REVISION HISTORY

Version	Change Summary	Date	Author
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01.01	Increased AT+CHFA AT+CPCS	15 Nov. 2002	Adam LIAO
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CONTENTS PAGE

CONTENTS PAGE

1 INTRODUCTION

This document details the AT Command interface between the Data Services Command Interpreter (CI) Task and a serial line application. It defines the AT Commands required for driving the SIM Application Toolkit from a serial line application, and also includes those AT commands for GSM, GPRS, Voice Recognition support. ITM100 is the next-generation data services product supporting all functionality referenced in this document.

1.1 References

[1]	ITU-T Draft new recommendation V.25ter:	Serial asynchronous automatic dialling and control
[2]	GSM 07.07:	Digital cellular telecommunications (Phase 2+); AT command set for GSM Mobile Equipment (ME)
[3]	GSM 07.05:	Digital cellular telecommunications (Phase 2+); Use of Data Terminal Equipment – Data Circuit terminating Equipment (DTE – DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
[4]	GSM 11.14:	Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface
[5]	GSM 11.11:	Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface
[6]	GSM 03.38:	Digital cellular telecommunications system (Phase 2+); Alphabets and language-specific information
[7]	ISO 639 (1988):	Code for the representation of names and languages

2 AT COMMANDS INTERFACE

This section lists the AT commands and responses that are currently supported as standard in the ITM100 product, which implements the majority of specifications GSM 07.07 , GSM 07.05 and ITU-T V25ter .

2.1 AT Commands according to V.25ter

The V.25ter commands correspond to the commands of AT Hayes-compatible modems applicable for GSM 07.07.

2.1.1 Overview

Command	Description
A /	Re-issues last AT command given
ATA	Answer incoming call
ATD	Mobile Originated call to dialable number
ATD><MEM><N>	Originate call to phone number in memory <MEM>
ATD><N>	Originate call to phone number in current memory
ATD><STR>	Originate call to phone number in memory which corresponds to alphanumeric field <STR>
ATDL	Redial last telephone number used
ATE	Set command echo mode
ATH	Disconnect existing connection
ATI	Display product identification information
ATL	Set monitor speaker loudness
ATM	Set monitor speaker mode
ATO	Switch from command mode to data mode
ATP	Select pulse dialling
ATQ	Set Result code presentation mode
ATS0	Set number of rings before automatically answering the call
ATS3	Set command line termination character
ATS4	Set response formatting character
ATS5	Set command line editing character
ATS6	Set pause before blind dialling
ATS7	Set number of seconds to wait for connection completion
ATS8	Set number of seconds to wait when comma dial modifier used
ATS10	Set disconnect delay after indicating the absence of data carrier
ATT	Select tone dialling
ATV	Set result code format mode
ATX	Set connect result code format and call monitoring
ATZ	Set all current parameters to user defined profile
AT&C	Set DCD function mode
AT&D	Set DTR function mode
AT&F	Set all current parameters to manufacturer defaults
AT&V	Display current configuration
AT&W	Store current parameter to user defined profile

AT+DR	V.42bis data compression reporting control
AT+DS	V.42bis data compression control
AT+GCAP	Request complete TA capabilities list
AT+GMI	Request manufacturer identification
AT+GMM	Request TA model identification
AT+GMR	Request TA revision identification
AT+GOI	Request global object identification
AT+GSN	Request TA serial number identification (IMEI)
AT+ICF	Set TE-TA control character framing
AT+IFC	Set TE-TA local data flow control
AT+ILRR	Set TE-TA local rate reporting mode
AT+IPR	Set fixed local rate

2.1.1.i Detailed descriptions of commands

Tab1 1 A/ Reissues the last command given	
Execute command A/	Response Re-issues the previous command Note: It does not have to end with terminating character. Parameter
Reference V.25ter	Note This command does not work when the serial multiplexer is active

Tab1 2 ATA Answers a call	
Execute command ATA	Response TA sends off-hook to the remote station. Note1: Any additional commands on the same command line are ignored. Note2: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking. If connection successful CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data mode. When TA returns to command mode after call release OK If no connection NO CARRIER Parameter
Reference V.25ter	Note

Tab1 3 ATD Mobile originated call to dialable number	
Execute command ATD[<n>][<mgsm][;]	Response TA attempts to set up an outgoing call. Note: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking. If no dialtone and (parameter setting X=2 or X=4) NO DIALTONE If busy and (parameter setting X=3 or X=4) BUSY If a connection cannot be established NO CARRIER If connection successful and non-voice call CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data state. When TA returns to command mode after call release OK If connection successful and voice call OK Parameter <n> string of dialing digits and optionally V.25ter modifiers dialing digits: 0-9, * , #, +, A, B, C V.25ter modifiers are ignored: ,(comma), T, P, !, W, @ **Additional only:** <mgsm> string of GSM modifiers: I override current CLIR setting for the call G, g CUG info, uses set with command +CCUG <;> voice call , return to command state
Reference V.25ter / GSM 07.07	Note

Tab1 4 ATD><mem><n> Originate call to phone number in memory <mem>	
Execute command ATD><mem><n>[<I>][<G>][;]	Response TA attempts to set up an outgoing call to stored number. Note: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of

	connection establishment such as handshaking. If error is related to ME functionality +CME ERROR: <err> If no dialtone and (parameter setting X=2 or X=4) NO DIALTONE If busy and (parameter setting X=3 or X=4) BUSY If a connection cannot be established NO CARRIER If connection successful connection and non-voice call CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data state. When TA returns to command mode after call release OK If connection successful and voice call OK Parameter <mem> phone book: FD SIM fix dialing-phone book LD SIM last-dialing-phone book DC ME dialed calls list ON SIM (or ME) own numbers (MSISDNs) list SM SIM phone book <n> integer type memory location should be in the range of locations available in the memory used <I> I override current CLIR setting for the call <G> G, g CUG info, uses set with command +CCUG <;> voice call , return to command state
Reference V.25ter / GSM 07.07	Note 1. There is no <mem> for emergency call (“EN“). 2. For example: The command “ATD>SM7; “ is going to dial the phone number stored at location 7 in SIM phone book.

Tab1 5 ATD><n> Originate call to phone number in current memory	
Execute command ATD><n>[<I>][<G>][;]	Response TA attempts to set up an outgoing call to stored number. The used memory is already selected by command +CPBS. Note: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking. If error is related to ME functionality +CME ERROR: <err> If no dialtone and (parameter setting X=2 or X=4) NO DIALTONE

	If busy and (parameter setting X=3 or X=4) BUSY If a connection cannot be established NO CARRIER If connection successful and non-voice call CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data state. When TA returns to command mode after call release OK If connection successful and voice call OK Parameter <n> integer type memory location should be in the range of locations available in the memory used <I> I override current CLIR setting for the call <G> G, g CUG info, uses set with command +CCUG <;> voice call , return to command state
Reference V.25ter / GSM 07.07	Note

Tab1 6 ATD><str> Originate call to phone number in memory which corresponding alphanum. field	
Execute command ATD><str>[I][G][;]	Response TA attempts to set up an outgoing call to stored number. All available memories are searched for the entry <str>. Note: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking. If error is related to ME functionality +CME ERROR: <err> If no dialtone and (parameter setting X=2 or X=4) NO DIALTONE If busy and (parameter setting X=3 or X=4) BUSY If a connection cannot be established NO CARRIER If connection successful and non-voice call CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data state. When TA returns to command mode after call release OK If connection successful and voice call OK

	Parameter		
	<str>		string type value("x"), which should equal to an alphanumeric field in at least one phone book entry in the searched memories. str formatted as current TE character set specified by +CSCS.
	<I>	I	override current CLIR setting for the call
	<G>	G, g	CUG info, uses set with command +CCUG
	<;>		voice call , return to command state
Reference V.25ter / GSM 07.07	Note		

Tab1 7 ATDL Redial last telephone number used	
Execute command ATDL[;]	Response TA attempts to set up an outgoing call to the last dialled number in the current session. Note: This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking. If there is no last number or number is not valid: +CME ERROR else: If no dialtone and (parameter setting X=2 or X=4) NO DIALTONE If busy and (parameter setting X=3 or X=4) BUSY If a connection cannot be established NO CARRIER If connection successful and non-voice call CONNECT<text> Note: <text> only if parameter setting X>0 TA switches to data state. When TA returns to command mode after call release OK If connection successful and voice call OK
	Parameter <;> voice call
Reference V.25ter / GSM 07.07	Note

Tab1 8 ATE Set command echo mode	
Set command ATE[<value>]	Response This setting determines whether or not the TA echoes characters received from TE during command state. OK Parameter <value> 0 Echo mode off 1 Echo mode on
Reference V.25ter	Note

Tab1 9 ATH Disconnect existing connection	
Execute command ATH[n]	Response Disconnect existing call by local TE from command line and terminate call OK Note: OK is issued after circuit 109(DCD) is turned off, if it was previously on. Parameter <n> 0 disconnect from line and terminate call
Reference V.25ter	Note

Tab1 10 ATI Display product identification information	
Execute command ATI	Response TA issues product information text Example: SIMCOM Ltd GSM Mobile Station Revision: DD.MM.YY HH:MM OK (to be developed) Parameter
Reference V.25ter	Note

Tab1 11 ATL Set monitor speaker loudness	
Set command ATL<value>	Response No effect in GSM OK Parameter <value> 0 low speaker volume

	1	low speaker volume	
	2	medium speaker volume	
	3	high speaker volume	
Reference V.25ter	Note		

Tab1 12 ATM Set monitor speaker mode			
Set command ATM<value>	Response No effect in GSM OK Parameter		
	<value>	0	speaker is always off
		1	speaker on until TA inform TE that carrier has been detected
		2	speaker is always on when TA is off-hook
Reference V.25ter	Note		

Tab1 13 ATO Switch from command mode to data mode			
Execute command ATO[n]	Response TA resumes the connection and switches back from command mode to data mode. If connection is not successfully resumed NO CARRIER else TA returns to data mode from command mode CONNECT <text> Note: <text> only if parameter setting X>0 Parameter		
	<n>	0	switch from command mode to data mode
Reference V.25ter	Note		

Tab1 14 ATP Select pulse dialing			
Set command ATP	Response No effect in GSM OK Parameter		
Reference V.25ter	Note		

Tab1 15 ATQ Set result code presentation mode

Set command	Response
ATQ[<n>]	This parameter setting determines whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting. If <n>=0: OK If <n>=1: (none) Parameter <n> 0 TA transmits result code 1 Result codes are suppressed and not transmitted
Reference V.25ter	Note

Tab1 16 ATS0 Set number of rings before automatically answering the call	
Read command ATS0?	Response <n> OK
Set command ATS0=[<n>]	Response This parameter setting determines the number of rings before auto-answer. OK Parameter <n> 0 automatic answering is disable 1-255 enable automatic answering on the ring number specified
Reference V.25ter	Note

Tab1 17 ATS3 Set command line termination character	
Read command ATS3?	Response <n> OK
Set command ATS3=[<n>]	Response This parameter setting determines the character recognised by TA to terminate an incoming command line. The TA also returns this character in output. OK Parameter <n> 0-13-127 command line termination character Note: default 13 = CR
Reference V.25ter	Note

Tab1 18 ATS4 Set response formatting character	
Read command	Response <n> OK

ATS4?	
Set command ATS4=[<n>]	Response This parameter setting determines the character generated by the TA for result code and information text. OK Parameter <n> 0-10-127 response formatting character Note: default 10 = LF
Reference V.25ter	Note

Tab1 19 ATS5 Set command line editing character	
Read command ATS5?	Response <n> OK
Set command ATS5=[<n>]	Response This parameter setting determines the character recognised by TA as a request to delete from the command line the immediately preceding character. OK Parameter <n> 0-8-127 command line editing character Note: default 8 = Backspace
Reference V.25ter	Note

Tab1 20 ATS6 Set pause before blind dialing	
Read command ATS6?	Response <n> OK
Set command ATS6=[<n>]	Response No effect in GSM OK Parameter <n> 0-2-255 number of seconds to wait before blind dialing
Reference V.25ter	Note

Tab1 21 ATS7 Set number of seconds to wait for connection completion	
Read command ATS7?	Response <n> OK
Set command ATS7=[<n>]	Response This parameter setting determines the amount of time to wait for the connection completion in case of answering or originating a call. OK Parameter <n> 0-60-255 number of seconds to wait for connection completion
Reference	Note

V.25ter	

Tab1 22 ATS8 Set number of seconds to wait when comma dial modifier	
Read command ATS8?	Response <n> OK
Set command ATS8=[<n>]	Response No effect in GSM OK Parameter <n> 0 no pause when comma encountered in dial string 1-255 number of seconds to wait
Reference V.25ter	Note

Tab1 23 ATS10 Set disconnect delay after indicating the absence of data carrier	
Read command ATS10?	Response <n> OK
Set command ATS10=[<n>]	Response This parameter setting determines the amount of time that the TA will remain connected in absence of data carrier. If the data carrier is once more detected before disconnect, the TA remains connected. OK Parameter <n> 1-15-255 number of tenths seconds of delay
Reference V.25ter	Note

Tab1 24 ATT Select tone dialing	
Set command ATT	Response No effect in GSM OK Parameter
Reference V.25ter	Note

Tab1 25 ATV Set result code format mode	
Set command ATV[<value>]	Response This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses.

	When <value>=0 0 When <value>=1 OK Parameter <value> 0 Information response: <text><CR><LF> Short result code format: <numeric code><CR> 1 Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code><CR><LF>
Reference V.25ter	Note

Tab1 26 ATX Set CONNECT result code format and call monitoring	
Set command ATX[<value>]	Response This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes OK Parameter <value> 0 CONNECT result code only returned, dial tone and busy detection are both disabled 1 CONNECT<text> result code only returned, dial tone and busy detection are both disabled 2 CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled 3 CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled 4 CONNECT<text> result code returned, dial tone and busy detection are both enabled
Reference V.25ter	Note

Tab1 27 ATZ Set all current parameters to user defined profile	
Execute command ATZ[<value>]	Response TA sets all current parameters to the user defined profile. Note1: The user defined profile is stored in non volatile memory. Note2: If the user profile is not valid, it will default to the factory default profile. Note3: Any additional commands on the same command line are ignored. OK Parameter <value> 0 Reset to profile number 0
Reference V.25ter	Note

Tab1 28 AT&C Set circuit Data Carrier Detect (DCD) function mode	
Set command AT&C[<value>]	Response This parameter determines how the state of circuit 109(DCD) relates to the detection of received line signal from the distant end. OK Parameter <value> 0 DCD line is always ON 1 DCD line is ON only in the presence of data carrier
Reference V.25ter	Note

Tab1 29 AT&D Set circuit Data Terminal Ready (DTR) function mode	
Set command AT&D[<value>]	Response This parameter determines how the TA responds when circuit 108/2(DTR) is changed from the ON to the OFF condition during data mode. OK Parameter <value> 0 TA ignores status on DTR 1 ON->OFF on DTR: Change to command mode with remaining the connected call 2 ON->OFF on DTR: Disconnect call, change to command mode. During state DTR = OFF is auto-answer off.
Reference V.25ter	Note

Tab1 30 AT&F Set all current parameters to manufacturer defaults	
Execute command AT&F[value]	Response TA sets all current parameters to the manufacturer defined profile. OK Parameter <value> 0 set all TA parameters to manufacturer defaults
Reference V.25ter	Note

Tab1 31 AT&V Display current configuration	
Execute command AT&V[<n>]	Response TA returns the current parameter setting.

	<current configurations text> OK Parameter <n> 0 profile number
Reference	Note

Tab1 32 AT&W Store current parameter to user defined profile	
Execute command AT&W[<n>]	Response TA stores the current parameter setting in the user defined profile. Note1: The user defined profile is stored in non volatile memory. OK Parameter <n> 0 profile number to store to
Reference	Note

Tab1 33 AT+DR V.42bis data compression reporting control	
Test command AT+DR=?	Response +DR:(list of supported <value>s) OK Parameter see set command
Read command AT+DR?	Response +DR: <value> OK Parameter see set command
Set command AT+DR=<value>	Response This parameter setting determines whether or not intermediate result code of the current data compressing is reported by TA to TE after a connection establishment. OK Parameter <value> 0 reporting disabled 1 reporting enabled
	Intermediate result code +DR: <type> Note: reported at call set up Parameter <type> NONE data compression is not in use V42B Rec. V42bis is in use in both direction V42B RD Rec. V42bis is in use in receive direction only V42B TD Rec. V42bis is in use in transmit direction only
Reference V.25ter	Note

Tab1 34 AT+DS V.42bis data compression control	
Test command	Response

AT+DS=?	+DS:(list of supported <p0>s), (list of supported <n>s), (list of supported <p1>s), (list of supported <p2>s) OK Parameter see set command
Read command AT+DS?	Response +DR: <p0>,<n>,<p1>,<p2> OK Parameter see set command
Set command AT+DS=[<p0>,[<n>,[<p1>,[<p2>]]]]	Response This parameter setting determines the possible data compression mode by TA at the compression negotiation with the remote TA after a call set up. Note1: only for data call Note2: GSM transmits the data transparent. The remote TA may support this compression. OK Parameter Note: see also ITU V.42bis <p0> 0 NONE 1 transmit only 2 receive only 3 both direction, but allow negotiation <n> 0 allow negotiation of p0 down 1 do not allow negotiation of p0 - disconnect on difference <p1> 512-2048 dictionary size Note: default determined by manufacturer <p2> 6-255 maximum string size (default 20)
Reference V.25ter	Note This command must be used in conjunction with command AT+CRLP to enable compression (+CRLP=X,X,X,X,1,X).

Tab1 35 AT+GCAP Request complete TA capabilities list

Test command AT+GCAP=?	Response OK Parameter
Execute command AT+GCAP	Response TA reports a list of additional capabilities. +GCAP: <name>s OK Parameter <name> e.g.: +CGSM, +FCLASS, +DS
Reference V.25ter	

Tab1 36 AT+GMI Request manufacturer identification

Test command	Response

AT+GMI=?	OK Parameter
Execute command AT+GMI	Response TA reports one or more lines of information text which permit the user to identify the manufacturer. <manufacturer id> OK Parameter
Reference V.25ter	Note

Tab1 37 AT+GMM Request TA model identification	
Test command AT+GMM=?	Response OK Parameter
Execute command AT+GMM	Response TA reports one or more lines of information text which permit the user to identify the specific model of device. <model id> OK Parameter
Reference V.25ter	Note

Tab1 38 AT+GMR Request TA revision identification	
Test command AT+GMR=?	Response OK
Execute command AT+GMR	Response TA reports one or more lines of information text which permit the user to identify the version, revision level or data or other information of the device. <Revision id> OK Parameter
Reference V.25ter	Note

Tab1 39 AT+GOI Request global object identification	
Test command AT+GOI=?	Response OK
Execute command AT+GOI	Response TA reports one or more lines of information text which permit the user to

	identify the device, based on the ISO system for registering unique object identifiers. Parameter <Object Id> identifier of device type see X.208, 209 for the format of <Object Id>
Reference V.25ter	Note

Tab1 40 AT+GSN Request TA serial number identification(IMEI)	
Test command AT+GSN=?	Response OK
Execute command AT+GSN	Response TA reports the IMEI(international mobile equipment identifier) number in information text which permit the user to identify the individual ME device. <sn> OK Parameter <sn> IMEI of the telephone(International Mobile station Equipment Identity)
Reference V.25ter	Note The serial number (IMEI) is varied by individual ME device.

Tab1 41 AT+ICF Set TE-TA control character framing		
Test command AT+ICF=?	Response +ICF:(list of supported <format>s), (list of supported <parity>s) OK Parameter see set command	
Read command AT+ICF?	Response +ICF: <format>,<parity> OK Note: This framing is applied for command state Parameter see set command	
Set command AT+ICF=[<format>,[<parity>]]	Response This parameter setting determines the serial interface character framing format and parity received by TA from TE. Note: +IPR=0 forces +ICF=0 OK Parameter Note: The parity field is ignored if the format field specifies no parity.	
	<format>	1 8 data 0 parity 2 stop 2 8 data 1 parity 1 stop 3 8 data 0 parity 1 stop 4 7 data 0 parity 2 stop 5 7 data 1 parity 1 stop 6 7 data 0 parity 1 stop
	<parity>	0 odd 1 even

	2 mark (1) 3 space (0)
Reference V.25ter	Note

Tab1 42 AT+IFC Set TE-TA local data flow control	
Test command AT+IFC=?	Response +IFC:(list of supported <dce_by_dte>s), (list of supported <dte_by_dce>s) OK Parameter see set command
Read command AT+IFC?	Response +IFC: <dce_by_dte>,<dte_by_dce> OK Note: This flow control is applied for data mode Parameter see set command
Set command AT+IFC=[<dce_by_dte>[,<dte_by_dce>]]	Response This parameter setting determines the data flow control on the serial interface for data mode. OK Parameter <dce_by_dte> specifies the method will be used by TE at receive of data from TA 0 None 1 XON/XOFF, don't pass characters on to data stack 2 line 133: Ready for Receiving 3 XON/XOFF, pass characters on to data stack <dte_by_dce> specifies the method will be used by TA at receive of data from TE 0 None 1 XON/XOFF 2 line 106: Clear to send(CTS)
Reference V.25ter	Note SIMCOM uses line 105(RTS) for this method.

Tab1 43 AT+ILRR Set TE-TA local rate reporting mode	
Test command AT+ILRR=?	Response +ILRR:(list of supported <value>s OK Parameter see set command
Read command AT+ILRR?	Response +ILRR: <value> OK Parameter see set command
Set command AT+ILRR=<value>	Response This parameter setting determines whether or not an intermediate result code of local rate is reported at connection establishment. The rate is

	applied after the final result code of the connection is transmitted to TE. OK Parameter <value> 0 Disables reporting of local port rate 1 Enables reporting of local port rate
	Intermediate result +ILLR:<rate> Note: It indicates port rate settings on connection. Parameter <rate> port rate setting on call connection in Baud per second 300 1200 2400 4800 9600 19200 28800 38400 57600 115200
Reference V.25ter	Note

Tab1 44 AT+IPR Set fixed local rate	
Test command AT+IPR=?	Response +IPR: (list of supported auto detectable <rate>s),(list of supported fixed-only<rate>s) OK Parameter see set command
Read command AT+IPR?	Response +IPR: <rate> OK Parameter see set command
Set command AT+IPR=<rate>	Response This parameter setting determines the data rate of the TA on the serial interface. The rate of command takes effect following the issuance of any result code associated with the current command line. OK Parameter <rate> Baud-rate per second 300 1200 2400 4800 9600 19200 28800 38400 57600 115200
Reference	Note

V.25ter	

2.1.2 Summary of Result Codes Related to V.25ter Commands

Response	Code	Type	Meaning
OK	0	final	Command executed, no errors
CONNECT	1	intermediate	Connection set up, if parameter setting X=0
CONNECT[<text<]	manuf. spec.	intermediate	Connection set up, if parameter setting X>0
RING	2	unsolicited	Ring detected
NO CARRIER	3	final	Link not established or disconnected
ERROR	4	final	Invalid command or command line too long
NO DIALTONE	6	final	No dial tone, dialing impossible, wrong mode
BUSY	7	final	Remote station busy
NO ANSWER	8	final	Connection completion time-out

2.2 AT Commands according to GSM 07.07

The GSM 07.07 commands are for remote control of GSM functionality, including phone book functionality.

2.2.1 Overview

Command	Description
AT+CACM	ACCUMULATED CALL METER(ACM) RESET OR QUERY
AT+CAMM	ACCUMULATED CALL METER MAXIMUM(ACMMAX) SET OR QUERY
AT+CAOC	ADVICE OF CHARGE
AT+CBST	SELECT BEARER SERVICE TYPE
AT+CCFC	CALL FORWARDING NUMBER AND CONDITIONS CONTROL
AT+CCUG	CLOSED USER GROUP CONTROL
AT+CCWA	CALL WAITING CONTROL
AT+CEER	EXTENDED ERROR REPORT
AT+CGMI	REQUEST MANUFACTURER IDENTIFICATION
AT+CGMM	REQUEST MODEL IDENTIFICATION

AT+CGMR	REQUEST REVISION IDENTIFICATION
AT+CGSN	REQUEST PRODUCT SERIAL NUMBER IDENTIFICATION (IDENTICAL WITH +GSN)
AT+CSCS	SELECT TE CHARACTER SET
AT+CSTA	SELECT TYPE OF ADDRESS
AT+CHLD	CALL HOLD AND MULTIPARTY
AT+CIMI	REQUEST INTERNATIONAL MOBILE SUBSCRIBER IDENTITY
AT+CKPD	KEYPAD CONTROL
AT+CLCC	LIST CURRENT CALLS OF ME
AT+CLCK	FACILITY LOCK
AT+CLIP	CALLING LINE IDENTIFICATION PRESENTATION
AT+CLIR	CALLING LINE IDENTIFICATION RESTRICTION
AT+CMEE	REPORT MOBILE EQUIPMENT ERROR
AT+COLP	CONNECTED LINE IDENTIFICATION PRESENTATION
AT+COPS	OPERATOR SELECTION
AT+CPAS	MOBIL EQUIPMENT ACTIVITY STATUS
AT+CPBF	FIND PHONEBOOK ENTRIES
AT+CPBR	READ CURRENT PHONEBOOK ENTRIES
AT+CPBS	SELECT PHONEBOOK MEMORY STORAGE
AT+CPBW	WRITE PHONEBOOK ENTRY
AT+CPIN	ENTER PIN
AT+CPWD	CHANGE PASSWORD
AT+CR	SERVICE REPORTING CONTROL
AT+CRC	SET CELLULAR RESULT CODES FOR INCOMING CALL INDICATION
AT+CREG	NETWORK REGISTRATION
AT+CRLP	SELECT RADIO LINK PROTOCOL PARAM. FOR ORIG. NON-TRANSP. DATA CALL
AT+CSQ	SIGNAL QUALITY REPORT
AT+FCLASS	FAX: SELECT, READ OR TEST SERVICE CLASS
AT+FMI	FAX: REPORT MANUFACTURED ID
AT+FMM	FAX: REPORT MODEL ID
AT+FMR	FAX: REPORT REVISION ID
AT+VTD	TONE DURATION
AT+VTS	DTMF AND TONE GENERATION
AT+CMIC	Change the Microphone Gain Level
AT+SIDET	Change the Side Tone Gain Level
AT+ECHO	Echo cancellation control
AT+CEPY	Get Unicode of Chinese characters base on Pinyin
AT+UNMO	Get Dots Information based on Unicode of Chinese characters (GB2312)

2.2.1.i Detailed Descriptions of Commands

Tab2 1 AT+CACM Accumulated call meter(ACM) reset or query

Test command AT+CACM=?	Response OK Parameters
Read command AT+CACM?	Response TA returns the current value of ACM. +CACM: <acm> OK If error is related to ME functionality: +CME ERROR: <err> Parameters <acm> string type; three bytes of the current ACM value in hexa-decimal format (e.g. "00001E" indicates decimal value 30)

	000000 - FFFFFF
Set command AT+CACM=[<passwd>]	Parameters <passwd> string type: SIM PIN2 Response TA resets the Advice of Charge related accumulated call meter(ACM) value in SIM file EF(ACM). ACM contains the total number of home units for both the current and preceding calls. OK If error is related to ME functionality: +CME ERROR: <err>
Reference GSM 07.07	Note

Tab2 2 AT+CAMM Accumulated call meter maximum(ACMmax) set or query	
Test command AT+CAMM=?	Response OK Parameters
Read command AT+CAMM?	Response TA returns the current value of ACMmax. +CAMM: <acmmax> OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Set command AT+CAMM=[<acmmax>[,<passwd>]]	Response TA sets the Advice of Charge related accumulated call meter maximum value in SIM file EF(ACMmax). ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <acmmax> string type; three bytes of the max. ACM value in hexa-decimal format (e.g. "00001E" indicates decimal value 30) 000000 disable ACMmax feature 000001-FFFFFF <passwd> string type SIM PIN2
Reference GSM 07.07	Note

Tab2 3 AT+CAOC Advice of Charge

Test command AT+CAOC=?	Response +CAOC: list of supported <mode>s OK Parameters see execute command
Read command AT+CAOC?	Response +CAOC: <mode> OK Parameters see execute command
Execute command AT+CAOC=<mode>	Response TA sets the Advice of Charge supplementary service function mode. If error is related to ME functionality: +CME ERROR: <err> If <mode>=0, TA returns the current call meter value +CAOC: <ccm> OK If <mode>=1, TA deactivates the unsolicited reporting of CCM value OK If <mode>=2. TA activates the unsolicited reporting of CCM value OK Parameter <mode> 0 query CCM value 1 deactivate the unsolicited reporting of CCM value 2 activate the unsolicited reporting of CCM value <ccm> string type; three bytes of the current CCM value in hexa-decimal format (e.g. "00001E" indicates decimal value 30); bytes are similarly coded as ACMmax value in the SIM 000000-FFFFFF
Action command AT+CAOC	Response TA returns the current call meter value (same as AT+CAOC=0)
	Unsolicited result code When activated, an unsolicited result code is sent when the CCM value changes, but not more that every 10 seconds +CCCM: <ccm> Parameter see execute command
Reference GSM 07.07	Note

Tab2 4 AT+CBST Select Bearer Service Type

Test command AT+CBST=?	Response +CBST: (list of supported <speed>s) ,(list of supported <name>s) ,(list of supported <ce>s) OK Parameter see set command
Read command AT+CBST?	Response +CBST: <speed>,<name>,<ce> OK Parameter see set command
Set command AT+CBST=[<speed>]	Response TA selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated.

[,<name>[,<ce>]]]	OK Parameter		
	<speed>	0	autobauding
		1	300 bps(V.21)
		2	1200 bps(V.22)
		3	1200/75 bps(V.23)
		4	2400 bps(V.22bis)
		5	2400 bps(V.26ter)
		6	4800 bps(V.32)
		7	9600 bps(V.32)
		12	9600 bps(V.34)
		14	14400 bps(V.34)
		65	300 bps (V.110)
		66	1200 bps(V.110 or X.31 flag stuffing)
		68	2400 bps(V.110 or X.31 flag stuffing)
		70	4800 bps(V.110 or X.31 flag stuffing)
		71	9600 bps(V.110 or X.31 flag stuffing)
		75	14400 bps(V.110 or X.31 flag stuffing)
	<name>	0	asynchronous modem
		2	PAD access (asynchronous)
	<ce>	0	transparent
		1	non-transparent
Reference GSM 07.07	Note GSM 02.02[1]: lists the allowed combinations of the subparameters		

Tab2 5 AT+CCFC Call forwarding number and conditions control

Test command AT+CCFC=?	Response +CCFC: (list of supported <reas>s) OK Parameters see execute command
Execute command AT+CCFC = <reas>, <mode> [, <number> [, <type> [,<class> [, <subaddr> [,<satype> [,<time>]]]]]]	Response TA controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported. Only ,<reas> and <mode> should be entered with mode (0-2,4) If <mode><>2 and command successful OK If there is a network error: +CCFC: 0, 0 If <mode>=2 and command successful (only in connection with <reas> 0 – 3) For registered call forward numbers: +CCFC: <status>, <class1>[, <number>, <type> [, <time>]] [<CR><LF>+CCFC: ....] OK If no call forward numbers are registered (and therefore all classes are

	inactive): +CCFC: <status>, <class> OK where <status>=0 and <class>=7 If error is related to ME functionality: +CME ERROR: <err> Parameters <reas> 0 unconditional 1 mobile busy 2 no reply 3 not reachable 4 all call forwarding (0-3) 5 all conditional call forwarding (1-3) <mode> 0 disable 1 enable 2 query status 3 registration 4 erasure <number> string type phone number of forwarding address in format specified by <type> <type> type of address in integer format; default 145 when dialing string includes international access code character "+", otherwise 129 <subaddr> string type subaddress of format specified by <satype> <satype> type of subaddress in integer; default 128 <class> 1 voice 2 data 4 fax 7 all classes <time> time, rounded to a multiple of 5 sec. 1...20..30 <status> 0 not active 1 active
Reference GSM 07.07	Note

Tab2 6 AT+CCUG Closed User Group control	
Test command AT+CCUG=?	Response OK
Read command AT+CCUG?	Response +CCUG: <n>,<index>,<info> OK If error is related to ME functionality: +CME ERROR: <err> Parameter see set command
Set command AT+CCUG=[<n>] [,<index>[,<inf	Response TA sets the Closed User Group supplementary service parameters as a default adjustment for all following calls. OK

o>]]]	If error is related to ME functionality: +CME ERROR: <err> Parameter <n> 0 disable CUG 1 enable CUG <index> 0...9 CUG index 10 no index (preferred CUG taken from subscriber data) <info> 0 no information 1 suppress OA (Outgoing Access) 2 suppress preferential CUG 3 suppress OA and preferential CUG
Reference GSM 07.07	Note

Tab2 7 AT+CCWA Call Waiting Control	
Test command AT+CCWA=?	Response +CCWA: (list of supported <n>s) OK Parameter see set command
Read command AT+CCWA?	Response +CCWA: <n> OK Parameter see set command
Execution command AT+CCWA=[<n>] [,<mode>[,<class>]]]	Response TA controls the Call Waiting supplementary service. Activation, deactivation and status query are supported. If there is a network error: +CCWA: 0, 0 If <mode><>2 and command successful OK If <mode>=2 and command successful +CCWA:<status>,<class1>[<CR><LF>+CCWA:<status>,<class2>[...]] OK Note:<status>=0 should be returned only if service is not active for any <class> ie +CCWA : 0 , 7 will be returned in this case. When mode=2 , all active call waiting classes will be reported. In this mode the command is abortable by pressing any key. If error is related to ME functionality: +CME ERROR: <err> Parameter <n> 0 disable presentation of an unsolicited result code 1 enable presentation of an unsolicited result code <mode> when <mode> parameter not given, network is not interrogated 0 disable 1 enable 2 query status <class> is a sum of integers each representing a class of information

	1 voice (telephony) 2 data (bearer service) 4 fax (teleservice) 7 default(equals to all classes) <status> 0 not active 1 enable
	Unsolicited result code When the presentation Call Waiting at the TA is enabled (and Call Waiting is enabled) and a terminating call set up has attempted during an established call, an unsolicited result code is returned: +CCWA: <number>,<type>,<class>[,<alpha>] Parameter <number> string type phone number of calling address in format specified by <type> <type> type of address octet in integer format; 145 when dialing string includes international access code character "+", otherwise 129 <alpha> optional string type alphanumeric representation of <number> corresponding to the entry found in phone book
Reference GSM 07.07	Note

Tab2 8 AT+CEER Extended error report	
Test command AT+CEER=?	Response OK
Execute command AT+CEER	Response TA returns an extended report of the reason for the last call release. +CEER: <report> OK Parameters <report> Reason for last call release as number code
Reference GSM 07.07	Note

Tab2 9 AT+CGMI Request manufacturer identification	
Test command AT+CGMI=?	Response OK
Execute command AT+CGMI	Response TA returns manufacturer identification text. <manufacturer> OK Parameters <manufacturer>
Reference GSM 07.07	

Tab2 10 AT+CGMM Request model identification	
Test command AT+CGMM=?	Response OK
Execute command AT+CGMM	Response TA returns product model identification text. <model> OK Parameters <model>
Reference GSM 07.07	

Tab2 11 AT+CGMR Request revision identification	
Test command AT+CGMR=?	Response OK
Execute command AT+CGMR	Response TA returns product software version identification text. <revision> OK Parameters <revision>
Reference GSM 07.07	

Tab2 12 AT+CGOI Request global object identification	
Test command AT+CGOI=?	Response OK
Execute command AT+CGOI	Response TA reports one or more lines of information text which permit the user to identify the device, based on the ISO system for registering unique object identifiers. Parameter <Object Id> identifier of device type see X.208, 209 for the format of <Object Id>
Reference V.25ter	Note

Tab2 13 AT+CGSN Request product serial number identification (Identical with +GSN)	
Test command AT+CGSN=?	Response OK
Execute command AT+CGSN	Response see +GSN <sn> OK Parameters see +GSN
Reference GSM 07.07	Note

Tab2 14 AT+CSCS Select TE Character Set	
Test command AT+CSCS=?	Response +CSCS: (“GSM”)
Read command AT+CSCS?	Response +CSCS: <chset> OK Parameters <chset> “GSM” GSM default alphabet. “UCS2” UCS2 alphabet.
Set command AT+CSCS=[<chset>]	Response Sets which character set <chset> is used by the TE. The TA can then convert character strings correctly between the TE and ME character sets. Parameter <chset> “GSM” GSM default alphabet. “UCS2” UCS2 alphabet.
Reference GSM 07.07	Note

Tab2 15 AT+CSTA Select Type of Address	
Test command AT+CSTA=?	Response +CSTA: (129,145)
Read command AT+CSTA?	Response +CSTA: <type> OK Parameters <type> Current address type setting.
Set command AT+CSTA=[<type>]	Response Selects the type of number for further dialling commands (ATD) according to GSM specifications. The data services software only supports default settings. Parameter <type> 129 Type Unknown 145 Type International
Reference GSM 07.07	Note The ATD command overrides this setting when a number is dialled. I.e. if dial string has ‘+’ at start the type of number is set to 145, otherwise it is set to 129.

Tab2 16 AT+CHLD Call hold and multiparty	
Test command AT+CHLD=?	Response +CHLD: list of supported <n>s OK
Execute command AT+CHLD=[<n>]	Response TA controls the supplementary services Call Hold, MultiParty and Explicit Call Transfer. Calls can be put on hold, recovered, released, added to conversation, and transferred. Note This supplementary services are only applicable to tele service 11 (Speech: Telephony).

	OK If error is related to ME functionality: +CME ERROR: <err> Parameters <n> 0 Terminate all held calls or UDUB (User Determined User Busy) for a waiting call 1 Terminate all active calls (if any) and accept the other call (waiting call or held call) 1X Terminate the active call number X (X= 1-7) 2 Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call 2X Place all active calls except call X (X= 1-7) on hold 3 Add the held call to the active calls
Reference GSM 07.07	Note

Tab2 17 AT+CIMI Request international mobile subscriber identity	
Test command AT+CIMI=?	Response OK Parameters
Execute command AT+CIMI	Response TA returns <IMSI>for identifying the individual SIM which is attached to ME. +CIMI: <IMSI> OK If error is related to ME functionality: +CME ERROR: <err> Parameter <IMSI> International Mobile Subscriber Identity (string without double quotes)
Reference GSM 07.07	Note

Tab2 18 AT+CKPD Keypad Control	
Test command AT+ CKPD=?	Response OK Parameters
Execute command AT+CKPD=<keys> [,<time>[,<pause>]]	Response TA emulates ME keypad by giving each keystroke as a character in a string <keys>. <time>*0.1 seconds is the time to stroke each key and <pause>*0.1 seconds is the length of pause between two strokes. Keystrokes <keys> are emulated.

	OK If error is related to ME functionality: +CME ERROR: <err> Parameters <keys> string of characters representing keys as listed in the following table (based on PCCA STD-101 Annex table I-3): Char.: ASCII-Code: Note: # 35 hash (number sign) * 42 star (*) 0... 9 48... 57 number keys : 58 escape character for manufacturer specific keys D/d 68/100 volume down E/e 69/101 connection end (END) R/r 82/114 recall last number (R/RCL/MR) S/s 83/115 connection start (SEND) U/u 85/117 volume up <time> 0...25.5 seconds (default value is manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly) <pause> 0... 25.5 seconds (default value is manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly)
Reference GSM 07.07	Note

Tab2 19 AT+CLCC List current calls of ME	
Test command AT+CLCC=?	Response OK Parameters
Execute command AT+CLCC	Response TA returns a list of current calls of ME. Note: If command succeeds but no calls are available, no information response is sent to TE. [+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]] [...]]] OK If error is related to ME functionality: +CME ERROR: <err> Parameters <id*x*> integer type; call identification number as described in GSM 02.30[19] subclause 4.5.5.1; this number can be used in +CHLD command operations <dir> 0 mobile originated (MO) call 1 mobile terminated (MT) call <stat> state of the call:

		0	active
		1	held
		2	dialing (MO call)
		3	alerting (MO call)
		4	incoming (MT call)
		5	waiting (MT call)
	<mode>		bearer/tele service:
		0	voice
		1	data
		2	fax
		9	unknown
	<mpty>	0	call is not one of multiparty (conference) call parties
		1	call is one of multiparty (conference) call parties
	<number>		string type phone number in format specified by <type>
	<type>		type of address octet in integer format; 145 when dialing string includes international access code character "+", otherwise 129
	<alpha>		string type alphanumeric representation of <number> corresponding to the entry found in phone book
Reference GSM 07.07	Note		

Tab2 20 AT+CLCK Facility lock			
Test command AT+CLCK=?	Response +CLCK: (list of supported <fac>s) OK Parameters see execute command		
Execute command AT+CLCK = <fac>, <mode> [,<passwd> [,<class>]]	Response This command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. If <mode><>2 and command is successful OK If <mode>=2 and command is successful +CLCK: <status>[,<class1>[<CR><LF> +CLCK: <status>, class2....]] OK If error is related to ME functionality: +CME ERROR: <err> Parameters		
	<fac>	"PS"	PH-SIM (lock PHone to SIM card) (ME asks password when other than current SIM card inserted; ME may remember certain amount of previously used cards thus not requiring password when they are inserted)
		"SC"	SIM (lock SIM card) (SIM asks password in ME power-up and when this lock command issued)

		"AO"	BAOC (Bar All Outgoing Calls) (refer GSM02.88[6] clause 1)
		"OI"	BOIC (Bar Outgoing International Calls) (refer GSM02.88[6] clause 1)
		"OX"	BOIC-exHC (Bar Outgoing International Calls except to Home Country) (refer GSM02.88[6] clause 1)
		"AI"	BAIC (Bar All Incoming Calls) (refer GSM02.88[6] clause 2)
		"IR"	BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer GSM02.88 [6] clause 2)
		"AB"	All Barring services (refer GSM02.30[19]) (applicable only for <mode>=0)
		"AG"	All out Going barring services (refer GSM02.30[19]) (applicable only for <mode>=0)
		"AC"	All in Coming barring services (refer GSM02.30[19]) (applicable only for <mode>=0)
		"PN"	Network Personalisation (refer GSM 02.22[33])
		"PU"	network sUbset Personalisation (refer GSM 02.22[33])
		"PP"	service Provider Personalisation (refer GSM 02.22[33])
		"PC"	Corporate Personalisation (refer GSM 02.22[33])
	<mode>	0	unlock
		1	lock
		2	query status
	<passwd>		password
	<class>	1	voice
		2	data
		4	fax
		7	all classes (default)
	<status>	0	off
		1	on
Reference GSM 07.07	Note		

Tab2 21 AT+CLIP Calling line identification presentation

Test command AT+CLIP=?	Response +CLIP: (list of supported <n>s) OK Parameters see set command
Read command AT+CLIP?	Response +CLIP: <n>, <m> OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Set command AT+CLIP=<n>	Response TA enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network. OK If error is related to ME functionality: +CME ERROR: <err> Parameters

	<n>	0	suppress unsolicited result codes
		1	display unsolicited result codes
	<m>	0	CLIP not provisioned
		1	CLIP provisioned
		2	unknown
	Unsolicited result code When the presentation of the CLI at the TE is enabled (and calling subscriber allows), an unsolicited result code is returned after every RING (or +CRING: <type>) at a mobile terminating call. +CLIP: <number>, <type> Parameter <number> string type phone number of calling address in format specified by <type> <type> type of address octet in integer format; 145 when dialing string includes international access code character "+", otherwise 129		
Reference GSM 07.07	Note		

Tab2 22 AT+CLIR Calling Line Identification Restriction	
Test command AT+CLIR=?	Response +CLIR: (list of supported <n>s) OK Parameters see set command
Read command AT+CLIR?	Response +CLIR: <n>, <m> OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Set command AT+CLIR=<n>	Response TA restricts or enables the presentation of the CLI to the called party when originating a call. The command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <n> (parameter sets the adjustment for outgoing calls): 0 presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression <m> (parameter shows the subscriber CLIR service status in the network): 0 CLIR not provisioned 1 CLIR provisioned in permanent mode

	2 unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed
Reference GSM 07.07	Note

Tab2 23 AT+CMEE Report mobile equipment error	
Test command AT+CMEE=?	Response +CMEE: (list of supported <n>s) OK Parameters see set command
Read command AT+CMEE?	Response +CMEE: <n> OK Parameters see set command
Set command AT+CMEE=<n>	Response TA disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the ME. OK Parameters <n> 0 disable result code 1 enable result code and use numeric values 2 enable result code and use verbose values
Reference GSM 07.07	Note

Tab2 24 AT+COLP Connected Line Identification Presentation	
Test command AT+COLP=?	Response +COLP: (list of supported <n>s) OK Parameters See set command
Read command AT+COLP?	Response +COLP: <n>,<m> OK If error is related to ME functionality: +CME ERROR: <err> Parameters See set command
Set command AT+COLP=[<n>]	Response TA enables or disables the presentation of the COL(Connected Line) at the TE for a mobile originated call. It has no effect on the execution of the supplementary service COLR in the network. Intermediate result code is returned from TA to TE before any +CR or V.25ter responses. OK Parameters <n> (parameter sets/shows the result code presentation status in the TA):

	0 disable 1 enable <m> (parameter shows the subscriber COLP service status in the network): 0 COLP not provisioned 1 COLP provisioned 2 unknown (e.g. no network, etc.)
	Intermediate result code When enabled (and called subscriber allows), an intermediate result code is returned before any +CR or V.25ter responses: +COLP:<number>,<type>[,<subaddr>,<satype> [,<alpha>]] Parameters <number> string type phone number of format specified by <type> <type> type of address octet in integer format; 145 when dialing string includes international access code character "+", otherwise 129 <subaddr> string type sub address of format specified by <satype> <satype> type of sub address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.8) <alpha> optional string type alphanumeric representation of <number> corresponding to the entry found in phone book
Reference GSM 07.07	Note

Tab2 25 AT+COPS Operator selection	
Test command AT+COPS=?	Response TA returns a list of quadruplets, each representing an operator present in the network. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks. +COPS: list of supported(<stat>, long alphanumeric <oper>, numeric <oper>)s [,,(list of supported <mode>s),(list of supported <format>s)] OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Read command AT+COPS?	Response TA returns the current mode and the currently selected operator. If no operator is selected, <format> and <oper> are omitted. +COPS: <mode>[, <format>[, <oper>]] OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Set command AT+COPS = <mode> [, <format>[,	Response TA forces an attempt to select and register the GSM network operator. If the selected operator is not available, no other operator shall be selected (except <mode>=4). The selected operator name format shall apply to

<oper>]]	further read commands (+COPS?). OK If error is related to ME functionality: +CME ERROR: <err> Parameters <stat> 0 unknown 1 operator available 2 operator current 3 operator forbidden <oper> operator in format as per <mode> <mode> 0 automatic mode; <oper> field is ignored 1 manual operator selection; <oper> field shall be present 2 manual deregister from network 3 set only <format> (for read command +COPS?) – not shown in Read command response 4 manual/automatic selected; if manual selection fails, automatic mode (<mode>=0) is entered <format> 0 long format alphanumeric <oper>;can be up to 16 characters long 1 short format alphanumeric <oper> 2 numeric <oper>; GSM Location Area Identification number
Reference GSM 07.07	Note

Tab2 26 AT+CPAS Mobile equipment activity status	
Test command AT+CPAS=?	Response +CPAS: (list of supported <pas>s) OK Parameters see execute command
Execute command AT+CPAS	Response TA returns the activity status of ME. +CPAS: <pas> OK If error is related to ME functionality: +CME ERROR: <err> Parameters <pas> 0 ready 2 unknown (ME is not guaranteed to respond to instructions) 3 incoming call (ringing) 4 call in progress or call hold
Reference GSM 07.07	Note

Tab2 27 AT+CPBF Find phone book entries	
Test command AT+CPBF=?	Response +CPBF: [maximum length of field <nlength>)],[maximum length of field

	<tlength>] OK Parameters see execute command
Execute command AT+CPBF=<findtext>	Response TA returns phone book entries (from the current phone book memory storage selected with +CPBS) which contain alphanumeric string <findtext>. [+CPBF: <index1>,<number>,<type>,<text>[[...] <CR><LF>+CBPF: <index2>,<number>,<type>,<text>] OK] If error is related to ME functionality: +CME ERROR: <err> Parameters <index1>, <index2> integer type values in the range of location numbers of phone book memory <number> string type phone number of format <type> <type> type of address octet in integer format ; 145 when dialling string includes international access code character "+", otherwise 129 <findtext>, <text> string type field of maximum length <tlength> in current TE character set specified by +CSCS. <nlength> integer type value indicating the maximum length of field <number> <tlength> integer type value indicating the maximum length of field <text>
Reference GSM 07.07	Note

Tab2 28 AT+CPBR Read current phone book entries	
Test command AT+CPBR=?	Response TA returns location range supported by the current storage as a compound value and the maximum lengths of <number> and <text> fields. +CPBR: (list of supported <index>s), <nlength>, <tlength> OK If error is related to ME functionality: +CME ERROR: <err> Parameters <index> location number <nlength> max. length of phone number <tlength> max. length of text for number
Execute command AT+CPBR = <index1> [, <index2>]	Response TA returns phone book entries in location number range <index1>...<index2> from the current phone book memory storage selected with +CPBS. If <index2> is left out, only location <index1> is returned. +CPBR: <index1>, <number>, <type>, <text>[<CR><LF>+CPBR: .....+CPBR: <index2>, <number>,

	<type>, <text>] OK If error is related to ME functionality: +CME ERROR Parameters <index1> read as of this location number <index2> read to this location number <number> phone number <type> type of number <text> text for phone number in current TE character set specified by +CSCS.
Reference GSM 07.07	Note

Tab2 29 AT+CPBS Select phone book memory storage	
Test command AT+CPBS=?	Response +CPBS: (list of supported <storage>s) OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Read command AT+CPBS?	Response TA returns currently selected memory +CPBS: <storage> OK If error is related to ME functionality: +CME ERROR: <err> Parameters see set command
Set command AT+CPBS=<storage>	Response TA selects current phone book memory storage, which is used by other phone book commands. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <storage> "DC" ME dialed calls list(+CPBW may not be applicable for this storage) "FD" SIM fixdialing-phone book "LD" SIM last-dialing-phone book "ON" SIM (or ME) own numbers (MSISDNs) list "SM" SIM phonebook "MC" Missed call memory
Reference GSM 07.07	Note

Tab2 30 AT+CPBW Write phone book entry	
Test command	Response

AT+CPBW=?	TA returns location range supported by the current storage, the maximum length of <number> field, supported number formats of the storage, and the maximum length of <text> field. +CPBW: (list of supported <index>s), <nlength>, (list of supported <typ>s), <tlength> OK If error is related to ME functionality: +CME ERROR: <err> Parameters see execute command
Execute command AT+CPBW = [<index>], [<number>, [<type>, [<text>]]]	Response TA writes phone book entry in location number <index> in the current phone book memory storage selected with +CPBS. Entry fields written are phone number <number> (in the format <type>) and text <text> associated with the number. If those fields are omitted, phone book entry is deleted. If <index> is left out, but <number> is given, entry is written to the first free location in the phone book. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <nlength> max. length of phone number <tlength> max. length of text for number <index> location number <number> phone number <type> type of number; e.g. 145 when dialing string includes international access code character "+", otherwise 129 <text> text for phone number in current TE character set specified by +CSCS. Note: The following characters in <text> must be entered via the escape sequence: GSM char. Seq. Seq.(hex) Note \ \5C 5C 35 43 (backslash) “ \22 5C 32 32 (string delimiter) BSP \08 5C 30 38 (backspace) NULL \00 5C 30 30 (GSM null) ‘0’ (GSM null) may cause problems for application layer software when reading string lengths.
Reference GSM 07.07	Note

Tab2 31 AT+CPIN Enter PIN	
Test command AT+CPIN=?	Response OK
Read command AT+CPIN?	Response TA returns an alphanumeric string indicating whether some password is required or not. +CPIN: <code> OK

	If error is related to ME functionality: +CME ERROR: <err> Parameters <code> READY — no further entry needed SIM PIN — ME is waiting for SIM PIN SIM PUK — ME is waiting for SIM PUK PH_SIM PIN — ME is waiting for phone to SIM card (antitheft) PH_SIM PUK — ME is waiting for SIM PUK (antitheft) SIM PIN2 — PIN2, e.g. for editing the FDN book possible only if preceding command was acknowledged with +CME ERROR:17 SIM PUK2 — possible only if preceding command was acknowledged with error +CME ERROR:18.
Set command AT+CPIN=<pin> [, <new pin>]	Response TA stores a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message, +CME ERROR, is returned to TE. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <pin> — string type; password <new pin> — string type; If the PIN required is SIM PUK or SIM PUK2: new password
Reference GSM 07.07	Note

Tab2 32 AT+CPWD Change password	
Test command AT+CPWD=?	Response TA returns a list of pairs which present the available facilities and the maximum length of their password. +CPWD: list of supported (<fac>, <pwdlength>)s OK If error is related to ME functionality: +CME ERROR: <err> Parameters <fac> otherwise — see execute command, without "FD" <pwdlength> — integer max. length of password
Execute command AT+CPWD = <fac>, [<oldpwd>], <newpwd>	Response TA sets a new password for the facility lock function. OK If error is related to ME functionality: +CME ERROR: <err> Parameters <fac> "SC" SIM (lock SIM card) (SIM asks password in ME power-up and

	when this lock command issued) "AO" BAOC (Barr All Outgoing Calls) (refer GSM02.88[6] clause 1) "OI" BOIC (Barr Outgoing International Calls) (refer GSM02.88[6] clause 1) "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country) (refer GSM02.88[6] clause 1) "AI" BAIC (Barr All Incoming Calls) (refer GSM02.88[6] clause 2) "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer GSM02.88 [6] clause 2) "AB" All Barring services (refer GSM02.30[19]) (applicable only for <mode>=0) "AG" All outGoing barring services (refer GSM02.30[19]) (applicable only for <mode>=0) "AC" All inComing barring services (refer GSM02.30[19]) (applicable only for <mode>=0) "P2" SIM PIN2<oldpwd> password specified for the facility from the user interface or with command. If an old password has not yet been set, <oldpwd> is not to enter. <newpwd> new password
Reference GSM 07.07	Note

Tab2 33 AT+CR Service Reporting Control			
Test command AT+CR=?	Response +CR: list of supported <mode>s OK Parameters see set command		
Read command AT+CR?	Response +CR: <mode> OK Parameters see set command		
Set command AT+CR=<mode>	Response TA controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE at a call set up. OK Parameters <mode> 0 disable 1 enable		
	Intermediate result code If enabled, an intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted. +CR:<serv> Parameters <serv> ASYNC asynchronous transparent SYNC synchronous transparent		

	REL ASYNC asynchronous non-transparent REL SYNC synchronous non-transparent
Reference GSM 07.07	Note

Tab2 34 AT+CRC Set Cellular Result Codes for incoming call indication	
Test command AT+CRC=?	Response +CRC: list of supported <mode>s OK Parameters see set command
Read command AT+CRC?	Response +CRC: <mode> OK Parameters see set command
Set command AT+CRC=<mode>	Response TA controls whether or not the extended format of incoming call indication is used. OK Parameters <mode> 0 disable extended format 1 enable extended format
	Unsolicited result code When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING. Parameters <type> ASYNC asynchronous transparent SYNC synchronous transparent REL ASYNC asynchronous non-transparent REL SYNC synchronous non-transparent FAX facsimile VOICE voice
Reference GSM 07.07	Note

Tab2 35 AT+CREG Network registration	
Test command AT+CREG=?	Response +CREG: list of supported <n>s OK Parameters see set command
Read command AT+CREG?	Response TA returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network. +CREG: <n>,<stat> OK If error is related to ME functionality: +CME ERROR: <err> Parameters

	see set command
Set command AT+CREG=[<n>]	Response TA controls the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the ME network registration status. OK Parameters <n> 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CREG: <stat> 2 enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>] <stat> 0 not registered, ME is not currently searching a new operator to register to 1 registered, home network 2 not registered, but ME is currently searching a new operator to register to 3 registration denied 4 unknown 5 registered, roaming <lac> string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <ci> string type; two byte cell ID in hexadecimal format
	Unsolicited result code When <n>=1 and there is a change in the ME network registration status: +CREG: <stat> Parameters see set command
Reference GSM 07.07	Note

Tab2 36 AT+CRLP Select Radio Link Protocol param. for orig. non-transp. data call	
Test command AT+CRLP=?	Response TA returns values supported. RLP versions 0 and 1 share the same parameter set. TA returns only one line for this set (where <ver*x*> is not present). +CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s), (list of supported <ver1>s), (list of supported <T4>s) ... OK Parameters see set command
Read command AT+CRLP?	Response TA returns current settings for RLP version. RLP versions 0 and 1 share the same parameter set. TA returns only one line for this set (where <ver*x*> is not present).

	+CRLP: <iws>,<mws>,<T1>,<N2>,<ver1>,<T4> ... OK Parameters see set command
Set command AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]]]	Response TA sets radio link protocol (RLP) parameters used when non-transparent data calls are setup. OK Parameters <iws> 0-61-255 Interworking window size (IWF to MS) <mws> 0-61-255 Mobile window size(MS to IWF) <T1> 0-48-255 acknowledgment timer T1 in 10 ms units) <N2> 0-6-255 retransmission attempts N2 <verx> 0-1 RLP version number in integer format; when version indication is not present it shall equal 0. Note: Versions 0 and 1 share the same parameter set. <T4> 0-3-255 re-sequencing period in integer format, in units of 10 ms. This is NOT used for RLP versions 0 and 1.
Reference GSM 07.07	Note

Tab2 37 AT+CSQ Signal Quality Report	
Test command AT+CSQ=?	Response +CSQ: (list of supported <rssi>s),(list of supported <ber>s) Parameters see execute command
Execute command AT+CSQ	Response +CSQ: <rssi>,<ber> *+CME ERROR: <err>* Execution command returns received signal strength indication <rssi> and channel bit error rate <ber> from the ME. Test command returns values supported by the TA. Parameters <rssi>: 0 -113 dBm or less 1 -111 dBm 2...30 -109... -53 dBm 31 -51 dBm or greater 99 not known or not detectable <ber> (in percent): 0...7 as RXQUAL values in the table in GSM 05.08 [20] subclause 8.2.4

	99 not known or not detectable
Reference GSM 07.07	Note

Tab2 38 AT+FCLASS FAX: select, read or test service class	
Test command AT+FCLASS=?	Response +FCLASS: list of supported <n>s OK Parameters see set command
Read command AT+FCLASS?	Response +FCLASS: <n> OK Parameters see set command
Set command AT+FCLASS=<n>	Response TA sets a particular mode of operation (data, fax). This causes the TA to process information in a manner suitable for that type of information. OK Parameters <n> 0 data 1 fax class 1 (TIA-578-A)
Reference GSM 07.07	Note

Tab2 39 AT+FMI FAX: report manufactured ID	
Test command AT+FMI=?	Response OK
Execute command command AT+FMI	Response TA reports one or more lines of information text which permit the user to identify the manufacturer. <manufacturer Id> OK
	Parameters <manufacturer Id>
EIA / TIA-578-D	

Tab2 40 AT+FMM FAX: report model ID	
Test command AT+FMM=?	Response OK
Execute command AT+FMM	Response TA reports one or more lines of information text which permit the user to identify the specific model of device. <model Id> OK Parameters

	<model Id>
Reference EIA / TIA-578-D	Note

Tab2 41 AT+FMR FAX: report revision ID	
Test command AT+FMR=?	Response OK
Execute command AT+FMR	Response TA reports one or more lines of information text which permit the user to identify the version, revision level or data or other information of the device. <Revision Id> OK Parameters <Revision Id> Revision: 0.01
Reference EIA / TIA-578-D	

Tab2 42 AT+VTD=<n> Tone duration	
Test command AT+VTD=?	Response +VTD: list of supported <n>s OK Parameters see set command
Read command AT+VTD?	Response +VTD: <n> OK Parameters see set command
Set command AT+VTD = <duration>	Response This command refers to an integer <n> that defines the length of tones emitted as a result of the +VTS command. This does not affect the D command. OK Parameters <n> 0 default setting 1-255 duration of the tone in 1/10 seconds
Reference GSM 07.07	Note

Tab2 43 AT+VTS DTMF and tone generation	
Test command AT+VTS=?	Response +VTS: list of supported <dtmf>s OK Parameters see set command
Set command	Response

AT+VTS=<dtmf-string>	This command allows the transmission of DTMF tones and arbitrary tones in voice mode. These tones may be used (for example) when announcing the start of a recording period. Note: D is used only for dialling. OK If error is related to ME functionality: +CME ERROR: <err> Note: The command is write only. Parameters <dtmf-string> which has a max length of 20 characters, must be entered between double qoutes (“ “) and consists of combinations of the following separated by commas. Each character in <dtmf-string> is a single ASCII character in the set 0-9,#,*,A-D. This is interpreted as a sequence of DTMF tones whose duration is set by the +VTD command.
Reference GSM 07.07	Note

TAB2 44 AT+CMIC Change the Microphone Gain Level	
Test command AT+CMIC=?	Response +CMIC: (channel),(gainlevel) Parameter See set command
Read command AT+ CMIC?	Response + CMIC: < gainlevel(Main_Mic) >, <gainlevel(Aux_Mic)> OK Parameter See set command
Set command AT+ CMIC = <channel>,< gainlevel >	Response OK Parameters <channel> 0 – Main Microphone 1 – Aux Microphone < gainlevel > int: 0 – 15 0 0dB 1 +1.5dB 2 +3.0 dB(default value) 3 +4.5 dB 4 +6.0 dB 5 +7.5 dB 6 +9.0 dB 7 +10.5 dB 8 +12.0 dB 9 +13.5 dB 10 +15.0 dB 11 +16.5 dB 12 +18.0 dB

	13 +19.5 dB 14 +21.0 dB 15 +22.5 dB
Reference	Note

TAB2 45 AT+SIDET Change the Side Tone Gain Level	
Test command AT+SIDET=? Read command AT+ SIDET?	Response +SIDET: (gainlevel) Parameter See set command Response + SIDET: < gainlevel> OK Parameter See set command
Set command AT+ SIDET = < gainlevel >	Response OK Parameters < gainlevel > int: 0 – 32767
Reference	Note The relation between the Side Tone Gain and <gainlevel> is Side Tone Gain/dB = 20*log(sideTone/32767)

TAB2 46 AT+ECHO Echo cancellation control	
Test command AT+ECHO=? Read command AT+ ECHO?	Response +ECHO: (voxGain),(minMicEnergy) ,(sampSlncePrd) Parameter See set command Response + ECHO: <voxGain>,<minMicEnergy>,<sampSlncePrd> OK Parameter See set command
Set command AT+ ECHO = <voxGain>,<minMicEnergy>,<sampSlncePrd>	Response OK Parameters < voxGain > int: 0 – 32767 < minMicEnergy > int: 0 – 32767 < sampSlncePrd > int: 0 – 32767
Reference	Note < voxGain >: the parameter models the acoustic path between ear-piece and microphone. < minMicEnergy >: the parameter sets the minimum microphone energy level to be attained before suppression is allowed. A typical value of this parameter is 20. < sampSlncePrd >: the parameter control the minimum number of speech frames that will be replace with SID frames when an echo is detected. A typical value of

	this parameter is 4.

Tab2 47 AT+CEPY Get Unicode of Chinese characters base on Pinyin	
Test command AT+CEPY?	Response "+CEPY"
Set command AT+CEPY=<MODE>,[STRING]	Response +CEPY:<DATAUNIT> Parameters <MODE > *1:Get Pinyin From Num* *2:Get* Unicode of Chinese characters from pinyin 3:Get Previous Group of Chinese characters based on current pinyin 4:Get next Group of Chinese characters based on current pinyin [STRING] Pinyin or Num based on mode < DATAUNIT > Hex Data Include Chinese characters information. Please See Chinese Document.
Reference	Note

Tab2 48 AT+UNMO Get Dots Information based on Unicode of Chinese characters (GB2312)	
Test command AT+UNMO?	Response "+UNMO"
Set command AT+UNMO =<UNICODE>	Response +UNMO:<DATAUNIT> Parameters <UNICODE> Unicode of Chinese characters (GB2312),Use Ucs2 String mode < DATAUNIT > Hex Data Include Chinese characters Dots information. Please See Chinese Document.
Reference	Note

2.2.2 Summary of CME ERROR Codes Related to GSM 07.07 Commands

Final result code `+CME ERROR: <err>` indicates an error related to mobile equipment or network. The operation is similar to `ERROR` result code. None of the following commands

in the same command line is executed. Neither ERROR nor OK result code shall be returned.

<err> values used by common messaging commands:

Code of <err>	Meaning
0	phone failure
1	no connection to phone
2	phone-adapter link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network time out
32	network not allowed - emergency calls only
40	network personalisation PIN required
41	network personalisation PUK required
42	network subset personalisation PIN required
43	network subset personalisation PUK required
44	service provider personalisation PIN required
45	service provider personalisation PUK required
46	corporate personalisation PIN required

47	corporate personalisation PUK required
100	Unknown
101…255	Reserved

2.3 AT Commands according to GSM 07.05

The GSM 07.05 commands are for performing SMS and CBS related operations. ITM100 II supports both Text and PDU modes.

2.3.1 overview

Command	Description
AT+CMGD	DELETE SMS MESSAGE
AT+CMGF	SELECT SMS MESSAGE FORMAT
AT+CMGL	LIST SMS MESSAGES FROM PREFERRED STORE
AT+CMGR	READ SMS MESSAGE
AT+CMGS	SEND SMS MESSAGEF
AT+CMGW	WRITE SMS MESSAGE TO MEMORY
AT+CMSS	SEND SMS MESSAGE FROM STORAGE
AT+CMGC	SEND SMS COMMAND
AT+CNMI	NEW SMS MESSAGE INDICATIONS
AT+CPMS	PREFERRED SMS MESSAGE STORAGE
AT+CRES	RESTORE SMS SETTINGS
AT+CSAS	SAVE SMS SETTINGS
AT+CSCA	SMS SERVICE CENTER ADDRESS
AT+CSCB	SELECT CELL BROADCAST SMS MESSAGES
AT+CSDH	SHOW SMS TEXT MODE PARAMETERS
AT+CSMP	SET SMS TEXT MODE PARAMETERS
AT+CSMS	SELECT MESSAGE SERVICE

2.3.1.i Detailed Descriptions of Commands

Tab3 1 AT+CMGD Delete SMS message	
Test command AT+CMGD=?	Response OK
Execute command AT+CMGD=<index>	Response TA deletes message from preferred message storage <mem1> location <index>. OK If error is related to ME functionality: +CMS ERROR <err> Parameters <index> integer type; value in the range of location numbers supported by the associated memory
Reference GSM 07.05	Note

Tab3 2 AT+CMGF Select SMS Message Format	
Test command AT+CMGF=?	Response +CMGF: list of supported <mode>s OK Parameters see set command
Read command AT+CMGF?	Response +CMGF: <mode> OK Parameters see set command
Set command AT+CMGF = [<mode>]	Response TA sets parameter to denote which input and output format of messages to use. OK Parameters <mode> 0 PDU mode 1 text mode
Reference GSM 07.05	Note

Tab3 3 AT+CMGL List SMS messages from preferred store	
Test command AT+CMGL=?	Response +CMGL: list of supported <stat>s OK Parameters see execute command
Execute command AT+CMGL [=<stat>]	Parameters 1) If text mode: <stat> "REC UNREAD" Received unread messages (default) "REC READ" Received read messages "STO UNSENT" Stored unsent messages "STO SENT" Stored sent messages "ALL" All messages 2) If PDU mode: <stat> 0 Received unread messages (default) 1 Received read messages 2 Stored unsent messages 3 Stored sent messages 4 All messages Response TA returns messages with status value <stat> from message storage <mem1> to the TE. . If status of the message is 'received unread', status in the storage changes to 'received read'. 1) If text mode (+CMGF=1) and command successful: for SMS-SUBMITs and / or SMS-DELIVERs: +CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<*tooa/toda*>

	,<*length*>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<*tooa/toda*> ,<*length*>]<CR><LF><data>[...]] OK 2) If PDU mode (+CMGF=0) and command successful: +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu> [<CR><LF>+CMGL: <index>,<stat>,[alpha],<length><CR><LF><pdu> [...]] OK 3)If error is related to ME functionality: +CMS ERROR: <err> Parameters <alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toda> <data> In the case of SMS: GSM 03.40 TP-User-Data in text mode responses; format: -if <dcs> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A -if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format: - if <dcs> indicates that GSM 03.38 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A -if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number <length> integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) <index> integer type; value in the range of location numbers supported by the associated memory <oa> GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <tooa> <pdu> In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of

	TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format. <scts> GSM 03.40 TP-Service-Center-Time-Stamp in time-string format (refer <dt>) <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <tooa> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>)
Reference GSM 07.05	

Tab3 4 AT+CMGR Read SMS message

Test command AT+CMGR=?	Response OK
Execute command AT+CMGR=<index>	Parameters <index> integer type; value in the range of location numbers supported by the associated memory Response TA returns SMS message with location value <index> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'. 1) If text mode (+CMGF=1) and command successful: for SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> for SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> 2) If PDU mode (+CMGF=0) and command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> OK 3) If error is related to ME functionality: +CMS ERROR: <err> Parameters <alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <toda>

	<data>	In the case of SMS: GSM 03.40 TP-User-Data in text mode responses; format: -if <dcs> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A -if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format: - if <dcs> indicates that GSM 03.38 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A -if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number
	<dcs>	depending on the command or result code: GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format
	<fo>	depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format
	<length>	integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
	<mid>	GSM 03.41 CBM Message Identifier in integer format
	<oa>	GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted characters of the currently selected TE character set (specified by +CSCS);; type of address given by <tooa>
	<pdu>	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.
	<sca>	GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <tosca>
	<scts>	GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
	<stat>	0 "REC UNREAD" Received unread messages

	1 "REC READ" Received read messages 2 "STO UNSENT" Stored unsent messages 3 "STO SENT" Stored sent messages 4 "ALL" All messages <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <tooa> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>) <tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <toda>) <vp> depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
Reference GSM 07.05	Note

Tab3 5 AT+CMGS Send SMS message

Test command AT+CMGS=?	Response OK
Execute command 1) If text mode (+CMGF=1): **+**CMGS=<da>[,<toda>]<CR> **text is entered** <ctrl-Z / ESC> ESC quits without sending 2) If PDU mode (+CMGF=0): +CMGS=<length><CR> **PDU is given** <ctrl-Z / ESC>	Parameters <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <toda> <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <length> integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) Response TA transmits SMS message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(+CMGF=1) and sending successful: +CMGS: <mr> OK

	2) If PDU mode(+CMGF=0) and sending successful: +CMGS: <mr> OK 3)If error is related to ME functionality: +CMS ERROR: <err> Parameters <mr> GSM 03.40 TP-Message-Reference in integer format
Reference GSM 07.05	Note

Tab3 6 AT+CMGW Write SMS message to memory	
Test command AT+CMGW=?	Response OK
Execute command 1) If text mode (+CMGF=1): +CMGW[=<oa/da>[,<tooa/toda>]] <CR> **text is entered** <ctrl-Z/ESC> <ESC> quits without sending 2) If PDU mode (+CMGF=0): +CMGW=<length><CR> PDU is given <ctrl-Z/ESC>	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. If writing is successful: +CMGW: <index> OK If error is related to ME functionality: +CMS ERROR: <err> Parameters <oa> GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <tooa> <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <toda> <tooa> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>) <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <length> integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) <pdu> In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number

	(e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format. <index> Index of message in selected storage <mem2>
Reference GSM 07.05	Note

Tab3 7 AT+CMSS Send SMS message from storage	
Test command AT+CMSS=?	Response OK
Execute command +CMSS=<index>[,<da>[,<toda>]]	Response TA sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT). If new recipient address <da> is given, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(+CMGF=1) and sending successful: +CMGS: <mr> OK 2) If PDU mode(+CMGF=0) and sending successful: +CMGS: <mr> OK 3)If error is related to ME functionality: +CMS ERROR: <err> Parameters <index> integer type; value in the range of location numbers supported by the associated memory <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <toda> <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <mr> GSM 03.40 TP-Message-Reference in integer format
Reference GSM 07.05	Note

Tab3 8 AT+CMGC Send SMS Command	
Test command AT+CMGC=?	Response OK
Execute command 1) If text mode	Parameters <fo> first octet of GSM 03.40 SMS-COMMAND (default 2) in integer

(+CMGF=1): **+**CMGC=<fo>,<ct>[<pid>[,<mn>[,<da>[,<toda>]]]]<CR> **text is entered** <ctrl-Z / ESC> ESC quits without sending 2) If PDU mode (+CMGF=0): +CMGC=<length><CR> **PDU is given** <ctrl-Z / ESC>	format <ct> GSM 03.40 TP-Command-Type in integer format (default 0) <pid> GSM 03.40 TP-Protocol-Identifier in integer format (default 0) <mn> GSM 03.40 TP-Message-Number in integer format <da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <toda> <toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <length> integer type value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) Response TA transmits SMS Command message from a TE to the network (SMS-COMMAND). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(+CMGF=1) and sending successful: +CMGC: <mr> OK 2) If PDU mode(+CMGF=0) and sending successful: +CMGC: <mr> OK 3)If error is related to ME functionality: +CMS ERROR: <err> Parameters <mr> GSM 03.40 TP-Message-Reference in integer format
Reference GSM 07.05	Note

Tab3 9 AT+CNMI New SMS message indications	
Test command AT+CNMI=?	Response +CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) OK Parameters see set command
Read command AT+CNMI?	Response +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK Parameters see set command

Set command	Response
AT+CNMI = [<mode> [,<mt>[,<bm> [,<ds>[,<bfr>]]]]]	TA selects the procedure for how the receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in GSM 03.38. OK If error is related to ME functionality: +CMS ERROR: <err> Parameters <mode> 0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. 3 Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode. <mt> (the rules for storing received SMs depend on its data coding scheme (refer GSM 03.38 [2]), preferred memory storage (+CPMS) setting and this value): 0 No SMS-DELIVER indications are routed to the TE. 1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index> 2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled) or +CMT: <oa>, [<alpha>],<scts> *[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF><data> (text mode enabled; about parameters in italics, refer command Show Text Mode Parameters +CSDH). Class 2 messages result in indication as defined in <mt>=1. 3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other classes result in indication as defined in <mt>=1. <bm> (the rules for storing received CBMs depend on its data coding scheme (refer GSM 03.38 [2]), the setting of Select CBM Types (+CSCB) and this value): 0 No CBM indications are routed to the TE. 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled) or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled).

	<ds>	0	No SMS-STATUS-REPORTs are routed to the TE.
		1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)
	<bfr>	0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes).
		1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.
	Unsolicited result code +CMTI: <mem>,<index> Indication that new message has been received +CMT: ,<length><CR><LF><pdu> Short message is output directly +CBM: <length><CR><LF><pdu> Cell broadcast message is output directly		
Reference GSM 07.05	Note		

Tab3 10 AT+CPMS Preferred SMS Message Storage

Test command AT+CPMS=?	Response +CPMS: (list of supported <mem1>s),(list of supported <mem2>s) ,(list of supported <mem3>s) Parameters see set command
Read command AT+CPMS?	Response +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3> OK If error is related to ME functionality: +CMS ERROR Parameters see set command
Set command AT+CPMS = <mem1> [,<mem2> [,<mem3>]]	Response TA selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK If error is related to ME functionality: +CMS ERROR:<err> Parameters <mem1> Messages to be read and deleted from this memory storage "SM" SIM message storage <mem2> Messages will be written and sent to this memory storage "SM" SIM message storage <mem3> Received messages will be placed in this memory storage if routing to PC is not set ("+CNMI") "SM" SIM message storage <usedx> Number of messages currently in <memx> <totalx> Number of messages storable in <memx>

Reference	Note
GSM 07.05	

Tab3 11 AT+CRES Restore SMS settings	
Test command AT+CRES=?	Response +CRES: list of supported <profile>s OK
Execute command AT+CRES[=<profile>]	Response TA restores SMS settings for +CMGF, +CNMI, +CSDH from non-volatile memory to active memory. OK If error is related to ME functionality: +CMS ERROR:<err> Parameters <profile> 0 manufacturer specific profile number where setting are to be stored
Reference GSM 07.05	Note

Tab3 12 AT+CSAS Save SMS settings	
Test command AT+CSAS=?	Response +CSAS: list of supported <profile>s OK
Execute command AT+CSAS[=<profile>]	Response TA saves current message service settings for +CMGF, +CNMI, +CSDH, to a non-volatile memory. OK If error is related to ME functionality: +CMS ERROR:<err> Parameters <profile> 0 manufacturer specific profile number where settings are to be stored
Reference GSM 07.05	Note

Tab3 13 AT+CSCA SMS Service Center Address	
Test command AT+CSCA=?	Response OK
Read command AT+CSCA?	Response +CSCA: <sca>,<tosca> OK Parameters see set command
Set command AT+CSCA = <sca>[,<tosca>]	Response TA updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

	Note: The command writes the parameters in NON-VOLATILE memory. OK Parameters <sca> GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);; type of address given by <tosca> <tosca> Service center address format GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <toda>)
Reference GSM 07.05	Note

Tab3 14 AT+CSCB Select cell broadcast SMS messages			
Test command AT+CSCB=?	Response +CSCB: list of supported <mode>s OK Parameters see set command		
Read command AT+CSCB?	Response +CSCB: <mode>,<mids>,<dcss> OK Parameters see set command		
Set command AT+CSCB=[<mode>[,mids>[,<dcss>]]]	Response TA selects which types of CBMs are to be received by the ME. Note: The command writes the parameters in NON-VOLATILE memory. OK Parameters <mode>	0	message types specified in <mids> and <dcss> are accepted
		1	message types specified in <mids> and <dcss> are not accepted
	<mids>	string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320-478,922".	
	<dcss>	string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5".	
Reference GSM 07.05	Note		

Tab3 15 AT+CSDH Show SMS text mode parameters	
Test command AT+CSDH=?	Response +CSDH: list of supported <show>s OK Parameters see set command

Read command AT+CSDH?	Response +CSDH:<show> OK Parameters see set command
Set command AT+CSDH=<show>	Response TA determines whether detailed header information is shown in text mode result codes. OK Parameters <show> 0 do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes in text mode 1 show the values in result codes
Reference GSM 07.05	Note

Tab3 16 AT+CSMP Set SMS text mode parameters	
Test command AT+CSMP=?	Response +CSMP:(list of supported <fo>s),(list of supported <vp>s) OK Parameters see set command
Read command AT+CSMP?	Response +CSMP:<fo>,<vp>,<pid>,<dcs> OK Parameters see set command
Set command AT+CSMP=[<fo>[<vp>[,pid>[,<dcs>]]]]	Response TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text mode is selected (+CMGF=1). It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). Note: The command writes the parameters in NON-VOLATILE memory. OK Parameters <fo> depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format <vp> depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>) <pid> GSM 03.40 TP-Protocol-Identifier in integer format. <dcs> GSM 03.38 SMS Data Coding Scheme in Integer format.
Reference GSM 07.05	Note

Tab3 17 AT+CSMS Select Message Service	
Test command AT+CSMS=?	Response +CSMS: list of supported <service>s OK Parameters see set command
Read command AT+CSMS?	Response +CSMS: <service>,<mt>,<mo>,<bm> OK Parameters see set command
Set command AT+CSMS= <service>	Response +CSMS: <mt>,<mo>,<bm> OK If error is related to ME functionality: +CMS ERROR: <err> Parameters <service> 0 GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes)) 128 SMS PDU mode - TPDU only used for sending/receiving SMSs. <mt> Mobile Terminated Messages: 0 Type not supported 1 Type supported <mo> Mobile Originated Messages: 0 Type not supported 1 Type supported <bm> Broadcast Type Messages: 0 Type not supported 1 Type supported
Reference GSM 07.05	Note

2.3.2 Summary of CMS ERROR Codes Related GSM 07.05 Commands

Final result code +CMS ERROR: <err> indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same command line is executed. Neither ERROR nor OK result code shall be returned.

<err> values used by common messaging commands:

Code of <err>	Meaning
0...127	GSM 04.11 Annex E-2 values, see CME ERROR codes related GSM 07.07
128...255	GSM 03.40 subclause 9.2.3.22 values
300	ME failure

301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgment expected
500	unknown error
511	other values in range 256...511 are reserved
512...	manufacturer specific
513	Unread SM on SIM

3 AT COMMANDS FOR GPRS SUPPORT

This section defines the AT Commands implemented in ITM100 for the control of a GPRS MT, as per specification GSM 07.07. The following table lists the subset of AT commands supported. For each listed command a detailed description follows of the parameters supported.

The approach adopted is that the GPRS AT commands control the operation of PPP in the SIMCOM GPRS stack. This means that MT context activation is not relevant in this implementation since a PPP session cannot be started by the terminal. As a result, commands +CGAUTO and +CGANS are not supported.

3.1 Overview

Command	Description
+CGDCONT	Define PDP context
+CGQREQ	Quality of service profile (requested)
+CGQMIN	Quality of service profile (minimum acceptable)
+CGACT	Context activation
+CGDATA	Enter Data State
+CGATT	GPRS attach or detach
+CGPADDR	Show PDP address
+CGCLASS	GPRS mobile station class
+CGEREP	Control unsolicited GPRS event reporting
+CGREG	Network registration status
+CGSMS	Select service for MO SMS messages
+CGCOUNT	GPRS Packet Counters (SIMCOM Proprietary)

3.2 Detailed Descriptions of Commands

Tab1 1 AT+CGDCONT Define the PDP context	
Test command AT+CGDCONT=?	Response +CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [...]] Parameter See set command
Read command	Response

AT+CGDCONT?	+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>[,<pd1>[,…[,pdN]]] [<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>[,<pd1>[,…[,pdN]]] [...]] Parameter See set command
Set command AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,…[,pdN]]]]]]]]]	Response OK ERROR Parameter <cid> (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. <PDP_type> (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol X25 ITU-T/CCITT X.25 layer 3 IP Internet Protocol (IETF STD 5) OSPIH Internet Hosted Octet Stream Protocol PPP Point to Point Protocol (IETF STD 51) <APN> (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. <PDP_addr> a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. <d_comp> a numeric parameter that controls PDP data compression 0 - off (default if value is omitted) 1 - on Other values are reserved. <h_comp> a numeric parameter that controls PDP header compression 0 - off (default if value is omitted) 1 – on Other values are reserved. NOTE. At present only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a command will be provided to select one or more of these. <pd1>,…<pdN> zero to N string parameters whose meanings are specific to the <PDP_type> For PDP type OSP:IHOSS the following

	parameters are defined: <pd1> = <host> the fully formed domain name extended hostname of the Internet host <pd2> = <port > the TCP or UDP port on the Internet host <pd3> = <protocol> the protocol to be used over IP on the Internet - "TCP" or "UDP
Reference GSM07.07	Note

Tab1 2 AT+CGQREQ Quality of service profile (requested)	
Test command +CGQREQ=?	Response +CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [<CR><LF>+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) […]] Parameter See set command
Read command +CGQREQ?	Response +CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> […]] Parameter See set command
Set command +CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability.>[,<peak>[,<mean>]]]]]]	Response OK ERROR Parameter <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). The following parameters are defined in GSM 03.60 - <precedence>a numeric parameter which specifies the precedence class <delay> a numeric parameter which specifies the delay class <reliability> a numeric parameter which specifies the reliability class <peak> a numeric parameter which specifies the peak throughput class <mean> a numeric parameter which specifies the mean throughput class
Reference GSM07.07	Note

Tab1 3 AT+CGQMIN Quality of service profile (minimum acceptable)	
Test command	Response

+CGQMIN=?	+CGQMIN: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) […]] Parameter See set command
Read command +CGQMIN?	Response +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> […]] Parameter See set command
Set command +CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]	Response OK ERROR Parameter <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). The following parameters are defined in GSM 03.60 - <precedence>a numeric parameter which specifies the precedence class <delay> a numeric parameter which specifies the delay class <reliability> a numeric parameter which specifies the reliability class <peak> a numeric parameter which specifies the peak throughput class <mean> a numeric parameter which specifies the mean throughput class
Reference GSM07.07	Note

Tab1 4 AT+CGACT PDP context activate or deactivate	
Test command +CGACT=?	Response +CGACT: (list of supported <state>s) Parameter See set command
Read command +CGACT?	Response +CGACT: <cid>,<state> [<CR><LF>+CGACT: <cid>,<state> […]] Parameter See set command
Set command +CGACT=[<state>[,<cid>[,<cid>[,…]]]]	Response OK NO CARRIER ERROR

	Parameter <state> indicates the state of PDP context activation 0 – deactivated 1 – activated Other values are reserved and will result in an ERROR response to the execution command. <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command)
Reference GSM07.07	Note If context is deactivated successfully, NO CARRIER is returned

Tab1 5 AT+CGDATA Enter Data State	
Test command +CGDATA=?	Response +CGDATA: (list of supported <L2P>s) Parameter See set command
Set command +CGDATA=[<L2P>[,<cid>[,<cid>[,…]]]]	Response OK ERROR Parameter <L2P> a string parameter that indicates the layer 2 protocol to be used between the TE and MT: PPP – Point to Point protocol for a PDP such as IP Other values are not supported and will result in an ERROR response to the execution command. <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command)
Reference GSM07.07	Note The command does not fully implement the CGDATA command as specified in GSM 07.07. The command will not enter data state once the PDP context has been activated and will simply generate the result code “OK” if the context has been successfully activated.

Tab1 6 AT+CGATT GPRS attach or detach	
Test command +CGATT=?	Response +CGATT: (list of supported <state>s) Parameter See set command
Read command +CGATT?	Response +CGATT: <state> Parameter See set command
Set command +CGATT=[<state>]	Response OK ERROR Parameter <state> indicates the state of GPRS attachment 0 – detached 1 – attached Other values are reserved and will result in an ERROR response to the execution command.

Reference GSM07.07	Note

Tab1 7 AT+CGPADDR Show PDP address	
Test command +CGPADDR=?	Response +CGPADDR: (list of defined <cid>s) Parameter See set command
Set command +CGPADDR=[<cid>[,<cid>[,…]]]	Response +CGPADDR: <cid>,<PDP_addr> [<CR><LF>+CGPADDR: <cid>,<PDP_addr> [...]] Parameter <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. <PDP_addr> a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.
Reference GSM07.07	Note This command dictates the behaviour of PPP in the ME but not that of any other GPRS-enabled foreground layer, eg browser.

Tab1 8 AT+CGCLASS GPRS mobile station class	
Test command +CGCLASS=?	Response +CGCLASS: (list of supported <class>s) Parameter See set command
Read command +CGCLASS?	Response +CGCLASS: <class> Parameter See set command
Set command +CGCLASS=[<class>]	Response OK ERROR Parameter <class> a string parameter which indicates the GPRS mobile class (in descending order of functionality) A class A (highest) B class B C class C CG class C in GPRS only mode CC class C in circuit switched only mode (lowest)
Reference GSM07.07	Note Class A and is not supported by the SIMCOM GPRS solution.

	Class C is only supported for <class> values of “CG” and “CC”

Tab1 9 AT+CGEREP Control unsolicited GPRS event reporting	
Test command +CGEREP=?	Response +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) Parameter See set command
Read command +CGEREP?	Response +CGEREP: <mode>,<bfr> Parameter See set command
Set command +CGEREP=[<mode>[,<bfr>]]	Response OK ERROR Parameter <mode> 0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE <bfr> 0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes) Unsolicited Result Codes supported: +CGEV: NW DEACT <PDP_type>,<PDP_addr>[,<cid>] +CGEV: ME DEACT <PDP_type>,<PDP_addr>[,<cid>] +CGEV: NW DETACH +CGEV: ME DETACH +CGEV: ME CLASS <class> Parameter <PDP_type> Packet Data Protocol type (see +CGDCONT command) <PDP_addr> Packet Data Protocol address (see +CGDCONT command} <cid> Context Id (see +CGDCONT command) Note: <cid> only given if known to the MT. <class> GPRS mobile class (see +CGCLASS command)
Reference	Note

GSM07.07	

Tab1 10 AT+CGREG Network registration status	
Test command +CGREG=?	Response +CGREG: (list of supported <n>s) Parameter See set command
Read command +CGREG?	Response +CGREG: <n>,<stat>[,<lac>,<ci>] *+CME ERROR: <err>* Parameter See set command
Set command +CGREG=[<n>]	Response Parameter <n> 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CGREG: <stat> 2 enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>] <stat> 0 not registered, ME is not currently searching a new operator to register to 1 registered <lac> string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <ci> string type; two byte cell ID in hexadecimal format
Reference GSM07.07	Note For parameter stat, options 0 and 1 supported only.

Tab1 11 AT+CGSMS Select service for MO SMS messages	
Test command +CGSMS=?	Response +CGSMS: (list of currently available <service>s) Parameter See set command
Read command +CGSMS?	Response +CGSMS: <service> Parameter See set command
Set command +CGSMS= [<service>]	Response OK ERROR Parameter <service> a numeric parameter which indicates the service or service preference to be used 0 GPRS 1 circuit switched 2 GPRS preferred (use circuit switched if GPRS not available) 3 circuit switched preferred (use GPRS if circuit switched not available)
Reference GSM07.07	Note The circuit switched service route is the default method

Tab1 12 AT+CGCOUNT	
Test command +CGCOUNT=?	Response +CGCOUNT: (list of supported <actions>s),(list of supported <cid>s),(list of supported <period>s) Parameter See set command
Read command +CGCOUNT?	Response +CGCOUNT: <cid>,<state>[,<period>] [<CR><LF>+CGCOUNT: <cid>,<state>[,<period>] […]] Parameter <state> indicates the state of the GPRS counters 1 – periodic. The <period> will then also be displayed 2 – on GPRS context deactivation. <period> is N/A in this case For other parameters see set command
Set command +CGCOUNT=<action>,<cid>[,<period>]	Response OK ERROR Parameter <action> indicates the action to be performed 0 – reset counter for specified <cid> 1 – read counter for specified <cid> 2 – start reporting counter periodically for specified <cid> defined by <period>. Counter is also reported on context deactivation. 3 – report counter on context deactivation for specified <cid> 4 – stop reporting counter on specified <cid> <cid> a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) <period> period for periodic packet counter reporting in seconds Unsolicited Result Once a counter has been setup for a <cid> the counter will be displayed as Following either periodically or when the context has been deactivated: +CGCOUNT: <cid>,<uc>,<uu>,<un>,<dc>,<du>,<dn> <uc> a numeric 32 bit parameter which indicates the number of compressed bytes transferred in the uplink direction displayed in decimal format <uu> a numeric 32 bit parameter which indicates the number of uncompressed bytes transferred in the uplink direction displayed in decimal format <un> a numeric 32 bit parameter which indicates the number of N-PDUs (i.e. IP packets) transferred in the uplink direction

	displayed in decimal format <dc> a numeric 32 bit parameter which indicates the number of compressed bytes transferred in the downlink direction displayed in decimal format <du> a numeric 32 bit parameter which indicates the number of uncompressed bytes transferred in the downlink direction displayed in decimal format <dn> a numeric 32 bit parameter which indicates the number of N-PDUs (i.e. IP packets) transferred in the downlink direction displayed in decimal format Note that the current counter values will be displayed immediately this command is entered for any action (i.e. even stopping the counter display will generate the above unsolicited result code for the cancelled <cid>).
Reference GSM07.07	Note This command displays byte and IP packet counters for GPRS contexts. It is proprietary to SIMCOM. If counters are displayed periodically, they will only be displayed if: - there is a separate multiplexer channel for unsolicited result codes, or - the user switches to command mode using the "+++" escape sequence

4 AT COMMANDS FOR ITM100TCPV04.0.6(TCP/UDP1.2)

The following commands are for control of TCP or UDP connection through CSD/GPRS.

4.1 Overview

Command	Description
AT+CIPSTART	Start up a connection
AT+CIPSEND	Send data to server after connection established
AT+CIPCLOSE	Close connection
AT+CIPSHUT	Shut down connection
AT+CLPORT	Set local port
AT+CSTT	Set APN, user name, password
AT+CIICR	Attach to GPRS network or establish CSD connection
AT+CIFSR	Get local IP address
AT+CIPSTATUS	Query current status
AT+CDNSCFG	Configure DNS
AT+CDNSGIP	Get IP address respected to given Domain Name
AT+CDNSORIP	Set whether connect with IP address or domain name

AT+CIPHEAD	Set whether add an IP header to received data
AT+CIPATS	Set auto send timer
AT+CIPSPRT	Set prompt of '>' when sending data
AT+CIPSERVER	Configure as a server
AT+CIPCSGP	Set CSD or GPRS for wireless connection
AT+CIPCCON	Choose server or client connection for operation such as sending data, closing connection

4.2 Detailed Descriptions of Commands

Tab 4 1 AT+CIPSTART Start up a connection	
Test Command AT+CIPSTART=?	Response +CIPSTART: (list of supported connection),(IP address range),(port range) OK
Set command AT+CIPSTART=<mode>,[<ip address>,<domain name>],<port>	Parameters <mode> "TCP" Establish a TCP connection "UDP" Establish a UDP connection <IP address> remote server IP address <domain name> remote server Domain Name <port> remote server port Response This command will start the process of establishing a connection. There are two kinds of connection: TCP and UDP. For establishing a connection, it is necessary to know IP address or Domain name and port of remote server. 1) If format is right: OK Otherwise ERROR 2) If connection is established successfully: CONNECT OK Otherwise CONNECT FAIL
Reference	Note

Tab 4 2 AT+CIPSEND Send data	
Test command AT+CIPSEND=?	Response OK
Execute command AT+CIPSEND<CR>	Response This command is used to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol.

Text is entered <ctrl-Z>	There are at most 1024 bytes that can be sent each time. 1) OK 2) If sending successfully: SEND SUCCESS 3) If error is occurred: SEND FAIL
set command AT+CIPSEND=<data length>	This command is used to send fixed length of data. In this way, termination symbol is not used any more. Parameter <data length> the length of data that would be sent Response 1) OK 2) If sending successfully: SEND SUCCESS 3) If error is occurred: SEND FAIL
Reference	Note

Tab 4 3 AT+CIPCLOSE Close connection	
Test command AT+CIPCLOSE=?	Response OK
Execute command AT+CIPCLOSE<CR>	Response This command is used to close TCP or UDP connection. After this command, data can not be sent or received any more. However, the PDP context is still active when connecting GPRS network and CSD is still connected when connecting GSM network. OK
Reference	Note

Tab 4 4 AT+CIPSHUT Detach from GPRS network	
Test command AT+CIPSHUT=?	Response OK
Execute command AT+CIPSHUT<CR>	Response This command is used to shut down connection. After this command executed, it will generally get a different IP address when starting up a new connection. OK
Reference	Note

Tab 4 5 AT+CLPORT Set local TCP or UDP port	
Test command AT+CLPORT=?	Response OK
set command AT+CLPORT=<mode>,<port>	This command is used to set local port for connection. In default, local port 2020 is used for TCP connection and 3001 is used for UDP

	connection. Parameters <mode> "TCP" Set local TCP port "UDP" Set local UDP port <port> port number range from 0 to 65535 Response OK
Reference	Note

Tab 4 6 AT+CSTT Set APN, user name, password for GPRS attachment	
Test command AT+CSTT=?	Response OK
set command AT+CSTT=<apn>,<user name>,<password>	Parameters <apn> access point name <user name> user name <password> password Response This command is used to set APN, user name and password for GPRS attachment. OK
Reference	Note

Tab 4 7 AT+CIICR Attach to GPRS network	
Test command AT+CIICR=?	Response OK
Execute command AT+CIICR<CR>	Response This command is used to activate a PDP context or establish a CSD connection for wireless connection. OK
Reference	Note

Tab 4 8 AT+CIFSR Get local IP address	
Test command AT+CIFSR=?	Response OK
Execute command AT+CIFSR<CR>	Response This command is used to get local IP address assigned by GPRS or GSM network. If wireless connection has been established successfully: <IP Address> Otherwise: OK

Reference	Note

Tab 4 9 AT+CIPSTATUS Query current status	
Test command AT+CIPSTATUTS=?	Response OK
Execute command AT+CIPSTATUS<CR>	Response This command is used to query current status of connection progress. Status:<IP status> <IP status> IP INITIAL Initializing state IP START starting state IP IND activating PDP context / establishing CSD connection IP GPRSACT PDP context activated / CSD connection established IP STATUS local IP address got TCP / UDP CONNECTING connecting IP CLOSE connection closed CONNECT OK TCP / UDP connection established
Reference	Note

Tab 4 10 AT+CDNSCFG Configure DNS	
Test command AT+ CDNSCFG=?	Response OK
set command AT+CDNSCFG=<pri_dns>,[<scd_dns>]	Response This command is used to configure both primary DNS and secondary DNS. OK Parameter <pri_dns> primary DNS IP address <sec_dns> secondary DNS IP address
Reference	Note

Tab 4 11 AT+CDNSGIP Get IP address	
Test command AT+ CDNSGIP=?	Response OK
set command AT+CDNSCFG=<domain_name>	Response This command is used to get IP address respected to domain name. OK <IP address> ERROR: <err> Parameter <domain_name> domain name registered on internet. <err>

	3 INVALID PARAMETER 4 NETWORK ERROR 5 NO SERVER 6 TIMEOUT 7 NO CONFIG 8 NO MEMORY 9 BAD MSG
Reference	Note

Tab 4 12 AT+CDNSORIP Set whether connection with server IP address or domain name	
Test command AT+ CDNSORIP =?	Response OK
set command AT+ CDNSORIP =<mode>	Response OK ERROR Parameter <mode> 0 remote server is a IP address when issuing an AT+CIPSTART command 1 remote server is a domain name when issuing an AT+CIPSTART command
Reference	Note

Tab 4 13 AT+CIPHEAD Set whether add a header to data received	
Query command AT+CIPHEAD?	Response OK
Test command AT+CIPHEAD=?	Response +CIPHEAD:(0-NO HEADER,1-ADD HEADER)
set command AT+ CIPHEAD =<mode>	Response This command is used to add a header to data received from TCP/UDP connection, distinguishing data received by other way such as SMS. OK ERROR Parameter <mode> 0 no header 1 set header, the format is "+IPD(data length):"
Reference	Note
Tab 4 14 AT+CIPATS Set auto send timer	
Query command AT+CIPATS?	Response OK
Test command AT+CIPATS=?	Response +CIPATS:(0-NOT AUTO SEND,1-AUTO SEND)
set command AT+ CIPATS =<mode>,<time>	Response OK ERROR Parameter

	<mode> 0 not set timer of sending data 1 set timer of sending data <time> time of sending data timer, unit of second
Reference	Note

Tab 4 15 AT+CIPSPRT Set prompt of '>' when sending data	
Query command AT+CIPSPRT?	Response OK
Test command AT+CIPSPRT=?	Response +CIPSPRT: (0-NOT PROMPT,1-PROMPT)
set command AT+ CIPSPRT =<send_prompt>	Response OK ERROR Parameter < send_prompt > 0 no prompt after issuing AT+CIPSEND command 1 with ">" prompt after issuing AT+CIPSEND command
Reference	Note

Tab 4 16 AT+CIPSERVER Configure as a server waiting for connection	
Query command AT+CIPSERVER?	Response 0 not configured 1 server is OK
Execute command AT+ CIPSERVER	Response OK when configuration is accepted ERROR when configuration cannot be accepted After configuration accepted, succeeding response is returned as following: SERVER OK when configure successfully STATE:<ip status> CONNECT FAIL when configure fail
Reference	Note When a remote client is connecting with server, there is a prompt of REMOTE IP:<IP ADDRESS>

Tab 4 17 AT+CIPCSGP Set CSD or GPRS for wireless connection mode	
Query command AT+CIPCSGP?	Response 0 CSD mode 1 GPRS mode
Test command AT+CIPCSGP=?	Response +CIPCSGP: 0-CSD,DIAL NUMBER,USER

	NAME,PASSWORD,RATE(0,3) +CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD
set command AT+ CIPCSGP =<mode>,[<apn>, <user ID>,<pwd>,<dial num>,<user ID>,<pwd>,<rate>]	Response OK ERROR Parameter <mode> 0 CSD connection mode 1 GPRS connection mode CSD connection parameters <dial num> dial number, default is 17201 <user ID> user name, default is 172 <pwd> password, default is 172 <rate> connection rate, 0 2400bps 1 4800bps 2 9600bps 3 14400bps default connection rate is 9600bps GPRS connection parameters <apn> access point name, default is CMNET <user ID> user name, default is null <pwd> password, default is null
Reference	Note

Tab 4 18 AT+CIPCCON Choose server or client connection for operation	
Query command AT+CIPCCON?	Response <connRef> OK Parameter See set command
Test command AT+CIPCCON=?	Response +CIPCCON: 1-CLIENT,2-SERVER
set command AT+ CIPCCON =<connRef>	Response When connection has been established, OK is returned, otherwise, ERROR is returned. Parameter <connRef> 1 choose connection acting as a client 2 choose connection acting as a server
Reference	Note

5 TEST MODE AT COMMAND UGD

This section lists the AT commands and responses required for test mode.

5.1 Overview

Command	Description
AT+CFUN	Set phone functionality
AT+MTEST	Set test mode.
AT+BTEST	Select test frequency band.
AT+BURST	Set transmitting burst parameter.

5.2 Detailed Descriptions of Commands

Tab 1 AT+CFUN Set phone functionality	
Test command **AT+CFUN=?**	Response +CFUN: (0-1,4),(0-1) OK +CME ERROR: <err>
	Parameter See set command
Read command **AT+CFUN?**	Response +CFUN:<fun> OK +CME ERROR: <err>
	Parameter See set command
Set command **AT+CFUN=<fun>,<rst>**	Response OK +CME ERROR: <err>
	Parameter *<fun> 0 minimum functionality* *1 full functionality (Default)* *<rst> 0 Not set the function level of module to <fun> right now, but set the function level of module to <fun> everytime when the module been reset(Power down then Power on).* *1 Set the function level of module to <fun> right now.*
Reference	Note

Tab 2 AT+MTEST Set test mode.	
Test command **AT+MTEST=?**	Response +MTEST: (0,1) OK +CME ERROR: <err>

	Parameter See set command
Read command **AT+MTEST?**	Response +MTEST: <N> OK +CME ERROR: <err>
	Parameter See set command
Set command **AT+MTEST=<N>**	Response OK +CME ERROR: <err>
	Parameter *<N> 0 Exit test mode* *1 Enter test mode*
Reference	Note

Tab 3 AT+BTEST Select test frequency band.	
Test command **AT+BTEST= ?**	Response +BTEST: (0 = EGSM_DCS,1 = EGSM_PCS,2 = EGSM, 3 = DCS,4=PCS) OK +CME ERROR: <err>
	Parameter See set command
Read command **AT+BTEST?**	Response +BTEST: <N> OK +CME ERROR: <err>
	Parameter See set command
Set command **AT+BTEST=<N>**	Response OK +CME ERROR: <err>
	Parameter *<N> 0 Select test frequency band in EGSM900and DCS1800* *1 Select test frequency band in EGSM900and PCS1900* *2 Select test frequency band in EGSM900 only* *3 Select test frequency band in DCS1800 only* *4 Select test frequency band in PCS1900 only*
Reference	Note

Tab 4 AT+BURST Set transmitting burst parameter.	
Test command **AT+BURST= ?**	Response +BUSRT:(0-1),(0-65535),(0-19) OK +CME ERROR: <err>
	Parameter See set command
Read command **AT+BURST?**	Response +BTEST: <Burst Mode>,<Channel>,<Power Level> OK +CME ERROR: <err>
	Parameter See set command
Set command **AT+BURST=<Burstmode>,<Channel>,<Powerlevel>**	Response OK +CME ERROR: <err>
	Parameter *<Burst Mode> 0 DM_BURST OFF* ***1*** *DM_BURST CONTINUOUS* *<Channel> 0~124 GSM900* *512~885 DCS1800* *512~810 PCS1900* *<Powerlevel> 5~19 GSM900* *0~15 DCS1800* *0~15 PCS1900*
Reference	Note

5.3 APPLICATION SAMPLE

5.3.1 TEST IN GSM900 FREQUENCY BAND

Command/ response	Syntax	Description
command	AT+CFUN=0,1	Module turn off right now
response	OK	
command	AT+MTEST=1	Enter test mode
response	OK	
command	AT+BTEST=0	*Select test frequency band in EGSM900 and DCS1800*

response	OK	
command	AT+BURST=1,10,6	*Transmit burst in channel 10(Freq.892.0MHz) of GSM900 and PCL is 6*
response	OK	

5.3.2 TEST IN DCS1800 FREQUENCY BAND

Command/ response	Syntax	Description
command	AT+CFUN=0,1	Module turn off right now
response	OK	
command	AT+MTEST=1	Enter test mode
response	OK	
command	AT+BTEST=0	*Select test frequency band in EGSM900 and DCS1800*
response	OK	
command	AT+BURST=1,885,10	*Transmit burst in channel 885(Freq.1784.8MHz) of DCS1800 and PCL is 10*
response	OK	

5.3.3 TEST IN PCS1900 FREQUENCY BAND

Command/ response	Syntax	Description
command	AT+CFUN=0,1	Module turn off right now
response	OK	
command	AT+MTEST=1	Enter test mode
response	OK	
command	AT+BTEST=1	*Select test frequency band in EGSM900 and PCS1900*
response	OK	
command	AT+BURST=1,512,1	*Transmit burst in channel 512(Freq.1850.2MHz) of PCS1900 and PCL is 1*

response	OK	

5.4 ATTACHMENT

5.4.1 POWER CONTRAL LEVEL TABLE

TABLE 1 EGSM900 PCL，CLASS 4

PCL	POWER(dbm)	Normal range	Utmost range
5	33	±2dB	±2.5 dB
6	31	±3 dB	±4 dB
7	29	±3 dB	±4 dB
8	27	±3 dB	±4 dB
9	25	±3 dB	±4 dB
10	23	±3 dB	±4 dB
11	21	±3 dB	±4 dB
12	19	±3 dB	±4 dB
13	17	±3 dB	±4 dB
14	15	±3 dB	±4 dB
15	13	±3 dB	±4 dB
16	11	±5 dB	±6 dB
17	9	±5 dB	±6 dB
18	7	±5 dB	±6 dB
19	5	±5 dB	±6 dB

TABLE 2 DCS1800 and PCS1900 PCL，CLASS 1

PCL	POWER(dbm)	Normal range	Utmost range
0	30	±2 dB	±2.5 dB
1	28	±3 dB	±4 dB
2	26	±3 dB	±4 dB
3	24	±3 dB	±4 dB
4	22	±3 dB	±4 dB
5	20	±3 dB	±4 dB
6	18	±3 dB	±4 dB
7	16	±3 dB	±4 dB
8	14	±3 dB	±4 dB
9	12	±4 dB	±5 dB
10	10	±4 dB	±5 dB

11	8	±4 dB	±5 dB
12	6	±4 dB	±5 dB
13	4	±4 dB	±5 dB
14	2	±5 dB	±6 dB
15	0	±5 dB	±6 dB

6 AT COMMANDS FOR VOICE RECOGNITION SUPPORT

This section lists the AT commands and responses required for Voice Recognition support. These commands are SIMCOM proprietary. For each of the commands listed in the table below a more detailed description is follows. The reader should refer to [6] [12] for an explanation of the Application Programming Interface (API) to the Speech Processing functions located within the Speech Processing (SP) Module.

Note that these commands may be altered slightly during development due to alterations in the voice recognition software API.

6.1 Overview

Command	Description
+VRPTMD	Changes Voice recognition prompt display mode
+VRTAGS	Play, Delete, or List voice samples for the current context Deleting and listing all tags associated with a context.
+VRSTOP	Stop current processes and operations
+VRTRAIN	Train a voice sample
+VRRECOG	Enter voice recognition mode
+VRLANG	Changes voice recognition language

The SP module provides a fixed list of contexts for the application. This list provides up to seven customer configurable contexts. To allow the application to list either contexts or samples the CI task will call the SP module using the *Initialise* signal and decode the returned *spCapabilities* signal. It should be noted that these commands may be subject to change as a consequence of current Voice Recognition implementation activity.

6.2 Detailed Description of Commands

Tab 1 AT+VRPTMD Change/Display voice recognition prompt display mode	
Command AT+VRPTMD = <n>	Response OK / ERROR
AT+VRPTMD?	AT+VRPTMD: <n> - current VR display mode
AT+VRPTMD=?	AT+VRPTMD: (0-5) - possible prompt display modes Parameters <n> - VR prompt display mode

	0 integer format - numeric representation of prompt. 1 string format - prompt string 2 integer/string format 3 integer/audio format 4 string/audio format 5 integer/string/audio format
Reference	Note

Tab 2 AT+VRTAGS Play, Delete, or List voice samples for current context	
Execute command AT+VRTAGS=<cmd_type>, [[<tag>] [<context>]] Note: if <cmd_type> is 3 or 4 then <context> is expected as the second argument, otherwise, <tag> is expected.	Response OK / ERROR Parameters <cmd_type> integer type: 0 Play tag(s) 1 Delete tag 2 List tag 3 Delete context 4 List context <tag> integer type: 1..254 – uniquely identifies a voice sample. 0 and 255 are reserved values <context> integer type: context name identifier. 7 contexts can be defined with each context having a customer configurable name.
Reference	Note Response if <cmd_type> = List tag or List context AT+VRTAGS: <tag>, 1 or 0 (tag trained or not trained, respectively)

Tab 3 AT+VRSTOP Stop current processes and operations	
Execute command AT+VRSTOP	Response OK – if in control of Voice recognition operations and processes stopped. ERROR – otherwise Parameters None
Reference	Note: Any character entered via the AT interface will stop an active voice recognition or training session.

Tab 4 AT+VRTRAIN Record a voice sample.	
Execute command AT+VRTRAIN=<max_retries>,<context>,<tag>	Response OK / ERROR Parameters <max_retries> range application defined (<= 10) <context> integer type: context name identifier. 7 contexts can be defined with each context having a customer

	configurable name. <tag> integer type: range 1..254 0, 255 are reserved
Reference	Note

Tab 5 AT+VRRECOG Enter voice recognition mode.	
Execute command AT+VRRECOG=<context>	Response OK / ERROR Parameters <context> integer type: context name identifier Up to 7 contexts can be defined, each having a customer configurable number (and name)
Reference	Note

Tab 6 AT+VRLANG Changes voice recognition language.	
Execute command AT+VRLANG = <n> AT+VRLANG? AT+VRLANG=?	Response OK / ERROR AT+VRLANG: <n> - current VR language mode AT+VRLANG: (0-5) - possible language modes Parameters <n> integer type: 0 UK English (default) 1 US English 2 German 3 Korean 4 French 5 Spanish
Reference	Note Must be used before other VR AT commands, otherwise value is ignored.

7 AT COMMANDS FOR SIM APPLICATION TOOLKIT SUPPORT

This section defines the AT Commands implemented in ITM100 for the control of the SIM Application Toolkit protocol, as per specification GSM 11.14 . The table in section 5.1 lists the AT commands supported – these are SIMCOM proprietary commands as no formal specification currently exists defining STK functionality via an AT interface. The parameters supported by each AT command for the different proactive commands is given in the subsections which follow the main table.

The protocol defined below provides a generic mechanism for the exchange of information between the ME and the application for a typical proactive SIM command.

The CI task will receive an indication from the SIM AT task that will contain the data and a command identifier. The task will not receive any further proactive command signals until the Terminal Response for that command has been sent back to the originating task en route to the SIM.

Distribution of information to the application from the CI task is divided into two stages. Firstly, the CI task informs the application that the task has received a signal containing proactive command data by issuing an unsolicited result code to indicate that command data is available for the application to retrieve. This result code includes a unique hexadecimal identifier denoting the proactive command type, which will allow the application to make a decision on whether the data associated with the code is of interest. The application can then request the associated data by sending an AT command containing the unique command identifier to the CI Task. On parsing this command, the CI task replies with a response code containing all relevant data for the application to undertake the proactive SIM command. The response code that contains the data, which is sent to the application, is also prefixed with the unique command identifier. The confirmation AT command sent from the application to the CI task needs to be prefixed with a copy of the identifier, which corresponds to the type of proactive command that initiated the transaction. On processing this data, the application sends a confirmation AT command to the ME to enable it to complete the transaction by acknowledging the application via an AT response and sending any relevant terminal response data to the SIM AT task.

The CI task may also distribute information to the application using only an unsolicited results code. This mechanism applies to proactive SIM indications that do not require a response from the application. The unsolicited result code and associated data is sent to the application purely to inform the accessory that an event has occurred.

The CI task may include a GKI timer that will monitor the period following a message being sent to the application, thus allowing for the scenario where the application receives the unsolicited results code and decides that it does not require the associated data. In

this situation the ME will not receive an acknowledgement. The timer function will allow a time period for the application to respond. If the timeout is reached the proactive transaction will be ended by the CI task returning the confirmation signal back to the SIM AT task.

7.1 Overview of Commands, Responses and Result codes

The following tables outline the AT commands, responses and unsolicited result codes applicable for control of the SIM Application Toolkit protocol via the AT command interface.

Notation	Description
+STC:	Unsolicited result code issued by the CI Task to the application to indicate either: • there is no STK application available on the SIM • there is a proactive SIM command to retrieve and action • end of the current proactive command session – used if the user wishes to terminate the current proactive SIM session.
+STGC=…	AT command to Get Command parameters for a proactive SIM command from the CI Task. This will be sent from the application after unsolicited result code +STC: <cmdId> informs it the SIM has issued a proactive SIM command to be performed.
+STCR=…	AT command to provide Command Response parameters for a previously executed proactive SIM command. Its purpose is to relay response data to the lower layers of the SIMCOM protocol stack to allow the Terminal Response SIM command (see [10]) to be returned to the SIM for the current proactive command.
+STPD=…	AT command to provide Profile Download parameters to the CI Task. This contains information relating to the SIM Application Toolkit capabilities of the application, and is used by the SIMAT task to limit its SAT instruction set accordingly. Any application plugging into the serial port should send this command or it will be assumed that the application has no SAT support and will therefore never receive any SAT related information.
+STMS=…	AT Command for selecting a menu option. On power-up the SIM will send the Set-Up-Menu proactive indication. The accessory should load and display the menu structure. This AT command should be used to inform ITM100 of the item selected from the list.
+STEV=…	This command is used to inform the MS that an MMI specific event has occurred.
+STRT=…	AT command for setting the automatic response timer used by the CI Task to issue the Terminal Response (no user response) to a proactive command which has not been processed. The default response time is ten seconds, but it is recommended this is increased when performing SIM Toolkit FTA.
+STTONE=…	AT command for playing SIM Toolkit Tones in both idle and dedicated mode. This command should be used in conjunction with the Play Tone proactive command.

7.2 Definition of Unsolicited Result Codes

Not all proactive commands are required to be visible to the application. For example, the proactive commands More Time and Provide Local Information are transparent and therefore do not require an unsolicited result code to be sent to the user. The commands, which are relevant for user interaction in one form or another, are listed in the following tables.

The output generated for strings is controlled by the +CMGF AT command. The factory default for string output is PDU mode where strings are output in HEX. The tables below illustrate the alternative mechanism of TEXT output; this is obtained by using the +CMGF AT command with a parameter of one.

7.2.1 +STC Command

Tab3 1 +STC Informs the application of the type of proactive SIM command data awaiting retrieval.	
Execute command +STC: <cmdId>	Parameters <cmdId> Hexadecimal format of Type of Command . Unique identifier for the current SIM Toolkitproactive command issued by the SIM - see [9]. The following values are supported: ‘10’ Get Acknowledgement For Set Up Call command ‘15’ Launch Browser command ‘20’ Play Tone command ‘21’ Display Text command ‘22’ Get Inkey command ‘23’ Get Input command ‘24’ Select Item command ‘25’ Set Up Menu command ‘28’ Set Up Idle Mode Text command ‘40’ Open Channel command ‘14’ Send DTMF command ‘05’ Set Up Event List command ‘81’ End of proactive session
Reference	Note The special case is +STC: 0 that is issued when there is no STK application accessible on the SIM.

The following tables in this section detail the information that is distributed to the application for proactive indications using unsolicited result codes. The information applicable to the proactive command is sent to the application using the +STUD (SIM Toolkit Unsolicited Data) results code.

7.2.2 Send SM

Tab3 2 Command data for Send Short Message unsolicited proactive command	
Result Code +STUD: 13[,<alphaId>[,<iconId>,<dispMode>]]	Parameters 13 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB). '0' : Special case indicating SIM provided a null alphaId and user should not be informed of SMS transaction. If alphaId field is not present it is up to the ME to decide whether to inform the user or not. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 0 display with alphaId or text string
Reference	Note

7.2.3 Send SS

Tab3 3 Command data for Send SS unsolicited proactive command	
Result Code +STUD: 11[,<alphaId>[,<iconId>,<dispMode>]]	Description 11 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [10]) or UCS2 alpha field coding (see [12] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and user should not be informed of SS transaction. If alphaId field is not present it is up to the ME to decide whether to inform the user or not. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on

	the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.2.4 Send USSD

Tab3 4 Command data for Send USSD unsolicited proactive command

Result Code	Parameters
+STUD: 12[,<alphaId>[,<iconId>,<dispMode>]]	12 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and user should not be informed of USSD transaction. If alphaId field is not present it is up to the ME to decide whether to inform the user or not. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.2.5 Set Up Call

Tab3 5 Command data for Set Up Call unsolicited proactive command

Result Code	Parameters
+STUD: 10,<alphaId>,<dialstring>,<cps>[,<i	10 hex notation: Command Type value. See Section 5.2 for values.

conId>,<dispMode>]	<alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <dialstring> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <cps> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.2.6 Close Channel

Tab3 7 Command data for Close Channel proactive command	
Result Code	Parameters
+STUD: 41[,<alphaId>[,<iconId>,<dispMode>]]	41 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId)

	1 display with alphaId or text string
Reference	Note

7.2.7 Receive Data

Tab3 8 Command data for Receive Data proactive command	
Result Code	Parameters
+STUD: 42,<length>[,<alphaId>[,<iconId>,<dispMode>]]	42 hex notation: Command Type value. See Section 5.2 for values. <length> integer type: number of bytes requested in command <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.2.8 Send Data

Tab3 9 Command data for Send Data proactive command	
Result Code	Parameters
+STUD: 43,<length>,<data>[,<alphaId>[,<iconId>,<dispMode>]]	43 hex notation: Command Type value. See Section 5.2 for values. <length> integer type: number of bytes of data transmitted <data> string type: channel data – coded as 8bit data. This appears in BCD notation with two TE characters representing one byte of actual data

	<alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.2.9 Language Notification

Tab3 10 Command data for Language Notification proactive command	
Result Code +STUD: 35[,<language>]	Parameters 35 hex notation: Command Type value. See Section 5.2 for values. <language> language code: coded as pair of alphanumeric characters, as given in ISO 639 [12].
Reference	Note The language parameter is optional. Its inclusion in the result code indicates a specific language notification. Omission from the result code indicates a non-specific language notification, which cancels a previous specific language notification

7.2.10 Run AT

Tab3 11 Command data for Run AT Command proactive command	
Result Code +STUD: 34[,<alphaId>[,<iconId>,<dispMode>]]	Parameters 34 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction.

	'0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string

7.2.11 Refresh

Tab3 13 Command data for Refresh proactive command	
Result Code +STUD: 01,<refMode>[,<numFiles>,<fileList>]	Parameters 01 hex notation: Command Type value. See Section 5.2 for values. <refMode > hex notation: command Qualifier information giving the type of Refresh to be performed. 00 SIM Initialisation and Full File Change Notification 01 File Change Notification 02 SIM Initialisation and File Change Notification 03 SIM Initialisation 04 SIM Reset <numFiles> integer: gives number of Files in the list <fileList> string type, hex notation: gives the full paths for the SIM files, each file being delimited by commas within the string
Reference	Note For <refMode> values '01' and '02' file list data must be provided by the SIM. For all other <refMode> values any included file list information will be ignored. If the optional <fileList> parameter is not present in the result code, we assume that <refMode>s '01'and '02' cannot occur.

7.3 ME Initialisation Procedure

On powering up the ME the SIM's Phase file (EF 0x6FAE) is read. If this indicates the SIM is of Phase 2+ or greater the ME sends a Terminal Profile command to the SIM to inform it of the SIM Application Toolkit capabilities of the ME. The SIM then limits its instruction set based on this profile. This terminal profile data is configurable and resides in an application layer configuration file for ease of customisation. For the range of STK features available within the SIMCOM software. On sending the Profile Download command the SIM will respond with signals that will provide the ME with information on whether the SIM has a SIM Toolkit application present.

On completing ME initialisation the signal *ApexSimOkInd* will be routed to the appropriate foreground layers including the CI task. This signal contains a field *simService* which contains a list of all the services on the SIM and their allocated / activated status for the current subscription. Several of these fields (e.g. proactiveSim, callControl, etc.) are STK specific and if this indicates that the SIM has no STK capability an unsolicited result code +STC: 0 will be issued to indicate to the user that there is no SIM toolkit availability during the current session.

However, if the simService field of signal *ApexSimOkInd* indicates that STK information is available for use by the ME / application then the lower layers of the SIMCOM Protocol Stack are issued an indication that there is proactive command data waiting for the ME to FETCH from the SIM. The data could be for any proactive command although the majority of SIMs with STK applets encountered to date tend to issue the Set Up Menu command to allow the ME to include any available STK menu in its own menu structure. This would cause unsolicited result code +STC: 25 to be issued by the CI Task after it has received this proactive command from the SIMAT task. However, more recent SIM cards have tended to issue other commands such as Display Text or Set Up Event List, so it should not be assumed that the first proactive command will be Set Up Menu.

7.4 Definition of AT Commands

This section details the AT commands for driving an STK application on the SIM.

7.4.1 AT+STGC SIM Toolkit Get Command parameters

Tab4 1 Get proactive Command parameters	
Set command +STGC=<cmdId>	Response +STGC: <cmdId>,<data> Parameter <cmdId> hex notation: Command Type value See Section 5.2 for values. <data> proactive command specific data, dependent on <cmdId>
Reference	Note

The <data> information varies between proactive SIM commands, according to the type of command issued by the SIM, as given by <cmdId>. This reflects the useful part of the proactive command from a user's perspective. The result codes returned to the application on a command by command basis are outlined in the following subsections:

7.4.1.i Display Text

Tab4 2 Command data for Display Text proactive command	
Result Code +STGC: 21,<dcs>,<text>,<priority>,<clear>[, <iconId>,<dispMode>[,<response>]]	Parameters 21 hex notation: Command Type value. See Section 5.2 for values. <dcs > integer: data coding scheme used for <text>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <text> string format: text string in <dcs> format <priority> integer: display priority information 0 Normal priority 1 High priority <clear> integer: mode of clearing message 0 Clear after delay 1 User clears message <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon

	1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 Display icon only (replaces any text string or alphaId) 1 display with alpha Id or text string <response> 0 normal reponse expected 1 immediate response expected.
Reference	Note

7.4.1.ii Get InKey

Tab4 3 Command data for Get Inkey proactive command	
Result Code +STGC: 22,<dcs>,<text>,<response>,<helpInfo>[,<iconId>,<dispMode>]	Parameters 22 hex notation: Command Type value. See Section 5.2 for values. <dcs > integer: data coding scheme used for <text> The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <text> string format: text string in <dcs> format <response> integer: expected response character format. 0 Digits (0-9, *, # and +) only 1 SMS default alphabet 2 UCS2 alphabet 3 Yes/No response only <helpInfo> 0 no help information available 1 help information available <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alpha Id or text string
Reference	Note Entry of the Digits only response is the same regardless of alphabet set – coding of this response is performed within the SIMCOM Protocol Stack when creating the Terminal Response

7.4.1.iii Get Input

Tab4 4 Command data for Get Input proactive command

Result Code	Parameters
+STGC: 23,<dcs>,<text>,<response>,<echo>,<helpInfo>,<minLgth>,<maxLgth>[,<dcs>,<default>[,<iconId>,<dispMode>]]	23 hex notation: Cmmand Type value. See Section 5.2 for values. <dcs > integer: data coding scheme used for <text> or <default>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <text> string format: text string in <dcs> format <response> integer: expected response characters and their format. 1 Digits (0-9, *, # and +) only from SMS default alphabet (unpacked) 2 Digits (0-9, *, # and +) only from SMS default alphabet (packed) 3 Digits from UCS2 alphabet 4 SMS default alphabet (unpacked) 5 SMS default alphabet (packed) 6 UCS2 alphabet <echo> 0 echo input to display 1 no echo allowed (see Note) <helpInfo> 0 no help information available 1 help information available <minLgth> Integer: minimum length of expected response, in range 0..255 0 indicates no minimum length requirement <maxLgth> Integer: maximum length of expected response, in range 1..255 255 indicates no maximum length requirement <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alpha Id or text string
Reference	Note
	Actual input string may not be displayed in this case but can alternatively be masked to indicate key entry using characters from the set (0-9, * and #). If <minLgth> and <maxLgth> are equal, the response string is to

	be of fixed length.

7.4.1.iv PlayTone

Tab4 5 Command data for Play Tone proactive command	
Result Code +STGC: 20[,<alphaId>[,<tone>[,<duration>]]]	Parameters 20 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <tone> integer: identifies requested tone type. SST denotes a Standard Supervisory Tone, MPT denotes an ME Proprietary Tone. 1 Dial (SST) 2 Called subscriber busy (SST) 3 Congestion (SST) 4 Radio Path acknowledge (SST) 5 Radio path not available / Call dropped (SST) 6 Error / Special information (SST) 7 Call waiting (SST) 8 Ringing Tone (SST) 16 General Beep (MPT) 17 Positive ack (MPT) 18 Negative ack or Error (MPT) <duration> integer: duration of the tone to be played, given in milliseconds.
Reference	Note If no tone is specified the ME shall default to the General Beep SST. If no duration is specified the ME default of 500ms is chosen.

7.4.1.v Set Up Menu

Tab4 6 Command data for Set Up Menu proactive command	
Result Code +STGC: 25,<numItems>,<selection>,<helpInfo>,<removeMenu><alphaId>[,<iconId>,<dispMode>]<CR><LF> +STGC: <itemId>,<itemText>[,<iconId>,<dispMode>,<nai><CR><LF> [+STGC: <itemId>,<itemText>[,<iconId>,<dispMode>,<nai><CR><LF>	Parameters 25 hex notation: Command Type value. See Section 5.2 for values. <numItems> integer: indicates the number of items accessible in the menu structure. 0 is a special case, indicating the existing menu is to be removed from the ME's menu structure. <selection> integer: gives preferred user selection method 0 no selection preferrence 1 soft key selection preferred

[…]]]]	<helpInfo> 0 no help information available 1 help information available <removeMenu> 0 do not remove the current menu 1 remove the current menu <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alpha Id or text string <itemId> integer: denotes the identifier of the item <itemText> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <nai> hex notation: next action indicator – this takes one of the allowed values from the Command Type (see section 5.2) range, as specified in [9], section 13.4
Reference	Note

7.4.1.vi Select Item

Tab4 7 Command data for Select Item proactive command

Result Code	Parameters
+STGC: 24,<numItems>,<selection>,<helpInfo>,<alphaId>[,<iconId>,<dispMode>]<CR><LF> +STGC: <itemId>,<itemText>[,<iconId>,<dispMode>,<nai><CR><LF> [+STGC: <itemId>,<itemText>[,<iconId>,<dispMode>,<nai><CR><LF> […]]]]	24 hex notation: Command Type value. See Section 5.2 for values. <numItems> integer: indicates the number of items accessible in the menu structure. 0 is a special case, indicating the existing menu is to be removed from the ME's menu structure. <selection> integer: gives preferred user selection method 0 no selection preferrence 1 soft key selection preferred <helpInfo> 0 no help information available 1 help information available <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on

	the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 2 display with alpha Id or text string <itemId> integer: denotes the identifier of the item <itemText> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <nai> hex notation: next action indicator – this takes one of the allowed values from the Command Type (see section 5.2) range, as specified in [9], section 13.4
Reference	Note

7.4.1.vii Get Acknowledgement For Set Up Call

Tab4 8 Command data for Set Up Call proactive command	
Result Code	Parameters
+STGC: 10,<alphaId>[,<iconId>,<dispMode>]	10 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.4.1.viii Set Up Idle Mode Text

Tab4 9 Command data for Set Up Idle Mode Text proactive command	
Result Code	Parameters
+STGC: 28,<dcs>,<text>[,<iconId>,<dispMode>]	28 hex notation: Command Type value. See Section 5.2 for values. <dcs > integer: data coding scheme used for

	<text>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <text> string format: text string in <dcs> format See Note below. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note If the text string given in the result code is Null (i.e. zero length and set as "" in the result code) it implies the existing Idle Mode Text is to be removed.

7.4.1.ix Send DTMF

Tab4 10 Command data for Send DTMF proactive command	
Result Code	Parameters
+STGC: 14[,<alphaId>[,<iconId>,<dispMode>]]	14 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string

Reference	Note

7.4.1.x Launch Browser

Tab4 11 Command data for Launch Browser proactive command

Result Code	Parameters
+STGC: 15,<comQual>,<url>[,<browserId>[,<bearer>[,<numFiles>,<provFiles>[,<dcs>,<gateway>[,<alphaId>[,<iconId>,<dispMode>]]]]]]	15 hex notation: Command Type value. See Section 5.2 for values. <comQual> hex notation: command qualifier information from Command Details Data Object: 00 launch browser without making connection, if not already launched 01 launch browser making connection, if not already launched 02 use existing browser 03 close existing browser, launch new browser, making a connection 04 close existing browser, launch new browser, using secure session <url> string format: 8bit data using GSM default 7bit alphabet. Special case: <url>="" – Null value, so use default URL <browserId> hex notation: Browser Id to use. Available values: '00' Use default browser <bearer> hex notation: list of allowed bearers in priority order. Possible values: '00' SMS '01' CSD '02' USSD '03' GPRS <numFiles> integer: denotes the number of provisioning files given <provFiles> string type, hex notation file ids: List of Provisioning File Reference ids. Full Paths are given, delimeted within the string by a comma <dcs > integer: data coding scheme used for <text>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <gateway> string format: text string in <dcs> format

	<alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.4.1.xi Open Channel

Tab4 12 Command data for Open Channel proactive command	
Result Code	Parameters
+STGC: 40[,<alphaId>[,<iconId>,<dispMode>]]	40 hex notation: Command Type value. See Section 5.2 for values. <alphaId> string format: using either SMS default alphabet (see [11]) or UCS2 alpha field coding (see [10] AnnexB) to inform user of current transaction. '0' : Special case indicating SIM provided a null alphaId and the user should not be informed of the current transaction. If alphaId field is not present it is up to the ME to decide whether or not to inform the user. <iconId> Numeric tag for the icon to be displayed – corresponds to the index in the Image file on the SIM (see [10]) 0 No icon 1..255 Icon tag <dispMode> integer: denotes use of associated icon 0 display icon only (replaces any text string or alphaId) 1 display with alphaId or text string
Reference	Note

7.4.1.xii Set Up Event List

Tab4 13 Command data for Set Up Event List proactive command	
Result Code +STGC: 05,<eventList>	Parameters 05 hex notation: Command Type value. See Section 5.2 for values. <eventList> hex: denotes applicable event identifiers. 05 User activity event 06 Idle Screen Available event 08 Language Selection event 09 Browser termination event FF Remove existing event list
Reference	Note <eventList> value of FF used to remove existing list of events as value 0 can be confused with event MT Call value. This command causes the application to send a GSM 11.14 [9] ENVELOPE (EVENT DOWNLOAD) command to the SIM.

7.4.2 AT+STCR SIM Toolkit Command Response

Once a proactive command has been processed by the application a response needs to be sent to the SIM in the form of a TERMINAL RESPONSE command. It is therefore only a requirement for the application to issue command +STCR for those proactive commands it already retrieved via the +STGC AT command. The general format is shown below:

Tab5 1 AT+STCR SIM Toolkit Command Response data	
Set command +STCR=<cmdId>,<result>[,<data>]	Response *+CME ERROR: <err>* Parameter <result> hex notation: dependent on the command type – see following sections for each proactive command supported. The values given in the result field for each set of proactive command response parameters the setting of the general result parameter returned to the SIMAT task in the next phase of signaling for building the Terminal Response command. <data> additional data provided for certain commands, as required for the Terminal Response returned to the SIM after processing a proactive SIM command
Reference [10]	Note

For the above AT Command, the data contained within the <data> field varies depending on the current proactive SIM command being processed. The result data available for each of the proactive commands processed by the application is described in the following subsections:

7.4.2.i Display Text

Tab5 2 Command response for Display Text proactive command	
Execute command +STCR=21,<result>	Parameters 21 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Message displayed OK 1 Terminate proactive session 2 User cleared message 3 Screen is busy 4 Backward move requested 5 No response from user
Reference	Note

7.4.2.ii Get InKey

Tab4 3 Command response for Get Inkey proactive command	
Execute command +STCR=22,<result>[,<dcs>,<text>]	Parameters 22 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Data entered OK 1 Terminate proactive session 2 Help information requested 3 Backward move requested 4 No response from user <dcs > integer: data coding scheme used for <text>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet <text> string format: text string in <dcs> format Special cases are: "00"Negative response entered "01"Positive response entered
Reference	Note The <dcs> and <text> information must be provided for <result>=0 as the SIM expects the input to be provided in a Text String Data Object in the Terminal Response SIM command when data has been input.

7.4.2.iii Get Input

Tab5 4 Command response for Get Input proactive command	
Execute command +STCR=23,<result>[,<dcs>,<text>]	Parameters 23 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Data entered OK 1 Terminate proactive session 2 Help information requested 3 Backward move requested 4 No response from user <dcs > integer: data coding scheme used for <text>. The schemes used are as per GSM 03.38 for SMS (see [11]). 0 7bit GSM default alphabet (packed) 4 8bit data 8 UCS2 alphabet

	<text> string format: text string in <dcs> format
Reference	Note If the <dcs> is present but <text> is an empty string this indicates a null text string data object must be sent to the SIM. This is caused by the user making an 'empty' input.

7.4.2.iv PlayTone

Tab5 5 Command response for Play Tone proactive command	
Execute command +STCR=20,<result>	Parameters 20 hex notation: Command Type value. See section 5.2 for values. <result> integer: possible values: 0 Command performed OK 1 Terminate proactive session 2 Tone not played 3 Specified tone not supported
Reference	Note

7.4.2.v Set Up Menu

Tab5 6 Command response for Set Up Menu proactive command	
Execute command +STCR=25,<result>	Parameters 25 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Menu successfully added/removed 1 User chosen menu item 2 Help information requested 3 Problem with menu operation
Reference	Note

7.4.2.vi Select Item

Tab5 7 Command response for Select Item proactive command	
Execute command +STCR=24,<result>[,<itemId>]	Parameters 24 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Item Selected OK 1 Terminate proactive session 2 Help information requested 3 Backward move requested

	4 No response given <itemId> integer: denotes identifier of item selected
Reference	Note

7.4.2.vii Get Acknowledgement For Set Up Call

Tab5 8 Command response for Set Up Call proactive command	
Execute command	Parameters
+STCR=10,<result>	10 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 user accepted call (conf phase only) 1 user rejected call (conf phase only) 2 user cleared call (any phase)
Reference	Note

7.4.2.viii Set Up Idle Mode Text

Tab5 10 Command response for Set Up Idle Mode Text proactive command	
Execute command	Parameters
+STCR=28,<result>	28 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Text successfully added/removed 1 Problem performing command
Reference	Note

7.4.2.ix Launch Browser

Tab5 11 Command response for Launch Browser proactive command	
Execute command	Parameters
+STCR=15,<result>	15 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Command performed successfully 1 Command performed – partial comp 2 Command performed – missing info 3 User rejected launch 4 Error – no specific cause given 5 Bearer unavailable 6 Browser unavailable 7 ME cannot process command

	8 Network cannot process command 9 Command beyond MEs capabilities
Reference	Note

7.4.2.x Open Channel

Tab5 12 Command response for Open Channel proactive command	
Execute command	Parameters
+STCR=40,<result>	40 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Channel not accepted 1 Channel required
Reference	Note

7.4.2.xi Send DTMF

Tab5 13 Command response for Send DTMF proactive command	
Execute command	Parameters
+STCR=13,<result>	13 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 DTMF not accepted 1 DTMF required
Reference	Note

7.4.2.xii Set Up Event List

Tab4 9 Command response for Set Up Event List proactive command	
Execute command	Parameters
+STCR=05,<result>	05 hex notation: Command Type value. See Section 5.2 for values. <result> integer: possible values: 0 Command performed successfully 1 Cannot perform command
Reference	Note

7.4.3 AT+STPD SIM Toolkit Profile Download

When an application is plugged into the serial port the SIMAT task needs to have knowledge of its SAT capabilities to enable it to route all SAT related signalling to that application if required. If this command is not received it will be assumed that any attached application has no SAT capability and will therefore not send any related signals to it. If the SIM has reported that it does not have any proactive capability then an STC: 0 unsolicited response will be sent to the application.

Tab5 12 AT+STPD SIM Toolkit Command Response data	
Set command +STPD=<length >,<data>	Response *OK* *+CME ERROR: <err>* *+STC: 0* Parameter <length > Integer Determines the number of bytes of <data> used for the Profile Download data from the application. <data> List Of Hex Values, two digits each: Hexadecimal representation of the Terminal Profile data (see [8]).
Reference	Note Some octets are optional in the profile, hence the inclusion of a length parameter. For example, the following command sets all the bits in octets 3 and 4: AT+STPD=4,0000FFFF.

7.4.4 AT+STEV SIM Toolkit Event Command

The application can inform the MS of defined MMI events using this command.

Tab5 13 AT+STEV SIM Toolkit Event Command	
Test command AT+STEV=?	Response +STEV: (supported <event> list) *+CME ERROR: <err>*
Set command +STEV=<event>,<language>	Response *+CME ERROR: <err>* Parameter <event> hex two digits: 05 User Activity Event 06 Idle Screen Event 08 Language Selection Event 09 Browser Termination Event FF Clear Current Event List <language> string type up to two characters
Reference	Note The <language> parameter is applicable only to Language Selection Event. For example the language can be set by: AT+STEV=09,”11”

7.4.5 AT+STMS SIM Toolkit Main Menu Selection Command

The application may set up its main menu on receipt of the Set Up Menu SIM Toolkit event. The application can select an item from the menu by sending this AT command to the MS.

Tab5 14 AT+STMS SIM Toolkit Menu Selection Command	
Test command AT+STMS=?	Response +STMS: (range of available <item>s),<0-1> *+CME ERROR: <err>*
Set command +STMS=<item>[,help]	Response *+CME ERROR: <err>* Parameter <item> numeric type, giving unique identifier of menu item <help> numeric type
Reference	Note For example, AT+STMS=2,1 will select item 2 from the main menu with help.

7.4.6 AT+STRT SIM Toolkit Response Timer Command

When a proactive command is received from the SIM an automatic response timer is started. If this timer expires before the application has provided a suitable response via the +STCR command, a Terminal Response is sent to the SIM containing a result of No User Response. This AT command allows the automatic response timeout period to be configured by the application at run-time, thus giving it extended time to respond to certain proactive commands (e.g. the Get Input command may request a long input string to be entered as part of the associated test case). The default setting for the response timer is ten seconds, and the maximum duration available is one hour.

Tab5 14 AT+STRT SIM Toolkit Response Timer Command	
Test command AT+STRT=?	Response +STRT: (list of supported <duration>s) *+CME ERROR: <err>*
Read command AT+STRT?	Response +STRT: <duration> *+CME ERROR: <err>* Parameter See set command
Set command +STRT=<duration>	Response *+CME ERROR: <err>* Parameter <duration> numeric type. Minimum = 1s, maximum = 3600s
Reference	Note Default setting is ten seconds

7.4.7 AT+STTONE SIM Toolkit Tone Command

The application may request a tone to played after receiving the Play Tone proactive command. The application either starts playing the tone with the requested tone Id, or stops playing the current tone depending on the <mode> parameter. Tones may be played in either idle or dedicated mode.

On completion of the current tone, unsolicited result code +STTONE: 0 will be issued by the CI Task. However, if <mode>=0 is used to terminate the tone before it has completed playing there will be no unsolicited result code but only a result code of OK generated by the CI Task.

Tab5 14 AT+STMS SIM Toolkit Menu Selection Command

Test command AT+STTONE=?	Response +STTONE: (list of supported <mode>s),(list of supported <tone>s),<list of supported <duration>s> *+CME ERROR: <err>*
Set command +STTONE=<mode>[,<tone>[,<duration>]]	Response *+CME ERROR: <err>* Parameter <mode> 0 Stop playing tone 1 Start playing tone <tone> numeric type 1 Dial Tone 2 Called Subscriber Busy 3 Congestion 4 Radio Path Acknowledge 5 Radio Path Not Available / Call Dropped 6 Error / Special information 7 Call Waiting Tone 8 Ringing Tone 16 General Beep 17 Positive Acknowledgement Tone 18 Negative Acknowledgement or Error Tone <duration> numeric type, in milliseconds. Max requested value = 255*60*1000 = 15300000ms (supported range = 1- 15300000)
Reference	Note The default <tone>, if none entered, is General Beep. The default <duration>, if none entered, is 500ms.

8 AT COMMANDS ADDITIONAL TO ITM100 II

This section lists the AT commands and responses that are additional to ITM100. For each of the commands listed in the table below a more detailed description is provided in the following section. Some commands are SIMCOM proprietary as none currently exist in the GSM specifications for certain functions. If an AT command is SIMCOM proprietary it is indicated in the table below.

8.1.1 Overview

Command	Description	SIMCOM Proprietary
+CLTS	Get local timestamp. (Time/Date comes from NITZ)	Y
+CFUN	Set phone functionality	
+CEXTHS	External headset jack control	Y
+CEXTBUT	Headset button status reporting	Y
+CMUT	Mute control	
+CLVL	Loudspeaker volume level	
+CBC	Battery charge	
+CUSD	Unstructured supplementary service data	
+CSSN	Supplementary services notification	
+CSIM	Generic SIM access	
+CMUX	GSM 07.10 Multiplexer control	
+CPOL	Preferred operator list	
+COPN	Read operator names	
+CNUM	Read Subscriber Number	
+CSMINS	SIM inserted status reporting	Y
+CCLK	Clock	
+CALM	Alert Sound Mode (ringer type)	
+CRSL	Ringer Sound Level	
+CPUC	Price Per Unit and Currency Table	
+CCWE	Call Meter Maximum Event	
+CLDTMF	Local DTMF Tone Generation	Y
+CDRIND	CS Call/GPRS PDP Context termination indication	Y
+CMEMO	Voice memo	Y
+CSPN	Get Service Provider name from SIM	Y
+CCVM	Get and Set the Voice Mail Number on the SIM	Y
+CGURC	Generic unsolicited result codes	Y
+CHFA	Swap the audio channels	Y
+CPCS	Choose the frequency band	Y

8.1.2 Detailed Description

Tab6 1 AT+CLTS Get local timestamp (Time/Date comes from NITZ).	
Test command AT+CLTS=?	Response
Set command AT+CLTS	Response +CLTS: <tds> Parameter <tds> time-string format: “yy/MM/dd,hh:mm:ss±zz” where characters indicate year

	(last two digits), month, day, hours, minutes, seconds and time zone
Reference	Note

Tab6 2 AT+CFUN	Set phone functionality.
Test command AT+CFUN=?	Response +CFUN: (list of supported <fun>s), (list of supported <rst>s) *+CME ERROR: <err>* Parameter See set command
Read command AT+CFUN?	Response +CFUN: <fun> *+CME ERROR: <err>* Parameter See set command
Set command AT+CFUN=<fun>,[<rst>]	Response *+CME ERROR: <err>* Parameters <fun> 0 minimum functionality 1 full functionality (Default) 2 disable phone transmit RF circuits only 3 disable phone receive RF circuits only 4 disable phone both transmit and receive RF circuits 5...127 reserved for manufacturers as intermediate states between full and minimum functionality. <rst> 0 Set the function level of module to <fun> right now. (This value is a default value if the value of <rst> is not given) 1 Not set the function level of module to <fun> right now, but set the function level of module to <fun> everytime when the module been reset(Power down then Power on)
Reference [5]	Note Support for this command will be hardware dependant. For UPGRADE_SYSTEM_2, <fun> settings above 1 are not supported. <fun> = 0 performs all system shutdown actions without removing power <fun> = 1 performs a system startup

Tab6 3 AT+EXTHS	External headset jack control
Read command AT+CEXTHS?	Response +CEXTHS: <n>,<attach> Parameters <n> 0 unsolicited result code disabled 1 unsolicited result code enabled <attach> 0 unattached external headset 1 attached external headset Unsolicited result code:

	+CEXTHS: <attach>
Set command AT+CEXTHS=<n>	Response Parameter <n> 0 Disable unsolicited result code 1 Enable unsolicited result code
Reference	Note Support for this command will be hardware dependant

Tab6 4 AT+EXTBUT External headset button status reporting	
Read command AT+CEXTBUT?	Response +CEXTBUT: <n>,<pressed> Unsolicited result code: +CEXTBUT: <pressed> Parameters <n> 0 Unsolicited result code disabled 1 Unsolicited result code enabled <pressed> 0 Headset button not pressed 1 Headset button pressed
Set command AT+CEXTBUT=<n>	Response Parameter <n> 0 Disable unsolicited result code 1 Enable unsolicited result code
Reference	Note Support for this command will be hardware dependant

Tab6 5 AT+CMUT Mute control	
Test command AT+CMUT=?	Response +CMUT: (list of supported <n>s) Parameter See set command
Read command AT+CMUT?	Response +CMUT: <n> *+CME ERROR: <err>* Parameter See set command
Set command AT+CMUT=<n>	Response *+CME ERROR: <err>* Parameters <n> 0 mute off 1 mute on
Reference	Note

[5]	

Tab6 6 AT+CLVL Loudspeaker volume level	
Test command AT+CLVL=?	Response +CLVL: (list of supported <level>s) *+CME ERROR: <err>* Parameter See set command
Read command AT+CLVL?	Response +CLVL: <level> *+CME ERROR: <err>* Parameter See set command
Set command AT+CLVL=<level>	Response *+CME ERROR: <err* Parameters <level> integer type value with manufacturer specific range (smallest value represents the lowest sound level)
Reference [5]	Note

Tab6 7 AT+CBC Battery charge	
Test command AT+CBC=?	Response +CBC: (list of supported <bcs>s),(list of supported <bcl>s) Parameter See set command
Read command AT+CBC?	Response *+CME ERROR: <err>* Parameter
Set command AT+CBC	Response +CBC: <bcs>, <bcl> *+CME ERROR: <err>* Parameters <bcs> battery connection status 0 ME is powered by the battery 1 ME has a battery connected, but is not powered by it 2 ME does not have a battery connected 3 Recognized power fault, calls inhibited <bcl> battery connection level 0 battery is exhausted, or ME does not have a battery connected 1...100 battery has 1-100 percent of capacity remaining
Reference [5]	Note Support for this command will be hardware dependant

Tab6 8 AT+CUSD Unstructured supplementary service data	
Test command AT+CUSD=?	Response +CUSD: (list of supported <n>s) Parameter

	See set command
Read command AT+CUSD?	Response +CUSD: <n> *+CME ERROR: <err>* Parameter See set command
Set command AT+CUSD=[<n>[,<str>[,<dcs>]]]	Response *+CME ERROR: <err>* Parameters <n> 0 disable result code presentation in the TA 1 enable result code presentation in the TA 2 cancel session <str> string type: USSD string (see GSM 07.07 for use) <dcs> integer type: GSM 03.38 Cell Broadcast Data Coding Scheme Unsolicited result codes supported: +CUSD: <m>[,<str>,<dcs>] Parameters <m> 0 no further user action required 1 further user action required 2 USSD terminated by network 3 other local client has responded 4 operation not supported 5 network time out
Reference [5]	Note

Tab6 9 AT+CSSN	Supplementary service notifications
Test command AT+CSSN=?	Response +CSSN: (list of supported <n>s), (list of supported <m>s) Parameter See set command
Read command AT+CSSN?	Response +CSSN: <n>,<m> *+CME ERROR: <err>* Parameter See set command
Set command AT+CSSN=[<n>[,<m>]]	Response *+CME ERROR: <err>* Parameters <n> sets/shows +CSSI result code presentation status in the TA 0 disable 1 enable <m> sets/shows +CSSU result code presentation status in the TA 0 disable 1 enable
	Unsolicited result codes supported: +CSSI: <code1>[,<index>]

	+CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] Parameters <code1> 0 unconditional call forwarding is active 1 some conditional call forwarding types are active 2 call has been forwarded 3 call is waiting 4 this is a CUG call (<index> also present) 5 outgoing calls are barred 6 incoming calls are barred 7 CLIR suppression rejected <index> integer type: 0..9 CUG index 10 no index (preferred CUG taken from subscriber info) <code2> 0 forwarded call (MT call setup) 1 not implemented 2 call put on hold (during voice call) 3 call retrieved (during voice call) 4 multiparty call entered (during voice call) 5 call on hold released (during voice call) 6 forward check SS message received <number> string type: phone number, in format specified by <type> <type> integer type: type of address octet (see GSM04.08, sec.10.5.4.7) <subaddr> string type: subaddress, in format specified by <satype> <satype> integer type: type of subaddress, as per GSM 04.08, sec. 10.5.4.8
Reference [5]	Note <code 2> values 2,3,4 and 5 assume that the +CHLD command is used to manipulate the current call list.

Tab6 10 AT+CSIM Generic SIM Access	
Test command AT+CSIM=?	Response OK
Set command AT+CSIM=<length>,<command>	Response +CSIM: <command>,<response> *+CME ERROR: <err>* Parameters <length> integer type: length of characters sent to the TE in <command> or <response> (i.e. twice the number of octets in the raw data) <command> string type: hex format: GSM 11.11 SIM command sent from the ME to the SIM <response> string type: hex format: GSM 11.11 response from SIM to <command>
Reference GSM07.07	Note

Tab6 11 AT+CMUX Serial Multiplexer control	
Test command AT+CMUX=?	Response +CMUX: (list of supported <mode>s) Parameter See set command

Read command AT+CMUX?	Response +CMUX: <mode> *+CME ERROR: <err>* Parameter See set command
Set command AT+CMUX=<mode>	Response *+CME ERROR: <err>* Parameters <mode> 0 Basic option (i.e. No multiplexer in operation) 1 Advanced option (GSM 07.10 multiplexer) 2 Proprietary option (manufacturer specific multiplexer)
Reference GSM07.07	Note

Tab6 12 AT+CPOL Preferred operator list

Test command AT+CPOL=?	Response +CPOL: (list of supported <index>s),(list of supported <format>s) Parameter See set command
Read command AT+CPOL?	Response +CPOL: <index1>,<format>,<oper1> [<CR><LF>+CPOL: <index2>,<format>,<oper2> […]] *+CME ERROR: <err>* Parameter See set command
Set command AT+CPOL=[<index>][,<format>[,<oper>]]	Response *+CME ERROR: <err>* Parameters <index> integer type: order number of operator in SIM preferred operator list <format> 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> <oper> string type: <format> indicates whether alphanumeric or numeric format used (see +COPS command)
Reference [5]	Note

Tab6 13 AT+COPN Read operator names

Test command AT+COPN=?	Response OK
Execute command AT+COPN	Response +COPN: <numeric1>,<alpha1 > [<CR><LF>+COPN: <numeric2>,<alpha2> […]] *+CME ERROR: <err>* Parameters <numeric*n*> string type: operator in numeric format (see +COPS) <alpha*n*> string type: operator in long alphanumeric format (see +COPS)

Reference	Note
[5]	

Tab6 14 AT+CNUM Subscriber Number

Test command	Response
AT+CNUM=?	OK

Execute command	Response
AT+CNUM	+CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service> [,<itc>]] [...]] *+CME ERROR: <err>* Parameters <alpha*x*> optional alphanumeric string associated with <*number*x*>*; used character set should be the one selected with command Select TE Character Set +CSCS <number*x*> string type phone number of format specified by <type*x*> <type*x*> type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7) <speed> as defined by the +CBST command <service> (service related to the phone number:) 0 asynchronous modem 1 synchronous modem 2 PAD Access (asynchronous) 3 Packet Access (synchronous) 4 Voice 5 Fax <itc> (information transfer capability:) 0 3.1 kHz 1 UDI
Reference	Note
[5]	

Tab6 15 AT+CSMINS SIM inserted status reporting

Read command	Response
AT+CSMINS?	+CSMINS: <n>,<inserted> Unsolicited result code: +CSMINS: <inserted> Parameters <n> 0 Disable unsolicited result code 1 Enable unsolicited result code <inserted> 0 SIM change inserted → removed 1 SIM change removed → inserted
Set command	Response
AT+CSMINS=<n>	Parameter <n> 0 Disable unsolicited result code 1 Enable unsolicited result code

Reference	Note

Tab6 16 AT+CCLK Clock

Test command AT+CCLK=?	Response Parameter
Read command AT+CCLK?	Response +CCLK: <time> *+CME ERROR: <err>* Parameter See set command
Set command AT+CCLK=<time>	Response *+CME ERROR: <err>* Parameters <time> string type value; format is "yy/MM/dd,hh:mm:ss"; where characters indicate year (two last digits), month, day, hour, minutes and seconds e.g: 22:10:00 GMT equals to "94/05/06,22:10:00"
Reference [5]	Note ME does not support time zone indication

Tab6 17 AT+CALM Alert Sound Mode

Test command AT+CALM=?	Response +CALM: (list of supported <mode>s) *+CME ERROR: <err>* Parameter See set command
Read command AT+CALM?	Response +CALM: <mode> *+CME ERROR: <err>* Parameter See set command
Set command AT+CALM=<mode>	Response *+CME ERROR: <err>* Parameters <mode> 0 normal mode 1 silent mode (all sounds from ME are prevented)
Reference [5]	Note

Tab6 18 AT+CRSL Ringer Sound Level

Test command AT+CRSL=?	Response +CRSL: (list of supported <level>s) *+CME ERROR: <err>* Parameter See set command

Read command AT+CRSL?	Response +CRSL: <level> *+CME ERROR: <err>* Parameter See set command
Set command AT+CRSL=<level>	Response *+CME ERROR: <err>* Parameters <level> integer type value with manufacturer specific range (smallest value represents the lowest sound level)
Reference [5]	Note Range of <level> is TBD

Tab6 19 AT+CPUC Price Per Unit and Currency Table	
Test command AT+CPUC=?	Response Parameter
Read command AT+CPUC?	Response +CPUC: <currency>,<ppu> *+CME ERROR: <err>* Parameter See set command
Set command AT+CPUC=<currency>,<ppu>[,<passwd>]	Response *+CME ERROR: <err>* Parameters <currency> string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS <currency> string type; price per unit; dot is used as a decimal separator (e.g. "2.66") <passwd> string type; SIM PIN2
Reference [5]	Note

Tab6 20 AT+CCWE Call Meter Maximum Event	
Test command AT+CCWE=?	Response +CCWE: (list of supported <mode>s) *+CME ERROR: <err>* Parameter See set command
Read command AT+CCWE?	Response +CCWE: <mode> *+CME ERROR: <err>* Parameter See set command
Set command	Response

AT+CCWE=<mode>	*+CME ERROR: <err>* Parameters <mode> 0 Disable call meter warning event 1 Enable call meter warning event
	Unsolicited result codes supported: +CCWV Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command. The warning is issued approximately when 5 seconds call time remains. It is also issued when starting a call if less than 5 s call time remains. Parameters
Reference [5]	Note GSM 07.07 specifies 30 seconds, so SIMCOM deviate from the specification.

Tab6 21 AT+CLDTMF Local DTMF Generation	
Test command AT+CLDTMF=?	Response Parameter
Read command AT+CLDTMF?	Response Parameter
Set command AT+CLDTMF=<n>,<dtmf-string>	Response *+CME ERROR: <err>* Parameters <n> Duration of all DTMF tones in <dtmf-string> in 1/10 seconds <dtmf-string> as a max length of 20 characters of form <dtmf>, must be entered between double qoutes (“ “) and consists of combinations of the following separated by commas: <dtmf> A single ASCII characters in the set 0-9,#,*,A-D. This is interpreted as a sequence of DTMF tones whose duration is set by <n>
Execute command AT+CLDTMF	Response Aborts any DTMF tone currently being generated and any DTMF tone sequence Parameters
Reference	Note

Tab6 22 AT+CDRIND CS Call / GPRS PDP Context Termination Indication	
Read command AT+CDRIND?	Response +CDRIND: <n> Unsolicited result code: +CDRIND: <channel>

	Parameters <n> 0 Unsolicited result code disabled 1 Unsolicited result code enabled <channel> 0 CS voice 1 CS Data/Fax 2 GPRS (PPP)
Set command AT+CDRIND=<n>	Response Parameter <n> 0 Disable unsolicited result code 1 Enable unsolicited result code
Reference	Note This unsolicited result code is useful for use with Class B operation and the software Multiplexer. The unsolicited result code will be sent after the “NO CARRIER” result code

Tab6 23 AT+CMEMO Voice memo	
Execute command AT+CMEMO=<cmd_type>, [<location>]	Response +CMEMO: <result> Parameters <cmd_type> integer type: 0 play 1 delete 2 Record <location> integer type: 1-10 <result > integer type: 0 memo record/play start failed (error occurred) 1 memo record/play started 2 memo record/play stopped 3 memo record/play aborted (error occurred)
Reference	Note: It is possible to have more than one result per action e.g. when recording and playing back voice memos If <location> is not entered, attempt is made to store memo to next available record in the voice memo context. <location> field can only be omitted for recording. Example voice memo command sequence: AT+CMEMO=2,1 +CMEMO: 1 +CMEMO: 2 OK Any character entered via the AT interface will stop record or playback.

Tab6 24 AT+CSPN Service Provider Name (from SIM)	
Read command +CSPN?	Response +CSPN: <spn>,<display mode> *+CME ERROR: <err>* Parameters <spn> string type; service provider name on SIM <display mode> 0 – don't display PLMN. Already registered on PLMN 1 – display PLMN
Reference	Note CME errors possible if SIM not inserted, PIN not entered, or SPN service is not allocated and activated in the SIM Service Table.

Tab6 25 AT+CCVM Read and Write The Voice Mail Number On The SIM	
Test command AT+CCVM=?	Response +CCVM: <vm number>[,<alpha string>] Parameter
Read command AT+CCVM?	Response +CCVM: <vm number>[,<alpha string>] Parameter
Set command AT+CCVM=<vm number>[,<alpha string>]	Response *+CME ERROR: <err>* Parameters <vm number> String Type -The voice mail number to write to the SIM <alpha-string> String Type -The alpha-string to write to the SIM
Reference	Note CPHS voice mail only currently available on Orange SIMS

Tab6 26 AT+CGURC Generic Unsolicited Result Codes	
Test command AT+CGURC=?	Response +CGURC: (list of supported <state>s),(list of supported <event>s) Parameter
Read command AT+CGURC?	Response +CGURC: <state> Parameter
Set command AT+CGURC=<state>	Response *+CME ERROR: <err>* Parameters <state> 0 - generic unsolicited result codes disabled (default) 1 - generic unsolicited result codes enabled <event> 0 - active call disconnected, held call(s) still connected
Reference	Note This command enables or disables the presentation of an unsolicited result code when triggered by any defined event. The result code is of the form:

	+CGURC: <event> At present only one event is defined, however any event that requires notification to the user can be defined (in the source code) and used to trigger the unsolicited result code. The set command enables or disables the presentation of result codes for all defined events.

Tab6 27 AT+CHFA Swap the audio channels	
Test command AT+CHFA=?	Response +CHFA: (0 = NORMAL_AUDIO, 1 = AUX_AUDIO) Parameter
Read command AT+ CHFA?	Response + CHFA: <n> Parameter
Set command AT+ CHFA =<state>	Response OK *+CME ERROR: <err>* Parameters <n> 0 – Normal audio channel(default) 1 – Aux audio channel
Reference	Note This command swaps the audio channels between the normal channel and the aux channel.

Tab6 27 AT+CPCS Choose the frequency band	
Test command AT+CPCS=?	Response +CPCS: (0 = EGSM_DCS, 1 = EGSM_PCS) Parameter
Read command AT+ CPCS?	Response + CPCS: <band> Parameter
Set command AT+ CPCS =<n>	Response <state> *+CME ERROR: <err>* Parameters <band> 0 (EGSM_DCS) 1 (EGSM_PCS) <state> PCS OFF- EGSM and DCS together PCS ON - EGSM and PCS together <n> 0 - EGSM and DCS together 1 - EGSM and PCS together
Reference	Note

9 SUPPORTED UNSOLICITED RESULT CODES

This section lists the unsolicited result codes supported in the Data Services software. The AT commands specific to ITM100 III implementation which are defined in this document include details of the relevant values supported.

Unsolicited Result Code	Description	ITM100 III Specific?	SIMCOM Proprietary
+CME ERROR	Error report	N	
+CR	Service reporting control	N	
+DR	Data compression control	N	
+ILRR	Determines whether the used local TE-TA data rate is informed using intermediate result code +ILRR: <rate> before going online data state after call answering or originating	N	
+CMTI	New SMS indication	N	
+CMT	New SMS indication including message content	N	
+CBM	New CBS indication including message content	N	
+CDS	SMS-STATUS-REPORT indication	N	
+CMS ERROR	SMS error report	N	
+CCWA	Call waiting indication	N	
+CLIP	Calling line identification presentation	N	
+COLP	Connected Line Identification Presentation	N	
+CREG	Network registration	N	
+CRING	Extended format: incoming call indication	N	
+CSSI	intermediate result indication / Supplementary service notifications	Y	
+CSSU	unsolicited result indication / Supplementary service notifications	Y	
+CUSD	Unstructured supplementary service data	Y	
+CEXTHS	External headset jack state reporting	Y	Y
+CEXTBUT	External headset button state reporting	Y	Y
+CGEV	GPRS event reporting information	Y	
+CSMINS	SIM insertion and removal reporting	Y	Y
+CCWV	Call Meter Maximum Event	Y	
+CDRIND	CSD call or GPRS PDP context termination reporting	Y	Y
+CGURC	Generic unsolicited result code	Y	Y

10 AT COMMANDS SAMPLE

10.1 Profile Commands

Demonstration	Syntax	Expect Result
The AT command interpreter is actively responding to input.	AT	OK
Display product identification information: the manufacturer, the product name and the product revision information.	ATI	SIMCOM_Ltd SIMCOM_ITM100 Revision:ITM100_V01.00
Display current configuration, a list of the current active profile parameters.	AT&V	[A complete listing of the active profile]
Reporting of mobile equipement errors. The default CME error reporting setting is disabled. Switching to verbose mode displays a string explaining the error in more details.	AT+CMEE=? AT+CMEE? AT+CSCS=? AT+CSCS=”TEST” AT+CMEE=2 AT+CSCS=”TEST”	+CMEE:(0,1,2) +CMEE:0 +CSCS:”GSM” +CSCS:”UCS2” ERROR OK +CME ERROR: +CSCS type not found
Storing the current configuration in nonvolatile memory. When the board is reset, configuration changes from the last session are loaded.	ATE0;&W AT [Reset the board] AT ATE1;&W AT	OK [No echo] OK [No echo] [Echo on]
Set the ME to NON-CYCLIC SLEEP mode.	AT+CFUN=0	OK

When, for example, and SMS is being received and indicated by an unsolicited result code (URC), the ME wakes up to full operation.

+CMTI:”SM”,5 Note that the URC used in this example will appear only if CMTI=1,1 was configured before.

After this, you may want to verify the operation status:

ME has entered full functionality mode.	AT+CFUN?	+FUN:1
Reset and restart the ME	AT+CFUN=1,1 Alternatively,	OK

	AT+CFUN=0,1 or 5,1 or 6,1 or 7,1 or 8,1	^SYSSTART

The ^SYSSTART URC confirms that the ME has been rebooted. Note that ^SYSSTART appears only if AT+IPR≠0.

10.2 SIM Commands

Demonstration	Syntax	Expect Result
Listing available phonebooks, and selecting the SIM phone book.	AT+CPBS=? AT+CPBS="SM"	+CPBS:("DC","FD", "LD","ON","SM","MC") OK
Displaying the ranges of phone book entries and listing the contents of the phone book.	AT+CPBR=? AT+CPBR=1,10	+CPBR:(1-150),41,14 [a listing of phone book contents]
Wrinting an entry to the current phonebook.	AT+CPBW=,"13918 18xxxx", ,"Daniel" AT+CPBR=1,10	OK [a listing of phone book contents]
Finding an entry in the current phonebook using a text search.	AT+CPBF="Daniel"	+CPBF: 5,"139181860 89",129,"Daniel"
Deleting an entry from the current phonebook specified by its position index.	AT+CPBW=2," " AT+CPBR=1,10	OK [a listing of phone book contents]

10.3 General Commands

Demonstration	Syntax	Expect Result
Displays the current network operator that the handsent is currently registered with.	AT+COPS?	+COPS: 0,0,"CHINA MOBILE"
Display a full list of network operator names.	AT+COPN	AT+COPN +COPN:"20201", "COSMO" [skip a bit] +COPN:"730100", "ENTEL PCS" OK

Power down the phone – reducing its functionality. This will deregister the handset from the network.	AT+CFUN=0 [wait for deregister] ATD6241xxxx; AT+CFUN=1	OK NO CARRIER OK
CFUN disables access to the SIM. CSMINS shows when the SIM is available again.	AT+CSMINS=1 AT+CFUN=0 AT+CFUN=1	OK OK +CSMINS:0 OK +CSMINS:1
Emulating the MIMI keypad to make a voice call.	AT+CKPD="6241xxxxs",4,4	OK [the voice call is connected]
Request the IMSI	AT+CIMI	460008184101641
Record and Play a memo by deleting the memo location, recording and playing the memo.	AT+CMEMO=1,1 AT+CMEMO=2,1 AT+CMEMO=0,1	OK(operation,index) +CMEMO:1 +CMEMO:2 OK +CMEMO:0 ERROR

10.4 GPRS Commands

Demonstration	Syntax	Expect Result
To establish a GPRS context.	Setup modem driver Setup dial up connection with *99# Run internet explorer	Should be able to surf the web using Internet explorer.

There are two GPRS Service Codes for the ATD Command: Value 98 and 99. Establish a connection by service code 99. Establish a connection by service code 99, IP address123… and L2P=PPP and using CID 1.The CID has to be defined by AT+CGDCONT. Establish a connection by service code 99 and L2P=PPP Establish a connection by service code 99 and using CID 1 Establish a connection by service code 99 and L2P=PPP and using CID1. The CID has to be defined by AT+CGDCONT Establish an IP connection by service code 98	 ATD*99# ATD*99*123.124.125.126*PPP*1# ATD*99**PPP# ATD*99***1# ATD*99**PPP*1# ATD*98#	
To check if the MS is connected to the GPRS network Detach from the GPRS network To check if the MS is connected to the GPRS network	AT+CGATT? AT+CGATT=0 AT+CGATT?	+CGATT:1 OK +CGATT:0
To check the class of the MS	AT+CGCLASS?	+CGCLASS:B
Establish a context using the terminal equipment: defines CID 1 and sets the PDP type to IP, access point name and IP address aren't set.	AT+CGDCONT=1, "IP" ATD*99#	OK CONNECT <data>
Cancel a context using the terminal equipment Pause data transfer and enter command mode by +++ Stop the GPRS data transfer	AT+CGDCONT=1, "IP" ATD*99# +++ ATH	OK CONNECT <data> OK
Reconnect a context using the terminal equipment	AT+CGDCONT=1, "IP"	OK CONNECT

Resume the data transfer	AT*99# +++ ATO	<data> CONNECT <data>
Pause the data transfer and make a voice call. The the release of voice call, resume the data transfer	AT+CGDCONT=1, ”IP” ATD*99# +++ ATD6241xxxx; ATH ATO ATH	OK CONNECT <data> OK OK CONNECT <data> OK

*****Quality of Service(QoS) is a special parameter of a CID which consists of several parameters itself.

The QoS consists of

The precedence class
The delay class
The reliability class
The peak throughput class
The mean throughput class

And is decided in “requested QoS” and “minimum acceptanble QoS”.

All parameters of the QoS are initiated by default to the “network subscribed value (=0)” but the QoS itself is set to be undefined. To define a QoS use the AT+CGQREQ or AT+CGQMIN command.

Overwrites the precedence class of QoS of CID 1 and sets the QoS of CID 1 to be present	AT+CGQREQ=1,2	OK
Response: all QoS values of CID 1 Are set to network subscribed except precedence class which is set to 2	AT+CGQREQ?	+CGQREQ:1,2,0,0,0,0 OK
Set the QoS of CID 1 to not present. Once defined, the CID it can be activated.	AT+CGQREQ=1	OK
Activate CID 2, if the CID is already active, the mobile returns OK at once. If no CID is defined the mobile responses +CME ERROR: invalid index. Note: If the mobile is NOT attached by AT+CGATT=1 before activating,	AT+CGACT=1,2 AT+CGACT=1,3	OK +CME ERROR: 123

the attach is automatically done by the AT+CGACT command.		
Use the defined and activated CID to get online. The mobile can be connected using the parameters of appointed CID or using default parameter	AT+CGDATA="PPP", 1	CONNECT

The mobile supports Layer 2 Protocol(L2P) PPP only.
Note: If the mobile is NOT attached by AT+CGATT=1 and the CID is NOT activated before connecting, attaching and activating is automatically done by the AT+CGDATA command.

Some providers require to use an APN to establish a GPRS connection. So if you use the Microsoft Windows Dial-Up Network and ATD*9... to connect to GPRS you must provide the context definition as part of the modem definition (Modem properties / Connection / Advanced... / Extra settings.) As an alternative, you can define and activate the context in a terminal program (e.g. Microsoft HyperTerminal) and then use the Dial-Up Network to send only the ATD command.

10.5 Call Control Commands

Demonstration	Syntax	Expect Result
Make a voice call	ATD6241xxxx;	OK MS makes a voice call
Hang up a call	ATH	OK Call dropped
Make a voice call using the last number facility. The initial call is established then cancelled. The second call is made using the previous dial string.	ATD6241xxxx; ATH ATDL	OK OK
Make a circuit switch data call	ATD*99#	The dial string does not include the terminating semicolon. The call is made to a configured modem. Data can be exchanged using a terminal emulator.
Make a circuit switch data call, suspend the call and then resume the call	ATD*99# +++ ATO	CONNECT <text> OK CONNECT

		<text>
Example of a MT voice call	Make MT voice call to MS. ATA ATH	RING RING OK[accept call] OK[hang up call]
Call related supplementary service: AT+CHLD. This command provides support for call waiting functionality.	AT+CHLD=<N> <N>=0 RELEASE ALL HELD CALLS OR SENDS USER BUSY STATUS TO WAITING CALL <N>=1 RELEASE ALL ACTIVE CALLS AND ACCEPT OTHER CALL(WAITING OR HELD) <N>=1X RELEASE CALL X <N>=2 PLACE ALL ACTIVE CALLS ON HOLD AND ACCEPT CALL <N>=2X PLACE ALL CALLS ON HOLD EXCEPT CALL X	Return value:(0,1,1x,2,2x,3)
Terminate current call and accept waiting call. Establish a voice call from EVB, receive an incoming call(incoming call accepts waiting status), terminate active call and accept incoming call. Note call waiting must be active for this option – use “AT+CCWA=1,1” before running this demonstration.	AT+CCWA=1,1 ATD6241xxxx; <RX incoming call> AT+CHLD=1	OK OK +CCWA:”62418148”, 129,1 OK <waiting call active>
Set current call to busy and accept waiting call. Establish a voice call from EVB, receive an incoming call(incoming call accepts waiting status), place active call on hold and switch to	ATD6241xxxx; <RX incoming call> AT+CHLD=2 AT+CHLD=1	 +CCWA:”1391818 6089”,129,1 OK<waiting call active other call on hold> OK<incoming call

incoming call. Terminate active call and switch back to original call. Note call waiting must have been previously enabled for this demonstration to work.		terminated, dialed number now active>
Switch between active and held calls. Establish a voice call from EVB, receive an incoming call (incoming call accepts waiting status), place active call on hold and switch to incoming call. Switch between both calls, placing each in the hold state whilst the other is active before terminating each one. This feature relies on knowing each call's ID. This is done using the List Current Calls(AT+CLCC) command. A call's ID is required to switch between held and active calls. Held calls that are not automatically resumed when all other calls are terminated. They need to be made active using the AT+CHLD=2x command. Note call waiting must have been previously enabled for this demonstration to work.	ATD6241xxxx; <RX incoming call> AT+CHLD=2 AT+CHLD=21 AT+CCLC AT+CHLD=23 AT+CHLD=13 AT+CHLD=11	OK +CCWA:"1391818 6089",129,1 OK <incoming call activated,original on hold> OK <original call active,incoming call held> +CLCC:1,0,0,0,0,"62 418148",129 +CLCC:3,1,1,0,0,"139 18186089",129 OK < note incoming call held flag set> OK <original call held, incoming call active> OK <terminate incoming call> <terminate original call>
Send busy status to incoming waiting caller. Establish a voice call from EVB, receive an incoming call(incoming call accepts waiting status), send 'busy' status to waiting mobile. Note call waiting must have been previously enabled for this demonstration to work.	ATD6241xxxx; <RX incoming call> AT+CHLD=0	OK +CCWA:"1391818 6089",129,1 OK OK <incoming call sent busy msg, current call retained>
Drop all calls on hold. Establish a voice call from EVB, receive an incoming call (incoming	ATD6241xxxx; <RX incoming call>	OK +CCWA:"1391818

call accepts waiting status), switch to incoming call and drop all waiting calls. Note call waiting must have been previously enabled for this demonstration to work.	AT+CHLD=2 AT+CHLD=0	6089",129,1 OK <incoming call active, original on hold> OK <incoming call on hold terminated, current call retained>

10.6 SIM Toolkit Commands

Demonstration	Syntax	Expect Result
Inform voyager that the accessory Has SAT97 capability and sets the output to TEXT mode.	AT+STPD=5,1F7FF F7F7F AT+CMGF=1	OK +STC: 25 OK +STC: 81
Sets the response timer	AT+START=200	OK

10.7 Audio Commands

Demonstration	Syntax	Expect Result
DTMF tones	AT+CLDTMF=2,"1, 2,3,4,5"	DTMF tones generated in the headset

10.8 SMS commands

Demonstration	Syntax	Expect Result
Set SMS system into text mode, as opposed to PDU mode.	AT+CMGF=1	OK
Send an SMS to myself.	AT+CMGS="+8613 91818xxxx" >This is a test	+CMGS:34 OK
Unsolicited notification of the SMS arriving		+CMTI:"SM",1
Read SMS message that has just arrived.	AT+CMGR=1	+CMGR: "REC UNREAD",

Note: the number should be the same as that given in the +CMTI notification.		“+8613918186089”, ,”02/01/30,20:40:31+00” This is a test OK
Reading the message again changes the status to “READ” from ”UNREAD”	AT+CMGR=1	+CMGR: “REC READ”, “+8613918186089”, , “02/01/30,20:40:31+00” This is a test OK
Send another SMS to myself.	AT+CMGS=”+861391818xxxx” >Test again	+CMGS:35 OK
Unsolicited notification of the SMS arriving		+CMTI:”SM”,2
Listing all SMS messages. Note:”ALL” must be in uppercase.	AT+CMGL=”ALL”	+CMGL: 1,”REC READ”,”+8613918186089”, , “02/01/30,20:40:31+00” This is a test +CMGL: 2,”REC UNREAD”,” ”,”+8613918186089”, , “02/01/30,20:45:12+00” Test again OK
Delete an SMS message.	AT+CMGD=1	OK
List all SMS messages to show message has been deleted.	AT+CMGL=”ALL”	+CMGL: 2,”REC READ”, “+8613918186089”,”02/01/30,20:45:12+00” Test again OK
Send SMS using Chinese characters	AT+CSMP=17,0,2,25 AT+CSCS=”UCS2” AT+CMGS=”00310033003900310038003x003x003x003x” >4E014E50	OK OK +CMGS:36 OK