

**Atrie 33.6K  
MODEM  
User's Manual**



**ATRIE 336RE**

**MODEM**

**USER'S MANUAL**

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# **CHAPTER 1**

## **INTRODUCTION**

**This manual is written for 33600bps dial-up/leased line modem.**

### **Features**

- \* Compatible with BELL 103, 212A standards and ITU-T V.21, V.22, V.23, V.22bis, V.32, V.32bis, V.FC, V.34, V.8, V.25bis, V.42, V.42bis recommendation.**
- \* Provides MNP4, ITU-T V.42 error correction and MNP5, ITU-T V.42bis data compression.**
- \* Provides ITU-T V.8 and Multi-mode handshake according to ITU-T recommendation.**
- \* Utilizes full duplex asynchronous transmission with a maximum effective throughput of 115200bps.**
- \* Provides 2 wire full duplex dial up line and leased line operation.**
- \* Asynchronous and synchronous operation selectable on both DIP switch or AT command.**
- \* Provides auto-dial, auto-answer, redial, and full call progress monitoring functions.**
- \* Provides Microcom Networking Protocol (MNP) Class 10 to ensure best performance during Cellular Phone communication.**
- \* Supports GIII Fax with EIA Class 1 and Class 2 command and ITU-T V.17.**

### **Package Contents**

**Carefully unpack the product package that you have received. The following is a checklist of the package:**

- \* The modem**
- \* One AC power adapter**
- \* One RJ-11 telephone cable**
- \* One User's Manual**

If there is any wrong, missing or damaged part, please contact your dealer.

## Modem Panel Description

### Modem Front Panel

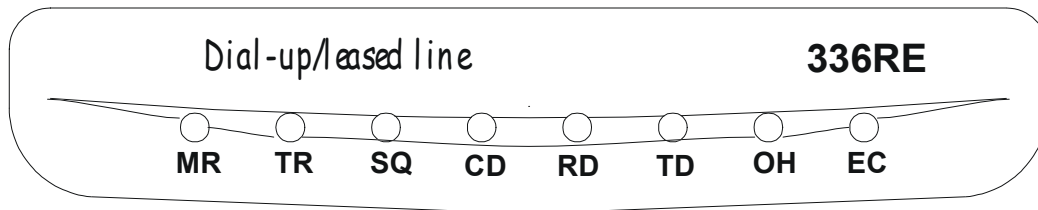


Figure 1-1 Modem Front Panel

### LED Indicators

**MR Power and Test Indicator**

This LED indicator indicates three conditions:

1. Flashes when the modem is error in power on self-test.
2. Lights ON when the power is applied to the modem.
3. Flashes when the modem is in the loop back test.

**TR Terminal Ready**

Lights up when the computer or terminal is ready to receive data.

**SQ Signal Quality**

Indicates the signal quality of the telephone line. Describes below:

- |       |    |        |
|-------|----|--------|
| ON    | -- | Good   |
| FLASH | -- | Medium |
| OFF   | -- | Poor   |

**CD Carrier Detect**

Lights up when carrier signal from a remote modem is detected.

**RD Receive Data**

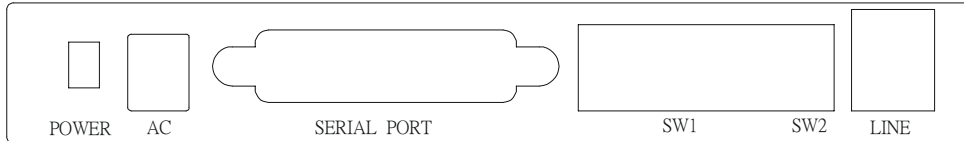
Flashes when the local DTE receives data from the modem.

**TD Transmit Data**

Flashes when the local DTE (Data Terminal Equipment) transmits data into the serial port of the modem.

- OH Off-Hook**  
Lights up when off-hook.
- EC Error Correction**  
When configure to error correction mode in command mode  
When making a protocol link (V.42 or MNP4) with remote modem in data mode.

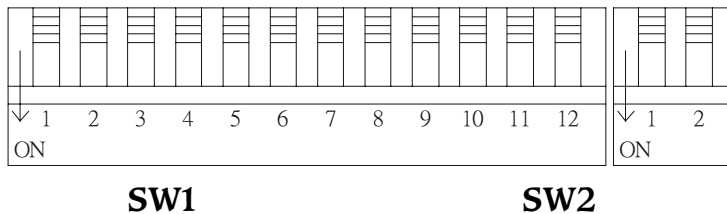
**Modem Rear Panel**



**Figure 1-2 Modem Rear Panel**

- POWER** Power switch
- AC** The power source input. Put the other end into the wall outlet of the AC power source.
- SERIAL PORT** The RS-232 serial port. Use the RS-232C cable to connect the modem and the computer or terminal.
- LINE** The jack allows user to connect the telephone line to the modem.

**Dip Switch**



**SW1 The 12-position DIP Switch**

**POSITION 1, 2 - Operation and line type selection**

<b>1</b>	<b>2</b>	
<b>ON</b>	<b>ON</b>	<b>Power on operation</b>
<b>OFF</b>	<b>ON</b>	<b>V.25bis operation</b>
<b>ON</b>	<b>OFF</b>	<b>dumb mode operation</b>
<b>OFF</b>	<b>OFF</b>	<b>AT command operation</b>

**POSITION 3 - Asynchronous/Synchronous Operation selection**

<b>ON</b>	<b>Synchronous operation</b>
<b>OFF</b>	<b>Asynchronous operation</b>

**POSITION 4, 5, 6, 7 - The DTE Speed selection**

<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>DTE Speed</b>
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>1200bps</b>
<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>2400bps</b>
<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>4800bps</b>
<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>7200bps</b>
<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>9600bps</b>
<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>12000bps</b>
<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>14400bps</b>
<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>16800bps</b>
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>19200bps</b>
<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>21600bps</b>
<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>24000bps</b>
<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>26400bps</b>
<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>28800bps</b>
<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>38400bps</b>
<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>57600bps</b>
<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>115200bps</b>

**POSITION 8, 9, 10, 11 - The Line Speed (DCE Speed) selection**

<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>Line Speed (DCE Speed)</b>
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>300bps (V.21)</b>
<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>1200/75bps (V.23)</b>
<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>1200bps (V.22/Bell 103)</b>
<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>2400bps (V.22 bis)</b>
<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>4800bps (V.32/ V.32 bis)</b>
<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>7200bps (V.32 bis)</b>
<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>9600bps (V.32/ V.32 bis)</b>
<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>12000bps (V.32 bis)</b>
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>14400bps (V.32 bis)</b>
<b>OFF</b>	<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>16800bps (V.34)</b>
<b>ON</b>	<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>19200bps (V.34)</b>
<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>21600bps (V.34)</b>
<b>ON</b>	<b>ON</b>	<b>OFF</b>	<b>OFF</b>	<b>24000bps (V.34)</b>

OFF	ON	OFF	OFF	26400bps (V.34)
ON	OFF	OFF	OFF	28800bps (V.34)
OFF	OFF	OFF	OFF	Line speed follow DTE speed

**POSITION 12  $\bar{n}$  DIP switch/NVRAM selection**

ON	Loads DIP switch for power on configuration.
OFF	Loads NVRAM for power on configuration.

**SW2 The 2-position DIP Switch**

Position	State	Description
1	ON	Answer mode
	OFF	Originate mode
2	ON	Leased Line Operation
	OFF	Dial-up Operation



# CHAPTER 2

## AT COMMAND GUIDELINES

### AT Command Set

<b>ATA</b>	<b>Manual Answer</b> Force modem to go off-hook and answer an incoming call.
<b>A/</b>	<b>Repeat Last Command</b> There is no need to type <Enter>, after the "/" has typed, the modem executes the last executed command immediately.
<b>ATBn</b>	<b>Select ITU-T/BELL Mode (for 300 and 1200 bps only)</b>
<b>ATB0</b>	<b>Selects ITU-T (Default)</b>
<b>ATB1</b>	<b>Selects BELL</b>
<b>ATDs</b>	<b>Dial</b>
String s	Description
0-9	Dialing digits
*, #, A,B,C,D	DTMF dialing digits
-()	Ignored by modem
P	pulse dial
T	Tone dial
J	Perform MNP10 link negotiation at 1200bps
K	Enable power level adjustment during MNP10 link negotiation
L	Re-dial last number
R	Reverse originate mode
S=n	Dial NVRAM telephone number (n = 0 to 3).
W	Wait for dial tone
&	Wait for AT&T "bong" tone for credit card dialing before continuing with the dial string
,	Pause
;	Return to command state
@	Wait for quiet answer
!	Flash hook
^	Calling tone
<b>ATEn</b>	<b>Echo Command</b>
<b>ATE0</b>	<b>Disables command echo</b>

<b>ATE1</b>	<b>Enables command echo (Default)</b>
<b>ATHn</b>	<b>Hook on/off</b>
<b>ATH0</b>	<b>On-hook</b>
<b>ATH1</b>	<b>Off-hook</b>
<b>ATIn</b>	<b>Identification Command</b>
<b>ATI0</b>	<b>Reports product code</b>
<b>ATI1</b>	<b>Reports ROM checksum</b>
<b>ATI2</b>	<b>Verify the checksum of ROM. If correct, reports "OK"; if not reports "ERROR".</b>
<b>ATI3</b>	<b>Reports ROM revision</b>
<b>ATI4</b>	<b>Reports model name, ROM revision, issue date.</b>
<b>ATI5</b>	<b>Reports region code</b>
<b>ATI6</b>	<b>Reports DATA PUMP revision</b>
<b>ATLn</b>	<b>Speaker Volume Control</b>
<b>ATL0</b>	<b>Low speaker volume(Default)</b>
<b>ATL2</b>	<b>Medium speaker volume</b>
<b>ATL3</b>	<b>High speaker volume</b>
<b>ATMn</b>	<b>Speaker Control</b>
<b>ATM0</b>	<b>Speaker always off.</b>
<b>ATM1</b>	<b>Speaker on until the modem receives a carrier. (Default)</b>
<b>ATM2</b>	<b>Speaker always on.</b>
<b>ATM3</b>	<b>Speaker off while dialing, then on until the modem receives a carrier .</b>
<b>ATNn</b>	<b>Set Multi- or Fix- Mode Handshake</b>
<b>ATN0</b>	<b>Fix-mode handshake. The connection speed depends on the DTE speed or register S37.</b>
<b>ATN1</b>	<b>Multi-mode handshake. Follows the recommendation of ITU-T multi-mode handshake. It can automatically change the line speed to make most efficient connection. (Default)</b>
<b>ATN3</b>	<b>Same as ATN1 but without V.23 mode.</b>
<b>ATOn</b>	<b>Return to On-Line Mode</b>
<b>ATO0</b>	<b>Returns on-line data mode without a retrain.</b>
<b>ATO1</b>	<b>Returns on-line data mode with a retrain.</b>
<b>ATQn</b>	<b>Result Code Command</b>
<b>ATQ0</b>	<b>Enables the modem to report result codes (Default)</b>
<b>ATQ1</b>	<b>Disables the modem to report result codes.</b>
<b>ATSr=n</b>	<b>Read/write S-register</b>

<b>ATSr=n</b>	Sets S-register r to the value n
<b>ATSr?</b>	Read the content of S-register r
<b>ATVn</b>	Result Code Type
<b>ATV0</b>	Selects short (digit) form result codes.
<b>ATV1</b>	Selects long (verbose) form result codes. (Default)
<b>ATWn</b>	Negotiation Progress Message Command
<b>ATW0</b>	Upon connection, reports the DTE speed. (Default)
<b>ATW1</b>	Upon connection, reports the line speed, the error correction protocol, and the DTE speed.
<b>ATW2</b>	Upon connection, reports the DCE speed.
<b>ATXn</b>	Extended Result Codes
<b>ATX0</b>	The modem ignores dial tone and busy tone when dialing. Sends standard result codes when a connection is made.
<b>ATX1</b>	The modem ignores dial tone and busy tone when dialing. Sends extended result codes when a connection is made.
<b>ATX2</b>	The modem detects dial tone when dialing. Sends extended result codes when a connection is made.
<b>ATX3</b>	The modem detects busy tone. Sends extended result codes when a connection is made.
<b>ATX4</b>	The modem detects dial tone and busy tone. Sends extended result codes when a connection is made. (Default)
<b>ATYn</b>	Long Space Disconnect
<b>ATY0</b>	Disables the long space disconnect feature. (Default)
<b>ATY1</b>	Enables the long space disconnect feature.
<b>ATZn</b>	Reset Command
	Reset and load restore profile n, where n = 0~3.
<b>+ + +</b>	The Escape Code
	The Escape Code forces the modem to the command mode from the data mode, without releasing the line connection.
<b>AT&amp;Cn</b>	Serial Port DCD Control
<b>AT&amp;C0</b>	Sets CD always ON
<b>AT&amp;C1</b>	Sets CD to follow the state of carrier (Default)
<b>AT&amp;C2</b>	Sets CD ON except during disconnect (3~5 sec.)
<b>AT&amp;Dn</b>	Serial Port DTR Control
<b>AT&amp;D0</b>	Assumes DTR ON.

<b>AT&amp;D1</b>	<b>Enters command mode on detecting ON-to-OFF transition of DTR.</b>
<b>AT&amp;D2</b>	<b>Goes ON-HOOK on detecting ON-to-OFF transition of DTR. (Default)</b>
<b>AT&amp;D3</b>	<b>Resets the modem on detecting ON-to-OFF transition of DTR.</b>
<b>AT&amp;Fn</b>	<b>Restore Factory Configuration(Profile) Restore factory configuration n, where n = 0~9.</b>
<b>AT&amp;Gn</b>	<b>Select Guard Tone</b>
<b>AT&amp;G0</b>	<b>Disables guard tone (Default)</b>
<b>AT&amp;G1</b>	<b>Selects 550 Hz guard tone</b>
<b>AT&amp;G2</b>	<b>Selects 1800 Hz guard tone</b>
<b>AT&amp;Kn</b>	<b>Serial Port Flow Control</b>
<b>AT&amp;K0</b>	<b>Disables flow control.</b>
<b>AT&amp;K1</b>	<b>Enables unidirectional RTS/CTS hardware flow control.</b>
<b>AT&amp;K2</b>	<b>Enables unidirectional XON/XOFF software flow control.</b>
<b>AT&amp;K3</b>	<b>Enables bi-directional RTS/CTS hardware flow control. (Default)</b>
<b>AT&amp;K4</b>	<b>Enables bi-directional XON/XOFF software flow control.</b>
<b>AT&amp;K5</b>	<b>Enables transparent XON/XOFF software flow control.</b>
<b>AT&amp;K6</b>	<b>Enables both RTS/CTS and XON/XOFF flow control.</b>
<b>AT&amp;K7</b>	<b>Enables bi-directional DTR/DSR hardware flow control.</b>
<b>AT&amp;K8</b>	<b>Enables unidirectional DTR/DSR hardware flow control.</b>
<b>AT&amp;Ln</b>	<b>Line Type Select</b>
<b>AT&amp;L0</b>	<b>PSTN line operation. (Default)</b>
<b>AT&amp;L1</b>	<b>leased line operation</b>
<b>AT&amp;Mn</b>	<b>Asynchronous/Synchronous Mode Selection</b>
<b>AT&amp;M0</b>	<b>Selects asynchronous operation. (Default)</b>
<b>AT&amp;M1</b>	<b>Selects synchronous data mode with Async. off-line command mode.</b>
<b>AT&amp;M2</b>	<b>Selects synchronous data mode with Async. off-line command mode. Same as &amp;M1 except that &amp;M2 enables DTR dialing of stored telephone number at location 0.The modem will disconnect if DTR is OFF for more than the time period in register S25.</b>
<b>AT&amp;M3</b>	<b>Selects synchronous data mode. The call is manually initiated while DTR is inactive. The handshake is proceeding when DTR becomes active.</b>
<b>AT&amp;Pn</b>	<b>Select Pulse Dial Make/Break Ratio</b>

<b>AT&amp;P0</b>	<b>39%-61% Make/Break ratio at 10 pulses/second. (Default)</b>
<b>AT&amp;P1</b>	<b>33%-67% Make/Break ratio at 10 pulses/second.</b>
<b>AT&amp;P2</b>	<b>39%-61% Make/Break ratio at 20 pulses/second.</b>
<b>AT&amp;P3</b>	<b>33%-67% Make/Break ratio at 20 pulses/second.</b>
<b>AT&amp;Qn</b>	<b>Select Communication Mode</b>
<b>AT&amp;Q0</b>	<b>Communicates in direct asynchronous mode.</b>
<b>AT&amp;Q1</b>	<b>Refers to the command AT&amp;M1</b>
<b>AT&amp;Q2</b>	<b>Refers to the command AT&amp;M2</b>
<b>AT&amp;Q3</b>	<b>Refers to the command AT&amp;M3</b>
<b>AT&amp;Q5</b>	<b>Communicates in error correction mode. (Default)</b>
<b>AT&amp;Q6</b>	<b>Communicates in asynchronous data operation with normal speed buffered mode.</b>
<b>AT&amp;Rn</b>	<b>Serial Port RTS/CTS Option Command</b>
<b>AT&amp;R0</b>	<b>CTS follows RTS at all time (Default)</b>
<b>AT&amp;R1</b>	<b>Assumes CTS always on</b>
<b>AT&amp;Sn</b>	<b>Serial Port DSR Control Command</b>
<b>AT&amp;S0</b>	<b>DSR remains ON at all time (Default)</b>
<b>AT&amp;S1</b>	<b>DSR follows the ITU-T recommendation</b>
<b>AT&amp;S2</b>	<b>DSR follows carrier</b>
<b>AT&amp;Tn</b>	<b>Loop Test Functions</b>
<b>AT&amp;T0</b>	<b>Ends loop test</b>
<b>AT&amp;T1</b>	<b>Local analog loop back</b>
<b>AT&amp;T3</b>	<b>Local digital loop back</b>
<b>AT&amp;T4</b>	<b>Responds to remote digital loop back request (Default)</b>
<b>AT&amp;T5</b>	<b>Ignores remote digital loop back request.</b>
<b>AT&amp;T6</b>	<b>Initiates ITU-T remote digital loop back</b>
<b>AT&amp;T7</b>	<b>Remote digital loop back with self-test</b>
<b>AT&amp;T8</b>	<b>Local analog loop back with self-test</b>
<b>AT&amp;Un</b>	<b>Trellis Coding Modulation Selection Command</b>
<b>AT&amp;U0</b>	<b>Enables trellis coding modulation (Default)</b>
<b>AT&amp;U1</b>	<b>Disables trellis coding modulation</b>
<b>AT&amp;V</b>	<b>View Profiles and Stored Telephone Number</b> <b>This command shows the active configuration, and four user profiles.</b>
<b>AT&amp;Wn</b>	<b>Store Current Configuration</b> <b>Saves current configuration at user profile n, including commands and registers, where n = 0~3.</b>
<b>AT&amp;Xn</b>	<b>Select Synchronous Clock Source</b>
<b>AT&amp;X0</b>	<b>Selects internal clock. (Default)</b>

<b>AT&amp;X1</b>	Selects external clock.
<b>AT&amp;X2</b>	Selects slave receive clock.
<b>AT&amp;Yn</b>	Power On Profile Selection Command Recalls profile n when power on, where n = 0~3.
<b>AT&amp;Zn=m</b>	Store Telephone Number The n indicates the telephone number locations, where n = 0~9. The m is a dial string (refer to ATDs command) of up to 35 characters. This command must be the last one on a command line.
<b>AT%Cn</b>	Data Compression Protocol Selection
<b>AT%CO</b>	Disables data compression
<b>AT%C1</b>	Enables MNP5 error correction
<b>AT%C2</b>	Enables V.42bis data compression
<b>AT%C3</b>	Enables both MNP5 and V.42bis data compression (Default)
<b>AT%En</b>	Retrain and Rate Negotiation Command
<b>AT%E0</b>	Disables auto retrain feature
<b>AT%E1</b>	Enables auto retrain feature
<b>AT%E2</b>	Enables auto retrain and rate negotiation with fall back/forward feature (Default)
<b>AT%L</b>	Line Signal Level Returns a value, which indicates the received signal level. For example, 009 = -9 dBm, 043 = -43 dBm, and so on.
<b>AT%Q</b>	Line Signal Quality Reports the line signal quality. The line quality is reported in three decimal digits, rang from 000(good) to 128(poor).
<b>AT%Rn</b>	Ring Back Message Command
<b>AT%R0</b>	Disables ring back message (Default).
<b>AT%R1</b>	Enables ring back message
<b>AT\An</b>	Select Maximum MNP Block Size
<b>AT\A0</b>	The maximum MNP block size to be 64 characters
<b>AT\A1</b>	The maximum MNP block size to be 128 characters
<b>AT\A2</b>	The maximum MNP block size to be 192 characters (Default)
<b>AT\A3</b>	The maximum MNP block size to be 256 characters
<b>AT\Bn</b>	Transmit Break to Remote

	Transmit a break signal to the remote modem with a length in multiples of 100 ms according to parameter n specified.
	Where n = 1~9. (Default n = 3)
AT\F	View Stored Telephone Number Reports the content of the ten stored telephone numbers.
AT\Gn	Modem Port Flow Control
AT\G0	Disables modem port flow control (Default)
AT\G1	Enables modem port flow control
AT\Nn	Operating Mode
AT\N0	Selects normal speed buffered mode.
AT\N1	Selects direct mode. (Forces &Q0)
AT\N2	Selects reliable (error-correction) mode. The modem will first attempt a LAP-M connection and then an MNP connection. Failure to make a reliable connection results in the modem hanging up (Forces &Q5, S36=4, and S48=7)
AT\N3	Selects auto reliable mode. This operates the same as \ N2 except failure to make a reliable connection results in the modem falling back to the speed buffered normal mode (Forces &Q5, S36=7, and S48=7) (Default)
AT\N4	Selects LAP-M error-correction mode. Failure to make a LAP-M error-correction results in the modem hanging up. (Forces &Q5 and S48=0) The AT-K1 command can override the AT\N4 command.
AT\N5	Selects MNP5 error-correction mode. Failure to make a n MNP error-correction connection results in the mode m hanging up. (Forces &Q5, S36=4 and S48=128)
AT\Rn	Serial Port Ring Indicator Control
AT\R0	The ring indicator ON for the duration of the telephone call.
AT\R1	Turns OFF the ring indicator after the telephone call is answered. (Default)
AT\S	Modem Status Display This command displays the active commend setting and lists the command.
AT*Kn	Keyboard Interrupt Command

**AT\*K0** Enables keyboard interrupt during handshake (Default)  
**AT\*K1** Disables keyboard interrupt during handshake  
**AT+MS** Select Modulation  
 The command format is:  
**AT+MS=<mod>,<automode>,<min\_rate>,<max\_rate>,<CR>**  
 For example: **AT+MS=10,1,1200,14400**

**\*\* <mod> Parameter Definitions :**

mod	Modulation	Possible Rates(bps)
0	V.21	300
1	V.22	1200
2	V.22bis	2400, 1200
3	V.23	1200
9	V.32	9600, 4800
10	V.32bis	14400, 12000, 9600, 7200, 4800
11	V.34	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400
64	BELL 103	300
69	BELL 212	1200
74	V.FC	28800, 26400, 24000, 21600, 19200, 16800, 14400

**\*\* <mod> Parameter Definitions :**

Automode	Option Selected
0	Auto mode disable
1	Auto mode enable using V.8 or multi-mode (Default)

The following table are the explanation of the MNP10 command set.

**AT)Mn** Power Level Adjust Command  
**AT)M0** Disables power level adjustment during MNP 10 link negotiation. The AT)M0 command will allow the transmitter adjustment if cellular operation is requested by the remote modem.(Default)  
**AT)M1** Enables power level adjustment during MNP 10 link negotiation. NOTE: AT)M1 should not be used with



	AT*H2.
AT*Hn	Link Negotiation Speed
AT*H0	Link negotiation occurs at the highest supported speed. (Default)
AT*H1	Link negotiation occurs at 1200bps; used primarily for establishing cellular connections.
AT*H2	Link negotiation occurs at 4800bps; used primarily to negotiate an MNP 10 connection on less than average quality telephone lines.
AT-Kn	MNP Extended Services
AT-K0	Disables V.42 LAP-M to MNP 10 conversion. (Default)
AT-K1	Enables V.42 LAP-M to MNP 10 conversion.
AT-Qn	Enable Fallback to V.22bis/V.22
AT-Q0	Disables fallback to 2400 bps (V.22bis) and 1200 bps (V.22). Fallback is enabled only to 4800 bps.
AT-Q1	Enables fallback to 2400 bps (V.22bis) and 1200 bps (V.22). (Default)
AT@Mn	Initial Cellular Power Level Setting
	Parameter n Initial Cellular Power Level
	0 -26 dBm (Default)
	1 -30 dBm
	2~10 -10 dBm
	$11f \leq f \leq 31$ - n dBm
AT:En	Compromise Equalizer Enable Command
AT:E0	Disables the equalizer
AT:E1	Enables the equalizer (Default)

# CHAPTER 3

## V.25bis COMMAND

### V.25bis Command set

- CRN n**      **Dialing Command**  
This command dials a telephone number specified by the parameter "n". The "n" in this command is a dial string which includes telephone number 0 to 9, and #, \* for tone dialing only, dial modifiers (please refer to ATDs command). Any dial modifier specified in ATD command is valid here in ITU-T V.25bis command mode. There are four extra dial modifiers that V.25bis defined listed below:  
: Same definition as "W" modifier in the ATD command.  
< Same definition as ", " modifier in the ATD command.  
& Same definition as "!" modifier in the ATD command.  
= Same definition as ";" modifier in the ATD command.
- CRS n**      **Dialing Stored Number Command**  
Dials the telephone number that previously stored in memory location n. Where n = 0~9.
- PRN m;n**    **Stored Telephone Number in Location m**  
This command stores telephone number in memory location m for later dialing. It is identical with the AT&Z command in AT command mode. Where m = 0~9. The n is a dial string of up to 35 characters. Valid dial string characters are 0 to 9, dial modifiers, and for tone dialing #, \*.
- RLN**        **Display the Stored Telephone Number**  
This command shows the ten (location 0 to 9) stored telephone numbers.
- DIC**        **Disregard Incoming Call**  
The DIC command disables the auto answer function of the modem in ITU-T V.25bis operation mode.
- CIC**        **Connect Incoming Call**

This command enables the auto answer function of the modem.

**CNL**      **Execute AT Command**  
This command allows the user to issue and execute the AT command while in the V.25bis command mode.

## V.25bis Result Code

<b>RESULT CODE</b>	<b>DESCRIPTION</b>
<b>CNX m</b>	Modem connects to the remote modem. The m indicates the DCE speed.
<b>VAL</b>	Command valid and executed successfully.
<b>INV</b>	Command error, can not be executed.
<b>INC</b>	Ring signal detected.
<b>CFI m</b>	Failure of dialing, the m represents the meanings below: ET Line busy RT No answer CB Local modem busy NT No carrier NS Memory location is empty, no telephone number stored AB Receive interrupt while dialing
<b>LSN m;n</b>	Display the stored telephone numbers, m indicates the memory location of the telephone number, n indicates the telephone number.

# CHAPTER 4

## REGISTERS

### S Register Summary

REGISTER	Function	Default	Range	Units
S0	Rings to Auto-Answer	0	0-255	Rings
S1	Ring Counter	0	0-255	Rings
S2	Escape Character	43	0-255	ASCII
S3	Carriage Return Character	13	0-127	ASCII
S4	Line Feed Character	10	0-127	ASCII
S5	Backspace Character	8	0-32	ASCII
S6	Wait Time for Dial Tone	2	2-255	Sec.
S7	Wait Time for Carrier	45	1-255	Sec.
S8	Pause Time for Dial Delay	2	0-255	Sec.
S9	Carrier Detect Response Time	6	0-255	.1 Sec.
S10	Delay for Hanging Up after Carrier Loss	14	1-255	.1 Sec.
S11	DTMF Duration and Spacing	95	50-255	.001 Sec.
S12	Escape Code Guard Time	50	0-255	.02 Sec.
S14	Bit Mapped Register	-	-	-
S16	Bit Mapped Register	-	-	-
S18	Test Timer	0	0-255	Sec.
S19	AutoSync Bit Mapped Option	-	-	
S20	AutoSync HDLC Address or BSC Sync. Character	0	0-255	
S21	Bit Mapped Register	-	-	-
S22	Bit Mapped Register	-	-	-
S23	Bit Mapped Register	-	-	-
S25	Delay to DTR	5	0-255	.01 Sec.
S26	RTS to CTS Delay Interval	1	0-255	.01 Sec.

S27	Bit Mapped Register	-	-	-
S28	Bit Mapped Register	-	-	-
S29	Flash Dial Modifier Time	70	0-255	.01 Sec.
S30	Inactivity Timer	0	0-255	Minute
S31	Bit Mapped Options Status	-	-	-
S32	XON Character	17	0-255	ASCII
S33	XOFF Character	19	0-255	ASCII
S36	Negotiation Fallback	7	0-7	-
S37	Desired Line Speed	0	0-12	-
S38	Delay Before Forced Hang up	5	0-255	Second
S39	Flow Control Options Status	3	0-8	-
S40	General Bit Mapped Options Status	-	-	-
S41	General Bit Mapped Options Status	-	-	-
S46	Data Compression Selection	138	136or138	-
S48	Negotiation Selection	7	0,7or128	-
S82	Break Signaling Control	(for compatibility only)		
S91	PSTN Transmit Attenuation Level	10	0-15	dBm
S92	Fax Transmit Attenuation Level	10	0-15	dBm
S95	Negotiation Messages Options	0	-	-
S99	Leased Line Transmit Attenuation	10	0-31	dBm
S201	Cellular Transmit Level	20H	-	-

# APPENDIX A

## SPECIFICATION

<b>COMPATIBILITY</b>	ITU- T V.34bis/V.34/V.FC/V.32bis/V.32/V.22bis /V.23/V.22 /V.21 and BELL 212A/103 Compatible
<b>SPEED</b>	300,1200,2400,4800,7200,9600,12000,14400, 16800,19200,21600,24000,26400,28800, 31200, 33600bps
<b>THROUGHPUT</b>	Max. 115200 bps(Asynchronous)
<b>COMMAND</b>	Hayes AT Command or ITU-T V.25bis Command Compatible
<b>PROTOCOL</b>	ITU- T V. 42 and MNP 1-4 Error Correction ITU- T V. 42bis and MNP 5 Data Compression ITU- T V. 8 Multi-mode Handshake ITU- T V. 54 Diagnostic MNP 10 Cellular Protocol
<b>DIP SWITCH</b>	12-position and 2-position DIP Switch
<b>LED</b>	8 LEDs indicator MR, TR, SQ, CD, RD, TD, OH, EC
<b>HANDSHAKE</b>	Provide Multi- and Fix- Mode Handshake with ITU-T V. 8 Multi- Mode Handshake
<b>DIAGNOSTIC</b>	Loop Back Test (Digital, Analog, Remote Digital) with Test Pattern
<b>FLOW CONTROL</b>	RTS/CTS (Hardware), DTR/DSR (Hardware) and XON/XOFF (Software)
<b>NVRAM FUNCTION</b>	Storage of 4 Configuration Profiles and 10 Telephone Numbers (35 Digits Each)

<b>OUTPUT LEVEL</b>	Adjustable from 0 dBm to -31 dBm in 32 Steps for Leased Line Operation. Adjustable from 0 dBm to -15 dBm in 16 Steps for Other Operations
<b>LINE TYPE</b>	Dial Up (PSTN) and 2 Wire Leased Line Selectable Using AT Command or DIP Switch
<b>SIZE</b>	161mm (L)x 127.5mm (W)x 37mm (H)
<b>WEIGHT</b>	295 Gram (Without AC Adapter)
<b>POWER SUPPLY</b>	AC 12V, 800mA
<b>INTERFACE</b>	Line: RJ-11 Terminal : 25 Pin RS-232C D-type Connector

#### RS-232C PIN DEFINITION

Pin	V.24	EIA	Description	Direction
1	101	AA	Protective Ground (FG)	NA
7	102	AB	Signal Ground (SG)	NA
2	103	BA	Transmitted Data (TXD)	To DCE
3	104	BB	Received Data (RXD)	From DCE
4	105	CA	Request to Send (RTS)	To DCE
5	106	CB	Clear to Send (CTS)	From DCE
6	107	CC	Data Set Ready (DSR)	From DCE
20	108	CD	Data Terminal Ready (DTR)	To DCE
22	125	CE	Ring Indicator (RI)	From DCE
8	109	CF	Received Signal Detector (CD)	From DCE
24	113	DA	Transmitter Signal Element Timing (XTCLK)	To DCE
15	114	DB	Transmitter Signal Element Timing (TXCLK)	From DCE
17	115	DD	Receiver Signal Element Timing (RXCLK)	From DCE

# APPENDIX B

## RESULT CODES

Short Form	Long Form	Standard	Extended
0	OK	*	
1	CONNECT	*	
2	RING	*	
3	NO CARRIER	*	
4	ERROR	*	
5	CONNECT 1200		*
6	NO DIALTONE		*
7	BUSY		*
8	NO ANSWER		*
9	CONNECT 600		*
10	CONNECT 2400		*
11	CONNECT 4800		*
12	CONNECT 9600		*
13	CONNECT 7200		*
14	CONNECT 12000		*
15	CONNECT 14400		*
16	CONNECT 19200		*
17	CONNECT 38400		*
18	CONNECT 57600		*
19	CONNECT 115200		*
22	CONNECT 1200TX/75RX		*
23	CONNECT 75TX/1200RX		*
40	CARRIER 300		*
44	CARRIER 1200/75		*
45	CARRIER 75/1200		*
46	CARRIER 1200		*
47	CARRIER 2400		*
48	CARRIER 4800		*
49	CARRIER 7200		*



50	CARRIER 9600		*
51	CARRIER 12000		*
52	CARRIER 14400		*
53	CARRIER 16800		*
54	CARRIER 19200		*
55	CARRIRE 21600		*
56	CARRIER 24000		*
57	CARRIER 26400		*
58	CARRIER 28800		*
59	CONNECT 16800		*
61	CONNECT 21600		*
62	CONNECT 24000		*
63	CONNECT 26400		*
64	CONNECT 28800		*
84	CONNECT 33600		*
91	CONNECT 31200		*
66	COMPRESSION: CLASS 5		*
67	COMPRESSION: V.42 bis		*
69	COMPRESSION: NONE		*
70	PROTOCOL: NONE		*
77	PROTOCOL: LAPM		*
80	PROTOCOL: ALT		*
81	PROTOCOL: ALT-CELLULAR		*
+F4	+FCERROR		*

← For your convenience, cut form the dash line and put beside your modem.

<b>DIP Switch 1</b>				POSITION	STATE	DESCRIPTION		
POSITION	STATE	DESCRIPTION		<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	
<b>1</b>	<b>2</b>			ON	ON	ON	ON	Line speed 300bps (V.21/Bell 103)
ON	ON	Power on operation		OFF	ON	ON	ON	Line speed 1200/75bps (V.23)
OFF	ON	V.25bis operation		ON	OFF	ON	ON	Line speed 1200bps (V.22/Bell 212A)
ON	OFF	dumb mode operation		OFF	OFF	ON	ON	Line speed 2400bps (V.22 bis)
<b>OFF</b>	<b>OFF</b>	<b>AT command operation</b>		ON	ON	OFF	ON	Line speed 4800bps (V.32/ V.32 bis)
				OFF	ON	OFF	ON	Line speed 7200bps (V.32 bis)
				ON	OFF	OFF	ON	Line speed 9600bps (V.32/ V.32 bis)
<b>3</b>		ON	Synchronous operation	OFF	OFF	OFF	ON	Line speed 12000bps (V.32 bis)
		OFF	<b>Asynchronous operation</b>	ON	ON	ON	OFF	Line speed 14400bps (V.32 bis)
				OFF	ON	ON	OFF	Line speed 16800bps (V.34)
				ON	OFF	ON	OFF	Line speed 19200bps (V.34)
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	OFF	OFF	ON	OFF	Line speed 21600bps (V.34)
ON	ON	ON	ON	ON	ON	OFF	OFF	Line speed 24000bps (V.34)
OFF	ON	ON	ON	OFF	ON	OFF	OFF	Line speed 26400bps (V.34)
ON	OFF	ON	ON	ON	OFF	OFF	OFF	Line speed 28800bps (V.34)
OFF	OFF	ON	ON	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>Line speed follow DTE speed</b>
ON	ON	OFF	ON					
OFF	ON	OFF	ON					
ON	OFF	OFF	ON	<b>12</b>		ON		Read DIP switch 4 through 11(the
OFF	OFF	OFF	ON					DTE speed selection and line speed
ON	ON	ON	OFF					selection Switches) while power on or
OFF	ON	ON	OFF					encontering of the ATZ command.
ON	OFF	ON	OFF			OFF		<b>Read NVRAM for DTE speed and line s</b>
OFF	OFF	ON	OFF					<b>peed while power on or encontering</b>
ON	ON	OFF	OFF					<b>of the ATZ command.</b>
OFF	ON	OFF	OFF					
ON	OFF	OFF	OFF					
OFF	OFF	OFF	OFF					
<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>					<b>DTE speed 115200bps</b>
				<b>DIP Switch 2</b>				
POSITION	STATE	DESCRIPTION						
<b>1</b>		ON		Answer				
		OFF		<b>Originate</b>				
<b>2</b>		ON		Leased Line				
		OFF		<b>Dial-up</b>				

\* The preset value shown as bold format.

**501100220102**