



Hardware Reference Guide

HP Desktop Mini Business PC

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Product Notice

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. Go to <http://www.microsoft.com> for details.

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About This Book

This guide provides basic information for upgrading the HP Desktop Mini Business PC.

-
-  **WARNING!** Indicates a hazardous situation that, if not avoided, **could** result in serious injury or death.
 -  **CAUTION:** Indicates a hazardous situation that, if not avoided, **could** result in minor or moderate injury.
 -  **IMPORTANT:** Indicates information considered important but not hazard-related (for example, messages related to property damage). Warns the user that failure to follow a procedure exactly as described could result in loss of data or in damage to hardware or software. Also contains essential information to explain a concept or to complete a task.
 -  **NOTE:** Contains additional information to emphasize or supplement important points of the main text.
 -  **TIP:** Provides helpful hints for completing a task.
-

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1 Product features

Standard configuration features

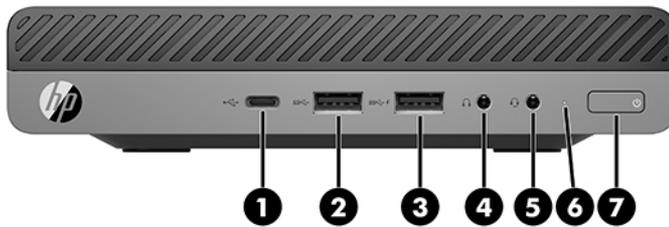
Features may vary depending on the model. For a complete listing of the hardware and software installed in the computer, run the diagnostic utility (included on some computer models only).



NOTE: This computer model can be used in a tower orientation or a desktop orientation. The tower stand is sold separately.

Front panel components

 **NOTE:** Refer to the illustration that most closely matches your computer.



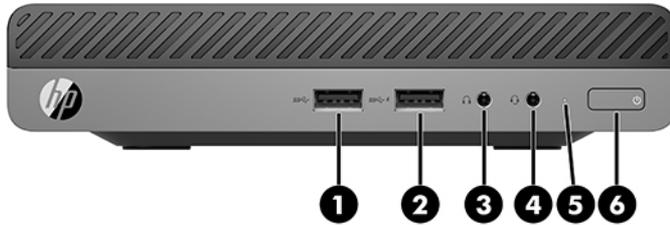
 **NOTE:** Your computer model may look slightly different from the illustration in this section.

Table 1-1 Front panel components

Component	Component
1 USB Type-C SuperSpeed port with HP Sleep and Charge*	5 Audio-out (headphone)/Audio-in (microphone) combo jack
2 USB SuperSpeed port	6 Main storage LED
3 USB SuperSpeed port with HP Sleep and Charge*	7 Dual-state power button
4 Headphone jack	

*When the computer is on, the USB port connects a USB device, provides high-speed data transfer, and even when the computer is off, charges products such as a cell phone, camera, activity tracker, or smartwatch.

NOTE: The main storage LED is normally white when the power is on. If it is flashing red, there is a problem with the computer and the main storage LED is displaying a diagnostic code. Refer to the *Maintenance and Service Guide* to interpret the code.



 **NOTE:** Your computer model may look slightly different from the illustration in this section.

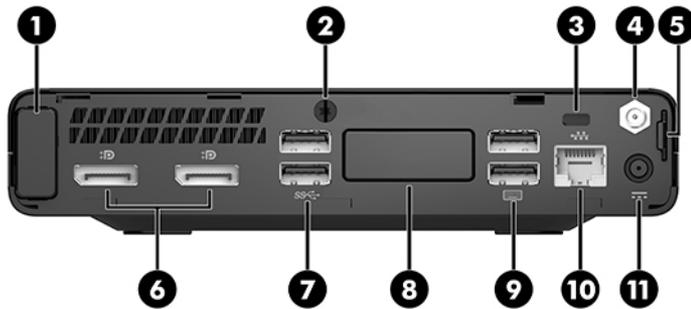
Table 1-2 Front panel components

Component		Component	
1	USB Type-A SuperSpeed port	4	Audio-out (headphone)/Audio-in (microphone) combo jack
2	USB Type-A SuperSpeed port with HP Sleep and Charge*	5	Main storage LED
3	Headphone jack	6	Dual-state power button

*When the computer is on, the USB port connects a USB device, provides high-speed data transfer, and even when the computer is off, charges products such as a cellphone, camera, activity tracker, or smartwatch.

NOTE: The main storage LED is normally white when the power is on. If it is flashing red, there is a problem with the computer and the main storage LED is displaying a diagnostic code. Refer to the *Maintenance and Service Guide* to interpret the code.

Rear panel components



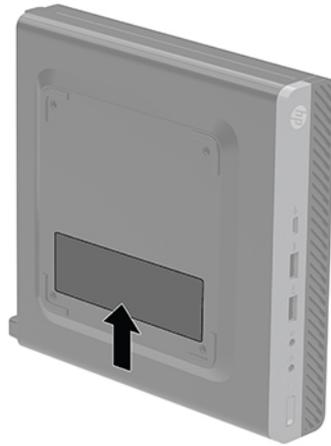
NOTE: Your computer model may look slightly different from the illustration in this section.

Table 1-3 Rear panel components

Component	Component
1 Antenna cover	7 USB SuperSpeed ports (2)
2 Thumbscrew	8 Optional port One of the following ports may be used: DisplayPort, HDMI, VGA, USB Type-C, serial port, Thunderbolt, or Fiber NIC.
3 Security cable slot	9 USB ports (2) (black)
4 External antenna connector (optional)	10 RJ-45 (network) jack/status lights
5 Padlock loop	11 Power connector
6 Dual-Mode DisplayPort (2)	

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 support for assistance.



2 Setup

Changing from desktop to tower orientation

 **IMPORTANT:** Be sure that at least 10.2 centimeters (4 inches) of space on all sides of the computer remains clear and free of obstructions.

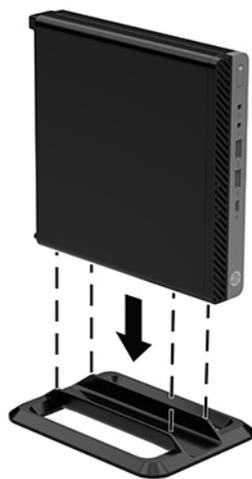
The computer can be used in a tower orientation with an optional tower stand that can be purchased from HP.

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

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, 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 AC 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. To avoid damage to the internal components of the computer, you must disconnect the power cord.

5. Orient the computer so that its right side is facing up, and place the computer in the optional stand.



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

 **IMPORTANT:** Be sure that at least 10.2 centimeters (4 inches) of space on all sides of the computer remains clear and free of obstructions.

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

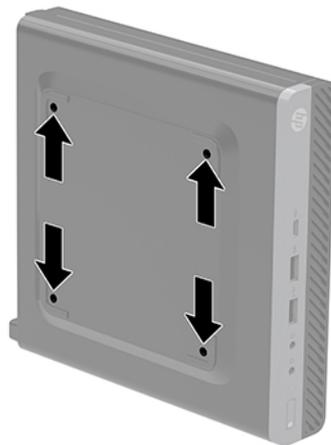
Attaching the computer to a mounting fixture

The computer can be attached to a wall, swing arm, or other mounting fixture.

 **NOTE:** This apparatus is intended to be supported by UL or CSA Listed wall-mount bracket.

1. If the computer is on a stand, remove the computer from the stand and position the computer right-side up on a stable surface.
2. To attach the computer to a swing arm (sold separately), insert four screws through the holes on the swing arm plate and into the mounting holes on the computer.

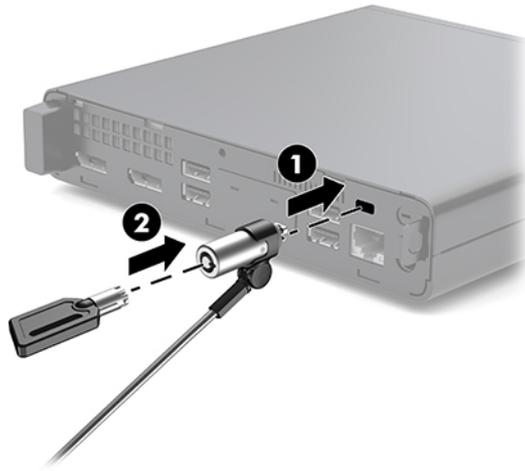
 **CAUTION:** This computer supports the VESA industry standard 100 mm mounting holes. To attach a third-party mounting solution to the computer, use the screws that are supplied with the solution. It is important to verify that the manufacturer's mounting solution is compliant with the VESA standard and is rated to support the weight of the computer. For best performance, it is important to use the power cord and other cables provided with the computer.



To attach the computer to other mounting fixtures, follow the instructions included with the mounting fixture to ensure that the computer is safely attached.

Installing a security cable

The security cable displayed below can be used to secure the computer.



NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Connecting the power cord

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

1. Connect the power cord to the AC adapter (1).
2. Plug the power cord into an AC outlet (2).
3. Connect the AC adapter to the power connector on the rear of the computer (3).



3 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 from electrical shock, hot surfaces, or fire:

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

Do not connect telecommunications or telephone connectors to 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) AC 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 36](#) 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.

 **NOTE:** Your computer model may look slightly different from the illustrations in this chapter.

Removing and installing the access panel

Removing the access panel

 **NOTE:** Your computer model may look slightly different from the illustration in this section.

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

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

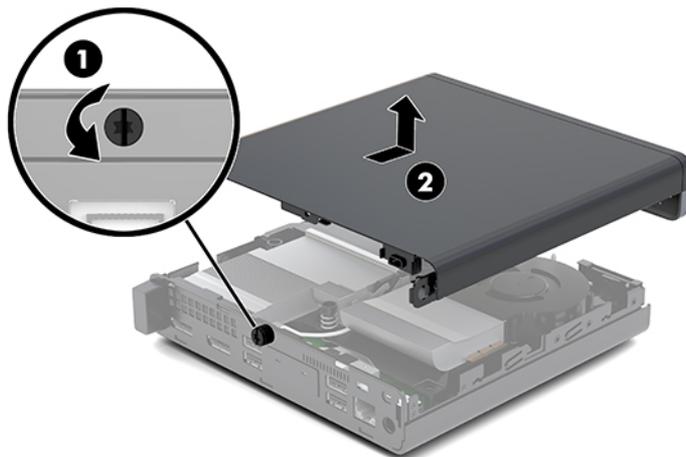
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the AC outlet 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. Then position the computer right-side up on a stable surface.
6. Loosen the thumbscrew (1) on the rear panel as shown in the following image.

 **NOTE:** If necessary, a Torx T-15 screwdriver may be used to loosen the thumbscrew.

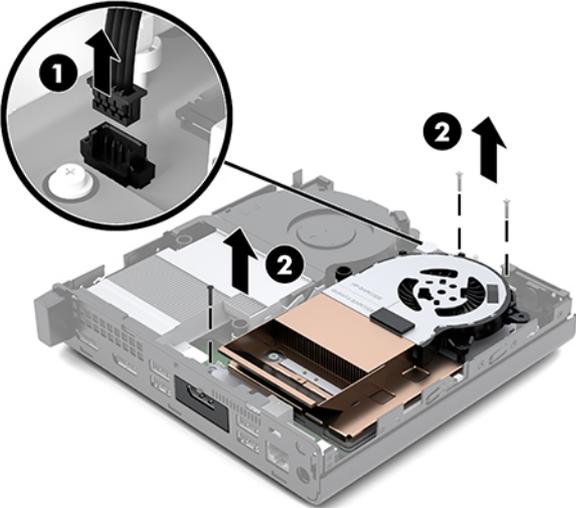
7. Slide the access panel forward, and lift it off the computer (2).



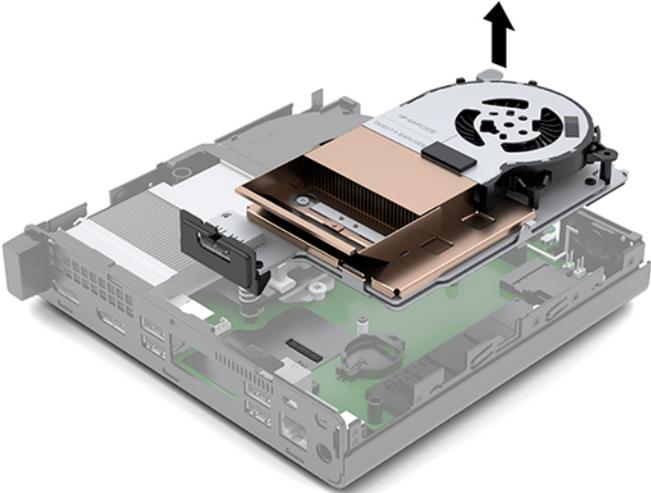
 **WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

8. If your computer closely resembles the illustration below, the computer is equipped with a discrete graphics processing unit (DGPU) that must also be removed.
 - a. Disconnect the fan cable (1) from the system board.

b. Remove the three screws (2) securing the DGPU to the system board.



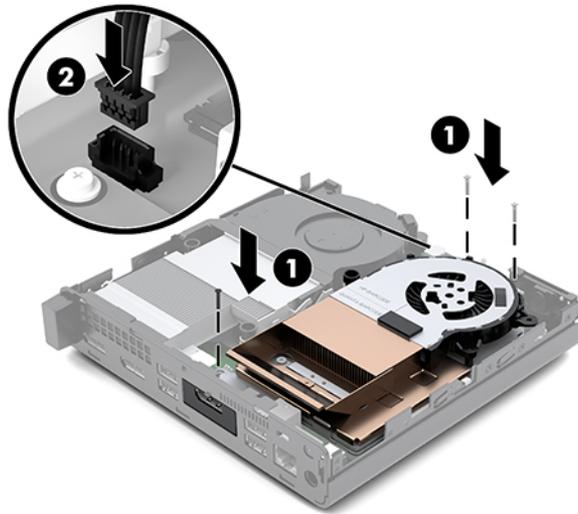
c. Lift the DGPU up by the tab at the fan end and pull the DGPU up out of the chassis.



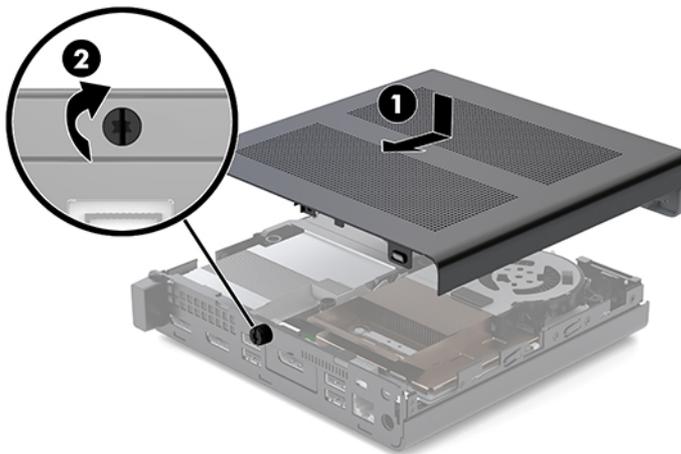
Installing the access panel

 **NOTE:** Your computer model may look slightly different from the illustration in this section.

1. If your computer closely resembles the illustration below, replace the DGPU.
 - a. Set the DGPU into the chassis and secure it to the system board with three screws: two screws at the fan end of the DGPU and one screw at the inner corner of the opposite end of the DGPU (1).
 - b. Plug the fan cable into the connector (2) on the system board.



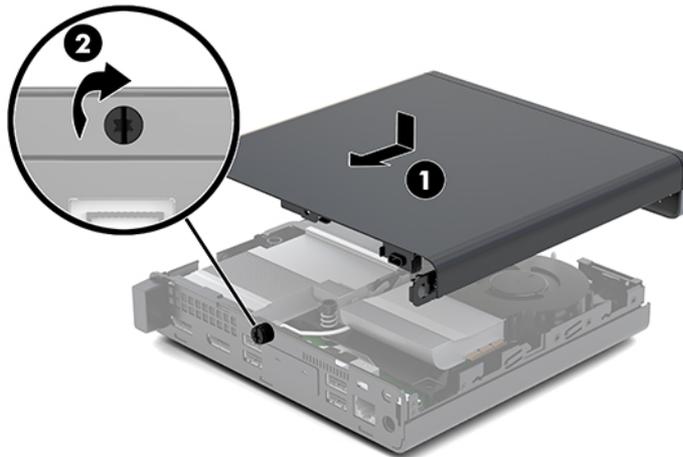
- c. Place the access panel on the computer and slide it back (1).
 - d. When the access panel slides into place, tighten the thumbscrew (2) to secure the access panel in place as shown in the following image.



 **NOTE:** Your computer model may look slightly different from the illustration in this section.

2. Place the access panel on the computer and slide it back (1).

- When the access panel slides into place, tighten the thumbscrew (2) to secure the access panel in place as shown in the following image.



Upgrading system memory

The computer comes with at least one small outline, dual in-line memory module (SODIMM). To achieve maximum memory support, you can populate the system board with up to 32 GB of memory.

Memory module specifications

For proper system operation, the memory modules must adhere to the following specifications.

Table 3-1 Memory modules and their specifications

Component	Specification
Memory modules	1.2 volt DDR4-SDRAM memory modules
Compliance	Unbuffered non-ECC PC4-17000 DDR4-2133 MHz-compliant
Pins	Industry-standard 260-pin containing the mandatory Joint Electronic Device Engineering Council (JEDEC) specification
Support	CAS latency 15 DDR4 2400 MHz (15-15-15 timing)
Slots	2
Maximum Memory	32 GB
Supported	2 Gbit, 4 Gbit, 8 Gbit, and 16 Gbit non-ECC memory technologies single-sided and double-sided memory modules

NOTE: The system does not operate properly if you install unsupported memory modules. Memory modules constructed with $\times 8$ and $\times 16$ DDR devices are supported; memory modules constructed with $\times 4$ SDRAM are not supported.

HP offers upgrade memory for this computer and advises that the consumer purchase it to avoid compatibility issues with unsupported third-party memory.

Populating memory module slots

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

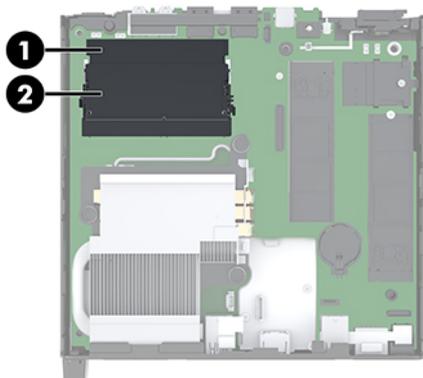


Table 3-2 Memory module slots and their descriptions

Item	Description	System Board Label	Slot Color
1	Memory module slot, Channel B	DIMM1	Black
2	Memory module slot, Channel A	DIMM3	Black

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

- The system will operate in single-channel mode if the memory module slots are populated in one channel only.
- The system will operate in a higher-performing dual-channel mode if the memory capacity of the memory module in Channel A is equal to the memory capacity of the memory module in Channel B.
- The system will operate in flex mode if the memory capacity of the memory module in Channel A is not equal to the memory capacity of the memory module 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 memory module in the system.

Installing a memory module

⚠ 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 slots 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, see [Electrostatic discharge on page 36](#).

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

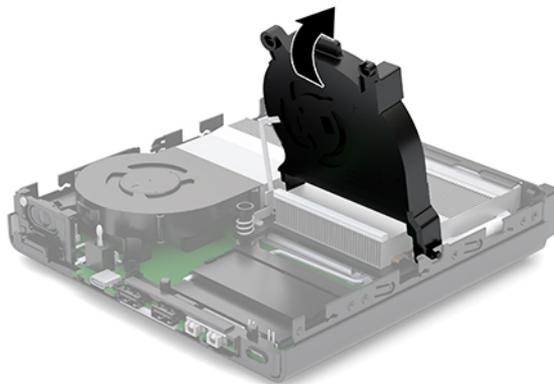
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and then turn off any external devices.
4. Disconnect the power cord from the AC outlet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

For instructions, see [Removing the access panel on page 10](#).

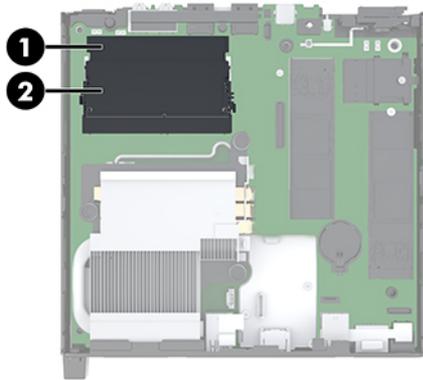
⚠ WARNING! To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

6. Tilt the fan up using the front tab and leave it in the up position.

📝 NOTE: It is not necessary to fully remove the fan to remove or install a memory module.



7. Locate the memory modules on the system board.



8. To remove a memory module, press outward on the latches (1) on each side of the memory module, and then pull the memory module (2) out of the slot.



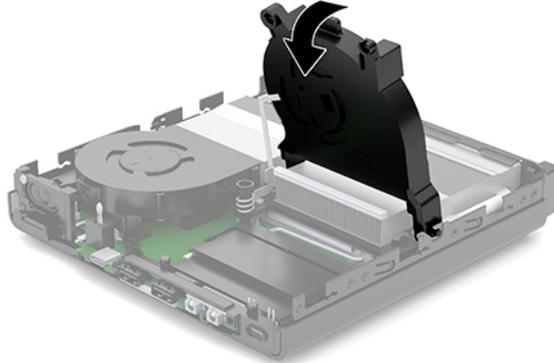
9. Slide the new memory module (1) into the slot at approximately a 30° angle, and press the memory module down (2) so that the latches lock it in place.



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

10. Tilt the fan down, and then press the fan down until the it clicks into place.

 **CAUTION:** Avoid pulling the fan cable.



11. Install the access panel.

For instructions, see [Installing the access panel on page 12](#).

12. If the computer was on a stand, replace the stand.
13. Reconnect external devices, plug in the power cord, and then turn on the computer. The computer automatically recognizes the new memory.
14. Lock any security devices that were disengaged when the access panel was removed.

Removing a 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.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, 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 AC 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.

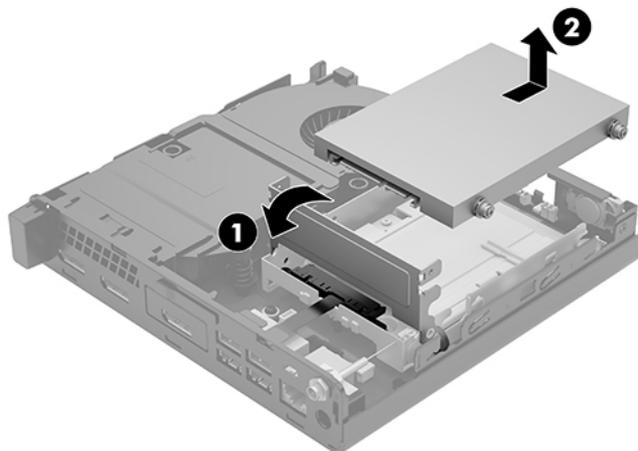
5. Remove the access panel.

For instructions, see [Removing the access panel on page 10](#).

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

6. To remove the hard drive, rotate the hard drive latch up and out (1) to disengage the hard drive from the cage.
7. Slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

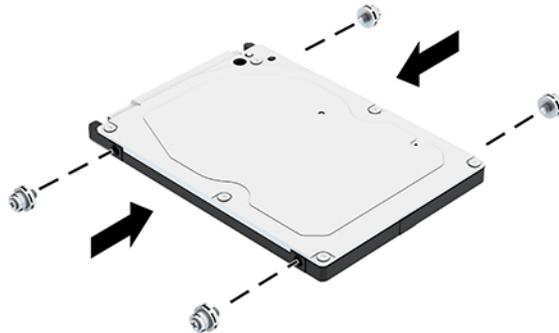
 **NOTE:** The power cable from the system board is located in the drive cage and disconnects when the hard drive is removed.



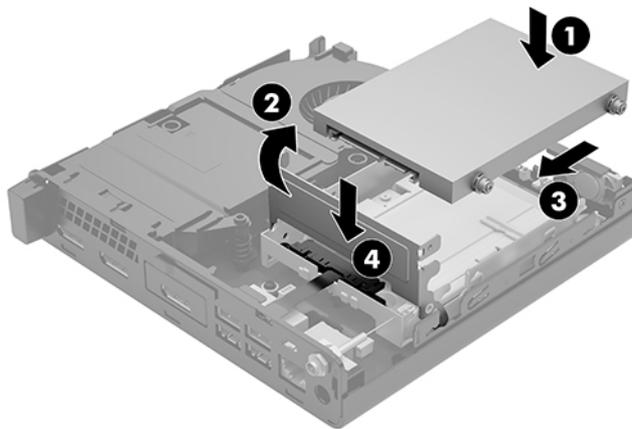
Installing a hard drive

 **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.

1. If you are replacing a hard drive, transfer the silver and blue isolation mounting guide screws from the old hard drive to the new hard drive.



2. Align the hard drive guide screws with the slots on the hard drive cage, press the hard drive down into the cage, and then slide it forward until it stops and locks into place (1).
3. Rotate the hard drive latch down (2) to engage the hard drive.



4. Install the access panel.
For instructions, see [Installing the access panel on page 12](#).
5. If the computer was on a stand, replace the stand.

6. Reconnect external devices, plug in the power cord, and then turn on the computer.
7. Lock any security devices that were disengaged when the access panel was removed.

Replacing an M.2 PCIe solid-state drive

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, 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 AC outlet and disconnect any external devices.

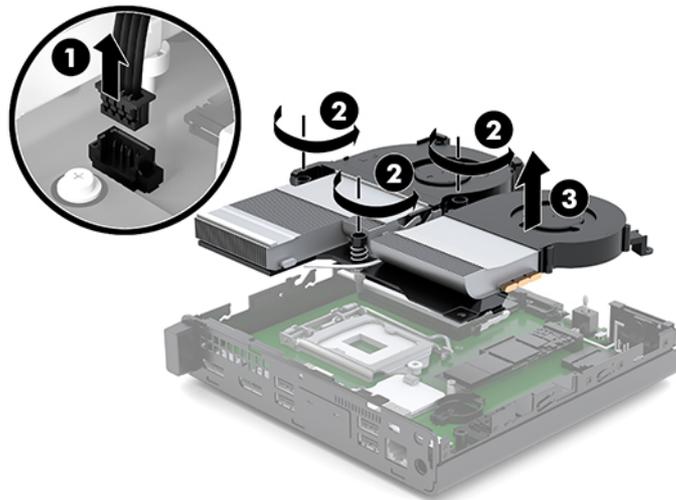
⚠ CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the access panel.

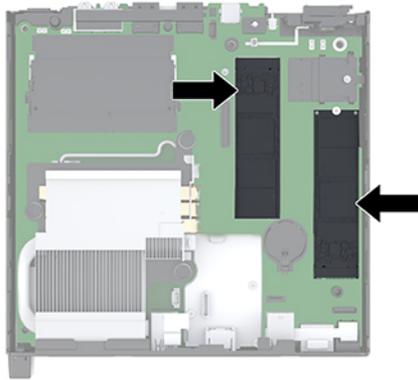
For instructions, see [Removing the access panel on page 10](#).

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

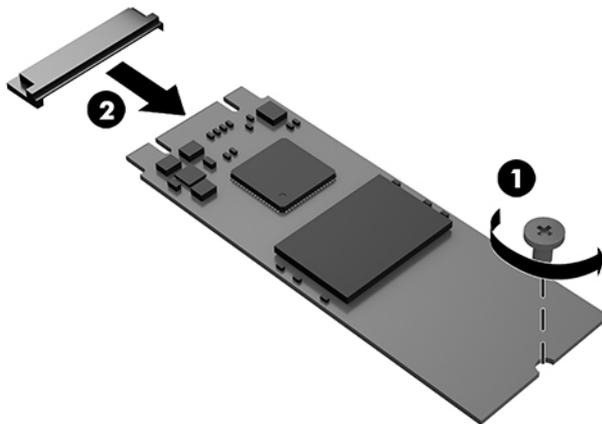
6. If your computer closely resembles the illustration below, remove the fan assembly.
 - a. Disconnect the fan assembly plug (1) from the system board.
 - b. Loosen the three captive screws securing the fan assembly (2).
 - c. Lift the fan assembly out of the chassis (3).



7. Locate the solid-state drives on the system board.



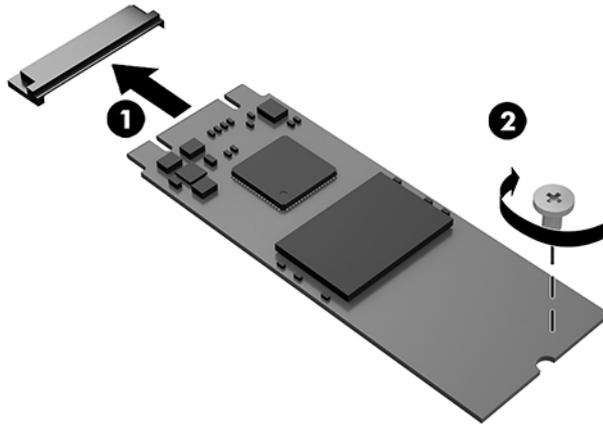
8. Remove the screw securing a solid-state drive to the system board (1).
9. Grasp the solid-state drive by the sides and carefully pull it out of the socket (2).
10. Remove the screw holder from the solid-state drive (3) for use on the replacement solid-state drive.



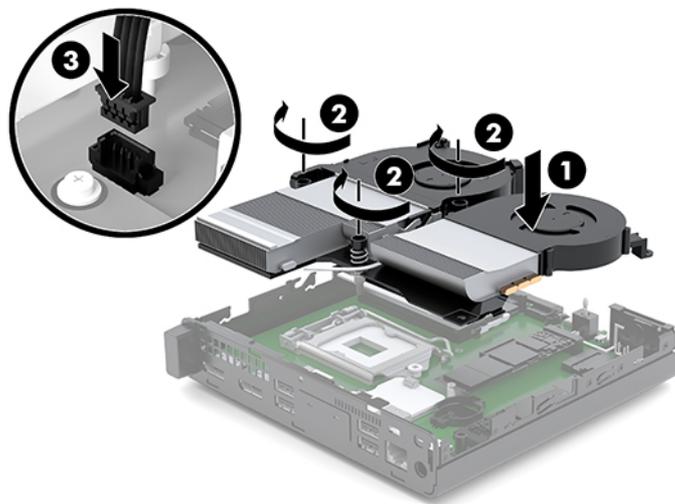
11. Insert the screw holder into the niche on the end of the new solid-state drive (1).
12. Insert the new solid-state drive into the socket on the system board and press the solid-state drive connectors (2) firmly into the socket.

 **NOTE:** A solid-state drive can be installed in only one way.

13. Press the solid-state drive down to the system board and use the included screw (3) to secure the solid-state drive.



14. If your computer closely resembles the illustration below, replace the fan assembly.
 - a. Set the fan assembly in place (1).
 - b. Tighten the three captive screws to secure the fan assembly to the chassis (2).
 - c. Connect the fan assembly plug to the system board (3).



15. Install the access panel.
For instructions, see [Installing the access panel on page 12](#).
16. If the computer was on a stand, replace the stand.
17. Reconnect external devices, plug in the power cord, and then turn on the computer.
18. Lock any security devices that were disengaged when the access panel was removed.

Replacing the WLAN module

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, 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 AC outlet and disconnect any external devices.

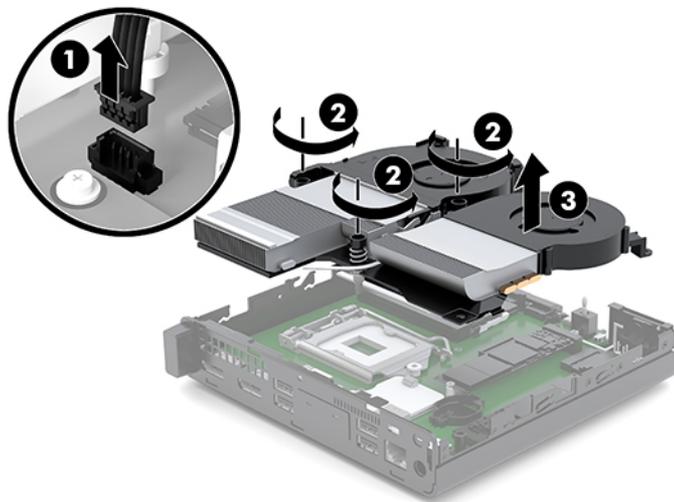
⚠ CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the access panel.

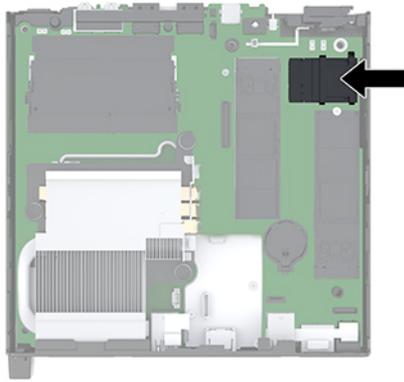
For instructions, see [Removing the access panel on page 10](#).

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

6. If your computer closely resembles the illustration below, remove the fan assembly.
 - a. Disconnect the fan assembly plug (1) from the system board.
 - b. Loosen the three captive screws securing the fan assembly (2).
 - c. Lift the fan assembly out of the chassis (3).



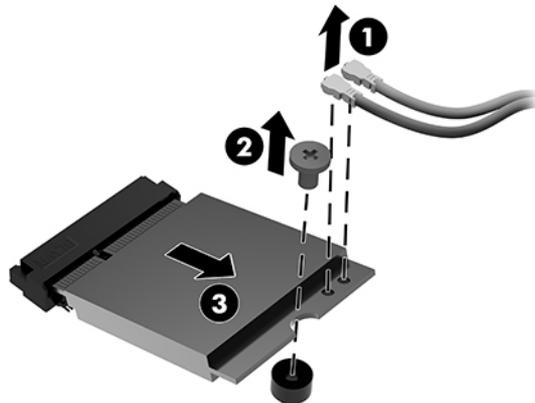
7. Locate the WLAN module on the system board.



8. Disconnect both antenna cables (1) from the WLAN module.

 **NOTE:** You may need to use a small tool, such as a pair of tweezers or needle-nose pliers, to disconnect and connect the antenna cables.

9. Remove the screw (2) securing the WLAN module to the system board.
10. Grasp the WLAN module (3) by the sides and pull it out of the socket.

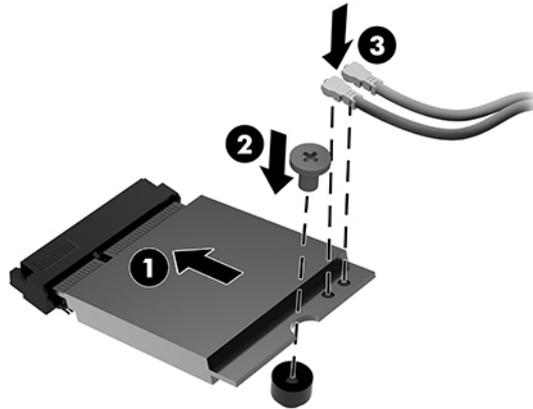


11. Insert the new WLAN module into the socket on the system board. Press the WLAN module connectors firmly into the socket (1).

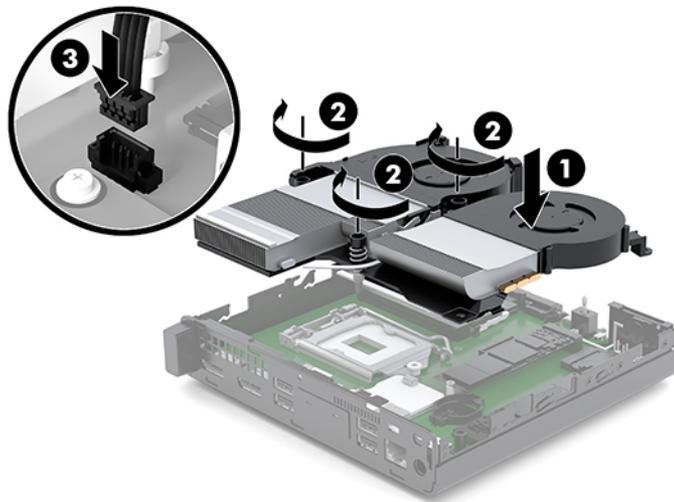
 **NOTE:** A WLAN module can be installed in only one way.

12. Press the WLAN module down to the system board and use the included screw to secure the module (2).

- 13.** Match the label on each antenna cable to the corresponding connector on the WLAN module and attach the antennas (3) to the connectors.



- 14.** If your computer closely resembles the illustration below, replace the fan assembly.
- Set the fan assembly in place (1).
 - Tighten the three captive screws to secure the fan assembly to the chassis (2).
 - Connect the fan assembly plug to the system board (3).



- 15.** Install the access panel.
For instructions, see [Installing the access panel on page 12](#).
- 16.** If the computer was on a stand, replace the stand.
- 17.** Reconnect external devices, plug in the power cord, and then turn on the computer.
- 18.** Lock any security devices that were disengaged when the access panel was removed.

Installing an external antenna

Internal WLAN antennas are standard. If the computer is to be installed in a metal kiosk or other enclosure, you may wish or need to use an external WLAN antenna.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, 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 AC outlet and disconnect any external devices.

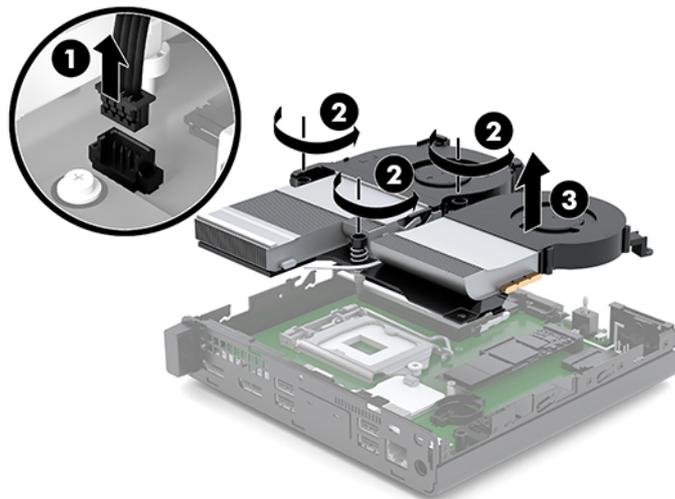
⚠ CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the access panel.

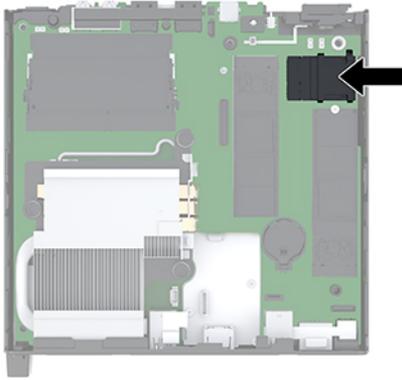
For instructions, see [Removing the access panel on page 10](#).

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

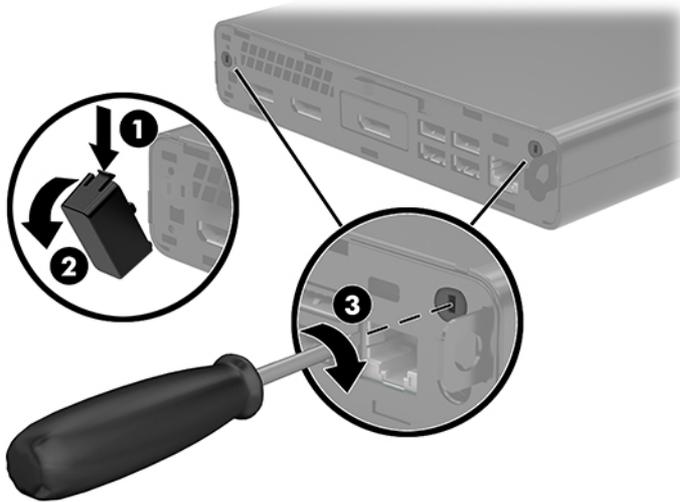
6. If your computer closely resembles the illustration below, remove the fan assembly.
 - a. Disconnect the fan assembly plug (1) from the system board.
 - b. Loosen the three captive screws securing the fan assembly (2).
 - c. Lift the fan assembly out of the chassis (3).



7. Locate the WLAN module on the system board.

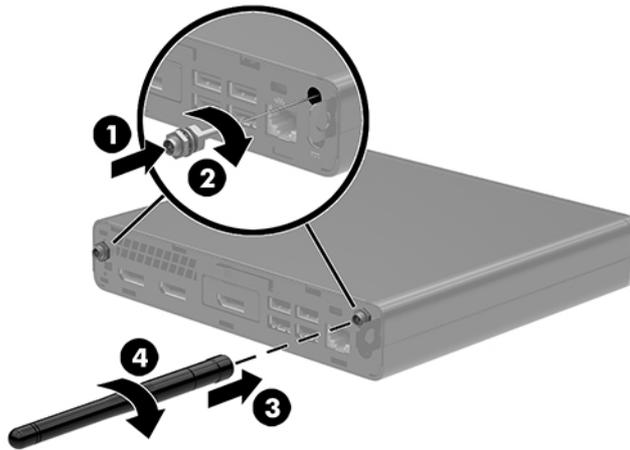


8. Disconnect the internal antennas from the WLAN module.
For instructions, see [Replacing the WLAN module on page 23](#).
9. Locate both external antenna positions on the rear of the chassis.
10. To view the knock-out feature on the left side of the rear panel, remove the antenna cover by pushing down on the antenna cover (1) and pulling it away (2) from the panel.
11. Insert a Phillips screwdriver into each knock-out feature and rotate (3) to remove the blank.

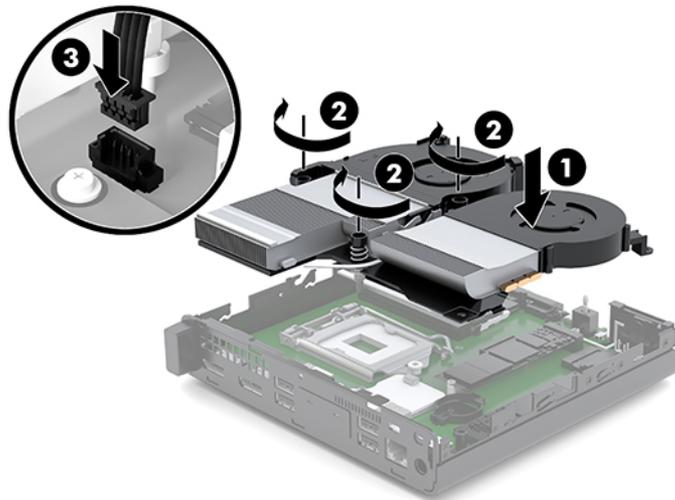


12. Feed the external antenna cable through each hole (1) and tighten the nut (2) to secure the cable.

13. Connect the external antenna (3) and screw into place (4).



14. If your computer closely resembles the illustration below, replace the fan assembly.
- Set the fan assembly in place (1).
 - Tighten the three captive screws to secure the fan assembly to the chassis (2).
 - Connect the fan assembly plug to the system board (3).



15. Install the access panel.
For instructions, see [Installing the access panel on page 12](#).
16. If the computer was on a stand, replace the stand.
17. Reconnect external devices, plug in the power cord, and 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 a USB flash drive, 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 AC 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.

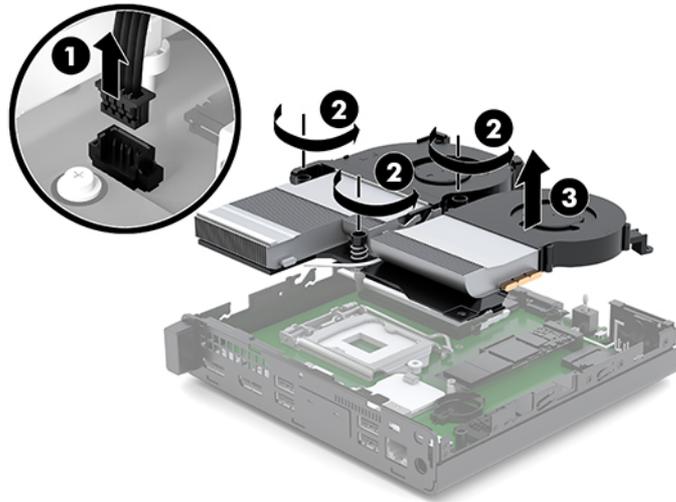
5. Remove the access panel.

For instructions, see [Removing the access panel on page 10](#).

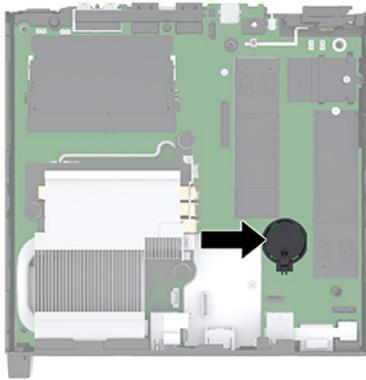
⚠ WARNING! To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

6. If your computer closely resembles the illustration below, remove the fan assembly.
 - a. Disconnect the fan assembly plug (1) from the system board.
 - b. Loosen the three captive screws securing the fan assembly (2).

- c. Lift the fan assembly out of the chassis (3).



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



 **NOTE:** You may need to use a small tool, such as tweezers or needle-nose pliers, to remove and replace the battery.

8. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery (1). When the battery pops up, lift it out (2).

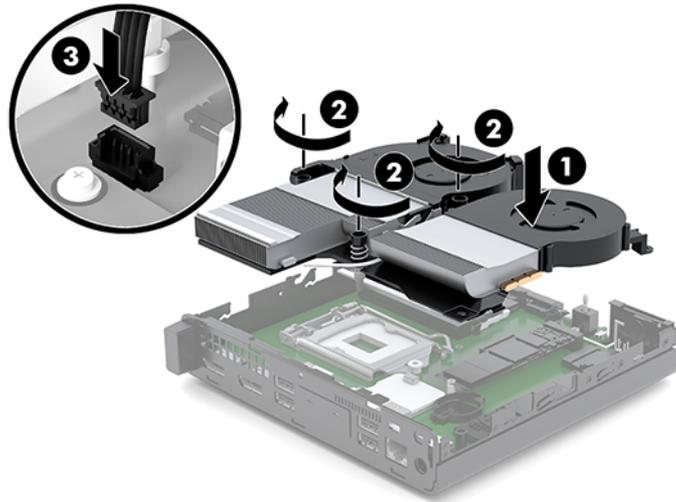


9. To insert the new battery, slide one edge of the replacement battery into the holder with the positive side up (1). Push the other edge down until the clamp snaps over the other edge of the battery (2).



10. If your computer closely resembles the illustration below, replace the fan assembly.
- Set the fan assembly in place (1).
 - Tighten the three captive screws to secure the fan assembly to the chassis (2).

- c. Connect the fan assembly plug to the system board (3).



11. Replace the access panel.

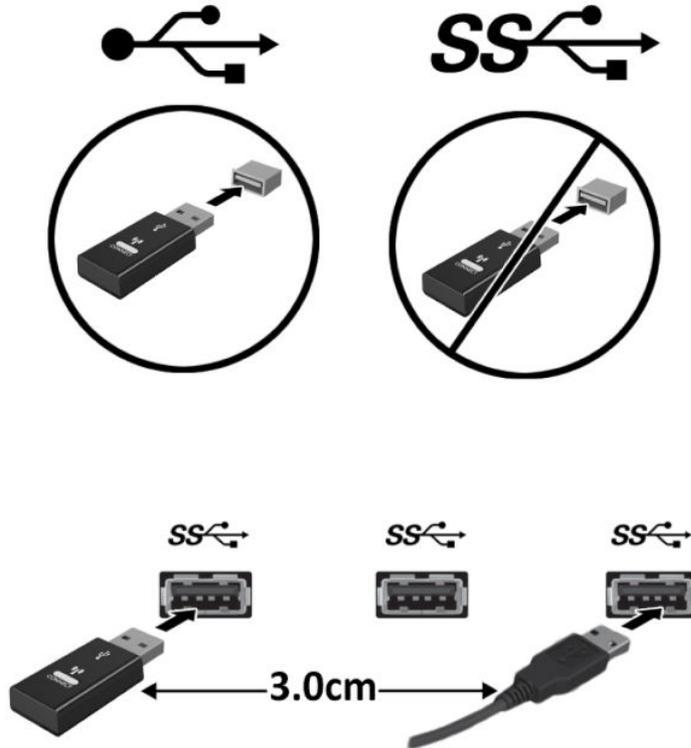
For instructions, see [Installing the access panel on page 12](#).

12. If the computer was on a stand, replace the stand.
13. Reconnect external devices, plug in the power cord, and then turn on the computer.
14. Lock any security devices that were disengaged when the computer access panel was removed.
15. Reset the date and time, your passwords, and any special system setups using Computer Setup.

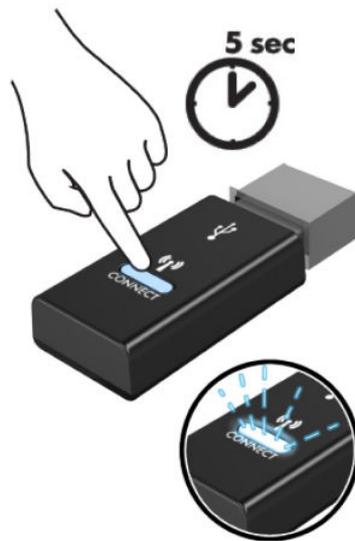
Synchronizing the optional wireless keyboard and mouse

The mouse and keyboard are synchronized at the factory. If they do not work, remove and replace the batteries. If the mouse and keyboard are still not synchronized, then follow this procedure to manually re-synchronize the pair.

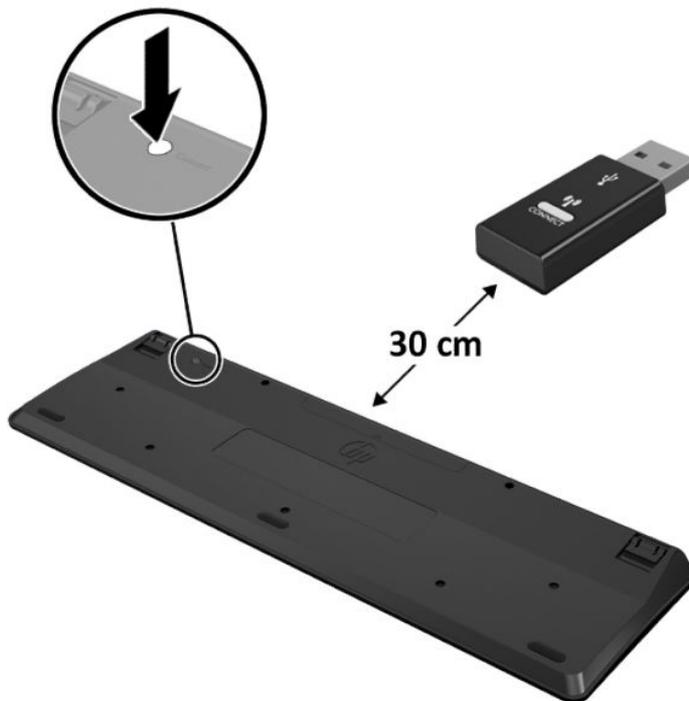
1. Connect the mouse and keyboard USB device to a USB 2.0 port. Be sure that the mouse and keyboard USB device is at least 3 cm from the next nearest USB device.



2. Press the connect button on the mouse and keyboard USB device for 5 seconds.



3. With the keyboard 30 cm from the mouse and keyboard USB device, press the connect button on the bottom of the keyboard.



4. With the mouse 30 cm from the mouse and keyboard USB device, press the connect button on the bottom of the mouse.



 **NOTE:** If the mouse and keyboard still do not work, then remove and replace the batteries. If the mouse and keyboard are still not synchronized, then synchronize the keyboard and mouse again.

A 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.

B 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 SSD 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.
2. Remove and store all removable media.
3. Turn off the computer and external devices.
4. Disconnect the power cord from the AC 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.

C Accessibility

Accessibility

HP is working to weave diversity, inclusion and work/life into the fabric of our company, so it is reflected in everything we do. Here are some examples of how we are putting differences to work to create an inclusive environment focused on connecting people to the power of technology throughout the world.

Finding the technology tools you need

Technology can unleash your human potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology helps increase, maintain, and improve the functional capabilities of electronic and information technology. For more information, see [Finding the best assistive technology on page 40](#).

Our commitment

HP is committed to providing products and services that are accessible for people with disabilities. This commitment supports our company's diversity objectives and helps us ensure that the benefits of technology are available to all.

Our accessibility goal is to design, produce, and market products and services that can be effectively used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices.

To achieve our goal, this Accessibility Policy establishes seven key objectives to guide our actions as a company. All HP managers and employees are expected to support these objectives and their implementation in accordance with their roles and responsibilities:

- Raise the level of awareness of accessibility issues within our company, and provide our employees with the training they need to design, produce, market, and deliver accessible products and services.
- Develop accessibility guidelines for products and services, and hold product development groups accountable for implementing these guidelines where competitively, technically, and economically feasible.
- Involve people with disabilities in the development of accessibility guidelines, and in the design and testing of products and services.
- Document accessibility features and make information about our products and services publicly available in an accessible form.
- Establish relationships with leading assistive technology and solution providers.

- Support internal and external research and development that will improve assistive technology relevant to our products and services.
- Support and contribute to industry standards and guidelines for accessibility.

International Association of Accessibility Professionals (IAAP)

IAAP is a not-for-profit association focused on advancing the accessibility profession through networking, education, and certification. The objective is to help accessibility professionals develop and advance their careers and to better enable organizations to integrate accessibility into their products and infrastructure.

HP is a founding member, and we joined to participate with other organizations to advance the field of accessibility. This commitment supports our company's accessibility goal of designing, producing, and marketing products and services that can be effectively used by people with disabilities.

IAAP will make our profession strong by globally connecting individuals, students, and organizations to learn from one another. If you are interested in learning more, go to <http://www.accessibilityassociation.org> to join the online community, sign up for newsletters, and learn about membership options.

Finding the best assistive technology

Everyone, including people with disabilities or age-related limitations, should be able to communicate, express themselves, and connect with the world using technology. HP is committed to increasing accessibility awareness within HP and with our customers and partners. Whether it's large fonts that are easy on the eyes, voice recognition that lets you give your hands a rest, or any other assistive technology to help with your specific situation—a variety of assistive technologies make HP products easier to use. How do you choose?

Assessing your needs

Technology can unleash your potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology (AT) helps increase, maintain, and improve the functional capabilities of electronic and information technology.

You may choose from many AT products. Your AT assessment should allow you to evaluate several products, answer your questions, and facilitate your selection of the best solution for your situation. You will find that professionals qualified to do AT assessments come from many fields, including those licensed or certified in physical therapy, occupational therapy, speech/language pathology, and other areas of expertise. Others, while not certified or licensed, may also provide evaluation information. You will want to ask about the individual's experience, expertise, and fees to determine if they are appropriate for your needs.

Accessibility for HP products

The following links provide information about accessibility features and assistive technology, if applicable, included in various HP products. These resources will help you select the specific assistive technology features and product(s) most appropriate for your situation.

- [HP Elite x3—Accessibility Options \(Windows 10 Mobile\)](#)
- [HP PCs—Windows 7 Accessibility Options](#)
- [HP PCs—Windows 8 Accessibility Options](#)
- [HP PC's—Windows 10 Accessibility Options](#)
- [HP Slate 7 Tablets—Enabling Accessibility Features on Your HP Tablet \(Android 4.1/Jelly Bean\)](#)
- [HP SlateBook PCs—Enabling Accessibility Features \(Android 4.3, 4.2/Jelly Bean\)](#)

- [HP Chromebook PCs—Enabling Accessibility Features on Your HP Chromebook or Chromebox \(Chrome OS\)](#)
- [HP Shopping—peripherals for HP products](#)

If you need additional support with the accessibility features on your HP product, see [Contacting support on page 46](#).

Additional links to external partners and suppliers that may provide additional assistance:

- [Microsoft Accessibility information \(Windows 7, Windows 8, Windows 10, Microsoft Office\)](#)
- [Google Products accessibility information \(Android, Chrome, Google Apps\)](#)
- [Assistive Technologies sorted by impairment type](#)
- [Assistive Technologies sorted by product type](#)
- [Assistive Technology vendors with product descriptions](#)
- [Assistive Technology Industry Association \(ATIA\)](#)

Standards and legislation

Standards

Section 508 of the Federal Acquisition Regulation (FAR) standards was created by the US Access Board to address access to information and communication technology (ICT) for people with physical, sensory, or cognitive disabilities. The standards contain technical criteria specific to various types of technologies, as well as performance-based requirements which focus on functional capabilities of covered products. Specific criteria cover software applications and operating systems, web-based information and applications, computers, telecommunications products, video and multi-media, and self-contained closed products.

Mandate 376 – EN 301 549

The EN 301 549 standard was created by the European Union within Mandate 376 as the basis for an online toolkit for public procurement of ICT products. The standard specifies the functional accessibility requirements applicable to ICT products and services, together with a description of the test procedures and evaluation methodology for each accessibility requirement.

Web Content Accessibility Guidelines (WCAG)

Web Content Accessibility Guidelines (WCAG) from the W3C's Web Accessibility Initiative (WAI) helps web designers and developers create sites that better meet the needs of people with disabilities or age-related limitations. WCAG advances accessibility across the full range of web content (text, images, audio, and video) and web applications. WCAG can be precisely tested, is easy to understand and use, and allows web developers flexibility for innovation. WCAG 2.0 has also been approved as [ISO/IEC 40500:2012](#).

WCAG specifically addresses barriers to accessing the web experienced by people with visual, auditory, physical, cognitive, and neurological disabilities, and by older web users with accessibility needs. WCAG 2.0 provides characteristics of accessible content:

- **Perceivable** (for instance, by addressing text alternatives for images, captions for audio, adaptability of presentation, and color contrast)
- **Operable** (by addressing keyboard access, color contrast, timing of input, seizure avoidance, and navigability)
- **Understandable** (by addressing readability, predictability, and input assistance)
- **Robust** (for instance, by addressing compatibility with assistive technologies)

Legislation and regulations

Accessibility of IT and information has become an area of increasing legislative importance. This section provides links to information about key legislation, regulations, and standards.

- [United States](#)
- [Canada](#)
- [Europe](#)
- [United Kingdom](#)
- [Australia](#)
- [Worldwide](#)

United States

Section 508 of the Rehabilitation Act specifies that agencies must identify which standards apply to the procurement of ICT, perform market research to determine the availability of accessible products and services, and document the results of their market research. The following resources provide assistance in meeting Section 508 requirements:

- www.section508.gov
- [Buy Accessible](#)

The U.S. Access Board is currently updating the Section 508 standards. This effort will address new technologies and other areas where the standards need to be modified. For more information, go to [Section 508 Refresh](#).

Section 255 of the Telecommunications Act requires telecommunications products and services to be accessible to people with disabilities. FCC rules cover all hardware and software telephone network equipment and telecommunications equipment used in the home or office. Such equipment includes telephones, wireless handsets, fax machines, answering machines, and pagers. FCC rules also cover basic and special telecommunications services, including regular telephone calls, call waiting, speed dialing, call forwarding, computer-provided directory assistance, call monitoring, caller identification, call tracing, and repeat dialing, as well as voice mail and interactive voice response systems that provide callers with menus of choices. For more information, go to [Federal Communication Commission Section 255 information](#).

21st Century Communications and Video Accessibility Act (CVAA)

The CVAA updates federal communications law to increase the access of persons with disabilities to modern communications, updating accessibility laws enacted in the 1980s and 1990s to include new digital, broadband, and mobile innovations. Regulations are enforced by the FCC and documented as 47 CFR Part 14 and Part 79.

- [FCC Guide on the CVAA](#)

Other U.S. legislation and initiatives

- [Americans with Disabilities Act \(ADA\), Telecommunications Act, the Rehabilitation Act and others](#)

Canada

The Accessibility for Ontarians with Disabilities Act was established to develop and implement accessibility standards to make goods, services, and facilities accessible to Ontarians with disabilities and to provide for the involvement of persons with disabilities in the development of the accessibility standards. The first standard of the AODA is the customer service standard; however, standards for transportation, employment, and information and communication are also being developed. The AODA applies to the Government of Ontario, the Legislative Assembly, every designated public sector organization, and to every other person or organization that provides goods, services, or facilities to the public or other third parties and that has at least one employee in Ontario; and accessibility measures must be implemented on or before January 1, 2025. For more information, go to [Accessibility for Ontarians with Disability Act \(AODA\)](#).

Europe

EU Mandate 376 ETSI Technical Report ETSI DTR 102 612: "Human Factors (HF); European accessibility requirements for public procurement of products and services in the ICT domain (European Commission Mandate M 376, Phase 1)" has been released.

Background: The three European Standardization Organizations have set up two parallel project teams to carry out the work specified in the European Commission "Mandate 376 to CEN, CENELEC and ETSI, in Support of Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain."

ETSI TC Human Factors Specialist Task Force 333 has developed ETSI DTR 102 612. Further details about the work performed by STF333 (e.g., Terms of Reference, specification of the detailed work tasks, time plan for the work, previous drafts, listing of comments received and means to contact the task force) can be found at the [Special Task Force 333](#).

The parts relating to the assessment of suitable testing and conformity schemes were carried out by a parallel project, detailed in CEN BT/WG185/PT. For further information, go to the CEN project team website. The two projects are closely coordinated.

- [CEN project team](#)
- [European Commission mandate for e-accessibility \(PDF 46KB\)](#)

United Kingdom

The Disability Discrimination Act of 1995 (DDA) was enacted to ensure that websites are accessible to blind and disabled users in the United Kingdom.

- [W3C UK Policies](#)

Australia

The Australian government has announced their plan to implement [Web Content Accessibility Guidelines 2.0](#).

All Australian government websites will require Level A compliance by 2012, and Double A by 2015. The new standard replaces WCAG 1.0, which was introduced as a mandated requirement for agencies in 2000.

Worldwide

- [JTC1 Special Working Group on Accessibility \(SWG-A\)](#)
- [G3ict: The Global Initiative for Inclusive ICT](#)
- [Italian accessibility legislation](#)
- [W3C Web Accessibility Initiative \(WAI\)](#)

Useful accessibility resources and links

The following organizations may be good resources for information about disabilities and age-related limitations.

 **NOTE:** This is not an exhaustive list. These organizations are provided for informational purposes only. HP assumes no responsibility for information or contacts you may encounter on the Internet. Listing on this page does not imply endorsement by HP.

Organizations

- American Association of People with Disabilities (AAPD)
- The Association of Assistive Technology Act Programs (ATAP)
- Hearing Loss Association of America (HLAA)
- Information Technology Technical Assistance and Training Center (ITTATC)
- Lighthouse International
- National Association of the Deaf
- National Federation of the Blind
- Rehabilitation Engineering & Assistive Technology Society of North America (RESNA)
- Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI)
- W3C Web Accessibility Initiative (WAI)

Educational institutions

- California State University, Northridge, Center on Disabilities (CSUN)
- University of Wisconsin - Madison, Trace Center
- University of Minnesota computer accommodations program

Other disability resources

- ADA (Americans with Disabilities Act) Technical Assistance Program
- Business & Disability network
- EnableMart
- European Disability Forum
- Job Accommodation Network
- Microsoft Enable
- U.S. Department of Justice - A Guide to disability rights Laws

HP links

[Our contact webform](#)

[HP comfort and safety guide](#)

[HP public sector sales](#)

Contacting support



NOTE: Support is in English only.

- Customers who are deaf or hard of hearing that have questions about technical support or accessibility of HP products:
 - Use TRS/VRS/WebCapTel to call (877) 656-7058 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.
- Customers with other disabilities or age-related limitations who have questions about technical support or accessibility of HP products, choose one of the following options:
 - Call (888) 259-5707 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.
 - Complete the [Contact form for people with disabilities or age-related limitations](#).

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