

Wireless (Select Models Only)
User Guide

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Product notice

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

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1 About integrated wireless devices

Wireless technology transfers data across radio waves instead of wires. Your computer may be equipped with one or more of the following wireless devices:

- **Wireless local area network (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, each mobile wireless device communicates with a wireless router or a wireless access point.
- **HP Broadband Wireless Module**—A wireless wide area network (WWAN) device that provides access to information wherever mobile network operator service is available. In a WWAN, each mobile device communicates to a mobile network operator's base station. Mobile network operators install networks of 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 m (33 ft) of each other.

2 Using the wireless controls


You can control the wireless devices in your computer using these methods:

- Wireless button or wireless switch (referred to in this guide as the wireless button)
- Wireless Assistant software (select models only)
- Operating system controls


Using the wireless button ⁽¹⁾

The computer has a wireless button, one or more wireless devices, and one or two wireless lights, depending on the model. All of the wireless devices on your computer are enabled at the factory, so the wireless light is on (blue) when you turn on the computer.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices. If the wireless light is blue, at least one wireless device is on. If the wireless light is off, all wireless devices are off.


 **NOTE:** On some models, the wireless light is amber when all wireless devices are turned off.

Because the wireless devices are enabled at the factory, you can use the wireless button to turn on or turn off the wireless devices simultaneously. Individual wireless devices can be controlled through Wireless Assistant software (select models only) or through Computer Setup.

 **NOTE:** If the wireless devices are disabled by Computer Setup, the wireless button will not work until you reenables your devices.

Using Wireless Assistant software (select models only)

A wireless device can be turned on or off using the Wireless Assistant software. If a wireless device is disabled by Computer Setup, it must be reenabled by Computer Setup before it can be turned on or off using Wireless Assistant.

 **NOTE:** Enabling or turning on a wireless device does not automatically connect the computer to a network or a Bluetooth-enabled device.

To view the state of the wireless devices, click the Wireless Assistant icon  in the Windows® Mobility Center.

For more information, refer to the Wireless Assistant online Help:


1. Open Wireless Assistant by clicking the icon in the Windows Mobility Center.
2. Click the **Help** button.

Using operating system controls


Some operating systems also offer a way to manage integrated wireless devices and the wireless connection. For more information, refer to the user guide for your operating system.

3 Using WLAN devices (select models only)

With a WLAN device, you can access a wireless local area network, which is composed of other computers and accessories that are linked by a wireless router or a wireless access point.


 **NOTE:** The terms *wireless router* and *wireless access point* are often used interchangeably.

- A large-scale WLAN, such as a corporate or public WLAN, typically uses wireless access points that can accommodate a large number of computers and accessories and can separate critical network functions.
- A home or small office WLAN typically uses a wireless router, which allows several wireless and wired computers to share an Internet connection, a printer, and files without requiring additional pieces of hardware or software.

 **NOTE:** To use the WLAN device in your computer, you must connect to a WLAN infrastructure (provided through a service provider or a public or corporate network).

Computers with WLAN devices support one or more of the following IEEE industry standards:

- 802.11b, the first popular standard, supports data rates of up to 11 Mbps and operates at a frequency of 2.4 GHz.
- 802.11g supports data rates of up to 54 Mbps and operates at a frequency of 2.4 GHz. An 802.11g WLAN device is backward compatible with 802.11b devices, so they can operate on the same network.
- 802.11a supports data rates of up to 54 Mbps and operates at a frequency of 5 GHz.

 **NOTE:** 802.11a is not compatible with 802.11b and 802.11g.

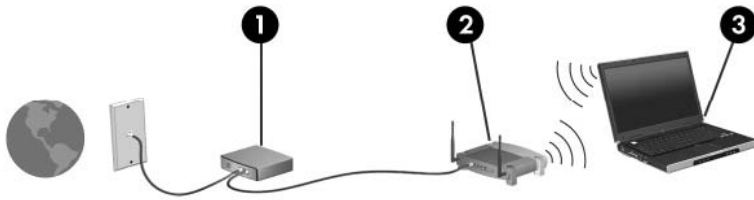
- 802.11n supports data rates of up to 270 Mbps and may operate at 2.4 GHz or 5 GHz, making it backward compatible with 802.11a, b, and g.

Setting up a WLAN

To set up a WLAN and connect to the Internet, you need the following equipment:

- A broadband modem (either DSL or cable) **(1)** and high-speed Internet service purchased from an Internet service provider (ISP)
- A wireless router (purchased separately) **(2)**
- The wireless computer **(3)**

The illustration below shows an example of a wireless network installation that is connected to the Internet.




As your network grows, additional wireless and wired computers can be connected to the network to access the Internet.

For help in setting up your WLAN, refer to the information provided by your router manufacturer or your ISP.

Connecting to a WLAN


To connect to the WLAN, follow these steps:


1. Verify that the WLAN device is turned on. If it is on, the wireless light is on. If the wireless light is off, press the wireless button.

 **NOTE:** On some models, the wireless light is amber when all wireless devices are turned off.

2. Open Connect to a Network by clicking the **Start** button, and then clicking **Connect to**.

3. Select your wireless network in the list, and then type the network security key, if required.

 **NOTE:** If you don't see the network you want to connect to, click **Set up a connection or network**. A list of options will appear that includes manually searching for and connecting to a network, as well as creating a new network connection.

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

More information about using a WLAN is available through the following resources:

- Information from your ISP and the user guide included with your wireless router and other WLAN equipment
- Information and Web site links provided in Help and Support

For a list of public WLANs near you, contact your ISP or search the Web. Web sites that list public WLANs include Cisco Internet Mobile Office Wireless Locations, Hotspotlist, and Geektools. Check with each public WLAN location for cost and connection requirements.

For additional information on connecting your computer to a corporate WLAN, contact your network administrator or IT department.

Using wireless security features

When you set up a WLAN or access an existing WLAN, always enable security features to protect your network from unauthorized access. The most common security levels are Wi-Fi Protected Access (WPA)-Personal and Wired Equivalent Privacy (WEP).


When setting up a network, you should use one or more of the following security measures:

- Enable WPA-Personal or WEP security encryption on the router.
- Change the default network name (SSID) and password.
- Use a firewall.
- Set security on your Web browser.

For more information about WLAN security, see the HP Web site at <http://www.hp.com/go/wireless> (English only).

Identifying a WLAN device

If you have a problem connecting to a wireless network, confirm that the integrated WLAN device is properly installed on your computer:

 **NOTE:** Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing applications, running utilities, or changing Windows settings. Refer to Windows online Help for more information.

1. Select **Start > Computer > System properties**.
2. In the left pane, click **Device Manager**.
3. Identify the WLAN device from the Network adapters list. The listing for a WLAN device may include the term *wireless*, *wireless LAN*, *WLAN*, or *802.11*.

If no WLAN device is listed, either your computer does not have an integrated WLAN device, or the driver for the WLAN device is not properly installed.

4 Using HP Broadband Wireless (select models only)

HP Broadband Wireless enables your computer to access the Internet from more places and over larger areas than WLANs. Using HP Broadband Wireless requires a network service provider (called a *mobile network operator*), which in most cases will be a mobile phone network operator. Coverage for HP Broadband Wireless is similar to mobile phone voice coverage.

When used with mobile network operator service, HP Broadband Wireless gives you the freedom to stay connected to the Internet, send e-mail, or connect to your corporate network whether you are on the road or outside the range of Wi-Fi hotspots.

HP offers two types of broadband wireless modules:

- The HSDPA (High Speed Downlink Packet Access) module provides access to networks based on the Global System for Mobile Communications (GSM) telecommunications standard.
- The EV-DO (Evolution Data Optimized) module provides access to networks based on the code division multiple access (CDMA) telecommunications standard.

To identify which type of broadband wireless module is provided with your computer, refer to the label located inside the battery bay.

- A label that includes an IMEI (International Mobile Equipment Identity) code indicates that your computer includes the HSDPA module.
- A label that includes an ESN (electronic serial number) indicates that your computer includes the EV-DO module.

A subscriber identity module (SIM) is required if your computer uses the HP Broadband Wireless Module with HSDPA technology. A SIM contains basic information about you, such as a PIN (personal identification number), as well as network information. If your computer includes a SIM, the serial number, or Integrated Circuit Card Identifier (ICCID), is located on the label inside the battery bay.

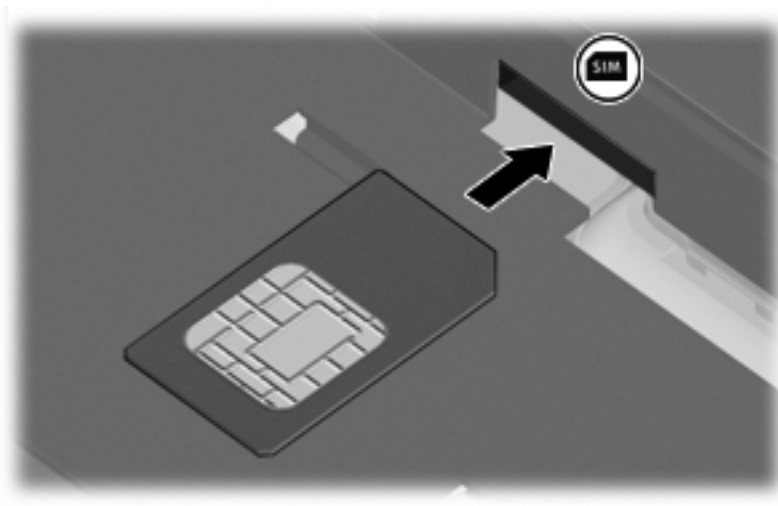
For information on HP Broadband Wireless and how to activate service with a preferred mobile network operator, refer to the broadband wireless information included with your computer. For additional information, see the HP Web site at <http://www.hp.com/go/broadbandwireless>.

Inserting a SIM

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

To insert a SIM:

1. Shut down the computer. If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.
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, with the battery bay toward you.
6. Remove the battery.
7. Insert the SIM into the SIM slot, and gently push the SIM into the slot until it is firmly seated.



8. Replace the battery.



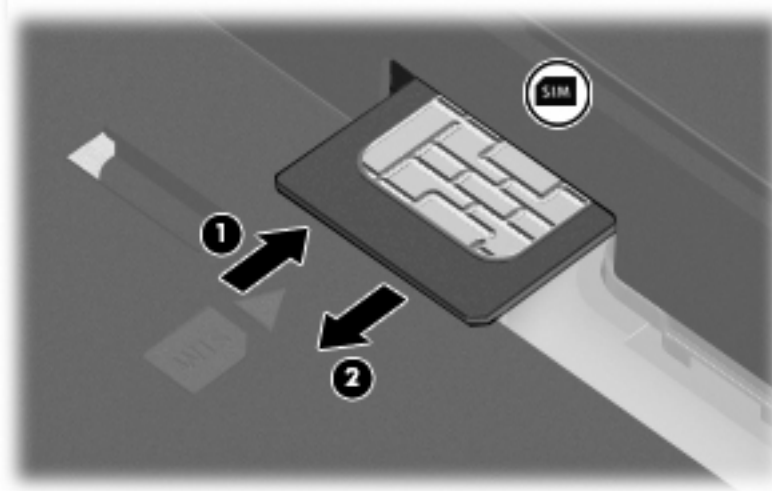
NOTE: HP Broadband Wireless will be disabled if the battery is not replaced.

9. Reconnect external power.
10. Turn on the computer.

Removing a SIM

To remove a SIM:

1. Shut down the computer. If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.
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, with the battery bay toward you.
6. Remove the battery.
7. Press in on the SIM **(1)**, and then remove it from the slot **(2)**.



8. Replace the battery.
9. Reconnect external power.
10. Turn on the computer.

Using the external WWAN antenna (select models only)

⚠ WARNING! Exposure to Radio Frequency Radiation The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna is minimized during normal operation of the computer. Refer to the following section for instructions on positioning the antenna properly.

During WWAN operation in tablet mode: To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should be no less than 2.5 cm (1 inch) and the antenna should be positioned at a 180-degree angle.

During WWAN operation in notebook mode: To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should be no less than 20 cm (8 inches), including when the computer display is closed, and the antenna should be positioned at a 90-degree angle.

⚠ CAUTION: Do not use WWAN functionality unless the external WWAN antenna is open and in a recommended position.

The external WWAN antenna allows you to connect to a wireless wide-area network (WWAN), and then to the Internet, using the integrated HP Broadband Wireless Module and service from a supported cellular network operator.

📝 NOTE: Do not close the external WWAN antenna if you are connected to a WWAN.

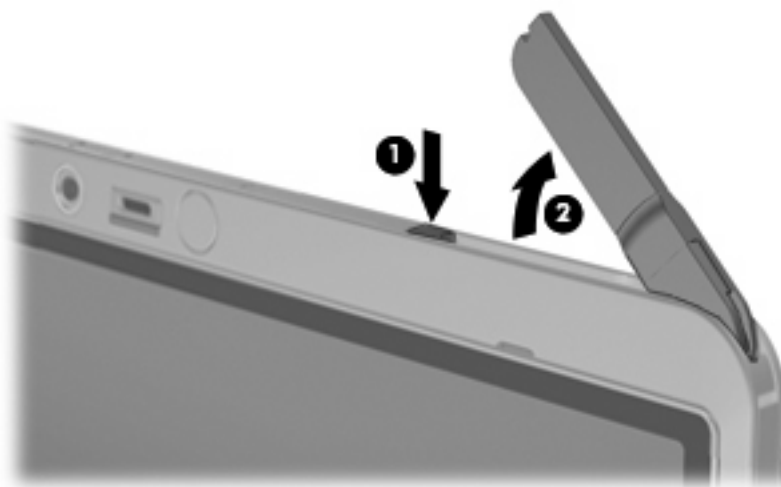
NOTE: For optimal transmission, keep the areas immediately around the antenna free from obstructions.

Opening and closing the external WWAN antenna

📝 NOTE: Before connecting to a WWAN, open the external WWAN antenna to a recommended position.

To open the external WWAN antenna:

1. Press the external WWAN antenna release button (1).
2. Lift the antenna to an upright position (2).



3. Position the antenna in one of the following antenna configurations:

- If the computer is in notebook mode, the antenna should be positioned at a 90-degree angle.



- If the computer is in tablet mode, the antenna should be positioned at a 180-degree angle and held away from the body. Refer to the following illustrations to view tablet position configurations that are recommended and not recommended.

⚠ WARNING! To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should be no less than 2.5 cm (1 inch). Do not position the antenna so that it points toward you. When carrying the computer in tablet mode, be sure that the antenna is as far away from the body as possible.

Recommended:





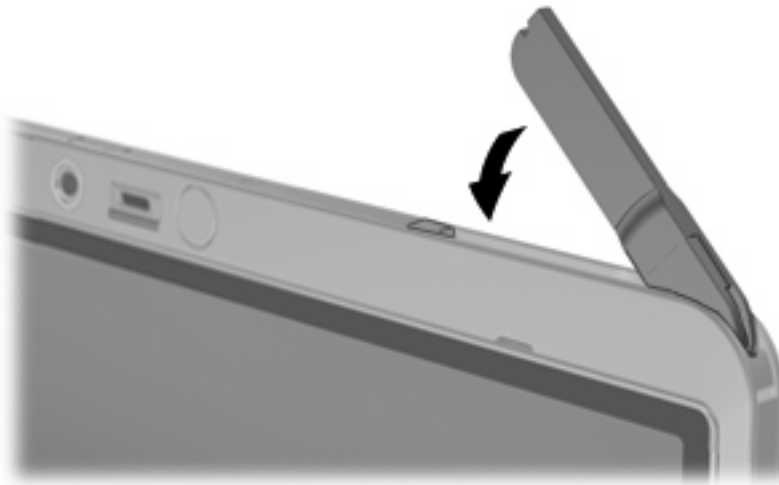
Not recommended:





To close the external WWAN antenna:

1. Be sure that you are no longer connected to a WWAN.
2. Press the antenna down until it clicks into place.

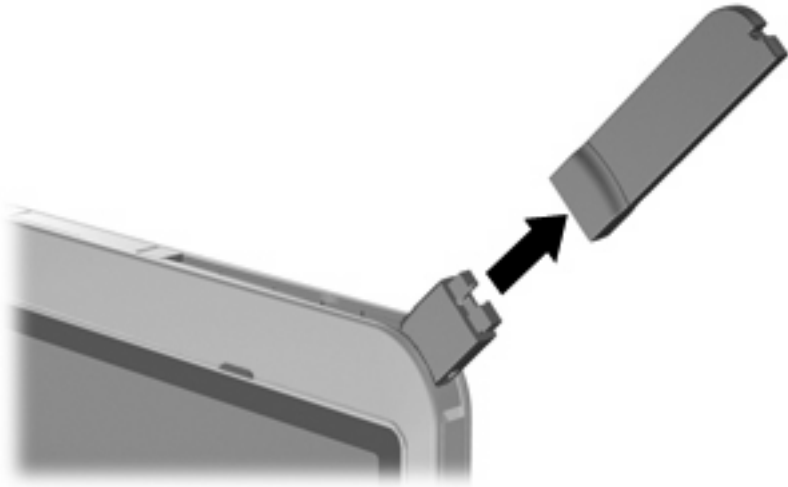


Removing and replacing the external WWAN antenna

To remove the external WWAN antenna:

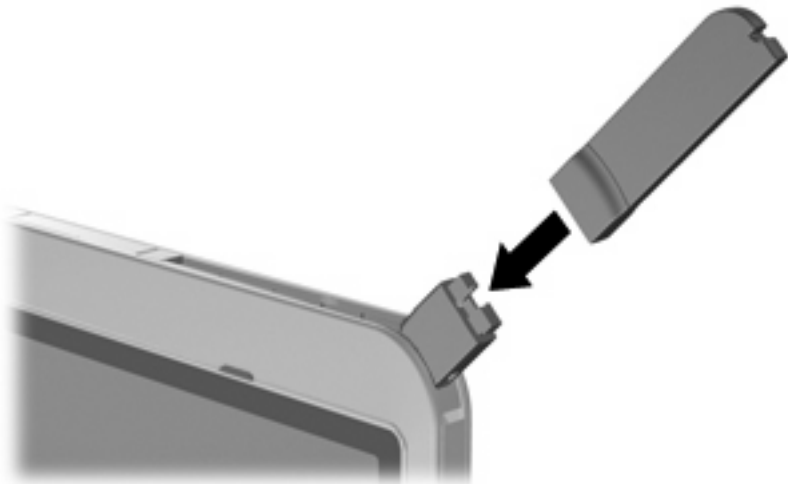
1. Open the antenna.

2. Pull gently on the antenna to remove it from the antenna joint.



To connect the external WWAN antenna:

- ▲ Align the external WWAN antenna with the antenna joint and press gently until the antenna clicks into place.



5 Using Bluetooth wireless devices (select models 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, PDA)
- Phones (cellular, cordless, smart phone)
- Imaging devices (printer, camera)
- Audio devices (headset, speakers)

Bluetooth devices provide peer-to-peer capability that allows you to set up a PAN of Bluetooth devices. For information on configuring and using Bluetooth devices, refer to the Bluetooth software Help.

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