Dell™ Dimension™ 5100 Service Manual

Before You Begin
Removing the Computer Cover
About Your Dell™ Dimension™ 5100 Computer
Advanced Troubleshooting
Removing and Installing Parts
Replacing the Computer Cover
Specifications
Technical Overview
System Setup

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.

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

October 2005 Rev. A01

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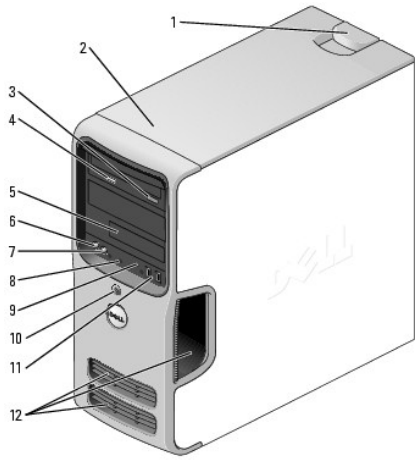
About Your Dell™ Dimension™ 5100 Computer

Dell™ Dimension™ 5100 Service Manual

- Front View of the Computer
- Back View of the Computer

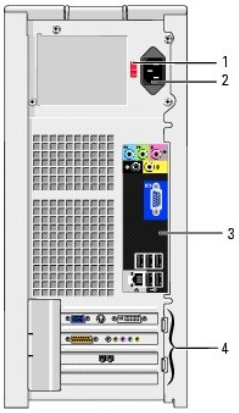
Front View of the Computer



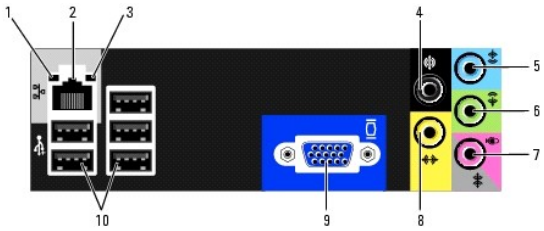
1	cover latch release	Use this latch to remove the computer cover.
2	location of Service Tag	Use the Service Tag to identify your computer when you access the Dell Support website or call technical support.
3	CD or DVD eject button	Press to eject a disk from the CD or DVD drive.
4	CD or DVD activity light	The drive light is on when the computer reads data from the CD or DVD drive.
5	FlexBay	Can contain an optional floppy drive or optional Media Card Reader. For more information about the Media Card Reader, see your computer *Owner's Manual*.
6	microphone connector	Use the microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, the microphone connector is on the card.
7	headphone connector	Use the headphone connector to attach headphones.
8	diagnostic lights (4)	Use the lights to help you troubleshoot a computer problem based on the diagnostic code. For more information, see "Diagnostic Lights."
9	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.
10	power button, power light	Press the power button to turn on the computer. The power light in the center of this button indicates the power state. See "Specifications" for more information. **NOTICE:** To avoid losing data, do not use the power button to turn off the computer. Instead, perform an operating system shutdown.
11	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, keyboards, and mice, or for bootable USB devices, which may not function properly if attached to the front connectors.
12	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: Do not lift or carry the computer by the vents to avoid damage to the computer. **NOTICE:** Keep the vent area clean and dust-free to ensure that the computer is adequately ventilated. Use only a dry cloth to clean the vent area to avoid water damage to the computer.

Back View of the Computer



1	voltage selection switch (may not be available on all computers)	See the safety instructions in the *Product Information Guide* for more information.
2	power connector	Insert the power cable.
3	back panel connectors	Plug USB, audio, and other devices into the appropriate connector.
4	card slots	Access connectors for any installed PCI and PCI Express cards.



1	link integrity light	• Green — A good connection exists between a 10-Mbps network and the computer. • Orange — A good connection exists between a 100-Mbps network and the computer. • Off — The computer is not detecting a physical connection to the network.
2	network adapter connector	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 the back panel of your computer. A click indicates that the network cable has been securely attached. **NOTE:** Do not plug a telephone cable into the network connector. On computers with a network connector card, use the connector on the card. 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.
3	network activity light	Flashes a yellow light when the computer is transmitting or receiving network data. A high volume of network traffic may make this light appear to be in a steady "on" state.

4	surround connector	Use the black surround connector to attach multichannel-capable speakers.
5	line-in connector	Use the blue line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. On computers with a sound card, use the connector on the card.
6	line-out connector	Use the green line-out connector (available on computers with integrated sound) to attach headphones and most speakers with integrated amplifiers. On computers with a sound card, use the connector on the card.
7	micro-phone/side surround connector	Use the pink and silver connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, the microphone connector is on the card. The side-surround output provides enhanced surround audio for computers with 7.1 speakers.
8	center/subwoofer connector	Use the yellow connector to attach a speaker to a Low Frequency Effects (LFE) audio channel.
9	VGA video connector	If your monitor has a VGA connector, plug it into the VGA connector on the computer.
10	USB 2.0 connectors (5)	Use the back USB connectors for devices that typically remain connected, such as printers, keyboards, and mice, or for bootable USB devices which may not function properly if attached to the front connectors (see "System Setup" for more information on booting to a USB device) It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras.

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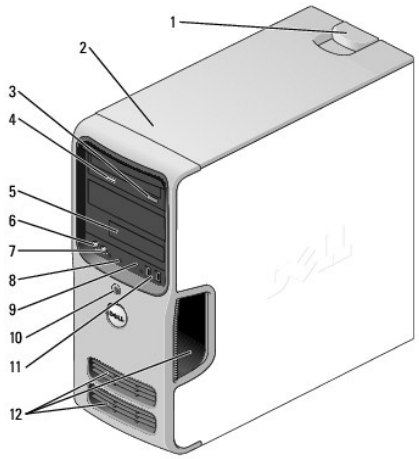

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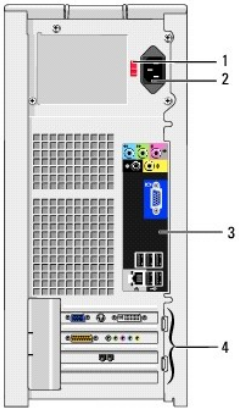

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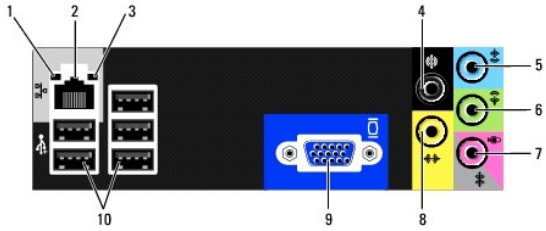

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Before You Begin

Dell™ Dimension™ 5100 Service Manual

- 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:

- You have performed the steps in "Turning Off Your Computer" and "Before Working Inside Your Computer."
- You have read the safety information in your Dell™ *Product Information Guide.*
- 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:

- Small flat-blade screwdriver
- Phillips screwdriver
- 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 port or device.

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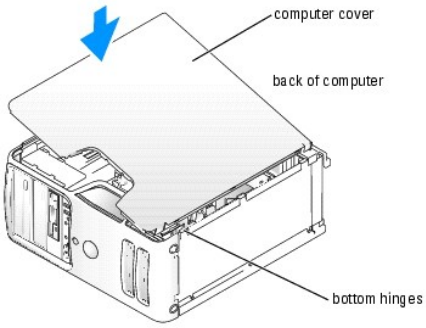
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Ensure that all cables are connected, and fold cables out of the way.
2. Ensure that no tools or extra parts are left inside the 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 press down to close it.



5. 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 port or device and then plug it into the computer.

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

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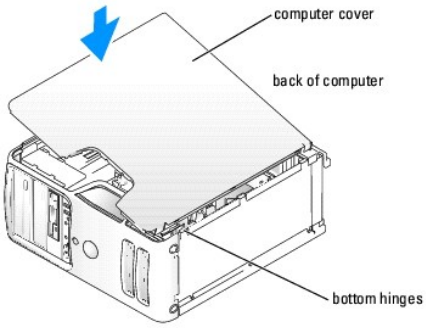

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Removing the Computer Cover

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

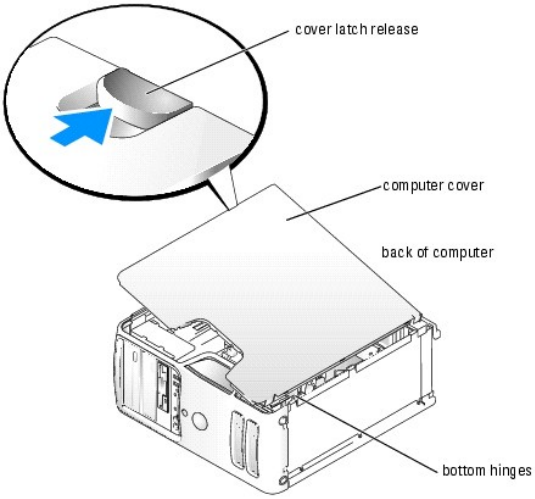
1. Follow the procedures in "Before You Begin."

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 located on the top panel.



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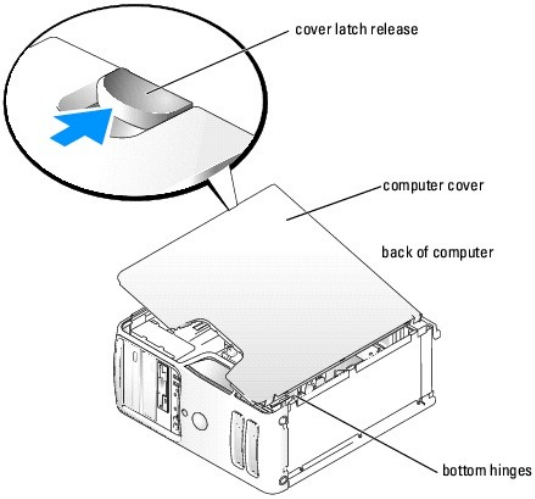

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Removing and Installing Parts

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Memory	CD/DVD Drive
Cards	Heat-Sink Assembly
Drive Panel	Processor
Front Panel	Fan Assembly
Drives	Front I/O Panel
Hard Drive	System Board
Floppy Drive	Power Supply
Media Card Reader (Optional)	

Memory

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

Your computer supports DDR2 memory. For additional information on the type of memory supported by your computer, see your *Owner's Manual*.

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

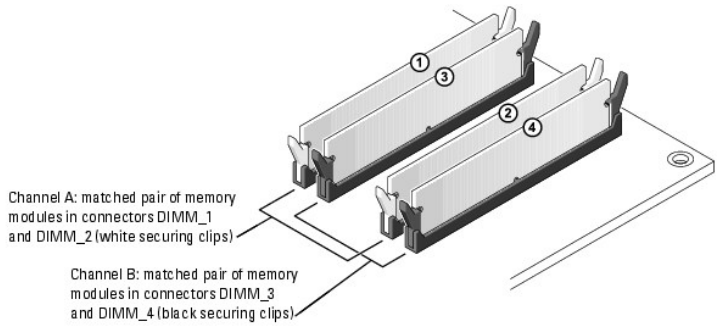
or

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

NOTICE: Do not install ECC or buffered memory modules. Only unbuffered, non-ECC memory is supported.

NOTE: If you install DDR2 667-MHz memory, the speed is reduced to 533 MHz.

- 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.
- 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.

NOTICE: 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.

Removing Memory

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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. Remove the computer cover.
3. Press out the securing clip at each end of the memory module connector.
4. 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.

Installing Memory

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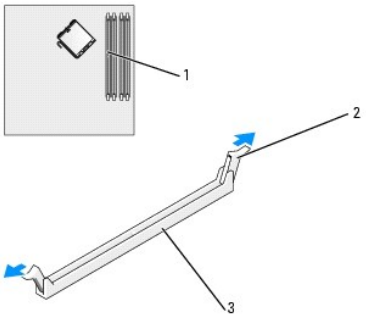
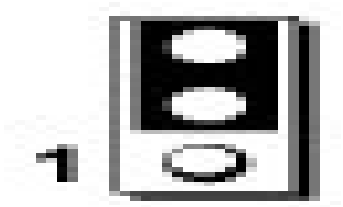
3. Press out the securing clip at each end of the memory module connector.



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

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

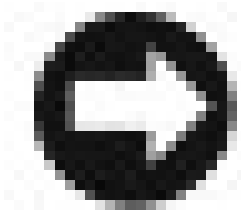


1	notch
2	memory module
3	cutouts (2)
4	crossbar

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 port or device and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.
8. When a message appears, stating that memory size has changed, press <F1> to continue.
9. Log on to your computer.
10. Right-click the **My Computer** icon on your Microsoft® Windows® desktop and click **Properties**.
11. Click the **General** tab.
12. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Cards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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:

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

PCI Cards

Your computer supports two PCI cards.

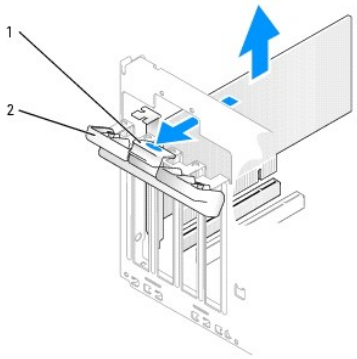
If you are installing or replacing a card, follow the procedures in the next section. If you are removing but not replacing a PCI card, see "Removing a PCI Card."

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."
2. Remove the computer cover.



1	release tab
2	card retention door

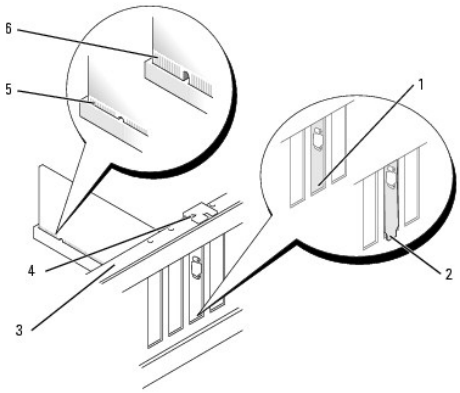
3. Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.
4. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 6.
5. If you are replacing a card that is already installed in the computer, remove the card.

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

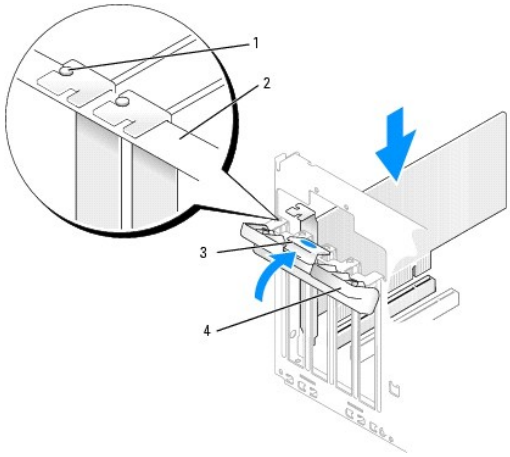
CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

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



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

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



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

9. 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.

10. 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 port or device and then plug it into the computer.

11. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

12. 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.

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

a. Enter system setup, select **Integrated NIC,** 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.

14. 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. Remove the computer cover.
3. 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.
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 (see your *Owner's Manual* for information about how to 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. Close the card retention door by snapping it into place to secure the card(s).

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

6. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
7. Remove the card's driver from the operating system.
8. 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.
9. If you removed an add-in network connector:
   a. Enter system setup, select **Integrated NIC**, 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.

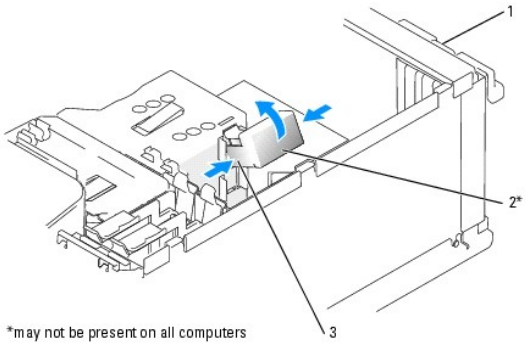
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see "Removing a PCI Express Card."

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."
2. Remove the computer cover.



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

3. 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.

4. If your computer includes a card retention mechanism, to secure the x16 card in place from the top:

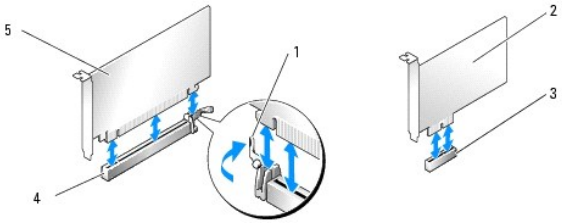
   a. Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.

   b. Set the retention mechanism aside in a secure location.

5. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 6.

6. 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 computer includes a card 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	securing tab	4	PCI Express x16 card slot
2	PCI Express x1 card	5	PCI Express x16 card
3	PCI Express x1 card slot		

7. Prepare the card for installation.

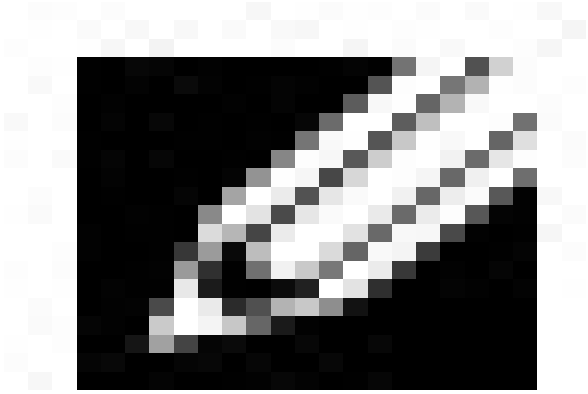
   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

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.

8. 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.

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

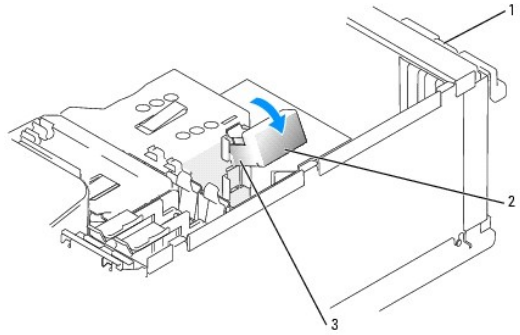


1	bracket within slot	4	alignment guide
2	bracket caught outside of slot	5	fully seated card
3	alignment bar	6	not fully seated card

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

11. Before replacing the card retention mechanism, ensure that:
    - The tops of all cards and filler brackets are flush with the alignment bar.
    - The notch in the top of the card or filler bracket fits around the alignment guide.

12. 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 port or device and then plug it into the computer.

13. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

14. 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.

15. If you installed an add-in network adapter and want to disable the integrated network adapter:
    a. Enter system setup, select **Integrated NIC,** 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.

16. 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. Remove the computer cover.
3. 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.
4. 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.
5. 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 (see your *Owner's Manual* for information about how to 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.

NOTE: When you install a filler bracket, ensure that the bracket is seated correctly.

6. Reseat the card retention mechanism in the tabs and pivot downward to snap it into place.
7. 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 port or device and then plug it into the computer.

8. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
9. Remove the card's driver from the operating system.
10. 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.
11. If you removed an add-in network connector:
    a. Enter system setup, select **Integrated NIC**, and then change the setting to **On**.
    b. Connect the network cable to the integrated connector on the back panel of the computer.
12. Install any drivers required for the card as described in the card documentation.

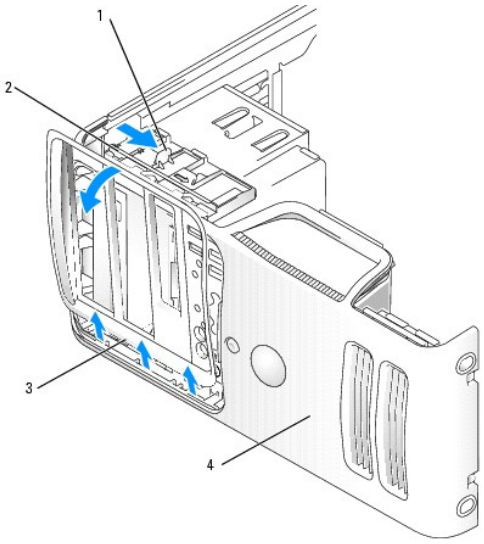
Drive Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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."
2. Remove the computer cover.



1	sliding plate lever	3	drive panel
2	sliding plate	4	front panel

3. Grasping the sliding plate lever, slide and hold the sliding plate until the drive panel snaps open.

NOTE: The sliding plate secures and releases the drive panel and helps to secure the drives.

4. Pivot the drive panel outward and lift away from the computer.

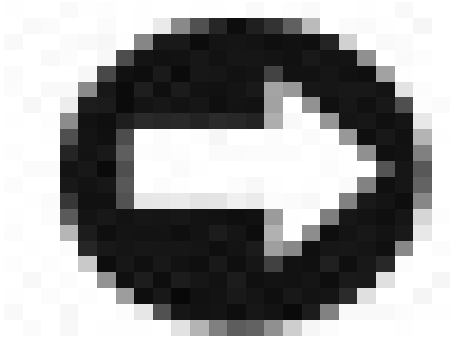
5. Set the drive panel aside in a secure location.

Removing the Drive-Panel Insert

1. Follow the procedures in "Before You Begin."

2. Remove the computer cover.

3. Remove the drive panel.



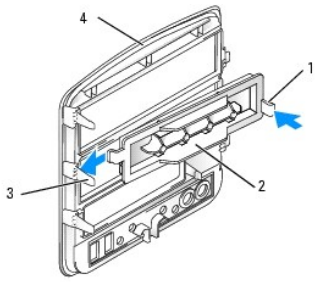
1	drive-panel insert tab
2	drive-panel insert
3	drive panel

1. Turn the drive panel sideways and find the tip of the drive-panel insert tab that latches over a tab on the right side of the drive panel.

2. Pull the inner tip of the drive-panel insert tab away from the drive panel.

3. Pivot the drive-panel insert out and away from the drive panel.
4. Set the drive-panel insert aside in a secure location.

Replacing the Drive-Panel Insert

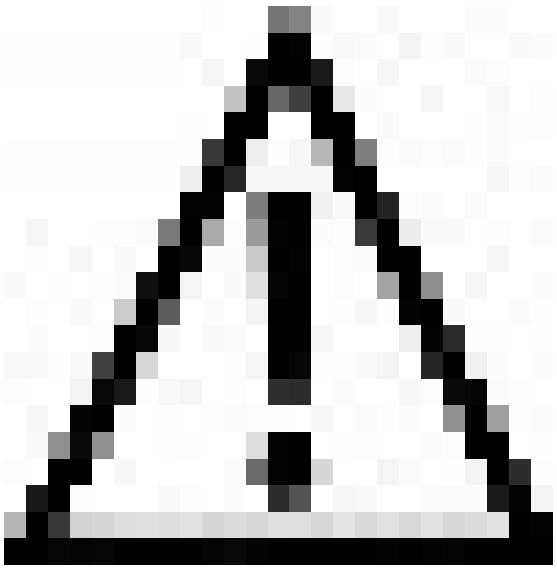


1	drive-panel insert tab	3	center drive-panel tab
2	drive panel insert	4	drive panel

1. Slide the tab on the left side of the drive-panel insert under the center-drive panel tab.
2. Rotate the drive-panel insert into place and snap the drive-panel insert tab over the corresponding tab on the drive panel.

Replacing the Drive Panel

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover if you have not already done so.
3. If you are installing a replacement drive panel, remove the old drive panel.



1	sliding plate lever	3	drive panel
2	sliding plate	4	front panel

4. Align the drive panel tabs with the side-door hinges.
5. Rotate the drive panel toward the computer until it snaps into place on the front panel.

Front Panel

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

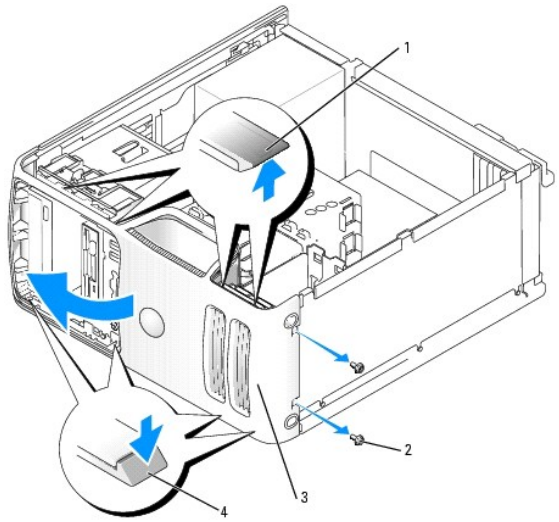
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

Removing the Front Panel

1. Remove the computer cover.
2. Remove the drive panel.
3. Remove the hard drive and second hard drive, if applicable.
4. Remove the two front-panel screws.

NOTICE: Use care when handling the front-panel release tabs to avoid damaging them.

5. Using a small, flat-blade screwdriver, press the four top front-panel release tabs upwards and press down on the four bottom release tabs to loosen the front panel.
6. Starting from the bottom of the front panel, pivot the panel toward the top of the computer and remove the panel.

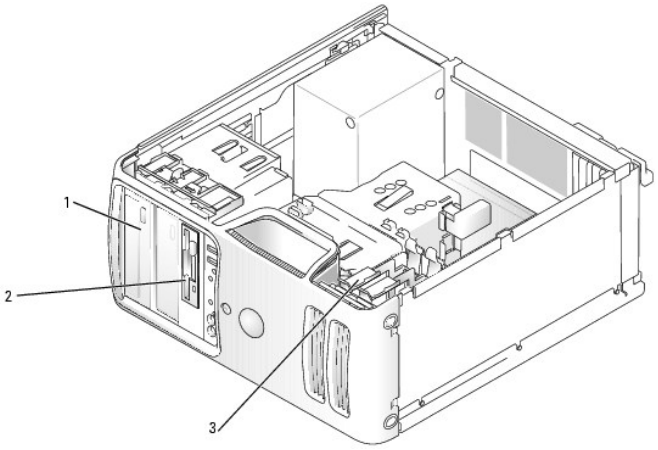


1	top front-panel release tabs (4)
2	front-panel screws (2)
3	front panel
4	bottom front-panel release tabs (4)

Drives

Your computer supports a combination of these devices:

- Up to two serial ATA hard drives
- One FlexBay drive (may contain an optional floppy drive or an optional Media Card Reader)
- Up to two CD or DVD drives



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

Connect CD/DVD drives to the connector labeled "IDE1" 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 and Disconnecting Drive Interface Cables

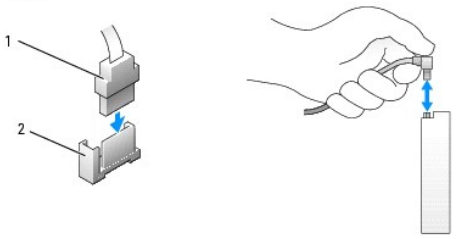
When you install a drive, you connect two cables—a DC power cable and a data cable—to the back of the drive and to the system board.

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

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.

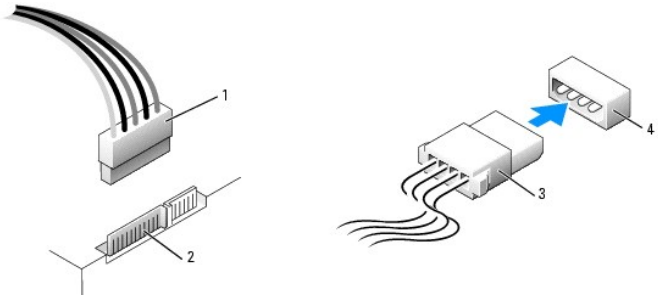
Table 1-1. Serial ATA



1	interface cable
2	interface connector

Power Cable Connector

To connect a drive using the power cable, locate the power connector on the power supply.



1	SATA power cable connector	3	power cable connector
2	power connector	4	power connector

Hard Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

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.

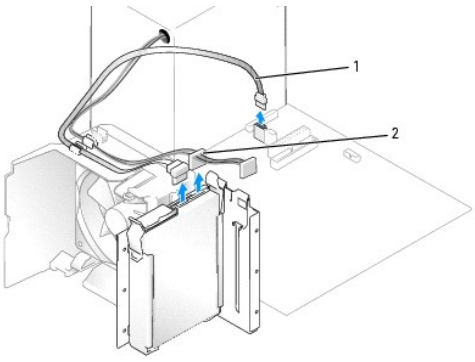
Check the documentation for the drive to verify that it is configured for your computer.

Removing a Hard Drive

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.

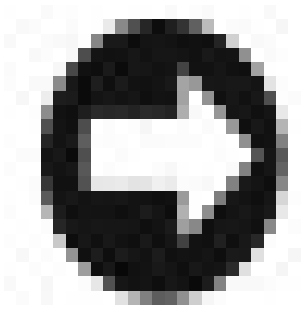
NOTICE: Use the pull-tab to remove the data cable from your hard drive or from the system board.

3. Disconnect the power and data cables from the drive.



1	serial ATA data cable
2	power cable

4. Press the blue tabs on either side of the hard drive bracket toward each other and slide the drive up and out of the computer.

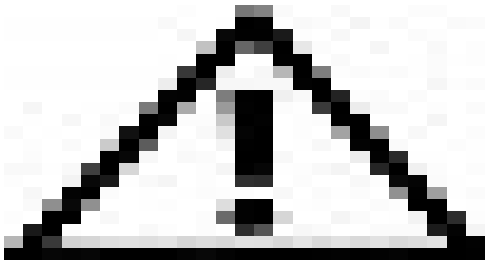


1	hard drive
2	tabs (2)

Installing a Hard Drive

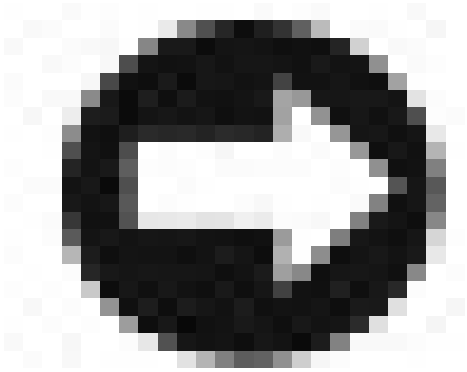
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. If you are installing a replacement hard drive, remove the old hard drive.
4. Unpack the replacement hard drive, and prepare it for installation.
5. Check the documentation for the drive to verify that it is configured for your computer.

NOTE: If your replacement hard drive does not have the hard drive 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	hard drive bracket

6. Gently slide the drive into place until you feel a click or feel the drive securely installed.
7. Connect the power and hard-drive cables to the drive.



1	serial ATA data cable

2	power cable

8. Check all connectors to be certain that they are properly cabled and firmly seated.
9. Replace the computer cover.

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

10. 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

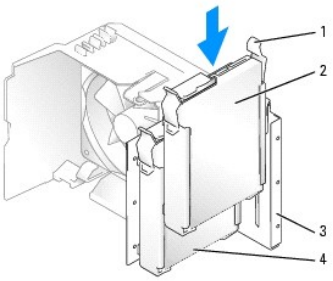
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

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 computer cover.
4. Press the blue release tabs on each side of the hard drive bracket toward each other and slide the drive up and out of the computer.
5. Snap the bracket onto the hard drive.
6. Gently slide the new drive (the second hard drive) into place until you feel a click or feel the drive securely installed.



1	release tabs (2)	3	hard drive bay
2	second hard drive in lower bay	4	primary hard drive in upper bay

7. Connect a power cable to the drive.
8. 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 in the *Product Information Guide*.

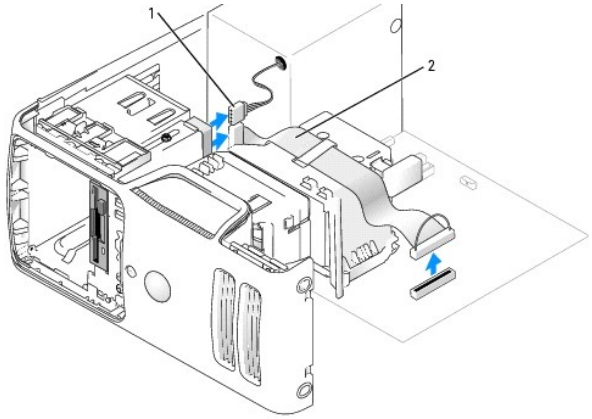
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: To 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.

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 computer cover.
3. Remove the drive panel.

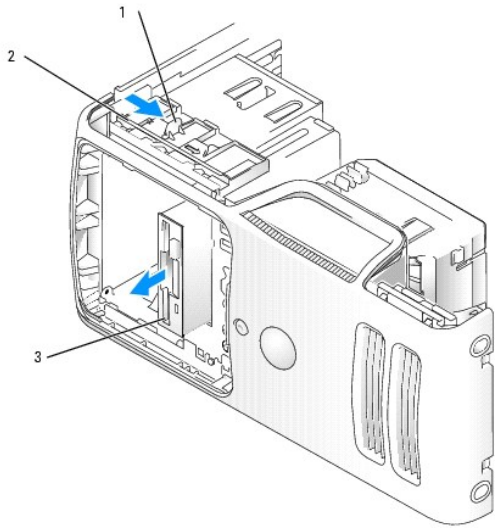


1	power cable
2	data cable

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

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

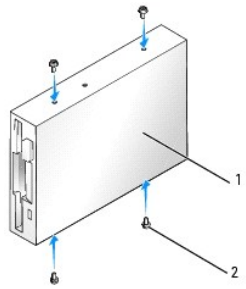
5. Slide the sliding plate lever toward the bottom of the computer and, without releasing the sliding plate lever, slide the floppy drive out through the front of the computer.



1	sliding plate lever
2	sliding plate
3	floppy drive

Installing a Floppy Drive

NOTE: If the new floppy drive does not include shoulder screws, use the screws within the drive panel insert.

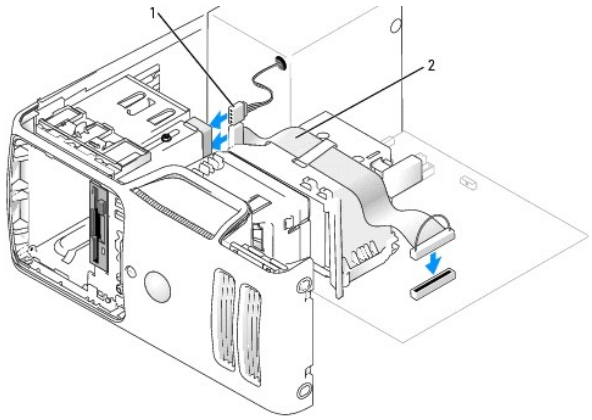


1	drive
2	screws (4)

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the drive panel.

NOTE: If you are installing a new drive, you need to remove the drive-panel insert.

4. Slide the drive into place until you feel a click or feel the drive securely installed.
5. Attach the power and data cables to the floppy drive.
6. Connect the other end of the data cable to the connector labeled "DSKT2" on the system board and route the cable through the clip on the shroud.



1	power cable
2	data cable

7. Check all cable connections and fold cables out of the way to avoid blocking the fan and cooling vents.
8. Replace the drive panel.
9. Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable in to the network port or device and then plug it 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 (Optional)

For information about using a Media Card Reader, see your *Owner's Manual*.

Removing a Media Card Reader

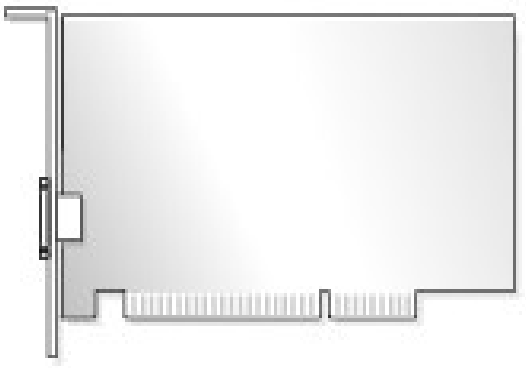
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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."

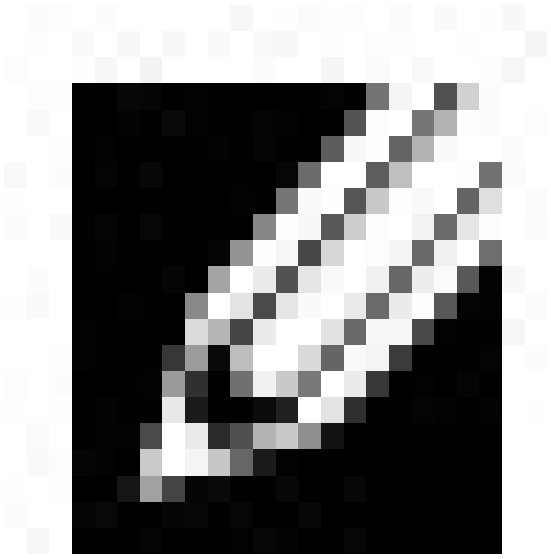
2. Remove the computer cover.

3. Remove the drive panel.



1	cable
2	Media Card Reader

4. Disconnect the FlexBay USB cable on the back of the Media Card Reader from the Media Card Reader connector on the system board and route the cable through the cable routing clip.



1	sliding plate lever
2	sliding plate
3	Media Card Reader

5. Slide the sliding plate toward the bottom of the computer and, without releasing the sliding plate, slide the Media Card Reader out through the front of the computer.

6. Replace the drive panel.

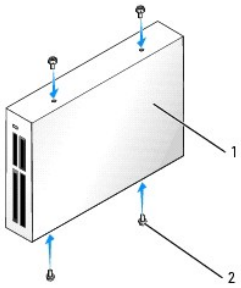
7. Replace the computer cover.

Installing a Media Card Reader

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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	screws (4)

2. Remove the computer cover.

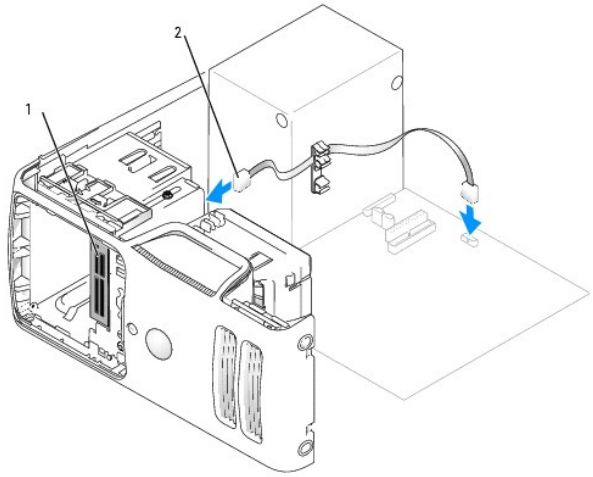
3. Remove the drive panel.

4. Remove the Media Card Reader and bracket from its packaging and ensure that all of the screws are included.

5. Slide the Media Card Reader into place until you feel a click or feel the drive securely installed.

NOTE: Ensure that the Media Card Reader is installed before the FlexBay cable is connected.

6. Connect the FlexBay USB cable to the back of the Media Card Reader and to the Media Card Reader connector on the system board.



1	Media Card Reader
2	FlexBay USB cable

7. Route the FlexBay USB cable through the cable routing clip.
8. Replace the drive panel.
9. Replace the computer cover.

CD / DVD Drive

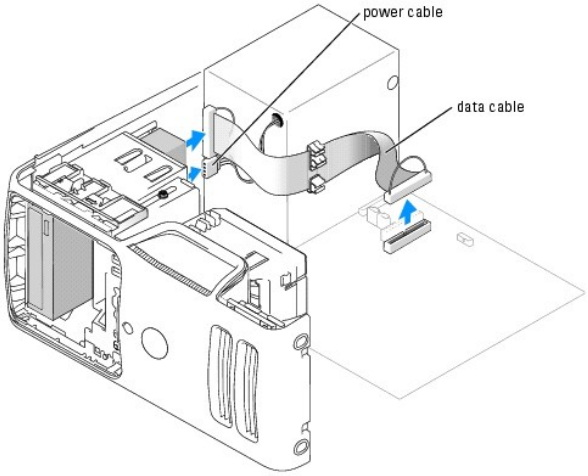
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

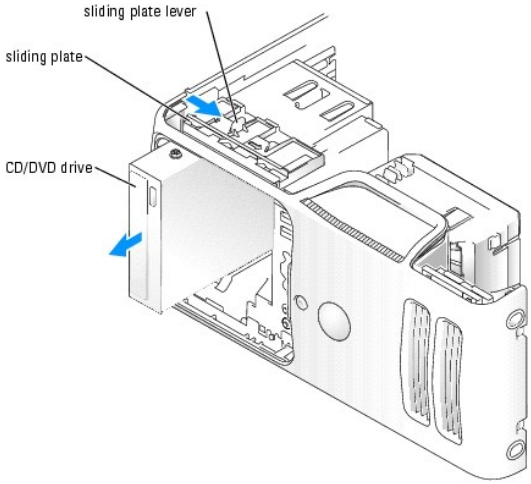
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

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.



5. Slide the sliding plate lever toward the bottom of the computer and, without releasing the sliding plate lever, slide the CD/DVD drive out through the front of the computer.

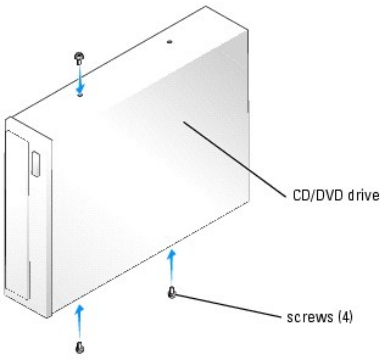


Installing a CD/DVD Drive

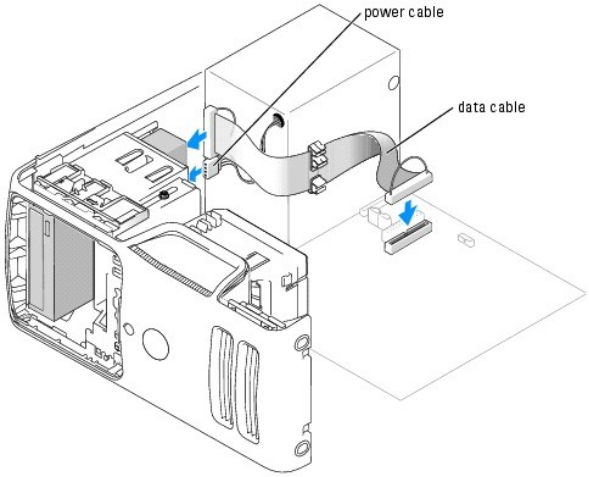
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the drive panel.

NOTE: If you are installing a new drive, you need to remove the drive-panel insert.

4. Slide the drive into place until you feel a click or feel the drive securely installed.



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



6. Check all cable connections, and fold cables out of the way to avoid blocking the fan and cooling vents.
7. Replace the drive panel.
8. Replace the computer cover.

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

9. 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.

10. Enter system setup and select the appropriate **Drive** option.
11. Verify that your computer works correctly by running the Dell Diagnostics.

Heat-Sink Assembly

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

Removing the Heat-Sink Assembly

1. Follow the procedures in "Before You Begin."

2. Remove the computer cover.

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

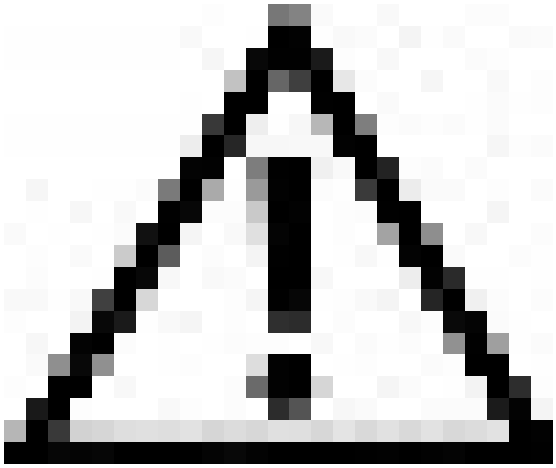
NOTE: To loosen the two captive screws on each side of the heat-sink assembly, you need a long Phillips screwdriver.

3. Loosen the two captive screws that attach the heat-sink assembly to the system board on either side of the assembly.

4. Pivot the assembly toward the back of the computer and lift to remove the assembly.

NOTICE: After you remove the heat-sink assembly, lay the assembly on its side. Do not set the heat-sink assembly upright or touch the thermal interface, as this may result in damage to the thermal interface material.

5. Lay the assembly aside on its side.



1	heat-sink assembly
2	captive screws (2)

NOTICE: When you install the heat-sink assembly, do not touch the thermal interface on its underside, as this may result in damage to the thermal interface material.

Processor

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

Removing the Processor

1. Follow the procedures in "Before You Begin."

2. Remove the computer cover.

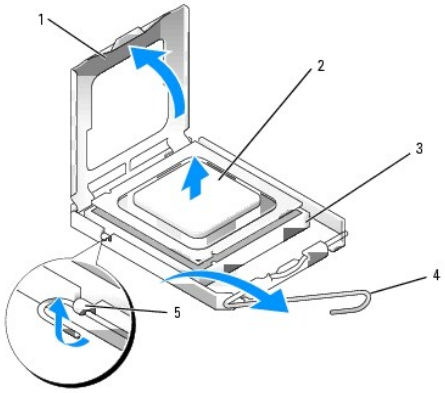
NOTICE: If you are installing a processor upgrade kit from Dell, discard the original heat-sink assembly. If you are *not* installing a processor upgrade kit from Dell, reuse the original heat-sink assembly when you install your new processor.

3. Remove the heat-sink assembly.

4. Open the processor cover:

   a. Push down on the release lever and slide the lever out from under the side latch on the processor socket.

b. Pull the lever back to release the processor cover.



1	processor cover	4	release lever
2	processor	5	side latch
3	processor socket		

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

5. Grasp the processor by the edges to remove it from the processor 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 installing the processor, do not touch any of the pins inside the socket or allow any objects to fall onto the pins in the socket.

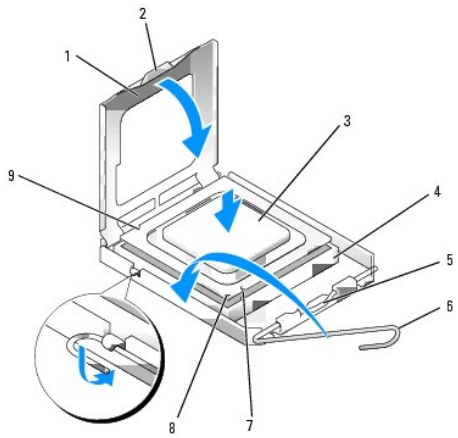
1. Unpack the new processor, being careful not to touch the underside of the processor.

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 processor 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 indicators
4	processor socket	9	rear alignment notch
5	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 release lever at the front of the socket.
7. Pivot the release lever back toward the socket and snap it into place under the side latch 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.

NOTICE: When installing the heat-sink assembly, do not touch the thermal interface on its underside, as this may result in damage.

8. Install the heat-sink assembly.
9. Replace the computer cover.

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

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

Fan Assembly

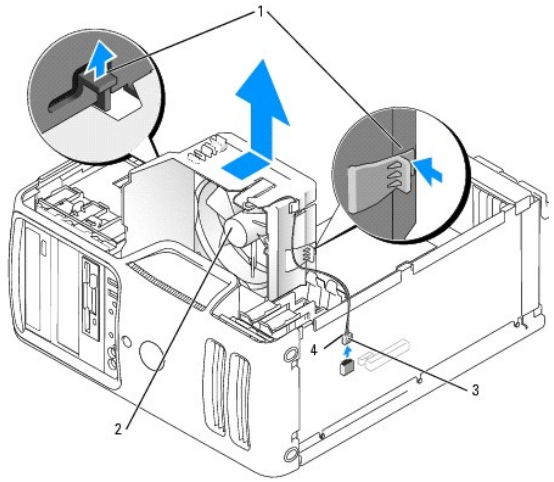
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

Removing the Fan Assembly

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the heat-sink assembly.
4. Press the release tab on the fan-cable connector on the system board to remove the connector.



1	fan release tabs (2)
2	fan assembly
3	fan cable connector
4	release tab on fan cable connector

5. Simultaneously press the fan-release tab on one side of the fan assembly and pull the fan- release tab located on the bottom of the opposite side of the assembly upwards.

6. Slide the fan assembly toward the back of the computer and lift to remove the assembly.

Front I/O Panel

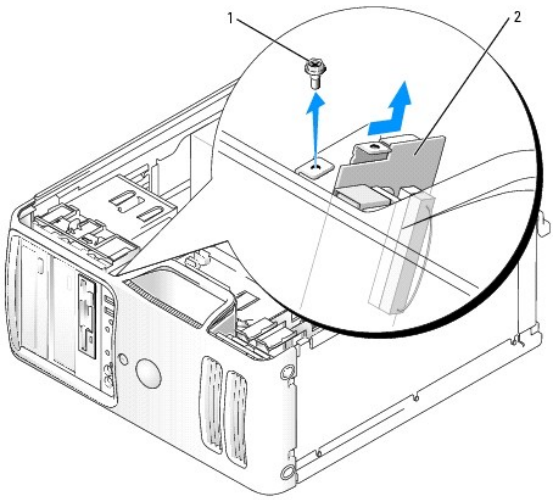
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

Removing the Front I/O Panel

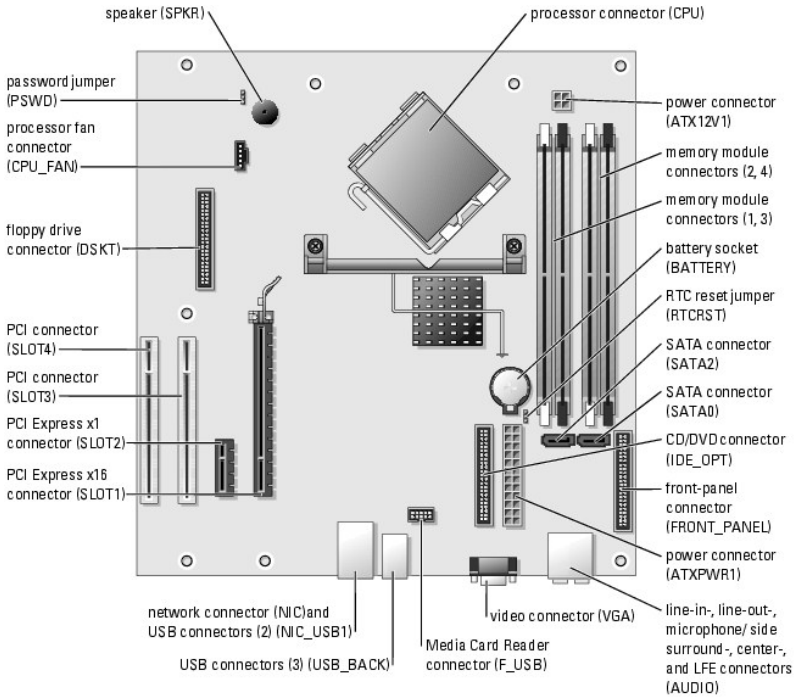
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the heat-sink assembly.
4. Remove the fan assembly.



1	screw
2	front I/O panel

5. Remove the screw that secures the front I/O panel to the front of the computer.
6. Pull the I/O panel toward the back of the computer and lift the panel to remove from the computer.
7. Disconnect any cables from the I/O panel.

System Board



Jumper Settings

The jumper locations are shown below.

Jumper	Setting	Description
PSWD	(default)	Password features are enabled.
		Password features are disabled.
RTCRST	(default)	Real-time clock reset in normal operation.
		Clear CMOS settings.

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.

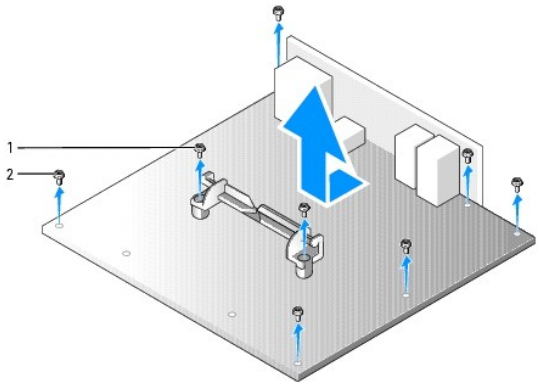
1. Shut down the computer through the **Start** menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network port or device.

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. Remove the computer cover.
6. Remove any components that restrict access to the system board (CD/DVD drive(s), floppy drive, hard drive, front I/O panel).
7. Remove the heat-sink assembly and processor.
8. Disconnect all cables from the system board.

NOTE: The mounting-bracket screws also hold the system board and need to be removed for the removal of the system board.

9. Remove the eight system-board screws and the two mounting-bracket screws.
10. Slide the system board assembly toward the front of the computer, and then lift the board away.



1	mounting-bracket screws (2)
2	system-board screws (8)

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

Replacing the System Board

1. Gently align the system board in the chassis and slide the board toward the back of the computer.
2. Replace the eight system-board screws and the two mounting-bracket screws.
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 port or device, and then plug the cable into the computer.

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

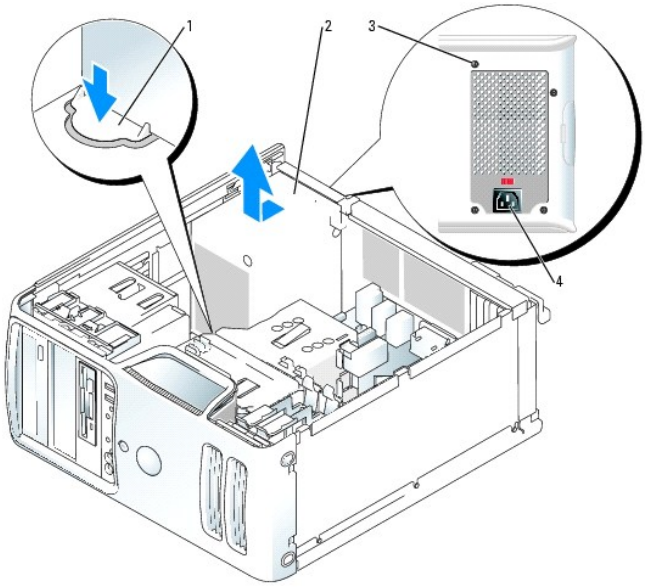
Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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.

Removing the Power Supply

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Disconnect the DC power cables from the system board and the drives.



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

NOTICE: Note the routing of the DC power cables underneath the routing clips 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.

4. Remove the four screws that attach the power supply to the back of the computer frame.
5. Press the release button located on the floor of the computer frame.
6. Slide the power supply toward the front of the computer approximately 1 inch.
7. Lift the power supply out of the computer.

Replacing the Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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.

NOTICE: You must route the DC power cables properly through the routing clips when you replace the cables to prevent them from being pinched or crimped.

4. Route the cables through the routing clips, and press the clips to close them over the cables.
5. Replace the computer cover.

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

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

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Back to Contents Page

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Dell™ Dimension™ 5100 Service Manual

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- Cards
- Drive Panel
- Front Panel
- Drives
- Hard Drive
- Floppy Drive
- Media Card Reader (Optional)
- CD/DVD Drive
- Heat-Sink Assembly
- Processor
- Fan Assembly
- Front I/O Panel
- System Board
- Power Supply

Memory

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

Your computer supports DDR2 memory. For additional information on the type of memory supported by your computer, see your *Owner's Manual*.

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

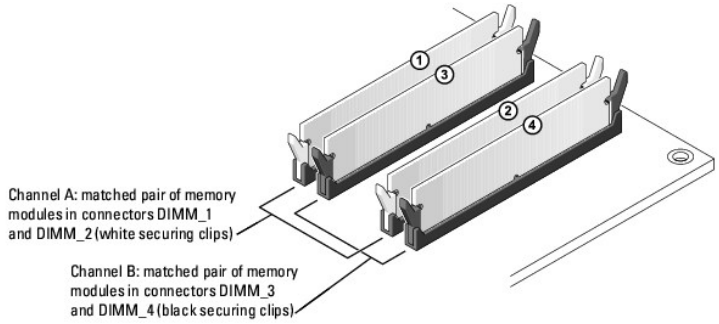
or

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

NOTICE: Do not install ECC or buffered memory modules. Only unbuffered, non-ECC memory is supported.

NOTE: If you install DDR2 667-MHz memory, the speed is reduced to 533 MHz.

- 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.
- 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.

NOTICE: 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.

Removing Memory

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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. Remove the computer cover.
3. Press out the securing clip at each end of the memory module connector.
4. Grasp the module and pull up.

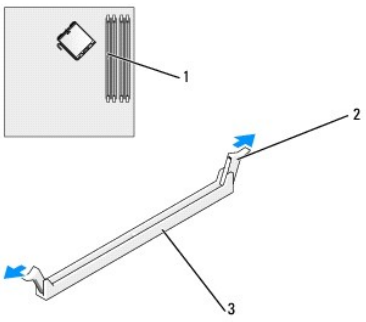
If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

Installing Memory

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

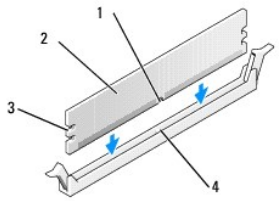
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
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	memory connector

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

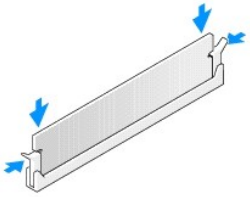


1	notch
2	memory module
3	cutouts (2)
4	crossbar

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 port or device and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.
8. When a message appears, stating that memory size has changed, press <F1> to continue.
9. Log on to your computer.
10. Right-click the **My Computer** icon on your Microsoft® Windows® desktop and click **Properties**.
11. Click the **General** tab.
12. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Cards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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:

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

PCI Cards

Your computer supports two PCI cards.

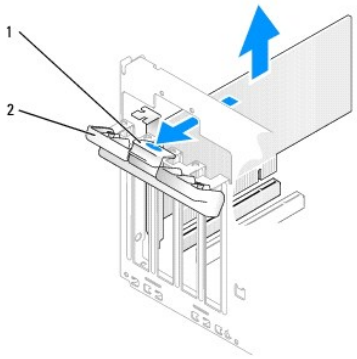
If you are installing or replacing a card, follow the procedures in the next section. If you are removing but not replacing a PCI card, see "Removing a PCI Card."

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."
2. Remove the computer cover.



1	release tab
2	card retention door

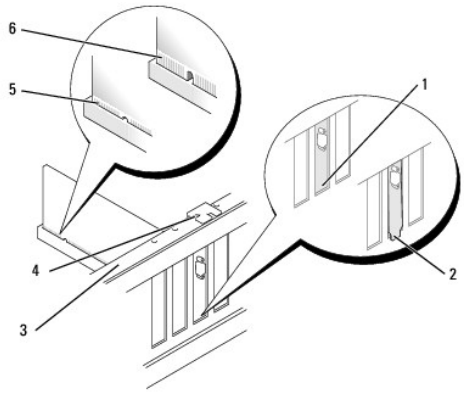
3. Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.
4. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 6.
5. If you are replacing a card that is already installed in the computer, remove the card.

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

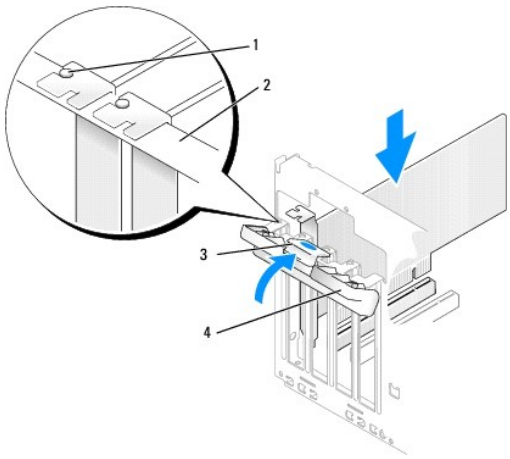
CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

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



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

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



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

9. 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.

10. 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 port or device and then plug it into the computer.

11. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

12. 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.

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

a. Enter system setup, select **Integrated NIC,** 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.

14. 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. Remove the computer cover.
3. 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.
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 (see your *Owner's Manual* for information about how to 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. Close the card retention door by snapping it into place to secure the card(s).

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

6. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
7. Remove the card's driver from the operating system.
8. 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.
9. If you removed an add-in network connector:
   a. Enter system setup, select **Integrated NIC**, 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.

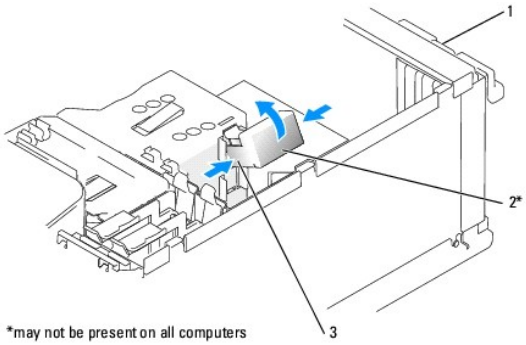
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see "Removing a PCI Express Card."

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."
2. Remove the computer cover.



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

3. 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.

4. If your computer includes a card retention mechanism, to secure the x16 card in place from the top:

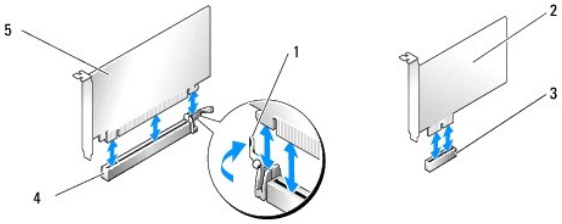
   a. Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.

   b. Set the retention mechanism aside in a secure location.

5. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 6.

6. 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 computer includes a card 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	securing tab	4	PCI Express x16 card slot
2	PCI Express x1 card	5	PCI Express x16 card
3	PCI Express x1 card slot		

7. Prepare the card for installation.

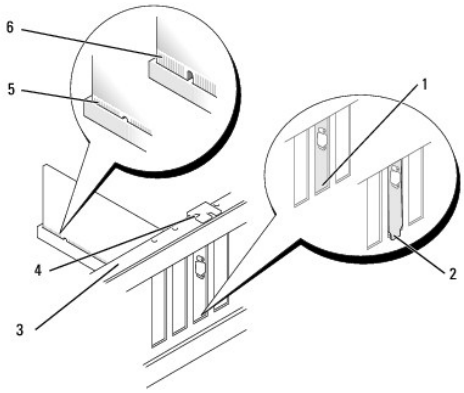
   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

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.

8. 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.

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

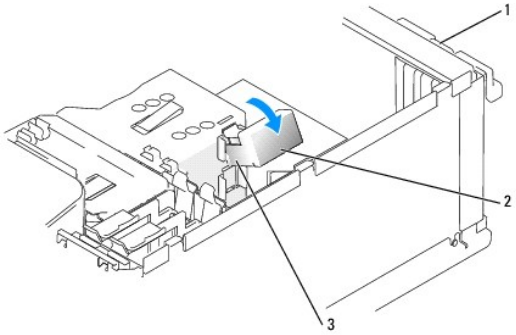


1	bracket within slot	4	alignment guide
2	bracket caught outside of slot	5	fully seated card
3	alignment bar	6	not fully seated card

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

11. Before replacing the card retention mechanism, ensure that:
    - The tops of all cards and filler brackets are flush with the alignment bar.
    - The notch in the top of the card or filler bracket fits around the alignment guide.

12. 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 port or device and then plug it into the computer.

13. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

14. 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.

15. If you installed an add-in network adapter and want to disable the integrated network adapter:
    a. Enter system setup, select **Integrated NIC,** 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.

16. 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. Remove the computer cover.
3. 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.
4. 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.
5. 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 (see your *Owner's Manual* for information about how to 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.

NOTE: When you install a filler bracket, ensure that the bracket is seated correctly.

6. Reseat the card retention mechanism in the tabs and pivot downward to snap it into place.
7. 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 port or device and then plug it into the computer.

8. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
9. Remove the card's driver from the operating system.
10. 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.
11. If you removed an add-in network connector:
    a. Enter system setup, select **Integrated NIC**, and then change the setting to **On**.
    b. Connect the network cable to the integrated connector on the back panel of the computer.
12. Install any drivers required for the card as described in the card documentation.

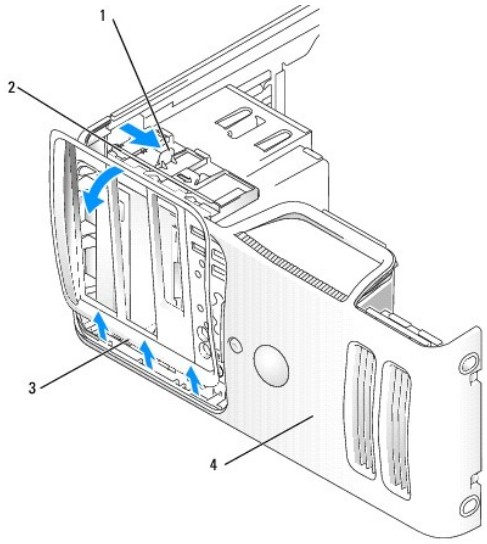
Drive Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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."
2. Remove the computer cover.



1	sliding plate lever	3	drive panel
2	sliding plate	4	front panel

3. Grasping the sliding plate lever, slide and hold the sliding plate until the drive panel snaps open.

NOTE: The sliding plate secures and releases the drive panel and helps to secure the drives.

4. Pivot the drive panel outward and lift away from the computer.

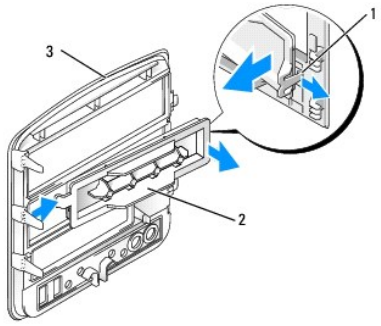
5. Set the drive panel aside in a secure location.

Removing the Drive-Panel Insert

1. Follow the procedures in "Before You Begin."

2. Remove the computer cover.

3. Remove the drive panel.



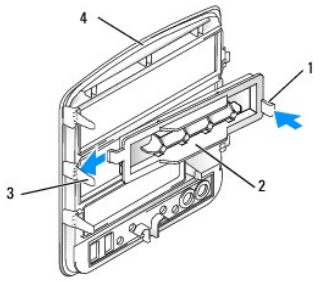
1	drive-panel insert tab
2	drive-panel insert
3	drive panel

1. Turn the drive panel sideways and find the tip of the drive-panel insert tab that latches over a tab on the right side of the drive panel.

2. Pull the inner tip of the drive-panel insert tab away from the drive panel.

3. Pivot the drive-panel insert out and away from the drive panel.
4. Set the drive-panel insert aside in a secure location.

Replacing the Drive-Panel Insert

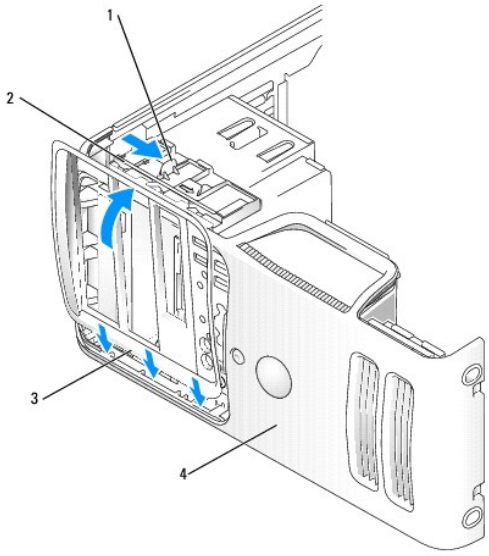


1	drive-panel insert tab	3	center drive-panel tab
2	drive panel insert	4	drive panel

1. Slide the tab on the left side of the drive-panel insert under the center-drive panel tab.
2. Rotate the drive-panel insert into place and snap the drive-panel insert tab over the corresponding tab on the drive panel.

Replacing the Drive Panel

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover if you have not already done so.
3. If you are installing a replacement drive panel, remove the old drive panel.



1	sliding plate lever	3	drive panel
2	sliding plate	4	front panel

4. Align the drive panel tabs with the side-door hinges.
5. Rotate the drive panel toward the computer until it snaps into place on the front panel.

Front Panel

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

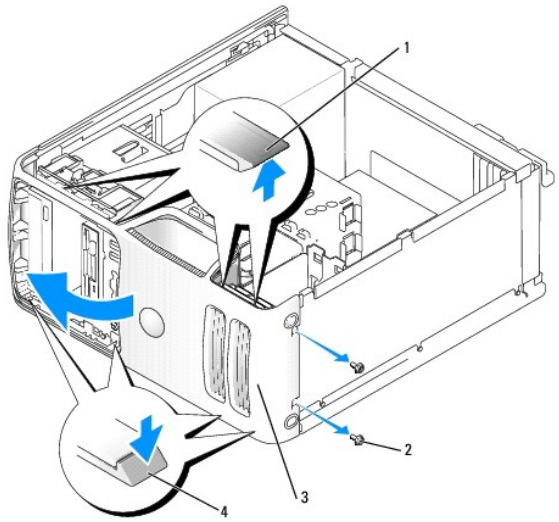
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

Removing the Front Panel

1. Remove the computer cover.
2. Remove the drive panel.
3. Remove the hard drive and second hard drive, if applicable.
4. Remove the two front-panel screws.

NOTICE: Use care when handling the front-panel release tabs to avoid damaging them.

5. Using a small, flat-blade screwdriver, press the four top front-panel release tabs upwards and press down on the four bottom release tabs to loosen the front panel.
6. Starting from the bottom of the front panel, pivot the panel toward the top of the computer and remove the panel.

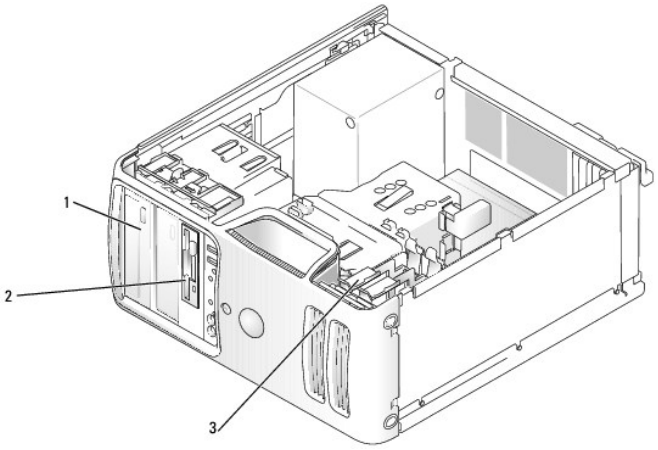


1	top front-panel release tabs (4)
2	front-panel screws (2)
3	front panel
4	bottom front-panel release tabs (4)

Drives

Your computer supports a combination of these devices:

- Up to two serial ATA hard drives
- One FlexBay drive (may contain an optional floppy drive or an optional Media Card Reader)
- Up to two CD or DVD drives



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

Connect CD/DVD drives to the connector labeled "IDE1" 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 and Disconnecting Drive Interface Cables

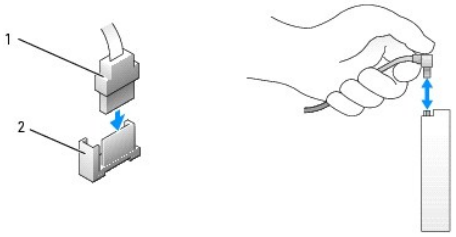
When you install a drive, you connect two cables—a DC power cable and a data cable—to the back of the drive and to the system board.

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

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.

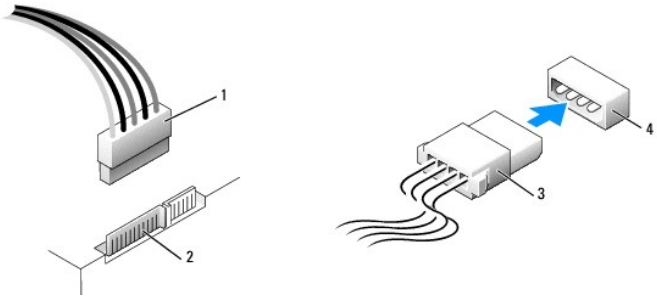
Serial ATA Connector



1	interface cable
2	interface connector

Power Cable Connector

To connect a drive using the power cable, locate the power connector on the power supply.



1	SATA power cable connector	3	power cable connector
2	power connector	4	power connector

Hard Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

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.

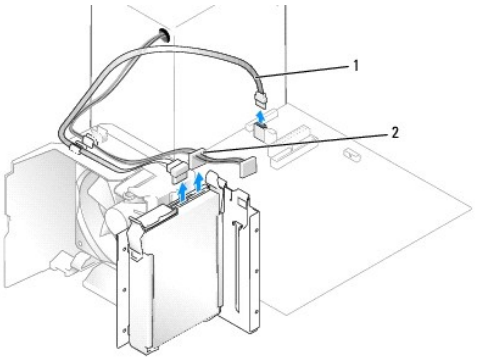
Check the documentation for the drive to verify that it is configured for your computer.

Removing a Hard Drive

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.

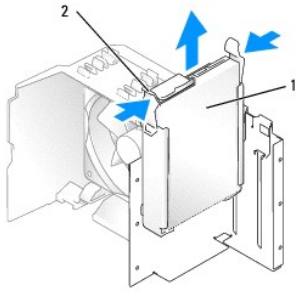
NOTICE: Use the pull-tab to remove the data cable from your hard drive or from the system board.

3. Disconnect the power and data cables from the drive.



1	serial ATA data cable
2	power cable

4. Press the blue tabs on either side of the hard drive bracket toward each other and slide the drive up and out of the computer.

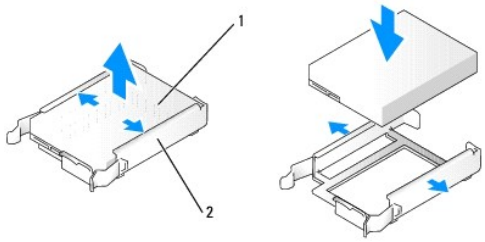


1	hard drive
2	tabs (2)

Installing a Hard Drive

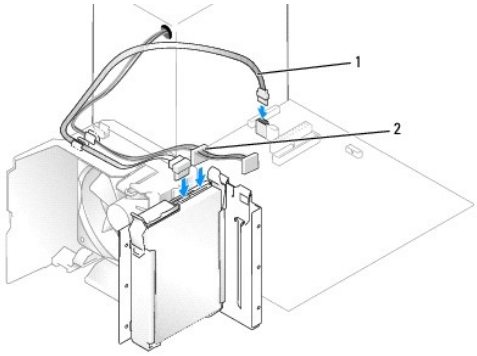
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. If you are installing a replacement hard drive, remove the old hard drive.
4. Unpack the replacement hard drive, and prepare it for installation.
5. Check the documentation for the drive to verify that it is configured for your computer.

NOTE: If your replacement hard drive does not have the hard drive 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	hard drive bracket

6. Gently slide the drive into place until you feel a click or feel the drive securely installed.
7. Connect the power and hard-drive cables to the drive.



1	serial ATA data cable

2	power cable

8. Check all connectors to be certain that they are properly cabled and firmly seated.
9. Replace the computer cover.

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

10. 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

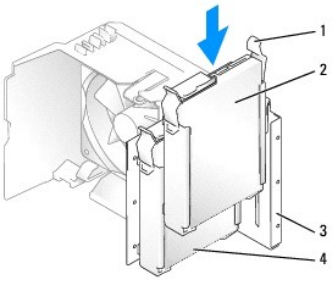
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

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 computer cover.
4. Press the blue release tabs on each side of the hard drive bracket toward each other and slide the drive up and out of the computer.
5. Snap the bracket onto the hard drive.
6. Gently slide the new drive (the second hard drive) into place until you feel a click or feel the drive securely installed.



1	release tabs (2)	3	hard drive bay
2	second hard drive in lower bay	4	primary hard drive in upper bay

7. Connect a power cable to the drive.
8. 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 in the *Product Information Guide*.

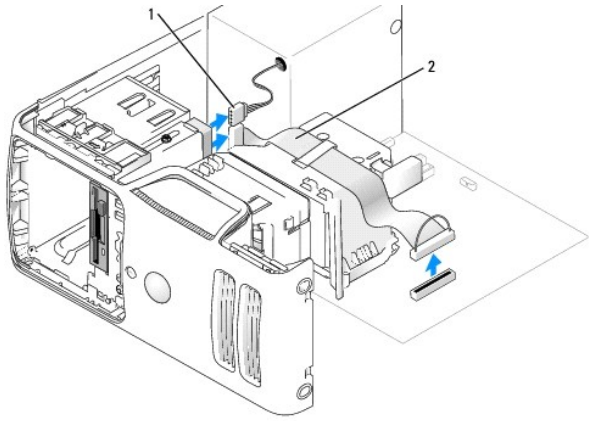
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: To 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.

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 computer cover.
3. Remove the drive panel.

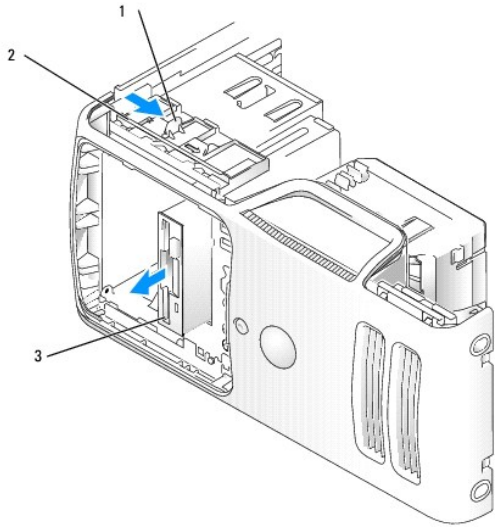


1	power cable
2	data cable

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

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

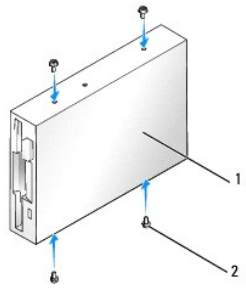
5. Slide the sliding plate lever toward the bottom of the computer and, without releasing the sliding plate lever, slide the floppy drive out through the front of the computer.



1	sliding plate lever
2	sliding plate
3	floppy drive

Installing a Floppy Drive

NOTE: If the new floppy drive does not include shoulder screws, use the screws within the drive panel insert.

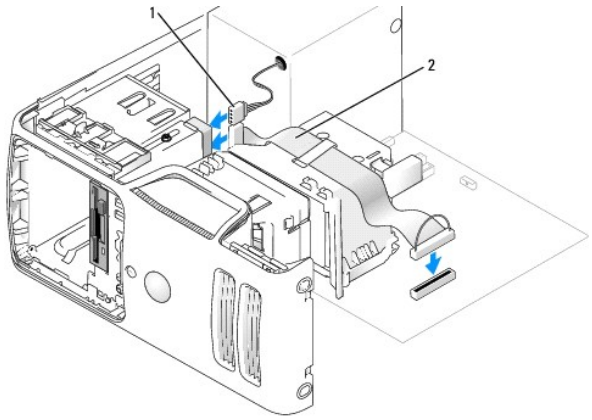


1	drive
2	screws (4)

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the drive panel.

NOTE: If you are installing a new drive, you need to remove the drive-panel insert.

4. Slide the drive into place until you feel a click or feel the drive securely installed.
5. Attach the power and data cables to the floppy drive.
6. Connect the other end of the data cable to the connector labeled "DSKT2" on the system board and route the cable through the clip on the shroud.



1	power cable
2	data cable

7. Check all cable connections and fold cables out of the way to avoid blocking the fan and cooling vents.
8. Replace the drive panel.
9. Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable in to the network port or device and then plug it 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 (Optional)

For information about using a Media Card Reader, see your *Owner's Manual*.

Removing a Media Card Reader

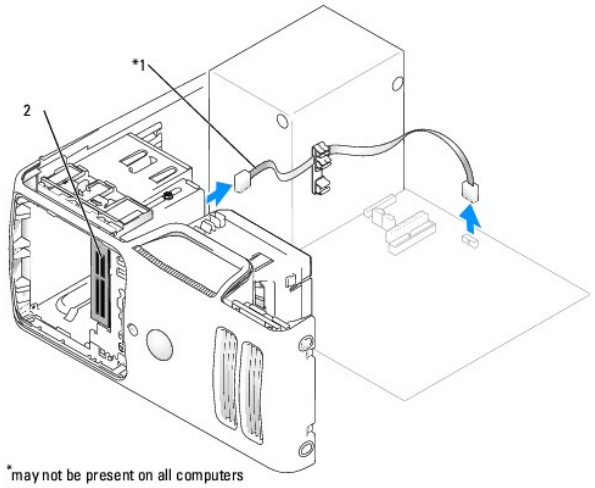
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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."

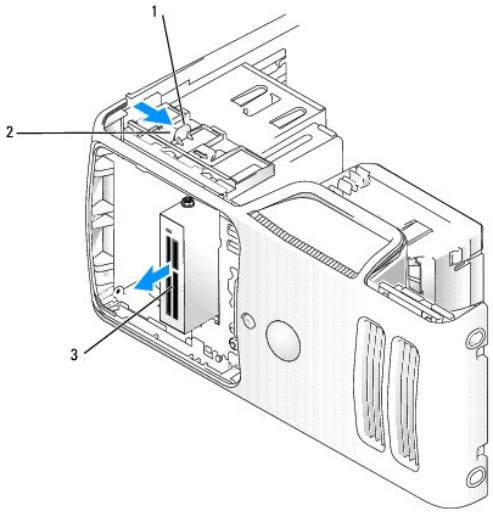
2. Remove the computer cover.

3. Remove the drive panel.



1	cable
2	Media Card Reader

4. Disconnect the FlexBay USB cable on the back of the Media Card Reader from the Media Card Reader connector on the system board and route the cable through the cable routing clip.



1	sliding plate lever
2	sliding plate
3	Media Card Reader

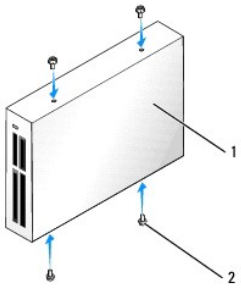
5. Slide the sliding plate toward the bottom of the computer and, without releasing the sliding plate, slide the Media Card Reader out through the front of the computer.
6. Replace the drive panel.
7. Replace the computer cover.

Installing a Media Card Reader

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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."



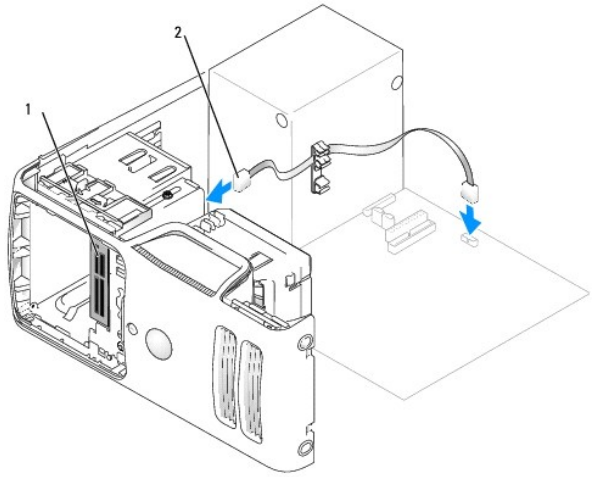
1	Media Card Reader
2	screws (4)

2. Remove the computer cover.
3. Remove the drive panel.
4. Remove the Media Card Reader and bracket from its packaging and ensure that all of the screws are included.

5. Slide the Media Card Reader into place until you feel a click or feel the drive securely installed.

NOTE: Ensure that the Media Card Reader is installed before the FlexBay cable is connected.

6. Connect the FlexBay USB cable to the back of the Media Card Reader and to the Media Card Reader connector on the system board.



1	Media Card Reader
2	FlexBay USB cable

7. Route the FlexBay USB cable through the cable routing clip.
8. Replace the drive panel.
9. Replace the computer cover.

CD / DVD Drive

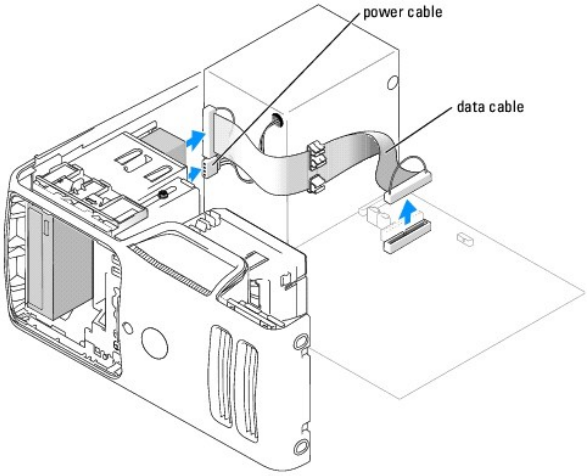
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

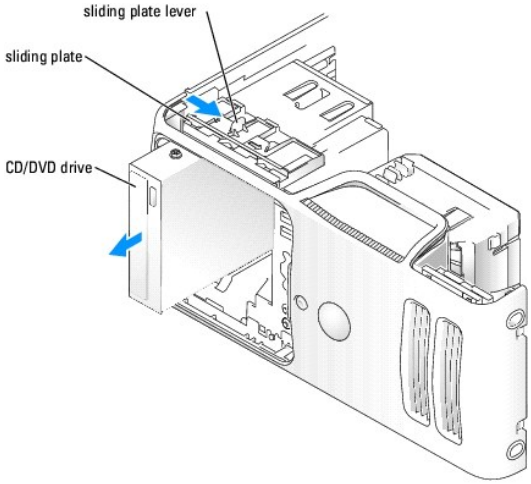
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

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.



5. Slide the sliding plate lever toward the bottom of the computer and, without releasing the sliding plate lever, slide the CD/DVD drive out through the front of the computer.

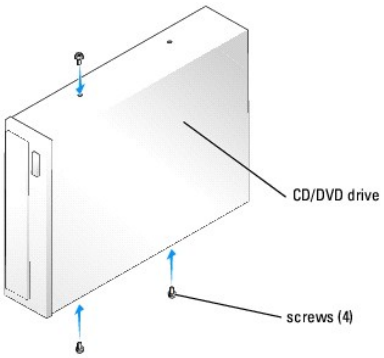


Installing a CD/DVD Drive

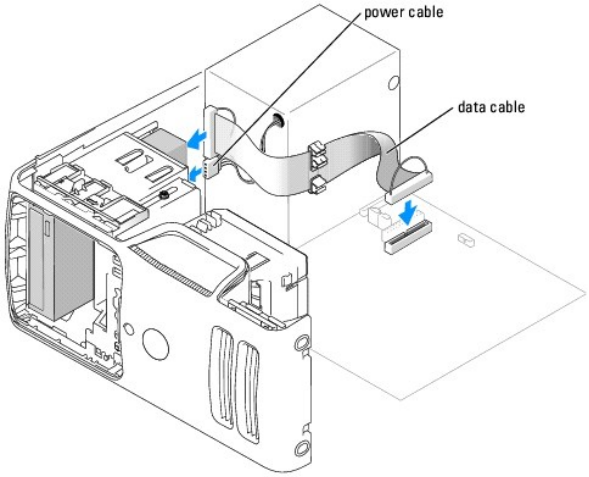
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the drive panel.

NOTE: If you are installing a new drive, you need to remove the drive-panel insert.

4. Slide the drive into place until you feel a click or feel the drive securely installed.



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



6. Check all cable connections, and fold cables out of the way to avoid blocking the fan and cooling vents.
7. Replace the drive panel.
8. Replace the computer cover.

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

9. 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.

10. Enter system setup and select the appropriate **Drive** option.
11. Verify that your computer works correctly by running the Dell Diagnostics.

Heat-Sink Assembly

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

Removing the Heat-Sink Assembly

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.

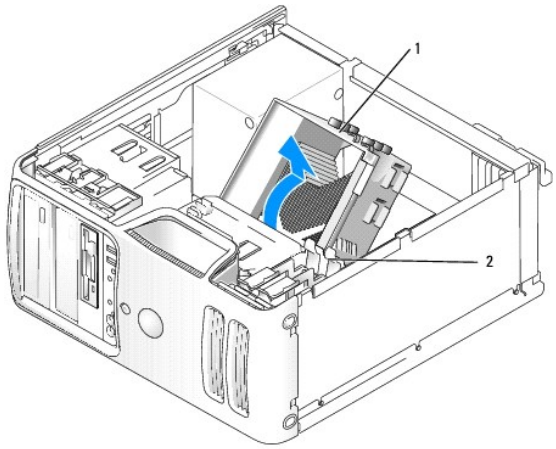
CAUTION: Despite having a plastic shield, the heat-sink assembly may be very hot during normal operation. Ensure that the assembly has had sufficient time to cool before you touch it.

NOTE: To loosen the two captive screws on each side of the heat-sink assembly, you need a long Phillips screwdriver.

3. Loosen the two captive screws that attach the heat-sink assembly to the system board on either side of the assembly.
4. Pivot the assembly toward the back of the computer and lift to remove the assembly.

NOTICE: After you remove the heat-sink assembly, lay the assembly on its side. Do not set the heat-sink assembly upright or touch the thermal interface, as this may result in damage to the thermal interface material.

5. Lay the assembly aside on its side.



1	heat-sink assembly
2	captive screws (2)

NOTICE: When you install the heat-sink assembly, do not touch the thermal interface on its underside, as this may result in damage to the thermal interface material.

Processor

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 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.

Removing the Processor

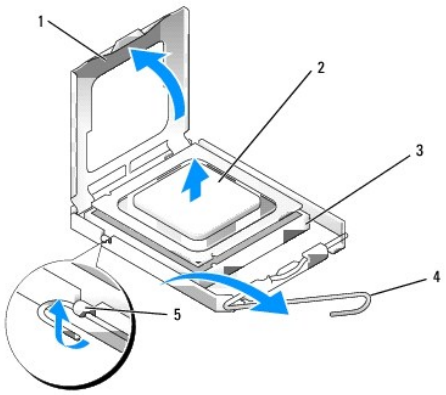
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.

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

3. Remove the heat-sink assembly.
4. Open the processor cover:

a. Push down on the release lever and slide the lever out from under the side latch on the processor socket.

b. Pull the lever back to release the processor cover.



1	processor cover	4	release lever
2	processor	5	side latch
3	processor socket		

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

5. Grasp the processor by the edges to remove it from the processor 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 installing the processor, do not touch any of the pins inside the socket or allow any objects to fall onto the pins in the socket.

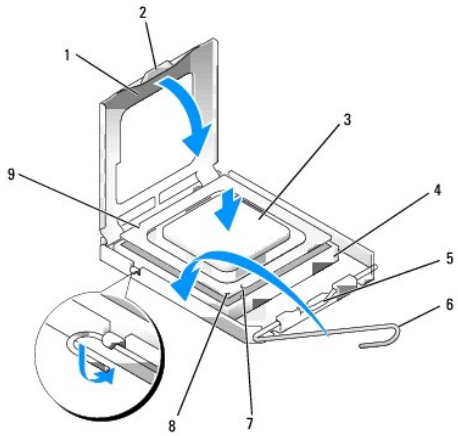
1. Unpack the new processor, being careful not to touch the underside of the processor.

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 processor 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 indicators
4	processor socket	9	rear alignment notch
5	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 release lever at the front of the socket.
7. Pivot the release lever back toward the socket and snap it into place under the side latch 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.

NOTICE: When installing the heat-sink assembly, do not touch the thermal interface on its underside, as this may result in damage.

8. Install the heat-sink assembly.
9. Replace the computer cover.

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

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

Fan Assembly

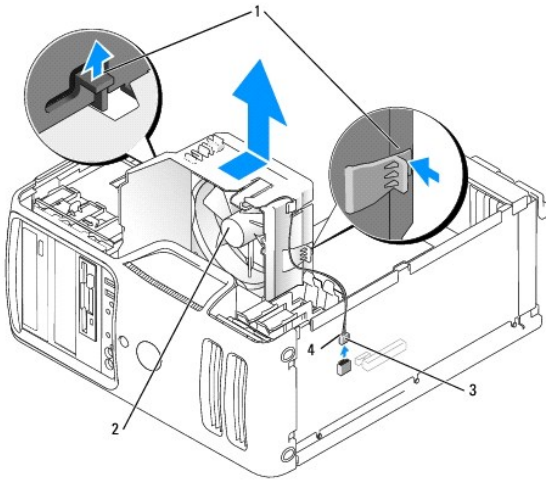
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

Removing the Fan Assembly

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the heat-sink assembly.
4. Press the release tab on the fan-cable connector on the system board to remove the connector.



1	fan release tabs (2)
2	fan assembly
3	fan cable connector
4	release tab on fan cable connector

5. Simultaneously press the fan-release tab on one side of the fan assembly and pull the fan- release tab located on the bottom of the opposite side of the assembly upwards.

6. Slide the fan assembly toward the back of the computer and lift to remove the assembly.

Front I/O Panel

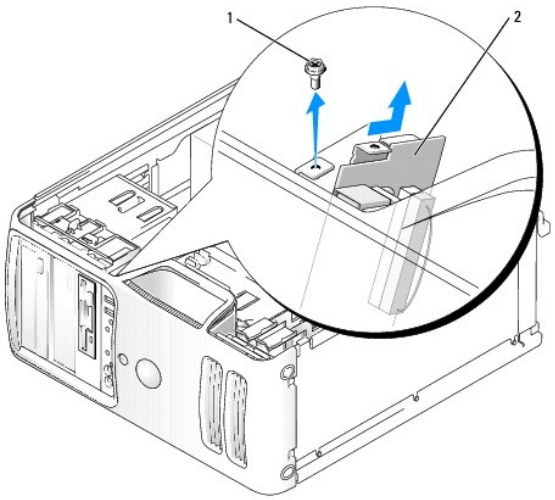
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

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

NOTICE: To 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.

Removing the Front I/O Panel

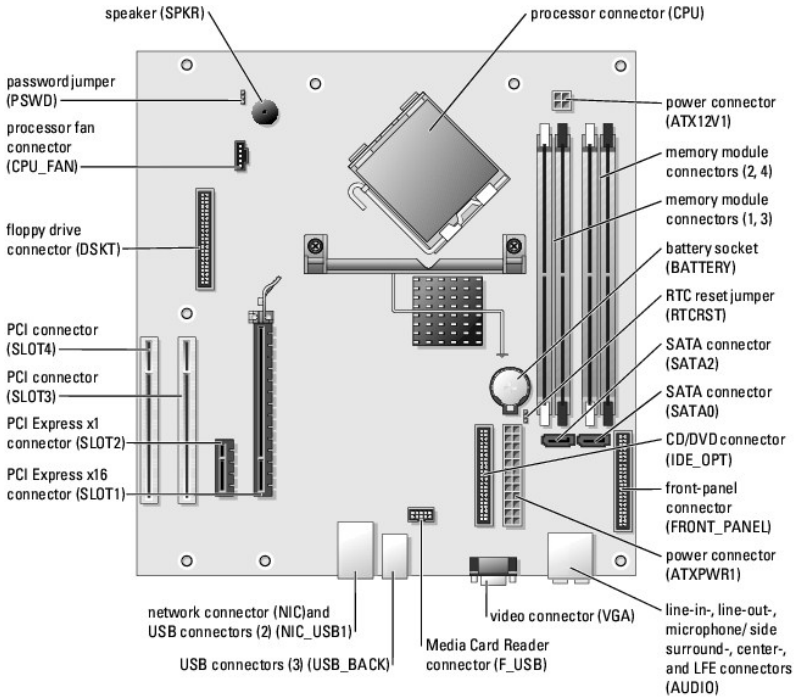
1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Remove the heat-sink assembly.
4. Remove the fan assembly.



1	screw
2	front I/O panel

5. Remove the screw that secures the front I/O panel to the front of the computer.
6. Pull the I/O panel toward the back of the computer and lift the panel to remove from the computer.
7. Disconnect any cables from the I/O panel.

System Board



Jumper Settings

The jumper locations are shown below.

Jumper	Setting	Description
PSWD	(default)	Password features are enabled.
		Password features are disabled.
RTCRST	(default)	Real-time clock reset in normal operation.
		Clear CMOS settings.

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.

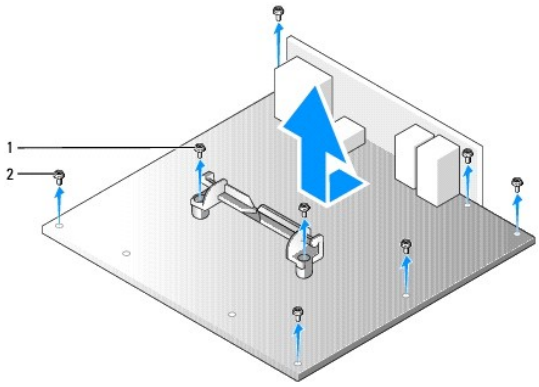
1. Shut down the computer through the **Start** menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network port or device.

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. Remove the computer cover.
6. Remove any components that restrict access to the system board (CD/DVD drive(s), floppy drive, hard drive, front I/O panel).
7. Remove the heat-sink assembly and processor.
8. Disconnect all cables from the system board.

NOTE: The mounting-bracket screws also hold the system board and need to be removed for the removal of the system board.

9. Remove the eight system-board screws and the two mounting-bracket screws.
10. Slide the system board assembly toward the front of the computer, and then lift the board away.



1	mounting-bracket screws (2)
2	system-board screws (8)

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

Replacing the System Board

1. Gently align the system board in the chassis and slide the board toward the back of the computer.
2. Replace the eight system-board screws and the two mounting-bracket screws.
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 port or device, and then plug the cable into the computer.

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

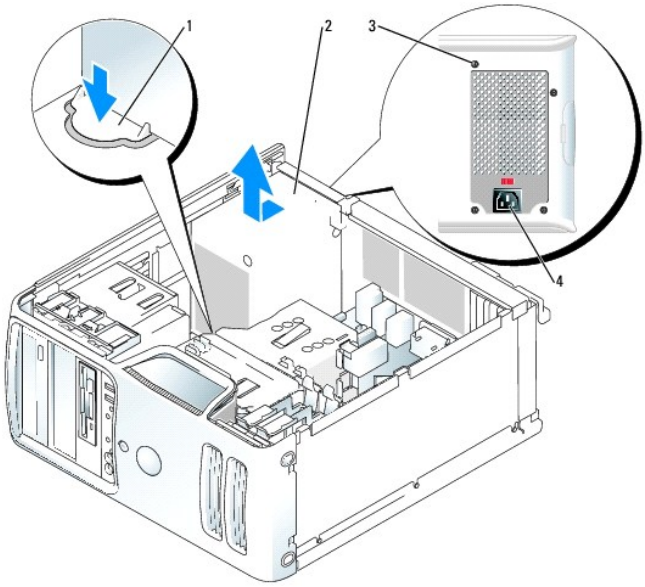
Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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.

Removing the Power Supply

1. Follow the procedures in "Before You Begin."
2. Remove the computer cover.
3. Disconnect the DC power cables from the system board and the drives.



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

NOTICE: Note the routing of the DC power cables underneath the routing clips 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.

4. Remove the four screws that attach the power supply to the back of the computer frame.
5. Press the release button located on the floor of the computer frame.
6. Slide the power supply toward the front of the computer approximately 1 inch.
7. Lift the power supply out of the computer.

Replacing the Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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.

NOTICE: You must route the DC power cables properly through the routing clips when you replace the cables to prevent them from being pinched or crimped.

4. Route the cables through the routing clips, and press the clips to close them over the cables.
5. Replace the computer cover.

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

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

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System Setup

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- Overview
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Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- 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	
Processor Info	Displays the following information for the processor installed in the system: **Processor Type**, **Processor Clock Speed**, **Processor Bus Speed**, **Processor Cache** Size**, Processor ID** number, whether the processor is **Hyperthreading Capable o**r multiple-core capable, and if the processor has **64-bit Technology**.
Memory Info	Displays the amount of **Installed Memory**, **Memory Speed**, **Memory Channel Mode**, and a description of the **Memory Technology**. This option also displays a table that describes the memory size, whether the memory module is ECC capable, single or dual rank, type, and organization.
PCI Info	Displays the contents of each PCI slot.
Date/Time	Controls the system's internal calendar and clock.
Boot Sequence (**Diskette drive** default)	Determines the order in which the system searches for boot devices during system startup. **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 (**Internal** default)	Enables and disables the floppy drives and sets read permission for the internal floppy drive. **Off** disables all floppy drives. **USB** enables the USB floppy drive. **Internal** enables the internal floppy drive. **Read Only** enables the internal drive controller and allows the internal floppy drive read-only permission. **NOTE:** Operating systems with USB support will recognize USB floppy drives regardless of this setting.
Drives 0 through 3 (**On** default)	Enables or disables an ATA or SATA device (such as hard-drive, CD drive, or DVD drive). **On** enables the interface so that the device can be used. Displays the **Controller** type (**ATA** or **SATA**), **Port** number the drive is using, **Drive ID** number, Capacity, and whether the drive is controlled by the **BIOS**.
SATA Operation (**Normal** default)	Determines the integrated SATA controller's operating mode: 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 (**On** default)	Enables or disables the integrated NIC controller. Settings are **On**, **Off**, or **On w/ PXE**. When the **On w/ PXE setting is active** (available only for setting up a future boot process), the computer prompts you to press <Ctrl><Alt><b>. 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.
Front USB Ports (**On** default)	Enables or disables the front USB ports.
USB for Flexbay (**On** default)	**On** enables internal USB for FlexBay. **NOTE:** This USB option appears only if a FlexBay device is installed.

Video	
Primary Video (**Auto** default)	Specifies which video controller is primary when two video controllers are present on the computer. **Auto** enables the add-in video controller. **Onboard** enables the integrated video controller.
Video	Configures the system memory allocation reserved for the integrated video controller. Settings

Memory Size (**8 MB** default)	are 1MB and 8MB.

Performance	
HyperThreading (**On** default)	Determines whether the physical processor appears as one or two logical processors. The performance of some applications improve with additional logical processors installed. **On** enables hyperthreading.
SpeedStep (**On** default)	Enables SpeedStep for all supported processors in the computer.
Hard Drive Acoustics (**Bypass** default)	• **Bypass (default)** — Your computer does not test or change the current acoustics mode setting. • **Quiet** — The hard drive operates at its most quiet setting. • **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. • **Performance** — The hard drive operates at its maximum speed. **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. **NOTE:** Changing the acoustics setting does not alter your hard drive image.

Security	
Admin Password (**Not Set** default)	Displays the current status of your System Setup program's password security feature and allows you to verify and assign a new admin password.
System Password (**Not Set** default)	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Changes	Determines the interaction between the **System** password and the **Admin** password. **Locked** prevents a user without a valid **Admin** password from being able to modify the **System** password. **Unlocked** allows a user with a valid **Admin** password to modify the system password.
Execute Disable (**On** default)	Enables or disables **Execute Disable** memory protection technology.

Power Management	
AC Recovery (**Off** default)	Determines how the system responds when AC power is re-applied after a power loss. **Off** commands the system to stay off when the power is re-applied. You must press the front-panel power button before the system turns on. **On** commands the system to turn on when the power is re-applied. **Last** commands the system to return to the last power state the system was in just before it was turned off.
Auto Power On (**Off** default)	Sets the computer to automatically turn on. **Off** disables this feature. **Everyday** turns the computer on every day at the time set in **Auto Power Time**. **Weekdays** turns the computer on every day from Monday through Friday at the time set in **Auto Power Time**. **NOTE:** This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in the standard 12-hour format (*hours:minutes*). 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.
Suspend Mode	Sets the computer's 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	
Load Defaults	Restores System Setup options to their factory defaults.
Event Log	Allows you to view the **Event Log**. Entries are marked **R** for **Read** and **U** for **Unread**. **Mark All**

	Entries Read puts an R to the left of all the entries. **Clear Log** clears the **Event Log**.

POST Behavior	
Fastboot (**On** default)	When enabled, this feature reduces computer startup time by bypassing some compatibility steps. **Off** does not skip any steps during computer startup. **On** starts the system more quickly.
Numlock Key (**On** default)	Determines the functionality of the numeric keys on the right side of your keyboard. **Off** commands the right keypad keys to function as arrows. **On** commands the right keypad keys to function as numbers.
POST Hotkeys	Determines whether the sign-on screen displays a message stating the keystroke sequence that is required to enter the **Setup** program or the **Quickboot** feature. **Setup & Boot Menu** displays both messages (F2=Setup and F12=Boot Menu). **Setup** displays the setup message only (F2=Setup). **Boot Menu** displays the **Quickboot** message only (F12=Boot Menu). **None** displays no message.
Keyboard Errors	When set to **Report** (enabled) and an error is detected during POST, the BIOS will display the error message and prompt you to press <F1> to continue or press <F2> to enter System Setup. When set to **Do Not Report** (disabled) and an error is detected during POST, the BIOS will display the error message and continue booting the system.

Boot Sequence

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

Option Settings

- **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.
- **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.
- **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.
- **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 (see "Front View of the Computer" and "Back View of the Computer").
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.

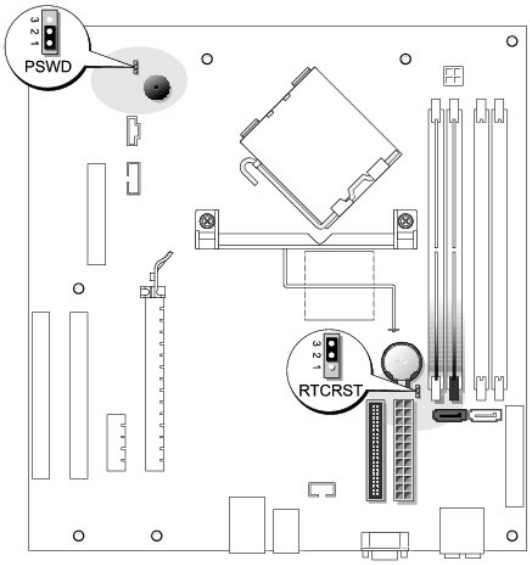
NOTE: Write down your current boot sequence in case you want to restore it.

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 in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin."



2. Locate the 3-pin password jumper (PSWD) on the system board, and attach the jumper plug to pins 2 and 3 to clear the password.

NOTE: When you receive your computer, the jumper plug is attached to pins 1 and 2.

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 your computer. Turn off the monitor and disconnect it from the electrical outlet.
6. Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.
7. Open the computer cover.
8. Locate the 3-pin password jumper (PSWD) on the system board and attach the jumper to pins 1 and 2 to re-enable the password feature.
9. Close the computer cover.

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

10. 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 in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin."
2. Reset the current CMOS settings:
   a. Locate the 3-pin CMOS jumper (RTCRST) on the system board.
   b. Remove the jumper plug from pins 2 and 3.
   c. Place the jumper plug on pins 1 and 2 and wait for approximately 5 seconds.
   d. Replace the jumper plug on pins 2 and 3.
3. Close the computer cover.

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

4. Connect your computer and devices

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System Setup

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Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- 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	
Processor Info	Displays the following information for the processor installed in the system: **Processor Type**, **Processor Clock Speed**, **Processor Bus Speed**, **Processor Cache** Size**, Processor ID** number, whether the processor is **Hyperthreading Capable** or multiple-core capable, and if the processor has **64-bit Technology**.
Memory Info	Displays the amount of **Installed Memory**, **Memory Speed**, **Memory Channel Mode**, and a description of the **Memory Technology**. This option also displays a table that describes the memory size, whether the memory module is ECC capable, single or dual rank, type, and organization.
PCI Info	Displays the contents of each PCI slot.
Date/Time	Controls the system's internal calendar and clock.
Boot Sequence (**Diskette drive** default)	Determines the order in which the system searches for boot devices during system startup. **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 (**Internal** default)	Enables and disables the floppy drives and sets read permission for the internal floppy drive. **Off** disables all floppy drives. **USB** enables the USB floppy drive. **Internal** enables the internal floppy drive. **Read Only** enables the internal drive controller and allows the internal floppy drive read-only permission. **NOTE:** Operating systems with USB support will recognize USB floppy drives regardless of this setting.
Drives 0 through 3 (**On** default)	Enables or disables an ATA or SATA device (such as hard-drive, CD drive, or DVD drive). **On** enables the interface so that the device can be used. Displays the **Controller** type (**ATA** or **SATA**), **Port** number the drive is using, **Drive ID** number, Capacity, and whether the drive is controlled by the **BIOS**.
SATA Operation (**Normal** default)	Determines the integrated SATA controller's operating mode: 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 (**On** default)	Enables or disables the integrated NIC controller. Settings are **On**, **Off**, or **On w/ PXE**. When the **On w/ PXE setting is active** (available only for setting up a future boot process), the computer prompts you to press <Ctrl><Alt><b>. 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.
Front USB Ports (**On** default)	Enables or disables the front USB ports.
USB for Flexbay (**On** default)	**On** enables internal USB for FlexBay. **NOTE:** This USB option appears only if a FlexBay device is installed.

Video	
Primary Video (**Auto**	Specifies which video controller is primary when two video controllers are present on the computer. **Auto** enables the add-in video controller. **Onboard** enables the integrated video controller.

default)	
Video Memory Size (**8 MB** default)	Configures the system memory allocation reserved for the integrated video controller. Settings are 1MB and 8MB.

Performance	
HyperThreading (**On** default)	Determines whether the physical processor appears as one or two logical processors. The performance of some applications improve with additional logical processors installed. **On** enables hyperthreading.
SpeedStep (**On** default)	Enables SpeedStep for all supported processors in the computer.
Hard Drive Acoustics (**Bypass** default)	• **Bypass (default)** — Your computer does not test or change the current acoustics mode setting. • **Quiet** — The hard drive operates at its most quiet setting. • **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. • **Performance** — The hard drive operates at its maximum speed. **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. **NOTE:** Changing the acoustics setting does not alter your hard drive image.

Security	
Admin Password (**Not Set** default)	Displays the current status of your System Setup program's password security feature and allows you to verify and assign a new admin password.
System Password (**Not Set** default)	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Changes	Determines the interaction between the **System** password and the **Admin** password. **Locked** prevents a user without a valid **Admin** password from being able to modify the **System** password. **Unlocked** allows a user with a valid **Admin** password to modify the system password.
Execute Disable (**On** default)	Enables or disables **Execute Disable** memory protection technology.

Power Management	
AC Recovery (**Off** default)	Determines how the system responds when AC power is re-applied after a power loss. **Off** commands the system to stay off when the power is re-applied. You must press the front-panel power button before the system turns on. **On** commands the system to turn on when the power is re-applied. **Last** commands the system to return to the last power state the system was in just before it was turned off.
Auto Power On (**Off** default)	Sets the computer to automatically turn on. **Off** disables this feature. **Everyday** turns the computer on every day at the time set in **Auto Power Time**. **Weekdays** turns the computer on every day from Monday through Friday at the time set in **Auto Power Time**. **NOTE:** This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in the standard 12-hour format (*hours:minutes*). 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.
Suspend Mode	Sets the computer's 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	
Load Defaults	Restores System Setup options to their factory defaults.

Event Log	Allows you to view the **Event Log**. Entries are marked **R** for **Read** and **U** for **Unread**. **Mark All Entries Read** puts an R to the left of all the entries. **Clear Log** clears the **Event Log**.

POST Behavior	
Fastboot (**On** default)	When enabled, this feature reduces computer startup time by bypassing some compatibility steps. **Off** does not skip any steps during computer startup. **On** starts the system more quickly.
Numlock Key (**On** default)	Determines the functionality of the numeric keys on the right side of your keyboard. **Off** commands the right keypad keys to function as arrows. **On** commands the right keypad keys to function as numbers.
POST Hotkeys	Determines whether the sign-on screen displays a message stating the keystroke sequence that is required to enter the **Setup** program or the **Quickboot** feature. **Setup & Boot Menu** displays both messages (F2=Setup and F12=Boot Menu). **Setup** displays the setup message only (F2=Setup). **Boot Menu** displays the **Quickboot** message only (F12=Boot Menu). **None** displays no message.
Keyboard Errors	When set to **Report** (enabled) and an error is detected during POST, the BIOS will display the error message and prompt you to press <F1> to continue or press <F2> to enter System Setup. When set to **Do Not Report** (disabled) and an error is detected during POST, the BIOS will display the error message and continue booting the system.

Boot Sequence

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

Option Settings

- **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.
- **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.
- **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.
- **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 (see "Front View of the Computer" and "Back View of the Computer").
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.

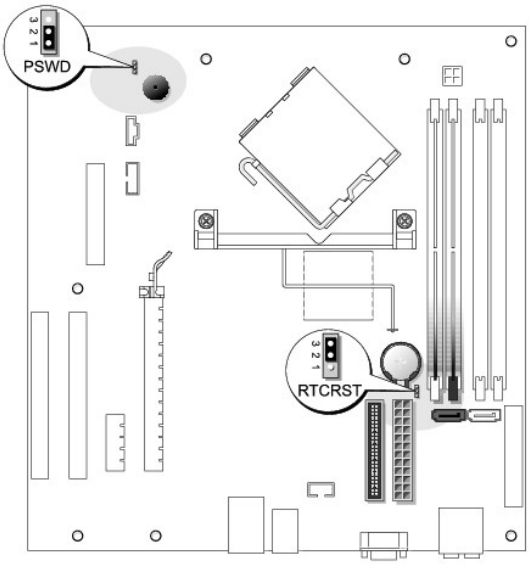
NOTE: Write down your current boot sequence in case you want to restore it.

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 in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin."



2. Locate the 3-pin password jumper (PSWD) on the system board, and attach the jumper plug to pins 2 and 3 to clear the password.

NOTE: When you receive your computer, the jumper plug is attached to pins 1 and 2.

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 your computer. Turn off the monitor and disconnect it from the electrical outlet.
6. Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.
7. Open the computer cover.
8. Locate the 3-pin password jumper (PSWD) on the system board and attach the jumper to pins 1 and 2 to re-enable the password feature.
9. Close the computer cover.

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

10. 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 in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin."
2. Reset the current CMOS settings:
   a. Locate the 3-pin CMOS jumper (RTCRST) on the system board.
   b. Remove the jumper plug from pins 2 and 3.
   c. Place the jumper plug on pins 1 and 2 and wait for approximately 5 seconds.
   d. Replace the jumper plug on pins 2 and 3.
3. Close the computer cover.

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

4. Connect your computer and devices

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Specifications

Dell™ Dimension™ 5100 Service Manual

Processor	Expansion Bus
Memory	Connectors
Computer Information	Controls and Lights
Video	Power
Audio	Physical
Drives	Environmental

Processor	
Processor type	Intel® Pentium® 4 5*XXX* and 6XXX processors 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 for Pentium 5XXX processors 2 MB for Pentium 6XXX processors (depending on your computer configuration) pipelined-burst, eight-way set associative, write-back SRAM

Memory	
Type	400-MHz 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 945G Express
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4 Mb
NIC	Integrated network interface capable of 10/100 communication
System clock	800- or 1066-MHz data rate

Video	
Type	Integrated Intel Graphics Media Accelerator 950 (GMA950)

Audio	
Type	Sigmatel STAC9220

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 FlexBay (may contain an optional floppy drive or an optional Media Card Reader) 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, DVD and CD-RW combo drive, and Media Card Reader
Internally accessible:	two bays for 1-inch high serial ATA hard drives

Connectors	
External connectors:	
Video	15-hole connector
Network adapter	RJ-45 connector
USB	two front-panel and five back-panel USB 2.0-compliant connectors
Audio	five connectors for line-in, line-out, microphone/ side-surround, surround, and center/subwoofer connector (LFE channel); two front-panel connectors for headphones and microphone
System board connectors:	
Primary IDE drive	one 40-pin connector
Serial ATA	two 7-pin connectors
FlexBay Drive	one USB 10-pin header for optional Media Card Reader (3.5-inch bay device)
Floppy drive	one 33-pin connector
Fan	one 5-pin connectors
PCI 2.3	two 120-pin connectors
PCI Express x1	one 36-pin connector
PCI Express x16	one 164-pin connector

Controls and Lights	
Power button	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 (see "Power Problems" in your computer *Owner's Manual*).
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	1039 BTU/hr
Voltage (see the safety instructions in the *Product Information Guide* 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 35°C (50° to 95°F)
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 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

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Specifications

Dell™ Dimension™ 5100 Service Manual

- Processor
- Memory
- Computer Information
- Video
- Audio
- Drives
- Expansion Bus
- Connectors
- Controls and Lights
- Power
- Physical
- Environmental

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Heat dissipation	1039 BTU/hr
Voltage (see the safety instructions in the *Product Information Guide* 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

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Height	41.3 cm (16.3 inches)
Width	18.7 cm (7.4 inches)
Depth	45.9 cm (18.0 inches)
Weight	14.2 kg (32 lb)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F)
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 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

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Technical Overview

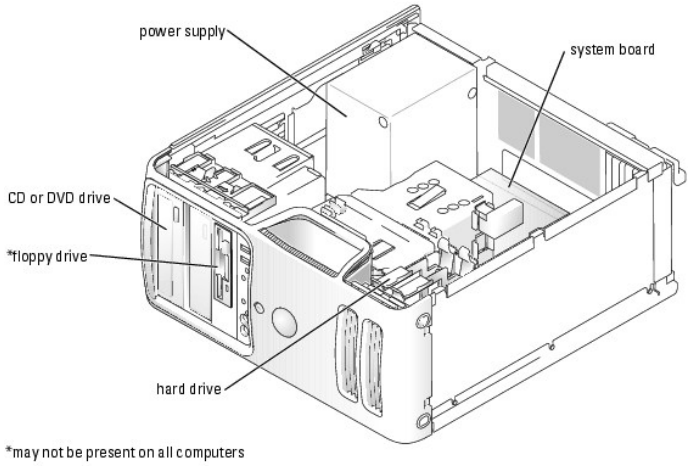
Dell™ Dimension™ 5100 Service Manual

- Inside View of Your Computer
- System Board Components
- Power Supply DC Connector Pin Assignments

Inside View of Your Computer

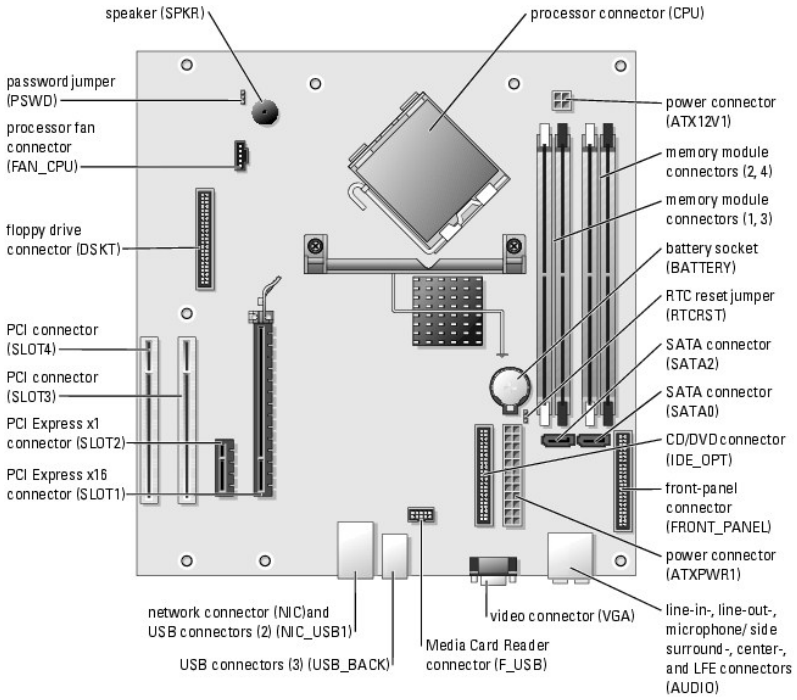
⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

Follow the procedures in "Before You Begin."

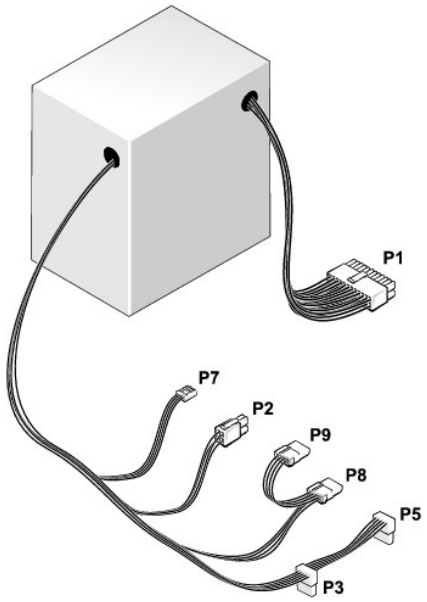


*may not be present on all computers

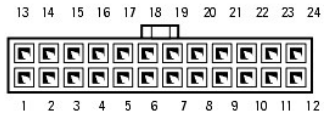
System Board Components



Power Supply DC Connector Pin Assignments



DC Main Power Connector P1



Pin Number	Signal Name	18-AWG Wire
1	+3.3 VDC*	Orange
2	+3.3 VDC*	Orange
3	COM	Black
4	+5VDC	Red
5	COM	Black
6	+5 VDC	Red
7	COM	Black
8	POK	Gray
9	+5 VFP	Purple
10	+12 VBDC	White
11	+12 VBDC	White
12	+3.3 VDC*	Orange
13	+3.3 VDC*/SE*	Orange
14	–12 VDC	Blue
15	COM	Black
16	PS-ON	Green
17	COM	Black
18	COM	Black
19	COM	Black
20	NA	NA
21	+5 VDC	Red
22	+5 VDC	Red
23	+5 VDC	Red
24	COM	Black
*The orange +3.3 VDC output wires must be 16 AWG. The +3.3 VDC terminals are high current type (9 A current rating/Molex-HCS type). *The +3.3VDC/SE is a brown sense wire for +3.3VDC and is optional.		

DC Processor Power Connector P2

Pin Number	Signal Name	18-AWG Wire
1	COM	Black
2	COM	Black
3	+12 VADC	Yellow
4	+12 VADC	Yellow

DC Peripheral Connectors P3 and P5

Pin Number	Signal Name	18-AWG Wire
1	+3.3 VDC	Orange
2	COM	Black
3	+5 VADC	Red
4	COM	Black
5	+12 VBDC	White

DC FDD Connector P7

Pin Number	Signal Name	18-AWG Wire
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 VADC	Yellow

DC Peripheral Connectors P8 and P9

Pin Number	Signal Name	18-AWG Wire
1	+12 VBDC	White
2	COM	Black
3	COM	Black
4	+5 VDC	Red

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Technical Overview

Dell™ Dimension™ 5100 Service Manual

- Inside View of Your Computer
- System Board Components
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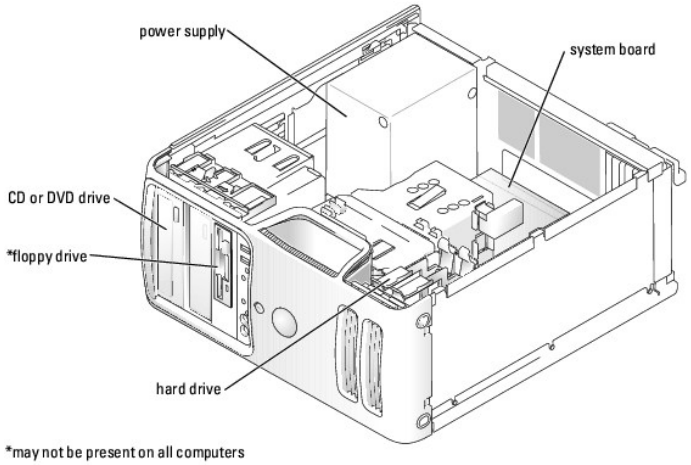
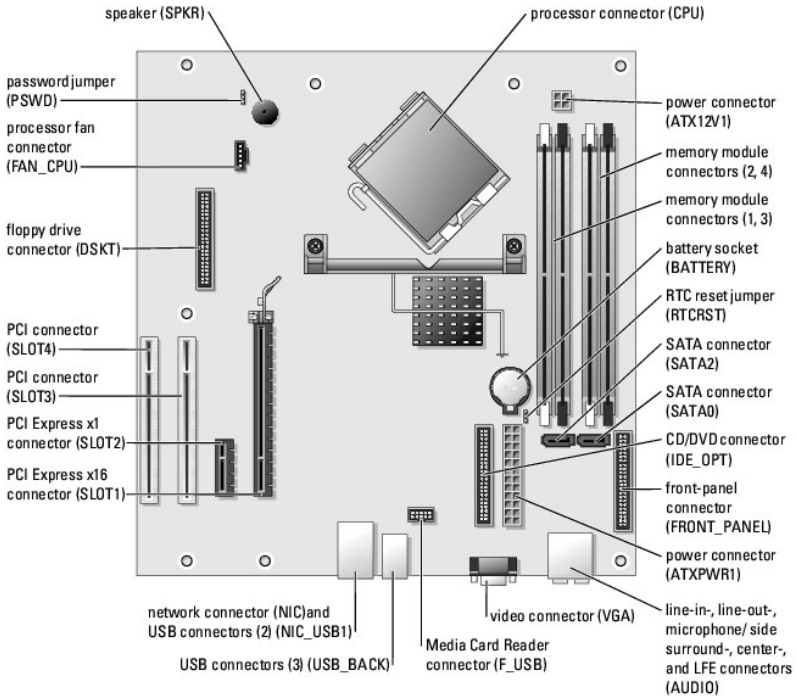
Inside View of Your Computer

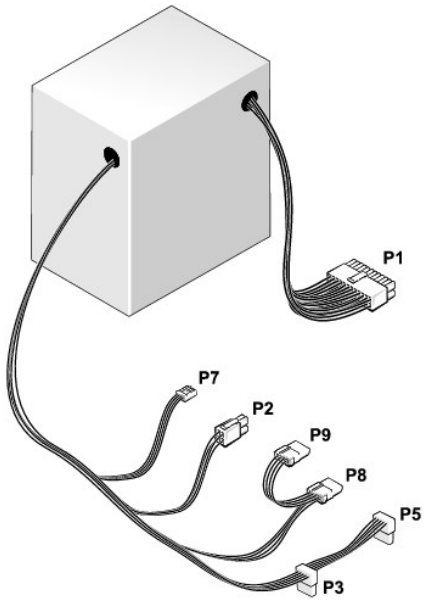
⚠ **CAUTION:** **Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**



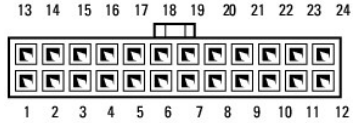
System Board Components



Power Supply DC Connector Pin Assignments



DC Main Power Connector P1



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3	COM	Black
4	+5VDC	Red
5	COM	Black
6	+5 VDC	Red
7	COM	Black
8	POK	Gray
9	+5 VFP	Purple
10	+12 VBDC	White
11	+12 VBDC	White
12	+3.3 VDC*	Orange
13	+3.3 VDC*/SE*	Orange
14	–12 VDC	Blue
15	COM	Black
16	PS-ON	Green
17	COM	Black
18	COM	Black
19	COM	Black
20	NA	NA
21	+5 VDC	Red
22	+5 VDC	Red
23	+5 VDC	Red
24	COM	Black
*The orange +3.3 VDC output wires must be 16 AWG. The +3.3 VDC terminals are high current type (9 A current rating/Molex-HCS type). *The +3.3VDC/SE is a brown sense wire for +3.3VDC and is optional.		

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DC Peripheral Connectors P3 and P5

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3	+5 VADC	Red
4	COM	Black
5	+12 VBDC	White

DC FDD Connector P7

Pin Number	Signal Name	18-AWG Wire
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 VADC	Yellow

DC Peripheral Connectors P8 and P9

Pin Number	Signal Name	18-AWG Wire
1	+12 VBDC	White
2	COM	Black
3	COM	Black
4	+5 VDC	Red

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Dell™ Dimension™ 5100 Service Manual

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.

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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Advanced Troubleshooting

Dell™ Dimension™ 5100 Service Manual

- Dell Diagnostics
- System Lights
- Diagnostic Lights
- Beep Codes

Dell Diagnostics

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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 optional *Drivers and Utilities* CD (*ResourceCD*).

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 (optional) *Drivers and Utilities* CD.

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 Optional Drivers and Utilities CD

1. Insert the *Drivers and Utilities* CD.
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 (see your computer *Owner's Manual* for information about how to 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 activity light may indicate a computer problem.

Power Light	Problem Description	Suggested Resolution
Solid green	Power is on, and the computer is operating normally.	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 amber	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.

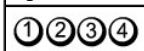
		If the computer does not boot, contact Dell for technical assistance (see your computer *Owner's Manual* for information about how to contact Dell).
Blinking amber	A power supply or system board failure has occurred.	Check the diagnostic lights to see if the specific problem is identified. Also, see "Power Problems" in your computer *Owner's Manual*.
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 Power Problems" in your computer *Owner's Manual*.
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. See your computer *Owner's Manual* for information on how to contact Dell.

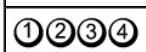
Hard-Drive Activity Light	**Problem Description**	**Suggested Resolution**
Solid green	The hard-drive activity light is on when the computer reads data from or writes data to the hard drive. The light might also be on when a device such as a CD player is operating.	No corrective action is required.

Diagnostic Lights

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

To help you troubleshoot a problem, your computer has four diagnostic lights labeled "1," "2," "3," and "4" on the front panel. When the computer starts normally, the lights flash. After the computer starts, all four lights display solid green. If the computer malfunctions, the color and sequence of the lights identify the problem.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.

Light Pattern	**Problem Description**	**Suggested Resolution**
	The computer is in a normal "off" condition, has successfully booted to the operating system, or a possible pre-BIOS failure has occurred.	Plug the computer into a working electrical outlet and press the power button. Also see "Power Problems" in your computer *Owner's Manual*.
	A possible processor failure has occurred.	Contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	Memory modules are detected, but a memory failure has occurred.	• 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. • If available, install properly working memory of the same type into your computer. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	A possible graphics card failure has occurred.	• If the computer has a graphics card, remove the card, and then restart the computer. • If the problem still exists, install a graphics card that you know works and restart the computer. • If the problem persists or the computer has integrated graphics, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.
	No memory modules are detected.	• 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. • If available, install properly working memory of the same type into your computer. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	Memory modules are detected, but a memory configuration or compatibility error exists.	• Ensure that no special memory module/memory connector placement requirements exist (see "Memory"). • Verify that the memory modules that you are installing are compatible with your computer (see "Memory"). • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).

	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card (not a graphics card) (see "Cards") and restarting the computer. 2. If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. 3. Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Compatibilities" in your computer *Owner's Manual*). 4. If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	Another failure has occurred.	• Ensure that the cables are properly connected to the system board from the hard drive, CD drive, and DVD drive (see "System Board Components"). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to ensure that it is functioning properly. • The operating system is attempting to boot from a device (such as the floppy drive or hard drive); check system setup to ensure that the boot sequence is correct for the devices installed on your computer. • Check the computer message that appears on your monitor screen. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	The computer is in a normal operating condition after POST. **NOTE:** The diagnostic lights are not lit after the system successfully boots to the operating system.	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 code.
2. Run the Dell Diagnostics to identify a more serious cause.
3. Contact Dell for technical assistance (see your computer *Owner's Manual* for information about how to contact Dell).

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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Advanced Troubleshooting

Dell™ Dimension™ 5100 Service Manual

- Dell Diagnostics
- System Lights
- Diagnostic Lights
- Beep Codes

Dell Diagnostics

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions 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.

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

Start the Dell Diagnostics from either your hard drive or from the optional *Drivers and Utilities* CD (*ResourceCD*).

Starting the Dell Diagnostics From Your Hard Drive

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

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

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 Optional Drivers and Utilities CD

1. Insert the *Drivers and Utilities* CD.
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 (see your computer *Owner's Manual* for information about how to 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 activity light may indicate a computer problem.

Power Light	Problem Description	Suggested Resolution
Solid green	Power is on, and the computer is operating normally.	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 amber	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 (see your computer *Owner's Manual* for information about how to contact Dell).

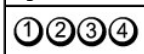
Blinking amber	A power supply or system board failure has occurred.	Check the diagnostic lights to see if the specific problem is identified. Also, see "Power Problems" in your computer *Owner's Manual*.
Solid green and a beep code during POST	A problem was detected while the BIOS was executing.	See "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 Power Problems" in your computer *Owner's Manual*.
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. See your computer *Owner's Manual* for information on how to contact Dell.

Hard-Drive Activity Light	**Problem Description**	**Suggested Resolution**
Solid green	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.	No corrective action is required.

Diagnostic Lights

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

To help you troubleshoot a problem, your computer has four diagnostic lights labeled "1," "2," "3," and "4" on the front panel. When the computer starts normally, the lights flash. After the computer starts, all four lights display solid green. If the computer malfunctions, the color and sequence of the lights identify the problem.

Light Pattern	**Problem Description**	**Suggested Resolution**
	The computer is in a normal "off" condition, has successfully booted to the operating system, or a possible pre-BIOS failure has occurred.	Plug the computer into a working electrical outlet and press the power button. Also see "Power Problems" in your computer *Owner's Manual*.
	A possible processor failure has occurred.	Contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	Memory modules are detected, but a memory failure has occurred.	• 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. • If available, install properly working memory of the same type into your computer. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	A possible graphics card failure has occurred.	• If the computer has a graphics card, remove the card, and then restart the computer. • If the problem still exists, install a graphics card that you know works and restart the computer. • If the problem persists or the computer has integrated graphics, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.
	No memory modules are detected.	• 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. • If available, install properly working memory of the same type into your computer. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
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	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card (not a graphics card) (see "Cards") and restarting the computer. 2. If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. 3. Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software

		and Hardware Compatibilities" in your computer *Owner's Manual*). 4. If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
	Another failure has occurred.	• Ensure that the cables are properly connected to the system board from the hard drive, CD drive, and DVD drive (see "System Board Components"). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to ensure that it is functioning properly. • The operating system is attempting to boot from a device (such as the floppy drive or hard drive); check system setup to ensure that the boot sequence is correct for the devices installed on your computer. • If the problem persists, contact Dell (see your computer *Owner's Manual* for information about how to contact Dell).
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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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