USRobotics®

56K USB Modem
User Guide

R46.1999.00
rev 1 5/08

Contents

56K USB Modem
User Guide

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Introduction

The USRobotics 56K USB Modem delivers the performance and reliability USRobotics is known for, in a compact, flexible form factor. This controller-based modem integrates powerful communications processing functions into the modem itself, for assured performance without sapping your computer's processing power. It is also broadly compatible across major operating systems including Linux, Windows and Macintosh.

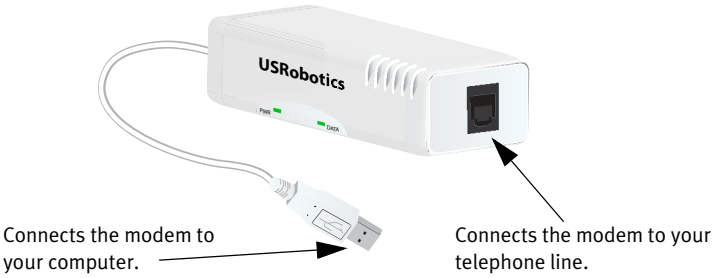
The 56K USB Modem is backward compatible and will negotiate the highest possible speed when connecting to a service provider.

The V.92 standard is an exciting advancement in 56K technology. Contact your service provider to find if your ISP offers V.92 technology. The USRobotics 56K USB Modem offers V.92 functions that enhance the V.90 standard.

- "V.PCM-Upstream" technology: This allows a modem's upstream communication to reach speeds of 48,000 bps. The V.90 standard limits upstream to V.34 speeds.

- Quick Connect: Quick Connect supports quicker dial-up connections by allowing the modem to remember the line, eliminating the need for the modem to go through the full training sequence every time you connect to your service provider.

Physical Features



LED	State	Condition
PWR	Solid	Receiving power and driver is properly installed.
	Off	Not receiving power.
DATA	Flashing	Modem is active.
	Solid	Receiving a valid data signal from a remote modem; data transmission is possible. OR Carrier Detect override is ON (`&C0`).
	Off	Modem is not active.

System Requirements

Operating System

- Windows Vista™, Windows® XP, or Windows® 2000
- Linux kernel 2.4.20 or higher
- Mac OS X 10.4.3 or later

Other

- Intel Pentium III 600 MHz processor or equivalent
- CD-ROM drive
- Available USB port
- 56K Compatible analogue telephone line
- Country telephone adapter

Installation Instructions

Step One: Prepare for Installation

1. Go to the USRobotics website to download the most current drivers for your modem: www.usr.com
2. Uninstall all other modems that are installed on your computer. For instructions, refer to the documentation for your previous modem.
3. Unplug all telephone and power cords connected to any previous modem(s).

Step Two: Install the Hardware

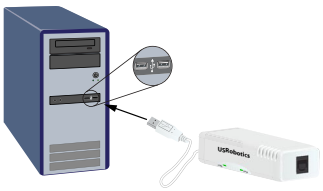
Caution: Use an analogue phone line only. The modem will be damaged if you connect it to a digital phone line.

Most office phones are wired through digital lines. If you do not know whether you phone line is analogue or digital, consult your telephone service provider or building facilities department.

1. Use the provided telephone cord to connect the phone jack on the modem to an analogue telephone wall jack.

   To connect a telephone to the same line as the 56K USB Modem for V.92 features such as “Modem on Hold”, you will need to use a telephone line splitter to connect your modem and telephone to the same wall jack.

2. Insert the 56K USB Modem in to an available USB port on your computer.



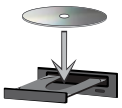
Step Three: Install the Modem Driver

Windows Vista

You must be logged in as an administrator in order to install this modem.

1. When the Found New Hardware Wizard appears, select **Locate and install driver software (recommended)**.
2. If prompted for permission, click **Continue**.
3. If prompted, select **Don’t search online**.

4. When prompted, insert the USRobotics Installation CD-ROM into your CD-ROM drive.



   OR

   If a driver CD was not provided or the driver was downloaded from www.usr.com, browse to the folder where the drivers were downloaded.

5. Windows searches for the modem driver automatically.

   OR

   If prompted, click **Next** to instruct Windows to search for the driver.

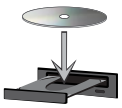
6. If prompted by Windows Security, click **Install**.[1]
7. Windows installs the modem driver.
8. When installation is complete, click **Close**.
9. The **PWR** LED on the modem will light.

Congratulations. You have successfully completed the installation procedure. Please register your 56K USB Modem at www.usr.com/productreg/.

Windows XP

You must be logged in as an administrator in order to install this modem.

1. When the Found New Hardware Wizard appears, select **No, not this time** and click **Next.**
2. Select **Install the software automatically (Recommended)**, but do not click Next.
3. If you accidentally clicked Next, click **Back**.
4. When prompted, insert the USRobotics Installation CD-ROM into your CD-ROM drive.



   OR

   If a driver CD was not provided or the driver was downloaded from www.usr.com, browse to the folder where the drivers were downloaded.

5. Windows searches for the modem driver automatically.

   OR

   If prompted, click **Next** to instruct Windows to search for the driver.

6. If Windows displays a message regarding logo testing, click **Continue Anyway**.[2]
7. Click **Finish** to complete the installation.

---

1 USRobotics has thoroughly tested this driver in conjunction with the supported hardware and has verified compatibility with Windows Vista, XP, and 2000.

2 USRobotics has thoroughly tested this driver in conjunction with the supported hardware and has verified compatibility with Windows Vista, XP, and 2000.

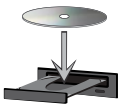
8. The **PWR** LED on the modem will light.

Congratulations. You have successfully completed the installation procedure. Please register your 56K USB Modem at www.usr.com/productreg/.

Windows 2000

You must be logged in as an administrator in order to install this modem.

1. When the Found New Hardware Wizard appears, click **Next**.
2. Insert the USRobotics Installation CD-ROM into your CD-ROM drive, select **Search for a suitable driver for my device (recommended).**
3. Click **Next**, then select only **CD-ROM drives** and click **Next**.



   OR

   If a driver CD was not provided or the driver was downloaded from www.usr.com, browse to the folder where the drivers were downloaded .

4. Select **Search for a suitable driver for my device (recommended)** and click **Next**.
5. Select only **CD-ROM drives** and click **Next**.
6. When Windows locates the driver for the modem, click **Next**.
7. If a Digital Signature Not Found window appears, click **Yes**.[3]
8. Click **Finish** to complete the installation.
9. The **PWR** LED on the modem will light.

Congratulations. You have successfully completed the installation procedure. Please register your 56K USB Modem at www.usr.com/productreg/.

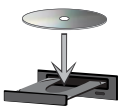
Linux Kernel 2.4.20 or Higher

You need a USB modem driver (CDC ACM) compiled into a Linux kernel 2.4.20 or higher or as a loadable module for your kernel. Installation of the modem under these kernels is fully automatic provided your kernel has the Plug and Play module enabled (default). You do not need to install any drivers off the USRobotics installation CD-ROM.

Congratulations. You have successfully completed the installation procedure. Please register your 56K USB Modem at www.usr.com/productreg/.

Mac OS X 10.4.3 or Later

1. Insert the USRobotics Installation CD-ROM into your CD-ROM drive.
2. Go to **Finder** and double-click the CD icon.



3 USRobotics has thoroughly tested this driver in conjunction with the supported hardware and has verified compatibility with Windows Vista, XP, and 2000.

3. Double click **USRobotics 56K USB Modem.pkg** to launch the installer, and follow the on-screen instructions.
4. Go to **Apple** > **System Preferences** > **Network**. If prompted, click **OK**.
5. Select **USB Modem** from the **Show** menu.
6. Select the **Modem** tab.
7. Scroll through the **Modem** list, select **USRobotics 56K USB Modem** and click **Apply Now**.
8. The **PWR** LED on the modem may not light until you initiate a connection to your Internet service provider (ISP).

Congratulations. You have successfully completed the installation procedure. Please register your 56K USB Modem at www.usr.com/productreg/.

Command Reference

How to Use These Commands

USRobotics' AT command set for controller-based modems consists of commands based on data, FAX, and voice communications. The commands presented in this manual follow the conventions set by ITU-T Recommendation V.250 (05/99), which standardized many of the common AT extensions.

This section identifies the relevant standards from V.250, and any modifications to presentation which have been made for clarity and ease of use.

USRobotics' controller-based command set also includes commands that have not been standardized by a specific ITU recommendation. Some of these commands support legacy systems, other commands support test and debug efforts, and still others support features that are specific to USRobotics products.

U.S. Robotics' controller-based modems support a broad base of commands for data, FAX, and voice communications.

This command set includes support for the basic data commands standardized by ITU-T Recommendation V.250 (05/99)*, class 1 FAX commands standardized by ITU-T Recommendation T.31 (08/95)†, class 2 FAX commands standardized by ITU-T Recommendation T.32 (08/95)‡, and voice commands standardized by ITU-T Recommendation V.253 (02/98).

Additional support is included for many nonstandard commands. This includes commands to support POS applications.

Most of the nonstandard commands are designed to support modem product development and solution debugging efforts. This document contains an overview of the supported commands, responses, and registers used by USRobotics' controller-based modem products. However, a particular modem may not support the entire AT command set. Certain products do not contain all features documented in this command reference. To obtain a complete list of features supported by a device, refer to the appropriate product data sheet.

Some features are dependent on product application, licensing, and other contractual agreements.

AT Command Conventions

This document describes the AT commands and S registers associated with the USRobotics controller-based modem chip sets. Each command has a standard layout consisting of the following:

- A command title.
- A general command description.
- Result codes including the conditions for obtaining the result.
- A detailed command description.

The command title is formatted in large bold letters and contains the command, its parameters, and a descriptive command name. The general command description identifies in broad terms the function of the command and when to use it. The detailed command description breaks down the effect of each of the parameter values. This section may also contain supplementary information needed for proper usage of the command.

The modem or data circuit-terminating equipment (DCE) returns at least one result code for each command submitted to it by the host system or data terminal equipment (DTE). The most common result codes returned by the DCE are *OK* and *ERROR*. Conditions for receiving the result code follow the listed

result code.

Sample Command

E<value>—Command Echo

Use this command to instruct the modem to echo characters sent to it. When the echo feature is selected, characters sent to the modem are sent back to the host and displayed on the monitor.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 1. E<value> Commands

Command	Function
E0	Disables echo command.
E1	Enables echo command (default).

Basic Syntax Commands

Basic syntax commands use the following format:

- <command>[<parameter>]

where <command> is a single character or a group of characters that represent the command, and <parameter> is an optional decimal number. There are some exceptions to these rules; they are noted for each command as needed. The echo command in the previous example follows the basic commands syntax structure.

Extended Syntax Commands

Extended syntax commands[1] have three different command formats:

- No parameters: +<name>
- Single parameter: +<name>[=<parameter>]
- Multiple parameters: +<name>[=<parameter1>][,<parameterX>]

where <name> is the name of the command and begins with an alphanumeric character and <parameterX> is an optional decimal number. There are some exceptions to these rules; they are noted for each command as needed.

In addition to the standard command format, extended commands have a read and test syntax. The host system uses the read syntax to poll the modem and determine the current setting for the command parameters. Read syntax has the following format:

Read syntax: +<name>?

The host system uses the test syntax to poll the modem and determine the supported parameter values for the command. Test syntax has the following format:

- Test syntax: +<name>=?

The modem responds to this command with a list of the supported parameter ranges.

1. The description of extended syntax commands presented here is a simplified version of the information presented in ITU-T Recommendation V.250 (05/99). For further details, refer to Section 5.4 of Recommendation V.250.

S Register Conventions

S registers contain parameters used by the modem. The presentation format for an S register is very similar to the format used for an AT command. Each S register has a standard layout consisting of the following:

- S register title.
- S register description.
- Parameter description.

The S register title is formatted in large bold letters and begins with a capital S followed by the register number. The title also includes a descriptive name for the register. The S register description defines the parameter the S register represents.

S register parameters can have a variety of effects on the functionality of the modem. As a result, the parameter description can have several forms. The most common form includes the parameter range, the parameter default, and the units used by the parameter.

S Register Sample

S2—Escape Character (User Defined)

S2 contains the decimal value of the ASCII character used as the escape character. The default value corresponds to an ASCII +. The escape sequence allows the modem to exit data mode and enter command mode when online. A value over 127 disables the escape process, i.e., no escape character is recognized.

- Range: 0—255
- Default: 43 (+)
- Units: ASCII

Other Document Conventions

For the sake of clarity, the following conventions have been adopted and used throughout this document.

Table 2. Other Document Conventions

Item	Example	Conventions Description
AT Command	**&C <value>**	AT commands are all capitals followed by parameter values in bold print. This document does not explicitly use the AT prefix when presenting commands. However, the AT prefix is used for all examples.
S Registers	S <value>	S registers have a capital S followed by the register number.
Parameters	<value>	Parameters or variables always use lowercase lettering enclosed in brackets, <>.
Results Codes	OK	Result codes are all capitals and italics.
Examples	—	Examples use the Courier font and are shown exactly as they appear when the commands are entered into a terminal program such as Windows Hyperterminal.

Synchronous Mode and V.80 AT Commands

USRobotics' controller-based modem AT command set supports synchronous command mode and most of the commands defined in ITU-T Recommendation V.80, which defines in-band modem control and synchronous data modes for asynchronous host systems. Recommendation V.80 addresses two types of commands:

- AT commands issued in command mode.
- In-band commands transmitted in the data stream.

The in-band commands are delimited by the hexadecimal characters EM (or numerically, 19h). The USRobotics controller-based commands set supports the most common AT commands identified in Recommendation V.80:

- **+ES**.
- **+ESA**.
- **+IFC**.

AT Command Set

AT commands are issued to the modem to control the modem's operation and software configuration. AT commands can only be entered while the modem is in command mode. The basic command syntax is as follows:

- <command><parameter>.

The <command> is a combination of the attention prefix (AT) followed by the AT command. The <parameter> is a string that represents a numeric decimal value.

Any command issued is acknowledged with a response in either text or numeric values. These responses are known as result codes. The result codes are listed in Result Code Summary on page 107.

Commands may be executed while in command mode, which is entered under one of the following conditions:

- After powerup, at the termination of a connection, or after the execution of a command other than dial or answer.
- Upon the receipt of the escape sequence (three consecutive character matching the contents of resister S2) while in online mode.
- Upon the on-to-off transition of DTR if **&D1**, **&D2**, or **&D3** has been set.

Data and General Commands

+++ Escape Sequence

An escape sequence allows the modem to exit data mode and enter online command mode. While in online
command mode, AT commands are sent directly to the modem.

Use the return to online data mode command (O<value>—Return to Online Data Mode on page 18) to return to data mode.

Place a pause before and after the escape sequence to prevent the modem from interpreting the escape sequence as data. The length of the pause is set by register S12 (S12—Escape Guard Time on page 99). The escape guard time. Register S2 (S2—Escape Character (User Defined) on page 97) identifies the

escape sequence character.

A/—Repeat Last Command

Use this command to repeat the last AT command. The modem repeats the command currently in the command buffer. Do not use the AT prefix with this command. Do not conclude the command with a terminating character such as enter.

A—Answer

Use this command to instruct the modem to connect to the line and establish a connection with the remote modem or DCE. This command can be canceled if the modem receives a new command or character from the host system before handshaking has begun.

Result codes:

- *CONNECT* if a connection is established and the extended result code parameter (X<value>—Select Result Code and Monitor Call Progress on page 21) is equal to 0.
- *CONNECT <rate>* if a connection is established and the extended result code parameter is not equal to 0.
- *NO CARRIER* if a connection cannot be established or the modem aborts the connection on request of the host system.
- *OK* if the command is aborted or DTR is turned off by the host system when the data terminal ready control (&D<value>—Data Terminal Ready (DTR) Control on page 24) is not set to 0.
- *ERROR* if the modem is in online command mode when receiving the A command.

B<value>—Communication Standard Setting

Use this command to select the communication standard used by the modem.

Result codes:

- *OK* if <value> = 0—3, 15, 16.
- *ERROR* if <value> ≠ 0—3, 15, 16.

Table 3. B<value> Commands

Command	Function
B0	Selects CCITT V.22 mode when the modem is at 1200 bits/s.
B1	Selects Bell 212A when the modem is at 1200 bits/s (default).
B2	Deselects V.23 reverse channel (same as **B3**).
B3	Deselects V.23 reverse channel (same as **B2**).
B15	Selects V.21 when the modem is at 300 bits/s.
B16	Selects Bell 103J when the modem is at 300 bits/s (default).

C<value>—Carrier Control

Controller-based modems support this command to ensure backwards compatibility with communication software that issues the **C1** command. However controller-based modems do not support the **C0** command. The **C0** command may instruct some other modems not to send carrier (i.e., it puts them in receive-only mode).

Result codes:

- *OK* if <value> = 1.
- *ERROR* if <value> ≠ 1.

Table 4. C<value> Commands

Command	Function
C1	Normal transmit carrier switching (default).

D<dial_string>—Dial

Use this command to instruct the modem to begin the dialing sequence. The dial string, which is made up of the telephone number and dial modifiers, is entered after the **D** command.

A dial string can be up to 60 characters long. Any digit or symbol may be dialed as touch-tone digits. Characters such as spaces, hyphens, and parentheses are ignored by the modem and may be included in the dial string to enhance readability.

Result codes:

- *CONNECT* if a connection is established and the extended result code parameter (X<value>—Select Result Code and Monitor Call Progress on page 21) is equal to 0.
- *CONNECT <rate>* if a connection is established and the extended result code parameter is not equal to 0.
- *NO CARRIER* if a connection cannot be established or the modem aborts the connection on request of the host system.
- *BUSY* if the W or @ modifiers are used and a busy signal is detected.
- *NO ANSWER* if the @ modifier is used and the remote ring followed by 5 seconds of silence is not detected before expiration of the connection timer (S10—Automatic Disconnect Delay on page 99).
- *NO DIALTONE* if tone detection is enabled or the W modifier is used and no dial tone is detected.
- *OK* if the command is aborted or DTR is turned off by the host system when the data terminal ready control (&D<value>—Data Terminal Ready (DTR) Control on page 24) is not set to 0.
- *ERROR* if the modem is in online command mode when receiving the dial command.)

Table 5. Dial Modifiers

Modifier	Function Name	Description
L	Dial the last number	Instructs the modem to dial the last number dialed. This modifier is valid only if it is the first symbol of the dial string. All consecutive characters are discarded.
P	Select pulse dialing	—
T	Select tone dialing (default)	—
W	Wait for dial tone	Instructs the modem to wait for a second dial tone before processing the dial string.

Table 5. Dial Modifiers

,	Dial pause	Instructs the modem to pause before processing the next character in the dial string. Register S8 (S8—Pause Time for Comma Dial Modifier on page 98) determines the length of the pause.
!	Hook flash	Instructs the modem to go on-hook for 0.5 seconds and then return to off-hook.
@	Wait for quiet answer	Instructs the modem to wait for five seconds of silence after dialing the number. If silence is not detected, the modem sends a *NO ANSWER* result code back to the user.
;	Return to command mode	Instructs the modem to return to command mode after it has finished dialing without disconnecting the call. This modifier must be the last character in the dial string.
$	Bong tone detection	—
S=<location>	Dial from register	Instructs the modem to dial a telephone number previously stored using the **&Z<location>=<dial_string>** command. Valid storage locations are 0—2.
^	Disable data calling tone transmission	—
V	Dial using speakerphone	Instructs the modem to switch to speakerphone mode and dial the number. Use the **ATH** command to disconnect the voice call.

E<value>—Echo Command

Use this command to enable or disable the modem's echo feature. When the echo feature is selected and the modem is in command mode, characters sent to the modem are sent back to the host and displayed on the monitor.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 6. E<value> Commands

Command	Function
E0	Disables echo command.
E1	Enables echo command (default).

F<value>—Online Data Character Echo Command

Controller-based products support this command to ensure backward compatibility with communications software that issues the **F1** command. The **F0** version of this command is not supported. This command was originally used to set echo features for the DTE.

Result codes:

- *OK* if <value> = 1.
- *ERROR* if <value> ≠ 1.

Table 7. F<value> Commands

Command	Function

Table 7. F<value> Commands

F1	Online data character echo disabled.

H<value>—Hook Control

This command[1] instructs the modem to go on-hook to disconnect a call or go off-hook to make the telephone line busy.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 8. H<value> Commands

Command	Function
H0	The modem goes on-hook (default).
H1	The modem goes off-hook.

I<value>—Request ID Information

Use this command to display product information about the modem. In each case, the information is transmitted to the host system followed by a final result code.

Result codes:

- As described in ERROR if <value> ≠ 0—9, 11.6. I<value> if <value> = 0—9, 11.
- *ERROR* if <value> ≠ 0—9, 11.

Table 9. I<value> Commands

Command	Function
I0, I3	Returns modem identity string and driver version number (default).
I1	Calculates a ROM checksum and displays it on the DTE.
I2	Performs a ROM check, calculates the checksum, and then verifies the checksum by displaying *OK* or *ERROR*.
I4	Returns firmware version for the data pump.
I5	Returns the code version, board ID, and country ID in hexadecimal.
I6, I7, I8	Returns *OK* for compatibility.
I9	Returns Country ID in English
I11	Displays connection information as described below.

The **ATI11** results are listed on two screens. To get to the second screen, the user must hit any key. The following is an example of the **ATI11** results.

```
      Description                                          Status
      ---------------                                      --------------
------
1     Last Connection                                      V.90
2     Initial Transmit Carrier Rate                        28800
3     Initial Receive Carrier Rate                         49333
4     Final Transmit Carrier Rate                          28800
```

1. ITU-T Recommendation V.250 (05/99) standardized this command. However, the standard does not include the additional functionality added with the H1 command.

```
5     Final Receive Carrier Rate                              49333
6     Protocol Negotiation Result                             LAPM
7     Data Compression Result                                 V42bis
8     Estimated Noise Level                                   152
9     Receive Signal Poser Level (-dBm)                       25
10    Transmit Signal Power Level (-dBm)                      16
11    Round Trip Delay (msec)                                 4
Press any key to continue; ESC to quit
      Description                                             Status
      ---------------                                         --------------
------
12    Near Echo Level (-dBm)                                  NA
13    Far Echo Level (-dBm)                                   NA
14    Transmit Frame Count                                    3
15    Transmit Frame Error Count                              0
16    Receive Frame Count                                     0
17    Receive Frame Error Count                               0
18    Retrain by Local Modem                                  0
19    Retrain by Remote Modem                                 0
20    Rate Renegotiation by Local Modem                       0
21    Rate Renegotiation by Remote Modem                      0
22    Call Termination Cause                                  0
23    Robbed-Bit Signalling                                   00
24    Digital Loss (dB)                                       6
25    Remote Server ID                                        NA
26    Last PCM S PTR
27    Connection Time (msec)
OK
```

The **ATI11** command may be issued from online command mode or after the end of a call. After a call, some of the values are no longer valid. The following table describes each of the results listed for the **ATI11** command.

Table 10. ATI11 Command Results

Result	Description
Last Connection	V92 PCM, V.92, V.90, V.34, or V.32, depending on the type of connection negotiated.
Initial Transmit Carrier Rate	Initial upstream rate.
Initial Receive Carrier Rate	Initial downstream rate.
Final Transmit Carrier Rate	Current or final upstream rate.
Final Receive Carrier Rate	Current or final downstream rate.
Protocol Negotiation Result	LAPM/SREC, LAPM, MNP, or none, depending on V.42 negotiation.
Data Compression Result	LAPM, MNP, V.42bis, V.44, or none, depending on V.42 and V.44 negotiation.
Estimated Noise Level	Mean-square error of received downstream signal. Difference between received constellation point and reference decision point. This is a dimensionless decimal number that is only valid during a call. Higher numbers are worse. There is no absolute threshold of goodness; it depends on the downstream data rate. The number varies during a call, so it is useful to sample it a few times.

Table 10. ATI11 Command Results(Continued)

Result	Description
Receive Signal Power Level (–dBm)	The received signal power, although labeled with units of –dBm, is only a relative measure for comparing calls to/from different locations. This value is valid only during a call.
Transmit Signal Power Level (–dBm)	Upstream transmit signal power.
Round Trip Delay (ms)	Round trip delay in milliseconds.
Near Echo Level (–dBm)	Echo levels are valid for V.34 only.
Far Echo Level (–dBm)	Echo levels are valid for V.34 only.
Transmit Frame Count	Number of LAPM frames sent upstream during this call. Count wraps around at 65535.
Transmit Frame Error Count	Number of REJ frames received at the analog client modem.
Receive Frame Count	Number of LAPM frames received by the client during this call. Count wraps around at 65535.
Receive Frame Error Count	Number of frames received in error by the client.
Retrain by Local Modem	Number of retrains or rate renegotiations requested by the modem.
Retrain by Remote Modem	Number of retrains or rate renegotiations requested by remote modem.
Rate Renegotiation by Local Modem	Number of rate renegotiations requested by the local modem.
Rate Renegotiation by Remote Modem	Number of rate renegotiations requested by the remote modem.
Call Termination Cause	Reason for call ending. Only valid after call ends. Result codes: • 0 = local modem command: ATH, DTR drop. • 1 = remote modem: cleardown, loss of signal. • 2 = no answer, busy, etc. • 3 = training failure V.92, V.90, or V.34. • 4 = protocol failure if required by \N4, for example.
Robbed-Bit Signaling	For PCM connection only, a hexadecimal 6-bit pattern of T1 frames with robbed-bit signaling.
Digital Loss (dB)	For PCM connection only, the downstream digital loss.
Last PCM S PTR	Shows the last S pointer when the modem is expected to go to PCM mode.

L<value>—Speaker Volume

Use this command to set the speaker volume setting when the speaker is on.

Result codes:

- *OK* if <value> = 0—3.
- *ERROR* if <value> ≠ 0—3.

Table 11. L<value> Commands

Command	Function
L0	Low volume.
L1	Low volume.
L2	Medium volume (default).
L3	High volume.

M<value>—Speaker Control

Use this command to turn the speaker on and off.

Result codes:

- *OK* if <value> = 0—3.
- *ERROR* if <value> ≠ 0—3.

Table 12. M<value> Commands

Command	Function
M0	Speaker is off.
M1	Speaker is on until the modem detects the carrier signal (default).
M2	Speaker is always on when the modem is off-hook.
M3	Speaker is on until the carrier is detected, except when dialing.

Note: ITU-T Recommendation V.250 (05/99) standardized this command. However, the standard does not include the additional functionality added with the M3 command.

N<value>—Modulation Handshake

Use this command to set the modem protocol for handling handshake negotiation at connection time if the communication speed of the remote modem is different from the speed of the local modem.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 13. N<value> Commands

Command	Function
N0	When originating or answering, this is for handshake only at the communication standard specified by register **S37** and the **B <value>** command.
N1	When originating or answering, begin the handshake only at the communication standard specified by **S37** and the **B <value>** command. During handshake, fallback to a lower speed may occur (default).

O<value>—Return to Online Data Mode

Use this command to exit online command mode and reenter online data mode. If the modem is not in online command mode when this command is received, the modem generates an *ERROR* result code.

Result codes:

- *CONNECT* if <value> = 0, 1, 3 and the result code and call progress monitor is set to 0 (**X0**).
- *CONNECT* <*rate*> if <value> = 0, 1, 3 and the result code and call progress monitor is not set to 0 (**X<value>** where n = 1—7).
- *NO CARRIER* if the connection is not successfully resumed.
- *ERROR* if <value> ≠ 0—1, 3.

Table 14. O<value> Commands

Command	Function
O0	Instructs the modem to exit online command mode and return to data mode (default).*
O1	Issues a retrain before returning to online data mode.

Table 14. O<value> Commands

O3	Issues a rate renegotiation before returning to online data mode.

* See +++ Escape Sequence section on page 11.

P—Select Pulse Dialing

Use this command to configure the modem for pulse dialing. All subsequent **D<dial_string>** commands use pulse dialing until either the **T** command or a tone dial modifier is received by the modem. Tone dialing is the default setting. This command does not use parameters and generates an *ERROR* result code when parameters are attached to the command.

Q<value>—Result Code Control

Result codes are informational messages sent from the modem and displayed on the monitor. Basic result codes include *OK*, *CONNECT*, *RING*, *NO CARRIER*, and *ERROR*. Use the **Q<value>** command to enable or disable result code generation by the modem. If result codes are disabled and an invalid parameter value is entered, the modem does not generate an *ERROR* result code because result codes are turn off.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 15. Q<value> Commands

Command	Function
Q0	Enables result codes (default).
Q1	Disables result codes.

S<register number>=<value>—S Register Control

Use this command to view or change an S-register. S-registers contain parameters used by the modem. This command has two forms, one to show the contents of the register and the other to change the contents of the register. Some registers are read only and are not affected by the S<register number>=<value> command. Each register has a specific function (see Table 212 on page 95).

Result codes:

- *OK* if <register number> is a valid register
- *ERROR* if <register number> is not a valid register.

Table 16. S<register number> Extended Syntax Commands

Syntax	Function
S<register number>?	Displays register contents.
S<register number>=<value>	Sets the contents of the register to <value> if the register is not read only.

T—Select Tone Dialing

Use this command to configure the modem for DTMF tone dialing. All subsequent **D<dial string>** commands use tone dialing until either the **P** command or a pulse dial modifier is received by the modem. Tone dialing is the default setting. This command does not use parameters and generates an *ERROR* result code when parameters are attached to the command.

V<value>—DCE Response Format

Controller-based modems generate result codes using one of two formats. Verbose mode generates result codes in the familiar text formats using words. Numerical mode generates result codes as a number. Each result code has a number assigned to it (page 107). Use this command to switch between numerical and verbose modes. Call progress and negotiation progress messages are affected by this command.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 17. V<value> Commands

Command	Function
V0	Displays result codes as digits.
V1	Displays result codes as text (default).

Table 18. V<value> Result Code Formats

Command	Result Code Format
V0	<numeric code><CR>
V1	<CR><LF><verbose code><CR><LF>

W<value>—Result Code Option

Use this command to select the modems *CONNECT* message options.

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value> ≠ 0—2.

Table 19. W<value> Commands

Command	Function
W0	*CONNECT* result code reports DTE receive speed. Disables protocol result codes.
W1	*CONNECT* result code reports DTE receive speed. Enables protocol result codes.
W2	*CONNECT* result code reports DCE receive speed. Enables protocol result codes (default).

X<value>—Select Result Code and Monitor Call Progress

Use this command to enable tone detection options used in the dialing process. As each function is chosen, the modem's result codes are also affected; therefore, this command is frequently used to control the modem's responses. The primary function of this command is to control call response capabilities.

Result codes:

- *OK* if <value> = 0—7.
- *ERROR* if <value> ≠ 0—7.

Table 20. X<value> Commands

Command	Extended Result Codes	Dial Tone Detect	Busy Tone Detect
X0	Disabled	Disabled	Disabled
X1	Enabled	Disabled	Disabled
X2	Enabled	Enabled	Disabled
X3	Enabled	Disabled	Enabled
X4 (default)	Enabled	Enabled	Enabled
X5, X6	Enabled	Enabled	Enabled
X7	Disabled	Enabled	Enabled

Table 21. X<value> Option Description

Function	Enabled	Disabled
Ext Result Codes	Modem displays basic result codes, connect messages with data rate, and an indication of the modems error correction and data compression operations.	Modem displays the basic result codes.
Dial Tone Detect	Modem dials upon detection of a dial tone, and disconnects the call if the dial tone is not detected within 10 seconds.	Modem dials a call regardless of whether it detects a dial tone. Register S6 (S6—Wait Time Before Dialing on page 98) contains the dial delay.
Busy Tone Detect	Modem monitors for busy tones.	Modem ignores any busy tones it receives.

X<value> Option Result Codes

Command	Result Codes		
X0	• OK • CONNECT	• RING • NO CARRIER	• ERROR
X1	• OK • CONNECT <RATE>	• RING • NO CARRIER	• ERROR
X2	• OK • CONNECT <RATE>	• RING • NO CARRIER	• ERROR • NO DIALTONE
X3	• OK • CONNECT <RATE> • BLACKLISTED	• RING • NO CARRIER	• ERROR • BUSY
X4	• OK • CONNECT <RATE> • BLACKLISTED • CALL WAITING DETECTED	• RING • NO CARRIER • DELAYED	• ERROR • BUSY • NO DIALTONE
X5, X6	• OK • CONNECT <RATE> • BLACKLISTED • CALL WAITING DETECTED	• RING • NO CARRIER • DELAYED	• ERROR • BUSY • NO DIALTONE
X7	• OK • CONNECT	• RING • NO CARRIER	• ERROR

Y<value>—Long-Space Disconnect

Use this command to disconnect the modem from a call upon receiving a long-space signal from the distant end. This command is only valid in 1200 bits/s and 2400 bits/s modes.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 22. Y<value> Commands

Command	Function
Y0	Disables long-space disconnect (default).
Y1	Enables long-space disconnect.

Z<value>—Reset and Recall Stored Profile

Use this command to make the modem go on-hook and restore the profile saved by the last **&W** command.

Note: Both Z0 and Z1 restore the same profile (see &W<value>—Store Current Configuration on page 28). USRobotics controller-based modems only have one stored profile.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 23. Z<value> Commands

Command	Function
Z0	Resets and restores stored profile.
Z1	Resets and restores stored profile.

&B<value>—V.32 Auto Retrain

This command is supported to ensure backward compatibility with communications software that issues the **B1** command. The **B0** version of this command is not supported. USRobotics controller-based modems always retrain.

Result codes:

- *OK* if <value> = 1.
- *ERROR* if <value> ≠ 1.

Table 24. &B<value> Commands

Command	Function
&B1	Enables V.32 auto retrain (default).

&C<value>—Data Carrier Detect (DCD) Control

Use this command to control the modem's response to receiving a remote modem's carrier signal. Data carrier detect (DCD) is a signal from the modem to the computer indicating that the carrier signal is being received from a remote modem. The modem typically turns off DCD when it no longer detects the remote modem's carrier signal.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 25. &C<value> Commands

Command	*Function*
&C0	The state of the carrier from the remote modem is ignored. DCD remains on at all times.
&C1	DCD turns on when the remote modem's carrier signal is detected and off when the carrier signal is not detected (default).

&D<value>—Data Terminal Ready (DTR) Control

Use this command to select the modem's response to the data terminal ready (DTR) signal. The host system generates the DTR signal and supplies it to the modem.

Result codes:

- *OK* if <value> = 0—3.
- *ERROR* if <value> ≠ 0—3.

Table 26. &D<value> Commands

Command*	Function
&D0	Modem ignores the true status of DTR and treats it as always on. Use this command if the computer does not provide DTR to the modem.
&D1	If the DTR signal is not detected while in online data mode, the modem enters command mode, issues the OK result code, and remains connected.
&D2	If the DTR signal is not detected while in online data mode, the modem disconnects (default).
&D3	Resets modem on the on-to-off DTR transition.

* ITU-T Recommendation V.250 (05/99) standardized this command. However, the standard does not include the additional functionality added with the **D3** command.

&F<value>—Restore Factory Default Configuration

Use this command to reset the modem to the configuration programmed at the factory. This operation replaces all of the command options[1] and S-register settings in the active configuration with factory default values.

Note: In voice mode, the command line is ignored if the **AT&F** command is placed on the same line as the other commands. To load factory settings in voice mode, issue the **&F<value>** command by itself.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 27. &F<value> Commands

Command	Function
&F0	Loads the configuration stored and programmed at the factory (default).

&G<value>—V.22bis Guard Tone Control

Use this command to select which guard tone, if any, the modem sends while transmitting in the high band (answer mode). This command is only used in V.22 and V.22bis mode. This option is not used in North America; it is for international use only.

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value> ≠ 0—2.

1. There are several noted exceptions to this command and caution should be used when determining the state of the command options once this command has been executed.

Table 28. &G<value> Commands

Command	Function
&G0	Disables guard tone (default).
&G1	Selects 550 Hz guard tone.
&G2	Selects 1800 Hz guard tone.

&J<value>—Auxiliary Relay Option

This command is supported to ensure backward compatibility with communications software that issues the **J0** command. The **J1** version of this command is not supported. The auxiliary relay is never closed.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 29. &J<value> Commands

Command	Function
&J0	The auxiliary relay is never closed (default).

&K<value>—Local Flow Control Selection

Use this command to select a flow control method.

Result codes:

- *OK* if <value> = 0, 3, or 4.
- *ERROR* if <value> ≠ 0, 3, or 4.

Table 30. &K<value> Commands

Command	Function
&K0	Disables flow control.
&K3	Enables RTS/CTS (hardware) flow control (default).
&K4	Enables XON/XOFF software flow control.

&M<value>—Asynchronous Communications Mode

This command is supported to ensure backward compatibility with communication software that issues the **&M0** command. The preferred method for changing the asynchronous communication mode is to use the **\N<error control mode>** command.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 31. &M<value> Commands

Command	Function
&M0	Asynchronous mode (default).

&P<value>—Pulse Dial Make-to-Break Ratio Selection

Use this command to select the make-to-break ratio. This command is effective only for Japan.

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value>n ≠ 0—2.

Table 32. &P<value> Commands for Domestic Versions

Command	Function
&P0	Selects 39%—61% make/break ratio at 10 pulses per second.
&P1	Selects 33%—67% make/break ratio at 10 pulses per second (default).
&P2	Selects 33%—67% make/break ratio at 20 pulses per second.

&Q<value>—Asynchronous Communications Mode

This command is supported to ensure backward compatibility with communication software that issues the **&Q<value>** command. The preferred method for changing the asynchronous communication mode is to use the **\N<error control mode>** command.

Result codes:

- *OK* if <value> = 0, 5, 6, 8, or 9.
- *ERROR* if <value> ≠ 0, 5, 6, 8, or 9.

Table 33. &Q<value> Commands

Command	Function
&Q0	Asynchronous mode, buffered. Same as **\N0**.
&Q5	Error control mode, buffered (default). Same as **\N3**.
&Q6	Asynchronous mode, buffered. Same as **\N0**.
&Q8	MNP error control mode. If an MNP error control protocol is not established, the modem falls back according to the current user setting in register **S36**.
&Q9	V.42 or MNP error control mode. If neither error control protocol is established, the modem falls back according to the current user setting in register **S36**.

&S<value>—Data Set Ready (DSR) Option

Use this command to controls DSR action.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 34. &S<value> Commands

Command	Function
&S0	DSR is always on (default).
&S1	DSR comes on after establishing a connection and goes off when the connection ends.

&T<value>—Self-Test Commands

Use this command to perform diagnostic tests on the modem. Each test is designed to isolate a problem location when experiencing periodic data loss or random errors.

Result codes:

- *OK* if <value> = 0.
- *CONNECT* if <value> = 1 or 3.
- *ERROR* if <value> ≠ 0—1 or 3.

Table 35. &T<value> Commands

Command	Function
&T0	Abort. Terminates the test in progress.
&T1	Local analog loop. This test verifies modem operation as well as the connection between the modem and computer. Any data entered at the local DTE is modulated, demodulated, and then returned to the local DTE. To work properly, the modem must be offline.
&T3	Local digital loopback test.

&V<value>—View Active Configuration

Use this command to view the active modem profile.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

An example of the results of the command are shown below:

```
      Option                          Selection             AT Cmd
      Comm Standard                   Bell                  B
      CommandCharEcho                 Enabled               E
      Speaker Volume                  Medium                L
      Speaker Control                 OnUntilCarrier        M
      Result Codes                    Enabled               Q
      Dialer Type                     Tone                  T/P
      ResultCode Form                 Text                  V
      ExtendResultCode                Enabled               X
      DialToneDetect                  Enabled               X
      Busy Tone Detect                Enabled               X
      LSD Action                      Standard RS232        &C
      DTR Action                      Standard RS232        &D
Press any key to continue; ESC to quit.
      Option                          Selection             AT Cmd
      V22b Guard Tone                 Disabled              &G
      Flow Control                    Hardware              &K
      Error Control Mode              V42, MNP, Buffer      \N
      Data Compression                V44 V42bis MNP5       %C
      AutoAnswerRing#                 0                     S0
      AT Escape Char                  43                    S2
      CarriageReturnChar              13                    S3
      Linefeed Char                   10                    S4
      Backspace Char                  8                     S5
```

```
      Blind Dial Pause                  2 sec                 S6
      NoAnswer Timeout                  50 sec                S7
      "," Pause Time                    2 sec                 S8
Press any key to continue; ESC to quit.
      Option                            Selection             AT Cmd
      No Carrier Disc                   2000 msec             S10
      DTMF Dial Speed                   95 msec               S11
      Escape GuardTime                  1000 msec             S12
      Data Calling Tone                 Disabled              S35
      LineRate                          33600                 S37
Press any key to continue; ESC to quit.
      Stored Phone Numbers
      &Z0=9725551356
      &Z1=6095553367
      &Z2=6105558625
OK
```

&W<value>—Store Current Configuration

Use this command to store the modems command options and all S registers except S3, S4, and S5. The **Z0**
command or a powerup reset of the modem restores this profiles.

Note: This command is not valid during a cellular call.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 36. &W<value> Commands

Command	Function
&W0	Stores the current configuration as profile 0.

&Y<value>—Select Stored Profile for Hard Reset

This command is supported to ensure backward compatibility with communications software that issues the **&Y0** command. The **&Y1** version of this command is not supported. There is only one stored profile.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 37. &Y<value> Commands

Command	Function
&Y0	Selects stored profile 0 on powerup.

&Z<location>=<stored_number>—Store Telephone Number

Use this command to store a dialing string. Controller-based modems can save four dialing sting. The format for the command is **&Z<storage_location> = <dialing_string>**. The dial string may contain up to 40 characters. The **ATDS=<storage_location>** command (D<dial_string>—Dial on page 13) dials using the stored string.

- *OK* if <value>= 0—2.
- *ERROR* if <value> ≠ 0—2.

\A<value>—Select Maximum MNP Block Size

Use this command to select a MNP error corrected link with a maximum block size controlled by the parameter <block size>.

Result codes:

- *OK* if <value> = 0—3.
- *ERROR* if <value> ≠ 0—3.

Table 38. \A<value> Commands

Command	Function
\A0	64 characters.
\A1	128 characters.
\A2	192 characters.
\A3	256 characters (default).

\B<break_time>—Send Break

Use this command in non-error-controlled mode. The command causes the modem to transmit a break signal to the remote modem. The minimum break length is 100 ms, and the maximum break length is 900 ms. The <break_time> parameter has values between one and nine, with each increment representing 100 ms. The default of <value> = 3 corresponds to a length of 300 ms.

The command works in conjunction with the **\K** (\K<value>—Set Break Control on page 30) command.

Result codes:

- *OK* if connected in data modem mode.
- *NO CARRIER* if not connected or if connected in FAX modem mode.
- *ERROR* if <break_time> ≠ 1—9.

\G<value>—Modem Port Flow Control

Use this command to process XON/XOFF flow control locally or pass XON/OFF flow control to the remote DCE.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 39. \G<value> Commands

Command	Function
\G0	The modem processes XON/XOFF flow control characters locally (default).
\G1	The modem passes XON/XOFF flow control characters.

\J<value>—Adjust Bits/s Rate Control

Use this command to specify whether or not the negotiated connect speed of the modem forces the adjustment of the speed of the DTE to the modem's speed.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 40. \J<value> Commands

Command	Function
\J0	Buffer mode. Error control is set or disabled with the **\N <value>** command (default).
\J1	Forces the maximum DCE rate to the DTE rate.

\K<value>—Set Break Control

Use this command to control the response of the modem to a break received from the DTE, remote modem, or the **\B<value>** command.

Result codes:

- *OK* if <value> = 0—5.
- *ERROR* if <value> ≠ 0—5.

The response is different in three separate cases. In the first case, the modem receives a break from the DTE when it is operating in data transfer mode. See Table 41.

Table 41. \K<value> Commands When Modem Is Operating in Data Transfer Mode

Command	Function
\K0, **\K2**, **\K4**	Enters online command mode. No break is sent to the remote modem.
\K1	Clears data buffers and sends a break to the remote modem.
\K3	Sends a break to the remote modem immediately.
\K5	Sends a nondestructive, nonexpedited break to the remote modem (default).

In the second case, shown in Table 42, the modem is in the online command state (waiting for AT commands) during a data connection, and the **\B<value>** command is received in order to send a break to the remote modem.

Table 42. \K<value> Commands When Modem Is Online Command State During Data Connection

Command	Function
\K0, **\K1**	Clears data buffers and sends a break to the remote modem.
\K2, **\K3**	Sends a break to the remote modem immediately.
\K4, **\K5**	Sends a break to the remote modem in sequence with data (default).

In the third case, the modem receives a break from a remote modem during a connection. These commands are shown in Table 43.

Table 43. \K<value> Commands When Break Is Received During Connection

Command	Function
\K0, **\K1**	Clears data buffers and sends a break to the DTE.
\K2, **\K3**	Sends a break to the DTE immediately.
\K4, **\K5**	Sends a break to the DTE in sequence with received data (default).

\N<value>—Select Error Control Mode

Use this command to select the type of error control used by the modem when sending or receiving data.

Result codes:

- *OK* if <value> = 0—5, or 7.
- *ERROR* if <value> ≠ 0—5, or 7.

Table 44. \N<value> Commands

Command	Function
\N0	Buffer mode. No error control (same as **&Q6**).
\N1	Direct mode.
\N2	MNP or disconnect mode. The modem attempts to connect using MNP 2—4 error control procedures. If this fails, the modem disconnects. This is also known as MNP reliable mode.
\N3	V.42, MNP, or buffered (default). The modem attempts to connect in V.42 error control mode. If this fails, it attempts to connect in MNP mode. If this also fails, the modem connects in buffer mode and continues operation. This is also known as V.42/MNP auto reliable mode (same as **&Q5**).
\N4	V.42 or disconnect. The modem attempts to connect in V.42 error control mode. If this fails, the modem disconnects.
\N5	V.42, MNP, or buffered (same as **\N3**).
\N6	SDLC, a full-duplex protocol. To be used in conjunction with fast-connect commands (see Table 202, \F<value> Commands, on page 88).
\N7	V.42, MNP, or buffered (same as **\N3**).

\Q<value>—Local Flow Control Selection

Use this command to set the local flow control method.

Result codes:

- *OK* if <value> = 0—1, or 3.
- *ERROR* if <value> ≠ 0—1, or 3.

Table 45. \Q<value> Commands

Command	Function
\Q0	Disables flow control (same as **&K0**).
\Q1	XON/XOFF software flow control (same as **&K4**).
\Q3	RTS/CTS to DTE (same as **&K3**) (default).

\R<value>—Ring Indicator Signal Off After Answer

This command is supported to ensure backward compatibility with communications software that issues the **\R0** command. The **\R1** version of this command is not supported.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 46. \R<value> Commands

Command	Function
\R0	Ring indicator signal is off after the telephone call is answered.

\T<value>—Inactivity Timer

Use this command to specify the delay time used by the inactivity timer. The delay time is the length of time in minutes that the modem waits during periods of inactivity before disconnecting. Periods of inactivity are defined by no data being sent or received by the DCE. To disable the inactivity timer, use the **T0** command. The delay time may also be specified in register S30 (S30—Inactivity Timer on page 101).

Result codes:

- *OK* if <value> = 0—255.
- *ERROR* if <value> ≠ 0—255.

Table 47. \T<value> Commands

Command	Function
\T0	Inactivity timer disabled (default).
\T1—\T255	Specifies the length of time in minutes that the modem will wait before disconnecting when no data is sent or received.

\V<value>—Protocol Result Code

Use this command to enable or disable protocol result codes (see Result Code Summary on page 107).

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value> ≠ 0—2.

Table 48. \V<value> Commands

Command	Function
\V0	Disables protocol result code appended to DCE speed.
\V1	Enables protocol result code appended to DCE speed (default).
\V2	Enables protocol result code appended to DCE speed (same as **\V1**).

\X<value>—XON/XOFF Pass Through

Use this command to restrict the XON/XOFF flow control to the local DCE for processing or have the local DCE send the flow control characters to the remote DCE.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 49. \X<value> Commands

Command	Function
\X0	The modem processes XON/XOFF flow control characters locally (default).
\X1	The modem passes XON/XOFF flow control characters.

-C<value>—Send Data Calling Tone

Data calling tone is a tone of a certain frequency and cadence, as specified in V.25, which allows remote data/FAX/voice discrimination. The frequency is 1300 Hz with a cadence of 0.5 s on and 2.0 s off. The setting of the homologation parameter 1f, calling tone flag, determines if –C (same as S35) is enabled. If the calling tone flag is set to 1, this command is valid. Otherwise, this command has no effect.

Note: This command's default value may vary based on country selection.

- Range: 0—1.
- Default: 0.

-V90=<rate>—V.90 Downstream Rate Control

Use this command to control the V.90 downstream rate. This command has three forms and is used to view the current settings, view the range of input values, enable or disable V.90, or set the downstream V.90 rate to a specific value.

Result codes:

- *OK* if <rate> = 0—21.
- *ERROR* if <rate> ≠ 0—21.

Table 50. -V90 Extended Syntax Commands

Syntax	Function
-V90=<rate>	Disables or selects the V.90 downstream rate.
-V90?	Displays the current value.
-V90=?	Displays the range of values for the variable <rate>.

Table 51. -V90=<value> Commands

Command	Function
-V90=0	Disables V.90.
-V90=1	Selects auto rate (default).
-V90=2	Selects 28000 bits/s.
-V90=3	Selects 29333 bits/s.
-V90=4	Selects 30666 bits/s.

Table 51. -V90=<value> Commands

-V90=5	Selects 32000 bits/s.
-V90=6	Selects 33333 bits/s.
-V90=7	Selects 34666 bits/s.
-V90=8	Selects 36000 bits/s.
-V90=9	Selects 37333 bits/s.
-V90=10	Selects 38666 bits/s.
-V90=11	Selects 40000 bits/s.
-V90=12	Selects 41333 bits/s.
-V90=13	Selects 42666 bits/s.
-V90=14	Selects 44000 bits/s.
-V90=15	Selects 45333 bits/s.
-V90=16	Selects 46666 bits/s.
-V90=17	Selects 48000 bits/s.
-V90=18	Selects 49333 bits/s.
-V90=19	Selects 50666 bits/s.
-V90=20	Selects 52000 bits/s.
-V90=21	Selects 53333 bits/s.

%B—View Numbers in Blacklist

When the blacklisting option is active, use this command to display the telephone numbers and status of any failed or troubled calls. The blacklisting option is associated with the country selection. Some countries have national requirements that prohibit repeat calls to the same number through automatic dialing. Blacklisting[1] is a method of handling failed or troubled calls encountered during automatic dialing.

Result codes:

- *<list of phone numbers and their status>* if country supports blacklisting.
- *OK* if no failed calls occur.
- *ERROR* if country selection does not support blacklisting.

%C<value>—Data Compression Control

Use this command to enable or disable data compression. This command enables or disables V.44, V.42bis, and MNP class 5 data compression. The command overwrites the current status of the **+DCS** command. The command is also overwritten by changes made by the **+DCS** command. Online changes do not take effect until a disconnect occurs.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

1. This command is only used to display the contents of the blacklist when blacklisting is active. It does not affect the functionality associated with blacklisting. For more information on how blacklisting works, see the Controller-Based Homologation Reference Manual.

Table 52. %C<value> Commands

Command	Function
%C0	V.44/V.42bis/MNP 5 disabled. No data compression.
%C1	V.44/V.42bis/MNP 5 enabled. Data compression enabled (default).

%E<value>—Auto Fallback/Fallforward Control

This command provides the option for the modem to automatically monitor line quality, to fall back when line quality is insufficient, and to fall forward when line quality is sufficient.

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value> ≠ 0—2.

Table 53. %E<value> Commands

Command	Function
%E0	Disables fallback/fallforward.
%E1	Enables fallback and disables fallforward.
%E2	Enables fallback/fallforward (default).

+A8E=<v8o>,<v8a>,<v8cf>,<v8b>—V.8 and V.8bis Operation Controls

Use this command to set the control parameters for early call negotiation through V.8 and V.8bis. **+A8E*** may also be used as an action command to reinitiate V.8 or V.8bis if an earlier attempt to use either protocol has failed.

<v8o> enables or disables DCE-controlled V.8 origination negotiation; <v8a> enables or disables DCE-controlled V.8 answer negotiation; <v8b> disables V.8 negotiation or sets it to DCE controlled or DTE controlled negotiation. The <v8cf> parameter contains the V.8 CI signal call function octet (refer to V8 document for details). Call function octet <v8cf> accepts values in the range 0-FF. The default values are <v8o> = 1, <v8a> = 1, and <v8cf> = C1.

Result codes:

- *OK* if <v8o> = 1, 6 and <v8a> = 1, 5 and <v8cf> = 0-FF and <v8b> = 0—2.
- *ERROR* if <v8o> ≠ 1, 6 or <v8a> ≠ 1, 5 or <v8cf> ≠ 0-FF or <v8b> ≠ 0—2.

The following parameter values are supported when V.80 is enabled.

Table 54. Valid <v8o> Values

Value	Meaning
1	Enables DCE-controlled V.8 origination negotiation (default).
6	Enables DCE-controlled V.8 origination negotiation, issues **+A8x** indications.

Table 55. Valid <v8a> Values

Value	Meaning
1	Enables DCE-controlled V.8 answer negotiation (default).
5	Enables DCE-controlled V.8 answer negotiation, issues **+A8x** indications.

Note: ITU-T Recommendation V.251 (02/98) standardized this command. However, the controller-based command set only includes partial support for the standard. For complete details of the standard form of this command, refer to Recommendation V.251.

Table 56. Valid <v8cf> Values

Value	Meaning
1	Enables DCE-controlled V.8 origination negotiation.
6	Enables DCE-controlled V.8 origination negotiation, issues **+A8x** indications.

Table 57. Valid <v8b> Values

Value	Meaning
0	Disables V.8 negotiation.
1	Enables DCE-controlled V8bis negotiation (default).
2	Enables DTE-controlled V.8 negotiation.

+A8E Extended Syntax Commands

Table 58. A8E Extended Syntax Commands

Command	Description
+A8E=<v8o>,<v8a>,<v8cf>,<v8b>	Sets the parameters used by the modem during V.8 negotiation.
+A8E?	Displays the current settings for V.8 or V.8bis negotiation.
+A8E=?	Displays the supported parameter values for the **A8E** commands.

+A8T=<signal>,<1st message>,<2nd message>,<sig en>,<msg en>,<supp delay>—Send V.8bis Signal and/or Message

Use this command to send a V.8bis signal or message from the local DCE. This command is only supported when V.80 is enabled.

Result codes:

- *OK* if <signal> = 0—10 and <sig en> = 0, 1 and <msg en> = 0, 1 and <supp delay> = 0,1.
- *ERROR* if <signal> ≠ 0—10 or <sig en> ≠ 0, 1 or <msg en> ≠ 0, 1 or <supp delay> ≠ 0,1.

Table 59. Valid <signal> Values

Value	Meaning
0	None.
1	Initiating MRe.
2	Initiating MRd.
3	Initiating CRe, low power.
4	Initiating CRe, high power.
5	Initiating CRd.
6	Initiating Esi.
7	Responding MRd, low power.
8	Responding MRd, high power.
9	Responding CRd.
10	Responding Esr.

Table 60. Valid <sig_en> Values

Value	Meaning
0	Enables detection of initiation signals (default).
1	Enables detection or responding signals.

Table 61. Valid <msg_en> Values

Value	Meaning
0	Disables detection of messages (default).
1	Enables detection of V.8bis messages.

Table 62. Valid <supp_delay> Values

Value	Meaning
0	No delay inserted (default).
1	Inserts 1.5 second delay between the transmitted V.8bis signal and the subsequent V.8bis message.

Table 63. +A8T Extended Syntax Commands

Command	Description
+A8T=<signal>,<1st message>,<2nd message>,<sig_en>,<msg_en>,<supp_delay>	Sends a V.8bis command or message.
+A8T?	Displays the current configuration for sending a V.8bis message or command.
+A8T=?	Displays the supported configuration parameters.

+DCS=<v42bis>,<v44>—Select Data Compression Algorithm

Use this command to configure the available compression algorithms. The <v42bis> parameter enables or disables the V.42bis, and the <v44> parameter enables or disables V.44. This command works in conjunction with the **%C** command, and the result of either the **%C** command or the **+DCS** command replaces the current data compression configuration.

Result codes:

- *OK* if <v42bis> = 0, 1 and <v44> = 0—2.
- *ERROR* if <v42bis> ≠ 0, 1 or <v44> ≠ 0—2.

Table 64. Valid <v42bis> Values

Value	Meaning
0	Disables V.42bis.
1	Enables V.42bis (default).

Table 65. Valid <v44> Values

Value	Meaning
0	Disables V.44.
1	Enables V.44 (default).
2	Enables V.44 for V.92 servers only.

Table 66. +DCS Extended Syntax Commands

Command	Description
+DCS=<v42bis>,<v44>	Configures compression algorithms.
+DCS?	Displays the current data compression configuration.
+DCS=?	Displays the valid **+DCS** parameter values.

+DR<value>—Data Compression Reporting

Use this command to enable or disable the compression report. If the compression report is enabled, the *+DR:<type>* intermediate result code reports the current DCE-DCE data compression type. It is issued after the error control report (+ER) and before the final result code (e.g., *CONNECT*).

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 67. +DR Data Compression Report Value

Command	Function
+DR=0	Disables the compression report.
+DR=1	Enables the compression report.

Table 68. +DR Data Compression Reporting Intermediate Result Codes

Result Code	Description
+DR: NONE	Data compression is not in use.
+DR: V42B	V.42bis is in use in both directions.
+DR: V44	V.44 is in use in both directions.

Table 69. +DR Extended Syntax Commands

Command	Description
+DR=<value>	Turns the data compression report result code on or off.
+DR?	Displays the current status of the data compression report result code.
+DR=?	Displays all of the supported values for the <value> parameter.

+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string>—V.42bis Data Compression

Use the **+DS** command to configure the V.42bis data compression method used by the modem. The settings of this command overwrite the setting of a **%C<value>** command. However, it can also be overwritten by the **%C<value>** command.

Result codes:

- *OK* if <direction> = 0, 3 and <compression negotiation> = 0, <max_dict> = 1024, <max_string> = 32.
- *ERROR* if <direction> ≠ 0, 3 or <compression negotiation> ≠ 0, <max_dict> ≠ 1024, <max_string> ≠ 32.

The <direction> parameter sets which directions use the compression method. USRobotics controller-based products use compression in both directions or no compression at all.

Table 70. Valid <direction> Values

Value*	Meaning
0	Does not negotiate V.42bis compression.
3	Modem accepts V.42bis compression in both direction (default).

* ITU-T Recommendation V.250 (05/99) standardized this command. The standard command includes two additional parameter values (1 and 2), which are not supported by the controller-based AT command set. For additional information on the functionality of the <direction parameter, refer to ITU-T Recommendation V.250 (05/99).

The <compression_negotiation> parameter tells the modem whether it should disconnect if V.42 negotiations fail. The controller-based AT command set does not support the disconnect feature when V.42 negotiation fails, and the <compression_negotiation> parameter is always set to 0. The default dictionary, <max_dict> size, is always 1024, and the default string length, <max_string>, is always 32.

Table 71. +DS Extended Syntax Commands

Command	Description
+DS=<direction>,0,1024,32	Configures modem V.42 compression method.
+DS?	Displays the current V.42 compression configuration.
+DS=?	Displays the supported V.42 compression setting.

+DS44=<direction>,<compression_negotiation>,<capability>,<max_codewords_tx>, <max_codewords_rx>, <max_string_tx>,<max_string_rx>,<max_history_tx>,<max_history_rx>—V.44 Data Compression

Use this command to configure the V.44 data compression method used by the modem. This controller-based modem only supports the stream method for capability and does not support the disconnect feature if V.44 is not negotiated (for compression negotiation). As a result, both parameters, <compression_negotiation> and <capability>, are always 0.

Result codes:

- *OK* if <direction> = 0, 3 and <compression_negotiation> = 0 and <compatibility> = 0 and <max_codewords_tx> = 256—2048 and <max_codewords_rx> = 256—2048 and <max_string_tx> = 31—255 and <max_string_rx> = 31—255 and <max_history_tx> = 512—11008 and <max_history_rx> = 512—11008.
- *ERROR* if <direction> ≠ 0, 3 or <compression_negotiation> ≠ 0 or <compatibility> ≠ 0 or <max_codewords_tx> ≠ 256—2048 or <max_codewords_rx> ≠ 256—2048 or <max_string_tx> ≠ 31—255 or <max_string_rx> ≠ 31—255 or <max_history_tx> ≠ 512—11008 or <max_history_rx> ≠ 512—11008.

The <direction> parameter sets which directions use the compression method. USRobotics controller-based products use compression in one or both directions.

Table 72. Valid <direction> Values

Value	Meaning
0	Do not negotiate V.44 compression.
3	Modem accepts V.44 compression in both direction (default).

The <max_codewords_tx> parameter specifies the maximum number of code words to negotiate in the transmit direction. The <max_codewords_rx> parameter specifies the maximum number of code words to negotiate in the receive direction.

Table 73. Valid <max_codewords_tx> and <max_codewords_rx> Values

Value	Meaning
1024	Default <max_codewords_tx> and <max_codewords_rx> value.
256—2048	Valid transmit and receive code word settings.

The <max_string_tx> parameter specifies the maximum string length to negotiate in the transmit direction. The <max_string_rx> parameter specifies the maximum string length to negotiate in the receive direction.

Table 74. Valid <max_string_tx> and <max_string_rx> Values

Value	Meaning
255	Default <max_string_tx> and <max_string_rx> value.
31—255	Valid transmit and receive string lengths.

The <max_history_tx> parameter specifies the maximum length of the history buffer to negotiate in the transmit direction. The <max_history_rx> parameter specifies the maximum length of the history buffer to negotiate in the receive direction.

Table 75. Valid <max_history_tx> and <max_history_rx> Values

Value	Meaning
5120	Default <max_history_tx> value.
4096	Default <max_history_rx> value.
512—11008	Valid maximum transmit and receive history buffer sizes.

Table 76. +DS44 Extended Syntax Commands

Command	Description
+DS44=<direction>,0,0, <max_codewords_tx>,<max_codewords_rx>, <max_string_tx>,<max_string_rx>, <max_history_tx>,<max_history_rx>	Configures modem V.44 compression method.
+DS44?	Displays the current V.44 compression configuration.
+DS44=?	Displays the supported V.44 compression setting.

+EB=<break_selection>,<timed>,<default_length>—Break Handling In Error Control Operation

Use this command to set the modem behavior when a BREAK is received. Table 77 lists the valid break selection values. The valid values for default length are 10—90 in steps of 10, with a default for this field of 30. Each increment of the <default_length> parameter indicates 10 ms of time.

Result codes: Command usage example, both are valid: AT+EB=1,0,10 or AT+EB=1,,10.

- *OK* if <break_selection> = 0—3 and <timed>[1] = 0 and <default_length>[2] = 10—90 in increments of 10.

1. ITU-T Recommendation V.250 (05/98) standardized this command. The <timed> parameter in the recommendation allows for V.42 L-SIGNALs to indicate a break length. The controller-based AT command set does not support this option. For more information on the standardized version of this command, refer to ITU-T Recommendation V.250.
2. ITU-T Recommendation V.250 (05/98) standardized this command. The <default length> parameter in the recommendation allows for break length from 10 ms to 2.54 s. The controller-based AT commands set only supports break lengths between 10 ms and 90 ms. For more information on the standardized version of this command, refer to ITU-T Recommendation V.250.

- *ERROR* if <break_selection> ≠ 0—3 or <timed> ≠ 0 or <default_length> ≠ 10—90 in increments of 10.

Table 77. Valid break_selection Values

Value	Meaning
0	Ignore break (default).
1	Nonexpedited, nondestructive.
2	Expedited, nondestructive.
3	Expedited, destructive.

Table 78. +EB Extended Syntax Commands

Command	Description
+EB=<break selection>,<timed>, <default length>	Sets the modem behavior when a break is received.
+EB?	Displays the current break selection settings.
+EB=?	Displays the supported break selection settings.

+EFCS=<value>—32-bit Frame Check Sequence

Use this command to control the 32-bit frame check sequence option in V.42. The only valid combination is +EFCS=0, 16 bit frame check sequence.

Result codes:

- OK if <value> = 0.
- ERROR if <value> ≠ 0.

Table 79. +EFCS Extended Syntax Commands

Command	Description
+EFCS=0	Sets the 32-bit frame check sequence to a 16-bit frame check sequence.
+EFCS?	Displays the current 32-bit frame check sequence.
+EFCS=?	Displays the support parameters for the 32-bit frame check sequence.

+ER=<value>—Error Control Reporting

Use this command to enable or disable the error control report. If the compression report is enabled, the *+ER:<type>* intermediate result code reports the current DCE-DCE error control type. It is issued after the determination of the error control protocol and before the final result code (e.g., *CONNECT*). Specifically, the *+ER* intermediate result code is issued after the modulation report (*+MCR* and *+MRR*) and before the data compression report (*+DR*).

The compression report format is shown in Table 81.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 80. +ER Control Reporting Commands

Command	Function
+ER=0	Disables the error control report (default).
+ER=1	Enables the error control report.

Table 81. +ER Error Control Reporting Intermediate Result Codes

Command	Function
+ER: NONE	Data compression not in use.
+ER: LAPM	V.42 LAPM protocol is in use.
+ER: ALT	V.42 alternative protocol is in use.

Table 82. +ER Extended Syntax Commands

Command	Description
+ER=<value>	Enables or disables error control reporting.
+ER?	Displays the current setting for error control reporting.
+ER=?	Displays the supported error control reporting settings (0, 1).

+ES=<orig_rqst>,<orig_fbk>,<ans_fbk>—Error Control Selection

Use this command to select the error correction mode. If the modem is operated in V.80 mode (synchronous buffered mode), and **+ES=,,8,** the **+ES?** always returns **+ES: 6,,8**. The setting of this command overwrites the **\N** command. However, the **+ES** command is overwritten by the setting on a **\N** command.

Result codes:

- *OK* if one of the combinations is shown in Table 81.
- *ERROR* all other parameter combinations.

Controller-based modems support the following parameter combinations.

Table 83. +ES Combinations

Combination	Mode
+ES=1,0,1	Buffered mode.
+ES=0,1,0	Direct mode.
+ES=4,4,6	MNP or disconnect mode.
+ES=3,3,5	LAPM or disconnect mode.
+ES=4,0,6	MNP or buffered mode.
+ES=3,0,2	LAPM, MNP, or buffered mode (default).
+ES=2,0,2	LAPM or buffered mode.
+ES=3,2,4	LAPM, MNP, or disconnect mode.
+ES=,,8	V.42 sync buffer mode (V.80 enabled).
+ES=6,,8	V.42 sync buffer mode (V.80 enabled).

Table 84. +ES Extended Syntax Commands

Command	Description
+ES=<value>	Selects the modem error control method.
+ES?	Displays the current error control settings.
+ES=?	Displays the supported error control settings.

+ESA=<trans_idle>,<frame_idle>,<framed_un_ov>,<hd_auto>,<crc_type>,<nrzi_en>,<syn1>—Set Up Error Control Parameters

Use this command to set the control parameters for the DCE in synchronous access mode (see page 11). USRobotics host-based modems do not use the <framed_un_ov>, <hd_auto>, and <syn1> parameters.

Result codes:

- *OK* if <trans_idle> = 0 and <frame_idle> = 0 and <crc_type> = 0, 1 and <nrzi_en> = 0.
- *ERROR* if <trans_idle> = 0 or <frame_idle> = 0 or <crc_type> = 0, 1 or <nrzi_en> = 0.

Table 85. +ESA Commands

Command	Meaning
+ESA=0,,,,0,0,,	Disables CRC generation and checking.
+ESA=0,,,,1,0,,	Causes the DCE to generate a 16-bit CRC in the transmit direction in framed sub-mode and check the CRC in the receive direction.

Table 86. Valid <crc_type> Values

Value	Meaning
0	Disables CRC generation and checking.
1	In framed submode, the 16-bit CRC specified in V.42 is generated by the DCE in the transmit direction and checked by the DCE in the receive direction.

+ESR=<value>—Selective Repeat

USRobotics controller-based modems products do not use the selective reject mode. This command initiates the selective reject mode, and only the **+ESR=0**[1] form of this command is supported.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 87. +ESR Extended Syntax Commands

Command	Description
+ESR=<value>	Enables or disables the selective reject mode.
+ESR?	Displays the current settings for the selective reject mode.
+ESR=?	Displays the supported settings for the selective reject mode.

1. ITU-T Recommendation V.250 (05/98) standardized this command. For further details on the standard version of this command, see Recommendation V.250.

+ETBM=<pending_TD>,<pending_RD>,<timer>—Call Termination Buffer Management

Use this command to set the behavior of the modem upon call termination. Only **+ETBM=0,0,0*** is a valid combination. This means that the modem discards all the buffered data when the call is terminated.

Result codes:

- *OK* if <pending TD> = 0 and <pending RD> = 0 and <timer> = 0.
- *ERROR* if <pending TD> ≠ 0 or <pending RD> ≠ 0 or <timer> ≠ 0.

Table 88. +ETBM Extended Syntax Commands

Command	Description
+ETBM=<value>	Sets the modem behavior upon call termination.
+ETBM?	Displays the current settings for call termination behavior.
+ETBM=?	Displays the supported settings for call termination behavior.

+FCLASS=<value>—Service Class Indication

Use this command to set the modem service class. The service class determines if the modem is in data, FAX, or voice mode. The **+FCLASS** command is an extended syntax command.

Result codes:

- *OK* if <value> = 0, 1, 1.0, 2, 2.0, 2.1, 8.
- *ERROR* <value> ≠ 0, 1, 1.0, 2, 2.0, 2.1, 8.

Table 89. +FCLASS Values

Commands	Description
+FCLASS=0	Selects the modems data mode.
+FCLASS=1	Selects the modems class 1 FAX mode.
+FCLASS=1.0	Selects the modems class 1.0 FAX mode.
+FCLASS=2	Selects the modems class 2 FAX mode.
+FCLASS=2.0	Selects the modems class 2.0 FAX mode.
+FCLASS=2.1	Selects the modems class 2.1 FAX mode.
+FCLASS=8	Selects the modems voice mode.

Table 90. +FCLASS Extended Syntax Commands

Command	Description
+FCLASS=<value>	Selects the class or mode of the modem.
+FCLASS?	Displays the current class or mode.
+FCLASS=?	Displays the available parameter values for the +FCLASS command.

+GCAP—Request Complete Capabilities List

Use this command to display the modems supported capabilities. The +GCAP command is an action command that always generates an *OK* result code and does not have extended syntax. The valid responses are shown in Table 91.

Result codes:

- This command always yields an *OK* result code.
- *ERROR* if a parameter is supplied.

Table 91. Valid +GCAP Responses

Commands	Description
+FCLASS	Class 1 or class 2 facsimile DCE control.
+MS	Modulation control: +MS, +MR commands.
+ES	Error control: +ES, +EB, +ER, +EFCS, +ETBM commands.
+DS	Data compression: +DS, +DR commands.

+GCI=<T.35 country code>—Country of Installation

Use this command to set the modem country code. ITU-T Recommendation T.35 defines the country codes and the country names (see Table 231 on page 121).

Result codes:

- if <T.35 country code> = valid country code as defined by Table 231 on page 121.
- *ERROR* if <T.35 country code> ≠ valid country code as defined by Table 231 on page 121.

Table 92. +GCI Extended Syntax Commands

Command	Description
+GCI=<T.35 country code>	Sets the country code.
+GCI?	Displays the current country code setting.
+GCI=?	Displays all supported country code settings.

+GMI—Manufacturer Identification

+GMI is an extended syntax command. It returns the modem manufacturer and either the *OK* or *ERROR* result code. The **+GMI=?** syntax returns an *ERROR* result code. The other two forms return an *OK* result code.

Result codes:

- *OK* when using the **+GMI** or **+GMI?** syntax.
- *ERROR* when using the **+GMI=?** syntax.

Table 93. +GMI Extended Syntax Commands

Command	Description
+GMI, **+GMI?**	Displays modem manufacturer and generates an *OK* result code.
+GMI=?	Displays modem manufacturer and generates an *ERROR* result code.

+GMM—Modem Identification

Use this command to display the modem identity string and driver version number. The modem returns the same result codes as those generated by the I0 or I3 commands.

Result codes:

- *OK* for all extended syntax forms of this command.
- This command does not generate an *ERROR* result code.

Table 94. +GMM Extended Syntax Commands

Command	Description
+GMM, **+GMM?, +GMM=?**	Displays the modem identity string and driver version followed by the *OK* result code.

+GMR—Request Revision Information

Use this command to display the version of the modem code.

Result codes:

- *OK* for all extended syntax forms of this command.
- This command does not generate an *ERROR* result code.

Table 95. +GMR Extended Syntax Commands

Command	Description
+GMR, **+GMR?, +GMR=?**	Displays the version and revision information followed by the *OK* result code.

+IFC=<DCE_by_DTE>,<DTE_by_DCE>—DTE-DCE Local Flow Control

Use this command to select the local flow control method. The input parameters of the **+IFC** command overwrite the settings of the **\Q** and **\X<value>** commands. The reverse is also true. By modifying the settings of the **\Q** and **\X<value>** commands, the **+IFC** command parameters are overwritten.

Result codes:

- *OK* if <DCE by DTE> = 0—2 and <DTE by DCE> = 0—2.
- *ERROR* if <DCE by DTE> ≠ 0—2 or <DTE by DCE> ≠ 0—2.

The following combinations are accepted by the modem.

Table 96. +IFC Commands

Command	Data Format
+IFC=0,0	No flow control.
+IFC=1,1	Software flow control.
+IFC=2,2	Hardware flow control (default).

Table 97. +IFC Extended Syntax Commands

Command	Description
+IFC=<DCE by DTE>,<DTE by DCE>	Sets the local flow control method.
+IFC?	Displays the current local flow control settings.

Table 97. +IFC Extended Syntax Commands

+IFC=?	Displays the supported local flow control parameter settings.

+ILRR=<value>—DTE-DCE Local Rate Reporting

Use this command to display or hide the local rate report result code. If the rate report is enabled, the reported <rate> is the current DTE-DCE rate. The rate report is an intermediate result code. It is transmitted after any modulation, error control, or data compression reports, and before the final result code (e.g., *CONNECT*).

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 98. +ILRR Commands

Command	Function
+ILRR=0	Disables the local rate report (default).
+ILRR=1	Enables the local rate report.

Table 99. +ILRR Extended Syntax Commands

Command	Description
+ILRR=<value>	Selects or deselects transmission of the rate report result code.
+ILRR?	Displays the current status of the rate report result code.
+ILRR=?	Displays the supported parameter values for DTE-DCE local rate reporting.

+IPR=<DTE rate>—Fixed DTE Rate

Use this command to set the DTE to DCE transmission rate. There are 12 fixed transmission rates used by the DTE to communicate with the DCE. This command selects one of these predefined transmission rates. If a rate is entered that is not supported, the transmission rate defaults to the next lower rate.

Result codes:

- *OK* for all values of <DTE rate>

Table 100. +IPR Commands

Command	DTE Rate
+IPR=0	Automatic rate detection (default).
+IPR=110	100 bits/s.
+IPR=300	300 bits/s.
+IPR=600	600 bits/s.
+IPR=1200	1200bits/s.
+IPR=2400	2400 bits/s.
+IPR=4800	4800 bits/s.
+IPR=9600	9600 bits/s.
+IPR=14400	14400 bits/s.
+IPR=19200	19200 bits/s
+IPR=38400	38400 bits/s.
+IPR=57600	57600 bits/s.

Table 100. +IPR Commands

+IPR=115200	115200 bits/s.

Table 101. +IPR Extended Syntax Commands

Command	Description
+IPR=<DTE rate>	Sets the DTE to DCE transmission rate.
+IPR?	Displays the current DTE to DCE transmission rate.
+IPR=?	Displays all supported transmission rates.

+ITF=<off>,<on>—Transmit Flow-Control Threshold

Use this command to set the flow-control thresholds. The <off> parameter represents the off signal threshold in octets. When this threshold is reached, the DCE generates a flow-off signal. The <on> parameter represents the on signal threshold in octets. When the volume of data resident on the DCE goes below this value, the DCE generates a flow on signal.

ITU-T Recommendation V.80 defines an additional parameter (<report period>) for the **+ITF** command. This parameter is only used in synchronous mode and is not supported in the controller-based set.

Result codes:

- *OK* if <off> = 0—3 and <on> = 0—2.
- *ERROR* if <off> ≠ 0—3 or <on> ≠ 0—2.

Table 102. +ITF Extended Syntax Commands

Command	Description
+ITF=<off>,<on>	Sets the flow control thresholds.
+ITF?	Displays the current value of the flow control thresholds.
+ITF=?	Displays the supported values of the flow control thresholds.

+MR=<value>—Modulation Reporting Control

Use this command to hide or display the modulation report. When the modulation report is enabled, the DCE transmits the *+MRR: <rate>, <rx_rate>,* and the *+MCR:<carrier>* intermediate result codes to the DTE. The <carrier> reported is the current modulation, e.g., V.34. The <rate> reported is the transmit rate in bits per second or is zero if negotiation fails. The <rx_rate> is the receive channel rate and is only reported when different receive and transmit rates have negotiated.

The intermediate result codes are transmitted after the modulation and the rate have been determined and before any error control or data compression reports or the final result code (e.g., *CONNECT*) is transmitted.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 103. +MR Commands

Command	Function
+MR=0	Turns off the modulation report.
+MR=1	Turns on the modulation report.

Table 104. +MR Extended Syntax Commands

Command	Description
+MR=<value>	Selects or deselects transmission of the modulation result codes.
+MR?	Displays the current status of the modulation report result code.
+MR=?	Displays the supported parameter values for modulation rate reporting.

+MS=<carrier>,<automode>,<min_rate>,<max_rate>,<min_rx_rate>, <max_rx_rate>—Modulation Selection

Use this command to set the modem's modulation, the modulation's minimum and maximum transmission rates, and the status of automatic modulation negotiation (automode). The <carrier>, <min_rate>, and <max_rate> parameters define the modulation and its minimum and maximum transmission rates. <min_rx_rate> and <max_rx_rate> define the minimum and maximum reception rates. The minimum transmission and reception rates are always set to 0.

The <automode> parameter enables or disables automatic modulation negotiation. If a subsequent **+MA** command is not provided, the automode parameters are constrained by the modulation set by the <carrier> parameter. The **+MA** command can further restrict the automatic modulation negotiation settings but it cannot set a modulation that is higher than the modulation set by the **+MS** command.

Result codes:

- *OK* if <automode> = 0, 1 and <min_rate> = <min_rx_rate> = 0 and <max_rate> = 0, 300—33600 and <max_rx_rate> = 0, 300—56000 and carrier is equal to one of the entries in Table 105.
- *ERROR* if <automode> ≠ 0, 1 or <min_rate> ≠ <min_rx_rate> ≠ 0 or <max_rate> ≠ 0, 300—33600 or <max_rx_rate> ≠ 0, 300—56000 or carrier is not equal to one of the entries in Table 105.

Table 105. Valid <carrier> Values

Value	Meaning
V92	V.92 (default)
V90	V.90
V34	V.34
V32B	V.32bis
V32	V.32
V22B	V.22bis
V.22	V.22
Bell212A	Bell 212A*
V23C	V.23, constant carrier, asymmetric FDM
V21	V21
Bell103	Bell 103*

* The +MS command was standardized by ITU-T Recommendation V.250. However, the standard command does not include the additional functionality provided by the Bell212A and Bell103 values of the <carrier> parameter.

Automatic modulation negotiation is enabled or disabled by <automode>. However, if a value is specified for the <max_rate>, automatic rate selection is disabled and the modem attempts to connect at the specified rate.

Table 106. Valid <automode> Values

Value	Meaning
0	Disabled.
1	Enabled (default).

The <max_rate> specifies the highest connections rate for the DCE.

Table 107. Valid <max_rate> Range

Value	Meaning
31200	Determined by modulation selected in <carrier> (default).
300—56000	Value limited by modulation selected in <carrier>.

Table 108. Valid <max_rate> for Each <carrier>

Value	Meaning
V34	2400 bits/s—33600 bits/s in steps of 2400 bits/s.
V32bis	4800 bits/s—19200 bits/s in steps of 2400 bits/s.
V32	4800 bits/s—14400 bits/s in steps of 2400 bits/s.
V22bis	2400 bits/s.
V22	2200 bits/s.
V23C, Bell212A	1200 bits/s.
V.21, Bell103	300 bits/s.

The <max_rx_rate> specifies the highest receive rate the modem will negotiate.

Table 109. Valid <max_rate> Range

Value	Meaning
56000	Determined by modulation selected in <carrier> (default).
300—56000	Value limited by modulation selected in <carrier>.

Table 110. Valid <max_rx_rate> Value for Each <carrier>

Value	Meaning
V92	28000 bits/s—56000 bits/s in steps of 1333 bits/s.
V90	28000 bits/s—56000 bits/s in steps of 1333 bits/s.
V34	2400 bits/s—33600 bits/s in steps of 2400 bits/s.
V32bis	4800 bits/s—19200 bits/s in steps of 2400 bits/s.
V32	4800 bits/s—14400 bits/s in steps of 2400 bits/s.
V22bis	2400 bits/s.
V22	2200 bits/s.
V23C, Bell212A	1200 bits/s.
V.21, Bell103	300 bits/s.

Table 111. +MS Extended Syntax Commands

Command	Description
+MS=<carrier>,<automode>,0, <max_rate>,0,<max_rx_rate>	Selects the modem's default modulation selection parameters.
+MS?	Displays the current default modulation selection parameters.
+MS=?	Displays the range of values accepted by the **+MS** command.

Once a modulation is selected by the **+MS** command, the autorate in both directions and the automode are activated unless <max_rate> is specified by the same command.

The settings of this command overwrite the settings of S28 and S37. Likewise, changes to these registers overwrite the settings of the **+MS** command.

+PCW=<call_waiting>—Call Waiting Enable

Use this command to select how the modem responds to a call waiting signal. The controller-based response is also dependent on the current setting of the caller ID command, **+VCID** (+VCID=<pmode>—Caller-ID on page 77).

- *OK* if <call_waiting> = 0—2.
- *ERROR* if <call_waiting> ≠ 0—2.

Table 112. Valid <call_waiting> Values

Value	Meaning
0	Enables the call waiting detector. When a call waiting signal is detected, toggle V.24 circuit 125 and collect caller ID as set by **+VCID**.
1	Enables the call waiting detector. When a call waiting signal is detected, hang up the current call.
2	Disables call waiting detector (default).

Table 113. +PCW Extended Syntax Commands

Command	Meaning
+PCW=<call_waiting>	Enables or disables call waiting.
+PCW?	Displays the current call waiting configuration.
+PCW=?	Displays the supported <call_waiting> parameter values.

+PIG=<value>—PCM Upstream Ignore

Use this command to enable or disable PCM upstream in a V.92 connection.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 114. Valid +PIG Commands

Command	Meaning
+PIG=0	Enables PCM upstream.
+PIG=1	Disables PCM upstream (default).

Table 115. +PIG Extended Syntax Commands

Value	Meaning
+PIG= <value>	Enables or disables PCM upstream.
+PIG?	Displays the current state of the **+PIG** command.
+PIG=?	Displays the supported **+PIG** parameter values.

+PMH=<value>—Modem On Hold Enable

Use this command to enable or disable modem on hold. Note that the **+PMH** command does not affect the parameters of the **+PMHT** (+PMHT=<value>—Modem On-Hold Timer on page 53) command. The **+PMH** command only enables or disables modem on hold. The **+PMHT** command configures the modem to deny a modem on hold request or grant a modem on hold request with the selected hold time.

Result codes:

- *OK* if <value> = 0, 1
- *ERROR* if <value> ≠ 0, 1

Table 116. Valid +PMH Parameter Values

Value	Meaning
+PMH=0	Enables modem on hold.
+PMH=1	Disables modem on hold (default).

Table 117. +PMH Extended Syntax Commands

Value	Meaning
+PMH= <value>	Enables or disables modem on hold.
+PMH?	Displays the current state of the **+PMH** command.
+PMH=?	Displays the supported **+PMH** parameter values.

+PMHD<dialing_string>—Modem On-Hold DTMF Dialing

Use this command to switch the line while modem on hold is active. Execution of the +PMHD <dial_string> command causes the modem to use DTMF dialing to dial the characters in the <dial_string>. Valid <dial_string> characters are 0—9, #, and *. This operation is not supported in all countries.

Result codes:

- *OK* if <dial_string> is valid and modem on hold has been requested and granted.
- *ERROR* if <dial_string> is invalid or the modem is not on hold when the command is executed.

+PMHF—Modem On-Hold Hook Flash

Use this command to generate a hook flash during modem on-hold operations. The command causes the modem to go on-hook for a period of time set by homologation parameter 26. Then the modem returns to the off-hook state for an equivalent amount of time.

Result codes:

- *ERROR* if the modem is not on hold when the command is executed.

+PMHR—Initiate Modem On Hold

Use this command to initiate a modem on-hold request. Once the local modem receives this request from the user or controlling application, the controller-based modem requests that the remote modem go on hold. The remote modem either denies the request, grants the request, or generates an error if modem on hold is not enabled. If the request is granted, the remote modem initializes the modem on-hold timer and transmits the request index. If the request is denied, the remote modem only transmits the request index. The request index either identifies the maximum hold time until the request is granted, or it identifies a problem code when the request is denied.

The request index is encoded in a MH sequence. MH[1] sequences are used to exchange information

1. For additional information on modem on hold and MH sequences, reference ITU-T Recommendation V.92, Section 8.9 for modem on hold and Section 8.9.2 for MH sequences.

during a modem on-hold procedure. In particular, bits 16—19 of the sequence define hold time.

The **+PMHR** command does not have any extended syntax command forms.

Result codes:

- *OK* if the modem on-hold request is granted.
- *ERROR* if modem on hold is not enabled.

Table 118. Request Index

Bits 16:19	T1
0000	Reserved for the ITU
0001	10 s
0010	20 s
0011	30 s
0100	40 s
0101	1 minute
0110	2 minutes
0111	3 minutes
1000	4 minutes
1001	6 minutes
1010	8 minutes
1011	12 minutes
1100	16 minutes
1101	no limit
1110	Reserved for the ITU
1111	Reserved for the ITU

+PMHT=<value>—Modem On-Hold Timer

Use this command to configure the controller-based modem to grant or reject a modem on-hold request. This command configures the modem so it can respond to a modem on-hold request. The command must be executed prior to reception of a modem on-hold request. If a modem on-hold request is made prior to execution of the **+PMHT** command, by default, the modem on-hold request is denied.

This command also sets the modem on-hold timer. The modem on-hold timer sets the amount of time the modem remains on hold waiting for the requesting modem to return to the line. If the timer expires, the controller-based modem hangs up the call.

Result codes:

- *OK* if <value> = 0—13.
- *ERROR* if <value> ≠ 0—13.

Table 119. Valid +PMHT Commands

Command	Meaning
+PMHT=0	Denies modem on-hold request (default).
+PMHT=1	Grants modem on-hold request with a 10 s time-out.
+PMHT=2	Grants modem on-hold request with a 20 s time-out.
+PMHT=3	Grants modem on-hold request with a 30 s time-out.
+PMHT=4	Grants modem on-hold request with a 40 s time-out.
+PMHT=5	Grants modem on-hold request with a 1 min. time-out.
+PMHT=6	Grants modem on-hold request with a 2 min. time-out.

Table 119. Valid +PMHT Commands

+PMHT=7	Grants modem on-hold request with a 3 min. time-out.
+PMHT=8	Grants modem on-hold request with a 4 min. time-out.
+PMHT=9	Grants modem on-hold request with a 6 min. time-out.
+PMHT=10	Grants modem on-hold request with a 8 min. time-out.
+PMHT=11	Grants modem on-hold request with a 12 min. time-out.
+PMHT=12	Grants modem on-hold request with a 16 min. time-out.
+PMHT=13	Grants modem on-hold request with an indefinite time-out.

Table 120. +PMHT Extended Syntax Commands

Value	Meaning
+PMHT= <value>	Configures the controller-based response to a modem on-hold request.
+PMHT?	Displays the current modem on-hold settings.
+PMHT=?	Displays the valid **+PMHT** parameter values.

+PQC=<value>—V.92 Phase 1 and Phase 2 Control

Use this command to configure the V.92 short training sequence. This command selects which short phases are used during initiation of a connection. Once the modem is configured, use the **+PSS** (+PSS=<value>—Use Short Sequence on page 55) command to enable or disable the short training sequence.

Result codes:

- *OK* if <value> = 0—3.
- *ERROR* if <value> ≠ 0—3.

Table 121. Valid +PQC Commands

Command	Meaning
+PQC=0	Enables short Phase 1 and short Phase 2.
+PQC=1	Enables short Phase 1 only.
+PQC=2, 3	Disables short Phase 1 and short Phase 2 (default).

Table 122. +PQC Extended Syntax Commands

Value	Meaning
+PQC= <value>	Configures the controller-based V.92 short training sequence.
+PQC?	Displays the current short training sequence settings.
+PQC=?	Displays the valid **+PQC** parameter values.

+PSS=<value>—Use Short Sequence

Use this command to enable or disable the V.92 short training sequence.

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 123. Valid +PSS Commands

Command	Meaning
+PSS=0	Uses training sequence set in by the +PQC command.

Table 124. +PSS Extended Syntax Commands

Value	Meaning
+PSS= <value>	Selects whether the modem determines if the short sequence is used.
+PSS?	Displays the current short training sequence settings.
+PSS=?	Displays the valid **+PSS** parameter values.

FAX Commands

The USRobotics controller-based modems support FAX commands conforming to ITU-T Recommendation T.31 (08/95), which outlines service class 1 asynchronous facsimile under DCE control, ITU-T Recommendation T.32 (08/95), which outlines service class 2 asynchronous facsimile under DCE control, and Amendment 1 to both T.31 and T.32, which defines command modifications for V.34 FAX.

In FAX communication, ia facsimile machine transmits a graphic image to a receiving facsimile machine. As a result, most of the commands in this section are not designed for interaction with an end user.

The commands generate a result code to acknowledge reception and the action taken on a command. However, in many cases the command will generate an *ERROR* result code if it is not connected to a sending or receiving facsimile device.

+FAA=<value>—Adaptive Answer

A service class 2 or class 1 FAX DCE may have the ability to answer as a data modem DCE or as a FAX DCE. It may also be able to change from class 2 or class 1 FAX mode to data-modem operation in response to an incoming call.

Note: This command controls automatic switching from class 2 or class 11 to class 0 for call answering only. It does not affect call origination, switching to class 2 or class 1 from other classes, or switching to classes other than class 0.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 125. +FAA Commands

Command	Function
+FAA=0	The DCE answers only as a class 1 FAX device. No automatic switching of service class occurs based on the calling device type (default).

Table 125. +FAA Commands

+FAA=1	The DCE can answer and automatically determine whether to answer as a facsimile DCE or as a data modem.

Table 126. +FAA Extended Syntax Commands

Command	Description
+FAA=<value>	Enables or disables adaptive answer.
+FAA?	Displays the current setting for adaptive answer.
+FAA=?	Displays the available parameter values for the **+FAA** command.

+FAP=<sub>,<sep>,<pwd>—Address and Polling Capabilities

+FAP=<sub>,<sep>,<pwd> is used by DTE to indicate its capability regarding subaddressing, selective polling, and passwords. It is also used by DTE to indicate its willingness to accept this information. The remote station is notified of these capabilities in the DIS or DTC frames: bit 47 for SEP, bit 49 for SUB, and bit 50 for PWD.

A value of 0 indicates capability is disabled, and a value of 1 indicates it is enabled; the default value is 0,0,0. The DCE receiving this information ignores disabled subparameter frames. If a subparameter is enabled, the DCE reports the received frame using the +FPA: report command.

Result codes:

- *OK* if <sub> = 0,1 and <sep> = 0,1 and <pwd> = 0, 1.
- *ERROR* if <sub> ≠ 0, 1 and <sep> ≠ 0, 1 and <pwd> ≠ 0, 1.

+FBS?—DCE Buffer Size Reporting (Read Only)

This command allows the DCE to report its transmit and receive data buffer size. The buffer size is reported in hexadecimal and represented in octets. The first value represents the transmit buffer size (tbs), followed by the receive buffer size (rbs). Default value is 0800,0800. The range for tbs and rbs is 0000-FFFF.

Result codes:

- <tbs>,<rbs>
- This command always yields an *OK* result code.

Table 127. +FBS Extended Syntax

Command	Description
+FBS?	Displays the DCE transmit and receive buffer size followed by the OK result code.

+FBO=<value>—Phase C Data-Bit Order and Phases B and D Data-Bit Order

This command is used to by DCE to offer service to convert Phase C and Phase B/D data bit order transparently to the DTE and remote facsimile. A direct mapping means the first bit transferred of each octet on the DTE-DCE link is the first bit transferred on the PSTN line. A reversed mapping means the last bit transferred of each octet on the DTE-DCE link it the first bit transferred on the PSTN line.

Result codes:

- *OK* if <value> = 0, 3.
- *ERROR* if <value> ≠ 0, 3.

Table 128. +FBO Commands

Command	Function
+FBO=0	Selects direct bit order for Phase C and for Phase B/D (default).
+FBO=1	Selects reversed bit order for Phase C. Selects direct bit order for Phase B/D.
+FBO=2	Selects direct bit order for Phase C. Selects reversed bit order for Phase B/D.
+FBO=3	Selects reversed bit order for Phase C and for Phase B/D.

Table 129. +FBO Extended Syntax Commands

Command	Description
+FBO=<value>	Selects direct or reversed Phase C and Phase B/D bit order.
+FBO?	Displays the current setting for Phase C and Phase B/D bit order.
+FBO=?	Displays the available parameter values for the **+FBO** command.

+FBU=<enable>—HDLC Frame Reporting Control

Use this command to enable the DCE to report the contents of Phase B and Phase D HDLC frames to the DTE as they are sent and received, and also to disable this function.

Result codes:

- *OK* if <enable> = 0, 1.
- *ERROR* if <enable> ≠ 0, 1.

Table 130. +FBU Commands

<enable>	Function
0	Disables HDLC frame reporting (default).
1	Enables HDLC frame reporting.

Table 131. +FBU Extended Syntax Commands

Command	Function
+FBU=<enable>	Enables or disables HDLC frame reporting.
+FBU?	Returns the current value of <enable>.
+FBU=?	Displays all available parameter values. The DCE returns (00,01).

+FCC—Establish DCE Capabilities

+FCC=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp> is used by DTE to sense DCE capabilities and constrain if necessary. The controllable capabilities are resolution (vr), bit rate (br), page width in pixels

(wd), page length (ln), data compression format (df), error correction (ec), file transfer mode (bf), scan time/line (ST), and JPEG for color and black and white (jp).

Result codes:

- *OK* if <vr> = 000-0FF,
 = 00-0D,<wd> = 00-02, <ln> = 00-02, <df> = 00-03, <ec> = 00-01, <bf> = 00, <st> = 00-07, <jp> = 00-FF.
- *ERROR* if <vr> ≠ 00-FF,
 ≠ 00-0D,<wd> ≠ 00-02, <ln> ≠ 00-02, <df> ≠ 00-03, <ec> ≠ 00-01, <bf> ≠ 00, <st> ≠ 00-07, <jp> ≠ 00-FF.

Table 132. +FCC Valid Parameter Values

Label	Values	Description	Label	Values	Description
VR	00 01 02 04 08 10 20 40 80	R8 x 3.85 l/mm, Normal R8 x 7.7 l/mm, Fine (default) R8 x 15.4 l/mm R16 x 15.4 l/mm 200 dpi x 100 (cross select R8x3.85) 200 dpi x 200 (cross select R8x7.7) 200 dpi x 400 (cross select R8x15.4) 300 dpi x 300 (no cross select) 400 dpi x 400 (cross select R16x15.4)	EC	0 1	Disable ECM Enable Annex A/T.30, ECM (default)
BR	0 1 2 3 4 5 6 7 8 9 A B C D	2 400 bit/s 4 800 bit/s 7 200 bit/s 9 600 bit/s 12 000 bit/s 14 400 bit/s (default) 16 800 bit/s 19 200 bit/s 21 600 bit/s 24 000 bit/s 26 400 bit/s 28 800 bit/s 31 200 bit/s 33 600 bit/s	BF	00	Disable file transfer modes (default)
WD	 0 1 2	R8 d/mm R16 d/mm 200 dpi 300 dpi 400 dpi 1728 3456 1728 2592 3456 (default) 2048 4096 2048 2432 4864 2432	ST	 0 1 2 3 4 5 6 7	VR = 0 VR > 0 0 ms 0 ms (default) 5 ms 5 ms 10 ms 5 ms 10 ms 10 ms 20 ms 10 ms 20 ms 20 ms 40 ms 20 ms 40 ms 40 ms

Table 132. +FCC Valid Parameter Values(Continued)

Label	Values	Description	Label	Values	Description
LN	0 1 2	A4, 297 mm B4, 364 mm Unlimited length (default)	JT	00 01 02 04 08 10 20 40	Disable JPEG coding Enable JPEG coding (Rec. T.81) Full color mode Enable preferred Huffman tables (Note 5) 12 bits/pel/component No subsampling (1:1:1) Custom illuminant Custom gamut range
DF	0 1 2 3	1-D Modified Huffman (Rec. T.4) (default) 2-D Modified read (Rec. T.4) 2-D Uncompressed mode (Rec. T.4) 2-D Modified modified read (Rec. T.6)			

+FCI—DCE Reports Received Remote CSI ID

A +FCI response from DCE to DTE reports the identification of the called station. The syntax of the response is as follows:

+FCI:<CSI ID string>, where CSI ID string is the remote facsimile's identification.

Result codes:

- NA

+FCLASS=<value>—Enter Class 1, Class 1.0, Class 2, Class 2.0, or Class 2.1 FAX Mode

The **+FCLASS=1** command (+FCLASS=<value>—Service Class Indication on page 44) puts the modem in FAX mode class entered in value. The **+FCLASS=1.0** (ITU T.32) command puts the modem in class 1.0 FAX mode. The **+FCLASS=2** (ITU T.32) command puts the modem in class 2 FAX mode. The **+FCLASS=2.0** (ITU T.32) command puts the modem in class 2.0 FAX mode. The **+FCLASS=2.1** (ITU T.32) command puts the modem in class 2.1 FAX mode.

Result codes:

- *OK* if <value> = 0, 1, 1.0, 2, 2.0, 2.1, 8.
- *ERROR* <value> ≠ 0, 1, 1.0, 2, 2.0, 2.1, 8.

Table 133. +FCLASS Values

Commands	Description
+FCLASS=0	Selects the modem's data mode.
+FCLASS=1	Selects the modem's class 1 FAX mode.
+FCLASS=1.0	Selects the modem's class 1.0 FAX mode.
+FCLASS=2	Selects the modem's class 2 FAX mode.
+FCLASS=2.0	Selects the modem's class 2.0 FAX mode.
+FCLASS=2.1	Selects the modems class 2.1 FAX mode.
+FCLASS=8	Selects the modem's voice mode.

Table 134. +FCLASS Extended Syntax Commands

Command	Description
+FCLASS=<value>	Selects the class or mode of the modem.
+FCLASS?	Displays the current class or mode.
+FCLASS=?	Displays the available parameter values for the +FCLASS command.

+FCO—Facsimile Connection

A +FCO response from DCE to DTE indicates a connection with a facsimile station. DCE makes this determination based on detection of HDLC flags in the first received frame, in execution of originate command or answer command.

The syntax of the response is as follows:

+FCO:

Result codes:

- NA

+FCQ=<rq>,<tq>—Copy-Quality Checking

The DCE is responsible for receive copy-quality checking, although a DTE may do its own receive copy quality checking. The +FCQ command is used to enable or disable the DCE's copy-quality checking. The rq parameter controls copy quality of data received from the remote facsimile. The tq parameter controls copy quality of data received from the local DTE (not supported by USRobotics modem).

A value of 0 indicates capability is disabled and 1 enabled; the default value is 1,0.

Result codes:

- *OK* if <rq> = 0,1 and <tq> = 0.
- *ERROR* if <rq> ≠ 0, 1 and <tq> ≠ 0.

+FCR=<value>—Capability to Receive Message Data

The +FCR command indicates to the DCE whether the DTE is capable or not of receiving message data. The syntax is as follows:

+FCR=1

Result codes:

- *OK* if <value> = 0,1.
- *ERROR* if <value> ≠ 0, 1.

Table 135. +FCR Commands

Command	Function
+FCR=0	Indicates the DCE will not receive message data.
+FCR=1	Indicates the DCE is capable of receiving message data (default).

Table 136. +FCR Extended Syntax Commands

Command	Description

Table 136. +FCR Extended Syntax Commands

+FCR=<value>	Controls capability to receive message data.
+FCR?	Displays the current receive message data capability.
+FCR=?	Displays all available parameter values. The DCE returns (00,01).

+FCS—DCE Reports the DCS Frame Information

A +FCS response from DCE to DTE reports the digital command signal (DCS) frame information. The syntax of the response is as follows:

+FCS:<VR>,
,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>,<JP> (see +FCC valid parameter value table for valid value of each parameter).

Result codes:

- NA

+FCT=<value>—Phase C Time-Out Control

The +FCT command informs the DCE how long to wait for a command after having transmitted all available Phase C data. The default value is 1E.

Result codes:

- *OK* if <value> = 00-FF.
- *ERROR* if <value> ≠ 00-FF.

Table 137. +FCT Extended Syntax Commands

Command	Description
+FCT=<value>	Sets the Phase C time-out.
+FCT?	Displays the current Phase C time-out setting.
+FCT=?	Reports the supported Phase C time-out values.

+FDR—Data Reception Transition Command

A +FDR command initiates transition to Phase C data reception. In addition, the DCE may report the negotiated T.30 parameters with the remote ID and NSS frame information if available.

From DCE to DTE reports the digital command signal (DCS) frame information. The syntax of the response is as follows:

+FDR<CR>

Result codes:

- NA

+FDT—Data Transmission Request

A +FDT command from DTE requests the DCE to transmit a Phase C page. This command is issued at the beginning of every page. If DCE receives command during Phase B, it proceeds with negotiation and releases the DCS message to the remote facsimile. The syntax of the response is as follows:

+FDT<CR>

Result codes:

- *ERROR* if DCE is onhook.

+FET—Post Page Message (ppm) Response

The +FET:<ppm> response is sent by a receiving facsimile DCE once it receives the post page message from the transmitting facsimile. The post page message codes are shown below.

Result codes:

- NA

Table 138. PPM Codes

PPM Code	Description (T.30 Mnemonic in Parentheses)
0	Another page next, same document (MPS).
1	Another document next (EOM).
2	No more pages or documents (EOP).
3	Another page next, same document, procedure interrupt requested (PRI-MPS).
4	Another document next, procedure interrupt requested (PRI-EOM).
5	No more pages or documents, procedure interrupt requested (PRI-EOP).

+FHS—Call Termination Status Indicator

+FHS:<hsc> indicates that the call has been terminated and the hangup status cause (hsc) is reported and saved. Table 139 shows valid HSC codes. HSC codes are two-digit hexadecimal values.

Result codes:

- NA

Table 139. HSC Codes

HSC Code	Hangup Cause Description
00-0F	Call placement and termination
00 01 02 03 04 05	Normal and proper end of connection Ring detect without successful handshake Call aborted, from +FKS or <CAN> No loop current Ringback detected, no answer (time-out) Ringback detected, answer without CED
10—1F	Transmit Phase A and miscellaneous errors
10 11	Unspecified Phase A error No answer (T.30 T1 time-out)
20—3F	Transmit Phase B hangup codes

Table 139. HSC Codes(Continued)

HSC Code	Hangup Cause Description
20	Unspecified transmit Phase B error
21	Remote cannot receive or send
22	COMREC error in transmit Phase B
23	COMREC invalid command received
24	RSPREC error
25	DCS sent three times without response
26	DIS/DTC received 3 times; DCS not recognized
27	Failure to train at 2400 bit/s or +FMS value
28	RSPREC invalid response received
40—4F	Transmit Phase C hangup codes
40	Unspecified transmit Phase C error
41	Unspecified image format error
42	Image conversion error
43	DTE to DCE data underflow
44	Unrecognized transparent data command
45	Image error, line length wrong
46	Image error, page length wrong
47	Image error, wrong compression code
50—6F	Transmit Phase D hangup codes
Values	Hangup cause description
50	Unspecified transmit Phase D error
51	RSPREC error
52	No response to MPS repeated 3 times
53	Invalid response to MPS
54	No response to EOP repeated 3 times
55	Invalid response to EOP
56	No response to EOM repeated 3 times
57	Invalid response to EOM
58	Unable to continue after PIN or PIP
70—8F	Receive Phase B hangup codes
70	Unspecified receive Phase B error
71	RSPREC error
72	COMREC error
73	T.30 T2 time-out, expected page not received
74	T.30 T1 time-out after EOM received
90—9F	Receive Phase C hangup codes
90	Unspecified receive Phase C error
91	Missing EOL after 5 seconds (3.2/T.4)
92	Bad CRC or frame (ECM mode)
93	DCE to DTE buffer overflow
A0—BF	Receive Phase D hangup codes
A0	Unspecified receive Phase D errors
A1	RSPREC invalid response received
A2	COMREC invalid response received
A3	Unable to continue after PIN or PIP
C0—DF	Reserved for future standardization
E0-FF	Reserved for manufacturer-specific use

+FHR—Report Received HDLC Frame

+FHR:<received HDLC frame octets> reports the HDLC data that was sent by the DCE.

Result codes:

- NA

+FHT—Report Transmitted HDLC frame

+FHT:<transmitted HDLC frame octets> reports the HDLC data that was received by the DCE.

Result codes:

+FIP—Initialize Facsimile Parameters

The +FIP command causes the DCE to initialize all Service Class 2.0 facsimile parameters to the manufacturers determined default settings.

Result codes:

- NA

+FIS—Report Remote Capabilities

+FIS=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp> is used by DTE to sense DCE capabilities and constrain if necessary (see +FCC valid parameter value table for valid value of each parameter).

Result codes:

- *OK* if <vr> = 00-FF,
 = 00-0D,<wd> = 00-02, <ln> = 00-02, <df> = 00-03, <ec> = 00-01, <bf> = 00, <st> = 00-07, <jp> = 00-FF.
- *ERROR* if <vr> ≠ 00-FF,
 ≠ 00-0D,<wd> ≠ 00-02, <ln> ≠ 00-02, <df> ≠ 00-03, <ec> ≠ 00-01, <bf> ≠ 00, <st> ≠ 00-07, <jp> ≠ 00-FF.

+FKS—Session Termination Command

The +FKS command causes the DCE to terminate the session in an orderly manner.

Result codes:

- NA

+FLI—DCE Transmits Local ID String for TSI or CSI

The DTE sends the local ID string to the DCE using +FLI=<local ID string>. The DCE sends the ID string to the remote station using the CSI or TSI frame. The syntax is as follows:

+FLI:<local ID string>.

Result codes:

- *OK* if < local ID string > has between 0 and 20 characters.
- *ERROR* if < local ID string > has more than 20 characters.

Table 140. +FLI Extended Syntax Commands

Command	Description
+FLI=<local ID string**>**	Local ID string.
+FLI?	Displays the range of character values supported.
+FLI=?	Displays the range of character values supported.

+FLO=<value>—Flow Control Selection

Use this command to set the type of flow control used to transmit data between the host and the modem. This command can enable hardware or software flow control. It can also disable all flow control.

Result codes:

- *OK* if <value> = 0—2.
- *ERROR* if <value> ≠ 0—2.

Table 141. +FLO Commands

Command	Function
+FLO=0	Disables flow control.
+FLO=1	Enables software flow control.
+FLO=2	Enables hardware flow control (default).

Table 142. +FLO Extended Syntax Commands

Command	Description
+FLO=<value>	Sets the flow control mode of operation.
+FLO?	Displays the current flow control mode.
+FLO=?	Reports the supported flow control values.

+FLP=<value>—Indicates Document to Poll

The DTE uses this command to indicate if it has a document to poll.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 143. +FLP Commands

Command	Function
+FLP=0	Indicates that the DTE has no documents to poll (default).
+FLP=1	Indicates that the DTE has a document ready for polling. The DCE resets this parameter to 0 after a polled document is sent.

+FMI?—Manufacturer Identification

This command returns:

- U.S. Robotics

Result codes:

- This command always yields an *OK* result code.

Table 144. +FMI Extended Syntax

Command	Description
+FMI, **+FMI?**	Displays the modem manufacturer identification.

+FMM—Product Identification

This command returns the product identification, depending on the product. The following example shows the kind of information generated by the modem.

- U.S. Robotics CV92 Ver6.5 (Mar 8 2007) +Sphone Voice Polaris DP3SH mode-ii SERIAL

Result codes:

- This command always yields an *OK* result code.

Table 145. +FMM Extended Syntax

Command	Description
+FMM, **+FMM?**	Displays the modem product identification.

+FMR?—Version/Revision Information

This command returns the modem version code. The version code consists of the interface type followed by the release date.

Result codes:

- This command always yields an *OK* result code.

Table 146. +FMR Extended Syntax

Command	Description
+FMR, **+FMR?**	Displays the modem version code.

Table 147. +FMR Interface Specifications

Version Code	Interface
S	Serial
I	ISA
P	PCMCIA card
U	USB

+FMS=<value>—Minimum Phase C Speed Control

Use this command to limit the lowest negotiable speed for a session. The value is the same as the BR parameter in the +FCC valid parameter table.

Result codes:

- *OK* if <value> = 0—5.
- *ERROR* if <value> ≠ 0—5.

Table 148. +FMS Commands

Command	Function
+FMS=0	2400 bits/s (default)
+FMS=1	4800 bits/s
+FMS=2	7200 bits/s
+FMS=3	9600 bits/s
+FMS=4	12000 bits/s
+FMS=5	14400 bits/s

+FNC—Report Nonstandard Command (NSC) Frames

The +FNC:<NSC FIF string> response reports any received nonstandard command frame, one response per frame. FIF is the facsimile information field.

Result codes:

- NA

+FND=<value>—Nonstandard Message Data Indication

If the DTE has negotiated to exchange a nonstandard message type with the remote facsimile, the DTE must indicate this to the DCE prior to issuing the +FDT or +FDR command for the message data.

+FND=0, the message type is specified in DCS.

+FND=1, the message type is nonstandard. The DCE does not modify data on transmission or reception. The DCE copy quality checking is disabled.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

+FNF—Report Nonstandard Facilities (NSF) Frames

The +FNF:<NSF FIF string> response report any received nonstandard facilities frame, one response per frame. FIF is the facsimile information field.

Result codes:

- NA

+FNR—Negotiation Message Reporting Control Parameter

+FNR=<rpr>,<tpr>,<idr>,<nsr> is used to control the reporting of messages generated during Phase B negotiations. Description of controls is shown in table below.

Result codes:

- *OK* if <rpr> = 0-1, <tpr> = 0-1,<idr> = 0-1, <nsr> = 0-1.
- *ERROR* if <rpr> ≠ 0-1, <tpr> ≠ 0-1,<idr> ≠ 0-1, <nsr> ≠ 0-1.

Table 149. +FNR Valid Parameter Values

Label	Values	Description
RPR	00	Receiver parameters are not reported. +FIS: and +FTC: reports are suppressed.
	01	Receiver parameters are reported. +FIS: and +FTC: reports are generated.
TPR	0	Transmitter parameters are not reported. +FCS: reports are suppressed.
	1	Transmitter parameters are reported. +FCS: reports are generated.
IDR	0	ID strings are not reported. +FTI:, +FCI:, and +FPI: reports are suppressed.
	1	ID strings are reported. +FTI:, +FCI:, and +FPI: reports are generated.
NSR	0	Nonstandard frames are not reported. +FNF:, +FNS:, and +FNC: reports are suppressed.
	1	Nonstandard frames are reported. +FNF:, +FNS:, and +FNC: reports are generated.

+FNS—Report Nonstandard Setup (NSS) Frames

The +FNS:<NSS FIF string> response reports any received nonstandard setup frame, one response per frame. FIF is the facsimile information field. The string is limited to 20 bytes.

Result codes:

- NA

+FPA—Selective Polling Address

The +FPA:<selective polling address string> is a 20-digit ASCII string in the range from 0x20—0x7E. This string is sent by the DCE at the time specified by the T.30 recommendation, as long as parameter is not null.

Result codes:

- *ERROR* if string is greater than 20 characters.

Table 150. +FPA Extended Syntax Commands

Command	Description
+FPA=<Selective Polling Address String>	The +FPA parameter is used to report the received addressing string.
+FPA=?	Report the corresponding ranges of character values supported (0x20—0x7E).

+FPI—Report Remote ID, CIG

The +FPI:<CIG ID string> is a 20-digit ASCII string in the range from 0x20—0x7E. This response reports the received remote ID string, as long as parameter is not null. CIG is the calling subscriber identification.

Result codes:

- *ERROR* if string is greater than 20 characters.

Table 151. +FPI Extended Syntax Commands

Command	Description
+FPI=<CIG ID String>	The +FPI parameter is used to report the received remote identification.
+FPI=?	Report the corresponding ranges of character values supported (0x20—0x7E).

+FPO—Remote Polling Indication

The +FPO response indicates that the remote station has a document to poll and invites the DTE to poll it.

Result codes:

- NA

+FPP—Packet Protocol Control

The +FPP=<value> command controls DCE to DTE packet protocol. The USRobotics FAX modem only supports the disable command (+FPP=0).

Result codes:

- *OK* if <value> = 0.
- *ERROR* if <value> ≠ 0.

Table 152. +FPP Commands

Command	Function
+FPP=0	DCE to DTE packet protocol is disabled (default).

Table 153. +FPP Extended Syntax Commands

Command	Description
+FPP=<value>	DCE to DTE packet protocol setting. Disabled only setting supported.
+FPP?	Displays the current setting for packet protocol.
+FPP=?	Displays the available parameter values for the **+FPP** command.

+FPR=<value>—Select FAX Port Rate

This command sets the DTE to DCE FAX port rate. The FAX port rate specifies the rate used by the modem and the host system to transmit data between the two devices. In general, this rate only applies to modems that are connected via an RS232C serial interface.

Result codes:

- This command always yields an *OK* result code.

Table 154. +FPR Commands

DTE Command	Description
+FPR=0	Selects automatic rate detection.
+FPR=1	Sets DTE-DCE to 2400 bits/s.
+FPR=2	Sets DTE-DCE to 4800 bits/s.
+FPR=4	Sets DTE-DCE to 9600 bits/s.
+FPR=8	Sets DTE-DCE to 19200 bits/s.
+FPR=10	Sets DTE-DCE to 38400 bits/s.
+FPR=18	Sets DTE-DCE to 57600 bits/s.

Table 155. +FPR Extended Syntax

DTE Command	Description
+FPR=<value>	Does not perform any particular action in controller-based systems.
+FPR? *	Does not perform any particular action in controller-based systems.

+FPS—Phase C Page Reception Response

The +FPS:<ppr> is generated by the DCE at the end of Phase C data reception, in execution of a +FDR command. The receiving DCE may count lines (lc), bad lines (blc), maximum consecutive bad lines (cblc), and octets lost due to DCE buffer overflow (lbc), and report them [+FPS:<ppr>,<lc>,<blc>,<cblc>,<lbc>].

The post page response (ppr) message codes are shown below. The USRobotics FAX modem only supports ppr message codes 1—3.

Result codes:

- See Table 156.

Table 156. PPR Message Codes

PPR Code	Result Code	Description (T.30 Label in Parentheses)
1	OK	Page good (MCF).
2	ERROR	Page bad; retrain requested (RTN).
3	OK	Page good; retrain requested.

+FPW—Sending or Polling Password

The +FPW:<PassWord string> is a 20-digit ASCII string in the range from 0x20—0x7E. This string is sent by the DCE at the time specified by the T.30 Recommendation, as long as parameter is not null.

Result codes:

- ERROR if string is greater than 20 characters.

Table 157. +FPW Extended Syntax Commands

Command	Description
+FPW=<PassWord String>	The +FPW parameter is used to report the received password string.
+FPW=?	Reports the corresponding ranges of character values supported (0x20—0x7E).

+FRH=<mod>—Receive HDLC Data with <mod> Carrier

Use the **+FRH** command to instruct the modem to receive data framed in the HDLC protocol at the modulation defined by +FRH Commands.

Result codes:

- *CONNECT* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is an intermediate result code.
- *OK* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is a final result code.
- *ERROR* if <mod> ≠ 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, or the connection is not established. This is a final result code.

Table 158. +FRH Commands

Command	Modulation	Speed
+FRH=3	V.21 channel 2.	300 bits/s.
+FRH=24	V.27ter.	2400 bits/s.
+FRH=48	V.27ter.	4800 bits/s.
+FRH=72	V.29.	7200 bits/s.
+FRH=96	V.29.	9600 bits/s.
+FRH=73	V.17.	7200 bits/s.
+FRH=74	V.17 (short train).	7200 bits/s.
+FRH=97	V.17.	9600 bits/s.
+FRH=98	V.17 (short train).	9600 bits/s.
+FRH=121	V.17.	12000 bits/s.
+FRH=122	V.17 (short train).	12000 bits/s.
+FRH=145	V.17.	14400 bits/s.
+FRH=146	V.17 (short train).	14400 bits/s.

Table 159. +FRH Extended Syntax Commands

Command	Description
+FRH=<mod>	Sets the FAX receive rate and frames the data using HDLC protocol.
+FRH=?	Displays all available parameter values for the **+FRH** command.

+FRM=<mod>—Receive Data

Use the **+FRM** command to instruct the modem to received data using the modulation defined by Table 160.

Result codes:

- *CONNECT* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is an intermediate result code.
- *OK* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is a final result code.
- *ERROR* if <mod> ≠ 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, or the connection is not established. This is a final result code.

Table 160. +FRM Commands

Command	Modulation	Speed
+FRM=3	V.21 channel 2.	300 bits/s.
+FRM=24	V.27ter.	2400 bits/s.
+FRM=48	V.27ter.	4800 bits/s.
+FRM=72	V.29.	7200 bits/s.
+FRM=96	V.29.	9600 bits/s.
+FRM=73	V.17.	7200 bits/s.
+FRM=74	V.17 (short train).	7200 bits/s.
+FRM=97	V.17.	9600 bits/s.
+FRM=98	V.17 (short train).	9600 bits/s.
+FRM=121	V.17.	12000 bits/s.
+FRM=122	V.17 (short train).	12000 bits/s.
+FRM=145	V.17.	14400 bits/s.
+FRM=146	V.17 (short train).	14400 bits/s.

Table 161. +FRM Extended Syntax Commands

Command	Description
+FRM=<mod>	Sets the FAX receive rate.
+FRM=?	Displays all available parameter values for the **+FRM** command.

+FRQ—Receive Quality Threshold

This +FRQ=<pgl>,<cbl> command is used to decide if copy quality is OK. This decision is made based on the percentage of good lines (pgl) and the consecutive bad line count (cbl). The USRobotics FAX modem supports this command only for MH encoding.

Result codes:

- *OK* if <pql> = 00-64, <cbl> = 00-FF.
- *ERROR* if <pql> ≠ 00-64, <cbl> ≠ 00-FF.

Table 162. +FRQ Extended Syntax Commands

Command	Description
+FRQ=<pql>,<cbl>	Sets pql and cbl threshold used to determine copy quality.
+FRQ?	Displays the current setting for receive quality threshold.
+FRQ=?	Displays the available parameter values for the **+FRQ** command.

+FRS=<value>—Receive Silence

+FRS=<value> causes the modem to listen and wait for <value> * 10 ms of silence to be detected on the line. For example, <value> = 5 results in a 50 ms interval. At the end of this period, the modem responds with the *OK* result code. <value> has a range of 0—255.

Result codes:

- *OK* if <value> = 0—255.
- *ERROR* if <value> ≠ 0—255.

+FRY<value>—ECM Retry Count

In error-correcting mode, the transmitting DCE tries to send a partial page four times. These four attempts are called an attempt block. The +FRY<value> command controls how many attempt blocks the DCE must try at a given signaling rate before giving up on transmitting the partial page.

Result codes:

- *OK* if <value> = 00-FF.
- *ERROR* if <value> ≠ 00-FF.

Table 163. +FRY Extended Syntax Commands

Command	Description
+FRY=<value>	Sets number of attempt blocks that DCE must try when trying to successfully send a partial page.
+FRY?	Displays the current setting for ECM retry count.
+FRY=?	Displays the available parameter values for the **+FRY** command.

+FSA—Destination Subaddress

The +FSA:<destination subaddress string> is a 20-digit ASCII string in the range from 0x20—0x7E. This string is sent by the DCE at the time specified by the T.30 Recommendation, as long as parameter is not null.

Result codes:

- *ERROR* if string is greater than 20 characters.

Table 164. +FSA Extended Syntax Commands

Command	Description
+FSA=<Selective Polling Address String>	Reports the received subaddressing string.
+FSA=?	Report the corresponding ranges of character values supported (0x20—0x7E).

+FSP<value>—Request to Poll

The DTE uses the +FSP=<value> command to indicate if it can receive a poll document or not.

Result codes:

- *OK* if <value> = 0—1.
- *ERROR* if <value> ≠ 0—1.

Table 165. +FSP Commands

Command	Function
+FSP=0	Indicates that the DTE does not want to poll.
+FSP=1	Indicates that the DTE can receive a polled document.

Table 166. +FSP Extended Syntax Commands

Command	Description
+FSP=<value>	Requests poll setting.
+FSP?	Displays the current request to poll setting.
+FSP=?	Displays the available parameter values for the **+FSP** command.

+FTC—Response Reports Remote Capabilities and Intentions

+FTC=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp> is used by DTE to sense DCE capabilities and constrain if necessary (see +FCC valid parameter value table for valid value of each parameter).

Result codes:

- *OK* if <vr> = 00-FF,
 = 00-0D,<wd> = 00-02, <ln> = 00-02, <df> = 00-03, <ec> = 00-01, <bf> = 00, <st> = 00-07, <jp> = 00-7F.
- *ERROR* if <vr> ≠ 00-FF,
 ≠ 00-0D,<wd> ≠ 00-02, <ln> ≠ 00-02, <df> ≠ 00-03, <ec> ≠ 00-01, <bf> ≠ 00, <st> ≠ 00-07, <jp> ≠ 00-7F.

+FTI—DCE Reports Received Transmit Station ID (TSI)

A +FTI response from DCE to DTE reports the identification of the transmitting facsimile. The syntax of the response is as follows:

+FTI: <TSI ID string>, where TSI ID string is the remote facsimile's identification. The string is limited to 20 characters in range from 0x20—0x7E.

Result codes:

- NA

+FTH=<mod>—Transmit HDLC Data with <mod> Carrier

The **+FTH=<mod>** command causes the modem to transmit data framed in the HDLC protocol at the modulation defined by Table 167.

Result codes:

- *CONNECT* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is an intermediate result code.
- *OK* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is a final result code.
- *ERROR* if <mod> ≠ 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, or the connection is not established. This is a final result code.

Table 167. +FTH Commands

Command	Modulation	Speed
+FTH=3	V.21 channel 2.	300 bits/s.
+FTH=24	V.27ter.	2400 bits/s.
+FTH=48	V.27ter.	4800 bits/s.
+FTH=72	V.29.	7200 bits/s.
+FTH=96	V.29.	9600 bits/s.
+FTH=73	V.17.	7200 bits/s.
+FTH=74	V.17 (short train).	7200 bits/s.
+FTH=97	V.17.	9600 bits/s.
+FTH=98	V.17 (short train).	9600 bits/s.
+FTH=121	V.17.	12000 bits/s.
+FTH=122	V.17 (short train).	12000 bits/s.
+FTH=145	V.17.	14400 bits/s.
+FTH=146	V.17 (short train).	14400 bits/s.

Table 168. +FTH Extended Syntax Commands

Command	Description
+FTH=<mod>	Sets the FAX transmit rate and frames the data using HDLC protocol.
+FTH=?	Displays all available parameter values for the **+FTH** command.

+FTM=<mod>—Transmit FAX Data with <mod> Carrier

+FTM=<mod> command causes the modem to transmit data using the modulation defined by Table 169.

Result codes:

- *CONNECT* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is an intermediate result code.
- *OK* if <mod> = 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, and the connection is established. This is a final result code.
- *ERROR* if <mod> ≠ 3, 24, 48, 72—74, 96—98, 121, 122, 145, 146, or the connection is not established. This is a final result code.

Table 169. +FTM Commands

Command	Modulation	Speed
+FTM=3	V.21 channel 2.	300 bits/s.
+FTM=24	V.27ter.	2400 bits/s.
+FTM=48	V.27ter.	4800 bits/s.
+FTM=72	V.29.	7200 bits/s.
+FTM=96	V.29.	9600 bits/s.
+FTM=73	V.17.	7200 bits/s.
+FTM=74	V.17 (short train).	7200 bits/s.
+FTM=97	V.17.	9600 bits/s.
+FTM=98	V.17 (short train).	9600 bits/s.
+FTM=121	V.17.	12000 bits/s.
+FTM=122	V.17 (short train).	12000 bits/s.
+FTM=145	V.17.	14400 bits/s.
+FTM=146	V.17 (short train).	14400 bits/s.

Table 170. +FTM Extended Syntax Commands

Command	Description
+FTM=<mod>	Sets FAX transmit rate.
+FTM=?	Displays all available parameter values for the +FTM command.

+FTS=<value>—Transmission Silence

+FTS=<value> causes the modem to terminate a transmission and wait for <value> x 10 ms before responding with the *OK* result code. For example, <value> = 5 results in a 50 ms interval. <value> has a range of 0—255.

Result codes:

- *OK* if <value> = 0—255.
- *ERROR* if <value> ≠ 0—255.

Voice Commands

The AT voice command set follows ITU-T Recommendation V.253. The commands are sent through the com port, but the data path is sent either through the com port or through a DMA channel using the wave driver.
Table 230 on page 121 shows a summary of the AT voice command set.

S32=<value>—Synthetic Ring Volume

See S32—Synthetic Ring Volume on page 101.

S33=<value>—Synthesized Ring Frequency

See S33—Synthetic Ring Frequency on page 101.

+FCLASS=8—Enter Voice Mode

The command **+FCLASS=8** (+FCLASS=<value>—Service Class Indication on page 44) puts the modem in voice mode. Speakerphone and TAD modes are subsumed under the more general heading of voice mode, and use a particular subset of voice mode commands to implement their respective features and functions.

The modem controller maintains the overall state of the system so as to know when voice commands are issued in the context of using the speakerphone versus TAD or other voice contexts.

+VCID=<pmode>—Caller-ID

Use this command to enable or to disable caller-ID.

Result codes:

- *OK* if <pmode> = 0—2.
- *ERROR* if <pmode> ≠ 0—2.

Table 171. +VCID Commands

Command	Function
+VCID=0	Disables caller-ID (default).
+VCID=1	Enables formatted caller report.
+VCID=2	Enables unformatted caller report.

Table 172. +VCID Extended Syntax Commands

Command	Function
+VCID=<pmode>	Sets the status of caller-ID.
+VCID?	Returns the current caller-ID pmode.
+VCID=?	Queries the DCE for the range of supported caller-ID report formats. The DCE returns 0, 1, 2.

+VDR=<enable>,<report>—Distinctive Ringing and Cadence Report

Use this command to enable or disable the distinctive ringing feature. Distinctive ringing features are identified by the *DROF=<length of ring in 0.1 s increments>* and *DRON=<length of silence in 0.1 s increments>* result codes. The default value assigned to the <enable> and <report> parameters is zero.

Result codes:

- *OK* in <enable> = 0, 1 and <report> = 0—255.
- *ERROR* if <enable> ≠ 0, 1 and <report> ≠ 0—255.

Table 173. +VDR Commands

<enable>	<report>	Function
0	0—255	Disables the ring report result code.
1	0—255	Enables the ring report result code and sets the report delay to <report>/10. The result is evaluated in seconds.

Table 174. +VDR Extended Syntax Commands

Command	Function
+VDR=<enable>,<report>	Enables or disables distinctive ringing features.
+VDR?	Returns the current values of <enable> and <report>.
+VDR=?	Queries the DCE for the range of supported distinctive ring configurations. The DCE returns (0, 1), (0—255).

+VEM=<mask>—Event Reporting and Masking

The DTE can use this command to disable an event report regardless of the DCE state or of the analog signal source or destination configuration. <mask> is bits 0—33 (i.e., FFFFFFFFC). See the IS-101 specification for defined bit values.

Table 175. +VEM Extended Syntax Commands

Command	Function
+VEM=<mask>	Sets event reporting mask.
+VEM?	Returns the current values of the <mask>.
+VEM=?	Queries the DCE for the range of supported service level events.

+VGM=<gain>—Microphone Gain

Use this command to set the microphone gain of the speakerphone function. <gain> is an unsigned octet where values greater than 128 indicate a gain larger than nominal, and values smaller than 128 indicate a gain smaller than nominal. The gain control has a range between 0 and 255.

Result codes:

- Default: manufacturer-specific.
- *OK* if <gain> = 0—255.
- *ERROR* if <gain> ≠ 0—255.

Table 176. +VGM Extended Syntax Commands

Command	Function
+VGM=<gain>	Sets the microphone gain level.
+VGM?	Displays the current gain level.
+VGM=?	Displays the supported speaker gain levels for the product.

+VGR=<gain>—Receive Gain Selection

Use this command to set the receive microphone gain control. The receive gain has a range of 0—255. However, the values are only significant between 121 and 134. Any value set below 121 uses the same gain as 121. And any value set above 134 uses the same gain as 134.

Note: While in TAD mode, this command may be used in TAD local recording to control the recording level from the microphone. While in speakerphone mode, this command controls the gain to the remote caller.

Result codes:

- Default: manufacturer-specific.
- *OK* if <gain> = 0—255.
- *ERROR* if <gain> ≠ 0—255.

Table 177. <gain> Values

Command	Function
<gain> = 128	Nominal level for receive gain from microphone (default).
<gain> = a value greater than 128	Increases gain above nominal level.
<gain> = a value less than 128	Decreases gain below nominal level.

Table 178. +VGR Extended Syntax Commands

Command	Function
+VGR = <level>	Sets the microphone receive gain.
+VGR?	Displays the current value of receive gain.
+VGR=?	Displays the range of supported gain values.

+VGS=<gain>—Speaker Gain

Use this command to set the speaker gain of the speakerphone function. <gain> is an unsigned octet where values greater than 128 indicate a gain larger than nominal, and values smaller than 128 indicate a gain smaller than nominal. The speaker gain control has a range from 0 to 255.

Result codes:

- Default: 128.
- *OK* if <gain> = 0—255.
- *ERROR* if <gain> ≠ 0—255.

Table 179. +VGS Command <gain> Values

Command	Function
<gain> = 128	Nominal level for speaker gain (default).
<gain> = a value greater than 128	Increases gain above nominal level.
<gain> = a value less than 128	Decreases gain below nominal level.

Table 180. +VGS Extended Syntax Commands

Command	Function
+VGS = <level>	Sets the speaker gain.
+VGS?	Displays the current value of the speaker gain.
+VGS=?	Displays the range of supported gain values.

+VGT=<level>—Speaker Volume Control

Use this command to set the speaker volume control.

Result codes:

- *OK* if <level> = 0—255.
- *ERROR* if <level> ≠ 0—255.

Table 181. <level> Values

Command	Function
<level>=128	Nominal volume level for sending to speaker (default).
<level> = a value > 128	Increases volume above nominal level.
<level> = a value < 128	Decreases volume below nominal level.

Table 182. +VGT Extended Syntax Commands

Command	Function
+VGT=<level>	Sets the speaker volume level.
+VGT?	Displays the current setting for the speaker volume level.
+VGT=?	Displays the support speaker volume level values.

+VIP—Initialize Voice Parameters

Use the **+VIP** command to reset all the voice parameters to their default values. The command has no effect on the **+FCLASS** setting.

+VIT=<timer>—DTE/DCE Inactivity Timer

Use this command to set the DTE/DCE inactivity timer. The DTE/DCE inactivity timer is activated when the DTE or host system selects voice fixed-rate mode. If the timer lapses, the DCE drops the connection. Inactivity in either the voice command mode or the voice data mode starts the countdown. The units are in one-second intervals.

Result codes:

- *OK* if <timer> = 0—255.
- *ERROR* if <timer> ≠ 0—255.

Table 183. +VIT Extended Syntax Commands

Command	Function
+VIT=<timer>	Sets the DTE/DCE inactivity timer.
+VIT?	Displays the current value of the timer.
+VIT=?	Displays the range of supported delay times in seconds.

+VNH=<Hook>—Automatic Hang-Up Control

Use this command to enable or disable automatic DCE hang-ups in the data and facsimile modes. The **+VNH** command is part of a group of commands used for call discrimination. Call discrimination is a means for the modem to supply the DTE or host system with the information and means to discriminate between data, FAX, and voice calls. The automatic hang-up control is just one of the controls used to manage call discrimination. Refer to Section 5.3.1 of ITU-T Recommendation V.253 (02/98) for a full description of call discrimination and how the **+VNH** command is used.

Result codes:

- *OK* if <hook> = 0, 2.
- *ERROR* if <hook> ≠ 0, 2.

Table 184. +VNH Commands

Command	Function
+VNH = 0	The DCE retains automatic hang-ups (as in the other nonvoice modes).
+VNH = 2	The DCE disables automatic hang-ups in the other nonvoice modes. The DTE only performs a logical hang-up (returns the *OK* result code).

Table 185. +VNH Extended Syntax Commands

Command	Function
+VNH=<hook>	Enables or disables automatic DCE hang-ups.
+VNH?	Displays the current parameter value.
+VNH=?	Displays the range of supported parameter values.

Voice Commands: Speakerphone Operation

+VLS=<label>—Analog Source/Destination Selection

Use this general-purpose analog source/destination command to attach various analog devices to the system in voice mode.

Table 186. +VLS Commands

Command	Function
+VLS=0	Speakerphone off.
+VLS=5	Disables/detaches microphone analog source (leaving speaker only) when speaker-phone is in operation (phone mute feature).
+VLS=7	Speakerphone on. Attach internal speaker and internal microphone, DCE off-hook. Restores/attaches microphone along with speaker (normal speakerphone operation).

Table 187. +VLS Extended Syntax Commands

Command	Function
+VLS=<value>	Attaches or detaches an analog source or destination to the system in voice mode.
+VLS?	Reports the current analog source/destination configuration, along with a listing of all event codes reported from the modem to the DTE under that configuration.
+VLS=?	Queries the DCE for the range of supported configurations and the list of unsolicited event codes that the modem reports to the DTE under each configuration. For speakerphone, the configurations supported are 0, 5, and 7 (as explained above).

Voice Commands: Telephone Answering Device (TAD)

+VLS=?—Analog Source/Destination Selection and DTMF/Tone Reporting

Requests for the modem's DTMF/tone reporting capabilities are made using this command. For each system configuration in voice mode (i.e., speakerphone and answering machine), the modem reports the capabilities that are enabled for the configuration.

For each configuration, the modem indicates tone-reporting capabilities for each of the three different voice states: voice transmit data, voice receive data, and voice command state (voice idle).

TAD supports each of the following ITU-T Recommendation V.253 analog source/destination configurations.

Table 188. Analog Source/Destination Configurations

Label #	Description
0	DCE on-hook, local phone connected to the telephone company.
1	DCE off-hook, DCE connected to telephone company.
2	DCE off-hook, local phone connected to DCE.
3	DCE off-hook, local phone connected to telephone company, DCE to local phone.
4	Speaker connected to DCE, DCE on-hook (playback messages).
5	Speaker connected to DCE, DCE off-hook (call screening).
6	Microphone connected to DCE, DCE on-hook (record greeting).
7	Microphone and speaker connected, DCE off-hook (speakerphone).

+VPR=<rate>—Select DTE/DCE Interface Rate

The **+VPR** command returns an *OK* result code for any rate but has no action.

Events Reported to the DTE

The modem returns *OK* when going off-hook in voice mode (**+FCLASS=8**). After answering in voice mode, the modem may send any of the following <DLE> shielded event codes to the DTE, as appropriate.

Table 189. <DLE> Shielded Codes Sent from DCE to DTE

Code Character	Description
0—9, A—D, #, *	DTMF tones.
a	Answer tone.
b	Busy tone.
c	FAX calling tone.
d	Dial tone.
e	Data calling tone.
h	Local phone on-hook.
H	Local phone off-hook.
R	Ring.
s	Silence timer has expired.
<ETX>	End of voice data transmission.
@	CAS tone detected.

<DLE> Codes Sent to DCE

For simple actions in voice mode, the modem may send any of the following <DLE> shielded event codes (in ASCII) to the DTE, as appropriate.

Table 190. <DLE> Shielded Codes Sent from DTE to DCE

Code Character	Description
u	Raise the volume by 1 dB.
d	Lower the volume by 1 dB.
<ETX>	End of voice data transmission.
!	End receive data state.

Note: The information supplied for this command does not affect host-based controller modems. The dialogue included with this command applies to controller-based modems only.

+VRA=<interval>—Ringing Tone Goes Away Timer

Use this command to set the **ringing tone goes away timer** before originating a call. The **ringing tone goes away** timer defines the amount of time the modem waits between ringing tones before assuming that the remote station has gone off-hook. The default is 50, and each value represents a 0.1 second increment.

Result codes:

- *OK* if <interval> = 0—255.
- *ERROR* if <interval> ≠ 0—255.

Table 191. +VRA Extended Syntax Commands

Command	Function
+VRA=<interval>	Sets the ringing tone goes away timer.
+VRA?	Displays the current value.
+VRA=?	Displays the range of supported timer values.

+VRN=<interval>—Ringing Tone Never Appeared Timer

Use this command to set the **ringing tone never appeared timer** before originating a call. The **ringing tone never appeared timer** defines the amount of time that the modem waits for an initial ringing tone. If a ringing tone is not detected within this interval, the modem assumes that the remote station has gone off-hook. The default is 10, and each value represents a one-second increment.

Result codes:

- *OK* if <interval> = 0—255.
- *ERROR* if <interval> ≠ 0—255.

Table 192. +VRN Extended Syntax Commands

Command	Function
+VRN=<interval>	Sets the ringing tone never appeared timer.
+VRN?	Displays the current value.
+VRN=?	Displays the range of supported timer values.

+VRX—Enter Voice Receive Data State

Use this command to initiate the voice receive state with the voice stream received through the comm port. Applications using the wave interface do not use the **+VRX** command. The modem returns the *CONNECT* result code to the DTE.

There are two ways for the DCE to leave the voice receive state:

- Modem receives <DLE>-! from the DTE.
- Upon expiration of the silence detection timer, the modem passes <DLE> shielded event codes indicating a presumed hang-up (<DLE>-s) or presumed end-of-message (<DLE-q>).

+VSD=<sds>,<sdi>—Silence Detection (QUIET and SILENCE)

Use this command to set the silence detection sensitivity (<sds>) and silence detection interval (<sdi>). The <sds> parameter defines the line noise sensitivity level in decibels.

The <sdi> parameter specifies the amount of time the modem waits before reporting silence to the DTE. It is used for determining the presumed hang-up (SILENCE), after which the modem sends <DLE>-s to the DTE. The default is 50 (5 seconds).

Result codes:

- *OK* if <sds> = 0—255 and <sdi> = 0—255.
- *ERROR* if <sds> ≠ 0—255 or <sdi> ¼ 0—255.

Larger values of <sds> indicate that the modem is to treat noisier line conditions as silence (see Table 193).

Table 193. <sds> Values

Value	Function
<sds> = 128	Nominal level of sensitivity; –40 dBm (default).
<sds> > 128	More aggressive; <sds> = 129 is –39 dBm.
<sds> < 128	Less aggressive; <sds> = 127 is –41 dBm.

Table 194. +VSD Extended Syntax Commands

Value	Function
+VSD=<sds>,<sdi>	Sets the silence sensitivity level and the silence detection interval.
+VSD?	Displays the current silence detection sensitivity and silence detection interval.
+VSD=?	Displays the range of supported values for the silence detection sensitivity and silence detection interval.

+VSM=<cml>,<vsr>—Compression Method and Sampling Rate Specifications

Use the **+VSM*** command to set the voice compression method and the sampling specification. The <cml> parameter identifies the compression method and the <vsr> parameter identifies the sampling rate.

Result codes:

- *OK* if <cml> = 128—133 and <vsr> = 7200, 8000, 11025.
- *ERROR* if <cml> ≠ 128—133 or <vsr> ≠ 7200, 8000, 11025.

Table 195. Compression Method

<cml>	Compression Method	Available Sampling Rates
128	8-bit linear.	7200, 8000, 11025
129	16 bit linear (default).	7200, 8000 (default), 11025
130	8-bit A-law.	8000
131	8-bit μ-law.	8000
132	IMA ADPCM.	8000
133	G.729.	8000

Table 196. +VSM Extended Syntax Commands

Command	Function
+VSM=<cml>,<vsr>	Sets the compression method and the sampling rate.

Table 196. +VSM Extended Syntax Commands

+VSM?	Returns the numeric and string labels of the compression method currently in use, and the sampling rate currently in use.
AT+VSM=?	Reports the voice compression methods supported by the DCE and the voice sampling rates at which they are supported. The default is 129,800 (16-bit linear, 8.0 kHz).

+VSP=<value>—Speakerphone On/Off

Use this command to turn the speakerphone function on and off.

Result codes:

- *OK* if <value> = 0, 1.
- *ERROR* if <value> ≠ 0, 1.

Table 197. +VSP Commands

Command	Function
+VSP=0	Speakerphone function off (default).
+VSP=1	Speakerphone function on.

* ITU-T Recommendation V.253 standardized this command. The standard version contains two additional parameters that are not supported by the USRobotics controller-based AT command set. For additional information on these parameters, see ITU-T Recommendation V.253.

Table 198. +VSP Extended Syntax Commands

Command	Function
+VSP=<value>	Turns the speakerphone on or off.
+VSP?	Displays the current status of the speaker phone.
+VSP=?	Displays the range of supported values.

+VTD=<dur>—Beep Tone Duration Timer

Use this command to set the default duration for DTMF/tone generation in 0.01 s increments. For DTMF digits, beep tone duration is the interdigit time. For tone generation, this number is the actual tone duration. The default tone duration is 100 or 1 s.

Result codes:

- *OK* if <dur> = 0—400.
- *ERROR* if <dur> ≠ 0—400.

Table 199. +VTD Commands

Command	Function
+VTD=<dur>	Sets the duration for DTMF/tone generation.
+VTD?	Displays the current beep tone duration timer.
+VTD=?	Displays the range of supported values.

+VTR—Start Voice Transmission and Reception Process

Use this command to initiate full-duplex voice mode* in the DCE. In this mode, the DTE selects the analog source and sink through the **+VLS** command; the selections can be microphone and speaker or GSTN. The DCE is not required to perform any acoustic echo cancellation or line echo cancellation.

Result codes:

- *CONNECT* if full-duplex voice mode is initiated.
- *ERROR* if the DCE is not connected to at least one off-hook duplex PSTN line or one duplex non-PSTN device.

+VTS=<string>—DTMF and Tone Generation in Voice Mode

Use this command to produce a sequence of DTMF tones (or other tones, such as dial tone, busy, silence, etc.) as specified in the string parameter. String parameters are made up of a sequence of elements separated by commas. If the string does not supply a duration for a particular tone, then the DCE uses the duration designated by the **+VTD** command. The command can also generate a hook flash, **+VTS=!**.

Result codes:

- *OK* if <string> is valid (see Table 201).
- *ERROR* if <sting> is not valid.

* See ITU-T Recommendation V.253 for further details on the voice states.

Table 200. +VTS Extended Syntax Commands

Command	Function
+VTS=<string>	Generates DTMF tones according to the <string> parameter.
+VTD=?	Displays the range of supported tones and duration.

Table 201. String Elements

String Elements*	Description
A single character	The valid single characters are 0—9, #, *, !, and A—D. This element always uses the default duration specified by the +VTD command.
A bracketed group []	A bracketed group has three components. It is used to generate a dual tone. The first component is the first tone† in the dual tone. The second component is the second tone† in the dual tone. The third component is the duration of the tones. The duration is specified in 0.01 s intervals. If one of the tone parameters is missing, its value is defaulted to 0 and that tone is not generated.
A curly bracketed group {}	A curly bracketed group has two components. The first component is a DTMF tone or hookflash character(!). The second component is the tone duration. The duration of the tone is specified in 0.01 s intervals.

* The string definition provided in this text is a excerpt from the detailed definition provided in ITU-T Recommendation V.253 (02/98). Refer to Section 10.1.5.1.1 for a full description of the <string> parsing.

† The tone specified in the bracketed group in a numerical value between 300 and 3300.

+VTX—Enter Voice Transmit Data State

Use this command to initiate the voice transmission process with the voice stream sent through the comm port. Applications using the wave interface do not use the **+VTX** command.

There are two ways for the DCE to leave the voice transmit state:

- Modem receives <DLE>-<EXT>in voice stream.
- DTE/DCE inactivity timer expires.

Result codes:

- *CONNECT* if the DCE is connected to another off-hook DCE.
- *ERROR* if the DCE is not connected to at least one other off-hook DCE.

Fast Connect and V23 Reverse Channel Commands

The AT fast connect command set is not covered by any ITU recommendation. This set of commands allow point-of-sale (POS), set-top boxes (STB), and other applications to quickly connect to a host and transfer small amount of data per connection.

Use this command to select the fast connect modulation or to disable fast connect. The data transfer modes supported for V.22 fast connect are asynchronous (\N0), SDLC (\N6) and V.80 HDLC (+ES, +ESA) command. The data transfer mode supported for V.29 is +FCLASS = 1.0.

Result codes:

- *OK* if <value> = 0—8.
- *ERROR* if <value> ≠ 0—8.

Table 202. \F<value> Commands

Command	Description
\F0	Fast connect is disabled (default).
\F1	V.22 fast connect is enabled.
\F2	V.29 fast connect is enabled.
\F3 and \F4	Reserved.
\F5	RTS used to reverse V.23 channel.
\F6	DTR used to reverse V.23 channel.
\F7 through \F8	Reserved.

Testing and Debugging AT Commands Set

S109—V.PCM Connection Options

Use this register for testing only. S109 is a guide for the connection type. Each bit of the register enables or disables a different protocol or function of the modem.

Note: The downstream connection rate is determined by the S38.

Range: 0—2

- Default: 1

Table 203. Register S109

Bit	Description
S109[1:0] = 00	V34
S109[1:0] = 01, 10, 11	V90
S109[2] = 1	Fast connect Phase 1 enable
S109[3] = 1	PCM upstream enable
S109[4] = 1	V.92 enable
S109[5] = 1	Fast connect Phase 2 enable
S109[6] = 1	Reserved
S109[7] = 1	Reserved

#UD—Unimodem Diagnostics

This command is defined by Microsoft's unimodem diagnostics command specification. The modem implements a subset of the parameters in that specification.

#UD is an action command. It does not take parameters. It should be the last command in the command line. The modem logs aspects of its operation for each call and saves these results in volatile memory until cleared by one of the following events. These results are not cleared by changing DTR, V.24 circuit 108.2, &D0, &D1, or &D2.

- Power off (or D1 or D3 state entered).
- Hard reset (e.g., negate DTR with &D3 set, reset button).
- Soft reset = ATZ or AT&F.
- ATD or ATA command issued.
- Automatic answer (e.g., set register S0 > 0 and ring detected).

In response to this command, the modem reports one or more lines of information text. Information text format is defined in ITU V.25ter. Each line is both preceded and terminated by a <CR><LF> pair. Note that, as per V.25ter, CR and LF characters may be changed by writing new values to the contents of registers S2 and S3 respectively.

DIAG <token key=value [[key=value [key=value]]. . .>

where:

DIAG = 5 characters, hexadecimal 44, 49, 41, 47, 20.

'<' = left angle bracket, hexadecimal 3C.

'=' = equal sign, hexadecimal 3D.

'>' = right angle bracket, hexadecimal 3E.

token = unique 32-bit hexadecimal string, i.e., 2A4D3263.

key = one- or two-digit hexadecimal number. See Table 204 on page 90.

value = any string.

Unless otherwise noted, all values are hexadecimal numbers. Any numeric values from tables in ITU V.58 are converted to hexadecimal. Multidigit values are reported MSD first. Leading zeros may be deleted.

The following table includes all items listed in Microsoft's specification for the #UD command. The items that have an X in the Implemented column have been implemented in this release.

Please refer to Microsoft's unimodem diagnostics command specification for more information.

Table 204. #UD Last Call Status Report Format

Note: Refer to Table 1 in the Microsoft specification.

Key	Value(s)	Required	Definition	Implemented
0	2 digits	Yes	Diagnostic command specification revision number, digit.digit.	X
1	See Table 205 on page 92.	0—A	Call setup result code.	X
2	See Table 3*	0—1	Multimedia mode.	—
3	See Table 4*	0	DTE-DCE interface mode.	—
4	String	Yes	V.8 CM octet string. Same format as V.25ter Annex A, in quotes.	—
5	String	Yes	V.8 JM octet string. Same format as V.25ter Annex A in quotes.	—
6—F	—	—	Reserved for call negotiation reports.	—
10	2 digits	Note 4*	Received signal power level in –dBm (0—43).	X
11	2 digits	Note 4*	Transmit signal power level in –dBm (0—17).	X
12	2 digits	Note 4*	Estimated noise level in –dBm (10—90).	X
13	2 digits	Note 4*	Normalized mean squared error. 100 (0x64) = minimum intersymbol distance.	—
14	2 digits	Note 4*	Near echo loss in dB.	X
15	2 digits	Note 4*	Far echo loss in dB.	X
16	4 digits	Note 4*	Far echo delay in ms.	—
17	—	Note 4*	—	X
18	—	Note 4*	—	—
19—1F	—	—	Reserved for modulation setup and training reports (see note 5*).	—
20	See Table 206 on page 92.	Note 6*	Transmit carrier negotiation result.	X
21	See Table 206.	Note 6*	Receive carrier negotiation result.	X
22	4 digits	0—1F40	Transmit carrier symbol rate (0—8000).	X
23	4 digits	0—1F40	Receive carrier symbol rate (0—8000).	X
24	4 digits	0—FA0	Transmit carrier frequency (0—4000).	—
25	4 digits	0—FA0	Receive carrier frequency (0—4000).	—
26	4 digits	0—FA00	Initial transmit carrier data rate (0—64000).	X
27	4 digits	0—FA00	Initial receive carrier data rate (0—64000).	X
28—2F	—	—	Reserved.	—
30	2 digits	0—FF	Temporary carrier loss event count.	—
31	2 digits	0—FF	Carrier rate renegotiation event count.	—
32	2 digits	0—FF	Carrier retrains requested.	X
33	2 digits	0—FF	Carrier retrain requests granted.	X

* Refers to notes or tables in the Microsoft specification.

Table 204. #UD Last Call Status Report Format(Continued)

Note: Refer to Table 1 in the Microsoft specification.

Key	Value(s)	Required	Definition	Implemented
34	4 digits	0—FA00	Final transmit carrier rate.	X
35	4 digits	0—FA00	Final receive carrier rate.	X
36—3F	—	—	Reserved.	—
40	See Table 207 on page 93.	0—2	Protocol negotiation result (see note 7 *).	X
41	3 digits	0—400	Error control frame size.	—
42	2 digits	0—FF	Error control link time-outs.	X
43	2 digits	0—FF	Error control link NAKs.	—
44	See Table 208 on page 93.	0—1	Compression negotiation result (see note 7 *).	X
45	4 digits	0—200	Compression dictionary size (see note 7 *).	—
46—4F	—	—	Reserved.	—
50	1 digit	0—2	Transmit flow control. • 0 = off. • 1 = DC1/DC3. • 2 = V.24 ckt 106/133.	X
51	1 digit	0—2	Receive flow control. • 0 = off. • 1 = DC1/DC3. • 2 = V.24 ckt 106/133.	X
52	8 digits	0—FFFFFFFF	Transmit characters sent from DTE (see note 8 *).	X
53	8 digits	0—FFFFFFFF	Receive characters sent to DTE (see note 8 *).	X
54	8 digits	0—FFFF	Transmit characters lost (data overrun errors from DTE) (see note 9 *).	X
55	8 digits	0—FFFF	Receive characters lost (data overrun errors from DTE) (see note 9 *).	X
56	8 digits	0—FFFFFFFF	Transmit frame count, if error control protocol running (see note 9 *).	X
57	8 digits	0—FFFFFFFF	Receive frame count, if error control protocol running (see note 9 *).	X
58	8 digits	0—FFFF	Transmit frame error count, if error control protocol running (see note 9 *).	X
59	8 digits	0—FFFF	Receive frame error count, if error control protocol running (see note 9 *).	X
5A—5F	—	—	Reserved.	—
60	See Table 209 on page 93.	Note 10*	Termination cause.	X

* Refers to notes or tables in the Microsoft specification.

Table 204. #UD Last Call Status Report Format(Continued)

Note: Refer to Table 1 in the Microsoft specification.

Key	Value(s)	Required	Definition	Implemented
61	2 digits	0—FF	Call waiting event count.	X
62—7F	—	—	Reserved for future versions of the specification.	—
80-FF	—	—	Reserved for manufacturer proprietary keys.	—

* Refers to notes or tables in the Microsoft specification.

Table 205. Call Setup Result Codes

Note: Refer to Table 2 in the Microsoft specification.

Code	Definition	Implemented
0	No previous call (modem log has been cleared since any previous call).	X
1	No dial tone detected.	X
2	Reorder signal detected. Network busy.	—
3	Busy signal detected.	X
4	No recognized signal detected.	X
5	Voice detected.	—
6	Text telephone signal detected (see V.18).	—
7	Data answering signal detected (e.g., V.25 ANS, V.8ANSam).	X
8	Data calling signal detected (e.g., V.25 CT, V.8 CI).	—
9	FAX answering signal detected (e.g., T.30 CED, DIS).	—
A	FAX calling signal detected (e.g., T.30 CNG).	—
B	V.8bis signal detected.	—
C—F	Reserved.	—

Table 206. gstnModulationSchemeActive from 3.7.2/V.58

Note: Refer to Table 6 in the Microsoft specification.

Value (hexadecimal)	Description	Implemented
0	V.17.	—
1	V.21.	—
2	V.22.	—
3	V.22bis.	—
4	V.23 constant carrier (1200/75).	—
5	V.23 switched carrier (half duplex).	—
6	V.26bis.	—
7	V.26ter.	—
8	V.27ter.	—
9	V.29 HD.	—
A	V.32.	X
B	V.32bis.	—
C	V.34.	X
D	V.34 HD.	—
E	V.pcm (asymmetric).	—

Table 206. gstnModulationSchemeActive from 3.7.2/V.58

Note: Refer to Table 6 in the Microsoft specification.

F	V.pcm (symmetric).	—
E—7F	Reserved (V.58).	—
80	X2.	—
81	K56flex.	X
82	V.FC.	—
83	V.32terbo.	—
80-FF	Reserved for mfgs.	—

Table 207. errorControl Active from 3.5.2/V.58

Note: Refer to Table 7 in the Microsoft specification.

Value	Description	Implemented
0	Disable/none.	X
1	V.42 LAPM.	X
2	V.42 alternative protocol (MNP).	X
3—7F	Reserved (V.58).	—
80	MNP Class 10.	—
81	Enhanced cellular protocol.	—
82	ETC.*	—
82—FF	Reserved for mfgs.	—

Table 208. compressionActive from 3.2.2/V.58

Note: Refer to Table 8 in the Microsoft specification.

Value	Description	Implemented
0	None.	X
1	V.42bis.	X
2—7F	Reserved (V.58).	—
80	MNP Class 5.	X
81—FF	Reserved for mfgs.	—

Table 209. Additional callCleared Codes (3.6.4/V.58)

Note: Refer to Table 9 in the Microsoft specification.

Code	Definition	Implemented
1	No previous call.	X
2	Call is still in progress.	X
3	Call waiting signal detected.	—
4	Delayed (see ETS 300 001).	X

Table 210. callCleared Codes from 3.6.4/V.58-1994

Note: callCleared indicates that the DCE has gone on-hook and that the previously existing network connection has been cleared. These values are hexadecimal, converted from decimal in V.58. Refer to Table 10 in the Microsoft specification.

Value	Description	Notes	Implemented
0	CauseUnidentified.	Call setup issues.	X
1—3	See Table 209.	—	X
A	NMSinitiatedDialCall.	Network management system.	—
B	NMSinitiatedLeasedLineRestoral.	Network management system.	—
C	NMSinitiatedRedial.	Network management system.	—
D	NMSinitiatedDialDisconnect.	Network management system.	—
14	PowerLoss.	DCE.	—
15	EquipmentFailure.	—	—
16	FrontPanelDisconnectRequested.	—	—
17	FrontPanelLeasedLineRestoral.	—	—
18	AutomaticLeasedLineRestoral.	—	—
19	InactivityTimerExpired.	—	X
1E	cct116RestoralRequest.	DTE interface.	—
1F	cct108isOffInhibitsDial.	—	—
20	cct108turnedOff.	—	—
28	NoNumberProvided.	Line interface.	—
29	BlacklistedNumber.	—	X
2A	CallAttemptsLimitExceeded.	—	X
2B	ExtensionPhoneOffhook.	—	—
2C	CallSetupFailTimerExpired.	—	X
2D	IncomingCallDetected.	—	X
2E	LoopCurrentInterrupted.	—	—
2F	NoDialTone.	—	X
30	VoiceDetected.	—	—
31	ReorderTone.	—	—
32	SitTone.	—	—
33	EngagedTone.	—	—
34	LongSpaceDisconnect.	—	—
3C	CarrierLost.	Signal converter.	X
3D	TrainingFailed.	—	X
3E	NoModulationinCommon.	—	—
3F	RetrainFailed.	—	X
40	RetrainAttemptCountExceeded.	—	—
41	GstnCleardownReceived.	—	—
42	FaxDetected.	—	—
46	InTestMode.	Test.	—
47	IntrusiveSelfTestInitiated.	—	—
50	AnyKeyAbort.	Call control.	X
51	DteHangupCommand.	—	X
52	DteResetCommand.	—	—

Table 210. callCleared Codes from 3.6.4/V.58-1994(Continued)

Note: callCleared indicates that the DCE has gone on-hook and that the previously existing network connection has been cleared. These values are hexadecimal, converted from decimal in V.58. Refer to Table 10 in the Microsoft specification.

Value	Description	Notes	Implemented
5A	FrameReject.	Error control.	—
5B	NoErrorControlEstablished.	—	X
5C	ProtocolViolation.	—	—
5D	n400exceeded.	—	X
5E	NegotiationFailed.	—	—
5F	DisconnectFrameReceived.	—	—
60	SabmeFrameReceived.	—	—
64	LossOfSynchronization.	Data compression.	—

S-Registers

The current setting of each S-register may be displayed by the command (**S<register number>?**). There are two forms for this command.

Table 211. S<register number> Extended Syntax

Syntax	Function
S<register number>?	Displays register contents.
S<register number>=<value>*	Sets the contents of the register to <value>.

***** Some registers are read only and are not affected by the **S<register number>=<value>** command.

Table 212 summarizes the S-registers used by USRobotics controller-based modems.

Table 212. S-Register Summary

Register	Description	Range	Unit	Default
S0	Auto-answer ring number.	0—255	Rings	0
S1	Ring counter.	0—255	Rings	0
S2	AT escape character (user defined).	0—255	ASCII	43
S3	Command-line termination character (user defined).	0—127	ASCII	13
S4	Response-formatting character.	0—127	ASCII	10
S5	Command-line editing character.	0—8	ASCII	8
S6	Wait before dialing.	2—255	s	2
S7	Connection completion time-out.	1—255	s	50
S8	Pause time for comma (,) modifier.	0—65	s	2
S9	DTMF off=time duration	50—200	ms	95
S10	Automatic disconnect delay.	1—255	100 ms	20
S11	DTMF tone duration.	50—150	ms	95
S12	Escape guard time.	0—255	20 ms	50
S14	General bit-mapped options status.	—	—	8
S18	Dial-pulse interdigit period.	0—255	5 ms	
S21	V.24/general bit-mapped options status.	—	—	48

Table 212. S-Register Summary(Continued)

Register	Description	Range	Unit	Default
S22	Results bit-mapped options status.	—	—	112
S28	V.34 modulation enable/disable.	0—1	—	1
S29	V17 disable.	0—1	On/Off	0
S30	Inactivity timer.	0—255	Minutes	0
S32	Synthetic ring volume.	0—255	dB	10
S33	Synthetic ring frequency.	0—5	—	0
S35	Data calling tone.	0—1	—	0
S36	Negotiation fallback.	—	—	7
S37	Dial line rate.	0, 2—19	—	0
S38	56K downstream rate.	0—23	—	1
S42	Auto rate.	0—1	—	1
S43	Auto mode.	0—1	—	1
S48	LAPM error control and feature negotiation.	7, 128	—	7
S71	Silence sensitivity.	0—255	dB	128
S72	Silence-detect timer.	0—255	ms	50

Table 212. S-Register Summary (continued)

Register	Description	Range	Unit	Default
S82	Enable distinctive ring reporting in milliseconds,	0—1	On/Off	0 (off)
S86	Fax TCF error tolerance.	0—255	# error bytes	—
S90	Read-only local phone.	0—1	—	0
S91	Line transmit level.	6—25	dB	10
S127	Caller ID impedance activation.	0—3	—	0

S-Register Definitions

S0—Auto-Answer Ring Number

This register sets the number of rings the modem counts before automatically answering a call. Enter zero to disable auto-answer. When auto-answer is disabled, the modem requires an **A** command to answer an incoming call.

Range: 0—255.

- Default: 0.
- Units: rings.

S1—Ring Counter

The modem increments the S1 register each time it detects a ring signal on the telephone line. The modem clears S1 if no rings occur over a six second interval. This register is read-only.

Range: 0—255.

- Default: 0.
- Units: rings.

S2—Escape Character (User Defined)

S2 holds the decimal value of the ASCII character used as the escape character. The default value corresponds to an ASCII +. The escape sequence allows the modem to exit data mode and enter command mode when online. A value over 127 disables the escape process, i.e., no escape character is recognized.

Range: 0—255.

- Default: 43 (+).
- Units: ASCII.

S3—Command Line Termination Character (User Defined)

S3 sets the character used to terminate command line and result codes.

Note: This register value is not stored with the **&W** command.

Range: 0—127.

- Default: 13 (carriage return).
- Units: ASCII.

S4—Response Formatting Character (User Defined)

This register determines the ASCII value used as the line feed character. The modem uses a line feed character in command mode when it responds to the computer.

Note: This register value is not stored with the **&W** command.

Range: 0—127.

- Default: 10 (line feed).
- Units: ASCII.

S5—Command Line Editing Character (User Defined)

S5 sets the character recognized as a backspace (pertains to asynchronous operation only). The modem does not recognize the backspace character if it is set to a value that is greater than 32 ASCII. This character can be used to edit a command line. When the echo command is enabled, the modem echoes back to the local DTE the backspace character, an ASCII space character, and a second backspace character. Therefore, a total of three characters are transmitted each time the modem processes the backspace character.

Note: This register value is not stored with the **&W** command.

Range: 0—32.

- Default: 8 (backspace).
- Units: ASCII.

S6—Wait Time Before Dialing

This register sets the length of time in seconds that the modem must pause after going off-hook before dialing the first digit of the telephone number. The modem always pauses for a minimum of two seconds, even if the value of S6 is less than two seconds. The wait for dial tone progress feature (W dial modifier in the dial string) overrides the value in register S6. This operation, however, may be affected by some X<value> command options according to country restrictions.

Note: This register default value may vary based on country selection.

Range: 2—255.

- Default: 2.
- Units: seconds.

S7—Connection Completion Time-Out

S7 sets the length of time, in seconds, that the modem waits for a carrier before hanging up. The timer starts when the modem finishes dialing (originate) or goes off-hook (answer). In originate mode, the timer is reset upon detection of an answer tone if allowed by country restrictions. The timer also specifies the wait for silence time for the @ dial modifier in seconds. S7 is not associated with the W dial modifier.

Note: This register default value may vary based on country selection.

Range: 1—255.

- Default: 50.
- Units: seconds.

S8—Pause Time for Comma Dial Modifier

S8 sets the time, in seconds, that the modem pauses when the comma (,) dial modifier is encountered in the dial string.

Note: This register default value may vary based on country selection.

Range: 0—65.

- Default: 2.
- Units: seconds.

S9—DTMF Tone Off Duration

This register determines the number of ms that the DTMF tone is off. Refer to the USRobotics *Controller-Based Homologation Manual* for specific country defaults.

Note: This register default is set to the same as S11 register upon reset.

Range: 50—200.

- Default: 95.
- Units: milliseconds.

S10—Automatic Disconnect Delay

S10 sets the length of time the controller-based modem waits before hanging up after loss of carrier. Register values are given in tenths of a second and range from 0.1 to 25.5 seconds. This allows for a temporary carrier loss without causing the local modem to disconnect.

Note: This register default value may vary based on country selection.

Range: 1—255.

- Default: 20*.
- Units: 0.1 s.

* The register default shown here is for North America.

S11—DTMF Dialing Speed

This register determines the dialing speed. Refer to *Homologation Parameters for Controller Modem Chips* for specific country defaults.

Note: This register default value may vary based on country selection.

Range: 50—150.

- Default: 95*.
- Units: milliseconds.

S12—Escape Guard Time

This register sets the escape guard time. An escape character is framed with silence to ensure that it is not confused as data. This register sets the duration of the silence that must come before and after an escape sequence.

Range: 0—255.

- Default: 50.
- Units: 0.02 seconds.

S14—General Bit-Mapped Options Status

S14 indicates the status of command options. Only bits 3 and 6 are used; they are read-only.

- Default: 8 (00001000b).

Table 213. Register S14 Bits

Bit	Description	Value
3	Result codes (**V <value>**).	0 = Numeric (**V0**). 1 = Verbose (**V1**) (default).
6	Pulse dial pulses/s selection (**&Pn**).	0 = 10 pulses/s (**&P0** and **&P1**) (default). 1 = 20 pulses/s (**&P2**).

S18—Dial Pulse Interdigit Period

This register sets the delay between dial pulses.

Range: 0—255 in 5 ms increments.

- Default:
- Units: 0.05 seconds.

* The register default shown here is for North America.

S21—V.24/General Bit-Mapped Options Status

S21 indicates the status of command options. Only bits 3, 4, and 5 are used; they are read only.

- Default: 48 (00110000b).

Table 214. Register S21 Bits

Bit	Description	Value
3—4	DTR behavior (&Dn).	0 = **&D0**. 1 = **&D1**. 2 = **&D2** (default). 3 = **&D3**.
5	DCD behavior (&Cn).	0 = **&C0**. 1 = **&C1** (default).

S22—Results Bit-Mapped Options Status

S22 indicates the status of command options. Only bits 4, 5, 6, and 7 are used; they are read-only.

- Default: 112 (01110000b).

Table 215. Register S22 Bits

Bit	Description	Value
4—6	Result codes (**X <value>**).	0 = **X0**. 4 = **X1**. 5 = **X2**. 6 = **X3**. 7 = **X4** (default).
7	Pulse dial make/break ration (**&P <value>**).	0 = 33/67 make/break ratio (**&P1** and **&P2**) (default). 1 = 39/61 make/break ratio.

S28—V.34 Modulation Enable/Disable

This register enables/disables V.34 modulation.

Range: 0—1.

- Default: 1.

Table 216. S28 Values

Value	Function
0	Disables V.34 modulation.
1	Enables V.34 modulation.

S30—Inactivity Timer

This register specifies the length of time in minutes that the modem must wait before disconnecting when no data is sent or received. This function is only applicable to buffer mode.

Note: This register's default value may vary based on country selection.

Range: 0—255.

- Default: 0 (disabled)*.
- Units: minutes.

S32—Synthetic Ring Volume

S32 specifies the synthetic ring volume. It provides a synthetic ring volume in dB with an implied minus sign. The default is 10.

Range: 0—255.

- Default: 10.
- Units: dB.

S33—Synthetic Ring Frequency

This register specifies a synthetic ring frequency. Register values from one to five select a unique ring frequency.

Range: 0—5.

- Default: 0 (disabled).

* The register default shown here is for North America.

S35—Data Calling Tone

Data calling tone is a tone of a certain frequency and cadence as specified in V.25, which allows remote data/FAX/voice discrimination. The frequency is 1300 Hz with a cadence of 0.5 s on and 2.0 s off. The setting of the homologation parameter 1f, calling tone flag, determines if S35 (same as -C command) is enabled. If the calling tone flag is set to 1, this register is valid. Otherwise, this register has no effect.

Note: This register's default value may vary based on country selection.

Range: 0—1.

- Default: 0.

S36—Negotiation Fallback

S36 specifies the action to take in the event of negotiation failure when error control is selected.

S36 is used in conjunction with S48, LAPM error control and feature negotiation, to negotiate certain connection types. Refer to Table 224 on page 104 for the settings of each connection type.

Range: 0—7.

- Default: 7.

Table 217. Register S36 Values

Values	Description
0, 2	Hang up.
1, 3	Fall back to an asynchronous connection.
4, 6	Attempt MNP. If MNP fails, hang up.
5, 7	Attempt MNP. If MNP fails, fall back to asynchronous connection.

S37—Dial Line Rate

This register sets the maximum line data rate. In V.90 mode, S37 controls the upstream V.34 rate.

Range: 0—19.

- Default: 0.

Table 218. Register S37 Values

Value	Rate		Value	Rate
0	Auto rate (default).		10	12000 bits/s.
1	Reserved.		11	14400 bits/s.
2	1200/75 bits/s (V.23).		12	16800 bits/s.
3	300 bits/s.		13	19200 bits/s.
4	Reserved.		14	21600 bits/s.
5	1200 bits/s.		15	24000 bits/s.
6	2400 bits/s.		16	26400 bits/s.
7	4800 bits/s.		17	28800 bits/s.
8	7200 bits/s.		18	31200 bits/s.
9	9600 bits/s.		19	33600 bits/s.

S38—56K Downstream Rate

Once a connection type* (V.90) is determined, use register S38 to force a particular downstream rate. A value of zero disables both connection types and allows a more reliable V.34 connection. The default value of one allows the modem to select the downstream rate automatically. Other values of S38 force the downstream rate, with fallback to V.34 if unsuccessful at the configured rate.

Range: 0—23.

- Default: 1.

Table 219. Register S38 Values

Value	INF File's HKR Value	V.90 Downstream Rate
0	—	V.90 disabled
1	—	Automatic rate selection (default)
2	60,6d,00,00	28 kbits/s
3	95,72,00,00	29.333 kbits/s
4	CA,77,00,00	30.666 kbits/s
5	—	32 kbits/s
6	35,82,00,00	33.333 kbits/s
7	6A,87,00,00	34.666 kbits/s
8	—	36 kbits/s
9	D5,91,00,00	37.333 kbits/s
10	0A,97,00,00	38.666 kbits/s
11	—	40 kbits/s
12	75,A1,00,00	41.333 kbits/s
13	AA,A6,00,00	42.666 kbits/s
14	—	44 kbits/s
15	15,B1,00,00	45.333 kbits/s
16	4A,B6,00,00	46.666 kbits/s
17	—	48 kbits/s
18	B5,C0,00,00	49.333 kbits/s
19	EA,C5,00,00	50.666 kbits/s
20	—	52 kbits/s
21	55,D0,00,00	53.333 kbits/s
22	8A,D5,00,00	54.666 kbits/s
23	—	56 kbits/s

* Refer to register S109 to determine connection type.

The number of robbed-bit signaling (RBS) frames detected decreases the true DCE rate as shown in Table 220.

Table 220. RBS Frames Detected

RBS Links	Rate Hit		RBS Links	Rate Hit
0	0 kbits/s		4	6 kbits/s
1	2 kbits/s		5	8 kbits/s
2	4 kbits/s		6	8 kbits/s
3	4 kbits/s		—	—

For example, if S38 = 10 and there are three RBS links, the K56flex downstream rate is 44 kbits/s

(48 kbits/s – 4 kbits/s). The exception to this is for 32 kbits/s and 34 kbits/s rates, which are the true rates regardless of the number of RBS frames detected.

S42—Auto Rate

This command is used for testing and debugging only.

V.32bis and V.22bis auto rates are disabled. Retrain operation is disabled or enabled in data mode, and fallback is disabled in data mode. In K56flex mode, S42 = 0 forces connection at the rate specified by S38, even if the rate cannot be sustained, without fallback to V.34.

Range: 0—1

- Default: 1

Table 221. Register S42

Value	Function
S42 = 0	Auto rate disabled.
S42 = 1	Auto rate enabled (default).

S43—Auto Mode

This command is used for testing and debugging only.

V.32bis start-up auto mode operation is disabled.

Range: 0—1

- Default: 1

Table 222. Register S43

Value	Function
S43 = 0	Auto mode disabled.
S43 = 1	Auto mode enabled (default).

S48—LAPM Error Control and Feature Negotiation

S48 enables or disables error control and feature negotiation. It works in conjunction with S36 to determine the type of error correction method to use. Table 223 shows how the values of S48 and S36 interact to select the error control method.

- Range: 7, 128.
- Default: 7.

Table 223. Register S48

Value	Description
S48 = 7	Enables negotiation (default).
S48 = 128	Disables negotiation. Forces immediate fallback options specified in S36.

Table 224 lists the S36 and S48 configuration settings necessary to negotiate certain types of connections.

Table 224. Register S36 and S48 Configuration Settings

Register S36 Settings	S48 = 7	S48 = 128

Table 224. Register S36 and S48 Configuration Settings

S36 = 0, 2	LAPM or hang-up.	Do not use.
S36 = 1, 3	LAPM or asynchronous.	Asynchronous.
S36 = 4, 6	LAPM, MNP, or hang-up.	MNP or hang-up.
S36 = 5, 7	LAPM, MNP, or asynchronous.	MNP or asynchronous.

S71—Silence Sensivity

This S-register sets the sensivity for detecting silence over the modem.

- Range: 0—255
- Default: 128
- Units: dB

S72—Silence Detect Timer

This register defines length of time that silence (based on the sensitivity setting) waits before reporting silence to the application (in the form of a callback function).

- Range: 0—255
- Default: 50 (5 s).
- Units: 1/10 s.

S82—Enable Millisecond Distinctive Ring

This register determines the granularity of the duration set for a distinctive ring. If this register is set to on (1), the duration unit for distinctive ring is in milliseconds (ms). If this register is set to off (0), the duration unit for distinctive ring is in 1/10 s.

- Range: 0 = off, 1 = on
- Default: 0 (off)

S86—FAX TCF Error Tolerance

This register determines the maximum number of error bytes detected in a Class 2 TCF training check before the TCF check is failed.

- Range: 0—255
- Default: 0

S90—Read-Only Local Phone

This register provides the status of the local phone. The register is read-only.

- 0 = on-hook.
- 1 = off-hook.

S91—Line Transmit Level

Register S91 is effective only for Japan. It specifies the line transmit level in dBm with an implied minus sign.

Range: 6—25 (corresponding to –6 dBm to –25 dBm transmit level)

- Default: 10 (–10 dBm transmit level)
- Units: –dBm

S127—Caller ID Impedance Activation

Register S127 invokes the Caller ID impedance specifications for a particular country.

Range: 0 = North America; 1 = Japan; 2 = UK; 4 = France; 7 = Taiwan (FSK + DTMF); 8 = DTMF

- Default: Set according to country code.
- Units: NA.

Result Codes

The modem's AT command handler responds to commands from the caller and to activity on the line via result codes. Table 225 presents a summary of these result codes.

Two forms of each result code are available. The long-form, or verbose, response is given when **V1** is selected, and the short-form, data-like numeric response is given when **V0** is selected. The long-form code is preceded and terminated by the sequence <CR> <LF>. The short-form is also terminated by <CR>, but it has no preceding sequence. If result codes are suppressed, nothing is returned to the caller.

Table 225. Result Code Summary

Result Code	Numeric Code	Description
OK	0	Acknowledges the execution of a command line.
CONNECT	1	Modem connected to line.
RING	2	Incoming ring signal has been detected.
NO CARRIER	3	Modem lost carrier signal, does not detect carrier signal, or does not detect answer tone.
ERROR	4	Invalid command.
CONNECT 1200 EC*	5	Connection at 1200 bits/s.
NO DIALTONE	6	No dial tone detected.
BUSY	7	Busy signal detected.
NO ANSWER	8	Remote end never answered.
CONNECT 2400 EC*	10	Connection at 2400 bits/s.
CONNECT 4800 EC*	11	Connection at 4800 bits/s.
CONNECT 9600 EC*	12	Connection at 9600 bits/s.
CONNECT 14400 EC*	13	Connection at 14400 bits/s.
CONNECT 19200 EC*	14	Connection at 19200 bits/s.
CONNECT 7200 EC*	24	Connection at 7200 bits/s.
CONNECT 12000 EC*	25	Connection at 12000 bits/s.
CONNECT 16800 EC*	86	Connection at 16800 bits/s.
CONNECT 300 EC*	40	Connection at 300 bits/s.
CONNECT 21600 EC*	55	Connection at 21600 bits/s.
CONNECT 24000 EC*	56	Connection at 24000 bits/s.
CONNECT 26400 EC*	57	Connection at 26400 bits/s.
CONNECT 28800 EC*	58	Connection at 28800 bits/s.
CONNECT 31200 EC*	59	Connection at 31200 bits/s.
CONNECT 33600 EC*	60	Connection at 33600 bits/s.
CONNECT 38400 EC*	28	Connection at 38400 bits/s (DTE rate).
CONNECT 57600 EC*	18	Connection at 57600 bits/s (DTE rate).
CONNECT 115200 EC*	87	Connection at 115200 bits/s (DTE rate).

* EC only appears when the extended result codes configuration option is enabled. EC is replaced by one of the following symbols, depending on the error control method used:
V.44—V.44 data compression.
V42bis—V.42 error control and V.42bis data compression.
V42—V.42 error control only.
MNP 5—MNP class 4 error control and MNP class 5 data compression.
MNP 4—MNP class 4 error control only.
NoEC—no error control protocol.

Table 225. Result Code Summary (continued)

Result Code	Numeric Code	Description
DELAYED	88	Delay is in effect for the dialed number.
BLACKLISTED	89	Dialed number is blacklisted.
BLACKLIST FULL	90	Blacklist is full.
CONNECT 32000 EC*	70	Connection at 32000 bits/s.
CONNECT 34000 EC*	71	Connection at 34000 bits/s.
CONNECT 36000 EC*	72	Connection at 36000 bits/s.
CONNECT 38000 EC*	73	Connection at 38000 bits/s.
CONNECT 40000 EC*	74	Connection at 40000 bits/s.
CONNECT 42000 EC*	75	Connection at 42000 bits/s.
CONNECT 44000 EC*	76	Connection at 44000 bits/s.
CONNECT 46000 EC*	77	Connection at 46000 bits/s.
CONNECT 48000 EC*	78	Connection at 48000 bits/s.
CONNECT 50000 EC*	79	Connection at 50000 bits/s.
CONNECT 52000 EC*	80	Connection at 52000 bits/s.
CONNECT 54000 EC*	81	Connection at 54000 bits/s.
CONNECT 56000 EC*	82	Connection at 56000 bits/s.
CONNECT 28000 EC*	100	Connection at 28000 bits/s.
CONNECT 29333 EC*	101	Connection at 29333 bits/s.
CONNECT 30666 EC*	102	Connection at 30666 bits/s.
CONNECT 33333 EC*	103	Connection at 33333 bits/s.
CONNECT 34666 EC*	104	Connection at 34666 bits/s.
CONNECT 37333 EC*	105	Connection at 37333 bits/s.
CONNECT 38666 EC*	106	Connection at 38666 bits/s.
CONNECT 41333 EC*	107	Connection at 41333 bits/s.
CONNECT 42666 EC*	108	Connection at 42666 bits/s.
CONNECT 45333 EC*	109	Connection at 45333 bits/s.
CONNECT 46666 EC*	110	Connection at 46666 bits/s.
CONNECT 49333 EC*	111	Connection at 49333 bits/s.
CONNECT 50666 EC*	112	Connection at 50666 bits/s.
CONNECT 53333 EC*	113	Connection at 53333 bits/s.
CONNECT 54666 EC*	114	Connection at 54666 bits/s.

* EC only appears when the extended result codes configuration option is enabled. EC is replaced by one of the following symbols, depending on the error control method used:
V.44—V.44 data compression.
V42bis—V.42 error control and V.42bis data compression.
V42—V.42 error control only.
MNP 5—MNP class 4 error control and MNP class 5 data compression.
MNP 4—MNP class 4 error control only.
NoEC—no error control protocol.

Voice Modem Command Examples

The application issues AT commands to request actions by the modem, and the modem responds with standard TIA-602 result codes to tell the application that the requested action has been completed.

Notes for Speakerphone Examples

1. If the user decides to pick up his local (parallel) phone while in the middle of a speakerphone call, the DCE senses the transition and sends the application a <DLE>-H sequence. The application, which should always be screening for DLE-shielded codes in the background when the modem is in the voice mode, can then respond to the <DLE>-H (for example, by resetting speakerphone buttons or doing whatever else needs to be done with the speakerphone interface).
2. DLE-shielded codes that the modem sends to the application while in speakerphone mode are listed in Table 226.

Table 226. DLE-Shielded Codes

Command	Description
DLE - c	FAX calling tone detect.
DLE - e	Data calling tone detect.
DLE - h	Local phone went on-hook (hung up).
DLE - H	Local phone went off-hook (picked up).

3. When the user is in the middle of a speakerphone call, call waiting (hold operation) can be initiated when the user hears the call waiting signal through the speaker. Call waiting entails the following communication between the application and the modem.

Command/Response	Description
ATD!	Put the current call on hold, and answer the new incoming call.
OK	DCE responds. Original call is on hold, and the speakerphone user is connected to the second call.

To terminate the second call and return to the first, the application should again send the modem the ATD! command.

Command/Response	Description
ATD!	Terminate the second call and return to the original call.
OK	DCE responds. Second call is terminated and the user is again connected to the original call.

Example #1: Initiating a Speakerphone Call (with Phone Muting During Conversation)

The speakerphone application is loaded. The modem is initially idle in data mode. The user then decides to pick up the phone to place a speakerphone call. Picking up the phone should initiate the following chain of events.

Command/Response	Description
AT+FCLASS=8	The modem enters voice mode.
OK	DCE responds. Now in voice mode.
AT+VGT=128	Set speaker volume to normal level.
OK	DCE responds. Volume level is set.
AT+VLS=7	Attach internal speaker and microphone, DCE off-hook
OK	DCE responds. Now in speakerphone mode. Phone off hook, dial tone audible, speaker and microphone ready to use.
ATD5551234	Provide dial string for DCE to place the call.
OK	DCE responds. Number is dialed.

The call is placed through the phone network. The caller can hear ringback or busy signal from the phone being called. If the person at the other end picks up the phone, the caller and the person at the other end converse. If the speakerphone user decides to mute his speakerphone, the application sends the following to mute the speakerphone.

Command/Response	Description
AT+VLS=5	Enters mute mode. Microphone is disconnected from the line, leaving the speaker only.
OK	DCE responds. The microphone is no longer connected to the line, and the speakerphone is mute.

After a while, the speakerphone user decides to turn the microphone back on (mute off). This is done when the application issues the following command.

Command/Response	Description
AT+VLS=7	No mute. Microphone is reattached to system along with speaker.
OK	DCE responds. Speakerphone with both microphone and speaker is operational.

The conversation ends, and the user hangs up.

Command/Response	Description
ATH	Application tells the modem to terminate the call with standard AT command.
OK	DCE responds.

The speakerphone is now on-hook. The speaker and microphone have been detached from the system, and the modem is now in data mode (+FCLASS=0).

Example #2: Initiating a Stored Number Speakerphone Call

The speakerphone application is loaded. The modem is initially idle in data mode. The user then decides to place a speakerphone call either by entering the number without first going off-hook or by selecting a number previously stored in the application. When the user tells the application to dial, the following events occur:

Command/Response	Description
ATD5551234	Provide a dial string appended with a semicolon (;) for the DCE to place the call and go to command mode.
OK	DCE responds, and the number is dialed.

The call is placed through the phone network in data mode. The modem stays in command mode, and the application should wait for the OK before sending next command.

Command/Response	Description
AT+FCLASS=8	Put the modem into voice mode.
OK	DCE responds: The modem is now in voice mode.
AT+VGT=128	Set the speaker volume to normal level.
OK	DCE responds: The volume level is set.
AT+VLS=7	Start the speakerphone by attaching the internal speaker and microphone to the line; DCE off-hook.
OK	DCE responds: Speakerphone mode is active. The phone is off-hook; dial tone is audible, and the speaker and microphone are ready to use.

The caller can hear ringback or busy signal from the phone being called. If the person at the other end picks up, the caller and the person on the other end converse. The conversation then ends, and the speakerphone user hangs up.

Command/Response	Description
ATH	The application tells the modem to terminate the call with a standard AT command.
OK	DCE responds: The speakerphone is now on-hook. The speaker and microphone have been detached from the system, and the modem is now in data mode (+FCLASS = 0).

Example #3: Answering a Speakerphone Call

The speakerphone application is loaded. The modem is initially idle in data mode. In this mode, the modem is always screening for incoming calls.

Command/Response	Description
RING	DCE reports ringing from remote station. The user decides to pick up the phone, which should initiate the commands listed below in this table.
AT+FCLASS=8	Modem enters voice mode.
OK	DCE responds. Now in voice mode.
AT+VGT=128	Speaker volume set to normal.
OK	DCE responds. Volume level is set.

Command/Response	Description
AT+VLS=7	Call is answered. Attach internal speaker and microphone to the line, DCE off-hook.
OK	DCE responds. Now in speakerphone mode, connected to the line (call is answered).

The speakerphone user picks up the phone and hears the caller from the other end. Conversation continues for awhile. When it ends, the speakerphone user hangs up.

Command/Response	Description
ATH	DTE issues standard command to terminate call.
OK	dCE responds. Speakerphone goes on-hook. Speaker and microphone are detached from system, and modem returns to data mode (+FCLASS = 0).

Note: When the local phone goes off-hook in the middle of a speakerphone call, the speakerphone disconnects, and the DCE returns <DLE>-H to the DTE.

When the speakerphone is on, call waiting (hold operation) is initiated by the following:

Command/Response	Description
ATD!	DTE sends hold command to DCE.
OK	DCE responds.

Example #4: Receiving an Incoming FAX Call in Speakerphone or TAD Mode and Switching to FAX Mode

In this example, the sequence begins with the user or telephone answering device (TAD) taking the speakerphone off-hook and detecting a FAX calling tone from the other end.

Command/Response	Description
<DLE>-c	DCE detects FAX calling tone from the remote FAX and informs the application by sending DLE-c sequence.
AT+FCLASS=1	Application switches modem out of voice mode and into FAX mode.
OK	DCE responds. Now in FAX mode, still off-hook and connected to incoming call.
ATA	Application instructs modem to answer FAX call using standard AT commands.
OK	DCE responds. The call is answered, and modem continues with procedures to establish connection and receive FAX transmission. The application software then disconnects the call when the FAX is done and returns to data mode (+FCLASS=0).

Example #5: Receiving an Incoming Data Call in Speakerphone or TAD Mode and Switching to Data Mode

In this example, the sequence begins at the point of the user or telephone answering device (TAD) taking the speakerphone off-hook and detecting a data calling tone from the other end.

Command/Response	Description
DLE>-e	DCE detects data calling tone from the remote modem and informs the application by sending DLE-e sequence.
AT+FCLASS=0	Application switches modem out of voice mode and into data mode.
OK	DCE responds. Now in data mode, still off-hook and connected to incoming call.
ATA	Application instructs modem to answer data call using standard AT commands.
CONNECT	DCE responds. The call is answered, and modem continues with procedures to establish connection.

Example #6: Switching from Speakerphone Mode to TAD Mode

In this example, the sequence begins with the user in speakerphone mode and intending to put the other end on hold. The application may switch to TAD mode in hold state and play a music Wav file to the line.

Command/Response	Description
AT+VLS=1	Applications switches modem out of speakerphone mode and into TAD mode.by sending DLE-e sequence.
OK	DCE responds. Now in TAD mode.
AT+VTX	DTE selects voice transmit mode.
CONNECT	DCE responds.
<Data>	DTE plays music through modem to remote caller.
<DLE><ETX>	DTE indicates end of voice transmit data.establish connection.
OK	DCE acknowledges switch back to voice command state.

The application may switch back to speakerphone mode by following the example to switch from TAD mode to speakerphone mode.

Example #7: Call Screening and Recording a Message Using TAD—IS101 <dle> Shielded Method

The TAD application is loaded. The modem is initially idle in data mode (+FCLASS = 0).

Command/Response	Description
RING	DCE reports ringing from remote station.
AT+FCLASS=8	The modem enters voice mode.
OK	DCE responds.
AT+VGT=128	Sets speaker volume to normal.
OK	DCE responds.
AT+VSM=132,8000	DTE selects IMA ADPCM with 8.0 kHz sampling rate.
OK	DCE responds.

AT+VSD=128,0	DTE selects normal silence detection sensitivity, and a silence detection interval of 0 seconds. Disables silence detection.
OK	DCE responds.
<DLE>-R	DCE detects another ring and notifies DTE.
AT+VLS=1	The modem answers the call.
OK	DCE is off-hook.

The TAD next plays its greeting message, issues a beep, and records the caller's message.

Command/Response	Description
AT+VTX	DTE selects voice transmit mode.
CONNECT	DCE responds.
<Data>	DTE plays greeting through modem to remote caller.
<DLE><ETX>	DTE indicates end of voice transmit data.
OK	DCE acknowledges switch back to voice command state.
AT+VTS=[933,0,120]	DTE annotates greeting message with a 1.2 second beep.
OK	DCE responds.
AT+VSD=128,50	DTE selects normal silence detection sensitivity and a silence detection interval of 5 s. Enables silence detection.
OK	DEC responds.
AT+VLS=5	The speaker is attached to the system, and the modem is off-hook.
OK	DCE is off-hook.
AT+VRX	DTE selects voice receive mode.
CONNECT	DCE agrees.
<Data>	DCE delivers <DLE> shielded voice message to DTE.

The caller leaves a message and hangs up. The modem detects silence for a specified period of time, and then notifies the DTE that the message being recorded has ended.

Command/Response	Description
<DLE>-s	DCE issues presumed end of message after silence detection interval has elapsed.
<DLE>-!	DTE signals end of voice receive state.
<DLE><ETX>	DCE ends voice transmission to DTR, with this code, and returns back to voice command state.
ATH	DTE issues standard command to terminate call. Speakerphone goes on-hook, speaker and microphone are detached from system, and modem returns to data mode (+FCLASS = 0).
OK	DCE responds.

Example #8: Call Screening and Recording a Message with TAD Using the Wave Driver to Transmit and Receive Voice Samples

In this example, the TAD application is loaded. The modem is in data mode (+FCLASS=0), idle state.

Command/Response	Description
RING	DCE reports ringing from remote station.
AT+FCLASS=8	The modem enters voice mode.
OK	DCE responds.
AT+VGT=128	Sets speaker volume to normal.
OK	DCE responds.
AT+VSM=132,8000	DTE selects IMA ADPCM with 8.0 kHz sampling rate.
OK	DCE responds.
AT+VSD=128,0	DTE selects normal silence detection sensitivity, and a silence detection interval of 0 seconds. Disables silence detection.
OK	DCE responds.
<DLE>-R	DCE detects another ring and notifies DTE.
AT+VLS=1	The modem answers the call.
OK	DCE is off-hook.

The TAD next plays its greeting message, issues a beep, and records the caller's message. The application may transmit voice samples using the wave driver. The application may issue WAVE_OUT_OPEN and WAVE_OUT_WRITE messages to the wave driver. At the end of the greeting message, the application may issue the WAVE_OUT_STOP message to the wave driver.

Command/Response	Description
AT+VTS=[933,0,120]	DTE annotates greeting message with a 1.2 s beep.
OK	DCE responds.

The application may receive voice samples using the wave driver. The application may issue WAVE_IN_OPEN and WAVE_IN_START messages to the wave driver.

Command/Response	Description
AT+VSD=128,50	DTE selects normal silence detection sensitivity and a silence detection interval of 5 seconds. Enables silence detection.
OK	DCE responds.
AT+VLS=5	Speaker is attached to system, and modem is off-hook.
OK	DCE is off-hook.

The caller leaves a message and hangs up. The modem detects silence for a specified period of time, and then notifies the DTE.

Command/Response	Description
<DLE>-s	DCE issues presumed end of message after silence detection interval has elapsed.

At the end of the message, the application may issue the WAVE_IN_STOP message to the wave driver.

Command/Response	Description
ATH	DTE issues standard command to terminate call. DCE goes on-hook, speaker and microphone are detached from system, and modem returns to data mode (+FCLASS=0).
OK	DCE responds.

V.22 Fast Connect Command Example

When the POS server supports V.22 Fast-Connect in V.80 HDLC frame, the modem needs to be issued the following AT command:

Command/Response	Description
AT+MS = V22	Sets modem modulation to V.22.
OK	—
AT+ES = 6,,8	V.42 sync buffer mode (V.80 enabled).
OK	—
AT+ESA = 0,,,,1,0,,	Causes the DCE to generate a 16-bit CRC in the transmit direction in framed submode and check the CRC in the receive direction.
OK	—
AT\F1	Enables V.22 fast connect.
OK	—
ATDT<Host Tel Number>	Dials host telephone number.
CONNECT 1200NoEC	—
<0x19> <0xBE> <0x20> <0x20> <0x19> <0xB1> …	

The first <EM><rate> indicator shows that the modem connected with a TX rate of 1200 bits/s and an RX rate of 1200 bits/s. The <EM><flag> that occurs immediately after the <EM><rate> indicates that a non-flag-to-flag transition has occurred and that the receiver has now been synchronized.

AT Command Cross-Reference Tables

Table 227. Data and General Commands

Command	Description	Reference*
A/	Repeat last command.	—
A	Answer.	V.250 (05/99)
B	Communication standard setting.	—
C	Carrier control.	—
D	Dial.	V.250 (05/99)
E	Echo command.	V.250 (05/99)
F	Online data character echo command.	—
H	Hook control.	V.250 (05/99)
I	Request ID information.	V.250 (05/99)
L	Speaker volume.	V.250 (05/99)
M	Speaker control.	V.250 (05/99)
N	Modulation handshake.	—
O	Return to online data mode.	V.250 (05/99)
P	Select pulse dialing.	V.250 (05/99)
Q	Result code control.	V.250 (05/99)
T	Select tone dialing.	V.250 (05/99)
S	S register control.	V.250 (05/99)
V	DCE response format.	V.250 (05/99)
W	Result code option.	—
X	Extended result code control.	V.250 (05/99)
Y	Long-space disconnect.	—
Z	Reset and recall stored profile.	V.250 (05/99)
&B	V.32 auto retrain.	—
&C	Data carrier detect (DCD) control.	V.250 (05/99)
&D	Data terminal ready (DTR) control.	V.250 (05/99)
&F	Restore factory default configuration.	V.250 (05/99)
&G	V.22bis guard tone control.	—
&J	Auxiliary relay options.	—
&K	Local flow control selection.	—
&M	Asynchronous communications mode.	—
&P	Pulse dial make-to-break ratio selection.	—
&Q	Asynchronous communications mode.	—
&S	Data set ready (DSR) option.	—
&T	Self-test commands.	—
&V	Display active configuration.	—
&W	Store current configuration.	—
&Y	Select stored profile for hard reset.	—
&Z	Store telephone number.	—
\A	Select maximum MNP block size.	—
\B	Send break.	—

* All references are ITU-T recommendations unless otherwise noted.

Table 227. Data and General Commands

\G	Modem port flow control.	—
\J	Adjust bits/s rate control.	—

* All references are ITU-T recommendations unless otherwise noted.

Table 227.

Command	Description	Reference*
\J	Adjust bits/s rate control.	—
\K	Set break control.	—
\N	Select error control mode.	—
\Q	Local flow control selection.	—
\R	Ring indicator off after answer.	—
\T	Inactivity timer.	—
\V	Protocol result code.	—
\X	XON/XOFF pass through	—
%B	View numbers in blacklist.	—
%C	Data compression control.	—
%E	Auto fallback/fallforward control.	—
-C	Data calling tone.	—
-V90	Enable/disable V.90 settings.	—
#UD	Unimodem diagnostics.	—
+A8E	V.8 and V.8bis operation control.	—
+A8T	Send V.8bis signal and/or message.	—
+DR	Data compression reporting.	V.250 (05/99)
+DS	Data compression.	V.250 (05/99)
+EB	Brake handling in error control operations.	V.250 (05/99)
+EFCS	32-Bit frame check sequence	V.250 (05/99)
+ER	Error control reporting.	—
+ES	Error control selection.	V.250 (05/99)
+ESA	Set up error control parameters.	—
+ESR	Selective repeat.	V.250 (05/99)
+ETBM	Call termination buffer management.	V.250 (05/99)
+FCLASS	Service class indicator.	V.253 (02/98)
+GCAP	Request complete capabilities list	V.250 (05/99)
+GCI	Country of installation.	V.250 (05/99)
+GMI	Manufacturer identification.	V.250 (05/99)
+GMM	Modem identification.	V.250 (05/99)
+GMR	Request revision information.	V.250 (05/99)
+IFC	DTE-DCE local flow control.	V.250 (05/99)
+ILRR	DTE-DCE local rate reporting.	V.250 (05/99)
+IPR	Fixed DTE rate.	V.250 (05/99)
+ITF	Transmit flow control threshold	—
+MR	Modulation reporting control	V.250 (05/99)
+MS	Modulation selection	V.250 (05/99)

* All references are ITU-T recommendations unless otherwise noted.

Table 228. V.92 and V.44 Commands

Command	Function	Reference*
+DCS	Select data compression algorithm	V.250
+DS44	V.44 data compression	V.250
+PCW	Call waiting enable	V.250
+PIG	PCM upstream ignore	V.250
+PMH	Modem on-hold enable	V.250
+PMHD	Modem on-hold DTMF dialing	V.250
+PMHF	V.92 modem on-hold flash hook	V.250
+PMHR	Initiate modem on hold	V.250
+PMHT	Modem on-hold timer	V.250
+PQC	V.92 Phase 1 and Phase 2 control	V.250
+PSS	Use short sequence	V.250

* All references are ITU-T recommendations unless otherwise noted.

Table 229. FAX Class 1/Class 1.0/Class 2/Class 2.0/2.1 Commands Summary

Command	Function	Reference*
+FAA	Set DCE adaptive answer mode	T.32 (08/95)
+FAP	Set DCE addressing and polling capabilities	T.32 (08/95)
+FBS	DCE buffer size reporting (read only)	T.32 (08/95)
+FBO	Phase C data bit order conversion services offered by DCE	T.32 (08/95)
+FBU	DCE to DTE HDLC frame reporting control	T.32 (08/95)
+FCC	Allows DTE to set DCE capabilities	T.32 (08/95)
+FCI	DCE reports received remote ID, CSI	T.32 (08/95)
+FCLASS	Service class identification and control	T.32 (08/95)
+FCO	Facsimile connection report to DTE	T.32 (08/95)
+FCQ	Copy quality checking and correction control	T.32 (08/95)
+FCR	Indicates DCE's ability to receive message data	T.32 (08/95)
+FCS	DCE reports negotiated session parameters, DCS	T.32 (08/95)
+FCT	DTE Phase C time-out control	T.32 (08/95)
+FDM	Transition to data mode (not supported)	T.32 (08/95)
+FDR	Data reception transition command	T.32 (08/95)
+FDT	Data transmission request	T.32 (08/95)
+FEA	Phase C received EOL alignment (not implemented)	T.32 (08/95)
+FET	DCE post page message response	T.32 (08/95)
+FFC	Image format conversion setting	T.32 (08/95)
+FFD	Report received diagnostic message frame (not supported)	T.32 (08/95)
+FHS	Call termination status indicator	T.32 (08/95)
+FHR	Report received HDLC frame	T.32 (08/95)
+FHT	Report transmitted HDLC frame	T.32 (08/95)
+FIE	Procedure interrupt (not implemented)	T.32 (08/95)
+FIP	Initialize facsimile parameters	T.32 (08/95)
+FIS	Report remote capabilities, DIS	T.32 (08/95)

* All references are ITU-T recommendations unless otherwise noted.

Table 229. FAX Class 1/Class 1.0/Class 2/Class 2.0/2.1 Commands Summary(Continued)

Command	Function	Reference*
+FIT	DTE inactivity timer (not supported	T.32 (08/95)
+FKS	Session termination command	T.32 (08/95)
+FLI	DCE transmits local ID string, TSI or CSI	—
+FLO	Set DTE-DCE flow control	T.31 (08/95)
+FLP	DTE document to poll indicator	T.32 (08/95)
+FMI	Manufacturer identification.	T.31 (08/95)
+FMM	Product identification.	T.31 (08/95)
+FMR	Version/revision information.	T.31 (08/95)
+FMS	Minimum Phase C speed control	T.32 (08/95)
+FNC	Response reporting nonstandard command (NSC)	T.32 (08/95)
+FNF	Response reporting nonstandard facilities (NSF)	T.32 (08/95)
+FNR	Negotiation message reporting control parameters	T.32 (08/95)
+FND	Nonstandard message data indication	T.32 (08/95)
+FNS	Response reporting nonstandard setup (NSS)	T.32 (08/95)
+FPA	Selective polling address	T.32 (08/95)
+FPI	Report remote ID, CIG	T.32 (08/95)
+FPO	Remote document available for polling indicator	T.32 (08/95)
+FPP	DCE-DTE packet protocol control	T.32 (08/95)
+FPR	Set DTE-DCE FAX port rate	T.31 (08/95)
+FPS	T.30 Phase C page reception	T.32 (08/95)
+FPW	PassWord (sending or polling)	T.32 (08/95)
+FRH	Receive HDLC data with n carrier	T.31 (08/95)
+FRM	Receive FAX data with n carrier	T.31 (08/95)
+FRQ	Receive quality thresholds	T.32 (08/95)
+FRS	Receive silence	T.31 (08/95)
+FRY	ECM retry count	T.32 (08/95)
+FSA	Destination subaddress	T.32 (08/95)
+FSP	Request to poll	T.32 (08/95)
+FTC	Response reports remote capabilities and intentions	T.32 (08/95)
+FTI	Response reports remote ID	T.32 (08/95)
+FTH	Transmit HDLC data with n carrier	T.31 (08/95)
+FTM	Transmit FAX data with n carrier	T.31 (08/95)
+FTS	Transmission silence	T.31 (08/95)
+FVO	Transition to voice (not supported)	T.32 (08/95)

* All references are ITU-T recommendations unless otherwise noted.

Note: The description of the V.92 and V.44 commands is based on the USRobotics's implementation of the commands specified in ITU-T Recommendation V.250 prerelease for V.92 and V.44.

Table 230. AT Voice Commands Summary

Command	Description	Reference*
+FCLASS=8	Enter voice mode.	V.253 (02/98)
+VCID	Caller-ID.	V.253 (02/98)
+VDR	Distinctive ring.	V.253 (02/98)
+VEM	Event reporting and masking.	IS-101
+VGM	Microphone gain.	—
+VGR	Receive gain selection.	V.253 (02/98)
+VGS	Speaker gain.	—
+VGT	Speaker volume control.	V.253 (02/98)
+VIP	Initialize voice parameters.	—
+VIT	DTE/DCE inactivity timer.	V.253 (02/98)
+VNH	Automatic hang-up control.	V.253 (02/98)
+VLS	Analog source/destination selection and DTMF/tone reporting.	V.253 (02/98)
+VPR	Select DTE/DCE interface rate.	—
+VRA	Set ringback goes away timer.	V.253 (02/98)
+VRN	Set ringback never came timer.	V.253 (02/98)
+VRX	Enter voice receive state.	V.253 (02/98)
+VSD	Set silence detection timer.	V.253 (02/98)
+VSM	Voice compression method.	V.253 (02/98)
+VSP	Speakerphone on/off.	—
+VTD	Set beep tone duration timer.	V.253 (02/98)
+VTR	Start full-duplex voice transmission and reception process.	—
+VTS	DTMF/tone generation.	V.253 (02/98)
+VTX	Enter voice transmit state.	V.253 (02/98)

* All references are ITU-T recommendations unless otherwise noted.

Table 231. T.35 Country Code Table

TAPI Code (decimal)	Country	T.35 Code Used in +GCI (hex)	Modem Internal CountryID (hex)
0	Europe (TBR21 Countries)	FB	2A
213	Algeria	—	68
376	Andorra	—	5D
244	Angola	—	69
54	Argentina	07	33
61	Australia	09	01
43	Austria	0A	0F
973	Bahrain	—	62
880	Bangladesh	0D	4C
104	Barbados	0E	46
501	Belize	—	58
55	Brazil	16	2B
375	Belarus	1E	4E

* Country code formerly associated with the German Democratic Republic.

Table 231. T.35 Country Code Table(Continued)

TAPI Code (decimal)	Country	T.35 Code Used in +GCI (hex)	Modem Internal CountryID (hex)
32	Belgium	0F	02
591	Bolivia	14	34
387	Bosnia	—	5F
673	Brunei	—	7B
359	Bulgaria	1B	2C
238	Cabo Verde (Cape Verde)	—	6A
855	Cambodia	—	7C
107	Canada	20	1C
—	Canary Island	—	6B
—	Caribbean	—	7F
56	Chile	25	35
86	China	26	11
57	Colombia	27	36
242	Congo	—	6C
506	Costa Rica	2B	40
385	Croatia	F5	4F
53	Cuba		59
357	Cyprus	2D	2D
420	Czech	2E	28
45	Denmark	31	03
593	Ecuador	35	37
20	Egypt	36	45
503	El Salvador	—	57
291	Eritrea	—	6D
372	Estonia	FA	51
251	Ethiopia	—	6E
500	Falkland	—	5A
358	Finland	3C	04
33	France	3D	05
220	Gambia	—	6F
49	Germany	04* or 42	06
233	Ghana	—	70
350	Gibraltar	—	5E
30	Greece	46	21
124	Guam	48	47
502	Guatemala	49	3F
245	Guinea-Bissau	—	71
592	Guyana	—	5B
504	Honduras	—	56
852	Hong Kong	50	1B
36	Hungary	51	22
354	Iceland	52	2E

* Country code formerly associated with the German Democratic Republic.

Table 231. T.35 Country Code Table(Continued)

TAPI Code (decimal)	Country	T.35 Code Used in +GCI (hex)	Modem Internal CountryID (hex)
91	India	53	1E
62	Indonesia	54	17
98	Iran	—	63
353	Ireland	57	1A
972	Israel	58	30
39	Italy	59	08
81	Japan	00	10
962	Jordan	—	64
254	Kenya	—	72
965	Kuwait	62	48
371	Latvia	F8	52
961	Lebanon	64	4D
423	Liechtenstein	68	42
370	Lithuania	C7	50
352	Luxembourg	69	29
389	Macedonia	—	61
265	Malawi	—	73
60	Malaysia	6C	13
356	Malta	70	53
230	Mauritius	—	74
52	Mexico	73	1D
212	Morocco	77	54
258	Mozambique	—	75
95	Myanmar	—	7D
977	Nepal	—	7E
31	Netherlands	7B	07
64	New Zealand	7E	09
505	Nicaragua	7F	41
234	Nigeria	—	76
47	Norway	82	0A
968	Oman	83	4B
92	Pakistan	84	32
507	Panama	85	38
595	Paraguay	87	3B
51	Peru	88	39
63	Philippines	89	20
48	Poland	8A	25
351	Portugal	8B	18
121	Puerto Rico	8C	3D
974	Qatar	—	65
40	Romania	8E	49
7	Russia	B8	2F

* Country code formerly associated with the German Democratic Republic.

Table 231. T.35 Country Code Table(Continued)

TAPI Code (decimal)	Country	T.35 Code Used in +GCI (hex)	Modem Internal CountryID (hex)
966	Saudi Arabia	98	31
—	Serbia	—	60
248	Seychelles	—	77
65	Singapore	9C	14
421	Slovakia	C5	27
386	Slovenia	C6	26
27	South Africa	9F	24
82	South Korea	61	12
34	Spain	A0	0B
94	Sri Lanka	A1	4A
597	Suriname	—	5C
46	Sweden	A5	0C
41	Switzerland	A6	0D
963	Syria	—	66
886	Taiwan	FE	15
255	Tanzania	—	78
66	Thailand	A9	16
216	Tunisia	—	55
90	Turkey	AE	23
256	Uganda	—	79
380	Ukraine	B2	44
971	United Arab Emirates (UAE)	B3	43
44	United Kingdom	B4	0E
1	United States of America	B5	19
598	Uruguay	B7	3C
58	Venezuela	BB	3A
84	Vietnam	BC	1F
123	Virgin Islands (British)	19	3E
967	Yemen	—	67
260	Zambia	—	7A

* Country code formerly associated with the German Democratic Republic.

Uninstallation

Note: These instructions only apply to this USRobotics modem. If the modem you'll be uninstalling was made by another manufacturer or is an another USRobotics modem, refer to that modem's documentation for instructions.

Windows Vista

1. Click Windows **Start** > **Control Panel** > **Programs** > **Programs and Features**.
2. Select **U.S. Robotics V.92 USB Modem**, then click **Uninstall**.
3. If prompted, click **Continue**.

   When the computer completes the uninstallation, disconnect the phone cord from the modem and physically remove the modem from the computer.

Caution: Always disconnect all telephone lines from the wall outlet before servicing or disassembling this equipment.

Windows XP

1. Click Windows **Start** > **Control Panel** and double-click **System**.
2. Click the **Hardware** tab and click the **Device Manager** button.
3. Double-click to expand **Modems**.
4. Right-click **U.S. Robotics V.92 USB Modem** and select **Uninstall**. To confirm the removal of the device from your system, click **OK**.

   When the computer completes the uninstallation, disconnect the phone cord from the modem and physically remove the modem from the computer.

Caution: Always disconnect all telephone lines from the wall outlet before servicing or disassembling this equipment.

Windows 2000

1. Click Windows **Start** > **Settings** > **Control Panel** and double-click **System**.
2. Click the **Hardware** tab and click the **Device Manager** button.
3. Double-click to expand **Modems**.
4. Right-click **U.S. Robotics V.92 USB Modem** and select **Uninstall**. To confirm the removal of the device from your system, click **OK**.

   When the computer completes the uninstallation, disconnect the phone cord from the modem and remove the modem from the computer.

Caution: Always disconnect all telephone lines from the wall outlet before servicing or disassembling this equipment.

Linux Kernal 2.4.20 or Higher and Mac OS X 10.4.3 or Later

To uninstall your modem, disconnect the phone cord from the modem and remove the modem from the computer.

Caution: Always disconnect all telephone lines from the wall outlet before servicing or disassembling this equipment.

Troubleshooting

General

This procedure addresses a number of symptoms that you might experience with your modem.

1. Verify that the cables are connected correctly. This includes all cables connecting the telephone line, the modem, and your computer.
2. If possible, test your modem with a different phone cord and/or wall jack.
3. Try a different USB port on the computer. If a USB hub is being used, try plugging directly into the USB port on the computer.
4. Shut down and restart your computer.
5. Verify that the modem was installed correctly:

Windows Vista

A. Click Windows **Start** > **Control Panel**.
B. Click **Hardware and Sound**.
C. Click **Phone and Modem Options** and then click the **Modems** tab.
   You should see **U. S. Robotics V.92 USB Modem** and a COM port setting. If you do not see a description of your modem, repeat the installation procedure.
D. On the **Modems** tab, select the description of your modem and click **Properties**.
E. On the **Diagnostics** tab, click the **Query Modem** button.
   If you see a series of commands and responses from the modem, the installation was successful.
   If you do not see a description of your modem, the installation was not successful; repeat the installation procedure.

Windows XP

A. Click Windows **Start** > **Control Panel**.
B. Click **Phone and Modem Options** and then click the **Modems** tab.
   You should see **U. S. Robotics V.92 USB Modem** and a COM port setting. If you do not see a description of your modem, repeat the installation procedure.
C. Highlight the description of your new modem, and click **Properties**.
D. Click the **Diagnostics** tab and then click the **Query Modem** button.
   If you see a series of commands and responses from the modem, the installation was successful.
   If you do not see a description of your modem, the installation was not successful; repeat the installation procedure.

Windows 2000

A. Click Windows **Start** > **Settings** > **Control Panel**.
B. Double-click the **Phone and Modem Options** icon.
C. Click the **Modems** tab.
   Make sure that **U. S. Robotics V.92 USB Modem** is selected. If you do not see a description of your modem, repeat the installation procedure.
D. Click the **Properties** button.
E. Click the **Diagnostics** tab.
F. Click the **Query Modem** button.
   If you see a series of commands and responses from the modem, the installation was successful.
   If you do not see a series of commands and responses, the installation was not successful; repeat the installation procedure.

Linux 2.4.20 or higher

A. Verify you have a USB modem driver (CDC ACM) compiled into a Linux kernel 2.4.20 or higher or as a loadable module for your kernel.
B. Verify the **PWR** LED on the modem is lit.
C. Unplug the USB modem from your computer, then plug the modem back in. If the **PWR** LED does not light, try another USB port on your computer.
D. For advanced troubleshooting information, see the *Linux* folder on the USRobotics Installation CD-ROM

Mac 10.4.3 or later

A. Go to **Apple** > **System Preferences** > **Network**.
B. Select **USB Modem** from the **Show** menu. If **USB Modem** is not listed, repeat the installation procedure.
C. Select the **Modem** tab.
D. Verify that **USRobotics 56K USB Modem** is shown as your current modem.
   If the modem is not selected; scroll through the **Modem** list, select **USRobotics 56K USB Modem** and click **Apply Now**.
   If the installation was still not successful; repeat the installation procedure making sure you plug the modem directly in to a USB port on your computer.

My PWR LED is not lit.

Solution 1:

The PWR LED does not light until the drivers are installed. Make sure that the drivers are installed correctly by following the general troubleshooting procedure.

Solution 2:

When you insert or remove a USB cable from your computer, the computer should indicate activity such as hard disk activity or an hourglass cursor. If the computer does not show any sign of activity, your system may not be properly communicating with the USB ports. Try these techniques to determine whether the ports are communicating properly:

1. Try using a different USB port on the computer. If you are using a USB hub, try using a USB port on the computer instead.
2. If the modem has worked previously and you removed the USB cable from the computer and then reconnected it, try another USB port. The modem may have been installed originally on the other USB port.
3. **Windows Users**: Your USB port may not be enabled. To ensure that USB is enabled on your system:

   A. Go to the device manager:

   Windows Vista:

   1.Click Windows **Start** > **Control Panel** > **System and Maintenance** > **System**.

   2.Under **Tasks**, click **Device Manager**.

   Windows XP:

   1.Click Windows **Start** > **Control Panel**.

   2.Double-click **System**.

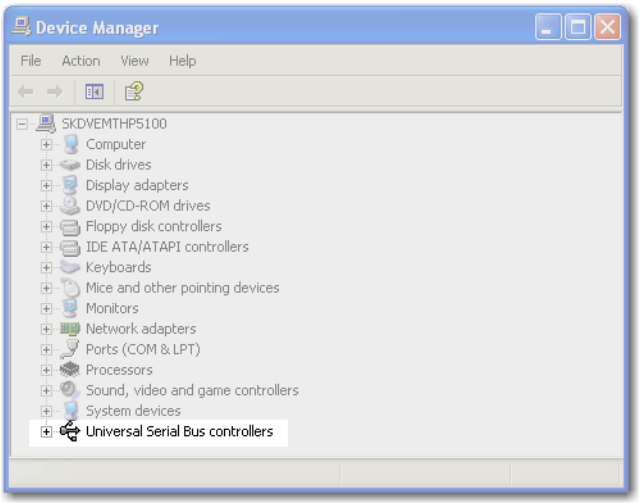
   3.On the **Hardware** tab, select **Device Manager.**

   Windows 2000:

   1.On the desktop, right-click **My Computer** and select **Properties**.

   2.On the **Hardware** tab, click **Device Manager**.

   3.Look for an entry for USB controllers:



   B. If the device manager does not have an entry for USB controllers, you must enable USB in the computer's BIOS. For instructions, check with your computer manufacturer's technical support. Once your USB port has been enabled in your system's BIOS, Windows will automatically detect and install USB support when you restart your computer.

My communication software does not recognize the modem.

Solution 1:

Your communication software may not function properly if any of the following are true:

- More than one version of the software is installed on your computer.
- You are using an old version of the software.
- More than one communication software package is installed on your computer.
- USRobotics highly recommends using the communication software provided with the modem on the USRobotics Installation CD-ROM.

Solution 2:

Your communication software may be selecting the wrong modem type. For instructions on adjusting the modem settings in your software, refer to your communication software's documentation.

Solution 3:

Windows Users: Make sure that your Windows Dial-Up Networking connection is using the correct modem.

Windows Vista:

1. Click Windows **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Manage network connections**.
2. Right-click the description of the dial-up networking connection, and select **Properties**.
3. Make sure that your new modem is selected.

Windows XP:

1. Click Windows **Start** > **Control Panel**, and double-click **Network Connections**.
2. Double-click the description of the dial-up networking connection, and select **Properties**.
3. Make sure that your new modem is selected.

Windows 2000:

1. Click Windows **Start** > **Settings** > **Network and Dial-up Connections**.
2. Double-click the description of the dial-up networking connection, and select **Properties**.
3. Make sure that your new modem is selected.

My modem doesn’t dial out or doesn’t answer incoming calls.

Solution 1:

You may have a bad telephone cord. Try another telephone cord.

Solution 2:

You may have plugged the modem's phone cord into a digital line. Contact the department responsible for your phone system if you are unsure whether your phone line is analogue or digital.

Solution 3:

If your phone system requires an access code to access an outside line, be sure to include the code in the number that you are dialling.

Solution 4:

If your voice mail alters your dial tone when messages are waiting, restore the normal dial tone by retrieving your messages before using the modem to dial out.

My modem tries to connect to another modem, but the connection fails.

Solution:

You may have a poor connection. Try placing the call again.

My modem or computer is performing erratically.

Solution:

Some USB host controllers have power output issues which may cause erratic performance for any USB device or the computer itself when any USB device is in use. Try using a powered USB hub or check with the manufacturer of your USB host controller for a possible driver update.

My modem is not achieving a 56K Internet connection.[1]

Solution 1:

Contact your ISP to verify that the number you are dialling supports V.90/V.92 speeds.

Solution 2:

Contact your telephone company to verify that the telephone line for your modem supports V.90/V.92 speeds.

Solution 3:

Line interference or the routing of the telephone call to your ISP may be causing a slower connection speed. Try placing the call again.

Solution 4:

Verify that the modem is connecting to a V.90/V.92 server. A pair of 56K modems will not connect to each other at 56K speeds.

1.Capable of receiving at up to 56 Kbps and sending at up to 48 Kbps (or 31.2 Kbps with V.90 server). Due to FCC regulations on power output, receiving speeds are limited to 53.3 Kbps. Actual speeds may vary. V.92 and V.90 features require compatible phone line and support from your Internet Service Provider (ISP). USRobotics modems fea-turing V.92 enhancements are backward compatible and will negotiate the highest posible speed when connecting to an ISP. Typical recieve speeds range from 40 Kbps to 53 Kbps.

Additional Information

For regulatory and warranty information, see the *User Guide* on the USRobotics Installation CD-ROM.

For operation and configuration information, see the *User Guide* on the USRobotics Installation CD-ROM.

For troubleshooting and technical support, see:

1. The *User Guide* on the USRobotics Installation CD-ROM.
2. The Support section of the USRobotics Web site at www.usr.com/support/.
3. Many of the most common difficulties that users experience have been addressed in the FAQ and Troubleshooting Web pages for your 56K USB Modem. The Support pages also contain current support contact information and documentation.
4. The support contact information on the last page of this guide.

Regulatory Information

Declaration of Conformity

U.S. Robotics Corporation

935 National Parkway

Schaumburg, IL 60173

U.S.A.

declares that this product conforms to the FCC's specifications:

Part 15, Class B

Operation is subject to the following conditions:

1) this device may not cause harmful electromagnetic interference, and

2) this device must accept any interference received including interference that may cause undesired operations.

This equipment complies with Part 15 for Home and Office use.

Caution to the User: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Radio and Television Interference:

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. If this equipment is not installed and used in accordance with the manufacturer's instructions, it 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 receiver.
- Connect the equipment to 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.

FCC Part 68 Registration

Customer Information

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US: AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

This equipment uses the following Universal Service Order Code (USOC) jacks: RJ11C.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See this document for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US: AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3).

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If the equipment is causing harm to the telephone network, the telephone company may request that you

disconnect the equipment until the problem is resolved.

There are no serviceable parts in this equipment.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

UL Listing/CUL Listing:

If you use your own telephone cable, you must use a minimum No. 26 AWG and FCC compliant telephone cable.

This Information Technology Equipment (ITE) is UL Listed and C-UL Listed for both the US and Canadian markets respectively for the uses described in the User Guide. Use this product only with UL Listed Information Technology Equipment (ITE).

Fax Branding:

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 the 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, an identification of the business or other entity, or other individual sending the message, and the telephone number of the sending machine or of 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 modem, refer to the BVRP software on the CD-ROM that shipped with your modem. If you are using a different communication software program, refer to its manual.

For Canadian Modem Users

Industry Canada (IC)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled Digital Apparatus, ICES-003 of Industry Canada.

Customer Information

Notice: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Notice: The Ringer Equivalence Number (REN) for this terminal equipment is 0.2B. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on a interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

CE Compliance

Declaration of Conformity

We, U.S. Robotics Corporation of 935 National Parkway, Schaumburg, Illinois, 60173-5157 USA, declare under our sole responsibility that the product, USRobotics 56K USB Modem, Model 5637, to which this declaration relates, is in conformity with the following standards and/or other normative documents.

EN60950-1

EN55022

EN55024

We hereby declare that the above named product is in conformity with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The conformity assessment procedure referred to in Article 10(3) and detailed in Annex II of Directive 1999/5/EC has been followed.

An electronic copy of the original CE Declaration of Conformity is available at the U.S. Robotics website: www.usr.com

Network Compatibility Declaration

This equipment is designed to work satisfactorily on all European Union PSTN (Public Switching Telephone Network) networks.

This equipment is supplied with a suitable PSTN connector for the country in which it was supplied. If it is required to use this equipment on a different network to the one for which it was supplied, the user is advised to contact the vendor for guidance regarding connection.

Support

Support / Assistance / Servizio assistenza / Asistencia técnica / Destek / Υποστήριξη

1. USRobotics: www.usr.com/support/

Model Number	Serial Number
5637-OEM	

2.

United States	www.usr.com/emailsupport	(888) 428-9450
Canada	www.usr.com/emailsupport	(888) 428-9450
Austria / Österreich / Ausztria	www.usr.com/emailsupport/de	07110 900 116
Belgium / België	www.usr.com/emailsupport/nl	070 23 35 45
Belgium/ Belgique	www.usr.com/emailsupport/be	070 23 35 46
Czech Republic / Česká republika	www.usr.com/emailsupport/cz	
Denmark	www.usr.com/emailsupport/ea	38323011
Finland	www.usr.com/emailsupport/ea	08 0091 3100
France	www.usr.com/emailsupport/fr	0825 070 693
Germany / Deutschland	www.usr.com/emailsupport/de	0180 567 1548
Greece / Ελλάδα	www.usr.com/emailsupport/gr	
Hungary / Magyarország	www.usr.com/emailsupport/hu	0180 567 1548
Ireland	www.usr.com/emailsupport/uk	1890 252 130
Italy / Italia	www.usr.com/emailsupport/it	39 02 69 43 03 39
Luxembourg / Luxemburg	www.usr.com/emailsupport/be	342 080 8318
Middle East/Africa	www.usr.com/emailsupport/me	+44 870 844 4546
Netherlands / Nederland	www.usr.com/emailsupport/nl	0900 202 5857
Norway	www.usr.com/emailsupport/ea	23 16 22 37
Poland / Polska	www.usr.com/emailsupport/pl	
Portugal	www.usr.com/emailsupport/pt	21 415 4034
Russia / Россия	www.usr.com/emailsupport/ru	8 800 200 20 01
Spain / España	www.usr.com/emailsupport/es	902 117964
Sweden / Sverige	www.usr.com/emailsupport/se	08 5016 3205
Switzerland / Schweiz / Suisse / Svizzera	www.usr.com/emailsupport/de	0848 840 200
Turkey / Türkiye	www.usr.com/emailsupport/tk	0212 444 4 877
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