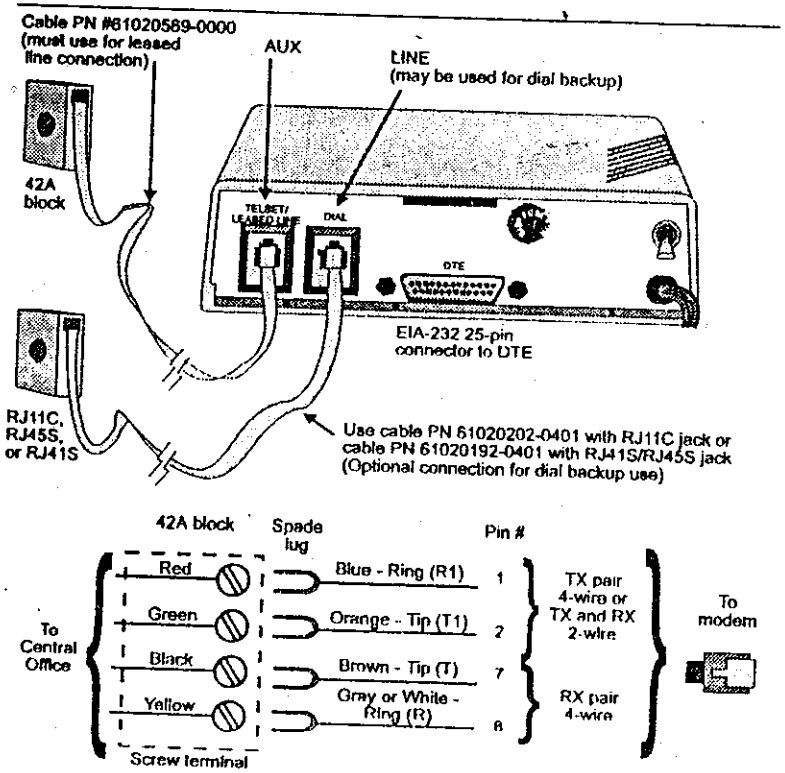
V.3400
Manual

For Sales or Service Contact:

Data Connect Enterprise
301-924-7400

http://www.data-connect.com/
sales@data-connect.com



Notes:

1. *Set the transmit output level to 0 dBm.*
2. *DTR, which is the signal on pin 20 of the DTE interface, must be active or the option DTE IGNORED must be set for 2-wire OR 4-wire leased line operation.*
3. *The connection shown includes dial backup. Connect only the 42A block to the AUX jack for regular leased line use.*

Figure 2-4 Leased Line Connection

Chapter 3
Getting Started

OPTION SELECTION

There are six ways to change or select options:

- LCD - Using the front panel LCD and pushbuttons is simple, straightforward, and requires the least amount of technical background. Chapter 4 explains LCD operation.
- AT Commands - The AT compatible command set can be used to select modem options. Chapter 5 describes AT commands.
- V.25 bis Commands - An extended set of V.25 commands allows selection of modem options during synchronous operation. Refer to Chapter 11.
- Status Registers - A series of special ATS commands allows the operator to change the decimal or hexadecimal value of a memory byte to change one or more options in that byte. Chapter 10 describes S-registers.
- Single Bit Status Registers - A second series of special ATS commands allows the user to change single bits within a byte to change an option. Chapter 10 explains single bit control.
- Software program - A wide variety of software programs are available, or advanced computer users can write their own software programs to interact with the modem. This manual does not discuss software programs.

POWERUP

A powerup procedure is not required. Turn the ON/OFF power switch on the rear panel to ON. The modem is factory configured to operate in most public switched telephone applications. If a user has stored a desired option set it will be automatically be restored at power up.

PLACING A CALL

Using a Standard Telephone

1. Lift the telephone receiver. Wait for the dial tone.

2. Dial the number of the remote site.

3. When the answer back tone is heard, immediately press the TALK/DATA button and hang up the telephone. The modems go through a connection sequence and establish a data link. If a data link is not established, return to the first step.

4. After the link is established, hang up the telephone.

Autodial from Front Panel

1. If no number to dial is stored yet advance to Main Menu #6, CHANGE PHONE NUMBER.

2. Enter the number using NO to scroll and YES to select.

3. When number is entered press YES to store the number.

4. Advance the LCD to main #2, DIAL STORED NUMBER.

5. Select number to dial and press YES to dial. After dialing the modems follow the same procedure as when using a standard telephone.

Autodial from a Terminal with the AT Command Set

To dial a number, for example 555-1212, type *AT D 555-1212* and press Enter, or enter *ATDSn* where *n* equals the stored telephone number location 1-9 to dial.

The modem dials the number — either pulse or tone, whichever is currently in effect — and takes the role of the originate modem.

Refer to Dial Commands section in Chapter 5 for additional dialing commands.

ANSWERING A CALL

Autoanswer

Normally the modem is configured to autoanswer on the first ring. A telephone plugged into the AUX jack will also ring.

Manual Answer

On ring detection the modem LCD displays ringing status.

Press TALK/DATA to answer the call and place the modem in the data mode.

Answer from Terminal with AT Command Set.

The modem displays the ring response.

To answer an incoming call type *ATA*. The modem begins sending an answer back tone and attempts to connect to the remote modem.

ENDING A CALL

Call Termination from Front Panel

1. Press TALK/DATA and DO YOU WANT TO DISCONNECT will be displayed.

2. Answer YES.

Call Termination from Terminal with AT Command Set

1. Enter +++ and the modem will enter command mode.

2. Enter *ATH* and the modem will terminate the call.

Reasons for Call Termination

The following conditions cause call termination.

Condition	Description
Abort Disconnect (No answer, busy signal, no modem, etc.)	Default 30 sec; select 1 to 255 sec (S-register 7)
ATH	Disconnect command
Loss of Carrier Disconnect	Select 100 ms to 25.5 sec (S-register 10)
Receive Long Space Disconnect	Disabled or select 2 sec
DTR Disconnect	Disabled or select 10 ms to 2.55 sec (S-register 25)
Loss of Line Current	
Cleardown	A disconnect method used in V.32 and V.34 mode
LCD Display	When TALK/DATA is pressed, the LCD displays DO YOU WANT TO GO TO TALK? When YES is pressed modem hangs up, if no telephone is connected or if the connected telephone is not off hook. Pressing NO displays DO YOU WANT TO DISCONNECT? Press YES to disconnect.
Train Timeout	Modem fails to establish communication with remote site. Default is 30 seconds (S-register 7)
Protocol Link Establishment Failure	Reliable mode only; failure to establish reliable link
Inactivity Timeout	Default is 0 or disabled; select for disabled or 1 to 255 minutes (S-register 8)
Protocol Retry Limit Exceeded	12 retransmissions of the frame
Minimum DCE Speed	A connection occurred at a rate less than minimum
Security Password Failure	Maximum password entry attempts exceeded
Security Callback	Security callback is enabled and a new remote connection is established. The modem disconnects and places a call to the programmed number
Signal Quality	Leased line operation with dial backup enabled; extended loss of carrier or 4 unsuccessful retrains in 3 minutes cause dial backup
Test Mode entered	Certain test modes require call termination
Modem power is turned off.	

Chapter 4
Front Panel Operation

GENERAL

The function of the LCD front panel is to provide easy real-time access to modem configuration and status. The LCD can be used at any time to modify modem options or obtain information about modem operation and status. All of the major options of the modem can be controlled through the LCD interface without an external terminal or phone line connection. Operation of the LCD can be secured using a password protection feature. A remote modem can even be configured using the local LCD through the use of the front panel remote configuration feature.

LED DESCRIPTIONS

The V.3400 has six LED indicators: TR, CS, RS, CD, RD, and TD. The functions of these LEDs are as follows:

TR - Terminal Ready. This LED lights when the DTE asserts Data Terminal Ready. This signal is input on pin 20 (CCITT V.24/108.2).

CS - Clear to Send. This LED lights when the modem is ready to send data to the DTE. This signal is output on pin 5 (CCITT V.24/106).

RS - Request to Send. This LED lights when the DTE is ready to send data to the modem. This signal is input on pin 4 (CCITT V.24/105).

CD - Carrier Detect. This LED lights when the received audio carrier signal is detected or, if enabled, when error control protocol negotiation is complete. This signal is output on pin 8 (CCITT V.24/109).

RD - Received Data. This LED lights for a data space condition at the receive data output, indicating receive data output activity. This signal is output on pin 3 (CCITT V.24/104).

TD - Transmit Data. This LED lights for a data space condition at the transmit data input, indicating transmit data input activity. This signal is input on pin 2 (CCITT V.24/103).

LCD MENUS

The V.3400 has seven main LCD menus that support modem operations. Table 4-1 lists them in the following sequence:

- MODEM STATUS
- DIAL STORED NUMBER
- DISPLAY STATUS
- SELECT TEST
- MODIFY CONFIGURATION
- CHANGE PHONE NUMBERS
- FRONT PANEL FEATURES

LCD MENU OPERATION

The LCD menu is portrayed by a six column table (Table 4-1). The first column lists the seven main menu categories. The second column is the submenus, listing functions for each category in the main menu. The third column lists specific items for submenu functions. The fourth column lists option choices or status for the specific items in the third column. The fifth and sixth columns in the table show associated AT commands and S-registers as a cross reference.

Each column item has a corresponding header in the previous column. If an option setting is selected or if all settings have been scrolled through, the display will return to that header.

Because of the menu structure and option choices not all main menus use all four columns in Table 4-1. However, option selection and sequence are the same.

In general, while operating in the option menu, pressing NO scrolls vertically down the columns and pressing YES advances horizontally across the columns. However, responding to the LCD prompt is the best method to reach an option.

If the NO pushbutton is pressed and held, the LCD scrolls through the menus.

Press the TALK/DATA button to return to the previous menu.

Table 4-1. Menu Options

MAIN MENU		LCD MESSAGES				S-REG
1	MODEM STATUS	V.34 28800 IDLE *Note: Shows the current modulation, bit rate, and modem status.*		(Press NO to advance to MAIN 2)		S91 S67
MAIN MENU		**SUBMENU**	**SUBMENU ITEM**	**ITEM OPTION**	**AT COM.**	**S-REG**
2	DIAL STORED NUMBER?		DIAL #1-9	YES, NO	DSn (n-1-9)	---
3	DISPLAY STATUS? *(status only)*	DTE SIGNALS	QM ON/OFF DSR ON/OFF OH ON/OFF RI ON/OFF	DISPLAY STATUS	---	---
		PROTOCOL*	NONE MNP 2, 3, 4, or 5 LAPM	DISPLAY STATUS	---	---
		COMPRES-SOR*	NONE MNP 5, V.42b	DISPLAY STATUS	---	---
		CARRIER DESCRIP-TIONS*	RECEIVE LEVEL NEAR END ECHO LEVEL FAR END ECHO LEVEL FAR END ECHO DELAY FREQUENCY TRANSLATION BAUD RATE RX BIT RATE TX BIT RATE	DISPLAY STATUS	---	---
		LAST DISCON-NECT REASON	DISPLAY STATUS		I5	
4	SELECT TEST?	(Offline test only)	LOCAL ANALOG LOOP	INITIATE, EXIT	&T1	S16
			LOCAL ANALOG LOOP WITH TP	INITIATE, EXIT	&T8	S16

** When modem is not online, the display flashes and shows the status from the last connection.*

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
4 cont.	SELECT TEST? (continued)	(Online test)	LOCAL DIGITAL LOOP †	INITIATE, EXIT	&T3	S16
			REMOTE DIGITAL LOOP †	INITIATE, EXIT	&T6	S16
			REMOTE DIGITAL LOOP WITH TP †	INITIATE, EXIT	&T7	S16
			TEST PATTERN†	INITIATE, EXIT	%T	---
5	MODIFY CONFIGU-RATION?	CHANGE MODEM OPTIONS?	CHANGE LEASED/ DIAL LINE?	2 WIRE/ 4 WIRE	&L1, &L	S27
			CHANGE MODULATION?	AUTOMODE V.21 BELL 103 B212A V.22 bis V.27 ter * V.29 * V.33 * V.32bis V.34	*MM *MM1 *MM2 *MM4 *MM5 *MM6 *MM8 *MM10 *MM11 *MM12	S88
			CHANGE MAX DCE RATE?	28800 26400 24000 21600 19200 16800 14400 12000 7200 9600 9600U 4800 2400 1200 300 DTE SPEED	%B15 %B14 %B13 %B12 %B11 %B10 %B9 %B8 %B7 %B6 %B5 %B4 %B3 %B2 %B1 %B	S69

† Modem must be online with protocols disabled
** Lease line only*

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE MODEM OPTIONS? (continued)	CHANGE MIN DCE RATE?	28800 26400 24000 21600 19200 16800 14400 12000 7200 9600 9600U 4800 2400 1200 DISABLED DISABLED	%L15 %L14 %L13 %L12 %L11 %L10 %L9 %L8 %L7 %L6 %L5 %L4 %L3 %L2 %L1 %L	S69
			CHANGE V.34 RATE THRESH-OLD?	LOW BER MED BER HIGH BER	*TH *TH1 *TH2	---
			V.34 ASYM RATES	ENABLE DISABLE	*AS1 *AS	S96
			NORMAL ORIGINATE FORCED ANSWER*	NORMAL ORIG. FORCED ANS.	*OR *OR1	S14
			V.22 GUARD TONE	DISABLE 550 Hz 1800 Hz	&G &G1 &G2	S23
			V.32 FAST TRAIN	ENABLE DISABLE	*FT1 *FT	S29
			SQ RETRAIN	ENABLE DISABLE	%E1 %E	S60
			SQ AUTO RATE	HIGH BER MED BER LOW BER DISABLED	%R3 %R2 %R1 %R	S53
			TRANSMIT CLOCK SELECT	INTERNAL EXTERNAL RECEIVE	&X &X1 &X2	S27

** Lease line only*

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE MODEM OPTIONS? (continued)	DIAL LINE JACK †	PER - RJ11 PROG - RJ15	%Z %Z1	S51
			DIAL TRANSMIT LEVEL	-9 dBm to -21 dBm	*TDn	S51
			LEASE TRANSMIT LEVEL*	0 to -21 dBm	*TLn	S52
			LINE CURRENT DISCONNECT †	OFF SHORT LONG	*LC, *LC1, *LC2	S32
			LONG SPACE DISCONNECT †	ENABLE DISABLE	Y1 Y	S21
			DIAL BACKUP*	MANUAL AUTO-MATIC	*DB *DB1	S32
			LOOKBACK TIME*	0 DISABLED to 255 MINUTES	---	S28
		CHANGE PROTOCOL OPTIONS?	LAPM PROTOCOL	ENABLE DISABLE	\N4, \N5, \N6, \N7 \N, \N1, \N2, \N3	S70
			MNP PROTOCOL	ENABLE DISABLE	\N2, \N3, \N6, \N7 \N, \N1, \N4, \N5	S70
			PROTOCOL FALLBACK	ENABLE DISABLE	\N3, \N5, \N6, \N7 \N, \N1, \N2, \N4	S70
			DATA COMPRES-SION	DISABLE NORM TX RX	%C %C1, %C2 %C3	S56
			DTE SPEED	DTE=DCE CONSTANT DTE	\J1 \J	S70

** Lease Line only*
† Dial Line only

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE PROTOCOL OPTIONS? (continued)	DTE FLOW CONTROL	DISABLE XON/XOFF CTS RTS/CTS	\Q \Q1 \Q2 \Q3	S54
			DCE FLOW CON-TROL	DISABLE XON/XOFF CTS	\Q4 \Q5 \Q6, \Q7	S54
			XON/XOFF PASS THROUGH	ENABLE DISABLE	\X1 \X	S54
			INACTIVITY TIMER	OFF, 15, 30, 45, 60, 75, 90 MIN	\TLn	S58
			BREAK CONTROL	0, 1, 2, 3, 4, 5	\K, \K1, \K2, \K3, \K4, \K5	S59
			V.42 FAST DETECT	ENABLE DISABLE	\M1 \M	S70
		CHANGE DTE OPTIONS?	OPERATION	SYNC ASYNC	&M1, 2, 3, 4, 5, 6 &M	S27 S30
			DTE RATE (Async)	300, 600, 1200, 2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 38400, 21600, 24000, 26400, 28800, 57600, 115200	---	S80
			CHAR SIZE (Async)	7 BIT 8 BIT	---	S61
			PARITY (Async)	NO, EVEN, ODD	---	S61

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE DTE OPTIONS?	DIAL METHOD	ASYNC DTR, MANUAL, V.25 BISYNC, V.25 SDLC V.25 bis async	&M1,&M2 &M3 &M4 &M5 &M6	S27 S30
			AT COMMAND SET	ENABLE DISABLE	*NT1 *NT	S29
			CHARACTER TYPE (V.25 only)	ASCII, EBCDIC	---	S30
			SDLC DATA FOR-MAT	NRZ, NRZI	---	S30
			DTR STATE	IGNORE RECALL CMD DISCON-NECT RESET	&D &D1 &D2 &D3	S21
			DSR STATE	NORMAL FORCED HIGH OFF 5 SEC ON DISCON-NECT FOLLOWS OH	&S1 &S &S2 &S3	S21
			DCD STATE	NORMAL FORCED HIGH OFF 5 SEC ON DISCON-NECT FOLLOWS REMOTE RTS	&C1 &C &C2 &C3	S21

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE DTE OPTIONS? (continued)	CTS STATE	NORMAL FORCED HIGH CTS FOL-LOWS DCD CTS=RTS	&R &R1 &R2 &R9	S21 S72
			RTS/CTS DELAY	0 to 150 ms (10 ms)	---	S26
			DTE COM-MANDED FALLBACK	ENABLE DISABLE	*FB1 *FB	S53
			OPTIONS RES/ RETND AT DISC	RESTORED RETAINED	*RO1 *RO	S29
		CHANGE TEST OPTIONS?	BILATERAL DIGITAL LOOP	ENABLE DISABLE	*DG1 DG	S34
			DTE LOCAL TEST	ENABLE DISABLE	*LA1 *LA	S34
			DTE REMOTE TEST	ENABLE DISABLE	*RD1, *RD	S34
			REMOTE COM-MANDED	ENABLE DISABLE	&T4 &T5	S23
			TEST TIMEOUT	OFF, 60, 120, 180. 240 SEC	---	S18
		CHANGE DIAL OPTIONS?	DIAL TYPE	PULSE, TONE	P, T	S14
			AUTODIAL #	OFF, 1 - 9	*AUn (n=1-9)	---
			DIAL TONE	BLIND DIAL WAIT FOR DIAL TONE	X, X1, X3 X2, X4	S22
			WAIT DELAY (Blind Dial)	1, 2, 3, 4, 8, 16, 32 SEC	---	S6
			PAUSE DELAY	1, 2, 3, 4, 8, 16, 32 SEC	---	S8
			CALL TIMEOUT	15, 30, 45, 60, 75, 90, 105, 120 SEC	---	S7

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
5 cont.	MODIFY CONFIGU-RATION? (continued)	CHANGE DIAL OPTIONS? (continued)	ANSWER RING #X	1, 2, 4, 8, 16	---	S0
			AUTOCALLBACK	ENABLE, DISABLE	---	S72
		CHANGE SPEAKER OPERATION?	VOLUME CONTROL	LOW MEDIUM HIGH	L1 L2 L3	S22
			SPEAKER CONTROL	ON UNTIL CARR DETECT ALWAYS ON OFF WHILE DIALING ALWAYS OFF	M1 M2 M3 M	S22
		LOAD/STORE OPTION SET?	LOAD FACTORY OPTION	NO, 1-9	&Fn (n=1-9)	---
			LOAD USER OPTION SET	1 2	Z0 Z1	---
			STORE PRESENT OPTIONS	1 2	&W &W1	---
			USER OPTION AT RESET	1 2	&Y &Y1	---
6	CHANGE PHONE NUMBERS?		PHONE NUMBER	ENTER NUMBER 32 digits	&Zn (n= phone # and modi-fiers) *CNn,x	---
7	FRONT PANEL FEATURES?		CHANGE RMT PASSWORD?	ENTER PASSWORD	%P	---
			ENTER REMOTE CONFIGURATION	ENTER REM CFG PASSWORD	%T	---
			EXIT REMOTE CONFIGURATION	EXIT	&T	---

Table 4-1. Menu Options (Continued)

MAIN MENU		SUBMENU	SUBMENU ITEM	ITEM OPTION	AT COM.	S-REG
7 cont.	FRONT PANEL FEATURES? (continued)		CHANGE FRONT PANEL PASSWORD	ENTER PASSWORD *	---	---
				ACTIVATE SECURITY	---	---

** Password of 0000 disables front panel security.*

FRONT PANEL SECURITY

The Front Panel Security feature provides password protection for front panel menu access. The modem is shipped from the factory with this feature disabled.

The Front Panel Security password is a 4-digit string that can be set to any combination of digits from "0000" to "9999". Selecting a password of "0000" disables Front Panel Security; any other password enables it.

When this feature is enabled there are two ways it may be activated. It may be explicitly activated via a front panel screen under Main Menu #7, or the modem will activate it when no front panel buttons have been pressed for 3 minutes. When Front Panel Security is activated, the front panel menu will return to Main Menu #1 and the front panel will become secured.

While in this secured state, the Main Menu #1 screen continues to maintain modem status, but a password must be entered before other front panel screens may be accessed. Pressing any front panel button causes the modem to prompt for the front panel password. After the password has been entered, a message briefly displays the result of the password validation process and, depending on the result, Front Panel Security either becomes inactive or returns to its active state.

During password entry, the front panel buttons are interpreted as follows:

NO — Pressing the NO button causes the character at the cursor to change to the next valid password character.

YES — Pressing the YES button while the cursor is on any of the first three password characters causes the cursor to advance to the next password character. When the cursor is on the last password character, pressing the YES button causes the modem to accept the displayed password.

TALK/DATA — Pressing the TALK/DATA button while the cursor is on the first password character causes the password entry to be aborted. When the cursor is on any other character, this button causes the cursor to move to the first password character.

Chapter 5
AT Commands

GENERAL

This chapter describes commands used to select options and to operate the modem. Some options depend on or are restricted by the mode of operation.

COMMAND CATEGORIES

The modem offers eight major categories of command statements:

- Response
- Dial
- Answer
- Terminal Interface
- General
- Private Line
- Configuration
- Remote Configuration

Six other groups of AT commands are discussed in their respective chapters:

- Protocol
- Test
- Security
- Fax
- S-registers

OPERATION MODES

During asynchronous operation the modem functions in one of three modes:

- Offline Command Mode
- Online Command Mode
- Data Mode