DIVA T/A PC Card Reference Guide

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What is ISDN?

While you've heard of ISDN, there's a good chance you're unsure whether you need it - or even what, exactly, it is. Even though ISDN is globally available, it's so new that understanding it may require a little investigation.

In simple terms, ISDN is a replacement for plain old telephone service, which was never designed to meet the needs of the information age. ISDN uses the same wiring that currently serves homes and businesses. You get ISDN service from the same companies who provide telephone service, and you use it to connect telephones, computers, and fax machines. The difference is that you get much faster, much more dependable connections for voice, data, fax, and even video - all through a single line. There is no other technology that comes close to delivering such communications benefits today.

International ISDN standards were established about 10 years ago. Since then, telephone companies throughout the world have raced to upgrade their equipment to ISDN standards. As ISDN service availability has spread, many millions of computer users have turned to ISDN, and new users are coming on board even faster.

ISDN stands for Integrated Services Digital Network

"**Integrated Services**" refers to ISDN's ability to deliver two simultaneous connections, in any combination of data, voice, video, and fax, over a single line. Multiple devices can be attached to the line, and used as needed. That means an ISDN line can take care of most people's complete communications needs, without forcing the purchase of multiple analog phone lines at a higher transmission rate.

The "**Digital**" in ISDN refers to its purely digital transmission, as opposed to the analog transmission of plain old telephone service. If you're using a modem for Internet access at this moment, your Internet service provider's modem has converted this site's digital content to analog signals before sending it to you, and your modem converts those signals back to digital when receiving (the same thing happens with every keystroke and mouse click you transmit). When you connect with ISDN, there is no analog conversion. ISDN transmits data digitally, resulting in a very clear transmission quality. There is none of the static and noise of analog transmissions that can slow transmission speed.

"**Network**" refers to the fact that ISDN is not simply a point-to-point solution like a leased line. ISDN networks extend from the local telephone exchange to the remote user and include all of the telecommunications and switching equipment in between. When you have ISDN, you can make connections throughout the world to other ISDN equipment. If your ISDN equipment includes analog capabilities, you can also connect to analog modems, fax machines, and telephones, even though they may be connected to plain old telephone service.

Benefits

While ISDN accommodates telephones and fax machines, its most popular advantage is in computer applications. You can plug an ISDN adapter into a phone jack, like you would an analog modem, and get a much faster connection with no "line noise."

The most common ISDN service, Basic Rate Interface (BRI), provides two 64 Kbps channels per line. When the two channels are bonded in a single connection, you get a speed of 128 Kbps, which is about four times the actual top speed of the fastest analog modems. Compression can increase throughput to around 250 Kbps.

Telecommuters, for example, benefit immensely from ISDN. Whether you access the corporate LAN in the evenings or maintain a full-time, remote home office, ISDN is the next best thing to being there. E-mail, database access, and file transfers improve dramatically, making it seem like you're locally attached to the LAN.

Internet access is another great application for ISDN. Compared with even the fastest modem access, ISDN makes Web graphics appear almost immediately, and can reduce download times by over 75%. ISDN can even provide advantages over shared, higher-bandwidth office connections; PC Magazine advises that an ISDN connection can deliver better performance than a T1 shared among users on a LAN. And in many markets, it's actually cheaper than an isolated analog business line.

Such large-scale file transfer applications as medical imaging, insurance and law enforcement imaging, and the preparation of printed materials are additional arenas where ISDN proves highly beneficial. With the dramatic reduction in file transfer time, ISDN makes even multi-megabyte files available to recipients within minutes, not hours.

Videoconferencing is an ISDN application that's growing fast in popularity, and ISDN is currently the only way of making it happen.

ISDN Communication Channels

In the ISDN interface, a number of communication channels are carried over a digital line. These communication channels can vary by the type of information they transmit and by the transmission speed they support. The number and type of channels used may vary.

The communication channels can be of the following types:

B-Channel - 64 Kbps

D-Channel - 16 or 64 Kbps

H-Channel - 384, 1536, or 1920 Kbps (not yet commercially available)

Different combinations of these channels are used to support different types of usage (e.g., basic, primary and broadband).

B-Channel

The B-channel is a user (bearer) channel which carries a subscriber's digital traffic (e.g. digitized video, voice, audio, or digital data, or perhaps a mixture). The bandwidth of this channel is 64 Kbps. The control signals used to set up the connection, however, are not sent over the B-channel. The call establishment is done on the D-channel using common-channel signaling. This concept will be discussed shortly.

Two kinds of connections can be established over a B-channel:

- Circuit-Switched
- Packet-Switched

Circuit-switched connections are ideal for voice traffic for several reasons. Voice data is "delay-sensitive", meaning that it must not be delayed, and that it must be received in the order in which it was transmitted. There is a call set-up time that is characteristic of circuit-switched connections. This time lag is quite acceptable when measured against the length of a typical telephone call.

In a **packet-switched** data network or PSDN, data to be transmitted is broken up into individual units called **packets** that are then routed from sender to receiver. The sender/receiver can be any type of terminal, printer, computer or other device that supports an interface to the network.

D-Channel

The primary function of the D-channel is to carry common-channel signaling information to manage and control circuit-switched calls on B-channels.

The D-channel can also be used for packet-switching or low-speed telemetry when it is not involved in control signaling. Message signaling takes priority over data packet-switching.

The D-channel functions at 16 Kbps for Basic Rate Interface or 64 Kbps for Primary Rate Interface. The speed is dependent on the end-user's interface.

H-Channel

The H-channel is used for high-speed user data traffic at bit rates higher than 64Kbps. Examples of services which require these higher rates are: fast facsimile, teleconferencing, and video. An H-channel user can subdivide the channel using TDM to meet specific requirements.

Connecting to ISDN - BRI and PRI

There are two types of access interfaces to the ISDN: Basic Rate Access (also referred to as Basic Rate Interface (BRI)) and Primary Rate Access (also referred to as Primary Rate Interface (PRI)).

Basic Rate Access

Basic Rate Interface or Access consists of two B-channels operating at 64 Kbps and one D-channel operating at 16 Kbps. It is also commonly referred to as 2B+D.

Primary Rate Access

The primary rate interface is designed for users with large capacity requirements.

There is no single transmission rate defined for primary rate access. In North America and Japan, for example, primary rate interface is based upon the T1 rate (defined in detail shortly) of 1.544 Mbps. In Europe, by comparison, the rate is 2.048 Mbps.

What is EZ-ISDN/IOC?

We highly recommend that you use our toll free ISDN ordering service to make sure you get the correct ISDN line the first time. The service is free to our customers.

EZ-ISDN / IOC simplifies the ordering of your ISDN line. It lets you use simple codes to order pre-configured packages of ISDN features and services.

The North American ISDN User's Forum (NIUF) and Local Exchange Carriers (LEC) administer the assignment of codes. Bellcore administers the National ISDN Ordering Code (IOC) process.

We recommend the use of the following ISDN Ordering codes:

When ordering your ISDN line, use these codes depending on which method your ISDN provider supports:

EZ-ISDN: Use ordering code **1**

IOC: Use ordering code **R**

What is AutoSPID?

(North America only)

AutoSPID is a new National ISDN protocol feature which enables the DIVA T/A to download a list of Service Profile Identifiers (SPIDs), Directory Number and Call Type information from the ISDN line, and to determine whether the SPIDs are currently initialized by other devices.

Note: Check with your ISDN service provider to determine if they support the AutoSPID feature.

This feature effectively eliminates the need for you to configure any ISDN parameters.

AutoSPID works in the following manner:

If there are no SPIDs configured, then AutoSPID attempts to determine and then assign SPIDs and DNs to the location designated to store the AutoSPID parameters. The location for storing your AutoSPID information can be configured on the Advanced Configuration page.

If AutoSPID fails to detect the SPIDs, try entering the DNs (in a 10 digit format) and the DIVA T/A will attempt to perform generic SPID guessing.

Unless the SPIDs and DNs are configured correctly, whether through AutoSPID, SPID guessing, or configured manually, ISDN will fail to initialize (the D-LED will flash).

The only way to use the DIVA T/A without entering SPIDs, is to configure the ISDN numbers for Non-Initializing Terminal mode.

What is Non-Initializing Terminal Mode?

(North America only)

Non-Initializing Terminal mode is a new ISDN NI-1 protocol feature which enables the DIVA T/A to operate without SPIDs. This leaves the SPIDs available for use by other ISDN devices connected over the same NT1.

To configure the DIVA T/A for Non-Initializing Terminal mode, deselect the SPID checkbox in the Windows Configuration Tool, or specify Yes for the Non-Initializing parameter in the VT-100 Configuration Tool.

Warning: (NI-1 switches only) While in Non-Initializing Terminal mode, the DIVA T/A will only allow outgoing calls to be made, and most line interfaces will allow some form of restricted operation (for example: access to operator and emergency services). All incoming calls will be rejected. No AutoSPID information will be stored in non-volatile memory; however, the auto-detection status remains available.

Note: Check with your ISDN service provider to determine if they support Non-Initializing terminal mode.

What is Multilink PPP?

The DIVA T/A serves as an intermediary between its host workstation and the remote device to which data is being transmitted. All the protocol processing required for the negotiation of a Multilink PPP connection is performed on the DIVA T/A itself. The PC forwards asynchronous PPP packets to the DIVA T/A which, in turn, converts the packets for synchronous transmission and negotiates the various authentications required to establish the Multilink PPP connection with the target system over ISDN lines. This allows for the more efficient use of the ISDN line without requiring any changes to the PPP stack currently loaded on your PC.

While Multilink PPP effectively doubles the DIVA T/A's throughput to 128 kbps, the DIVA T/A can support COM port bit rates as high as 512 kbps by enabling the Turbo Mode feature. Turbo Mode comprises a set of proprietary DIVA T/A commands which permit the user to specify throughput speeds in excess of the traditional terminal emulation upper limit of 115200 bps. The Turbo Mode bit rate is set using the AT%MT1 command (see page 35, for more on AT%MT1).

What is BACP/BOD?

DIVA T/A supports the Bandwidth Allocation Control Protocol (BACP) and Bandwidth on Demand (BOD). These two features combine to allow the DIVA T/A to establish multilink sessions that provide larger amounts of bandwidth than that offered over a single dialup channel. Such multilink sessions are established according to procedures defined in the Internet Engineering Task Force (IETF) PPP Multilink specification (RFC 1717).

BACP/BOD works by informing the DIVA T/A which dial-in ports are presently available for a multilink session. It allows the answering location to reserve those ports for the calling party and provides the calling party with the telephone numbers of those ports.

A bandwidth control protocol also allows a user at the calling location to establish a multilink session by knowing only one telephone number instead of all the numbers to be dialed for the full session. With a bandwidth control protocol, the answering location provides the calling location with a list of the remaining telephone numbers to be used for the connection, and the additional channels are dialed by the calling equipment transparently to the user. This effectively raises a 64kbps connection into a 128 kbps connection.

BACP/BOD also controls whether the second line is required or not. When bandwidth demand goes up, the second B-channel can automatically be established, and conversely, when bandwidth demand goes down, the second channel can be dropped. The primary advantage, therefore, is a reduction of dial up charges; a second line is only used (and hence paid for) when it is required.

What is Data Compression?

To establish communications over a PPP link, each end of the connection must first send packets to configure and test the data link. After the link has been established, optional facilities may be negotiated as needed. One such facility is data compression. A wide variety of compression methods may be negotiated, although typically only one method is used for both directions of the link.

Data compression is a process where the effective throughput is increased by encoding data in such a way that fewer bits are required to represent it. For example, a text file might be compressed by representing common words with single characters; thus if the word "the" is represented by the character "@", it will be transmitted three times faster. Popular compression algorithms typically reduce the size of the data by 50%, effectively doubling the rate at which it is transmitted.

The Compression Control Protocol (CCP) works with MLPPP and is responsible for configuring, enabling, and disabling data compression algorithms on both ends of the point-to-point link. PC Compression negotiation takes precedence over the DIVA T/A negotiation for performance considerations (for example, the PC compression may reduce the number of bytes that go through the serial interface, the PC has the quicker CPU, etc.). The DIVA T/A compression negotiation, however, will assume control should no compression be detected or the initial negotiation fail. No user configuration is required to enable the DIVA T/A's compression functionality.

Compression algorithms currently supported by the DIVA T/A include Stacker LZS (Hi/fn), MPPC (Microsoft), and Ascend.

AT Commands

This section contains a description of all AT Commands relevant to DIVA T/A.

Locating Commands

To make it easier for you to locate a command, this guide has organized commands in two ways.

AT Commands are grouped into several categories. Use the section AT Command Groups on page 15 to locate the relevant category.

An alphabetical list of commands is also available. It is found in the section Alphabetical List of Supported AT Commands on page16

AT Command Format

When using AT commands, you must follow these conventions:

- A command line consists of a prefix, body, and terminator. Each command line must begin with "AT" (except A/ and ??).
- AT commands must be terminated by a carriage return (except A/).
- Commands entered in upper or lower case are accepted.
- The body is a string of commands restricted to printable ASCII characters (032 - 126).
- Space (ASCII 032) and control characters other than CR (ASCII 013) and BS (ASCII 010) in the command string are ignored.
- A command line may be aborted at any time by entering < ctrl-x > (ASCII 024).
- Carriage returns are programmable through register S3.
- The default terminator is the ASCII <CR> character. Characters that precede the AT prefix are ignored.

Command Format--Continued

- The DIVA T/A recognizes the backspace character for editing. When echo is enabled, a backspace or delete is echoed as a backspace character followed by a space character, and another backspace. The code used for the backspace character is programmable through register S5. Values equal to 0 or greater than 32, or the carriage return character value, cannot be used for the backspace character.

The AT sequence may be followed by any command sequence, except for the following: ATZ, ATD, ATA, AT@MENU, AT>H, AT>VC, AT>VD, AT>VT, and AT>Z. Commands following these (on the same command line) are ignored.

- Execution of commands ATD and ATA, either as a result of a direct command or a re-execute command, will be aborted if another character is entered before completion of the handshake.

- The maximum number of characters on any command line is 80 (including "A" and "T").

- If a syntax error is found in a command, the remainder of the line will be ignored and an ERROR code will be returned.

- Missing decimal parameters (*n*) are assumed as 0.

- Most commands entered with parameters out of range will not be accepted and the ERROR response will be returned to the DTE.

- The next command will only be accepted by the DIVA T/A once the previous command has been fully executed.

AT Command Groups

Alphabetical List of Supported AT Commands

The following table summarizes the AT Commands supported by the DIVA T/A. Go to the specified page number for more information.

Note: Static parameters are preceded by an asterisk "". Changes made to static parameters do not take effect until you restart your system (use the AT&Wn command to restart your system). Changes to all other parameters (dynamic parameters) take effect immediately.*

AT Command	Description	See Page
ATA	Answer Calls	40
ATDn	Dial a Number	40
ATEn	Local Echo	35
ATH	Hangup a Call	41
ATIn	View Product Information	25
ATO	Return Online	25
ATQn	Quiet Result Codes	36
ATSn	Establishes S-Registers *n* as the selected register	25
ATSn=v	S-Register *n* to Value *v*	37
ATS0=n	Rings to Auto-Answer	41
ATS1?	View Ring Count	41

AT Command	Description	See Page
ATS2=n	Escape Character	36
ATS3=n	Carriage Return Character	36
ATS4=n	Line Feed Character	36
ATS5=n	Back Space Character	37
ATSn?	Value of S-Register n	26
ATVn	Result Code Format	37
ATWn	Connect Message Control	37
ATXn	Extended Results Code	38
ATZn	Restart Diva	47
AT!C1=n	*ISDN Switch Type (Primary)	29
AT!C11=n	*ISDN Switch Type (Alternate)	29
AT!C2=n	*AutoSPID Storage Location	30
AT!C4=n	*Enable/Disable Primary Non-initializing mode	30
AT!C41=n	*Enable/Disable Alternate Non-initializing mode	30
AT!C5=n	*Enable/Disable Primary Non-initializing mode for second B-channel	31

AT Command	Description	See Page
AT!C51=n	*Enable/Disable Alternate Non-initializing mode for second B-channel	31
AT!C6=n	* ISDN Primary SPID Number (applicable to North America only)	31
AT!C61=n	* ISDN Alternate SPID Number (applicable to North America only)	31
AT!C7=n	* ISDN Primary SPID Number for second B-channel (applicable to North America only)	31
AT!C71=n	* ISDN Alternate SPID Number for second B-channel (applicable to North America only)	31
AT!E0=n	V.120 N201 Tx (Maximum Transmit Frame Size)	42
AT!E1=n	V.120 N201 Rx (Maximum Receive Frame Size)	42
AT!E2=n	V.120 Multiframe Mode	42
AT!E3=n	V.120 K Window Size	43
AT!E4=n	V.120 T200 (Retransmission Timer)	43
AT!E5=n	V.120 N200 (Maximum Retry Count)	43

AT Command	Description	See Page
AT!E6=n	V.120 T203 (Link Integrity Timer)	44
AT!E7=n	V.120 Idle Timer	44
AT!N1=n	* ISDN Primary Directory Number	32
AT!N11=n	* ISDN Alternate Directory Number	32
AT!N2=n	* ISDN Primary Directory Number for second B-channel	32
AT!N21=n	* ISDN Alternate Directory Number for second B-channel	32
AT!N3=n	* ISDN Primary Subaddress	33
AT!N31=n	* ISDN Alternate Subaddress	33
AT!N4=n	* ISDN Primary Subaddress for second B-channel	33
AT!N41=n	* ISDN Alternate Subaddress for second B-channel	33
AT!On	Outgoing Call Type	33
AT!V0=n	V.110 Configuration Override	45
AT!V1=n	V.110 Stream Rate	45
AT!V2=n	V.110 Character Length	45

AT Command	Description	See Page
AT!V3=n	V.110 Parity	45
AT!V4=n	V.110 Stop Bits	45
AT!V5=n	V.110 Flow Control	45
AT@MENU	Activate VT100 Configuration Tool	26
AT$CP=n	Enable/Disable Compression	51
AT$In	On Demand SPID Testing (North America only)	51
AT$SL	Stop LAPD Trace	52
AT$SM	Stop Mail Trace	52
AT$SP	Stop PPP Trace	52
AT$SQ	Stop Q.931 Trace	52
AT$VI	View Initial Profile	51
AT$VL	View LAPD Trace	52
AT$VM	Start Mail Trace	52
AT$VP	View PPP Trace	52
AT$VQ	View Q.931 Trace	52

AT Command	Description	See Page
AT$Y	Enter Mini Monitor on Next Reset	52
AT%A2=n	* Protocol Control	39
AT%A95=c	Incoming Data Call Answer	39
AT%M1=n	Local Endpoint Discriminator Class	48
AT%M2=n	Remote Endpoint Discriminator Class	48
AT%M3=n	Local Endpoint Discriminator Address	48
AT%M4=n	Remote Endpoint Discriminator Address	48
AT%MT1=n	Set Turbo Mode Bit Rate	35
AT%MT2=n	Set Turbo Mode Threshold	36
AT%P5	Enable Bandwidth Allocation Control Protocol / Bandwidth on Demand	48
AT%P6	Set Initial Billing Interval Timer	49
AT%P7	Set Billing Interval Timer	49
AT&Cn	Data Carrier Detect	34
AT&Dn	Data Terminal Ready	34

AT Command	Description	See Page
AT&F	Loading Factory Profile	46
AT&Kn	Flow Control	35
AT&Sn	Data Set Ready	35
AT&V	View Current and Stored Profile	47
AT&Wn	Save Current to Stored Profile	46
AT&Yn	Designate Stored Profile *n* as the Powerup Profile	46
AT&Zn=n	Store Telephone Number(s)	40
AT=n	Last accessed S-Register to Value *n*	26
AT>F	Restores All Profiles to Factory Settings	46
AT>FC	Reset Current Profile	46
AT>Hs	View Help Information	27
AT>VC	View Current Profile	47
AT>VCC	View Call and COM Port Parameters	26

Alphabetical List of Supported AT Commands—Continued

AT Command	Description	See Page
AT>VCD	View Dynamic Parameters	26
AT>VDD	Initialization Status Display (North America Only)	27
AT>VCP	View Protocol Parameters	27
AT>VCS	View Static Parameters	27
AT>VD	View Link And Connection Status Information	26
AT>VDC	View Connection Status	26
AT>VDL	View Link States	26
AT>VPn	View Stored Profile *n*	47
AT>VT	View Stored Phone Numbers	26
AT>Z	Restart the DIVA T/A	47
AT?	View Last Accessed S Switch	27
AT\Vn	Connect Message Control	38
A/	Re-execute Previous Command	27
$Load	Loading New Firmware	53
$Dump	Dumping Memory Using XMODEM	53

Alphabetical List of Supported AT Commands—Continued

AT Command	Description	See Page
$Msg	Display Cause for Entering Monitor	53
$>F	Reset Factory Profiles	53
+++	Escape Sequence	28
??	Last AT Command Result Explained	28

General AT Commands

This section describes General AT Commands.

Command	Description
ATIn	**View Product Information:** Displays information about your DIVA T/A.
	n=0
	Displays hardware code for the DIVA T/A
	n=1
	Displays software checksum
	n=2
	Reports "OK"
	n=3
	Displays software version
	n=4
	Displays capability string
	n=8
	Displays Eicon Technology DIVA T/A (detect string)
ATO	**Return Online:** In the online data mode, the DIVA T/A is ready to send and receive data, providing you are connected. Normally, the DIVA T/A remains in this mode until your computer sends the data mode escape sequence (+++) or until the call is terminated.
	Note: This command can only be used when the DIVA T/A is in the online escape mode.
ATSn	**Establishes S-Register n as the Selected Register**
	The ATSn command establishes S-Register n as the last register accessed, where n is the number identifying the S-Register. For example, ATS7 establishes S7 as the last accessed register.

Command	Description
ATS*n*?	**Reports the Value of S-Register n:** This command reports the last value stored into S-Register *n*. If *n* is omitted, the value of the last S-Register accessed is reported.
AT@MENU	**Activate VT100 Configuration Tool:** The AT@MENU command activates the DIVA T/A VT100 Configuration tool for configuring basic ISDN parameters.
AT=n	**Last Accessed S-Register to Value *n*:** Use this command to set the last accessed S-Register to the new value *n*.
AT>VD	**View Connection and Link Status Information:** This command displays link and connection status for troubleshooting problems. Your Eicon Technology Customer Services representative may ask you to display this information.
AT>VDL	**View Link States:** Displays the link states.
AT>VDC	**View Connection Status:** Displays the connection status.
AT>VT	**View Stored Telephone Numbers:** You can display a list of all stored telephone numbers currently saved on your DIVA T/A.
AT>VCC	**View Call and COM Port Parameters:** Displays the Call and COM Port dynamic parameters.
AT>VCD	**View Dynamic Parameters:** Displays all dynamic parameters (Call, COM, V.120, PPP, MLPPP).

Command	Description
AT>VDD	**Initialization Status Display (North America only):** Displays information about the detection progress, the initialization of the logical channels, as well as auxiliary information.
AT>VCP	**View Protocol Parameters:** Displays the protocol parameters (V.120, PPP, MLPPP).
AT>VCS	**View Static Parameters:** Displays all static parameters (ISDN, Rate Adaptation).
AT>H*s*	**View Help Information:** Displays full or partial help for any AT command, where *s* specifies which AT command help is requested for.
AT?	**View Last Accessed S-Register:** This command displays the contents of the "selected" S-Register. The "selected" S-Register is the last S-Register that was accessed using an S-Register command, or selected with the ATSn command.
A/	**Re-execute Previous Command:** Re-executes all the commands in the command buffer. This command is mainly used to place another call (using the ATD dial command) that failed to connect due to a busy line, no answer, or a wrong number. This command is *not* preceded by AT nor followed by Enter.

Command	Description
+++	**Escape Sequence:** The escape sequence is used to return to the command state from data state. To issue the escape sequence, wait one second then enter the escape character three consecutive times (+++) and wait another second. Its value is stored in S-Register 2. The default value of the escape character as stored in S-Register 2 is '+'.
??	**Last AT Command Result Explained:** The ?? command (no AT prefix required) reports the result of the last AT command issued. This command is useful for debugging long strings of AT commands and for determining which command was rejected and why.

ISDN Configuration Commands

This section describes the ISDN Configuration Commands.

Some of the commands in this section allow you to configure primary and alternative settings. If the DIVA T/A is unable to connect using the primary ISDN settings, it automatically tries again using the alternate ISDN settings.

For example, you could set-up one profile containing information for calling from both home and the office. If you call mainly from home, enter information specific to home in the primary ISDN settings and enter information specific to the office in the alternate ISDN settings.

Command	Description
AT!C1=n AT!C11=n	**ISDN Switch Type:** Specifies the ISDN Switch Type for your primary (AT!C1) or alternate (AT!C11) configuration. *Note:* These parameters are static. They do not take effect until you restart your DIVA T/A. For North American Firmware n=0 National ISDN n=1 AT&T 5ESS Custom n=9 (default for North America) Auto-detect switch type. If you have multiple ISDN line definitions, the DIVA T/A automatically determines the correct switch type to be used (National ISDN or AT&T 5ESS Custom). This auto-detect feature saves you from having to worry about which ISDN configuration to use when you are in a different location. n=255 No alternate switch type. Use this command when you want to disable all alternate settings. Entering a valid switch type causes the DIVA T/A to use the alternate settings if ISDN initialization has failed using the primary settings.

Command	Description
AT!C1=n	For International Firmware
AT!C11=n *(continued)*	n=2 EuroISDN (default)
	n=3 TPH (Australia).
	n=4 INS-Net64 (Japan).
	n=254 Enables the alternate switch type with the same value as the primary switch type.
AT!C2=n	**AutoSPID Storage Location:** Sets the ISDN AutoSPID storage location to Primary or Alternate (North American version only).
	n= 0 Primary (default)
	n=1 Alternate
	Note: This parameter is static. Changes do not take effect until you restart your DIVA T/A.
AT!C4=n AT!C41=n	**Enable/Disable Non-Initializing mode (first B-channel):** Specifies whether the first B-channel in the ISDN primary (AT!C4) or alternate (AT!C41) ISDN settings is set to Non-Initializing mode (North American version only).
	n=0 Disable Non-initializing mode (default)
	n=1 Enable Non-initializing mode
	Note: These parameters are static. They do not take effect until you restart your DIVA T/A.

Command	Description
AT!C5=n AT!C51=n	**Enable/Disable Non-Initializing mode (second B-channel):** Specifies whether the second B-channel in the ISDN primary (AT!C5) or alternate (AT!C51) ISDN settings is set to Non-Initializing mode (North American version only). n=0 Disable Non-initializing mode (default) n=1 Enable Non-initializing mode *Note: These parameters are static. They do not take effect until you restart your DIVA T/A.*
AT!C6=*n* AT!C61=*n*	**SPID Number for 1st B-channel:** *For North America only.* The SPID (Service Profile Identifier) as assigned by your local telephone company for your primary (AT!C6=*n*) or alternate (AT!C61=*n*) configuration. This number is a unique ID which identifies an ISDN terminal to the local ISDN switch. *Note: These parameters are static. They do not take effect until you restart your DIVA T/A.*
AT!C7=*n* AT!C71=*n*	**SPID Number for 2nd B-channel:** *For North America only.* The SPID (Service Profile Identifier) as assigned by your local telephone company for your primary (AT!C7=*n*) or alternate (AT!C71=*n*) configuration. This number is a unique ID which identifies an ISDN terminal to the local ISDN switch. *Note: These parameters are static. They do not take effect until you restart your DIVA T/A.*

ISDN Configuration Commands—Continued

Command *Description*

AT!N1=*n* **ISDN Directory Number for 1ˢᵗ B-channel:**
AT!N11=*n* Your local ISDN data directory number as
assigned by your local telephone company for
your primary (AT!N1=*n*) or alternate
(AT!N11=*n*) configuration. This number is
used by the DIVA T/A to identify itself on
outgoing calls and to recognize incoming calls
which are destined for it. This number is a
string with up to 20 characters. Valid
characters are: 0-9, *, and #. Default: null
string.

*Note: These parameters are static. They do not
take effect until you restart your DIVA T/A.*

AT!N2=*n* **ISDN Directory Number for 2ⁿᵈ B-channel:**
AT!N21=*n* Your local ISDN data directory number as
assigned by your local telephone company for
your primary (AT!N1=*n*) or alternate
(AT!N11=*n*) configuration. This number is
used by the DIVA T/A to identify itself on
outgoing calls and to recognize incoming calls
which are destined for it. This number is a
string with up to 20 characters. Valid
characters are: 0-9, *, and #. Default: null
string.

*Note: These parameters are static. They do not
take effect until you restart your DIVA T/A.*

Command   Description

AT!N3=*n*   **ISDN Subaddress for 1ˢᵗ B-channel:** The
AT!N31=*n*   ISDN subaddress is used to further identify the
terminal on the ISDN basic rate interface for
your primary (AT!N3=*n*) or alternate
(AT!N31=*n*) configuration. In cases where
two terminals share the same directory
number, the subaddress identifies which
terminal will answer a particular incoming
call. This number is a string with up to 20
characters. Valid characters are: 0-9, *, and #.
Default: null string (this is an optional value).

*Note: These parameters are static. They do not
take effect until you restart your DIVA T/A.*

AT!N4=*n*   **ISDN Subaddress for 2ⁿᵈ B-channel:** The
AT!N41=*n*   ISDN subaddress is used to further identify the
terminal on the ISDN basic rate interface for
your primary (AT!N4=*n*) or alternate
(AT!N41=*n*) configuration. In cases where
two terminals share the same directory
number, the subaddress identifies which
terminal will answer a particular incoming
call. This number is a string with up to 20
characters. Valid characters are: 0-9, *, and #.
Default: null string (this is an optional value).

*Note: These parameters are static. They do not
take effect until you restart your DIVA T/A.*

AT!O*n*   **Outgoing Call Type.** Specifies the call type
for outgoing calls.

n=0
Data call (default)

n=3
Data over voice bearer capability call

*Note: If you fail to connect with any of the primary ISDN settings, the
DIVA T/A attempts the connection with the alternate ISDN
parameters.*

COM Port Configuration Commands

This section describes the COM Port Configuration commands.

Command	Description
AT&Cn	**Data Carrier Detect:** This command controls the Data Carrier Detect (DCD) output.
	n=0 DCD always enabled.
	n=1 DCD tracks connection (default).
AT&Dn	**Data Terminal Ready:** This command controls interpretation of the Data Terminal Ready (DTR) input.
	n=0 Ignores status of DTR signal.
	n=1 Monitors DTR signal: when an on-to-off transition of DTR signal occurs, enter the command state. Return to the online state when the ATO command is issued.
	n=2 Monitors DTR signal: when an on-to-off transition of DTR signal occurs, hang up and enters the command state (default).
	n=3 Monitors DTR signal: when an on-to-off transition of DTR signal occurs, hang up and reset.
	n=9 Monitors DTR signal: when an off-to-on transition of DTR signal occurs, automatically dial the stored telephone number 0

Command	Description
AT&Kn	**Flow Control (AT&Kn):** This command allows you to enable and disable flow control so that data is stopped and restarted when buffer space becomes available.
	n=0
	Disables flow control
	n=3
	Enables RTS/CTS flow control (default)
	n=4
	Enables XON/XOFF flow control
	n=6
	Enables both RTS/CTS and XON/XOFF flow control
AT&Sn	**Data Set Ready:** Data Set Ready (DSR) controls the behavior of the DSR output.
	n=0
	DSR always on (default).
	n=1
	DSR always on after protocol is connected.
ATEn	**Local Echo:** The E command enables or disables command echo on your computer. If you do not see commands entered on your screen, enable command echo. If you see double characters, disable command echo.
	n=0
	Disables local echo.
	n=1
	Enables local echo (default).
AT%MT1=n	**Set Turbo Mode Bit Rate:** Specifies the turbo bitrate value.
	n=a value from 128,000 to 512000
	n=0 disables turbo.
	Default=512000

Command	*Description*
AT%MT2=n	**Set Turbo Mode Threshold:** Specifies the minimum PC bitrate threshold for the activation of turbo mode. n=a value in the range 57,600 to 115,200 Default=115200
ATQn	**Quiet Result Codes:** This command enables or disables the sending of result codes to the DTE. n=0 Enables result codes to the DTE (default). n=1 Disables result codes to the DTE.
ATS2=n	**Escape Character:** Use this command to configure the character used to escape from the data mode and return to the AT command mode. n can be a value between 0-255 (default is ASCII 043, translates into the "+" character). A value of 128-255 disables the escape function.
ATS3=n	**Carriage Return Character:** Sets the character that the AT command processor uses to detect the end of a command line in both the receive and transmit directions. n can be a value between 0-127(default is ASCII 013 which translates into the carriage return character).
ATS4=n	**Line Feed Character:** Sets the character that the AT command processor uses to indicate the end of each status message. n can be a value between 0-127 (default is ASCII 010 line feed).

COM Port Configuration Commands—Continued

Command	Description
ATS5=n	**Back Space Character:** Sets the backspace character used for command line editing.
	n can be a value between 0-32 (default is ASCII 008 backspace).
ATSn=v	**S-Register n to Value v:** Use this command to set S-Register *n* to the value *v*.
ATVn	**Result Code Format:** You can set your DIVA T/A to display messages as digits or words. Word responses are preferable since they are more meaningful.
	n=0 Result codes are sent to the DIVA T/A as numbers (short form).
	n=1 Result codes are sent to the DIVA T/A as full words (long form/verbose) (default).
ATWn	**Connect Message Control:** This command controls the format of connection messages.
	n=0 Upon connection, the DIVA T/A reports the DTE speed only; for example, CONNECT 19200 (default).
	n=1 Upon connection, the DIVA T/A reports the DCE speed, the protocol, and the DTE speed.
	n=2 Upon connection, the DIVA T/A reports the DCE speed; for example, CONNECT 64000.

Command	Description
ATXn	**Extended Result Codes:** This command selects which subset of the result messages will be used by the DIVA T/A to inform the DTE of the results from commands.

n=0
Provide basic result codes: sends only OK, CONNECT, RING, NO CARRIER, ERROR, and NO ANSWER.

n=1
Provide basic result codes and appropriate connection speed (e.g., CONNECT 2400, CONNECT 19200).

n=2
Provide basic result codes, connection speed, and DIALTONE detection (default).

n=3
Provide basic result codes, connection speed, and BUSY signal detection.

n=4
Sends all messages.

n=5
Terminal screen displays the remote number along with the RING message. If the remote number is not known the message UNKNOWN is displayed.

Command	Description
AT\Vn	**Connect Message Control:** This command controls the format of connection messages

n=0
Upon connection, the DIVA T/A reports the DTE speed only; for example, CONNECT 19200 (default).

n=1
Upon connection, the DIVA T/A reports the DCE speed, the protocol, and the DTE speed (same as ATW2).

Call Control Commands

This section describes the Call Control commands.

Command	Description
AT%A2=n	**Protocol Control:** Specifies the protocol you want to use for your ISDN connection.

n=2

V.120 rate adaption protocol.

n=95

PPP asynchronous to synchronous conversion.

n=96

Multilink PPP connection (default).

Note:

• *Both PPP and Multilink PPP require that a PPP communications stack be installed on your computer.*

• *Both the local terminal adapter (DIVA T/A) and the remote device must be set to the same protocol.*

• *If your workstation is configured as a Windows for Workgroups RAS client, you must configure the V.120 rate adaption protocol on the DIVA T/A workstation and the remote device (RAS Server ISDN adapter).*

• *Multilink PPP does not support the callback feature used by some servers for security purposes.*

• *When using Multilink PPP for **incoming** calls, only SPAP or PAP authentication are supported. (Windows NT only) In order to support **incoming** calls with Windows NT RAS Server, you must enable the parameter "Allow clear text authentication" in the RAS Server setup. Refer to the RAS online help on how to configure this parameter.*

Note: These parameters are static. They do not take effect until you restart your DIVA T/A.

AT%A95=c	**Incoming Data Call Answer:** Sets how incoming data calls are handled (accepted or rejected).

c=E

All incoming data calls can be accepted either by the DIVA T/A (ATS0=1) or by the application (default).

c=D

All incoming data calls are rejected upon receipt

Command	*Description*
AT&Zn=v	**Store Telephone Number:** Specify stored telephone number(s). The telephone number can be a string with up to 20 characters (0-9, *, #, space, hyphen, parenthesis, and period are accepted). You can store up to ten telephone numbers where *n* identifies the memory location number (0-9) and *v* is the telephone number.
ATA	**Answer Calls:** Instructs the DIVA T/A to accept an incoming call.
ATD*n*	**Dial a Number:** Directs the DIVA T/A to go online, dial the specified number, and attempt to establish a connection.

Punctuation characters may be used for clarity, with parentheses, hyphens, spaces, and periods being ignored. Also, the "P", "T", "W", "@", ", and "R" dial modifiers used by modems are ignored since they are not relevant to ISDN.

The "~" and "&" characters are used to dial two numbers within the same dialing string.

The following modifiers can be used:

L
Re-dial last number

S=n
Dial the number stored in the directory n (n=0-9)

N
Establish a data connection

I
Establish a 56K ISDN data connection

V
Establish an ISDN DATA over VOICE connection

;
Any character following this parameter is treated as an AT command (entered in the command mode)

Call Control Commands—Continued

Command	Description
ATH	**Hangup a Call:** To disconnect and hang up a call. If the DIVA T/A is currently online, the connection is terminated.
ATS0=n	**Rings to Auto-Answer:** Allows you to enable or disable auto-answer. Setting a value other than "0" instructs the DIVA T/A to auto-answer after *n* rings. A value of "0" instructs the DIVA T/A to disable the auto-answer mode. Specify a value between 0-255 (default is 0).
ATS1?	**View Ring Count:** Use this command to display the current number of rings (incoming call).

V.120 Configuration Commands

This section describes the V.120 Configuration commands.

Command	*Description*
AT!E0=*n*	**V.120 N201 Tx (Maximum Transmit Frame Size):** N201 Tx (Maximum Transmit Frame Size) determines the maximum number of octets in an information field to be transmitted to the remote V.120 device. Valid range is 16-260. Default: 260. *Note: If a larger frame needs to be transmitted, the DIVA T/A segments it into V.120 fragments and expects the remote device to perform reassembly.*
AT!E1=*n*	**V.120 N201 Rx (Maximum Receive Frame Size):** N201 Rx (Maximum Receive Frame Size) determines the maximum number of octets in an information field to be received from the remote V.120 device. Valid range is 16-260. Default: 260.
AT!E2=n	**V.120 Multiframe Mode:** The V.120 protocol supports two different transfer modes described below: n=E **Multiframe mode** is enabled (default). This mode provides acknowledged transfers by using Information (I) and acknowledgment (RR/RNR) frames, and provides error correction and recovery procedures. The link verification procedure is provided by exchanging SABME and UA frames. n=D **Unacknowledged mode** is enabled. This mode uses Unnumbered Information (UI) frames. The link verification procedure is provided by exchanging XID frames. The unacknowledged mode is less robust than multiframe mode. *Note: The DIVA T/A may automatically switch to the other mode if the link verification frames issued from the remote device do not match the configured mode on the local device. The DIVA T/A always prefers the multiframe mode*

Command *Description*

AT!E3=*n* **V.120 K Window Size:** *Applicable to the multiframe mode only.* K (Window Size) determines the maximum number of sequential data frames that may be outstanding (not acknowledged) at any given time. Valid range is 1-127 frames. Default: 7.

AT!E4=*n* **V.120 T200 (Retransmission Timer):** *Applicable to the multiframe mode only.* T200 (Retransmission Timer) is the maximum time allowed to determine if a transmitted frame was received by the remote device, prior to its retransmission. The unit of measurement is 1/10 seconds. Valid range is 1-255. Default: 15 (equal to 1.5 second).

The value specified for T200 (Retransmission Timer) must be less than the value specified for T203 (Link Integrity Timer). Otherwise, the default values are used.

AT!E5=*n* **V.120 N200 (Maximum Retry Count):** *Applicable to the multiframe mode only.* N200 (Maximum Retry Count) is a system parameter which identifies the maximum number of retransmissions of a frame due to T200 expiring. When the maximum number of retransmissions is reached, the recovery process is started which may cause call disconnection.

Valid range is 1-10.

Default: 3.

Command Description

AT!E6=*n*   **V.120 T203 (Link Integrity Timer):** *Applicable to the multiframe mode only.* T203 (Link Integrity Timer) is the maximum time allowed without frames (including data and control) being exchanged. Its purpose is to verify that the remote device is still online and operational. When the Link Integrity Timer expires, recovery procedures are started which may cause the disconnection of the current call.

The unit of measurement is seconds. Valid range is 1-255. Default: 30.

The value specified for T200 (Retransmission Timer) must be less than the value specified for T203 (Link Integrity Timer). Otherwise, the default values are used.

AT!E7=*n*   **V.120 Idle Timer (AT!E7=n):** Idle Timer refers to the maximum time without the exchange of data frames between the local and the remote devices and before the automatic termination of the connection. Its purpose is to reduce communications costs while data is not being transferred for a period of time (operates in both the multiframe and unacknowledgement modes). When Idle Timer expires, this immediately initiates the disconnection of calls. Setting a "0" value disables Idle Timer.

The unit of measurement is minutes. Valid range is 0-10000.
Default: 1440 (24 hours)

V.110 Configuration Commands

This section describes the V.110 configuration commands.

Command Description

AT!V0=*n* **V.100 Configuration Override**: Specifies whether the DIVA T/A uses the COM port setting to configure V.110 or overrides them with user settings.

n=0 Use the default settings

n=1 Override the COM port settings as per AT!V1, AT!V2, AT!V3, AT!V4, and AT!V5

Default: n=1

AT!V1=*n* **V.110 Stream Rate:** Specifies the V.110 Stream Rate

Values for n=1200, 2400, 4800, 9600, 19200

Default: 19200.

AT!V2=*n* **V.110 Character Length:** Specifies the character length.

Values for n= 7 or 8

Default: 8

AT!V3=*n* **V.110 Parity:** Specifies the parity used for V.110.

Values for n= 0 (none), 1 (even), 2(odd), 3(one), 4(zero).

Default: 0

AT!V4=n **V.110 Stop Bits.** Specifies the Stop Bits used for V.100.

Values for n= 1 or 2.

Default: 2

AT!V5=n **V.110 Flow Control.** Specifies the Flow Control method to be used for V.110.

Values for n= 0(none), 1(receive only), 2(transmit only), 3 (receive and transmit).

Default:1 (receive only).

Profile Commands

This section describes the Profile commands.

Command Description

AT&F **Use Factory Settings in Current Profile:**
Restores and loads all settings in the
current profile with the original factory
settings. Previously configured ISDN
commands, stored telephone numbers, and
the rate adaption control values are
retained; all other settings are lost.

AT>F **Use Factory Settings in All Profiles:**
Restores all stored profiles and the current
profile to the original factory settings.
Reverts the powerup profile to number 0.
Use when you need to reset the card to its
original factory settings.

*Warning: All previous user-defined
settings are lost.*

AT>FC **Reset Current Profile and Telephone
Numbers.** Resets the current profile and
telephone numbers to the default factory
settings.

AT&W*n* **Save Settings as Profile n:** Writes storable
parameters of current profile in memory as
stored profile *n*. Use when you are satisfied
with your current configuration settings
and want to save them to a specific stored
profile *n*.

AT&Y*n* **Set Powerup Profile:** Designates stored
profile *n* as the powerup profile. Use to
load your desired stored profile the next
time your DIVA T/A is powered.

Profile Commands—Continued

Command Description

ATZ*n*   **Restart DIVA T/A Using Profile *n*:**
          Restarts your DIVA T/A using stored
          profile *n*. Use after changing a static
          parameter.

AT>Z   **Restart DIVA T/A Using Powerup
          Profile:** Restarts your DIVA T/A using the
          powerup profile. Use anytime you want to
          load the powerup profile.

AT>VC   **View Current Profile:** Presents a screen
          display of the current profile settings on
          your DIVA T/A.

AT>VP*n* **View Stored Profile:** Presents a screen
          display of the desired stored profile, where
          n is the number of the stored profile (0,1,2)
          you want to view.

AT&V   **View Current and Stored Profiles:**
          Displays the current and stored profiles as
          well as stored telephone numbers in your
          DIVA T/A.

Multilink PPP Commands

This section describes the MLPPP commands.

Command	Description
AT%M1=*n*	**Local Endpoint Discriminator Class:** Specifies the local endpoint discriminator class. See the section Endpoint Discriminator Class/Address on page 50
AT%M2=*n*	**Remote Endpoint Discriminator Class:** Specifies the remote endpoint discriminator class. See the section Endpoint Discriminator Class/Address on page 50
AT%M3=*n*	**Local Endpoint Discriminator Address:** Specifies the local endpoint discriminator address. See the section Endpoint Discriminator Class/Address on page 50
AT%M4=*n*	**Remote Endpoint Discriminator Address:** Specifies the remote endpoint discriminator address. See the section Endpoint Discriminator Class/Address on page 50
AT%P5=n	**Enable Bandwidth Allocation Control Protocol / Bandwidth on Demand.** Specifies whether Bandwidth Allocation Control Protocol is enabled or disabled. n=0 Disable n=1 Enable (default)

Command Description

AT%P6=n **Set Initial Billing Interval Timer.** Sets the timer (secs) to match the amount of time your ISDN provider allocates as the first time interval.

Note: If the value is set to 0, the timer is not used. Setting this value to 0, also effectively sets AT%P7 to 0.

n can be a value from 0 to 65535.

Default value=60 seconds

AT%P7=n **Set Billing Interval Timer.** Sets the timer (secs) to match the amount of time your ISDN provider designates as the minimum chargeable unit for all subsequent billing..

Note: If the value is set to 0, the timer is not used.

n can be a value from 0 to 65535.

Default value=60 seconds

Endpoint Discriminator Class/Address

Class	Description	Address Format
0	Null Class	No address is used.
1	Locally Assigned Address	Uses a hexadecimal format with a maximum length of 40 characters. Valid characters are "0-9, a-f" (ex. AT%M3=b3c665ac1).
2	Internet Protocol (IP) Address	Uses a numerical format with a maximum length of 15 characters. Valid characters are "0-9" (ex. AT%M4=192.219.23.100).
3	IEEE 802.1 Globally Assigned MAC Address	Uses a hexadecimal format with a maximum length of 12 characters. Valid characters are "0-9, a-f" (ex. AT%M3=b3c665ac1).
4	PPP Magic-Number Block	Uses a hexadecimal format with a maximum length of 40 characters, and the length must be a multiple of 8. Valid characters are "0-9, a-f" (ex. AT%M3=b3c665acffff0001).
5	Public Switched Network Directory Number	Uses a normal telephone number with a maximum length of 15. Valid characters are "0-9, *, #).
255	Accept Any Remote Endpoint Discriminator	No address is used. This class is valid only for remote endpoint discriminators (EPDs), and is used to accept any remote EPDs received that are all part of the same bundle.

Utility Commands

This section describes the Utility commands.

Command	Description
AT$CP=n	Enables or disables compression.
	n=0 Disable
	n=1 Enable (default)
AT$In	On Demand SPID Testing (North America only)
	Lets you test SPIDs on demand
	n=<SPID Number> Tests the specified SPID. To perform this test you must be connected to National ISDN or AT&T 5ESS Custom interface. The test is only supported if neither logical channel is initialized (either with a SPID or in NIT mode). If required, clear the SPID and disable NIT mode for both channels, then reset the card. You can then run two SPID tests (further tests will be rejected).
	n=<blank> Retrieves any AutoSPID data downloaded from the SPCS during location detection. Note that this command does not initiate the AutoSPID procedure; it simply retrieves historical data.
	The following information is retrieved:
	SPIDs, DNs, CTs (v=voice, d=data, p=packet), error code.
	Note: If AutoSPID cannot detect DNs and CTs, these fields will be empty. If an AutoSPID download has not been performed, no information will be retrieved.
AT$VI	View initial Profile

Command Description

Command	Description
AT$VL	Starts or displays the result of a LAPD trace
AT$VM	Controls the internal Mail Trace. Your Eicon Technology Customer Services representative may ask you to use this command.

Format is:
AT$VM [total size, entry_size, filter]
(parameters are optional)

Example:
AT$VM : starts mail trace with default size of 16K, entry_size of 64 bytes, no filter

AT$VM -p: to pause the mail trace
AT$VM -r: to reset the mail trace
AT$VM -s: to restart the mail trace

Command	Description
AT$VP	Starts or Displays the result of a PPP trace.
AT$VQ	Starts or Displays the result of a Q931 trace.
AT$SL	Stops an LAPD trace.
AT$SM	Stops a Mail trace.
AT$SP	Stops a PPP trace.
AT$SQ	Stops a Q931 trace.
AT$Y	Enter the monitor on the next reset.
AT$Z	Soft reset the unit and enter the monitor.

Mini-monitor Commands

This section describes the Mini-monitor commands.

Note: These commands are not to be prefixed by AT. Typing AT will exit the mini-monitor and revert back to the normal software mode.

Your Eicon Technology Customer Services representative may ask you to use these commands.

Command	Description
$Load	Loading new firmware
	Note: This command needs a terminal emulation program which supports XMODEM.
$Dump	Dumping memory using XMODEM
	Note: This command needs a terminal emulation program which supports XMODEM.
$Msg	Display cause for entering the monitor
$>F	Restores all profiles to the original factory settings. Reverts the powerup profile to number 0. This command has the same effect as AT>F.
	Warning: All previous user-defined settings are lost.

AT Command Result Codes

This section describes the AT Command Result Codes (also known as status messages). These codes are displayed after an AT command is issued.

Result codes can be displayed as a word message (long-form English) or as a number code (short-form numeric response). Word messages are preceded and terminated by the sequence < CR > <LF>. Numeric codes are terminated by < CR > only. The Result Code Format command (ATV*n*) determines short- or long-form usage.

The following table provides the AT command result codes in both number code and word message as well as a description:

Number Code	Word Message	Description
0	OK	The DIVA T/A has successfully executed your command
1	CONNECT	Connection was made: the range of the result code response is restricted by the X command such that no speed reporting is allowed, or the bitrate is less than or equal to 300 bps
2	RING	Incoming ringing is detected on the line
3	NO CARRIER	- Attempt to establish a connection failed - Connection ended

Number Code	Word Message	Description
4	ERROR	- Syntax of command is incorrect - Unable to execute command - Command does not exist - Entered command is outside permitted range
5	CONNECT 1200	Connection made at a bitrate less than or equal to 1200 bps
6	NO DIALTONE	ISDN not initialized
7	BUSY	Remote user busy
8	NO ANSWER	Remote user not responding
10	CONNECT 2400	Connection made at a bitrate less than or equal to 2400 bps
11	CONNECT 4800	Connection made at a bitrate less than or equal to 4800 bps
12	CONNECT 9600	Connection made at a bitrate less than or equal to 9600 bps
13	CONNECT 7200	Connection made at a bitrate less than or equal to 7200 bps

Number Code	Word Message	Description
14	CONNECT 12000	Connection made at a bitrate less than or equal to 12000 bps
15	CONNECT 14400	Connection made at a bitrate less than or equal to 14400 bps
16	CONNECT 19200	Connection made at a bitrate less than or equal to 19200 bps
17	CONNECT 38400	Connection made at a bitrate less than or equal to 38400 bps
18	CONNECT 57600	Connection made at a bitrate less than or equal to 57600 bps
19	CONNECT 64000	Connection made at a bitrate less than or equal to 64000 bps
20	CONNECT 115200	Connection made at a bitrate less than or equal to 115200 bps
21	CONNECT 230400	Connection made at a bitrate less than or equal to 230400 bps
23	CONNECT 512000	Connection made at a bitrate less than or equal to 512000 bps

Number Code	Word Message	Description
57	CARRIER 57600	Connection made at a bitrate less than or equal to 57600 bps
59	CARRIER 64000	Connection made at a bitrate less than or equal to 64000 bps
60	CONNECT 128000	Connection made at a bitrate less than or equal to 128000 bps
83	PROTOCOL: V.120	V.120 Rate Adaption Protocol
85	PROTOCOL: PPPC	PPP Protocol
86	PROTOCOL: MLPPP	Multilink PPP Protocol