Chapter 4
Option Configuration

GENERAL

This chapter explains how to configure BitSURFR Pro parameters to fit your application. Each configuration option is grouped by function; associated commands are provided to the right of the headings. PPP, AIMux, BONDING, V.25bis dialer, and Caller ID delivery and security options are also discussed in detail in their respective chapters.

CONFIGURATION COMMANDS

Configuration commands are issued either by LocalMenu or AT commands. If you need more information about the format and operation of AT commands, refer to Chapter 3 in this guide. If you wish to use LocalMenu to configure your BitSURFR Pro, refer to the *Getting Started Guide* for step-by-step instructions.

CONFIGURATION OPTIONS

The BitSURFR Pro supports a number of configuration options. The parameter values of each option can be saved in memory (stored profiles) and retained even when the unit is powered off.

The BitSURFR Pro's nonvolatile memory is used for stored profiles and stored telephone numbers.

CONFIGURATION PROFILES

The BitSURFR Pro contains three sets of configuration options:

- *Factory defaults* (also referred to as factory profiles) are stored permanently in the BitSURFR Pro.
- *Active settings* (also referred to as active profiles) are stored temporarily in the BitSURFR Pro.
- *Custom settings* (also referred to as stored profiles) are stored in nonvolatile memory.

These option storage methods are called profiles. To prevent accidental changes, the ISDN network options are stored separately from other options and can be saved, loaded, or reset only by using the switch, store, and load commands.

Active Profile

The active profile holds the current configuration option settings and is used by the BitSURFR Pro for all operations and functions. When options are changed, the active profile is changed.

☞ **Note**

The active profile is lost when the BitSURFR Pro is unplugged or loses power. The stored profile is loaded into the active profile according to the ***&Y*** *command setting when the BitSURFR Pro is plugged in.*

Stored Profiles

When the most suitable active configuration is established, it can be saved in a stored profile to be recalled on powerup or loaded back into the active profile at any time. There are two stored profiles available, referred to as *Stored Profile 0* and *Stored Profile 1*.

Factory Profile

The factory profiles are permanently stored in the BitSURFR Pro, and can always be loaded into the active configuration. Figure 4-1 illustrates how the active, stored and factory profiles interact.

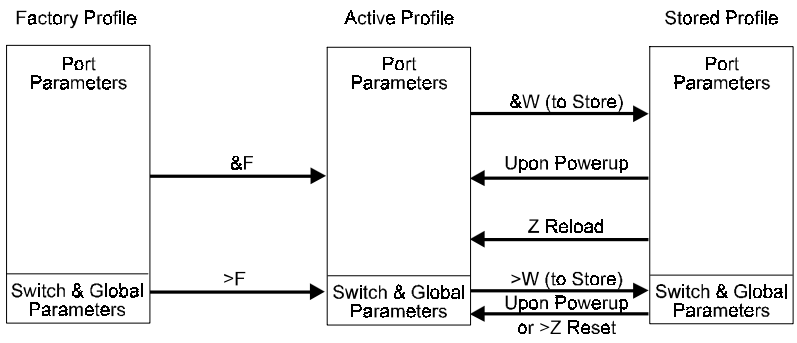

Figure 4-1
Profile Storage and Recall

Changing the Configuration While On-line

The value of any configuration option can be changed while the BitSURFR Pro is on-line. However, changes to switch options do not take effect until the new configuration is saved by entering the **>W** command and the network is reset by entering the **>Z** command.

LOADING AND SAVING CONFIGURATION

The active profile you create can be stored or the factory default profile can be loaded and saved in order to change the BitSURFR Pro's operating configuration.

Powerup Stored Profile

Use the **&Y** command to instruct the BitSURFR Pro which stored profile to load when power is applied, or when the Data Terminal Ready (DTR) reset (**&D3**) option is in effect.

Command	Operation
&Y0	Loads active from stored profile 0 upon powerup or DTR reset.
&Y1	Loads active from stored profile 1 upon powerup or DTR reset

Loading Stored Profile Z and >Z

Use the **Z** command to load the port options or the **>Z** to load the switch options from the stored profile.

Command	Operation
Z0	Loads the active profile port options from stored profile 0 (except switch options).
Z1	Loads the active profile port options from stored profile 1 (except switch options).
>Z	Loads the active profile switch options from the stored profile and restarts the network.

Loading Factory Profile &F and >F

Use the **&F** and **>F** commands to load the active port and switch profiles from the Quick Setup factory profile

☞ **Note**
Reloading the factory switch profile will overwrite the current switch configuration.

Command	Operation
&F1	Loads the active profile port options from the Quick Setup factory profile 1 (except switch and global options).
&F2	Loads the active profile port options from the Quick Setup factory profile 2 (except switch and global options).
&F3	Loads factory default port options from the Quick Setup factory profile 3 (except switch and global options).
>F	Loads the active profile switch and global options from the factory default profile.

The Quick Setup factory default profiles are industry standard for compatibility with most PCs and communications links. They are stored permanently in the BitSURFR Pro and you cannot modify them. The Quick Setup factory default profiles are listed in Appendix D.

Saving the Active Profile &W and >W

The BitSURFR Pro performs many functions based on configuration values located in the active profile. Selected active profile values can be changed with AT commands to meet current system requirements.

Some active port profile values can be changed and then saved in the stored profile using the **&W** command. When power is applied to the BitSURFR Pro, it automatically loads the stored profile into the active profile. This can save time once a proven configuration is established. The **>W** command stores switch values for use when power is reapplied.

Command	Operation
&W0	Stores active profile to stored profile 0 (except switch and global options).
&W1	Stores active profile to stored profile 1 (except switch and global options).
>W	Stores switch and global options to stored profile.

DISPLAYING CONFIGURATION AND INFORMATION

The port, switch, and global configuration can be displayed using view commands. This is a convenient way to review your BitSURFR Pro configuration without having to display the value for each individual option.

Display Port Configuration &V

To display the current port configuration use the **&V** command. This command is helpful in determining if the BitSURFR Pro is configured properly for your PC or terminal.

Command	Operation
&V	Display port configuration options (except for V.120 and stored dial strings)
&V=E	Display V.120 configuration options
&V=Z	Display stored dial strings

Display Global Configuration >V=G

To display the current global configuration options, use the **>V=G** command. The **>V=G** command displays the switch configuration as well as parameters relating to provisioning. This command is helpful in determining if the BitSURFR Pro is configured properly for the network.

Display DN, SPID, and TEI >V=C

To display the current DN, SPID, and TEI values, use the **>V=C** command. This command is helpful in determining if your BitSURFR Pro is configured properly for your network.

Display Product Information

Use the **I** command to display product information.

Command	Operation
I0	Product ID ("960")
I1	ROM checksum
I2	ROM checksum verification
I3	Firmware revision
I4	Numeric capability string
I8	Verbose capability string
I9	Plug-and-Play ID (use for Plug-and-Play operating systems)
I10	Displays ISDN link layer status.

DATE AND TIME

The BitSURFR Pro can keep the date and time internally. This date and time will be displayed on an analog Caller ID box when an incoming call is received on one of the BitSURFR Pro's analog ports.

Set the Date and Time

The date is a six-digit value that includes the month, date and year (MM/DD/YY). The time is a six-digit value that includes the hour, minute and second (HH:MM:SS). The time must be entered in 24-hour clock format.

When the BitSURFR Pro is first powered up, the time will begin incrementing from 00:00:00, and may be used to keep the elapsed time. When you enter the correct date and time, the BitSURFR Pro will keep the accurate date and time until the BitSURFR Pro loses power.

Command	Operation
>D0=	Sets the date
>D1=	Sets the time

CONFIGURATION OPTIONS

The following sections describe each of the configuration options. For each section, the AT commands associated with the option are provided to the right of the option heading name.

ISDN Network Options

To program the ISDN network options, you must have the Terminal Endpoint Identifiers (TEIs) that are usually automatically assigned within the equipment, Service Profile Identifier (SPID), and Directory Numbers (DNs) agreed upon with the telephone company at subscription time. You must also know the central office switch type. Refer to Appendix B for instructions on how to order your ISDN service if you have not already done so. Configuration information will be provided to you at the time of installation.

Ideally, you should first set the network options to a known state (factory default settings). This can be done by using the **>F** command to reset all of the network parameters to factory defaults or by using the **!C0=x** command to set the network switch type. If the **>F** command is used, the network switch type needs to be set. The BitSURFR Pro does not use network options that have been changed, until the options are saved to the stored profile (**>W**) and the network has been restarted (**>Z**). This means that at the end of setup (i.e., changing any of the network options), enter the **>W** command to save the network options to the stored profile and enter the **>Z** command to restart the network using the new network options.

Network Switch Type !C0

To make voice or data calls with the BitSURFR Pro, the unit must be configured to match the central office switch type of the ISDN line that is being used. The following table lists switch types supported by the BitSURFR Pro.

☞ **Note**
Changing the switch type causes all of the other switch options to be set to their factory default settings.

Command	Operation
!C0=0	AT&T 5ESS.
!C0=1	Northern Telecom DMS-100
!C0=2	National ISDN-1 (NI-1)*

** default*

Switch Software Version !C1

These commands select the software version that the central office switch is using when the network switch type is set for AT&T 5ESS (**AT!C0=0**)

Command	Switch Type
!C1=0	AT&T Point-to-Point
!C1=1	AT&T Multi-Point*

** default*

These commands select the software version that the central office switch is using when the network switch type is set for Northern Telecom DMS100 (**AT!C0=1**).

Command	Switch Type
!C1=2	DMS100 PVC IC-0
!C1=3	DMS100 PVC IC-1*

** default*

These commands select the software version that the central office switch is using when the network switch type is set for National ISDN-1 (**AT!C0=2**).

Command	Switch Type
!C1=4	National ISDN-1 (NI-1)*

**default*

SPID (Service Profile Identifier) !C6, *1!C6, *2!C6

Your ISDN service provider will provide you with a SPID number when you subscribe. Your SPID identifies the set of service or feature options associated with your line. The following table lists the valid SPID requirements with respect to switch type. The BitSURFR Pro will validate your SPID number based on these requirements.

Switch Type	Length	Valid Characters
AT&T	0 to 20 characters	numerals 0 to 9
Northern Telecom DMS100	0 to 20 characters	all printable characters
National ISDN-1 (NT-1) (includes Siemens)	9 to 20 characters	numerals 0 to 9

Use the following AT commands to enter your SPID numbers:

Command	Operation
!C6=	Sets the data SPID number
*1!C6=	Sets the voice 1 SPID number
*2!C6=	Sets the voice 2 SPID number

☞ **Note**
Your SPID number may or may not resemble your Directory Number. Each ISDN service provider will have their own scheme for assigning SPID numbers.

DN (Directory Number) !N1, *1!N1, *2!N1

The DN is provided to you by your ISDN service provider when you subscribe. It is the "phone number" for the port it is associated with. The following table lists the valid DN requirements with respect to the switch type. The BitSURFR Pro will validate the DN based on these requirements.

Switch Type	Length	Valid Characters
AT&T	0 to 24 characters	numerals 0 to 9, *, #
Northern Telecom DMS100	0 to 24 characters	numerals 0 to 9, *, #
National ISDN-1 (NI-1)	0 to 15 characters	numerals 0 to 9

The following AT commands are used to enter the DNs:

Command	Operation
!N1=	Sets the data DN
*1!N1=	Sets the voice 1 DN
*2!N1=	Sets the voice 2 DN

TEI (Terminal Endpoint Identifier) !D3, *1!D3, *2!D3

The terminal endpoint identifier (TEI) is a number used by the central office switch to uniquely identify each device that may be connected to the ISDN.

☞ **Note**
In most cases the TEI assignment is automatic (dynamic). Thus, you will not have to enter a TEI into your BitSURFR Pro. If the TEI is fixed (or manual), your ISDN service provider will supply you with this number when you subscribe.

TEI Value	Meaning
0 - 63	Fixed or Manual TEI number
255	TEI will be automatically assigned *
127	Disables port

**default*

The following AT commands are used to enter the TEI numbers:

Command	Operation
!D3=	Sets the data TEI number
*1!D3=	Sets the voice 1 TEI number
*2!D3=	Sets the voice 2 TEI number

FLEXIBLE CALLING COMMANDS

The following commands configure feature values for Flexible Calling. In most cases, the values need not be changed from the defaults.

☞ **Note**
If you are a Pacific Bell customer, refer to Chapter 7, Flexible Calling for the required values.

Command	Operation
!V3=	Conference Feature Value, range: 1-63, *default (60)*
!V4=	Drop Feature Value, range: 1-63, *default (62)*
!V5=	Transfer Feature Value, range: 1-63, *default (61)*
!V8=	Message Waiting Value, range: 1-63, *default (63)*

PORT OPTIONS

These options determine how the data and voice ports communicate on the ISDN line used by your BitSURFR Pro. The majority of options apply only to the data port. Unless explicitly designated, you may assume an option applies only to the data port.

Rate Adaption Protocol Selection %A2

The **%A2=** commands select the rate adaption protocol.

Command	Operation
%A2=0	Clear channel with no protocol
%A2=2	V.120 rate adaption protocol*
%A2=3	BONDING protocol
%A2=3&M	AIMux protocol
%A2=95	Point-to-Point protocol

** default*

☞ **Note**
*Both the local ISDN modem (BitSURFR Pro) and remote ISDN modem must be set to the same rate adaption protocol. Also, **%A2=0** (clear channel) is synchronous mode only. Asynchronous data should be passed using the V.120 or AIMux rate adaption protocols. The AIMux*

*command is actually the BONDING command (**%A2=3**) combined with the asynchronous DTE data mode command (**&M**).*

V.120 Configuration %E

This command customizes the V.120 protocol. Typically, the factory default settings for the V.120 protocol work in almost all applications. The following settings can be modified for special applications.

Command	Operation
%E0=	V.120 maximum transmit frame size Range: 1-260 *default (256)* ***See note below.***
%E1=	V.120 maximum receive frame size Range: 1-260 *default (260)*
%E2=	V.120 window size Range: 1-127 *default (8)*
%E3=	V.120 T200 transmission timer Range: 1-255 *default (10)*

☞ **Note**

*Some ISDN modems can only accommodate 128 byte V.120 transmit frame sizes. If your call disconnects when using V.120 protocol, set the V.120 maximum transmit frame size to 128 by entering **AT%E0=128**.*

Rate Multiplier @B0

This command selects the number of B-channels (1 or 2). It is typically used in conjunction with the BONDING, AIMux, and PPP options. Refer to Chapter 8, Asynchronous Inverse Multiplexing Protocol, Chapter 9, Point-to-Point Protocol, and Chapter 11, BONDING Protocol for more details.

Command	Operation
@B0=1	Selects one B-channel (56 or 64 kbps)*
@B0=2	Selects two B-channels (112 or 128 kbps)

** default*

Authentication Protocols (PAP and CHAP) @M2

These commands allow you to choose authentication schemes used by PPP servers to validate the identity of the originator of the connection. After establishing a link and enabling the Password Authentication Protocol (PAP) or the Challenge-Handshake Authentication Protocol (CHAP), your Internet package will require you to enter a password to be authenticated by the host. This password can be entered using the dial-string modifier >P="*password*". For additional information on PAP and CHAP, see "Authentication Protocols (PAP & CHAP)" on page 9-4.

Command	Operation
@M2=N	Disables PAP
@M2=P	Enables PAP*
@M2=C	Enables CHAP-MD5
@M2=M	Enables CHAP-MS *(Microsoft)*

** default*

CHAP Respond Mode @M20

☞ **Note**
CHAP Respond Mode should only be used with the Windows 95 operating system. CHAP-MS does not support CHAP Respond Mode.

This command is used with the Challenge-Handshake Authentication Protocol (CHAP). It is used to ensure the BitSURFR Pro responds to all challenge messages by using the provided password and the built-in algorithm. This password (up to 30 characters) must be the same as the password that you have entered in your Windows 95 Dialer.

Command	Operation
@M20="password"	Provides your password to the Internet package. *default=0*
@M20=""	Clears the password

☞ **Note**

It is highly recommended that you use the Dial String Modifier (>P="password") to provide your password, and not the @M20 command. If the Dial String Modifier is provided and you enter the @M20="password" command, the password in the Dial String Modifier takes precedence.

☞ **Note**

The Respond Mode parameter is stored in nonvolatile memory and remains active even after the BitSURFR Pro is powered off. Once the Respond Mode command @M20="password" has been issued, Respond Mode will remain active for CHAP until the @M20="" command is entered to clear the password.

B-Channel Speed %A4

This command selects the B-channel speed. The B-channels are capable of supporting up to 64 kbps, but some network B-channels may be limited to a bandwidth of 56 kbps. This should be so stated in the network specifications provided by the telephone company. Due to this limitation, the BitSURFR Pro defaults to 56 kbps.

Command	Operation
%A4=0	B-channel speed is 64 kbps
%A4=1	B-channel speed is 56 kbps*

** default*

Rings To Answer S0

This command instructs the BitSURFR Pro on which ring to answer an incoming data call. If this value is set too high, the calling unit may "time out" before the call is answered. The BitSURFR Pro will *not* automatically answer the call if the value is set to "0".

Command	Operation
S0=	Range: 0-255 *default (1)*

Ring Count S1

This command is read only. It returns the current ring count, and is "0" if the phone is not ringing. The count remains for eight seconds after the last ring.

Command	Operation
S1?	Display the ring count.

Wait for Connection S7

This command instructs the BitSURFR Pro how long it should wait for a connection. If the connection is not complete within this amount of time, a **NO CARRIER** message is returned.

Command	Operation
S7=	Range: 0-255 *default (30)* Units = seconds

Speech Call Answer Option %A93

This command instructs the BitSURFR Pro as to whether to answer an incoming data call as a speech Bearer Capability (BC) call.

Command	Operation
%A93=D	Do not answer*
%A93=E	Answer

* *default*

3.1kHz Audio Call Answer Option %A94

This command instructs the BitSURFR Pro as to whether to answer an incoming data call as a 3.1kHz audio Bearer Capability (BC) call.

Command	Operation
%A94=D	Do not answer*
%A94=E	Answer

* *default*

Data Call Answer Option %A95

This command instructs the BitSURFR Pro as to whether to answer an incoming data call as a data Bearer Capability (BC) call.

Command	Operation
%A95=D	Do not answer
%A95=E	Answer*

** default*

☞ **Note**
The BitSURFR Pro voice port will answer speech or audio calls only. The voice port answer options are not configurable.

Echo Disable Tone %A96

This command instructs the BitSURFR Pro whether or not to generate an Echo Disable Tone. When selected, the BitSURFR Pro will send a tone at the beginning of the data call that will disable the echo canceller.

Command	Operation
%A96=0	Disables echo tone*
%A96=1	Enables echo tone

** default*

Dialing Method %A97

This command instructs the BitSURFR Pro as to the type of dialing method used when placing a data call. In most cases, the default of Enbloc is correct. However, in some instances, it may be necessary to change to Overlap Dialing for the call to complete properly.

Command	Operation
%A97=O	Overlap
%A97=E	Enbloc*

** default*

Data Port Originate Mode %A98

This command alters the Bearer Capability (BC) sent to the switch in placing outgoing data calls. Placing an outgoing data call with voice BC (or 3.1 kHz audio) may sometimes facilitate the completion of a call through a network that may not necessarily accommodate data end-to-end mode. The answering unit must be able to receive a voice BC call as if it were a data BC call.

Command	Operation
%A98=D	Originates with data BC*
%A98=A	Originates with 3.1 kHz audio BC
%A98=S	Originates with voice BC

** default*

Voice Port Originate Mode *1%A98, *2%A98

This command has the same effect as the **%A98** command for the data port except that the voice port cannot be configured to originate with data BC.

Command	Operation
*%A98=A	Originates with 3.1 kHz audio BC
*%A98=S	Originates with speech BC *

** default*

TERMINAL INTERFACE AND PIN OPTIONS

These options affect the interface between the BitSURFR Pro and your computer. They select the format of the data sent to your computer, and the operation of the pins on the DTE interface with your computer.

DTE Data Mode &M

An important consideration in configuring the BitSURFR Pro is the type of interface with your computer. There are two basic types of interface: asynchronous and synchronous.

☞ **Note**

The BitSURFR Pro cannot operate in synchronous mode if attached to a PC (unless an add-in synchronous card has been installed in your PC) or asynchronous terminal. The BitSURFR Pro's synchronous features are designed primarily for various commercial applications.

The BitSURFR Pro supports an asynchronous mode (the default) and two synchronous modes. BitSURFR Pro operation in synchronous mode is described in Chapter 10.

The **&M** command used in conjunction with the BONDING command (**%A2=3**) configures the BitSURFR Pro for AIMux operation.

Command	Operation
&M	Asynchronous mode*
&M1	Synchronous mode 1
&M2	Synchronous mode 2

** default*

DTR Detect Time S25

This command specifies the time (in .01 second increments) that DTR must stay low to be recognized. Also, in Sync Mode 1 (**&M1**) the DTR detect time is the amount of time (in seconds) between when a call connects and when the BitSURFR Pro begins to monitor the DTR pin.

Command	Operation
S25=	Range: 0-255 *default (5)* Units = 1/100 seconds

DTE Speed @P2

This command sets the speed at which your computer operates. The AT command processor normally detects the DTE speed and parity automatically.

Command	Operation
AT@P2=300	300 bps
AT@P2=1200	1200 bps

Command	Operation
AT@P2=2400	2400 bps
AT@P2=4800	4800 bps
AT@P2=9600	9600 bps
AT@P2=19200	19200 bps
AT@P2=38400	38.4 kbps
AT@P2=48000	48 kbps
AT@P2=56000	56 kbps
AT@P2=57600	57.6 kbps
AT@P2=64000	64 kbps †
AT@P2=112000	112 kbps
AT@P2=115200	115.2 kbps*
AT@P2=128000	128 kbps †

** default*
† disables autobaud

DTE Parity @P3

This command sets the DTE parity. The AT command processor, in most cases, will detect the DTE speed and parity automatically.

Command	Operation
@P3=N	No parity*
@P3=O	Odd parity
@P3=E	Even parity
@P3=M	Mark parity

** default*

DTE Number of Data Bits @P4

This command sets the number of data bits your computer uses.

Command	Operation
@P4=7	7 data bits
@P4=8	8 data bits*

** default*

DTE Number of Stop Bits @P6

This command sets the number of stop bits your computer uses.

Command	Operation
@P6=0	One stop bit*
@P6=1	One and one-half stop bits
@P6=2	Two stop bits

** default*

Flow Control Options \Q

This command controls the flow of data when the BitSURFR Pro and your computer are set to different asynchronous speeds or when using V.120 protocol in asynchronous mode. If the DTE speed is faster than the BitSURFR Pro speed, flow control will stop data transmission when the BitSURFR Pro buffers are full. When buffer space becomes available, flow control instructs your computer to resume transmitting data. The opposite will happen if the BitSURFR Pro speed is faster than the DTE speed.

The **\Q1** command enables bidirectional XON/XOFF flow control. The BitSURFR Pro sends an XOFF (**DC3**) character to your computer to stop data transmission and sends an XON (**DC1**) character when transmitting can resume. Your computer can also send an XOFF character to tell the BitSURFR Pro to stop transmitting and an XON character when transmitting can resume.

The **\Q2** command enables unidirectional CTS flow control. The BitSURFR Pro turns CTS off causing your computer to stop transmitting and turns CTS on when your computer can resume transmitting.

The **\Q3** command enables bidirectional RTS/CTS flow control. The BitSURFR Pro can turn CTS on and off, causing your computer to start and stop transmitting. Your computer can turn RTS on and off causing the BitSURFR Pro to start and stop transmitting.

The **\Q4** command enables unidirectional XON/OFF flow control. The BitSURFR Pro sends an XOFF character to your computer to stop transmitting and sends an XON character to resume transmitting.

Command	Operation
\Q	Flow control off
\Q1	DTE/DCE XON/XOFF flow control
\Q2	DTE CTS flow control
\Q3	DTE/DCE RTS/CTS flow control*
\Q4	DTE XON/XOFF flow control

** default*

Data Carrier Detect (DCD) &C

This command controls the DCD output (pin 8) in asynchronous mode. There are three choices: *Always On*, *Normal*, and *Always On Except During Disconnect.*

- *Always On* (default) - Use the **&C** command to force DCD to always be on.
- *Normal* - Use the **&C1** command to specify that DCD remains off until the BitSURFR Pro recognizes the remote BitSURFR Pro's carrier signal and the rate adaption protocol (if any) is established.
- *Always On except during disconnect* - Use the **&C2** command to force DCD to always be on except during a disconnect. The **S10** command determines how long the DCD signal will remain off after a disconnect.

Command	Operation
&C	DCD always on*
&C1	DCD goes on when the BitSURFR Pro establishes a connection
&C2	DCD always on except during S10 disconnect

** default*

☞ **Note**
During synchronous data mode operation, the DCD output behaves as if it were in normal mode regardless of the ***&C*** *option setting.*

Data Carrier Detect (DCD) Drop Time S10

This command controls the amount of time which the DCD signal is turned off after a disconnect. This command applies only if the **&C2** command is in effect.

Command	Operation
S10=	Range: 0-255 *default (14)* Units = 1/10 seconds

Data Terminal Ready (DTR) &D

This command controls interpretation of the DTR input. The commands, **&D1**, **&D2**, and **&D9** are valid only when the BitSURFR Pro is in asynchronous mode.

☞ **Note**
In synchronous mode, the DTR pin has other functions (see Chapter 10).

- *Ignore* (default) - Use the **&D** command to allow the BitSURFR Pro to ignore the DTR signal. This option is valid for both asynchronous and synchronous modes.
- *DTR Drop to Command Mode* - Use the **&D1** command to specify that if the BitSURFR Pro is on-line and detects a high-to-low transition of DTR, the BitSURFR Pro will exit the data mode and enter the AT command mode. If the BitSURFR Pro is off-line DTR will have no effect, the BitSURFR Pro can connect and enter the data mode without DTR on.
- *DTR Drop Hangs Up* - Use the **&D2** command to specify that if the BitSURFR Pro is off-line, it will not connect (dial or answer) if DTR is low. If the BitSURFR Pro is on-line and a high-to-low transition of DTR is detected, the BitSURFR Pro will hang up, return to the command mode, and disable auto answer.
- *DTR Drop Resets* - Use the **&D3** command to reinitialize the data port when the BitSURFR Pro detects an on-to-off transition of DTR. If it is on-line, it will hang up and reset the active configuration to the stored configuration based on the Powerup Stored Profile (**&Y**) option. The BitSURFR Pro will not

automatically answer while DTR is off. This option is valid for both asynchronous and synchronous modes.

- *DTR Dial* - Use the **&D9** command to enable DTR dialing of the stored dial string for the asynchronous mode.

Command	Operation
&D	Ignores DTR*
&D1	On-to-off DTR transition recalls the command mode
&D2	On-to-off DTR transition causes the BitSURFR Pro data port to disconnect and disables auto answer while DTR is off
&D3	On-to-off DTR transition resets the data port and disables autoanswer
&D9	Enables DTR dial for asynchronous mode

** default*

☞ **Note**
For all modes, DTR must remain low for the duration of the time indicated by the S25 register to be considered a drop in DTR.

Persistent DTR Dialing (PDD) &L

This command controls the PDD feature which provides the capability for a given port to automatically re-dial the configured stored phone number 0 continuously whenever the port does not have an active call and the DTR pin is on.

Command	Operation
&L0	Disables persistent DTR dialing*
&L1	Enables persistent DTR dialing

** default*

Data Set Ready (DSR) &S

This command selects the function of the DSR output (pin 6). DSR normal means DSR is off until the BitSURFR Pro begins the connect sequence, then remains on as long as the BitSURFR Pro is on-line.

Command	Operation
&S	DSR always on*
&S1	DSR on after protocol is connected

** default*

Request to Send/Clear to Send &R

This command controls the CTS output (pin 5) when the BitSURFR Pro is in synchronous mode. In asynchronous mode, CTS is always on unless the CTS flow control option is enabled.

- *Normal* (default) - Use the **&R** command to allow CTS to follow RTS (pin 4) after a configurable delay. If the BitSURFR Pro is on-line and ready to receive data from the DTE, when it detects an off-to-on RTS transition, the BitSURFR Pro turns CTS on after the delay specified in S26 (default is 0).
- *Forced High* - Use the **&R1** command to allow the BitSURFR Pro to ignore RTS. CTS is turned on when the BitSURFR Pro is on-line and ready to receive data from the DTE.

Command	Operation
&R	CTS follows RTS*
&R1	CTS forced on

** default*

Request to Send/Clear to Send Delay S26

This command sets the amount of time to follow the off-to-on transition of the RTS pin before the CTS pin is turned on.

☞ **Note**
This command is valid only in synchronous mode.

Command	Operation
S26=	Range: 0-255 *default (1)* Units = 1/100 seconds

COMMAND AND MESSAGE OPTIONS

The AT command interpreter interprets the commands and sends status and connect messages to your computer. This section describes the options that affect the command interpreter and the messages that it can send.

Choosing to Use Response Messages Q

This command enables or disables response messages. The unit still responds to commands when the response display is inhibited.

Command	Operation
Q	Enables response messages*
Q1	Disables response messages (quiet mode)
Q2	Disables during answer mode

** default*

Selecting Response Form V

This command instructs the BitSURFR Pro which type of response message to display. These messages indicate the present state of the BitSURFR Pro and can appear as digits or words. Some software requires digit responses, but word responses are preferred because their meanings are easier to remember. See the **X** command later in this section.

Command	Operation
V	Enables digit response message
V1	Enables word response message*

** default*

CARRIER/PROTOCOL/CHANNEL Messages Display W

This command instructs the BitSURFR Pro whether or not to return the CARRIER, PROTOCOL, and CHANNEL messages (result codes numbered greater than 50) when a call is connected. When this option is disabled only the CONNECT message is returned when a call is

connected. Table 5-1 in Chapter 5 describes the status and connect messages along with their respective result codes.

Command	Operation
W	Disables Carrier/Protocol/Channel Messages*
W1	Enables Carrier/Protocol/Channel Messages

** default*

☞ **Note**
*If the **W** command option is set to 1, then the CARRIER, PROTOCOL and CHANNEL messages will be displayed regardless of the **X** command option setting.*

Connect Speed and Dial Messages Display X

This command selects the connect speed and dial messages display (result codes numbered less than 50). Table 5-1 in Chapter 5 describes the status and connect messages along with their respective result codes.

Command	Operation
X	Enables messages OK, CONNECT, RING, NO CARRIER, ERROR (corresponds to result codes 0-4, respectively)
X1	Enables all messages except BUSY (result code 7) (corresponds to result codes 0-5, 10-14, 17-19, 28, 32)
X2	Enables all messages* (corresponds to result codes 0-5, 7, 10-14, 17-19, 28, 32)

**default*

☞ **Note**
*If the **X** command option is set to 0 or 1 and a call is placed to a busy line, the BitSURFR Pro will return a **NO CARRIER** message.*

Command Mode @P1

This command determines which set of commands are used to operate the BitSURFR Pro.

Command	Operation
@P1=N	None
@P1=A	AT command mode enabled*
@P1=VB	V.25 bis BISYNC
@P1=VH	V.25 bis HDLC

**default*

☞ **Note**

***AT@P1=N**, **AT@P1=VB**, and **AT@P1=VH** disables the AT command set. If an **AT&W** has not been executed after modifying the command mode, the AT command set can be re-enabled by removing and reapplying power to the BitSURFR Pro. Otherwise, the AT command set must be re-enabled by resetting the BitSURFR Pro to the factory default configuration. This is accomplished by placing the 4th switch on the 4-position dip switch located on the rear of the BitSURFR Pro into the ON position, then unplugging (for 10 seconds) and reapplying power to the BitSURFR Pro. Return the 4th switch on the 4-position dip switch to the OFF position. The 3 remaining switches are reserved and should remain in the OFF position. Be sure to close all active applications before doing this.*

DTE Character Echo E

This command instructs the BitSURFR Pro whether or not to echo characters received from your computer while in the command mode.

Command	Operation
E0	Disables character echo
E1	Enables character echo*

* *default*

Escape Character S2

This command configures the ASCII character used to escape from the data mode and return to the AT command mode. The default character is '+'.

Command	Operation
S2=	Range: 0-127 *default (43)* 128-255 is disabled

Carriage Return Character S3

This command configures the ASCII character used by the AT command processor to indicate the end of a command line in both the receive and transmit directions. The standard character used for this is the ASCII carriage return (13).

Command	Operation
S3=	Range: 0-127 *default (13)*

Line Feed Character S4

This command configures the character sent by the AT command processor after each status message. The standard character used for this is the ASCII line feed (10) (CTRL-L).

Command	Operation
S4=	Range: 0-127 *default (10)*

Backspace Character S5

This command configures the character sent by the AT command processor to back up one space in the command line. The standard character used for this is the ASCII backspace (8) (CTRL-H).

Command	Operation
S5=	Range: 0-127 *default (8)*

Escape Sequence Guard Time S12

This command sets the escape sequence guard time--the minimum pause before and after the escape characters (pause, +++, pause). The guard time also defines the maximum amount of time between each of

the three characters in the escape sequence. This becomes significant only at low data rates and small pauses. The guard time is in 0.02 second increments.

Command	Operation
S12=	Range: 0-255 *default (50)* Units = 1/50 seconds

DTE Guard @G

This command allows the user to prevent other users from altering the saved configuration. It disables the ability to save configurations to nonvolatile memory through the use of AT commands (**&W** and **&Z**) and restores the stored configuration (profile 0) after each call.

This feature is useful in modem pooling applications where a user can acquire a modem for a call, reconfigure the modem, and then make the call. When the call is complete, the user can release the modem without worring about restoring the configuration.

Command	Operation
@G=D	Disables DTE guard*
@G=E	Enables DTE guard

** default*

CALLER ID DELIVERY

Caller ID Delivery permits you to identify and log the telephone numbers of incoming calls. Except where noted, these commands can be configured for either data or voice port. To configure a command for the voice port, add an asterisk (*) followed by a 1 or 2 (to designate voice port 1 or voice port 2) immediately after AT.

Caller ID Auto Delivery @N1

Auto Delivery allows the BitSURFR Pro to display the incoming telephone number immediately following the incoming call response message (**RING** if verbose responses have been selected, or **2** if

numeric responses have been selected). *This option is valid only for the DTE port*.

Command	Operation
@N1=0	Disables auto delivery*
@N1=1	Enables auto delivery

** default*

Caller ID Delivery to Voice Ports

If you have an analog Caller ID device connected to a voice port, you can view an incoming analog telephone number immediately after the first ring. If you do not have an analog Caller ID device, you can still retrieve the incoming telephone number, from the list of telephone numbers, if you have enabled Caller ID Logging. No AT commands are necessary to enable Caller ID on the POTS ports.

Caller ID Logging @N0

When Caller ID Logging is enabled, the BitSURFR Pro stores each incoming telephone number. The Logging feature is available to all ports, data and voice, and stores up to 10 telephone numbers per port. Each number may be up to 16 digits in length. Enabling or disabling this feature does not clear the list of stored numbers. You must place an asterisk (*) followed by a 1 or 2 before the command in order for it to configure voice port 1 or 2.

Command	Operation
@N0=0	Disables logging for the DTE port †
@N0=1	Enables logging for the DTE port
*1@N0=0	Disables logging for voice port 1 †
*1@N0=1	Enables logging for voice port 1
*2@N0=0	Disables logging for voice port 2 †
*2@N0=1	Enables logging for voice port 2

† *default*

Caller ID Number Clearing and Retrieval @Ln

Use these commands to clear the Caller ID logs, or to retrieve the most recent telephone number received by a port, or to retrieve the entire list of numbers logged by a port. You can use these commands whether or not Caller ID Logging is enabled. The retrieval commands do not clear the list of stored numbers. The feature is available to both the data port and the voice ports. You must place an asterisk (*) followed by a 1 or 2 before the command in order for it to configure voice port 1 or 2.

Command	Operation
@L0	Clears the list of numbers for the DTE port
@L1	Retrieves the most recent number for the DTE port
@L2	Retrieves the entire list of numbers for the DTE port
*1@L0	Clears the list of numbers for voice port 1
*1@L1	Retrieves the most recent number for voice port 1
*1@L2	Retrieves the entire list of numbers for voice port 1
*2@L0	Clears the list of numbers for voice port 2
*2@L1	Retrieves the most recent number for voice port 2
*2@L2	Retrieves the entire list of numbers for voice port 2

Caller ID Screening and Blocking @IS

Caller ID Security operates in one of two mutually exclusive modes: Call Screening and Call Blocking. Both features operate based on a list of user-entered ID numbers. The entire list of Caller ID Security numbers may be assigned to one port or the list may be divided between the voice and data ports. If Call Screening is selected, an incoming call is accepted only if its number is in the list of stored ID numbers. If Call Blocking is selected, an incoming call is accepted only if its number is not in the list of stored ID numbers. If the feature is disabled, all incoming calls are accepted.

Command	Operation
@IS=D	Disables Caller ID security for the DTE port †
@IS=S	Enables Caller ID security for screening calls for the DTE port
@IS=B	Enables Caller ID security for blocking calls for the DTE port

Command	Operation
*1@IS=D	Disables Caller ID security for voice port 1 †
*1@IS=S	Enables Caller ID security for screening calls for voice port 1
*1@IS=B	Enables Caller ID security for blocking calls for voice port 1
*2@IS=D	Disables Caller ID security for voice port 2 †
*2@IS=S	Enables Caller ID security for screening calls for voice port 2
*2@IS=B	Enables Caller ID security for blocking calls for voice port 2

† *default*

Caller ID Status and ID Numbers @I*x*

Chapter 6, Caller ID Delivery and Security, discusses ID Security numbers in detail. You can add up to 44 14-digit numbers to the Caller ID Security list. You can divide the numbers among the ports as you like. Note that identical numbers assigned to different ports are treated as one number in the Caller ID Security list. In other words, you can assign 44 numbers to each port if the numbers are the same.

Command	Operation
@IA=	Adds the given ID to the Security ID list for the data port. If no space is available, an ERROR message will be returned.
*1@IA=	Adds the given ID to the Security ID list for voice port 1. If no space is available, an ERROR message will be returned.
*2@IA=	Adds the given ID to the Security ID list for voice port 2. If no space is available, an ERROR message will be returned.
@ID=	Deletes the given ID from the Security ID list for the data port. If the ID does not exist in the list, an ERROR message will be returned.
*1@ID=	Deletes the given ID from the Security ID list for voice port 1. If the ID does not exist in the list, an ERROR message will be returned.

Command	Operation
*2@ID=	Deletes the given ID from the Security ID list for voice port 2. If the ID does not exist in the list, an ERROR message will be returned.
@IC	Clears the Caller ID Security list (deletes all IDs) for the data port.
*1@IC	Clears the Caller ID Security list (deletes all IDs) for voice port 1.
*2@IC	Clears the Caller ID Security list (deletes all IDs) for voice port 2.
@IL	Lists the status of Caller ID Security for the data port and lists all IDs stored in the list.
*1@IL	Lists the status of Caller ID Security for voice port 1 and lists all IDs stored in the list.
*2@IL	Lists the status of Caller ID Security for voice port 2 and lists all IDs stored in the list.
*1@IP	Copies the Security status and Caller ID Security list from voice port 1 to the data port.
*2@IP	Copies the Security status and Caller ID Security list from voice port 2 to the data port.
@IV	Copies the Security status and Caller ID Security list from the data port to voice port 1 and voice port 2.