AT Commands Set

Basic AT Commands

A/	Re-execute Command The modem repeats the last command line sent by the DTE. Usually used for re-dialing. **Note:** This command should **not** be terminated by <CR>.
A	Answer The modem will go off-hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode. **Notes:** If +FCLASS=0 is selected, the modem will enter the connect state after exchanging carrier with the remote system. If no carrier is detected within the period specified in S7, the modem hangs up. Any character entered while connecting will abort the connection process. If +FCLASS=1, the modem will go off-hook in V21 answer mode. It will generate the V21 2100 Hz answer tone for 3 +/- 0.5 seconds, and following a delay of 70 ms, will proceed as if the +FTH=3 command were issued. At any stage up to (but excluding) the +FTH=3 command state, any character will abort the communication. If +FCLASS=8 (#CLS=8), the modem will go off-hook and a voice session will take place. Related S-Reg: S0
Bn	CCITT Control B0 Connect at V.22 1200 bps Result codes: OK n=0 Error Otherwise
Dn	Dial Directs the modem to go on-line, dial according to the string entered, and attempt to establish a connection. The Dial String may consist of any of the characters described below:
*	T Tone dialing (first character in the string) P Pulse dialing (first character in the string) L Redial last dialed number (first character in the string) 0-9 Digits 0 to 9. * Asterisk (tone only) # Hash (tone only) W Wait for dial tone; the modem will wait for dial tone before dialing the digits following "W". S6 register will be used for timeout. (X3 or higher) , (Comma); Pause for the time specified by S8 before resuming the dialing ; (Semicolon) Return to command mode after dialing. This allows the user to issue additional AT commands while remaining off-hook. Actual call progress will be entered only after a dial command issued without the ";" terminator. S=n Dial the number stored in the directory; n=0-3 (see &Z). ! Flash; The modem will go on hook for a time defined by S24. @ Wait for silence; The modem will wait for at least 5 seconds of silence before resuming the dialing. If no such silence is detected before the expiration of the call abort timer (S7), the modem will terminate with NO ANSWER response (or BUSY if applicable). If answer tone arrives during execution of this parameter, the modem handshakes. (X3 or higher) (),< > (space) String format characters - ignored <i> any other character - ignored. **Notes:** If +FCLASS=0 is selected, the modem will attempt to connect with another data modem. The modem will use the time period specified in S6 and S7 as time-outs in the handshake process. If a timeout expires, the modem will go on-hook and respond with NO CARRIER response. The command will be aborted in progress is a DTE character is entered before completion of the handshake. If +FCLASS=1, the modem will attempt to connect with a fax machine (or modem) by entering the HDLC V21 channel 2 receive state (as if +FRH=3 had been issued).

	The command will be aborted upon receipt of a DTE character if the modem has not finished dialing. In this case the modem will go on-hook and return to command mode responding with NO CARRIER message. If the modem has finished dialing, It proceeds as if +FRH=3 command has been issued. If +FCLASS=8 (#CLS=8), the modem will go off-hook in V21 answer mode. It will decide (based on timers) when the other side answers in voice and a voice session will take place. Related S-Reg: S5,S6,S7,S16,S22,S28,S56
En *	Set local echo The modem enables/disables echo of characters to DTE. Parameter value is written to S13. E0 Disable command echo. E1 Enable command echo. Result codes: OK n=0 or 1 Error Otherwise Related S-Reg: S13
Hn *	Set ON/OFF hook H0 Modem hangs up (goes on-hook). H1 Modem goes off hook. Result codes: OK n=0 or 1 Error Otherwise

In	Identification/Information
	
	I1 Modem Name, Vendor Name, Modem Version,
	         for example **:**
	         ModemX
	         ModemWorks Ltd.
	         Ver 1.10
	
	I2 SW Provider /SW Version, for example
	         Smart Link Ltd.
	         Ver 1.20
	
	I3 Chipset Vendor/Chipset ID, for example
	         Chip Vendor Ltd.
	         XY4220
	
	I4 Modem active profile for example,
	         Active Profile:
	         S00=000 S01=000 S02=000 S03=000 S04=000 S05=000 S06=000 S07=000 S08=000 S00=009
	         S10=000 S11=000 S12=000 S13=000 S14=000 S15=000 S16=000 S17=000 S18=000 S01=019
	         S20=000 S21=000 S22=000 S23=000 S24=000 S25=000 S26=000 S27=000 S28=000 S29=000
	         S30=000 S31=000 S32=000 S33=000 S34=000 S35=000 S36=000 S37=000 S38=000 S39=000
	         S40=000 S41=000 S42=000 S43=000 S44=000 S45=000 S46=000 S47=000
	
	I5 Stored profile 0
	         Active Profile 0:
	         (Same format as above)
	
	I6 Stored profile 1
	         Active Profile 1:
	         (Same format as above)

	I7 Display stored pone numbers (See &Z command)
Ln *	Speaker volume Select speaker volume. L0 Low L1 Low L2 Medium L3 High Result codes: OK n=0-3 Error Otherwise Related S-Reg: S30
Mn *	Speaker control Select when the speaker is On/Off. M0 Speaker always OFF M1 Speaker ON from start of dialing until receiving carrier M2 Speaker always ON M3 Speaker OFF from end of dialing until receiving carrier Result codes: OK n=0-3 Error Otherwise Related S-Reg: S29
Nn *	Automode control Enable/Disable Automode detection. N0 Automode detection disabled. A subsequent handshake will be conducted according to the contents of S32. N1 Automode enabled. A subsequent handshake will be conducted according to the Automode algorithm. Result codes: OK n=0 or 1 Error Otherwise Related S-Reg: S31
On	Returns to on-line data mode This command is normally used to connect the DTE back after an escape (+++) has been issued. O0 Return to on-line data mode. O1 Return to on-line data mode, retrain first. Result codes: OK n=0-1 Error Otherwise
P	Pulse dialing Forces pulse dialing. Applies to subsequent dialing commands. This command holds until the next T dial modifier or T command is received. The modem will go off hook and attempt to answer an incoming call. Upon successful completion of handshake, the modem will go on-line in answer mode. Related S-Reg: S16
Q	Quiet result codes control

*	Q0 Enable sending result codes to DTE. Q1 Disable sending result codes to DTE. Result codes: OK n=0 or 1 Error Otherwise Related S-Reg: S14
S	Read/Write S-Register This command has a few derivatives: Sn=v Sets the value v (decimal) to S-register n (v=0-255) Sn? Displays the value of S-register in decimal format (3 digits) **Note:** Some registers are read-only Result codes: OK All parameters valid Error Invalid S register or value. Trying to write to a read-only register
T	Tone dialing Forces tone dialing. Applies to subsequent dialing commands. This command holds until the next T dial modifier or T command is received. This command changes S14 to reflect the current dialing mode. Related S-Reg: S16
Vn *	Verbose/Numeric result codes Select the time of result messages sent to the DTE. For a list of result codes and verbal messages see X command. V0 Short form (numeric) result codes to be sent to DTE. V1 Long form (verbose) result codes to be sent to DTE. Result codes: OK n=0 or 1 Error otherwise Related S-Reg: S15
Xn	Extended result codes Select the subset of result codes to be used by the modem to the DTE. If the modem is in fax mode (+FCLASS=1), the only message sent to indicate connection is "CONNECT" without a speed indication. X0 Supported messages: OK, CONNECT, RING, NO CARRIER and ERROR, Blind call enabled. X1 Supported messages: OK, CONNECT xxxx, RING, NO CARRIER and ERROR, Blind call enabled. X2 Same as X1 + NO DIAL TONE message, Blind call disabled X3 Same as X1 + BUSY message, Blind call enabled.
*	X4 All messages supported, Blind call disabled (see list below). **Notes:** W,@ dial modifiers are ignored in X1, X2 S6 (Wait before dial) is ignored in X2, X4 if no W is specified in dial string S6 is set to 0 means a blind call

Result Codes

Result Code	Message	X0	X1	X2	X3	X4
0	OK	*	*	*	*	*
1	CONNECT	*	*	*	*	*
2	RING	*	*	*	*	*
3	NO CARRIER	*	*	*	*	*
4	ERROR	*	*	*	*	*
5	CONNECT 1200	1	*	*	*	*
6	NO DIAL TONE	3	3	*	3	*
7	BUSY	3	3	3	*	*
8	NO ANSWER	3	3	3	*	*
9	CONNECT 0300	1	*	*	*	*
10	CONNECT 0600	1	*	*	*	*
11	CONNECT 2400	1	*	*	*	*
12	CONNECT 4800	1	*	*	*	*
13	CONNECT 7200	1	*	*	*	*
27	CONNECT 9600	1	*	*	*	*
14	CONNECT 12000	1	*	*	*	*
15	CONNECT 14400	1	*	*	*	*
16	CONNECT 16800	1	*	*	*	*
17	CONNECT 19200	1	*	*	*	*
18	CONNECT 21600	1	*	*	*	*
19	CONNECT 24000	1	*	*	*	*
20	CONNECT 26400	1	*	*	*	*
21	CONNECT 28800	1	*	*	*	*
22	CONNECT 31200	1	*	*	*	*
23	CONNECT 33600	1	*	*	*	*
24	CONNECT 34800	1	*	*	*	*
25	CONNECT 40000	1	*	*	*	*
26	CONNECT 42000	1	*	*	*	*
28	CONNECT 44000	1	*	*	*	*
29	CONNECT 46000	1	*	*	*	*
30	CONNECT 48000	1	*	*	*	*
31	CONNECT 50000	1	*	*	*	*
32	CONNECT 52000	1	*	*	*	*
33	CONNECT 54000	1	*	*	*	*
34	CONNECT 56000	1	*	*	*	*
35	CONNECT 57600	1	*	*	*	*
36	CONNECT 115200	1	*	*	*	*
37	CONNECT 230400	*	*	*	*	
38	CONNECT 460800	1	*	*	*	*
39	CONNECT 921600	1	*	*	*	*
40	CONNECT 32000	*	*	*	*	
41	CONNECT 34000	1	*	*	*	*
42	CONNECT 36000	1	*	*	*	*
43	CONNECT 38000	*	*	*	*	*
44	CONNECT 58000	*	*	*	*	*
45	CONNECT 60000	*	*	*	*	*
46	CONNECT 28000	*	*	*	*	*
47	CONNECT 29333	*	*	*	*	*
48	CONNECT 30666	*	*	*	*	*
49	CONNECT 33333	*	*	*	*	*
50	CONNECT 34666	*	*	*	*	*
51	CONNECT 37333	*	*	*	*	*

	52	CONNECT 38666	*	*	*	*	*
	53	CONNECT 41333	*	*	*	*	*
	54	CONNECT 42666	*	*	*	*	*
	55	CONNECT 45333	*	*	*	*	*
	56	CONNECT 46666	*	*	*	*	*
	57	CONNECT 49333	*	*	*	*	*
	58	CONNECT 50666	*	*	*	*	*
	59	CONNECT 53333	*	*	*	*	*
	60	CONNECT 54666	*	*	*	*	*
	70	FAX	*	*	*	*	*
	71	DATA	*	*	*	*	*
	100	VCON	4	4	4	4	*
	101	DELAYED	4	4	4	4	*
	102	BLACKLISTED	4	4	4	4	*
	66	COMPRESSION: CLASS 5	-	*	*	*	*
	67	COMPRESSION: V.42BIS	-	*	*	*	*
	69	COMPRESSION: NONE	-	*	*	*	*
	76	PROTOCOL: NONE	-	*	*	*	*
	77	PROTOCOL: LAPM	-	*	*	*	*
	78	PROTOCOL: MNP	-	*	*	*	*
	1021	MODULATION: V.21	-	*	*	*	*
	1022	MODULATION: V.22	-	*	*	*	*
	1032	MODULATION: V.32	-	*	*	*	*
	1034	MODULATION: V.34	-	*	*	*	*
	1103	MODULATION: B103	-	*	*	*	*
	1122	MODULATION: V.22BIS	-	*	*	*	*
	1132	MODULATION: V.32BIS	-	*	*	*	*
	1134	MODULATION: V.34BIS	-	*	*	*	*
	1212	MODULATION: B212	-	*	*	*	*
	+F4	+FCERROR	*	*	*	*	*

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

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

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

Related S-Reg: S56

Yn	Select default configuration
	Select the default user defined configuration.
	Note: The default configuration is not loaded by Yn (See Zn)
	Y0 Select user template 0
	Y1 Select user template 1
*	Y2 Select factory setting 0
	Y3 Select factory setting 1
	Related S-Reg: S161
Zn	Select user defined configuration
	Select the user defined configuration.

	Z0	Select default user template (as defined by Yn)
	Z1	Select user template 0
	Z2	Select user template 1
	Z3	Select factory setting 0 (&F0)
	Z4	Select factory setting 1 (&F1)
	Result codes:	
	OK	n=0-5
	Error	Otherwise
	Related S-Reg: S59	

AT& Commands

&An	Connect message format
*	Select the format of the CONNECT message.
	&A0 no extra messages besides CONNECT xxxxx
	&A1 Add Modulation indicator:
	V.21/ V.22/ V.22BIS/ V.32/ V.32BIS/ V.34/
	V.34BIS/ B103/ B212
	For example:
	Modulation: V.34
	&A2 Add Error Detection Protocol and Data Compression indicators.
	For example:
	Protocol: LAPM/MNP/NONE
	Compression: CLASS 5/V.42BIS/NONE
	&A3 Add Modulation Indicator + Error Detection Protocol + Data Compression indicators (see above).
	Related S-Reg: S70, S71

&Cn	Control Carrier Detect (CD,RLSD) behavior
	Controls the RLSD output behavior.
	&C0 RLSD is assumed to be ON all the time
*	&C1 RLSD follows the carrier state
	Result codes:
	OK n=0 or 1
	Error Otherwise
	Related S-Reg: S60

&Dn	Controls DTR behavior (NA)
	Controls the DTR output behavior.
	Note: This command is supported for compatibility.
	It has no significance in Modio environment.
*	&D0 DTR is taken to be ON all the time
	&D1 DTR drop causes entry to command mode without disconnect
	&D2 DTR follows DTR circuit definition
	&D3 DTR drop causes software reset (as in Z0)
	Result codes:
	OK n=0-3
	Error Otherwise
	Related S-Reg: S63
&En	Connect message speed source
	Select the requested source for the speed field in the CONNECT message.
	&E0 DCE Speed
*	&E1 DTE Speed
	Note: Since a virtual port is involved, the DTE is not bound by any UART limitation, and may be theoretically set as high as 921600.
	DTE speed is supported for compatibility only. It bears little significance in Modio environment.

	Related S-Reg: S71
&Fn	Sets factory configuration
	Select one of the factory settings.
	&F0 Select factory setting 0
	&F1 Select factory setting 1
	Result codes:
	OK n=0-1
	Error Otherwise
	Related S-Reg: S59
&Hn	Sets flow control
	Select the user defined configuration.
	&H0 Flow control disabled (NA)
*	&H1 "HW" flow control RTS/CTS (emulation)
	Result codes:
	OK n=0-1
	Error Otherwise
	Related S-Reg: S62
&Kn	Same as %Cn
&Pn	Set pulse dial make/break ratio
*	&P0 US & Canada 39%/61% (10 pps)
	&P1 UK & Hong Kong 33%/67% (10 pps)
	&P2 Same as 0, except at 20 pps
	&P3 Same as 1, except at 20 pps
	Result codes:
	OK n=0-3
	Error Otherwise
	Related S-Reg: S28
&Rn	Controls RTS behavior
	Controls the RTS output behavior.
	Note: This command is supported for compatibility.
	It has no actual effect
	&R0 RTS ignored
	&R1 Modem receives data only on RTS (NA)
	Result codes:
	OK n=0 or 1
	Error Otherwise
	Related S-Reg: S61
&Sn	Controls DSR behavior
	Note: This command is supported for compatibility.
	It has no actual effect.
	&S0 DSR override (is assumed to be ON all the time)
	&S1 DSR follows circuit definition
	Result codes:
	OK n=0 or 1
	Error Otherwise

	Related S-Reg: S64
&V	Display Active profile, Stored Profiles, Stored Phone Numbers (Equivalent to I4-I7 combined)
&Wn	Writes current configuration &W0 Write to template 0 &W1 Write to template 1 Result codes: OK n=0-1 Error Otherwise Written to registry.
&Zn	Stores dial string Stores/Displays dial string (up to 47 characters) &Zn=s Store dial string (n=0-4) &Zn=L Store the last dialed string (n=0-4) &Zn? Display the nth string &ZL? Display the last dialed string Written to registry.

AT\ Commands - Error correction control

\An *****	Maximum MNP block Size \A0 64 characters maximum block size \A1 128 characters maximum block size \A2 192 characters maximum block size \A3 256 characters maximum block size Result codes: OK n=0-3 Error Otherwise Related S-Reg: S<basereg+1> of V.42 registers
\Bn	Transmit break to remote (-) In non-error correction mode, the modem will transmit a break signal to the remote modem with a length of n*100ms. If a number above 9 is entered, 9 is used. Result codes: OK if connected in data modem mode Error if not connected or if connected in fax modem mode
\Kn *****	Break Control (-) Controls the response of the modem to a break received from DTE or a remote modem or the \Bn command. The behavior parameter is written to Sxx \K0 Enter on-line command mode, no break sent to remote modem \K1 Clear data buffers and send break to remote modem \K2 Same as 0 \K3 Send break to remote modem immediately \K4 Same as 0 \K5 Send a break to remote modem in sequence with transmitted data Related S-Reg: S<basereg+x> of V.42 registers Result codes: OK n=0-5 Error Otherwise
\Nn *****	Error correction operating mode \N0 Normal (Speed buffering) - No error correction \N1 Direct (pass-through) 128 characters maximum block size \N2 Reliable (error correction) mode. The Modem will attempt LAPM and then MNP \N3 Auto reliable mode. Same as \N2, but will fall back to Normal

	\N4 LAPM error correction mode only, hang up upon failure.
	\N5 MNP error correction mode only, hang up upon failure.
	Result codes:
	OK n=0-5
	Error Otherwise
	Related S-Reg: S<basereg> of V.42 registers

AT% Commands

%Cn	Compression control
	%C0 Disable data compression
	%C1 Enable MNP5 data compression
	%C2 Enable V.42bis data compression
*	%C3 Enable MNP5/V.42bis data compression
	Result codes:
	OK n=0-3
	Error Otherwise
	Related S-Reg: S<basereg+2> of V.42 registers
%En	Line quality monitor control
	Controls whether or not the modem will automatically monitor
	the line quality and request a retrain (%E1), or fall back when
	quality is insufficient or fall forward when line quality
	improves (%E2).
	%E0 Disable line quality control
*	%E1 Enable line quality control and auto retrain
	%E2 Enable line quality control and fallback/forward
	Result codes:
	OK n=0-3
	Error Otherwise
	Related S-Reg: S39

AT+MS Command

+MS	Modulation select
	This command selects the modulation, optionally enables/disables Automode, and optionally specifies the lowest and highest connection rates.
	The command format is:
	AT+MS= [\<mod>][,[\<automode>][,[\<min_rate>][,[\<max_rate>]]]]
	\<mod> a decimal number specifying the preferred modulation (automode enabled), or the modulation (automode disabled).
	\<automode> 0/1 Automode disabled/enabled
	\<min_rate> minimum rate for connection. If lower than the actual minimum rate for the selected modulation, the actual lowest supported rate will be taken.
	\<max_rate> maximum rate for connection. If higher than the actual maximum rate for the selected modulation, the actual highest supported rate will be taken.

	Table 1 - +MS command parameters		
	\<mod> Modulation	Possible rates	
	22 V.22	1200	
	122 V.22bis	2400,1200	
	32 V.32	9600, 4800	
	132 V.32bis	14400, 12000, 9600,	7200, 4800
	34 V.34	33600, 31200, 28800,	26400, 24000,
		21600, 19200,16800,	14400, 12000,
		9600	

56	K56Flex	32000,34000,36000	,56000
90	V.90	29333, 30666,32000 .....,56000	
212	Bell 212	1200	
103	Bell 103	300	

Examples:

AT+MS=34,0,4800,33600   V.34, No Automode, Min. speed 4800, Max speed 33600

AT+MS=,1   Automode

AT+MS=32,1,,14400   V.32 Automode, Max speed 14400 (min speed as before)

Factory Settings: 90,1,300,56000

The requested modulation scheme will be written to S32

The requested min rate will be written to S33

The requested max rate will be written to S34

The actual rate may be read from S35

The actual modulation scheme may be read from S37

(The codes as specified in the Xn command)

Other derivatives of the +MS command:

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

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

Result codes:

OK   Syntax OK

Error   Otherwise

Related S-Reg: S31-S37

AT* Commands – Black List Support

Note: The following command will always return OK as a result code.

*B	Return Blacklisted numbers

Blacklisting is a country dependent parameter.

When no time-out is defined:

When a number is unsuccessfully called x successive times, it is blocked altogether, until next system reset.

Further calls will return **BLACKLISTED** code.

When time-out is defined:

When a number is unsuccessfully called x successive times, it is blocked temporarily until the time-out expires.

Calls within the time-out period will return **DELAYED** code.

Format:

No.	Called	Blocked	Phone
Index	# of calls	' ' (blank)	Phone number
		- not blocked	
		(number still candidate for blacklist)	
		or	
		'*' (asterisk) - blacklisted/blocked	
		or	
		'Xmin' - # of min to time-out – delayed	

Example 1: No time-out defined. Full blocking occurs

No.	Called	Blocked	Phone

No.	Called	Blocked	Phone
1	5	*	t1234
2	3		t5678

Example 2: Time-out defined. Delay scheme used.

No.	Called	Blocked	Phone
1	5	2min	t1234
2	3		t5678

S-Registers

S-Register Summary

S#	Function	Range	Units	PW	Default	AT Command
S0	Rings to Auto-Answer	0-255	rings		0	A
S1	Ring Counter	0-255	rings		0	
S2	Escape Character	0-255	ASCII		43	
S3	CR Character	0-255	ASCII		13	
S4	LF Character	0-255	ASCII		10	
S5	BS Character	0-255	ASCII		8	
S6	Wait Time for Dial Tone (Also wait before Blind Dialing)	2-255	s	*	2	D
S7	Wait Time for Carrier	1-255	s	*	60	D
S8	Pause Time for Dial (,)	0-255	s		2	D
S9	Carrier Detect Response Time	1-255	0.1s		6	
S10	Carrier Loss Disconnect Time	1-255	0.1s	*	7	
S11	DTMF Tone duration	50-255	0.001s	*	100	D
S12	Reserved					
S13	Echo	0-1			1	E
S14	Quiet	0-1			0	Q
S15	Verbose	0-1			1	V
S16	Pulse/Tone	0-1		*	1	T,P,D
S17	Reserved					

S18	Test Timer	0-255	s		0	&T
S19	System Inactivity Timer	0-255	min		0	
S20	Reserved					
S21	Break Length	0-9	100ms		9	\B
S22	Origin/Answer	0-1			0	
S23	XOFF Character (NA)	0-127	ASCII		19	
S24	Flash Timer	0-255	10 ms		20	