

## Modems

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## Modem diagnostics overview

You can verify that your modem is working properly by using the diagnostics that are available through Phone and Modem Options in Control Panel. To open Phone and Modem Options, click **Start**, click **Control Panel**, click **Printers and Other Hardware**, and then click **Phone and Modem Options**.

When you query a modem, Windows XP tries the following commands and displays the results.

Command	Response
ATQ0V1E0	Initializes the query.
AT+GMM	Model identification ( <a href="#">ITU</a> V.250 recommendation is not supported by all modems).
AT+FCLASS=?	Fax classes supported by the modem, if any.
AT#CLS=?	Shows whether the modem supports the Rockwell voice command set.
ATI <i>n</i>	Displays manufacturer's information for $n = 1$ through 7. This provides information such as the port speed, the result of a checksum test, and the model information. Check the manufacturer's documentation for the expected results.

You can also record a log of commands as they are sent to the modem by communication programs or the operating system.

# Troubleshooting Modems

What problem are you having?

☒ [The modem diagnostics indicate that an external serial modem is not receiving commands.](#)

**Cause:** If the modem diagnostics indicate that the modem is not receiving commands, the modem cabling may be faulty.

**Solution:** Try connecting the modem with a new cable.

☒ [The modem cable is good, but the modem still does not receive commands.](#)

**Cause:** The modem is installed incorrectly.

**Solution:** Check the modem's documentation to make sure that you installed it correctly.

☒ [The modem is installed correctly, but the diagnostics indicate that it is not responding correctly.](#)

**Cause:** The incorrect model and make were specified during installation in Windows, or an obsolete installation (.inf) file was used to install the modem.

**Solution:** Check the modem documentation for the correct model and make or a compatible model and make, and reinstall the modem. You can check with the manufacturer to see if there are more recent installation files available for installing the modem.

☒ [According to the modem diagnostics, the modem works but you still cannot make a connection.](#)

**Cause:** The modem is connected incorrectly to the phone line, or there is a problem with the phone line.

**Solution:** Check the connection to the phone line. If the modem is connected correctly, have a telephone professional check your phone line.

☒ [You cannot connect or are having problems connecting to another computer or an online service provider.](#)

**Cause:** The data connection parameters (see [Hardware settings](#)) for the two modems are not the same. Data connection parameters for two modems need to be identical for them to connect successfully.

**Solution:** Check the hardware settings for both computers. Typical settings are eight data bits, None for parity, and one stop bit.

If you are connecting to an online service provider, refer to the documentation provided by your service provider for the correct settings. These are typically eight data bits, None for parity, and one stop bit. Bulletin boards and most service providers

use these settings. If these do not work, try seven data bits, even parity, and one stop bit. A few online service providers use these settings. Other settings are extremely rare.

☒ [Your PCMCIA modem card was not detected automatically when you inserted it.](#)

**Cause:** The card's built-in COM port is not configured.

**Solution:** Use **Add Hardware** in Control Panel to configure the card's built-in COM port. You can then install the PCMCIA modem by using the **Phone and Modem Options** in Control Panel (See [To install a modem](#)).

☒ [An RS-232 serial device is functioning poorly or not at all.](#)

**Cause:** Some [RS-232](#) serial devices now support speeds faster than the 115.2 kilobits per second (Kbps) currently supported by the standard serial ports installed on most computers. (For example, some serial devices support 230 Kbps.)

**Solution:** If the **Port speed** in the connection preferences is faster than 115.2 Kbps, then try reducing the speed to 115.2 Kbps. You can leave the **Maximum Port Speed** in the modem properties at the higher setting. If the serial port on your computer supports speeds faster than 115.2 Kbps, then set the **Port speed** to whichever is slower, the serial port speed or the device speed.

☒ [A connection in Network Connections reports that a port is in use or not configured for remote access.](#)

**Cause:** There are several possible causes:

- When you started Windows, a Plug and Play modem was not connected or it was turned off, so it was not detected correctly.
- The port is in use by another program, such as Fax or Phone Dialer.
- The connection may not have been updated to reflect changes in communications equipment, such as new serial ports or modems.

**Solution:** Use one of the following solutions:

- If the modem was disconnected or turned off, reconnect or turn on your modem, and then either restart Windows or use Device Manager to scan for new hardware.
- If the communications port is already in use by another connection, hang up the connection, or modify the connection to use a different port.
- If you have changed your hardware (such as a new serial port or modem), you must reconfigure the connection.

See [Configure a connection](#), [Reinstall a Plug and Play device](#)

📌 Notes

- To diagnose and correct modem problems with the interactive modem troubleshooter, see [Modem Troubleshooter](#). For modem diagnostics, see [To](#)

[test a modem](#). Refer to the modem manufacturer's documentation or customer service representative for the correct modem commands and responses.

- It is usually a good idea to note changes to modem settings and switches as you make them. This enables you to return the modem to its previous state, if necessary.
- If you have modem problems, you might want to report them to your system administrator, the modem manufacturer, or your supplier. In your report, include your modem log, which records information about your attempts to connect to other systems. For information about creating a modem log, see [To log and view modem commands](#).

## To test a modem

You must be logged on as an administrator or a member of the Administrators group in order to complete this procedure. If your computer is connected to a network, network policy settings might also prevent you from completing this procedure.

1. Open [Phone and Modem Options](#) in Control Panel.
2. On the **Modems** tab, click the modem you want to test.
3. Click **Properties**, click **Diagnostics**, and then click **Query Modem**.

### Notes

- To open Phone and Modem Options, click **Start**, click **Control Panel**, click **Printers and Other Hardware**, and then click **Phone and Modem Options**.
- This procedure sends standard AT commands to your modem, and displays the responses that indicate features supported by your modem.

## Attaining fast speeds with a 56 kbps modem

A modem connection must fulfill three requirements to support a 56 kilobits per second (Kbps) (also called [V.90](#)) connection:

- The host server must use a digital connection to the network. Your Internet service provider can tell you if they support 56 Kbps service.
- Both ends of the connection must support the same protocol, the V.90 standard or either of its predecessors, K56flex, or 3COM/USR X2. For example, if your Internet service provider has a V.90 device, your modem must support the V.90 protocol.
- There can only be one analog connection between your modem and the host computer. The phone line in most homes is an analog line.

If a connection does not meet these requirements, a modem falls back to the fastest protocol that works for the connection. For example, a 56 Kbps V.90 modem falls back to the 33.6 Kbps V.34 protocol if it cannot make a V.90 connection. Even if your connection fulfills these requirements, other factors may reduce either the transmission speed or the number of times that you successfully obtain the highest speed connection. For example, old lines, or lines that are subject to interference, might reduce transmission speeds. Maximum throughput speeds of 26 Kbps are not unusual in these cases.

Devices to improve the quality of your telephone service may also hamper 56 Kbps V.90 modem connections. Load coils found on long wire lengths to improve voice quality do not usually prevent V.90 connections, but can reduce the speed. Digital pads, which balance the volume of voice calls, usually do not prevent V.90 connections, but they can reduce the speed. Analog pads prevent V.90 connections, because they convert the digital data to analog to balance the volume, and then back to digital data. This inserts an additional analog section in the line.

In practice, the 56 Kbps speed supported by the V.90 and other protocols is unattainable. U.S. government regulations that currently safeguard public phone systems limit transmission speeds to 53 Kbps. Phone-line noise and other limitations of phone systems usually keep average transmissions in the 40 to 50 Kbps range.

## To change hardware settings

You must be logged on as an administrator or a member of the Administrators group in order to complete this procedure. If your computer is connected to a network, network policy settings might also prevent you from completing this procedure.

1. Open [Phone and Modem Options](#) in Control Panel.
2. On the **Modems** tab, click the modem that you want to configure, and then click **Properties**.
3. Click the **Advanced** tab.
4. Click **Change Default Preferences**.
5. Click the **Advanced** tab.
6. Under **Hardware Settings**, change the setting for **Data bits**, **Parity**, **Stop bits**, or **Modulation**.

### Notes

- To open Phone and Modem Options, click **Start**, click **Control Panel**, click **Printers and Other Hardware**, and then click **Phone and Modem Options**.
- These values are usually set correctly when the modem is installed.

# To install a Bluetooth mobile phone and use it as a modem

Some mobile phones can be used as a modem for your computer. To find out if your phone has this dial-up networking capability, read the documentation that came with the phone.

1. Attach or turn on the Bluetooth radio adapter for your Windows XP computer.
2. Following the manufacturer's documentation, set up your mobile phone so that Windows XP can find it. Setting up your phone includes:
  - Turning it on
  - Making it discoverable
  - Giving it a name (optional)
3. Open [Bluetooth Devices](#) in Control Panel.
4. Click **Add**, and then follow the instructions in the Add Bluetooth Device Wizard.
5. To set up an Internet connection, see [Create a Bluetooth connection to the Internet using a Bluetooth mobile phone](#).

## Notes

- To open Bluetooth Devices, click **Start**, click **Control Panel**, click **Printers and Other Hardware**, and then click **Bluetooth Devices**.
- Passkeys can be up to 16 characters long. We recommend using a long passkey.
- The passkey and encryption features help to secure your data. However, these and other security measures can be compromised or fail, and, if that happens, your data could be visible to or accessible by other devices or computers within range. Therefore, Bluetooth wireless technology should not be considered completely secure.
- To install your Bluetooth device, refer to the instructions that came with the device.

## Modem overview

Telephone lines that are used in a conventional phone system are designed to transmit human speech with analog signals. Analog signals vary continuously, like waves, along their length. Computers store and process data in digital format and communicate both internally and with each other in [binary digits](#).

When two computers communicate with each other over a conventional phone line, a modem translates the binary information from the computer at the sending end to an analog signal that can pass over the phone line. At the receiving end, another modem translates the analog signal back to binary information that can be used by the computer. The conversion from binary to analog information is called *modulation*, and the conversion back from analog to binary is called *demodulation*. The word *modem*, short for modulator/demodulator, is the name for the device that performs these conversions.

Both standard modems and fax modems perform this conversion. There are also [ISDN](#), DSL, and cable modems that provide digital communication. These modems do not convert digital and analog signals. They enable computers to transmit digital information directly without the conversion. When you communicate over analog telephone lines, you need standard modems.

The speed at which modems transmit data is called the *throughput*. This is measured in [bits per second \(bps\)](#).

The conversion between digital and analog data is governed by proprietary and international standards, called *modem protocols*. Improving protocols have allowed faster data throughput rates. Besides using the available bandwidth more effectively, protocols have incorporated data compression to speed the throughput and error control for greater reliability. The protocols for modems operating at 56 kilobits per second (Kbps) are now designed to support receiving data from an Internet service provider connected to a digital line, but send with the standard digital-to-analog conversion.

Windows supports many different modems. To find hardware that is supported by Windows operating systems, visit the [Windows Catalog](#) on the Microsoft Web site. Microsoft has tested these modems with **Network Connections**. If you have a modem that is not on this list, it might still work perfectly well with Windows, especially if the manufacturer provides an installation disk or [.inf file](#) for Windows. Some modems are compatible with a supported modem and can be installed by choosing the supported information. Check the documentation provided with the modem for details. You may also find installation files or other useful information at the manufacturer's Web site.

## Installing modems overview

To install the modem hardware on your computer, refer to the manufacturer's documentation. Generally, the following instructions apply:

- If you have an internal modem with jumpers, set the jumpers for [Plug and Play](#) for Windows XP or, if that option is unavailable, for Windows 95, Windows 98, Windows NT, Windows 2000, or Windows Millennium Edition. See your modem documentation for information about setting the jumpers.

- Install an internal modem in an empty slot. Attach an external serial modem to an unused [communication port](#).
- If you have an external modem, make sure that it is attached to the computer, plugged into the power source, and turned on before you turn on the computer and start Windows.
- Make sure that your modem is properly connected to the phone line and to your computer.

Most modems manufactured now are compatible with Plug and Play and installed automatically after they are connected to the computer. However, older modems and external serial modems may not be detected. If your modem is not installed automatically, use Phone and Modem Options in Control Panel to install it manually. To open Phone and Modem Options, click **Start**, click **Control Panel**, click **Printers and Other Hardware**, and then click **Phone and Modem Options**.