



Hardware Reference Guide

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Product notice

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

Not all features are available in all editions 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.

To access the latest user guides, go to <http://www.hp.com/support>, and follow the instructions to find your product. Then select **User Guides**.

Software terms

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

For any further information or to request a full refund of the price of the computer, please contact your seller.

About This Guide

This guide provides basic information for upgrading this computer model.






-  **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

Overview



 **NOTE:** To access the latest user guides, go to <http://www.hp.com/support>, and follow the instructions to find your product. Then select **User Guides**.

HP ProOne 600 21.5-inch and HP ProOne 400 23.8-inch components

Front components



Table 1-1 HP ProOne 600 21.5-inch and HP ProOne 400 23.8-inch front components

| Front components | |
|---------------------------------------|-------------------------------|
| (1) Webcam microphones (2) (optional) | (4) Webcam/IR lens (optional) |
| (2) IR light (optional) | (5) IR LED (optional) |
| (3) Webcam LED (optional) | (6) Speakers (2) (optional) |

Side components

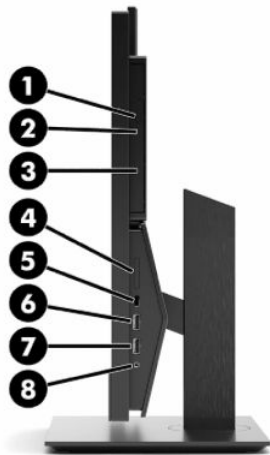


Table 1-2 HP ProOne 600 21.5-inch and HP ProOne 400 23.8-inch side components

| Side components | |
|--|--|
| (1) Optical disc drive (optional) | (5) USB Type-C port NOTE: The USB Type-C port does not support video output. |
| (2) Optical disc drive light (optional) | (6) USB SuperSpeed (charging) port |
| (3) Optical disc drive eject button (optional) | (7) USB SuperSpeed port |
| (4) SD memory card reader (optional) | (8) Audio-out (headphone)/Audio-in (microphone) combo jack |

Rear components

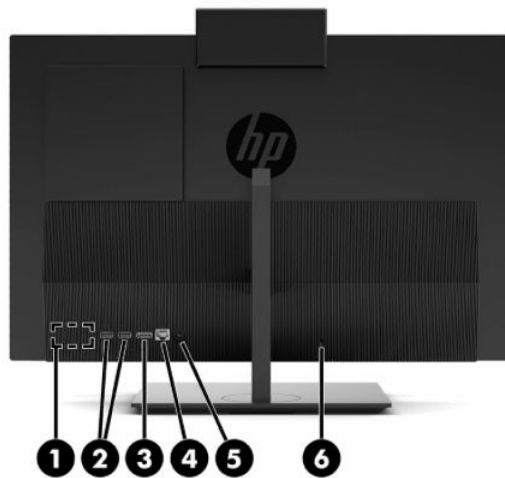


Table 1-3 HP ProOne 600 21.5-inch and HP ProOne 400 23.8-inch rear components

| Rear components | |
|--|--------------------------|
| (1) DisplayPort connector (optional) – or – HDMI port (optional) – or – Serial port (optional) | (4) RJ-45 (network) jack |
| (2) USB SuperSpeed ports with wake from keyboard or mouse (2) | (5) Power connector |
| (3) DisplayPort connector | (6) Security cable slot |

Bottom components

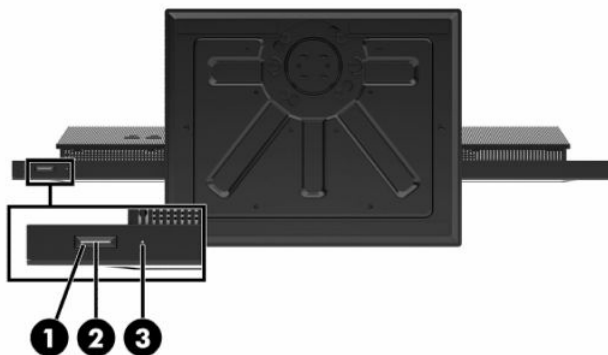


Table 1-4 HP ProOne 600 21.5-inch and HP ProOne 400 23.8-inch bottom components

| Bottom components | |
|-------------------|-------------------------------|
| (1) Power button | (3) Hard drive activity light |
| (2) Power light | |

HP ProOne 400 20-inch components

Front components



Table 1-5 HP ProOne 400 20-inch front components

| Front components | |
|----------------------------|----------------------------------|
| (1) Webcam LED (optional) | (3) Webcam microphone (optional) |
| (2) Webcam lens (optional) | (4) Speakers (2) (optional) |

Side components

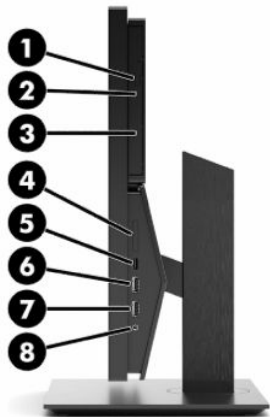


Table 1-6 HP ProOne 400 20-inch side components

| Side components | |
|---|------------------------------------|
| (1) Optical disc drive (optional) | (5) USB Type-C port |
| (2) Optical disc drive light (optional) | (6) USB SuperSpeed (charging) port |

NOTE: The USB Type-C port does not support video output.

Table 1-6 HP ProOne 400 20-inch side components (continued)

| Side components | | | |
|-----------------|--|------------|--|
| (3) | Optical disc drive eject button (optional) | (7) | USB SuperSpeed port |
| (4) | SD memory card reader (optional) | (8) | Audio-out (headphone)/Audio-in (microphone) combo jack |

Rear components

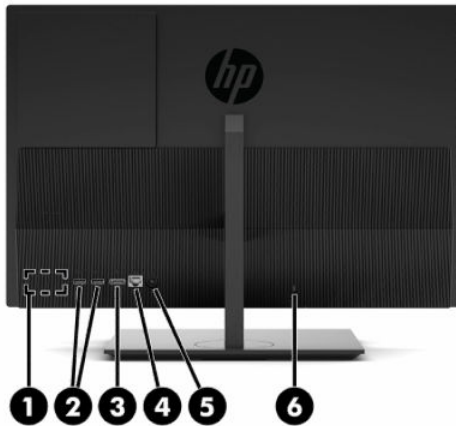


Table 1-7 HP ProOne 400 20-inch rear components

| Rear components | | | |
|-----------------|--|------------|----------------------|
| (1) | DisplayPort connector (optional) – or – HDMI port (optional) – or – Serial port (optional) | (4) | RJ-45 (network) jack |
| (2) | USB SuperSpeed ports with wake from keyboard or mouse (2) | (5) | Power connector |
| (3) | DisplayPort connector | (6) | Security cable slot |

Bottom components

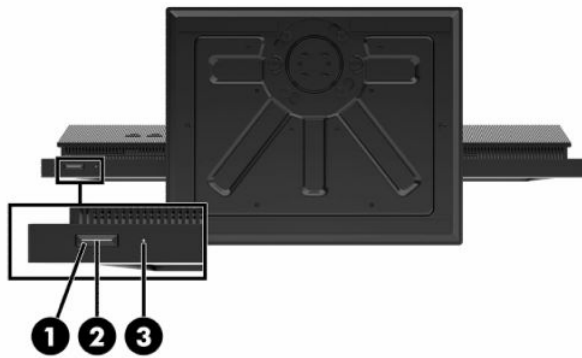


Table 1-8 HP ProOne 400 20-inch bottom components

| Bottom components | |
|-------------------|---------------------------|
| (1) | Power button |
| (2) | Power light |
| (3) | Hard drive activity light |

Special keys

Your keyboard may be different.

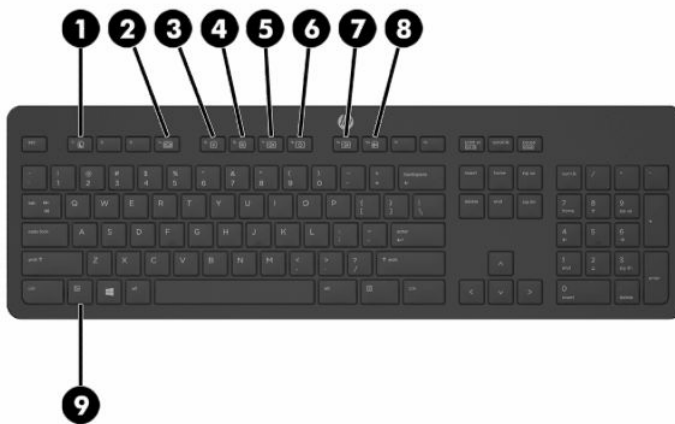
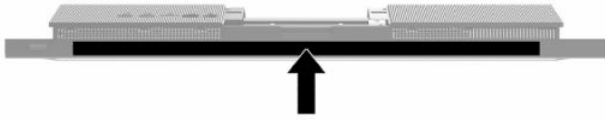


Table 1-9 Special keys

| Special keys | |
|--------------|--------------|
| (1) | Sleep |
| (2) | Fast reverse |
| (3) | Play/Pause |
| (4) | Stop |
| (5) | Fast forward |
| (6) | Mute |
| (7) | Volume down |
| (8) | Volume up |
| (9) | Function |

Locating the serial number and product number

The serial number and product number are located on a label on the bottom edge of the bezel. You may need these numbers when contacting HP about the computer model.



2 Setup

Overview

Set up the computer in the following order:

- Attach a stand. See [Attaching and removing a stand on page 9](#).
–Or–
Attach the computer to a mounting fixture. See [Attaching the computer to a mounting fixture on page 12](#).
- Connect the cables for peripherals and power. See [Connecting and disconnecting cables on page 13](#).
- Connect an additional display, if desired. See [Connecting a monitor on page 13](#).
- Install and secure the rear port cover. See [Installing the rear cover on page 23](#).
- Select a comfortable computer position and viewing angle. See [Adjusting the computer on page 14](#).
- Install a security cable for security. See [Installing a security cable on page 16](#).
- Turn on the power. See [Connecting power on page 16](#).
- The mouse and keyboard are synchronized at the factory. Should you ever need to synchronize the mouse and keyboard again, see [Synchronizing the optional wireless keyboard and mouse on page 18](#).

Attaching and removing a stand

Two stands are available for the computer:

- Fixed-height stand
- Adjustable-height stand

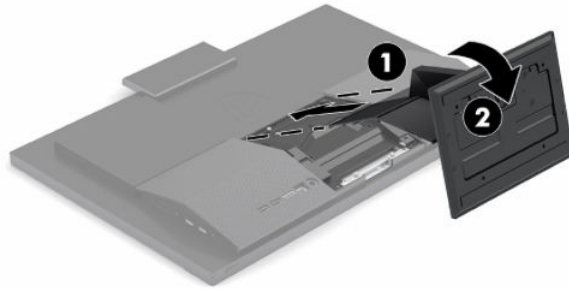
Attaching and removing a fixed-height stand

Attaching a fixed-height stand

To install the stand:

1. Place the computer facedown on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
2. Engage the hooks in the top of the stand (1) in the two large holes in the upper part of the back of the computer.

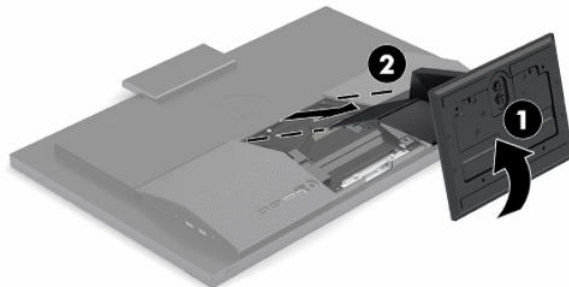
3. Rotate the stand (2) down until it clicks into place.



Removing a fixed-height stand

To remove the stand:

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system. Then turn off any external devices.
3. Disconnect the power cord from the AC outlet, and then disconnect any external devices.
4. Place the computer facedown on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
5. Press the stand release latch.
6. Rotate the stand (1) away from the computer.
7. Slide the stand hooks (2) out of the computer.



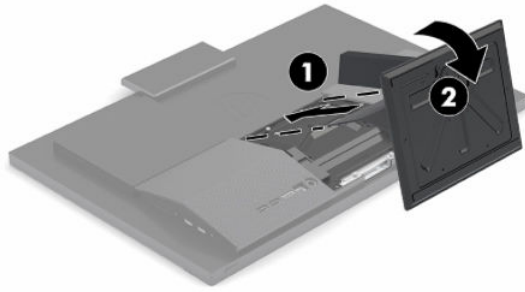
Attaching and removing an adjustable-height stand

Attaching an adjustable height stand

To install the stand:

1. Place the computer facedown on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
2. Engage the hooks in the top of the stand in the two large holes in the upper part of the back of the computer (1).

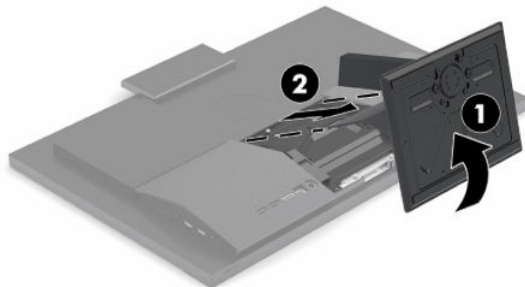
3. Rotate the stand down (2) until it clicks into place.



Removing an adjustable height stand

To remove the stand:

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system. Then turn off any external devices.
3. Disconnect the power cord from the AC outlet, and then disconnect any external devices.
4. Place the computer facedown on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
5. Press the stand release latch.
6. Rotate the stand (1) away from the computer.
7. Slide the stand hooks (2) out of the computer.



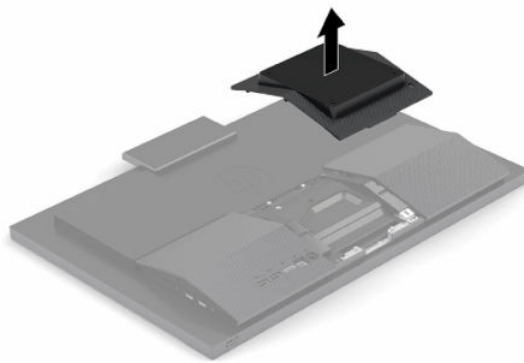
Attaching the computer to a mounting fixture

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

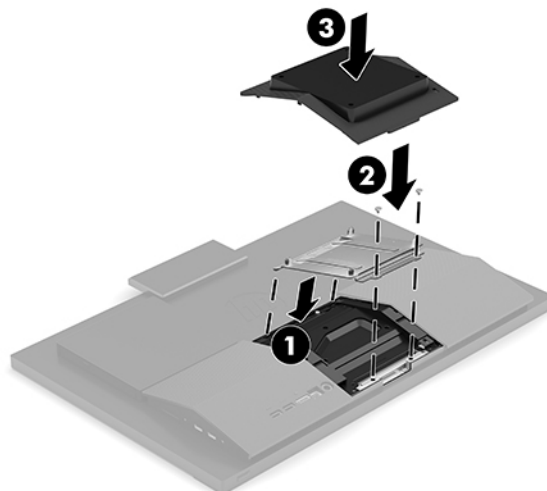
IMPORTANT: This computer supports the VESA industry standard 100 mm mounting holes. To attach a third-party mounting solution to the computer, four 4 mm, 0.7 pitch, 20-mm long screws are required. These screws are supplied with the computer. Longer screws must not be used because they may damage the computer. 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.

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

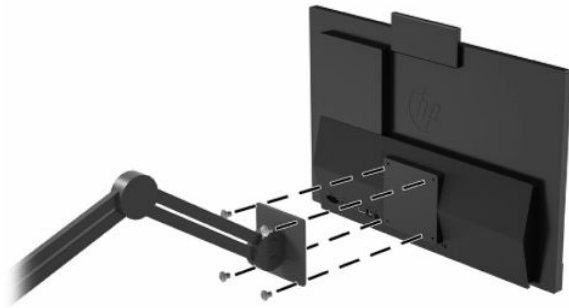
1. Remove the VESA trim plate from the rear of the computer.



2. Insert the VESA mount bracket into the two large holes in the upper part of the back of the computer (1), and then rotate it down.
3. Secure the VESA mount bracket with two screws (2).
4. Press the supplied VESA trim plate onto the VESA opening until it snaps into place (3).



5. To attach the computer to a swing arm (sold separately), insert the four 20 mm screws that are supplied with the computer through the holes on the swing arm plate and into the mounting holes on 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.

Connecting and disconnecting cables

Connecting cables

1. Connect the peripheral cables to the appropriate ports.
2. Connect the power cord to the power connector on the rear of the computer.

Connecting a monitor

The ports on the rear of the computer allow you to connect up to two monitors to the computer.

If you are adding a monitor that has a DisplayPort connector, no video adapter is required. If you are adding a monitor that does not have a DisplayPort connector, you can purchase a video adaptor from HP for your configuration.

DisplayPort adapters and video cables are purchased separately. HP offers the following adapters:

- DisplayPort-to-VGA adapter
- DisplayPort-to-DVI adapter

To connect a monitor:

1. Turn off power to the computer and to the monitor that you are connecting to the computer.
2. If your monitor has a DisplayPort connector, connect a DisplayPort cable directly between the DisplayPort connector on the rear of the computer and the DisplayPort connector on the monitor.
3. If your monitor does not have a DisplayPort connector, connect a DisplayPort video adapter to the DisplayPort connector on the computer. Then connect a cable (VGA or DVI, depending on your application) between the adapter and the monitor.
4. Turn on power to the computer and the monitor.

 **NOTE:** Use the graphics card software or the Windows Display Settings to configure the monitor as a mirrored image of the computer display or an extension of the computer display.

Disconnecting cables

1. You may need to remove the security cable, if one is installed on the rear of the computer.
2. Disconnect the cables from the ports.

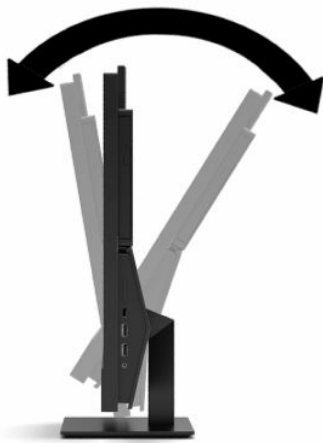
Adjusting the computer

This computer may ship with a fixed-height stand or an adjustable height stand.

Adjusting a fixed-height stand

This stand allows you to tilt the computer from -5° to 20° from the desktop.

To tilt the computer, grasp both top and bottom of the computer and adjust to the appropriate tilt.



Adjusting an adjustable-height stand

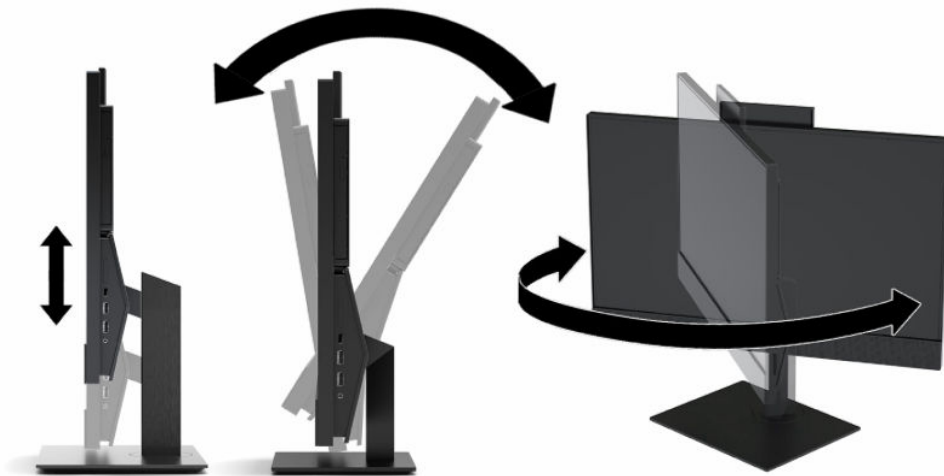
This stand allows you to:

- Adjust the computer height within a range of 110 mm (4.3 in).
- Tilt the computer from -5° to 20° from the desktop.
- Swivel the computer up to 45° to either side.

To change the height of the computer, grasp both sides of the computer and lift or lower to the appropriate height.

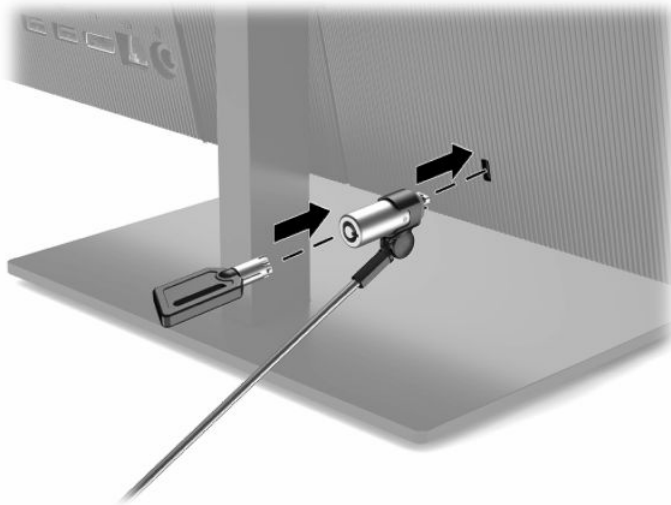
To tilt the computer, grasp the top and bottom of the computer and adjust to the appropriate tilt.

To swivel the computer, grasp both sides of the computer and swivel left or right.



Installing a security cable

A security cable is a key lock device that has a wire cable attached. You attach one end of the cable to your desk (or other stationary object) and the other end of the cable to the security cable slot on the computer. Secure the security cable lock with the key.

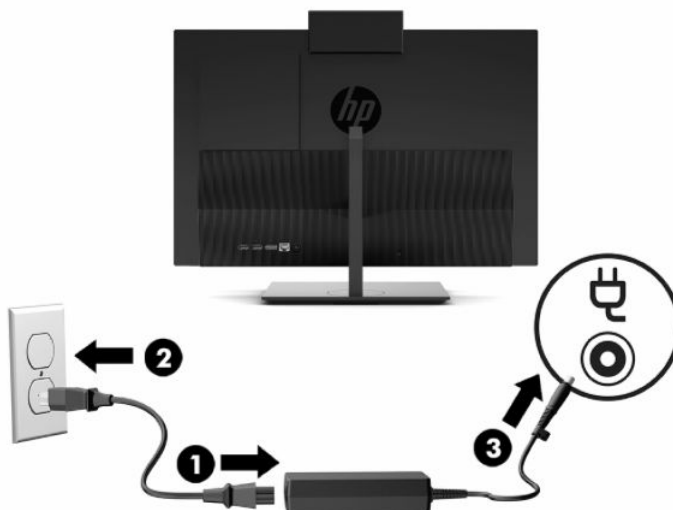


IMPORTANT: Use caution when adjusting the tilt, swivel, or height of the computer if a security cable is installed. The cable or the lock may interfere with the adjustment.

Connecting and disconnecting power

Connecting power

1. Connect one end of the power cord to the AC adapter (1) and the other end to a grounded AC outlet (2), and then connect the AC adapter to the computer (3).



2. Press the power button on the computer to turn it on.

Disconnecting power

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

Webcam

With Skype® for Business installed, you can use the webcam in the following ways:

- Stream online video conferences
- Maintain security over conversations

Webcam operation

- ▲ On the HP ProOne 600 21.5-inch or HP ProOne 400 23.8-inch computer, raise the webcam to unlock it.
– or –
On the HP ProOne 400 20-inch, slide the webcam shutter to the right to open the webcam.
- ▲ On the HP ProOne 600 21.5-inch or HP ProOne 400 23.8-inch computer, press the webcam down until it locks to close it.
– or –
On the HP ProOne 400 20-inch, slide the webcam shutter to the left to close the webcam.

Setting up Windows Hello

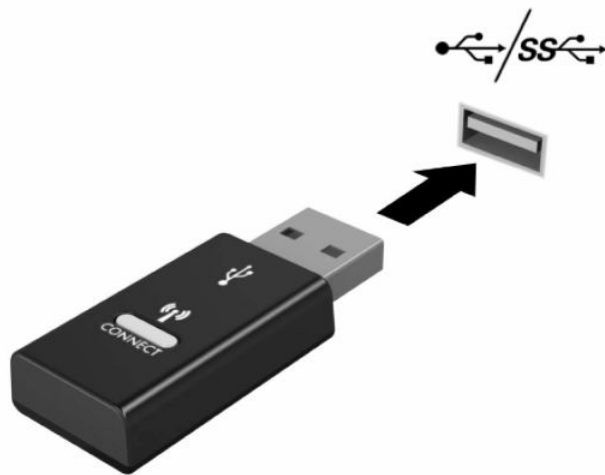
If the Windows® 10 operating system is installed on your computer, follow these steps to set up Windows Hello facial recognition:

1. Select the **Start** button, select **Settings**, select **Accounts**, and then select **Sign-in options**.
2. Under **Windows Hello**, follow the on-screen instructions to add both a password and a 4-digit PIN. Then enroll your fingerprint or facial ID.

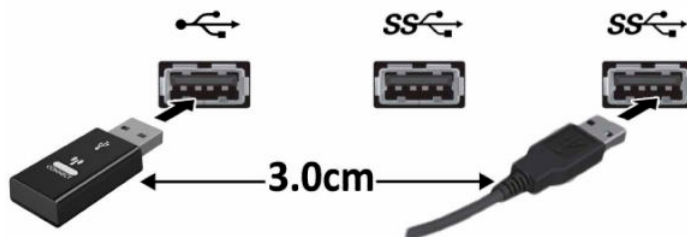
Synchronizing the optional wireless keyboard and mouse

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, follow this procedure to manually re-synchronize the pair.

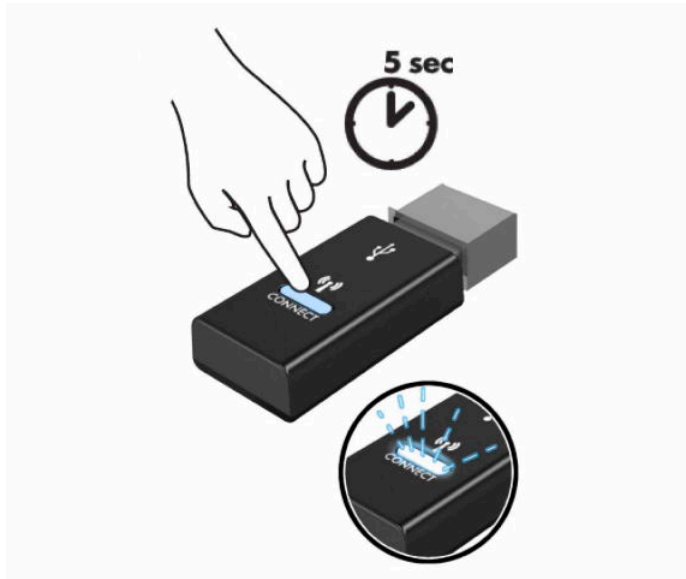
1. Connect the receiver to a USB port on the computer. If your computer only has USB SuperSpeed ports, connect the receiver to a USB SuperSpeed port.



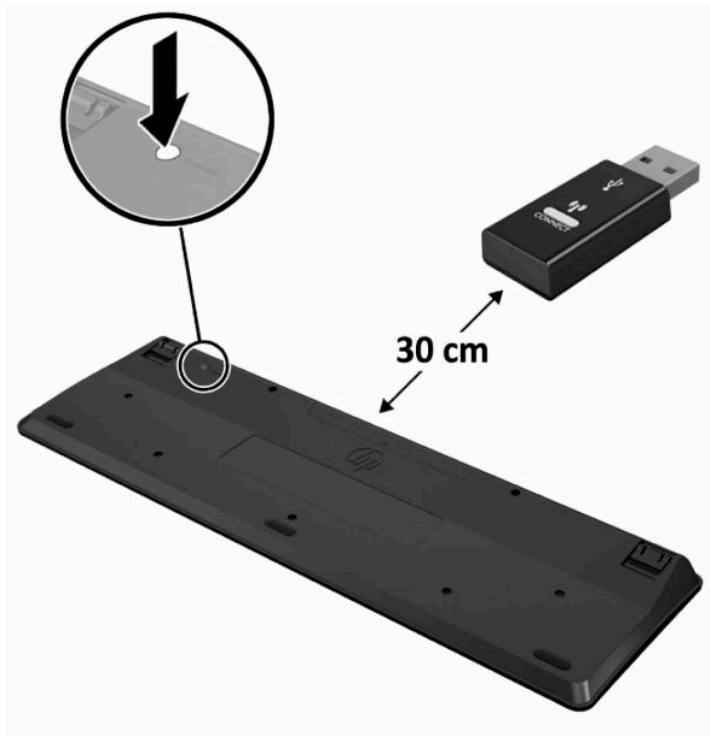
2. To avoid signal interference with a USB SuperSpeed device, distance the receiver at least 3.0 cm from the USB SuperSpeed device.



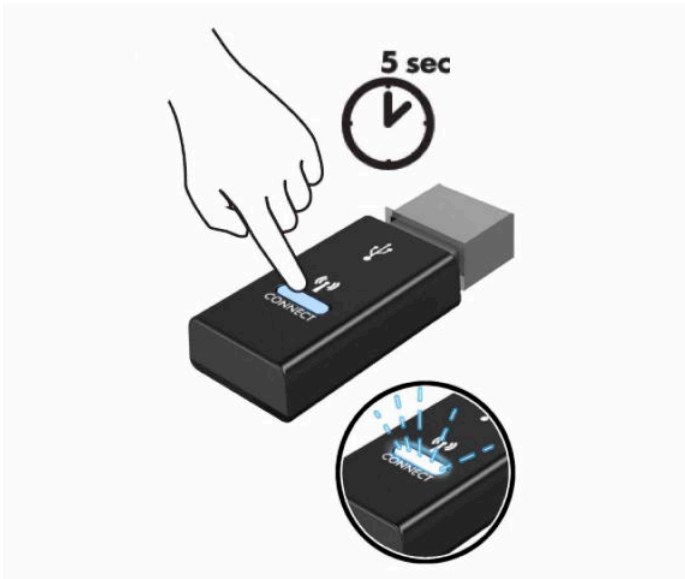
3. Press the Connect button on the receiver for approximately five seconds. The status light on the receiver will flash for approximately 30 seconds after the Connect button is pressed.



4. While the status light on the receiver is flashing, press the Connect button on the underside of the keyboard for five to ten seconds. After the Connect button is released, the status light on the receiver will stop flashing, indicating that the devices have been synchronized.




5. Press the Connect button on the receiver for approximately five seconds. The status light on the receiver will flash for approximately 30 seconds after the Connect button is pressed.



6. While the status light on the receiver is flashing, press the Connect button on the underside of the mouse for five to ten seconds. After the Connect button is released, the status light on the receiver will stop flashing, indicating that the devices have been synchronized.



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

3 Hardware repair and upgrade

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 before removing the enclosure. Energized parts are inside.

Allow the internal system components to cool before you touch them.

Replace and secure the enclosure before restoring power to the equipment.


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 into a grounded (earthed) AC outlet that is easily accessible at all times.

For your safety, do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the AC outlet, grasp the cord by the plug.

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


 **IMPORTANT:** 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 30](#) 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.

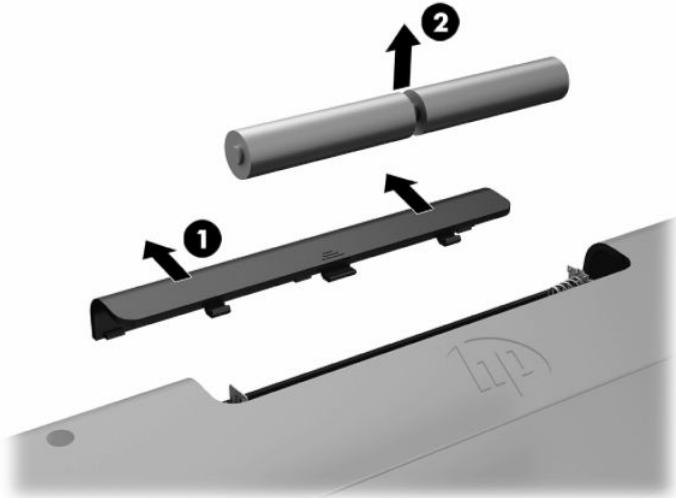
Additional information

For more information on removing and replacing hardware components, the Computer Setup utility, and troubleshooting, see the *Maintenance and Service Guide* (available in English only) for your computer model at <http://www.hp.com>.

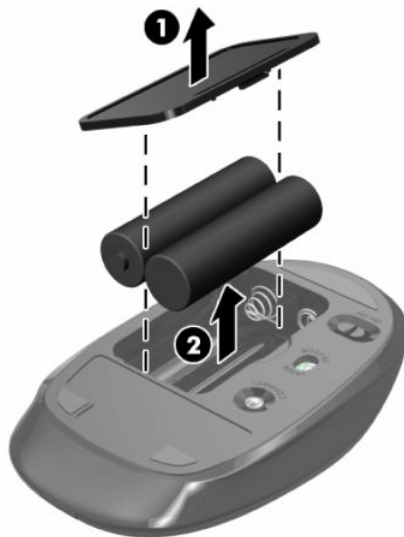
Removing batteries from the optional wireless keyboard or mouse

 **NOTE:** The wireless keyboard and mouse are optional components.

To remove batteries from the wireless keyboard, remove the battery door on the underside of the keyboard (1) and lift the batteries out of the battery compartment (2).



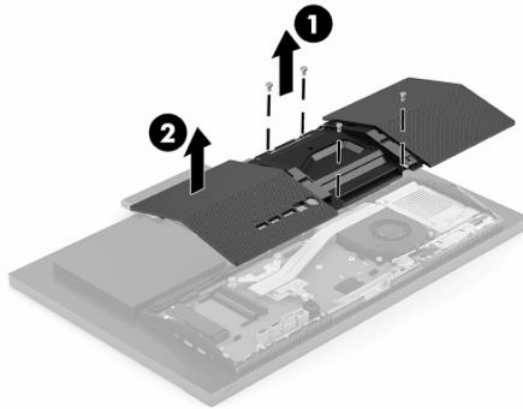
To remove batteries from the wireless mouse, remove the battery door on the underside of the mouse (1) and lift the batteries out of the battery compartment (2).



Removing and installing the rear cover

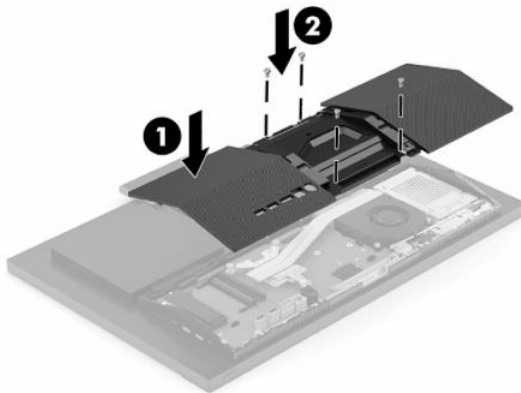
Removing the rear cover

1. Place the computer facedown on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
2. Remove the four screws securing the back cover (1), and then lift the back cover from any cavity to remove it from the computer (2).



Installing the rear cover

Align the rear cover with the computer, press all tabs on the panel into place (1), and then secure it with the four screws (2) used to remove it.



Locating internal components

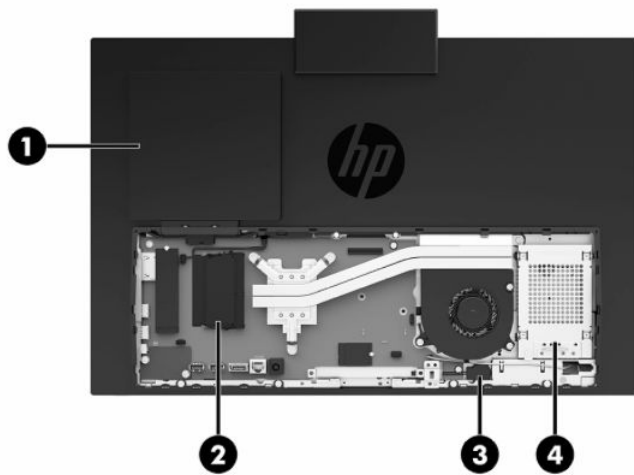


Table 3-1 Internal components

| Internal components | | | |
|---------------------|-------------------------------|-----|-------------|
| (1) | Optical disc drive (optional) | (3) | RTC battery |
| (2) | Memory modules | (4) | Hard drive |

Removing and installing memory

The memory slots on the system board can be populated with up to two industry-standard small outline dual inline memory modules (SODIMMs). These memory slots are populated with at least one preinstalled memory module. A metal shield protects the memory modules.

Memory module specifications

For proper system operation, the memory modules must meet the following qualifications:

Table 3-2 Memory specifications

| Component | Specification |
|-----------------------|---|
| Memory modules | 1.2 volt DDR4-SDRAM memory modules |
| Compliance | Unbuffered non-ECC DDR4-2666 MHz SODIMM compliant |
| Pins | Industry-standard 260 pins containing the mandatory Joint Electronic Device Engineering Council (JEDEC) specification |
| Support | Support CAS latency 19 DDR4 2666 MHz (19-19-19 timing) |
| Slots | 2 |
| Maximum memory | 16 GB per memory slot, 32 GB total |
| Supported | 8 Gbit (base) non-ECC memory technologies single-sided and double-sided SODIMMs |
| Note | The system will not operate properly if you install unsupported SODIMM memory. SODIMMs constructed with ×8 and ×16 DDR devices are supported; memory modules constructed with ×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

Refer to the following table to identify the memory module channel locations.

Table 3-3 Memory module slots

| Location | System board label | Channel |
|------------|--------------------|-----------|
| Lower slot | SODIMM1 | Channel B |
| Upper slot | SODIMM3 | Channel A |

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 memory modules


There are two memory slots on the system board. To remove or install memory modules:

1. To locate the memory modules on the system board, see [Locating internal components on page 24](#).
2. To remove a memory module, press outward on the two latches (1) on each side of the memory module, then pull the memory module (2) out of the slot.



3. Slide the new memory module into the slot (1) at approximately a 30° angle, then press the memory module down so that the latches (2) 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 slot.

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

Replacing the RTC 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.

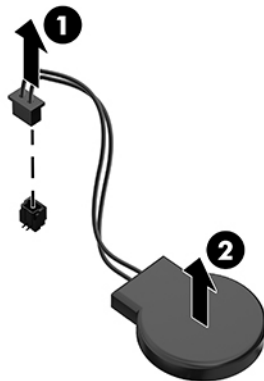
📝 IMPORTANT: Before replacing the battery, it is important to back up the computer CMOS settings. When the battery is removed or replaced, the CMOS settings will be cleared.

📝 NOTE: The lifetime of the lithium battery can be extended by plugging the computer into a live AC outlet. 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>.

To locate the battery on the system board, see [Locating internal components on page 24](#).

1. To release the battery, disconnect the battery cable (1), and then lift the battery from the computer (2).



2. To insert the new battery, connect the battery cable, and then press the battery into the computer.
3. Turn on the computer.
4. Reset the date and time, your passwords, and any special system setups using Computer Setup.

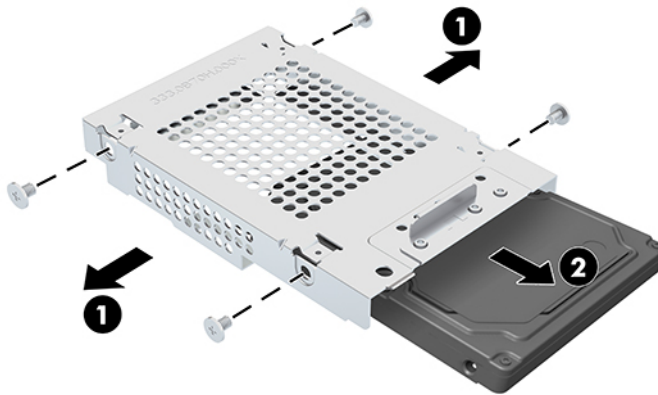
Replacing drives

Replacing a hard drive

The 2.5-inch primary hard drive is installed on the right side of the computer. To locate the hard drive on the system board, see [Locating internal components on page 24](#).

Removing a hard drive

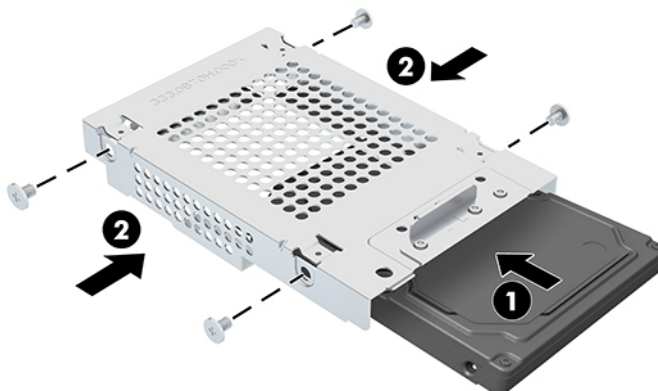
1. Remove the screw securing the hard drive to the computer.
2. Slide the hard drive away the edge of the computer and lift the hard drive out of the computer.
3. Disconnect the power and data cables from the hard drive. There is a tab you can pull to disconnect these cables.
4. Remove the four mounting screws from the 2.5-inch hard drive cage (1). Be sure to keep the screws to use to install a replacement drive. Remove the hard drive (2).



For instructions on installing a hard drive, see [Installing a 2.5-inch hard drive on page 28](#).

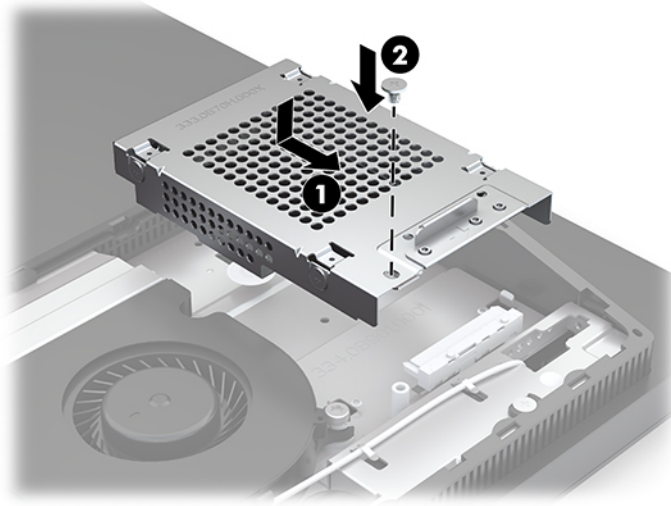
Installing a 2.5-inch hard drive

1. Insert the hard drive into the drive cage (1) and fasten four mounting screws onto the new 2.5-inch hard drive (2).



2. Position the hard drive above the drive cage with the connectors facing the power and data cables.


3. Connect the power and data cables to the hard drive.
4. Align the hard drive and slide it toward the edge of the computer (1) until the hard drive snaps into place, and then secure it with a screw (2).

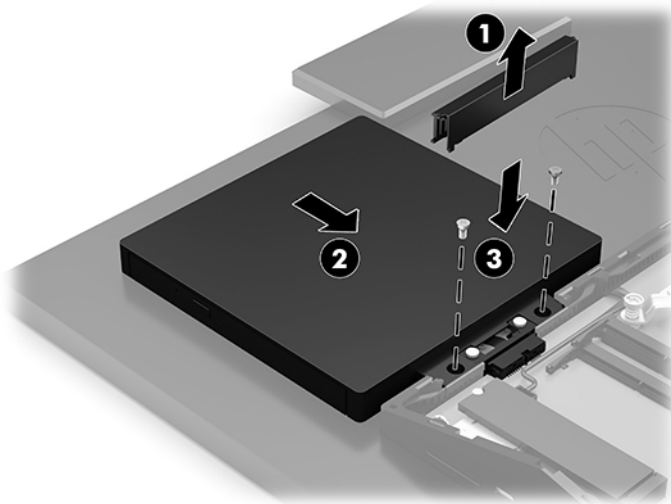


Installing the optical disc drive

The optical disc drive is located above the system components. To locate the optical disc drive on the system board, see [Locating internal components on page 24](#).

- ▲ Remove the blank covering the optical disc drive connector (1) and slide the optical disc drive enclosure into place (2). Optionally, secure it with two screws for stability (3).

 **NOTE:** The optical disc drive can be installed in only one way.



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

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 in) 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 any of the access panels or any of the expansion card slot covers removed.
- Do not stack computers or place computers so near each other that they are subject to each other's recirculated 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 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 any 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.
 - Wipe the screen with a soft, clean antistatic cloth. For more difficult cleaning situations, use a 50/50 mix of water and Isopropyl alcohol. Spray the cleaner onto a cloth and use the damp cloth to gently wipe the screen surface. Never spray the cleaner directly on the screen surface. It may run behind the bezel and damage the electronics.
 - 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.
- Do not use cleaners that contain any petroleum based materials such as benzene, thinner, or any volatile substance to clean the screen or cabinet. These chemicals may damage the computer.

Optical disc drive precautions

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

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



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

Shipping preparation

Follow these suggestions when preparing to ship the computer:

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



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

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

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 34](#).

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 39](#).

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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