Hardware Reference Guide

SUMMARY

This guide provides information about components, network connection, power management, security, backing up, and more.

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Product Notice

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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 is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com. **If your product ships with Windows in S Mode:** Windows in S Mode works exclusively with apps from the Microsoft Store within Windows. Certain default settings, features, and apps cannot be changed. Some accessories and apps that are compatible with Windows may not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance may vary, even if you switch out of S Mode. If you switch to Windows, you cannot switch back to S Mode. Learn more at Windows.com/SmodeFAQ.

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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 using and upgrading this product.

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 Computer features

This chapter provides you with an overview of your computer's features.

Front panel components

To identify the front panel components, use this illustration and table.

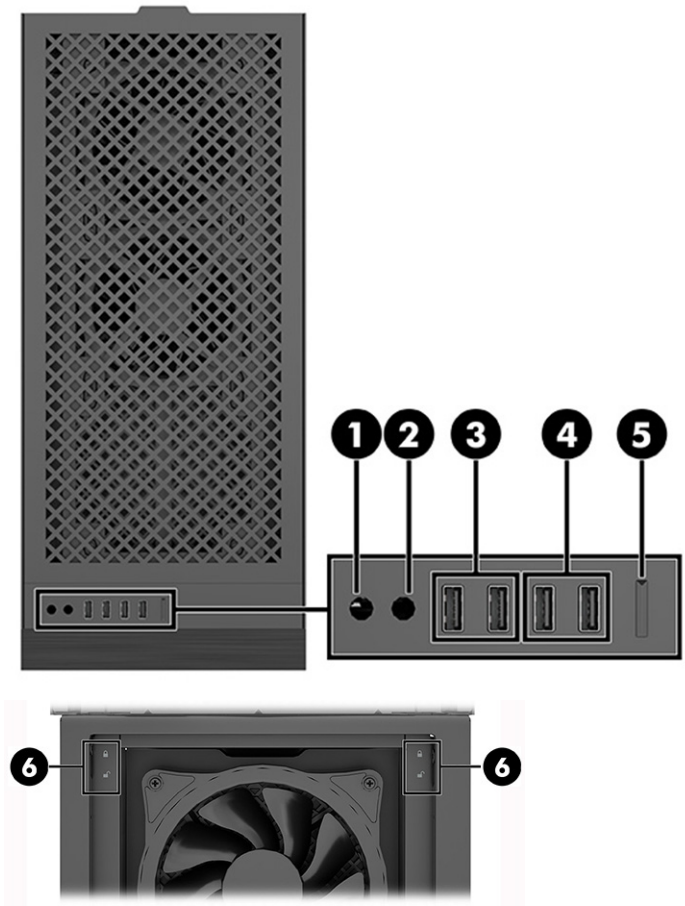


Table 1-1 Identifying the front panel components

Front panel components					
1		Audio-out (headphone jack)	4		USB ports (2)
2		Audio-in (microphone) jack	5		Power button
3	SS	USB SuperSpeed 5 Gbps ports (2)	6		Side cover locks (2)

2 Hardware setup

This chapter provides removal and replacement procedures for commonly replaced parts.

Warnings and cautions

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

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

- Unplug the power cord from the AC outlet and allow the internal system components to cool before you touch them.
- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and provides guidelines for posture and work habits that increase your comfort and decrease your risk of injury. It also provides electrical and mechanical safety information. The Safety & Comfort Guide is located on the HP website at http://www.hp.com/ergo.

⚠ **WARNING!** The inside of the computer includes electric and moving parts.

Disconnect power to the equipment before removing the access panel.

Replace and secure the access panel before re-energizing the equipment.

IMPORTANT: Static electricity can damage the electrical components of the computer or optional equipment. Before beginning the following procedures, be sure that you are discharged of static electricity by briefly touching a grounded metal object. See Electrostatic discharge on page 33 on page 37 for more information.

Preparation for disassembly

Use this information to properly prepare to disassemble and reassemble the computer.

1. Remove all removable media, such as a USB flash drive, from the computer.
2. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

IMPORTANT: Turn off the computer before disconnecting any cables.

Regardless of the power state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. In some systems, the cooling fan is on even when the computer is in the Standby or Suspend modes. Always disconnect the power cord before servicing a unit.

3. Unplug the power cord from the AC outlet and disconnect any external devices.

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

CAUTION: Beware of sharp edges inside the chassis.

NOTE: During disassembly, label each cable as you remove it, and note its position and routing. Keep all screws with the removed components.

Parts

Use this list to identify the parts included with the computer.

- Lighting control module (4x RGB support, 3x aRGB support)
- RGB lighting strip
- ARGB fans in front (optional) (3)
- 120 mm rear system fan
- Removable 360 mm front dust filter
- Magnetic 120 mm power supply dust filter
- 2.5 inch SATA solid-state drive trays (2)
- 3.5 inch SATA hard drive trays (2)
- Rubber grommets for cable routing
- Cable clamps and hooks for cable routing
- Extend cables for front fan (models with ARGB fans) (3)
- 20 screws (models without ARGB fans) or 16 screws (models with ARGB fans)

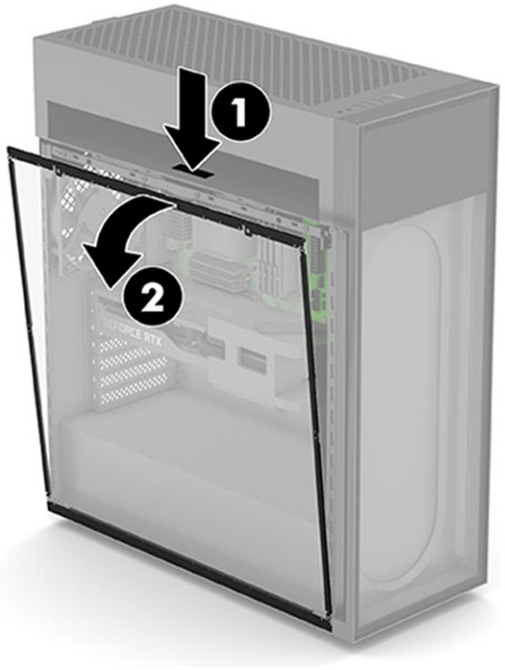
Glass access panel

To remove and install the glass access panel, use these procedures and illustrations.

NOTE: On select products, the glass access panel might be locked to meet safety regulations. If the access panel is locked, move the lock screw to the unlock position before opening the access panel. After replacing the glass access panel, be sure to move the lock screw to the lock position. For more information about lock screw location, see Front panel components on page 1.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. To remove the glass access panel:
   a. Press the release button **(1)**.

b. After the top of the panel rotates outward **(2)**, pull it up to remove it.



3. To install the glass access panel:

   a. Insert the bottom of the panel into the groove in the bottom of the computer **(1)**.

   b. Rotate the top of the panel until it clicks into place onto the computer **(2)**.



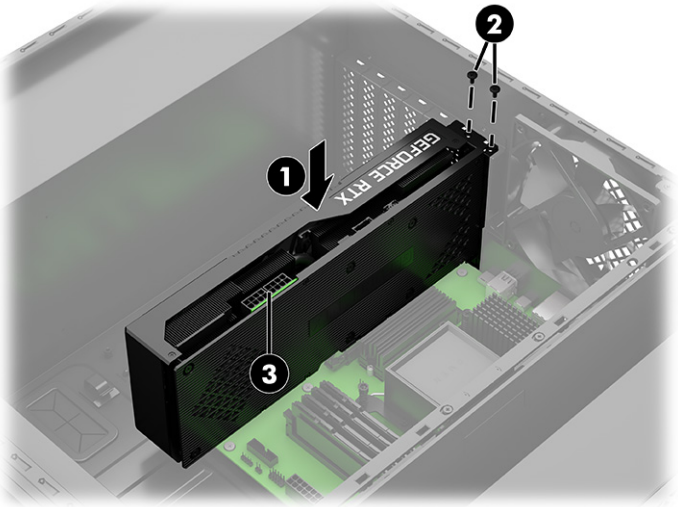
Graphics card

To install a graphics card, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the glass access panel (see Glass access panel on page 3).
3. Position the computer with the system board facing upward.
4. Insert the graphics card into the slot until it clicks into place **(1)**.
5. Install the Phillips screws **(2)**.

NOTE: Screw quantity might vary depending on graphics card.

6. Connect the power cable to the connector on the graphics card **(3)**.

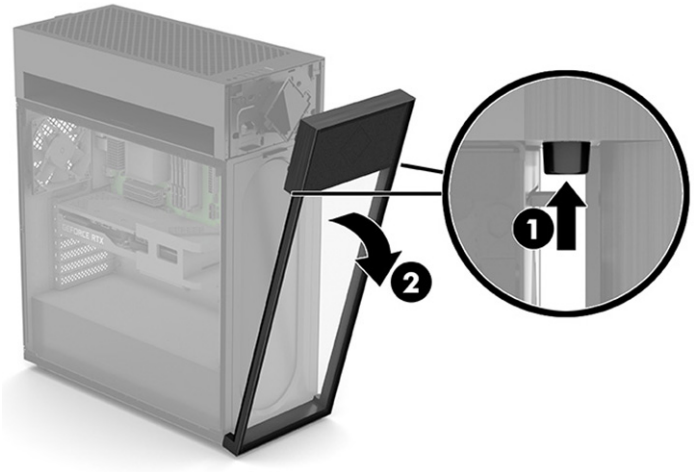


Front bezel

To remove and install the front bezel, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).

2. To remove the front bezel, press the two release buttons at the top of each side of the bezel **(1)**, and then rotate the top of the bezel away from the computer to remove it **(2)**.



3. To install the front bezel, insert the two tabs at the bottom of the bezel into the slots at the bottom of the computer **(1)**, and then rotate the top of the bezel onto the computer until it clicks into place **(2)**.



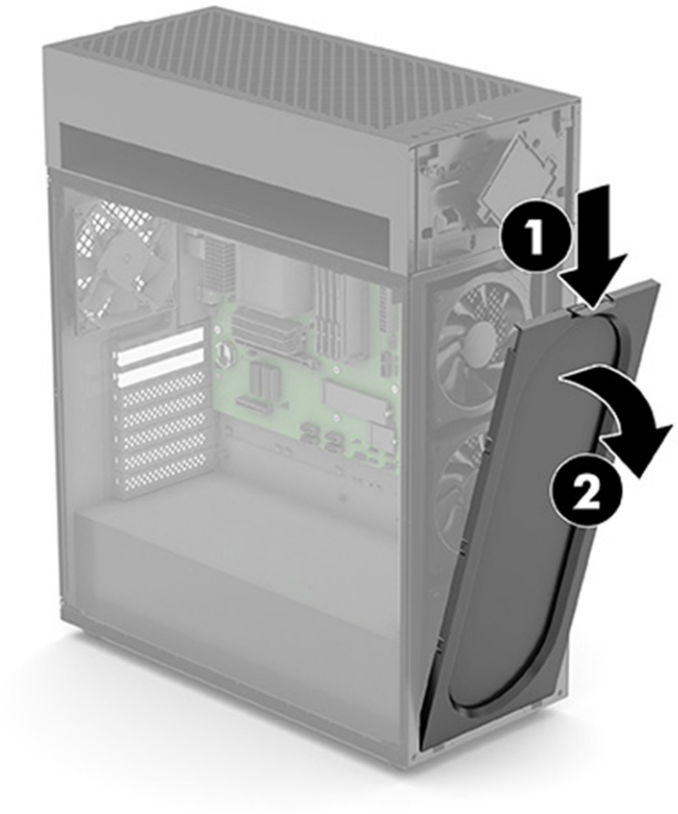
Dust filter

To remove and install the dust filter, use these procedures and illustrations.

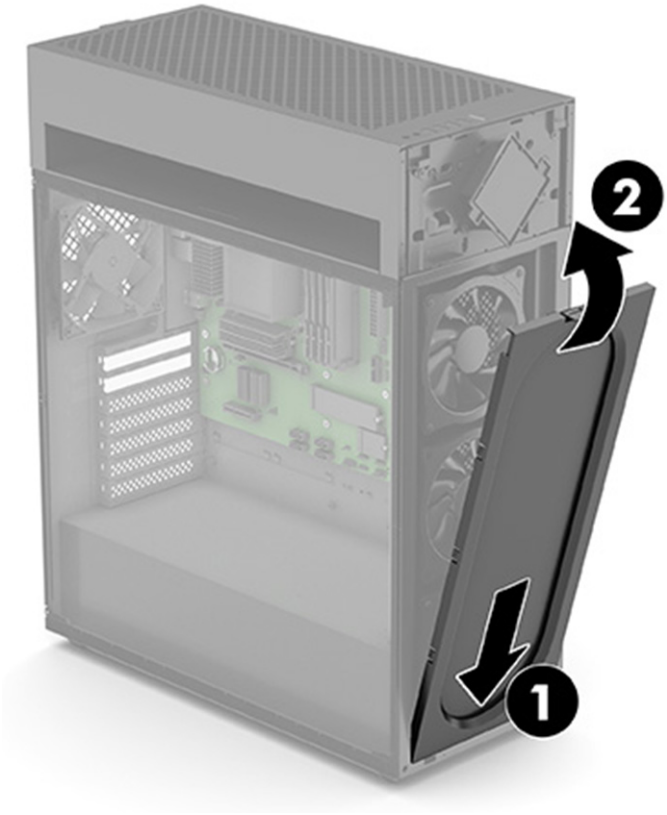
IMPORTANT: If your computer has a magnetic dust filter, be sure that the filter is installed. If the filter has been removed, install the filter before using the computer.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).

2. Remove the front bezel (see Front bezel on page 5).
3. To remove the dust filter, press the release tab at the top of the filter **(1)**, and then rotate the top of the filter away from the computer to remove it **(2)**.



4. To install the dust filter, insert the two tabs at the bottom of the filter into the slots at the bottom of the computer **(1)**, and then rotate the top of the filter onto the computer until it clicks into place **(2)**.



Right access panel

To remove and install the right access panel, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. To remove the panel on the right side:
   a. Press the release button **(1)**. The top of the panel rotates outward **(2)**.

b. Pull the panel up to remove it **(3)**.



3. To install the right access panel:

   a. Insert the bottom of the panel into the groove in the bottom of the computer **(1)**.

b. Rotate the top of the panel until it clicks into place onto the computer **(2)**.

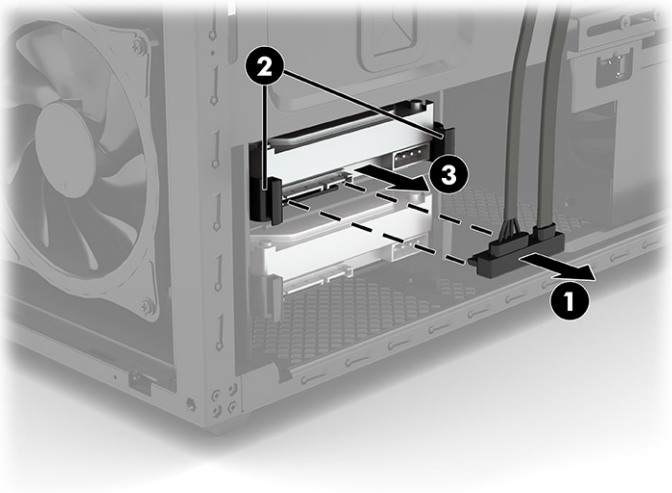


Hard drive

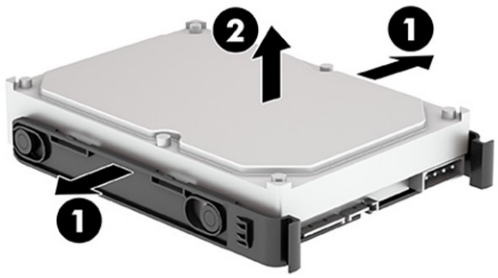
To remove and install the hard drive, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the right side access panel (see Right access panel on page 8).
3. To remove a hard drive:
   a. Disconnect the power and data cables from the rear of the hard drive **(1)**.

b. Squeeze the hard drive holder tabs **(2)**, and then pull the hard drive assembly out of the hard drive bay **(3)**.



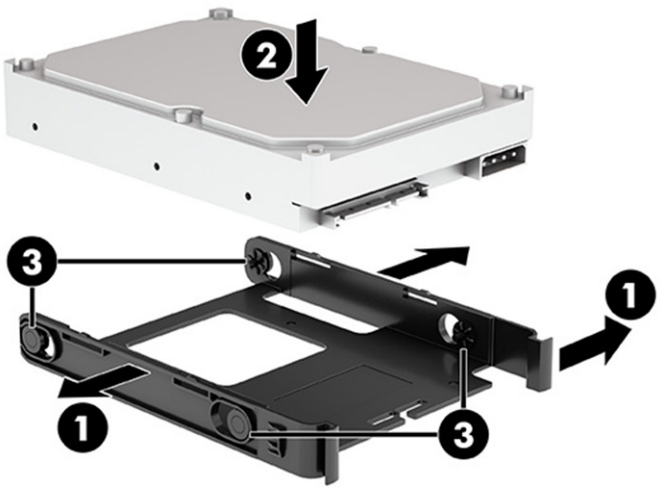
c. Flex the hard drive cover top and sides outward and away from the hard drive **(1)**, and then remove the hard drive from the cover **(2)**.



4. To install a hard drive:

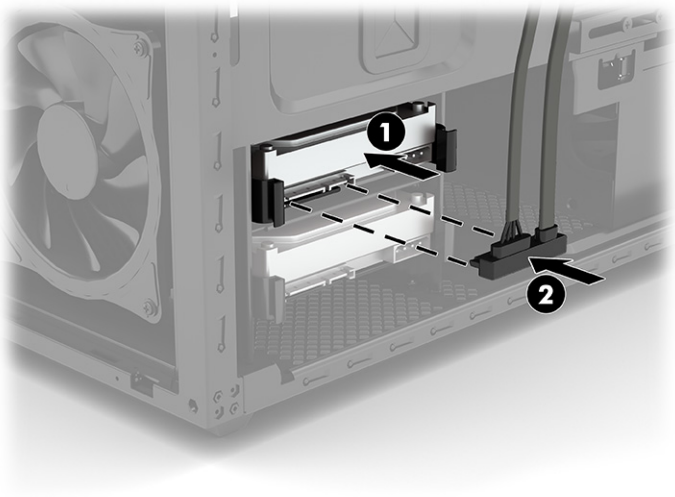
a. Flex the hard drive cover top and sides outward and away from the hard drive **(1)**, and then insert the hard drive into the cover **(2)**.

NOTE: Be sure that the four posts **(3)** on the inside of the cover are inserted into the holes on the sides of the hard drive.



b. Insert the hard drive assembly into the drive bay until in clicks in to place **(1)**.

c. Connect the power and data cables into the rear of the hard drive **(2)**.



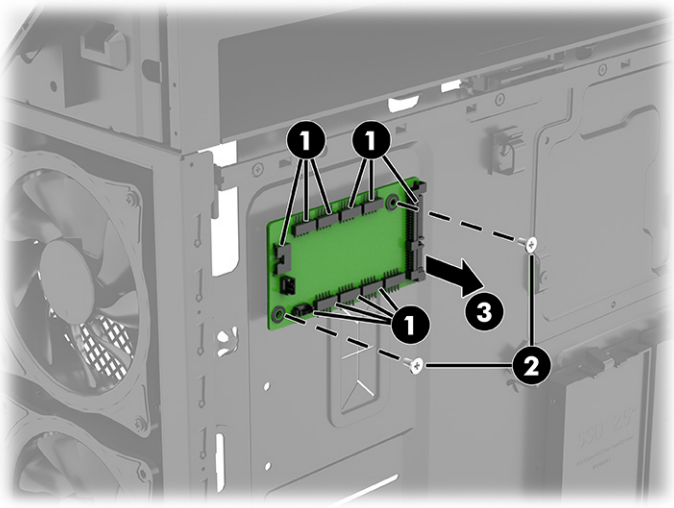
RGB board

To remove and install the RGB board, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the right side access panel (see Right access panel on page 8).
3. To remove the RGB board:
   a. Position the computer with the RGB board facing upward.
   b. Disconnect the cables from the RGB board **(1)**.
   c. Remove the two Phillips screws from the board **(2)**.

d. Remove the board from the computer **(3)**.

NOTE: Connector appearance can vary.

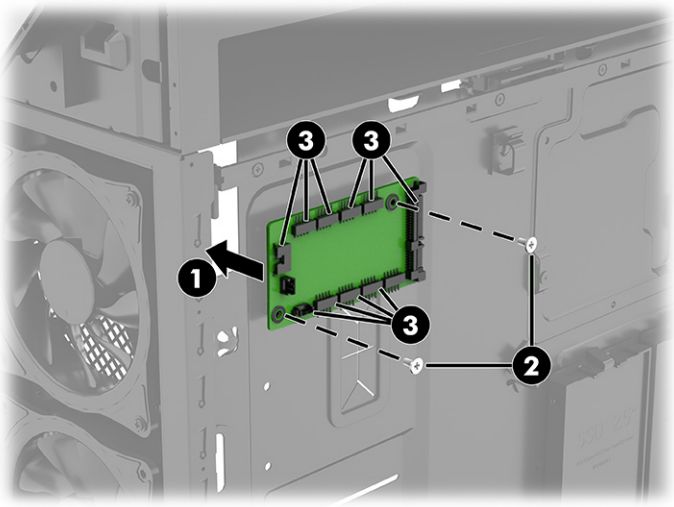


4. To install the RGB board:

a. Position the board in the computer **(1)**.

b. Install the two screws that secure the board to the computer **(2)**.

c. Connect the cables to RGB board **(3)**.



The following illustration and table defines the connectors on the RGB board:

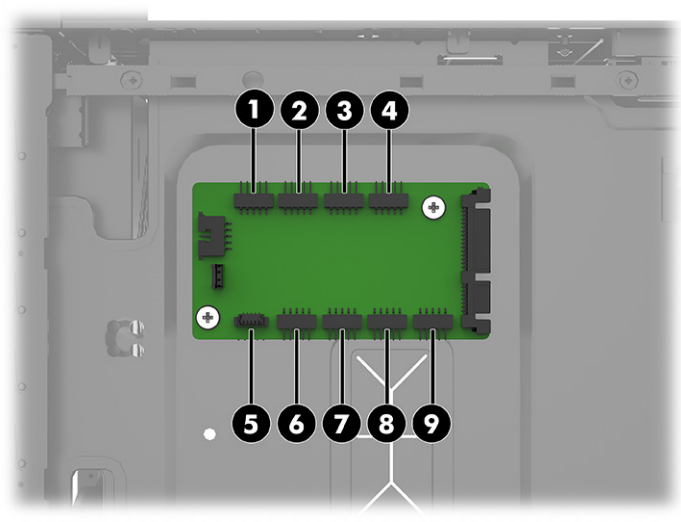


Table 2-1 RGB board connectors

Connector	
1. RGB pin headers reserved for self-configuration	6. RGB chassis light bar (12 V)
2. ARGB front fan 1 (5 V) (models with ARGB) -or- ARGB pint headers for self-configuration (models without ARGB)	7. RGB pin headers reserved for self-configuration
3. ARGB front fan 2 (5 V) (models with ARGB) -or- ARGB pint headers for self-configuration (models without ARGB)	8. RGB pin headers reserved for self-configuration
4. ARGB front fan 3 (5 V) (models with ARGB) -or- ARGB pint headers for self-configuration (models without ARGB)	9. RGB pin headers reserved for self-configuration
5. RGB logo (5 V)	

NOTE:

- A small triangle on the plug of each RGB/ARGB component identifies pin 1. A bracket mark on the RGB header 12 V pin indicates pin 1. The ARGB header is marked with 5 V next to pin 1.
- HP provides addressable lighting effects such as spiral for Addressable RGB (ARGB) front fan models. To be sure the addressable lighting effects are synchronized, use the same models of ARGB fans for installation in non-ARGB models.
- The OMEN Gaming Hub is upgradeable and compatible with system boards with standard USB pin headers. You can control up to seven zones using the OMEN Gaming Hub. The three RGB headers are in the same zone. Each ARGB header is its own zone.

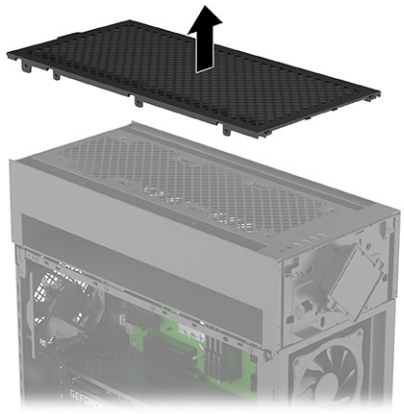
Table 2-2 **Front fan**

RGB board pin header	Factory configuration	OMEN gaming hub lighting zone
LOGO	OMEN logo	Chassis/1
Light bar	Chassis internal light strip	Chassis/2
FFAN ARGB1	None (non-ARGB models)	CUSTOM ARGB/1
	Bottom front ARGB fan (ARGB models)	
FFAN ARGB2	None (non-ARGB models)	CUSTOM ARGB/2
	Middle front ARGB fan (ARGB models)	
FFAN ARGB3	None (non-ARGB models)	CUSTOM ARGB/3
	Top front ARGB fan (ARGB models)	
CPU RGB	None	CUSTOM RGB/1
FFAN RGB (left)	None	CUSTOM RGB/2
FFAN RGB (middle)	None	CUSTOM RGB/2
FFAN RGB (right)	None	CUSTOM RGB/2

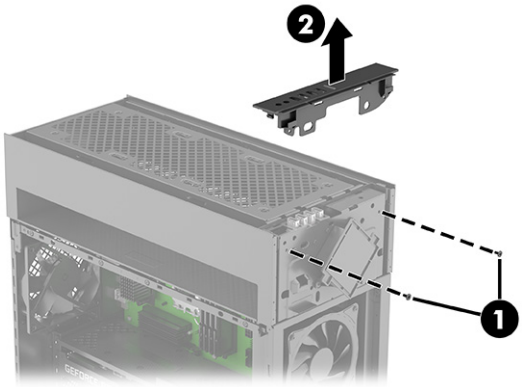
RGB logo module

To remove and install the RGB logo module, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the front bezel (see Front bezel on page 5).
3. Remove the dust filter (see Dust filter on page 6).
4. Remove the right side access panel (see Right access panel on page 8).
5. To remove the RGB logo module:
   a. Remove the top cover by lifting it straight up and off the computer.



b. Remove the top I/O bezel by removing the two Phillips screws **(1)**, and then lifting the top I/O bezel off the computer **(2)**.

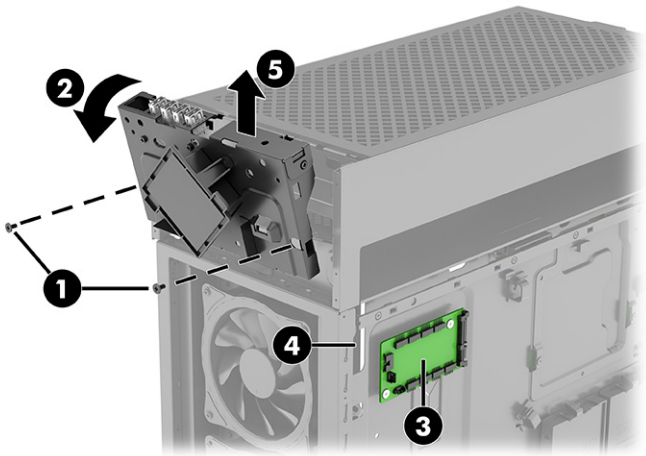


c. Remove the two Phillips screws that secure the RGB module to the computer **(1)**.

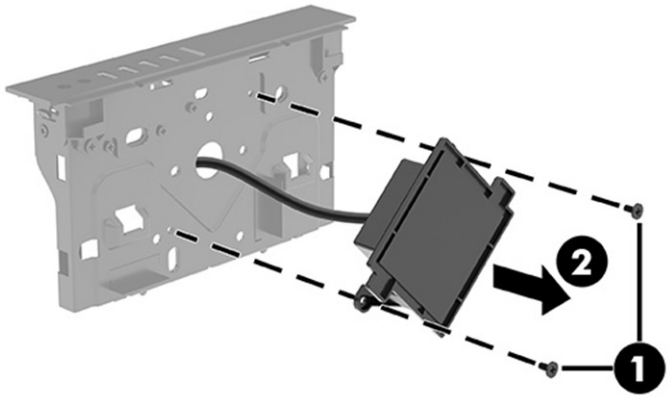
d. Rotate the top of the module downward **(2)**.

e. Disconnect the cable from the RGB board **(3)**.

f. Pull the cable through the hole in the computer chassis **(4)**, and then remove the module and cable **(5)**.

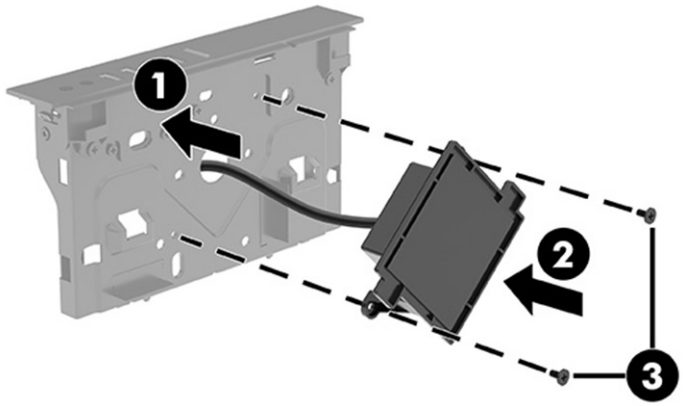


g. Remove the two screws that secure the module to the bracket **(1)**, and then lift the module off the bracket and pull the cable through the hole in the bracket **(2)**.



6. To install the RGB logo module:

a. Route the cable for the logo module through the hole in the bracket **(1)**. Position the module on the front of the bracket **(2)**, and then install the two Phillips screws **(3)** that secure the module to the bracket.



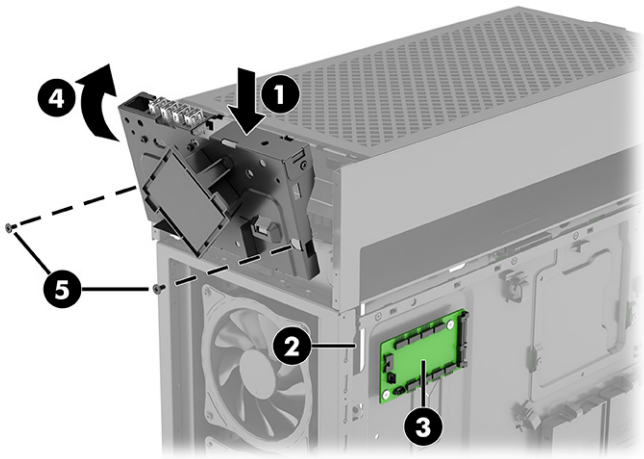
b. Position the module on the front of the computer with the top rotated outward **(1)**.

c. Route the cable through the hole in the computer chassis to the RGB board **(2)**.

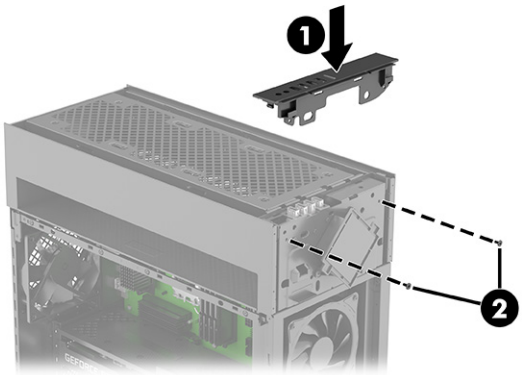
d. Connect the cable to the RGB board **(3)**. For RGB board connector designations, see the RGB board connectors cable in RGB board on page 12.

e. Rotate the top of the module upward and into place on the computer **(4)**.

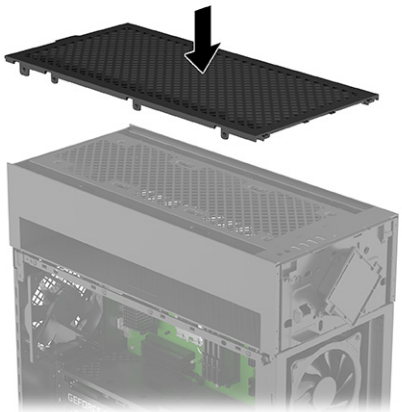
f. Install the two Phillips screws **(5)** that secure the module.



g. Install the top I/O bezel by positioning it on the top-front of the computer **(1)**, and then installing the two Phillips screws **(2)**.



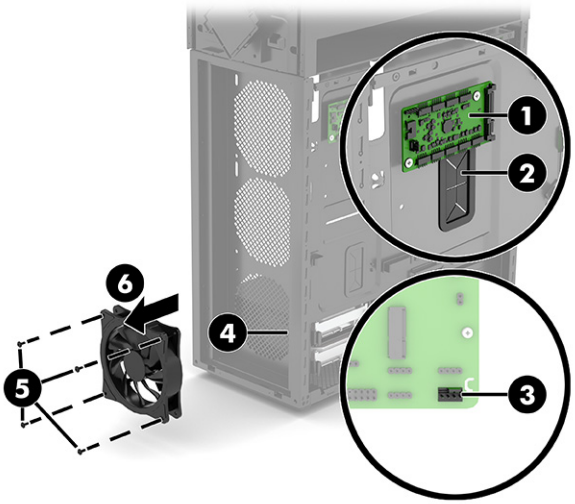
h. Install the top cover pressing it down on the top of the computer until it snaps into place.



Front RGB fans

To remove the front RGB fans, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the glass access panel (see Glass access panel on page 3).
3. Remove the right side access panel (see Right access panel on page 8).
4. Remove the front bezel (see Front bezel on page 5).
5. Remove the dust filter (see Dust filter on page 6).
6. To remove the front bottom RGB fan:
   a. Disconnect the cable from the RGB board on the right side of the computer **(1)**.
   b. Pull the cable through the hole where it routes to the fan on the front of the computer (under the front bezel) **(2)**.
   c. Disconnect the fan power cable from the system board **(3)** (under the glass access panel).
   d. Pull the power cable through the two holes in the side of the computer **(4)**. The power cable routes from the fan (under the front bezel), to the right side, and then to the system board (under the glass access panel).
   e. Remove the four screws from the outside-front (under the front bezel) that secure the fan to the front of the computer **(5)**.
   f. Remove the fan from the computer **(6)**.



7. To remove the front middle and top RGB fan:

NOTE: The procedure to remove the middle and top fans is the same. The fans connect to different connectors on the RGB board.

   a. Disconnect the cable from the RGB board on the right side of the computer **(1)**.

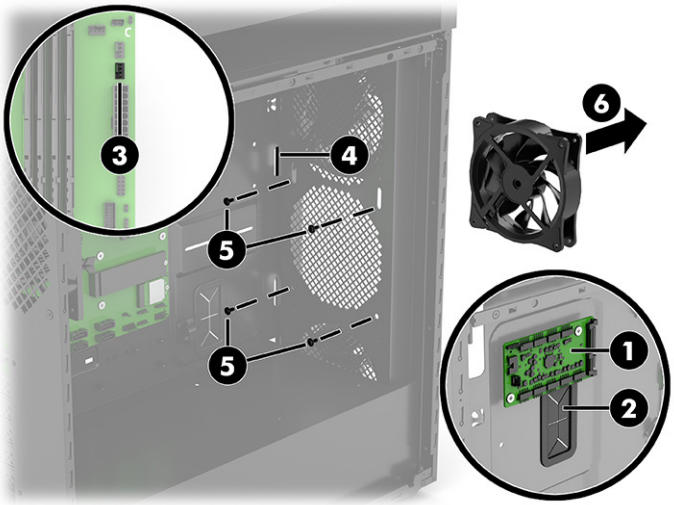
b. Pull the cable through the hole where it routes to the fan on the front of the computer (under the front bezel) **(2)**.

c. Disconnect the fan power cable from the system board **(3)** (under the glass access panel).

d. Pull the power cable through the two holes in the computer **(4)**. The power cable routes from the fan (under the front bezel), to the right side, and then to the system board (under the glass access panel).

e. From the inside-front of the computer, remove the four screws that secure the fan to the front of the computer **(5)**.

f. Remove the fan from the computer **(6)**.



8. To install the front bottom RGB fan:

a. Position the fan on the bottom of the computer **(1)** (under the front bezel).

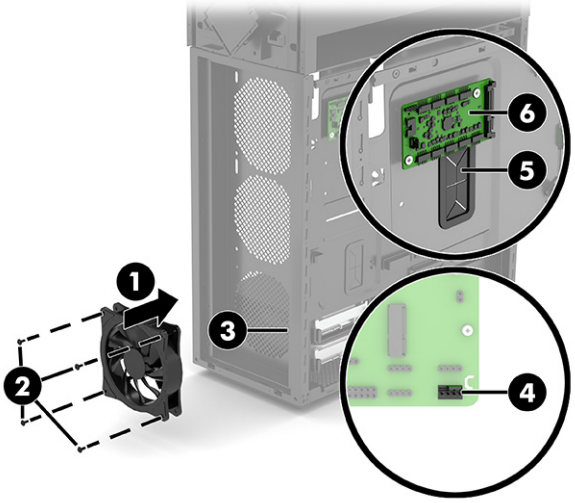
b. Install the four screws from the outside-front that secure the fan to the front of the computer **(2)**.

c. Route the power cable through the hole to the right side of the computer and then through the hole to the system board side (under the glass access panel) **(3)**.

d. Connect the fan power cable to the system board **(4)**.

e. Route the RGB cable through the hole to right side of the computer **(5)**.

f. Connect the cable to the RGB board **(6)**. For RGB board connector designations, see RGB board on page 12.



9. To install the middle and top RGB fans:

   a. Position the fan on the middle of the computer **(1)** (under the front bezel).

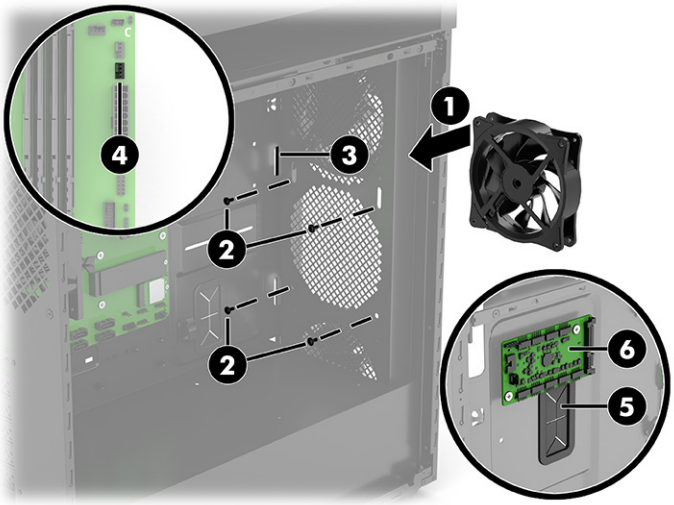
   b. From the inside-front of the computer, install the four screws that secure the fan to the front of the computer **(2)**.

   c. Route the power cable through the hole to the right side of the computer and then through the hole to the system board side (under the glass access panel) **(3)**.

   d. Connect the fan power cable to the system board **(4)**.

   e. Route the RGB cable through the hole to right side of the computer **(5)**.

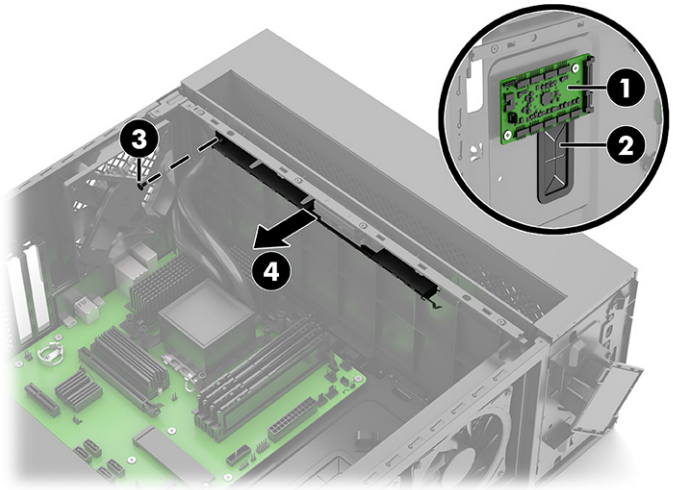
   f. Connect the cable to the RGB board **(6)**. For RGB board connector designations, see RGB board on page 12.



Internal light bar

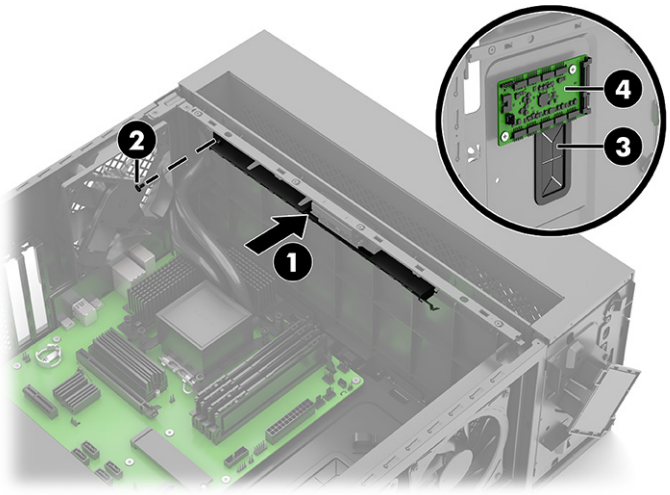
To remove and install the internal light bar, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the glass access panel (see Glass access panel on page 3).
3. Remove the right side access panel (see Right access panel on page 8).
4. To remove the internal light bar:
   a. Position the computer with the RGB board facing upward (under the right side access panel).
   b. Disconnect the cable from the RGB board **(1)**.
   c. Pull the cable through the hole to the system board side (under the glass access panel) of the computer **(2)**.
   d. Position the computer with the system board facing upward.
   e. Remove the Phillips screw from the light bar **(3)**, and then remove the bar and cable from the computer **(4)**.



5. To install the internal light bar:
   a. Position the computer with the system board facing upward (under the glass access panel).
   b. Position the light bar on the inside-top of the computer **(1)**, and then install the Phillips screw into the light bar **(2)**.
   c. Route the cable through the hole to the right side of the computer **(3)**.
   d. Position the computer with the RGB board facing upward (under the right side access panel).

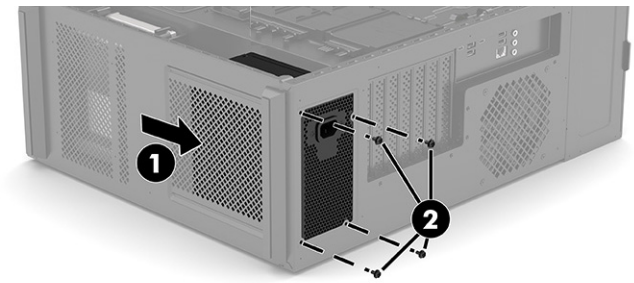
e. Connect the cable to the RGB board **(4)**. For RGB board connector designations, see RGB board on page 12.



Power supply

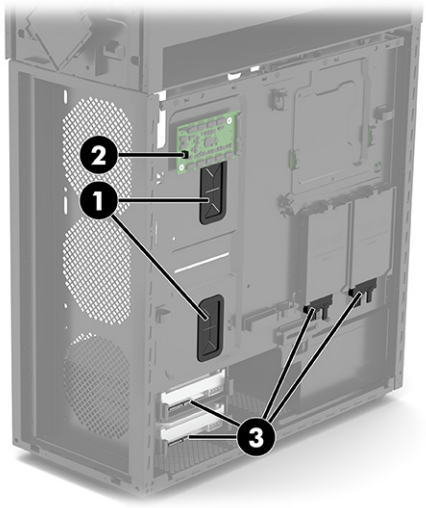
To install the power supply, use these procedures and illustrations.

1. Prepare the computer for disassembly (see Preparation for disassembly on page 2).
2. Remove the glass access panel (see Glass access panel on page 3).
3. Remove the right side access panel (see Right access panel on page 8).
4. To install the power supply:
   a. Insert the power supply into the computer, and then slide the power supply to the back of the computer **(1)**.
   b. Install the four Phillips screws that secure the power supply to the computer **(2)**.



   c. Position the computer with the RGB board facing upward (under the right side access panel).
   d. Push the cables through the holes in the computer **(1)** that lead to the system board (under the glass access panel).
   e. Connect the power supply cable to the RGB board **(2)**.

f. Connect the power supply cables to any installed hard drives **(3)**.



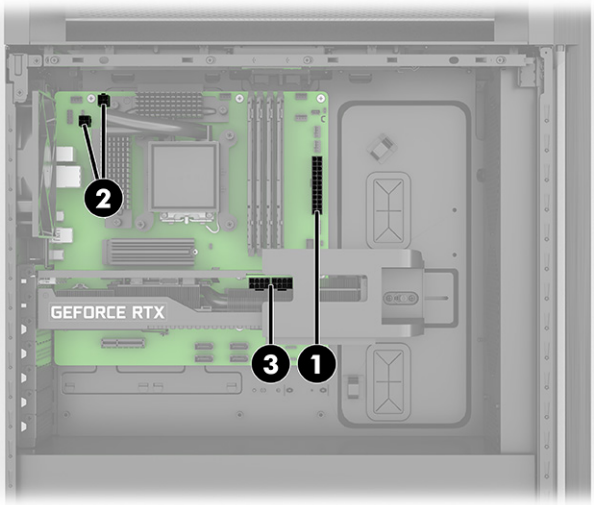
g. Position the computer with the system board facing upward (under the glass access panel).

h. Connect the 24-pin power supply cable to the system board **(1)**.

i. Connect the two 4-pin power supply cables to the system board **(2)**.

j. Connect the power supply cable to the graphics card **(3)**.

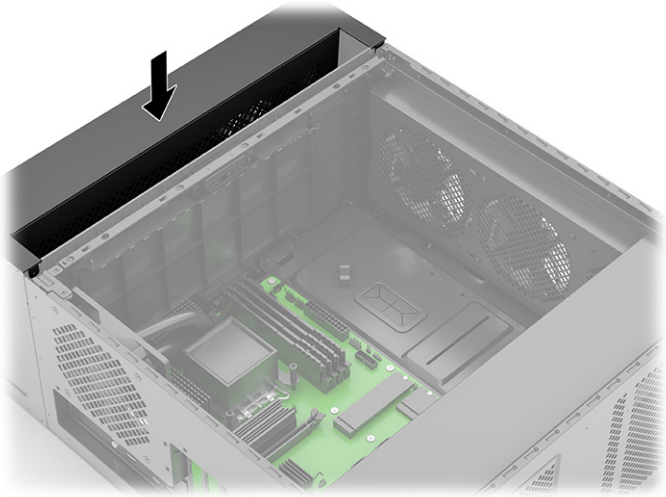
NOTE: Connector placement on the system board or graphics card might vary.



Cryo chamber

You can install a liquid cooler up to 120 mm × 360 mm in the cryo chamber.

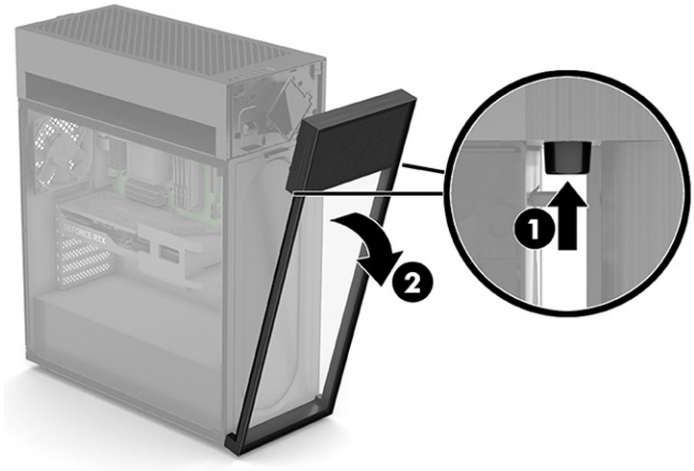
A 120 mm × 360 mm liquid cooler is installed in the location shown in the following illustration.



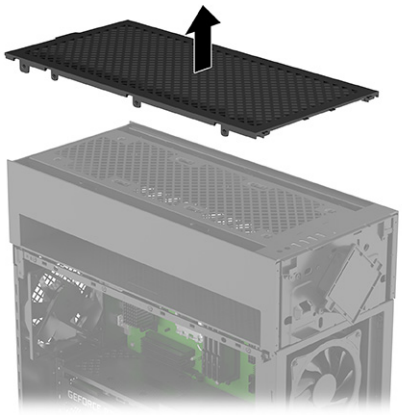
Please note the following considerations when upgrading to this cooling solution:

- To access the screw holes that secure the cooler to the chassis, remove the top cover by lifting it straight up and off the computer. There are up to eight available screw holes to use to secure the cooler.
- You must remove the radiator mounting using the following steps:

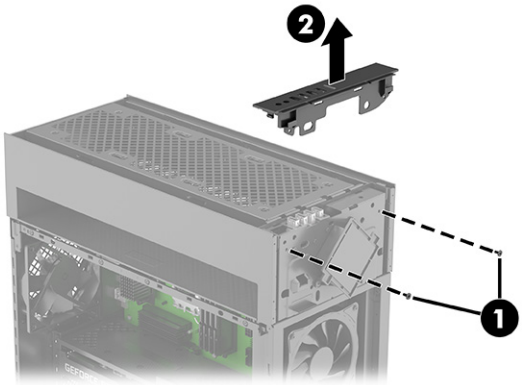
  1. Remove the front bezel by pressing the two release buttons at the top of each side of the bezel **(1)**, and then rotate the top of the bezel away from the computer to remove it **(2)**.



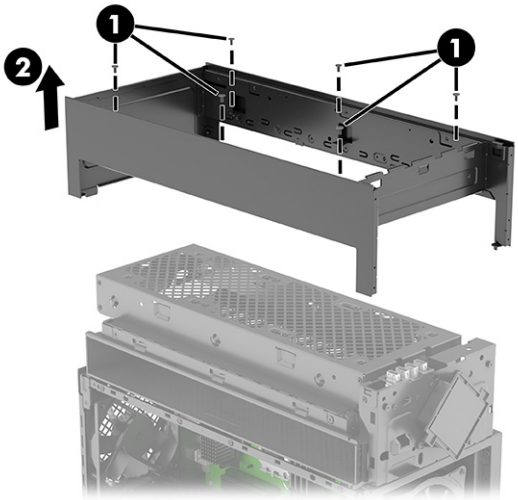
  2. Remove the top cover by lifting it straight up and off the computer.



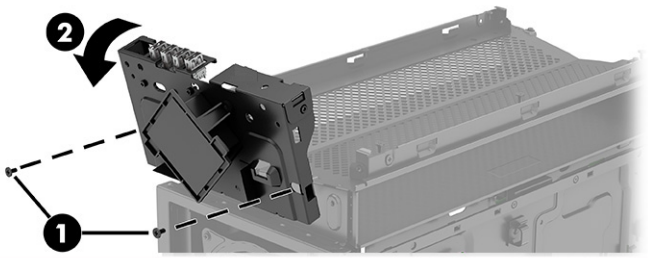
3. Remove the top I/O bezel by removing the two Phillips screws **(1)**, and then lifting the top I/O bezel off the computer **(2)**.



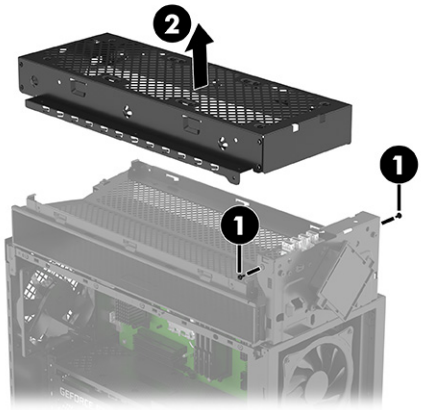
4. Remove the cryo chamber housing by removing the six Phillips screws **(1)**, and then pulling the housing up and off the computer **(2)**.



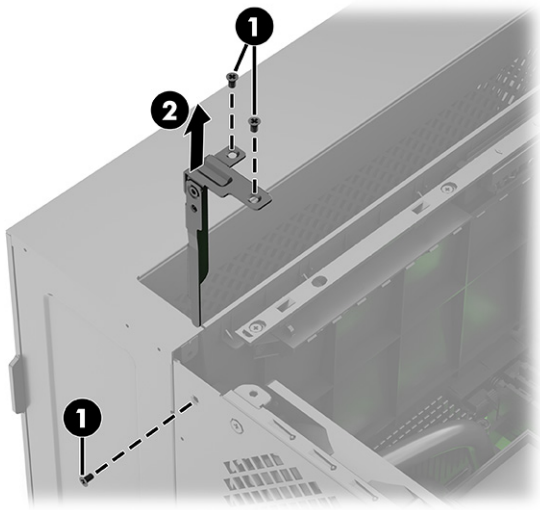
5. Remove the two Phillips screws that secure the RGB module to the computer **(1)**, and rotate the top of the RGB module forward **(2)**.



6. Remove two screws **(1)** and lift the bracket off the computer **(2)**.



- Liquid cooler tube length can be predefined, or it might be customizable to fit the distance between the processor and the radiator/fan mounting location.
- The mounting pitch differs on computers with Intel versus AMD processors.
- To route the tubes, fan power, and RGB cables from the cryo chamber to the main chamber, remove the bracket from the left side of the chassis near the fan. To remove the bracket, remove three screws **(1)**, and then remove the bracket **(2)**. The maximum tube diameter is 14 mm. For tubes with a diameter between 14 - 17 mm, confirm that the tubes can be squeezed down to 14 mm so they fit into the cryo chamber tunnel during installation.



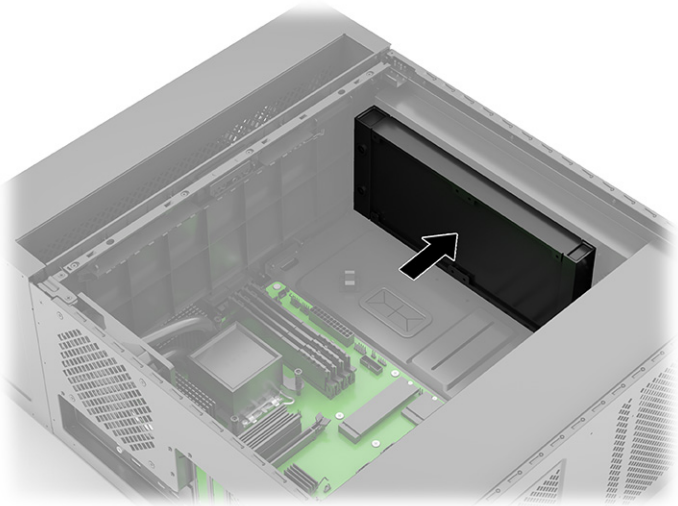
- Depending on your configuration, you might need a fan power bridge or RGB Y cable if you determine you need more fan power headers or RGB lighting pin headers. A standard 120 mm × 360 mm liquid cooler with lighting comes with three fans, each of which has one power cable and one lighting cable. Three fan power bridge cables come with ARGB models. Use the these cables to bridge from the ARGB fans to the system board if necessary.

Front 240 mm fan or radiator

You can install a 120 mm × 120 mm or a 120 mm × 240 mm fan or radiator on the front of the chassis.

NOTE: This is not an option that can be configured at the factory.

A 240 mm fan or radiator is installed in the location shown in the following illustration.



Please note the following considerations when upgrading to this cooling solution:

- Radiator fan mounting holes are shared with the top and middle front fan.
- Be sure that there is no conflicting air flow from the front fans.

- The mounting pitch differs on computers with Intel versus AMD processors.
- Depending on your configuration, you might need a fan power bridge or RGB Y cable if you determine you need more fan power headers or RGB lighting pin headers.

Standalone chassis configuration

This chapter provides you with information about configuring the standalone chassis.

Top I/O cabling

To properly configure the cabling to the top I/O, use these procedures and illustrations.

1. The top I/O connectors and their associated cables resemble this illustration:

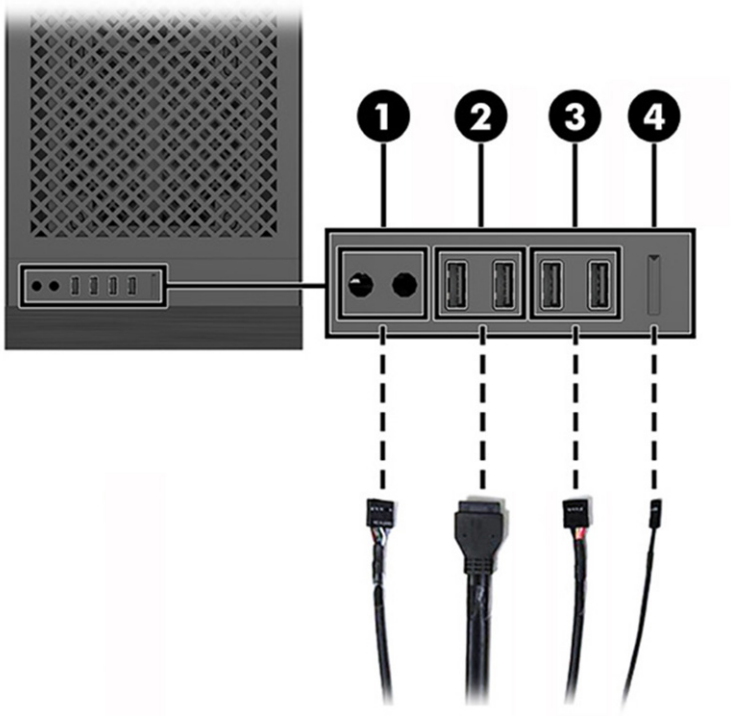
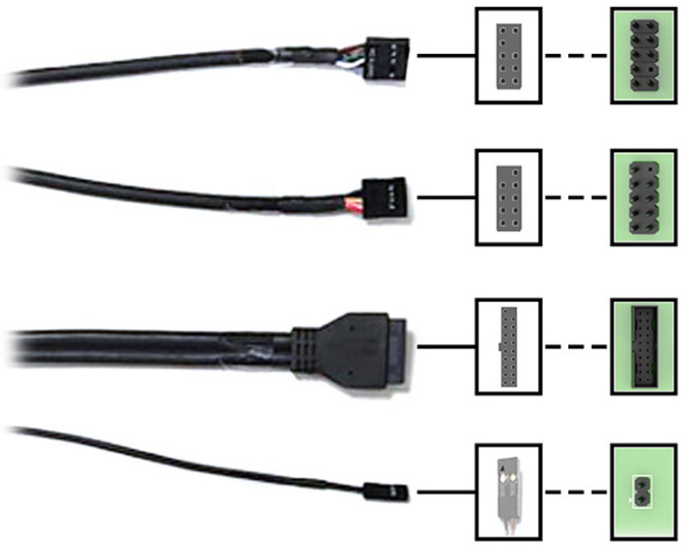


Table 2-3 Identifying the top I/O cables

Top I/O cables	
1	Audio
2	USB 3.2 Gen 1*
3	5 × 2 or 9-pin USB 2.0
4	Power switch
*Actual USB port bandwidth depends on the system board specification.	

2. When plugging the cables into the system board, be sure to connect the cables to the correct connectors on the system board, as shown in the following illustration.



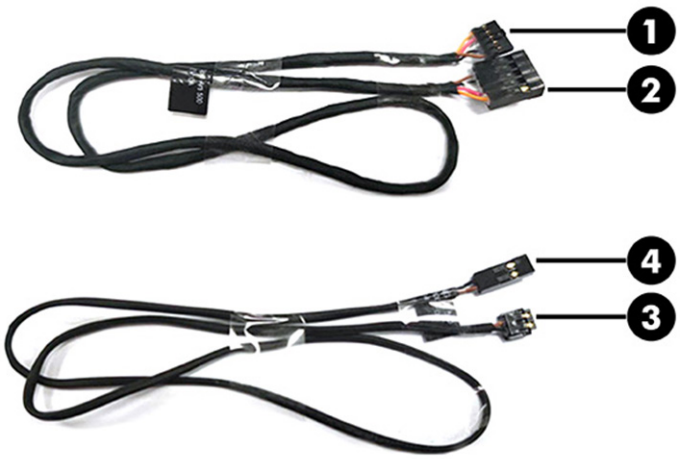
NOTE: Match the triangle mark on the power switch cable plug with the positive pin on the system board connector.

Except for the power switch, each system board connector has an empty pin. When connecting the cable, be sure to orient the cable plug with the empty pin on the system board connector.

Lighting board cabling

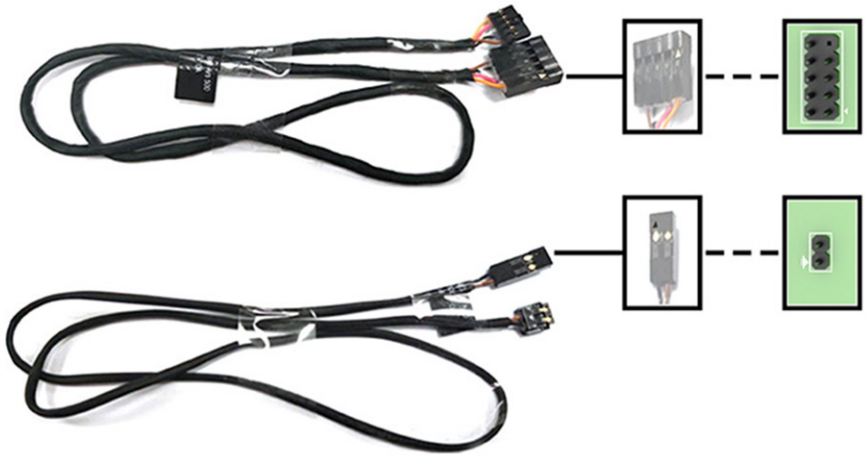
To properly configure the cabling to the lighting board, use these procedures and illustrations.

1. Cables **(1)** and **(3)** are preinstalled on the lighting board. Connect the other ends **(2)** and **(4)** to USB 2.0 and power LED connectors on the system board, respectively.

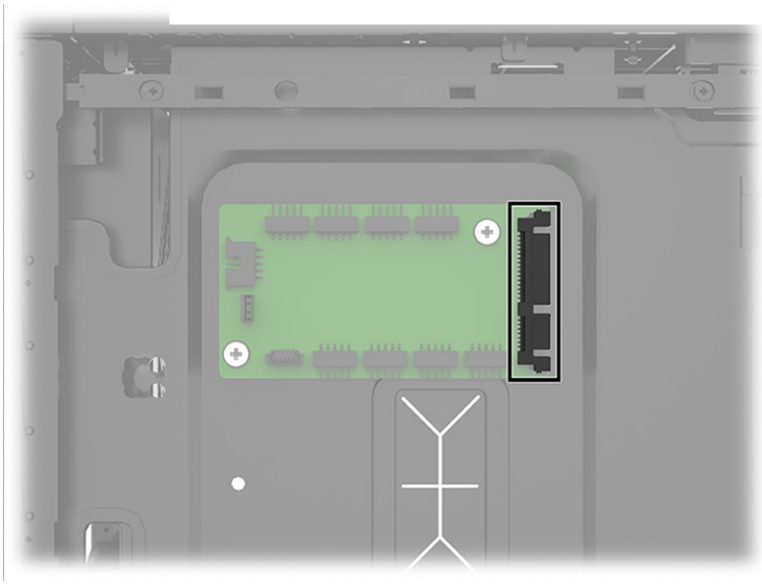


2. When plugging the cables into the system board, be sure to connect the cables to one of the 9-pin USB 2.0 connectors and the 2-pin POWER LED connector. The 9-pin connector has an empty pin. When connecting the cable, be sure to orient the cable plug with the empty pin on the system board

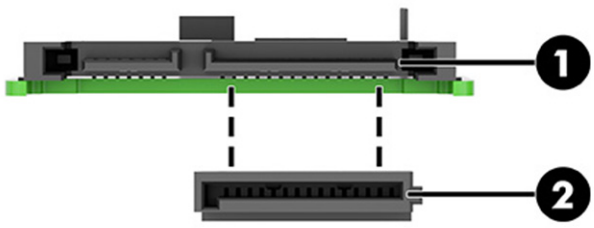
connector. Match the triangle mark on the cable plug with the positive pin on the system board connector.



3. Plug the cable from the power supply into the SATA connector on the lighting board.



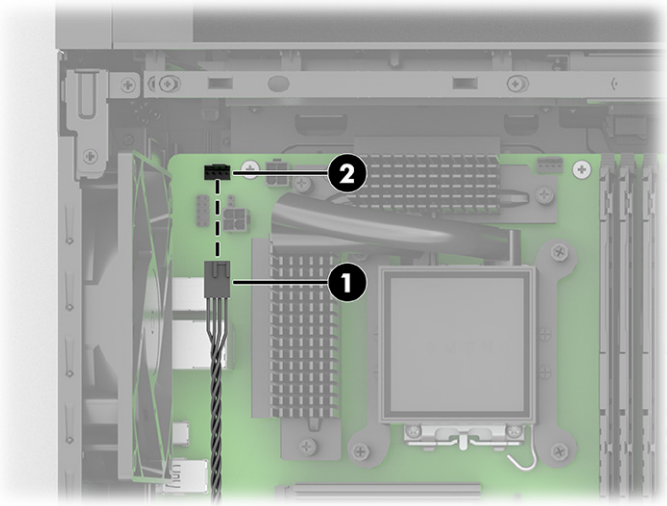
4. When connecting a power supply SATA cable to the lighting board, note the proper installation location on the board **(1)** for the cable **(2)**.



5. Install the OMEN gaming hub from the Microsoft app store to control lighting on the internal light strip and OMEN logo. See RGB board on page 12 for information about extended RGB and ARGB lighting connections to third party lighting components and lighting zone settings in the OMEN gaming hub. HP recommends that ARGB lighting components are all the same brand and installed in the same orientation in all three front fan locations to avoid a mismatched lighting effect.

Rear fan cabling

To connect the cable to the rear fan, connect the rear fan cable **(1)** to the 4-pin connector on the system board **(2)**.



Screw kit

Use this information to determine installation locations of the screws in the screw kit.

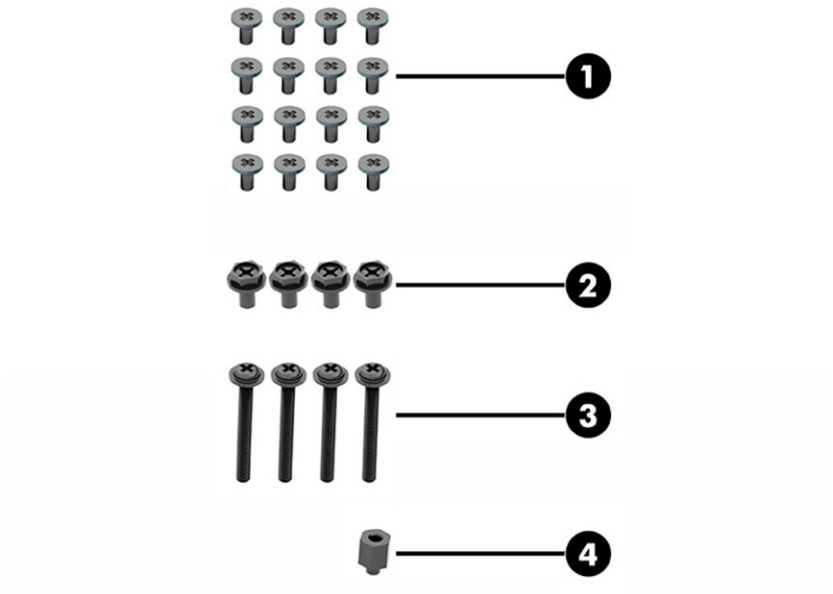


Table 2-4 **Identifying the screw kit**

Screw kit	
1	System board screws (20 for models without ARGB fans; 16 models with ARGB fans)
2	Power supply screws (4)
3	Bottom front fan screws (only for non-ARGB models)
4	Hex screw as extra standoff for microATX system board

3 Computer operating guidelines, routine care, and shipping preparation

Follow these guidelines to ensure the best performance and useful life of your computer.

Operating guidelines and routine care

HP has developed guidelines to help you properly set up and care for the computer and monitor.

- Keep the computer away from excessive moisture, direct sunlight, and extreme 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 because 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 recirculated or preheated air.
- To operate a computer within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the previous operating guidelines 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 tasks:
  - Wipe the exterior of the computer with a soft, damp cloth as needed. Cleaning products might discolor or damage the finish. See Removing dirt and debris from your computer on page 35 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 35 for guidelines to help prevent the spread of harmful bacteria and viruses.
  - 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.

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.
2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

> ⚠ **CAUTION:** To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

> **IMPORTANT:** To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

> **IMPORTANT:** Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.
6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.
7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See Cleaning your computer with a disinfectant on page 35 for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in Removing dirt and debris from your computer on page 35, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.
2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

> ⚠ **CAUTION:** To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

CAUTION: Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Shipping preparation

If you have to ship your computer, follow these tips to keep your equipment safe.

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: Be sure 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.

4 Electrostatic discharge

Electrostatic discharge is the release of static electricity when two objects come into contact—for example, the shock you receive when you walk across the carpet and touch a metal door knob.

A discharge of static electricity from fingers or other electrostatic conductors may damage electronic components.

IMPORTANT: To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- If removal or installation instructions direct you to unplug the computer, first be sure that it is properly grounded.
- Keep components in their electrostatic-safe containers until you are ready to install them.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- Use nonmagnetic tools.
- Before handling components, discharge static electricity by touching an unpainted metal surface.
- If you remove a component, place it in an electrostatic-safe container.

5 Accessibility

HP's goal is to design, produce, and market products, services, and information that everyone everywhere can use, either on a standalone basis or with appropriate third-party assistive technology (AT) devices or applications.

HP and accessibility

Because HP works to weave diversity, inclusion, and work/life into the fabric of the company, it is reflected in everything HP does. HP strives 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 39.

The HP commitment

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

The HP 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 standalone basis or with appropriate assistive devices.

To achieve that goal, this Accessibility Policy establishes seven key objectives to guide HP actions. 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 HP, and provide 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 HP 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 improves assistive technology relevant to HP 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.

As a founding member, HP joined to participate with other organizations to advance the field of accessibility. This commitment supports HP's accessibility goal of designing, producing, and marketing products and services that people with disabilities can effectively use.

IAAP will make the 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 can 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, can 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

These links provide information about accessibility features and assistive technology, if applicable and available in your country or region, that are included in various HP products. These resources will help you select the specific assistive technology features and products most appropriate for your situation.

- HP Aging & Accessibility: Go to http://www.hp.com, type `Accessibility` in the search box. Select **Office of Aging and Accessibility**.
- HP computers: For Windows 7, Windows 8, and Windows 10, go to http://www.hp.com/support, type `Windows Accessibility Options` in the **Search our knowledge** search box. Select the appropriate operating system in the results.
- HP Shopping, peripherals for HP products: Go to http://store.hp.com, select **Shop**, and then select **Monitors** or **Accessories**.

If you need additional support with the accessibility features on your HP product, see Contacting support on page 42.

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)

Standards and legislation

Countries worldwide are enacting regulations to improve access to products and services for persons with disabilities. These regulations are historically applicable to telecommunications products and services, PCs and printers with certain communications and video playback features, their associated user documentation, and their customer support.

Standards

The US Access Board created Section 508 of the Federal Acquisition Regulation (FAR) standards 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 multimedia, and self-contained closed products.

Mandate 376 – EN 301 549

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

The HP policy landscape website provides information about key legislation, regulations, and standards in the following locations:

- United States
- Canada
- Europe
- Australia

Useful accessibility resources and links

These organizations, institutions, and resources might be good sources of 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 encounter on the internet. Listing on this page does not imply endorsement by HP.

Organizations

These organizations are a few of the many that provide information about disabilities and age-related limitations.

- 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

Many educational institutions, including these examples, provide information about disabilities and age-related limitations.

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

- University of Minnesota computer accommodations program

Other disability resources

Many resources, including these examples, provide information about disabilities and age-related limitations.

- ADA (Americans with Disabilities Act) Technical Assistance Program
- ILO Global Business and Disability network
- EnableMart
- European Disability Forum
- Job Accommodation Network
- Microsoft Enable

HP links

These HP-specific links provide information that relates to disabilities and age-related limitations.

HP comfort and safety guide

HP public sector sales

Contacting support

HP offers technical support and assistance with accessibility options for customers with disabilities.

NOTE: Support is in English only.

- Customers who are deaf or hard of hearing who 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:
  - Call (888) 259-5707 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.

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