



## User Guide

© Copyright 2017 HP Development Company, L.P.

AMD is a trademark of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by HP Inc. under license. Intel and Thunderbolt are trademarks of Intel Corporation in the U.S. and other countries. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

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

First Edition: March 2017

Document Part Number: 917651-001

### Product notice

This user 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. See <http://www.microsoft.com>.

To access the latest user guides or manuals for your product, go to <http://www.hp.com/support>. Select **Find your product**, and then follow the on-screen instructions.

### 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.

## Safety warning notice

---

**⚠ WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

---



---

# Table of contents

<b>1 Welcome</b> .....	<b>1</b>
Finding information .....	2
<b>2 Components</b> .....	<b>3</b>
Locating hardware .....	3
Locating software .....	3
Right .....	3
Left .....	5
Display .....	6
Top .....	7
TouchPad .....	7
Lights .....	8
Buttons and fingerprint reader .....	9
Keys .....	11
Using the hot keys .....	12
Bottom .....	13
Front .....	14
Labels .....	15
Inserting a SIM card (select products only) .....	16
<b>3 Network connections</b> .....	<b>17</b>
Connecting to a wireless network .....	17
Using the wireless controls .....	17
Wireless button .....	17
Operating system controls .....	17
Connecting to a WLAN .....	18
Using HP Mobile Broadband (select products only) .....	18
Using HP Mobile Connect Pro (select products only) .....	19
Using GPS (select products only) .....	19
Using Bluetooth wireless devices (select products only) .....	19
Connecting Bluetooth devices .....	19
Using NFC to share information (select products only) .....	19
Sharing .....	20
Connecting to a wired network .....	20
Connecting to a local area network (LAN) (select products only) .....	20
Using HP LAN-WLAN Protection (select products only) .....	21

Turning on and customizing HP LAN-WLAN Protection .....	21
Using HP MAC Address Manager to identify your computer on a network (select products only) .....	22
Turning on and customizing the system MAC address .....	22
<b>4 Screen navigation .....</b>	<b>23</b>
Using the TouchPad and touch screen gestures .....	23
Tap .....	23
Two-finger pinch zoom .....	24
Two-finger scroll (TouchPad only) .....	24
Two-finger tap (TouchPad only) .....	24
Four-finger tap (TouchPad only) .....	25
Three-finger swipe (TouchPad only) .....	25
One-finger slide (touch screen only) .....	25
Using the keyboard and optional mouse .....	26
Using the integrated numeric keypad .....	26
<b>5 Entertainment features .....</b>	<b>27</b>
Using a webcam (select products only) .....	27
Using audio .....	27
Connecting speakers .....	27
Connecting headphones .....	27
Connecting headsets .....	28
Using sound settings .....	28
Using video .....	28
Connecting video devices using a USB Type-C cable (select products only) .....	29
Connecting video devices using an HDMI cable (select products only) .....	29
Setting up HDMI audio .....	30
Discovering and connecting wired displays using MultiStream Transport .....	30
Connect displays to computers with AMD or Nvidia graphics (with an optional hub) ...	31
Connect displays to computers with Intel graphics (with an optional hub) .....	31
Connect displays to computers with Intel graphics (with a built-in hub) .....	31
Discovering and connecting to Miracast-compatible wireless displays (select products only) .....	32
<b>6 Managing power .....</b>	<b>33</b>
Using Sleep and Hibernation .....	33
Initiating and exiting Sleep .....	33
Initiating and exiting Hibernation (select products only) .....	34
Shutting down (turning off) the computer .....	34
Using the Power icon and Power Options .....	35
Running on battery power .....	35

Using HP Fast Charge (select products only) .....	35
Displaying battery charge .....	36
Finding battery information in HP Support Assistant (select products only) .....	36
Conserving battery power .....	36
Identifying low battery levels .....	36
Resolving a low battery level .....	37
Resolving a low battery level when external power is available .....	37
Resolving a low battery level when no power source is available .....	37
Resolving a low battery level when the computer cannot exit Hibernation .....	37
User-replaceable battery .....	37
Removing a user-replaceable battery .....	37
Storing a user-replaceable battery .....	39
Disposing of a user-replaceable battery .....	39
Running on external power .....	39

## **7 Security .....** **40**

Protecting the computer .....	40
Using passwords .....	40
Setting passwords in Windows .....	41
Setting passwords in Computer Setup .....	42
Managing a BIOS administrator password .....	42
Entering a BIOS administrator password .....	44
Using DriveLock Security Options .....	44
Selecting Automatic DriveLock (select products only) .....	44
Enabling Automatic DriveLock .....	44
Disabling Automatic DriveLock .....	45
Entering an Automatic DriveLock password .....	45
Selecting manual DriveLock .....	45
Setting a DriveLock master password .....	46
Enabling DriveLock and setting a DriveLock user password .....	46
Disabling DriveLock .....	47
Entering a DriveLock password .....	47
Changing a DriveLock password .....	47
Using Windows Hello (select products only) .....	48
Using antivirus software .....	48
Using firewall software .....	48
Installing software updates .....	49
Using HP Client Security (select products only) .....	49
Using HP Touchpoint Manager (select products only) .....	49
Using an optional security cable (select products only) .....	49
Using a fingerprint reader (select products only) .....	50

Locating the fingerprint reader .....	50
---------------------------------------	----

**8 Maintenance ..... 51**

Improving performance .....	51
Using Disk Defragmenter .....	51
Using Disk Cleanup .....	51
Using HP 3D DriveGuard (select products only) .....	51
Identifying HP 3D DriveGuard status .....	52
Updating programs and drivers .....	52
Cleaning your computer .....	52
Cleaning procedures .....	52
Cleaning the display .....	53
Cleaning the sides or cover .....	53
Cleaning the TouchPad, keyboard, or mouse (select products only) .....	53
Traveling with or shipping your computer .....	53

**9 Backing up, restoring, and recovering ..... 55**

Creating recovery media and backups .....	55
Creating HP Recovery media (select products only) .....	55
Using Windows tools .....	56
Restore and recovery .....	57
Recovering using HP Recovery Manager .....	57
What you need to know before you get started .....	57
Using the HP Recovery partition (select products only) .....	58
Using HP Recovery media to recover .....	58
Changing the computer boot order .....	59
Removing the HP Recovery partition (select products only) .....	60

**10 Computer Setup (BIOS), TPM, and HP Sure Start ..... 61**

Using Computer Setup .....	61
Starting Computer Setup .....	61
Using a USB keyboard or USB mouse to start Computer Setup (BIOS) .....	61
Navigating and selecting in Computer Setup .....	61
Restoring factory settings in Computer Setup .....	62
Updating the BIOS .....	62
Determining the BIOS version .....	62
Downloading a BIOS update .....	63
Changing the boot order using the f9 prompt .....	64
TPM BIOS settings (select products only) .....	64
Using HP Sure Start (select products only) .....	64





<b>11 Using HP PC Hardware Diagnostics (UEFI)</b> .....	<b>65</b>
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device .....	65
<b>12 Specifications</b> .....	<b>67</b>
Input power .....	67
Operating environment .....	67
<b>13 Electrostatic Discharge</b> .....	<b>68</b>
<b>14 Accessibility</b> .....	<b>69</b>
Supported assistive technologies .....	69
Contacting support .....	69
<b>Index</b> .....	<b>70</b>



---

# 1 Welcome

After you set up and register the computer, we recommend the following steps to get the most out of your smart investment:

-  **TIP:** To quickly return to the computer Start screen from an open app or the Windows desktop, press the Windows key  on your keyboard. Pressing the Windows key again will return you to the previous screen.
- **Connect to the Internet**—Set up your wired or wireless network so that you can connect to the Internet. For more information, see [Network connections on page 17](#).
- **Update your antivirus software**—Protect your computer from damage caused by viruses. The software is preinstalled on the computer. For more information, see [Using antivirus software on page 48](#).
- **Get to know your computer**—Learn about your computer features. See [Components on page 3](#) and [Screen navigation on page 23](#) for additional information.
- **Find installed software**—Access a list of the software preinstalled on the computer:  
Select the **Start** button.  
– or –  
Right-click the **Start** button, and then select **Programs and Features**.
- Back up your hard drive by creating recovery discs or a recovery flash drive. See [Backing up, restoring, and recovering on page 55](#).

## Finding information

To locate resources that provide product details, how-to information, and more, use this table.

Resource	Contents
<i>Setup Instructions</i>	<ul style="list-style-type: none"><li>• Overview of computer setup and features</li></ul>
HP support For HP support, go to <a href="http://www.hp.com/support">http://www.hp.com/support</a> .	<ul style="list-style-type: none"><li>• Online chat with an HP technician</li><li>• Support telephone numbers</li><li>• HP service center locations</li></ul>
<i>Safety &amp; Comfort Guide</i> To access this guide: <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP Help and Support</b>, and then select <b>HP Documentation</b>.</li></ul> – or – <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP</b>, and then select <b>HP Documentation</b>.</li></ul> – or – <ul style="list-style-type: none"><li>▲ Go to <a href="http://www.hp.com/ergo">http://www.hp.com/ergo</a>.</li></ul> <p><b>IMPORTANT:</b> You must be connected to the Internet to access the latest version of the user guide.</p>	<ul style="list-style-type: none"><li>• Proper workstation setup</li><li>• Guidelines for posture and work habits that increase your comfort and decrease your risk of injury</li><li>• Electrical and mechanical safety information</li></ul>
<i>Regulatory, Safety and Environmental Notices</i> To access this document: <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP Help and Support</b>, and then select <b>HP Documentation</b>.</li></ul> – or – <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP</b>, and then select <b>HP Documentation</b>.</li></ul>	<ul style="list-style-type: none"><li>• Important regulatory notices, including information about proper battery disposal, if needed.</li></ul>
<i>Limited Warranty*</i> To access this document: <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP Help and Support</b>, and then select <b>HP Documentation</b>.</li></ul> – or – <ul style="list-style-type: none"><li>▲ Select the <b>Start</b> button, select <b>HP</b>, and then select <b>HP Documentation</b>.</li></ul> – or – <ul style="list-style-type: none"><li>▲ Go to <a href="http://www.hp.com/go/orderdocuments">http://www.hp.com/go/orderdocuments</a>.</li></ul> <p><b>IMPORTANT:</b> You must be connected to the Internet to access the latest version of the user guide.</p>	<ul style="list-style-type: none"><li>• Specific warranty information about this computer</li></ul>

\*You can find your HP Limited Warranty located with the user guides on your product and/or on the CD or DVD provided in the box. In some countries or regions, HP may provide a printed warranty in the box. For countries or regions where the warranty is not provided in printed format, you can request a copy from <http://www.hp.com/go/orderdocuments>. For products purchased in Asia Pacific, you can write to HP at POD, PO Box 161, Kitchener Road Post Office, Singapore 912006. Include your product name, and your name, phone number, and postal address.

# 2 Components

## Locating hardware

To find out what hardware is installed on your computer:

- ▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

A list displays all the devices installed on your computer.

For information about system hardware components and the system BIOS version number, press `fn+esc` (select products only).

## Locating software

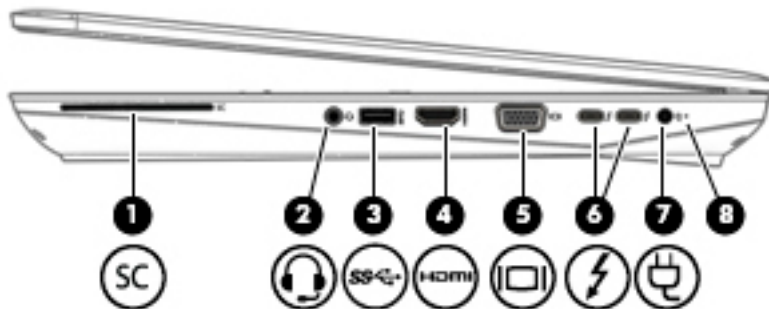
To find out what software is installed on your computer:



- ▲ Select the **Start** button.







– or –

Right-click the **Start** button, and then select **Programs and Features**.

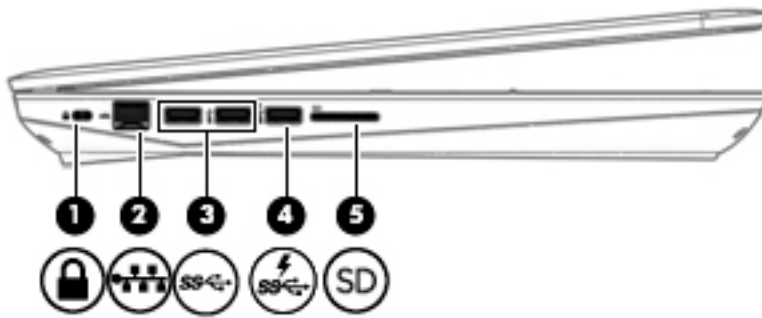
## Right








Component	Description
(1)  Smart card reader	Supports optional Smart cards.
(2)  Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.

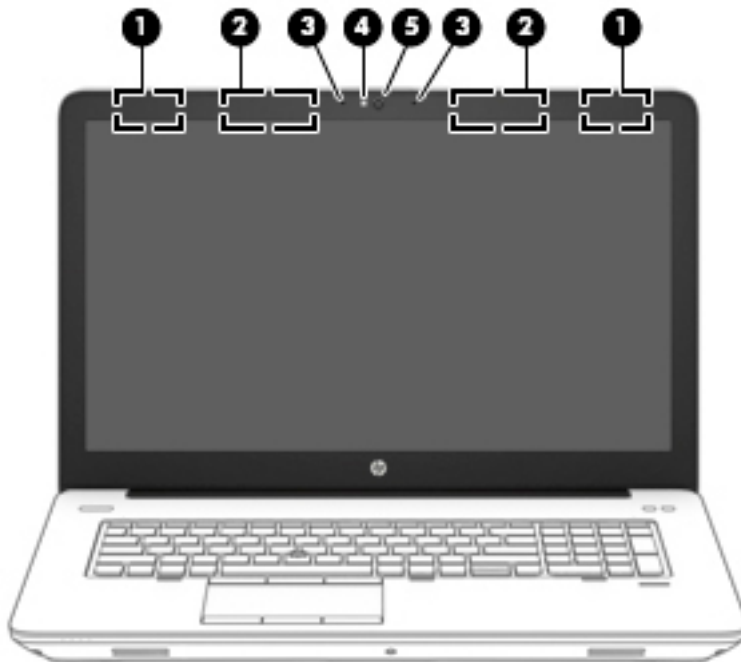
Component	Description
	<p><b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ol style="list-style-type: none"> <li>1. Type <code>support</code> in the taskbar search box, and then select the <b>HP Support Assistant</b> app.</li> <li>– or –</li> <li>Click the question mark icon in the taskbar.</li> <li>2. Select <b>My PC</b>, select the <b>Specifications</b> tab, and then select <b>User Guides</b>.</li> </ol> <p><b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.</p>
<p>(3)</p> 	<p>USB 3.0 port</p> <p>Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.</p>
<p>(4)</p> 	<p>HDMI port</p> <p>Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device.</p>
<p>(5)</p> 	<p>External monitor port</p> <p>Connects an external VGA monitor or projector.</p>
<p>(6)</p> 	<p>USB Type-C Thunderbolt ports (2)</p> <p>Connect and charge USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.</p> <p>– or –</p> <p>Connect a display device that has a USB Type-C connector, providing display output.</p> <p><b>NOTE:</b> Your computer may also support a Thunderbolt docking station. Adapters (purchased separately) may be required.</p>
<p>(7)</p> 	<p>Power connector</p> <p>Connects an AC adapter.</p>
<p>(8)</p> 	<p>Battery light</p> <p>When AC power is connected:</p> <ul style="list-style-type: none"> <li>• White: The battery charge is greater than 90 percent.</li> <li>• Amber: The battery charge is from 0 to 90 percent.</li> <li>• Off: The battery is not charging.</li> </ul> <p>When AC power is disconnected (battery not charging):</p> <ul style="list-style-type: none"> <li>• Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly.</li> <li>• Off: The battery is not charging.</li> </ul>

# Left



Component	Description
<b>(1)</b>  Security cable slot	Attaches an optional security cable to the computer.  <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
<b>(2)</b>  RJ-45 (network) jack/status lights	Connects a network cable.  <ul style="list-style-type: none"> <li>Green (left): The network is connected.</li> <li>Amber (right): Activity is occurring on the network.</li> </ul>
<b>(3)</b>  USB 3.x ports (2)	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide data transfer.
<b>(4)</b>  USB 3.x port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. Standard USB ports will not charge all USB devices or will charge using a low current. Some USB devices require power and require you to use a powered port.  <b>NOTE:</b> USB charging ports can also charge select models of cell phones and MP3 players, even when the computer is off.
<b>(5)</b>  Memory card reader	Reads optional memory cards that store, manage, share, or access information.  To insert a card: <ol style="list-style-type: none"> <li>Hold the card label-side up, with the connectors facing the computer.</li> <li>Insert the card into the memory card reader, and then press in on the card until it is firmly seated.</li> </ol> To remove a card: <ul style="list-style-type: none"> <li>Press in on the card, and then remove it from the memory card reader.</li> </ul>

# Display



Component	Description
(1) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2) WWAN antennas (select products only)*	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(3) Internal microphones (2)	Record sound.
(4) Webcam light (select products only)	On: The webcam is in use.
(5) Webcam (select products only)	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video.  To use the webcam:  ▲ Type <code>camera</code> in the taskbar search box, and then select <b>Camera</b> .

\*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

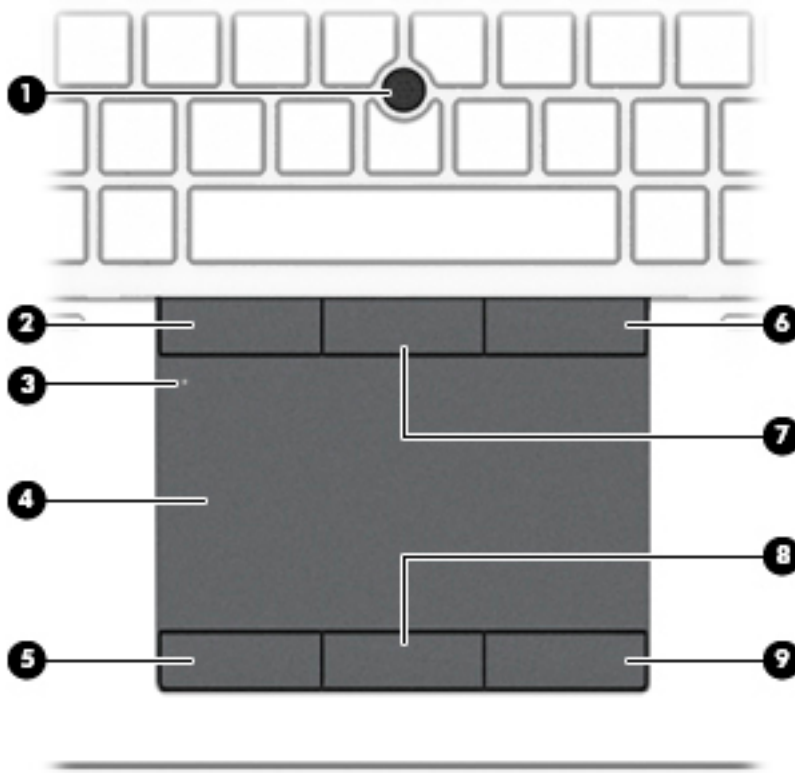
To access this guide:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.  
– or –  
Click the question mark icon in the taskbar.
2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.



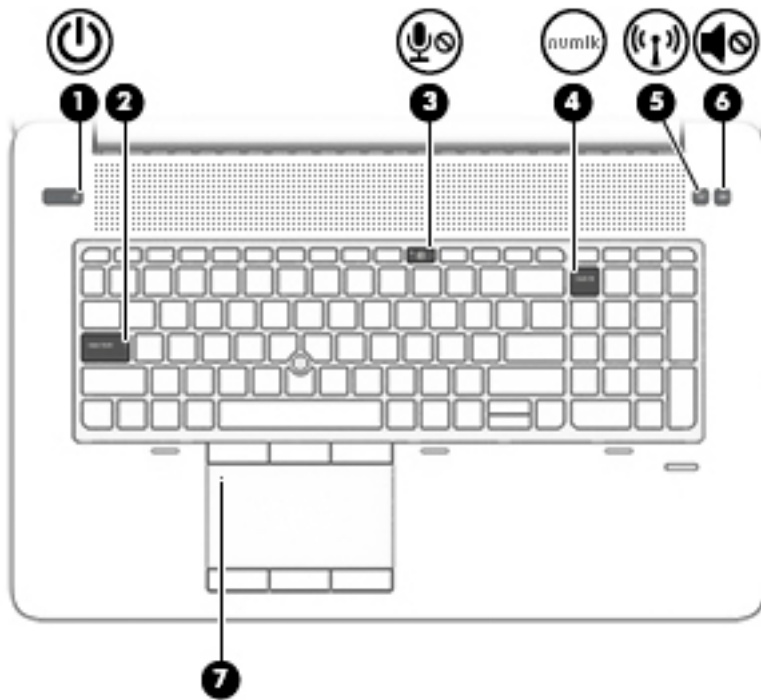
# Top





## TouchPad



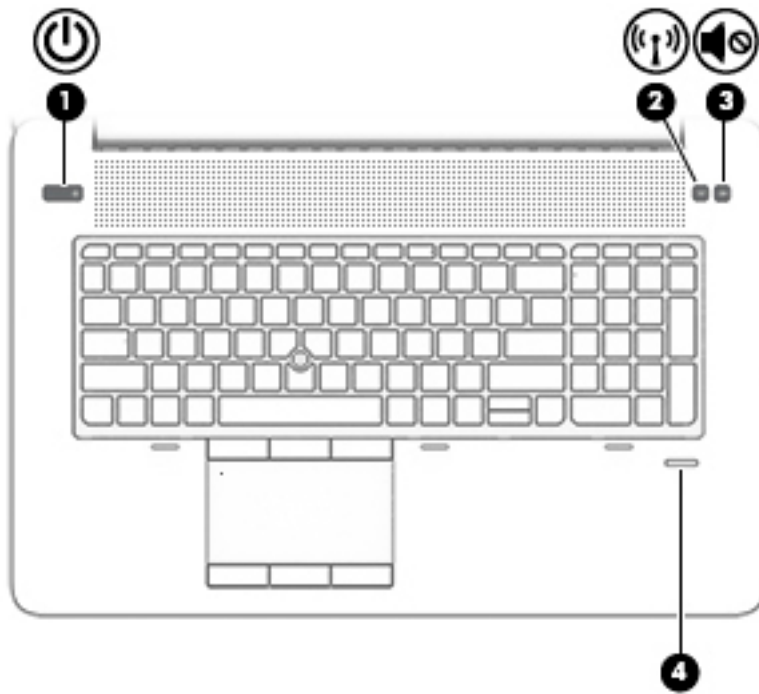
Component	Description
(1) Pointing stick	Moves the pointer and selects or activates items on the screen.
(2) Left pointing stick button	Functions like the left button on an external mouse.
(3) TouchPad on/off button	Turns the TouchPad on and off.
(4) TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(5) Left TouchPad button	Functions like the left button on an external mouse.
(6) Right pointing stick button	Functions like the right button on an external mouse.
(7) Center pointing stick button	Functions like the center button on an external mouse.
(8) Center TouchPad button	Functions like the center button on an external mouse.
(9) Right TouchPad button	Functions like the right button on an external mouse.




## Lights




Component	Description
(1)  Power light	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.</li> <li>Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.</li> </ul>
(2) Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)  Microphone mute light	<ul style="list-style-type: none"> <li>Amber: Microphone sound is off.</li> <li>Off: Microphone sound is on.</li> </ul>
(4) Num lk light	On: Num lock is on.
(5)  Wireless light	<p>On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</p> <p><b>NOTE:</b> On some models, the wireless light is amber when all wireless devices are off.</p>
(6)  Mute light	<ul style="list-style-type: none"> <li>Amber: Computer sound is off.</li> <li>Off: Computer sound is on.</li> </ul>
(7) TouchPad light	<ul style="list-style-type: none"> <li>On: The TouchPad is off.</li> <li>Off: The TouchPad is on.</li> </ul>

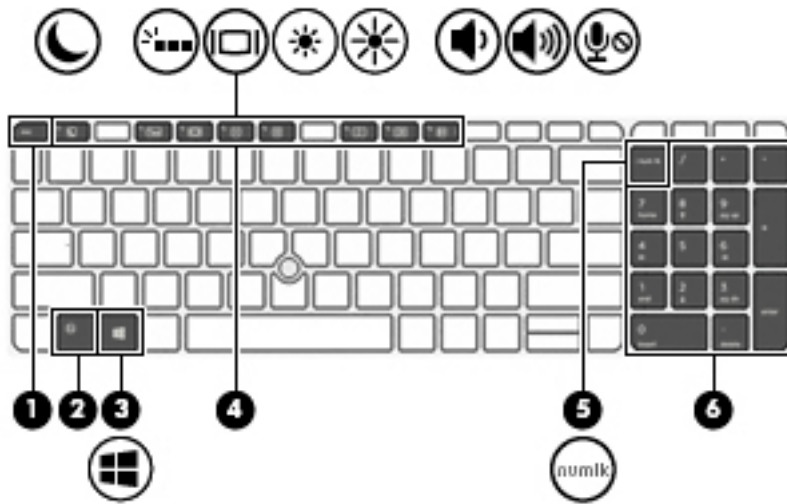
## Buttons and fingerprint reader





Component	Description
(1)  Power button	<ul style="list-style-type: none"> <li>• When the computer is off, press the button to turn on the computer.</li> <li>• When the computer is on, press the button briefly to initiate Sleep.</li> <li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li> <li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li> </ul> <p><b>CAUTION:</b> Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options.</p> <p>▲ Type <code>power options</code> in the taskbar search box, and then select <b>Power Options</b>.</p> <p>– or –</p> <p>Right-click the <b>Power</b> icon , and then select <b>Power Options</b>.</p>
(2)  Wireless button	<p>Turns the wireless feature on or off but does not establish a wireless connection. A wireless network must be set up before a wireless connection is possible.</p>

Component	Description
(3) 	Volume mute button Mutes and restores speaker sound.
(4) Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon.

## Keys











Component	Description
(1)  <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes frequently used system functions when pressed in combination with a function key, the <code>num lk</code> key, the <code>esc</code> key, or other key.  See <a href="#">Using the hot keys on page 12</a> .
(3)  Windows key	Opens the <b>Start</b> menu.  <b>NOTE:</b> Pressing the Windows key again will close the <b>Start</b> menu.
(4) Function keys	Execute frequently used system functions when pressed in combination with the <code>fn</code> key.  See <a href="#">Using the hot keys on page 12</a> .
(5) <code>num lk</code> key	Alternates between the navigational and numeric functions on an integrated numeric keypad.
(6) Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When <code>num lk</code> is pressed, the integrated keypad can be used like an external numeric keypad.

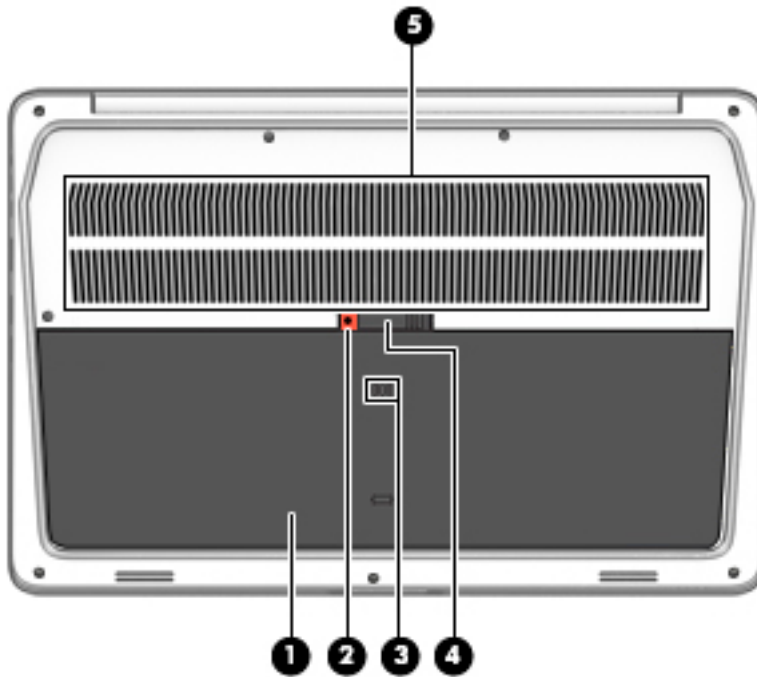
## Using the hot keys


To use a hot key:

- ▲ Press the **fn** key, and then press one of the keys listed in the following table.

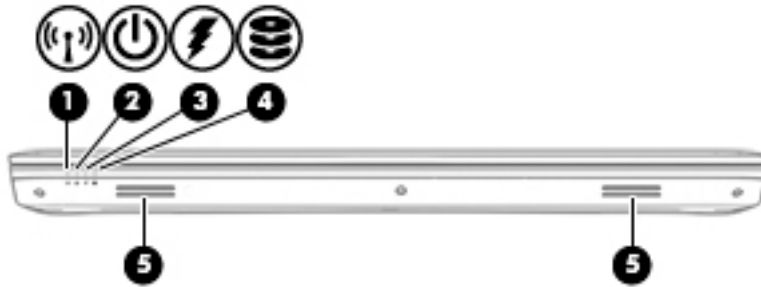
Press <b>fn</b> + function key	Description
	Initiates Sleep, which saves your information in system memory. The display and other system components turn off and power is conserved. To exit Sleep, briefly press the power button. <b>CAUTION:</b> To reduce the risk of information loss, save your work before initiating Sleep.
	Turns the keyboard backlight off or on. <b>NOTE:</b> To conserve battery power, turn off this feature.
	Switches the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing the hot key alternates the screen image from computer display to monitor display to simultaneous display on both the computer and monitor.
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Mutes the microphone.





# Bottom



Component	Description
(1) Service door	<p>Provides access to the hard drive bay, the WLAN module slot, the WWAN module slot, and the memory module slots.</p> <p><b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support.</p> <p>▲ Type <code>support</code> in the taskbar search box, and then select the <b>HP Support Assistant</b> app.</p> <p>- or -</p> <p>Click the question mark icon in the taskbar.</p>
(2) Service door release screw	Releases the service door.
(3) Spill drain	Allows spilled liquids, such as sodas or coffee, to drain out of the computer.
(4)  Service door release latch	Releases the service door.
(5) Vents	<p>Enable airflow to cool internal components.</p> <p><b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.</p>

# Front



Component	Description
(1)  Wireless light	<p>On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</p> <p><b>NOTE:</b> On some models, the wireless light is amber when all wireless devices are off.</p>
(2)  Power light	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.</li> <li>Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.</li> </ul>
(3)  Battery light	<p>When AC power is connected:</p> <ul style="list-style-type: none"> <li>White: The battery charge is greater than 90 percent.</li> <li>Amber: The battery charge is from 0 to 90 percent.</li> <li>Off: The battery is not charging.</li> </ul> <p>When AC power is disconnected (battery not charging):</p> <ul style="list-style-type: none"> <li>Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly.</li> <li>Off: The battery is not charging.</li> </ul>
(4)  Drive light	<ul style="list-style-type: none"> <li>Blinking white: The hard drive is being accessed.</li> <li>Amber: HP 3D DriveGuard has temporarily parked the hard drive.</li> </ul> <p><b>NOTE:</b> For more information about HP 3D DriveGuard, see <a href="#">Using HP 3D DriveGuard (select products only) on page 51</a>.</p>
(5) Speakers	Produce sound.



# Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

**IMPORTANT:** Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, or on the back of the display.

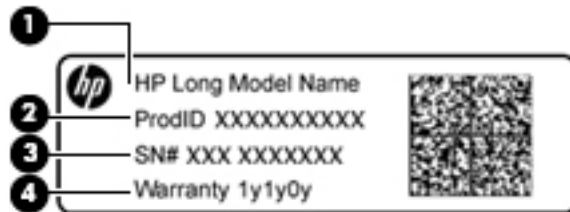
- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.



### Component

- (1) Serial number
- (2) Product number
- (3) Warranty period
- (4) Model number (select products only)



### Component

- (1) Model name (select products only)
- (2) Product number
- (3) Serial number
- (4) Warranty period

- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

## Inserting a SIM card (select products only)

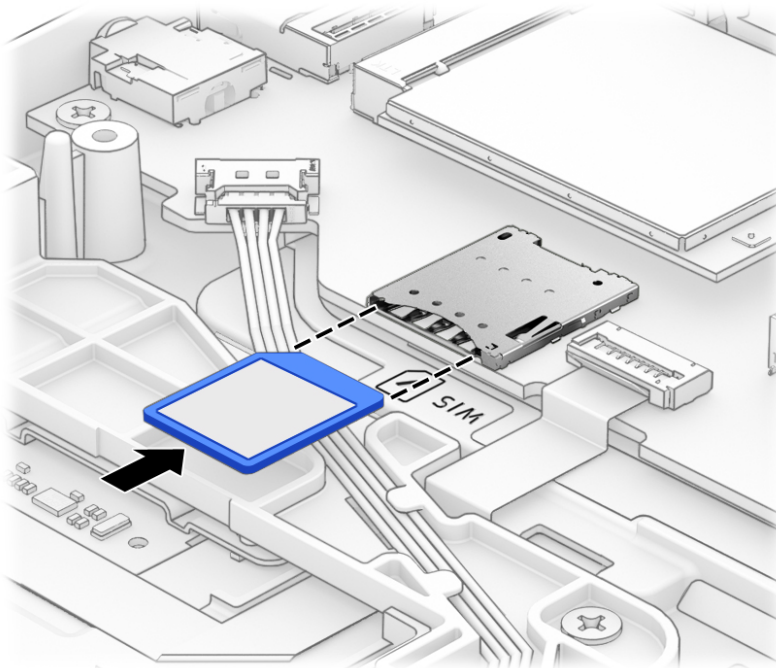
**CAUTION:** To prevent damage to the connectors, use minimal force when inserting a SIM card.

To insert a SIM card, follow these steps:

1. Turn off the computer by using the Shut down command.
2. Close the display.
3. Disconnect all external devices connected to the computer.
4. Unplug the power cord from the AC outlet.
5. Turn the computer upside down on a flat surface.
6. Remove the service door and the battery.
7. Insert the SIM card into the SIM card slot, and then press in on the SIM card until it is firmly seated.

**NOTE:** The SIM card in your computer may look slightly different from the illustration in this section.

**NOTE:** See the image on the battery bay to determine which way the SIM card should be inserted into your computer.



To remove a SIM card, press in on the SIM card, and then remove it from the slot.

---

## 3 Network connections

Your computer can travel with you wherever you go. But even at home, you can explore the globe and access information from millions of websites using your computer and a wired or wireless network connection. This chapter will help you get connected to that world.

### Connecting to a wireless network

Your computer may be equipped with one or more of the following wireless devices:

- **WLAN device**—Connects the computer to wireless local area networks (commonly referred to as Wi-Fi networks, wireless LANs, or WLANs) in corporate offices, your home, and public places such as airports, restaurants, coffee shops, hotels, and universities. In a WLAN, the mobile wireless device in your computer communicates with a wireless router or a wireless access point.
- **HP Mobile Broadband Module (select products only)**—A wireless wide area network (WWAN) device that gives you wireless connectivity over a much larger area. Mobile network operators install base stations (similar to cell phone towers) throughout large geographic areas, effectively providing coverage across entire states, regions, or even countries.
- **Bluetooth® device**—Creates a personal area network (PAN) to connect to other Bluetooth-enabled devices such as computers, phones, printers, headsets, speakers, and cameras. In a PAN, each device communicates directly with other devices, and devices must be relatively close together—typically within 10 meters (approximately 33 feet) of each other.

### Using the wireless controls

You can control the wireless devices in your computer using one or more of these features:

- **Wireless button (also called airplane mode key or wireless key)** (referred to in this chapter as wireless button)
- **Operating system controls**

#### Wireless button

The computer may have a wireless button, one or more wireless devices, and one or two wireless lights. All the wireless devices on your computer are enabled at the factory.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices.

#### Operating system controls


The Network and Sharing Center allows you to set up a connection or network, connect to a network, and diagnose and repair network problems.

To use operating system controls:

1. Type `control panel` in the taskbar search box, and then select **Control Panel**.
2. Select **Network and Internet**, and then select **Network and Sharing Center**.

## Connecting to a WLAN

---

 **NOTE:** When you are setting up Internet access in your home, you must establish an account with an Internet service provider (ISP). To purchase Internet service and a modem, contact a local ISP. The ISP will help set up the modem, install a network cable to connect your wireless router to the modem, and test the Internet service.


---


To connect to a WLAN, follow these steps:

1. Be sure that the WLAN device is on.
2. Select the network status icon in the taskbar, and then connect to one of the available networks.

If the WLAN is a security-enabled WLAN, you are prompted to enter a security code. Enter the code, and then select **Next** to complete the connection.

---

 **NOTE:** If no WLANs are listed, you may be out of range of a wireless router or access point.


 **NOTE:** If you do not see the WLAN you want to connect to, right-click the network status icon in the taskbar, and then select **Open Network and Sharing Center**. Select **Set up a new connection or network**. A list of options is displayed, allowing you to manually search for and connect to a network or to create a new network connection.

---

3. Follow the on-screen instructions to complete the connection.

After the connection is made, select the network status icon at the far right of the taskbar, to verify the name and status of the connection.

---


 **NOTE:** The functional range (how far your wireless signals travel) depends on WLAN implementation, router manufacturer, and interference from other electronic devices or structural barriers such as walls and floors.

---

## Using HP Mobile Broadband (select products only)

Your HP Mobile Broadband computer has built-in support for mobile broadband service. Your new computer, when used with a mobile operator's network, gives you the freedom to connect to the Internet, send e-mail, or connect to your corporate network without the need for Wi-Fi hotspots.

---

 **NOTE:** If your computer includes HP Mobile Connect, the instructions in this section do not apply. See [Using HP Mobile Connect Pro \(select products only\) on page 19](#).

---

You might need the HP Mobile Broadband Module IMEI and/or MEID number to activate mobile broadband service. The number may be printed on a label located on the bottom of your computer, inside the battery bay, under the service door, or on the back of the display.

– or –

You can find the number following these steps:

1. From the taskbar, select the network status icon.
2. Select **View Connection Settings**.
3. Under the **Mobile broadband** section, select the network status icon.

Some mobile network operators require the use of a SIM card. A SIM card contains basic information about you, such as a personal identification number (PIN), as well as network information. Some computers include a SIM card that is preinstalled. If the SIM card is not preinstalled, it may be provided in the HP Mobile Broadband information provided with your computer or the mobile network operator may provide it separately from the computer.

For information about HP Mobile Broadband and how to activate service with a preferred mobile network operator, see the HP Mobile Broadband information included with your computer.

## Using HP Mobile Connect Pro (select products only)

HP Mobile Connect Pro is a prepaid, mobile broadband service that provides a cost-effective, secure, simple, and flexible mobile broadband connection for your computer. To use HP Mobile Connect Pro, your computer must have a SIM card and the HP Mobile Connect app. For more information about HP Mobile Connect Pro and where it is available, go to <http://www.hp.com/go/mobileconnect>.

## Using GPS (select products only)

Your computer may be equipped with a Global Positioning System (GPS) device. GPS satellites deliver location, speed, and direction information to GPS-equipped systems.

To enable GPS, make sure location is enabled under the Windows privacy setting.

1. Type `location` in the taskbar search box, and then select **Location privacy settings**.
2. Follow the on-screen instructions for using location settings.

## Using Bluetooth wireless devices (select products only)

A Bluetooth device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as the following:


- Computers (desktop, notebook)
- Phones (cellular, cordless, smartphone)
- Imaging devices (printer, camera)
- Audio devices (headset, speakers)
- Mouse
- External keyboard


## Connecting Bluetooth devices

Before you can use a Bluetooth device, you must establish a Bluetooth connection.

1. Type `bluetooth` in the taskbar search box, and then select **Bluetooth settings**.
2. Turn on Bluetooth, if it is not already turned on.
3. Select your device from the list, and then follow the on-screen instructions.

---

 **NOTE:** If the device requires verification, a pairing code is displayed. On the device you are adding, follow the on-screen instructions to verify that the code on your device matches the pairing code. For more information, refer to the documentation provided with the device.

 **NOTE:** If your device does not appear in the list, be sure that Bluetooth on that device is turned on. Some devices may have additional requirements; refer to the documentation provided with the device.

---

## Using NFC to share information (select products only)

Your computer supports Near Field Communication (NFC), which allows you to wirelessly share information between two NFC-enabled devices. Information is transferred by tapping the tapping area (antenna) of the

computer with the antenna of your phone or other device. With NFC and supported apps, you can share websites, transfer contact information, transfer payments, and print on NFC-enabled printers.



---

**NOTE:** To locate the tapping area on your computer, see [Components on page 3](#).

---

## Sharing

1. Confirm that the NFC function is enabled.
  - a. Type `wireless` in the taskbar search box, and then select **Turn wireless devices on or off**.
  - b. Confirm that the selection for NFC is **On**.
2. Tap the NFC tapping area with an NFC-enabled device. You may hear a sound when the devices connect.



---

**NOTE:** To find the location of the antenna on the other NFC device, refer to your device instructions.

---

3. Follow any on-screen instructions to continue.

## Connecting to a wired network

Select products may allow wired connections: local area network (LAN) and modem connection. A LAN connection uses a network cable and is much faster than a modem, which uses a telephone cable. Both cables are sold separately.



---

**WARNING!** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug a modem cable or telephone cable into an RJ-45 (network) jack.

---

## Connecting to a local area network (LAN) (select products only)

Use a LAN connection if you want to connect the computer directly to a router in your home (instead of working wirelessly), or if you want to connect to an existing network at your office.



---

**NOTE:** A feature called HP LAN-WLAN Protection may be enabled on your computer. It closes your wireless (Wi-Fi) connection when you connect directly to a LAN. For more information about HP LAN-WLAN Protection, see [Using HP LAN-WLAN Protection \(select products only\) on page 21](#).


---

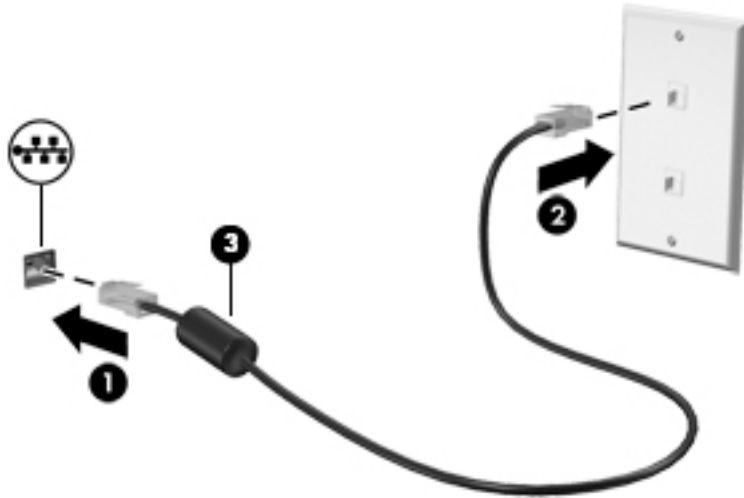
If there is no RJ-45 port on the computer, connecting to a LAN requires an 8-pin, RJ-45 network cable or an optional docking device or expansion product.

To connect the network cable, follow these steps:

1. Plug the network cable into the network jack **(1)** on the computer or on an optional docking device or expansion product.

2. Plug the other end of the network cable into a network wall jack **(2)** or router.

 **NOTE:** If the network cable contains noise suppression circuitry **(3)**, which prevents interference from TV and radio reception, orient the circuitry end of the cable toward the computer.



## Using HP LAN-WLAN Protection (select products only)

In a LAN environment, you can set HP LAN-WLAN Protection to safeguard your LAN network from unauthorized wireless access. When HP LAN-WLAN Protection is enabled, the WLAN (Wi-Fi) connection is turned off when the computer is connected directly to a LAN.

### Turning on and customizing HP LAN-WLAN Protection

1. Connect a network cable to the network jack on the computer, or on an optional docking device or expansion product.
  2. Start Computer Setup (BIOS).
    - Computers or tablets with keyboards:
      - ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
    - Tablets without keyboards:
      - ▲ Turn on or restart the tablet, and then quickly hold down the volume down button until the Startup menu is displayed. Tap **f10** to enter Computer Setup.
  3. Select **Advanced**, and then select **Built-in Device Options**.
  4. Select the check box for **LAN/WLAN Auto Switching** to turn off WLAN connections when connected to a LAN network.
  5. To save your changes and exit Computer Setup, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.
- or –
- Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Using HP MAC Address Manager to identify your computer on a network (select products only)

You can enable a system Media Access Control (MAC) address to provide a customizable way of identifying your computer and its communications on networks. This system MAC address provides unique identification even when your computer is connected through an external device, such as a docking station or external wireless adapter. This address is disabled by default.

### Turning on and customizing the system MAC address

1. Connect a network cable to the network jack on the computer, or on an optional docking device or expansion product.
2. Start Computer Setup (BIOS).
  - Computers or tablets with keyboards:
    - ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    - ▲ Turn on or restart the tablet, and then quickly hold down the volume down button until the Startup menu is displayed. Tap **f10** to enter Computer Setup.
3. Select **Advanced**, and then select **Host Based MAC Address**.
4. In the box to the right of **Host Based MAC Address**, select either **System** to enable the host-based MAC address or **Custom** to customize the address.
5. Make selections for boot order and devices supported.
6. If you selected Custom, select **MAC ADDRESS**, enter your customized system MAC address, and then press **enter** to save the address.
7. To save your changes and exit Computer Setup, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

For additional documentation about HP MAC Address Manager and using system MAC addresses, go to <http://www.hp.com/support>. Select **Find your product**, and then follow the on-screen instructions.



## 4 Screen navigation

You can navigate the computer screen in the following ways:


- Use touch gestures directly on the computer screen (select products only)
- Use touch gestures on the TouchPad
- Use keyboard and optional mouse (mouse purchased separately)
- Use the pointing stick (select products only)

### Using the TouchPad and touch screen gestures

The TouchPad helps you navigate the computer screen and control the pointer using simple touch gestures. You can also use the left and right TouchPad buttons as you would use the corresponding buttons on an external mouse. To navigate a touch screen (select products only), touch the screen directly using gestures described in this chapter.

You can also customize gestures and view demonstrations of how they work. Type `control panel` in the taskbar search box, select **Control Panel**, and then select **Hardware and Sound**. Under **Devices and Printers**, select **Mouse**.

---

 **NOTE:** Unless noted, gestures can be used on the TouchPad or a touch screen (select products only).

---

#### Tap

Use the tap/double-tap gesture to select or open an item on the screen.

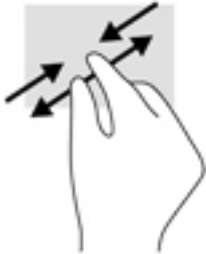
- Point to an item on the screen, and then tap one finger on the TouchPad zone or touch screen to select the item. Double-tap an item to open it.



## Two-finger pinch zoom

Use the two-finger pinch zoom to zoom out or in on images or text.

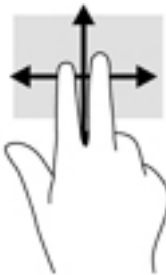
- Zoom out by placing two fingers apart on the TouchPad zone or touch screen and then moving your fingers together.
- Zoom in by placing two fingers together on the TouchPad zone or touch screen and then moving your fingers apart.



## Two-finger scroll (TouchPad only)

Use the two-finger scroll to move up, down, or sideways on a page or image.

- Place two fingers slightly apart on the TouchPad zone and then drag them up, down, left, or right.



## Two-finger tap (TouchPad only)

Use the two-finger tap to open the menu for an object on the screen.

 **NOTE:** The two-finger tap performs the same function as right-clicking with the mouse.

- Tap two fingers on the TouchPad zone to open the options menu for the selected object.



## Four-finger tap (TouchPad only)

Use the four-finger tap to open the action center.

- Tap four fingers on the Touchpad to open the action center and view current settings and notifications.



## Three-finger swipe (TouchPad only)

Use the three-finger swipe to view open windows and to switch between open windows and the desktop.

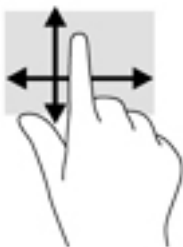
- Swipe 3 fingers away from you to see all open windows.
- Swipe 3 fingers toward you to show the desktop.
- Swipe 3 fingers left or right to switch between open windows.



## One-finger slide (touch screen only)

Use the one-finger slide to pan or scroll through lists and pages, or to move an object.

- To scroll across the screen, lightly slide one finger across the screen in the direction you want to move.
- To move an object, press and hold your finger on an object, and then drag your finger to move the object.



## Using the keyboard and optional mouse

The keyboard and mouse allow you to type, select items, scroll and to perform the same functions as you do using touch gestures. The keyboard also allows you to use action keys and key combinations to perform specific functions.



**NOTE:** Depending on the country or region, your keyboard may have different keys and keyboard functions than those discussed in this section.

## Using the integrated numeric keypad

The computer includes an integrated numeric keypad, and it also supports an optional external numeric keypad or an optional external keyboard that includes a numeric keypad. For more details about the integrated numeric keypad, see [Keys on page 11](#).

Component	Description
<a href="#">num lk</a> key	Controls the function of the integrated numeric keypad. Press the key to alternate between the standard numeric function found on an external keypad (this function is turned on at the factory) and the navigational function (indicated by the directional arrows on the keys). <b>NOTE:</b> The keypad function that is active when the computer is turned off, is reinstated when the computer is turned back on.
Integrated numeric keypad	Set at the factory to function like an external numeric keypad. To alternate between this numeric function and the navigational function (indicated by the directional arrow keys), press the <a href="#">num lk</a> key.

---

## 5 Entertainment features

Use your HP computer for business or pleasure to meet with others via the webcam, mix audio and video, or connect external devices like a projector, monitor, TV, or speakers. See [Components on page 3](#) to locate the audio, video and camera features on your computer.

### Using a webcam (select products only)

Your computer has a webcam (integrated camera) that records video and captures photographs. Some models allow you to video conference and chat online using streaming video.

- ▲ To access the camera, type `camera` in the taskbar search box, and then select **Camera** from the list of applications.

### Using audio

You can download and listen to music, stream audio content (including radio) from the web, record audio, or mix audio and video to create multimedia. You can also play music CDs on the computer (on select models) or attach an external optical drive to play CDs. To enhance your listening enjoyment, attach headphones or speakers.


### Connecting speakers

You can attach wired speakers to your computer by connecting them to a USB port or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer or on a docking station.

To connect wireless speakers to your computer, follow the device manufacturer's instructions. To connect high-definition speakers to the computer, see [Setting up HDMI audio on page 30](#). Before connecting speakers, lower the volume setting.

### Connecting headphones

---

 **WARNING!** To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety and Environmental Notices*.

To access this document:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –


Click the question mark icon in the taskbar.

2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.
- 

You can connect wired headphones to the headphone jack or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headphones to your computer, follow the device manufacturer's instructions.

## Connecting headsets

 **WARNING!** To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety and Environmental Notices*.

To access this document:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.  
– or –  
Click the question mark icon in the taskbar.
2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

Headphones combined with a microphone are called headsets. You can connect wired headsets to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headsets to your computer, follow the device manufacturer's instructions.

## Using sound settings

Use sound settings to adjust system volume, change system sounds, or manage audio devices.

To view or change sound settings:

- ▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

– or –

Right-click the **Start** button, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

Your computer may include an enhanced sound system by Bang & Olufsen, DTS, Beats audio, or another provider. As a result, your computer may include advanced audio features that can be controlled through an audio control panel specific to your audio system.

Use the audio control panel to view and control audio settings.

- ▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select the audio control panel specific to your system.


– or –

Right-click the **Start** button, select **Control Panel**, select **Hardware and Sound**, and then select the audio control panel specific to your system.

## Using video

Your computer is a powerful video device that enables you to watch streaming video from your favorite websites and download video and movies to watch on your computer when you are not connected to a network.

To enhance your viewing enjoyment, use one of the video ports on the computer to connect an external monitor, projector, or TV.

 **IMPORTANT:** Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

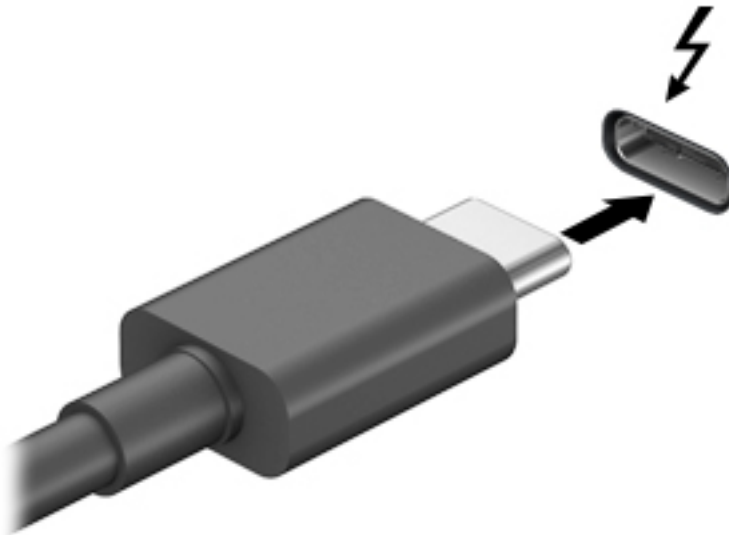
For information on using your video features, refer to HP Support Assistant.

## Connecting video devices using a USB Type-C cable (select products only)

 **NOTE:** To connect a USB Type-C Thunderbolt® device to your computer, you need a USB Type-C cable, purchased separately.


To see video or high-resolution display output on an external Thunderbolt device, connect the Thunderbolt device according to the following instructions:

1. Connect one end of the USB Type-C cable to the USB Type-C Thunderbolt port on the computer.



2. Connect the other end of the cable to the external Thunderbolt device.
3. Press **fn+f4** to alternate the computer screen image between 4 display states.
  - **PC screen only:** View the screen image on the computer only.
  - **Duplicate:** View the screen image simultaneously on both the computer and external device.
  - **Extend:** View the screen image extended across both the computer and external device.
  - **Second screen only:** View the screen image on the external device only.

Each time you press **fn+f4** the display state changes.

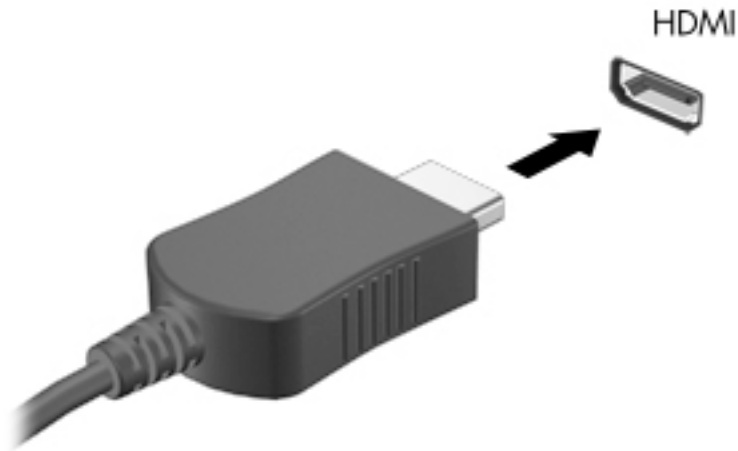
 **NOTE:** For best results, especially if you choose the "Extend" option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, select **System**, select **Display**, and then select **Advanced display settings**. Select the appropriate resolution and then select **Apply**.

## Connecting video devices using an HDMI cable (select products only)

 **NOTE:** To connect an HDMI device to your computer, you need an HDMI cable, purchased separately.

To see the computer screen image on a high-definition TV or monitor, connect the high-definition device according to the following instructions:


1. Connect one end of the HDMI cable to the HDMI port on the computer.



2. Connect the other end of the cable to the high-definition TV or monitor.
3. Press **fn+f4** to alternate the computer screen image between 4 display states:
  - **PC screen only:** View the screen image on the computer only.
  - **Duplicate:** View the screen image simultaneously on both the computer and the external device.
  - **Extend:** View the screen image extended across both the computer and the external device.
  - **Second screen only:** View the screen image on the external device only.

Each time you press **fn+f4**, the display state changes.

---

 **NOTE:** For best results, especially if you choose the "Extend" option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, select **System**, select **Display**, and then select **Advanced display settings**. Select the appropriate resolution and then select **Apply**.

---

## Setting up HDMI audio

HDMI is the only video interface that supports high-definition video and audio. After you connect an HDMI TV to the computer, you can then turn on HDMI audio by following these steps:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Playback devices**.
2. On the **Playback** tab, select the name of the digital output device.
3. Click **Set Default**, and then click **OK**.

To return the audio stream to the computer speakers:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then click **Playback devices**.
2. On the **Playback** tab, click **Speakers**.
3. Click **Set Default**, and then click **OK**.

## Discovering and connecting wired displays using MultiStream Transport

MultiStream Transport (MST) allows you to connect multiple wired display devices to your computer by connecting to the VGA or DisplayPorts on your computer and also to the VGA or DisplayPorts on a hub or an external docking station. You can connect in several ways, depending on the type of graphics controller





installed on your computer and whether or not your computer includes a built-in hub. Go to Device Manager to find out what hardware is installed on your computer.

- ▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app. A list displays all the devices installed on your computer.

## Connect displays to computers with AMD or Nvidia graphics (with an optional hub)

---

 **NOTE:** With an AMD graphics controller and optional hub, you can connect up to 6 external display devices.


 **NOTE:** With an Nvidia graphics controller and optional hub, you can connect up to 4 external display devices.

---

To set up multiple display devices, follow these steps:

1. Connect an external hub (purchased separately) to the DisplayPort on your computer, using a DP-to-DP cable (purchased separately). Be sure that the hub power adapter is connected to AC power.
2. Connect your external display devices to the VGA ports or DisplayPorts on the hub.
3. To see all of your connected display devices, type `device manager` in the taskbar search box, and then select the **Device Manager** app. If you don't see all of your connected displays, be sure that each is connected to the correct port on the hub.

---

 **NOTE:** Multiple display choices include **Duplicate**, which mirrors your computer screen on all enabled display devices, or **Extend**, which spans your computer screen across all enabled display devices.

---

## Connect displays to computers with Intel graphics (with an optional hub)

---


 **NOTE:** With an Intel graphics controller and optional hub, you can connect up to 3 display devices.

---

To set up multiple display devices, follow these steps:

1. Connect an external hub (purchased separately) to the DisplayPort on your computer, using a DP-to-DP cable (purchased separately). Be sure that the hub power adapter is connected to AC power.
2. Connect your external display devices to the VGA ports or DisplayPorts on the hub.
3. When Windows detects a monitor connected to the DP hub, the **DisplayPort Topology Notification** dialog box is displayed. Click the appropriate options to configure your displays. Multiple display choices include **Duplicate**, which mirrors your computer screen on all enabled display devices, or **Extend**, which extends the screen image across all enabled display devices.

---

 **NOTE:** If this dialog box does not appear, be sure that each external display device is connected to the correct port on the hub. For more information, select the **Start** button, select **Settings**, select **System**, select **Display**, and then select **Advanced display settings**. Select the appropriate resolution and then select **Apply**.

---

## Connect displays to computers with Intel graphics (with a built-in hub)

With your internal hub and Intel graphics controller, you can connect up to 3 display devices in the following configurations:

- Two 1920 x 1200 DP monitors connected to the computer + one 1920 x 1200 VGA monitor connected to an optional docking station
- One 2560 x 1600 DP monitor connected to the computer + one 1920 x 1200 VGA monitor connected to an optional docking station

To set up multiple display devices, follow these steps:

1. Connect your external display devices to the VGA ports or DisplayPorts (DP) on the computer base or the docking station.
2. When Windows detects a monitor connected to the DP hub, the **DisplayPort Topology Notification** dialog box is displayed. Click the appropriate options to configure your displays. Multiple display choices include **Duplicate**, which mirrors your computer screen on all enabled display devices, or **Extend**, which extends the screen image across all enabled display devices.



**NOTE:** If this dialog box does not appear, be sure that each external display device is connected to the correct port on the hub. For more information, select the **Start** button, select **Settings**, select **System**, select **Display**, and then select **Advanced display settings**. Select the appropriate resolution and then select **Apply**.

---

## Discovering and connecting to Miracast-compatible wireless displays (select products only)

---



**NOTE:** To learn what type of display you have (Miracast-compatible or Intel WiDi®), refer to the documentation that came with your TV or secondary display.

---

To discover and connect to Miracast-compatible wireless displays without leaving your current apps, follow the steps below.

To open Miracast:

- ▲ Type `project` in the taskbar search box, and then click **Project to a second screen**. Click **Connect to a wireless display**, and then follow the on-screen instructions.


---

## 6 Managing power

Your computer can operate on either battery power or external power. When the computer is running on battery power and an external power source is not available to charge the battery, it is important to monitor and conserve the battery charge.

Some power management features described in this chapter may not be available on your computer.

### Using Sleep and Hibernation

 **CAUTION:** Several well-known vulnerabilities exist when a computer is in the Sleep state. To prevent an unauthorized user from accessing data on your computer, even encrypted data, HP recommends that you always initiate Hibernation instead of Sleep anytime the computer will be out of your physical possession. This practice is particularly important when you travel with your computer.

**CAUTION:** To reduce the risk of possible audio and video degradation, loss of audio or video playback functionality, or loss of information, do not initiate Sleep while reading from or writing to a disc or an external media card.

Windows has two power-saving states, Sleep and Hibernation.

- Sleep—The Sleep state is automatically initiated after a period of inactivity. Your work is saved to memory, allowing you to resume your work very quickly. You can also initiate Sleep manually. For more information, see [Initiating and exiting Sleep on page 33](#).
- Hibernation—The Hibernation state is automatically initiated if the battery reaches a critical level. In the Hibernation state, your work is saved to a hibernation file and the computer powers down. You can also initiate Hibernation manually. For more information, see [Initiating and exiting Hibernation \(select products only\) on page 34](#).

### Initiating and exiting Sleep


You can initiate Sleep in any of the following ways:

- Close the display (select products only).
- Select the **Start** button, select the **Power** icon, and then select **Sleep**.
- Press the Sleep hot key; for example, **fn+f3** (select products only)

You can exit Sleep in any of the following ways:

- Briefly press the power button.
- If the computer is closed, raise the display (select products only).
- Press a key on the keyboard (select products only).
- Tap the TouchPad (select products only).

When the computer exits Sleep, your work returns to the screen.

 **NOTE:** If you have set a password to be required on exiting Sleep, you must enter your Windows password before your work returns to the screen.

## Initiating and exiting Hibernation (select products only)

You can enable user-initiated Hibernation and change other power settings and timeouts using Power Options.

1. Type `power options` in the taskbar search box, and then select **Power Options**.

– or –


Right-click the **Power** icon , and then select **Power Options**.

2. In the left pane, select **Choose what the power buttons do** (wording may vary by product).
3. Depending on your product, you can enable Hibernation for battery power or external power in any of the following ways:
  - **Power button**—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the power button**, and then select **Hibernate**.
  - **Sleep button** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the sleep button**, and then select **Hibernate**.
  - **Lid** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I close the lid**, and then select **Hibernate**.
  - **Power menu**—Select **Change Settings that are currently unavailable**, and then, under **Shutdown settings**, select the **Hibernate** check box.

The Power menu can be accessed by selecting the **Start** button.

4. Select **Save changes**.
  - ▲ To initiate Hibernation, use the method that you enabled in step 3.
  - ▲ To exit Hibernation, briefly press the power button.


---

 **NOTE:** If you have set a password to be required on exiting Hibernation, you must enter your Windows password before your work returns to the screen.

---

## Shutting down (turning off) the computer

---

 **CAUTION:** Unsaved information is lost when the computer shuts down. Be sure to save your work before shutting down the computer.

---

The Shut down command closes all open programs, including the operating system, and then turns off the display and the computer.

Shut down the computer when it will be unused and disconnected from external power for an extended period.

The recommended procedure is to use the Windows Shut down command.

---

 **NOTE:** If the computer is in the Sleep state or in Hibernation, first exit Sleep or Hibernation by briefly pressing the power button.


---



1. Save your work and close all open programs.
2. Select the **Start** button, select the **Power** icon, and then select **Shut down**.

If the computer is unresponsive and you are unable to use the preceding shutdown procedures, try the following emergency procedures in the sequence provided:

- Press **ctrl+alt+delete**, select the **Power** icon, and then select **Shut down**.
- Press and hold the power button for at least 10 seconds.
- If your computer has a user-replaceable battery (select products only), disconnect the computer from external power, and then remove the battery.

## Using the Power icon and Power Options


The Power icon  is located on the Windows taskbar. The Power icon allows you to quickly access power settings and view the remaining battery charge.

- To view the percentage of remaining battery charge and the current power plan, place the mouse pointer over the **Power** icon .
- To use Power Options, right-click the **Power** icon , and then select **Power Options**. You can also type `power options` in the taskbar search box, and then select **Power Options**.

Different Power icons indicate whether the computer is running on battery or external power. Placing the mouse pointer over the icon reveals a message if the battery has reached a low or critical battery level.

## Running on battery power

---

 **WARNING!** To reduce potential safety issues, use only the battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

---

When a charged battery is in the computer and the computer is not plugged into external power, the computer runs on battery power. When the computer is off and unplugged from external power, the battery in the computer slowly discharges. The computer displays a message when the battery reaches a low or critical battery level.

Computer battery life varies, depending on power management settings, programs running on the computer, screen brightness, external devices connected to the computer, and other factors.

---

 **NOTE:** When you disconnect external power, the display brightness is automatically decreased to conserve battery charge. Select computer products can switch between graphic modes to conserve battery charge.

---


## Using HP Fast Charge (select products only)

The HP Fast Charge feature allows you to quickly charge your computer battery. Charging time may vary by +/- 10%. Depending on your computer model and the HP AC adapter provided with your computer, HP Fast Charge operates in one of the following ways:

- When the remaining battery charge is between zero and 50%, the battery will charge to 50% of full capacity in no more than 30 minutes.
- When the remaining battery charge is between zero and 90%, the battery will charge to 90% of full capacity in no more than 90 minutes.

To use HP Fast Charge, shut down your computer, and then connect the AC adapter to your computer and to external power.

## Displaying battery charge

To view the percentage of remaining battery charge and the current power plan, place the mouse pointer over the **Power** icon .

## Finding battery information in HP Support Assistant (select products only)

To access battery information:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.  
– or –  
Select the question mark icon in the taskbar.
2. Select **My PC**, select the **Diagnostics and tools** tab, and then select **HP Battery Check**. If HP Battery Check indicates that your battery should be replaced, contact support.

HP Support Assistant provides the following tools and information about the battery:

- HP Battery Check
- Information about battery types, specifications, life cycles, and capacity

## Conserving battery power

To conserve battery power and maximize battery life:

- Lower the brightness of the display.
- Select the **Power saver** setting in Power Options.
- Turn off wireless devices when you are not using them.
- Disconnect unused external devices that are not plugged into an external power source, such as an external hard drive connected to a USB port.
- Stop, disable, or remove any external media cards that you are not using.
- Before you leave your work, initiate Sleep or shut down the computer.

## Identifying low battery levels

When a battery that is the sole power source for the computer reaches a low or critical battery level, the following behavior occurs:

- The battery light (select products only) indicates a low or critical battery level.

– or –

- The Power icon  shows a low or critical battery notification.



**NOTE:** For additional information about the Power icon, see [Using the Power icon and Power Options on page 35](#).

The computer takes the following actions for a critical battery level:

- If Hibernation is disabled and the computer is on or in the Sleep state, the computer remains briefly in the Sleep state and then shuts down and loses any unsaved information.
- If Hibernation is enabled and the computer is on or in the Sleep state, the computer initiates Hibernation.

## Resolving a low battery level

### Resolving a low battery level when external power is available

Connect one of the following to the computer and to external power:

- AC adapter
- Optional docking device or expansion product
- Optional power adapter purchased as an accessory from HP

### Resolving a low battery level when no power source is available


Save your work and shut down the computer.


### Resolving a low battery level when the computer cannot exit Hibernation

1. Connect the AC adapter to the computer and to external power.
2. Exit Hibernation by pressing the power button.

## User-replaceable battery

---

 **WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.


 **CAUTION:** Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

---

## Removing a user-replaceable battery

To remove the battery:

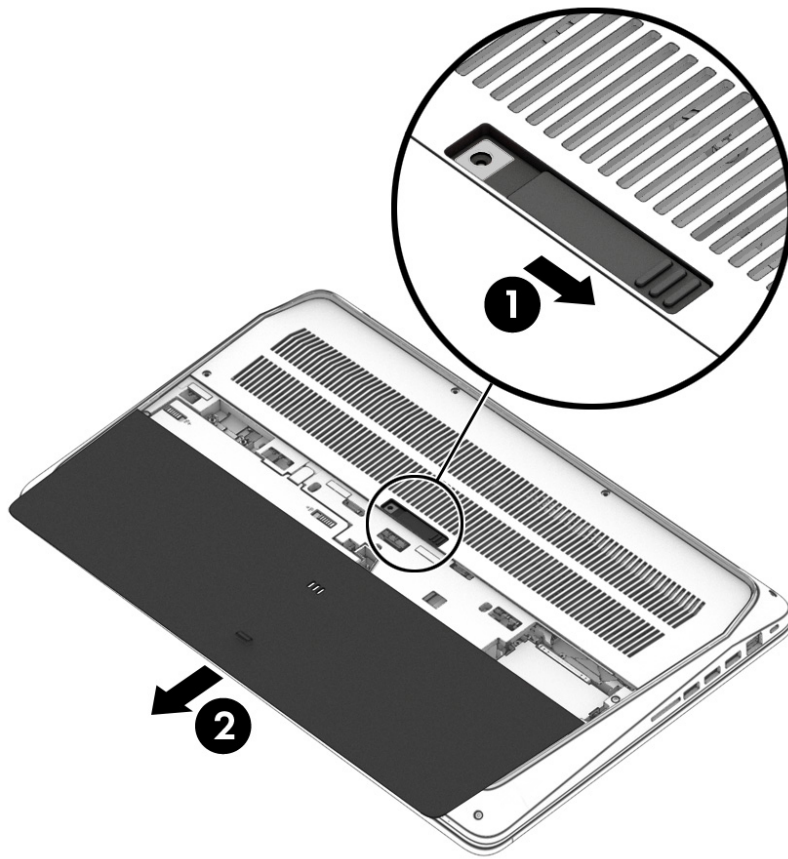
---

 **CAUTION:** Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work and shut down the computer through Windows before removing the battery.

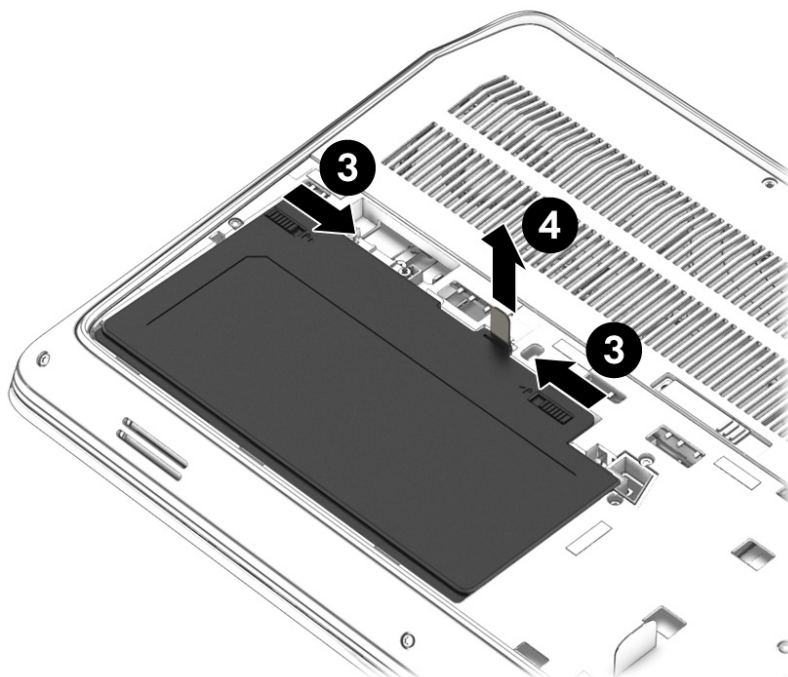
---

1. Position the computer upside down on a flat surface.

2. Slide the service door release latch **(1)**, and then remove the service door **(2)**.



3. Slide the battery release latches **(3)**, and then pull the battery tab **(4)** up to remove the battery from the computer.





## Storing a user-replaceable battery

**⚠ CAUTION:** To reduce the risk of damage to a battery, do not expose it to high temperatures for extended periods of time.

A stored battery should be checked every 6 months. If the capacity is less than 50 percent, recharge the battery before returning it to storage.

## Disposing of a user-replaceable battery

**⚠ WARNING!** To reduce the risk of fire or burns, do not disassemble, crush, or puncture; do not short external contacts; do not dispose of in fire or water.

See the *Regulatory, Safety, and Environmental Notices* for proper battery disposal.

To access this document:

- ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.

## Running on external power

For information about connecting to external power, refer to the *Setup Instructions* poster provided in the computer box.

The computer does not use battery power when the computer is connected to external power with an approved AC adapter or an optional docking device or expansion product.


**⚠ WARNING!** To reduce potential safety issues, use only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible AC adapter purchased from HP.

**⚠ WARNING!** Do not charge the computer battery while you are aboard aircraft.


Connect the computer to external power under any of the following conditions:

- When charging or calibrating a battery
- When installing or updating system software
- When updating the system BIOS
- When writing information to a disc (select products only)
- When running Disk Defragmenter on computers with internal hard drives
- When performing a backup or recovery

When you connect the computer to external power:

- The battery begins to charge.
- The screen brightness increases.
- The Power icon  changes appearance.





When you disconnect external power:

- The computer switches to battery power.
- The screen brightness automatically decreases to conserve battery charge.
- The Power icon  changes appearance.

# 7 Security

## Protecting the computer

Standard security features provided by the Windows operating system and the Windows Computer Setup utility (BIOS, which runs under any operating system) can protect your personal settings and data from a variety of risks.

-  **NOTE:** Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.
-  **NOTE:** Before you send your computer for service, back up and delete confidential files, and remove all password settings.
-  **NOTE:** Some features listed in this chapter may not be available on your computer.
-  **NOTE:** Your computer supports Computrace, which is an online security-based tracking and recovery service available in select regions. If the computer is stolen, Computrace can track the computer if the unauthorized user accesses the Internet. You must purchase the software and subscribe to the service in order to use Computrace. For information about ordering the Computrace software, go to <http://www.hp.com>.

Computer risk	Security feature
Unauthorized use of the computer	<ul style="list-style-type: none"><li>• HP Client Security software, in combination with a password, smart card, contactless card, registered fingerprints, or other authentication credential</li><li>• BIOS power-on password</li></ul>
Unauthorized access to Computer Setup (BIOS)	BIOS administrator password in Computer Setup*
Unauthorized access to the contents of a hard drive	DriveLock password (select products only) in Computer Setup*
Unauthorized startup from an optional external optical drive (select products only), optional external hard drive (select products only), or internal network adapter	Boot options feature in Computer Setup*
Unauthorized access to a Windows user account	Windows user password
Unauthorized access to data	Windows BitLocker
Unauthorized removal of the computer	Security cable slot (used with an optional security cable on select products only)

\*Computer Setup is an embedded, ROM-based utility that can be used even when the operating system is not working or will not load. You can use a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

**NOTE:** On tablets without keyboards, you can use the touch screen.

## Using passwords

A password is a group of characters that you choose to secure your computer information. Several types of passwords can be set, depending on how you want to control access to your information. Passwords can be set in Windows or in Computer Setup, which is preinstalled on the computer.

- BIOS administrator, power-on, and DriveLock passwords are set in Computer Setup and are managed by the system BIOS.
- Windows passwords are set only in the Windows operating system.
- If you forget both the DriveLock user password and the DriveLock master password set in Computer Setup, the hard drive that is protected by the passwords is permanently locked and can no longer be used.

You can use the same password for a Computer Setup feature and for a Windows security feature.

Use the following tips for creating and saving passwords:

- When creating passwords, follow requirements set by the program.
- Do not use the same password for multiple applications or websites, and do not reuse your Windows password for any other application or website.
- Use the Password Manager feature of HP Client Security to store your user names and passwords for your websites and applications. You can securely read them in the future if they cannot be remembered.
- Do not store passwords in a file on the computer.

The following tables list commonly used Windows and BIOS administrator passwords and describe their functions.

## Setting passwords in Windows

Password	Function
Administrator password*	Protects access to a Windows administrator-level account.  <b>NOTE:</b> Setting the Windows administrator password does not set the BIOS administrator password.
User password*	Protects access to a Windows user account.

\*For information about setting a Windows administrator password or a Windows user password, type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

## Setting passwords in Computer Setup

Password	Function
BIOS administrator password*	Protects access to Computer Setup.  <b>NOTE:</b> If features have been enabled to prevent removing the BIOS administrator password, you may not be able to remove it until those features have been disabled.
Power-on password	<ul style="list-style-type: none"><li>• Must be entered each time you turn on or restart the computer.</li><li>• If you forget your power-on password, you cannot turn on or restart the computer.</li></ul>
DriveLock master password*	Protects access to the internal hard drive that is protected by DriveLock, and is set under DriveLock Passwords during the enable process. This password is also used to remove DriveLock protection.
DriveLock user password*	Protects access to the internal hard drive that is protected by DriveLock, and is set under DriveLock Passwords during the enable process.

\*For details about each of these passwords, see the following topics.

## Managing a BIOS administrator password

To set, change, or delete this password, follow these steps:

### Setting a new BIOS administrator password

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    - ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    - ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Select **Security**, select **Create BIOS administrator password** or **Set Up BIOS administrator Password** (select products only), and then press **enter**.
3. When prompted, type a password.
4. When prompted, type the new password again to confirm.
5. To save your changes and exit Computer Setup, select the **Save** icon and then follow the on-screen instructions.  
  
– or –  
  
Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

### Changing a BIOS administrator password

1. Start Computer Setup.

- Computers or tablets with keyboards:
    - ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    - ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Enter your current BIOS administrator password.
  3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press **enter**.
  4. When prompted, type your current password.
  5. When prompted, type your new password.
  6. When prompted, type your new password again to confirm.
  7. To save your changes and exit Computer Setup, select the **Save** icon, and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

### Deleting a BIOS administrator password

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    - ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    - ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Enter your current BIOS administrator password.
3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press **enter**.
4. When prompted, type your current password.
5. When prompted for the new password, leave the field empty, and then press **enter**.
6. When prompted to type your new password again, leave the field empty, and then press **enter**.
7. To save your changes and exit Computer Setup, select the **Save** icon, and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Entering a BIOS administrator password

At the **BIOS administrator password** prompt, type your password (using the same kind of keys you used to set the password), and then press **enter**. After two unsuccessful attempts to enter the BIOS administrator password, you must restart the computer and try again.

## Using DriveLock Security Options

DriveLock protection prevents unauthorized access to the contents of a hard drive. DriveLock can be applied only to the internal hard drive(s) of the computer. After DriveLock protection is applied to a drive, the appropriate password must be entered to access the drive. The drive must be inserted into the computer or an advanced port replicator in order for it to be unlocked.

DriveLock Security Options offers the following features:

- **Automatic DriveLock**—See [Selecting Automatic DriveLock \(select products only\) on page 44](#).
- **Set DriveLock Master Password**—See [Selecting manual DriveLock on page 45](#).
- **Enable DriveLock**—See [Enabling DriveLock and setting a DriveLock user password on page 46](#).

## Selecting Automatic DriveLock (select products only)

A BIOS administrator password must be set before you can enable Automatic DriveLock. When Automatic DriveLock is enabled, a random DriveLock user password and a DriveLock master password derived from the BIOS administrator password are created. When the computer is turned on, the random user password automatically unlocks the drive. If the drive is moved to another computer, you must enter the BIOS administrator password for the original computer at the DriveLock password prompt to unlock the drive.

## Enabling Automatic DriveLock

To enable Automatic DriveLock, follow these steps:

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    1. Turn off the computer.
    2. Press the power button, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    1. Turn off the tablet.
    2. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. At the BIOS administrator password prompt, enter the BIOS administrator password, and then press **enter**.
3. Select **Security**, select **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
4. Use the **enter** key, left mouse click, or touch screen to select the **Automatic DriveLock** check box.
5. To save your changes and exit Computer Setup, select the **Save** icon and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

## Disabling Automatic DriveLock

To disable Automatic DriveLock, follow these steps:

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    1. Turn off the computer.
    2. Press the power button, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    1. Turn off the tablet.
    2. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. At the BIOS administrator password prompt, enter the BIOS administrator password, and then press **enter**.
3. Select **Security**, select **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
4. Select an internal hard drive, and then press **enter**.
5. Use the **enter** key, left mouse click, or touch screen to clear the **Automatic DriveLock** check box.
6. To save your changes and exit Computer Setup, select the **Save** icon, and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

## Entering an Automatic DriveLock password


While Automatic DriveLock is enabled and the drive remains attached to the original computer, you will not be prompted to enter a DriveLock password to unlock the drive. However, if the drive is moved to another computer, or the system board is replaced on the original computer, you will be prompted to provide the DriveLock password.

If this happens, at the **DriveLock Password** prompt, type the BIOS administrator password for the original computer (using the same kind of keys you used to set the password), and then press **enter** to unlock the drive.

After three incorrect attempts to enter the password, you must shut down the computer and try again.

## Selecting manual DriveLock

---

 **CAUTION:** To prevent a DriveLock-protected hard drive from becoming permanently unusable, record the DriveLock user password and the DriveLock master password in a safe place away from your computer. If you forget both DriveLock passwords, the hard drive will be permanently locked and can no longer be used.

---

To manually apply DriveLock protection to an internal hard drive, a master password must be set, and DriveLock must be enabled in Computer Setup. Note the following considerations about using DriveLock protection:

- After DriveLock protection is applied to a hard drive, the hard drive can be accessed only by entering either the DriveLock user password or the master password.
- The owner of the DriveLock user password should be the day-to-day user of the protected hard drive. The owner of the DriveLock master password may be either a system administrator or the day-to-day user.
- The DriveLock user password and the DriveLock master password can be identical.

### Setting a DriveLock master password

To set a DriveLock master password, follow these steps:

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    1. Turn off the computer.
    2. Press the power button, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    1. Turn off the tablet.
    2. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Select **Security**, make the selection for **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
3. Select the hard drive you want to protect, and then press **enter**.
4. Select **Set DriveLock Master Password**, and then press **enter**.
5. Carefully read the warning.
6. Follow the on-screen instructions to set a DriveLock master password.

---

 **NOTE:** You can enable DriveLock and set a DriveLock user password before exiting from Computer Setup. For more information, see [Enabling DriveLock and setting a DriveLock user password on page 46](#).

---

7. To exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

### Enabling DriveLock and setting a DriveLock user password

To enable DriveLock, and set a DriveLock user password, follow these steps:

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    1. Turn off the computer.
    2. Press the power button, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:



1. Turn off the tablet.
2. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Select **Security**, select **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
3. Select the hard drive you want to protect, and then press **enter**.
4. Select **Enable DriveLock** and then press **enter**.
5. Carefully read the warning.
6. Follow the on-screen instructions to set a DriveLock user password and enable DriveLock.
7. To exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

## Disabling DriveLock

1. Start Computer Setup.
  - Computers or tablets with keyboards:
    1. Turn off the computer.
    2. Press the power button, and when the HP logo appears, press **f10** to enter Computer Setup.
  - Tablets without keyboards:
    1. Turn off the tablet.
    2. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.
2. Select **Security**, select **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
3. Select the hard drive you want to manage, and then press **enter**.
4. Select **Disable DriveLock**, and then press **enter**.
5. Follow the on-screen instructions to disable DriveLock.
6. To exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

## Entering a DriveLock password

Be sure that the hard drive is inserted into the computer (not into an optional docking device or external MultiBay).

At the **DriveLock Password** prompt, type your DriveLock user or master password (using the same kind of keys you used to set the password), and then press **enter**.

After three incorrect attempts to enter the password, you must shut down the computer and try again.

## Changing a DriveLock password

To change a DriveLock password in Computer Setup, follow these steps:

1. Turn off the computer.
2. Press the power button.

3. At the **DriveLock Password** prompt, type the current DriveLock user password or master password that you are changing, press **enter**, and then press or tap **f10** to enter Computer Setup.
4. Select **Security**, select **Hard Drive Utilities**, select **DriveLock/Automatic DriveLock**, and then press **enter**.
5. Select the hard drive you want to manage, and then press **enter**.
6. Make the selection for the DriveLock password that you want to change, and then follow the on-screen instructions to enter passwords.



---

**NOTE:** The **Change DriveLock Master Password** option is visible only if the DriveLock master password was provided at the DriveLock Password prompt in step 3.

---

7. To exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

## Using Windows Hello (select products only)

On products equipped with a fingerprint reader or an infrared camera, you can use Windows Hello to sign in by swiping your finger or looking at the camera.

To set up Windows Hello, follow these steps:

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 numeric PIN, and then enroll your fingerprint or facial ID.



---

**NOTE:** The PIN is not limited in length, but it must consist of numbers only. No alphabetic or special characters are allowed.

---

## Using antivirus software

When you use the computer to access e-mail, a network, or the Internet, you potentially expose it to computer viruses. Computer viruses can disable the operating system, programs, or utilities, or cause them to function abnormally.

Antivirus software can detect most viruses, destroy them, and, in most cases, repair any damage they have caused. To provide ongoing protection against newly discovered viruses, antivirus software must be kept up to date.

Windows Defender is preinstalled on your computer. It is strongly recommended that you continue to use an antivirus program in order to fully protect your computer.

For more information about computer viruses, access the HP Support Assistant.

## Using firewall software

Firewalls are designed to prevent unauthorized access to a system or network. A firewall can be a software program you install on your computer and/or network, or it can be a solution made up of both hardware and software.


There are two types of firewalls to consider:

- Host-based firewalls—Software that protects only the computer it is installed on.
- Network-based firewalls—Installed between your DSL or cable modem and your home network to protect all the computers on the network.

When a firewall is installed on a system, all data sent to and from the system is monitored and compared with a set of user-defined security criteria. Any data that does not meet those criteria is blocked.

Your computer or networking equipment may already have a firewall installed. If not, firewall software solutions are available.

---


 **NOTE:** Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. To temporarily resolve the problem, disable the firewall, perform the task that you want to perform, and then reenable the firewall. To permanently resolve the problem, reconfigure the firewall.

---

## Installing software updates

HP, Windows, and third-party software installed on your computer should be regularly updated to correct security problems and improve software performance.

---

 **IMPORTANT:** Microsoft sends out alerts regarding Windows updates, which may include security updates. To protect the computer from security breaches and computer viruses, install all updates from Microsoft as soon as you receive an alert.

---

You can install these updates automatically.

To view or change the settings:

1. Select the **Start** button, select **Settings**, and then select **Update & Security**.
2. Select **Windows Update**, and then follow the on-screen instructions.
3. To schedule a time for installing updates, select **Advanced Options**, and then follow the on-screen instructions.

## Using HP Client Security (select products only)

HP Client Security software is preinstalled on your computer. This software can be accessed through the HP Client Security icon at the far right of the taskbar or Windows Control Panel. It provides security features that help protect against unauthorized access to the computer, networks, and critical data. For more information, see the HP Client Security software Help.

## Using HP Touchpoint Manager (select products only)

HP Touchpoint Manager is a cloud-based IT solution that enables businesses to effectively manage and secure their company assets. HP Touchpoint Manager helps protect devices against malware and other attacks, monitors device health, and enables customers to reduce time spent solving end-user device and security issues. Customers can quickly download and install the software, which is highly cost effective relative to traditional in-house solutions. For more information, see <http://www.hptouchpointmanager.com>.

## Using an optional security cable (select products only)

A security cable (purchased separately) is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. To connect a security cable to your computer, follow the device manufacturer's instructions.

## Using a fingerprint reader (select products only)

Integrated fingerprint readers are available on select products. In order to use the fingerprint reader, you must enroll your fingerprints in HP Client Security's Credential Manager. Refer to the HP Client Security software Help.

After you enroll your fingerprints in Credential Manager, you can use HP Client Security's Password Manager to store and fill in your user names and passwords in supported websites and applications.

### Locating the fingerprint reader

The fingerprint reader is a small metallic sensor that is located in one of the following areas of your computer:

- Near the bottom of the TouchPad
- On the right side of the keyboard
- On the upper-right side of the display
- On the left side of the display
- On the back of the display

Depending on your product, the reader may be oriented horizontally or vertically.

---

# 8 Maintenance

It is important to perform regular maintenance to keep your computer in optimal condition. This chapter explains how to use tools like Disk Defragmenter and Disk Cleanup. It also provides instructions for updating programs and drivers, steps to clean the computer, and tips for traveling with (or shipping) the computer.

## Improving performance

You can improve the performance of your computer by performing regular maintenance tasks with tools such as Disk Defragmenter and Disk Cleanup.

### Using Disk Defragmenter

HP recommends using Disk Defragmenter to defragment your hard drive at least once a month.

---

 **NOTE:** It is not necessary to run Disk Defragmenter on solid-state drives.

---

To run Disk Defragmenter:

1. Connect the computer to AC power.
2. Type `defragment` in the taskbar search box, and then select **Defragment and optimize your drives**.
3. Follow the on-screen instructions.

For additional information, access the Disk Defragmenter software Help.

### Using Disk Cleanup

Use Disk Cleanup to search the hard drive for unnecessary files that you can safely delete to free up disk space and help the computer run more efficiently.

To run Disk Cleanup:

1. Type `disk` in the taskbar search box, and then select **Disk Cleanup**.
2. Follow the on-screen instructions.


### Using HP 3D DriveGuard (select products only)


HP 3D DriveGuard protects a hard drive by parking the drive and halting data requests under either of the following conditions:

- You drop the computer.
- You move the computer with the display closed while the computer is running on battery power.

A short time after the end of one of these events, HP 3D DriveGuard returns the hard drive to normal operation.

---

 **NOTE:** Only internal hard drives are protected by HP 3D DriveGuard. A hard drive installed in an optional docking device or connected to a USB port is not protected by HP 3D DriveGuard.

 **NOTE:** Because solid-state drives (SSDs) lack moving parts, HP 3D DriveGuard is unnecessary for these drives.

---

For more information, see the HP 3D DriveGuard software Help.

## Identifying HP 3D DriveGuard status

The hard drive light on the computer changes color to show that the drive in a primary hard drive bay and/or the drive in a secondary hard drive bay (select products only) is parked. To determine whether a drive is currently protected or whether it is parked, view the icon on the Windows desktop in the notification area, at the far right of the taskbar.

## Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis. Updates can resolve issues and bring new features and options to your computer. For example, older graphics components might not work well with the most recent gaming software. Without the latest driver, you would not be getting the most out of your equipment.

Go to <http://www.hp.com/support> to download the latest versions of HP programs and drivers. In addition, register to receive automatic notifications when updates become available.

If you would like to update your programs and drivers, follow these instructions:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.  
– or –  
Click the question mark icon in the taskbar.
2. Select **My PC**, select the **Updates** tab, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.

## Cleaning your computer

Use the following products to safely clean your computer:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration (for example, disposable wipes, which come in a variety of brands)
- Alcohol-free glass-cleaning fluid
- Solution of water and mild soap
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

---

**⚠ CAUTION:** Avoid strong cleaning solvents that can permanently damage your computer. If you are not sure that a cleaning product is safe for your computer, check the product contents to make sure that ingredients such as alcohol, acetone, ammonium chloride, methylene chloride, and hydrocarbons are not included in the product.

---

Fibrous materials, such as paper towels, can scratch the computer. Over time, dirt particles and cleaning agents can get trapped in the scratches.

## Cleaning procedures

Follow the procedures in this section to safely clean your computer.

---

**⚠ WARNING!** To prevent electric shock or damage to components, do not attempt to clean your computer while it is on.

1. Turn off the computer.
2. Disconnect AC power.
3. Disconnect all powered external devices.

**⚠ CAUTION:** To prevent damage to internal components, do not spray cleaning agents or liquids directly on any computer surface. Liquids dripped on the surface can permanently damage internal components.

---

## Cleaning the display

Gently wipe the display using a soft, lint-free cloth moistened with an alcohol-free glass cleaner. Be sure that a display is dry before you close the computer.

## Cleaning the sides or cover

To clean the sides or cover, use a soft microfiber cloth or chamois moistened with one of the cleaning solutions listed previously, or use an acceptable disposable wipe.

**📝 NOTE:** When cleaning the cover of the computer, use a circular motion to aid in removing dirt and debris.

---

## Cleaning the TouchPad, keyboard, or mouse (select products only)

**⚠ WARNING!** To reduce the risk of electric shock or damage to internal components, do not use a vacuum cleaner attachment to clean the keyboard. A vacuum cleaner can deposit household debris on the keyboard surface.

**⚠ CAUTION:** To prevent damage to internal components, do not allow liquids to drip between the keys.

---

- To clean the TouchPad, keyboard, or mouse, use a soft microfiber cloth or a chamois moistened with one of the cleaning solutions listed previously or use an acceptable disposable wipe.
- To prevent keys from sticking and to remove dust, lint, and particles from the keyboard, use a can of compressed air with a straw extension.

## Traveling with or shipping your computer

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

- Prepare the computer for traveling or shipping:
  - Back up your information to an external drive.
  - Remove all discs and all external media cards, such as memory cards.
  - Turn off and then disconnect all external devices.
  - Shut down the computer.
- Take along a backup of your information. Keep the backup separate from the computer.
- When traveling by air, carry the computer as hand luggage; do not check it in with the rest of your luggage.

**⚠ CAUTION:** Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. Airport conveyer belts and similar security devices that check carry-on baggage use X-rays instead of magnetism and do not damage drives.

---

- If you plan to use the computer during a flight, listen for the in-flight announcement that tells you when you are allowed to use your computer. In-flight computer use is at the discretion of the airline.
- If you are shipping the computer or a drive, use suitable protective packaging and label the package “FRAGILE.”
- The use of wireless devices may be restricted in some environments. Such restrictions may apply aboard aircraft, in hospitals, near explosives, and in hazardous locations. If you are uncertain of the policy that applies to the use of a wireless device in your computer, ask for authorization to use your computer before you turn it on.
- If you are traveling internationally, follow these suggestions:
  - Check the computer-related customs regulations for each country or region on your itinerary.
  - Check the power cord and adapter requirements for each location in which you plan to use the computer. Voltage, frequency, and plug configurations vary.

---

 **WARNING!** To reduce the risk of electric shock, fire, or damage to the equipment, do not attempt to power the computer with a voltage converter kit sold for appliances.

---



# 9 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most products.


- Creating recovery media and backups
- Restoring and recovering your system

For additional information, refer to the HP Support Assistant app.

- ▲ Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Select the question mark icon in the taskbar.

 **IMPORTANT:** If you will be performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

## Creating recovery media and backups

The following methods of creating recovery media and backups are available on select products only. Choose the available method according to your computer model.

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see [Creating HP Recovery media \(select products only\) on page 55](#). For information on the recovery options that are available using the recovery media, see [Using Windows tools on page 56](#).
- Use Windows tools to create system restore points and create backups of personal information.

For more information, see [Recovering using HP Recovery Manager on page 57](#).

 **NOTE:** If storage is 32 GB or less, Microsoft System Restore is disabled by default.

## Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. From the **Start** menu, select **File Explorer**, and then select **This PC**.

- If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.

You can use Windows tools to create system restore points and create backups of personal information, see [Using Windows tools on page 56](#).

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.
  - Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
  - HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
  - To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
  - If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.
  - Be sure that the computer is connected to AC power before you begin creating the recovery media.
  - The creation process can take an hour or more. Do not interrupt the creation process.
  - If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:



---

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

---

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 57](#).

## Using Windows tools

You can create recovery media, system restore points, and backups of personal information using Windows tools.



---

**NOTE:** If storage is 32 GB or less, Microsoft System Restore is disabled by default.

---

For more information and steps, see the Get started app.

- ▲ Select the **Start** button, and then select the **Get started** app.

# Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:



**IMPORTANT:** Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get started app.
  - ▲ Select the **Start** button, and then select the **Get started** app.
- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.
  - ▲ Type `recovery` in the taskbar search box, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.
- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 57](#). If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 55](#).
- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 57](#).
- On select products, if you want to remove the Recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition \(select products only\) on page 60](#).

## Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 55](#).

### What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.




**IMPORTANT:** Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 55](#).
- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 55](#).
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.

---

 **IMPORTANT:** HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you want to retain.

---

Using HP Recovery media, you can choose from one of the following recovery options:

---

 **NOTE:** Only the options available for your computer display when you start the recovery process.

---

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.


The HP Recovery partition (select products only) allows System Recovery only.

## Using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:

---

 **IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).

---

1. Type `recovery` in the taskbar search box, select **Recovery Manager**, and then select **HP Recovery Environment**.

– or –

For computers or tablets with keyboards attached, press **f11** while the computer boots, or press and hold **f11** as you press the power button.

For tablets without keyboards:

- Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f11**.

– or –

- Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f11**.

2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

## Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.

---

 **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 59](#).

---

3. Follow the on-screen instructions.

## Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive.

To change the boot order:



---

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

---

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.

For computers or tablets with keyboards attached:

- ▲ Turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.

For tablets without keyboards:

- ▲ Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f9**.

– or –

Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f9**.

3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

## Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.



**IMPORTANT:** After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see [Creating HP Recovery media \(select products only\) on page 55](#).



**NOTE:** The Remove Recovery Partition option is only available on products that support this function.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

---

# 10 Computer Setup (BIOS), TPM, and HP Sure Start

## Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.



**NOTE:** Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

---

## Starting Computer Setup

- ▲ Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.

## Using a USB keyboard or USB mouse to start Computer Setup (BIOS)

You can start Computer Setup by using a keyboard or mouse connected to a USB port, but you must first disable FastBoot.

1. Turn on or restart the computer, and when the HP logo appears, press **f9** to enter the Boot Device Options menu.
2. Clear the check box for **Fast Boot**.
3. To save your changes and exit, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to select the item.
- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
- To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes:  
Select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.  
– or –  
Select **Main**, select **Ignore Changes and Exit**, and then press **enter**.
- To save your changes and exit Computer Setup menus:  
Select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.  
– or –  
Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Restoring factory settings in Computer Setup

---


 **NOTE:** Restoring defaults will not change the hard drive mode.

---

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Start Computer Setup. See [Starting Computer Setup on page 61](#).
2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

---

 **NOTE:** On select products, the selections may display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

---

3. Follow the on-screen instructions.
4. To save your changes and exit, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.  
– or –  
Select **Main**, select **Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

---

 **NOTE:** Your password settings and security settings are not changed when you restore the factory settings.

---

## Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named *Readme.txt*, which contains information regarding installing and troubleshooting the file.

## Determining the BIOS version

To decide whether you need to update Computer Setup (BIOS), first determine the BIOS version on your computer.

BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed by pressing **fn+esc** (if you are already in Windows) or by using Computer Setup.



1. Start Computer Setup. See [Starting Computer Setup on page 61](#).
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.


– or –

Select **Main**, select **Ignore Changes and Exit**, and then press [enter](#).

To check for later BIOS versions, see [Downloading a BIOS update on page 63](#).

## Downloading a BIOS update

---

 **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

---

1. Type `support` in the taskbar search box, and then select the HP Support Assistant app.  
– or –  
Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
  - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
  - b. Follow the on-screen instructions to download your selection to the hard drive.  
  
Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.



**NOTE:** If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

---

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an `.exe` extension (for example, *filename.exe*).  
  
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.



---

**NOTE:** After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

---

## Changing the boot order using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Access the Boot Device Options menu:
  - Turn on or restart the computer, and when the HP logo appears, press **f9** to enter the Boot Device Options menu.
2. Select a boot device, press **enter**, and then follow the on-screen instructions.

## TPM BIOS settings (select products only)



---

**IMPORTANT:** Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation/usage of TPM which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

---

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).



---

**NOTE:** If you change the TPM setting to Hidden, TPM is not visible in the operating system.

---

To access TPM settings in Computer Setup:

1. Start Computer Setup. See [Starting Computer Setup on page 61](#).
2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

## Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.

HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

To access the latest documentation on HP Sure Start, go to <http://www.hp.com/support>. Select **Find your product**, and then follow the on-screen instructions.


---

# 11 Using HP PC Hardware Diagnostics (UEFI)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

When HP PC Hardware Diagnostics (UEFI) detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.

---

 **NOTE:** To start diagnostics on a convertible computer, your computer must be in notebook mode and you must use the keyboard attached.

---

To start HP PC Hardware Diagnostics (UEFI), follow these steps:

1. Turn on or restart the computer, and quickly press **esc**.
2. Press **f2**.

The BIOS searches three places for the diagnostic tools, in the following order:

- a. Connected USB drive

---

 **NOTE:** To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 65](#).

---

- b. Hard drive
  - c. BIOS
3. When the diagnostic tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.


---

 **NOTE:** If you need to stop a diagnostic test, press **esc**.

---

## Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

---

 **NOTE:** The HP PC Hardware Diagnostics (UEFI) download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are offered.

---

There are two options to download HP PC Hardware Diagnostics to a USB device.

### Download the latest UEFI version

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. In the HP PC Hardware Diagnostics section, select the **Download** link, and then select **Run**.

### Download any version of UEFI for a specific product

1. Go to <http://www.hp.com/support>.
2. Select **Get software and drivers**.

3. Enter the product name or number.

– or –

Select **Identify now** to let HP automatically detect your product.

4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

# 12 Specifications

## Input power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. The voltage and current for your computer is located on the regulatory label.

Input Power	Rating
Operating voltage and current	19.5 V dc @ 10.3 A – 200 W



**NOTE:** This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.

## Operating environment

Factor	Metric	U.S.
<b>Temperature</b>		
Operating (writing to optical disc)	<b>5°C to 35°C</b>	41°F to 95°F
Nonoperating	<b>-20°C to 60°C</b>	-4°F to 140°F
<b>Relative humidity (noncondensing)</b>		
Operating	<b>10% to 90%</b>	10% to 90%
Nonoperating	<b>5% to 95%</b>	5% to 95%
<b>Maximum altitude (unpressurized)</b>		
Operating	<b>-15 m to 3,048 m</b>	-50 ft to 10,000 ft
Nonoperating	<b>-15 m to 12,192 m</b>	-50 ft to 40,000 ft

---

# 13 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.

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.

---


# 14 Accessibility

HP designs, produces, and markets products and services that can be used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices. To access the latest information on HP accessibility, go to <http://www.hp.com/accessibility>.

## Supported assistive technologies

HP products support a wide variety of operating system assistive technologies and can be configured to work with additional assistive technologies. Use the Search feature on your device to locate more information about assistive features.

---


 **NOTE:** For additional information about a particular assistive technology product, contact customer support for that product.

---

## Contacting support

We are constantly refining the accessibility of our products and services and welcome feedback from users. If you have an issue with a product or would like to tell us about accessibility features that have helped you, please contact us at +1 (888) 259-5707, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time. If you are deaf or hard-of-hearing and use TRS/VRS/WebCapTel, contact us if you require technical support or have accessibility questions by calling +1 (877) 656-7058, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time.

---

 **NOTE:** Support is in English only.

---

# Index

- A**
  - accessibility 69
  - administrator password 41
  - airplane mode key 17
  - antivirus software 48
  - Audio 28
  - audio-out (headphone)/audio-in (microphone) combo jack, identifying 3
  - Automatic DriveLock
    - disabling 45
    - enabling 44
  - Automatic Drivelock 44
  - Automatic DriveLock password entering 45
- B**
  - backups 55
  - battery
    - conserving power 36
    - discharging 36
    - disposing 39
    - finding information 36
    - low battery levels 36
    - resolving low battery level 37
    - storing 39
    - user-replaceable 37
    - user-replaceable, removing 37
  - battery charge 36
  - battery information, finding 36
  - battery light 4, 14
  - battery power 35
  - battery temperature 39
  - BIOS
    - determining version 62
    - downloading an update 63
    - updating 62
  - Bluetooth device 17, 19
  - Bluetooth label 15
  - boot order
    - changing 59
    - changing using the f9 prompt 64
  - bottom 15
- buttons
  - center pointing stick 7
  - center TouchPad 7
  - left TouchPad 7
  - power 9
  - right pointing stick 7
  - right TouchPad 7
  - TouchPad on/off 7
- C**
  - caps lock light, identifying 8
  - caring for your computer 52
  - cleaning your computer 52
  - components
    - bottom 13
    - display 6
    - front 14
    - left side 5
    - right side 3
    - top 7
  - Computer Setup
    - BIOS administrator password 42
    - navigating and selecting 61
    - restoring factory settings 62
    - using a USB keyboard or USB mouse to start Computer Setup 61
  - computer setup 61
  - computer, traveling 39
  - connecting to a WLAN 18
  - connector, power 4
  - corporate WLAN connection 18
  - critical battery level 37
- D**
  - Disk Cleanup software 51
  - Disk Defragmenter software 51
  - drive light 14
  - DriveLock
    - description 45
    - disabling 47
    - enabling 46
  - DriveLock master password changing 47
- DriveLock password
  - changing 47
  - entering 47
  - setting 46
- E**
  - electrostatic discharge 68
  - esc key, identifying 11
  - external monitor port 4
  - external power, using 39
- F**
  - fingerprint reader 50
  - fingerprint reader, identifying 10
  - fingerprints, registering 48
  - firewall software 48
  - fn key, identifying 11
  - four-finger tap TouchPad gesture 25
  - function keys, identifying 11
- G**
  - GPS 19
- H**
  - hard drive, identifying 13
  - HDMI port
    - connecting 29
  - HDMI port, identifying 4
  - HDMI, configuring audio 30
  - headphones, connecting 27
  - headsets, connecting 28
  - Hibernation
    - exiting 34
    - initiated during critical battery level 37
    - initiating 34
  - high-definition devices, connecting 29, 32
  - hot keys
    - microphone mute 12
    - using 12
  - HP 3D DriveGuard 51
  - HP Client Security 49
  - HP Fast Charge 35



HP LAN-WLAN Protection 21  
HP MAC Address Manager 22  
HP Mobile Connect 19  
HP PC Hardware Diagnostics (UEFI)  
using 65  
HP Recovery Manager  
correcting boot problems 59  
starting 58  
HP Recovery media  
creating 55  
recovery 58  
HP Recovery partition  
recovery 58  
removing 60  
HP resources 2  
HP Touchpoint Manager 49

## I

initiating Sleep and Hibernation 33  
input power 67  
integrated numeric keypad,  
identifying 11, 26  
integrated webcam light,  
identifying 6  
internal microphones, identifying 6

## J

jacks  
audio-out (headphone)/audio-in  
(microphone) combo 3  
network 5  
RJ-45 (network) 5

## K

keyboard and optional mouse  
using 26  
keypad  
integrated numeric 11  
keys  
esc 11  
fn 11  
Windows key 11

## L

labels  
Bluetooth 15  
regulatory 15  
serial number 15  
service 15  
wireless certification 15  
WLAN 15

left pointing stick button,  
identifying 7  
lights  
battery 4, 14  
caps lock 8  
drive 14  
microphone mute 8  
num lock 8  
power 8, 14  
RJ-45 (network) 5  
TouchPad 8  
webcam 6  
wireless 8, 14  
locating information  
hardware 3  
software 3  
low battery level 36

## M

maintenance  
Disk Cleanup 51  
Disk Defragmenter 51  
HP 3D DriveGuard 51  
updating programs and drivers  
52  
managing power 33  
memory card reader, identifying 5  
memory module  
identifying 13  
microphone mute key, identifying  
12  
microphone mute light, identifying  
8  
minimized image recovery 58  
minimized image, creating 57  
Miracast 32

## N

network jack, identifying 5  
NFC 19  
num lock key, identifying 26  
num lock light 8

## O

one-finger slide touch screen  
gesture 25  
operating environment 67  
original system recovery 57

## P

passwords  
administrator 41  
BIOS administrator 42  
user 41  
pointing stick 7  
ports  
external monitor 4  
HDMI 4, 29  
Miracast 32  
USB 3.0 charging (powered) 5  
USB Type-C (Thunderbolt-  
enabled) 4  
USB Type-C Thunderbolt 29  
power  
battery 35  
external 39  
power button, identifying 9  
power connector, identifying 4  
Power icon, using 35  
power lights 8, 14  
power settings, using 35  
product name and number,  
computer 15  
public WLAN connection 18

## R

recover  
options 57  
recovery  
discs 56, 58  
HP Recovery Manager 57  
media 58  
starting 58  
supported discs 56  
system 57  
USB flash drive 58  
using HP Recovery media 56  
recovery media  
creating 55  
creating using HP Recovery  
Manager 56  
recovery partition  
removing 60  
regulatory information  
regulatory label 15  
wireless certification labels 15  
removing, user-replaceable battery  
37  
RJ-45 (network) jack, identifying 5

RJ-45 (network) lights, identifying 5

## S

security cable slot, identifying 5  
serial number 15  
serial number, computer 15  
service labels, locating 15  
setup utility  
    navigating and selecting 61  
    restoring factory settings 62  
shipping the computer 53  
shutdown 34  
SIM card  
    inserting 16  
Sleep  
    exiting 33  
    initiating 33  
Sleep and Hibernation  
    initiating 33  
slots  
    security cable 5  
    smart card 3  
smart card  
    slot 3  
software  
    antivirus 48  
    Disk Cleanup 51  
    Disk Defragmenter 51  
    firewall 48  
    HP 3D DriveGuard 51  
software updates, installing 49  
sound settings, using 28  
speakers  
    connecting 27  
speakers, identifying 14  
spill drain, identifying 13  
storing a battery 39  
supported discs, recovery 56  
Sure Start  
    using 64  
system recovery 57  
system restore point  
    creating 56  
system restore point, creating 55

## T

tap TouchPad and touch screen  
    gesture 23  
temperature 39

three-finger swipe TouchPad  
    gesture 25  
Thunderbolt  
    connecting USB Type-C 29  
touch screen gestures  
    one-finger slide 25  
TouchPad  
    buttons 7  
    using 23  
TouchPad and touch screen gestures  
    tap 23  
    two-finger pinch zoom 24  
TouchPad gestures  
    four-finger tap 25  
    three-finger swipe 25  
    two-finger scroll 24  
    two-finger tap 24  
TouchPad light, identifying 8  
TouchPad on/off button,  
    identifying 7  
TouchPad zone  
    identifying 7  
TPM settings 64  
traveling with the computer 15, 39,  
    53  
turning off the computer 34  
two-finger pinch zoom TouchPad and  
    touch screen gesture 24  
two-finger scroll TouchPad gesture  
    24  
two-finger tap TouchPad gesture 24

## U

unresponsive system 34  
updating programs and drivers 52  
USB 3.0 charging (powered),  
    identifying 5  
USB 3.0 port 4, 5  
USB ports, identifying 4, 5  
USB Type-C (Thunderbolt-3-enabled)  
    port, identifying 4  
USB Type-C port, connecting 29  
user password 41  
user-replaceable battery 37  
using external external power 39  
using Power icon 35  
using power settings 35  
using sound settings 28  
using the integrated numeric  
    keypad 26

using the keyboard and optional  
    mouse 26  
using the TouchPad 23

## V

vents, identifying 13  
video 28

## W

webcam 6  
    using 27  
webcam light, identifying 6  
webcam, identifying 6  
Windows  
    system restore point 55, 56  
Windows Hello  
    using 48  
Windows key, identifying 11  
Windows tools  
    using 56  
wireless antennas, identifying 6  
wireless button 17  
wireless certification label 15  
wireless controls  
    button 17  
    operating system 17  
wireless key 17  
wireless light 8, 14, 17  
wireless network (WLAN)  
    connecting 18  
    corporate WLAN connection 18  
    functional range 18  
    public WLAN connection 18  
WLAN antennas, identifying 6  
WLAN device 15  
WLAN label 15  
WWAN antennas, identifying 6  
WWAN device 17, 18