NEC Mobile Data Card

Modem/fax 56k+GSM

PC Card™ by digicom

INDEX

USER' MANUAL rev. 1.0 01/99

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PREFACE

The contents of this booklet may be modified without prior permission. Every possible care has been taken in testing and putting together all the documentation contained in this booklet, however Digicom can not take any responsability brought by the use of this booklet. The following installation rules should be respected in order to have the best working order of the equipment and for the user's safety.

ENVIROMENTAL CONDITIONS

For all devices:

ENVIROMENTAL TEMPERATURE	**RELATIVE HUMIDITY**
from 0 to + 45∞C	from 20 to 80% n.c

Rapid changes of temperature or humidity should be avoided (0,03°C/min).

This equipment, including cables, should be installed in an area free from:

- Dust, humidity, heat from direct sun light.
- Objects which irradiate heat. These could cause damage to the container or other problems.
- Objects which produce a strong electtromagnetic field (loudspeakers, etc.)
- Liquids or chemical corrosive substances.

CLEANING THE TERMINAL

Use a clean and soft cloth. Wet the cloth with water or natural detergent if it is necessary to remove any stains. Never use chemical products such as petrol or solvents.

VIBRATIONS OR DROPPING

Caution against vibrations and dropping

WARNING
This is a class A product.

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

INFORMATION NOTE

product: Mobile DATA CARD

"This equipment has been approved in accordance with the Council Decision 98/482/EC – "CTR21" 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 problems, you should contact your equipment supplier in the first instance".

Approval
N° KCS/98211184

Issued by: **KCS Certification**
Certificate number: **KCS/98211184/AA/00**

NETWORK COMPATIBILITY DECLARATION

prodotto: Mobile DATA CARD

- "The equipment has been designed to work with the following PSTN analog networks":

Austria
Belgium
Denmark
Finland
France
Iceland
Ireland
Italy
Luxembourg
Norway
Switzerland
The Netherlands
United Kingdom
Sweden

- "No hardware or software switch setting is required for use on another network".

- "The equipment may have some interworking difficulties with the following PSTN analog networks":

Germany
Greece
Portugal
Spain

Telecommunications Safety Requirements

The Mobile DATA CARD modem incorporates a safety barrier between the telecommunication line ports and the data terminal equipment (DTE) PCMCIA port.

The PCMCIA port of your DTE is a single socket which provides a safety extra low voltage (SELV) electrical interface for the connection of data terminal equipment. The electrical interface of data terminal equipment connected to this socket must also use SELV to maintain the SELV integrity and safety compliance of please contact a qualified engineer before making connection.

The power required by the host and the total of all adapter cards installed within the host environment, together with any auxiliary apparatus, shall not exceed the power specification of the host apparatus.

The power requirements for this 56K modem adapter are:

Voltages with tolerance:	5V +5% -5% Volt DC
Voltages peak/rms:	-- Volt
Max. power rail noise specification:	0,052 Watt
Max. power at the above voltages:	1,2 Watt
Max. current at the above voltage:	240 mA

"It is essential that the PC Card is fitted only in a compatible slot designed for PC Card/PCMCIA cards, containing only Safety Extra Low Voltages (SELV). Under normal conditions, the SELV limit is 42,4V peak a.c. or 60V d.c.
If you have any doubt, seek advice from a competent engineer before installing the card".

1. GENERAL

1

This operating manual describes the installation procedures and the main features of the Mobile DATA CARD PC Card (PCMCIA) modem.
The Mobile DATA CARD card is the ideal modem fax solution for mobile applications that require reliable connection over GSM and/or normal analog telephone lines: the perfect solution for data, and fax, communication for professional, office or the home user.

See the relevant section giving details of the installation procedures for your particular PC operating enviroment.

DEAR CUSTOMER,

Thank you for choosing a digicom modem.
Your Mobile DATA CARD offers the latest in V.90 technology that enabling the modem to achieve a speed of 56K over standard telephone lines.

The main applications, where Mobile DATA CARD can demostrate superior performace compared with current V.34 (33.600bps) modems, are: Internet access, Remote Access in the Corporate Network, tele-gaming, and videoconferencing. V.90 technology is different than other modem technologies as the downstream data is digitally encoded instead of modulated. This is an asymmetrical method, so downstream data can reach 56,000bps while upstream transmission is at the V.34 rate.

This means that the modem that you are connecting to must be digital (typically over ISDN) and the Internet service provider (ISP) or the Central Server modem must support V.90 compatibily. Other 56K protocols are present in the market and may not be compatible with V.90.
Please verify which protocol is supported by your provider.

1.1. PRODUCT FEATURES

GSM Features

- Data modem modes for: V.32, V.22bis, V.22, V.21
- Fax modem modes: 9600/4800bps, V.29/V.27 Group 3
- Class 1 fax command set
- Error Correction: MNP4 and V.42 trasparent, RLP and non trasparent
- Enchanced AT commands set with autobaud for the data mode up to 115.200bit/s.

PSTN Features

- Computer speed: up to 115.200 bit/s
- Data modem modes for: 56K(V.90), V.34, V.32bis, V.32, V.22bis, V.22, V.21, V.23 (1200/75).
- Fax modem modes: 9600/4800bps, V.29/V.27 Group 3 and 14.400bps V.17.
- Enchanced AT commands set with autobaud for the data mode up to 115.200 bit/s.
- Class 1 fax command set
- Non volatile memory directory for user profiles
- Auto dial and autoanswer
- Tone dialingl
- Error Correction: MNP4 and V.42
- Data Compression: MNP5 and V.42bis

2. INSTALLATION

2

2.1. MOBILE DATA CARD OVERVIEW

The Mobile DATA CARD permits the connection of your portable computer to a GSM phone or to a standard PSTN line.

Before starting the installation, check that you have the Mobile DATA CARD software drivers and the correct cable to connect to your GSM phone.

The selection between GSM and PSTN is determined automatically by the cable used: when the GSM cable is inserted in the card, the PSTN functionality is disabled. When the PSTN cable is inserted in the card the GSM section is disabled.

Your GSM phone must be enabled for fax and data service and your agreement with the GSM Telecom provider must allow for the sending/receiving of data and fax messages. In this case you should have 2 additional GSM telephone numbers: one for the reception of data and one for fax reception.

2.2. MOBILE DATA CARD (GSM ONLY) OVERVIEW

The Mobile DATA CARD permits the connection your portable computer to a GSM phone.Before starting the installation, check that you have the Mobile DATA CARD software drivers and the correct cable to connect to your GSM phone.

Your GSM phone must be enabled for fax and data service and your agreement with the GSM Telecom provider must allow for the sending/receiving of data and fax messages. In this case you should have 2 additional GSM telephone numbers: one for the reception of data and one for fax reception.

2.3. HOW TO INSERT THE CARD IN YOUR COMPUTER

The Mobile DATA CARD PC Card is compliant with any PCMCIA 2.0 socket.

Insert the card in the PCMCIA slot of your computer the correct way up.
The way up sign is on the modem sticker.

We suggest to insert the card when the computer is powered off.

Power on the computer and follows the windows instructions.

3. MODEM AT COMMAND SET

The modem supports the AT command set to define the configuration, initiate or terminate modem communication, test the modem and the communication link. The modem will work in two basic operation modes: command mode and data mode.

Command mode is when the modem is not connected to another modem, therefore Off Line or in a idle condition. In this mode the modem will accept commands beginning with AT prefix.
Data mode is when the modem is connected to another modem, that is an On Line condition or functioning. In this mode all the characters sent from computer are interpreted as data and they are sent to the remote modem.
You may switch from data to command mode by entering an escape sequence. The default escape sequence is +++ there must have at least one second before and after being keyed. To go back into data mode simply type ATO.

Data Length
Each caracter of the AT command must be an ASCII code with any of the following format combinations:

START BIT	DATA BIT	PARITY	STOP BIT	TOT
1	7	1	1	10
1	8	0	1	10
1	7	0	2	10
1	8	1	1	11

The modem will accept even, odd, mark, or space.

3.1. AT COMMAND SET DESCRIPTION

AT Attention

All the characters following the letters AT are commands. In AT command mode the modem automatically detects the computer speed and parity format. The modem will response using the same speed and parity format of AT command.

ATA Answer incoming data call

Causes the modem to go off hook and attempt a handshake in answer mode.

A/ Repeat last command

Causes the modem to repeat the last AT command. This command is neither preceded by AT and is not followed by CR.

ATB CCITT/BELL Mode

B0	CCITT mode.
B1	Bell Mode.

ATD Dial Command

0:9	Dial number.
*	DTMF digits.
#	DTMF digits.
A-D	DTMF digits.
T	tone dial.
S=n	Dial one of the four stored phone numbers (n=0-3) in the modem non volately memory (See &z Command).
!	flash.
W	wait for dial tone.
@	wait for five seconds of silence.
,	pause.
L	recall the last number dialed.
;	return to Command state. Added to the end of the dial string, this causes the modem to return to thecommand state after it processes the portion of the dial string preceding the ;. The modem will enter call progress only after an additional dial command is issued without the; terminator.
^	Toggle calling tone.

ATE Commands Echo

E0	Commands echo disabled.
E1	Commands echo enabled.

ATF Select Line Modulation

This command is supported only for compatibility. No function is performed. Refer to +MS command to select modulation.

ATH DISCONNECTION

H0	Modem disconnects.
H1	Modem connects to the line and remain in command mode for the time defined in S7.

ATI IDENTIFICATION

I0	Maximum line speed.
I1	Product code.
I3	Product name.
I4	Firmware release.
I5	Country Code active when in PSTN and the GSM phone mode.

ATL SPEAKER VOLUME

L1	Low speaker volume.
L2	Medium speaker volume.
L3	High speaker volume.

ATM SPEAKER CONTROL

M0	Speaker always off.
M1	Speaker on until carrier is detect.
M2	Speaker always on.
M3	Speaker off during dialing and on until carrier is detect.

ATN AUTOMODE ENABLE

N0	Automode detection is disabled (equivalent to setting AT+MS=X,0).
N1	Automode detection is enabled (equivalent to setting AT+MS=X,1).

Note: see also AUTOMODE parameter in AT+MS command

ATO RETURN ON LINE

O0	On line state when during connection the modem is in command mode.
O1	Like previous plus equalaizer retrain.

ATQ QUIET RESULT CODES

Q0	Display result codes.
Q1	No result code (quiet).

ATS READ/WRITE A REGISTER

Sn=x	Write value x to S Register n.
Sn?	Read value at S Register n.

ATV VERBOS RESULT CODE

V0	Result code display as digit (short form).
V1	Result code display as words (extention form).

SHORT	GSM Mode	PSTN Mode
0	OK	OK
1	CONNECT	CONNECT
2	RING	RING
3	NO CARRIER	NO CARRIER
4	ERROR	ERROR
5	CONNECT 1200	CONNECT 1200
6	NO DIALTONE	NO DIALTONE
7	BUSY	BUSY
8	NO ANSWER	NO ANSWER
10	CONNECT 2400	CONNECT 2400
11	CONNECT 4800	CONNECT 4800
12	CONNECT 9600	CONNECT 9600
13	CONNECT 7200	CONNECT 7200
14	CONNECT 12000	CONNECT 12000
15	CONNECT 14400	CONNECT 14400
16	CONNECT 19200	CONNECT 19200
17	CONNECT 38400	CONNECT 38400
19	CONNECT 115200	CONNECT 115200
22	CONNECT 1200TX/75RX	CONNECT 1200TX/75RX
23	CONNECT 75TX/1200RX	CONNECT 75TX/1200RX
24	DELAYED	DELAYED
33	FAX	FAX
34	+FCERROR	+FCERROR
35	DATA	DATA
40	CARRIER 300	CARRIER 300
44	CARRIER 1200/75	CARRIER 1200/75
45	CARRIER 75/1200	CARRIER 75/1200
46	CARRIER 1200	CARRIER 1200
47	CARRIER 2400	CARRIER 2400
48	CARRIER 4800	CARRIER 4800
49	CARRIER 7200	CARRIER 7200
50	CARRIER 9600	CARRIER 9600
51		CARRIER 12000
52		CARRIER 14400
53		CARRIER 16800
54		CARRIER 19200
55		CARRIER 21600
56		CARRIER 24000
57		CARRIER 26400
58		CARRIER 28800
59		CARRIER 16800

SHORT	GSM Mode	PSTN Mode
61		CARRIER 21600
62		CARRIER 24000
63		CARRIER 26400
64		CARRIER 28800
66	COMPRESSION:CLASS5	COMPRESSION:CLASS5
67	COMPRESSION: V42 bis	COMPRESSION: V42 bis
69	COMPRESSION: NONE	COMPRESSION: NONE
70	PROTOCOL: NONE	PROTOCOL: NONE
77	PROTOCOL: LAP-M	PROTOCOL: LAP-M
78	PROTOCOL:RPL	CARRIER 31200
79		CARRIER 33600
80	PROTOCOL: ALT	PROTOCOL: ALT
81	PROTOCOL: ALT-CELLULAR	PROTOCOL: ALT-CELLULAR
84		CONNECT 33600
150		CARRIER 32000
151		CARRIER 34000
152		CARRIER 36000
153		CARRIER 38000
154		CARRIER 40000
155		CARRIER 42000
156		CARRIER 44000
157		CARRIER 46000
158		CARRIER 48000
159		CARRIER 50000
160		CARRIER 52000
161		CARRIER 54000
162		CARRIER 56000
165		CARRIER 32000
166		CARRIER 34000
167		CARRIER 36000
168		CARRIER 38000
169		CARRIER 40000
170		CARRIER 42000
171		CARRIER 44000
172		CARRIER 46000
173		CARRIER 48000
174		CARRIER 50000
175		CARRIER 52000
176		CARRIER 54000
177		CARRIER 56000

ATW REPORT AT CONNECTION

W0	When connected the modem displays: CONNECT and the digital rate.
W1	When connected the modem displays: Line Speed,Error Correction Protocol (if any), Digital rate.
W2	When connected the modem displays: CONNECT and line speed.

ATX DIAL TONE DETECTION

X0	Busy and dial tone detect disable. OK and ERROR code enable.
X1	Busy and dial tone detect disable. OK and CONNECT xxxxx code enable.
X2	Dial tone enable only. OK, NO DIAL TONE and CONNECT xxxxx enable.
X3	Busy tone enable only. OK, BUSY and CONNECT xxxxxx enable.
X4	Busy and dial tone enable OK, BUSY, NO DIAL TONE and CONNECT xxxxx enable.

ATY BREAK DISCONNECTION

Y0	Disable long space disconnect.
Y1	Enable long space disconnect. In non-error correction mode or in buffer mode, the modem will senda long space of four seconds prior to going on-hook. In error correction mode, the modem wil respond to the receipt of a long space (a break signal greater than 1,6 seconds) by going on-hook.

ATZ RESET AND LOAD USER PROFILE

Z0	Reset and load user profile 0.
Z1	Reset and load user profile 1.

AT+MS MODULATION FORMAT

This extended-format command selects the modulation, optionally enables or disable automode, and optionally specifies the lowest and highest rates using one to four subparameters. The command format is:

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

[mod] = modulation type
[automode] = automode enable or disable
[min_rate] = min line speed
[max_rate] = max line speed

- **Modulation type:** (see following table)

MOD	MODULATION	POSSIBLE RATE bps
0	V.21	300
1	V.22	1200
2	V.22bis	2400 or 1200
3	V.23	1200
9	V.32	9600 or 4800
10	V.32bis	from 14400 to 4800
11	V.34	from 33600 to 2400
56	K56FLEX	from 56000 to 32000
64	Bell 103	300
69	Bell 212	1200

- **Automode:** see the ATN command
- **Line speed min/max:** These parameters permit to define, within a modulation standard,the minimum and maximum connection rate. The command AT+MS? shows the currently modem configuration, the default value is: 33,6,1,300,33,6000,1,0

Some configuration examples

Modem set up in V.34 with automode disabled and speed fix at 33.600

AT+MS=11,0,33600,33600

In this case the modem make the connection only if the computer speed is equal or greater than 33.600 bps.

AT+MS=9,1,300,9600

The modem is able to make the handshake from V.32 (9600 bps) to V.21 (300 bps).
Modem set up in V.32 with automode enable and speed with 300bps to 9600bps.
Mobile DATA CARD modem setup with automode and connection speed within 300 bps to 56 Kbps:

AT+MS=56,1,300,56000,1,0

AT%C COMPRESSION CONTROL

%C0	Compression disable.
%C1	MNP5 enable only.
%C2	V42bis enable only.
%C3	MNP% and V42bis enable.

AT%E AUTORETRAIN CONTROL

%E0	Autoretrain disable.
%E1	Autoretrain enable.
%E2	Fallback/fallforward enable. Enable only in error corrector or buffer mode.

AT%L DISPLAY RECEIVE LEVEL IN DBM

Returns a value which indicates the received signal level.
For example: 009 = -9 dBm, 043 = -43 dBm**.**

AT%Q LINE SIGNAL QUALITY

From 000 (good quality) to 127 (poor quality, disturbed signal).

AT&C CARRIER DETECT OPTION

	&C0	Carrier detect always ON. When modem disconnects DCD (C109) goes OFF for 1 sec.; function 109 wink.
	&C1	Carrier detect is ON when remote carrier is present.

AT&D DATA TERMINAL READY OPTION

	&D0	DTR signal is ignored.
	&D1	Modem return to Command Mode upon detecting ON to OFF transition on DTR.
●	&D2	Modem hangs up and disables auto-answer upon detecting ON to OFF transition on DTR.
	&D3	Modem reset upon detecting ON to OFF transition on DTR.

AT&F FACTORY CONFIGURATION

	&F0	Load factory configuration 0.
	&F1	Load factory configuration 1.

AT&G GUARD TONE

●	&G0	Disable Guard Tone.
	&G2	Select 1800 Hz Guard Tone. Only in V.22 (1200 bps) and V.22 bis (1200 bps) modulations.

AT&K DATA FLOW CONTROL

	&K0	Flow control disable.
	&K3	Hardware flow control (RTS/CTS) enable (Default for data modem modes).
	&K4	Software flow control (Xon/Xoff) enable.
	&K5	Software flow control (Xon/Xoff) in trasparent mode enable.
	&K6	Hardware and software flow control enable (default for fax modem modes).

AT&Q OPERATING MODE SELECTION

	&Q0	Asyncronous direct mode.
	&Q5	Operations with error corrector. It is automatically selected with \N command (different fron 0 and 1).
	&Q6	Asynchronous with buffer enabled (AT/N0).

AT&R C106

&R0	In asynchronous mode, C106 is controlled according to V25 handshake recomendation.
&R1	In synchronous mode, C106 follows the flow control.

AT&S C107 (DATA SET READY OPTION)

&S0	DSR will remain ON all the time.
&S1	DSR will became active after answer tone has been detected and inactive after the carrier has been lost.

AT&T TEST AND DIAGNOSTIC (LOOP)

To use the AT&Tn command the error correction must be disabled (AT\N0).

&T0	Terminate test in progress.
&T1	Local analog loopback.
&T3	Local digital loopback.
&T4	Grant Remote digital loopback test request by remote modem.
&T5	Deny Remote digital loopback test request by remote modem.
&T6	Remote digital loopback.
&T7	Remote digital loopback with self-test.
&T8	Local analog loopback with self-test.

AT&V VIEW ACTIVE AND STORED PROFILES

AT&W STORE ACTIVE PROFILE

&W0	Store active profile as Profile 0.
&W1	Store active profile as Profile 1.

AT&Y DEFINE DEFAULT PROFILE AFTER POWER ON

&Y0	Use profile 0 after power on.
&Y1	Use profile 1 after power on.

AT&Z STORE THE X TELEPHONE NUMBER IN A N LOCATION

AT&Zn =X (n = from 0 to 3; X = dialing string from 0 to 35 numbers).

AT\A MNP BLOCK SIZE

\A0	Block size 64 chr.
\A1	Block size 128 chr.
\A2	Block size 192 chr.
\A3	Block size 233,6 chr.

AT\B BREAK SIGNAL SIZE

\B1 to \B9 In non-error corrector mode, the modem will trasmit a break signal to the remote modem with a length in multiples of 100 ms according parameter specified. The command works in conjunction with the \K command. In error corrector mode, the modem will signal a break through the active error correction protocol, giving no indication of the length.

AT\Kn SET BREAK CONTROL

Controls the response of the modem to a break received from the DTE or the remote modem or the \B command according to the parameter supplied. The response is different in three separate states.

1) The first state is where the modem receives a break from the DTEwhen the modem is operating in data transfer mode.

\K0 Enter on-line command mode, no break sent to remote modem.
\K1 Clear data buffer and send break to remote modem.
\K2 Same as 0.
\K3 Send break to remote modem immediatly.
\K4 Same as 0.
\K5 Send break to remote modem in sequence with trasmitted data.

2) The second case is where the modem is in the on-line command state (waiting for AT commands) during a data connection, and the \B is received in order to send a break to the remote modem.

\K0 Clear data buffer and send break to remote modem.
\K1 Same as 0.
\K2 Send break to remote modem immediatly.
\K3 Same as 2.
\K4 Send break to remote modem in sequence with data.
\K5 Same as 4.

3) The third case is where a break is received from a remote modem during a non-error corrected connection.

\K0 Clear data buffers and sends break to the DTE.
\K1 Same as 0.
\K2 Send a break immediately to DTE.
\K3 Same as 2
\K4 Send a break in sequence with received data to DTE.
\K5 Same as 4.

AT\N ERROR CORRECTION MNP AND V42 (IN PSTN)

\N0 Selects normal speed buffered mode (disables error correction mode).

3.2. S REGISTERS

REG.	RANGE	UNIT	DEF	DESCRIPTION
S0	0-255	Ring	0	Ring to answer on
S1	0-255	Ring	0	Ring count
S2	0-255	ASCII	43	Escape character
S3	0-127	ASCII	13	Carriage return character
S4	0-127	ASCII	10	Line Feed character
S5	0-127	ASCII	8	Back Space character
S6	0-255	1 sec	4	Wait for dial tone
S7	0-60	1 sec	60	Wait for data carrier
S8	0-255	1sec	2	Pause time for "," character
S9	0-255	100ms	6	Answer tone detection time
S10	0-255	100ms	14	Lost carrier to hang up delay
S12	0-255	20ms	50	Escape sequence code guard
S18	0-255	1sec	0	Test timer
S29	0-255	10ms	10	Flash time
S30	0-255	1 min	0	Inactivity timer on data (cannot be stored)
S32	0-255	ASCII	17	Xon character
S33	0-255	ASCII	19	Xoff character
S91	3-15	ASCII	10	Adjust transmission level
S92	3-15	ASCII	10	Adjust transmission level in fax mode
S95	0-255	ASCII	2	Connection messages management

3.2.1. SPECIAL S REGISTERS DESCRIPTION

ATS9 DETECTION TIME FOR ANWER TONE

0 - 255	100ms	The modem after the dial doesnít wait for remote answer tone but starts with the handshake.

Default = 6

ATS10 CARRIER DETECT RESPONSE TIME

0-255	100ms	Sets the length of time, in tenths of a seconds, that the modem waits before hanging up after a loss of carrier.
255	10ms	The modem doesnít disconnect for a loss of carrier.

Default = 14

ATS30 INACTIVITY DISCONNECT TIMER

0	The modem doesnít disconnect as no data is sent or received.
0-255	Sets the length of time, in tens of seconds, that the modem will stay online before disconnectiong when no data is sent or received. The timer is inoperative in synchronous mode.

Default = 0 (cannot be stored)

ATS91 ADJUST TRANSMISSION LEVEL IN SWITCHED LINE

-3-15	dB	This register checks the modem transmission level in switched line.

Default=10

ATS92 ADJUST TRANSMISSION LEVEL IN FAX MODE

-3-15	dB	This register checks the modem transmission level in fax mode.

Default=10

Note: Each change of S91 and S92 is automatically stored into the modem non volatile memory.

3.2.2. CONNECTION MESSAGE

After the handshake phase the modem gives a message indication to your Computer. The syntax of these messages (when ATX1) is in according to the value of register S95 and the state of the ATWn command.
In the table below you can see the available messages:

S95	ATW0	ATW1	ATW2
0	CONNECT Dte	PROTOCOL:Prot CONNECT Dte	CONNECT Dce
0	CONNECT Dte	PROTOCOL:Prot CONNECT Dte	CONNECT Dce
1	CONNECT Dte	PROTOCOL:Prot CONNECT DCe	CONNECT Dce
2	CONNECT Dte/ARQ	PROTOCOL:Prot CONNECT Dte/ARQ	CONNECT Dce/ARQ
4	CARRIER Dce CONNECT Dte	CARRIER Dce PROTOCOL:Prot CONNECT Dte	CARRIER Dce CONNECT Dce
8	PROTOCOL:Prot CONNECT Dte	PROTOCOL:Prot CONNECT Dte	PROTOCOL:Prot CONNECT Dce
32	COMPRESSION:Comp CONNECT Dte	PROTOCOL:Prot PROTOCOL:Prot CONNECT Dte	CARRIER Dce CONNECT Dce

Dce = Line Speed
Dte = Interface Speed
Comp. = V.42bis - MNP5 - NONE
Prot. = V.42 - LAPM-NONE

COMMAND	DESCRIPTION
ATX	List of available messages
ATW	Answer message Format
ATS95	Connection message management

4. DIAGNOSTIC

4

This modem has a very powerful command set and facilities to test the modem itself, the telephone line and the remote side.
In this chapter you can find some simple procedures to implement the diagnostic features.

IMPORTANT
To activate the loop the modem must be set up without error correction (AT\N0).

4.1. LOCAL ANALOG LOOPBACK TEST (CCITT LOOP 3)

The target of this test is to verify the modem itself. When the modem is Off Line type the command: AT&T1. This command forces the modem in local analog loop that means to be connected with itself. You can send single or characters strings or files and they are received from your computer. To exit from test condition type the escape sequence (+++) and then, when the response OK is displayed enter the command AT&T0.

4.2. LOCAL DIGITAL LOOPBACK TEST (CCITT LOOP 2 LOCAL)

The target of this test is to verify the COM port and the serial cable of your computer. When the modem is Off Line type the command: AT&T3. This command forces the modem in local digital loop that means to connect send data and receive data before modulation processor. You can send single or characters strings or files and they are received from your computer. To exit from test condition type the escape sequence (+++) and then, when the response OK is displayed enter the command AT&T0.

4.3. LOCAL ANALOG LOOPBACK WITH SELFTEST

The target of this test is to verify the modem itself using an internal test pattern. When the modem is Off Line type the command: AT&T8. This command forces the modem in local analog loop, sends a test pattern and check the receive stream. The duration of this test is defined from register S18.

4.4. REMOTE DIGITAL LOPBACK

The target of this test is to verify the complete connection. When the modem is ON line with the remote type before the escape sequence (+++) and then, when the

response OK is displayed enter the command AT&T6.
This command forces the remote modem in digital loop that means to connect the digital send data and receive data before the remote computer. You can send single or characters strings or files and they are received from your computer. To exit from test condition type the escape sequence (+++) and then, when the response OK is displayed enter the command AT&T0.

4.5. REMOTE DIGITAL LOOPBACK WITH SELFTEST

The target of this test is to verify the complete connection using an internal test pattern When the modem is ON line with the remote type the escape sequence (+++) and then, when the response OK is displayed enter the command AT&T7. This command forces the remote modem in digital loop and a test pattern and check the receive stream. The duration of this test is defined from register S18.

DECLARATION CE OF CONFORMITY

This product satisfies the basic requirements of Electromagnetic Compatibility and Safety of the below indicated Directive:

- *89/336/CEE of 3 May 1989 with subsequent modifications (Directive 92/31/CEE of April 28, 1992, Directive 93/68/CEE of July 22,1993 and Directive 93/97/CEE of 29 October 1993).*
- *73/23/CEE of February 19, 1973 with subsequent modifications (Directive 93/68 ECC of July 22, 1993).*

CHECK REPORT

The equipment has been successfully tested according to the check procedure indicated on the inside back cover of the user's manual. It is in conformity with the technical characteristics described in the users' manual supplied with the equipment.

WARRANTY

WARRANTY CLAUSES

- The equipment has a warranty which covers manufacturing and operating faults for the period indicated on the inside back cover of the user's manual.
- The warranty is to be considered freight forward and the goods must reach the address indicated below at customer's expences.
- Warranty means the substitution or repairing of fault products. Working hours used for repairing included in the warranty.
- The estetic and the separable parts are not included in the warranty.
- The warranty is not extended to equipments which have been subject to misuse, improper installation, electric discharge or repaired by unauthorized staff.

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