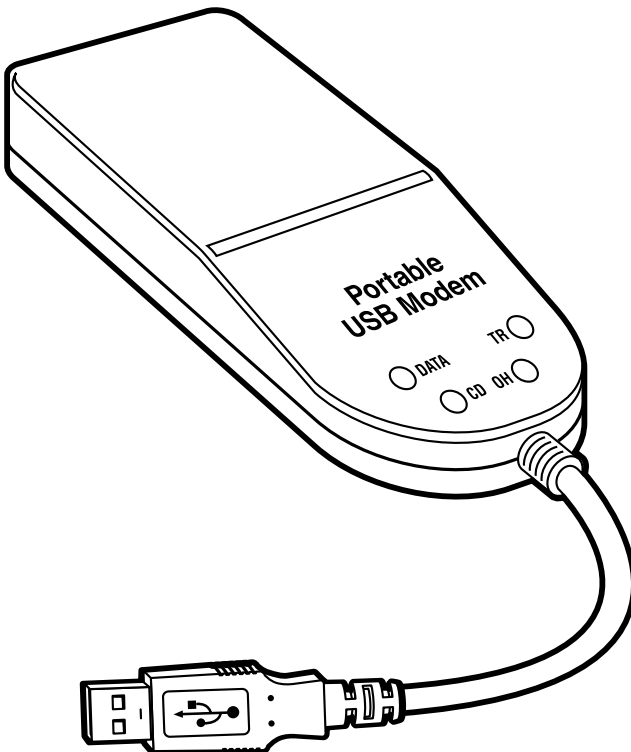




Portable USB Modem Users' Manual



**CUSTOMER
SUPPORT
INFORMATION**

Order toll-free in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

**FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS**

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.



EMC, Safety and R&TTE Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility.

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

and

Council Directive 1999/5/EEC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

FCC Requirements for Telephone-Line Equipment

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network with standardized jacks. This equipment should not be used on party lines or coin lines.
2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until the repair has been made. If this is not done, the telephone company may temporarily disconnect service.
3. If you have problems with your telephone equipment after installing this device, disconnect this device from the line to see if it is causing the problem. If it is, contact your supplier or an authorized agent.
4. The telephone company may make changes in its technical operations and procedures. If any such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.
5. If the telephone company requests information on what equipment is connected to their lines, inform them of:
 - a. The telephone number that this unit is connected to.
 - b. The ringer equivalence number.
 - c. The USOC jack required: RJ-11C.
 - d. The FCC registration number.

Items (b) and (d) can be found on the unit's FCC label. The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

6. In the event of an equipment malfunction, all repairs should be performed by your supplier or an authorized agent. It is the responsibility of users requiring service to report the need for service to the supplier or to an authorized agent.

Certification Notice for Equipment Used in Canada

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications-network protective, operation, and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly (extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized maintenance facility—in this case, Black Box. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices, subject only to the requirement that the total of the load numbers of all the devices does not exceed 100.

NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS USED IN THIS MANUAL

America Online is a registered trademark of Quantum Computer Services, Inc.

AT&T is a registered trademark of AT&T.

MNP is a registered trademark of Microcom Systems Incorporated.

UL is a registered trademark of Underwriters' Laboratories Incorporated.

Microsoft, Windows, and Windows NT are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

Chapter	Page
1. Specifications	10
2. Introduction	13
2.1 Overview	13
2.2 What the Package Includes	14
2.3 Universal Serial Bus (USB)	14
2.4 What Can You Do with Your Modem?	14
2.5 Features	15
2.5.1 Data	15
2.5.2 Fax	16
2.5.3 Required Equipment	16
2.6 Connections	17
2.6.1 Connecting to the Computer (“USB”)	17
2.6.2 Connecting to the Telephone Line (“LINE”)	17
2.6.3 Surge Protectors and Lightning	17
2.7 Front Panel	18
3. Installation	19
3.1 Step 1: Connect the Modem to Your System	19
3.1.1 USB Connection	20
3.1.2 Line Connection	20
3.2 Step 2: Installing the Modem	20
3.2.1 Installation in Windows 2000	20
3.2.2 Installation in Windows Me	27
3.2.3 Installation in Windows 98	29
3.2.4 Removing Your Old Modem from Windows	35
3.3 Configuring the Modem for Your Country	36
3.3.1 Using the Global Wizard Utility	36
3.3.2 Using AT Commands	36
3.4 References	37
4. AT Commands, S-Registers, and Result Codes	38
4.1 AT Commands	38
4.2 S-Registers	53
4.3 Result Codes	58

Chapter	Page
5. Remote Configuration	61
5.1 Introduction	61
5.2 Basic Procedure	61
5.3 Setup	61
5.3.1 Changing the Setup Password	62
5.3.2 Changing the Remote Escape Character	62
6. Troubleshooting	63
6.1 None of the Indicators Light	63
6.2 The Modem Does Not Respond to Commands	63
6.3 The Modem Dials But Cannot Connect	64
6.4 The Modem Disconnects While Online	65
6.5 The Modem Cannot Connect When Answering	66
6.6 The Modem Doesn't Work with Caller ID	66
6.7 Fax and Data Software Can't Run at the Same Time	66
6.8 Calling Black Box	67
6.9 Shipping and Packaging	67
Appendix A. V.90 Support	68
A.1 Introduction	68
A.2 V.90 Troubleshooting	68
Appendix B. Loopback Tests	69
B.1 Introduction	69
B.2 Local Analog Loopback Test (V.54 Loop 3)	70
B.3 Remote Digital Loopback Test (V.54 Loop 2)	71
B.4 Local Digital Loopback Test (V.54 Loop 2)	72
Appendix C. Dial-Up Networking	74
C.1 Windows 98/Me Dial-Up Networking	75
C.2 Windows 2000 Dial-Up Networking	79
Appendix D. Upgrading the Modem	84
D.1 Introduction	84
D.2 Upgrade Overview	84

1. Specifications

Client-to-Server Data Rates: V.90 or K56flex speeds when accessing an ISP type V.90 or K56flex server (actual speed depends on server capabilities/line conditions)

Client-to-Client Data Rates: 33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400, 12,000, 9600, 7200, 4800, 2400, 300 bps

Fax Data Rates: 14,400, 12,000, 9600, 7200, 4800, 2400, 300 bps

Data Format: Serial, binary, asynchronous

Modem Compatibility: ITU V.90, K56flex; ITU-T V.34 enhanced, V.34, V.32terbo, V.32bis, V.32, V.22bis, V.22; Bell 212A and 103/113; ITU-T V.29, V.42, V.42bis; ITU-T V.21 and V.23 in international versions

Fax Compatibility: ITU-T Group 3, Class 1 and 2, T.4, T.30, V.21, V.27ter, V.29, V.17, and TIA/EIA TR29.2

Error Correction: ITU-T V.42 (LAP-M or MNP® 3-4)

Data Compression: ITU-T V.42bis (4:1 throughput), MNP 5 (2:1 throughput)

Flow Control: X-ON/X-OFF (software), RTS/CTS (hardware)

Intelligent Features: Plug and play; fully AT command compatible; autodial, redial, repeat dial; pulse or tone dial; dial pauses; auto answer; caller ID; EIA extended automode; adaptive line probing; automatic symbol and carrier frequency during startup, retrain, and rate negotiation; call status display, auto-parity and data rate selections; keyboard-controlled modem options; non-volatile memory; on-screen displays for modem option parameters; command lines of up to 40 characters each; help menus; remote configuration

Command Buffer: 40 characters

Data Modulation: FSK at 300 bps, PSK at 1200 bps, QAM at 2400, 4800, and 9600 bps (non-trellis), QAM with trellis-coded modulation (TCM) at 9600, 12,000, 14,400, 16,800, 19,200, 21,600, 24,000, 26,400, 28,800, 31,200, 33,600, and 56,000 bps

Fax Modulation: V.21 CH2 FSK at 300 bps (half-duplex); V.27ter DPSK at 4800 and 2400 bps; V.29 QAM at 9600 and 7200 bps; V.17TCM at 14,400, 12,000, 9600, and 7200 bps

Carrier Frequencies ITU-T V.34: 1600, 1646, 1680, 1800, 1829, 1867, 1920, 1959, 2000 Hz

Carrier Frequencies ITU-T V.32bis/V.32: 1800 Hz

Carrier Frequencies V.22bis/V.22 or Bell 212A Standard (2400 and 1200 bps):
Transmit originate: 1200 Hz; Transmit answer: 2400 Hz; Receive originate:
2400 Hz; Receive answer: 1200 Hz

Carrier Frequencies ITU-T V.23 (1200 bps): Transmit originate: 390 Hz mark,
450 Hz space; Receive originate: 1300 Hz mark, 2100 Hz space; Transmit answer:
1300 Hz mark, 2100 Hz space; Receive answer: 390 Hz mark, 450 Hz space

Carrier Frequencies ITU-T V.21 (0 to 300 bps): Transmit originate: 980 Hz mark,
1180 Hz space; Receive originate: 1650 Hz mark, 1850 Hz space; Transmit answer:
1650 Hz mark, 1850 Hz space; Receive answer: 980 Hz mark, 1180 Hz space

Carrier Frequencies Bell 103/113 (0 to 300 bps): Transmit originate: 1270 Hz
mark, 1070 Hz space; Receive originate: 2225 Hz mark, 2025 Hz space; Transmit
answer: 2225 Hz mark, 2025 Hz space; Receive answer: 1270 Hz mark, 1070 Hz
space

Fax Carrier Frequencies: V.21 Ch2 (half-duplex): 1650 Hz mark, 1850 Hz space
for transmit originate; 1650 Hz mark, 1860 Hz space for transmit answer; V.27ter:
1800 Hz originate/answer; V.29 QAM: 1800 Hz originate/answer; V.17 TCM:
1800 Hz originate/answer

Transmit Level: -11 dBm (dial-up)

Frequency Stability: $\pm 0.01\%$

Receiver Sensitivity: -43 dBm under worst-case conditions

AGC Dynamic Range: 43 dB

Connectors: (1) USB connector; (1) RJ-11 phone jack

Cables: (1) RJ-11 phone cable

NOTE

Any cables connected to the computer should be shielded to reduce interference.

Diagnostics: Power-on self-test, local analog loop, local digital loop, remote digital loop

PORTABLE USB MODEM

Indicators: LEDs for Data, Carrier Detect, Off-Hook, Terminal Ready

Temperature Tolerance: 32 to 120°F (0 to 50°C)

Humidity: 20 to 90%, noncondensing

Size: 1"H x 1.25"W x 3.1"D (2.5 x 3.2 x 7.9 cm)

Weight: 2.2 oz. (62 g)

2. Introduction

2.1 Overview

The Portable USB Modem incorporates V.90 technology, which enables Internet connections at data rates up to 56 kbps* over standard telephone lines. V.90 technology sends data downstream from the Internet to your computer at these speeds because data on the telephone network typically is converted from digital to analog only once before it reaches your modem. Upstream transmissions, and transmissions between client modems, are limited to data rates of 33.6 kbps, as are downstream transmissions that are converted more than once on the telephone network.

The modem is Plug-and-Play in Windows® 2000, Windows Me, and Windows 98 operating systems with interactive automatic dialing and command mode configuration. In standard mode, you can store up to two command lines or telephone numbers of up to 40 characters each in the modem's nonvolatile memory. The modem pulse- or tone-dials, and recognizes dial tones and busy signals for reliable call-progress detection. The modem can detect AT&T® calling card tones. It also has Caller ID, remote configuration, and incorporates self-resetting lightning protection. The modem is FCC-registered for connection without notification to the telephone company.

This full-duplex, intelligent modem also has V.42 error correction, V.42bis data compression, and V.17 (14,400 bps), Class 1 and 2, Group 3 fax capabilities.

The modem operates with the Global Wizard program. Telephone company technical requirements differ from country to country. In the Global Wizard program, simply specify the country in which you will operate, selecting from a pull-down menu. Global Wizard does the rest, automatically setting up the correct operating parameters for your modem to operate in your country.

The Flash Wizard utility lets you update the modem's firmware.

* Although K56flex technology is capable of downloads of up to 56 kbps, FCC regulations currently restrict ISP modems to downloads of 53 kbps.

2.2 What the Package Includes

Your package should include the following items:

- Portable USB Modem
- (1) CD-ROM
- (1) RJ-11 telephone cable
- (1) Quick Start Guide

If anything is missing or damaged, please call Black Box at 724-746-5500.

You must supply:

- A computer with an unused USB port.
- A nearby telephone line jack.

2.3 Universal Serial Bus (USB)

Universal Serial Bus (USB), defined by a consortium of industry leaders, permits connection of multiple low-speed and medium-speed computer peripheral devices—telephones, modems, printers, keyboards, mice, and scanners—all from a single personal computer port. The specification, based on an open architecture is quickly becoming a standard feature in new desktop and notebook computers.

2.4 What Can You Do with Your Modem?

You can use it to access commercial on-line information services such as America Online®, Genie, and Prodigy. These services provide access to databases, encyclopedias, stock reports, news, weather, and shopping. They provide e-mail links to subscribers of the same and other services. Public message areas, called forums, allow subscribers to trade information and opinions on a vast array of topics, while vendor forums provide hardware and software support from manufacturers. Online services also allow you to upload and download computer programs, data files, and updated software such as video and printer drivers.

Your modem can also connect you to the Internet. Like the commercial online services, the Internet provides e-mail services, public message areas, and access to information and software, much of it easily accessed through the Web.

Other uses include direct links to colleagues with modems, to banks, and to service bureaus. You can also telecommute with your fax modem—work at home while communicating with the office by modem or fax.

And of course, you can use your modem to exchange faxes with any fax machine in the world, enabling you to communicate quickly with businesses and organizations that do not have direct modem communications.

2.5 Features

- Complies with major ITU-T, TIA, and EIA international standards to ensure compatibility with other modems.
- Caller ID capability can identify a caller's phone number (available only on U.S. products).

2.5.1 DATA

- Supports the V.90 standard for data transmission speeds up to 56 kbps while maintaining compatibility with lower-speed modems.
- Supports the enhanced ITU-T V.34 standard, with data transmission speeds to 33.6 kbps.
- Supports asynchronous data rates at 56, 33.6, 31.2, 28.8, 26.4, 24, 21.6, 19.2, 16.8, 14.4, and 12 kbps as well as 9600, 4800, 2400, 1200, and 300 bps.
- Supports automatic fallback to slower speeds in noisy line conditions, and fall-forward to faster speeds as conditions improve.
- ITU-T V.42 LAP-M and MNP Class 3 and 4 error correction.
- ITU-T V.42bis (4-to-1) and MNP 5 (2-to-1) data compression.
- Automatically disables data compression when transferring already-compressed files.
- Autodial, redial, pulse (rotary), and touch-tone dial.
- Dial tone and busy signal detection for reliable call-progress reporting.
- Compatible with the standard AT command set used by most communication programs.

2.5.2 FAX

- Supports V.17, Group 3 fax communication standards, allowing it to communicate with other fax modems as well as with fax machines.
- Responds to EIA/TIA Class 1 and 2 fax commands.
- Sends and receives faxes from your computer at 14,400 bps, 9600 bps, 7200 bps, 4800 bps, 2400 bps, or 300 bps.

2.5.3 REQUIRED EQUIPMENT

In addition to the contents of your modem package, you need the following equipment.

- **Computer:** Your modem can be connected only to a computer with a USB port.
- **Telephone Line:** You must have a telephone line with jack (connector) that accepts the cable that comes with the modem. If you do not have a telephone jack near your computer, you should install one before proceeding.

Do-it-yourself telephone extension kits and accessories are available wherever telephones are sold. You may also hire an independent contractor or your local telephone company to install an extension. If you want a separate line for your fax modem, you must contact your telephone company.

- **Communications Software:** To operate your modem, you must have data communications and fax communications software (included with the modem). Data communications software simplifies control of the modem by guiding you through the process of selecting your serial port, your port speed, and other variables, and then storing your settings, including frequently called phone numbers, so they can be recalled with the stroke of a key or the click of a mouse. Data communications software must be set up, or configured, before you can use it.

2.6 Connections

To use your modem, you must connect its USB cable connector to your computer (“USB”) and to a telephone line (“LINE”).

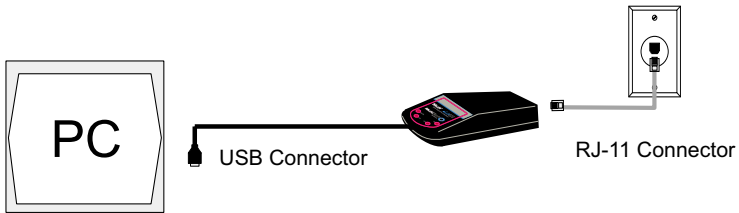


Figure 2-1. USB and communications connectors.

2.6.1 CONNECTING TO THE COMPUTER (“USB”)

Connect the USB connector on the Modem to a USB connector on the back of your computer.

2.6.2 CONNECTING TO THE TELEPHONE LINE (“LINE”)

Plug one end of the cable provided with the Modem into the telephone jack in your home or office. Plug the other end into the LINE jack on the modem.

NOTE

The Federal Communications Commission (FCC), Industry Canada, and other regulatory agencies impose certain restrictions on equipment connected to public telephone systems. See pages 1–3 for more information.

2.6.3 SURGE PROTECTORS AND LIGHTNING

Your modem has self-resetting lightning protection to protect it from electrical spikes on the telephone line. During an electrical storm, unplug your computer equipment from both the power outlet and the telephone line.

2.7 Front Panel

The Portable USB Modem has four LEDs on the front panel indicating status, configuration, and activity.

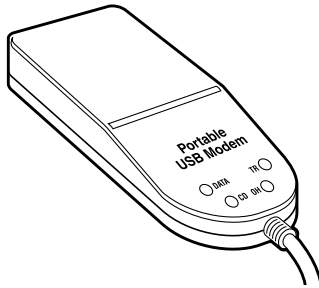


Figure 2-2. Front panel.

- **Data.** The Data LED flashes when the modem is transmitting/receiving data to/from another modem.
- **Carrier Detect.** The CD LED lights when the modem detects a valid carrier signal from another modem. It is on when the modem is communicating with the other modem and off when the link is broken.
- **Off-Hook.** The OH LED lights when the modem is off-hook, which occurs when the modem is dialing, online, or answering a call. The LED flashes when the modem pulse-dials.
- **Terminal Ready.** The TR LED lights when Windows detects and initializes the modem.

3. Installation

WARNING

1. Never install telephone wiring during a lightning storm.
2. Never install a telephone jack in wet locations unless the jack is specifically designed for wet locations.
3. This product is to be used with UL® and cUL listed computers.
4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
5. Use caution when installing or modifying telephone lines.
6. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
7. Do not use a telephone in the vicinity of a gas leak.
8. To reduce the risk of fire, use only 26 AWG or larger telecommunication line cord.

3.1 Step 1: Connect the Modem to Your System

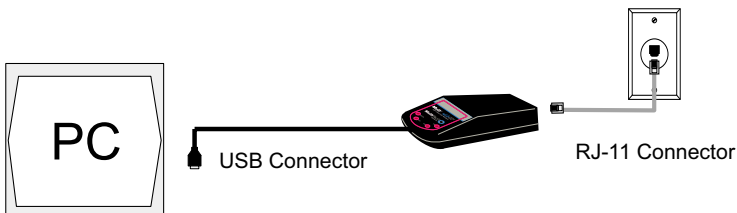


Figure 3-1. Modem connections.

3.1.1 USB CONNECTION

Plug the USB cable connector on the Portable USB Modem into a USB port connector on your computer.

3.1.2 LINE CONNECTION

Plug one end of the phone cable into the Portable USB Modem's LINE jack and the other end into a phone line wall jack.

NOTE

The Federal Communications Commission (FCC) and Industry Canada impose certain restrictions on equipment connected to public telephone systems. See pages 1–3 for more information.

3.2 Step 2: Installing the Modem

3.2.1 INSTALLATION IN WINDOWS 2000

1. Power up your Windows 2000 system.
2. If you have not already done so, connect a) the modem to your computer's USB port and b) the telephone line to your modem and a telephone wall jack.

- Windows will detect that the new modem is present and indicate that it's in the process of installing. The **Welcome** screen of the **Found New Hardware Wizard** appears.



Figure 3-2. Welcome screen.

Click **Next >**.

4. The **Install Hardware Device Drivers** screen appears, indicating that it will install the hardware device drivers.



Figure 3-3. Install Hardware Device Drivers screen.

Verify that “Search for a suitable driver for my device (recommended)” is selected, and click **Next >**.

5. The **Locate Driver Files** screen appears and asks where you want Windows to search for the driver files.

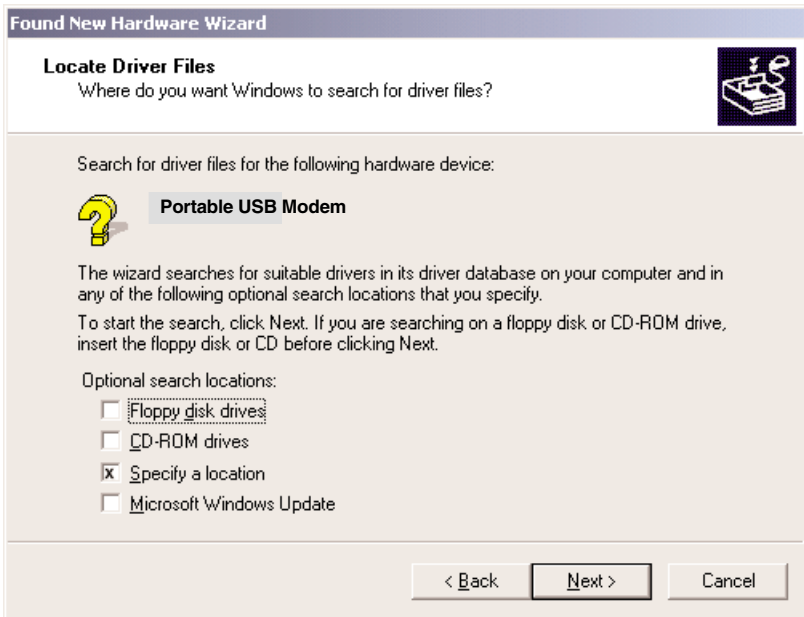


Figure 3-4. Locate Driver Files screen.

Verify that the “Specify a location” option is the only box selected, place the Modem Installation CD into your CD drive, and click **Next >**.

6. The next screen will say “Insert the manufacturer’s installation disk into the drive selected and then click OK.”

Click on the **Browse** button. When prompted to insert a disk into drive A:\, click **Cancel**. Navigate to your computer’s CD-ROM drive. Select the folder **DRIVERS\WIN 2000**. Select the file **mdmibusb.INF** and click **Open**.

- The **Driver Files Search Results** screen appears, indicating that Windows has found the proper driver from the Modem Installation CD.

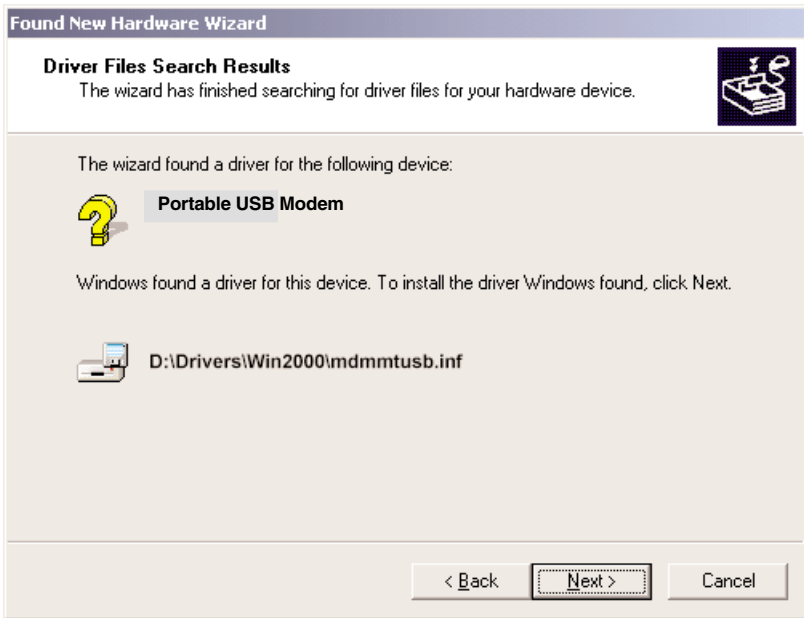


Figure 3-5. Driver Files Search Results screen.

Click **Next >** to install the selected driver.

8. The **Digital Signature Not Found** screen appears.

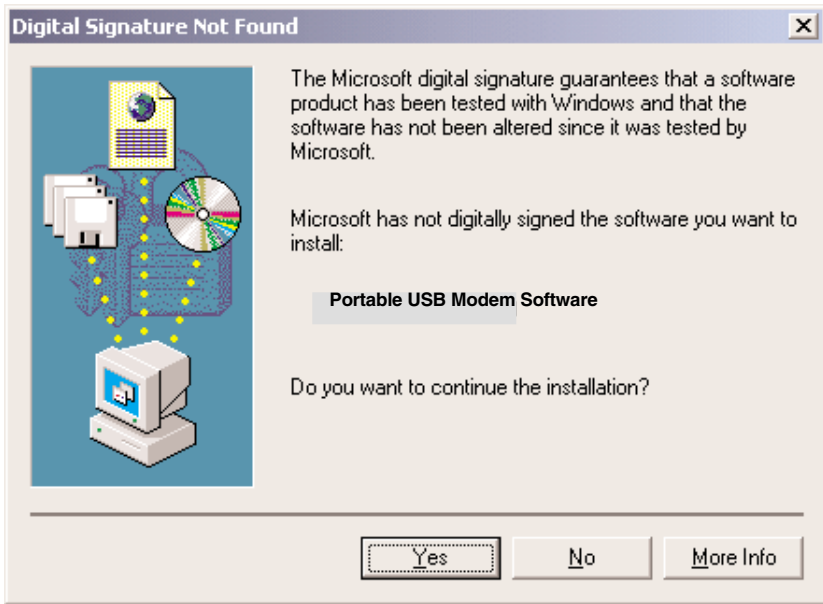


Figure 3-6. Digital Signature Not Found screen.

Click **Yes** to continue with the installation.

NOTE

This Microsoft® operating system searches for a digital signature when you install any new hardware. If a “Digital Signature Not Found” screen appears, simply click the “Yes” button to continue installation. Not having a digital signature does not affect product performance in any way.

9. A **Copying Files** screen appears briefly, indicating that driver files are being copied to your computer's hard drive. Then a completion screen appears and tells you that Windows has finished installing the driver.

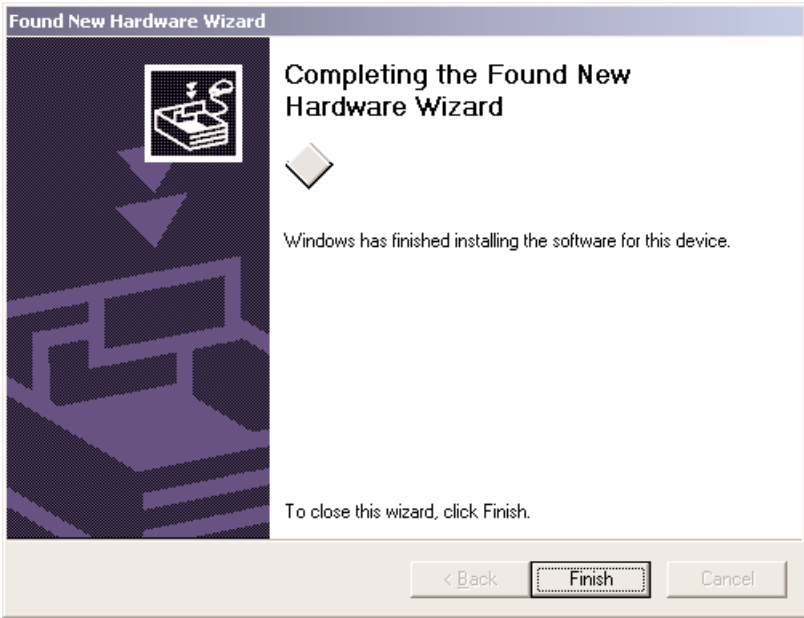


Figure 3-7. Completion screen.

Click **Finish** to complete the installation and exit the wizard.

3.2.2 INSTALLATION IN WINDOWS ME

The Portable USB Modem driver files for Windows Me are installed in two groups, as described below. The installation wizard begins by installing certain driver files. At that point, Windows Me detects the modem as a new device. Then the installation wizard runs again to install the remaining driver files.

1. Power up your Windows Me computer.
2. Connect the Portable USB Modem to your computer's USB port. Then connect one end of the provided telephone line cord to your Portable USB Modem and the other end to a telephone wall jack.
3. Windows Me will detect that the new modem is present and launch the **Add New Hardware Wizard**.

Place the Portable USB Modem Installation CD into the CD drive of your PC. The first **Add New Hardware Wizard** screen will appear with the message, "What would you like to do?"

Choose "Specify the location of the driver (Advanced)" and click **Next>**.

4. At the **Add New Hardware Wizard** "Windows will search for new drivers..." screen, uncheck the "Removable Media" button (if necessary), and check "Specify a location."
5. Click the "Browse" button and navigate to the "Windows Me" subfolder of the "Drivers" folder on the MD403A Installation CD. Then click **OK**. Click **Cancel** if it prompts you for a floppy disk.
6. The **Add New Hardware Wizard** "Windows driver file search..." screen appears. Click **Next>**.
7. Transient progress screens will appear while files are being copied. After the files have been copied to your PC, an **Add New Hardware Wizard** screen will appear, indicating that Windows has finished installing the first of two drivers.

Click **Finish** to complete the installation of this first driver. The wizard will close.
8. Windows Me will now detect an "Unknown Device" and begin another **Add New Hardware Wizard**, again asking "What would you like to do?"

Choose "Specify the location of the driver (Advanced)," and click **Next>**.

9. At the next screen (the **Add New Hardware Wizard** “Windows will search for new drivers...” screen), uncheck the “Removable Media” button (if necessary), and check “Specify a location.” Click **Next>**.
10. Transient screens will appear while files are being copied. The **Add New Hardware Wizard** “Windows driver file search...” screen will appear. Click **Next>**.
11. After files have been copied, a completion screen will appear.

Click **Finish** to complete the installation of the second driver. The wizard will close.
12. Remove the Portable USB Modem Installation CD from the computer’s CD drive.

3.2.3 INSTALLATION IN WINDOWS 98

1. Power up your Windows 98 system.
2. If you have not already done so, connect a) the modem to your computer's USB port and b) the telephone line to your modem and a telephone wall jack.
3. Windows will detect that the new modem is present and launch the **Add New Hardware Wizard** dialog box.



Figure 3-8. Add New Hardware Wizard screen.

4. Place the Modem Installation CD into your CD drive and click **Next >** to proceed with the installation.

5. The **Add New Hardware Wizard** dialog box appears with the message “What do you want Windows to do?”

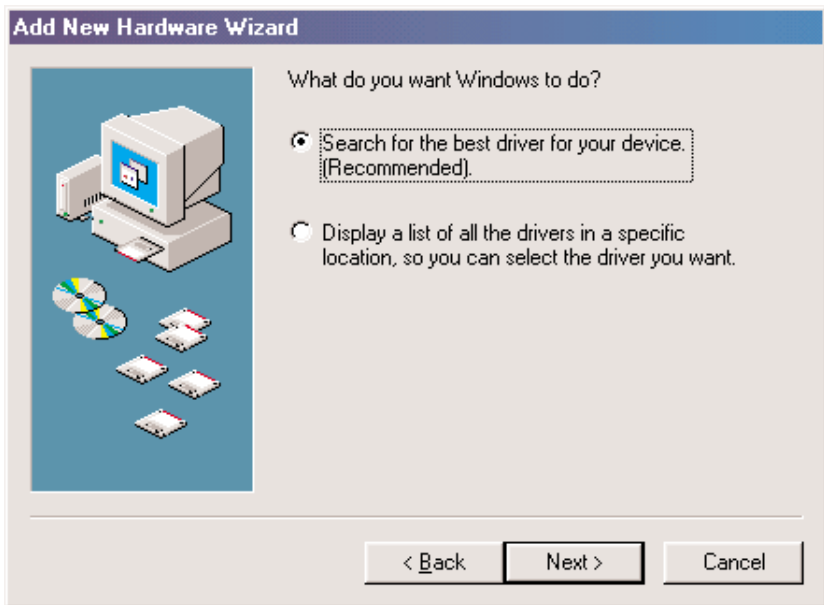


Figure 3-9. What do you want Windows to do? screen.

Verify that the “Search for the best driver for your device (Recommended)” option is selected, and click **Next >**.

6. The **Add New Hardware Wizard** dialog box is displayed with the message “Windows will search for a new driver...”



Figure 3-10. Windows will search for a new driver screen.

Verify that the “CD-ROM drive” option is selected, and click **Next >**.

- The **Add New Hardware Wizard** dialog box indicates that Windows has found an updated driver for this device, and also some other drivers that should work with this device.



Figure 3-11. Updated driver found screen.

Verify that the “Updated driver (Recommended)” option is selected, and click **Next >**.

- The **Add New Hardware Wizard** dialog box indicates that Windows will select the proper driver from the Modem Installation CD and will display the information for verification.



Figure 3-12. Verification screen.

Click **Next >** to install the selected driver.

9. Once the files have been copied to your PC, the **Add New Hardware Wizard** dialog box appears. It indicates that Windows has finished installing the driver.



Figure 3-13. Finish screen.

Click **Finish** to complete the installation and exit the wizard. The TR LED on your modem will light when the installation is complete. Remove the CD from the computer.

3.2.4 REMOVING YOUR OLD MODEM FROM WINDOWS

When your new modem replaces another modem, the old modem installation remains in Windows even after you install the new modem. The old modem will be selected in HyperTerminal and other Windows applications. Although you can change the application connection descriptions one at a time, it is easier to force Windows applications to use the new modem by removing the old modem from Windows.

From Windows 2000

1. Click **Start | Settings | Control Panel**.
2. Double-click the Phone and Modems icon and click on the Modems tab.
3. In the list box, select the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

From Windows Me

1. Go to **Start | Settings | Control Panel**.
2. Double-click the Modems icon to open the **Modems Properties** screen.
3. In the **General** tab a list of modems appears. In this list, highlight the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

From Windows 98

1. Click **Start | Settings | Control Panel**.
2. Double-click the Modems icon to open the **Modems Properties** screen.
3. In the list box, select the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

3.3 Step 3: Configuring the Modem for Your Country

Different countries have different requirements for how modems must function. Therefore, before you use the modem, you must configure it to match the defaults of the country in which you are using it. You can configure the modem either manually using AT commands or with the Global Wizard. Both methods are described on the next page.

3.3.1 USING THE GLOBAL WIZARD UTILITY

The Global Wizard configuration utility is recommended for computers running Windows 98, Me, or 2000. The Global Wizard can configure your modem for a specific country with just a few mouse clicks.

1. Insert the Modem Installation CD into the CD-ROM drive. The **Autorun** dialog box appears.
2. Click **Initial Setup and Country Selection**. The **Global Wizard** dialog box appears. Click **Next >**.
3. View the Global Wizard as it searches for your modem and identifies it. Click **Next >**.
4. Select the country in which the modem will be used, then click **Next**.
5. Review your choice of country. If it is correct, click **Next >** to configure the modem.
6. When Global Wizard announces that the parameters have been set, click **Finish** to exit.

3.3.2 USING AT COMMANDS

If you are comfortable using AT commands, you can configure your modem using AT commands. You must enter these commands in your communication program's terminal window.

To configure the modem for a specific country, execute the following AT commands:

1. Type **AT%T19,0,m** (where *m* represents the country code). Press **Enter**.
2. The modem will respond "OK."
3. Type **AT&F&W** (this saves changes). Press **Enter**.

4. The modem will respond “OK.”
5. Type **ATI9** (this verifies that country code has been chosen). Press **Enter**.
6. The modem will display the country code in decimal format followed by an “OK.”
7. Check to be sure the code for your country is displayed. If not, repeat procedure to correct.

Here are two examples of country, command, and result codes.

Country	AT Command (Hexidecimal)	ATI9 Result Code (Decimal)
Euro/NAM	AT%T19,0,34 (default)	52
Japan	AT%T19,0,10	16

3.4 References

The Internet is an excellent source of information in general and modem installation, configuration, and troubleshooting in particular. The following Web site is a good places to start:

- Data Communications FAQ: <http://www.best.com/~malch/comfaq.html>

4. AT Commands, S-Registers, and Result Codes

4.1 AT Commands

AT commands are used to control the operation of your modem. They are so called because each command must be preceded by the characters *AT* to get the ATtention of the modem.

AT commands can be issued only when the modem is in command mode or online command mode. The modem is in *command mode* when it is not connected to another modem. The modem is in *data mode* when it is connected to another modem and ready to exchange data. *Online command mode* is a temporary state in which you can issue commands to the modem while connected to another modem. To put the modem into online command mode from data mode, you must issue an *escape sequence* (+++) followed immediately by the AT characters and the command (for example, +++ATH to hang up the modem). To return to data mode from online command mode, you must issue the command ATO.

To send AT commands to the modem you must use a communications program, such as the HyperTerminal applet in Windows NT® 4.0, or the communications program included with your modem. You can issue commands to the modem either directly (by typing them in the terminal window of the communications program) or indirectly (by configuring the operating system or communications program to send the commands automatically). Fortunately, communications programs make daily operation of modems effortless by hiding the commands from the user. Most users, therefore, need to use AT commands only when reconfiguring a modem (for example, to turn autoanswer on or off).

The format for entering an AT command is **ATXn**, where *X* is the command and *n* is the specific value for the command, sometimes called the command *parameter*. The value is always a number. If the value is zero, you can omit it from the command; thus, **AT&W** is equivalent to **AT&W0**. Most commands have a *default* value, which is the value that is set at the factory.

You must press ENTER to send the command to the modem. Any time the modem receives a command, it sends a response known as a *result code*. The most common result codes are *OK*, *ERROR*, and the *CONNECT* messages that the modem sends to the computer when it is connecting to another modem. For a table of valid result codes, see **Section 4.3**.

You can issue several commands in one line, in what is called a command string. The command string begins with **AT** and ends when you press **ENTER**. Spaces to separate the commands are optional; they are ignored by the command interpreter. The most familiar command string is the *initialization string*, which is used to configure the modem when it is turned on or reset, or when your communications software calls another modem.

AT COMMAND SUMMARY

Command: AT Values: n/a Description:	Attention Code The attention code precedes all command lines except A/ , A: , and escape sequences.
Command: ENTER Key Values: n/a Description:	Press the Enter (Return) key to execute most commands.
Command: A Values: n/a Description:	Answer Answer call before final ring.
Command: A/ Values: n/a Description:	Repeat Last Command Repeat the last command string. Do not precede this command with AT . Do not press Enter to execute.
Command: Bn Values: n=0–3, 15, 16 Default: 1 and 16 Description:	Communication Standard Setting Select ITU-T V.22 mode when modem is at 1200 bps. B1 Select Bell 212A when modem is at 1200 bps. B2 Deselect V.23 reverse channel (same as B3). B3 Deselect V.23 reverse channel (same as B2). B15 Select V.21 when the modem is at 300 bps. B16 Select Bell 103J when the modem is at 300 bps.

Command:	Cn	Carrier Control
Values:		<i>n</i> =1
Default:		1
Description:	C0 C1	Transmit carrier always off. (Not supported.) Normal transmit carrier switching (included for backward compatibility with some software).
Command:	Ds	Dial
Values:		<i>s</i> =dial string (phone number and dial modifiers)
Default:		none
Description:		Dial telephone number <i>s</i> , where <i>s</i> may up to 40 characters long and include the 0–9, *, #, A, B, C, and D characters, and the L , P , T , V , W , S , comma (,), semicolon (;), ! , @ , ^ , and \$ dial string modifiers. L Redial last number. (Must be placed immediately after ATD .) P Pulse-dial following numbers in command. T Tone-dial following numbers in command (default). V Switch to speakerphone mode and dial the following number. Use ATH command to hang up. W Wait for a new dial tone before continuing to dial. (X2 , X4 , X5 , X6 , or X7 must be selected.) , Pause during dialing for time set in register S8 . ; Return to command mode after dialing. (Place at end of dial string.) ! Hook flash. Causes the modem to go on-hook for one-half second, then off-hook again. @ Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing next part of command. If silence is not detected, the modem returns a NO ANSWER code. ^ Disable data calling tone transmission. \$ Detect AT&T call card “bong” tone. The character should follow the phone number and precede the user’s call card number: ATDT1028807637853500\$123456789

Command:	DS=y	Dial Stored Telephone Number
Values:		<i>n</i> =0–1
Default:		none
Description:		Dial a number previously stored in directory number <i>y</i> by the &Zy=x command. Example: ATDS=1
Command:	En	Echo Command Mode Characters
Values:		<i>n</i> =0 or 1
Default:		1
Description:	E0	Do not echo keyboard input to the terminal.
	E1	Do echo keyboard input to the terminal.
Command:	Fn	Echo Online Data Characters
Values:		<i>n</i> =1
Default:		1
Description:	F0	Enable online data character echo. (Not supported.)
	F1	Disable online data character echo (included for backward compatibility with some software).
Command:	Hn	Hook Control
Values:		<i>n</i> =0 or 1
Default:		0
Description:	H0	Go on-hook (hang up).
	H1	Go off-hook (make the phone line busy).
Command:	In	Information Request
Values:		<i>n</i> =0–5, 9, 11
Default:		None
Description:	I0	Display default speed and controller firmware version.
	I1	Calculate and display ROM checksum (for example, <i>12AB</i>).
	I2	Check ROM and verify the checksum, displaying <i>OK</i> or <i>ERROR</i> .
	I3	Display default speed and controller firmware version.
	I4	Display firmware version for data pump (for example, <i>9A</i>).
	I5	Display the board ID: software version, hardware version, and country ID.

I9 Display the country code (for example, *NA Ver. 1*).
 I11 Display diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

Command: **Mn** **Monitor Speaker Mode**
 Values: $n=0, 1, 2, \text{ or } 3$
 Default: 1
 Description: M0 Speaker always off.
 M1 Speaker on until carrier signal detected.
 M2 Speaker always on when modem is off-hook.
 M3 Speaker on until carrier is detected, except while dialing.

Command: **Nn** **Modulation Handshake**
 Values: $n=0 \text{ or } 1$
 Default: 1
 Description: N0 Modem performs handshake only at communication standard specified by **S37** and the **B** command.
 N1 Modem begins handshake at communication standard specified by **S37** and the **B** command. During handshake, fallback to a lower speed can occur.

Command: **On** **Return Online to Data Mode**
 Values: $n=0, 1, 3$
 Default: None
 Description: O0 Exit online command mode and return to data mode (see **+++AT<CR>** escape sequence).
 O1 Issue a retrain and return to online data mode.
 O3 Issue a rate renegotiation and return to data mode.

Command: **P** **Pulse Dialing**
 Values: P, T
 Default: T
 Description: Configures the modem for pulse (non-touchtone) dialing. Dialed digits are pulsed until a **T** command or dial modifier is received.

Command:	Qn	Result Codes Enable/Disable
Values:		<i>n</i> =0 or 1
Default:		0
Description:	Q0 Q1 Q2	Enable result codes. Disable result codes. Returns an OK for backward compatibility with some software.
Command:	Sr=n	Set Register Value
Values:		<i>r</i> =S-register number; <i>n</i> varies
Default:		None
Description:		Set value of register <i>Sr</i> to value of <i>n</i> , where <i>n</i> is entered in decimal format. For example, S0=1 .
Command:	Sr?	Read Register Value
Values:		<i>r</i> =S-register number
Default:		None
Description:		Read value of register <i>Sr</i> and display it in 3-digit decimal form. For example, S2? gives the response <i>043</i> .
Command:	T	Tone Dialing
Values:		P, T
Default:		T
Description:		Configures the modem for DTMF (touchtone) dialing. Dialed digits are tone dialed until a <i>P</i> command or dial modifier is received.
Command:	Vn	Result Code Format
Values:		<i>n</i> =0 or 1
Default:		1
Description:	V0 V1	Displays result codes as digits (terse response). Displays result codes as words (verbose response).
Command:	Wn	Result Code Options
Values:		<i>n</i> =0, 1, or 2
Default:		2
Description:	W0 W1 W2	CONNECT result code reports serial port speed, disables protocol result codes. CONNECT result code reports serial port speed, enables protocol result codes. CONNECT result code reports line speed, enables protocol result codes.

Command:	Xn	Result Code Selection
Values:		<i>n</i> =0–7
Default:		4
Description:	X0	Basic result codes (for example, <i>CONNECT</i>); does not look for dial tone or busy signal.
	X1	Extended result codes (for example, <i>CONNECT 46000 V42bis</i>); does not look for dial tone or busy signal.
	X2	Extended result codes with <i>NO DIALTONE</i> ; does not look for busy signal.
	X3	Extended result codes with <i>BUSY</i> ; does not look for dial tone.
	X4	Extended result codes with <i>NO DIALTONE</i> and <i>BUSY</i> .
	X5	Extended result codes with <i>NO DIALTONE</i> and <i>BUSY</i> .
	X6	Extended result codes with <i>NO DIALTONE</i> and <i>BUSY</i> .
	X7	Basic result codes with <i>NO DIALTONE</i> and <i>BUSY</i> .
Command:	Yn	Long Space Disconnect
Values:		<i>n</i> =0
Default:		0
Description:	Y0	Disable sending or responding to long space break signal on disconnect.
	Y1	Enable sending or responding to long space break signal on disconnect. (Not supported.)
Command:	Zn	Modem Reset
Values:		<i>n</i> =0 or 1
Default:		None
Description:	Z0	Reset modem to profile saved by the last &W command.
	Z1	Same as Z0 .
Command:	&Bn	V.32 Auto Retrain
Values:		<i>n</i> =1
Default:		1
Description:	&B0	Disable V.32 auto retrain. (Not supported.)
	&B1	Enable V.32 auto retrain.

Command:	&Cn	Data Carrier Detect (DCD) Control
Values:		<i>n</i> =0 or 1
Default:		1
Description:	&C0	Forces the DCD circuit to be always high.
	&C1	DCD goes high when the remote modem's carrier signal is detected, and goes low when the carrier signal is not detected.
	&C2	DCD drops briefly following disconnect, then goes high again. Register S18 defines how long DCD signal remains low after disconnect.
Command:	&En	X-ON/X-OFF Pacing Control
Values:		<i>n</i> =12 or 13
Default:		12
Description:	&E12	Disables X-ON/X-OFF pacing.
	&E13	Enables X-ON/X-OFF pacing. (&K4 must also be set.)

NOTE

&E13 has no effect if hardware control (&K3) is selected.

CAUTION

Do not enable pacing unless you need it. Some applications may not work if pacing is enabled.

Command:	&Fn	Load Factory Settings
Values:		<i>n</i> =0
Default:		None
Description:	&F0	Load factory settings as active configuration.
Command:	&Gn	V.22bis Guard Tone Control
Values:		<i>n</i> =0, 1, or 2
Default:		0
Description:	&G0	Disable guard tone.
	&G1	Set guard tone to 550 Hz.
	&G2	Set guard tone to 1800 Hz.

NOTE

The &G command is not used in North America.

Command:	&Kn	Flow Control Selection
Values:		<i>n</i> =0, 3, or 4
Defaults:		3
Description:	&K0	Disable flow control.
	&K3	Enable CTS/RTS hardware flow control.
	&K4	Enable X-ON/X-OFF software flow control.
Command:	&Qn	Asynchronous Communications Mode
Values:		<i>n</i> =0, 5, 6, 8, or 9
Default:		5
Description:	&Q0	Asynchronous with data buffering. Same as \N0 .
	&Q5	Error control with data buffering. Same as \N3 .
	&Q6	Asynchronous with data buffering. Same as \N0 .
	&Q8	MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in S36 .
	&Q9	V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in S36 .
Command:	&Sn	Data Set Ready (DSR) Control
Values:		<i>n</i> =0 or 1
Default:		0
Description:	&S0	Force DSR always high (on).
	&S1	Let DSR go high only during a connection.
Command:	&Tn	V.54 Test Commands
Values:		<i>n</i> =0, 1, 3 or 6
Default:		None
Description:	&T0	Abort. Stop any test in progress.
	&T1	Local analog loopback test.
	&T3	Local digital loopback test.
	&T6	Remote digital loopback test.

NOTE

To stop a test, you must use the escape sequence (**+++AT**) before typing **AT&T0**.

CHAPTER 4: AT Commands, S-Registers, and Result Codes

Command:	&V	Display Current Settings
Values:		n/a
Description:		Displays the active modem settings, including the callback security settings if callback security is enabled. If the setup password has been entered, it also displays the callback security passwords.
Command:	&Wn	Store Current Configuration
Values:		n=0
Default:		None
Description:	&W0	Stores current modem settings in nonvolatile memory and causes them to be loaded at power-on or following the ATZ command instead of the factory defaults. See also the &F command.
	&W1	Clears user default settings from nonvolatile memory and causes the factory defaults to be loaded at power-on or following the ATZ command.
Command:	&Yn	Select Stored Configuration for Hard Reset
Values:		n=0
Default:		0
Description:	&Y0	Select stored configuration 0 on power-up. (For backward compatibility with some software.)
	&Y1	Not supported—responds <i>ERROR</i> .
Command:	&Zy=x	Store Dialing Command
Values:		y=0–1 x=Dialing command
Default:		None
Description:		Stores dialing command x in memory location y. Dial the stored number using the command ATDS=y .
Command:	\An	Select Maximum MNP Block Size
Values:		n=0, 1, 2, or 3
Default:		3
Description:	\A0	64-character maximum.
	\A1	128-character maximum.
	\A2	192-character maximum.
	\A3	256-character maximum.

Command:	\Bn	Transmit Break
Values:		<i>n</i> =0–9 in 100-ms units
Default:		3
Description:		In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the \K command.
Command:	\Gn	Modem Port Flow Control
Values:		<i>n</i> =0
Default:		0
Description:	\G0	Returns an <i>OK</i> for backward compatibility with some software.
	\G1	Not supported—responds <i>ERROR</i> .
Command:	\Jn	Data Buffer Control
Values:		<i>n</i> =0
Default:		0
Description:	\J0	Enable data buffer—serial port speed is independent of connect speed.
	\J1	Disable data buffer—serial port speed is forced to the line speed.
Command:	\Kn	Break Control
Values:		<i>n</i> =0–5
Default:		5
Description:		Controls the response of the modem to a \B command. The response is different for each of three different states.
		Data mode. The modem receives the break from the computer:
	\K0	Enter online command mode, no break sent to the remote modem.
	\K1	Clear data buffers and send break to the remote modem.
	\K2	Same as \K0 .
	\K3	Send break immediately to the remote modem.
	\K4	Same as \K0 .
	\K5	Send break to the remote modem in sequence with the transmitted data.

Data mode. The modem receives the break from the remote modem:

- \K0 Clear data buffers and send break to the computer.
- \K1 Same as **\K0**.
- \K2 Send break immediately to the computer.
- \K3 Same as **\K2**.
- \K4 Send break to the computer in sequence with the received data.
- \K5 Same as **\K4**.

Online command mode. The modem receives a **\Bn** command from the computer:

- \K0 Clear data buffers and send break to the remote modem.
- \K1 Same as **\K0**.
- \K2 Send break immediately to the remote modem.
- \K3 Same as **\K2**.
- \K4 Send break to the remote modem in sequence with the transmitted data.
- \K5 Same as **\K4**.

Command: **\Nn**

Values:

Default:

Description:

Error Correction Mode Selection

$n=0-5$, or 7

3

- \N0 Non-error correction mode with data buffering (buffer mode; same as **&Q6**).
- \N1 Direct mode.
- \N2 MNP reliable mode. If the modem cannot make an MNP connection, it disconnects.
- \N3 V.42/MNP auto-reliable mode. The modem attempts first to connect in V.42 error correction mode, then in MNP mode, and finally in non-error-correction (buffer) mode with continued operation.
- \N4 V.42 reliable mode. If the modem cannot make a V.42 connection, it disconnects.
- \N5 V.42, MNP, or non-error correction (same as **\N3**).
- \N7 V.42, MNP, or non-error correction (same as **\N3**).

Command:	\Qn	Flow Control Selection
Values:		<i>n</i> =0, 1, or 3
Default:		3
Description:	\Q0	Disable flow control (same as &K0).
	\Q1	X-ON/X-OFF software flow control (same as &K4).
	\Q2	CTS-only flow control. Not supported.
	\Q3	RTS/CTS hardware flow control (same as &K3).
Command:	\Tn	Inactivity Timer
Values:		<i>n</i> =0, 1–255
	Default:	0
Description:	\Tn	Sets the time (in minutes) after the last character is sent or received that the modem waits before disconnecting. A value of zero disables the timer. Applies only in buffer mode.

NOTE

You can also set the inactivity timer by changing the value of **S30**.

Command:	\Vn	Protocol Result Code
Values:		<i>n</i> =0, 1, or 2
Default:		1
Description:	\V0	Disable the appending of the protocol result code to the DCE speed.
	\V1	Enable the appending of the protocol result code to the DCE speed.
	\V2	Same as \V1 .
Command:	\Xn	X-ON/X-OFF Pass-Through
Values:		<i>n</i> =0 or 1
Defaults:		0
Description:	\X0	Modem responds to and discards X-ON/X-OFF characters.
	\X1	Modem responds to and passes X-ON/X-OFF characters.
Command:	-Cn	Data Calling Tone
Values:		<i>n</i> =0 or 1
Defaults:		0
Description:	-C0	Disable v.25 data calling tone to deny remote data/fax/voice discrimination.
	-C1	Enable V.25 data calling tone to allow remote data/fax/voice discrimination.

Command: Values: Defaults: Description:	%A %A0 %A1	Adaptive Answer Result Code Enable <i>n</i> =0 or 1 0 The %A command controls whether the <i>DATA</i> and <i>FAX</i> result codes will be sent by the modem. The modem must be in fax mode for this command to work. Also, the modem must be set to +FAA=1 which enables the modem to distinguish between a fax and a data call. When these commands are enabled, the modem sends <i>DATA</i> to the computer when it detects data tones and <i>FAX</i> when it detects fax tones. These strings are used by some servers to select the appropriate communication program. Disables adaptive answer result codes. Enables adaptive answer result codes.
Command: Values: Description:	%B n/a	View Numbers in Blacklist If blacklisting is in effect, AT%B displays the numbers for which the last call attempted in the previous two hours failed. In countries that do not require blacklisting, the <i>ERROR</i> result code appears.
Command: Values: Default: Description:	%Cn %C0 %C1	Data Compression Control <i>n</i> =0 or 1 1 Disable V.42bis/MNP 5 data compression. Enable V.42bis/MNP 5 data compression.
Command: Values: Default: Description:	%En 2 %E0 %E1 %E2	Fallback and Fall Forward Control <i>n</i> =0, 1, or 2 Disable fallback and fall forward. Enable fallback, disable fall forward. Enable fallback and fall forward.
Command: Values: Default: Description:	#Sx	Enter Setup Password x=password (1–8 characters, case-sensitive) blackbox Enters the remote configuration setup password.

Command: **#S=x** Store Setup Password
Values: x=password (1–8 characters, case-sensitive)
Default: blackbox
Description: Stores a new remote configuration setup password.

Command: **+++AT<CR>** **Escape Sequence**
Values: n/a
Description: Puts the modem in command mode (and optionally issues a command) while remaining online. Type **+++AT** and up to ten command characters, then press ENTER. Used mostly to issue the hang-up command: **+++ATH<CR>**.

Command: **%%%AT<CR>** **Remote Configuration Escape Sequence**
Values: n/a
Description: Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register *SI3*.

4.2 S-Registers

Certain modem values, or parameters, are stored in memory locations called S-registers. Use the **S** command to read or to alter the contents of S-registers (see previous section).

Register	Unit	Range	Default	Description
S0	1 ring	0, 1–255	1	Sets the number of rings until the modem answers. ATS0=0 disables autoanswer completely.
S1	1 ring	0–255	0	Counts the rings that have occurred.
S2	decimal	0–127, 128–255	43(+)	Sets ASCII code for the escape character. Values greater than 127 disable ESC.
S3	decimal	0–127	13(^M)	Sets the ASCII code for the carriage-return character.
S4	decimal	0–127	10(^J)	Sets the ASCII code for the line-feed character.
S5	decimal	0–32, 33–127	8(^H)	Sets the ASCII code for the backspace character. Values greater than 32 disable backspace.
S6	seconds	2–65*	2*	Sets the time the modem waits after it goes off-hook before it begins to dial the telephone number.

PORTABLE USB MODEM

Register	Unit	Range	Default	Description
S7	seconds	1–255*	50*	Sets the time the modem waits for a carrier signal before aborting a call. Also sets the wait for silence time for the @ dial modifier.
S8	seconds	0–65	2	Sets the length of a pause caused by a comma character in a dialing command.
S9	decimal	0, 1–127	37(%)	Sets ASCII code for remote configuration escape character. S9=0 disables remote configuration.
S10	100 ms	1–254	20	Sets how long a carrier signal must be lost before the modem disconnects.
S11	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
S18	1 ms	0–255	20	Sets duration of time from the time the carrier signal goes low and then goes high again as set up by the &C2 command.
S28	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
S30	1 minute	0, 1–255	0	Sets the length of time that the modem waits before disconnecting when no data is sent or received. A value of zero disables the time. See also the \T command.

Register	Unit	Range	Default	Description
S35	decimal	0–1	0	0 disables, 1 enables the V.25 data calling tone, which allows remote data/fax/voice discrimination.
S36	decimal	0–7	7	Specifies the action to take if negotiation fails when error control is selected. (See S48 .)
S37	decimal	0–19	0	<p>Sets the maximum V.34 upstream speed at which the modem attempts to connect.</p> <p>0 = maximum modem speed 1 = reserved 2 = 1200/75 bps 3 = 300 bps 4 = reserved 5 = 1200 bps 6 = 2400 bps 7 = 4800 bps 8 = 7200 bps 9 = 9600 bps 10 = 12,000 bps 11 = 14,400 bps 12 = 16,800 bps 13 = 19,200 bps 14 = 21,600 bps 15 = 24,000 bps 16 = 26,400 bps 17 = 28,800 bps 18 = 31,200 bps 19 = 33,600 bps</p>

Register	Unit	Range	Default	Description																																														
S38	decimal	0–23	1	<p>Sets downstream data rate where K56flex provides rates of 32,000 to 56,000 bps in 2000 bps increments. V.90 provides rates of 28,000 to 56,000 bps in increments of 1333 bps.</p>																																														
				<p>0 = V.90 disabled</p> <table border="0"> <tr> <td>1 = V.90 autorate</td> <td><u>K56flex rates</u></td> </tr> <tr> <td>2 = 28,000 bps</td> <td>2 = 32,000 bps</td> </tr> <tr> <td>3 = 29,333 bps</td> <td>3 = 34,000 bps</td> </tr> <tr> <td>4 = 30,666 bps</td> <td>4 = 36,000 bps</td> </tr> <tr> <td>5 = 32,000 bps</td> <td>5 = 38,000 bps</td> </tr> <tr> <td>6 = 33,333 bps</td> <td>6 = 40,000 bps</td> </tr> <tr> <td>7 = 34,666 bps</td> <td>7 = 42,000 bps</td> </tr> <tr> <td>8 = 36,000 bps</td> <td>8 = 44,000 bps</td> </tr> <tr> <td>9 = 37,333 bps</td> <td>9 = 46,000 bps</td> </tr> <tr> <td>10 = 38,666 bps</td> <td>10 = 48,000 bps</td> </tr> <tr> <td>11 = 40,000 bps</td> <td>11 = 50,000 bps</td> </tr> <tr> <td>12 = 41,333 bps</td> <td>12 = 52,000 bps</td> </tr> <tr> <td>13 = 42,666 bps</td> <td>13 = 54,000 bps</td> </tr> <tr> <td>14 = 44,000 bps</td> <td>14 = 56,000 bps</td> </tr> <tr> <td>15 = 45,333 bps</td> <td></td> </tr> <tr> <td>16 = 46,666 bps</td> <td></td> </tr> <tr> <td>17 = 48,000 bps</td> <td></td> </tr> <tr> <td>18 = 49,333 bps</td> <td></td> </tr> <tr> <td>19 = 50,666 bps</td> <td></td> </tr> <tr> <td>20 = 52,000 bps</td> <td></td> </tr> <tr> <td>21 = 53,333 bps</td> <td></td> </tr> <tr> <td>22 = 54,666 bps</td> <td></td> </tr> <tr> <td>23 = 56,000 bps</td> <td></td> </tr> </table> <p>Upstream data rates The upstream V.90 data rates are 4800 to 33,600 bps in 2400-bps increments.</p>	1 = V.90 autorate	<u>K56flex rates</u>	2 = 28,000 bps	2 = 32,000 bps	3 = 29,333 bps	3 = 34,000 bps	4 = 30,666 bps	4 = 36,000 bps	5 = 32,000 bps	5 = 38,000 bps	6 = 33,333 bps	6 = 40,000 bps	7 = 34,666 bps	7 = 42,000 bps	8 = 36,000 bps	8 = 44,000 bps	9 = 37,333 bps	9 = 46,000 bps	10 = 38,666 bps	10 = 48,000 bps	11 = 40,000 bps	11 = 50,000 bps	12 = 41,333 bps	12 = 52,000 bps	13 = 42,666 bps	13 = 54,000 bps	14 = 44,000 bps	14 = 56,000 bps	15 = 45,333 bps		16 = 46,666 bps		17 = 48,000 bps		18 = 49,333 bps		19 = 50,666 bps		20 = 52,000 bps		21 = 53,333 bps		22 = 54,666 bps		23 = 56,000 bps	
1 = V.90 autorate	<u>K56flex rates</u>																																																	
2 = 28,000 bps	2 = 32,000 bps																																																	
3 = 29,333 bps	3 = 34,000 bps																																																	
4 = 30,666 bps	4 = 36,000 bps																																																	
5 = 32,000 bps	5 = 38,000 bps																																																	
6 = 33,333 bps	6 = 40,000 bps																																																	
7 = 34,666 bps	7 = 42,000 bps																																																	
8 = 36,000 bps	8 = 44,000 bps																																																	
9 = 37,333 bps	9 = 46,000 bps																																																	
10 = 38,666 bps	10 = 48,000 bps																																																	
11 = 40,000 bps	11 = 50,000 bps																																																	
12 = 41,333 bps	12 = 52,000 bps																																																	
13 = 42,666 bps	13 = 54,000 bps																																																	
14 = 44,000 bps	14 = 56,000 bps																																																	
15 = 45,333 bps																																																		
16 = 46,666 bps																																																		
17 = 48,000 bps																																																		
18 = 49,333 bps																																																		
19 = 50,666 bps																																																		
20 = 52,000 bps																																																		
21 = 53,333 bps																																																		
22 = 54,666 bps																																																		
23 = 56,000 bps																																																		

Register	Unit	Range	Default	Description										
S42	decimal	0–1	1	Enables/disables the 56 kbps auto rate. When 56 kbps is disabled, fallback to V.34 is also disabled. 0=disable; 1=enable.										
S43	decimal	0–1	1	For testing and debugging only. Enables/disables V.32bis start-up auto mode operation. 0=disable; 1=enable.										
S48	decimal	7 or 128	7	<p>Enables (7) or disables (128) LAPM negotiation. The following table lists the S36 and S48 configuration settings for certain types of connections.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">S48=7</th> <th style="text-align: center;">S48=128</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">S36=0, 2</td> <td style="text-align: center;">do not use</td> </tr> <tr> <td style="text-align: center;">S36=1, 3</td> <td style="text-align: center;">Async</td> </tr> <tr> <td style="text-align: center;">S36=4, 6</td> <td style="text-align: center;">MNP or hangup</td> </tr> <tr> <td style="text-align: center;">S36=5, 7</td> <td style="text-align: center;">MNP or async</td> </tr> </tbody> </table>	S48=7	S48=128	S36=0, 2	do not use	S36=1, 3	Async	S36=4, 6	MNP or hangup	S36=5, 7	MNP or async
S48=7	S48=128													
S36=0, 2	do not use													
S36=1, 3	Async													
S36=4, 6	MNP or hangup													
S36=5, 7	MNP or async													
S89	seconds	0, 5–255	10	Sets the length of time in the off-line command mode before the modem goes into standby mode. A value of zero prevents standby mode; a value of 1–4 sets the value to 5.										

Register	Unit	Range	Default	Description
S109	decimal	0–2	1	<p>Sets one of three 56-kbps operating modes: K56flex mode, V.90 mode, or Auto-mode. S109=2 forces V.90 connections for testing purposes, etc. S109 sets the 56-kbps operating mode as shown below:</p> <p>0=V.90 disabled 1=K56flex or V.90 (Dual mode enabled) 2=V.90 only (K56flex disabled).</p>

4.3 Result Codes

In command mode, your modem can send responses called *result codes* to your computer. Result codes are used by communications programs and can also appear on your monitor.

<u>Terse</u>	<u>Verbose</u>	<u>Description</u>
0	OK	Command executed
1	CONNECT	Modem connected to line
2	RING	Ring signal detected
3	NO CARRIER	Carrier signal lost or not detected
4	ERROR	Invalid command
5	CONNECT 1200	Connected at 1200 bps
6	NO DIALTONE	No dial tone detected
7	BUSY	Busy signal detected
8	NO ANSWER	No answer at remote end

<u>Terse</u>	<u>Verbose</u>	<u>Description</u>
10*	CONNECT 2400	Connected at 2400 bps
11*	CONNECT 4800	Connected at 4800 bps
12*	CONNECT 9600	Connected at 9600 bps
13*	CONNECT 14400	Connected at 14,400 bps
14*	CONNECT 19200	Connected at 19,200 bps
24*	CONNECT 7200	Connected at 7200 bps
25*	CONNECT 12000	Connected at 12,000 bps
26*	CONNECT 16800	Connected at 16,800 bps
40*	CONNECT 300	Connected at 300 bps
55*	CONNECT 21600	Connected at 21,600 bps
56*	CONNECT 24000	Connected at 24,000 bps
57*	CONNECT 26400	Connected at 26,400 bps
58*	CONNECT 28800	Connected at 28,800 bps
59*	CONNECT 31200	Connected at 31,200 bps
60*	CONNECT 33600	Connected at 33,600 bps
70*	CONNECT 32000	Connected at 32,000 bps, 56 K rate
71*	CONNECT 34000	Connected at 34,000 bps, 56 K rate
72*	CONNECT 36000	Connected at 36,000 bps, 56 K rate
73*	CONNECT 38000	Connected at 38,000 bps, 56 K rate
74*	CONNECT 40000	Connected at 40,000 bps, 56 K rate
75*	CONNECT 42000	Connected at 42,000 bps, 56 K rate
76*	CONNECT 44000	Connected at 44,000 bps, 56 K rate
77*	CONNECT 46000	Connected at 46,000 bps, 56 K rate
78*	CONNECT 48000	Connected at 48,000 bps, 56 K rate
79*	CONNECT 50000	Connected at 50,000 bps, 56 K rate
80*	CONNECT 52000	Connected at 52,000 bps, 56 K rate
81*	CONNECT 54000	Connected at 54,000 bps, 56 K rate
82*	CONNECT 56000	Connected at 56,000 bps, 56 K rate

*EC is added to these result codes when the extended result codes configuration option is enabled. EC is replaced by one of the following codes, depending on the type of error control connection:

V42bis—V.42 error control (LAP-M) and V.42bis data compression.

V42—V.42 error control (LAP-M) only.

MNP5—MNP 4 error control and MNP 5 data compression.

MNP4—MNP 4 error control only.

NoEC—No error control protocol.

<u>Terse</u>	<u>Verbose</u>	<u>Description</u>
88	DELAYED	Delay is in effect for the dialed number
89	BLACKLISTED	Dialed number is blacklisted
90	BLACKLIST FULL	Blacklist is full
100	CONNECT 28000	Connected at 28,000 bps, V.90 rate
101	CONNECT 29333	Connected at 29,333 bps, V.90 rate
102	CONNECT 30666	Connected at 30,666 bps, V.90 rate
103	CONNECT 33333	Connected at 33,333 bps, V.90 rate
104	CONNECT 34666	Connected at 34,666 bps, V.90 rate
105	CONNECT 37333	Connected at 37,333 bps, V.90 rate
106	CONNECT 38666	Connected at 38,666 bps, V.90 rate
107	CONNECT 41333	Connected at 41,333 bps, V.90 rate
108	CONNECT 42666	Connected at 42,666 bps, V.90 rate
109	CONNECT 45333	Connected at 45,333 bps, V.90 rate
110	CONNECT 46666	Connected at 46,666 bps, V.90 rate
111	CONNECT 49333	Connected at 49,333 bps, V.90 rate
112	CONNECT 50666	Connected at 50,666 bps, V.90 rate
113	CONNECT 53333	Connected at 53,333 bps, V.90 rate
114	CONNECT 54666	Connected at 54,666 bps, V.90 rate

5. Remote Configuration

5.1 Introduction

Remote configuration is a network management tool that allows you to configure modems anywhere in your network from one location. With password-protected remote configuration, you can issue AT commands to a remote Portable USB Modem for maintenance or troubleshooting as if you were on-site.

5.2 Basic Procedure

The following steps are valid regardless of whether the connection is established by the local or the remote modem.

1. Establish a data connection with a remote modem.
2. Send three remote configuration escape characters followed by **AT** and the setup password, and press ENTER. Example: `%%%ATblackbox<CR>`. You have four tries to enter the correct password before being disconnected. If the password is correct, the remote modem responds with

OK

3. You can now send AT commands to configure the remote modem.
4. When you have finished configuring the remote modem, save the new configuration by typing `AT&W0<CR>`, then type `ATO<CR>` to exit remote configuration. You can then break the connection in the normal way.

CAUTION

If you hang up while you are in remote configuration mode, it may lock up the remote modem.

5.3 Setup

The Portable USB Modem is shipped with a default setup password (blackbox). Because anyone who has an owner's manual knows the default setup password, for security you should change the password and possibly also the remote configuration escape character.

5.3.1 CHANGING THE SETUP PASSWORD

1. Open a data communications program such as HyperTerminal.
2. In the terminal window, type **AT#Sblackbox** (or **AT#Syyyyyy** if you have replaced the blackbox password with yyyyyy) and press ENTER. The modem responds with **OK** if the setup password is correct and **ERROR** if it is wrong.
3. To change the password, type **AT#S=yyyyyy**, where yyyyyy stands for the password, and press ENTER. The password can include any keyboard character, and must be one to eight characters long. The modem responds with **OK**.
4. The new password is saved automatically. You can now either enter more AT commands or exit the data communications program. The next time you remotely configure the modem you must use the new setup password.

NOTE

You can only change the setup password locally; you cannot do it remotely. Also, passwords are case-sensitive. The next time you enter the password, it must be in the same case as you set it up.

5.3.2 CHANGING THE REMOTE ESCAPE CHARACTER

To increase security, you can change a remote modem's remote configuration escape character. The remote configuration escape character is stored in register **S9**. The factory default is 37, which is the ASCII code for the percent character (%). Setting **S9** to 0 (zero) disables remote configuration entirely—but if you do this remotely, you won't be able to change it back remotely!

1. Establish a remote configuration link with the remote modem as described in "Basic Procedure."
2. Type **ATS9=*n***, where *n* is the ASCII code for the new remote configuration escape character, then press ENTER.
3. Save the new value by typing **AT&W** and pressing ENTER.
4. Type **ATO<CR>** to exit remote configuration.

6. Troubleshooting

Your modem was thoroughly tested at the factory before it was shipped. If you are unable to make a successful connection, or if you experience data loss or garbled characters during your connection, the modem might be defective. However, it is more likely that the source of your problem lies elsewhere. The following symptoms are typical of problems you might encounter:

- None of the LEDs light when the modem is on.
- The modem does not respond to commands.
- The modem dials but is unable to make a connection.
- The modem disconnects while online.
- The modem cannot connect when answering.
- The modem doesn't work with Caller ID.
- Fax and data software can't run at the same time.

If you experience problems, please check the following possibilities before calling Technical Support.

6.1 None of the Indicators Light

When you plug in the modem, the operating system detects and configures the modem, and the TR LED should come on.

If the TR LED does not come on, check to see that the software from the Modem Installation CD has been installed.

6.2 The Modem Does Not Respond to Commands

- Make sure you are issuing the modem commands from the data communications software, either manually in terminal mode or automatically by configuring the software. (You cannot send commands to the modem from the DOS prompt.)
- Make sure you are in terminal mode in your data communications program, then type **AT** and press **ENTER**. If you get an *OK* response, your connections are good and the problem likely is in the connection setup in your communications software.

- Try resetting your modem by unplugging the USB cable from the modem, and then plugging it back in.
- Try rebooting the computer.
- The modem might be defective. If you have another Portable USB Modem, try swapping modems. If the problem goes away, the first modem is possibly defective. Call Tech Support for assistance.

6.3 The Modem Dials But Cannot Connect

There can be several reasons that the modem fails to make a connection. Possibilities include:

- lack of a physical connection to the telephone line.
- incompatibility between modems.
- a busy signal.
- a wrong number.
- no modem at the other end.
- a faulty modem, computer, or software at the other end.

You can narrow the list of possibilities by using extended result codes. Extended result codes are enabled by default. If they have been disabled, enter **ATVIX4** and press ENTER while in terminal mode, or include **VIX4** in the modem's initialization string. When you dial again, the modem will report the call's progress.

- If the modem reports NO DIALTONE, check that the modem's telephone line cable is connected to both the modem's LINE jack (not the PHONE jack) and the telephone wall jack. If the cable looks secure, try replacing it. If that doesn't work, the problem might be in your building's telephone installation. To test the building installation, plug a telephone into your modem's telephone wall jack and listen for a dial tone. If you hear a dial tone, your modem might be installed behind a company phone system (PBX) with an internal dial tone that sounds different from the normal dial tone. In that case, the modem might not recognize the dial tone and might treat it as an error. Check your PBX manual to see if you can change the internal dial tone; if you can't, change your modem's initialization string to replace **X4** with **X3**, which will cause the modem to ignore dial tones (note, however, that **X3** is not allowed in some countries, such as France and Spain).

- If the modem reports *BUSY*, the other number might be busy, in which case you should try again later, or it might indicate that you have failed to add a **9**, prefix to the phone number if you must dial **9** for an outside line.

If you must dial **9** to get an outside line, the easiest way to dial it automatically is to include it in the modem's dial prefix, for example, **ATDT9,**. Note the comma, which inserts a pause before the number is dialed. By inserting **9**, into the dial prefix, you do not have to include it in each directory entry.

To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, and type **9** in the local and long distance boxes in **How I dial from this location**.

- If the modem reports *NO ANSWER*, the other system has failed to go off-hook, or you might have dialed a wrong number. Check the number.
- If the modem reports *NO CARRIER*, the phone was answered at the other end, but no connection was made. You might have dialed a wrong number, and a person answered instead of a computer, or you might have dialed the correct number but the other computer or software was turned off or faulty. Check the number and try again, or try calling another system to make sure your modem is working. Also, try calling the number on your telephone. If you hear harsh sounds, then another modem is answering the call, and the modems might be having problems negotiating because of modem incompatibilities or line noise. Try connecting at a lower speed.

6.4 The Modem Disconnects While Online

- If you have Call Waiting on the same phone line as your modem, it can interrupt your connection when someone tries to call you. If you have Call Waiting, disable it before each call. In most telephone areas in North America, you can disable Call Waiting by preceding the telephone number with ***70** (check with your local telephone company).

You can automatically disable Call Waiting by including the disabling code in the modem's dial prefix (for example, **ATDT*70,**—note the comma, which inserts a pause before the number is dialed). To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, check **This location has Call Waiting**, and select the correct code for your phone service.

- If you have extension phones on the same line as your modem, you or someone else can interrupt the connection by picking up another phone. If this is a frequent problem, disconnect the extension phones before using the modem, or install another phone line especially for the modem.
- Check for loose connections between the modem and the computer and the telephone jack.
- You might have had a poor connection because of line conditions or the problem might have originated on the other end of the line. Try again.
- If you were online with an online service, it might have hung up on you because of lack of activity on your part or because you exceeded your time limit for the day. Try again.

6.5 The Modem Cannot Connect When Answering

Autoanswer might be disabled. Turn on autoanswer in your data communications program or send the command `ATS0=1` (`ATS0=2` if you have Caller ID service) to make sure your modem is in terminal mode.

6.6 The Modem Doesn't Work with Caller ID

- Caller ID information is transmitted between the first and second rings, so if autoanswer is turned off (`S0=0`) or if the modem is set to answer after only one ring (`S0=1`), the modem will not receive Caller ID information. Check your initialization string, and if necessary change it to set the modem to answer after the second ring (`S0=2`).
- Make sure that you have Caller ID service from your telephone company.

6.7 Fax and Data Software Can't Run at the Same Time

Communications devices can be accessed by only one application at a time. In Windows 98, you can have data and fax communication applications open at the same time, but they cannot use the same modem at the same time.

6.8 Calling Black Box

If you determine that your Portable USB Modem is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

6.9 Shipping and Packaging

If you need to transport or ship your Portable USB Modem:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Portable USB Modem for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Appendix A. V.90 Support

A.1 Introduction

V.90 is the ITU designation for what had been formerly called V.pcm. The ITU recommendation V.90 was determined at a meeting in Geneva ending February 6, 1998.

V.90 will replace K56flex and other proprietary solutions for PCM connections. Dual-mode client modem code will be important until all central-site digital modems are upgraded to V.90 and all interoperability problems have been resolved. Until that time, the dual-mode client code will provide reliable connections in K56flex mode to the central-site modems currently deployed.

Your V.90 dual-mode (V.90/K56flex) modem now includes:

- New AT commands,
- New Result Codes in V.90 mode, and
- A-law/ μ -law selection and various changes to the AT command documentation.

A.2 V.90 Troubleshooting

1. Check that the modem firmware is the latest.
2. Try adding one or more comma (,) characters to the dialed number in the dialing string.
3. Try limiting the speed with the **S37** (sets the maximum upstream speed) and **S38** (sets the maximum downstream speed) commands.
4. Perform another basic modem/line troubleshooting (check the phone line for noise, try a different line, or try another device on the same line).

Appendix B. Loopback Tests

B.1 Introduction

Each time you turn on your modem, it performs an automatic self-test to ensure proper operation. Your modem also has three diagnostic tests: local analog loopback, remote digital loopback, and local digital loopback. These ITU-T V.54 loopback tests isolate telephone circuit and transmission problems.

In a loopback test, data from your computer loops through the circuits of your modem and/or a remote modem before it appears on your monitor. When the loop has been completed, the data on your PC's monitor should match the original data.

The local analog loopback test allows you to verify that the modem's transmitter and receiver circuits are functioning properly.

The local digital loopback allows you to verify that the local computer or terminal, the two modems, and the transmission line between them are functioning properly.

The remote digital loopback test allows you to verify that the remote computer or terminal, the remote modem, the serial ports, the telephone line, and the local modem are functioning properly.

NOTE

All loopback tests operate at all speeds except 300 bps.

B.2 Local Analog Loopback Test (V.54 Loop 3)

In this test, data from your computer or terminal is sent to your modem's transmitter, converted into analog form, looped back to the modem's receiver, converted into digital form, and then sent to your monitor for verification. No connection to the phone line is required.

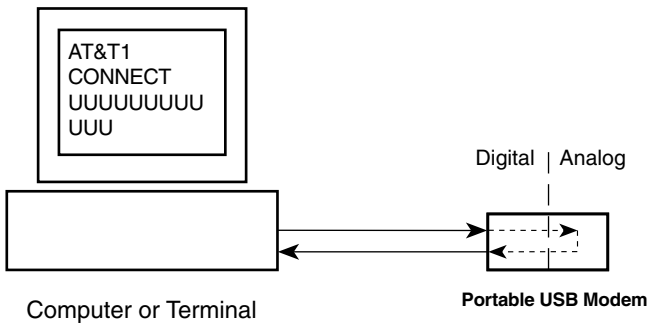


Figure B-1. Local analog loopback test.

TEST PROCEDURE

1. Connect the modem to your computer. Using your communication program, set the desired baud rate and go into terminal mode.
2. Type **AT&T1** and press **ENTER**. This places your modem in analog loopback mode in the originate mode. A *CONNECT* message should appear on your display. The modem is now out of command mode and in a pseudo-online mode.
3. Note that the CD LED is on. If you are set for 14,400 bps or higher, a speed LED should be on. If the CD LED is not on, there is a defect in your modem.
4. Enter characters from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The characters entered should be displayed on your monitor. The TD and RD LEDs should flash when a character is entered.
5. To exit the test, type the escape sequence **+++AT** and press **ENTER**. This puts the modem in online command mode. Then type either **AT&T** or **ATH** to return to command mode.

- Your modem passes this test if the data received on your monitor are the same as the data entered from your keyboard. If different data appear on your monitor, your modem is probably causing the problem, though it could also be your computer. If your modem passes this test, but you are receiving errors while on line, the remote modem or the phone line could be at fault.

B.3 Remote Digital Loopback Test (V.54 Loop 2)

The remote digital loopback test tests the phone lines and the circuits of both your modem and a remote modem. In this test, your modem must be on line with another modem that is set up to respond to a request for remote digital loopback. (Note that some modems might not support remote digital loopback or might have it disabled.) Data from your computer or terminal is transmitted through your modem and over the phone line to the remote modem, where it is then looped back to your modem.

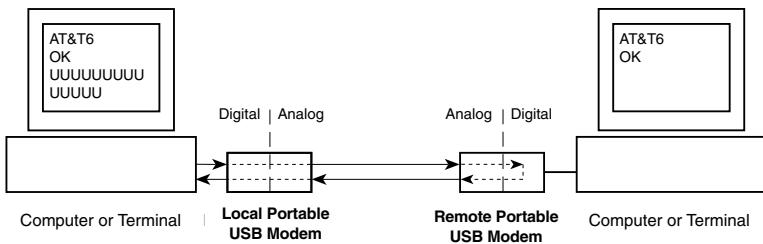


Figure B-2. Remote digital loopback test.

TEST PROCEDURE

- Arrange to have **&T6** set on the remote test modem.
- Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an *OK* message. Type **AT+N** and press ENTER to disable error correction.
- Dial the remote modem and establish your online connection.
- Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.

5. Type **AT&T6** and press ENTER. The local modem responds to this command by transmitting an unscrambled marking signal, which causes the remote modem to place itself in digital loopback mode. Then the local modem exits online command mode and enters data mode.
6. Enter data from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeroes. Data received by the remote modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to your modem. Your modem passes this test if the data received on your monitor is the same as the data entered from your keyboard.
7. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

B.4 Local Digital Loopback Test (V.54 Loop 2)

The local digital loopback test is identical to the remote digital loopback test with one exception. Instead of using your modem to signal a remote modem to place itself in digital loopback mode, your modem is placed in digital loopback mode while the remote modem is not. Data is entered and transmitted from the remote modem, sent across the phone line to your modem, and looped back to the remote modem.

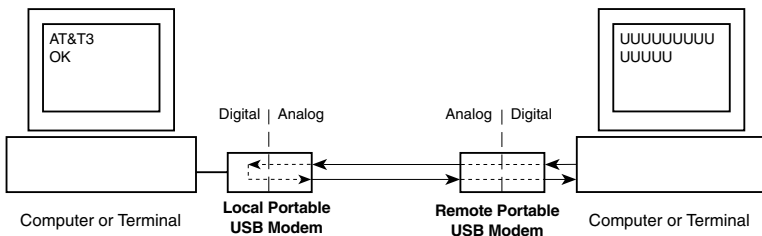


Figure B-3. Local digital loopback test.

TEST PROCEDURE

1. Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an OK message. Type **AT\N** and press ENTER to disable error correction.
2. Dial the remote modem and establish your online connection.
3. Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.
4. Type **AT&T3** and press ENTER. Once you receive an *OK* message from your modem (if responses are enabled), your modem is placed in digital loopback mode.
5. Have someone enter data from the remote keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The data received by your modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to the remote modem. Your modem passes this test if the data received on the remote monitor is the same as the data entered from the remote keyboard.
6. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

Appendix C. Dial-Up Networking

Microsoft's Dial-Up Networking (DUN) is a system component of Windows 98 and 2000 that enables you to connect your computer to a variety of computer systems and networks, including the Internet.

Dial-Up Networking has been integrated into Windows 2000. If you are using Windows 98, you may need to install the Dial-Up Networking code from the full-release Windows CD, a companion CD from your Original Equipment Manufacturer (OEM), or from a complete set of installation (*.CAB) files on your hard drive. If you are connecting to the Internet, the TCP/IP protocol suite must also be installed on your computer.

If you are making a Dial-Up connection to the Internet, you'll need to set up an account with an Internet Service Provider (ISP). Your ISP should give you the following information:

- Your access account userid and password.
- The access phone number(s) for dialing into your Internet Service Provider.
- The protocol used to connect to your ISP (PPP or SLIP).
- Your ISP may or may not provide a *static* IP address for your computer. If your ISP provides an IP address for your computer or for their Domain Name Server (DNS), you'll need to enter these addresses when you configure the Dial-Up connection. Many ISPs use *dynamic* IP addresses, which means they issue your computer a new IP address each time you log into their system. If your ISP uses dynamic IP addresses, you do not need to configure an IP address when you create your Dial-Up Connection.

The following instructions will guide you through setting up a basic Dial-Up Networking connection to the Internet. Many features and settings beyond those shown here are available for use when creating a Dial-Up connection.

C.1 Windows 98/Me Dial-Up Networking

NOTE

Before beginning, make certain Dial-Up Networking and TCP/IP are installed on your computer.

1. To begin your set up:

In Windows 98/Me, go to **Start | Programs | Accessories | Communications | Dial-Up Networking**.

2. If this is the first time you have set up a connection with Dial-Up Networking, the **Welcome to Dial-Up Networking Wizard** dialog box is displayed. If the Wizard does not display, double-click the **Make New Connection** icon to display the **Make New Connection** dialog box.
3. The **Make New Connection** dialog box is displayed. Enter a descriptive name for this connection. In the “Select a device:” list box, select your Portable USB Modem from the list.

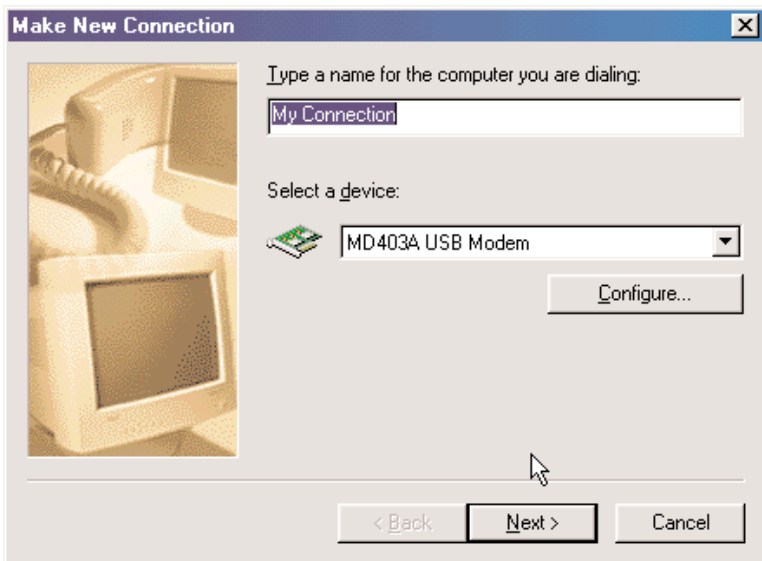


Figure C-1. Make New Connection dialog box, selecting the modem.

Click **Next>**.

4. The **Make New Connection** dialog box is displayed. Enter the Area Code, Telephone number and Country Code for the computer you will be calling

with this connection (your ISP's access phone number).

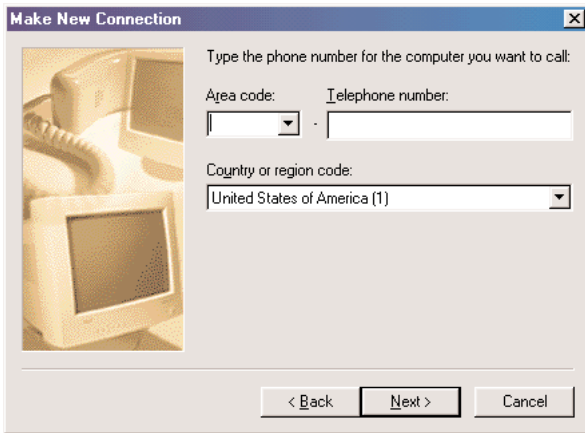


Figure C-2. Make New Connection dialog box, entering phone number.

Click **Next>**.

5. The **Make New Connection** dialog box is displayed indicating you have successfully created a new Dial-Up connection.

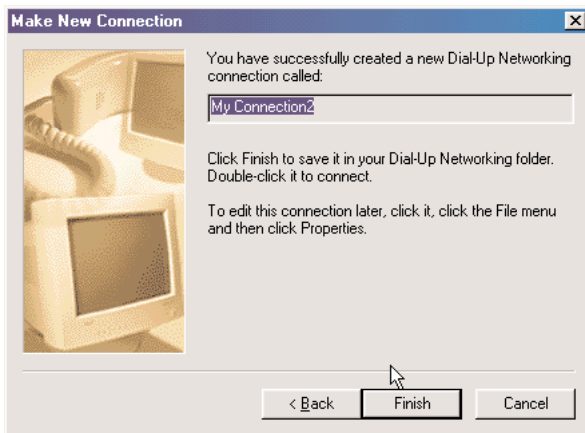


Figure C-3. Dial-Up connection created.

Click **Finish**.

6. From the Dial-Up Networking folder, right click on the Dial-Up Connection just created and select **Properties** to open the **Modem Properties** dialog box.

7. The **Modem Properties** dialog box is displayed. For Windows 98, click the **Server Types** tab to display the server property screen. Select the appropriate Server Type, Log on options, and protocol selections for the device to which you are connecting (for example, your ISP). **For Windows Me**, go to the **Networking** tab to choose these same server-related options.

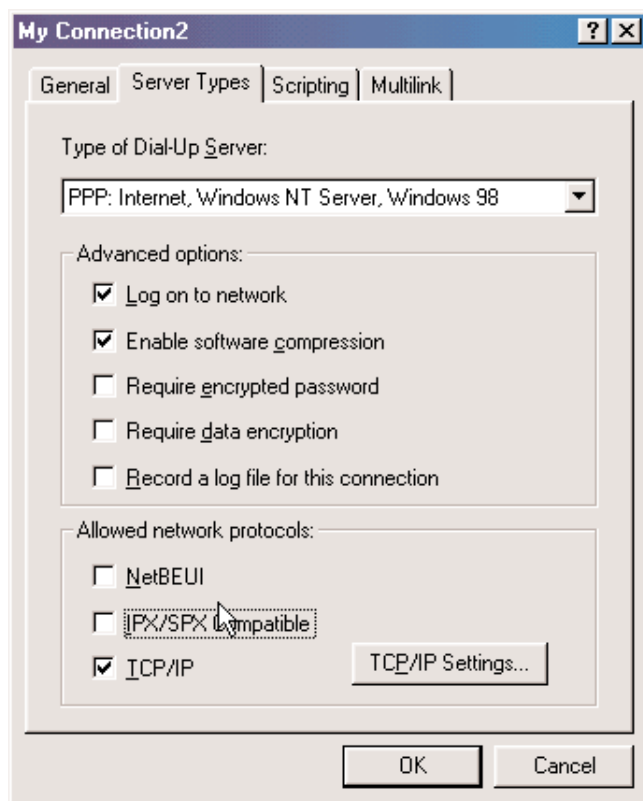


Figure C-4. Networking tab.

Click **OK**.

8. If your ISP requires you to enter IP addresses for their server or DNS (Domain Name Server), click the **TCP/IP Settings** button. (In Windows 98, the TCP/IP Settings button is on the Server Types screen; in Windows Me, the **TCP/IP Settings** button is on the **Networking** screen.)
9. The **TCP/IP Settings** dialog box is displayed.

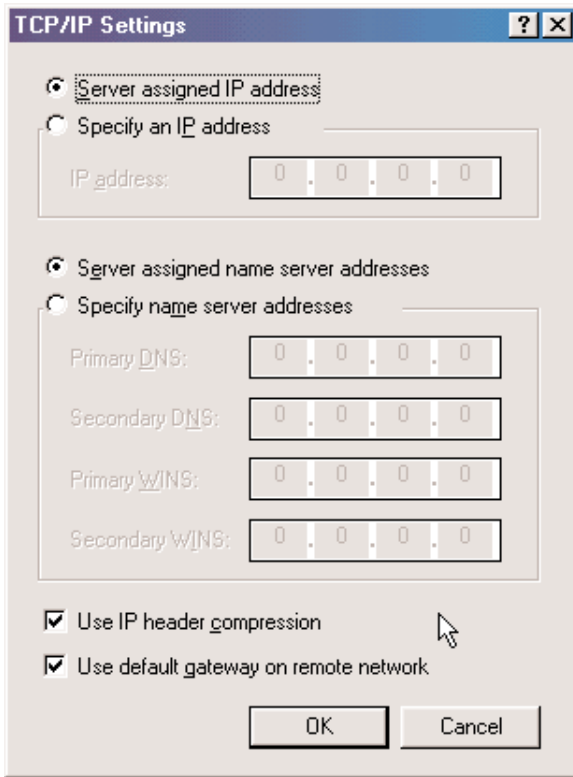


Figure C-5. TCP/IP Settings dialog box.

If your ISP provided you with an IP address for your computer, select **Specify an IP address** and enter the static address in the box provided. If your ISP requires you to enter an IP address for their name server (DNS), select **Specify name server addresses** and enter the IP addresses given to you by your ISP. Click **OK** to save the TCP/IP values and return to the Server Types tab.

When you have completed customizing the modem properties for this connection, click **OK**.

To use this connection, double-click the Dial-Up Connection icon within the Dial-Up Networking folder. If prompted, enter your Internet account User Name and Password and click **Connect**.

C.2 Windows 2000 Dial-Up Networking

The following instructions describe all Dial-Up Networking connection options under Windows 2000 as well as guide you through setting up a Dial-Up Networking connection to an Internet Service Provider (ISP).

NOTE

If you are connecting to the Internet, make sure TCP/IP is installed on your computer and that you've set up an access account with an Internet Service Provider.

1. To set up a Dial-Up Networking connection within Windows 2000, select **Start | Settings | Network and Dial-up Connections**.
2. In the **Network and Dial-up Connections** dialog box, double-click the **Make New Connection** icon. The **Network Connection Wizard** dialog box is displayed, indicating the Wizard will help in creating a connection to other computers and networks enabling applications such as e-mail, web browsing, file sharing, and printing.



Figure C-6. Network Connection Wizard dialog box.

Click **Next**.

3. The **Network Connection Type** dialog box is displayed offering several connection options. Select the option which best describes the type of connection you are creating with this definition.

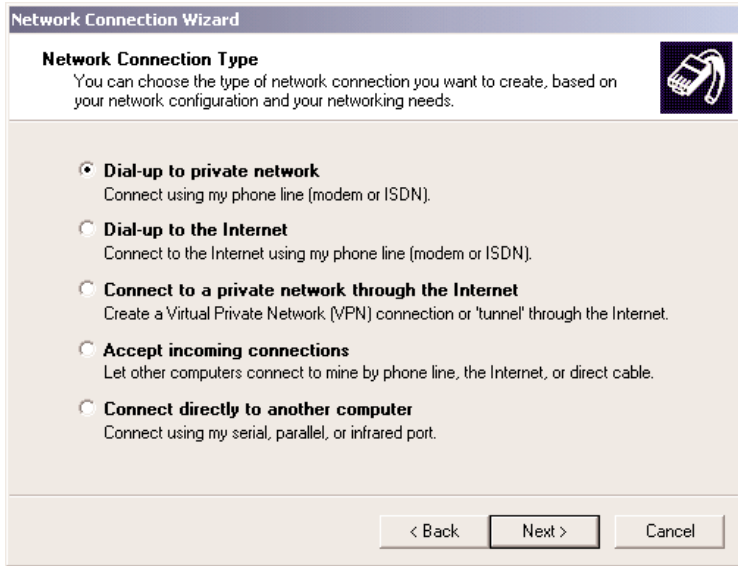


Figure C-7. Network Connection Type dialog box.

Click **Next>**.

The process for completing your Dial-Up Networking connection will vary based on the connection type selected in the previous step.

*If you select **Dial-up to private network** and have only one modem installed:*

- a. The **Phone Number to Dial** dialog box is displayed. Enter the phone number of the computer, network, or Internet Service Provider (ISP) to which you are connecting. Click **Next>**.
- b. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.
- c. The **Completing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the box provided, then click **Finish**.

If you select *Dial-up to the Internet*, the *Welcome to the Internet Connection Wizard* is displayed as shown below.

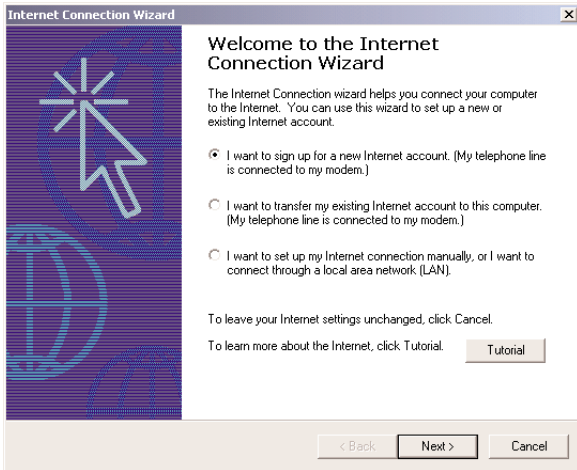


Figure C-8. Welcome to the Internet World Connection Wizard.

- a. Select the appropriate option for the type of connection you are making to the Internet and click **Next>**. In this example, *“I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)”* has been selected.
- b. The **Setting up your Internet connection** dialog box is displayed. Select **I connect through a phone line and modem**. Click **Next>**.
- c. If you have only one modem installed, proceed to the next step. If you have more than one modem installed on your computer, select the Portable USB Modem from the list and click **Next>**.
- d. The **Step 1 of 3: Internet account connection information** dialog box is displayed. Enter the Area code, Telephone number and Country/region name and code for your Internet Service Provider’s access number.
- e. Click the **Advanced** tab to access options for selecting your connection type and logon procedures. Your ISP should provide this information for your account. If you are not sure which connection type to choose, try PPP.

Although many ISPs automatically provide an IP address for your machine and their Domain Name Server (DNS) each time you connect to them, some ISPs do not. If your ISP provided IP addresses to you, click the **Addresses** tab.

In the IP Address section, select **Always use the following:**, and enter the IP addresses into the appropriate boxes. Click **OK** to return to **Step 1 of 3: Internet account connection**, and click **Next>**.

NOTE

If your machine has a network adapter installed, do not enter this address in the address box. Enter the IP address provided by your ISP.

- f. The **Step 2 of 3: Internet account logon information** dialog box is displayed. Enter the user name and password you will use for your Internet account. Click **Next>**.
- g. The **Step 3 of 3: Configuring your computer** dialog box is displayed. In the box provided, enter a descriptive name for this connection and click **Next>**.
- h. You are then asked if you would like to set up an Internet mail account. You may select **Yes** or **No**. If you select yes, you will be asked to provide specific information about your mail service. In this example, **No** is selected. Click **Next>**.
- i. The **Completing the Internet Connection Wizard** is displayed. Click **Finish**.

*If you select **Connect to a private network through the Internet**:*

- a. In the box provided, enter the Host name or IP address belonging to the computer to which you are calling. Contact the network administrator for the device to which you are connecting to obtain this information. Click **Next>** to continue.
- b. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.
- c. The **Completing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the box provided. Click **Finish**.

*If you select **Accept incoming connections**:*

This option allows another computer to create a virtual connection to your computer through the Internet, other public network, or a direct cable. Virtual Private connections to your computer through the Internet are possible only if your computer has a known name or IP address on the Internet.

- a. The **Devices for Incoming Connections** dialog box is displayed. Select the Portable USB Modem and click **Next>**.
- b. At the **Incoming Virtual Private Connection** dialog box, select either **Allow virtual private connection** or **Do not allow virtual private connection**.
- c. The **Allowed Users** dialog box is displayed. Next, you can **Add** or **Delete** users you will allow to connect to this device. Click **Next>**.
- d. In the **Networking Components** dialog box, select the boxes next to the name of each networking component you want to enable for incoming connections. Click **Next>**.
- e. The **Completing the Network Connection Wizard** dialog box is displayed. In the box provided, enter a meaningful name for this connection and click **Finish**.

*If you select **Connect directly to another computer**:*

This connection option is designed to allow a connection between two computers using a serial, parallel, or infrared port.

- a. The **Host or Guest** dialog box is displayed. Select the role you'd like for *this* computer. Select **Host** if this computer has the information you want to access. Select **Guest** if this computer will be used to access information on the Host computer.
- b. If you select **Host**, you will be presented with the **Connection Device** dialog box. Select the device from the list. After installing the device through the Wizard, you may configure the connection properties by right clicking on the icon for this connection and selecting **Properties**. Upon completion, click **Next>**.

The **Allowed Users** dialog box is displayed. Select the check box next to the name of each user you want to allow to connect to this computer. Click **Next>**.

- c. If you select **Guest**, the **Select a Device** dialog box is displayed. Select the COM port you'd like to use for this connection from the list. Click **Next>**.
- d. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.
- e. The **Completing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the field provided and click **Finish**.

Appendix D. Upgrading the Modem

D.1 Introduction

Your modem is controlled by semi-permanent software, called firmware, which is stored in flash memory. Firmware is nonvolatile; that is, it remains stored in memory when the modem is turned off. However, it can be changed by either the manufacturer or the user as bugs are fixed or new features are added.

Since the firmware in your modem is stored in flash memory, you can upgrade it yourself in a few minutes by using the following procedures and the Flash Wizard program.

D.2 Upgrade Overview

The upgrade procedure consists of the following steps, which are described in greater detail in the following sections.

1. Identify the model number and firmware version of your modem.
2. Identify the current version of the firmware. If your modem already has the current firmware, there is no need to update it.
3. Download the upgrade file for your modem.
4. Extract the firmware .HEX file and the appropriate flash upgrade program from the file you downloaded.
5. Document and clear your stored parameters.
6. Upgrade the modem's firmware using the .HEX file and the flash upgrade program.
7. Restore your parameters.

IDENTIFY THE MODEM FIRMWARE

You must know the model number and firmware version of your modem to know whether or not you should upgrade it.

1. Run your favorite terminal program. You can use HyperTerminal for Windows 98, Me, 2000 or Windows NT.
2. In the program's terminal window, type **AT&F**. Even if you cannot see the **AT&F** command on your screen, be sure to type it completely, and then press Enter. If the modem does not respond with *OK*, repeat the **AT&F** command.
3. Now type **ATI3** and record your results. The firmware version should appear first in the response, which should look *similar* to the following:

```
V2.300G-V90_2M_DLS
```



© Copyright 2004. Black Box Corporation. All rights reserved.

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746