Mini PCI Type 3B Data Fax Modem By 3Com User's Guide

Initial release: 6 Nov 1999

Back to Contents Page

Modem AT Commands: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Modem AT Commands

CAUTION: In most cases, your modem will work using the factory-set defaults. We recommend that you have a good understanding of modems before you change any settings.

You can enter modem commands from several places, but the most common way is from terminal mode in your communications software.

The basic rules for entering AT commands follow:

- Type commands in either upper or lower case, not a combination.
- You can enter up to 60 characters, not counting AT, carriage returns, or spaces (spaces are not necessary when entering several (a string of) AT commands at once; they just make it easier to read).
- If you leave the number off a command, zero is assumed. For example, if you type ATE, ATE0 is assumed.
- Every command except A/ and +++ must be prefixed with AT and completed by pressing Enter.
- The modem will respond with OK, ERROR, or other result codes (see the result code summary below).

For example, follow these steps if you want to view the version of firmware used in your modem.

1. Check the following table to find the AT command that controls viewing firmware information. The functions are listed in alphabetical order. Note that the AT command for displaying the firmware version is I7.
2. Enter your communications software.
3. Enter Terminal mode.
4. Because almost all commands must be preceded by AT to get the modem's attention, prefix the command with AT. Type **ATI7** and press Enter. The firmware version will be displayed.

To view defaults, widen the right-hand side of the view window.

Command	Syntax	Function	Default
+++	+++	Escape to online command mode (not preceded by AT)	
/	/	Pause (not preceded by AT)	125 ms
A	ATA	Answer manually	
A/	A/	Repeat last command (not preceded by AT)	
D	ATD	Dial	
		n Phone #, 0 through 9	
DT	ATDT	T Tone dial	
DP	ATDP	P Pulse dial	
DR	ATDR	R Call an originate-only modem	
DTnWn	ATDTnWn	W Wait for second dial tone (X2, X4)	
DTWn@	ATDTWn@	@ Wait for answer (X3, X4)	
DTn!n	ATDTn!n	! Flash switch hook	
DTn#n	ATDTn#n	# Auxiliary tone dial digit	
DTn,n	ATDTn,n	, Pause in dialing (S8)	2 seconds
DTn*n	ATDTn*n	* Auxiliary tone dial digit	
DTn;n	ATDTn;n	; Stay in command mode after dialing	
DTn$n	ATDTn$n	$ Wait for calling card bong	
DTn&n	ATDTn&n	& Wait for calling card bong	
DTn"n	ATDTn"n	" Set quote mode for the following	
D$	ATD$	Display a list of dial commands	
DL	ATDL	Redial last number	

DL?	ATDL?	Display last dialed number	
DSn	ATDSn	Dial stored number	
E0	ATE0	Turn command echo off	
E1	ATE1	Turn command echo on	X
F0	ATF0	Turn online echo on	
F1	ATF1	Turn online echo off	X
H0	ATH0	Hang up (go on-hook)	
H1	ATH1	Pick up (go off-hook)	
I0	ATI0	Display the 4-digit product code	
I1	ATI1	Display the checksum	
I2	ATI2	Display the RAM test results	
I3	ATI3	Display the firmware version	
I4	ATI4	Display the current modem settings	
I5	ATI5	Display user profiles	
I7	ATI7	Display the product configuration	
I8	ATI8	Display black list screen	
I10	ATI10	Display VXD configuration screen	
I11	ATI11	Display V.34 link screen	
L0	ATL0	Set modem speaker volume off	
L1	ATL1	Set modem speaker volume on (low)	
L2	ATL2	Set modem speaker volume on (medium)	X
L3	ATL3	Set modem speaker volume on (high)	
M0	ATM0	The modem's speaker is always off	
M1	ATM1	The modem's speaker is on until a connection is made	X
M2	ATM2	The modem's speaker is always on	
M3	ATM3	The modem's speaker is off during dialing, and on after dialing until the connection is made	
O0	ATO0	Return to online mode	
O1	ATO1	Return to online mode and retrain (automatically return to the highest speed)	
S$	ATS$	Display the list of S-register settings	
Sr=n	ATSr=n	Set S-Register "r" to "n"	
Sr?	ATSr?	Display the value of S-Register "r"	
V0	ATV0	Display result codes in numeric form	
V1	ATV1	Display result codes in verbose form (words)	X
X0	ATX0	Report basic call progress result codes, i.e., OK, CONNECT, RING, NO CARRIER, (also, for busy, if enabled, and dial tone not detected), NO ANSWER and ERROR	
X1	ATX1	Report basic call progress result codes and the connect rates-OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled, and dial tone not detected), NO ANSWER, CONNECT XXXX and ERROR	
X2	ATX2	Report basic call progress result codes and the connect rates i.e., OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled), NO DIAL TONE, NO ANSWER, CONNECT XXXX and ERROR	
X3	ATX3	Report basic call progress result codes and connection	

		rate i.e., OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT XXXX, BUSY and ERROR	
X4	ATX4	Report all call progress result codes and connection rate i.e., OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT XXXX, BUSY, NO DIAL TONE and ERROR	X
Y0	ATY0	On the next reset, use &W settings	X
Y1	ATY1	On the next reset, use &W1 settings	
Y2	ATY2	On the next reset, use &F settings	
Y3	ATY3	On the next reset, use &F1 settings	
Y4	ATY4	On the next reset, use &F2 settings	
Z0	ATZ0	Reset the modem according to the settings of ATY	
Z1	ATZ1	Reset the modem and use &W settings	
Z2	ATZ2	Reset the modem and use &W1 settings	
Z3	ATZ3	Reset the modem using &F settings and load factory default profile 1	
Z4	ATZ4	Reset the modem using &F1 settings and load factory default profile	
Z5	ATZ5	Reset the modem using &F2 settings and load factory default profile 2	
$	AT$	Display the list of AT commands	
&$	AT&$	Display the list of ampersand commands	
&A0	AT&A0	Disable data compression result codes	
&A1	AT&A1	Enable data compression result codes	
&A2	AT&A2	Enable modulation result codes	
&A3	AT&A3	Enable data compression result codes and add V.42bis and MNP 5 protocol indicators	X
&B0	AT&B0	Use a floating DTE speed	X
&B1	AT&B1	Use a fixed DTE speed	
&B2	AT&B2	Use a fixed DTE speed when using data compression	
&C0	AT&C0	Carrier detect is always on	
&C1	AT&C1	Carrier detect is controlled by the modem	X
&D0	AT&D0	Ignore DTR	
&D1	AT&D1	Use online command mode	
&D2	AT&D2	DTE controls DTR	X
&D3	AT&D3	DTE controls DTR and reset	
&F0	AT&F0	Set the factory profile that uses hardware (RTS/CTS) flow control (this is the active profile when the modem is shipped)	
&F1	AT&F1	Set the factory profile that uses hardware (RTS/CTS) flow control	
&F2	AT&F2	Set the factory profile that uses software (XON/XOFF) flow control	
&G0	AT&G0	No guard tone	X
&G1	AT&G1	Use 550 Hz guard tone	
&G2	AT&G2	Use 1800 Hz guard tone	
&H0	AT&H0	Flow control for transmitted data - Disable flow control	
&H1	AT&H1	Flow control for transmitted data - Enable hardware flow control (RTS/CTS)	X
&H2	AT&H2	Flow control for transmitted data - Enable software (XON/XOFF)	

&H3	AT&H3	Flow control for transmitted data - Enable both software and hardware flow control	
&I0	AT&I0	Flow control for received data - Disable flow control	X
&I1	AT&I1	Flow control for received data - send XON/XOFF signals to modems on both ends	
&I2	AT&I2	Flow control for received data - send XON/XOFF signals to your modem only	
&I3	AT&I3	HP Eng/Ack in Host mode	
&I4	AT&I4	HP Eng/Ack in Terminal Mode	
&I5	AT&I5	Flow control for received data - If error correction is used, send XON/XOFF signals to your modem only; if data compression is not used, look for incoming XON/XOFF	
&K0	AT&K0	Disable data compression	
&K1	AT&K1	Enable data compression (V.42bis, MNP 5, NONE)	X
&K2	AT&K2	Enable data compression (forces V.42bis)	
&K3	AT&K3	Use selective data compression	
&M0	AT&M0	Disable error correction in 1200 bps and faster transfers	
&M4	AT&M4	Allow V.42 or MNP error correction in 1200 bps and faster transfers	X
&M5	AT&M5	Allow either V.42 or MNP error correction in 1200 bps and faster transfers	
&N0	AT&N0	Highest link speed	X
&N1	AT&N1	Link Speed - 300 bps	
&N2	AT&N2	Link Speed - 1200 bps	
&N3	AT&N3	Link Speed - 2400 bps	
&N4	AT&N4	Link Speed - 4800 bps	
&N5	AT&N5	Link Speed - 7200 bps	
&N6	AT&N6	Link Speed - 9600 bps	
&N7	AT&N7	Link Speed - 12000 bps	
&N8	AT&N8	Link Speed - 14400 bps	
&N9	AT&N9	Link Speed - 16800 bps	
&N10	AT&N10	Link Speed - 19200 bps	
&N11	AT&N11	Link Speed - 21600 bps	
&N12	AT&N12	Link Speed - 24000 bps	
&N13	AT&N13	Link Speed - 26400 bps	
&N14	AT&N14	Link Speed - 28800 bps	
&N15	AT&N15	Link Speed - 31200 bps	
&N16	AT&N16	Link Speed - 33600 bps	
&N17	AT&N17	Link Speed - 33333 bps	
&N18	AT&N18	Link Speed - 37333 bps	
&N19	AT&N19	Link Speed - 41333 bps	
&N20	AT&N20	Link Speed - 42666 bps	
&N21	AT&N21	Link Speed - 44000 bps	
&N22	AT&N22	Link Speed - 45333 bps	
&N23	AT&N23	Link Speed - 46666 bps	

&N24	AT&N24	Link Speed - 48000 bps	
&N25	AT&N25	Link Speed - 49333 bps	
&N26	AT&N26	Link Speed - 50666 bps	
&N27	AT&N27	Link Speed - 52000 bps	
&N28	AT&N28	Link Speed - 53333 bps	
&N29	AT&N29	Link Speed - 54666 bps	
&N30	AT&N30	Link Speed - 56000 bps	
&N31	AT&N31	Link Speed - 57333 bps	
&R1	AT&R1	Ignore RTS	
&R2	AT&R2	Receive to DTE/RTS high	X
&S0	AT&S0	Data Set Ready (DSR) is always on	X
&S1	AT&S1	Data Set Ready (DSR) signals that the modem is ready to send data	
&U0	AT&U0	Variable link rate floor	X
&U1	AT&U1	Minimum link rate-300 bps	
&U2	AT&U2	Minimum link rate-1200 bps	
&U3	AT&U3	Minimum link rate-2400 bps	
&U4	AT&U4	Minimum link rate-4800 bps	
&U5	AT&U5	Minimum link rate-7200 bps	
&U6	AT&U6	Minimum link rate-9600 bps	
&U7	AT&U7	Minimum link rate-12000 bps	
&U8	AT&U8	Minimum link rate-14400 bps	
&U9	AT&U9	Minimum link rate-16800 bps	
&U10	AT&U10	Minimum link rate-19200 bps	
&U11	AT&U11	Minimum link rate-21600 bps	
&U12	AT&U12	Minimum link rate-24000 bps	
&U13	AT&U13	Minimum link rate-26400 bps	
&U14	AT&U14	Minimum link rate-28800 bps	
&U15	AT&U15	Minimum link rate-31200 bps	
&U16	AT&U16	Minimum link rate-33600 bps	
&U17	AT&U17	Minimum link rate-33333 bps	
&U18	AT&U18	Minimum link rate-37333 bps	
&U19	AT&U19	Minimum link rate-41333 bps	
&U20	AT&U20	Minimum link rate-42666 bps	
&U21	AT&U21	Minimum link rate-44000 bps	
&U22	AT&U22	Minimum link rate-45333 bps	
&U23	AT&U23	Minimum link rate-46666 bps	
&U24	AT&U24	Minimum link rate-48000 bps	
&U25	AT&U25	Minimum link rate-49333 bps	
&U26	AT&U26	Minimum link rate-50666 bps	
&U27	AT&U27	Minimum link rate-52000 bps	
&U28	AT&U28	Minimum link rate-53333 bps	

&U29	AT&U29	Minimum link rate-54666 bps	
&U30	AT&U30	Minimum link rate-56000 bps	
&U31	AT&U31	Minimum link rate-57333 bps	
&W0	AT&W0	Write (store) user profile 0 to memory	
&W1	AT&W1	Write (store) user profile 1 to memory	
&Zn=s	AT&Zn=s	Store phone number	
&Zn?	AT&Zn?	Display phone number	

Back to Contents Page

Back to Contents Page

Installation: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Overview • Connecting the Cable • Configuring Communications Software

Overview

Congratulations on your choice of a Mini PCI Type 3B Data Fax Modem by 3Com. Now 3Com's superior modem technology is built in to your computer, allowing you to transfer data and faxes faster than ever. This saves you both time and money.

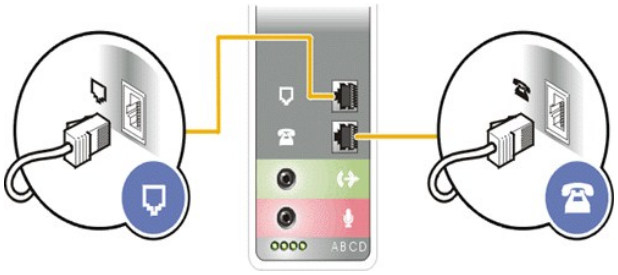
Connecting the Cable

Your modem uses a regular six-foot telephone cable similar to this:

To connect the modem cable, follow these steps:

1. Connect one end of the modem cable into the RJ-11 jack on the computer's panel.
2. Plug the modem cable into the country-specific adapter or, if no country-specific adapter is required, into a standard telephone wall jack.

The complete connection from modem to telephone line looks like this:



Configuring Communications Software

Communications software may be shipped with your modem, but any data or fax communications software package will work with your modem when set up correctly.

In your data or fax communications software settings, wherever you have an option:

- Select the highest transmission speed or baud rate listed
- Select fax class 1
- Select NONE for parity
- Select a word length of 8
- Set the stop bits to 1
- Select RTS/CTS (hardware) flow control
- In the modem setup section of your communications software, select a Mini PCI Type 3B Data Fax Modem by 3Com. If no Mini PCI modems appear, go to the Troubleshooting section of the User's Guide.

Back to Contents Page

Back to Contents Page

Introduction: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Overview • Features

Overview

Model Name: Mini PCI type 3B Data Fax Modem by 3Com

Model Number: 3CN3BM556-D-100

Your Mini PCI 56K (V.90) modem by 3Com can connect at speeds up to 56,000 bits per second (bps), although FCC regulations currently limit download speeds to 53,333 bps. It can also send or receive faxes at speeds up to 14,400 bps. With V.90 technology, your modem is capable of receiving at up to 56 Kbps and sending at up to 31.2 Kbps. Actual download speeds you experience may be lower due to varying line conditions. Compatible phone line and server equipment are required.

Features

Automatic Calling Card Dialing

Whenever you make a calling card call, your modem will detect the “bong” that sounds prior to entering your calling card number. You can set up your modem to enter your calling card number and place your call automatically by entering the following string either in your communications software or in terminal mode:

ATDT <phone#>&<calling card#>

Call Progress Detection

An optional set of result codes lets you know when:

- The telephone number you have dialed is busy
- The line has been picked up, but a modem is not answering the call
- There is no dial tone on the telephone line
- A call is coming in

These result codes, and the commands that enable or disable these result codes are controlled by the **ATXn** command. See **ATXn** in the Modem Commands listing, and the Result Codes listing.

Dialing Stored Phone Numbers

Your modem can store up to four of your most frequently called numbers (**AT&Z0** through **AT&Z3**). See **AT&Z** for storing that number and **ATDS** for dialing stored phone numbers in the AT Commands section.

For example, suppose you are dialing a phone number of 123-4567, and it is the first number you want to store. Enter AT&Z0=1234567 to store the number, and ATDS0 to dial it. To dial the second phone number in the list, you would enter AT&Z1 to store it, and ATDS1 to dial it.

Digital Line Guard

Your modem must use an *analog* line. If you are in an office and you are not sure what type of line you are connecting to, check with your telephone company or telephone administrator. If that is not possible, use a line that is connected to a fax machine or another modem. If you only have a digital line, you may be able to request a data line from your telephone company or telephone administrator.

The Mini PCI 56K Modem is equipped with a digital line guard to protect it if you accidently connect to a digital phone line. If, after you have connected the cables and entered the communications software, a sound is made and this message appears:

SEE MODEM USER REFERENCE
PHONE LINE NOT VALID
"DIGITAL LINE ERROR"

Disconnect your telephone cable immediately! This means the modem is connected to the wrong kind of telephone line, like a line from a digital PBX system. To use your modem, see if your digital PBX or telephone has a data port or look for a separate analog modem or fax line to use.

Back to Contents Page

Back to Contents Page

Modem S-Registers: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Modem S-Registers

The AT command settings are stored in the S-Registers. S-Register values can be changed either by entering an AT command or by entering the new value of the S-Register, preceded by AT, like this:

AT*n*=*v*

where *n* is the number of the S-Register you want to change and *v* is the new value of that S-Register.

Suppose you want to change from manual answer (when you answer the call) to auto-answer (where the modem picks up the call after a certain number of rings), and have the call answered after three rings. Follow these steps:

1. Check the table below to find the S-Register that controls answering.
2. Enter your communications software.
3. Enter Terminal mode.
4. Type **ATS0=3** and press Enter. The modem will now answer a call after three rings.

Register	Function	Range	Default
S0	Number of rings before the modem auto-answers a call. If set to 0, auto-answer is disabled and manual answer is in effect	0-255	0 rings
S1	Counts and logs the number of rings	0-255	0 rings
S2	Designates the ASCII character used to indicate an escape character (refer to an ASCII character conversion chart)	0-127	ASCII 43
S3	Designates the ASCII character used for carriage returns (refer to an ASCII character conversion chart)	0-127	ASCII 13
S4	Designates the ASCII character used for line feeds (refer to an ASCII character conversion chart)	0-127	ASCII 1
S5	Designates the ASCII character used for backspaces	0-127	ASCII 8
S6	Dial tone wait time; if AT command X is set to X2 or X4, the modem ignores this register and dials as soon as it detects a dial tone	2-255	6 seconds
S7	Carrier wait time	1-255	60 seconds
S8	Pause in dialing time (comma in dialing string)	0-255	2 seconds
S9	Carrier detect validation time (1/10 second)	1-255	6
S10	Delay time between lost carrier and	1-255	7

	hangup; if S1=255, the modem will not hang up when the carrier is lost; dropping DTR hangs up the modem (1/10 second)		
S11	Duration of the touchtone dialing tone spacing	50-255	70 ms
S12	Guard time for the escape code (1/50 second)	0-255	50
S13	Bitmapped register. Selects the bit(s) you want on and sets S13 to the total of the values in the Value column. For example, ATS13.0=17 enables bit 0 (value 1) and bit 4 (value 16)	0-255	0
	1 = Reset on DTR loss		
	2 = Reduced non-ARQ transmit buffer		
	4 = Set DEL=backspace		
	8 = Do DS0 on DTR		
	16 = Do DS0 on Reset		
	128 = Escape code hangup		
S15	Bitmapped register.	0-255	0
	1 = MNP/V.42 disabled in V.22		
	2 = MNP/V.42 disabled in V.22bis		
	4 = MNP/V.42 disabled V.32, V.34		
	8 = Disable MNP handshake		
	16 = Disable MNP level 4		
	32 = Disable MNP level 3		
	64 = Unusual MNP incompatibility		
	128 = Disable V.42		
	136 = Disable V.42 detection phase		
S16	Bitmapped test register. 2 = Dial test	2	0
S18	Test timer for AT command &T; when AT&T=0 the timer is disabled.	0-255	0 sec
S19	Duration for inactivity timer; S19=0 disables the timer	0-255	0
S21	Sets error correction break length (1/100 second)	0-255	10
S22	Designates the ASCII character code for XON	0-127	ASCII 17
S23	Designates the ASCII character code for XOFF	0-127	ASCII 19

S25	DTR debounce time indicator (1/100 second)	0-255	5
S27	Bitmapped register.	-	0
	1 = V.21 mode		
	2 = Disable TCM		
	4 = Disable V.32		
	8 = Disable 21Hz		
	16 = Enable V.23 fallback		
	32 = Disable V.32bis		
	128 = Software compatibility mode		
S28	V.32 Handshake Time (1/10 second)	0-255	8
S29	V.21 Answer Mode Fallback Timer	0-255	20
S32	Connection bitmapped operations.	-	2
	1 = V.8 call indicate enable		
	2 = Enable V.8 mode*		
	8 = Disable V.34 modulation		
	16 = Disable V.34+ modulation		
	32 = Disable x2 modulation*		
	64 = Disable V.90 modulation		
	* Be sure to enable 2.8 mode when disabling X2		
S33	V.34 and V.34+ connection setup bitmapped control flags.	-	32
	1 = Disable 24 symbol rate		
	2 = Disable 2743 symbol rate		
	4 = Disable 28 symbol rate		
	8 = Disable 3 symbol rate		
	16 = Disable 32 symbol rate		
	32 = Disable 3429 symbol rate		
	128 = Disable shaping		
S34	V.34 and V.34+ connection setup bitmapped control flags	-	0
	16 = Disable nonlinear coding		
	32 = Disable transmit level deviation		
	64 = Disable preemphasis		
	128 = Disable precoding		

S38	Delay before forced hangup (optional)	0-255	0

Back to Contents Page

Back to Contents Page

Regulatory: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Manufacturer's U.S. FCC Part 15 Declaration of Conformity

3Com Corporation
605 North 5600 West
Salt Lake City, UT 84116-3738
(800) 527-8677

Declares that the product:

Date: 17 March 1999
Brand Name: 3Com Corporation
Model Number: 3CN3BM556-D-100
Equipment Type: 3Com Mini PCI 56K (V.90) modem

Complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

U.S. FCC Part 15 Class B Verification Statement

3Com Corporation
Model No: 3CN3BM556-D-100

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

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

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

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

NOTE: In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Refer to the manual for specifications on cabling types.

Industry Canada (IC) Emissions Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

VCCI Statement

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

U.S. FCC Part 68 Statement

The modem complies with Part 68 of the Federal Communications Commission (FCC) rules. On the computer is a label that contains the FCC registration number and Ringer Equivalence Number (REN) for this device. If requested, this information must be provided to the telephone company.

- Equipment Manufacturer

  3Com Corporation
  5400 Bayfront Plaza
  Santa Clara, CA 95052-8145
- Model No: 3CN3BM556-D-100
- FCC Registration Number: See identification number for modem marked on computer label.
- Ringer Equivalency Number: See “REN” number marked on computer label.

The Ringer Equivalence Number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN’s on a telephone line may result in the devices not ringing in response to an incoming call. In most areas, the sum of REN’s should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total REN’s, contact the local telephone company.

An FCC compliant telephone line cord with a modular plug is required for use with this device. The modem is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. The telephone company may request that you disconnect the equipment until the problem is resolved.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of this equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. This equipment cannot be used on telephone company provided coin service. Connection to party line service is subject to state tariffs. Contact the state public utility commission or public service commission for information.

When programming and/or making test calls to emergency numbers:

- Remain on the line and briefly explain to the dispatcher the reason for the call.
- Perform such activities in the off-peak hours such as early morning or late evenings.

NOTE: The United States Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. Refer to your fax communication software documentation for details on how to comply with the fax-branding requirement.

If trouble is experienced with this equipment or for repair or warranty information, please contact 3Com Corporation. Contact details can be found in the main body of this manual.

Industry Canada (IC) Notice

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

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

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

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

CAUTION: Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

*NOTICE: The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.*

European Community - CE Notice

Marking by the symbol CE indicates compliance of this equipment to the EMC Directive 89/336/EEC, the Low Voltage Directive 73/23/EEC

amended by 93/68/EEC and the Telecom Terminal Equipment and Satellite Earth Stations Directive 98/13/EC. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment. (CISPR 22 Class B).
- EN 50082-1 - Electromagnetic compatibility - Generic immunity standard Part 1: Residential, commercial, and light industrial.
- EN60950 (1992) - Safety of information technology equipment, including electrical business equipment.
- CTR 21 (1998) - Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting voice telephony services) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling

WARNING: Although this equipment can use either loop disconnect (Pulse) or DTMF (Tone) signaling, only the performance of the DTMF signaling is subject to regulatory requirements for correct operation. It is therefore strongly recommended that the equipment is set to use DTMF signaling for access to public or private emergency services. DTMF signaling also provides faster call set up.

This equipment has been approved to Council Decision 98/482/EC--"CTR 21" for Pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN termination point. In the event of problems, you should contact your equipment supplier in the first instance.

This equipment has been designed to interwork with Public Switched Telephone Networks in the following countries in Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland & United Kingdom.

The safety status of the ports on this modem is as follows:

Line Interface Port - TNV

Mini-PCI Bus connector to PC - SELV

Note that only SELV ports should be connected to other SELV ports or TNV ports to other TNV ports. Interconnection of ports with different safety status may invalidate the approval. If in doubt about making such a connection, advice should be sought from a competent engineer.

The user should ensure that the power drawn by the modem, together with the host and any auxiliary apparatus drawing power from the host is within the rating of the power supply.

The modem power requirements are: 3.3V 10mA
5V 160mA

The user should be aware that it is the modem and not the host that is approved.

When the modem is supplied along with a host machine, the modem user instructions must also be supplied. Failure to do so will invalidate the modem approval.

Please consult the supplier or maintainer of the modem, not the network operator, if operational difficulties are experienced.

Back to Contents Page

Back to Contents Page

Modem Result Codes: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Modem Result Codes

Result codes are messages that appear on your computer screen to inform you of the status of modem actions or when an error has occurred. The result codes that can appear depend on the setting of the ATXn command (see ATXn in the AT Commands list).

Verbose CONNECT result codes can have appendages such as ARQ, V32, VFC, V34, V.90, NONE, LAPM, MNP, V42BIS, MNP5, SREJECT, and ETC. Numeric values change as appendages are added.

NUMERIC	VERBOSE	X0	X1	X2	X3	X4
0	OK	X	X	X	X	X
1	CONNECT	X	X	X	X	X
2	RING	X	X	X	X	X
3	NO CARRIER	X	X	X	X	X
4	ERROR	X	X	X	X	X
5	CONNECT 1200		X	X	X	X
6	NO DIAL TONE				X	X
7	BUSY				X	X
8	NO ANSWER				X	X
	(requires @ in dial string; replaces NO CARRIER)					
10	CONNECT 2400		X	X	X	X
11	RINGING		X	X	X	X
13	CONNECT 9600		X	X	X	X
15	CONNECT 1200		X	X	X	X
18	CONNECT 4800		X	X	X	X
20	CONNECT 7200		X	X	X	X
21	CONNECT 12000		X	X	X	X
25	CONNECT 14400		X	X	X	X
43	CONNECT 16800		X	X	X	X
85	CONNECT 19200		X	X	X	X
91	CONNECT 21600		X	X	X	X
99	CONNECT 24000		X	X	X	X
103	CONNECT 26400		X	X	X	X
107	CONNECT 28800		X	X	X	X
151	CONNECT 31200		X	X	X	X
155	CONNECT 33600		X	X	X	X
180	CONNECT 33333		X	X	X	X
184	CONNECT 37333		X	X	X	X
188	CONNECT 41333		X	X	X	X
192	CONNECT 42666		X	X	X	X
196	CONNECT 44000		X	X	X	X
200	CONNECT 45333		X	X	X	X

204	CONNECT 46666		X	X	X	X
208	CONNECT 48000		X	X	X	X
212	CONNECT 49333		X	X	X	X
216	CONNECT 50666		X	X	X	X
220	CONNECT 52000		X	X	X	X
224	CONNECT 53333		X	X	X	X
228	CONNECT 54666		X	X	X	X
232	CONNECT 56000		X	X	X	X
236	CONNECT 57333		X	X	X	X

The following functions are also available:

Adaptive dialing	X	X	X
Wait for 2nd Dial Tone (W)		X	X
Wait for Answer (@)		X	X
Fast Dial	X		X

Back to Contents Page

Back to Contents Page

Specifications: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

General • Operational • Mechanical • Electrical • Environmental • Protocols and Standards

General

Manufacturer

3Com Corporation

Model

3CN3BM556-D-100

Chipset

3Com/ADI 1826 - Controllerless Fax/Modem

Countries Supported

United States
Canada

Operational

Asynchronous Character Format

Up to 10 bits, including data, start, stop, and parity bits

Asynchronous Data Rates

Transmission rate fallback through 300bps

Command Set

3Com Hayes Compatible AT Command Set
EIA602
V.250
V.251

Wire Connection

RJ11

Mechanical

Size

58.75 mm x 44.6 mm x 4.8 mm

Electrical

Power Requirements

390 mA	connected
35 mA	sleep mode

Environmental

Operating Temperature (board only)

Operating:	0° to 75° C
Storage:	-40° to 75° C

Operating Environment

Altitude:	Operating-up to 10,000 ft. (3050m) Non-operating-up to 30,000 ft (9100m)
Humidity:	Operating-10% to 90% noncondensing Non-operating-5% to 95% @ 39 C

Protocols and Standards

Dialing Capability

Tone

Fax Capability

ITU-T V.17
ITU-T V.29
ITU-T V.27ter
ITU-T V.21 channel 2
Group 3 fax, class 1

Line Requirements

RJ11
Public Switched Network

Operating Modes

Asynchronous
Full duplex
Automatic and manual call originate/answer

Speed

33600 bps data (send/receive)
14400 bps FAX (send/receive)
5600 bps data (receive)*
31200 bps data (send)
* Due to FCC rules, which restrict power output of service providers, modems download speed is currently limited to 53Kbps. Actual speed may vary depending on line conditions.

Standards and Protocols

ITU V.90 (including support for both a-law and u-law countries)
V.34 Annex 12
V.34
V.32bis
V.32
V22bis
V.22
V.23
V.21
Bell 212A
Bell 103

Tones Detected

Dial, busy, ringback, credit card bong, and modem answer tones.
Blind dialing based on timeout periods available for incompatible tones

---

Back to Contents Page

Back to Contents Page

Troubleshooting: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Common Problems and Solutions • How to Properly Uninstall Modem Drivers

Common Problems and Solutions

Message/Symptom	Possible Solution
ERROR	ı If you are typing from the command line in terminal mode, try retyping the command. ı Make sure that you issued the correct AT command.
Modem Communication Error or Modem not found.	ı If fax software is being used, make sure the correct fax class (Class 1) is selected. ı Make sure that you selected the correct COM port in the software setup.
NO DIAL TONE	ı Make sure that the cable connections are secure. The connection to the phone line could be incomplete or the phone cable could be bad. ı Make sure that the telephone line being used is not in use by someone else. ı Make sure that a standard analog telephone line is being used. If the connection being attempted is to a digital phone system or a private branch exchange (PBX), an error message may result. ı Make sure that the phone line is working by connecting a standard telephone and listening for a dial tone.
DIGITAL LINE ERROR	ı The modem is trying to connect to a digital phone system (see Modem Features), a public branch exchange (PBX), or another kind of invalid line. Change lines to connect to a standard analog telephone line.
Can not hear modem or speaker	ı Make sure that the modem's speaker is turned on (ATM1). ı Make sure that the computer's speaker is turned on. Refer to the computer's manual for instructions.
Modem does not dial correctly	ı Make sure that the telephone number that you dialed is correct if the dialing directory is being used. ı Make sure that the number that you dialed is correct if you dialed in terminal mode. ı Make sure that you dialed 1 before dialing the number if dialing long distance. ı Make sure that you dialed a prefix (such as 9) if required. ı The other line could be busy or not answering. Make sure it is available to answer before calling. ı If you are dialing internationally, the modem may not recognize the dial tone. Try blind dialing using the ATX1 command (see AT Commands) and the telephone number. ı If you have Call Waiting, disable it (usually *70).
Modem does not dial	ı Check the phone line and cable connections. ı Make sure that no other phone extension has been picked up on the same line. ı Make sure that you are using a standard analog telephone line. An error could result if you are trying to connect to a digital phone system or a private branch exchange (PBX). ı Listen for a normal dial tone on the line. If there is no dial tone or the dial tone sounds differently than normal, use another telephone line.
Modem does not fax	ı Make sure that you selected fax Class 1. ı Make sure that no other communications programs are open.
Modem does not connect	ı If there is no trouble communicating with any modem except on one particular line, the problem may be with the modem on the other end. ı Disable error correction (see &M0 in AT Commands) and data compression (see &K0 in AT Commands) and try again.
Modem connects, but characters are garbled	ı Make sure the parity, modem speed, word length, and stop bits match on both sending and receiving modems. ı Disable error correction (see &M0 in AT Commands) and data compression (see &K0 in AT Commands) and try again.
Modem clicks repeatedly, but no connection is made	ı Ordinarily, a DIGITAL LINE ERROR message would appear, but if the current is under 100mA, the modem will click repeatedly but a no dial tone message will appear. ı The cable may not be seated securely. Check all cable connections.

Modem does not respond or "Port Not Available" message appears	• This is usually due to incorrect driver installation. If the driver installation is unsuccessful uninstall and repeat the driver installation. 1. To remove the driver click Settings>Control Panel>System>Device Manager>Modem 2. Select the 3Com Modem and click *Remove*. 3. Reboot and reinstall the driver. • For any general problems use the Modem Manager that is included with the modem on your computer. Access the Modem Manager by clicking Start>Programs>Modem Manager. Use it to troubleshoot any modem functionality problems. The Modem Manager uses a comprehensive Help system making it easy to use and understand.

How to Properly Uninstall Modem Drivers

The modem driver comes already installed on your computer. You can uninstall the modem driver any time following the installation; however, any changes to the system files made between the install and the uninstall will be lost.

1. Click Start>Settings>Control Panels
2. Click the *System* icon.
   The System Properties window appears.
3. Click the *Device Manager* tab.
4. Click *Modem*.
5. Select "MINI PCI type_3B Data Fax Modem by 3Com".
   The *MINI PCI type_3B Data Fax Modem by 3Com Properties* window appears.
6. Click the *Country Setting* Tab.
7. Click the *Uninstall* button and follow the prompts.

The Uninstall utility removes desktop icons, registry entry files, the User Guide, and files used by the modem.

Back to Contents Page

Back to Contents Page

Using the modem: Mini PCI Type 3B Data Fax Modem by 3Com User's Guide

Overview • Transferring Data • Faxing

Overview

Your modem allows you to send and receive both data and fax files using your communications software. Your modem can also be used for data communications with an online service, the Internet, an electronic Bulletin Board System (BBS), or another modem, at up to V.90 speeds.

Your modem can connect at speeds up to 56,000 bits per second (bps), and send or receive faxes at speeds up to 14,400 bps. With V.90 technology, your modem is capable of receiving at up to 56 Kbps and sending at up to 31.2 Kbps. Actual download speeds you experience may be lower due to varying line conditions. Compatible phone line and server equipment are required.

Your modem supports class 1 faxing. If problems arise when you attempt to fax, we suggest you try changing the fax class.

Transferring Data

Because your modem is optimized for Windows, it takes advantage of the Windows interface and the capabilities of your computer to achieve faster data transfers than a regular modem.

Terminal Emulation Protocols

You may be required to designate a terminal emulation protocol to use for data transmission. Various computer systems use different types of terminal emulation, such as IBM 3270, TTY, DEC, or ANSI. Contact the system operator of the host modem you are dialing into to determine the type of emulation to use for that connection. If the system operator is unknown, try using the ANSI terminal emulation protocol.

File Transfer Protocols

File transfer is the ability to transport files between two computers via two modems. The modem must use a file transfer protocol (ftp), which can correct errors in transmission and begin the file transfer process. Both modems must use the same file transfer protocol.

At the time you set up a file transfer, your communications software will prompt you to designate a file transfer protocol. The following table describes some of the most common protocols:

Protocol	Description
ZMODEM	Transfers files in a streaming protocol, making it very fast even with error correction. Also provides an automatic receive function that saves you steps when receiving data.
YMODEM-G	A variation of YMODEM designed for modems that support error control. Does not provide error correction or recovery, but relies on the modem to provide it. If any block is unsuccessfully transferred, the entire transfer is canceled.
YMODEM	An error correcting file transfer data transmission protocol that sends information in 1024-byte (1k) blocks. Checksums are done on each block and the result is sent along with the block. If the result does not check out at the receiving end, a NAK (Negative AcKnowledgement) is sent to retransmit that block. If the block checks out, an ACK (ACKnowledgement) is sent.
XMODEM	An error correcting file transfer protocol that sends informaton in 128-byte blocks. Checksums are done on each block and the result is sent along with the block. If the result does not check out at the receiving end, a NAK (Negative AcKnowledgement) is sent to retransmit that block. If the block checks out, an ACK (ACKnowledgement) is sent.
KERMIT	A very reliable asynchronous file transfer protocol that can communicate successfully with virtually any system. Because of this portability, throughput is significantly reduced.
ASCII	Sends TEXT ONLY files directly to the computer screen. Is very slow. Binary or graphics files cannot be transferred using the ASCII protocol.

Rules for Using File Transfer Protocols

For the best results when sending or receiving a file, follow these basic rules:

- If both systems support ZMODEM, use it!
- Both the sending and receiving modem must use the same file transfer protocol. BBS or online services usually inform you which protocols are available.
- Most communications software packages must be informed of the name of the sending (uploading) or receiving (downloading) file before file transfer can begin, and when a file transfer is about to take place. See your communications software manual for specific information.

CAUTION: When files are shared, the risk of getting a computer virus always exists. We recommend the use of virus scanning software to make sure the files you receive and send do not contain viruses.

Sending a Data Transmission

All communications software allows for automatic dialing. See your software documentation for instructions.

To manually dial another modem, go into terminal mode in your communications software, and enter **ATDT** followed by a space and the telephone number.

When dialing, enter the same information you would if you were calling someone on the phone. For example, when dialing long distance, prefix the phone number with a **1** and the area code. If you're dialing from a telephone system that requires a 9 for an outside line, dial **9** before dialing the telephone number. You'll probably need to place a comma or two after the 9 (**9**,,) to allow enough pause time to access the outside line (each comma designates a two-second delay).

Receiving a Data Transmission

A modem can answer a call in one of three ways: Host, auto-answer, or manual answer.

- *Host mode* is a feature of the software (although it is not available in all communications software packages) that allows the modem to answer the phone and place the caller into a "host" mode, allowing the caller to download files, upload files, and chat with you while his or her modem is connected. Refer to your software documentation for instructions on how to use this feature. To answer cellular calls in host mode, be sure AT&F6 is included in the answer string.
- *Auto-answer* is used to answer an incoming call without user intervention. The AT command for auto-answer is ATS0=n, where n is the number of rings before the incoming call is answered. For example, ATS0=2 tells the modem to answer after the second ring.
- *Manual answer* tells the receiving modem not to answer when the phone rings. ATS0 must be set to 0 (ATS0=0) when you are using manual answer. When the phone rings while you are in terminal mode in your communications software, the word RING will appear on the computer screen. You must then type ATA to tell the modem to answer. If the phone rings when you are not in terminal mode, you will neither hear nor see any indication that a call is coming in. If ATS0= anything except 0, the Auto-Answer feature will be activated after the number of rings you specify.

Faxing

Your modem can send and receive faxes at speeds up to 14,400 bps when used with fax communications software programs. This section describes faxing with your modem.

Fax Cover Page

Your software may allow you to create a cover sheet to accompany your fax. Some fax software packages offer an option to customize a cover page. A cover page should give the person receiving the fax information about the fax, the sender, and the transmission. Most regulatory agencies require the following information to be displayed on either the top or the bottom of at least the first faxed page:

- Your name
- Your phone number
- Your fax number
- Date and time

You might also include the following information:

- The person you are sending the fax to
- That person's phone number
- That person's fax number
- The number of pages, including the cover sheet
- Your company, if applicable

Sending a Fax

Because different fax software packages treat the faxing process in different ways, check the software user manual before sending a fax.

Opening the fax software loads the driver and prepares the modem to send the fax. If you are faxing from another application, you may have to create the fax, then go into the application's print setup menu to select the fax driver.

When entering a fax number, enter the same information you would if you were calling someone on the phone. For example, when you fax long distance, prefix the fax number with a **1** and the area code. If you're faxing from a telephone system that requires a 9 for an outside line, dial **9** before dialing the fax number. You may want to add a comma or two following the 9 (**9**,,) to allow enough time to access the outside line (each comma places a two-second delay into your dialing string. See S-Register S8).

Receiving a Fax

NOTE: Your fax software must be open and a fax driver loaded in order for you to receive a fax.

Check your fax software manual to see how your fax software handles receiving faxes.

A fax driver must be loaded before you can receive a fax. If auto receive is enabled, opening the fax software program loads the fax driver and prepares the modem to receive a fax. You must have the fax communications software open.

Windows fax packages may be opened and then minimized so you can receive a fax while working in another program.

Hints for Successful Faxes

- Avoid loading more than one fax package at a time on your computer. Because all fax software packages use the same types of files for operation, conflicts frequently occur if you have more than one fax program installed.
- Because many fax drivers keep possession of the COM port after being loaded, you may need to unload the fax driver in order to use other modem functions. Consult your communications software manual for instructions about unloading the fax driver.
- In many Windows application packages, the fax driver is displayed among the printer selections in the Windows application software. Direct a fax to this driver to send it. Direct a received fax to your normal printer selection for printing.

Back to Contents Page