



# Hardware Reference Guide

HP RP5 Retail System

© Copyright 2014 Hewlett-Packard  
Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: March 2014

Document Part Number: 756968-001

## Product Notice

This guide describes features that are common to most models. Some features may not be available on your computer.

Not all features are available in all editions of Windows 8. This computer may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 functionality. See <http://www.microsoft.com> for details.

This computer may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://windows.microsoft.com/en-us/windows7/get-know-windows-7> for details.


## Software terms


By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a refund subject to the refund policy of your place of purchase.

For any further information or to request a full refund of the computer, please contact your local point of sale (the seller).

## About This Book

This guide provides basic information for upgrading this computer model.

 **WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

 **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

 **NOTE:** Text set off in this manner provides important supplemental information.



---

# Table of contents

<b>1 Product Features .....</b>	<b>1</b>
Standard Configuration Features .....	1
Front Panel Components .....	2
Rear Panel Components .....	3
Changing from Desktop to Tower Configuration .....	4
Installing the Optional Port Cover .....	5
Serial Number Location .....	6
 <b>2 Hardware Upgrades .....</b>	 <b>7</b>
Warnings and Cautions .....	7
Removing the Computer Access Panel .....	8
Replacing the Computer Access Panel .....	8
Removing the Front Bezel .....	9
Installing an Optical Drive Bezel .....	10
Removing a Bezel Blank .....	11
Replacing the Front Bezel .....	11
Installing Additional Memory .....	12
DIMMs .....	12
DDR3-SDRAM DIMMs .....	12
Populating DIMM Sockets .....	13
Installing DIMMs .....	14
Installing a Half-Height Expansion Card .....	17
Installing a 12-Volt Powered USB Expansion Card .....	18
Installing a Second DisplayPort Expansion Card .....	24
Installing a Full-Height Expansion Card .....	27
Installing a Powered Serial Port Expansion Card .....	28
Configuring Powered Serial Ports .....	32
Replacing the Riser Card .....	32
Drive Positions .....	39
Installing and Removing Drives .....	39
System Board Drive Connections .....	41
Removing an Optical Drive from the 5.25-inch Drive Bay .....	42

Installing an Optical Drive into the 5.25-inch Drive Bay .....	44
Removing a Secondary Hard Drive from the 3.5-inch Drive Bay .....	48
Installing a Secondary Hard Drive into the 3.5-inch Drive Bay .....	50
Removing and Replacing the Primary 3.5-inch Internal Hard Drive .....	51
Replacing the Battery .....	57
<b>Appendix A External Security Devices .....</b>	<b>59</b>
Installing a Security Lock .....	59
HP Keyed Cable Lock .....	59
Padlock .....	60
HP Business PC Security Lock .....	61
Front Bezel Security .....	65
<b>Appendix B Optional Integration Tray and Accessories .....</b>	<b>67</b>
<b>Appendix C Electrostatic Discharge .....</b>	<b>69</b>
Preventing Electrostatic Damage .....	69
Grounding Methods .....	69
<b>Appendix D Computer Operating Guidelines, Routine Care and Shipping Preparation .....</b>	<b>70</b>
Computer Operating Guidelines and Routine Care .....	70
Optical Drive Precautions .....	71
Operation .....	71
Cleaning .....	71
Safety .....	71
Shipping Preparation .....	71
<b>Index .....</b>	<b>72</b>

---

# 1 Product Features

## Standard Configuration Features


Features may vary depending on the model. For a complete listing of the hardware and software installed on the computer, run the diagnostic utility (included on some computer models only).

Some models include an optical drive while other models have a driveless bezel covering the optical drive bay. On models without an optical drive, the driveless bezel can be removed and replaced with an optical drive and optical drive bezel.

**Figure 1-1** Configuration



---

 **NOTE:** This product features optional Powered USB ports. In the retail industry, “Powered USB” is also referred to as “USB + Power,” “USB Plus Power,” and “Retail USB.” In this document, these ports are referred to as “Powered USB.”

---

# Front Panel Components

Drive configuration may vary by model.

Figure 1-2 Front Panel Components

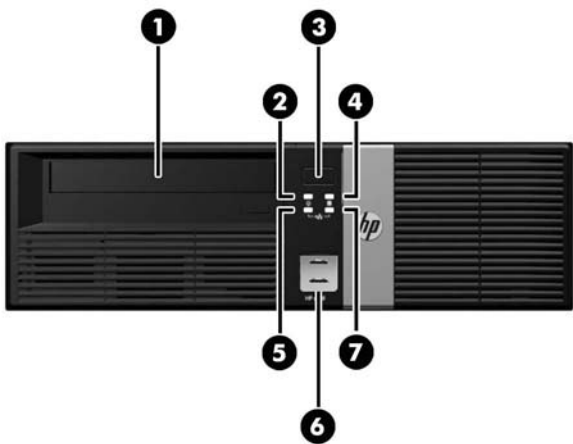


Table 1-1 Front Panel Components

1	5.25-inch Optical Drive (optional)	5	NIC Link Light
2	Power On Light	6	USB Ports (2)
3	Dual-State Power Button	7	NIC Activity Light
4	Hard Drive Activity Light		

**NOTE:** Some models without an optical drive include a driveless bezel in place of the optical drive bezel. Other models without an optical drive include an optical drive bezel with a bezel blank covering the optical drive bay.

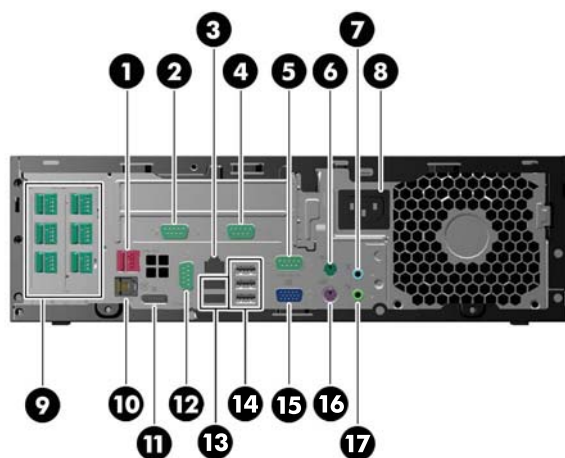
The USB ports are located behind a sliding door.

The NIC link light indicates a network connection. The NIC activity light indicates network activity.

The Power On Light is normally green when the power is on. If it is flashing red, there is a problem with the computer and it is displaying a diagnostic code. Refer to the *Maintenance and Service Guide* to interpret the code.



# Rear Panel Components



**Table 1-2 Rear Panel Components**

1	Powered USB 24V	10	Cash Drawer Connector
2	Serial Connector (COM3) (optional)	11	DisplayPort
3	RJ-45 Network Connector	12	Serial Connector (COM2)
4	Serial Connector (COM4) (optional)	13	USB 3.0 Ports (2)
5	Serial Connector (COM1)	14	USB 2.0 Ports (3)
6	PS/2 Mouse Connector (green)	15	VGA Connector
7	Line-In Audio Connector (blue)	16	PS/2 Keyboard Connector (purple)
8	Power Cord Connector	17	Line-Out Connector for powered audio devices (green)
9	Powered USB 12V (optional)		

**NOTE:** Arrangement and number of connectors may vary by model.

An optional eSATA adapter, an optional parallel port, and an optional second DisplayPort are available from HP.

The serial ports can be configured as 5V or 12V powered serial ports.

**CAUTION:** The cash drawer connector is similar in size and shape to a modem jack. To avoid damage to the computer, DO NOT plug a network cable into the cash drawer connector.

**CAUTION:** The system must be powered off before installing or removing peripherals on serial ports.

# Changing from Desktop to Tower Configuration


The computer can be used in a tower orientation with an optional tower stand that can be purchased from HP.

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.
4. Orient the computer so that its right side is facing down and place the computer in the optional stand.

**Figure 1-3** Changing from Desktop to Tower Orientation




---

 **NOTE:** To stabilize the computer in a tower orientation, HP recommends the use of the optional tower stand.

---

5. Reconnect the power cord and any external devices, then turn on the computer.

---

 **NOTE:** Ensure at least 10.2 centimeters (4 inches) of space on all sides of the computer remains clear and free of obstructions.

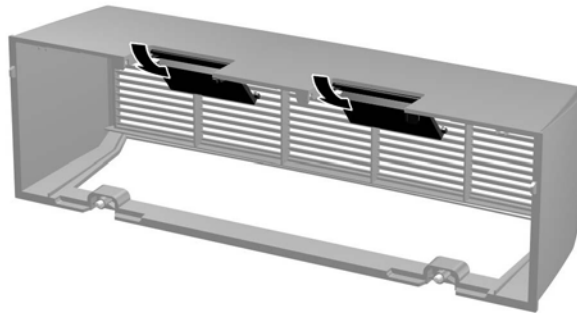
---

## Installing the Optional Port Cover

The computer can support an optional rear port cover that can be installed to hide the rear ports and cables. The doors on top of the port cover can be opened and snapped back to allow room for a security lock if one is attached to the rear of the computer. To install the port cover:

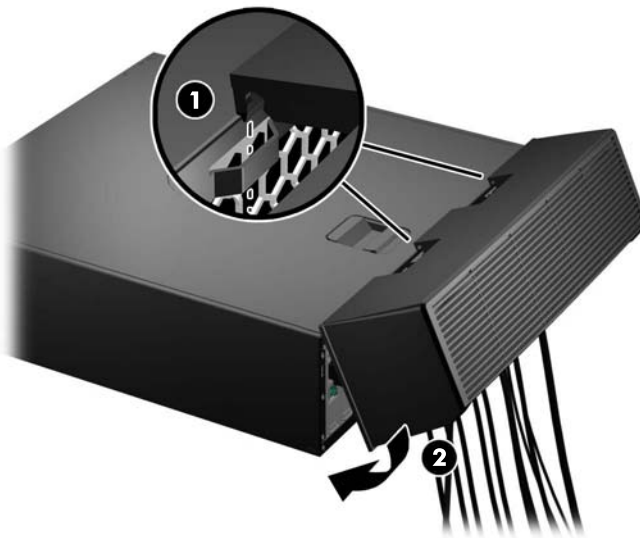
1. If there is a security lock attached to the rear of the computer, open the appropriate door on the top of the port cover and snap it back to make room for the security lock.

**Figure 1-4** Opening the Security Lock Doors



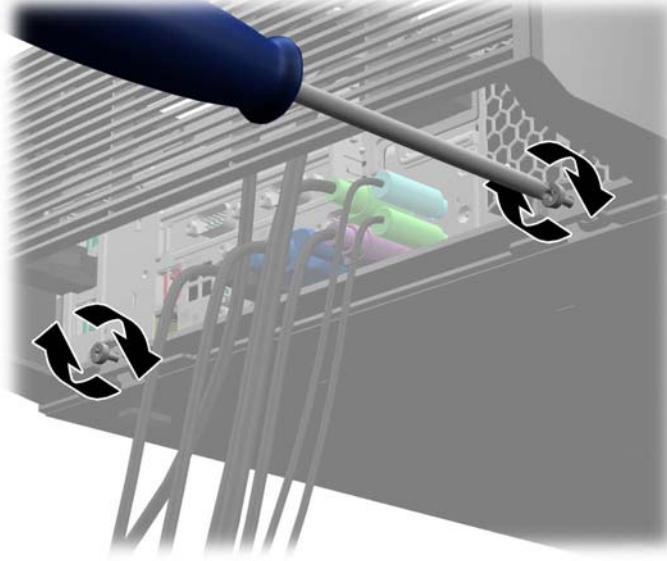
2. Insert the tabs on top of the port cover into the slots on the rear of the computer access panel (1) and rotate the bottom of the port cover against the rear of the computer (2).

**Figure 1-5** Installing the Port Cover



3. Tighten the two captive screws on the bottom of the port cover to secure it in place.

**Figure 1-6** Securing the Port Cover



4. The port cover is designed to allow cables to route out of the back of the computer horizontally or vertically.

**Figure 1-7** Cable Routing



## Serial Number Location

Each computer has a unique serial number and product ID number located on the back or side of the computer. Keep these numbers available for use when contacting customer service for assistance.


---

## 2 Hardware Upgrades

### Warnings and Cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.

---

 **WARNING!** To reduce the risk of personal injury from electrical shock, hot surfaces, or fire:

Disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

Do not disable the power cord grounding plug. The grounding plug is an important safety feature.


Plug the power cord in a grounded (earthed) outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at <http://www.hp.com/ergo>.

 **WARNING!** Energized and moving parts inside.

Disconnect power to the equipment before removing the enclosure.

Replace and secure the enclosure before re-energizing the equipment.

 **CAUTION:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See [Electrostatic Discharge on page 69](#) for more information.

When the computer is plugged into an AC power source, voltage is always applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent damage to internal components.

---

## Removing the Computer Access Panel

To access internal components, you must remove the access panel:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Slide the access panel handle toward the rear of the computer (1) then lift the access panel up and off the computer (2).

**Figure 2-1** Removing the Computer Access Panel



## Replacing the Computer Access Panel

Slide the lip on the front end of the access panel under the lip on the front of the chassis (1) then press the back end of the access panel onto the unit so that it locks into place (2).

**Figure 2-2** Replacing the Computer Access Panel



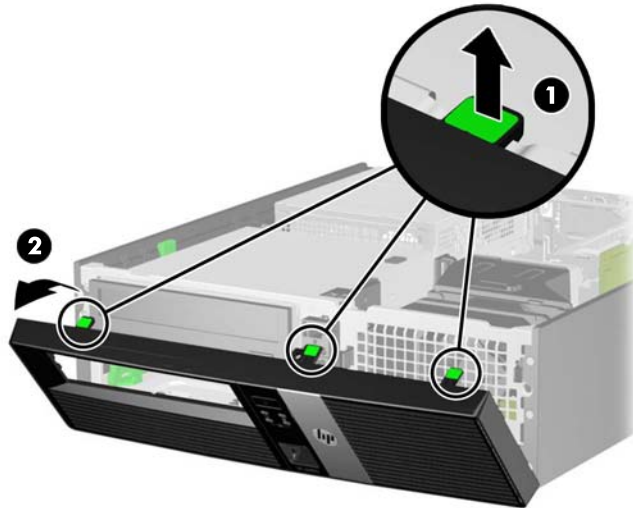
## Removing the Front Bezel

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.
7. Lift up the three tabs on the side of the bezel (1), then rotate the bezel off the chassis (2).

**Figure 2-3** Removing the Front Bezel (shown with optical drive installed)

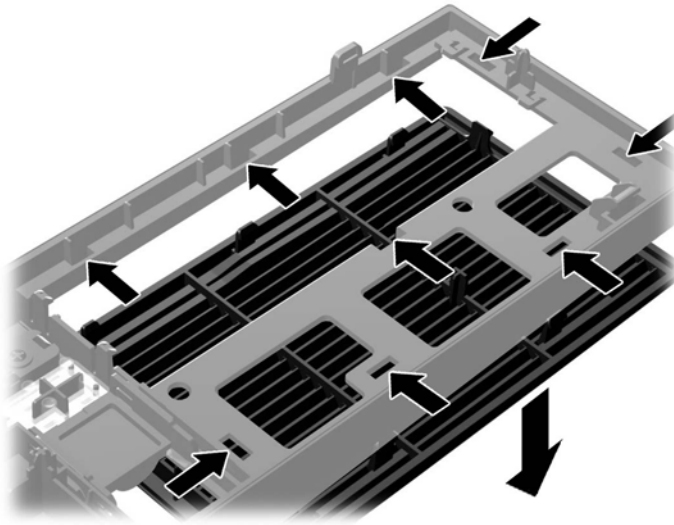


## Installing an Optical Drive Bezel

On some models there is a driveless bezel in place of the optical drive bezel that must be replaced with an optical drive bezel if you are installing an optical drive. To install an optical drive bezel:

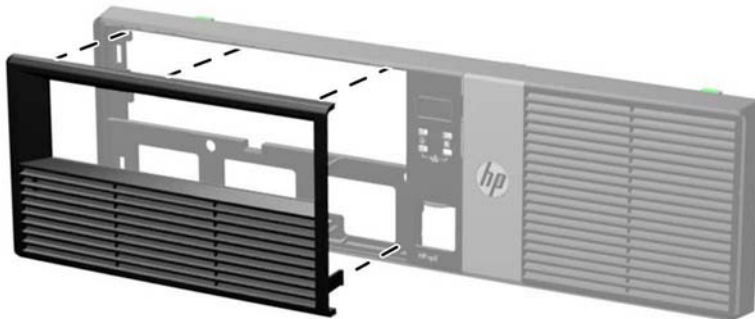
1. Remove the access panel and front bezel.
2. Press each of the clips that secure the driveless section of the bezel to the front bezel in the direction shown below to remove the driveless bezel.

**Figure 2-4** Removing the Driveless Bezel



3. Insert the clips on the optical drive bezel into the slots on the front bezel ensuring that the optical drive bezel snaps securely in place.

**Figure 2-5** Installing the Optical Drive Bezel



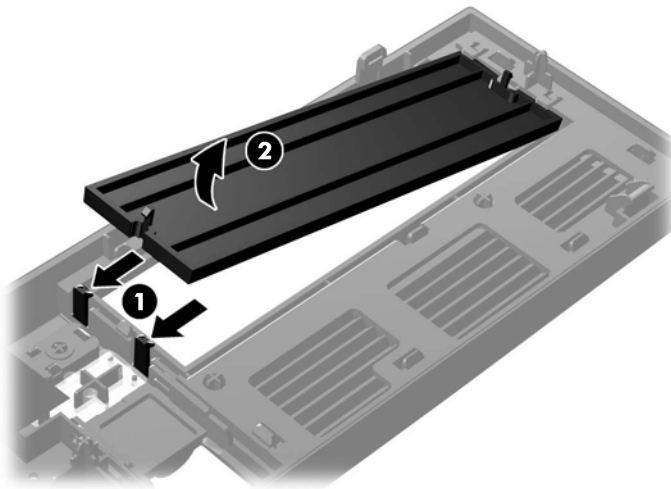


## Removing a Bezel Blank

On some models, there is a bezel blank covering the optical drive bay that must be removed before installing a drive. To remove a bezel blank:

1. Remove the access panel and front bezel.
2. Push outward on the two retaining tabs that hold the bezel blank in place (1) then pull the blank inward to remove it (2).

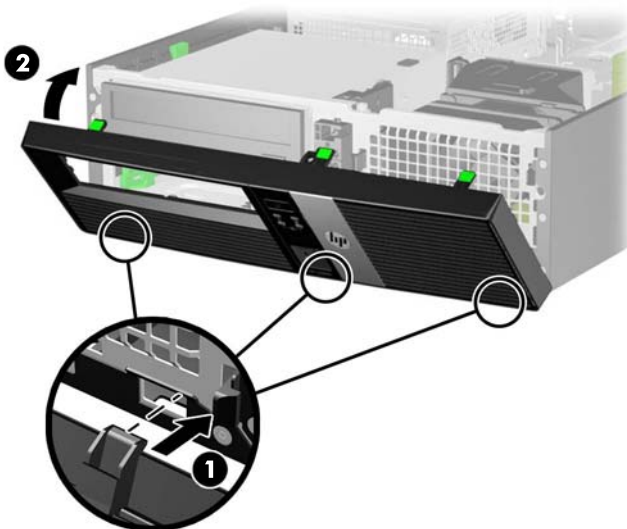
**Figure 2-6** Removing a Bezel Blank



## Replacing the Front Bezel

Insert the three hooks on the bottom side of the bezel into the rectangular holes on the chassis (1) then rotate the top side of the bezel onto the chassis (2) and snap it into place.

**Figure 2-7** Replacing the Front Bezel (shown with optical drive installed)



# Installing Additional Memory

The computer comes with double data rate 3 synchronous dynamic random access memory (DDR3-SDRAM) dual inline memory modules (DIMMs).

## DIMMs

The memory sockets on the system board can be populated with up to four industry-standard DIMMs. These memory sockets are populated with at least one preinstalled DIMM. To achieve the maximum memory support, you can populate the system board with up to 32-GB of memory configured in a high-performing dual channel mode.

## DDR3-SDRAM DIMMs

For proper system operation, the DDR3-SDRAM DIMMs must be:

- industry-standard 240-pin
- unbuffered non-ECC PC3-12800 DDR3-1600 MHz-compliant
- 1.35 volt or 1.5 volt DDR3/DDR3L-SDRAM DIMMs

The DDR3-SDRAM DIMMs must also:

- support CAS latency 11 DDR3 1600 MHz (11-11-11 timing)
- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 512-Mbit, 1-Gbit, and 2-Gbit non-ECC memory technologies
- single-sided and double-sided DIMMs
- DIMMs constructed with x8 and x16 DDR devices; DIMMs constructed with x4 SDRAM are not supported



---

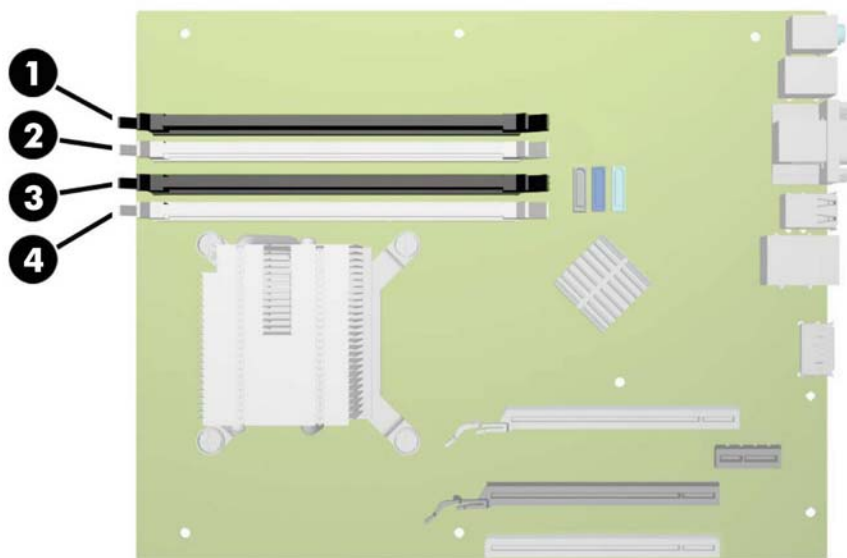
**NOTE:** The system will not operate properly if you install unsupported DIMMs.

---

## Populating DIMM Sockets

There are four DIMM sockets on the system board, with two sockets per channel. The sockets are labeled XMM1, XMM2, XMM3, and XMM4. Sockets XMM1 and XMM2 operate in memory channel A. Sockets XMM3 and XMM4 operate in memory channel B.

**Figure 2-8** DIMM Socket Locations



**Table 2-1** DIMM Socket Locations

Item	Description	Socket Color
1	XMM1 socket, Channel A (populate first)	Black
2	XMM2 socket, Channel A (populate third)	White
3	XMM3 socket, Channel B (populate second)	Black
4	XMM4 socket, Channel B (populate fourth)	White

The system will automatically operate in single channel mode, dual channel mode, or flex mode, depending on how the DIMMs are installed.

- The system will operate in single channel mode if the DIMM sockets are populated in one channel only.
- The system will operate in a higher-performing dual channel mode if the total memory capacity of the DIMMs in Channel A is equal to the total memory capacity of the DIMMs in Channel B. The technology and device width can vary between the channels. For example, if Channel A is populated with two 1-GB DIMMs and Channel B is populated with one 2-GB DIMM, the system will operate in dual channel mode.

- The system will operate in flex mode if the total memory capacity of the DIMMs in Channel A is not equal to the total memory capacity of the DIMMs in Channel B. In flex mode, the channel populated with the least amount of memory describes the total amount of memory assigned to dual channel and the remainder is assigned to single channel. For optimal speed, the channels should be balanced so that the largest amount of memory is spread between the two channels. If one channel will have more memory than the other, the larger amount should be assigned to Channel A. For example, if you are populating the sockets with one 2-GB DIMM, and three 1-GB DIMMs, Channel A should be populated with the 2-GB DIMM and one 1-GB DIMM, and Channel B should be populated with the other two 1-GB DIMMs. With this configuration, 4-GB will run as dual channel and 1-GB will run as single channel.
- In any mode, the maximum operational speed is determined by the slowest DIMM in the system.

## Installing DIMMs

---

**⚠ CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

The memory module sockets have gold-plated metal contacts. When upgrading the memory, it is important to use memory modules with gold-plated metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

Static electricity can damage the electronic components of the computer or optional cards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. For more information, refer to [Electrostatic Discharge on page 69](#).

When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

---

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

---

**⚠ CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

---

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.

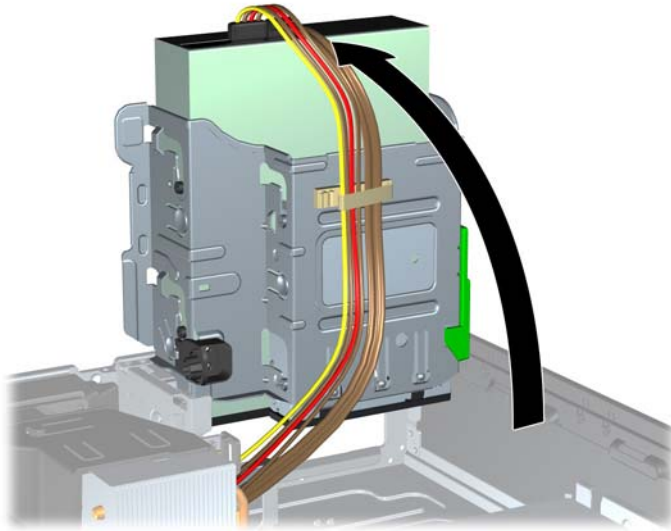
---

**⚠ WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

---

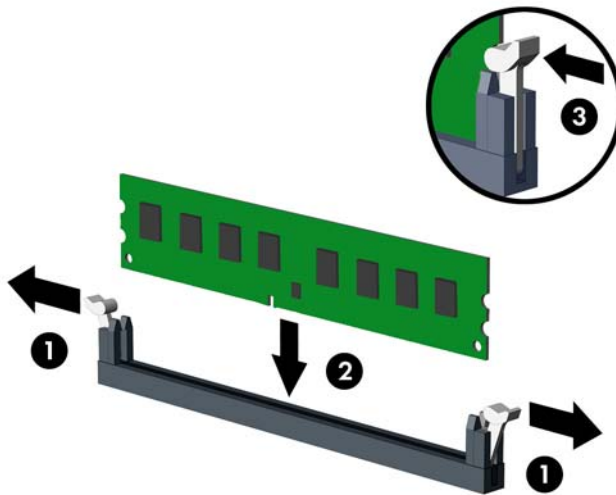
7. Rotate up the internal drive bay housing to access the memory module sockets on the system board.

**Figure 2-9** Rotating the Drive Cage Up



8. Open both latches of the memory module socket (1), and insert the memory module into the socket (2).

**Figure 2-10** Installing a DIMM



**NOTE:** A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.

Populate the black DIMM sockets before the white DIMM sockets.

For maximum performance, populate the sockets so that the memory capacity is spread as equally as possible between Channel A and Channel B. Refer to [Populating DIMM Sockets on page 13](#) for more information.

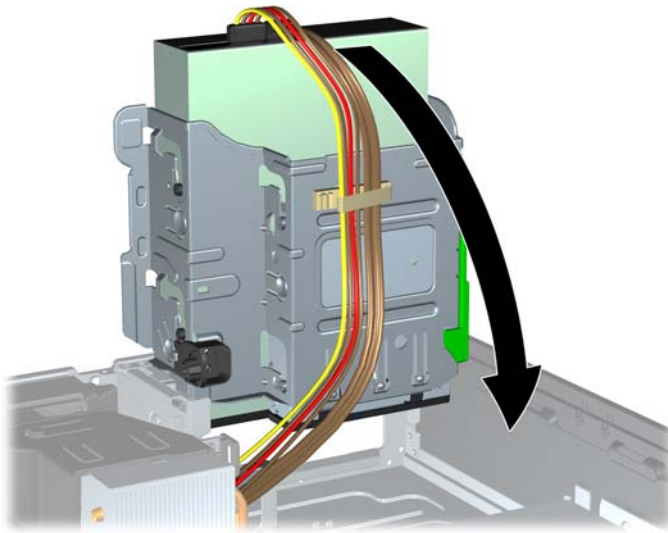
9. Push the module down into the socket, ensuring that the module is fully inserted and properly seated. Make sure the latches are in the closed position (3).
10. Repeat steps 8 and 9 to install any additional modules.
11. Rotate the drive cage back down to its normal position.

---

**⚠ CAUTION:** Be careful not to pinch any cables or wires when rotating the drive cage down.

---

**Figure 2-11** Rotating the Drive Cage Down




12. Replace the access panel.
13. If the computer was on a stand, replace the stand.
14. Reconnect the power cord and any external devices, then turn on the computer.
15. Lock any security devices that were disengaged when the access panel was removed.

The computer should automatically recognize the additional memory the next time you turn on the computer.

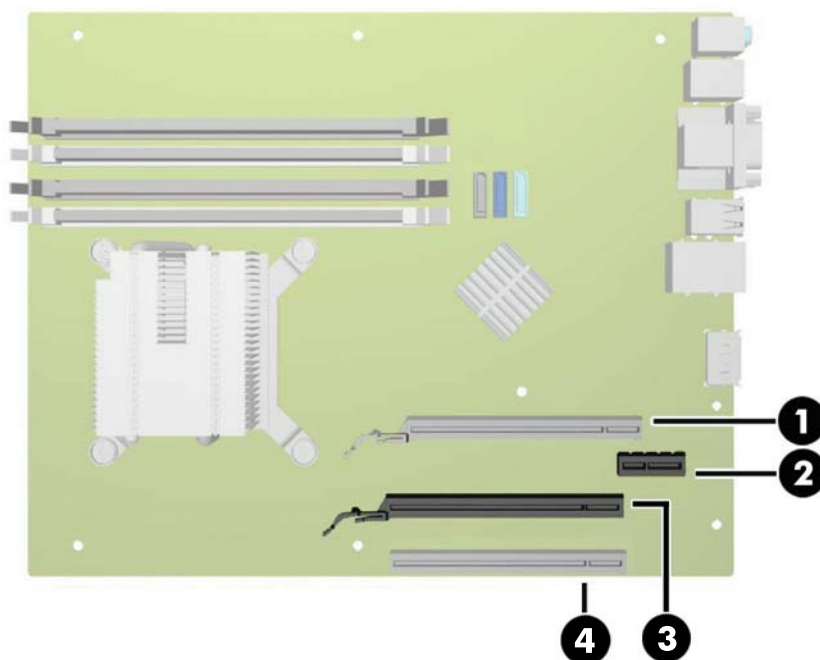
## Installing a Half-Height Expansion Card

The computer system board has a PCI Express x16 expansion slot, a PCI Express x16 expansion slot that is downshifted to a x4 slot, a DisplayPort expansion slot, and a riser card expansion slot. The riser card expansion slot is populated with a riser card specifically designed for this product.

 **NOTE:** The PCI Express slots support only low profile cards.

You can install a PCI Express x1, x4, x8, or x16 expansion card in the PCI Express x16 slots.

**Figure 2-12** System Board Expansion Slot Locations



**Table 2-2** System Board Expansion Slot Locations

No.	Expansion Slot
1	Riser Card (populated)
2	DisplayPort 2
3	PCI Express x16
4	PCI Express x16 downshifted to a x4

**CAUTION:** The Riser Card expansion slot is specifically designed for either of the two riser cards designed for this product. DO NOT attempt to plug any other type of card into this slot.

**NOTE:** The DisplayPort expansion slot is specifically designed for an HP DisplayPort expansion card.

**NOTE:** You cannot install an expansion card into both the DisplayPort slot (2) and the PCI Express x16 slot (3) at the same time.

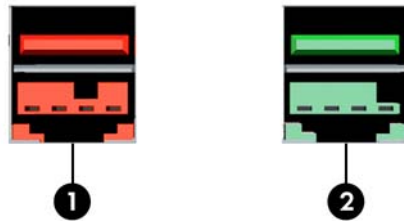


**NOTE:** The following sections provide instructions for installing a Powered USB expansion card. However, the procedure is basically the same for installing any PCI Express expansion card into a PCI Express x16 expansion slot.

## Installing a 12-Volt Powered USB Expansion Card

The computer is equipped with a 24-volt Powered USB connector on the riser card, and may have one or two 12-volt Powered USB half-height expansion cards installed for a total of 6 optional 12-volt Powered USB ports. The 24-volt Powered USB connector and the 12-volt Powered USB connector are keyed differently as a precaution to prevent connection errors.

**Figure 2-13** 24-volt and 12-volt Powered USB Connectors



**Table 2-3** 24-volt and 12-volt Powered USB Connectors

No.	Connector	Color
1	24-volt Powered USB	Red
2	12-volt Powered USB	Teal

To install a half-height 12-volt Powered USB expansion card:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.



**CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. Locate the correct vacant expansion socket on the system board and the corresponding expansion slot on the back of the computer chassis.

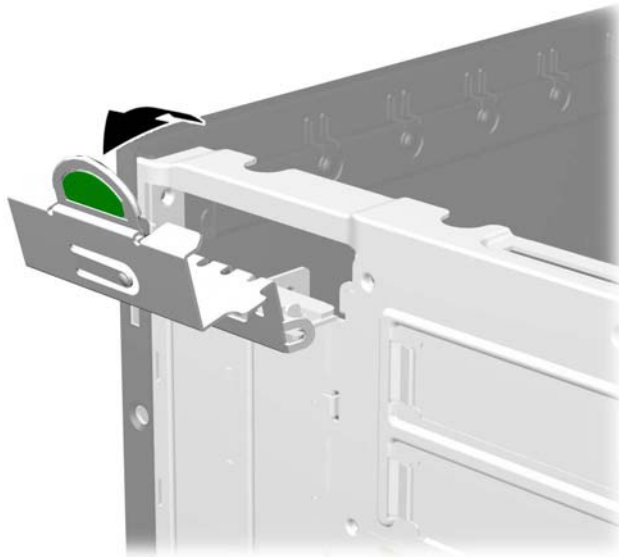


**NOTE:** You can install the Powered USB expansion card in either the PCI Express x16 slot or the PCI Express x16 slot that is downshifted to a x4 slot, or both. Two 12-volt Powered USB expansion cards are supported.




8. Release the half-height slot cover retention latch by lifting the green tab on the latch and rotating the latch to the open position.

**Figure 2-14** Opening the Half-Height Slot Cover Retention Latch

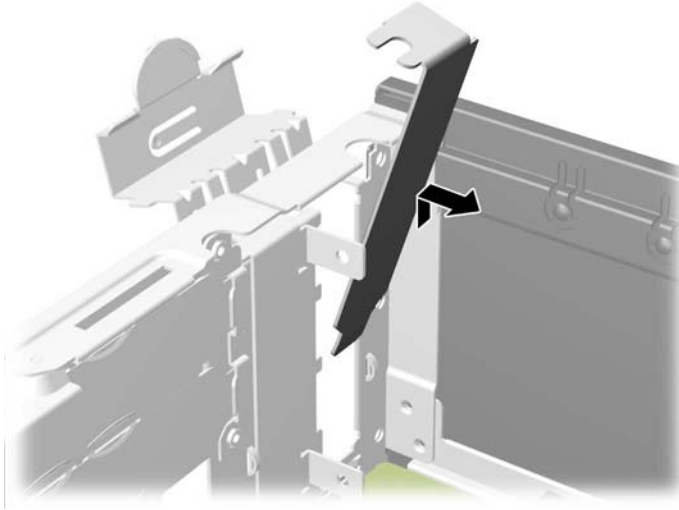


9. Before installing an expansion card, remove the expansion slot cover or the existing expansion card.

 **NOTE:** Before removing an installed expansion card, disconnect any cables that may be attached to the expansion card.

- a. If you are installing an expansion card in a vacant socket, remove the appropriate expansion slot cover on the back of the chassis. Pull the slot cover straight up then away from the inside of the chassis.

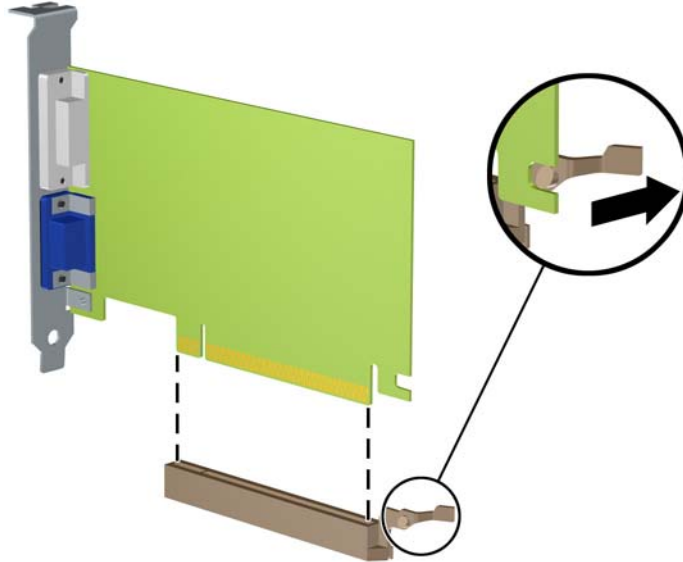
**Figure 2-15** Removing an Expansion Slot Cover



- b. If you are removing a PCI Express card from the white PCI Express x16 socket that is downshifted to a x4 socket, hold the card at each end, and carefully rock it back and forth until the connectors pull free from the socket. Pull the expansion card straight up from the socket then away from the inside of the chassis to release it from the chassis frame. Be sure not to scrape the card against the other components.


- c. If you are removing a PCI Express card from the black PCI Express x16 socket, pull the retention arm on the back of the expansion socket away from the card and carefully rock the card back and forth until the connectors pull free from the socket. Pull the expansion card straight up from the socket then away from the inside of the chassis to release it from the chassis frame. Be sure not to scrape the card against the other components.

**Figure 2-16** Removing a PCI Express x16 Expansion Card

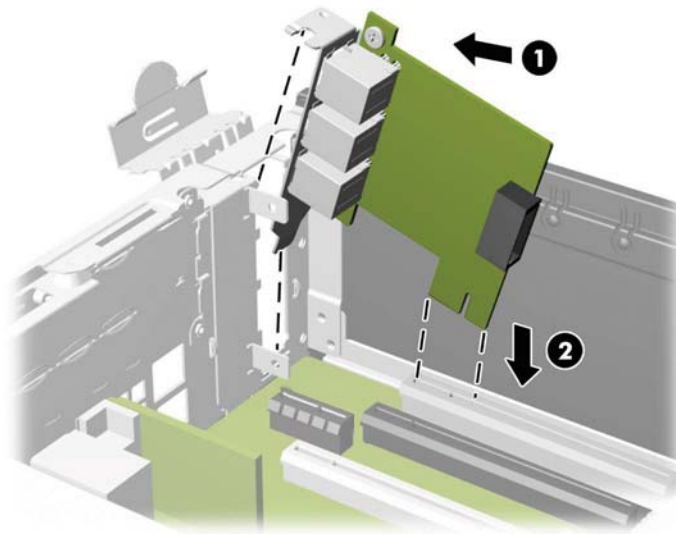



**CAUTION:** After removing an expansion card, you must replace it with a new card or expansion slot cover for proper cooling of internal components during operation.

10. To install a new 12-volt Powered USB expansion card, hold the card just above the PCI Express expansion socket on the system board then move the card toward the rear of the chassis (1) so that the bracket on the card is aligned with the open slot on the rear of the chassis. Press the card straight down into the expansion socket on the system board (2).


 **NOTE:** You can install the Powered USB expansion card in either the PCI Express x16 slot or the PCI Express x16 slot that is downshifted to a x4 slot, or both. Two 12-volt Powered USB expansion cards are supported.

**Figure 2-17** Installing a 12-volt Powered USB Expansion Card

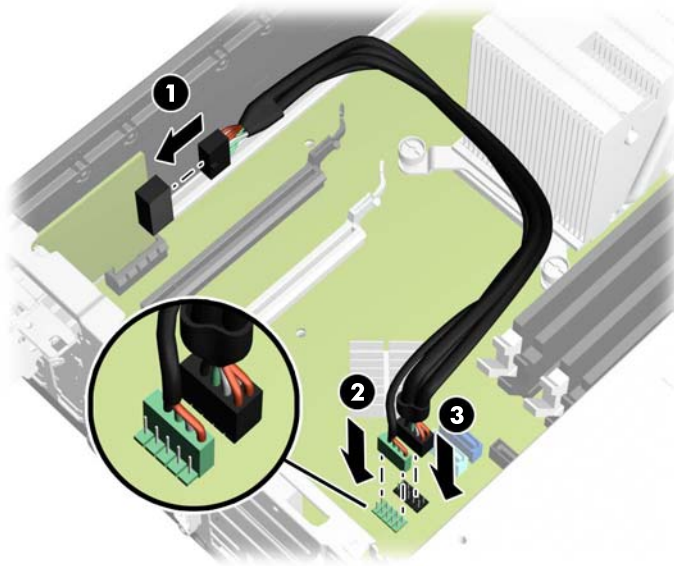


 **NOTE:** When installing an expansion card, press firmly on the card so that the whole connector seats properly in the expansion card slot.

11. The cable included with the card has a single connector on one end and dual connectors on the other end. Connect the single end of the cable to the rear of the card (1). Connect the green connector on the other end of the cable to the green 12-volt USB connector on the system board (2). The cable will plug on one side of the green connector only. Connect the black connector to one of the two black 12-volt USB connectors on the system board (3).

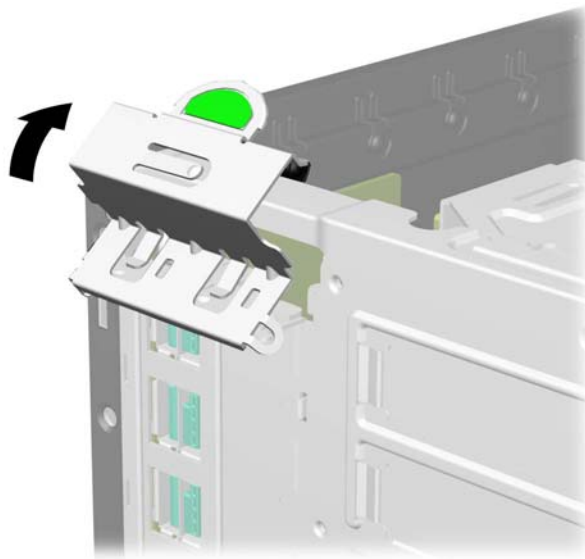
 **NOTE:** The system board connectors allow you to install two 12-volt Powered USB expansion cards. The green connectors on the system board are coupled together as one connector. The black connectors on the system board are separate connectors.

**Figure 2-18** Connecting the 12-volt Powered USB Cable



12. Rotate the slot cover retention latch back in place to secure the expansion card.

**Figure 2-19** Closing the Expansion Card Retention Latch



13. Replace the computer access panel.
14. If the computer was on a stand, replace the stand.

15. Reconnect the power cord and any external devices, then turn on the computer.
16. Lock any security devices that were disengaged when the access panel was removed.
17. Reconfigure the computer, if necessary.


## Installing a Second DisplayPort Expansion Card

The computer is equipped with one DisplayPort on the rear panel. You can add a second DisplayPort by installing the DisplayPort expansion card into the DisplayPort expansion socket on the system board.

To install a DisplayPort expansion card:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.


---

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

---

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. Locate the correct vacant expansion socket on the system board and the corresponding expansion slot on the back of the computer chassis.

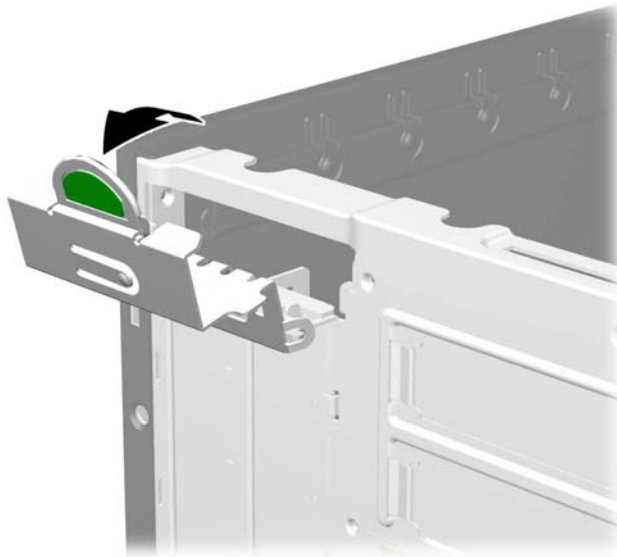
---

 **NOTE:** You must install the DisplayPort expansion card into the socket specifically designated for it.

---

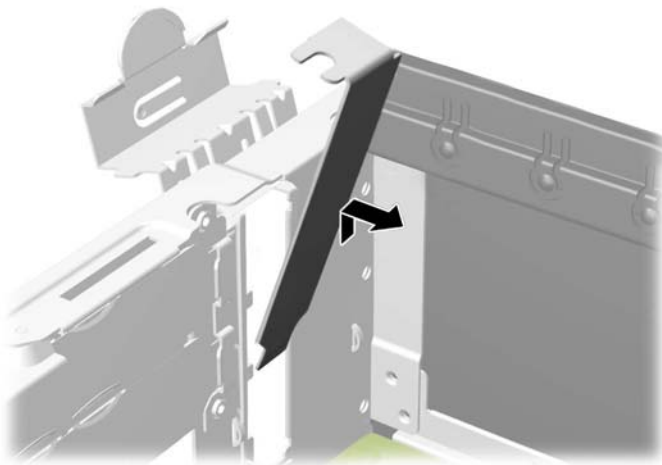
8. Release the half-height slot cover retention latch by lifting the green tab on the latch and rotating the latch to the open position.

**Figure 2-20** Opening the Half-Height Slot Cover Retention Latch




9. Before installing an expansion card, remove the expansion slot cover. Pull the slot cover straight up then away from the inside of the chassis.

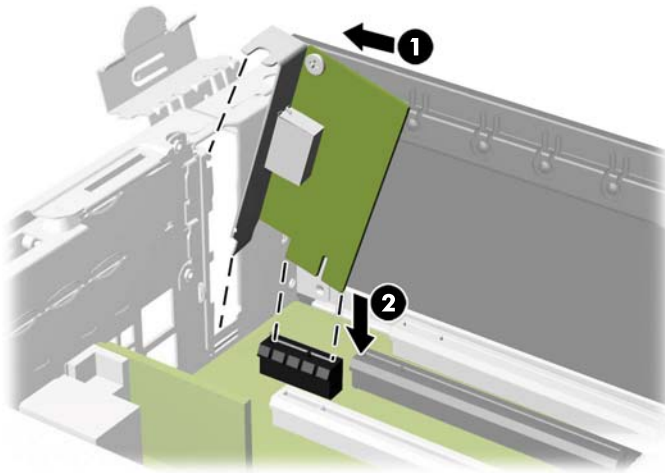
**Figure 2-21** Removing an Expansion Slot Cover




10. To install a new DisplayPort expansion card, hold the card just above the DisplayPort expansion socket on the system board then move the card toward the rear of the chassis (1) so that the bracket on the card is aligned with the open slot on the rear of the chassis. Press the card straight down into the expansion socket on the system board (2).

 **NOTE:** You must install the DisplayPort expansion card into the socket specifically designated for it.

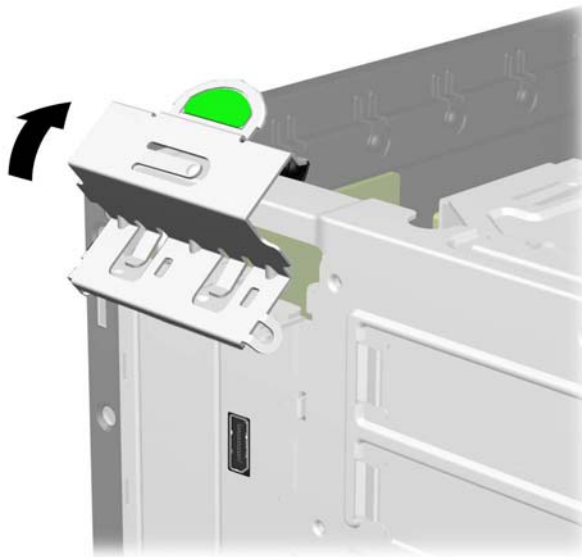
**Figure 2-22** Installing a DisplayPort Expansion Card



 **NOTE:** When installing an expansion card, press firmly on the card so that the whole connector seats properly in the expansion card slot.

11. Rotate the slot cover retention latch back in place to secure the expansion card.

**Figure 2-23** Closing the Expansion Card Retention Latch



12. Replace the computer access panel.
13. If the computer was on a stand, replace the stand.



- 14. Reconnect the power cord and any external devices, then turn on the computer.
- 15. Lock any security devices that were disengaged when the access panel was removed.
- 16. Reconfigure the computer, if necessary.

# Installing a Full-Height Expansion Card

Full-height expansion cards can be installed into the riser card slots on the computer.

There are two riser cards available from HP for this product. One has two PCI slots and the other has two PCI Express x1 slots. Both cards have a slot designated for the Powered Serial Port expansion card.

**CAUTION:** The Powered Serial Port expansion card slot on the riser cards looks very similar to a PCI Express x1 expansion card slot. Do not attempt to insert a PCI Express x1 expansion card into the Powered Serial Port expansion card slot and do not attempt to insert a Powered Serial Port expansion card into a PCI Express x1 expansion card slot

Figure 2-24 Riser Card Configurations

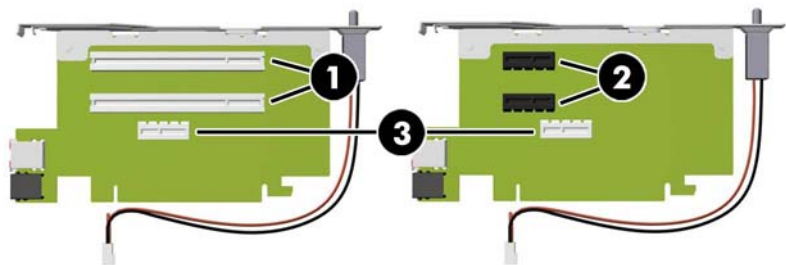


Table 2-4 Riser Card Configurations

No.	Expansion Slots
1	PCI Expansion Card slots
2	PCI Express x1 Expansion Card slots
3	Powered Serial Expansion Card slots

**NOTE:** Although there are three slots in each riser card, you can only install two expansion cards in the riser card: one in the top slot and one in either the middle slot or the bottom slot

The bottom slot on each card (3) is designed specifically for an HP Powered Serial Port expansion card. DO NOT attempt to plug any other type of card into the bottom slot.

**NOTE:** The following sections provide instructions for installing a Powered Serial Port expansion card. However, the procedure is basically the same for installing any full-height PCI expansion card or PC Express x1 expansion card.

# Installing a Powered Serial Port Expansion Card

Two powered serial ports, COM 1 and COM 2, are standard on the computer. Some models have a powered serial port expansion card installed that supplies two additional powered serial ports, COM 3 and COM 4. If your computer is not configured with a powered serial port expansion card, you may purchase one from HP.

Figure 2-25 Powered Serial Ports

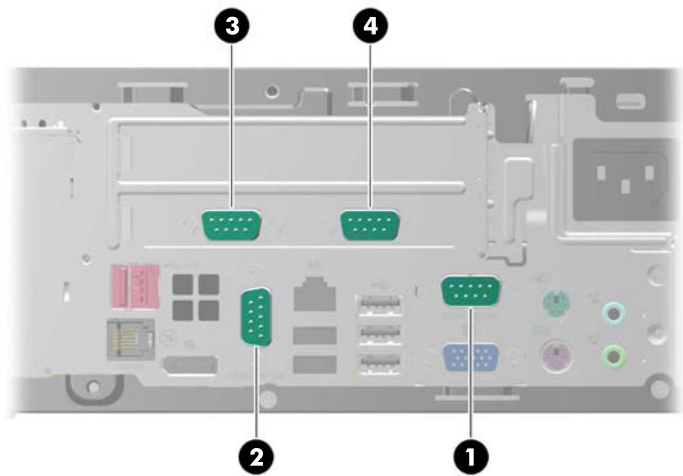


Table 2-5 Powered Serial Ports

Item	Description	Supports	
		+5V	+12V
1	COM 1	Yes	Yes
2	COM 2	Yes	Yes
3	COM 3 (optional)	Yes	Yes
4	COM 4 (optional)	Yes	Yes


**NOTE:** The powered serial ports are configured for power in the Computer Setup utility. Refer to [Configuring Powered Serial Ports on page 32](#) for more information.

To install a Powered Serial Port expansion card:

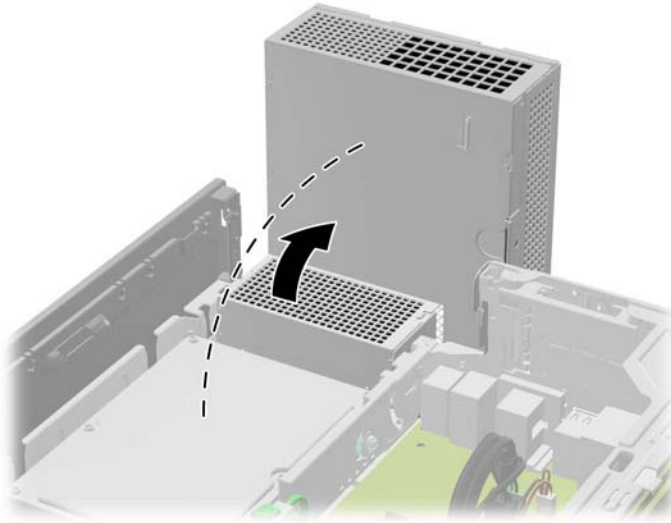
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. Rotate the power supply all the way back to access the full-height expansion card retention latch.

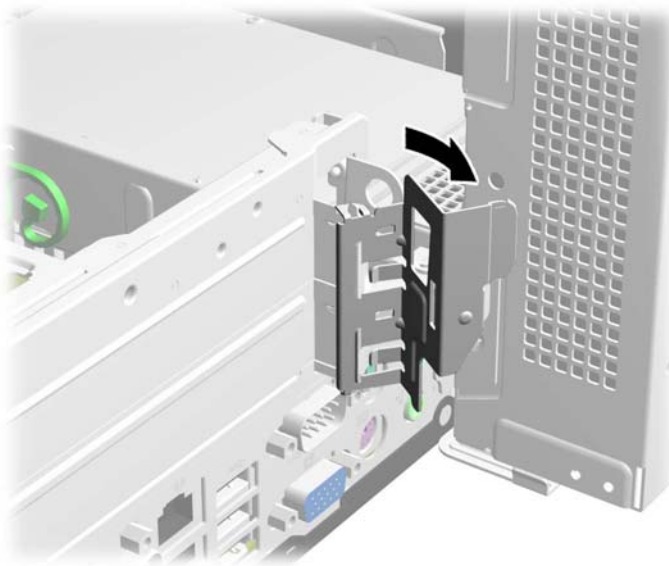
 **NOTE:** If you are using a PS/2 mouse and/or PS/2 keyboard, make sure they are unplugged from the rear of the computer so that the connectors do not block the power supply from rotating all the way back.

**Figure 2-26** Raising the Power Supply



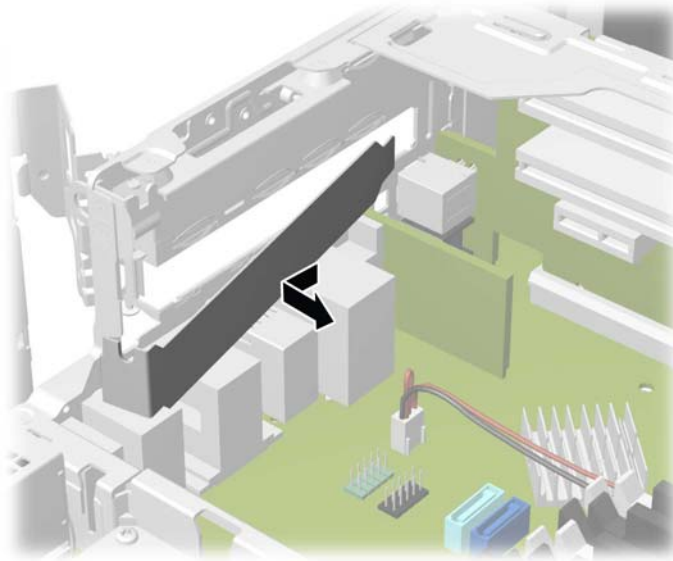
8. Pull back the green tab on the full-height expansion card retention latch to open the latch.

**Figure 2-27** Opening the Full-Height Slot Cover Retention Latch




9. Before installing the expansion card, remove the expansion slot cover in the lower slot. The Powered Serial Port expansion card must be installed in the lower slot.

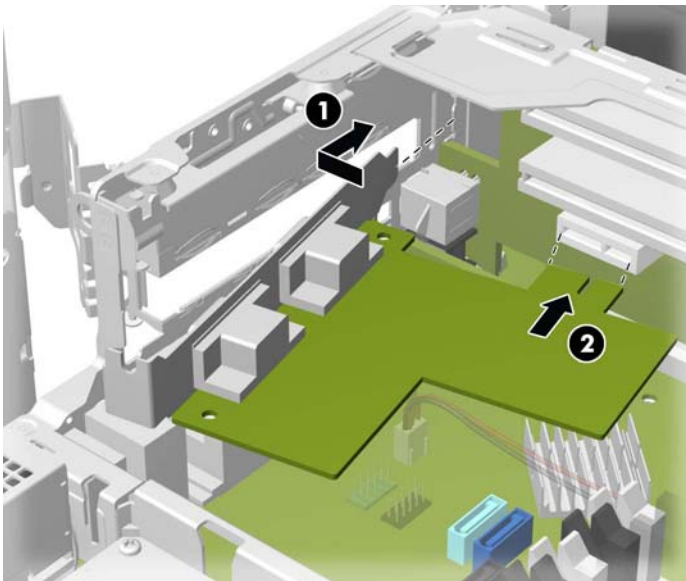
**Figure 2-28** Removing an Expansion Slot Cover



10. Install the Powered Serial Port expansion card into the bottom socket on the riser card. Move the card toward the rear of the chassis so that the bracket on the card is aligned with the open slot on the rear of the chassis (1). Press the card straight down into the expansion socket on the riser card (2).

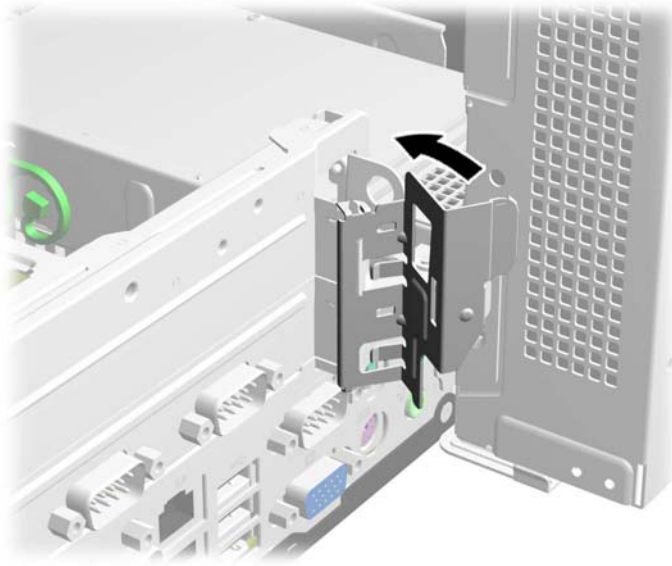
 **NOTE:** The Powered Serial Port expansion card must be installed in the bottom socket on the riser card. The bottom socket is designed specifically for that card. DO NOT attempt to install any other card in the bottom socket.

**Figure 2-29** Installing the Powered Serial Port Expansion Card in the Riser Card



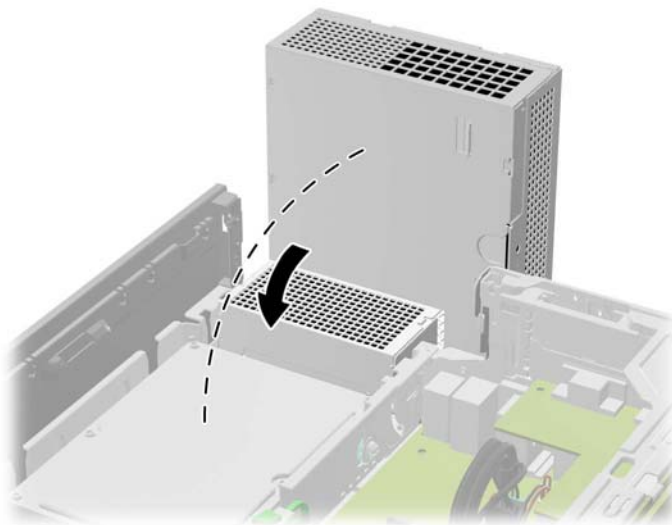
11. Close the expansion card retention latch.

**Figure 2-30** Closing the Expansion Card Retention Latch



12. Rotate the power supply back down to its normal position.


**Figure 2-31** Lowering the Power Supply



13. Replace the computer access panel.
14. If the computer was on a stand, replace the stand.
15. Reconnect the power cord and any external devices, then turn on the computer.
16. Lock any security devices that were disengaged when the access panel was removed.
17. Reconfigure the computer, if necessary.

## Configuring Powered Serial Ports


The serial ports can be configured as standard (non-powered) serial ports or powered serial ports. Some devices use a powered serial port. If the serial port is configured as a powered port, devices that support a powered serial interface do not require an external power source.

 **NOTE:** The computer ships with all serial ports configured in standard serial mode by default unless the powered serial port AV numbers are ordered.

---

The serial ports can be configured using the Computer F10 Setup utility. Under the **Onboard Devices** menu, you are given the option to select the following three settings for each individual serial port (port A, B, if available C, and D):

- Standard
- 5v on pins 1 and 9
- 12v on pins 1 and 9

 **NOTE:** To access the Computer F10 Setup utility, restart the computer and press the **F10** key as soon as the HP logo screen is displayed (before the computer boots to the operating system).


---

## Replacing the Riser Card

There are two riser cards available from HP for this product. One has two PCI slots and the other has two PCI Express x1 slots. Both cards have a slot designated for the Powered Serial Port expansion card. You can purchase either card as a replacement from HP.

To replace the riser card:


1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

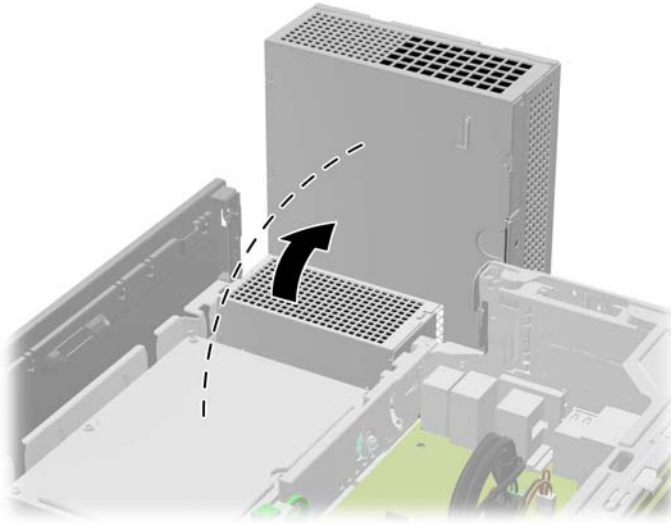
---

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.

7. Rotate the power supply all the way back to access the full-height expansion card retention latch.

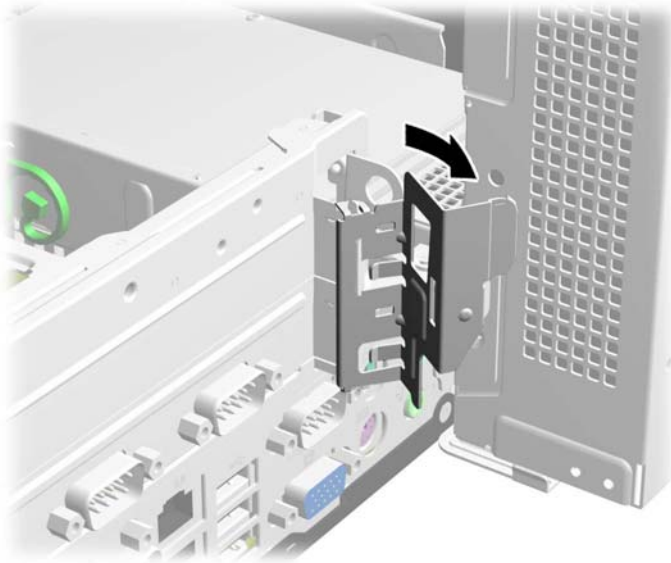
 **NOTE:** If you are using a PS/2 mouse and/or PS/2 keyboard, make sure they are unplugged from the rear of the computer so that the connectors do not block the power supply from rotating all the way back.

**Figure 2-32** Raising the Power Supply



8. Pull back the green tab on the full-height expansion card retention latch to open the latch.

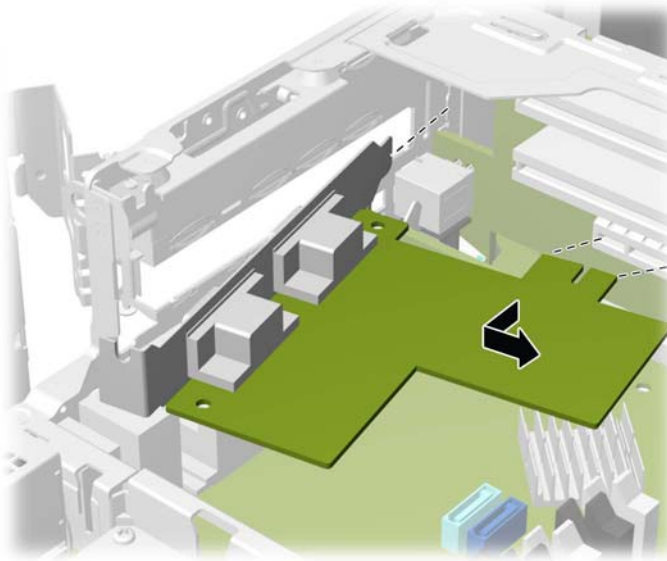
**Figure 2-33** Opening the Full-Height Slot Cover Retention Latch





9. If a one or two expansion cards are installed in any of the riser card expansion slots, remove the cards.

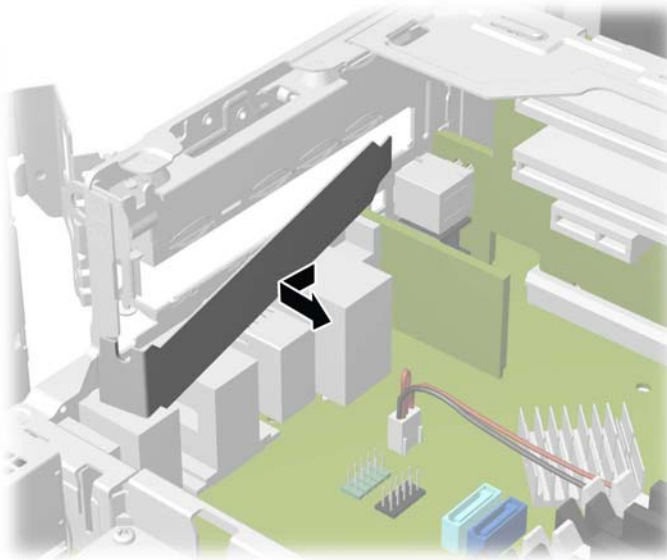
**Figure 2-34** Removing a Full-Height Expansion Card



10. If an expansion slot cover is installed in the lower slot, remove the slot cover.

**CAUTION:** You must remove the lower expansion slot cover to avoid damaging the riser card when removing or installing the card.

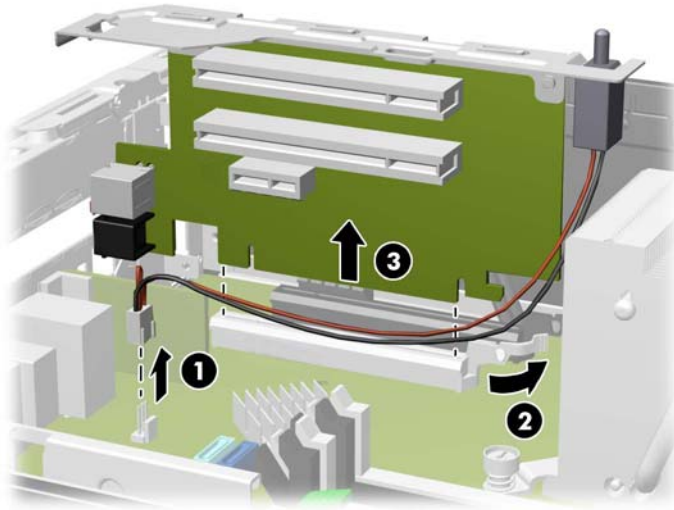
**Figure 2-35** Removing the Lower Expansion Slot Cover





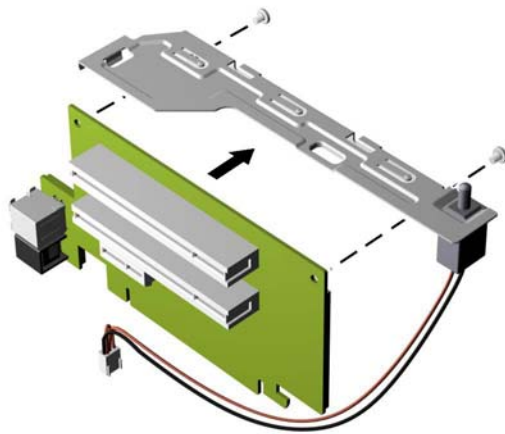
11. To remove the riser card, disconnect the hood sensor cable from the system board (1), pull back the arm on the back of the riser card slot (2), then lift the riser card out of the riser card slot (3).

**Figure 2-36** Removing the Riser Card



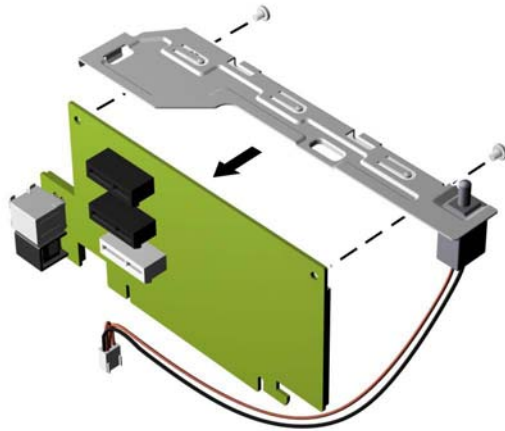
12. Remove the two screws that secure the metal bracket to the top of the card and remove the bracket. You do not need to remove the hood sensor from the bracket.

**Figure 2-37** Removing the Riser Card Bracket



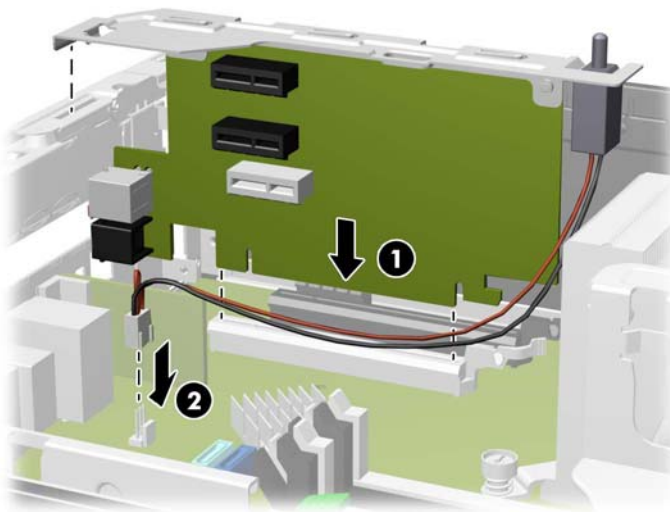
13. Install the metal bracket onto the new riser card using the two screws that secure the bracket in place.

**Figure 2-38** Installing the Riser Card Bracket



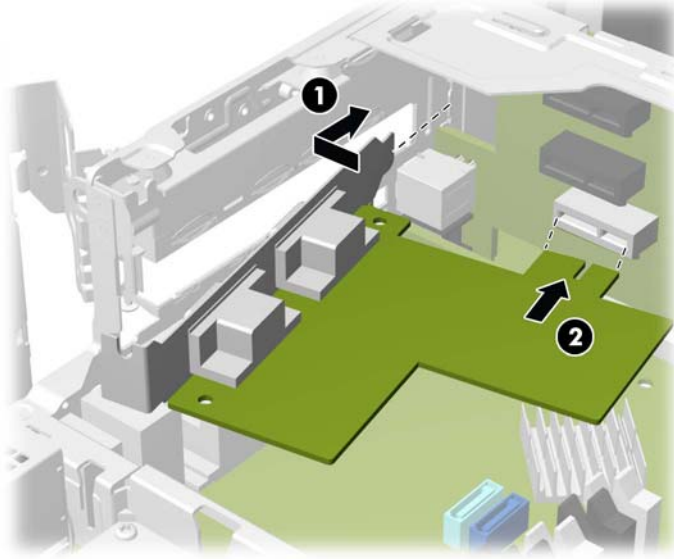
14. To install the new riser card, press the riser card firmly down into the riser card slot on the system board (1) and plug the hood sensor cable into the hood sensor connector on the system board (2).

**Figure 2-39** Installing the Riser Card



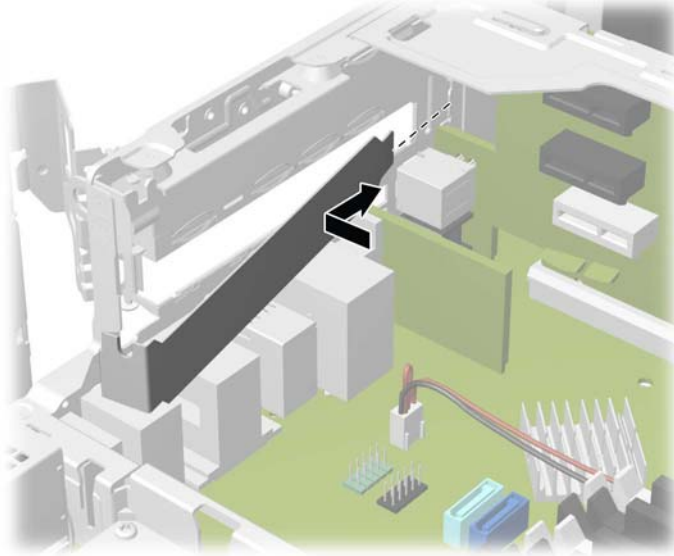
15. If any expansion cards were removed from the old riser card, install the cards into the appropriate slots on the new riser card. Move the card toward the rear of the chassis so that the bracket on the card is aligned with the open slot on the rear of the chassis (1). Press the card straight down into the expansion socket on the riser card (2).

**Figure 2-40** Installing an Expansion Card in the Riser Card



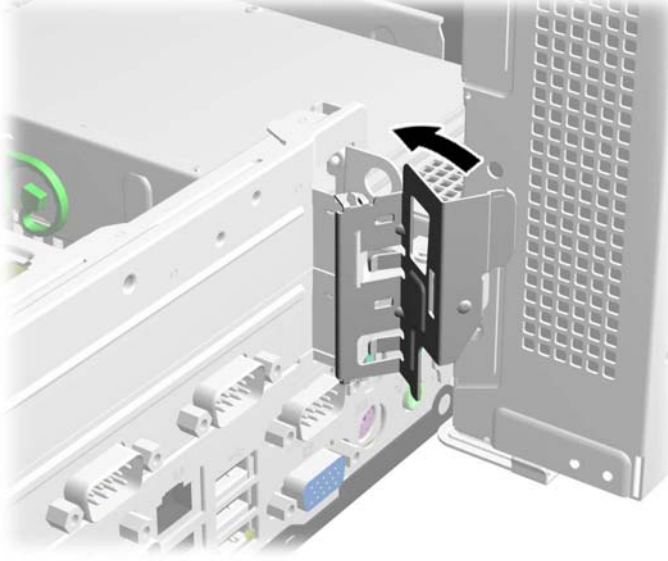
16. If an expansion slot cover was removed from the lower slot, replace the slot cover.

**Figure 2-41** Replacing the Lower Expansion Slot Cover



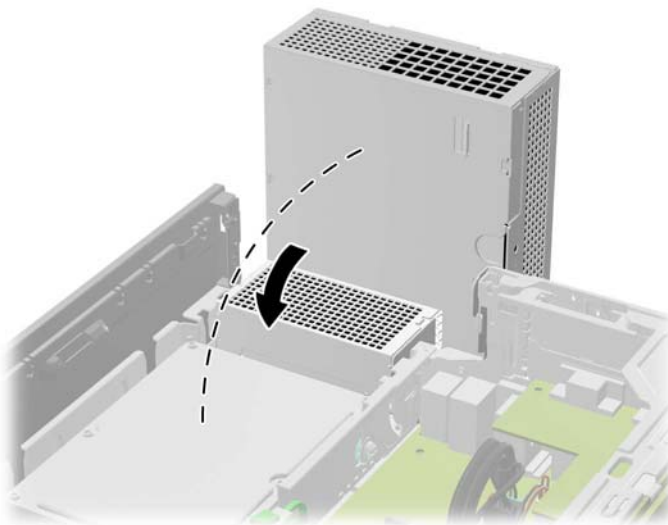
17. Close the expansion card retention latch.

**Figure 2-42** Closing the Expansion Card Retention Latch



18. Rotate the power supply back down to its normal position.

**Figure 2-43** Lowering the Power Supply



19. Replace the computer access panel.
20. If the computer was on a stand, replace the stand.
21. Reconnect the power cord and any external devices, then turn on the computer.
22. Lock any security devices that were disengaged when the access panel was removed.

# Drive Positions

Figure 2-44 Drive Positions

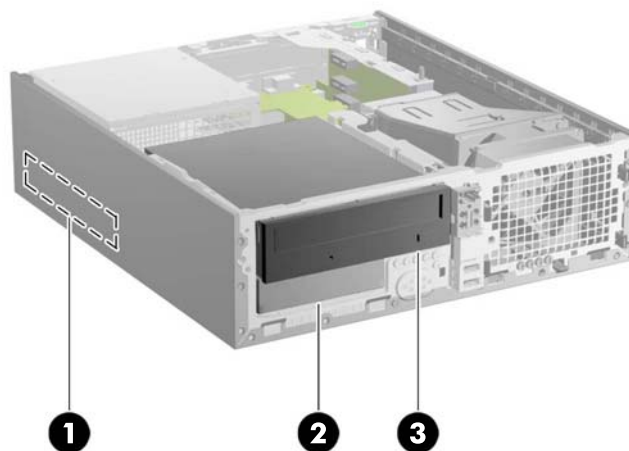


Table 2-6 Drive Positions

1	3.5-inch Primary Hard Drive Bay
2	3.5-inch Secondary Hard Drive Bay
3	5.25-inch Optical Drive Bay

**NOTE:** The drive configuration on your computer may be different than the drive configuration shown above.

To verify the type and size of the storage devices installed in the computer, run Computer Setup.

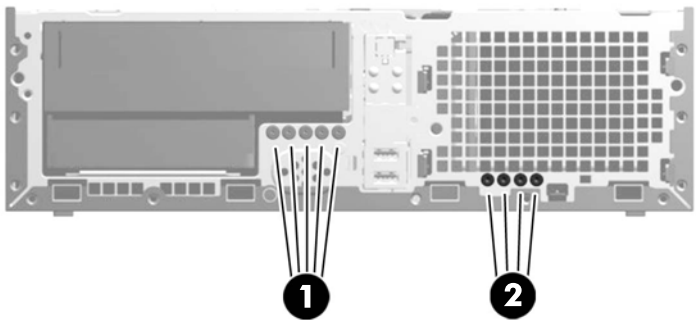
## Installing and Removing Drives

When installing drives, follow these guidelines:

- The computer supports up to three drives in the following configurations:
  - Two hard drives and one optical drive
  - Two hard drives and one eSATA drive
  - One hard drive, one optical drive, and one eSATA drive
- The primary Serial ATA (SATA) hard drive must be connected to the dark blue primary SATA connector on the system board labeled SATA0. If you are adding a second hard drive, connect it to the light blue connector on the system board labeled SATA1.
- Connect a SATA optical drive to the black eSATA connector on the system board labeled ESATA unless an eSATA adapter is installed. If an eSATA adapter is installed, connect the optical drive to the light blue SATA connector on the system board labeled SATA1.

- Connect an optional eSATA adapter cable to the black eSATA connector on the system board labeled ESATA.
- The power cable for the SATA drives is a three-headed cable that is plugged into the system board with the first connector routed to the rear of the primary hard drive, the second connector routed to the rear of the secondary hard drive, and the third connector routed to the rear of the optical drive.
- You must install guide screws to ensure the drive will line up correctly in the drive cage and lock in place. HP has provided extra guide screws for the drive bays (five 6-32 standard screws and four M3 metric screws), installed in the front of the chassis, under the front bezel. The 6-32 standard screws are required for a secondary hard drive. The M3 metric screws are required for an optical drive. The HP-supplied metric screws are black and the HP-supplied standard screws are silver. If you are replacing the primary hard drive, you must remove the four silver and blue 6-32 isolation mounting guide screws from the old hard drive and install them in the new hard drive.

**Figure 2-45** Extra Guide Screw Locations



**Table 2-7** Extra Guide Screw Locations

No.	Guide Screw	Device
1	Black M3 Metric Screws	Optical Drive
2	Silver 6-32 Standard Screws	Secondary Hard Drive

There are at total of five extra silver 6-32 standard screws. Four are used as guide screws for a secondary hard drive. The fifth is used for bezel security (see [Front Bezel Security on page 65](#) for more information).

**CAUTION:** To prevent loss of work and damage to the computer or drive:

If you are inserting or removing a drive, shut down the operating system properly, turn off the computer, and unplug the power cord. Do not remove a drive while the computer is on or in standby mode.

Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, refer to [Electrostatic Discharge on page 69](#).

Handle a drive carefully; do not drop it.

Do not use excessive force when inserting a drive.

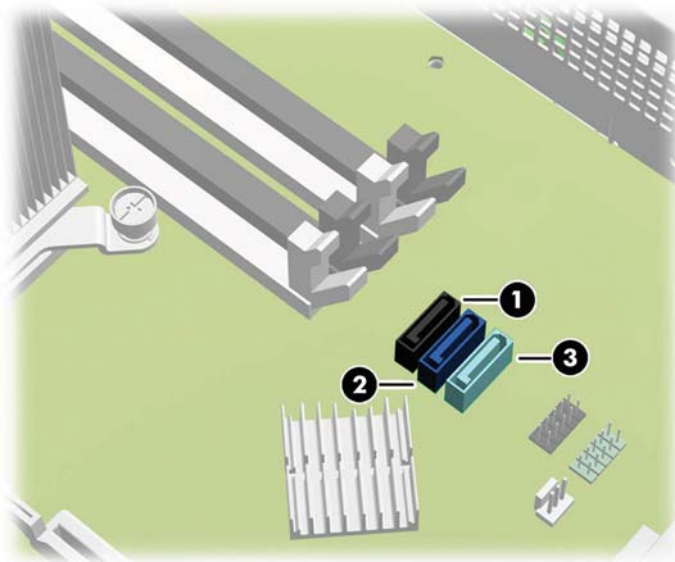
Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields such as monitors or speakers.

If a drive must be mailed, place the drive in a bubble-pack mailer or other protective packaging and label the package "Fragile: Handle With Care."

## System Board Drive Connections

Refer to the following illustration and table to identify the system board drive connectors.

**Figure 2-46** System Board Drive Connections



**Table 2-8** System Board Drive Connections

No.	System Board Connector	System Board Label	Color	Device
1	eSATA	ESATA	black	eSATA Adapter or Optical Drive
2	SATA0	SATA0	dark blue	Primary Hard Drive
3	SATA1	SATA1	light blue	Secondary Hard Drive or Optical Drive if an eSATA Adapter is present

## Removing an Optical Drive from the 5.25-inch Drive Bay

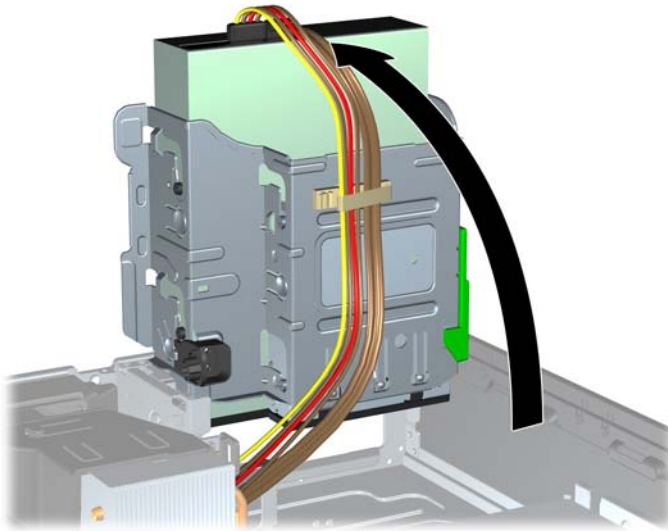
**CAUTION:** All removable media should be taken out of a drive before removing the drive from the computer.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. Rotate the drive cage to its upright position.

**Figure 2-47** Rotating the Drive Cage Up

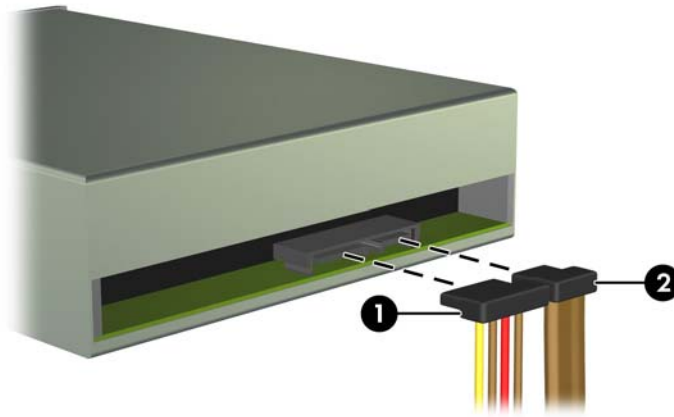




8. Disconnect the power cable (1) and data cable (2) from the rear of the optical drive.

**CAUTION:** When removing the cables, pull the tab or connector instead of the cable itself to avoid damaging the cable.

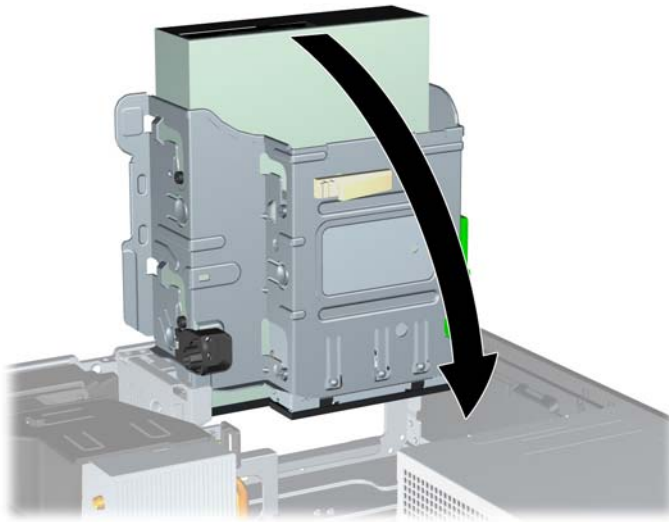
**Figure 2-48** Disconnecting the Power and Data Cables



9. Rotate the drive cage back down to its normal position.

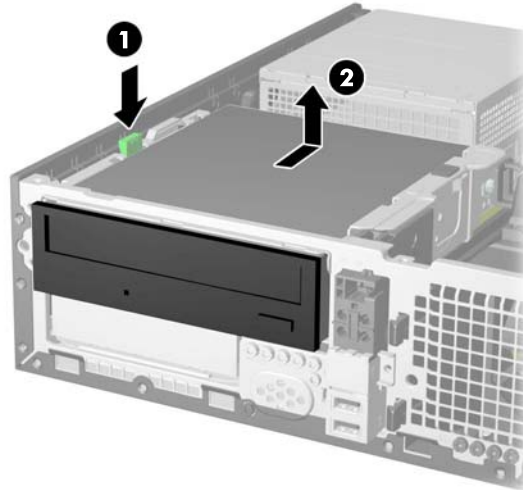
**CAUTION:** Be careful not to pinch any cables or wires when rotating the drive cage down.

**Figure 2-49** Rotating the Drive Cage Down



10. Press down on the green drive retainer button located on the left side of the drive to disengage the drive from the drive cage (1). While pressing the drive retainer button, slide the drive back until it stops, then lift it up and out of the drive cage (2).

**Figure 2-50** Removing the 5.25-inch Drive




## Installing an Optical Drive into the 5.25-inch Drive Bay


1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. On some models, you may need to replace the driveless section of the front bezel with an optical drive bezel. On other models, you may need to remove a bezel blank from the optical drive bezel.
  - If you are replacing the driveless bezel with an optical drive bezel, remove the front bezel and install the optical drive bezel. See [Installing an Optical Drive Bezel on page 10](#) for more information
  - If you are installing a drive in a bay covered by a bezel blank, remove the front bezel then remove the bezel blank. See [Removing a Bezel Blank on page 11](#) for more information.

8. Install four M3 metric guide screws in the lower holes on each side of the drive. HP has provided four extra M3 metric guide screws on the front of the chassis, under the front bezel. The M3 metric guide screws are black. Refer to [Installing and Removing Drives on page 39](#) for an illustration of the extra M3 metric guide screws location.

 **NOTE:** When replacing the drive, transfer the four M3 metric guide screws from the old drive to the new one.

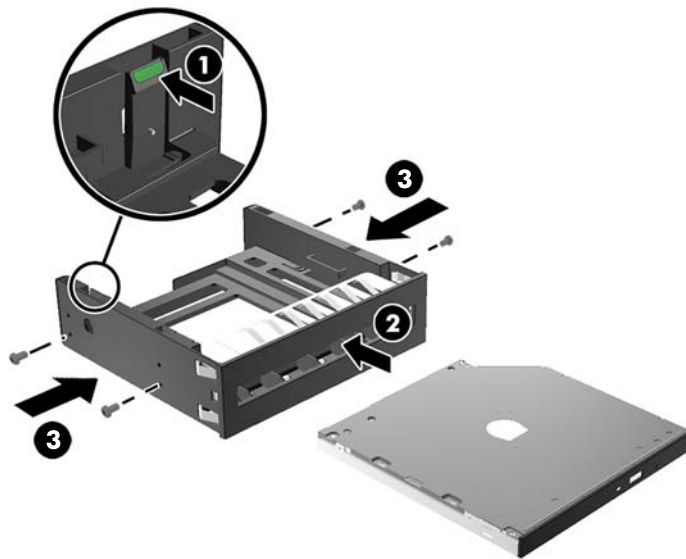
 **CAUTION:** Use only 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

**Figure 2-51** Installing Guide Screws in the Optical Drive



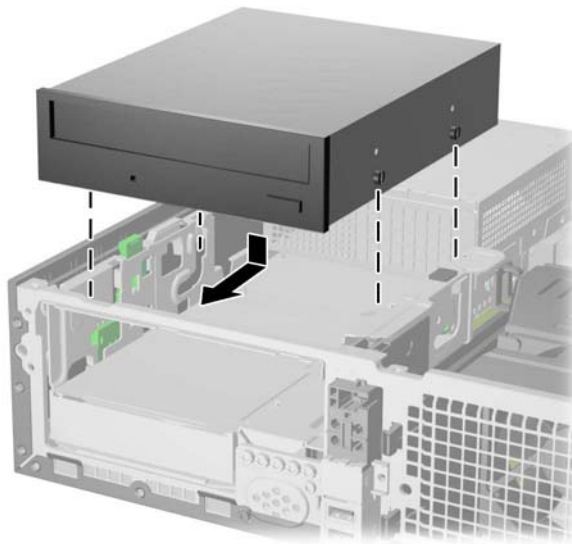
If you are installing a slim optical drive into a 5.25-inch drive adapter, push outward on the lever near the back of the adapter (1), slide the slim optical drive into the adapter (2), and insert the four M3 metric guide screws in the lower holes on each side of the adapter (3).

**Figure 2-52** Installing a Slim Optical Drive into a 5.25" Adapter



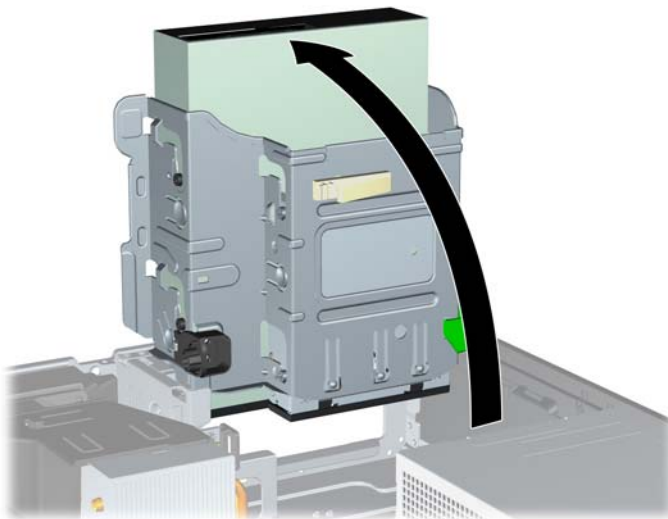
9. Position the guide screws on the drive into the J-slots in the drive bay. Then slide the drive toward the front of the computer until it locks into place.

**Figure 2-53** Installing the Optical Drive




10. Rotate the drive cage to its upright position.

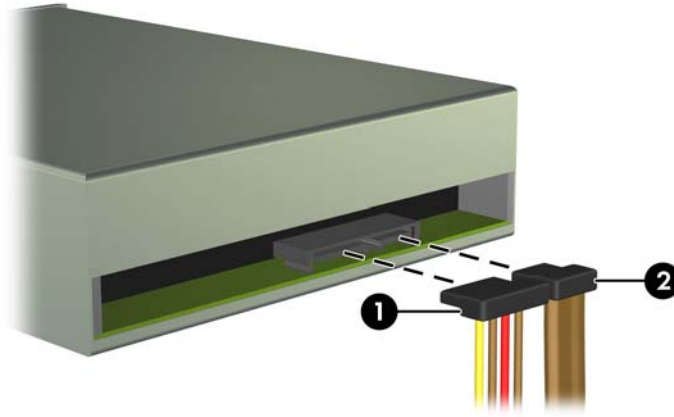
**Figure 2-54** Rotating the Drive Cage Up



11. Connect the power cable (1) and data cable (2) to the rear of the optical drive.

 **NOTE:** The power cable for the optical drive is a three-headed cable that is routed from the system board to the primary hard drive, then to the secondary hard drive, then to the rear of the optical drive.


**Figure 2-55** Connecting the Power and Data Cables



12. Connect the SATA data cable to the black eSATA connector on the system board labeled ESATA unless an eSATA adapter is installed. If an eSATA adapter is installed, connect the SATA data cable to the light blue SATA connector on the system board labeled SATA1.

 **NOTE:** Refer to [System Board Drive Connections on page 41](#) for an illustration of the system board drive connectors.

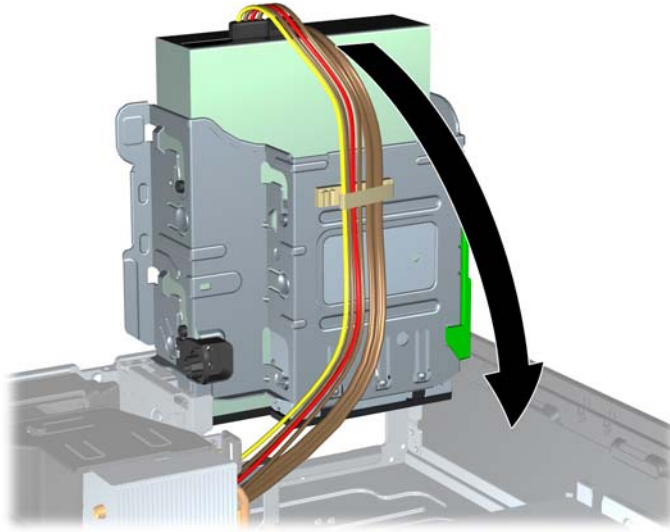
13. Route the data cable through the cable guides.

 **CAUTION:** There are two cable guides that keep the data cable from being pinched by the drive cage when raising or lowering it. One is located on the bottom side of the drive cage. The other is located on the chassis frame under the drive cage. Ensure that the data cable is routed through these guides.

14. Rotate the drive cage back down to its normal position.

**CAUTION:** Be careful not to pinch any cables or wires when rotating the drive cage down.

**Figure 2-56** Rotating the Drive Cage Down



15. Replace the front bezel (if removed) and access panel.
16. If the computer was on a stand, replace the stand.
17. Reconnect the power cord and any external devices, then turn on the computer.
18. Lock any security devices that were disengaged when the access panel was removed.

## Removing a Secondary Hard Drive from the 3.5-inch Drive Bay

**NOTE:** Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive.

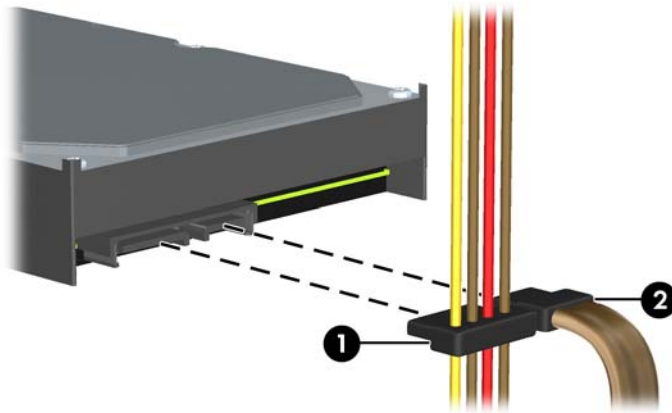
The 3.5-inch secondary hard drive is located underneath the 5.25-inch optical drive. You must remove the 5.25-inch optical drive before removing the 3.5-inch secondary hard drive.

1. Follow the procedure in [Removing an Optical Drive from the 5.25-inch Drive Bay on page 42](#) to remove the optical drive and access the secondary hard drive.

**CAUTION:** Ensure that the computer is turned off and that the power cord is disconnected from the electrical outlet before proceeding.

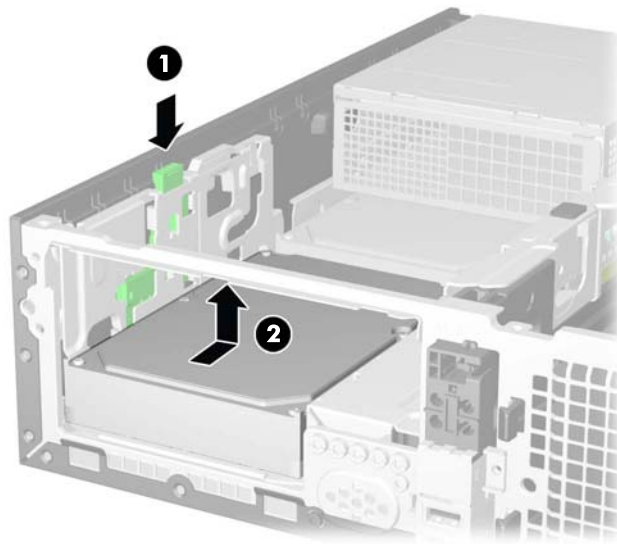
2. Disconnect the power cable (1) and data cable (2) from the back of the hard drive.

**Figure 2-57** Disconnecting the Secondary Hard Drive Power and Data Cables



3. Press down on the green drive retainer button located on the left side of the drive to disengage the drive from the drive cage (1). While pressing the drive retainer button, slide the drive back until it stops, then lift it up and out of the drive cage (2).

**Figure 2-58** Removing a Secondary Hard Drive



## Installing a Secondary Hard Drive into the 3.5-inch Drive Bay

The 3.5-inch secondary hard drive bay is located underneath the 5.25-inch optical drive. To install a secondary hard drive:

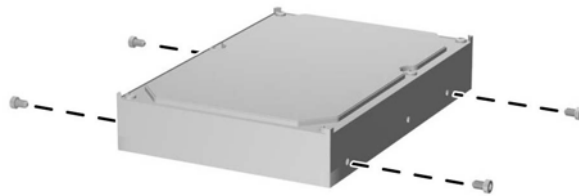
1. Follow the procedure in [Removing an Optical Drive from the 5.25-inch Drive Bay on page 42](#) to remove the 5.25-inch optical drive and access the 3.5-inch secondary hard drive bay.

**CAUTION:** Ensure that the computer is turned off and that the power cord is disconnected from the electrical outlet before proceeding.

2. Install four 6-32 standard guide screws in the holes on each side of the drive. HP has provided four extra 6-32 standard guide screws on the front of the chassis, under the front bezel. The 6-32 standard guide screws are silver. Refer to [Installing and Removing Drives on page 39](#) for an illustration of the extra 6-32 standard guide screws location.

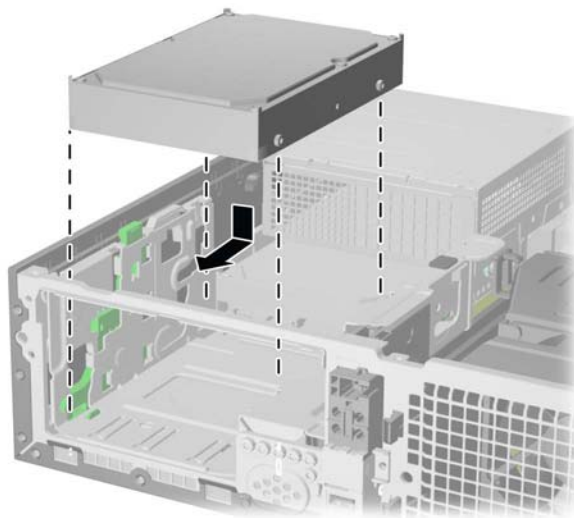
**NOTE:** When replacing the drive, transfer the four 6-32 standard guide screws from the old drive to the new one.

**Figure 2-59** Installing Secondary Hard Drive Guide Screws



3. Position the guide screws on the drive into the J-slots in the drive bay. Then slide the drive toward the front of the computer until it locks into place.

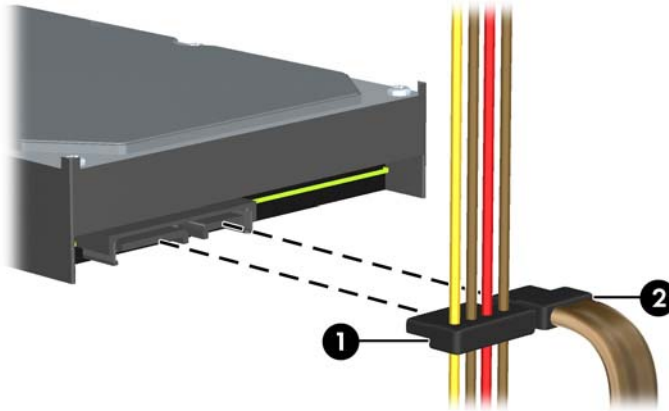
**Figure 2-60** Installing a Secondary Hard Drive






4. Connect the power cable (1) and data cable (2) to the back of the hard drive. Connect the other end of the data cable to the light blue SATA connector on the system board labeled SATA1.

**Figure 2-61** Connecting the Secondary Hard Drive Power and Data Cables




 **NOTE:** Refer to [System Board Drive Connections on page 41](#) for an illustration of the system board drive connectors.

5. Route the data cable through the cable guides.

 **CAUTION:** There are two cable guides that keep the data cable from being pinched by the drive cage when raising or lowering it. One is located on the bottom side of the drive cage. The other is located on the chassis frame under the drive cage. Ensure that the data cable is routed through these guides.


6. Replace the optical drive.
7. Replace the access panel.
8. If the computer was on a stand, replace the stand.
9. Reconnect the power cord and any external devices, then turn on the computer.
10. Lock any security devices that were disengaged when the access panel was removed.

## Removing and Replacing the Primary 3.5-inch Internal Hard Drive

 **NOTE:** Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive.

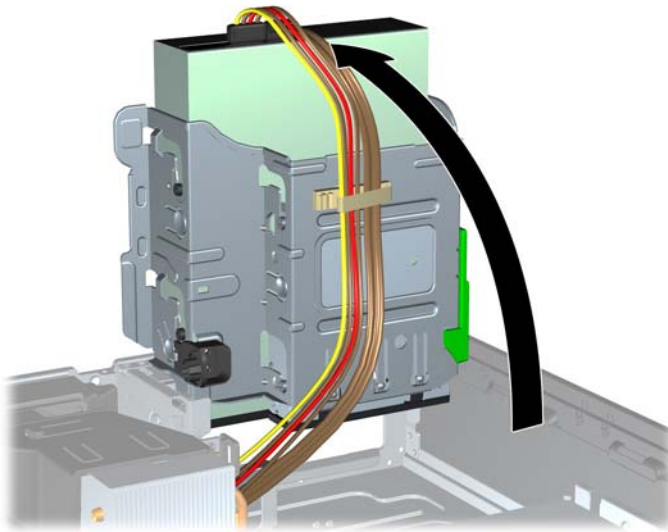
The preinstalled 3.5-inch primary hard drive is located under the power supply. To remove and replace the primary hard drive:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.


5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.
7. Rotate the drive cage for internal drives to its upright position.

**Figure 2-62** Rotating the Drive Cage Up



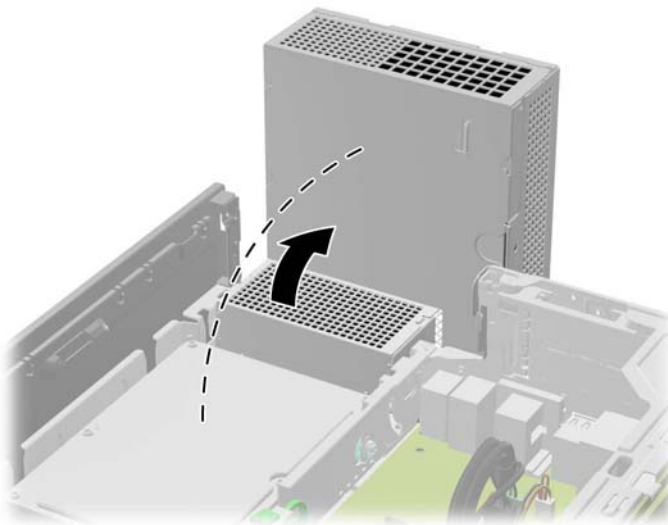
8. Rotate the power supply to its upright position. The hard drive is located beneath the power supply.

---

 **NOTE:** If you are using a PS/2 mouse and/or PS/2 keyboard, make sure they are unplugged from the rear of the computer so that the connectors do not block the power supply from rotating all the way back.

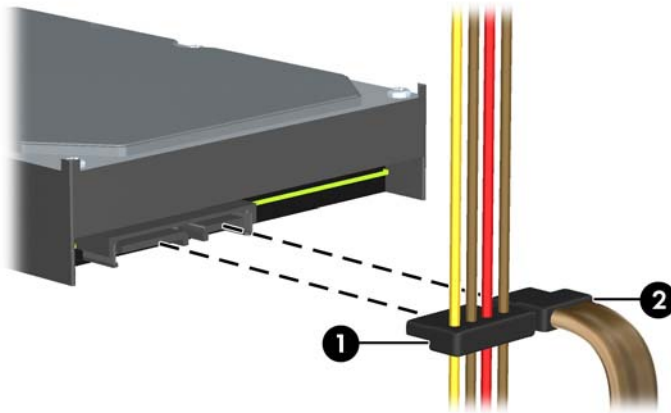
---

**Figure 2-63** Raising the Power Supply



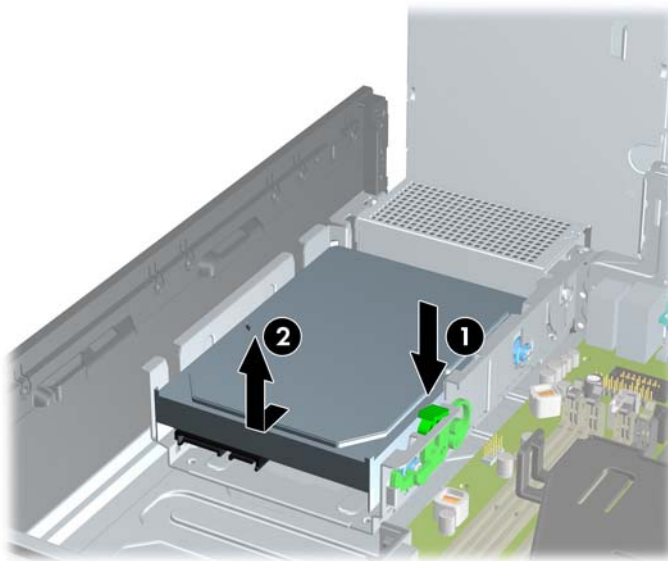
9. Disconnect the power cable (1) and data cable (2) from the back of the hard drive.

**Figure 2-64** Disconnecting the Hard Drive Power and Data Cables



10. Press down on the green release latch next to the hard drive (1). While holding the latch down, slide the drive forward until it stops, then lift the drive up and out of the bay (2).

**Figure 2-65** Removing the Hard Drive



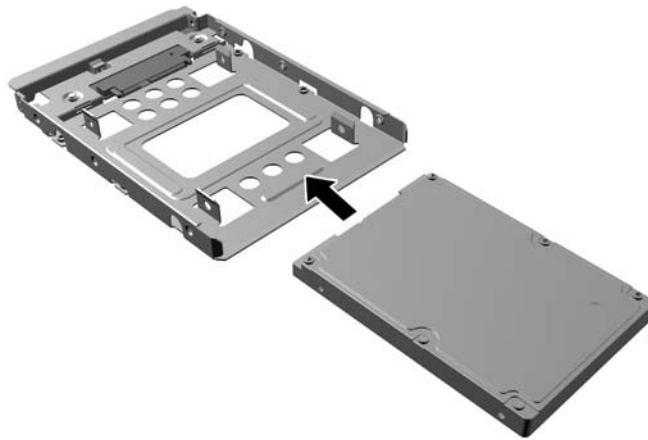
11. To install a hard drive, you must transfer the silver and blue isolation mounting guide screws from the old hard drive to the new hard drive.

**Figure 2-66** Installing Primary Hard Drive Guide Screws

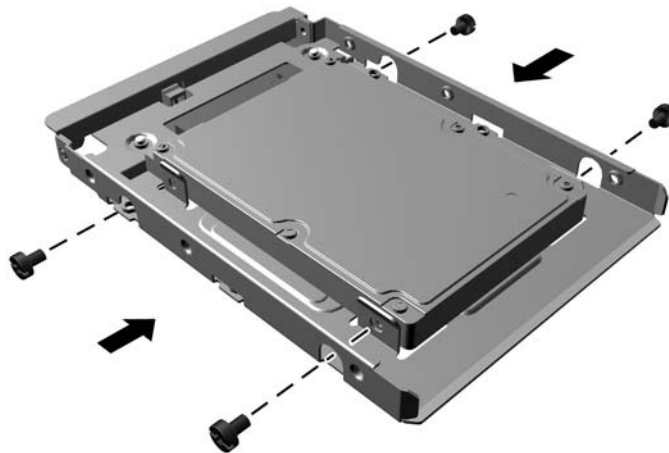


You can also install a 2.5-inch hard drive into a 3.5-inch drive bay using an adapter bracket similar to the example shown below.

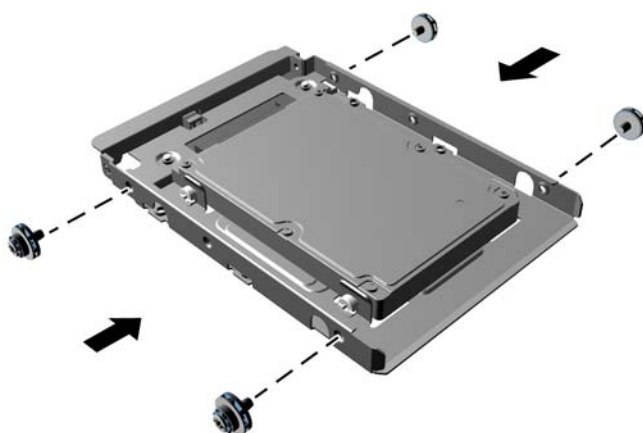
- a.** Slide the drive into the bay adapter bracket, ensuring the connector on the drive is fully inserted into the connector on the adapter bracket.



- b.** Secure the drive to the bay adapter bracket by installing four black M3 adapter bracket screws through the sides of the bracket into the drive.

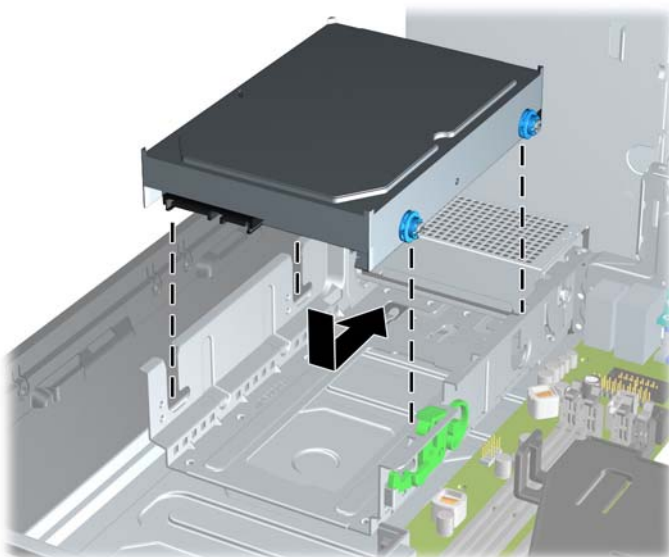


- c. Install four 6-32 silver and blue isolation mounting guide screws in the adapter bracket (two on each side of the bracket).




12. Align the guide screws with the slots on the chassis drive cage, press the hard drive down into the bay, then slide it back until it stops and locks in place.

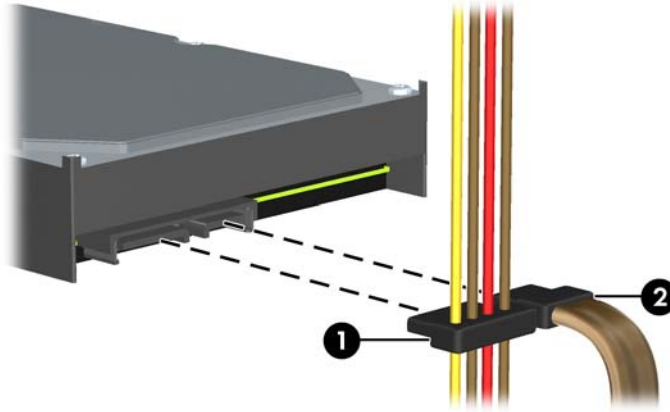
**Figure 2-67** Installing the Hard Drive



13. Connect the power cable (1) and data cable (2) to the back of the hard drive.

 **NOTE:** The data cable for the primary hard drive must be connected to the dark blue connector labeled SATA0 on the system board to avoid any hard drive performance problems.

**Figure 2-68** Connecting the Hard Drive Power and Data Cables




 **NOTE:** Refer to [System Board Drive Connections on page 41](#) for an illustration of the system board drive connectors.

14. Rotate the drive cage for internal drives and the power supply down to their normal positions.
15. Replace the access panel.
16. If the computer was on a stand, replace the stand.
17. Reconnect the power cord and any external devices, then turn on the computer.
18. Lock any security devices that were disengaged when the access panel was removed.

# Replacing the Battery

The battery that comes with the computer provides power to the real-time clock. When replacing the battery, use a battery equivalent to the battery originally installed in the computer. The computer comes with a 3-volt lithium coin cell battery.


 **WARNING!** The computer contains an internal lithium manganese dioxide battery. There is a risk of fire and burns if the battery is not handled properly. To reduce the risk of personal injury:

Do not attempt to recharge the battery.


Do not expose to temperatures higher than 60°C (140°F).

Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Replace the battery only with the HP spare designated for this product.


 **CAUTION:** Before replacing the battery, it is important to back up the computer CMOS settings. When the battery is removed or replaced, the CMOS settings will be cleared.

Static electricity can damage the electronic components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

 **NOTE:** The lifetime of the lithium battery can be extended by plugging the computer into a live AC wall socket. The lithium battery is only used when the computer is NOT connected to AC power.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to <http://www.hp.com/recycle>.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

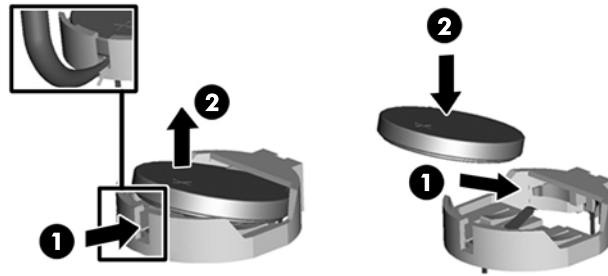
5. Remove the computer access panel.
6. Locate the battery and battery holder on the system board.
7. Depending on the type of battery holder on the system board, complete the following instructions to replace the battery.

## Type 1

- a. To release the battery from its holder, insert a thin metal instrument into the slot on the side of the holder below the battery (1) and pry the battery up and out of the holder (2).

- b. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up (1) and press the other edge down into the holder so that it snaps in place (2).

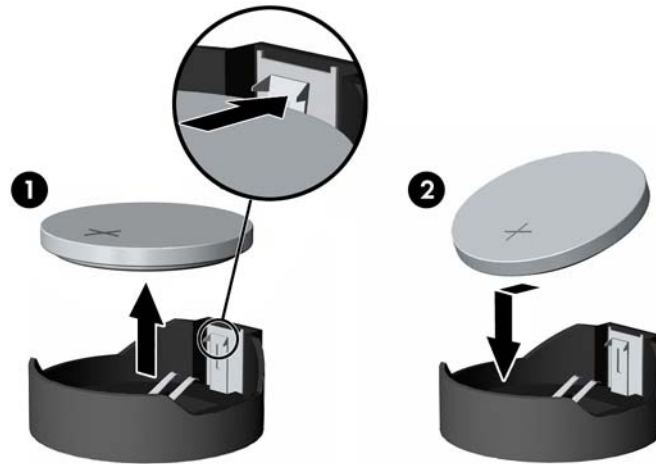
**Figure 2-69** Removing and Replacing a Coin Cell Battery (Type 1)




### Type 2

- a. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out (1).
- b. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery (2).

**Figure 2-70** Removing and Replacing a Coin Cell Battery (Type 2)



 **NOTE:** After the battery has been replaced, use the following steps to complete this procedure.

8. Replace the computer access panel.
9. Reconnect the power cord and any external devices, then turn on the computer.
10. Reset the date and time, your passwords, and any special system setups using Computer Setup.
11. Lock any security devices that were disengaged when the computer access panel was removed.



---

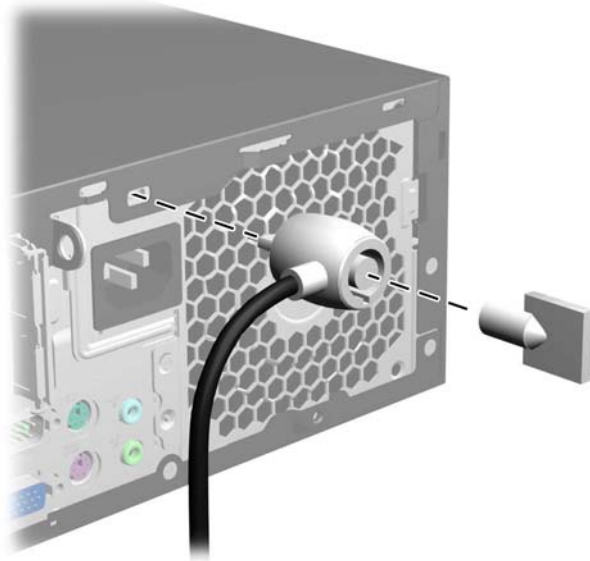
# A External Security Devices

## Installing a Security Lock

The security locks displayed below and on the following pages can be used to secure the computer.

### HP Keyed Cable Lock

**Figure A-1** Installing a Cable Lock



## Padlock

**Figure A-2** Installing a Padlock



## HP Business PC Security Lock

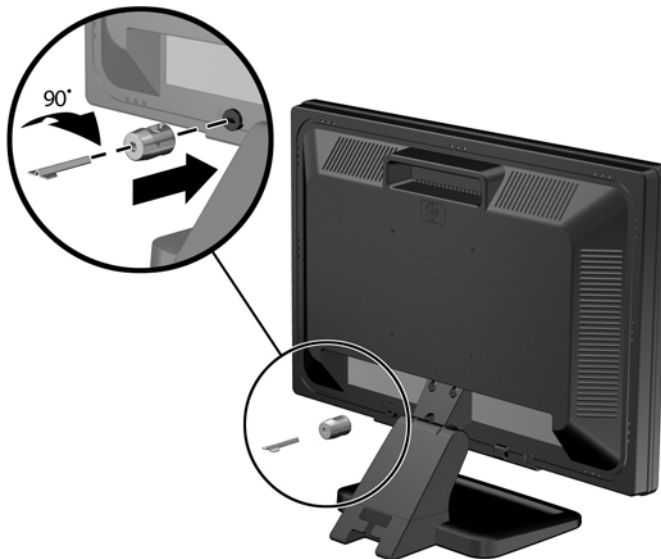
1. Fasten the security cable by looping it around a stationary object.

**Figure A-3** Securing the Cable to a Fixed Object



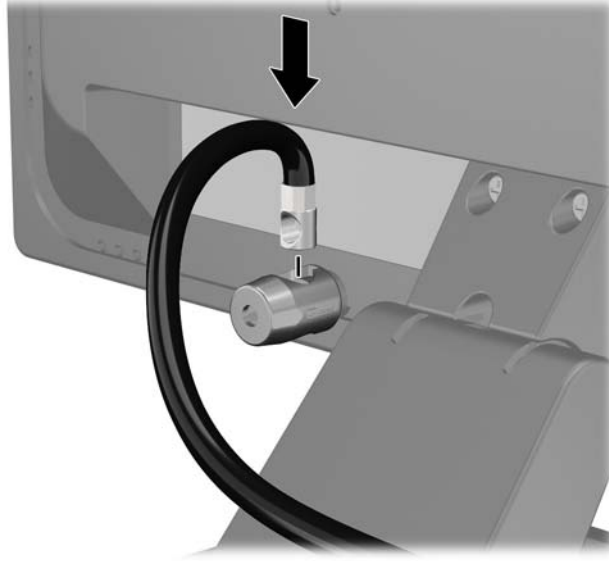
2. Insert the cable lock into the cable lock slot on the back of the monitor and secure the lock to the monitor by inserting the key into the key hole on the rear of the lock and rotating the key 90 degrees.

**Figure A-4** Installing the Cable Lock on the Monitor



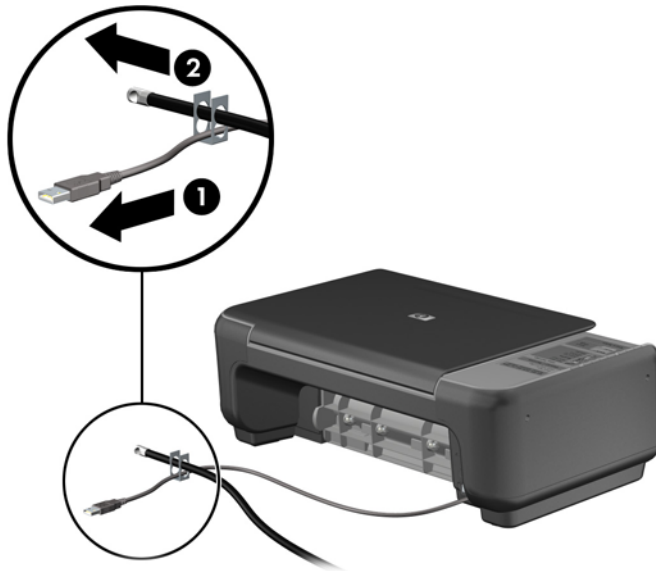
3. Slide the security cable through the hole in the cable lock on the rear of the monitor.

**Figure A-5** Securing the Monitor



4. Use the bracket provided in the kit to secure other peripheral devices by laying the device cable across the center of the bracket (1) and inserting the security cable through one of the two holes in the bracket (2). Use the hole in the bracket that best secures the peripheral device cable.

**Figure A-6** Securing Peripheral Devices (Printer Shown)



5. Thread the keyboard and mouse cables through the computer chassis lock.

**Figure A-7** Threading the Keyboard and Mouse Cables



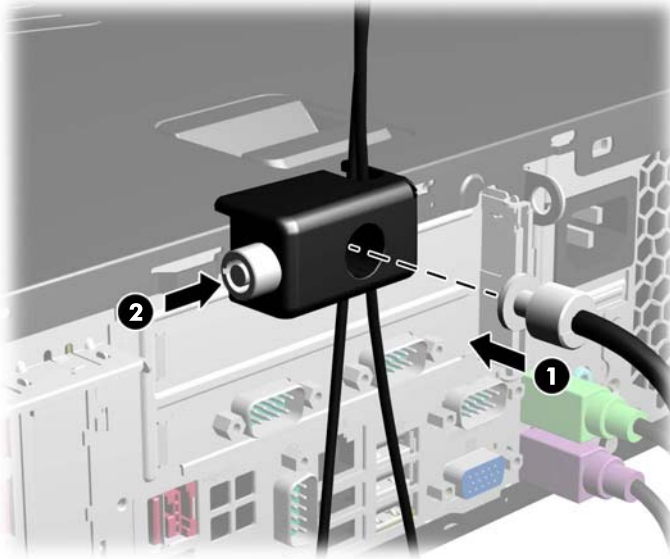
6. Screw the lock to the chassis in the thumbscrew hole using the screw provided.

**Figure A-8** Attaching the Lock to the Chassis



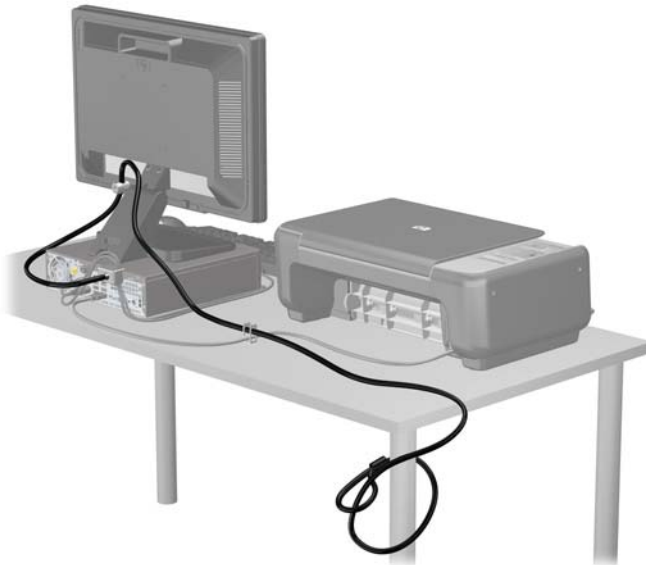
7. Insert the plug end of the security cable into the lock (1) and push the button in (2) to engage the lock. Use the key provided to disengage the lock.

**Figure A-9** Engaging the Lock



8. When complete, all devices in your workstation will be secured.

**Figure A-10** Secured Workstation



## Front Bezel Security

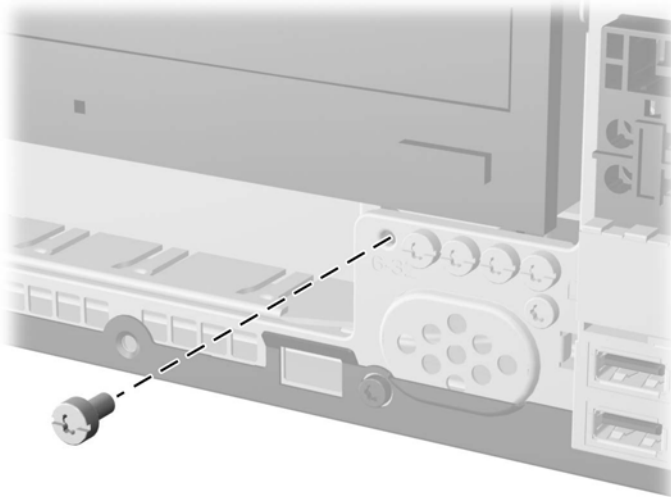
The front bezel can be locked in place by installing a security screw provided by HP. To install the security screw:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as optical discs or USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the access panel and front bezel.
7. Remove one of the five silver 6-32 standard screws located on the front of the chassis behind the bezel.

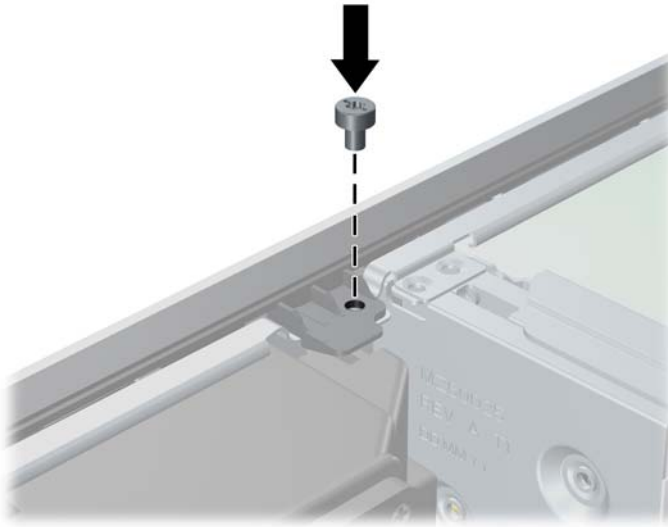
**Figure A-11** Retrieving the Front Bezel Security Screw



8. Replace the front bezel.

9. Install the security screw next to the middle front bezel release tab to secure the front bezel in place.

**Figure A-12** Installing the Front Bezel Security Screw



10. Replace the access panel.
11. If the computer was on a stand, replace the stand.
12. Reconnect the power cord and any external devices, then turn on the computer.
13. Lock any security devices that were disengaged when the access panel was removed.

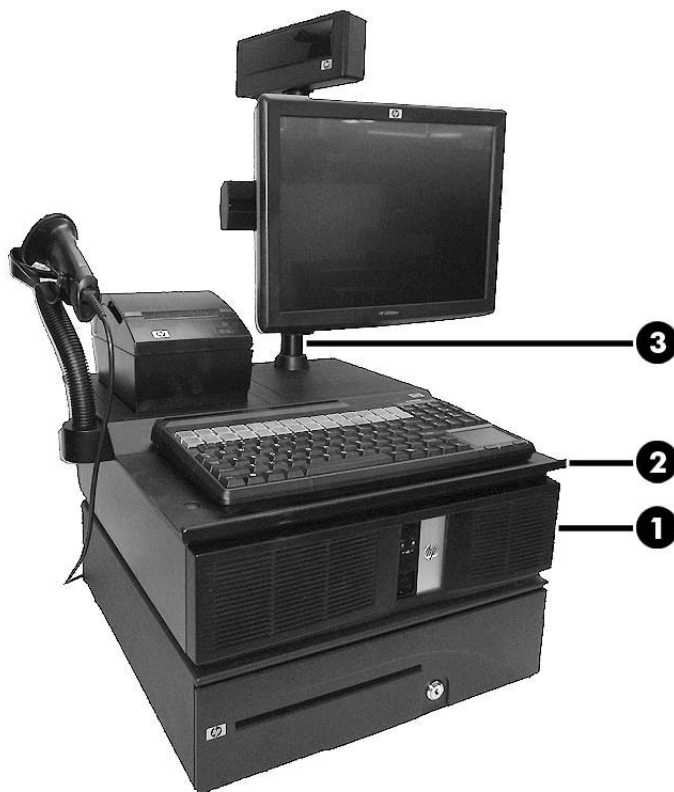


---

## B Optional Integration Tray and Accessories

The optional integration tray and accessories are available on some models only.

**Figure B-1** Optional Integration Tray and Accessories



The following integration system options are available from HP:

- Terminal Enclosure Assembly (1)
- Integration Tray Assembly (2)
- Display Pole Mount Assembly (3)
- Optional Display Arm Assembly (not shown)

The following peripheral options are available from HP:

- HP Cash Drawer
- HP POS Keyboard
- HP POS MSR Keyboard
- HP Mini MSR
- HP Single Station PUSB Receipt Printer
- POS Dual Serial/USB Receipt Printer
- Hybrid MICR Receipt Printer
- Hybrid MICR/Imager Receipt Printer
- USB Barcode Scanner

---

## C Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

### Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

### Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an HP authorized dealer, reseller, or service provider.



**NOTE:** For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.

---

---

# D Computer Operating Guidelines, Routine Care and Shipping Preparation

## Computer Operating Guidelines and Routine Care

Follow these guidelines to properly set up and care for the computer and monitor:

- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Operate the computer on a sturdy, level surface. Leave a 10.2-cm (4-inch) clearance on all vented sides of the computer and above the monitor to permit the required airflow.
- Never restrict the airflow into the computer by blocking any vents or air intakes. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Never operate the computer with the access panel or any of the expansion card slot covers removed.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- Turn off the computer before you do either of the following:
  - Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
  - Occasionally clean the air vents on all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow.

# Optical Drive Precautions

Be sure to observe the following guidelines while operating or cleaning the optical drive.

## Operation

- Do not move the drive during operation. This may cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

## Cleaning

- Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.
- Avoid using any type of solvent, such as alcohol or benzene, which may damage the finish.

## Safety

If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized HP service provider.

## Shipping Preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files to an external storage device. Be sure that the backup media is not exposed to electrical or magnetic impulses while stored or in transit.



---

**NOTE:** The hard drive locks automatically when the system power is turned off.

---

2. Remove and store all removable media.
3. Turn off the computer and external devices.
4. Disconnect the power cord from the electrical outlet, then from the computer.
5. Disconnect the system components and external devices from their power sources, then from the computer.



---

**NOTE:** Ensure that all boards are seated properly and secured in the board slots before shipping the computer.

---

6. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

---

# Index

## A

access panel  
    locking and unlocking 59  
    removal 8  
    replacement 8  
accessories 67  
audio connectors 3

## B

battery replacement 57

## C

cash drawer connector 3  
computer operating guidelines 70

## D

DIMMs. See memory  
DisplayPort  
    embedded location 3  
    installing expansion card 24  
drives  
    cable connections 39, 41  
    installation 39  
    locations 39

## E

electrostatic discharge, preventing  
    damage 69  
expansion card  
    installing full-height 27  
    installing half-height 17  
    riser card slot locations 27  
    system board slot locations 17

## F

front bezel  
    blank removal 11  
    optical drive 10  
    removal 9

    replacement 11  
    security 65  
front panel components 2

## G

guide screws location 40

## H

hard drive  
    cable connections 39, 41  
    primary installation 51  
    primary removal 51  
    secondary installation 50  
    secondary removal 48

## I

installation guidelines 7  
installing  
    12V Powered USB expansion  
        card 18  
    battery 57  
    DisplayPort expansion card 24  
    drive cables 39  
    full-height expansion card 27  
    half-height expansion card 17  
    memory 12  
    optical drive 44  
    optical drive bezel 10  
    powered serial port expansion  
        card 28  
    primary hard drive 51  
    riser card 32  
    secondary hard drive 50  
    security locks 59  
integration tray 67

## L

locks  
    cable lock 59  
    front bezel 65  
    HP Business PC Security  
        Lock 61  
    padlock 60

## M

memory  
    installation 12  
    socket population 13  
    specifications 12

## N

network connector 3

## O

optical drive  
    bezel replacement 10  
    cleaning 71  
    installation 44  
    precautions 71  
    removal 42

## P

port cover installation 5  
product ID location 6

## R

rear panel components 3  
removing  
    battery 57  
    bezel blank 11  
    computer access panel 8  
    front bezel 9  
    optical drive 42  
    primary hard drive 51  
    secondary hard drive 48

- riser card
  - configurations 27
  - replacing 32

## S

- SATA connectors 39, 41
- secondary hard drive
  - installation 50
  - removal 48
- security
  - cable lock 59
  - front bezel 65
  - HP Business PC Security Lock 61
  - padlock 60
- serial number location 6
- serial ports
  - configuring for power 32
  - installing expansion card 28
  - locations 3, 28
- shipping preparation 71
- specifications
  - memory 12

## T

- tower conversion 4

## U

- USB
  - 12V and 24V identification 18
  - 12V Powered USB
    - installation 18
  - port locations 2, 3

## V

- ventilation guidelines 70
- VGA connector 3