V.90 (V.92 Upgradeable) 56K PCI Modem User's Guide

Second Edition, Version 2.0

Getting the Most From Your V.90 Modem

Section One - Introduction

Congratulations on purchasing your 56k V.90 modem, the latest in communication technology. Your modem represents a new generation of PC communication peripheral devices, combining high-speed Data and Fax functions into a single device. It supports V.90 and K56flex technology for 56kbits/s data transfer rates. This high performance modem connects your computer to all popular modems and fax machines in use today. The modem uses the Lucent chipset and standard Lucent LT Winmodem software drivers for the highest level of compatibility.

1.1 How Does V.90 Work

V.90 technology allows users to receive data from their Internet Service Provider (ISP) at data rates up to 56kbps. To make use of this capability, your ISP must support either the V.90 or the K56flex standard.

1.2 Benefits of V.90 56k Communications

For serious Internet users the increase in speed is dramatic, because the information that usually makes you wait – graphics-heavy Web pages, sound, video, and other large files – now downloads to your computer twice as fast as with previous speed standards. Upstream transmissions (mostly keystroke and mouse commands from your computer, which require less bandwidth) continue to flow quickly at the conventional rate of 33.6Kbps.

1.3 Modem Features and Compatibility

Your modem is compatible with the following standards.

- V.90 / K56flex
- Upgradeable to the V.92
    standard when finalized
- V.32 (9600 bps)
- V.32bis (14400 bps)
- V.34 (28800 bps)
- V.22bis (2400 bps)
- Bell 212A (1200 bps)
- V.17 (14400 bps FAX)
- V.27ter (4800 bps FAX)
- V.42bis (data compression)
- MNP 5 (data compression)
- V.70 DSVD
- AT Command set
- Class 1 Fax Command Set

- V.34plus (33600 bps)
- V.22 (1200 bps)
- Bell 103 (300 bps)
- V.29 (9600 bps FAX)
- V.21 Channel 2 (300 bps FAX)
- V.42 (error correction)
- MNP 2-4 (error correction)
- V.80 for Video Conferencing
- PCI spec V2.1

The modem supports Windows 95, Windows 98 and 98SE, Windows ME, Windows NT, Windows XP, and Windows 2000 operating systems. In fact, Windows ME, Windows XP, and Windows 2000 come from Microsoft with the drivers necessary to run the modem. The operating system will recognize the modem chipset

Section Two - Installing the FAX/Modem

2.1 PCI Modem Installation

Your modem may have come pre-installed in your new computer. If so, you may skip this section.

CAUTION: Before removing the cover from your computer, turn off and unplug the computer and all attached external peripherals. Prior to removing the modem from its antistatic bag, discharge any static electricity from your body by touching the power supply or the chassis of the computer before removing the modem from its anti-static bag.

1. Turn off the computer and unplug it from the AC outlet.
2. Remove the computer's cover, in accordance to its owner's manual.
3. Select any available PCI bus slot.
4. Unscrew and remove the slot cover. Set the screw aside for later use.
5. Carefully insert the modem into the selected slot. Apply even pressure until the modem is firmly seated.
6. Secure the bracket with the screw saved earlier.
7. Replace the computer cover and plug in your computer. Reconnect all cables.
8. Connect the telephone cable into either phone cable connector on the back of the modem. Attach the other end into the telephone wall jack.

2.2 Communication Port and Interrupt Settings

The modem requires a communications (COM) port to communicate with the computer system. Most computers are equipped with one or more COM ports on the rear panel. Your modem does not connect to these COM ports, but connects to the internal expansion bus on your computer. The internal modem will therefore be assigned its own COM port number. Your modem supports Plug and Play (PnP), which allows the COM port and IRQ settings to be automatically assigned by the computer and the operating system.

2.3 Installing the Modem in Windows

The modem is compatible with all Windows desktop Operating systems from Windows 95 to the present, including:

- Windows 95 OSR2
- Windows 98
- Windows 98SE
- Windows ME
- Windows NT versions 4 and 5
- Windows 2000
- Windows XP

The installation procedure is the the same for all versions of Windows.

After physically installing the modem into the computer, when the computer is first turned on, Windows will automatically recognize the new modem and will ask if you want to install software drivers for the new device.

For Windows ME, Windows 2000, and Windows XP, the operating system will install drivers that are already included with Windows. No additional drivers are required.

For other versions of Windows, you will need a driver installation disk. When Windows identifies the new hardware and asks for a driver disk, select 'Cancel' to terminate the Windows 'new hardware installation' procedure. Windows will stop the installation procedure and boot normally.

After Windows has finished startup, insert the diskette included with the modem. From the Start Menu, select 'Run' and type "a:\setup.exe".

To verify the modem was configured properly, go to the Windows START button, select the SETTINGS option, then select CONTROL PANEL. Double-click the MODEMS icon. You should see your new modem listed in the GENERAL tab of the Modem Properties window. Next, click on the DIAGNOSTICS tab of the Modem Properties window. Find your new modem in the list of installed modems and highlight the port the modem has been assigned to. Now click on the More Info... button. This will show a window with information about your modem and your configuration.

Please consult "Section Three: Troubleshooting" if you encounter any difficulties.

2.5 Testing the Modem

To confirm that the modem is working properly after installation, run a modem communication program and set the software for the correct modem COM port. COM port setting information can be found in the Modem Control panel of your Windows operating system. To verify your software is communicating properly with your modem, at the software's terminal mode prompt, type **AT** followed by the **ENTER** key. The modem should respond by displaying **OK.** The **OK** response indicates that the modem is working properly. If the modem does not return the proper response, refer to *Section 3* for troubleshooting information.

Section Three - Troubleshooting

Your modem is designed to provide reliable and trouble-free functionality. However, should you experience any difficulty, the information contained in this section will assist you in determining and resolving the source of the problem. If you can not resolve your situation after reading this chapter, contact your dealer or vendor for assistance.

3.1 Modem does not respond to commands.

1. Make sure the modem is not configured with a conflicting COM port and IRQ setting. Check for conflicts by going to the SYSTEM control panel and selecting the Device Manager tab. Then, double-click on the modem icon to get a listing of modems that are installed on your computer. Double-click on the listing for your new modem. This will show you the modem's properties. If Windows configured the modem correctly, the section labeled "Device status" should read "This device is working properly." If this is not the case, you might have a hardware resource conflict. To correct this, click on the Resources tab to view and manually change your configuration to avoid the conflict.
2. Make sure the modem is properly initialized by the communication software. Your modem may have been improperly initialized by the software because you have selected an incorrect modem type. Select "Lucent Based Data/Fax/Voice/DSVD Modem" in your application software. Alternatively, you should use the "Generic Hayes Modem" option for data-only applications. You may also be prompted to enter an initialization string" by the software. Use AT&F as your initialization string.

3.2 Modem dials but does not connect.

1. Make sure the phone line is working properly. A noisy line will prevent proper modem operation.

2. Try connecting to another modem number to ensure the problem is not related to the answering modem.

3.3 Modem makes a connection but no data appears on your screen.

1. Make sure all communication parameters (baud rate, data, stop, and parity bits) are properly configured and are identical on both sides. Be certain hardware flow control (RTS/CTS - default) is enabled in both the modem and the communication software.
2. Press the **ENTER** key several times. The remote system may be waiting to receive your data before it begins.
3. Make sure the correct terminal emulation mode is being used in the software (refer to software manual).

3.4 Modem experiences errors while on-line with a remote modem.

1. Make sure Call Waiting is turned off.
2. Make sure RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control when transferring binary files).

Section Four - AT Command Set

4.1 Executing Commands

Your modem is in Command Mode upon power-on and is ready to receive and execute "**AT**" commands. The modem remains in Command Mode until it makes a connection with a remote modem.

4.2 AT Commands & Format

All commands must begin with the **AT** prefix, followed by the command letter and ended with the **ENTER** key. All default settings are printed in **bold text.** Spaces are allowed in the command string to increase command line readability but are ignored by the modem during command execution. All commands may be typed in either upper or lower case, but not mixed. A command issued without any parameters is considered as specifying the same command with a parameter of **"0"**.

Example: **ATL [ENTER]**

This command causes your modem to lower its speaker volume.

All default settings are printed in bold text.

Command	Function
A	Answer incoming call
A/	Repeat last command. **Do not** precede **A/** with **AT** or follow with **ENTER**
B0	CCITT mode @ 1200 bps
B1	**Bell mode @ 300/1200 bps**
D*n*	0 - 9, A-D, # and *
	L last number redial
	P pulse dial
	T tone dial
	W wait for second dial tone
	, pause
	@ wait for five seconds of silence
	! flash
	; return to Command Mode after dialing
	$ wait for AT&T "bong" tone
E0	Echo disabled
E1	**Echo enabled**
+++	switch from Data mode to Command Mode
H0	**Modem goes on-hook**
H1	Modem goes off-hook
I0	Returns default speed and controller firmware version
I1	ROM Check sum code
I2	ROM test
I3	Returns default speed and controller firmware version

I9	Returns country code
L0	Low speaker volume
L1	Low speaker volume
L2	**Medium speaker volume**
L3	High speaker volume
M0	Speaker always off
M1	**Speaker on until carrier detected**
M2	Speaker always on
M3	Speaker off during dialing, on until carrier detected
O0	Return online to Data Mode
O1	Issue a retrain before returning to Data Mode
P	Pulse dial
Q0	**Result codes enabled**
Q1	Result codes disabled
T	**Tone Dial**
V0	Display result codes as digits
V1	**Display result codes as text**
Y0	**Disable long space disconnect**
Z0	Reset & recall user profile 0
Z1	**Reset & recall user profile 1**
&F	Load factory default configuration
&M0	**Asynchronous mode operation**
&S0	**DSR always ON**
&S1	DSR comes on when establishing a connection and goes off when the connection ends
&V	View Active profile
&W0	Store active profile as Profile 0
&Y0	Select Profile 0 upon Power on or reset
&Zn=x	Store phone number x into non-volatile RAM, n=0-3
\N0	Buffer mode, no error control
\N1	Direct mode
\N2	MNP reliable mode
\N3	**V.42, MNP, or buffer mode (autoreliable mode)**
\N4	V.42 mode or disconnect
\Q0	Disable flow control
\Q1	XON/XOFF software flow control
\Q3	**RTS/CTS hardware flow control**
\T$n$	Inactivity timer, n=0-255
\V0	Disable protocol result code appended to DCE speed
\V1	**Enable protocol result code appended to DCE speed**

Section Five - Support and Service

If after trying the recommended troubleshooting tips, you are unable to isolate or resolve a problem, you should consult your computer dealer or the place of purchase.

Section Six - Technical Specifications

Modulation Std.:	V.90, K56flex, V.42bis, V.42, V.34, V.32bis, V.32, V.29, V.27ter, V.22bis,V.22, V.21, V.17, Bell212/103
Compression:	MNP 5, 4, 3, 2
Host Interface:	PCI Bus socket, PCI spec version 2.1
COM ports:	1, 2, 3, 4, 5
IRQ lines:	3, 4, 5, 7, 9, 10, 11, 12
FAX Group:	Group III
FAX Command:	Class 1
Escape Detection:	TIES escape sequence
Transmit level:	-12 dBm +/- 1 dB
Sensitivity:	-43 dBm
UART:	16550 compatible
Power:	.75 W max
Temperature:	0 to 55 degrees C, operating; -20 to 80 degrees C, non-operating

Section Seven – Regulatory Notices

FCC Compliance

This equipment complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service. The FCC prohibits this equipment to be connected to party lines or coin-telephone service.

In the event that this equipment should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

FCC Class B Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna

• Increase the separation between the equipment and the receiver

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

• Consult the dealer or an experienced radio / TV technician for help

Notice: 1) Shielded cables, if any, must be used in order to comply with the emission limits. 2) Any change or modification not expressly approved by the Grantee of the equipment authorization could void the user's authority to operate the equipment.

FCC Fax Branding Statement

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine, or such business, other entity, or individual. (The telephone number provided may not be a 900 number or any other number for which charges exceed local or long-distance transmission charges.)

In order to program this information into your fax machine or fax/modem consult your fax machine user's manual or software user's manual for setup instructions.

DOC Compliance Information

NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users 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. 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 Canadian maintenance facility designated by the supplier. 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.

NOTICE: 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 sum of the Load Numbers of all the devices does not exceed 100.

UL/CUL Statement

This equipment is to be used only with a UL listed equipment.