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E500 V.90 USB MODEM USER'S MANUAL

TABLE OF CONTENT

1. Contents of Package
2. Comprehensive Modem Installation Instructions

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Section 1   Contents of Package

- One V.90 USB Modem
- Quick installation guide
- One CD-ROM disk comprises Communication software, Modem Driver & User's Manual
- One Telephone Cable
- One USB Cable

Please contact the place of purchase if any of the above listed items are missing.

**Section 2   Comprehensive Modem Installation Instructions**

Section 2.1   System Requirements

The modem operates on a personal computer equipped with the following:

- Pentium$^{\circledR}$ 166MMX or faster CPU (200 MHz recommended)
- 16 MB RAM
- USB port
- Windows 98 or Windows NT 5.0 operating system

Section 2.2   Hardware Installation

Please refer to Fig. 2 - 1 and proceed to following steps for how to connect your modem to the computer and with USB port and telephone wire.

Phone Jack   **FIGURE 2-1 V.90 USB modem diagram**   **USB Jack**
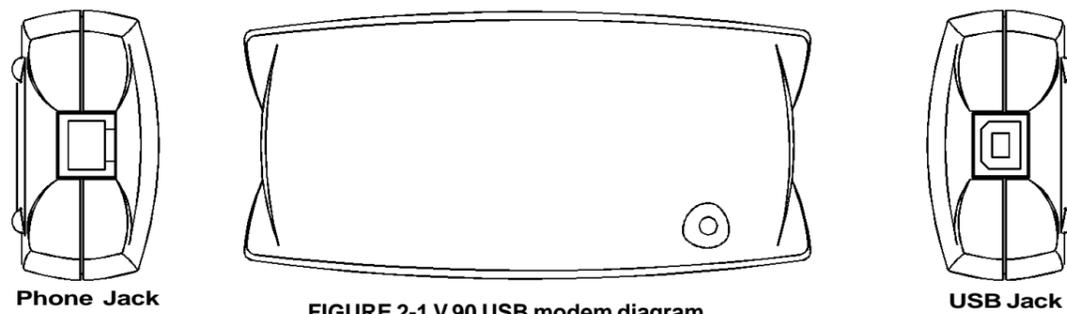
1.   Plug one end of USB cable into the "**USB**" jack on your PC.
Plug another end of USB cable into the USB jack at the V.90 USB modem.
2.   Plug one end of telephone cord into the telephone jack at the V.90 USB modem.
Plug another end of the telephone cord into the telephone wall jack.
3.   Up to now, the hardware installation has been finished. If you have not encountered any problems, you can go to **Section 2.3 System Setup**. If you are having problems, see **Section 3 Troubleshooting.**

NOTE : The telephone wall jack you use must be for an ANALOG phone line (the type found in most homes). Many offices are equipped with digital phone lines. Please be sure you know which type of line you have. The modem will be damaged if you use a digital phone line.

Section 2.3   System Setup

Section 2.3.1 Setup instructions for Windows 98

STEP 1.   After you complete the modem hardware installation . Windows system will automatically detect your new added devices.Windows system will then prompt you with a **Add New Hardware Wizard** screen as shown in figure.

Then click on **Next**.

STEP 2.   A prompt screen will ask you to select **"search for the best driver for your device"** or display a list of all the drivers in a specific location, so you can select the driver you want. Please select   the recommended one as shown in figure.

Then click on **Next**

STEP 3.   And then, a prompt screen will ask you to indicate where your driver is located, "floppy disk drives", **"CD-ROM drive"**, "Microsoft Windows Update" or "specify a location:". Please select "CD-ROM drive" as shown in figure.

Insert the **Modem Driver** CD-ROM disk attached with your modem into the CD-ROM drive device then click on **Next**.

STEP 4.   Then, a prompt screen indicates Windows has found the best driver for your modem as shown in figure.

Please make sure the source of your driver is correct then click on **Next**.

**STEP 5.**   Click on **Finish** to complete the modem installation.

Windows will detect again a **New Hardware** and will install the modem driver.

STEP 6.   The system will prompt another **Add New Hardware Wizard** screen with the phrase **Wave Device for Voice Modem**. Please remain the **Modem Driver** CD-ROM disk attached with your modem in the CD-ROM drive device **D:\.** Then go through the above **STEP 2** to **STEP 5** again.

STEP 7.   At the end of this installation process,the **Device Manager** tab of the **System Properties** will show the addtion of **STMicroelectronic USB Modem** in the Modem section and **USB Device of STM Soft Modem** in the USB section.
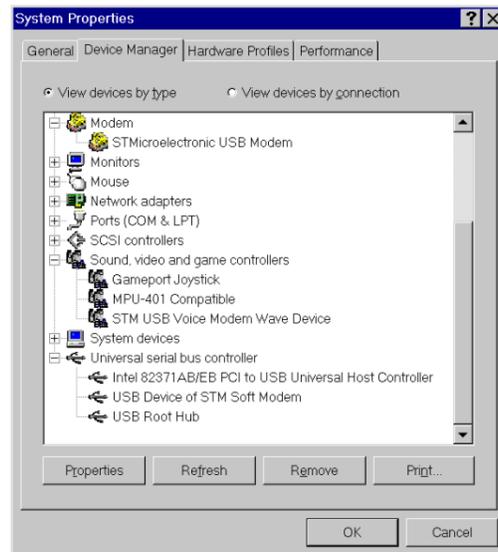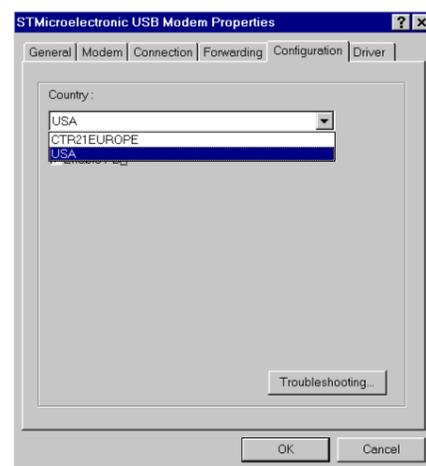

STEP 8.   Double click the **STMicroeletronic USB Modem** and choose the **Modem** tab as shown below.
Make sure that the Maximum speed is set to 460800.
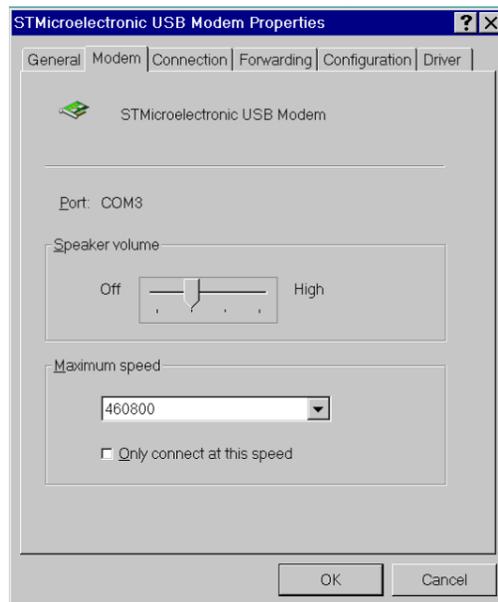
STEP 9. (OPTIONAL)

Please check the back of your USB Modem if there are "CTR21" label and serial label like the figure below.

Please Set your country setting at "CTR21-EUROPE" for pan-Europe Usage.

STEP 10. If there was no error message while installation process is finished,your modem has been set up properly and finctionally.

Section 2.4   Testing Your Modem

Before you set up your software, start with a quick test to check that your modem is working. Once you have determined that your modem is setup properly, go on to **Section 2.6 Install Communication Software** to install your communications software. If you are having problems, see **Section 3 Troubleshooting**.

Click on **Start** and point to **Setting**. Then click on **Control Panel**. When the **Control Panel** window opens. Scroll down to the **Modem** icon and double click on it. Click on the **Diagnostics** tab and highlight the COM port for your modem. Then click on **More Info**, your computer will automatically communicate with your new modem using AT commands and receiving responses from your modem. A list of response means the modem is setup properly.

Section 2.5   Monitor Application of USB modem

You will find the icon of the Monitor of STMicroelectronic USB modem at **Task List** while you have succed to dialup your ISP or RAS with your STMicroelectronic USB modem.

Click on the icon

Then, a screen display the linking speed and some information of modem in **Status** tab as shown in figure.
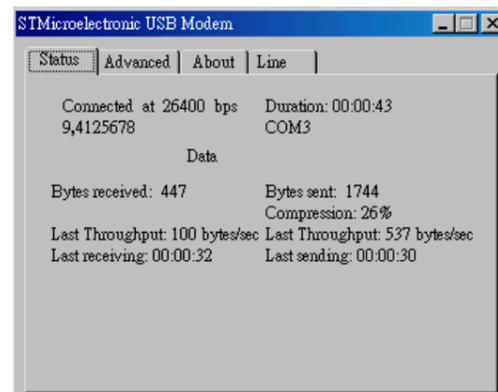
Click on **Advanced** tab. It will show more detail information of communication protocol as shown in figure below.
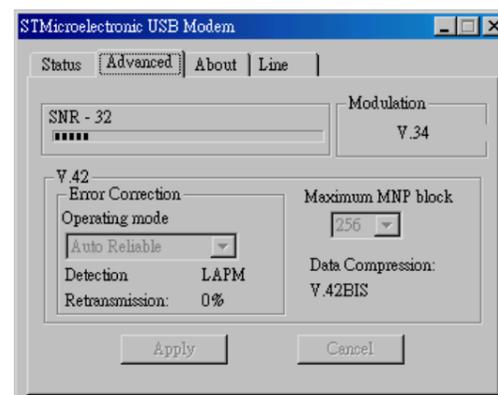
Click on **About** tab. It will show detail software and hardware version of STMicroelectronic USB modem as shown in figure below.
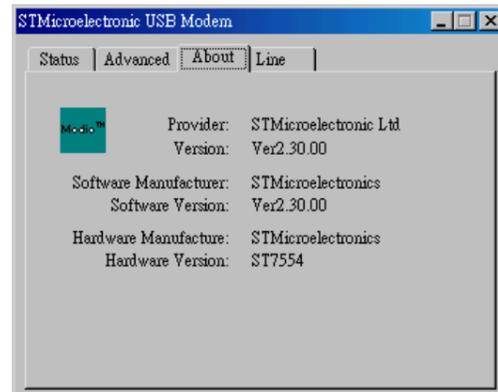
Click on **Line** tab.It will show connecting modem of phone line as sown in figure below.
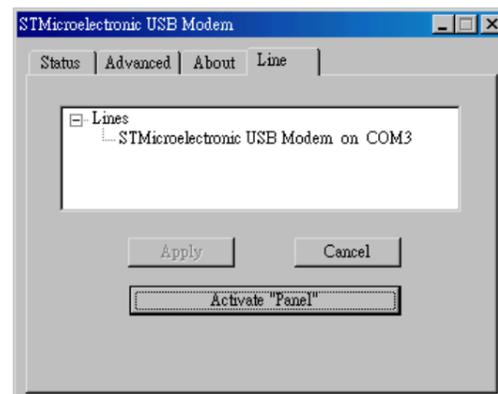
Click on **Activate "Panel"** button. It wiil open signal monitor of USB modem as shown in figure below.
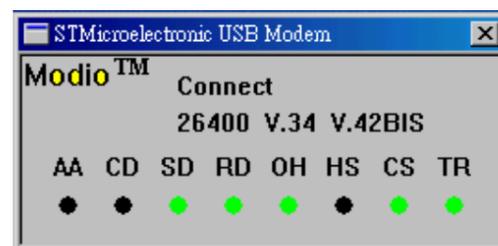
Section 2.6   Install Communication Software

You can install the communication software from the CD-ROM disc attached with your new modem. Please consult the software manual in the CD-ROM disc for the detail of software installation.

You do not have to use the communication software attached with your new modem. The modem was designed for and tested using a wide range of communications software packages. Many communication applications identify the modem automatically and configure themselves for the correct operating settings. Some of the communication applications will ask you to select the type of modem you are using. Select a **Generic Fax class 1 modem** will let you use basic communication and fax functions.

Section 3   Troubleshooting

Your modem is designed to provide reliable and trouble-free functionality, however, should you experience any difficulty, the information contained in this section will assist you in determining and resolving the source of the problem.

Problem: Modem does not respond to AT commands
Possible solutions:

1.   Make sure the modem is not configured with a conflicting COM port and IRQ setting. Make sure the communication software is configured with the correct COM and IRQ settings (the same COM port and IRQ as the modem). Your communications software will not be able to send or receive any data if it is not configured to match the COM port and IRQ settings for the modem.

      DOS based communication program is not working with this modem neither can you operate the modem in MS-DOS prompt screen.

2.   Make sure the modem is properly initialized using the driver software. The software may improperly initialize your modem because you have selected an incorrect modem type. You may also be prompted to enter an initialization string by the software. Use AT&F as your initialization string.

Problem: Modem dials but does not connect
Possible solutions:

1.   Be sure the IRQ setting and USB port is identical on the modem and the software.
2.   Make sure that the phone line is working properly. A noisy line will prevent proper modem operation.

Problem: Modem makes a connection but no data appears on screen
Possible solutions:

3.   Make sure all communication parameters (baud rate, data, stop, and parity bits) are properly configured and are identical on both sides. Be certain hardware flow control (RTS/CTS - default) is enabled in both the modem and the communication software.
4.   Press the ENTER key several times. The remote system may be waiting to receive your data before it begins.
5.   Make sure the correct terminal emulation mode is being used in the software (refer to software manual).

Problem: Modem displays errors while on-line with a remote modem
Possible solutions:

6.   Make sure Call Waiting is turned off.
7.   Make sure RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control when transferring binary files).

8.   Make sure the data speed is not faster than your computer capability. Operating too many applications at the same time may cause communication problem. Close unnecessary application in your System.

Problem: Modem exhibits poor voice recording or playback
Possible solutions:
9.   Make sure the correct modem type is selected in the Voice/FAX software. Volume adjustment is available in control panel.
10.   Make sure your computer is fast enough to handle voice operations (38.4 Kbps). Voice operations are CPU intensive and require a better CPU sharing when running under Windows.

Problem: No dial tone
Possible solutions:
11.   Ensure that the telephone cord it securely connected at both modem and wall outlet.
12.   Unplug the telephone cord from the computer and connect it directly to a telephone from the wall outlet. Check for a dial tone. If there is none, the problem is in the telephone cord or system. Call your telephone service provider.
13.   Double-check your country setting. Different country setting will cause different modem performance. Please select the correct country as you located.
14.   Check modem performance with a direct line from your telephone company. Some PBXs may cause the telephone line condition change and affect modem performance.

Problem: The modem does not answer incoming calls
Possible solutions:
15.   Ensure that the automatic answer parameter is set to one of the enabled options, using the ATS0 command (ATS0=1 to answer after one ring, and so on).
16.   Ensure that no other devices, such as fax or answering machines, are answering calls before the modem does.

If you can not resolve your situation after reading this section, contact your dealer or vendor for assistance.

Appendix 1   Modem Specifications

Data Protocols:

- V.90, V.34, V.32bis, V.32, V.22bis, V.22, V.21, V.23, Bell 212A, Bell 103

Data Speed:

56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333, 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, 28000, 26.4k,24k, 21.6k, 19.2k, 16.8k, 14.4k, 12k, 9600, 7200, 4800, 2400, 1200, 300

Data Compression

- V.42bis, MNP5

Error Correction

- V.42 LAPM, MNP2,3,4

Fax Protocols:

- Group 3 Compatible, Class 1 fax: V.17, V.29, V.27ter, V.21

Fax Speed:

- 14.4k, 12k, 9600, 7200, 4800, 2400, 300

General:

Standard AT commands

V.8 and Automode

V.80

Virtual UART (460.8kpbs)

DTMF detection and generation

Wake-up on ring

OnNow Power Management

Low power consumption

Virtual DTE

Distinctive ring for data/fax/voice (by communication software)

World wide country support

Answering machine (voice)

Appendix 2   Modio™ AT Commands Sets

Modem operation is controlled by AT commands. These AT commands include the following:

- Basic AT commands, for example ATDT123
- Extended AT Commands for example AT&E,AT\A,AT%C,AT+MS
- S-Register commands, for example ATS0=1
- Fax Class 1 commands, for example AT+FTM
- Voice commands, for example AT#VTX

The command syntax and operation guidelines for each command category are described in the following sections.

A command line is a string of characters sent from a DTE (Terminal or Data Terminal Equipment) to the DCE while the DCE is in command state. Command lines have a prefix, a body and a terminator. The prefix consists of the ASCII characters **AT** or **at**. The body consists of printable ASCII characters. Space characters other than <CR> (See register S3), and <BS> (See register S5) are ignored. <CR> is command terminator.

Characters preceding the AT prefix are ignored.

AT Command Guidelines:

- Basic AT commands consist of single ASCII characters, which may be preceded by a prefix character, for example **&**, and followed by a decimal number, for example **AT&W1**.
- Missing decimal parameters are interpreted as 0. For example, if you type **ATH**, the command **ATH0** is assumed.
- Fax commands are preceded with the **+F** characters and terminated by semicolon (**;**) or <CR> character.
- The modem supports editing command lines by recognizing the <BS> character.
- The AT command sequence may be followed by any number of commands in sequence, with the exception of commands Z, D or A, where all characters following on the same command line will beignored.
- When a syntax error is found in the command line, an ERROR response will be returned to the DTE. Execution of commands D and A will be aborted if another character is entered before completion of the hand shake.
- When the modem has entered on-line data mode, it is possible to break the data transmission in order to is sue more AT commands. This is done by the DTE sending a sequence of three escape characters (defined in S2, '+' by default).

The modem will comply with the commands listed below. Parameters applicable to each command are listed below. Default factory configuration settings are marked by an asterisk *.
Features marked with (-) are not yet available in current version of **Modio**.

Basic AT Commands

A/   Re-execute Command

The modem repeats the last command line sent by the DTE. Usually used for re-dialing.

Note: This command should not be terminated by <CR>.

A   Answer

The modem will go off-hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode.

Notes:

If +FCLASS=0 is selected, the modem will enter the connect state after exchanging carrier with the remote system. If no carrier is detected within the period specified in S7, the modem hangs up.

Any character entered while connecting will abort the connection process.

If +FCLASS=1, the modem will go off-hook in V21 answer mode. It will generate the V21 2100 Hz answer tone for 3 +/- 0.5 seconds, and following a delay of 70 ms, will proceed as if the +FTH=3 command were issued. At any stage up to (but excluding) the +FTH=3 command state, any character will abort the communication.

If +FCLASS=8 (#CLS=8), the modem will go off-hook and a voice session will take place.

Related S-Reg: S0

Bn   CCITT Control

B0   Connect at V.22 1200 bps

Result codes:

OK   n=0

Error   Otherwise

Dn   Dial

Directs the modem to go on-line, dial according to the string entered, and attempt to establish a connection.

The Dial String may consist of any of the characters described below:

T   Tone dialing (first character in the string)

P   Pulse dialing (first character in the string)

L   Redial last dialed number (first character in the string)

0-9   Digits 0 to 9.

*   Asterisk (tone only)

Hash (tone only)

W   Wait for dial tone; the modem will wait for dial tone before dialing the digits following "W". S6 register will be used for timeout. (X3 or higher)

,   (Comma); Pause for the time specified by S8 before resuming the dialing

;   (Semicolon) Return to command mode after dialing. This allows the user to issue additional AT commands while remaining off-hook. Actual call progress will be entered only after a dial com mand issued without the ";" terminator.

S=n   Dial the number stored in the directory ; n=0-3 (see &Z).

!   Flash; The modem will go on hook for a time defined by S24.

@   Wait for silence; The modem will wait for at least 5 seconds of silence before resuming the dialing.

            If no such silence is detected before the expiration of the call abort timer (S7), the modem will terminate with NO ANSWER response (or BUSY if applicable). If answer tone arrives during

execution of this parameter, the modem handshakes. (X3 or higher)

(),< > (space) String format characters - ignored

<i> any other character - ignored.

Notes:

If +FCLASS=0 is selected, the modem will attempt to connect with another data modem. The modem will use the time period specified in S6 and S7 as time-outs in the handshake process. If a timeout expires, the modem will go on-hook and respond with NO CARRIER response. The command will be aborted in progress is a DTE character is entered before completion of the handshake.

If +FCLASS=1, the modem will attempt to connect with a fax machine (or modem) by entering the HDLC V21 channel 2 receive state (as if +FRH=3 had been issued).

The command will be aborted upon receipt of a DTE character if the modem has not finished dialing. In this case the modem will go on-hook and return to command mode responding with NO CARRIER message. If the modem has finished dialing, It proceeds as if +FRH=3 command has been issued.

If +FCLASS=8 (#CLS=8), the modem will go off-hook in V21 answer mode. It will decide (based on timers) when the other side answers in voice and a voice session will take place.

Related S-Reg: S5,S6,S7,S16,S22,S28,S56

En   Set local echo

The modem enables/disables echo of characters to DTE.

Parameter value is written to S13.

E0   Disable command echo.

E1   Enable command echo.(default)

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S13

Hn   Set ON/OFF hook

H0   Modem hangs up (goes on-hook).

H1   Modem goes off hook.

Result codes:

OK   n=0 or 1

Error   Otherwise

In   Identification/Information

I1   Modem Name, Vendor Name, Modem Version, for example **:**

ModemX , ModemWorks Ltd. ,Ver 1.10

I2   SW Provider /SW Version, for example

Smart Link Ltd.

1.23

I3   Chipset Vendor/Chipset ID, for example

ST Microelectronics

XY4220

I4   Modem active profile for example,

Active Profile:

S00=000 S01=000 S02=000 S03=000 S04=000 S05=000 S06=000 S07=000 S08=000
S00=009 S10=000 S11=000 S12=000 S13=000 S14=000 S15=000 S16=000 S17=000
S18=000 S01=019 S20=000 S21=000 S22=000 S23=000 S24=000 S25=000 S26=000
S27=000 S28=000 S29=000 S30=000 S31=000 S32=000 S33=000 S34=000 S35=000
S36=000 S37=000 S38=000 S39=000 S40=000 S41=000 S42=000 S43=000 S44=000
S45=000 S46=000 S47=000

I5   Stored profile 0

Active Profile 0:

(Same format as above)

I6   Stored profile 1

Active Profile 1:

(Same format as above)

I7   Display stored pone numbers

 (See &Z command)

Ln   Speaker volume

Select speaker volume.

L0   Low

L1   Low (Default)

L2   Medium

L3   High

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S30

Mn   Speaker control

Select when the speaker is On/Off.

M0   Speaker always OFF

M1   Speaker ON from start of dialing until receiving carrier (Default)

M2   Speaker always ON

M3   Speaker OFF from end of dialing until receiving carrier

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S29

Nn   Automode control

Enable/Disable Automode detection.

N0   Automode detection disabled. A subsequent handshake will be conducted according to the contents of S32.

N1   Automode enabled. A subsequent handshake will be conducted according to the Automode algorithm. (Default)

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S31

On   Returns to on-line data mode

This command is normally used to connect the DTE back after an escape (+++) has been issued.

O0   Return to on-line data mode.

O1   Return to on-line data mode, retrain first.

Result codes:

OK   n=0-1

Error   Otherwise

P   Pulse dialing

Forces pulse dialing. Applies to subsequent dialing commands.

This command holds until the next T dial modifier or T command is received.

The modem will go off hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode.

Related S-Reg: S16

Q   Quiet result codes control

Q0   Enable sending result codes to DTE.(Default)

Q1   Disable sending result codes to DTE.

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S14

S   Read/Write S-Register

This command has a few derivatives:

Sn=v   Sets the value v (decimal) to S-register n (v=0-255)

Sn?   Displays the value of S-register in decimal format (3 digits)

Note: Some registers are read-only

Result codes:

OK   All parameters valid

Error   Invalid S register or value. Trying to write to a read-only register

T   Tone dialing

Forces tone dialing. Applies to subsequent dialing commands.

This command holds until the next T dial modifier or T command is received.

This command changes S14 to reflect the current dialing mode.

Related S-Reg: S16

Vn   Verbose/Numeric result codes

Select the time of result messages sent to the DTE.

For a list of result codes and verbal messages see X command.

V0   Short form (numeric) result codes to be sent to DTE.

V1   Long form (verbose) result codes to be sent to DTE.(Default)

Result codes:

OK   n=0 or 1

Error   otherwise

Related S-Reg: S15

Xn   Extended result codes

Select the subset of result codes to be used by the modem to the DTE.

If the modem is in fax mode (+FCLASS=1), the only message sent to indicate connection is

"CONNECT" without a speed indication.

X0   Supported messages: OK, CONNECT, RING, NO CARRIER and ERROR, Blind call enabled.

X1   Supported messages: OK, CONNECT xxxx, RING, NO CARRIER and ERROR, Blind call enabled.

X2   Same as X1 + NO DIAL TONE message, Blind call disabled

X3   Same as X1 + BUSY message, Blind call enabled.

X4   All messages supported, Blind call disabled (Default).

Notes:

W, @ dial modifiers are ignored in X1, X2

S6 (Wait before dial) is ignored in X2, X4 if no W is specified in dial string

S6 is set to 0 means a blind call

Table 1 - Result Codes

Result Code	Message	X0	X1	X2	X3	X4
0	OK	*	*	*	*	*
1	CONNECT	*	*	*	*	*
2	RING	*	*	*	*	*
3	NO CARRIER	*	*	*	*	*
4	ERROR	*	*	*	*	*
5	CONNECT 1200	1	*	*	*	*
6	NO DIAL TONE	3	3	*	3	*
7	BUSY	3	3	3	*	*
8	NO ANSWER	3	3	3	*	*
9	CONNECT 0300	1	*	*	*	*
10	CONNECT 0600	1	*	*	*	*
11	CONNECT 2400	1	*	*	*	*
12	CONNECT 4800	1	*	*	*	*
13	CONNECT 7200	1	*	*	*	*
27	CONNECT 9600	1	*	*	*	*
14	CONNECT 12000	1	*	*	*	*
15	CONNECT 14400	1	*	*	*	*
16	CONNECT 16800	1	*	*	*	*
17	CONNECT 19200	1	*	*	*	*
18	CONNECT 21600	1	*	*	*	*
19	CONNECT 24000	1	*	*	*	*
20	CONNECT 26400	1	*	*	*	*
21	CONNECT 28800	1	*	*	*	*
22	CONNECT 31200	1	*	*	*	*
23	CONNECT 33600	1	*	*	*	*
24	CONNECT 34800	1	*	*	*	*
25	CONNECT 40000	1	*	*	*	*
26	CONNECT 42000	1	*	*	*	*
28	CONNECT 44000	1	*	*	*	*
29	CONNECT 46000	1	*	*	*	*
30	CONNECT 48000	1	*	*	*	*

Result Code	Message	X0	X1	X2	X3	X4
37	CONNECT 230400	*	*	*	*	
38	CONNECT 460800	1	*	*	*	*
39	CONNECT 921600	1	*	*	*	*
40	CONNECT 32000	*	*	*	*	
41	CONNECT 34000	1	*	*	*	*
42	CONNECT 36000	1	*	*	*	*
43	CONNECT 38000	*	*	*	*	*
44	CONNECT 58000	*	*	*	*	*
45	CONNECT 60000	*	*	*	*	*
46	CONNECT 28000	*	*	*	*	*
47	CONNECT 29333	*	*	*	*	*
48	CONNECT 30666	*	*	*	*	*
49	CONNECT 33333	*	*	*	*	*
50	CONNECT 34666	*	*	*	*	*
51	CONNECT 37333	*	*	*	*	*
52	CONNECT 38666	*	*	*	*	*
53	CONNECT 41333	*	*	*	*	*
54	CONNECT 42666	*	*	*	*	*
55	CONNECT 45333	*	*	*	*	*
56	CONNECT 46666	*	*	*	*	*
57	CONNECT 49333	*	*	*	*	*
58	CONNECT 50666	*	*	*	*	*
59	CONNECT 53333	*	*	*	*	*
60	CONNECT 54666	*	*	*	*	*
70	FAX	*	*	*	*	*
71	DATA	*	*	*	*	*
100	VCON	4	4	4	4	*
101	DELAYED	4	4	4	4	*
102	BLACKLISTED	4	4	4	4	*

66	COMPRESSION: CLASS 5	-	*	*	*	*
67	COMPRESSION: V.42BIS	-	*	*	*	*
69	COMPRESSION: NONE	-	*	*	*	*
76	PROTOCOL: NONE	-	*	*	*	*
77	PROTOCOL: LAPM	-	*	*	*	*
78	PROTOCOL: MNP	-	*	*	*	*
1021	MODULATION: V.21	-	*	*	*	*
1022	MODULATION: V.22	-	*	*	*	*
1032	MODULATION: V.32	-	*	*	*	*
1034	MODULATION: V.34	-	*	*	*	*
1103	MODULATION: B103	-	*	*	*	*
1122	MODULATION: V.22BIS	-	*	*	*	*
1132	MODULATION: V.32BIS	-	*	*	*	*
1134	MODULATION: V.34BIS	-	*	*	*	*
1212	MODULATION: B212	-	*	*	*	*
+F4	+FCERROR	*	*	*	*	*

<*>   message will be generated when n has been selected

<I>   message will be replaced by message <I> when n has been selected

<->   message will not be generated when n has been selected.

Related S-Reg: S56

Yn   Select default configuration

Select the default user defined configuration.

Note: The default configuration is not loaded by Yn (See Zn)

Y0   Select user template 0

Y1   Select user template 1

Y2   Select factory setting 0 (Default)

Y3   Select factory setting 1

Related S-Reg: S161

Zn   Select user defined configuration

Select the user defined configuration.

Z0   Select default user template (as defined by Yn)

Z1   Select user template 0

Z2   Select user template 1

Z3   Select factory setting 0 (&F0)

Z4   Select factory setting 1 (&F1)

Result codes:

OK   n=0-5

Error   Otherwise

Related S-Reg: S59

AT& Commands

&An Connect message format

Select the format of the CONNECT message.

&A0   no extra messages besides CONNECT xxxxx (Default)

&A1   Add Modulation indicator:

V.21/ V.22/ V.22BIS/ V.32/ V.32BIS/ V.34/ V.34BIS/ B103/ B212

For example:

Modulation: V.34

&A2   Add Error Detection Protocol and Data Compression indicators.

For example:

Protocol: LAPM/MNP/NONE

Compression: CLASS 5/V.42BIS/NONE

&A3   Add Modulation Indicator + Error Detection Protocol + Data Compression indicators (see above).

Related S-Reg: S70, S71

&Cn Control Carrier Detect (CD,RLSD) behavior

Controls the RLSD output behavior.

&C0   RLSD is assumed to be ON all the time

&C1   RLSD follows the carrier state (Default)

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S60

&Dn Controls DTR behavior (NA)

Controls the DTR output behavior.

Note: This command is supported for compatibility.

It has no significance in Modio environment.

&D0   DTR is taken to be ON all the time

&D1   DTR drop causes entry to command mode without disconnect (Default)

&D2   DTR follows DTR circuit definition

&D3   DTR drop causes software reset (as in Z0)

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S63

&En Connect message speed source

Select the requested source for the speed field in the CONNECT message.

&E0   DCE Speed

&E1   DTE Speed

Note: Since a virtual port is involved, the DTE is not bound by any UART limitation, and may be theoretically set as high as 921600.

DTE speed is supported for compatibility only. It bears little significance in Modio environment.

Related S-Reg: S71

&Fn Sets factory configuration

Select one of the factory settings.

&F0   Select factory setting 0

&F1   Select factory setting 1

Result codes:

OK   n=0-1

Error   Otherwise

Related S-Reg: S59

&Hn Sets flow control

Select the user defined configuration.

&H0   Flow control disabled (NA)

&H1   "HW" flow control RTS/CTS emulation (Default)

Result codes:

OK   n=0-1

Error   Otherwise

Related S-Reg: S62

&Pn Set pulse dial make/break ratio

&P0   US & Canada 39%/61% (10 pps) (Default)

&P1   UK & Hong Kong 33%/67% (10 pps)

&P2   Same as 0, except at 20 pps

&P3   Same as 1, except at 20 pps

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S28

&Rn Controls RTS behavior

Controls the RTS output behavior.

Note: This command is supported for compatibility.

It has no significance in Modio environment.

&R0   RTS ignored

&R1   Modem receives data only on RTS (NA)

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S61

&Sn Controls DSR behavior

Note: This command is supported for compatibility.

It has no significance in Modio environment.

&S0   DSR override (is assumed to be ON all the time)

&S1   DSR follows circuit definition

Result codes:

OK   n=0 or 1

Error   Otherwise

Related S-Reg: S64

&Tn Test mode

&T0   TBD (Default)

&T1   TBD

&T2   TBD

Result codes:

OK   n=0-3

Error Otherwise

Relate S-Reg: s18,S50-S55

&V   Display Verbose Information

Display Active profile, Stored Profiles, Stored Phone Numbers

(Equivalent to I4-I7 combined)

&Wn Writes current configuration

&W0   Write to template 0

&W1   Write to template 1

Result codes:

OK   n=0-1

Error   Otherwise

Written to registry.

&Zn Stores dial string

Stores/Displays dial string (up to 47 characters)

&Zn=s   Store dial string (n=0-4)

&Zn=L   Store the last dialed string (n=0-4)

&Zn?   Display the nth string

&ZL?   Display the last dialed string

Written to registry.

AT\ Commands - Error correction control

\An Maximum MNP block Size

\A0   64 characters maximum block size

\A1   128 characters maximum block size(Default)

\A2   192 characters maximum block size

\A3   256 characters maximum block size

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S<basereg+1> of V.42 registers

\Bn Transmit break to remote (-)

In non-error correction mode, the modem will transmit a break signal to the remote modem with a length of n*100ms. If a number above 9 is entered, 9 is used.

Result codes:

OK   if connected in data modem mode

Error   if not connected or if connected in fax modem mode

\Kn   Break Control (-)

Controls the response of the modem to a break received from DTE or a remote modem or the \Bn command.

The behavior parameter is written to Sxx

\K0   Enter on-line command mode, no break sent to remote modem

\K1   Clear data buffers and send break to remote modem

\K2   Same as 0

\K3   Send break to remote modem immediately

\K4   Same as 0

\K5   Send a break to remote modem in sequence with transmitted data (Default)

Related S-Reg: S<basereg+x> of V.42 registers

Result codes:

OK   n=0-5

Error   Otherwise

\Nn   Error correction operating mode

\N0   Normal (Speed buffering) - No error correction

\N1   Direct (pass-through) 128 characters maximum block size

\N2   Reliable (error correction) mode. The Modem will attempt LAPM and then MNP

\N3   Auto reliable mode. Same as \N2, but will fall back to Normal

\N4   LAPM error correction mode only, hang up upon failure. (Default)

\N5   MNP error correction mode only, hang up upon failure.

Result codes:

OK   n=0-5

Error   Otherwise

Related S-Reg: S<basereg> of V.42 registers

AT% Commands

%Cn Compression control

%C0   Disable data compression

%C1   Enable MNP5 data compression

%C2   Enable V.42bis data compression

%C3   Enable MNP5/V.42bis data compression (Default)

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S<basereg+2> of V.42 registers

%En Line quality monitor control

Controls whether or not the modem will automatically monitor the line quality and request a retrain (%E1), or fall back when quality is insufficient or fall forward when line quality improves (%E2).

%E0   Disable line quality control

%E1   Enable line quality control and auto retrain (Default)

%E2   Enable line quality control and fallback/forward

Result codes:

OK   n=0-3

Error   Otherwise

Related S-Reg: S39

AT+MS Command

+MS Modulation select

This command selects the modulation, optionally enables/disables Automode, and optionally specifies the lowest and highest connection rates.

The command format is:

AT+MS= [<mod>][,[<automode>][,[<min_rate>][,[<max_rate>]]]]

<mod>   a decimal number specifying the preferred modulation (automode enabled), or the modulation. (automode disabled).

<automode>   0/1 Automode disabled/enabled

<min_rate>   minimum rate for connection. If lower than the actual minimum rate for the selected modulation, the actual lowest supported rate will be taken.

<max_rate>   maximum rate for connection. If higher than the actual maximum rate for the selected modulation, the actual highest supported rate will be taken.

Table 2 - +MS command parameters

<mod>	Modulation	Possible rates
22	V.22	1200
122	V.22bis	2400,1200
32	V.32	9600, 4800
132	V.32bis	14400, 12000, 9600, 7200, 4800
34	V.34	33600, 31200, 28800, 26400, 24000, 21600, 19200,16800, 14400, 12000,9600
56	K56Flex	32000,34000,36000 ..... ,56000
90	V.90	29333, 30666,32000 .....,56000
212	Bell 212	1200
103	Bell 103	300

Examples:

AT+MS=34,0,4800,33600	V.34, No Automode, Min. speed 4800, Max speed 33600
AT+MS=,1	Automode
AT+MS=32,1,,14400	V.32 Automode, Max speed 14400 (min speed as before)

Factory Settings: 90,1,300,56000

The requested modulation scheme will be written to S32

The requested min rate will be written to S33

The requested max rate will be written to S34

The actual rate may be read from S35

The actual modulation scheme may be read from S37

(The codes as specified in the Xn command)

Other derivatives of the +MS command:

AT+MS? report current MS settings (e.g. 34,1,9600,33600)

AT+MS=?   list the supported values +MS:(22,122.....), (0,1), (300-33600), (300-33600)

Result codes:

OK   Syntax OK

Error   Otherwise

Related S-Reg: S31-S37

AT+F Commands - Fax Support

+FCLASS   Data/Fax Class1/Voice mode.

Sets Data/Fax Class1/Voice (0,1,8) mode.

+FCLASS=<value>

[<value> - 0,1,8 (Data/Fax Class1/Voice]

Result codes:

OK   Syntax OK

Error   Otherwise

+FCLASS? Returns the current setting

Related S-Regs: S32, S150

+FAE   Data/Fax Auto Answer

Select Data/Fax Auto Answer

+FAE=<value> [<value> - 0,1 (Data/Fax Class1)]

+FAE? Returns the current setting

Related S-Regs: S151

+FTS Stops transmission and wait

+FTS= < value >

Terminates transmission and waits for <value>*10ms interval before responding with OK. ERROR is issued if the modem is on-hook.

+FTS? Returns the current setting

+FRS Receives Silence.

+FRS= < value>

Report back to DTE with OK after <value>*10ms silence interval has been detected. The command is aborted if any character is received from the DTE (The response will still be OK). ERROR is issued if modem is on-hook.

+FRS? Returns the current setting

+FTM Transmit Modulated Data

+FTM=<value>

Transmits data according to the defined modulation. ERROR is issued if modem is on-hook.

Value	Modulation
24	V.27 ter 2400 bps
48	V.27 ter 4800 bps
72	V.29 7200 bps
73	V.17 7200 bps long
74	V.27 7200 bps short
96	V.29 9600 bps
97	V.17 9600 bps long
98	V.17 9600 bps short
121	V.17 12000 bps long
122	V.17 12000 bps short
145	V.17 14400 bps long
146	V.17 14400 bps short

+FTM=?   Return "24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146"

+FRM   Receive Modulated Data

+FRM=<value>

Receives data according to the defined modulation (See Values above)

ERROR is issued if modem is on-hook.

+FRM=?   Return "24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146"

see +FTM

+FRH Receive HDLC Data

+FRH=<value>

Receives data using HDLC protocol and the defined modulation .

ERROR is issued if modem is on-hook.

<value> - 3 (V.21 channel 2 300 bps)

+FRH=? Return "3"

+FTH Transmit HDLC Data

+FTH=<value>

Transmits data using HDLC protocol and the defined modulation .

ERROR is issued if modem is on-hook.

<value> - 3 (V.21 channel 2 300 bps)

+FTH=? Return "3"

AT# Commands - Voice Modem Support

Note: All the following commands will return OK as a result code (or ERROR if the parameters are faulty), unless stated otherwise.

#BDR DTE Baud Rate

Sets DTE Baud Rate

#BDR=<value>

<value> - DTE Baud rate (0-48) *2400

#CID Caller ID

Enables the caller ID feature in any mode

#CID=<value>

#CID=0 - Disable Caller ID

#CID=1 - Enable Caller ID (Verbose)

#CID=2 - Enable Caller ID (Numeric)

Writes the value to Sreg

Related S-Reg: S75

#RG Receive gain level

Sets receive gain level (effects the AUDIO IN level)

#RG=<value>

<value> - 0-7fff

#TL Transmit Level

Sets transmit level (effects the AUDIO OUT level)

#TL=<value>

<value> - 0-7fff

#VBT **Beep tone timer**

Sets Beep tone timer for generating tones and DTMF.

#VBT=<value> [<value> - 0-40 (* 1/10 ms)]

#VBT? Returns the current setting

#VBT=? Returns "0-40"

Related S-Regs: S77

#VIP **Voice Parameters**

Initializes Voice Parameters

Related S-Regs: S75-S89

#VIT **Inactivity timer**

Sets Inactivity timer.

#VIT=<value> [0-255 (* 1/10 ms)]

#VIT?   Returns the current setting

#VIT=? Returns "0-255"

Related S-Regs: S19

#VLS **Voice Source selection.**

Select Voice Source

#VLS=<value>

0 - Telephone Line Select (Go on hook)

2 - Speakers

3 - Microphone

4 - Telephone Line Select + Samples routed to/from

Speakers/Mic in TX/RX modes

6 - Speakerphone

#VLS? Returns the current setting

#VLS=?Returns "0,2,3,4,6"

Result codes:

OK n=0, 4, 6

VCON   n=2, 3

ERROR Otherwise

(For 0, 4, 6, VCON will be issued upon line connection)

Related S-Regs: S78

#VRA   Ringback Goes Away Timer (originate)

This value is used during call progress to detect a voice answer.

This is the interval between ringback ending and voice answer determined.

#VRA=<value> [0-255 (*1/10 MS)]

#VRA? Returns the current setting

#VRA=?Returns "0-255"

Related S-Regs: S79

#VRN   Ringback Never Came Timer (originate)

This value is used during call progress to detect a voice answer.

This is the interval without detection of ringback before voice answer is determined.

#VRN=<value> [0-255 (*1/10 MS)]

#VRN? Returns the current setting

#VRN=?Returns "0-255"

Related S-Regs: S80

#VRX   Voice Receive Mode.

Go to Voice Receive Mode.

Result codes:

CONNECT Data may be sent

ERRORVLS=0, 4, 6 and line not connected

Note: Any input from the terminal will abort Voice Receive Mode

#VSD   Silence Deletion

Enables/Disables silence deletion (voice receive, ADPCM)

#VSD=<value> [0,1 - Disable/Enable]

#VSD? Returns the current setting

#VSD=? Returns "0,1"

Related S-Regs: S81

#VSP   Silence Period

Sets Silence Period (voice receive, ADPCM)

#VSP=<value> [0-255 (*1/10 ms)]

#VSP? Returns the current setting

#VSP=? Returns "0,255"

Related S-Regs: S83

#VSR   Sample Rate

Sets Sample Rate (PCM, ADPCM)

#VSR=<value> [7200, 11025, 8000]

#VSR? Returns the current setting

#VSR=? Returns "7200, 11025, 8000"

Only 7200 is currently supported

Related S-Regs: S91

#VSS   Silence Sensitivity

Sets Silence Sensitivity (voice receive, ADPCM)

#VSS=<value> [0-3] (0-Disable, 3-allow noisy conditions

#VSS? Returns the current setting

#VSS=? Returns "0-3"

Related S-Regs: S82

#VTD   DTMF reporting capabilities

Sets DTMF reporting capabilities in Voice Transmit, Receive, and Voice Online Command Modes.

#VTD=<value><value><value> [0-3F]

#VTD? Returns the current setting

#VTD=? Returns "<0-3F>,<0-3F>,<0-3F>"

Bit Settings

Bit	Description
0	Disable/Enable DTMF detection
1	Disable/Enable V.25 1300 Hz detection
2	Disable/Enable T.30 1100 Hz detection (Fax)
3	Disable/Enable V.25/T.30 2100 Hz detection (Modem)
4	Disable/Enable Bell 2225 Hz detection
5	Disable/Enable Busy/Dial tone detection
6-7	reserved

Related S-Regs: S84-S86

#VTM   timing mark

Enables timing mark placement.

#VTM=<value> [0-10 (* 1/10 ms)]

#VTM? Returns the current setting

#VTM=? Returns "0-10"

Related S-Regs: S87

#VTS   tone signal

Generates a tone signal.

#VTS= [x,y,z] | {x,z} | x, ...

[x,y,z]   x represents the first frequency (Hz)

                 y represents second frequency (Hz)

                 z represents the duration (in 100 ms units)

{x,z}   DTMF Digits with Variable Duration.

                 x represents the DTMF digit (0-9,A-D,*,#)

                 z represents the duration (in 100 ms units)

x   DTMF Digits, with duration defined by #VBT. This is represented by a value x (non-bracketed) corresponding to a DTMF digit (0-9,A-D,*,#, !).

                 Note: '!' stands for flash.

#VGT   Playback Volume

Sets Playback Volume [Default 192]

#VGT=<value> [0-255 (*1/10 ms)]

#VGT? Returns the current setting

#VGT=? Returns "0-255"

Related S-Regs: S74

#VTX   Voice Receive Mode

Go to Voice Receive Mode

Result codes:

     CONNECT Data may be sent

     ERROR   VLS=0, 4, 6 and line not connected

#SPK   Full Duplex Speakerphone

Sets Full Duplex Speakerphone parameters

#SPK=<mute>,<speaker>,<mic>

     <mute>   0 Microphone Mute

                1 Microphone On (default)

                2 Room Monitor (mic on Max, Speaker off)

     <speaker> 0-15 & 2-30 = dB attenuation

                 5 = Default

                16 = speaker mute

     <mic>   0 - 0 dB gain

                1 - 6 dB gain Default

                2 - 9 dB gain

                3 - 12 dB gain

Related S-Regs: S88-S90

S-Registers

The S-Registers are summarized in the following table. Registers denoted with a * may be customized using the PTT Wizard Tool.

Factory defaults

Factory defaults are stored in the Windows OS registry. They are loaded at initialization time or by AT commands (&F,Z). In addition the designated default profile (as specified by the Yn command) is subsequently loaded. The defaults shown are of the Smart Link factory settings 0 and 1.

S-Register Summary

Note: This S-register List is not to be used as is by End Users and in End User's manuals. For end users the contents of the first 24 S-registers should suffice.

S#	Function	Range	Units	PW	Default	AT Command
S0	Rings to Auto-Answer	0-255	rings		0	A
S1	Ring Counter	0-255	rings		0	
S2	Escape Character	0-255	ASCII		43	
S3	CR Character	0-255	ASCII		13	
S4	LF Character	0-255	ASCII		10	
S5	BS Character	0-255	ASCII		8	
S6	Wait Time for Dial Tone (Also wait before Blind Dialing)	2-255	s	*	2	D
S7	Wait Time for Carrier	1-255	s	*	60	D
S8	Pause Time for Dial (,)	0-255	s		2	D
S9	Carrier Detect Response Time	1-255	0.1 s		6	
S10	Carrier Loss Disconnect Time	1-255	0.1 s	*	7	

S11	DTMF Tone duration	50-255	0.001s	*	100	D
S12	Reserved					
S13	Echo	0-1			1	E
S14	Quiet	0-1			0	Q
S15	Verbose	0-1			1	V
S16	Pulse/Tone	0-1		*	1	T,P,D
S17	Reserved					
S18	Test Timer	0-255	s		0	&T
S19	System Inactivity Timer	0-255	min		0	
S20	Reserved					
S21	Break Length	0-9	100ms		9	\B
S22	Origin/Answer	0-1			0	
S23	XOFF Character (NA)	0-127	ASCII		19	
S24	Flash Timer	0-255	10ms		20	

Appendix3   Government compliance notices

FCC compliance

This equipment complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.
The FCC prohibits this equipment to be connected to party lines or coin-telephone service.
In the event that this equipment should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

FCC Class B statement

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

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

Notice: 1) Shielded cables, if any, must be used in order to comply with the emission limits.
2)Any change or modification not expressly approved by the Grantee of the equipment authorization could void the user's authority to operate the equipment.

European CTR 21 compliance

The equipment has been approved in accordance with Council Decision 98/482/EC for pan-European single terminal connection to the public switched telephone network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point. In the event of problem, you should contact your equipment supplier in the first instance.

Note: The manufacturer should ensure that the vendor and user of the equipment is clearly informed of the above information by means of package and /or user manuals of the forms of user instructions.