PP2I AT Command Reference Manual

1. Special Key

Command	Options	Function & Description	Ref.
A/		Re-execute the last command once.	
A>		Re-execute the last command once or repeat the last call up to 9 times. (See also S8)	
<any key>		Terminate current connection attempt when entered in handshaking state.	
+++		Escape sequence code, entered in data state, wait for modem to return to on line command mode.	

Table 1. Basic AT Command Sets

2. Basic AT Command Sets

All the Following Commands Require an “AT” Prefix:

Command	Options	Function & Description	Ref.
A		Go on-line in answer mode. (See also S39.2, S43.6)	
Bn		Handshake option.	S28.7
	B0 *	Select CCITT V.22 for 1200 bps	
	B1	Select Bell 212A for 1200 bps communication.	
D*s*		Dial s (numbers and options) that follow (see also S38.0, S35.4). The options of s are listed as follows:	
	0-9, A, B, C,D #, *	Digits for dialing	
	P	Pulse dialing	S23.1
	T	Tone dialing	S23.1
	,	Pause for a time specified in S8. Remaining digits will be dialed as in-band DTMF.	
	;	Return to command state after dialing	
	!	Hook flash	
	@	Wait for a 5 second silence before proceeding , otherwise return NO ANSWER	
	R	Reverse handshake (go on-line in Answer mode)	S17.5
	W	Wait for the second dial tone. Remaining digits will be dialed as in-band DTMF	
DL		Dials the last-dialed number	
DS*n*	n=0-3	Dial the number stored in non-volatile RAM at location 'n'	S44.3

Command	Options	Function & Description	Ref.
E*n*		Command mode local echo of keyboard commands	S23.0
	E0	Echo off	
	E1 *	Echo on	
H*n*		On/off hook control	S56
	H0 *	Hang up (on-hook) the modem or ISDN, same as 'ATH'	
	H1	Off hook the modem	
I*n*		Display inquired information	
	I0	Display numerical product code, same as 'ATI'	
	I1	Display product information and ROM checksum	
	I2	Display modem link status report	
	I12	Display physical layer status	
	I13	Display channel response for V.34	
L*n*	n=0-7 4 *	Speaker volume control. The higher the value, the higher the volume	S24.4-6
M*n*		Speaker control	S21.1-2
	M0	Speaker is always OFF	
	M1 *	Speaker is ON until carrier detected	
	M2	Speaker is always ON	
	M3	Speaker is ON after the last digit is dialed out Tone dialing is not heard.	
O		Return to on-line state	
O1		Force modem to request a retrain	
Q*n*		Result code displayed	S23.7
	Q0 *	Modem returns result code	
	Q1	Modem does not return result code	
	Q2	Modem returns result code but quiet after answering on a RING (see also S42.2)	S40.1
Sr.b=*n*		Set bit 'b' of S-register 'r' to value 'n'. 'n' is a binary digit '0' or '1'	
Sr.b?		Display value of bit 'b' of S-register 'r'	
Sr=*n*		Set S-register 'r' to value 'n'. 'n' must be a decimal number between 0 and 255	
Sr?		Display value stored in S-register 'r'	
T		Tone dial	S23.1
UPX		Download firmware to the Flash EPROM by using Xmodem protocol	
V*n*		Sets display type for Result Codes	S23.6
	V0	Display result code in numeric form. (See also S35.7 and the result code table of 'ATXn')	
	V1 *	Display result code in verbose form.	
X*n*	n=0-7 5 *	Result code options, see the Options Table	S23.3-5
Z*n*	n=0-2	Reset modem and set power-on profile.	S15.5-7
	Zn	Reset modem and load user profile n (0-1).	
	Z2	Reset modem and load factory settings.	
+++		Escape sequence code , entered in data state , wait for modem to return to command state	

Table 2. AT Command Sets Requiring an "AT" Prefix

3. Extended AT& Command Sets

Command	Options	Function & Description	Ref.
&Bn		Data rate, terminal-to-modem. (DTE/DCE)	S28.6
	&B0	DTE rate follows connection rate. (See also S44.6)	
	&B1 *	DTE/DCE rate fixed at DTE setting (See also S18, S20, and S44.6)	
&Cn		Carrier Detect (CD) options	S21.4
	&C0	CD always ON (See also S42.7)	
	&C1 *	CD tracks presence of carrier (See also S38.3, S42.7)	
&Dn		Data Terminal Ready (DTR) options. (See also S25)	S21.6-7
	&D0	Ignore DTR signal, assume DTR is always ON.	
	&D1	108.1, DTR OFF-ON transition causes dial of the default number. (See also 'AT*Dn' and S48.4)	
	&D2 *	108.2, Data Terminal Ready, DTR OFF causes the modem to hang up.	
	&D3	Same as &D2 but DTR OFF causes the modem to hang up and reset from profile 0.	
&F		Load factory settings to RAM as active configuration.	
&Gn		Guard tone options	S28.4-5
	&G0 *	No guard tone (within USA, Canada).	
	&G2	1800 Hz guard tone.	
&Hn		Data flow control, DTE/DCE.	S27.3-5
	&H0	Flow control disabled.	
	&H3 *	Hardware (CTS/RTS) flow control	
	&H4	Software (XON/XOFF) flow control.	
&Kn		Modem error control and data compression.	S27.0-2
	&K0	No error control.(Same as AT&K)	
	&K1	MNP4 (See also S41.0).(include MNP3)	
	&K2	MNP4+MNP5 (See also S38.5, S41.0).	
	&K3	V.42+MNP4.	
	&K4 *	V.42+V.42bis, compatible with &K2 (See also S38.5).	
&Nn		Modem link mode options (DCE/DCE). (See also S43.7, S48.1)	S19
	&N0 *	Multi-Auto, auto negotiate highest possible link rate: V.90,V.34, V.32bis, V.32, V.22bis, V.22 and Bell 212A, G3 Fax V.17/V.29/V.27ter.	
	&N3	V.32 9600T/9600/7200T/4800	
	&N4	V.32 9600/7200/4800	
	&N5	V.32 4800	
	&N12	V.23 1200/75	
	&N13	V.23 600/75	
	&N14	V.22bis 2400/1200	
	&N15	V.22 1200	
	&N16	V.21 300	
	&N17	V.32bis 14400/12000/9600/7200/4800	
	&N18	V.32bis 12000/9600/7200/4800	

Command	Options	Function & Description	Ref.
	&N19	V.32bis 7200/4800	
	&N24	BELL 212A 1200	
	&N25	BELL 103 300	
	&N60	V.34 33600	
	&N61	V.34 31200	
	&N62	V.34 28800	
	&N63	V.34 26400	
	&N64	V.34 24000	
	&N65	V.34 21600	
	&N66	V.34 19200	
	&N67	V.34 16800	
	&N68	V.34 14400	
	&N69	V.34 12000	
	&N70	V.34 9600	
	&N71	V.34 7200	
	&N72	V.34 4800	
	&N73	V.34 2400	
	&N99	V.90 28000	
	&N98	V.90 29333	
	&N97	V.90 30666	
	&N96	V.90 32000	
	&N95	V.90 33333	
	&N94	V.90 34666	
	&N93	V.90 36000	
	&N92	V.90 37333	
	&N91	V.90 38666	
	&N90	V.90 40000	
	&N89	V.90 41333	
	&N88	V.90 42666	
	&N87	V.90 44000	
	&N86	V.90 45333	
	&N85	V.90 46666	
	&N84	V.90 48000	
	&N83	V.90 49333	
	&N82	V.90 50666	
	&N81	V.90 52000	
	&N80	V.90 53333	
	&N79	V.90 54666	
	&N78	V.90 56000	
&Pn		Pulse dial make/break ratio	S23.2
	&P0 *	make / break=39% / 61%	
	&P1	make / break=33% / 67%	
&Rn		RTS (Request To Send) function selection	S21.5
	&R0	CTS tracks RTS, response delay is set in S26	
	&R1 *	Ignore RTS, assumes RTS always ON	
&Sn		Data Set Ready (DSR) function selection.	S21.3
	&S0 *	DSR overridden, DSR always ON.	
	&S1	DSR according to CCITT (ITU-TSS). (See also S41.5, S44.4)	
&Tn		Modem testing.	S16
	&T0	Terminate test in progress.	
	&T1	Initiate Analog Loop-back (ALB) test.	
	&T3	Initiate Local Digital Loop-back (LDL) test	
	&T4	Grant Remote Digital Loop-back request from remote modem	S14.1
	&T5	Deny Remote Digital Loop-back request from remote modem	S14.1
	&T6	Initiate Remote Digital Loop-back (RDL) test	
	&T7	Initiate Remote Digital Loop-back with self test (RDL+ST)	

Command	Options	Function & Description	Ref.
	&T8	Initiate Analog Loop-back with self test. (ALB+ST)	
&Vn		View profile settings.	
	&V0	View current active settings.	
	&Vn	View the (n-1) user profile settings (n=1-2)	
	&V3	View factory default settings.	
&Wn	n=0-1	Save current settings to user profile n in non-volatile RAM. (See also S35.6)	
&Yn		Break handling. Destructive Break clears the buffer. Expedited Break is sent immediately to the remote system.	S28.2-3
	&Y0	Destructive, expedited.	
	&Y1 *	Nondestructive, expedited.	
	&Y2	Nondestructive, unexpedited.	
&Z?		Display all the phone numbers stored in non-volatile RAM.	
&Zn=s	n=0-3	Store phone number/s to NVRAM at location n (n=0-3) use AT*Dn or ATS29=n to set the default dial pointer.	

Table 3. Extended AT& Command Sets

4. Extended AT* Command Sets

Command	Options	Function & Description	Ref.
*Cn		Character length, including start, stop and parity bit.	S15.3-4
	*C0 *	10-bit character length.	
	*C1	11-bit character length.	
	*C2	9-bit character length.	
	*C3	8-bit character length.	
*Dn	n=0-3	Set default dial pointer at telephone directory location n.	S29
	*D0 *	(See also S35.4 and S38.0)	
*En		Modem error control negotiation.	S21.0
	*E0 *	if error control negotiation fails, keep the non-error control connection.	
	*E1	If error control negotiation fails, disconnect the call (hang-up).	
*Pn	n=0-15 *P9 *	Set transmission power level; ranges from -8 dBm to -15 dBm (default: -11 dBm)	S17.1-4
*Qn		Action taken when line quality changes.	S27.6-7
	*Q0	No action to poor signal quality.	
	*Q1	Retrain action taken if signal quality is poor. (See also S41.2)	
	*Q2 *	Adaptive rate, automatic fall-back or forward.	
	*Q3	Disconnect if signal quality is poor.	
*T		Recall the last CND (Caller ID) information.	S40.2

Table 4. Extended AT* Command Sets

5. Extended AT# Command Sets

Command	Options	Function & Description	Ref.
#En		Modem status in escape state	
	#E0	Disable the report of modem status in escape state	
	#E1	Enable the report of modem status in escape state	

Table 5. Extended AT# Command Sets

6. Fax Service Class 1 Commands

Command	Description	Value
+FCLASS=n	Service Class Identification and Control	n=0:Sets to modem mode n=1:Sets to Class 1 mode n=2.0:Sets to Class 2.0 mode n=8:Sets to Voice mode
+FTS=n	Stop Transmission and pauses	n=0-255 in 10 ms units.
+FRS=n	Wait for Silence	n=0-255 in 10 ms units.
+FTM=<MOD>	Transmit Data with <MOD> Carrier	See table 6.1
+FRM=<MOD>	Receive Data with <MOD> Carrier	See table 6.1
+FTH=n	Transmit HDLC Data with <MOD>=3 Carrier	n=3
+FRH=n	Receive HDLC Data with <MOD>=3 Carrier	n=3

Table 6. Service Class 1 Commands

The value of <MOD> parameters lists as below:

Value	Modulation	Speed
3	V.21 ch 2	300
24	V.27ter	2400
48	V.27ter	4800
72	V.29	7200
73	V.17	7200
74	V.17 short train	7200
96	V.29	9600
97	V.17	9600
98	V.17 short train	9600
121	V.17	12000
122	V.17 short train	12000
145	V.17	14400
146	V.17 short train	14400

Table 7. The Value of <MOD> Parameters

7. Service Class 2 Commands

The following Class 2 commands are supported and implemented as per TIA PN2388 (8/20/90):

Command Syntax	Description
+<command>=<value>	Execute a command or set a parameter.
+<command>=?	Read permissible settings.
+<command>?	Read current setting.

Table 8. Command Syntax

Command	Description	Value
+FAA=*n*	Auto-answer mode parameter:	
	Answer as set by +FCLASS.	n=0
	DCE answers and auto-determines type.	n=1
+FBADLIN=<*value*>	Bad line threshold (number of consecutive bad lines for a bad page parameter): Determine if Copy Quality OK on the T.30 flow chart . <Value>=0 to 255; a value of 0 implies that error checking is disabled.	0-255
+FBOR=*n*	Phase C data bit order:	
	Select direct bit order.	n=0
	Select reversed bit order in receiving mode for phase C data.	n=1
+FBUF?	Buffer size; read only parameter: Allow DTE to determine the characteristics of the DCE's buffer size.	
+FCIG=*"string"*	Local fax station ID string, for polling Rx.	
+FCLASS=*n*	Service class selection: Refer to +FCLASS Class 1 command in previous section.	
+FCON	DCE responds fax connection.	
+FCQ=*n*	Copy quality check capability parameter	
	No copy quality checks capability.	n=0
	Only check 1D phase C data.	n=1
	Check both 1D and 2D phase C data.	n=2
+FCR=*n*	"Capability to receive" parameter	
	DCE will not receive message data or poll a remote device.	n=0
	DCE receives message data or polls a remote device.	n=1
+FDCC=*vr,br,wd,ln,df,ec,bf,st*	DCE capabilities parameters.	
	Vertical resolution: Normal; 98 lpi.	vr=0
	Vertical resolution: Fine; 196 lpi.	vr=1
	Bit rate: 2400 bit/s; V.27ter.	br=0
	Bit rate: 4800 bit/s; V.27ter.	br=1
	Bit rate: 7200 bit/s; V.29 or V.17.	br=2
	Bit rate: 9600 bit/s; V.29 or V.17.	br=3
	Bit rate: 12000 bit/s; V.17.	br=4
	Bit rate: 14400 bit/s; V.17.	br=5
	Page width: 1728 pixels in 215mm.	wd=0
	Page width: 2048 pixels in 255mm.	wd=1
	Page width: 2432 pixels in 303mm.	wd=2
	Page length: A4; 297mm.	ln=0
	Page length: B4; 364mm.	ln=1
	Page length: unlimited length.	ln=2

Command	Description	Value
	Data compression format: 1-D; modified Huffman.	df=0
	Data compression format: 2-D; modified Read.	df=1
	Error correction disabled.	ec=0
	Disable binary file transfer.	bf=0
	Minimum scan time/line: 0 ms.	st=0
	Minimum scan time/line: 5 ms.	st=1
	Minimum scan time/line: 10 ms (normal); 5 ms (fine).	st=2
	Minimum scan time/line:10 ms.	st=3
	Minimum scan time/line: 20 ms (normal); 10ms (fine).	st=4
	Minimum scan time/line:20 ms.	st=5
	Minimum scan time/line: 40 ms (normal); 20ms (fine).	st=6
	Minimum scan time/line:40 ms.	st=7
+FDCS=*vr,br,wd,ln,df,ec,bf,st*	Current session parameter; refer to +FDCC command.	
+FDIS=*vr,br,wd,ln, df,ec,bf,st*	Current session negotiation parameter; refer to +FDCC command.	
+FDR	Receive phase C data command; initiates document reception.	
+FDT=*df,vr,wd, ln*	Transmit phase C data command: release the DCE to proceed with negotiation.	
+FET=*n*	End of page or document command:	
	More pages; same document.	n=0
	End of document; another document follows.	n=1
	No more pages or documents.	n=2
	Procedure interrupts; another page follows.	n=4
	Procedure interrupt; end of document, another document follows.	n=5
	Procedure interrupts; end of document.	n=6
+FK	Regular fax aborts command.	
+FLID=*"string"*	Local ID string parameter.	
+FLO=*n*	Flow control options:	
	No flow control.	n=0
	Set XON/XOFF software flow control.	n=1
	Set CTS/RTS hardware flow control.	n=2
+FLPL=*n*	Document for polling command:	
	The DTE has no document available for polling.	n=0
	Indicate a document available for polling.	n=1
+FMDL?	Request DCE model.	
+FMFR?	Request DCE manufacturer.	
+FMINSP=*n*	Minimum phase C speed parameter:	
	2400 bps.	n=0
	4800 bps.	n=1
	7200 bps.	n=2
	9600 bps.	n=3
	12000 bps.	n=4
	14400 bps.	n=5
+FPHCTO=<*value*>	DTE Phase C response time-out: Determine how long the DCE will wait for a command after reaching the end of data when transmitting in Phase C. <value>=0 to 255; 100 ms units.	0-255
+FPTS=*n*	Page transfer status	
	Received page good.	n=1
	Page bad; retrain requested.	n=2
	Page good; retrain requested.	n=3
	Page bad; procedure interrupt requested.	n=4
	Page good; procedure interrupt requested.	n=5
+FREL=*n*	Phase C received EOL alignment:	
	The EOL patterns are bit aligned as received.	n=0
	The last received bits of EOL patterns are byte aligned by the DCE, with necessary zero fill bits inserted. Refer to TIA PN-2388 for details.	n=1
+FREV?	Request the DCE revision identification.	
+FSPL=*n*	"Enable polling" command:	

Command	Description	Value
	Disable polling.	n=0
	Enable polling.	n=1

Table 9. Supported Commands (per TIA PN2388 8/20/90)

All other +F commands are not supported, but the modem will respond OK. In many cases this means "don't care."

Response	Value	Function and Description
+FCFR		Confirmation .
+FCIG:"string"		Report remote ID response CIG.
+FCON		Facsimile connection response.
+FCSI:"string"		Report remote ID response CSI.
+FDCS:vr,br,wd,ln,df,ec,bf,st		Report session parameters response; refer to +FDCC=.... command.
+FDIS:vr,br,wd,ln,df,ec,bf,st		Report session negotiation parameters response; refer to +FDCC=.... command.
+FDTC:vr,br,wd,ln,df,ec,bf,st		Report remote capabilities response; refer to +FDCC=.... command.
+FET:n		Post page message response; refer to the +FET=n command.
+FHNG:n		Call termination status response.
	n=00	Normal and proper end of connection.
	n=10	Transmit error on phase A hang up code.
	n=20	Transmit error on phase B hang up code.
	n=40	Transmit error on phase C hang up code.
	n=50	Transmit error on phase D hang up code.
	n=70	Receive error on phase B hang up code.
	n=90	Receive error on phase C hang up code.
	n=100	Receive error on phase D hang up code.
+FNSC:"HEX string"		Report the non-standard facilities command frame.
+FNSF:"HEX string"		Report the non-standard facilities frame response.
+FNSS:"HEX string"		Report the non-standard setup frame response.
+FPOLL		Remote polling indication.
+FPTS:n		Receive page transfer status response; refer to +FPTS=n command.
+FTSI:"string"		Report remote ID response TSI.
+FVOICE		Transition to Voice response.

Table 10. Class 2 Command Responses

Class 2 Flow Control

Flow control is necessary to match the DTE-DCE data rate to the line-signaling rate while transmitting or receiving Group 3 (T.4) data. In Class 2 fax mode, both hardware (RTS/CTS) and software (XON/XOFF) flow control are enabled.

8. Service Class 2.0 Commands

Command	Description	Value
+FDT	Transmit phase C data command: releases the DCE to proceed with the negotiation	
+FDR	Receive phase C data command: initiates document reception	
+FKS	Terminate a Session , orderly fax abort	
+FIP	Initialize Service Class 2.0 Parameters	
+FCLASS=n	Service Class Identification and Control	n=0,1,2.0,8;refer to the +FCLASS Class 1 command
+FMI?	Identify DCE Manufacturer	ZyXEL
+FMM?	Identify DCE	Omni56K
+FMR?	Identify DCE Revision	Vx.x
+FCC=vr,br,wd,ln,df,ec,bf,st	Establish DCE Capabilities	
	Vertical Resolution	vr=0:Normal;98 lpi vr=1:Fine;196 lpi
	Bit Rate	br=0:2400 bps br=1:4800 bps br=2:7200 bps br=3:9600 bps br=4:12000 bps br=5:14400 bps
	Page Width	wd=0:1728 pixels in 215mm wd=1:2048 pixels in 255mm wd=2:2432 pixels in 303mm
	Page Length	ln=0:A4;297mm ln=1:B4;364mm ln=2:unlimited length
	Data Compression Format	df=0:1-D df=1:2-D
	Error Correction	ec=0:Disable
	Binary File Transfer	bf=0:Disable
	Minimum Scan Time/Line	st=0:0 ms st=1:5 ms st=2:10 ms (normal); 5 ms (fine) st=3:10 ms st=4:20 ms (normal); 10 ms (fine) st=5:20 ms st=6:40 ms (normal);20 ms (fine) st=7:40 ms
+FIS=vr,br,wd,ln,df,ec,bf,st	Current Session negotiating parameters	The same as above
+FCS=vr,br,wd,ln,df,ec,bf,st	Current Session Parameters	The same as above
+FLI=”string”	Local Facsimile station ID String, TSI/CSI	
+FPI=”string”	Local Facsimile station ID String, CIG	
+FLP=n	Indicate Document available for polling	n=0:No document n=1:A document is available
+FSP=n	Enable/Disable polling	n=0:Disable n=1:Enable
+FNR=rpr,tpr,idr,nsr	Negotiation Reporting Enable	rpr= 0:Receiver parameters are not reported rpr=1:Receiver parameters are

		reported tpr= 0:Transmitter parameters are not reported tpr=1:Transmitter parameters are reported idr= 0: ID Strings are not reported idr=1: ID Strings are reported nsr= 0:Non-standard frames are not reported nsr= 1:Non-standard frames are reported
+FIE=n	Procedure Interrupt parameter	n=0:Disable n=1:Enable
+FPS=n	Page Transfer Status	n=1:Received page is good n=2:Page is bad; retrain is requested n=3:Page is good; retrain is requested n=4:Page is bad; procedure interrupt is requested n=5:Page is good; procedure interrupt is requested
+FLO=n	Flow Control Select	n=0:No flow control n=1:Sets XON/ XOFF software flow control n=2:Sets CTS/RTS hardware flow control
+FPR=n	Serial Port Rate Control	n=0:Automatic DTE rate detection by the DCE n>0:Serial rate is fixed at the value multiplied by 2400 bps
+FBO=n	Phase C Data Bit Order	n=0:Selects direct bit order n=1:Selects reversed bit order
+FEA=n	Phase C Received EOL alignment	n=0:EOL patterns are as received
+FCR=n	Capability to Receive	n=0:Not receive message data or poll a remote device n=1: Receives message data or poll a remote device
+FCQ=<rq>,<tq>	Copy Quality disable/enable	rq= 0:Receive copy quality check is disable rq=1:Receive copy quality check is enable tq= 0:Transmit copy quality check is disable tq=1:Transmit copy quality check is enable
+FRQ=pql,cbl	Receive Quality Thresholds	pgl= 0-64h:Specifies the percentage of good lines cbl= 0-ffh:Specifies the maximum tolerable number of consecutive bad lines
+FAA=n	Adaptive Answer Mode	n=0:Answers as set by FCLASS n=1:Answers and auto-determines the call type
+FCT=n	Phase C Timeout	n=0-ffh,1 sec units
+FMS=n	Minimum Phase C Speed	n=0:2400 bps n=1:4800 bps n=2:7200 bps n=3:9600 bps n=4:12000 bps n=5:14400 bps
+FBS?	Buffer Size	512,256

9. Voice AT Commands

Command	Function	Option	Default	Description
+FLO	Flow control select.	0,1,2	1	0: NO flow control. 1: (XON/XOFF) Software flow control. 2: (RTS/CTS) Hardware flow control.
+VIP	Initialize parameters.	N/A	N/A	+VSD=15,70 (15*4, 7 second) +VTD=100 (1 second) +VRN=10 (10 second) +VRA=70 (7 second) +VGR=0 (Enable AGC) +VGT=128 +FLO=1 (XON/XOFF) +VIT=70 (7 second)
+FCLASS	Voice/data/fax selection	0,1,2.0,8	0	0: DATA. 1: CLASS 1 FAX. 2.0: CLASS 2.0 FAX. 8: VOICE.
+FMI	Manufacturer ID.	N/A	Omni56K	
+FMM?	Model ID	N/A	ZyXEL	
+FMR?	Revision	N/A	V1.x	
+VRX	Voice recording	N/A	N/A	Start recording.
+VGR	Set the gain for the received voice sample.	0	0	0: Automatic gain control(AGC)
+VGT	Set the gain for the transmitted voice sample.	0-255	128	
+VLS	Select a voice I/O device.	0,1,2	0	0: The DCE is on hook. Local phone connected to Telco line. 1: The DCE is on-hook and is connected to the local phone. The local phone is provided with power. The modem can record/play through the local phone set. 2: The DCE is off-hook and is connected to the Telco line. The local phone is provided with power. The modem can record/play though the telephone line.
+VRA	Ring back goes away timer	0 – 255	70	0 : turn off timer Unit: 100 ms
+VRN	Ring back never come timer	0 – 255	10	0 : ring back never come
+VTX	Voice transmit mode	NA	NA	Enter voice transmission process.
+VSD	Silence detection	Threshold, Period (0-31),(0-255)	15,70	(0-31): DCE silence detection threshold 0: Disable silence detection. (0-255): The required period of silence detection before DCE reporting event. 0: Disable silence detection. Unit: 0.1 second
+VSM	Selection compression method	4;ZyXEL ADPCM; 4 Bit;(9600)	4,9600	IMA 4 bit ADPCM. Sample rate : 9600
+VTS= [x,y,x]	Dual Tone generation	[[x,y,z]: x: 0-3000 Hz y: 0-3000 Hz z: 0- 1000 (in 10ms)	NA	[x,y,z]: x: first frequency y: second frequency z: duration in 10ms.

+VTS = {x,z}	DTMF tone generation	{x,y} x:0-9,A-D,*,# y:0-1000	NA	{x,y} x: DTMF y: duration in 0.1 sec.
+VTS = x	DTMF tone generation	{x} x:0-9,A-D,*,#	NA	x: Default duration:+VTD setting.
+VTD	Default DTMF tone generation duration.	0-255	50	Unit: 0.01 second.
+VIT	Inactivity timer.	0-255	70	Unit: 0.1 second.

Table 11. Voice AT Commands

Note1: The voice function can be determined by WinFax Pro 9.0 excepts speaker phone function.

Note2: Above voice command set is the subset of G2 voice command set excepts the following command:

AT+VLH=? Inquire hook status.

AT+VNH=<hook> Enable/disable automatic hang-up function.

AT+VDD=<dds>, <ddi> Set DTMF detection threshold and required period.

AT+VSY=<timer> Set recording resync timer.

Note2: The d evice selection command “+VLS” is different from IS101 and “#” voice command set. This problem is associated with speaker phone function.

Response Code	Description
<DLE>0 - <DLE>9 <DLE>*,<DLE># <DLE>A-<DLE>D	DTMF
<DLE>a	Answer Tone
<DLE>b	Busy
<DLE>c	Calling Tone
<DLE>d	Dial tone
<DLE>e	European Data Modem Calling Tone
<DLE>f	Bell Answer Tone
<DLE>h	Hang Hand set
<DLE>o	Overrun
<DLE>q	Quiet , silence detected with voice received before,
<DLE>s	Silence, silence detected with never received voice.
<DLE>t	Handset off-Hook
<DLE>u	Under run
<DLE>T	Timing Mark
<DLE><ETX>	End of stream

10. S-Register Description

In most bit-mapped S-registers, the default bit value is 0. Non-0 default values are followed by an asterisk. In some cases, default values are shown in the reference column preceded by +. Some bits are reserved for factory use and should not be changed.

10.1 Basic S-Registers "ATSn=x"

Command	Function & Description	+Ref.
S0=	Set the number of rings on which the modem will answer. 0 value disable auto-answer	+000
S1=	Counts and stores number of rings from an incoming call	+000
S2=	Define escape code character, default '+' (43 dec.). A value of 128-255 disables the escape code	+043
S3=	Define ASCII Carriage Return	+013
S4=	Define ASCII Line Feed	+010
S5=	Define ASCII Backspace. A value of 128-255 disables the Backspace key's delete function	+008
S6=	Set the number of seconds the modem waits before dialing if 'X0' or 'X1' is selected. If a setting of 'X2' to 'X7' is selected, the modem will dial as soon as it detects a dial tone. This register also sets the time-out interval for the "W" dial modifier to wait for the dial tone. (See also S41b4)	+003
S7=	Set duration, in number of seconds modem waits for a carrier	+060
S8=	Set duration, in seconds, for pause (,) option in Dial command and pause between command re-executions for Repeat (>) command	+002
S9=	Set duration, in tenths of a second of remote carrier signal before recognition (Ignored if in non-FSK or half-duplex operation)	+006
S10=	Set duration, in tenths of a second, modem waits after loss of carrier before hanging up	+007
S11=	Set duration and spacing, in milliseconds, of dialed Touch-Tones	+070

10.2 Extended S-Registers "ATSn=x"

Command	bit	dec	hex	Function and description	Ref.
S13=	bit	dec	hex	Bit-mapped register	+000
	1	2	2	Capture modem manufacturer information during V.42 handshake, can be displayed at ATI2 <Last Speed/Protocol> line if available (‘Flash’ or ‘ ZyXEL’ stands for ZyXEL connection)	
S14=	bit	dec	hex	Bit-mapped register:	+002
	1	0	0	Grant Remote Digital Loop-back test request	&T4
		2	2	Deny Remote Digital Loop-back test	&T5
S15=	bit	dec	hex	Bit-mapped register	+066
	0,1	0	0	Even parity	
		1	1	Odd parity	
		2	2	No parity	
	2	0	0	1 stop bit	
		4	4	2 stop bits	
	4,3	0	0	10 bit character length	*C0
		8	8	11 bit character length	*C1
		16	10	9 bit character length	*C2
		24	18	8 bit character length	*C3
	7-5	0	0	Profile 0 as active settings after power on	Z0
		32	20	Profile 1 as active settings after power on	Z1
		64	40	Factory default as active settings after power on	Z2
S16=		dec	hex	Test status register	+000
		0	0	No test in progress	&T0
		1	1	Analog Loop-back test in progress	&T1
		3	3	Local Digital Loop-back test in process	&T3
		6	6	Remote Digital Loop-back test in process	&T6
		7	7	Remote Digital Loop-back with self-test in process	&T7
		8	8	Analog Loop-back with self test in progress	&T8
S17=	bit	dec	hex	Bit-mapped register	+022
	4-1	0-30	0-1E	Set transmit power level from 0 to -15 dBm. (See also S35b3) (Default *P11)	*Pn
	5	0	0	Normal dial (Default)	D
		32	20	Reverse dial, go on-line in answer mode.	DR
S18=		dec	hex	Force modem to fix baud rate when answering	+000
		0	0	Disable fixed baud function	
		1-46	1-2E	Enable baud rate to be fixed when answering. Baud rate value settings (n) the same as S20	
S19=		dec	hex	Modem connection mode, same	+000/&Nn
		0-99	0-63	setting value as 'AT&Nn' command	
S20=		dec	hex	DTE speed (bps). Auto detected from AT Command	+001
		0	0	230400 bps	
		1	1	115200 bps (Default)	
		2	2	76800 bps	
		3	3	57600 bps	
		4	4	38400 bps	
		5	5	19200 bps	
		6	6	16800 bps	

Command	bit	dec	hex	Function and description	Ref.
		7	7	14400 bps	
		8	8	12000 bps	
		9	9	9600 bps	
		10	A	7200 bps	
		11	B	4800 bps	
		12	C	2400 bps	
		13	D	1200 bps	
		14	E	460800 bps	
		15	F	300 bps	
		16	10	307200 bps	
		17	11	153600 bps	
		18	12	102400 bps	
		20	14	61440 bps	
		21	15	51200 bps	
		22	16	624000 bps	
		24	18	124800 bps	
		25	19	62400 bps	
		26	1A	41600 bps	
		27	1B	31200 bps	
		28	1C	24960 bps	
		29	1D	20800 bps	
		46	2E	921600 bps	
Note: Only the speeds up to S20=15 are supported by auto speed detection.					
S21=	bit	dec	hex	Bit mapped register	+178
	0	0	0	Maintain non-error control connection when modem error control handshake fails	*E0
		1	1	Drop connection when modem error control handshake fails (default)	*E1
	1-2	0	0	Speaker is always OFF	M0
		2	2	Speaker is ON until carrier is detected (default)	M1*
		4	4	Speaker is always ON	M2
		6	6	Speaker is ON after last digit is dialed out until carrier detected	M3
	3	0	0	DSR is always ON (default)	&S0
		8	8	According to CCITT (see also S44.4, S41.5)	&S1
	4	0	0	CD is always ON	&C0
		16	10	CD tracks presence of data carrier (see also S38.3) (default)	&C1
	5	0	0	CTS Follows RTS in synchronous mode. Response delay set in S26	&R0
		32	20	Ignore RTS (CTS always ON) in Synchronous mode. (Default)	&R1
	6-7	0	0	Assume DTR always On	&D0
		64	40	108.1, DTR OFF-ON transition causes dial of the default number	&D1
		128	80	108.2 Data Terminal Ready, DTR OFF causes the modem to hang up and return to command state (default)	&D2
		192	C0	108.2, DTR OFF causes the modem to hang up and reset the modem to profile 0 after DTR dropped	&D3
S23=	bit	dec	hex	Bit mapped register	+105
	0	0	0	Command echo disabled	E0
		1	1	Command echo enabled (default)	E1
	1	0	0	Tone dial. (Default)	T
		2	2	Pulse dial.	P
	2	0	0	Pulse dial make/break ratio = 39% / 61% (default)	&P0

Command	bit	dec	hex	Function and description	Ref.
		4	4	Pulse dial make/break ratio = 33% / 67%	&P1
	3-5	0	0	ATX0 (See result code table)	X0
		8	8	ATX1	X1
		16	10	ATX2	X2
		24	18	ATX3	X3
		32	20	ATX4	X4
		40	28	ATX5, error control result code is enabled (Default)	X5
		48	30	ATX6, error control result code is enabled	X6
		56	38	ATX7, error control result code is enabled	X7
	6	0	0	Display result code in numeric format (see S35.7)	V0
		64	40	Display result code in verbose format	V1
	7	0	0	Modem returns result code	Q0
		128	80	Modem does not return result code (see also S40.1)	Q1
S24=	bit	dec	hex	Bit mapped register	+067
	6-4	16-112	10-70	Speaker volume control, increments of 16 in decimal value	L0-7
S25=		0-255	0-FF	Specify the time delay that DTR signal needs to be OFF before it will be recognized, in 10 ms units. If S25=0, the delay time is set to 4 ms	+000
S26=		dec	hex	RTS/CTS delay	+000
		0-255	0-FF	Set the delay, in 10 millisecond units between the RTS and modem's CTS response in synchronous mode (see '&Rn' command)	&Rn
S27=	bit	dec	hex	Bit mapped register	+156
	0-2			Modem error control	
		0	0	No error control	&K0
		1	1	MNP4 + MNP3 (see also S41.0)	&K1
		2	2	MNP4 + MNP5 (see also S38.5, S41.0)	&K2
		3	3	V.42+MNP4	&K3
		4	4	V.42 + V.42bis (compatible with &K2) (default)	&K4
	3-5	0	0	Flow control disabled	&H0
		24	18	Hardware (RTS/CTS) flow control (default)	&H3
		32	20	Software (XON/XOFF) flow control	&H4
		40	28	Reserved	&H5
	6-7			Signal quality	
		0	0	No response to poor signal quality	*Q0
		64	40	Retrain action taken if signal quality is poor	*Q1
		128	80	Adaptive rate (auto fall-back /forward) when signal quality changes.(Defaults)	*Q2 S41.2
		192	C0	Disconnect when signal quality is poor	*Q3
S28=	bit	dec	hex	Bit mapped register	+068
	2-3	0	0	Destructive, expedited break	&Y0
		1	4	Non-destructive, expedited break (default)	&Y1
		10	8	Non-destructive, un-expedited break	&Y2
	4-5	0	0	No guard tone (default)	&G0
		16	10	Reserved	&G1
		32	20	1800 Hz guard tone	&G2
	6	0	0	DTE/DCE rate follows link rate (See also S18, S44b6)	&B0
		1	64	DTE/DCE rate is fixed at the DTE setting, range from 300-460.8 Kbps (default, also see S18, S44b6)	&B1
S29=		0-3	0-3	Set default dial phone number pointer, use AT&Zn=s to store phone numbers in EEPROM.	+000 *D
S31=		0-255	0-FF	Holds the ASCII decimal value of the XON	+017
S32=		0-255	0-FF	Holds the ASCII decimal value of the XOFF	+019
S35=	bit	dec	hex	Bit mapped register	+032

Command	bit	dec	hex	Function and description	Ref.
	1	2	2	Disable aborting from terminal during modem handshaking	
	2	4	4	V.26 alternative A. (see also ‘&N11’)	
	3	8	8	Add 16dB attenuation to the leased line transmission power	
	5	32	20	Enable Selective Reject in V.42 (Default)	
	7	128	80	Enable extended numerical result codes from 50-65 when an error corrected connection is made. Use with ATV0. (see result code table)	V0 S23.6
S38=	bit	dec	hex	Bit mapped register	+000
	0	1	1	Repeatedly dialing default number	*Dn S29
	3	8	8	DCD ON/OFF sequence follows UNIX standard, DCD ON before connect message is sent, DCD off after last DCE response is sent	&C1 S21.4
	4	16	10	Auto-mode fax receiving disabled, hang up if a fax call is received	&N0
	5	32	20	Disable MNP5 negotiation.	&Kn
S39=	bit	dec	hex	Bit mapped register	+032
	2	4	4	Reverse the answers. Answer in originating mode	ATA
S40=	bit	dec	hex	Bit mapped register	+000
	1	2	2	No result code is displayed in answer mode	Q2
	2	4		Enables caller ID detection	
	3	8		Enables type 1 ring detection	
	4	16		Enables type 2 ring detection	
	5	32		Enables type 3 ring detection	
	6	64		Enables type 4 ring detection	
S41=	bit	dec	hex	Bit mapped register	+000
	0	1	1	Special MNP compatibility (see also S27.0, S38.5)	&Kn
	3	8	8	Enable CCITT signals 140 and 141 on EIA-232D interface	
	4	16	10	In X2-X7 setting, modem waits for S6 seconds before dialing and ignores dial tone detection	
	5	32	20	DSR follows DCD and pulses for 0.5 sec after DCD on-off transition	&Sn
	6	64	40	Force S0>=2; doesn‘t answer on the first ring.	S0
	7	128	80	Ignore calling tone, not to be used as fax detection	
S42=	bit	dec	hex	Bit mapped register	+000
	1	2	2	Enables throughput averaging	
	2	4	4	CND message will be forced on even if ATQ2 is set	
	3	8	8	Disable escape sequence code in answer mode	
	4	16	10	Disable V.17 14,400 Fax in calling mode, no effect to answering mod	
	6	64	40	Disable ‘RINGING’ result code	Xn
	7	128	80	DCD forced on but pulse off for 0.5 seconds at carrier loss	&C0
S43=	bit	dec	hex	Bit mapped register	+008
	6	64	40	Enable 1.5 sec, pause between off-hook and modem answering	
	7	128	80	Modem hang-up if the line condition does not permit modem to run at the highest speed set by ‘&Nn’ command	
S44=	bit	dec	hex	Bit mapped register	+000
	3	8	8	ATDSn initiates auto-dial of the stored numbers consecutively until connection is made (cyclic dial).	DSn
	4	16	10	DSR follows DTR (see also S41.5)	&S1

Command	bit	dec	hex	Function and description	Ref.
	6	64	40	When selected with ‘&B0’, DTE speed fixed at 38400 when the link speed is above 9600. DTE speed fixed at 9600 if link speed is 7200. If it is below 7200, DTE speed follows link speed. When selected with &B1, DTE speed fixed at current rate when an ARQ connection is made, when a non-ARQ connection is made, DTE speed follows the link speed. (See also S18)	&Bn
S45=		dec 0-255	hex 0-FF	Delay during which the CND silence detection is disabled, in 20 ms units. (See also S46)	+100
S46=		dec	hex	CND silence detection interval	+028
		0-255	0-FF	To process the CND, silence must be detected for the specified interval, in 20 ms units	
S48=	bit	dec	hex	Bit-mapped register	+000
	0	1	1	Cause CND information to be reported in raw format	
	2	4	4	Enable data calling tone (CNG) sending	
	3	8	8	Reverse the V.23 channel speed. Originate mode modem speed (Send/Receive) 1200/75; Answer mode modem speed (Send/Receive) 75/1200	&N12
	4	16	10	(Work with &D1 command) DTR ON will have the modem dial the default number and DTR OFF will have the modem hang-up and reset to profile 0. When the modem is idle (waiting for command), it will not dial any number when DTR changes from ON to OFF	
S52=	bit	dec	hex	Bit-mapped register	+000
	7	0	0	Select ‘Mark’ as the first signal of the V.23 handshaking sequence (Default)	&N12
		128	80	Select ‘Space’ as the first signal of the V.23 handshaking sequence	&N12
S56=		dec	hex		+000
		0-255	0-FF	Hook flash detect time, in units of 10ms, country specific	
S57=	bit	dec	hex	Bit-mapped register	+016
	4	16	10	Enables the reporting of Class 1 capability in the response to +FCLASS=?	
S63=	bit	dec	hex	Bit-mapped register	
	0	1	1	Power down mode on[0], off[1]	

Bit	S-register bit number, 'b', used in 'ATSr.b=n' and 'ATSr.b=?'
dec	Decimal value, 'x', used in 'ATSn=x'
hex	Equivalent Hexadecimal value.
+nnn	Factory default when listed in 'Reference' column.
Note:	'AT' is omitted when an AT command is referred to in the 'Reference' column.

11. Country Code Setting

Type commands as follow:

ATS38=2#G< Decimal Country code >

For example US (255):
ATS38=2#G255

(AT#H could see the country code setting)

COUNTRY	TLD	Decimal	COUNTRY	TLD	Decimal
United States	US	255	Russia	SU	230
South Africa	ZA	254	Hungary	HU	229
Netherlands	NL	253	Slovak	SK	228
Denmark	DK	252	Thailand	TH	227
Switzerland	CH	225	Israel	IL	226
Sweden	SE	250	Switzerland	CH	225
United Kingdom	UK	249	UAE	AE	224
Belgium	BE	248	China_T	CN	
Greece	GR	247	China	CN	222
Czech Republic	CZ	246	Ukraine	UA	221
Norway	NO	245	Portugal	PT	220
Australia	AU	244	France	FR	219
New Zealand	NZ	243	Korea (u-law)	KR	218
Hong Kong	HK	242	Korea (a-law)	KR	217
Singapore	SG	241	Philippine	PH	216
Finland	FI	240	Slovenia	SI	215
Morocco	MA	239	India	IN	214
Taiwan	TW	238	Spain	SP	213
Germany	DE	237	European CTR21		212
Italy	IT	236	Turkey	TR	211
Ireland	IE	235	Taiwan (a-low)	TW	210
Japan	JP	234			
Austria	AT	233			
Malaysia	MY	232			
Poland	PL	231			

12. Caller ID

1. Set correct country code.
2. Issue **“ATS40.2=1”.**

13. Power-Down Mode

Use terminal and AT command to control power down mode:

1. Enable power-down mode:
   Issue **“ATS63.1=0”.** (Def.)
2. Disable power-down mode:
   Issue **“ATS63.1=1”**.

14. Upgrade Firmware

A. Flash the “INTEL flash ROM”:

1. Let J1 (jump 1 next LED) to be short before power on.
2. Type "ATF" and type "4" for menu query.
3. Type “ATUPX" and type "Y" for query.
4. Wait erases information.....
5. Send attached firmware "ZyIr****.HEX" in "XMODEM" protocol.
6. After finished, please open the J1 jumper.
7. Re-power on

B. Flash the “SST flash ROM”:

1. Let J1 (jump 1 next LED) to be short before power on.
2. Type "AT**". Send attached file "romcode.m00" with RAW “**ASCII”** protocol.
4. After finished Type "ATG8000".
5. Type "ATF" and type"2” for menu query.
6. Type “ATUPXK" and type "Y" for query.
7. Wait erases information.....
8. Send attached firmware "ZyIr****.HEX" in "XMODEM" protocol.
9. After finished, please open the J1 jumper.
10. Re-power on.

15. Advanced AT Commands (For Debug)

Command	Function & Description	
ATREEP	Display EEPROM	
ATREEP10000,256	Clear EEPROM to FF	
AT&T8	Modem send ASCII codes to PC continuous	
AT&T1 +++ AT#E1 AT#E0	Hardware noise testing	