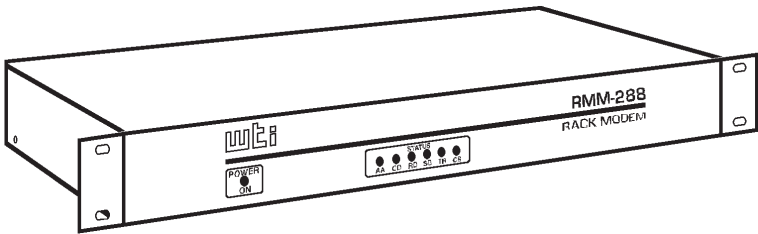


RMM

Rack Mount Data/Fax Modem



User's Guide

wti western™
telematic inc.



5 Sterling • Irvine • California 92618-2517
(949) 586-9950 • Toll Free: 1-800-854-7226
Fax: (949) 583-9514 • <http://www.wti.com>

1. Introduction

The RMM Rack Mount Data/Fax Modem is designed for applications that require a single “Industrial Strength” modem that easily installs in equipment bays. The unit requires only 1 rack space, thus eliminating the hassle of equipment trays and power bricks required for “Plastic Box” modems.

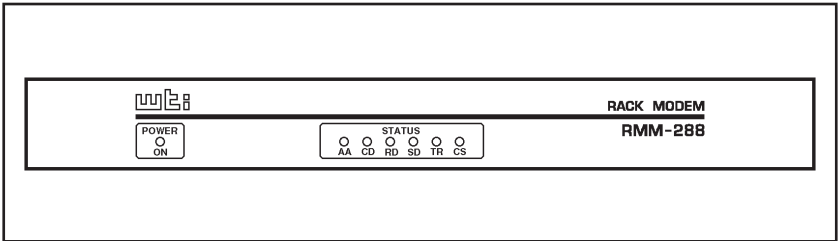


Figure 1: Front Panel

The heart of the RMM is the popular and highly reliable U.S. Robotics® Sportster® 28.8 modem card. The power supply is filtered, fused and surge protected for operation in harsh environments. The RMM is available in 115/230 (switchable) and 48 volt DC versions.

Features

- Requires Only One 19 Inch Rack Unit.
- High Speed ITU-T V.34+
- Filtered and Surge Protected Power Supply.
- 115/220 Volt AC and 48 Volts DC Versions.

2. Unit Description

2.1. Front Panel Indicators

LED	Status	Meaning
AA (Auto Answer)	On	Answer mode only: Modem is answering a call and DIP Switch 5 is UP (Enable Auto Answer), or register S0 is set to 1 (Auto Answer, 1 Ring).
	Off	No activity, or modem is originating a call.
	Flash	Incoming call.
CD (Carrier Detect)	On	A valid data carrier signal has been received from a remote modem, and Dip Switch 6 is UP (Normal Carrier Detect). Modem is ready to transmit data. The CD Indicator will remain ON constantly if Dip Switch 6 is DOWN (Carrier Detect Override).
RD (Receive Data)	Flash	Modem is sending result codes or passing received data bits.
SD (Send Data)	Flash	Computer is sending data bits.
TR (Data Terminal Ready)	On	Modem is receiving DTR signal from computer. The TR indicator will only function when Dip Switch 1 is UP (Normal DTR). Remains ON constantly if Dip Switch 1 is DOWN (DTR Override).
CS (Clear to Send)	On	Hardware flow control is enabled (&H1, &H3), modem is waiting for low CTS signal.

3. Operation

The following commands can be used to display current configuration status and various help menus:

View Modem Setup:	ATI4
Basic Help Menu:	AT\$
Dial Command Help Menu:	ATD\$
Configuration Command Help Menu:	AT&\$
List of S-Registers:	ATSS
Reset Modem to Default Profile 0:	ATZ3

When the View Modem Setup command (**ATI4**) is invoked, the RMM will display a status screen as shown below.

```
B0 E1 F1 M1 Q0 V1 X1 Y0
BAUD=9600 PARITY=N WORDLEN=8
DIAL=PULSE ON HOOK

&A1 &B0 &C1 &D2 &G0 &H0 &I0 &K1
&M4 &N0 &P0 &R1 &S0 &T5 &Y1

S00=001 S01=000 S02=043 S03=013 S04=010 S05=008 S06=002
S07=060 S08=002 S09=006 S10=007 S11=070 S12=050 S13=000
S14=000 S15=000 S16=000 S17=000 S18=000 S19=000 S20=000
S21=010 S22=017 S23=019 S24=000 S25=005 S26=000 S27=000
S28=008 S29=020 S30=000 S31=000 S32=000 S33=000 S34=006
S35=000 S36=014 S37=000 S38=000 S44=015 S51=000
```

Figure 2: The Status Screen (Defaults Shown)

4. Installation

4.1. 48 Volt DC Power Option

The 48 Volt DC input is not polarity sensitive. Therefore, you can connect either positive or negative wires from your 48 volt power source to either input and the internal circuitry will adjust for the proper polarity.

Input Range: 40 - 60 Volts DC, 200 milliamps maximum.

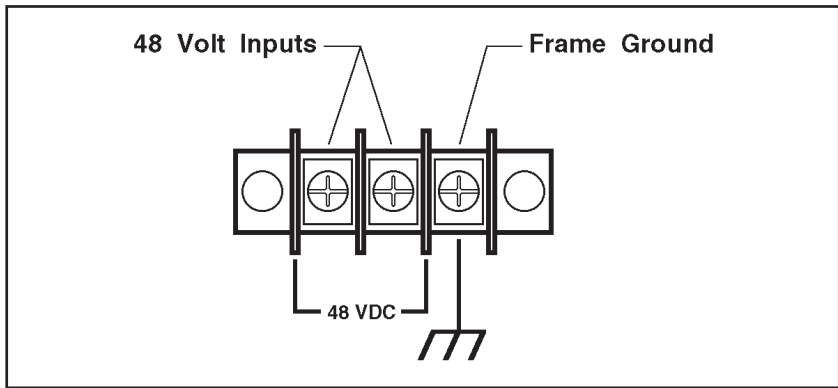


Figure 3: 48 Volt DC Power Option

4.2. Dip Switch Settings

Switch	Factory Setting	Function
1	●	Data Terminal Ready (DTR) Override UP Normal DTR operations: Computer must provide DTR signal for modem to accept commands. Dropping DTR terminates call. DOWN DTR Override: Modem ignores DTR
2	●	Verbal/Numeric Result Codes UP Verbal (Word) Results DOWN Numeric Results
3	●	Result Code Display UP Suppress Result Codes DOWN Display Result Codes
4	●	Command Mode Local Echo Suppression UP Enable Echo DOWN Suppress Echo
5	●	Auto Answer Suppression UP Auto Answer On: Modem answers on first ring, or higher if specified in NVRAM DOWN Auto Answer Off: Disable auto answer
6	●	Carrier Detect (CD) Override UP Normal: Modem sends CD signal when connecting with another modem, drops CD on disconnect DOWN Override: CD always ON
7	●	Power-On and ATZ Reset Software Defaults UP User Defaults: Load Y or Y1 configuration from user-defined nonvolatile memory (NVRAM). DOWN Factory Defaults; Load &F0 (Generic) template from read-only memory (ROM).
8	●	AT Command Set Recognition UP Dumb Mode: Disables command recognition DOWN Smart Mode: Enables command recognition

5. Command Summary

- Type commands in either upper or lower case. Do not use a combination of upper *and* lower case characters.
- Use the Backspace key to delete errors. Note that the original AT command is stored in the modem buffer, and cannot be deleted.
- Some commands have numeric options. If these commands are invoked *without* a numeric option, the modem will assume option 0 (zero). For example, when the command **ATB** is invoked, the modem will assume command **ATB0** was intended.
- All commands begin with the **AT** prefix, and are invoked by pressing **[Enter]** (Carriage Return). The only exceptions are the **A/** command (Repeat previous command) and **+++** (Exit to on-line command mode).
- The maximum command length is 40 characters. This does not include the **AT** prefix, Carriage Returns, or spaces.

Note:

- All defaults are based on the &F1-Hardware Flow Control template loaded in NVRAM.
- Defaults are marked with an asterisk (*).

Command	Function/Options
\$	Displays basic command list (On-line Help Menu).
A	Manual Answer: goes off hook in answer mode. Pressing any key aborts the operation.
A/	Re-executes the last issued command. Used mainly to redial. Does not require the AT prefix or a Carriage Return.
Any key	Aborts off-hook dial/answer operation and hangs up.
AT	Required prefix for all modem commands. Can also be used to test for the "OK" result code. Not required for the A/ command or +++ command.
B <i>n</i>	U.S./ ITU-T answer sequence * B0 ITU-T answer sequence B1 U.S. answer tone

Command Function/Options

<i>Dn</i>	<p>Dials the specified phone number. Can also include the following command options:</p> <ul style="list-style-type: none"> L Re-dials last number dialed * P Pulse (Rotary) Dial Mode R Originates call using answer (reverse) frequencies. <i>Sn</i> Dials phone number string stored in NVRAM at position <i>n</i> (<i>n</i> = 0-3). Phone numbers are stored with the &Z<i>n</i>=<i>s</i> command. T Tone Dial Mode , (Comma) Two Second Pause. Comma pause duration can be redefined via the S8 Register. ; (Semicolon) Return to Command mode after dialing “ Dials the letters that follow (in an alphabetic phone number) ! (Exclamation point) Flashes the switch hook / Delays for 125 msec before proceeding with dial string W Wait for second dial tone (X3 or higher). Linked to S6 register @ Dials, waits for 5 seconds of silence after detecting ringbacks, and then continues (X2 or X4). \$ Displays a list of dial commands.
<i>En</i>	<p>Sets local echo. See DIP Switch 4 (Section 4.2).</p> <ul style="list-style-type: none"> E0 Echo OFF * E1 Modem displays keyboard commands
<i>Fn</i>	<p>Sets online local echo of transmitted data ON/OFF.</p> <ul style="list-style-type: none"> F0 Local echo ON. Modem sends a copy of data it sends to the remote system to your screen. * F1 Local echo OFF. Receiving system may send a remote echo of data it receives.
<i>Hn</i>	<p>Controls ON/OFF hook.</p> <ul style="list-style-type: none"> H0 Hangs up (goes on hook) H1 Goes off hook

Command Function/Options

<i>In</i>	Displays the following information. I0 Four-digit product code I1 Results of ROM checksum I2 Results of RAM checksum I3 Product type I4 Current modem settings I5 Nonvolatile memory (NVRAM) settings I6 Link diagnostics I7 Product configuration
<i>Mn</i>	Operates speaker. M0 Speaker always OFF * M1 Speaker ON until CONNECT M2 Speaker always ON M3 Speaker ON after dial, until CONNECT
<i>On</i>	Returns online. O0 Returns online O1 Returns online and retrains
<i>P</i>	Sets pulse dial (for phone lines that don't support touch-tone dialing).
<i>Qn</i>	Displays/suppresses result codes. See DIP Switch 3 (Section 4.2). * Q0 Displays result codes Q1 Quiet mode; no result codes Q2 Displays result codes only in Originate mode. Cannot be stored in NVRAM.
<i>Sr.b=n</i>	Sets bit <i>.b</i> of register <i>r</i> to value <i>n</i> (0/OFF or 1/ON).
<i>Sr=n</i>	Sets register <i>r</i> to value <i>n</i> . See list of S-register settings (Section 6).
<i>Sr?</i>	Displays contents of S-register <i>r</i> .
<i>S\$</i>	Displays a list of the S-Registers (Section 6).
<i>T</i>	Sets tone dial.
<i>Vn</i>	Displays verbal/numeric result codes. See DIP Switch 2 (Section 4.2). V0 Numeric codes * VI Verbal codes

Command Function/Options

Xn Sets result code displayed. Default is X4.

Result Codes	Xn Setting				
	X0	X1	X2	X3	X4
0/OK	•	•	•	•	•
1/CONNECT	•	•	•	•	•
2/RING	•	•	•	•	•
3/NO CARRIER	•	•	•	•	•
4/ERROR	•	•	•	•	•
5/CONNECT 1200		•	•	•	•
6/NO DIAL TONE			•		•
7/BUSY				•	•
8/NO ANSWER*				•	•
10/CONNECT 2400		•	•	•	•
13/CONNECT 9600		•	•	•	•
18/CONNECT 4800		•	•	•	•
20/CONNECT 7200		•	•	•	•
21/CONNECT 12000		•	•	•	•
25/CONNECT 14400		•	•	•	•
43/CONNECT 16800		•	•	•	•
85/CONNECT 19200		•	•	•	•
91/CONNECT 21600		•	•	•	•
99/CONNECT 24000		•	•	•	•
103/CONNECT 26400		•	•	•	•
107/CONNECT 28800		•	•	•	•
151/CONNECT 31200		•	•	•	•
155/CONNECT 33600		•	•	•	•

Functions

Adaptive Dialing			•	•	•
Wait for 2nd Dial Tone (W)			•		•
Wait for Answer (@)				•	•
Fast Dial			•		•

*Requires @ in dial string; replaces NO CARRIER

Yn Selects power-on/reset default configuration.

- * Y0 Default is profile 0 setting in NVRAM
- Y1 Default is profile 1 setting in NVRAM

Command	Function/Options
<i>Zn</i>	Resets modem based on current DIP Switch settings. <ul style="list-style-type: none"> Z0 Resets modem to NVRAM profile selected by the Y command Z1 Resets modem to NVRAM profile 0 Z2 Resets modem to NVRAM profile 1 Z3 Resets modem to factory default profile 0 (&F0) Z4 Resets modem to factory default profile 1 (&F1) Z5 Resets modem to factory default profile 2 (&F2)
<i>&\$</i>	Displays a list of ampersand (&) commands.
<i>&An</i>	Enables/disables additional result code subsets (see <i>Xn</i>). <ul style="list-style-type: none"> &A0 ARQ result codes disabled &A1 ARQ result codes enabled &A2 V.32 modulation indicator added * &A3 Protocol indicators added-LAPM/MNP/NONE (error control) and V42BIS/MNP5 (data compression)
<i>&Bn</i>	Manages modem's serial port rate. <ul style="list-style-type: none"> &B0 Variable, follows connection rate * &B1 Fixed serial port rate &B2 Fixed in ARQ mode, variable in non-ARQ mode
<i>&Cn</i>	Controls Carrier Detect (CD) signal. See DIP Switch 6 (Section 4.2). <ul style="list-style-type: none"> &C0 CD override * &C1 Normal CD operations
<i>&Dn</i>	Controls Data Terminal Ready (DTR) operations. See DIP Switch 1 (Section 4.2). <ul style="list-style-type: none"> * &D0 DTR override &D1 DTR toggle causes online Command mode &D2 Normal DTR operations &D3 Resets on receipt of DTR

Command Function/Options

&Fn	Loads a read-only (non-programmable) factory configuration. &F0 Generic template * &F1 Hardware flow control template &F2 Software flow control template
&Gn	Sets Guard Tone. * &G0 No guard tone (U.S. and Canada) &G1 550 Hz guard tone (some European countries), requires B0 setting. &G2 1800 Hz guard tone (U.K.), requires B0 setting.
&Hn	Sets Transmit Data (TD) flow control &H0 Flow control disabled * &H1 Hardware flow control, Clear to Send (CTS) &H2 Software flow control, XON/XOFF &H3 Hardware and software control
&In	Sets Receive Data (RD) software flow control (see also &Rn). * &I0 Software flow control disabled &I1 XON/XOFF signals to your modem and remote system &I2 XON/XOFF signals to your modem only
&Kn	Enables/disables data compression. &K0 Data compression disabled * &K1 Auto enable/disable &K2 Data compression enabled &K3 MNP5 compression disabled
&Mn	Sets Error Control (ARQ) for connections at 1200 bps and higher. &M0 Normal mode, error control disabled &M1 Reserved &M2 Reserved &M3 Reserved * &M4 Normal/ARQ &M5 ARQ mode

Command Function/Options

&Nn	<p>Sets connect speed. If connection cannot be established at this speed, the modem will hang up. Sets ceiling connect speed if &Un is greater than 0 (See &Un).</p> <p>* &N0 Variable rate</p> <p> &N1 300 bps</p> <p> &N2 1200 bps</p> <p> &N3 2400 bps</p> <p> &N4 4800 bps</p> <p> &N5 7200 bps</p> <p> &N6 9600 bps</p> <p> &N7 12,000 bps</p> <p> &N8 14,400 bps</p> <p> &N9 16,800 bps</p> <p> &N10 19,200 bps</p> <p> &N11 21,600 bps</p> <p> &N12 24,000 bps</p> <p> &N13 26,400 bps</p> <p> &N14 28,800 bps</p> <p> &N15 31,200 bps</p> <p> &N16 33,600 bps</p>
&Pn	<p>Sets pulse (rotary) dial make/break ratio.</p> <p>* &P0 U.S. /Canada ratio, 39% / 61%</p> <p> &P1 U.K. ratio, 33 % / 67%</p>
&Rn	<p>Sets Receive Data (RD) hardware flow control, Request to Send (RTS) (see also &In).</p> <p> &R0 Reserved</p> <p>* &R1 Modem ignores RTS</p> <p> &R2 Received Data to computer only on RTS</p>
&Sn	<p>Controls Data Set Ready (DSR) operations.</p> <p>* &S0 DSR override; always ON</p> <p> &S1 Modem controls DSR</p>

Command Function/Options

&Tn	Begins test modes. &T0 Ends Test in Progress &T1 Analog Loopback &T2 Reserved &T3 Local Digital Loopback &T4 Enables Remote Digital Loopback * &T5 Prohibits Remote Digital Loopback &T6 Initiates Remote Digital Loopback &T7 Remote Digital with self test and error detector &T8 Analog Loopback with self test and error detector
\$Un	Sets floor connect speed when &Un is greater than 0. &Nn is the ceiling connect speed (See &Nn). * &U0 Disabled &U1 300 bps &U2 1200 bps &U3 2400 bps &U4 4800 bps &U5 7200 bps &U6 9600 bps &U7 12,000 bps &U8 14,400 bps &U9 16,800 bps &U10 19,200 bps &U11 21,600 bps &U12 24,000 bps &U13 26,400 bps &U14 28,800 bps &U15 31,200 bps &U16 33,600 bps
&Wn	Writes current configuration to NVRAM templates. &W0 Modifies the NVRAM 0 template (Y0) &W1 Modifies the NVRAM 1 template (Y1)
&Yn	Sets break handling. &Y0 Destructive, but doesn't send break * &Y1 Destructive, expedited &Y2 Non-destructive, expedited

Command Function/Options

<i>&Zn=s</i>	Writes phone number <i>s</i> to NVRAM at position <i>n</i> (<i>n</i> = 0-3).
<i>&Zn=L</i>	Writes last executed dial string to NVRAM at position <i>n</i> (<i>n</i> = 0-3).
<i>&Zn?</i>	Displays the phone number stored at position <i>n</i> (<i>n</i> = 0-3).
<i>&ZL?</i>	Displays the last executed dial string.
+++	Escapes to online-command mode.

6. S-Registers

Note: To change a setting, use the `ATSr=n` command, where r is the register and n is a decimal value from 0-255 (unless otherwise indicated).

Register	Default	Function
S0	1	Sets the number of rings on which to answer in Auto Answer Mode. When set to 0, Auto Answer is disabled. See DIP Switch 5 (Section 4.2).
S1	0	Counts and stores the number of rings from an incoming call. Register S0 must be greater than 0.
S2	43	Stores the ASCII decimal code for the escape code character. The default character is +. A value of 128-255 disables the escape code.
S3	13	Stores the ASCII code for the Carriage Return character. Valid range is 0-127.
S4	10	Stores the ASCII decimal code for the Line Feed character. Valid range is 0-127.
S5	8	Stores the ASCII decimal code for the Backspace character. A value of 128-255 disables the Backspace key's delete function.
S6	2	Sets the number of seconds the modem will wait before dialing. If Xn is set to X2 or X4, S6 determines the timeout length when no dial tone is detected.
S7	60	Sets the number of seconds the modem will wait for a carrier. Often used to select a longer duration when the modem is originating an international connection.
S8	2	Sets the duration (in seconds) for the Dial command pause option (.).
S9	6	Determines the length of time (in tenths of a second) the remote modem's carrier signal must continue in order to be recognized by the RMM.
S10	7	Sets the length of time (in tenths of a second) the modem will wait after loss of carrier before hanging up. Allows the modem to distinguish between a line hit (or other momentary break) from a true disconnect (hang up) by the remote modem.

Register	Default	Function																											
S10 (continued)		<p>Although it is not recommended to connect to a line with call waiting, the S10 register can be adjusted upward to prevent the modem from misinterpreting the second call signal as a remote disconnect. If call waiting is a problem, it is preferable to contact your phone company to determine the command to temporarily disable call waiting (typically *70W). For example: ATDT *70W <i>phone number</i>.</p> <p>Note: If S10 = 255, the modem will not hang up when the carrier is lost. Dropping DTR hangs up the modem.</p>																											
S11	70	Sets the duration and spacing (in milliseconds) for tone dialing.																											
S12	50	Sets the duration (in fiftieths of a second) of the guard time for the escape code sequence (+++).																											
S13	0	<p>Bit-mapped register. Select the bit(s) you want on and set S13 to the total of the values in the Value Column. For example, ATS13=17 enables bit 0 (value is 1) and bit 4 (value is 16).</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Reset when DTR drops.</td> </tr> <tr> <td>1</td> <td>2</td> <td>Reset non-MNP transmit buffer from 1.5K to 128 bytes.*</td> </tr> <tr> <td>2</td> <td>4</td> <td>Set backspace key to delete.</td> </tr> <tr> <td>3</td> <td>8</td> <td>On DTR signal, autodial the number stored in NVRAM at position 0.</td> </tr> <tr> <td>4</td> <td>16</td> <td>At Power On/Reset, autodial the number stored in NVRAM at position 0.</td> </tr> <tr> <td>5</td> <td>32</td> <td>Reserved</td> </tr> <tr> <td>6</td> <td>64</td> <td>Reserved</td> </tr> <tr> <td>7</td> <td>128</td> <td>Disconnect on escape code.</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	Reset when DTR drops.	1	2	Reset non-MNP transmit buffer from 1.5K to 128 bytes.*	2	4	Set backspace key to delete.	3	8	On DTR signal, autodial the number stored in NVRAM at position 0.	4	16	At Power On/Reset, autodial the number stored in NVRAM at position 0.	5	32	Reserved	6	64	Reserved	7	128	Disconnect on escape code.
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* The 1.5K-byte non-ARQ buffer allows data transfer with Xmodem and Ymodem type file transfer protocols without using flow control.

The 128 Byte option allows remote users with slower modems to prevent transmitted data from scrolling off screen. When a remote user sends an XOFF (Ctrl-S) to your computer and transmission stops, data in transit from your modem's buffer does not exceed the size of the remote user's screen. This is also helpful when a remote modem/printer application is losing characters.

Register	Default	Function																											
S14	0	Reserved																											
S15	0	<p>Bit-mapped register setup. To set the register, see instructions for S13.</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Disable ARQ/MNP for V.22.</td> </tr> <tr> <td>1</td> <td>2</td> <td>Disable ARQ/MNP for .22bis.</td> </tr> <tr> <td>2</td> <td>4</td> <td>Disable ARQ/MNP V.32 / V.32bis / V.32terbo.</td> </tr> <tr> <td>3</td> <td>8</td> <td>Disable MNP handshake.</td> </tr> <tr> <td>4</td> <td>16</td> <td>Disable MNP level 4.</td> </tr> <tr> <td>5</td> <td>32</td> <td>Disable MNP level 3.</td> </tr> <tr> <td>6</td> <td>64</td> <td>MNP incompatibility</td> </tr> <tr> <td>7</td> <td>128</td> <td>Disable V.42 operation.</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	Disable ARQ/MNP for V.22.	1	2	Disable ARQ/MNP for .22bis.	2	4	Disable ARQ/MNP V.32 / V.32bis / V.32terbo.	3	8	Disable MNP handshake.	4	16	Disable MNP level 4.	5	32	Disable MNP level 3.	6	64	MNP incompatibility	7	128	Disable V.42 operation.
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S17	0	Reserved.																											
S18	0	<p>Test timer for &Tn loopback testing. Sets the length of time (in seconds) the modem will wait before automatically timing out and terminating the test. When set to 0, the timer is disabled. Valid range is 1 - 255</p>																											
S19	0	<p>Sets the duration (in minutes) for the Inactivity Timer. The timer activates when there is no data activity on the phone line. At time out, the modem hangs up. S19 = 0 disables the timer.</p>																											
S20	0	Reserved.																											
S21	10	<p>Sets the length (in 10 millisecond units) of Breaks sent from the modem to the computer. Applies to MNP or V.42 mode only.</p>																											
S22	17	<p>Stores the ASCII decimal code for the XON character.</p>																											
S23	19	<p>Stores the ASCII decimal code for the XOFF character.</p>																											
S24	0	Reserved.																											

Register	Default	Function																											
S25	5	Sets the duration (in hundredths of a second) that DTR must be dropped in order to be interpreted as a DTR loss. Allows the modem to differentiate between a random glitch and a true DTR loss. In most cases, the default value can be used. The S25 register is useful for setting compatibility with older systems running under older operating software.																											
S26	0	Reserved.																											
S27	0	Bit-mapped register setup. To set the register see the instructions for S13. <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Enables ITU-T V.21 modulation at 300 bps for overseas calls; in V.21 mode, the modem answers both overseas and domestic (U.S. And Canada) calls, but only originates V.21 calls. (Default Bell 103)</td> </tr> <tr> <td>1</td> <td>2</td> <td>Enables un-encoded (non-trellis coded) modulation in V.32 mode.</td> </tr> <tr> <td>2</td> <td>4</td> <td>Disables V.32 modulation.</td> </tr> <tr> <td>3</td> <td>8</td> <td>Disables 2100 Hz answer tone to allow two V.42 modems to connect more quickly.</td> </tr> <tr> <td>4</td> <td>16</td> <td>Enables V.23 fallback mode.</td> </tr> <tr> <td>5</td> <td>32</td> <td>Disables V.32<i>bis</i> mode.</td> </tr> <tr> <td>6</td> <td>64</td> <td>Reserved.</td> </tr> <tr> <td>7</td> <td>128</td> <td>Software compatibility code. This setting disables the codes and displays the 9600 code instead. The actual rate of the call can be viewed on the ATI6 screen. Used for unusual software incompatibilities. Some software may not accept 7200, 12000 and 14400 bps or greater result codes.</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	Enables ITU-T V.21 modulation at 300 bps for overseas calls; in V.21 mode, the modem answers both overseas and domestic (U.S. And Canada) calls, but only originates V.21 calls. (Default Bell 103)	1	2	Enables un-encoded (non-trellis coded) modulation in V.32 mode.	2	4	Disables V.32 modulation.	3	8	Disables 2100 Hz answer tone to allow two V.42 modems to connect more quickly.	4	16	Enables V.23 fallback mode.	5	32	Disables V.32 <i>bis</i> mode.	6	64	Reserved.	7	128	Software compatibility code. This setting disables the codes and displays the 9600 code instead. The actual rate of the call can be viewed on the ATI6 screen. Used for unusual software incompatibilities. Some software may not accept 7200, 12000 and 14400 bps or greater result codes.
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S28	0 8 255	Eliminates the V.32 answer tones for a faster connection. Default item, all times are in tenths of a second. Disables all connections except V.32 at 9600 bps.																											

Register	Default	Function																											
S29	20	Sets the duration (in tenths of a second) of the V.21 answer mode fallback timer.																											
S30	0	Reserved.																											
S31	128	Reserved.																											
S32	2	Bit mapped register setup for 28.8 modems only. To set the register, see the instructions for S13. <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>V.8 Call Indicate enabled.</td> </tr> <tr> <td>1</td> <td>2</td> <td>Enables V.8 mode.</td> </tr> <tr> <td>3</td> <td>8</td> <td>Disable V.34 modulation</td> </tr> <tr> <td>4</td> <td>16</td> <td>Disable 33.6 Kbps support.</td> </tr> <tr> <td>5-7</td> <td>32-128</td> <td>Reserved</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	V.8 Call Indicate enabled.	1	2	Enables V.8 mode.	3	8	Disable V.34 modulation	4	16	Disable 33.6 Kbps support.	5-7	32-128	Reserved									
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S35-S37		Reserved.																											

Register	Default	Function
S38	0	<p>Sets an optional delay (in seconds) before a forced hang-up and clearing of the Transmit buffer when DTR drops during an ARQ call. This allows time for a remote modem to acknowledge receipt of all transmitted data before it is disconnected.</p> <p>When set at the default (0), the modem immediately hangs up when DTR drops.</p> <p>This option applies only to connections terminated by dropping DTR. If the modem receives the ATH command, it ignores S38 and immediately hangs up.</p>

7. Specifications

Compatibility:

ITU-T V.34+: 33.6 Kbps

ITU-T V.34: 28.8 Kbps

ITU-T V.32 bis: 14.4 Kbps

ITU-T V.32: 9600 bps

ITU-T V.22 bis: 2400 bps

Bell: 212 / V.22, 103 / V.21

Supports: V.42 / MNP 2-4 Error Control
V.42 bis / MNP 5 Data Compression.

Command Set: Industry Standard "AT" Commands

Status/Help: Status display shows current settings and stored numbers. A Help display summarizes the command set and S-Register functions.

FCC Reg. No.: CJEUSA-24375-M5-E

Ringer Equivalence: 0.9 B

Compliance: FCC Part 68 / Part 15 Class B

Temperature: 0° to 50° C (operating)

Power:

AC Model: 115/230 VAC, 50/60 Hz, 10 Watts (switchable)

DC Model: 40 - 60 VDC, 10 Watts Maximum

Size: 1.75" x 19.00" x 4.5" (H x W x D)

Weight: 4 pounds shipping weight

8. Customer Service

Customer Service hours are from 8:00 AM to 5:00 PM, PST, Monday through Friday. When calling, please be prepared to give the name and make of the unit, its serial number and a description of its symptoms. If the unit should need to be returned for factory repair it must be accompanied by a Return Authorization number from Customer Service.

WTI Customer Service
5 Sterling
Irvine, California 92618

949-586-9950
Toll Free: 1-800-854-7226
Fax: 949-583-9514
<http://www.wti.com>

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