Hardware Reference Guide

HP t820 Flexible Thin Client

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Hardware Reference Guide

HP t820 Flexible Thin Client

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About this book

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.

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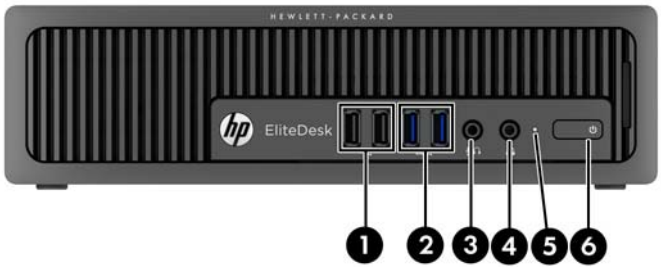
1 Product features

Standard configuration features

Front panel components

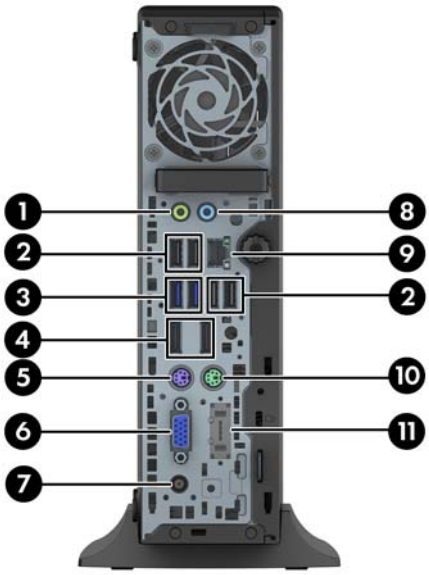


1	USB 2.0 Ports (black)	4	Headphone Connector
2	USB 3.0 Ports (blue)	5	Hard Drive Activity Light
3	Microphone/Headphone Connector	6	Dual-State Power Button

NOTE: When a device is plugged into the Microphone/Headphone Connector, a dialog box appears asking if you want to use the connector for a microphone Line-In device or a headphone. You can reconfigure the connector at any time by double-clicking the Audio Manager icon in the Windows® taskbar.

NOTE: The Power On Light is normally white 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



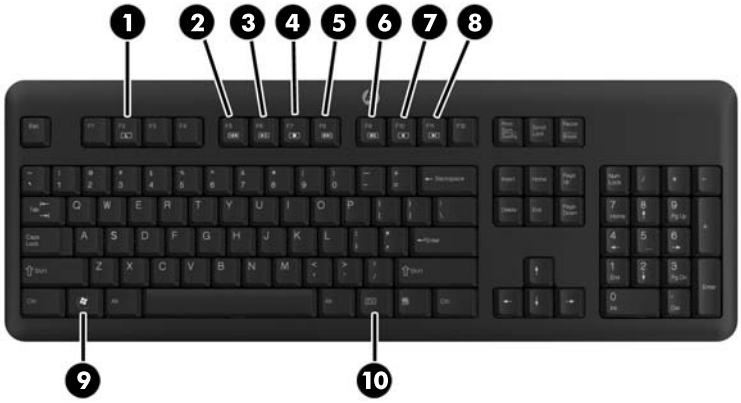
1		Line-Out Connector for powered audio devices (green)	7		Power Cord Connector
2		USB 2.0 Ports (black)	8		Line-In Audio Connector (blue)
3	SS	USB 3.0 Ports (blue)	9		RJ-45 Network Connector
4		Dual-Mode DisplayPort Monitor Connectors	10		PS/2 Mouse Connector (green)
5		PS/2 Keyboard Connector (purple)	11		Fiber NIC (optional)
6		VGA Monitor Connector			

NOTE: When a device is plugged into the blue Line-In Audio Connector, a dialog box will pop up asking if you want to use the connector for a line-in device or a microphone. You can reconfigure the connector at any time by double-clicking the Audio Manager icon in the Windows taskbar.

If an MXM graphics card is installed, all of the video connectors may be used at the same time. However, for such a configuration, only the display connected to the upper DisplayPort will display POST messages.

The system board graphics can be disabled by changing settings in Computer Setup.

Keyboard



Component		Component	
1	Sleep	6	Mute volume
2	Fast reverse	7	Decrease volume
3	Play/pause	8	Increase volume
4	Stop	9	Windows logo key
5	Fast forward	10	Function

Windows Logo Key

Use the Windows Logo Key in combination with other keys to perform certain functions available in Windows operating systems.

Windows Logo Key + Tab	Switch between open items.
Windows Logo Key + e	Open My Computer.
Windows Logo Key + f	Search for a file or folder.
Windows Logo Key + Ctrl + f	Search for computers.
Windows Logo Key + m	Minimize all windows.
Windows Logo Key + Shift + m	Undo minimize all.
Windows Logo Key + Break	Display the System Properties dialog box.
Windows Logo Key + r	Open the Run dialog box.

Serial number location

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

2 Hardware upgrades

Serviceability features

The computer includes features that make it easy to upgrade and service. No tools are needed for most of the installation procedures described in this chapter.

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 or equipment damage from electric shock, hot surfaces, or fire:

Disconnect the power cord from the power outlet and allow the internal system components to cool before you touch them.

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 into 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. The *Safety & Comfort 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.

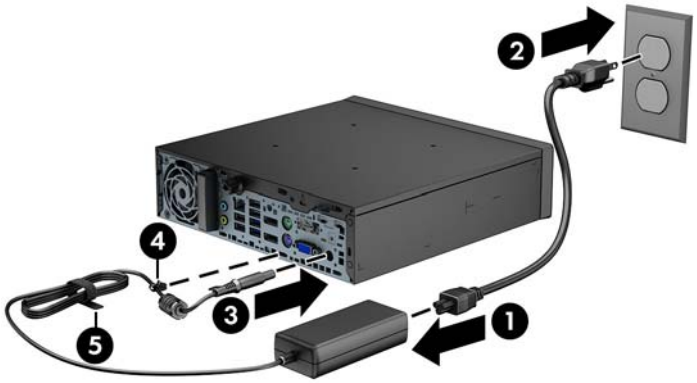
⚠ **CAUTION:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning the following procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Electrostatic discharge on page 27 for more information.

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

Connecting the power cord

When connecting the power supply, it is important to follow the steps below to ensure that the power cord does not pull free from the computer.

1. Plug the female end of the power cord into the power supply brick (1).
2. Connect the other end of the power cord to an electrical outlet (2).
3. Connect the round end of the power supply cord to the power supply connector on the rear of the computer (3).
4. Insert the power cord retainer clip into a slot on the air vent to prevent the cord from becoming disconnected from the computer (4).
5. Bundle any excess power cord with the supplied strap (5).



⚠ **CAUTION:** Failure to secure the power cable with the retainer clip may result in the power cord becoming disconnected, causing loss of data.

Removing the computer access panel

WARNING! To reduce the risk of personal injury or equipment damage from electric shock, hot surfaces, or fire, ALWAYS operate the computer with the access panel in place. In addition to enhancing safety, the access panel may provide important instructions and identification information, which may be lost if the access panel is not used. DO NOT use any access panel except the one that is provided by HP for use with this computer.

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 USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, and 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. Loosen the thumbscrew on the rear of the computer (1), slide the access panel toward the rear of the computer, and then lift it off (2).

Replacing the computer access panel

1. Align the tabs on the panel with the slots on the chassis (1), and then slide the panel towards the front of the chassis until it stops.
2. Tighten the thumbscrew to secure the access panel (2).

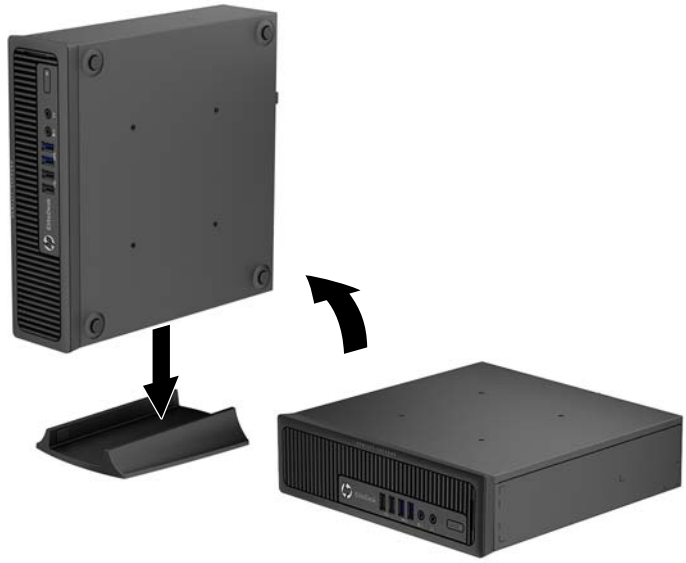
Changing from desktop to tower configuration

The computer can be used in a tower orientation with the tower stand included with the computer.

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, and 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. Orient the computer so that its left side is facing down, and place the computer firmly down into the stand.



6. Reconnect the external equipment, plug the power cord into a power outlet, and then turn the computer on.

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

7. Lock any security devices that were disengaged when the computer cover or access panel was removed.

NOTE: An optional Quick Release mounting bracket is available from HP for mounting the computer to a wall, desk, or swing arm. When the mounting bracket is used, do not install the computer with the I/O ports oriented towards the ground.

Installing additional memory

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

SODIMMs

The memory sockets on the system board can be populated with up to two industry-standard SODIMMs. These memory sockets are populated with at least one preinstalled SODIMM. To achieve the maximum memory support, you can populate the system board with up to 16-GB of memory.

DDR3-SDRAM SODIMMs

For proper system operation, the SODIMMs must adhere to the following specifications:

- industry-standard 204-pin
- unbuffered non-ECC PC3-12800 DDR3-1600 MHz-compliant
- 1.35 volt or 1.5 volt DDR3-SDRAM SODIMMs
- support CAS latency 11 DDR3 1600 MHz (11-11-11 timing)
- contain the mandatory Joint Electronic Device Engineering Council (JEDEC) specification

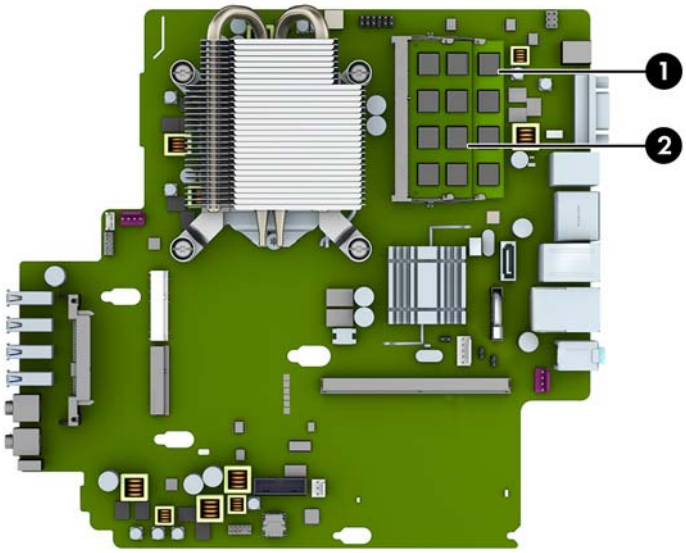
The computer supports the following:

- 512 Mbt, 1 Gb, and 2 Gb non-ECC memory technologies
- single-sided and double-sided SODIMMS
- SODIMMs constructed with x8 and x16 devices; SODIMMs constructed with x4 SDRAM are not supported

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

Populating SODIMM sockets

There are two SODIMM sockets on the system board, with one socket per channel. The sockets are labeled DIMM1 and DIMM3. The DIMM1 socket operates in memory channel B. The DIMM3 socket operates in memory channel A.



Item	Description	System Board Label	Socket Color
1	SODIMM1 socket, Channel B	DIMM1	Black
2	SODIMM3 socket, Channel A	DIMM3	Black

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

- The system will operate in single-channel mode if the SODIMM sockets are populated in one channel only.
- The system will operate in a higher-performing dual-channel mode if the memory capacity of the SODIMM in Channel A is equal to the memory capacity of the SODIMM in Channel B.
- The system will operate in flex mode if the memory capacity of the SODIMM in Channel A is not equal to the memory capacity of the SODIMM 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. If one channel will have more memory than the other, the larger amount should be assigned to channel A.
- In any mode, the maximum operational speed is determined by the slowest SODIMM in the system.

Installing SODIMMs

⚠ **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 the following 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 27.

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 USB flash drives, from the computer.
3. Turn off the computer properly through the operating system, and then turn off any external devices.
4. Disconnect the power cord from the power outlet, and disconnect any external devices.

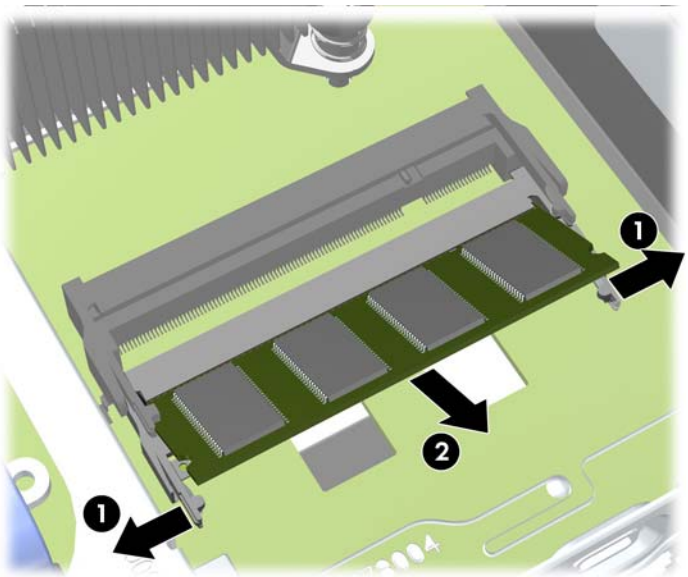
   ⚠ **CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or 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 and lay the computer down.
6. Remove the computer access panel.
7. Locate the memory module sockets on the system board.

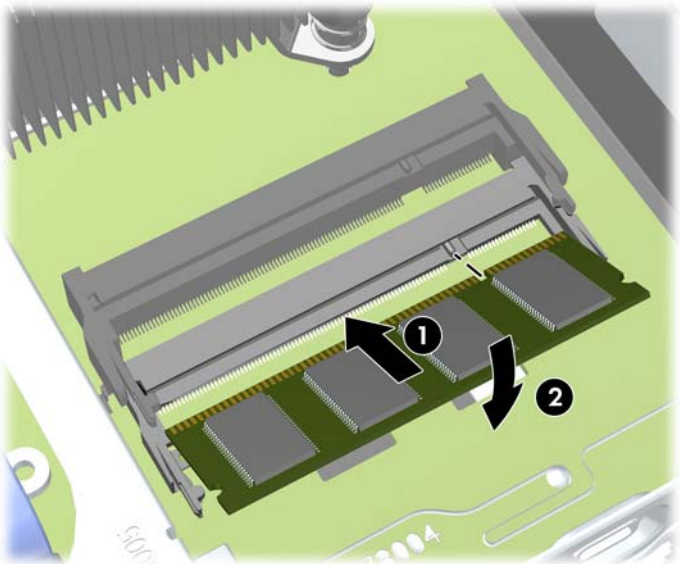
   ⚠ **WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

8. To remove a SODIMM, press outward on the two latches on each side of the SODIMM (1), and then pull the SODIMM out of the socket (2).

NOTE: If a solenoid hood lock is installed in the computer, it may be necessary to remove the lock before removing or installing a SODIMM.



9. Slide the new SODIMM into the socket at approximately a 30° angle (1), and then press the SODIMM down (2) so that the latches lock it in place.



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

10. Replace the access panel.

11. If the computer was on a stand, replace the stand.

12. Reconnect the power cord and turn on the computer.
13. Lock any security devices that were disengaged when the computer cover or access panel was removed.

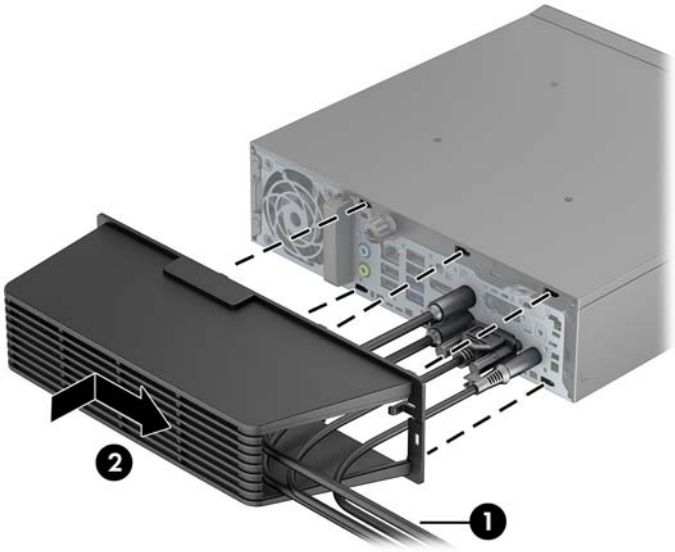
The computer automatically recognizes the additional memory when you turn on the computer.

Installing and removing a port cover

An optional rear port cover is available for the computer.

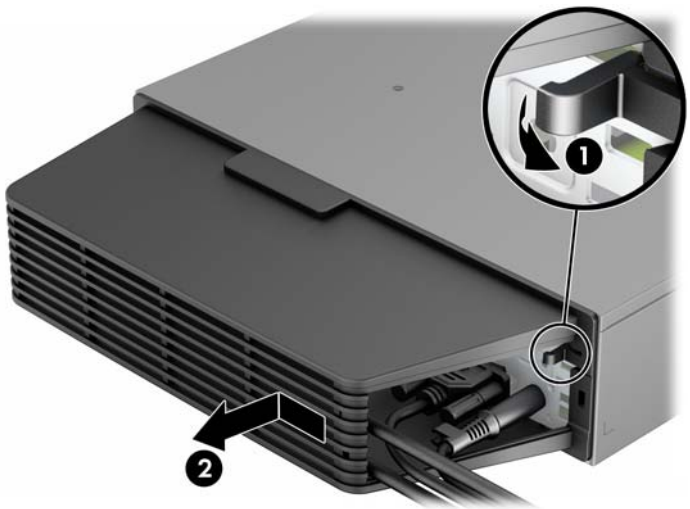
To install the port cover:

1. Thread the cables through the bottom hole on the port cover (1) and connect the cables to the rear ports on the computer.
2. Insert the hooks on the port cover into the slots on the rear of the chassis (2), and then slide the cover to the right to secure it in place.



NOTE: For security purposes, you can install an optional cable lock to the chassis that locks the port cover and secures the computer. See Installing a security lock on page 17.

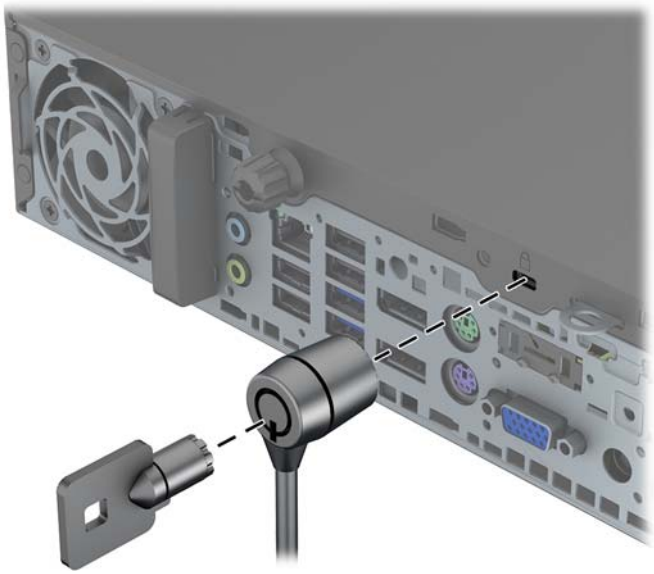
The port cover is secured in place by a retention lever just inside the port cover opening. To remove the port cover, pull the lever back towards the port cover opening (1), and then slide the cover to the left and off the computer (2).

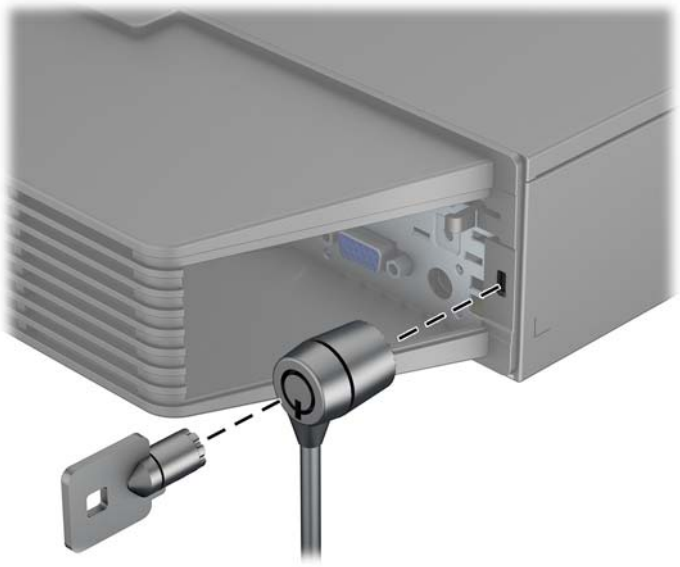


Installing a security lock

Cable lock

There are two cable lock slots on the rear of the computer. The slot next to the thumbscrew should be used when there is no port cover. The slot on the far right should be used when a port cover is installed.



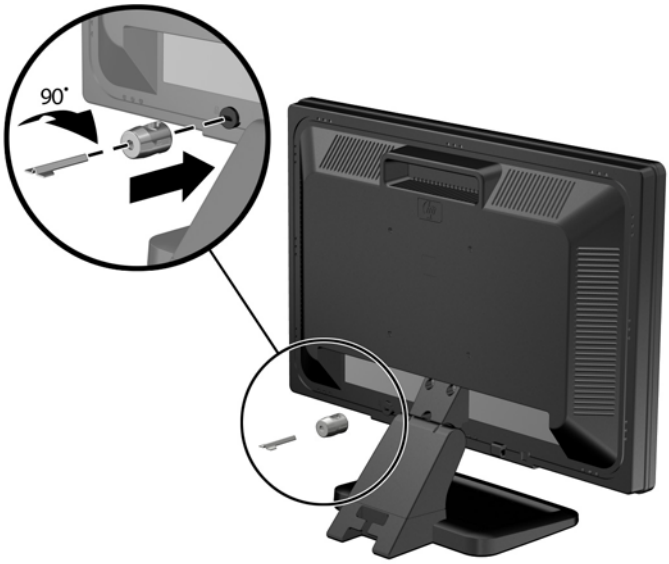


Padlock

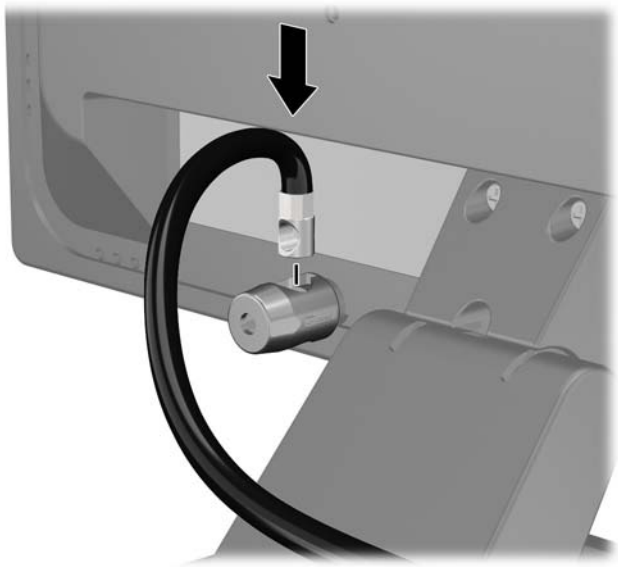
HP business PC security lock

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

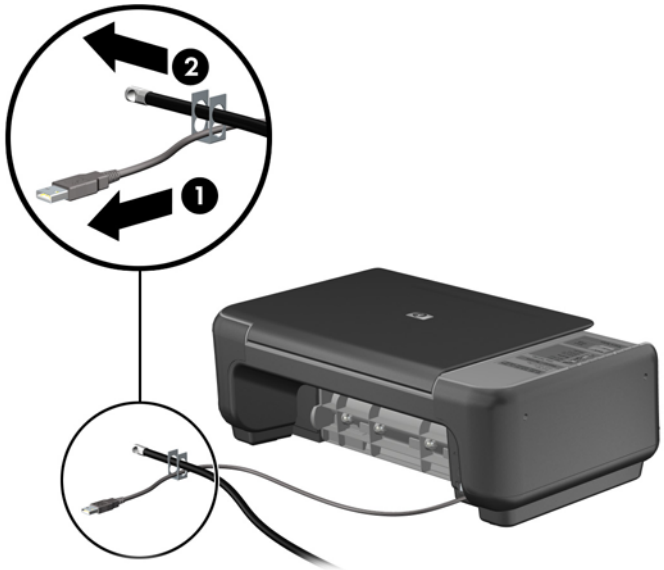
2. Insert the cable lock into the cable lock slot on the back of the monitor and secure the lock to the monitor by inserting the key into the key hole on the rear of the lock and rotating the key 90 degrees.



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

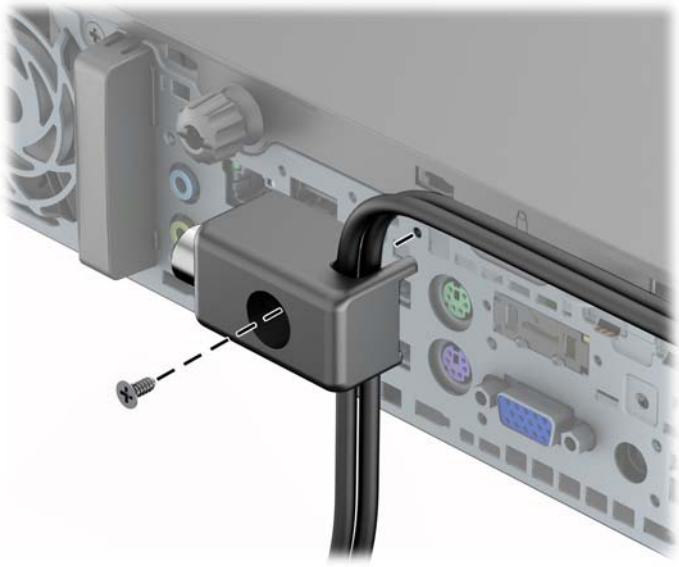


4. Use the bracket provided in the kit to secure other peripheral devices by laying the device cable across the center of the bracket (1) and inserting the security cable through one of the two holes in the bracket (2). Use the hole in the bracket that best secures the peripheral device cable.

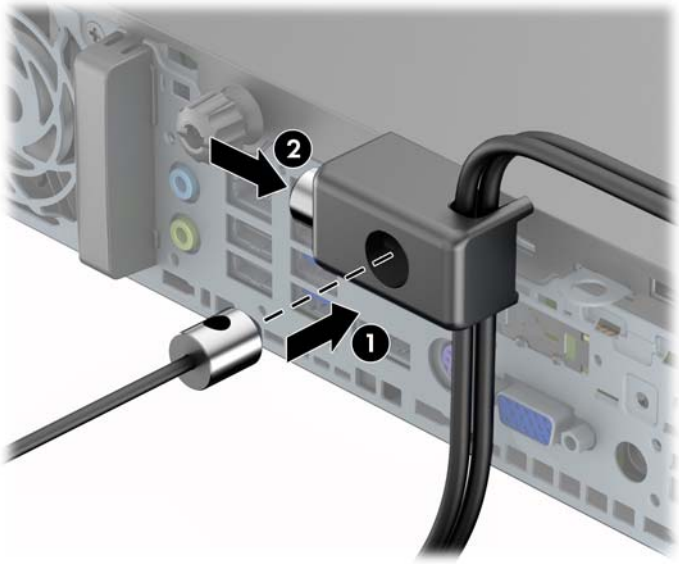


5. Thread the keyboard and mouse cables through the computer chassis lock.

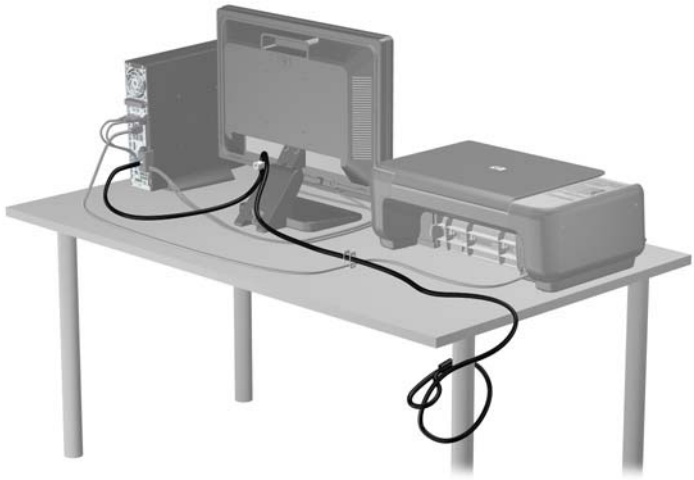
6. Screw the lock to the chassis in the thumbscrew hole using the screw provided.



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.



8. When complete, all devices in your workstation are secured.



Front bezel security

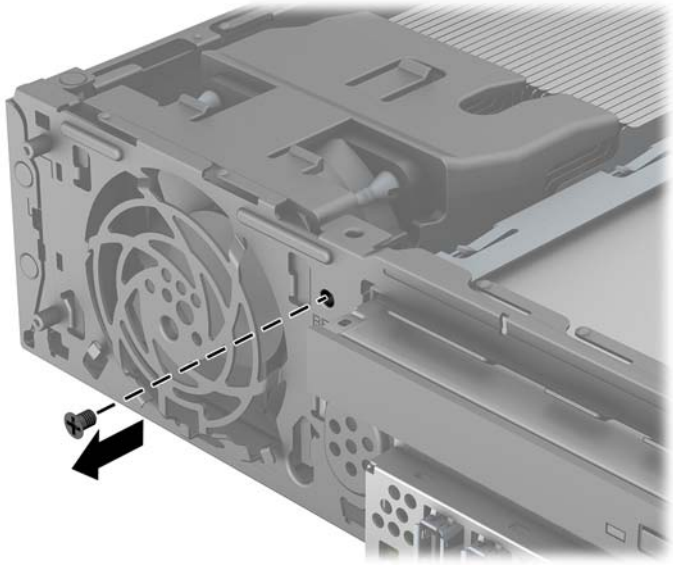
The front bezel can be locked in place by installing a security screw provided by HP. To install the security screw:

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

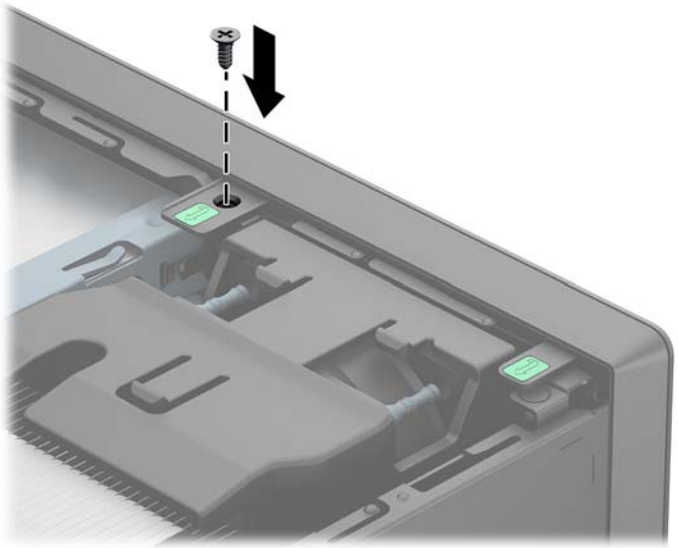
⚠ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

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

7. Remove the black screw on the front of the chassis behind the bezel. The screw is labeled **BEZEL**.



8. Replace the front bezel.
9. Install the security screw through the middle front bezel release tab and into the chassis to secure the front bezel in place.



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

A Battery replacement

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 (140ºF).

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, and 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.

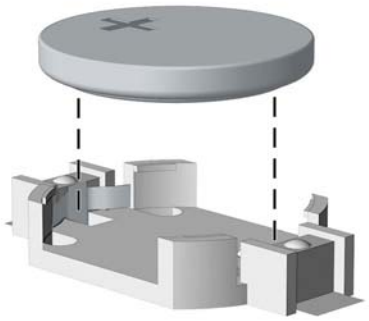
6. Locate the battery and battery holder on the system board.

NOTE: On some computer models, it may be necessary to remove an internal component to gain access to the battery.

7. Depending on the type of battery holder on the system board, complete the following instructions to replace the battery.

Type 1

a. Lift the battery out of its holder.

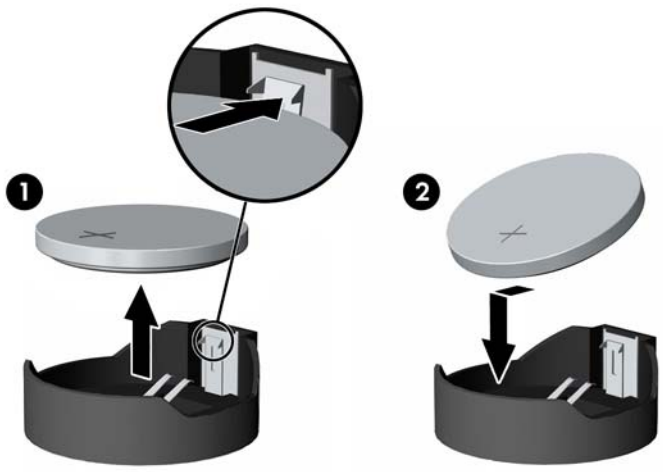


b. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.

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).

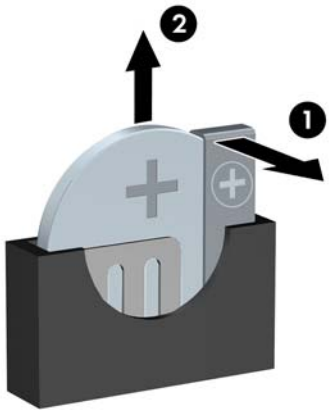
b. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery (2).



Type 3

a. Pull back on the clip (1) that is holding the battery in place, and remove the battery (2).

b. Insert the new battery and position the clip back into place.



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

8. Replace the computer access panel.
9. Plug in the computer and turn on power to 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.

B 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.

C 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.

Shipping preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files on PD discs, tape cartridges, CDs, or USB flash drives. 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, and then from the computer.
5. Disconnect the system components and external devices from their power sources, and 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.

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