



DM336P

AT Command Set & Operation Manual
V.34 Integrated Data/Fax/Voice/Speakerphone

Operation Manual & AT Command Set DM336P DATA/FAX/VOICE MODEM

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Operation manual

DM336P provides ISA plug & play function. This function includes two operation modes. One is Win95 mode. The other one is Jumpless mode. User must use DM336P installation program to setup the COM port when the card is set in Jumpless mode.

Installation

a. Jumpless mode

1. Open the setting jumper.
2. Put modem card in computer's slot.
3. Execute Comset.exe
4. Move Bar to "Configuration" and press "Enter" to choose the configuration function
5. Move Bar to "Modify COM port" and press "Enter" to entry COM port selection mode.
6. Select the COM port and press "Enter".
7. Move Bar to "Modify IRQ" and press "Enter" to enter IRQ selection mode.
8. Select the IRQ and press "Enter".
9. Move Bar to "Save Configuration" and press "Enter" to save your setting in EEPROM.
10. Quit the installation program.

b. Win95 mode

1. Short the setting jumper.
2. Put modem card in computer's slot.
3. Use the "Control Panel" to setup you modem system.

Specification

- CCITT/ITU/Bell Standard: V.34+, V.34, V.32bis, V32, V22, V21, Bell 103, V.17, V.29, V.21ter
- MNP 5, 4, 3, 2
- Host Interface : ISA bus PnP
- Fax Group : Group III
- Fax Command : EIA/TIA-578 Class 2
- Voice Command : Davicom Command
- Escape Command : TIES
- Transmit Level : -12dbm +/- 1dbm
- Sensitivity : -35dbm
- Power : 620mw (Max)
- Temperature : 0 to 55 Degree C
- Dial Tone detection : 340Hz - 550Hz

Troubleshooting

Your modem is designed to provide reliable and trouble-free operation. However, please follow the suggest to solve your problems.

Modem does not respond to commands.

1. Using Comset.exe program to set up Com Port again.
2. Run "Diagnostic" to check you modem
3. Use "AT&F&W&W1" as your initialization command.

Modem dials but not connect.

1. Make sure the IRQ setting is identical on both the modem AND the software.

Make sure the Phone line is working properly. A noisy line will prevent proper modem operation.





PART I : Data COMMAND SET

returning to the Command Mode. Please refer to S2 and S12.

General Command

A/ Repeat the last executed AT command
Do not precede A/ with AT or follow with ENTER.

AT Attention Characters.
'AT' character pairs always at the beginning of each command line, except 'A', which is to repeat the last executed AT command.

Note: The following commands always have to precede with 'AT' attention character pair, if it is the first command in the command line.

A Manually answer incoming call.

D Dial (Originate a Call).
The following modifiers can be used in the dial string:
0-9,#,* Dialing digits. Touch Tone dial characters.
P Pulse dialing.
T Touch Tone dialing.
W Wait for second dial tone.
, Pause (programmable by S8).
^ Enable 1300 Hz calling tone.
! Flash (delay 500 ms).
; Return to command mode.

DS=n Dial stored number.
Dials one of three telephone numbers (n = 0,1 or 2) which is stored in the modem's nonvolatile memory via AT&Zn=x command.

En Command Echo.
E0 Disables command echo.
E1* Enables Command echo.

+++ Default Escape Character.
To switch from data mode to command mode, you can pause one second and type '+++'. Do not follow with carriage return. The default ASCII character '+' is decimal 43. You can change register S2 to any value from 0 to 255. Values greater than 127 disable the escape feature and prevent you from

Hn Hook control.
H0* Modem is on-hook (disconnect from line).
H1 Modem is off-hook (connect to line).

In Identification.
I0* Display product-identification code.
I1 Factory set.
I2 Internal memory test.
I3 Firmware version 1.
I4 Firmware version 2.

Ln Volume Control.
L0 Speaker volume off.
L1 Low speaker volume.
L2* Medium speaker volume.
L3 Loud speaker volume.

Mn Speaker Control.
M0 Speaker off.
M1* Speaker on until carrier detected.
M2 Speaker always on.
M3 Speaker on until carrier detected and off while dialing.

Nn Auto mode Selection.
N0 Disable auto mode. Modem connect speed is fixed according to AT*Nn setting.
N1* Enable adaptive connect speed (always connect at the highest compatible speed).

On Return to Data Mode Selection.
O0* Return to Data Mode.
O1 Return to Data Mode and initiate a retrain.

Qn Modem Response Selection.
Q0* Modem sends responses.
Q1 Modem does not sends responses.

Sr? Reads Register r Value.
r is 0 to 97.

Sr=n Set Register r to Value n.
r is 0 to 97, n is 0 to 255.

Un **V.34 Control.**



AT Command Set

U0	Disable V.34 when AT*N1 - AT*N6.	&D1	Modem returns to Command Mode and asynchronous operation following an ON-to-OFF Data Terminal Ready transition.
U1	Enable V.34.	&D2*	Modem hangs up, returns to the Command Mode, and prepares for asynchronous operation following an ON-to-OFF Data Terminal Ready transition.
U2	Enable V.34 aggressive connection	&D3	Modem resets following an ON-to-OFF Data Terminal Ready transition and retrieves modem default configuration (Same as ATZ).
Vn	Responses Selection.	&F	Load Modem Factory Default Configuration Restores the modem to the default operating characteristics.
V0	Numeric responses.	&Gn	Guard Tone Selection.
V1*	Verbose (text) responses.	&G0*	Disable guard tone.
Xn	Response Set Selection (See table 1).	&G1	Enable 550 Hz guard tone.
X0	Report basic call progress result codes.	&G2	Select 1800 Hz guard tone.
X1	Report basic call progress result codes and connections speeds, disable dial tone and busy tone detection.	&Ln	Dial-up or Leased-Line Operation Selection.
X2	Report basic call progress result codes and connections speeds, disable busy tone detection only.	&L0*	Modem is setup for dialup operation.
X3	Report basic call progress result codes and connections speeds, disable dial tone detection only.	&L1	Modem is setup for 2-wire leased-line operation.
X4*	Report all call progress result codes and connection rate.	&L2	Modem is setup for 4-wire leased-line operation.
Yn	Long Space Disconnect Selection.	&Pn	Make/Break Ratio.
Y0*	Disables long space disconnect. Modem does not send or respond to long space disconnect.	&P0*	US setting for off-hook (make) to on-hook (break) ratio.
Y1	Enables long space disconnect. Modem sends break signal for 4 seconds before disconnect or will disconnect after receiving 1.6 seconds of break from remote modem.	&P1	UK and Hong Kong setting for off-hook to on-hook ratio.
Zn	Reset and Profile Retrieve Selection	&Rn	Clear To Send (CTS) Signal Selection.
Z0*	Reset modem and retrieve active configuration profile from stored configuration profile 0.	&R0	Modem turns on the Clear To Send signal when it detects the Request To Send (RTS) signal from host.
Z1	Reset modem and retrieve active configuration profile from stored configuration profile 1.	&R1	Modem ignores the Request To Send signal and turns on its Clear To Send signal when ready to receive data.
&Cn	Carrier Output Selection.	&R2*	Clear To Send force on.
&C0	Keep Data Carrier Detect (DCD) signal always ON.	&Sn	Data Set Ready (DSR) Signal Selection.
&C1*	Set Data Carrier Detect (DCD) signal according to remote modem data carrier signal.	&S0*	Data Set Ready is forced on.
&Dn	Data Terminal Ready (DTR) Signal Handling.	&S1	Data Set Ready to operate according to RS-232 specification.
&D0	Modem ignores the Data Terminal Ready signal from host.	&Tn	Test Selection.
		&T0*	Terminates test in progress.



AT Command Set

&T1	Performs Local Analog Loopback Test.	*Pn	User Abort Selection.
&V	Configuration Profile Display Selection.	*P0*	Enables user abort feature.
		*P1	Disables user abort feature.
&Wn	Active Configuration Profile Store Selection.	*Qn	Auto Retrain Selection.
&W0*	Stores active configuration profile in configuration profile 0.	*Q0	Disables auto retrain.
&W1	Stores active configuration profile in configuration profile 1.	*Q1*	Enables auto retrain.
&Yn	Selection of the Active Configuration After Power-On or Reset.	*Tn	Trellis Coding Selection.
&Y0*	Retrieves configuration profile 0 as the active configuration profile when the Modem is turned on or is reset.	*T0	Disables Trellis coding.
&Y1*	Retrieves configuration profile 1 as the active configuration profile when the Modem is turned on or is reset.	*T1*	Enables Trellis coding.
&Zn=x	Store Telephone Numbers in Nonvolatile Memory. Stores three telephone numbers, 31 characters each, in the non-volatile memory. Uses ATDS=n to dial or to use AT&M2 for synchronous data mode.	*Xn	Transmission Level Selection.
*Gn	Adaptive Handshake Selection.	*X0*	Selects output level -11dBm.
*G0	Disables adaptive protocol handshake.	*X1	Selects output level -12dBm.
G1	Enables adaptive protocol handshake.	*X2	Selects output level -13dBm.
		*X3	Selects output level -14dBm.
		*X4	Selects output level -15dBm.
		*X5	Selects output level -16dBm.
		*X6	Selects output level -17dBm.
		*X7	Selects output level -18dBm.
		*X8	Selects output level -19dBm.
		*X9	Selects output level -20dBm.
		*X10	Selects output level -21dBm.
		*X11	Selects output level -22dBm.
		*X12	Selects output level -23dBm.
		*X13	Selects output level -24dBm.
		*X14	Selects output level -25dBm.
		*X15	Selects output level -26dBm.
*Nn	Connect Speed Selection.	<u>V.42bis / MNP Command Set</u>	
*N0	Selects connect speed 1200bps.	%An	Set Auto-Reliable Fall Back Character Set auto-reliable fall back character to n (n = 0 to 127).
*N1	Selects connect speed 2400bps.	\An	MNP Block Size Selection.
*N2	Selects connect speed 4800bps.	\A0	Selected 64-character maximum block size.
*N3	selects connect speed 7200bps.	\A1	Selected 128-character maximum block size.
*N4	Selects connect speed 9600bps.	\A2	Selected 192-character maximum block size.
N5	Selects connect speed 12000bps.	\A3	Selected 256-character maximum block size.
*N6	Selects connect speed 14400bps.	\Bn	Set Line Break. Send a n/10 seconds line break to the modem (n = 0 to 9). Default = 3. Break length always 300 msec for MNP mode.
*N7	Selects connect speed 16800bps.	%Cn	Data Compression.
*N8	Selects connect speed 19200bps.	%C0	Disables data compression.
*N9	Selects connect speed 21600bps.		
*N10	Selects connect speed 24000bps.		
*N11	Selects connect speed 26400bps.		
*N12	Selects connect speed 28800bps.		
*N13	Selects connect speed 31200bps .		
N14	Selects connect speed 33600bps .		
*N15	Selects connect speed 1200/75bps.		
*N16	Selects connect speed 300bps (V.21).		
*N17	Selects connect speed 300bps (Bell 103).		



AT Command Set

%C1*	Enables data compression.	\Vn	V42/MNP Extended Response Selection.
\En	Normal Mode Data Echo Selection.	\V0	Disables V42/MNP extended responses.
\E0*	Disables data echo during a normal link.	\V1*	Enables V42/MNP extended responses.
\E1	Enables data echo during a normal link.	\Xn	XON\XOFF Pass-through Selection.
\Jn	DTE Baud Rate Adjustment Selection.	\X0*	Process XON\XOFF and don't pass through.
\J0*	Disables DTE rate adjustment. DTE rate is constant regardless of data link speed.	\X1	Processes XON\XOFF and pass through.
\J1	Enables DTE rate adjustment. DTE matches data link speed	Wn	DTE/DCE Speed Response Selection.
\Kn	Break Control Selection.	W0	Display DCE connection rate
\K0	Enters the Command Mode, but does not send a Break to remote modem. (To send a Break after use the \B command).	W1*	Display DTE connection rate
\K1	Empty data buffers and immediately sends a Break to remote.	&Kn	Flow Control Selection.
\K2	Same as AT\K0.	&K0	Disable Local flow control.
\K3	Immediately send a Break.	&K3*	Selects RTS\CTS hardware flow control.
\K4	Same as AT\K0.	&K4	Selects XON\XOFF in-band flow control.
\K5*	Send a Break in sequence with any data received from host.	&K5	Selects Transparent XON\XOFF in-band flow control.
\Nn	Data Link Selection.	&Mn	Data Connection Selection.
\N0	Selects Normal data link.	&M0	Selects Direct data link.
\N1	Selects Direct data link.	&M5*	Instructs the modem to make a data connection using V.42 standard .
\N2	Selects MNP Reliable link only.		
\N3	Selects MNP Auto-reliable link.		
\N4	Selects V.42 reliable link with phase detection.		
\N5*	Selects V.42 auto-reliable link with phase detection.		
\N6	Selects V.42 reliable link without phase detection.		
\N7	Selects V.42 auto-reliable link without phase detection.		
\Qn	Flow Control Selection.		
\Q0	Disables flow control.		
\Q1	Selects XON\XOFF in-band flow control.		
\Q2	Selects CTS hardware flow control.		
\Q3*	Selects RTS\CTS hardware flow control.		
\Tn	Set Inactive Timer. Set inactivity timer to n minutes (n = 0 to 90). Default = 0.		

Result Code (Table 1)

Long Form	Short Form	n value in ATXn
		0 1 2 3 4
OK	0	x x x x x
CONNECT	1	x x x x x
RING	2	x x x x x
NO CARRIER	3	x x x x x
ERROR	4	x x x x x
CONNECT 1200	5	x x x x
NO DAILTONE	6	x x
BUSY	7	x x
NO ANSWER	8	x x
CONNECT 600	9	x x x x x
CONNECT 2400	10	x x x x
CONNECT 4800	11	x x x x
CONNECT 9600	12	x x x x
CONNECT 7200	13	x x x x
CONNECT 12000	14	x x x x
CONNECT 14400	20	x x x x
CONNECT 19200	21	x x x x
CONNECT 38400	22	x x x x



CONNECT 57600 23 x x x x
 CONNECT 115200 24 x x x x
 CONNECT 1200RX/75TX 25 x x x x
 CONNECT 75TX/1200RX 26 x x x x
 RINGBACK 27 x x x x
 CONNECT BELL 300 28 x x x x
 CONNECT V21 29 x x x x

(Display DCE speed by ATW0)

CONNECT 16800 15 x x x x
 CONNECT 19200 16 x x x x
 CONNECT 21600 17 x x x x
 CONNECT 24000 21 x x x x
 CONNECT 26400 30 x x x x
 CONNECT 28800 31 x x x x
 CONNECT 31200 32 x x x x
 CONNECT 33600 33 x x x x

%TT34 V.25 calling tone (1100)
 %TT40 V.23 channel 2
 %TT41 V.24 ter 2400 bps
 %TT42 V.27 ter 4800 bps
 %TT43 V.29 7200 bps
 %TT44 V.29 9600 bps
 %TT45 V.17 7200 bps long train
 %TT46 V.17 7200 bps short train
 %TT47 V.17 9600 bps long train
 %TT48 V.17 9600 bps short train
 %TT49 V.17 12000 bps long train
 %TT4A V.17 12000 bps short train
 %TT4B V.17 14400 bps long train
 %TT4C V.17 14400 bps short train
 %TT6R,S,A,P V.34 modulation

PTT Testing Utilities

%TT00 - %TT 09 DTMF tone dial digits 0 to 9.

%TT0A DTMF digit *.

%TT0B DTMF digit A.

%TT0C DTMF digit B.

%TT0D DTMF digit C.

%TT0E DTMF digit #.

%TT0F DTMF digit D.

%TT10 V.21 channel 1 mark (originate)

%TT11 V.21 channel 2 mark symbol

%TT12 V.23 backward channel mark symbol

%TT13 V.23 forward channel mark symbol

%TT14 V.22 originate (call mark) signal at 600bps

%TT15 V.22 originate (call mark) signal at 1200bps

%TT16 V.22 bis originate (call mark) signal at 2400bps

%TT17 V.22 answer signal (guard tone if PTT require).

%TT18 V.22 bis answer signal (guard tone if PTT require).

%TT19 V.21 channel 1 space symbol.

%TT20 V.32 9600 bps.

%TT21 V.32 bis 14400 bps.

%TT1A V.21 channel 2 space symbol.

%TT1B V.23 backward channel space symbol

%TT1C V.23 forward channel space symbol

%TT30 Silence (on-line), i.e., go off-hook

%TT31 V.25 answer tone

%TT32 1800 Hz guard tone

%TT33 V.25 calling tone (1300Hz)

R parameter	Data Rate (bps)
1	2400 (V.34 only)
2	4800 (V.34 only)
3	7200 (V.34 only)
4	9600 (V.34 only)
5	12000 (V.34 only)
6	14400
7	16800
8	19200
9	21600
A	26400
B	28800
C	31200
D	33600

S parameter	Symbol Rate (Baud)
1	2400
2	Reserved
3	2800



AT Command Set

4	3000
5	3200
6	3429

A Parameter	Auxiliary Channel
0	Disable
1	Enable

P parameter	Amount of upper Band Edge Attenuation Compensated (dB)
0-9	see ITU - V.34 Figures 1,2 and Table 3,4

+FAA=1 Enables Auto detection of Data or Fax operations.

+FBOR=n Phase C Data Bit Order Selection.

+FBOR=0 Selects direct bit order for both Phase C data and for Phase D data.

+FBOR=1 Selects reversed bit order for Phase C data and selects direct bit order for Phase D data.

+FCR= Capability to Receive.

+FCR=0 Indicates the DCE will not receive message data. Also the DCE will not be able to poll a remote device.

+FCR=1 Indicates the DCE can receive message data.

+FDCS=vr, br, wd, ln, df, er, ft, st Set Current Session Parameter.

+FDCC=vr, br, wd, ln, df, er, ft, st Set DCE Capabilities Parameters.

+FDIS=vr, br, wd, ln, df, er, ft, st Set Current Session Negotiation Parameters.

PART II : FAX Command

Fax Class 1 Command

+FCLASS=n Data or Fax Mode Selection.
+FCLASS=0 Selects Data mode operation.
+FCLASS=1 Selects Fax Class 1 mode operation.

+FAE=n Data/Fax Auto answer.
+FRH=n Receive data with HDLC framing.
+FRM=n Receive data.
+FRS=n Receive silence.
+FTH=n Transmit data with HDLC framing.
+FTM=n Transmit data.
+FTS=n Stop Transmit and wait.

Fax Class 2 Command

+FCLASS=n Data or Fax Mode Selection.
+FCLASS=0 Selects Data mode operation.
+FCLASS=2 Selects Fax Class 2 mode operation.

+FAA=n Fax Auto Answer Mode Selection.
+FAA=0 Disables Fax Auto Answer operation

+FDR Receive Data Command.

+FDT Transmit Data Command.

+FLID="m" Set Local ID String.
 'm' is 20 characters numeric string, set by user, to be used in TSI or CSI frame.

+FMDL? Request Model Information.

+FMFR? Request Manufacturer Information.

+FREV? Request Revision Information.

The Fax class 2 mode Result codes are:

OK Command valid and executed successfully.

ERROR Command error and can not be executed.

+FCFR Confirmation to receive prompt.

Modem issues the response when detects an acceptable TCF training burst and a valid DCS signal from remote modem.

- +FCON** Facsimile connection response
Modem issues the response when detects call progress and fax handshaking is in progress.
- +FCSI:'m'** Report the called station ID response
Modem issues this after receiving the remote ID string.
- +FDCS:vr, br, wd, ln, df, er, ft, st** Report session parameters response.
- +FDIS:vr, br, wd, ln, df, er, ft, st** Report remote capabilities response.
- +FET:<ppr>** Post page message response
Modem issues this after the end of Phase C reception, on receipt the post page message from the transmitting modem.
0 MPS Another page, same parameters
1 EOM Another document, new page parameters.
2 EOP No more pages or documents.
- +FHNG:m** Call termination status response
Modem issues this to indicate the call has been terminated.
- +FPTS:<ppr>** Page transfer status response
Modem issues this indicating the copy quality and related post page message responses received from the remote modem.
- +FTSI:** Report remote station ID
Modem issues this after receiving TSI from calling station.



any CID packet received after the first RING cycle including SDM, MDM, or call waiting packet.

#CLS Data, Fax or Voice Mode Selection.
#CLS? Returns the current setting of the #CLS.
#CLS=0* Selects data mode operation.
#CLS=2 Selects fax class 2 command operation.
#CLS=8 Selects voice mode operation.

#MDL? Request Model Information.

#MFR? Request Manufacturer Information.

#REV? Request Revision Information.

#TL=XXXX Voice Playback Volume Control.
#TL=0 mute, means no volume.
#TL=1 -24db, low volume
#TL=2 -18db
#TL=3 -12db
#TL=4 -6db
#TL=5* -0db
#TL=6 +6db
#TL=7 +12db
#TL=8 +18db, high volume

#VBS Bits Per Sample Selection.
#VBS? Returns the current setting of #VBS.
#VBS=1 Selects 8 bits PCM.
#VBS=2 Selects 2 bits per sample ADPCM.
#VBS=3 Selects 3 bits per sample ADPCM.
#VBS=4* Selects 4 bits per sample ADPCM.

PART III : VOICE MODE COMMAND SET

Voice Command

#BDR Baud Rate Selection.
#BDR? Returns the current setting of the #BDR.
#BDR=0* Enable autobaud detection.
#BDR=n Where n = 1,2,4,6,8,16,24. Sends OK message and switches to the new speed defined by n*2400 bps.

#CID Caller ID Selection.
#CID Returns the current settings of #CID.
#CID=0* Disable Caller ID.
#CID=1 Enables formatted Caller ID reporting Single Data Message (SDM) and Multiple Data Message (MDM) packets.
#CID=2 Enables unformatted Caller ID reporting of

#VBT Beep Tone Timer.
#VBT? Returns the current setting of the #VBT command.
#VBT=0 Disables the tone generation capability
#VBT=n Sets tone duration time in 100 msec. Where n = 1-40. Default is 10.

#VCI? Request Compression Method Information.

#VLS Voice Line Selection.
#VLS? Returns the current setting of the #VLS.
#VLS=0* This command causes the telephone line



interface to be routed through the modem.

#VLS=1 This command causes the handset to be routed through the modem.

#VLS=2 This command routes the speaker through the modem.

#VLS=3 This command routes the auxiliary input device through the modem.

#VLS=4 This command is the same as #VLS=0, except the modem enables the internal speaker.

#VLS=6 This command enables the microphone and speaker interface, use for speaker phone mode.

#VRX Set Voice Receive Mode
This action command is only valid if the modem is in the on-line voice command mode.

#VTX Set Voice Transmit Mode
This action command is only valid if the modem is in the on-line voice command mode.

<DLE>0-9 DTMF digits 0 through 9

<DLE>*,# DTMF digits *, #

<DLE>A-D DTMF A through D

<DLE>a **Answer Tone detected**, V.35/T30 2100Hz answer tone is detected.

<DLE>b **Busy**, The busy cadence is detected.

<DLE>c **Calling Tone**, T.30 1100Hz Calling tone is Detected.

<DLE>d **Dial Tone**, The Dial tone is detected.

<DLE>e **European Calling Tone**, V.25 1300Hz Calling Tone is detected.

<DLE>f **Bell Answer Tone**, Bell 2225Hz Answer tone is detected.

Voice mode Result codes

OK Command valid and executed successfully.

ERROR Command error and can not be executed.

VCON Issued in Voice mode (#CLS=8) when the modem determines that the remote modem or handset has gone off-hook, or when returning to on-line voice command mode.

NO ANSWER Issued in Voice mode (#CLS=8) when the modem determines that the remote modem has not picked up the line after the

S7 timer has expired.

CONNECT When Voice transmission by DTE can begin.

Voice mode Shielded codes

Register **S1** : Count Incoming Rings.

The S1 register records the number of incoming rings. Reset to 0 after 8 seconds of no ring.

Register **S2** : Value of the Escape Character.

Register S2 sets the ASCII value in decimal of the escape character. The default value (decimal 43) is equivalent to the ASCII character '+'. You can change this register to any value from 0 to 255. Values greater than 127 disable the escape feature.

Register **S3** : Value of the Carriage Return Character.

Register S3 sets the ASCII value in decimal of the carriage return character (End-Of-Line). The default value is 13. You can change it to any ASCII value between 0 and 127.

Register **S4** : Value of the Line Feed Character.

Register S4 sets the ASCII value in decimal of the line feed character. The default value is 10. You can change it to any ASCII value between 0 and 127. If you do not want to receive a line feed character, you can change the value in this register to a null character, but you cannot disable line feed characters.

Register **S5** : Value of the Backspace Character

Register S5 sets the ASCII value in decimal of the backspace character. This character is the character created by pressing BACKSPACE key and the characters echo to host are BACKSPACE, SPACE, BACKSPACE (i.e. move the cursor to the left). The default value is 8. You can change it to any ASCII value between 0 and 32, or 127.

Note: Do not set the value of the backspace character between 33 and 126.

PART V: S Registers

Register **S0** : Auto Answer Ring.

Assigning a value from 1 to 255 in Register S0 tells the modem the number of rings that must occur before it can automatically answer incoming calls. The default value = 0 (no Auto Answer).

Register **S6** : Dial Tone Wait Time.

Register S6 sets the time to wait after going off-hook before dialing the first digit in a Dial command when using the X0, X1 or X3 responses. The default time is 2



seconds, although you can change it to any value between 2 and 255 seconds. This feature is convenient when it takes longer than 2 seconds to obtain a dial tone.

Register S7 : Remote Carrier Signal Wait Time.

Register S7 decides how many seconds to wait for a remote modem's carrier signal before hanging up. The default value is 45 seconds. You can change it to a value between 1 and 255 seconds. Register S7 also controls the time-out of the W command.

Register S8 : Pause Time for Comma

Register S8 decides how many seconds to pause for each comma (,) encountered in a Dial command line. You usually use the comma when dialing through a PBX or other special telephone services to wait for an outside telephone line. The default value is 2 seconds, although you can change it to a value between 0 and 255 seconds. An alternative to changing this register is to include more than one comma in your command line.

Register S9 : Carrier Detect Response Time.

Register S9 sets the time the remote modem's carrier signal must be present for the local modem to recognize it. This feature ensures that your modem does not mistake a busy signal, ring, or voice for the carrier signal. The value of this register is in tenths of a second. The default value is 600 ms, although you can change it from 1 to 255. For example, entering a value 13 means that the remote modem's carrier signal must be present for 1.3 seconds for the local modem to recognize it. Setting this value higher increases the chances the modem will not mistakenly identify the carrier signal.

Register S10 : Carrier Loss Time.

Register S10 sets the time between the loss of a remote modem's carrier signal and when the local modem disconnects. This allows the remote modem's carrier signal to momentarily disappear from the telephone line. The value of this register is in tenths of a second. The default value is 1.4 seconds, although you can change it from 1 to 255. You may want to set this value higher if you have a noisy telephone line that might interfere with the remote modem's carrier signal. If you want your modem to ignore the Carrier Detect

status and act as if the remote modem's carrier signal is always present, set the value to 255.

Register S11 : Touch Tone Dialing Duration.

Register S11 controls the speed of the Touch Tone (DTMF) dialing. You can change the value from 50 to 255 ms. The default value will be 95 ms which sets a dialing rate of 5.26 digits per second. Increasing the value to 255 slows the dialing rate to 1.9 digits per second.

Note : Register S11 has no effect on pulse dialing, which is fixed at 10 pulses per second.

Register S12 : Escape Guard Time.

Register S12 controls the escape guard time (i.e. the time delay required before and after you enter the escape characters). The guard time prevents your modem from misinterpreting data as the escape sequence. This value is designated in measurements of 20 ms. The default value is 50 (which is equivalent to one second), although you can change it to between 0 (0 seconds) to 255 (5.1 seconds).

Register S14 : Bit-mapped Register.

Bit-mapped register S14 lets you control modem echo, responses, dialing method, and the originate or answer mode.

<u>Bit</u>	<u>Function</u>
0 = x	Undefined.
1 = 0	Do not echo command (E0).
1	Echo command (E1) – default.
2 = 0	Responses appear (Q0) – default.
1	Responses do not appear (Q1).
3 = 0	Numeric responses (V0).
1	Verbose (Verbal) Responses (V1) – default.
4 = x	Undefined.
5 = 0	Use touch-tone dialing method (T) – default.
1	Use pulse dialing method (P).
6 = x	Undefined
7 = 0	Answer incoming calls (A)



1 Originate calls (D) -- default
Register **S16** : Modem Tests.

Bit-mapped register S16 displays the modem tests status.

<u>Bit</u>	<u>Function</u>
0 = 0	Local analog loop back test off (&T0) – default.
1	Local analog loop back test on (&T1).

1 = x Undefined.

Register **S18** : Duration of Modem Test.

Register S18 sets the amount of time for the modem tests. The tests can run from 1 to 255 seconds, depending on the value in this register. This register has a default value of 0, which turns off the timer and tests will run until manually terminated.

Register **S21** : Bit-mapped Register.

Bit-mapped register S21 lets you control certain data communication control signals.

<u>Bit</u>	<u>Function</u>
0,1 = x	Undefined.
2 = x	Undefined.
3,4= 0	Modem ignores the DTR signal (&D0).
1	Modem enters command mode after ON-to-OFF DTR transition (&D1).
2	Modem hangs up after ON-to-OFF DTR transition (&D2) – default.
3	Modem resets after ON-to-OFF DTR transition (&D3).
5 = 0	CD signal always on (&C0).
1	CD signal on when a remote carrier signal is present (&C1) – default.
6 = x	Undefined.
7 = 0	Long space disconnect turned off (Y0) – default.
1	Long space disconnect turned on (Y1).

Register **S22** : Bit-mapped Register

Bit-mapped register S22 lets you control internal speaker and the modem responses.

<u>Bit</u>	<u>Function</u>
0,1= 0	Speaker volume off (L0).
1	Low speaker volume (L1).
2	Medium speaker volume (L2) – default.
3	Loud speaker volume (L3).
2,3= 0	Speaker off (M0).
1	Speaker on until carrier detected (M1) – default.
2	Speaker always on (M2).
3	Speaker on until carrier detected but off during dialing (M3).
4,5,6=0	Hayes™ Smartmodem compatibility (X0).
4	Include CONNECT XXX responses (X1).
5	Same as 4 plus dial tone detection (X2).
6	Same as 4 plus BUSY response and blind dialing (X3).
7	Same as 6 plus dial tone detection (X4) – default.
7 = 0	US make/break ratio (&P0) – default.
1	UK and Hong Kong make/break ratio (&P1).

Register **S23** : Bit-mapped Register.

<u>Bit</u>	<u>Function</u>
1,2,3= 0	Use 0-300bps DTE data rate.
2	Use 1200bps DTE data rate.
3	Use 2400bps DTE data rate.
4	Use 4800bps DTE data rate.
5	Use 9600bps DTE data rate.
6	Use 19200bps DTE data rate.
7	Use 38400bps or above DTE data rate.
4,5= 0	Use even parity.
1	Use space parity.
2	Use odd parity.
3	Use mark or none parity.
6,7= 0	Turn off guard tone (&G0) – default.



- 1 Turn off guard tone (&G1).
- 2 Use 1800 HZ guard tone (&G2).

When there is an inactivity time out with #CLS=8, the modem always forces #CLS=0 and #BDR=0.

Register **S25** : Data Terminal Ready Delay.

When Modem is on-line, it will ignore a Data Terminal Ready signal lasting less than the value of this register. In this mode, the values for this register are 0 to 255 in hundredths of a second, and the default value is 0.05 seconds. If you will be entering synchronous mode after dialing asynchronously, this register determines how long the modem waits before looking for the Data Terminal Ready signal. This lets you detach the asynchronous terminal and connect a synchronous terminal while remaining in the Data Mode. In this mode, the values for this register are from 0 to 255 seconds and the default value is 5.

Register **S26** : Request To Send-to-Clear To Send Delay.

This register affects synchronous operation only and applies only when you are using the &R0 command. This register determines how long the modem waits to turn on the Clear To Send signal after a Request To Send OFF-to-ON transition in 10 ms increment. The default value is 1, although this register accepts values from 0 to 255.

Register **S27** : Bit-mapped Register.

Bit-mapped register S27 lets you control modem transmission mode and line type.

Bit	Function
0	0 : Dial up line (&L0) – default. 1 : 2W Leased line (&L1).
1-7	Undefined.

Register **S30**: Value of the voice inactivity timer.

S30 = 0	Voice inactivity timer off (default).
S30 = 1 - 255	This is the period of time (in sec), which if expired causes the modem to hang up the telephone line if it is offhook and no data has passed during the period.

Register **S36** : V.42 negotiation fallback.

Register S36 defines the type of connection attempted by the modem and the action to take if the attempt fails:

Bit	Value	Function
2,1,0	0	Modem hangs up.
	1	Same as 5.
	2	Reserved.
	3	Same as 7.
	4	Modem tries to connect using V.42 Alternative Protocol (compatible with MNP levels 2 - 5). If handshaking fails, modem hangs up.
	5	Modem tries to connect using V.42 Alternative Protocol compatible with MNP levels 2 - 5). If handshaking fails, modem tries to connect using a standard asynchronous connection.
	6	Reserved.
	7	Modem tries to connect using V.42 Alternative Protocol (compatible with MNP levels 2 - 5). If handshaking fails, modem tries to connect using a standard asynchronous connection and automatic speed buffering -- default.

Register **S46** : Protocol selection.

Register S46 defines the protocol selections specified for future negotiation.

Value	Function
136	LAP-M only.
138	LAP-M with adaptive data compression – default.

Register **S82** : Break handling

Register S82 specifies the break signal method used during V.42 applications. The break type to be used depends on the user application.

Value	Function
3	Expedited break signaling, regardless of its

- sequence in data sent and received by each modem. Data integrity maintained both ahead of and after the break.
- 7 Destructive break signaling, regardless of its sequence in data sent and received by each modem. Data not being processed by each modem at time of break is discarded.
- 128 In sequence break signaling as data is sent and received. Data integrity is maintained both ahead of and after the break. – default.

Register **S95** : Negotiation message options.

- < 32 Disable V.42 extended response.
 ≥ 32 Enable V.42 extended response.

Register **S96** : Dial tone/busy tone detect range select.

<u>VALUE</u>	<u>RANGE (Hz)</u>	<u>COUNTRY</u>
0	350 - 620	USA, KOREA, TAIWAN, --default.
1	425 - 450	BELGIUM.
2	440 - 700	FRANCE.
3	350 - 450	ISRAEL, JAPAN.
4	375 - 475	ITALY, NORWAY, GERMANY, DENMARK.
5	150 - 450	NETHERLANDS.
6	270 - 320	SINGAPORE.
7	350 - 500	SWEDEN.
8	375 - 550	SWITZERLAND.
9	350 - 440	UK.
10	110 - 700	FULL RANGE.

Register **S97** : Energy detection threshold
 This register can use in Call Progress Mode (CPM) mode, for dial tone detect threshold. The default value is 2. This register determine the detection threshold for Call Progress (CPM) tones. The default value is 2.