

3. MODEM INSTALLATION

3.1. COMPOSITION

The modem is supplied with the following equipment:

- Cable for switched line
- Cable for Leased line
- This User's Manual

3.2. SITE PREPARATION

Electrical current from power, telephone and signal cables is potentially hazardous.

When connect or disconnect cables from the modem or installing, moving or opening the covers of attached devices, follow the proper instruction.

Connection steps:

- Turn OFF the modem (the power switch is located on the rear panel) and all devices that you are connecting to.
- Connect the remote end of the signal cable and of telecommunication line
- Connect the power cable at the outlet
- Plug the line and the DTE cable to the modem
- Set the modem power switch to ON

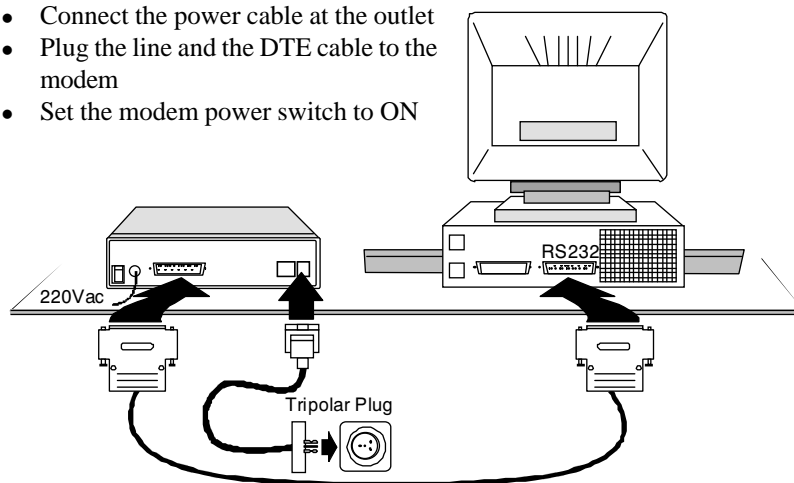


fig.3.1. Installation SNM49 and SNM50

3.3. FRONT PANEL

In this section you can find information about:

3.3.1. Front Panel of SNM49

3.3.2. Front Panel of SNM50

3.3.2.1. Lights and keys of SNM49 and SNM50

3.3.2.2. Configuration from the front panel SNM 49 and SNM50

3.3.3. Front Panel of SNM 54

3.3.3.1. Lights and keys of SNM 54

3.3.3.2. Configuration from the front panel SNM 54

3.3.4. Special operation from the front panel (PWR ON)

3.3.1. Front Panel of SNM49

On the front panel of SNM49 are present 9 lights (Led) and 2 Keys

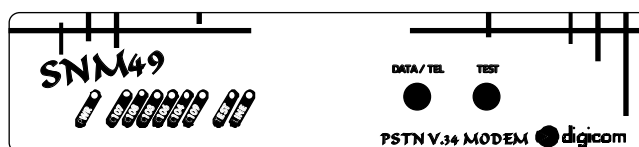


Fig.3.2. Front Panel of SNM49

3.3.2. Front Panel of SNM50

On the front panel of SNM50 are present 9 lights (Led) and 2 Keys



Fig.3.3. Front Panel of SNM50

3.3.2.1. Lights and keys of SNM49 and SNM50

The function of each light and key present on the front panel is identified by a write indication.

LED	Colour	Description
PWR	Green	Power
C107	Red	Data Set Ready
C108	Red	Data Terminal Ready
C103	Red	Send Data
C106	Red	Clear To Send
C104	Red	Receive Data
C109	Red	Data Carrier Detector
TEST	Red	Test indicator in analog loop or remote digital loop
LINE	Red	Modem off-hook. Led blinks to indicate modem in back-up (only for SNM50/54)

KEY	Description
DATA/TEL	Data to telephone switch
TEST	In off line it puts the modem in analog loop, in on line puts the remote modem in digital loop

3.3.2.2. Configuration from the front panel SNM 49 and SNM50

The user can modify very easily the active profile of the modem by the front panel keys, using the following procedure.

Step 1 To enter in the manual set-up, at the modem power on hold pressed the button TEST until the led Test is blinking.

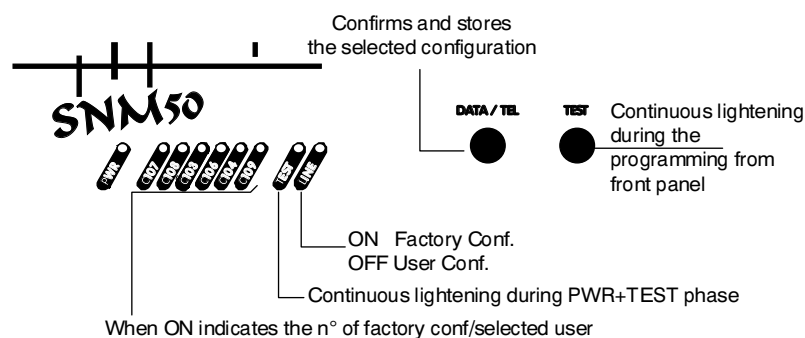
Step2 Using the lights and the TEST button you can select one of the pre loaded factory or user configuration in according with the following table:

	Led LINE (ON)	Led LINE (OFF)
Led C107 ON	Set summer time	Set solar time
Led C108 ON	Load factory Conf.N°0	Load user Conf.N°0
Led C103 ON	Load factory Conf.N°1	Load user Conf.N°1
Led C106 ON	Load factory Conf.N°2	Load user Conf.N°2
Led C104 ON	Load factory Conf.N°3	Load user Conf.N°3
Led C109 ON	Load factory Conf.N°9	Load user Conf.N°9

Step3 To confirm the configuration selected push once the button DATA/TEL

Step4 Turn off the modem

Step5 Turn on the modem with the active configuration selected by step2



3.3.3. Front Panel of SNM 54

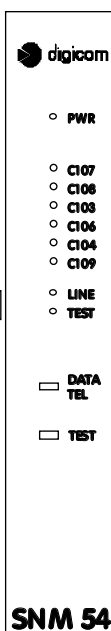
On the front panel of SNM54 are present 9 lights (Led) and 2 Keys.

Fig.3.4. Front Panel of SNM50

3.3.3.1. Lights and keys of SNM54

The function of each light and key present on the front panel is identify by a write indications.

LED	Colour	Description
PWR	Green	Power
C107	Red	Data Set Ready
C108	Red	Data Terminal Ready
C103	Red	Send Data
C106	Red	Clear To Send
C104	Red	Receive Rata
C109	Red	Data Carrier Detector
TEST	Red	Test indicator in analog loop or remote digital loop
LINE	Red	Modem off-hook. It blinks when modem in back-up (only for SNM50/54)



KEY	Description
DATA/TEL	Data to telephone switch
TEST	In off line it puts the modem in analog loop, in on line puts the remote modem in digital loop

3.3.3.2. Configuration from the front panel SNM 54

The user can modify very easily the active profile of the modem by the front panel keys, using the following procedure.

Step 1 To enter in the manual set-up, at the modem power on hold pressed the button TEST until the led Test is blinking.

Step 2 Using the lights and the TEST button you can select one of the pre loaded factory or user configuration in according with the following table:

	Led LINE (ON)	Led LINE (OFF)
Led C107 ON	Set summer time	Set the solar time
Led C108 ON	Load factory Conf.N°0	Load user Conf.N°0
Led C103 ON	Load factory Conf.N°1	Load user Conf.N°1
Led C106 ON	Load factory Conf.N°2	Load user Conf.N°2
Led C104 ON	Load factory Conf.N°3	Load user Conf.N°3
Led C109 ON	Load factory Conf.N°9	Load user Conf.N°9

Step 3 To confirm the configuration selected push once the button DATA/TEL

Step 4 Turn off the modem

Step 5 Turn on the modem with the active configuration selected by step 2

○ PWR

○ C107
○ C108
○ C103
○ C106
○ C104
○ C109

When ON indicates the n° of factory conf/selected user

Countinuous lightening during the programming from front panel

○ LINE ON Factory Conf.
○ TEST OFF User Conf.

DATA TEL Confirm and stores the selection configuration

Selects a different configuration TEST

3.3.4. Special operation from the front panel (PWR ON)

Addition special operation are available from the front panel:

- Power On Test
- Load factory configuration N°9

To activate the POT ,at the modem power on, hold pressed in the same time, the keys DATA/TEL and TEST. After about 10 sec the led TEST stops to blink and remains off to indicate that the POT is all right. Otherwise, if the led TEST continues to blink, your modem is fault.

To load the factory configuration N°9 at the modem power on, hold pressed the key DATA/TEL only.

3.4. REAR PANEL

3.4.1. Rear panel of SNM49

On the rear panel of modem SNM49 are available the following devices:

- Power ON/OFF switch
- Interface connector (JA) V.24/V.28, female 25 pins for the DTE cable
- Line plug (SW) for the switched line cable

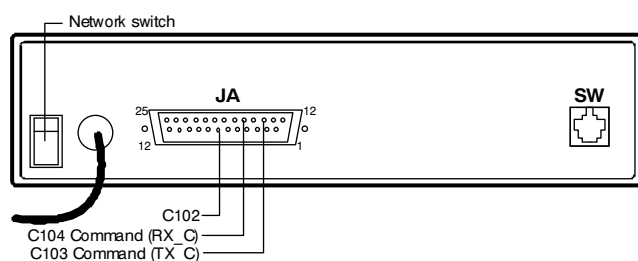


Fig.3.5. Rear Panel of SNM49

SNM49 has only one interface connector (JA) . On this connector there are Main and Command Port circuits. Command Port is useful for special applications, typically in synchronous, where the main port is not able to manage the AT commands.

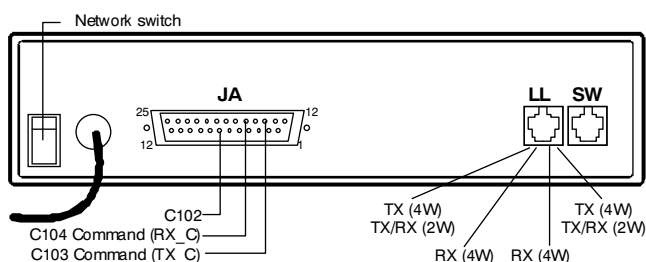
See the following table for more details.

Pin	Circuit V.24	DTE-DCE	Ref.	Description
1	101	<————>	PG	Protective ground
2	103	————>	TD	Transmitted Data
3	104	<————	RD	Received Data
4	105	————>	RTS	Request to Send
5	106	<————	CTS	Clear to Send
6	107	<————	DSR	Data Set Ready
7	102	<————>	SG	Signal Ground
8	109	<————	DCD	Data Carrier Detector
9	—		+Vcc	Voltage for Test +
10	—		-Vcc	Voltage for Test -
11				
12				
13				
14	TX_C	————>		Transmitted Data Command Port
15	114	<————	TC	Transmission Clock from DCE
16	RX_C	<————		Received Data Command Port
17	115	<————	RC	Reception Clock
18	141	————>	L3	Loop 2 Request
19				
20	108.1	————>	CDSTL	Modem Connection to the line
20	108.2	————>	DTR	DTR Data terminal ready
21	140	————>	L2	Loop 2 Request
22	125	<————	RI	Call Indicator
23				
24	113	————>	ETC	Transmission Clock from DTE
25	142	<————	TI	Active Loop

3.4.2. Rear panel of SNM 50

On the rear panel of the modem SNM50 are available the following devices:

- Power ON/OFF switch
- Interface connector (JA) V.24/V.28, female 25 pins for the DTE cable
- Line plug (SW) for the switched line cable
- Line plug (LL) for the leased line



*Fig.3.6. Rear Panel
of SNM 50*

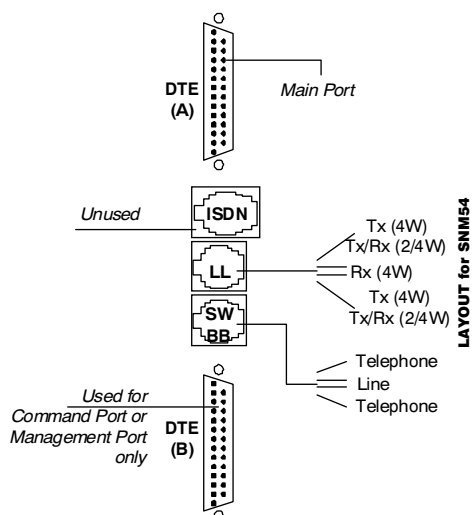
SNM50 has only one interface connector (JA). In this connector there are Main and Command Port

circuits. Command Port is useful for special applications, typically in synchronous, where the main port is not able to manage the AT commands.

See the following table for more details.

Pin	Circuit V.24	DTE-DCE	Ref.	Description
1	101	<————>	PG	Protective ground
2	103	————>	TD	Transmitted Data
3	104	<————	RD	Received Data
4	105	————>	RTS	Request to Send
5	106	<————	CTS	Clear to Send
6	107	<————	DSR	Data Set Ready
7	102	<————>	SG	Signal Ground
8	109	<————	DCD	Data Carrier Detector
9	—		+Vcc	Voltage for Test +
10	—		-Vcc	Voltage for Test -
11				
12				
13				
14	TX_C	————>		Transmitted Data Command Port
15	114	<————	TC	Transmission Clock from DCE
16	RX_C	<————		Received Data Command Port
17	115	<————	RC	Reception Clock
18	141	————>	L3	Loop 2 Request
19				
20	108.1	————>	CDSTL	Modem Connection to the line
20	108.2	————>	DTR	DTR Data terminal ready
21	140	————>	L2	Loop 2 Request
22	125	<————	RI	Call Indicator
23				
24	113	————>	ETC	Transmission Clock from DTE
25	142	<————	TI	Active Loop

3.4.3. Rear Panel SNM54



The modem board SNM54 must be put into the Digicom's rack RMC27 or RMC28, whose dimensions are 19" wide and 4U high (176mm). RMC27 can contain up to 12 boards SNM54 and a power supply unit PSU27, while RMC28 can contain up to 10 boards SNM54 and two power supply units PSU27.

In this section is described the rear panel of RMC27/28 related at one modem board SNM54.

Fig.3.7. Rear Panel of SNM54

On the rear panel of the RMC 27/28 are available the following devices for each SNM54:

- Interface connector (JA) V.24/V.28, female 25 pins for the Main Port (DTE)
- Interface connector (JB) V.24/V.28, female 25 pins for the Command or Management port
- Line plug (SW) for the switched line cable
- Line plug (LL) for the leased line
- Line plug (ISDN) not used by SNM54

See the below table for more details about interface connector JA (Main Port).

Pin	Circuit V.24	DTE-DCE	Ref.	Description
1	101	<————>	PG	Protective ground
2	103	————>	TD	Transmitted Data
3	104	<————	RD	Received Data
4	105	————>	RTS	Request to Send
5	106	<————	CTS	Clear to Send
6	107	<————	DSR	Data Set Ready
7	102	<————>	SG	Signal Ground

Pin	Circuit V.24	DTE-DCE	Ref.	Description
8	109	<————	DCD	Data Carrier Detector
9	—		+Vcc	Voltage for Test +
10	—		-Vcc	Voltage for Test -
11	116	————>		Request for back-up
12				
13	113	<————		Back-up indicator
14	TX_C	————>		Transmitted Data Command Port
15	114	<————	TC	Transmission Clock from DCE
16	RX_C	<————		Received Data Command Port
17	115	<————	RC	Reception Clock
18	141	————>	L3	Loop 2 Request
19				
20	108.1	————>	CDSTL	Modem Connection to the line
20	108.2	————>	DTR	DTR Data terminal ready
21	140	————>	L2	Loop 2 Request
22	125	<————	RI	Call Indicator
23				
24	113	————>	ETC	Transmission Clock from DTE
25	142	<————	TI	Active Loop

See the below table for more details about interface connector JB (Command Port).

Pin	Circuit V.24	DTE-DCE	Ref.	Description
2	103	————>	TD	Transmitted Data
3	104	<————	RD	Received Data
7	102	<————>	SG	Signal Ground

3.5. AT COMMAND

3.5.1. AT Command Summary

Command	Description	Default	SNM49	SNM50	SNM54
AT	Attention	n.a.	*	*	*
A/	Repeat Last AT Command	n.a.	*	*	*
A	Answer Connection	n.a.	*	*	*
B	Full-Duplex/Half Duplex mode	0	*	*	*
C	Carrier Sending	1	*	*	*
D	Dial Command	n.a.	*	*	*
E	Echo ON/OFF	1	*	*	*
F	Line speed selection	0	*	*	*
H	On-Hook	n.a.	*	*	*
I	Inquiry	n.a.	*	*	*
L	Speaker Volume	2	*	*	*
M	Speaker Control	1	*	*	*
Nn&Z	Store Telephone Number in position "n"	n.a.	*	*	*
Nn?	Display Stored Number "n"	n.a.	*	*	*
O	On-Line	n.a.	*	*	*
Q	Quiet Mode	0	*	*	*
Sr=	Set Register "r"	n.a.	*	*	*
Sr?	Read Register "r"	n.a.	*	*	*
V	Verbose Result Codes	1	*	*	*
X	Extended Result Codes	1	*	*	*
Y	Long Space Disconnect	0	*	*	*
Z	Recall User ConFfiguration	n.a.	*	*	*
&A	Multistandard Control	0	*	*	*
&C	C107-C109 Control	0	*	*	*
&D	C108 Options	0	*	*	*
&E	Error Correction	0	*	*	*
&F	Recall Factory ConFfiguration	n.a.	*	*	*
&G	Guard Tone Selection	2	*	*	*
&H	Auto Leased Line Handshake	1		*	*
&I	BuFFer Selection	1	*	*	*
&K	Modem Flow Control	3	*	*	*
&L	Leased Line/Switched Network Selection	0		*	*
&M	Asynchronous/Synchronous Mode	0	*	*	*

Command	Description	DeFault	SNM49	SNM50	SNM54
&N	Display Telephone Number Directory	n.a.	*	*	*
&P	Make/Break Ratio	0	*	*	*
&Q	Asynchronous/Synchronous	0	*	*	*
&R	C106 ON/Control in Synchronous Mode	0	*	*	*
&S	Enable/Disable Front Panel	1	*	*	*
&T	Test Mode	4	*	*	*
&U	DTE Flow Control	0	*	*	*
&V	Dumb Mode Control	0	*	*	*
&W	Store User ConFfiguration	n.a.	*	*	*
&X	Synchronous Clock Source	0	*	*	*
&Y	Command Port	0	*	*	*
&Z	Store a phone number	n.a.	*	*	*
*B	Display Blacklist Numbers	n.a.	*	*	*
*C	Display conFfiguration	n.a.	*	*	*
*D	Asynchronous C108/1 Mode	0	*	*	*
*E	Data Compression	1	*	*	*
*F	Line Flow Control	0	*	*	*
*G	Calling Tone	0	*	*	*
*I	DTE speed selection	0	*	*	*
*K	C106 and XON/XOFF options	0	*	*	*
*L	Transmit level For switched line	10	*	*	*
*N	Display C108/1 Stored Number	n.a.	*	*	*
*O	Overspeed Selection	0	*	*	*
*P	C107 Control	0	*	*	*
*Q	Signal Quality Action Control	1	*	*	*
*S	S-Register Status Display	n.a.	*	*	*
*T	C140-C141 Control	0	*	*	*
*V	Enter V.25bis Mode	n.a.	*	*	*
*X	Sync. Clock Control	1	*	*	*
*Y	Break Mode Control	0	*	*	*
*Z	Store V.25bis C108/1 Number	n.a.	*	*	*
#A	Autoreliable BuFFer/Character Control	0	*	*	*
#B	Dial Line Back-up Control	0		*	*
#E	Detection Phase Control	1	*	*	*
#F	Minimum speed connection	0	*	*	*
#H	Half Duplex Simulation (V.13)	0	*	*	*
#K	XON/XOFF Control in retrain	1	*	*	*

Command	Description	DeFault	SNM49	SNM50	SNM54
#P	Handshake Break	0	*	*	*
#Q	B.E.R. Threshold	1	*	*	*
#T	Remote Control	5	*	*	*
#V	Special mode	0	*	*	*
#W	Dialling preFix control	0	*	*	*
#X	Extended Code	1	*	*	*
!L	Transmit level in leased line	10		*	*
+++	Escape Sequence	n.a.	*	*	*

3.5.2. Dial Commands (ATD)

0:9	Dial digits
*,#	DTMF used only
N	Selects stored telephone number
P	Pulse dialling
R	Reverse mode
T	DTMF dialling
W	Wait for dial tone
@	Wait for quiet
;	Return to Command mode
,	Pause (see S8)
/	Wait for 1/8 sec.
!	On Hook for 1/2 sec.

3.5.3. Additional Commands Used with AT&Z

0:9,*,#	used with ATD commands
<Ctrl>T	Enter a TX string
<Ctrl>R	Wait For RX string
<Ctrl>P	Enter a 0.5 sec. pause
<Ctrl>C	Enter a Call-Back number
<Ctrl>D	Disconnect after handshake
<Ctrl>N	Wait For Call-Back number
<Ctrl>Fn	Recall Factory conFiguration
<Ctrl>Zn	Recall User's conFiguration
<....>	Secure Test
:....:	Mnemonic Delimiters

3.5.4. AT command set description

AT	Attention	Default=n/a
----	-----------	-------------

In AT command state the modem can automatically detect the DTE bit rate and character format, and adapt itself accordingly, as soon as a command is issued.

A/	Repeat last command	Default=n/a
----	---------------------	-------------

This command causes the modem to repeat the last AT command. This command is neither preceded by the Attention Code (AT) nor Followed by a carriage return.

ATA	Answer connection	DeFault=n/a
-----	-------------------	-------------

This command causes the modem to go oFF-hook immediately, answer an incoming telephone call and begin the answer sequence

ATB	HalF/Full Duplex	DeFault=B0
-----	------------------	------------

Selects the working standard and the execution modes of the carrier, fixed or controlled; Accompanied by the F command selects the modulation standard which must be used.

B0 CCITT Modulation standard with fixed carrier. The principal functions implemented are: connection at Handshaking completion in the S7 time, trasmission carrier always fixed, retrain in case of bad line quality, resynchronism in case of bad line quality, disconnection for C109 off for the time indicated by S10.

B2 Not used. This commad don't change anything.

ATC	Carrier Sending	DeFault=C1
-----	-----------------	------------

C0 carrier absent.

C1 carrier present.

Used for testing only.

ATD	Dial command	Default=n/a
-----	--------------	-------------

This command causes the modem to go oFF-hook and automatically originate a telephone call.

“ATDnnnnnn”, executes a dialling sequence.

“ATDNn”, calls number stored in phonebook position n.

ATE Echo ON/OFF Default=E1

This command enables or disables echo characters.

E0 echo disabled.

E1 echo enabled.

ATF Modulation standard Default=F0

This command determines the modem's modulation standard

	bit/s	with #F0	Mode
F0	Multistandard mode		Synchronous/Asynchronous
F1	300	V21	Asynchronous
F3	1200/75(*)	V23	Asynchronous
F4	1200	V22	Synchronous/Asynchronous
F5	2400	V22bis	Synchronous/Asynchronous
F6	4800	V32	Synchronous/Asynchronous
F7	7200	V32bis	Synchronous/Asynchronous
F8	9600	V32	Synchronous/Asynchronous
F9	12000	V32bis	Synchronous/Asynchronous
F10	14400	V32bis	Synchronous/Asynchronous
F11	16800	V34	Synchronous/Asynchronous
F12	19200	V34	Synchronous/Asynchronous
F13	21600	V34	Synchronous/Asynchronous
F14	24000	V34	Synchronous/Asynchronous
F15	26400	V34	Synchronous/Asynchronous
F16	28800	V34	Synchronous/Asynchronous
F17	31200	V34+	Synchronous/Asynchronous
F18	33600	V34+	Synchronous/Asynchronous
(*)	See also command #V		

ATH ON-Hook DeFault=n/a

This command controls the telephone switch hook, causing the modem to go immediately on-hook and terminate a call connection.

H0 disconnects the modem.

H1 connects the modem to the telephone line, but the modem is not in data mode (useful for testing).

ATI Inquiry DeFault=n/a

This command requests the product code of the modem and other information regarding its Firmware.

- I0 modem type.
- I1 software revision level.
- I2 checksum EPROM
- I3 identification in S38
- I4 product code
- I8 revision level modules

ATL Speaker Volume DeFault=L2

This command controls the volume of the modem's internal speaker.

- L0 low speaker volume.
- L1 low speaker volume.
- L2 medium speaker volume.
- L3 high speaker volume.

ATM Speaker Control DeFault=M1

This command determines whether the modem's internal speaker is enabled.

- M0 disables the speaker.
- M1 disables the speaker when a remote carrier signal is present.
- M2 speaker is always On.
- M3 disables the speaker when a remote carrier signal is present and while the modem is dialling.

ATNn&Z Store telephone number DeFault=n/a

This command stores a dial string in location "n" to dial with ATDNn (Dial stored number) command or under control of DTR (synchronous operation). If "n" is omitted, the number is stored in location 0. If a telephone number is already stored in this location, the new number will be written over the old number. Mnemonics can be stored with each telephone number, and numbers can be secured individually, masking subsequent display.

For instance "ATNn&Z0,123456" stores the number 0,123456 in the "n" position of the dial directory.

This command must be the last in the command string.

ATNn? Display store number "n" DeFault=n/a

This command displays a stored number "n" of the dial directory.

ATO Goes back On-Line DeFault=n/a

This command brings the modem back On-Line From an escape sequence.

O0 Goes back On-Line.

ATQ Quiet Mode DeFault=Q0

This command enables or disables result codes From DCE to DTE. The commands are always executed.

Q0 messages or result codes are sent.

Q1 messages or result codes are not sent.

ATSr= Set register “r” DeFault=n/a

This command allows the user to change modem conFIGuration parameters stored in the S-Registers.

Sr=xxx where r is between 0 and 99, and xxx is between 0 and a maximum number (typically 0 to 255) speciFied in each Register.

ATSr? Read register “r” DeFault=n/a

This command is used to test the value oF the Register. Also see *S command.

ATV Verbose result codes DeFault=V1

This command determines whether the modem sends the result codes to the DTE in English (Verbose Mode) or as digit codes (Terse Mode). IF the results are not being returned to a program that requires digit responses, use oF word codes is recommended. Digit codes are Followed by <CR> ; verbouse codes are Followed by <CR> and <LF>.

V0 selects digit codes; digit code is Followed by a carriage return.

V1 selects word codes; word code is preceded and Followed by a carriage return and line Feed.

ATX Extended result codes DeFault=X1

This command provides the user with an extended set oF result codes. As result codes are enabled and disabled, the modem responds to or ignores conditions such as dial tone and busy signal.

X0 AT compatible.

X1 The modem does not recognize dial tone and busy signal.

X2 Looks For a dial tone.

X3 IF a busy signal is received aFter dialling, the modem gives the “BUSY” signal to the DTE.

X4 The modem listens For a dial tone beFore dialling and recognizing a busy signal.

Digit code	Result code	X0	X1	X2	X3	X4
0	OK	*	*	*	*	*
1	CONNECT	*				
1	CONNECT 300		*	*	*	*
2	RING	*	*	*	*	*
3	NO CARRIER	*	*	*	*	*
4	ERROR	*	*	*	*	*
5	CONNECT 1200		*	*	*	*
6	NO DIALTONE			*		*
7	BUSY				*	*
8	NO ANSWER	*	*	*	*	*
9	... Not Used					
10	CONNECT 2400		*	*	*	*
11	CONNECT V23		*	*	*	*
12	RDL GRANTED		*	*	*	*
13	RDL DENIED	4	*	*	*	*
14	LDL GRANTED		*	*	*	*
15	(Aborted!)	3	*	*	*	*
16	DOWN-LOAD IN PROGRESS		*	*	*	*
17	TPG GRANTED		*	*	*	*
18	TPG DENIED	4	*	*	*	*
19	/V42BIS		*	*	*	*
20	/REL5		*	*	*	*
21	/V42		*	*	*	*
22	/REL		*	*	*	*
23	/BUF		*	*	*	*
24	AUTOLOGON FAILED	3	*	*	*	*
25	CALLBACK PROGRESS		*	*	*	*
26	... Not Used					
27	DELAYED	4	*	*	*	*
28	FORBIDDEN	4	*	*	*	*
29	NO MEMORY	4	*	*	*	*
30	CONNECT 4800		*	*	*	*
31	CONNECT 9600		*	*	*	*
32	CONNECT 9600T		*	*	*	*
33	CONNECT 19200		*	*	*	*
34	CONNECT 38400		*	*	*	*
35	CONNECT 7200		*	*	*	*
36	CONNECT 12000		*	*	*	*
37	CONNECT 14400		*	*	*	*

Digit code	Result code	X0	X1	X2	X3	X4
38..58	... Not Used					
59	CONNECT 16800		*	*	*	*
60	... Not Used					
61	CONNECT 21600		*	*	*	*
62	CONNECT 24000		*	*	*	*
63	CONNECT 26400		*	*	*	*
64	CONNECT 28800		*	*	*	*
65	CONNECT 31200		*	*	*	*
66	CONNECT 33600		*	*	*	*
67	CONNECT 57600		*	*	*	*
68	CONNECT 115200		*	*	*	*

Numbers 3 and 4 indicate that message sent, due to AT modems compatibility, which will be equivalent to the above table, when the modem is configured X0. (For example RDL DENIED will be replaced by ERROR 4).

ATY Long Space Disconnect DeFault=Y0

This command controls the long space disconnected Feature. When enabled, the modem will disconnect itself From the telephone line (go on-hook) aFter receiving a continuous BREAK From the remote modem For 1.6 seconds. IF Long Space Disconnect is enabled, the modem sends a continuous BREAK For 4 seconds aFter receiving the ATH0 command or when DTR is lowered if the AT&D2 (Data Terminal Ready) option is selected.

Y0 Long space disconnect disabled.

Y1 Long space disconnect enabled.

ATZ Recall User ConFfiguration DeFault=n/a

This command resets the modem and loads the user deFined conFfiguration stored with &W command.

During remote conFfiguration operation this command does not reset the modem but loads the user deFined conFfiguration in the temporary conFfiguration.



The user can store up to 10 conFfigurations; they are stored in the momory locations From 0 to 9.

Zn Loads the user deFined conFfiguration stored with the command AT&Wn.

AT&A Multistandard Control**DeFault=&A0**

This command controls the multistandard detection Feature of the modem which allows the modem to Fall Forward and Fallback if the signalling rate of the called modem does not match the local DTE. When enabled, a handshake is attempted at the highest rate possible in its multi-mode sequence; if unsuccessful, the lower speeds are tried until the call is established. When disabled, the modem will attempt to initially handshake at the DTE data rate set by the last AT command. Used when the modem is programmed For multistandard operation (command ATF0).

&A0 multistandard detection disabled; multistandard starting From the DTE speed.

&A1 multistandard detection enabled. The modem will start the handshake at the maximum speed available on the line.

AT&C C107-C109 Control**Default=&C0**

C107 and C109 control. (Also see *P2 and *P3 commands)

&C0 C107 and C109 forced On.

&C1 C107 and C109 are related to the modulation standard.

&C2 C107 Forced On.

&C3 C109 Forced On.

&C4 C107 and C109 Forced On; at the disconnection C109 goes OFF For 2 seconds.

&C5 C107 and C109 Forced On; OFF-Line condition: if C108 goes OFF, C107 and C109 go OFF For 500 ms; On-Line condition: if modem disconnects, C107 and C109 go OFF For 500 ms.

AT&D C108 Options**Default=&D0**

This command determines how the modem responds to the presence or absence of DTR (Data Terminal Ready) From the terminal.

&D0 The modem ignores the true status of V.24 DTR (C108) pin condition and always treats it as ON.

&D1 The modem returns to the command state when detecting an ON to OFF transition on DTR.

&D2 C108 handled as C108.2; the modem drops the line and goes to idle mode when an ON to OFF transition of DTR (C108) is detected. Automatic answering and calling are disabled until DTR goes to ON condition. IF the modem is configured a For leased line, an OFF to

- ON transition of C108 brings the modem in handshake.
- &D3 Same as AT&D2, but the modem assumes initialization state if it detects an ON to OFF transition on DTR.

AT&E Error Correction DeFault=&E0

This command controls the integrated error detection and correction Feature (MNP and/or V.42). When enabled, the received data is buffered and checked for errors. If errors are detected, the modem requests retransmission of the data from the sending modem. The &E command must be used when *E (Data Compression) is enabled.

*See also *E command*

- &E0 Error Correction disabled.
- &E1 Same as &E6 with Autoreliable Buffer always active independent #A and #E commands. Autoreliable character active if S48 is different from 255.
- &E2 LAPM sequence in Autoreliable mode; normal data mode if LAPM not detected.
- &E3 LAPM sequence in reliable mode, disconnection if it fails.
- &E4 MNP correction mode in Autoreliable; normal data mode if MNP is not detected.
- &E5 MNP error correction in reliable mode; Forced disconnection if MNP not detected.
- &E6 LAPM and MNP in autoreliable mode; normal data mode if no error corrector detected.
- &E7 LAPM and MNP in reliable mode; disconnection if no error corrector is detected.

AT&F Recall Factory Configuration DeFault=n/a

This command causes the modem to overwrite the current command options with the Factory standard options. This command may be used also for resetting the modem. During remote configuration operations this command does not reset the modem but loads the Factory configuration in the temporary configuration.

&Fn loads as configuration options the Factory configuration number "n".

Example: To store the modem default configuration (and indirectly activate a reset of the active configuration) enter AT&F command (AT&F0 equivalent). Remember to store it entering AT&W command.

There are 10 Factory configurations (see for more details Chapter 5.5).

AT&G Guard Tone Selection **DeFault=&G2**

This command selects guard tones to be generated by the modem.

&G0 no guard tones are generated.

&G2 1800Hz tone generated.

AT&H Auto Leased Line Handshake **DeFault=&H1**

This command enables or disables the automatic leased line handshake Feature. When enabled the modem will automatically try to re-handshake aFter being disconnected. This also pertains to dial back-up. AFter the leased line becomes disconnected, the modems will try once to reconnect beFore switching to the dial line. This is the Factory deFault. IF this Feature is disabled, then aFter each leased line disconnect, the handshake must be manually re-initiated.

&H0 disables leased line auto-handshake.

&H1 enables leased line auto-handshake.

When &H1 is selected, the modem automatically tries to reconnect immediately aFter it has been disconnected.

AT&I InterFace BuFFer **DeFault=&I1**

This command allows the data rate oF the DTE to be set at a uniForm rate, regardless oF the rate determined by the communication Format selected. This Feature is useFul For error correction and data compression Features oF the modem. See &K command (Flow control).

&I0 Constant speed interFace to disabled DTE.

&I1 Constant speed interFace enabled; CONNECT message indicates the connect rate. Parity is transFered in transparent.

&I2 Constant speed interFace enabled; CONNECT message indicates the DTE rate. Parity is transFered in transparent mode.

&I3 Constant speed interFace enabled; CONNECT message indicates the connect rate. Parity is reconstructed by the modem.

AT&K Modem Flow Control **DeFault=&K3**

This command allows the user to select a method oF Flow control oF inFormation From the terminal to the modem. This command is used to set Flow control with the error detection (&En) and/or the constant speed interFace (&In) Features; see S39 and S40. Using the #K command this Feature can be extended also during the retrain phase.

&K0 Flow control disabled.

- &K1 XON/XOFF Flow control selected.
- &K2 C106 Flow control selected.
- &K3 XON/XOFF (inband) and hardware (C106) Flow control enabled.

AT&L Leased Line/Switched Network Selection DeFault=&L0

This command selects a leased line or switched Network telephone connection.
Not available on SNM49.

- &L0 switched line.
- &L1 2 wire leased line.
- &L2 4 wire leased line.

AT&M Asynchronous/Synchronous Mode DeFault=&M0

This command selects asynchronous or synchronous terminal modes of operation. This command also provides manual, automatic dialling of a stored number under DTR control.

- &M0 Selects asynchronous operation For dialling and data transmission.
- &M1 Synchronous mode 1. Call initiated with asynchronous terminal, via MAIN PORT (or COMMAND PORT if enabled), manual handset or Front panel dialling and terminated by the loss of DTR. With the modem on-line the MAIN PORT is enabled For synchronous data transmission.
- &M2 Synchronous mode 2. Modem dials the number stored in the memory location indicated in S63 register when DTR is raised; communication is synchronous. The modem hangs up and returns to command mode when DTR is lowered. An asynchronous terminal is required to enter or change the stored telephone number.
- &M3 Synchronous mode 3. The call begins manually by a telephone connected to the "PHONE" jack on the rear panel of the modem and DTR must be ON before dialling. After dialling a call manually, wait for the answer tone, momentarily press the DATA/ENTER key to go on-line, and hang up the telephone. Refer to the DTE operator's manual for instructions on controlling the DTR circuit. Once in data mode, the modem operates synchronously, hangs up and returns to command mode when DTR is lowered. C106 (CTS) is OFF until the complete connection with the remote modem regardless of AT&R setting, necessary for 3720, 3725 and 3745 applications.

AT&N Display Telephone Number Directory DeFault=n/a

This command displays the entire telephone directory on the DTE screen.

&N Displays telephone directory.

&N99 Deletes entire telephone directory.

AT&P Make/Break Ratio DeFault=&P0

This command allows the user to select the make/Break ratio (oFF-hook to on-hook) interval used For pulse dialling.

&P0 40 make; 60 break.

&P1 33 make; 67 break.

AT&R C106 ON/Control in Synchronous Mode DeFault=&R0

This command controls the interaction oF C105/C106 signals in synchronous mode.

&R0 C106 Follows C105. A Register S26 value greater than 0 delays C106 reaction time by the value selected (0 to 2.55 seconds).

&R1 Modem ignores C105; C106 is always On except when the modem goes on-hook and during retrain and handshake.

&R2 C106 is always ON.

&R3 C106 always follows C105 (off-line, on-line, retrain, test, ecc.)

V.25bis HDLC C106 follows C108.

With the option &R it is possible to activate the standard CCITT C106 Followed by C108 in OFF LINE and C105 in ON LINE.

To activate this Feature, select &R0, store the conFiguration and activate V.25bis HDLC.

AT&S Enable/Disable Front Panel DeFault=&S1

This command enables or disables front panel keys.

&S0 Front panel disabled.

&S1 Front panel enabled.

AT&T Activates Test DeFault=&T4

Activates the modem's test.

&T0 Ends the test in execution.

&T1 Activates loop 3.

&T2 Not Used.

&T3 Activates local loop 2.

- &T4 Abilitates the modem to carry out a request oF loop 2 received From the line.
- &T5 Disables the modem From carrying out a request oF loop 2 received From the line.
- &T6 Sends an activation request oF remote loop 2.
- &T7 Sends an activation request oF remote loop 2 whit a self test.
- &T8 Activates loop 3 with a self-test.



Register S18 establishes a test period which can be used with an active test sequence to cause the modem to end the test aFter the time (indicated in the Register).

AT&U DTE Flow Control

DeFault=&U0

Data From the modem to the DTE is immediately stopped when XOFF stored in the S50 register is sent by the terminal (For example, printer not ready to accept data). Flow is restored when the XON character stored in Register S49 is issued to the modem.

- &U0 Flow control disabled.
- &U1 Flow control enabled with XON/XOFF. XON starts a transmission From DCE.
- &U2 Flow control enabled with pass through remote terminal.
- &U3 Not Used.
- &U4 C105 Flow control.
- &U5 C105 and XON/XOFF Flow control.
- &U6 C105 and XON/XOFF Flow control; XON/XOFF control pass through remote terminal.
- &U7 Not Used.

AT&V Dumb Mode Control

Default=&V0

This command controls access to the command mode.

- &V0 Normal command mode access selected.
- &V1 Command mode access via escape sequence disabled.
- &V2 Dumb mode; all commands are ignored. This situation can be changed only through the front panel.

AT&W Store User ConFfiguration

Default=n/a

This command stores a user-defined configuration in the modem's non volatile memory. During operations in remote configuration this command

stores the temporary configuration as user-defined configuration.

The last conFiguRation saved using AT&W is automatically loaded when the modem is turned ON.

&Wn Stores user-defined configuration in location n.

&W99 The 10 Factory configurations are written in the 10 user-defined configurations.

For example: You sent the modem a series of parameters to create a configuration (user-deFined). To store the new configuration in one of the 10 modem's nonvolatile memory locations (for example location 4) enter the command: AT&W4.

AT&X Synchronous Clock Source Default=&X0

This command determines the synchronous clock source at the DTE interface when the modem is in data mode (Synchronous only).

&X0 Internal clock.

&X1 External clock.

&X2 Slave clock.

AT&Y Command Port Default=&Y0

This command enables/disables Command serial Port. Command Port is available on Main Connector, as shown in 3.4.2.

&Y0 Command Port disabled

&Y1 Command Port enabled

The AT&Y1 command is valid only in synchronous and asynchronous direct mode.

Use condition of Main and Command serial Port are shown in the following table:

MODE	AT&Y	OFF-LINE	ON-LINE	ON-LINE ESCAPE
Sync	0	main	main	main
	1	command	main	command
Async, buffer and/or EC	1	main	main	main
Async, direct mode	1	command	main	command

AT*B Display Blacklist Numbers deFault=n/a

This command displays black list numbers.

*B0 Displays delayed and Forbidden numbers.

*B1 Displays delayed numbers.

*B2 Displays Forbidden numbers.

AT*C Display ConFiguration DeFault=n/a

This command displays the active configuration of the modem. At the end of the list configuration is possible to display the error message relative to the connection state.

AT*D Asynchronous C108/1 Mode Default=*D0

This command enables C108/1 direct call in asynchronous mode. The selected number location of the telephone directory is defined in Register S63. The ON/OFF transition of C108 causes the disconnection of the modem. See also AT*Z command.

*D0 C108/1 disabled.

*D1 C108/1 enabled with C106 ON in OFF-LINE.

*D2 C108/1 enabled with C106 OFF in OFF-LINE.

AT*E Data Compression Default=*E1

This command controls the integral data compression Feature of the modem during error-corrected connection.

*E0 Data compression operation disabled.

*E1 Data compression operation enabled (MNP5 or V.42bis).

AT*F Line Flow Control DeFault=*F0

This command controls the Flow of data between local and remote modems in response to an XON/XOFF sequence between the local terminal and the modem (Asynchronous only) using characters defined in S39 and S40 registers.

*F0 Remote Flow control disabled.

*F1 Remote Flow control enabled.

AT*G Calling Tone DeFault=*G0

This command enables the CCITT recommendation V.25 calling tone; a pulsing intermittent 1300Hz tone generated by the originating modem during the connection phase of a call.

*G0 Calling tone disabled.

*G1 Calling tone enabled.

AT*I DTE Speed Control Default=*I0

This command controls DTE interface data rate

*I0 Autospeed rate active From 300bps to 115200.

- *I1 DTE speed 300 bps.
- *I4 DTE speed 1200 bps.
- *I5 DTE speed 2400 bps.
- *I6 DTE speed 4800 bps.
- *I7 DTE speed 7200 bps.
- *I8 DTE speed 9600 bps.
- *I10 DTE speed 14400 bps.
- *I11 DTE speed 19200 bps.
- *I13 DTE speed 38400 bps.
- *I14 DTE speed 57600 bps.
- *I15 DTE speed 115200 bps.

AT*K C106 and XON/XOFF Options Default=*K0

This command selects the C106 and XON/XOFF options during handshaking, connection and disconnection phases; C106 can be forced OFF in OFF-LINE or go OFF during the handshake; after the connection the modem sends a XON to the DTE, and during the disconnection sends a XOFF. This command is not influenced by &K and #K commands and it is active only in asynchronous mode. XON/XOFF option is active only when buffer or error corrector are enabled; the decimal value for XON and XOFF is in S39 and S40 registers.

- *K0 C106 Fixed ON.
- *K1 Only XON/XOFF during connection and disconnection.
- *K2 Only C106 OFF during handshake.
- *K3 C106 OFF during handshake and XON/XOFF during connection and disconnection.
- *K4 Only C106 OFF in OFF-LINE (C106 Follows C109).
- *K5 C106 OFF in OFF-LINE (C106 Follows C109) and XON/XOFF during connection and disconnection.

AT*L Transmission Level in Switched Line Default=*10

This command selects the transmission level when the modem operates in Switched line: it's possible to set-up the TX level from -3dBm to -15dBm by 1dB step.

- *L3 TX level in Switched line -3dBm
- *L4 TX level in Switched line -4dBm
- *Ln TX level in Switched line -ndBm
- *L15 TX level in Switched line -15dBm

AT*N Display C108/1 Stored Number DeFault=n/a

This command displays the stored telephone number For C108/1 direct call in V.25bis mode.

AT*O Overspeed Selection Default=O0

This command selects the overspeed range.

*O0 overspeed +1%:-2.5%.

*O1 overspeed +2.3%:-2.5%.

AT*P C107 Control Default=*P0

Special handling of C107 (DSR); this command is active only with C107 controlled (&C1 or &C3).

*P0 C107 standard.

*P1 C107 Wink; after an aborted call C107 goes ON For 200.

*P2 C107 follows C109 during handshaking.

*P3 C107 follows C109 during handshaking + C107 Wink.

AT*Q Signal quality Action Control DeFault=*Q1

This command controls the Signal Quality Action. This action depends on #Q command setting.

The modem disconnects when *Q is not 0 and after S61 Retrain or Fallback in S62 time.

Command is valid in V.34, V.32bis, V.32 and V.22bis mode.

*Q0 Disabled

*Q1 Retrain

*Q2 Fall Back (in V.34,V.32bis, V.32 or V.22bis mode)

*Q3 Disconnects after the first aborted retrain.

AT*S S-Register Status Display DeFault=n/a

This command displays the values stored in the modem's S- Registers.

AT*T C140-C141 Control Default=*T0

This command enables C140 and C141 signal interface.

*T0 C140 and C141 disabled.

*T1 only C140 enabled.

*T2 only C141 enabled.

*T3 C140 and C141 enabled.

*T4 C140 and C141 enabled. C141 to make a request of loop 3 with modem on-line.

AT*V Enter V.25bis Mode Default=n/a

This command enables V.25bis mode.

See also AT&Y command.

*V0 V.25 bis in C108/2 ASYNC.

*V1 V.25bis in C108/1 SYNC/ASYNC according AT&M.

*V2 V.25bis in C108/2 HDLC (NRZ - ASCII).

*V7 Returns in AT mode (useful in Remote Configuration).

AT*X Sync.Clock Control Default=*X1

This command will Force the modem's transmit and receive clocks at the DTE interface and during BACK-UP LL/SW.

*X0 synchronous clocks are On in data mode only.

*X1 synchronous clocks are always On.

AT*Y Break Mode Control Default=*Y0

This command allows the user to specify how break transmission is implemented with Buffer or Error Corrector active.

*Y0 Break issued by the terminal is immediately passed through the modem bypassing the buFFers (Expedited, non-destructive).

*Y1 Break issued by the terminal is immediately passed through the modem and the buFFers are emptied (expedited, destructive).

*Y2 Break issued by the terminal is passed through the modem in sequence with the data (non-expedited, non-destructive).

*Y3 Break signal is ignored.

AT*Z V.25bis C108/1 Store Number Default=n/a

This command stores a number For C108/1 operation in V.25bis. The syntax is AT*Zxxxx, where xxxx represents the telephone number inserted with V.25bis Format.

The command: AT*ZP0,123456<CR>

The transition OFF/ON oF C108 activates a selection oF the Following number 0,123456 with pulse mode.

*Z command must be the last one oF the command string.

AT#A Autoreliable Buffer/Character Control DeFault=#A0

This command controls the Autoreliable Buffer and Autoreliable character during MNP or V.42 negotiation. The Autoreliable Buffer stores the data (200 characters) in the originate modem during Error Correction negotiation. The

Autoreliable buffer is a special “wake up” character (0DH, carriage return) that disables the negotiation of Error Corrector and connects the modem in buffer mode.

- #A0 Autoreliable BuFFer and character disabled.
- #A1 Only Autoreliable character enabled.
- #A2 Only Autoreliable BuFFer enabled.
- #A3 Autoreliable BuFFer and character enabled.

AUTORELIABLE BUFFER

It is a Feature which allows to store user’s data during the negotiation of the error corrector MNP or V.42.

Example: modem A ORIGINATE with MNP, modem B Answer senza MNP. Modem A makes the call, modem B answers the call and connects itself immediately after the handshake and the DTE hear connected starts sending data; modem A after the handshake tries to negotiate the error corrector For about 10 seconds; only after this will it go in data mode.

The Function Autoreliable BuFFer allows modem A to store the data arrived From the telephone line during the error corrector negotiation and send them to the connected DTE at the end of this operation.

If received more than 200 characters from the line, modem A breaks the error corrector negotiates and goes in data mode.

AUTORELIABLE CHARACTER

This feature makes possible to stop the error corrector negotiation when a particular character is received from the line (default character is Carriage Return: 13 Hex).



The Autoreliable Buffer and Autoreliable Character features are active both on ORIGINATE and ANSWER modems, but only with MNP or V.42 with detection phase enabled.

AT#B Dial Line Back-Up Control

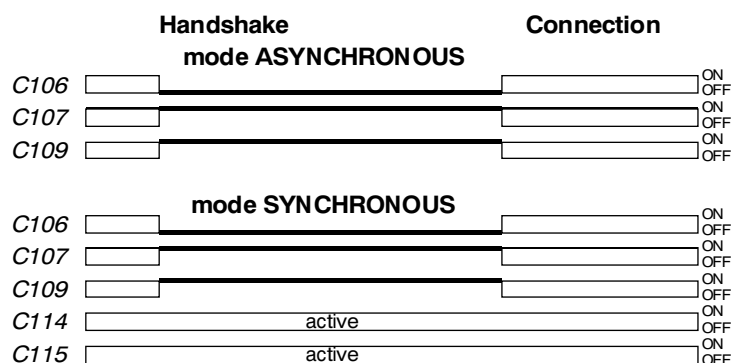
DeFault=#B0

This command enables/disables a Dial Line Back-up.
Not available on SNM49.

The modem can detect the down condition on the leased line passing automatically on the dial up one. The modem will call the telephone numbers stored in the non volatile memory so as to connect the remote modem. The modem can come back to the leased line after the expiration of the time stored in the S28 register or the detection of the on condition of the leased line.

During the back-up operation, it is possible to stay on the switched line for one minute, after the look back; this feature is useful to avoid continuous switching between the switched and leased line if there is not synchronization between the modems (see S78 register).

- #B0 Dial line back-up disabled.
- #B1 Dial line back-up enabled, when the leased Lines is in Failure, the modem automatically switch to the switched line permanently
- #B2 Dial line back-up enabled with automatic Look Back (see S28 register). When leased line is in failure, the modem automatically uses switched line for time set-up on register S28.
- #B4 Dial Line back-up enabled C116 controlled. In this case back-up is managed across C116 DTE interface circuit (C116ON= Switched, C116OFF=Leased).
- #B5 Like #B2 with different management of ledads:



AT#E Enable Detection Phase Default=#E1

This command enables/disables the Detection Phase before the negotiation of LAPM protocol with commands AT&E1, AT&E2, AT&E3, AT&E6 and AT&E7.

- #E0 Detection Phase disabled.
- #E1 Detection Phase enabled.

AT#F Minimum Line Speed DeFault=#F0

This command enables/disables a minimum line speed operation. It works in conjunction with ATF(when it is (0) that define the maximum line speed operation.

#F0	Minimum speed selection disabled: modem works only with ATF command	
#F1	300	V21
#F3	1200/75(*)	V23
#F4	1200	V22
#F5	2400	V22bis
#F6	4800	V32/V34
#F7	7200	V32bis/V34
#F8	9600	V32/V34
#F9	12000	V32bis/V34
#F10	14400	V32bis/V34
#F11	16800	V34
#F12	19200	V34
#F13	21600	V34
#F14	24000	V34
#F15	26400	V34
#F16	28800	V34
#F17	31200	V34Plus
#F18	33600	V34Plus

Example 1: Modem in multistandard:

ATF0&Ax

Example 2: Modem set-up from 9600 to 28800bps

ATF16#F8 (Max=ATF16; Min=ATF8)

Example 3: Modem set-up from 4800 to 33600bps

ATF18#F6 (Max=ATF18; Min=ATF6)

AT#H Half Duplex Simulation (V.13) Default=#H0

This command enables half duplex simulation mode (V.13 recommendation). It is possible to use this command with V.22, V.22bis, V.32, V.32bis and V.34 in synchronous mode.

#H0 Half-Duplex simulation disabled.

#H1 Half-Duplex simulation enabled.

AT#K XON/XOFF Control during retrain Default=#K0

Selects C106 and XON/XOFF (flow control) handling during the retraining phases. When retrain starts the modem forces C106 OFF and/or sends a XOFF; at the end of retrain it forces C106 ON and/or sends a XON.

This command is influenced by the setting of &K and is active only in asynchronous mode with MNP, V.42 or Buffer (see &E and &I commands). The decimal value for XON and XOFF is stored in S39 and S40 registers. See command *K for flow control during the connection and disconnection phases.

#K0 No action.

#K1 Flow control option during retrain follows &K command selection.

AT#P Handshake Break Default=#P0

This command enables/disables handshake abort if DTE sends data during handshake.

#P0 Handshake abort enabled.

#P1 Handshake abort disabled.

AT#Q B.E.R. Threshold Default=#Q1

This command defines the Bit Error Rate Threshold to initiate a Retrain of Fall Back/Forward.

#Q0 Standard B.E.R. threshold: SQ=3 equivalent at BER of $1 \cdot 10^{-5}$

#Q1 Alternative B.E.R. threshold.: SQ=2 equivalent at BER of $1 \cdot 10^{-3}$

AT#T Remote Control Default#T5

This command enables/disables the “down-load” or “remote access control”. The down-load sends automatically 2 user configurations indicated respectively in the registers S65 and S66. The default values are S65=9 and S66=255 (disabled). After a request for down-load the modem sends the configuration(s) to the remote one and then returns in data mode automatically.

The remote access control is activated by AT#T6 and indicated with a new prompt TPG>OK. To end this procedure type AT#T0 from Escape mode. You can activate an autologon sequence stored in a memory location. The register S44 works as memory location pointer.

#T0 End of remote access control.

#T4 Enables the modem to receive a remote access control or down-load request; it also enables the modem to execute a loop 2 remote regardless AT&T5 command.

#T5 disables the modem to receive a remote access control or down load request.

#T6 sends a request for remote access control.

#T7 sends a request for a down-load of the configurations indicated by the registers S65 and S66.

AT#V Special Mode Default=#V0

This command selects special functioning mode.

Standard V.23 Full Duplex

#V0 V.23 Automatic Mode:Org.=TX 75bps - RX 1200bps.
 Ans.=TX 1200bps - RX 75bps.
#V1 TX 75bps -RX 1200bps fixed.
#V2 TX 1200bps - RX 75bps fixed.

AT#W Dialling Prefix Default=#W0

This command enables the automatic dialling of a prefix before every number.
This prefix is stored in position 19 of the memory. This feature is useful for
calling from PABX.

#W0 Function disabled

#W1 Function enabled

Example.

You must call the number "263122" from a PABX where it is necessary to dial
"0" to have access to the public telephone line.

The calling command must be: ATD0,263122.

You can avoid inserting the dial prefix "0" storing this number in the position
19 of the memory and activating this feature.

AT#W1 activation of the feature

ATN19&Z0 storing of the prefix

ATD263122 dialling command

AT#X Extended Code Default=#X1

This command enables/disables the extended code to CONNECT messages
to indicate Buffer or Error Correction activation (see ATX command).

#X0 No /xxx message enabled.

#X1 Only /BUF and /REL messages enabled.

#X2 All /xxx messages enabled.

#X3 Like previous command in AT mode. ONL/OFL messages disabled
in V.25bis.

AT!L Trasmission Level in Leased Line Default=!10

This command define the trasmit level when the modem operates in Leased
line: it's possible to set-up the TX level from -3dBm to -15dBm by 1dB
step.

!L3 TX level in Leased -3dBm
 !L4 TX level in Leased -4dBm
 !Ln TX level in Leased -ndBm
 !L15 TX level in Leased -15dBm

+++ Escape Sequence **Default=n/a**

This command is used to get into the command mode during data connection. Escape character (typically "+") is stored in S2 register. S12 register (guard time) contains minimum time before and after escape sequence. It also defines maximum time between escape characters.

3.5.5. Syntax for Dial Command (ATD)

ATD0..9 Dial digits **Default=n/a**

Represents digits of the telephone number.

To dial this nr: 06987654 the following string: ATD06987654<CR> must be sent to the modem.

ATD*,# DTMF used only **Default=n/a**

These digits are reserved for DTMF selection.

ATDNn Select Stored Telephone Number **Default=n/a**

The modem calls the number stored in memory location n.

"ATDNn" selects the telephone number linked to memory location n.

ATDP Pulse Dial **Default=P**

Instructs the modem to pulse dial a telephone number.

ATDR Reverse Mode **Default=n/a**

This command allows the user to call a modem used only for originating, not answering calls. The modem originates the call in answer mode.

ATDT DTMF Dial **Default=T**

Instructs the modem to dial the telephone number in tone mode.

ATDW Wait for dial Tone **Default=n/a**

Instructs the modem to wait 5 sec. for a dial tone before dialling the rest of the dial string.

ATD@ Wait for Quiet **Default=n/a**

Causes the modem to wait until it detects 5 seconds of silence on the line before continuing.

ATD; Return to Command Mode **Default=n/a**

When the semicolon is placed at the end of a dial string, this causes the modem to return to the command state after dialling a number without disconnecting the call.

ATD, Pause (S8 sec.) **Default=n/a**

This command instructs the modem to pause during dialling for the number of seconds set by the value of Register S8.

ATD/ Wait for 1/8 sec. **Default=n/a**

This command identifies one or more alternate telephone numbers that are dialled if the modem cannot establish a connection with the primary number.

ATD! Off Hook for 1/2 sec. **Default=n/a**

This command causes the modem to go from off-hook to on-hook for 1/2 second.

3.5.6. Syntax for Store command (AT&Z)**0-9,*,# Used with ATD commands**

It's the syntax to store a telephone number into the modem's phonebook

<Ctrl>T Enters a TX string **Hex = 14**

This command inserts a string that will be sent during an autologon procedure or password exchange. If you wish to insert a control character (for example The Bell 07 Hex) digit “^G”.

<Ctrl>R Wait for RX string **Hex = 12**

This command inserts a string. The line will wait 30 sec. for it during an autologon procedure or password exchange. If you wish to insert a control character (for example The bell 07 Hex) digit “^G”.

<Ctrl>P Enters a 0.5 sec. pause **Hex = 10**

This command inserts a pause during an autologon procedure or a password exchange.

<Ctrl>C Enters a Call-Back number Hex = 03

This command inserts a telephone number to use during a call-back procedure, usually after a password.

<Ctrl>D Disconnect after handshake Hex = 4

This command allows to disconnect the modem after the handshake. It's useful for call-back procedure.

<Ctrl>N Waits for Call-Back number Hex = 0E

This command waits for 30 sec.in order to receive the telephone number from the line in order to use it for call-back.

<Ctrl>Fn Recalls Factory configuration Hex = 06

This command inserts a Factory configuration reference to use before the calling.

<Ctrl>Zn Recalls User's configuration Hex = 1A

This command inserts User's configuration reference to use before the calling.

<....> Secure Test

Another important feature of modems SNM49, SNM50, SNM54 is the hidden field storage of telephone numbers. Secure numbers will not be shown when memory contents are displayed or when the number is dialled. To reserve a number when storing it, enclose the number in brackets.

:...: Mnemonic Delimiters

Text can be stored with a telephone number, allowing the user to reference numbers using mnemonics. Any text to be stored is enclosed in colons.

3.6. CLOCK & NOTEBOOK

In this section you can find informations about:

3.6.1. Clock and notebook Command and Response Summary

3.6.2. Weekly and periodic notebook

3.6.3. Clock set-up

3.6.4. Notebook configuration

3.6.5. Weekly Notebook configuration

3.6.6. Periodic Notebook configuration

3.6.7. Notebook special commands

Using the modem real time clock and the easy instructions set it is possible to edit special automatic procedures implemented by the modem itself. These procedures, loaded into a non volatile memory, are structured like a Notebook, where in predefined slots time (hour, minute and data) are written the action to make. Some example are:

- Change the modem configuration in a defined day period: for instance stop in the night every incoming call.
- Make a call to a predefined telephone number: for instance automatic upload procedures
- Change the modem configuration in a defined year period (Christmas, Summer or National holiday)

3.6.1. Clock and notebook Command and Response Summary

Command	Description
ATW=DW-DD/MM/YY-hh:mm:ss	Clock set-up
ATW?	Display time and date
ATW99	Notebook debug
AT%C0	Display weekly notebook
AT%C1	Display periodic notebook number 1
AT%Cn	Display periodic notebook number n (1-9)
AT%D0	Delete weekly notebook
AT%D0=(DW,DW,...-*-*)	Delete daily action into the weekly notebook (0)
AT%D0=(*-hh:mm-*)	Delete hour action into the weekly notebook (0)
AT%D0=(*-*-c)	Delete into the weekly notebook (0) the clock configuration c
AT%Dn	Delete periodic notebook number n (1-9)
AT%Dn=(*-*-DW,DW....-*-*)	Delete into the n periodic notebook daily configuration
AT%Dn=(*-*-*-hh:mm-*)	Delete into the n periodic notebook time configuration

AT%Dn=(*.*.*-c)	Delete into the n periodic notebook clock configuration (CONF)
AT%Kn=(Cx,Rx,Fx)	Edit clock configuration (CONF) n
AT%Kn	Erase clock configuration (CONF) n
AT%K99	Erase all clock configurations (CONF)
AT%L	Load last clock configuration (CONF)
AT%M0=(DW,DW,...-hh:mm-c)	Weekly notebook configuration
AT%Mn=(DD/MM/YY-dd/mm/yy-DW,DW,...-hh:mm-c)	Periodic notebook configuration
AT%On	Solar/Summer time
AT%O?	Display Solar/summer time
AT%W0	Notebook disable
AT%W1	Notebook enable
AT%W?	Display notebook status (enabled/disabled)

3.6.2. Weekly and periodic notebook

The modem has up to 2 different notebooks :

- **weekly**
- **periodic**

The weekly notebook allows to manage the event(s) within a week (example: different modem configurations during night and day) and with the same chronology week by week.

The periodic configuration allows to manage event(s) within a maximum of 9 different period (indicated from 1 to 9). Each period is identify by a starting date and a ending date. The periodic configuration can also works with weekly configuration to increase the flexibility of the system in special period of the year (National holiday..).

3.6.3. Clock set-up

The internal clock of the modem must be set-up at the first power on, then the time and date are stored into the non volatile memory of the modem.

ATW=DW-DD/MM/YY-hh:mm:ss

The parameters of this command are:

DW Day of the week (MO,TU,WE,TH,FR,SA,SU)

DD Day of the month (01,31)

MM Month of the year (01,12)

YY Year (1997,2096)

hh Hour (00,23)

mm Minute (00,59)

ss Second (00,59)

Response to this command is: **OK**

ATW?

Display date and time

The response to this command is the date and time.

DW-DD/MM/YY-hh:mm:ss

AT%On Solar or Summer time

%O1= Summer time

%O2= Solar time

AT%O? Display Solar or Summer time

The response to this command is:

SUMMER TIME

or

SOLAR TIME

AT%Kn=(Cx,Rx,Fx)

Edit Clock Configuration n

For each notebook are available 10 different macro instruction identify with a number from 0 to 9 and labeled with Clock Configuration (CONF). This command permits to edit the Clock Configuration (CONF) "n". Each Clock Configuration (CONF) has 3 categories of instruction:

Cx (where x is from 0 to 9) to load a modem user configuration (one of the 10 modem user configuration)

Rx (where x is from 0 to 9) to dial a telephone number inserted into the modem phonebook (one of the first 10 location)

F_x (where x is from 0 to 6) to activate one of the follow special function:

- 0= Disconnect the modem
- 1= Connect in Originate only
- 2= Connect in Answer only
- 3= Disable dial on switched line
- 4= Disable answer on switched line
- 5= Load Summer time
- 6= Load Solar time

EXAMPLE: At a determinate time, you want to load the modem user configuration 5, to make a call to the telephone number inserted into the phonebook (location 7) and if modem is on-line to disconnect it. The syntax of the command is:

AT%K0=(C5,R7,F0)

The execution sequence of the single instruction is:

- 1) F0 (disconnect the modem if it's on line)
- 2) C5 (load the user configuration number 5)
- 3) R7 (dial the number inserted into the location 7 of the modem phonebook)

The table below shows the sequence of the single instruction inside a Clock Configuration (CONF):

Special Function	Sequence
F0	F0->Cx->Rx
F1	Cx->F1
F2	Cx->F2
F3	Cx->F3
F4	Cx->F4
F5	F5->Cx->Rx
F6	F5->Cx->Rx

Using special functions F1, F2, F3, F4 is not possible to make a call.

AT%Kn Delete a Clock Configuration (CONF)

This command deletes the Clock Configuration (CONF) n and the modem responses with: OK

AT%K99 Delete all Clock Configurations (CONF)

This command deletes all the Clock Configurations (CONF) and the modem responses with: OK

AT%C0**Display weekly notebook (0)**

The modem responses showing the weekly notebook:

```
RISPOSTA DEL MODEM =  SU   MO   TU   WE   TH   FR   SA
                        [
                        ]
                        CONF 0 : ...      CONF 5 : ...
                          1 : ...      6 : ...
                          2 : ...      7 : ...
                          3 : ...      8 : ...
                          4 : ...      9 : ...
```

ATTENTION: The indication CONF means Clock Configuration

3.6.4. Notebook configuration

The user can configure the weekly notebook or the 9 periodic notebook in accordance with the application. We suggest to use the weekly notebook when the event(s) are repeated in the same way week by week.

3.6.5. Weekly Notebook configuration**AT%M0****(DW,DW,...-hh:mm-c)**

The details of the parameters for this command are:

DW Day of th Week, is possible to configure more day in the same instruction (su,mo,tu,we,th,fr,sa)
 hh:mm Hour and Minute to make the macro c
 c Macro c to execute (where c is from 0 to 9)

EXAMPLE: On Monday, Tuesday and Thursday at 8:30 the modem loads the user configuration 1 and make a call using the telephone number into the location 3 of the modem phonebook, on Wednesday and Friday the modem make the same action at 15:45 (instead of 8:30) and on Friday at 17:30 the modem must not accept the incoming calls .

First Step.

Edit 2 Clock Configuration (CONF0 and CONF1), the first to load the user configuration 1 and to call using phonebook location 3, the second to disable incoming calls:

AT%K0=(C1,R3)

AT%K1=(F3)

Second Step.

Configure weekly notebook with the 3 time (8:30, 15:45 and 17:30) and the 5 days linked with the proper Clock Configuration (CONF0 or CONF1).

AT%M0=(mo,tu,th-08:30-0)

AT%M0=(we,fr-15:45-0)

AT%M0=(fr-17:30-1)

Third Step.

Check the configuration of the weekly notebook with:

AT%C0

The modem show:

SU	MO	TU	WE	TH	FR	SA
	(08:30-0)	(08:30-0)	(15:45-0)	(08:30-0)	(15:45-0)	(17:30-1)
<hr/>						
CONF 0 : (C1,R3)				CONF 5 :		
1 : (F3)				6 :		
2 :				7 :		
3 :				8 :		
4 :				9 :		

ATTENTION: The indication CONF means Clock Configuration

AT%D0 Delete weekly notebook

Without any other additional parameters, this command delete the Clock Configuration (CONF) into the weekly notebook.

Using additional parameters it is possible to delete selectively like show below.

AT%D0=(DW,DW,...-*-*) Delete link with Clock Configuration (CONF) only for specified days.

AT%D0=(*-hh:mm-*) Delete link with Clock Configuration (CONF) only for specified time.

AT%D0=(*-*-n) Delete link the Clock Configuration (CONF) "n", regardless days and time.

AT%D99**Delete all notebook configuration**

3.6.6. Periodic Notebook configuration

The periodic Notebook has higher priority than weekly notebook, and it's different because there are starting and ending date specified.
It's possible to define up to 9 different periods into this Notebook.

AT%Mn=(DD/MM/YY-dd/mm/yy-DW,DW,...-hh:mm-c)

The parameters of this command are:

n	Periodic Notebook identification (from 1 to 9)
DD/MM/YY	Period starting date definition (day/month/year)
dd/mm/yy	Period ending date definition (day/month/year)
DW	Day(s) of the week (MO,TU,WE,TH,FR,SA,SU)
hh:mm	Time (Hour and Minutes)
c	Clock Configuration (CONF) to activate (from 1 to 9)

IMPORTANT: The 9 periodic Notebooks can not be overlayed.

We suggest to define first of all the Notebook(s) period(s):

AT%Mn= (DD/MM/YY-dd/mm/yy)

Then edit the time and the Clock Configuration (CONF) to link:

AT%Mn= (*-*-DW,DW,...-hh:mm-c)

AT%Dn

Delete Periodic Notebook

This command permits to delete the period "n" (1 to 9) of the periodic Notebook.

Using additional parameters it is possible to delete selectively like show below.

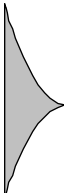
AT%Dn=(*-*-DW,DW,...-*) Delete link with Clock Configuration (CONF) only for specified days.

AT%Dn=(*-*-*-hh:mm-*) Delete link with Clock Configuration (CONF) only for specified time.

AT%Dn=(*-*-*-c) Delete link the Clock Configuration (CONF) "n", regardless days and time.

3.7. V25BIS COMMANDS

In this section you can find more informations about:

- 
- 3.7.1. Asynchronous V.25bis Commands**
 - 3.7.2. V.25bis Commands and Responses Summary**
 - 3.7.3. Asynchronous V.25bis commands description**
 - 3.7.4. Asynchronous V.25bis Responses**
 - 3.7.5. Synchronous V.25bis**
 - 3.7.6. Synchronous V.25bis Commands**
 - 3.7.7. Synchronous V.25bis Responses**

The modem includes the V.25bis command protocol to allow auto-dialling from synchronous and asynchronous data terminal equipment. This is an international standard which makes it compatible with host software already written for dial-up modems. For synchronous applications, the User can select the HDLC format with NRZ and ASCII code.



Using “CRNF” dial command it is possible to indicate the modulation standard to be used at the connection.

With this sole feature it is possible to define the speed for every connection in the host’s “telephone book”; in this way it is not necessary to change the modem setting for each calling.

Speed conversion and MNP (Microcom Networking Protocol), V42 and V42bis are active during ASYNC mode. In synchronous mode the DTE interface rate must be between 1200 to 33600bps. There is no auto-baud or parity training during commands. V.25bis commands can be echoed or not to the DTE.

3.7.1. Asynchronous V.25bis Commands

The modem provides auto-dialling according to V.25bis, using interface circuits series 100. Use AT*Vxx to activate Asynchronous V.25bis.

Attention: Use AT&W before activating V.25bis.

Format to use in V.25bis:

COMMAND<CR><LF>

Within “COMMAND” consecutive 8-bit data units are formed by a 7-bit IA5 character and an odd parity bit.

EXAMPLE

A message sent from the modem in this form:

CFICB

shows the host that the dialled number is engaged.

For details about V.25bis commands see CCITT V.25bis recommendation.

3.7.2. V.25bis Command and Response Summary

V.25bis	AT equivalent	Description
CRNy..y	ATDy...y	Call request with telephone number provided.
<;=>	,	Dialling pause.
CRNFnP/Ty..y	ATFnDP/Ty..y	Call request with modulation standard and selection mode indication.
CRSxx	ATDNxx	Call request with stored telephone number.
PRNxx;y..y	ATNxx&Zy..y	Telephone number storage.
RLNxx	AT&Nxx	Request list of numbers in memory.
RLF	none	Request list of forbidden numbers.
RLD	AT*B	Request list of delayed numbers.
DIC	ATS0=0	Disregard incoming call.
CIC	ATS0=1	Connecting incoming call.
CLAxx	ATNxx&Z	Clear designated address.
DLN	A/	Last number redial.
EON	ATE1	Echo On.
EOF	ATE0	Echo Off.
CSP	AT	Change of speed.
HAY	none	Return AT mode.
EOL	none	End of list.
ONL	CONNECTxxxx	ON-LINE data mode.
OFL	NO CARRIER	OFF-LINE idle mode.
DLC	DELAYED	Delayed call.
INV	ERROR	Invalid command entered.
VAL	OK	Valid command entered.
INC	RING	Incoming call detected.

3.7.3. Asynchronous V25bis Commands description

CRN	CALL REQUEST WITH NUMBER PROVIDED This command is used when the number to be dialled is issued directly from the terminal.
CRN <dial string>	where the <dial string> is the number to be dialled
< CRNX..<..X	Pause of 2 seconds. It is like character “,” in AT commands.
= CRNX..=..X	Pause of 5 seconds.
> CRNX..>..X	Pause of 10 seconds.
: CRNX...:..X	Wait 5 seconds for a dial tone before dialling the rest of the user string. Same as ATDW command.
CRNF CRNFnP/TX..X	Call request with number and modulation standard provided. Same as CRNXX..X with the possibility to insert the modulation standard to use. P or T must be inserted. “n”: modulation standard (see ATF command). “P”: pulse dialling. “T”: tone dialling. X..X: number to call.
CRS	CALL REQUEST WITH STORED NUMBER This command is used when the number to be dialled is stored in the modem’s memory (see command PRN).
CRSxx	Where xx specifies the address (01 to 20) of the memory location. Locations 1 to 9 can be entered as single digits (for example CRS6).
PRN	TELEPHONE NUMBER STORAGE This command is used to store telephone numbers in the modem’s memory. The modem can store up to 20 telephone numbers. Individual numbers may contain more than 30 characters but may limit the total number of the telephone numbers that can be stored.
PRNxx;	T(orP)yy..yy where xx followed by a semicolon specifies the address of the memory location (1 to 20), T or P = Tone or Pulse dialling, and yy specifies the number to be stored. Locations 0 to 9 can be entered as single digits.
RLN	REQUEST LIST OF NUMBERS IN MEMORY This command lists the telephone numbers stored in the modem’s nonvolatile memory. The user can request to have all the numbers displayed, or by identifying a location, the user can display the number stored in a specific location.

RLN	displays telephone numbers in all locations
RLNxx	displays the telephone number in location xx.
RLF	REQUEST LIST OF FORBIDDEN NUMBERS This command displays the memory address, telephone number, and status of a forbidden number. If a telephone number has been called without success for a maximum of N times (as specified by the local regulatory agency) that number will not be accessible for 120 minutes after the first call attempt.
RLD	REQUEST LIST OF DELAYED NUMBERS This command displays all telephone numbers that have been placed on the delayed call list. If a telephone number has been dialled for N consecutive times (as specified by the local regulator agency) without success, any further request will be inhibited for a period of 2 minutes. The next attempt to use the number after it enters this state will be ignored by the modem and the message "DELAYED CALL" will be returned to the terminal.
DIC	IGNORE INCOMING CALL This command disables the auto-answer capability of the modem.
CIC	ACCEPT INCOMING CALL This command enables the auto-answer capability of the modem.
CLA	CLEAR ADDRESS This command clears unrestricted telephone numbers from the memory of the modem. The user can request that all numbers are cleared, or by identifying a location, the user can clear the number stored in a specific location.
CLAx	clears the telephone number in location xx (only the numbers not in Black List).
DLN	DIAL LAST NUMBER This command forces the modem to redial the last telephone number dialled.
EON	ECHO ON This command enables local echo of any command sequence which is received by the modem from the connected DTE. The EON command is applicable in asynchronous mode only.

EOF	ECHO OFF Command sequences received by the modem from the local DTE are not echoed. This command is applicable in asynchronous mode only.
CSP	RATE CHANGE
CSP300	RATE CHANGE 300 BPS
CSP1200	RATE CHANGE 1200 BPS
CSP2400	RATE CHANGE 2400 BPS
CSP4800	RATE CHANGE 4800 BPS
CSP9600	RATE CHANGE 9600 BPS
CSP19200	RATE CHANGE 19200 BPS
CSP38400	RATE CHANGE 38400 BPS
CSP57600	RATE CHANGE 57600 BPS
CSP115200	RATE CHANGE 115200 BPS New rate is stored in the modem's nonvolatile configuration.
HAY	EXIT V.25BIS MODE This command is used to exit the V.25bis mode and return the modem to the "AT" command mode.

3.7.4. Asynchronous V.25bis Responses

MESSAGE	DESCRIPTION
EOL	END OF LIST This command's response is appended at the end of a stored number listing and notifies the user that the requested list is complete.
ONL	ON-LINE INDICATION RESPONSE This response is issued by the modem after a call connection has been established. The response is generated by both the originating and answering modems.
OFL	OFF-LINE INDICATION RESPONSE This response is issued by the modem after a call disconnection. This indication will always follow an ONL (ON-LINE) indication.
DLC	DELAYED CALL(s) This response notifies the user that telephone number has been placed on the delayed call listing. The delay time is 1 or 2 minutes.

INV	INVALID COMMAND RESPONSE This response is issued by the modem when an invalid command is received. The terminal is informed that the modem does not recognize the command sequence issued by the DTE.
VAL	VALID COMMAND RESPONSE This response is issued by the modem when a valid V.25bis command is received. The terminal is informed that the latest command sequence has been accepted and executed.
INC	INCOMING CALL RESPONSE This response is issued by the answering modem to its locally attached DTE when a ring signal is detected. This code has priority over a dial command (CRN and CRS) sequence which has not yet been issued by the terminal unless the DIC command has been previously executed.
LSN	LIST OF STORED NUMBERS This response is generated in response to the RLN(xx) command. LSNxx;y..y where xx specifies the memory location and y....y the telephone number.
LSF	LIST OF FORBIDDEN NUMBERS LSFxx;y..y where xx specifies the memory location and y....y the telephone number
LSD	LIST OF DELAYED CALLS This message is issued in response to the RLD command (request of list of delayed numbers). LSDxx;y..y where xx, followed by a semicolon, specifies the address of the location in modem memory and y..y represents the stored telephone number.
CFI	CALL FAILURE INDICATION The modem issues this response after a call failure. It is followed by a 2-character code that identifies the reason of the failure. CFIxx where xx specifies a 2-character failure code as defined below:

BEFORE A CALL:

- CB** DCE is not ready for calling.
FC The number dialled is a forbidden number, and the call attempt is aborted.
ET The call is aborted because busy tone was detected during selection.
MF The call is aborted because the black list is full.

DURING A CALL:

- NS** The number requested is not stored in the modem's memory and the call cannot be executed (in response to a CRS command sequence).

AFTER A CALL:

- AB** The call is aborted because no carrier is detected (length of time-out 60+5s).
ET The call destination is busy, and the call is not completed.
NT The call is aborted for lack of answer tone from the remote modem.
RT The remote modem does not answer.

3.7.5. Synchronous V.25bis

Use the command AT*Vxx to select Synchronous V.25bis.

Commands are given in the following format:

F A C COMMAND FCS F

WHERE:

F = 7EH (flag)
A = FFH
C = 13H
FCS = CCITT-CRC

Example:

The following message:

F / A / C / "CFICB" / FCS / F

indicates to the host that the number dialled is busy.

For more details on the V.25bis command structure, see the CCITT V.25bis.



Usually ASCII 7bit IA5 is used with odd parity. With the Modem you can select ASCII with NRZ or NRZI codification.

3.7.6. Synchronous V.25bis Commands

COMMAND	DESCRIPTION
CRN	Call request with number provided
<;=>	Dialling pauses
CRNF_n	Call request with indication of the modulation standard to use (see Asynchronous V.25bis command set). T” or “P” must be inserted.
CRS	Call request with memory address provided
PRN	Normal program (number into memory)
DLN	Last number repetition
CLA	Clear address
HAY	Hayes modality

3.7.7. Responses in V.25bis Synchronous

MESSAGES	DESCRIPTION
INV	Invalid command
VAL	Valid command
CFI	Call failure indication
CFI NS	Number not stored
CFI CB	Busy
CFI AB	User or timer abort
CFI NT	No answer tone
ONL	Modem ON-LINE
OFL	Modem OFF-LINE

3.8. REGISTERS S

3.8.1. S-Register Summary

Reg.	(*)	Range	Unit	Def.	Description	SNM49	SNM50 SNM54
S0	*	0-255	RING	00	Ring to answer on	*	*
S1		0-255	RING	00	Ring Count	*	*
S2	*	0-127	ASCII	43	Escape code character	*	*
S3	*	0-127	ASCII	13	Carriage Return character	*	*
S4	*	0-127	ASCII	10	Line feed character	*	*
S5	*	0-127	ASCII	08	Back space character	*	*
S6	*	0-255	1 sec	03	Wait for dial tone	*	*
S7	*	0-255	1 sec	45	Wait for data carrier	*	*
S8	*	0-255	1 sec	02	Pause time for comma	*	*
S9	*	0-40	100 ms	06	Answer tone detection time	*	*
S10	*	1-255	100 ms	07	Lost carrier to hang-up delay	*	*
S11	*	50-255	1 ms	70	DTMF Dialling speed	*	*
S12	*	0-255	20 ms	50	Escape Sequence code guard time	*	*
S13	*	0-255	1 sec	08	Time out wait for dial tone	*	*
S14	*	0-255	—	170	Bit mapped options register	*	*
S15	*	—	—	—	Not used		
S16		0-255	—	00	Modem test options register	*	*
S17	*	0-255	1 sec	02	Time monitor line quality	*	*
S18	*	0-255	1 sec	60	Test timer	*	*
S19	*	0-255	—	02	Autosync	*	*
S20	*	0-255	—	255	Autosync	*	*
S21	*	0-255	—	04	Bit mapped options register	*	*
S22	*	0-255	—	70	Bit mapped options register	*	*
S23	*	0-255	—	136	Bit mapped options register	*	*
S24	*	0-255	—	07	Bit mapped options register	*	*
S25	*	0-255	1 sec	05	C108 delay (Sync only)	*	*
S26	*	0-255	10 ms	02	C105 (RTS) to C106 (CTS) delay	*	*
S27	*	0-255	—	00	Bit mapped options register	*	*
S28	*	0-255	1 min	30	Lookback timer	*	*
S29	*	0-255	—	72	Bit mapped options	*	*
S30	*	0-255	—	00	Data mode format; bit mapped register	*	*
S31	*	0-255	—	128	Bit mapped options register	*	*
S32	*	0-255	—	99	Bit mapped options register	(●)	*
S33	*	0-255	—	00	Bit mapped options register	*	*
S34	*	0-255	—	00	DIGICOM internal use	*	*

Reg.	(*)	Range	Unit	Def.	Description	SNM49	SNM50 SNM54
S35	*	0-255	—	00	Bit mapped options	*	*
S36	*	0-255	1 sec	255	Inactivity Timer transmitted data	*	*
S37	*	0-255	1 sec	255	Inactivity Timer received data	*	*
S38	*	0-255	—	00	ATI1 response value	*	*
S39	*	0-255	ASCII	17	X ON character for &K and *F	*	*
S40	*	0-255	ASCII	19	X OFF character for &K and *F	*	*
S41	*	—	—	—	Not used		
S42	*	0-255	1 sec	00	Wait time for callback in backup		*
S43	*	0-19	—	255	Autologon pointer for call-back	*	*
S44	*	0-19	—	255	Remote control security sequence pointer	*	*
S45	*	1-255	10 ms	200	Length of break signal	*	*
S46	*	—	—	00	DIGICOM internal use	*	*
S47	*	0-255	1 sec	10	Timer Retrain	*	*
S48	*	0-127	ASCII	13	Error Correction fallback character	*	*
S49	*	0-255	ASCII	17	XON character for &U command	*	*
S50	*	0-255	ASCII	19	XOFF character for &U command	*	*
S51	*	—	—	—	Reserved for Network Management		
S52	*	—	—	—	Not used		
S53	*	0-255	1 sec	255	Time-Out for busy modem with C108 Off	*	*
S54	*	0-255	—	08	Bit mapped options register	(●)	*
S55	*	0-255	—	21	Bit mapped options register	*	*
S56	*	0-255	—	32	Bit mapped options register	*	*
S57	*	0-255	—	36	Bit mapped options register	*	*
S58	*	0-255	—	00	Bit mapped options register	*	*
S59	*	0-255	—	00	Bit mapped options register	*	*
S60	*	0-9	—	255	Different configuration for dial up line during back-up operations (only for answer modem)	(●)	*
S61	*	0-255	—	03	Number of retrains in S62 sec to disconnect	*	*
S62	*	1-255	1 sec	60	Retrain counting	*	*
S63	*	0-99	—	0	C108/1 phonebook pointer	*	*
S64	*	—	—	—	Not used		
S65	*	0-9	—	9	First configuration pointer for Down-Load	*	*
S66	*	0-9	—	255	Second configuration pointer for Down-Load	*	*
S67	*	0-255	1 sec	255	C105 antistreaming timeout	*	*
S68	*	0-255	1 sec	255	C109 Off Time with controlled carrier	*	*
S69	*	0-255	—	8	Bit mapped options register		
S70	*	0-255	—	0	Bit mapped options register		
S71	*	—	—	—	Not used		
S72	*	—	—	—	Not used		

(•) indicates a register stored in the user configurations.

S5	BACK SPACE character			Default=08
	range	units	function	
	0-127	ASCII	stores the ASCII value of the BACK SPACE	
S6	Wait for DIAL TONE			Default=02
	range	units	function	
	0-255	sec.	determines how long the modem waits for a dial tone after going off-hook before dialling the first digit of a telephone number	
S7	Wait for DATA CARRIER			Default=45
	range	units	function	
	0-255	sec.	determines how long the modem waits for receipt of remote carrier signal after dialling a call	
S8	Pause Time for Comma			Default=02
	range	units	function	
	0-255	sec.	determines the length of the pause associated with the pause dial modifier inserted in a dial string	
S9	Detection Time for ANSWER TONE			Default=06
	range	units	function	
	0	-	determines the blind call; the modem handshakes immediately after the call.	
	1-40	100ms	In auto dialling, determines how long the modem waits for ANSWER TONE detection, before handshaking	
S10	Lost Carrier to Hang-up Delay			Default=07
	range	units	function	
	1-254	100ms	determines the length of time the modem waits before disconnecting from the line after losing the carrier signal from the remote modem	
	255	100ms	the modem will NOT disconnect for loss of carrier	
S11	DTMF Dialling Speed			Default=70
	range	units	function	
	50-255	1ms	waiting" default value" between each number when dialling	

S12 ESCAPE Code Guard Time Default=50

range	units	function
0-255	20ms	determines the time delay (guard time) required immediately before, during and after entering the ESCAPE sequence

S13 Dial-Tone Time out Default=8

range	units	function
0-255	1S	determines the time out before to receive a dial-tone; it's valid only with ATX2 or 4

S14 Bit Mapped Options Register Default=B'10101010'= H'AA'=170

bit	function	command	default
7	0=Answer mode	A,R	
	1=Originate mode	D	*
6	0=Escape enabled	&V0	*
	1=Escape disabled	&V1,&V2	
5	0=Tone dial	T	
	1=Pulse dial	P	*
4	0=Command mode	&V0,&V1	*
	1=Dumb mode	&V2	
3	0=Short codes	V0	
	1=Long codes	V1	*
2	0=On (Result codes)	Q0	*
	1=Off(Quiet codes)	Q1	
1	0=Echo off	E0	
	1=Echo on	E1	*
0	0=Not used		*
	1=Not used		

S15 Not used**S16 Bit Mapped Options Register - Test Options Default=B'00000000'= H'00'=000**

bit	function	command	default
7	0=TPG command without Down-Load	#T6	*
	1=TPG command with Down-Load	#T7	
6	0=Local analog loopback+self test Off	&T1	*
	1=Local analog loopback+self test On	&T8	

5	0=RDL command + self test Off 1=RDL command + self test On	&T6 &T7	*
4	0=RDL command Off 1=RDL command On	&T0 &T6	*
3	0=RDL not initiated 1=RDL initiated		*
2	0=LDL Off 1=LDL On	&T0 &T3	*
1	0=Not used 1=Not used		*
0	0=Local analog loopback Off 1=Local analog loopback On	&T0 &T1	*

S17 Time monitor for signal quality Default=2

range	units	function
1-255	sec.	Time to test signal quality before modem starts a retrain

S18 Modem Test Timer Default=60

range	units	function
0	sec.	No limitation for the test time
1-255	sec.	Determines how long the modem diagnostic test will run before the modem terminates it automatically (&T7 and &T8 commands)

S19 Bit Mapped Options Register Default=B'0000010'= H'02'=002

bit	function	command	default
7-5	Not used		
4	0=mark idle 1=flag idle		
3	0=NRZI 1=NRZ		
2	0=Address check disable 1=Address check enable		
1	0=not used 1=HDLC		
0	Reserved		

S20 Bit Mapped Options Register Default=B'11111111'= H'00=255

bit	function	command	default
0-7	Address in HDLC		

S21 Bit Mapped Options Register Default=B'00000100'= H'04'=004

bit	function	command	default
7-5	000=C107 and C109 always On	&C0	*
	001=C107 and C109 controlled	&C1	
	010=C107 always On and C109 controlled	&C2	
	011=C109 always On and C107 controlled	&C3	
	100=C109 Off 2 sec. at disconnection	&C4	
	101=C107/C109 Off 500ms if C108 Off	&C5	
	110=Not used		
4-3	111=Not used		*
	00=C108 ignored	&D0	
	01=C108 equivalent to escape sequence	&D1	
	10=C108 Controlled - Handshake in LL	&D2	
2	11=C108 equivalent to ATZ (RESET)	&D3	*
	0=RDL disabled	&T5	
	1=RDL enabled	&T4	
1-0	00=C108 standard	*D0	*
	01=ASYNC C108/1 C106 On in Off-Line	*D1	
	10=ASYNC C108/1 C106 Off in OFF-Line	*D2	
	11=Not used		

S22 Bit Mapped Options Register Default=B'01000110'= H'46'=070

bit	function	command	default
7	0=39/61 Make/Break ratio	&P0	*
	1=33/67 Make/Break ratio	&P1	
6-4	000=CONNECT message	X0	*
	001=Not used		
	010=Not used		
	011=Not used		
	100=CONNECT xx message	X1	
	101=CONNECT xx, DIAL TONE test	X2	
	110=CONNECT xx, BUSY test	X3	
	111=CONNECT xx, DIAL TONE and BUSY test		

3-2	00=Speaker Off	M0	
	01=Speaker On until carrier detect	M1	*
	10=Speaker On	M2	
	11=Speaker ON until carrier detect and OFF for dialling	M3	
1-0	00=Low Speaker volume	L0	
	01=Low Speaker Volume	L1	
	10=Medium Speaker volume	L2	*
	11=High Speaker volume	L3	
<i>4,5,6 bit definition can be described like this:</i>			
6	0=CONNECT message	X0	
	1=CONNECTxxxx message	X1,X2,X3,X4	*
5	0=BUSY TONE detection disabled	X0,X1,X2	*
	1=BUSY TONE detection enabled	X3,X4	
4	0=DIAL TONE detection disabled	X0,X1,X3	*
	1=DIAL TONE detection enabled	X2,X4	

S23 Bit Mapped Options Register Default=B'10001101'= H'8D'=141

bit	function	command	default
7-6	00=Guard tone disabled	&G0	
	01=Not used		
	10=1800Hz Guard tone	&G2	*
	11=Not used		
5-4	00=EVEN parity	AT	*
	01=No parity (SPACE parity)	AT	
	10=ODD parity	AT	
	11=MARK parity	AT	
3-0	0000=Not used		
	0001=300bps	AT	
	0010=not used		
	0011=not used		
	0100=1200bps	AT	
	0101=2400bps	AT	
	0110=4800bps	AT	
	0111=7200bps	AT	
	1000=9600bps	AT	
	1001=12000bps	AT	
	1010=14400bps	AT	

1011=19200bps	AT	
1100=28800bps	AT	
1101=38400bps	AT	*
1110=57600bps	AT	
1111=115200bps	AT	

S24 Bit Mapped Options Register Default=B'0000111'= H'07'=7

bit	function	command	default
7-6	00=C140 and C141 disabled	*T0	*
	01=Only C140 enabled		
	(Remote Digital Loopback)	*T1	
	10=Only C141 enabled		
	(Local Analog Loopback)	*T2	
5-4	11=C140 and C141 enabled (Remote Digital and Local Analog Loopback)	*T3	*
	00=C107 standard in V.25bis	*P0	
	01=C107 Wink	*P1	
	10=C107 Follows C109	*P2	
	11=C107 Follows C109 + Wink	*P3	
3	0=Not used		*
	1=Loop on line	*T4	
2-0	000=V.25bis C108/2 async.	*V0	
	001=V.25bis C108/1 sync/async.		
	(see AT&M)	*V1	
	010=V.25bis C108/2 (NRZ-ASCII)	*V2	
	011= not used		
	100= not used		
	101= not used		
	110=Not used		
	111= AT mode	*V7	*

S25 C108 Delay Default=05

range	units	function
0-255	sec.	determines the delay after the completion of a call attempt before the modem examines the status of the Data Terminal Ready circuit C108. This Register is used for synchronous applications only (AT&M1 command), allowing time for the operator to

disconnect the modem from an asynchronous DTE and reconnect it to a synchronous device without causing the modem to drop the call.

S26 C105 to C106 Delay Default=02

range	units	function
0-255	10ms	determines the delay after the modem detects an Off-to-On transition of the Request-to-Send circuit before Clear-to-Send On (valid in synchronous only)

S27 Bit Mapped Options Register Default =B'00000000'=H'00'=000

bit	function	command	default
7	0=Full Duplex mode (fixed carrier) 1= not used	B0	*
6	0=see bit 1-0 1=autosync		*
5-4	00=Internal clock timing 01=External clock timing 10=Slave clock timing 11=Not used	&X0 &X1 &X2	*
3-2	00=Dial line&L0 01=2-wire leased line 10=4-wire leased line	* &L1 &L2	
1-0	00=Asynchronous 01=Synchronous mode 1 10=Synchronous mode 2 11=Synchronous mode 3	&M0 &M1 &M2 &M3	*

S28 Lookback Timer Default=30

range	units	function
0		function disabled
1-255	min.	determines the "lookback" frequency on the leased line when in the dial line back-up condition. The modem will drop the dial line to re-test the leased line.

Not used by SNM49

S29 Bit Mapped Options Register Default=B'01001000'=H'48'=072

bit	function	command	default
7-6	00=Data compression disabled	*E0	
	01=MNP5/LAPM Tx-Rx)enabled	*E1	*
	10=Not used		
	11=Not used		
5	Not used		
4	0=Remote configuration disabled	#T5	*
	1=Remote configuration enabled	#T4	
3	0=Clock On at connection	*X0	
	1=Clock always On	*X1	*
2-1	00=Overspeed standard +1.0%:-2.5%	*O0	*
	01=Overspeed +2.3%:-2.5%	*O1	
	10=Not used		
	11=Not used		
0	Not used		

S30 Data Mode Format Register - UART Default=B'00000000'=H'00'=000

bit	function	command	default
7	0=Data format set by AUTOBAD		*
	1=Data format set by USER		
6	not used		
5-4	00=EVEN parity		*
	01=No parity		
	10=ODD parity		
	11=Not used		
3	not used		
2	0=1 Stop bit		*
	1=2 Stop bit		
1-0	00=5 data bit		*
	01=6 data bit		
	10=7 data bit		
	11=8 data bit		



Note: S30 determines the character format (asynchronous) that will be sent by DTE to the modem in on-line condition. Bit 7 determines if the on-line format must be like the format determined by AUTOBAUD or that defined by the following bit. To calculate the range to give to S30 register see the following table:

DTE Setting	Contents				
	Data	Parity	Stop	S30	
	5	No	1	144	
	5	Even	1	128	
	5	Odd	1	160	
	5	Mark	1	148	
	5	Space	1	145	
	5	No	2	148	
	5	Even	2	132	
	5	Odd	2	164	
	5	Mark	2	Not possible	
	5	Space	2	149	
	6	No	1	145	
	6	Even	1	129	
	6	Odd	1	161	
	6	Mark	1	149	
	6	Space	1	146	
	6	No	2	149	
	6	Even	2	133	
	6	Odd	2	165	
	6	Mark	2	Not possible	
	6	Space	2	150	
	7	No	1	146	
Buffer	7	Even	1	130	If not AT&I0
Buffer	7	Odd	1	162	If not AT&I0
Buffer	7	Mark	1	150	If not AT&I0
Buffer	7	Space	1	147	If not AT&I0
Buffer	7	No	2	150	If not AT&I0
Buffer	7	Even	2	134	If not AT&I0
Buffer	7	Odd	2	166	If not AT&I0
	7	Mark	2	Not possible	
Buffer	7	Space	2	151	If not AT&I0
Buffer	8	No	1	147	If not AT&I0
Buffer	8	Even	1	131	If not AT&I0
Buffer	8	Odd	1	163	If not AT&I0
Buffer	8	Mark	1	151	If not AT&I0
	8	Space	1	Not possible	
Buffer	8	No	2	151	If not AT&I0
	8	Even	2	135	
	8	Odd	2	167	
	8	Mark	2	Not possible	
	8	Space	2	Not possible	

S31 Bit Mapped Options Register Default=B'10000000'=H'80'=128

bit	function	command	default
7	0=I/F constant rate disabled	&I0	
	1=I/F constant rate enabled	&I1,&I2,&I3	*
6-4	000=Command port disable	&Y0	*
	001=Command port enable	&Y1	
	010-111=Not used		
<i>If bit 0 of S33 is 0</i>			
3-0	0000=Multistandard	F0	*
	0001=300 bps FSK (V.21)	F1	
	0010=Not used	F2	
	0011=(see #V) FSK (V.23)	F3	
	0100=1200 bps PSK (V.22)	F4	
	0101=2400 bps QAM (V.22bis)	F5	
	0110=4800 bps QAM (V.32)	F6	
	0111=7200 bps TCM (V.32bis)	F7	
	1000=9600 bps TCM (V.32)	F8	
	1001=12000 bps TCM (V.32bis)	F9	
	1010=14400 bps TCM (V.32bis)	F10	
	1011=16800 bps (V.34)	F11	
	1100=19200 bps (V.34)	F12	
	1101=21600 bps (V.34)	F13	
	1110=24000 bps (V.34)	F14	
	1111=26400 bps (V.34)	F15	
<i>If bit 0 of S33 is 1</i>			
3-0	0000=28800 bps (V.34)	F16	
	0001=31200 bps (V.34)	F17	
	0010=33600 bps (V.34)	F18	

S32 Bit Mapped Options Register Default=B'01100011'=H'63'=099

bit	function	command	default
7	Not used		
6-5	00=DCE Flow control disabled	&K0	
	01=DCE,XON/XOFF Flow control	&K1	
	10=DCE,C106 Flow control	&K2	
	11=DCE,C106 and XON/XOFF Flow control	&K3	*
4	0=Multistandard from DTE rate	*	
	1=Multistandard starting from maximum speed	&A1	

3	0=CONNECT message (line speed)	&I0,&I1,&I3	*
	1=CONNECT message (I/F speed)	&I2	
2-1	00=Front panel keys disabled	&S0	
	01=Front panel keys enabled	&S1	*
	10-11=not used		
0	0=Auto handshake disabled	&H0	
	1=Auto handshake enabled	&H1	*

S33 Bit Mapped Options Register Default=B'00000000'=H'00'=000

bit	function	command	default
7-5	000=DTE Flow control disabled	&U0	*
	001=DTE,XON/XOFF Flow control	&U1	
	010=DTE,XON/XOFF->remote Flow ctrl		&U2
	011=Not used	&U3	
	100=DTE and C105 Flow Ctrl	&U4	
	101=DTE,C105 and XON/XOFF flow control		&U5
	110=DTE,C105 and XON/XOFF->remote Flow ctrl	&U6	*
	111=Not used	&U7	
4	Not used		*
3	0=Line control disabled	*F0	*
	1=Line control enabled	*F1	
2	Not used		*
1	0=Calling tone disabled	*G0	*
	1=Calling tone enabled	*G1	
0	0=S31 from F0 to F15		*
	1= S31 from F16 to F18		*

S34 DIGICOM internal Use
S35 Bit Mapped Options Register Default=B'00000000'=H'00'=000

bit	function	command	default
7-6	00=Not expedited,Not destructive BREAK	*Y0	*
	01=Expedited, Destructive BREAK	*Y1	
	10=Expedited, Not destructive BREAK	*Y2	
	11=Ignored BREAK	*Y3	
5-4	Not used		*
3-0	0000=DTE speed determined by AUTOSPEED*I0		*

0001=300bps DTE speed	*I1
0010=Not used	
0011=Not used	
0100=1200bps DTE speed	*I4
0101=2400bps DTE speed	*I5
0110=4800bps DTE speed	*I6
0111=7200bps DTE speed	*I7
1000=9600bps DTE speed	*I8
1001=Not used	
1010=14400bps DTE speed	*I10
1011=19200bps DTE speed	*I11
1100=Not used	
1101=38400bps DTE speed	*I13
1110=57600bps DTE speed	*I14
1111=115200bps DTE speed	*I15

S36 Inactivity Timer Transmitted Data Default=255

range	units	function
0-254	sec.	determines the length of time the modem waits before disconnecting from the line after the uninterrupted detection of the transmitted data MARK or SPACE
255	sec.	Timer disabled

S37 Inactivity Timer Received Data Default=255

range	units	function
0-254	sec.	determines the length of time the modem waits before disconnecting from the line after the uninterrupted detection of the received data MARK or SPACE
255	sec.	Timer disabled

S38 Modem Identifier Default=00

range	units	function
0-255	—	determines the response to the I3 command

S39	Flow Control XON Character		Default=17
	range	units	function
	0-255	ASCII	stores the XON character used with &K and *F commands
S40	Flow Control XOFF Character		Default=19
	range	units	function
	0-255	ASCII8	stores the XOFF character used with &K and *F commands
S41	Not used		
S42	Wait time for Callback in Back-up		Default=00
	range	units	function
	0	sec	The function is disabled
	1-255	sec	Using the Callback feature during a back-up, it is mandatory to set this register, on the originate modem, with a value which permits the modem to be called on a dial-up line. In this way the modem remains in autohandshake mode on the leased line for the time indicated by S7+S42 and is ready to respond to the second ring of the call; expired this time the modem will attempt a new back-up on the dial-up line.
	Example: <i>Modem A answer, modem B originate:</i> Functionality: leased line with back-up on switched line. When leased line is fault, modem B call modem A on switched line. After the connection is established modem A disconnect and call back modem B.		
S43	CallBack & Logon Pointer		Default=255
	range	units	function
	0-99	—	Establishes selection of the memory location the modem uses to initiate a CallBack or Logon. See par. 3.9.
	100-253		The call back will be executed looking in the phone number memory for a location which contains the first word received during the connection.

It is necessary to interrupt the transmission word by “pipe”. “Pipe” character must be used only in transmission mode.

Example: It is possible to search digicom word in this way: “digicom|”.

255 Callback disabled.

S44 Remote Configuration Pointer Default=255

range	units	function
0-99	—	establishes selection of the memory location for autologon procedure.
100-255		Autologon is disabled; the modem initiates remote access control sending OK.

S45 Length of BREAK Signal Default=200

range	units	function
1-254	10ms	used when Error Corrector is active and determines the length of the BREAK; it is active only if “&En” command is entered.

S46 DIGICOM internal use

S47 Timer Retrain Default=10

range	units	function
0-255	1 sec	waiting time for retrain answer before hang-up.

S48 Error Correction FALLBACK Character Default=13

range	units	function
0-127	ASCII	The character in this register is used to disable the Error Correction entered with “&E1” command
255	ASCII	Error correction FALLBACK character is disabled.

S49 XON Character for &U command Default=17

range	units	function
0-255	ACII	Store the 8-bit value of the user flow control XON character. Used with &U command.

S50	XOFF Character for &U command		Default=19
	range	units	function
	0-255	ASCII	Stores the 8-bit value of the user flow control XOFF character. Used with the &U command
S51	Reserved for Network Management		
S52	Not Used		
S53	Time-Out for busy modem with C108 Off		Default=255
	range	units	function
	0-254	sec.	if C108 is Off for the time indicated, the modem will engage the line
	255	sec.	Disabled
S54	Bit Mapped Options Register		Default=B'00001000' =H'08'=008
	bit	function	command default
	7-5	0=Not used	*
	4-3	00=No /xxx message enabled	#X0
		01=Only /BUF and /REL messages enabled	#X1 *
		10=All /xxx messages enabled	#X2
		11=Like #X2. No ONL/OFL in V.25bis	#X3
	2-0	000=Disables dial line back-up	#B0 *(●)
		001=Enables dial line back-up	#B1 (●)
		010=Lookback BACKUP with S28	#B2 (●)
		011=Not used	
		100=BACKUP with C116	#B4 (●)
		101=BACKUP with monitor LL/SW	#B5 (●)
		110=Not used	
		111=Not used	
	(●) Not used on SNM49		

S55 Bit Mapped Options Register Default=B'00000001'= H'01'=001

bit	function	command	default
7-6	Not used		
5	0=V.13 disabled	#H0	*
	1=V.13 enabled	#H1	
4	0=B.E.R. standard threshold	#Q0	*
	1=B.E.R. alternative threshold	#Q1	
3-2	Not used		
1-0	00=No action if very bad line	*Q0	
	01=Retrain if very bad line	*Q1	*
	10=Fallback if very bad line	*Q2	
	11=Disconnection if very bad line	*Q3	

S56 Bit Mapped Options Register Default=B'00100000'= H'20'=032

bit	function	command	default
7	Not used		
6	0=Handshake break enabled	#P0	*
	1=Handshake break disabled	#P1	
5	0=Detection Phase disabled	#E0	
	1=Detection Phase enabled	#E1	*
4-3	00=Autoreliable Buffer/Char disabled	#A0	*
	01=Only Autoreliable Char enabled	#A1	
	10=Only Autoreliable Buff. enabled	#A2	
	11=Autoreliable Buffer/Char enabled	#A3	
<i>If the CCITT standard is V.23 (ATF3)</i>			
2-0	000=V.23 Org=Tx75-Rx1200 Ans=Tx1200-Rx75	#V0	*
	001=V.23 Tx75-Rx1200bps	#V1	
	010=V.23 Tx1200-Rx75bps	#V2	
	011-111=Not used		

S57 Bit Mapped Option Register Default B'00100000' = H'20' = 032

bit	function	command	default
7	Not used		
6-5	00=No XON/XOFF send to DTE	#K0	
	01=XON/XOFF at connection, disconnection and retrain	#K1	*
	10-11=Not used		
4-0	Not used		

S58 Bit Mapped Option Register Default=B'00000000'= H'00'=000

bit	function	command	default
7-5	000=No action	*K0	*
	001=XON/XOFF conn./disc.	*K1	
	010=C106 OFF handshake	*K2	
	011=C106 XON/XOFF conn./disc.	*K3	
	100=C106 OFF in off-line	*K4	
	101=C106 XON/XOFF conn./disc.	*K5	
	110-111=not used		
4-3	Not used		*
2	0=Automatic dial prefix disabled	#W0	*
	1=Automatic dial prefix enabled	#W1	
1-0	Not used		

S59 Not Used**S60 Switched-Line alternative configuration (only for answer modem). Default=255**

range	units	function
0-9	—	Store the user configuration pointer to activate when BACKUP and LL/SW are enabled and the modem works in SW. The right configuration can be entered when passing in SW.
10-254	—	No configuration will be activated
255	—	When the modem goes in SW, it runs the commands ATF0&A1

S61 Number of Retrain in S62 seconds to disconnect Default=03

range	units	function
0-255	—	Maximum retrain number in the time defined by S62 to force the disconnection

S62 Retrain counting Default=60

range	units	function
0-255	sec	length of time to count the Retrain number defined by the register S62 to force the disconnection

S63 Directory Pointer for C108/1 control Default=00

range	units	function
0-99	—	store the reference for the directory location which contains the telephone number to select for C108/1 control in AT mode
100-255		No number will be dialled

S64 Not Used**S65 First Configuration Pointer for Down-Load Default=09**

range	units	function
0-9		Stores the pointer to the first user configuration to use for Down-Load
10-255		No configuration is transferred

S66 Second Configuration Pointer for Down-Load Default=255

range	units	function
0-19		stores the pointer to the second configuration to use for Down-load
20-255		no configuration is transferred

S67 C105 Antistreaming Timeout Default=255

range	units	function
0-254	sec	used in Half Duplex simulation (#H). If C105 remains ON for S67 seconds, the carrier is kept OFF.
255		Timeout disabled

S68 Timeout C109 in controlled carrier (V13) Default=255

range	units	function
0-254	sec	Used in Half Duplex simulation (V13). If C105/ C109 remains OFF for S68 seconds the modem disconnects.
255	sec	Timeout disabled

S69 Bit Mapped Option Register Default B'0001000' = H'08' = 008

bit	function	command	default
7	0=Parity transparent for DTE 1=Parity rebuilt for DTE	&I0,&I1,&I2 &I3	*
6-4	Not used		
3-2	00=V25bis sync parity even 01=V25bis sync no parity (space) 10=V25bis sync parity odd 11=V25bis sync parity mark		*
1-0	00=V25bis async parity even 01=V25bis async no parity (space) 10=V25bis async parity odd 11=V25bis async parity mark		*

S70 Bit Mapped Option Register Default=00

bit	function	command	default
7-6	00=C106 follows C105 in Sync. mode 01= C106 always ON except for retrain 10=C106 always ON 11=C106 always follows C105	&R0 &R1 &R2 &R3	*
5	0=BREAK disconnection disabled 1=BREAK disconnection enabled	Y0 Y1	*
4	Not used		
3-0	0000=MNP and LAPM disabled 0001=like &E8+Autoreliable Buffer 0010=LAPM in AUTORELIABLE mode 0011=LAPM in RELIABLE mode 0100=MNP in AUTORELIABLE mode 0101=MNP in RELIABLE mode 0110=LAPM+ MNP AUTORELIABLE 0111=LAPM+ MNP RELIABLE 1000-1111=Not used	&E0 &E1 &E2 &E3 &E4 &E5 &E6 &E7	*

S71 Not used**S72 Not used**

S73 Fall-Forward Delay Default=60

range	units	function
0-255	1 sec	When the adaptive rate is set (*Q2), define the time to return on the upper speed.

S74 Trasmit Level (SW/LL) Default=B'10011001'= H'99=153

bit	function	command	default
7-4	0000-0001=not used		
	0010=-3dBm	!L3	
	0011=-4dBm	!L4	
	0100=-5dBm	!L5	
	0101=-6dBm	!L6	
	0110=-7dBm	!L7	
	0111=-8dBm	!L8	
	1000=-9dBm	!L9	
	1001=-10dBm	!L10	
	1010=-11dBm	!L11	
	1011=-12Bm	!L12	
	1100=-13Bm	!L13	
	1101=-14Bm	!L14	
	1110=-15Bm	!L15	
	1111= not used		
<i>Not used by SNM 49</i>			
3-0	0000-0001=not used		
	0010=-3dBm	*L3	
	0011=-4dBm	*L4	
	0100=-5dBm	*L5	
	0101=-6dBm	*L6	
	0110=-7dBm	*L7	
	0111=-8dBm	*L8	
	1000=-9dBm	*L9	
	1001=-10dBm	*L10	*
	1010=-11dBm	*L11	
	1011=-12Bm	*L12	
	1100=-13Bm	*L13	
	1101=-14Bm	*L14	
	1110=-15Bm	*L15	
	1111= not used		

S75 Reserved for network management**S76 Not used****S77 Bit Mapped Option Register (Special functions)**

Default B'0000000' = H'00' = 000

bit	function	command	default
7	0=Echo enable in remote set-up 1=Echo disable in remote setup		*
6	0=S42 value in seconds 1=S42 value in minutes		*
5-1	Not used		
0	0=Notebook back research function disabled 1=Notebook back research function enabled		

S78 Bit Mapped Option Register (Special functions)

Default B'0000000' = H'00' = 000

bit	function	command	default
7-5	Not used		
4	0=Ring Indicator delay 200mS 1=ring indicator delay 110mS		*
3	Not used		
2	0=In backup SW is on hook 1=In backup SW is off hook during handshake on LL		*
<i>Not Used by SNM49</i>			
1	Not used		
0	0=In remote set-up phone book disable 1=In remote set up phone book is enable		*
<i>Not Used by SNM49</i>			

S79 Bit Mapped Option Register

Default B'0000000' = H'00' = 000

bit	function	command	default
7-5	Not used		
4-0	00000=Min speed disabled 00001= Min speed 300 bps 0010=Not used 00011= Min speed V23 00100= Min speed 1200 bps 00101= Min speed 2400 bps	#F0 #F1 #F3 #F4 #F5	*

00110=	Min speed 4800 bps	#F6
00111=	Min speed 7200 bps	#F7
01000=	Min speed 9600 bps	#F8
01001=	Min speed 12000 bps	#F9
01010=	Min speed 14400 bps	#F10
01011=	Min speed 16800 bps	#F11
01100=	Min speed 19200 bps	#F12
01101=	Min speed 21600 bps	#F13
01110=	Min speed 24000 bps	#F14
01111=	Min speed 26400 bps	#F15
10000=	Min speed 28800 bps	#F16
10001=	Min speed 31200 bps	#F17
10010=	Min speed 33600 bps	#F18

3.9. SECURITY FEATURES OVER PSTN

In this section you can find informations about:



3.9.1. Dial up with password (autologon)

3.9.2. Call-back

3.9.3. Enhanced call-back

3.9.1. Dial up with password (autologon)

In each location of modem phonebook is possible to insert a security password. Password can be send by originate modem and waited by answer modem. Password exchange is case insensitive.

Example 1

In originate modem insert in a available location (3) of modem phonebook, the telephone number 1234 linked with the password PASS1 using the following command:

ATN3&Z1234<ctrl>T

The modem response:

TRANSMIT

Type the password

PASS1<CR>

In answer modem insert in a available location (7) of modem phonebook the password PASS1 using the following command:

ATN7&Z<ctrl>R

The modem response **RECEIVE**
Type the password **PASS1<CR>**
Set-up the register S43 with right phonebook position:
 ATS43=7<CR>
Now originate modem can call answer one.

3.9.2. Call-back

This feature allows answer modem to drop the line after a connection (and eventually a password exchange) and recall a defined number stored into modem phonebook.

Example 1: call-back without password

The modem A (originate with phone number 1234) calls modem B (answer with phone number 5678); when a connection is active modem B will disconnect and recall modem A.

- 1 Modem A:** load modem B phone number in phonebook location 8
Type **ATN8&Z5678<ctrl>D**
The modem response: **DISCONNECT!**
Type **<CR>**
- 2 Modem B:** load modem A phone number and call-back command in phonebook location 9
Type **ATN9&Z<ctrl>C**
The modem response: **CALL_BACK Nr.**
Type **1234<CR>**
- 3 Modem B:** set-up the register S43 right phonebook position:
 ATS43=9
- 4 Modem A:** call modem B **ATDN8**

Example 2: call-back with password

The modem A (originate with phone number 1234) calls modem B (answer with phone number 5678); when a connection is active and after a successful password exchange modem B will disconnect and recall modem A.

- 1 Modem A:** load modem B phone number and password in phonebook location 8
Type **ATN8&Z5678<ctrl>T**
The modem response: **TRANSMIT**
Type the password **XXXX**

- 2 **Modem B:** load modem A phone number, password check and call-back command in phonebook location 9

Type	ATN9&Z<ctrl>R
The modem response:	RECEIVE
Type	XXXX<ctrl>C
The modem response:	CALL_BACK Nr.
Type	1234
- 3 **Modem B:** set-up the register S43 with a value in range 100-253

	ATS43=100
--	------------------
- 4 **Modem A:** call modem B

	ATDN8
--	--------------

Example 3: Call-back with password and research in the phonebook

The modem A (originate with phone number 1234) calls modem B (answer with phone number 5678); when connection is active modem A sends password and disconnect. The modem B look for the password into its phonebook. The first location founded is used to recall modem A.

- 1 **Modem A:** load modem B phone number, password and research command in phonebook location 8

Type	ATN8&Z5678<ctrl>T
The modem response:	TRANSMIT
Type the password	XXXX <ctrl>D
The character “ ” (ASCII 124) indicates to the remote modem to look for the previous value into its phonebook	
The modem response:	DISCONNECT!
To end the procedure:	<CR>
- 2 **Modem B:** load the password and the phone number of modem A in the phonebook location 9

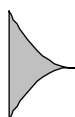
Type	ATN9&Z<ctrl>R
The modem response:	RECEIVE
Type	XXXX<ctrl>C
The modem response:	Call_BACK Nr.
Type	1234<CR>
- 3 **Modem B:** set-up the register S43 with a value in range 100-253

	ATS43=100
--	------------------
- 4 **Modem A:** make a call to modem B

	ATDN8
--	--------------

3.10. ACCESS TO THE REMOTE MODEM

In this section you can see more informations about:

**3.10.1. Down-load****3.10.2. Down-load from PC****3.10.3. Remote Configuration****3.10.4. Remote Configuration from PC**

These features are particularly useful to make remote technical assistance to your modem network. Some special AT commands are available to implement these features and it's possible to manage them under a password control procedure.

**ATTENTION**

The remote configuration available on the modem SNM49,50 and SNM54 is independent from the active configuration (synchronous or asynchronous) but only depend if the function is enable.

There are two operation modes:

- Down-load
- Remote Configuration

**ATTENTION**

During Down-load or Remote Configuration, the Error Control Protocol is always automatically activated (LAPM).

ATTENTION

After a Down-load the modem returns ON-LINE. After a Remote configuration the modem returns in ESCAPE mode.

3.10.1. Down-load

Up to 2 user configuration of the local modem can be down loaded to the remote modem. The register S65 and S66 contain the indication of the 2 user configuration are available for down load (from 0 to 9). All the remote modem registers are update and only the telephone numbers into the remote phonebook are maintained.

The last configuration received by the remote modem will be active after line disconnection.

3.10.2. Down-load from PC

- 1 **Remote modem** : enable the down-load with the command
AT#T4
- 2 Connect the modems
- 3 **Local modem**: digit the escape sequence to go in command mode:
+++
Wait for the response:
OK
Set the register S65 and S66 with the two user configuration (ex.6 and 7)
ATS65=6
ATS66=7
Run the down-load:
AT#T7
The modem response:
LOCAL MODEM:...
REMOTE MODEM:...
Press ENTER to confirm down-load or any other key to abort:
The modem response:
DOWN-LOAD IN PROGRESS
At the end the modem can response:
TPG(OK
or in case of unsuccessful
TPG(ERROR

3.10.3. Remote Configuration

This feature permits to modify locally, command by command or register by register, the remote modem . For security reason the remote configuration can be under password control. The register S44 contains the location of modem phonebook to use for this application.

3.10.4. Remote Configuration from PC

- 1 **Remote modem** : enable the remote configuration with the command
AT#T4
- 2 Connect the modems
- 3 **Local modem**: digit the escape sequence to go in command mode:
+++

Wait for the response:

OK

Run the remote access with:

AT#T6

The modem response:

TPG GRANTED

followed by the prompt coming from the remote modem

TPG(OK

From this time each command typed locally acts on remote modem

To exit from the remote configuration type:

+++

The modem response:

OK

Then:

AT#T0

***EXAMPLE:** Remote configuration with password*

In remote mode, starting from factory configuration 9, insert password into phonebook position 7 and enable password exchange.

- 1 **Local Modem:** Load the factory configuration 0

AT&F

- 2 **Remote Modem:** Load the factory configuration 9 and insert in S44 register the phonebook position (7)

AT&F9S44=7

Type: **ATN7&Z<ctrl>T**

The modem response: **TRANSMIT**

Type **INSERT PASSWORD< ctrl>R**

The modem response: **RECEIVE**

Type **YOUR PASSWORD<CR>**

The modem response: **OK**

- 3 Connect the modems

- 4 **Local Modem:** digit the escape sequence to go in command mode

+++

Wait for the response:

OK

Run the remote access with:

AT#T6

The modem response:

TPG GRANTED

followed by the message, coming from the remote modem:

INSERT PASSWORD

Type: **YOUR PASSWORD**

Wait for the remote prompt

TPG(OK