. Unpack the new processor, being careful not to touch the underside of the processor.

➡ **NOTICE:** You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.

2. If the release lever on the socket is not fully extended, move it to that position.

3. Orient the front and rear alignment notches on the processor with the front and rear alignment notches on the socket.

4. Align the pin-1 corners of the processor and socket.



1	processor cover	6	release lever
2	tab	7	front alignment notch
3	processor	8	socket and processor pin-1 indicator
4	processor socket	9	rear alignment notch
5	center cover latch		

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

5. Set the processor lightly in the socket and ensure that the processor is positioned correctly.

6. When the processor is fully seated in the socket, close the processor cover.

Ensure that the tab on the processor cover is positioned underneath the center cover latch on the socket.

7. Pivot the socket release lever back toward the socket and snap it into place to secure the processor.

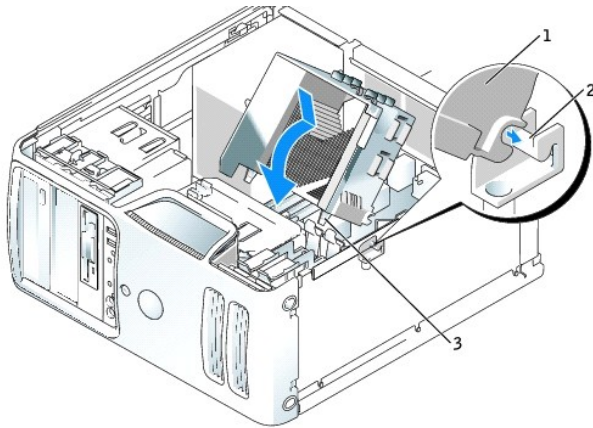
➡ **NOTICE:** If you are not installing a processor upgrade kit from Dell, reuse the original heat sink assembly when you replace the processor.

If you installed a processor replacement kit from Dell, return the original heat sink assembly and processor to Dell in the same package in which your replacement kit was sent.

8. Install the heat sink assembly:

- a. Place the heat sink assembly back onto the heat sink assembly bracket.
- b. Rotate the heat sink assembly down towards the computer base and tighten the two capture screws.

➡ **NOTICE:** Ensure that the heat sink is correctly seated and secure.



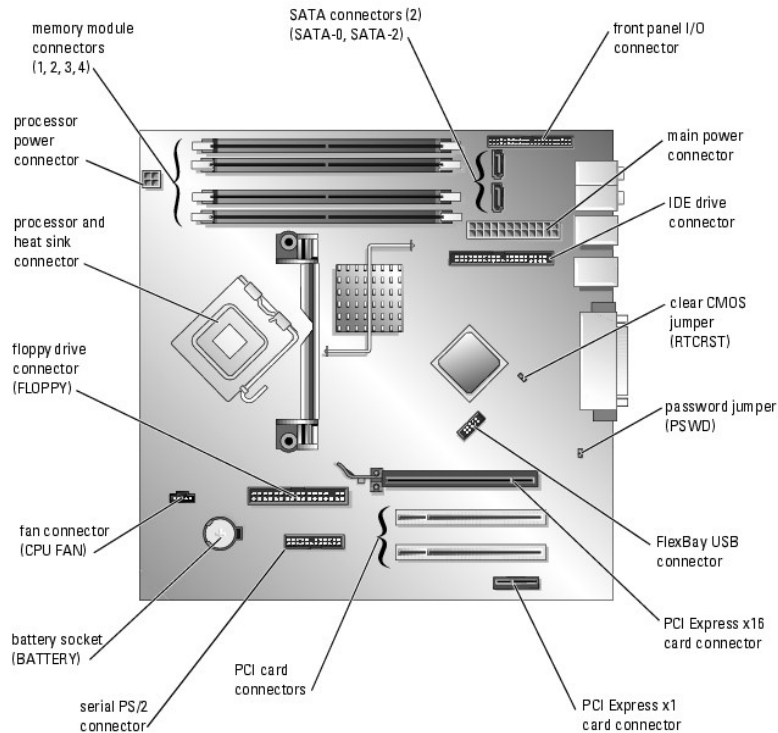
1	heat sink and fan shroud assembly
2	heat sink assembly bracket
3	captive screw housing (2)

9. Replace the [computer cover](#).

➡ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug the cable into the computer.






10. Connect your computer and devices to electrical outlets, and turn them on.

System Board



Jumper Settings

The jumper locations are shown below.

Jumper	Setting	Description
PSWD		Password features are enabled.
	(default) 	Password features are disabled.
RTCST		Real-time clock reset.
 <i>jumpered</i>  <i>unjumpered</i>		

Removing the System Board

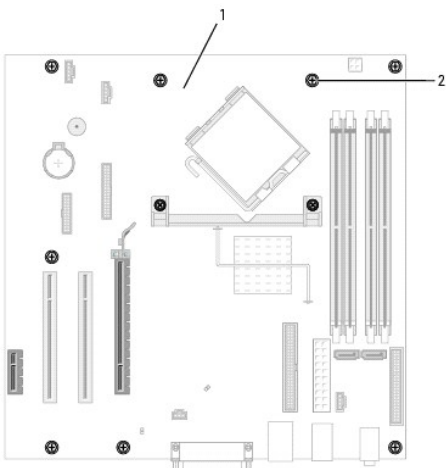
⚠ CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

👉 NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

1. Shut down the computer through the Start menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

👉 NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Disconnect any telephone or telecommunication lines from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.
5. Open the computer cover.
6. Remove any components that restrict access to the system board (CD/DVD drive(s), floppy drive, hard drive, I/O panel).
7. Remove the heat sink assembly and processor.
8. Disconnect all cables from the system board.
9. Remove the 10 screws from the system board (see illustrations below for screw locations).
10. Slide the system board assembly toward the front of the computer, and then lift the board up and away.



1	system board
2	screw (10)

11. Place the system board assembly that you just removed next to the replacement system board to ensure it is identical.

Replacing the System Board

1. Gently align the board into the chassis and slide it toward the back of the computer.
2. Replace the screws on the system board.
3. Replace any components and cables that you removed from the system board.
4. Reconnect all cables to their connectors at the back of the computer.
5. Replace the [computer cover](#).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug the cable into the computer.

6. Connect your computer and devices to electrical outlets, and turn them on.

Power Supply

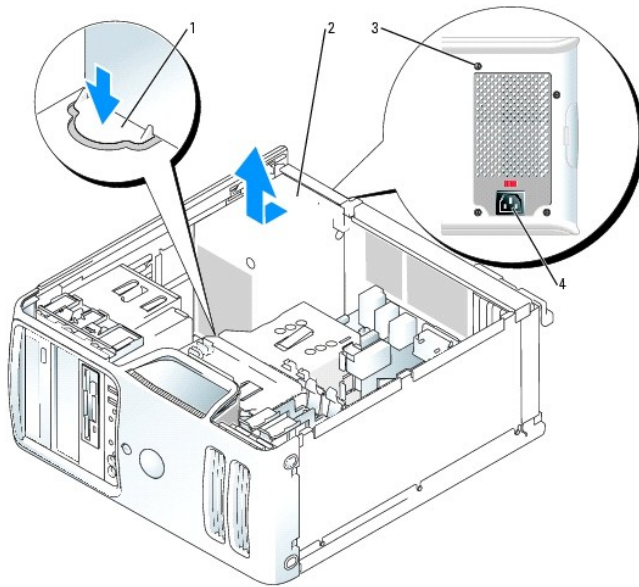
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

Removing the Power Supply

1. Follow the procedures in "[Before you Begin.](#)"
2. Disconnect the DC power cables from the system board and the drives.

Note the routing of the DC power cables underneath the tabs in the computer frame as you remove them from the system board and drives. You must route these cables properly when you replace them to prevent them from being pinched or crimped.

3. Remove the four screws that attach the power supply to the back of the computer frame.
4. Press the release button located on the floor of the computer frame.



1	release button
2	power supply
3	screws (4)
4	AC power connector

5. Slide the power supply toward the front of the computer approximately 1 inch.
6. Lift the power supply up and out of the computer.

Replacing the Power Supply

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

1. Slide the power supply into place.
2. Replace the screws that secure the power supply to the back of the computer frame.
3. Reconnect the DC power cables.
4. Connect the AC power cable to the connector.
5. Run the cables underneath the clips, and press the clips to close them over the cables.
6. Replace the [computer cover](#).

➡ NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug the cable into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

Battery

Replacing the Battery

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

➡ NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

A coin-cell battery maintains computer 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.

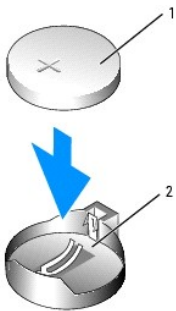
⚠ CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

To replace the battery:

1. Record all the screens in system setup so that you can restore the correct settings in [step 8](#).
2. Follow the procedures in "[Before you Begin](#)."
3. Locate the battery socket.

➡ NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, 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 carefully prying it out of its socket with your fingers or with a blunt, nonconducting object such as a plastic screwdriver.
5. Insert the new battery into the socket with the side labeled "+" facing up, and snap the battery into place.



1	battery
2	battery socket

6. Replace the [computer cover](#).

➡ NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.
8. Enter system setup and restore the settings you recorded in step 1.
9. Properly dispose of the old battery. See the *Product Information Guide* for battery disposal information.

Specifications

Dell™ Dimension™ 5000 Service Manual

Processor	
Processor type	Intel® Pentium® 4 with Hyper-Threading technology NOTE: Not all Pentium 4 processors support Hyper-Threading technology.
Level 1 (L1) cache	16 KB
Level 2 (L2) cache	1 MB (depending on your computer configuration) pipelined-burst, eight-way set associative, write-back SRAM

Memory	
Type	400- and 533-MHz DDR2 unbuffered SDRAM
Memory connectors	four
Memory capacities	256 MB, 512 MB, or 1 GB non-ECC
Maximum memory	4 GB NOTE: See " Addressing Memory With 4-GB Configurations " to verify the amount of memory available to the operating system.
BIOS address	F0000h

Computer Information	
Chipset	Intel 915G Express
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4 Mb
NIC	Integrated network interface capable of 10/100 communication
System clock	800-MHz data rate

Video	
Type	PCI Express

Audio	
Type	ADI 1986 CODEC

Expansion Bus	
Bus type	PCI 2.3 PCI Express x1 and x16
Bus speed	PCI: 33 MHz PCI Express: x1 slot bidirectional speed - 500 MB/s x16 slot bidirectional speed - 8 GB/s
PCI connectors	two

connector size	120 pins
connector data width (maximum)	32 bits
PCI Express	
connector	one x1
connector size	36 pins
connector data width (maximum)	1 PCI Express lane
PCI Express	
connector	one x16
connector size	164 pins
connector data width (maximum)	16 PCI Express lanes

Drives	
Externally accessible:	
	one 3.5-inch drive bay (FlexBay) two 5.25-inch drive bays
Available devices	Serial ATA drives (2), floppy drive, USB memory devices, CD drive, CD-RW drive, DVD drive, DVD-RW drive, and DVD and CD-RW combo drive, and media reader
Internally accessible:	two bays for 1-inch high hard drives

Connectors	
External connectors:	
Serial	9-pin connector; 16550C-compatible
Parallel	25-hole connector (bidirectional)
Video	15-hole connector
Network adapter	RJ45 connector
USB	two front-panel and five back-panel USB 2.0-compliant connectors
Audio	five connectors for line-in, line-out, microphone, surround, and center/Low Frequency Effects (LFE) channel; two front-panel connectors for headphones/microphone
System board connectors:	
Primary IDE drive	40-pin connector on PCI local bus
Serial ATA	two 7-pin connectors
FlexBay Drive	USB 10-pin header for optional floppy drive or optional Media Card Reader (3.5-inch bay devices)
Fan	one 5-pin connectors
PCI 2.3	120-pin connector
PCI Express x1	36-pin connector
PCI Express x16	164-pin connector

Controls and Lights	
Power control	push button
Power light	green light — Blinking green in sleep state; solid green for power-on state. amber light — Blinking amber indicates a problem with the power supply inside the computer. If the system cannot boot and there is a solid amber light, this indicates a problem with the system board.
Hard-drive access light	green
Link integrity light (on integrated network adapter)	green light — A good connection exists between a 10-Mbps network and the computer. orange light — A good connection exists between a 100-Mbps network and the computer. off (no light) — The computer is not detecting a physical connection to the network.

Activity light (on integrated network adapter)	yellow blinking light
Diagnostic lights	four lights on the front panel (see "Diagnostic Lights" .)
Standby power light	AUX_PWR on the system board

Power	
DC power supply:	
Wattage	305 W
Heat dissipation	434.6 BTU/hr
Voltage (see the safety instructions located in the <i>Product Information Guide</i> for important voltage setting information)	90 to 135 V and 180 to 265 V at 50/60 Hz
Backup battery	3-V CR2032 lithium coin cell

Physical	
Height	41.4 cm (16.3 inches)
Width	18.8 cm (7.4 inches)
Depth	45.7 cm (18.0 inches)
Weight	12.7 kg (28 lb)

Environmental	
Temperature:	
Operating	10° to 50°C (50° to 122°F) NOTE: At 35°C (95°F), the maximum operating altitude is 914 m (3000 ft).
Storage	-40° to 65°C (-40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 0.5 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 20 inches/sec (50.8 cm/sec)
Storage	27-G faired square wave with a velocity change of 200 inches/sec (508 cm/sec)
Altitude:	
Operating	-15.2 to 3023 m (-50 to 10,000 ft)
Storage	-15.2 to 11,115 m (-50 to 50,000 ft)

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System Setup

Dell™ Dimension™ 5000 Service Manual


- [Entering System Setup](#)
- [System Setup Options](#)
- [Boot Sequence](#)
- [Clearing Forgotten Passwords](#)
- [Clearing CMOS Settings](#)

Overview

Use system setup as follows:


- 1 To change the system configuration information after you add, change, or remove any hardware in your computer
- 1 To set or change a user-selectable option such as the user password
- 1 To read the current amount of memory or set the type of hard drive installed

Before you use system setup, it is recommended that you write down the system setup screen information for future reference.

 **NOTICE:** Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo is displayed, you must watch for the F2 prompt to appear.
3. Once this F2 prompt appears, press <F2> immediately.

 **NOTE:** The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2>. If you press <F2> before you are prompted, this keystroke will be lost.

4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then, shut down your computer and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the options list, active options field, and key functions.

Options List — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.


Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the **Option Field** displays more information about that option and the option's current and available settings. By pressing <Enter> or the left and right arrow keys, you can toggle between a primary topic (collapsed) and subtopics (expanded).

Option Field — This field contains information about each option. In this field you can view your current settings and make changes to your settings.

Use the right and left arrow keys to highlight an option. Press <Enter> to make that selection active.

Key Functions — This field appears below the **Option Field** and lists keys and their functions within the active system setup field.

System Setup Options

 **NOTE:** Depending on your computer and installed devices, the items listed in this section may not appear, or may not appear exactly as listed.

System	
CPU Info	Identifies whether the computer's processor supports Hyper-Threading and lists the processor bus speed, processor ID, clock speed, and L2 cache.
Memory Info	Indicates amount of installed memory, memory speed, channel mode (dual or single), and type of memory installed.
Date/Time	Displays current date and time settings.
Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list. NOTE: If you insert a boot device and restart the computer, this option appears in the system setup menu. To boot from a USB memory device, select the USB device and move it so it becomes the first device in the list.
Drives	
Diskette Drive	Identifies and defines the floppy drive attached to the FLOPPY connector on the system board as Off , USB , Internal , or Read Only .
Drives 0 through 3	Identifies the drives attached to the SATA connectors on the system board, and lists the capacity for hard drives.
SATA Operation	Hard-drive controller feature that provides two configuration settings: Normal – native mode, which provides the highest drive performance and optimal flexibility. Combination – combination mode, which offers compatibility with versions of the operating system that do not support SATA drives.
Onboard Devices	
Integrated NIC Controller	You can set the NIC to On (default), Off , or On w/ PXE . When the On w/ PXE setting is active (available only for the future boot process), the computer prompts you to press <Ctrl><Alt>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.
Integrated Audio Controller	Enables or disables the onboard audio controller.
USB Controller	Set to On (default) so that USB devices will be detected and supported in the operating system.
USB for FlexBay	This field enables and disables the internal USB for FlexBay. Off = Internal USB for FlexBay is disabled. On = Internal USB for FlexBay is disabled. The factory default setting is On . NOTE: This USB option appears only if a FlexBay device is installed.
LPT Port Mode	Identifies and defines the parallel port settings. You can set the parallel port to Off , AT , PS/2 , EPP , or ECP .
LPT Port Address	Identifies the address for the parallel port.
LPT Port DMA	Identifies and defines the parallel port DMA settings. You can set the parallel port DMA to Off , DMA1 , or DMA3 .
Serial Port #1	Identifies and defines the serial port settings. Auto , the default setting, automatically configures a connector to a particular designation (COM1 or COM3).
Serial Port #2 (optional)	Identifies and defines the serial port settings. Auto , the default setting, automatically configures a connector to a particular designation (COM2 or COM4).
PS/2 Mouse Port (optional)	Enables or disables the onboard PS/2-compatible mouse controller.
Video	

Primary Video	This setting specifies which video controller is primary when two video controllers are present on the computer.
Video Memory Size	Offering selectable options of 1MB and 8MB, this field configures the system memory allocation reserved for the integrated video controller.
Performance	
HyperThreading	If your computer's processor supports Hyper-Threading, this option appears in the Options List.
Hard Drive Acoustics	<ul style="list-style-type: none"> 1 Bypass (default) — Your computer does not test or change the current acoustics mode setting. 1 Quiet — The hard drive operates at its most quiet setting. 1 Suggested — The hard drive operates at the level suggested by the drive manufacturer. 1 Performance — The hard drive operates at its maximum speed. <p>NOTE: Switching to performance mode will cause the drive heads to move faster, causing the hard drive to be noisier. However, some drives may not see an increase in data transfer rates.</p> <p>NOTE: Changing the acoustics setting does not alter your hard drive image.</p>
Security	This section displays available system security options.
Admin Password	This option provides restricted access to the computer's system setup program in the same way that access to the system can be restricted with the System Password option.
System Password	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Status	This option locks the system password field with the setup password. When the field is locked, you can no longer disable password security by pressing <Ctrl><Enter> when the computer starts.
Power Management	
AC Recovery	Determines what happens when AC power is restored to the computer.
Auto Power On	<p>Sets the computer to automatically turn on. Choices are every day or every Monday through Friday.</p> <p>The default setting is Off.</p> <p>This feature does not work if you turn off your computer using a power strip or surge protector.</p>
Auto Power Time	<p>Sets time to automatically turn on the computer.</p> <p>Time is kept in the standard 12-hour format (<i>hours:minutes</i>). Change the startup time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields.</p> <p>This feature does not work if you turn off your computer using a power strip or surge protector.</p>
Low Power Mode	When Low Power Mode is selected, remote wakeup events no longer power up from Hibernate or Off .
Remote Wake Up	<p>This option allows the computer to power up when a NIC or Remote Wakeup-capable modem receives a wake up signal.</p> <p>On is the default setting. On w/ Boot to NIC allows the computer to attempt to boot from a network prior to using the boot sequence.</p> <p>NOTE: Normally, the system can be powered up remotely from suspend mode, hibernate mode, or when powered off. When Low Power Mode (in the Power Management menu) is enabled, the computer can only be powered up remotely from Suspend.</p>
Suspend Mode	The options are S1 , a suspend state where the computer is running in a low-power mode, and S3 , a standby state where the power is reduced or turned off for most components, however, system memory remains active.


Maintenance	
CMOS Defaults	This setting restores the computer's default settings.
Event Log	Displays the system event log.
POST Behavior	
Fastboot	When set to On (default), your computer starts more quickly because it skips certain configurations and tests.
Numlock Key	This option involves the rightmost bank of keys on your keyboard. When set to On (default), this option activates the numeric and mathematical features shown at the top of each key. When set to Off , this option activates the cursor-control functions labeled on the bottom of each key.
POST Hotkeys	This option allows you to specify the function keys to display on the screen when the computer starts.
Keyboard Errors	This option disables or enables keyboard error reporting when the computer starts.

Boot Sequence

This feature allows you to change the boot sequence for devices.


Option Settings

1. **Diskette Drive** — The computer attempts to boot from the floppy drive. If the floppy disk in the drive is not bootable, if no floppy disk is in the drive, or if there is no floppy drive installed in the computer, the computer generates an error message.
1. **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
1. **CD Drive** — The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer generates an error message.
1. **USB Flash Device** — Insert the memory device into a USB port and restart the computer. When **F12 = Boot Menu** appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.

 **NOTE:** To boot to a USB device, the device must be bootable. To make sure that your device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer to a USB device such as a floppy drive, memory key, or CD-RW drive.


 **NOTE:** If you are booting to a USB floppy drive, you must first set the floppy drive to OFF in system setup.

1. If you are booting to a USB device, connect the USB device to a USB connector.
2. Turn on (or restart) your computer.
3. When **F2 = Setup**, **F12 = Boot Menu** appears in the upper-right corner of the screen, press <F12>.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then shut down your computer and try again.


The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.

4. At the bottom of the menu, enter the number of the device that is to be used for the current boot only.
For example, if you are booting to a USB memory key, highlight **USB Flash Device** and press <Enter>.

 **NOTE:** To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

1. Enter system setup.
2. Use the arrow keys to highlight the **Boot Sequence** menu option and press <Enter> to access the menu.

 **NOTE:** Write down your current boot sequence in case you want to restore it.

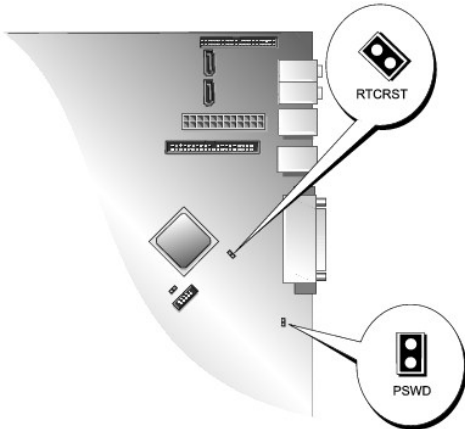
3. Press the up- and down-arrow keys to move through the list of devices.

4. Press the spacebar to enable or disable a device (enabled devices have a checkmark).
 5. Press plus (+) or minus (-) to move a selected device up or down the list.
-

Clearing Forgotten Passwords

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

1. Follow the procedures in "[Before you Begin.](#)"



2. Locate the 2-pin password jumper (PSWD) on the system board, and attach the jumper plug to pins 1 and 2 to clear the password.

🔧 NOTE: When you receive your computer, the jumper plug is attached to pin 1.

3. Close the computer cover.
4. Connect your computer and monitor to electrical outlets, and turn them on.
5. After the Microsoft® Windows® desktop appears on your computer, shut down the computer.
6. Turn off the monitor and disconnect it from the electrical outlet.
7. Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.
8. Open the computer cover.
9. Locate the 2-pin password jumper (PSWD) on the system board and attach the jumper to pin 1 to reenble the password feature.
10. Close the computer cover.

➡ NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.
-


Clearing CMOS Settings

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

1. Follow the procedures in "[Before you Begin.](#)"

2. Reset the current CMOS settings:
 - a. Locate the 2-pin CMOS jumper (RTCRST) on the system board.
 - b. Remove the jumper plug from pin 1.
 - c. Place the jumper plug on pins 1 and 2 and wait approximately five seconds.
 - d. Replace the jumper plug on pin 1.

3. Close the computer cover.

 **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

4. Connect your computer and devices to electrical outlets, and turn them on.

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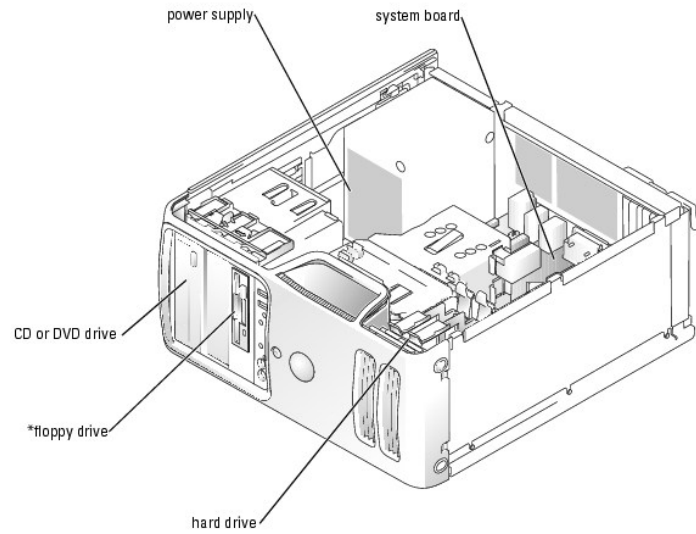
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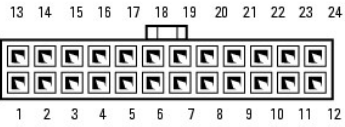
- [Inside View of Your Computer](#)
 - [System Board Components](#)
 - [Power Supply DC Connector Pin Assignments](#)
-

Inside View of Your Computer



*May not be present on all computers.

System Board Components



Pin Number	Signal Name	18-AWG Wire
1	+3.3 VDC	Orange
2	+3.3 VDC	Orange
3	COM	Black
4		Red
5		Black
6		Red
7		Black
8		Gray
9		Purple
10		Yellow
11		Orange
12		Blue
13		Black
14		Green
15		Black
16		Black
17		Black
18		N/C
19		Red
20		Red




*Sense connector.

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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 the *Dell Dimension Help* file.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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Model DCSM

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